



BRITISH
HIP
SOCIETY

BRITISH HIP SOCIETY ANNUAL SCIENTIFIC MEETING

& Instructional Course

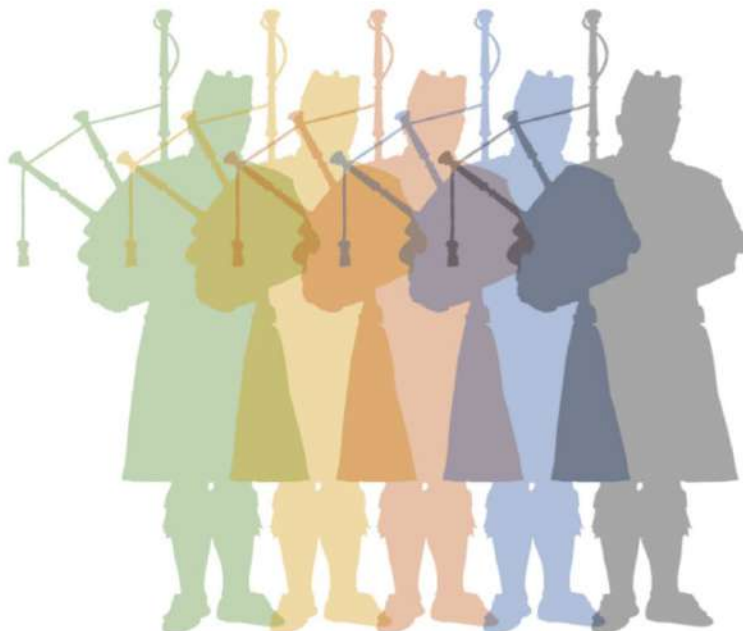
2023 | EICC, EDINBURGH

8th - 10th March



Programme

The Royal College of Surgeons of England has awarded **up to 16.25 CPD points**



#bhs2023

BRITISH HIP SOCIETY
ANNUAL SCIENTIFIC
MEETING
& Instructional Course



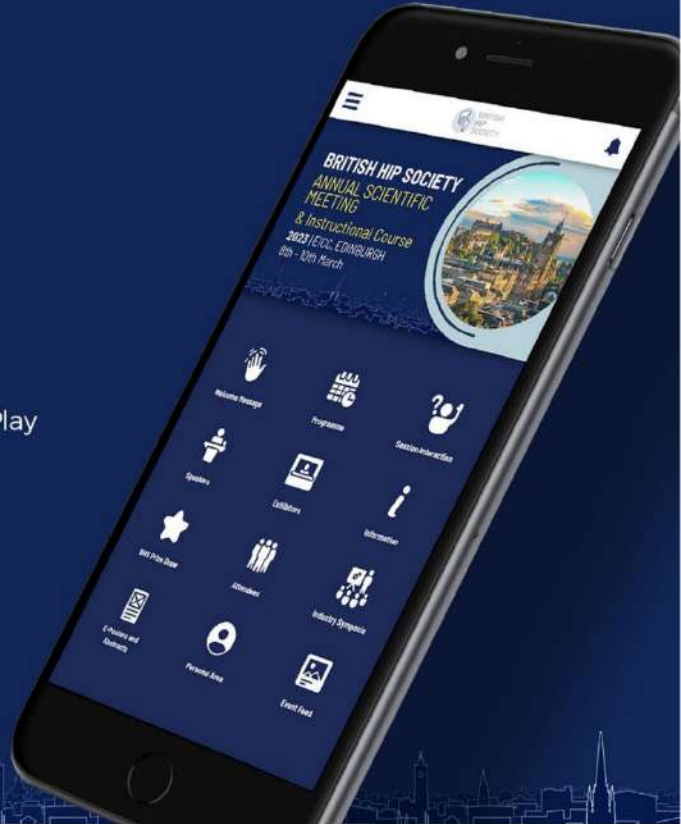
**BRITISH
HIP
SOCIETY**



**Download the
BHS 2023 official App**

- 1 Look up "BHS 2023"
on AppStore or Google Play
- 2 Download the App
- 3 Enjoy!

**BHS
2023**



Engage



Debate



Enjoy



Executive Committee

britishhipsociety.com | [#bhs2023](https://twitter.com/bhs2023)



BRITISH
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SOCIETY

Instructional Course 2023

The Hip - Applied Clinical Knowledge



EICC, Edinburgh

Friday 10th March

The Royal College of Surgeons of England has awarded **up to 6 CPD points**

Why attend?

✓ **Calling all Trainees** preparing for the FRCS (Orth) exam and those who wish to develop an interest in Hip Surgery.

✓ **20+ Diverse Surgeon Faculty** and opinion leaders giving an insight through video-based presentations, debates and didactic talks.



Satish Kutty

BHS Education Committee Chair
Instructional Course Convenor

JOIN US



britishhipsociety.com

#bhs2023

Welcome to EDINBURGH!

EICC venue - how to get here?

[Click here](#)

Food & drinks recommendations?

[Click here](#)

Top attractions | things to do?

[Click here](#)



#bhs2023

Contents

	Page
President's Welcome	5
Foreword	6
General information FAQs	8
Sponsors Industry Exhibition	9
Programme at-a-glance	12
Venue Floorplan	13
BHS Schools Engagement	14
Annual Scientific Programme	15
BOMSA x BHS Programme	61
Instructional Course Programme	63
<u>Available online and BHS 2023 App only:</u>	
Abstracts: PODIUM SCIENTIFIC PAPERS	71
Abstracts: JAM SCIENTIFIC PAPERS	119
Abstracts: POSTER SCIENTIFIC PAPERS	156



President's Welcome

Dear Friends,

It's an absolute pleasure for me to welcome all of you to Edinburgh for our 2023 Annual Scientific Meeting and Instructional Course. The BHS Executive, in particular Simon Buckley, Satish Kutty and Joanna Maggs, have been working incredibly hard to design the most informative, diverse, engaging, and innovative BHS scientific programme and meeting yet, which aims to cater to the requirements of all our members.

Whilst maintaining the traditional BHS 'flavour', we have reimagined the scientific programme to encompass six 'topics in focus' (TIF) with equity in subject matter. The TIFs have been designed to be interactive and include: Primary Arthroplasty; Revision Arthroplasty; Non-Arthroplasty Hip Surgery; Trauma; Artificial Intelligence; and Greater Trochanteric Pain Syndrome (an inaugural topic by our newly inducted physiotherapist members). We have also introduced the concept of the 'Plenary Hour', during which we will have the lectures from our Keynote Speakers as well as other important updates. We are pleased to welcome Prof Paul Beaulé from Canada as my Presidential Guest Speaker and Prof Klaus Siebenrock from Switzerland as the first ever Charnley Legacy Lecturer. The Plenary Hour will also include updates from the National Joint Registry, BAJIR Registry, Non-Arthroplasty Registry, Culture and Diversity Committee, reports from travelling fellows and the annual Presidential update. The meeting programme also includes a debate on robotic surgery, complex case discussion session, the emerging hip surgeons' forum, six corporate symposia, a special session on unconscious bias, podium presentations of the latest research and an excellent array of 'Just a Minute' (JAM) and electronic poster presentations.

The last day of the programme will have the Instructional Course running in parallel. The theme this year is 'Applied Clinical Knowledge'. Focusing on the mantra of inclusivity and engagement, dedicated and enthusiastic surgeons, physiotherapists and academics from across the country have been brought together to lecture on their area of expertise.

For the runners out there, there will be an early morning 5km 'fun run'. Planned by the Culture and Diversity Committee this will take in a scenic route around Edinburgh. We have also planned two additional events; one for local school children, to provide them with exposure to hip surgery, and another for medical students via the British Orthopaedic Medical Students Association. These events will run on Wednesday and Thursday respectively, culminating in the inaugural awards and Networking Event on Thursday evening. For those who are unable to make it face-to-face, we have the option to live stream the meeting as well. Please do download the BHS 2023 app to fully engage with all parts of the conference and to get your CPD certificate afterwards.

Finally, we have had over 580 face-to-face registrations already which will make this the biggest BHS ever! There is nothing more special than 'meeting friends and discussing hips' with the perfect backdrop of a city like Edinburgh; so, if you have not registered yet, please do sign up. I look forward to seeing you there, for what promises to be an exciting academic and social event.



Vikas Khanduja

President, British Hip Society



Foreword

On behalf of our President, Vikas Khanduja and the Executive Committee, I would like to welcome you all to the 2023 Annual Scientific Meeting of the British Hip Society.

The Annual Scientific Meeting of the BHS is one of the best conferences to attend and remains a highlight of the orthopaedic calendar each year.

Last year in Bournemouth was fantastic and this year I think could be even better. An amazing venue and a bit of a redesign of the meeting with the aim of making it more interactive and engaging.

It is our honour to welcome Professor Paul Beaulé, Consultant Surgeon from Ottawa as our Presidential Guest Speaker. Professor Beaulé will make a significant contribution to this year's meeting with his keynote lecture. He is an internationally renowned surgeon in the field of joint preserving hip surgery.

We are also delighted to welcome Professor Klaus Siebenrock to give the Charnley Legacy lecture. Professor Siebenrock is a consultant working in Bern, Switzerland and President of the European Hip Society.

The programme this year will be the usual combination of topic in focus sessions, podium presentations of the latest research and an excellent array of electronic poster presentations. We have also introduced JAM presentations at lunchtime - this is just a minute where we will offer the chance for some of the abstracts not selected for full podiums to present a one slide one minute presentation. There will be a prize for the best of these.

We have shortened the individual session durations this year and aim to increase interaction to get you all involved. There is still time in the programme for wide ranging discussion and of course the opportunity to catch up with friends and colleagues and to share experiences. We are delighted to maintain the Emerging Hip Surgeon's session and are really pleased to introduce a session led by the UK physiotherapy Hip Network. There will also be updates from the registries on Friday morning.

New this year will also be the BHS awards on Thursday evening which will be linked with the drinks reception and informal sessions with industry.

We will have three concurrent industry led symposia on day one and two, repeated twice during the meeting, allowing our industry partners an opportunity to showcase their latest developments. Networking with the industry sponsors will be possible in all the coffee and lunch breaks and on the Thursday evening at the drinks reception. We are very grateful for the support we receive from industry, without which we would simply not be able to put on such a wide and varied meeting. Their support also allows us to spread our wings wider with the monthly education sessions, support for research fellowships and many other things you will hear about this week.



Foreword

The Annual Scientific Meeting of the BHS is of course an important opportunity for us all to present, even if only virtually, our original research and this year the Scientific Committee received 228 abstracts for consideration. This number clearly reflects the importance of the BHS meeting to our members. The review process was undertaken by five independent, blinded judges and we were able to accept 48 abstracts for podium presentation, 40 for JAM presentations and a further 90 as posters. The podium presentations have been grouped under headline topics and will last five minutes with two minutes for questions. There are some outstanding messages in the posters section, and I would encourage all of you to spend some time at the conference browsing through these between the podium sessions. Prizes will be awarded for the best overall research paper, the best podium presentation, the best JAM presentation and the best poster and these will be presented on Friday towards the end of the meeting. Once again, we are extremely grateful to the BJJ for their generosity in the support of the best translational research award. The abstracts for the papers presented from the podium will be published in the Bone and Joint Journal supplement later this year.

The Annual General Meeting of the Society will be on Wednesday evening. This year there are a range of posts for election and also a vital vote on constitutional change, so we would really encourage all members to attend before you go to your own social events.

We have also kept in the “fun run” after the great turn out last year and I look forward to seeing many of you bright and early on Thursday morning.

The organisation and smooth running of the BHS relies upon the vital contributions made by some key people who deserve our appreciation. This year, as in previous years, Jai Mistry from MICE Organiser deserves our massive thanks for his efforts, dedication and hard work in organising the logistics of this meeting. Without him, organisation of this meeting would simply not be possible.

I would like to finish with the hope that you all have an enjoyable and informative Annual Scientific Meeting.



Simon Buckley
Editorial Secretary, British Hip Society

General information | FAQs

CPD CERTIFICATES?

The Royal College of Surgeons of England has awarded up to **16.25 CPD points** for the annual scientific meeting and up to **6 CPD points** for the instructional course. An online evaluation form will be available on the BHS 2023 App post-event. CPD certificates will be issued electronically, subject to the evaluation form being completed.

PODIUM, JAM & E-POSTER CERTIFICATES?

Certificates of presentation for podium, JAM and E-poster presenters will be sent electronically post-event to the corresponding author.

Note: all podium paper abstracts will be published in the orthopaedic proceedings of the Bone and Joint Journal post-event, and a link provided on the BHS website post-event.

E-POSTERS?

View our selected scientific poster presentations displayed on digital screens in the Lennox Suite. Full abstracts are available to view at the end of this programme (digital copy only). E-posters will also be available to view on our event APP.

LIVE STREAM & ON DEMAND VIEWING?

Live stream viewing will be available for registered delegates not attending in-person. On demand viewing will be available from a few months post-event for **BHS members only**.

Not a member? Join now at:

<https://britishhipsociety.com/join-bhs/>

Please note: JAM papers, industry symposia, the BOMSA meeting and BHS AGM will not be recorded and not available for live stream or demand post-event viewing. The MDT forum session will not be live streamed but will be available for on demand post-event viewing.

FAMILY ROOM FACILITIES?

The BHS are pleased to provide a family room with access to appropriate facilities. Pre-registration is required to make use of this room (subject to availability) – please email events@miceorganiser.com in advance of arriving at the venue.

PRAYER ROOM?

Please check with a member of staff at our registration desk for further details.

MEETING VENUE & PARKING?

Edinburgh International Conference Centre (EICC)
150 Morrison Street, Edinburgh, EH3 8EE

How to get here? – Click here

There are many car parks in close walking distance to the EICC. Please access the following links for further details:

[National Car Parks \(NCP\)](#) in central Edinburgh.
[Sheraton Hotel Car Park](#) 150 meters from the EICC.
[Sempole Street Car Park](#) 300 meters from the EICC.
[Spaces near EICC via yourparkingspace.co.uk](https://www.yourparkingspace.co.uk)

Wi-Fi @ EICC VENUE?

Network name: delegate | **Password:** haymarket

SPEAKER PREVIEW ROOM?

All speakers are requested to proceed to the speaker preview room **upon arrival and no later than two hours prior to their scheduled presentation time**. Please bring your slides (16:9 format) on a USB stick and check all is in order with our audio visual colleagues.

Please Note: All talks will be live streamed and recorded for post-event on demand viewing – please anonymise any clinical videos/photographs and/or items of a confidential/sensitive nature.

REGISTRATION & BADGES?

Our registration desk will be located in the main entrance foyer and will be open from 7.30am on all three days. Lanyards and name badges will be issued to delegates upon arrival - **for purposes of security, please wear these at all times**.

FIRE ALARM?

In the event of the fire alarm activation which is a **“two tone electronic sounder”** all Delegates shall be directed to the Assembly Points by EICC Staff & Hosts using the nearest Emergency Exits.

Security Officers shall ensure the security of the building in the event of an evacuation to confirm that no one re-enters the building until the all clear is given.

All EICC Staff members will assist with the evacuation of the EICC by the nearest exit and direct Delegates/Clients to the Assembly Point and assist delegates at these locations until the “All Clear” is given.

Premium Sponsors



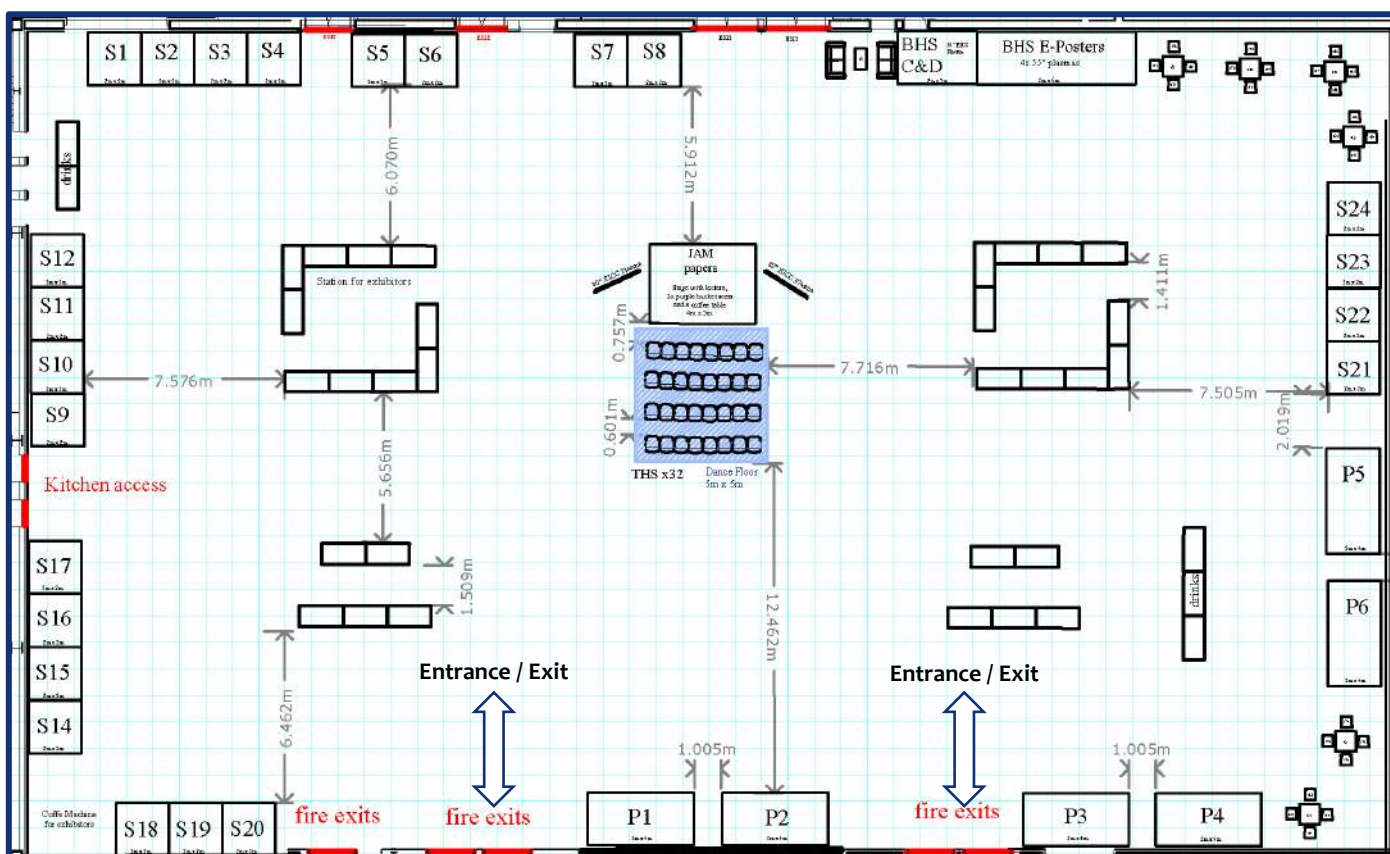
Sponsors





Exhibition | E-Posters | JAM papers | Catering

Lennox Suite



Exhibitor

Stand No.

ADLER ORTHO UK LTD	P2
ARTHREX LTD	S10
B. BRAUN MEDICAL LTD	S11
BHS CULTURE & DIVERSITY	BHS C&D
BHS E-POSTERS	E-POSTERS
BIOCOMPOSITES	S3
CIVICA – MEDICAL BILLING & COLLECTION	S16
CONVATEC	S5
CORIN LTD	S14
DEPUY SYNTHES	P6
GREENBONE ORTHO S.P.A.	S19
HERAEUS MEDICAL	S4
IMPLANTCAST UK	S7
ISHA – THE HIP PRESERVATION SOCIETY	S22
JRI ORTHOPAEDICS	S9

Exhibitor

Stand No.

LIMA ORTHOPAEDICS UK	S17
LINK ORTHOPAEDICS UK	P1
MATERIALISE	S12
MATORTHO	S1
MEDBELLE	S20
MICROPORT ORTHOPAEDICS	S6
MOLNLYCKE HEALTH CARE	S15
NATIONAL JOINT REGISTRY	S24
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ORTHOPAEDIC RESEARCH UK	S23
SMITH + NEPHEW	P4
STRYKER UK LTD	P5
SUMMIT MEDICAL	S8
SYMBIOS UK LTD	P3
TISSUE SERVICES - NHS BLOOD & TRANSPLANT	S21
ZIMMER BIOMET	S2

Industry Exhibition

Lennox Suite, EICC

PRIZE DRAW

**TWO WINNERS
EACH TO RECEIVE**
BHS 2024 BELFAST
REGISTRATION
&
£100 AMAZON
VOUCHER

→ Click 'Prize Draw' on the BHS 2023 event App.

→ Visit exhibitors shown and scan the QR code at their stand.

Exhibition opening times:

Wed: 09:00 – 17:30 | Thu: 09:00 – 17:00 | Fri: 09:00 – 11:30

Two winners will be announced at close of the meeting
on Friday 10th March.

BRITISH HIP SOCIETY
ANNUAL SCIENTIFIC
MEETING
& Instructional Course





**BRITISH
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**Download the
BHS 2023 official App**

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- 2 Download the App
- 3 Enjoy!



BHS 2023
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Programme at-a-glance

Three days of compelling *education, collaboration, innovation* and *social networking*.

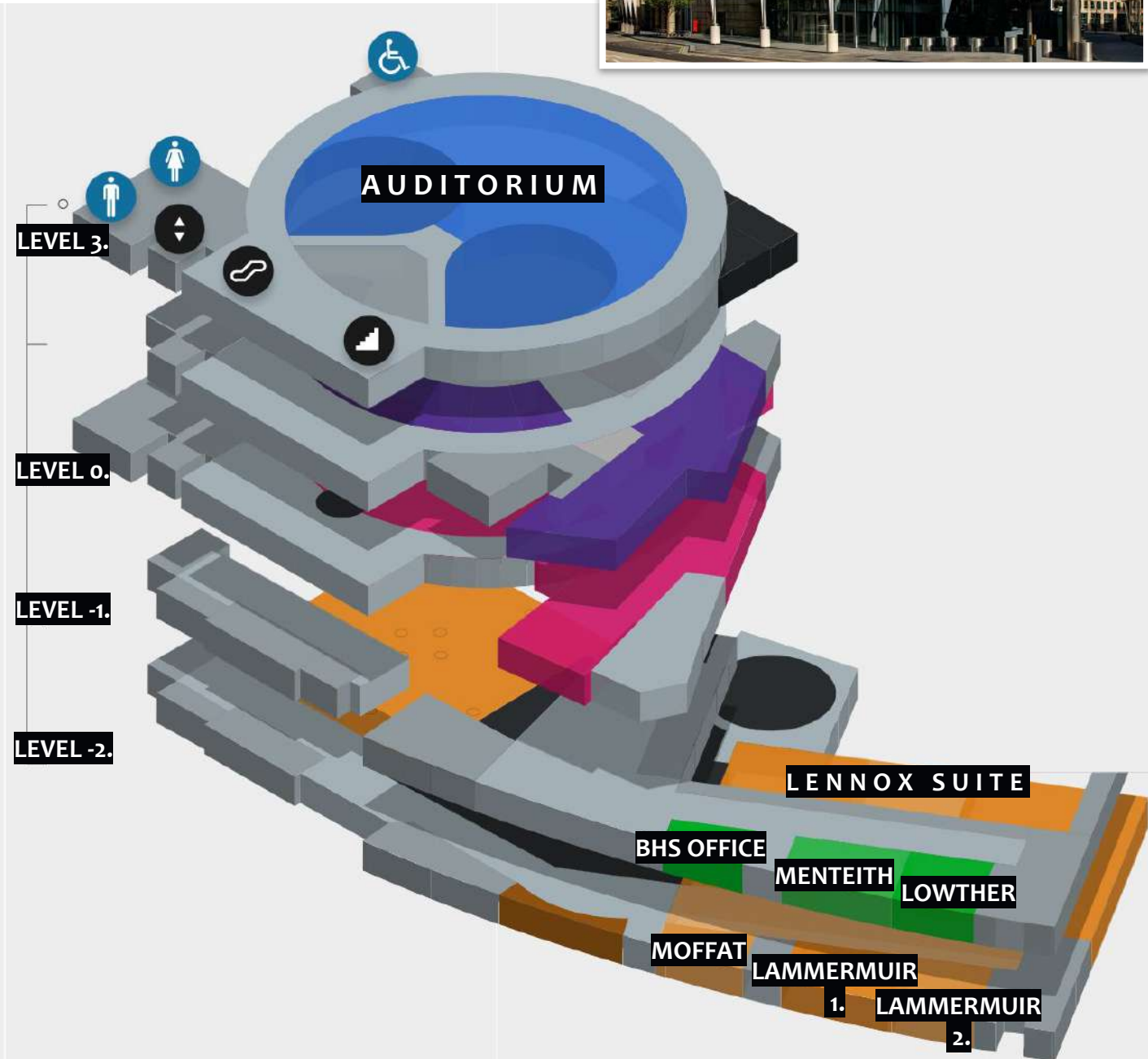
Room	WEDNESDAY 8 th March	THURSDAY 9 th March	FRIDAY 10 th March
ATRIUM EICC Lennox Entrance	REGISTRATION DESK 07:30 – 18:00 SPEAKER PREVIEW 07:30 – 18:00	REGISTRATION DESK 07:30 – 18:00 SPEAKER PREVIEW 07:30 – 18:00	REGISTRATION DESK 07:30 – 14:00 SPEAKER PREVIEW 07:30 – 13:00
LENNOX SUITE Level -2	INDUSTRY EXHIBITION 09:00 – 17:30 CATERING E-POSTERS	INDUSTRY EXHIBITION 09:00 – 17:00 CATERING E-POSTERS	INDUSTRY EXHIBITION 09:00 – 11:30 CATERING E-POSTERS
	JAM (just a minute) scientific papers 13:10 – 13:50	JAM (just a minute) scientific papers 13:10 – 13:50	
		BHS AWARDS & NETWORKING RECEPTION 18:00 – 20:00	
AUDITORIUM Level 3	ANNUAL SCIENTIFIC MEETING 08:20 – 17:00 EMERGING HIP SURGEONS 17:10 – 18:00 BHS AGM (Members only) 18:15 – 19:30	ANNUAL SCIENTIFIC MEETING 08:25 – 18:00 BHS CULTURE & DIVERSITY FORUM: Unconscious Bias 13:30 – 14:45	ANNUAL SCIENTIFIC MEETING 08:00 – 13:10
MOFFAT Level -2	FAMILY ROOM 08:00 – 19:30	FAMILY ROOM 08:00 – 18:00	FAMILY ROOM 08:00 – 17:00
LAMMERMUIR 1+2 Level -2	MDT FORUM: GTPS, creating winners 17:10 – 18:15		INSTRUCTIONAL COURSE 08:00 – 16:45 Note: Kindly ensure you are registered to attend this parallel event.
LAMMERMUIR 1 Level -2	ADLER ORTHO SYMPOSIUM 14:00–14:40 & 14:50–15:30	DEPUY SYNTHES SYMPOSIUM 14:00–14:40 & 14:50–15:30	
LAMMERMUIR 2 Level -2	LINK ORTHOPAEDICS SYMPOSIUM 14:00–14:40 & 14:50–15:30	SYMBIOS SYMPOSIUM 14:00–14:40 & 14:50–15:30	
MENTEITH Level -1	SMITH+NEPHEW SYMPOSIUM 14:00–14:40 & 14:50–15:30	STRYKER SYMPOSIUM 14:00–14:40 & 14:50–15:30	
LOWTHER Level -1	SCHOOLS ENGAGEMENT Why be a Surgeon? 09:30 – 12:30	BOMSA x BHS Future Hip Surgeons 09:30 – 17:30	

Venue Floorplan

Edinburgh International Conference
Centre (EICC)

150 Morrison Street,
Edinburgh, EH3 8EE

[How to get here? – Click here](#)





BRITISH
HIP
SOCIETY



Wednesday 8th March

09.00 - 12.30

EICC, Edinburgh | Room: Lowther

#culture #diversity

SCHOOLS ENGAGEMENT

Why be a Surgeon?

Objectives:



Increase awareness for school students about careers in Trauma and Orthopaedic Surgery.



Facilitate access and interaction in an inclusive environment.



Provide positive role models and championing diversity.



Provisional programme - subject to change:

09.00 - Registration

09.30 - Introduction

09.40 - Accessing medicine: a medical student's perspective

09.50 - Group discussions with expert faculty surgeons and allied health professionals

10.30 - Practical workshop

11.00 - Hot chocolate and refreshments

11.15 - Industry exhibition tour

12.00 - Closing remarks | ask a question

12.30 - Packed lunches and departure



Room: Auditorium

08:20 – 08:30

WELCOME



Vikas Khanduja
President, BHS

Room: Auditorium

08:30 – 09:30



PODIUM SCIENTIFIC PAPERS PRIMARY ARTHROPLASTY

5 minutes presentation | 2 minutes discussion.

Chairs:



Simon
Buckley



Samantha
Hook

08:30

(32)

AUTOMATED VERSUS MANUAL COMPONENT IMPACTION IN TOTAL HIP ARTHROPLASTY: EFFECTS ON COGNITIVE FUNCTION, PHYSICAL FATIGUE, AND STRESS LEVEL

Frans-Jozef Vandeputte¹, Christophe Hausswirth², Jeroen Dille³, Kristoff Corten¹

¹Ziekenhuis Oost-Limburg, Genk, Belgium. ²BeScored Institute, Sophia Antipolis, France. ³DeoCare, Beringen, Belgium

08:37

(28)

THE ENVIRONMENTAL IMPACT AND SUSTAINABILITY OF TOTAL HIP AND KNEE ARTHROPLASTY

Rohan Prakash, Husnain Abid, Abdus Wasim, Akash Sharma, Yuvraj Agrawal

Royal Orthopaedic Hospital, Birmingham, United Kingdom

08:44

(95)

THE INCIDENCE AND RISK FACTORS FOR ABNORMAL POSTOPERATIVE BLOOD TESTS FOLLOWING PRIMARY TOTAL JOINT ARTHROPLASTY: A SINGLE CENTRE RETROSPECTIVE COHORT STUDY

Georgios Orfanos¹, Nakulan Nantha Kumar^{2,3}, David Lowe¹, Dan Redfern¹, Benjamin Burston¹, Robin Banerjee¹, Geraint Thomas^{1,3}

¹The Robert Jones and Agnes Hunt Orthopaedic Hospital NHS Foundation Trust, Oswestry, United Kingdom. ²University Hospitals of North Midlands NHS Trust, Stoke-on-Trent, United Kingdom.

³Keele University, Newcastle, United Kingdom

08:51

(111)

POSITIONING THE LIPPED LINER IN TOTAL HIP ARTHROPLASTY: A KINEMATIC MODEL ANALYSIS OF LIP ORIENTATION, CUP POSITION AND STEM ANTEVERSION.

Alessandro Navacchia¹, Joseph Pagkalos², Edward Davis^{2,3}

¹Smith & Nephew Inc., Watford, United Kingdom. ²The Royal Orthopaedic Hospital NHS Foundation Trust, Birmingham, United Kingdom. ³Institute of Inflammation and Ageing, University of Birmingham, Birmingham, United Kingdom



Room: Auditorium

08:30 – 09:30



PODIUM SCIENTIFIC PAPERS
PRIMARY ARTHROPLASTY

5 minutes presentation | 2 minutes discussion.

Chairs:



Simon
Buckley



Samantha
Hook

08:58

(121)

INCIDENCE OF VENOUS THROMBOEMBOLISM IN ELECTIVE HIP ARTHROPLASTY SURGERY: A REVIEW OF 8,890 PATIENTS RECEIVING POST-OPERATIVE ASPIRIN VTE PROPHYLAXIS

Eamonn Coveney¹, Christopher Hutton¹, Nimish Patel¹, Sarah Whitehouse^{1,2}, Jonathan Howell¹, Matthew Wilson¹, Matthew Hubble¹, Al-Amin Kassam¹

¹Exeter Hip Unit, Princess Elizabeth Orthopaedic Centre, Royal Devon University Healthcare NHS Foundation Trust, Exeter, United Kingdom. ²Queensland University of Technology, Brisbane, Australia

09:05

(139)

RAPIDLY PROGRESSIVE OSTEOARTHRITIS IN PATIENTS AWAITING TOTAL HIP REPLACEMENT - THE HIDDEN IMPACT OF COVID-19 PANDEMIC

Vaishnav Raghavan, Satheesh Kumar, Vineeth Gopalannair, Sasan Dehbozorgi, Deepu Bhaskar
Glan Clwyd Hospital, Rhyl, United Kingdom

09:12

(161)

DUAL MOBILITY IMPLANTS IN HIGH-RISK PATIENTS AND PERI-PROSTHETIC FRACTURE – “A PERFECT STORM”

Stephen Jones, Sunil Raj, Ahmed Magan
Cardiff & Vale University Health Board, Cardiff, United Kingdom

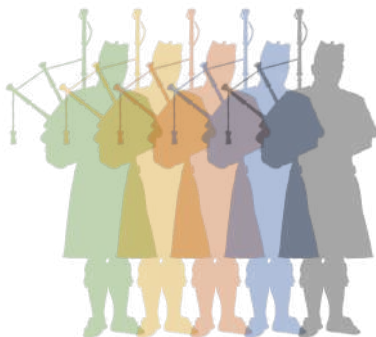
09:19

(228)

THE PREVALENCE OF MUSCULOSKELETAL CONDITIONS AMONG HIP SURGEONS IN THE UNITED KINGDOM: A CROSS-SECTIONAL STUDY

Khalid Malik-Tabassum¹, Maryam Ahmed², Henry Wynn Jones¹, Kathryn Gill², Tim Board¹, Anil Gambhir¹

¹Wrightington Hospital, Wrightington, United Kingdom. ²Royal Surrey County Hospital, Guildford, United Kingdom



FAQ

CPD Certificates

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Room: Auditorium

09:30 – 10:30



TOPIC IN FOCUS: NON ARTHROPLASTY

Chairs:

Ajay Malviya

Vikas Khanduja



Klaus A. Siebenrock
(Bern, Switzerland)



Johan Witt
(London)



**Theodora
Papadopolou**
(Loughborough)



Tony Andrade
(Reading)



Sanjeev Patil
(Glasgow)



Marcus Bankes
(London)



09:30

Ten tips to improve outcomes after hip preservation surgery

Klaus A. Siebenrock

09:40

Ten top tips on radiological assessment of the Young Adult Hip

Johan Witt

09:50 – 10:30

Case discussion



Cases to include (subject to change):

- Asymptomatic Cam lesion
- FAI and secondary OA
- Hip dysplasia and acetabular cyst
- Borderline dysplasia
- Stress fracture of the femoral neck

Panel:

Klaus A. Siebenrock

Johan Witt

Theodora Papadopolou

Tony Andrade

Sanjeev Patil

Marcus Bankes



10:30 – 11:00



COFFEE | EXHIBITION | E-POSTERS

Room: Lennox Suite

Room: Auditorium

11:00 – 12:00



PODIUM SCIENTIFIC PAPERS
BASIC SCIENCES

5 minutes presentation | 2 minutes discussion.

Chairs:



Kate Gill



Ajit Shetty

- (59)**
LEARNING FROM SIMULATION IN HIGHER ORTHOPAEDIC TRAINING: ARE WE ON THE SAME PAGE?
Lena Al-Hilfi¹, Irrum Afzal², Sarkhell Radha^{1,2}, Michael Shenouda³
¹Croydon University Hospital, London, United Kingdom. ²South West London Elective Orthopaedic Centre, London, United Kingdom. ³Open Medical, London, United Kingdom
- (66)**
CARDIAC FUNCTION IS COMPROMISED IN PATIENTS WITH ELEVATED BLOOD COBALT LEVELS SECONDARY TO METAL-ON-METAL HIP IMPLANTS
Mark Jenkinson^{1,2}, Dominic Meek², Sandy MacMillan¹, Rothwelle Tate¹, M Helen Grant³, Susan Currie¹
¹Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, Glasgow, United Kingdom. ²Department of Trauma and Orthopaedics, Queen Elizabeth University Hospital, Glasgow, United Kingdom. ³Department of Biomedical Engineering, University of Strathclyde, Glasgow, United Kingdom
- (92)**
RETRIEVAL ANALYSIS OF DUAL MOBILITY POLYETHYLENE LINERS FOR TOTAL HIP REPLACEMENT
Mackenzie Smeeton¹, Ruth Wilcox¹, Graham Isaac¹, James Anderson², Tim Board³, Douglas W. Van Citters⁴, Sophie Williams¹
¹University of Leeds, Leeds, United Kingdom. ²DePuy Synthes, Leeds, United Kingdom. ³Wrightington, Wigan and Leigh NHS Foundation Trust, Wigan, United Kingdom. ⁴Dartmouth College, Thayer School of Engineering, Hanover, NH, USA
- (132)**
DISTAL CEMENT MANTLE THICKNESS AND POSITION OF STEM TIP ARE PREDICTORS OF PERIPROSTHETIC FRACTURES IN CEMENTED TAPERED FEMORAL STEMS
Zakiyyah Hoskins, Gunasekaran Kumar, Rajkumar Gangadharan
Liverpool University Hospitals NHS Foundation Trust, Liverpool, United Kingdom
- (138)**
STRUCTURAL DEFECTS AND VARIABLE POROSITY IN 3D PRINTED CUPS FROM 6 MANUFACTURERS
Harry Hothi¹, Johann Henckel¹, Anna Di Laura¹, Klaus Schlueter-Brust², Alister Hart^{1,3}
¹The Royal National Orthopaedic Hospital, Stanmore, United Kingdom. ²St. Franziskus Hospital Köln, Cologne, Germany. ³The Institute of Orthopaedics and Musculoskeletal Science, University College London, London, United Kingdom



Room: Auditorium

11:00 – 12:00



PODIUM SCIENTIFIC PAPERS BASIC SCIENCES

Chairs:



Kate Gill



Ajit Shetty

5 minutes presentation | 2 minutes discussion.

11:35

(177)

RETRIEVAL ANALYSIS OF 3D PRINTED IMPLANTS SHOWS ENCOURAGING RESULTS

Harry Hothi¹, Johann Henckel¹, Anna Di Laura¹, John Skinner¹, Alister Hart^{1,2}

¹The Royal National Orthopaedic Hospital, Stanmore, United Kingdom. ²Institute of Orthopaedics, University College London, Stanmore, United Kingdom

11:42

(184)

THREE-YEAR AND FIVE-YEAR REVISION RATES OF PRIMARY TOTAL HIP REPLACEMENT ARE POOR PREDICTORS OF 15-YEAR REVISION RATES – A NATIONAL JOINT REGISTRY ANALYSIS

Krishna Boddu

Ipswich Hospital, Ipswich, United Kingdom

MS

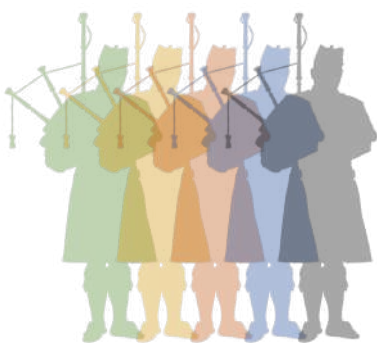
11:49

(232)

SHORT- AND LONG-TERM MORTALITY RISK OF TOTAL HIP REPLACEMENT IN OBESE PATIENTS: DOES IT CONSTITUTE THR CONTRAINDICATION?

Alexis Panzures, Aava Param, Rebecca Van Vliet, Muhammad Adeel Akhtar

University of Edinburgh, Edinburgh, United Kingdom



#bhs2023



FAQ

Live stream & on demand viewing?

Live stream viewing will be available for registered delegates not attending in-person. On demand viewing will be available from a few months post-event for **BHS members only**.

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BRITISH
HIP
SOCIETY

Annual Scientific Meeting 2023 | EICC, Edinburgh

Wednesday 8th March

Final programme | 20

Room: Auditorium

12:00 – 12:10

ROTHMAN-RANAWAT FELLOWSHIP
UPDATE



Jonathan Hutt

12:10 – 12:20

TRAVELLING FELLOWSHIP UPDATE



**K H Sunil
Kumar**



**James
Shelton**

Room: Auditorium

12:20 – 13:00



**Charnley
Legacy
lecture**

*Sir John Charnley, CBE, FRS, was a master surgeon, innovator
and bio-engineer. His work has been an outstanding
contribution to the relief of human suffering.*

John Charnley Trust

12:20 – 12:25

Introduction



Vikas Khanduja
President, BHS

12:25 – 12:30

Background



Martyn Porter
Chairman,
The John Charnley Trust

12:30 – 13:00

Charnley Legacy lecture:

A light in the dark – a comprehensive view on hip
pathology



Prof. Klaus A. Siebenrock
Director and Chairman
University of Bern, Switzerland
President,
European Hip Society



13:00 – 14:00



LUNCH | EXHIBITION | E-POSTERS | JAM papers

Room: Lennox Suite

Room: Lennox Suite

13:10 – 13:50



**JAM – just a minute
scientific papers**

1 minute, 1 slide presentation | 1 question.

Please note: these presentations take place in the
Lennox Suite.

Chairs:



Kate Gill



**Vikas
Khanduja**

13:10

(20)

DEFINING THE “OPTIMUM” ACETABULUM – DIFFERENCES WITH DISTINCT YOUNG ADULT HIP PATHOLOGIES

Jeroen Verhaegen^{1,2,3}, Zach Devries³, Kawan Rakhra³, Andrew Speirs⁴, Paul Beaulé³, George Grammatopoulos³

¹University Hospital Antwerp, Antwerp, Belgium. ²Orthopedic Center Antwerp, Antwerp, Belgium. ³The Ottawa Hospital, Ottawa, Canada. ⁴Carleton University, Ottawa, Canada

13:12

(22)

VARIABILITY OF FEMORAL AND ACETABULAR VERSION AMONG PATIENTS WITH SYMPTOMATIC HIP DISEASE AND CLINICAL IMPLICATIONS

Jeroen Verhaegen^{1,2,3}, Michaela Burke³, Claudia Galletta⁴, Paul Beaulé³, George Grammatopoulos³

¹University Hospital Antwerp, Antwerp, Belgium. ²Orthopedic Center Antwerp, Antwerp, Belgium. ³The Ottawa Hospital, Ottawa, Canada. ⁴Michele e Pietro Ferrero Hospital, Verduno, Italy

13:14

(33)

AN EVALUATION OF OUTCOMES IN THE USE OF G7 DUAL MOBILITY CUP FOR PRIMARY TOTAL HIP REPLACEMENT: A SINGLE CENTRE RETROSPECTIVE STUDY

William Aldridge, Fatima Braimah, Hamida Ahmed, Shah Jehan, Simon Jones, Aaron Ng

Pinderfields General Hospital, Wakefield, United Kingdom

13:16

(41)

A FIVE-YEAR RETROSPECTIVE ANALYSIS OF HIP FRACTURE CARE IN A TERTIARY CARE HOSPITAL

Bisola Salaja¹, Peter Staunton¹, Pamela Hickey¹, Jude Ryan¹, Stephen Madden², Finbarr Condon¹

¹University Hospital Limerick, Limerick, Ireland. ²Royal College of Surgeons, Dublin, Ireland

13:18

(221)

CT-GUIDED INJECTIONS FOR THE TREATMENT OF PIRIFORMIS SYNDROME: A REVIEW OF 45 CASES.

Christian Smith¹, Amy Verrinder¹, Mohammed Ali², Rahul Dharmadhikari¹, Ajay Malviya¹

¹Northumbria Healthcare, Newcastle, UK. ²Newcastle University, Newcastle, UK.

13:20

(75)

CERAMIC HIP RESURFACING ARTHROPLASTY IN WOMEN ENABLES NEAR NORMAL GAIT FUNCTION

Amy Maslivec¹, Camilla Halewood², Susannah Clarke^{1,2}, Justin Cobb^{1,2}

¹Imperial College, London, United Kingdom. ²Emboddy Orthopaedics Limited, London, United Kingdom



Room: Lennox Suite

13:10 – 13:50



JAM - just a minute scientific papers

1 minute, 1 slide presentation | 1 question.

Please note: these presentations take place in the
Lennox Suite.

Chairs:



Kate Gill



**Vikas
Khanduja**

13:22

(46)

VARIATION IN PRACTICE OF PROPHYLACTIC MEASURES TO REDUCE PROSTHETIC JOINT INFECTION (PJI) IN PRIMARY HIP AND KNEE ARTHROPLASTY: A NATIONAL CROSS-SECTIONAL STUDY

James Morris, Lee Hoggett, Sophie Rogers, Sophie Rogers, John Ranson, Andrew Sloan
East Lancashire Hospitals National Health Service Trust Department of Surgery Royal Blackburn Hospital,
Blackburn, United Kingdom

13:24

(49)

SIMULTANEOUS FRACTURE FIXATION AND HIP REPLACEMENT FOR ACETABULAR FRACTURES WITH “A FIX & REPLACE CONSTRUCT” IN OLDER PATIENTS. CLINICAL AND RADIOGRAPHIC RESULTS WITH A MINIMUM OF 1 YEAR FOLLOW UP.

Nelson Bua¹, Simon Hislop¹, Joseph Alsousou², Daud Chou¹, Jaikirty Rawal³, Peter Hull¹,
Andrew Carrothers¹

¹Addenbrooke Hospital, Cambridge, United Kingdom. ²Addenbrooke Hospital, Cambridge, United Kingdom. ³addenbrooke Hospital, Cambridge, United Kingdom

13:10 – 13:50



JAM - just a minute scientific papers

1 minute, 1 slide presentation | 1 question.

Chairs:



Ajay Malviya



Dominic Meek

13:26

(67)

EVIDENCE BASED RECOMMENDATIONS ON 'PRE-HABILITATION' PRIOR TO HIP ARTHROSCOPY FOR FEMORO-ACETABULAR IMPINGEMENT (FAI) SYNDROME

Alison Smeatham¹, Katie Monnington², Louise Grant³, Lucie Gosling⁴, Edward Dickenson⁴

¹Hip unit. Royal Devon University Healthcare NHS Foundation Trust, Exeter, United Kingdom. ²Royal National Orthopaedic Hospital, Stanmore, United Kingdom. ³Physiocure physiotherapy, Leeds, United Kingdom. ⁴The Royal Orthopaedic Hospital NHS Foundation Trust, Birmingham, United Kingdom

13:28

(70)

STAKEHOLDER PRIORITISATION PREFERENCES FOR HIP ARTHROPLASTY

Luke Farrow^{1,2}, Nick Clement³, Dominic Meek⁴, Katie Gillies¹, Mandy Ryan¹, Lesley Anderson¹,
George Ashcroft¹

¹University of Aberdeen, Aberdeen, United Kingdom. ²Grampian Orthopaedics, Aberdeen, United Kingdom. ³Edinburgh Orthopaedics, Edinburgh, United Kingdom. ⁴Queen Elizabeth University Hospital, Glasgow, United Kingdom

13:30

(73)

FUNCTIONAL PELVIC TILT FREQUENTLY DIFFERS FROM THE ANTERIOR PELVIC PLANE – IMPLICATIONS FOR 3D MOTION ANALYSIS

Mark Jenkinson¹, Shahril Shaarani², Calvin Cheung³, Kartik Logishetty², Alastair Dick², Johan Witt²,
Jonathan Hutt²

¹Queen Elizabeth University Hospital, Glasgow, United Kingdom. ²University College Hospital, London, United Kingdom. ³University College London, London, United Kingdom



Room: Lennox Suite

13:10 – 13:50



JAM - just a minute scientific papers

Chairs:



Ajay Malviya **Dominic Meek**

1 minute, 1 slide presentation | 1 question.

Please note: these presentations take place in the
Lennox Suite.

13:32

(76)

DYSPLASTIC HIPs MAY SAFELY BE RESURFACED WITHOUT A CONTOURED FEMORAL COMPONENT

Takuro Ueno^{1,2}, Justin Cobb¹

¹Imperial College, London, United Kingdom. ²Kanazawa University, Kanazawa, Japan

13:34

(81)

WHICH ONE IS THE LESSER EVIL? – PERIPROSTHETIC FRACTURE FOLLOWING ANTERIOR APPROACH OR DISLOCATION AFTER POSTERIOR APPROACH?

Jeroen Verhaegen^{1,2,3}, Tom Schmidt-Braekling³, Roger Wei³, Paul Beaulé³, George Grammatopoulos³

¹University Hospital Antwerp, Antwerp, Belgium. ²Orthopaedic Centre Antwerp, Antwerp, Belgium. ³The Ottawa Hospital, Ottawa, Canada

13:36

MS

(87)

ANCHORING OF FOLLOW-UP IN SURGICAL TRIALS: AN OVERVIEW OF CURRENT PRACTICE AND RECOMMENDATIONS FOR FUTURE TRIALS

Noemi Jester¹, Sanjana Mehrotra¹, Wei Shao Tung¹, Ryan Rowles², Antony Palmer³, Sumedh Talwalker⁴, Joseph Dias⁵, James Byrne⁶, Laura Hancock⁷, Richard Jacques⁸, Stephen Walters⁸, Ines Rombach⁸

¹Sheffield Medical School, Sheffield, UK. ²Sheffield University, Sheffield, UK. ³Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, Oxford, UK. ⁴Wrightington, Wigan & Leigh NHS Foundation Trust, Wigan, UK. ⁵University Hospitals Leicester, Leicester, UK. ⁶University Hospital Southampton UK. ⁷Central Manchester University Hospital, Manchester, UK. ⁸School of Health and Related Research, Sheffield, UK.

13:38

(88)

CAN ARTIFICIAL INTELLIGENCE IMPROVE THEATRE SCHEDULING EFFICIENCY FOR ELECTIVE TOTAL HIP REPLACEMENTS: A SCOPING REVIEW

Christopher Spence, Andrew Womersley, Jad Wehbe, Keith Tucker, David Sochart, Vipin Asopa
South West London Elective Orthopaedic Centre, Epsom, United Kingdom

13:40

(103)

TO FIX OR TO REPLACE IN ELDERLY STABLE NECK OF FEMUR FRACTURES. A 5-YEAR RETROSPECTIVE STUDY IN A MAJOR TRAUMA CENTRE

Jehan Zaib, Aamer Nisar, Feroze Khawaja, Naveed Khan

Hull University Teaching Hospitals, Hull, United Kingdom

13:42

(105)

TEN-YEAR FOLLOW-UP STUDY OF THE TRIPLE TAPERED C-STEM AMT CEMENTED FEMORAL STEM

Khalid Malik-Tabassum, Amit Yadav, Dheeraj Attarde, Gautham Balaji, Paul Siney, Martyn Porter, Anil Gambhir

Wrightington Hospital, Wrightington, United Kingdom

13:44

(220)

TOTAL HIP REPLACEMENT FOR NECK OF FEMUR FRACTURE: MOBILITY AND COGNITION ARE NOT THE ONLY DECIDING FACTORS.

Alistair Macey¹, Eoghan Donnelly¹, Davidson Martin², Kim Ferguson³, Helen Murray¹, Andy Marsh¹, Dominic Meek¹

¹Queen Elizabeth University Hospital, Glasgow, United Kingdom. ²University Hospital Wishaw, Wishaw, United Kingdom. ³Royal Hospital for Children, Glasgow, United Kingdom

13:46

(125)

THE BIRMINGHAM INTERLOCKING PELVIC OSTEOTOMY: 22 TO 30 YEAR SURVIVAL

John O'Hara¹, Callum McBryde², Dylan Jewell³

¹BMI Priory Birmingham, Farnham, United Kingdom. ²Royal Orthopaedic Hospital, Birmingham, United Kingdom. ³Withybush Hospital, Haverfordwest, United Kingdom

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Room: Lammermuir 1

14:00 – 14:40

INDUSTRY SYMPOSIA

Parallel industry session

&
repeated

14:50 – 15:30



LIMB SALVAGE FOR THE 21st CENTURY

Professor Skinner will introduce the session with an overview of limb salvage surgery and what it means to provide this type of care in the 21st century, with new technologies on hand and an ever-increasing demand for riskier yet rewarding complex surgery.



John Skinner
(London)

A novel porous endosteal collar will change salvage surgery for the better - early results from a propensity matched radiographic study in two referral units

Porous metal technology is not new to Orthopaedics, but it is new to complex surgery using proximal femoral replacement. This presentation will demonstrate how a novel porous endosteal collar is out-performing conventional collars with data presented from two main referral centres in the UK.



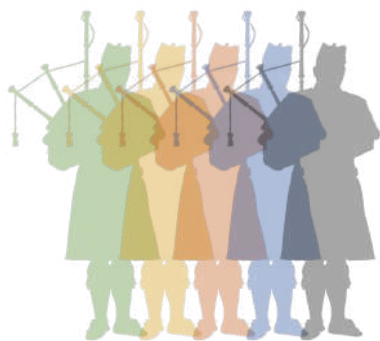
Jonathan Stevenson
(Birmingham)

The Pantheon PFR 5-year experience in revision surgery: not all collars are created equal

The Pantheon proximal femoral replacement has been in use for 5 years with outstanding results and excellent fixation between the collar and bone: no cases of aseptic loosening have been recorded. Join us to glean from the experience of one large referral unit using the Pantheon PFR for complex revision surgery.



Ben Kendrick
(Oxford)



? FAQ

E-Posters

View our selected scientific poster presentations displayed on digital screens in the Lennox Suite. Full abstracts and E-posters are also available to view on the BHS 2023 App.

#bhs2023



Visit us at stand P1



Lubinus SPII®

The road isn't
always straight.
Stick with nature.

3.5x lower risk for PPFF when
compared with the Exeter stem*

*Chatziagorou, G., Lindahl, H., & Kärrholm, J. (2019). The design of the cemented stem influences the risk of Vancouver type B fractures, but not of type C: an analysis of 82,837 Lubinus SPII and Exeter Polished stems. Acta Orthopaedica, 90, 135 - 142.



Room: Lammermuir 2

14:00 – 14:40

INDUSTRY SYMPOSIA

Parallel industry session

&
repeated



14:50 – 15:30

COMPOSITE BEAM VERSUS POLISHED TAPERED STEMS - WHAT DOES THE LITERATURE SAY ABOUT THE RISK OF PERI-PROSTHETIC FRACTURE?

A review of comparative studies addressing the influence of cemented stem design on the incidence of PPFF in global markets.



Muhammad Adeel Akhtar
(Kirkcaldy)

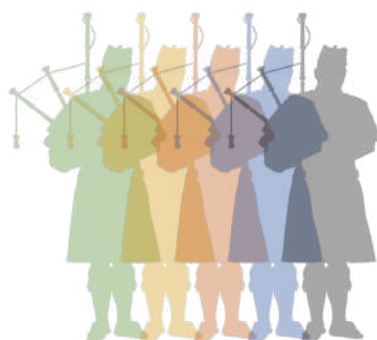
THE CHALLENGES AND LESSONS OF CHANGING HIP STEMS WITHIN A LARGE DISTRICT GENERAL

As the literature points towards 10x lower risk of peri-prosthetic fracture with cemented composite beam vs polished tapered stems, what are the challenges of switching implants?



Andy Ballantyne
(Kirkcaldy)

Andy Ballantyne, Consultant orthopaedic surgeon will present NHS Fife's experience of changing to the Lubinus SPII anatomic cemented hip stem – identifying the challenges, concerns vs reality and benefits.



? FAQ

CPD Certificates

The Royal College of Surgeons of England has awarded up to **16.25 CPD points** for the annual scientific meeting and up to **6 CPD points** for the instructional course.

An online evaluation form will be available on the BHS 2023 App post-event. CPD certificates will be issued electronically, subject to the evaluation form being completed.



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Best-in-class solution.**

- POLARSTEM & R3 shows the highest survivorship of all Uncemented THRs with **98.46% at 10 years¹**
- OXINIUM/XLPE shows the highest survivorship of all bearing combinations with **98.04% at 10 years²**
- Significantly higher patient satisfaction, allowing patients to live a **life unlimited^{3**}**

*According to analysis of the National Joint
Registry (England, Wales and Northern Ireland)*

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R3 Acetabular
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New Rating!
ODEP 10A*
POLARSTEM
Cementless Hip
System

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References **1.** National Joint Registry for England, Wales and Northern Ireland: 17th Annual Report. Available at: <http://www.njrcentre.org.uk/njrcentre> Accessed 23 September 2020. **2.** Davis ET, Pagkalos J, Kopjar B. Bearing surface and survival of cementless and hybrid total hip arthroplasty in the National Joint Registry of England, Wales, Northern Ireland and the Isle of Man. JBJS OA. 2020;5:e0075. Available from: JBJS OA. **3.** National Joint Registry for England, Wales and Northern Ireland: POLARSTEM cementless (Oxinium/XLPE/R3 cup) bespoke summary report. 14 August 2019. Available at: http://bit.ly/POLAR3_Aug2019

Orthopaedic Data Evaluation Panel (ODEP). Available at: <http://www.odep.org.uk/> Accessed 17/05/2021.

**Compared to all other cementless stems in NJR, p<0.001

We thank the patients and staff of all the hospitals in England, Wales and Northern Ireland who have contributed data to the National Joint Registry. We are grateful to the Healthcare Quality Improvement Partnership (HQIP), the NJR Steering Committee and staff at the NJR Centre for facilitating this work. The views expressed represent those of the authors and do not necessarily reflect those of the National Joint Registry Steering Committee or the Health Quality Improvement Partnership (HQIP) who do not vouch for how the information is presented.

The data used for this analysis was obtained from the National Joint Registry ("NJR"). The Healthcare Quality Improvement Partnership ("HQIP"), the NJR and/or its contractor, Northgate Public Services (UK) Limited ("NPS") take no responsibility for the accuracy, currency, reliability and correctness of any data used or referred to in this report, nor for the accuracy, currency, reliability and correctness of links or references to other information sources and disclaims all warranties in relation to such data, links and references to the maximum extent permitted by legislation.



Room: Menteith

14:00 – 14:40

INDUSTRY SYMPOSIA

Parallel industry session

&
repeated

Smith+Nephew

14:50 – 15:30

OPTIMISING HIP REPLACEMENT, IMPLANT SELECTION AND ORIENTATION.



Edward Davis
(Birmingham)

15:30 – 16:00



TEA | EXHIBITION | E-POSTERS

Room: Lennox Suite

? FAQ

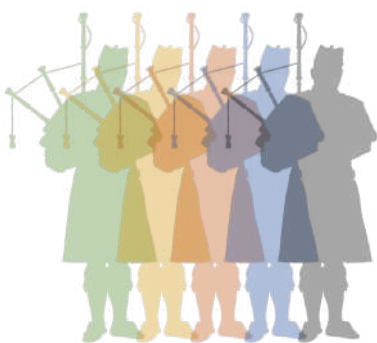
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#bhs2023



Room: Auditorium

16:00 – 17:00



TOPIC IN FOCUS: ARTIFICIAL INTELLIGENCE AND HIP SURGERY

Chair:



Mike Reed



Mike Reed
(Northumbria)



Cody Wyles
(Rochester, MN, USA)



Richie Gill
(Bath)



Justin Green
(Northumbria)

16:00	Introduction	Mike Reed
16:05	PR Optimising patient-specific preoperative planning with artificial intelligence tools	Cody Wyles
16:20	Recognising fracture patterns	Richie Gill
16:35	Predicting the outcome of hip procedures	Justin Green
16:50	Discussion	

Room: Auditorium

17:00 – 17:10

THE GIRFT / SWLEOC PLAYBOOK: A TOOL FOR NEW ELECTIVE HUBS



Richard Field



introduced by:
Vikas Khanduja



Room: Auditorium

17:10 – 18:00

EMERGING HIP SURGEONS FORUM

Chairs:



**K H Sunil
Kumar**



**James
Shelton**



Ben Haughton

17:10

Navigating finances as a new consultant



James Hahnel
(Bradford)

17:25

Tips and tricks for starting as a new consultant



Andrew Hamer
(Sheffield)

17:35

How to minimise cancellations and maximise elective activity?



Tim Petheram
(Northumbria)

17:45 – 18:00

Discussion



Room: Auditorium

18:15 – 19:30

ANNUAL GENERAL MEETING (BHS Members only)



Room: Lammermuir 1+2

17:10 – 18:15

MDT FORUM:

Chairs:

Parallel session

Greater trochanteric pain syndrome (GTPS),
creating winners.

Who should attend?

Physios, Surgeons, MSK Physicians, and members of the
multidisciplinary team who see patients with GTPS.

Why attend?

Patients with GTPS are frequently encountered by
clinicians in hip clinics but finding effective treatment can
be challenging. This session explores the range of
treatment options available and stratifies them to create
an environment for successful management.



Alison
Smeatham



Lucie
Gosling



Barry Davison
(Northumbria)



Lucie Gosling
(Birmingham)



Fraser Pressdee
(Birmingham)



Chris Clifford
(Glasgow)



Tony Andrade
(Reading)



Katie Monnington
(Stanmore)

17:10

Introduction

Alison Smeatham

17:15

Pathophysiology, patient presentation and assessment

Barry Davison

17:23

Risk factors, imaging and PROM's

Lucie Gosling

17:31

Loading principles

Chris Clifford

17:39

Shockwave, PRP & CSI

Fraser Pressdee

17:47

Surgical indications/criteria

Tony Andrade

17:55

Summary & stratification

Katie Monnington

18:03

Discussion



Room: Auditorium

18:15 – 19:30

ANNUAL GENERAL MEETING (BHS Members only)



BRITISH
HIP
SOCIETY

BHS Culture & Diversity initiative
#bhsfunrun #bhs2023

Thursday 9th March
07:00 – 08:00

FUN Run
Edinburgh



*Join us bright and breezy...
conferences aren't just all about hips!*

FULLY BOOKED

- ✓ 5k flat route, accessible and fun for all abilities.
- ✓ Make new friends and colleagues, have Fun!
- ✓ 80's/neon fancy dress encouraged!
- ✓ Photo stops and snippets of Edinburgh's history.
- ✓ Breakfast bap and hot drink.
- ✓ Prizes for best 80's/fancy dress | best group pic.



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The BHS have chosen to support **Held In Our Hearts**, a Scottish charity providing baby loss counselling and peer support to families, with over 40 years' experience of offering compassionate bereavement care in the community.

In 2021, Held In Our Hearts provided 1,200 counselling sessions and anticipate the need in 2023 to be even greater.



Room: Auditorium

08:25 – 08:30

WELCOME



Dominic Meek
President Elect, BHS

Room: Auditorium

08:30 – 09:30



PODIUM SCIENTIFIC PAPERS PRIMARY ARTHROPLASTY

5 minutes presentation | 2 minutes discussion.

Chairs:



**Samantha
Tross**



**Tim
Petheram**

08:30

(7)

WHICH FACTORS PREDICT A SUCCESSFUL OUTCOME FOLLOWING TOTAL HIP REPLACEMENT IN PATIENTS WITH EARLY RADIOGRAPHIC OSTEOARTHRITIS?

Martin Sharrock, Tim Board
Wrightington Hospital, Wigan, United Kingdom

08:37

(85)

SAFETY AND EFFICACY OF DULOXETINE IN PATIENTS UNDERGOING TOTAL HIP OR KNEE ARTHROPLASTY: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS.

Kaif Qayum¹, Zhan Ng², Veena Sudarshan³, Kavina Kudhail¹, Huzaefah Sapra¹, Daniel Guerero¹, Ahmed Daoub⁴

¹Dudley Group NHS Foundation Trust, Dudley, United Kingdom. ²University Hospitals Dorset NHS Foundation Trust, Poole, United Kingdom. ³Bedfordshire Hospitals NHS Foundation Trust, Luton, United Kingdom. ⁴Robert Jones and Agnes Hunt Orthopaedic Hospital NHS Foundation Trust, Oswestry, United Kingdom

08:44

(122)

EXPERIENCE OF THE 150 MM LUBINUS SP II FEMORAL STEM IN A UK CENTRE - EXCELLENT SURVIVORSHIP, LOW DISLOCATION AND NEGLIGIBLE PERIPROSTHETIC FRACTURE RATES UP TO 15 YEARS FOLLOWING PRIMARY THA

Gareth Turnbull, Adeel Akhtar, Edward Dunstan, Andy Ballantyne
National Treatment Centre – Fife Orthopaedics, Kirkcaldy, United Kingdom

08:51

(172)

FACTORS INFLUENCING OUTCOMES IN CLIMBERS AND MOUNTAINEERS UNDERGOING HIP ARTHROPLASTY

Holly Warder^{1,2}, Tim Sanders¹, Nicholas Wright¹, Beth Hall-Thompson¹, Simon Alford¹, David Johnson²
¹University of Central Lancashire, Preston, United Kingdom. ²Stockport NHS Foundation Trust, Stockport, United Kingdom



Room: Auditorium

08:30 – 09:30



PODIUM SCIENTIFIC PAPERS PRIMARY ARTHROPLASTY

5 minutes presentation | 2 minutes discussion.

Chairs:



Samantha
Tross



Tim
Petheram

MS

08:58

(179)

POTENTIAL IMPACT OF THE IMPLEMENTATION OF AN ELECTRONIC HEALTH RECORD ON NATIONAL JOINT REGISTRY OUTLIER ANALYSES

Rohan Ewels¹, Al-Amin Kassam², Jonathan Evans^{2,1}

¹University of Exeter, Exeter, United Kingdom. ²Exeter Hip Unit, Princess Elizabeth Orthopaedic Centre, Exeter, United Kingdom

09:05

(187)

COLLABORATIVE TEAM TRAINING IN IMMERSIVE VIRTUAL REALITY IS SUPERIOR TO INDIVIDUAL LEARNING FOR PERFORMING TOTAL HIP ARTHROPLASTY: A RANDOMISED CONTROLLED TRIAL

Thomas Edwards¹, Daniella Soussi¹, Shubnam Gupta¹, Sikandar Khan¹, Arjun Patel¹, Amogh Patil¹, David Badri², Alexander Liddle¹, Justin Cobb¹, Kartik Logishetty^{1,3}

¹Imperial College London, London, United Kingdom. ²Johnson & Johnson, Solothurn, Switzerland.

³University College London Hospitals, London, United Kingdom

09:12

(217)

HYPONATRAEMIA - THE ENEMY OF ENHANCED RECOVERY FOLLOWING PRIMARY HIP ARTHROPLASTY

Alex Denning^{1,2}, Mamdouh Hefny², Jon Waite²

¹Basingstoke North Hampshire Hospital, Basingstoke, United Kingdom. ²Warwick Hospital, Warwick, United Kingdom

09:19

(225)

DIRECT ANTERIOR APPROACH OR POSTERIOR APPROACH TOTAL HIP ARTHROPLASTY - IS THERE A DIFFERENCE IN LONG-TERM REVISION RATES AND 10-YEAR PATIENT REPORTED OUTCOME MEASURES?

Irrum Afzal, Richard Field

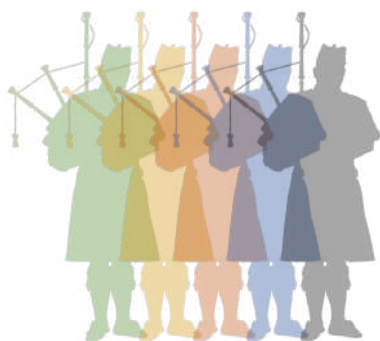
Southwest London Elective Orthopaedic Centre, London, United Kingdom



FAQ

E-Posters

View our selected scientific poster presentations displayed on digital screens in the Lennox Suite. Full abstracts and E-posters are also available to view on the BHS 2023 App.



#bhs2023



Room: Auditorium

09:30 – 10:30



TOPIC IN FOCUS: PERI-PROSTHETIC FEMORAL FRACTURE

Chair:



Jonathan Evans



Jonathan Evans
(Exeter)



Josh Lamb
(New Zealand)



Charlotte
Carpenter
(Bristol)



Al-Amin
Kassam
(Exeter)



Alex Bottle
(London)



Cliff Shelton
(Lancaster)

09:30

What do we know now?

Jonathan Evans
Josh Lamb

- Results of a NJR/HES linked analysis of periprosthetic femoral fractures, a dataset that includes both revision and fixation
- Incidence and predictors of periprosthetic fractures
- Outcomes following periprosthetic fracture
- How much does treating periprosthetic fractures cost?

09:38

The patient perspective and qualitative studies

Cliff Shelton
Charlotte Carpenter

09:46

The future of PPFF research

Alex Bottle

09:54

Fixation or revision. Who to fix, how I fix and why I fix?

Al-Amin Kassam

10:02

Panel Discussion



Jonathan Evans
Josh Lamb
Charlotte Carpenter
Alex Bottle
Cliff Shelton
Al-Amin Kassam



Room: Auditorium

09:30 – 10:30



TOPIC IN FOCUS: PERI-PROSTHETIC FEMORAL FRACTURE

Chair:



Michael Whitehouse

10:10

Debate:

Should the surgical management of PPFF be centralised as part of a network?



Mark Higgins
(Nottingham)



Paul Baker
(Middlesbrough)

For: Mark Higgins
Against: Paul Baker

10:30 – 11:00



COFFEE | INDUSTRY EXHIBITION | E-POSTERS

Room: Lennox Suite

? FAQ

Live stream & on demand viewing?

Live stream viewing will be available for registered delegates not attending in-person. On demand viewing will be available from a few months post-event for **BHS members only**.

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#bhs2023



Room: Auditorium

11:00 – 12:00



PODIUM SCIENTIFIC PAPERS

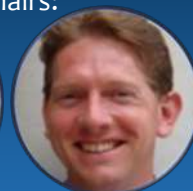
REVISION ARTHROPLASTY / INFECTION

5 minutes presentation | 2 minutes discussion.

Chairs:



**Homa
Arshad**



**Sebastian
Dawson-
Bowling**

- (154)**
ARTIFICIAL INTELLIGENCE CAN IDENTIFY FAILING TOTAL HIP REPLACEMENTS BEFORE RADIOGRAPHIC FEATURES OR A DROP IN PROMS SCORES
11:00 Vipin Asopa, Andrew Womersley, Jad Wehbe, Christopher Spence, Peter Harris, David Sochart, Keith Tucker, Richard Field
South West London Elective Orthopaedic Centre, London, United Kingdom
- (119)**
DOES SIZE MATTER? OUTCOMES OF LONG VERSUS STANDARD FEMORAL PROSTHESIS IN REVISION TOTAL HIP ARTHROPLASTY: A SYSTEMATIC REVIEW
11:07 Rajpreet Sahemey, Ali Ridha, Alastair Stephens, Muhamed Farhan-Alanie, Bryan Riemer, Jakub Jozdryk
UHCW, Coventry, United Kingdom
- (99)**
WHEN SHOULD A DEEP INFECTION IN A TOTAL HIP REPLACEMENT BE CLASSIFIED AS THEATRE ACQUIRED?, NEW INSIGHTS FROM OLD DATA.
11:14 Andrew Thomas¹, Martyn Wilkinson²
¹The Royal Orthopaedic Hospital, Birmingham, United Kingdom. ²The Queen Elizabeth Hospital, Birmingham, United Kingdom
- (104)**
ISCHIAL SCREW FIXATION CAN PREVENT CUP MIGRATION IN 3D-PRINTED CUSTOM ACETABULAR COMPONENTS FOR COMPLEX HIP RECONSTRUCTION
11:21 Suroosh Madanipour, Daniel Lemanu, Chethan Jayadev, Will Aston, James Donaldson, Jonathan Miles, Richard Carrington, Robert McCulloch, John Skinner
Royal National Orthopaedic Hospital, Stanmore, United Kingdom
- (112)**
REVISION OF METAL-ON-METAL HIP REPLACEMENTS WITH DUAL MOBILITY BEARINGS AND ACETABULAR COMPONENT RETENTION.
11:28 Rajpal Nandra¹, William Fishley², Sarah Whitehouse^{1,3}, Ian Carluke², Derek Kramer², Paul Partington², Mike Reed², Jonathan Evans¹, Michalis Panteli¹, John Charity¹, Matthew Wilson¹, Jonathan Howell¹, Matthew Hubble¹, Timothy Petheram², Al-Amin Kassam¹
¹Royal Devon and Exeter Hospital, Exeter, United Kingdom. ²Northumbria Healthcare NHS Foundation Trust, Northumbria, United Kingdom. ³Queensland University of Technology, Brisbane, Australia



Room: Auditorium

11:00 – 12:00



PODIUM SCIENTIFIC PAPERS

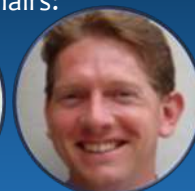
REVISION ARTHROPLASTY / INFECTION

5 minutes presentation | 2 minutes discussion.

Chairs:



Homa
Arshad



Sebastian
Dawson-
Bowling

11:35

(131)

A COMPARISON OF 5 YEAR MORTALITY RATES FOLLOWING REVISION HIP ARTHROPLASTY FOR PERIPROSTHETIC FRACTURE, ASEPTIC LOOSENING OR INFECTION AT A TERTIARY REFERRAL CENTRE

Richard Unsworth, Jonathan Barrow, Mohammed As-Sultany, Graham Hastie, Paul Siney, Tim Board, Hiren Divecha
Wrightington, Wigan & Leigh NHS Foundation Trust, Wigan, United Kingdom

11:42

(189)

DO DELAYS IN PROCESSING INFLUENCE THE ABILITY TO PERFORM SYNOVIAL LEUKOCYTE COUNT IN INVESTIGATION OF PERIPROSTHETIC JOINT INFECTION?

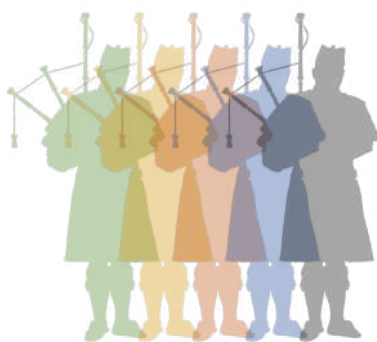
Rathan Jeyapalan, Paul Baker, Simon Jameson, Sindhoo Rangarajan, Igor Kubelka
South Tees NHS Foundation Trust, Middlesbrough, United Kingdom

11:49

(222)

REVISION BEARING SELECTION FOLLOWING CERAMIC BEARING FRACTURE - A PATIENT SAFETY DECISION.

Daniel Howard^{1,2}, Brad Manktelow², Richard DeSteiger³, John Skinner⁴, Robert Ashford^{1,2}
¹University Hospitals of Leicester, Leicester, United Kingdom. ²University of Leicester, Leicester, United Kingdom. ³The University of Melbourne, Melbourne, Australia. ⁴Royal National Orthopaedic Hospital, London, United Kingdom



FAQ

CPD Certificates

The Royal College of Surgeons of England has awarded up to **16.25 CPD points** for the annual scientific meeting and up to **6 CPD points** for the instructional course.

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#bhs2023



Room: Auditorium

12:00 – 12:20

PRESIDENTIAL REVIEW OF THE YEAR



Vikas Khanduja

Room: Auditorium

12:20 – 13:00

PRESIDENTIAL GUEST LECTURE

12:20 – 12:25

Introduction



Vikas Khanduja
BHS President

12:25 – 12:55

Presidential Guest Lecture
Form follows Function: A Hip Journey!



Paul E. Beaulé
Professor of Surgery,
University of Ottawa,
Canada

13:00 – 14:00



LUNCH | EXHIBITION | E-POSTERS | JAM papers

Room: Lennox Suite

Room: Lennox Suite

13:10 – 13:50

JAM – just a minute scientific papers

1 minute, 1 slide presentation | 1 question.

Please note: these presentations take place in the
Lennox Suite.

Chairs:



Simon Buckley Andy Hamer

13:10

(110)

TOTAL HIP ARTHROPLASTY FOR NECK OF FEMUR FRACTURE – CAN WE BETTER PREDICT PATIENTS THAT WILL BENEFIT?

Lauren Smith¹, Lee Hoggett², Reinier Van-Mierlo³, George McLauchlan³

¹University of Manchester, Manchester, United Kingdom. ²Health Education Northwest, Manchester, United Kingdom. ³Lancashire Teaching Hospitals NHS Foundation Trust, Preston, United Kingdom



Room: Lennox Suite

13:10 – 13:50

**JAM – just a minute
scientific papers**

Chairs:

1 minute, 1 slide presentation | 1 question.

Please note: these presentations take place in the
Lennox Suite.**Simon Buckley Andy Hamer**

13:12

(151)**TOTAL HIP REPLACEMENT IN ANKYLOSING SPONDYLITIS – SURGICAL CHALLENGES AND ITS OUTCOMES.**Javahir Pachore, Vikram Shah, Amish Kshatriya, Ashish Sheth, Kalpesh Shah
Shalby Hospital, Ahmedabad, India

13:14

(115)**CONCERNS WITH DUAL-MOBILITY BEARINGS: A CASE REPORT OF ILIOPSOAS IMPINGEMENT MANAGED ARTHROSCOPICALLY**Ivor Vanhegan, Saad Islam, Luke Roberts
Salisbury District Hospital, Salisbury, United Kingdom

13:16

(134)**ACCURACY OF TEMPLATING FEMORAL OFFSET FROM PELVIC X-RAYS FOR IMPLANT SELECTION FOR HIP ARTHROPLASTY SURGERY AND THE CREATION OF A MODEL TO ESTIMATE TRUE FEMORAL OFFSET.**Kok Kiong Ang, Gareme Holt
NHS Ayrshire and Arran, Kilmarnock, United Kingdom

13:18

(224)**OUTCOMES OF JOINT PRESERVATION SURGERY: A COMPARISON OF PATIENTS WITH DEVELOPMENTAL DYSPLASIA OF THE HIP (DDH) AND FEMOROACETABULAR IMPINGEMENT (FAI)**Ajay Malviya, Christian Smith, Shiv Kolhe
Northumbria Healthcare NHS Trust, Northumbria, United Kingdom

13:20

(142)**EARLY OUTCOMES OF 1.5 STAGE REVISION OF FEMORAL ENDOPROTHETIC REPLACEMENTS FOR THE MANAGEMENT OF INFECTION.**Harshadkumar Rajgor, Jasprit Kaur, Guy Morris, Lee Jeys, Jonathan Stevenson
Royal Orthopaedic Hospital, Birmingham, United Kingdom

13:22

(143)**PROFESSIONALISM IN TRAUMA & ORTHOPAEDIC SURGERY - A NATIONAL SNAPSHOT**Marieta Franklin¹, Lisa Kells², Cronan Kerin^{3,4}¹ST7 Mersey Deanery, Liverpool, United Kingdom. ²CT1 Royal Stoke University Hospital, Stoke, United Kingdom. ³Consultant T&O Surgeon Liverpool University Hospitals, Liverpool, United Kingdom. ⁴Training Programme Director, T&O Higher Surgical Training Programme, HENW West Sector, Liverpool, United Kingdom

13:24

(35)**COVID-19 VACCINATION: DOES IT ALTER POSTOPERATIVE MORTALITY AND MORBIDITY IN HIP FRACTURES?**Nuthan Jagadeesh^{1,2}, Sachindra Kapadi¹, Jabez Gnany¹, Nidhin Koshy¹, Debbie Shaw¹¹Wrightington Wigan and Leigh NHS foundation trust, Wigan, United Kingdom. ²Robert Jones and Agnes Hunt Hospital, Oswestry, United Kingdom



Room: Lennox Suite

13:10 – 13:50

JAM – just a minute scientific papers

1 minute, 1 slide presentation | 1 question.

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Lennox Suite.

Chairs:



**Anil
Gambhir**



**Tim
Petheram**

(148)

DOES TIME TO SURGERY INFLUENCE OUTCOMES FOR THOSE UNDERGOING TOTAL HIP ARTHROPLASTY FOR HIP FRACTURE? A NATIONWIDE STUDY FROM THE SCOTTISH HIP FRACTURE AUDIT

13:26

Lewis Mitchell¹, Caroline Martin², Kirsty Ward², Karen Adam³, Andrew Hall⁴, Nick Clement⁵, Alasdair MacLulich⁶, Luke Farrow^{7,8}

¹University of Aberdeen, Aberdeen, United Kingdom. ²Public Health Scotland, Edinburgh, United Kingdom. ³Scottish Government, Edinburgh, United Kingdom. ⁴Golden Jubilee National Hospital, Clydebank, United Kingdom. ⁵Edinburgh Orthopaedics, Edinburgh, United Kingdom. ⁶Usher Institute, University of Edinburgh, United Kingdom. ⁷University of Aberdeen, Aberdeen, United Kingdom. ⁸Grampian Orthopaedics, Aberdeen, United Kingdom

(153)

COST-EFFECTIVENESS OF THE SCOTTISH HIP FRACTURE AUDIT

13:28

Luke Farrow^{1,2}, Jennifer Hislop³, Kirsty Ward⁴, Karen Adam⁵, Andrew Hall⁶, Nick Clement⁷, Alasdair MacLulich⁸

¹University of Aberdeen, Aberdeen, United Kingdom. ²Grampian Orthopaedics, Aberdeen, United Kingdom. ³Health Improvement Scotland, Edinburgh, United Kingdom. ⁴Public Health Scotland, Edinburgh, United Kingdom. ⁵Scottish Government, Edinburgh, United Kingdom. ⁶Golden Jubilee National Hospital, Clydebank, United Kingdom. ⁷Edinburgh Orthopaedics, Edinburgh, United Kingdom. ⁸Usher Institute, Edinburgh, United Kingdom

(155)

FACTORS ASSOCIATED WITH FAILURE OF FIXATION OF VANCOUVER B FRACTURES AROUND A CEMENTED POLISHED TAPERED STEM: A 5 TO 14 YEAR FOLLOW UP STUDY

13:30

Matilda Powell-Bowns¹, Erlend Oag¹, Damien Martin¹, Nicholas Clement¹, Matthew Moran¹, Chloe Scott^{1,2}

¹Royal Infirmary of Edinburgh, Edinburgh, United Kingdom. ²University of Edinburgh, Edinburgh, United Kingdom

(176)

COMPLIANCE WITH LOSARTAN USE AFTER HIP ARTHROSCOPY IS POOR AND SUBSEQUENT CLINICAL AND FUNCTIONAL BENEFITS ARE NOT SIGNIFICANT

13:32

Jurek Pietrzak¹, Dyllan Geldenhuys¹, Ashleigh Lewis¹, Josip Cacic^{1,2}

¹University of the Witwatersrand, Johannesburg, South Africa. ²Life Fourways Hospital, Johannesburg, South Africa

(182)

PATIENTS WITH LOW-GRADE OA HAVE LESS FAVOURABLE OUTCOMES POST-THA COMPARED TO A MATCHED COHORT OF PATIENTS WITH END-STAGE OA.

13:34

Wouter Peeters^{1,2}, Frans-Jozef Vandeputte¹, Jeroen Verhaegen^{1,2,3}, Kristoff Corten^{1,4,5}

¹Ziekenhuis Oost-Limburg, Genk, Belgium. ²Orthopaedic Center Antwerp/ AZ Monica Hospitals, Antwerp, Belgium. ³University of Antwerp, Antwerp, Belgium. ⁴Heuppraktijk/European Hip Clinic, Herselt, Belgium. ⁵University of Hasselt, Hasselt, Belgium



Room: Lennox Suite

13:10 – 13:50

JAM – just a minute scientific papers

1 minute, 1 slide presentation | 1 question.

Please note: these presentations take place in the
Lennox Suite.

Chairs:



Anil
Gambhir



Tim
Petheram

13:36

(183)

MID-TERM PERIPROSTHETIC FRACTURE RISK WITH CEMENTLESS AND CEMENTED STEMS IN AN ELECTIVE PRIMARY HIP POPULATION

Matthew Lynch Wong, Mark Robinson, Leeann Bryce, Roslyn Cassidy, Josh Lamb, Janet Hill, Owen Diamond, David Beverland
Musgrave Park Hospital, Belfast, United Kingdom

13:38

(196)

EARLY OUTCOMES OF HIP ARTHROSCOPY FOR FEMOROACETABULAR IMPINGEMENT: A STUDY OF 6,736 CASES USING THE NAHR DATASET

Richard Holleyman¹, Marcus Bankes², Tim Board³, NAHR User Group⁴, Ajay Malviya⁵, Vikas Khanduja⁶
¹Health Education North East, Newcastle Upon Tyne, United Kingdom. ²Guy's and St Thomas' NHS Foundation Trust, London, United Kingdom. ³Wrightington, Wigan and Leigh NHS Foundation Trust, Wigan, United Kingdom. ⁴British Hip Society, UK, United Kingdom. ⁵Northumbria NHS Foundation Trust, Ashington, United Kingdom. ⁶Addenbrooke's Hospital, Cambridge, United Kingdom

13:40

(198)

DOES SELECTIVE SCREW AUGMENTATION AFFECT PATIENT-REPORTED OUTCOME OR COMPLICATIONS IN CEMENTLESS ACETABULAR REPLACEMENT DURING TOTAL HIP ARTHROPLASTY (THA)?

Samantha Downie¹, Ewan Semple¹, David Ridley², Graeme Nicol¹
¹NHS Tayside, Dundee, United Kingdom. ²University of Dundee, Dundee, United Kingdom

13:42

(207)

DOES HIP RESURFACING CONSERVE BONE? A MODELLING STUDY USING A NOVEL CT BASED SURGICAL PLANNING PLATFORM

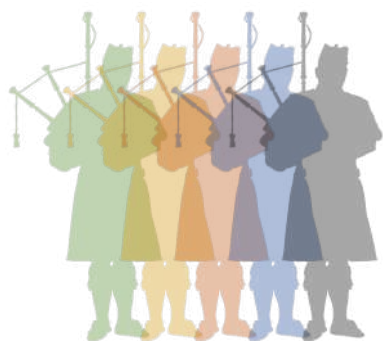
Kartik Logishetty^{1,2}, Ciaran O'Hanlon^{3,1}, Arjun Patel¹, Thomas Edwards¹, Simon Harris¹, Justin Cobb¹
¹Imperial College London, London, United Kingdom. ²University College London Hospitals, London, United Kingdom. ³Kings College London, London, United Kingdom

13:44

(214)

NOVEL APPLICATION OF THE OXFORD HIP SCORE TO ASSESS HIP PAIN, FUNCTION AND QUALITY OF LIFE AFTER WEIGHT LOSS

Simon Federer^{1,2}, Madeleine Bates^{1,2}, Chris Pring¹, Neal Smith², Penny Hudson²
¹St. Richard's Hospital, Chichester, United Kingdom. ²University of Chichester, Chichester, United Kingdom



? FAQ

E-Posters

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BRITISH
HIP
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BHS Culture & Diversity committee presents:

IS YOUR MIND PLAYING TRICKS ON YOU

Are you sabotaging your ability to promote excellence in everyone around you



Thursday 9th March

13:30 - 14:45

Auditorium | EICC, Edinburgh

Join us with professional actors in an exploration of unconscious bias



Prof. Amy Grove
University of Warwick



Homa Arshad
Royal London Hospital



Joanna Maggs
Torbay & South Devon
NHSFT



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Room: Lammermuir 1

14:00 – 14:40

INDUSTRY SYMPOSIA

Parallel industry session

&
repeated

14:50 – 15:30



GETTING THE MOST FROM YOUR IMPLANT PROVIDER? REAL WORLD EXAMPLES OF HOW PARTNERING WITH DEPUY SYNTHES CAN REDUCE LENGTH OF STAY, ENHANCE PRODUCTIVITY AND IMPROVE OUTCOMES

Mr Magra, Consultant orthopaedic surgeon discussing the GIRFT case story and how J&J and Morecambe partnered to deliver significant improvements in joints LOS.



Merzesh Magra
(Lancashire)

Fractured NOF project in UHB and how the partnership with J&J enabled the trust to improve BPT adherence by 26%.



Anastasios Nikolaidis
(Birmingham)

How have J&J used subject matter experts to improve the speed at which hospitals can improve their performance?



Hilary Young
(Northumbria)

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INDIVIDUAL HIP®

Personalized femoral stem



British Hip Society Meeting 2023
MEET US AT STAND N°P3





Room: Lammermuir 2

14:00 – 14:40

&
repeated

14:50 – 15:30

INDUSTRY SYMPOSIA

Parallel industry session



THE YOUNG ADULT COMPLEX HIP

Understanding helitorsion and the proximal femur for young dysplastic hip replacement.



Pramod Achan
(London)

The Individual Hip – how planning, engineering and surgery can optimise the outcome



Callum McBryde
(Birmingham)

? FAQ

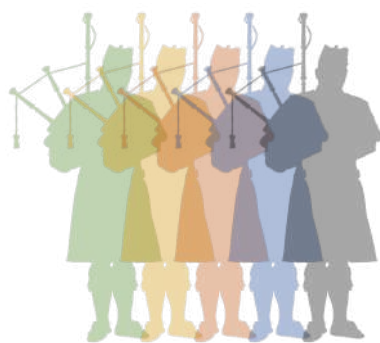
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1. Ilgen RL Nd, Bukowski BR, Abiola R, et al. Robotic-assisted total hip arthroplasty: outcomes at minimum two-year follow-up. *Surg Technol Int.* 2017;30:365-372.
2. Suarez-Ahedo C, Gui C, Martin TJ, Chandrasekaran S, Lodhia P, Domb BG. Robotic-arm assisted total hip arthroplasty results in smaller acetabular cup size in relation to the femoral head size: a matched-pair controlled study. *Hip Int.* 2017;27(2):147-152. doi:10.5301/hipint.5000418
3. Scott CE, Bugler KE, Clement ND, MacDonald D, Howie CR, Biant LC. Patient expectations of arthroplasty of the hip and knee. *J Bone Joint Surg Br.* 2012;94(7):974-981. doi:10.1302/0301-620X.94B7.28219

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Room: Menteith

14:00 – 14:40

INDUSTRY SYMPOSIA

Parallel industry session

&
repeated

14:50 – 15:30

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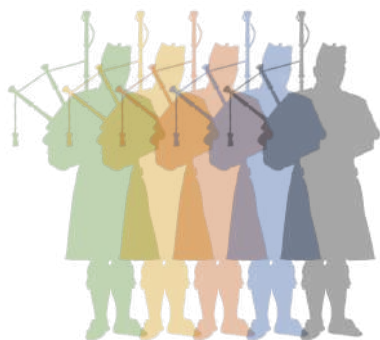
FACILITATING SHORT STAY / DAYCASE ARTHROPLASTY IN THE POST COVID ERA AND CURRENT NHS CLIMATE



Samantha Hook
(Portsmouth)



Al-Amin Kassam
(Exeter)



? FAQ

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#bhs2023



BRITISH
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Annual Scientific Meeting 2023 | EICC, Edinburgh

Thursday 9th March

Final programme | 51



TEA | EXHIBITION | E-POSTERS

15:30 – 16:00



Room: Lennox Suite

Room: Auditorium

16:00 – 17:00

COMPLEX CASES DISCUSSION

Chairs:



Samantha
Hook



Marcus
Bankes

16:00

Neck/shaft fracture



Ajit Shetty

16:12

Exeter fracture



Ross Barker

16:24

Subtroch fractures



Jahavir Pachore

16:36

Polio



James Shelton

16:48

Fused hip



Jerome Davidson



Room: Auditorium

17:00 – 18:00



TOPIC IN FOCUS:

THE GREAT DEBATE: THIS HOUSE BELIEVES THAT A ROBOT SHOULD BE USED FOR EVERY PRIMARY HIP REPLACEMENT.



Vikas Khanduja
(Cambridge)



Edward Davis
(Birmingham)



Al-Amin Kassam
(Exeter)



Tim Petheram
(Northumbria)



Joanna Maggs
(Torbay)



Simon Buckley
(Sheffield)



Martyn Porter
(Wrightington)



Andrew Hamer
(Sheffield)



Rob Banerjee
(Oswestry)

17:00	Introduction	Joanna Maggs
17:02	Getting the biomechanics right?	Edward Davis Martyn Porter
17:18	Training?	Al-Amin Kassam Andrew Hamer
17:34	Cost benefits?	Tim Petheram Rob Banerjee
17:50	Conclusions	Joanna Maggs

18:00 – 20:00



BHS AWARDS RECEPTION

Don't miss out! All delegates and exhibitors are welcome to attend.

Room: Lennox Suite

BHS Awards Reception

All delegates and exhibitors are welcome to attend this great evening of...



Lennox Suite, EICC
Thursday 9th March
18:00 – 20:00



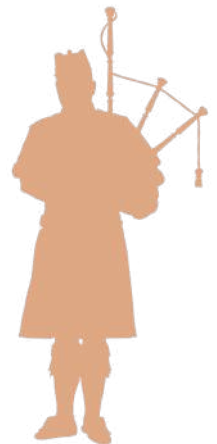
BRITISH
HIP
SOCIETY

Don't miss out!
included in your
registration fee

social networking,



food and drinks.





Room: Auditorium

08:00 – 08:05

WELCOME



Vikas Khanduja
President, BHS

Room: Auditorium

08:05 – 09:05



PODIUM SCIENTIFIC PAPERS NON ARTHROPLASTY / TRAUMA

5 minutes presentation | 2 minutes discussion.

Chairs:



Debbie Shaw



Henry
Wynn Jones

- 08:05 (17)
ACETABULAR SECTOR ANGLES IN ASYMPTOMATIC AND DYSPLASTIC HIPs – DEFINING THRESHOLDS FOR DYSPLASIA
Jeroen Verhaegen^{1,2,3}, Zach Devries³, Isabel Horton³, Pablo Slullitel⁴, Kawan Rakhra³, Paul Beaulé³, George Grammatopoulos³
¹University Hospital Antwerp, Antwerp, Belgium. ²Orthopedic Center Antwerp, Antwerp, Belgium. ³The Ottawa Hospital, Ottawa, Canada. ⁴Hospital Italiano de Buenos Aires, Buenos Aires, Argentina
- 08:12 (24)
WHAT IS THE VALUE OF A HIP SPECIFIC MRI IN THE MANAGEMENT OF PATIENTS WITH SYMPTOMATIC HIP DYSPLASIA UNDERGOING COMBINED HIP ARTHROSCOPY AND PERI-ACETABULAR OSTEOTOMY? A MULTI-CENTER TRIAL
Jeroen Verhaegen^{1,2,3}, Kenneth Milligan³, Ira Zaltz⁴, Michael Stover⁵, Ernest Sink⁶, Etienne Belzile⁷, John Clohisy⁸, Stéphane Poitras⁹, Paul Beaulé³
¹University Hospital Antwerp, Antwerp, Belgium. ²Orthopedic Center Antwerp, Antwerp, Belgium. ³The Ottawa Hospital, Ottawa, Canada. ⁴Beaumont Hospital, Royal Oak, USA. ⁵Northwest Medical Group, Chicago, USA. ⁶Hospital Special Surgery, New York, USA. ⁷Université Laval, Quebec, Canada. ⁸Washington University, St Louis, USA. ⁹University of Ottawa, Ottawa, Canada
- 08:19 (30)
THE PERI-ARTICULAR MUSCLE ENVELOPE SHOWS ATROPHY AFTER ILIOPSOAS TENOTOMY.
Jonas Declercq^{1,2}, Frans-Jozef Vandeputte², Kristoff Corten^{2,3,4}
¹UZ Gent, Ghent, Belgium. ²ZOL Genk, Genk, Belgium. ³Heuppraktijk, European Hip Clinic, Herselt, Belgium. ⁴EVAL Research, University of Hasselt, Hasselt, Belgium



Room: Auditorium

08:05 – 09:05



PODIUM SCIENTIFIC PAPERS NON ARTHROPLASTY / TRAUMA

Chairs:

5 minutes presentation | 2 minutes discussion.



Debbie Shaw



**Henry
Wynn Jones**

- (89)**
SLIDING HIP SCREW CONSTRUCTS ARE ASSOCIATED WITH EARLY MOBILISATION, RETURN TO DOMICILE AND SHORTER LENGTH OF STAY WHEN COMPARED TO AN INTRAMEDULLARY NAIL: RESULTS FROM THE SCOTTISH HIP FRACTURE AUDIT
08:26 Thomas Diffley¹, Jamie Ferry¹, Regina Sumarlie¹, Mostafa Beshr², Bin Chen³, Nick Clement³, Luke Farrow¹
¹University of Aberdeen, Aberdeen, United Kingdom. ²Aberdeen Royal Infirmary, Aberdeen, United Kingdom. ³Edinburgh Royal Infirmary, Edinburgh, United Kingdom
- (106)**
IS VIRTUAL REALITY THE ANSWER? A STUDY TO VALIDATE THE USE OF HIGH-FIDELITY VIRTUAL REALITY SIMULATION IN HIP ARTHROSCOPY TRAINING.
08:33 Benjamin Schapira, Emmanuel Spanoudakis, Parag Jaiswal, Akash Patel
Royal Free Hospital, Trauma & Orthopaedics department, London, United Kingdom
- (108)**
A COMPARISON OF INTERNAL FIXATION AND HEMIARTHROPLASTY IN THE MANAGEMENT OF UN-OR MINIMALLY DISPLACED HIP FRACTURES IN PATIENTS OVER 60 YEARS OLD
08:40 Maryam Ahmed¹, Romesh Tirimanna², Umar Ahmed³, Soltan Hussein⁴, Habib Syed¹, Khalid Malik-Tabassum¹, Mark Edmondson¹, NOF Collaborative¹
¹University Hospitals Sussex, Brighton, United Kingdom. ²William Harvey Hospital, Ashford, United Kingdom. ³East Surrey Hospital, Redhill, United Kingdom. ⁴St Mary's Hospital, London, United Kingdom
- (152)**
THE HISTORIC AND PROJECTED HIP FRACTURE BURDEN AND INCIDENCE IN SCOTLAND 2017 – 2029
08:47 Euan Harris¹, Luke Farrow², Caroline Martin³, Karen Adam⁴
¹Glasgow Royal Infirmary, Glasgow, United Kingdom. ²Aberdeen Royal Infirmary, Aberdeen, United Kingdom. ³Public Health Scotland, Edinburgh, United Kingdom. ⁴Scottish Government, Edinburgh, United Kingdom
- (191)**
EARLY TO MID-TERM OUTCOMES OF PERIACETABULAR OSTEOTOMY FOR DEVELOPMENTAL HIP DYSPLASIA AND FEMOROACETABULAR IMPINGEMENT: A STUDY OF 1,087 CASES USING THE NAHR DATASET
08:54 Richard Holleyman¹, Marcus Bankes², Johan Witt³, Vikas Khanduja⁴, Ajay Malviya⁵
¹Health Education Northeast, NEWCASTLE UPON Tyne, United Kingdom. ²Guy's and St Thomas' NHS Foundation Trust, London, United Kingdom. ³University College London Hospitals NHS Foundation Trust, London, United Kingdom. ⁴Addenbrooke's Hospital, Cambridge, United Kingdom. ⁵Northumbria Healthcare NHS Foundation Trust, Ashington, United Kingdom



Room: Auditorium

09:05 – 10:05



TOPIC IN FOCUS: REVISION

Chairs:

Dominic Meek
Anil Gambhir



09:05

Revision hip network update



Andrew Hamer
(Sheffield)

09:10

NJR revision hip data project update.



Richard Holleyman
(Newcastle)

09:25

Revision hip complexity classification



Tim Board
(Wrightington)



Case discussion:

Using the Revision hip complexity classification (RHCC) below, let's listen to our expert faculty discuss two cases each – please see overleaf.

H1

- Acetabular bone loss (Paprosky)
 - I, IIA
- Femoral bone loss (Paprosky)
 - I
- Periprosthetic fracture
 - UCS A
- No evidence of abductor compromise
- First time revision for aseptic loosening

H2

- Bone Loss
 - Acetabulum (Paprosky)
 - IIB, IIC
 - Cup Retrieval- well fixed socket (+lysis)
- Femur (Paprosky)
 - II, IIIa
- Periprosthetic Fracture
 - UCS B1, B1, C, D
- Infection
 - DAIR
 - First time revision
- Evidence of abductor deficiency
- Revision for dislocation

H3

- Bone loss
 - Acetabulum (Paprosky)
 - IIIA, IIIB
 - Pelvic Discontinuity
- Femur
 - IIIB, IV
- Femoral retrieval- metaphyseal filling stem⁵
- Periprosthetic Fracture
 - UCS B3, E, F
- Infection
 - Fungal, TB, multidrug resistant organism
 - Re-revision
- Cases requiring plastic or vascular surgical support
- Revision of
 - TFR or PFR
- Re-revision for dislocations



Room: Auditorium

09:05 – 10:05



TOPIC IN FOCUS: REVISION

Chairs:

Dominic Meek

Anil Gambhir



Case discussion:

Using the Revision hip complexity classification (RHCC), it's over to our expert faculty to illustrate and discuss two cases each.



09:35



RHCC: H1, H2

Samantha Hook
(Portsmouth)



Homa Arshad
(London)

09:42



RHCC: H2, H3

Andrew Manktelow
(Nottingham)



Sarah Eastwood
(Newcastle Upon Tyne)

09:49



RHCC: H2, H3

Joanna Maggs
(Torbay)



Al-Amin Kassam
(Exeter)

09:56



RHCC: H2, H3

Philip Mitchell
(London)



Becky Aspinall
(Chesterfield)



COFFEE | EXHIBITION | E-POSTERS

10:05 – 10:30



Room: Lennox Suite

Room: Auditorium

10:30 – 11:30



PODIUM SCIENTIFIC PAPERS
PRIMARY ARTHROPLASTY

Chairs:

5 minutes presentation | 2 minutes discussion.



Theodora
Papadopolou



Tim
Harrison

- 10:30 (6)
CAN ARTHROPLASTY STEM INFLUENCE OUTCOME (CASINO): A RANDOMISED CONTROLLED TRIAL OF STEM LENGTH IN CEMENTED TOTAL HIP ARTHROPLASTY
Paul Gaston¹, Nicholas Clement¹, Nicholas Ohly², Gavin Macpherson¹, David Hamilton³
¹Edinburgh Orthopaedics, Edinburgh, United Kingdom. ²Golden Jubilee Hospital, Glasgow, United Kingdom. ³Glasgow Caledonian University, Glasgow, United Kingdom
- 10:37 (78)
ORTHOPAEDICS INSTRUMENTS AND ORTHOPAEDIC OPERATIONS CAN EXCEED NOISE REGULATION – A SYSTEMATIC REVIEW
Dylan Mistry¹, Usman Ahmed², Randeep Aujla³, Nadim Aslam⁴, Peter D'Alessandro⁵, Shahbaz Malik⁴
¹Worcestershire Acute hospitals Trust, Worcester, United Kingdom. ²Worcestershire Acute hospitals Trust, Worcester, United Kingdom. ³Leicester Royal Infirmary, Leicester, United Kingdom. ⁴Worcestershire Acute Hospitals NHS Trust, Worcester, United Kingdom. ⁵Orthopaedic Research Foundation of Western Australia, Claremont, Australia
- 10:44 (80)
WARP: RESULTS OF THE WYCOMBE ARTHROPLASTY RAPID-RECOVERY PATHWAY
John McNamara¹, Jane Eastman¹, Abigail Perring¹, Nicola Vallance², Aniko Frigyi¹, Athanasios Pollalis¹
¹Buckinghamshire NHS Trust, Aylesbury, United Kingdom. ²Aylesbury, Aylesbury, United Kingdom
- 10:51 (145)
NHS HOSPITALS IN ENGLAND ARE AT A DISADVANTAGE IN PROCURING INTEGRATED CARE BOARD (ICB) CONTRACTS FOR TOTAL HIP REPLACEMENTS.
Gunasekaran Kumar, Rajkumar Gangadharan
Broadgreen Hospital, Liverpool, United Kingdom
- 10:58 (157)
THE RISK OF EARLY REVISION SURGERY AFTER TRAINEE LED PRIMARY TOTAL HIP REPLACEMENT
Daniel Howgate¹, Patrick Garfield Roberts¹, Antony Palmer^{1,2}, Andrew Price^{1,2}, Adrian Taylor², Jonathan Rees^{1,2}, Ben Kendrick^{1,2}
¹Botnar Research Centre, NDORMS, University of Oxford, Oxford, United Kingdom. ²Nuffield Orthopaedic Centre, Oxford, United Kingdom



Room: Auditorium

10:30 – 11:30



PODIUM SCIENTIFIC PAPERS PRIMARY ARTHROPLASTY

5 minutes presentation | 2 minutes discussion.

Chairs:



Theodora
Papadopolou



Tim
Harrison

11:05

(170)

THE HIPHOP STUDY: A FEASIBILITY STUDY FOR AN RCT OF HYBRID VS. CEMENTED TOTAL HIP REPLACEMENT

Tim Board^{1,2}, Rachael Powell², Amy Davies², Tony Coffey³, Vikki Wylde⁴, Tracey Taylor¹, Helen Hickey³, Matt Gornall³, Richard Jackson³, Garima Dalal², Martin Eden², Matthew Wilson⁵, Hiren Divecha^{1,2}
¹Wrightington Hospital, Wigan, United Kingdom. ²University of Manchester, Manchester, United Kingdom. ³University of Liverpool, Liverpool, United Kingdom. ⁴University of Bristol, Bristol, United Kingdom. ⁵Royal Devon and Exeter NHS Trust, Devon, United Kingdom

11:12

(178)

IMMERSIVE VIRTUAL REALITY IS SUPERIOR TO CONVENTIONAL TRAINING FOR SURGICAL TEAM MEMBERS LEARNING ANTERIOR APPROACH TOTAL HIP ARTHROPLASTY: A RANDOMISED CONTROLLED TRIAL

Thomas Edwards, Francesca Kablean-Howard, Isabelle Poole, Jonathan Edwards, Monil Karia, Alexander Liddle, Justin Cobb, Kartik Logishetty
Imperial College London, London, United Kingdom

11:19

(193)

PATIENT-REPORTED OUTCOMES (PROMS) IN SECOND OF STAGED TOTAL HIP ARTHROPLASTY (THA) PROCEDURES: DOES A GOOD OUTCOME FROM THE FIRST PREDICT THE SECOND?

Samantha Downie¹, Seraj Haque², David Ridley³, Benedict Clift¹, Graeme Nicol¹
¹NHS Tayside, Dundee, United Kingdom. ²NHS Grampian, Aberdeen, United Kingdom. ³University of Dundee, Dundee, United Kingdom

Room: Auditorium

11:30 – 12:00

BHS Culture & Diversity update



Joanna Maggs

Room: Auditorium

12:00 – 12:10

NAHR update



Ajay Malviya



Room: Auditorium

12:10 – 12:20

BAJIR update



Tim Petheram

12:20 – 12:50

NJR update



Mike Reed



Tim Wilton



Peter Howard

12:50 – 13:10

Prizes & Presidential handover

12:50

- **McKee Prize** - for the best podium presentation
- **Best JAM (just a minute) Prize** – for the best just a minute presentation
- **Best Poster Prize** – for the best poster presentation.
- **BJJ Prize** - for the best study with potential for translation into clinical care
- **President's Prize** - discretionary award for a particular fine presentation not recognised elsewhere or a noteworthy medical student contribution



Simon
Buckley



Vikas
Khanduja

13:00

President's address and handover to incoming President



Vikas
Khanduja



Dominic
Meek

13:10



ANNUAL SCIENTIFIC MEETING CLOSE
PACKED LUNCHES ON DEPARTURE

BHS 2023 ANNUAL SCIENTIFIC MEETING

BOMSA x BHS FUTURE HIP
SURGEONS STREAM

We are proud to announce the inaugural BOMSA x BHS Future Hip Surgeons Stream at the BHS 2023 Annual Scientific Meeting.

Our programme is designed to offer guidance, motivation & provide unique insights into orthopaedic hip surgery, with renowned T&O faculty & practical workshops!

All Medical Students and FY/Trust Grade/CST Doctors welcome

Only **50 places** available

Registration Fee: **£35**

Lunch, Dinner and Networking Drinks included from 6pm onwards

THURSDAY 9TH MARCH 2023

09:30 - 17:30

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THE EXCHANGE, EDINBURGH, EH3 8EE,
SCOTLAND

**MEDICAL STUDENTS:
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**BRITISH
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BHS 2023 ANNUAL SCIENTIFIC MEETING

BOMSA x BHS: FUTURE HIP SURGEONS STREAM PROGRAMME

Venue: EICC Edinburgh | Room: Lowther (Level -1)



BHS Website and
Event Registration



TIME	SESSION	FACULTY
9:30	Welcome and Introduction	Dr Shiv Kolhe Mr Vikas Khanduja
9:40	Changing Culture and Myth Busting in Hip Surgery	Miss Joanna Maggs
10:00	Life as a Consultant T&O Hip Surgeon	Mr Tim Petheram
10:15	Hip Surgery "Cradle to Grave" Paediatric Hip Surgery (10:15) Young Adult & Sports Hip Surgery (10:30) Arthroplasty & Revision Hip Surgery (10:45)	Mr Andy Craig Mr Vikas Khanduja Mr Antony Palmer
11:00	Coffee/Tea Break	Lowther Foyer
11:15	Getting Into and Making the Most of Orthopaedic Training	Mr Andrew Hall Mr Tobias Stedman
11:45	Tailoring Training in Orthopaedics Clinical Academia (11:45) Medical Education (11:55) Sports Medicine (12:05) Leadership & Management (12:15)	Miss Naomi Gibbs Mr Chris Lewis Mr Andrew Hall Miss Homa Arshad
12:30	Panel Debate: "Robots - a Threat or an Opportunity for the Future of Orthopaedic Surgery?" <u>Against Robots:</u> Mr James Shelton, Mr Andrew Hamer <u>For Robots:</u> Mr Al-Amin Kassam, Mr Tim Petheram	
13:00	Lunch	Lennox Suite
14:00	BHS Industry Exhibition/Symposia (see main BHS programme)	
15:30	Coffee/Tea Break	Lennox Suite
16:00	Practical Workshops <u>Delegates have the choice of 3 out of 4 workshops:</u> Bone Cementing (Heraeus) MAKO Robotic THR (Stryker) Hip Arthroscopy Simulator (Arthrex) Trauma Sawbone Workshop (DePuy)	Mr Ajay Malviya Mr Sebastian Dawson-Bowling Mr Christian Smith Mr Suroosh Madanipour Mr John Charity Mr Andy Craig Mr Tobias Stedman Mr Andrew Hall
17:30	Closing Remarks and Feedback	Lowther Room
18:00	BHS Awards Reception (Food and Drinks Included)	Lennox Suite



FOREWORD

The BHS Instructional course was set up with the aim of providing a comprehensive, FRCS (Orth) syllabus and evidence-based update on topics related to hip surgery.

This facilitates acquiring and updating knowledge at a rapid rate and in a short span of time. The first course was run on the last day of the 2020 Newport Annual Meeting and was a roaring success both in terms of numbers attending and the feedback. Building on the success and the feedback of the first course, the second course on 'Trauma and Revision' took place virtually in 2021 and yet again proved very successful.

The theme in 2022 was 'The Young Adult Hip'. This year we restart a new cycle with the theme 'Applied Clinical Knowledge'.

We have been awarded six CPD points by the Royal College of Surgeons of England. Focusing on the mantra of 'Inclusivity and Diversity', dedicated and enthusiastic surgeons and academics from across the country have been brought together to lecture on their area of expertise for this course.

This course is aimed at trainees preparing for the FRCS (Orth) exam and also for trainees who want to develop an interest in Hip Surgery.

So, if you wish to learn, share, debate and discuss in an exciting environment, the BHS Instructional Course is for you!



Satish Kutty
BHS Education Committee Chair
Instructional Course Convenor



Room: EICC Main Entrance

07:30 **REGISTRATION & COFFEE**

Room: Lammermuir 1+2

08:00 **WELCOME & INTRODUCTION**



Satish Kutty
(Course Convenor)

SESSION ONE: HIP BASICS – APPLIED ANATOMY & APPROACHES



Paula Vickerton
(London)



Andrew Thomas
(Birmingham)



Hussein Kazi
(Crewe)



Richard Field
(London)



K H Sunil Kumar
(Cambridge)

08:10 **PR**

Applied anatomy of the hip joint.

Paula Vickerton

Debate 1:

Surgical exposures of the hip joint



Chair:



Mike Whitehouse

08:30 Anterolateral / direct lateral approach

Andrew Thomas

08:40 Posterior approach

Hussein Kazi

08:50 Direct anterior approach (DAA)

Richard Field

09:00 **D i s c u s s i o n**

09:15 Arthroscopic exposure of the hip joint

K H Sunil Kumar

09:30 **D i s c u s s i o n**



09:45



COFFEE | INDUSTRY EXHIBITION | E-POSTERS

Room: Lennox Suite

Room: Lammermuir 1+2

SESSION TWO: HIP BASICS – BIOMECHANICS & BIOMATERIALS



Richie Gill
(Bath)



Ajay Malviya
(Northumbria)



Mike Whitehouse
(Bristol)

10:00	Basic biomechanics	Richie Gill
10:15	Materials used for hip replacements	Ajay Malviya
10:30	Biomechanics of the normal and replaced hip	Richie Gill
10:40	Tribology and corrosion	Mike Whitehouse
10:55	D i s c u s s i o n	

SESSION THREE: PRINCIPLES OF PRIMARY TOTAL HIP REPLACEMENT



Paul Lee
(London)



Samantha Hook
(Portsmouth)



Kate Gill
(Guildford)



Satish Kutty
(Harlow)



Tim Board
(Wrightington)

11:10	Principles of primary THR	Paul Lee
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How to do it – Video based session 7 minutes each

11:25	Cemented acetabulum	Samantha Hook
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Room: Lammermuir 1+2

SESSION THREE: PRINCIPLES OF PRIMARY TOTAL HIP REPLACEMENT



Paul Lee
(London)



Samantha Hook
(Portsmouth)



Kate Gill
(Guildford)



Satish Kutty
(Harlow)



Tim Board
(Wrightington)

11:32	Cemented femur	Kate Gill
11:39	Uncemented acetabulum	Satish Kutty
11:46	Uncemented femur	Tim Board
11:53	D i s c u s s i o n	

12:00 – 13:00

JOIN BHS SESSION IN MAIN AUDITORIUM

13:00



PACKED LUNCHES

Room: Lammermuir Suite



? FAQ

CPD Certificates

The Royal College of Surgeons of England has awarded up to **16.25 CPD points** for the annual scientific meeting and up to **6 CPD points** for the instructional course.

An online evaluation form will be available on the BHS 2023 App post-event. CPD certificates will be issued electronically, subject to the evaluation form being completed.



Room: Lammermuir 1+2

SESSION FOUR: PRINCIPLES OF PRIMARY TOTAL HIP REPLACEMENT



Debate 2:

Femoral head size – does it matter?

Chair:



Kate Gill



Mukesh Hemmady
(Wrightington)



Nikhil Shah
(Wrightington)



Dennis Kosuge
(Harlow)



Samantha Tross
(London)

14:00	Size 22mm – it has history behind it	Mukesh Hemmady
14:05	Size 28mm – tried and tested	Nikhil Shah
14:10	Size 32mm – it is the gold standard	Dennis Kosuge
14:15	Size 36mm – is the new standard?	Samantha Tross

14:20 **D i s c u s s i o n**

? FAQ

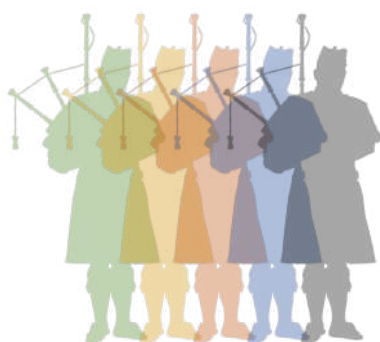
Live stream & on demand viewing?

Live stream viewing will be available for registered delegates not attending in-person. On demand viewing will be available from a few months post-event for **BHS members only**.

Not a member? Join now at:

<https://britishhipsociety.com/join-bhs/>

Please note: JAM paper presentations, industry symposia, the BOMSA meeting and BHS AGM will not be recorded and thus not available for live stream and on demand post-event viewing. The MDT forum session will not be live streamed but will be available for on demand post-event viewing.



#bhs2023



Room: Lammermuir 1+2

SESSION FIVE: PRINCIPLES OF PRIMARY TOTAL HIP REPLACEMENT



Debate 3: Bearing surfaces

Chair:



Nikhil Shah



Johan Witt
(London)



Callum McBryde
(Birmingham)



Julie Smith
(Paisley)



Stephen Duckett
(Crewe)

14:25	Ceramic on ceramic	Johan Witt
14:30	Metal on metal	Callum McBryde
14:35	Metal on polyethylene	Julie Smith
14:40	Ceramic on polyethylene	Stephen Duckett

14:45 **D i s c u s s i o n**



Debate 4: Fixation

Chair:



Samantha Tross



Tim Petheram
(Northumbria)



Syed Ahmed
(Tunbridge Wells)

14:50	Cemented	Tim Petheram
14:55	Uncemented	Syed Ahmed

15:00 **D i s c u s s i o n**



Room: Lammermuir 1+2

SESSION FIVE: PRINCIPLES OF PRIMARY TOTAL HIP REPLACEMENT



Debate 5:

The difficult primary THR

Chair:



Richard Field



Dominic Meek
(Glasgow)



Marcus Banks
(London)

15:05	Standard implants alone should suffice	Dominic Meek
15:12	There is a need for 'non standard' / custom implants	Marcus Banks
15:20	D i s c u s s i o n	

15:25



T E A

Room: Lammermuir Suite

SESSION SIX: COMPLICATIONS & VIVAS



Homa Arshad
(London)



Vikas Khanduja
(Cambridge)



Satish Kutty
(Harlow)

15:40	Complications following THR – how to prevent it?	Homa Arshad
15:55	Interactive cases / Mock Vivas	All Faculty
16:30	What can the British Hip Society do for the Trainees?	Vikas Khanduja
16:40	Closure and evaluation	Satish Kutty



BRITISH
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Save the dates

20

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24

28 February – 1 March

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(6)

CAN ARTHROPLASTY STEM INFLUENCE OUTCOME (CASINO): A RANDOMISED CONTROLLED TRIAL OF STEM LENGTH IN CEMENTED TOTAL HIP ARTHROPLASTY

Paul Gaston¹, Nicholas Clement¹, Nicholas Ohly², Gavin Macpherson¹, David Hamilton³

¹Edinburgh Orthopaedics, Edinburgh, United Kingdom. ²Golden Jubilee Hospital, Glasgow, United Kingdom. ³Glasgow Caledonian University, Glasgow, United Kingdom

Introduction

In this RCT the primary aim was to assess whether a short (125mm) Exeter V40 stem offered an equivalent hip specific function compared to the standard (150mm) stem when used for cemented total hip arthroplasty (THA). Secondary aims were to evaluate health-related quality of life (HRQoL), patient satisfaction, stem height and alignment, radiographic loosening, and complications between the two stems.

Materials and Methods

A prospective multicentre double-blind randomised control trial was conducted. During a 15-month period, 220 patients undergoing THA were randomised to either a standard (n=110) or short (n=110) stem Exeter. There were no significant ($p \geq 0.065$) differences in preoperative variables between the groups. Functional outcomes and radiographic assessment were undertaken at 1- and 2-years.

Results

There were no differences ($p=0.428$) in hip specific function according to the Oxford hip score at 1-year (primary endpoint) or at 2-years ($p=0.767$) between the groups. The short stem group had greater varus angulation (0.9 degrees, $p=0.003$) when compared to the standard group and were more likely (odds ratio 2.42, $p=0.002$) to have varus stem alignment beyond one standard deviation from the mean. There were no significant ($p \geq 0.083$) differences in the Forgotten joint scores, EuroQol-5-Dimension, EuroQol-VAS, Short form 12, patient satisfaction, complications, stem height or radiolucent zones at 1 or 2-years between the groups.

Conclusions/Discussion

The Exeter short stem offers equivalent hip specific function, HRQoL, patient satisfaction, and limb length when compared to the standard stem at 2-years post-operation. However, the short stem was associated with a greater rate of varus malalignment which may influence future implant survival.

(7)

WHICH FACTORS PREDICT A SUCCESSFUL OUTCOME FOLLOWING TOTAL HIP REPLACEMENT IN PATIENTS WITH EARLY RADIOGRAPHIC OSTEOARTHRITIS?Martin Sharrock, Tim Board

Wrightington Hospital, Wigan, United Kingdom

Introduction

It is unclear whether patients with early radiographic osteoarthritis (OA) but severe hip symptoms benefit from total hip replacement (THR). We aimed to assess which factors were associated with successful THR in this patient group.

Materials and Methods

From a consecutive series of 1,935 patients undergoing THR we identified 70 (3.6%) patients with early OA (Kellgren and Lawrence (KL) grades 0-2). These were compared with 200 patients with advanced OA (KL grades 3-4). Outcomes were Oxford Hip Scores (OHS), EQ5D and EQ-VAS scores; compared pre-operatively with one year post-operatively. We investigated which clinical and radiographic (plain x-ray, CT, MRI) features predicted successful THR in the early OA group. Success was defined as reaching a postoperative OHS $\geq$ 42.

Results

The early OA group were significantly younger (61 vs 66 years; $P=0.0035$). There were no significant differences in body mass index, ASA grade or gender. After adjusting for confounders, the advanced OA group had a significantly greater percentage of possible change (PoPC) in OHS (75.8% versus 50.4%; $P<0.0001$) and improvement in EQ5D (0.151 versus 0.002; $P<0.0001$). There were no significant differences in complication, revision or readmission rates. In the early OA group, we identified 16/70 (22.9%) patients who had a 'successful' THR. Of those with early OA, 38 patients had pre-operative CT or MRI scans. Patients who had a 'successful' THR were significantly more likely to have subchondral cysts on CT/MRI (91.7% versus 57.7%; $P=0.0362$). The presence of cysts on CT/MRI was associated with a significantly greater PoPC in OHS (61.6% versus 38.2%; $P=0.0353$). The combination of cysts and joint space width (JSW) <1 mm was associated with a PoPC of 68%. Plain radiographs were found to significantly underestimate the narrowest JSW compared to CT/MRI (2.4mm versus 1.0mm; $P<0.0001$).

Conclusions/Discussion

We advise caution in performing THRs in patients with early OA (KL grades 0-2) on plain radiographs. We advocate pre-operative cross-sectional imaging (CT or MRI) in these patients. In the absence of cysts on cross-sectional imaging, a THR seems unlikely to provide a satisfactory outcome.

(17)

ACETABULAR SECTOR ANGLES IN ASYMPTOMATIC AND DYSPLASTIC HIPs – DEFINING THRESHOLDS FOR DYSPLASIA

Jeroen Verhaegen^{1,2,3}, Zach Devries³, Isabel Horton³, Pablo Slullitel⁴, Kawan Rakhra³, Paul Beaulé³, George Grammatopoulos³

¹University Hospital Antwerp, Antwerp, Belgium. ²Orthopedic Center Antwerp, Antwerp, Belgium.

³The Ottawa Hospital, Ottawa, Canada. ⁴Hospital Italiano de Buenos Aires, Buenos Aires, Argentina

Introduction

Traditional radiographic criteria might underestimate or fail to detect subtle types of acetabular dysplasia. Acetabular sector angles (ASA) can measure the degree of anterior and posterior coverage of the femoral head on computed tomography (CT). This study aims to determine ASA values at different axial levels in a cohort of (1) asymptomatic, high-functioning hips without underlying hip pathology (controls); and (2) symptomatic, dysplastic hips that underwent periacetabular osteotomy (PAO). Thereby, we aimed to define CT-based thresholds for hip dysplasia and its subtypes.

Materials and Methods

This is an IRB approved cross-sectional study of 51 high functioning, asymptomatic patients (102 hips) (Oxford Hip Score >43), without signs of osteoarthritis (Tönnis grade ≤1), who underwent a CT scan of the pelvis (mean age: 52.1±5.5 years; 52.9% females); and 66 patients (72 hips) with symptomatic hip dysplasia treated with peri-acetabular osteotomy (PAO) (mean age: 29.3±7.3 years; 85.9% females). Anterior and posterior acetabular sector angles (AASA & PASA) were measured by two observers at three CT axial levels to determine equatorial, intermediate, and proximal ASA. Inter- and intra-observer reliability coefficient was high (between 0.882-0.992). Cut-off values for acetabular deficiency were determined based on Receiver Operating Characteristic (ROC) curve analysis, area under the curve (AUC) was calculated.

Results

The dysplastic group had significantly smaller ASAs compared to the Control Group, AUC was the highest at the proximal and intermediate PASA. Controls had a mean proximal PASA of 162°±17°, with a cut-off value for dysplasia of 137° (AUC: 0.908). At the intermediate level, the mean PASA of controls was 117°±11°, with a cut-off value of 107° (AUC 0.904). Cut-off for anterior dysplasia was 133° for proximal AASA (AUC 0.859) and 57° for equatorial AASA (AUC 0.868). Cut-off for posterior dysplasia was 102° for intermediate PASA (AUC 0.933).

Conclusions/Discussion

Measurement of ASA on CT is a reliable tool to identify dysplastic hips with high diagnostic accuracy. Posterior ASA less than 137° at the proximal level, and 107° at the intermediate level should alert clinicians of the presence of dysplasia.

(24)

WHAT IS THE VALUE OF A HIP SPECIFIC MRI IN THE MANAGEMENT OF PATIENTS WITH SYMPTOMATIC HIP DYSPLASIA UNDERGOING COMBINED HIP ARTHROSCOPY AND PERI-ACETABULAR OSTEOTOMY? A MULTI-CENTER TRIAL

Jeroen Verhaegen^{1,2,3}, Kenneth Milligan³, Ira Zaltz⁴, Michael Stover⁵, Ernest Sink⁶, Etienne Belzile⁷, John Clohisy⁸, Stéphane Poitras⁹, Paul Beaulé³

¹University Hospital Antwerp, Antwerp, Belgium. ²Orthopedic Center Antwerp, Antwerp, Belgium.

³The Ottawa Hospital, Ottawa, Canada. ⁴Beaumont Hospital, Royal Oak, USA. ⁵Northwest Medical Group, Chicago, USA. ⁶Hospital Special Surgery, New York, USA. ⁷Université Laval, Quebec, Canada.

⁸Washington University, St Louis, USA. ⁹University of Ottawa, Ottawa, Canada

Introduction

The gold standard treatment of hip dysplasia is a peri-acetabular osteotomy (PAO). Labral tears are seen in the majority of patients presenting with hip dysplasia and diagnosed using Magnetic Resonance Imaging (MRI). The goal was to (1) evaluate utility/value of MRI in patients undergoing hip arthroscopy at time of PAO, and (2) determine whether MRI findings of labral pathology can predict outcome.

Materials and Methods

A prospective randomized controlled trial was conducted at tertiary institutions, comparing patients with hip dysplasia treated with isolated PAO versus PAO with adjunct hip arthroscopy. This study was a subgroup analysis on 74 patients allocated to PAO and adjunct hip arthroscopy (age 26±8 years; 89.2% females). All patients underwent radiographic and MRI assessment using a 1.5-Tesla with or 3-Tesla MRI without arthrography to detect labral or cartilage pathology. Clinical outcome was assessed using international Hip Outcome Tool-33 (iHOT).

Results

74% of patients (55/74) were pre-operatively diagnosed with a labral tear on MRI. Among these, 41 underwent labral treatment (74%); whilst among those without a labral tear on MRI, 42% underwent labral treatment (8/19). MRI had a high sensitivity (84%), but a low specificity (56%) for labral pathology ($p=0.053$). There was no difference in pre-operative (31.3±16.0 vs. 37.3±14.9; $p=0.123$) and post-operative iHOT (77.7±22.2 vs. 75.2±23.5; $p=0.676$) between patients with and without labral pathology on MRI.

Conclusions/Discussion

Value of MRI in the diagnostic work-up of a patient with hip dysplasia is limited. MRI had a high sensitivity (84%), but low specificity (44%) to identify labral pathology in patients with hip dysplasia. Consequently, standard clinical MRI had little value as a predictor of outcome with no differences in PROM scores between patients with and without a labral tear on MRI. Treatment of labral pathology in patients with hip dysplasia remains controversial. The results of this subgroup analysis of a prospective, multi-centre RCT do not show improved outcome among patients with dysplasia treated with labral repair.

(28)

THE ENVIRONMENTAL IMPACT AND SUSTAINABILITY OF TOTAL HIP AND KNEE ARTHROPLASTY

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Introduction

The National Health Service produces over 500,000 tonnes of waste and 25 mega tonnes of CO₂ annually. Operating room waste is segregated into different streams which are recycled, disposed of in landfill sites, or undergo costly and energy-intensive incineration processes.

By assessing the quantity and recyclability of waste from primary hip and knee arthroplasty cases, we aim to identify strategies to reduce the carbon footprint of arthroplasty surgery.

Materials and Methods

Data was collected prospectively at a tertiary orthopaedic hospital, in the theatres of six arthroplasty surgeons between April – July 2022. Fifteen primary total hip arthroplasty (THA) and 16 primary total knee arthroplasty (TKA) cases were included; revision and complex primary cases were excluded.

Waste was categorised into non-hazardous waste, hazardous waste, recycling, sharps, and linens. Each waste category was weighed. Items disposed as non-hazardous waste were catalogued for a sample of 10 TKA and 10 THA cases. Recyclability of items was determined from packaging.

Results

Average total waste generated for THA and TKA were 14.46kg and 17.16kg respectively, with TKA generating significantly greater waste ($p < 0.05$).

On average only 5.4% of waste was recycled in TKA and just 2.9% in THA cases. The mean recycled waste was significantly greater in TKA cases compared to THA, 0.93kg and 0.42kg respectively ($p < 0.05$).

Hazardous waste represented the largest proportion of the waste streams for both TKA (69.2%) and THA (73.4%). On average TKA generated a significantly greater amount (11.87kg) compared to THA (10.61kg), $p < 0.05$.

Non-hazardous waste made up 15.1% and 11.3% of total waste for TKA and THA respectively.

In the non-hazardous waste, only two items (scrub brush packaging and sterile towel packaging) were identified as recyclable based on packaging.

Conclusions/Discussion

We estimate that annually total hip and knee arthroplasty generates over 2.7 million kg of waste in the UK. Through increased use of recyclable plastics for packaging, combined with clear labelling of items as recyclable, medical suppliers can significantly reduce the carbon footprint of arthroplasty. Our data highlight only a very small percentage of waste is recycled in total hip and knee arthroplasty cases.

(30)

THE PERI-ARTICULAR MUSCLE ENVELOPE SHOWS ATROPHY AFTER ILIOPSOAS TENOTOMY.Jonas Declercq^{1,2}, Frans-Jozef Vandeputte², Kristoff Corten^{2,3,4}¹UZ Gent, Ghent, Belgium. ²ZOL Genk, Genk, Belgium. ³Heuppraktijk, European Hip Clinic, Herselt, Belgium. ⁴EVAL Research, University of Hasselt, Hasselt, Belgium**Introduction**

Tenotomy of the iliopsoas tendon has been described as an effective procedure to treat refractive groin pain induced by iliopsoas tendinitis. However, the procedure forces the rectus femoris to act as the primary hip flexor and little is known about the long-term effects of this procedure on the peri-articular muscle envelope (PAME). Studies suggest that iliopsoas tenotomy results in atrophy of the iliopsoas and decreased hip flexion strength with poorer outcomes, increasing the susceptibility for secondary tendinopathy. The aim of this study is to describe changes in the PAME following psoas release.

Materials and Methods

All patients who presented for clinical examination at our hospital between 2016 and 2021 were retrospectively reviewed. Patients who presented after psoas tenotomy with groin pain and who were unable to actively lift the leg against gravity, were included. Pelvic MRI was taken. Qualitative muscle evaluation was done with the Quartile classification system. Quantitative muscle evaluation was done by establishing the cross-sectional area (CSA).

Two independent observers evaluated the ipsi- and contralateral PAME twice. The muscles were evaluated on the level: iliacus, psoas, gluteus minimus-medius-maximus, rectus femoris, tensor fasciae latae, piriformis, obturator externus and internus.

For the qualitative evaluation, the intra- and inter-observer reliability was calculated by using kappa statistics. A Bland-Altman analysis was used to evaluate the intra- and inter-observer reliability for the quantitative evaluation. The Wilcoxon test was used to evaluate the changes between the ipsi- and contra-lateral side.

Results

17 patients were included in the study. Following psoas tenotomy, CSA reduced in the ipsilateral gluteus maximus, if compared with the contralateral side. Fatty degeneration occurred in the tensor fasciae latae. Both CSA reduction and fatty degeneration was seen for psoas, iliacus, gluteus minimus, piriformis, obturator externus and internus. No CSA reduction and fatty degeneration was seen for gluteus medius and rectus femoris.

Conclusions/Discussion

Following psoas tenotomy, the PAME of the hip shows atrophy and fatty degeneration. These changes can lead to detrimental functional problems and may be associated with debilitating rectus femoris tendinopathy. In patients with psoas tendinopathy, some caution is advised when considering an iliopsoas tenotomy.

(32)

AUTOMATED VERSUS MANUAL COMPONENT IMPACTION IN TOTAL HIP ARTHROPLASTY: EFFECTS ON COGNITIVE FUNCTION, PHYSICAL FATIGUE, AND STRESS LEVELFrans-Jozef Vandeputte¹, Christophe Hausswirth², Jeroen Dille³, Kristoff Corten¹¹Ziekenhuis Oost-Limburg, Genk, Belgium. ²BeScored Institute, Sophia Antipolis, France. ³DeoCare, Beringen, Belgium**Introduction**

Total Hip Arthroplasty (THA) surgery is a physical and cognitive challenge for surgeons. Data on stress levels, cognitive and physical load of orthopaedic surgeons, as well as ergonomic impact, are limited. With and without the use of an automated impaction device, operational efficiency and the surgeon's ergonomic, mental, and physical load was investigated.

Materials and Methods

In a total of thirty THA procedures, a standard manual technique was compared with an automated impaction device. Three computerized cognitive tasks (Simon, pattern comparison, and pursuit rotor) and five physical tests (isometric wall-sit, plank-to-fatigue, handgrip, supra-postural task, and shoulder endurance) were used to assess psychophysiological load of the surgeon. Surgeon's cortisol concentration was evaluated from saliva samples. Postural risk was assessed by Rapid Upper Limb Assessment (RULA) and Rapid Entire Body Assessment (REBA). Efficiency was assessed by timing surgical steps and instrumentation flow.

Results

Cognitive performances after automated impaction showed faster response times and lower error rates with a greater time-on-target (+1.5 s) and a lower mouse deviation from target (-1.7 pixels). Manual impaction showed higher physical exhaustion in the isometric wall-sit test (10.6% vs. 22.9%), plank-to-fatigue (2.2% vs. 43.8%), the number of taps in the supra-postural task (-0.7% vs. -7.7%), handgrip force production in the dominant (-6.7% vs. -12.7%) and contralateral hand (+4.7% vs. +7.7%), and in shoulder endurance (-15s vs. -56s). An increase of 38.2% in salivary cortisol concentration between the midday (1.31 nmol/l) and afternoon session (1.81 nmol/l) was observed with manual impaction. After using automated impaction, salivary cortisol concentration decreased (-51.2%). Manual broaching time was on average 6'20" versus 7'3" with automated impaction. RULA of manual impaction scored 6 for cup impaction and 5 for femoral broaching, versus 3 and 3 for automated impaction, respectively. REBA of manual impaction scored 9 for cup impaction and 5 for femoral broaching, versus 4 and 3 for automated impaction, respectively.

Conclusions/Discussion

Automated impaction lowers surgeons' cognitive and physical fatigue and leads to reduced stress and improved ergonomics without loss of surgical efficiency.

(59)

LEARNING FROM SIMULATION IN HIGHER ORTHOPAEDIC TRAINING: ARE WE ON THE SAME PAGE?Lena Al-Hilfi¹, Irrum Afzal², Sarkhell Radha^{1,2}, Michael Shenouda³¹Croydon University Hospital, London, United Kingdom. ²South West London Elective Orthopaedic Centre, London, United Kingdom. ³Open Medical, London, United Kingdom**Introduction**

Simulation use in training is rapidly becoming a mainstay educational tool seen to offer perceived benefits of a safe environment for repeated practice and learning from errors without jeopardising patient safety. However, there is currently little evidence addressing the trainees' perspectives and attitudes of simulation training, particularly in comparison with trainers and the educational community.

Materials and Methods

This study investigates orthopaedic trainees' and trainers' conceptions of learning from simulation-based training, exploring whether the orthopaedic community are 'on the same page', with respect to each other and the educational community. Qualitative research in the form of semi-structured interviews is used to identify commonalities and differences between trainee and trainer conceptions, based on respective experiences and expectations, and suggests ways of enhancing collaboration between stakeholders to achieve better alignment of conceptions.

Results

The research revealed that orthopaedic trainees and trainers conceive key themes in a similar manner: supporting the role of simulation in developing the 'pre-trained novice' as opposed to skill refinement or maintenance; attributing greater importance to non-technical rather than technical skills development using simulation; questioning the transferability to practice of learnt skills; and emphasising similar barriers to increased curriculum integration, including financing and scheduling. These conceptions are largely in contrast to those of the educational community, possibly due to differing conceptions of learning between the two communities, along with a lack of a common language in the discourse of simulation.

Conclusions/Discussion

There was some evidence of changing attitudes and positively emerging conceptions among the orthopaedic community, and capitalising on this by engaging trainers and trainees may help reconcile the differing conceptions and facilitate increasing simulation utilisation and curriculum integration. Developing a common language to make the educational more tangible to surgeons, bringing the educational closer to the surgical, may help maximise the educational benefit and shape the future of simulation use in surgical training.

(66)

CARDIAC FUNCTION IS COMPROMISED IN PATIENTS WITH ELEVATED BLOOD COBALT LEVELS SECONDARY TO METAL-ON-METAL HIP IMPLANTSMark Jenkinson^{1,2}, Dominic Meek², Sandy MacMillan¹, Rothwelle Tate¹, M Helen Grant³, Susan Currie¹

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Introduction

Elevated blood cobalt secondary to metal-on-metal (MoM) hip arthroplasties has been shown to be a risk factor for developing cardiovascular complications including cardiomyopathy. Published case reports document cardiomyopathy in patients with blood cobalt levels as low as 13µg/l (13ppb, 221nmol/l). Clinical studies have found conflicting evidence of cobalt-induced cardiomyopathy in patients with MoM hips. Global longitudinal strain (GLS) is an echocardiography measurement known to be more sensitive than ejection fraction at diagnosing early cardiomyopathies. The extent of cardiovascular injury, as measured by GLS, in patients with elevated blood cobalt levels has not previously been examined.

Materials and Methods

Sixteen patients with documented blood cobalt ion levels above 13µg/l were identified from a regional arthroplasty database. They were matched with eight patients awaiting hip arthroplasty with no history of cobalt implants. All patients underwent electrocardiogram and echocardiogram assessment for signs of cardiomyopathy including GLS.

Results

Patients with MoM hip arthroplasties had a mean blood cobalt level of 29µg/l (495nmol/l) compared to 0.01µg/l (0.2nmol/l) in the control group. There was no difference or correlation in ejection fraction (EF), left ventricular (LV) end systolic dimension, LV end diastolic dimension, fractional shortening, ventricular wall thickness or E/e' ratio. However, GLS was significantly reduced in patients with MoM hip arthroplasties compared to those without (-15.2% v -18%, (MoM v control) p= 0.0125). Pearson correlation demonstrated that GLS is significantly correlated with blood cobalt level (r= 0.8742, p=0.0009).

Conclusions/Discussion

For the first time, this study has demonstrated reduced cardiac function in the presence of normal EF as assessed by GLS in patients with elevated cobalt above 13µg/l. As GLS is a more sensitive measure of systolic function than EF, routine echocardiogram assessment including GLS should be performed in all patients with MoM hip arthroplasties and elevated blood cobalt above 13µg/l. Further work is recommended to assess if these cardiac changes are present in patients with elevated blood cobalt levels below 13µg/l.

(78)

ORTHOPAEDICS INSTRUMENTS AND ORTHOPAEDIC OPERATIONS CAN EXCEED NOISE REGULATION – A SYSTEMATIC REVIEWDylan Mistry¹, Usman Ahmed², Randeep Aujla³, Nadim Aslam⁴, Peter D'Alessandro⁵, Shahbaz Malik⁴¹Worcestershire Acute hospitals Trust, Worcester, United Kingdom. ²Worcestershire Acute hospitals Trust, Worcester, United Kingdom. ³Leicester Royal Infirmary, Leicester, United Kingdom.⁴Worcestershire Acute Hospitals NHS Trust, Worcester, United Kingdom. ⁵Orthopaedic Research Foundation of Western Australia, Claremont, Australia**Introduction**

Industries such as agriculture, construction and military have stringent rules about hearing protection due to the risk of noise induced hearing loss (NIHL). Due to the use of power tools, orthopaedic staff may be at risk of the same condition. The UK Health and Safety Executive (HSE) have clear standards as to what is deemed acceptable occupational noise levels on an A-weighted and C weighted scale. This review is aimed to assess evidence on noise exposure testing within Orthopaedic theatres to see if it exceeds the HSE regulations.

Materials and Methods

A targeted search of online databases PUBMED and EMBASE was conducted using Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) principles. This review was registered prospectively in PROSPERO. An eligibility criterion identifying clinical studies which assessed noise exposure for Orthopaedic staff in theatres were included. Noise exposure data was extracted from these studies and a comparison was made with A weighted and C weighted acceptable exposure levels as quoted in the HSE regulations.

Results

Fourteen papers were deemed eligible, which reviewed 133 Orthopaedic operations and 64 Orthopaedic instruments. In total, 61% (81 of 132) of Orthopaedic operations and 70% (45 of 64) of instruments exceeded the noise regulations on an A weighted scale. 22% (10 of 46) of operations exceeded the maximum C weighted peak acceptable noise level.

Conclusions/Discussion

Orthopaedic instruments and operations can exceed safe occupational noise levels. NHS Trusts have clear policies about noise exposure in the workplace but have yet to identify Orthopaedic theatres as a potential at risk area. Orthopaedic staff need education, monitoring and protection whereas Employers and Occupational Health should consider assessments to identify at risk staff in Orthopaedic theatres and offer preventative methods from NIHL.

(80)

WARP: RESULTS OF THE WYCOMBE ARTHROPLASTY RAPID-RECOVERY PATHWAYJohn McNamara¹, Jane Eastman¹, Abigail Perring¹, Nicola Vallance², Aniko Frigyk¹, Athanasios Pollalis¹¹Buckinghamshire NHS Trust, Aylesbury, United Kingdom. ²Aylesbury, Aylesbury, United Kingdom**Introduction**

The development and implementation of Enhanced Recovery After Surgery (ERAS) protocols are of particular interest in elective orthopaedics due to clinical benefits and cost effectiveness. The Wycombe Arthroplasty Rapid-Recovery Pathway (WARP) was designed to streamline hip and knee joint arthroplasty to reduce time spent in hospital whilst optimising outcomes in an NHS District General Hospital.

Materials and Methods

966 patients were admitted to Wycombe General Hospital for primary elective joint replacement (60 UKR, 446 THR, 460 TKR) during the period 1st September 2020 to 31st September 2022. The WARP pathway was used for 357 (37%) patients (32 UKR, 155 THR, 170 TKR) and the standard “non-WARP” pathway was used for 609 (63%) patients (28 UKR, 291 THR, 290 TKR). Data was collected on length of stay, time of mobilisation, number of physiotherapy sessions, and inpatient morbidity.

Results

Average length of stay following UKR was 0.75 days for WARP vs 2.96 for non-WARP patients, following THR was 2.17 days for WARP vs 4.17 for non-WARP patients, following TKR was 3.4 days for WARP vs 3.92 for non-WARP patients. Day-0 mobilisation after UKR was achieved in 97% of WARP vs 12% of non-WARP patients, after THR in 43% of WARP vs 14% of non-WARP patients, after TKR in 33% of WARP vs 11% of non-WARP patients. Same-day discharge was achieved in the WARP cohort in 63% of UKR, 10% of THR, 2% of TKR patients. There were no same-day discharges in the non-WARP cohort. Complications delaying mobilisation (pain, nausea/vomiting, dizziness/low BP) were identified in 8.4% of WARP vs 25% of non-WARP patients.

Conclusions/Discussion

Our cohort study shows that the initiation of WARP Rapid Recovery pathway for joint arthroplasty decreased the average length of stay after UKR by 2.21 days, after THR by 2 days, after TKR by 0.52 days. Time to first mobilisation was decreased significantly by increased rates of same-day mobilisation and reduced rates of postoperative anaesthetic-related complications.

(85)

SAFETY AND EFFICACY OF DULOXETINE IN PATIENTS UNDERGOING TOTAL HIP OR KNEE ARTHROPLASTY: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS.

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Introduction

Patients undergoing total hip or knee arthroplasty (THA/TKA) are commonly associated with high pain scores and narcotic use. Duloxetine is effective in relieving chronic pain. The aim of this study was to evaluate the safety and efficacy of duloxetine for pain management following THA/TKA.

Materials and Methods

Five major databases (PubMed, Embase, Scopus, Cochrane, and Web of Science) were searched for randomised controlled trials (RCTs) that compared duloxetine to placebo in patients that underwent THA/TKA. The primary outcome was pain reduction with rest and movement at short-term and long-term time intervals. Secondary outcomes were the use of analgesics, length of stay, and safety profile. The risk of bias was assessed using the Cochrane tool. Data were pooled using RevMan 5.4. The results were reported as mean difference (MD) or standardised MD (SMD) and 95% confidence intervals (CI).

Results

Eight RCTs with 767 patients were included. 50.2% (n=385/767) of patients received duloxetine. After one day, duloxetine was superior to the control regarding pain reduction with rest (SMD= -0.22 [-0.41, -0.03], p=0.02) after sensitivity analysis and pain reduction at movement (SMD= -0.39 [-0.55, -0.24], p<0.001). Similarly, after 12 weeks, duloxetine significantly reduced pain with rest (SMD= -0.3 [-0.52, -0.09], p=0.006) and pain with movement (SMD= -0.52 [-0.87, -0.17], p=0.003). In addition, after sensitivity analysis, duloxetine was associated with less analgesic use after one day (MD= -4.65 [-7.3, -2.01], p<0.001) and two days (MD= -5.65 [-10.62, -0.67], p=0.03). Patients who received duloxetine also required fewer analgesics after three days. However, there was no significant difference between the duloxetine and control groups in analgesic use after one week, length of stay, and adverse events.

Conclusions/Discussion

Duloxetine was superior to the placebo regarding short-term and long-term pain reduction with rest and movement following THA/TKA. Duloxetine reduced postoperative analgesic use. There was no significant difference between duloxetine and placebo regarding adverse events and length of stay.

(89)

SLIDING HIP SCREW CONSTRUCTS ARE ASSOCIATED WITH EARLY MOBILISATION, RETURN TO DOMICILE AND SHORTER LENGTH OF STAY WHEN COMPARED TO AN INTRAMEDULLARY NAIL: RESULTS FROM THE SCOTTISH HIP FRACTURE AUDITThomas Diffley¹, Jamie Ferry¹, Regina Sumarlie¹, Mostafa Beshr², Bin Chen³, Nick Clement³, Luke Farrow¹¹University of Aberdeen, Aberdeen, United Kingdom. ²Aberdeen Royal Infirmary, Aberdeen, United Kingdom. ³Edinburgh Royal Infirmary, Edinburgh, United Kingdom**Introduction**

Appropriate surgical management of hip fractures has major clinical and economic consequences. Recently IMN use has increased compared to SHS constructs, despite no clear evidence demonstrating superiority of outcome. We therefore set out to provide further evidence about the clinical and economic implications of implant choice when considering hip fracture fixation strategies.

Materials and Methods

A retrospective cohort study using Scottish hip fracture audit (SHFA) data was performed for the period 2016-2022. Patients ≥ 50 with a hip fracture and treated with IMN or SHS constructs at Scottish Hospitals were included. Comparative analyses, including adjustment for confounders, were performed utilising Multivariable logistic regression for dichotomous outcomes and Mann-Whitney-U tests for non-parametric data. A sub-group analysis was also performed focusing on AO-A1/A2 configurations which utilised additional regional data. Cost differences in Length of Stay (LOS) were calculated using defined costs from the NHS Scotland Costs book. In all analyses $p < 0.05$ denoted significance.

Results

13638 records were included (72% female). 9867 received a SHS (72%).

No significant differences were identified in 30 or 60-day survival (Odds Ratio [OR] 1.05, 95%CI 0.90-1.23; $p = 0.532$), (OR 1.10, 95%CI 0.97-1.24; $p = 0.138$) between SHS and IMN's.

There was however a significantly lower early mobilisation rate with IMN vs SHS (OR 0.64, 95%CI 0.59-0.70; $p < 0.001$), and lower likelihood of discharge to domicile by day-30 post-admission (OR 0.77, 95%CI 0.71-0.84; $p < 0.001$). Acute and overall, LOS were significantly lower for SHS vs IMN (11 vs 12 days and 20 vs 24 days respectively; $p < 0.001$). Findings were similar across a sub-group analysis of 559 AO A1/A2 fracture configurations.

Differences in LOS potentially increases costs by £1230 per-patient, irrespective of the higher costs of IMN's v SHS.

Conclusions/Discussion

Appropriate SHS use is associated with early mobilisation, reduced LOS and likely with reduced cost of treatment. Further research exploring potential reasons for the identified differences in early mobilisation are warranted.

(92)

RETRIEVAL ANALYSIS OF DUAL MOBILITY POLYETHYLENE LINERS FOR TOTAL HIP REPLACEMENT

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Introduction

Dual Mobility (DM) Total Hip Replacements (THRs) were introduced to reduce dislocation risk, which is the most common cause of early revision. The in-vivo mechanics of these implants is not well understood, despite their increased use in both elective and trauma settings. Therefore, the aim of this study was to comprehensively assess retrieved DM polyethylene liners for signs of damage using visual inspection and semi-quantitative geometric assessment techniques.

Materials and Methods

Retrieved DM liners (n=20) were visually inspected for the presence of seven established modes of polyethylene damage. If embedded debris was identified on the external surface, its material composition was characterised using energy-dispersive x-ray analysis (EDX). Additionally, each liner was geometrically assessed for signs of wear/deformation using a validated methodology.

Results

Visual inspection of the liners revealed that scratching and pitting were the most common damage modes on either surface. Burnishing was observed on 50% and 15% of the internal and external surfaces, respectively. In addition, embedded debris was identified on 25% of the internal and 65% of the external surfaces. EDX analysis of the debris identified several materials including iron, titanium, cobalt-chrome, and tantalum. Geometric analysis demonstrated highly variable damage patterns across the liners.

Conclusions/Discussion

The results of this study provide insight into the in-vivo mechanics of DM bearings. For example, the results suggest that the internal bearing (i.e., between the head and liner) acts as the primary articulation site for DM-THRs as evidenced by a higher incidence of burnishing and larger, more concentrated regions of penetration across the liners' internal surfaces. Furthermore, circumferential, and crescent-shaped damage patterns were identified on the articulating surfaces of the liners thus providing evidence that these components can rotate within the acetabular shell with varying degrees of mobility. The mechanics of DM bearings are complex and may be influenced by several factors (e.g., soft tissue fibrosis, patient activities) and thus further investigation is warranted.

Finally, the results of this study suggest that DM liners may be susceptible to ex-vivo surface damage and thus caution is advised when handling and/or assessing these types of components.

(95)

THE INCIDENCE AND RISK FACTORS FOR ABNORMAL POSTOPERATIVE BLOOD TESTS FOLLOWING PRIMARY TOTAL JOINT ARTHROPLASTY: A SINGLE CENTRE RETROSPECTIVE COHORT STUDY

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Introduction

Primary total joint arthroplasty (TJA) is an increasingly common and safe way of treating joint disease. Robust preoperative assessment improved intraoperative techniques and holistic rehabilitation contribute to an uneventful postoperative period. Despite there being evidence against the utility of postoperative blood tests, it is still often part of routine practice. We aim to evaluate the usefulness of these tests by investigating their incidence following TJA as well as identifying preoperative risk factors for abnormal blood test results postoperatively especially pertaining to anaemia and acute kidney injury (AKI).

Materials and Methods

This is a retrospective cohort study of patients who had elective TJA between January and December 2019 at a tertiary centre. An independent student's t-test and Fisher's exact test was used to compare variables between the normal and abnormal postoperative results groups. An analysis of variance (ANOVA) was performed to identify risk factors for an abnormal blood test result. Analyses of receiver operating characteristic (ROC) curves and the area under the curve (AUC) were used to determine cut off values that could be suggestive of abnormal test results postoperatively.

Results

The study included 2721 patients with a mean age of 69 of which 46.6% were males. Abnormal postoperative bloods were identified in 444 (16.3%) patients. We identified age (≥ 65 years), female gender, ASA ≥ 3 as risk factors for developing abnormal postoperative blood tests. Preoperative haemoglobin (≤ 127 g/dL), haematocrit (≤ 0.395 L/L) and potassium (≤ 3.7 mmol/L) were noted as cut-offs that could be predictive of postoperative anaemia or AKI respectively.

Conclusions/Discussion

The costs outweigh the benefits of ordering routine postoperative blood tests in TJA patients. Clinicians should risk stratify their patients and have a lower threshold for ordering blood tests in patients with one or more of the risk factors we have identified. These risk factors are age (≥ 65 years), females, ASA ≥ 3 , preoperative haemoglobin (≤ 127 g/L), haematocrit (≤ 0.395 L/L), and potassium (≤ 3.7 mmol/L).

(99)

WHEN SHOULD A DEEP INFECTION IN A TOTAL HIP REPLACEMENT BE CLASSIFIED AS THEATRE ACQUIRED?, NEW INSIGHTS FROM OLD DATA.Andrew Thomas¹, Martyn Wilkinson²¹The Royal Orthopaedic Hospital, Birmingham, United Kingdom. ²The Queen Elizabeth Hospital, Birmingham, United Kingdom**Introduction**

The documentation of deep infection rates in joint replacement is fraught with multiple difficulties. Deep infections acquired in theatre may present late, but some later presenting deep infections are clearly haematogenous, and not related to surgical management. The effect of Ultra Clean Air on infection rates was published by Charnley in 1972 (CORR,87:167-187). The data is valuable because large numbers of THRs were performed in standard and Ultra Clean theatres, and detailed microbiology of the air was also recorded. No IV antibiotics were used, so only the effect of air quality was studied.

Materials and Methods

We extracted the data on theatre type and numbers from Table 3, and numbers and intervals from surgery of deep infections from Table 7. Theatre types with 300 air changes per hour and 3.5 CFU/M³ were classified as Ultra Clean. A logistic regression model was used to examine the effect of theatre type and time elapsed after procedure on the probability of becoming infected.

Results

The model suggests that, controlling for time period, Ultra Clean Air is associated with a significantly lower probability of infection, with an OR of 0.30, $p = 2.74 \times 10^{-6}$. The effect is larger earlier post-surgery, but it does persist. The results are best reviewed as a graphic, which shows that Ultra Clean Air clearly affects the deep infection rate for up to four years post-surgery.

Conclusions/Discussion

Ultra Clean Air reduces infection rates for up to four years post-surgery, so it is safe to assume that infections presenting after this are haematogenous. Ultra Clean Air does not eliminate early deep infection, so some early infections are not related to air quality. It is not practical to undertake widespread detailed retrospective analyses of cases. When monitoring infection rates there needs to be a balance between failing to record infections related to surgical technique and waiting many years to record low numbers of very late presenting problems. We suggest that registries should regard infections documented within three years of surgery as treatment complications.

(104)

ISCHIAL SCREW FIXATION CAN PREVENT CUP MIGRATION IN 3D-PRINTED CUSTOM ACETABULAR COMPONENTS FOR COMPLEX HIP RECONSTRUCTION

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Introduction

Custom acetabular components have become an established method of treating massive acetabular bone defects in hip arthroplasty. Complication rates, however, remain high and migration of the cup is still reported. Ischial screw fixation (IF) has been demonstrated to improve mechanical stability for non-custom, revision arthroplasty cup fixation. We hypothesise that ischial fixation through the flange of a custom acetabular component aids in anti-rotational stability and prevention of cup migration.

Materials and Methods

Electronic patient records were used to identify a consecutive series of 49 custom implants in 46 patients from 2016 to 2022 in a unit specializing in complex joint reconstruction. IF was defined as a minimum of one screw inserted into the ischium passing through a hole in a flange on the custom cup. The mean follow-up time was 30 months. IF was used in 36 cups. There was no IF in 13 cups. No difference was found between groups in age (68.9 vs. 66.3, $P = 0.48$), BMI (32.3 vs. 28.2, $P = 0.11$) or number of consecutively implanted cups (3.2 vs. 3.6, $P = 0.43$). Aseptic loosening with massive bone loss was the primary indication for revision. There existed no difference in Paprosky grade between the groups ($P = 0.1$). 14.2% of hips underwent revision and 22.4% had at least one dislocation event.

Results

No ischial fixation was associated with a higher risk of cup migration (6/13 vs. 2/36, $X^2 = 11.5$, $P = 0.0007$). Cup migration was associated with an increased risk for all cause revision (4/8 vs. 3/38, $X^2 = 9.96$, $P = 0.0016$, but not with dislocation (3/8 vs. 8/41, $X^2 = 1.2$, $P = 0.26$).

Conclusions/Discussion

The results suggest that failure to achieve adequate ischial fixation, with screws passing through the flange of the custom component into the ischium, increases the risk of cup migration, which, in turn, is a risk factor for revision.

(106)

IS VIRTUAL REALITY THE ANSWER? A STUDY TO VALIDATE THE USE OF HIGH-FIDELITY VIRTUAL REALITY SIMULATION IN HIP ARTHROSCOPY TRAINING.Benjamin Schapira, Emmanuel Spanoudakis, Parag Jaiswal, Akash Patel

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Introduction

Surgical trainees are finding it increasingly more challenging to meet operative requirements and coupled with the effects of COVID-19, we face a future of insufficiently trained surgeons. As a result, virtual reality (VR) simulator training has become more prevalent and whilst more readily accepted in certain arthroscopic fields, its use in hip arthroscopy (HA) remains novel. This project aimed to validate VR high-fidelity HA simulation and assess its functional use in arthroscopic training.

Materials and Methods

Seventy-two participants were recruited to perform two basic arthroscopic tasks on a VR HA simulator, testing hip anatomy, scope manipulation and triangulation skills. They were stratified into novice (39) and experienced (33) groups based on previous arthroscopy experience. Metric parameters recorded from the simulator were used to assess construct validity. Face validity was evaluated using a Likert-style questionnaire. All recordings were reviewed by 2 HA experts for blinded ASSET score assessment.

Results

Experienced participants were significantly faster in completing both tasks compared with novice participants ($p < 0.001$). Experienced participants damaged the acetabular and femoral cartilage significantly less than novice participants ($p = 0.011$) and were found to have significantly reduced path length of both camera and instrument across both tasks ($p = 0.001$, $p = 0.007$), demonstrating significantly greater movement economy. Total ASSET scores were significantly greater in experienced participants compared to novice participants ($p = 0.041$) with excellent correlation between task time, cartilage damage, camera and instrument path length and corresponding ASSET score constituents. 62.5% of experienced participants reported a high degree of realism in all facets of external, technical and haptic experience with 94.4% advising further practice would improve their arthroscopic skills. There was a relative improvement of 43% in skill amongst all participants between task 1 and 2 ($p < 0.001$).

Conclusions/Discussion

This is the largest study to date validating the use of simulation in HA training. These results confirm significant construct and face validity, excellent agreement between objective measures and ASSET scores, significant improvement in skill with continued use and recommend VR simulation to be a valuable asset in HA training for all grades.

(108)

A COMPARISON OF INTERNAL FIXATION AND HEMIARTHROPLASTY IN THE MANAGEMENT OF UN-OR MINIMALLY DISPLACED HIP FRACTURES IN PATIENTS OVER 60 YEARS OLD

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Introduction

The incidence of hip fractures in the elderly is increasing. Minimally displaced and un-displaced hip fractures can be treated with either internal fixation or hemiarthroplasty. The aim was identifying the revision rate of internal fixation and hemiarthroplasty in patients 60 years or older with Garden I or II hip fractures and to identify risk factors associated with each method.

Materials and Methods

A retrospective analysis was conducted from 2 Major Trauma Centres and 9 Trauma Units between 01/01/2015 and 31/12/2020. Patients managed conservatively, treated with a total hip replacement and missing data were excluded from the study.

Results

1273 patients were included of which 26.2% (n=334) had cannulated hip fixation (CHF), 19.4% (n=247) had a dynamic hip screw (DHS) and 54.7% (n=692) had a hemiarthroplasty. 66 patients in total (5.2%) required revision surgery. The revision rates for CHF, DHS and hemiarthroplasty were 14.4%, 4%, 1.2% (p<0.001) respectively. Failed fixation was the most common reason for revision with the incidence increasing by 7-fold in the CHF group [45.8% (n=23) vs. 33.3% (n=3) in DHS; p<0.01]. The risk factors identified for CHF revision were age >80 (p<0.05), female gender (p<0.05) and smoking (p<0.05). The average length of hospital stay was decreased when using CHF compared to DHS and hemiarthroplasty (12.6 days vs 14.9 days vs 18.1 days respectively, p<0.001) and the 1 year mortality rate for CHF, DHS and hemiarthroplasty was 2.5%, 2% and 9% respectively.

Conclusions/Discussion

Fixation methods for Garden I and II hip fractures in elderly patients are associated with a higher revision rate than hemiarthroplasty. CHF has the highest revision rate at 14.4% followed by DHS and hemiarthroplasty. Female patients, patients over the age of 80 and patients with poor bone quality are considered high risk for fixation failure with CHF. When considering a fixation method in such patients, DHS is more robust than a screw construct, followed by hemiarthroplasty.

(111)

POSITIONING THE LIPPED LINER IN TOTAL HIP ARTHROPLASTY: A KINEMATIC MODEL ANALYSIS OF LIP ORIENTATION, CUP POSITION AND STEM ANTEVERSION.Alessandro Navacchia¹, Joseph Pagkalos², Edward Davis^{2,3}¹Smith & Nephew Inc., Watford, United Kingdom. ²The Royal Orthopaedic Hospital NHS Foundation Trust, Birmingham, United Kingdom. ³Institute of Inflammation and Ageing, University of Birmingham, Birmingham, United Kingdom**Introduction**

We have previously reported on the improved all-cause revision and improved revision for instability risk in lipped liner THAs using the NJR dataset. These findings corroborate studies from the Australian (AOANJRR) and New Zealand (NZOA) joint registries. The optimal orientation of the lip in THAs utilising a lipped liner remains unclear to many surgeons. The aim of this study was to identify impingement-free optimal liner orientations whilst considering femoral stem version, cup inclination and cup version.

Materials and Methods

A cementless THA kinematic model was developed using a 20 degree XLPE liner. Physiological ROM and provocative dislocation manoeuvre analyses were performed. A total of 9 cup positions were analysed (inclination 30-40-50 degrees, anteversion 5-15-25 degrees) and combined with 3 stem positions (anteversion 0-15-30 degrees) and 5 lip orientations (right hip 11 to 7 o'clock).

Results

Some lip orientation/component position combinations lead to impingement within the physiological ROM range. Using a lipped liner increases the femoral head travel distance prior to dislocation when impingement occurs in the plane of the lip. In THAs with a cup inclination of 30 and 40 degrees, inferior lip orientations (7-8 o'clock for a right hip) performed best. Superior lip orientation performed best with a cup inclination of 50 degrees. Femoral stem version has a significant effect on the range of movement prior to impingement and hence the preferred lip orientation.

Conclusions/Discussion

The optimal orientation of the lip in lipped liner THA is dependent on the position of both the acetabular and femoral components. In the common component orientation combination of stem anteversion 15, cup inclination 40 and cup anteversion 15, the optimal lip orientation was postero-inferiorly (8 o'clock for a right hip). Preventing impingement during physiological ROM is possible with appropriate lip liner orientation.

(112)

REVISION OF METAL-ON-METAL HIP REPLACEMENTS WITH DUAL MOBILITY BEARINGS AND ACETABULAR COMPONENT RETENTION.

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Introduction

In metal-on-metal (MoM) hip replacements or resurfacings, mechanical induced corrosion can lead to a local inflammatory response, pseudo tumours and elevated serum metal ions, requiring revision surgery.

The size and diametral clearance of Anatomic (ADM) and Modular (MDM) Dual Mobility bearings matches that of certain MOM components. Presenting the opportunity for revision with exchange of the metal head for ADM/MDM bearings without removal of the acetabular component if it is well-fixed and appropriately positioned.

Materials and Methods

Between 2012 and 2020, across two centres, 94 patients underwent revision of a MoM hip replacement or resurfacing. The mean age was 65.5 (33-87) years. In 53 patients (56.4%), the acetabular component was retained, and dual mobility bearings were used (DM); in 41 (43.6%) the acetabulum was revised (AR). DM was only considered where the acetabular component was satisfactorily positioned and well-integrated into bone, with no surface damage. Patients underwent clinical and radiographic follow-up to at least one-year (mean 42.4 (12-96) months).

Results

One (1.1%) patient died before one-year, for reasons unrelated to the surgery. In the DM group, two (3.8%) patients underwent further surgery; one (1.9%) for dislocation and one (1.9%) for infection. In the AR group, four (12.2%) underwent further procedures; two (4.9%) for loosening of the acetabular component and two (4.9%) following dislocations. There were no other dislocations in either group. In the DM group, operative time (68.4 v 101.5 mins, $p < 0.001$), postoperative drop in haemoglobin (16.6 v 27.8 g/L, $p < 0.001$), and length of stay (1.8 v 2.4 days, $p < 0.001$) were significantly lower. There was a significant reduction in serum metal ions postoperatively in both groups ($p < 0.001$ both Cobalt and Chromium) although there was no difference between groups for this reduction ($p = 0.674$ Cobalt; $p = 0.186$ Chromium).

Conclusions/Discussion

In selected patients with MoM hip arthroplasty, where the acetabular component is well-fixed, in a satisfactory position and there is no surface damage, the metal head can be exchanged for ADM/MDM bearings with retention of the acetabular prosthesis. Presenting significant benefits through a less invasive procedure, and a low risk of complications, including dislocation.

(119)

DOES SIZE MATTER? OUTCOMES OF LONG VERSUS STANDARD FEMORAL PROSTHESIS IN REVISION TOTAL HIP ARTHROPLASTY: A SYSTEMATIC REVIEW

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Introduction

Revision total hip arthroplasty (rTHA) in the presence of femoral defects can be technically challenging. Reconstruction with long stems is widely accepted as the standard. However long stems can be difficult to insert and can compromise distal bone stock for future revisions. The aims of this study were to identify whether there was a difference in survival and outcomes following rTHA using a long versus standard or short femoral stem.

Materials and Methods

A comprehensive systematic review was performed according to PRISMA guidelines using the MEDLINE, EMBASE, Cochrane Library and Web of Science databases. Inclusion criteria were (i) adult patients >18 years; (ii) randomised controlled trials, joint registry, or cohort studies; (iii) single or staged rTHA for Paprosky 1-3B femoral defects. Exclusion criteria were (i) mixed reporting without subgroup analysis for revision stem length; (ii) ex-vivo studies. Screening for eligibility and assessment of studies was performed by the authors.

Results

Out of 341 records, 9 studies met criteria for analysis (including 1 study utilising joint registry data and 1 randomised controlled trial). Across studies there were 3102 rTHAs performed in 2982 patients with a mean age of 67.4 years and a male: female ratio of 0.93. Revision prostheses were long-stemmed in 1727 cases and short or standard in 1375 cases with a mean follow up of 5 years (range, 0-15 years). On subgroup analysis the use of a long cemented stem compared to a long cementless prosthesis was associated with fewer complications and periprosthetic fracture in older patients. Survivorship was 95% with short stems compared to 84% with long stems at 5 years.

Conclusions/Discussion

Moderate quality evidence suggests that in rTHA with Paprosky type 1-3B femoral defects, the use of a short or standard stem can achieve comparable outcomes to long stems with fewer significant complications and revisions. Using a shorter stem may yield a more straightforward surgical technique and can preserve distal bone stock for future revision.

(121)

INCIDENCE OF VENOUS THROMBOEMBOLISM IN ELECTIVE HIP ARTHROPLASTY SURGERY: A REVIEW OF 8,890 PATIENTS RECEIVING POST-OPERATIVE ASPIRIN VTE PROPHYLAXIS

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Introduction

Venous thromboembolism (VTE) is a preventable cause of morbidity and mortality in patients undergoing elective hip arthroplasty surgery. The balance of post-operative VTE prophylaxis and risk of post-operative haemorrhage remains at the forefront of surgeon's mind. The National Institute for Clinical Excellence (NICE) has altered their prophylaxis guidance in the setting of total hip arthroplasty (THA). The aim of this study was to present the VTE incidence in 8,890 patients who underwent total hip arthroplasty between January 1997 and March 2018 with Aspirin as the primary agent for pharmacological thromboprophylaxis.

Materials and Methods

Analysis of prospective data collection from consecutive patients undergoing THA was performed with the incidence of deep vein thrombosis (DVT) and pulmonary embolism (PE) occurring within 6 months of the index operation as the primary outcome measure. 90-day all-cause mortality of this cohort of patients was also analysed.

Results

8890 patients were reviewed. This included 7235 primary, 224 complex primary and 1431 revision cases. The incidence of DVT was 0.64% after elective THA and the incidence of PE was 0.54%. There was no difference in the incidence between primary and revision cases. The 90-day all-cause mortality was 0.88%. Cardiovascular and respiratory disease were the main causes of death following surgery. Only 0.03% of deaths (n= 3) within 90 days of index surgery were due to VTE.

Conclusions/Discussion

Our results support the use of aspirin as an effective form of prophylaxis against VTE following THA. It is not associated with an increased incidence in symptomatic DVT, PE or death compared to other published studies. The fact that it is inexpensive, readily available, requires no monitoring and does not pose an increased risk of bleeding are other attractive advantages of using aspirin for VTE prophylaxis.

(122)

EXPERIENCE OF THE 150 MM LUBINUS SP II FEMORAL STEM IN A UK CENTRE - EXCELLENT SURVIVORSHIP, LOW DISLOCATION AND NEGLIGIBLE PERIPROSTHETIC FRACTURE RATES UP TO 15 YEARS FOLLOWING PRIMARY THA

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Introduction

The Lubinus SP II is an anatomical femoral stem with high survivorship levels notably described in the Swedish Arthroplasty Register. As the clinical and economic burden of revision total hip arthroplasty (THA) and periprosthetic fracture (PPF) continues to increase, it has been suggested that use of anatomical stems may facilitate more uniform cement mantles and improve implant survival. The primary aim of this study was to determine the long-term survivorship and PPF rate of the Lubinus SP II 150mm stem in a single UK centre.

Materials and Methods

Between January 2007 and April 2012, 1000 consecutive THAs were performed using the Lubinus SP II femoral stem in our institution. Patient demographics and operative details were collected in a prospective arthroplasty database. Patient records and national radiographic archives were then reviewed at a mean of 12.3 years (SD 1.3) following surgery to identify occurrence of subsequent revision surgery, dislocation or periprosthetic fracture.

Results

Mean patient age at surgery was 69.3 years (SD 10.1, 24-93 years). There were 634 women (63%). Osteoarthritis was the operative indication in 974 patients (97%). There were 13 revisions in total (4 for recurrent dislocation, 3 for infection, 6 for acetabular loosening) and 16 dislocations (1.6%). Stem survivorship at 10 years was 99.6% (95% confidence interval [CI], 99.5%-99.7%) and at 15 years was 98.8% (98.7%-98.9%). The 15-year stem survival for aseptic loosening was 100%. Analysis of all cause THA failure demonstrated a survivorship of 99.1% (99.0%-99.3%) at 10 years and 98.2% (98.1%-98.3%) at 15 years. There were 4 periprosthetic fractures in total (0.4%) at mean 12.3 year follow-up.

Conclusions/Discussion

The Lubinus SP II stem demonstrated excellent survivorship, low dislocation rates and negligible PPF rates up to 15 years following primary THA. Use of anatomical stems such as the Lubinus SPII would appear to be a wise clinical and economic investment for patients and healthcare systems alike.

(131)

A COMPARISON OF 5 YEAR MORTALITY RATES FOLLOWING REVISION HIP ARTHROPLASTY FOR PERIPROSTHETIC FRACTURE, ASEPTIC LOOSENING OR INFECTION AT A TERTIARY REFERRAL CENTRE

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Introduction

Mortality following revision hip surgery for periprosthetic fracture (PPF) has been reported to be as high as 60% at 5 years. The aim of this study was to determine the mortality rate for PPF revisions, compared to revision for aseptic loosening or infection at our tertiary referral centre.

Materials and Methods

Revision arthroplasty procedures performed for PPF, aseptic loosening or infection between January 2014 and December 2015 at our institution were identified using a prospectively collected PPF referral database and locally collected NJR data. Comparisons were made between the 3 groups for baseline demographics, admission to higher-level care, length of stay, complications, and Kaplan-Meier failure (mortality) at 1 & 5 years post-operative (with log-rank test for equality).

Results

There were 37 PPF, 71 infected and 221 aseptic revisions. PPF had a higher proportion of females (65% vs. 39% in infection and 53% in aseptic; $p = 0.031$) and grade 3 and 4 ASA patients ($p = 0.006$). Median time to surgery from injury for PPF was 8 days (95% CI, 6–16). Single-stage procedures were performed in 84% of PPF, 42% of infection and 99% of aseptic revisions ($p < 0.001$). 19% of PPF revisions required HDU admission, 1% in the aseptic group and none in the infection group ($p < 0.001$). Median length of stay was significantly different (PPF 10; infection 14; aseptic 8 days ($p < 0.001$)). The Kaplan-Meier estimate of 1-year mortality were: PPF = 0%; infection = 2.8% (0.7-11.1%); aseptic = 0.9% (0.2-3.5%). 5-year mortality estimates were: PPF = 17.1% (8-34%), infection = 8.7% (4-18.3%), aseptic = 12% (8.4-17%). Log-rank test of equality was not significant, $p=0.833$.

Conclusions/Discussion

Despite the PPF group having an average delay to surgery of 8 days, higher ASA grades and more admissions to HDU there was no significant difference in mortality rates between the groups at 1 and 5 years postoperatively. Using a coherent MDT approach with dedicated healthcare professionals this service demonstrates a low post operative mortality rate which merits further investment and development.

(132)

DISTAL CEMENT MANTLE THICKNESS AND POSITION OF STEM TIP ARE PREDICTORS OF PERIPROSTHETIC FRACTURES IN CEMENTED TAPERED FEMORAL STEMSZakiyyah Hoskins, Gunasekaran Kumar, Rajkumar Gangadharan

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Introduction

Periprosthetic femoral fractures are increasingly seen in recent years, adding considerable burden to the National Health Service. These require complex revision or fixation and prolonged post-operative care, with significant morbidity with associated costs. The purpose of this study was to assess whether the size of femoral cement mantle is associated with periprosthetic femoral fractures (PPF).

Materials and Methods

This retrospective study was carried out on a cohort of 49 patients (Fracture Group - FG) who previously had a revision procedure following a proximal PPF between 2010 and 2021. Inclusion criteria – all primary cemented total hip replacements (THR). Exclusion criteria – complex primary THR, any implant malposition that required early revision surgery or any pre-fracture stem loosening. The antero-posterior (AP) radiographs from this cohort of patients were assessed and compared to an age, sex, time since THR-matched control group of 49 patients without PPF (Control Group - CG). Distal cement mantle area (DCMA) was calculated on an AP radiograph of hip; the position of the femoral stem tip prior to fracture was also recorded: valgus, varus or central. Limitations: AP radiographs only. Statistical analyses were performed using Microsoft® Excel.

Results

Chi-square test demonstrated statistically significant difference in DCMA between FG and CG. DCMA of 700 to 900 mm² appeared to be protective when compared to DCMA of 0 to 300 mm². Also, a valgus position observed in 23% in FG Vs 4 % in CG increased the risk, with a smaller area of DCMA.

Conclusions/Discussion

This study demonstrates and recommends that a size of 700 – 900 mm² of the DCMA is protective against periprosthetic fractures, which are further influenced by the positioning of the distal stem tip. This could be due to the gradual decrease in the stiffness gradient from proximal to distal around the stem tip than steep changes, thereby decreasing possibility of a stress riser just distal to the cement mantle or restrictor. Further biomechanical research specific to this finding may be helpful to validate the observation, progressing to suggest a safe standardised surgical technique.

(138)

STRUCTURAL DEFECTS AND VARIABLE POROSITY IN 3D PRINTED CUPS FROM 6 MANUFACTURERSHarry Hothi¹, Johann Henckel¹, Anna Di Laura¹, Klaus Schlueter-Brust², Alister Hart^{1,3}¹The Royal National Orthopaedic Hospital, Stanmore, United Kingdom. ²St. Franziskus Hospital Köln, Cologne, Germany. ³The Institute of Orthopaedics and Musculoskeletal Science, University College London, London, United Kingdom**Introduction**

3D printing is rapidly being adopted by manufacturers to produce orthopaedic implants. There is a risk however of structural defects which may impact mechanical integrity. There are also no established standards to guide the design of bone-facing porous structures, meaning that manufacturers may employ different approaches to this. Characterisation of these variables in final-production implants will help understanding of the impact of these on their clinical performance.

Materials and Methods

We analysed 12 unused, final-production custom-made 3D printed acetabular cups that had been produced by 6 orthopaedic manufacturers. We performed high resolution micro-CT imaging of each cup to characterise the morphometric features of the porous layers: (1) the level of porosity, (2) pore size, (3) thickness of porous struts and (4) the depth of the porous layers. We then examined the internal cup structures to identify the presence of any defects and to characterise: (1) their total number, (2) volume, (3) sphericity, (4) size and (5) location.

Results

There was a variability between designs in the level of porosity (34% to 85%), pore size (0.74 to 1.87mm), strut thickness (0.28 to 0.65mm), and porous layer depth (0.57 to 11.51mm). One manufacturer printed different porous structures between the cup body and flanges; another manufacturer printed two differing porous regions within the cup body.

5 cups contained a median (range) of 90 (58-101) defects. The median defect volume was 5.17 (1.05-17.33) mm³. The median defect sphericity and size were 0.47 (0.19-0.65) and 0.64 (0.27-8.82) mm respectively. The defects were predominantly located adjacent to screw holes, within flanges and at the transition between the flange and main cup body; these were between 0.17 and 4.66mm from the cup surfaces.

Conclusions/Discussion

There is a wide variability between manufacturers in the porous titanium structures they 3D print. The size, shape and location of the structural defects identified are such that there may be an increased risk of crack initiation from them, potentially leading to a fracture. Regulators, surgeons, and manufacturers should be aware of this variability in final print quality.

(139)

RAPIDLY PROGRESSIVE OSTEOARTHRITIS IN PATIENTS AWAITING TOTAL HIP REPLACEMENT - THE HIDDEN IMPACT OF COVID-19 PANDEMIC

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Introduction

There is a surge of patients on the waiting-list for primary total hip replacement (THR), due to unprecedented reduction of elective activity caused by COVID-19. A higher incidence of femoral head collapse (FC) and acetabular erosion (AE) leading to increase in pain and instability as well as requirement of more complex surgery and potentially higher risk to patients was noted in this period. Rapidly progressive Arthritis (RPA) of the hip is a known entity often described as progression of joint space narrowing greater than 2mm over one year time period. The study aims to identify any potential relationship between waiting time and establishment of femoral head collapse and/ or acetabular erosion.

Materials and Methods

A retrospective review of arthroplasty surgeon's waiting list during COVID. Serial hip radiographs recorded between February 2020 and February 2022 were analysed.

FC was quantified as a percentage of the femoral head radius, while AE was assessed by drawing two parallel lines, one through both tear drops and the other through superior most aspect of intact acetabulum, parallel to the inter tear-drop line and expressed as percentage of normal side.

Results

Only 105 patients out of 264 patients added to the waiting list had elective arthroplasty for hip/knee. Only 35 patients out of 90 listed for THR, had the surgery.

36 of 90 (40%) were found to have developed FC and fitted the criteria for RPA. Acetabular erosion was seen in 19 (21%). Therefore 53% (19 of 36) of those who developed FC progressed to AE.

Incidence of collapse was higher in females (32%), with mean age of 62 (range 51-81), compared to 21% in males with mean age 59 (range 53-87). Mean extent of femoral head collapse was 20% (10 – 44%).

Conclusions/Discussion

A significant proportion of patients added to waiting list during COVID developed RPA of the hip with 40% having femoral head collapse and 21% progressing to acetabular erosion leading to a complex case-mix. Patients on long waiting lists need regular x-ray checks/PROMS since significant proportion progress to FC and Acetabular Erosion.

(145)

NHS HOSPITALS IN ENGLAND ARE AT A DISADVANTAGE IN PROCURING INTEGRATED CARE BOARD (ICB) CONTRACTS FOR TOTAL HIP REPLACEMENTS.

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Introduction

Clinical commissioning groups (CCG) have been replaced with ICBs that will bring together NHS and social care for the local population. ICBs are allocating contracts for long waiters for total hip replacements (THR) to hospitals that have achieved pre-covid volumes of THR, THR volumes undertaken by hospitals in 2022 should be at 2019 levels or more.

Purpose of this study was to identify whether NHS hospitals in England are at a disadvantage in procuring ICB contracts for THR.

Materials and Methods

THR volumes for NHS and independent sector (IND) hospitals from January 2012 to November 2022 were identified via National Joint Registry. Regional and national trend for THR volumes were identified for both NHS and IND hospitals using linear regression analysis.

Results

Trends of THR for NHS hospitals showed either stagnation or reduction in volume from 2014-2019. In 2022, nationally THR volume of NHS was 70% of 2019 (Figure 1). Trend of THR volume for IND hospitals nationally was a strong uptrend from 2012 to 2022 with a break only in 2020 due to COVID pandemic (Figure 2). Since the pandemic IND have overtaken NHS hospitals in volumes of THR undertaken. Similar picture of trends evolves when THR trends were assessed on a region by region basis.

Conclusions/Discussion

With NHS hospitals not back to pre-pandemic THR volumes, IND hospitals have a distinct advantage in securing more contracts via ICB. This in turn puts NHS hospitals at risk of taking on more complex and medically unwell patients potentially worsening NJR outcomes for NHS hospitals.

The reasons for the lag in NHS hospitals' THR volumes are multifactorial, not limited to continued bed pressures, increased emergency and unplanned admissions, staff shortages and sickness, pension taxations preventing doctors from undertaking more THR. However, lack of access to contracts from ICB will put NHS hospitals at huge financial and existential risk for elective care.

(152)

THE HISTORIC AND PROJECTED HIP FRACTURE BURDEN AND INCIDENCE IN SCOTLAND 2017 – 2029Euan Harris¹, [Luke Farrow](#)², Caroline Martin³, Karen Adam⁴¹Glasgow Royal Infirmary, Glasgow, United Kingdom. ²Aberdeen Royal Infirmary, Aberdeen, United Kingdom. ³Public Health Scotland, Edinburgh, United Kingdom. ⁴Scottish Government, Edinburgh, United Kingdom**Introduction**

Hip fracture represents a significant challenge, placing increasing pressure on health and social care services in Scotland. This study establishes the ‘historic’ hip fracture burden, namely, the annual number of hip fractures in Scotland, and respective incidence, between 2017 – 2021. Furthermore, the ‘projected’ hip fracture burden and incidence from 2022 – 2029 was estimated, to inform future capacity and funding of health and social care services.

Materials and Methods

The number of individuals with a hip fracture in Scotland between 2017 and 2021 was identified through the Scottish Hip Fracture Audit, enabling the annual number of hip fractures and respective incidence between 2017 – 2021 to be calculated. Projection modelling was performed using Exponential Smoothing and Auto Regressive Integrated Moving Average to estimate the number of hip fractures occurring annually from 2022 - 2029. A combined average projection was employed to provide a more accurate forecast. Accounting for predicted changes within the population demographics of Scotland, the projected hip fracture incidence up to 2029 was calculated.

Results

Between 2017 and 2021 the annual number of hip fractures in Scotland increased from 6675 to 7797 (15%), with an increase in incidence from 313 to 350 per 100,000 (11%) of the at-risk population. Hip fracture was observed to increase across all groups, notably males, and the 70-79 and 80-89 age cohorts. By 2029, the combined average projection estimated the annual number of hip fractures at 10311, with an incidence rate of 463 per 100,000, representing a 32% increase from 2021. The largest percentage increase in hip fracture by 2029 occurs in the 70-79 and 80-89 age cohorts (57% and 53% respectively). Based upon these projections, overall length of hospital stay following hip fracture will increase by 60699 days per annum by 2029, incurring an additional cost of at least £25 million.

Conclusions/Discussion

Projection modelling demonstrates the annual number of hip fractures in Scotland will increase substantially by 2029, with significant implications for health and social care services. This increase in hip fracture burden and incidence is influenced strongly by changing population demographics, primarily an ageing population.

(154)

ARTIFICIAL INTELLIGENCE CAN IDENTIFY FAILING TOTAL HIP REPLACEMENTS BEFORE RADIOGRAPHIC FEATURES OR A DROP IN PROMS SCORES

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Introduction

Over 8000 total hip arthroplasties (THA) in the UK were revised in 2019, half for aseptic loosening. It is believed that Artificial Intelligence (AI) could identify or predict failing THA and result in early recognition of poorly performing implants and reduce patient suffering.

The aim of this study is to investigate whether Artificial Intelligence based machine learning (ML) / Deep Learning (DL) techniques can train an algorithm to identify and/or predict failing uncemented THA.

Materials and Methods

Consent was sought from patients followed up in a single design, uncemented THA implant surveillance study (2010-2021). Oxford hip scores and radiographs were collected at yearly intervals. Radiographs were analysed by 3 observers for presence of markers of implant loosening/failure: periprosthetic lucency, cortical hypertrophy, and pedestal formation.

DL using the RGB ResNet 18 model, with images entered chronologically, was trained according to revision status and radiographic features. Data augmentation and cross validation were used to increase the available training data, reduce bias, and improve verification of results.

Results

184 patients consented to inclusion. 6 (3.2%) patients were revised for aseptic loosening. 2097 radiographs were analysed: 21 (11.4%) patients had three radiographic features of failure.

166 patients were used for ML algorithm testing of 3 scenarios to detect those who were revised. 1) The use of revision as an end point was associated with increased variability in accuracy. The area under the curve (AUC) was 23-97%. 2) Using 2/3 radiographic features associated with failure was associated with improved results, AUC: 75-100%. 3) Using 3/3 radiographic features, had less variability, reduced AUC of 73%, but 5/6 patients who had been revised were identified (total 66 identified).

The best algorithm identified the greatest number of revised hips (5/6), predicting failure 2-8 years before revision, before all radiographic features were visible and before a significant fall in the Oxford Hip score. True-Positive: 0.77, False Positive: 0.29.

Conclusions/Discussion

ML algorithms can identify failing THA before visible features on radiographs or before PROM scores deteriorate. This is an important finding that could identify failing THA early.

(157)

THE RISK OF EARLY REVISION SURGERY AFTER TRAINEE LED PRIMARY TOTAL HIP REPLACEMENT

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Introduction

Primary total hip replacement (THR) is a successful and common operation which orthopaedic trainees must demonstrate competence in prior to completion of training. This study aimed to determine the impact of operating surgeon grade and level of supervision on the incidence of 1-year patient mortality and all-cause revision following elective primary THR in a large UK training centre.

Materials and Methods

National Joint Registry (NJR) data for all elective primary THR performed in a single University Teaching Hospital from 2005-2020 were used, with analysis performed on the 15-year dataset divided into 5-year temporal periods (B1 2005-2010, B2 2010-2015, B3 2015-2020). Outcome measures were mortality and revision surgery at one year, in relation to lead surgeon grade, and level of supervision for trainee-led operations.

Results

9999 eligible primary THR were undertaken, of which 5526 (55.3%) were consultant led (CL), and 4473 (44.7%) trainees led (TL). Of TL, 2404 (53.7%) were non-consultant supervised (TU), and 2069 (46.3%) consultant supervised (TS). The incidence of 1-year patient mortality was 2.05% (n=205), and all-cause revision was 1.11% (n=111). There was no difference in 1-year mortality between TL (n=82, 1.8%) and CL (n=123, 2.2%) operations (p=0.20, OR 0.78, CI 0.55-1.10). The incidence of 1-year revision was not different for TL (n=56, 1.3%) and CL (n=55, 1.0%) operations (p=0.15, OR 1.37, CI 0.89-2.09). Overall, there was no temporal change for either outcome measure between TL or CL operations. A significant increase in revision within 1-year was observed in B3 between TU (n=17, 2.7%) compared to CL (n=17, 1.0%) operations (p=0.005, OR 2.81, CI 1.35-5.87).

Conclusions/Discussion

We found no difference in 1-year mortality or 1-year all-cause revision rate between trainee-led primary THR and consultant-led operations over the entire fifteen-year period. However, unsupervised trainee led THR in the most recent 5-year block (2015-2020) has a significantly increased risk of early revision, mainly due to instability and prosthetic joint infection. This suggests that modern surgical training is having a detrimental effect on THR patient outcomes. More research is needed to understand the reasons if this trend is to be reversed.

(161)

DUAL MOBILITY IMPLANTS IN HIGH-RISK PATIENTS AND PERI-PROSTHETIC FRACTURE – “A PERFECT STORM”Stephen Jones, Sunil Raj, Ahmed Magan

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Introduction

Dual mobility (DM) is most often used by surgeons to reduce instability in high risk patients. NJR data on DM has not demonstrated a reduction in all cause revision and has reported an increase in revision for peri-prosthetic fracture (PPF). The aim of our study was:

1. Report outcome of DM used in high-risk patients including non-revision re-operations (dislocation & PPF).
2. Comparison with conventional bearing THA (cTHA) with local, national and NJR benchmarking data.
3. Retrospective cohort assessment of falls risk for patients receiving DM.

Materials and Methods

Prospective F/U of a DM implant since 2016 and enrolled into Beyond Compliance (BC). Primary outcome measure all-cause revision with secondary outcome including any re-operation and Oxford Hip Score (OHS). All patients were risk stratified and considered high risk for instability. Complications were identified via hospital records, clinical coding linkage, NJR and BC. Benchmarking data for comparison was obtained from same data sources we also considered all B type PPF that occurred with cemented polished taper stem (PTS).

Results

159 implants in 154 patients with a mean age 74.0 years and a maximum F/U of 6.7 years. Survivorship for all-cause revision 99.4% (95% CI 96.2-99.8). One femoral only revision. Mean gain in OHS 27.4. Dislocation rate 0.6% with a single event. Patients with a PTS rate of Type B PPF 2.1% requiring revision/fixation. Compared to cTHA this cohort was significantly older (74.0 vs 68.3 years), more co-morbidity (ASA 3 46.5% vs 14.4%) and more non-OA indications (32.4% vs 8.5%). Relative risks for dislocation 0.57 (95%CI 0.08-4.1) and PPF 1.75 (95%CI 0.54-5.72). Every patient had at least one risk factor for falling and >50% of cohort had 4 or more risk factors using NICE tool.

Conclusions/Discussion

The selective use of DM in high-risk patients can reduce the burden of instability. These individuals are very different to the "average" THA patient. A “perfect storm” is created using a high-risk implant combination (DM & PTS) in high-risk falls risk population. This re-enforces the need to consider all patient and implant factors when deciding bearing selection.

(170)

THE HIPHOP STUDY: A FEASIBILITY STUDY FOR AN RCT OF HYBRID VS. CEMENTED TOTAL HIP REPLACEMENT

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Introduction

Studies have shown that 10-30% patients do not achieve optimal function outcomes after total hip replacement (THR). High quality randomised controlled trials (RCTs) evaluating the clinical and cost-effectiveness of techniques to improve functional outcomes after THR are lacking. We performed this study to evaluate the feasibility of a RCT comparing patient-reported functional outcomes after hybrid or fully cemented THR (ISRCTN11097021).

Materials and Methods

Patients were recruited from two centres and randomised to receive either a fully cemented or hybrid THR. Data collection included Patient Reported Outcome Measures (PROMs), non-serious adverse events of special interest (AESI), serious adverse device effects (SADE) and NHS resource use. Qualitative interviews were undertaken to understand a) patient experiences of study processes and their reasons for taking part or not, and b) to understand surgeons' perceptions of the study, factors affecting willingness to participate, and barriers to implementation of the future RCT findings.

Results

The target of 40 patients were successfully recruited for the feasibility RCT; the ratio of successful recruitment to eligible patients was 0.61 across both sites. Treatment crossovers occurred in four patients, all related to bone quality. Four patients were withdrawn due to not undergoing surgery within the study window because of the pandemic. Follow-up was 100% and PROMs were completed by all patients at all time points. The feasibility of conducting a within-trial cost-utility analysis was demonstrated. Interviews were conducted with 27 patients and 16 surgeons. Patients and surgeons generally found the study procedures acceptable and workable. Some declined participation because they did not want treatment allocated at random, or because blinding was off-putting. Surgeons' perceptions of equipoise varied, and implementation of findings from the future RCT would need to recognise the 'craft' nature of surgery and the issue of training.

Conclusions/Discussion

We conclude that a full RCT with economic analysis will be both feasible and practicable, although mechanisms to safely implement potential changes to practice because of RCT findings may need consideration by the wider arthroplasty community.

(172)

FACTORS INFLUENCING OUTCOMES IN CLIMBERS AND MOUNTAINEERS UNDERGOING HIP ARTHROPLASTYHolly Warder^{1,2}, Tim Sanders¹, Nicholas Wright¹, Beth Hall-Thompson¹, Simon Alford¹, David Johnson²¹University of Central Lancashire, Preston, United Kingdom. ²Stockport NHS Foundation Trust, Stockport, United Kingdom**Introduction**

Climbers and mountaineers will present to arthroplasty surgeons in need of hip replacement surgeries. There is a lack of guidance for both parties with a paucity in the literature. Climbing is often considered a high-risk activity to perform with a total hip replacement, due to the positions the hip is weighted in, and the potential austere environment in which an injury may occur.

The aim was to assess levels of climbing and mountaineering possible following hip arthroplasty, and any factors affecting these levels.

Materials and Methods

Ethical approval was obtained from the University of Central Lancashire. An anonymous online questionnaire was disseminated via email, social media and word-of-mouth to include all climbers, hill-walkers or mountaineers across the UK. This was used to collect climbing and mountaineering ability at various timepoints, along with scores such as the Oxford Hip Score and UCLA Score. The Kappa statistic was used to assess for correlations.

Results

Of the responders, 28 had undergone right hip arthroplasty surgery, with 11 having left hips and 22 receiving bilateral hips. A total of 67 of the replaced hips were total hip replacements, with 16 having undergone hip resurfacing. There is a fair agreement in level of climbing ability 3 months pre- and 3 months post-operatively ($\kappa=0.287$, $p<0.001$), and a substantial agreement between 1 year post-operatively and currently for both climbing ($\kappa=0.730$, $p<0.001$) and mountaineering ($\kappa=0.684$, $p<0.001$). Impressively, 17 participants are climbing at more than E1 trad or 6c sport at one or more time points post operatively, which is regarded as an advanced level within the climbing community. Out of those 17 participants, 8 were climbing at this level within 3 months post-operatively.

Conclusions/Discussion

The level of climbing possible following hip arthroplasty surgery is above what is expected and perhaps desired by the operating surgeon. It is essential to take the individual patient into account when planning an operative intervention such as arthroplasty. The one year post-operative time point is highly predictive of longer term outcomes for both climbing and mountaineering.

(177)

RETRIEVAL ANALYSIS OF 3D PRINTED IMPLANTS SHOWS ENCOURAGING RESULTSHarry Hothi¹, Johann Henckel¹, Anna Di Laura¹, John Skinner¹, Alister Hart^{1,2}¹The Royal National Orthopaedic Hospital, Stanmore, United Kingdom. ²Institute of Orthopaedics, University College London, Stanmore, United Kingdom**Introduction**

3D printing acetabular cups offers the theoretical advantage of enhanced bony fixation due to greater design control of the porous implant surfaces. Analysing retrieved 3D printed implants can help determine whether this design intent has been achieved.

Materials and Methods

We sectioned 14 off-the-shelf retrieved acetabular cups for histological analysis; 7 cups had been 3D printed and 7 had been conventionally manufactured. Some of the most commonly used contemporary designs were represented in both groups, which were removed due to either aseptic loosening, unexplained pain, infection or dislocation. Clinical data was collected for all implants, including their age, gender, and time to revision.

Bone ingrowth was evaluated using microscopic assessment and two primary outcome measures: 1) bone area fraction and 2) extent of bone ingrowth.

Results

The additively manufactured cups were revised after a median (IQR) time of 24.9 months (20.5 to 45.6) from patients with a median (IQR) age of 61.1 years (48.4 to 71.9), while the conventional cups had a median (IQR) time to revision of 46.3 months (34.7 to 49.1, $p = 0.366$) and had been retrieved from patients with a median age of 66.0 years (56.9 to 68.9, $p = 0.999$).

The additively and conventionally manufactured implants had a median (IQR) bone area fraction of 65.7% (36.4 to 90.6) and 33.9% (21.9 to 50.0), respectively ($p < 0.001$).

A significantly greater amount of bone ingrowth was measured into the backside of the additively manufactured acetabular cups, compared to their conventional counterparts ($p < 0.001$). Bone occupied a median of 60.0% and 5.7% of the porous depth in the additively manufactured and conventional cups, respectively.

Conclusions/Discussion

3D printed components were found to achieve a greater amount of bone ingrowth than their conventionally manufactured counterparts, suggesting that the complex porous structures generated through this manufacturing technique may encourage greater osteointegration.

(178)

IMMERSIVE VIRTUAL REALITY IS SUPERIOR TO CONVENTIONAL TRAINING FOR SURGICAL TEAM MEMBERS LEARNING ANTERIOR APPROACH TOTAL HIP ARTHROPLASTY: A RANDOMISED CONTROLLED TRIAL

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Introduction

Superior team performance in surgery leads to fewer technical errors, reduced mortality, and improved patient outcomes. Scrub nurses are a pivotal part of this team, however they have very little structured training, leading to high levels of stress, low confidence, inefficiency, and potential for harm. Immersive virtual reality (iVR) simulation has demonstrated excellent efficacy in training surgeons. We tested the efficacy of an iVR curriculum for training scrub nurses in performing their role in an anterior approach total hip arthroplasty (AA-THA).

Materials and Methods

Sixty nursing students were included in this study and randomised in a 1:1 ratio to learning the scrub nurse role for an AA-THA using either conventional training or iVR. The training was derived through expert consensus with senior surgeons, scrub nurses and industry reps. Conventional training consisted of a 1-hour seminar and 2 hours of e-learning where participants were taught the equipment and sequence of steps. The iVR training involved 3 separate hour-long sessions where participants performed the scrub nurse role with an avatar surgeon in a virtual operation. The primary outcome was their performance in a physical world practical objective assessment with real equipment. Data were confirmed parametric using the Shapiro-Wilk test and means compared using the independent samples student's t-test.

Results

53 participants successfully completed the study (26 iVR, 27 conventional) with a mean age of 31 ± 9 years. There were no significant differences in baseline characteristics or baseline knowledge test scores between the two groups ($p > 0.05$). The iVR group significantly outperformed the conventionally trained group in the real-world assessment, scoring $66.9 \pm 17.9\%$ vs $41.3 \pm 16.7\%$, $p < 0.0001$.

Conclusions/Discussion

iVR is an easily accessible, low cost training modality which could be integrated into scrub nursing curricula to address the current shortfall in training. Prolonged operating times are strongly associated with an increased risk of developing serious complications. By upskilling scrub nurses, operations may proceed more efficiently which in turn may improve patient safety.

(179)

POTENTIAL IMPACT OF THE IMPLEMENTATION OF AN ELECTRONIC HEALTH RECORD ON NATIONAL JOINT REGISTRY OUTLIER ANALYSESRohan Ewels¹, Al-Amin Kassam², Jonathan Evans^{2,1}¹University of Exeter, Exeter, United Kingdom. ²Exeter Hip Unit, Princess Elizabeth Orthopaedic Centre, Exeter, United Kingdom**Introduction**

Electronic Health Records (EHRs) have benefits for hospitals and uptake in the UK is increasing. The National Joint Registry (NJR) monitors implant and surgeon performance and relies on accuracy of data. NJR data are used for identification of potential outliers for both mortality and revision; analyses are adjusted for age, sex, and American Society of Anaesthesiologists score (ASA) and cases with some indications are excluded from analyses. In October 2020, the Royal Devon University Hospitals NHS Foundation Trust “went live” on an EHR, almost eradicating paper from the Trust. This included stopping use of paper NJR forms by creating a bespoke electronic template. We sought to identify discrepancies between operation notes and data input to the NJR in variables that may influence potential outlier analyses.

Materials and Methods

Data input to the NJR from 15/10/2020 to 18/10/2022 for hip procedures were provided by NEC Software Solutions. NJR data were compared to those recorded on operation notes.

Results

There were 1067 hip procedures recorded in the NJR (946 primary THRs). Of the primary THRs, discrepancies in indication between NJR and operation note were identified in 139 (15%) cases. Common discrepancies included cases being recorded as osteoarthritis where the true indication was acute trauma (n=63), avascular necrosis (n=14), metastatic cancer/malignancy (n=6) and 21 cases with no recorded indication. We identified 88 cases where the ASA recorded in the NJR differed from the anaesthetic chart. Other inaccuracies were identified including 23 cases missing type of procedure (e.g., primary or revision) and one where revision surgery had been recorded as primary.

Conclusions/Discussion

We identified at least 83 cases that should have been excluded from NJR mortality analyses but were not. Given the low incidence of mortality following primary THR, these cases (with increased risk of death) have the potential to incorrectly identify the hospital as a potential outlier. Discrepancies in ASA may also impact on both revision and mortality outlier calculations. We urge caution to hospitals in the implementation of EHRs and advise regular audit of data sent to the NJR.

(184)

THREE-YEAR AND FIVE-YEAR REVISION RATES OF PRIMARY TOTAL HIP REPLACEMENT ARE POOR PREDICTORS OF 15-YEAR REVISION RATES – A NATIONAL JOINT REGISTRY ANALYSISKrishna Boddu

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Introduction

Total hip arthroplasty has been constantly evolving with technological improvements to achieve the best survival rates. Although the new implants are under closer surveillance through processes such as Beyond Compliance, orthopaedic surgeons generally tend to look out for the latest implants with good short-term results and hope for better long-term results for these. We questioned whether such an assumption or bias is valid.

Materials and Methods

We analysed the data of Kaplan-Meier estimates of cumulative revisions of primary hip replacement by fixation, stem/cup brand and bearing combinations from the NJR 19th Annual Report published in September 2022. We performed a univariate linear regression analysis to predict the 10- and 15-year revision rates for these different hip implant combinations from the 3- and 5-year revision rates.

Results

Thirty-seven implant combinations had their 15-year revision rates reported and 67 had the 10-year revision rates. The correlation co-efficients were 0.43 and 0.58 for the 3-year and 5-year revision rates against 15-year revision rates. Only 17% of the variance in 15-year revision rates could be predicted by a linear regression model from the 3-year revision rate and 32% from the 5-year revision rate. Corresponding values for the 10-year revision rates were 46% and 67%.

95% prediction intervals for the 15-year revision rate were $\pm 3.1\%$ from the 3-year revision rate and $\pm 2.8\%$ from the 5-year revision rate. Corresponding values for the 10-year revision rates were $\pm 1.3\%$ and $\pm 1\%$.

19 of 37 implant combinations showed 15-year revision rate of more than 4%. Average 3-year and 5-year revision rates for this cohort was 1.0% and 1.42% compared to 1.4% and 1.9% for the rest and the difference was statistically significant.

Conclusions/Discussion

Although average early revision rates showed small but significant difference between the groups with lower and higher 15-year revision rates, the prediction intervals for 15-year revision rates for individual hips based on their 3-year and 5-year revision rates are very wide. Three- and 5-year revision rates for primary total hip replacements are poor predictors of 15-year revision rates.

(187)

COLLABORATIVE TEAM TRAINING IN IMMERSIVE VIRTUAL REALITY IS SUPERIOR TO INDIVIDUAL LEARNING FOR PERFORMING TOTAL HIP ARTHROPLASTY: A RANDOMISED CONTROLLED TRIALThomas Edwards¹, Daniella Soussi¹, Shubnam Gupta¹, Sikandar Khan¹, Arjun Patel¹, Amogh Patil¹, David Badri², Alexander Liddle¹, Justin Cobb¹, Kartik Logishetty^{1,3}¹Imperial College London, London, United Kingdom. ²Johnson & Johnson, Solothurn, Switzerland.³University College London Hospitals, London, United Kingdom**Introduction**

Superior teamwork in the operating theatre is associated with improved technical performance and clinical outcomes. Yet modern rota patterns, workforce shortages, and increasing complexity of surgery, means that there is less familiarity between staff and the required choreography. Immersive Virtual Reality (iVR) can successfully train surgical staff individually, however iVR team training has yet to be investigated. We aimed to design a multiplayer iVR platform for anterior approach total hip arthroplasty (AA-THA) and assess if multiplayer iVR training was superior to single player training for acquisition of both technical and non-technical skills.

Materials and Methods

An iVR platform with choreographed roles for the surgeon and scrub nurse was developed using Cognitive Task Analysis. Forty participants were randomised to individual or team iVR training. Individually-trained participants practiced alongside virtual avatar counterparts, whilst teams trained live in pairs. Both groups underwent five iVR training sessions over 6-weeks. Subsequently, they underwent a real-life assessment in which they performed AA-THA on a high-fidelity model with real equipment in a simulated theatre. Teams performed together and individually trained participants were randomly paired up. Videos were marked by two blinded assessors recording the NOTSS, NOTECHS II and SPLINTS scores - validated technical and non-technical scores assessing surgeon and scrub nurse skills. Secondary outcomes were procedure time and number of technical errors.

Results

Teams outperformed individually trained participants for non-technical skills in the real-world assessment (NOTSS 13.1 ± 1.5 vs 10.6 ± 1.6 , $p = 0.002$, NOTECHS-II score 51.7 ± 5.5 vs 42.3 ± 5.6 , $p = 0.001$ and SPLINTS 10 ± 1.2 vs 7.9 ± 1.6 , $p = 0.004$). They completed the assessment 28.1% faster (27.2 minutes ± 5.5 vs 41.8 ± 8.9 , $p < 0.001$), and made fewer than half the number of technical errors (10.4 ± 6.1 vs 22.6 ± 5.4 , $p < 0.001$).

Conclusions/Discussion

Multiplayer training leads to faster surgery with fewer technical errors and the development of superior non-technical skills for anterior approach total hip arthroplasty. The convention of surgeons and nurses training separately, but undertaking real complex surgery together, can be supplanted by team training, delivered through immersive virtual reality.

(189)

DO DELAYS IN PROCESSING INFLUENCE THE ABILITY TO PERFORM SYNOVIAL LEUKOCYTE COUNT IN INVESTIGATION OF PERIPROSTHETIC JOINT INFECTION?Rathan Jeyapalan, Paul Baker, Simon Jameson, Sindhoo Rangarajan, Igor Kubelka

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Introduction

Elevated synovial leukocyte count is a minor criterion derived from the musculoskeletal infection society (MSIS) widely used in clinical practice for diagnosis of prosthetic joint infection. There is evidence to suggest analysis within 1 hour, preferentially within 30 minutes, of aspiration reduces the risk of ex vivo cell lysis occurring during prolonged transport. Multiple site working is more common practice and the availability of a lab on site to perform these tests is not always possible. We aimed to assess whether we could safely perform synovial leukocyte counts within our cold site in the diagnosis of prosthetic joint infection.

Materials and Methods

We reviewed all orthopaedic synovial fluid aspirates within the lower limb arthroplasty unit from April 2021 – April 2022 performed at South Tees NHS Foundation Trust. We assessed time from aspirate to the lab using electronic data resources. This information was compared with the labs ability to perform a synovial leukocyte count to determine the impact of delays on testing.

Results

110 patients (34.5% hips and 63.6% knees) were identified between two sites. Time from aspirate to lab ranged from 0 mins to 26 hrs 34 mins. Mean time to processing was 3hrs 10 mins. 50% of all samples had a synovial leukocyte count performed. 67% of patients had a cell differential performed. There was no difference in the ability to perform a synovial leukocyte count between samples process in < 2hours vs > 6 hours.

Conclusions/Discussion

We conclude that it is safe practice to perform joint aspirates for the work up of periprosthetic joint infections in sites where no laboratory is immediately available as the delay to processing synovial fluid does not alter the ability to perform a synovial leukocyte count. This study will provide evidence to enable the work up of periprosthetic joint infections in cold centres and therefore reduce the delay in diagnosis and proceeding management.

(191)

EARLY TO MID-TERM OUTCOMES OF PERIACETABULAR OSTEOTOMY FOR DEVELOPMENTAL HIP DYSPLASIA AND FEMOROACETABULAR IMPINGEMENT: A STUDY OF 1,087 CASES USING THE NAHR DATASETRichard Holleyman¹, Marcus Bankes², Johan Witt³, Vikas Khanduja⁴, Ajay Malviya⁵

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Introduction

Periacetabular osteotomy (PAO) is an established treatment for developmental hip dysplasia (DDH) in young adults and can also be utilised in the management of femoroacetabular impingement (FAI) with acetabular retroversion. This study used a national registry to assess the outcomes of PAO for DDH and FAI.

Materials and Methods

PAOs recorded in the UK Non-Arthroplasty Hip Registry between 2012 and November 2022 were identified along with recorded patient and surgical characteristics. Cases were grouped according to the primary pathology (DDH or FAI). Patient reported outcome measures (PROMs) captured included the International Hip Outcome Tool (iHOT)-12 (primary outcome) and the EuroQol-5 Dimensions (EQ-5D) index preoperatively and at 6 months, 1, 2, and 5 years post-operatively.

Results

1,087 PAOs were identified; 995 for DDH (91%), 98 for FAI (9%). Most patients (91%) were female. The DDH group were significantly older (mean 31.7 years) than the FAI group (25.4 years) but had similar body mass index (mean 25.7kg/m²). Overall, significant (all $p < 0.0001$) iHOT-12 and EQ-5D improvement (delta) vs baseline pre-operative scores were achieved at 6 months (mean iHOT-12 improvement +27.4 (95%CI 25.3 to 29.5); $n=515$) and maintained out to 5 years (+30.0 (21.4 to 38.6); $n=44$ [9.8% of those eligible for follow-up at 5 years]), at which point 71% and 55% of patients continued to demonstrate a score improvement greater than or equal to the minimum clinically important difference (≥ 13 points) and substantial clinical benefit (≥ 28 points) for iHOT-12 respectively.

Conclusions/Discussion

This study demonstrates excellent functional outcomes following PAO undertaken for DDH and FAI in the short to medium term in a large national registry.

(193)

PATIENT-REPORTED OUTCOMES (PROMS) IN SECOND OF STAGED TOTAL HIP ARTHROPLASTY (THA) PROCEDURES: DOES A GOOD OUTCOME FROM THE FIRST PREDICT THE SECOND?Samantha Downie¹, Seraj Haque², David Ridley³, Benedict Clift¹, Graeme Nicol¹¹NHS Tayside, Dundee, United Kingdom. ²NHS Grampian, Aberdeen, United Kingdom. ³University of Dundee, Dundee, United Kingdom**Introduction**

It is anecdotally thought that a good outcome from the first of staged total hip arthroplasties (THAs) is predictive of benefit on the contralateral side. The objective was to determine whether outcome from the first THA could be used to predict outcome from the second, contralateral THA.

Materials and Methods

A retrospective cohort study of consecutive patients undergoing staged THAs at a UK arthroplasty centre over 25-years (1995-2020). A control THA group was identified and matched for age, gender, BMI, implant and diagnosis. One-year patient-reported outcome data was available for 91% 1543/1700.

Results

1700 patients who underwent staged THA were compared to 1700 matched controls. Preoperative status was comparable for pain, function, and modified Harris hip score (mHHS, mean 41 SD 13 for both groups).

At one year, there was a 2% dissatisfaction rate in all groups (first of staged THAs, second of staged THAs and controls). Groups were similar in terms of pain, function and mHHS (mean 88 SD 11 for all groups). For every 100 patients undergoing staged THAs, 87 had a bilateral good outcome (mHHS >70 both), 11 had unilateral poor outcome (mHHS >70 one, <70 other) and 2 had bilateral poor outcome (mHHS <70 both).

If the first THA had a good outcome, the relative risk of a bad outcome was 20% less than for controls (RR 0.8 95% CI 0.6-1.1). If the first THA had a poor outcome, the risk of a second poor outcome was 4.5 times higher (RR 4.5 95% CI 3.2-6.4), increasing from 6% to 29% (absolute risk).

Conclusions/Discussion

Patients undergoing staged THAs with a good outcome from the first THA were less likely to have a bad outcome with the second. Risk of a poor outcome after a previous successful THA was 6% but rose to almost 30% with a previous poor outcome. This remained after correcting for patient variables including gender, age, BMI and diagnosis, indicating a potentially novel independent risk factor for poor outcome from staged THA.

(217)

HYPONATRAEMIA - THE ENEMY OF ENHANCED RECOVERY FOLLOWING PRIMARY HIP ARTHROPLASTYAlex Denning^{1,2}, Mamdouh Hefny², Jon Waite²¹Basingstoke North Hampshire Hospital, Basingstoke, United Kingdom. ²Warwick Hospital, Warwick, United Kingdom**Introduction**

Hyponatraemia is a potentially preventable post-operative complication following hip arthroplasty. There is a paucity of literature reporting its incidence and guidelines for prevention - unlike AKI which has been prioritised to great success. Hyponatraemia is now rife in elective orthopaedics causing multiple symptoms that delay ambulation and increase the length of hospital stay. We aim to assess the incidence of hyponatraemia and AKI as a benchmark following elective primary total hip arthroplasty (THA), as well as identify patients most at risk in a high volume arthroplasty centre.

Materials and Methods

Between April 2018 and September 2018 all primary THA surgeries performed in one hospital were retrospectively reviewed. Pre-operative and 1 day post operative bloods were analysed. Patients included had normal pre-operative sodium.

Results

A total of 221 patients underwent THA. The mean age was 73.6 and ASA 2.1. No patients had a recorded AKI, however 42% of patients had a new post operative hyponatraemia. Of the hyponatraemia cases, 75% were mild, 18% were moderate, and 7% were severe. There was correlation between increased age and increased severity of hyponatraemia. The mean age of patients with mild hyponatraemia was 72.1, moderate was 77.7, and severe was 78.8. An association between ASA and severity of hyponatraemia was noted. In patients who had an ASA of 4 and hyponatraemia, 66% were moderate or severe, ASA 3 was 25%, ASA 2 was 24% and ASA 1 was 0%. The patients who had severe hyponatraemia received on average 3.5L fluid input perioperatively.

Conclusions/Discussion

Rates of post op hyponatraemia are significantly higher than AKI in primary THA. Severity of hyponatraemia increases with age and ASA. Due to its negative outcomes on recovery the high levels of hyponatraemia are worrying. We have identified which patient cohorts are more at risk and recommend more care should be taken in their perioperative fluid balance. It may be beneficial to consider successful AKI prevention and management campaigns and apply them to the prevention of hyponatraemia following hip arthroplasty.

(222)

REVISION BEARING SELECTION FOLLOWING CERAMIC BEARING FRACTURE - A PATIENT SAFETY DECISION.Daniel Howard^{1,2}, Brad Manktelow², Richard DeSteiger³, John Skinner⁴, Robert Ashford^{1,2}¹University Hospitals of Leicester, Leicester, United Kingdom. ²University of Leicester, Leicester, United Kingdom. ³The University of Melbourne, Melbourne, Australia. ⁴Royal National Orthopaedic Hospital, London, United Kingdom**Introduction**

Ceramic bearing fractures are rare events, but mandate revision and implantation of new bearings. Revisions using metal heads have been reported to lead to gross volumetric head wear (due to abrasive retained ceramic micro-debris), cobalt toxicity, multi-organ failure and death. Such complications are widely published (50+ reports), yet we know that patients continue to be put at risk. Using data from the NJR and AOANJRR, this study seeks to compare the risk of re-revision and death by revision bearing combination following a ceramic bearing fracture.

Materials and Methods

Data were extracted from the NJR and AOANJRR, identifying revisions for ceramic bearing fracture. Subsequent outcomes of survival, re-revision and death were compared between revision bearing combinations (ceramic-on-ceramic, ceramic-on-polyethylene, and metal-on-polyethylene).

Results

366 cases were available for analysis from the NJR dataset (MoP=34, CoP=112, CoC=221) and 174 from the AOANJRR dataset (MoP=17, CoP=44, CoC=113). The overall incidence rate of adverse outcome (revision or death) was 0.65 for metal heads and 0.23 for ceramic head articulations ($p=0.0012$) across the whole time period (NJR). Kaplan-Meier survival estimates demonstrate an increased risk of both re-revision and death where a metal head has been used vs a ceramic head following revision for ceramic fracture.

Conclusions/Discussion

There are few decisions in arthroplasty surgery that can lead to serious harm or death for our patients, but revision using a metal head following ceramic bearing fracture is one of them. This study enhances the signal of what is already known but previously only reported as inherently low-level evidence (case reports and small series) due to event rarity. Use of a metal head in revision for ceramic fracture represents an avoidable patient safety issue, which revision guidelines should seek to address.

(225)

DIRECT ANTERIOR APPROACH OR POSTERIOR APPROACH TOTAL HIP ARTHROPLASTY - IS THERE A DIFFERENCE IN LONG-TERM REVISION RATES AND 10-YEAR PATIENT REPORTED OUTCOME MEASURES?

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Introduction

The Posterior and Lateral approaches are most commonly used for Total Hip Arthroplasty (THA) in the United Kingdom (UK). Fewer than 5% of UK surgeons routinely use the Direct Anterior Approach (DAA). DAA THA is increasing, particularly among surgeons who have learned the technique during overseas fellowships. Whether DAA offers long-term clinical benefit is unclear.

Materials and Methods

We undertook a retrospective analysis of prospectively collected 10-year, multi-surgeon, multi-centre implant surveillance study data for matched cohorts of patients whose operations were undertaken by either the DAA or posterior approach. All operations were undertaken using uncemented femoral and acetabular components. The implants were different for the two surgical approaches. We report the pre-operative, and post operative six-month, two-year, five-year and 10-year Oxford Hip Score (OHS) and 10-year revision rates.

Results

125 patients underwent DAA THA; these patients were matched against those undergoing the posterior approach through propensity score matching for age, gender and body mass index. The 10-year revision rate for DAA THA was 3.2% (4/125) and 2.4% (3/125) for posterior THA. The difference in revision rate was not statistically significant. Both DAA and Posterior THA pre-operative OHS were comparable at 19.85 and 19.12 respectively. At the six-month time point, there was an OHS improvement of 20.89 points for DAA and 18.82 points for Posterior THA and this was statistically significant (P-Value <0.001). At the two, five and 10-year time-points the OHS and OHS improvement from the pre-operative review were comparable. At the 10-year time point post-op the OHS for DAA THA was 42.63, 42.10 for posterior THA and the mean improvement from pre-op to 10-years post op was 22.78 and 22.98 respectively. There was no statistical difference when comparing the OHS or the OHS mean improvements at the two, five and 10-year point.

Conclusions/Discussion

Whilst there was greater improvement and statistical significance during the initial six month time period, as time went on there was no statistically significant difference between the outcome measures or revision rates for the two approaches.

(228)

THE PREVALENCE OF MUSCULOSKELETAL CONDITIONS AMONG HIP SURGEONS IN THE UNITED KINGDOM: A CROSS-SECTIONAL STUDYKhalid Malik-Tabassum¹, Maryam Ahmed², Henry Wynn Jones¹, Kathryn Gill², Tim Board¹, Anil Gambhir¹¹Wrightington Hospital, Wrightington, United Kingdom. ²Royal Surrey County Hospital, Guildford, United Kingdom**Introduction**

Musculoskeletal disorders have been recognised as common occupational risks for all orthopaedic surgeons. The nature of tasks performed by hip surgeons often requires both forceful and repetitive manoeuvres, potentially putting them at higher risk of musculoskeletal injuries compared to other orthopaedic sub-specialities. This study aimed to investigate the prevalence of musculoskeletal conditions among hip surgeons and evaluate the association between their workplace and lifestyle factors and musculoskeletal health.

Materials and Methods

An online questionnaire consisting of 22 questions was distributed to UK-based consultant hip surgeons via email and social media platforms. This survey was completed by 105 hip surgeons.

Results

The mean age of the respondents was 49 years (range 35-69), with an average of 12 years (range 1-33) in service. 94% were full-time and 6% worked part-time. 49% worked at a district general hospital, 49% at a tertiary centre and 4% at a private institution. 80% were on the on-call rota and 69% had additional trauma commitments. 91% reported having one or more, 50% with three or more and 13% with five or more musculoskeletal conditions. 64% attributed their musculoskeletal condition to their profession. The most common musculoskeletal conditions were base of thumb arthritis (22%), subacromial impingement (20%), degenerative lumbar spine (18%) and medial or lateral epicondylitis (18%). 60% stated that they experienced lower back pain. Statistical analysis showed that being on the on-call rota was significantly ($P < 0.001$) associated with a higher musculoskeletal burden. Regular resistance and/or endurance training and BMI < 30 were statistically significant protective factors ($P < 0.001$).

Conclusions/Discussion

Over the last few decades, most of the hip-related literature has focused on improving outcomes in patients, yet very little is known about the impact of hip surgery on the musculoskeletal health of hip surgeons. This study highlights a high prevalence of musculoskeletal conditions among UK-based hip surgeons. Hip surgeons have a pivotal role to play in the ongoing recovery of elective orthopaedics services. There is a pressing need for the identification of preventative measures and improvement in the surgical environment of our hip surgeons.

(232)

SHORT- AND LONG-TERM MORTALITY RISK OF TOTAL HIP REPLACEMENT IN OBESE PATIENTS: DOES IT CONSTITUTE THR CONTRAINDICATION?

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Introduction

Osteoarthritis (OA) of the hip is the most common indication for total hip replacement (THR). Obesity is a risk factor for the development of OA and has recently resulted in patients requiring THRs at much younger ages to relieve pain at the joint capsule and restore mobility. However, the impact of obesity on THR mortality is not well understood.

An updated systematic review was performed to identify whether an obese BMI should influence patient selection for surgery. Specifically, the impact of obesity on short-term mortality, long-term mortality, and peri- and post-operative complications was assessed with a particular focus on BMI classes.

Materials and Methods

A comprehensive literature search of Ovid Medline and EMBASE in November 2022 identified relevant papers in accordance with PRISMA methodology. After removing duplicates, 2988 articles underwent strict inclusion and exclusion criteria, resulting in 12 papers for analysis.

Results

There was no statistically significant difference in mortality risk between obese and non-obese populations. Obesity was associated with a lower risk of short-term mortality than in the normal weight control group, however there was an increased mortality risk in obese patients long-term likely due to comorbidities. Obese patients were significantly younger than normal BMI and underweight patients. However, the paper found increased mortality risk in underweight and morbidly obese patients.

Conclusions/Discussion

Obese patients did not have an increased risk of mortality when compared to non-obese patients following THR. Obesity may have a protective effect on mortality up to a BMI of 40kg/m², although this may be influenced by the obesity paradox which states only the healthiest obese individuals are selected for surgery, which could attribute to a lower mortality risk. The greatest risk of mortality and complication was associated with underweight patients. As a result, a BMI greater than 30kg/m² may not necessitate a hip replacement contraindication. It is important surgeons apply careful consideration and comprehensive risk assessment on patients who require a THR, especially at the BMI extremes.

(20)

DEFINING THE “OPTIMUM” ACETABULUM – DIFFERENCES WITH DISTINCT YOUNG ADULT HIPS PATHOLOGIES

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Introduction

Acetabular morphology and spinopelvic characteristics are important determinants of hip biomechanics and play a role in development of hip pain and joint degeneration. Traditional radiographic diagnostic criteria based on 2D-imaging might underestimate or fail to detect subtle abnormalities. Computed tomography (CT) allows for a better characterization, and can account for pelvic tilt, rotation, and obliquity. The goal of this study was to (1) determine “optimal” acetabular morphology in a cohort of asymptomatic, high-functioning, middle-aged controls, and (2) compare with patients with acetabular dysplasia, cam-femoro-acetabular impingement (FAI), or acetabular over coverage.

Materials and Methods

Cross-sectional study of high-functioning controls (Oxford Hip Score ≥ 43), without osteoarthritis (Tönnis grade ≤ 1) (n=78), (age: 54.7 ± 4.7 years; 47.4% females); and patients treated with hip arthroscopy or peri-acetabular osteotomy (n=104) (age: 31.2 ± 8.2 years; 49.0% females). Measurements on pelvic-CT included subtended angles around the acetabular clockface, relative articular cartilage area, inclination, anatomical/functional anteversion, pelvic tilt and incidence.

Results

Among controls, acetabular depth was 22 ± 2 mm and the acetabular articular cartilage area was 1499 ± 451 mm², covering $57 \pm 12\%$ of the whole acetabular articular surface. The subtended angles around the entire acetabular clockface were significantly greater in the control-group compared to the patient-group ($p < 0.001$), all measuring greater than 80° . Controls had an acetabular inclination of $47^\circ \pm 7^\circ$. The difference between anatomical ($24^\circ \pm 8^\circ$) and functional ($22^\circ \pm 7^\circ$) anteversion was minimal among controls. Acetabular inclination among patients was not different from controls ($p = 0.482$), but controls had a higher anatomical and functional anteversion ($p < 0.001$), and a smaller difference between anatomical and functional anteversion ($2^\circ \pm 5^\circ$ vs. $6^\circ \pm 6^\circ$; $p < 0.001$). Pelvic tilt was higher among controls in comparison to patients ($11^\circ \pm 6^\circ$ vs. $8^\circ \pm 8^\circ$; $p = 0.002$). There were no differences in pelvic incidence ($55^\circ \pm 12^\circ$ vs. $53^\circ \pm 13^\circ$; $p = 0.100$) and sacral slope ($45^\circ \pm 10^\circ$ vs. $44^\circ \pm 9^\circ$; $p = 0.365$).

Conclusions/Discussion

“Optimal” acetabular morphology is characterized by subtended angles $> 80^\circ$, 60% relative cartilage area, a minimal difference between anatomical and functional anteversion, and increased pelvic tilt allowing for more impingement-free hip flexion. These findings can be used to guide management of young adults with hip pain.

(22)

VARIABILITY OF FEMORAL AND ACETABULAR VERSION AMONG PATIENTS WITH SYMPTOMATIC HIP DISEASE AND CLINICAL IMPLICATIONSJeroen Verhaegen^{1,2,3}, Michaela Burke³, Claudia Galletta⁴, Paul Beaulé³, George Grammatopoulos³¹University Hospital Antwerp, Antwerp, Belgium. ²Orthopedic Center Antwerp, Antwerp, Belgium.³The Ottawa Hospital, Ottawa, Canada. ⁴Michele e Pietro Ferrero Hospital, Verduno, Italy**Introduction**

Rotational morphology of femur and acetabular are contributing factors to development of hip pain in patients with femoroacetabular impingement (FAI) and hip dysplasia. The goal of this study was to (1) Assess the range of femoral version, acetabular version, and McKibbin values of patients presenting to a hip preservation clinic, (2) Investigate how version abnormalities influence patient presentation, and (3) Describe prevalence of versional morphologies.

Materials and Methods

This is a prospective, multi-surgeon, cross-sectional study of 196 patients (209 symptomatic hips) who presented at a tertiary referral centre for hip preservation surgery between 2018 and 2021 (mean age 35±9 years, 60% females, mean BMI 27±5 kg/m²). Patients underwent a computed tomography (CT) scan to measure acetabular version (AV) and femoral version (FV), which was classified as normal between 10° to 25°. McKibbin index was calculated. Patient-reported measures were recorded using international Hip Outcome Tool (iHOT).

Results

Mean AV was 18.4°±5.6° and mean FV 12.6°±10.0°. Although 79% of hips fell within the range of 10-25° AV, only 46% had a FV of 10-25°, and 57% had a normal McKibbin index. Patients with high FV presented at younger age (28.5±6.7y) in comparison to patients with normal (34.0±8.8y; p=0.005) or low FV (35.1±9.2y; p<0.001). Patients with combined low version presented the latest in comparison to others (p=0.012). Mean pre-operative iHOT was not different among version abnormality groups (p=0.945).

Conclusions/Discussion

Previously defined values of normal version may not truly reflect what normal version is. Both femoral version and acetabular version are considered normal between 10 and 25°. However, we found a much higher variability in femoral version than in acetabular version. Patients with chronic impingement patterns present at an older age with worse PROM scores in comparison to those with instability. Impingement patterns may lead to more cartilage and labral wear, hence why PROM scores are lower. However, symptoms may be more tolerable, hence why patients present at an older age.

(33)

AN EVALUATION OF OUTCOMES IN THE USE OF G7 DUAL MOBILITY CUP FOR PRIMARY TOTAL HIP REPLACEMENT: A SINGLE CENTRE RETROSPECTIVE STUDY

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Introduction

Hip instability is one of the commonest complications of total hip replacement (THR) and remains a leading indication for revision surgery. The G7 Dual Mobility Cup (G7 DMC) was designed to improve hip stability and increase range of movement. Our study aims to look at the use of G7 DMC in patients with varying risk of dislocation, to observe rates of hip instability, as well as their short and long term post-operative outcomes.

Materials and Methods

Between 2017 and 2021, at a single institution, 177 patients received a G7 DMC for primary hip arthroplasty. These patients were divided into three groups: elective surgery with low risk for dislocation, elective surgery with high risk of dislocation or THR for trauma. Patient demographics were compared between groups, as well as outcome measures which included dislocation rate, Oxford Hip Score (OHS), short- and long-term complications and revision surgery.

Results

57 patients (32%) were deemed as low risk for dislocation, 53 (30%) were deemed high-risk and 77 (44%) received G7 DMC for trauma. No significant difference in patient age, gender or Charlson Co-morbidity Index was seen between groups, however BMI and ASA scores were higher overall in the high-risk group.

One traumatic dislocation (1.9%) was seen in the high-risk group following a fall in the post-operative period, no dislocations were seen in the low-risk or trauma groups. No patients required revision surgery for dislocation or hip instability.

OHS was significantly lower in the high-risk group (39.4 +/- 8.9) compared with low-risk (43.5 +/- 6.5) ($P=0.012$), however no significant difference was seen against the trauma group (41.5 +/- 7.8). High-risk patients had a higher rate of the short-term complications, however long-term complications were similar in all three groups.

Conclusions/Discussion

Despite higher rates of short-term complications and poorer OHS seen in the high-risk group of patients, no spontaneous dislocation or revision surgery for hip instability has been seen in any of the three groups. We therefore support its use in primary THR, particularly in those with high risk of dislocation.

(35)

COVID-19 VACCINATION: DOES IT ALTER POSTOPERATIVE MORTALITY AND MORBIDITY IN HIP FRACTURES?Nathan Jagadeesh^{1,2}, Sachindra Kapadi¹, Jabez Gnany¹, Nidhin Koshy¹, Debbie Shaw¹¹Wrightington Wigan and Leigh NHS foundation trust, Wigan, United Kingdom. ²Robert Jones and Agnes Hunt Hospital, Oswestry, United Kingdom**Introduction**

The primary aim of our study was to evaluate the impact of COVID-19 vaccination on mortality in patients with hip fractures by comparing it to those who are unvaccinated. Our secondary objective was to compare the impact on postoperative morbidity parameters like length of hospital stay and complications.

Materials and Methods

There were 300 patients with hip fractures in the 'vaccinated group' and 319 patients in the 'unvaccinated group'. Patient demographic variables, Nottingham hip fracture score, ASA grade, type of anaesthesia used, and Charlson Comorbidity Index were collected. Our primary outcome measures were 30- and 90-day mortality. Secondary Outcome measures included postoperative complications like thromboembolic complications, cardiac, and respiratory complications, etc. Mortality among the covid positive patients was also compared between the groups.

Results

30-day postoperative mortality was higher in the unvaccinated group at 13.2% than in the vaccinated group at 5.3%. A similar increase in 90-day mortality was also observed in the unvaccinated group at 24.8% when compared to 14.7% in the vaccinated group ($p < 0.001$). Despite having a higher baseline prevalence of cardiac comorbidities, the Vaccinated group had fewer post-operative Cardiac, thromboembolic, and neurological complications ($p > 0.05$). Moreover, electrolyte imbalance and AKI were also seen in fewer patients in the vaccinated group compared to the control group ($p < 0.05$). Furthermore, it was found that among the vaccinated patients who did, unfortunately, have perioperative COVID-19 infection, the 30- day mortality was significantly lower (10%) compared to the control group (31.2%) ($p < 0.001$). Similarly, the 90- day mortality was significantly lower (25%) compared to the control group (43.75%) ($p < 0.001$).

Conclusions/Discussion

Vaccination against COVID-19 independently reduced mortality and morbidity among patients with hip fractures when compared to those who are not vaccinated. Furthermore, it decreased the risk of acquiring COVID-19, and subsequent postoperative complications. Among those who are infected with COVID-19 despite vaccination, the mortality was significantly lesser.

(41)

A FIVE-YEAR RETROSPECTIVE ANALYSIS OF HIP FRACTURE CARE IN A TERTIARY CARE HOSPITALBisola Salaja¹, Peter Staunton¹, Pamela Hickey¹, Jude Ryan¹, Stephen Madden², Finbarr Condon¹¹University Hospital Limerick, Limerick, Ireland. ²Royal College of Surgeons, Dublin, Ireland**Introduction**

The Irish Hip Fracture Database Governance Committee implemented the Irish Hip Fracture Standards (IHFS) in 2017 as a means of auditing hospital performance against agreed measurable standards. Despite the evidence supporting the implementation of modern standards around hip care, it remains a significant challenge for hospitals to achieve these standards due primarily to resource constraints. This study sought to evaluate the performance of our unit regarding hip fracture care and analyse individual outcome parameters.

Materials and Methods

Data was extracted from our unit's hip fracture database for the time-period 1/1/2015 to 31/12/2019. Patients with hip fractures over the age of 60 were included. Demographics and recorded outcomes for each patient were used to populate a study database. Access to the Irish death events register was used to confirm death events. Mortality rates were measured at discharge, one month, three months, six months, 12 months, 3 years, and 5 years.

Results

1685 hip fractures were treated within the study period. The mean age was 78. Females constituted 68% of the cohort. Mortality rate at 1 year was 20% (n=337). Older (p=<2e-16), male patients (p=8.13e-05) with ASA scores of 4 (p= 0.000701) performed poorly in our facility. Patients whose care met IHFS 1 (p=0.00768) and IHFS 2 (p=7.91e-05) had significantly better outcomes but conversely, our unit delivered IHFS 1 & 2 standard care less frequently than standards 3-6. IHFS 3 - 6 had no statistical significance on outcomes. Poorer outcomes were significantly associated with certain discharge destinations, particularly those who self-discharged (p=0.000287). A multivariate predictive model demonstrated that the combined relevance of the considerable variables on survival status was statistically insignificant. Therefore, significant variables in our logistic regression analysis influenced survival status independently of each other.

Conclusions/Discussion

Constraints within the Irish health system result in challenges in delivering recommended care pathways in their entirety, as designed. Until adequate resources for hip fracture care are provided, complete standards will remain poorly delivered. This study provides information that will allow us to focus scant resources in areas where outcomes can be most affected.

(46)

VARIATION IN PRACTICE OF PROPHYLACTIC MEASURES TO REDUCE PROSTHETIC JOINT INFECTION (PJI) IN PRIMARY HIP AND KNEE ARTHROPLASTY: A NATIONAL CROSS-SECTIONAL STUDY

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Introduction

Prosthetic joint infection (PJI) has an enormous physiological and psychological burden on patients. Surgeons rightly wish to minimise this risk. It has been shown that a standardised, evidence-based approach to peri-operative care leads to better patient outcomes. A review of current practice was conducted using a cross-sectional survey, to determine current practice in peri operative PJI prophylaxis in primary arthroplasty amongst surgeons at multiple centres nationwide.

Materials and Methods

An 11-question electronic survey was circulated to hip & knee arthroplasty consultants nationally via the BOA e-newsletter.

Results

56 consultants working across 19 different trusts. 34 (61%) screen patients for asymptomatic bacteriuria (ASB) pre-operatively, with 19 (56%) would treating with antibiotics. 56 (100%) screen for MRSA and treat if positive. Only 15 (27%) screen for MSSA or empirically eradicate. 0 (0%) routinely catheterise patients peri-operatively. 41 (73%) would give intramuscular or intravenous gentamicin for a peri-operative catheterisation. All surgeons 56 (100%) use laminar flow theatres. 26 (46%) use only an impervious gown, 6 (11%) exhaust pipes and 24 (43%) surgical helmet system. 5 different antimicrobial prophylaxis regimens are used 9 (15%) cefuroxime, 2 (4%) flucloxacillin, 19 (34%) flucloxacillin & gentamicin, 10 (18%) teicoplanin, 16 (29%) teicoplanin & gentamicin. 22 (39%) routinely give further doses.

Conclusions/Discussion

ASB screening, treatment and intramuscular gentamicin for peri-operative catheterisation is routinely practiced despite no supporting evidence base. MSSA screening and treatment is underutilised. Multiple antibiotic regimens exist despite little variation in organisms in PJI. Practice varies between surgeons and centres, we should all be practicing evidence-based medicine.

(49)

SIMULTANEOUS FRACTURE FIXATION AND HIP REPLACEMENT FOR ACETABULAR FRACTURES WITH “A FIX & REPLACE CONSTRUCT” IN OLDER PATIENTS. CLINICAL AND RADIOGRAPHIC RESULTS WITH A MINIMUM OF 1 YEAR FOLLOW UP.

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Introduction

Fix and replace is an option for elderly patients with displaced acetabular fractures and pre-existing hip osteoarthritis. Clinical outcomes and survival analysis of 57 patients who were treated with fix and replace is reported.

Materials and Methods

A series of 57 patients managed with fix and replace construct were reviewed retrospectively. Data retrieved included demographics, mechanism of injury, time to surgery, fracture type, comorbidities, and complications. Patient recorded outcomes measures were assessed using EQ-5D and Oxford hip scores. Follow-up Radiographs were reviewed for union, heterotopic ossification, implant loosening and cup migration.

Results

57 patients with a mean age of 77 years (60-95), with 42% (24/57) being female. 79% of injury mode was a low energy fall, with 21% being a road traffic accident or fall off a push bike. The fracture patterns were anterior column posterior hemi-transverse (67%), associated both columns (9%), posterior column (9%), posterior column and posterior wall (9%), and transverse (2%). 46% (26/57) patients needed transfusion.

Complications observed included 4 dislocations treated with closed reduction and 1 that required excision arthroplasty. 2 infections resolved with debridement, antibiotics, and implant retention (DAIR), whilst 1 required a two-stage revision. 1 acetabular component had migrated requiring revision. The median pre-injury Oxford hip score was 44 (26-48) compared to 37.3 (28-48) at 1 year. 60% patients were mobilising full weight bearing with walking aids.

Mortality at 30 days was 0%, and 12.3% (7/57) patients had died.

Conclusions/Discussion

Results of these series is encouraging, however as the patient cohort is mostly complex with high ASA, there is need for considerable support in the peri-operative and immediate post-operative recovery period to further guide holistic management of this complex group of patients.

(67)

EVIDENCE BASED RECOMMENDATIONS ON 'PRE-HABILITATION' PRIOR TO HIP ARTHROSCOPY FOR FEMORO-ACETABULAR IMPINGEMENT (FAI) SYNDROMEAlison Smeatham¹, Katie Monnington², Louise Grant³, Lucie Gosling⁴, Edward Dickenson⁴¹Hip unit. Royal Devon University Healthcare NHS Foundation Trust, Exeter, United Kingdom. ²Royal National Orthopaedic Hospital, Stanmore, United Kingdom. ³Physiocure physiotherapy, Leeds, United Kingdom. ⁴The Royal Orthopaedic Hospital NHS Foundation Trust, Birmingham, United Kingdom**Introduction**

This abstract describes the production of evidence based guidance for NHS physiotherapists on pre-operative physiotherapy prior to hip arthroscopy for FAI syndrome. A separate abstract outlines the production of guidance on post-operative rehabilitation.

In 2019 the International Society of Hip Preservation (ISHA) published guidance on physiotherapy assessment and treatment of patients with FAI syndrome. Where research evidence was lacking, the consensus of physiotherapists and orthopaedic surgeons, all experts in the field was sought on best practice. At least 17 of the 19 clinicians involved were based in private healthcare settings where waiting times and patient demographics differ from those in the NHS so the generalisability of the consensus to a public healthcare setting was limited.

Materials and Methods

Throughout 2022, members of the UK hip physiotherapy network completed the process of producing draft guidance relevant to NHS settings:

- A review of the demographics and waiting times in the NHS young adult hip units of its members in order to identify differences in waiting times and demographics between the NHS and private healthcare settings.
- A literature review on physiotherapy in FAIS
- Draft guidance on provision of pre- arthroscopy physiotherapy (prehab) in the NHS

The draft guidance was circulated to the represented specialist units for review by therapists and surgeons and the resulting feedback incorporated into the final guidance.

Results

The literature review panel identified a single level 1 pilot study which along with the ISHA consensus and feedback from NHS young adult hip units provided the basis for the final guidance.

The evidence based recommendations on prehab prior to hip arthroscopy for FAI syndrome are detailed under the following headings:

- One to one review with the patient
- Provision of advice and information
- Pre-operative exercise programme
- Use of validated outcome measures

Service delivery suggestions and the basis for the recommendations are also included.

Conclusions/Discussion

Pre-operative physiotherapy prior to hip arthroscopy is recommended in international consensus guidance produced by ISHA. Whilst the application of some specific recommendations may be limited within an NHS setting, the principles of best practice can be introduced.

(70)

STAKEHOLDER PRIORITISATION PREFERENCES FOR HIP ARTHROPLASTY

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Introduction

The Coronavirus (COVID-19) Pandemic has seen a huge deterioration across the U.K. in the time that patients must wait for hip and knee replacement once listed for surgery.

These observed prolonged waits for orthopaedic surgery have raised important questions about the regional and interpersonal equity of current approaches to prioritisation of elective primary hip arthroplasty patients.

We therefore set out to develop a new key stakeholder (patient and surgeon) led clinical prioritisation tool determined through an evidence-based approach.

Materials and Methods

In the first part of this research, we performed a Delphi study of these key stakeholders to decide which factors should be included in surgical priority decision making. This included an initial idea generation round with direct content analysis, followed by two rounds of anonymous ranking with feedback towards consensus.

A consensus meeting (involving representation from British Hip Society, British Association for Surgery of the Knee, Versus Arthritis, Scottish Committee for Orthopaedics and Trauma, and a patient partner) was then held to determine which factors should be utilised in development of a clinical prioritisation tool.

The full study protocol is available at: <https://doi.org/10.1302/2633-1462.310.BJO-2022-0071>.

Results

There were 43 responses in the first round, with a subsequent 91% participation rate. 13 potential factors were identified: *Severity of Pain; Mobility/Function; Ability to Perform Activities of Daily Living; Frailty; Work status; Length of Time on Waiting List; Radiological Severity; Mental Wellbeing; Lifestyle Factors; Caring Responsibilities; Age; Social Support and Quality of Life*. Severity of Pain, Mobility/Function and Ability to Perform Activities of Daily Living were the three most strongly rated options.

Following the consensus meeting agreement was obtained that the italicised factors should be taken forwards to be utilised in the second study work package.

Conclusions/Discussion

This work is the first to identify the factors that key stakeholders hold important in priority decision making for primary hip arthroplasty. This information will now be used to inform development of a Weighted Benefit Score, through Discrete Choice Experiment methodology, that can be utilised to develop a tool that determine comparative priority across this patient group.

(73)

FUNCTIONAL PELVIC TILT FREQUENTLY DIFFERS FROM THE ANTERIOR PELVIC PLANE – IMPLICATIONS FOR 3D MOTION ANALYSIS

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Introduction

Hip preservation surgeons are increasingly using commercially available 3D motion analysis software to investigate areas of impingement and to quantify femoral head coverage. Variations in functional pelvic tilt will affect the position of the acetabular rim and projected femoral head coverage, but currently most of the available software standardizes sagittal rotation to the anterior pelvic plane (APP). The study hypothesis was that the APP does not correlate well with patient specific pelvic position.

Materials and Methods

60 patients with an adequate pre-operative CT scan and AP pelvic radiographs were identified from the institutional database – 20 with acetabular retroversion (AR), 20 with developmental dysplasia of the hip (DDH) and 20 with cam type femoroacetabular impingement syndrome (FAIS). Multiplanar CT reformats were created and corrected for axial and coronal rotation before the sagittal rotation was aligned to the APP. The sagittal pelvic orientation was then corrected until the AP projection reflected that of the plain radiographs. The change in sagittal pelvic tilt angle required was measured.

Results

The mean deviation from the APP in the AR group was 11.55° (SD +/- 4.96°) for supine radiographs and 3.28° (SD +/- 8.66°) for standing radiographs. The mean deviation from the APP for standing radiographs in the DDH group was 6.96° (SD +/- 3.43°) and -1.28° (SD +/- 7.31°) in the FAIS group.

Conclusions/Discussion

There is a wide variation in patients' functional pelvic positioning in both supine and standing radiographs which rarely correlates with the APP. Commercial 3D motion analysis may therefore give misleading results for both the extent and location of hip impingement as well as femoral head coverage, which may affect surgical decision making. Consideration should be given to incorporating this into the software algorithms.

(75)

CERAMIC HIP RESURFACING ARTHROPLASTY IN WOMEN ENABLES NEAR NORMAL GAIT FUNCTIONAmy Maslivec¹, Camilla Halewood², Susannah Clarke^{1,2}, Justin Cobb^{1,2}¹Imperial College, London, United Kingdom. ²Embodiment Orthopaedics Limited, London, United Kingdom**Introduction**

Gait function improves after Total Hip Arthroplasty (THA) but is not restored to normal levels. Metal-on-metal Resurfacing Arthroplasty (MoM-HRA) is an alternative to THA and has shown to restore normal levels gait function and physical activity but has been restricted to men owing to problems of metal-ion release. Ceramic HRA (cHRA) removes the cobalt-chrome bearing surfaces, thereby eliminating these specific metal-ion concerns, and aiming to be safe for females. The aim of the study was to examine gait function of female cHRA patients compared to female THA using subjective and objective measures.

Materials and Methods

Eighteen unilateral cHRA and 17 unilateral THA, age and BMI matched, completed patient reported outcome measures (PROMs) (Oxford Hip Score, EQ5d and MET score) and underwent gait analysis using an instrumented treadmill pre- (1-10 weeks) and post-operatively (51-74 weeks). Top walking speed (TWS), Vertical GRF of the stance phase, GRF symmetry index (SI) and spatiotemporal gait measures were recorded. Patients were compared to age, gender and BMI healthy controls (CON).

Results

There were no differences in PROMs or gait function between groups pre-operatively. Post-operatively, cHRA had a higher MET score (11.5 vs 7.3, $p=0.03$) and a higher TWS (6.1 vs 6.9km/hr, $p=0.01$) compared to THA. cHRA had a similar TWS and GRF profile to CON, whereas THA had a reduced push-off force at 70-77% of the stance phase compared to CON. At faster walking speeds of 6km/hr walking speed, THA displayed an asymmetric GRF profile ($SI < 4.4\%$) whereas the cHRA patients continued to display a symmetrical gait profile. cHRA was able to increase step length from pre-op levels (63.2 vs 67.5 cm, $p=0.02$) and produced a larger step length compared to THA at faster walking speeds (72.4 vs 79.4cm, $p=0.02$).

Conclusions/Discussion

In conclusion, this small study confirms that both THA and HRA procedures improve function in women from preoperative levels using subjective and objective measures. However, Female cHRA returned to levels of gait function and activity like healthy controls unlike female THA.

(76)

DYSPLASTIC HIPS MAY SAFELY BE RESURFACED WITHOUT A CONTOURED FEMORAL COMPONENTTakuro Ueno^{1,2}, Justin Cobb¹¹Imperial College, London, United Kingdom. ²Kanazawa University, Kanazawa, Japan**Introduction**

The oversized apron of the femoral component that extends beyond the limit of the original femoral head is a potential cause of groin pain following resurfacing of dysplastic hips. A contoured head design has been proposed to address this.

We investigated whether these dysplastic hips can effectively be resurfaced without the overhang by reducing the femoral head size, correcting the stem angulation into valgus, and translating the head laterally ensuring that its anteromedial metal rim is close to the bony margin, thereby removing the need for a contoured femoral component.

Materials and Methods

Virtual surgery and measurements were done with three-dimensional CT-based planner. Retrospectively gathered data of dysplastic patients who underwent total hip arthroplasty with the centre edge angle of less than 20° and with the femoral head size 48mm or more.

Virtual surgery with The Birmingham Hip Resurfacing (BHR) system (Smith+Nephew) was undertaken using two techniques: Anatomical resurfacing (AR), using the native head, and Reduced head resurfacing (RR), reducing the femoral head size, correcting the angulation into valgus (135-145°) and translating the component laterally to the medial head/neck junction.

Results

20 patients (12 women and 8 man) were finally included, with a mean age of 55 and mean height of 163 cm.

The mean head size was 50mm, the mean Center Edge angle was 10°, the mean femoral version was 21°, mean neck-shaft angle was 134°.

The mean stem-shaft angle in AR was 136° while in RR it was 141°.

The mean overhang in AR was 6mm while in RR it was 2mm. The overhang in RR was significantly smaller ($P < 0.01$, paired t-test).

The mean size reduction needed in RR was 4 mm. The femoral offset was reduced in RR by the mean value of 5 mm. The leg length was reduced in RR by the mean value of 1 mm.

Conclusions/Discussion

A reduced head resurfacing technique allows even dysplastic hips to be resurfaced with minimal overhang, suggesting that a contoured femoral component may not be necessary to avoid psoas impingement.

(81)

WHICH ONE IS THE LESSER EVIL? – PERIPROSTHETIC FRACTURE FOLLOWING ANTERIOR APPROACH OR DISLOCATION AFTER POSTERIOR APPROACH?Jeroen Verhaegen^{1,2,3}, Tom Schmidt-Braekling³, Roger Wei³, Paul Beaulé³, George Grammatopoulos³¹University Hospital Antwerp, Antwerp, Belgium. ²Orthopaedic Centre Antwerp, Antwerp, Belgium.³The Ottawa Hospital, Ottawa, Canada**Introduction**

The two most common approaches in primary total hip arthroplasty (THA) have different complication profiles: anterior-approach (AA-THA) has an increased risk of per-operative periprosthetic-femoral-fractures (PPF); posterior-approach (PA-THA) is associated with a higher dislocation risk. However, little is known on the impact of these two complications on outcome. This study aims to compare the outcome of patients, who suffered PPF post-AA with those that sustained dislocation post- PA.

Materials and Methods

This is a retrospective, single-centre, consecutive case-series of primary THA patients who experienced either PPF post-AA-THA or dislocation post-PA-THA. Eighty patients fulfilled the approach-specific, post-operative complication criteria, of which 45 were PPF-AA-THAs (14xVancouver-A, 16xVancouver-B1; 11xVancouver-B2 and 4xVancouver-B3; 18 intra- and 27 post- operative) and 35 Dislocation-PA-THAs. Patient demographics, comorbidity-scores (Charlson-Comorbidity-Index (CCI), ASA), surgical treatment (re-operations, revisions), complications and patient related outcomes (Oxford-Hip-Score (OHS) and EQ-5D) were compared.

Results

There was no difference in demographics (age, sex, BMI, CCI, ASA) between groups ($p=0.3-1.0$). Reoperation was more common in the Dislocation-PA-THA group (23/35 vs. 21/45; $p=0.09$). Change of surgical approach occurred in 16/21 of PPF-AA-THA but none for Dislocation-PA-THA. Following re-operation, complication rate was greater in PPF-AA-THA (11/21; 52%; 8xPJI, 1xdislocation, 2xfixation failure) compared to Dislocation-PA-THA-group (4/23; 17%; 1xPJI, 3xdislocation) ($p=0.012$). EQ-5D (PPF: 0.74 ± 0.3 vs. Dislocation: 0.64 ± 0.1 ; $p=0.04$) and OHS (41 ± 8 vs 36 ± 8 ; $p=0.02$) were superior in the PPF-AA-THA group. Vancouver As- (39 ± 9) and B1s (43 ± 3) had superior scores to Vancouver B2/3 (38 ± 11). No difference in OHS was detected between Vancouver-B2 and Dislocation-PA-THA-group ($p=0.5$).

Conclusions/Discussion

Dislocation following PA-THA is more likely to require revision. However, PPF-AA treatment is likely to require different surgical approach and is 3x more likely to be associated with additional complications, and reoperations. Despite the increased surgical burden post-operative PROMs are better in PPF-AA-THA, especially in cases not requiring revision of implants, which was associated with worse function.

(87)

ANCHORING OF FOLLOW-UP IN SURGICAL TRIALS: AN OVERVIEW OF CURRENT PRACTICE AND RECOMMENDATIONS FOR FUTURE TRIALS

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Introduction

The number of randomised controlled trials (RCTs) investigating surgical interventions has increased in recent years. An important decision in study design for surgical RCTs is whether follow-up assessments should be anchored at the time of randomisation or delivery of intervention, particularly when there is a substantial difference between these two timepoints. We identify current practice and propose a decision-making tool for anchoring follow-up in surgical trials.

Materials and Methods

We searched the UK's National Institute for Health Research (NIHR) Health Technology Assessment (HTA) journal from 1997 to 2022, for definitive two-arm, individually randomised surgical trials, and assessed how they anchored follow-up assessments. We explored clinician perspectives on anchoring approaches and compared them to methodological considerations.

Results

Fifty-six RCTs were identified. Forty-six (82%) randomised patients before surgery, while the remaining 10 (18%) were randomised either on the day of surgery or during surgery.

Thirty-one (55%) trials anchored follow-up from randomisation and 17 (30%) anchored from intervention. In eight trials (14%), randomisation and intervention occurred simultaneously. Anchoring follow-up from randomisation predominated more recent studies. Clinicians identified factors for consideration in deciding the anchoring of follow-up: waiting times, patient outcome, pathology and patient population, intervention, and health resources.

Conclusions/Discussion

The decision around when to anchor follow-up in surgical trials is complex, with conflicting stakeholder preferences. Where possible, randomisation on the day of, or during, surgery is ideal. Where randomisation on the day of surgery is not possible, follow-up from randomisation should be used to assess how interventions compare in real-world settings, where not all participants may be able or willing to take up the offer of an intervention, and some interventions are subject to long waiting lists. Post-intervention follow-up may be more appropriate in certain settings, i.e. where outcomes relate directly to the intervention delivery, or where the research question is explanatory, as detailed in our proposed decision making flowchart.

(88)

CAN ARTIFICIAL INTELLIGENCE IMPROVE THEATRE SCHEDULING EFFICIENCY FOR ELECTIVE TOTAL HIP REPLACEMENTS: A SCOPING REVIEW

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Introduction

Elective surgery waiting lists continue to rise. Prolonged waits for total hip arthroplasties lead to increasing pain, limit quality of life, and may be associated with worse outcomes. Identifying methods to improve the scheduling of hip replacements could help to increase efficiency. At present, scheduling is based on the experience of schedulers and their predictions of surgical case duration. Machine learning (ML) and deep learning (DL) algorithms may provide more accurate predictions of the duration of surgical procedures than current methods.

The aim of this scoping review was to evaluate the use of ML and DL algorithms in predicting surgical time for procedures and how this compares to standard practice.

Materials and Methods

The PRISMA extension for scoping reviews and the Arksey O'Malley framework were used to guide the development of the protocol. Search terms were developed with a medical librarian. Two searches were conducted in November 2021 and June 2022 across PubMed, Embase and Medline libraries to identify appropriate articles for inclusion. Standard guidance on the reporting of orthopaedic AI papers was used to develop a study assessment tool. AI performance was reported using a variety of performance indicators including R², MAE, MSE, RMSE, MAPE, CRPS, and percentage underage/overage.

Results

2323 articles were identified, with 12 deemed suitable for inclusion. 11 studies developed ML and DL models and compared them to the standard methods for case duration prediction, all found that accuracy was improved and six found these differences to be significant ($p < 0.05$). DL models generated more accurate predictions than ML models in studies where the initial dataset had over 50,000 records. Improvements were identified in a randomised clinical trial in which an ML algorithm was implemented into the theatre scheduling workflow. The ML algorithm provided more accurate predictions, fewer large prediction errors (errors that would disrupt a surgical list), and reduced patient wait times. The quality assessment tool identified methodological limitations across most studies.

Conclusions/Discussion

Implementing ML and DL algorithms into operating theatre scheduling workflows could result in improved case duration predictions and increased productivity.

(103)

TO FIX OR TO REPLACE IN ELDERLY STABLE NECK OF FEMUR FRACTURES. A 5-YEAR RETROSPECTIVE STUDY IN A MAJOR TRAUMA CENTRE

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Introduction

Hip fractures in the elderly are very common but still, the decision for the treatment in the stable neck of femur fractures can be controversial. Though fixation of stable fractures can be quicker with decreased blood loss, but the revision rates are quite higher than the arthroplasty group. This retrospective study was conducted to analyse the revision and mortality rates in arthroplasty and fixation of stable NOFs.

Materials and Methods

This retrospective cohort study included patients between the ages of 65 and older who underwent internal fixation or arthroplasty for a femoral neck fracture during 2013–2017 in Hull Royal Infirmary Hospital. Primary outcomes that were measured are reoperation and mortality rates.

Results

A total of 1672 were identified as intracapsular fractures. 101 stable (Garden I&II) femoral neck fracture patients were treated with internal fixation during the study period (mean age 72 years). The revision rate in IF group was 28.7% (29/101). 11/44 were revised in DHS and 18/57 were revised in cannulated screws. A total of 102 patients with stable neck of femur fractures (Garden I&II) were treated with arthroplasty (Hemiarthroplasty/THR). Only 6/102 patients had THR and rest of them were treated with hemiarthroplasty. The revision rate in this group was 17.6% (18/102). The most common reason for revision in Cannulated screws was pain, AVN, loss of reduction and collapse of fracture. In DHS group cut out, screw breakage, malunion, secondary osteoarthritis and pain were the most common reasons. Commonest reasons for revision in replacement group were dislocation, peri prosthetic fractures and superficial infection. The correlation between comorbidities, ASA, Nottingham hip fractures score and mortality scores were also analysed. 5 year mortality was significantly higher in replacement group especially after dislocation of hemiarthroplasties (64.8%) compared to internal fixation (28%).

Conclusions/Discussion

Replacement was found to be superior to internal fixation regarding revision even in stable NOFs in terms of revision rates, but 5 year mortality was higher in hemiarthroplasty and DHS group compared to cannulated screws because of age and comorbidities.

(105)

TEN-YEAR FOLLOW-UP STUDY OF THE TRIPLE TAPERED C-STEM AMT CEMENTED FEMORAL STEM

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Introduction

C-Stem AMT is a force-closed design, triple-tapered, polished cemented stem. It was first introduced to the market in 2005 following design modifications to the original C-stem. This study aimed to report radiological outcomes and survivorship of the C-stem AMT, with a minimum 10-year follow-up.

Materials and Methods

This was a single-centre, multi-surgeon, retrospective study of total hip replacements (THRs) performed using the C-stem AMT between 2006 and 2012.

Results

246 THRs we performed in 229 patients using the C-stem AMT, 137 female and 92 male patients. The mean age at surgery was 67 years (range 31-88). The average follow-up was 11.5 years (range 10-15). Surgical indications were osteoarthritis=229, avascular necrosis=9, dysplasia=4, fracture=2, and arthrodesis takedown=1. Eleven different consultant hip surgeons performed these procedures. All THRs were performed via the posterior approach. The constructs for THRs were 207 (84%) cemented and 39 (16%) hybrid. The bearing combinations were 158 (64%) metal-on-polyethylene, 87 (35%) ceramic-on-polyethylene, and 1 (0.4%) metal-on-metal. The quality of the cement mantle on the postoperative radiographs was Barrack A in 213 (87%) and B in 33 (13%).

Five patients returned to theatre within a year; 2 periprosthetic fractures that required open reduction and internal fixation, 2 dislocations treated with manipulation under anaesthesia, and 1 wound washout. At the final follow-up radiographs, there were no Gruen zone lucencies in 148 (60.2%), 77(31.3%) in a single zone, and 21(8.5%) in two or more zones. Calcar resorption was seen in 42(17%). To date, 4 THRs (1.6%) have been revised (aseptic loosening of cup=1, infection=1, periprosthetic fracture=1). The mean time to revision was 12.1 years (range 10-14). There were no revisions for aseptic loosening of the femoral stem.

Conclusions/Discussion

The C-stem AMT femoral stem has demonstrated excellent implant survivorship at a 10-year follow-up with modern cementing techniques for THRs. Aseptic loosening of the femoral component is yet to be observed in a long-term review of the C-stem AMT THRs at our institution.

(110)

TOTAL HIP ARTHROPLASTY FOR NECK OF FEMUR FRACTURE – CAN WE BETTER PREDICT PATIENTS THAT WILL BENEFIT?Lauren Smith¹, Lee Hoggett², Reinier Van-Mierlo³, George McLauchlan³¹University of Manchester, Manchester, United Kingdom. ²Health Education Northwest, Manchester, United Kingdom. ³Lancashire Teaching Hospitals NHS Foundation Trust, Preston, United Kingdom**Introduction**

NICE guidance for the treatment of neck of femur fractures is to offer total hip arthroplasty (THA) in patients who are independent outdoors with no more than the use of a stick and are not cognitively impaired. Recent RCT evidence suggests little difference in outcomes between THA and hemiarthroplasty in patients up to 2 years after their index procedure. We report on the relationship of pre-operative frailty scores on post-operative mortality at 2 years in patients undergoing THA for femoral neck fracture.

Materials and Methods

Prospective case series of all femoral neck fractures treated at a major trauma centre with a primary THA between 2013-2020. Patients were included provided they were ≥ 65 years of age and fulfilled the NICE CG-124 criteria for THA. They were excluded if the fracture was pathological or around an existing implant. Pre-operative data was collected on Nottingham Hip Fracture Score (NHFS), Johns Hopkins Frailty Assessment (JHFA), Rockwood Frailty Score (RFS) and Sernbo score. Mortality data was obtained from the primary care mortality database.

Results

333 patients were included. 71% (238) were female. The median age was 83 years (65-93). The overall mortality rate was 28% (92 patients) at a median follow-up of 66 months (24-109). The two-year mortality rate was 8.4% (28). Patients who died within 2 years had no significant difference in Sernbo risk $p=0.138$. NHFS, JHFA and RFS were all independently significantly different between those alive or dead at two years $p<0.001$. Factors most strongly associated with 2-year mortality were JHFA score consistent with frailty (OR 6.914; 95% CI 3.04 to 15.71; $p<0.001$) and RFS ≥ 4 (OR 17.03; 95% CI 2.28 to 127.065; $p=0.006$).

Conclusions/Discussion

Pre-operative frailty scores are strongly predictive of two-year mortality following arthroplasty for a neck of femur fracture. We suggest surgeons consider hemiarthroplasty in patients over 65 with a JHFA consistent with frailty or RFS ≥ 4 .

(115)

CONCERNS WITH DUAL-MOBILITY BEARINGS: A CASE REPORT OF ILIOPSOAS IMPINGEMENT MANAGED ARTHROSCOPICALLY

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Introduction

Dual mobility (DM) usage in THA continues to rise each year. Concerns have been raised regarding intra-prosthetic dissociation, wear, metallosis, and soft tissue impingement. The latest NJR report has indicated higher five-year revision rates with DM than for any other unipolar bearing combination.

We present the first known case of successfully managed arthroscopic DM-related psoas impingement.

Materials and Methods

A 50-year old female presented with left hip arthritis. Past medical history included a prior CVA with residual left-sided weakness. Her neuromuscular condition and falls risk placed her at an increased risk of dislocation and she was counselled appropriately for a dual-mobility articulation.

In August 2021 she underwent an uneventful THA. The case had been pre-operatively templated with small anatomy noted: 35.5 Exeter stem, 50mm Trident 'D' shell, 38D MDM liner, X3 insert and 22.2 V40 metal head. She was discharged within 24-hours and initially made an excellent recovery.

Pre- and post-operative radiographs are available and indicate appropriately sized implants with adequate anteversion of the cup which lay inside the bony margins of the acetabulum.

Results

6-weeks post-op the patient sat on a low chair precipitating extreme groin pain. On clinical review she was complaining of the left leg internally rotating when walking, limited mobility, and severe groin pain. Ultra-sound commented on a hypoechoic and swollen iliopsoas as it crossed the anterior aspect of the joint suspicious for tendinopathy. She failed to respond to an injection.

The decision was taken for arthroscopic release. Pre-op OHS 9, EQ-VAS 30%, iHOT-12 & EQ-5D reflected severe symptoms.

Arthroscopy was performed on the post-less Guardian table (Stryker). In extension the X3 insert was seen stretching the psoas tendon which appeared tendinopathic. In flexion, the insert rolled back and pressure relieved. The tendon was lengthened using radio-frequency ablation with visible release and retraction (video available).

Conclusions/Discussion

The patient reported immediate relief of symptoms. All PROMs showed significant improvement and she was delighted with the profound response.

This highlights one of the concerns with DM implants and is the first known report of arthroscopic assessment and management with photographs / videos available.

(125)

THE BIRMINGHAM INTERLOCKING PELVIC OSTEOTOMY: 22 TO 30 YEAR SURVIVALJohn O'Hara¹, Callum McBryde², Dylan Jewell³¹BMI Priory Birmingham, Farnham, United Kingdom. ²Royal Orthopaedic Hospital, Birmingham, United Kingdom. ³Withybush Hospital, Haverfordwest, United Kingdom**Introduction**

We report the results at a mean of 27 years (22 to 30) of our first 100 patients (116 hips) treated by the Birmingham Interlocking Pelvic Osteotomy (BIPO) in patients with previously untreated acetabular dysplasia. The operation uniquely combines; use of an external fixator to manoeuvre and control the final position of the central acetabular fragment accurately with interlocking iliac bone cuts for intrinsic bony stability and immediate weight-bearing.

Materials and Methods

We retrospectively analysed prospectively collected data from a consecutive cohort of the first 100 patients treated by BIPO for symptomatic acetabular dysplasia between January 1992 and June 2000. A total of 116 BIPO procedures (100 patients) were performed. Of these, 88 procedures were performed on women and 28 on men. There were 60 left hips and 56 right hips. 96 patients were reviewed and interviewed. OHS and UCLA scores were calculated.

Results

The mean age at operation was 31 years (7 to 57). Eighty-eight operations were performed on females and 28 on males. Survivorship was 76% at 12.5 years 57% at 17 years and 50% at 27 years follow up. Younger patients had the best survivorship (89% at 27 years follow up if under 20 years at operation). Hips that had not undergone hip arthroplasty exhibited a median OHS of 39 (interquartile range (IQR) 23.5 to 46.0) - a slight reduction on their score in 2015, and a median UCLA of 5 (IQR 3 to 6.5), unchanged. BIPO has a low complication rate of 10.4% and these did not compromise the outcome in any patient.

Conclusions/Discussion

BIPO continues to provide patients with a durable end result, better than the long-term clinical and radiographic outcomes of more popular techniques and with a much lower complication rate even during the learning curve.

(134)

ACCURACY OF TEMPLATING FEMORAL OFFSET FROM PELVIC X-RAYS FOR IMPLANT SELECTION FOR HIP ARTHROPLASTY SURGERY AND THE CREATION OF A MODEL TO ESTIMATE TRUE FEMORAL OFFSET.

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Introduction

Femoral offset at present is typically measured using X-ray imaging methods which produce a single projection. On the other hand, CT scanning has the ability to obtain 3D cross-sectional imaging that allows for more accurate measurements.

The importance of maintaining an accurate femoral offset has been highlighted in studies that assess surgical outcomes post-arthroplasty. Implications with incorrect femoral offset include gait changes, loss of mobility, and increased risk for dislocation.

Materials and Methods

200 Scottish patients' CT scan images were collected between Dec 2020 to Dec 2021, and radiographic measurements of their hips were matched. Demographics of the patients and digital measurements of femoral neck-shaft angle, angle of anteversion, apparent femoral offset (AFO) and true femoral offset (TFO) were recorded. The study included patients over the age of 50 and excluded those with previous trauma to the hip, femur or pelvis, and pelvic bone malignancy. Descriptive analysis and linear regression models were used to analyse the datasets.

Results

There is a significant discrepancy between TFO and AFO, with a mean ratio (TFO/AFO) of 1.09, median of 1.07, range of 1.02 – 1.23, and a standard deviation of 0.05. Three regression models were generated to estimate TFO, and had R^2 values of 0.9943, 0.9947, and 0.9946, with standard deviations of 0.3546, 0.3416, and 0.3444, indicating that the regression models are a good fit for estimating TFO.

Conclusions/Discussion

As TFO and AFO are measured from scans of the same patient, a strong correlation is expected. The discrepancy between TFO and AFO was apparent through the results analysed on the ratio between TFO and AFO (TFO/AFO), with a range of 1.02 – 1.23. This meant that the AFO potentially underestimated the TFO by the best case of 2% and worst case of 23%, thereby showcasing it is inaccurate to identify the TFO purely from a pelvic X-ray's AFO value. Considering all factors, the most efficient model found to predict a good TFO estimate is $TFO = 0.247 AA + 0.995 AFO - 1.35$.

(142)

EARLY OUTCOMES OF 1.5 STAGE REVISION OF FEMORAL ENDOPROSTHETIC REPLACEMENTS FOR THE MANAGEMENT OF INFECTION.

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Introduction

Management of prosthetic joint infection (PJI) in patients with femoral bone loss can present significant surgical challenges. Two-stage revisions of infected endoprosthetic replacements (EPRs) is thought to offer the best eradication rate, however fabricating articulating spacers after explanting proximal femoral EPRs has a high rate of dislocation, fracture, or both. However, 1.5-stage exchange has seen preliminary success, whereby new prostheses are placed wrapped with antibiotic loaded cement without intention for subsequent second stage. We sought to examine all patients who underwent a 1.5-stage exchange femoral EPR for infection.

Materials and Methods

All patients since this new procedure began in 2019 were included. Demographics, surgical procedures, types of implants used, and microbiology results were collated. The primary outcome was absence of infection and all cause re-operation rate at a minimum two-years. Successful treatment in our study was defined as infection eradication with a healed wound, without infection relapse or recurrence, nor repeat surgical intervention and without PJI related mortality.

Results

In total, 12 patients underwent a 1.5 stage femoral EPR for infection, with a mean age of 58 years. Indications for the index EPR surgery included failed arthroplasty (n=3), oncological resection (n=4), peri-prosthetic fracture (n=3) and failed osteosynthesis (n=3). Mean follow up was 1.14 years (range, 0.1 to 2.4 years). Proximal femoral EPRs wrapped in antibiotic loaded cement were performed in ten patients and total femoral replacements in two patients. Estimated implant survival after two years was 87.5% (95% CI: 67.3% to 100%). Re-operation for PJI occurred in two (17%) patients with absence of infection in 10 (83%) patients at two-years. Both failures occurred in the presence of multi-drug resistant bacteria. No PJI related deaths were reported at two years.

Conclusions/Discussion

Our study demonstrates 1.5 stage EPR's are a safe and effective way to manage infection in the presence of significant bone loss with low re-operation and mortality rates. This also presents a significant cost saving to the health economy.

(143)

PROFESSIONALISM IN TRAUMA & ORTHOPAEDIC SURGERY - A NATIONAL SNAPSHOTMarieta Franklin¹, Lisa Kells², Cronan Kerin^{3,4}¹ST7 Mersey Deanery, Liverpool, United Kingdom. ²CT1 Royal Stoke University Hospital, Stoke, United Kingdom. ³Consultant T&O Surgeon Liverpool University Hospitals, Liverpool, United Kingdom.⁴Training Programme Director, T&O Higher Surgical Training Programme, HENW West Sector, Liverpool, United Kingdom**Introduction**

Recent decades have seen significant work-place culture change within Trauma and Orthopaedic Surgery. The NHS work force spans four generations and fostering intra-specialty understanding has never been more relevant given current training challenges. If trainers better understand their trainees, they can offer better guidance; spot and guard against burnout; and foster and develop a stronger working relationship. Similarly, if trainees better understand their trainers and mentors, they will be better placed to optimise their training. Generational theory explains the potentially differing viewpoints of trainers and trainees on what constitutes professionalism.

Materials and Methods

We conducted a national, anonymised, online questionnaire based on documents issued by the Royal College of Surgeons of England and the Royal College of Physicians. It explored attitudes on good and bad professionalism, leadership, first impressions, clinicians as teachers and students, and advocating for others.

Results

46% of respondents were core or ST3-8 specialist trainees, 37.5% were consultants and 8.3% were SAS doctors. Respondents all have worked in Trauma & Orthopaedic Surgery and spanned four generations. Over half defined professionalism as being 'a set of behaviours and attitudes defined by societal or workplace etiquette'. Expectations around attitudes to leadership, learning and teaching changed as responders' seniority increased. Nearly 40% cited a fear of damaging relationships with colleagues as a deterrent against advocating for themselves, a patient or colleague. Just under half said a fear of being labelled a 'troublemaker' as a factor that would influence speaking up for a colleague being unfairly reprimanded. Core trainees and below were more likely to introduce themselves to a new supervisor by email or in person on the first day of a placement, whereas registrars and above were more likely to email a CV introduction or to telephone ahead. 75% cited arriving on time as a top factor contributing to a good impression.

Conclusions/Discussion

Attitudes around professionalism in Orthopaedics are dynamic though clear core themes transcend grades. Generational diversity in orthopaedics is a strength to be celebrated.

(148)

DOES TIME TO SURGERY INFLUENCE OUTCOMES FOR THOSE UNDERGOING TOTAL HIP ARTHROPLASTY FOR HIP FRACTURE? A NATIONWIDE STUDY FROM THE SCOTTISH HIP FRACTURE AUDIT

Lewis Mitchell¹, Caroline Martin², Kirsty Ward², Karen Adam³, Andrew Hall⁴, Nick Clement⁵, Alasdair Maclullich⁶, [Luke Farrow](#)^{7,8}

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Introduction

Patients undergoing total hip arthroplasty for hip fracture (THA#) commonly experience surgical delay to access sufficient procedural expertise. There are established links between surgical delay and poorer outcomes in hip fracture patients, but there is little evidence regarding the impact in the less frail THA# group. We therefore set out to establish the influence of surgical delay on key healthcare outcomes in this setting.

Materials and Methods

A retrospective cohort study was undertaken using patient data from the Scottish Hip Fracture Audit (SHFA) covering 2016-2020. The SHFA includes all units managing hip fracture care within Scotland. Only patients undergoing THA# were included, with categorisation according to attainment of Scottish Standards of Care of Hip Fracture Patients Standard 4 (must undergo surgical management within 36 hours of admission). Those who had delays related to being classified “medically unfit” were excluded. The primary outcome was 30-day survival. Length of stay cost differences were estimated according to the Public Health Scotland Costs Book.

Results

1375 patients undergoing THA# were included, with 397 (28.9%) experiencing surgical delay ≥ 36 hours. There were no significant differences in the age; sex; residence prior to admission; and Scottish Index of Multiple Deprivation (SIMD) for those with, and without, surgical delay. Both groups had similar 30-day (99.7% vs 99.3%, $p=0.526$) and 60-day (99.2% vs 99.0%, $p=0.876$) survival. There was however a significantly longer length of mean stay for the delay group (acute: 7.0 vs 8.9 days, $p<0.001$; overall: 8.7 vs 10.2 days, $p<0.002$). Operative delay did not significantly affect 30-day readmission ($p=0.085$) or discharge destination from acute care ($p=0.884$). Estimated total additional cost from surgical delay was £467,666.

Conclusions/Discussion

Operative delay >36 hours from admission in the THA# group was not associated with increased mortality. Delayed patients did however have a longer acute and overall length of stay, which has health economic consequences. Further research is required to evaluate the balance of ethical considerations, service provision and optimisation of outcomes when evaluating surgical delay in the THA# setting.

(151)

TOTAL HIP REPLACEMENT IN ANKYLOSING SPONDYLITIS – SURGICAL CHALLENGES AND ITS OUTCOMES.Javahir Pachore, Vikram Shah, Amish Kshatriya, Ashish Sheth, Kalpesh Shah

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Introduction

Ankylosing spondylitis is a disease of predominantly young, male population with gross deformity of hip and spine. The medical morbidity and spinal involvement adds to the challenges to the surgeon.

Materials and Methods

This is a retrospective study from 2008 to 2020, at high volume centre operated by Posterior approach using uncemented implant. The total number of patients are 144 with 191 hips. The Male to Female ratio is 3:1 with average age of 42 years, Bilateral to Unilateral ratio was 3:1. Three distinct Radiological varieties were identified and the commonest was chondrolytic 66%, followed by bony fusion in 20% and Protrusio 14%. In bony ankylosis, acetabulum placement was a challenge and pat fat sign was used for guidance. 10% patients needed fiberoptic Intubation due to gross deformity of cervical spine.

Results

Midterm results at average 8.2 years show very low revision rates. One stem revision after 8 years due to added sickle cell pathology and one cup revision after 14 years, both were aseptic loosening, one postoperative periprosthetic fracture after 6 months due to fall which needed fixation, one post tubercle infection after 6 years which was treated by antitubercular drugs, one ALVAL lesion and only one dislocation. Rate of ectopic ossification was very low due to use of Indomethacin. There was no surgical site infection which needed further revision surgeries.

Conclusions/Discussion

Midterm results of Total Hip Arthroplasty in Ankylosing spondylitis are like those reported relatively uncomplicated hip replacements. Surgeon must be cognizant of specific challenges inherent to this pathology and use appropriate technique to ensure optimal outcome.

(153)

COST-EFFECTIVENESS OF THE SCOTTISH HIP FRACTURE AUDIT

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Introduction

The NHS is currently under significant financial pressure, with ongoing efforts to identify where budgets savings are possible. Given the upfront running costs, as well as the lack of direct clinical impact, national clinical audits are often seen as a potentially expendable resource. We therefore set out to quantify the clinical and financial effectiveness of the Scottish Hip Fracture Audit (SHFA) justify its ongoing delivery.

Materials and Methods

Data from the SHFA between 2016-2021 was assessed in a collaboration between the SHFA and Health Improvement Scotland. This included all patients admitted to hospitals involved in hip fracture care across Scotland. Individual attainment of the Scottish Standards of Care for Hip Fracture Patients (SSCHFP) was assessed. Regression modelling (with adjustment for confounding) was used to determine the association between overall SSCHFP attainment and key healthcare outcomes. Costs were determined from the Public Health Scotland Costs Book.

Results

35,956 hip fracture episodes were included. 30-day survival increased from 87.8% (5858/6675) in 2017 to 92.1% (7179/7797) in 2021. Overall length of stay reduced significantly from 27.3 days to 18.2 days from 2017-2021. The total number of acute bed days required however rose from 73,522 in 2017 to 96,273 in 2021, primarily driven by a 16.8% increase in annual patient volume. Mean SSCHFP attainment increased from 6.6 (SD 2.0) in 2016 to 8.6 (SD 2.2) in 2021.

Logistic regression analysis with adjustment for age, sex, year, and admitting hospital revealed a 1 unit increase in SSCHFP attainment was associated with a 77% increase in 30-day survival ($p < 0.001$). Similarly, a 1 unit increase in SSCHFP attainment was associated with an expected reduction in total cost of £600-700.

With an estimated audit cost of £508,000 per annum, application of this saving to patients across the included 5-year period revealed a cost saving in the region of £32-37 million. This equated to £11.59 - £13.14 in avoided bed costs for every £1 of investment.

Conclusions/Discussion

The Scottish Hip Fracture Audit provides significant benefits to cost-effective hip fracture care that is an integral part of providing high quality services within a financially constrained healthcare system.

(155)

FACTORS ASSOCIATED WITH FAILURE OF FIXATION OF VANCOUVER B FRACTURES AROUND A CEMENTED POLISHED TAPERED STEM: A 5 TO 14 YEAR FOLLOW UP STUDY

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Introduction

The aim of this study was to report the 5year survival of plate-fixation to treat polished-taper- slip cemented stem associated Vancouver-B fractures.

Materials and Methods

Retrospective cohort study assessed 129 consecutive unilateral Vancouver-B fractures involving Exeter stems, at a minimum of 5years following open-reduction-internal-fixation (ORIF) with non-locked unilateral plating +/- cerclage cables. The primary outcome measure was reoperation for any reason. Kaplan Meier survival analysis was performed.

Results

Fractures (B1 n=31 (24%); B2 n=91 (71%); and B3 n=7 (5%)) occurred at median of 6 years (IQR 1.2-9.2) after primary surgery. Mean patient age was 78.2 (SD 10.56, range 46-96) and 54 (42.9%) were female. Mean follow up was 8.7 years (SD 2.48, 5.7 to 14.4). The most common mode of failure was non-union (7, 5%). Both fixation failure (6/31 Vs 3/91 vs 0/8, p=0.008) and reoperation (8/31 vs 6/91 vs 0/9, p=0.008) were significantly higher following fixation of B1 fractures compared to B2 and B3 fractures. Symptomatic femoral loosening requiring revision occurred in 2 patients. Overall 5year survival free from reoperation was 88.8% (82.0-94.7 95%CI). Fracture type significantly affected survival, being worst in B1 fractures (endpoints fixation failure p=0.010; and reoperation p=0.016). Transverse fractures were associated with a relative risk of reoperation of 4.22 (1.63-10.9 95% CI, p=0.008).

Conclusions/Discussion

Using a strategy of fixation of Exeter stem associated Vancouver-B fractures where the bone-cement interface is intact and the fracture is anatomically reducible was not associated with stem loosening at minimum 5 year follow up and appears safe into the medium term.

(176)

COMPLIANCE WITH LOSARTAN USE AFTER HIP ARTHROSCOPY IS POOR AND SUBSEQUENT CLINICAL AND FUNCTIONAL BENEFITS ARE NOT SIGNIFICANTJurek Pietrzak¹, Dyllan Geldenhuys¹, Ashleigh Lewis¹, Josip Cakic^{1,2}¹University of the Witwatersrand, Johannesburg, South Africa. ²Life Fourways Hospital, Johannesburg, South Africa**Introduction**

Revision Hip Arthroscopy often serves as a surrogate for failed Hip Arthroscopy (HA). Causes of failed HA include FAI, postoperative microinstability and capsulolabral adhesions. Losartan is an angiotensin receptor blocker with inhibitory effects on transforming growth factor beta (TGF- β) and has been used to mitigate the impact of scar tissue formation following HA. This study aimed to assess the compliance of patients undergoing HA with the off-label use of this medication and the subsequent short-term clinical outcomes.

Materials and Methods

We prospectively evaluated the compliance of 178 consecutive patients who underwent HA by a single high volume hip surgeon. All patients were counselled and prescribed Losartan 25mg twice daily for 2 weeks upon discharge. A novel questionnaire was created. Clinical and functional outcomes were assessed at a mean follow-up of 1.89 years and outcomes were compared between compliant and non-compliant patients.

Results

There were 65 male and 113 female patients prescribed losartan post-operatively. 96 (53.9%) were fully compliant while 82 (46.1%) were non-compliant. Losartan medication was never started in 43 (52.43%) patients. There was no correlation between age ($p=0.12$), gender ($p=0.022$), intra-operative findings ($p=0.87$) and compliance. Only 14 patients (0.08%) reported complications related to losartan medication. The most common reasons for non-compliance were polypharmacy 32% and perceived insufficient education over the importance of losartan compliance (34%). There was no difference in length of hospital stay (0.87 vs 0.76 days; $p=0.8$) (p , VAS pain score at 1 year (1.65 vs 1.81; $p=0.67$), Δ improvement in iHOT33 (23.2 vs 27.5; $p=0.6$) and Δ improvement in HHS (29.3 vs 31.9; $p=0.9$) between losartan-compliant and -non compliant patients). At 6 months the torque ratio for hip flexion and extension ($p=0.86$) and hip abduction and adduction ($p=1$) was equivalent. At 1 year follow-up, no patients had undergone re-operation irrespective of compliance to losartan.

Conclusions/Discussion

While the side-effect profile of losartan medication is narrow, the compliance with its off-label use in HA is poor. The clinical and functional benefits are doubtful and more robust clinical examination is necessary.

(182)

PATIENTS WITH LOW-GRADE OA HAVE LESS FAVOURABLE OUTCOMES POST-THA COMPARED TO A MATCHED COHORT OF PATIENTS WITH END-STAGE OA.Wouter Peeters^{1,2}, Frans-Jozef Vandeputte¹, Jeroen Verhaegen^{1,2,3}, Kristoff Corten^{1,4,5}¹Ziekenhuis Oost-Limburg, Genk, Belgium. ²Orthopaedic Center Antwerp/ AZ Monica Hospitals, Antwerp, Belgium. ³University of Antwerp, Antwerp, Belgium. ⁴Heuppraktijk/European Hip Clinic, Herselt, Belgium. ⁵University of Hasselt, Hasselt, Belgium**Introduction**

Total hip arthroplasty (THA) is an effective procedure for patients with end-stage hip osteoarthritis (OA). Due to the successful results and the optimisation of the procedure, the indications for THA have been widened to patients with chronic hip pain and low-grade OA. However, little is known about the clinical outcome of THAs in low-grade OA compared to end-stage OA patients.

Materials and Methods

Out of prospectively recorded data on 2,120 primary anterior approach THAs (1,815 patients), 37 low grade OA (Tönnis 1) cases with available pre- and 1-year postoperative patient reported outcome measures (PROMs) were matched 1:1 by age($p=0.093$), gender($p=1.000$) and BMI($p=0.987$) to 37 end-stage OA (Tönnis 3) controls. Hip Disability and Osteoarthritis Outcome Scores (HOOS) and Short Form-36 (SF-36) scores were analysed. The HOOS parameters included Symptoms, Pain, Activity in daily life (ADL), Sport and Quality of Life (QoL). The SF-36 parameters included Physical functioning, Role limitations due to physical health, Role limitations due to emotional problems, Vitality, Mental health, social functioning, Pain and General health.

Results

Similar scores for all pre-operative PROMs were seen in Tönnis 1 and Tönnis 3, except for HOOS Sport (22.8 vs 12.5; $p=0.007$) and SF-36 Physical Functioning (48.0 vs 40.1; $p=0.049$). At 1-year postoperative, all HOOS scores were significantly lower in the Tönnis 1 compared to Tönnis 3 group (Symptoms (70.8 vs 83.2; $p=0.007$), Pain (71.1 vs 88.6; $p<0.001$), ADL (75.4 vs 89.9; $p<0.001$), Sport (58.8 vs 73.5; $p=0.019$), QoL (62.8 vs 77.0; $p=0.008$)). The differences between the post- and preoperative HOOS scores were significantly lower in the Tönnis 1 group for all scores. Similarly, except from Emotional wellbeing and Role limitations due to emotional problems, all 1-year postoperative SF-36 scores were significantly lower in the Tönnis 1 compared to the Tönnis 3 group, with mean SF-36 scores of respectively 65.1 and 73.6 ($p=0.012$).

Conclusions/Discussion

This study shows that, although a substantial clinical improvement is seen post-THA in patients with low-grade OA, the extent of improvement and 1-year post-THA outcome is significantly lower in low-grade OA patients compared to patients with end-stage OA.

(183)

MID-TERM PERIPROSTHETIC FRACTURE RISK WITH CEMENTLESS AND CEMENTED STEMS IN AN ELECTIVE PRIMARY HIP POPULATION

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Introduction

Periprosthetic femoral fracture (PPF) is a severe complication of total hip arthroplasty (THA). Our aim was to record the incidence of PPF requiring surgical intervention after THA, performed in a single, high-volume hospital when comparing a collared cementless stem with a cemented polished tapered stem.

Materials and Methods

We performed a retrospective review of a consecutive series of 11,683 THAs over a 10-year period. All local x-rays and electronic care records were reviewed to identify PPF admitted for surgery to any Northern Ireland hospital.

Results

11,683 THAs were implanted. 5,394 were cementless Corail® stems and 6,289 were polished tapered Exeter® cemented stems. The demographics in the two cohorts including age, gender and ASA grade were similar. Overall, there were 80 (0.68%) PPFs which required further surgery. Of those, 62 (77.5%) had open reduction and internal fixation (ORIF), and 18 (22.5%) were revised. Thus, 77.5% of these cases would be missed by registries only capturing revisions.

The overall rate of PPF in the Corail group was 0.74%. Of these, 37.5% were managed conservatively, 55.0% underwent ORIF and 7.5% underwent revision. In the Exeter group, the overall rate of PPF was 0.89%. Of these, 1.8% were managed conservatively, 73.2% underwent ORIF and 25% underwent revision.

Subgroup analysis was performed for those requiring surgery. In the Corail group, the overall rate of PPF requiring surgery was 0.46% (25 patients). Of those, 22 (88%) had ORIF and 3 (12%) were revised. In the Exeter group, the overall rate of PPF requiring surgery was 0.87% (55 patients). Of those, 41 (74.5%) had ORIF and 14 (25.5%) were revised.

For males, the rate of PPF requiring surgery was 0.25% (6 patients) in the Corail group which was significantly lower than the 1.34% (37 patients) in the Exeter group. There was no difference in PPF rate in females.

Conclusions/Discussion

In contrast to previous studies, we have shown a significantly higher rate of PPF in males with a polished tapered cemented stem as compared to a collared cementless stem. There was no difference in PPF rate in females.

(196)

EARLY OUTCOMES OF HIP ARTHROSCOPY FOR FEMOROACETABULAR IMPINGEMENT: A STUDY OF 6,736 CASES USING THE NAHR DATASET

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Introduction

This study used a national registry to assess the outcomes of hip arthroscopy (HA) for the treatment femoroacetabular impingement (FAI).

Materials and Methods

All HAs in which a procedure for FAI was recorded in the UK Non-Arthroplasty Hip Registry (NAHR) between January 2012 and November 2022 were identified along with recorded patient and surgical characteristics. Cases were grouped according to the index procedure performed for FAI (cam, pincer, or mixed). Patient outcomes captured included the International Hip Outcome Tool (iHOT)-12 and the EuroQol-5 Dimensions (EQ-5D) index preoperatively and at 6 and 12 months post-operatively.

Results

6,736 HAs were identified; 4,148 cam (61.6%), 567 pincer (8.4%), 2,021 mixed (30%). Mean age (36.0) was similar between groups. There was a greater proportion of females in the pincer group (76%) compared to cam (53%) and mixed (50%). A higher proportion of patients had a recorded cartilage injury in association with a cam lesion compared to pincer. The pincer group had significantly poorer mean pre-op iHOT-12 scores (29.5 [95%CI 27.8 to 31.2]; n=395) compared to cam (33.5 [95%CI 32.9 to 34.2]; n=3,573) and achieved significantly lower scores at 12 months (pincer = 53.9 (50.2 to 57.5); n=217, cam = 60.8 (59.4 to 62.1); n=1,618).

Overall, significant (all p <0.0001) iHOT-12 and EQ-5D improvement (delta) vs baseline pre-operative scores were achieved for all FAI subtypes at 6 months (overall mean iHOT-12 improvement +26.0 [95%CI 25.0 to 26.9]; n=2,657) and maintained out to 12 months (+26.2 [25.1 to 27.2]; n=2,392) at which point 66% and 47% of patients continued to demonstrate a score improvement greater than or equal to the minimum clinically important difference (≥13 points) and substantial clinical benefit (≥28 points) for iHOT-12 respectively.

Conclusions/Discussion

This study demonstrates excellent early functional outcomes following HA undertaken for FAI in a large national registry.

(198)

DOES SELECTIVE SCREW AUGMENTATION AFFECT PATIENT-REPORTED OUTCOME OR COMPLICATIONS IN CEMENTLESS ACETABULAR REPLACEMENT DURING TOTAL HIP ARTHROPLASTY (THA)?Samantha Downie¹, Ewan Semple¹, David Ridley², Graeme Nicol¹¹NHS Tayside, Dundee, United Kingdom. ²University of Dundee, Dundee, United Kingdom**Introduction**

Screw augmentation can increase immediate cup stability in a cementless acetabular component during total hip arthroplasty (THA). Studies in the literature have failed to determine any difference in early loosening or patient-reported outcome measures (PROMs). The objective was to determine whether there is a difference in early loosening/revision or PROMS with cementless acetabular component screw augmentation on a selective basis.

Materials and Methods

A retrospective cohort study at a UK arthroplasty centre over a 10 year period (1999-2008) was conducted on consecutive patients undergoing cementless acetabular components with screw augmentation. They were compared to individuals undergoing cementless acetabular replacement without screws over the same period. One-year patient-reported outcome data was available for 92% 816/885.

Results

885 patients underwent cementless acetabular replacement over the study period. 42% had selective screw augmentation (330/793) and 58% did not (463/793). Preop status was comparable for pain, function, and modified Harris hip score (mHHS, mean 36 SD 12 with screw augmentation, 38 SD 12 without screws).

There was a 2% dissatisfaction rate in both groups (6/330 with screw augmentation and 10/463 without).

mHHS was similar between those with screw augmentation and those without at one (mean 86 SD 13 and 88 SD 12, respectively $p=0.005$), five (mean 85 SD 13 and 86 SD 13, respectively $p=0.302$) and ten years (mean 83 SD 11 and 85 SD 12, respectively $p=0.147$).

Dislocation rate was 4% in those with screw augmentation (13/330) and 3% in those without (12/463).

Revision rate was significantly higher in those undergoing screw augmentation than those without screws (6% 20/330 and 3% 13/463, respectively $p=0.033$).

Conclusions/Discussion

In a UK arthroplasty centre where screw augmentation is used selectively, THA patients with and without acetabular screws show comparable rates of satisfaction and function at 1, 5 and 10 years postoperatively. Rate of dislocation was also similar, but revision rate was twice as high in the group undergoing screw augmentation. Requiring screw augmentation for cementless acetabular replacement in THA is associated with similar patient-reported outcomes but a higher rate of subsequent revision.

(207)

DOES HIP RESURFACING CONSERVE BONE? A MODELLING STUDY USING A NOVEL CT BASED SURGICAL PLANNING PLATFORMKartik Logishetty^{1,2}, Ciaran O'Hanlon^{3,1}, Arjun Patel¹, Thomas Edwards¹, Simon Harris¹, Justin Cobb¹¹Imperial College London, London, United Kingdom. ²University College London Hospitals, London, United Kingdom. ³Kings College London, London, United Kingdom**Introduction**

Preserving bone stock in arthroplasty is desirable in the event of future revision surgery and is one proposed advantage of hip resurfacing arthroplasty (HRA). However, it has been argued that the near-native femoral implant diameter coupled with a thick monobloc metal acetabular implant, results in greater acetabular bone loss than with total hip arthroplasty (THA). In this study, a bespoke CT-based surgical planning platform is used to calculate planned bone loss following both procedures.

Materials and Methods

Following an a priori power calculation, pre-operative CT scans were obtained for 30 patients undergoing hip arthroplasty; and imported into 3D planning software. Each patient had expert surgeon planned HRA and THA, using the BHR (Smith & Nephew) and Furlong Evolution/CSF (JRI) systems, respectively.

Once components were appropriately sized and positioned, bone volume was calculated by measuring the linear distance between the internal surface of the implant and the native bony edge. Appropriate geometric formulae for 3D shapes of acetabulum, femoral head, and femoral meta-diaphysis were used to calculate the volume of excess bone present. The individual volumes were then summed to calculate total acetabular and femoral bone removal.

Results

28 males and 2 females, with mean age was 58.5 yrs. SD 11.0 (Range 34-83) were included. The mean native femoral head size was 52.1±3.1mm; and acetabular cup size for HRA was 58 ± 2.5mm compared to 55 ± 2.6mm for THA. Mean acetabular bone loss was 17.0 ± 4.5cc for HRA and 14.8 ± 3.6 for THA (p = 0.026). On the femoral side, mean bone loss was 26.3 ± 5.8cc for HRA and 131.9 ± 20.5cc for THA (p < .001). Patients undergoing metal-on-metal hip resurfacing received modestly larger acetabular cups (3mm) and experience greater acetabular bone loss (2.2cc) than those undergoing THA. THA resulted in 339% more bone loss overall.

Conclusions/Discussion

HRA resulted in significantly less overall bone loss than THA at the cost of a small but increased removal of acetabular bone volume. This emphasises the importance of careful patient selection for HRA, and the attraction of novel thinner ceramic and polyethylene HRA acetabular implants.

(214)

NOVEL APPLICATION OF THE OXFORD HIP SCORE TO ASSESS HIP PAIN, FUNCTION AND QUALITY OF LIFE AFTER WEIGHT LOSSSimon Federer^{1,2}, Madeleine Bates^{1,2}, Chris Pring¹, Neal Smith², Penny Hudson²¹St. Richard's Hospital, Chichester, United Kingdom. ²University of Chichester, Chichester, United Kingdom**Introduction**

Many patients with obesity experience hip pain. Excess body weight is a modifiable risk factor for osteoarthritis (OA) and weight loss is encouraged in patients with OA. Significant weight loss is rapidly achieved through bariatric surgery that could improve or limit the progression of these conditions. The Oxford Hip Score (OHS) is a validated tool in the assessment of hip replacement surgery for OA. We present a novel application of the OHS to assess hip pain & function after weight loss. The primary aim of this study was to assess whether there was a significant difference in mean OHS before and 24 months after significant weight loss.

Materials and Methods

Eighteen female participants were included in this study. They underwent sleeve gastrectomy or Roux-en-Y gastric bypass. Patient demographics, body mass index (BMI) and OHS were collected pre- and 24 months post operatively.

Results

There was an increase in the mean OHS from 36.1 (SD 10.1) pre surgery to 41.4 (SD 10.5) at 24 months. This was statistically significant (95% CI 0.99-10.5, $p=0.01$). Mean BMI reduced from 46.6 kg/m² (SD 5.8) to 33.0 kg/m² (SD 3.5).

Conclusions/Discussion

A significant improvement in mean OHS was seen after weight loss. These findings demonstrate an improvement in hip pain & function with weight loss. This study contributes to a larger project evaluating the kinetic and kinematic changes to walking gait from weight loss.

(220)

TOTAL HIP REPLACEMENT FOR NECK OF FEMUR FRACTURE: MOBILITY AND COGNITION ARE NOT THE ONLY DECIDING FACTORS.

Alistair Macey¹, Eoghan Donnelly¹, Davidson Martin², Kim Ferguson³, Helen Murray¹, Andy Marsh¹, Dominic Meek¹

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Introduction

The National Institute of Clinical excellence (NICE) guidelines suggest consideration of total hip replacement (THR) for patients with a displaced intracapsular neck of femur fracture, if they are cognitively intact and walk outdoors with one stick.

This study assesses application of the guideline and debates whether these indications are reasonable.

Materials and Methods

Between October 2012 and October 2014 all arthroplasties for hip fracture were identified in 3 Glasgow hospitals. American Society of Anaesthesiologists (ASA) score, cognitive, mobility and mortality data to 7 years were collected. Data was analysed with Minitab and Kaplan Meier curves produced by group and ASA.

Results

625 hip arthroplasties had full data. 275 met NICE criteria for THR from which 30 THRs (11%) were performed.

THR patients were younger and fitter with a mean age of 70. 79% were ASA 2. Hemiarthroplasty had a mean age 79 ($p < 0.0001$) and 78% ASA 3 or greater ($p < 0.01$).

No deaths were recorded in the THR group until 3 years post op. At mean 7 years follow up (range 7-8); 33% of the THR cohort had died versus 78% of the hemiarthroplasties. Those who qualified for, but did not get a THR, had a 63 % mortality.

Conclusions/Discussion

Much research comparing THR vs hemiarthroplasty for hip fracture is based upon previously fit patient populations. This is not reflective of reality for many surgical teams. Surgeons exercise a pragmatic approach to the NICE guideline using age and comorbidity in making decisions. Given the age and health conditions of this population this may be reasonable despite the broad scope of the guideline.

(221)

CT-GUIDED INJECTIONS FOR THE TREATMENT OF PIRIFORMIS SYNDROME: A REVIEW OF 45 CASES.Christian Smith¹, Amy Verrinder¹, Mohammed Ali², Rahul Dharmadhikari¹, Ajay Malviya¹¹Northumbria Healthcare, Newcastle, United Kingdom. ²Newcastle University, Newcastle, United Kingdom**Introduction**

Piriformis syndrome (PS) (also called deep gluteal pain syndrome or fat wallet syndrome) is a peripheral neuropathy caused by sciatic nerve entrapment in the deep gluteal space and can be categorised into primary or secondary causes. Injection of local anaesthetics, steroids, or botulinum toxin around the piriformis muscle can decrease hypertrophy or inflammation and improve symptoms. Ultrasound (US) and CT-guided injection techniques have been reported to have more accurate results than non-guided techniques in recent studies. This study assesses the clinical outcomes of CT-guided corticosteroids injections.

Materials and Methods

A retrospective analysis was performed on prospectively collected data for a cohort of patients who received a CT guided steroid injection. The intervention was performed by a single Consultant Musculoskeletal Radiologist between 23/07/2013 and 25/02/2020 following referral from a specialist Orthopaedic Surgeon. All patients were referred for physiotherapy after the injection and patients were followed up by the Orthopaedic Surgeon at least 3 months after the injection.

Results

A total of 45 CT-guided injections were performed. Six patients required a second injection, and three patients needed a third injection. The average patient age was 45 years old. 12.5% of patients were current or retired professional athletes, 12.5% competed in running or triathlons competitively but at an amateur level and over 50% were exercised regularly, most commonly running. The mean follow-up appointment was 5 months (range 3-7 months) after the intervention. Long-lasting (>3 month) complete resolution of symptoms was reported in 38%, with 13% describing partial improvement. A shorter period of relief (<3 months) was encountered by 6%. The pain was worse following the injection in 9% of patients. No complications were reported from the injections.

Conclusions/Discussion

Deep gluteal pain is a challenging condition and therefore needs specialist opinion to ensure the correct diagnosis is made and a multidisciplinary approach to treatment. Our experience found that 51% of patients received long-term benefit from CT-guided injections for PS, with only 6% experiencing short term benefit.

(224)

OUTCOMES OF JOINT PRESERVATION SURGERY: A COMPARISON OF PATIENTS WITH DEVELOPMENTAL DYSPLASIA OF THE HIP (DDH) AND FEMOROACETABULAR IMPINGEMENT (FAI)Ajay Malviya, Christian Smith, [Shiv Kolhe](#)

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Introduction

Hip arthroscopic (HA) impingement surgery and periacetabular osteotomy (PAO) for hip dysplasia are the two most frequently performed joint-preserving procedures for young patients with hip pain. The Academic Network of Conservation Hip Outcome Research (ANCHOR) members from North America have suggested that the FAI surgery's outcome may not be similar to surgery for DDH.

Materials and Methods

The aim of this study was to analyse prospectively collected data from a local registry (Northumbria Hip Preservation Registry) to compare the outcomes of surgery for the two conditions in the UK performed by a single surgeon. All patients are consented to enter data into the local registry preoperatively, and subsequently at 6 months, 12 months and then annually.

Results

Five hundred and forty-seven patients treated with PAO for DDH were compared with 713 patients treated with HA for FAI. The patients undergoing PAO with a mean age of 32 (sd10) years were younger than those undergoing HA with a mean age of 38 (sd10). There was a female preponderance in the DDH group (92%) compared to the FAI (57%) cohort. BMI was similar in both groups (DDH-26, FAI-27.2). At two years the scores improved significantly in both groups - DDH (EQ-5D INDEX – 0.527 to 0.686; NAHS – 50.46 to 76.71; iHOT12 – 28.56 to 63.99; UCLA – 4.12 to 6.73) and FAI (EQ-5D INDEX – 0.519 to 0.642; NAHS – 52.6 to 69.9; iHOT12 – 31.38 to 56.33; UCLA – 4.61 to 5.65). The improvement of scores in each outcome measure was statistically better for the DDH group than the FAI group. The satisfaction from surgery at six-month (DDH – 4.11; FAI – 3.59) and two years (DDH – 4.30; FAI – 4.03) was also significantly better for the DDH group.

Conclusions/Discussion

Patients with DDH have a superior improvement in two-year scores in contrast to patients having surgery for FAI, although the preoperative scores of the DDH cohort are lower. The reason for this is unclear and needs further examination, and possibly may be related to the advanced degeneration and later presentation in the course of the disease.

(3)

POST-OPERATIVE DISLOCATION, PERI-PROSTHETIC FRACTURE, REVISION AND MORTALITY FOLLOWING TOTAL HIP ARTHROPLASTY FOR TRAUMA: A MULTICENTRE COHORT STUDY COMPARING DUAL MOBILITY WITH CONVENTIONAL ACETABULAR BEARINGSDinesh Alexander¹, Lee Hoggett¹, Anthony Helm¹, NWORC Collaborative²¹Lancashire Teaching Hospitals NHS FT, Preston, United Kingdom. ²HEE North West, Manchester, United Kingdom**Introduction**

Dislocation of a total hip replacement is a serious complication after total hip arthroplasty (THA). Dislocation rates are higher when surgery is performed following trauma. Our study compares postoperative dislocation rates between conventional acetabular bearing (CAB) and dual mobility acetabular bearing (DMB) THA performed for neck of femur fracture alongside post-operative peri-prosthetic fracture, revision and mortality.

Materials and Methods

A retrospective multi-centre observational study at 9 hospital trusts in the United Kingdom of all total hip replacements performed for trauma between March 2018 and Feb 2019.

Results

A total of 295 operations were performed. 64% (189) were CAB and 36% (106) were DMB. Average age was 75 years (38-98). 223 Female: 72 Male. The follow-up period was an average of 42 months (36-48). Overall revision rate was 1.6% (8), peri-prosthetic fracture rate was 6 (2%) and overall mortality was 9.8% (29) with no significant difference between cohorts for any outcome. The posterior approach was favoured 82% (242) vs the lateral approach (LA) 18% (53) with the PA used more often in patients undergoing DMB 96% (102) vs CAB 74% (140) $p=0.001$. Patients approached posteriorly at the time of their index procedure were significantly less likely to sustain a simple dislocation following a DMB 0 (0%) vs. CAB 8 (5.7%) $p=0.015$.

Conclusions/Discussion

Our study demonstrates that the risk of dislocation following THA for trauma is more than four times higher than when conventional bearings are used compared to dual mobility acetabular components. This effect is most pronounced when the posterior approach is utilised for the index procedure. The use of these bearings does not impact mortality, peri-prosthetic fracture or revision rate. We would encourage the use of dual mobility acetabular bearings in patients undergoing THA for fracture via a posterior approach.

(9)

RETROSPECTIVE POPULATION-BASED ANALYSIS OF THE ASSOCIATION BETWEEN APPROACH-SPECIFIC-SURGEON'S VOLUME & THE COMPLICATIONS FOLLOWING DIRECT ANTERIOR APPROACH FOR THR

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Introduction

Various surgical approaches are used for total hip arthroplasty (THA), the most common being the direct lateral, posterior and direct anterior (DAA) approaches. Of these three, the DAA is recommended as the "muscle-sparing" approach, what can contribute to faster initial recovery. However, this can also make exposure more challenging and is associated with significantly higher complication rate relative to the direct lateral and posterior approaches. However, it is unclear if the risks for the DA approach improve with increased surgeon volume.

Materials and Methods

The study is a retrospective population-based cohort study of patients undergoing THA via the DAA in Ontario, Canada during the period between April-2016 to March-2021. Data was collected using administrative healthcare data housed at ICES (www.ices.on.ca). Data collected included patients' demographics, medical history, approach and outcomes after surgery. Surgeon volume was defined as the number of DA THA performed by the primary surgeon in the 365 days immediately preceding the index procedure. Restricted cubic splines with three knots were used to visualize the relationship between DAA surgeon volume and the risks for complications following DAA THA. A separate cohort of non-DAA THA patients were defined over the same time period & splines were generated for complications relative to non-DAA surgeon volume.

Results

There were 9,672 patients (median age 67 [IQR 59-74] years; 5,108 (51.7%) women) who received their first primary THA via the direct anterior approach from 53 hospitals by 196 surgeons. 2.5% (242) patients had major surgical complication (revision, dislocation, infection) within one year of surgery. Results suggested a major reduction in the risk as volume increases, with a plateau after 80-100 cases/year. Over the same time period, the curve for conventional approaches were similar, but with a lower trough and tail.

Conclusions/Discussion

The results suggest that increased approach-specific surgeon volume is associated with significant reduction in the risk for complications following DAA THA. However, even at higher surgical volumes, the risk for complications after DAA remains higher than that of conventional surgical approaches performed by surgeons with comparable volumes.

(10)

STANDARD VERSUS SHORT LENGTH CEMENTED EXETER FEMORAL STEM FOR PRIMARY TOTAL HIP ARTHROPLASTY: A SURVIVORSHIP ANALYSIS

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Introduction

This study aims to compare the survival of the standard length (150mm) with the short length variants (DDH [35.5mm offset or less], number 1 short stem [125mm options of 37.5mm, 44mm, 50mm offset] and revision [44/00/125]) of the Exeter V40 femoral stem when used for primary total hip arthroplasty (THA).

Materials and Methods

Patients were retrospectively identified from an arthroplasty database. There were 664 short stem Exeter variants identified, of which there were 229 DDH stems, 208 number 1 stems and 227 revision stems, that were implanted between 2011 and 2020. A control group of 698 standard Exeter stems were identified with a minimum of 10 year follow up (implanted 2011). All cause survival was assessed for THA and for the stem only. Adjusted analysis was undertaken for age, sex and ASA grade.

Results

The median survival time for the short stems varied according to design: DDH 6.7 years, number 1 stems 4.1 years, and revision stems 7.2 years. The short stem group (n=664) was significantly younger (difference 5.1, $p<0.001$) and were more likely to be female (odds ratio 1.89, 95% CI 1.50 to 2.39, $p<0.001$) compared to the standard group. There were no differences in THA ($p=0.26$) or stem ($p=0.35$) survival at 5-years (adjusted THA: 98.3% vs 97.2%; stem 98.7% vs 97.8%) or 10-years (adjusted THA 97.0% vs 96.0 %; stem 96.7% vs 96.2%) between standard and short stem groups, respectively. At 5-years there was no difference in THA (DDH: 96.7%, number 1 97.5%, revision 97.3%, standard 98.6%) or stem (DDH: 97.6%, number 1 99.0%, revision 97.3%, standard 98.2%) survival between the different short stems or when compared to the standard group.

Conclusions/Discussion

The Exeter short stems offer equivocal survival when compared to the standard stem at 5 to 10-years follow up, which does not seem to be influenced by the short stem design.

(12)

SURGICAL SITE INFECTIONS AND THEATRE TIMINGS: HIP FRACTURES AND COVID-19 IN A DISTRICT GENERAL HOSPITAL

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Introduction

The SARS-CoV-2 (Covid-19) pandemic in 2020 led to an increase in the vigilance and stricter guidelines regarding the use of PPE (Personal Protective Equipment) and hand hygiene practices both within and outside of clinical areas. This study was completed to establish if heightened awareness and implementation of new infection control procedures resulted in lower SSI (surgical site infection) rates and caused longer theatre times.

Materials and Methods

All surgically treated hip fractures in the district general hospital from the 16th March to the 16th June in both 2019 and 2020 were included. This allowed comparison of the outcomes between pre-covid surgery in 2019 to the outcomes during the height of the first wave of Covid-19 in 2020. A minimum of 90 day follow-up was established to capture all associated superficial deep surgical site infections.

Results

The results demonstrated a 37% reduction in the number of hip fractures presenting to the unit from 126 in 2019 to 79 in 2020. SSI rates were statistically similar with 1.59% in 2019 compared to 1.26% in 2020. Both results are lower than the published national averages of 2.3-4.4%. The theatre timings were statistically similar, in 2019 the mean surgical time for all hip fracture surgeries was 72 minutes compared to 73 minutes in 2020.

Conclusions/Discussion

There was no statistically significant change in SSI rates even with the heightened awareness of infection control measures and PPE use. The similar surgical times demonstrated may be explained because experienced surgeons operated during the pandemic which allowed for improved efficiency in theatres.

Even with heightened infection control measures and PPE there is no demonstrated benefit in SSI rates. During pandemic waves it may be beneficial to encourage more senior operating in order to allow for efficient theatre utilisation.

(14)

TOTAL FEMORAL REPLACEMENT FOR NON-ONCOLOGICAL INDICATIONS: OUTCOMES FROM A SINGLE TERTIARY REFERRAL REVISION ARTHROPLASTY UNIT - 26 YEARS OF EXPERIENCE

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Introduction

Total Femoral Replacement (TFR) is a rare procedure used in cases of significant femoral bone loss, most commonly from cancer, infection, and trauma. Low patient numbers have resulted in limited published work on long-term outcomes, and even less regarding TFR undertaken for non-oncological indications. The aim of this study was to evaluate the long-term clinical outcomes of all TFRs in our unit.

Materials and Methods

A retrospective review of our institution's prospectively collected revision arthroplasty database was performed. All patients who underwent TFR in our unit were included. Pre-operative demographics, operative factors, and short and long-term outcomes were collected for analysis. Outcome was defined using the MSIS outcome reporting tool.

Results

38 TFR were identified. The mean age was 73 years (range 42-80). All patients underwent TFR for non-oncological indications, most commonly because of infection (53%) and periprosthetic fracture (26%). The average follow-up time was 10 years (range 0-26). 63% of TFR were considered a success based upon the MSIS outcome reporting tool; with survivorship of over 70% observed at 8 years. 70% of TFR undertaken for infection were considered infection-free at time of final follow-up. 66% of the cohort suffered at least one complication; dislocation being most common (37%), and 55% of the total cohort required at least one subsequent operation. The percentage of mobile patients improved from 52% to 65% between pre- and post-op, with all patients being able to at least transfer at time of final review.

Conclusions/Discussion

This study is the largest in the UK assessing the use of TFR in patients with bone loss secondary to non-oncological conditions. It demonstrates that TFR has a significant complication profile, however, it is favourable in terms of mortality and rehabilitation when compared to its alternatives, amputation and disarticulation.

(15)

HIP INSTABILITY FOLLOWING SINGLE COMPONENT REVISION OF TOTAL HIP ARTHROPLASTY – MEDIUM TO LONG TERM RESULTSJithuram Jayaram, Mukesh Hemmady

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Introduction

Revision total hip Arthroplasty (THA) is widely practiced but there is a paucity of data in the literature regarding outcomes following single component revisions especially with respect to instability. This study is a retrospective analysis of prospectively collected data at Wrightington hospital on patients undergoing single component revision.

Materials and Methods

Between January 2005 to March 2021, a total of 55 patients, 29 females and 26 males, undergoing single component revision arthroplasty were considered with a mean follow up of 5.5 years, with a maximum follow up of 15 years. The mean age at operation was 71 years. The procedure was carried out using a posterior approach with capsulotendinous repair and close attention was paid to the component orientation and restoration of both femoral and acetabular offset. All revisions were cemented with or without bone grafting/augmentation. Clinical outcomes were assessed by Oxford hip score and Merle d'Aubigne and Postel scores which showed significant functional improvement. Four patients died due to unrelated causes. X-rays were evaluated on Trauma CAD.

Results

There were no cases of post operative dislocations during the observed follow up period. Acetabular offset was restored in most patients when compared with pre-operative offset.

Conclusions/Discussion

In our series, single component revision arthroplasty provides better outcomes to the results quoted in literature, with regards to postoperative instability, we would recommend that should be considered in appropriate cases.

(18)

SELECTIVE THA-APPROACH USE AMONGST JUNIOR SURGEONS IMPROVES SAFETY OF INTRODUCING THE ANTERIOR APPROACH – A PROSPECTIVE, MULTI-SURGEON, COMPARATIVE, STUDYJeroen Verhaegen^{1,2,3}, Reza Ojaghi³, Paul Kim³, Josh Bingham⁴, George Grammatopoulos³¹University Hospital Antwerp, Antwerp, Belgium. ²Orthopedic Center Antwerp, Antwerp, Belgium.³The Ottawa Hospital, Ottawa, Canada. ⁴Mayo Clinic, Phoenix, USA**Introduction**

Anterior approach (AA) has gained popularity for total hip arthroplasty (THA), because it may offer advantages such as enhanced recovery, decreased postoperative pain, and decreased dislocation rates. However, some studies have reported higher complication rates, which might have been associated with the steep learning curve. This study compared outcome of junior, fellowship-trained, surgeons who perform THA through both anterior and posterior (PA) approach, with senior surgeons who perform either AA or PA, to determine whether: 1. Fellowship training and selective practice allows for safe introduction of AA into practice; and 2. Whether selective approach-use influences outcome.

Materials and Methods

This is a prospective, consecutive study comparing the first 800 THAs of two junior, dual-approach, surgeons (AA/PA: 455/345), with 400 THAs cases of two senior, single-approach, surgeons (AA/PA: 200/200), between 2018 and 2020. Most patients were female (54.4%), mean age was 65 years-old (range: 19-96) and mean BMI was 29 kg/m² (range: 16-66). Outcome included radiologic measurements (inclination/anteversion and leg-length), complication- and revision rates, and patient-reported outcomes including Oxford Hip Score (OHS).

Results

Amongst juniors, there was no difference in cup positioning between AA-THA and PA-THA (inclination: 42.2°±4.4° vs. 42.2°±5.8°; p=0.245 & anteversion: 23.1°±4.9° vs. 22.8°±4.9°; p=0.266), and a same proportion of cups within the optimal orientation zone (91.8% vs. 87.4%; p=0.106). At 3.1 years (range: 2.0-6.8) follow-up, there were 43 complications (3.6%), including 27 re-operations (2.3%); with no difference between junior and senior surgeons for AA-THA (Junior: 8/455 vs. Senior: 3/200; p=0.355) or PA-THA (Junior: 11/345 vs. Senior: 5/200; p=0.400). Amongst juniors, there was no difference in complications (AA:8/455 vs. PA:11/345; p=0.140) and in ΔOHS (AA:20.5±7.7 vs. PA:20.5±8.0; p=0.581) between approaches.

Conclusions/Discussion

Contemporary training and selective approach-use minimizes the learning curve associated with independent practice and AA-THA allowing junior staff to have equivalent outcomes to established, senior surgeons in both approaches. We would thus advocate for selective approach use amongst junior arthroplasty surgeons when introducing the AA into practice.

(19)

DOES PELVIC TILT CHANGE WITH A PERI-ACETABULAR OSTEOTOMY?Jeroen Verhaegen^{1,2,3}, Emin Dedeogullari⁴, Isabel Horton³, Paul Beaulé³, George Grammatopoulos³¹University Hospital Antwerp, Antwerp, Belgium. ²Orthopedic Center Antwerp, Antwerp, Belgium.³The Ottawa Hospital, Ottawa, Canada. ⁴Hacettepe University, Ankara, Turkey**Introduction**

Change in pelvic tilt (PT) during and after peri-acetabular osteotomy (PAO) is important for surgical planning. The aims of this study were to 1. Determine how PT varies throughout the course of treatment in patients undergoing PAO; 2. Test what factors influence change in PT; and 3. Assess whether changes in PT influenced achieved correction.

Materials and Methods

This is an IRB-approved, retrospective, single-centre, consecutive case-series of 111 patients treated with PAO for global- (n=79), posterior- (n=49) or anterior dysplasia (n=6) (mean age: 27.3±7.7 years; 85% females). PT was determined on supine, anteroposterior pelvic radiographs pre-, intra-, 1-day, 6-weeks and 1-year post-operatively, using the Sacro-Femoral-Pubic (SFP) angle; a validated, surrogate marker of PT. Optimal acetabular correction was based on lateral center-edge angle (25°-40°), acetabular index (-5°-10°) and cross-over ratio (<20%).

Results

There was a significant difference between pre- (70.1°±4.8°), 1-day (71.7°±4.3°; p<0.001) and early post-operative SFP (70.6°±4.7°; p=0.004). Difference in SFP between pre-operative and 1-year post-operative was -0.5° ±3.1, with 9% of cases having a difference >5°. Difference in SFP did not correlate with age, sex, BMI, type of dysplasia or achievement of optimal acetabular correction (p=0.1-0.9).

Conclusions/Discussion

In the early post-operative period, PT is reduced, leading to a relative appearance of acetabular retroversion, which gradually corrects and is restored by annual follow-up. The degree of change in PT during PAO did not adversely affect fragment orientation. PT does not significantly change in most patients undergoing PAO and therefore does not appear to be a compensatory mechanism.

(23)

HOW TO SCREEN FOR LUMBAR SPINE STIFFNESS IN PATIENTS AWAITING TOTAL HIP ARTHROPLASTY

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Introduction

Spinopelvic abnormalities, including lumbar spine stiffness, are associated with adverse outcome following total hip arthroplasty (THA). It is thus of value for the arthroplasty surgeon to reliably identify patients with such features. The aim of this study was to: (1) Define the prevalence of spinopelvic abnormalities (lumbar spine stiffness, abnormal pelvic tilt, and spinopelvic imbalance) amongst patients with hip osteoarthritis; (2) Test if the prevalence is different to matched, healthy, volunteers; and (3) Identify factors that reliably predict the presence of lumbar spine stiffness.

Materials and Methods

This is a prospective, case-control, study of patients with end-stage hip osteoarthritis, who underwent primary THA between 2019-2021 in two tertiary, academic centres. The patients were compared with a cohort of asymptomatic volunteers (controls), matched for age-, sex- and BMI, with a 2:1 ratio. Radiographic spinopelvic measurements were performed in the standing and deep-flexed seated positions. Spinopelvic pathologies were defined as lumbar spine flatback deformity ($PI-LL \geq 10^\circ$), a standing sagittal pelvic-tilt of $\geq 19^\circ$ and lumbar spine stiffness (lumbar flexion $< 20^\circ$ between both postures). Logistic regression and ROC-analyses were performed.

Results

The prevalence of spinopelvic pathologies was similar between patients and controls (flatback deformity: 23/140 (16%) vs. 7/70 (10%), $p=0.209$; standing pelvic tilt $> 19^\circ$: 24/140 (17%) vs. 17/70 (24%), $p=0.218$; lumbar spine stiffness: 7/140 (6%) vs. 4/70 (5%), $p=0.827$). Age over 65 years-old and a standing lumbar lordosis less than 45° , were associated with high sensitivity and specificity for identifying patients with lumbar spine stiffness (age > 65 years: 82% and 66%; standing lumbar lordosis angle $< 45^\circ$: 85% and 73%).

Conclusions/Discussion

The presence of at least one abnormal spinopelvic characteristic was seen in 1-in-6 patients pre-THA. Hip osteoarthritis was not associated with increased prevalence of adverse spinopelvic characteristics compared to matched, asymptomatic, volunteers. Young patients (under 55-years-old) did not exhibit spinal stiffness. A single, static lateral spinopelvic view would suffice in patients above 65-years-old, with a relevant LLstanding threshold of 45° , as it would provide all data sufficient for screening for adverse spinopelvic characteristics in patients pre-THA.

(25)

DIFFERENCES IN DYNAMIC SPINOPELVIC CHARACTERISTICS BETWEEN PATIENTS WITH FEMORO-ACETABULAR IMPINGEMENT AND CONTROLS

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³The Ottawa Hospital, Ottawa, Canada

Introduction

Spinopelvic characteristics influence hip mechanics. Patients with reduced spinal flexion have inferior outcomes following hip arthroplasty, presumably by demanding more from their hip during daily activities. Whether the degree of lumbar spine mobility is associated with the development of symptoms in the presence of femoro-acetabular impingement (FAI) morphology is unknown. This study aims to assess for differences in spinopelvic characteristics between FAI patients and controls to identify factors contributing to symptom development.

Materials and Methods

This is prospective, cross-sectional cohort study of 180 patients presenting to a young-adult hip clinic and 54 asymptomatic (Oxford Hip Score >45) volunteers. Of those, 106 patients (59%) and 28 asymptomatic controls (52%) had features of FAI morphology. All participants underwent standing- and supine- anteroposterior pelvic and Dunn radiographs; lateral spinopelvic radiographs in the standing and deep-flexed seated positions to determine static (pelvic incidence, lumbar-lordosis, pelvic tilt, pelvic-femoral-angle) and dynamic parameters including maximal hip flexion (Δ PFA: Difference in Pelvic-Femoral-Angle), spine flexion (Δ LL: Difference in Lumbar-Lordosis), pelvic motion (Δ PT: Difference in Pelvic Tilt), overall Sagittal Flexion Arc ($SFA = \Delta$ LL + Δ PFA) and Hip-User-Index ($HUI = \Delta$ PFA / (Δ LL + Δ PFA)).

Results

There was no difference in the static standing spinopelvic parameters between symptomatic- FAI and controls ($p=0.4-0.6$). There was no difference in the total flexion arc between patients and controls ($156^\circ \pm 17$ vs. $156^\circ \pm 14$; $p=0.9$). However, FAI patients had significantly greater hip- ($99^\circ \pm 14$ vs. $94^\circ \pm 10$; $p=0.04$) and pelvic- ($11^\circ \pm 13$ vs. $5^\circ \pm 10$; $p=0.04$) flexion and significantly smaller lumbar flexion ($57^\circ \pm 10$ vs. $62^\circ \pm 9$; $p=0.2$) compared to controls. Thus, their hip-user index was much greater ($63\% \pm 6$ vs. $60\% \pm 5$; $p=0.01$).

Conclusions/Discussion

Despite the presence of symptoms, patients with FAI morphology, exhibited greater hip flexion than asymptomatic volunteers. The increased hip requirements to achieve equivalent sagittal flexion is likely to contribute to the pathomechanics. Maintenance of spine health and mobility may prevent the development of symptoms in individuals with FAI morphology.

(26)

PREVALENCE OF ADVERSE SPINO-PELVIC CHARACTERISTICS IN PATIENTS UNDERGOING TOTAL HIP ARTHROPLASTY AND ITS CLINICAL IMPLICATIONS – A PROSPECTIVE STUDYJeroen Verhaegen^{1,2,3}, Moritz Innmann⁴, Paul Monk⁵, Christian Merle⁶, George Grammatopoulos³¹University Hospital Antwerp, Antwerp, Belgium. ²Orthopedic Center Antwerp, Antwerp, Belgium.³The Ottawa Hospital, Ottawa, Canada. ⁴Heidelberg University Hospital, Heidelberg, Germany.⁵Auckland City Hospital, Auckland, New Zealand. ⁶Diakonie Klinikum Stuttgart, Stuttgart, Germany**Introduction**

Adverse spinopelvic characteristics (ASC) are associated with increased dislocation risk following primary total hip arthroplasty (THA). How often such patients are presenting to clinic and whether surgical approach influences dislocation-risk is unknown. This study aims to 1: Describe prevalence of patients presenting for a THA with adverse spinopelvic characteristics; 2. Test for association with pre-THA functional scores; and 3. Describe early-term dislocation rate with different approaches.

Materials and Methods

This is a prospective, three-centre, multi-surgeon, consecutive, cohort series of 460 patients (mean age: 65.8±11.8y; 52.5% females; mean BMI: 28.1±5.5kg/m²) undergoing THA through anterolateral- (n=202; 44%), direct anterior- (n=216; 47%) or posterior- approaches (n=142; 22.8%) without dual-mobility bearings or robotics. All participants underwent spinopelvic radiographs in standing and deep-flexed-seated positions to determine spinopelvic characteristics. ASC were Pelvic tilt >19°; spinopelvic imbalance (PI-LL >10°); and spinal stiffness (lumbar flexion <20°). Pre-operative patient reported outcomes was measured using Oxford Hip Score (OHS). Dislocation rates were prospectively recorded at follow-up of 1.5±0.9 years.

Results

Presence of any ASC was seen in 41%. Most common characteristic was high pelvic-tilt (34%), followed by spinopelvic imbalance (22%) and spine stiffness (6%). Only 3% had all three characteristics. 1% has all 3 ASC characteristics (n=11). There was no difference in the pre-operative OHS between patients without or with ASC (20.2±9.4 vs. 18.1±7.5; p=0.370). At 1-year, two patients sustained a dislocation (0.4%), both with all three ASC characteristics that had posterior approach. Amongst patients with ASC, anterior- and anterolateral approaches were associated with reduced dislocation risk (p=0.03).

Conclusions/Discussion

The prevalence of any ASC, especially high pelvic-tilt, is high. However, the presence of all three ASCs is low (3%). Use of the anterior- and antero-lateral approaches in such patients minimizes dislocation risk. However, patients with ASCs, especially all three, treated with posterior approach may benefit from advanced technology to minimize dislocation-risk.

(31)

LONG TERM FOLLOW UP OF CERAMIC-ON METAL TOTAL HIPO ARTHROPLASTY

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Introduction

In 2015 we published the results of 285 Ceramic on Metal total hip arthroplasties (THAs) performed between October 2007 and July 2009 with a mean follow-up of 34 months. The aim of this paper is to present the long term outcomes for this same patient cohort.

Materials and Methods

Patients were invited for review at a mean of 5.8 years and 10.1 years to determine pain, outcome scores, radiological analysis and blood ion levels. Those unwilling or unable to travel were contacted by telephone.

Results

The mean pain score at 10 years was 1.94, the mean Oxford Hip Score (OHS) was 23.18. This compared to 1.68 and 20.77 at 5 years. The median Cobalt and Chromium ion levels were 1.44 ppb and 1.39 ppb, respectively, compared to 1.22 ppb and 0.98 ppb at 5 years. Cobalt and Chromium levels were above 4 ppb in 18 and 11 CoM THAs, respectively. Survivorship was 93.4% at 10.1 years.

Conclusions/Discussion

When compared to the original review, there has been a gradual deterioration in pain score, OHS, X-ray appearance and most critically, survivorship, over the last 7 years. A survivorship of 93.4% does not meet the ODEP 10a* 95% threshold and this bearing has now been removed from the market. The need for specific protocols may be warranted for this patient group due to levels of failure, in our institute, any patients who are symptomatic or have metal ion levels over 4 ppb are kept under review.

(34)

THE SPAIRE MODIFICATION, ADDRESSING THE ACHILLES HEEL.Mohammad H Amer^{1,2}, Elliot A Ayling³, Karim Abdelghafour^{4,2}, Douglas G Dunlop^{3,5}¹University Hospital of Sussex NHS trust, Brighton, United Kingdom. ²Cairo University, Cairo, Egypt.³University of Southampton, Southampton, United Kingdom. ⁴East and North Hertfordshire NHS Trust, Stevenage, United Kingdom. ⁵University Hospital of Southampton NHS trust, Southampton, United Kingdom**Introduction**

The posterior approach (PA) is the most common approach for total hip replacement (THR) in the United Kingdom, Sweden and Australia. Its Achilles heel has been a perceived higher dislocation rate compared to the direct anterior (DAA) and lateral approaches, and the slower recovery compared to the DAA. The Sparing Piriformis and Internus, Repair Externus (SPAIRE) technique in theory increases stability, enhances proprioception, and expedites recovery. The learning curve and clinical outcomes have not been reported.

Materials and Methods

We reviewed prospectively collected data of consecutive simple primary total hip replacements in a single surgeon practice across 3 sites between 11/2018 and 9/2020. The outcome measures were dislocation, revision, and hospital stay, with a minimum follow up of 18 months.

Results

Starting in November 2018 a SPAIRE approach was considered for every THR. This was either performed, converted intra operatively or decided against preoperatively for teaching purposes. Of the cohort of 327 THR's, 209 used the SPAIRE approach, 25 a piriformis preserving (PP) and 93 through a PA. Mean age, ASA, and BMI are presented. The mean BMI was higher in PA than in SPAIRE or PP. No dislocations occurred in the SPAIRE or PP group. 1 dislocation occurred in PA group. The overall revision rate was 1.5% (5/327 patients). 3 revisions were observed in the SPAIRE group (1.4% 3/209). 2 revisions occurred in PA group (2.2% 2/93). There was a statistically significant difference in favour of the SPAIRE approach compared to PA in terms of hospital stay in all 3 sites ($P < 0.05$). Within the first 3 months, in the non-teaching sector, 49 % of THRs performed by the senior author were done using SPAIRE increasing to 95 % within 6 months.

Conclusions/Discussion

The SPAIRE approach is readily adopted and has the versatility to convert to a PP or PA if exposure is suboptimal. We have found no apparent increased risk of complication during the learning curve. The SPAIRE approach resulted in an earlier discharge compared to PA. The effect on reducing dislocation may be hard to prove outside registry data given how uncommon it is.

(37)

THE ROLE OF FRAILTY SCORES TO PREDICT THE OUTCOMES IN NON-OPERATIVE TREATMENT OF VALGUS IMPACTED NECK OF FEMUR FRACTURES.Mohammed Ali¹, Chryssa Neo², Aysha Rajeev², Sharad Bhatnagar³¹University Hospital of North Durham, Durham, United Kingdom. ²Gateshead health Foundation NHS Trust, Gateshead, United Kingdom. ³Royal Victoria Infirmary, Newcastle, United Kingdom**Introduction**

Managing valgus-impacted neck of femur fracture is controversial between operative and conservative treatments. This study aimed to investigate the usefulness of the Clinical frailty Score for predicting the prognosis of patients who underwent non-operative treatment for the valgus-impacted neck of femur fracture (NOF).

Materials and Methods

A single-centred retrospective review of patients admitted with valgus impacted NOF. Data were collected from patients' records, including demographics, Clinical Frailty Score (CFS), Nottingham Hip Fracture Score (NHFS) and Abbreviated Mental Test Score (AMTS). Patients were followed up to 24 months postoperatively.

Results

Fifty-eight patients who were treated non-operatively with a mean follow-up of 2.6 years met our inclusion criteria. Twenty-nine patients failed the non-operative treatment and required replacement surgeries, while 29 had successful outcomes (50%). There were no differences between the two groups' mean age and gender distributions ($P = 0.527$ and 0.139 , respectively). The successful group had significantly higher CFS ($P = 0.013$), worse AMTS and higher mortality risk based on the NHFS ($P = 0.006$ and $P < 0.001$, respectively).

Conclusions/Discussion

This study demonstrates that CFS, AMTS and NHFS can be predictors when considering non-operative treatment for the valgus-impacted neck of femur fracture. Patients who are frail, demented, and high risk based on the NHFS have higher success rates with non-operative treatment.

(38)

POSTERIOR SURGICAL APPROACH TO THE HIP AND DISLOCATION RATE IN THE TRAUMA SETTING: A RETROSPECTIVE COHORT STUDY

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Introduction

Current literature reports an increased risk of dislocation with the posterior surgical approach in Total Hip Replacement (THR) surgery, compared with alternative approaches. This risk is deemed highest within the trauma setting with reported rates of between 4-22%. The aim of this study was to investigate the rate of dislocation in THR's using the posterior surgical approach, within the trauma setting.

Materials and Methods

A retrospective review of 385 patients, with intracapsular neck of femur fractures, was conducted between February 2016 and July 2019. This review took place between two separate centres within Northern Ireland. All patients involved were ≥ 65 years old and eligible for a THR according to NICE guidelines. The posterior surgical approach was used in all THR's within this timeframe. A comparative analysis was made of the rate of hip dislocations as well as other potential factors for dislocation.

Results

Fifteen patients (3.9%) experienced at least one dislocation post operatively. Patients were reviewed for a minimum follow up time of 1 year, however almost all dislocations occurred within the first six weeks. Recurrent dislocations were seen in seven patients (1.82%) and four patients (1.04%) proceeded to have revision surgery.

Conclusions/Discussion

Dislocation is multifactorial and careful consideration of patient factors and pre-operative planning is critical in reducing this risk. This study has shown an overall dislocation rate of 3.9% within this cohort of patients. This is a much lower dislocation rate than what previous literature reports and is comparable to alternative approaches. This study supports the posterior surgical approach as a safe approach for use in the trauma setting.

(39)

WHAT ARE THE MAIN RISK FACTORS FOR THE INCIDENCE OF FRACTURED STEMS AFTER TOTAL HIP REPLACEMENT IN ADULTS?Samuel Soete, Muhammad Adeel Akhtar

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Introduction

Although prosthetic stem fracture is a rare complication of total hip arthroplasty (THR), the increased number of hip replacements is making them more common. The incidence rate of femoral stem fracture after THR ranges between 0.17-3.4%.

Materials and Methods

A literature search was conducted on EMBASE, MEDLINE & AMED to identify relevant studies. A total of 15 studies were included in the review. Data extraction was performed on a custom form that was generated using the guidance of Cochrane methodology. Data was further collated in an excel spreadsheet.

Results

The results showed that sex (% males in non-fracture group: 46%, fracture group: 77%), weight (average weight (kg) for non-fractured stems: 71.1, fractured stems: 94.1), age (non-fractured stems 64.4, fractured stems: 63.1), varus stem alignment (non-fractured group: 24%, fractured group 48%), and revision arthroplasty (revision THRs in non-fractured group: 19%, fractured group: 47%) were significant risk factors for prosthetic stem fracture. A risk window of 15 years post-surgery was identified.

Conclusions/Discussion

This review concludes that sex, weight, age, varus stem alignment and revision arthroplasty are significant risk factors for prosthetic stem fracture. The compounding of several of these predisposing factors likely explains the majority of prosthetic stem fractures and places patients at increased risk. These patients should be identified early on and measures should be taken to prevent stem fracture from occurring.

(40)

SOCIOECONOMICALLY-DEPREIVED PATIENTS SUFFER HIP FRACTURES AT A YOUNGER AGE AND REQUIRE MORE HOSPITAL ADMISSIONS, BUT EARLY MORTALITY RISK IS UNCHANGED: THE IMPACT DEPRIVATION STUDYRobert Kay¹, Andrew Hall², Andrew Duckworth³, Nick Clement⁴¹Academic Foundation Programme, University of Edinburgh, Edinburgh, United Kingdom.²Department of Orthopaedics, Golden Jubilee National Hospital, Clydebank, United Kingdom. ³Usher Institute, University of Edinburgh, Edinburgh, United Kingdom. ⁴Edinburgh Orthopaedics, Royal Infirmary of Edinburgh, Edinburgh, United Kingdom**Introduction**

Socioeconomic deprivation is associated with multi-morbidity and frailty, but influence on hip fracture outcomes is poorly understood. The primary aim was to investigate the association between deprivation and mortality, and secondary aims were to assess the effects on: i) age at presentation; ii) inpatient outcomes, and iii) post-discharge outcomes.

Materials and Methods

This cohort study included all patients aged >50 years admitted with a hip fracture to a high-volume centre between 01/03/20–20/11/21. Data were collected contemporaneously by specialist auditors and underwent validation using live health records after 180 days follow-up. Variables were demographics including Scottish Index of Multiple Deprivation, injury and management factors, and outcome measures including length of stay, discharge destination, readmission, and mortality status at 180 days.

Results

There were 1822 patients of which 1306/1822 (72%) were female. Deprivation was independently associated with younger age at hip fracture, demonstrating a linear correlation with each deprivation level. The overall mean age was 80.7 years (range 50-102), with the mean age in the most deprived group being 77.2 years (95% CI; 75.7-78.7) versus 82.8 years (95% CI; 82.0-83.5) in the least deprived. Multivariate logistic regression showed no association between deprivation and 30-day or 180-day mortality risk. Kaplan-Meier survival analysis demonstrated no difference between the most deprived versus least deprived (log-rank, $p = 0.854$). Deprivation had no influence on length of stay, discharge destination, or COVID-19 status, but deprived patients had an increased risk of readmission (OR 1.63, 95% CI (1.18-2.24); $p=0.003$).

Conclusions/Discussion

Although socioeconomic deprivation was not independently associated with increased mortality within 180 days of acute hip fracture, the significantly lower age at which deprived patients sustain their hip fracture may confer a greater risk of dying at an earlier age. Readmission rates were higher in the most deprived quintile, but return to independent living, COVID-19 status during admission, and length of stay were not influenced by deprivation.

(42)

THE EFFECTIVENESS OF ENDOSCOPY IN THE ASSESSMENT OF OCCULT GI BLEED CAUSING REFRACTORY ANAEMIA IN FRACTURE NECK OF FEMURSAysha Rajeev, George Koshy, Katie Ward, Anand Reddy

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Introduction

Post-operative anaemia in hip fracture patients has been associated with increased risk of blood transfusion, poorer functional outcomes, increased morbidity, and mortality. Patients with persisting drop in haemoglobin after fracture neck of femur with no obvious source of blood loss are often referred for endoscopy to find the cause of anaemia. The reported incidence of perioperative acute upper gastrointestinal bleeding varies from 1 to 15%.

The aim of our study is to find out the usefulness of endoscopy in finding gastrointestinal causes leading to the occult loss of blood causing irreversible anaemia in post operative fracture neck of femurs.

Materials and Methods

A retrospective case-control study of patients admitted to the orthogeriatric unit for surgical management of neck of femur fracture between January 2015 and December 2020. A total of 1863 cases were admitted with neck of femur fractures, of which 918 (49.3%) patients had post operative anaemia. 45 (5%) patients with refractory anaemia were referred for endoscopy. Patient demographics including age, sex, fracture pattern, pre-existing anaemia and the type of procedure done were recorded. The co-morbidities including anaemia, cardiac disorders, chronic kidney disease and oral anticoagulants at the time of admission were noted. All the patients received intra-operative tranexamic acid injections.

Results

There were 11 (24%) males and 34 (76%) females. The average age was 82.3 years (range 73-94). There were 37 (60%) intracapsular and 17 (40%) extracapsular fractures. Eleven (patients 24%) had iron deficiency anaemia, 9 (20%) was on oral anticoagulants and 6 (12%) had systemic malignancy. The mean post operative haemoglobin at the time of referral for endoscopy was 77.3 g/dL. Endoscopy revealed normal findings in 27 (60%), esophagitis/gastritis in 8 (20%) and hiatus hernia in 7 (16%) of patients. None of the patients were diagnosed to have a demonstrable source of active gastrointestinal bleeding or malignancy causing the drop in haemoglobin post-op.

Conclusions/Discussion

In the diagnosis of resistant and refractory post operative anaemia following fracture neck of femur surgery the use of endoscopy to diagnose a treatable cause of anaemia is not effective.

(44)

A RADIOLOGICAL UCLA ANALYSIS OF CONSECUTIVE 283 CASES OF THA USING SUPERPATH APPROACHAshwin Kulkarni¹, Sherif Ahmed Kamel², Priya Murali³¹University Hospitals of Leicester, Leicester, United Kingdom. ²Ain Shams University Hospitals, Cairo, Egypt. ³MicroPort Orthopedics, Arlington, USA**Introduction**

Supercapsular percutaneously-assisted total hip (SuperPath) approach for total hip arthroplasty (THA) is a minimally invasive, tissue-sparing technique utilizing the gap between piriformis and minimus. Studies have demonstrated short learning curve for SuperPath and potential advantages compared to traditional approaches like improved pain relief and early healing. Here radiographic analysis of consecutive patient cohort undergoing SuperPath approach is reported.

Materials and Methods

THA was performed in 283 cases using SuperPath approach. Age and BMI of cohort was 69.1 ± 11.0 years and $27.3 \pm 4.4 \text{ kg/m}^2$, respectively. Radiographs were collected post-operatively and analysed for component placement. Amount of femoral subsidence, degree of cup inclination and leg length difference (LLD) was determined. These parameters were analysed for difference in gender (male or female), age (≥ 65 or < 65 years), and BMI (≥ 30 or < 30). Two-sample t-test was performed to determine any significant difference between groups at $p < 0.05$.

Results

Patient cohort included 140 females: 182 patients ≥ 65 years of age and 68 patients with BMI ≥ 30 . Mean subsidence, inclination and LLD for the cohort was 0.45mm, 41.4° and 0.15cm, respectively. There was significant difference in amount of subsidence between males and females with $p = 0.03$. However, no difference was seen between patients ≥ 65 years of age ($p = 0.3$) or between patients with a BMI ≥ 30 or < 30 ($p = 0.2$). No significant difference was observed in terms of cup inclination (males-females: $p = 0.85$, $\geq$ or < 65 years of age: $p = 0.11$ or $\geq$ or < 30 BMI: $p = 0.11$) or LLD (male-female: $p = 0.7$; $\geq$ or < 65 years: $p = 0.9$ and $\geq$ or < 30 BMI: $p = 0.35$), between any of the groups.

Conclusions/Discussion

The National Institute for Health and Care Excellence (NICE) is in the process of drafting guidance on SuperPath technique to be issued to the National Health Service in England, Wales, Scotland, and Northern Ireland. This study may aid in development of this guidance as it represents the largest and only consecutive SuperPath series reported from the UK. This study showed that SuperPath technique provides similar outcomes in patients irrespective of age, BMI and to a large extent gender, in terms of implant placement, thus proving that THA can be performed safely and accurately using SuperPath approach.

(47)

MINIMUM 5-YEAR FOLLOW UP OF A HIGHLY VERSATILE DISTALLY ANCHORED FEMORAL REVISION SYSTEM WITH HYDROXYAPATITE COATING.

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Introduction

Total hip arthroplasty (THA) is one of the most successful operations medicines can offer. As more patients undergo THA the revision burden increases proportionately. Many femoral revision systems demonstrate excellent medium term survival and thus in addition to survival, flexibility becomes a key discriminator of the platforms.

Materials and Methods

This is a cohort study of the Arcos® Modular Femoral Revision System. The primary outcome was re-revision of the femoral component. Secondary outcomes include complications, radiological and clinical outcomes over 5 years.

The study was designed as a prospective, multicentre, multinational, longitudinal cohort study.

Pre-operatively patient demographics, reason for revision and hip scores were collected. The patients' radiographs were assessed for lucency using Charnley & Delee and Barrack grading and subsequently classified using the Proprosky classification of bone loss in the femur.

Intra-operatively data was gathered on surgical approach, components used on femoral, acetabular, and bearing surfaces of the joint and intra-operative complications.

Post-operatively, patients were invited to follow up at intervals of 6 weeks, 1 year, 3 years and 5 years. At each assessment patients were evaluated clinically, with Harris Hip Score (HHS), Oxford Hip Score (OHS) and EQ5D patient reported outcome measures. Post operative complications both acute and delayed were reported. Patients were radiographically assessed for lucency around the cup and the stem for indications of failure. Survivorship of the implant was assessed using a Kaplan-Meier survival analysis by a professional biostatistician.

Results

74 patients were recruited, the femoral survival rate was 100% at 5 years with 12 censorships. 31 patients were Proprosky 3/4 pre-operatively. 11 patients underwent further procedures however no femoral components were revised. Kaplan Meier analysis was performed by a biostatistician. Patients demonstrated a consistent and sustained improvement in HHS, OHS and EQ5D. Radiological review revealed minimal and stable lysis around the femoral components.

Conclusions/Discussion

The ARCOS Modular Femoral Revision System provides a flexible, reliable option for femoral revision which boasts 117 combinations across 5 stem and 3 body types. This may allow femoral bone stock preservation and avoiding conversion to an endoprosthesis.

(48)

FUNCTIONAL OUTCOMES AND SATISFACTION IN CONSECUTIVE CASES FOLLOWING SUPERPATH APPROACHAshwin Kulkarni¹, Priya Murali²¹University of Hospitals of Leicester, Leicester, United Kingdom. ²MicroPort Orthopedics, Arlington, USA**Introduction**

Supercapsular percutaneously assisted total hip (SuperPath) approach for total hip arthroplasty (THA) is a minimally invasive technique with no muscle releases and preserves the external rotators. This study aims to report the time required to return to function and overall satisfaction after SuperPath approach, which has not been reported earlier.

Materials and Methods

Two hundred seventy consecutive THAs were performed using SuperPath from 2017 to 2021. Operation time, anaesthesia, opioid usage, length of stay (LOS), complications, Oxford Hip Scores (OHS) and physiotherapy sessions were collected. LOS was analysed by differences in age and BMI. Questionnaires were sent to patients asking their: ability to walk, drive, return to sport, feeling "normal" again, and satisfaction with the procedure (0-10 scale). Differences in categorical variables were analysed by Chi-squared test, for continuous variables, between two groups by two-sample t-test, and ≥ 3 unpaired groups with ANOVA and Tukey post hoc test ($p < 0.05$).

Results

Mean operation time was 110 minutes including anaesthesia. Most patients required no opioids postoperatively (70%) and one physiotherapy session (90%). Mean LOS was 1.2 days with 84% discharged on Day 1. Patients > 80 years had longer LOS, with no significant differences in LOS between the remaining age and BMI groups. At 6 months, OHS significantly increased to 24.7. Five complications were reported. There were 136 respondents to the questionnaire. Approximately half never used crutches or stopped using within a week. Within first four weeks, most respondents resumed walking (76%), driving (74%), tying shoes (79%) as before surgery; with no significant differences between age groups. In the first six weeks, 67% reported feeling "normal" again. Most respondents (95%) reported a "9" or "10" satisfaction with procedure. Patients returned to sporting activities of their choice.

Conclusions/Discussion

SuperPath was first introduced in 2010 but is relatively new in the UK. The results are similar to other SuperPath publications from outside the UK and compared better than the average for THA in the UK. This study is the first to demonstrate that patients are highly satisfied, feel normal, and can resume their normal activities and sports sooner compared to traditional approaches.

(51)

SURVIVAL OF THE GAP II CAGE IN THE MANAGEMENT OF METASTATIC DISEASE OF THE ACETABULUMIan Kennedy¹, Omer Farhan-Alanie¹, David Young², Michael Kelly¹, Peter Young³¹Queen Elizabeth University Hospital, Glasgow, United Kingdom. ²University of Strathclyde, Glasgow, United Kingdom. ³University Hospital Ayr, Ayr, United Kingdom**Introduction**

The aim of this study was to assess the clinical and radiological outcomes of an antiprotrusio acetabular cage (APC) when used in the surgical treatment of periacetabular bone metastases.

Materials and Methods

This retrospective cohort study using a prospectively collected database involved 56 patients who underwent acetabular reconstruction for periacetabular bone metastases or haematological malignancy using a single APC between January 2009 and 2020. The mean follow-up was 20 months (1 to 143). The primary outcome measure was implant survival. Postoperative radiographs were analysed for loosening and failure. Patient and implant survival were assessed using a competing risk analysis. Secondary parameters included primary malignancy, oncological treatment, surgical factors, length of stay in hospital, and postoperative complications.

Results

A total of 33 patients (59%) died during the study period at a mean of 15 months postoperatively (1 to 63). No patient had radiological evidence of loosening or failure. Acetabular component survival was 100%. Three patients (5.4%) had further surgery; one (1.8%) underwent revision of the femoral component for dislocation, one required debridement with implant retention for periprosthetic joint infection, and one required closed reduction for dislocation. Using death as a competing risk, at 100 months, the probability of revision was 0.036 and the risk of death was 0.84.

Conclusions/Discussion

With appropriate patient selection, the antiprotrusio cage offers good implant survival, with a reasonable perioperative complication rate in this high-risk group of patients when managing metastatic disease or haematological malignancy around the acetabulum.

(53)

PERIACETABULAR METASTASIS: A DISEASE OF THE POSTERIOR COLUMNChristopher Donoghue, Graeme Nicol, Benedict Clift

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Introduction

Management of destructive periacetabular metastatic disease (PMD) remains undefined. Optimising acetabular implant fixation is complex and current classifications are limited in guiding surgical decision-making. This study critically assesses remaining pelvic architecture in PMD, describing a functional method of evaluating pre-operative imaging and showing outcome of total hip arthroplasty (THA) using partial pelvis replacement.

Materials and Methods

We investigated all patients with PMD presenting to a single tertiary arthroplasty and major trauma centre, currently serving a population of ~500,000 patients, between 2016 and 2022. From this population, there were eleven patients with significant bone destruction requiring surgical intervention. Radiographs and CT imaging was assessed for femoral head displacement, disease location and bone loss. We utilised Harrington and Letournel classification to assess structural stability. Outcome measures utilised included pre- and post-operative mobility, operative time, complications, recreation of centre of rotation, length of stay (LOS) and mortality.

Results

On radiological assessment iliopubic and ilioischial line was disrupted in 71% and 100% of cases. There was hip protrusion in 71%, with superior dome/ ilium involvement in 100% of cases. The Harrington classification of these cases were III and IV (n= nine and two, respectively). There were posterior column cancellous lytic deposits in 100%, with cortical disruption in >70%. 57% had bone and soft tissue expansion. None had ischial or anterior column cortical involvement. 100% had quadrilateral plate involvement, with dome and ilium deposits in 100%. LOS was 20 days (4-36), mean LOS post-operatively 11 days (4-21). There were seven total mortalities. Mean time between operation and mortality was 10 months. 67% of patients had improved pain control and mobility at first post-operative clinic review.

Conclusions/Discussion

PMD concentrates destruction in the posterior column, with the restoration of stability of the posterior column essential. The ischium and anterior column is typically preserved, allowing for their utilisation in stabilisation. We propose that restoration of the posterior column, utilising a partial pelvis replacement with ischial and anterior flanges as a potential solution in these surgically complex cases. We have demonstrated good functional improvement and pain control with this approach, maintaining quality of life and function.

(55)

FEMORAL IMPACTION BONE GRAFTING IN REVISION HIP ARTHROPLASTY WITH THE EXETER STEM: OUTCOME FOLLOW UP OUTSIDE OF THE ORIGINATING CENTREEamonn Coveney¹, Bisola Salaja¹, Paddy Kenny^{1,2}¹National Orthopaedic Hospital, Cappagh, Dublin, Ireland. ²Connolly Hospital, Dublin, Ireland**Introduction**

Femoral impaction bone grafting is a technique used in the setting of revision hip arthroplasty cases where there is host femoral bone loss. This technique was developed in Exeter and has been successfully used in the revision hip arthroplasty setting. This aims to restore bone stock and provide the patient with a long term solution in their revision case. We set out to examine our outcomes in a unit outside of the originating centre for this technique.

Materials and Methods

A retrospective review was performed of prospectively collected data in a tertiary referral centre. Cases were performed by a single surgeon over an 18 year period. Outcomes were examined at interval follow up with a minimum of 1 year follow up. Our primary outcome was re-revision surgery as a result of aseptic loosening. Secondary outcomes were re-revision surgery for any other cause and patient reported outcome measures (PROMs), SF-36 and Harris Hip Scores, examined at interval follow up.

Results

There were 56 procedures performed with femoral impaction grafting over this time period. 29 cases had both femoral and acetabular impaction grafting performed. No cases underwent re-revision surgery as a result of aseptic loosening on the femoral components. All cause re-revision rate was 10% (n=6) and all cause re-revision rate for stem failure was 5% (n=3). Improvement in PROMs (SF-36 and WOMAC) were noted in recorded cases.

Conclusions/Discussion

Femoral impaction bone grafting in the revision hip arthroplasty setting is a safe and effective method of managing complex cases with bone loss. Our results demonstrate low rates of re-revision surgery with this method, comparable results with the originating centre and improvements in PROMs.

(56)

PATIENT-REPORTED OUTCOME MEASURES AND QUALITY OF LIFE FOLLOWING OPERATIVE MANAGEMENT OF PROXIMAL FEMORAL METASTASES: A SYSTEMATIC REVIEWGrace Kennedy¹, Maurice Kennedy², Gavin Bartlett¹¹Royal Cornwall Hospital Truro, Truro, United Kingdom. ²Open University, Belfast, United Kingdom**Introduction**

In the United Kingdom, over 350,000 new cancers are diagnosed annually. As survival continues to improve, bony metastases are encountered increasingly frequently. Proximal femoral metastases (PFM) may present clinically with pain or pathological fracture, and operative intervention should aim to alleviate these whilst posing undue risks. Strategies include endoprosthetic replacement (EPR) and intramedullary nailing (IMN).

We aimed to compare these strategies regarding patient-reported outcome measures (PROMs) and quality of life indices (QoL). Secondary aims were to compare survival and complication rates.

Materials and Methods

MEDLINE, Embase and Cochrane databases were reviewed. Experimental or observational analytic studies were included. Studies focusing primary bone cancer, or cases where data for proximal femoral metastases could not be distinguished from cancer of other sites were excluded.

Results

Of 278 citations identified, ten observational studies reporting upon 865 PFM (768 EPR, 97 IMN) were included.

Average post-operative Musculoskeletal Tumour Society scores were 65.0-84.6% following EPR (nine studies) and 77.2-80.0% following IMN (two studies). QoL was reported following EPR in one study only.

One-year survival was 27.3-56.4% following EPR and 19.0% following IMN. Reoperation rates were higher following IMN (10.3%) than EPR (3.4%). Complications included dislocation (3.6%), deep infection (3.4%), perioperative death (1.2%), and venous thrombo-embolism (1.6%) following EPR and non-union (12.4%), implant breakage (4.1%), and deep infection (1.0%) following IMN.

Conclusions/Discussion

PROMs following EPR and IMN were comparable, however the evidence is lacking, particularly following IMN. As operative intervention for PFM is predominantly palliative, aiming to improve patient QoL, more work is needed in this area.

(57)

DISLOCATION AFTER TOTAL HIP REPLACEMENT (THR) IN FEMORAL NECK FRACTURE- DOES THE SURGICAL APPROACH MATTERS? - A PROSPECTIVE COMPARATIVE STUDYDan Arvinte, Manoj Sood

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Introduction

Approximately 76,000 patients are admitted with fracture neck of femur (NOF) in UK every year. If THR is done, the risk of dislocation is higher (up to 20%) in comparison with THR for degenerative disease (2-10%). A posterior approach has been traditionally associated with a higher risk of dislocation compared with a lateral approach.

Materials and Methods

74 patients were prospectively enrolled in this study between August 2015 and December 2021. 36 patients were operated using posterior approach and 38 patients were operated using lateral approach. The 2 groups were matched regarding age and gender: there were 25 females and 11 males in the posterior approach group and 28 females and 10 males in the lateral approach group. The average age was 72 y.o. (range 60-85 y.o.). Posterior approach multimodal protocol included: doing the femur first and assess correct length and stem orientation, positioning the cup in rapport Total and position of stem (Ranawat combined version), assessing clinically the stability and the soft tissue tension during trial reduction, using 32 and 36 mm heads and a meticulous repair of external rotators. No dual-mobility heads were used, and lipped liners had to be used only in 6 cases.

Results

Patients' electronic records were searched, and patients had face to face or telephonic consultations to find out if any readmission related to surgery happened. The average follow-up was 43 months (range 7 – 81 months). 5 patients died of unrelated causes. None of the patients in either group had dislocation, nor other complications related to surgery.

Conclusions/Discussion

Despite traditional and some recent studies showing high rate of dislocation when conventional THR is done using a posterior approach, unless a dual-mobility bearing is used, our study does not confirm this. We suggest that using a multimodal protocol when doing the posterior approach can significantly reduce the rate of dislocation in patient with fracture NOF having THR, even when normal modular heads are used. The outcome was as good as with the lateral approach.

(58)

ENVIRONMENTAL SUSTAINABILITY IN ORTHOPAEDIC SURGERY

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Introduction

In the UK, the NHS generates an estimated 25 mega tonnes of carbon dioxide equivalents (4% to 5% of the nation's total carbon emissions) and produces over 500,000 tonnes of waste annually. There is limited evidence demonstrating the principles of sustainability and its benefits within orthopaedic surgery. The primary aim of this study was to analyse the environmental impact of orthopaedic surgery and the environmentally sustainable initiatives undertaken to address this. The secondary aim of this study was to describe the barriers to making sustainable changes within orthopaedic surgery.

Materials and Methods

A literature search was performed according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines through EMBASE, Medline, and PubMed libraries using two domains of terms: "orthopaedic surgery" and "environmental sustainability".

Results

A total of 13 studies were included in the final analysis. All papers studied the environmental impact of orthopaedic surgery in one of three areas: waste management, resource consumption, and carbon emissions. Waste segregation was a prevalent issue and described by nine studies, with up to 74.4% of hazardous waste being generated. Of this, six studies reported recycling waste and up to 43.9% of waste per procedure was recyclable. Large joint arthroplasties generated the highest amount of recyclable waste per procedure. Three studies investigated carbon emissions from intraoperative consumables, sterilization methods, and using telemedicine. One study investigated water wastage and demonstrated that simple changes to practice can reduce water consumption by up to 63%. The two most common barriers to implementing environmentally sustainable changes identified across the studies was a lack of appropriate infrastructure and lack of education and training.

Conclusions/Discussion

Environmental sustainability in orthopaedic surgery is a growing area with a wide potential for meaningful change. Further research to cumulatively study the carbon footprint of orthopaedic surgery and the wider impact of environmentally sustainable changes is necessary.

(60)

HIP ABDUCTION AS THE ONLY POSTERIOR HIP PRECAUTION STRATEGY IN POSTERIOR APPROACH TOTAL HIP ARTHROPLASTY: A COMPUTER SIMULATION STUDY

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Introduction

Extant literature suggests that posterior hip precautions following primary total hip arthroplasty (THA) are unnecessary, however, many surgeons and patients still prefer to follow them to some extent. We hypothesized that 20° of hip abduction is sufficient in preventing impingement and dislocation in motions requiring hip flexion when larger prosthetic heads are used, and the acetabular implant is placed within a reasonable orientation.

Materials and Methods

Using Stryker Mako Total Hip 4.0 preoperative planning software, the effect of hip abduction on prosthetic and bony impingement was investigated in 43 hips. The anterior pelvic tilt was set at 10° and 20° for the flexed-seated position, while 70° and 90° were chosen for the forward-bending position. Ten degrees of external hip rotation and 10° or 20° of internal hip rotation were added to the simulation to evaluate the efficacy of hip abduction in preventing postoperative impingement and dislocation. Except for one hip that received a 32mm head, all other replacements used a 36mm, 40mm, or modular dual mobility head. All preoperative plans were altered to match data collected intraoperatively to maximize the accuracy of the study.

Results

Bone-bone impingement between the calcar and anterior-inferior iliac spine was the predominant type of impingement. The absolute risk of all types of impingements considered decreased from 9.3% to 2.3% in both the flexed-seated and forward-bending positions with the addition of 20° of hip abduction.

Conclusions/Discussion

With modern stems and an overall acceptable cup anteversion angle, small degrees of hip abduction may be the only posterior hip precaution required to lower the risk of postoperative dislocation among patients undergoing primary THA with a larger prosthetic head. Traditional hip precautions can be a source of anxiety and dissatisfaction for patients. We make a simplified recommendation that will not limit daily activities significantly and to increase adherence to a strategy that has the potential to prevent impingement and dislocation. Future studies can potentially investigate the concept of personalized hip precautions based on preoperative computer simulations, utilized implants, patient-specific hip-spine relationships, and final implant orientation.

(61)

PLUS AND MINUS HEADS AFFECT THE PROSTHETIC RANGE OF MOTION AND RATE OF PROSTHETIC IMPINGEMENT AFTER TOTAL HIP ARTHROPLASTY

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Introduction

Extant literature does not provide sufficient evidence on the effect of skirt less prosthetic neck lengths on prosthetic impingement following total hip arthroplasty (THA). Due to the increase in neck diameter closer to the body of the stem, the use of minus heads can decrease the head-neck ratio and increase the risk of impingement, polyethylene damage, and dislocation. We hypothesized that the use of minus heads increases the risk of prosthetic impingement by decreasing the prosthetic range of motion (ROM) in most patients when compared to neutral or plus heads.

Materials and Methods

A cohort of 43 primary THAs performed using MAKO robotic-arm-assisted surgery were included in this study. The outcome variables investigated were the maximum external rotation at full extension and the maximum internal rotation at 45°(mid-flexion), 90°, and 100° (deep) of flexion prior to prosthetic impingement using head diameter (32mm or 36mm) and prosthetic neck length (minus, zero, plus heads) as predictors. All other specifications of the implant such as stem size, stem angle, and cup size, as well as stem and cup positionings, were amended to match intraoperative data for accuracy.

Results

The prosthetic ROM increases significantly with the stepwise change of neck length from minus to zero and zero to plus heads. The observed effect is more pronounced when the hip is externally rotated at full extension (mean increase between 1.6° and 2.8° for the 36mm head and between 2.8° and 3.4° for the 32mm head; $p = 0.0001$).

Conclusions/Discussion

In this study, the negative effect of minus heads on the prosthetic ROM was shown. Surgeons should be aware of the negative impact on prosthetic ROM and impingement risk when they use short neck options. When possible, surgeons should improve the prosthetic ROM by placing the stem lower in the femoral canal and recreate the desired offset with plus heads instead of high offset stems.

(65)

REVISION TO LONG STEMMED CEMENTED PROSTHESIS FOLLOWING PROXIMAL FEMORAL OSTEOTOMY PROVIDES EXCELLENT LONG TERM OUTCOMES AND SURVIVORSHIPRajpreet Sahemey¹, Alastair Stephens¹, Ali Ridha¹, Mohammed Remtulla¹, Trevor Lawrence²¹UHCW, Coventry, United Kingdom. ²UHB, Birmingham, United Kingdom**Introduction**

Femoral stem revision during revision total hip arthroplasty (rTHA) can be challenging. Several osteotomies have been developed to aid in stem extraction. Whilst advantageous, they may compromise proximal femoral bone stock which would necessitate the use of a cementless revision stem with a diaphyseal mode of fixation. This study aims to explore long term outcomes of patients who have undergone cemented femoral revision to a long stem taper-slip prosthesis following proximal femoral osteotomy to bypass the distal extent of the osteotomy.

Materials and Methods

We identified all patients at a single centre who underwent single or staged revision using a proximal femoral osteotomy to a cemented long stemmed taper-slip prosthesis for Paprosky types I-III B defects for infection, aseptic loosening or recurrent dislocation. Immediate post-operative radiographs were compared up to the latest follow-up to assess for survivorship, stem subsidence and evaluation of cement mantle. Pre and post-operative WOMAC scores were compared.

Results

40 rTHAs were performed in 36 patients with a mean age of 69 years. Mean follow-up was 6.6 years (range, 3.8-10). Preoperative WOMAC score was 71 which improved to 25.4 at the latest follow-up. There was 100% component survivorship, and no hips underwent further surgery. None of the rTHAs developed radiographic loosening or prosthetic joint infection.

Conclusions/Discussion

For rTHA where femoral osteotomy is performed to extract the original stem, the use of a cemented long-stemmed femoral prosthesis over a distally fixed cementless prosthesis remains a viable option and provides excellent patient-reported clinical and radiological outcomes.

(68)

FACTORS INFLUENCING LENGTH OF STAY AND MORTALITY IN PATIENTS WITH PERIPROSTHETIC FEMORAL FRACTURE: A RETROSPECTIVE COHORT ANALYSISHaseeb Khawar, Kerry Anderson, Rory Middleton

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Introduction

Periprosthetic fractures of the femur (PFFs) represent an increasing burden on United Kingdom (UK) healthcare services. Recently, the National Hip Fracture Database in the UK published key performance indicator (KPI) data for PFFs, which shows that PFF care across the UK is not as optimised as hip fracture care is. There is also no evidence based guideline to dictate optimal care for this cohort. Our study would like to assess factors which increase length of stay or mortality in patients with PFF, to help hospitals and clinicians identify the high risk PFF patients.

Materials and Methods

Hospital records from a high-volume local district general hospital were retrospectively analysed. All patients with PFF admitted between 1st April 2015 and 31st August 2022 were included. Baseline demographic information was obtained including age on admission, date of admission, date of discharge, date of death (if appropriate) and comorbidity information. Logistic regression was performed to establish the comorbidities which affected either length of stay (LOS), 30-day mortality or 1-year mortality. All statistics was performed on SPSS. P value of <0.05 was considered statistically significant.

Results

640 patients with PPFF were admitted during the aforementioned timeframe. Mean age on admission was 78 years (SD 12). There is a significant positive association between 30-day mortality and liver disease [OR 10.13 (95% CI 1.33-77.01)]. There is a significant positive association between 1-year mortality and MI [OR 2.32 (95% CI 1.19-4.53)], CHF [OR 3.14 (95% CI 1.58-6.28)], dementia [OR 5.23 (95% CI 3.02-9.07)] and active cancer [OR 5.01 95% CI 1.95-12.86]. There was significantly increased LOS in patients with PPFF who also suffered from dementia [+3.75 days (95% CI 2.96-9.47)] and liver disease [+2.01 days (95% CI 0.27-21.18)].

Conclusions/Discussion

There is a significant association between comorbidities and both length of stay and mortality in patients with PFFs even after controlling for age and gender. Hospitals should identify the high risk PFF patients early in order to optimise care. These patients should be highlighted to discharge teams to try to reduce hospital length of stays.

(69)

DOES EARLY SURGERY FOR PATIENTS WITH PERIPROSTHETIC FEMORAL FRACTURE HAVE A POSITIVE IMPACT ON OUTCOMES? A RETROSPECTIVE COHORT ANALYSISHaseeb Khawar, Kerry Anderson, Rory Middleton

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Introduction

Periprosthetic femoral fractures (PPFFs) represent an increasing burden to healthcare services. Recently, the National Hip Fracture Database (NHFD) in the United Kingdom (UK) has published Key Performance Indicator (KPI) data for PPFF patients. Time to theatre is one such KPI and a prolonged time to theatre has been shown to adversely affect patient mortality in hip fractures, with recommendation to operate within 48 hours to improve outcomes. Due to the added complexity of PPFF cases the 48 hour window is rarely met. The aim of our study is to investigate if surgery for patients with PPFF within 48 hours of admission is associated with improved mortality.

Materials and Methods

Hospital records from a high-volume local district general hospital were retrospectively analysed. All patients with PPFF admitted between 1st April 2015 and 31st August 2022 were included. Baseline demographic information was obtained including age on admission, date of admission, date of discharge, date of death, date of surgery, and comorbidities. These were used to calculate 30-day and 1-year mortality. Binomial regression analysis was performed to establish whether surgery within 48 hours has any impact on either 30-day or 1-year mortality. All statistics were performed on SPSS. A P value of <0.05 was considered statistically significant.

Results

640 patients with PPFF were admitted between 1st April 2015 and 31st August 2022. Of these, 461 (72%) received surgical intervention for their injury. After controlling for age, gender, and comorbidities, we have found no significant association between surgery within 48 hours and 30-day mortality [OR 1.24 (95% CI 0.54-2.82)], or 1-year mortality [OR 0.70 (95% CI 0.42-1.18)].

Conclusions/Discussion

We have not found any significant association between early surgery and improved mortality for PPFF patients. PPFF cases therefore should be meticulously planned, ideally on an operating list with availability of kit and expertise of the surgeon, and medically optimised before proceeding with surgery. Further research should be performed with larger datasets to validate our findings, and a national collaboration will help to answer this.

(72)

SURGICAL VARIANCE AND EFFICIENCY IN MAKO ROBOTIC-ASSISTED TOTAL HIP REPLACEMENTS.Jamie Ferry¹, Samarth Arya², Sahil Gaba², Christopher Munro², Luke Farrow²¹Institute of Applied Health Sciences, University of Aberdeen, Aberdeen, United Kingdom. ²Grampian Orthopaedics, Woodend Hospital, Aberdeen, United Kingdom**Introduction**

The introduction of Mako® (Stryker, Michigan) robotic-assisted total hip replacements (MAKO RA-THR) has allowed surgeons to optimise implant positioning, resulting in improved functional stability and decreased risk of prosthesis dislocation. Consistent and efficient surgery is essential to maintaining the benefits of utilising MAKO RA-THR. In addition, it is imperative that we maintain high levels of theatre productivity to tackle the backlog of arthroplasty cases due to COVID-19. We aimed to analyse surgical variation in MAKO RA-THR cases and identify areas where surgical efficiency could be improved to aid operating theatre productivity.

Materials and Methods

We included 69 MAKO RA-THR cases across 6 consultants/fellows and a cohort of senior surgical registrars performed at Woodend Hospital Aberdeen between June 2021 and April 2022. To compare surgical variation, the non-parametric ANOVA (Kruskal-Wallis) test was used to determine if there was a statistically significant difference in operating times in the distinct operative segments of the MAKO RA-THR procedure for the best performing surgeon (reference) versus the others. $p < 0.05$ denoted significance.

Results

The median [IQR] time to perform a MAKO RA-THR across 6 consultants and a cohort of surgical registrars was 82 [22] minutes. Surgical variance was found in the difference between tibia and femur pin placement and neck of femur incision (Median “reference” 16mins IQR [13] vs Median “others” 22.5mins IQR [6.25]; $p = 0.010$), neck of femur incision and pelvis registration (Median “reference” 6mins IQR [4.75] vs Median “others” 11.25mins IQR [4.25]; $p = 0.001$), and pelvis registration and acetabular reaming (Median “reference” 4mins IQR [1] vs Median “others” 6mins IQR [1.75]; $p = 0.008$) across surgeons. There was no significant difference ($p > 0.05$) in times between surgeons for acetabular reaming and impaction, impaction, and femoral broaching, broaching and component trial, trial and cement/implant insertion, or cement/implant insertion and closure.

Conclusions/Discussion

We have identified significant difference in operating times across performing consultants/fellows and surgical registrars in sections of MAKO RA-THR. With this we can look to analyse how operators are performing differently, work to decrease variance, improve surgical efficacy, and provide improved theatre productivity where individuals are undergoing MAKO RA-THR.

(79)

IS OUTCOME OF TOTAL HIP ARTHROPLASTY FOR HIP FRACTURE INFERIOR TO THAT OF ARTHRITIS IN A CONTEMPORARY ARTHROPLASTY PRACTICE?

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Introduction

Outcome of total hip arthroplasty (THA) for femoral neck fractures (FNF) has been associated with higher complication rate. However, THA for FNF is not always performed by arthroplasty-surgeons. This study aims to compare outcome of THA for FNF to THA for osteoarthritis (OA). In doing so, we describe contemporary failure modes of THAs for FNF performed by arthroplasty surgeons.

Materials and Methods

This is a retrospective, multi-surgeon study from an academic centre. Of FNF treated between 2010-2020, 177 received THA by an arthroplasty-surgeon [mean age: 67 years-old (range: 42-97), sex: 64.4% women]. These were matched (1:2) for age and sex with 354 THA performed for hip OA, by the same surgeons. No dual mobility was used. Outcome included radiologic measurements (inclination/anteversion and leg-length), complication- and revision rates, and patient-reported outcomes including Oxford Hip Score (OHS).

Results

Post-operative leg-length difference was 0 mm (range -10-10), with a mean cup inclination/anteversion of 41°/26°. There was no difference in accuracy of reconstruction between FNF and OA patients ($p=0.3$). At 5 years follow-up, there was no difference in complication- (7.3% vs. 4.2%; $p=0.098$) or reoperation rate (5.1% vs. 2.3%; $p=0.142$) between both groups. Dislocation rate was 1.7%. OHS at final follow-up was similar [43.7 (range 10.0-48.0) vs. 43.6 (range 10.0-48.0); $p=0.030$].

Conclusions/Discussion

THA for the treatment FNF is a reliable option and is associated with satisfactory outcome. Instability was not a common reason of failure, despite not using dual mobility in this at-risk population. This is likely due to THAs being performed by arthroplasty staff.

(82)

CAN THE SAGITTAL PELVIC TILT BE PREDICTED FROM AP PELVIC RADIOGRAPHS?

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Introduction

To identify patients with abnormal spinopelvic characteristics, sagittal X-rays of the pelvis and spine are suggested/required, which are associated with increased radiation/cost. The aim of this study was to assess whether pre-operative anteroposterior pelvic radiographs (the gold standard of pre-THA) can be used to identify patients with abnormal tilt. In doing so, the secondary aim was to describe features that would allow surgeons to estimate sagittal tilt from AP pelvic radiographs.

Materials and Methods

This is a prospective consecutive, case series from a tertiary, academic, centre. 300 patients (mean age: 64.8±11.4years; 53.5% females; mean BMI: 28.9±6.0kg/m²), with osteoarthritis, listed for THA underwent detailed pre-operative radiographic evaluations of their hip- and spine anatomy/characteristics. Patients underwent standing and supine AP pelvic radiographs to measure several parameters i. distance between several anatomical landmarks (sacroccygeal joint, femoral heads, sacro-iliac joint, transischial line, trans-ASIS line, height and width of obturator foramen), which allowed for calculation of various ratios and ii. the sacro-femoral pubic angle (SFP) (Figure 1). On a standing, lateral, spinopelvic radiograph, pelvic tilt (PT) and pelvic incidence were measured (PI).

Results

Mean standing pelvic tilt in this population was 15.8°±7.6°. Moderate correlation was found between pelvic tilt and the vertical distance between symphysis and a line connecting distal end of sacroiliac joint ($\rho = -0.410$), pubic symphysis to sacroiliac index (PS-SI) ($\rho = -0.426$), ratio between height of foramen obturator and distance between tear drops ($\rho = 0.455$), sacro-femoral-pelvic angle ($\rho = -0.421$) and vertical distance from symphysis to transischial line ($\rho = 0.414$). Correlation between PT and SFP-derived PT was moderate ($\rho = 0.421$).

Conclusions/Discussion

Vertical distance from symphysis to transischial line, and ratio between height of foramen and distance between tear drops, are variables that can help to assess pelvic tilt on standing AP pelvic radiographs. An SFP value <60° can be used as a relevant screening tool for increased pelvic tilt (PT>19°). However, none of the variables on an AP pelvic radiograph strongly correlated with pelvic tilt, showing the need for additional spinopelvic radiographs in patients at-risk.

(83)

DAY CASE LOWER LIMB (TOTAL HIP AND KNEE) ARTHROPLASTY – THE EXPERIENCE FROM ROTHERHAM NHS FOUNDATION TRUST

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Introduction

Pressures on arthroplasty services have increased, exacerbated by winter bed pressures and the COVID-19 pandemic, with over 700,000 patients waiting for Orthopaedic operations. There is recognition that utilisation of day case arthroplasty pathways will be crucial for recovery from the COVID-19 pandemic. We present our experience of day case arthroplasty in a District General Hospital.

Materials and Methods

Patients who were surgically suitable and motivated for day case total hip (THR) or total knee replacement (TKR) were added to the pathway, building on an established pathway for partial knee replacements. An agreed pathway for pre-assessment, anaesthetic, analgesia, post-operative recovery, and physiotherapy was used. Physiotherapy assessed the patients in orthopaedic clinic and post-operatively on the day surgery unit where the patients then had a nurse led discharge. All operations were performed by a single surgeon. Patients were contacted day 1 post-op to ensure no concerns.

Results

Over 18 months (March 2021 to August 2022) 28 patients were added to the pathway. 22 THR and 6 TKR were performed using spinal anaesthesia and local anaesthetic infiltration by the surgeon. Average age was 59 (range 37-71) and average BMI 28.6 (range 20.8-36.4). Average ASA 2 (ASA 1 (10 patients) ASA 2 (15 patients) ASA 3 (3 patients)).

89% (25 patients) on the pathway were discharged the same calendar day as the operation with the remaining three patients discharged the next day.

There were no readmissions. At follow up 4 patients (2 TKR and 2THR) required additional follow up at 3 months. The remaining patients were discharged to routine follow up at first appointment.

Patient satisfaction with the pathway was very high. Patients reported they were happy to have been done as day case operations with pain and nausea well controlled with medication provided on discharge.

Conclusions/Discussion

Use of this protocol has shown it to be safe and effective for facilitating day case hip and knee arthroplasty even when there have been no ring-fenced elective orthopaedic beds. This pathway has been presented and adopted by other centres to facilitate day case arthroplasty operations.

(91)

USING 'TRIGGER TOOL' TO ANALYSE ADVERSE EVENTS IN FRAGILITY HIP FRACTURE

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Introduction

Patient safety is one of the most important values in modern healthcare and different strategies are being implemented to detect and prevent adverse events (AE).

The aims of this study were:

1. To determine the incidence and level of harm of AE in patients with fragility hip fracture.
2. To evaluate the utility of 'Trigger Tool', developed by the Institute for Healthcare Improvement, to identify AE.
3. To investigate the influence of oral anticoagulants on the incidence of AE.

Materials and Methods

All patients over 70 years who underwent surgery for fragility hip fracture in 2019 in our hospital were included. A minimum of one year follow-up was required.

Medical records were investigated using the 'Trigger Tool' approach to detect AE. The selected triggers were: in hospital death, reoperation, readmission in less than 30 days, surgical site infection, other infections, transfusion of 3 or more packed red blood cells units. In patients who suffered AE, the level of harm was classified according to the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) Index.

Data were analysed employing SPSS software. A multivariate logistic regression model (statistical significance: p-value < 0.05) and a Cox proportional hazards model (statistical significance: p-value < 0.1) were carried out.

Results

A total of 65 patients were included. 44 patients suffered at least one AE (66.7% of patients). 94 AE were detected (155 AE per 1000 patients-day). The most common levels of harm were 'temporary' (40.9%) and 'temporary-increasing stay' (29.4%).

The statistically independent predictors of AE were the use of anticoagulants (Odds Ratio (OR)=0.93, 95% Confidence Interval (CI) 0.389-1.474, p<0.001) and the presence of at least one trigger in the medical record (OR=1.93, 95% CI 1.326-2.208, p<0.001). In the Cox model, the use of anticoagulant agents (Hazard Ratio (HR)=1.89, 95% CI 0.916-3.91, p=0.085) and the female sex (HR=1.94, 95% CI 1.004-3.773, p=0.049) were the statistically significant independent predictors of AE.

Conclusions/Discussion

'Trigger Tool' is a useful methodology to identify AE in fragility hip fracture. 'Trigger' presence, anticoagulant use and female sex are independent predictors of AE.

(94)

THE POST COVID RECOVERY FOR ELECTIVE PRIMARY TOTAL HIP ARTHROPLASTY

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Introduction

The COVID pandemic has caused significant disruption to arthroplasty practice. In the post COVID recovery period, the need to expand arthroplasty services to meet patient demand is crucial. However there remain organizational and patient factors to consider. The aim of this study was to determine length of inpatient stay (LOS) and associated factors for elective primary Total Hip Arthroplasty (THA) in the post COVID recovery period.

Materials and Methods

Prospectively collected data of all adults undergoing THA in the COVID restriction (March 2020 – July 2021) and post COVID restriction (Aug 2021 – Nov 2022) periods in our Trust was obtained. All revision procedures were excluded. The primary outcome measure was length of stay (LOS). Factors for delayed discharges were recorded. Quantitative analyses were performed, and data analysed for trends.

Results

967 THAs were included (269 COVID restriction; 698 post COVID). No THAs were performed from March 2020 – September 2020 due to the 1st COVID national lockdown. THAs performed during the COVID restriction period compared to the post covid restriction period had an average ASA per month of 2.3 and 2.2 ($p=0.36$) respectively. LOS was 2.3 and 1.9 days ($p<0.05$) respectively. Day 1 post operative discharges were prevented by medical reasons for 54% and 49% ($p>0.05$) of patients in the COVID restriction and post COVID period respectively, with mobility (26% and 29%) and pain (10% and 10%) being other two main reasons. The most common medical reason preventing discharge was low blood pressure, followed by nausea and vomiting in both groups.

Conclusions/Discussion

In the post COVID recovery period LOS significantly improved, equating to on average 2 bed days saved per week. Medical and mobility reasons preventing discharge remained similar in the COVID restriction and post COVID recovery periods. Concerns regarding the deconditioning impact of COVID on patients impacting on increased LOS in the post COVID period were not observed. This has organisational and financial implications for planning of elective services in the post COVID phase, as hospitals aim to accelerate the volume of arthroplasty to deal with waiting lists.

(96)

COMPARING PINNING IN SITU AND CAPITAL REALIGNMENT PROCEDURES FOR SEVERE, STABLE SLIPPED CAPITAL FEMORAL EPIPHYSIS: A SYSTEMATIC REVIEWGrace Kennedy¹, Jack Pullan², Ahmed El-Bakoury²¹Royal Cornwall Hospital, Truro, United Kingdom. ²Derriford Hospital, Plymouth, United Kingdom**Introduction**

Slipped Capital Femoral Epiphysis (SCFE) is one of the commonest adolescent conditions requiring orthopaedic intervention. For severe, stable slips, it is unclear whether pinning in-situ (PIS) or capital realignment procedures (CRP) are superior.

Our primary aim was to compare rates of femoral head avascular necrosis (AVN) following PIS with rates following CRP. Secondary aims were to consider patient-reported outcome measures (PROMs) and post-operative complications.

Materials and Methods

MEDLINE, Embase and Cochrane databases were searched according to an agreed strategy. Narrative review articles, case reports, letters to the editor and articles not written in English were excluded. Articles where severe stable cases could not be distinguished from unstable or less severe cases were also excluded. The risk of bias was assessed using the Newcastle–Ottawa Scale.

Results

Of the 132 citations identified, 127 were excluded following de-duplication and application of the exclusion criteria. Three observational studies comparing PIS with CRP, and two case series considering CRP alone were identified. One article was considered fair quality, and four articles were considered poor.

In total, 198 hips from five studies were included (66 PIS, 132 CRP). AVN was reported in 1.5% following PIS and 10.6% following CRP. PIS was associated with moderate-good functional outcomes, and CRP with good-high outcomes. Two comparative studies reported significantly better PROMs following CRP. Chondrolysis occurred in 3.0% following PIS and 2.4% following CRP. Femoroacetabular impingement rates were markedly higher following PIS (60.6%) than following CRP (2.3%). Requirement for reoperation was also greater following PIS (34.5%) than following CRP (13.3%).

Conclusions/Discussion

There is a trend for PIS to be associated with favourable AVN rates but CRP with favourable PROMs and complication rates. However, there is insufficient evidence to draw conclusions regarding this, as comparisons are drawn from heterogeneous studies that lack information regarding long-term sequelae. Further high-quality research is required.

(100)

DUAL MOBILITY ARTICULATION CONFERS LOWER DISLOCATION AND REVISION RATES: A STUDY USING REVIEW OF REVIEWS METHODOLOGYSonu Mehta^{1,2}, Amit Goel¹, Uday Mahajan¹, Nallamilli Rajyalakshmi Reddy¹, Deepu Bhaskar¹¹Glan Clwyd Hospital, Rhyl, United Kingdom. ²Airedale Hospital NHS trust, Steeton, United Kingdom**Introduction**

Dislocation post THA confers a higher risk of re-dislocation (Kotwal et al, 2009). The dual mobility (DM) cup design introduced in 1974 was aimed at improving the stability by increasing the femoral head to neck ratio (Cuthbert et al., 2019) combining the ideas of low friction arthroplasty with increased jump distance associated with a big head arthroplasty.

The current systematic review and meta-analysis is aimed at understanding the dislocation rates, rates of aseptic loosening, infection rate and revision rates between the 2 types of constructs to provide current and up-to date evidence.

Materials and Methods

Medline, PubMed, embase and Cochrane databases were used based on PRISMA guidelines. RevMan software was used for doing the meta-analysis. Studies published in English which used DM construct with at least 6 months follow used as intervention and non DM construct as control were included. 2 independent reviewers conducted the review with a third reviewer in case of difference in opinion regarding eligibility. Primary outcome was dislocation rate and secondary outcome was rate of revision.

Results

From the initially identified 564 articles, 44 articles were screened for full texts and eventually 4 systematic review articles were found eligible for the study. Thus, this study became a systematic review of systematic reviews. From the 4 systematic reviews, another 35 studies were identified for data extraction and 13 papers were used for meta-analysis.

Systematic reviews evaluated, projected an average follow up of 6-8 years with significantly lower dislocation rates for DM cups. The total number of patients undergoing DM cup primary THA were 30,559 with an average age 71 years while the control group consisted of 218,834 patients with an average age of 69 years. DM group had lower rate of dislocation ($p < 0.00001$), total lower rate of cup revision ($p < 0.00001$, higher incidence of fracture ($p > 0.05$).

Conclusions/Discussion

DM THA is a viable alternative for conventional THA. The long-term results of DM cups in primary THA need to be further evaluated using high quality prospective studies and RCTs.

(101)

DOES CONSTRAINED TOTAL HIP ARTHROPLASTY FOR RECURRENT HEMIARTHROPLASTY DISLOCATION GIVES GOOD FUNCTIONAL AND MORTALITY OUTCOMES AT ONE YEARAysha Rajeev, [George Koshy](#), Abdul Badarudeen, Kailas Devalia

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Introduction

The incidence of hemiarthroplasty dislocation for fracture neck of femurs ranges between 1-15% and the one-year mortality is 49- 70% respectively. The treatment options include closed manipulative or open reduction, conversion to bipolar or total hip replacement using constrained liner and excision arthroplasty. Revision of hemiarthroplasty to total hip replacement using a constrained liner has shown to improve the morbidity and mortality rates.

The aim of the study is to assess whether conversion of dislocated hemiarthroplasty to total hip replacement improve functional and one year mortality.

Materials and Methods

The data for the study was obtained from NHFD (National Hip Fracture Database) and internal hospital computer systems (Medway, Theatre notes and PACS) between Dec 2016 and Dec 2021. The number of patients who had dislocations were identified and the treatment methods were analysed. Patient demographics including age, sex AMTS score, functional assessment, and mortality at one year were documented.

Results

A total of 1575 patients were admitted during the study period of which 741 (47%) patients had ETS hemiarthroplasty. Fifteen (2.02%) patients had dislocation of hemiarthroplasty. The mean age was 81.4 years (range – 61 to 95). There were 13 (86.7%) females and two males. (13.3%). The average AMTS score was 2.3. Nine patients had closed manipulative and one patient had open reduction. Five patients (33.33%) had recurrent dislocation and underwent revision of hemiarthroplasty to a total hip replacement using constrained acetabular cup and 44 offset CDH Exeter stem with cement-to-cement fixation. All the patients had a good postoperative recovery. All patients were mobilised and discharged early. There were no complications including infections, deep vein thrombosis, pulmonary embolism or further dislocation and all patients were alive one year follow-up. The mortality at the end of one year for the patients treated with closed/open reduction was 66.67%.

Conclusions/Discussion

This study shows that aggressive treatment of recurrent hemiarthroplasty dislocation by revising to a total hip replacement with a constrained liner gives good functional and mortality outcomes.

(107)

THE SURGICAL MANAGEMENT OF REVERSE OBLIQUE HIP FRACTURES – IS ADDITIONAL FIXATION WITH CERCLAGE CABLES NECESSARY?

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Introduction

To evaluate the benefits and risk factors of additional fixation with cerclage cables in reverse oblique hip fractures following an intramedullary nail (IMN).

Materials and Methods

A retrospective analysis was conducted from a single major trauma centre of all patients diagnosed with an isolated AO/OTA 31-A3 reverse oblique hip fracture, between 01/01/2018 and 30/06/2021.

Results

70 patients were included of which only 21.6% (n=15) had additional cerclage cable fixation. Of these, 16.4% (n=9) patients had further surgery and 74.5% (n=41) had ongoing post-operative hip/thigh pain. In the additional fixation group, all patients did not require further surgery. The average neck shaft angle (NSA) and lateral femoral wall displacement (LFW) displacement were 121.4 degrees (SD +/- 4.4 degrees) and 0.58mm (SD +/- 0.81) respectively ($p < 0.001$) in the additional fixation group and all patients had either an 'excellent' or 'acceptable' reduction quality ($p < 0.001$). 20% (n=14) of patients had a radiological non-union: none of these patients had additional cerclage cable fixation during their primary surgery. The predictive risk factors for radiological non-union were: absence of cerclage cables ($p < 0.05$); varus malalignment ($p < 0.05$); female gender ($p < 0.05$); displaced lateral femoral wall ($p < 0.05$) and reduced NSA ($p < 0.05$).

Conclusions/Discussion

The optimum management of reverse oblique hip fractures requires achieving and maintaining anatomical or near anatomical reduction. Reduction can be maintained with the use of cerclage cables. Doing so will improve patient outcomes by reducing the risk of radiological non-union/delayed union, malreduction, post-operative pain and further surgical intervention.

(116)

POSITIVE MID-TERM OUTCOMES WITH SOCIÉTÉ D'ETUDES, DE RECHERCHES ET DE FABRICATION (SERF) DUAL MOBILITY ACETABULAR COMPONENTSSamir `Salih¹, Muhammad Asghar², Mark Andrew Sohatee^{3,2}, Sanjeev Madan^{3,2}, Hari Kumar²¹South Yorkshire Deanery, Sheffield, United Kingdom. ²Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust, Doncaster, United Kingdom. ³Sheffield Children's Hospital NHS Foundation Trust, Sheffield, United Kingdom**Introduction**

Dislocation of a total hip replacement (THR) is a complication that can result in pain and morbidity for patients in addition to presenting a clinical challenge for arthroplasty surgeons. The use of a dual mobility cup may potentially reduce the number of hip dislocations in high-risk patients. The aim of this retrospective study was to evaluate the medium term outcomes of the Société d'Etudes, de Recherches et de Fabrication (SERF) dual mobility cup.

Materials and Methods

A retrospective analysis of case notes and radiographs, for patients undergoing dual mobility hip replacement (primary or revision), was undertaken. These were from a single surgeon at a single institution. Factors that were investigated included 'indication for surgery', 'survival rate and need for subsequent procedures', 'patient reported outcome measures' (PROMs), and 'dislocation rate'.

Results

During the study period, 150 patients from the series underwent a primary procedure, using the SERF dual mobility cup. Two patients required revision during the follow-up period (range: 1.2-11.7 years, mean: 5.1 years). One of these was for periprosthetic fracture and one for aseptic loosening. There were 93 patients who underwent a revision procedure using a SERF dual mobility cup. Three patients required further revision during the follow-up period (range: 1.3 – 13.9 years, mean: 7.9 years) ; however, these revision were limited to the femoral component due to aseptic loosening, and the cup was not revised. There were no dislocations in either group.

Conclusions/Discussion

When dislocation rate and revision rate are considered, the SERF dual mobility acetabular components show favourable results at the midterm follow-up evaluation. Given the potential benefits of using a dual mobility acetabular component and the reduction in the risk of dislocation, the authors feel that the selective use of this implant may confer benefits when used in at risk groups.

(117)

VIRTUAL ARTHROPLASTY FOLLOW-UP: A “GREEN” REPLACEMENT.Joshua Nadimi, Mariam Pereira, Ian Starks, Ibrahim Malek

Wrexham Maelor Hospital, Wrexham, United Kingdom

Introduction

Virtual clinics (VC) for hip and knee arthroplasty have been shown to be a cost effective and safe alternative for post-operative review. The NHS has a significant carbon footprint, and we propose our virtual arthroplasty clinic as a more sustainable, environmentally friendly approach to follow up.

Materials and Methods

Retrospective data review of a locally compiled database of virtual post-operative follow-up (total hip and knee replacements). 1-year follow up data including PROMs, outcome at VC, follow-up plan and location where the patients attended for radiographs were evaluated. Those who attended a local Xray centre instead of the main hospital site for their follow up radiographs were identified and the distance travelled was calculated. This data was then compared to a return journey to the main hospital site and the total miles and amount CO₂e saved was analysed using a carbon footprint calculator.

Results

A total of 192 primary total hip replacement patients were invited for virtual follow up between January 2020 – November 2021. 13 patients were called back for a face-to-face review for clinical reasons (recall rate 6.8%). 31% of patients attended a local centre for follow-up radiographs and avoided excess travel to our main hospital site. Patients attending their local community hospital for X-ray travelled a total of 207.1 miles (mean 3.5, range 0.4 - 6.8). We calculated total of 1114 “avoided” miles and, assuming patients arrived by motor vehicle, there was an estimated total of 335.24 CO₂e saved.

Conclusions/Discussion

Virtual clinics are a safe and more sustainable way to conduct post-operative follow up for hip arthroplasty patients. The carbon footprint generated by healthcare systems is a growing concern and our unit demonstrates a “greener” alternative to face-to-face follow up.

(118)

HIP ARTHROPLASTY IN OSTEOPETROSIS, CHALLENGES AND OUTCOME

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Introduction

Osteopetrosis is a rare inherited bone disorder in which the bones have an increased density due to osteoclast dysfunction. As osteoclasts are required for the natural turnover of osteocytes, their dysfunction will lead to excess bone formation. The prevalence of the autosomal recessive forms is 1 in 250,000 while the autosomal dominant forms are more common at a prevalence of 1 in 20,000 births. Degenerative arthritis are among the orthopaedic manifestation of Osteopetrosis, which also include pathological fracture due to the brittle nature of the bone, and bone osteomyelitis. Despite the rare prevalence of the disease, it has a specific challenge intraoperatively that require to be predicted and the outcome might be affected by the actual disease process.

The aim of the study is to conduct a systematic review to assess the effect of osteopetrosis on the functional and radiological outcomes after total hip arthroplasty.

Materials and Methods

An initial search in the databases resulted in a total of 110 articles. Searching on the Medline database resulted in 42 articles, whereas EMBASE resulted in 52, and CINAHL resulted in 16 articles. After excluding duplicates and case reports, 3 papers remained.

Results

The total number of studies used for this review was 3. The first paper had a sample size of 5 patients, the second of 7, and the final one of 534. It was shown that patients with osteopetrosis have an increased risk of developing periprosthetic fractures intraoperatively (44%) (odds ratio 5.58). They also had a higher reoperation rate (58%) in comparison with patients with healthy bones. Smaller intramedullary diameters were associated with femoral fractures in patients with osteopetrosis. However, the 10 year survival was reasonable and the procedure successfully helpful for symptoms relief.

Conclusions/Discussion

Hip arthroplasty is a valid option in managing osteoarthritis in osteopetrosis, prediction of intraoperative challenges with careful planning is paramount.

(123)

EXCELLENT RESULTS WITH THE CEMENTED LUBINUS SP II 170-MM FEMORAL STEM IN A UK ORTHOPAEDIC CENTRE AT 20 YEARS OF FOLLOW-UPGareth Turnbull, Calum Blacklock, Adeel Akhtar, Edward Dunstan, Andy Ballantyne

National Treatment Centre – Fife Orthopaedics, Kirkcaldy, United Kingdom

Introduction

The Lubinus SP II is an anatomical femoral stem with high survivorship levels notably described in the Swedish Arthroplasty Register. As the clinical and economic burden of revision total hip arthroplasty (THA) and periprosthetic fracture (PPF) continues to increase, it has been suggested that use of anatomical stems may facilitate more uniform cement mantles and improve implant survival. The primary aim of this study was to determine the long-term survivorship and PPF rate of the Lubinus SP II 170 mm femoral stem in a single UK centre.

Materials and Methods

Between 2000 and 2002, 80 consecutive THAs were performed using the 170 mm Lubinus SP II femoral stem in our institution. Patient demographics and operative details were collected in a prospective arthroplasty database. Patient records and national radiographic archives were then reviewed at a minimum of 20 years following surgery to identify occurrence of subsequent revision surgery, dislocation or periprosthetic fracture.

Results

At mean 21.1 year follow-up (SD 0.7), 25 patients (32%) remained alive whilst 2 patients were lost to follow up. Mean patient age at surgery was 66.1 years (SD 12.2, 25-88 years). There were 40 women (52%). Osteoarthritis was the operative indication in 67 patients (86%). There were 2 revisions in total (2 for acetabular loosening with original stems retained) and 6 dislocations (7.7%). Analysis of all cause THA failure demonstrated a survivorship of 98.1% (97.7%-98.5%) at 10 years and 95.5% (94.9%-96.1%) at 20 years. Stem survivorship at 20 years was 100%. There were no periprosthetic fractures observed at mean 21.1 year follow-up.

Conclusions/Discussion

The Lubinus SP II stem demonstrated excellent survivorship, low dislocation and negligible PPF rates over 20 years following primary THA. Continued use of anatomical stems such as the Lubinus SP II would appear to be a wise clinical and economic investment for patients and healthcare systems alike.

(126)

CLINICAL OUTCOMES IN PATIENTS UNDERGOING ELECTIVE TOTAL HIP ARTHROPLASTY WITH OPIOID-FREE SPINAL ANAESTHETIC, AS RECOMMENDED BY THE ERAS® SOCIETY GUIDELINESJames Bailey¹, Andrew Gaukroger¹, Hoosai Manyar¹, Khalid Malik-Tabassum^{1,2},William Fawcett¹, Kathryn Gill¹¹Royal Surrey County Hospital, Guildford, United Kingdom. ²Wrightington Hospital, Wrightington, United Kingdom**Introduction**

Spinal anaesthesia with combined local anaesthetic and opioids has long been used as the anaesthetic of choice for lower limb arthroplasty procedures. However, intrathecal opioids are associated with numerous complications. ERAS® society guidelines for total hip and knee replacements discourage the use of spinal opioids. This study aims to report the early clinical outcomes in patients undergoing total hip arthroplasty (THA) with the use of opioid-free spinal anaesthetic.

Materials and Methods

This was a single-centre, retrospective cohort study of patients undergoing THA following the implementation of the ERAS® protocol under the care of a single surgeon at a district general hospital.

Results

A total of 81 THAs in 74 patients were included, 49 female and 25 males. The mean age at surgery was 71 years (range 41-86). The average BMI was 29 (range 18-46). The ASA grade distribution was 11 ASA=1, 58 ASA=2 and 12 ASA=3. The surgical indications were osteoarthritis in 65, avascular necrosis in 1, and neck of femur fracture (NOF) in 15 patients.

The mean inpatient length of stay (LOS) in this cohort was 2.7 days (range 0-9). This was significantly shorter compared to patients that underwent THA without adherence to the ERAS® guidelines at the same institution during the same period (4.7 days), $P < 0.001$. The mean pain score in post anaesthesia care unit (PACU) was 1 (0=no pain, 10=maximum pain). All patients were mobilised within 24 hours of surgery. There were 3 readmissions within 30 days of surgery, 1 pulmonary embolism with COVID-19, 1 tibial fracture, and 1 ipsilateral knee swelling.

Conclusions/Discussion

An opioid free spinal anaesthetic is safe and effective in patients undergoing both elective and acute THA for NOF. The implementation of the ERAS® guidelines has demonstrated a significant reduction in LOS following THA at our institution, which may in turn help increase the inpatient bed capacity. This may provide one possible solution to the ever-increasing elective orthopaedic waiting list burden. Further research is underway to evaluate patient-reported outcome measures in this group.

(127)

SUSTAINABILITY AND ENVIRONMENTAL IMPACT OF TOTAL HIP REPLACEMENT SURGERYGeorge Koshy, Kiran Singiseti

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Introduction

Environmental impact of surgeries is in focus given the issues with climate change. Hospitals in general and operating theatres have a large carbon footprint. Waste from operating theatres is a significant contributor to medical waste, which in turn has a serious environmental impact.

Hip replacement surgery is one of the commonest orthopaedic procedures with the numbers projected to increase year on year. We sought to quantify the weight of disposable waste generated in an average total hip replacement surgery.

Materials and Methods

A prospective study of ten elective hip replacement procedures was undertaken to analyse the average waste generated in the procedure. At the end of each procedure, the waste was segregated into general, contaminated, recyclable and implant packaging related waste categories; this was then weighed using standardised digital scales for analysis. All procedures included were primary total hip replacement surgeries with no change to routine practice of surgeons.

Results

The data was recorded and analysed for three fellowship trained hip surgeons with a selection of uncemented, cemented and hybrid hip replacements. The mean weight of 10.88 kg waste was generated for each procedure; this was categorised as general waste 775gm, contaminated waste 8.5kg, recyclable waste 600 gm, and implant packaging related waste was 1kg.

Conclusions/Discussion

Total hip replacement surgeries produce on an average of more than 10 kg of waste even if recyclable material was separated. A considerable part of carbon footprint in hip replacement surgery comes from implant packaging and single use material. The procedure will have an even bigger carbon footprint when the anaesthetic, heating and consumables used by staff are factored in. Surgeons and their speciality societies should carefully consider best ways of reducing environmental impact of surgery whilst not compromising on safety and sterility of the procedure. Clear markings of recyclable material and working with the industry to reduce packaging might be some factors to consider.

(133)

DOES THE EXETER TRAUMA STEM (ETS) ALLOW RESTORATION OF HIP BIOMECHANICS IN SCOTTISH HIP FRACTURE PATIENTS?Kok Kiong Ang, Graeme Holt

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Introduction

Modern hip implants comprise of four components: the acetabular component, acetabular liner, femoral head, and femoral stem. Multiple companies offer prosthetic options, each offering a range of different components. NICE recommended selected options should have a revision rate of 10% or less at 10-year follow up.

The ETS is a cemented hip replacement stem used in hemiarthroplasties. Numerous studies have shown population variance in hip anatomy and careful consideration is required during selection of hip implants as there are multiple implications such as gait changes with an incorrect femoral offset.

Materials and Methods

200 Scottish patients' CT scan images were collected between Dec 2020 to Dec 2021, radiographic measurements of their hips were then matched. Demographics of patients and digital measurements of both apparent femoral offset (AFO) and TFO were recorded. The study included patients over age of 50 and excluded patients with previous hip, femur or pelvic trauma and pelvic bone malignancy. Using the Boxplot method, descriptive analysis was conducted for TFO and AFO sample distribution of men and women.

Results

Candidates for ETS were defined as those with a TFO of 40 ± 3 mm and are considered to be within the TFO range. Mean TFO across all 200 samples was found to be 40.30 mm, with Standard Deviation of 4.64 mm. Mean TFO of women and men were 37.82 mm and 42.79 mm respectively.

Only 45% of the sample population were found to be within the TFO range. 46% of women, 44% of men and 33% of very short (<150cm) and tall (>170cm) patients fell within the TFO range.

Conclusions/Discussion

This study demonstrated that 55% of the population are not eligible for using ETS. Moreover, for shorter and taller subjects, only one-third were found to be eligible. Hence, there should be alternative options for very short and tall patients.

Implants are typically sourced centrally via NHS supply chains therefore higher level governance decisions may be required to support the procurement of a wider range of femoral implants. This will improve outcomes of hip replacements in the UK.

(135)

MISSED OPPORTUNITY FOR EARLY COMPLICATION DETECTION – ANALYSIS OF FOLLOW UP OF INTERNALLY FIXED INTRACAPSULAR NECK OF FEMUR FRACTURES

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Introduction

Up to 30% of internally fixed intracapsular neck of femur fractures (NOF#) require further surgery due to complications like non-union, avascular necrosis of the femoral head, implant failure etc. Follow up is a must to identify these complications early.

Materials and Methods

This study was aimed to determine follow up, factors affecting it, number requiring revision surgery and the indications. All patients who had internal fixation for intracapsular hip fractures in our DGH were included. The 1st cycle was conducted from 2017 to 2019, based on which, interventions were introduced. A 2nd cycle from 2021 to 2022, was done to measure any improvements. Data was collected from our local NHFD database and hospital records.

Results

1st cycle: 345 out of 910 proximal femur fractures had internal fixation out of which 58 were for intracapsular fractures (30- 2 hole DHS +DRS, 15- CC screws, 9- 2 holed DHS, 4- other). No relation was found between ASA grade and follow up. Younger patients were found to have better follow up. 30 day mortality was around 7%. Therefore potentially 93% of patients should have followed up. However only 43% patients had at least 1 follow up. Assuming a 30% reoperation rate, 15% of patients would have had an undetected complication. Charts were put up to show the patients requiring follow up.

2nd cycle: 19 out of 400 patients, were intracapsular NOF#. Follow up improved to 89%. 1 patient died before the appointment. The mortality rate (30%) and rate of revision remained the same (2 in the 1st cycle, 1 in the 2nd cycle, both for implant failure). The numbers were too low to calculate significance.

Conclusions/Discussion

There are many missed opportunities in the follow up of internally fixed Intracapsular NoF#. This may manifest as poor mobility or refusal to mobilise in this elderly age group due to pain or implant failure that may go undetected.

Therefore, there should be a robust system in hospitals to ensure that this vulnerable group of patients are followed up.

(141)

ACCELERATED CARE OF PATIENTS WITH HIP FRACTURES - META-ANALYSIS OF LEVEL ONE EVIDENCEPanth Shah¹, Emma Wilson¹, Bin Chen², Nick Clement^{1,2}¹University of Edinburgh, Edinburgh, United Kingdom. ²Edinburgh Orthopaedics, Royal Infirmary of Edinburgh, Edinburgh, United Kingdom**Introduction**

Data from non-randomised studies suggests that increasing time to surgery for patients with a hip fracture is associated with worse outcomes. However, delay to surgery is more likely in patients who may be comorbid, which may lead to bias in comparisons. The aim of this review was to assess the impact of time to surgery on patient mortality, peri-operative complication rates and length of stay following a hip fracture using level one data.

Materials and Methods

A systematic literature search was conducted in November 2021. RCTs in the English language assessing the relationship between time to theatre and at least one of the outcome measures (mortality, peri-operative complications, and length of stay in hospital) were included. Two reviewers evaluated study eligibility, data extraction and assessed study quality.

Results

Three studies comparing accelerated with standard care of hip fractures, providing data on 3430 patients in total, were included for review and meta-analysis. Patients allocated to the accelerated group had their surgery significantly quicker than patients allocated to the standard care group (mean difference -13.95 hours, 95% CI -14.94 to -12.96, $p < 0.001$). There was no statistically significant differences between patient groups in mortality risk (relative risk (RR) 0.94, 95% CI 0.78 to 1.14, $p = 0.55$), risk of pneumonia (RR 1.22, 95% CI 0.87 to 1.80, $p = 0.24$), pressure ulcers (RR 1.06, 95% CI 0.76 to 1.48, $p = 0.72$), sepsis (RR 1.08, 95% CI 0.79 to 1.49, $p = 0.62$), or major bleeding (RR 1.17, 95% CI 0.88 to 1.57, $p = 0.28$). There was, however, a significantly lower risk of delirium (RR 0.74, 95% CI 0.60 to 0.91, $p = 0.005$) and infection (RR 0.83, 95% CI 0.69 to 1.00, $p = 0.05$) favouring accelerated care. The accelerated group had a significantly shorter length of hospital stay (mean difference -0.99 days, 95% CI -1.59 to -0.38, $p = 0.001$).

Conclusions/Discussion

This review has shown that accelerated care of patients with hip fractures was associated with lower risks of delirium and infection, and a shorter length of hospital stay. However, the effect of time to surgery on patient mortality is not clear, as the standard care group had a lower mortality than expected for the population at risk and had surgery on average within 24-hours of presentation.

(144)

CT-BASED MIGRATION ANALYSIS OF A CEMENTLESS CERAMIC ACETABULAR CUPSusannah Clarke¹, Kartik Logishetty¹, Camilla Halewood², Justin Cobb¹¹Imperial College London, London, United Kingdom. ²Embody Orthopaedic Limited, London, United Kingdom**Introduction**

Early implant migration can be a predictor of long-term implant failure. Migration analysis can therefore form part of the initial safety assessment of an implant before it is released for wider use. The H1 Implant is a new cementless, ceramic hip resurfacing device with a monoblock acetabular cup and resurfacing femoral head. The cementless coating is vacuum plasma sprayed (VPS) titanium and hydroxyapatite.

Recent studies have shown CT to be a suitable imaging technique for measuring implant migration, with comparable accuracy to radiostereometric analysis (RSA). CT was used to measure migration of The H1 acetabular cup.

Materials and Methods

Patients were recruited to an ethically approved clinical investigation (ISRCTN91554748), in which 250 H1 Implants were implanted in 224 patients. A safety cohort of 66 patients underwent more intense follow-up, including migration analysis. Each patient had an unmodified cementless monoblock ceramic acetabular cup (H1, Embody Orthopaedic Limited) implanted into their acetabulum, and tantalum beads implanted into their pelvic bones. The corresponding H1 femoral head was implanted onto the femur.

Patients underwent low dose CT imaging at 2 days, 6 weeks, 3 months, 6 months, 12 months and 24 months. At each time point, the movement of the implant relative to the bone since the 2 day time point was calculated.

Results

“Zero migration” was defined as no significant difference found between total translation at 3 months and 24 months. The 3 months data point was used as a baseline instead of the 2 day data point to allow for any post-operative settlement as this is a cementless acetabular cup and some post-operative settlement is expected with such devices. The H1 acetabular cup translation was not significantly different between 3 months and 2 years.

Conclusions/Discussion

A cohort of 66 patients underwent hip resurfacing surgery and received a cementless monoblock ceramic acetabular cup which was followed up with CT-based migration analysis for 2 years. There was zero migration of the device between 3 months and 2 years. The device has been shown to be stable, and there is no early indication of long term loosening.

(146)

AN INCREASED INCIDENCE OF AVASCULAR NECROSIS AS THE PREDISPOSING AETIOLOGY FOR PRIMARY TOTAL HIP ARTHROPLASTY (THA) IN SUB-SAHARAN AFRICA - A RETROSPECTIVE REVIEW OF 2500 CONSECUTIVE PATIENTS

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Introduction

Worldwide, there are 1 million Total Hip Arthroplasties (THA) performed annually with this number increasing to 1,4 million by 2025. This places a significant burden on healthcare systems globally. Several factors ultimately contribute to the demand for THA and subsequent surgical outcomes and complications including the preoperative diagnosis which cannot be modified. Therefore, the aim of our paper was to describe the various aetiologies of hip pathologies in patients presenting for primary elective THA.

Materials and Methods

We retrospectively reviewed 2,500 consecutive patients presenting for elective primary THA between 2016 and 2021 in a sub-Saharan (SSA) academic institution. Patients' preoperative clinical notes, radiological records, serological and pathological records were evaluated. A comparison of the presenting preoperative aetiologies was made between those seen in both developed and other developing countries.

Results

3885 pathological hips were evaluated. Bilateral pathology was present in 2175 (56%) patients of which 92% had the same pathology bilaterally. There were 427 (31%) males, an average patient age of 58.80 ± 14.13 years and average BMI of 28.01 ± 5.13 kg/m². The predominant preoperative aetiologies included primary osteoarthritis 1126 (29%) and avascular necrosis of the hip (AVN) 932 (24%). The primary cause of AVN was HIV (50%) ($p=0.035$). Patients presenting with AVN were significantly younger ($p < 0.003$) and had a BMI < 30 kg/m² ($p < 0.002$) in comparison to patients presenting for other pathologies.

Conclusions/Discussion

There is a significantly greater proportion of patients in SSA presenting for primary THA with AVN compared to developed countries. 1 in 5 patients presented with AVN of the hip of which the majority are HIV related. Patients presenting with end stage HIV related hip pathology are statistically younger than patients presenting with other hip pathologies. We therefore believe the demand for THA may be limited and healthcare costs reduced by programmes designed to monitor this at-risk group prior to hip complaints.

(150)

TOTAL HIP REPLACEMENT IN UNIQUE SUBSET OF SKELETALLY IMMATURE PATIENTS – WHAT DOES INDIAN REGISTRY DATA TELL US?Javahir Pachore, Vijay Bose, Harish Bhalodiya, Vaibhav Bagaria

Indian Joint Registry, Ahmedabad, India

Introduction

In 2007, the Indian Joint Registry began a study and established a mechanism for online submitting and managing patient data for patients. These included a unique subset of those with skeletally immature bones.

Materials and Methods

The data was collated from submissions made over a period of 15 years. All patients who were less than 18 years at the time of performing surgery formed the study group. The relevant data points collected pertained to demographics, aetiology, technique, and implant type. Thirty-three surgeons contributed to this subset comprising of 114 patients of whom 70 were males and 44 were females.

Results

Most number of patients 51 were diagnosed with AVN (various causes), while 17 were diagnosed with ankylosing spondylitis, 12 cases of rheumatoid arthritis, 10 dysplasia, 8 failed fractures, 3 osteoarthritis, and 15 other varied clinical conditions. Most of the patients were between the ages of 15 and 18 years, and the youngest was 12. An average follow-up period for a patient was seven years. The data revealed 107 had uncemented implants, 3 patients had cemented implants and four had hybrid implants. At average follow up of 7 years there was no revisions in any of the case.

Conclusions/Discussion

The data from the Indian Joint Registry in this very specific yet relevant group of skeletally immature patients reveal that commonest primary aetiology is AVN and that the surgeons preferred to preform uncemented hip replacements for these cases. The THR done for these young patients tend to perform well on medium term follow up with no revisions being reported at a mean follow up of 7 years.

(158)

POST-TRAUMATIC STRESS DISORDER IS MORE LIKELY IN YOUNGER PATIENTS UNDERGOING HIP ARTHROPLASTY AND IS ASSOCIATED WITH WORSE PREOPERATIVE FUNCTION AND HEALTH RELATED QUALITY OF LIFEAndrew Womersley¹, Nick Clement^{1,2}, Sam Jones¹, Irrum Afzal¹, Richard Field¹, Deairy Kader¹¹South West London Elective Orthopaedic Centre, London, United Kingdom. ²Edinburgh Orthopaedics, Royal Infirmary of Edinburgh, Edinburgh, United Kingdom**Introduction**

The association between depression and poorer outcomes following arthroplasty is recognised. There is limited evidence regarding the prevalence and associations of PTSD with pre-operative function in patients undergoing arthroplasty. The primary aim was to assess whether a provisional diagnosis of PTSD was associated with preoperative joint specific function and health related quality of life (HRQoL) in patients undergoing total hip arthroplasty (THA). The secondary aim was to assess whether a provisional diagnosis of PTSD was associated with independent preoperative factors to identify patients at most risk.

Materials and Methods

This retrospective review collected data from a single centre arthroplasty database over 2-years (01/01/2020-01/12/2022). Patients undergoing THA completed pre-operative Oxford hip score and EuroQoL general health questionnaire (EQ-5D) to assess joint specific function and HRQoL. 6-months postoperatively, patients completed the self-reported PTSD Checklist for DSM-5 (PCL-5). With scores ranging from 0-60, a threshold score of 31 or greater determined a provisional diagnosis of PTSD. Logistic regression analysis was used to identify independent preoperative variables associated with PTSD.

Results

1244 patients completed the PCL-5; 42 patients (3.4%) had a score of ≥ 31 (PTSD group) and 1202 (96.6%) scored < 31 (subthreshold group). The PTSD group was significantly younger (mean 60.4) than the subthreshold group (mean 70.7); ($p < 0.001$). The preoperative Oxford hip scores of the PTSD group were significantly lower than the subthreshold group (14.2vs19.7 respectively; $p < 0.001$), as were the EQ5D scores (0.134vs0.330 respectively; $p < 0.001$). Age was the only significant preoperative factor associated with the PTSD group (odds ratio 0.929 with each increasing year, 95%CI 0.904 to 0.956); $p < 0.001$). Patients < 65 years had 71.8% sensitivity and 72.7% specificity of having PTSD on receiver operating characteristic curve analysis.

Conclusions/Discussion

Approximately 1 in 30 patients undergoing THA met criteria of a provisional diagnosis of PTSD; they were 10 years younger with worse preoperative joint specific function and HRQoL. Psychological screening could be used to identify patients who would benefit from counselling and readiness for THA, with those aged < 65 most at risk.

(159)

USING THE CAPABILITY, OPPORTUNITY, AND MOTIVATION MODEL OF BEHAVIOR (COM-B) TO IMPLEMENT A PATHWAY TO REDUCE 30-DAY ELECTIVE EMERGENCY ADMISSIONS.

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Introduction

A high value 30-day emergency readmission may indicate that patients experienced a complication related to the treatment once they returned home resulting in readmission. A quality improvement project with a board-approved pathway was introduced to reduce elective re-admissions. The aim of this project was to review the readmission rates following implementation of this pathway and discuss the importance of its introduction in future elective orthopaedic centres.

Materials and Methods

The pathway involved providing patients with a telephone and email contact details if they required any non-life threatening medical assistance allowing for nurse led management of all complaints in the first instance. Pathway implementation included a new clinic room available 7 days and same day ultrasound scanning for DVT studies. A capability, opportunity and behaviour model of change was implemented.

Data for readmission rates before and, prospectively for six months, after implementation of the pathway were collected using Model Hospital Services using Getting It Right First Time (GIRFT) metrics (based on Hospital Episode Statistics data). Our local Electronic Hospital System used for documenting patient communications, was analysed for patient outcomes following pathway utilization.

Results

Prior to implementation, readmission rates following elective primary total hip replacement (THR) at the 1st business quarter of 2021 (April – June 2021), was 7.0%, (above the benchmark of 3.2%). Following the pathway, readmission rates decreased to 3.8% (October – December 2021). 51% of patients making contact were managed with telephone advice. 5.1% of patients required face-to-face clinic follow up. 30% required a same day scan to exclude DVT (0/4).

Despite the implementation of the pathway, 21 out of 884 THRs performed in the same period were re-admitted within 30 days. The reasons for readmission were 60% surgical and 40% medical. A third of patients re-admitted were unaware of contact information. Discharge information has been modified to provide clearer contact information with expectation to further reduce readmissions.

Conclusions/Discussion

This pathway has significantly reduced re-admission rates in our centre and could be used as tool to reduce readmission rates in other elective treatment centres

(160)

IMPLEMENTATION AND EVOLUTION OF THE REGIONAL REVISION HIP AND KNEE ARTHROPLASTY MULTIDISCIPLINARY TEAM MEETING IN SOUTH WEST LONDON.Irrum Afzal¹, Sarkhell Radha^{1,2}, Philip Mitchell^{1,3}¹South West London Elective Orthopaedic Centre, London, United Kingdom. ²Croydon University Hospital, London, United Kingdom. ³St George's Hospital, London, United Kingdom**Introduction**

Multidisciplinary team (MDT) meetings in orthopaedic surgery are evolving. The goals include patient optimisation, surgical planning and discharge arrangements, individually on a patient specific basis. In line with British Hip society, British Association Surgery of the Knee and GIRFT guidelines, we report our regional experience on the implementation and evolution of our regional Revision Hip and Knee Arthroplasty MDT.

Materials and Methods

We undertook a retrospective review of the process, cases discussed, and quality assurance conducted in the weekly South West London MDT. Each meeting is attended by consultants from six different hospitals within the South West London and KSS regions, chaired by our network Lead.

Results

Since implementation of the MDT meeting in January 2019, 755 patients with painful joint replacements have been discussed. In May 2021, we formalised our 'terms of reference' and 'standard operating procedures' which are adhered to by the consultants operating within the network, all of whom attend the meeting. A proforma has been developed and is completed for all cases capturing all pertinent information. All cases are graded according to R1, R2, or R3 complexity scale. Since its inception, the MDT has looked at all post-operative imaging, we now describe a new classification system for grading the appearances. Confirmation of the pre-operative plan and actual surgical intervention is reviewed and audited. In addition, confirmation of indication of revision at the time of operation is reviewed and validated for accuracy with benefits to the unit, individual surgeon and the NJR.

Conclusions/Discussion

In conclusion, the implementation of the revision MDT facilitating pre-operative revision arthroplasty discussion and post-operative quality assurance processes enable surgeons to educate, reflect on their practice and ensure that the highest standards of care are being provided.

(162)

ORTHOPAEDIC INTERVENTION FOR SPINAL INJURY PATIENTS WITH NON-HEALING PRESSURE ULCERSFaye A. Loughenbury¹, Wajid Raza², Simon C. E. Jones¹¹Pinderfields Hospital, Mid Yorkshire Hospitals NHS Trust, Wakefield, United Kingdom. ²Yorkshire Regional Spinal Injuries Centre, Mid Yorkshire Hospitals NHS Trust, Wakefield, United Kingdom**Introduction**

The lifetime incidence of developing a pressure ulcer in a spinal cord injured patient is 86%. Pressure ulcers can lead to life-threatening complications, recurrent hospitalisations and multiple operations. Trochanteric ulcers are less common than ischial ulcers but are usually associated with osteomyelitis and are difficult to treat without radical debridement. When hip subluxation/dislocation is seen alongside chronic trochanteric ulceration that has failed to respond to non-operative management an excision arthroplasty ('Girdlestone procedure') is indicated.

Materials and Methods

This is a case series of 10 patients (12 pressure ulcers) treated with excision of the femoral head, debridement, and primary closure of the wound without tension. All had chronic non-healing or recurrent trochanteric pressure sores, and all had previous surgical debridement of pressure ulcers. The majority of patients (10/12) had dislocated hips. All patients had pre-operative MRIs to confirm the extent of osteomyelitis. The surgical technique and post-operative treatment and rehabilitation was standardised for each patient.

Results

Twelve excision arthroplasty procedures performed on ten patients were included (two bilateral cases). 8 patients were quadriplegic and 2 were paraplegic. All patients had spinal cord injuries classified as ASIA (American Spinal Cord Injury Association) grade A or B. Following excision arthroplasty all pressure sores were fully healed at six-month follow-up. There were no cases of persistent deep infection, wound breakdown, venous thromboembolism or recurrent pressure necrosis. Patient mobility was significantly improved following surgery with a reduction in reported pain levels and reduced need for nursing and tissue viability care. Pain is often a presenting symptom of a stage I ulcer in the patient with intact sensation, but the lack of protective sensation in patients with SCI places them at higher risk for delayed presentation of pressure ulcers.

Conclusions/Discussion

This case-series suggests that timely excision of the femoral head and direct closure leads to excellent healing rates of previously non-healing ulcers. Longer term follow-up is needed to ensure that femoral-head excision does not lead to the development of ischial pressure sores due to the altered biomechanics.

(163)

THE RELATIONSHIP BETWEEN THE STRYKER CEMENT PLUG AND THE EXETER STEM SIZE AS AN OPERATIVE GUIDANCEMunir Khan, Ashraf Awad

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Introduction

Exeter stem is a commonly used stem for total hip arthroplasty in the United Kingdom. Pre-operative templating is essential in surgical planning. We want to report another method of confirming the stem size intraoperatively. This is the relationship of the stem with the Exeter stem plug.

Materials and Methods

Retrospective study for cemented Exeter stem, we identified a relationship between the Stryker plug and the stem size with confident interval of 95% in our study.

Results

Plug 10 corresponds to stem 0

Plug 12 corresponds to stem 1

Plug 14 corresponds to stem 2

Plug 16 corresponds to stem 3

Plug 18 corresponds to stem 4

This can be a useful guidance intraoperative to avoid varus positioning of the stem and can be used in conjunction with preoperative templating.

Conclusions/Discussion

There is a relationship between Exeter stem and Stryker plug. This is a retrospective study; we have not found any other publications who has mentioned this relationship before. We have planned a prospective study for further confirmation this relationship.

(165)

CLINICAL OUTCOMES OF PROXIMAL FEMORAL DEROTATION OSTEOTOMY PERFORMED CONCURRENTLY WITH IPSILATERAL HIP ARTHROSCOPY.Saumil Shah, Andrew Langdown, Vitali Goriainov

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Introduction

The management of patients with rotational malalignment of the hip resulting in impingement is complex, especially if compounded by intra-articular pathology. Rotational correction of proximal femur can be stabilized with either plates or intramedullary nails. We reviewed these two methods of proximal femoral rotational correction when combined with hip arthroscopy.

Materials and Methods

We reviewed patients that underwent concurrent ipsilateral hip arthroscopy and proximal femoral derotation osteotomy (PFDO) for proximal femoral retroversion. PFDO was either stabilized with a plate (PS) or intramedullary nail (IMS). We analysed operative time, blood loss, time-to-union (radiologic), pain and functional outcomes.

Results

Each group consisted of 7 patients, average follow-up 45 months (20-65). Average age at operation – 22 and 27 years in PS and IMS groups, respectively. All patients had associated intra-articular bony pathomorphology (CAM/pincer lesions and labral tears) treated during hip arthroscopy as the first step. Average proximal femoral retroversion was 5 degrees (3-13) and 7 degrees (2-15) in PS and IMS groups, respectively. Subsequent PFDO operative time was 118 (105-130) and 95 (80-105) minutes in PS and IMS groups, respectively. Blood loss was 450 and 280 mls in PS and IMS groups, respectively. The average time-to-union was 8 and 7.6 months in PS and IMS groups, respectively. Average score improvements from pre-op to 12 months post-op were:

- pain – 8 to 1.2 and 7.9 to 0.9 in PS and IMS groups, respectively;
- iHOT12 – 31.8 to 91.6 and 26.7 to 94 in PS and IMS groups, respectively;
- NAHS – 52.9 to 93 and 45 to 95.1 in PS and IMS groups, respectively;
- UCLA – 2.8 to 6.4 and 2.6 to 7 in PS and IMS groups, respectively.

Conclusions/Discussion

The outcomes of PFDO stabilized with intramedullary nail were superior to the plate. We feel that in the presence of combined intra- and extra-articular patho-morphology contributing to the FAI phenomenon that failed to be resolved non-operatively, both aspects need to be addressed. Although the outcomes of concurrent hip arthroscopy and PFDO are encouraging, the question of timing of the two steps persists.

(166)

IMPACT ON 1-YEAR MORTALITY AFTER CONCOMITANT NECK OF FEMUR AND PROXIMAL HUMERUS FRACTURES

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Introduction

Combined hip and upper-extremity fractures hinder early mobilization, hence affect rehabilitation and mortality. Proximal humerus is the third most common frailty fracture behind hip fractures and distal radius fractures. Implications on mortality and morbidity on hip fractures has been reported widely in literature, however few studies report hip fractures with concomitant proximal humerus fractures in geriatric age group. We compared average length of stay and 1-year mortality in combined hip and proximal humerus fractures with isolated hip fractures.

Materials and Methods

A single-centre retrospective study over 11 years (January 2009- December 2019) identifying patients with concomitant neck of femur fractures with proximal humerus fractures in patients over 60 years of age. Data collection included demographics, ASA grade, co-morbidities, pre-fracture mobility, fracture pattern, operative intervention, post operative mobility, length of stay, discharge destination and 30-day and 1-year mortality was collected. Pathological fractures, peri-prosthetic fractures, and high energy mechanism injuries were excluded.

Results

A total of 116 patients were identified with concomitant fractures, out of which 114 proximal humeri were managed conservatively and 2 patients were surgically fixed. All neck of femur fractures were operatively fixed. Postoperatively, delayed weight-bearing was planned due to proximal humerus fractures. An ASA grade of an average 3 was documented in all patients with this injury. Average length of stay in the hospital was ~24 days compared to 15 days for isolated neck of femur fractures. The 30-day mortality of these fractures 11.40% and 1-year mortality of 42.11% compared to isolated neck of femur fractures have 6.5% at 30-day mortality and 30% at 1 year.

Conclusions/Discussion

Neck of femur fractures and proximal humerus fractures are both frailty fractures. However, a combination of these two injuries is seen in very frail patients with a higher number of co-morbidities and poor cognitive function. 1-year mortality in this cohort is higher compared to isolated neck of femur fractures.

(167)

A REVIEW OF UK POPULATION DATA AND WAITING TIMES FOR PATIENTS WITH FAI SYNDROME

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Introduction

This abstract describes a review of UK femoro-acetabular impingement (FAI) syndrome population data and waiting times by the UK Hip Physiotherapy Network

In 2019 the International Society of Hip Preservation (ISHA) published guidance on physiotherapy assessment and treatment of patients with FAI syndrome. Where research evidence was lacking, the consensus of expert Physiotherapists and Orthopaedic Surgeons was sought on best practice. At least 17 of the 19 clinicians involved were based in private healthcare settings making the generalisability of recommendations to public healthcare settings problematic.

We therefore identified a need to describe our UK NHS population in greater detail, in order to understand it's needs, challenges, but also to be able to generalise research findings to it accurately.

Materials and Methods

During 2022, members of the UK hip physiotherapy network reviewed UK FAI Syndrome population data and waiting times.

A review of the FAIT and UK FASHIoN trial demographics (total 469 patients) was conducted and compared against the 2022 NAHR report.

A review of waiting times for Physiotherapy, Surgical opinion and Surgery was conducted across 6 UK Specialist Centres with a Young Adult Hip Service.

Results

The mean age of UK patients was 35.75 years (majority of patients undergoing FAI surgery on NAHR <55); female gender 52.5% (NAHR 60%), BMI 26.2 - only reported in FAIT trial (NAHR 24); duration of symptoms >37 months (only reported by UK FASHIoN study).

Waiting times for Physiotherapy ranged from 2 days to 8 months, for a Specialist Young Adult Hip Surgical Clinic Appointment ranged from 6 weeks to 2 years and waiting times for Surgery ranged from 9 weeks to 12 months. The patient journey from Physiotherapy referral to surgical intervention (accounting for 6-8 weeks of Physiotherapy intervention), could take from 10 months up to 3 years and 2 months.

Conclusions/Discussion

The review has provided important baseline UK Population and waiting time data for patients with FAI syndrome. The review identifies that patients are waiting for prolonged periods with symptoms and in accessing treatment, which may potentially have a detrimental effect on prognosis.

(168)

DID THE COVID PANDEMIC AFFECT OUTCOMES FOR PATIENTS HAVING TOTAL HIP ARTHROPLASTY FOR HIP FRACTURE?

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Introduction

As per NICE criteria, total hip arthroplasty (THA) can provide superior clinical and functional outcomes in selected patients with intracapsular hip fractures. This study compares the outcomes of patients with hip fractures treated with THA during COVID and the previous year. The primary outcome measure was mortality, with secondary outcome measures being the length of stay (LOS), discharge destination, follow-up time, and complication rate. In-hospital COVID infection is reported in patients treated during the pandemic.

Materials and Methods

Data were collected for one year in 2020, during COVID, and an equivalent period in 2019, using the National Hip Fracture Database. Eligible patients, per the NICE criteria for THA after hip fracture, are included in the study. This data was further examined using local IT systems. All patients were followed up for a minimum of one year to report the overall survival in both groups.

Results

741 patients had hip fractures pre-COVID vs 632 during COVID. Fifty-nine patients had THA pre-COVID vs 47 during the pandemic. Gender and ASA distribution were similar; however, the patients during COVID were younger compared to the pre-pandemic year (73 years vs 77 years, $p=0.05$).

No mortalities reported in patients treated with THA during the pandemic compared to three in the pre-pandemic year ($p=0.12$).

Average LOS during COVID was 13.2 days vs 10.8 pre-covid ($P=0.167$). All patients returned to their pre-hospital discharge destination during COVID compared with 87.7% the previous year ($P=0.0126$).

Complication rates were 27% pre-COVID vs 21% during the pandemic ($P=0.5$) with one re-operation during pre-COVID. Two patients developed asymptomatic COVID-19 infection.

Conclusions/Discussion

The study demonstrates that THA for selected hip fracture patients can be safely delivered with a satisfactory outcome and lower mortality even during the pandemic. Average LOS during the pandemic is higher, potentially suggestive of the logistic constraints during COVID. However, a significantly higher number of patients returned to their pre-admission destination during the pandemic. In summary, we should seek to employ lessons learned during COVID to continue improving the care for our patients as practice returns to normal.

(169)

DOES COVID LEAD TO INCREASED MORTALITY IN NECK OF FEMUR FRACTURE PATIENTS: A MULTICENTRE RETROSPECTIVE STUDY

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Introduction

Several studies have shown that patients over 65 years have a higher mortality with covid. Combine with inherently increased morbidity and mortality in neck of femur (NoFF) fractures, it is logical to think that this subset would be most at risk.

Study aim- to investigate whether there is actual increase in direct mortality from Covid infection in neck of femur fracture patients, also investigate other contributing factors to mortality with covid positivity and compare the findings with current available literature.

Materials and Methods

1-year cross sectional, retrospective study from 1st March 2020 at two DGHs, one in Wales and one in England. Surgically treated NoFF patients with isolated intra/extracapsular fracture included. Mortality analysis done by creating a matched comparison group for each risk factor and combinations known to confer highest mortality. Chi square test for independence used to compare COVID status with 1 year mortality.

Results

610 patients, 62 patients had COVID-19 RT-PCR+ive test during hospital stay/in the community. 21(34%) deaths in COVID positive and 95 (17.33%) deaths in COVID negative patients. There was no mortality in ASA 1 or 2 patients. Mortality rates in matched groups for age and ASA revealed 22.8% mortality in COVID positive as opposed to 20.6% in COVID negative patients for ASA 3 ($p=0.805$). ASA 4 data revealed 31.8% mortality in covid positive vs 60% mortality in covid negative patients ($p=0.039$). Further analysis of as a matching with 10-year age ranges from 65 years revealed a nearly double mortality rate in covid+ group as opposed to covid negative for both ASA 3 and 4 groups. Parameters such as preinjury mobility, residential status, AMTS score, time to surgery, did not seem to play a significant role in mortality.

Conclusions/Discussion

This study is the first of its kind with a large subset of patients and unique parameters to identify causes leading to mortality in the vulnerable population of NOFF. It confirms a higher mortality in Covid positive NOFF patients, but the increase may not be as significant as identified by most current studies in the literature.

(173)

DO WE NEED MORE METAL? MANAGEMENT OF ACETABULAR BONE DEFECTS IN REVISION – TYPE 2C TO 3 USING A BIOABSORBABLE CERAMIC CARRIER AND ALLOGRAFT.Shahnawaz Khan¹, Amit Churvedi², Shahrukh Dotivala², Satish Kutty²¹Nuffield Orthopaedic Centre, Oxford, United Kingdom. ²Princess Alexandra Hospital, Harlow, United Kingdom**Introduction**

The management of acetabular bone defects in revision total hip arthroplasty represents a unique challenge. Interventions are varied but have converged on the use of metal augments, cages and jumbo cups depending on the size of the defect. The use of larger metal constructs comes with increased co intraoperative and post operative complications costs. We present data on the use of Injectable Bi-phasic bone Substitute in the management of type 2C- 3B acetabular bone defects in revision hip arthroplasty.

Materials and Methods

Cases where the senior author utilised this novel technique between Jan 2017 and Dec 2020 with a minimum of 2 year follow up were included in the study. Patients were prospectively followed-up and data was retrospectively collected. Primary outcomes were radiological evaluation of the acetabular components assessing for osseointegration in each of the DeLee and Charnley zones or any evidence of implant migration. Secondary outcome was revision procedure in the follow up period with revision for any cause deemed a failure of the procedure.

Results

A total of 11 patients were followed up for an average of 30months (24-52). The average age of patients at surgery was 78yrs (71-84). Patients had not previously undergone any revision procedures. The average time since primary procedure was 142 months. At most recent review there was no evidence of implant migration in any of the cases. 3 cases demonstrated persistent latency at last follow-up although this was not related to implant migration and no progression of latency was noted. There were no instances of revision surgery for any of the cohort. All patients had an increasing OHS in comparison to pre-operative findings ($P < 0.01$).

Conclusions/Discussion

This proof-of-concept study demonstrates a novel technique where a composite structure of femoral bone allograft and CERAMENT with impaction grafted to large acetabular defects is cheap, safe and effective in managing large bone defects.

(175)

TOPICAL TRANEXAMIC ACID WASH TO REDUCE BLOOD IN TOTAL HIP ARTHROPLASTY - DO THE NICE GUIDELINES WORK?Stasha Abhee, Jay Patel, Guy Slater, Syed S. Ahmed

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Introduction

Many randomised controlled trials and meta-analysis studies have presented the efficacy of tranexamic acid (TXA) without an increase of complications. 2 of the surgeons adopted the NICE guidelines on topical TXA relatively early in our Trust and report the blood loss, drop in Hb, transfusion rate, length of hospital stays and occurrence of DVT/PE using this protocol in hip replacements.

Materials and Methods

100 total hip replacements performed by 2 arthroplasty surgeons using both IV and topical tranexamic acid wash were included in the study. No revision joint replacements were included. Data was collected on Total blood loss, hidden blood loss, transfusion rate, hemoglobin drop, length of hospital stay and the occurrence of deep venous thrombosis (DVT)/ pulmonary embolus (PE). Data was also collected on any readmissions related to the formation of haematoma or increased bleeding from the wound site.

Results

TXA leads to statistically significant reduction of peri and postoperative bleeding and in that way decreases blood transfusion rates and the infection risk. Topical and intravenous (IV) use of TXA revealed similar results, with no increase of deep venous thrombosis.

Conclusions/Discussion

Blood loss control with TXA, a synthetic analogue of the amino acid lysine, may be an excellent and safe alternative to allogeneic blood transfusion after total hip arthroplasty with no haematoma formation or increased risk of DVT/PE.

(180)

MACHINE LEARNING CAN PREDICT DIFFICULTY IN ANTERIOR APPROACH TOTAL HIP ARTHROPLASTY, TO IMPROVE PATIENT SAFETY AND SURGICAL TRAINING

Thomas Edwards¹, Jonathan Lex², Hariharan Subbiah-Ponniah¹, Ross Davidson¹, Mustafa Al-Zubaidy¹, Irrum Afzal³, Richard Field³, Alexander Liddle¹, Justin Cobb¹, [Kartik Logishetty](#)¹

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Introduction

Anterior approach total hip arthroplasty (AA-THA) has a long learning curve even for experienced surgeons, with increased complication rates in the first 50-100 cases. The early risk in adopting new or complex techniques can be mitigated by appropriate surgical case selection during a surgeon's learning curve. This study aimed to identify patient- and radiographic factors associated with AA-THA difficulty using machine learning (ML).

Materials and Methods

Consecutive patients with primary AA-THA performed by two expert, right-hand dominant surgeons in two centres were recruited to this study. Patients who had undergone previous hip surgery, and the first 100 AA-THA cases performed by each surgeon, were excluded, leaving 328 THAs for analysis. K-means prototype clustering – an unsupervised ML algorithm – was used with two variables - operative duration and surgical complications within 6 weeks - to cluster operations into difficult or standard groups.

Radiographic measurements (neck shaft angle, offset, LCEA, inter-teardrop distance, Tonnis grade) were measured by two independent observers. These factors, alongside patient factors (BMI, age, sex, laterality) were employed in a multivariate logistic regression analysis and used for k-means clustering. Significant continuous variables were investigated for predictive accuracy using Receiver Operator Characteristics (ROC).

Results

A total of 198 operations (60%) were classified as standard, with the remaining 130 (40%) being difficult. The operative time for the difficult group was 106mins (range 99-116) including 2 complications, with the standard group exhibiting a mean operative time of 77mins (range 69-86) and 0 complications. Two factors were associated with operative difficulty: Tear-drop to tear-drop distance (odds ratio [OR] 0.97, 95% confidence interval [CI] 0.95-0.99, $p = 0.03$) and right-sided operations (OR 1.73, 95% CI 1.10-2.72, $p = 0.02$). ROC analysis for TTD and sided-surgery showed poor predictive accuracy alone, with area under the curve of 0.56. Excellent inter-observer reliability was reported (ICC >0.7).

Conclusions/Discussion

Right-sided hips (for right-hand dominant surgeons) and decreasing inter tear-drop distance were associated with case difficulty in AA-THA. These data could guide case selection during the learning phase. A larger dataset with more complications may reveal further factors.

(181)

DEVELOPMENT OF A CLINICAL DECISION SUPPORT ALGORITHM FOR MUSCULOSKELETAL HIP PAIN ACROSS AN INTEGRATED CARE SYSTEM

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Introduction

Musculoskeletal (MSK) pain affects up to 20 million of the UK population. Variation in clinical expertise and services has historically led to variability in patient treatment pathways. There are currently large elective backlogs and a need for the NHS to deliver an efficient Net Zero carbon emissions service. It was identified that a more streamlined and evidence-based patient pathway algorithm for Primary Care facing Clinicians managing adults with MSK hip pain across the Birmingham and Solihull (BSol) Integrated Care System (ICS) was needed. The aim was to direct patients to the most appropriate care services, reduce duplication of work, wastage of resources, unnecessary patient travel, health inequalities and optimise patient management.

Materials and Methods

The BSol MSK Transformation project commenced in November 2021, bringing together a diverse multi-disciplinary team (MDT) of MSK Clinicians and Stakeholders from across Primary and Secondary Care services.

A novel clinical pathway development and operations (ClinicalDevOps) platform, CrossCover OrthoPathway (www.crosscover.co.uk), created by Primum Digital Limited, was used by the MDT to collaboratively design, build, test and deploy optimised MSK decision support pathways into primary care workflows.

GIRFT guidance and the NHS Best MSK framework were referenced throughout the development process. Discussions were held over twelve months which comprised nine stakeholder face to face/ virtual meetings and regular communications across the teams using an agile iterative approach to develop an efficient algorithm.

Results

The integrated MDT developed a comprehensive decision support algorithm for Primary Care Clinicians managing adults with MSK hip pain. We standardized and streamlined the patient pathway by including self-management tools to support Patient Initiated Follow-Up (PIFU), evidenced based advice, shared decision making, balanced treatment plans, appropriate investigations, and suitable onward referral.

Conclusions/Discussion

We managed to design a system to support Primary Care Clinicians in making the best decisions for adult patients presenting with MSK hip pain. This was achieved with effective project management, collaborative working and utilising modern cloud-based software to deliver best practice into the workflow of our staff. A Pilot evaluation in GP practices across BSol is planned for February 2023.

(185)

IMPACT OF COVID-19 ON THE LENGTH OF STAY IN PATIENTS WITH NECK OF FEMUR FRACTURE – A 3 YEAR RETROSPECTIVE AUDITXin Yi Foong, Deepu Bhaskar

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Introduction

Since the COVID pandemic in 2020, there is a perceived increase in hospital length of stay (LoS). This is especially true in Neck of femur fracture (#NoF) patients who tend to be elderly, frailer and the condition is associated with significant morbidity and mortality. The aim of the audit is to assess the impact of COVID-19 on average (ALoS) and median length of stay (MLoS) in #NoF.

Materials and Methods

Retrospective data submitted to National Hip Fracture Database (NHFD) for first six months in 2019 (143 patients) and 2021 (128 patients) were studied. A second cycle for #NoF for first half of 2022 (146 patients) following appointment of a discharge coordinator for trauma was also analysed. This was compared to national length of stay available on NHFD. All #NoF above 60 included, while inpatient mortality and unrecorded discharge dates were excluded. The ALoS and MLoS for both periods were compared, with further breakdown to age, sex, fracture subtypes, operation performed, premorbid status and discharge destination.

Results

A total of 417 patients were included. In 2021, the ALoS (13.3 vs 13.9 days) is shorter but the MLoS (12.5 vs 11 days) is longer. These figures are better than the nationwide figures of 15.3 and 14.7 days. The ALoS in 2019 and 2021 are shorter than the nationwide ALoS. In 2022, both ALoS (16.4 days) and MLoS (15 days) are increased. The breakdown shows characteristics of #NoF that leads to increased stay in these patients (e.g. periprosthetic fractures with 26 days average stay).

Conclusions/Discussion

Surprisingly the average stay of #NoF reduced during 2021. However, since then stay has increased in 2022 with an increase in number of long stayers in hospital highlighting the difficulty in discharging patients to community care. The introduction of discharge coordinator did not shorten patient's stay.

(186)

SINGLE DOSE ANTIBIOTIC PROPHYLAXIS AND SURGICAL SITE INFECTION IN PRIMARY TOTAL HIP ARTHROPLASTY – A RETROSPECTIVE STUDY

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Introduction

Total Hip Arthroplasty (THA) remains a gold standard intervention for symptomatic hip arthritis. Associated surgical site infections (SSI) can have serious consequences including superficial and deep joint infections or requiring revision surgeries. Prophylactic antibiotics remain a mainstay in reducing SSI and revision rates, however duration remains controversial. Given the rise in use of single dose prophylactic antibiotics, our aim was to ascertain the rate of deep infections in patients undergoing primary THAs and associated revision rates.

Materials and Methods

This retrospective study was carried out at The Princess Alexandra Hospital, a District General Hospital based in the United Kingdom. All THAs were identified between January 2013 and December 2016 using the hospital's electronic records system. Trust Arthroplasty Records, discharge summaries and clinic letters were used for data collection. Inclusion criteria included primary THA, age >50y, and single dose antibiotic only. Complex and revision THAs were excluded. Patients were followed up for 4 years. Patient demographics, comorbidities including 'at risk' (immunocompromised or with ASA>3) were identified. Deep infection was defined as cases requiring joint aspiration, debridement and washout or revision.

Results

1001 patients met the inclusion criteria. All patients received a single dose of intravenous cefuroxime 1.5g pre-operatively as per the Trust microbiology guidelines unless there was a recorded contraindication.

There were 26 (2.59%) deep infections of which 13 cases (1.29%) subsequently had a revision. Average time from primary surgery to washout was 2.38 months and revision was 15.67 months. Of interest, 15 of the 26 (57.7%) patients with deep infections were identified as 'at risk'. Increasing age and length of stay were both associated with higher rate of SSIs ($p=0.044$ and $p=0.047$ respectively).

Conclusions/Discussion

This study demonstrates that single dose antibiotics in primary THA patients is a cost-effective approach for preventing SSIs. The deep infection and revision rates were comparable with previously reported SSI rates for primary THAs. Those 'at risk' may benefit from further doses of antibiotics post-operatively – this requires further investigation.

(188)

EQUIVALENT GOOD MID-TERM CLINICAL, FUNCTIONAL, AND RADIOLOGICAL OUTCOMES IN OBESE AND NON-OBESE PATIENTS UNDERGOING DAA THA USING A SPECIALIZED LEG POSITIONERNabila Goga¹, Jurek Rafal Tomasz Pietrzak¹, Josip Nenad Cakic^{1,2}¹University of the Witwatersrand, Johannesburg, South Africa. ²Life Fourways Hospital, Johannesburg, South Africa**Introduction**

Worldwide, more than one billion people are obese. In the United Kingdom, obesity affects 28.7% of the adult population. Obesity is associated with an increased risk of early primary total hip arthroplasty (THA) and a higher incidence of peri-operative complications. The direct anterior approach (DAA) for THA is growing in popularity globally, however concerns over its suitability for obese patients remain. This study compares medium-term clinical, functional, and radiological outcomes of obese and non-obese patients undergoing THA via the DAA.

Materials and Methods

We conducted a prospective study of 356 consecutive patients who underwent elective primary THA via the DAA using a specialized hip positioner and intraoperative fluoroscopy. Obesity was defined as a BMI $\geq 30 \text{ kg/m}^2$ and outcomes of obese and non-obese patients were compared.

Results

Outcomes of 107 obese (30%) and 249 (70%) non-obese participants were compared at a minimum one year follow-up. Patients in both groups were matched for age, sex, pre-operative diagnosis, Harris Hip Score (HHS) and VAS pain scores. In the obese cohort, surgical time was longer by a mean of 8.32 ± 6.9 minutes ($p=0.03$) and blood loss greater by $58.19 \pm 25.37 \text{ ml}$ ($p=0.0003$). Intra-operative radiation for obese and non-obese patients was $3.51 \pm 1.16 \text{ mGy}$ and $3.13 \pm 1.81 \text{ mGy}$ respectively ($p=0.2$). There was no significant difference in intraoperative complications, duration of admission and discharge destination between the two groups. Obese patients had an increased incidence of wound related complications, 5.6% vs 2.4% (OR 2.4), however, the overall complication rates were similar, 9.3% vs 6.8% ($p=0.67$). Clinical and functional outcomes were equivalent with a mean postoperative HHS of 97.57 ± 4.86 in the obese and 98.05 ± 5.59 in the non-obese cohort ($p=0.54$). PROMs including the Forgotten Joint Score ($p=0.34$), Patient Joint Perception score ($p=0.2$) and patient satisfaction rates ($p=0.085$) were equivalent.

Conclusions/Discussion

The results of this study suggest that DAA is a safe and effective approach for obese patients with excellent mid-term functional outcomes. An increased risk of wound related complications, however, exists.

(190)

1-YEAR MINIMUM FOLLOW-UP OF THE TRIDENT II® TRITANIUM ACETABULAR SHELL

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Introduction

Due to differences from the original Trident® design, the shell options of the Trident II® system are currently in the early stages of ODEP and beyond compliance rating. It is therefore integral that its early use in clinical practice is closely scrutinised to ensure that outcomes are not compromised. We therefore set out to examine implant survival in all cases where the Trident II® Tritanium (T2T) was utilised in primary and revision hip surgery.

Materials and Methods

A retrospective cohort study was performed utilising the Electronic Health Record system from a single large arthroplasty unit that was an early adopter of T2T. All patients receiving a T2T acetabular shell between May-December 2021 (to allow for sufficient 1-year follow up) were included. The primary outcome was survival free from revision assessed using Kaplan-Meier (KM) analysis.

Results

213 THR cases in 208 individuals were identified between May-December 2021 with at least one year follow-up. 94% were primary THR, with 55% robot arm assisted (RAA). Mortality at 1-year was 1.44%. 56(26.29%), 138(64.79%), and 19(8.92%) of the 213 cases used solidback, clusterhole, and multihole acetabular cups respectively. Solidback cups were significantly more likely to be used in RAA surgery (62.3% vs 26.8%, X²CHI p<0.001). Of the acetabular inserts, 27(12.68%) were 'Modular Dual Mobility (MDM)', 181(84.98%) 'X3 Polyethylene', and 4(1.88%) were 'Constrained'. 42(19.72%) of cases required screws. Screws were significantly less likely to be used in RAA surgery (8.3%vs29.1%, X²CHI p<0.001). KM Analysis indicated that survival free from both reoperation and revision at 12 months was 100% (n=209). At 15 months survival free from reoperation was 98.1% (95%CI 0.96-1.00, n=121) and revision was 99.4% (95%CI 0.98-1.00, n=122). The causes for reoperation were 2 closed reduction of dislocation and 1 debridement for infection. The single revision was due to recurrent dislocation. 1 patient had asymptomatic radiographic acetabular lucency.

Conclusions/Discussion

The T2T system appears to have excellent early outcomes, comparable to the best performing implants. Analyses of large patient cohorts should continue to ensure that results are maintained at later stages of follow-up.

(194)

THE ROLE FOR EARLY TRANEXAMIC ACID UPON DIAGNOSIS OF AN EXTRACAPSULAR HIP FRACTURE?Adam Tucker¹, Lewis Stevenson², Leeann Bryce¹, Roslyn Cassidy³, Owen Diamond¹¹Royal Victoria Hospital, Belfast, United Kingdom. ²Ulster Hospital Dundonald, Belfast, United Kingdom. ³TORC NI, Belfast, United Kingdom**Introduction**

Blood loss in hip fractures conveys a significant mortality risk, with recent evidence showing much higher transfusion requirements in extracapsular (EC) fractures. Tranexamic acid (TXA) has been shown to reduce transfusion rates and blood loss perioperatively. The aim of this study is to determine blood losses prior to admission (T₁), the interval between ED and theatre (T₂) and operative losses in the first 24 hours (T₃) for both intracapsular (IC) and EC fracture patients, to make recommendations on early TXA administration.

Materials and Methods

A prospective database identified 12-months of hip fracture patients. Patients with a haematology blood test within three months prior to their diagnosis of hip fracture were included. Blood losses were determined by analysing Haemoglobin drop and also using the Nadler and Mercuriali methods to estimate blood volume loss. Three timepoints were compared – Admission (T₁), interval from ED to surgery (T₂) and peri-operative (T₃).

Results

Of 936 patients, 366 were eligible for inclusion. Median age was 82.5 years with a female predominance (67.5%). IC fractures were more common (59.6%). Oral anticoagulants were present in 51.2%, and their use did not significantly increase blood losses.

Median haemoglobin drop was higher for EC fractures at T₁ (5.0 v 0.0, $p < 0.01$) and T₂ (5.0 v 0.0, $p < 0.01$) but not T₃ (10 v 12, $p = 0.97$). Median blood loss (mls) was higher for EC versus IC fractures, at all timepoints, T₁ (85.9 v 37.7, $p < 0.01$), T₂ (183.4 v 0.0, $p < 0.01$), and T₃ (190.2 v 151.6, $p < 0.01$). A significantly greater proportion of patients died within 1 year following a transfusion (42/105, 40.0%) compared to those who did not receive a transfusion (60/261, 23.0%): Odds ratio = 2.23 (95% CI 1.4-3.6), $p = 0.001$.

Conclusions/Discussion

This study would support the use of early TXA at the point of diagnosis in ED for EC hip fractures but not for IC hip fracture patients. EC fractures bleed as much during T₂ as they did during T₃ indicating equally valid targets for administration of TXA. This data supports the theory that IC bleed until the capsule is full and then tamponade prevents further blood loss until it is opened at the time of surgery.

(195)

PATIENT-REPORTED OUTCOMES (PROMS) IN EARLY AND LATE TOTAL HIP ARTHROPLASTY (THA) DISLOCATION: ARE EARLY DISLOCATIONS ASSOCIATED WITH POORER OUTCOMES?James Morrison¹, Samantha Downie², David Ridley¹, Graeme Nicol²¹University of Dundee, Dundee, United Kingdom. ²NHS Tayside, Dundee, United Kingdom**Introduction**

Dislocations after total hip arthroplasty (THA) are associated with muscle damage and a poorer outcome. Early dislocations (<12 weeks) can indicate implant malposition and are thought to be a poor prognostic sign. The objective was to determine whether there is a difference in outcome at one year for early versus late THA dislocations.

Materials and Methods

A retrospective cohort study of consecutive patients with a dislocation after THA over 21 years (2000-2020) was split into two groups: early (<12 weeks, n=123) and late dislocators (>12 weeks, n=72). They were compared to a control group of non-dislocating THA patients matched for gender, approach, age and body mass index (n=195). One-year patient-reported outcome data was available for 80% (313/390).

Results

Preoperative status was similar between all groups for pain, function and modified Harris hip score (mHHS, means of 40, 42 and 39 for control, early and late groups respectively, standard deviation 12). At one year, dissatisfaction was 3% in the control group (6/180). It was higher in both the early (6% 4/66 p=0.403) and late dislocators (12% 9/77 p=0.036).

mHHS was similar in controls and late dislocators (86 and 85, respectively) at one year. Mean mHHS was 81 in early dislocators, significantly lower than both controls (p=0.011) and late dislocators (p=0.046). A similar trend was seen for 5 year outcomes.

A mHHS of <70 was deemed a 'poor' outcome. The absolute risk of mHHS <70 at one year was 11% in controls (18/172), 3% in late dislocations (2/64) and 22% in early dislocations (17/77 p=0.031).

Conclusions/Discussion

Patients who experienced THA dislocations at <12 weeks had poorer outcomes and lower satisfaction rates than those with later dislocations. The risk of a poor outcome doubles when patients experience a THA dislocation within 12 weeks and remains after correcting for age, surgical approach and BMI.

(197)

SEXUAL FUNCTIONS BEFORE AND AFTER HIP ARTHROSCOPY: A STUDY USING THE NAHR DATASETChristian Smith¹, Luca Nero², Richard Holleyman¹, Sunil Kumar³, Vikas Khanduja³, Ajay Malviya¹¹Northumbria Healthcare, Newcastle, United Kingdom. ²Newcastle University, Newcastle, United Kingdom. ³Addenbrooks Hospital, Cambridge, United Kingdom**Introduction**

Symptomatic femoroacetabular impingement (FAI) commonly affects adults of reproductive age and can be successfully treated by hip arthroscopy (HA). Sexual activity can be severely impaired by hip pain, possibly leading to an increased strain on relationships and mental health. This study explores the changes in sexual activity and function of patients following HA in a large cohort, as reported in the Non-Arthroplasty Hip Registry (NAHR) dataset. Primarily this study details the trends in PROMs for sexual function before and after HA. A sub-analysis further compares the outcomes between females and males, as well as two age categories: 16-40 years and >40 years.

Materials and Methods

Data was acquired from the NAHR dataset. Patients over the age of 16 years old who had arthroscopic hip surgery between 1st January 2012 and 31st October 2020 were included. Pre- and post-operative patient reported outcome measures (PROMs) included the International Hip Outcome Tool – 12 Question (iHOT-12) and the EuroQol-5 Dimension-5 Level (EQ-5D-5L). Question 9 of the iHOT-12 is “How much trouble do you have with sexual activity because of your hip”, with patients recording a response from 0-100. Outcomes were compared before and after surgery.

Results

A total of 3691 procedures from 3438 patients were included. Overall iHOT-12 scores increased from 30.0 pre-operatively to 60.0 at 6-months ($p<0.001$) and to 61.0 at 12-months ($p<0.001$). EQ-5D-5L scores significantly improved by 0.117 at 6-months and 0.121 at 12-months (both $p<0.001$). Question 9 of iHOT-12, regarding sexual activity, was answered by 2547 patients 6-months post-operatively and 2314 again at 12-months post-operatively. Score for Q9 increased from 35.0 pre-operatively to 70.0 at 6- and 12-months ($p<0.001$). Females experienced a significantly greater improvement in their response to question 9 compared to males at 6-months ($p<0.001$) and 12-months ($p<0.001$). Comparing age groups did not find a significant difference.

Conclusions/Discussion

Hip arthroscopy for symptomatic FAI produces an improvement in PROMs scores measured. Scores for sexual function improved regardless of patient age or sex. Female patients experience a greater improvement in sexual function compared to males.

(199)

LOW FORCE ARTHROPLASTY: OPTIMAL HIP CAPSULAR RELEASE FOR ADEQUATE EXPOSURE

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Introduction

Satisfactory exposure of the acetabulum and proximal femur during hip arthroplasty procedures can be achieved through many different approaches. Techniques that claim to be minimally invasive such as the direct anterior approach (DAA) are reported to have clinical advantage but may create injury to the muscles because of excessive leverage. Our aim was to study the contribution of each segment of the hip capsule's release to achieve adequate exposure during hip arthroplasty.

Materials and Methods

Eight fresh-frozen hip joints from four pelvis to mid-tibia cadaveric specimens were approached using the DAA. A threaded rod securely fastened to the tibial and femoral diaphysis was used to guide attachment of a 6-axis force/torque sensor and 6-axis motion tracking sensor. Following dislocation, the torques generated to visualise the acetabulum and elevate the femur were assessed after sequential release of each of the following soft tissue structures: iliofemoral ligament, pubofemoral ligament, zona orbicularis (transverse cut), inferior ischiofemoral ligament, superior-posterior capsule, superior ischiofemoral ligament, conjoint tendon, and piriformis. "Adequate" visualisation was determined as the positions where the proximal femur could be prepared and an acetabular trial cup could be inserted.

Results

The zona orbicularis and superior-posterior capsule were the largest soft tissue restrictors in achieving adequate femoral and acetabular visualisation, respectively. On average, releasing the zona orbicularis decreased the extension torque by 1.4 Nm (21%), while releasing the superior-posterior capsule decreased the external rotation torque by 1.2 Nm (30%). The average extension torque and external rotational torque following a full capsulotomy decreased by 2.1 Nm (40%) and 2.9 Nm (49%), respectively. Adequate visualisation was achieved following a full capsulotomy in all cases. The external rotators had minimal contribution in torque generated during visualisation (< 0.3 Nm).

Conclusions/Discussion

The forces needed to deliver adequate exposure of the hip joint reduced well below any threshold of muscle damage following full circumferential capsular release. Satisfactory exposure of both proximal femur and acetabulum was delivered with minimal torque, without a traction table or any special attachments in cadaveric hips following a primary capsular release.

(200)

A SINGLE SURGICAL APPROACH FOR BICOLUMNAR ACETABULAR FRACTURES, PROSPECTIVE STUDY.Dheeraj Attarde, Atul Patil, Parag Sancheti, Ashok Shyam

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Introduction

The Surgical approaches to the acetabulum may be anterior, posterior, extensile or combined. Traditionally bicolumnar acetabular fractures are treated with a dual approach. Problems with the dual approach are that they were performed either in staged sitting or the same sitting, one side is fixed first then the opposite side was addressed. This situation makes it difficult if the surgeon decides to revisit another column for revision during surgery. In this prospective study, we intended to evaluate the use of a single approach to manage fractures involving both columns of the acetabulum in terms of resultant radiological outcome, functional assessment scores and complications.

Materials and Methods

After obtaining formal institutional review board and ethical committee approval, patients admitted with acetabular fractures involving both columns of the acetabulum (n = 23) were included. Patients suffering from the isolated anterior column, posterior column, anterior wall, posterior wall, and Posterior wall + column fractures were excluded from the study in addition to patients who had undergone surgical procedures of the hip prior to the trauma. Patients suffering from pathological and compound fractures of the acetabulum were also excluded from the study.

Results

Our study population consisted of 30.4% Transverse, 39.1% Associated Both-column, 21.7% T Type and 8.7% Anterior column + posterior Hemi-transverse. Of these, 65.2% were operated using the Kocher Langenbeck approach, while 30.4% patients required the Anterior intrapelvic approach. Remaining 4.3% of patients were operated by the Iliofemoral approach. Anatomic reduction was achieved in 100% of our study population with remaining displacement less than or equal to one millimetre. At 1 year follow up, all fractures showed satisfactory union with an excellent Matta index in 100% study subjects. Complications at 1 year included 1 case of foot drop, which was present preoperatively but failed to improve and 1 case of post traumatic arthritis. Average Harris Hip Score (HHS) and Mean Merle D'Aubigne (MDA) scores suggested good clinical outcomes in the study population.

Conclusions/Discussion

A single approach can be used to achieve good functional and radiological outcomes in carefully selected bi-columnar fractures of the acetabulum, with less approach-related morbidity.

(201)

TOTAL HIP ARTHROPLASTY IN PATIENTS WITH CEREBRAL PALSY: A RETROSPECTIVE COHORT STUDY AT A TERTIARY CENTRENakulan Nantha Kumar^{1,2,3}, Georgios Orfanos³, Geraint Thomas^{3,2}¹University Hospital North Midlands Trust, Stoke on Trent, United Kingdom. ²Keele University, Stoke on Trent, United Kingdom. ³Robert Jones and Agnus Hunt Orthopaedic Hospital, Oswestry, United Kingdom**Introduction**

Total Hip Arthroplasty (THA) is one of the most successful treatment options of hip arthrosis. However, patients with Cerebral Palsy (CP) have been reported to be at a higher risk of dislocation, subluxation, post-operative pain and aseptic loosening. There is paucity in the literature pertaining to outcomes of THA in CP patients which fuels the controversy against it. The aim of this study was to investigate the outcomes of THA in this subgroup of patients.

Materials and Methods

We reviewed our institutional electronic database for patients undergoing THA who had a diagnosis of CP over a 15-year period. Data on ambulatory status, Gross Motor Function Classification System (GMFCS), procedural details and post operative complications were collected and critically analysed.

Results

A total of 31 patients with cerebral palsy had 32 primary THAs at our tertiary centre. The cohort had a mean age of 54.8 years (SD 15.2, range 27.9-80.7y), mean BMI 29.3 kg/m² (SD 5.9, 18.7-40.0), 67% were female and had a mean follow up of 5.9 years (SD 5.4, range 0.1-17.4y). Preoperatively the GMFCS were 37.5% grade 1, 18.8% grade 2, 37.5% grade 3 and 6.3% grade 4. There was no marked change in preoperative ambulatory status versus postoperative ambulatory status. Postoperatively, complications included 3.1% (n=1) pneumonia, 6.3% (n=2) periprosthetic fractures and 6.3% (n=2) surgical site infections. 12.5% (n=4) required revision surgery. At the end of our follow up the mortality rate was 6.3%. An analysis of the temporal trend of all hip procedures in this subgroup of patients on our database showed that THAs are becoming an increasingly popular intervention for CP patients over time with girdlestone procedures still being practiced.

Conclusions/Discussion

Our data of 32 THA cases in CP patients with a mean follow up of 5.9 years show no deterioration in ambulatory status, GMFCS and an overall low complication rate. This study supports research findings that suggests contemporary THA is a viable treatment option in CP patients for symptomatic relief and preservation of joint function.

(203)

PATIENT-REPORTED OUTCOMES (PROMS) IN ELDERLY PATIENTS (>85 YEARS) UNDERGOING ELECTIVE REVISION TOTAL HIP ARTHROPLASTY (THA)Samantha Downie¹, Elizabeth Lindsay¹, David Ridley², Graeme Nicol¹¹NHS Tayside, Dundee, United Kingdom. ²University of Dundee, Dundee, United Kingdom**Introduction**

Revision total hip arthroplasty (THA) in elderly patients (>85 years) is associated with increased mortality, length of stay, need for supportive care and a high rate (51%) of complications. The objective was to assess the PROMs in this growing population of elderly patients undergoing elective revision (THA).

Materials and Methods

A retrospective cohort study of consecutive patients undergoing revision THA at a UK arthroplasty centre over 30 years (1992-2022). The commonest indications for revision in patients >85 years was aseptic loosening (34% 52/152), instability (19% 29/152) and fracture (18% 28/152). One-year patient-reported outcome data was available for 57% of elective revision patients (71/124).

Results

152 patients underwent revision THA with a mean age of 88 years (range 85-103 years, SD 3). PROMs were not available on patients undergoing revision due to trauma (n=28) so they were removed from analyses, resultant sample size (n=124).

Preoperative function was poor, with a mean modified Harris hip score (mHHS) of 32 (95% CI 0-64). 91% (78/86 known) of patients scored 0-20/44 for pain (Harris Hip Score: pain requiring opiate analgesia to completely bedbound). The mean change in mHHS at one year was +37 (range -2 to +70, 50/124 known).

At one year post-op, mean mHHS was 70 (95% CI 44-96) and only 8% scored 0-20 for pain (6/74 known). The improvement in mHHS was sustained at three (63 95% CI 31-85, 14/152 known) and five years (67 95% CI 33-100, 18/152 known).

The commonest outcomes at five years from surgery were death (63% 73/115 known), withdrawal (26% 30/115) and further revision (9% 10/115). Overall complication rate was 39% (48/124).

Conclusions/Discussion

Elderly patients undergoing elective revision THA show a large improvement in outcome at one year compared to preoperative status, with a mean improvement in modified Harris Hip score of +37. This is sustained at three and five years post-surgery. Mortality is high at five years post-surgery, but survivors achieve an improvement in outcome comparable to revision THA in younger patients.

(206)

A TEN YEAR REVIEW OF INSTABILITY CHARACTERISTICS IN 10,525 HIP ARTHROPLASTY PATIENTS IN MUSGRAVE PARK HOSPITAL, BELFAST.

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Introduction

Increasing numbers of arthroplasty surgeries are being carried out due to an aging population. Arthroplasty surgeons must therefore understand and look to minimise modifiable complications, such as instability.

This paper reports the instability characteristics that have led to revision between the two most common arthroplasty systems used in the unit; Exeter/Trident (ET) and Corail/Pinnacle (CP).

Materials and Methods

10,525 consecutive hip arthroplasties carried out between January 2010 and January 2020 using the above implant systems were reviewed for re-operations, ie. closed reductions and revisions in MPH via the theatre management system (BOIS). Using PACS, BOIS and electronic care systems, cases were then reviewed for time to first dislocation, direction of dislocation and definitive management.

Results

Overall, there were 5279 ET and 5246 CP systems used. All surgeons use a posterior approach. Average age: 70.1 for each system; range 30-97 years for ET and 33-96 CP. Females represented 56% and 55% in each cohort respectively. There was also no significant difference in ASA grades.

Overall, there were 69 (0.7%) dislocations that returned to Musgrave Park for re-operation. 41 (0.8%) CP, 28 (0.5%) ET ($p=0.110$). Of these, 24 (0.5%) CP versus 18 (0.3%) ET have undergone revision procedures ($p=0.343$).

Interestingly, of the ET system dislocations, 52% were anterior, 33% posterior and 15% direction uncertain dislocations. Whereas CP demonstrated a 70% posterior, 15% anterior and 15% direction uncertain dislocation rate. Early dislocations (<3 months) occurred in 79% of ET versus 39% of CP respectively. 96% of the anterior dislocations in MPH occurred within the first 3 months.

70% of the CP revisions were managed with constrained liners +/- head exchange. Only one case had a femoral stem component changed, whereas ET systems had a 39% femoral stem component exchange.

Conclusions/Discussion

Rates of dislocation following arthroplasty in MPH are low but have differing characteristics between the two most common implant systems. Surgeons should be aware of the potential instability characteristics of their chosen arthroplasty system and mitigate the risks where possible.

(208)

SURVIVORSHIP OF THE C-STEM IN CEMENT-IN-CEMENT REVISION HIP ARTHROPLASTYMohammed As-Sultany, Amit Yadav, Richard Unsworth, Paul Siney, Asim Rajpura

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Introduction

Cement-in-cement (CiC) is a well-established technique in revision hip arthroplasty. It involves cementing a new femoral stem into an existing intact cement mantle. It has the advantage of being less invasive compared to the conventional technique of removing well-fixed cement. There is currently limited survivorship data on the use of the triple-tapered C-stem in CiC revision hip arthroplasty.

Materials and Methods

Data on consecutive revision hip cases using the CiC technique have been prospectively collected into a database since July 2015. For this study, only those cases using the C-stem were further analysed. The electronic notes and radiological records were reviewed to obtain demographical data, clinical outcomes and stem survivorship. The primary end point was stem revision for all causes.

Results

There was a total of 102 cases with 78 having at least one-year clinical and radiological follow-up. The average patient age was 71 years (47-90). The mean follow-up was 41 months (25-72). The three most common reasons for revision surgery was cup loosening (60%), dislocation (16%) and stem loosening (11%). Following revision arthroplasty using the CiC technique, there was a total of 12 (11.8%) stem revisions. These were due to infection (7 cases), periprosthetic fracture (4 cases) or dislocation (1 case). Kaplan-Meier survival analysis at 4 years (40 cases at risk) was 86% (95% confidence interval 76-96) for stem revisions for all causes. Applying Barrack's classification demonstrated that most cases (93%) maintained their pre-operative grading with at least one-year follow-up. There was a 7.7% mortality rate.

Conclusions/Discussion

This single largest study demonstrates favourable medium-term implant survival when using the C-stem in CiC revision hip arthroplasty. This remains a viable technique in carefully selected revision cases since it is associated with a much lower complication and risk profile.

(209)

ANALYSIS OF THE COST EFFECTIVENESS OF ROUTINE FOLLOW-UP FOR HIP FRACTURE PATIENTS AFTER DYNAMIC HIP SCREW AND INTERMEDULLARY NAIL FIXATION

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Introduction

The rising number of hip fractures has incentivised several quality improvement initiatives aimed at improving outcomes. These include the national hip fracture audit, key performance indicators and the best practice tariff. Whilst there is an established standard of care for inpatients, the optimal outpatient management of patients after hip fracture fixation remains undefined. We aim to evaluate the cost-effectiveness of routine surgical appointments and provide evidence to support an improved outpatient hip fracture care pathway that focuses on comprehensive multidisciplinary treatment.

Materials and Methods

This study retrospectively examined all patients who underwent either DHS or IM Nail fixation for hip fragility fracture at our hospital over a 3-year period. Data was obtained from the Irish Hip Fracture Database (IHFD); the national integrated imaging system (NIMIS) and the medical charts. The number outpatient appointments, postoperative radiographs and estimated cost of these patient encounters were examined. The rate of revision surgery as well as the type and timing of these interventions was also analysed.

Results

We included 272 patients. The mean number of inpatient and outpatient radiographs was 1.13 and 1.54 per patient respectively. There were 428 outpatient appointments scheduled, an average of 1.6 (SD 1.5) per patient. The median length of stay was 12 days (IQR 8-17). Only 16 (5.8%) patients had abnormal X-ray findings and only 8 (2.9%) patients underwent revision surgery. The majority (15/16, 94%) of patients with surgical complications presented with significant symptoms. There was a 13.1% DNA rate resulting in a cost to the health service of €1,400. The combined total cost of follow-up for all patients over the 3 year period was €92,252.

Conclusions/Discussion

Routine postoperative surgical encounters rarely alter a patient's management and contribute significantly to healthcare costs, resources and time loss for patients and their carers. We propose more selective follow-up protocols, adequately resourcing virtual alternatives and an improved outpatient hip fracture care pathway that focuses on comprehensive multidisciplinary treatment such as rehabilitation, fracture prevention and bone health optimisation.

(212)

CLINICAL INVESTIGATION OF A NOVEL CERAMIC HIP RESURFACING USING RADIOSTEREOMETRYMartin R. Downing^{1,2}, Clare Moody³, James P. Holland⁴

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Introduction

Radiostereometric analysis (RSA) is a proven imaging method assessing implant stability and predicting longer-term survival.

As part of a larger clinical investigation of the ReCerf Hip Resurfacing Arthroplasty (MatOrtho Ltd., UK), implant stability will be assessed in a subgroup of patients.

To ensure a high-quality RSA imaging, surgeons and radiographers rehearsed using a cadaver and phantoms. For statistical validation, RSA precision under repeatability conditions was assessed with a phantom to determine whether it would be sufficient to measure the primary outcome of axial subsidence.

Materials and Methods

ReCerf implantation and rehearsal of marker insertion was carried out on a cadaver in a dedicated surgical training facility. Ten one-millimetre tantalum markers were placed into the pelvic and femoral bone near to the implant following the recommended plan. RSA imaging was implemented in a routine radiography room using a mobile unit for the second x-ray.

For the phantom, resurfacing implants were fixed to prepared sawbones secured to a Perspex base. The phantom was then imaged 25 times at the clinical site under typical radiographic variability conditions with up to 10 cm translation and 15-degree rotation in any axis between image exams. Precision at 95% confidence of migration was calculated using model based RSA software (Downing Imaging Ltd., UK) from all combinations of exams.

Results

Good marker insertion patterns were achieved in the cadaver. RSA cadaver imaging determined guide limits of x-ray exposure for sufficient image quality.

Precision for the cup migration along the axial, transverse and sagittal axes was 0.09, 0.16 and 0.34 mm respectively. For the stem precision was 0.08, 0.19 and 0.23 mm.

Conclusions/Discussion

Using an onsite precision assessment, we have shown that with a modified routine radiographic practice and competent staff training, a high-quality RSA study compatible with ISO 16087:2013 can be performed in our centre. While transverse and sagittal translational migration errors were slightly higher, our CAD model-based RSA method was validated capable of providing sufficiently precise axial migration measurements to assess implant stability of the resurfacing. Patient enrolment for this MHRA-approved clinical investigation has commenced with high-quality imaging and marker insertion.

(213)

PATIENT REPORTED OUTCOMES AT LEAST 10 YEARS AFTER ACETABULAR OSTEOTOMY FOR DYSPLASIA: A SYSTEMATIC REVIEW AND META-ANALYSISClarissa Griffin, Charlie Dunstan, Edward Dickenson, Damian Griffin

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Introduction

Acetabular dysplasia is a cause of hip pain in young adults and is a risk factor for osteoarthritis. Acetabular osteotomies reorientate the acetabulum to relieve pain and preserve the natural hip. In this systematic review we addressed the first of these objectives with the question: What is the longer term patient reported outcomes after acetabular osteotomy?

Materials and Methods

We searched the databases MEDLINE, EMBASE and Web of Science for a diagnosis of acetabular dysplasia and all techniques of acetabular osteotomy. Studies that reported patient reported outcomes of acetabular osteotomy after at least ten years were included. These studies were assessed for quality and risk of bias. Where reports described patient reported outcome scores before surgery, and at least ten years later, these were converted into standardised mean differences and combined into an overall estimate of effect.

Results

11 studies were included in the review. All were uncontrolled retrospective before-and-after studies and had a high risk of bias. Patient reported measures included: Merle d'Aubigne Score, Harris Hip Score, Iowa Hip Score, Oxford Hip Score, Japanese Orthopaedic Association Hip Score and Charnley Hip Score. Data for a meta-analysis was available in five of the 11 studies, although clinical and statistical heterogeneity was considerable ($I^2=94\%$). 12% of hips had been revised to a total hip replacement over the total duration of follow up, but among the remaining 88% the grouped standardised effect size of surgery was 1.55 (95% CI: 0.89-2.21). This is a large beneficial effect.

Conclusions/Discussion

Observational studies support the use of acetabular osteotomy in young adults with acetabular dysplasia, though there is a trade-off between the scale and risks of the surgery and the desire to avoid an early hip replacement. However, the lack of control groups, the heterogeneity of patients, dysplasia and surgical technique, and the need to combine different outcome measures as standardised mean differences, make the apparently large effect size far from robust. We need a randomised controlled trial to guide clinical practice; the Non-Arthritic Hip Registry could be a suitable platform for this.

(216)

SEXUAL FUNCTION BEFORE AND AFTER PERIACETABULAR OSTEOTOMY; A COHORT STUDY USING THE NAHR DATASETChristian Smith¹, Khurram Baig², Richard Holleyman¹, Sunil Kumar³, Vikas Khanduja³, Ajay Malviya¹¹Northumbria Healthcare, Newcastle, United Kingdom. ²Newcastle University, Newcastle, United Kingdom. ³Addenbrookes Hospital, Cambridge, United Kingdom**Introduction**

Symptomatic hip dysplasia typically affects women of childbearing age. It can cause disabling hip pain, interfere with sexual function, and put a significant strain on relationships and mental health. Pelvic osteotomy is the gold standard for treating symptomatic hip dysplasia in the young adult population. The most common pelvic osteotomy technique is the periacetabular osteotomy (PAO). This study explores the changes in sexual activity and function in a large cohort of hip dysplasia patients following a PAO, as reported in the Non-Arthroplasty Hip Registry (NAHR).

Materials and Methods

Data was acquired from the NAHR dataset. Patients who had a PAO between 1st January 2012 and 31st October 2020 were included. Pre- and post-operative PROMs included the International Hip Outcome Tool – 12 Question (iHOT-12). Question 9 of the iHOT-12 is “How much trouble do you have with sexual activity because of your hip”; responses to this specific question are analysed separately. Scores were compared before surgery and at the 6-, 12- and 24-month mark post-operatively.

Results

Data from a total of 1331 PAOs were included. The mean age at surgery was 29.9 years, the mean BMI was 25.4 kg/m² and 89.6% of patients were female. Scores for iHOT-12 improved from 29.6 pre-operatively to 55.5 at 6-months ($p<0.001$), 62.2 at 12-months ($p<0.001$) and 56.7 at 24-months ($p<0.001$). Question 9 of iHOT-12, regarding sexual function, was answered by 486 patients at 6-months, 460 at 12-months and 96 at 24-months post-operatively. Score for sexual function increased from 42.6 pre-operatively to 61.5 at 6-months ($p<0.001$), 67.2 at 12-months ($p<0.001$) and 66.0 at 24-months post-operatively ($p<0.001$).

Conclusions/Discussion

Results from our study show that PAO is successful in improving hip function and sexual function, as measured by the iHOT-12, at 6-, 12- and 24 months. The improvement in overall iHOT-12 scores was greater than the improvement of isolated scores for sexual function at all timepoints. This suggests that while patients experience a statistically significant improvement in sexual function, they must experience a greater degree of improvement in the majority of the other eleven functional domains on the iHOT-12.

(218)

IMPROVEMENTS IN PERIPROSTHETIC FEMORAL FRACTURE CARE SHOULD FOCUS ON POST OPERATIVE REHABILITATION AND REDUCING HOSPITAL LENGTH OF STAY.Ahmed Lashin¹, Christopher Wakeling¹, Luke Hodgson², Mark Roussot¹¹University Hospitals Sussex, Chichester, United Kingdom. ²University Hospitals Sussex, Worthing, United Kingdom**Introduction**

Our institution serves an aging population with an increasing incidence of periprosthetic femoral fractures (PFFs) that occur in patients with a similar profile to those with femoral neck fractures. Despite advances in PFF surgical care, mortality rates appear high and hospital length of stay (LOS) is frequently prolonged. Our objective was to (1) determine LOS for femoral PFFs before and after operative intervention, and (2) identify factors that can reduce LOS.

Materials and Methods

We reviewed all 522 periprosthetic fractures treated in our institution between from 2017 to 2021 with a minimum 1 year follow up. Of these, 396 were femoral PFFs in 382 patients with a mean age of 81.4 years (SD 9.7). We measured the pre-operative and post-operative LOS and determined the reasons for prolonged post-operative LOS. Femoral PFFs were classified with the Unified Classification System (UCS) as: A, 9.8%; B1, 22.1%; B2, 30.3%; B3, 10.7%; C2, 1.3%; C, D and E, 5.7%.

Results

The mean overall LOS was 19.7 days (SD 15.3), mean pre-op LOS was 4.2 (SD 3.7) and mean post operative LOS was 18.0 days (SD 14.7). 66% of patients underwent operative intervention within 4 days of admission. 89% of patients had a post-operative LOS >7 days, 42% of these patients were either medically fit for discharge but required supervised rehabilitation or experienced delays to hospital discharge while awaiting transfer to a rehabilitation facility.

Conclusions/Discussion

Almost 90% of patients with femoral PFFs stay >7 days post operative intervention, and almost half of those are delayed while awaiting rehabilitation. Efforts should focus on identifying suitable patients for home-based rehabilitation and increasing service provision for home-based care with appropriate remote monitoring to reduce the cost of managing PFFs, reduce hospital-associated risks for these vulnerable patients, and improve quality of life.

(223)

THE CLINICAL EFFICACY OF INJECTABLE CELL-BASED THERAPIES IN THE MANAGEMENT OF OSTEOARTHRITIS OF THE HIP; A SYSTEMATIC REVIEW AND ANALYSISNitya Kumarvel, Esther Hughes, Damian Griffin

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Introduction

Osteoarthritis (OA) is a common chronic degenerative disease of joints affecting 8.5 million people in the UK. Current treatment methods involve self-management with exercise and use of oral analgesia for mild to moderate grade OA, and joint-replacement surgery for those with severe OA. Unfortunately, many patients fall into the interim group of not gaining any relief from non-surgical methods and either being ineligible for or on waiting lists for surgery.

This systematic review focuses on finding a suitable treatment option for this large group of patients. Stem-cell therapy is a potential treatment that involves a non-surgical, injectable cell-based treatment that aims to increase quality of life, activity levels and provide pain relief for OA patients.

Materials and Methods

The initial search yielded 1,996 papers across different databases that related to stem-cell based therapies in treating osteoarthritis based on the decided inclusion criteria. Duplicates were removed and 1616 titles and abstracts were screened resulting in 7 studies in our final report. The clinical outcomes measured include the Harris Hip Score (HHS) and the Western Ontario and McMaster Universities Arthritis Index (WOMAC), which were used to test the efficacy of the intervention. A meta-analysis was conducted on only 3 of the included studies due to lack of data on HHS and WOMAC.

Results

Meta-analysis demonstrated a significant ($p < 0.005$) improvement in WOMAC score and HHS at 6 months post-final treatment compared to baseline. This was also compared to corticosteroid injections where there was a 1.95 times greater mean improvement in WOMAC score, however no statistical analysis could be conducted on this comparison.

Conclusions/Discussion

The meta-analysis concluded stem-cell therapy is effective in improving both HHS and WOMAC at a significant level. However, high levels of heterogeneity and low numbers of papers provide substantial limitations to this review. We therefore conclude the current evidence supporting this finding is weak and further research of more robust study designs (e.g., randomised control trials) into this area is required.

(226)

CAN MACHINE LEARNING PREDICT MINIMAL CLINICALLY IMPORTANT DIFFERENCE IN IHOT-12 AT 1 YEAR FOLLOWING ARTHROSCOPIC TREATMENT FOR FEMOROACETABULAR IMPINGEMENT?Justin Green¹, Richard Holleyman¹, NAHR User Group², Vikas Khanduja³, Ajay Malviya¹¹Northumbria Healthcare NHS Foundation Trust, Newcastle, United Kingdom. ²The British Hip Society, London, United Kingdom. ³Addenbrooke's Hospital, Cambridge, United Kingdom**Introduction**

The iHOT-12 has been used as the primary measure of impact of hip disease in young, active patients and the subsequent effect of treatment of this disease. The NAHR user group maintains outcomes following intervention for femoroacetabular impingement (FAI). High attrition in post-operative follow up within the registry may hinder longer term identification of patient who fail to meet satisfactory results. Can characteristics be determined that enable the identification of patient who are most likely to achieve or fail to achieve a minimally clinical important difference (MCID) at 12 months postoperatively using machine learning?

Materials and Methods

A retrospective analysis was conducted patient who were recorded in the NAHR as undergoing primary hip arthroscopic treatment for femoroacetabular impingement (FAI) November 2013 and March 2022 (n=6133). 23.1% (n=1422) of patients completed both baseline iHOT survey and 1 year follow-up survey. The average difference in score changes between the baseline survey and at 12 months was calculated (mean 25.86, SD 27.23). MCID was set as half of one SD (13.61) from the mean difference. A total of 907 (63.8%) patients attaining the threshold for MCID. Maximum Absolute Scaler and Logistic Regression modelling determined the likelihood of achieving or not achieving threshold for MCID. Model performance was assessed by accuracy, AUC and recall. Analysis was performed using pre-operative variables, then repeated using both pre-operative and post-operative variables.

Results

A total of 1422 records were used in modelling expected achievement of MCID at 1 year following arthroscopic treatment in conjunction with identification of feature importance. The best result was obtained by using both pre and postoperative input variables. Balanced accuracy achieved was 88.1%, recall 89.6% and AUC 92.3%. 12 variables were indicated as the strongest determinants in achieving threshold.

Conclusions/Discussion

The primary objective of this study was to develop a predictive score for determining if machine learning can be useful in determining the expected effect of treatment at 1 year following arthroscopic treatment for FAI. A high level of accuracy, recall and the distinction between patients achieving MCID and those that do not was achieved.

(230)

THE TREATMENT OF PIRIFORMIS SYNDROME: A SYSTEMATIC REVIEW OF THE LITERATURE AND META-ANALYSISChristian Smith¹, Mohammed Ali², Vikas Khanduja³, Ajay Malviya¹¹Northumbria Healthcare, Newcastle, United Kingdom. ²Newcastle University, Newcastle, United Kingdom. ³Addenbrookes Hospital, Cambridge, United Kingdom**Introduction**

Piriformis syndrome (PS) (also called deep gluteal pain syndrome or fat wallet syndrome) is a peripheral neuropathy caused by sciatic nerve entrapment in the deep gluteal space. If conservative management is unsuccessful, injections of local anaesthetic, steroid or botulinum toxin have been used. Ultrasound (US) and CT-guided injection techniques have been reported to have more accurate results than non-guided techniques in recent studies. Surgery to decompress the nerve can be performed as a last resort. This review assesses the efficacy of US- and CT-guided injections in patients with PS as well as endoscopic and open surgical release.

Materials and Methods

A multi-database literature search was performed from their year of inception to October 2022 with the keywords: ("Piriformis syndrome" OR "deep gluteal pain" OR "Wallet syndrome") AND ("steroid" OR "botulinum") AND ("CT guided" OR "ultrasound-guided"). A further search was conducted using the keywords: ("Piriformis syndrome" OR "deep gluteal pain" OR "Wallet syndrome") AND ("endoscopy" OR "tenotomy" OR "open release"). The Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) methodology guidance were utilised. Risk of bias was assessed using the Cochrane risk of bias tool and the National Institute of Health study quality assessment tool. Studies utilising the visual analogue scale for pain were included in the meta-analysis.

Results

A total of 22 papers were included in the review, with a combined 747 procedures. Four studies were level I, with the rest level III and IV. Studies used the following interventions: US-guided injections (n=6), CT-guided injections (n=8), endoscopic surgery (n=6) and open surgery (n=2). CT-guided injection had a superior odds ratio of 6.22 (4.61-7.84) in favour of the intervention compared to US-guided injection 2.68 (1.49-3.87). Surgery had a favourable odds ratio of 5.02 (4.70-5.33).

Conclusions/Discussion

All authors reported good outcomes from the treatments. CT guided injections were superior to US-guided but have the increased caveat of a significant radiation dose. Surgery can be effective for refractory cases.

(231)

EMBEDDING PROSPECTIVE ORTHOPAEDIC STUDIES WITHIN A NATIONAL REGISTRY: A FEASIBILITY STUDYMark Andrew Sohatee¹, Vikas Khanduja², Ajay Malviya³¹Royal Orthopaedic Hospital, Birmingham, United Kingdom. ²Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom. ³Northumbria NHS Foundation Trust, Northumbria, United Kingdom**Introduction**

Since its creation by the British Hip Society 2012 the UK-Non Arthroplasty Hip Registry (NAHR) has already been utilised to conduct national research studies. However, its limitation has been that, even though, these data are collected prospectively, they give rise to retrospective research.

To improve the level of evidence offered by registry studies, a new methodology: "Registry-based Randomized Control Trials" (RRCT) have allowed registries to generate prospective research.

Several national registries have conducted such studies, but no UK or Orthopaedic registry has to date. A prospective feasibility study examined the NAHR's suitability for such research.

Materials and Methods

A prospective feasibility study, looking at registry data, was undertaken. Six pilot centres received administrative support funded by Pfizer. The project was supervised by the BHS recipient of the BOA Future leaders programme.

The collected data were used to evaluate current practise. No new interventions were implemented for ethical reasons. The registry data collection tool; "minimum-data-set" (MDS) was updated to capture information on the use of routinely used medications. The duration of the study was three months, with two follow-up points at 30 and 90 days.

Results

There were 228 patients during the study, 124 of these were amongst the pilot centres and 114 at non-study centres.

Mean compliance of follow-up for all centres was 79% (30-days) and 69.4% (90-days). Variation was seen between pilot centres, due to differences in hospital administration. Statistically significant differences, between follow-up rates at pilot centres and non-pilot centres, was seen (30-days $p=0.009$, 90-days $p=0.0058$). Further sub-analysis demonstrated the statistically significant impact of NAHR committee surgeon presence on data collection vs non-committee centres (30-days $p=0.0047$, 90-days $p=0.0086$).

Conclusions/Discussion

The study identified that additional administrative support resulted in improved follow-up suggesting RRCTs would be feasible. However, follow-up was less effective if there were poor administration systems in place. In addition to funding/support, surgeon motivation is an important factor in ensuring follow-up. If we can learn from these lessons, the NAHR can be the first Orthopaedic registry in the world to undertake a prospective RRCT.