Join us Face-to-Face | Engage, discuss, debate.


Anil Gambhir


Dominic Meek


Vikas Khanduja


Andrew Hamer


Jonathan Howell


Ajay Malviya

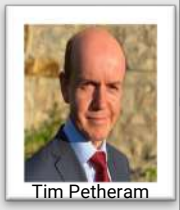

Simon Buckley


Matt Wilson


Tim Board


Henry Wynn Jones


Samantha Tross


Tim Petheram


Tony Andrade


Joanna Maggs


Kate Spacey


Sam Jain

F2F Registration includes:

- ✓ In-person attendance 2nd – 4th March at Bournemouth International Centre
- ✓ The Royal College of Surgeons of England have awarded up to **15 CPD points** for this event.
- ✓ Social networking drinks and international flavours on 3rd March
- ✓ Industry symposia
- ✓ Expert-led debates, case discussions
- ✓ Keynote lectures
- ✓ 40+ Podium scientific presentations
- ✓ 100 E-Poster scientific presentations
- ✓ 5K Fun Run
- ✓ Post-event on demand viewing 21st March – 30th June


Callum McBryde


Mike Reed


Kathryn Gill


Phil Mitchell


Sarah Eastwood


Kat Dayanandra


Jon Conroy


Samantha Hook


Michael Whitehouse


Shivam Kohle


Richie Gill


Sion Glyn-Jones


Naomi Gibbs


Sunil Kumar Karadi


Marcus Bankes


David Sochart

BRITISH HIP SOCIETY

Inspirational video bio series

Help showcase the remarkable experience and diversity within BHS by filming a short video bio at this year's meeting

Book a slot by emailing secretary@britishhipsociety.com

www.britishhipsociety.com
@britishhip
@britishhip

Contents

Premium Sponsors:

ADLER ORTHO

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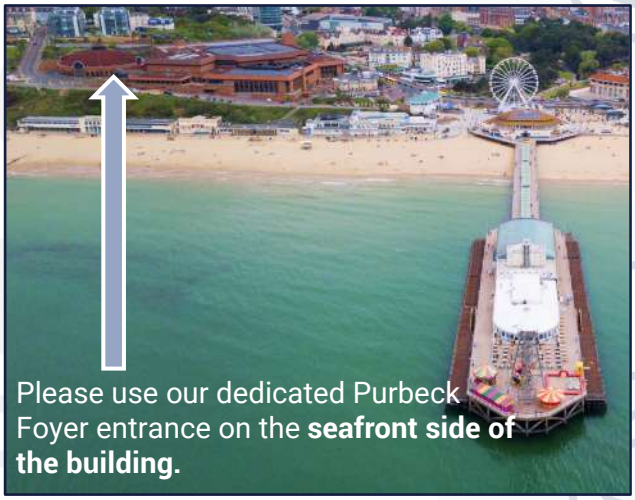
Welcome to Bournemouth



Bournemouth International Centre

Bournemouth Highcliff Marriott Hotel

Bournemouth Seafront

Foreword

On behalf of our President, Andrew Hamer and the Executive Committee, I would like to welcome you all to the 2022 Annual Scientific Meeting of the British Hip Society and those viewing on line at a later date.

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

I am sure you will all agree that after the last two years it is fantastic that we are able to meet again face to face here in Bournemouth. We had a great online meeting last year but I think we all agree that there is so much more benefit when we can meet, chat and discuss important issues.

We have been lucky to have had the outstanding BHS Midweek Special webinar series organised by Vikas Khanduja each month and that has kept us all in touch with a wide variety of topics in hip surgery during the lockdown period.

It is our honour to welcome Professor Robert Townsend, Consultant Microbiologist from Sheffield as our Presidential Guest Speaker. Professor Townsend will make a significant contribution to this year's meeting with his keynote lecture. As a colleague he is invaluable in the management of infection and I know he will have great insights to share on this difficult topic.

We are also delighted to welcome Professor Thorsten Gehrke to give the Charnley lecture. Professor Gehrke has worked at the Endo Klinik in Hamburg for many years and was due to give his lecture at the BOA Congress last autumn. This was not possible due to the travel restrictions but we are delighted that he is able to join us now. He will speak as an international authority on Single Stage Revision for PJI.

We also welcome the ACPA delegates and their President Cathy Armstrong. As in previous years they will be joining us for many of the sessions and running their parallel meeting.

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. There is 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 have all had in the last 24 months. We are delighted to maintain the Emerging Hip Surgeon's session and are really pleased to introduce a session led by the Culture and Diversity committee. There will also be an update from the NJR on Thursday morning.

New this year will also be the Fun Run on Thursday morning which I know a good number of you have signed up for. Of course this isn't meant to be competitive but we are surgeons so....!

During the meeting we will be looking for volunteers to record a short inspirational bio explaining their love and interest in Hip surgery and orthopaedics. These will be used to promote our field and encourage more of the wider T&O population to join us.

The Hot Topics in Hip Surgery organised by Fares Haddad will include: Arthroplasty after previous trauma, Day case arthroplasty, the Future of follow up and Elective recovery; is there a way out? Speakers will include two of our past presidents and the current BOA president.

Foreword

We will have four concurrent industry led symposia, 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.

During the main meeting, we have allocated time for four different "Topic in Focus" instructional sessions, aimed at addressing topical issues, new developments, thorny problems and some of the politics of our specialty. The first Topic in Focus (TIF) on Wednesday afternoon will look at training in hip surgery. Led by our President, this will include an insight from Wing Commander Norris on the training of fast jet pilots, another risky occupation! On Thursday morning we will discuss Dual mobility and its role in hip surgery, led by Professor Mark Wilkinson. The third is a session selected from an open invitation to members and Simon Jameson will lead a team from South Tees discussing digital pathways.

We will be celebrating the 10 year anniversary of the Non Arthroplasty Hip Register with the final TIF on Friday focussing on the achievements of this BHS led world leading initiative.

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 163 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 42 abstracts for podium presentation and a further 110 as posters. The podium presentations have been grouped under headline topics and will last five minutes with two and half minutes for discussion. 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 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 larger than usual number 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.

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, BHS

General information and FAQs

CPD CERTIFICATES?

The Royal College of Surgeons of England have awarded up to **15 CPD points** for this event. An online evaluation form will be sent to all delegates post-event. CPD certificates will be issued electronically, subject to the evaluation form being completed.

PODIUM & POSTER CERTIFICATES?

We do not issue certificates of presentation for podium or poster presenters. 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.

For poster presentations, authors may cite evidence for their portfolio using our programme and online platform.

E-POSTERS?

View our selected scientific poster presentations, which will be displayed on digital screens in the Purbeck Hall. Full abstracts are available to view at the end of this programme (digital copy only). E-posters are also available to view on our online platform.

FAMILY ROOM FACILITIES?

The BHS are pleased to provide a family room with baby changing facilities and a live video stream from the conference hall. Pre-registration is required to make use of these facilities (subject to availability) – please email events@miceorganiser.com well in advance of arriving at the venue.

PRAYER ROOM?

Please check with a member of staff at our registration desk for further details should you wish to make use of this provision, subject to availability.

ON DEMAND POST-EVENT VIEWING?

On demand viewing post-event will be available from 21st March until 30th June for the day(s) delegates have registered for. Log in details to our online platform will be sent by email as part of final joining instructions.

Note: The ACPA Parallel meeting and BHS AGM is not being recorded and will not be available for on demand post-event viewing.

MEETING VENUE & CAR PARKING?

Bournemouth International Centre, Exeter Road, Bournemouth, BH2 5BH. **Note:** Please use our dedicated Purbeck Foyer entrance on the **seafront side of the building.**

There should be ample car parking space at most hotels. Alternatively, there is a large car park onsite at the BIC venue – further details available at: bic.co.uk/parking

COVID-19 REGULATIONS?

Please follow guidance provided in our final joining instructions email that will be sent to all delegates prior to the event.

Wi-Fi @ BIC MEETING VENUE?

Network name: _BIC_Public **(No password)**

REGISTRATION & NAME BADGES?

Our registration desk will be located in the Purbeck Foyer – please refer to opening times shown on the 'programme at a glance' page. Lanyards and name badges will be issued to delegates upon arrival - **for purposes of security, delegates are requested to wear these at all times.**

SPEAKER PREVIEW FACILITIES?

All speakers are requested to proceed to the speaker preview room upon arrival, located in the Purbeck Foyer, **at least two hours prior to their scheduled presentation time.** Please bring your slides on a USB stick and check all is in order with our audio visual colleagues.

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

HOTEL ACCOMMODATION?

Provided a booking was made through the Business Events Bournemouth platform, please contact 01202 816 147 or at: bookings@bebres.org.uk for further information should you need to change your existing booking or check availability for a new booking.

BOURNEMOUTH - THINGS TO DO?

For advice on restaurants, shopping and things to do in the local area, please visit Bournemouth's official tourism website at: bournemouth.co.uk

We welcome all delegates and exhibitors to attend a great evening of

social networking,

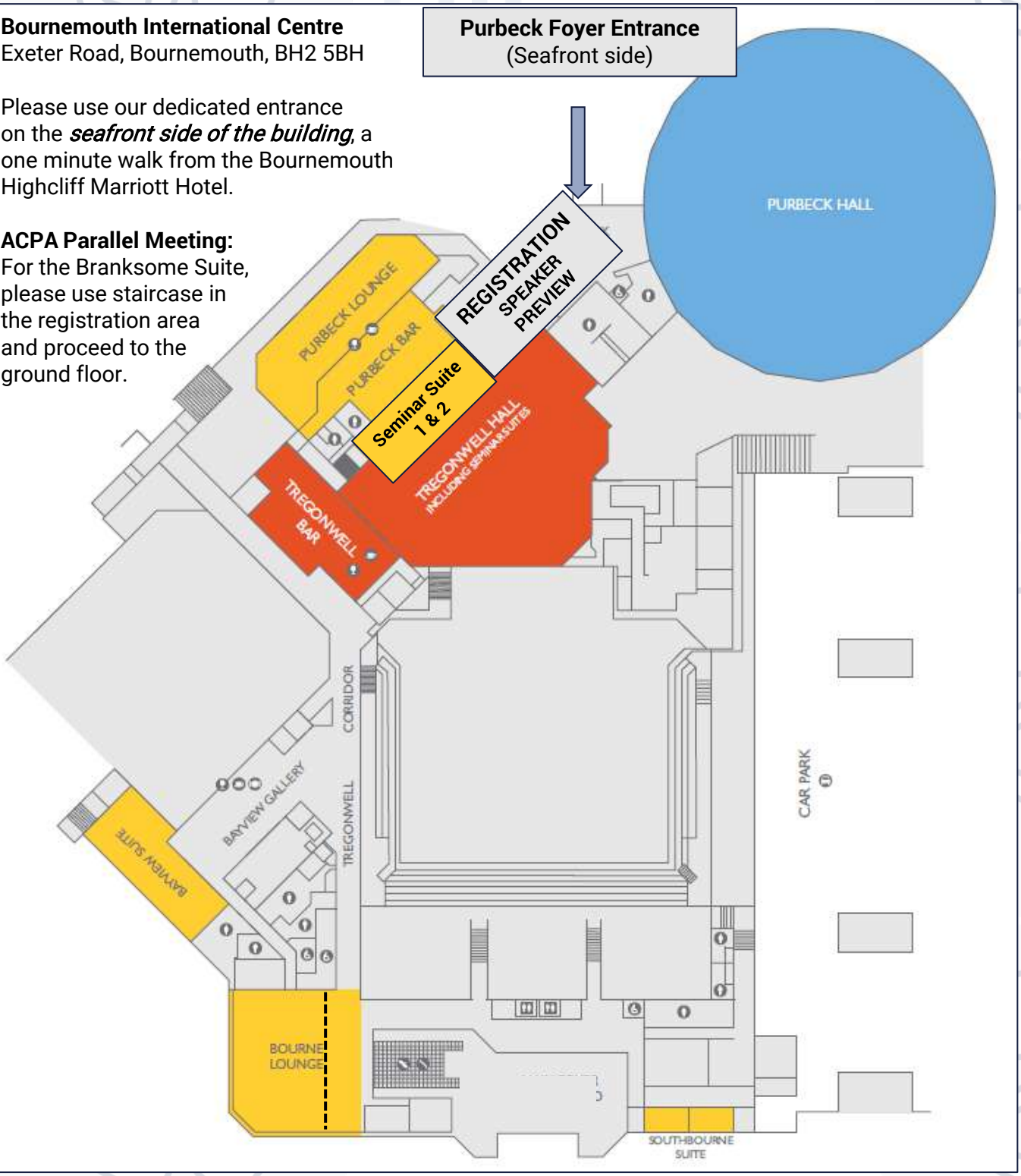
food and drinks.

Venue Floorplan

Bournemouth International Centre
Exeter Road, Bournemouth, BH2 5BH

Please use our dedicated entrance on the ***seafront side of the building***, a one minute walk from the Bournemouth Highcliff Marriott Hotel.

ACPA Parallel Meeting:
For the Branksome Suite, please use staircase in the registration area and proceed to the ground floor.



Programme at a glance

ROOM	WEDNESDAY 2nd March	THURSDAY 3rd March	FRIDAY 4th March
PURBECK FOYER	**REGISTRATION DESK** 08:30 – 18:00 **SPEAKER PREVIEW** Audio visual assistance 08:30 – 18:00	**REGISTRATION DESK** 07:30 – 18:00 **SPEAKER PREVIEW** Audio visual assistance 07:30 – 18:00	**REGISTRATION DESK** 07:30 – 14:00 **SPEAKER PREVIEW** Audio visual assistance 07:30 – 13:00
PURBECK HALL	**CATERING | EXHIBITION** **E-POSTERS**	**CATERING | EXHIBITION** **E-POSTERS** **TASTE YOUR WAY AROUND THE WORLD** **Drinks & International Flavours** **All are welcome to attend!** 18:30 – 20:00	**CATERING | EXHIBITION** **E-POSTERS**
TREGONWELL HALL	**BHS ANNUAL SCIENTIFIC MEETING** 09:30 – 18:00 **BHS AGM** (Members only) 18:15 – 19:30	**BHS ANNUAL SCIENTIFIC MEETING** 08:20 – 18:20	**BHS ANNUAL SCIENTIFIC MEETING** 08:15 – 13:30
BRANKSOME SUITE	**ACPA PARALLEL MEETING** 11:30 – 17:00	**ACPA PARALLEL MEETING** 08:30 – 17:20	**ACPA PARALLEL MEETING** 08:15 – 11:00
PURBECK LOUNGE	**EMERGING HIP SURGEONS FORUM** 17:10 – 18:10		**BHS INSTRUCTIONAL COURSE** 08:20 – 17:15 **Note:** Separate registration required see separate programme
BOURNE LOUNGE		**ADLER ORTHO SYMPOSIUM** 13:30–14:10 14:20–15:00	
SEMINAR SUITE 1	**DEPUY SYNTHES SYMPOSIUM** 14:00–14:40 14:50–15:30	**SMITH + NEPHEW SYMPOSIUM** 13:30–14:10 14:20–15:00	
SEMINAR SUITE 2	**SYMBIOS SYMPOSIUM** 14:00–14:40 14:50–15:30	**STRYKER SYMPOSIUM** 13:30–14:10 14:20–15:00	
BAYVIEW SUITE	**LINK ORTHOPAEDICS SYMPOSIUM** 14:00–14:40 14:50–15:30	**ZIMMER BIOMET SYMPOSIUM** 13:30–14:10 14:20–15:00	

Industry Exhibition

PRIZE DRAW

Please collect your 'Exhibition Passport' from the registration desk on arrival.

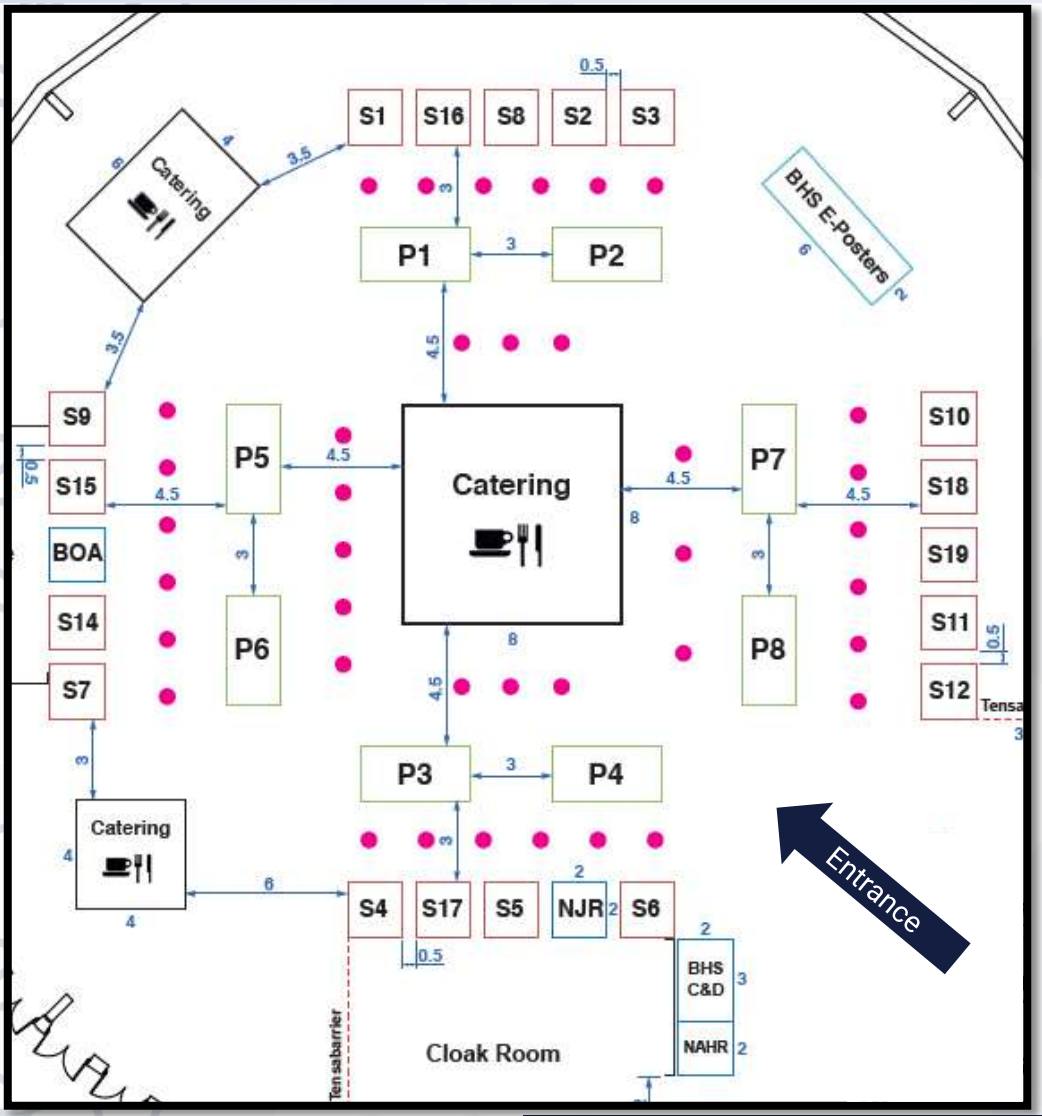
Visit ALL exhibitors and have your passport stamped.

Return your passport to the registration desk before 12pm on Friday 4th March.

Prize draw and two winners will be announced at close of meeting on Friday 4th March.

Good luck!

Industry Exhibition | E-Posters - Purbeck Hall



Exhibitor	Stand No.
ADLER ORTHO	P 7
B. BRAUN MEDICAL	S 1 9
BHS CULTURE & DIVERSITY	BHS C&D
BHS E-POSTERS	see plan
BIOCOMPOSITES	S 1 0
BRITISH ORTHOPAEDIC ASSOCIATION	B O A
CONVATEC	S 1 8
CORIN	S 1 2
DEPUY SYNTHES	P 1
HERAEUS	S 8
IMPLANTCAST	S 2
INCISION MEDICAL INDEMNITY	S 9
JRI	S 4
LIMA	S 5
LINK ORTHOPAEDICS	P 6
MATERIALISE	S 1

Exhibitor	Stand No.
MATHYS	S 1 6
MATORTHO	P 5
MICROPORT	S 3
MÖLNLYCKE	S 1 4
NON-ARTHROPLASTY HIP REGISTRY	NAHR
NATIONAL JOINT REGISTRY	NJR
ORTHOFIX	S 6
PREMIUM MEDICAL PROTECTION	S 7
SMITH + NEPHEW	P 8
STRYKER	P 2
SUMMIT MEDICAL	S 1 5
SYMBIOS	P 4
TORS	S 1 7
UNITED ORTHOPEDIC	S 1 1
ZIMMER BIOMET	P 3

ROOM: TREGONWELL HALL

09:30 – 09:45	**WELCOME**	**Andrew Hamer** President, BHS

ROOM: TREGONWELL HALL

09:45 – 11:00	**HOT TOPICS IN HIP SURGERY 2022**	**Chairs:** **Fares Haddad** (London) **Samantha Hook** (Portsmouth)
09:45 – 09:55	Arthroplasty after previous femoral or acetabular / pelvic trauma	**Andrew Manktelow** (Nottingham)
09:55 – 10:05	Day case hip arthroplasty – the state of play	**Edward Dunstan** (NHS Fife)
10:05 – 10:15	The future of arthroplasty surgery follow-up	**Lindsay Smith** (Bristol)
10:15 – 10:25	Elective recovery and hip surgery: is there a way out?	**John Skinner** (London)
10:25 – 11:00	Discussion	

11:00 – 11:30 **COFFEE | INDUSTRY EXHIBITION | E-POSTERS**

Room: Purbeck Hall

ROOM: BRANKSOME SUITE

11:30 – 12:15

ACPA ARTHROPLASTY CARE PRACTITIONERS ASSOCIATION
Promoting quality care for arthroplasty patients

ACPA Parallel Meeting

Please note: post-event on demand viewing will not be available for this session.

11:30 – 12:15	ACPA Welcome	**Cathy Armstrong** (ACPA President)
12:30 – 13:10	Join BHS Meeting (Tregonwell Hall)	

ROOM: TREGONWELL HALL

11:30 – 12:30	**PODIUM PRESENTATIONS OF SCIENTIFIC PAPERS: PRIMARY ARTHROPLASTY** Eight papers (5 mins. presentation + 2 mins. discussion)	**Chairs:** **Grace White** (Bradford) **Dominic Meek** (Glasgow)

11:30 – 11:37 (4)

USING TRANEXAMIC ACID FOR AN ADDITIONAL 24-HOURS POST OPERATIVELY IN HIP AND KNEE ARTHROPLASTY SAVES MONEY: A COST ANALYSIS FROM THE TRAC-24 RANDOMISED CONTROL TRIAL

Paul Karayiannis[1], Ashely Agus[2], Leanne Bryce[1], Janet Hill[1], David Beverland[1]

[1]Musgrave Park Hospital, Belfast, United Kingdom. [2]Northern Ireland Clinical Trials unit, Belfast, United Kingdom

11:37 – 11:44 (27)

THE FEASIBILITY OF ACHIEVING ELECTIVE CARE FRAMEWORK TARGETS FOR TOTAL HIP ARTHROPLASTY (THA) IN NORTHERN IRELAND

Alistair Mayne[1], Roslyn Cassidy[1], Paul Magill[2], Brian Mockford[1], Danny Acton[3], Gavan McAlinden[1]

[1]Musgrave Park Hospital, Belfast, United Kingdom. [2]Craigavon Area Hospital, Craigavon, United Kingdom. [3]Altnagelvin Area Hospital, Londonderry, United Kingdom

11:44 – 11:51 (30)

DOES THE MODE OF DATA ACQUISITION AFFECT THE OXFORD HIP SCORE AND EQ-5D SCORE FOR PATIENTS UNDERGOING TOTAL HIP REPLACEMENTS?

Irrum Afzal, Richard Field

South West London Elective Orthopaedic Centre, London, United Kingdom

11:51 – 11:58 (54)

THE IMPACT OF FRAILTY ON 30-DAY MORTALITY FOLLOWING PRIMARY HIP ARTHROPLASTY DUE TO OSTEOARTHRITIS

Michael Cook[1], Mark Lunt[1], Timothy Board[2], Terence O'Neill[1,3]

[1]The University of Manchester, Manchester, United Kingdom. [2]Wrightington Hospital, Wigan, United Kingdom. [3]NIHR Manchester Biomedical Research Centre, Manchester, United Kingdom

11:58 – 12:05 (55)

THE IMPACT OF DEPRIVATION AND FRAILTY ON THE LIKELIHOOD OF RECEIVING PRIMARY TOTAL HIP ARTHROPLASTY DUE TO OSTEOARTHRITIS

Michael Cook[1], Mark Lunt[1], Timothy Board[2], Terence O'Neill[1,3]

[1]The University of Manchester, Manchester, United Kingdom. [2]Wrightington Hospital, Wigan, United Kingdom. [3]NIHR Manchester Biomedical Research Centre, Manchester, United Kingdom

12:05 – 12:12 (66)

MANAGEMENT OF PROSTHETIC HIP DISLOCATION (PHD) PILOT STUDY: A TRAINEE LED COLLABORATIVE PROJECT IN THE NORTHWEST OF ENGLAND.

Sadia Afzal[1], Ghazal Hodhody[2], James Kennedy[3], Tim Board[4]

[1]Salford Royal Hospital, Manchester, United Kingdom. [2]Royal Blackburn Hospital, Blackburn, United Kingdom. [3]Royal Oldham Hospital, Manchester, United Kingdom. [4]Wrightington Hospital, Wrightington, United Kingdom

12:12 – 12:19 (85)

SURVIVAL OF THE EXETER V40 SHORT REVISION (44/00/125) STEM WHEN USED IN PRIMARY TOTAL HIP REPLACEMENT (THR), ANALYSIS OF THE NATIONAL JOINT REGISTRY (NJR).

Jonathan Evans[1], Omer Salar[2], Sarah Whitehouse[2], Al-Amin Kassam[2], Jonathan Howell[2], Matthew Wilson[2], John Timperley[2], Adrian Sayers[1], Michael Whitehouse[1], Timothy Wilton[3], Matthew Hubble[2]

[1]University of Bristol, Bristol, United Kingdom. [2]Princess Elizabeth Orthopaedic Centre, Exeter, United Kingdom. [3]National Joint Registry, London, United Kingdom

12:19 – 12:26 (139)

THE RISK OF MORTALITY IN PATIENTS UNDERGOING ELECTIVE PRIMARY TOTAL HIP REPLACEMENT FOR OSTEOARTHRITIS WITH RECENT INPATIENT ADMISSION FOR MANAGEMENT OF MEDICAL CONDITIONS, ANALYSIS OF THE NATIONAL JOINT REGISTRY.

Jonathan Evans[1], Linda Hunt[1], Ashley Blon[1], Mark Wilkinson[2], Andrew Stevenson[3], Michael Whitehouse[1]
[1]University of Bristol, Bristol, United Kingdom. [2]University of Sheffield, Sheffield, United Kingdom. [3]Musgrove Park Hospital, Taunton, United Kingdom

ROOM: TREGONWELL HALL

12:30 – 13:10 **CHARNLEY LECTURE:**
Diagnostics and Treatment of PJI – The Endo Clinic Experience

Prof. Thorsten Gehrke
Chief Physician, Helios ENDO-Klinik, Hamburg, Germany

Introduced by: **Andrew Hamer** (President, BHS)

13:10 – 14:00 **LUNCH | INDUSTRY EXHIBITION | E-POSTERS**

Room: Purbeck Hall

JOIN US AFTER LUNCH FOR INDUSTRY SYMPOSIA
PLEASE SEE OVERLEAF FOR FULL DETAILS

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DePuy Synthes BHS Industry symposium

Delivering enhanced outcomes with enabling technologies in THR

March 2nd
14:00-14:40pm
Repeated 14:50-15:30pm

British Hip Society 2022 – BIC Bournemouth

Faculty

David Beverland
Belfast, N. Ireland

Simon Garrett
Dorset, UK

Toby Briant-Evans
Basingstoke, UK

Overview

Please join us as Professor David Beverland and Mr Simon Garrett discuss how the development and use of innovative technologies can help surgeons deliver consistent and reproducible results in total hip replacement.

Professor Beverland will focus on Reality Based Navigation; a development driven by his extensive experience with CORAIL PINNACLE to improve accuracy without surgical compromise.

Mr Garrett will discuss his experience with the KINCISE surgical impactor, alleviating surgeon fatigue whilst improving accuracy of both cup and stem positioning.

Mr Briant-Evans will chair and moderate the discussion and Q&A.

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LINK® UK

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Upcoming Session

Periprosthetic Fractures of the Femur: Prevention of The Emerging Pandemic

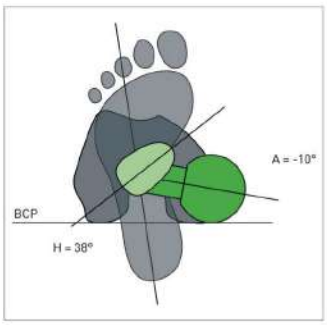
Wednesday 2nd March
14:00 – 14:40 & 14:50 – 15:30

Mr Muhammad Adeel Akhtar
Mr Jonathan N. Lamb

Bayview Suite

A leading opinion in the design and manufacture of Custom Implants - the Individual® Hip

Drawing upon 30 years of clinical experience involving the design and manufacture of over 30,000 Custom hip prostheses, Symbios has introduced the first system allowing total control of the three principle anatomical factors being leg length, offset and version to accurately reconstruct the hip joint.



Our 3D planning software fully supports the company's entire implant strategy for accurate pre-operative planning and reconstruction of the hip joint- the first system allowing total control of the three principle anatomical factors being leg length, offset and version.

Developed over the past 14 years, involving our resident software engineers, the project has evolved from the vast experience Symbios has gained during the design, manufacture and implantation of over 30,000 custom hip prosthesis since 1989. Many of these cases being complex dysplasias, planned from CT scans. The reported results have been hugely encouraging, Wettstein et al. reporting 100% survivorship at 94.9 months (CORR 2005), and Argenson reporting 93% survivorship at 15 years in patients less than 50 years old (COOR 2009). The software is affordable, transportable across multiple clinical commitments and a real alternative to navigated hip surgery optimising component positioning.

From the results published at 15 years, the Custom stem has been an especially effective treatment option in the young adult dysplastic hip. The National Joint Registry has reported just two revisions in 613 hips (max 13.1 years; mean 4.3 years). Furthermore, 57.7% of patients receiving the Symbios Custom implant were ‹50 years (vs just 8.4% in the comparator group being the 'Top 5' cementless brands on the Registry) representing a disproportionately high percentage of young high demand patients.

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14:00 – 15:30 INDUSTRY SYMPOSIA

Choose on the day which two of the three industry symposia below you wish to attend.
All three sessions will be repeated after a short comfort break.

ROOM: SEMINAR SUITE 1

14:00 – 14:40 **repeated** 14:50 – 15:30

DePuy Synthes
THE ORTHOPAEDICS COMPANY OF Johnson & Johnson

Chair:
Mr Toby Briant-Evans
(Basingstoke)

DELIVERING ENHANCED OUTCOMES WITH ENABLING TECHNOLOGIES IN THR

Professor David Beverland (Belfast) and **Mr Simon Garrett** (Dorset) will discuss how the development and use of innovative technologies can help surgeons deliver consistent and reproducible results in total hip replacement. Professor Beverland will focus on Reality Based Navigation; a development driven by his extensive experience with CORAIL PINNACLE to improve accuracy without surgical compromise. Mr Garrett will discuss his experience with the KINCISE surgical impactor, alleviating surgeon fatigue whilst improving accuracy of both cup and stem positioning.

14:40 – 14:50 COMFORT BREAK AND CHANGE OVER

ROOM: BAYVIEW SUITE

14:00 – 14:40 **repeated** 14:50 – 15:30

LINK®

PERIPROSTHETIC FRACTURES OF THE FEMUR: PREVENTION OF THE EMERGING PANDEMIC

Mr Muhammad Adeel Akhtar (NHS Fife)
Mr Jonathan N. Lamb (University of Leeds)

As the NHS looks to increase capacity to drive down surgical waiting lists, we review the growing problem of increased PPF admissions after hip surgery, implant-related risk factors and their associated cost implications and discuss what can be done to reverse the trend.

14:40 – 14:50 COMFORT BREAK AND CHANGE OVER

ROOM: SEMINAR SUITE 2

14:00 – 14:40 **repeated** 14:50 – 15:30

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THE YOUNG ADULT COMPLEX HIP

14:00 – 14:30	**Understanding helitorsion and the proximal femur for young dysplastic hip replacement.**	**Mr Prim Achan** (London)
14:30 – 14:40	Discussion	
14:40 – 14:50	**COMFORT BREAK AND CHANGE OVER**	
14:50 – 15:20	**The Individual Hip – how planning, engineering and surgery can optimise the outcome.**	**Mr Callum McBryde** (Birmingham)
15:20 – 15:30	Discussion	

ROOM: BRANKSOME SUITE

14:00 – 15:30

ACPA Parallel Meeting

Please note: post-event on demand viewing will not be available for this session.

14:00 – 14:50	ACPA AGM (ACPA Members only)	**Chair:** **Cathy Armstrong** (ACPA President)
14:50 – 15:30	ACPA BAJIR	**Anji Kingman** (Northumbria)

15:30 – 15:50 **TEA | INDUSTRY EXHIBITION | E-POSTERS**

Room: Purbeck Hall

ROOM: TREGONWELL HALL

15:50 – 17:00	**TOPIC IN FOCUS I:** TRAINING	**Chairs:** **Andrew Hamer** (Sheffield) **Jane Webber** (Milton Keynes)
15:50 – 15:55	Introduction	**Andrew Hamer** (Sheffield)
15:55 – 16:15	RAF Fast-Jet pilots and surgeons. Are they similar?	**Wing Commander** **Jamie Norris** (RAFC Cranwell)
16:15 – 16:30	Does simulation training for surgeons benefit patients?	**Hannah James** (Warwick)
16:30 – 16:45	How to train a hip surgeon. A better view from across the table?	**Rob Banerjee** (Oswestry)
16:45 – 17:00	Discussion and Questions	

ROOM: BRANKSOME SUITE

15:50 – 17:00

ACPA Parallel Meeting

Please note: post-event on demand viewing will not be available for this session.

15:50 – 16:30	Implant Retrieval, Beyond Compliance and ODEP: We need ACPA's help.	**Keith Tucker** (Norwich)
16:30 – 17:00	ACPA Networking session.	**ACPA Committee**

ROOM: PURBECK LOUNGE

17:10 – 18:10 *Parallel event*	**EMERGING HIP SURGEONS FORUM**	**Chairs:** **Joanna Maggs** (Torbay) **Saif Salih** (Sheffield) **Sam Jain** (Leeds)
	Balancing personal development with training in Covid times.	**Lisa Hadfield-Law** (Surgical Educationalist)
	Non-clinical tips for early years.	**Tim Harrison** (Sheffield)
	Delivering service improvement as a new consultant.	**Mike Reed** (Northumbria)

ROOM: TREGONWELL HALL

17:00 – 17:40 *Parallel event*	**NAHR 7th ANNUAL REPORT - 10 YEARS OF SUCCESS**	**Ajay Malviya** (Northumbria)

ROOM: TREGONWELL HALL

17:40 – 18:00 *Parallel event*	**KEY MESSAGES FROM E-POSTERS**	**Dominic Meek** (Glasgow) **Simon Buckley** (Sheffield)

ROOM: TREGONWELL HALL

18:15 – 19:30	**BHS ANNUAL GENERAL MEETING** (BHS Members only) **Please note:** post-event on demand viewing will not be available for this session.	

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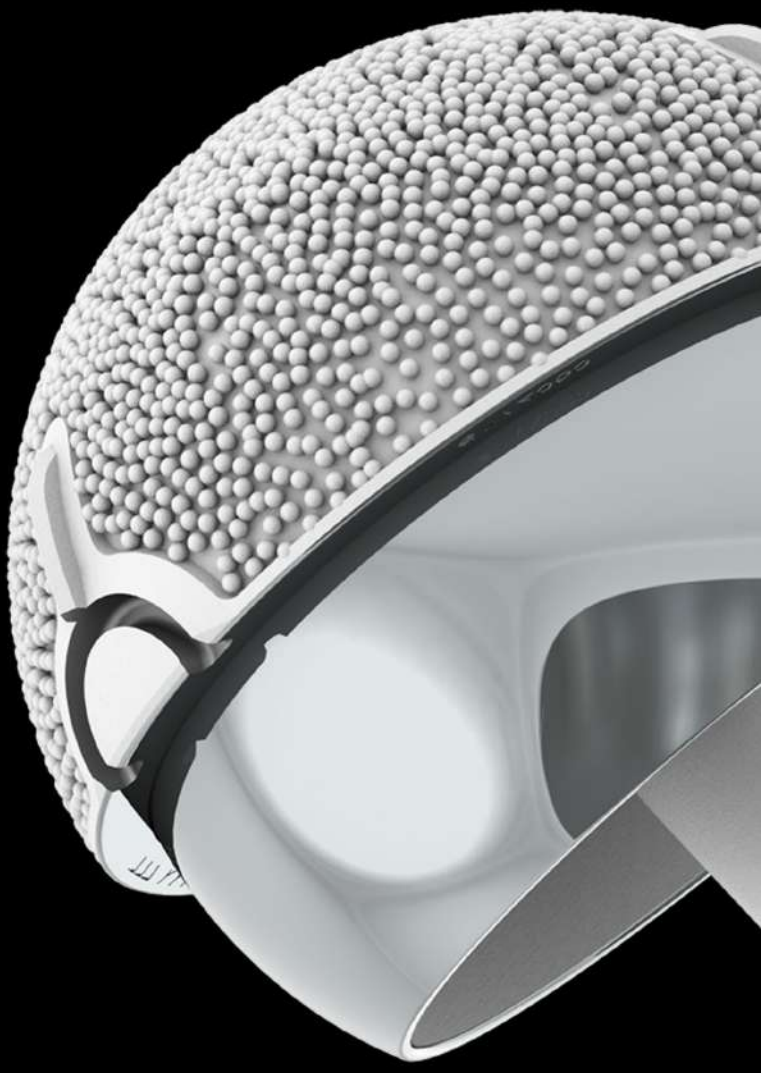

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1. Albert Einstein

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ROOM: TREGONWELL HALL

08:20 – 08:25	**WELCOME TO DAY TWO**	**Vikas Khanduja** President Elect, BHS

ROOM: TREGONWELL HALL

08:25 – 09:30	**TOPIC IN FOCUS II:** DUAL MOBILITY	**Chair:** **Mark Wilkinson** (Sheffield)
08:25 – 08:30	Introduction	**Mark Wilkinson** (Sheffield)
08:30 – 08:45 PR	Dual Mobility – the fracture experience	**Ian Harris** (Sydney, Australia)
08:45 – 09:00	Dual Mobility – the elective experience	**Michael Whitehouse** (Bristol)
09:00 – 09:15	Dual Mobility – a surgeon's experience	**Steve Jones** (Cardiff)
09:15 – 09:30	Panel and audience discussion	

ROOM: TREGONWELL HALL

09:30 – 10:00	**NJR UPDATE**	**Chair:** **Tim Wilton** (Derby)

ROOM: BRANKSOME SUITE

08:30 – 09:40

ACPA ARTHROPLASTY CARE PRACTITIONERS ASSOCIATION
Promoting quality care for arthroplasty patients

ACPA Parallel Meeting

Please note: post-event on demand viewing will not be available for this session.

08:30 – 08:35	Welcome to day two and summary of day one.	**Sharon Ferdinandus** (ACPA Vice President)
08:35 – 09:40	ACPA hip exam	**Prof. Paul Banaszkiewicz** (Gateshead)

10:00 – 10:25 **COFFEE I INDUSTRY EXHIBITION I E-POSTERS**

Room: Purbeck Hall

ROOM: TREGONWELL HALL

10:25 – 11:55 **PODIUM PRESENTATIONS OF SCIENTIFIC PAPERS: PRIMARY ARTHROPLASTY**
Twelve papers
(5 mins. presentation + 2 mins. discussion)

Chairs:
Julie Smith (Paisley)
Jonathan Howell (Exeter)

10:25 – 10:32 (26)
USING CLASSIFIER NEURAL NETWORKS TO ESTIMATE PERSONALISED PROMS AFTER HIP REPLACEMENT
Fabio de Mello, Visakan Kadirkamanathan, Mark Wilkinson
University of Sheffield, Sheffield, United Kingdom

10:32 – 10:39 (40)
LIPPED LINERS IN THR – THE EFFECT OF LIP ORIENTATION
Simon Williams[1], Gregory Pryce[1], Tim Board[2], Graham Isaac[1], Sophie Williams[1]
[1]University of Leeds, Leeds, United Kingdom. [2]Wrightington, Wigan and Leigh NHS Trust, Wigan, United Kingdom

10:39 – 10:46 (47)
TWO-YEAR MIGRATION OF A PROXIMALLY COATED, TAPERED, SHORT BLADE STEM.
Andreas Fontalis[1,2], Shanil Hansjee[1], Shwan Ali Ahmad[1], Andrew Ogilvie[1], Dia Giebaly[1], Babar Kayani[1], Fares Haddad[1,2]
[1]Department of Trauma and Orthopaedic Surgery, University College London Hospitals, London, United Kingdom. [2]Division of Surgery & Interventional Science, University College London, London, United Kingdom

10:46 – 10:53 (48)
PR
CAN WE PREDICT FRACTURE WHEN USING A SHORT CEMENTLESS FEMORAL STEM IN THE ANTERIOR APPROACH?
Niall P. McGoldrick, Michael Cochran, Brook Biniam, Raman Bhullar, Paul E. Beaulé, Paul R. Kim, Wade Gofton, George Grammatopoulos
The Ottawa Hospital, Ottawa, Canada

10:53 – 11:00 (49)
INTRA-OPERATIVE CELL SALVAGE IN REVISION HIP ARTHROPLASTY: A SYSTEMATIC REVIEW WITH META-ANALYSIS
Thomas Walton[1], Daniel Huntley[1], Sarah Whitehouse[2], Andrew Ross[1], Al-Amin Kassam[1]
[1]Royal Devon and Exeter NHS Foundation Trust, Exeter, United Kingdom. [2]Queensland University of Technology, Brisbane, Australia

11:00 – 11:07 (71)
MEDIUM TO LONG TERM OUTCOMES OF 117 CONSECUTIVE STRYKER® TRIDENT 'ALL-POLY' CONSTRAINED ACETABULAR INSERTS: A DISTRICT GENERAL EXPERIENCE
Christopher Lewis, Megan Baker, Ben Brooke, Bob Metcalf, Guy McWilliams, Sameh Sidhom
Calderdale Royal Hospital, Calderdale, United Kingdom

11:07 – 11:14 (73)
DUAL-MOBILITY CONSTRUCTS FOR HIP FRACTURE: WHAT IS THE ALL-CAUSE CONSTRUCT SURVIVAL AND IS THERE A BENEFIT TO THEIR ROUTINE USE?
Hamish Macdonald, Andrew Gardner, Jonathan Evans, Adrian Sayers, Michael Whitehouse
University of Bristol, Bristol, United Kingdom

11:14 – 11:21 (82)
20 YEAR RESULTS OF BIRMINGHAM HIP RESURFACING; CONSECUTIVE COHORT SERIES 1998 – 2001
Thomas Partridge, Suzanne Osborne, Martin Marsh, James Holland
Newcastle Hospitals NHS Foundation Trust, Newcastle upon Tyne, United Kingdom

11:21 – 11:28 (130)
EFFICACY OF MUPIROCIN, NEOMYCIN AND OCTENIDINE FOR NASAL STAPHYLOCOCCUS AUREUS DECOLONISATION: A RETROSPECTIVE COHORT STUDY
Jack Allport, Reyhan Choudhury, Peter Bruce-Wootton, Mike Reed, David Tate, Ajay Malviya
Northumbria healthcare NHS foundation trust, Northumberland, United Kingdom

11:28 – 11:35 (134)
EARLY QUALITY OF LIFE IMPROVEMENTS AFTER PAEDIATRIC HIP REPLACEMENT IN MULTIPLE AND SINGLE JOINT DISEASE PATHOLOGIES
Jonathan Barrow[1], Martin Eden[2], Anne Foster[3], Mohammed Kenawey[3], Tim Board[1]
[1]Centre for Hip Surgery, Wrightington Hospital, Wigan, United Kingdom. [2]University of Manchester Centre for Health Economics, Manchester, United Kingdom. [3]Royal Manchester Children's Hospital, Manchester, United Kingdom

11:35 – 11:42 (135)
EXETER ANALYSIS OF ROBOTIC TOTAL HIP ARTHROPLASTY (EARTH) – INITIAL RESULTS OF THE FIRST 40 CASES PERFORMED IN AN NHS HOSPITAL
Sush Gowda[1], Sarah Whitehouse[2], Robert Morton[1], Michalis Panteli[1], John Charity[1], Matthew Wilson[1], John Timperley[1], Matthew Hubble[1], Jonathan Howell[1], Al-Amin Kassam[1]
[1]Royal Devon and Exeter NHS Foundation Trust, Exeter, United Kingdom. [2]Queensland University of Technology, Brisbane, Australia

11:42 – 11:49 (161)
WHAT IS THE EFFECT OF TRUNNION BEARING ON REVISION RATE FOLLOWING PRIMARY THR?: A STUDY USING THE NJR DATASET
Richard Holleyman[1], Tim Petheram[1], Mike Reed[1], Paul Burton[2], Ajay Malviya[1]
[1]Northumbria Healthcare, Northumbria, United Kingdom. [2]Population Health Sciences Institute, Newcastle University, Northumbria, United Kingdom

ROOM: TREGONWELL HALL

12:00 – 12:40 **PRESIDENTIAL GUEST LECTURE**

ORTHOPAEDIC MICROBIOLOGY:
- Laboratory diagnosis
- Pitfalls and problems
- Antibiotic management
- MDT working

Prof. Rob Townsend
(Sheffield)

12:40 – 13:30 LUNCH | INDUSTRY EXHIBITION | E-POSTERS

Room: Purbeck Hall

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1. Klug A, Gramlich Y, Rudert M, et al. The projected volume of primary and revision total knee arthroplasty will place an immense burden on future health care systems over the next 30 years. Knee Surgery, Sports Traumatology, Arthroscopy. 2020;15:1-12. **2.** Sloan M, Premkumar A, Sheth NP. Projected Volume of Primary Total Joint Arthroplasty in the U.S., 2014 to 2030. J Bone Joint Surg Am. 2018;100:1455-1460. **3.** Ackerman IN, Bohensky MA, Zomer E, et al. The projected burden of primary total knee and hip replacement for osteoarthritis in Australia to the year 2030. BMC Musculoskeletal Disorders. 2019;23(1):90. **4.** 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. Journal of Bone Joint Surgery. 2020;5(2):pe0075. **5.** Peters RM, Van Steenbergen LN, Stevens M, et al. The effect of bearing type on the outcome of total hip arthroplasty. Acta Orthopaedica. 2018; 89(2):163-169. **6.** Atrey A, Ancarani C, Fitch D, Bordini B. Impact of bearing couple on long-term component survivorship for primary cementless total hip replacement in a large arthroplasty registry. Poster presented at: Canadian Orthopedic Association; June 20–23, 2018; Victoria, British Columbia, Canada. **7.** Australian Orthopaedic Association National Joint Replacement Registry (AOANJRR) Hip, Knee & Shoulder Arthroplasty: 2020 Annual Report. **8.** Innocenti M, Matassi F, Carulli C, Nistri L, Civinini C. Oxidized zirconium femoral component for TKA: A follow-up note of a previous report at a minimum of 10 years. The Knee. 2014;21:858–861. **9.** Hunter G, Dickinson J, Herb B, et al. Creation of oxidized zirconium orthopaedic implants. Journal of ASTM International. 2005;2:1-14. **10.** Long M, Riester L, Hunter G. Nano-hardness Measurements of Oxidized Zr-2.5Nb and Various Orthopaedic Materials. Abstract presented at: 24th Annual Meeting of the Society for Biomaterials. April 22-26, 1998, San Diego, California. **11.** Parikh A, Hill P, Pawar V, Sprague J. Long-term Simulator Wear Performance of an Advanced Bearing Technology for THA. Poster presented at: 2013 Annual Meeting of the Orthopaedic Research Society. Poster no. 1028. **12.** Papannagari R, Hines G, Sprague J, Morrison M. Long-term wear performance of an advanced bearing technology for TKA. Poster presented at: 2011 Annual Meeting of the Orthopaedic Research Society. Poster no. 1141. **13.** Smith+Nephew 2010. OR-10-155. **14.** Aldinger P, Williams T, Woodard E. Accelerated Fretting Corrosion Testing of Zirconia Toughened Alumina Composite Ceramic and a New Composition of Ceramicised Metal Femoral Heads. Poster presented at: 2017 Annual Meeting of the Orthopaedic Research Society. Poster no. 1037. **15.** Smith+Nephew 2016. OR-16-127.

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***For the Mako Total Hip application, "ream less" refers to greater bone preservation as compared to manual surgery.[1,2]**

1. Illgen 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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3785.1-GB-en-Issue Date 2022-01-14

13:30 – 15:00 INDUSTRY SYMPOSIA

Choose on the day which two of the four industry symposia below you wish to attend.
All four sessions will be repeated after the comfort break.

ROOM: BOURNE LOUNGE

13:30 – 14:10 **repeated** 14:20 – 15:00

ADLER ORTHO

EPR OUTCOMES: ADDRESSING THE UNMET NEED

Chair: **Professor Rob Ashford**
University Hospitals of Leicester NHS Trust

Early clinical data from a comparative in-growth study between a conventional cylindrical and a porous endosteal collar.	**Mr Adrian Taylor** Nuffield Orthopaedic Centre, Oxford
The role of EPRs in oncology and revision arthroplasty surgery.	**Mr Duncan Whitwell** Nuffield Orthopaedic Centre, Oxford

14:10 – 14:20 COMFORT BREAK AND CHANGE OVER

ROOM: SEMINAR SUITE 1

13:30 – 14:10 **repeated** 14:20 – 15:00

Smith+Nephew

13:30 – 14:00	**Optimising The Elective Recovery - Digital Enablers and Remote Patient Management**	Alex Gilbert (Digital Medicine - HUMA)
14:00 – 14:10	Discussion	

14:10 – 14:20 COMFORT BREAK AND CHANGE OVER

ROOM: SEMINAR SUITE 2

13:30 – 14:10 **repeated** 14:20 – 15:00

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13:30 – 13:45	**Daycase total hip replacement in the NHS -** Achievable reality or dream?	**Mike Reed** Northumbria Healthcare NHSFT
13:45 – 14:00	**MAKO - a love affair** A practical guide to fulfilment	**Prof A John Timperley** Royal Devon and Exeter Hospital
14:00 – 14:10	**Discussion**	

14:10 – 14:20 COMFORT BREAK AND CHANGE OVER

ROOM: BAYVIEW SUITE

13:30 – 14:10 **repeated** 14:20 – 15:00

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DAY CASE HIP SURGERIES: SHOULD WE ALL START TOMORROW?

Our faculty members will share their experience setting up day-case surgeries, their motivations, the challenges they faced, their short and mid-term outcomes in their respective practices.

13:30 – 13:40	**Key success factors**	**Mr Graeme Nicol** Tayside Hospital
13:40 – 13:50	**Pathway implementation and early experience**	**Mr Manju Ramappa** North Tees and Hartlepool Hospital
13:50 – 14:00	**Three year Scottish experience**	**Mr Edward Dunstan** NHS Fife
14:00 – 14:10	**Panel discussion and questions from the audience**	

14:10 – 14:20 COMFORT BREAK AND CHANGE OVER

ROOM: BRANKSOME SUITE

13:30 – 14:45

ACPA Parallel Meeting

Please note: post-event on demand viewing will not be available for this session.

13:30 – 14:45	ACPA knee exam	**Fazal Ali** (Chesterfield)

15:00 – 15:20 **TEA | INDUSTRY EXHIBITION | E-POSTERS**

Room: Purbeck Hall

ROOM: TREGONWELL HALL

15:20 – 16:35	**TOPIC IN FOCUS III:** DIGITAL PATHWAYS	**Chairs:** **Simon Jameson** (S. Tees) **Henry Wynn Jones** (Wrightington)
15:20 – 15:25	Introduction	**Simon Jameson** (S. Tees)
15:25 – 15:45	NHSe guidelines around peri-operative care.	**Richard Samuel** (NHSx)
15:45 – 16:00	Prehabilitation / Prepwell / Outcome data	**Rhiannon Hackett** (S. Tees)
16:00 – 16:15	Digital pathways / Patient engagement and experience / outcome data	**Paul Baker** (S. Tees)
16:15 – 16:20	Summary	**Simon Jameson** (S. Tees)
16:20 – 16:35	Discussion	

ROOM: TREGONWELL HALL

16:35 – 17:50	**PODIUM PRESENTATIONS OF SCIENTIFIC PAPERS: NON-ARTHROPLASTY / GENERAL ORTHO** Ten papers (5 mins. presentation + 2 mins. discussion)	**Chairs:** **Catherine Kellett** (Dubai) **Caroline Blakey** (Sheffield)
16:35 – 16:42	(20) **PELVIC TILT FROM SUPINE TO STANDING IN PATIENTS WITH SYMPTOMATIC ACETABULAR RETROVERSION OF THE HIP** Mark Jenkinson[1], Wouter Peeters[2], Jonathan Hutt[1], Johan Witt[1] [1]UCLH, London, United Kingdom. [2]Antwerp University Hospital, Antwerp, Belgium	

16:42 – 16:49 (64)

OXIDISED ZIRCONIUM VERSUS COBALT–CHROME FEMORAL HEADS IN TOTAL HIP ARTHROPLASTY: A MULTICENTRE PROSPECTIVE RANDOMISED CONTROLLED TRIAL WITH 10 YEARS FOLLOW-UP

Babar Kayani[1], Joanna Baawa[1], Andreas Fontalis[1], Jenni Tahmassebi[1], Nic Wardle[2], Robert Middleton[3], James Hutchinson[4], Fares Haddad[1]
[1]Department of Trauma and Orthopaedics, University College Hospital, London, UK [2]Colchester Hospital University Foundation Trust, Colchester, UK. [3]Department of Trauma and Orthopaedics, Bournemouth University, Bournemouth, UK. [4]Royal Derby Hospital, Derby, UK.

16:49 – 16:56 (65)

THE USE OF INTRA-ARTICULAR PLATELET-RICH PLASMA AS A THERAPEUTIC INTERVENTION FOR HIP OSTEOARTHRITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

Anthony Lim[1], John Zhu[1], Vikas Khanduja[2]
[1]University of Cambridge School of Clinical Medicine, Cambridge, United Kingdom. [2]Addenbrooke's - Cambridge University Hospital NHS Foundation Trust, Cambridge, United Kingdom

16:56 – 17:03 (126)

SCALING UP QUALITY IMPROVEMENT FOR SURGICAL TEAMS (QIST) - AVOIDING SURGICAL SITE INFECTION AND ANAEMIA AT THE TIME OF SURGERY: A CLUSTER RANDOMISED CONTROLLED TRIAL OF THE EFFECTIVENESS OF QUALITY IMPROVEMENT COLLABORATIVES TO INTRODUCE CHANGE IN THE NHS

Ashley Scrimshire[1,2], Alison Booth[1], Caroline Fairhurst[1], Elizabeth Coleman[1], Ajay Malviya[2], Alwyn Kotze[3], Annie Laverty[2], Gillian Davis[2], Win Tadd[4], David Torgerson[1], Catriona McDaid[1], Mike Reed[2,1]
[1]Univeristy of York, York, United Kingdom. [2]Northumbria Healthcare NHS Foundation Trust, Newcastle upon Tyne, United Kingdom. [3]Leeds Teaching Hospital, Leeds, United Kingdom. [4]Cardiff, Cardiff, United Kingdom

17:03 – 17:10 (127)

CAN MACHINE LEARNING ALGORITHMS PREDICT WHICH PATIENTS WILL ACHIEVE MCID AFTER ARTHROSCOPIC MANAGEMENT OF FEMOROACETABULAR IMPINGEMENT?

MH Pettit[1], Sebastian Hickman[1], Ajay Malviya[2], Vikas Khanduja[1]
[1]Cambridge University, Cambridge, United Kingdom. [2]Northumbria Hospital, Northumbria, United Kingdom

17:10 – 17:17 (132)

CAN GENETIC TESTING BE USED TO IMPROVE IMPLANT SELECTION AND POST OPERATIVE MONITORING?

David Langton[1], Rohan Bhalekar[1], Tom Joyce[2], Nish Shyam[3], Matthew Nargol[1], Moreica Pabbruwe[4], Ed Su[5], Antoni Nargol[6]
[1]ExplantLab, Newcastle-upon-Tyne, United Kingdom. [2]Newcastle University, Newcastle-upon-Tyne, United Kingdom. [3]ExplantLab, Newcastle University, United Kingdom. [4]CITRA, Perth, Australia. [5]Hospital for Special Surgery, New York, USA. [6]University Hospital of North Tees, Stockton, United Kingdom

17:17 – 17:24 (145)

WHAT ARE THE OUTCOMES OF HIP PRESERVATION SURGERY IN PATIENTS WITH A PRE-OPERATIVE QUALITY OF LIFE 'WORSE THAN DEATH'?: A STUDY USING THE NAHR DATASET

Richard Holleyman[1], Karadi H Sunil Kumar[2], Vikas Khanduja[3], Ajay Malviya[2]
[1]Newcaslte University, Newcastle, United Kingdom. [2]Wansbeck General Hospital, Northumbria Healthcare NHS Foundation Trust, Ashington, United Kingdom. [3]Addenbrookes – Cambridge University Hospitals NHS Trust, Cambridge, United Kingdom

17:24 – 17:31 (146)

SEXUAL FUNCTION BEFORE AND AFTER HIP ARTHROSCOPY: A STUDY USING THE NAHR DATASET

Richard Holleyman[1], Karadi H Sunil Kumar[2], Vikas Khanduja[3], Ajay Malviya[2]
[1]Newcaslte University, Newcastle, United Kingdom. [2]Wansbeck General Hospital, Northumbria Healthcare NHS Foundation Trust, Ashington, United Kingdom. [3]Addenbrookes – Cambridge University Hospitals NHS Trust, Cambridge, United Kingdom

17:31 – 17:38 (158)

LONDON INTERNATIONAL CONSENSUS ON HAMSTRING INJURIES

Ricci Plastow[1,1], Babar Kayani[1], Bruce Paton[2], Peter Moriarty[1], Mat Wilson[2], Nicolas Court[3], Michael Giakoumis[4], Paul Read[5], Gino Kerkhoffs[6], James Moore[7], Simon Murphy[8], Noel Pollock[4], Ben Stirling[9], Laura Tullochk[10], Nicol Van Dykl[11], David Wood[12], Fares Haddad[13,1,14]
[1]Orthopaedic dept University college London NHS foundation trust, London, United Kingdom. [2]Institute sport Exercise and Health, Division surgery Intervention Science University College London, UK, London, United Kingdom. [3]Bournemouth FC, Bournemouth, United Kingdom. [4]British Athletics, Lee Valley, United Kingdom. [5]BFR Physio, Caterham, United Kingdom. [6]Orthopaedic dept Amsterdam University Medical Centre,, Amsterdam, Netherlands. [7]Centre for Human Health and Performance, London, United Kingdom. [8]Leicester city FC, Leicester, United Kingdom. [9]Newport Dragons Rugby, Newport,, United Kingdom. [10]Saracens RFC, London, United Kingdom. [11]Irish Rugby, Dublin, Ireland. [12]North Sydney Orthopaedic and Sports Medicine Centre,, Sydney, Australia. [13]Institute sport Exercise and Health, Division surgery Intervention Science University College London, London, United Kingdom. [14]Princess grace Hospital HCA healthcare, London, United Kingdom

17:38 – 17:45 (159)

OPERATIVE REPAIR OF HAMSTRING INJURIES FROM THE JACKLING POSITION IN RUGBY

Ricci Plastow[1], Babar Kayani[1], Peter Moriarty[1], Joshua Thompson[1], Fares Haddad[1,2,3]
[1]University College London Hospital, London, United Kingdom. [2]Institute sport Exercise and Health, Division surgery Intervention Science University College London, London, United Kingdom. [3]Princess grace Hospital HCA healthcare, London, United Kingdom

ROOM: BRANKSOME SUITE

16:40 – 17:20

ACPA ARTHROPLASTY CARE PRACTITIONERS ASSOCIATION
Promoting quality care for arthroplasty patients

ACPA Parallel Meeting

Please note: post-event on demand viewing will not be available for this session.

16:40 – 17:20	ACPA & NICE guidelines – discussion on implementation before, during and after surgery.	**Lindsay Smith** (Bristol) **ACPA Committee**

ROOM: TREGONWELL HALL

17:50 – 18:20	**CULTURE & DIVERSITY UPDATE**	**Chairs:** **Naomi Gibbs** (Oxford) **Sam Jain** (Leeds)

18:30 – 20:00 **TASTE YOUR WAY AROUND THE WORLD**
Drinks and International Flavours
All delegates and exhibitors are welcome to attend.

Room: Purbeck Hall

We welcome all delegates and exhibitors to attend a great evening of

social networking,

food and drinks.

ROOM: TREGONWELL HALL

08:15 – 08:20	**WELCOME TO DAY THREE**	**Andrew Hamer** President, BHS

ROOM: BRANKSOME SUITE

08:15 – 08:20

ACPA ARTHROPLASTY CARE PRACTITIONERS ASSOCIATION
Promoting quality care for arthroplasty patients

ACPA Parallel Meeting

Please note: post-event on demand viewing will not be available for this session.

08:15 – 08:20	Welcome to day three and summary of day two.	**Sharon Ferdinandus** (Leeds)

ROOM: TREGONWELL HALL

08:20 – 09:50	**PODIUM PRESENTATIONS OF SCIENTIFIC PAPERS: ARTHROPLASTY / TRAUMA** Twelve papers (5 mins. presentation + 2 mins. discussion)	**Chairs:** **Homa Arshad** (London) **Simon Buckley** (Sheffield)

08:20 – 08:27

(21)

A COST ANALYSIS OF TREATING POSTOPERATIVE PERIPROSTHETIC FEMORAL FRACTURES FOLLOWING HIP REPLACEMENT IN A UK TERTIARY REFERRAL CENTRE.

Sameer Jain[1,2], Deepak Menon[1], Shahzeb Sheikh[2], David Bennett[2], Thomas Mitchell[1], Jonathan Kerr[1], Vinod Bassi[1], Hemant Pandit[2,1]

[1]Leeds Teaching Hospitals, Leeds, United Kingdom. [2]University of Leeds, Leeds, United Kingdom

08:27 – 08:34

(23)

ARE TERTIARY REVISION HIP ARTHROPLASTY CENTRES ADEQUATELY REMUNERATED FOR THE COMPLEXITY OF THEIR WORKLOADS? IMPLICATIONS FOR REGIONAL NETWORKS.

David Hillier, Michael Petrie, Tim Harrison, Andrew Hamer, Robert Kerry, Simon Buckley, Andrew Gordon, Saif Salih, Mark Wilkinson

Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, United Kingdom

08:34 – 08:41

(35)

SYSTEMIC ANTIBIOTICS ARE NOT REQUIRED FOR SUCCESSFUL TWO-STAGE REVISION HIP ARTHROPLASTY

Michael Petrie[1], Mohammad Al-Einzy[2], Sunil Panchani[3], David Partridge[1], Tim Harrison[1], Ian Stockley[1]

[1]Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, United Kingdom. [2]Sheffield Hallam University, Sheffield, United Kingdom. [3]Wrightington, Wigan and Leigh NHS Foundation Trust, Wigan, United Kingdom

08:41 – 08:48

(50)

THE IMPACT OF BEST PRACTICE TARIFF ATTAINMENT ON 30-DAY MORTALITY AND LENGTH OF HOSPITAL STAY IN HIP FRACTURE PATIENTS: AN OBSERVATIONAL COHORT STUDY AT A MAJOR TRAUMA CENTRE

Elizabeth Wong[1], Khalid Malik-Tabassum[2], Gareth Chan[2,1], Maryam Ahmed[2], Holly Harman[1], Alexey Chernov[3], Benedict Rogers[2,1]

[1]Brighton and Sussex Medical School, Brighton, United Kingdom. [2]University Hospitals Sussex NHS Foundation Trust, Brighton, United Kingdom. [3]University of Brighton, Brighton, United Kingdom

08:48 – 08:55 (51)

TAPER SLIP AND VANCOUVER B FRACTURES – A CRITICAL LOOK AT A NEW TREND

Mohammad Amer[1,2], Ali Assaf[1], Douglas G Dunlop[1]
[1]University Hospitals of Southampton NHS trust, Southampton, United Kingdom. [2]Cairo University, Cairo, Egypt

08:55 – 09:02 (63)

INFECTED REVISION TOTAL HIP ARTHROPLASTY IS ASSOCIATED WITH SIGNIFICANTLY HIGHER MORTALITY THAN ASEPTIC REVISIONS: LONG-TERM SINGLE-CENTRE STUDY (1063 PATIENTS)

Christopher Lodge, Benjamin Bloch, Hosam Matar, Sue Snape, Reshid Berber, Andrew Manktelow
Nottingham City Hospital, Nottingham, United Kingdom

09:02 – 09:09 (67)

IMPROVEMENTS IN NETWORKING PROCESSES FOR REVISION ARTHROPLASTY: A SILVER LINING OF THE COVID-19 PANDEMIC

Urjit Chatterji[1], Darren Puttock[1], Darren Sandean[2], Amin Kheiran[1], Gary Mundy[3], Dipen Menon[4], Andrew Brown[1]
[1]Leicester Orthopaedics, Leicester, United Kingdom. [2]Nottingham University Hospitals, Nottingham, United Kingdom. [3]Northampton General Hospital, Northampton, United Kingdom. [4]Kettering General Hospital, Kettering, United Kingdom

09:09 – 09:16 (88)

DENOSUMAB INHIBITS OSTEOLYSIS BUT WHAT ACTUALLY HAPPENS TO DISEASE ACTIVITY IN THE LOOSENING MEMBRANE?

Conor Gormley[1], Mark Dunning[1], Mandy Peffers[2], Mark Wilkinson[1]
[1]University of Sheffield, Sheffield, United Kingdom. [2]University of Liverpool, Liverpool, United Kingdom

09:16 – 09:23 (123)

PERI-PROSTHETIC FEMORAL FRACTURES, A REVIEW OF THE FIRST YEAR OF DATA COLLECTION FROM THE NATIONAL HIP FRACTURE DATABASE

Jonathan Evans[1], Dominic Inman[2], Anthony Johansen[3]
[1]University of Bristol, Bristol, United Kingdom. [2]Northumbria Specialist Emergency Care Hospital, Cramlington, United Kingdom. [3]University Hospital of Wales, Cardiff, United Kingdom

09:23 – 09:30 (133)

SEASONALITY OF SUPERFICIAL SITE INFECTIONS FOLLOWING JOINT REPLACEMENTS SYSTEMATIC REVIEW

Hassan Fawi[1,2], Henry Maughan[3], Daniela Fecht[1], Anna Freni Sterrantino[1], Theresa Lamagni[4], Catherine Wloch[4], Laure de Preux[1], Alan Norrish[5], Vikas Khanduja[2]
[1]Imperial College London, London, United Kingdom. [2]Cambridge University Hospital, Cambridge, United Kingdom. [3]Cambridge University, Cambridge, United Kingdom. [4]UKHSA, London, United Kingdom. [5]Queen Elizabeth Hospital, Kings Lynn, United Kingdom

09:30 – 09:37 (160)

THE IMPACT OF COVID-19 ON MORTALITY AFTER HIP FRACTURE: A POPULATION COHORT STUDY FROM ENGLAND

Richard Holleyman[1], Sameer Khan[2], Andre Charlett[3], Dominic Inman[2], Antony Johansen[4], Colin Brown[3], Sharmani Barnard[5], Sebastian Fox[3], Paul Baker[6], David Deehan[7], Paul Burton[1], Celia Gregson[8]
[1]Population Health Sciences Institute, Newcastle University, Newcastle upon Tyne, United Kingdom. [2]Northumbria Healthcare, Northumbria, United Kingdom. [3]PHE, London, United Kingdom. [4]University Hospital of Wales, Cardiff, United Kingdom. [5]Telethon Kids, Nedlands, Australia. [6]James Cook University Hospital, Middlesbrough, United Kingdom. [7]Newcastle upon Tyne NHS Foundation Trust, Newcastle upon Tyne, United Kingdom. [8]University of Bristol, Bristol, United Kingdom

09:37 – 09:44	(164) **A COMPARISON OF INTERNAL FIXATION AND HEMIARTHROPLASTY IN THE MANAGEMENT OF UN- OR MINIMALLY DISPLACED HIP FRACTURES IN PATIENTS OVER 60 YEARS OLD** Maryam Ahmed[1], Romesh Tirimanna[2], Soltan Hussein[3], Umar Ahmed[4], Habib Syed[1], Labib Syed[1], Minghong Gan[5], Preetha Sadasivan[6], Mark Edmondson[1], NOF Collaborative[7] [1]University Hospitals Sussex, Brighton, United Kingdom. [2]William Harvey Hospital, Ashford, United Kingdom. [3]St Mary's Hospital, London, United Kingdom. [4]Eastbourne District General Hospital, Eastbourne, United Kingdom. [5]East Surrey Hospital, Redhill, United Kingdom. [6]Luton and Dunstable University Hospital, Luton, United Kingdom. [7]Multicentre, Nationwide, United Kingdom

09:50 – 10:20 **COFFEE | INDUSTRY EXHIBITION | E-POSTERS**

Room: Purbeck Hall

ROOM: TREGONWELL HALL

10:20 – 11:35	**TOPIC IN FOCUS IV:** 10 years of NAHR – What have we learnt – how do we improve outcomes?	**Chairs:** **Ajay Malviya** (Northumberland) **Vikas Khanduja** (Cambridge)
10:25 – 10:30	NAHR – Ten years on– What was the vision?	**John Timperley** (Exeter)
10:30 – 10:37	How can technology drive outcomes?	**Tony Andrade** (Reading)
10:37 – 10:44	What has changed in the reporting facilities – recent updates and what more information does it give us?	**Marcus Bankes** (London)
10:44 – 10:51	How NAHR drives quality?	**Paul Gaston** (Edinburgh)
10:51 – 10:58	NAHR reports – how have they evolved over time?	**Callum McBryde** (Birmingham)
10:58 – 11:05	Reducing your complications – how to avoid them?	**Tim Board** (Wrightington)
11:05 – 11:12	How to pick winners?	**Johan Witt** (London)
11:12 – 11:19	The future of NAHR - what do we expect to see in the next 10 years?	**Vikas Khanduja** (Cambridge)
11:19 – 11:35	Discussion	

ROOM: BRANKSOME SUITE

10:20 – 10:50

ACPA Parallel Meeting

Please note: post-event on demand viewing will not be available for this session.

10:20 – 10:50	ACPA Presidential handover and farewell.	**Cathy Armstrong** (ACPA President)

ROOM: TREGONWELL HALL

11:40 – 12:00	UPDATE FROM BAJIR	**Tim Petheram** (Northumbria)

ROOM: TREGONWELL HALL

12:00 – 12:30	REVISION HIP NETWORKS UPDATE	**Andrew Hamer** (Sheffield) **Richard Holleyman** (Newcastle)

ROOM: TREGONWELL HALL

12:35 – 13:15	**PRESENTATION OF PRIZES** **PRESIDENTIAL HANDOVER**	**Andrew Hamer** President, BHS
	INCOMING PRESIDENT'S ADDRESS	**Vikas Khanduja** President Elect, BHS

13:30 **MEETING CLOSE & PACKED LUNCHES ON DEPARTURE**

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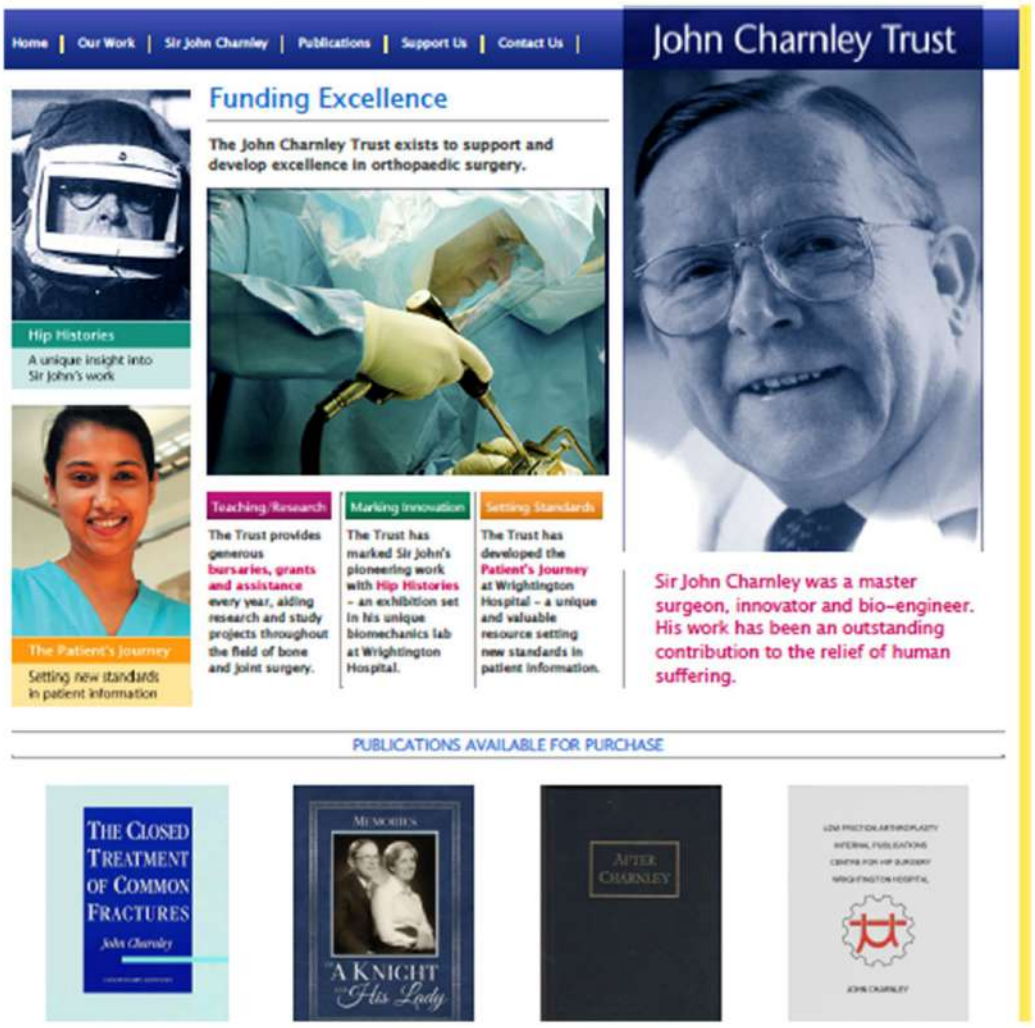

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ABSTRACTS:

Podium Scientific Papers

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

(4)

USING TRANEXAMIC ACID FOR AN ADDITIONAL 24-HOURS POST OPERATIVELY IN HIP AND KNEE ARTHROPLASTY SAVES MONEY: A COST ANALYSIS FROM THE TRAC-24 RANDOMISED CONTROL TRIAL

Paul Karayiannis[1], Ashely Agus[2], Leanne Bryce[1], Janet Hill[1], David Beverland[1]
[1]Musgrave Park Hospital, Belfast, United Kingdom. [2]Northern Ireland Clinical Trials unit, Belfast, United Kingdom

Introduction

Tranexamic Acid (TXA) is now commonly used in major surgical operations including orthopaedics. The TRAC-24 randomised control trial aimed to assess if an additional 24 hours of TXA post – operatively in primary total hip (THA) and total knee arthroplasty (TKA) reduced blood loss. Contrary to other orthopaedic studies to date this trial included high risk patients. This paper presents the results of a cost analysis undertaken alongside this RTC.

Materials and Methods

TRAC-24 was a prospective randomised controlled trial on patients undergoing TKA and THA. Three groups were included, Group 1 received 1 g intravenous (IV) TXA perioperatively and an additional 24-hour post-operative oral regime, group 2 received only the perioperative dose and group 3 did not receive TXA. Cost analysis was performed out to day 90.

Results

Group 1 was associated with the lowest mean total costs, followed by group 2 and then group 3. The difference between groups 1 and 3 -£797.77 (95% CI -1478.22, -117.32) were statistically significant. Extended oral dosing reduced costs for patients undergoing THA but not TKA. The reduced costs in groups 1 and 2 resulted from reduced length of stay, readmission rates, Accident and Emergency (A&E) attendances and blood transfusions.

Conclusions/Discussion

This study demonstrated significant cost savings when using TXA in primary THA or TKA. Extended oral dosing reduced costs further in THA but not TKA.

(20)

PELVIC TILT FROM SUPINE TO STANDING IN PATIENTS WITH SYMPTOMATIC ACETABULAR RETROVERSION OF THE HIP

Mark Jenkinson[1], Wouter Peeters[2], Jonathan Hutt[1], Johan Witt[1]
[1]UCLH, London, United Kingdom. [2]Antwerp University Hospital, Antwerp, Belgium

Introduction

Acetabular retroversion is a recognised cause of hip impingement. Pelvic tilt influences acetabular orientation and is known to change in different functional positions. While previously reported in patients with developmental dysplasia of the hip, positional changes in pelvic tilt have not been studied in patients with acetabular retroversion.

Materials and Methods

We retrospectively analysed supine and standing AP pelvic radiographs in 22 patients with preoperative radiographs and 47 with post-operative radiographs treated for symptomatic acetabular retroversion. Measurements were made for acetabular index (AI), lateral centre-edge angle (LCEA), crossover index, ischial spine sign, and posterior wall sign. The change in pelvic tilt angle was measured both by the Sacro-Femoral-Pubic (SFP) angle and the Pubic Symphysis to Sacro-iliac (PS-SI) Index.

Results

In the supine position, the mean calculated pelvic tilt angle (by SFP) was 1.05° which changed on standing to a pelvic tilt of 8.64°. A significant increase in posterior pelvic tilt angle from supine to standing of 7.59° (SFP angle) and 5.89° (PS –SI index) was calculated ($p<0.001$;paired t-test). There was a good correlation in pelvic tilt change between measurements using SFP angle and PS-SI index (rho .901 in pre-op group, rho .815 in post-op group). Signs of retroversion were significantly reduced in standing x-rays compared to supine: Crossover index (0.16 vs 0.38; $p<0.001$) crossover sign (19/28 vs 28/28 hips; $p<0.001$), ischial spine sign (10/28 hips vs 26/28 hips; $p<0.001$) and posterior wall sign (12/28 vs 24/28 hips; $p<0.001$).

Conclusions/Discussion

Posterior pelvic tilt increased from supine to standing in patients with symptomatic acetabular retroversion, in keeping with previous studies of pelvic tilt change in patients with hip dysplasia. The features of acetabular retroversion were much less evident on standing radiographs. The low pelvic tilt angle in the supine position is implicated in the appearance of acetabular retroversion in the supine position. Patients presenting with symptoms of hip impingement should be assessed by supine and standing pelvic radiographs so as not to miss signs of retroversion and to assist with optimising acetabular correction at the time of surgery.

(21)

A COST ANALYSIS OF TREATING POSTOPERATIVE PERIPROSTHETIC FEMORAL FRACTURES FOLLOWING HIP REPLACEMENT IN A UK TERTIARY REFERRAL CENTRE.

Sameer Jain[1,2], Deepak Menon[1], Shahzeb Sheikh[2], David Bennett[2], Thomas Mitchell[1], Jonathan Kerr[1], Vinod Bassi[1], Hemant Pandit[2,1]
[1]Leeds Teaching Hospitals, Leeds, United Kingdom. [2]University of Leeds, Leeds, United Kingdom

Introduction

Periprosthetic femoral fracture (PFF) incidence following hip replacement surgery continues to rise. There is a national drive to centralise PFF treatment within specialist centres to improve clinical outcomes and cost-effectiveness. The financial implications of treating PFFs must be analysed to guide allocation of funding.

Materials and Methods

Data were collected for 129 PFFs admitted from 02/04/2014-19/05/2020. Financial data were provided by the Patient Level Information and Costing Systems (PLICS) team. Primary outcomes were cost, revenue and margin for each PFF. Additional data were collected on length of stay (LOS), critical care requirements and clinical outcomes. Statistical comparisons were made between treatment type (fixation vs revision). Significance was set to $p<0.05$.

Results

Across the entire cohort, total cost was £2,389,901, total revenue was £1,695,435 and total loss was £694,481. Highest costs were ward stay (£714,591), theatre utilisation (£382,625), and overheads (£249,110). Median cost was £15,863 (IQR, £11,092-£22,221), median revenue was £11,305 (IQR, £7,147-£15,222) and median loss was £3,795 (IQR, £605-£8687). Median LOS was 21 days (IQR 13-34) and 28.7% patients required critical care admission.
Ninety-six patients were treated operatively with either fixation (n=53) or revision (n=43). Median operating time was lower for fixation versus revision (132 [IQR, 115-185] vs 201 [IQR,159-229] minutes, p=0.001). Median cost (£17,455 [IQR, £13,095-£22,824] vs £17,399 [£13,394-£23,404]) and median loss (£5,774 [IQR, £2,092-£10,472] vs £3,860 [IQR, £96-£7,601]) were similar for fixation and revision (p=0.99 and p=0.18, respectively). Median revenue was greater for revision versus fixation (£13,925 [IQR, £11,294-£17,037] vs £12,160 [IQR, £8,486-£14,390], p=0.02). There was no difference in LOS (21 [13-34] vs 21 [14-30] days, p=0.94), critical care requirements (20 [37.7%] vs 11 [25.6%], p=0.30), reoperations (3 [5.7%] vs 6 [14.0%], p=0.29], local complications (8 [15.1%) vs 12 [27.9%], p=0.20) or systemic complications (11 [20.8%] vs 11 [25.6%], p=0.75) between fixation and revision.

Conclusions/Discussion

PFF treatment costs are high with inadequate reimbursement through tariff. Work is needed to address this disparity and reduce costs associated with LOS, theatre utilisation and implants. Treatment cost should not be used when deciding between fixation and revision surgery.

(23)

ARE TERTIARY REVISION HIP ARTHROPLASTY CENTRES ADEQUATELY REMUNERATED FOR THE COMPLEXITY OF THEIR WORKLOADS? IMPLICATIONS FOR REGIONAL NETWORKS.

David Hillier, Michael Petrie, Tim Harrison, Andrew Hamer, Robert Kerry, Simon Buckley, Andrew Gordon, Saif Salih, Mark Wilkinson
Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, United Kingdom

Introduction

Revision total hip arthroplasty (rTHA) can be complex and associated with significant cost, with an increasing burden within the UK and globally. Regional rTHA networks have been proposed aiming to improve outcomes, reduce re-revisions and therefore costs. The aim of this study was to accurately quantify the cost and reimbursement for the rTHA service and to assess the financial impact of case complexity at a tertiary referral centre within the NHS.

Materials and Methods

A retrospective analysis of all revision hip procedures was performed over two consecutive financial years (2018–2020). Cases were classified according to the Revision Hip Complexity Classification (RHCC) and by mode of failure; infected or non-infected. Patients of ASA grade of 3 or greater or BMI over 40 are considered “high-risk” by the RHCC. Costs were calculated using PLICS and remuneration based on the HRG data. The primary outcome was the financial difference between tariff and cost per episode per patient. Comparisons between groups were analysed using analysis of variance and two-tailed unpaired *t*-test.

Results

199 revision episodes were identified in 168 patients: 25 (13%) least complex revisions (H1), 110 (55%) complex revisions (H2) and 64 (32%) most complex revisions (H3). 76 (38%) cases were due to infection. 78 (39%) of patients were in the “high-risk” group. Median length of stay increased with case complexity from 4, to 6 to 8 days (p=0.17) and significantly for revisions performed for infection (9 vs 5 days; p=0.01). Cost per episode increased significantly between complexity groups (p=0.0002) and for infected revisions (p=0.003). All groups demonstrated a mean deficit, but this significantly increased with revision complexity (£301, £1,820 and £4,757 per case; p=0.02) and for infected failure (£4,023 vs £1,679; p=0.02). The total deficit to the trust for the two-years was £512,202.

Conclusions/Discussion

Current NHS reimbursement for rTHA is inadequate and should be more closely aligned to complexity. An increase in the most complex rTHA at major revision centres (MRC) will likely place a greater financial burden on these units.

(26)

USING CLASSIFIER NEURAL NETWORKS TO ESTIMATE PERSONALISED PROMS AFTER HIP REPLACEMENT

Fabio de Mello, Visakan Kadirkamanathan, Mark Wilkinson
University of Sheffield, Sheffield, United Kingdom

Introduction

Successful estimation of postoperative PROMs prior to a joint replacement surgery is important in deciding the best treatment option for a patient. However, estimation of the outcome is associated with substantial noise around individual prediction. Here, we test whether a classifier neural network can be used to simultaneously estimate postoperative PROMs and uncertainty better than current methods.

Materials and Methods

We perform Oxford hip score (OHS) estimation using data collected by the NJR from 249,634 hip replacement surgeries performed from 2009 to 2018. The root mean square error (RMSE) of the various methods are compared to the standard deviation of outcome change distribution to measure the proportion of the total outcome variability that the model can capture. The area under the curve (AUC) for the probability of the change score being above a certain threshold was also plotted.

Results

The proposed classifier NN had a better or equivalent RMSE than all other currently used models. The standard deviation for the change score for the entire population was 9.93, which can be interpreted as the RMSE that would be achieved for a model that gives the same estimation for all patients regardless of the covariates. However, most of the variation in the postoperative OHS/OKS change score is not captured by the models, confirming the importance of accurate uncertainty estimation. The threshold AUC shows similar results for all methods close to a change score of 20 but demonstrates better accuracy of the classifier neural network close to 0 change and greater than 30 change, showing that the full probability distribution performed by the classifier neural network resulted in a significant improvement in estimating the upper and lower quantiles of the change score probability distribution. Consequently, probabilistic estimation as performed by the classifier NN is the most adequate approach to this problem, since the final score has an important component of uncertainty.

Conclusions/Discussion

This study shows the importance of uncertainty estimation to accompany postoperative PROMs prediction and presents a clinically-meaningful method for personalised outcome that includes such uncertainty estimation.

(27)

THE FEASIBILITY OF ACHIEVING ELECTIVE CARE FRAMEWORK TARGETS FOR TOTAL HIP ARTHROPLASTY (THA) IN NORTHERN IRELAND

Alistair Mayne[1], Roslyn Cassidy[1], Paul Magill[2], Brian Mockford[1], Danny Acton[3], Gavan McAlinden[1]

[1]Musgrave Park Hospital, Belfast, United Kingdom. [2]Craigavon Area Hospital, Craigavon, United Kingdom. [3]Altnagelvin Area Hospital, Londonderry, United Kingdom

Introduction

Waiting times for arthroplasty surgery in Northern Ireland are among the longest in the National Health Service, which have been further lengthened by the onset of the SARS-CoV-19 global pandemic in March 2020. The Department of Health (DoH) in Northern Ireland has announced a new Elective Care Framework (ECF), with the framework proposing that by March 2026 no patient will wait more than 52 weeks for inpatient/day case treatment. We aimed to assess the feasibility of achieving this with reference to Total Hip Arthroplasty (THA).

Materials and Methods

Waiting list information was obtained via a Freedom of Information request to the DoH (May 2021) and National Joint Registry data was used to determine baseline operative numbers. Mathematical modelling was undertaken to calculate the time taken to meet the ECF target and also to determine the time to clear the waiting lists for THA using the number of patients currently on the waiting list and percentage operating capacity relative to pre-Covid-19 capacity to determine future projections.

Results

As of May 2021, there were 3,757 patients awaiting primary THA in Northern Ireland. Prior to April 2020, there were a mean 2,346 patients/annum added to the waiting list for primary THA and there were a mean 1,624 primary THAs performed per annum.

The ECF targets for THA will only be achieved in 2026 if operating capacity is 200% of pre COVID-19 pandemic capacity and will be achieved in 2030 if capacity is 170%. Surgical capacity must exceed pre-Covid capacity by at least 30% to meet ongoing demand.

THA capacity was significantly reduced following resumption of elective orthopaedics post-COVID-19 (22% of pre-COVID-19 capacity - 355 THAs/annum post-COVID-19 versus 1,624/annum pre-COVID-19).

Conclusions/Discussion

This modelling demonstrates that, in the absence of major funding and reorganisation of elective orthopaedic care, the targets set out in the ECF will not be achieved with regards to hip arthroplasty. Waiting times for THA surgery in the NHS in Northern Ireland are likely to remain greater than 52 weeks for most of this decade.

(30)

DOES THE MODE OF DATA ACQUISITION AFFECT THE OXFORD HIP SCORE AND EQ-5D SCORE FOR PATIENTS UNDERGOING TOTAL HIP REPLACEMENTS?

Irrum Afzal, Richard Field
South West London Elective Orthopaedic Centre, London, United Kingdom

Introduction

Disease specific or generic Patient Reported Outcome Measures (PROMs) can be completed by patients using paper and postal services (pPROMS) or via computer, tablet or smartphone (ePROMs) or by hybrid data collection, which uses both paper and electronic questionnaires. We have investigated whether there are differences in scores depending on the method of PROMs acquisition for the Oxford Hip Score (OHS) and the EQ-5D scores, at one and two years post operatively.

Materials and Methods

Patients for this study were identified retrospectively from a prospectively compiled arthroplasty database held at the study centre. Patient demographics, mode of preferred data collection and pre- and post-operative PROMs for Total Hip Replacements (THRs) performed at this centre between 1st January 2018 and 31st December 2018 were collected.

Results

During the study period, 1494 patients underwent THRs and had complete one and two-year PROMs data available for analysis. All pre-operative scores were obtained by pPROMS. The average OHS and EQ-5D pre-operatively scores were 19.51 and 0.36 respectively. 72.02% of the patients consented to undertake post-operative questionnaires using ePROMs. The remaining 27.98% opted for pPROMS. The one and two-year OHS for ePROMS patients increased to 41.31 and 42.14 while the OHS scores for pPROMS patients were 39.80 and 39.83. At the one and two-year post-operative time intervals, a Mann-Whitney test showed statistical significance between the modes of administration for OHS (P-Value =0.044 and 0.01 respectively). The one and two-year EQ-5D for ePROMS patients increased to 0.83 and 0.84 while the EQ-5D scores for pPROMS patients were 0.79 and 0.81. The P-Value for Mann-Whitney tests comparing the modes of administration for EQ-5D were 0.13 and 0.07 respectively.

Conclusions/Discussion

Within Orthopaedics, PROMs have become the most widely used instrument to assess patients' subjective outcomes. However, there is no agreed mode of PROMs data acquisition. While we have demonstrated an apparent difference in scores depending on the mode of administration, further work is required to establish the influence of potentially confounding factors such as patient age, gender and familiarity with computer technology.

(35)

SYSTEMIC ANTIBIOTICS ARE NOT REQUIRED FOR SUCCESSFUL TWO-STAGE REVISION HIP ARTHROPLASTY

Michael Petrie[1], Mohammad Al-Einzy[2], Sunil Panchani[3], David Partridge[1], Tim Harrison[1], Ian Stockley[1]

[1]Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, United Kingdom. [2]Sheffield Hallam University, Sheffield, United Kingdom. [3]Wrightington, Wigan and Leigh NHS Foundation Trust, Wigan, United Kingdom

Introduction

The duration of systemic antibiotics following first-stage surgery is contentious. Our Institution's philosophy is to perform an aggressive debridement, high concentration of targeted antibiotics through cement beads and systemic prophylactic antibiotics alone. In the presence of significant soft tissue infection or microbiological diagnostic uncertainty; systemic antibiotics may be prescribed for 5 days whilst awaiting tissue culture results. The aim of this study was to assess the success of our philosophy for two-stage hip revision.

Materials and Methods

A retrospective review of our Institution's prospective database was performed to identify all intended two-stage hip revision procedures for PJI. All patients had a confirmed PJI as per MSIS 2013 criteria, minimum 5-years follow up and outcomes according to the MSIS working group outcome-reporting tool; then grouped into "successful" or "unsuccessful" (suppressive antibiotics, further revision for infection, death within 1 year).

Results

383 intended two-stage hip revisions were identified; of which 299 met our inclusion criteria, in 289 patients (6 repeat ipsilateral two-stage, 4 bilateral two-stage). Median follow up was 10.7 years (IQR 6.3 – 15.0). 258 (86%) patients proceeded to 2nd stage surgery. 91% success rate was observed for those patients who underwent reimplantation, although dropping to 86% when including the patients who did not proceed to second stage. The median duration of post-operative systemic antibiotics was 5 days (IQR 5-9). No significant difference was observed in patients who received either; < / = 48 hours (86%; n=70) compared to > 48 hours antibiotics (86%; n=229; p=0.96) or </= 5 days of antibiotics (88%; n=202) compared to > 5 days antibiotics (82%; p=0.38). A significant majority had gram-positive (88%) infection with 30% being polymicrobial. Greater success rates were observed with two-stage exchange or gram-positive PJI (86%); than for gram-negative PJI (81%) and polymicrobial infection (74%) (p=0.36). Fungal PJI was observed to have a significantly reduced rate of success (n=3; 33%; p=0.03).

Conclusions/Discussion

Aggressive surgical debridement with high concentration, targeted local antibiotic delivery at time of first stage to manage PJI of the hip provides a high rate of success, responsible antibiotic stewardship and reduced hospital costs.

(40)

LIPPED LINERS IN THR – THE EFFECT OF LIP ORIENTATION

Simon Williams[1], Gregory Pryce[1], Tim Board[2], Graham Isaac[1], Sophie Williams[1]
[1]University of Leeds, Leeds, United Kingdom. [2]Wrightington, Wigan and Leigh NHS Trust, Wigan, United Kingdom

Introduction

The 10 year survivorship of THR is generally over 95%. However, the incidence of revision is usually higher in year one. The most common reason being dislocation which at least in part is driven by inadequate range of motion (ROM) leading to impingement, subluxation and ultimately dislocation which is more frequently posterior. ROM is affected by patient activity, bone and component geometry, and component placement. To reduce the incidence of dislocation, supported by registry data, there has been an increase in the use of so-called 'lipped' liners. Whilst this increases joint stability, the theoretical ROM is reduced. The aim of this study was to investigate the effect of lip placement on impingement.

Materials and Methods

A rigid body geometric model was incorporated into a CT scan hemi-pelvis and femur, with a clinically available THR virtually implanted. Kinematic activity data associated with dislocation was applied, comprising of five posterior and two anterior dislocation risk activities, resulting from anterior and posterior impingement respectively. Cup inclination and anteversion was varied (30°-70°, 0°-50° respectively) to simulate extremes of clinical outcomes. The apex position of a 'lipped' liner was rotated from the superior position, anteriorly and posteriorly in steps of 45°. Incidence and location of implant and bone impingement was recorded in 5346 cases generated.

Results

A liner with the lip placed superior increased the occurrence of implant-implant impingement compared with a neutral liner. Rotation of the lip from superior reduced this incidence. This effect was more marked with posterior rotation which after 90° reduced anterior impingement to levels similar to a neutral liner. Complete inversion of the lipped liner reduced impingement, but this and anterior rotation both negate its function – additional stability.

Conclusions/Discussion

This study comprises one bone geometry and component design and one set of activity profiles. Nevertheless, it indicates that appropriate lip placement can minimise the likelihood of impingement for a range of daily activities whilst still providing additional joint stability.

(47)

TWO-YEAR MIGRATION OF A PROXIMALLY COATED, TAPERED, SHORT BLADE STEM.

Andreas Fontalis[1,2], Shanil Hansjee[1], Shwan Ali Ahmad[1], Andrew Ogilvie[1], Dia Giebaly[1], Babar Kayani[1], Fares Haddad[1,2]

[1]Department of Trauma and Orthopaedic Surgery, University College London Hospitals, London, United Kingdom. [2]Division of Surgery & Interventional Science, University College London, London, United Kingdom

Introduction

Cementless stem designs in total hip arthroplasty differ in relation to geometry and area of fixation. We utilised radiostereometric analysis (RSA) to evaluate the 2-year migration of a novel, short, proximally coated femoral stem.

Materials and Methods

30 participants undergoing primary total hip replacement for any cause (rheumatoid or inflammatory arthritis, osteoarthritis) were prospectively recruited in this study. Osteoporotic patients and cases of suspected infection were excluded. All patients received a short blade stem, proximally coated with a reduced lateral shoulder and narrow triple taper geometry to minimise bone removal. RSA radiographs were performed post-operatively and at 6 weeks, 6 months, 1- and 2 years. The Harris Hip Score (HHS), Oxford Hip Score (OHS) and EQ-5D were collected at baseline and at 2 years post-operatively. The stability of implants and complications were captured during each follow-up visit.

Results

A total of 14 female and 16 male patients were recruited with a mean age of 64.8 (range 47 to 75). At two years the mean subsidence of the stem was 0.34 mm (SD 0.62) and the total migration 0.74 mm (SD 0.60). The mean medial translation at two years was 0.059 (0.24) and the mean anterior translation 0.12 (0.59) respectively. Baseline PROM scores improved significantly at 2-years from pre-operatively (median and interquartile range): HHS from 33 (18.25) to 92 (19), EQ5D from 0.5 (0.35) to 0.94 (0.17), OHS from 21 (18.25) to 42 (4.25). P-value for all comparisons was <0.001. 2-year follow up data revealed no complications. There were no stem revisions in study participants and no heterotopic ossifications were identified on radiographs.

Conclusions/Discussion

2-year migration results of a cementless, short blade, proximally coated tapered femoral stem using RSA, showed the stem exhibits a predictable migration pattern and achieves initial stability. This is highly likely to translate to mid and long-term stability, which needs to be corroborated by long-term outcome studies. Furthermore, participants demonstrated excellent clinical, patient reported and radiological outcomes after 2 years of follow up to support expansion in the use of this prosthesis.

(48)

CAN WE PREDICT FRACTURE WHEN USING A SHORT CEMENTLESS FEMORAL STEM IN THE ANTERIOR APPROACH?

Niall P. McGoldrick, Michael Cochran, Brook Biniam, Raman Bhullar, Paul E. Beaulé, Paul R. Kim, Wade Gofton, George Grammatopoulos
The Ottawa Hospital, Ottawa, Canada

Introduction

Short cementless femoral stems are increasingly popular as they allow for less dissection for insertion. Use of such stems with the anterior approach (AA) may be associated with considerable per-operative fracture risk. This study's primary aim was to evaluate whether patient-specific femoral- and pelvic- morphology and surgical technique, influence per-operative fracture risk. In doing so, we aimed to describe important anatomical thresholds alerting surgeons.

Materials and Methods

This is a single-centre, multi-surgeon retrospective, case-control matched study. Of 1145 primary THAs with a short, cementless stem inserted via the AA, 39 periprosthetic fractures (3.4%) were identified. These were matched for factors known to increase fracture risk (age, gender, BMI, side, Dorr classification, stem offset and indication for surgery) with 78 THAs that did not sustain a fracture. Radiographic analysis was performed using validated software to measure femoral- (canal flare index [CFI], morphological cortical index [MCI], calcar-calcar ratio [CCR]) and pelvic- (Ilium-ischial ratio [IIR], ilium overhang, and ASIS to greater trochanter distance) morphologies and surgical technique (% canal fill). Multivariate and Receiver-Operator Curve (ROC) analysis was performed to identify predictors of fracture.

Results

Femoral factors that differed included CFI (3.7±0.6 vs 2.9±0.4, $p<0.001$) and CCR (0.5±0.1 vs 0.4±0.1, $p=0.006$). The mean IIR was higher in fracture cases (3.3±0.6 vs 3.0±0.5, $p<0.001$). % Canal fill was reduced in fracture cases (82.8±7.6 vs 86.7±6.8, $p=0.007$). Multivariate analysis and ROC analyses revealed a threshold CFI of 3.17 was predictive of fracture (sensitivity:84.6% / specificity:75.6%). Fracture risk was 29 times higher when patients had CFI>3.17 and II ratio>3 (OR:29.2 95%CI: 9.5–89.9, $p<0.001$).

Conclusions/Discussion

Patient-specific anatomical parameters are important predictors of fracture-risk. When considering the use of short stems via the AA, careful radiographic analysis would help identify those at risk in order to consider alternative stem options.

(49)

INTRA-OPERATIVE CELL SALVAGE IN REVISION HIP ARTHROPLASTY: A SYSTEMATIC REVIEW WITH META-ANALYSIS

Thomas Walton[1], Daniel Huntley[1], Sarah Whitehouse[2], Andrew Ross[1], Al-Amin Kassam[1]
[1]Royal Devon and Exeter NHS Foundation Trust, Exeter, United Kingdom. [2]Queensland University of Technology, Brisbane, Australia

Introduction

The aim of this study was to systemically review the evidence for the use of intra-operative cell salvage (ICS) among patients undergoing revision hip arthroplasty, and synthesis the available data to quantify any associated reduction in allogeneic blood transfusion.

Materials and Methods

An electronic database search of MEDLINE (PubMed), EMBASE, Scopus and the Cochrane Library was completed from the date of inception to 9th February 2021, using a search strategy and protocol created in conjunction with the PRISMA statement. Inclusion criteria were (i) adult patients >18 years, (ii) ICS utilised in one study group, (iii) revision hip arthroplasty performed. Exclusion criteria were (i) pre-donation of red blood cells, (ii) mixed reporting without dedicated subgroup analysis for revision hip arthroplasty. Screening for eligibility, and quality assessment of included studies, was performed independently by two authors (TW and DH), and any disputes settled by third author (AK).

Results

Of the 187 records identified, 11 studies were included in the qualitative analysis, and 5 studies suitable for quantitative meta-analysis. Across the included studies there were 1856 participants, with a mean age of 63.86 years and a male: female ratio of 0.90. Quality assessment demonstrated low or medium risk of bias only. For revision hip arthroplasty patients receiving ICS, 37.07% required ABT with a mean transfusion of 1.92 units or 385ml per patient. For patients treated without ICS, 64.58% required ABT with a mean transfusion of 4.02 units or 803ml per patient. This difference achieved statistical significance ($p < 0.05$).

Conclusions/Discussion

This study has demonstrated a significant reduction in the need for allogenic blood transfusion associated with intra-operative cell salvage use among patients undergoing revision hip arthroplasty. This study therefore supports the routine use of ICS in this patient group. However, a major limitation is the lack of clinical outcomes reported by the available studies. Further research is required to determine whether this effect is associated with sub-groups of revision arthroplasty procedure, and whether ICS impacts clinical outcomes such as length of stay, rehabilitation progress and mortality.

(50)

THE IMPACT OF BEST PRACTICE TARIFF ATTAINMENT ON 30-DAY MORTALITY AND LENGTH OF HOSPITAL STAY IN HIP FRACTURE PATIENTS: AN OBSERVATIONAL COHORT STUDY AT A MAJOR TRAUMA CENTRE

Elizabeth Wong[1], Khalid Malik-Tabassum[2], Gareth Chan[2,1], Maryam Ahmed[2], Holly Harman[1], Alexey Chernov[3], Benedict Rogers[2,1]

[1]Brighton and Sussex Medical School, Brighton, United Kingdom. [2]University Hospitals Sussex NHS Foundation Trust, Brighton, United Kingdom. [3]University of Brighton, Brighton, United Kingdom

Introduction

The 'Best Practice Tariff' (BPT) was developed to improve hip fracture care by incentivising hospitals to provide timely multidisciplinary care to patients sustaining these injuries. The current literature examining the association between BPT and patient outcomes is conflicting and underpowered. We aimed to determine if achieving BPT has an impact on 30-day mortality and postoperative length of stay.

Materials and Methods

A retrospective analysis for patients admitted to a major trauma centre (MTC) was performed between 01/01/2013 to 31/12/2020. Data were extracted from the National Hip Fracture Database. The study population was divided into two groups: those who achieved all BPT criteria (BPT-passed) and those who did not (BPT-failed). The primary outcomes of interest included the 30-day mortality rate and postoperative length of stay (LOS). As a secondary objective, we aimed to assess factors that predict perioperative mortality by utilising a logistic regression model.

Results

4397 cases were included for analysis. 3422 (78%) met the BPT criteria, whereas 973 (22%) did not. The mean LOS in the BPT-achieving group was 17.2 days compared with 18.6 in the BPT-failed group, $p<0.001$. 30-day mortality was significantly lower in the BPT-achieving group i.e., 4.3% in BPT-achieved vs. 12.1% in BPT-failed, $p<0.001$. Logistic regression modelling demonstrated that attainment of BPT was associated with significantly lower 30-day mortality (OR: 0.32; 95% CI:0.24-0.41; $p<0.001$).

Conclusions/Discussion

To our knowledge, this is the largest study to investigate the association between BPT attainment and 30-day mortality as well as the length of stay. The present study demonstrates that achieving BPT in hip fracture patients is associated with a significant reduction in the average length of stay and 30-day mortality rates. Our crude calculations revealed that achieving BPT for 3422 patients earned our hospital trust >£4 million over 8 years. Findings from this study suggest that achieving BPT not only improves 30-day survival in patients with hip fractures but also aids cost-effectiveness by reducing LOS and helps generate NHS Trusts a significant amount of financial reward.

(51)

TAPER SLIP AND VANCOUVER B FRACTURES – A CRITICAL LOOK AT A NEW TREND

Mohammad Amer[1,2], Ali Assaf[1], Douglas G Dunlop[1]
[1]University Hospitals of Southampton NHS trust, Southampton, United Kingdom. [2]Cairo University, Cairo, Egypt

Introduction

Fixation only of Vancouver B Proximal Femoral Fractures (PFF's), specifically with Cemented Taper Slip stems (CTS) with an intact bone cement interface, has been shown to have reduced blood transfusion requirements and reoperations, compared to revision arthroplasty. This potentially carries the risk of stem subsidence and loosening, which negatively impacts functional outcome. The incidence of stem subsidence and associated fracture morphology have not previously been reported.

Materials and Methods

We retrospectively reviewed all Vancouver B PFF's in primary THR around CTS stems treated with internal fixation only between June 2015 and March 2021 for fracture morphology (Low Spiral (LS), High Spiral (HS), Metaphyseal Split (MS) and Short Oblique (SO)), fracture union and stem subsidence. Interprosthetic fractures and inadequate follow up were excluded. Secondary outcomes were collected.

Results

Out of 577 cases on our local periprosthetic database, 134 Vancouver B PFF's around CTS stems were identified, of which 77 patients underwent ORIF only. Of these, 50 procedures were identified, 21 were lost to follow up and 6 patients died before 6 months. Age, mortality rate and ASA is presented.

Review of Fracture morphology showed: 100% (3/3) of HS subsided (1 revised for loosening); 68 % (19/28) of MS subsided (1 revised for loosening); 11.1 % (2/18) of LS subsided (0 revised for loosening); 0% (1/1) of SO subsided. There were 2 revisions for non-union (LS group). No dislocations were recorded. There was a statistically significant association between Morphology and Subsidence P value 0.0004)

Major subsidence was observed in 8 patients (3 HS, 4 MS and 1 LS) which was associated with a significance reduction in mobility. Subsidence was associated with negative symptoms (P value < 0.0001).

Conclusions/Discussion

Fixation of all Vancouver B PFF's does not produce uniformly good results. Revision rates following ORIF do not fully reflect patient outcomes. This trend will affect the NJR, stem rating and patient satisfaction. Subsidence after ORIF was associated with certain morphologies (HS & MS) and stem revision may be preferrable, in keeping with GIRFT. A morphology-based classification system can inform decision making.

(54)

THE IMPACT OF FRAILTY ON 30-DAY MORTALITY FOLLOWING PRIMARY HIP ARTHROPLASTY DUE TO OSTEOARTHRITIS

Michael Cook[1], Mark Lunt[1], Timothy Board[2], Terence O'Neill[1,3]
[1]The University of Manchester, Manchester, United Kingdom. [2]Wrightington Hospital, Wigan, United Kingdom. [3]NIHR Manchester Biomedical Research Centre, Manchester, United Kingdom

Introduction

We determined the association between frailty and 30-day mortality following total hip arthroplasty (THA) and the impact of THA on 30-day mortality compared to a control population.

Materials and Methods

We used primary care data (Clinical Practice Research Datalink), linked secondary care data (Hospital Episode Statistics) and Office for National Statistics mortality data. Frailty was assessed using a validated frailty index based on coded data in the primary care record and categorised as fit, mild, moderate, and severe frailty. The association between frailty and 30-day mortality following THA due to osteoarthritis was assessed using Cox regression, adjusted for year of birth, sex, quintile of index of multiple deprivation and year of surgery. Mortality following THA was also compared to a control population who had osteoarthritis but no previous THA, matched on year of birth, sex, and quintile of index of multiple deprivation.

Results

103,563 cases who had a THA and their matched controls contributed data. Among those who had THA, compared to fit participants, 30-day mortality increased with increasing frailty; adjusted hazard ratio (HR) (95% CI) among mild frailty, 0.87 (0.66, 1.15); moderate frailty 1.73 (1.26, 2.38); and severe frailty, 2.85 (1.84, 4.39).
Compared to fit controls who did not have surgery, 30-day mortality was higher among fit people who had THA, adjusted HR 1.60 (1.15, 2.21). There was, however, no statistically significant difference in 30-day mortality among cases with mild, moderate and severe frailty compared to controls in the same frailty category.

Conclusions/Discussion

Among people who had THA, 30-day mortality increased with increasing frailty. While 30-day mortality was increased among fit individuals who had THA compared to fit controls who did not have surgery, there did not appear to be increased mortality among individuals with mild, moderate or severe frailty compared to controls in the same frailty category. A healthy surgery (selection) effect may have impacted on the comparison of mortality among cases and controls.

(55)

THE IMPACT OF DEPRIVATION AND FRAILTY ON THE LIKELIHOOD OF RECEIVING PRIMARY TOTAL HIP ARTHROPLASTY DUE TO OSTEOARTHRITIS

Michael Cook[1], Mark Lunt[1], Timothy Board[2], Terence O'Neill[1,3]
[1]The University of Manchester, Manchester, United Kingdom. [2]Wrightington Hospital, Wigan, United Kingdom. [3]NIHR Manchester Biomedical Research Centre, Manchester, United Kingdom

Introduction
We determined the impact of deprivation and frailty at the time of diagnosis of hip osteoarthritis (OA) on the likelihood of receiving total hip arthroplasty (THA).

Materials and Methods
We used routinely collected primary care data (Clinical Practice Research Datalink) linked to Hospital Episode Statistics. Frailty was assessed at the time of hip OA diagnosis using a validated frailty index based on coded data in the primary care record and categorised as fit, mild, moderate, and severe frailty. The association between quintile of index of multiple deprivation (IMD), frailty category and likelihood of receiving THA was assessed in separate Cox regression models, adjusted for year of OA diagnosis, age, and sex.

Results
104,672 individuals with hip OA contributed. Compared to those in the first quintile of IMD (least deprived), those in the fourth and fifth quintile of IMD (most deprived), respectively, were less likely to receive THA, hazard ratio (HR) (95% CI), 0.92 (0.89, 0.95) and 0.80 (0.77, 0.83). Increasing frailty at OA diagnosis was associated with reduced likelihood of receiving THA. Compared to fit individuals, the HR (95% CI) for receiving THA among those with: mild frailty was 0.80 (0.78, 0.82); moderate frailty was 0.60 (0.58, 0.62); and severe frailty was 0.42 (0.39, 0.45).
Increasing deprivation was associated with increasing frailty at the time of hip OA diagnosis, independent of age, sex, and year of OA diagnosis. However, those in the two most deprived quintiles were still less likely to receive THA after additionally adjusting for frailty category.

Conclusions/Discussion
Greater deprivation and greater frailty were associated with lower likelihood of receiving THA among people with hip osteoarthritis. Greater frailty among those most deprived did not explain the reduced likelihood of receiving THA among those most deprived.

(63)

INFECTED REVISION TOTAL HIP ARTHROPLASTY IS ASSOCIATED WITH SIGNIFICANTLY HIGHER MORTALITY THAN ASEPTIC REVISIONS: LONG-TERM SINGLE-CENTRE STUDY (1063 PATIENTS)

Christopher Lodge, Benjamin Bloch, Hosam Matar, Sue Snape, Reshid Berber, Andrew Manktelow
Nottingham City Hospital, Nottingham, United Kingdom

Introduction

The aim of this study is to examine the differences in long-term mortality rates between infected and aseptic revision total hip arthroplasty (rTHA) in a single specialist centre over an 18-year period.

Materials and Methods

Retrospective consecutive study of all patients who underwent rTHA at our tertiary centre between 2003 and 2020 was carried out. Revisions were classified as infected or aseptic. We identified patients' age, gender, American Society of Anaesthesiologists grade (ASA) and body mass index (BMI). The primary outcome measure was all-cause mortality at 5 years, 10 years and over the whole study period at 18 years. Death was identified through both local hospital electronic databases and linked data for the National Joint Registry. Kaplan-Meier survival curves were used to estimate time to death. Where two-stage revision techniques were used of the management of infected cases, these were grouped as a single revision episode for the purpose of analysis.

Results

In total, 1138 consecutive hip revisions were performed on 1063 patients (56 bilateral revisions – aseptic, 10 Excision arthroplasties – infection, 9 – Debridement, Antibiotics, Implant retention (DAIR) with 893 aseptic revisions in 837 patients (78.7%) and 245 infected revisions in 226 patients (21.3%). Average age of the entire study cohort was 71.0 (24-101) with 527 female (49.6%). Average age of the infection and aseptic cohorts was 68.8 and 71.5 respectively. Revisions for infection had higher mortality rates throughout the three time points of analysis. Patients' survivorship for infected vs aseptic revisions was; 77.8% vs 87.7% at 5 years, 62.8% vs 76.5% at 10 years and 62.4% vs 72.0% at 18 years. The unadjusted 10-year risk ratio of death after infected revision was 1.58 (95% confidence interval 1.28-1.95) compared to aseptic revisions.

Conclusions/Discussion

rTHA performed for infection is associated with significantly higher long-term mortality at all time points compared to aseptic revision surgery.

(64)

OXIDISED ZIRCONIUM VERSUS COBALT–CHROME FEMORAL HEADS IN TOTAL HIP ARTHROPLASTY: A MULTICENTRE PROSPECTIVE RANDOMISED CONTROLLED TRIAL WITH 10 YEARS FOLLOW-UP

Babar Kayani[1], Joanna Baawa[1], Andreas Fontalis[1], Jenni Tahmassebi[1], Nic Wardle[2], Robert Middleton[3], James Hutchinson[4], Fares Haddad[1]

[1]1. Department of Trauma and Orthopaedics, University College Hospital, London, United Kingdom. [2]2. Colchester Hospital University Foundation Trust, Colchester, UK. [3]3. Department of Trauma and Orthopaedics, Bournemouth University, Bournemouth, UK. [4]4. Royal Derby Hospital, Derby, United Kingdom

Introduction

This study reports the ten-year polyethylene liner wear rates, incidence of osteolysis, clinical outcomes and complications of a three-arm, multicentre randomised controlled trial comparing Cobalt-Chrome (CoCr) and Oxidised Zirconium (OxZr) femoral heads with ultra-high molecular weight polyethylene (UHMWPE) versus highly cross-linked polyethylene (XLPE) liners in total hip arthroplasty (THA).

Materials and Methods

Patients undergoing THA from four institutions were prospectively randomised into three groups. Group A received a CoCr femoral head and XLPE liner; Group B received an OxZr femoral head and XLPE liner; and Group C received an OxZr femoral head and UHMWPE liner. Blinded observers recorded predefined outcomes in 262 study patients at regular intervals for ten years following THA.

Results

At ten years follow-up, increased linear wear rates were recorded in group C compared to group A (0.133 ± 0.21 mm/yr vs 0.031 ± 0.07 mm/yr respectively, $p<0.001$) and group B (0.133 ± 0.21 mm/yr vs 0.022 ± 0.05 mm/yr respectively, $p<0.001$). Patients in group C were associated with increased risk of osteolysis and aseptic loosening requiring revision surgery compared with group A (7/133 vs 0/133 respectively, $p=0.007$) and group B (7/133 vs 0/135 respectively, $p=0.007$). There was a non-significant trend towards increased liner wear rates in group A compared to group B (0.031 ± 0.07 mm/yr vs 0.022 ± 0.05 mm/yr respectively, $p=0.128$). All three groups were statistically comparable preoperatively and at ten years follow-up when measuring normalised Western Ontario and McMaster Universities Osteoarthritis Index($p=0.410$), short-form-36 ($p = 0.465$ mental, $p = 0.713$ physical), and pain scale scores ($p=0.451$).

Conclusions/Discussion

The use of UHMWPE was associated with progressively increased annual liner wear rates after THA. At ten years follow-up, this translated to UHMWPE leading to an increased incidence of osteolysis and aseptic loosening requiring revision THA, compared with XLPE. Femoral heads composed of OxZr were associated with a non-significant trend towards reduced wear rates compared to CoCr, but this did not translate to any differences in osteolysis, functional outcomes, or revision surgery between the two treatments groups.

(65)

THE USE OF INTRA-ARTICULAR PLATELET-RICH PLASMA AS A THERAPEUTIC INTERVENTION FOR HIP OSTEOARTHRITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

Anthony Lim[1], John Zhu[1], Vikas Khanduja[2]
[1]University of Cambridge School of Clinical Medicine, Cambridge, United Kingdom. [2]Addenbrooke's - Cambridge University Hospital NHS Foundation Trust, Cambridge, United Kingdom

Introduction

There are a number of patients in whom hip preservation surgery is not indicated as they have developed signs of early osteoarthritis, and nor can they have a hip replacement as they are too early in the disease process. The use of PRP in OA of the hip has not been studied systematically and this study concisely collates all the available data in the use of PRP in Hip OA. This systematic review and meta-analysis aimed to assess intra-articular platelet-rich plasma as a therapeutic intervention for hip osteoarthritis, including the duration of efficacy, influence of dose and composition of PRP, and the incidence of adverse effects.

Materials and Methods

We performed literature searches on the MEDLINE, EMBASE, CINHAL, WEB OF SCIENCE, COCHRANE and SCOPUS databases, and PRSIMA guidelines were followed. Data was pooled using random effects meta-analysis. We assessed quality of the included studies using the Methodological Index for Non-Randomised Studies (MINORS) instrument, with an additional assessment for Randomised Controlled Trials with the Revised Cochrane risk-of-bias tool for randomized trials (RoB 2).

Results

Eight studies were included in the analysis, with data from a total of 331 patients. PRP significantly reduced pain compared to baseline at multiple timepoints, with the greatest effect at 1-2mo follow-up. PRP only significantly improved function at the 1-2mo follow-up. A significantly larger reduction in pain was achieved with a single injection or PRP compared to multiple injections, a total injected dose of PRP <15mL compared to ≥15mL or using a leukocyte-poor PRP preparation compared to leukocyte-rich PRP. There were no lasting adverse effects.

Conclusions/Discussion

Low and moderate quality evidence suggests that PRP reduces pain and improves function at endpoint compared to baseline. Moderate quality evidence suggests a larger reduction in pain is achieved with a single injection of PRP compared to multiple injections, and low quality evidence attributes a larger reduction of pain with a total injected dose of PRP <15mL compared to ≥15mL or using leukocyte-poor PRP compared to leukocyte-rich PRP.

(66)

MANAGEMENT OF PROSTHETIC HIP DISLOCATION (PHD) PILOT STUDY: A TRAINEE LED COLLABORATIVE PROJECT IN THE NORTHWEST OF ENGLAND.

Sadia Afzal[1], Ghazal Hodhody[2], James Kennedy[3], Tim Board[4]
[1]Salford Royal Hospital, Manchester, United Kingdom. [2]Royal Blackburn Hospital, Blackburn, United Kingdom. [3]Royal Oldham Hospital, Manchester, United Kingdom. [4]Wrightington Hospital, Wrightington, United Kingdom

Introduction

Total Hip Replacements (THR) and Hip Hemiarthroplasties (HA) are both successful and common orthopaedic procedures. Dislocation is a well-recognised complication carrying significant morbidity and, in some cases, increased mortality risks. We define prosthetic hip dislocations (PHDs) to include both THRs and HAs. Prosthetic Hip Dislocations (PHDs) are a common acute admission yet there are no published guidelines or consensus on management following reduction.

Materials and Methods

A retrospective audit was undertaken by the North West Orthopaedic Research Collaborative (NWORC) between January 2019 and July 2019. A questionnaire was used to capture the management of each dislocation episode presenting to 11 Hospital trusts. The study was registered as a Quality Improvement (QI) project at each site. Data regarding the surgical management physiotherapy input, ongoing care and further management plans were recorded.

Results

A total of 183 patients with 229 dislocations were submitted for initial analysis (171 THRs, 10 HAs, 2 PFRs). Female to male ratio was 2:1 with mean age of 76.7 years. Average time to first dislocation was 8.1 years. 61.1% were first or second time dislocators and 38.9% presented with 3 or more dislocations. Initial reductions were predominantly attempted in theatre (96.5%, n=221) with only 3.5% (n=8) attempted in the emergency department. In theatre 89% (n=201) were reduced closed. There was no plan for revision surgery in 70.6% cases with no difference seen between patients with >=3 dislocations and <=2 dislocations. Of the patients with a revision plan, 71% of these were performed or planned locally.

Conclusions/Discussion

The high number of patients with 3 or more dislocations and the lack of plans for definitive interventions in the majority of cases highlights the significant variation in the management of this complex group of patients. This variation in the quality of care increases the burden on the National Health Service through repeat hospital episodes. We aim to roll out this study nationally to assess regional variations and ultimately make the case for national guidance on the management of prosthetic hip dislocations.

(67)

IMPROVEMENTS IN NETWORKING PROCESSES FOR REVISION ARTHROPLASTY: A SILVER LINING OF THE COVID-19 PANDEMIC

Urjit Chatterji[1], Darren Puttock[1], Darren Sandean[2], Amin Kheiran[1], Gary Mundy[3], Dipen Menon[4], Andrew Brown[1]
[1]Leicester Orthopaedics, Leicester, United Kingdom. [2]Nottingham University Hospitals, Nottingham, United Kingdom. [3]Northampton General Hospital, Northampton, United Kingdom. [4]Kettering General Hospital, Kettering, United Kingdom

Introduction

There is sufficient evidence that specialised orthopaedic services, in the form of 'hub' or specialist centres, which undertake a high volume of workload in revision arthroplasty generate superior outcomes.
The East Midlands South Orthopaedic Network (EMSSON) was set up in 2015 and is an example of a 'hub and spoke' network. The network has recently undergone adaptation in light of the COVID-19 pandemic. There is paucity of data considering the impact of such adaptations in a post-pandemic era and on adherence to advice given.

Materials and Methods

Two data sets were obtained from the EMSSON data base, pertaining to pre and post pandemic eras respectively. Datasets were analysed and compared for case volumes, proportion of overall arthroplasty volume discussed and adherence to agreed management plans.

Results

Dataset one included 107 cases, of these 99 cases were discussed (54 knees and 45 hips). This equates to 35% of total revision arthroplasty volume recorded in the National Joint Registry (NJR), by units involved in the network. A change of plan was recommended in 45/99 cases (45%), of these 41 (93%) were adhered to. Dataset two included 99 cases, of these 98 were discussed (39 knees and 59 hips). This equates 68% of revision arthroplasty volume performed by the region according to NJR records. A change in plan was recommended in 20 cases (20.5%), all of which were adhered to. One case was referred to the 'hub' for surgery.

Conclusions/Discussion

Following the implementation of recent adaptations, the efficiency of the EMSSON network has significantly improved. A greater volume and proportion of revision arthroplasty cases are now being discussed on a weekly basis. Management plans for which adaptations are suggested have decreased, indicating an educational value of such networking practices. Adherence to agreed plans also showed improvement ($p<0.03$).
These findings demonstrate a trend towards NHS England's target of 100% of revision arthroplasty cases undergoing MDT discussion. Changes made in light of the Covid-pandemic, are felt to have contributed significantly to the overall performance of regional networking and have been well received by consultants involved.

(71)

MEDIUM TO LONG TERM OUTCOMES OF 117 CONSECUTIVE STRYKER® TRIDENT 'ALL-POLY' CONSTRAINED ACETABULAR INSERTS: A DISTRICT GENERAL EXPERIENCE

Christopher Lewis, Megan Baker, Ben Brooke, Bob Metcalf, Guy McWilliams, Sameh Sidhom
Calderdale Royal Hospital, Calderdale, United Kingdom

Introduction

Constrained acetabular inserts provide a solution for both complex primary and revision hip arthroplasty, but there have been ongoing concerns for high risk of failure and their longevity. The Stryker® Trident acetabular insert is pre-assembled with its constrained ring. We believe this to be the largest series of constrained acetabular inserts with a minimum of 5 year follow-up.

Materials and Methods

We retrospectively reviewed all Stryker® Trident 'All-Poly' constrained acetabular inserts cemented into bone in our unit between 2008 and 2016. We collated demographic details and reviewed all patients' radiographs and clinical notes. Indications for surgery, latest Oxford Hip Scores (OHS) and clinical and radiographic complications were identified.

Results

117 consecutive Stryker® Trident 'All-Poly' constrained inserts were cemented into bone in 115 patients during the study period with a mean age of 80 (47-97). Most common indications for surgery were recurrent dislocation (47), complex primary arthroplasty (23), revision arthroplasty (19) and failed hemiarthroplasty (12). 41 patients required revision of the acetabular component only. Follow-up was a minimum of 5 years (mean 8.6, range 5-13). There were three 30-day mortalities and six 1-year mortalities. The mean latest OHS was 37 (24-45). Four cups failed in three patients, one at the cement-bone interface, two at the cement-prosthesis interface and one at the bipolar interface. These were treated conservatively in three patient and with excision arthroplasty in one patient. There were four peri-prosthetic fractures, one Vancouver C distal femur fracture treated conservatively and three Vancouver B1 fractures, two treated conservatively and one treated with open reduction internal fixation. There was breakage of one constrained ring with no adverse effects and one superficial wound infection requiring oral antibiotics only.

Conclusions/Discussion

This series demonstrated that despite the elderly and complex nature of these patients' clinical situations, constrained acetabular inserts offer a useful and pragmatic solution, with relatively low complications, including in our series a cup failure rate of 3% and peri-prosthetic fracture rate of 3%.

(73)

DUAL-MOBILITY CONSTRUCTS FOR HIP FRACTURE: WHAT IS THE ALL-CAUSE CONSTRUCT SURVIVAL AND IS THERE A BENEFIT TO THEIR ROUTINE USE?

Hamish Macdonald, Andrew Gardner, Jonathan Evans, Adrian Sayers, Michael Whitehouse
University of Bristol, Bristol, United Kingdom

Introduction

Dual-mobility constructs (DMCs) are increasingly used for total hip replacement (THR) following hip fracture.

The aims of this study were to identify whether there was a difference in all-cause construct survival following THR with a DMC (DMC-THR) or with a conventional construct following hip fracture, and to identify the expected net all-cause construct survival for DMC-THR performed for hip fracture.

Materials and Methods

We performed a systematic review and meta-analysis of published studies (including joint registries) including DMC-THR for hip fracture which provided Kaplan-Meier (KM) survival estimates. The primary outcome was all-cause construct survival over time.

Results

318 papers and 17 registry reports were identified. Three studies (two registry reports and one cohort study utilising joint registry data) met the inclusion criteria, including 8,834 DMC-THRs and 63,865 conventional THRs. Upon meta-analysis, DMC-THRs had lower all-cause construct survival. Five-year KM estimates (95% confidence intervals) were 95.3% (94.6-95.9%) for DMC-THR and 96.1% (95.9-96.3%) for conventional THR.

Conclusions/Discussion

These results suggest there is a small absolute but not clinically significant all-cause implant survival difference between THR with DMC and conventional implants following hip fracture. Given the higher comparative cost of DMC, this analysis does not support its routine use.

(82)

20 YEAR RESULTS OF BIRMINGHAM HIP RESURFACING; CONSECUTIVE COHORT SERIES 1998 – 2001

Thomas Partridge, Suzanne Osborne, Martin Marsh, James Holland
Newcastle Hospitals NHS Foundation Trust, Newcastle upon Tyne, United Kingdom

Introduction

We present a consecutive case cohort of the first 100 Birmingham Hip Resurfacing (BHR)'s in 90 patients with a minimum follow up of 20 years. All procedures were performed by a single surgeon having commenced the study in 1998.

Materials and Methods

The original cohort included 68 males with 75 hips (7 bilateral) and 22 females with 25 hips (3 bilateral). The mean age at index procedure was 52. Patients were recalled to review in clinic as per Medicines and Healthcare products Regulatory Agency guidelines with x-rays, metal ions and Harris Hip Scores recorded.

Results

After a minimum of 20 year follow-up review the known overall revision rate is 11%. 11 have died and 7 have been lost to review. In males the known revision rate is 4/75 (5%), 3 of which were due to early fractures and 1 revision for infection at 5 years. The known revision rate in females is 7/25 (28%) of which 6 were due to adverse reactions to metal debris; 3 at 7-8 yrs, 1 at 15 yrs, 2 at 18 years, and 1 at 2 months for avascular necrosis. The mean 20 year metal ions results were cobalt 36.6 nmol/l (range 7.4-232.1) and chromium 32.1 nmol/l (range 6-120.8). The mean Harris hip score was 88.5 (range 38.6-99.8).

Conclusions/Discussion

This case series with 20 years follow-up demonstrates excellent long term survival of the BHRs further to registry BHR data and similar to THR for same age recipients. Applying today's strict criteria for patient selection would likely improve survival rate further. BHR has not demonstrated the catastrophic revision rates associated with some metal-on-metal resurfacing and remains a safe option for those who meet the criteria.

(85)

SURVIVAL OF THE EXETER V40 SHORT REVISION (44/00/125) STEM WHEN USED IN PRIMARY TOTAL HIP REPLACEMENT (THR), ANALYSIS OF THE NATIONAL JOINT REGISTRY (NJR).

Jonathan Evans[1], Omer Salar[2], Sarah Whitehouse[2], Al-Amin Kassam[2], Jonathan Howell[2], Matthew Wilson[2], John Timperley[2], Adrian Sayers[1], Michael Whitehouse[1], Timothy Wilton[3], Matthew Hubble[2]

[1]University of Bristol, Bristol, United Kingdom. [2]Princess Elizabeth Orthopaedic Centre, Exeter, United Kingdom. [3]National Joint Registry, London, United Kingdom

Introduction

The Exeter V40 femoral stem is the most implanted stem in the NJR for primary THR. In 2004, the 44/00/125 stem was released for use in "cement-in-cement" revision cases. It has however been used 'off-label' as a primary stem when, for example, patient anatomy requires a smaller stem with a 44mm offset. We aimed to investigate survival of this stem in comparison to others in the range when used in primary THRs recorded in the NJR.

Materials and Methods

Analyses were performed using a dataset based on that used for the 2020 NJR annual report. Our exposure was the stem; the outcome was all-cause construct revision. Crude analyses were performed using Kaplan-Meier and adjusted using Cox models. The 44/00/125 stem was directly compared to other stems in the Exeter range.

Results

We analysed 330,732 primary THRs using the Exeter V40 stem comprising 34.5% of the 958,869 THRs with complete information from the start of the NJR to 31 December 2018. The 44/00/125 stem was implanted in 2,158 primary THRs with 67.5% in female patients and a mean age of 67.8. The 10-year revision estimate for the 44/00/125 stem was 4.9% (95%CI 3.6, 6.8) and in constructs using an Exeter V40 stem was 2.8% (95%CI 2.7, 2.8). Controlling for age, sex and ASA demonstrated an increased overall hazard of revision for constructs using the 44/00/125 stem compared to constructs using other Exeter V40 femoral stems (HR 1.8 (95%CI 1.4, 2.3)).

Conclusions/Discussion

Although the revision estimate is within the NICE 10-year benchmark, survivorship of constructs using the 44/00/125 stem appears to be lower than the rest of the Exeter V40 range. Attempts to control for age, sex and ASA will not take into account confounding by indication i.e. patients with more complex anatomy who may have a higher risk of revision. Surgeons and patients should be reassured by this but should be aware of the observed increased revision estimate and use the stem according to its indications.

(88)

DENOSUMAB INHIBITS OSTEOLYSIS BUT WHAT ACTUALLY HAPPENS TO DISEASE ACTIVITY IN THE LOOSENING MEMBRANE?

Conor Gormley[1], Mark Dunning[1], Mandy Peffers[2], Mark Wilkinson[1]
[1]University of Sheffield, Sheffield, United Kingdom. [2]University of Liverpool, Liverpool, United Kingdom

Introduction

In a recent phase 2 superiority clinical trial we demonstrated that a single dose of 60mg of the human monoclonal antibody denosumab inhibits osteolytic lesion activity in patients undergoing revision total hip arthroplasty (THA), demonstrating proof of biological efficacy for this clinical application. Here, we examined the effect that denosumab has on disease biology at the osteolysis tissue level.

Materials and Methods

Osteolytic tissue taken from the prosthesis-bone lesion interface at revision surgery in patients with osteolysis (n=10 participants that had received a single 60 mg dose of denosumab 8 weeks prior to revision surgery and n=10 that had received placebo) was examined for total genetic message activity and protein levels using whole genome sequencing and mass spectrometry, respectively.

Results

The top five upregulated enriched pathways with denosumab treatment included inflammatory response, myeloid cell activation, myeloid leukocyte migration, neutrophil and granulocyte activation ($p<6.26 \times 10^{-28}$). Cell morphogenesis was amongst the most downregulated pathways ($p<3.42 \times 10^{-23}$). Finally, comparison of the trial mRNA and protein data versus mouse single cell RNA sequencing data of the same pathway blockade in mouse tibia showed the same direction of effect, suggesting that giving the drug causes then cells responsible for osteolysis to disperse into a more immature form (128 of 189 genes ($z=4.87$, $P<0.0001$) disease and functional pathways at the mRNA level and 10 of 11 ($z=2.72$, $P=0.0065$) at the protein level).

Conclusions/Discussion

In this first-in-man study we identify multiple genes and pathways within periprosthetic osteolysis tissue that are affected by denosumab treatment. The dominant pathways involved upregulation of innate inflammatory signaling and downregulation of cell morphogenesis. We also found enrichment of similar disease and functional pathways at both the mRNA and protein levels versus mRNA pathway enrichment found in mouse osteomorphs. These data provide the first human data of the mechanistic effect of denosumab treatment on inflammatory osteolytic lesion activity after joint replacement that is necessary to support its clinical application.

(123)

PERI-PROSTHETIC FEMORAL FRACTURES, A REVIEW OF THE FIRST YEAR OF DATA COLLECTION FROM THE NATIONAL HIP FRACTURE DATABASE.

Jonathan Evans[1], Dominic Inman[2], Anthony Johansen[3]
[1]University of Bristol, Bristol, United Kingdom. [2]Northumbria Specialist Emergency Care Hospital, Cramlington, United Kingdom. [3]University Hospital of Wales, Cardiff, United Kingdom

Introduction

The National Hip Fracture Database (NHFD) started collecting data on peri-prosthetic femoral fractures (PPFF) in December 2019. We reviewed the data from the first year of data collection to describe the patients being admitted with PPFF and the care they received according to established Key Performance Indicators (KPIs) used in hip fracture surgery.

Materials and Methods

We performed a retrospective review of the NHFD between 1 January and 31 December 2020. Analyses consisted of the summary statistics used to generate the NHFD annual report. Of the KPIs used in hip fracture, data were available for PPFF on time to assessment by a geriatrician (KPI 1), time to theatre (if applicable) (KPI 2), and mobilisation the day after surgery (if applicable) (KPI 4).

Results

There were 2,411 PPFF fractures around a hip or knee replacement reported out of a total of 2,606 PPFF. Of the 171 hospitals reporting data to the NHFD, 135 reported at least one. The median number of fractures per hospital was 14 (IQR 8, 25, range 1 to 110). The median age of patients was 84 (range 60 to 104) and 1,604 (67%) patients were female. Of the 1,850 occasions a time to geriatrician review was documented, review within 72 hours was achieved on 89.2% of occasions. Of the 1,973 patients who underwent operative interventions, 546 patients went to theatre before the 36-hour target (28.4%). Of patients who had surgery 1,323 (67.4%) were mobilised the following day.

Conclusions/Discussion

In the first year collecting data on PPFF we can give the first idea of the incidence of these life changing injuries. Whilst geriatrician review with 72 hours was achieved in a high proportion of cases nationally, our data suggest fewer patients are mobilised the day after surgery. Notably, only 28.4% of patients who were managed operatively went to theatre within 36 hours of admission. We provide the first insight into the incidence and management of these injuries.

(126)

SCALING UP QUALITY IMPROVEMENT FOR SURGICAL TEAMS (QIST) - AVOIDING SURGICAL SITE INFECTION AND ANAEMIA AT THE TIME OF SURGERY: A CLUSTER RANDOMISED CONTROLLED TRIAL OF THE EFFECTIVENESS OF QUALITY IMPROVEMENT COLLABORATIVES TO INTRODUCE CHANGE IN THE NHS

Ashley Scrimshire[1,2], Alison Booth[1], Caroline Fairhurst[1], Elizabeth Coleman[1], Ajay Malviya[2], Alwyn Kotze[3], Annie Laverty[2], Gillian Davis[2], Win Tadd[4], David Torgerson[1], Catriona McDaid[1], Mike Reed[2,1]

[1]Univeristy of York, York, United Kingdom. [2]Northumbria Healthcare NHS Foundation Trust, Newcastle upon Tyne, United Kingdom. [3]Leeds Teaching Hospital, Leeds, United Kingdom. [4]Cardiff, Cardiff, United Kingdom

Introduction

This trial aims to assess the effectiveness of quality improvement collaboratives as a technique to introduce large-scale change and improve outcomes for patients undergoing primary elective total hip or total knee arthroplasty.

Materials and Methods

41 NHS Trusts that did not have; a preoperative anaemia screening and optimisation pathways, or a methicillin sensitive Staphylococcus Aureus (MSSA) decolonisation pathway, in place were randomised to one of two parallel collaboratives in a two arm, cluster randomised controlled trial. Each collaborative focussed on implementing one of these two preoperative pathways. Collaboratives took place from May 2018 to November 2019. 27 Trusts completed the trial. Outcome data were collected for procedures between November 2018 and November 2019.

Co-primary outcomes were perioperative blood transfusion (within 7 days of surgery) and deep surgical site infections (SSI) caused by MSSA (within 90 days) for the anaemia and MSSA arms respectively. Secondary outcomes include deep and superficial SSIs (any organism), length of stay, critical care admissions, and readmissions. Process measures include the proportion of patients receiving each preoperative initiative.

Results

19,254 procedures from 27 Trusts are included. Process measures show both preoperative pathways were implemented to a high degree (75.3% compliance in MSSA arm; 61.2% anaemia arm), indicating that QICs can facilitate change in the NHS. However, there were no improvements in blood transfusions (2.9% v 2.3% adjusted-OR 1.20, 95% CI 0.52-2.75, p=0.67), MSSA deep SSIs (0.13% v 0.14% adjusted-OR 1.01, 95%CI 0.42-2.46, p=0.98), or any secondary outcome.

Conclusions/Discussion

Whilst no significant improvement in patient outcomes were seen, this trial shows quality improvement collaboratives can successfully support the implementation of new preoperative pathways in planned surgery in the NHS.

(127)

CAN MACHINE LEARNING ALGORITHMS PREDICT WHICH PATIENTS WILL ACHIEVE MCID AFTER ARTHROSCOPIC MANAGEMENT OF FEMOROACETABULAR IMPINGEMENT?

MH Pettit[1], Sebastian Hickman[1], Ajay Malviya[2], Vikas Khanduja[1]
[1]Cambridge University, Cambridge, United Kingdom. [2]Northumbria Hospital, Northumbria, United Kingdom

Introduction

Identification of patients at risk of not achieving minimally clinically important differences (MCID) in patient reported outcome measures (PROMs) is important to ensure principled and informed pre-operative decision making. Machine learning techniques may enable the generation of a predictive model for attainment of MCID in hip arthroscopy.

Aims: 1) to determine whether machine learning techniques could predict which patients will achieve MCID in the iHOT-12 PROM 6 months after arthroscopic management of femoroacetabular impingement (FAI), 2) to determine which factors contribute to their predictive power.

Materials and Methods

Data from the UK Non-Arthroplasty Hip Registry database was utilised. We identified 1917 patients who had undergone hip arthroscopy for FAI with both baseline and 6 month follow up iHOT-12 and baseline EQ-5D scores. We trained three established machine learning algorithms on our dataset to predict an outcome of iHOT-12 MCID improvement at 6 months given baseline characteristics including demographic factors, disease characteristics and PROMs. Performance was assessed using area under the receiver operating characteristic (AUROC) statistics with 5-fold cross validation.

Results

The three machine learning algorithms showed quite different performance. The linear logistic regression model achieved AUROC = 0.59, the deep neural network achieved AUROC = 0.82, while a random forest model had the best predictive performance with AUROC 0.87. Of demographic factors, we found that BMI and age were key predictors for this model. We also found that removing all features except baseline responses to the iHOT-12 questionnaire had little effect on performance for the random forest model (AUROC = 0.85). Disease characteristics had little effect on model performance.

Conclusions/Discussion

Machine learning models are able to predict with good accuracy 6-month post-operative MCID attainment in patients undergoing arthroscopic management for FAI. Baseline scores from the iHOT-12 questionnaire are sufficient to predict with good accuracy whether a patient is likely to reach MCID in post-operative PROMs.

(130)

EFFICACY OF MUPIROCIN, NEOMYCIN AND OCTENIDINE FOR NASAL STAPHYLOCOCCUS AUREUS DECOLONISATION: A RETROSPECTIVE COHORT STUDY

Jack Allport, Reyhan Choudhury, Peter Bruce-Wootton, Mike Reed, David Tate, Ajay Malviya
Northumbria Healthcare NHS Foundation Trust, Northumberland, United Kingdom

Introduction

Periprosthetic joint infection (PJI) causes significant morbidity. Methicillin sensitive Staphylococcus Aureus (MSSA) is the most frequent organism, and the majority are endogenous. Nasal MSSA colonisation is a proven risk factor for S. aureus infection. Decolonisation reduces PJIs but there is a paucity of evidence comparing treatments. Aims; compare 3 nasal decolonisation treatments at (1) achieving MSSA decolonisation, (2) preventing PJI.

Materials and Methods

Our hospital trust introduced MSSA screening and decolonisation prior to hip and knee arthroplasty in 2010. Data was prospectively collected since 2013, including all MSSA carriers, decolonisation treatment received, MSSA status at time of surgery and all PJIs. Prior to 2017 MSSA carriers received nasal mupirocin or neomycin, from August 2017 until August 2019 nasal octenidine was used.

Results

During the study period 15,958 primary hip and knee replacements were performed. 3,200 (20.1%) were MSSA positive at preoperative screening and received decolonisation treatment, 698 mupirocin, 1,210 neomycin and 1,221 octenidine. Mupirocin (89.1%) and neomycin (90.9%) were more effective at decolonisation than octenidine (50.0%, $P<0.0001$). There was no difference in S. aureus PJI rates ($P=0.452$). Of those negative at original screening 9.1% were positive on the day of surgery (1,164/12,758).

Conclusions/Discussion

MSSA decolonisation is an effective method to decrease PJI rates but there is little research into the best treatment. Both mupirocin and neomycin are more effective than octenidine at achieving MSSA decolonisation. There was poor correlation between the MSSA status after treatment and PJI rates. There is debate if treatment should be targeted by screening or if all patients she be treated without screening. Global decolonisation without screening is supported by the 26.7% of carriers that were negative at original screening in our study.
Further research is needed comparing decolonisation treatments to reduce PJI rates and avoid the risk of drug resistance.

(132)

CAN GENETIC TESTING BE USED TO IMPROVE IMPLANT SELECTION AND POST OPERATIVE MONITORING?

David Langton[1], Rohan Bhalekar[1], Tom Joyce[2], Nish Shyam[3], Matthew Nargol[1], Moreica Pabbruwe[4], Ed Su[5], Antoni Nargol[6]

[1]ExplantLab, Newcastle-upon-Tyne, United Kingdom. [2]Newcastle University, Newcastle-upon-Tyne, United Kingdom. [3]ExplantLab, Newcastle University, United Kingdom. [4]CITRA, Perth, Australia. [5]Hospital for Special Surgery, New York, USA. [6]University Hospital of North Tees, Stockton, United Kingdom

Introduction

Cobalt chrome alloy is commonly used in joint replacement surgery. However, it is recognised that some patients develop lymphocyte mediated delayed type hypersensitivity (DTH) responses to this material, which may result in extensive bone and soft tissue destruction.

Materials and Methods

Phase 1. United Kingdom: From an existing database, we identified extreme phenotype patient groups following metal on metal (MoM) hip resurfacing or THR: ALVAL with low wearing prostheses; ALVAL with high wear; no ALVAL with high wear; and asymptomatic patients with implants in situ for longer than ten years. Class I and II HLA genotype frequency distributions were compared between these patients' groups, and in silico peptide binding studies were carried out using validated methodology.
Phase 2. United Kingdom: We expanded the study to include more patients, including those with intermediary phenotypes to test whether an algorithm could be developed incorporating "risk genotypes", patient age, sex and metal exposure. This model was trained in phase 3.
Phase 3. United Kingdom, Australia, United States. Patients from other centres were invited to give DNA samples. The data set was split in two. 70% was used to develop machine learning models to predict failure secondary to DTH. The predictions were tested using the remaining blinded 30% of data, using time-dependent AUROCs, and integrated calibration index performance statistics.

Results

A total of 606 DNA samples, from 397 males and 209 female patients, were typed. This included 176 from patients with failed prostheses, and 430 from asymptomatic patients at a mean of >10 years follow up. C-index and ROC(t) scores suggested a high degree of discrimination, whilst the IBS indicated good calibration and further backed up the indication of high discriminatory ability. At ten years, the weighted mean survival probability error was < 4%.

Conclusions/Discussion

At present, there are no tests in widespread clinical use which use a patient's genetic profile to guide implant selection or inform post-operative management. The algorithm described herein may address this issue and we suggest that the application may not be restricted to the field of MoM hip arthroplasty.

(133)

SEASONALITY OF SUPERFICIAL SURGICAL SITE INFECTIONS FOLLOWING JOINT REPLACEMENTS

Hassan Fawi[1,2], Henry Maughan[3], Daniela Fecht[1], Anna Freni Sterrantino[1], Theresa Lamagni[4], Catherine Wloch[4], Laure de Preux[1], Alan Norrish[5], Vikas Khanduja[2]
[1]Imperial College London, London, United Kingdom. [2]Cambridge University Hospital, Cambridge, United Kingdom. [3]Cambridge University, Cambridge, United Kingdom. [4]UKHSA, London, United Kingdom. [5]Queen Elizabeth Hospital, Kings Lynn, United Kingdom

Introduction

Emerging evidence from different countries around the world is increasingly associating hip and knee replacements performed during the summer months with an increased risk of surgical site infection (SSI). We aimed to synthesise evidence on this phenomenon globally.

Methods

A systematic review was performed according to PRISMA guidelines using Medline, PubMed, and EMBASE from inception until August 2021 for relevant original articles without language restrictions. Meta-analysis was performed using random effects models to estimate and compare the pooled odds ratio (OR) and the confidence interval (CI) of operations undertaken during the summer season as defined by study authors.

Results

Five studies from Canada, Japan, Pakistan, and the USA (n= 2) met the inclusion criteria. Data involving 1,589,207 primary hip and knee replacements, were included in the meta-analysis. There were 5985 superficial SSIs, out of total 420121 operations during the summer season, equating to a risk of 1.4%. During the other 3 seasons, there were 15364 Superficial SSIs out of 1169086 total operations, a risk of 1.3%.
The pooled OR highlighted increased odds of developing superficial SSI for patients who underwent joint replacements during the summer months (OR 1.29, 95% confidence interval 1.05 - 1.60, $P < 0.0001$); with evidence of significant heterogeneity.

Conclusion

Our preliminary meta-analysis suggests a 29% increased chance of having an SSI if the joint replacement was performed in the summer months. A high degree of heterogeneity was evident which warrants further exploration. Given the concerning consequences of developing wound infections after joint replacements, these findings may have important implications for informing individual patient-surgeon preoperative consent, surgical planning, and guiding future research.

(134)

EARLY QUALITY OF LIFE IMPROVEMENTS AFTER PAEDIATRIC HIP REPLACEMENT IN MULTIPLE AND SINGLE JOINT DISEASE PATHOLOGIES

Jonathan Barrow[1], Martin Eden[2], Anne Foster[3], Mohammed Kenawey[3], Tim Board[1]
[1]Centre for Hip Surgery, Wrightington Hospital, Wigan, United Kingdom. [2]University of Manchester Centre for Health Economics, Manchester, United Kingdom. [3]Royal Manchester Children's Hospital, Manchester, United Kingdom

Introduction

The decision to undertake total hip replacement (THA) in a child is complex and daunting. This is augmented by the paucity of data on potential quality of life (QoL) improvement and functional outcomes. Therefore, the aim of this study was to ascertain whether outcomes after surgery are influenced by the nature of the primary diagnosis.

Materials and Methods

This was a prospective, consecutive cohort study of patients under the age of 18 years undergoing THA by a single arthroplasty surgeon in collaboration with colleagues at a regional paediatric hospital. Patient electronic notes, radiographs and PROMS (EQ5D-Y, Oxford Hip Score(OHS) and modified Harris Hip Score(mHHS)) were reviewed.

Results

Twenty-two THAs were performed in patients less than 18 years (median 15 (range 10.7-17.9), with 7 patients undergoing bilateral surgery. Mean follow-up was 2 years. Thirteen of the THAs were undertaken for systemic conditions effecting multiple joints (Mucopolysaccharidoses, Mucolipidosis and Scwachman-Diamond syndrome) with the hip the worst affected joint and 9 for single joint disease (AVN, Perthes, dysplasia and idiopathic chondrolysis). PROMS scores showed reliable improvements with no differences between the two groups. Health related QoL was calculated from EQ5D-Y and indicated an overall improvement of 1.06(0.879-1.25). 6 patients were wheelchair users preop. All patients were independent walkers at follow-up. One patient underwent successful revision surgery for aseptic acetabular loosening. There were no other complications.

Conclusions/Discussion

THA in children leads to a significant positive impact on QoL as measured with validated PROMS scores. Patients with systemic conditions can benefit just as much as those with single joint disease. Further follow-up is required to understand the long-term outcomes.

(135)

EXETER ANALYSIS OF ROBOTIC TOTAL HIP ARTHROPLASTY (EARTH) – INITIAL RESULTS OF THE FIRST 40 CASES PERFORMED IN AN NHS HOSPITAL

Sush Gowda[1], Sarah Whitehouse[2], Robert Morton[1], Michalis Panteli[1], John Charity[1], Matthew Wilson[1], John Timperley[1], Matthew Hubble[1], Jonathan Howell[1], Al-Amin Kassam[1]
[1]Royal Devon and Exeter NHS Foundation Trust, Exeter, United Kingdom. [2]Queensland University of Technology, Brisbane, Australia

Introduction

The MAKO Robotic arm is a haptic robotic system that can be used to optimise performance during total hip arthroplasty (THA). We present the outcome of the first 40 robotic cases performed in an NHS foundation trust along with the technique of performing robotic THA in our unit.

Materials and Methods

Forty consecutive patients undergoing robotic THA (rTHA) were compared to a case matched group of patients undergoing manual THA (m-THA). 2:1 blinded case matching was performed for age, sex, implants used (Trident uncemented socket and cemented Exeter stem, Stryker Mahwah, NJ, US) and surgeon grade. Comparisons were made for radiological positioning of implants, including leg length assessment, and patient reported functional outcome (PROMS). Pre- and post-operative radiographs were independently analysed by 2 authors.

Results

All patients underwent THA for a primary diagnosis of osteoarthritis. No significant difference between groups was identified for post-operative leg length discrepancy (LLD) although pre-operatively a significantly higher LLD was highlighted on the MAKO group, likely due to patient selection. Significantly lower post-operative socket version was identified in the MAKO cohort although no difference in post-operative cup inclination was noted. However, there was significantly larger variance in post-op LLD ($p=0.024$), cup version ($p=0.004$) and inclination ($p=0.05$) between groups indicating r-THA was significantly less variable (Levene's test for homogeneity of variance) . There was no significant difference in the number of cases outside of Lewinnek's 'safe' zone for inclination ($p=0.469$), however, there were significantly more cases outside Lewinnek's 'safe' zone for version (12.5% vs 40.3%, $p=0.002$) in the m-THA group.

Conclusions/Discussion

We report the commencement of performance of MAKO robotic THA in an NHS institution. No problems with surgery were reported during our learning curve. Robotic THA cases had less variability in terms of implant positioning suggesting that the MAKO robot allows more accurate, less variable implant positioning with fewer outliers. Longer term follow-up of more cases is needed to identify whether this improved implant positioning has an effect on outcomes, but the initial results seem promising.

(139)

THE RISK OF MORTALITY IN PATIENTS UNDERGOING ELECTIVE PRIMARY TOTAL HIP REPLACEMENT FOR OSTEOARTHRITIS WITH RECENT INPATIENT ADMISSION FOR MANAGEMENT OF MEDICAL CONDITIONS, ANALYSIS OF THE NATIONAL JOINT REGISTRY.

Jonathan Evans[1], Linda Hunt[1], Ashley Blon[1], Mark Wilkinson[2], Andrew Stevenson[3], Michael Whitehouse[1]
[1]University of Bristol, Bristol, United Kingdom. [2]University of Sheffield, Sheffield, United Kingdom. [3]Musgrove Park Hospital, Taunton, United Kingdom

Introduction

Whilst total hip replacement (THR) is generally safe and effective, pre-existing medical conditions, particularly those requiring inpatient admission, may increase the risk of post-operative mortality. Delaying elective surgery may reduce the risk, but it is unclear how long a delay is sufficient.

Materials and Methods

We analysed 958,145 primary THRs performed for solely osteoarthritis April 2003-December 2018, in the NJR linked to Hospital Episodes Statistics to identify inpatient admissions prior to elective THR for 17 conditions making up the Charlson index including myocardial infarction, congestive heart failure, cerebrovascular disease and diabetes. Crude analyses used Kaplan-Meier and adjusted analyses used Cox modelling. Patients were categorised for each co-morbidity into one of four groups: not recorded in previous five-years, recorded between five-years and six-months before THR, recorded six-months to three-months before THR, and recorded between three-months and day before surgery.

Results

90-day mortality was 0.34% (95%CI: 0.33-0.35). In the 432 patients who had an acute MI in the three months before THR, this figure increased to 18.1% (95%CI 14.8, 22.0). Cox models observed 63 times increased hazard of death within 90-days if patients had an acute MI in the 3-months before their THR, compared to patients who had not had an MI in the five years before their THR (HR 63.6 (95%CI 50.8, 79.7)) This association reduced as the time between acute MI and THR increased. For congestive cardiac failure, the hazard in the same scenario was 18-times higher with a similar protective effect of delaying surgery.

Conclusions/Discussion

Linked NJR and HES data demonstrate an association between inpatient admission for acute medical co-morbidities and death within 90-days of THR. This association is greatest in MI, congestive cardiac failure and cerebrovascular disease with smaller associations observed in several other conditions including diabetes. The hazard reduces when longer delays are seen between the admission for acute medical conditions and THR in all diagnoses. This information will help patients with previous medical admissions and surgeons to determine optimal timing for surgery.

(145)

WHAT ARE THE OUTCOMES OF HIP PRESERVATION SURGERY IN PATIENTS WITH A PRE-OPERATIVE QUALITY OF LIFE 'WORSE THAN DEATH'?: A STUDY USING THE NAHR DATASET

Richard Holleyman[1], Karadi H Sunil Kumar[2], Vikas Khanduja[3], Ajay Malviya[2]
[1]Newcaslte University, Newcastle, United Kingdom. [2]Wansbeck General Hospital, Northumbria Healthcare NHS Foundation Trust, Ashington, United Kingdom. [3]Addenbrookes Cambridge University Hospitals NHS Trust, Cambridge, United Kingdom

Introduction

This study aims to describe the characteristics and outcomes of patients who reported their pre-operative quality of life (QoL) was 'worse than death' ('WTD') prior to hip arthroscopy (HA) or peri-acetabular osteotomy (PAO).

Materials and Methods

Adult patients who underwent HA or PAO between 1st January 2012 and 31st October 2020 were extracted from the UK Non-Arthroplasty Hip Registry. International Hip Outcome Tool 12 (iHOT-12) and EuroQol-5 Dimensions (EQ-5D) index questionnaires were collected pre-operatively and at 6 and 12 months. WTD was defined as an EQ-5D score of less than zero. Chi-squared and t-tests were used to compare categorical and continuous variables respectively.

Results

8493 procedures (6355 HA, 746 PAO) were identified in whom 7101 (84%) returned pre-operative EQ-5D questionnaires. 283 HA and 52 PAOs declared their pre-operative QoL to be 'WTD'. Compared to those patients with pre-operative QoL 'better than death' (n=6072, control group) (EQ-5D ≥ zero) patients reporting 'WTD' function prior to HA were more likely to be female (66% vs 59%, $p = 0.013$), of higher body mass index (mean 27.6 kg/m^2 (SD 5.9) vs 25.7 kg/m^2 (4.5), $p < 0.0001$) however there were no statistically significant differences in mean age (36.8 vs 36.4 years), femoroacetabular impingement pattern, or femoral or acetabular cartilage lesion severity. There were no significant demographic differences for PAO.

For HA, iHOT-12 scores in WTD patients were significantly poorer pre- [10.8 (95% CI 9.6 to 12.0) vs 33.3 (32.8 to 33.8)] and 12 months post-operatively [34.9 (29.0 to 40.8) vs 59.3 (58.2 to 60.4)] compared to controls. Whilst the majority of patients saw improvement in their scores ($p < 0.0001$), a significantly smaller proportion achieved the minimum clinically important difference for iHOT-12 by 12 months. (51% in the WTD group vs 65% in the control group). Similar trends were observed for PAO.

Conclusions/Discussion

Patients with WTD quality of life may benefit less from hip preservation surgery and should be counselled accordingly regarding expectations. Although the scores improve, only 51% achieve scores beyond MCID.

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SEXUAL FUNCTION BEFORE AND AFTER HIP ARTHROSCOPY: A STUDY USING THE NAHR DATASET

Richard Holleyman[1], Karadi H Sunil Kumar[2], Vikas Khanduja[3], Ajay Malviya[2]
[1]Newcaslte University, Newcastle, United Kingdom. [2]Wansbeck General Hospital, Northumbria Healthcare NHS Foundation Trust, Ashington, United Kingdom. [3]Addenbrookes Cambridge University Hospitals NHS Trust, Cambridge, United Kingdom

Introduction

Young adult hip pathology commonly affects patients of reproductive age. The extent to which hip arthroscopy (HA) treatments influence sexual function is not well described and limited to small cohorts. This study aims to describe trends in self-reported reported sexual function before and after HA.

Materials and Methods

Adult (≥18 years) patients who underwent HA between 1st January 2012 and 31st October 2020 were extracted from the UK Non-Arthroplasty Hip Registry. International Hip Outcome Tool 12 (iHOT-12) questionnaires were collected pre-operatively and at 6 and 12 months. Patients are first asked if 'questions about sexual activity are relevant to them'. The iHOT-12 then asks asking patients to quantify 'how much trouble they experience with sexual activity because of their hip?' with responses converted to a continuous scale (0-100) to measure function. Chi-squared and t-tests were used to compare categorical and continuous variables respectively.

Results

Of 7639 procedures (59% female, mean age 36.5 years (SD 11)), 91% (5616 of 6151 respondants) indicated pre-operatively that questions about sexual activity were relevant to them (male 93%, female 90%, $p < 0.001$). Overall, mean pre-operative sexual function increased from 42.0 (95%CI 41.2 to 42.8, n=5267) to 61.8 (60.6 to 63.1, n=2393) at 6 months, and 62.1 (60.8 to 63.5, n=2246) at 12 months post-operatively.

At 12 months, both sexes saw significant improvement in their pre-operative sexual function scores ($p<0.0001$). Males started from significantly higher baseline sexual function (53.3 vs 34.2) and achieved higher scores by 12 months (68.8 vs 58.0) compared to female patients. There was no significant difference in pre- or post-operative scores when comparing younger (<40 years) and older (>40 years).

Conclusions/Discussion

Most patients can expect to experience improvement in their sexual function following hip arthroscopy, regardless of sex or age group.

(158)

LONDON INTERNATIONAL CONSENSUS ON HAMSTRING INJURIES

Ricci Plastow[1,1], Babar Kayani[1], Bruce Paton[2], Peter Moriarty[1], Mat Wilson[2], Nicolas Court[3], Michael Giakoumis[4], Paul Read[5], Gino Kerkhoffs[6], James Moore[7], Simon Murphy[8], Noel Pollock[4], Ben Stirling[9], Laura Tullochk[10], Nicol Van Dykl[11], David Wood[12], Fares Haddad[13,1,14]

[1]Orthopaedic dept University college London NHS foundation trust, London, United Kingdom. [2]Institute sport Exercise and Health, Division surgery Intervention Science University College London, UK, London, United Kingdom. [3]Bournemouth FC, Bournemouth, United Kingdom. [4]British Athletics, Lee Valley, United Kingdom. [5]BFR Physio, Caterham, United Kingdom. [6]Orthopaedic dept Amsterdam University Medical Centre, Amsterdam, Netherlands. [7]Centre for Human Health and Performance, London, United Kingdom. [8]Leicester City FC, Leicester, United Kingdom. [9]Newport Dragons Rugby, Newport, United Kingdom. [10]Saracens RFC, London, United Kingdom. [11]Irish Rugby, Dublin, Ireland. [12]North Sydney Orthopaedic and Sports Medicine Centre, Sydney, Australia. [13]Institute sport Exercise and Health, Division surgery Intervention Science University College London, London, United Kingdom. [14]Princess grace Hospital HCA healthcare, London, United Kingdom

Introduction

The 2020 London International Hamstring Consensus meeting was convened to improve our understanding and treatment of hamstring injuries.

Materials and Methods

The multidisciplinary consensus panel included 14 International specialists on the management of hamstring injuries. The Delphi consensus process consisted of two rounds of surveys which were completed by 19 surgeons from a total of 106 participants. Consensus on individual statements was regarded as over 70% agreement between panel members.

Results

The consensus group agreed that the indications for operative intervention included the following: gapping at the zone of injury (86.9%); high functional demands of the patient(86.7%); symptomatic displaced bony avulsions(74.7%); and proximal free tendon injuries with functional compromise refractory to non-operative treatment(71.4%). Panel members agreed that surgical intervention had the capacity to restore anatomy and function, while reducing the risk of injury recurrence (86.7%). The consensus group did not support the use of corticosteroids or endoscopic surgery without further evidence.

Conclusions/Discussion

These guidelines will help to further standardise the treatment of hamstring injuries and facilitate decision-making in the surgical treatment of these injuries.

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OPERATIVE REPAIR OF HAMSTRING INJURIES FROM THE JACKLING POSITION IN RUGBY

Ricci Plastow[1], Babar Kayani[1], Peter Moriarty[1], Joshua Thompson[1], Fares Haddad[1,2,3]
[1]University College London Hospital, London, United Kingdom. [2]Institute sport Exercise and Health, Division surgery Intervention Science University College London, London, United Kingdom. [3]Princess grace Hospital HCA healthcare, London, United Kingdom

Introduction

The Jackling position within rugby has not been previously described as a mechanism for proximal hamstring injuries.

Materials and Methods

This prospective single surgeon study included 54 professional rugby players (mean age 26 ± 4.8 years) undergoing acute primary surgical repair of complete, proximal hamstring avulsion injuries confirmed on preoperative magnetic resonance imaging. All study patients underwent a standardised postoperative rehabilitation programme. Predefined outcomes were recorded at regular intervals. Mean follow-up time was 17 months (range, 12 months to 24 months) from date of surgery.

Results

51 patients (94.4%) returned to their pre-injury level of sporting activity. Mean time from surgical repair to full sporting activity was 7 months (range, 4 months to 12 months). Zero patients had recurrence of the primary injury. At 1 year after surgery compared to 3 months after surgery, patients had increased mean isometric hamstring muscle strength at 0° (98.4 ± 2.8% vs 88.1% ± 5.4%, $p<0.001$), 15° (95.9 ± 2.9 vs 88.2 ± 8.1%, $p<0.001$) and 45° (92.9% ± 4.1% vs 76.8% ± 9.7%, $p<0.001$), higher mean lower extremity functional scores (77.0 ± 2.3 vs 64.5 ± 4.5, $p<0.001$), and improved Marx activity rating scores (14.3 ± 1.5 vs 10.7 ± 2.6, $p<0.001$).

Conclusions/Discussion

Acute surgical repair of proximal hamstring avulsion injuries caused by the contact jackling position produces high patient satisfaction, high return to preinjury level of sporting activity, with low risk of recurrence at short-term follow-up.

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THE IMPACT OF COVID-19 ON MORTALITY AFTER HIP FRACTURE: A POPULATION COHORT STUDY FROM ENGLAND

Richard Holleyman[1], Sameer Khan[2], Andre Charlett[3], Dominic Inman[2], Antony Johansen[4], Colin Brown[3], Sharmani Barnard[5], Sebastian Fox[3], Paul Baker[6], David Deehan[7], Paul Burton[1], Celia Gregson[8]

[1]Population Health Sciences Institute, Newcastle University, Newcastle upon Tyne, United Kingdom. [2]Northumbria Healthcare, Northumbria, United Kingdom. [3]PHE, London, United Kingdom. [4]University Hospital of Wales, Cardiff, United Kingdom. [5]Telethon Kids, Nedlands, Australia. [6]James Cook University Hospital, Middlesbrough, United Kingdom. [7]Newcastle upon Tyne NHS Foundation Trust, Newcastle upon Tyne, United Kingdom. [8]University of Bristol, Bristol, United Kingdom

Introduction

Hip fracture principally affects the frailest in society, many of whom are care dependent, and are disproportionately at risk of contracting COVID-19. We examined the impact of COVID-19 infection on hip fracture mortality in England.

Materials and Methods

We conducted a cohort study of patients with hip fracture recorded in the National Hip Fracture Database between 1st February 2019 and 31st October 2020, in England. Data were linked to Hospital Episode Statistics to quantify patient characteristics and comorbidities, Office for National Statistics mortality data, and Public Health England's SARS-CoV-2 testing results. Multivariable Cox regression examined determinants of 90-day mortality. Excess mortality attributable to COVID-19 was quantified using Quasi-Poisson models.

Results

Analysis of 102,900 hip fractures (42,630 occurring during the pandemic) revealed that amongst those with COVID-19 infection at presentation (n=1,120) there was a doubling of 90-day mortality; hazard ratio (HR) 2.05 (95%CI 1.86-2.26), while for infections arising between 8-30 days after presentation (n=1,644) the figure was even higher at 2.52 (2.32-2.73). Malnutrition [1.44 (1.19-1.75)] and non-operative treatment [2.89 (2.16-3.86)] were the only modifiable risk factors for death in COVID-19 positive patients. Patients with previous COVID-19 initially had better survival compared to those who contracted COVID-19 around the time of their hip fracture; however, survival rapidly declined and by 365 days the combination of hip fracture and COVID-19 infection was associated with a 50% mortality rate. Between 1st January and 30th June 2020, 1,273 (99.7%CI 1,077-1,465) excess deaths occurred within 90 days of hip fracture, representing an excess mortality of 23% (20%-26%), with most deaths occurring within 30 days.

Conclusions/Discussion

COVID-19 infection more than doubled early hip fracture mortality; the first 30-days after injury were most critical, suggesting that targeted interventions in this period may have most benefit in improving survival.

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WHAT IS THE EFFECT OF TRUNNION BEARING ON REVISION RATE FOLLOWING PRIMARY THR?: A STUDY USING THE NJR DATASET

Richard Holleyman[1], Tim Petheram[1], Mike Reed[1], Paul Burton[2], Ajay Malviya[1]
[1]Northumbria Healthcare, Northumbria, United Kingdom. [2]Population Health Sciences Institute, Newcastle University, Northumbria, United Kingdom

Introduction

Modular femoral stems offer surgeons great flexibility in biomechanical configuration during total hip replacement (THR) however introduce a taper-trunnion articulation known to be a source of additional wear debris through crevice, fretting and galvanic corrosion with mixed material combinations. This study aimed to investigate the influence of the trunnion bearing surface combination on the revision rate following primary total hip replacement (THR).

Materials and Methods

All patients who underwent THR using an Exeter V40 cemented stainless steel stem and monobloc cemented polyethylene acetabular component (uncemented cups excluded to standardise the acetabular bearing surface and fixation) between January 2003 and December 2019 were extracted from the National Joint Registry for England, Wales, Northern Ireland, and the Isle of Man. The primary exposure was the head substrate used corresponding to the trunnion bearing.

Time-to-event was determined by duration of implantation from primary surgery to revision with cases censored at death or end of available follow-up. Multivariable Cox proportional hazard models were used to identify predictors of all cause revision, adjusted for age, sex, American Association of Anaesthesiologists (ASA) grade, body mass index, surgical indication (osteoarthritis or other), and femoral head size.

Results

229,870 THR were identified (66% female, mean age 73.4 years (SD 9.1) with the majority (91%) performed for osteoarthritis of which 4,598 were revised. Mean time from primary to revision or censoring was 6.8 years (SD 4.0).

Multivariable modelling showed CoCr/SS trunnions were associated with a significantly higher risk of revision (hazard ratio (HR) 1.31 (95%CI 1.15 to 1.48, $p<0.0001$) as compared to SS/SS (reference). Both Alumina/SS (HR 0.74 (0.65 to 0.84), $p<0.0001$) and Zirconia/SS (HR 0.61 (0.49 to 0.74), $p<0.0001$) were associated with a significantly lower risk of revision

Conclusions/Discussion

Ceramic heads on an Exeter stem were associated with significantly improved survivorship compared to metal heads in primary THR. CoCr/SS trunnion articulations had the poorest survivorship which may be contributed to by trunnionosis.

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

Maryam Ahmed[1], Romesh Tirimanna[2], Soltan Hussein[3], Umar Ahmed[4], Habib Syed[1], Labib Syed[1], Minghong Gan[5], Preetha Sadasivan[6], Mark Edmondson[1], NOF Collaborative[7]
[1]University Hospitals Sussex, Brighton, United Kingdom. [2]William Harvey Hospital, Ashford, United Kingdom. [3]St Mary's Hospital, London, United Kingdom. [4]Eastbourne District General Hospital, Eastbourne, United Kingdom. [5]East Surrey Hospital, Redhill, United Kingdom. [6]Luton and Dunstable University Hospital, Luton, United Kingdom. [7]Multicentre, Nationwide, United Kingdom

Introduction

The incidence of hip fractures in the elderly is increasing. Minimally displaced and undisplaced neck of femur fractures can be treated with either a form of internal fixation or hemiarthroplasty.

Materials and Methods

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 tor missing data were excluded from the study. Statistical analysis was performed used SPSS system and a p value of <0.05 was considered statistically significant.

Results

1273 patients were included in the study. 71.8% were female and the mean age was 83 years (SD +/- 9.08). 26.2% (n=3334) of patients had cannulated hip screw fixation (CSFN), 19.4% (n=247) had a dynamic hip screw (DHS) and 54.7% (n=692) had a hemiarthroplasty. 66 patients (5.2%) required revision surgery; there was as statistical difference between the revision rates among CSFN, DHS and hemiarthroplasty patients [14.4% (n=48) vs. 4% (n=10), vs 1.2% (n=8); χ^2 test p=0.000015]. Failed fixation was the most common reason for revision with the incidence increasing by 7-fold in the CSFN group [88.5% (n=23) vs. 11.5% (n=3) in DHS; χ^2 test p=0001]. The predictive risk factors for CSFN revision were age >80 (t-test, p=0.021), female gender (χ^2 test, p=0.047), smoking (χ^2 test, p=0.035). For DHS, smoking was a predictive risk factor (χ^2 test, p=0.0002). The average length of hospital stay was decreased when using CSFN compared to DHS and hemiarthroplasty (12.6 days vs 14.9 days vs 18.1 days respectively, ANOVA p=0.0006). The mortality rate for CSFN, DHS and hemiarthroplasty was 2.5%, 2% and 9% respectively (log rank test, p=0.113).

Conclusions/Discussion

This is the largest multicentre study to date assessing the failure rate of multiple fixation methods in Garden I and II hip fractures. Female patients over the age of 80 have a higher rate of fixation failure with CHS. A viable choice in such patients would be hemiarthroplasty.

ABSTRACTS:

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(Poster # 2)

CEMENT BEADS AT FIRST STAGE IMPROVE FEMORAL ENDOSTEAL RECOVERY. A COMPARATIVE STUDY OF REVISION AND PRIMARY TAPER SLIP FEMORAL COMPONENTS.

James Shelton, Mehnoor Khaliq, Jonathan Barrow, Sophie Miller, Andrew Hamer
Sheffield Teaching Hospitals, Sheffield, United Kingdom

Introduction

Debate continues about the merits of non-articulating cement beads versus articulating cement spacers. This unit believes beads promote femoral endosteal bone regeneration producing an environment conducive to cementing at second stage.
To assess the femoral cement mantle of matched primary and revision cemented taper slip stems (CTSSs)

Materials and Methods

We performed a retrospective cohort study of all second stage CTSSs then selected a randomised group from primary joints from the arthroplasty database. The two revision hip fellows assessed the initial post op radiograph for femoral cement quality using the Barack grading system. Results were analysed using SPSS for inter-observer reliability and quality of cementing.

Results

105 patients were identified as having received a CTSSs at second stage and 105 primaries randomly selected. The average age was 81 in the revision group and 79 in the primary group. The revision group contained 54% female patients and primary group contained 56%. In the primary group 73% on AP were grade A and 65% on lateral. In the revision group 77% on AP were grade A and 76% on the lateral. The inter-class correlation coefficient showed good correlation between assessors. Only the lateral cementing demonstrated a significant difference between groups in favour of the revision group.

Conclusions/Discussion

This paper suggests that the use of beads at first stage followed by a cemented femoral prosthesis at second stage will have equal to, or slightly better cementing that those receiving a primary hip replacement. We believe that cement can have additional benefits in second stage revisions such as further delivery of antibiotics into the effective joint space. As revision surgeons we aim to foster as many options as possible for the subsequent reconstruction. The major limitation of this study is the low number of articulating spacers used in this institution.

(Poster #3)

AGE AND AMT SCORE OF HIP FRACTURE PATIENTS FULFILLING NICE CRITERIA FOR THA BUT SELECTED FOR HEMIARTHROPLASTY ARE IMPORTANT PREDICTORS FOR SUBSEQUENT REVISION SURGERY

Lucy Walker, Qamar Mustafa, Omer Nasim, Boulos Eskander, Eslam Hassan, Suraj Kohli, Adrian Harvey
University Hospitals Dorset, Poole, United Kingdom

Introduction

It has been reported that only 41% of intracapsular hip fracture patients who met the NICE criteria for THA received a total hip rather than a hemiarthroplasty. THA can lead to a superior functional post-operative outcome and there is a high complication rate when revision surgery is required post-hemiarthroplasty. The current study proposed to identify patient factors pre-disposing to revision surgery post-hemiarthroplasty in those individuals who met the NICE criteria for THA.

Materials and Methods

A retrospective cohort study was conducted in a single orthopaedic department using data from 01/07/2009 to 31/10/2018. The cohort of patients who met the NICE criteria for THA was split into patients who received a THA and those who received a hemiarthroplasty. Comparisons were made between the two groups to identify any significant differences regarding complication and revision surgery rates.

Results

The final cohort had 1580 patients with 1243 receiving a hip hemiarthroplasty and 337 (21.3%) receiving a THA. Twenty-eight of the hemiarthroplasty patients went on to have revision surgery and they had a statistically significantly lower mean age and admission AMT score than those patients who did not receive revision surgery. Patients with an AMT score of 10 were statistically more likely to require a revision post-hemiarthroplasty than those with a lower AMT score.

Conclusions/Discussion

This study has identified the important of patient age and AMT score when considering implant selection for displaced intracapsular hip fractures. It suggests that patients with an AMT score of 10 should be given due consideration for THA over hemiarthroplasty.

(Poster # 5)

THE PREVALENCE OF PROTRUSIO ACETABULAI HAS SIGNIFICANTLY REDUCED IN PATIENTS UNDERGOING TOTAL HIP ARTHROPLASTY IN THE UK

James Shelton[1], ORIGIN Collaborative[2], Muthukrishnan Ramakrishnan[1]
[1]Wirral university Teaching Hospital NHS Foundation Trust, Wirral, United Kingdom. [2]Health Education North West Mersey Sector, Liverpool, United Kingdom

Introduction

Protrusio Acetabulai has been a common aspect of hip replacement (THR) surgery. After a librarian search only on paper in 1978 assessed the prevalence of protrusio in patients receiving a THR and found 5.3% of patients in this cohort had clinically relevant protrusio. This study group felt that 1 in 20 THRs seemed more frequent than in the current population.

Aims & objectives

To assess the current prevalence of protrusio acetabulai in patients receiving a THR in current practice.

To classify the severity of cases and discuss current practice in this area.

Materials and Methods

A study protocol was written and submitted to the integrated research application system. Relevant permissions were gained and disseminated to study sites. A power calculation was performed to recruit 330 patients across eight study sites. Results were anonymised and collated centrally. Statistics were performed using an excel statistics package. Patients' pre-operation radiographs were assessed for Charnley, Sotelo-Garza and centre-edge angles assessed. If 2 of the 3 classifications demonstrated protruiso they were noted as having protrusio. The severity was also denoted.

Results

Six study sites reported within the duration of the study 198 patients. The prevalence of protrusio had reduced from 5.3% to 1.5% (p=0.0073) of the 3 patients identified with protrusio 1 was mild and 2 were moderate.

Conclusions/Discussion

The prevalence of protrusio has reduced from 1 in 20 THRs to 1 in 50. Severe acetabula protrusio can require revision type techniques and equipment. As we move to a centralised 'hub and spoke' model of service delivery in the UK surgeons should consider referral onwards of these patients if this equipment is not 'on the shelf'.

(Poster # 7)

UNDERWEIGHT NOT OVERWEIGHT PATIENTS HAVE A PROLONGED LENGTH OF STAY: A MULTIVARIATE ANALYSIS OF 885 PATIENTS UNDERGOING ELECTIVE TOTAL HIP REPLACEMENT SURGERY

Kar May Phoon, Irrum Afzal, Vipin Asopa, Deiary Kader, Richard Field, David Sochart
Academic Surgical Unit (ASU), South West London Elective Orthopaedic Centre (SWLEOC), London, United Kingdom

Introduction

Current literature suggests conflicting information regarding the relationship between body mass index (BMI) and length of stay (LOS) following a total hip replacement (THR). Studies have reported that a BMI outside of the normal ranges is associated with comorbidities that can prolong LOS and affect post-operative outcomes following a THR. The aim of this study was to evaluate the impact of BMI on LOS after an elective primary THR.

Materials and Methods

This was a retrospective study of patients undergoing an elective primary THR between April and October 2021 at a high-volume elective orthopaedic centre. Data collected included patient demographics, BMI, American Society of Anaesthesiologists (ASA) grade, LOS, and reason for prolonged stay (where LOS was greater than 2 days). Patients were categorised according to BMI classified by WHO as follows: underweight = BMI <18.5, normal = 18.5-24.9, overweight = 25-29.9, obese-I = 30-34.9, obese-II = 35-39.9, obese-III = ≥40. Data was collated and analysed on Microsoft Excel and IBM SPSS-28.

Results

885 patients had an elective primary THR within this study period. The mean and median LOS was 2.6 days and 2 days respectively. 37.3% (n=330) of patients had a LOS greater than 2 days. Our study showed that there was a significant difference in the mean LOS across the BMI categories (p=0.02), with underweight patients having a significantly longer LOS compared to obese-II patients (p=0.034). Compared to patients with a normal BMI, the odds of obese-II patients having a longer LOS were significantly lower (OR=0.53; 95%CI=0.304-0.927; p=0.025), and the odds of underweight patients having a longer LOS were higher, however, the latter result was not statistically significant (OR=2.8; 95% CI=0.683-11.477; p=0.137). Additional multivariate analysis demonstrated that other factors such as age, gender, and ASA grade were significantly associated with an increased LOS (p<0.001).

Conclusions/Discussion

This study has demonstrated that BMI was associated with an increased LOS following a primary THR, which was seen in the underweight patient group. However, there was no association between obesity and increased LOS.

(Poster # 8)

IS A NOAC NICER THAN THE NEW HALF AND HALF REGIMEN? REVIEW OF WOUND COMPLICATIONS AND VTE IN ELECTIVE HIP ARTHROPLASTY PATIENTS FOLLOWING CHANGE IN NICE GUIDANCE

Georgia Scott, Mandeep Singh Koundu, Ann McCormack, Alastair Robertson, Oliver Keast-Butler
Conquest Hospital, Hastings, United Kingdom

Introduction

NICE Guidance surrounding venous thromboembolism (VTE) prophylaxis in hip arthroplasty were updated in 2019. A 10 day course of low molecular weight heparin (LMWH) injections followed by aspirin for 28 days was now proffered as an alternative to LMWH injections alone or novel oral anticoagulant (NOAC) tablets.

The aim was to review whether our VTE rates, wound infection requiring return to theatre or haemorrhagic complications had changed with our practice following this new guidance.

Materials and Methods

This was a retrospective review of all elective patients who underwent a primary hip arthroplasty during January 2018 - December 2020. Those discharged with a NICE approved chemical regimen were included with patients on a pre-existing anticoagulant omitted.

The hospital database provided admission data admission, imaging and clinic letters. Complications of interest included thrombotic events in 3 months post-surgery, wound problems requiring surgery and significant bleeding requiring hospital assessment whilst anti-coagulated.

Results

A total of 550 patients underwent a primary THR with a total of 77 excluded. Dabigatran was prescribed in 271 patients, 186 LMWH/aspirin and 21 patients solely LMWH injections.

Of the Dabigatran cohort, there was 1 surgical washout (0.4%) and 1 patient developed a pulmonary embolism 2 days post-operatively (0.4%).

There were 3 wound complications in the LMWH/aspirin group (1.6%) requiring surgery and 1 thrombotic episode (0.5%). No significant bleeding episodes were found within any cohort.

Conclusions/Discussion

Overall, our complication rates were low with similar VTE rates in the Dabigatran and LMWH/aspirin groups. Wound complications requiring a return to theatre were higher in the combined cohort.

In summary, this new ‘half and half’ regimen appears more acceptable to clinicians where aspirin is an older, more widely understood oral anticoagulant in which bleeding is considered to be less. This is not in keeping with our findings, where rates of re-operation for wound complications were three times greater than with Dabigatran. Concerns surrounding patient compliance with daily injections is also offset with this regimen.

(Poster # 9)

THE LARGEST SINGLE CENTRE SERIES OF CANNULATED SCREWS FOR NECK OF FEMUR FRACTURE

Mohannad Ammori, Junaid Aamir, Hassan Hamid, George McLauchlan, Amol Chitre
Lancashire Teaching Hospitals NHS Foundation Trust, Preston, United Kingdom

Introduction

The current recommendations by the National Institute for Health and Care Excellence are to offer replacement to patients with a displaced intracapsular neck of femur fracture. This is based on a significantly greater re-operation rate for internal fixation compared to hemiarthroplasty from 1 to 5 years (355/1,001; 35.5% vs. 99/1,033; 9.4%, respectively). The aims of this study were to determine the re-operation rate after cannulated screws for neck of femur fracture, and to determine the variables predictive of re-operation.

Materials and Methods

Six-hundred-and-three patients who underwent 608 operations were identified using a query created in Bluespier from May 2007 to February 2021. Data were retrospectively collected and included patient demographics, fracture classification (Garden, Pauwels) and operative details including an assessment of the reduction and configuration of the screws.

Results

The re-operation rates were 5.6% (*n*=33) at six months, 14.6% (*n*=79) at 2 years and 21.0% (*n*=87) at 5 years. The conversion rate to total hip arthroplasty was 9.2% (*n*=56) and removal of metalwork was performed in 5.4% (*n*=33). Common complications included avascular necrosis (*n*=29; 4.8%), metalwork irritation (*n*=25; 4.1%), non-union (*n*=21, 3.5%), and failure (*n*=21, 3.5%). A Cox proportional hazards regression found anatomical or valgus-impacted reduction to be the only independent predictor of re-operation.

Conclusions/Discussion

Our re-operation rates after cannulated screws for neck of femur fracture are substantively lower than that reported elsewhere. Anatomical or valgus-impacted reduction was more predictive of re-operations than initial fracture displacement.

(Poster # 10)

EDMONTON FRAIL SCALE IN ELECTIVE TOTAL HIP AND KNEE ARTHROPLASTY: A PREDICTOR FOR INCREASED LENGTH OF STAY

Kevin Syam, Gopikanthan Manoharan, Salam Ismael, Srinath Sallur Anand, Kahlan Al Kaisi, Ben Burston
The Robert Jones Agnes Hunt Hospital, Oswestry, United Kingdom

Introduction

The Edmonton Frail Scale (EFS) is a valid and reliable tool for defining frailty. EFS has been used to predict increased LOS and morbidity in elective cardiac and colorectal surgery. This study aimed to evaluate EFS as a predictor for increased post-operative LOS and complications in elective total hip arthroplasty (THA) and total knee arthroplasty (TKA).

Materials and Methods

Consecutive patients with completed EFS scores who underwent elective THA and TKA between October 2016 to March 2017 were retrospectively reviewed. Following power analysis, EFS score, ASA grade, co-morbidities, LOS, high dependency unit (HDU) admission and post-operative complications were collected. SPSS software was used for statistical analysis.

Results

Two-hundred patients (94 frail and 106 non-frail) were included. The median LOS was 4 days. The mean LOS for frail patients (8.4 days) was significantly longer than the non-frail patients (3.7 days). There were significantly higher post-operative complications and HDU admissions in the frail group ($p<0.05$). Receiver operator characteristic (ROC) curve analysis showed that EFS was an acceptable predictor for increased LOS (>4 days) with an EFS score of 6 or more being associated with greater LOS (ROC 0.753). Logistic regression analysis did not show any association between EFS score and post-operative complications.

Conclusions/Discussion

To the best of our knowledge this is the first study to look at EFS as a predictor for increased LOS in elective THA and TKA patients. EFS is an acceptable predictor for increased LOS, but not for post-operative complications in elective hip and knee arthroplasty. The use of EFS should be considered in pre-operative clinics for elective THA and TKA. A score of 6 or more should trigger pre-operative interventions to optimise these patients. This could also be used to improve bed modelling and discharge planning.

(Poster # 11)

THE INCLUSIVE O SIGN: A MORE APPRIOPRIATE SIGN FOR MORE INCLUSIVE TIMES?

Ana Dias[1], Sham Rahman[1], Toby Onafowokan[2], James Sherrington[1], Rory Middleton[1]
[1]Royal Cornwall hospital, Truro, United Kingdom. [2]Royal Blackburn hospital, Blackburn, United Kingdom

Introduction

There is an increasing awareness for the need of gender equality in society. Medicine is no exception with guidelines from medical governing bodies such as the WHO and BOA recognising it's importance.

The John Thomas (JT) sign has been widely taught as a tool to predict the side of hip fracture. The sign is dependent on the forces of gravity and resultant asymmetry. However, it is inherently gender biased and thus in contravention of current thought and policies concerning gender inclusivity within medical practice. We propose a novel, gender neutral, sign based on asymmetry of the Obturator foramen… "The Inclusive O Sign" and test it's efficacy with respect to the JT sign.

Materials and Methods

A Retrospective review of hip fracture patients across two sites (Royal Cornwall Hospital & Royal Blackburn Hospital). Pelvic radiographs were analysed for presence of a Correctly predictive O sign and JT sign. Investigators were blinded to fracture side.

Results

Obturator asymmetry was noted in 72% of patients while the presence of penis shadow in only 59% of males or 18% of our total cohort. When present, the O sign correctly predicted the fracture side in 66% of patients. When present the JT sign predicted the fracture side in 47% of patients. Taking the population as a whole, the JT sign predicted the injured side correctly in only 7.3% of fractures compared to the O signs 47% ($p<0.001$).

Conclusions/Discussion

In conclusion, this study has shown the JT sign to be completely inaccurate. The O sign is significantly more accurate but still not as good as actually looking for the fracture on Xray or using Shenton's line. It is a topic that brings amusement to medical education. However, the BOA guidance highlights the need for gender equality not only in the patient population but also within our profession.

It may be that if we were to adopt this sign instead of JT. It would bring more inclusivity to Orthopaedics.

Hopefully this study is only a steppingstone on a much larger movement towards gender inclusivity in the future.

(Poster # 12)

CANNULATED SCREW FIXATION FOR GARDEN I&II INTRACAPSULAR HIP FRACTURES(5-YEAR FOLLOW-UP AND POSTERIOR TILT ANALYSIS)

Joseph Boktor[1], Abdul Badurudeen[1], Manhal Yaseen[1], Peter Lewis[2], Gareth Roberts[1], Robert Hills[3], Antony Johansen[4,1], Simon White[1]
[1]UHW, Cardiff, United Kingdom. [2]Prince Charles Hospital, Merthyr, United Kingdom. [3]Oxford University, Oxford, United Kingdom. [4]School of Medicine, Cardiff, United Kingdom

Introduction

In UK there are around 76,000 hip fractures occur each year with 10-15% are undisplaced intracapsular. There is considerable debate whether internal fixation is the most appropriate treatment for undisplaced fractures in older patients. This study describes cannulated hip screws survivorship analysis for patients aged ≥ 60 with undisplaced intra-capsular fractures.

Materials and Methods

Retrospective cohort study of consecutive patients aged ≥ 60 who had cannulated screws fixation for Garden I & II fractures in teaching hospital between March 2013 and March 2016. Primary outcome was further same side hip surgery. Descriptive statistics were used, and Kaplan-Meier estimates calculated for implant survival.

Results

A total of 114 operations were performed on 112 patients with a mean age of 80.2 years (SD 8.9). Thirty-day and one-year mortality were 1% (n=1) and 13% (n=15) respectively. Median follow-up was 6.6 years. Kaplan-Meier estimates showed Cannulated screws' survivorship of 95% at 1 year and 90% at five years (95% CI: 84% to 95%). Nine patients underwent further hip surgery: four revision to THR, one revision to hemiarthroplasty, three removal of screws, and one haematoma washout. Posterior tilt was assessable in 106 patients; subsequent surgery was required in two of the six patients identified with posterior angle >20^{o} (p=0.04 *vs.* angle <20^{o}). Of the 100 patients with angle <20^{o}, five year survivorship was 91% with seven required further surgery.

Conclusions/Discussion

This study of cannulated hip screw fixation for undisplaced fractures in patients aged ≥ 60 reveals a construct survivorship without further operation of 90% at 5 years. Cannulated screws can be considered a safe reliable treatment option of Garden I & II fractures. Caution should be taken if posterior tilt angle on lateral view exceeds 20 degrees with a higher failure rate and reoperation, and these fractures considered for similar management to Garden III-IV injuries.

(Poster # 13)

A MULTI CENTRE EXPERIENCE OF A 3D PRINTED CUSTOM ACETABULAR IMPLANT IN COMPLEX REVISION HIP ARTHROPLASTY

Mehnoor Khaliq[1], Jonathan Barrow[1], James Shelton[1], Ashok Ramavath[2], Henry Wynn Jones[2], Tim Harrison[1]
[1]Sheffield Teaching Hospitals, Sheffield, United Kingdom. [2]Centre for Hip Surgery, Wrightington Hospital, Appley Bridge, United Kingdom

Introduction

With increasing life expectancy comes the increasing demand for revision surgery. Massive bone loss in the acetabulum is a rare, but difficult complication to address in revision arthroplasty. Previous methods of reconstruction include “off the shelf” non-customised components such as triflange implants, cup cage constructs, plating, mesh, trabecular metal, and bone graft. With the advances in imaging, materials and 3D printing, patient specific implants for massive bone loss have become an option. A custom three dimensional (C3D) printed hip implant provides a unique solution to this challenging issue. This multi-centre study aims to evaluate early survival, functional and radiological outcomes following revision surgery using a C3D component. To our knowledge, this is the largest review of a C3D components in the current literature.

Materials and Methods

This is a retrospective review of 32 patients who underwent revision arthroplasty using a custom C3D acetabular component. Databases from two tertiary referral arthroplasty centres were used to identify patients. Radiological imaging and case notes were analysed to establish participant demographics, complications, Paprosky grading of bone loss, and functional measures of pain and mobility. Descriptive statistics were used to identify means, frequencies, cross-tabulations, and standard deviations.

Results

The mean follow up was 1.9 years (0.2-6.7 years). The pre-operative Paprosky grade of bone loss was: IIC in one, IIIA in seven, and IIIC in twenty four. 31 (97%) patients experienced an improvement in their pain from pre-operative levels of severe/significant to post-operative levels of minimal/none. 19 (59%) patients experienced an improvement in their mobility state by at least one modality. 2 patients went from being wheelchair bound to walking unaided. 7 patients went from using 2 walking aids to walking unaided. 22% of patients reported complications. There was 100% survival of the C3D implants.

Conclusions/Discussion

Customised 3D printed acetabular implants for massive bone loss are a reliable option for individualised revision arthroplasty with a low complication profile given the extreme patient cohort. We recommend the use of such implants is limited to tertiary referral specialist arthroplasty centres, utilising a multidisciplinary approach.

(Poster # 15)

THE CRUCIAL FACTORS DETERMINING THE DEVELOPMENT AND OUTCOMES OF POST OPERATIVE DELRIUM IN PROXIMAL FEMUR FRACTURES

Aysha Rajeev, Catherine Railton, Kailash Devalia
Gateshead Health Foundation NHS Trust, Gateshead, United Kingdom

Introduction

Delirium is common in elderly patients undergoing surgery for proximal femur fractures, the rates ranging from 4 to 53%. The aim of the study is to find the factors contributing to the development and mortality of post-operative delirium in proximal femoral fractures

Materials and Methods

The data for the study was obtained from NHFD (National Hip Fracture Database) and internal hospital computer systems (Medway, ICE, Clinic letters) between Jan 2018 and Dec 2019. A total of 598 patients were admitted during the study period. After screening 175 patients were found have developed post-operative delirium. The diagnosis of delirium was made using the 4AT scoring system. The outcomes measured were post-operative anaemia, lower respiratory tract infection, urinary tract infection, acute kidney injury, urinary retention, cardiac event, and stroke, alcohol or drug withdrawal, length of hospital stay, 30 day and one year mortality. The effect of postoperative delirium on each of these outcomes was evaluated.

Results

The mean age for patients with delirium was 84.82 years. 124 patients (70.8%) had dementia (patients who scored ≤6 on AMT score) compared to 108(25.5%) patients without delirium ($p<0.05$). The patients who developed delirium there were 68(38.9%) with ASA grade 4 and 94(22, 3%) without delirium ($p<0.05$). There were no significant statistical difference between patients who had general anaesthesia (GA) and spinal anaesthesia (SA) or the type of procedure carried out for the hip fractures in the delirium group and in the group without delirium. The average length of stay after developing post-operative delirium was 19.69 days compared to 17.4 days for patients without delirium. The mortality at 30 days and one year was 10.9% and 37% in patients who had post-operative delirium compared 2.1% and 2.8% to those without delirium respectively. The factors leading to high mortality were mental illness, post- operative anaemia, lower respiratory tract infection, urinary tract infection, acute kidney injury, cardiovascular disease and general anaesthesia.

Conclusions/Discussion

Post-operative delirium is three times more common in hip fractures. Early detection and timely management is crucial in the improvement of outcomes and mortality.

(Poster # 16)

FACTORS ASSOCIATED WITH REDUCED INPATIENT LENGTH OF STAY FOLLOWING PRIMARY ELECTIVE TOTAL HIP REPLACEMENT SURGERY.

Arun Jassal[1], Emily Shaw[2], Sameer Jain[3,4], Bernard Van Duren[3,4], Jeya Palan[3,4], Hemant Pandit[3,4]
[1]University of Leeds School of Medicine - 5th Year Medical Student, Leeds, United Kingdom. [2]University of Leeds School of Medicine - 4th Year Medical Student, Leeds, United Kingdom. [3]Chapel Allerton Hospital, Leeds, United Kingdom. [4]LIRMM, University of Leeds, Leeds, United Kingdom

Introduction

Primary total hip replacement (THR) is the most effective treatment for end-stage osteoarthritis (OA). Postoperative length of stay (LOS) varies between 4-12 days, but a multimodal enhanced recovery (ER) pathway has been shown to reduce LOS to 1-4 days. This study aims to determine reasons for prolonged LOS in patients undergoing primary elective THR surgery for osteoarthritis.

Materials and Methods

Routine demographic and surgical data were collected for 358 patients who underwent THR at Chapel Allerton Hospital, Leeds, UK between 01/01/2019 and 31/12/2019. Outcome data was collected on LOS, reasons for continuing inpatient status at 24, 48 and 72 hours postoperative and same day mobilisation (SDM). Statistical comparisons were conducted using Mann-Whitney U testing. A multivariate regression analysis was performed to identify factors influencing LOS. Statistical significance was set to $p<0.05$.

Results

Median LOS was 2.0 days (IQR, 2.0-3.0 days). Incomplete rehabilitation was the main reason for continued inpatient status at 24, 48 and 72 hours. SDM was associated with a significantly reduced LOS compared to patients who did not achieve SDM (2.4 vs 3.0 days, respectively, p=0.03). Multivariate regression analysis identified male gender (p=0.04) and SDM (p=0.02) as factors associated with a significantly reduced LOS, whilst medical complications (p=0.01), pain (p=0.01), awaiting check radiographs (p=0.01), and wound leakage (p=0.02) were associated with a significantly increased LOS. Age, anaesthetic type (spinal vs general), body mass index and surgeon grade (consultant vs trainee) did not have an effect on LOS (all $p>0.05$).

Conclusions/Discussion

ER pathways optimise patients for faster rehabilitation but to reduce length of stay and increase operational efficiency, efforts should be made to ensure adequate physiotherapy staffing to mobilise all patients on the day of surgery. Reducing medical complications, pain and wound leakage must form the mainstay of any adopted ER pathway. Postoperative radiographs often provide limited clinical benefit and their routine use may be questioned as they prolong LOS. Further study, in the form of a prospective multi-centre cohort study is recommended to evaluate the benefits of ER interventions in solving inefficiencies in current THR pathways.

(Poster # 22)

MANAGEMENT OPTIONS AND OUTCOMES FOR THE DISLOCATED HIP HEMIARTHROPLASTY – WE NEED A NATIONAL AUDIT.

Christian Gray Stephens, Sham Rahmin, jonathan Milton, Rory Middleton, Paul Haggis
[1]Royal Cornwall Hospital, Truro, United Kingdom.

Introduction

Dislocation of hip hemiarthroplasty is a rare but serious complication with a reported mortality of 30-57% at 6 months. The literature remains sparse on how best to manage such cases. We present the largest case series of dislocated hemiarthroplasties published to date. We analyse complications and survival of patients undergoing further procedures for dislocated hip hemiarthroplasty at a single high volume hip fracture unit

Materials and Methods

We undertook a retrospective review of our Local Hip fracture database, crossed matched with institutional electronic records to identify all episodes of dislocation in hemiarthroplasty patients.

Results

We identified 2118 Hemiarthroplasty procedures of which 35 were complicated by dislocation. Mean age was 81.8 and with a 13:22 male to female ratio. All cases had at least 1 attempt at MUA.

5 patients re-dislocated after MUA and were left. 14 patients were successfully managed with MUA only (12 with 1 reduction, 2 with 2 reductions), 8 patients were revised, and 8 patients underwent excision arthroplasty. Of the revised patients 2 re-dislocated and were left and one developed a periprosthetic infection. 6-Month mortality was 35% and 12-Month mortality was 42%.

Conclusions/Discussion

Our results broadly reflect the sparse literature that is available. While there is increased mortality compared to the overall hip fracture population, our cohort survival analysis highlights that these patients may benefit from an optimised management pathway. We suggest that this would be better informed and relatively easily undertaken with a nationwide audit using trainee collaboratives.

(Poster # 24)

OUTCOMES FOLLOWING STAGED BILATERAL TOTAL HIP REPLACEMENT: IS FIRST SIDE SURGERY A RELIABLE PREDICTOR OF THE SECOND ?

Ullas Jayaraju[1], joseph Boktor[2], James Brock[3], Sanjeevan Yoganathan[4], Mohamed Elsheikh[2], Kunal Roy[2], Vinay Joseph[2], Stephen Sarasin[2], Peter Lewis[2]

[1]Morriston Hospital, Swansea, United Kingdom. [2]Prince Charles Hospital, Merthyr, United Kingdom. [3]The Grange Hospital, Newport, United Kingdom. [4]Princess of Wales, Merthyr, United Kingdom

Introduction

The purpose of this study was to establish Patient Reported Outcome Measures (PROMs) for bilateral staged hip arthroplasty and determine if first side outcomes predict second side outcomes. Those failing to achieve a Minimal Important Change (MIC) in Oxford Hip Score (OHS) following first side surgery were further scrutinized.

Materials and Methods

Retrospective review of a prospectively updated single surgeon database was undertaken evaluating a consecutive series of staged bilateral Total Hip Replacements (THR). Using a single implant system and standard technique analysis of ten years' period was undertaken (August 2009 to February 2020). Each patients' OHS was recorded preoperatively, postoperatively at 6 weeks and 1 year. The MIC was set at an OHS change ≥8.

Results

149 bilateral THR patients (298 THRs) were included, the majority receiving second side surgery within 6 to 12 months from the first. Mean age for patients for first was 63.1yrs (range 25 to 86 years) and 65.2yrs (range 27 to 87 years) for second side, with 63% female. Mean BMI for 1st side THR was 31.0, increased to 31.5 by second side ($p = 0.248$). 1-year follow-up PROMs data was available for 97% (n = 144/149) and 93% (n = 138/149) of first and second side surgeries respectively. Mean OHS improvement at 1-year following first side was 26.4 and for the second side 25.1, with 97% (n=140/144) and 92% (n=122/138) achieving an MIC ($p = 0.132$). The 4 patients who failed to achieve MIC following first side surgery all achieved MIC for their second side. Individual analysis of these patients revealed potentially confounding comorbidities of chronic degenerative lumbar spine disease, Perthes and protrusio acetabulae.

Conclusions/Discussion

This large single surgeon series identified no significant difference between first and second side OHS improvement following staged bilateral total hip replacements at 1-year of follow up. The informed consent process is therefore able to reflect this expectation. The small number however in this series who failed to achieve an MIC following first side surgery still achieved a successful PROMs improvement following their second side surgery.

(Poster # 25)

THE PATIENT IMPACT OF DELAYED ARTHROPLASTY

Adam Truss, Syam Morapudi
Macclesfield District General Hospital, Macclesfield, United Kingdom

Introduction

The national impact of COVID-19 on an already stretched elective orthopaedics service has been astronomical. As surgeons, we experience daily the delays caused by cancellations of elective theatre lists and re-allocation of elective beds. However, it can be difficult to appreciate the true impact these delays have on the individuals awaiting operations.

We aim to evaluate the impact that the ever-increasing delays are having on patients awaiting lower limb arthroplasty.

Materials and Methods

Patients currently listed for either a total hip or total knee replacement were invited to a specialised clinic. A qualitative assessment of patient's current condition, compared with that of when they were listed, was performed using questionnaires. These focussed on four key domains: mobility; care needs; exercise tolerance and analgesia requirements. As well as this, patients were consulted on the impact of the delays on their mental health.

Results

23 patients awaiting arthroplasty surgery (11 total hip; 12 total knee) completed questionnaires. Since the date of listing (median 56 weeks; range 14-150 weeks), over half (n=12) had an increased requirement of walking aids. 43% reported an increased requirement for support with ADLs. All but 1 experienced a notable deterioration in their walking tolerance with all but 3 patients now having an increased analgesia requirement. There were five times more patients requiring some form of opiate analgesia compared with at the time of listing.

Nearly one third of the patients reported that the wait for surgery has had a significant impact on their mental health.

Conclusions/Discussion

Patients awaiting elective surgery experience substantial deterioration in their general well-being as assessed over four domains; to the point that a third are now suffering from mental health decline.

The burden on the health service of delaying arthroplasty is perhaps even greater than is widely considered, with mental health referrals and analgesia requirements rising. With a large increase in the prescription of opiate based analgesia, the impact of side effects and drug dependence should not be ignored.

Whilst the absolute waiting list numbers understandably dictate resource allocation, the individual impact of delays should be carefully considered when making these decisions.

(Poster # 28)

ACUTE MANAGEMENT OF TRAUMATIC NATIVE HIP DISLOCATIONS AT A WELSH MAJOR TRAUMA CENTRE

Wahid Abdul, Jonathan Topping, Zayd Jawad, James Lewis, Khitish Mohanty, Gareth Roberts
University Hospital of Wales, Cardiff, United Kingdom

Introduction

Majority of native hip dislocations are due to high-energy trauma from motor vehicle accidents (MVA). These time-sensitive medical emergencies require immediate treatment to prevent AVN and chondrolysis. Current literature suggests reduction within 12 hours of presentation; some advocate reduction within 6 hours. We retrospectively reviewed the acute management of native hip dislocations presenting at our MTC and evaluated clinical practices across Welsh Emergency Departments.

Materials and Methods

All traumatic native hip dislocations presenting at University Hospital of Wales (UHW) between January 2019 – February 2020 were included. Data collection included age, mechanism of injury, associated injuries, time to X-Ray and CT, time to Orthopaedic review, time to reduction and location of reduction. An online survey was emailed to the Clinical Directors of all Emergency Departments in Wales.

Results

Fifteen cases were included in the study, mean age of 36 years (range 4-74). MVA accounted for 60% (n=9), sports 20% (n=3), other 20% (n=3). Mean time for Orthopaedic review was 34 minutes (range 0-157), mean time to reduction was 4.4 hours (range 1.3-11.6). 87% (n=13) were reduced in the operating theatre, 13% (n=2) reduced in ED. 87% (n=13) had associated fractures, acetabulum (n=12) and acetabulum and femoral head (n=1).
83% (n=10) Welsh Emergency Department Clinical Directors responded to the survey. Only 20% had established pathways, 30% reported reducing native hip dislocations without associated fractures in ED with Propofol and Fentanyl the most common anaesthetic agent utilised.

Conclusions/Discussion

Acute management of traumatic hip dislocations at UHW currently conforms to the standards set for reduction within 12 hours. However, reduction within 6 hours requires a pathway for managing these in the ED. Variation in the acute management of these injuries are evident across Wales. This can be standardised by an ‘All Wales Native Hip Dislocation Protocol’ to prevent permanent complications and improve patient care.

(Poster # 29)

ESTIMATING CAUSE-SPECIFIC REVISION RISK AFTER HIP REPLACEMENT: TIME GENTLEMEN PLEASE!

Fabio de Mello, Visakan Kadirkamanathan, Mark Wilkinson
University of Sheffield, Sheffield, United Kingdom

Introduction

Estimation of revision risk after hip replacement assume that the covariates have a time-constant effect on the revision risk. However, most revision hazards show time dependencies that undermine the accuracy of existing prediction models. We present a novel neural network survival model that accounts for non-linearities and time-dependency and their effect on risk for various revision indications in a competing risks framework.

Materials and Methods

Data from the NJR included 375,771 hip replacements from 2004 to 2019. Results were compared with the flexible parametric (FP) model or its cause-specific hazard competing risks extension. Different revision reasons were treated as competing risk. The models were compared using concordance index (CI) at 8 years and calibration plots of the marginalised hazard ratio (MHR) as a function of age and BMI, using a stratified Kaplan-Meier reference. 95% CIs were estimated using 5-fold cross-validation.

Results

The MHR showed nonlinearity and time-dependency, only captured by PH-MNN. MHR increased with age for fracture and dislocation/subluxation while decreasing for other risks. For single risk revision, the CI was respectively 56.7±0.5% and 56.6±0.7% with PH-MNN and FP. In aseptic loosening/lysis, it was 68.6±1.4% and 68.5±1.4%. In dislocation/subluxation, it was 61.6±1.9% and 61.9±1.5%. In fracture, it was 64.0±1.3% and 63.3±1.4%. In infection, it was 65.9±0.9% and 65.6±0.7%. In pain, it was 71.8±2.1% and 71.0±1.5%. In others, it was 61.9±1.8% and 61.4±2.0. The proposed model representation of non-linearities and time-dependencies is seen particularly when the change in covariate dependency is a function of time, especially for age, where the overall risk of revision reduces with age in the long term, but with an opposite tendency in the short term.

Conclusions/Discussion

Neural networks for hip revision provide a modest improvement in risk prediction versus conventional methods. This study highlights the difference in covariate effects to revision risk for different timescales, which is an important aspect of developing risk estimation tools for clinical application and patient information.

(Poster # 31)

AN ANALYSIS OF PATIENT REPORTED OUTCOME MEASURES FOR PATIENTS UNDERGOING TOTAL HIP ARTHROPLASTY FOR AVASCULAR NECROSIS.

Yiannis Vyrides[1], Irrum Afzal[1], Sarkhell Radha[1,2]
[1]South West London Elective Orthopaedic Centre, London, United Kingdom. [2]Croydon University Hospital, London, United Kingdom

Introduction

Avascular necrosis (AVN) of the femoral head is a type of osteonecrosis due to disruption of blood supply to the proximal femur. Common classifications that map the phases of osteonecrosis include the Ficat classification. Ficat describes disease progression based on clinical and radiographic findings.
We conducted a multi-surgeon, retrospective study to identify whether there are any significant differences in Length of Stay (LOS) and operative time for THA depending on the Ficat classification.

Materials and Methods

Patient electronic records, patient reported outcome measures and plain radiographers were reviewed for THAs undertaken between 1st January 2004 and Friday 6th November 2020. Upon reviewing indications for operation, pre and post-operative x-rays, 320 THAs were identified. Each case was classified using the Ficat classification.

Results

Results from our analysis showed our cohort was 45.63% female and 54.37% male.. The average LOS was 4.51 days. The LOS between Ficat classification and time interval from first AVN x-ray to immediate pre-operative x-ray was comparable between groups. There was no statistical difference in the LOS. The operative time increased as the Ficat classification increased, however there was no statistical difference. In this cohort of patient, there was an increased change of 21.92 in the Oxford Hip Score from pre-operative to 1-year post-operative. There was no statistical difference between the change in Oxford Hip score and the Ficat classification. In this cohort of patient, there was an increased change of 0.52 in the EQ-5D Score from pre-operative to 1-year post-operative. There was no statistical difference between the change in EQ-5D and the Ficat classification. In this cohort of patient satisfaction was 87.34 out of 100. There was no statistical difference between the patient satisfaction and the Ficat classification.

Conclusions/Discussion

Awareness of patient reported outcome measures, increased operative time dependent on the Ficat classification can help surgeons better prepare for their THAs. Future work would involve analysis of pre and post-operative patient reported outcomes and complications.

(Poster # 33)

A HIP TOPIC. REVISING OUR VIEWS ON PERIPROSTHETIC HIP FRACTURES.

Jonathan Milton, Segun Ayeko, Christopher Hughes, Gavin Bartlett, Rory Middleton
Royal Cornwall Hospital, Truro, United Kingdom

Introduction

Periprosthetic femoral fractures (PFF) in association with hip hemiarthroplasty or total hip arthroplasty is a common and serious complication. Based on the Vancouver Classification system algorithm, B1 fractures should be treated with ORIF alone whereas B2 and B3 fractures should preferentially be managed with revision in combination with ORIF. However, there are a small number of emerging studies demonstrating good outcomes of Vancouver B2 fractures with ORIF alone. This study to aims to assess patient outcomes after plate osteosynthesis for Vancouver B1 and B2 fractures. The main outcome is 1 year re-revision rate and secondary outcomes are 30-day and 1-year mortality

Materials and Methods

This is a retrospective single centre case-series review from January 2016 to June 2021. Vancouver B1 and B2, non-malignancy fractures in adults over 18 years of age treated with polyaxial Non-Contact Bridging plate osteosynthesis have been included. Outcomes were gathered from electronic notes and radiographs.

Results

There were 50 B1 and 64 B2 fractures. 26 B2 fractures were managed with ORIF and revision, 39 ORIF alone. Of the revision group, 1 died within 30 days (3.8%), 1 at 1 year (3.8%) and 2 were revised within 1 year (7.7). Of the B2 ORIF group, 3 died within 30 day mortality (7.96%), 8 at 1 year (21.1%) and 0 were revised in 1 year.

Conclusions/Discussion

This is one of the largest published outcome data on periprosthetic fracture management. It has demonstrated that satisfactory outcomes can be achieved with ORIF without revision in the management of B2 fractures.

(Poster # 36)

THE IMPACT OF ELECTRONIC PATHWAYS AND DIGITAL SYSTEMS ON NECK OF FEMUR FRACTURE OUTCOMES GLOBALLY: A SYSTEMATIC REVIEW

Devansh Tandon[1], Keegan Curlewis[2], Anuhya Vusirikala[3], Padmanabhan Subramanian[2], Akash Patel[2,1]

[1]UCL Medical School, London, United Kingdom. [2]Royal Free NHS Foundation Trust, London, United Kingdom. [3]Royal National Orthopaedic Hospital Stanmore, London, United Kingdom

Introduction

Electronic pathways and digital systems are novel interventions in Orthopaedic healthcare. They are a means of introducing protocols to standardise and streamline patient care, thereby improving treatment outcomes. Neck of femur (NOF) fractures are a common presentation in the elderly and variability in the perioperative care of these patients has led to unfavourable outcomes. The application of electronic pathways and digital systems in the management of (NOF) fractures is evolving. This is a systematic review of the existing literature evaluating the impact of electronic pathways and digital systems on NOF fracture outcomes: time to theatre, length of hospital stay, mortality rate and complications (secondary fracture prevention and post-operative delirium).

Materials and Methods

A systematic literature search was performed using the PRISMA guidelines. Randomised controlled trials, systematic reviews, cohort studies and pilot studies that demonstrated the impact of electronic pathways/digital systems on at least one pre-decided outcome measure were included. Studies not written in English, case reports and conference abstracts were excluded. 6 studies out of 698 citations passed the inclusion/exclusion criteria and were included in this systematic review.

Results

Statistically significant improvement was demonstrated for time to theatre (3 out of 6 studies), length of hospital stay (2 out of 6 studies) and secondary fracture prevention (2 out of 6 studies). Although post-operative delirium and mortality rate improved due to the introduction of electronic pathways/digital systems, statistical significance was not achieved. No outcome measures were adversely affected.

Conclusions/Discussion

Electronic pathways and digital systems aid in standardising patient care which results in improved quality, safety, and efficiency within healthcare systems. This systematic review has demonstrated that electronic pathways and digital systems have a positive impact on NOF fracture outcomes. However, more high quality homogenous prospective studies are required for a meta-analysis in order to strengthen the findings of this review and cement the use of these novel interventions for NOF fracture management.

(Poster # 37)

HAS THE COVID-19 PANDEMIC WORSENED THE QUALITY OF LIFE OF PATIENTS AWAITING ELECTIVE LOWER LIMB SURGERY?

Raja Jambulingam, Danyal Usman, Shahid Akhtar
Grange University Hospital, Newport, United Kingdom

Introduction

The COVID-19 pandemic has caused significant disruption to society and the delivery of healthcare worldwide. At the beginning of the pandemic, the NHS cancelled large volumes of elective orthopaedic surgery and as of March 2021, many patients prioritised for surgery in the pre-pandemic era are still awaiting operations. We investigated the effect that this delay may have on the quality of life of patients who are still awaiting elective lower limb surgery.

Materials and Methods

We identified a cohort of 34 patients under the care of a single arthroplasty surgeon who had their operations cancelled secondary to the pandemic. Patients were contacted and assessed via telephone questionnaire. Oxford Hip and Knee and EQ5D-3L scores were used to assess pain, function, and overall health-related quality of life. Secondary measures were ASA score, sex, age and qualitative responses.

Results

The majority of the patients (27 out of 34) were awaiting either hip or knee arthroplasty with the remaining 7 awaiting knee arthroscopy. The 2021 EQ5D, E5QD-VAS and Oxford Scores were each shown to be significantly ($p<0.0001$) worse than the respective 2020 scores overall. This was more pronounced in patients awaiting knee surgery, both arthroplasty and arthroscopy ($P<0.05$). Despite trending towards worse scores the 2021 EQ5D for patients awaiting THR was not significantly worse overall ($P=0.08$). Patients with higher ASA scores (>2) scored significantly worse on EQ5D scores ($P=0.02$) than patients with lower ASA scores. There was no significant association with age or sex. Qualitative analysis revealed patients commonly expressing frustration and anger due to ongoing uncertainty and delays.

Conclusions/Discussion

Patients were experiencing increasing delays even before the pandemic when waiting for elective orthopaedic surgery, this has been compounded by the public health measures implemented due to COVID-19 Pandemic. Our study has demonstrated significant worsening in quality of life due to these delays with more co-morbid patients suffering the most. The increased backlog is likely to represent a challenge to modern orthopaedic surgery for a long time and demonstrates the need for new and creative strategies to handle the increased demand.

(Poster # 38)

THE EFFECT OF FEMUR PROSTHESIS HEAD SIZE ON DISLOCATION RATES AFTER PRIMARY TOTAL HIP ARTHROPLASTY – A SYSTEMATIC REVIEW AND METANALYSIS

Ankit Prasad, Calum Cree
Dumfries and Galloway Royal Infirmary, Dumfries, United Kingdom

Introduction

Stability of total hip replacement is one of the key determinants for success of the procedure. Dislocation is a serious complication of total hip replacement warranting hospital admission and added procedure. It is one of the most common complications of THR. Factors contributing to prosthesis dislocation include indication, BMI, surgical approach, implant position and version, femur head size, design of the implant, and bearing types.

Materials and Methods

A search strategy was designed, and search conducted as per PRISMA guidelines. Search was conducted in Embase and MEDLINE on OVID. Hand searching by citation tracking and searching reference list of articles. Search was limited by English language and trials on humans. All studies reporting dislocation rates for different head sizes after primary total hip replacement for any indication was included. All studies reporting on revision hip arthroplasty, hemiarthroplasty and resurfacing was excluded. Biomechanical, simulation and computer model-based studies were excluded as well.

Data was extracted using pre-decided data extraction sheet. Quality of each trial was assessed using the NIH quality assessment tool. The data was analysed using the RevMan software for systematic review.

Results

The difference between dislocation rates between large heads and small heads was not significant based on assessment of the Randomised Controlled Trials included in the study (OR 0.64). Analysis of observational studies showed significantly improved outcome for large head size in terms of dislocation rates (OR 3.51)

Conclusions/Discussion

Large head sizes show reduced dislocation rate, but the difference has not been proven in randomised controlled trials.

(Poster # 39)

A CRACKING TALE OF CERAMIC COMPONENT FRACTURE REVISION: A CASE REPORT & REVIEW OF THE LITERATURE

Elliott Ayling[1], Mohammed Amer[2], Douglas Dunlop[2], Janos Kanczler[1], Katie Dexter[1]
[1]University of Southampton, Southampton, United Kingdom. [2]University Hospital Southampton, Southampton, United Kingdom

Introduction

Ceramic-on-ceramic (CoC) hip replacements have previously seen an increase in popularity due to theoretical superior wear characteristics compared to metal-on-polyethylene (MoP) bearings. However, some concerns surround their brittleness and susceptibility to fracture. Remnant ceramic particulates present a particular challenge as they can become embedded in the polyethylene, leading to wear of metal bearings causing significant metallosis.

Materials and Methods

This presentation uses a case report and literature review to explore the limited evidence guiding revisions of ceramic component fracture. The literature search used pre-defined search terms to explore the databases of PubMed, Ovid MEDLINE, The Cochrane Library and Web of Science.

Results

The case report outlines a 64-year-old gentleman, presenting with significant metallosis following revision of a CoC fracture to a MoP articulation (cobalt-chromium head). The literature emphasises aggressive debridement ensuring complete ceramic particle removal. However, in our experience, some particles are too small to identify. The remaining ceramic ‘sand’ can embed in polyethylene, resulting in wear of the opposing bearing surface. There is no consensus in the literature for an optimal revision bearing surface. Good functional, radiological and survival outcomes are reported for ceramic-on-polyethylene (CoP) and CoC, with an added risk of refracture, especially with trunnion damage. Conflicting results were seen with cobalt-chromium heads. Disastrous outcomes were seen with stainless steel heads in terms of revision rates, osteolysis and metal ion levels. This is consistent with our findings where the serum cobalt and chromium reached 7960 & 540 nmol/l, respectively. The femoral head lost 15% of its mass and a metallosis soup was present at revision.

Conclusions/Discussion

Improper revision of fractured ceramic components can cause severe metallosis, presenting a significant risk to patients. Metallic replacement for ceramic fracture, even with adequate debridement is inappropriate due to the potential for runaway abrasive wear. A ceramic ball should be a prerequisite of any such revision with either a polyethylene or ceramic liner to mitigate the risks outlined. This is poorly documented in the literature, with a need for greater awareness in the orthopaedic community.

(Poster # 41)

PATIENT REPORTED OUTCOMES OF DEBRIDEMENT, ANTIBIOTICS AND IMPLANT RETENTION (DAIR) FOR HIP PROSTHETIC JOINT INFECTIONS

Conor Beatty, Samuel MacKenzie, Joseph Littlechild, Peter Davies, Alistair Mayne, Ben Clift
Ninewells Hospital, Dundee, United Kingdom

Introduction

"Debridement, antibiotics, and implant retention" (DAIR) is a recognised treatment for acute prosthetic joint infection (PJI), but little is known of the influence of successful DAIR on patient reported outcome measures (PROMs). We aimed to examine Harris Hip Scores (HHS) in patients undergoing DAIR for PJI of the hip.

Materials and Methods

HHS were measured prospectively pre-operatively and at 1 year from the index procedure in all patients undergoing hip arthroplasty. All patients treated with DAIR for early onset total hip PJI between 2010 and 2018 were included and compared with a cohort of non-infected THA cases matched for age, gender, BMI, surgical indication and implants. Patient demographics, time from index procedure to DAIR and success of DAIR were recorded. Early onset PJI was defined as <90 days from index procedure.

Results

92 patients treated with DAIR for acute PJI were identified, 81 of those were for early PJI. The overall success rate of DAIR was 81.5% (75 out of 92). 1-year post-op HHS was available for 44 successful early onset hip PJI, with a mean of 80.2 (41-100). Mean HHS was inferior in the DAIR cases compared with the non-infected control patients who had mean HHS of 88.7 (33-100) [p=0.0001].

Conclusions/Discussion

Patients undergoing successful DAIR for acute early onset PJI report inferior HHS at one year compared with an uninfected control group. Both cohorts of patients reported mean HHS values conferring "good" function, indicating that clinical significance of this difference is unlikely.

(Poster # 43)

REDUCED DISLOCATION RATE WITH DUAL MOBILITY CUP IN REVISION TOTAL HIP REPLACEMENT

Shah Jehan, A Ng, SCE Jones, Ajit Shetty
Mid Yorkshire Hospitals NHS Trust, Wakefield, United Kingdom

Introduction

Dislocation is the second most common indication for revision total hip replacement. In revision cases the dislocation rate can be as high as 7%. The aim of this study aim was to assess the dislocation rate in revision total hip replacement where a dual mobility cup was used.

Materials and Methods

We retrospectively reviewed our cases of revision total hip replacement where a dual mobility cup (G7) was used. The indications for revision surgery, approach used, and post-operative complications were recoded. Patients' electronic records and radiographs were studied for any complications, re-operation and re-revision surgery.

Results

Between 2016 and 2019, we performed 35 revision total hip replacement procedures where a dual mobility cup (G7) was used. There were 18 male and 17 female patients. The average age was 70 years (range, 47-92). The average time between the initial surgery and revision surgery was 12.7 years. Indications for revision surgery were recurrent dislocation (17), aseptic loosening (9), infection (4), pseudotumour (3), and polyethylene wear (2). Posterior approach was used in 24 cases and lateral approach in 11 cases. In 23 patients only the acetabular component was revised whilst in 12 patients both the femoral and acetabular components were revised. The average follow -up time was 3.5 years (range, 2-5 years). No patient had dislocation after revision surgery at average 2 year follow up. Complications were noted in 5 cases. One patient had intraoperative fracture of femur and was treated with plate. Another patient had leg length discrepancy and treated with shoe raise. Two patients had mild abductor weakness. One patient had low grade infection. She was treated with long-term suppressive antibiotics.

Conclusions/Discussion

We conclude that dual mobility cup can be successfully used in recurrent dislocations when revising for instability. In addition to that it should be considered if there is high risk of dislocation after revision.

(Poster # 44)

SURVIVORSHIP OF ARTHROSCOPIC HIP SURGERY FOR FAIS AT 8-10 YEARS AND FACTORS PREDICTING REOPERATION

Lourens Jacobus Erasmus, Paul Gaston
Royal Infirmary of Edinburgh, Edinburgh, United Kingdom

Introduction

Hip arthroscopy (HA) is now established for the treatment of non-arthroplasty hip pathology. Good to excellent outcomes have been noted in the majority of patients undergoing this procedure for femoroacetabular impingement syndrome (FAIS). Despite this, some will require revision HA or conversion to total hip arthroplasty (THA). Data on survivorship and risk factors for secondary surgery are limited.

Materials and Methods

72 patients who had HA for FAIS between 2012 and 2013 were studied retrospectively. Electronic patient records and national radiology archives were used to obtain data. GP practices of patients from outside the region were contacted to confirm additional hip procedures. Follow-up ended November 2021 (minimum follow-up of 8 years). 42 surgeries were performed on the left hip (58.3%) and 44 patients were female (61.1%). 54 patients (75%) had labral repair at primary HA and 18 (25%) had labrectomy.

Results

4 patients had revision HA (5.6%). 8 patients had THA (11.1%). Survivorship for primary HA was 83.3% at a minimum of 8 years follow-up. Reoperated patients were older than primary only patients (mean age 38.7 years vs. 31.6 years). There was no difference in social deprivation rankings between the groups, with an average SIMD vigintile of 12.91 vs. 13.01. On preoperative radiographs of reoperated patients, the lateral centre-edge angle (LCEA) was on average 38.9°, and 5/12 patients (41.7%) had early radiographic signs of osteoarthritis (7 Tonnis Grade (TG) 0; 5 TG1). The primary only group had an average LCEA of 36.9° and 13/60 patients (21.7%) had early signs of osteoarthritis (47 TG0; 12 TG1; 1 TG2). 7/54 patients (13%) with labral repair had reoperation vs. 5/18 patients (27.8%) with labrectomy.

Conclusions/Discussion

Survivorship at a minimum of 8 years was good. The reoperated group had a greater mean age, had a higher proportion of early radiographic changes of osteoarthritis and were more likely to have had a labrectomy as opposed to a labral repair as compared to those who didn't have another operation.

(Poster # 45)

CHANGE IN OXFORD HIP SCORE IS NOT AN APPROPRIATE TOOL TO REPORT OUTCOMES AFTER REVISION HIP SURGERY

Shakir Hussain, David Dunlop, Katie Allen, Matthew Revell
The Royal Orthopaedic Hospital, Birmingham, United Kingdom

Introduction

Surgeons are increasingly monitored and compared using Patient Reported Outcome Measures (PROMs). Change in Oxford hip score is currently used for comparison of surgeon outcomes for primary surgery. We studied the relationship between different indications for Revision THA (rTHA), variations in the pre- and post-operative functional scores and the effect of these variations on the PROMs.

Materials and Methods

A total of 465 patients underwent rTHA by two surgeons in a single center, between Jun 2012 and May 2019. Data were collected from the Hospital Episode Statistics (HES) system and crosschecked with local registers and the hospital notes. 267 patients had complete PROMs data and were used as the study group to analyze the pre- and post-operative Oxford hip scores (OHS) and identify the change in score.

Results

The mean age of the patients was 68 years and 55% were female. The indications for revision included: 119 cases of Aseptic loosening/Osteolysis (ASL), 97 Adverse Reactions to Metal Debris (ARMD), 26 Prosthetic Joint Infections (PJI), 18 Dislocations, 1 case for Leg Length Discrepancy (LLD), 3 cases for Peri-Prosthetic Fractures (PPF) and 3 other diagnoses (2 for pain and 1 for a broken implant).

The mean pre-operative OHS was 20 points, which improved to 34 points postoperatively. Overall improvement in Oxford Hip score (OHS) was seen in just over 85% of the patients with a mean improvement of 14 points (range: -18 to 40). Differences in the observed improvement in PROMs were noted when comparing the indication for revision: aseptic loosening 94%, PJI 92%, osteolysis 85%, dislocation 77% and ARMD 74% improvement. We observed high pre-operative PROMs scores in the ARMD and dislocation groups compared to the other groups.

Conclusions/Discussion

We observed good post-operative PROMs scores (mean 34) in rTHA regardless of the indication for surgery. The best absolute mean score post-op was seen in the ARMD group, but their high pre-op PROMs scores meant the change in score was low. Similar but slightly less marked findings were seen in the dislocation group.

(Poster # 46)

DOES EXPERIENCE OF THE SURGEON AFFECT ACETABULAR COMPONENT PLACEMENT IN TOTAL HIP ARTHROPLASTY?

Shakir Hussain[1], Awais Habeebullah[2], Thomas Cloake[3], Manoj Sikand[2]
[1]The Royal Orthopaedic Hospital NHS Trust, Birmingham, United Kingdom. [2]Sandwell and West Birmingham Hospitals NHS Trust, Birmingham, United Kingdom. [3]University Hospital Coventry, Coventry, United Kingdom

Introduction

The orientation of the acetabular implant is a critical factor in the success of total hip arthroplasty (THA). There is no consensus on the correct inclination angle of acetabular component, with surgeons reliant on small studies or manufacturer technique brochures for the acetabular component placement and guide their practice. Recent literature has demonstrated there is a significant difference between desired and actual angle of inclination. This study aims to investigate the influence of surgeon's experience on the positioning of the acetabular implant in total hip arthroplasty.

Materials and Methods

All patients who received a THA using an un-cemented acetabular implant performed by a single surgeon and his trainees over a period of one year were included in this study. Angle of inclination of the acetabular implant was measured on immediate post-operative images and again at last radiographic follow up (median follow up 12 months).

Results

A total of 190 patients included in this study. The median angle of inclination of acetabular implant was 41.4º (IQR 37.8^0– 45^0). In 92.1% of patients, the acetabular implant was positioned within the 'target range' (30^0 – 50^0). There was no significant difference in acetabular implant inclination at last follow up (43.3^0, p = 0.91). A total of 77 patients (40.5%) operated on by ST6 level training registrars. The level of surgeon did not affect the angle of inclination (consultant 41.1^0, trainee 42.0^0, p = 0.78). Consultant surgeon displayed slightly greater accuracy in cup placement 96.4% when compared to trainees 93.2%. There was no association between inclination angle and complications (p = 0.21).

Conclusions/Discussion

This study showed that accuracy of acetabular component placement is not associated with the experience of the surgeon. The acetabular implant was in a satisfactory radiographic position postoperatively in most patients and this remained unchanged at last follow up. Acetabular implant positioning did not have a significant effect on complication rate.

(Poster # 53)

DO HIP STEROID/LOCAL ANESTHETIC INJECTIONS LEAD TO RAPID PROGRESSION OF OSTEOARTHRITIS?

Christopher Woodward, Stephen Phillips, Ian Starks
[1]Wrexham Maelor, Wrexham, United Kingdom.

Introduction

It has been previously suspected that hip steroid injections may lead to a more rapid progression of osteoarthritis, and this has partly been supported by recent literature. A recent study showed progression of osteoarthritis in 70% of patients post injection compared to 24% of controls. Proposed mechanisms include local anaesthetic toxicity to chondrocytes, or by creating a neuropathic joint. The objective of this study was to look for evidence of this phenomenon in a large series of hip joint injections.

Materials and Methods

3 years of local hip joint injections were gathered by searching synapse radiology records at a Welsh DGH. The most recent radiograph prior to injection, the II films, and post injection radiographs were viewed and graded using the Kellgren–Lawrence (KL) grading system for the diagnosis of radiographic osteoarthritis. The quality of grading was validated against a sample reviewed by an Orthopaedic Consultant specialising in arthroplasty. Patients were excluded if there were no post radiographs, if post radiographs were 2years+ after injection, if multiple unilateral injections were undertaken before a post radiograph, or if the hip was replaced on the first post radiograph.

Results

575 injections were reviewed. 306 injections were excluded. 74 exclusions were due to THR on 1st post radiograph. 269 were included. 38 of these were already KL Grade 3. Of the remainder, 58 had a worse KL Grade (74% female, average age 64). 173 had an unchanged grade (59% female, average age 64). The average injection content was equivalent between the two groups (80ml Kenalog + 6ml 0.5% chirocaine) . Average follow up period was 13 months. It was noted that no cases of catastrophic degeneration were noted eg KL Grade 1 becoming 3.

Conclusions/Discussion

Hip steroid injection is a safe procedure with severe progression related to it being a rare occurrence. Most patients (75%) show no evidence of radiographic progression of OA in the following months. More work is needed to investigate further including with a suitable control group.

(Poster # 56)

POST-OPERATIVE PERI-PROSTHETIC FRACTURE RATES FOLLOWING THE USE OF CEMENTED POLISHED TAPER-SLIP STEMS FOR PRIMARY TOTAL HIP ARTHROPLASTY: A SYSTEMATIC REVIEW

Kwaku Baryeh[1], Vipin Asopa[2], David Sochart[2]
[1]West Middlesex University Hospital, London, United Kingdom. [2]South West London Elective Orthopaedic Centre, London, United Kingdom

Introduction

Peri-prosthetic fractures (PPFs) are a serious complication of total hip arthroplasty (THA) associated with significant morbidity, mortality and re-operation. When exploring the PPF rates around cemented stems, many studies combine the results of composite beam and taper-slip stems, despite their different philosophies. This review looks specifically at PPFs with the use of cemented polished taper-slip stems to evaluate the demographics, PPF rate and fracture patterns in this patient cohort.

Materials and Methods

A systematic search of Embase, Medline and CINAHL databases was performed to seek studies involving the use of cemented, polished, taper-slip stems, reporting on a rate of PPF and not involving patient cohorts that were exclusively hip fracture or revision arthroplasty.

Results

27 studies met criteria and reported on 505 PPFs with an average time from primary operation to PPF of 71.2 months. The average age of patients who sustained PPFs was 70.6 years with the majority (64.2%) occurring in female patients. The Vancouver B2 fracture type was the most common pattern described featuring in 39.5% of patients. Open reduction and internal fixation represented the management of choice in 61.2% of PPFs. There was a re-operation rate in surgically managed PPF of 11.4%.

Conclusions/Discussion

This review suggests an association with being older and female, and a greater risk of PPFs secondary to low energy falls in cemented polished taper-slip stems. We suggest that in this patient cohort, careful consideration must be given to the method of cemented stem fixation used to reduce the risk of post-operative PPFs.

(Poster # 57)

BEARING SELECTION IN REVISION TOTAL HIP ARTHROPLASTY : AN ALGORITHMIC APPROACH

Niraj Vetharajan, Thomas Key, Stephen Jones
Cardiff & Vale University Health Board, Cardiff, United Kingdom

Introduction

Dislocation following revision THA is a leading cause of failure. Integrity of the hip abductor complex is a major contributor to stability. Large Diameter Heads (LDH), Dual Mobility (DM) and Constrained Acetabular Liners (CAL) are bearing choices employed to provide enhanced stability but the indication for these choices remains unclear. We have employed an algorithm based on Gluteus Medius (GM) deficiency to determine bearing selection.

Materials and Methods

215 consecutive revision THA cases prospectively followed-up to determine dislocation, re-revision for instability and all cause re-revision. The default choice in patients with no GM damage was a LDH as acetabular component size allowed. GM deficiency with posterior muscle intact received DM and CAL was used for GM deficiency with loss of posterior muscle.

Results

Mean age 70.9 years (range 32.1-94.1) cohort represented by four groups:

1. **LDH (36 & 40mm)** n= 121 / 8 dislocations / 2 Re-revision for Instability / 5 All-cause Revision
2. **DM** n= 41 / 1 dislocation / 1 Re-revision for Instability / 1 All-cause Revision
3. **CAL** n= 39 / 3 dislocations / 1 Re-revision for Instability / 1 All-cause Revision
4. **Other (28 & 32mm)** n=14 / 0 dislocations / 0 Re-revision for Instability / 0 All-cause Revision

12 patients dislocated with mean time to 1st dislocation of 8 months, 5 were single events and 4 patients required re-revision for instability 1.8% (95%CI 0.73-4.69). All cause re-revision rate at mean F/U 4.1 years was 2.8% (95%CI 1.3-5.9%).
Regarding indication for revision 34% cohort had PJI or ARMD and accounted for majority of dislocation cases. 14% were complex revisions (major bone loss/discontinuity) with no dislocations observed.

Conclusions/Discussion

Surgeons have a number of bearing options, all of which have both potential benefits and pitfalls. Decision making tools to guide selection are limited and in addition soft tissue deficiency has been poorly defined. The posterior vertical fibres of GM have the greatest lateral stabiliser effect on the hip. The algorithm we have used clearly defined indication & implant selection. We believe our outcomes support the use of an enhanced stability bearing selection algorithm to significantly reduce the burden of re-revision surgery.

(Poster # 58)

GAIT ANALYSIS SUGGESTS NON-INFERIORITY OF A CERAMIC HIP RESURFACING ARTHROPLASTY

Amy Maslivec[1], Camilla Halewood[2], Susannah Clarke[2,1], Justin Cobb[1]
[1]Imperial College, London, United Kingdom. [2]Embody Orthopaedic Limited, London, United Kingdom

Introduction

Reports of the improved functional outcome of hip resurfacing arthroplasty (HRA) over total hip arthroplasty (THA) are balanced by concerns relating to metal ion release. By eliminating cobalt-chrome, ceramic HRA removes these specific concerns. Using both subjective and objective metrics, the function of patients with a ceramic HRA was compared to a matched group with a conventional metal HRA, with the aim of demonstrating non-inferiority of the ceramic device.

Materials and Methods

24 patients received a unilateral ceramic HRA (H1, Embody) as part of a clinical investigation (ISRCTN91554748). They were compared with 24 age and gender matched patients with unilateral Birmingham Hip Resurfacing (BHR, Smith&Nephew) whose gait was captured prospectively in a longitudinal study of gait following lower limb arthroplasty. Participants completed patient reported outcome scores (Oxford Hip Score (OHS), Metabolic Equivalent of Task (MET)) and underwent gait analysis on an instrumented treadmill pre- and post-op. Walking trials started at 4km/hr and increased in increments of 0.5km/hr until top walking speed (TWS) was achieved. Statistical parametric mapping (SPM) was used to compare vertical ground reaction force (GRF) patterns.

Results

BHR patients were assessed pre-op and at a mean of 74 weeks (+/- 10) post-op, while H1 patients were assessed pre-op and at 53 weeks (+/- 2) post-op. The gain in OHS was similar: H1 increased from 27 to 46, BHR 26 to 47. Maximum MET gain was similar: H1 4.6-12.4, BHR 4.2-12.9. TWS increased by 19% with H1 (6.0 to 7.1km/hr), and 20% with BHR (6.3 to 7.4km/hr). Height adjusted TWS increased by 22% with H1 and 18% with BHR. SPM of the stance phase of the gait cycle illustrated the restoration of symmetry in both groups with no difference between groups at 5km/hr pre-op and post-op. At 6.5km/hr, the H1 patients had a mid-support GRF slightly closer to normal compared to BHR.

Conclusions/Discussion

This small non-blinded non-randomised study reports high OHS scores, very high MET scores and symmetric gait patterns at higher speeds for both devices. The results suggest that short-term functional outcome of H1 is not inferior to the BHR.

(Poster # 59)

AN ANATOMICAL NATURAL HIP SIMULATOR: PROOF OF CONCEPT

David Jimenez-Cruz[1], Mudit Dubey[1], Tim Board[2,1], Sophie Williams[1]
[1]University of Leeds, Leeds, United Kingdom. [2]Wrightington Hospital, Wrightington, United Kingdom

Introduction

Different pathologies cause geometric variation or abnormal morphologies on the femoral head and acetabulum. These variations contribute to altered contact mechanics that affects the tribology of the natural hip joint and increases the stress distribution on the articular surface leading to mechanical degradation. Experimental hip simulators have been successfully used in assessing the effects of different mechanical environments on total hip replacements, and such methodologies could be adapted to assess mechanical degradation in the natural hip. The aim of this study was to provide a proof on concept for an experimental human cadaveric hip simulation.

Materials and Methods

A cadaveric hip (61 yr male; United Tissue USA) was dissected and the joint disarticulated and capsule removed. The acetabulum and femoral head were mounted in an experimental anatomical hip simulator (SimSol, Stockport) so the hip centre was coincident with the simulator. A simplified gait cycle (twin peak load of 3kN, 25° to -18° flexion-extension, -10° to 2° internal–external rotation and 7° to -4° abduction-adduction) was applied. The hip was surrounded by Ringer's solution and test ran at 1 Hertz for 8 hours. Degradation of the cartilage and soft tissues were recorded by photogrammetry at 2 hr intervals.

Results

The developed methodology for fixing the cadaveric hip in the simulator and running a test with a simplified gait load and motion input for 8 hours was successful. Notably at the end of the test when the femoral acetabulum has disarticulated from the femoral head there was an audible "pop", indicating that the labrum continued to act as an effective seal in this set up. No degradation of the joint was recorded on visual inspection.

Conclusions/Discussion

This is the first experimental anatomical hip simulation that can be used to assess mechanical degradation of the natural hip. Future work will assess the effect of factors such as increased range of motion (causing labral impingement), altered cup inclination / anteversion and the mechanical integrity of labral repairs.

(Poster # 60)

SPAN THE WHOLE FEMUR TECHNIQUE FOR PERIPROSTHETIC FEMORAL FRACTURES.

Lena Al-Hilfi[1], Zien Fozo[1], Hasan Mercalose[1], Irrum Afzal[2], Sarkhell Radha[1,2]
[1]Croydon University Hospital, London, United Kingdom. [2]South West London Elective Orthopaedic Centre, London, United Kingdom

Introduction

Fractures around the hip prosthesis are common and a challenging dilemma, when occurred. The incidence periprosthetic fractures is constantly escalating due to the continuously expanding population of arthroplasty patients. They lead to considerable morbidity due to loss of fixation of the components, loss of bone stock, and subsequent functional deficits. Various management options are described in literature to treat periprosthetic fractures. We report our results for a case series from a single surgeon using the span the whole femur technique.

Materials and Methods

This case series is a retrospective review of 12 consecutive single surgeon case series of periprosthetic fracture admitted to our high-volume trauma institution between 2019-2021. The senior author of this abstract uses the minimally Invasive Span the whole femur technique for treating these complex cases. We use NCB Periprosthetic Femur Plate system Zimmer-Biomet to treat all patients in this case series. All patients were allowed to be full weight bearing after the surgery. Patients were reviewed post-operatively at 6 weeks, 3 months and 6 months. All patients were assessed for clinical and radiological union. Patient's demographic and intraoperative data was collected, including length of surgery and blood loss. Data was tabulated using Microsoft Excel (Microsoft, Redmond, WA) and analysed using SPSS Version 23 (IBM, SPSS Statistics).

Results

Radiological and clinical union was achieved in all patients within 12 months of surgery. One patient developed superficial wound infection and in one patient the tip of the drill was broken and was later found in the knee joint during a clinical review. No cases of deep infection and Venous Thrombo Embolism (VTE) were reported. Rehabilitation started in all patients immediately following surgery

Conclusions/Discussion

The span the whole femur technique is a reliable method of treating complex periprosthetic fracture with predictable radiological and clinical outcomes. This technique allows early unrestricted weight bearing, which may reduce postoperative complications.

(Poster # 62)

REVISION CERAMIC THR SURVIVORSHIP FOR CERAMIC BEARING FRACTURES -IS THE SURVIVORSHIP DIFFERENT?

Vishal Kumar[1,2], Piyush Udadhyay[3], Christopher Wakeling[4], Nirav Shah[1]
[1]UH Sussex, Worthing, United Kingdom. [2]Imperial College, London, United Kingdom. [3]Southmead Hospital Bristol, Bristol, United Kingdom. [4]UH Sussex, Chichester, United Kingdom

Introduction

We present a case series of 10 ceramic THR bearing fractures in 9 patients, followed clinically and radiologically for a mean of 10 years (Range 9-13 years) and analysed for re-revision for any cause (survivorship).

Materials and Methods

We reviewed patients revised by Senior Surgeon (NNS) for a fractured ceramic bearing components. Primary components were all cementless, hydroxyapatite-coated femoral stems and uncemented acetabular shells. There were 7 head and 3 liner breakage from different manufacturers. Nine ceramic components were 3rd generation Alumina ceramic, one was a 4th generation delta ceramic. The Index procedures were done between 2000-2007 and revised between 2008-2012. Of the bearings, there were two ceramic-on-poly couplings, and 8 ceramic-on-ceramic.

All Sockets were revised to uncemented JRI CSF cup with 4th Generation Ceramic on ceramic Bearings with Titanium sleeve Heads after through debridement of the soft tissues. As all femoral stems were well fixed, none of the stem required revisions.

Eight hips (7 patients) were followed up period 9-13 years (1 was lost to follow up, 1 patient died). End point for survivorship was defined as re-revision for any cause. Loss to follow up was analysed as re-revision so as to reflect the worst outcome.

Results

Clinical Assessment -The mean Oxford Hip Score at 10 years was 44 (38-48). One Patient had sustained a periprosthetic fracture but regained the function after fracture healing.

Radiological Assessment – There was no evidence of osteolysis, loosening, or change of component position nor evidence of wear on the final follow up with good osteo-integration of the socket.

Survival Analysis- 89% (SE 0.1) at 9-13 years

Conclusions/Discussion

Complex revision hip surgery is required for ceramic bearing fractures.

Adapter sleeves allow an even distribution of contact stresses between stem taper and head, compensating local taper damage and stopping further wear propagation from initial ceramic wear particles and avoids the need for revising a well fixed stem.

Revision hip surgery for fractured ceramic bearing with 4th generation Delta ceramic incorporating Sleeved Titanium head have given excellent Mid-Term radiological and functional results with excellent survivorship.

(Poster # 68)

BROKEN FEMORAL STEMS FOLLOWING TOTAL HIP ARTHROPLASTY: EXTRACTION TECHNIQUES AND OPERATIVE CHALLENGES

Dhaval Gotecha, Kuntal Patel, Deepak Herlekar, Amit Singh
Royal Lancaster Infirmary, Lancaster, United Kingdom

Introduction

The study aims to present our experience in the management of broken femoral stems following previous total hip replacement with emphasis on extraction techniques and operative challenges. Removal of the distal broken well fixed uncemented stem or the distal cemented stem (along with extraction of the cement and removal of cement tail) is the main challenge in these cases. Extended trochanteric osteotomy (ETO) is widely used in such cases, however specific emphasis in our series is to use the 'cortical window technique' for extraction of distal cement mental and the distal part of broken stem.

Materials and Methods

A retrospective study was performed of all patients with a broken femoral stem who underwent a revision hip arthroplasty at our institute from 2012 to 2021. We searched our database to identify these patients and their pre-operative radiographs were analysed using Paprosky and Vancouver Classification. Demographic data, BMI and ASA grade was collected from patients' electronic records. The extraction techniques used were studied from the operative notes. Post-operative follow-up analysis included immediate weight-bearing status, serial radiographic evaluation and to identify complications like non-union of osteotomy, implant loosening or subsidence or further revision for any other cause.

Results

11 patients were included in the study (7 males, 4 females). The average age at the time of surgery was 73 years and average BMI was 31. The implants encountered were a wide variety, consisting of 2 broken Corail stems, 1 broken Reef stem (with non-union of previous peri-prosthetic fracture) and 8 cemented stems. In terms of extraction techniques, ETO used for one patient and cortical window technique for 9 cases. One case required neither osteotomy nor cortectomy. This window technique involves careful pre-operative planning and intra-operative measurements. We will be including these specific details during the presentation.

Conclusions/Discussion

Various techniques have been used for revision hip surgery for broken femoral stems. Our study highlights that 'cortical window' technique can be used effectively in these difficult cases.

(Poster # 69)

A REVISION NETWORK EXPERIENCE OF PROXIMAL FEMORAL REPLACEMENT AS A SALVAGE PROCEDURE.

Eslam Aboursiha[1], Jaffar Ibrahim[1], Pierre Nasr[1], Andrew Brown[2], Rob Ashford[2], Steffan Hutchings[2], Nomann Sheikh[3], Gary Mundy[1]
[1]Northampton General, Northampton, United Kingdom. [2]University Hospitals Leicester, Leicester, United Kingdom. [3]Kettering General Hospital, Kettering, United Kingdom

Introduction

The management of massive proximal femoral bone loss in patients with failed hip replacements, periprosthetic fractures, failed metal hardware with associated fracture non-union and the presence of metastatic disease can be extremely challenging. This patient cohort is often elderly with multiple co-morbidities and have often undergone multiple previous surgeries. Treatment strategies available in such scenarios are limited and include revision hip surgery with impaction allografting, use of long cemented or distally locked revision stems, resection arthroplasty and proximal femoral replacement. Modular proximal femoral replacements provide a bespoke solution to these complex pathologies. It allows early mobilisation of the patient. The surgery is however technically demanding and requires appropriate pre-operative planning and decision making.

Materials and Methods

The 2015 *Getting It Right First Time* (GIRFT) report highlighted problems with low-volume operating in revision arthroplasty and recommended the introduction of regional networks. In response, orthopaedic regulatory bodies proposed a 'hub and spoke' model for regional revision arthroplasty networks. The East Midlands South Orthopaedic Network (EMSSON) was set up in 2015. Complex primary and revision cases are discussed on a weekly basis and we have also set up a metastatic tumour regional network to discuss management of bony metastatic disease. These forums provide an ideal opportunity to discuss the management strategies of the aforementioned pathologies associated with massive femoral bone loss.

Results

The aim of this study was to examine the use of proximal femoral replacements as a salvage procedure in our region over the past six years. Data was collected from surgeon logbooks, and the EMSSON dataset. Patient demographics, diagnoses, construct type, articular constraint, complications and survivorship data will be presented.

Conclusions/Discussion

Our experience is that proximal femoral replacement is a useful salvage procedure for failed trauma surgery, implant fatigue failure, periprosthetic fractures and metastatic disease. There is an acceptable survivorship for these complex problems with reasonable patient satisfaction. The complexity of such surgery however warrants discussion in a regional arthroplasty meeting and should be undertaken by surgeons with a regular revision hip practice

(Poster # 70)

FAST-AIDER: A VALIDATED LENGTH OF STAY PREDICTOR AFTER FRAGILITY HIP FRACTURES

Josie Porter[1], Gareth Chan[1,2], Maryam Ahmed[2], Khalid Malik-Tabassum[2], Benedict Rogers[1,2]
[1]Brighton & Sussex Medical School, Brighton, United Kingdom. [2]Royal Sussex County Hospital, Brighton, United Kingdom

Introduction

Increasing pressures on general NHS bed capacity especially with the on-going COVID-19 pandemic, in conjunction with consistent incidence levels of fragility hip fractures. Has necessitated the need for accurate patient length of stay (LoS) modelling to efficiently manage hospital capacity.

Materials and Methods

The FAST-AIDeR model was developed using routinely collected data from hospitals' National Hip Fracture Database (NHFD) dataset.

NHFD records for a high-volume hip fracture unit between June 2015 and June 2019 were reviewed. A predictive model was developed using a stepwise linear regression model with log-transformed patient data.

The resultant model was validated against the cohort of patients presenting to the same unit for a 7-month period from June 2019.

Results

Nine routinely collected NHFD patient data points were independently associated with LoS. Patients with the shortest LoS were treated with a total hip replacement or cannulated screws, had a low ASA grade and were aged <80 years.

The validated model confirmed FAST-AIDeR to be accurate to under 2 days.

Conclusions/Discussion

This is the most comprehensive analysis of factors which influence LoS in hip fracture patients. The FAST-AIDeR model is an accurate tool that utilises routinely collected data from hip fracture units and can be used to better reduce patient modifiable risk factors as well as providing hospitals with accurate LoS modelling to better manage clinical services.

(Poster # 72)

THE USE OF A HIGH OFFSET FULLY COATED COLLARLESS CEMENTLESS STEM DOES NOT RESULT IN EARLY FAILURES IN TOTAL HIP ARTHROPLASTY.

Matthew Clark, Matthew Hampton, Kiran Madhvani, Naren Garneti
Rotherham General Hospital, Rotherham, United Kingdom

Introduction

The Corail femoral stem has excellent long-term survivorship. However, there remains a paucity of information on the specific performance of the high offset collarless stem. Here, we report radiographic outcomes of the high offset collarless (KHO) Corail stem.

Materials and Methods

Retrospective data was collected on all consecutive KHO Corail stems implanted at a single centre in the UK between March 2010 and March 2020, with a minimum 1-year follow up. Patient demographics including age, BMI, sex was recorded. Femoral Dorr classification was recorded from pre-operative radiographs. Sequential post-operative radiographs were analysed for radiolucent lines and stem subsidence. Femoral offset was measured against the native offset of the contralateral hip. Any early failures, re-operations or requirement for revision surgery were recorded.

Results

We identified 162 stems for inclusion in the study. 95 patients were male. The mean age at the time of surgery was 60.5 years and mean BMI was 29.8. Mean length of follow up was 84.5 (range 12-130) months. The primary indication for surgery was osteoarthritis (76.5%). Ceramic-on-ceramic bearings were used in 98.7% of patients. Subsidence was recorded on 113 (69.7%) stems, being observed in all 5 undersized stems. The mean amount of total stem subsidence in the whole cohort was 1.62mm (range 0 to 3.9mm). This was observed early, with no subsidence seen after 6-months post-operatively. There was no correlation between the amount of subsidence and the pre-operative Dorr classification, age, sex, BMI or indication for surgery. Radiolucent lines were observed in 5 stems (3%), exclusively seen in stems paired with a large diameter 36mm femoral head. These did not progress on the 5-year radiographs. The high offset stem accurately reproduced native femoral offset, mean difference in offset was -1.21 mm (range -24mm to +21mm). There were no early failures, re-operations or revision surgeries.

Conclusions/Discussion

The use of a high offset Corail collarless stem can accurately reproduce native femoral offset when chosen for THA. The KHO Corail stem does not result in early failures in THA and we support their use.

(Poster # 74)

IMPLEMENTATION AND EVOLUTION OF THE REGIONAL REVISION HIP AND KNEE ARTHROPLASTY MULTIDISCIPLINARY TEAM MEETING IN SOUTH WEST LONDON.

Irrum Afzal[1], Sarkhell Radha[1,2], Philip Mitchell[1,3]
[1]South West London Elective Orthoapedic Centre, London, United Kingdom. [2]Croydon University Hospital, London, United Kingdom. [3]St George's University 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 the 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, 480 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 the 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 National Joint Registry.

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.

(Poster # 75)

SURVIVORSHIP OF THE DUAL MOBILITY CONSTRUCT IN ELECTIVE PRIMARY TOTAL HIP REPLACEMENT. A SYSTEMATIC REVIEW AND META-ANALYSIS INCLUDING JOINT REGISTRY DATA

Andrew Gardner, Hamish Macdonald, Jonathan Evans, Adrian Sayers, Michael Whitehouse
University of Bristol, Bristol, United Kingdom

Introduction
The primary aim of this study was to report survivorship of the dual mobility construct (DMC-THR) used in elective primary total hip replacement (THR). Secondary aims included reporting crude dislocation rate following DMC-THR and revision for instability, infection and fracture.

Materials and Methods
A systematic search was performed in MEDLINE, EMBASE, Web of Science, Cochrane Library and national joint registry reports. Studies were included if they published revision (all-cause) survival estimates and confidence intervals. A meta-analysis was performed weighting each series on the overall pooled estimate.

Results
37 studies reporting 39 case series were identified of which 9 (10,494 DMC-THR) were included. 11 series (16,824 DMCs) from 4 national registries were also included. Pooled analysis of data extracted from joint registries of DMC-THR showed an all-cause construct survivorship of 97.3% (95% CI 96.9 – 97.7) at 5 years and 96.1% (95% CI 94.0– 98.1) at 10 years. Results from case series showed DMC-THR all-cause construct survivorship of 99.7% (95% CI 99.5 – 100) at 5 years, 95.7% (95% CI 94.9 – 96.5) at 10 years, 98.4 (95% CI 96.1 – 100) at 15 years and 77% (95% CI 73.2 – 80.8) at 20 years.

Conclusions/Discussion
These results suggest caution in the use of DMC-THR in primary THR. DMC-THR may reduce the risk of dislocation, but other causes of failure maybe increased.

(Poster # 76)

QUANTIFICATION AND SEVERITY GRADING OF FEMORAL VESSEL COMPRESSION BY ALVAL LESIONS IN METAL-ON-METAL HIP REPLACEMENTS

Ben Tyas, Yousef Al-Khatib, Nicholas Kalson, Nickil Agni, Mike Reed, Priyesh Butani, Tim Petheram, Ian Carluke, Paul Partington
Northumbria Healthcare NHS Foundation Trust, Cramlington, United Kingdom

Introduction

Metal-on-metal (MoM) total hip arthroplasty (THA) may cause aseptic lymphocyte-dominated vasculitis-associated lesions (ALVAL) resulting in pain, soft tissue damage, and functional limitation. Extraluminal femoral vessel compression resulting in deep venous thrombosis (DVT) has been reported. The aim of this study was to 1) quantify femoral vessel compression by ALVAL lesions, 2) develop a severity scale and establish whether this correlated with development of DVT.

Materials and Methods

436 patients underwent MRI for suspected ALVAL. In patients with confirmed ALVAL, femoral artery (FA) and femoral vein (FV) diameters were measured on axial T2-weighted imaging at the point of maximal compression and compared to contralateral vessels at the same level. Patients were excluded if imaging was of insufficient quality (n=68) or in bilateral MOM (n=23). Primary outcome measure was the compression ratio (affected vessel/unaffected vessel). Cases of compression were classified according to compression ratios as mild (0.7-0.9), moderate (0.5-0.7) or severe (>0.5). Secondary outcome measures were rates of deep venous thromboembolism (DVT) and revision surgery.

Results

211/436 (48.4%) patients undergoing investigation had evidence of ALVAL, almost always fluid collections, on MRI. After exclusions, measurements were obtained on 121 MRI scans.

Compression: seen on MRI

FA + FV	41 (34%)
FV only	29 (24%)
None	51 (42%)

Of 70 compressed FVs, 38 were mild, 31 moderate and one severe. 83/211 (39.3%) patients underwent revision for ALVAL.

DVT rate:

With FV compression was	2/70 (2.9%)
Without FV compression	2/51 (3.9%)

Conclusions/Discussion

Extraluminal compression of the femoral vessels secondary to ALVAL was commonly found in patients with ALVAL lesion. Femoral vessel compression may be quantified as mild (0.7-0.9), moderate (0.5-0.7) or severe (>0.5), however, in this series, this did not correlate with risk of developing DVT. Interval MRI imaging may still be useful for monitoring advancing ALVAL lesions but does not reliably predict risk of DVT in our series.

(Poster # 77)

DAY CASE TOTAL HIP REPLACEMENT PATHWAY USING THE POSTERIOR APPROACH.

Adrian Brennan, Ciara Dolan, James Cashman
National Orthopaedic Hospital Cappagh, Dublin, Ireland

Introduction

Total Hip Replacement (THR) rates are predicted to increase by as much as 3-fold by 2060. In response to this trend healthcare providers have sought to reduce costs associated with elective THR, while at the same time improving patient safety and satisfaction. Ongoing improvements in Enhanced Recovery have enabled many centres to introduce Day-Case THR. Up to 15% of patients may be appropriate for Day Case THR, and in appropriately selected patients' studies show no increase in complication rate or readmission while affording a significant cost saving and maintaining a high rate of patient satisfaction.
Despite the potential benefits, levels of adoption of Day Case THR vary from country to county. A common cause for this is the perception that doing so would require the adoption of new surgical techniques, implants, or hospital infrastructure. This is a particular barrier in public health systems. We sought to implement a pilot Day-Case THR pathway in centres with an established and well-functioning Enhanced Recovery pathway, utilising the posterior approach and standard implants.

Materials and Methods

We prospectively collected the data on consecutive THRs performed by a single surgeon between June 2018 and July 2021. A standardised anaesthetic regimen using short acting spinal was used. Surgical data included approach, implants, operative time and estimated blood loss. Outcome data included time of discharge from hospital, post operative complications, readmissions, and unscheduled health service attendance.

Results

Data was gathered on 118 consecutive DCTHRs in 112 patients. 89% of patients were successfully discharged on the day of surgery. Of those that failed Same-Day Discharge all went home the following day. Four patients required re-admission: one infection treated with DAIR, one dislocation, one wound ooze admitted for a day of monitoring, one gastric ulcer. One short ED attendance for hypertension.

Conclusions/Discussion

The incidence of infection, dislocation and wound problems are similar with those seen in inpatient THR. Out data show that the widely used posterior approach using standard positioning and implants can be used effectively in a Day Case THR pathway, with no increase in failure of same-day discharge or re-admission to hospital.

(Poster # 78)

QUALITY IMPROVEMENT FRAMEWORKS TO STANDARDISE POST-OPERATIVE CARE DOCUMENTATION IN NECK OF FEMUR SURGERY

Harvey George, Joseph Colecchia, William Giles, Callum Edmonds, Cieran McCrory, Lucy Amos, Michael Davies, Rye Yap, Raveen Jayasuriya
Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, United Kingdom

Introduction

Comprehensive post-operative care documentation is essential to reduce information clarification requests, delays of which could compromise patient safety and length of stay.
This QI project demonstrates how documentation practices have been improved over a 4-year project involving 3 phases, the second of which aimed at improving neck of femur surgery through 5 audits cycles, and 433 reviewed operation notes.

Materials and Methods

Stage 1: Characterise the problem and engagement through SMART aims, Process mapping, Driver diagram and Stakeholder analysis. Consultation with MDT to achieve consensus to generate evidence-based auditable criteria.
Stage 2: Baseline audit to assess current practice.
Stage 3: Stakeholder group to plan and action intervention.
Stage 4: Longitudinal monitoring with run charts and iterative refinement.

Results

Stage 1: Identified the NOF surgery consultant lead, ward physiotherapy team and nurses as key stakeholders who needed to be engaged to maximise interest of influential individuals. A consensus of 12 evidence-based auditable criteria was agreed as the minimum detail required in all post-operative care notes in NOF surgery.
Stage 2: Baseline audit showed only >75% compliance in 5 criteria.
Stage 3: A two-click, suffixed, delete as appropriate template, matched to the same consensus criteria was embedded within the existing theatre IT software.
Stage 4: Subsequent re-audits at 3, 6, 12, 24, and 30 months demonstrated utilisation of the template increased with each audit cycle. Run chart data showed that weekly compliance was 55% at baseline, 86% at 6 months, and then maintained at 90% thereafter.

Conclusions/Discussion

Successfully implementing change was achieved by: 1) achieving a consensus from stakeholders; 2) a “shock and awe” moment to highlight existing poor documentation; 3) implementing change which fit easily into existing systems; 4) respecting autonomy rather than enforcing change; 5) run charts created to track weekly data and enhance the iterative process to ensure template was fit for purpose; 6) successful translation to elective arthroplasty.
Through the QI frameworks deployed in this programme of work we have demonstrated simple effective innovative change, achieved through a staged, iterative, and progressive plan.

(Poster # 79)

DEVELOPMENT OF A PATIENT-REPORTED OUTCOME MEASURE (PROM) AND CHANGE MEASURE FOR USE IN EARLY RECOVERY FOLLOWING HIP AND KNEE REPLACEMENT

Louise Strickland[1,2], David Murray[1,2], Hemant Pandit[1,3], Crispin Jenkinson[4]
[1]Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences University of Oxford, Oxford, United Kingdom. [2]Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom. [3]University of Leeds, Chapel Allerton Hospital, Leeds, United Kingdom. [4]Nuffield Department of Population Health University of Oxford, Oxford, United Kingdom

Introduction

Hip and knee replacements are effective procedures for end-stage arthritis that has not responded to medical management. However, until now, there have been no validated, patient-reported tools to measure early recovery in this growing patient population.
The process of development and psychometric evaluation of the Oxford Arthroplasty Early Recovery Score, a 14-item patient-reported outcome-measure measuring health status, and the Oxford Arthroplasty Early Change Score a 14-item measure to assess change during the first six weeks following surgery is reported.

Materials and Methods

A five-phase, best practice, iterative approach was used. From a literature-based starting point, qualitative interviews with orthopaedic healthcare professionals were performed ascertaining if and how clinicians would use data gained from such a patient-reported and change measure. Analysis of interviews identified important patient-reported factors in early recovery which were used to provide questionnaire themes. In Phase two, candidate items from interviews with patients were generated and tested. Exploratory factor analysis with item reduction and final testing was performed in phase three. Phase Four involved validation testing.
Qualitative interviews (n = 22) with orthopaedic healthcare professionals were performed in the planning phase to help determine views of potential users, and guide structure. In Phase One, factors from patient interviews (n = 30) were used to find questionnaire themes and generate items. Pilot questionnaires were developed and tested in Phase Two. Items were refined in the context of cognitive debrief interviews (n = 34) for potential inclusion in the final tools. Final testing of questionnaire properties with item reduction (n = 168) was carried out in phase three. Validation of the OARS and OACS was performed in phase four. Both measures were administered to consecutive patients (n = 155) in an independent cohort. Validity and reliability were assessed.

Results

Psychometric testing showed positive results. In addition, these measures have been found to be acceptable to patients throughout early recovery with validation across the 6 week period.

Conclusions/Discussion

These brief, easy-to-use tools could be of great use in assessing recovery pathways and interventions in arthroplasty surgery.

(Poster # 81)

HOW CLOSELY DO THE POST-OPERATIVE DIAGNOSTIC RESULTS CORROBORATE THE INDICATION FOR REVISION AS LISTED AT THE TIME OF SURGERY IN THE NATIONAL JOINT REGISTRY? A SINGLE CENTRE COHORT STUDY OF METAL-ON-METAL HIP REVISION PROCEDURES.

Thomas Murphy[1], Rajpal Nandra[2], Fiona Berryman[2], Michael Whitehouse[3], David Dunlop[2], Gulraj Mataru[3]

[1]Musculoskeletal Research Unit, Translational Health Sciences, Bristol Medical School, Southmead Hospital, Bristol, United Kingdom, Bristol, United Kingdom. [2]The Royal Orthopaedic Hospital, Birmingham, United Kingdom. [3]Musculoskeletal Research Unit, Translational Health Sciences, Bristol Medical School, Southmead Hospital, Bristol, United Kingdom

Introduction

Surgeons allocate an indication(s) for revision surgery on NJR forms in the immediate perioperative period. At this stage results from intraoperative histology and microbiology analyses are not available. If results were available, they may provide evidence to modify the NJR revision indication. We evaluated to what extent the post-operative diagnostics obtained for patients undergoing metal-on-metal hip arthroplasty (MoMHA) revision surgery corroborate the indication for revision listed in the NJR.

Materials and Methods

NJR data for MoMHA revision patients (2004-2015) were linked to hospital records at one centre to obtain diagnostics for prosthetic joint infection (PJI) and adverse reaction to metal debris (ARMD). The Musculoskeletal Infection Society and Mirra classifications were used as 'gold standards' to classify PJI and ARMD respectively and to assess diagnostic accuracy assessment of the revision indication listed in the NJR. The proportion of cases for which there was evidence to revise the recorded indication for revision, or justify capture of a postoperatively confirmed indication, was calculated.

Results

Of 301 cases, 5.6% (n=17) and 3.7% (n=11) were recorded in the NJR as revised for PJI and ARMD respectively. A further 6.6% (n=20) and 15.6% (n=47) showed evidence that may justify re-classification of the revision indication to PJI or ARMD respectively, or capture of a postoperatively confirmed indication. Diagnostic accuracy analysis, using hospital data as the reference standard, revealed sensitivity and specificity for PJI of 35.5% (95% CI=19.2-54.6) and 97.8% (CI=54.6-95.2) respectively, and for ARMD of 7.41% (CI=2.06-17.9) and 97.2% (CI=94.3-98.9) respectively.

Conclusions/Discussion

We have demonstrated that the results of histology and microbiology analyses of intraoperative samples may provide evidence to support an alternative indication for revision MoMHA in over 20% of cases. This may indicate a need for routine retrospective validation of the indications for revision surgery submitted to the NJR when all results are available.

(Poster # 83)

INTRA-OPERATIVE CELL SALVAGE FOR REVISION HIP ARTHROPLASTY: A 24-YEAR STUDY OF TRANSFUSION REQUIREMENTS

Daniel Huntley, Thomas Walton, Sarah Whitehouse, Andrew Ross, Al-Amin Kassam
Royal Devon and Exeter Hospital, Exeter, United Kingdom

Introduction

Revision hip arthroplasty is associated with significant blood loss and subsequent need for blood transfusion. Intra-operative cell salvage (ICS) is a method of recovering a patient's blood and preparing for autologous transfusion peri-operatively. This theoretically reduces the need for allogenic blood transfusion (ABT), avoiding associated risk and expense. This study assessed the impact the use of ICS has on the need for ABT in revision hip arthroplasty.

Materials and Methods

This is a retrospective analysis of prospectively collected data over a 24 year period. All revision hip arthroplasty procedures performed between 7th November 1996 and 18th May 2020 at the Royal Devon and Exeter Hospital were included. ABT and ICS use for each procedure were obtained, and statistical analysis performed. Analysis of variance (ANOVA), Mann-Whitney U and Chi-squared tests were used to assess the statistical significance between the use of ABT and ICS.

Results

2646 revision hip operations were included. ICS was used in 757 (28.6%) operations (ICS group) and not used (control group) in 1889 (71.4%) revision hip replacements. Significantly less patients in the ICS group required ABT (218 patients (28.8%) compared with 928 (49.1%) in the control group, $p<0.001$, χ^2 test). Where ABT was required, the number of units was not significantly different; the mean was 2.54 (SD 1.52) units for ICS group compared with 2.84 (SD 1.92) for the control group ($p=0.095$, ANOVA). Although the transfusion rates in transfused patients were similar, this represents a significant increase in transfusion rate when examined per patient over the entire cohort of 0.73 units/person (554/757, SD 1.4) for the ICS group compared with 1.36 units/person (2574/1889, SD 1.9) for the control group ($p<0.001$, ANOVA).

Conclusions/Discussion

These results indicate that the use of ICS in revision hip surgery significantly reduces the requirement for post-operative ABT. This reduces the known risks associated with ABT along with substantial cost saving effects of reduced transfusion rates per patient. We would advise the use of ICS in all patients undergoing revision hip surgery and in particular those patients with higher bleeding risks.

(Poster # 86)

CAN A CHANGE IN IMPLANT USE IMPROVE TOTAL HIP REPLACEMENT SURVIVAL?

Andrew Roberton[1], Benjamin Bolland[2], Michael Whitehouse[1], Jonathan Evans[1]
[1]University of Bristol, Bristol, United Kingdom. [2]Musgrove Park Hospital, Taunton, United Kingdom

Introduction
Total hip replacement (THR) is reliable with low revision rates, but variation in outcomes between units remains. Implant selection rather than a "unit effect" has been shown to be key in long-term survival of THRs. We assessed the impact of an implant use policy change (to a single cemented stem and three cups) in 2014 at a single centre, on survival through an interrupted time-series analysis.

Materials and Methods
We performed a retrospective observational study using National Joint Registry (NJR) data. We compared cumulative revision estimates before and after the policy change to investigate whether a change in implant use was associated with a change in survival. We also compared the survival of THRs at the single centre after the change to all other THRs in the NJR using the same constructs, to investigate whether results from this unit were generalisable. Crude analyses were performed using Kaplan-Meier and we adjusted for age, sex and ASA using Cox models.

Results
2,830 THRs from the single centre were included in analyses pre-implant policy change and 1,274 THRs after. Crude analyses demonstrated improved implant survival after the policy change with 5-year cumulative revision estimate of 3.90% (95% CI 3.23,4.70) for THRs implanted before the change compared to 1.61% (95% CI 0.85, 3.05; $P < 0.001$) after. The effect reduced however when restricting analyses to consultants operating in both time periods and excluding metal-on-metal (MoM) THRs; 1.70% (95% CI 1.09, 2.66) versus 1.66% (95% CI 0.88, 3.11; $P = 0.57$). The main limitations are the relatively small numbers in the single centre (contributing to wide confidence intervals) and only five-year follow-up.

Conclusions/Discussion
A change in implant use policy has influenced THR survival. The effect appears to be driven by halting the use of MoM bearings and not necessarily because of the choice of stem/cup construct. This study provides limited support to previously published observations. Longer term follow-up with larger numbers is required to better understand the determining variables. This remains an important topic of research to help future rationalisation of implant procurement, minimise variation and improve evidence-based practice.

(Poster # 87)

THE ACCURACY AND RELIABILITY OF PREOPERATIVE DIGITAL 2D TEMPLATING IN PROSTHESIS SIZE PREDICTION IN UNCEMENTED VERSUS CEMENTED TOTAL HIP ARTHROPLASTY: A SYSTEMATIC REVIEW AND META-ANALYSIS

Joshua Smith[1], Habeeb Bishi[1], Chao Wang[2], Vipin Asopa[1], David Sochart[1], Richard Field[1]
[1]Academic Surgical Unit, South West London Elective Orthopaedic Unit, London, United Kingdom. [2]Kingston University and St George's University of London, London, United Kingdom

Introduction
The purpose of this study was to compare the accuracy and the inter- and intra-observer reliability of preoperative digital 2D templating in prosthesis size prediction for the planning of cemented or uncemented THA.

Materials and Methods
This study was registered in the NIHR PROSPERO database (ID: CRD42020216649) and conducted according to the PRISMA guidelines. A search of electronic databases in March 2021 found 29 papers overall. The quality of evidence was assessed using the IHE Quality Appraisal of Case Series Studies Checklist and the CASP Randomised Controlled Trials Checklist. A meta-analysis was conducted, and the accuracy was presented as proportions and the inter- and intra-observer reliability were measured using intraclass correlation coefficients (ICC).

Results
Accuracy within one prosthesis size (±1) for cemented stems was 0.89 (95% confidence interval (CI) 0.83–0.95), cemented cups 0.78 (95% CI 0.67–0.89), uncemented stems 0.74 (95% CI 0.66–0.82) and uncemented cups 0.73 (95% CI 0.67–0.79) (test of group differences: p = 0.010). Inter-observer reliability (ICC) for uncemented cups was 0.88 (95% CI 0.85–0.91), uncemented stems 0.86 (95% CI 0.81–0.91), cemented stems 0.69 (95% CI 0.54–0.84) and cemented cups 0.68 (95% CI 0.55–0.81) (test of group differences: p = 0.004). Due to lack of data, intra-observer reliability (ICC) could only be calculated for uncemented prostheses, which for the stems was 0.90 (95% CI 0.88–0.92) and for the cups was 0.87 (95% CI 0.83–0.90) (test of group differences: p = 0.124).

Conclusions/Discussion
The accuracy of preoperative digital templating is greater for cemented prostheses, but the inter-observer reliability is greater for uncemented prostheses. The intra-observer reliability showed a high level of agreement for uncemented prostheses.

(Poster # 89)

THE RELATIVE PERCENTAGE OF ACETABULAR CARTILAGE TO COTYLOID FOSSA SURFACE AREA IS REDUCED IN ACETABULAR DYSPLASIA AND CORRELATES BEST WITH RADIOGRAPHIC FOSSA DEPTH.

Mark Roussot[1], Zachary Devries[2], Edward Bray[1], Andrew Speirs[2], Pablo Slullitel[2], George Grammatopoulos[2], Johan Witt[3]
[1]University College London Hospital, London, United Kingdom. [2]The Ottawa Hospital, Ottawa, Canada. [3]University College London Hospital, London, United Kingdom

Introduction

Standard measurements of acetabular dysplasia, such as lateral centre-edge angle (LCEA) and acetabular index (AI), inadequately characterise acetabular load-bearing morphology, an essential consideration when planning peri-acetabular osteotomy (PAO).

The purpose of this study is:

- to (i) characterize acetabular articular cartilage (AC) surface area relative to cotyloid fossa (CF) surface area, (ii)
- compare this ratio in dysplastic versus asymptomatic hips, and (iii)
- correlate 3D-CT measurements with reliable radiographic landmark

Materials and Methods

This cohort study assessed 221 hips with symptomatic acetabular dysplasia undergoing PAO between 2011 and 2017 compared with 195 control hips visualised on CT for non-hip related pathology. Imaging and medical records were reviewed to ensure the absence of hip pathology for controls. The acetabular articular surface index (ASI), defined as the percentage contribution of AC surface area relative to the CF, was evaluated with 3D analysis of CT scans using proprietary software. ASI was then correlated with 2D measurements on supine anterior-posterior (AP) pelvic radiographs and coronal CT images including LCEA, AI, and two novel measurements: fossa height (perpendicular distance from the interteardrop line to the medial edge of the acetabular sourcil) and fossa depth (distance from the medial margin of the femoral head to the corresponding acetabular fossa margin on X-ray and coronal CT). Inter-observer coefficients for X-ray and CT measurements were 0.97-0.99 ($p<0.001$) and intra-observer coefficients for segmented measurements were (0.93-0.96 ($p<0.001$).

Results

Mean ASI was 66.6% ± 4.7 (range: 54-84%), significantly lower for patients with symptomatic acetabular dysplasia compared to asymptomatic controls (64.6% vs. 68.6%; $p<0.001$). Fossa depth was a stronger predictor of ASI (rho = 0.411 and 0.398) than LCEA and AI (rho = 0.383 and 0.333). Fossa height and depth on pelvic radiographs correlated significantly with those on CT images (rho = 0.449 and 0.793).

Conclusions/Discussion

ASI is significantly lower in acetabular dysplasia compared to asymptomatic controls and best estimated by radiographic fossa depth and height. These novel measurements are simple, reproducible and valuable adjuncts to radiographic evaluation of hip dysplasia.

(Poster # 90)

PATIENT REPORTED OUTCOMES IN 1079 UNCEMENTED TOTAL HIP ARTHROPLASTIES (PROSPECTIVE 10 YEARS STUDY)

Henry Dewhurst[1], joseph boktor[2], Barbara Szomolay[3], Stephen sarasin[2], Peter Lewis[2]
[1]Royal Preston Hospital, Lancashire Teaching Hospitals, Preston, United Kingdom. [2]Prince Charles Hospital, Merthyr, United Kingdom. [3]Medical school Cardiff university, Cardiff, United Kingdom

Introduction

In recent years, 'Get It Right First Time (GIRFT)' have advocated cemented components are utilised for total hip arthroplasty (THA) in older patients. However, many studies, were unable to show any clear difference in outcomes whether utilised in older or younger patients. What therefore is the ideal candidate to receive such an implant?
Our aim is to assess a large series of uncemented THAs in order to determine the ideal demographics for those receiving an uncemented THA.

Materials and Methods

A single surgeon prospective data of a consecutive 1079 uncemented THAs performed for 954 patients between 2010 and 2020. Oxford Hip Score (OHS) and complications were analysed against demographic variables and prosthesis features. The change from pre-operative OHS to one year post-operatively was used to measure improvement in joint function and annotated as Delta-OHS.

Results

Mean pre-operative OHS was 14.6 which improved to 39.0 at 1 year follow up (P=0.00). There was no statistically significant difference between OHS outcomes in patients aged over 70 versus younger groups. There was insignificant slight increase of revisable complications with aged 50 or upwards. There was no statistically significant difference between the sex's Delta-OHS (p=0.96). Both male and female groups reached a mean Delta-OHS of 24.6. although higher BMI patients had worse pre and post-operative hip functions, there was a significant multivariate association between increased BMI and increased Delta-OHS in women aged 55-80 and men under 60. There was no difference in OHS between staged bilateral hip replacements and unilateral, nor with laterality of the replacement.

Conclusions/Discussion

Patients over 70 years-old are not associated with poorer outcomes despite small number of revisable complication rates that increase with age 50 or older. Higher BMI scores are associated with worse pre-operative hips and worse final OHS. However, the increase in OHS from pre-operation to 1 year is significantly improved with increased BMI in the 55-80 year old females and under 60 males. Patients should not be excluded from uncemented THAs on the basis of their BMI, gender or age.

(Poster # 93)

DOES CEMENT INFLUENCES BONE HEALING IN CASE OF A FRACTURE OR A CORTICAL OSTEOTOMY?

Amit Singh, Dhaval Gotecha, Akshay Lekhi, Srikanth Gandavaram, Husam Elbana, Kuntal Patel, Deepak Herlekar
University Hospital of Morecambe Bay NHS Foundation Trust, Lancaster, United Kingdom

Introduction

It is believed that bone cement can seep into the fracture site while implanting a cemented femoral stem for a periprosthetic femur fracture, leading to non-union. However, there is limited evidence in the literature to support this notion. This study aimed to test this hypothesis by performing radiological analysis of our patients who received cemented femoral stem for stabilisation of a periprosthetic femur fracture or following a cortical osteotomy for extraction of a stem.

Materials and Methods

The retrospective study was conducted between 2015 and 2020 at a specialist centre northwest of the UK. The periprosthetic femur fractures were classified according to Vancouver classification. The indication of extraction of the femoral stem using cortical osteotomy was identified from electronic patient records. Serial radiographs were done at regular intervals to analyse bone healing. It was considered healed if three cortical bridgings were noted on anterior-posterior and lateral radiographs. All patients were followed up until radiological bone healing was achieved.

Results

The total number of patients included in the study was 25. The mean age was 82.2 years with a female to male ratio of 16:9. Nineteen patients underwent cemented revision hip arthroplasty following a periprosthetic femur fracture. Seventeen were Vancouver type B2, one had B3, and another had Type C femur fracture. The rest of the six patients had cemented femoral stem implantation following a cortical osteotomy to extract femoral stems during revision surgery. The indication for all six patients was the aseptic loosening of a femoral stem. None of the patients received any bone grafts. No cement leak was observed intraoperatively across the fracture or osteotomy site for all 25 patients. Unfortunately, two patients were lost to follow up, and five died in the fracture group before the fracture had united. The rest of the 12 fractures united in 2.2 months (mean). All six cortical osteotomies healed in the 4.2 months (mean).

Conclusions/Discussion

Our study's findings conclude that using cemented femoral stem for revision hip arthroplasty following a periprosthetic femur fracture or a cortical osteotomy has no impact on bone healing.

(Poster # 94)

ARTIFICIAL INTELLIGENCE IN HIP ARTHROPLASTY: A SYSTEMATIC REVIEW OF THE LITERATURE

Vipin Asopa[1], Amit Sagi[2], Peter Harris[1], David Sochart[1], Keith Tucker[1], Richard Field[1], Irrum Afzal[1]
[1]SWLEOC, Epsom, United Kingdom. [2]Barzilai Medical Centre, Ashkelon, Israel

Introduction

Artificial intelligence (AI) is the powerful application of computer based algorithms to predict outcomes from either tabular data or images, such as radiographs. It has the potential to revolutionise hip replacement surgery.

Materials and Methods

We conducted a systematic review on the use of AI image analysis in hip arthroplasty surgery. The search strategy initially identified 455 articles on Medline, EMBASE and PubMed databases. Following screening, 9 suitable studies were identified. These reported the application of AI to hip arthroplasty.

Results

Seven out of the 9 papers (reporting on a total of 15.586 radiographs) were based in South Korea, USA or UK. Methodology was adequately reported; all were retrospective studies reporting on the analysis of AP, and sometimes, lateral / other radiographs of patients who had primary hip arthroplasty procedures.

Analysis was conducted using the pre-trained Convolutional Neural Networks (CNN) based on the ResNet, Inception, DenseNet or YOLOv3 classifier models. Computer hardware used ranged from linux based intel i5, 8 GB computers to xeon, mac, NVIDIA and iPhone based devices.

The main findings of this review are that artificial intelligence, using deep learning methods, is able to reliably identify hip replacement implants and their position in relation to bone anatomy (area under curve measurement: 70-90 %).

Conclusions/Discussion

The studies are limited by the relatively low patient numbers, limiting the algorithm training (and accuracy). The review highlights the importance of large volumes of hip arthroplasty data required to provide sufficient data for the training and development of deep learning algorithms to improve patient care. It also confirms that the technology does work but is still in early development.

(Poster # 95)

THE EFFECT OF SPINOPELVIC MOBILITY ON FUNCTIONAL COMPONENT POSITIONING IN TOTAL HIP ARTHROPLASTY PATIENTS WITH SPINAL PATHOLOGY AND THE ROLE OF ROBOTIC-ARM ASSISTANCE.

Andreas Fontalis[1,2], Fabrice Glod[3], Pierre Putzeys[3], Fares Haddad[1,2]
[1]Department of Trauma and Orthopaedic Surgery, University College London Hospitals, London, United Kingdom. [2]Division of Surgery & Interventional Science, University College London, London, United Kingdom. [3]Hôpitaux Robert Schuman-Fondation Hôpitaux Robert Schuman, Luxembourg-City, Luxembourg

Introduction

The complex relationship between spinopelvic mobility and component positioning in Total Hip Arthroplasty, presents a challenge in achieving functional implant positioning. Patients with spinal pathology, especially those with stiff spines are in high risk of instability. The objective of this study was to investigate the effect of spinopelvic parameters on patient-specific component positioning, impingement and elucidate the role of robotic arm-assistance.

Materials and Methods

This prospective cohort study included 109 patients with previous spinal pathology undergoing robotic arm-assisted primary THA; incorporating spinopelvic motion into planning and allowing dynamic evaluation of range-of-motion (ROM). Study participants were allocated in three groups based on their spinopelvic movement as measured by the difference in sacral slope between sitting and standing (Delta-SS); <10,stiff spine; <10<Delta-SS<30,normal movement; <30,hypermobile.

Results

Pre-operative ROM was comparable among the three groups (N=10 stiff spine, N= 69 normal mobility, N=30 hypermobile). Delta-SS was 8.2 (3.5), 18.8 (10.9) and 36 (6) respectively. Based on the pre-operative plan, impingement with the vROM tool was evident in 100% patients with stiff spines, 69.6% with normal motion and 45.2% in the hypermobile group, p=0.003. Intra-operative measurements revealed a significant difference in final component positioning; cup anteversion was 22.5 (2.4) vs. 21.42 (2.45) vs. 20.55 (1.85), p=0.049 one-way ANOVA; inclination 43.2 (3.32) vs. 40.46 (2.9) vs. 39.8 (2.02), p=0.003. Patients with stiff spines had their offset increased by 3.33mm (6.9), compared to -1.3 (5.2) and 0.3 (6.03), p=0.046. The median precision for achieving the desired leg length was 1mm (IQR, 2). There were no dislocations post-operatively.

Conclusions/Discussion

In our study, patient specific component positioning was significantly affected by the individual spinopelvic motion. We found that in the challenging subgroup of patients with spinal pathology, robotic-arm assistance enabled the execution of a patient-specific plan, avoiding impingement and maximising ROM; especially utilising the latest platform that encompasses a vROM tool to dynamically assess impingement. This could conceptually translate to lower risk of dislocation, less pain and better implant survivorship; however, this needs to be corroborated by long term studies.

(Poster # 96)

OUTCOMES OF PERI-PROSTHETIC FEMORAL FRACTURES FIXATION USING A POLYAXIAL LOCKING PLATE

Monketh Jaibaji[1], Rohit Singhal[2], Yousif Mahmoud[2], Timothy Petheram[2], Paul Partington[2]
[1]Health Education England North East, Newcastle Upon Tyne, United Kingdom. [2]Northumbria Healthcare NHS Foundation trust, Cramlington, United Kingdom

Introduction

There is an increasing trend towards fixation rather than revision in periprosthetic femur fractures (PFFs) especially around cemented polished tapered stems. We have been using a polyaxial periprosthetic femoral locking plate (NCB, Zimmer, Warsaw IN, USA) since November 2019. The staggered placement of the screw holes facilitates bi-cortical fixation around the femoral stem, providing a more stable construct as compared to unicortical fixation. We conducted a service evaluation of our outcomes with this implant.

Materials and Methods

A retrospective review was performed of PPFs fixed with NCB plates from November 2019 to August 2021. 45 cases were eligible for the review.

Results

Mean age at injury was 80.2 years (60 – 95). Mean follow up was 43.4 weeks (6-101). Four patients died leaving 41 cases of which, 26 fractures were around a hip arthroplasty with 9 Vancouver B1 fractures, 9 B2 and 8 type C fractures. There were 7 PFFs around knee replacements, one around a hemiarthroplasty and 7 inter-prosthetic fractures. There were two revisions unrelated to mechanical failure of the plate. The first was an 89-year-old female with an inter-prosthetic fracture who fell two weeks post operatively, causing failure of fixation. The second was a 68-year-old male with a Vancouver C fracture who presented with prosthetic joint infection for the ipsilateral hip requiring removal of metalware.

Conclusions/Discussion

In our series of 45 fixations there were no plate fractures, and one failure of fixation. Using a polyaxial locking plate to achieve bi-cortical purchase around an unstable cement mantle has led to good outcomes with minimal failures. We acknowledge the limitations of this series with regards to patient numbers and follow up length. However, we feel that our results support broadening of indications for PFF fixation in cases of Vancouver B2 displaced fractures with cemented polished tapered stems, in concordance with recent literature.

(Poster # 97)

ANALYSIS OF MORTALITY IN PERIPROSTHETIC FEMORAL FRACTURES AROUND THE HIP AND KNEE

Ramy Rashed, Lara Hodson, Hazem Hosny, Rathan Yarlagadda, Jonathan Keenan, Ahmed El-Bakoury
University Hospitals Plymouth NHS Trust, Plymouth, United Kingdom

Introduction

The risk factors for mortality in patients sustaining periprosthetic femoral fractures (PPFs) are poorly understood. Various studies have focused on identifying modifiable risk factors to improve outcomes for these complex injuries. The primary aim of this study was to evaluate the survivorship and mortality rates for patients sustaining PPFs admitted to our institution. The secondary aim was to evaluate the associated complications and the risk factors associated with mortality.

Materials and Methods

This is a retrospective study which included 247 cases of PPFs admitted to our Major Trauma institute. Basic demographic data were recorded, in addition to details about the surgical treatment, medical complications encountered within 90 days after surgery and surgical complications within 1 year after surgery. Kaplan Meier analysis was used to evaluate survivorship with death as the end point. The median survival for PPFs around hip replacement and around knee replacement was calculated. Cox proportional hazards model was used to evaluate the effect of risk factors on time to death. Further logistic regression analysis using stepwise selection was used to evaluate the effect of risk factors on the 30-days and 1-year mortality rates.

Results

The inpatient mortality rate was 2.4%, 30-days mortality rate was 7.3% and the 1-year mortality rate was 19.8%. The risk of mortality in cases sustaining PPFs around the knee was 1.34 times higher than in cases around the hip. The median survival for PPFs around the knee was lower than PPFs around the hip. We found that the 1-year risk of mortality is significantly affected by occurrence of pulmonary complications within 90 days of surgery.

Conclusions/Discussion

PPFs impose a significant physiological stress on patients, with a substantial mortality risk. The occurrence of pulmonary complications within 90 days of surgery increases the risk of 1-year mortality. A multi-disciplinary approach, with early involvement of relevant medical teams is essential to improve outcomes

(Poster # 98)

THE IMPORTANCE OF SOCIAL FACTORS IN BRINGING ABOUT FINANCIAL AND ENVIRONEMENTALLY SUSTAINABLE CHANGE IN PRIMARY HIP ARTHROPLASTY SURGERY.

Vipin Asopa[1], Amit Sagi[2], Vipul Patel[1], Deiary Kader[1], Nick Clement[1], David Sochart[1], Irrum Afzal[1]
[1]SWLEOC, Epsom, United Kingdom. [2]Barzilai Medical Centre, Ashkelon, Israel

Introduction

Sustainability has three pillars: Financial, Environmental, and Social. Despite its importance, social sustainability is often underestimated. Sustainable change is often targeted towards environmental improvements such as reducing waste, recycling and energy saving or financial savings. However, to make sustainable change, it is important to consider Maslow's Hierarchy of Needs (described in his 'Theory of Human Motivation'). This states that basic needs must first be met before people are motivated to make changes such as those related to sustainability. We report the use of a tool described by Pascal et al. to evaluate the eco-helping sustainable nature of staff.

Materials and Methods

We audited the 'sustainable' nature of staff working in the primary hip arthroplasty environment (surgeons, nurses, fellows, physiotherapists), using 5 domains: eco-helping, job satisfaction, helping colleagues, commitment to colleagues and perceived support at colleague level. Ward, Recovery, Theatre, Research and Outpatient/pre-assessment staff involved in the care of hip arthroplasty patients were included.

Results

17 staff were surveyed. 86% were generally satisfied with the work they do, 100% gave time to help colleagues who have work related problems, 100% felt proud to be part of the work force and 79% said they felt help was available from colleagues when they had a problem. 79% said they encouraged colleagues to adopt a more environmentally conscious behaviour.

Conclusions/Discussion

We have shown using the tool described by Pascal et al., that there is a high level of sustainable culture in the hip arthroplasty related workplace environment. Sustainable culture is important when promoting change and delivery of sustainable practice.

(Poster # 99)

REVISION HIP APPROACH: NO EVIDENCE THAT THE POSTERIOR APPROACH IS ASSOCIATED WITH A HIGHER RE-REVISION RATE.

Elizabeth Lindsay[1], Jun Wei Lim[2], David Ridley[3], Linda Johnston[3], Benedict Clift[1]
[1]NHS Tayside, Dundee, United Kingdom. [2]NHS Grampian, Aberdeen, United Kingdom. [3]University Department of Orthopaedics and Trauma Surgery, Dundee, United Kingdom

Introduction

Revision hip arthroplasty can be performed using either a posterior approach or anterolateral approach and controversy remains as to which is best. The posterior approach has been reported to be associated with a higher dislocation rate whereas the anterolateral approach damages the remaining abductors, resulting in abductor weakness and patient dissatisfaction.

We aimed to evaluate the effect of revision surgical approach on the intermediate functional outcomes and complication profiles of age and gender matched patients with revision total hip replacements (rTHR).

Materials and Methods

We retrospectively reviewed the pain, function and total Harris Hip scores (HHS) for age, gender and year of operation matched rTHR (anterolateral *versus* posterior). The Mann-Whitney *U* test and Kaplan Meier were used for statistical analysis.

Results

A total of 260 rTHR with anterolateral approach and 260 rTHR with posterior approach were compared. There was no significant differences for age, body mass index, hospital stay and survival years between both cohorts ($p = 0.974, 0.830, 0.279, 0.310$). There were no significant differences between the preoperative pain and total HHS ($p = 0.942, 0.337$), but the preoperative function score was better in the anterolateral approach cohort (20 vs 19, $p = 0.016$).

The posterior approach cohort achieved better scores at year 3 in all aspects, but did not reach statistical significance. At year 5, there were no significant differences for the pain and total HHS ($p = 1.000, 0.165$), but the function score was slightly better in the anterolateral approach cohort (31 vs 30, $p = 0.043$). The re-revision rate was lower for posterior approach cohorts (9.1%), compared with 11.5% in the anterolateral approach cohort. The most common reason for re-revision in anterolateral approach was aseptic loosening whereas the most common reason for re-revision in posterior approach was infection. There was no significant difference in Kaplan Meier survival analysis between both approaches ($p = 0.469$).

Conclusions/Discussion

rTHR with posterior approach can provide similar pain and functional outcomes as the anterolateral approach. There was no evidence that the posterior approach is associated with a higher re-revision rate.

(Poster # 100)

FINANCIAL SUSTAINABILITY IN PRIMARY HIP ARTHOPLASTY: OPTIMISING IMPLANT PRICES

Vipin Asopa, Vipul Patel, David Sochart, Deiary Kader, Irrum Afzal
SWLEOC, Epsom, United Kingdom

Introduction

Spending on healthcare now costs the UK, 8.2% of GDP; growing faster than the rise in the GDP and estimated to be 19.1% in 2061. Unsustainable increase is due to a growing population, increase cost of providing care, ageing population and developments in medical technology.

Financial consideration is becoming important for long-term sustainable hip arthroplasty work worldwide. Reducing variation in healthcare, cost-effective use of resources, promoting efficiency and value are all vital components. Ethical purchasing, production and sourcing in also important.

We describe hip surgery related strategies that have help an elective partnership of 4 NHS trusts, hosting over 50 surgeons, make a profit of £3.3M in 19/20 and how these could benefit others during these austere times.

Materials and Methods

During 2019-20, there was a wide variation in implant prices with un-cemented total hip replacements (CoP) costing £1490-1970 and cemented hybrids: £460-631. Uncemented femoral stem cost ranged £392-1200. Challenges with tendering included achieving agreed volumes, consultants choosing implants not part of tender, expensive list prices from suppliers not awarded contracts and less choice for surgeons, making them unhappy.

In order to rationalise cost, surgeons preferences were respected as far as possible, suppliers costs were aligned and no commitment was given to volume. Negotiations began with highest volume implant suppliers, and the price used as a benchmark. Other companies were encouraged to achieve this price. If not, surgeons would be discouraged from using the implant.

Other measures implemented include suppliers agreeing to have a product list, other items to be screened by the theatre user group and revision kit pricing agreed to reduce loan charges.

Results

Negotiation resulted in a mean reduction in price of 20%, with up to £500 off a the price of an uncemented total hip replacement. Through a variety of factors, £3.3M profit was realised in 19/20.

Conclusions/Discussion

In summary, single supply chain, rationalisation and negotiating hip arthroplasty contracts have contributed to significant savings during 2019/20 negotiations.

(Poster # 101)

EVALUATION OF FUNCTIONAL OUTCOME AND HEALTH RELATED QUALITY OF LIFE FOR SURGICALLY TREATED PERIPROSTHETIC FRACTURES AROUND HIP AND KNEE ARTHROPLASTY – AN OBSERVATIONAL LONGITUDINAL CROSS SECTIONAL STUDY

Ramy Rashed, Ahmed Hamed, Joshua Lau, Hazem Hosny, Rathan Yarlagadda, Jonathan Keenan, Ahmed El-Bakoury
University Hospitals Plymouth NHS Trust, Plymouth, United Kingdom

Introduction

The primary aim of this study was to evaluate the functional outcome of patients sustaining a periprosthetic fracture (PPF) around hip and knee arthroplasty presenting to a Major Trauma Centre in the UK. The secondary aim was to evaluate the associated complications.

Materials and Methods

345 patients presented with periprosthetic fractures over 9 years period were extracted from our database. Patients who sustained a PPF around a trauma implant, a PPF in the upper limb, or presented with a prosthesis failure were excluded. Baseline demographic data, co-morbidities and treatment methods were recorded. EQ-5D-5L index and Oxford hip or knee score were obtained via telephone survey.

Results

A total of 270 were eligible for inclusion. The mean follow up was 3.7 years (±2.4 years). The mortality rate at the mean follow up was 43.7%. The median EQ5D index was 0.672. Patients sustaining a PPF around the hip showed a median drop of 0.88 QALYs, and this was statistically significant when compared to the expected UK norm. The quality of life was mainly affected by the level of pre-injury mobility, occurrence of complications, and the patients' perception of regaining their mobility.

Conclusions/Discussion

PFFs around hip and knee replacements do display features of a unique disease, the outcome of which seems to be affected by the patient pre-injury level of mobility, the occurrence of complications, and the patient's perception of regaining their pre-injury mobility. This study shows a significant reduction in QALYs for patients sustaining PPFs around the hip compared to the expected UK population norm with surgical treatment and only 36% of patients thought they had regained their pre-injury mobility.

Not only PPFs do impose a significant burden on patients but also healthcare systems. The cost of treating PPF was mainly driven by the length of hospital stay in addition to the cost of implants used. The mean re-imbursement in the UK National Health Service was found to be only 58% of the average total cost of treatment.

(Poster # 102)

PROXIMAL FEMORAL REPLACEMENT FOR NON-PRIMARY BONE TUMOUR RELATED SURGERY

Maheshi Wijesekera, Sameer Jain, Ayodeji Banji-Kelan, George Whitwell, Veysi Veysi, Jeya Palan
Leeds Teaching Hospitals NHS Trust, Leeds, United Kingdom

Introduction

Proximal femoral replacement (PFR) is an established treatment for primary bone tumours but it also has a role as a salvage procedure for other indications such as failed hip replacements, acute proximal femoral fractures, unsuccessful hip trauma surgery and metastatic disease. The aim of this study was to report our experience at a large teaching hospital where PFR has been carried out for non-primary tumour related surgery.

Materials and Methods

Twenty patients that underwent PFR in our unit between 12th October 2018 and 31st August 2021 were analysed. Outcome measures were complications, reoperations and mortality rates. There were 15 females and five males in this group with a median age of 78 (IQR, 63-84) years. Seventeen (85%) patients had a Charlson comorbidity index of ≥3. A major drop in mobility was defined as a reduction by ≥2 levels from their preoperative status on the NHFD mobility score. Median follow up was 29.7 (IQR, 15.3-58.2) weeks.

Results

Twelve (60%) patients underwent surgery for failed fixation, two (10%) patients each underwent surgery for acute trauma, metastatic disease and aseptic loosening and one (5%) patient each had surgery for infection and dislocation. The PFR constructs involved 14 dual-mobility cups, three constrained cups, two hemiarthroplasties and one conventional polyethylene cup. Complications occurred in five (25 %) cases and were due to infection (four cases, 20%) and dislocation (one case, 5%). All five patients had further surgery giving a reoperation rate of 25%. There were no periprosthetic fractures. The 90-day mortality rate was 5%. Overall, 16 (80%) patients returned to their own home, with only two (10%) having a major drop in their mobility status.

Conclusions/Discussion

PFR is a useful salvage option in cases other than primary bone tumours, but it is associated with significant complications and mortality which must be communicated to patients and their families. Our comparatively low dislocation rate is likely due to the preferential use of dual-mobility cups, constrained cups and large diameter hemiarthroplasty heads. Following PFR, most patients are able to return to their usual residence with a reasonable level of mobility compared to their preoperative state.

(Poster # 103)

ENCOURAGING RECYCLING AND CORRECT DISPOSAL OF WASTE IN THE PRIMARY HIP ARTHROPLASTY OPERATING THEATRE ENVIRONMENT.

Vipin Asopa[1], Vipul Patel[2], Howell Fu[2], Christian Peacock[2], David Sochart[2], Deiary Kader[2], Irrum Afzal[1]
[1]SWLEOC, Epson, United Kingdom. [2]SWLEOC, Epsom, United Kingdom

Introduction

The NHS generates over 20 million tonnes of CO2 per annum, or 4% of the annual greenhouse gas emissions. Up to 33% of all hospital waste is produced in the operating theatre environment. The NHS's Net-Zero ambition by 2040 is reliant on everyone having role in delivery with focus on staff education and practice of sustainable practice. The aim of this project was to investigate whether staff working in the orthopaedic hip arthroplasty theatre environment knew which waste goes in which bin.

Materials and Methods

4 types of bins are present in primary hip arthroplasty operating theatre environment: recyclable, general, offensive and infectious waste. 20 randomly selected theatres staff were asked to complete an online 14-item picture questionnaire. The questions showed pictures of common waste items produced during primary hip arthroplasty surgery (example: theatre caps, blood stained swabs, trays, glove packet etc.)

Following evaluation, posters informing the correct disposal of common items were located within the theatre environment to help 'nudge' staff into correct disposal of waste. The education perspective of the posters was audited again by repeating the survey on another randomly selected group of theatre staff 2 weeks later. Information was collected on google forms and analysed using MS Excel.

Results

Before intervention, 65% of items for general waste, and 59%, for recycling were correctly identified.

Following intervention, the survey showed an improvement, with 68% correctly identifying general waste, and 85% correctly identifying waste for recycling.

Improved signage within the operating theatre environment resulted in a significant improvement in the correct identification of waste disposal bin.

Conclusions/Discussion

Simple measure such as clear signage can make a significant improvement in staff understanding of 'what rubbish goes into which bin', improving waste segregation in the hip arthroplasty setting. Simple measures can contribute to improved sustainability practices.

(Poster # 106)

THE INCIDENCE OF LINER DISSOCIATIONS IN 3209 CONSECUTIVE TOTAL HIP ARTHROPLASTIES IN PINNACLE ACETABULAR COMPONENT: SINGLE CENTRE EXPERIENCE

Prasad Patange Subba Rao, Paul Saunders, Mohammed Faisal, Steve Young
South Warwickshire Foundation Trust, Warwick Hospital, Warwick, United Kingdom

Introduction

There are documented reports of polyethylene liner dissociation of third-generation modular acetabular components, modularity has potential problems. One issue is dissociation of the liner from the metal shell. Liner dissociation can be catastrophic event in total hip arthroplasty (THA). We present data from a single centre high volume unit.

Materials and Methods

The Pinnacle acetabular system has been used since 2005, with 4639 cases to May 2021, (4567 in primary and 72 in single stage revision total hip arthroplasty cases). 3209 of these cases were combined with a polyethylene liner. We identified failures by reviewing both unit level data bases and the National Joint Registry. cases of liner dissociation were explored for, associated risk factors, and revision surgery outcome via reviewing electronic hospital records and x-rays.

Results

In our cohort the incidence of liner dissociation was 2 out of 3209 cases (0.062%). One case was 5 yrs post the time of the primary implant. The dissociation was the result of a fall Intraoperative findings suggested abduction angle of 46 deg. The second case occurred 4yrs8 months from the time of index operation, following a bending incident and sudden new pain onset. Abduction angle in this case was 47 deg.

Conclusions/Discussion

Understanding the locking mechanism is important in preventing liner dissociation in polyethylene liners We emphasise that all the pegs be locked and seated flush to the rim. and check for any soft tissue impingement. Our results are better than the current literature results for dissociation of the polyliner.

(Poster # 108)

REVISION IN TOTAL HIP ARTHROPLASTY 6 YRS EXPERIENCE IN 168 CONSECUTIVE CASES- SINGLE CENTRE SERIES.

Prasad Patange Subba Rao, Ajay Chourasia, Paul Saunders, Omar Mohammed, Steve Young, Mohammed Faisal
South Warwickshire Foundation Trust, Warwick Hospital, Warwick, United Kingdom

Introduction

Revision hip surgeries cases are on the rise due to the ageing population, with a huge financial burden to the NHS. We present our incidence and management of these in retrospective case series since 2016.

Materials and Methods

Hospital elective arthroplasty database for all Primary Hip Arthroplasty was reviewed since 2016 till May 2021. We retrospectively reviewed all revision hip surgeries following primary hip replacements. Radiographs were checked on the hospital PACS viewing system. All fractures were classified according to the Vancouver classification system. Management of these fractures, with length of stay, operative notes and biochemical investigations and ASA grades were noted.

Results

184 patients were identified for revision hip arthroplasty surgery. 168 of those were treated operatively. 85 females and 83 males were in each arm. LOS median 8 (IQR 5-13). Mean ASA grade was 3(2-4) in over 120 pts. Top 5 causes of revision were aseptic loosening (48), periprosthetic fractures around the stem (34), Dislocation (28), Instability (17), infection (14). 18 pts died at various times from the time of the procedure. 30-day mortality for 1.6 %. 8 pts had lost to follow up. At final review of cases. ETO was performed only in 27 cases. Porous coated acetabular revision implants in acetabular revisions in 75 cases. 13 had smooth tapered cemented stems. Long stem uncemented revision implants in 60 cases, modular porous coated long stems in 84 cases, 11 bearing changes.

Conclusions/Discussion

Our preferred treatment for majority of periprosthetic fractures is by using long stem uncemented modular implants or long stem revision implants supplemented with circumferential bone cables. Osteotomies were used sparingly and reserved for difficult cases. We recommend preserving the tube for reconstruction and to use HA coated implants with long stems like the primary arthroplasty scenario. Revision porous coated acetabular shells with bone grafts is our preferred treatment option. Dislocations need careful consideration as the cause and treatment planned accordingly.

(Poster # 110)

STANDARDISING POST-OPERATIVE INSTRUCTION DOCUMENTATION IN ARTHROPLASTY

Sarah Barkley, Simon Buckley, Saif Salih, Tim Harrison, Andrew Gordon
Sheffield Teaching Hospitals, Sheffield, United Kingdom

Introduction

Post-operative instruction templates improve documentation and reduce confusion on the ward about how to care for patients.
Anecdotally we found that many questions asked by ward staff about arthroplasty patients could have been addressed on the operative note, and postulated that creating templates would improve this.

Materials and Methods

Multiple discussions were had with our arthroplasty surgeons regarding what information should be included, based on the Royal College of Surgeons of England's guidance and surgeon experience.
It was agreed to include the following information:

- Theatre discharge destination
- Neurovascular observations
- Blood tests and imaging required
- Inpatient and outpatient venous thromboembolism prophylaxis details
- Microbiology details
- Weight bearing status
- Wound care
- Follow up details

Fifty operative notes of elective arthroplasty patients were then retrospectively reviewed to see if they contained this information. The data were analysed in Microsoft Excel. Post-operative templates for primary hip and knee arthroplasty and revision arthroplasty were then created. These were incorporated into Operative Room Management Information System (ORMIS) – the programme used to document operative procedures.
The templates included multiple options which could be deleted if not applicable. There was also the ability to add to them using free text if required.
Following their implementation, a further set of 50 notes were reviewed.

Results

Prior to template implementation, there was low compliance documenting VTE details (12% start date, 28% duration, 60% agent). This improved afterwards (64%, 72%, 88% respectively).
Documentation of which blood tests were required improved from 44% to 80%.
Weight bearing status, post-operative imaging and follow-up details remained static, with high compliance of each.
It was noted that 40% operative notes did not include the new template (the user needs to select it to be inserted) - none of these included all the information required.

Conclusions/Discussion

We have demonstrated that standardising post-operative instruction documentation by using a template can improve the quality of what is included. We have also had positive feedback from surgeons and ward staff, commenting that the templates are easy to use, easy to read and are more informative than before.

(Poster # 113)

POSITION AND NUMBER OF ANCHORS IN HIP ARTHROSCOPY LABRUM REPAIR: A SYSTEMATIC REVIEW

Andreas Samoutis[1], Min-Ho Lee[2], Akash Patel[1], Parag Jaiswal[1]
[1]UCL, London, United Kingdom. [2]Royal Free Hospital, London, United Kingdom

Introduction

Studies report the prevalence of hip labral tears in 22–55% of patients with hip or groin pain. Operative treatment is necessary for most cases, via hip arthroscopy with the use of suture anchors. The purpose of this systematic review is to determine the optimal number and position of anchors in hip labral repair by providing a comprehensive qualitative and quantitative review of the current literature.

Materials and Methods

Pubmed, Ovid & Embase were searched, and 2 researchers independently screened the 1,304 results. Clinical and biomechanical studies published in the last 10 years were included. Outcome measures such as procedures performed, number & position (clockface) of anchors, failure & articular involvement of anchors were extracted.

Results

5 studies were included in the analysis compromising of 1 Cross-Sectional Study (1645 Hips, mean age, 33.7 years, male to female ratio (M:F), 1:1.5) 3 Retrospective case studies (491 hips, mean age, 31.0 years, M:F, 1:1.4) and 1 Controlled Cadaveric study (32 cadaveric hips, mean age, 62.7 years, M:F, 1:0.6). Statistical analysis of 2 papers found a significant difference (X^2 (2, N = 323) = 17.88, $p < .001$) in the risk of articular involvement with the position of anchors at 11°-12° o'clock, 1°-2° o'clock and 3°-4° o'clock. There is an absolute risk reduction (ARR) of 19% with anchors positioned at 11°-12° compared to anchors positioned at 3°-4° (X^2 (1, N = 178) = 15.79, $p < .001$) and an ARR of 12% with anchors at 1°-2° compared to anchors positioned at 3°-4° (X^2 (1, N = 237) = 15.79, $p < .0109$). Additionally, by assessing 1645 operations it was found that for tear lengths spanning over 2 clockface hours, at least 2 anchors were fixated.

Conclusions/Discussion

Placement of anchors in the 3°-4° o'clock position carries the highest risk for articular involvement. Small diameter anchors and careful placement can be used to minimize articular injury. Preferable positions of anchors are 11°-12°, furthermore, for repairs spanning over 2 hours, a minimum of 2 anchors should be placed.

(Poster # 114)

OUTCOMES ASSOCIATED WITH PERI-OPERATIVE DISEASE-MODIFYING ANTIRHEUMATIC DRUG USE IN LOWER LIMB ARTHROPLASTY

Deepak Menon, Bernard van Duren, Kulveer Mankia, Hemant Pandit
Leeds Institute of Rheumatic and Musculoskeletal Medicine, University of Leeds, Leeds, United Kingdom

Introduction

Significant proportion of patients with inflammatory arthritis (IA) take biologic disease-modifying antirheumatic drugs (bDMARDs) to reduce the burden of inflammation. There is no consensus for the perioperative management of these agents due to mixed evidence relating to perceived risk of surgical site infection (SSI) and/or delayed wound healing. However, stopping bDMARDs can increase the risk of disease flare and suboptimal disease control. It is important to evaluate outcomes associated with current practice.

Materials and Methods

A retrospective cohort study was conducted comparing differences in the outcomes between IA patients on bDMARDs undergoing lower limb arthroplasty to those not on bDMARDs. Patients with a confirmed diagnosis of IA undergoing an arthroplasty procedure from 01/01/2013 were identified. Primary outcome was defined as SSI. The minimum follow-up period was 12 months post-operatively. A p-value < 0.05 was deemed statistically significant.

Results

Data was collected for 57 cases. 73.7% (n=42) were on a bDMARD at the time of surgery. bDMARDS were withheld perioperatively in 91.4% (n=32) of cases where data was available. Within the bDMARD cohort, median age was 65.0 (IQR 55.8–70.8), median BMI was 27.5 (IQR 25.0 – 31.2), and 57.1% (n=24) were females. Within the non-bDMARD cohort, median age was 60.0 (IQR 56.0 – 68.5), median BMI was 29.5 (IQR 26.2 – 31.6) and 60% (n=9) were females.

No statistically significant difference was noted in SSI rate at 12-month follow-up between the bDMARD and non-bDMARD cohort (2.4% vs 0.0%, p=1.00). Furthermore, no statistically significant difference was noted when comparing incidence of systemic infection (22.0% vs 20.0%, p=1.00), other post-operative complications (19.5% vs 0.0%, p=0.09), readmission rate (26.8% vs 33.3%, p=0.74), or infected revision rates (2.4% vs 0.0%, p=1.00) at 12 months post-operatively. However, there was a significant difference in inflammatory disease flare rates (50.0% vs 93.3%, p=0.004).

Conclusions/Discussion

Current practice generally involves withholding bDMARDs peri-operatively. However, a large proportion of IA patients suffer from disease flares in the post-operative period. This should be noted when considering bDMARD management. Further evidence is required to identify whether stopping or continuing bDMARDs in this clinical period is more appropriate.

(Poster # 115)

COMPARISON OF 1-YEAR MORTALITY AFTER HIP FRACTURE BETWEEN PRE-COVID ERA AND COVID-19 FIRST WAVE.

Ankit Prasad
Dumfries andGalloway Royal Infirmary, Dumfries, United Kingdom

Introduction

Hip fracture continues to be an important factor contributing to the mortality and morbidity of our elderly population. Various guidelines have been developed in different countries dictating the timeline and selection of surgical treatment for these fractures. COVID-19 made matters worse by developing a gap between patients and medical infrastructure.

Materials and Methods

All hip fractures treated surgically in a single centre were followed up to look for mortality between March - May 2019 and March - May 2020. These were followed up till 1 year to look for 1 year mortality. A companion was made to predict odds ratio and relative risk of mortality due to covid.

Results

No difference was noted in the mortality rates between the 2 periods. There were 36 Hip fractures treated surgically between March - May 2019 while there were 37 treated in the sam e time period in 2020. Presence of covid and adapting covid protocols had no effect on survival of hip fracture patients.

Conclusions/Discussion

With protocols in place, covid did not affect the mortality rates of hip fracture at 1 year.

(Poster # 116)

FACTORS AFFECTING OUTCOME FOR SINGLE STAGE LOWER LIMB REVISION ARTHROPLASTY FOR PROSTHETIC JOINT INFECTIONS

Kanai Garala[1], Michael Petrie[2], Vatsal Gupta[3], Arham Qureshi[3], Sushanth Vayalapra[3], Richard Westerman[3], Bryan Riemer[3], Richard King[4], Jakub Kozdryk[4], Pedro Foguet[3]
[1]UHNM, Stoke, United Kingdom. [2]Northern General Hospital, Sheffield, United Kingdom. [3]UHCW, Coventry, United Kingdom. [4]UHCW, coventry, United Kingdom

Introduction

Prosthetic joint infection is one of the most devastating complications that may occur following joint replacement surgery. Management philosophies can broadly be split into 3 methods; non-operative, single stage revision surgery and two stage revision surgery. This study provides a complete overview of the results of single stage revisions for lower limb prosthetic joint infections at a large volume revision unit. The primary objective was to explore the relationship between a number of preoperative, intra-operative and postoperative variables and compare them to a defined description of success.

Materials and Methods

A variety of patient data was gathered from a prospectively maintained patient list at a regional prosthetic joint infection centre. Patient demographics, co-morbidities, biochemistry assays, microbiological sampling were collected along with symptom and surgical timelines. Infection and surgical success was diagnosed using validated scoring system and criteria.

Results

93 patients were included in the study with a mean age of 72. 45 patients underwent revision hip surgery and 48 underwent revision knee surgery. 79 (85%) of patients had a successful outcome. Age, sex, BMI, pre-operative haemoglobin, renal function, use of surgical site antibiotics, ASA and identification of a pre-revision micro-organism had no statistically significant effect on the outcomes of single stage revision.

Patients undergoing re-revision ($p=0.01$) or revision post DAIR ($p=0.02$) were more likely to fail a single stage revision. Other factors which have a higher chance of an unsatisfactory result for single stage revisions are; low pre-operative albumin ($p=0.04$), smokers ($p=0.03$), long antibiotic courses ($p=0.05$) and a high KLICC score ($p=0.007$).

Conclusions/Discussion

This study demonstrates that by performing a radical debridement and synovectomy, a single stage revision surgery is a reliable procedure for eradicating infection in the medium to long term. Patients who have undergone a previous DAIR procedure should be carefully considered for single stage procedures. The KLICC score is an indicator for success. This is the first study to identify a link between a high KLICC score and failure of single stage revision for prosthetic joint infection and this is an area which deserves further research.

(Poster # 117)

CEMENTED ACETABULAR COMPONENTS COMBINED WITH TRABECULAR METAL AUGMENTS PROVIDE EXCELLENT LONG TERM SURVIVORSHIP FOR SEVERE ACETABULAR BONE LOSS

Kanai Garala[1], Mohammed Remtulla[2], Raghav Verma[3], Trevor Lawrence[3]
[1]UHNM, Stoke, United Kingdom. [2]UHCW, Coventry, United Kingdom. [3]UHB, Birmingham, United Kingdom

Introduction

Acetabular bone loss is a challenging problem for revision hip surgeons. This study aims to explore long term outcomes of patients who have undergone cemented acetabular revision with bone grafting in conjunction with trabecular metal augmentation in cases with significant segmental bone loss.

Materials and Methods

All patients who underwent cemented acetabular revision requiring trabecular metal augments with a minimum Paprowski score of 2B and minimum follow up of 5 years were identified. Pre and post operative WOMAC scores were compared. An assessment of pre and post operative hip centre of rotation was performed and compared to native centre of rotation. Immediate post operative centre of rotation was then compared to radiographs at latest follow up to measure for migration of acetabular components.

Results

42 patients were identified. Mean age was 53 years old with 7 males and 35 female patients. Mean follow up was 9.5 years. Preoperative WOMAC score was 30 and there was an increase to 90 ($P<0.0000001$) at latest follow up. No hips were revised for loosening or infection. There was a mean improvement in centre of rotation of 6.80mm (CI 4.57mm to 9.03mm) which was significant ($P<0.00002$). There was no change of position of centre of rotation from immediate post operative radiographs and those at latest follow up ($P=0.3$).

Conclusions/Discussion

Cemented acetabular components work well in conjunction with impaction bone grafting and trabecular metal augments in reconstructing complex acetabular defects. Together they provide immediate and long term component stability, with excellent long term clinical and radiological outcomes.

(Poster # 120)

WHAT IS MORTALITY IN THE OBESE VERSUS NON-OBESE POPULATION FOLLOWING TOTAL HIP REPLACEMENT?

Aava Param, Muhammad Adeel Akhtar
Edinburgh University, Edinburgh, United Kingdom

Introduction

Globally, more than one million THRs are performed each year, and this value is expected to rise as the percentage of obesity within the population increases. However, the impact of obesity on THR's is poorly understood. Obesity has generally been a risk factor for morbidity and mortality following surgery, and thus been a contraindication to THR for some surgeons. Regardless, obese individuals benefit from THRs at an equitable level to non-obese individuals, and therefore should not be denied life-changing operation over potential risk.
A systematic review was performed to analyse trends in mortality following THR in obese versus non-obese populations, to identify if BMI should influence patient selection for THR and if so, to what extent. Specifically, the impact of obesity on short-term mortality, long-term mortality, and post-surgical complications was analysed.

Materials and Methods

A comprehensive literature search was carried out in Ovid Medline and EMBASE, in accordance with PRISMA guidelines. The literature search produced 585 papers, which after undergoing strict inclusion and exclusion criteria, resulted in 10 papers.

Results

Analysis concluded that obese individuals had an equal, if not decreased, risk of mortality following THR when compared to non-obese individuals. Regarding short-term mortality, no significant difference in risk was identified, with three of the papers even describing a significantly decreased risk in the obese. It can be argued that obesity is a protective factor in short-term morality. Long-term mortality outcomes followed the same trend, with only one paper in opposition, raising the question of: how long do the protective effects of obesity on post-operative mortality last? Obese individuals did however have increased risk of post-surgical complications/morbidity.

Conclusions/Discussion

Obese individuals should not be denied THR's based on their BMI; however, physicians need to inform individuals of the increased risks of complications. In terms of long-term outcomes, there may be increased risk of mortality many years after the operation, but there is not enough current evidence to support whether this is due to comorbidities associated with being obese or an effect of BMI on the operation.

(Poster # 121)

THE USE OF "KIWI" TOTAL HIP REPLACEMENTS IN THE TREATMENT OF INFECTED HIP HEMIARTHROPLASTIES

Kathryn Kneale, Jagadeesh Vanyambadi, Muhammed Luqman, Sean Sexton
Royal Cornwall Hospital, Truro, United Kingdom

Introduction

Cemented hemiarthroplasty is commonly performed for intracapsular neck of femur fractures, with over 40000 done in 2019. One potential complication is infection, with a rate of 1.6-4.3%. Treatment options include washout, debridement and implant retention (DAIR), single or staged revision arthroplasty or excision arthroplasty. Whilst the insertion of spacers or excision arthroplasty may eradicate infection, the patient may be left in pain or with poor mobility. A “Kiwi” hip replacement, is a total hip replacement which is loosely cemented in antibiotic loaded cement, and may be used in these cases. We wanted to assess if patients treated with a “Kiwi” hip replacement had better outcomes than other treatments.

Materials and Methods

All patients who underwent surgery for an infected hip hemiarthroplasty between 2006 and 2021 were identified, and a retrospective analysis of the data was performed. Demographics including age, sex and ASA grade was recorded. Operation details for primary and secondary surgery were noted, including prosthesis and cement type, antibiotic prophylaxis and time between surgeries. The primary outcome measure was eradication of infection. Secondary outcome measures were reoperation rate, complications and mortality within a year.

Results

There were 34 patients identified, with 20 (59%) female and 14 (41%) male. The mean patient age was 83. Fourteen patients had a 'Kiwi', seven of these were after DAIRS. Infection was eradicated in eight patients who had a "Kiwi"(57%), and six of the non "Kiwi" group (30%). Six of the "Kiwi" group were dead within a year (43%), compared to 14 from the non "Kiwi" group. The mean time between surgeries was 6 weeks. The majority were ASA 3.

Conclusions/Discussion

There was a lower mortality in the “Kiwi” group (43%), and all were mobile, although one used an abduction brace due to 2 dislocations. Although this is a small group of patients, it suggests the "Kiwi" hip in the treatment of infected hemiarthroplasty is a viable option and may result in better outcomes than other treatments. Further work would involve a cost analysis.

(Poster # 122)

LONG-TERM IMPLANT SURVIVAL FOLLOWING ARTHROPLASTY FOR FRACTURED NECK OF FEMUR: AN ANALYSIS OF COMMONLY USED PROSTHESIS CONSTRUCTS USING AUSTRALIAN NATIONAL JOINT REGISTRY DATA

Ben Tyas[1], Martin Marsh[2], Mike Reed[1], Richard de Steiger[3], AOANJRR Statistician[3], Simon Jameson[4]

[1]Northumbria Healthcare NHS Foundation Trust, Cramlington, United Kingdom. [2]Newcastle Hospitals NHS Foundation Trust, Newcastle Upon Tyne, United Kingdom. [3]University of Melbourne, Melbourne, Australia. [4]South Tees Hospitals NHS Foundation Trust, Middlesbrough, United Kingdom

Introduction

In the UK, around 35,000 arthroplasties are performed annually for the treatment of intracapsular hip fracture. There is no clinical benefit of a modern, costly modular construct over a traditional, inexpensive mono-block design. Data on long-term outcomes are limited. The aim of this study was to establish whether there is a survival benefit of specific prosthesis concepts.

Materials and Methods

Patients recorded by the Australian Orthopaedic Association National Joint Replacement Registry (AOANJRR) up to 31st December 2018 who had a Stryker Exeter stem (unipolar, bipolar hemiarthroplasty, or THR), an Exeter Trauma Stem (ETS) or a Thompsons prosthesis (multiple manufacturers) for treatment of hip fracture, were included. Overall and age-defined 10-year cumulative revision rates were compared. A sub-analysis of Thompsons data, by type of material (Cobalt/Chrome or Titanium), was performed.

Results

43596 arthroplasties were included. Exeter/Unitrax hemiarthroplasty was the most common construct (39% of procedures).

Overall, cemented THR had the lowest revision rate of 4.5% (CIs 3.3,6.1). For hemiarthroplasty, revision rate of Cobalt/Chromium Thompsons (6.3%, CIs 4.7,8.6) was comparable to that of ETS (5.9%, CIs 4.0,8.6) and Exeter/Unitrax (7.6%, CIs 6.7,8.6). Titanium Thompsons had the highest 10-year revision rate at 10.5% (CIs 7.8,14.1). Co/Cr Thompsons and ETS had the lowest rates in patients aged >80.

10-year mortality rates were similar for ETS (87.9%), Exeter/Unitrax (80.0%) and Cobalt/Chromium Thompsons (90.7%), reflecting a similar level of frailty of patients receiving these implants. This contrasts with a 50% 10-year mortality for those receiving an Exeter V40 with a cementless cup.

Conclusions/Discussion

10-year implant survival of the inexpensive Cobalt/Chromium Thompsons is equivalent to the ETS and Exeter/Unitrax. In contrast, Titanium Thompsons are associated with higher revision rates. This study complements the published data on functional outcomes and supports the use of Cobalt/Chromium Thompsons implant as a cost-effective option for frail hip fracture patients.

(Poster # 124)

RECONSTRUCTION OF LEG-LENGTH, OFFSET, AND CENTRE OF ROTATION UTILISING FIXED ANATOMICAL LANDMARKS INTRA-OPERATIVELY IN TOTAL HIP ARTHROPLASTY: AN ACCURATE, NOVAL, SIMPLE AND REPRODUCIBLE TECHNIQUE

Rahul Mohan, Alan James Highcock
Arrowe Park Hospital, Wirral, United Kingdom

Introduction

Total hip arthroplasty(THA) should restore the original hip centre of rotation, leg-length and offset. Several subjective anatomical points(e.g. neck cut), intra-operative devices(e.g. callipers) and navigation have been suggested to help the arthroplasty surgeon restore the normal biomechanics. We describe an accurate, simple and reproducible technique, reporting the restoration of leg-length, offset and hip centre utilising the superior neck of femur and TAL as fixed anatomical points.

Materials and Methods

The superolateral femoral neck is used as a fixed anatomical landmark, pre-operatively to reference stem depth, utilising computer templating of the normal contralateral hip. Intra-operatively the neck is preserved during stem insertion, exactly matching the templated depth. Cup position is guided by TAL for version, depth and height. Once leg-length and cup position is accurately restored intra-operatively, offset can be adjusted to the soft tissue balance, with confidence.

218 consecutive THA patients were included. 12-month post-THA pelvis standardised radiographs, with calibration, were used to measure leg-length, offset and hip centre. The normal contralateral hip was used as the standard. Patients with contralateral hip pathology or THA were excluded. Leg-length, offset and centre of rotation were calibrated and measured as per the recognised standard (Herman et al). Accurate reconstruction was defined from previous studies for offset (Liebs et al.), leg length (Konyves et al.) and hip centre (Innmann et al.).

Results

We demonstrated accurate reproduction of leg-length (100%), offset (100%), and centre of rotation (96%) based on the criteria detailed in clinical studies. Furthermore, leg-length restored to within 5mm of the contralateral side in 92% of patients, offset was restored to within 5mm in 86%. There were no postoperative infections or dislocations.

Conclusions/Discussion

Optimal postoperative functional outcome is essential for patient satisfaction; accurate reconstruction of the hip geometry has been proven to influence these outcomes. The described technique does not require navigation, external devices, or any additional tools. We report excellent radiological outcomes of hip geometry reconstruction and component positioning using this simple technique, which is accurate, and reproducible.

(Poster # 128)

USE OF VISCOSUPPLEMENTATION FOR THE TREATMENT OF OA IN THE HIP: A SYSTEMATIC REVIEW AND METANALYSIS

John Zhu, Anthony Lim, Vikas Khanduja
University of Cambridge, Cambridge, United Kingdom

Introduction

Pharmacological management of osteoarthritis is largely comprised of oral pharmacotherapy and topical NSAIDs, with only one type of intra-articular injection (corticosteroids) being NICE-recommended as an adjunct to core treatments. In recent years there have been numerous primary studies investigating the efficacy of intra-articular hyaluronic acid injections in hip OA. This systematic review and meta-analysis aims to assess the efficacy of HA as a therapeutic intervention in hip OA, including the duration of efficacy, effect of dosage, number of injections and molecular weight on efficacy, and occurrence of adverse events, by analysing all available data.

Materials and Methods

We performed a literature search of the following databases: Embase, Medline, Pubmed, Web of Science and Scopus. Data was pooled using random effects meta-analysis conducted in RStudio. Quality assessment of the included studies was performed using the Modified Newcastle-Ottawa Quality Assessment Scale. Subgroup analyses were performed using a mixed-effects model.

Results

Thirty-two studies were included in analysis, with data from a total of 2702 patients. Viscosupplementation significantly reduced pain and improved function at 1 month, 3 month and 6 month follow-ups, as well as at endpoint. A significantly larger reduction in pain was achieved following treatment with multiple injections, compared to single injection, yet a corresponding improvement in function was not observed. There were no lasting adverse effects.

Conclusions/Discussion

Evidence from studies suggests Viscosupplementation improves pain and function at endpoint compared to baseline. A larger improvement of pain may be seen with multiple injections rather than single injection. However, substantial heterogeneity in the studies limits the strength of our conclusions. A standardised treatment and study protocol needs to be developed for future research, to minimise heterogeneity arising from methodological variation.

(Poster # 136)

EARLY CLINICAL AND RADIOLOGICAL OUTCOMES OF THE NEW POROUS TITANIUM SHELL – LOCKING SCREW COMBINATION IN REVISION THA

Shahril Shaarani, Monketh Jaibaji, Georges Vles, Sujith Konan
University College London Hospital, London, United Kingdom

Introduction

Extensive acetabular bone loss and poor bone quality are two key challenges often encountered in revision total hip arthroplasty. Recently, porous acetabular shells have been made available with the option to insert multiple variable-angle locking screws. We sought to evaluate the early clinical and radiological outcomes of this construct.

Materials and Methods

We performed a retrospective review of prospectively collected data in a single institution. Fifty revision hip arthroplasties were performed in 49 patients (32 female; mean age 68.6 ± 12.3 years) between February 2018 and April 2020 using a new porous titanium acetabular shell with multiple variable angle locking screws. Complications, clinical and radiographic outcomes were locally maintained. Patient reported outcome measures collected include the Western Ontario and McMaster Universities Osteoarthritis Index, the Oxford Hip Score, and the 12 item Short Form Survey.

Results

After a mean follow up of 26.7 ± 6.5 months two cases of shell migration was noted which did not require revision. No shell showed any evidence of radiographic loosening at final follow up. Nine defects were classified as Paprosky grade I, eighteen grade IIA, four grade IIB, eight were IIC, four were grade IIIA, and two were graded IIIB. Mean post-operative WOMAC function score was 84 (SD 17), WOMAC (stiffness) 83 (SD 15), WOMAC (pain) 85 (SD 15), WOMAC (global) 85 (SD 17). Mean post-operative OHS was 83 (SD 15), mean SF-12 physical score was 44 (SD 11).

Conclusions/Discussion

The additional augmentation of porous metal acetabular shells with multiple variable-angle locking screws provides reliable fixation with good clinical and radiological outcomes in the short term. Further studies are planned to establish the long-term outcomes.

(Poster # 138)

OUTCOME OF PERI-PROSTHETIC FEMORAL FRACTURES MANAGED WITH A VARIABLE ANGLE LOW CONTACT TITANIUM LOCKING PLATE

Benjamin Kapur, Simon Jameson, Paul Baker
The James Cook University Hospital, Middlesbrough, United Kingdom

Introduction

Periprosthetic fracture is a major complication following total hip replacement (THR), with a rate of 3.6% following THR and an estimated increase of 4.6% per decade. Contemporary management is mostly surgical and is technically challenging. Effective management of these injuries should be robust enough to enable early full weight bearing.

This study reviews the outcome of plate fixation in fractures around a femoral stem in our unit.

Materials and Methods

We retrospectively reviewed 55 patients who suffered PPF around a THR from July 2017 – October 2021 managed with ORIF (plus / minus revision stem) using the Zimmer NCB femoral plate as a bridging device. Fractures were classified using the Unified Classification system. Outcomes of interest were implant failure and mortality.

Results

Average age was 76.3 years (43-96) and 35 (63.6%) were female. Fractures comprised one type A, one B1, 22 B2 and 31 C. There were 5 (9.1%) plate failures, all occurred in type C fractures (5 of 31, 16.1%) at an average of 8 months (range 4-17 months.)

Of the 5 failures, 2 had revision to bypass the fracture with a long stem and have healed. Three failures were re-fixed with the same plate but with an attempt to change the construct ‘stiffness’. Two of these revised plates had further failures and were revised to long stem prostheses.

8 patients had died at latest follow up.

Conclusions/Discussion

There were no failures of a plate in patients where the fracture occurred around the stem of the prosthesis (type A or B). All failures occurred in type C fractures. Fractures in close proximity to the tip of the stem should be considered for stem revision to internally bypass the fracture. Refixation in 2 patients was not successful.

Fractures more distally should be considered for additional mechanical support, either intramedullary or the use of a second plate, especially in patients with poor bone quality.

(Poster # 142)

INFLUENCE OF TONNIS GRADE AND MCKIBBIN INDEX OF THE OUTCOME OF PERIACETABULAR OSTEOTOMY. A SINGLE SURGEON SERIES OF 353 CASES

Karadi H Sunil Kumar[1], Kartik Bhargava[2], Gregory Stamp[1], Ajay Malviya[1]
[1]Wansbeck General Hospital, Northumbria Healthcare NHS Foundation Trust, Ashington, United Kingdom. [2]Newcastle University, Newcastle, United Kingdom

Introduction

Periacetabular osteotomy (PAO) is an established surgical technique to treat symptomatic hip dysplasia. Patient selection is vital to achieve successful outcome. The aim of this study was to evaluate the influence of pre-operative Tonnis grade of arthritis and pre-operative McKibbin index (sum of femoral and acetabular version) on the outcome of PAO.

Materials and Methods

A single-surgeon series of 387 PAOs were identified from a prospectively collected database between January 2013 and March 2020. Minimally invasive Smith-Peterson approach was used to perform all PAOs. PAOs performed for hip dysplasia were included. Those cases for acetabular retroversion and those cases with femoral head under coverage due to other causes such as Perthes were excluded. Pre-operative Tonnis grade and McKibbin index was calculated for each case. Patient reported outcome measures (i-HOT 12, NAHS, UCLA and EQ-5D) were collected prospectively. Spearman correlation was calculated for Tonnis grade and McKibbin index with respect to the outcome scores at 6 and 12 months. Conversion to total hip arthroplasty was noted.

Results

A total of 352 PAOs were included for final analysis. Of these 229 were unilateral cases, and 123 were bilateral hips (62 patients) with a female preponderance (n=330). Pre-operative Tonnis grade was: grade 0 = 143 hips; grade 1 = 163 hips and grade 2 = 46 hips. Mean pre-operative McKibbin index was 33.4^0 (range -11.2^0 to 90.1^0). Pre- operative Tonnis grade had a negative correlation with EQ5D-VAS, and NAHS at 6 months but not at 1 year. Similarly pre-op McKibbin index had a negative correlation for iHOT-12 change at 6 months and EQ5D-VAS at 6 months. Four patients went on to have a total hip replacement, with a pre-operative Tonnis grade 1 in two cases and grade 2 in two cases.

Conclusions/Discussion

A lower preoperative Tonnis grade was associated with better outcome at six months but not at 12 months. Selected patients with Tonnis grade one and two degeneration with dysplasia may still be candidates for PAO, after appropriate counselling and may take a longer time to recover.

(Poster # 143)

CUSTOM UNCEMENTED FEMORAL STEMS IN COMPLEX PRIMARY HIP REPLACEMENT. RESULTS FROM TWO INDEPENDENT CENTRES

Walid Elnahal[1], Jonathan Barrow[2], Rajpal Nandra[1], Sri Yatham[2], Graham Hastie[2], Angelos Politis[1], Tim Board[2], Callum McBryde[1]

[1]Royal Orthopaedic Hospital, Birmingham, United Kingdom. [2]Wrightington, Wigan & Leigh NHS Foundation Trust, Wrightington, United Kingdom

Introduction

Complex primary hip replacement is a poorly defined entity but is often associated with abnormal anatomy such as very small femoral canals, segmental limb length discrepancies, severe rotational or angular abnormalities and significant dysplasia. Detailed and accurate preoperative planning is required in such cases which in some cases indicates the need to a custom femoral stem. The aim of this study was to present the early safety profile and functional results of a series of such cases where custom uncemented femoral stems were used.

Materials and Methods

Between June 2014 and June 2019, 60 patients underwent 67 total hip replacements with the use of custom femoral stems at two independent specialist orthopaedic tertiary referral centres. Three-dimensional surgical planning was based on CT scanning of the hips including femoral condyle and ankle slices to assess segmental limb lengths and rotational abnormalities. Acetabular reconstruction was performed with uncemented shells with the addition of augments or bone graft depending on requirements.

Results

The mean age was 42 years (range 19-55). Indications for surgery were dysplasia (27), Perthes(13), multiple epiphysial dysplasia(8), SUFE(4), cerebral palsy(3) and miscellaneous(12). Previous hip surgeries were recorded in 50%. Indications for custom implants were narrow canal (13), femoral offset(9), version abnormalities(13), leg length(6), femoral deformity(25). At a mean follow-up of 26 months (range 12-72) the mean OHS was 38(mean preop 17). All patients showed a minimum improvement of 8 points. EQ5D improved from 0.35 to 0.7. There were no dislocations, there was one case of neurovascular injury, one patient required revision for aseptic femoral loosening and one patient developed a deep infection.

Conclusions/Discussion

Complex hip replacement can be challenging for the surgeon, and we have shown that custom femoral implants can be a reliable way to achieve satisfactory short-term outcomes in this taxing patient group. As a significant amount of decision-making is made prior to surgery rather than during surgery, custom stems can transform a difficult operation into a relatively standard one. Early results are encouraging but longer-term data is required.

(Poster # 144)

PSOAS TENDON RELATIONSHIPS IN PATIENTS WITH RECURRENT HIP PAIN FOLLOWING PERIACETABULAR OSTEOTOMY

Karadi H Sunil Kumar[1], Floris Van Damme[2], Emmanuel Audenaert[2], Vikas Khanduja[3], Ajay Malviya[4]

[1]Wansbeck General Hospital, Northumbria Healthcare NHS Foundation Trust, Asgington, United Kingdom. [2]University of Ghent, Ghent, Belgium. [3]Addenbrookes – Cambridge University Hospitals NHS Trust, Cambridge, United Kingdom. [4]Wansbeck General Hospital, Northumbria Healthcare NHS Foundation Trust, Ashington, United Kingdom

Introduction

Recurrent groin pain following periacetabular osteotomy (PAO) is a challenging problem. Pre-operatively more than half of hip dysplasia patients have pain related to psoas tendon. The purpose of our study was to evaluate the position and dynamics of the psoas tendon as a potential cause for recurrent groin pain following PAO.

Materials and Methods

Patients with recurrent groin pain following PAO were identified from a single surgeon series. 386 PAO procedures were performed between January 2013 and January 2020. A total of 13 patients with 18 hips (4.7%) had recurrent groin pain with no other identifiable cause. All these 13 patients underwent CT scans pre- and post-operatively. 3D models from CT data were created with Mimics (Materialise NV) and the CT data was used to manually segment all relevant bony structures. In addition, muscle path of the psoas tendon was accurately represented while taking relevant geometrical constraints into account. A validated discrete element model using rigid body springs was used to predict psoas tendon movement during hip circumduction and walking. The distance of psoas tendon to and bony abnormality was calculated during circumduction and a gender specific walking motion of the hip. All computational analysis was performed in a MATLAB.

Results

Five out of the 18 hips did not show any malformations at the osteotomy site. Thirteen hips (72%) showed malformation secondary to callus at the superior pubic ramus. These were classified into: (1) osteophytes at the osteotomy site, (2) hypertrophic callus or non-union and (3) malunion at the osteotomy leading to a step in the pubic ramus. Mean minimal distance of the psoas tendon to osteophytes was found to be 6.24 mm (n=6) and to the osteotomy site was 14.18 mm (n=18).

Conclusions/Discussion

Recurrent groin pain after PAO needs a thorough assessment. One need to have a high suspicion of psoas issues as a cause. 3D CT scan may be necessary to identify causes related to healing of the pubic osteotomy. Dynamic ultrasound of the psoas tendon may help in evaluating for psoas impingement as a cause of recurrent groin pain in these cases.

(Poster # 148)

EARLY OUTCOMES OF HIP ARTHROSCOPY IN ADOLESCENCE: A STUDY USING THE NAHR DATASET.

Richard Holleyman[1], Karadi H Sunil Kumar[2], Vikas Khanduja[3], Ajay Malviya[2]
[1]Newcaslte University, Newcastle, United Kingdom. [2]Wansbeck General Hospital, Northumbria Healthcare NHS Foundation Trust, Ashington, United Kingdom. [3]Addenbrookes – Cambridge University Hospitals NHS Trust, Cambridge, United Kingdom

Introduction

Hip arthroscopy (HA) for adolescents is uncommonly performed and therefore evidence concerning outcomes are confined to small series. This study leveraged registry data to describe procedures performed and outcomes in this group.

Materials and Methods

Patients aged ≥12 and <18 years who underwent HA between 1st January 2012 and 31st October 2020 were extracted from the UK Non-Arthroplasty Hip Registry along with patient characteristics and information about the femoral and acetabular procedure(s) performed (more than one procedure may be recorded concurrently). International Hip Outcome Tool 12 (iHOT-12) and EuroQol-5 Dimensions (EQ-5D) questionnaires were collected pre-operatively and at 6 and 12 months. Chi-squared and t-tests were used to compare categorical and continuous variables respectively.

Results

259 HA were identified (62% female) with patient age ranging between 13.7 and 17.98 years (median 17.1 (IQR 1.1)). Cam excision was the most common femoral procedure performed (77 male (78%), 92 female (58%)) followed by labral repair (36 male (36%), 74 female (46%)) and labral debridement (26 male (26%), 46 female (29%)). Chondral procedures were performed in approximately 20% of cases.

Compared to males, females' iHOT-12 scores were significantly poorer pre-operative [mean 31.4 (95%CI 28.3 to 34.5) vs 40.9 (37.1 to 44.7)] and 12 months post-operatively [54.4 (45.9 to 62.8) vs 75.2 (62.9 to 87.6)] with a similar trend observed for EQ-5D Index; female pre-op 0.48 (0.43 to 0.52) vs male 0.57 (0.52 to 0.63), female 6-month 0.63 (0.57 to 0.70) vs male 0.74 (0.67 to 0.82), female 12-month 0.70 (0.63 to 0.77) vs male 0.83 (0.75 to 0.91). Pre- and 12-month post-operative scores were available for 50 (19%) of the cohort with 71% of achieving the minimum clinically important difference for iHOT-12 and 57% significant clinical benefit at 12 months with no significant difference between sexes.

Conclusions/Discussion

Compliance with follow-up was poor, however the majority of adolescent respondents benefited from HA with significantly improved outcomes maintained at 12 months.

(Poster # 149)

HOW DOES THE CAM-TYPE DEFORMITY DEVELOP IN ATHLETES? A SYSTEMATIC REVIEW AND META-ANALYSIS.

Matthew Pettit[1], Chantelle Doran[1], Yash Singh[1], Masayoshi Saito[2], Karadi H Sunil Kumar[2], Vikas Khanduja[2]

[1]University of Cambridge School of Medicine, Cambridge, United Kingdom. [2]Addenbrookes Cambridge University Hospitals NHS Trust, Cambridge, United Kingdom

Introduction

A higher prevalence of cam morphology has been reported in the athletic population, but the development of the cam morphology is not fully understood. The purpose of this systematic review is to establish the timing of development of the cam morphology in athletes, the proximal femoral morphologies associated with its development, and other associated factors.

Materials and Methods

Embase, MEDLINE and the Cochrane Library were searched for articles related to development of the cam morphology, and PRISMA guidelines were followed. Data was pooled using random effects meta-analysis. Study quality was assessed using the Downs and Black criteria and evidence quality using the GRADE framework.

Results

The search identified 16 articles involving 2,028 participants. In males, alpha angle was higher in athletes with closed physes than open physes (SMD 0.71; 95% CI 0.23, 1.19). Prevalence of cam morphology was associated with age during adolescence when measured per hip (β 0.053; 95% CI 0.024, 0.082) and per individual (β 0.049; 95% CI 0.034, 0.064). Lateral extension of the epiphysis was associated with an increased alpha angle (r 0.68; 95% CI 0.63, 0.73). A dose-response relationship was frequently reported between sporting frequency and cam morphology. There was a paucity of data regarding the development of cam morphology in females.

Conclusions/Discussion

Very low and low quality evidence suggests that in the majority of adolescent male athletes' osseous cam morphology developed during skeletal immaturity, and that prevalence increases with age. Very low quality evidence suggests that osseous cam morphology development was related to lateral extension of the proximal femoral epiphysis.

(Poster # 150)

THE INFLUENCE OF SPINO-PELVIC MOTION ON A 'SAFE ZONE' FOR COMBINED VERSION IN TOTAL HIP ARTHROPLASTY

Matthew Wilson, John Charity, Al-Amin Kassam, Jonathan Howell, Matthew Hubble, John Timperley
Exeter Hip Unit, Exeter, United Kingdom

Introduction

There is increasing appreciation that a safe zone for component positioning to reduce the incidence of dislocation cannot consider acetabular component position in isolation. The concept of combined version uses both acetabular and femoral component position and may be a more accurate model to reduce the risks of instability. In addition, spino-pelvic motion has a significant influence on relative component position and needs to be taken into consideration on an individualised basis. The aim of this study was to use computer modelling software to define a new safe zone for combined version using a variety of spino-pelvic parameters.

Materials and Methods

A pelvic CT scan was segmented and imported into robotic modelling software (Mako, Stryker Orthopaedics). Components were selected to recreate anatomic balance and then orientation of both acetabular and femoral components were optimised to minimise component-component impingement. The spino-pelvic parameters were adjusted within the normal ranges and component position was changed to the point of impingement in both sitting and standing poses.

Results

The influence of varying degrees of spino-pelvic mobility on the combined safe zone is presented. With a supine pelvic tilt of 0 degrees, the model revealed a combined version safe zone of 39 degrees is optimal for in impingement free range of motion in both sitting and standing positions.

Conclusions/Discussion

The use of computer modelling simulations may allow a personalised prescription for a combined version safe zone based on spino-pelvic motion. This allows the acetabular component position to be placed in line with the optimal bony anatomy and femoral component version to be selected, in accordance with a previously defined optimal combined version.

(Poster # 151)

WHAT ARE THE METHODS USED TO PRESENT AND MINIMISE LOSS-TO-FOLLOW-UP IN STUDIES BASED ON ARTHROSCOPY REGISTRIES?

Kalyan Vamshi Vemulapalli[1], Karadi Hari Sunil Kumar[2], Vikas Khanduja[2]
[1]mperial College Medical School, London, United Kingdom. [2]Addenbrookes Cambridge University Hospitals NHS Trust, Cambridge, United Kingdom

Introduction

Clinical registries are an important aspect of orthopaedic research in assessing the outcomes of surgical intervention and track medical devices. This study aimed to explore the research methodology available to account for patients lost to follow-up (LTFU) specifically in studies related to arthroscopic intervention and whether the rates of patient LTFU are within the acceptable margins for survey studies.

Materials and Methods

A scoping review, where a literature search for studies from nine arthroscopy registries, was performed on EMBASE, MEDLINE, and the annual reports of each registry. Inclusion criteria included studies with information on patient-reported outcome measures and being based on nine national registries identified. Exclusion criteria included review articles, conference abstracts, studies not based on registry data, and studies from regional, claims-based, or multi-centre registries. Studies were then divided into categories based on method of LTFU analysis used.

Results

Thirty-six articles were identified for the final analysis. Categories for LTFU analysis included dropout analyses (n=10), referencing validation studies (n=12), contacting non-responders (n=4), and sensitivity analyses (n=1). Referencing validation studies was the most common method (n=12). Majority (n=35) of the studies exceeded the recommended maximum rates for LTFU.

Conclusions/Discussion

Most arthroscopy studies have rates of LTFU higher than traditionally acceptable. Therefore, any conclusions drawn from these research papers may not be sufficiently valid or free from non-response bias.

(Poster # 152)

RETROSPECTIVE ANALYSIS OF RISK FACTORS FOR PROGRESSION TO FRACTURE IN PATIENTS WITH BONE METASTASES OF THE PROXIMAL FEMUR

Samantha Downie[1], Joe Littlechild[2], Alison Stillie[3], Matthew Moran[3], Cathie Sudlow[1], Hamish Simpson[1]
[1]University of Edinburgh, Edinburgh, United Kingdom. [2]NHS Tayside, Dundee, United Kingdom. [3]NHS Lothian, Edinburgh, United Kingdom

Introduction

There is poor evidence-base for predicting risk of pathological fracture in patients with bone metastases managed non-surgically. Radiological scoring systems like Mirels fail to incorporate patient-specific variables such as primary cancer type and lesion location. The aim was to identify predictors of fracture at 12 months in patients with long bone metastases.

Materials and Methods

This was a pilot study of 112 consecutive patients to power a larger multivariate regression analysis. Patients with a long new bone metastasis and x-ray/CT imaging were identified from radiology reports and excluded if they presented with a fracture. A literature review identified 15 potential predictors of fracture (variables of interest), including primary cancer type and radiological appearance.

Results

We reviewed data for 200 lesions in 112 patients (51% female, mean age 69 range 28-91 years). 73% were dead at follow-up (146/200 median survival 8.5 months IQR 18-3) median follow-up in living patients was 2 years (range 8 months-6.5 years).
The 12-month fracture rate was 16% (32/100), recommending a powered sample size of 1055 lesions to investigate 15 variables (confidence level 95%, error margins 4-4.5). Factors associated with risk of fracture included Mirels score >8 (fracture rate 34% 22/64 vs 9% 10/114 $p<0.001$), lytic radiological appearance (28% 19/68 vs 10% 13/132 mixed/sclerotic $p=0.002$) and increasing pain (35% 30/85 vs 2% 2/115 $p<0.0001$).

Conclusions/Discussion

Predicting risk of pathological fracture is vital in managing patients with bone metastases to avoid unnecessary surgery. This pilot study has generated a recommended sample size to validate the 15 variables of interest and provided preliminary evidence for their utility in predicting pathological fracture.

(Poster # 153)

OPTIMISING RETURN TO ELECTIVE TOTAL HIP ARTHROPLASTY FOLLOWING COVID-19 PANDEMIC: LESSONS LEARNED AND FUTURE DIRECTIONS

Anthony Paluch[1], Harris Tariq[2], Oliver Small[2], Emily Ratford[2], Sabrina Sokolowski[2], Al-Amin Kassam[2], Matthew Hubble[2], Jonathan Howell[2], John Charity[2], Sushmith Gowda[2], Michalis Panteli[2], Matthew Wilson[2]

[1]Royal Devon and Exeter NHS Foundation Trust, Exeter, United Kingdom. [2]Exeter Hip Unit, Princess Elizabeth Orthopaedic Centre, Royal Devon and Exeter NHS Foundation Trust, Exeter, United Kingdom

Introduction

The COVID-19 pandemic forced elective orthopaedic operating to a standstill, leading to unprecedented waiting times for elective procedures. Optimising patient pathways is paramount in tackling the backlog. Length of hospital stay (LOS) is an accepted surrogate for successful elective surgery.

The aim of our study was to: 1) report on the changes in LOS after restarting our elective THA service; 2) identify barriers to early discharge, 3) investigate the effectiveness of implemented changes.

Materials and Methods

A retrospective review of all consecutive patients admitted for an elective unilateral THA was conducted, comparing three groups: 1) enhanced care pathway group (n=96; 09/2019-12/2019); 2) COVID group (n=56; 03/2021-04/2021); 3) intervention group (n=96; 05/2021-08/2021).

Results

LOS in the enhanced care pathway group was 2.6 ±2.1 days (median: 2 days). During initial resumption of elective operating (COVID group) the LOS was 4.8 ±4.5 days (statistically significant increase; p=0.011, median: 3 days). Factors affecting LOS included reduced physiotherapy provision; lack of pre-operative occupational therapy review; loss of educational classes and worse pre-operative functional status.

To address these our department employed three new physiotherapists, introduced training for nurses to safely mobilise patients on day of surgery and introduced a post-operative proforma to streamline discharge planning. Following these changes, the LOS reduced to 3.7 ±4.6 days (p=0.166, median: 2 days).

Subgroup analysis of the intervention group showed age <75 (p<0.001) and ASA 1-2 (p=0.036) were associated with reduced LOS (LOS in this subgroup was 2.1±1.5 days, median2 days). Gender (p=0.575), prophylactic catheterisation (p=0.236), use of intrathecal opioids in spinal anaesthetic (p=0.098) and hypotension on day one post-operatively (p=0.470) did not significantly affect LOS.

The was no significant difference in the number/type of complications between the different groups.

Conclusions/Discussion

COVID-19 has had a significant effect on LOS, which is still not reversed. For effective resumption of THA services, pre-pandemic enhanced care pathways should be reinstated. With current restrictions preventing face-to-face classes, online educational sessions could be offered. Those younger than 75 years and ASA 1 or 2 are most likely to be discharged without significant delay.

(Poster # 154)

AN INNOVATIVE TOOL TO CALIBRATE AP PELVIC RADIOGRAPHS IN PATIENTS WITH INTRACAPSULAR NECK OF FEMUR FRACTURES.

Andrew Crone[1], Daniel Crawford[2], Ryan Moffatt[1], Patrick Hickland[1], Jonathon Macdonald[1], Gavan McAlinden[3]

[1]NIMDTA, Belfast, United Kingdom. [2]Axial3D, Belfast, United Kingdom. [3]South Eastern Health and Social Care Trust, Belfast, United Kingdom

Introduction

Pre-operative templating is routinely used in total hip arthroplasty (THR), to help the surgeons plan implant sizing and positioning. It is used less commonly in hip fracture surgery. Obtaining accurate templating requires a calibration tool/device to correlate with the patient's anatomy. These devices require movement of patients' hips for placement, which can cause considerable pain in hip fracture patients. At times, on removal of a femoral head in hip hemiarthroplasty; it is outside the range of implant sizes in stock. In our experience, it resulted in an arthroplasty surgeon being contacted intra-operatively to carry out a THR. This study aims to develop a user and patient friendly device with validated accuracy of calibration.

Materials and Methods

We undertook a pilot study to assess magnification in patients undergoing hip hemiarthroplasty, which demonstrated considerable variation. We collaborated with a medical 3D modelling company (Axial3D) to design a calibration tool "NOFpaddle"; that slides under the patients buttock when performing AP trauma pelvis radiographs. Within the NOFpaddle, a 28mm disc is used to calibrate the radiographs on Picture Archiving and Communication Service (PACS). Using the NOFpaddle we're able to assess femoral head size. In the first 2 months of NOFpaddle, it was used in 8 patients with neck of femur fractures. We also undertook a qualitative staff survey on ease of use and patient comfort.

Results

Magnification of Trauma pelvic X-rays varied from 112% to 126%. In 8 weeks of NOFpaddle, 8 patients had pre-operative templating using the NOFpaddle. 7 patients underwent hemiarthroplasty, and 1 underwent THR. The mean difference in pre-operative femoral head size and true femoral head size was 94% (true head / pre-op size), with largest difference in pre-op radiograph and true head size being 4mm. The qualitative survey demonstrated the device was easy to use and comfortable for hip fracture patients.

Conclusions/Discussion

NOFpaddle is easy to use and comfortable for patients. The design allows accurate assessment of true head size, with the potential benefit of preventing incorrect estimation of femoral head size, prior to undertaking hip hemiarthroplasty surgery.

(Poster # 155)

REVISION TO METAL-CONTAINING ARTICULATIONS FOLLOWING CERAMIC BEARING FRACTURES REPRESENTS AN AVOIDABLE PATIENT SAFETY ISSUE

Daniel Howard[1,2], Darren Puttock[3], Pip Divall[3], Reshid Berber[4], John Skinner[5,6], Robert Ashford[3,1]
[1]University of Leicester, Leicester, United Kingdom. [2]University Hospitals Coventry & Warwickshire, Coventy, United Kingdom. [3]University Hospitals of Leicester, Leicester, United Kingdom. [4]Nottingham University Hopspitals, Nottingham, United Kingdom. [5]Royal National Orthopaedic Hospital, Stanmore, United Kingdom. [6]University College London, London, United Kingdom

Introduction

Ceramic bearing fractures are uncommon events, but mandate revision to replace damaged components. Revisions to metal containing articulations following a ceramic fracture have been implicated in cases of early implant failure and, in the case of cobalt-chromium bearing use, systemic toxicity. This study aims to systematically review the literature to identify complications arising from revision to metal bearings following a ceramic fracture.

Materials and Methods

MEDLINE and Embase databases were systematically searched according to PRISMA guidelines for articles related to hip arthroplasty, revision, ceramic, and metallosis or cobalt or chromium, and poisoning or toxicity. Common themes and observations of local and systemic complications are identified and reported.

Results

57 articles were included in the synthesis. Retained ceramic micro-debris can become embedded within the revision articulation, resulting in aggressive third body abrasive head wear and metal ion release. Locally reported features of bearing failure included (cases): gross metallosis(63); volumetric head wear(55); radiodensities(36); pain(25); pseudotumor(20); ceramic embedded in polyethylene(25). Systemic features of cobalt toxicity included: hearing loss(22); visual loss(18); hypothyroidism(19); cardiomyopathy(19); peripheral neuropathy(18); weight loss(12). Five patients died of causes that were attributed to cobalt induced multi-organ failure. Mean and median peak cobalt levels were 902 and 625 p.p.b. respectively (35 cases; range = 22 to 6521 p.p.b.). Where re-revised and reported, metal ion levels improved following re-revision and signs/symptoms of systemic toxicity typically showed rapid improvement or complete resolution. Delayed causative diagnosis and extensive medical investigations were frequently reported when patients presented with features of systemic toxicity to departments outside of Orthopaedics.

Conclusions/Discussion

Revision to a metal containing articulation following a ceramic bearing fracture represents a serious (but avoidable) patient safety issue. Surgeons responsible for patients identified as at risk are now notified by the National Joint Registry (NJR) to highlight this concern, however this process is reactive in nature. Inclusion of this issue in the development of revision arthroplasty guidelines is therefore advocated to improve patient safety. A further review of registry-based outcomes is in progress.

(Poster # 157)

THE PSYCHOLOGICAL IMPACT OF PROLONGED WAITING TIMES FOR ELECTIVE TOTAL HIP ARTHROPLASTY SURGERY

Moez Zeiton[1,2], Anjeevan Klair[3], Mobeen Ismail[1], Sanat Shah[1]
[1]Manchester Royal Infirmary, Manchester, United Kingdom. [2]Health Education North West, Manchester, United Kingdom. [3]University of Manchester, Manchester, United Kingdom

Introduction

The COVID-19 pandemic has resulted in significant delays in orthopaedic elective operating. Current operating levels remain well below pre-Covid capacity and waiting lists have grown exponentially. The aim of this study was to determine the impact of prolonged waiting times for elective hip arthroplasty surgery on patients' mental health and quality of life.

Materials and Methods

A single-centre study involving patients who were on the waiting list for total hip arthroplasty (THA).

Inclusion criteria were any patient listed for THA surgery prior to November 2020. Exclusion criteria included revisions or conversions of other operations such as conversion of internal fixation to THA.

Demographic data included age, sex, Body Mass Index (BMI), comorbidities, procedure, and the date added to the waiting list.
We calculated the waiting time (in weeks) for surgery. Study information leaflets and patient consent forms were sent to participants along with questionnaires for Schwartz Outcome Scale-10 (to assess psychological well-being), Oxford Hip Score (OHS) (to assess disability).

Patients were then followed up and an interviewer-administrated EuroQol five dimension (EQ-5D) questionnaire was conducted.

Results

Complete responses were received from 40 patients.
Mean age = 67.7 years (range 36-92). 21/40 participants were male (52.5%). Mean BMI = 29.6 (range 16.7 – 46.5). Mean number of weeks awaiting surgery = 50.75 weeks (range 12.6 – 142).
Using the paired sample t-test, we found that increased time awaiting surgery was associated with increased psychological distress (Schwartz $p<0.05$), increased disability (OHS $p< 0.05$) and worse general health (EQ5D $p< 0.05$)

We also found BMI to be a risk factor for increased disability (OHS $p< 0.001$), worse general health (EQ5D $p< 0.001$) but not psychological distress (Schwartz $p> 0.185$)

Conclusions/Discussion

This study demonstrated that patients who have their arthroplasty surgery delayed have a negative impact on their psychological health, well-being, and increased disability with those waiting the longest suffering the most. It also demonstrated that other factors such as BMI and age play an important role. Further support should be offered to these patients and waiting list prioritisation should also take these important factors into account.

(Poster # 162)

EARLY TO MID TERM RESULTS OF AN UNCEMENTED MODULAR TAPERED FEMORAL STEM IN TOTAL HIP ARTHROPLASTY WITH NATIONAL JOINT REGISTRY OUTCOMES

Vishal Rajput[1], Peter Moriarty[1], Melinda Hau[2], Rohit Rambani[2], Hasnat Minhas[2]
[1]University College London Hospital, London, United Kingdom. [2]Pilgrim Hospital, Lincolnshire, United Kingdom

Introduction

To assess the clinical and radiological outcomes of an uncemented modular femoral stem in revision and complex primary total hip arthroplasty.

Materials and Methods

This retrospective study included 85 patients who underwent Total hip replacement using a Reclaim stem. 62 were revisions and 23 were complex primary THA. Out of the 62 revision surgeries, 55 were performed via single stage revision and 7 were two stage revision for infection. Indications for revision were periprosthetic fracture (25); aseptic loosening (22); adverse reaction to metal debris (5) Recurrent instability (2); and periprosthetic joint infections (7). Patients were assessed clinically and radiologically at 3 months; 12 months and then at yearly follow up for osteolysis and subsidence of the stem. Bone loss was categorised using the Paprosky classification.

Results

The mean follow up was 3 years (1 – 6 years), 5 patients had a revision of at least one component. One patient had a fracture of the stem, one had a change of proximal body to correct limb length discrepancy, one ended up with excision arthroplasty foe deep infection, 2 patients had periprosthetic fracture eventually needing total femur replacement. There were no intraoperative periprosthetic fractures. Post operative subsidence rate was 15.38%. There were no revisions for aseptic loosening or Osteolysis.

Conclusions/Discussion

Our results show good survival, and outcomes of a single uncemented modular tapered stem for revision and complex primary total hip arthroplasty.

(Poster # 166)

THE EFFECT OF A DEDICATED HIP FRACTURE UNIT ON CLINICAL OUTCOMES: A 10-YEAR STUDY

Belal Ahmed[1], Gareth Chan[2], Maryam Ahmed[2], Khalid Malik-Tabassum[2], Benedict Rogers[2]
[1]Brighton and Sussex Medical School, Brighton, United Kingdom. [2]University Hospitals Sussex, Brighton, United Kingdom

Introduction

Hip fractures are a major public health issue that has an impact on patient morbidity and mortality and has a significant cost to the healthcare system. In 2015, a hip fracture unit (HFU) was set up and featured a distinctly different patient pathway in an effort to improve patient outcomes. The aim of this study was to compare patient outcomes before and after HFU and assess for any improvement.

Materials and Methods

A ten-year retrospective analysis was conducted at a major trauma centre between 01/07/2010 to 30/06/2020. Using the National Hip Fracture Database (NHFD) two group of patients were identified (before and after HFU) and the clinical outcomes including time to surgery, length of hospital stay , discharge location and mortality were directly compared. Statistical analysis was performed used SPSS system and a p value of <0.05 was considered statistically significant.

Results

A total of 4998 patients were included of which 2387 patients (2533 injuries) were treated pre-HFU and 2611 patients were (2813 injuries) treated at the HFU. The mean time to surgical intervention in the HFU group was significantly lower by 3.07 days ($p < 0.001$). Length of hospital stay was also significantly reduced in the HFU group ($p < 0.001$). Discharged location was significantly different between the two groups with a higher number of patients returning to their pre-injury residence in the HFU group. Both the 30-day and 365-day mortality were significantly reduced in the HFU group ($P = 0.006$ and $P = 0.002$ respectively). Although the 120-day mortality did not show a significant difference, the mortality rate reduced from 12.84% in the pre-HFU group to 11.22% in the HFU group.

Conclusions/Discussion

The implementation of the HFU has shown to improve clinical outcomes. Therefore, replication of this model may continue to improve outcomes for patients and potentiate financial benefit.

(Poster # 167)

THE MANAGEMENT OF REVERSE OBLIQUE HIP FRACTURES WITH UNREAMED INTRAMEDULLARY NAILS WITH AND WITHOUT CERCLAGE CABLES

Maryam Ahmed[1], Diego Vergara-Jaladoni[1], Charlotte Ruscoe-Price[1], Ramy Wilson[1], Umar Ahmed[2], Khalid Malik-Tabassum[1], Roger Pattison[1]
[1]University Hospitals Sussex, Brighton, United Kingdom. [2]Eastbourne District General Hospital, Eastbourne, United Kingdom

Introduction

The incidence of reverse oblique hip fractures is expected to increase as the population ages. They are challenging to treat due to their unique biomechanical characteristics. The aim was to assess the fixation failure rate and non-union/delayed union and factors affecting this.

Materials and Methods

A retrospective analysis from a single major trauma centre was conducted between 01/01/2018 to 31/12/2021. All adult patients with a closed and isolated AO/OTA 31-A3 reverse oblique hip fracture were included. Statistical analysis was performed used SPSS system and a p value of <0.05 was considered statistically significant.

Results

A total of 70 patients were included in this study of which 31% were males (n=22) and 69% were females (n=48). The mean age was 83 years (SD +/- 13.96). All patients had a Smith & Nephew Intertan unreamed long intramedullary nail inserted. Only 22% of patients (n=15) had additional fixation in the form of cerclage cables. Of the patients who did not have additional fixation (n=55), 16% (n=9) underwent revision surgery (revision nail = 2, cables = 5, hemiarthroplasty = 1, plate fixation = 1). Revision surgery was not required in patients who had cerlage cables. 75% of patients who did not cerlage cables fixation experienced post-operative pain, 22% had non-union of the fracture (p=0.029) and 51% had delayed union (p=0.0009). The average neck shaft angle in patients who did not have cerclage cables was 122.7 degrees, which was statistically significant for non-union and delayed union (p=0.012). The lateral femoral wall (LFW) displacement was determined as 11.78 +/-6.77mm in the group without cerclage cable and 0.58 +/- 0.82mm (p=0.001) in the group where cerclage cable was used.

Conclusions/Discussion

Reverse oblique hip fractures are highly unstable injuries that require open reduction and additional internal fixation such as cerclage cables in order to reduce the risk of implant failure and post-operative pain. This study shows that for adequate fracture reduction, the ideal neck shaft angle is between 125 -135 degrees and LFW displacement should be at a minimal: both are predictors for non-union and delayed union.