Annual Scientific Meeting 2020 Wales

4th - 6th March

Incorporating the Inaugural

BHS Instructional Course

6th March

International Convention Centre Wales, Newport
(ICC Wales)

FOREWORD

On behalf of our President, Stephen Jones, and the Executive Committee, I would like to welcome all those attending the 2020 Annual Scientific Meeting of the British Hip Society in the new state of the art International Convention Centre Wales.

The Annual Scientific Meeting of the BHS has grown consistently in size and is one of the most rewarding conferences to attend remaining a highlight of the orthopaedic calendar each year. Last year's meeting at Royal Concert Hall and Nottingham Conference Centre hosted by our Past President, Andrew Manktelow attained a record number of CME points, and I am confident that the Newport meeting will be as equally stimulating an experience with the chosen topics in focus, scientific presentations and industry contributions. We are delighted that so many members continue to support this meeting each year.

The programme this year will again be a combination of instructional lectures, podium presentations of the latest research, industry sessions and an excellent array of poster presentations, with time in the programme allocated for discussion, and of course the opportunity to catch up with friends and colleagues and to share experiences.

It is our honour to welcome Professor Padgett Associate Surgeon-in-Chief and Deputy Medical Director, Hospital for Special Surgery, New York, as our Presidential Guest Speaker. Professor Padgett is a surgeon, educator, researcher, and is dedicated to exploring the cutting edge of medicine for his patients. As the co-author of over 150 scientific articles, his clinical interest has been clinical outcomes and biomaterials research as his main focus, but he has developed two fields of current interest in robotic surgery and deep vein thrombosis prevention. The interest in robotic assisted surgery combines surgical navigation with mechanical guidance to assist the surgeon in positioning the implant. The hope is that this will lead to improved implant position which results in better function and durability of the implant. He will make a significant contribution to this year's meeting, not least in his keynote lecture on 'Instability after Hip Arthroplasty: A Pluralistic Approach'.

This year's meeting starts with an exciting Hot Topics Session chaired again by Fares Haddad. Dual mobility – indications, uses and pitfalls by our president Stephen Jones, Networked care – are there any concerns by past president Andrew Manktelow, the Anterior approach – another fad or integral to training program by Professor Fares Haddad and Enhanced technology in THA by BOA Vice President Elect Professor John Skinner.

During the main meeting, we have allocated time for four different "Topic in Focus" instructional sessions, aimed at addressing topical issues, new developments, and again some of the politics of our specialty. The first Topic in Focus is indeed a first for the society as it was competitively selected after inviting the membership to submit a topic in focus. We are delighted that the topical subject of Day surgery being achievable in the NHS is being delivered by the Northumbria group. Also, on the Wednesday there will be an update on the Non-Arthroplasty Hip registry with its 4th Annual report and scientific podium presentations on total hip arthroplasty. We also continue the emerging hip surgeon's session with alternative advice on wealth management and pensions for the less young members. This will be followed by the AGM for members of the BHS society.

The start of Day Two will be an interesting clinical case discussion by senior hip surgeons and chaired by Stephen Jones. Subsequently there will be the continuation of the new instructional industry workshops, and then the morning will be completed with our second Topic in Focus looking at non-arthroplasty hip surgery chaired by Vikas Khanduja. It will cover history, examination and investigation of young adult hip pain. Prior to lunch there will be a review of the posters by Nick Wardle and an update on BAJHR by Tim Petheram.

Thursday afternoon will be the potentially controversial third Topic on Focus on hip networks and more time has been specifically set aside for this session. Senior representation from BASK, NJR, BOA and BHS will present and discuss this topic which we are sure will promote much discussion.

The rest of the Thursday will consist of further podium presentations on hip arthroplasty and additional industrial seminars. In a break with tradition there will be no formal dinner but an opportunity to meet everyone at the conference with a walk in buffet and drinks session in the evening.

Friday will start with a welcome from our President-Elect Jonathan Howell and be followed by a session on BHS research chaired by Jonathan Howell and Professor Tim Board. Following this there will be another BHS first with the inaugural trainee instructional course that will then run in parallel to the main meeting. The main meeting will continue with the last podium presentations on basic science and revision hip surgery. Our final "Topic in Focus" will be on the always challenging subject of periprosthetic joint infection. The difficult cases of culture negative PJIs and Fungal infections with an update on the microbiologist point of view will be covered. In addition, there will be a summary of the results of the INFORM study by Michael Whitehouse and Ashley Blom.

The Annual Scientific Meeting of the BHS is of course an important opportunity for us all to present our original research and this year the Scientific Committee received 185 abstracts for consideration. The review process was undertaken by five independent, blinded judges and we were able to accept 42 abstracts for podium presentation and over 100 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 excellent topics in the posters section, and I would encourage all of you to spend some time reading these at the conference. 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 research award.

There are plenty of other highlights in the rest of the meeting agenda and it promises to be a packed and possibly controversial three days. On behalf of you all I would like to thank our President, Stephen Jones for his hard work and leadership over the last year. He will formally open the meeting on Wednesday morning and after lunch on the Thursday will present his Presidential Review of the Year.

Before lunch on the Friday there will be the presidential hand over and incoming Presidential address by Jonathan Howell and presentation of the prizes by BHS Secretary Matt Wilson at the end of the conference. I am sure that I speak for you all in wishing Jonathan a very successful and productive year.

With regard to 'housekeeping' for those presenting. Please ensure that your presentation is brought to the Speaker Preview Room as a PowerPoint presentation in portable form. Talks should be checked and loaded on to the computer at least **2 hours** before your session begins. Please note there will be no facilities for connecting individual laptops. Similarly, it would be helpful if presenters made themselves known to the 'Chairs' of their session before it starts. I have asked colleagues chairing the free paper sessions to be absolutely ruthless on timing in order to ensure that the programme runs to time. In fairness to other presenters, and to allow adequate discussion, and indeed to avoid an abrupt 'cut-off', please ensure your presentation does not over-run your allocated time. To this end it would help if upcoming presenters made their way down to the 'next speaker' chairs at the front of the auditorium to keep our busy programme running and on time.

All poster presentations will have an allocated position and should be mounted on arrival on the first day using the velcro stickers provided on the boards or at the registration desk. Posters should remain until the last clinical session on Friday to allow judging for the poster prize. We would like to encourage everyone to view the posters which are in the Lounge on level 2 located at the top of the escalators.

Would presenters and senior authors of Podium Papers please check over their abstracts as they appear in this booklet and let me know as soon as possible if there are any corrections needed. The abstracts for the papers presented from the podium, will be published in the Bone and Joint Journal supplement later this year.

The organisation and smooth running of the BHS relies upon the vital contributions made by some key people who deserve our appreciation. I would like to thank Natasha Wainwright at the BOA for her help and support to the BHS throughout the year. In addition, Nic Wardle as the web master has continued a monumental task in rebooting the website and continued developing direct interaction with the members via this. We hope the direct communication from the President has improved the process for keeping all members up to date. This year we would like to thank Hazel Choules and Sam Carroll for co-ordinating this BHS event and the production of this booklet.

Finally I would like to finish by thanking you all for attending what will prove to be a scientifically and politically, challenging Annual Scientific Meeting and again in particular Stephen who has coped with the constant pressure of the presidential post and has orchestrated an excellent conference here in Newport.

Dominic Meek

Editorial Secretary, BHS
March 2020

BHS Executive Committee 2019/20

President:	**Stephen Jones**
President Elect:	**Jonathan Howell**
Vice President:	**Andrew Hamer**
Immediate Past President:	**Andrew Manktelow**
Hon. Treasurer:	**Anil Gambhir**
Hon. Secretary:	**Matt Wilson**
Editorial Secretary:	**Dominic Meek**
Web Master:	**Nicholas Wardle**
Member at Large:	**Timothy Board**
Registry Representative:	**Vikas Khanduja**

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5th March 2020
Workshop Location: Room 2D
09:00 - 09:45 / 10:00 - 10:45

AGENDA

Chairman
Professor J. Skinner
Welcome and overview

Faculty
Professor G. Blunn
Developing next generation fixation

Mr. D. Whitwell
The role for massive endo-prostheses

Mr. Ben Kendrick
Case review & demo

Mr. M Parry
Combating infection
in complex hip surgery

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1. AOANJRR 20th Annual Report 2019. http://www.aoa.org.au
2. NJR 16th Annual Report, 2019. http://www.njrreports.org.uk
3. Latest ODEP ratings can be found at www.odep.org.uk

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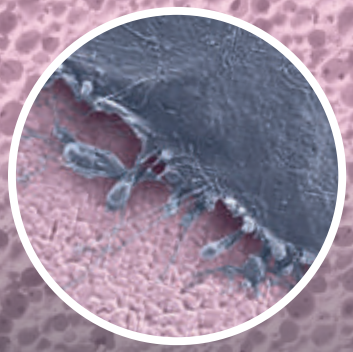

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BHS Programme

BRITISH HIP SOCIETY

Annual Scientific Meeting 2020
Newport, ICC Wales

WEDNESDAY 4th MARCH

Registration from 08.30hrs in the main Atrium (Ground Floor) - Tea & coffee served in Meeting Rooms 2 & 3 (1st Floor)

08.00 – 09.30	**BHS EXECUTIVE MEETING** BHS Officers only	*Room 5*
10.00 – 10.10	**WELCOME TO ICC Wales**	*Main Auditorium*
	Mr Stephen A Jones - President, British Hip Society	
10.10– 11.10	**HOT TOPICS in Hip Surgery 2020**	
	Chair: Fares Haddad	
10.10 – 10.22	**Dual mobility – indications, uses and pitfalls**	**Stephen A Jones**
10.22 – 10.34	**Networked care – are there any concerns?**	**Andrew RJ Manktelow**
10.34 – 10.46	**Anterior approach – another fad or integral to training program**	**Fares S Haddad**
10.46 – 10.58	**Enhanced technology in THA**	**John Skinner**
10.58 – 11.10	**Discussion**	

11.15 – 12.45 **PODIUM PRESENTATIONS OF SCIENTIFIC PAPERS: NON-ARTHROPLASTY HIP AND TRAUMA**

Chairs: Ajay Malviya & Tony Andrade

Ten Papers (5 minute presentations + 2 ½ Minutes Q&A)

005 - The Development of Cam Morphology during Adolescence: A Longitudinal Cohort of Elite Footballers and Controls
Scott Fernquest[1], Antony Palmer[1], Mo Gimpel[2], Richard Birchall[2], John Broomfield[1], Thamidu Wedatilake[2], Hendrik Dijkstra[3], Thomas Lloyd[1], Claudio Pereira[1], Simon Newman[1], Andrew Carr[1], Sion Glyn-Jones[1]
[1]University of Oxford, Oxford, UK. [2]Southampton Football Club, Southampton, UK. [3]Qatar Orthopaedic and Sports Medicine Hospital, Doha, Qatar

175 - Comparison of Outcomes of Arthroscopic Acetabular Labral Repair and Debridement: A study using the UK Non-Arthroplasty Hip Registry (NAHR) dataset
Richard Holleyman[1], Yuichi Kuroda[2], Masayoshi Saito[2], Ajay Malviya[3], Vikas Khanduja[2]
[1]Northern Deanery, Newcastle, UK. [2]Young Adult Hip Service, Addenbrooke's - Cambridge University Hospital, Cambridge, UK. [3]Newcastle University, Newcastle, UK

030 - Hip hemiarthroplasty dislocation: a multi-centre risk factor analysis
Gareth Chan[1], Rahmeh Aladwan[1], Samantha Hook[1], Benedict Rogers[2], David Ricketts[2], Philip Stott[2]
[1]St. Richard's Hospital, Chichester, UK. [2]Royal Sussex County Hospital, Brighton, UK

082 - Do acetabular parameters measured on two-dimensional imaging correlate with CT, and can lateral centre edge angle predict femoral head coverage?
Saif Salih[1,2], George Grammatopoulos[3,2], Johan Witt[2]
[1]Sheffield Teaching Hospitals, Sheffield, UK. [2]University College London Hospital, London, UK. [3]The Ottawa Hospital, Ottawa, Canada

156 - BETTER SURVIVAL AT 5 YEARS – Arthroscopic Vs. Open Debridement Hip surgery, a case-controlled study
Christopher J Marusza[1], Mohamed Lazizi[1], Lucy MS Hoade[2], Gavin E Bartlett[1], Edwin D Fern[1], Mark R Norton[1], Rory G Middleton[1]
[1]Royal Cornwall Hospitals NHS Trust, Truro, UK. [2]University of Exeter, Exeter, UK

136 - Data-driven Improvement in Trauma & Orthopaedics: National Registry Programmes and Experience from the Scottish Hip Fracture Audit
Andrew Hall[1,2], Graeme Holt[3,2]
[1]Royal Infirmary of Edinburgh, Edinburgh, UK. [2]Scottish Hip Fracture Audit, Edinburgh, UK. [3]University Hospital Crosshouse, Kilmarnock, UK

188 - Does BMI affect outcome after hip arthroscopy? A study using the UK Non-Arthroplasty Hip Registry dataset
Richard Holleyman[1], Yuichi Kuroda[2], Masayoshi Saito[2], Ajay Malviya[1], Vikas Khanduja[2]
[1]Northumbria Healthcare, Newcastle, UK. [2]Addenbrooke's - Cambridge University Hospital, Cambridge, UK

189 - Comparison of outcomes of Arthroscopic Chondral Procedure for the Articular Cartilage Injury: A study using the UK Non-Arthroplasty Hip Registry dataset
Richard Holleyman[1], Yuichi Kuroda[2], Masayoshi Saito[2], Vikas Khanduja[2], Ajay Malviya[1]
[1]Northumbria Healthcare, Newcastle, UK. [2]Addenbrooke's - Cambridge University Hospital, Cambridge, UK

145 - Do High Volume Hip Fracture Units Perform Better? – an analysis of outcome measures from the National Hip Fracture Database
Chika Edward Uzoigwe[1], Ahmed M E E Mostafa[2], Rory George Middleton[2]
[1]Leicester Royal Infirmary, Leicester, UK. [2]Royal Cornwall Hospital, Truro, UK

169 - Outcomes of Arthroscopic Intervention in Patients with Femoroacetabular Impingement Secondary to Slipped Capital Femoral Epiphysis: A Systematic Review
Masayoshi Saito, Yuichi Kuroda, Vikas Khanduja
Young Adult Hip Service, Addenbrooke's - Cambridge University Hospital, Cambridge, UK

12.45 – 13.30	**LUNCH & REFRESHMENTS** **POSTER VIEWING**	*Meeting Rooms 2 & 3/Lounge 2nd Level* *Lounge 2nd Level*
13.30 – 14.30	**TOPIC IN FOCUS I**	*Main Auditorium*

Is day case hip and knee replacement surgery achievable in the NHS?

Northumbria Healthcare NHS Foundation Trust

Chair: Tim Petheram

Laying the foundation of enhanced recovery	**Mike Reed**
Nurse Practitioner - How to manage the patients post-op	**Hilary Young**
Short patient video	
Launching day case joint replacement and how the data looks	**Paul F Partington**

14.30 – 14.45	**NAHR 5Th YEAR REPORT**	**Vikas Khanduja**
14.45 – 15.15	**TEA & COFFEE** **POSTER VIEWING**	*Meeting Room 2 / Lounge 2nd Level* *Lounge 2nd Level*
15.10 – 15.15	*TRANSFER BACK TO MAIN AUDITORIUM*	
15.15– 16.45	**PODIUM PRESENTATIONS OF SCIENTIFIC PAPERS: TOTAL HIP ARTHROPLASTY I**	

Chairs: Sanjeev Patil & Callum McBryde

Twelve Papers (5 Minutes Presentation + 2 ½ Minutes Q&A)

135 - Oral tranexamic acid for an additional 24 hours post-operatively versus a single pre-operative intravenous dose at reducing blood loss for total hip arthroplasty - results of a randomised controlled trial (TRAC-24)

Paul Magill[1], Janet Hill[1], Leeann Bryce[1], Al Dorman[1], Rosie Hogg[1], Christina Campbell[2], Gary Benson[3], David Beverland[1]
[1]Primary joint unit, Belfast, UK. [2]Northern Ireland Clinical Trials Unit, Belfast, UK. [3]Regional Haematology service, Belfast City Hospital, Belfast, UK

098 – The effect of polyethylene manufacturing modifications on the survival of uncemented and hybrid Total Hip Replacements. An analysis of data from the National Joint Registry of England, Wales, Northern Ireland and the Isle of Man

Edward Davis, Joseph Pagkalos, Branko Kopjar
The Royal Orthopaedic Hospital NHS Foundation Trust, Birmingham, UK

147 – Evidence-based follow-up recommendations following Primary Hip and Knee replacement (UK SAFE)

Martin Stone[1,2], Lindsay Smith[3], Sarah Kingsbury[4,2], Carolyn Czoski-Murray[5], Andy Judge[6,7], Rafael Pinedo-Villanueva[8], Robert West[5], Judy Wright[5], Chris Smith[5], Nigel Arden[8], Philip Conaghan[4,9]
[1]Chapel Allerton Hospital, Leeds, UK. [2]NUHR, LMBRC, Leeds, UK. [3]Weston Area Health Authority, Weston-Super-Mare, UK. [4]LIRMM, Leeds, UK. [5]Leeds Institute of Health Sciences, Leeds, UK. [6]MSK Research Unit, Bristol, UK. [7]MRC Lifecourse Epidemiology Unit, Southampton, UK. [8]Nuffield Orthopaedic and Rheumatological Sciences, Oxford, UK. [9]NIHR, Leeds Biomedical Research Centre, Leeds, UK

154 – Are the survival estimates of individual total hip replacement components good indicators of overall construct survival? Findings from the National Joint Registry for England, Wales, Northern Ireland and the Isle of Man (NJR)

Jonathan Evans[1], Ashley Blom[1], Emily Herrett[2], Adrian Sayers[1], Michael Whitehouse[1]
[1]University of Bristol, Bristol, UK. [2]London School of Hygiene and Tropical Medicine, London, UK

079 – Ceramic bearings are associated with a significantly reduced revision rate in Primary Hip Arthroplasty: a study using the NJR dataset

Richard Holleyman[1], Rebecca Critchley[1], Simon Jameson[2], James Mason[3], Mike Reed[1], Ajay Malviya[1]
[1]Northumbria Healthcare, Newcastle upon Tyne, UK. [2]James Cook University Hospital, Middlesborough, UK. [3]Warwick University, Warwick, UK

158 – Long-term prediction of total hip replacement survival using data from the Exeter hip database and the National Joint Registry for England, Wales, Northern Ireland and the Isle of Man (NJR)

Jonathan Evans[1], Ashley Blom[1], Jonathan Howell[2], John Timperley[2], Matthew Wilson[2], Sarah Whitehouse[3], Adrian Sayers[1], Michael Whitehouse[1]
[1]University of Bristol, Bristol, UK. [2]Princess Elizabeth Orthopaedic Centre, Exeter, UK. [3]University of Queensland, Brisbane, Australia

010 – How can patients with mobile hips and stiff lumbar spines be identified prior to total hip arthroplasty? – A Prospective, Diagnostic Cohort Study

Moritz Innmann[1,2], Christian Merle[1], Philippe Phan[2], Paul Beaulé[2], George Grammatopoulos[2]
[1]Department of Orthopaedics and Trauma Surgery, University of Heidelberg, Heidelberg, Germany. [2]Division of Orthopaedic Surgery, The Ottawa Hospital, Ottawa, Canada

070 - Is aspirin as effective as the newer direct oral anticoagulants for venous thromboembolism prophylaxis following total hip replacement? An analysis from the National Joint Registry for England, Wales, Northern Ireland and the Isle of Man

Gulraj Matharu[1], Cesar Garriga[2], Michael Whitehouse[1], Amar Rangan[3], Andrew Judge[1]
[1]Musculoskeletal Research Unit, Bristol Medical School, University of Bristol, Level 1 Learning and Research Building, Southmead Hospital, Bristol, UK. [2]Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford, Nuffield Orthopaedic Centre, Oxford, UK. [3]Department of Health Sciences, University of York, Seebohm Rowntree Building, Heslington, York, UK

013 – Does spinopelvic mobility change following total hip arthroplasty? – A Prospective, Diagnostic Cohort Study at 1 -year post-THA

Moritz Innmann[1,2], Franz Reichel[1], Bibiane Schaper[1], Christian Merle[1], Paul Beaulé[2], George Grammatopoulos[2]
[1]Department of Orthopaedics and Trauma Surgery, University of Heidelberg, Heidelberg, Germany. [2]Division of Orthopaedic Surgery, The Ottawa Hospital, Ottawa, Canada

065 – The Impact of Surgeon Training Status on the Survival and Revision Rate of Hip and Knee Replacements. A Systematic Review and Meta-analysis

Tim Fowler[1], Alex Aquilina[1], Ashley Blom[1,2], Adrian Sayers[1], Michael Whitehouse[1,2]
[1]Musculoskeletal Research Unit, Southmead Hospital, Bristol, UK. [2]National Institute for Health Research Bristol Biomedical Research Centre, Bristol, UK

092 – How much does a Medical and Healthcare Products Regulatory Agency (MHRA) medical device alert for metal-on-metal hip arthroplasty patients really cost?

Rajpal Nandra[1], Usman Ahmed[1], Fiona Berryman[1], Lesley Brash[1], David Dunlop[1], Gulraj Matharu[1,2]
[1]The Royal Orthopaedic Hospital, Birmingham, UK. [2]Musculoskeletal Research Unit, Translational Health Sciences, Bristol Medical School, 1st Floor Learning & Research Building, Southmead Hospital, Bristol, UK

093 - Increased peri-trochanteric fat depth is not associated with increased risk of early complication following total hip arthroplasty

Alistair Mayne, Roslyn Cassidy, Paul Magill, Owen Diamond, David Beverland
Musgrave Park Hospital, Belfast, UK

16.45- 17.55	**Emerging Hip Surgeons Forum**	*Main Auditorium*
	Chairs: Ben Burston, Chris Gooding	
	Fares Haddad, Adrian Taylor and Dan Howcroft	
16.45- 17.55	**Wealth Management/Pensions - Chase de Vere**	*Meeting Room 3*
18.00 - 19.20	**ANNUAL GENERAL MEETING (BHS Members only)**	*Main Auditorium*

BRITISH HIP SOCIETY

Annual Scientific Meeting 2020
Newport, ICC Wales

THURSDAY 5th MARCH

Registration from 07.15hrs in the main Atrium (Ground Floor) - Tea & coffee served in the Exhibition Area Hall 1 (1st Floor)

08.00 - 08.05 **Welcome to Day 2** **Stephen A Jones**

08.05 – 08.55 **"Every day is a school day"**

Key lessons learned from clinical cases from senior surgeons
Chair: Mr Stephen A Jones
Phil Mitchell – London
Jim Holland - Newcastle
Marcus Bankes - London
Andrew Manktelow - Nottingham

08.55 – 09.00 *MOVE TO INDUSTRY SEMINARS*

09.00 – 09.45 **INDUSTRY SEMINAR: A**

ROOM 2D: **Adler Ortho**
'**Changing the face of limb salvage surgery: Advanced fixation in complex hip surgery'**

ROOM 2E: **DePuy Synthes**
'Anterior Advantage: Efficient DAA Hip Surgery'

ROOM 3D**: Lima Orthopaedics UK Ltd**
'Complex acetabular reconstruction: Applying tomorrow's technology, today... digital solutions delivered by you.'

ROOM 3E: **Materialise**
'**Personalisation in Orthopaedics: Where are we heading?'**

09.45 – 10.15 **TEA & COFFEE** *Exhibition Area Hall 1*

10.15 – 11.00 **INDUSTRY SEMINAR: B**

ROOM 2D: **Adler Ortho**
'**Changing the face of limb salvage surgery: Advanced fixation in complex hip surgery'**

ROOM 2E: **DePuy Synthes**
'Anterior Advantage: Efficient DAA Hip Surgery'

ROOM 3D**: Lima Orthopaedics UK Ltd**
'Complex acetabular reconstruction: Applying tomorrow's technology, today... digital solutions delivered by you.'

ROOM 3E: **Materialise**
'**Personalisation in Orthopaedics: Where are we heading?'**

11.00 – 11.05 *TRANSFER BACK TO MAIN AUDITORIUM*

11.05 – 12.05 **TOPIC IN FOCUS II:**

Non-Arthroplasty Hip Surgery

Chair: Vikas Khanduja
History of a Young Adult with Hip Pain **Marcus Bankes**
Examination of a Young Adult with Hip Pain **Vikas Khanduja**
Diagnostic Pathway for a Young Adult with Hip Pain **Callum McBryde**

	Assessing the Plain Radiograph	**Matt Wilson**
	Assessing the MRI, CT and Ultrasound	**Ajay Malviya**
	The Diagnostic Hip Injection & Further Investigations	**Jon Conroy**
	Illustrative Cases	**Tony Andrade**
	Discussion	**Tim Board**
12.05 – 12.20	**KEY MESSAGES FROM THE POSTER BOARDS**	**Nick Wardle**
12.20 – 12.30	**Updates BAJIR (Bone and Joint Infection Registry)**	**Tim Petheram**
12.30 - 13.20	**LUNCH & REFRESHMENTS**	*Exhibition Area Hall 1*
	POSTER VIEWING	*Lounge 2nd Level*
13.20 – 13.30	**PRESIDENTIAL REVIEW OF THE YEAR**	**Stephen A Jones**
13.30 – 14.00	**PRESIDENTIAL GUEST LECTURE:**	
	'Instability after Hip Arthroplasty: A Pluralistic Approach'	**Dr Douglas Padgett** Hospital for Special Surgery, New York
14.00 – 15.10	**TOPIC IN FOCUS III: REVISION ARTHROPLASTY NETWORKS**	
	Chairs: Jonathan Howell & Andy Hamer	
	Introduction and scene setting	**Jonathan Howell**
	Knee Arthroplasty Networks: Where has BASK been, where is this going?	**Andrew Price**
	A regional perspective on NJR data, network organisation and some of the challenges	**Simon Jamieson**
	The BOA view on Complex Arthroplasty Networks	**John Skinner**
	Lessons Learned from A Regional Network.	**Andrew Manktelow**
	The British Hip Society plan	**Stephen A Jones**
15.10 – 15-30	**TEA & COFFEE**	*Exhibition Area Hall 1*
	POSTER VIEWING	*Lounge 2nd Level*
15.30 – 16.10	**PODIUM PRESENTATIONS OF SCIENTIFIC PAPERS: TOTAL HIP ARTHROPLASTY II**	

8 Papers (5 Minutes Presentation + 2 ½ Minutes Q&A)

Chairs: David Sochart & Marcus Bankes

099 - The effect of bearing surface and head size on the survival of uncemented and hybrid Total Hip Replacements. An analysis of data from the National Joint Registry of England, Wales, Northern Ireland and the Isle of Man.
Edward Davis[1], Joseph Pagkalos[1], Branko Kopjar[2]
[1]The Royal Orthopaedic Hospital NHS Foundation Trust, Birmingham, UK. [2]The Royal Orthopaedic Hospital NHS Foundation Trust, Birmingham, UK

107 - The uncertainty of femoral anteversion in THR.
Anna Di Laura[1], Johann Henckel[1], Martin Belzunce[1], Harry Hothi[1], Alister Hart[1,2]
[1]Royal National Orthopaedic Hospital, London, UK. [2]UCL, London, UK

140 - Managing patient expectations and recovery after a Total Hip Replacement.
Sarkhell Radha[1], Irrum Afzal[1], Richard Field[2]
[1]South West London Elective Orthopaedic Centre, London, UK. [2]South West London Elective Orthaopedic Centre, London, UK

006 - Antibiotic prophylaxis for urinary catheter manipulation following arthroplasty: a systematic review.
Tobias Roberts[1], Toby Smith[2], Henry Simon[3], Charles Goodmaker[4], Caroline Hing[5]
[1]Royal United Hospitals NHS Trust, Bath, UK. [2]Nuffield Department of Orthopaedics, Rheumatology and MSK Sciences, University of Oxford, Oxford, UK. [3]Chelsea and Westminster Hospitals NHS Trust, London, UK. [4]Salford Royal NHS Trust, Salford, UK. [5]St. George's University Hospitals NHS Foundation Trust, London, UK

016 - Are Lipped Polyethylene Liners Associated with Increased Revision Rates in Patients with Uncemented Acetabular Components? An Observational Cohort Study
Michael Wyatt[1], Michael Whitehouse[2], David Kieser[3], Chris Frampton[4], Gary Hooper[3]
[1]Massey University, Palmerston North, New Zealand. [2]University of Bristol, Bristol, UK. [3]Department of Orthopaedic surgery and musculoskeletal medicine, University of Otago, Christchurch, New Zealand. [4]Department of Orthopaedic Surgery and Musculoskeletal Medicine, University of Otago, Christchurch, New Zealand

021 - Capsular Resection Versus Capsular Repair in Direct Anterior Approach For Total Hip Arthroplasty: A Prospective Randomized Control Trial.
Kristoff Corten, Jens Vanbiervliet, Frans-Jozef Vandeputte
Ziekenhuis Oost-Limburg, Genk, Belgium

012 - How does spinopelvic mobility and sagittal functional cup orientation affect patient reported outcome 1 year after THA? - A prospective diagnostic cohort study
Moritz Innmann[1,2], Franz Reichel[1], Bibiane Schaper[1], Christian Merle[1], Paul Beaulé[2], George Grammatopoulos[2]
[1]Department of Orthopaedics and Trauma Surgery, University of Heidelberg, Heidelberg, Germany. [2]Division of Orthopaedic Surgery, The Ottawa Hospital, Ottawa, Canada

020 - What Can We Expect Following an Anterior THA? A Validation Study of an Artificial Intelligence Algorithm to Monitor Adverse Events in a High-Volume, Non-Academic Setting.
Kristoff Corten, Casper Van De Meulebroucke
Ziekenhuis Oost-Limburg, Genk, Belgium

16.10 – 16.15 *MOVE TO INDUSTRY SEMINARS*

16.15 - 17.00 **INDUSTRY SEMINAR: C**

ROOM 2D: **Smith & Nephew**
'For Outcomes that Outperform – the Solution is Black and White[1]
1. National Joint Registry for England, Wales and Northern Ireland: POLARSTEM cementless (Oxinium/XLPE/R3 cup) implant summary report.'

ROOM 2E: **Stryker**
'Primary THR Past, present, future'

ROOM 3D: **Symbios UK Ltd**
'Customised total hip replacement - A solution for when off the shelf will just not do'

ROOM 3E: **Zimmer Biomet**
'Periprosthetic Joint Infection – Putting all of the pieces in place'

17.00 - 17.15 *TURNOVER BETWEEN INDUSTRY SEMINARS*

17.15 - 18.00 **<u>INDUSTRY SEMINAR:</u> D**

ROOM 2D: **Smith & Nephew**
'**For Outcomes that Outperform – the Solution is Black and White**[1]
1. National Joint Registry for England, Wales and Northern Ireland: POLARSTEM cementless (Oxinium/XLPE/R3 cup) implant summary report.'

ROOM 2E: **Stryker**
'Primary THR Past, present, future'

ROOM 3D: **Symbios UK Ltd**
'Customised total hip replacement - A solution for when off the shelf will just not do'

ROOM 3E: **Zimmer Biomet**
'Periprosthetic Joint Infection – Putting all of the pieces in place'

18.00 – 21.00 **BHS WALKING BUFFET & DRINKS** *Exhibition Area Hall 1*

BRITISH HIP SOCIETY

Annual Scientific Meeting 2020
Newport, ICC Wales

FRIDAY 6th MARCH

Registration from 07.15hrs in the main Atrium (Ground Floor) - Tea & coffee served in Meeting Room 3 and Lounge 2nd Level

08.00 – 08.05 **Welcome to Day 3** **Mr Jonathan Howell**

08.05 – 08.55 **BHS Research**

Chair: Prof Tim Board & Jonathan Howell

What the NIHR has to offer hip researchers	**Sion Glyn Jones**
Equipoise in surgical trials – what is it and why is it important	**Mike Whitehouse**
Collaboration is the future for surgical trials	**Vikas Khanduja**
Research collaboratives and Associate Principal Investigators -How trainees can get involved in research trials	**Rory Morrison**

Discussion

08.55 *Transfer of Trainees only to Trainee* ***Instructional Course*** *Meeting Room 2*

08.55 – 10.30 **PODIUM PRESENTATIONS OF SCIENTIFIC PAPERS: BASIC SCIENCE AND REVISION**

Chairs: Simon Buckley & Anil Gambhir

12 Papers (5 Minutes Presentation + 2 ½ Minutes Q&A)

009 - Are there differences in spinopelvic mobility between patients with end-stage hip osteoarthritis awaiting total hip arthroplasty and a control group? – A prospective diagnostic case-controlled cohort study
Moritz Innmann[1,2], Christian Merle[1], Philippe Phan[2], Paul Beaulé[2], George Grammatopoulos[2]
[1]Department of Orthopaedics and Trauma Surgery, University of Heidelberg, Heidelberg, Germany. [2]Division of Orthopaedic Surgery, The Ottawa Hospital, Ottawa, Canada

117 - *What is the effect of a marathon on the pelvis and hips: an MRI study of 44 runners*
Laura-Maria Horga[1,2], Johann Henckel[2], Anastasia Fotiadou[2], Anna Di Laura[2], Anna Hirschmann[3], Alister Hart[1,2]
[1]Institute of Orthopaedics and Musculoskeletal Science, University College London, London, UK. [2]Royal National Orthopaedic Hospital, London, UK. [3]Department of Radiology and Nuclear Medicine, University Hospital Basel, Basel, Switzerland

047 - Hearing Evaluation of Arthroplasty Surgeons: results from the HEARS study
Jonathan Palmer[1], Christopher Wilson[2], Daniel Wilson[3], Simon Garrett[2]
[1]Salisbury District Hospital, Salisbury, UK. [2]Dorset County Hospital, Dorchester, UK. [3]Royal Adelaide Hospital, Adelaide, Australia

071 – The effect of surgical approach in total hip replacement on outcomes. An analysis of 723,904 elective operations from the National Joint Registry for England, Wales, Northern Ireland and the Isle of Man
Ashley Blom[1], Linda Hunt[1], Gulraj Matharu[1], Michael Reed[2], Michael Whitehouse[1]
[1]Musculoskeletal Research Unit, Translational Health Sciences, Bristol Medical School, 1st Floor Learning & Research Building, Southmead Hospital, Bristol, UK. [2]Northumbria Healthcare NHS Foundation Trust, Department of Trauma and Orthopaedics, Wansbeck General Hospital, Woodhorn Lane, Northumbria, UK

066 - The role of Dalbavancin in reducing length of hospital stay following treatment for prosthetic joint infection of the hip and knee
Mark Higgins, Saif Salih, Deepu Bhaskar, Simon Buckley, Robert Townsend, Mike Davies
Sheffield University Hospitals NHS Trust, Sheffield, UK

128 - Association of Pelvic Incidence and Acetabular Version Using 3D Reconstructed CT Scans
Zachary DaVries[1], Saif Salih[2,3], Andrew Speirs[4], Johanna Dobransky[1], Paul Beaule[1], George Grammatopoulos[1], Johan Witt[3]
[1]The Ottawa Hospital, Ottawa, Canada. [2]Sheffield Teaching Hospitals, Sheffield, UK. [3]University College Hospital London, London, UK. [4]Carelton University, Ottawa, Canada

116 - Diagnosis of prosthetic joint infection: sonication of joint fluid from removed hip and knee prosthesis versus traditional tissue culture.
Gosia Poznalska, Cressida Auckland, Sadie Heddon, Jonathan Phillips, Matthew Wilson
Royal Devon & Exeter NHS Foundation Trust, Exeter, UK

067 - Patient specific 3D printed Drill guides improve Accuracy of Cement Plug Extraction in Revision THA
Kris Govaers[1], Tim Philips[2], Ansofie Vandekelft[2]
[1]Sint Blasius Hospital, Dendermonde, Belgium. [2]Ghent University Hospital, Ghent, Belgium

119 - Retrieval Analysis of Dissociated Polyethylene Liner in Pinnacle Acetabular Components
Ahmed El-Bakoury[1], Asif Parkar[2], James Powell[3,4]
[1]University Hospitals Plymouth NHS Trust, Plymouth, UK. [2]Queens Hospital, London, UK. [3]University of Calgary, Calgary, Canada. [4]Canadian Arthroplasty Association, Westmount, Canada

124 - The role of 14-day extended culture of aspirates in the diagnosis of prosthetic joint infections of the hip and knee
Deepu Bhaskar, Mark Higgins, Daniel Mosby, Rob Townsend, Tim Harrison
Sheffield Teaching Hospitals NHS Trust, Sheffield, UK

176 - Does Histological Tissue Analysis Influence Management in Revision Total Hip Replacement: The Experience of a Specialist Orthopaedic Centre in the United Kingdom
Tim Holland[1], Deepathika Jeyaraman[2], Murina David[3], Edward Davis[1,2]
[1]Royal Orthopaedic Hospital, Birmingham, UK. [2]University of Birmingham, Birmingham, UK. [3]Queen Elizabeth Hospital Birmingham, Birmingham, UK

180 - Polymethylmethacrylate bone cement: Effect of Ropivacaine local anaesthetic on mechanical properties
Naeil Lotfi[1], Erik Hughes[2,3], Robert McCulloch[4], Christopher Horner[5], Duncan Shepherd[5], Liam Grover[5], Peter Nightingale[6], Edward Davis[1,5]
[1]Royal Orthopaedic Hospital, Birmingham, UK. [2]School of Chemical Engineering, University of Birmingham, Birmingham, UK. [3]NIHR Surgical Reconstruction and Microbiology Research Centre, Queen Elizabeth Hospital, Birmingham, Birmingham, UK. [4]Milton Keynes Hospital, Milton Keynes, UK. [5]University of Birmingham, Birmingham, UK. [6]Institute of Translational Medicine, Queen Elizabeth Hospital Birmingham, Birmingham, UK

10.30 – 10.50	**TEA & COFFEE** **POSTER VIEWING**	*Meeting Room 3* **/** *Lounge 2nd Level* *Lounge 2nd Level*
10.50 – 12.00	**TOPIC IN FOCUS IV: Periprosthetic Joint Infection**	*Main Auditorium*
	Chairs: Matt Wilson & Dominic Meek	
10.50 – 11.00	**Culture Negative PJI diagnostic algorithm and management**	**Pedro Foguet**
11.00 – 11.10	**Trials and tribulations of managing fungal infections in THA?**	**Phil Mitchell**
11.10 – 11.20	**Update from micro and PJI**	**Harriet Hughes**
11.20 – 11.30	**Discussion**	
11.30 – 11.50	**The INFORM Programme**	**Michael Whitehouse** **Prof. Ashley Blom**

11.50 – 12.00	**Discussion**	
12.00 – 12.05	**PRESIDENTIAL HANDOVER**	**Stephen A Jones**
12.05 – 12.20	**INCOMING PRESIDENTIAL ADDRESS**	**Jonathan Howell**
12.20 – 12.40	**REVIEW AND PRESENTATION OF PRIZES** McKee Prize for Best Podium Presentation BJJ Prize for Translational Research Best Poster Presidents Medical Student Prize	**Matt Wilson**
12.40 - 13.15	**LUNCH & REFRESHMENTS**	*Meeting Room 3*

FRIDAY 6th MARCH

Day 3 - Instructional Course Program

08.55 – 16.00	**BHS Instructional Program**	*Meeting Room 2*

Day 3 - Research Session

13.15 – 16.00	**INFORM Group – Prof Ashley Blom**	*Main Auditorium*

Exhibition

BRITISH HIP SOCIETY

ICC WALES

4-6 March 2020

Thursday 5th March - Exhibitors & Catering

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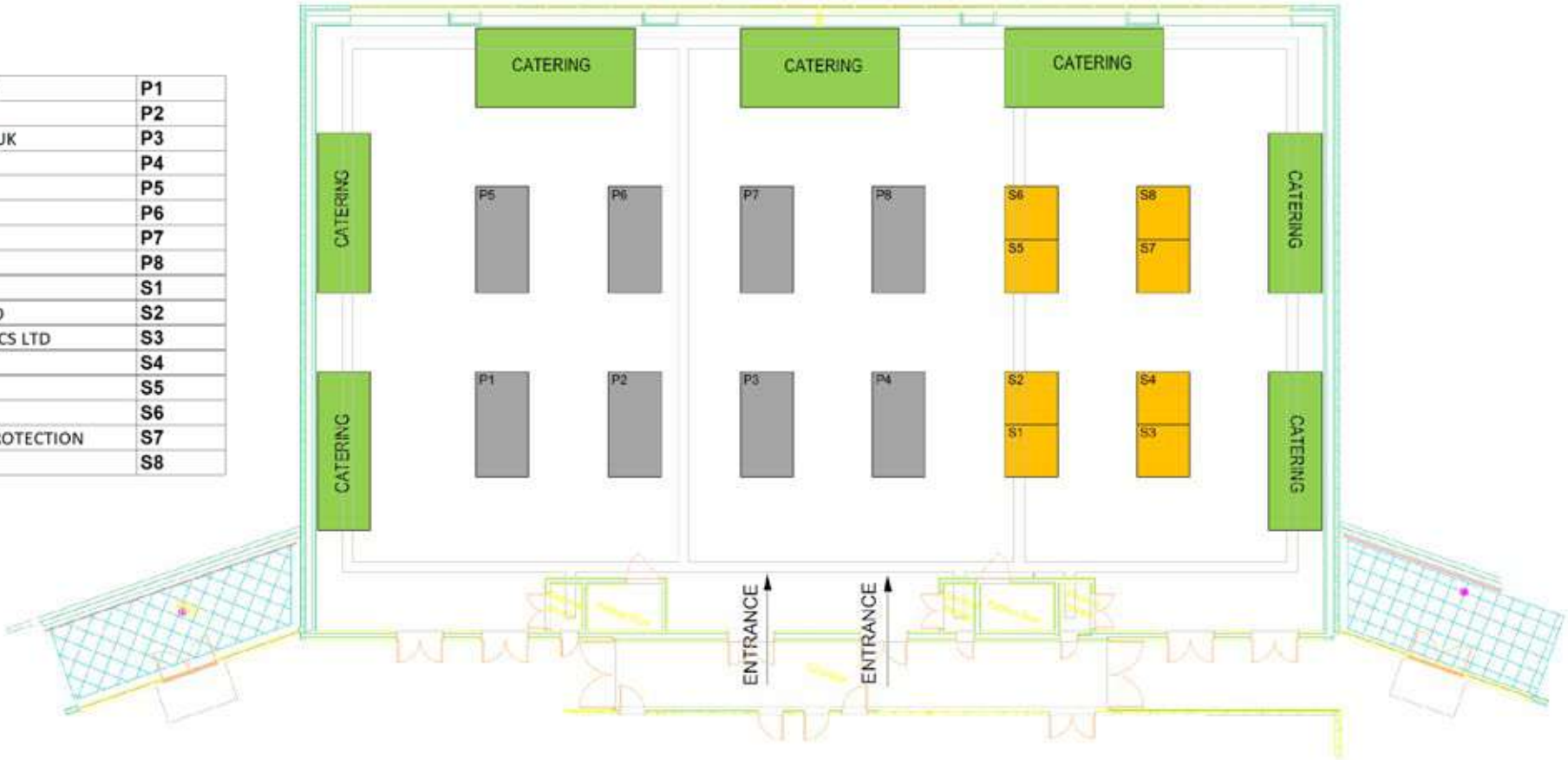

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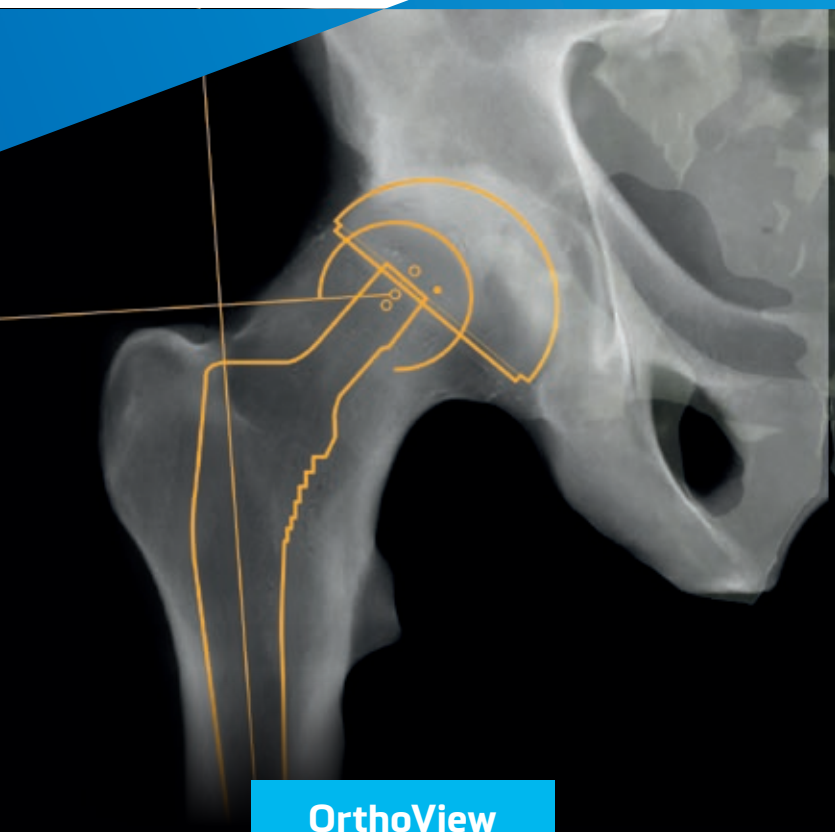
9:00 to 9:45 & 10:00 to 10:45

Place: Room 3E



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[1] Kutzner K.P., Kovacevic M.P., Roeder C., Rehbein P., et al. Reconstruction of femoro-acetabular offsets using a short-stem. Int Orthop, 2015. 39(7): p. 1269-75.
[2] Wyatt M., Weidner J., Pfluger D., Beck M. The RM Pressfit vitamys: 5-year Swiss experience of the first 100 cups. Hip Int, 2017: p. 0.

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Podium Papers

Wednesday 4th March: 11.15 – 12.45

NON ARTHROPLASTY HIP AND TRAUMA / Chairs: Ajay Malviya & Tony Andrade

005 THE DEVELOPMENT OF CAM MORPHOLOGY DURING ADOLESCENCE: A LONGITUDINAL COHORT OF ELITE FOOTBALLERS AND CONTROLS

Scott Fernquest[1], Antony Palmer[1], Mo Gimpel[2], Richard Birchall[2], John Broomfield[1], Thamidu Wedatilake[2], Hendrik Dijkstra[3], Thomas Lloyd[1], Claudio Pereira[1], Simon Newman[1], Andrew Carr[1], Sion Glyn-Jones[1]

[1]University of Oxford, Oxford, UK. [2]Southampton Football Club, Southampton, UK. [3]Qatar Orthopaedic and Sports Medicine Hospital, Doha, Qatar

Background: Cam morphology develops during adolescence and predisposes individuals to future hip pain and osteoarthritis. An improved understanding of cam development is required to determine whether the process is modifiable.

Hypothesis/Purpose: The aim of this study was to characterise the risk factors, timing, and pathogenesis of cam formation.

Study Design: Longitudinal prospective observational cohort study.

Methods: Longitudinal observational cohort study over three years of individuals from football club academies and an age-matched control population, aged 9-18 years at baseline. Assessments include questionnaires, clinical examination, and MRI of both hips. Alpha angle and epiphyseal extension were measured on radial images.

Results: Cohort comprised male academy footballers (121 at baseline and 78 at follow-up) and male and female controls (107 at baseline and 71 at follow-up).Mean change in cartilage alpha angle was 12.4° (SD 8.4) for footballers, 7.3° (SD 6.0) for male controls and 4.0° (SD 4.1) for female controls. A positive correlation was found between Physical Activity Questionnaire Score and change in cartilage alpha angle (coefficient 0.787, p=<0.001). The greatest change in cartilage alpha angle occurred in individuals aged 11-12 years at baseline, with no significant change after 14 years of age. A positive correlation between mean cartilage alpha angle and lateral epiphyseal extension was observed (r^2= 0.294, p=0.029).

Conclusions:

Males undertaking intense sporting activity during adolescence at greatest risk of developing cam morphology, but there is no significant change in hip morphology after 14 years of age. The findings are consistent with physiological adaptation and epiphyseal extension in response to hip loading during skeletal immaturity.

175 COMPARISON OF OUTCOMES OF ARTHROSCOPIC ACETABULAR LABRAL REPAIR AND DEBRIDEMENT: A STUDY USING THE UK NON ARTHROPLASTY HIP REGISTRY (NAHR) DATASET

Richard Holleyman[1], Yuichi Kuroda[2], Masayoshi Saito[2], Ajay Malviya[3], Vikas Khanduja[2]

[1]Northern Deanery, Newcastle, UK. [2]Young Adult Hip Service, Addenbrooke's - Cambridge University Hospital, Cambridge, UK. [3]Newcastle University, Newcastle, UK

Background Hip arthroscopy is effective in the management of acetabular labral tears. Although some studies have shown better outcomes with labral repair and preservation compared with debridement, there is a no comparative, multicentre, pragmatic study assessing the same. The UK Non-arthroplasty hip registry (NAHR), which is a national register, monitors the efficacy of hip preservation surgery via PROMs. The purpose of this study, therefore, was to compare the outcomes of acetabular labral repair and debridement using the NAHR dataset.

Methods A total of 4131 hips that had undergone arthroscopic labral repair or debridement between January 2012 and December 2015 were identified on the NAHR database. They were divided into the repair group and the debridement group. Patient-reported outcome measures (PROMs) which included Euro Quol 5D-5L and the International Hip Outcome Tool 12 (iHOT-12), were compared between groups pre-operatively and 6 months and 1 year post-operatively.

Results There were 1911 hips (1200 females) with a mean age of 35.2 years in labral repair group and 2220 hips (1234 females) with an average age of 36.7 years in labral debridement group. At 6 months and 1-year post-operatively, PROMs were significantly improved (P < .01) for both groups compared with pre-operative scores. However, there were no significant difference found between both the groups in all PROMs. There was also no significant different in the percentage achieving MCID and substantial clinical benefit of iHOT-12 at each stage of follow-up.

Conclusion

This first pragmatic Registry study found no significant difference in PROMs (EQ5D and iHOT 12) between labral repair and debridement in the short term. Adherence to patient selection and surgical indication may result in good clinical outcomes with no significant difference between both techniques for patients with labral tear. However, it remains to be seen whether these results can be maintained in the longer term.

030 HIP HEMIARTHROPLASTY DISLOCATION: A MULTI-CENTRE RISK FACTOR ANALYSIS

Gareth Chan[1], Rahmeh Aladwan[1], Samantha Hook[1], Benedict Rogers[2], David Ricketts[2], Philip Stott[2]

[1]St. Richard's Hospital, Chichester, UK. [2]Royal Sussex County Hospital, Brighton, UK

Introduction:

Dislocated hip hemiarthroplasties (HA) are associated with a 45% revision rate and 40% mortality rate.

Implant selection for HA operations vary with no universally accepted implant choice. The WHiTE3 trial suggested older designs such as the Thompson has equitable outcomes to more modern and expensive implants such as the Exeter V40+Unitrax.

Our multi-centre consecutive series of NOFs patients treated with HA assesses the impact of surgical and patient factors on dislocation risk.

Methods: Medical and radiographic records for patients treated between 1st January 2009 and 30th September 2017 with a HA at three acute hospitals were reviewed.

Implant and dislocation data were recorded. Patient demographics, comorbidities and operation details were extracted from the medical records and NHFD. Patients were excluded if there were no postoperative radiographs or when HA had been performed as a revision procedure.

Results: We identified 4305 consecutive patients with 189 excluded. There was no difference in patient characteristics between the hospitals or implant types (p>0.05). Four HA implants were used during the study period; Thompson, Austin-Moore, Furlong and Exeter V40+Unitrax.

63 dislocations were identified (1.5%), median time to dislocation was 24 days. Dislocation rates for Thompson HAs were significantly higher (p=0.004) at 3.7%.

No association was demonstrated with cemented versus uncemented, bipolar versus monopolar, fixed versus variable offsets, operating surgeon grade and dislocation rates (p>0.05).Patient factors (preoperative AMTS, postoperative AMTS, preoperative mobility and ASA grade) had no effect on dislocation (p>0.05).

Discussion: Our study which is reflective current implant choices, demonstrates that Thompson implants for HA after NOFs have a significantly higher dislocation rates than other common prostheses, and their continued use should be reconsidered. This effect has not been demonstrated in previous studies.

Patient, implant construct and surgeon factors had little bearing on the subsequent dislocation rate.

082 DO ACETABULAR PARAMETERS MEASURED ON TWO-DIMENSIONAL IMAGING CORRELATE WITH CT, AND CAN LATERAL CENTRE EDGE ANGLE PREDICT FEMORAL HEAD COVERAGE?

Saif Salih[1,2], George Grammatopoulos[3,2], Johan Witt[2]

[1]Sheffield Teaching Hospitals, Sheffield, UK. [2]University College London Hospital, London, UK. [3]The Ottawa Hospital, Ottawa, Canada

Acetabular dysplasia (AD) can cause hip pain and early osteoarthritis. Lateral Centre Edge Angle (LCEA) and sourcil angle (AI) are plain radiographic measures of acetabular morphology, however there is little agreement as to what constitutes mild, moderate or severe dysplasia. This study aims to establish the correlation, if any, between two-dimensional (XR) and three-dimensional (CT) measurements of acetabular morphology and to establish the level of femoral head cover (CTFHC) for different levels of dysplasia.

Methods Governance board approved retrospective study. 353 PAOs performed by the senior author between January 2014 and December 2017 were included. Exclusion criteria were inadequate pre-operative CT imaging and/or plain radiographs, previous pelvic/hip surgery, acetabular retroversion, or

femoral head asphericity. Of the remainder, 84 had 3D analysis by clinical graphics giving measurements for CTFHC, LCEA at 1100, 1200, 1300 and sourcil angle (AI). XRLCEA, AI, posterior wall index (PWI), and anterior wall index (AWI), were measured from supine AP pelvis radiographs. Pearson correlation coefficient, and mean CTFHC for stratified LCEAs were calculated. A linear regression model to predict CTFHC from XRLCEA was validated against these.
Results XRLCEA correlated very strongly with total femoral head coverage (Pearson=0.917,p<0.001). Mean CTFHC with XRLCEA between 15°-19.9° was 55% (range 51-59%). At 25° -29.9° mean CTFHC was 61%.
There was a linear relation of CTFHC with XR LCEA such that CTFHC = 41.5 + 0.78(XRLCEA). This linear regression model predicted CTFHC 55% (95%CI 54-56%) for XRLCEA of 17.5°, and CTFHC 63% (95%CI 62-64%) for XRLCEA 27.5°.
Conclusions Currently an XRLCEA greater than 25° is considered normal. Previously reported normal values for CTFHC are 71-75%. This study demonstrates that those with acetabular parameters considered normal, may have low CTFHC and AD should be considered as a cause for their hip pain.

156 BETTER SURVIVIAL AT 5 YEARS – ARTHROSCOPIC vs. OPEN DEBRIDEMENT HIP SURGERY, A CASE-CONTROLLED STUDY
Christopher J Marusza[1], Mohamed Lazizi[1], Lucy MS Hoade[2], Gavin E Bartlett[1], Edwin D Fern[1], Mark R Norton[1], Rory G Middleton[1]
[1]Royal Cornwall Hospitals NHS Trust, Truro, UK. [2]University of Exeter, Exeter, UK
Introduction Open and arthroscopic hip debridement may be used for treatment of femoral acetabular impingement (FAI). There is a paucity of evidence regarding the efficacy of one over the other.
Aim To compare survivorship in terms of further surgical procedure at five years, in patients having undergone either arthroscopic or open hip debridement.
Methods Using our institutional database, we identified all post learning curve arthroscopic and open hip debridement cases with five years of follow up. Patients were matched based on age, gender and Tonnis grade. The primary outcome measure was 5 year survivorship to total hip arthroplasty (THA). Secondary outcome measures included 5 year survivorship to further (non THA) procedures on the joint. Radiological parameters were analysed including femoral neck version, sourcil, centre-edge and alpha angles.
Results A total of 390 arthroscopic and 1316 open operations were identified. Following exclusion and matching 102 (62 female, 39 male) cases were available for analysis in each group. Mean age was 36 years (range 17-51). At 5 years 14.8% of arthroscopic debridement patients and 5.9% of open debridement patients had undergone THA (p =0 .038). There was no statistical difference in secondary outcome measures.
Discussion A significantly higher percentage of patients undergoing arthroscopic debridement went on to THA when compared to matched patients receiving open debridement. We acknowledge the limitations of this study. However, despite the increasing prevalence of arthroscopic surgery to treat FAI, our results would suggest that open debridement may still remain the gold standard intervention. Further investigation, ideally in the form of an RCT, is warranted.
Conclusion In our case matched series, despite the longer rehabilitation and greater soft tissue insult, open surgery for FAI was associated with significantly less patients progressing to THA within 5 years compared to those undergoing arthroscopic debridement.

136 DATA-DRIVEN IMPROVEMENT IN TRAUMA & ORTHOPAEDICS: NATIONAL REGISTRY PROGRAMMES AND EXPERIENCE FROM THE SCOTTISH HIP FRACTURE AUDIT
Andrew Hall[1,2], Graeme Holt[3,2]
[1]Royal Infirmary of Edinburgh, Edinburgh, UK. [2]Scottish Hip Fracture Audit, Edinburgh, UK. [3]University Hospital Crosshouse, Kilmarnock, UK
Background National hip fracture programmes are becoming widespread, but this practice is nascent and varied. The Scottish Hip Fracture Audit (SHFA) was an early adopter of this strategy and is credited with substantial systemic improvements in quality and outcomes.
Objectives To provide evidence and incentive to clinicians and administrators to adopt successful improvement strategies, and to facilitate data-driven change hip fracture care.
Study Design and Methods We reviewed the practice of seven national hip fracture improvement programmes in: Sweden, Denmark, Norway, Australia, New Zealand, UK, Scotland, and Ireland. We report our experience from the SHFA and describe: the results of our programme; challenges and learning points encountered, and successful strategies for implementing change.
Results There is variance in approach to data collection and reporting, for example: standalone programmes versus combined trauma and arthroplasty registries; annual trend reporting versus 'snapshot' or real-time information; population-level versus patient-level data, and the emphasis placed on service-level characteristics. The governance model also varies – some act as a passive data registry whereas others act as active agents of change and regulation. There is consensus on the key performance makers: prompt admission; early surgery and mobilisation, and a multidisciplinary approach. There have been significant challenges encountered by the SHFA with respect to funding, logistical, and political issues. Analysis of the effects of our programme have demonstrated its clinical efficacy, and has identified successful strategies for improvement. We describe this experience.
Conclusions The establishment of national audit programmes has resulted in significant improvements in quality, efficiency, and outcomes. This study of major national programmes provides evidence, incentive, and instruction to clinicians and administrators who seek to improve healthcare systems.

188 DOES BMI AFFECT OUTCOME AFTER HIP ARTHROSCOPY? A STUDY USING THE UK NON ARTHROPLASTY HIP REGISTRY DATASET
Richard Holleyman[1], Yuichi Kuroda[2], Masayoshi Saito[2], Ajay Malviya[1], Vikas Khanduja[2]
[1]Northumbria Healthcare, Newcastle, UK. [2]Addenbrooke's - Cambridge University Hospital, Cambridge, UK
Background: The debate persists about whether obesity affects outcomesafter hip arthroscopy. Some database studies demonstrated that obesity causes readmission or conversion to total hip replacement, while the recent systematic review concluded that the evidence for an association between BMI and inferior outcome is inadequate. The purpose of this study was to investigate the effect of BMI on clinical outcomes using the non-arthroplasty hip registry (NAHR).
Methods: A total of 7139 hips (4464 female) with a mean age of 35.7 years identified on the NAHR database that had undergone hip arthroscopy between January 2012 and December 2018 were retrospectively included. These patients were divided into 3 groups according to BMI: BMI<25 (1,882) , 25≤BMI<30 (1,307) , 30>BMI (607). Patient-reported outcome measures (PROMs); Euro Quol 5D-5L and the International Hip Outcome Tool 12 (iHOT-12) were compared among 3 groups before and 6 months and 1 year after surgery.
Results: The pre-operative PROMs score was significantly lower in the higher BMI group than in the lower group, and the inferiority persisted 6 months and 1 year after surgery. However, the post-operative PROMS scores were significantly improved in all groups, and there was no significant difference between the groups in terms of change of PROMs score at 6 and 12 months (iHOT12 – 26.2,26.4 and 25.4; EQ-5D - 0.129, 0.147 and 0.161 respectively at 12 months) and in the proportion of patients achieving the minimal clinically important difference (64.6%, 65.3% and 64.8%) and substantial clinical benefit of iHOT-12 at 12 months.
Conclusion: This registry study found significant clinical improvement in all groups based on BMI following hip arthroscopy. However, patients with high BMI had poor baseline, and clinical score was lower than those with low BMI even after surgery. Obese patients may not be contraindication for hip arthroscopy, but these results need to be informed.

189 COMPARISON OF OUTCOMES OF ARTHROSCOPIC CHONDRAL PROCEDURE FOR THE ARTICULAR CARTILAGE INJURY: A STUDY USING THE UK NON ARTHROPLASTY HIP REGISTRY DATASET
Richard Holleman[1], Yuichi Kuroda[2], Masayoshi Saito[2], Vikas Khanduja[2], Ajay Malviya[1]
[1]Northumbria Healthcare, Newcastle, UK. [2]Addenbrooke's - Cambridge University Hospital, Cambridge, UK
Background: Although many studies have demonstrated Intra-articular presence of articular cartilage injury in hip arthroscopy is generally a poor factor in post-operative clinical outcome, there are few large multicentre studies comparing various treatment options.The purpose of this study was to investigate the effect of the arthroscopic chondral procedure on clinical outcomes using the non-arthroplasty hip registry (NAHR), which is a United Kingdom national register.
Methods: A total of 6324 hips (3,779 females) with a mean age of 36.2 years identified on the NAHR database that had undergone hip arthroscopy between January 2012 and December 2018 were retrospectively included. These patients were divided into 3 groups according to surgical procedure for the articular

cartilage injury: chondroplasty (1,638) , microfracture (436) , or no cartilage procedure (4,250). Patient-reported outcome measures (PROMs); International Hip Outcome Tool 12 (iHOT-12) and Euro Quol 5D-5L (EQ-5D) were compared among 3 groups before, 6, and 12 months after surgery.
Results: The post-operative PROMS scores significantly improved in all three groups as compared to the pre-operative score. The chondroplasty group had a significantly higher i-HOT12 score than the other two groups at 6 and 12 months after surgery (12 month - 60.4, 57.7 and 56.5) . The change in i-HOT-12 at 6 months was higher in the chondroplasty group as compared with the microfracture group (26.2 vs 21.8) but this improvement levelled at 12 months (26.4 vs 25.7) . The proportion of patients achieving the minimal clinically important difference (65%, 64.1%, 63.8%) and substantial clinical benefit of iHOT-12 were not significantly different among the three groups.
Conclusion: This registry study found significant clinical improvement in all groups based on arthroscopic chondral procedure following hip arthroscopy. Patients who have microfracture seem to take longer to improve and have lower peak scores as compared with chondroplasty.

145 DO HIGH VOLUME HIP FRACTURE UNITS PERFORM BETTER? – AN ANALYSIS OF OUTCOME MEASURES FROM THE NATIONAL HIP FRACTURE DATABASE.
Chika Edward Uzoigwe[1], Ahmed M E E Mostafa[2], Rory George Middleton[2]
[1]Leicester Royal Infirmary, Leicester, UK. [2]Royal Cornwall Hospital, Truro, UK
Background In a number of disciplines, positive correlations have been reported between volume and clinical outcome. This has helped drive the evolution of specialist centres to deal with complex or high risk medical conditions. Hip fractures are a common injury associated with high morbidity and mortality.
Aim To assess whether volume of hip fracture cases attended to by individual hospitals is associated with the quality of care provided and clinical outcomes.
Methods
Utilising 19 quality of care measures espoused by NICE and available on the National Hip Fracture Database website, we examined whether there was a correlation between Volume of hip fractures per institution and each outcome measure for 2016 and 2018. Outcomes were assessed for normality of distribution and correlated using either Spearman rank or Pearson Correlation as appropriate.
Results Over 170 institutions were available for analysis. The average number of procedures per institution was 371 (sd 154) in 2016 and 378 (sd 158) in 2018. 9 units attended to in excess of 700 cases per annum. There was a positive correlation between volume of cases and a number of quality of care indices; notably survivorship, length of stay, ortho-geriatric consultation, pressure ulcer prevention, post-operative mobilisation, delirium prevention, bone health assessment and the proportion of patients satisfying the Best Practice Tariff (BPT) criteria. 5 of the measures had no correlation. The worst performances were observed for measures that were not financially incentivised.
Discussion Our analysis of a large synchronous national dataset show weak but favourable correlations with unit volume and important outcomes including mortality and length of stay. Our results do not invariably justify the centralisation of hip fracture services. Hip fracture care may be more convincingly improved by promoting compliance to the guidance that already exists via financial incentivisation or otherwise.

169 OUTCOMES OF ARTHROSCOPIC INTERVENTION IN PATIENTS WITH FEMOROACETABULAR IMPINGEMENT SECONDARY TO SLIPPED CAPITAL FEMORAL EPIPHYSIS: A SYSTEMATIC REVIEW
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Young Adult Hip Service, Addenbrooke's - Cambridge University Hospital, Cambridge, UK
Background Slipped capital femoral epiphysis (SCFE) creates a complex deformity of the hip that can result in cam type of femoroacetabular impingement (FAI), which may in turn lead to the early development of osteoarthritis of the hip.The purpose of this study was to evaluate the existing literature reporting on the efficacy of hip arthroscopic treatment of patients with FAI secondary to SCFE.
Methods A systematic computer search was conducted based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines using Embase, PubMed (Medline), and Cochrane Library up to November 2019. Data such as patient demographics, surgical outcomes and complications that described arthroscopic surgery following FAI secondary to SCFE were retrieved from eligible studies. Two authors independently reviewed study inclusion and data extraction with independent verification.
Results Following filtration, seven studies were included in this review comprising 96 patients (100 hips). The mean age was 14.9 years (SD, 2.7), and 54.2% of the cases were male. Eighty seven percent patients had undergone previous procedures at the first diagnosis of SCFE. Slip severity at the time of performing hip arthroscopy was mild for 54%, moderate for 31% and severe deformity for 15%. The mean alpha angle corrections was 32.0° (SD, 6.0°), and the mean improvement of internal rotation angle at 90° flexion was 23.6° (sd, 9.5°). ModifiedHarris Hip Scores (mHHS) was most reported (n = 3 studies; 38 hips) of the clinical outcomes, and the mean improvement of mHHS was 22.0 (sd, 3.6). Complication rates were 10%, and revision rate was 6.0%.
Conclusion Patients with FAI secondary to SCFE undergoing arthroscopic treatment demonstrate improved improvement in clinical outcome, rotation of the hip and correction of the alpha angle. It remains to be seen whether this eventually leads to prevention of OA and avoiding arthroplasty in this group of patients.

Wednesday 4th March: 15.15 – 16.45

TOTAL HIP ARTHROPLASTY I / Chairs: Sanjeev Patil & Callum McBryde

135 ORAL TRANEXAMIC ACID FOR AN ADDITIONAL 24 HOURS POST-OPERATIVELY VERSUS A SINGLE PRE-OPERATIVE INTRAVENOUS DOSE AT REDUCING BLOOD LOSS FOR TOTAL HIP ARTHROPLASTY - RESULTS OF A RANDOMISED CONTROLLED TRIAL (TRAC-24)
Paul Magill[1], Janet Hill[1], Leeann Bryce[1], Al Dorman[1], Rosie Hogg[1], Christina Campbell[2], Gary Benson[3], David Beverland[1]
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Background 91% of blood loss in Total Hip Replacement (THR) occurs in the period after skin closure and the first 24 post-operative hours. TRAC-24 was established to identify if an additional 24-hour post-operative oral regime of Tranexamic acid (TXA) is superior to a once-only intravenous dose at surgery.
Methods This was a prospective, phase IV, single centered, open label, parallel group controlled trial on patients undergoing primary elective THR. A history of thromboembolic or cardiovascular disease were not exclusion criteria. The primary outcome was indirect calculated blood loss at 48 hours (IBL). 534 patients were randomized on a 2:2:1 ratio over three different groups. Group 1 received an intravenous dose of TXA at the time of surgery and an additional 24-hour post-operative oral regime, Group 2 only received the intra-operative dose and Group 3 did not receive any TXA.
Results 233, 235 and 66 patients were recruited to groups 1,2 and 3. All groups had comparable baseline characteristics. 3.2% of all patients had previous thromboembolism and 5.4% had previous cardiac stenting. Group 3 mean (SD) IBL was 1371 (630) ml whereas group 1 and 2 combined had a mean (SD) IBL of 846 (471), $p<0.001$. There was no overall difference in IBL between group 1 and group 2, but subgroup analysis observed 12% less blood loss in group 1 than group 2 in the 36 patients weighing >100kg. No differences in mortality or thromboembolic events were observed in any group.
Conclusion
The use of a single, intravenous, peroperative, 1-gram dose of Tranexamic acid decreased the total blood loss associated with THA by 38%. The addition of another 24-hours oral tranexamic acid did not provide additional benefit but further study on the effect of patient weight is required. Tranexamic acid is safe in patients with history of thromboembolic and cardiovascular disease.

098 THE EFFECT OF POLYETHYLENE MANUFACTURING MODIFICATIONS ON THE SURVIVAL OF UNCEMENTED AND HYBRID TOTAL HIP REPLACEMENTS. AN ANALYSIS OF DATA FROM THE NATIONAL JOINT REGISTRY OF ENGLAND, WALES, NORTHERN IRELAND AND THE ISLE OF MAN.
Edward Davis, Joseph Pagkalos, Branko Kopjar
The Royal Orthopaedic Hospital NHS Foundation Trust, Birmingham, UK
Aim: To assess the effect of different polyethylene modifications on Total Hip Replacement survival.
Methods: We combined the NJR dataset with polyethylene manufacturing properties as supplied by the manufacturers. Cause specific and overall reasons for revisions were analysed using Kaplan-Meier and multi-variate Cox proportional hazard regression survival analyses. Revision for aseptic loosening was

the primary endpoint. Modification variables included resin type, radiation source, multiple cross-linking treatments, cross-linking dose, terminal sterilisation method, terminal sterilisation radiation dose, stabilisation treatment, total radiation dose, and packaging.
Results: A total of 292,920 primary THR cases were included with an associated 5,329 revisions. The variables found to significantly affect implant survival were the total radiation dose, liner face asymmetry, and stabilisation treatment. Total radiation dose was divided into four groups: G1 (no radiation); G2 (>0 Mrad and <5 Mrad); G3 (>5 Mrad and <10 Mrad), and G4 (>10 Mrad). The adjusted Cox Regression model with revision for aseptic loosening as the endpoint (G1 as reference) revealed a HR of 0.74 (0.64, 0.86) for G2, HR 0.36 (0.30, 0.43) for G3 and HR 0.38 (0.31, 0.47) for G4. In groups 3 and 4, stabilisation with vitamin E and heating above melting point performed best.
Conclusion: Irradiation of polyethylene with 5MRad or more was associated with a marked reduction in the risk of revision for aseptic loosening. Irradiation with higher doses was not associated with a further reduction at 12 years of follow up.

147 EVIDENCE-BASED FOLLOW-UP RECOMMENDATIONS FOLLOWING PRIMARY HIP AND KNEE REPLACEMENT (UK SAFE)

Martin Stone[1,2], Lindsay Smith[3], Sarah Kingsbury[4,2], Carolyn Czoski-Murray[5], Andy Judge[6,7], Rafael Pinedo-Villanueva[8], Robert West[5], Judy Wright[5], Chris Smith[5], Nigel Arden[8], Philip Conaghan[4,9]
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Follow-up of arthroplasty varies widely across the UK. The aim of this NIHR-funded study was to employ a mixed-methods approach to examine the requirements for arthroplasty follow-up and produce evidence-based and consensus-based recommendations. It has been supported by BHS, BASK, BOA, ODEP and NJR.
Four interconnected work packages have recently been completed: (1) a systematic literature review; (2a) analysis of routinely collected National Health Service data from four national data sets to understand when and which patients present for revision surgery; (2b) prospective data regarding how patients currently present for revision surgery; (3) economic modelling to simulate long-term costs and quality-adjusted life years associated with different follow-up care models and (4) a Delphi-consensus process, involving all stakeholders, to develop a policy document to guide appropriate follow-up care after primary hip and knee arthroplasty.
We will present the following Recommendations:

- For ODEP10A* minimum implants, it is safe to disinvest in routine follow-up from 1 to 10 years post non-complex hip and knee replacement provided there is rapid access to orthopaedic review
- For ODEP10A* minimum implants in complex cases, or non-ODEP10A* minimum implants, periodic follow-up post hip and knee replacement may be required from 1 to 10 years
- At 10 years post hip and knee replacement, we recommend clinical, which may be virtual, and radiographic evaluation
- After 10 years post hip and knee replacement, frequency of further follow-up should be based on the 10 year assessment; ongoing rapid access to orthopaedic review is still required

Overarching statements

- These recommendations apply to post primary hip and knee replacement follow-up
- The 10-year time point in these recommendations is based on a lack of robust evidence beyond ten years
- The term complex cases refer to individual patient and surgical factors that may increase the risk for replacement failure

154 ARE THE SURVIVAL ESTIMATES OF INDIVIDUAL TOTAL HIP REPLACEMENT COMPONENTS GOOD INDICATORS OF OVERALL CONSTRUCT SURVIVAL? FINDINGS FROM THE NATIONAL JOINT REGISTRY FOR ENGLAND, WALES, NORTHERN IRELAND AND THE ISLE OF MAN (NJR).

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Over 800 total hip replacement (THR) constructs were implanted in the UK in 2017. To ensure reliable implants are used, a NICE revision benchmark of 5% after 10 years exists. Surgeons are guided in choice by organisations such as the Orthopaedic Data Evaluation Panel (ODEP). Currently, ODEP publishes ratings for stem and cup separately and not for constructs. We used NJR data to investigate whether revision estimates of an individual stem (with all cups) is an accurate indicator of survival of all constructs using that stem.
The dataset comprised 234,289 THRs using the most frequently implanted stem between 2004 and 2017. Crude ten-year revision estimates were calculated using Kaplan-Meier for all THRs and for the five most implanted constructs. Adjusted comparisons between individual constructs and the overall stem revision estimate were made using flexible parametric survival analysis.
The 10-year crude, revision estimate for all THRs was 2.3% (95% CI 2.2, 2.4). Only four of the most frequently used constructs had long enough follow-up to analyse. 10-year estimates for these constructs ranged from 1.8% (95% CI 1.5, 2.1) to 3.7% (95% CI 3.2, 4.1), a log-rank test revealed strong evidence against the null hypothesis that revision estimates were the same for all constructs ($p<0.001$). Adjusted for age, sex and ASA, three of the four constructs showed a difference in 10-year revision estimates compared to this stem with all cups ($P=0.03$, $P<0.001$, $P<0.001$).
This study suggests 10-year revision estimates for all THRs using the most implanted stem in the NJR are not representative of all constructs involving that stem in crude or adjusted analyses. Current benchmarking systems report survival for the stem in combination with all cups and not for constructs. We suggest that benchmarking ratings basing on revision estimates for THR constructs would provide more accurate information, enabling informed construct decisions.

079 CERAMIC BEARINGS ARE ASSOCIATED WITH A SIGNIFICANTLY REDUCED REVISION RATE IN PRIMARY HIP ARTHROPLASTY: A STUDY USING THE NJR DATASET

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Prosthetic joint infections (PJI) are a devastating consequence in total hip arthroplasties (THA) with both significant morbidity and sometimes mortality, posing a significant health economic burden. Studies, both clinical and in-vitro have suggested possible reduction in PJI with the use of ceramic bearings. We have investigated the relationship of ceramic-on-ceramic (CoC), ceramic-on-polyethylene (CoP) or metal-on-polyethylene (MoP) bearing surface in affecting outcome of revision surgery after primary THA using data collected from National Joint Registry for England and Wales, Northern Ireland and the Isle of Man between 2002 and 2016. We used a competing risk regression model to investigate predictors of each revision outcome, such as infection, dislocation, aseptic revision and all cause revisions. The results were adjusted for age, gender, ASA grade, BMI, indication for surgery, intraoperative complications and implant data.
We identified 456,457 THA (228,786 MoP, 128,403 CoC and 99,268 CoP). In a multivariable model, the adjusted risk of revision for PJI was lower with CoC (OR-0.748, $p<0.001$) and CoP (OR-0.775, $p<0.001$) when compared to MoP bearing. Additionally there was also a significant reduction in the risk of all cause revision for CoC (OR-0.918, $p=0.002$) and CoP (0.806, $p<0.001$), bearings as compared with MoP. The protective effect of ceramic bearing was predominantly seen after two years of implantation with a significant ($p<0.0001$) reduction of revision for PJI in both CoC (by 42.8%) and CoP (by 41.3%) group. Similarly significant effect was seen for aseptic revision beyond two years and overall all cause revision rate beyond two years reduced by 21.6% for CoC and 27.1% for CoP ($p<0.001$).
Within the limits of registry analysis, this study has demonstrated an association between the use of ceramic bearing and lower rates of revision for all cause revisions especially infection and aseptic loosening. This finding supports the use of ceramic bearings in THA.

158 LONG-TERM PREDICTION OF TOTAL HIP REPLACEMENT SURVIVAL USING DATA FROM THE EXETER HIP DATABASE AND THE NATIONAL JOINT REGISTRY FOR ENGLAND, WALES, NORTHERN IRELAND AND THE ISLE OF MAN (NJR).

Jonathan Evans[1], Ashley Blom[1], Jonathan Howell[2], John Timperley[2], Matthew Wilson[2], Sarah Whitehouse[3], Adrian Sayers[1], Michael Whitehouse[1]
[1]University of Bristol, Bristol, UK. [2]Princess Elizabeth Orthopaedic Centre, Exeter, UK. [3]University of Queensland, Brisbane, Australia
Total hip replacements (THRs) provide pain relief and improved function to thousands of patients suffering from end-stage osteoarthritis, every year. Over 800 different THR constructs were implanted in the UK in 2017. To ensure reliable implants are used, a NICE revision benchmark of 5% after 10 years exists. Given the 10-year cumulative mortality of patients under 55 years of age receiving THRs is only 5% and that a recent study suggests 25-year THR survival of 58%, we aim to produce revision estimates out to 30 years that may guide future long-term benchmarks.
The local database of the Princess Elizabeth Orthopaedic Centre (PEOC), Exeter, holds data on over 20,000 patients with nearly 30-years follow-up with contemporary prostheses. A previous study suggests that the results of this centre are generalisable if comparisons restricted to the same prostheses. Via flexible parametric survival analysis, we created an algorithm using this database, for revision of any part of the construct for any reason, controlling for age and gender. This algorithm was applied to 664,761 patients in the NJR who have undergone THR, producing a revision prediction for patients with the same prostheses as those used at this centre.
Using our algorithm, the 10-year predicted revision rate of THRs in the NJR was 2.2% (95% CI 1.8, 2.7) based on a 68-year-old female patient; well below the current NICE benchmark. Our predictions were validated by comparison to the maximum observed survival in the NJR (14.2 years) using restricted mean survival time (P=0.32). Our predicted cumulative revision estimate after 30 years is 6.5% (95% CI 4.5, 9.4). The low observed and predicted revision rate with the prosthesis combinations studied, suggest current benchmarks may be lowered and new ones introduced at 15 and 20 years to encourage the use of prostheses with high survival.

010 HOW CAN PATIENTS WITH MOBILE HIPS AND STIFF LUMBAR SPINES BE IDENTIFIED PRIOR TO TOTAL HIP ARTHROPLASTY? – A PROSPECTIVE, DIAGNOSTIC COHORT STUDY

Moritz Innmann[1,2], Christian Merle[1], Philippe Phan[2], Paul Beaulé[2], George Grammatopoulos[2]
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Introduction
Patients with reduced lumbar spine mobility are at higher risk of dislocation after THA as their hips have to compensate for spinal stiffness. Therefore our study aimed to 1) Define the optimal protocol for identifying patients with mobile hips and stiff lumbar spines and 2) Determine clinical and standing radiographic parameters predicting high hip and reduced lumbar spine mobility.
Methods
This prospective diagnostic cohort study followed 113 consecutive patients with end-stage hip osteoarthritis (OA) awaiting THA. Radiographic measurements were performed for the lumbar lordosis angle, pelvic tilt and pelvic-femoral angle on lateral radiographs in the standing, 'relaxed-seated' and 'deep-seated' (i.e. torso maximally leaning forward) position. A "hip user index" was calculated in order to quantify the contribution of the hip joint to the overall sagittal movement performed by the femur, pelvis and lumbar spine.
Results
Radiographs in the relaxed-seated position had an accuracy of 56% (95%CI:46-65%) to detect patients with stiff lumbar spines, compared to a detected rate of 100% in the deep-seated position.
The mean 'hip user index' was 63±12% and ten patients (9%) were hip users, having an index of 80% or more. A standing pelvic tilt of ≥18.5° was the only predictor for being a hip user with a sensitivity of 90% and specificity of 71% (AUC 0.83). Patients with a standing pelvic tilt ≥18.5° and an unbalanced spine with a flatback deformity had a 30xfold relative risk (95%-CI:4-226; p<0.001) of being a hip user.
Conclusion
Patients awaiting THA and having high hip and reduced lumbar spine mobility can be screened for with lateral standing radiographs of the spinopelvic complex and a thorough clinical examination. If the initial screening is positive, radiographs in the deep-seated position allow for better identification of patients being 'hip users' compared to radiographs in the relaxed-seated position.

070 IS ASPIRIN AS EFFECTIVE AS THE NEWER DIRECT ORAL ANTICOAGULANTS FOR VENOUS THROMBOEMBOLISM PROPHYLAXIS FOLLOWING TOTAL HIP REPLACEMENT? AN ANALYSIS FROM THE NATIONAL JOINT REGISTRY FOR ENGLAND, WALES, NORTHERN IRELAND AND THE ISLE OF MAN

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Background Few studies have compared aspirin with DOACs (direct oral anticoagulants = direct thrombin inhibitors and factor Xa inhibitors) for venous thromboembolism (VTE) prophylaxis following total hip and knee replacement (THR and TKR). We assessed the efficacy and safety of aspirin compared with DOACs for VTE prophylaxis following THR and TKR using the world's largest joint replacement registry.
Methods We studied the National Joint Registry linked to English hospital inpatient episodes for 218,650 THR and TKR patients. Patients receiving aspirin were matched separately to (1) direct thrombin inhibitors, and (2) factor Xa inhibitors using propensity scores. Outcomes assessed at 90 days included VTE, length of stay, and adverse events.
Results Following THR, the risk of VTE was significantly lower in patients receiving direct thrombin inhibitors (0.44%; odds ratio (OR)=0.69, 95% confidence interval (CI)=0.55-0.87, p=0.002) and factor Xa inhibitors (0.37%; OR=0.63, CI=0.47-0.85, p=0.003) compared with aspirin (0.63%). Following THR, direct thrombin inhibitors (coefficient=-0.37, CI=-0.43 to -0.31, p<0.001) and factor Xa inhibitors (coefficient=-0.80, CI=-0.87 to -0.74, p<0.001) reduced length of stay compared with aspirin. Similar findings for both outcomes were observed following TKR. Compared with aspirin, DOACs did not increase the risk of short-term revision surgery; reoperation; major haemorrhage; wound disruption; surgical site infection; and mortality.
Conclusions
Following THR and TKR, the risk of VTE was lower in patients receiving DOACs compared with aspirin. DOACs were associated with a reduced length of stay, and DOACs did not increase the risk of further surgery, wound problems, bleeding complications, or mortality compared with aspirin.

013 DOES SPINOPELVIC MOBILITY CHANGE FOLLOWING TOTAL HIP ARTHROPLASTY? – A PROSPECTIVE, DIAGNOSTIC COHORT STUDY AT 1 -YEAR POST-THA

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Aims
Our study aimed to 1) Describe the changes in spinopelvic mobility when transitioning from standing, to 'relaxed-seated' and thereafter to 'deep-seated' position and 2) Determine the change in spinopelvic mobility types 1 year post-THA compared to preoperatively.
Methods
This prospective diagnostic cohort study followed 100 consecutive patients 1 year post-THA. Preoperatively and one year postoperatively, radiographic measurements were performed for the lumbar-lordosis-angle, pelvic tilt and pelvic-femoral-angle on lateral radiographs in the standing, 'relaxed-seated' and 'deep-seated' position (torso maximally leaning forward). Patients were classified according to their spinopelvic mobility type, according to the change in PT between the standing and relaxed-seated position (stiff:ΔPT<±10°, normal:10°≤ΔPT≤30°, hypermobile:ΔPT>±30°).
Results
Compared to preoperatively, when moving from a standing to a relaxed-seated position, hip flexion increased by 10°±18, leading to less posterior pelvic tilt by 6°±11 and reduced lumbar spine flexion by 6°±11 (all p<0.001).

Similarly, when moving from the standing to deep-seated position, hip flexion improved by a mean of 8°±22, leading to reduced lumbar spine flexion by a mean of 5°±8, whereas the change in pelvic tilt did not change compared to preoperatively (p=0.016, p<0.001, p=0.46).
The distribution of spinopelvic mobility types 1 year postoperatively was significantly different compared to preoperatively, as the percentage of patients with stiff spinopelvic mobility increased from 16% to 43% (p<0.001).
Conclusion
Hip flexion improved by 10° on average 1 year after total hip arthroplasty. Thus, slightly less compensatory posterior pelvic tilt and lumbar spine flexion was needed when taking a relaxed-seated position. When taking a deep-seated position, improved hip flexion required less lumbar spine flexion. However, these changes were small when being compared to preoperative variability of these parameters. Thus, individual spinopelvic mobility remains relatively unchanged 1 year after THA compared to preoperatively.

065 THE IMPACT OF SURGEON TRAINING STATUS ON THE SURVIVAL AND REVISION RATE OF HIP AND KNEE REPLACEMENTS. A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aims The aim of this study was to conduct evidence synthesis on the available published literature of the impact of the training status of the operating surgeon (trainee vs. consultant) on the survival and revision rate of primary hip and knee replacements.
Patients and Methods We conducted a systematic review according to Cochrane guidelines. Separate searches were performed for hip and knee replacements, with meta-analysis and presentation of results in parallel. We searched MEDLINE and Embase databases from inception to 17 September 2019 and included controlled trials and cohort studies reporting implant survival estimates, or revision rates of hip and knee replacements according to the grade of the operating surgeon. This study was registered with PROSPERO (CRD42019150494).
Results 8 studies (5 hip papers and 3 knee papers) met the inclusion criteria. There was no significant difference in the survival estimates for total hip replacements (THRs) performed by trainees compared to consultants at 5-years follow-up (97.9% vs 98.1%, *p* = 0.74). Furthermore, there was no significant difference in the revision rate of THRs performed by trainees and consultants at both 5 and 10-year intervals of follow-up (relative risk [RR]: 5yrs = 0.88 (95% CI: 0.46, 1.70; *P* = 0.71); 10yrs = 0.68 (95% CI: 0.37, 1.26; *P* = 0.22)). There was no significant difference in the survival estimates at 10-years for total knee replacements (TKRs) performed by trainees compared to consultants (96.2% vs 95.1%, *p*=0.49).
Conclusion
There is no evidence in the existing literature that trainee surgeons have worse outcomes than their consultant colleagues, in terms of the survival, or rate of revision of hip and knee replacements at 5-10 years follow-up. This may mean that there is genuinely no difference or that, in the context of contemporary training programmes, appropriate case-mix selection and supervision of trainees is currently employed.

092 HOW MUCH DOES A MEDICAL AND HEALTHCARE PRODUCTS REGULATORY AGENCY (MHRA) MEDICAL DEVICE ALERT FOR METAL-ON-METAL HIP ARTHROPLASTY PATIENTS REALLY COST?

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Introduction Many worldwide regulatory authorities recommend regular surveillance of metal-on-metal hip arthroplasty patients given high failure rates. However concerns have been raised about whether such regular surveillance, which includes asymptomatic patients, is evidence-based and cost-effective. We determined: (1) the cost of implementing the 2015 MHRA surveillance in "at-risk" Birmingham Hip Resurfacing (BHR) patients, and (2) how many asymptomatic hips with adverse reactions to metal debris (ARMD) would have been missed if patients were not recalled.
Methods All BHR patients subject to the 2015 MHRA recall (all females, and males with head sizes 46mm or below, regardless of symptoms) at one specialist centre were invited for review (707 hips). All patients were investigated (Oxford Hip Score, radiographs, blood metal ions, and targeted cross-sectional imaging) and managed accordingly. Surveillance costs were calculated using finance department data, as was the number needed to treat (NNT) to avoid missing one case of asymptomatic ARMD.
Results The overall institutional surveillance cost to investigate all patients once was £105,922 (range £148 to £258 per patient). The most expensive aspects of surveillance were radiographs (£39,598), advanced nurse practitioner assistance (£23,618), cross-sectional imaging (£14,828), and blood metal ions (£14,825). 31 hips had imaging evidence of ARMD (12 revised, with 19 under surveillance). Seven hips were asymptomatic, however all revisions were symptomatic. The NNT to avoid missing one case of asymptomatic ARMD (on imaging and/or requiring revision) was 101 patients, equating to a screening cost of £18,041 to avoid one case of asymptomatic ARMD.

Conclusions
Implementing MHRA surveillance for "at-risk" BHR patients was extremely costly, both financially and logistically. As the risk of asymptomatic ARMD was low, our data suggests the 2015 MHRA surveillance is not cost-effective. We therefore have concerns about the increasingly intensive surveillance recommended in the 2017 MHRA guidance for all metal-on-metal hip arthroplasty patients.

093 INCREASED PERI-TROCHANTERIC FAT DEPTH IS NOT ASSOCIATED WITH INCREASED RISK OF EARLY COMPLICATION FOLLOWING TOTAL HIP ARTHROPLASTY

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Introduction Previous research has demonstrated increased early complication rates following total hip arthroplasty in obese patients, as defined by body mass index (BMI). Subcutaneous fat depth has been shown to be an independent risk factor for wound infection in cervical and lumbar spine surgery as well as after abdominal laparotomy. The aim of this study was to investigate whether increased peri-trochanteric fat depth was associated with increased risk of early complication following total hip arthroplasty.
Methods We analysed prospectively collected data on a consecutive series of 1220 patients undergoing primary total hip arthroplasty from June 2013 until May 2018. The vertical soft tissue depth from the most prominent part of the greater trochanter to the skin was measured using a sterile ruler and recorded to the nearest millimetre. BMI was calculated at the patient's pre-operative assessment review. All complications (infection, dislocation and peri-prosthetic fracture) occuring within the initial 12 month follow-up were identified.
Results Females had a significantly greater fat depth at the greater trochanter in comparison to males (median 3.0cm (IQR 2.3-4.0) versus 2.0cm (IQR 1.7-3.0), p<0.001) despite equivalent BMI between genders (males median BMI 30.0 (IQR 27.0-33.0); female median 29.0 (IQR 25.0-33.0). Fat depth had a weak correlation with BMI (R^2 0.41 males and R^2 0.43 females). Patients with the greatest fat depth (upper quartile) were at no greater risk of developing a complication compared to patients with the lowest fat depth (lower quartile); 2% vs 1.8%, p=0.829.
Conclusions
Peri-trochanteric fat depth is only weakly correlated with BMI. We found no correlation between increased fat depth and risk of early complication following primary total hip arthroplasty.

Thursday 5th March: 15.30 – 16.10

TOTAL HIP ARTHROPLASTY II / Chairs: David Sochart & Marcus Bankes

099 THE EFFECT OF BEARING SURFACE AND HEAD SIZE ON THE SURVIVAL OF UNCEMENTED AND HYBRID TOTAL HIP REPLACEMENTS. AN ANALYSIS OF DATA FROM THE NATIONAL JOINT REGISTRY OF ENGLAND, WALES, NORTHERN IRELAND AND THE ISLE OF MAN.

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Aim: To assess the effect of the bearing surface and head size on the survival of total hip replacements with modern bearing surface combinations.
Methods: We combined the NJR dataset with polyethylene manufacturing properties as supplied by the manufacturers to sub-divide polyethylene into conventional (PE) and highly crosslinked (XLPE). Cause specific and overall reasons for revisions were analysed using Kaplan-Meier and multi-variate Cox proportional hazard regression survival analyses. The bearing surface analysis was repeated in patients undergoing THR under the age of 55.
Results: A total of 337,786 primary THR cases were included with an associated 5,618 revisions. Head size was grouped in <= 28mm (group A), 32mm (group B) and >=36mm (group C). A Cox regression model adjusted for age, gender, bearing combination and stem fixation was used to provide Hazard Ratios (HR). With Group C as reference, revision for all causes in Group A had a HR 1.07 (95%CI 0.99, 1.15) and in Group B HR 0.92 (0.86, 0.98). In patients <55y of age, with MoP as reference, Hazard Ratio for MoXLPE was 0.77 (0.59, 1.01), CoC 0.64 (0.52, 0.78), CoXLPE 0.61 (0.47, 0.78), CoP 0.50 (0.36, 0.70) and CMoXLPE 0.47 (0.30, 0.76).
Conclusion: When combined with modern bearing combinations, the use of femoral heads of 36mm or larger was associated with a decreased cumulative incidence of revision for dislocation and an increased incidence of revision for aseptic loosening. In patients under the age of 55, CMoXLPE performed best at maximum follow up of 11 years.

107 THE UNCERTAINTY OF FEMORAL ANTEVERSION IN THR.

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Introduction The achieved anteversion of uncemented stems is to a large extent limited by the internal anatomy of the bone. A better understanding of this has recently become an unmet need because of the increased use of uncemented stems.
We aimed to assess plan compliance in six degrees of freedom to evaluate the accuracy of PSI and guides for stem positioning in primary THAs.
Materials and Methods We prospectively collected 3D plans generated from preoperative CTs of 30 consecutive THAs (17 left and 13 right hips), in 29 patients with OA, consisting of 16 males and 13 females (median age 68 years, range 46-83 years). A single CT-based planning system and cementless type of implant were used.
Post operatively, all patients had a CT scan which was reconstructed using state-of-the-art software solution: the plan and CT reconstruction models were
Outcome measures: 1) discrepancy between planned and achieved stem orientation angles **Fig.2&3**; 2) clinical outcome.
Results 1) The mean (±SD) discrepancy was low for: Varus-valgus –1.1 ± 1.4 deg (IQR -2.2 - 0.3 deg); Anterior-posterior 0.1 ± 1.6 deg (IQR -0.7 - 1.3 deg). The discrepancy was higher for femoral version -1.4 ± 8.2 deg (IQR -8.3 - 7.2 deg). 3D-CT planning correctly predicted sizes in 93% of the femoral components.
2) There was no intra-operative fracture, no case showed evidence of early periprosthetic osseous injury.
Discussion Surgeons and engineers should be cautious with their expectation of achieving the planned femoral stem version of an uncemented femoral stem from the pre-operative 3D-CT plan.
Conclusion
This is the first study to 3D-mensionally evaluate 3D-printed patient-specific instrumentation and guides for achieved femoral stem component orientation vis-à-vis to the plan. The tools allow accurate implant orientation, however there is still potential for improvement.

140 MANAGING PATIENT EXPECTATIONS AND RECOVERY AFTER A TOTAL HIP REPLACEMENT.

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Clinical decision-making is often based on evidence of outcome after a specific treatment. Surgeons and patients may, have different perceptions and expectations of what to achieve following a Total Hip Replacement (THR). Several studies have shown that unfulfilled expectations are a principal source of patient dissatisfaction and patients are typically overly optimistic with regards to expected outcomes following surgery. Published data on clinical and functional outcomes show that persistence of symptoms, such as pain, and failure to return to preoperative levels of function are normal. To measure patient's expectations we undertook prospective study reviewing patients' expectations in 1800 THRs over a 21-year period (1997-2018).
Of the whole cohort, 48.98% patients reported they wanted a THR to overcome unbearable pain. 11.75 % wanted a THR to be able to walk without a limp. 9.69% wanted to a THR to increase walk endurance. 61.97% reported it was extremely important to decrease pain following a THR. In 2001, the most important reason for a THR reported by patients was to relieve unbearable pain and this remained the same most important reason in 2018. This result was also statistically significant with a p-value of 0.001. 80.36% reported they anticipated 'no pain' after recovery from a THR, 16.75% reported they anticipated 'some pain' and 2.89% reported they anticipated 'extreme pain' following a THR. 74.71% reported it was extremely important to increase their ability to undertake normal activities. 22.06% reported it was very important, 2.40% reported it was moderately important, 0.55% slightly important and 0.28% reported it was not all to important to increase their ability to undertake normal activity.
In conclusion patients' want to reduce their pain, walk normally and increase their level activities. Differences in expectation fulfilment may be due to unrealistic expectations. To achieve optimal outcome managing patient expectations is vital.

006 ANTIBIOTIC PROPHYLAXIS FOR URINARY CATHETER MANIPULATION FOLLOWING ARTHROPLASTY: A SYSTEMATIC REVIEW.

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Aims: Urinary catheter use in the peri-operative and post-operative phase following arthroplasty may be associated with increased risk of urinary tract infection (UTI) and deep prosthetic joint infection (PJI). These can be catastrophic complications in joint arthroplasty. We performed a systematic review of the evidence on routine use of antibiotics for urinary catheter insertion and removal following arthroplasty.
Methods: Electronic databases were searched using the HDAS interface. Grey literature was also searched. From 219 citations, six studies were deemed eligible for review. Due to study heterogeneity a narrative approach was adopted. Methodological quality of each study was assessed using the CASP appraisal tool. Included studies were found to have moderate to good methodological quality.
Results: A total of 4696 hip and knee arthroplasties were performed on 4578 participants across all studies. Of these 1475 (31%) were undertaken on men and 3189 (68%) on women. The mean age of the study participants was 69 years. 3489 cases (74.3%) related to hip arthroplasty and 629 of cases (13.4%) to knee arthroplasty. 578 cases (12.3%) specified either hip or knee arthroplasty. In total, 45 PJIs were reported across all studies (0.96%). Two of the studies found either no PJI or no statistical difference in the rate of PJI when antibiotic prophylaxis was not used for catheter manipulation. Where studies report potential haematogenous spread from UTIs, this association can only be assumed. Rates of bacteriuria varied greatly between studies and depend on timing of sample and gender. Increased duration of urinary catheterisation is positively associated with UTI.
Conclusion: It remains difficult to justify the routine use of prophylactic antibiotics for catheter manipulation in well patients undergoing arthroplasty. Their use is not recommended for this indication.

016 ARE LIPPED POLYETHYLENE LINERS ASSOCIATED WITH INCREASED REVISION RATES IN PATIENTS WITH UNCEMENTED ACETABULAR COMPONENTS? AN OBSERVATIONAL COHORT STUDY

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Background Reduced dislocation rates using lipped polyethylene (PE) liners in modular uncemented acetabular components has been shown, yet there may be increased wear because of impingement, which may lead to aseptic loosening. We used New Zealand Joint Registry (NZJR) data to compare survival rates, revision rates for dislocation and aseptic loosening between lipped and neutral liners.
Methods 31,247 primary THAs using the four commonly used uncemented modular cups were identified (January 1, 1999 to December 31, 2018). The lipped liner group comprised 49% males vs 42% in the neutral group ($p < 0.001$); 96% had OA vs 95% in the neutral group ($p < 0.001$). There was no difference in other patient characteristics. Mean follow-up was 5.1 years (SD 3.9); longest follow-up 19.3 years. Kaplan Meier survival rates were compared (20,240 lipped and 11,007 neutral PE liners). Highly cross-linked PE was used in 99% of lipped liner cups vs 85% of neutral liner cups. Associated hazard ratios were calculated using a Cox regression analysis.
Results KM survival at 10 years for lipped PE liners was 96% for lipped (95%CI 95.4%-96.2%) and 95% for neutral liners (95%CI 94.7%-95.9%). Controlling for age, gender approach, head size, image guidance, the all-cause revision risk was greater for neutral liner (HR 1.17 [95% CI 1.06 to 1.36]; $p = 0.032$). There was a higher risk of revision for dislocation in those with neutral liners (HR 1.84 [95%CI 1.41-2.41]; $p < 0.001$) but no difference in the revision rate for aseptic acetabular loosening (HR 0.85 [95%CI 0.52-1.38]; $p = 0.511$).
Conclusions Using lipped PE liners is not associated with a higher rate of aseptic loosening in patients who undergo primary THA. Lipped PE liners are associated with lower rates of dislocation and lower all-cause revision rates without any increased association with revision rates for wear and aseptic loosening.

021 CAPSULAR RESECTION VERSUS CAPSULAR REPAIR IN DIRECT ANTERIOR APPROACH FOR TOTAL HIP ARTHROPLASTY: A PROSPECTIVE RANDOMIZED CONTROL TRIAL.

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INTRODUCTION: The capsular releasing sequence is crucial to safely conduct the Direct Anterior Approach for THA on a regular OR table. The release of the anterior capsule is the first step of the releasing sequence and allows for optimal exposure. This can be done by either resecting a part of the anterior capsule or by preserving it. Our zero hypothesis was that clinical outcomes would not be different between both techniques.
MATERIALS & METHODS: 190 Patients operated between November 2017 and May 2018, met the inclusion criteria and were randomly allocated in a double blinded study to either the capsular resection (CR)(N=99) or capsular preservation (CP)(N=91) cohort. The same cementless implant was used in all cases. Patient-reported outcome measures (PROMS) were collected pre- and post-operatively at 6 weeks, 3 months and 1 year. Adverse events were recorded. Outcomes were compared with the Mann-Withney U test and a significance level of $p<0,05$.
RESULTS: Both cohorts had significant improvements of all PROMS post-operatively. There was no significant difference in HSS, HOOS or SF-36 between both cohorts ($p>0,05$). The incidence of peri-articular muscle soreness and transient tenderness in the groin was 7.5% of patients in the CR cohort and in 9.3% in the CP cohort, at 6 weeks to 3 months post-operatively ($p>0.05$). At one year, 80% of patients had a forgotten hip ($p>0.05$). There were no dislocations, readmissions or reoperations in both groups. Acetabular and femoral component position was similar in both groups ($p>0,05$).
CONCLUSION: No clinical differences were found between resection or preservation of the anterior capsule when performing a primary THA through the anterior approach on a regular OR table. During the learning curve, it might be advisable to resect a part of the capsule in order to optimize the acetabular exposure, without compromising the clinical outcomes.

012 HOW DOES SPINOPELVIC MOBILITY AND SAGITTAL FUNCTIONAL CUP ORIENTATION AFFECT PATIENT REPORTED OUTCOME 1 YEAR AFTER THA? - A PROSPECTIVE DIAGNOSTIC COHORT STUDY

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Aims
Our study aimed to 1) determine if there was a difference for the HOOS-PS score between patients with stiff/normal/hypermobile spinopelvic mobility and 2) to investigate if functional sagittal cup orientation affected patient reported outcome 1 year post-THA.
Methods This prospective diagnostic cohort study followed 100 consecutive patients having received unilateral THA for end-stage hip osteoarthritis. Pre- and 1-year postoperatively, patients underwent a standardized clinical examination, completed the HOOS-PS score and sagittal low-dose radiographs were acquired in the standing and relaxed-seated position. Radiographic measurements were performed for the lumbar-lordosis-angle, pelvic tilt (PT), pelvic-femoral-angle and cup ante-inclination. The HOOS-PS was compared between patients with stiff ($\Delta PT<\pm10°$), normal ($10°\leq\Delta PT\leq30°$) and hypermobile spinopelvic mobility ($\Delta PT>\pm30°$).
Results Preoperatively, 16 patients demonstrated stiff, 70 normal and 14 hypermobile spinopelvic mobility without a difference in the HOOS-PS score (66±14/67±17/65±19;p=0.905).
One year postoperatively, 43 patients demonstrated stiff, 51 normal and 6 hypermobile spinopelvic mobility. All postoperative hypermobile patients had normal spinopelvic mobility preoperatively and showed significantly worse HOOS-PS scores compared to patients with stiff or normal spinopelvic mobility (21±17/21±22/35±16;p=0.043).
Postoperatively, patients with hypermobile spinopelvic mobility demonstrated no significant difference for the pelvic tilt in the standing position compared to the other two groups (19±8°/16±8°/19±4°;p=0.221), but a significantly lower sagittal cup ante-inclination (36±10°/36±9°/29±8°;p=0.046).
Conclusion
The present study demonstrated that patients with normal preoperative and postoperative spinopelvic hypermobility show worse HOOS-PS scores than patients with stiff or normal spinopelvic mobility. The lower postoperative cup ante-inclination seems to force the pelvis to tilt more posteriorly when moving from the standing to seated position (spinopelvic hypermobility) in order to avoid anterior impingement. Thus, functional cup orientation in the sagittal plane seems to affect postoperative patient reported outcome.

020 WHAT CAN WE EXPECT FOLLOWING AN ANTERIOR THA? A VALIDATION STUDY OF AN ARTIFICIAL INTELLIGENCE ALGORITHM TO MONITOR ADVERSE EVENTS IN A HIGH-VOLUME, NON-ACADEMIC SETTING.

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Ziekenhuis Oost-Limburg, Genk, Belgium

INTRODUCTION. Quality monitoring is increasingly important to support and assure sustainability of the Orthopaedic practice. Many surgeons in a non-academic setting lack the resources to accurately monitor quality of care. Widespread use of electronic medical records (EMR) provides easier access to medical information and facilitates its analysis. However, manual review of EMRs is inefficient and costly. Artificial Intelligence (AI) software has allowed for development of automated search algorithms for extracting relevant complications from EMRs. We questioned whether an AI supported algorithm could be used to provide accurate feedback on the quality of care following Total Hip Arthroplasty (THA) in a high-volume, non-academic setting.
METHODS. 532 Consecutive patients underwent 613 THA between January 1st and December 31st, 2017. Patients were prospectively followed pre-op, 6 weeks, 3 months and 1 year. They were seen by the surgeon who created clinical notes and reported every adverse event. A random derivation cohort (100 patients, 115 hips) was used to determine accuracy. The algorithm was compared to manual extraction to validate performance in raw data extraction. The full cohort (532 patients, 613 hips) was used to determine its recall, precision and F-value.

RESULTS. The algorithm had an accuracy value of 95.0%, compared to 94.5% for manual review (p=0.69). Recall of 96.0% was achieved with precision of 88.0% and F-measure of 0.85 for all adverse events. Recovery of 80.6% of patients was completely uneventful. Re-intervention was required in 1.3% of cases and 18.1% had a 'transient' event such as low back pain. The infection and dislocation rate was 0,3%.
CONCLUSION. An AI supported search algorithm can analyze and interpret large quantities of EMRs at greater speed but with performance comparable to manual review. Using the program, new clinical information surfaced. 18.1% of patients can be expected to have a 'transient' problem following a THA procedure.

009 ARE THERE DIFFERENCES IN SPINOPELVIC MOBILITY BETWEEN PATIENTS WITH END-STAGE HIP OSTEOARTHRITIS AWAITING TOTAL HIP ARTHROPLASTY AND A CONTROL GROUP? – A PROSPECTIVE DIAGNOSTIC CASE-CONTROLLED COHORT STUDY

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Aims The aims of the study were to determine the differences in spinopelvic mobility between a cohort of hip OA patients and a control group for the 1) standing to relaxed-seated and 2) standing to deep-seated task.

Methods A cohort of 40 patients with end-stage hip OA and a control group of 40 subjects, matched for age, gender and BMI were prospectively studied. Clinical data and lateral view radiographs in different positions were assessed. Sagittal spinopelvic mobility was calculated as the change when moving from the standing to relaxed-seated and standing to deep-seated positions for the lumbar lordosis angle, pelvic tilt and pelvic-femoral angle.

Results When moving from the standing to sitting position, hip OA patients demonstrated less hip flexion (52±18 vs. 69±11,p<0.001), an increased posterior pelvic tilt (23±13 vs. 12±9,p<0.001) and more flexion of the lumbar spine (22±15 vs. 14±11, p=0.01).

Similarly, when moving from the standing to deep-seated position, hip OA patients demonstrated also less hip flexion (64±21 vs. 84±18, p<0.001), accompanied by a posterior and not an anterior pelvic tilt as in the control group (10±16 vs. -3±17, p<0.001). No difference could be found for lumbar spine flexion (40±15 vs. 43±13, p=0.28).

The percentage of subjects with stiff spinopelvic mobility was significantly lower in the patient group (15% vs 48%; p=0.002) and there was a trend towards a higher percentage in spinopelvic hypermobility in patients (20% vs 2%; p=0.08).

Conclusions

Decreased hip flexion due to OA leads to an increased posterior pelvic tilt when taking a relaxed-seated position. Less than 10° of posterior pelvic tilt from the standing to relaxed seated position (spinopelvic 'stiffness') is more frequent in controls without hip OA and results from hip mobility and not from stiffness of the lumbar spine.

117 WHAT IS THE EFFECT OF A MARATHON ON THE PELVIS AND HIPS: AN MRI STUDY OF 44 RUNNERS

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Background Over 30 million people run marathons annually. The impact of marathon running on hips is unclear with existing literature being extremely limited (only one study of 8 runners).

Aim and Objectives We aimed to better understand the effect of marathon running on the pelvis and hip joints by designing the largest MRI study of asymptomatic volunteers.The objectives were to evaluate the pelvis and both hip joints before and after a marathon.

Materials and Methods This was a prospective cohort study, Fig.1. We recruited 44 asymptomatic volunteers who were registered for the Richmond Marathon. They were divided into novice and experienced marathoners, Fig.2.

All volunteers underwent 3T MRI of pelvis and hips with Dixon sequences 4 months before, and within 2 months after the marathon. Outcome measures were: 1. change in radiological score of each hip joint structure and muscle from the pre- to the post-marathon MRI; 2. change in the self-reported hip function questionnaire score (HOOS) between the two timepoints.

Results Pre-marathon, Asymptomatic novice marathoners' hips showed few joint abnormalities (cartilage, bone marrow, labrum), while minimal fatty muscle atrophy of the abductors and CAM-type hip impingement were common (68%; 34%, respectively).

Experienced marathoners had no cartilage lesions and slightly lower prevalences of abnormalities than novice runners.

Post-marathon, Hip joint cartilage, bone edema and labrum did not worsen in neither novice nor experienced marathoners. Abductor muscles were unaffected post-marathon.

Self-reported hip outcomes were not significantly different after the run for both groups.

Conclusion

This is the largest MRI study of long-distance runners. We showed that marathon running has no negative impact on the pelvis and hip joints.

047 HEARING EVALUATION OF ARTHROPLASTY SURGEONS: RESULTS FROM THE HEARS STUDY

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Background Orthopaedic surgeons are exposed to high levels of noise when performing common surgical procedures. Noise induced hearing loss (NIHL) has been demonstrated amongst senior orthopaedic staff. The objective of this study was to investigate the prevalence of hearing loss amongst arthroplasty surgeons compared to non-surgical clinicians and explore the factors associated with hearing loss.

Methods A cross-sectional prevalence study. Arthroplasty surgeons and non-surgical clinicians were recruited from orthopaedic and medical conferences. All participants were given a paper questionnaire including demographic details, hearing history and Tinnitus and Hearing Survey (THS). All participants were screened for hearing loss in a quiet room using the HearCheck Screener™ (Siemens, UK).

Logistic regression was used to identify factors associated with hearing loss. All statistical models were adjusted for age, gender, smoking status and personal noise exposure. A power calculation estimated a sample size of 100 participants.

Results The HEARS study recruited 189 participants (107 arthroplasty surgeons; 82 non-surgical clinicians). Prevalence of hearing loss identified by the HearCheck Screener™; 31% arthroplasty surgeons vs 11% non-surgical clinicians. The odds of failing the HearCheck Screener™ were 3.7 times higher in arthroplasty surgeons compared to their non-surgical colleagues (p<0.004).

Similarly, the odds of self-reported hearing loss were 2.79 times higher amongst arthroplasty surgeons (p<0.003).

Conclusion

The prevalence of hearing loss amongst arthroplasty surgeons is significantly higher than their non-surgical colleagues. Noise generated during arthroplasty surgery should be recognised and managed to create safer working conditions.

071 THE EFFECT OF SURGICAL APPROACH IN TOTAL HIP REPLACEMENT ON OUTCOMES. AN ANALYSIS OF 723,904 ELECTIVE OPERATIONS FROM THE NATIONAL JOINT REGISTRY FOR ENGLAND, WALES, NORTHERN IRELAND AND THE ISLE OF MAN

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Background Total hip replacement (THR) is clinically and cost-effective. The surgical approach influences outcomes, however there is little generalisable and robust evidence to guide practice. We assessed the effect of surgical approach on THR outcomes.

Methods 723,904 primary THRs captured in the National Joint Registry, linked to hospital inpatient, mortality and patient reported outcome measures (PROMs) data with up to 13.75 years follow-up were analysed. There were seven surgical approach groups: conventional posterior, lateral, anterior and trans-trochanteric groups and minimally invasive posterior, lateral and anterior. Survival methods were used to compare revision rates and 90-day mortality. Groups were compared using Cox proportional hazards and Flexible Parametric Survival Modelling (FPM). Confounders included age at surgery, sex, risk group (indications additional to osteoarthritis), ASA grade, THR fixation, thromboprophylaxis, anaesthetic, body mass index (BMI), and deprivation. PROMs were analysed with regression modelling or non-parametric methods.

Results Unadjusted analysis showed a higher revision risk than the referent conventional posterior for the conventional lateral, minimally invasive lateral, minimally invasive anterior and trans-trochanteric groups. This persisted with all adjusted FPM and adjusted Cox models, except in the Cox model including BMI where the higher revision rate persisted for the conventional lateral approach (hazard ratio (HR)=1.12 [95% CI=1.06,1.17] P<0.001). PROMs demonstrated statistically, but not clinically, significant differences. Self-reported complications were more frequent with the conventional lateral approach and the risk of 90-day mortality was higher (HR=1.15 [CI=1.01-1.30] P=0.029).

Conclusions

Lateral approaches for THR are associated with worse outcomes, including more deaths and revisions, than the posterior approach.

066 THE ROLE OF DALBAVANCIN IN REDUCING LENGTH OF HOSPITAL STAY FOLLOWING TREATMENT FOR PROSTHETIC JOINT INFECTION OF THE HIP AND KNEE.

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Introduction:

Prosthetic joint infection (PJI) is the leading cause of failure of primary and revision hip and knee arthroplasty. It is challenging condition which represents a growing burden on hospital resources. In-patient hospital stay for antibiotic therapy post-operatively is costly and access to out-patient IV therapy (OPAT) varies between regions. In a tertiary referral centre for revision and infection, the suitability and cost-effectiveness of Dalbavancin was reviewed as a "single-shot" therapy following DAIR or revision lower limb arthroplasty for PJI.

Methods & Materials: A prospective service evaluation was carried out for consecutive patients treated for PJI of the hip or knee who received Dalbavancin. Treatment was indicated by Consultant Microbiologist advice within an MDT setting where clinical or patient factors made alternative therapies eg. OPAT inappropriate. Service-level data was collected to allow calculation of bed-day savings compared to a traditional 14-day course of IV treatment. Readmission rates to the trust within 30 days were reviewed as a marker of clinical efficacy and safety.

R**esults:** 12 patients received dalbavancin for PJI. Mean bed-day saving was 6.9 (SD 3.7) per patient. A total of 83 bed days were saved compared to traditional treatment and there was a modest cost-benefit. There were no adverse reactions noted and no readmissions within 30 days.

Discussion: The safety and efficacy of dalbavancin has been demonstrated in recent literature, but the impact that it can have on health-care costs and in-patient burden has not been explored. In addition, the success of out-patient therapy relies on patient engagement. In patients with co-existing cognitive difficulty or alcohol/substance use Dalbavancin offers an attractive alternative.

Conclusions:

The results of our pilot suggest that IV Dalbavancin is cost-effective as part of the treatment strategy for PJI and can lead to significant bed-day savings, which can assist in patient flow and departmental efficiency.

128 ASSOCIATION OF PELVIC INCIDENCE AND ACETABULAR VERSION USING 3D RECONSTRUCTED CT SCANS

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Purpose: Spinopelvic parameters are associated with the development of symptomatic femoroacetabular impingement and subsequent osteoarthritis. Pelvic incidence (PI) characterizes the sagittal profile of the pelvis and is important in the regulation of both lumbar lordosis and pelvic orientation (i.e. tilt). The purpose of this imaging-based study was to test the association between PI and acetabular morphology.

Methods: Measurements of the pelvis and acetabulum were performed for 96 control patients and 29 hip dysplasia patients using 3D-computed topography (3D-CT) scans. Using previously validated measurements the articular cartilage and cotyloid fossa area of the acetabulum, functional acetabular version/inclination, acetabular depth, pelvic tilt, sacral slope, and PI were calculated. Non-parametric statistical tests were used; significance was set at $p<0.05$.

Results: Of the 125 scans analyzed in this study, 65% were females and the average age was 24.8±6.0 years old. Thirty-six (14.4%) hips had acetabular retroversion; 178 (71.2%) had normal acetabular version; and 36 (14.4%) had high acetabular anteversion. Acetabular version moderately correlated with pelvic incidence; (Spearman= 0.4; $p<0.001$). Patients with acetabular retroversion had significantly lower PI (44.2^0; 95% CI 41.0-47.4^0), compared to those with normal acetabular version (49.4^0; 95% CI 47.8-51.0^0) ($p=0.004$). Patients with normal version had significantly lower PI compared to those with high acetabular anteversion (56.4^0; 95% CI 52.8-60.0^0) ($p<0.001$). A significant difference in pelvic tilt between the groups (retroversion: 3±7; normal: 9±6; high version: 17±7) ($p<0.001$) was noted. Acetabular depth inversely and weakly correlated with pelvic incidence ($\rho= -0.2$; $p=0.001$). No other of the acetabular parameter correlated with the spinopelvic parameters tested.

Conclusion: This is the first study to demonstrate the association between PI and functional acetabular version using 3D-CT scans. The results of this study illustrate the importance of PI as a descriptor of both pelvic and acetabular morphology and function.

116 DIAGNOSIS OF PROSTHETIC JOINT INFECTION: SONICATION OF JOINT FLUID FROM REMOVED HIP AND KNEE PROSTHESIS VERSUS TRADITIONAL TISSUE CULTURE.

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Royal Devon & Exeter NHS Foundation Trust, Exeter, UK

Joint replacement is a life-enhancing, cost-effective surgical intervention widely used to treat disabling joint pain mainly caused by osteoarthritis. Hip and knee joint replacements are common, highly successful operations bringing many patients relief from pain, and improve mobility.

Prosthetic joint infections (PJI) are often difficult to diagnose; diagnosis often relying on a combination of clinical findings, microbiological data and histological evaluation of periprosthetic tissue. The majority of recent studies demonstrate a higher sensitivity for the culture of sonication fluid (62-94%) than periprosthetic tissue (55-88%).

The Royal Devon & Exeter NHS Foundation Trust provided a specialist multidisciplinary team. We evaluated the use of sonication for identifying pathogens during revision hip and knee replacement in our unit with the intention of applying for further grants to study this technology in more detail; it was a diagnostic feasibility study. The target recruitment was 50 patients; 25 consecutive patients undergoing revision hip arthroplasty for any reason, and 25 undergoing revision knee arthroplasty for any reason. The majority of patients were identified in outpatient clinics.

Our results show that tissue culture remains more sensitive than sonication. The sensitivity for direct sonication was 75% compared with 80% for tissue culture; sensitivity of enriched sonication was 80 %, compared to the unit results for tissue culture of 83%. The combined sensitivity of tissue culture was better as a higher number of tissue specimens were obtained.

The different methodology might explain reported differences between this and other studies; however, our study does not support the use of sonication as the only tool in the diagnosis of PJI.

067 PATIENT SPECIFIC 3D PRINTED DRILL GUIDES IMPROVE ACCURACY OF CEMENT PLUG EXTRACTION IN REVISION THA

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We hereby report on a cadaverstudy and early experience using patient specific drill guides to prevent cortex perforations and reduce the need for a trochanteric osteotomy in revision THA.

Mimic software (Materialise) was used for 3D analysis of the cement mantle and cement plug **(Figure 1**). Based on the CT findings a Cannulated drill guide with the shape of the feporal stem was printed in medical graded nylon intraoperative findings and complications were recorded on videotape using a standard 5 mm laparoscope for medulloscopic inspection

Surgical Technique

- Pre-operative CT scan with MARS protocol of the proximal femur to evaluate the femoral stem positioning , the 3D anatomy of the cement mantle , the length of the cement plug and the quality of the surrounding bone
- 3D printing of patient specific cannulated drill guide with the shape of the removed femoral component but an eccentric cannulation (**Figure 2**)
- Endoscopic inspection of the inside of the cement mantle (**figure 3**)
- Insertion of the autoclaved cannulated drill guide (Materialise) in the existing cement mantle.
- Perforation of the distal plug through the PSI drill guide using either a long drill or an ultrasound plug perforation tool (Zimmer Biomet, Warsaw)
- Reaming of excessive cement with standard available flexible femoral shaft reamers (golden boys, Zimmer Biomet)
- Medulloscopy of the femoral canal to verify completeness of the cement removal

Results CT scans with 3D reconstruction of the existing cement mantle is possible using Modern CT with MARS protocols. After the training on sawbones and cadaverbones a predictable plug perforation was obtained in all clinical cases. There were no intraoperative cortex perforations and no intraoperative femoral fractures.

CT scan analysis of femoral cement mantles together with patient specific drill guides are promising tools to reduce the risk of femoral perforation in revision total hip arthroplasty.

119 RETRIEVAL ANALYSIS OF DISSOCIATED POLYETHYLENE LINER IN PINNACLE ACETABULAR COMPONENTS.

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Background: One of the potential complications of polyethylene liner (PL) is its dissociation from the metal shell. This is a rare but catastrophic complication of total hip replacement (THR).

Objective: was to analyze the retrieved dissociated components (PL and shell) (Depuy Pinnacle, Warsaw, IN, USA) to evaluate the mechanism of failure. All these components were dissociated within four years of implantation.

Methods: Components were retrieved from three different centers in Canada over the period from January 2011 to October 2016. The analysis was done at the Orthopaedic Innovation Centre (OIC) in Winnipeg Canada. Nine PLs were retrieved at the time of revision THR. Assessment using optical and scanning electron microscopies at magnification between 25x and 150x was performed. The following questions were asked: 1) were the liners correctly seated at the primary surgery? 2) Are there signs of impingement present which could have caused the liner to become dissociated? 3) Does the wear pattern indicate that the liner was failing prior to dissociation?

Results: All PLs dissociated in the inferior direction. Five PL were believed to have been seated properly at the time of indexed surgery. All PL displayed signs of post dissociation impingement. Only 1 PL had fractured resulting in failure prior to dissociation. Other PL showed signs of wear, however none of them reached thinness that would be a cause for concern. Eight PLs demonstrated shearing of the anti rotation tabs. Assessment of the anti rotation tabs revealed that a couple had sheared off suddenly while remaining anti rotation tabs sheared off in progressive fatigue resulting in the failure of the locking mechanism.

Conclusions: Retrieval analysis was useful in identifying common patterns of failure such as anti-rotation tab damage. This was suggestive that the locking mechanism of the acetabular components has probably failed in 8 out of 9 of the retrieved liners.

124 THE ROLE OF 14-DAY EXTENDED CULTURE OF ASPIRATES IN THE DIAGNOSIS OF PROSTHETIC JOINT INFECTIONS OF THE HIP AND KNEE

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Literature debates whether fluid aspirates for suspected PJI should undergo prolonged incubation for cultures. We looked at sensitivity and specificity of 14-day cultures, compared to 7-days, for aspirates from prosthetic hips and knees.

Design and methods

Conducted at a quaternary referral centre for PJIs from Jan 2017 to July 2019. Suspected PJIs who underwent aspiration, incubated 14 days and later surgical intervention with minimum three tissue samples were included.

Results

176 aspirates were included. This is an increased number compared to our historic figures (average 88 Vs 48 pts/yr).

47 patients had fluid and tissue positive (true positive), 20 fluid +ive but tissue -ive (false positive), 98 fluid and tissue -ive (true negative) and 15 fluid negative but tissue +ive (False negative). Thus, sensitivity 76%, specificity 83%, positive predictive value70% and negative predictive value 87%.

Of 88 positive aspirates, only 75% were within 7-day cultures. Low virulence organisms as Propionibacterium acnes and coagulase negative staph were grown later.

Of 48 with only one tissue sample positive, 38 were culture-negative on aspiration and 6 grew different organisms on aspirate and tissues. Also, as many were cultured later, it suggests contamination.

Conclusion

Increased numbers reflect quaternary referral nature of institution and increasing PJI load.

Modest drop in sensitivity and specificity of 14-day cultures compared to 7-day(84 and 85% respectively) is due to higher false negatives. Contamination contributes to false-ive as more tissue samples become positive (there were 1076 tissue samples due to multiple sampling Vs 176 aspirates). Higher tissue yield may also be because they are more representative. Effect of antibiotic use between samples cannot be determined.

Organism profile suggest14-day culture produces more contaminant growth despite a well-equipped microbiology lab with laminar airflow for subcultures. Caution in interpreting 14-day results in diagnosis of PJI of Hip and Knee is advised.

176 DOES HISTOLOGICAL TISSUE ANALYSIS INFLUENCE MANAGEMENT IN REVISION TOTAL HIP REPLACEMENT: THE EXPERIENCE OF A SPECIALIST ORTHOPAEDIC CENTRE IN THE UNITED KINGDOM

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The use of routine sampling for histological analysis during revision hip replacement has been standard practice in our unit for many years. It is used to assess for the presence of inflammatory processes that may represent peri-prosthetic infection.

Our study examines 152 consecutive patients who underwent revision hip replacement in our centre for all reasons, excluding malignant neoplasm or metastasis. We reviewed the cases from a prospectively collated database, comparing microbiology results with histology results. Both microscopic and macroscopic analysis by specialist musculoskeletal histopathologist was included in our study.

We found 17 (11.2%) patients had cultured bacteria from intra-operative samples. Eight patients (5.3%) had histological findings interpreted as infection. Only one patient who had macroscopic and microscopic histology findings suggestive of infection also had culture results that identified a pathogen. Furthermore, the macroscopic analyses by the histopathologist suggested infection in nine patients. Only one patient with positive culture in greater than 2 samples had histological features of infection.

Of the 4 patients who were found to have 3 or more samples where an organism was identified only one had histological features of infection. This represents 25% sensitivity when using histology to analyse samples for infection. Of the 8 patients who had both macroscopic and microscopic features of infection only 1 patients cultured bacteria in more than 3 samples (PPV 12.5%).

Our experience does not support the routine sampling for histology in revision hip replacement. We suggest it is only beneficial in cases where infection is suspected or where a multi-procedure, staged revision is performed and the surgeon is planning return to theatre for the final stage. This is a substantial paradigm shift from the current practice among revision arthroplasty surgeons in the United Kingdom but will equate to a substantial cost saving.

180 POLYMETHYLMETHACRYLATE BONE CEMENT: EFFECT OF ROPIVACAINE LOCAL ANAESTHETIC ON MECHANICAL PROPERTIES

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Polymethylmethacetate (PMMA) is a bone cement used in over 725,000 primary hip arthroplasties in 2018. Cement integrity is affected by external factors, including temperature, mixing technique and moisture uptake, which can influence cement microstructure. Changes in the cement microstructure may ultimately threaten the survivorship of the implant.

The introduction of enhanced recovery and various local anaesthetic infiltration techniques have been adopted in an attempt to facilitate early mobilisation and reduce length of stay. Our study aims to investigate if the mechanical properties of PMMA are altered with exposure to Ropivacaine LA.

Cements were cured in three separate states (air, serum and serum with LA) and the mechanical properties tested at 24 hours and 28 days. Using Refobacin bone cement provided by ZimmerBIOMET, cylindrical molds (12x6mm) were constructed with a split-mold. The LA used was 2mg/ml Ropivacaine hydrochloride solution. Using pilot data, this study was powered to 80% and a sample size of 10 per group (n=60) was calculated.

Cement samples were subjected to compressive loading using a universal testing apparatus (Zwick/Roell). Yield-strength and modulus values were extracted from the respective stress versus strain curves. Significant differences were determined by one-way anova for each time point, and Bonferroni post-hoc testing to determine significance between actual groups.

At 24-hours there were no significant differences in strength or modulus between groups. At 28-day strength and modulus increased in all groups. Compared to the air group, both serum and LA groups show a significant decrease in compressive strength. The modulus for the LA group is significantly less stiff compared to the air group.

The results suggest that the initial exposure to LA has a significant impact on the physical properties of the PMMA. We propose increased awareness of the potential effects this may have on the longevity and survivorship of cemented implants.

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1. National Joint Registry for England, Wales, Northern Ireland and the Isle of Man Annual Report 2019. 2. National Joint Registry for England, Wales and Northern Ireland: POLARSTEM cementless (Oxinium/XLPE/R3 cup) implant summary report. 3. Latest ODEP ratings can be found at www.odep.org.uk

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Poster Papers

129 WHEN IS IT SAFE TO RETURN TO SPORT AFTER HIP ARTHROSCOPY FOR FEMOROACETABULAR IMPINGEMENT? IMPLEMENTATION OF A STANDARDISED "RETURN TO PLAY" TEST BATTERY TO GUIDE REHABILITATION

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Objectives Criteria for return to sport after arthroscopic hip surgery for femoroacetabular impingement (FAI) are not clearly defined. We implemented a multifactorial test battery to objectively measure function and guide decisions.

Methods 29 patients (26 male, 3 female) were evaluated after hip arthroscopy for FAI with a standardised rehabilitation protocol. Mean interval between surgery and evaluation was 9 months, median 6 months, (range 2 - 34). The test battery was comprised of proprioceptive tests (MFT tests), isokinetic strength measurements (BTE-primus), Hop for distance, Lateral speed chase (Speed Court – Global Speed), Single leg hop ground reaction force (Force Plate Bertec) and 3D-motion analysis (Myomotion, Noraxon). The results were interpreted using the non-operated limb as a control and expressed as a percentage of the time/distance/forces measured.

Results In proprioceptive testing patients scored 102% (SD 8%). Isokinetic strength testing: Abduction 92% (SD 14%); Adduction 100% (SD 16%); Internal Rotation 90% (SD 15%); External Rotation 96% (SD 16%). Hop for distance: 104% (SD 25%). Lateral Speed Chase: 100% (SD 11%). Peak ground reaction forces were 99% (SD 15%) during single leg hops, 110% (SD 30%) during hop for distance and 101% (SD 30%) during double leg drop jumps. 3D kinematics demonstrated reduced hip flexion and hip abduction of 90% (SD 12%) and 95% (SD 13%) respectively with increased knee flexion of 117% (SD 14%).

Conclusions

At a mean time after surgery of 9 months (median 6 months) despite near normal proprioception, hop for distance, ground reaction force and lateral speed chase results, the test battery identified persistent side to side deficits, particularly abduction and internal rotation isokinetic strength as well as reduced hip flexion and abduction with compensatory increased knee flexion during functional movements. The use of a multifactorial "return-to-play" test battery postoperatively may ensure that patients do not return to sport prematurely.

134 WHERE DO HIP IMPLANTS WEAR: COMBINING PRE-REVISION 3D CT IMAGING WITH RETRIEVAL ANALYSIS

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Introduction: The ability to accurately quantify and locate wear on retrieved metal-on-metal (MOM) hip implants enhances our understanding of their failure mechanisms. Comparing this retrieval data with accurate measures of component positioning, using pre-revision CT imaging, can help explain the impact of cup orientation on the performance of the implant.

The aim of this study was to co-register implant position with the in-vivo location of primary wear scars on MOM hips, to better understand the relationship between the two.

Method: Thirty patients with retrieved BHR hips and pre-revision 3D CT scans were included in this study. Stabilising acetabular fins (Figure 1) allowed the co-registration of wear maps to a 3D representation of the acetabular components from segmented CT scans. The in-vivo location of primary wear scars could then be determined. Implant positioning was also measured from the CT scans, relative to the anterior pelvic plane.

Results: The median volume of material loss from the hips in this study was 6.74mm^3. The in-vivo location of their primary wear scars was consistently located on the superior edge of the cup, in a sagittal view of the acetabulum (Figure 2). The components were positioned with a median inclination and anteversion of 49° and 23°,respectively. Components positioned with a greater degree of anteversion were found to exhibit a greater number of anteriorly positioned wear scars. The size of the wear scar, extending from the rim, also increased as the degree of inclination increased.

Conclusion: Increased inclination was found to increase the size of the wear scar, while the degree of anteversion determined whether they were anteriorly or posteriorly positioned. This relationship, found between component positioning and in-vivo wear scar location, highlights the impact surgical factors on hip replacement performance. These trends could also inform our understanding of hip joint function and reaction forces.

Poster Papers – Non Arthroplasty & Trauma

007 COMPLICATIONS AND OUTCOME AFTER PERIACETABULAR OSTEOTOMY - INFLUENCE OF SURGICAL APPROACH

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Background: Bernese periacetabular osteotomy (PAO) was introduced by Ganz as a novel surgical technique for hip dysplasia with a congruent hip to reorient the acetabulum in skeletally mature patients. The PAO through a modified Smith-Petersen (Iliofemoral) approach, has been subject to many modifications in order to avoid complications and to minimise risks for failure.

Aim: The aim of this review was to report on the complication rates, functional and radiological outcomes in relation to surgical approaches.

Methods: A search of NICE healthcare database advanced search, was conducted from the year of inception to May 2018. We included studies that reported complications of PAO. Data extracted from case series was analysed to detect the incidence of complications, relation to surgical approach and temporal trend of complications.

Results: 40 studies including 4070 hips with a mean age of 29 years and a mean follow-up of 52.8 month, were analysed. Outcome measures demonstrated good to excellent outcome in 82%. Higher rates of LFCN and sciatic nerve injuries were found to be associated with the ilioinguinal and the 2-incision approach. Minimally invasive (MIS) modified Smith- Petersen (MSP), minimally invasive trans-sartorial and trans-trochanteric approaches were not reported to be associated with any major wound complications. Radiological correction achieved with a mean improvement in acetabular inclination of 17.90 (range 4.5–40), anterior centre-edge correction 25.40 (range 10–51), lateral centre-edge correction 23.30 (range 15–44.6) and medial translation of 6 mm (range 3.2–10).

Conclusions: The complication rates seem to be lower in this current review (7%) as compared to the previous review performed by Clohisy et al. (6–37%). The MIS trans-sartorial/MIS MSP and intertrochanteric approaches are associated with an even reduced complications rates. This review enables favouring the minimally invasive approaches with regard to reducing nerve injury and wound complications.

018 EFFECT OF BLOOD TRANSFUSION ON MORBIDITY AND FIVE-YEAR SURVIVAL AFTER HIP FRACTURE SURGERY.

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Background Our primary goal was to audit the difference in length of stay and five year mortality with erythrocyte blood transfusion (EBT) after hip fracture surgery between Jan 2013 to Dec 2014.

Methods In a retrospective cohort study all patients 60 years old and above treated operatively for an acute hip fracture were included over a 24-month period with a 5-year follow-up period. Postoperative haemoglobin levels were used to investigate at what threshold EBT was used. The relation between EBT and Length of stay(morbidity) and survival at 30 days ,one year and five years was analysed with multivariate regression analysis. Data collection was done from institutional transfusion portal system and case records of patients.

Results : Of the 501 included patients, 15.8% received a blood transfusion. The postoperative haemoglobin level was the strongest predictor for EBT. Patients who received EBT had a significant longer hospital stay(22.01 days) compared to Non transfused group(16.85 days)with P value of 0.022 .Overall mortality at 5 years in EBT group was 63.2% and non-transfused group is 57.5%.On applying Kaplan Meir survival analysis between two groups there was no significant difference in mortality at 30days, one year and five years .

Conclusion : Transfusion in patient treated operatively for hip fracture has significantly increased length of hospital stay .Although overall mortality is higher in transfused group at 30 days ,one year and five year but the difference is mortality is not stastically significant.

Keywords Blood transfusion · Hip fracture surgery · Survival · Morbidity

027 OUTCOMES OF FEMORAL ANTEVERTING OSTEOTOMY FOR TREATMENT OF FEMOROACETABULAR IMPINGEMENT SECONDARY TO DECREASED FEMORAL ANTE-VERSION IN ADULTS

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Background: decreased femoral neck anteversion has been stated among the causes of femoroacetabular impingement (FAI).

Objective: was to assess the clinical outcome of anteverting femoral rotation osteotomy (AFRO) to treat symptomatic FAI. The secondary aims were to assess the union rate and the postoperative complications.

Patients and Methods: this was a retrospective study which included patients who underwent AFRO for FAI secondary to femoral retroversion in the period between May 2013 and December 2017. The inclusion criteria were: (1) any patient with symptomatic FAI secondary to decreased femoral anteversion (less than 5 degrees); (2) and failed to improve with non-operative treatment; (3) and had completed at least one year of post-surgical follow-up; (4) and was 16 years or older. The study included 17 patients with 20 retroverted femora. Fourteen patients were females (82.4%) and 3 were males (17.6%). The mean patients' age was 27 years (16-43) at the time of surgery.Preoperatively, all patients were clinically examined for signs of FAI and their range of both external and internal rotation of the hip was clearly documented. MRI was also acquired for all patients to calculate the femoral version angle as well as to assess for intra-articular hip pathology. All patients underwent AFRO with fixation using an intramedullary nail. Patients were followed up clinically and radiologically. Postoperative International hip outcome tool (iHOT 33) was obtained for all patients.

Results: The average follow-up was 27 months (R: 12- 72). The mean iHOT 33 score was 74 (R: 23-98). The osteotomy site was fully united in 18 femora (90 %), while 2 (10%) osteotomies did not unite and required further surgical intervention. Two patients had postoperative trochanteric bursitis (10%) and one femur showed evidence of heterotopic ossification (5%).

Conclusions: Patients with symptomatic FAI secondary to decrease femoral anterverion can be effectively treated with AFRO.

034 DEDICATED STEERING GROUP INTERVENTION RESULTS IN IMPROVED CARE AND FINANCIAL BENEFITS IN HIP FRACTURE CARE: A BURTON HOSPITAL EXPERIENCE

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Aim: Retrospective observational study to compare effects of steering group on hip fracture care over study period of 16 months. Methods: Steering group was set up in May 2018. The study period was 8 months prior and 8 months after the steering group was set up, for comparison of Best Practice performance and against the national average. Series of targeted interventions undertaken to improve the standard of care. These were to implement a 6-day Ortho Geriatric service in the form of a Sunday morning ward round to comply with 72 hour review criteria, increased consultant led trauma list to facilitate total hip replacements for eligible patients, targeted education of the physiotherapists, implementing mandatory delirium score, robust medical optimisation of patients and a structured format of operative notes. Data was collected from National Hip Fracture Database. Results: The pre intervention control arm had 198 patients and post intervention cohort had 206 patients. Over the existing performance there was further increase in Ortho Geriatric review by 13%, patients having their surgery within 36 hours by 8%, physiotherapy assessment by 13%, total hip replacements by 15%. Overall length of stay reduced by 2.8 days. Best Practice Tariff (BPT) improved from 44% to 76%. The net gain in BPT following our intervention was around £93,000 and net savings from reduction in length of stay was £128,000. Conclusion: Targeted intervention by Hip fracture steering group significantly improved the quality of hip fracture care above the national average along with significant financial gain.

037 THE IMPACT OF MENTAL HEALTH DISORDERS ON OUTCOMES FOLLOWING HIP ARTHROSCOPY FOR FEMOROACETABULAR IMPINGEMENT SYNDROME – A SYSTEMATIC REVIEW

Alastair Dick, Christian Smith, Marcus Bankes, Marc George
Guy's Hospital, London, UK

Background Hip arthroscopy for femoroacetabular impingement syndrome (FAI) has been shown to be beneficial in the short to medium-term though outcomes vary between individuals. Multiple factors have been suggested to affect outcomes including pre-operative mental health disorders.

Methods A systematic review was undertaken following PRISMA guidelines to assess the evidence relating to the effect of pre-existing mental health disorders on outcomes following hip arthroscopy for FAI. A systematic search was undertaken using three concepts: 'mental health', 'FAI' and 'hip arthroscopy' between 1998 and 2019 across seven electronic databases. Results were screened and data extracted from relevant studies.

Results Six studies met the inclusion criteria including 2248 hips, all published between 2017 and 2019. All studies were of evidence level III or IV with reasonable methodological quality. One study demonstrated pre-operative depression to be related to altered pain reduction in the short-term following surgery. Three studies reported inferior outcomes in the medium-term (1-2 years) in those with worse mental health. One study demonstrated an increased risk of persistent pain two years following surgery and one a reduced chance of returning to active military service

following surgery in those with worse mental health. Despite inferior outcomes individuals with mental health disorders generally did still benefit from surgery.

Conclusions

The presence of a pre-existing mental health disorder is associated with inferior outcomes in the medium-term following arthroscopic surgery for the treatment of FAI. Patients with mental health conditions and worse scores on pre-operative depression scales do, however, demonstrate improvements in their symptoms following surgery, just possibly to a lesser extent. Surgeons should consider screening patients for mental health disorders prior to surgery and counselling them appropriately as to the potential for less satisfactory outcomes following surgery. Further research is warranted to assess whether pre-operative treatment of mental health disorders could improve post-operative outcomes.

040 COMPARISON OF ACUTE VS DELAYED THR IN THE SETTING OF ACETABULAR ORIF OF THE ELDERLY.

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The Ottawa Hospital, Ottawa, Canada

Purpose: Elderly acetabular fractures are challenging to treat, and no guidelines exist. This study aims to describe outcome following total hip replacement (THR) in elderly patients with acetabular fracture and compare outcome between patients that had a THR acutely at the time ORIF (ORIF-acute-THR) with those that had THR at a later stage (ORIF-delayed-THR).

Method: This is a retrospective, tertiary trauma centre consecutive case series; between 2007-2018 of the 117 elderly acetabular fracture treated, 10 underwent acute-THR-ORIF and 15 underwent ORIF-delayed-THR-ORIF at 19 (2.5-77) months post-injury. Data collected included demographics, fracture pattern, Charlson Comorbidity Index, morbidity/mortality, re-operation and revision-rates. Oxford Hip Score (OHS) was collected at follow-up.

Results: The ORIF-acute-THR group was older (81±7 vs. 70±6 years) at time of injury (p=0.02). No sex differences between groups (p=0.4). The CCI was similar (4±2 Vs. 4±2) (p=0.9) as were fracture patterns; both columns (n=9), anterior column posterior hemi-transverse (n=7) (p=0.9). In total seven patients had at least one complication. In the ORIF-delayed-THR group five of 15 patients (33%) had at least one post-operative complication, infection (n=3), fracture (n=2) and failed cup fixation (n=2). In the ORIF-acute-THR group, two out of the 10 had a complication (recurrent instability; infection) resulting in reoperation. Complication rates were not significantly between groups (p=0.45). The ORIF-acute-THR had a mean OHS of 41±4, compared to a mean OHS score of 31±9 in ORIF-delayed-THR group (p=0.047).

Conclusion:

This retrospective review, which suffers from selection biases, evident by the difference in age between groups illustrates the significant morbidity and re-operation rates associated with arthroplasty in the setting of an elderly acetabular fracture (7/25, 28%). Despite low numbers, there was clinically significant trend towards superior OHS in the acute-THR group that should be considered when treating such patients, it also permits earlier mobilisation.

041 OUTCOME OF TOTAL HIP ARTHROPLASTY FOR THE TREATMENT OF OSTEOARTHRITIS SECONDARY TO TRAUMA AND PREVIOUS ORIF – A COMPARISON OF CASES WITH PREVIOUS ACETABULAR VS. PROXIMAL FEMUR FRACTURE

Graeme Nicol, Brook Biniam, Paul Kim, Wade Gofton, Paul Beaulé, George Grammatopoulos
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Purpose: This study aims to assess outcome of total hip replacement (THR) for the treatment of post-traumatic osteoarthritis; in doing so we compared outcome in patients with a previous acetabular fracture, to those that had a previous proximal femoral fracture.

Method: This is a retrospective, tertiary trauma centre, consecutive case series. Between 2006-2017, 114 patients underwent THR for post-traumatic OA; 25 had a previous acetabulum fracture (Acetabular group) and 88 had previous femur fracture (Femur group), 55 with intra-capsular fractures (70% cannulated screws) and 33 with extra-capsular fractures (66% dynamic hip screws). Data collected included: demographics, morbidity, mortality, re-operation, revision-rates and Oxford Hip Scoreat follow-up.

Results: The cohort's mean age was 64 (30–94 years), most cases were female (56%). Significant age and gender differences were identified between groups; more females (64% Vs. 35%; p=0.004) and older patients (68 Vs. 57 years old; p=0.01) were in the femoral group. Revision implants were used in 50% of the cases; predominantly in previous extracapsular (66%) or acetabular fractures (60%). Overall, 12 patients sustained post-operative complications and re-operations (11%). There were 5 complications/re-operations in the femur group (5.7%); 4 of which had revision THR and 7 in the acetabular group (28%). There were significantly higher complications and re-operation rates in the acetabular group (p=0.001); with a relative increased risk of 6.2 in the acetabular group requiring revision surgery. The mean OHS 37±6; OHS was significantly higher in the femoral (40±8) compared to the acetabular (31±6) group (p=0.02) .

Conclusion:

Patients with osteoarthritis 2˚ to trauma are likely to require revision-type implants for their THR and is associated with increased morbidity, re-operation risks and inferior OHS to that described for primary OA. Outcome is worse in cases secondary to previous acetabular ORIF compared to cases with previous femoral surgical fixation.

044 PREOPERATIVE SIZING OF HIP HEMIARTHROPLASTIES TO ACCURATELY ESTIMATE HEAD SIZE FROM NON- STANDARDISED PELVIC RADIOGRAPHS: CAN IT BE DONE?

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Background: Preoperative sizing of implants for hip fracture patients requiring a hemiarthroplasty is difficult due to non-standardised radiographs, absence of sizing marker, variable patient position and body habitus. We investigated whether a simple tool could help predict femoral head size, allowing surgeons to safely proceed with surgery when implant stocks are limited, and to potentially improve theatre efficiency.

Methods: Three independent reviewers measured the maximum width of the contralateral (intact) femoral head using PACS software in 50 cases of intracapsular hip fracture. This was linearly regressed on actual implant size to calculate the average magnification coefficient. Inter- and intra-rater reliability were evaluated using intraclass correlation coefficients (ICC).

Results: The best fitting magnification constant was 118% (95% confidence interval 16.0–19.7%), which achieved a mean error of 1.7 mm. Prediction accuracy was significantly improved by allowing a constant (intercept) as a second parameter in the regression model (p = 0.01), which achieved a mean error of just 1.4 mm from the implant used. The inclusion of the constant reduces errors at the upper and lower extremes of head sizes. ICCs for inter- and intra-rather agreement were 0.94 and 0.98 respectively.

Conclusion(s): We have shown that hip hemiarthroplasty head sizes can be reliably and accurately predicted from non-standardised pre-operative radiographs. We have devised a method which can easily be adopted by other centres and tailored to the characteristics of their radiology department. It may also be a vital tool in hospitals in developing countries, where implants have to be ordered by patients in advance to their surgery.

046 A CLINICAL STUDY TO EVALUATE THE EFFECTIVENESS OF PROXIMAL FEMORAL NAIL ANTIROTATION IN THE MANAGEMENT OF PERITROCHANTERIC FRACTURES OF THE FEMUR

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Background: Fractures around the trochanteric region of the femur are one of the commonest fractures encountered in orthopedics in elderly and young patients. In younger patients, the fractures usually result from high-energy trauma like RTA or fall from height and older patients suffering from a minor fall can sustain fracture in this area because of weakened bone due to osteoporosis.

Methods: Forty-nine patients, aged above 40 years with closed intertrochanteric fractures who were operated using proximal femoral nail anti-rotation (PFN-A) were evaluated for functional outcome and analyzed for the technical problems and complications associated with surgery.

Results: Nineteen patients were less than 60 years of age group and all patients of this group had excellent and good outcome. 25 patients who belonged to more than 60 years of age group of which 7 patients had fair and poor outcome and it was statistically significant (p=0.0139).

Conclusion: Closed reduction and internal fixation using PFN-A is an excellent method of treatment for an intertrochanteric fracture, to provide rapid recovery and good functional outcome. Age is a significant predictor of final outcome following surgical treatment. Younger is the age better the outcome.

Keywords: Intertrochanteric Fractures, Proximal femoral nail anti-rotation (PFN-A), Closed reduction and internal fixation

049 CLINICAL STUDY OF FIXATION OF UNSTABLE INTER-TROCHANTERIC FEMORAL FRACTURES WITH 95° ANGLE BLADE PLATE

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BACKGROUND: Inter-Trochanteric hip fractures account for approximately half of the hip fractures in the elderly. By definition, these include any fracture from the extracapsular part of the neck of the femur to a point 5cm distal to the lesser trochanter. Intertrochanteric fractures unite with conservative management, but this method is associated with high rate of complications. In this study, we have attempted to evaluate the results of surgical management of unstable inter-trochanteric fractures with a 95 degrees angle blade plate.

MATERIALS AND METHODS: Prospective study on 30 patients with Unstable inter-trochanteric fractures treated with open reduction and internal fixation with 95 degrees angle blade plate.

RESULTS: Patients were regularly followed-up post-operatively. Thirty cases were available for follow up. Excellent results were seen in 21 patients, good results in 7 patients, fair results in 2 patients and poor results in none.

CONCLUSION:

This study shows that the 95 degrees angle blade plate offers a reliable and effective alternative for the treatment of trochanteric fractures. The 95 degrees angle blade plate can be used for both stable and unstable intertrochanteric fractures, but the final outcome is dependent on various factors such as the type of fracture, the condition of the medial wall, the bony architecture, and the co-morbid conditions of the patient, the operative technique, implant position and post-operative care. The position of the implant should be such that the tip of the blade should be in the lower half of the femoral head and the blade should pass below the superior cortex of the neck. The 95 degrees angle blade plate is a stable and acceptable implant for the treatment of intertrochanteric fractures.

KEY WORDS: inter-trochanteric fractures; hip fractures; 95 degrees angle blade plate; condylar blade plate

053 RISK DISCUSSION INCLUDING END OF LIFE PREFERENCES IN ASA GRADE 4 PATIENTS WITH FRACTURE NECK OF FEMUR SURGERY

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INTRODUCTION The one year mortality of fragility fractures of the hip is about 30%. The aims of our study is to look at whether a discussion has taken with the patients undergoing fracture neck of femur surgery or next of kin regarding the risk of surgery and end of life preferences in ASA grade 4 patients.

Material and Methods An audit of presence or absence of pre-op DNACPR forms of one hundred consecutive patients with fracture neck of femur that were classified as ASA grade 4 from January 2017 was carried out. The patient demographics including age, co-morbidities and whether they had dementia were noted. The number of patients who died within 30 days and one year were recorded.

Results The mean age was 83.4 years .Forty one patients (41%) had dementia. The average numbers of co-morbidities were 4.79. Only 29 had DNACPR forms in place. Twenty patients had pre and 9 had post-operative DNACPR forms. Fifteen out of 41 patients (27.3%) with dementia had DNACPR forms signed pre-operatively. The overall 30 day mortality was 18 % .The one year mortality was 39 %. The number of patients alive at the end of one year was 61 of which 7 patients had DNACPR forms. Out of the 29 patients who had DNAR forms, 30 day mortality was 10% and one year mortality was 22%.

Conclusions

In ASA grade4 patients with fracture neck of femurs after discussion of high risk of mortality with the patient or their relatives before the surgery 29 patients had DNACPR forms in place. We recommend that in ASA grade 4 patients who are undergoing surgery for hip fractures the outcomes, mortality rates, end of life preferences and expectations should be discussed and documented .DNACPR forms should be considered only in selected patients.

068 Conversion of MoM hip (resurfacing)arthroplasty to dual mobility constructs with cup retention

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Introduction High complication rates have been reported when monoblock metal on metal (MoM) hips and hip resurfacings are revised. Aseptic loosening of the revision cup, intraoperative acetabular fracture and dissociation as well as instability and infection have been reported.

Conversion to a dual mobility polyethylene bearing without cup extraction could be a simple strategy to prevent these complications . Our Hypothesis is that this conversion simplifies the revision procedure of MoM THA in the absence of severe ARMD

Material & Methods Review of three institutions THA MoM revisions identified 20 patients who underwent conversion to dual mobility constructs .The Original acetabular components consisted of 8 Conserve Plus (Wright Medical) , 6 Birmingham Hip Resurfacing (Smith & Nephwew) and 6 Redapt (Biomet) . The dual mobility liner used was Trident MDM liner (Stryker) in 14 hips and Avantage dual mobility liner (Zimmer Biomet) in 6 cases Inclusion criteria were perfect cup positioning and absence of acetabular loosening on CT scan .Patients with severe ARMD on ultrasound or MRI scan were excluded and underwent complete revision .

Results Of 20 patients undergoing dual mobility revision, there was 1 complication .

..There were no re-revisions for aseptic loosening , infection or instability. Average length of stay was 2-3 days and there was no need for blood transfusion .

Conclusion

Dual mobility constructs are becoming increasingly popular in both primary and revision THA mainly because there lower risk of dislocation. The high complication rate observed In revising MoM THA urged us to explore a less invasive revision technique . Our early findings confirm the acceptable results reported by others .

Retention of a well fixed monoblock acetabular component and mating it to a dual mobility bearing seems a low morbidity option at short term. Undoudtly longer follow-up on his patient population is mandatory .

081 DOES ASA GRADINGS AFFECT THE OUTCOMES OF BEST PRACTICE TARRIFF FOR FRACTURE NECK OF FEMURS

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Introduction: Best Practice Tariff (BPT) was introduced to improve the outcomes of fracture neck of femur surgery. The aim of this study is to find the various factors influencing whether the BPT is achieved or not in different ASA grades in patients admitted with fracture neck of femurs.

Methods: A retrospective study of all fracture neck of femurs admitted over a five year period in our hospital is analysed to find whether they achieved BPT or not. The patient demographics, ASA grading, hospital admission timing, time to theatre and discharge date were recorded. The 30 day mortality rate and length of stay were calculated for each ASA grades for patients who met and failed BPT. The patients were divided in to Group 1 with ASA≤2 and Group 2 with ASA≥3.

Results: The mean age of patients who failed BPT was 85.2 years in Group 1 and 86.9 years in Group 2. The mean AMT score of patients who failed BPT was 4.5 and 3.9 ($p<0.05$) respectively for two groups of ASA grades. The average length of stay in the hospital was 17.5 and 17.6 days in both groups respectively who failed BPT. In ASA 3 patients the 30 day mortality rate was 8% in patients who failed compared to those who met BPT, 8.5%.In ASA 4 patients who missed BPT the mortality was 33% compared to 19% who met BPT ($P<0.001$). The patients who failed BPT the ASA grade was more than 3 in 81(84%) from nursing home.

Conclusion: Patients who have ASA grade 3 or more with higher age, AMT score, those from nursing, residential, sheltered accommodation, inpatients are more likely to fail BPT. The length of stay is longer and 30 day mortality is higher in ASA group 3 or more in patients who did not meet BPT.

083 SURGICAL MANAGEMENT OF ADULT BORDERLINE HIP DYSPLASIA: A SYSTEMATIC REVIEW

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Introduction Developmental dysplasia of the hip (DDH) leads to instability and pain due to insufficient coverage of the femoral head by the acetabulum. This overloads the acetabular rim and labrum causing degeneration.

DDH is quantified radiographically using the Lateral Centre Edge Angle (LCEA); this includes a borderline category (20-25º), though there is inconsistency in measurement and stratification.

In severe DDH, PAO is the standard management, but in borderline DDH arthroscopy is also used. This equipoise has not previously been systematically reviewed.

Aims

To determine:

1) Variations in stratification of DDH cases.

2) Outcomes following arthroscopy or PAO for borderline DDH.

Method Databases were searched from 2003 to 2019. Search terms included 'osteotomy' OR 'arthroscopy' AND 'hip dysplasia' AND 'treatment outcome'. Inclusion criteria were English language, borderline dysplasia identified as a discreet group, arthroscopy or osteotomy performed, PROMs reported, ≥10 patients & >1 year follow up. Studies were excluded if mean age <14 or >60, mean BMI > 35, or if surgery was performed for non-DDH indications or followed previously failed surgical treatment.

Results We identified 13 studies, including 971 hips. Eight studies investigated arthroscopy, four PAO and one a combined approach. Levels of evidence ranged from II-IV. All studies showed improvements in PROMs. Following arthroscopy, revision arthroscopy was required in 2-25% and THR in 0-32%, compared to 0-6% THR conversion for PAO. Use of the lower LCEA threshold varied, with both 18 & 20º used. The upper threshold was consistently 25º. Eight papers specified a standardised radiographic protocol.

Conclusions

Variations in the measurement and definition of borderline hip dysplasia limit meaningful comparisons of surgical outcomes. PAO is effective in the management of borderline dysplastic hips. Arthroscopy also improves outcomes, but may have a higher revision rate. Future studies should standardise definitions, and use these in randomised trials comparing PAO and arthroscopy.

085 OUTCOMES AFTER HIP ABDUCTOR REPAIR: A CASE SERIES.

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Introduction: Lateral sided hip pain is a common presentation in the outpatient department.There are numerous differential diagnoses. Of those found to be caused by gluteal tendon tears, there are a range of options described for surgical management. These include open or endoscopic repair using transosseus sutures, anchors or a ligament augment reconstruction system (LARS) and a repair described by Whiteside et al., involving transfer of anterior portion of the gluteus maximus muscle.

We present a series of patients presenting with clinical and radiological findings of abductor tendon tears who have failed conservative management.

Method: 14 patients underwent abductor repair with LARS augmentation, and/or gluteus maximus transfer, 2 patients underwent Whiteside's repair (one after failed LARS). Patients were evaluated with Oxford Hip Score (OHS) preoperatively, and at 3, 6, and 12 months.

Results: The follow up was from 6 weeks to 153 weeks with a mean follow up of 62 weeks.

5 were in native hips, 1 in a patient with previous hemiarthroplasty (which was revised to a THR) and 7 in the presence of THR. 3 patients underwent concurrent revision of THR.

There was a statistically significant difference (p=0.0008) in OHS at 3 months, the improvement in OHS was 17 (CI 10.25 – 23.75).

At 1 year post operation the improvement was maintained with mean OHS of 23 (p=0.0114, CI 8.66 – 37.74)

Conclusion:

Our results show that good clinical and functional outcomes can be achieved. Longer term follow up will demonstrate the durability of the repair and improved quality of life.

087 OUTCOMES OF MAGNETIC RESONANCE IMAGING DETECTED OCCULT NECK OF FEMUR FRACTURES: DO THEY REPRESENT A LESS SEVERE INJURY WITH IMPROVED OUTCOMES?

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Purpose: Occult hip fractures in the elderly can be missed on standard radiographs and are a known cause of morbidity.These are generally diagnosed on either magnetic resonance imaging (MRI) or computed tomography scan, depending upon local hospital policy. While there is an abundance of literature on hip fractures in general, little is known about the clinical outcome of patients with occult hip fractures. The aim of this study was to review the demographics, injury characteristics, management and clinical outcome of patients diagnosed with occult femoral neck fractures on MRI.

Materials and Methods: Using an existing hospital database, a retrospective analysis of all patients with occult hip fractures diagnosed by MRI scan from 2005 to 2014 was conducted.

Results: Sixty-four patients (23 males and 41 females) were included. The mean duration of hospitalisation was 16 days. A significantly higher percentage of patients were discharged to their pre-existing residence compared to National Institute for Health and Care Excellence (NICE) commissioning guidelines (66% vs. 45%). The 30 and 60-day mortalities were 3% and 10%, respectively. Mortality was lower in patients who underwent internal fixation (n=3/31) compared with those undergoing replacement (hemi/total hip arthroplasty) (n=5/12) (P=0.056).

Conclusion: Patients with occult hip fractures diagnosed on an MRI scan are more likely to be discharged to their pre-existing residence and have lower mortality rates compared to NICE guidelines and National Hip Fracture Database (NHFD).

088 HIP ARTHROSCOPY IN THE OLDER PATIENT

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The purpose of this study was to assess the outcome after hip arthroscopy in a consecutive series of patients aged 50 and over.

We assessed 583 consecutive hip arthroscopies performed by a single surgeon at our centre between January 2013 and December 2018. Forty two patients (46 hip arthroscopies) were identified who were 50 years of age or older at the time of surgery, and data was retrieved. Data was collected on the patients' age at the time of surgery, underlying pathology, pre-operative and post-operative non arthritic hip score (NAHS) at first follow up (8 weeks post-operatively) and again at any subsequent follow up appointments (16 weeks post-operatively and onwards). Final follow-up was assessed by postal questionnaire and NAHS assessment. Mean final NAHS by way of postal questionnaire was at 2.2 years post surgery.

Mean patient age at the time of surgery was 56.2 years with a range of 50-79 years. Mean pre-operative NAHS was 55 with a range from 29 to 92. Mean change in NAHS from the pre-operative score to final follow up was +22 with a range of -27 to +66. Three patients had osteoarthritis identified at the time of arthroscopy and 2 have subsequently undergone total hip replacement.

The results demonstrate that 82% of the patients in our series experienced a sustained improvement in their hip symptoms post arthroscopy. This suggests that in a carefully selected population, with no radiographic evidence of osteoarthritis, there is a role for hip arthroscopy in the patient aged over 50.

115 THE ROLE OF DUAL MOBILITY ACETABULAR COMPONENTS IN PATIENTS UNDERGOING TOTAL HIP REPLACEMENT FOR NECK OF FEMUR FRACTURES – A THREE-YEAR EXPERIENCE WITH NO DISLOCATIONS

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The National Hip Fracture Database (NHFD) demonstrates that the provision of total hip replacements (THR) for neck of femur (NOF) patients who meet then NICE criteria is rising, however there is wide variation per trust. One of the areas where THR patients experience a poorer outcome versus their elective counterparts is with dislocation. A retrospective audit was performed of the dislocation rates at our trust following the introduction of a dual mobility acetabular component (ADES) with a view to providing greater stability in this patient population.

Patients undergoing THR for NOF from 2012-2013 (pre-ADES) and November 2015 – February 2019 (post ADES) were analysed. Patient data was collected utilising NHFD, Bluespiers and PACS systems.

In the pre-ADES cohort, there were 56 patients (mean age 72 [56-93]) with a dislocation rate of 12.5%. In the post-ADES cohort, 80 patients were found (mean age 73 [61-87]), of which 56 patients had a dual mobility cup with a dislocation rate of 0%. The remaining 24 patients were treated by surgeons who through their own preference used the standard acetabular component with a dislocation rate of 8%.

Of the nine individual dislocations across both cohorts, two patients underwent revision surgery, whilst one had a deep infection requiring Girdlestone procedure. Overall, each patient had an average of 3.1 dislocations during their follow up period with an average total length of stay of 35.1 days. A cost analysis was performed which validates that these readmissions in addition to the costs of revision surgery far outweigh the cost of utilising the dual mobility cup in this patient cohort. It was also noted that there were no deep infections, revision surgery or periprosthetic fractures for the dual mobility cohort.

Dual mobility acetabular components are a vital tool for managing this patient population, with the potential for significant cost savings.

122 TOTAL HIP ARTHROPLASTY FOR FAILED INTERNAL FIXATION OF PROXIMAL FEMUR FRACTURES – LONG TERM FOLLOW UP AND REVIEW

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Background and Objective: With an aging population and wide prevalence of osteoporosis, the incidence of proximal femur fractures is on the rise. Hip fracture surgery is one of the most common orthopedic procedures performed today. When fixation for hip fractures fails, a conversion total hip arthroplasty is the routine treatment. THA after failed fixation for proximal femur fractures is a difficult problem with its own challenges. The objective of this study was to evaluate the results, complications such as infection, dislocation & fracture, and functional outcome after conversion total hip arthroplasty for failed internal fixation of proximal femur fractures.

Methods: Forty-three patients had conversion total hip arthroplasty between August 2008 and January 2018 for failed internal fixation of proximal femur fractures. There were twenty-one intertrochanteric fractures and twenty intracapsular femur neck fractures. Etiology for failure included five of non-union, twelve cases of implant failure, fifteen cases of implant cutout, eight cases of AVN and secondary osteoarthritis, two cases of infection and no cases of peri-implant fracture. Patients' data was collected from operative records and follow up clinic letters. All patients' pre-op and post-op radiogarphs were reviewed.

Results: There were seven patients who had surgical complications related to the procedure. These include two infection, two dislocations, one periprosthetic fracture, & 15 percent one year mortality

The follow up has been up to 8 years.

Conclusions:

Total hip arthroplasty for failed internal fixation for proximal femoral fractures remains a challenging and complex procedure with an increased risk of intraoperative and postoperative morbidity. It requires meticulous surgical planning, especially with respect to exposure and implants. It must be considered as an entity on its own separate from primary total hip replacement. However the final outcome for patient is satisfactory in relation to mobility, pain and functional improvement of the hip.

137 MRI IN LATERAL HIP PAIN AND ABDUCTOR DYSFUNCTION

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Objective To assess the role of MRI in the investigation of lateral hip pain and hip abductor dysfunction.

Methods We assessed 71 patients who presented with lateral hip pain and underwent an MRI between March 2011 and January 2016. 32/71 (45.1%) had isolated lateral hip pain; 39/71 (54.9%) had lateral hip pain with ipsilateral abductor dysfunction). 45/71 (63.4%) of patients had symptoms in relation to a native hip;26/71 (36.6%) had an ipsilateral total hip replacement. We reviewed the case notes to obtain patient demographics and clinical details, and a specialist musculoskeletal radiologist assessed the MR imaging.

Results 39/71 (54.9%) patients demonstrated pathological changes on MRI. These were varied: 19/71 (26.8%) tendinopathy; 7/71 (9.9%) abductor dysfunction; 4/71 (5.6%) bursitis, and 9/71 (12.7%) mixed pathology. Pathological findings on MRI were significantly more likely in patients with abductor dysfunction (26/39; 66.7%) than those with isolated pain (13/32; 40.6%) (OR: 2.92; x^2= 4.815, p= 0.028). 7/26 (26.9%) arthroplasty patients underwent surgery for abductor repair or tendon transfer; 1/45 (2.2%) native hip patients underwent surgical tendon debridement for pain and abductor dysfunction.

Conclusions

Pathological findings on MRI were unlikely in the absence of abductor dysfunction. MRI was unlikely to change management, the mainstay of which was non-operative for all patient groups. MRI investigation of lateral hip pain is therefore of limited value, except in guiding surgical management of post-arthroplasty patients. The varied pathology identified by MRI in this study supports the view that the aetiology of lateral hip pain and hip abductor dysfunction is complex, and discourages the use of 'trochanteric bursitis' as a single clinical entity.

153 OUTCOME OF NON-VASCULARISED FIBULAR GRAFT FIXATION FOR DELAYED, DISPLACED INTRACAPSULAR NECK OF THE FEMUR FRACTURE IN NON-ELDERLY POPULATION

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Background: Intracapsular neck of the femur fracture is a very common fracture with a high risk of non-union with or without avascular necrosis of the head. After the sixth decade most of the patients undergo hip arthroplasty whereas fixation of the fracture is preferred up to the sixth decade. Risk of complications are higher when the fixation is delayed. Both vascularized and non-vascularized bone graft procedures are described for delayed fracture management.

Objectives: To determine the outcome of fibular graft fixation for delayed, displaced intracapsular neck of the femur fracture in non-elderly population.

Methods: Prospective study. Fibular graft fixation was done for all the patients below 60 years of age with displaced intra-capsular neck of the femur fracture when there was delay more than 72 hours since 2016. Everyone had fibular autograft from ipsilateral mid fibula and two 16mm thread length cannulated screws. Regular radiological and functional assessment was done.

Results: Ten patients underwent fibular graft fixation. Mean age at surgery was 43 years (28-58). Male: female ratio was 5:5. Mean delay for the surgery was 7 days (4-40). Nine patients showed radiological evidence of fracture healing during the average follow up period of 28 months(42-18) with good functional outcome in post-operative 3months. They did not develop any complications on further follow up. The other patient underwent total hip replacement due to non-union with avascular necrosis 12 months after the surgery.

Conclusion: Fibular graft fixation is a good treatment option for displaced intracapsular neck of the femur fracture when there is a delay in surgery. It is a technically straightforward procedure.

177 SURGICAL MANAGEMENT OF CHRONIC PELVIC INSTABILITY FOLLOWING PERIACETABULAR OSTEOTOMY NON-UNION

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Introduction Periacetabular Osteotomy (PAO) is an established treatment for symptomatic acetabular dysplasia in skeletally mature individuals without arthritis. Pelvic non-union and associated stress fractures are under-reported. Non-united stress fractures can cause continued buttock pain and pelvic instability. The aim of this study is to report on our experience managing patients with ongoing pain following non-union of PAO.

Patients/Methods 8 patients presented to a tertiary referral pelvic service with symptomatic PAO non-union between 2015-2018. All patients underwent open reduction internal fixation of the superior pubic ramus non-union with ipsilateral iliac autograft, at an average of 48.1 months (15-82) following osteotomy. Demographic and perioperative data were recorded. Follow up was on average to 9.9 months, once union was confirmed radiographically.

Results All patients were female and average age was 31.8 years (18-41). In 7/8 (87.5%) patients a modified Stoppa approach was successfully utilised. One patient required an ilioinguinal approach due to the amount of rotational correction.

All patients went on to union at the superior pubic ramus and reported improvement in mechanical symptoms. 5/8 (62.5%) patients were noted to develop union of the posterior column or inferior pubic ramus stress fracture indirectly. 2/8 (25%) patients developed progression of intra-articular pain, despite restoration of pelvic stability.

One patient required intraoperative transfusion due to femoral vein injury. There were no other complications seen in this series.

Conclusion

To our knowledge, this is the largest case series of surgically managed PAO non-union. Pelvic instability resulting from non-union and stress fracture can be satisfactorily addressed by treating the non-union at the superior pubic ramus. The modified Stoppa approach is suitable in most cases, allowing excellent exposure whilst minimizing the insult to soft tissues. The altered anatomy of the pelvis following PAO should however be anticipated, to reduce the risk to nearby neurovascular structures.

183 ANATOMICAL VARIATION OF PSOAS VALLEY: A SCOPING REVIEW

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Background The depression of the anterior acetabular rim, so-called psoas valley, is of significant importance in the patients undergoing hip preservation surgery and also THRs.The aim of this scoping review was to investigate the anatomy and the anatomical variations of the psoas valley and its surrounding structures.

Methods A systematic computer search of EMBASE, PubMed and Cochrane for literature related to the psoas valley was undertaken using Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines. Clinical outcome studies, prospective/retrospective case series, case reports and review articles that described the psoas valley and its synonyms were included. Studies on animals as well as book chapters were excluded.

Results The literature search identified 14 articles describing the psoas valley and its synonyms such as iliopsoas notch, notch between anterior inferior iliac spine and the iliopubic eminence, Psoas-U and anterior wall depression. Most of these were cross-sectional studies that mainly analysed normal skeletal hips. In terms of anatomical variation, 4 different configurations of the anterior acetabular rim have been identified and it was found that the curved type was the most frequent while the straight type may be nonexistent. Additionally, the psoas valley tended to be deeper in males than females. Several articles established that the psoas

valley, or Psoas-U is at a consistent location of approximately 3 o'clock on the acetabular rim.

Conclusion

It is essential for all surgeons engaged in hip preservation surgery and also those performing THRs to understand the anatomy and variations of the psoas valley. This valley is a reliable bony landmark for consideration in patients undergoing a THR to avoid Iliopsoas impingement on the anterior edge of the acetabular component and arthroscopic surgery to ensure that the psoas is released in patients with a labral tear in the 3' o clock position.

184 THE ROLE OF ILIOCAPSULARIS IN YOUNG ADULT HIP PATHOLOGY: A SCOPING REVIEW

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Background The iliocapsularis is a relatively unheard of muscle, located deep in the hip, covering the anteromedial capsule of the hip joint. Little is known about this constant muscle despite its clinical relevance.The aims of this scoping review are to collate the studies reporting on the detailed anatomy and function of iliocapsularis, and to demonstrate how inter-individual differences in iliocapsularis can be used as a clinical adjunct in guiding diagnosis and treatment of certain hip pathologies affecting the young adults.

Methods A computer-assisted literature search was conducted based on PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines usingEmbase, PubMed (Medline), and Cochrane Library up to October 2019.The using keywords are iliocapsularis,iliacus minor,iliotrochantericus,ilioinfratrochantericus, ilio-capsulotrochanteric, or iliacus brevis.Two authors independently reviewed study inclusion and data extraction with independent verification.

Results Our review found 13 studies including 384 cases meeting our inclusion criteria, and the level of evidencein all studies was III, IV, or V. 53.8%of studies were studies involving human cadavers. Our review indicates the relevant anatomy of iliocapsularis, being a small muscle which arises from the inferior border of the anterior inferior iliac spine and anteromedial capsule of the hip joint, inserting distal to the lesser trochanter. Based upon these anatomical attachments, iliocapsularis acts as a dynamicstabiliser by tightening the anterior capsule of the hip joint. Implications of this association are that the muscle is hypertrophied in dysplastic or unstable hips. Determining the size of the iliocapsularis could be of conceivable use in patients with hip symptoms presenting with signs of both borderline hip dysplasia and subtle cam-type deformities.

Conclusion

Although future research in this arena is warranted, this study will certainly aid surgeons to understand the anatomy and clinical importance of iliocapsularis.

185 PATIENT-RELATED RISK FACTORS ASSOCIATED WITH LESS FAVORABLE OUTCOMES FOLLOWING HIP ARTHROSCOPY

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Background Recognizing patient-related risk factors for a less favorable outcome is important to avoid surgery that will have marginal or no benefit. This scoping review aims to provide an evidence-based appraisal of the patient-related factors associated with a less favourable outcomes following hip arthroscopy.

Methods Literature reporting on pre-operative patient-related risk factors and outcomes following hip arthroscopy were systematically identified from computer-assisted literature search of Pubmed (Medline), EMBASE, and Cochrane Library using Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines and a scoping review was undertaken.

Results Assessment of these texts yielded 100 final articles involving 90218 hips for qualitative analysis.Among them, 65 studies reported risk factors related to inferior outcomes such as low post-operative patient-reported outcome scores. Older age was the most frequently reported, followed by osteoarthritis and longer symptom duration. The risk factors related to failure including conversion to total hip replacement and revision surgery were reported in 46 studies. Older age and osteoarthritis are the two most frequently reported factors for inferior outcome, followed by female sex and acetabular dysplasia. Less favourable outcomes are also associated with higher BMI, workers compensation, low preoperative clinical score and the morphological abnormalities including a large cam deformity, excess acetabular retroversion or abnormal version of the femoral neck.

Conclusion

Identifiable patient-related risk factors are associated with less favourable outcomes following hip arthroscopy. Understanding these risk factors will allow the appropriate surgical indications for hip arthroscopy to be further refined and help patients to comprehend their individual risk profile.

187 FEMORAL OFFSET AND LENGTH VARIATION IN HIP HEMIARTHROPLASTY WITH EXETER TRAUMA STEM (ETS).

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Introduction Exeter Trauma Stem (ETS) is a well proven implant for surgical management of displaced femoral neck fractures (NOF) in the elderly. Ease of use and low complication rates support the use of ETS.

Aim Purpose of this study was to assess the reproduction of native hip offset and length when using ETS.

Methods From April 2019 to September 2019, displaced NOFs in elderly who underwent hip hemiarthroplasty were identified. Exclusion criteria: deformity or implant in opposite hip, non- anatomic positioning of the opposite hip in Antero-posterior (AP) radiograph. AP radiograph of both hips performed in Casualty department was used to digitally template the opposite hip with ETS using TraumaCad® (Brainlab AG, Germany). Femoral offset and length restoration were assessed. Femoral offset difference (FOD) was measured as lateral perpendicular distance between centre of femoral head and centre of ETS head. Length difference (LD) was measured as vertical perpendicular distance between femoral head and ETS head, with the middle hole of ETS stem at the femoral neck osteotomy.

Analysis of data was performed with a scatter plot of FOD versus LD using Microsoft Excel®.

Results During the study period, 50 patients met the inclusion and exclusion criteria. All of them had digital templating done. Only 3 patients had 0 FOD and LD. Scatter plot showed that the majority were negative FOD (mean of – 6mm) and negative LD (-5.3mm).

Discussion

ETS does not reproduce native femoral offset and leg length in most cases of NOF in the elderly. Care must be taken to pre-operatively identify patients who would be well outside the femoral offset provided by ETS. Good outcomes of ETS in literature potentially reflect the low demand of hip hemiarthroplasty patients.

Poster Papers – Primary Arthroplasty

011 HOW CAN PATIENTS WITH OPTIMAL CUP ORIENTATION IN THE CORONAL PLANE BUT FUNCTIONAL MALALIGNMENT IN THE SAGITTAL PLANE BE IDENTIFIED PRIOR TO THA - A PROSPECTIVE DIAGNOSTIC COHORT STUDY

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Background The sagittal functional hip position, being defined as the combined sagittal index (CSI), has been shown to be a predictor for impingement and dislocation after THA. Therefore, our study aimed to 1) determine the percentage of cups with optimal orientation in the coronal plane but malalignment in the sagittal plane and 2) identify preoperative factors allowing to predict sagittal malalignment post-THA despite having optimal coronal alignment.

Methods This prospective diagnostic cohort study followed 100 consecutive patients 1 year post-THA. Preoperatively and one year postoperatively, radiographic measurements were performed for the lumbar-lordosis-angle, pelvic tilt, pelvic-femoral-angle and cup ante-inclination on lateral radiographs in the standing and sitting position. The CSI was calculated as the sum of cup ante-inclination and pelvic-femoral-angle. Optimal cup orientation in the coronal plane was defined as 40/20°±10° for inclination/anteversion and determined on postoperative supine ap radiographs of the pelvis.

Results 80 cups were in the target zone for combined inclination/anteversion in the coronal plane, but 26 (33%) were malaligned in the sagittal plane (CSI-standing>243°: 4 cups; CSI-sitting<151°: 21 cups; 1 cup malaligned in both positions).

A ROC analysis showed that the preoperative change in sacral slope between the standing and sitting position of 20° or less was the best predictor of having a sagittally maligned cup despite having an optimally oriented cup in the coronal plane (sensitivity 77%; specificity 50%; AUC 0.74; p<0.001).

Conclusion

The present study demonstrated that 33% of patients with optimally aligned cups in the coronal plane showed malalignment in the sagittal plane. These patients can be identified prior to THA by determining the change in sacral slope between the standing and sitting position. Thus, patients with potentially higher risk for impingement and dislocation can be preoperatively identified by taking lateral radiographs in the standing and sitting position before THA.

014 RAPIDLY PROGRESSIVE OSTEOARTHRITIS AND ACETABULAR BONE LOSS - OUTCOMES FOR PATIENTS UNDERGOING PRIMARY TOTAL HIP REPLACEMENT

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Background Rapidly progressive osteoarthritis (RPO) of the hip is a relatively rare condition which remains poorly understood. Limited published literature exists on its pathogenesis and outcomes for patients undergoing surgery. The aim of this study was to report on a cohort of patients with RPO and acetabular bone loss. We aimed to quantify acetabular bone loss and report outcomes and survivorship when using a primary cementless acetabular component.

Methods This was a retrospective audit of prospectively collated data for patients undergoing a primary Total Hip Arthroplasty (THA) with RPO. Acetabular bone loss was measured on calibrated preoperative radiographs. All patients were treated surgically using a primary cementless acetabular cup without augmentation or screws. Patients within the RPO cohort where compared to all other THA performed under the senior author over the same time period.

Results 49 cases met the inclusion criteria over an 18-year period from 1999 to 2017. RPO patients were significantly older (p=0.006) and had a lower BMI (p=0.03). Increased use of Non – Steroidal Anti-inflammatory Drugs (NSAID's) was identified in RPO patients (p<0.001). The mean acetabular bone loss at the sourcil was 10.0mm. 7 patients without bone loss on booking radiographs developed RPO and lost bone stock while awaiting surgery. To date 3 patients have had further surgery with none planned.

Conclusions

Despite extensive acetabular bone loss, we have described a technique, which allows the use of primary acetabular components with comparable results. The pathogenesis and aetiology of RPO remain unclear. Urgent surgery is important to maintain bone stock. In the environment of a long waiting list patients with deteriorating symptoms require repeat imaging but inevitably some will come to harm.

015 GUIDELINES FOR THE FOLLOW-UP OF TOTAL HIP ARTHROPLASTY. DO THEY NEED REVISED?

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Aims As the number of primary total hip arthroplasties (THA) being performed increases, adopting a cost - effective model for long term follow up is imperative. The aim of this retrospective audit was to determine the route of referral or presentation of patients requiring revision following primary total hip arthroplasty.

Patients and Methods A total of 4802 patients were implanted with an Orthopaedic Data Evaluation Panel (ODEP) 10A* cementless implant (Corail/Pinnacle) between 2005 and 2015; 80 patients with a mean age of 67.8 years (sd 10.8) underwent a subsequent revision. A retrospective analysis of an electronic database and patient notes was carried out to determine how these patients were referred back to our service. The primary outcome measure was route of referral for revision.

Results Of the 80 revisions, 31 (38.8%) took place within the first year and 69 (86.3%) took place within six years. Only two of the 80 patients were picked up at a routine review clinic, one for infection and the other for liner dissociation. A total of 36 revised patients (45.0%) were reviewed following self-referral. Of the remaining 44 revised patients (55.0%), 15 (18.8%) were General Practitioner referrals, 13 (16.3%) were other hospital referrals, six (7.5%) were inpatients, six (7.5%) were Emergency Department referrals, and two (2.5%) were readmitted from their homes. No revisions were carried out on asymptomatic patients.

Conclusion

If combined with a robust system for self-referral, patients with an ODEP 10A* hip implant can, if asymptomatic, be safely discharged at the time of their first postoperative review. The game changer has been cross linked polyethylene which has to date removed the spectre of silent osteolysis.

019 The effect of standardized retractor placement during the learning curve of Anterior Approach THA.

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Introduction. The learning curve of the anterior approach can be difficult with a significant impact on the recovery of the patient. Repetitive repositioning of the retractors could lead to muscle damage, increased blood loss and a longer duration of the procedure.

Purpose. To investigate whether standardized retractor placement with a table mounted retractor system would reduce the extent of muscle damage, OR-time and post-operative inflammatory response during the learning curve of the DAA.

Materials and methods. In total 43 patients were randomly allocated to be operated by (1) an EDA expert surgeon, (2) trainee surgeons with (EDA group)) and (3) without orthostatic retractor placement (DAA group). Preoperative levels of Creatine Kinase (CK), C-Reactive Protein (CRP), Hemoglobin (Hb), Lactate Dehydrogenase (LDH) and Blood Sedimentation Rate (BSR) were measured within one hour before the operation. Exactly one, 24 and 48 hours post-operatively, these parameters were measured again.

Results. . There were no complications in any group. The mean operation time in the DAA-trainee group was 67 minutes, in the EDA-resident group 47 minutes and in the EDA-expert group 34 minutes (p<0,001). Post-operative CRP levels were significantly higher on the first (p = 0.003) and second post-operative day (p = 0.004) in the DAA cohort. Post-operative Hb levels were significantly lower in the DAA group at day one (p=0,0008) and two (p=0,03). Post-operative ESR levels were significantly higher in the DAA-cohort at day 2 (p=0.004) (45 mm/h (DAA group), 24 mm/h (EDA group) and 23 mm/h (expert)). No significant differences were found for the CK and LDH levels at any time postoperatively.

Conclusion. Standardizing retractor placement with an orthostatic device allows for reducing the operation time, post-operative blood loss and post-operative inflammatory response, even during the learning curve.

022 INCIDENCE AND RISK FACTORS ASSOCIATED WITH POST-OPERATIVE ACUTE KIDNEY INJURY (AKI) IN ELECTIVE HIP & KNEE JOINT REPLACEMENTS

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Aims To quantify the incidence of AKI in elective lower limb arthroplasty patients and identify the risk factors for developing post-operative AKI.

Methods A retrospective observational study of 100 consecutive elective joint replacement patients. Study period was from October 2018 to January 2019. Retrospective case notes review undertaken.

Data was collected on: 1) pre- and post-operative creatinine levels and percentage drop in eGFR (estimated glomerular filtration rate) 2) potential risks for developing AKI (i.e. types of joint replacement, pre-operative nephrotoxic medications, post-operative fluids and NSAIDs *(nonsteroidal anti-inflammatory drug)* prescriptions. The KDIGO (Kidney Disease, Improving Global Outcomes) diagnostic criteria were used to calculate the incidence of AKI in the cohort.

Results

The incidence of AKI in the total cohort was 8% (n=8). It was identified that the high risk group consisted of elderly male patients between 70-79 years old (50%; n=4). Patients undergoing hip joint arthroplasty were also found to have a higher AKI incidence (62.5%; n=5) as compared to knee (37.5%; n=3). Pre-operative nephrotoxic medications (100%; n=8) and post-operative NSAIDs (62.5%; n=5) were strongly linked to the development of AKI.

Conclusion

Our review shows that pre-operative nephrotoxic medications and hip arthroplasty are strong indicators for developing post-operative AKI. Our recommendations include routinely prescribing 2 litres of fluid post-operatively (excluding patients with significant congestive heart failure), to encourage patients to drink clear fluids up to 2 hours before the operation and avoid post-operative NSAIDs treatment.

023 TEN YEARS ON: THE IMPACT OF TIME ON RAISED METAL ION LEVELS IN A COHORT OF PATIENTS WHO UNDERWENT UNCEMENTED METAL-ON-POLYETHYLENE TRIDENT-ACCOLADE TOTAL HIP REPLACEMENTS WITH LARGE DIAMETER HEADS

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Aims: It was previously demonstrated that raised cobalt and chromium levels were found among larger diameter femoral heads, following metal-on-polyethylene total hip replacements[1]. Further data has been collected, to see whether these associations have altered with time and to determine the long-term implications for these patients.

Methods: Patients who underwent Trident-Accolade primary total hip replacements in 2009 were included in this follow-up study. Patients were invited to have their cobalt and chromium levels re-tested, and were provided an Oxford Hip Score. Serum ion levels were then compared between groups (28mm, 36mm and 40mm heads) and with those cited in the original study.

Results: Blood tests were repeated for 33 patients from the original study. When comparing the results of serum metal ion levels over time, regardless of head size, there was a statistically significant increase in both levels (p <0.001). Two patients within the 40-mm sub-group had metal ion levels above the MRHA failure threshold[2].

The increase in cobalt and chromium, when comparing the 36-mm and 40-mm groups with those of the 28-mm group, was not statistically significant (36-mm vs. 28-mm p 0.09/0.20; 40-mm vs. 28-mm p 0.19/0.09, respectively).

There was no significant difference, between femoral head sizes, when comparing responses from the Oxford Hip Score.

Conclusion: This study indicates that the rise in levels of cobalt and chromium is significant over time for all femoral head sizes. Furthermore, with two patients demonstrating ion levels above the predictive threshold for failure, and a further two patients undergoing revision for trunnionosis, these results may have important clinical implications regarding follow-up and future surgical choice of implants, particularly among younger patients.

025 LONG TERM SURVIVORSHIP OF DUROM HIP RESURFACING ARTHROPLASTY AND RADIOLOGICAL PREDICTION OF FAILURE

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This was a longitudinal observational cohort study with minimum 10 years (10 to 18 years) follow-up of 253 (190 men and 63 women) hip resurfacing performed between 2001 and 2009 at a single institute.

The primary outcome was to report the long-term survivorship in a consecutive series of patients with the Durom Hip Resurfacing Arthroplasty (Zimmer). The secondary outcome was to correlate early radiological migration in cup position and poor clinical outcome. Radiological changes in cup position were measured for all patients for any change in the acetabular cup inclination. In addition, the prospective collected data reported functional scores (Oxford hip score) and Cobalt and Chromium whole blood ion levels

Results: At latest follow up 10 Hip Resurfacing arthroplasty underwent revision. The Cumulative survival rate was 96%. The causes of failure were painful metal reaction and failure of the femoral component.

Statistical analysis of change in inclination angle for the acetabular cup throughout follow up was correlated with Oxford Hip score. A cutoff point for angle difference > 2.5 degrees was associated with poor clinical outcome (P value <0.001).

Conclusion: This study reports that the Durom hip resurfacing provided a durable solution for hip arthritis in young patients while providing a high level of function. In addition, we report that changes in cup inclination of more than 2.5 degrees is associated with pain and failure following Durom Resurfacing arthroplasty.

028 Short external rotator tendon integrity during anterior approach total hip arthroplasty –a prospective cohort MRI study

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Background: Anterior surgical approach for total hip arthroplasty is believed to be a completely tissue sparing approach that aims to spare the short external rotator (SER) tendons but the rate of tendon release is unknown. This study prospectively determines the early appreciable incidence of SER tendon release in subjects undergoing anterior approach total hip replacement (AATHR) for osteoarthritis (OA) using MRI.

Methods and materials: This single centre, prospective study recruited 25 subjects (Sample size determined preoperatively) . All obtained 1.5T MRI pre-operatively and 3-months postoperative. AA THA was performed using the orthopaedic table and all used technique of lateral capsular release in shoulder of the greater trochanter. The surgeon recorded the status of SER tendons intra-operatively. MRIs were prospectively reviewed independently by 2 fellowship-trained musculoskeletal radiologists for integrity of SER tendons at 3 months post-operatively. Radiographic Discrepancies were resolved by consensus.

Results: 25 subjects with Kellgren-Lawrence (KL) grade 3 or 4 OA were recruited. Average age 65 years (range 51-80); 13(52%) males; 14(56%) left hips; average BMI 28.2kg/m2(21.2-40.9). On pre-op MRI all SER tendons were intact. Intra-operatively, the surgeon reported two complete releases of obturator internus (8%) and intact piriformis or obturator externus. On post-op MRI, consensus read was complete release of obturator internus in all subjects (100%); piriformis in 72%; obturator externus in 4%; statistically significant for obturator internus and piriformis (p<0.001).

Conclusion: Due to complexity of attachment of conjoint and piriformis to the lateral capsule, release to some extent, if not fully, of these tendons is inevitable. However due to limitations of MRI at 3 months, some residual attachment of these tendons on the posterior grater trochanter may be difficult to assess. However, we confirm that tears of obturator internus and piriformis tendons were common following AATHR and not readily apparent to the surgeon during the procedure.

031 CHANGES TO EXPECTATION FULFILMENT FOLLOWING TOTAL HIP ARTHROPLASTY: A 10-YEAR FOLLOW-UP STUDY

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Background: The primary aim of this study was to assess how expectation fulfilment changes up to 10 years following total hip arthroplasty (THA).

Methods: Three hundred and forty-six patients completed an expectation questionnaire (encompassing 18 activities), Oxford hip score (OHS) and Short Form (SF)-12 prior to surgery. At 1 year postoperatively, expectation fulfilment was assessed in addition to OHS, SF-12 and patient satisfaction (n=346). This was repeated in surviving patients with intact THAs at 9.1-9.9 years postoperative (n=224). Linear regression analysis was used to identify factors independently associated with early (one year) and late (mean 9.5 years) expectation fulfilment.

Results: Early postoperative expectation fulfilment scores declined from 36.5 to 33 at late follow-up (95% confidence intervals (CI) 0.0-5.0, p<0.001). Increased (better) late expectation fulfilment scores were significantly associated with better scores for all PROMs applied at both timepoints. Younger age, greater pre-operative expectation score and greater (better) change in OHS (both early and late) were all independent predictors when adjusting for confounding (p<0.05). At late follow-up 78% (14/18) activities demonstrated high levels of persistent expectation fulfilment. Approximately two out of every five patients who considered themselves unfulfilled at early follow-up went on to experience late fulfilment, but this was dependent upon the specific expectation (mean 40%, range: 0-64%).

Conclusions: Expectation fulfilment following THA changes with time. The majority of patients report high levels of expectation fulfilment following THA at late follow-up. This information can be used to help manage the longer-term expectations of patients undergoing THA.

032 PREDICTING RISK OF DISLOCATIONS AFTER TOTAL HIP REPLACEMENTS BY CALCULATING SACRO-FEMORO-PUBIC ANGLE- A NOVEL TECHNIQUE

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The objective of this study was to evaluate the Sacro-Femoro-Pubic angle (SFP angle), which is a direct reflection of the pelvic tilt, in patients who had total hip replacements (THR). This is a retrospective study of 80 patients who had THR. They were divided into two subgroups, one with dislocations (n-40) and other without any dislocations (n-40). We evaluated the SFP angles on AP radiographs of pelvis and compared them in both the groups. The Pelvic Tilt (PT) which is a predictor of an unbalanced and balanced pelvis, can be calculated by the formula: PT= 75- SFP angle. The average SFP angle was 60.95 in dislocated THR compared to 65.78 in non-dislocated THR. The PT thus calculated in dislocated vs non-dislocated groups was 14.05 vs 9.22. There was no significant difference between the left and right SFP. The relationship between SFP angle and PT was analysed by Pearson's correlation analysis and linear regression analysis. The sagittal parameter like PT is an important parameter which shows the relationship of pelvis with spine. The SFP angle gives an advantage of predicting the PT on AP radiograph of pelvis which can predict the risk of dislocations after THR. The stability of THR depends upon the version of acetabulum which can be influenced by the PT and this can be taken into account while planning the placement of implants. To the best of our knowledge, this is the first study in the available English literature assessing the PT and SFP angles in dislocated THR and non-dislocated THR.

033 IS THERE A "WEEKEND EFFECT" IN ELECTIVE LOWER LIMB ARTHROPLASTY?

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Introduction The weekend effect has been defined as a real or perceived decline in patient care provided on weekends and that provided on weekdays. Length of stay (LOS) is a commonly used quality metric in joint arthroplasty which can be linked to patient outcomes. It is also useful as a marker of service efficiency and healthcare costs. The primary aim of this study was to investigate the association between day of surgery and LOS for patients receiving elective lower limb joint arthroplasty in a large NHS teaching hospital.

Materials and Methods Data were obtained from a prospectively collected database of consecutive patients undergoing elective primary TKR and THR. Patient and clinical variables were collected alongside LOS. Data were anonymised and analysed using a multiple linear regression model.

Results 3544 TKR and 3277 THR were included. No association was found between LOS and day of surgery for TKR or THR. A significant association was noted between longer LOS and increasing age, higher ASA grade and male vs female gender.

Discussion No evidence of a weekend effect was identified. Certain patient factors predicted longer hospital stay and focussing additional resources on these patient groups may prove a useful strategy in reducing overall LOS.

Conclusions LOS reduced across the time period included in this review whilst maintaining equality between the days of the week, which represents the successful management of weekend services**.**

Keywords: Length of stay, Arthroplasty, Elective surgical procedures, Postoperative care

035 RELIABILITY, FEASIBILITY, PATIENTS' SATISFACTION, COST AND TIME EFFECTIVENESS OF VIRTUAL JOINT REPLACEMENT CLINIC (VJRC) FOLLOW-UP OF HIP AND KNEE REPLACEMENT.

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Background: Total hip (THR) and knee (TKR) replacement are increasingly performed operations with 259,859 records submitted to NJR in 2019. Appropriate follow-up, as advised by BOA, places huge demands on orthopaedic services. This study investigates the reliability, feasibility, patients' satisfaction, cost and time effectiveness of Virtual Joint Replacement Clinic (VJRC) follow-up of hip and knee replacement in a university hospital.

Material and method: We reviewed all patients who were invited for VJRC follow up during two years. The patients were referred if routine follow up was appropriate after their 6 week post-operative review. Patients who needed to remain under consultant review due to concern were excluded. Routine VJRC review was undertaken at 1, 7 years and then 3 yearly thereafter, following BOA advice. We evaluated the patients' response rate, attendance and VJRC cost and time effectiveness. Patients' satisfaction was measured in a subgroup patients using a satisfaction survey.

Results: 1749 patients were invited for VJRC follow up with a total of 1523 patients completing VJRC review (87 % response rate). Only 7.2 % subsequently needed an outpatient clinic review. 4.2% were reviewed by the specialist Arthroplasty Physiotherapist and only 3 % required a consultant review. VJRC was found to be cost and time effective. The patients' satisfaction survey showed that 89% of the patients who had a VJRC follow up were satisfied / very satisfied.

Conclusions:

VJRC follow-up for hip and knee arthroplasty patients is a feasible, acceptable and clinically effective alternative with lower associated costs than in-person clinic assessment.

039 CRP AND ESR EVALUATION DURING FIRST THREE WEEKS AFTER TOTAL HIP AND TOTAL KNEE ARTHROPLASTY

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***Objective*:** To evaluate the behaviour of C-reactive protein (CRP) and Erythrocyte sedimentation rate (ESR) in the first three weeks after uncomplicated Total hip (THR) and total knee (TKR) arthroplasty.

***Methods*:** 73 patients enrolled for the prospective study out of which 31 were of THR ,26 were of bilateral TKR (BL TKR) performed as one stage procedure and 16 were of unilateral TKR (UL TKR). Serum CRP and ESR were measured on the day before surgery and postoperatively on day1,2,3,7,12 and at 3 weeks.

***Results*:** CRP showed a peak at day 2 with normalization by 3 weeks. ESR showed a peak at day 3 and continued to remain elevated even at 3 weeks. CRP and ESR values of THR, BL TKR AND UL TKR were in the order of THR> BL TKR> UL TKR.

***Conclusion*:** CRP correlates with a higher degree of inflammatory activity with a more rapid increase and a faster return to normal than ESR at 3 weeks. CRP shows a more predictable response with less atypical patterns and appears to be a better indicator of acute phase response than ESR. These baseline values of inflammatory markers can be used as a guide while suspecting prosthetic joint infection.

050 RELATIONSHIP BETWEEN THE TRANSVERSE ACETABULAR LIGAMENT & THE PSOAS FOSSA: IMPLICATIONS FOR ILIOPSOAS IMPINGEMENT AGAINST THE ACETABULAR COMPONENT. A CADAVER STUDY.

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Background: Total hip arthroplasty (THA) has excellent long-term outcomes. Transverse acetabular ligament (TAL) and posterior labrum have been shown to be a reliable landmark to guide optimum acetabular cup position, which is vital for avoiding complications such as dislocation, impingement, and range of motion. Acetabular component mal-positioning and oversizing of acetabular component are associated with iliopsoas impingement, which are seen in both cemented and uncemented acetabular components. The Psoas fossa (PF) is not a well-regarded landmark to help with Acetabular Component positioning. Our aim was to assess the relationship of the TAL and PF in relation to Acetabular Component positioning.

Methods: A total of 12 cadavers on two different occasions were implanted with an uncemented acetabular component, their position was initially aligned to TAL. Following optimal seating of the acetabular component the distance of the rim of the acetabular shell from the PF was noted. The Acetabular component was then repositioned inside the PF to prevent exposure of the rim of the Acetabular component. This study was performed at Smith & Nephew wet lab in Watford.

Results: Out of the twelve acetabular components that were implanted parallel to the TAL, all had the acetabular rim very close to or outside the psoas notch with a potential to cause iliopsoas impingement. Alteration of the acetabular component position was necessary in all cadavers to inside the PF to prevent iliopsoas impingement. It was evident that the edge of PF was not aligned with TAL.

Conclusion: Optimal acetabular component position is vital to the longevity and outcome following THA. TAL provides a landmark to guiding acetabular component position. We however feel the PF is a better landmark to allow appropriate positioning of the acetabular component inside bone without exposure of the component rim and thus preventing iliopsoas impingement at the psoas notch.

052 THE LEARNING CURVE OF INTRODUCING DIRECT ANTERIOR APPROACH FOR TOTAL HIP ARTHROPLASTY IN PRACTICE USING CONTEMPORARY TRAINING: FELLOWSHIP FOLLOWING RESIDENCY VS. MENTORSHIP IN EXPERIENCED HANDS

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PURPOSE: The purpose of this study was to describe outcome of introducing the direct anterior approach (DAA) in practice of four surgeons and compare the effect of two contemporary training methods (a) arthroplasty fellowship-training for new consultants and (b) mentorship-training for experienced surgeons.

METHODS: This was a prospective, multi-center study reviewing four consultants, collecting information on consecutive THRs. (A&B) were 1st year consultants with dedicated DAA training (Fellowship-group). Consultants (C&D) had over 20 years experience with a modified Hardinge approach prior to starting DAA (Mentorship-Group); they underwent cadaveric courses and visited surgeons performing DAA. We reviewed the first 50 DAA and the first 50 posterior- (Fellowship-Group) or lateral-approach (Mentorship-Group) THRs for each surgeon. We included patients operated with the approach surgeons were most familiar with to act as intra-surgeon control comparisons. Outcome measures included intra-operative, post-operative complications and Oxford Hip Score (OHS) at minimum 6-month post-op. 400 hips were studied; majority being female (61%), mean age 65±12 years.

RESULTS: There were six intra-operative complications (1.5%), three occurred in the DAA group (one Fellowship-Group; two Mentorship-Group); one in the lateral approach group and 2 in the posterior approach. There were six post-operative complications; two dislocations (one DAA–Fellowship-Group, one Posterior–Fellowship-Group), one failure of integration requiring revision (DAA–Fellowship-Group), two infections requiring revision (Posterior–Fellowship-Group; DAA–Mentorship-Group) and a periprosthetic fracture (Lateral–Mentorship-Group). Mean OHS improved from 20±9 to 42±8. There was no difference in complication nor the OHS between the two training groups, surgeons, or approaches (p=0.5 – 1).

CONCLUSION:

The DAA can safely be introduced into practice of both new and experienced consultants, provided adequate training/mentorship takes place. As there was no difference in outcome using any of the parameters tested between different approaches, no patient compromise takes place provided training is respected.

054 DOES VENOUS THROMBOEMBOLISM PROPHYLAXIS EFFECT THE RISK OF VENOUS THROMBOEMBOLISM AND ADVERSE EVENTS FOLLOWING PRIMARY TOTAL HIP REPLACEMENT?

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Introduction The optimum chemical venous thromboembolism (VTE) prophylactic agents following total hip replacement (THR) remain unknown. NICE recommend a range of agents, including direct oral anticoagulants (DOACs), low-molecular weight heparin (LMWH), and aspirin proceeded by LMWH. We assessed the risk of VTE and adverse events following primary THR, and whether these were influenced by VTE prophylaxis.

Methods We assessed 525 elective primary THRs at a large tertiary centre during 2018. The primary outcome was any VTE (DVT and/or PE) within 90-days post-surgery. Secondary outcomes were adverse events within 90-days, including major bleeding (gastrointestinal and stroke), wound problems (ooze, infection, haematoma), and reoperation. VTEs and adverse events were identified by systematically searching hospital databases (including discharge/outpatient letters, readmissions, emergency department visits, and imaging) for every patient. The association of VTE prophylaxis on VTE and adverse events was assessed using Fisher's exact test and logistic regression.

Results The overall prevalence of VTE and adverse events were 1.0% (n=5) and 5.0% (n=26). The commonest adverse events were wound ooze (n=18), followed by wound infection and/or haematoma (n=12). Agents used were: 22%=aspirin (+/-LMWH), 73%=DOAC (+/-LMWH), and 5%=LMWH only. The risk of VTE (1.8%=aspirin, 0.8%=DOAC, 0%=LMWH) was not significantly different between the three agents (p=0.483). The risk of any adverse event (5.3%=aspirin, 4.7%=DOAC, 7.1%=LMWH) was not significantly different between the three agents (DOAC vs. aspirin odds ratio (OR)=0.88, 95% CI=0.34-2.26, p=0.786; LMWH vs. aspirin OR=1.37, 95% CI=0.26-7.19, p=0.708).

Conclusions

Following THR, the risk of VTE was low with all agents currently recommended by NICE. There was no difference in adverse events between agents with the numbers available. However given the low VTE event rates, large multicentre randomised controlled trials are still required to determine if aspirin is truly non-inferior to DOACs and LMWH for VTE prophylaxis following primary THR.

055 CAN WE USE ROUTINELY COLLECTED OUTCOME DATA FOR A NATIONWIDE TRIAL ON VENOUS THROMBOEMBOLISM PROPHYLAXIS FOLLOWING PRIMARY JOINT REPLACEMENT? A FEASIBILITY STUDY

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Introduction The optimum chemical venous thromboembolism (VTE) prophylactic agents following total joint replacement (THR and TKR) remain unknown, which was highlighted in recent NICE guidance. Trials have proved difficult, due to the substantial numbers needed given the low VTE event rate. New routinely collected healthcare datasets such as the Hospital Acquired Thrombosis (HAT) register, present a new potential source of obtaining data on VTE outcomes, which would substantially reduce trial costs and increase feasibility. UK hospitals nationally report VTEs within 90-days of hospital admission, with HAT registers at each centre used for this. We assessed the accuracy of our HAT register in identifying VTE following primary THR and TKR.

Methods We assessed 982 elective admissions for primary THR and TKR at a large tertiary centre during 2018. The primary outcome was any VTE (DVT and/or PE) within 90-days post-surgery. VTEs were identified by systematically searching hospital databases (including discharge and outpatient letters, readmissions, emergency department visits, and imaging) for every patient. VTEs were also collected using the HAT database at our centre, which is maintained regularly by a specialist nursing team and used to report VTEs nationally. Diagnostic test characteristics were assessed for HAT in identifying VTEs compared to the gold standard (i.e. VTE's from the hospital databases).

Results The prevalence of VTE was 2.7% (n=27), with 20 VTEs identified by HAT. The accuracy of HAT in identifying VTEs were: sensitivity=74.1% (95% CI=53.7-88.9%), specificity=100% (CI=99.6-100%), positive predictive value=100% (CI=83.2-100%), negative predictive value=99.3% (CI=98.5-99.7%).

Conclusions

One-quarter of VTEs occurring after THR and TKR were not identified by the HAT register. This would have substantial implications if HAT were primarily used to identify VTEs in a trial. Further work is needed to improve the accuracy of HAT VTE reporting before this could be relied upon in this setting.

056 SMALL DIAMETER FEMORAL HEAD AND POSTERIOR SURGICAL APPROACH DOES NOT INCREASE DISLOCATION RATES IN TOTAL HIP ARTHROPLASTY: RESULTS OF A LONG TERM FOLLOW UP STUDY

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Background It is believed that using small diameter femoral heads with a posterior approach increases the risk of dislocation. We investigated the long-term dislocation rates in a cohort of 401 consecutive total hip replacements using a 22.225mm diameter femoral heads, implanted using a posterior surgical approach.

Methods Consecutive series of 401 hip replacements performed under the care of four surgeons using a posterior approach. Modular C-stem polished triple-tapered femoral implants with 22.225mm heads were cemented using Palacos R cement containing gentamicin, in conjunction with cemented UHMWt-polyethylene long posterior wall cups. There were 207 extended femoral heads and 194 standard heads. Direct repair of the short external rotators was performed without the use of trans-osseous sutures. Standard hip precautions were followed for twelve weeks following surgery. All patients underwent annual clinical and radiological review for five years and on alternate years thereafter.

Results During the study period, 21 cases withdrew, four were revised and 206 died. 170 remain under follow up at an average of 15 years (range 9-19 years). None were lost to follow up. Thirteen hips (3.2%) dislocated at an average of 7.2 years (range 1-15 years) from index operation. Eight (3.9%) extended head implants dislocated as opposed to five (2.6%) standard head implants. Eight dislocations occurred on a single occasion and five were recurrent, requiring further surgery. Two of these (0.5%) underwent a cup revision and three (0.75%) required a posterior lip augmentation device (PLAD).

Conclusions
We found low long-term dislocation rates in total hip replacements using small diameter heads, performed through the posterior approach. Extended heads were associated with a higher dislocation rate. Therefore, we recommend a combination of high offset stems with standard heads, to maximum head-neck ratio.

057 ERAS PROTOCOL SUBSTANTIALLY REDUCED RE-ADMISSION AFTER TOTAL HIP ARTHROPLASTY(THA): CONSECUTIVE 1855 PATIENTS SERIES

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Introduction: Unplanned re-admissions following Total Hip Arthroplasty (THA) are undesirable as it poses inconvenience to patients as well as increases the burden on health-care institutions. The reported re-admission rates are as high as 11% following Enhanced Recovery After Surgery (ERAS) protocol after THA. The aim of this study was to assess the influence of ERAS on 28 days re-admission rates following THA in our unit.

Material and Methods: Multi-surgeon, single centre, consecutive series of 28 days readmission data following THA performed between 2011 and 2018. All primary procedures except for trauma were included in this series. Revision THA procedures were excluded. All in-patient hospital re-admissions for any cause within 28 days following the index procedures were analysed. The medical records were used to identify the reason of re-admission and investigations were reviewed to confirm the diagnosis.

Results: There were 53 (2.85%) readmissions within 28 days of discharge after 1855 index procedures over 8 years period. Out of these, 28 (1.51%) re-admissions were due to underlying orthopaedic causes, whereas 24 (1.35%) were non-orthopaedic reasons (including medical and general surgical). Leg swelling with suspicion of DVT (n=9) and dislocation (n=9) were the two most common orthopaedic reasons for readmission (64% of all orthopaedic readmissions). Gastrointestinal complications (n=5, including ileus, bleeding, abdominal pain etc.) and urinary complications (n=5, including infection, retention etc.) were the two most common non-orthopaedic reasons for readmission (42% of all non-orthopaedic readmissions.

Yearly assessment confirms steady decline in readmissions which is currently 1.99% compared to 5.20% at the start of the ERAS process in our institution in 2011.

Conclusions:
Our results suggest that, a matured ERAS protocol does substantially reduces 28 days re-admission for any complications after index THA procedures.

058 ETHYLENE OXIDE STERILISED CEMENTED ACETABULAR COMPONENTS ARE AT INCREASED RISK OF MEDIUM AND LONG TERM OSTEOLYSIS AND LOOSENING

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Introduction We report a consecutive series of total hip replacements using either cemented UHMWPE Ogee (DePuy International Ltd.) or Opera (Smith & Nephew Ltd) acetabular components. The components shared similarities including: a long posterior wall, wire marker, flange and manufacturing from the same resin and with the same techniques. The only difference was the sterilisation method, the Opera with ethylene oxide and the Ogee gamma irradiated.

Methods Data was collected prospectively on 352 consecutive total hip replacements, performed between March 2000 and July 2004**,** at a single centre and by 4 consultant surgeons**.** A posterior approach was used with a cemented C-Stem femoral component (DePuy International Ltd.) in all cases. The acetabulum was prepared with multiple key holes and pulse lavage, with Palacos-R bone cement containing Gentamicin and using a pressuriser. Patients were reviewed clinically and radiologically with minimum 15 year follow up.

Results Of the 352 replacements, 191 were Opera (54.3%) and 161 were Ogee (45.7%). In the Opera group, average age was 66.2, BMI 28.5, acetabular angle 45.8°, and 111 were female (58%). There were 27 implant failures, of which 14 have been revised (7.33%) and 74.6% were Hodgkinson Grade 0 or 1 at 15 years. In the Ogee group, average age was 69.8, BMI 29.1, acetabular angle 46.3°, and 106 were female (66%). There were 3 implant failures, all of which were revised (1.86%) and 100% were Hodgkinson Grade 0 or 1 at 15 years. 15 year survivorship to radiological failure was 93% for the Ogee and 70% for the Opera.

Conclusion
We report increased rates of revision, loosening and failure with the Opera acetabular component compared to the Ogee. The key difference is the sterilisation method, and we recommend ongoing clinical and radiological surveillance of the Opera implants, as failure due to acetabular loosening is typically silent.

059 THE INCIDENCE OF PERIPROSTHETIC FRACTURES IN A CONSECUTIVE SERIES OF 500 C-STEM TOTAL HIP ARTHROPLASTIES WITH 14-19 YEAR FOLLOW-UP

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Introduction: Previously published estimates of periprosthetic fracture rates are 0.8-3.5% at 5-10 years. The majority of data originates from arthroplasty registries which will underestimate the true incidence as they only include those fractures that require revision and not internal fixation.

We present the long-term incidence of periprosthetic fractures in a consecutive series of 500 arthroplasties using the C-stem cemented polished triple-tapered femoral implant at a single centre.

Materials and Methods: All patients underwent cemented total hip replacement between March 2000 and December 2005 with a C-stem cemented triple tapered femoral implant, using a posterior approach. Palacos-R cement containing gentamicin was used with a 3rdgeneration cementing technique. The patients were reviewed annually both clinically and radiologically for the first five years and then on alternate years thereafter.

Results: Of the 500 arthroplasties, 208 are still currently under follow-up at 14-19 years, with an average of 15.1 years**.**There were 7 (1.4%) periprosthetic fractures at a mean of 7.9 years following primary procedure.

Vancouver grading of the fractures was 1 A, 3 B1, 2 B2 and 1 B3. One B2 fracture was treated non-operatively due to multiple co-morbidities, the B3 fracture was treated by revision and the other 5 by internal fixation. No typical fracture pattern was identified.

We compared age, gender, side, BMI, implant size, offset, Barrack classification and alignment between the fracture and non-fracture group. Mean age in the fracture group was higher at 74 years compared to 68.3 years, but there were no other differences.

Conclusions:
The incidence of periprosthetic fractures in this study was 1.4% at a mean follow up of 15.1 years. This rate compares to the previously reported rates in prospective studies for the Exeter (1.9%) at 12.5 years and is lower than the CPT stem (3.3%) at 4 years.

063 CAN WE REDUCE REVISION RATES FOR TOTAL HIP REPLACEMENTS BY CHANGING THE FIXATION MECHANISM USED?

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The optimal method of fixation for primary total hip replacements (THR), particularly fixation with or without the use of cement remains a controversial topic. Surgeons throughout the world continue to vary their technique for implant fixation. Surgeons discussing the risk of a revision procedure becoming necessary, after a THR using different fixation mechanisms can draw upon the orthopaedic literature and arthroplasty registries for long-term implant survival.

We have investigated whether the probability of revision is similar for the different fixation mechanisms in terms of rate and reason for revision. Of a cohort of 6,499 primary THRs, 160 revisions were reported to the NJR as revised over an eleven-year period (2004-2015).

Results from this study show 1.83% (14/766) of the primary cemented THRs were revised, 3.24% (122/3768) of the primary uncemented THRs were revised, 0.87% (15/1601) of the primary hybrids THRs were revised and 2.48% (9/364) of the primary resurfacing were revised following a primary THR. The key indications for revision were adverse soft tissue reaction to particulate debris, aseptic loosening, dislocation, infection and peri-prosthetic fracture. Results from chi-square test ($p < 0.1$) showed indication for revision and fixation mechanism are not statistically associated, taking into account only the five highest indications for revision.

In conclusion, our study shows patients from our hospital are 3.44 times more likely to be revised if they have an uncemented primary THR instead of a hybrid primary THR. Patients from our hospital are 1.77 more likely to be revised if they have an uncemented THR instead of a cemented THR. The optimal method to reduce revision rates would be for surgeons to adapt to cemented or hybrid THRs.

072 THE EXETER-TRIDENT THA WITH ALUMINA ON ALUMINA BEARINGS: MINIMUM 10-YEAR OUTCOMES IN 275 CONSECUTIVE THA

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Aims The aim of this study is to report the results of the Exeter-Trident total hip arthroplasty (THA) using an alumina on alumina bearing with a minimum 10-year follow-up.

Patients and Methods
275 THA were performed in our unit between January 2001 and January 2006. The mean age at surgery was 52.7 (17-86) years, and 84 patients (33.6%) were aged under 50 years. Primary outcome was all cause construct survival at a minimum of 10-years. Secondary outcomes included Oxford Hip Score (OHS), Harris Hip Score (HHS), EQ-5D, and Hospital for Special Surgery Noise Questionnaire score (HSS-NQ). Radiographs were compared between baseline and latest follow-up and assessed for component loosening, migration and lysis.
Results
Mean follow up for surviving patients was 12.4 (9.5 - 15.6) years. Kaplan-Meier survival for all-cause revision was 94.4% (95% CI 90.9 to 97.9) at 14.3 years. Survival for aseptic loosening was 100%. Two patients had a fracture of the neck of the femoral component. Oxford and Harris Hip Scores both improved significantly at latest follow-up. HSS-NQ responses were obtained for 248 hips (90.2%) at a mean 9.1 (range 7.0-14.4) years post implantation. Most hips (93.2%) reported no more than occasional noise. At a minimum of 10 years radiolucency was observed in at least one Charnley and De Lee zone in two hips (0.8%), and lysis in one hip (0.4%).
Conclusion
The Exeter-Trident THA with alumina on alumina bearings performed well in this relatively young population. Patients are at low risk of revision in the first decade. However, there is a small risk of stem fracture as a late complication and some patients experience significant noise. Discussion of this should form part of the consent process for this implant combination.

074 THE USE OF AN INCLINOMETER TO REDUCE VARIATION IN ACETABULAR COMPONENT INCLINATION IN PRIMARY THA
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Aims: The aim of this study was to assess the effect of introducing the use of a low-cost, commercially available, digital inclinometer to aid implantation of cementless acetabular components in primary THA of a single surgeon.
Patients and Methods: Radiographic assessment was undertaken of the immediate post-operative AP pelvis radiographs to assess the inclination of the acetabular component. Fifty-one patients from before and fifty-one patients from after the introduction of the inclinometer were included (pre-inclinometer group and post-inclinometer group). Only hemispherical shells without the use of augments were included. Age and sex distribution were similar between the groups. Mean cup inclination was compared using Welch's unpaired T-test. The distribution of acetabular inclination was described using range and standard deviation, and demonstrated using a box plot and kernel density plot. Equality of distribution was tested using a two-sample Kolmogorov-Smirnov test.
Results: Mean cup inclination in the pre inclinometer group was 45.2° (35-68, ±6.61) and in the post-inclinometer group was 46.2° (38-52, ±3.33), p=0.817. The Kolmogorov-Smirnov test shows strong evidence for unequal distributions, p=0.039. Graphical analysis demonstrated that the variation in acetabular inclination was less in the post-inclinometer group than in the pre-inclinometer group, and that extreme outliers had been eliminated.
Conclusion: The introduction of a low-cost commercially available inclinometer reduced variation in acetabular inclination in this single surgeon study. This may provide an inexpensive option to improve component positioning in cementless hemispherical acetabular components.

076 : ONE YEAR OF DAYCASE TOTAL HIP REPLACEMENT: THE SUCCESSES, AND FAILURES
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Background Daycase total hip replacement (THR) is relatively new in Europe. A small number of institutions have successfully implemented it and fewer still have reported outcomes.
Objectives
The aim of this prospective study was to compare patient reported outcomes to a matched control group and report factors associated with failure of daycase THR, after 1 year of its implementation.
Study Design & Methods
A consecutive series of planned primary daycase THR were performed from November 2018 until October 2019. The control group were patients having THR in the preceding 3 months, that would have met the criteria for daycase THR. Day 1 pain, nausea, sickness as well as 6 week pain, nausea, satisfaction and question on timing of discharge were collected in both groups as well as mean length of stay and 30 day re-admission rate. Deviations from daycase protocols were compared between successful and unsuccessful daycase patients.
Results In the daycase group, 22 of 47 patients were successfully discharged on the same day of operation, with a mean length of stay of 0.66 days. In the control group, there were 40 patients, with a mean length of stay of 2.05 days. There was no statistically significant difference in any patient reported outcome measure between groups. 95% and 90% of patients in the daycase and control groups respectively thought the timing of discharge was appropriate. In the daycase group 42 patients had a spinal anaesthetic, of which 15 had a protocol deviation by having fentanyl in addition to local anaesthetic; only one patient was successfully discharged on the same day. There were 2 re-admissions in the daycase group and 1 in the control group.
Conclusions
Daycase arthroplasty has been safely implemented, with similar early patient reported outcomes. Despite dissemination, anaesthetic protocol deviations were common and were strongly associated with daycase failure.

077 DAYCASE TOTAL HIP REPLACEMENT: THE FLAGSHIP MODEL OF ENHANCED RECOVERY
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Background Enhanced recovery protocols in arthroplasty are designed to safely decrease length of hospital stay(LOS) and improve cost efficiency. Daycase total hip replacement (THR) protocols offer little different in content to standard enhanced recovery, except the optimisation of each step to ensure early discharge is feasible. A number of studies have shown that daycase arthroplasty is safe, but it is not appropriate for everyone.
Objectives We hypothesised that implementing daycase arthroplasty for a few selected patients would have the additional effect of reducing length of stay for non-daycase patients.
Study Design & Methods Prospective data collection was carried out for 1 year before (Nov 2017 - Oct 2018) and 1 year following (Nov 2018 - Oct 2019) the introduction of daycase arthroplasty. All primary elective THR performed were included. Outcomes included mean length of stay, the number of patients discharged on the day following surgery and re-admission due to any cause.
Results In the pre-daycase period there were 368 THR performed, with a mean LOS of 2.82 days. In the post daycase period, there were 353 THR performed, with a mean LOS of 2.12 days. In the post daycase period, there were 22 daycase THR. Excluding these patients from analysis, the mean LOS was 2.26 days. The patients discharged on day 1 increased from 3.8% to 27.5% following the introduction of daycase arthroplasty. Re-admission rate due to any cause increased from 3.8% to 5.7%.
Conclusions
The introduction of daycase arthroplasty was associated with a significant decrease in LOS for THR patients, despite excluding daycase THR patients from the analysis. In the context of minimal change in LOS over the last few years and an already short LOS, it seems likely that the optimisation of THR pathways for daycase patients also improves non-daycase discharges.

084 SAME-DAY AND 24-HOUR-DISCHARGE AFTER ELECTIVE HIP AND KNEE REPLACEMENTS AT ROTHERHAM GENERAL HOSPITAL: SERVICE EVALUATION.
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Background: Increasing demand for early discharge after elective arthroplasty by patients, prompted a review of how this could be facilitated at Rotherham General Hospital.
Method: Patients suitable for same-day- discharge or 24-hour discharge were identified using set criteria. Data was collected prospectively from 14/06/2018 to 24/10/2019.
Results: 13 patients had a same- day- discharge after either a THR or a TKR. All patients were placed first on the list. They had no postoperative or post discharge problems.
The average age of patients was 55years (Range 46-65). There were 5 female and 6 male patients. 6 patients had a TKR (3 PFC RP TKRs and 3 Zimmer uncemented TKRs) and 7 patients had a THR (6 Corail/ Pinnacle THRs and 1 Trilock/ Pinnacle THR). The diagnosis was primary Osteoarthritis in 10 patients, post-traumatic OA in one patient, Hip dysplasia in one patient and AVN in one patient
A further 6 patients went on to have a planned or unplanned 24-hour discharge. The average age of patients was 58 years (range 50-64). 1 patient was a woman and 5 patients were men. 3 patients had TKR (Zimmer uncemented TKRs) and 3 patients had a THR (2 Corail/ Pinnacle THRs and 1 Trilock/ Pinnacle THR). None had post discharge problems.
Four patients who were planned same-day-discharge patients failed.
Conclusion:

Same- day and 24-hour discharge works well after elective THR and TKR for a select group of patients at Rotherham General Hospital.

089 DO "BONE-PRESERVING" FEMORAL PROSTHESES CONSERVE BONE? A TWO-YEAR RANDOMISED CLINICAL TRIAL OF THE TRI-LOCK VERSUS CORAIL PROSTHESES

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Introduction: Whether short stems (SS) conserve more femoral bone than standard-length stems (SLS) remains unclear. The aim of this prospective, randomised controlled trial was to compare the biological process of bone remodelling that takes place post-THA between a standard-length and a "bone-conserving" shorter stem.

Methods: Eighty-five participants were randomised to receive either a short, proximally coated stem (Tri-Lock, 45 participants) or a conventional, fully-coated stem (Corail, 40 participants). While the SS were implanted with bone-removing broaches, the SLS were prepared with a bone compaction system. No baseline demographic differences were detected between the groups for sex, age, body mass index, and canal flare index ($p>0.05$). Radiographs and patient-reported outcome measures (PROMs) were evaluated at a minimum 2-year follow-up. A novel computational imaging method, termed dual energy X-ray absorptiometry region free analysis (DXA-RFA), was used to quantitate spatially complex changes in periprosthetic bone mineral density (BMD). Serum samples of carboxy-terminal telopeptide of type I collagen (CTX) and intact amino-terminal propeptide of type I procollagen (PINP) were used as bone turnover biomarkers.

Results: All patients showed better functional results when comparing preoperative to postoperative PROMs, without differences between groups ($p>0.05$). No baseline differences in BMD or bone biomarkers were found between groups ($p>0.05$). DXA-RFA detected significant changes at 26 (SLS 0/11115 pixels [0%] versus SS 114/9460 pixels [1.205%]; $p<0.001$), 54 (SLS 28/11115 pixels [0.252%] versus SS 125/9460 pixels [1.321%]; $p<0.001$) and 104 weeks (SLS 76/11115 pixels [0.684%] versus SS 306/9460 pixels [3.235%]; $p<0.001$). Both groups experienced similar changes in bone turnover markers over the study period ($p>0.05$).

Conclusions: Early periprosthetic bone loss around these prostheses was modest, and both achieved excellent clinical results and early implant stability. Longer-term studies will have to confirm whether the better bone preservation with the Corail translates into improved prosthesis survivorship versus the Tri-Lock.

091 LONG TERM OUTCOMES OF PRIMARY TOTAL HIP ARTHROPLASTY IN PATIENTS WITH LEGG-CALVÉ-PERTHES DISEASE.

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Background: Total hip arthroplasty (THA) in patients with childhood Legg-Calvé-Perthes disease (LCPD) can be challenging due to multi planar deformities and multiple procedures on the proximal femur. The long-term results of THA in patients with LCPD have not been widely reported.

Methods: We retrospectively studied data of patients who underwent primary THA due to sequelae of LCPD at our hospital between 1965 and 2015 with a minimum of 2 years follow up. Details including age at surgery and follow up; previous operations and deaths were recorded. Outcomes assessed were survivorship, functional outcome, post-operative complications and revision rate.

Results: Total of 146 patients (169 hips) with a mean follow up of 14.1 years (range: 2 to 43.57) and mean age at surgery of 50 years (17 to 79) were reviewed. Thirty-two hips (18.9%) had a previous surgery including fusion (n=5), pinning (n=6) and osteotomy (n=21). 14 patients (17 hips) died during follow up and mean age at follow up was 64 years (20 to 89). Kaplan-Meier survival rate was 92.2% at 14 years and 77.14% at 20 years. Charnley hip scores available for 66 patients (77 hips) showed significant improvement in pain, function and movement at 1 year follow up. Post-operative complications (18.3%, n=31) included 28 cases of aseptic loosening (16 cup, 8 stem, 4 both) and one each of fracture femur, dislocation and deep infection. 22 hips (13%) were revised at a mean follow up of 16.7 years (6.8 to 43.5) and were mostly due to aseptic loosening (n=20).

Conclusion: Patients with LCPD undergo THA at a younger age. THA in Perthes is an effective treatment with good functional outcome but an implant survival lower than that of adult THA. Aseptic loosening was the most common complication and reason for revision.

095 THE BRADLEY CARBON FIBRE REINFORCED PLASTIC HIP REPLACEMENT STEM: LONG TERM RESULTS

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Background The Bradley hip replacement stem was a carbon fibre reinforced poly-ether-ether-ketone (CFR-PEEK) composite, designed and trialled at the Royal Gwent Hospital, Newport in the 1990s and 2000s. The aim of this experiment was to produce a stem that did not loosen over time. We present the basic science analysis of the construct and the long term clinical results of this device, used as part of a total hip replacement system.

Methods 150 devices were implanted in 137 patients between 1993 and 2007. Standard cemented and uncemented acetabular components were used with the stem. All patients were consented for an experimental procedure, in line with practice at the time. Bone mineral density analysis was performed in the first 40 patients receiving the device. Postoperative patient reported outcome measures and radiographs were collected in the short and long term.

Results The overall survival of total hip replacements using the Bradley stem at 25 years was 85%; 128 of 150 hip replacements were not revised. 22 devices were revised in 21 patients and eight of them were 45 years old or less at the time of their primary operation. Kaplan Meier survivorship estimates showed no significant difference between the survival of the Bradley stems alone and the standard cup with Bradley stem hip replacements.

Long term radiographic follow up of 38 devices showed lysis around the stem in four patients and one stem had subsided. Harris Hip scores for pain and function were maintained in the long term. Bone mineral density around the stem improved in the short term.

Conclusion

This is the largest series of CFR-PEEK devices in hip arthroplasty. These results can be used to consider the value of this construct for future experimental and clinical applications.

097 INCIDENCE OF VENOUS THROMBOEMBOLISM IN ELECTIVE HIP ARTHROPLASTY SURGERY: A REVIEW OF 8,891 PATIENTS RECEIVING POST-OPERATIVE ASPIRIN VTE PROPHYLAXIS

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Background Venous thromboembolism (VTE) is a preventable cause of morbidity and mortality in patients undergoing elective hip arthroplasty surgery. The balance of post-operative VTE prophylaxis and risk of post-operative haemorrhage remains at the forefront of surgeons mind. The National Institute for Health and Care Excellence (NICE) published updated guidelines in 2018 which recommend the use of both mechanical and pharmacological methods in patients undergoing elective hip arthroplasty surgery.

Objectives The aim of this study was to present the venous VTE incidence in 8,891 patients who underwent total hip arthroplasty (THA) between January 1997 and March 2018 with aspirin as the primary agent for pharmacological thromboprophylaxis.

Methods We performed an analysis of prospectively collected data of the incidence of deep vein thrombosis (DVT) and pulmonary embolism (PE) occurring with 6 months of the index operation. We also investigated the 90-day mortality of this cohort of patients.

Results 8,891 patients were reviewed. This included 6,973 primary, 224 complex primary and 1694 revision cases. The incidence of DVT was 0.58% after elective hip arthroplasty, the incidence of PE was 0.54%. There was no difference in the incidence between primary and revision cases. The 90-day mortality was 0.88%. Cardiovascular and respiratory disease were the main causes of death following surgery. Only 0.03% of deaths (n= 3) within 90 days of index surgery were due to VTE.

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

101 MODERN BEARING SURFACE THR SURVIVAL USING CEMENTED AND UNCEMENTED ACETABULAR COMPONENT FIXATION. AN ANALYSIS OF DATA FROM THE NATIONAL JOINT REGISTRY OF ENGLAND, WALES, NORTHERN IRELAND AND THE ISLE OF MAN.

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Aim: To assess the effect bearing combination on the survival of total hip replacements with modern bearing surface combinations.

Methods: We combined the NJR dataset with polyethylene manufacturing properties as supplied by the manufacturers to sub-divide polyethylene into conventional (PE) and highly crosslinked (XLPE). Cause specific and overall reasons for revisions were analysed using Kaplan-Meier and multi-variate Cox proportional hazard regression survival analyses.
Results: A total 0f 337,786 uncemented cup and 290,770 cemented cup THR cases were included in the analysis. A Cox regression model adjusted for age, gender, bearing combination and stem fixation was used to provide Hazard Ratios (HR). In uncemented cups with MoXLPE as the reference, the CoC all cause revision HR was 0.99 (0.93, 1.07), CoXLPE HR 0.84 (0.77, 0.92), CMoXLPE HR 0.75 (0.62, 0.92). When analysing revision for aseptic loosening with MoXLPE as reference: CoC HR 1.05 (0.90, 1.21), CoXLPE HR 0.85 (0.70, 1.03) and CMoXLPE HR 0.52 (0.32, 0.860). Cemented cups were split into three polyethylene groups: G1 (no radiation); G2 (>0 Mrad and <5 Mrad); G3 (≥5 Mrad). The adjusted Cox Regression model with revision for aseptic loosening as the endpoint (G1 as reference) revealed a HR of 0.70 (0.58, 0.83) for G2 and HR 0.40 (0.30, 0.53) for G3.
Conclusion: When compared with XLPE-based bearings, CoC did not offer an advantage at mid-term follow up in uncemented cup THRs. In cemented cup THR, XLPE and ceramic head use were associated with the lowest risk of revision for aseptic loosening.

109 INCIDENCE OF PERIPROSTHETIC FRACTURES SEEN SINCE INTRODUCTION OF THE CPT STEM; THE NOTTINGHAM EXPERIENCE.

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Introduction: Periprosthetic fractures (PPF) are a serious complication of total hip replacement (THR). Recent publications have suggested a higher prevalence of PPF with the CPT stem compared to other polished taper stem designs and a higher revision rate for PPF in the UK National Joint Registry (NJR). The incidence of PPF was assessed in a consecutive series of patients undergoing elective THR in an NHS teaching hospital.
Methods and materials: NJR records were obtained for consecutive patients receiving a CPT stem since its introduction with a minimum 5 year follow up. Data were cross-checked against a prospective local trauma database. All available imaging carried out after primary surgery was reviewed on a regional digital x-ray platform and details of any fractures recorded. Canal morphology was assessed using cortical thickness index (CTI)and Dorr classification and technical performance was calculated by measuring stem alignment and barrack cement grade.
Results: 349 stems were reviewed in 328 patients with a mean age 65 years (SD 14.7), 15% 80+ years and 72% females. 93% of femurs were Dorr B and the mean CTI was 0.55 (SD 0.08). There were no revisions for fracture at a mean of 72 months (range 36 – 122). We observed 2 PPF at intervals of 22 and 25 months, with satisfactory outcomes following open reduction internal fixation. The incidence of PPF was 0.57%.
Discussion: Results of this series demonstrate no evidence of an increased incidence of revision for PPF when using the CPT stem. Registry data has the potential to underestimate PPF incidence in fractures that do not lead to revision.
Conclusions:
The incidence of fracture compares favourably with published results of other cemented polished taper stems and there was 100% survivorship of stems at a mean of 6 years follow-up when taking revision for PPF as the end-point.

112 WHAT IS THE OUTCOME OF CEMENTED TOTAL HIP ARTHROPLASTY FOR PROTRUSIO ACETABULI? A MATCHED CASE-CONTROL STUDY WITH MINIMUM 5-YEAR FOLLOW-UP.

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Background: This study aims to report the clinical, radiographic and functional outcomes of THA for protrusio acetabuli.
Methods: All patients undergoing THA for protrusio acetabuli during the period 2003 to 2014 were included. A cohort of 2275 patients undergoing THA for simple osteoarthritis were used as a control group. Case-control matching was undertaken based upon age and gender. Comparisons were made for clinical and functional outcomes (pre- and 1-year post-operative Oxford Hip Score (OHS)).
Results: 113 THAs performed for protrusio acetabuli were identified (mean follow-up 9 years (5-15 years); 101 Females (89.4%); average age 66.5 years; 21 (18.5%) deceased). 38 patients (33.6%) had an underlying diagnosis of inflammatory arthropathy. Increasing Sotello-Charnley grade of severity was significantly associated with varus neck-shaft angle (p=0.005), reduced acetabular offset (p<0.001) and increased centre-edge angle (p=0.001). Acetabular floor bone-grafting occurred in the majority of cases (99.1%) and acetabular cage augments were required in 15 cases (13.3%). Radiographic follow-up demonstrated incorporation of the bone graft in 98.1%. During follow-up, revision surgery was undertaken in 5 cases (4.4%) (3 infection; 2 loosening).
Following case-control matching, median pre-operative OHS were found to be significantly lower in the Protrusio group than the control group (Pre-Op 9 vs 21, 95%Confidence Intervals (CI):9-13,p<0.001). However, post-operative OHS scores demonstrated no significant difference (Post-op 39.0 vs 43.0, 95%CI:0-4,p=0.149). The median net change in OHS was significantly higher in the Protrusio group (28.0 vs 17.0, 95%CI:5-11,p<0.001). Protrusio patients were also more likely to achieve the Minimal Clinically Important Difference (MICD) for the OHS (98.9% vs 89.7%, p=0.003).
Conclusion: Despite lower pre-operative OHS scores, the Protrusio group experienced greater improvement and was more likely to experience a clinically-important change in function. This study demonstrates that THA is effective in the treatment of protrusio acetabuli and has comparable outcomes to a standard OA population undergoing THA.

113 OUTCOMES OF THE EXETER V40 CEMENTED FEMORAL STEM AT A MINIMUM OF 10 YEARS FOLLOW-UP IN A NON-DESIGNER CENTRE

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Background: The Stryker Exeter V40 cemented femoral stem was first introduced in 2000. The largest analysis of this implant conducted so far was published in 2018 by Westermann et al. with a minimum 10 year follow-up of the first 540 cases performed in the designer centre in the Exeter NHS Trust, and demonstrated excellent long term survival. The aim of this study is to report long term outcomes and survivorship for the Exeter V40 stem from a non-designer centre.
Methods: All patients undergoing primary total hip arthroplasty using the Exeter V40 femoral stem between 01/01/2005 and 31/12/2009 were eligible for inclusion in this study.
Data was collected prospectively, with routine follow-up at 1, 2, 5 and 10 years as per joint registry protocol in our institution. Data was then reviewed retrospectively between July 2019 and January 2020. Endpoints were defined as components in situ beyond 10/12/14 years, death occurring before 10/12/14 years with components in situ, and revision or component revision surgery.
Results: 783 patients were included in the data set. 766 (97.8%) patients did not undergo revision surgery within the follow-up period; 621 (79.3%) were in situ beyond 10 years, and 145 (18.5%) were in situ at death before 10 years. 17 (2.2%) patients underwent revision surgery. Stem offset ranged from 30mm to 50mm with a mode of 44mm. Head size ranged from 22.2mm to 36mm with a mode of 32mm. Head materials predominantly consisted of Orthinox stainless steel, Alumina ceramic, and mixed oxide ceramic.
Discussion: The Exeter V40 cemented femoral stem demonstrates excellent survival when used in a high volume non-designer centre. Outcomes are comparable to those of its serially validated predecessor, the Exeter Universal Stem.

114 THE PREVALENCE OF PRE-OPERATIVE ANEMIA IN PRIMARY ARTHROPLASTY AND ITS EFFECT ON OUTCOME – DOES A BLOOD OPTIMISATION CLINIC IMPROVE OUTCOME?

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Introduction: Reducing the occurrence of post-operative anemia is associated with improved outcomes in cardiac surgery. However, the clinical impact of anemia in arthroplasty is largely unknown. This study aims to 1) identify the prevalence of anemia in a primary arthroplasty cohort; 2) identify its association with post-operative outcome (transfusion-, complication-, 90-day readmission rates and length of stay (LOS)); and 3) report the effect of a blood optimisation clinic on outcomes.
Methods: This is a retrospective, consecutive case review of all 5548 primary total joint arthroplasties performed between 2012–2017 at a university, tertiary referral centre. Patient demographics, Charlson Comorbidity Index (CCI), transfusion rates, hemoglobin levels, length of stay, complications, and 90-day readmission were recorded. The World

Health Organization (WHO) classification of anemia was used (Hb<130g/L for males, Hb<120g/L for females). Multivariate analysis and odd's ratio (OR) adjusted for sex, age, BMI, ASA, CCI, surgery type, and baseline Hb were used.

Results: There were 787 (14%) (M: 300, F: 487) patients with pre-operative anemia. Pre-operative anemia was predictive of higher transfusion rates (OR = 3.20, 95% confidence interval (CI), 1.93-5.31), complications (OR = 1.36, 95% CI, 0.93-2.00), 90 readmission rates (OR = 1.78, 95% CI, 1.21-2.62), and LOS (OR = 21%, 95% CI, 15%-27%). Visit to the blood optimization clinic (n=178) trended towards lower transfusion rates (OR=0.60, 95% CI, 0.28-1.28), 90-day readmissions (OR=0.70, 95% CI, 0.30-1.68), and complications (OR=0.51, 95% CI, 0.21-1.22). Optimising pre-op hemoglobin was associated with a 30% reduction in LOS (p<0.001).

Discussion/Conclusion:

This study confirms the prevalence of anemia in primary arthroplasty as identified in previous studies. Furthermore, pre-operative anemia is an independent, reversible, predicting factor of higher transfusion-, complication-, 90-day readmission- rates, and increased LOS. The use of a blood optimization clinic is strongly advised as patients surgery should be delayed until hemoglobin is optimized.

118 IS A ZERO PERCENT DISLOCATION RATE ACHIEVABLE FOLLOWING PRIMARY HIP ARTHROPLASTY ?

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INTRODUCTION: Dislocation remains one of the leading complications following Total Hip Arthroplasty (THA). The use of larger diameter heads and Dual Mobility (DM) are commonly used by surgeons to potentially reduce dislocation. We report our use of risk stratification to aid implant selection and the observed effect on dislocation and re-operation rates.

METHODS: Between March 2016 and 2019 all patients undergoing primary THA performed by a single surgeon were risk stratified using the 8 evidence based criteria listed below:

i) Females over 80 years old
ii) ASA grade 3 and above
iii) Alcoholism
iv) Failed fixation or hip fracture
v) Cognitive impairment
vi) Neuromuscular compromise
vii) Abductor deficiency
viii) Spino-pelvic stiffness/deformity

Patients with a single risk factor received a 36mm head and those with multiple risk factors received a DM. Primary outcome measure was dislocation and the secondary outcome was all-cause revision. These complications were identified via hospital records and clinical coding linkage using Patient Episode Database for Wales (PEDW) enabling any treatment events at other hospitals to be identified.

RESULTS: In 473 primary THA we observed 2 dislocation events with overall dislocation rate of 0.42% (95%CI 0.12-1.5). Group 1 - 36mm heads, 387 patients, mean age of 62 years (26-88) contained both dislocations 3 revision events (2 peri-prosthetic fractures & 1 PJI). Both dislocations are single events now with excess of 18 months follow- up. Group 2 - DM 86 patients, mean age 74 years (33-94) with no dislocation events and one revision for peri- prosthetic fracture.

DISCUSSION AND CONCLUSION:

Whilst we failed to achieve a zero percent dislocation rate, to date we have eliminated recurrent instability for this patient cohort. Identification of patients at risk of dislocation can assist with patient education and informed consent. We believe our results demonstrate that risk stratification successfully aids implant selection to prevent dislocation.

121 IMPORTANCE OF ACTIVE TRACING OF MOM BEARING PATIENTS – LESSONS FROM RECALL CLINIC

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Methods All patients who underwent hip replacement involving a metal-on-metal (MoM) bearing at The Pennine Acute Hospitals were recalled to check compliance with MHRA guidelines. Blood metal ions (Chromium & Cobalt) and hip radiographs and MARS MRI or Ultrasound scans were performed.

Results 138 patients with ages from 40 – 84 years attended the recall clinic. Follow up ranged from 8 to 18 years.

With 24 bilateral, a total of 162 procedures were evaluated. There were 32(19.8%) revision procedures.

There were 39 MoM Resurfacing with 9(23%) revisions and 123 MoM Stemmed THA with 23(18.7%) revisions.

Stemmed THRs was MagnumTHR – 39 with 5(13%)revisions, Durom TMT/FMT – 69 with 9(13%)revisions, ASR/Summit – 6 with 4(66.7%)revisions, ASR/C-stem – 8 with 5(62.5%)revisions, and Furlong – 1 without revision.

55 patients had a single 6 week follow up or no follow up at all.

10 patients(1 B/L) with HR were not followed up.

45patients(9b/l) THA have no follow up. One patient (ASR C-Stem) had significantly raised metal ions levels with a normal MRI scan, and 4 patients had normal metal ions & MRI scan.

Conclusions:

There is no correlation between positive symptoms, radiographic findings or high blood metal ion levels with the development of ARMD in MoM bearing hips.

Of the 55 patients not having follow up 15(27.3%) patients had positive findings that could suggest ARMD. Therefore, without active tracing of the patients who had MoM bearings, they could potentially come to harm.

Many of the patients with positive MARS MRI could not be detected by symptoms or metal ion levels and therefore we would recommend that all patients have a scan.

A lack of trust-wide tracing of these patients can potentially leave the trust vulnerable to litigation

123 MORTALITY AND MORBIDITY AFTER LOWER LIMB ARTHROPLASTY IN NONAGENARIANS

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Introduction The UK population is consistently getting older and this trend is expected to continue, with the fastest rise seen in those over 85 years. As a consequence there will be more incidence of nonagenarians (over 90 years old) having lower limb arthroplasty.

Methods Retrospective review of patients electronic records over 90 years following primary total knee replacement (TKR) or total hip replacement (THR) between 01/01/2015 - 15/11/18 (3 years). The 30 day re-admission, 1 year mortality and length of stay were compared with a control group aged between 70-80 years who had lower limb arthroplasty during the same time period. ASA, THR and TKR were matched between the two groups. Unicompartment knee replacement and revision surgeries were excluded.

Results There were 31 nonagenarians, with a mean age of 91.6 (90–96) and the control group consisted of 31 patients, with a mean age of 74.6 (70–80). The average length of stay was 5 days in the nonagenarians compared to 4 in the younger group. There was no difference in the 1 year mortality which was 3% for both groups, but the 30 day readmission was 16% in the older cohort and 5% in the younger. The reasons for readmission were noted. There was a steady rise in nonagenarians having arthroplasty over the years with 2 patients in 2015, 7 patients in 2016, 6 patients in 2017 and 16 in 2018.

Conclusions

There is an increasing trend in nonagenarians undergoing lower limb arthroplasty. Nonagenarians and those aged between 70-80 years have a comparable length of stay and 1 year mortality, but nonagenarians have a higher rate of readmission.

125 BEST PRACTICE TARIFF IN TOTAL HIP REPLACEMENT - IS A MOVE FROM UNCEMENTED TO CEMENTED NECESSARY AND SAFE?

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Introduction - In UK there is a move towards incentivising surgeons/NHS Trusts to use cemented THR in over 70s age group, using the best practise tariff. This may involve move from a predominantly uncemented practice to cemented. Due to the learning curve the results of cemented THR and results achieved by individual 'uncemented surgeons' may suffer.

Aim of the study was to see whether an experienced 'uncemented' surgeon gets good results in all age groups and whether a change of practice, with its inherent risks, was necessary from a patient safety perspective?

Results – 1053 primary THRs were recorded in NJR for a single surgeon who favoured uncemented THRs (97% cases uncemented) over a period from 2002 to 2019. There were 716 uncemented, 154 hybrids and 119 Cemented THRs. There was also 54 metal on metal THRs and 8 hip resurfacings. The number of revisions was 27 (2.56%) over this period. Removing MoM bearing, the revision rate was 19/989(1.92%). Only 3 patients (0.4%) over 70 underwent revision while 9(3%) under 55yrs underwent revision. The 1 year, 3 year and 5-year revision rates for this surgeon show a year on year reduction in revisions for all uncemented THRs implanted.

Conclusion –

The study clearly demonstrates that in experienced hands the uncemented surgeon can achieve similar or better results than the best performing cemented surgeons. British NJR shows a 14-year revision of 7.27% compared to 2.56% for an experienced hip surgeon.

The surgical experience of the surgeon probably matters more than the implant fixation used.
The data demonstrates one major fallibility of Registries which does not take into consideration the falling revision rate with experience.
There should not be incentivisation of trusts to make these surgeons change practice to cemented implants in the over 70 age group.

130 STAGNANT PRIMARY THR NUMBERS IN ENGLISH NHS HOSPITALS - A THREAT TO NHS HOSPITALS' SUSTAINABILITY

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Introduction Numbers of primary Total Hip Replacement (THR) are expected to keep rising in short to medium term. Changes to tariffs for THR, medical co-morbidities, obesity and older age group are some of the factors that adversely affect the financial sustainability of National Health Service (NHS) hospitals. Under these circumstances, volume of THR plays a significant role in counteracting these negative effects.
The aim of this study is to assess the trends in volumes of THR in NHS and Independent sector (IND) hospitals.
Materials and methods Publicly available data from National Joint Registry website was accessed for the period January 2012 to June 2019. Data collected included NHS or IND hospital, Strategic Health Authority (SHA) and number of THR (monthly and yearly). Annual volume for 2019 was estimated using forecast feature in Microsoft Excel®.
Linear regression models were used to analyse trends in monthly and yearly volumes of THR in NHS and IND hospitals in each SHA and cumulative volume for all of England. Analysis of Covariance (ANCOVA) was performed to assess the difference in trends between NHS and IND hospitals.
Results During the period January 2012 to Dec 2019 linear regression analysis showed consistently flat or negative coefficient for NHS hospitals based on SHA and whole of England while the coefficient was consistently strongly positive for IND hospitals.
ANCOVA analysis between NHS and IND showed significant difference in trends between NHS and IND for individual SHA and whole of England ($p<0.0001$).
Conclusions
The significant stagnation or drop in volumes of THR in NHS compared to IND, represents a serious risk to the financial viability of NHS hospitals, a threat to training opportunities for surgeons and could increase patient waiting times. Urgent further analysis is critical to determine the impact of this effect and the action required to mitigate it.

131 ACETABULAR COMPONENT POSITION USING A DIGITAL PROTRACTOR

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Meermans et al (1) have shown the beneficial effect of a digital goniometer on cup positioning in total hip
replacement. Recognising this refinement, this study was performed to validate this method by investigating the
effect of this simple, inexpensive (<£25), widely available digital goniometer (WR 300 Digital Angle Gauge, Barry
Wixey Development, Seattle, Washington) on uncemented acetabular component positioning during total hip
replacement performed through a posterior approach with trans-osseous repair of the capsule and external
rotators.
All cups were Pinnacle or Pinnacle Gription and implanted by the senior author (MJKB). At surgery, the target
angle on the protractor was 30-35º, to achieve a radiographic cup abduction angle between 30-45º as
recommended by Meermans.
The cup abduction angle was measured on the 6-week post-operative radiograph of two cohorts, each of 100
hips. Group A patients had their acetabular component implanted freehand while Group B patients were
implanted using the guidance of the digital protractor.
The demographics of each group was similar for age, gender variation and BMI. There were no dislocations in
either group.
The mean abduction angle in Group A was 41.1º (range 32.6 º and interquartile range of 37 – 46 º) and 41.5º in
Group B (range 24º and interquartile range 38.4 – 44.5º). There was no statistically significant difference between
the abduction angle in the 2 different groups (p value – 0.55). This is a similar observation to the original study by
Meermans. In addition, similar to original study, there were fewer outliers (30-45º radiographic abduction angle)
in the protractor group when compared to the freehand group and there was no correlation between the cup
abduction angle and BMI in both groups.
This study confirms that the addition of a simple digital goniometer reduces variability of the acetabular
component positioning and recommends that its use becomes widespread.

132 SURVIVORSHIP OF C-STEM TOTAL HIP REPLACEMENT USING THE FRENCH PARADOX TECHNIQUE

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Aims: This study aims to evaluate the survivorship of the C-Stem total hip replacement when using the French paradox method at medium-term follow-up.
Patients and Methods: 321 C-Stem total hip replacements in 307 patients were performed between July 2007 and March 2018 under the care the same consultant, using the French paradox technique for the femoral stem. Patients were followed up for a mean of 68 months. The mean age was 70 (30 to 91), with 10% of patients less than 60 years old. 59% of patients were female, while 41% were male and 37% were performed by a trainee under direct supervision of the consultant. The mean stem size was 3 (1-8), with the most commonly used head being 28, 0 (76%). The primary outcome was aseptic loosening of the stem. Survival analysis was performed for all-cause revision.
Results: There were no cases aseptic loosening of the femoral stem. Two patients (0.6%) underwent revision for aseptic loosening of the acetabular component. A revision rate was found of 2% (7 patients). Four were revised due to problems with the acetabular component: two became loose, two were revised for recurrent dislocation. One was revised due to inadequate offset and pain, one for periprosthetic fracture and one for infection. Mean time to revision for these patients was 53 months (29 – 106). Overall ten-year survival (282 hips at risk) was 97.7%.
Conclusion: This is a unique study demonstrating successful outcomes of total hip replacement, using the French paradox technique with a triple-tapered stem.

133 IMPACT OF GOVERNMENT HEALTH REGULATORS ON MEDICAL DEVICE REMOVAL FROM PATIENTS

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Background: Metal-on-metal hips are a notable example of medical device failure, as they were found to wear excessively in vivo. The necrotic effect of released debris on the peri-prosthetic tissue was detrimental to their performance, resulting in many being revised. This drew a significant amount of media attention, while many alerts were released by Government Health Regulators (FDA and MHRA), warning surgeons of their potential risk. This study aimed to determine the effect of this regulatory intervention on the revision of MOM implants.
Methods: The present study included a series of 1,079 retrieved MOM hip implants, collected at our centre. Whole blood Co and Cr ion levels were measured from each patient, prior to revision; the material loss of a subset was also measured. These values were assessed with respect to the year of implant revision, while the relationship between their time to revision and primary implantation dates was also investigated.
Results: There was no significant difference found between the pre-revision blood ion levels of MOM implants revised ($p = 0.7323$) at different time points (Figure 1). The difference found between the total wear rate of these hips was also insignificant ($p = 0.6988$). However, an annual reduction in the mean time to revision was observed, as the year of MOM hip implantation became more recent, Figure 2.
Conclusion: The pre-revision blood ion levels and wear rates of these MOM hips were consistently high, irrespective of their year of revision. Both parameters are indicators of their poor performance, in-vivo. However, the trend in their time to revision suggests that more hips implanted in later years were revised sooner, with many coinciding with the release of medial alerts. Regulatory intervention may have been a contributing factor, informing surgeons of specific indicators of failing implants.

138 THE IMPORTANCE OF EFFECTIVE LEADERSHIP IN REDUCING LENGTH OF STAY AND MOVING TOWARDS DAY CASE TOTAL HIP ARTHROPLASTY (THA)

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Day case Total Hip Arthroplasty (THA) has gained great awareness as surgical and implant techniques have advanced. However, in addition to multimodal protocols and clinical pathways, effective leadership and communication amongst surgeons and allied health care professionals is imperative to make day case THA a success. Prolonged length of stay (LOS) following a THA leads to increased costs and reduced income for the hospital.

We undertook a mixed method research study to review the causes of patients staying in hospital for greater than three nights following THA and the effectiveness of the leadership in reducing the length of stay and increasing day case discharge of patients following THA.

Qualitative data was collected using a focus group technique, interviewing thirty healthcare professionals with discharge expertise. Based on the findings of the qualitative analysis, a structured process with checklists and strong communication was implemented through effective communication in a district general hospital. Quantitative data was collected from the hospital records for two periods: 6th October 2016 to 27th March 2017, which is prior to interventions being implemented and 27th April 2017 until 6th October 2016 which was the period after the intervention had been implemented.

Research findings from this study showed implementing a clear process show that effective leadership encourages effective communication between patients, their families and admitting team that leads to earlier discharge. The length of stay greater than three nights dropped following the intervention by 25% and this was statistically significant with a p-value of 0.001.

In conclusion, our results demonstrated flexible leadership and clear communication is fundamental in reducing length of stay. Involving all staff, patients and their families the most effective strategy in early discharge and the move towards day case arthroplasty.

139 THE LEARNING CURVE OF ROBOTIC-ASSISTED ACETABULAR CUP POSITIONING DURING TOTAL HIP ARTHROPLASTY.

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Background: Robotic-assisted surgery aims to reduce manual errors and improve accuracy of implant positioning and orientation during total hip arthroplasty (THA). The objective of this study was to assess the surgical team's learning curve for robotic-assisted acetabular cup positioning during THA.

Methods: This prospective cohort study included 100 patients with symptomatic hip osteoarthritis undergoing primary total THA performed by a single surgeon. This included 50 patients receiving conventional manual THA and 50 patients undergoing robotic-assisted acetabular cup positioning during THA. Independent observers recorded surrogate markers of the learning curve including operative times, confidence levels amongst the surgical team using the state-trait anxiety inventory (STAI) questionnaire, accuracy in restoring native hip biomechanics, acetabular cup positioning, leg-length discrepancy, and complications within 90 days of surgery.

Results: Cumulative summation (CUSUM) analysis revealed robotic-assisted acetabular cup positioning during THA was associated with a learning curve of 12 cases for achieving operative times (P<0.001) and surgical team confidence levels (P<0.001) comparable to conventional manual THA. There was no learning curve for accuracy of achieving the planned horizontal (p=0.83) and vertical (p=0.71) centres of rotation, combined offset (p=0.67), cup inclination (p=0.68), cup anteversion (p=0.72), and correction of leg-length discrepancy (p=0.61). There was no difference in postoperative complications between the two treatment groups.

Conclusion:

Integration of robotic-assisted acetabular cup positioning during THA was associated with a learning curve of 12 cases for operative times and surgical team confidence levels but there was no learning curve effect for accuracy in restoring native hip biomechanics or achieving planned acetabular cup positioning and orientation.

141 CLINICAL AND RADIOGRAPHIC OUTCOMES POST UNCEMENTED ARTHROPLASTY WITH IMPACTION BONE GRAFTING FOR PROTRUSIO ACETABULI

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Introduction: Protrusio acetbuli is an uncommon finding in primary arthroplasty. Results of uncemented acetabular component fixation with impaction bone grafting have shown favourable outcomes when compared to cemented fixation. Medial acetabular wall remodelling post uncemented fixation has not to our knowledge been reported on or objectively quantified. We sought to quantify the depth of acetabular wall remodelling and examine factors affecting this in primary hip arthoplasties for protrusio acetabuli.

Methods: We examined arthroplasties minimum 1 year follow up. Clinical outcomes were recoreded based on Pre and postoperative WOMAC and Oxford hip scores. A radiographic analysis was performed based on preoperative AP pelvis X ray and post operative AP pelvis xrays taken at 1,2 and 10 years respectively. Preoperative Xrays were graded according to the depth/mm of protrusion in accordance with the Sotelo- Garza and Charnley classification. The Depuy Pinnacle Gription and Zimmer Biomet TMARS acetabular impants were used.

Results: All hips in our series underwent a degree of acetabular remodelling. There was no significant correlation between depth of acetabular remodelling and time postop, use of screws, patient age or bearing surface. There were no revision surgeries performed within the study period. There was a mean improvement in Oxford hip scores

Conclusion: This study demonstrated good short to medium term clinical outcomes with the use of uncemented acetabular components with impaction bone grafting.

142 ARE THERE GENDER SPECIFIC ERRORS IN RESTORATION OF HIP BIOMECHANICS THAT AFFECT OUTCOME FOLLOWING TOTAL HIP ARTHROPLASTY?

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Background There are morphological differences between males and females, which are currently under appreciated during Total Hip Arthroplasty. We sought to assess if these differences affected surgical process and subsequent outcome.

Methods 123 patients (75 females, 48 males) had pre-operative and 1-year Oxford Hip Score (OHS) and pain scores recorded. Acetabular height and offset, femoral height and offset and acetabular floor depth were measured on pre- and post-operative x-rays and then compared to their normal opposite hip. Discrepancies between the replaced and normal hip X-ray measurements were then correlated with changes (the delta gain) in pre-operative and 1-year post-operative OHS and pain scores. To reduce systematic errors 30 patients were selected randomly and measured by a second author.

Results Pre-operatively males have greater femoral height (p <0.001), acetabular offset (p <0.001), femoral offset (p= 0.003) and greater acetabular floor depth (7.23mm vs 4.91mm, p <0.001). However acetabular height for males and females was not significantly different (p= 0.240).

Postoperatively, females had significantly greater femoral height discrepancy (p= 0.023) which meant they were lengthened. This led to a reduced delta gain in OHS and pain score at 1 year. Males lost more acetabular offset than females (p= 0.002) leading to a medialised acetabular centre and subsequently reduced delta gain in pain score at 1 year (p= 0.017). The Interclass Correlation Coefficient (ICC) was 0.991 (95% CI 0.988-0.993, p<0.001).

Conclusion

Females have a smaller femur leading to a bias towards a conservative (higher) neck cut compared with males and potential for femoral lengthening. Males have a greater acetabular floor depth compared with females and thus reaming to the true floor results in greater loss of acetabular offset. In this series, both scenarios led to reduced improvement in OHS and/or pain scores at 1 year.

150 A NOVEL APPROACH AND PHILOSOPHY TO POST TOTAL HIP ARTHROPLASTY FOLLOW-UP APPOINTMENTS AS A MEANS OF IMPROVING PHYSICAL ACTIVITY LEVELS.

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Introduction:

In response to a local audit highlighting that patients post total hip arthroplasty (THA) were not meeting recommended physical activity (PA) levels, we changed the method and focus of the routine 6-week post-operative appointment and reviewed its impact.

Method: The routine 6-week post-operative review with an orthopaedic consultant/registrar was replaced with a group-appointment that focused on education and promotion of PA. No further changes were made to the pathway.

Fifty patients were assigned to the intervention group and completed questionnaires pre and post (1 year) elective THA (intervention group). The questionnaire included; (1) the Oxford Hip Score (OHS); (2) satisfaction Likert statements (0-5 score) regarding pain, the operation and PA, (3) and 15 activities that were rated for their frequency and influences on their participation. The one-year outcomes were compared to a control group,

£244 per patient is being offered to incentivise Trusts to perform cemented Total Hip Replacements in the over 70's instead of uncemented. We have retrospectively reviewed our practice and consider how this new financial "Tariff" could influence our future practice.

Methods: We performed a retrospective analysis of our theatre database over an 8 year period (2011 – 2018). All primary procedures in patients over 70 years of age were included. Procedures recorded as "Complex" were excluded, as were bilateral THR's. Variables analysed included patient age, procedure type (cemented, uncemented, hybrid, reverse hybrid) and length of surgery (defined as time into theatre to time out of theatre).

Results: A total of 4,873 procedures met the inclusion criteria: 2,856 (58%) uncemented, 884 (18%) hybrid, 247 (5%) reverse hybrid and 886 (18%) cemented. The mean time in theatre was 72 minutes, 100 minutes, 88 minutes and 99 minutes, respectively ($p < 0.05$). The median number of arthroplasty cases per all day operating list was 4.

Discussion / Conclusions:

Cemented and hybrid THR's took an additional 27 and 28 minutes, respectively, compared to uncemented THR's. Changing our Institute's practice to comply with the GiRFT BPT would have significant implications. Modelling future operating lists based on our retrospective data suggests that instead of 4 joints per all day list, we would only be able to achieve 3. This would have significant cost implications, which would far outweigh the additional income from the tariff. At times of financial austerity, these factors need to be considered by Trusts when considering the impact of the BPT.

168 COMPARISON OF MAKO CT PLANNING AND WITH PLAIN FILM RADIOGRAPHIC PLANNING IN TOTAL HIP ARTHROPLASTY

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Exeter Hip Unit, Princess Elizabeth Orthopaedic Centre, Exeter, UK

Introduction Pre-operative planning is an essential part of Total Hip Arthroplasty (THA), helping to select the correct implant size, restore femoral offset and leg length. Conventional templating is carried out on plain films using a marker and acetate or digital templating. Robotic technology such as MAKO comes with 3D planning using computed tomography (CT).

The aim of our study was to compare conventional templating with CT-based templating.

Method A comparative study was carried out investigating the outcome of traditional templating for a series of cases who also underwent CT planning for Mako robot-assisted THA. The same cases were templated using 2D planning with our standardised radiographs using acetates for an Exeter V40 cemented stem and Trident uncemented socket by two surgeons.

The planned femoral stem offset and cup sizes were compared. We also noted the planned stem insertion depth (SID) between the two techniques, which is used to help restore leg length.

Results Between April 2017 and January 2019, 92 MAKO THA cases were available for analysis. Compared to plain-film templating, the MAKO CT template planned the acetabular component to be a mean of +0.75mm. The mean SID was +3.6mm on the plain-film plan. The mode difference in stem offset planned was 0, however in 22.3% of cases, the MAKO plan templated one stem size up, which equates to +6mm.

Conclusion

Since CT templating and MAKO is not widely available in all units, it is important to take account that standard 2D templating tends to undersize the stem offset 22% of the time. One should perhaps aim to favour sinking the femoral stem by 3-4mm further and err on the side of greater offset. This discrepancy probably occurs due to difficulty of internal rotation and slight flexion during imaging in hip arthritis patients.

172 EXCELLENT LONG TERM SURVIVORSHIP OF THE UNCEMENTED PROXIMALLY POROUS COATED BI-METRIC FEMORAL STEM

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Introduction: We assessed the survivorship of the proximally porous coated Bi-Metric femoral stem in a single centre, at an average of 12.5 years follow up (9.5-15.8 years). Many stems were inserted as part of a metal on metal (MOM) total hip replacement (THR). Thus stem survivorship in the MOM setting is assessed.

Methods: Data was collected prospectively in a local database. A retrospective review was performed of all patients undergoing a primary THR with a Bi-Metric femoral stem between 2003-2010. Primary outcome was revision of the stem for any cause. Analysis was also performed for stem revision for aseptic loosening, stem revision in the MOM setting and a worst case scenario whereby lost to follow up were presumed to have failed. True stem failure was considered if revision occurred for a stem related complication.

Results: 1,466 stems were included (1311 patients, 155 bilateral). Bearing surfaces included; cobalt chrome on cobalt chrome in 1343 cases, ceramic on ceramic in 41, ceramic on cobalt chrome in 28, cobalt chrome on polyethylene in 27 and ceramic on polyethylene in 27. Seven hips were lost to follow up. Thirty-three stems underwent revision for any cause. Kaplan Meier analysis demonstrates an overall 97.3% survivorship of the Bi-Metric femoral stem at 11.9 years. Considering aseptic loosening and worst case scenario, Kaplan Meier analysis demonstrates a 100% and 96.6% survivorship respectively. In the MOM setting, Kaplan Meier analysis demonstrates a 97.3% survivorship. Of the 33 cases of stem revision, only 14 were classified as 'true' stem failure.

Conclusion: To our knowledge this study represents the largest cohort of uncemented Bi-Metric femoral stems in the literature to date. Our results demonstrate excellent long-term survivorship of the porous coated Bi-Metric femoral stem. Even in the presence of a challenging MOM environment, stem performance remains high.

174 PRELIMINARY MID-TERM RESULTS IN PRIMARY UNCEMENTED TOTAL HIP ARTHROPLASTY USING A SHORT, PARTIAL NECK PRESERVING FEMORAL STEM.

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Historically, clinical performance of novel implants was usually reported by designer surgeons who were the first to acquire clinical data. Regional and national registries now provide rapid access to survival data on new implants and drive ODEP ratings. To assess more than implant survival, clinical and radiological data is required. Prospective, multi-surgeon, multi-centre assessments have been advocated as the most meaningful. We report the preliminary 7-year results of this MiniHip™ femoral component (Corin Ltd, UK).

545 cementless total hip arthroplasties were performed on 503 patients between over 5 years at 4 sites in the UK. At surgery, the average age and BMI of the study group was 58.2 years (range 21 to 76 years) and 27.9 (range 16.3 to 43.4) respectively. Harris Hip Score (HHS) and radiological review were completed at 6 months, 3, 5 and 7 years. Postal Oxford Hip Score (OHS) and EuroQol-5D (EQ5D) score were obtained at 6 months and annually thereafter.

Crude revision rate is 1.83% (10/545), with revision for any reason as an endpoint. KM survivorship is 98.26% (95% CI* 96.67%-99.09%) at 7 years. 72 hips have been assessed at the 7-year time point with an improvement of HHS from 52.8 preoperatively to 93.1 ($p<0.01$) after surgery. The preliminary results of 72 OHS and 75 EQ5D postal questionnaires completed at 7-year FU showed a significant increase in average from 21.3 to 43.1 ($p<0.01$) and from 0.42 to 0.82 ($p<0.01$) respectively. Radiological analysis is ongoing, and thus far has revealed more variation in stem alignment than is usually observed for more conventional length femoral components. This may indicate that optimal alignment of calcar loading, short stems is different to that of longer, medullary canal aligned implants.

Preliminary analysis of the data shows greater than 98% survivorship. Longer surveillance will determine whether safety and performance are maintained.

178 BACK ON FORM: A UNIQUE NEW PERSPECTIVE ON RETURN TO ACTIVITY AFTER TOTAL HIP REPLACEMENT FROM PATIENTS' SMARTPHONE DATA.

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Introduction: Hip replacement has been described as "the operation of the century", with excellent functional results and satisfaction scores in the majority of patients. With modern materials, both surgeons' and patients' expectations are increasing. Patients want to know more about when they can return to normal activities and return to work, yet our answers are based on historical data. It has been suggested that previous data does not show improvement in activity in the year before versus after arthroplasty (Withers et Al, 2017) although "the low to moderate methodological quality of the included articles should be taken into consideration when drawing conclusions".

Method: To overcome some limits of traditional methodologies, in this study, smartphone data was used with patients' consent for collection of their activity levels. Steps counts in the periods before and after surgery were compared for individual patients as well as in groups of different ages

and pain scores pre- and post-operatively. A total of nearly 100 million steps was captured for analysis.

Results: Contrary to recent publications, all patients had returned to better than pre-operative activity levels as early as two month post-operatively; this is faster than traditionally reported.

Conclusion: This unique dataset provides a novel way to provide up-to-date results to enable surgeons and therapists to answer questions for patients and help to set expectations as well as demonstrate the timeline of recovery after total hip replacement using modern technology to overcome the limitations in traditional studies.

179 RESULTS OF A MULTIMODAL PROTOCOL TO OPTIMISE LEG-LENGTH DISCREPANCY AND OFFSET IN PRIMARY TOTAL HIP ARTHROPLASTY (THA) - A SERIES OF 125 CONSECUTIVE PATIENTS

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Background: Restoration of anatomy ("soft tissue balancing") in THA is essential to help optimise function and stability. Leg length discrepancy (LLD) >10mm and incorrect offset correction can lead to poor functional outcome. Overlengthening can also be subject of litigation.

Objectives: To determine the accuracy of restoring leg-length and offset using a multimodal protocol

Methods: A prospective study of 125 consecutive patients who underwent THA for unilateral arthritis. We utilised a multimodal protocol comprising digital templating, on operating table clinical assessment of LLD supine and again when positioned in the lateral position for surgery, use of an intraoperative leg-length and offset measuring device (LLOMD) and assessment of soft tissue tension with shuck testing. The LLD and global offset achieved were measured by an independent observer on post-operative radiographs and compared with the templated target LLD and offset.

Results: LLD was less than 5mm in 82.4% and less than 10mm in 93.3%. 95.2% had a global offset difference of less than 10mm and 72.6% less than 5mm.

Conclusion: Reliable restoration of anatomy was achieved with the use of a multi-modal protocol. Post-operative LLD and offset difference was reduced to more acceptable levels than those quoted in the published literature. We recommend the use of a similar protocol to optimise soft tissue balancing in THA in order to help maximise function and patient satisfaction and undoubtedly minimise the risk of litigation.

Poster Papers
Revison Arthroplasty/Infection

026 OUTCOMES OF MODULAR FEMORAL REVISION STEM AND EFFECT OF DESIGN ON SUBSIDENCE

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Background Femoral revision stem subsidence has been identified as predicting early failure in revision hip surgery. This comparative cohort study assessed the potential risk factors of subsidence in two commonly used femoral stem implant designs.

Methods A consecutive series of patients who underwent revision total hip replacements using either a modular-fluted tapered-titanium stem (TM) or a porous-coated cylindrical modular stem (PCM), between April 2006 and May 2018. Radiographic assessment was undertaken with serial anteroposterior (AP) X-rays of the pelvis. Radiographic and function outcomes were recorded and any risk factors for subsidence.

Results Sixty-five TM and 35 PCM were included. Mean follow up was 7 years (range 1-13years). Subsidence was recorded in the initial 3 months postoperatively then stabilised (p<0.001); 58.7% of the TM (average 2.32mm) and 48.8% of PCM (average 1.86mm) (p, 0.344). The subsidence of PCM stems were significantly increased by extended trochanteric osteotomy (ETO) (p <0.041). Significant improvement of the mean oxford hip score (OHH) was reported in both cohorts (p <0.001).

Conclusion

Both modular tapered stems and extensively cylindrical porocoat stems subsided within the femur. Modular Taper stems subsided slightly more frequently than cylindrical stems if the femur was intact but with no difference in the reported good clinical functional results. However, if an ETO is performed then a porocoat will subside significantly more and then a modular taper stem would be advised.

029 THE USE OF CALCIUM SULPHATE BEADS IN PERIPROSTHETIC JOINT INFECTION, A SYSTEMATIC REVIEW.

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PURPOSE: To assess the use of calcium sulphate beads in the management of knee and hip periprosthetic joint infections in terms of complications and re-infection rates.

METHODS: A search of NICE healthcare database advanced search (HDAS) was conducted from their year of inception to October 2019 with the keywords: “Calcium Sulphate Beads” or “Antibiotics beads” or “Stimulan” and “Arthroplasty” or “Hip Replacement” or “Knee Replacement”. A quality assessment was performed using the NIH study Quality Assessment Tool for case series.

RESULTS: Favourable outcomes and good success rates have been reported in most of the patients. A small number of wound discharges and heterotrophic ossification which are rarely symptomatic. There has been an increase in complications when higher volumes of beads are used, especially in subcutaneous structures and in high-risk patients.

CONCLUSIONS:

The use of calcium sulphate beads in the treatment of PJI has been proven to be a useful technique in delivering high doses of antibiotics locally. CS beads have the ability to accommodate both heat and non-heat stable antibiotic as well as antifungal, in addition to its complete absorbability.

036 MID TO LONG TERM RESULTS OF THE CONE-CONICAL MODULAR SYSTEM IN REVISION HIP ARTHROPLASTY.

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Background Modular design in revision hip surgery allows some flexibility intraoperatively to address leg length discrepancy, version and offset while allowing the surgeon to bypass a deficient proximal femur and achieve axial and rotational stability distally. The purpose of this study was to analyse the mid- term to long-term survival, clinical and radiological outcomes using a conical fluted stem and a cone shaped hydroxyapatite coated proximal body “The Cone-Conical modular system (Stryker)” in revision hip surgery.

Methods We reviewed all the patients who underwent hip revision surgery using Cone-Conical modular system between January 2006 and May 2017 at our institution. 100 patients (104 hips) were included with a mean age of 71 years. We had a mean follow-up period of 74 months; 71 patients (74 hips) had a minimum follow-up of 5 years. Femoral bone defects were classified according to the Paprosky classification system. There were 2.9% hips classified as Paprosky type I, 47.1% hips as Paprosky type II, 39.4% hips as Paprosky type IIIA, 7.7% hips as Paprosky type IIIB, and 2.9% hips as Paprosky type IV. A Kaplan-Meier analysis was used to determine the survival of the implant. Functional outcomes were assessed using Oxford Hip Score. Plain radiographs were performed to assess implant fixation and osseointegration.

Results The mean OHS improved significantly from 13 preoperatively to 35 at the final follow-up (P < .001). The Cone-Conical system survivorship for Aseptic loosening as an end point was 99.04%. The all-cause survivor- ship was 97.12%. Three patients had revisions, one for aseptic loosening and two for recurrence of infection.

Conclusion

The Cone-Conical femoral modular revision system has shown excellent mid-term to long-term clinical and radiographic results with low failure rate and minimal complications. Longer term follow-up would be of value to assess the ongoing survival of this implant construct.

045 CLINICAL AND RADIOLOGICAL SURVIVORSHIP OF THE THACKRAY CROSS PLATE WITH RIM REINFORCEMENT RING FOR CEMENTED ACETABULAR REVISION

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Introduction: We report on the survivorship of the Thackray cross shell with rim reinforcement ring (DePuy, Leeds, UK) for cemented acetabular revision.

Patients and Methods: We retrospectively reviewed all patients treated with the implant. Acetabular defects were characterized according to the Paprosky classification. We collected data on potential risk factors for failure of the construct. We performed Kaplan-Meier survival analysis with aseptic loosening (clinical and radiological) as the end point. Post-operative complications, additional procedures and the final Oxford Hip Score (OHS) were documented.

Results: Between 2000 and 2017, 38 revisions in 16 male and 19 female patients (bilateral in three) with an average age of 72.5 years were identified. Bone allograft was used in 30 cases and additional implants (mesh, augments) in 15. Seven patients have deceased and the fate of all revisions is known. To date and at an average clinical follow-up of 8.9 (1.2 to 19.2) years none of the hips has been re-revised or is awaiting re-revision. Five hips have demonstrated radiological evidence of aseptic loosening. Loose components were associated with more severe grades (Paprosky Type 3) of acetabular defects (60% vs 6%, p=0.011). K-M survival analysis showed 77% overall survivorship at 7.2 years. Survivorship for Type 1&2 defects was significantly longer compared to Type 3 defects (87.7% vs 0% at 7 years, Logrank test p<0.001, Cox proportional hazards p=0.001). Complications included one recurrent dislocation, two VTEs, one wound abscess that was debrided and one symptomatic sciatic nerve entrapment within scar tissue. The final median OHS was 35 (12-48) and did not appear to be affected by component loosening.

Conclusions: This is an easily reproducible and cost-effective technique for Paprosky Type 1&2 defects. The device functions as a lavatory seat protecting the underlying bone graft (73% complete remodeling) and preventing subsidence of the cemented cup.

051 EARLY PATIENT REPORTED OUTCOME MEASURES FOR THE EXETER V40 125MM STEM USED IN PRIMARY AND REVISION TOTAL HIP REPLACEMENTS.

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Short femoral stems are being advocated for use in total hip replacement (THR) as they could potentially improve Patient Reported Outcomes Measures (PROMs), functional outcomes and ease revision surgery. Our study reports the PROMs of the Exeter V40 125mm stem used both in primary THR and revision THR.

In this non-designer, multi-surgeon, single centre study, 25 primary Exeter V40 125mm THRs were implanted and 33 revision Exeter V40 125mm were implanted. PROMs data was collected from the validated Oxford Hip Score (OHS) and EQ- 5D 3L Questionnaire. Patient satisfaction to the service and outcome of the THR was also reported at one and two years post operatively. Data was analysed using (SPSS Software. Version 23), Mean and Confidence Interval were reported. Significant P value was set at 0.05.

At baseline, mean pre-operative OHS for all patients was 17.29, and was 31.50 and 25.36 at 1 and 2 years post-operatively, respectively. For primary procedures, mean OHS at baseline was 13.29, and was 32.86 and 23.29 at one and two years, respectively. For revision procedures, mean OHS at baseline (prior to their revision procedure) was 19.41, and was 30.55 and 26.05 at 1 and 2 years, respectively. EQ-5D-3L scores for primary procedures were 0.14, 0.59 and 0.35 at baseline, one-year follow-up and

two-year follow-up, respectively. For revision procedures, EQ5D scores were 0.33, 0.61 and 0.48 for baseline, one-year follow-up and two-year follow-up, respectively. Satisfaction scores at 1 and 2 years post-operatively were 80.0% and 50.0% for primary procedures, and 78.5% and 61.4% for revision procedures, respectively.
The two-year performance of the femoral stem is consistent with established femoral implants. Longer surveillance will determine whether performance is maintained.

064 MODIFIABLE RISK FACTORS FOR MORTALITY IN REVISION TOTAL HIP REPLACEMENT FOR PERIPROSTHETIC FRACTURE

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Aims The aim of this study was to identify modifiable risk factors associated with mortality in patients requiring revision total hip replacement for periprosthetic hip fracture (PPHF).

Patients and Methods Electronic records for those patients undergoing revision total hip replacement for PPHF between December 2011 and October 2018 were reviewed. Potential risk factors identified for study included age, gender, body mass index, American Society of Anaesthesiologists physical status classification, pre-operative haemoglobin, time to surgery, duration of surgery, blood transfusion, length of hospital stay and post-operative surgical and medical complications. Univariate and multivariable logistic regression analyses were used to determine independent modifiable risk factors for mortality at one year post-operatively.

Results 203 patients were identified (53% female, median age 79 [IQR: 71-86]). The median time to surgery was 3 days [IQR: 2-5]. Mortality rate at one year was 13.8% (n=28). The commonest surgical complication was dislocation (n=22, 10.8%). Multivariable analysis demonstrated that risk of death at one year post-operatively increased fivefold in patients who sustained a dislocation (OR 5.03 [95% CI:1.60-15.83] p=0.006). Risk of death increased fourfold for patients who developed hospital acquired pneumonia within 90 days post-operatively (OR 4.43 [95% CI:1.55-12.67] p=0.005). No evidence was found that time to surgery was a risk factor for death at one year.

Conclusion

Dislocation and hospital acquired pneumonia following revision total hip replacement for PPHF have not been previously reported as independent potentially modifiable risk factors for mortality. Our study suggests that surgeons should consider increasing constraint to reduce dislocation risk and the early involvement of the multidisciplinary team to reduce the risk of hospital acquired pneumonia post-operatively. In our study, there was no evidence that time to surgery affected mortality, which may allow time for medical optimisation, surgical planning, and resource allocation.

073 OUTCOME OF CONVERSION TOTAL HIP ARTHROPLASTY FOR FAILED FIXATION/HEMIARTHROPLASTY FOR NECK OF FEMUR FRACTURES

Abdul Baig, Qasim Afzaal, Waleed Khan, John Davison, Steffan Hutchings, Ashwin Kulkarni, Colin Esler, Andrew Brown, Robert Ashford
Leicester Royal Infirmary Hospital, Leicester, UK

Background 75,000 hip fractures occur annually in the United Kingdom. The majority of these fractures are successfully treated with internal fixation or hemiarthroplasty.
This study evaluated the outcome of THR following failed fixation or hemiarthroplasty for femoral neck fractures.

Methods Patients between 2006 and 2016 undergoing THR following previous internal fixation or hemiarthroplasty were included. Complications and mortality at 2 and 5 years were recorded.

Results 60 cases underwent conversion Total Hip Replacement ; 46 female, mean age 67.9 years (range 42-88), 14 male, mean age 66.5 years (range 43-88).
Previous surgery was 32 patients sliding hip screws, 12 intramedullary nails, 8 cannulated screws and 5 hemiarthroplasty.
The mean time from fracture surgery to failure was 22 months (range 2 weeks to 60 months) and there were 6 cases of late post-traumatic arthritis (range 4-23yrs). The mean time from documented failure to THR was 2 months.
2 patients developed superficial wound infections which were treated with antibiotics. 1 patient had a leaky wound which settled spontaneously. 2 cases of deep infection requiring multiple surgical debridement's and prolonged stay, of which one underwent excision arthroplasty and 180 day length of stay (LOS).The other was treated with suppressive antibiotics and had a 21 day LOS. Excluding these 2 cases, the mean LOS was 5.9 days. 1 patient readmitted for dislocation at 2 weeks and treated with closed reduction without recurrence.
At 2yr Follow up 13 had died, 21.6%. 49 had 5yr Follow up and 28 had died, 57.1%.

Conclusion

THR is a successful procedure for failed fixation or hemiarthroplasty in selected patients despite technical challenges. LOS and infection rate are higher in this fractured neck of femur population than for primary THR. The 2 year mortality rate compares well against the 30% 1 year rate for fracture neck of femur patients.

075 ANAEMIA AND MALNUTRITION IN PATIENTS UNDERGOING REVISION HIP ARTHROPLASTY SURGERY FOR PERI-PROSTHETIC JOINT INFECTION (PJI)

Bonita Tsang, Simon Buckley, Andrew Gordon, Tim Harrison, Robert Kerry, Ian Stockley, Mark Wilkinson, Andrew Hamer
Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, UK

Aim This study investigated whether patients undergoing revision hip surgery for confirmed PJI were anaemic and/or malnourished pre-operatively. We also investigated whether surgical treatment of PJI improved these parameters hence implicating PJI as their cause.

Methods Review of data from a tertiary referral centre Lower Limb Arthroplasty Unit database. Patients included underwent 1st stage hip revision for PJI between January 2008 and April 2019. Full Blood Count (haemoglobin (Hb) and lymphocyte count), serum albumin before and after 1st stage revision and blood transfusion data were examined. Paired t-test was used to detect significant differences.

Results Between January 2008 and April 2019, 221 patients underwent 1st stage hip revision for PJI of which 129 (58%) were anaemic (<120 g/L) with a mean pre-operative Hb of 105g/L. All these patients required blood transfusion within 1 week post-surgery. 40% had a low lymphocyte count (<1.5 x 10^9/L) and 30% had a low serum albumin (<35 g/L) at 1st stage revision, indicating malnutrition.
Of the anaemic patients, 112 proceeded to 2nd stage revision or had bloods available 6 months post first stage. Their mean Hb was 123 g/L, an increase of 18 g/L ($p < 0.001$).

Discussion Patients undergoing revision surgery for PJI are likely to be anaemic, malnourished and if so inevitably require post-op transfusion. It appears that eradication of PJI improves the anaemia.
It is known that the outcome of primary total hip arthroplasty is improved by treatment of pre-operative anaemia and malnutrition (1).
Pre-operative recognition and treatment of these abnormalities in patients with PJI might reduce blood transfusion requirements and improve outcomes in this more compromised patient group.

1. Gu A et al. Preoperative Malnutrition Negatively Correlates With Postoperative Wound Complications and Infection After Total Joint Arthroplasty: A Systematic Review and Meta-Analysis. J Arth. 2019;34(5):1013-1024.

078 LONG TERM RESULTS OF REVISION TOTAL HIP ARTHROPLASTY USING A MODERN EXTENSIVELY POROUS COATED FEMORAL STEM

Charles Wallace, Syed S. Ahmed, Sujith Konan, Fares S. Haddad
University College London Hospital, London, UK

This is a long term, prospective study of 56 femoral stem revisions in 56 patients using a contemporary cementless extensively porous-coated component with a mean follow-up of 11.6 years. Revisions performed for prosthetic joint infection, aseptic loosening and periprosthetic fracture were included in the study.
The primary indications for revision were aseptic loosening in 31 cases (Paprosky Type II in 13, Type IIIa in 18), sepsis in 12 (Paprosky type II in 3, Paprosky type 3a in 9), and peri-prosthetic fractures in 13. The peri-prosthetic fractures were classified as Vancouver type B1 in 6 cases, B2 in 4 and B3 in 3. The indications for using this specific extensively porous coated system included patients with deficient proximal femoral bone stock and/or those with a damaged metaphysic precluding proximal fixation but preserved isthmal bone stock - allowing at least 5cms of scratch fit.
All implants showed evidence of bony ingrowth, stable fixation and no evidence of loosening, instability, deep infection, stress shielding, subsidence or osteolysis at midterm follow-up. After long term follow-up 1 patient had thigh pain and was suspected to have a deep infection with evidence of femoral stem loosening however this patient later declined further revision surgery due to medical co-morbidities and went onto long term suppression antibiotics.
Most patients survived 10 years after revision hip surgery and upon follow-up all were still pain free with evidence of good bony ingrowth, with some mild stress shielding. The patients that died prior to the 10 year follow-up,

reported to be pain free and mobilising as able at their last review.None of the 56 femoral stems were due for any re-revision surgery.
The extensively porous coated femoral stem has shown that it has excellent long-term survivorship and, in most cases, will outlive the patient.

102 MANAGING THE INTERVAL IN TWO-STAGE REVISION FOR PROSTHETIC JOINT INFECTION IN TOTAL HIP REPLACEMENT: CHOICE OF ARTICULATING SPACER?

James Coleman[1], Stephen Jones[2], Oliver Blocker[2]
[1]Cardiff University, Cardiff, UK. [2]Cardiff and Vale University Health Board, Cardiff, UK

Introduction: In two-stage revision for Periprosthetic Joint Infection (PJI) a spacer is often used, with the potential to have both functional and therapeutic roles, by maintaining mobility and enhancing antibiotic delivery. Our study looks at articulating spacers and the management of a safe interval, focusing on those that have received a constrained liner.

Methods: A retrospective case series of 153 consecutive surgical procedures for 87 patients performed for PJI by the Senior Author at University Hospital Llandough between 2005 and 2018. 23 of the 87 patients did not undergo a two-stage procedure using a spacer and were excluded from the study leaving 64 patients. Review of electronic radiographic and clinical records from the health boards systems was completed to determine complications that occurred during the interval.

Results: 68 spacers in 64 patients with a mean age of 67.1 years and a mean interval between procedures of 139.9 days. There was an overall 5.9% mortality rate between stages. Eight complications occurred overall. Seven of these occurred in 55 articulating spacers (12.3%). Analysis of 37 constrained, articulating spacers revealed three complications and a complication rate of 8.1%. This is a lower rate in comparison to five complications occurring in the 31 non-constrained spacers (16.1%).

Conclusion: Complications remain uncommon in interval spacers. Our retrospective study suggests that the use of a constrained liner in an articulating spacer avoids dislocation and reduces the rate of other complications, when compared to alternative spacer techniques. This offers surgeons a safe and reliable option for interval prostheses.

105 REVISION OF LARGE DIAMETER METAL-ON-METAL THA USING A CUSTOM-MADE DUAL-MOBILITY BEARING

Oliver Blocker, James Coleman, Elizabeth Clatworthy, Mark Goodson, Alun John, Stephen Jones
Cardiff and Vale University Health Board, Cardiff, UK

Introduction: Reduction of cobalt (Co) and chromium (Cr) generation is a key principal in patients who develop an Adverse Reaction to Metallic Debris & is usually achieved by extraction of the mono block socket. There may be cases in which retention of a well-fixed and orientated socket is beneficial and present least harm. This can be achieved with the use of a custom-made Dual Mobility Bearing (DMB).

Methods: A consecutive case series using a custom-made DMB. All cases had a Birmingham Resurfacing Cup with a modular Birmingham head used on-label with the same manufactures stem. After confirmation of LOT codes and a digital measurement of component orientation a compatible custom-made DM head was manufactured and implanted.

Results: 19 cases in 18 patients (one bilateral) with a mean age 74 years (63-85). Pre-op the mean Oxford Hip Score (OHS) was 26 (5-47). All patients had a MARS MRI confirming ARMD. Mean pre-op Co was 13.09ppb (2.58-26.33) & Cr 6.78ppb (2.19-30.18). Implant position (degrees) a mean cup inclination of 43.3 (34.0-55.0) & version 17.4 (2.0-28.0) and stem version 4.7 (0.0-14.5). At 6-months the OHS was 41 (35-48) & metal ion levels had significantly decreased with Co 3.87ppb (0.56-12.84) and Cr 3.06 (0.95-9.31). At a maximum follow-up of 3.8 years one patient, with complete abductor destruction, had required revision to a constrained liner for dislocation.

Conclusion: This series highlights potential scenarios where the preservation of a well fixed resurfacing socket maybe beneficial. Those being poor bone stock, severe medical co-morbidity and high dislocation risk. Surgical morbidity is reduced and elevated metal ion levels resolved. The retention of the Birmingham Socket and the use of a Custom DMB represents a treatment option in selected cases.

108 INITIAL RESULTS OF PROXIMAL FEMORAL REPLACEMENT FOR PROSTHETIC HIP JOINT INFECTION

Lucy Maling, Adam Fell, Richard Slack
Queen Elizabeth the Queen Mother Hospital, Margate, UK

Background Revision total hip arthroplasty is an exponentially increasing burden. Proximal femoral replacement (PFR) is a revision solution for the challenging situation posed by prosthetic hip joint infection (PJI) in the presence of poor bone stock.

Methods This retrospective single surgeon series comprised 15 PFR in 14 patients. Infection was the indication for surgery in all cases. 13 had confirmed PJI using the 2018 Musculoskeletal Infection Society Criteria; 2 were unproven. The primary outcome measure was eradication of infection. Secondary outcome measures were peri- and post-operative complications, re-operation, mobility, and death. The mean follow up was 3.3 years (range 6 months - 9 years).

Results Infection was eradicated in 13 cases (86.6%). Complications included dislocation (3 episodes in 2 patients), peri-operative pulmonary embolus (1) and lower respiratory tract infection (1). One patient underwent revision of the acetabular component for infective loosening. All but one patient were ambulant with walking aids. The two patients with persistent infection consequently died.

Conclusions

PFR is an option for patients with PJI for whom standard revision hip arthroplasty would be unsuitable, and excision surgery unacceptable. PJI poses similar challenges to bone tumours, which are managed in specialist centres by an expert multi-disciplinary team. The ideal management of PJI requires the same.

110 OUTCOME OF TITANIUM MODULAR HEAD-NECK ADAPTER FOR METAL-ON-METAL HIP REVISION ARTHROPLASTY

Rishi Agarwal, Alun John
UHW, Cardiff, UK

Purpose: Describe the outcome of BioBall modular neck adapter system used for revision arthroplasty secondary to adverse reaction to metallic debris (ARMD) in metal-on-metal (MOM) hips.

Method: Retrospective analysis of 70 patients operated between 2010 and 2018. Average follow up was 3.86 +- 2.04 years. Pre and Post operative cobalt and chromium levels were recorded. Clinical notes and radiological images were reviewed and complications were noted.

Result: Surgeries were performed 72 months after primary MOM hip arthroplasty. Cobalt and chromium levels dropped from an average pre-operative level of 15.01 to 2.81 and 8.12 to 2.91 post-operative respectively.

2 patients had multiple dislocations and were revised by changing the liner to a constrained liner. 2 patients had a single episode of dislocation at 4 weeks and 9 months respectively. Both were stable after closed reduction. One patient had a deep infection and needed 2 staged revision. 2 patients needed re-revision for secondary acetabular and femoral loosening respectively. The complication rates are similar to ones described in literature for revision total hip arthroplasty.

Significance:

We describe the first series in English literature describing outcome of BioBall system used specifically in MoM revision hip arthroplasty. BioBalls are safe and effective for this procedure. They provide the advantage of preserving a well fixed femoral stem, removing the source of cobalt and chromium and allowing a ceramic head to be used during acetabular revision.

111 IS REVISION TO A CERAMIC ON POLYETHYLENE ARTICULATION SAFE FOLLOWING REVISION FOR CERAMIC FRACTURE IN TOTAL HIP REPLACEMENT?

Jonathan Barrow, Adeel Aqil, Henry Wynn-Jones
Wrightington, Wigan, UK

BACKGROUND Bearing fracture is a rare complication following implantation using modern day ceramic bearing materials. Revision to a hard on soft bearing (delta ceramic head and cross-linked polyethylene) is controversial, with concerns about catastrophic wear caused by the fractured ceramic particles.

METHODS Data was collected retrospectively in our institution from electronic patient records, revision database and picture archiving and communication system (PACS). Templating software was used to determine wear. Using univariate analysis, we examined patient demographic and wear rates for all patients who underwent revision for ceramic bearing fractures to ceramic on polyethylene components.

RESULTS There were twelve patients identified as meeting inclusion criteria, with 9 males, and 3 females. The average age at revision was 62 years (54 - 72). There were 6 liner and 6 ceramic head fractures. The average time to revision surgery was 8.2 years (1.2 - 14.9). All hips were revised to delta ceramic heads and cross-linked polyethylene acetabula components. The most common head size used was 32mm. At a mean follow up of 10 months (5-16.6 months) wear was calculated at 0.17mm (0-0.3). At mean follow up of 19 months (14-24), the wear was calculated at 0.30mm (0.1-0.8). There were no instances of catastrophic failure and only 1 hip was subsequently revised for infection.

CONCLUSION

Revision to ceramic on polyethylene bearings following ceramic fracture does not cause early catastrophic wear. Ceramic on polyethylene bearing is

safe in early follow up, with wear rates comparable to primary ceramic on polyethylene bearings. Long term follow up is required to assess if there is later accelerated wear.

120 DOES TRAINEE LED REVISION HIP SURGERY IMPACT ON OUTCOMES? AN ANALYSIS OF 1091 PATIENTS FROM A TERTIARY REFERRAL CENTRE

Adeel Aqil, Hassaan Sheikh, Paul Siney, Nikhil Shah, Henry Wynn Jones, Tim Board
Wrightington Hospital, Wigan, UK

BACKGROUND Mortality is arguably the most clinically relevant outcome measure. Our aim was to perform a quantitative analysis of potential risk factors for death, with the specific intention of assessing whether trainee led surgery affected mortality rates.

METHODS Retrospectively collected data was obtained from our institutions electronic patient records and revision database. Mortality data was obtained using a DBS trace against National Spine records. Using univariate analysis, we examined potential risk factors including; age, sex, ASA grade, comorbidities, as well as the reason for revision surgery. Subsequent multivariate analyses identified covariate-adjusted risk factors, associated with death at the 1-year time point.

RESULTS There were 501 males and 590 females with a median age of 71 (range:21-94). Average ASA grade and Charlson co-morbidity score was 2 and 3 respectively. There were 23 deaths at one year. The most common indications for revision included aseptic loosening(39%), Dislocation(20%), infection(17%) and peri-prosthetic fracture(9%). Univariate analyses showed seven variables that met the criteria for inclusion into the Cox regression model. However the model thereafter inferred that only 3 variables were significant risk factors for mortality. A history of a myocardial infarction was most strongly associated with an increased risk of death (HR 15.6, 95% CI 1.8 – 131.6, p=0.01), followed by a history of dementia (HR 5.2, 95% CI 1.4 – 19.4, p= 0.01), and then by higher ASA grades (HR 3.5, 95% CI 1.6 – 7.8, p< 0.001). Indication for revision and surgeon grade was not associated with higher mortality rates.

CONCLUSION

Trainee led revision hip arthroplasty was not associated with higher mortality rates. Factors that were associated with higher rates of death were patient related and non-modifiable.

144 THE SURVIVORSHIP OF REVISION TOTAL HIP REPLACEMENT WITH SEVERE PROXIMAL BONE DEFICIENCY USING A MODULAR TAPER FLUTED PROSTHESIS.

Siddharth Govilkar, John Paul Whittaker, Chris Evans, Richard Spencer-Jones, Patrick Gregson
The Robert Jones Agnes Hunt Orthopaedic Hospital, Oswestry, UK

Background National Joint Registry Report 2019 reports revision hip replacements contributed around 10% of the hip arthroplasty workload in the UK. Contemporary uncemented femoral revision hip systems have become commonly used over the past decade and have enabled the reconstruction of leg length, offset and anteversion as independent variables through the use of modular junctions. Modular junction failures between the proximal body and distal stem have been described with early revision systems. We sought to identify the survivorship of one revision system in a clinical worst-case scenario where no host bone support of the modular junction was present.

Methods A single design modular taper fluted femoral revision system was assessed in this study, in patients with severe proximal femoral bone loss (Paprosky IIIB or IV). This was a retrospective, observational study, consecutive series of 136 patients, 15 patients (16 hips) were identified without host bone support of the modular junction with a mean radiological follow up of over 6 years (76 months +/- 35 months).

Results Seven females and eight males were in the study group; one female had revision hip surgery, resulting in a final study group of 16 revision hip replacements. The mean age at surgery was 67.5 years (38.7 years to 80.4 years; SD 9.9 years). The mean survivorship of the unsupported junction to most recent follow-up with radiographs was over 6 years and clinical follow up was 7 years. There were two revisions for reasons unrelated to the femoral component with no modular junction fractures identified.

Conclusion

Although underlying risk factors always need to be considered before, during, and after revision, our results provide reassurance that the proximal body-distal stem junction of the contemporary revision prosthesis can prevent interface failures and can be used with confidence over the medium term even in the absence of proximal femoral bony support.

146 DOES HIP RESURFACING MAKES FOR EASIER SURGERY WITH BETTER FUNCTIONAL OUTCOMES AT TIME OF REVISION? - A CASE CONTROLLED STUDY

Ahmed M E E Mostafa, Andrew King, Wajid Ali, Benjamin P Kent, Mark R Norton, Rory G Middleton
Royal Cornwall Hospital, Truro, UK

Background Revision total hip replacement (THR) is known to be a challenging procedure with potential for poor outcomes. Due to its lack of metaphyseal encroachment total hip resurfacing (TSR) is classified as a bone conserving procedure. Although, the literature postulates that this is an advantage at time of revision surgery, there is no evidence to either support or refute this claim.

Objectives To compare functional outcomes and markers of surgical difficulty between matched revision resurfacing and revision THR patients.

Design and methods

Power analysis identified a sample size of 47 patients in each arm. 65 patients who had undergone revision TSR and 65 controls undergoing primary revision THR were identified and matched for age and sex. Data collected included demographics, indications for surgery, Oxford Hip Score (OHS), length of surgery, length of hospital stay, blood transfusion and further surgical procedures. Outcomes were compared using the unpaired 't' test. Significance was taken as $p < 0.05$.

Results Mean follow up was 73 months. There was a significant 9 point difference in postoperative OHS in favour of the revision resurfacing group (p=<0.001). Reductions in length of surgery (p=0.006), length of hospital stay (p=0.035) and blood transfusion (OR=0.148) were also found in the hip resurfacing group.

Conclusion

While we acknowledge the limitations of this study, our results suggest that, in contrast to THR, the bone conservation element of TSR may make for a less traumatic revision procedure with better functional outcomes. Use of TSR has seen a dramatic decline as a result of concerns regarding metallosis. However, this information remains of relevance when counselling young active patients about their arthroplasty options and may become pertinent in the future if the promise of ceramic TSR is ever realised.

163 EARLY CLINICAL AND RADIOLOGICAL OUTCOMES OF A NEW TAPERED FLUTED MONOBLOC TITANIUM STEM IN REVISION TOTAL HIP ARTHROPLASTY

Syed S. Ahmed, Georges Vles, Peter Moriarty, Fares S. Haddad, Sujith Konan
UCLH, London, United Kingdom

Introduction. Tapered, fluted, titanium monobloc (TFTM) stems for complex primary or revision total hip arthroplasty (THA) provide immediate axial and rotational stability, improved load transfer, allow restoration of native anatomy, and negate the complications of modularity. However, subsidence has been reported for older monobloc stems. Our objective was to evaluate the early clinical and radiological outcomes of one of the newer stems incorporating design modifications to overcome this problem.

Methods. We reviewed 40 patients (mean age 77 years, range 52-90 years) undergoing reconstruction using a novel TFTM stem from January 2017 to May 2019. Indications included revision for periprosthetic fracture (9), aseptic loosening (9), infection (9), metastasis (3), failed neck-of-femur fracture fixation (6), instability (1) and complex trauma (3). Periprosthetic fractures were classified as Vancouver B2 (7), B3 (1) and C (1) and bone loss was graded as Paprosky I (3), II (11), IIIA (8), and IIIB (9).

Results. After an average follow-up of 23,3 months (10,4-39.3) no revisions, no radiological subsidence, loosening, stem fractures, or perforations were seen. All patients were fully weight bearing with no residual thigh pain, and all osteotomies healed. One patient developed a PJI while on chemotherapy successfully treated with a DAIR. Two dislocations were encountered, 1 with pre-existing instability and 1 known with Ehlers-Danlos syndrome.

Discussion and conclusion. This new monobloc stem demonstrates favourable early clinical and radiological outcomes. 100% survivorship with no subsidence or stem fracture was noted for patients treated for a range of indications and severity of bone loss. This suggests that the design modifications, including the more aggressive 3° taper, allow improved fixation compared with previous generations of TFTM revision stems. It may be used as the revision stem of choice in majority of uncemented revisions.

164 EARLY CLINICAL AND RADIOLOGICAL OUTCOMES OF THE NEW POROUS TITANIUM SHELL –LOCKING SCREW COMBINATION IN REVISION THA

Syed S. Ahmed, Georges Vles, Peter Moriarty, Fares S. Haddad, Sujith Konan
University College London Hospital, London, UK

Introduction. Cementless fully porous coated titanium revision acetabular systems have shown favourable outcomes in prospective and registry-

based studies. Achieving stable fixation and appropriate cup position remains a challenge with acetabular bone loss. Our objectives were to evaluate 1) the clinical application, and 2) the early clinical and radiological outcomes of a newly introduced fully porous non-peripherally expanded titanium shell which allows locking screw options for fixation.

Methods. We reviewed the first 25 patients (10 males, mean age 78 years) who underwent reconstructions using this novel cup for aseptic loosening (9), polyethylene wear (2), infection (7), instability (5) or a combination of these (2). Bone loss was graded as Paprosky I (3), IIA (4), IIB (3), IIC (5), and IIIB (7).

Results. With a minimum of 3 locking screws (1 ischium, 2 ilium; range 3-5), adequate primary stability without bone grafting was achieved for all cases. In 12/25 cases a cemented dual mobility shell was used, permitting restoration of version and inclination, and improved stability. Immediately post-operatively, all patients were allowed weight-bearing mobilisation. After mean follow-up of 18,6 months (10-25), no cup failures, dislocations, new infections, or re-operations were encountered. One shell settled after showing initial migration.

Discussion and conclusion. For a wide spectrum of acetabular bone loss, stable primary fixation was achieved with press-fit without peripheral expansion, and this was augmented with locking screws. Longer follow up is required and underway. Nevertheless, this system has the potential to overcome the challenges facing techniques such as impaction bone grafting and complex reconstruction options traditionally used in similar cases.

167 TREATMENT OF ACUTE PERIPROSTHETIC JOINT INFECTION IN TOTAL HIP ARTHROPLASTY: THE SINGLE-STAGE APPROACH.

Jonathan Robinson[1], Syed S. Ahmed[2], Charles Wallace[2], Sujith Konan[2], Fares S. Haddad[2]

[1]Bronx Lebanon Hospital, New York, USA. [2]University College London Hospital, London, United Kingdom

Background: Prosthetic joint infection (PJI) after total hip arthroplasty (THA) can be a difficult and costly complication to treat. In the acute setting (6-8 weeks post-operatively) debridement and exchange of all modular components with retention of stable implants is the popular treatment option. While this option is easier on both the patient and the surgeon it does limit the amount of debridement that can be performed. The aim of this study is to present the outcomes and methodology of single-stage exchange to treat acute PJI in THA.

Methods: We retrospectively reviewed patients undergoing single-stage exchange for the treatment of acute PJI from 2002-2014 at our institution. Inclusion criteria required patients to be culture positive for a deep infection after cementless primary or revision THA and have a minimum 5-year follow up.

Results: 39 patients were included in the study. There were 21 males and 18 females with a mean age of 64years. All patients had minimum 5-year follow-up. There were 33 primary THA's and 6 revision THA's. Average time from index operation to development of symptoms was 18days. The most common organism cultured was coagulase negative Staph 25%. 35 out of 39 patients were infection free at most recent follow up with only 4 re-infections. All re-infections resolved after two-stage revision.

Discussion:

Our study shows that single-stage exchange is a viable and successful treatment option for PJI in the acute setting. We believe that the removal of implants gives us access to perform a thorough debridement aiding in the eradication of the infection. In the acute setting cementless implants can be removed with relative ease and little to no bone loss. Our study shows 90% success rate and retention of implants at most recent follow up.

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INFORM Group Programme

INFORM Symposium British Hip Society

INFORM Infection: Orthopaedic Management

Friday 6th March 2020

Time: 13.15 – 16.00 / Location: Main Auditorium, ICC Wales

Prosthetic Hip Joint Infection

		Speaker
13.15	Introduction	Prof. Ashley Blom
13.30	Question 1. What is the scale of the problem?	Prof. Ashley Blom
	• Incidence and time trends – NJR data analysis	Dr Erik Lenguerrand
13.45	Question 2. How does it impact on patients' lives?	Prof. Ashley Blom
	• Patient experience of infection and treatments – Qualitative studies	Dr Andrew Moore
	• Surgeons perspective of managing infection – Qualitative studies	Dr Andrew Moore
	• What are patients prepared to accept from treatment? – DCE	Simon Strange
COFFEE BREAK		
14.30	Question 3. Who is most at risk of getting PJI?	Prof. Ashley Blom
	• Risk factors - Systematic reviews	Dr Setor Kunutsor
	• Risk factors - NJR data analysis	Michael Whitehouse
15.00	Question 4. What is the best treatment?	Prof. Ashley Blom
	• DAIR – systematic review	Dr Setor Kunutsor
	• Reinfection outcomes (1vs2 stage) – systematic rv & IPD	Dr Setor Kunutsor / Dr Andrew Beswick
	• Mortality and re-revision (1vs2 stage) – NJR	Dr Erik Lenguerrand
	• RCT (1vs2 stage) – Trial design and delivery	Simon Strange
	• Cost-effectiveness of treatments – Economics plan	Dr Sian Noble
15.50	Summary	
	What have we learned and what is still coming from the INFORM Programme?	Prof. Ashley Blom
16.00	Finish Time	

Speakers:

Prof. Ashley Blom: Head of Bristol Medical School, Professor of Orthopaedic Surgery
Mr Michael Whitehouse: Reader in Trauma and Orthopaedics, Bristol Medical School
Dr Andrew Moore: Research Fellow in Qualitative Health Research, Bristol Medical School
Dr Erik Lenguerrand: Research fellow, Medical statistician, Bristol Medical School
Dr Setor Kunutsor: Research Fellow in Medical Synthesis, Bristol Medical School
Dr Andrew Beswick: Research Fellow, Bristol Medical School
Dr Sian Noble: Senior Lecturer in Health Economics, Bristol Medical School
Mr Simon Strange: Research Programme Manager, North Bristol NHS Trust

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Mr Philip Stott *Consultant Orthopaedic Surgeon, Brighton & Sussex University Hospitals NHS Trust*

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BHS INSTRUCTIONAL COURSE - Programme

Convenors

Vikas Khanduja MA, MSc, FRCS (Orth) - Cambridge, UK

Andy Hamer FRCS (Orth) Sheffield, UK.

Faculty

Kate Gill - Guildford
Ajay Malviya - Newcastle
Satish Kutty - Harlow
Sebastian Dawson-Bowling - London
Callum McBryde - Birmingham
Richie Gill - Bath
Tim Board - Wrightington
Steve Jones - Cardiff
Simon Buckley - Sheffield
Tim Harrison - Sheffield
Andrew Gordon - Sheffield
Andrew Thomas - Birmingham
Richard Field - London
Andrew Carrothers - Cambridge
Sam Hook - Chichester
Dominic Meek - Glasgow
Richard Baker - Bristol
Fares Haddad - London
A Manketlow - Nottingham
Mike Whitehouse - Bristol

Date

Friday, 6th March 2020

Venue

ICC Wales, Newport

Time

0850 to 1600 hrs

Theme

Hip - Applied Clinical Knowledge

The Hip - Applied Clinical Knowledge

Time	*Topic*	*Lecturer*	*Region*
830	*Coffee & Registration*		
850	*Welcome & Introduction*	*Mr. Vikas Khanduja* *Mr. Andy Hamer*	*Cambridge* *Sheffield*
Session I	*Hip Basics - Applied Anatomy*		
900	*Surgical Exposures to the Hip Joint - Anterior*	*Mr. Callum McBryde*	*Birmingham*
915	*Anterolateral*	*Mr. Andrew Thomas*	*Birmingham*
930	*Posterior*	*Mr. Mike Whitehouse*	*Bristol*
945	*Arthroscopic Approach to the Hip Joint*	*Prof. Richard Field*	*London*
1000	*Discussion*		
1015	*Coffee Break*		
Session II	*Hip Basics - Biomechanics and Biomaterials*		
1100	*Basic Biomechanics*	*Prof. Richie Gill*	*Bath*
1115	*Materials Used for Hip Replacements*	*Mr. Ajay Malviya*	*Newcastle*
1145	*Biomechanics of the Normal & Replaced Hip*	*Prof. Richie Gill*	*Bath*
1215	*Tribology & Corrosion*	*Mr. Andrew Carrothers*	*Cambridge*
1245	*Principles of Primary THR*	*Mr. Sebastian Dawson-Bowling*	*London*
1300	*"How to Do" Session - Technical Videos - 7 minutes each* *Cemented Acetabulum* *Cemented Femur* *Uncemented Acetabulum* *Uncemented Femur*	 *Ms. Kate Gill* *Ms. Sam Hook* *Mr. Satish Kutty* *Mr. Dominic Meek*	 *Guildford* *Chichester* *Harlow* *Glasgow*
1330	*The BORS Travelling Fellowship*	*Prof. Richie Gill, President BORS*	*Bath*
1335	*Lunch*		
Session III	*Bearing Surfaces & Fixation*		
1415	*Debate 1: Bearing Surfaces* *5 minutes each and 5 minutes to conclude* *Ceramic on Ceramic* *Metal on Metal* *Metal on Poly* *Ceramic on Poly* *Oxinium on Poly*	*Prof. Fares Haddad* *Mr. Simon Buckley* *Mr. Richard Baker* *Mr. Andrew Gordon* *Mr. Richard Baker* *Prof. Fares Haddad*	*London* *Sheffield* *Bristol* *Sheffield* *Bristol* *London*
1445	*Debate 2: Fixation -* *5 minutes each and 5 minutes to conclude* *Uncemented* *Cemented*	*Mr. Andy Hamer* *Prof. Tim Board* *Mr. Andrew Manketlow*	*Sheffield* *Wrightington* *Nottingham*
1500	*The Difficult Primary THR*	*Mr. Callum McBryde*	*Birmingham*
1515	*Complications following THR*	*Mr. Tim Harrison*	*Sheffield*
1530	*Interactive Cases*	*Mr. Steve Jones*	*Cardiff*
1600	*Closure and Evaluation (Web Based)*	*Mr. Vikas Khanduja* *Mr. Andy Hamer*	*Cambridge* *Sheffield*

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1. "The long-term results of the original Exeter polished cemented femoral component" Ling R, Charity J, Lee A, Whitehouse S, Timperley A, Gie G *Journal of Arthroplasty*, (2009); 24(4):511-1
2. National Joint Registry for England and Wales. 9th Annual Report 2012
3. The Exeter Hip 40 years of Innovation in Total Hip Arthroplasty. Issue 1. Ling et al. Exeter Hip Publishing 2010
4. The Exeter Hip 40 years of Innovation in Total Hip Arthroplasty. Issue 1. Chapter 3.1 "Exeter Hip Instrumentation" J Howell. Exeter Hip Publishing 2010

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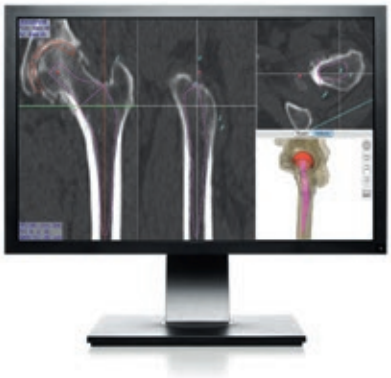

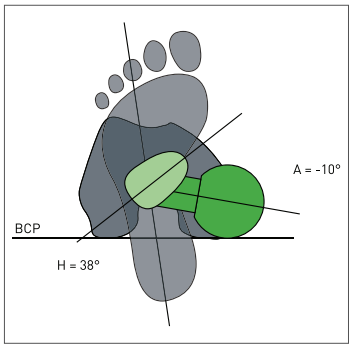

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*Reference: HIP International: 'A 20-year follow-up evaluation of total hip arthroplasty in patients younger than 50 using a custom cementless stem', *author: Jean-Noël Argenson, et al.*

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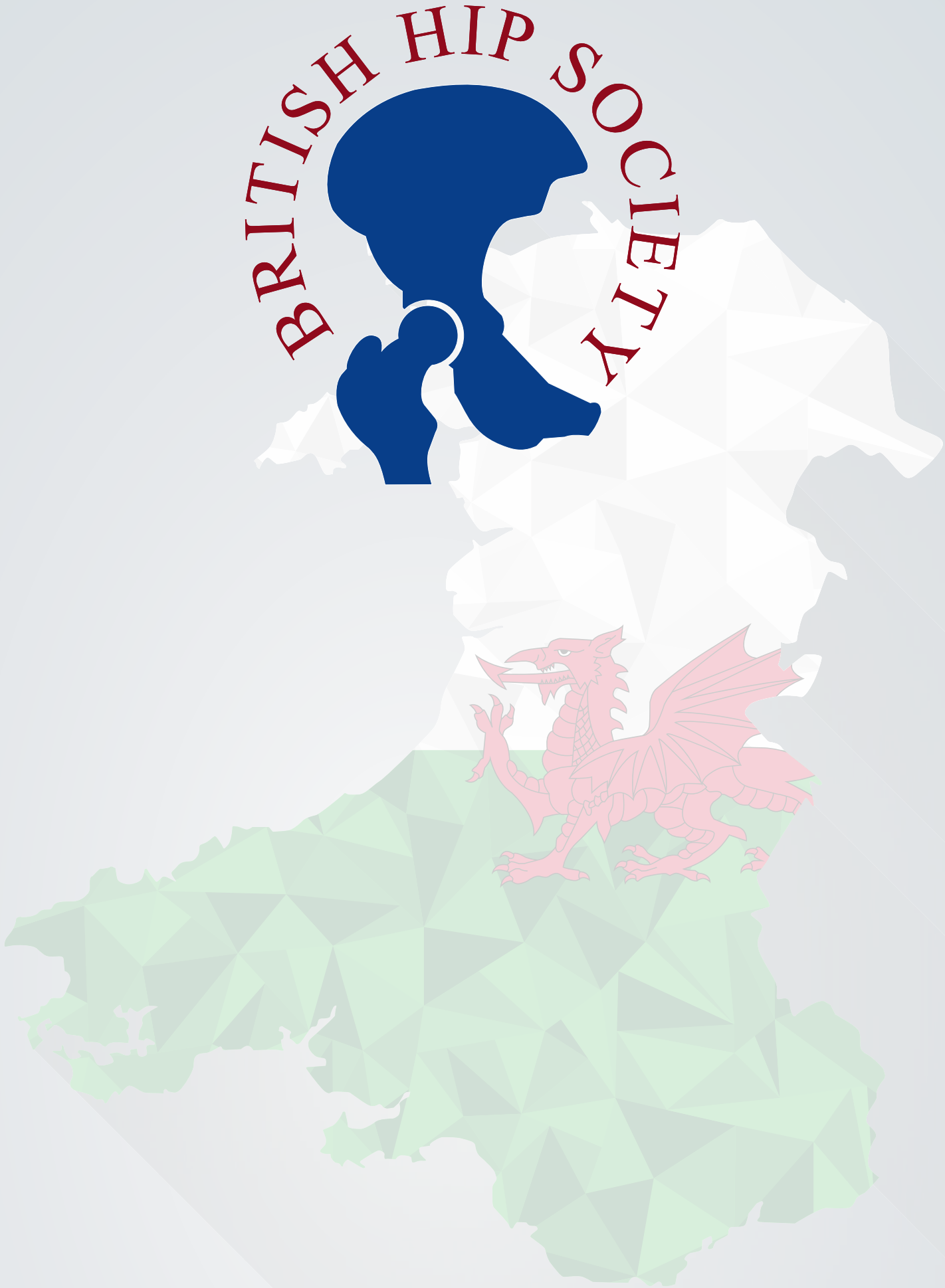
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