



REGISTRI, APPROCCI CHIRURGICI, SCORES



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27. Direct Anterior Approach vs Postero-Lateral approach with a same implant in 60 patients. Clinical and Radiological findings and Review of Literature
28. One-stage bilateral total hip arthroplasty through a minimally invasive anterior approach (AMIS): Functional outcomes and complications in 20 patients
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30. The posterior approach
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Registry data errors in the National Hip Fracture Database

D.J. Cundall-Curry MBBS MRCS Dip Clin Ed¹

J. E. Lawrence MA MB BChir¹

D.M. Fountain BSc²

C.R. Gooding FRCS¹

1. Addenbrookes Hospital, Cambridge University Hospitals NHS Foundation Trust, Cambridge, England

2. School of Clinical Medicine, Cambridge University Hospitals NHS Foundation Trust

Introduction

- National Hip Fracture Database (NHFD)
- Methods
- Findings
- Discussion
- Conclusion
- References & Questions

NHFD

- Clinically led web based audit project
- Set up by the British Geriatric Society and the British Orthopaedic Association 2007, run by the Royal College of Physicians
- Demonstrable improvements in patient care and outcomes
 - Six care standards
- 64, 838 fractures registered in 2013
- 100,000 expected by 2020
- Numbers are important to detect differences in outcomes¹

Method

- Internal audit at a level I major trauma centre
- July 2009 – June 2014
- Compared NHFD dataset to Hospital Records:
 - Administrative databases
 - Electronic medical records
 - Picture Archiving and Communication System
 - Patient notes
- Reliability data calculated with cross tabulation, sensitivity, specificity, accuracy, confidence intervals, and McNemar's test results

Findings

- 2058 patients on NHFD
 - 7 duplications
 - 15 exclusions due to medical records being unavailable at the time of analysis
- 2036 patients included
 - 1436 F: 600 M,
Mean age 84
(range 46-103)
- 6 incorrect hospital numbers
- 9 incorrect dates of birth
 - Difference range -32yrs to +21yrs
 - Mean difference -2.4yrs
- 10 incorrect discharge dates
 - mean over-recording 6 bed days
 - (range -20 to +4)
 - 4 missing discharge data
- 10.2% fractures coded incorrectly
 - 3.7% and 6.5% of intracapsular and extracapsular fractures respectively
- 8 pts had returns to theatre within 30days of original surgery not recorded on NHFD

NHFD Code	Total	Incorrec t	%	Corrected Code												
				1	2	3	4	5	6	7	8	9	10	11	12	13
1	148	18	12	130	0	0	0	0	6	0	2	9	0	1	0	0
2	8	8	100	0	0	1	0	0	6	0	0	1	0	0	0	0
3	175	73	42	0	0	102	1	1	65	0	1	5	0	0	0	0
4	123	52	42	1	0	13	71	0	29	0	0	8	1	0	0	0
5	12	2	17	0	0	2	0	10	0	0	0	0	0	0	0	0
6	579	113	20	9	0	41	30	0	466	0	11	15	0	5	2	0
7	4	4	100	0	0	0	1	0	3	0	0	0	0	0	0	0
8	61	10	16	0	0	2	1	0	6	0	51	1	0	0	0	0
9	756	168	22	9	0	11	5	0	62	0	4	588	24	53	0	0
10	14	1	7	0	0	0	0	0	0	0	0	0	13	1	0	0
11	129	25	19	1	0	1	1	0	0	0	0	7	14	104	1	0
12	2	2	100	0	0	0	0	0	0	0	0	2	0	0	0	0
13	25	3	12	0	0	0	0	0	0	0	0	2	0	1	0	22
Total	2036	479	23.53	150	0	173	110	11	643	0	69	638	52	165	3	22

(1) Internal fixation, (2) Hemiarthroplasty – Bipolar uncemented, (3) Hemiarthroplasty – Bipolar cemented, (4) Hemiarthroplasty – unipolar uncemented uncoated, (5) Hemiarthroplasty – unipolar uncemented coated, (6) Hemiarthroplasty – unipolar cemented, (7) Total hip arthroplasty - uncemented, (8) Total hip arthroplasty - cemented, (9) Dynamic hip screw fixation 10Intramedullary nail (short), (11) Intramedullary nail (long), (12) Other / Endoprosthesis, (13) No operation performed.

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Findings

- Rate of incorrect data in operation codes included in statistical analysis ranged from 7-42%
- Overall accuracy for the analysed operation code data was 0.637 (95% CI 0.615-0.658)
- Sensitivity range 0.250-1.000, Specificity range 0.879-0.999
- Grouped analysis:
 - Cement – sensitivity 0.932, specificity **0.713**
 - Total hip arthroplasty – sensitivity **0.739**, specificity 0.983
 - Nails – sensitivity **0.608**, specificity 0.986
- Accuracy for mortality data 0.942
 - 95% CI 0.931-0.952
 - sensitivity 0.967, specificity 0.917

		Corrected	
		Alive	Dead
NHFD	Alive	1879	54
	Dead	64	39

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Discussion

- Data
 - Responsibility for data entry
 - Administrative databases – low sensitivity, low specificity, and poor positive predictive value²
- Database inaccuracy
 - Poor or nonexistent auditing and control procedures
 - Validity should be supported by data quality checks including logical checks and data reabstractions^{3, 4}
- National Orthopaedic databases
 - Inaccuracies in a hip fracture database⁵
 - Missed cases⁶
 - Incorrect diagnosis⁷
 - Incorrect operation^{7,8}
 - Incorrect clinicians involved in patient care⁹
- Financial incentive to drive improvement
 - Best Practice Tariff
 - prospectively data collection increases data completion and accuracy¹⁰

Conclusion

- First paper to validate NHFD dataset
- Data recording accuracy and validation procedures required to improve data
- NHFD
 - Improve care as measured by orthogeriatrician input, time to surgery, length of stay and survival^{11,12}
- Continued work to improve nationally collected data is vital to inform both clinical decision, and policy makers¹³, and improve confidence in the NHFD

Thank you

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INTERNATIONAL COMBINED MEETING

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SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY



Surrogate Markers of Long-Term Outcome in Primary Total Hip Arthroplasty: A Systematic Review



Malak T T, Broomfield J AJ, Palmer A JR, Hopewell S,
Carr A, Brown C, Prieto-Alhambra D, Glyn-Jones S

DPhil Student
University of Oxford

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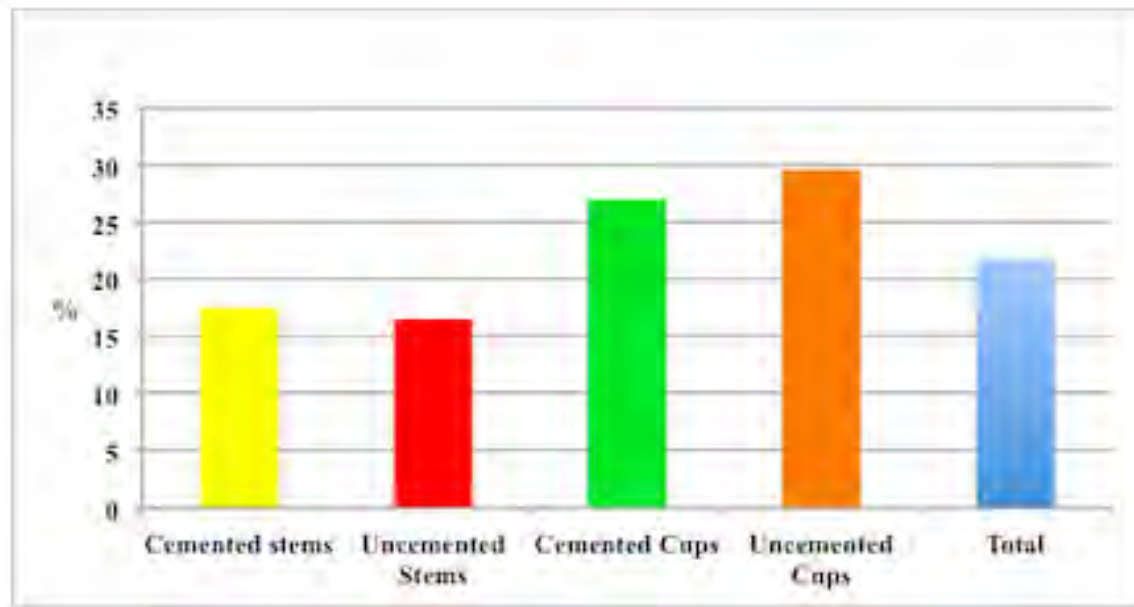
Background

- Failing Implants
 - MoM
 - Charnley Elite
- Safety
- ODEP / NJR

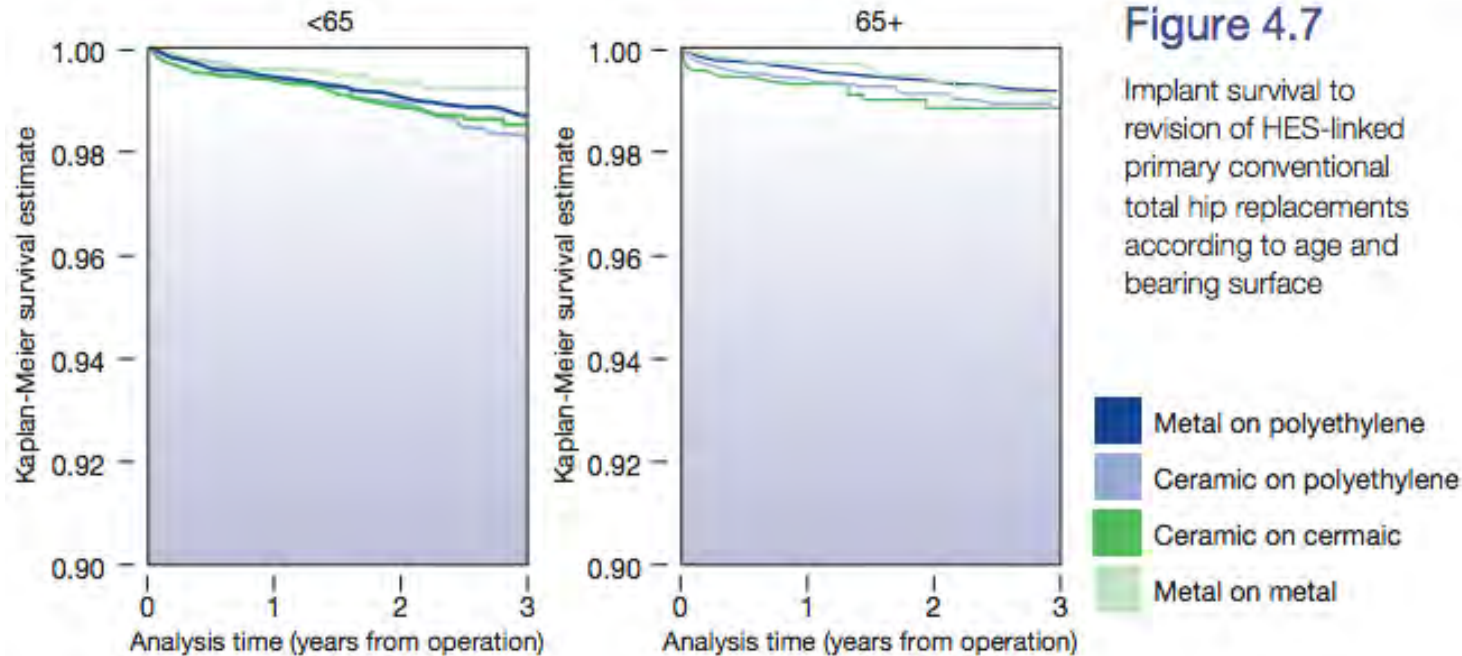


ODEP Rating

- 24% of Implants available – NO evidence¹
- Device Regulation

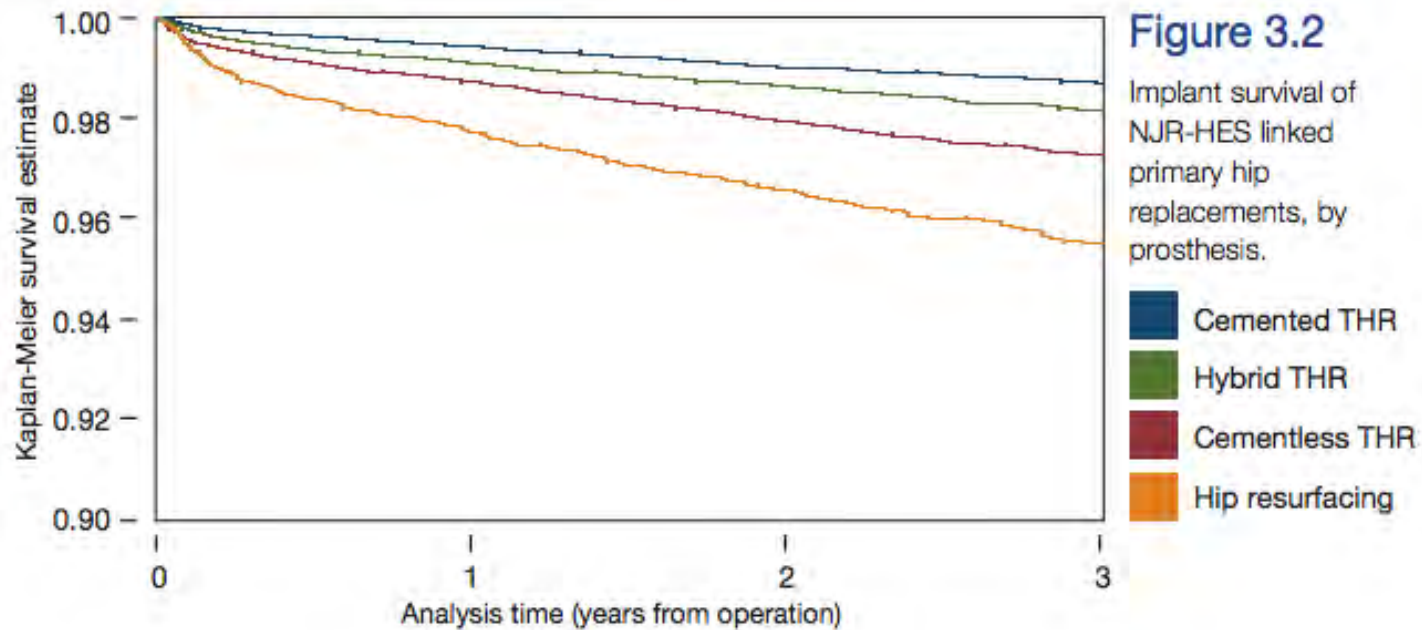


2007-08



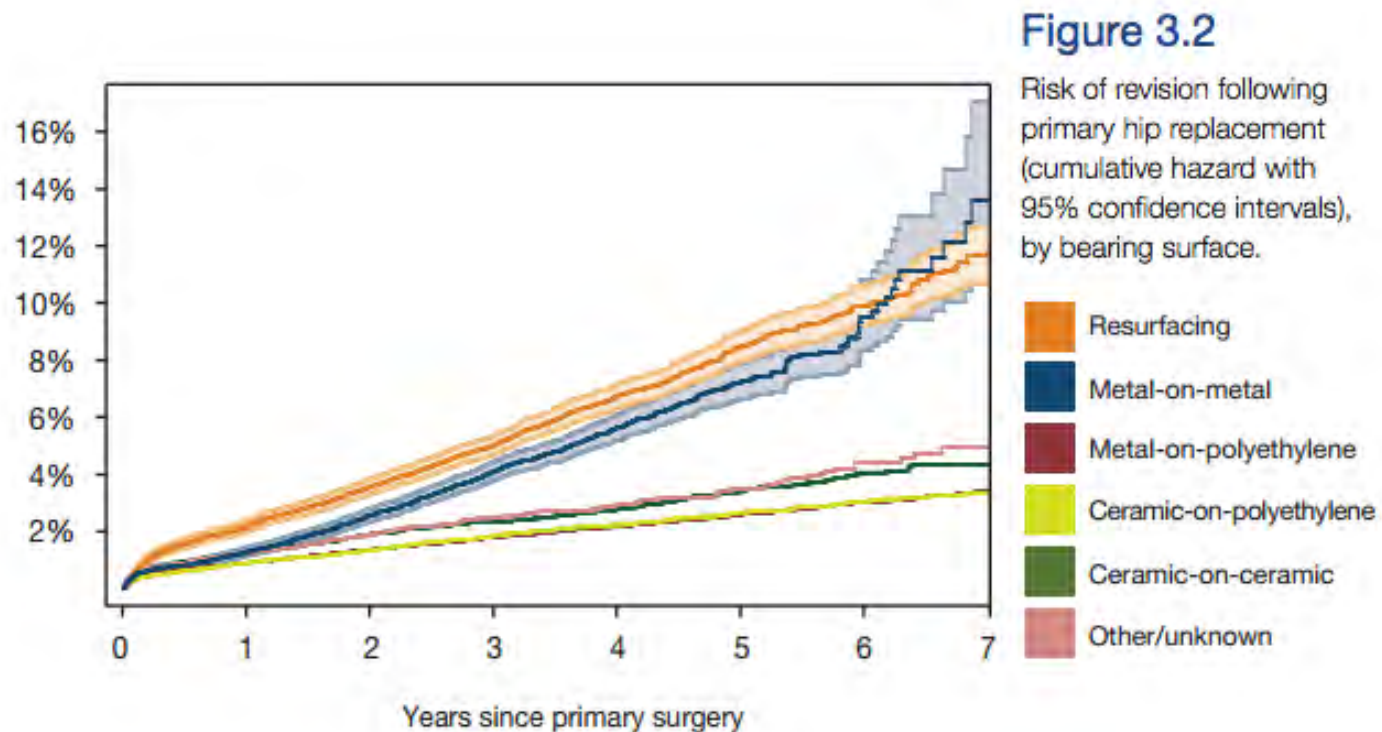
<10,000
Implanted

2008-09



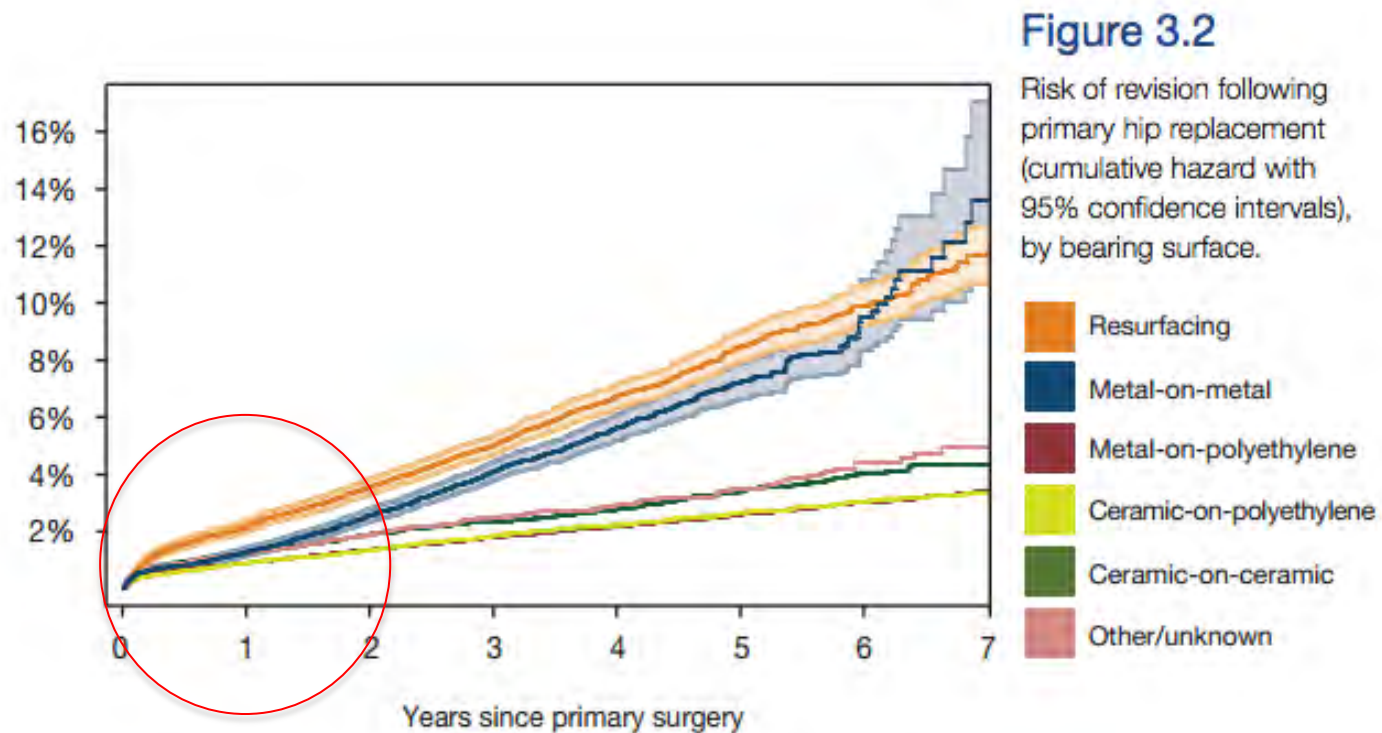
<15,000
Implanted

2010-11



>30,000
Implanted

Aim



<15,000
Implanted

Methods

- Systematic Review
- Revision rate at 10 years¹
- Medline, Embase, Cochrane
- In vivo, primary THA

1. NICE. 2014. Total hip replacement and resurfacing arthroplasty for end-stage arthritis of the hip (review of technology appraisal guidance 2 and 44)

Flow Chart

- 2 Systematic Reviews
- 1 RCT
- 1 Cohort Study
- 13 Case Series



Results

- Radiostereometric Analysis (RSA) - 6
- Einzel-Bild-Röntgen-Analyse (EBRA) - 4
- Other pre 2000 - 6

RSA

- 3D Imaging Technique
- Migration & Wear
- Predict Long-Term Revision within 2 years
- 17 patients per arm

EBRA

- 2D Imaging Technique
- Migration & Wear
- Acetabular > Femoral

Discussion

- NICE
- Beyond Compliance
- IDEAL



	1 Idea	2a Development	2b Exploration	3 Assessment	4 Long-term study
Purpose	Proof of concept	Development	Learning	Assessment	Surveillance
Number and types of patients	Single digit; highly selected	Few; selected	Many; may expand to mixed; broadening indication	Many; expanded indications (well defined)	All eligible
Number and types of surgeons	Very few; innovators	Few; innovators and some early adopters	Many; innovators, early adopters, early majority	Many; early majority	All eligible
Output	Description	Description	Measurement; comparison	Comparison; complete information for non-RCT participants	Description; audit, regional variation; quality assurance; risk adjustment
Intervention	Evolving; procedure inception	Evolving; procedure development	Evolving; procedure refinement; community learning	Stable	Stable
Method	Structured case reports	Prospective development studies	Research database; explanatory or feasibility RCT (efficacy trial); diseased based (diagnostic)	RCT with or without additions/modifications; alternative designs	Registry; routine database (eg, SCOAP, STS, NSQIP); rare-case reports
Outcomes	Proof of concept; technical achievement; disasters; dramatic successes	Mainly safety; technical and procedural success	Safety; clinical outcomes (specific and graded); short-term outcomes; patient-centred (reported) outcomes; feasibility outcomes	Clinical outcomes (specific and graded); middle-term and long-term outcomes; patient-centred (reported) outcomes; cost-effectiveness	Rare events; long-term outcomes; quality assurance
Ethical approval	Sometimes	Yes	Yes	Yes	No
Examples	NOTES video ⁶	Tissue engineered vessels ⁷	Italian D2 gastrectomy study ⁸	Swedish obese patients study ⁹	UK national adult cardiac surgical database ¹⁰

RCT=randomised controlled trial. SCOAP=Surgical Clinical Outcomes Assessment Programme. STS=Society of Thoracic Surgeons. NSQIP=National Surgical Quality Improvement Program. NOTES=natural orifice transluminal endoscopic surgery.

Table: Stages of surgical innovation

Limitations

- Strict inclusion criteria
- Search term “predict”

Recommendations

- RSA as part of phased introduction
 - Predictive of aseptic loosening
- Identify alternative surrogate markers
 - E.g. PROMs

Thank You





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How arthroplasty registries will influence clinical practice in the next decade

Henrik Malchau, MD, PhD

Professor at Harvard Medical School,

Vice Chief (Research), Co-director The Harris Orthopaedic Laboratory

Attending physician, Orthopedics MGH and

Sahlgrenska University Hospital, Göteborg. Sweden



Harris Orthopaedic Laboratory
Massachusetts General Hospital



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- Educational and advisory consultant for MAKO and Biomet
- Board member and share holder in RSA Biomedical Inc.

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Martyn Porter, MD
Tim Briggs, MD
Steven Graves, MD
And many more around the world

Outline

- Introduction
- What effect has Registries had in the past ?
- Evidence based practice and phased introduction of new technology
- The Swedish experience
- Are surgeons compliant with registry findings
- The next decade “Nested clinical Trials”
- Summary and conclusions

We are all obliged to build the clinical treatment on evidence based principles



Our patients have the right to be protected from unexpected hazards.

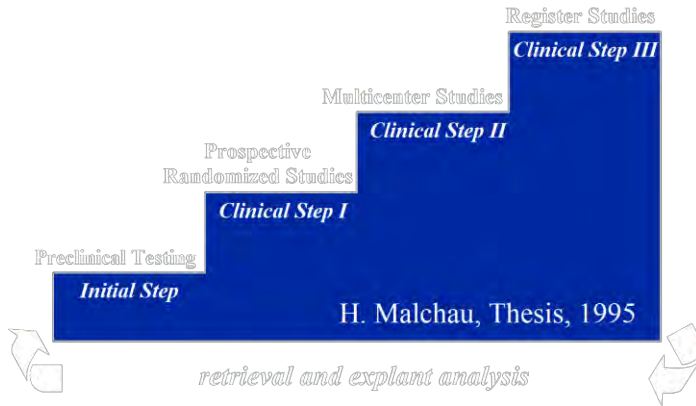
Evidence-based introduction

A hypothesis

A more precise and careful evaluation when new implant technology is introduced will reduce the number of patients at risk.

Henrik Malchau

Ph.D. Thesis 1995



On the importance of Stepwise Introduction of New Implant Technology.

*Assessment of Total Hip Replacement using
Clinical scoring, Radiostereometry, Digitized
Radiography and a National Hip Registry.*

Compromises in the introduction process are driven by

- The magnitude of the problem addressed (incidence and severity)
- The advantages and risks of the proposed solution

Two examples

- The first generation highly cross-linked polyethylene
- The recent disaster with metal-on-metal large head THA.



THE HIP SOCIETY

The John Charnley Award 2012:

Clinical Multi-centric Studies of the Wear Performance of Highly Cross-linked Re-melted Polyethylene in THR

**¹Charles R. Bragdon PhD, ¹Michael Doerner BA, ¹Harry E. Rubash MD, ¹Young-Min Kwon MD, PhD, ²John Martell MD, ³John Clohisy MD, ⁴Richard White MD, ⁵Craig Della Valle MD, ⁶Daniel Berry MD, ¹Bryan Jarrett BS, ⁷Paul Lachiewicz MD, ⁸Kim Bertin MD, ⁹Per-Erik Johanson MD, ¹⁰Henrik Palm MD, ¹W.H.Harris MD
¹Henrik Malchau MD**

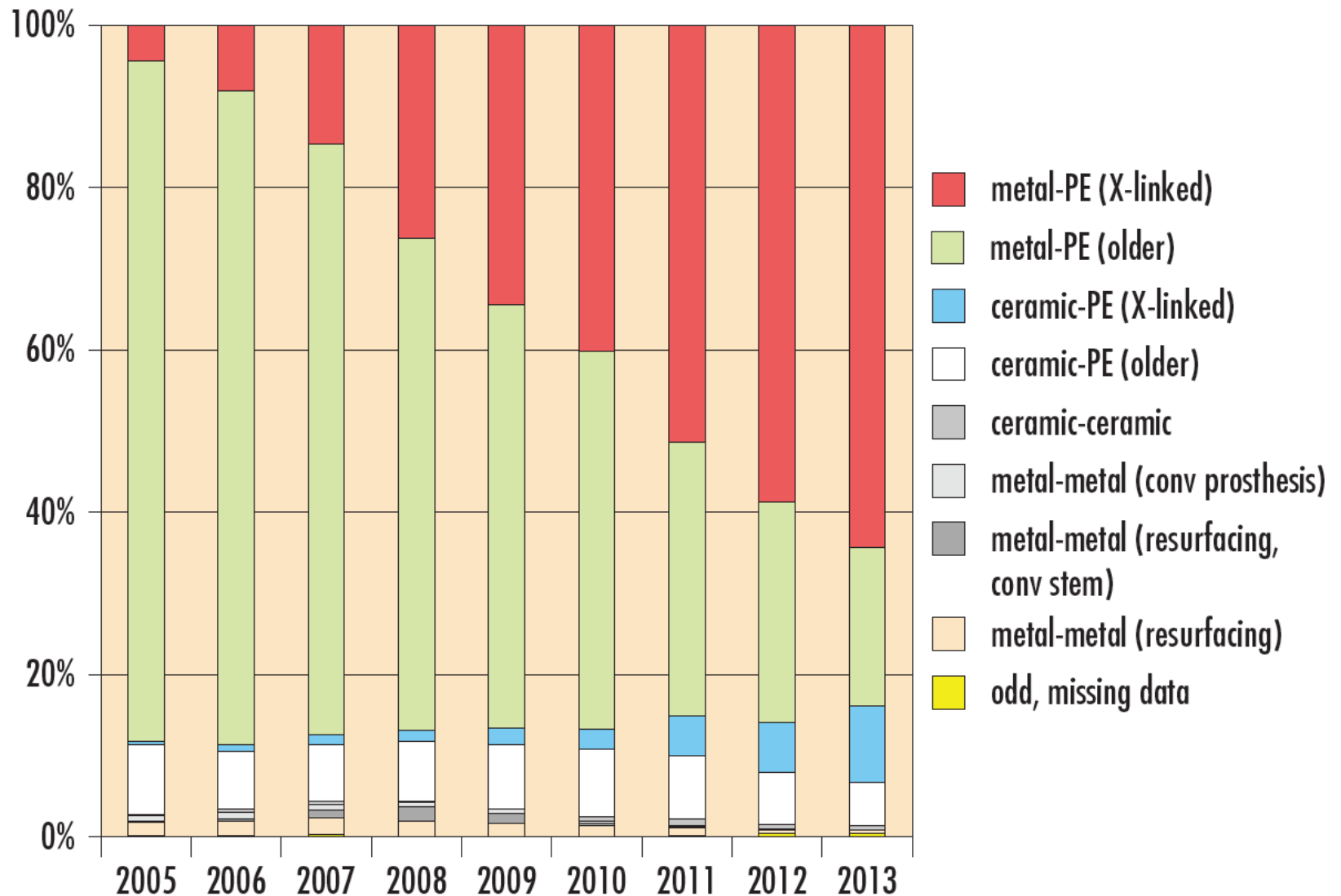
¹Massachusetts General Hospital, Boston, MA, ²University of Chicago Medical Center, Chicago, IL, ³Washington University in St. Louis, St. Louis, MO, ⁴Presbyterian Hospital, Albuquerque, NM, ⁵Rush University Medical Center, Chicago, IL, ⁶Mayo Medical School, Rochester, MN, ⁷Chapel Hill Orthopedics, Chapel Hill, NC, ⁸Utah Bone & Joint Center, Salt Lake City, UT, ⁹Sahlgrenska University Hospital, Gothenburg, Sweden, ¹⁰Hvidovre Copenhagen University, Denmark

Polyethylene



- How many patients will suffer from osteolysis complications due to late acceptance of the “new” highly cross-linked technology?

Bearings used in Sweden

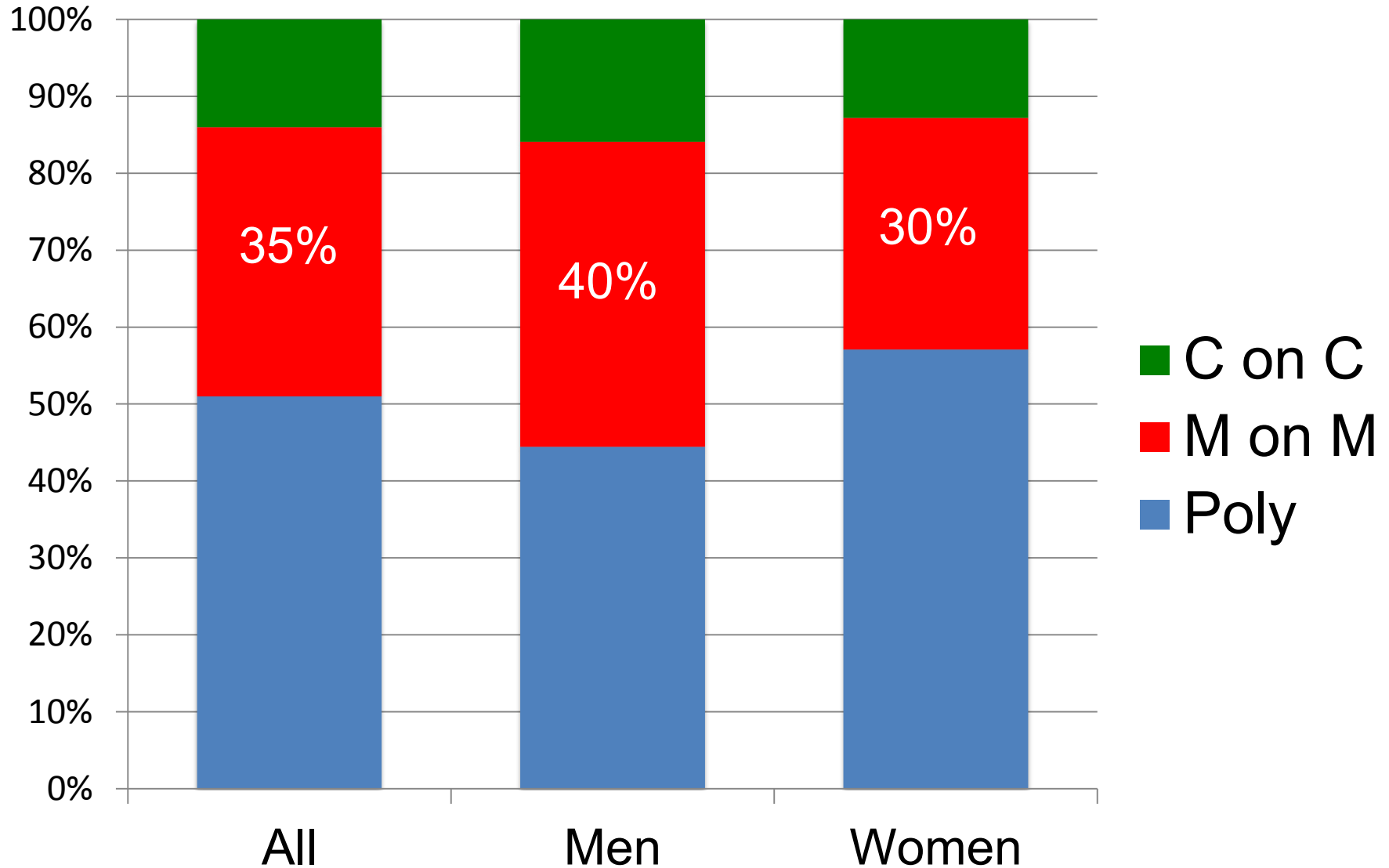


The Metal-on-Metal disaster



- How should the increasing incidence of revision due to recurrent dislocation after THA be addressed?
 - Larger head sizes
- As a consequence we got a fast acceptance and high usage of large head resurfacing M-o-M and the concept was expanded to conventional stemmed THA.

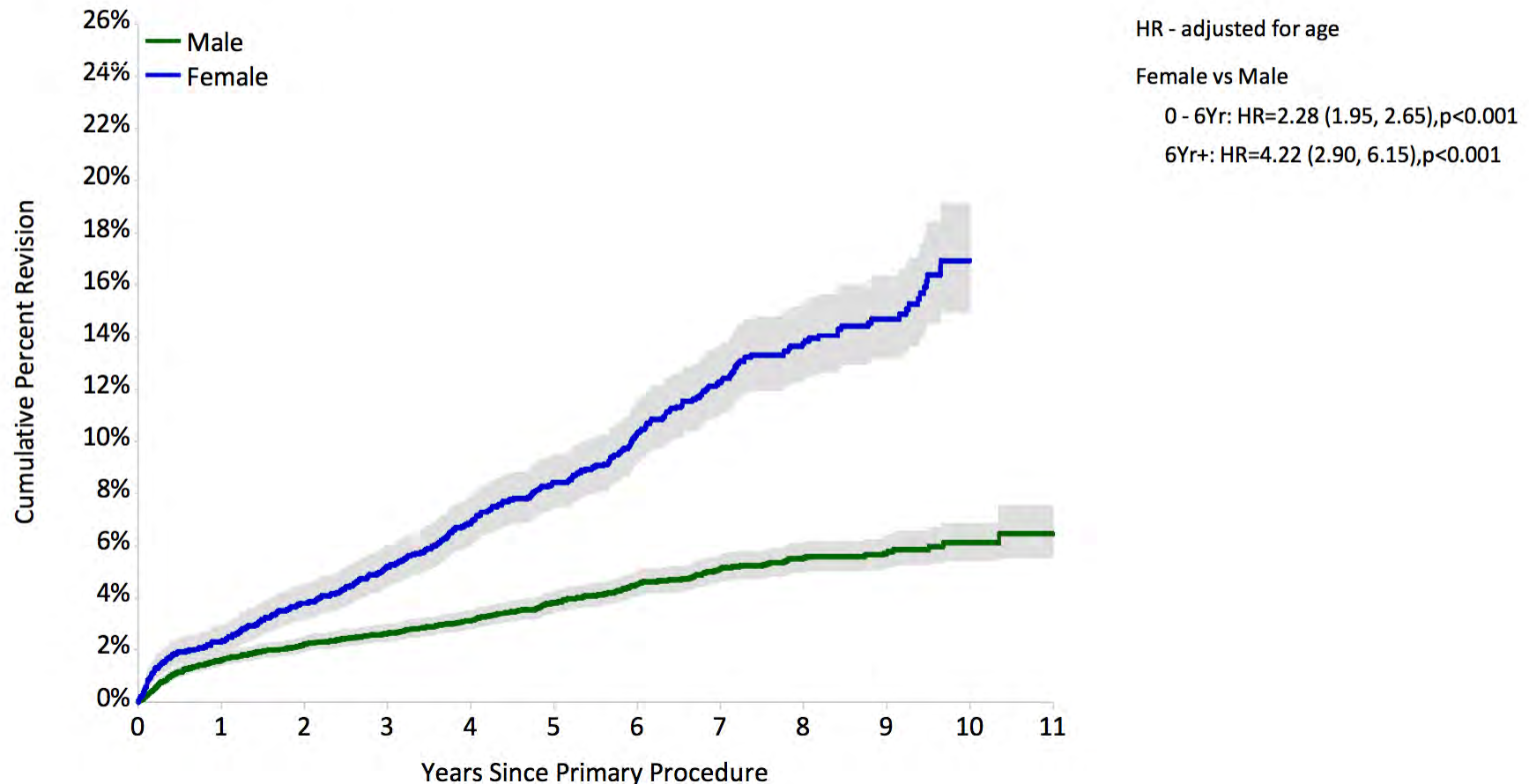
Bearing Surfaces in US 2005-06 by Gender



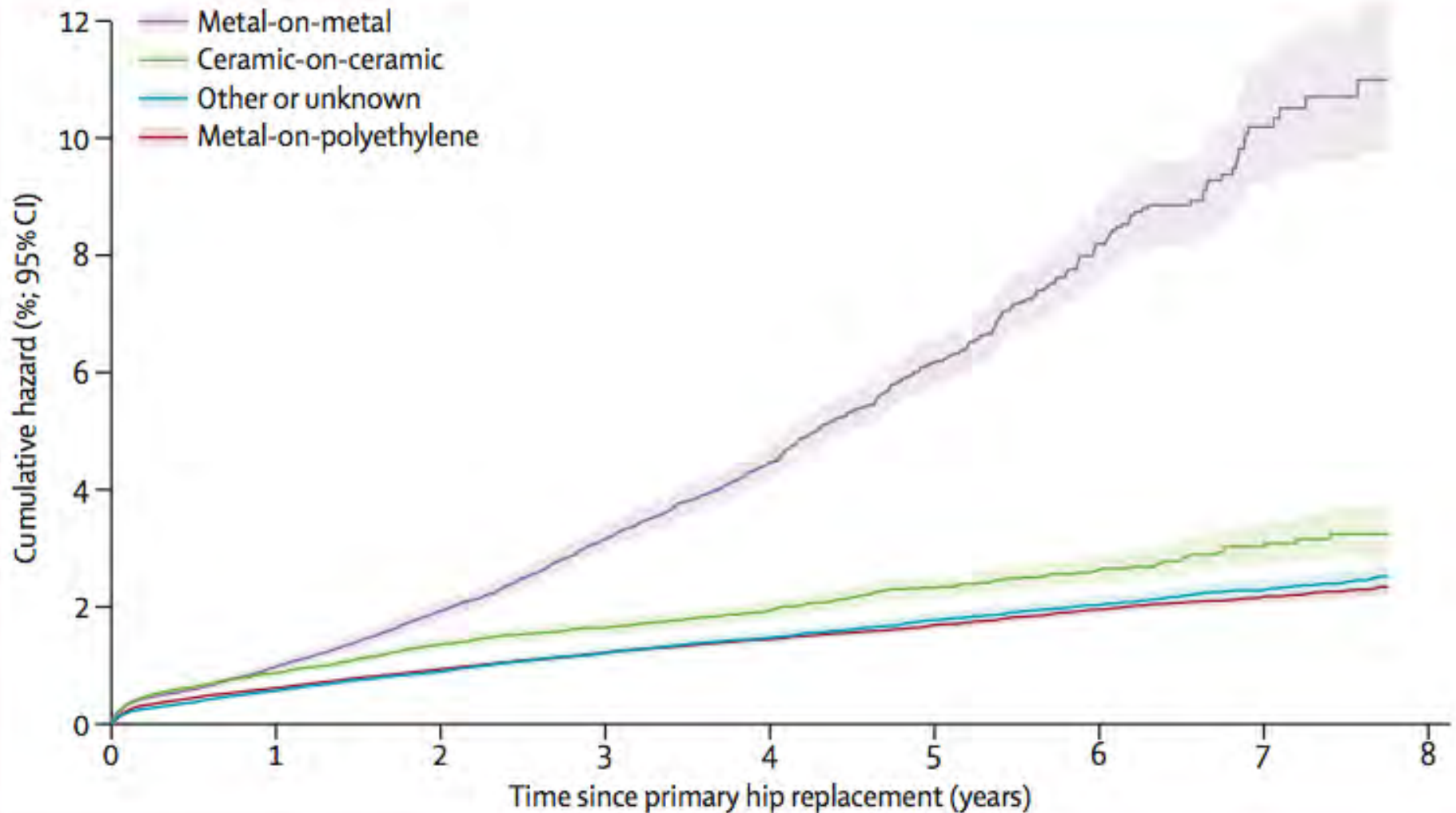
Thanks to Michael Dunbar

Resurfacing Revisions by Gender Australia 2011

Figure HT39: Cumulative Percent Revision of Primary Total Resurfacing Hip Replacement by Gender (Primary Diagnosis OA)



Higher Revision Rate with MoM



The Lancet 13th March 2012



Failure rates of stemmed
metal-on-metal hip replacements:
Analysis of data from the National Joint Registry
of England and Wales

Alison J Smith MSc, Prof Paul Dieppe FRCP, Kelly Vernon BSc,
Martyn Porter FRCS, Prof Ashley W Blom PhD, on behalf of the
National Joint Registry of England and Wales

Who is to blame?

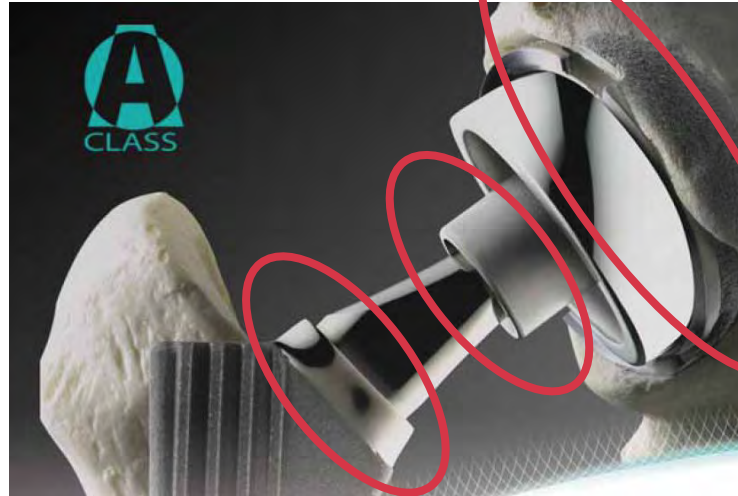


- The physicians or the industry?

Famous People's Hip



Jack "The squeaker"

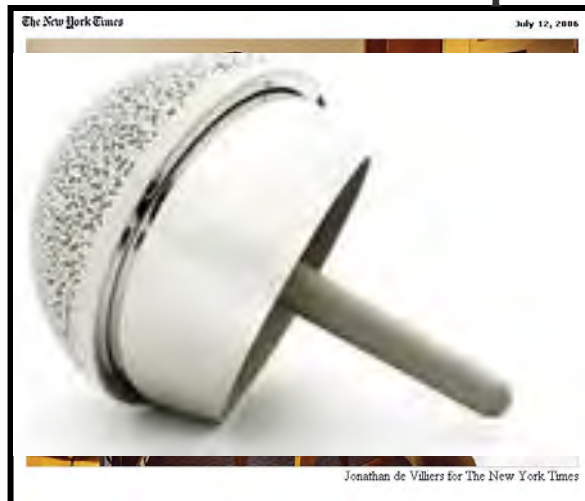


Jimmy "The Unfortunate"
Triple bad features

Mary Lou
Bottom



Mary Lou



Floyd



The solution?

The idea of a national register

...a serious consideration should be given to establishing a central register to keep a finger on the pulse of total implant surgery on a nation-wide basis...

NJR started 2002

USA/Germany might start 2013



Sir John Charnley 1972

Mission for all Joint Replacement Registries

- monitoring of “health care quality”/outcomes
- Improvement, implementing best practise
- clinical research
- quality control of the whole process
- not a device register!

Registries in Sweden:

- Knee Arthroplasty 1975
- Hip Arthroplasty 1979
- Hip Fracture 1988
- Vascular Surgery 1988
- 96 other nation-wide medical quality registries 1990 – 2011



One of the essential fundamentals

1947



Personal ID number

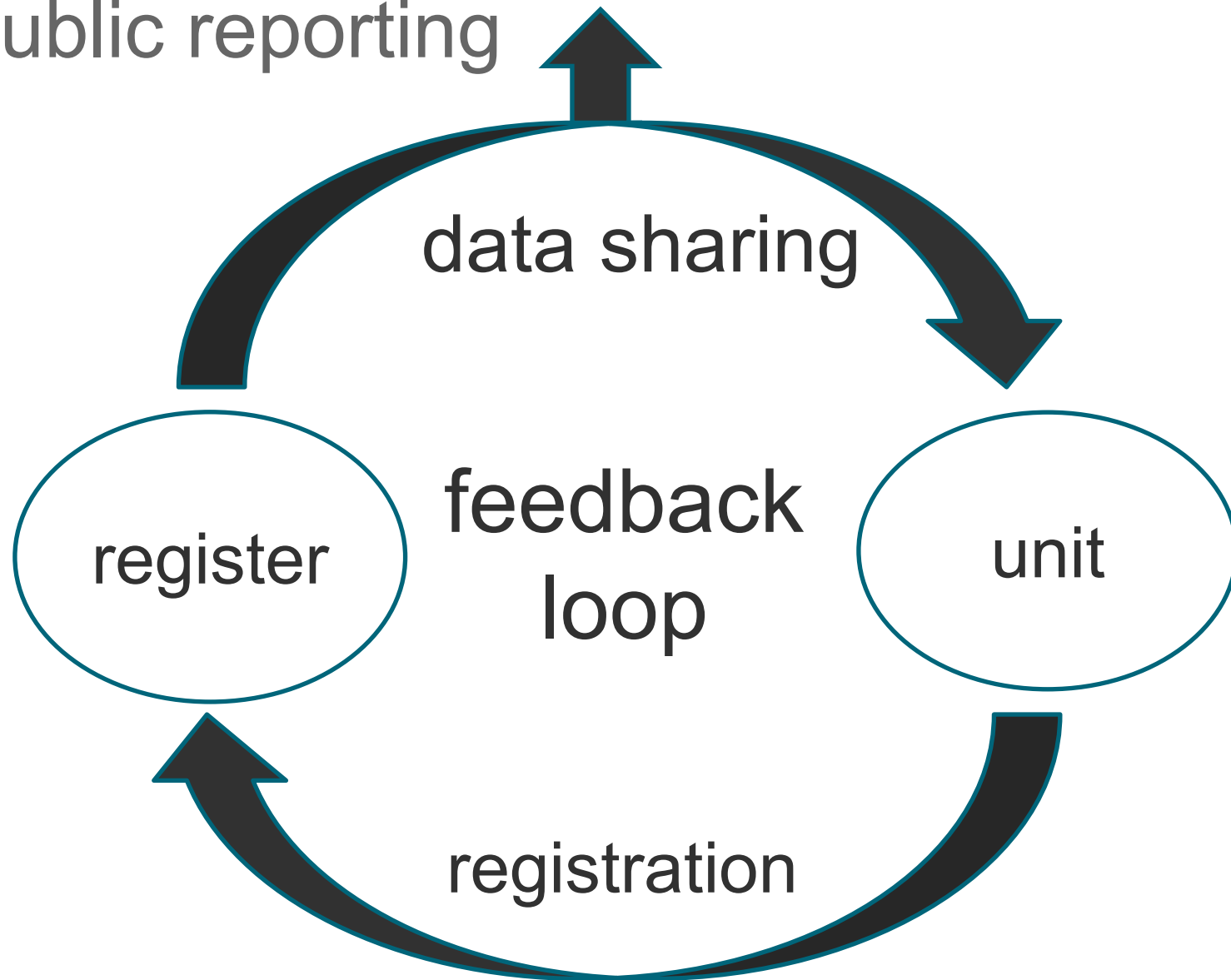
620510-XXXX

the patient is always traceable

linked databases and unique databases!



public reporting



implemeting best practice

The profession has:

- Initiated
- developed
- analyzed
- Interpreted and owned the registries
- ...without involvement of decision makers and/or industry



Swedish Hip Arthroplasty Register

- started 1979
- 100% participation
- public reporting 1999
- 98,5% completeness 2010
- PROM since 2002
- overall 10-year survival 96%
- lowest reported revision rate



Potential US “savings”

Initiate a Register

- For each percent lower (from 17.6%) the direct annual cost savings are estimated to \$42.5 million - \$112.6 million
- A 10% reduction (to the Swedish level) could save \$ 1 billion/year in US!

Kurtz et al: NHDS data, JBJS (Am), 2005

Patient-reported Outcome Measures and Health-economic Aspects of Total Hip Arthroplasty

A study of the Swedish Hip Arthroplasty Register

WHEN WE WANT YOUR OPINION
WE'LL GIVE IT TO YOU



Ola Rolfson

Institute of Clinical Sciences
at Sahlgrenska Academy
University of Gothenburg



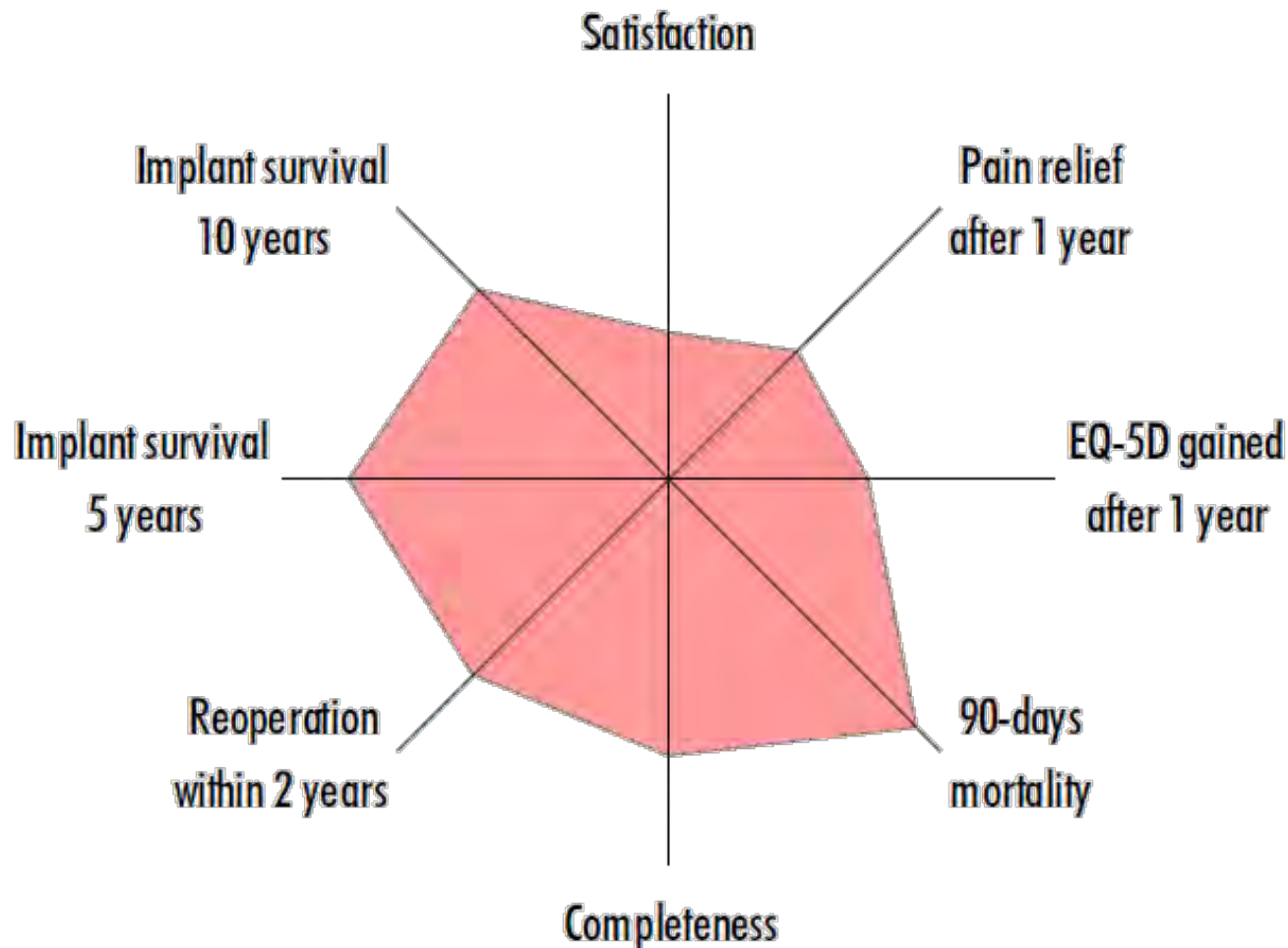
UNIVERSITY OF GOTHENBURG

11% uncertain or
dissatisfied @1 year

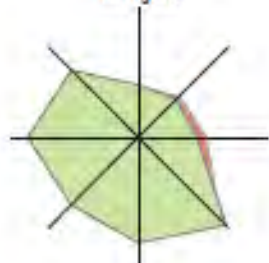
further surgery
@1 year <1.0%

Quality indicators

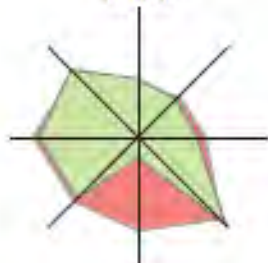
clinical value compass - national averages



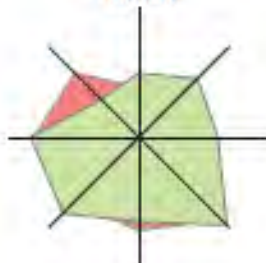
Alingsås



Arvika



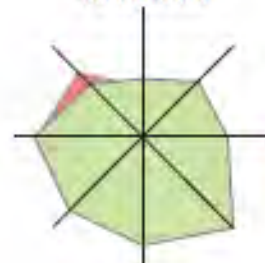
Bollnäs



Borås



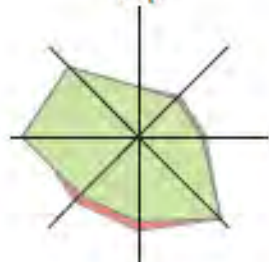
Carlanderska



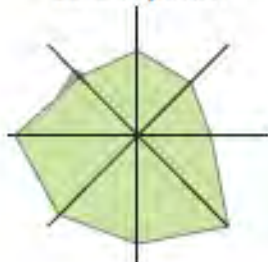
Danderyd



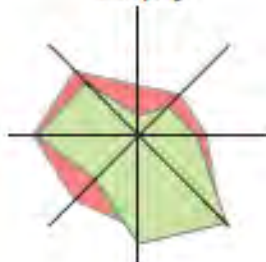
Eksjö



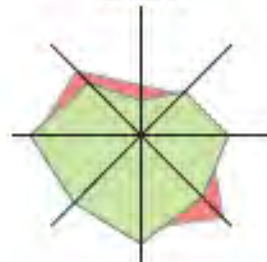
Elisabethsjukhuset



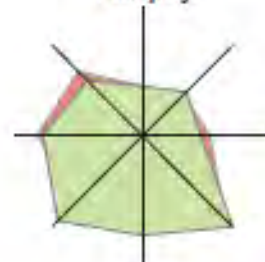
Enköping



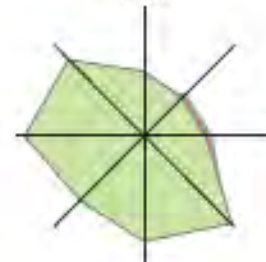
Eskilstuna



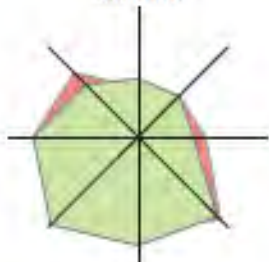
Falköping



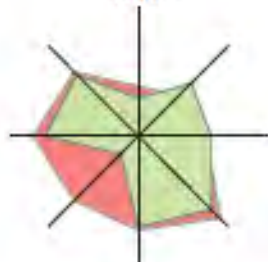
Falun



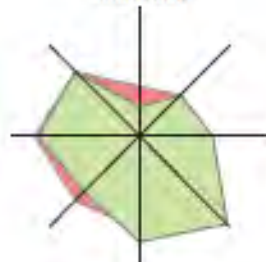
Gällivare



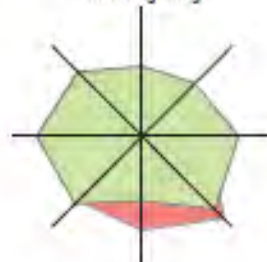
Gävle



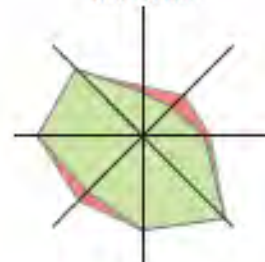
Halmstad



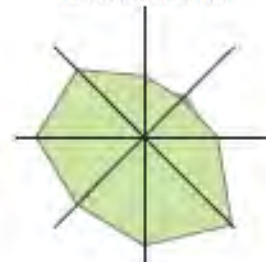
Helsingborg



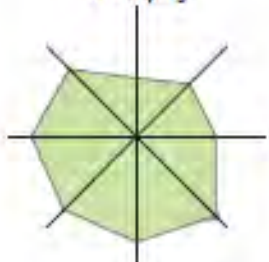
Hudiksvall



Hässelholm-Krstd



Jönköping



Kalmar



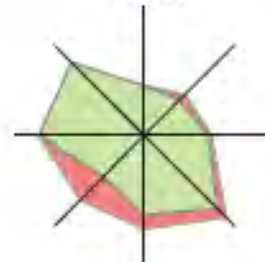
Karlshamn



Karlskoga



Karlstad



Katrineholm



Is there clinical compliance with respect to findings in the registries?



Clin Orthop Relat Res
DOI 10.1007/s11999-013-2941-7

Clinical Orthopaedics
and Related Research®
A Publication of The Association of Bone and Joint Surgeons®

SURVEY

A Review of Current Fixation Use and Registry Outcomes in Total Hip Arthroplasty: The Uncemented Paradox

Anders Troelsen MD, PhD, DMSc, Erik Malchau MD,
Nanna Sillesen MD, Henrik Malchau MD, PhD

Revision risk:

Cemented vs. Uncemented



Country	AUS	DK	E-W (male)	E-W (female)	NZ
Age groups					
DK: <50 AUS, E-W, NZ: <55					
DK: 50-59 AUS, E-W, NZ: 55-64					
DK: 60-74 AUS, NZ: 65-75 E-W: >65					
AUS, DK, NZ: >75 E-W: >65					

AUS =
Australia

DK =
Denmark

E-W =
England-
Wales,

NZ =
New
Zealand

 = Insignificant ($p > 0.05$) difference in risk of revision following cemented vs. uncemented fixation

 = Significant ($p < 0.05$) higher risk of revision following cemented vs. uncemented fixation

 = Significant ($p < 0.05$) lower risk of revision following cemented vs. uncemented fixation

- Clear pattern that risk of revision is statistically lower using cemented compared to uncemented fixation for the elderly age groups

RESEARCH

Of 536.962 THA's 347.899 were included

Failure rate of cemented and uncemented total hip replacements: register study of combined Nordic database of four nations

Conclusion: The survival of cemented implants for total hip replacement was higher than that of uncemented implants in patients aged 65 years or older. The increased use of uncemented implants in this age group is not supported by these data. However, because our dataset includes only basic information common to all Nordic registers there is a potential for residual confounding.

What Is the Benefit of Introducing New Hip and Knee Prostheses?

Rajan Anand, MBBS, Stephen E. Graves, MBBS, DPhil, FAOrthA, Richard N. de Steiger, MBBS, Dip Biomech, FRACS(Orth), David C. Davidson, MBBS, FRCSEd, FAOrthA, Philip Ryan, MBBS, BSc, FAFPHM, Lisa N. Miller, BSc Hons (Math), and Kara Cashman, BSc Hons (O&G), Grad Dip Math Sc

Investigation performed at the Australian Orthopaedic Association National Joint Replacement Registry, Adelaide, Australia

TABLE I Summary of Performance of New Hip Prostheses Used in More Than 100 Procedures

Hip Prosthesis	Total No. of Components	Compared with the Three Best Performing Prostheses with Follow-up of ≥ 5 Years		
		Better	Same	Worse
Cementless femoral	11	0	9	2
Cementless acetabular	12	0	9	3
Cemented femoral	1	0	0	1
Cemented acetabular	0	0	0	0
Resurfacing femoral	5	0	3	2
Resurfacing acetabular	4	0	2	2
Total	33	0	23	10

None better!

TABLE II Summary of Performance of New Knee Prostheses Used in More Than 100 Procedures

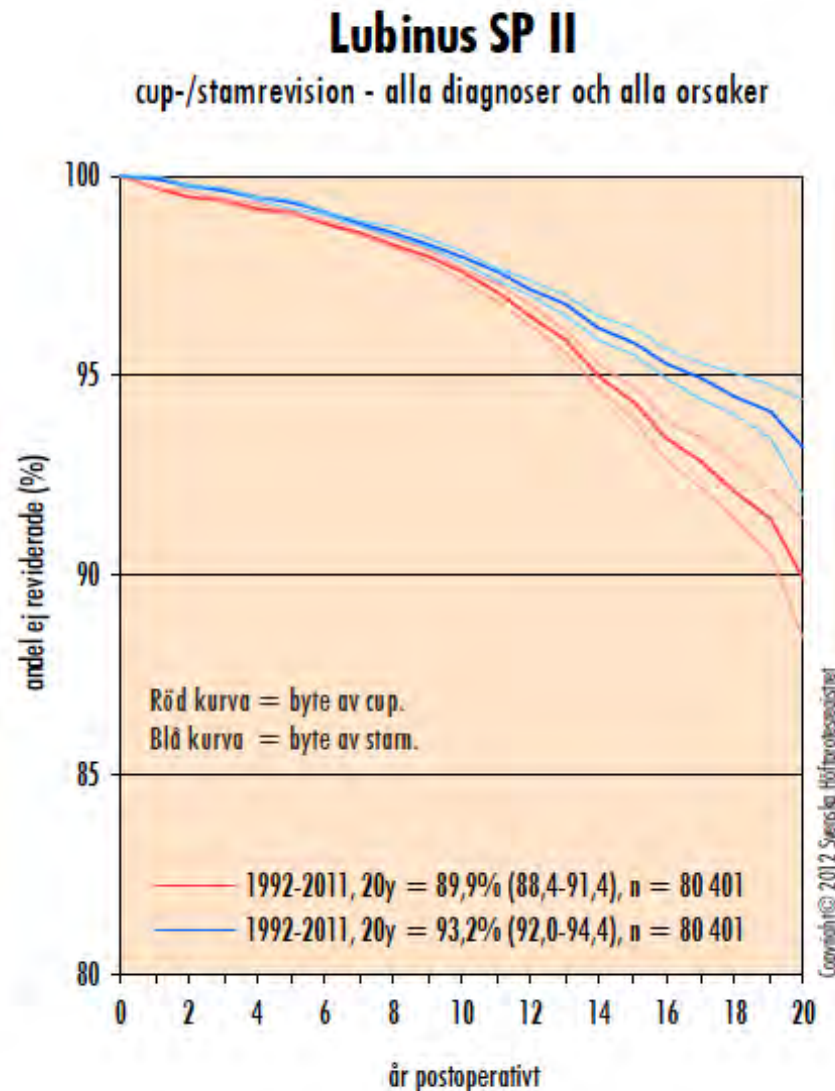
Knee Prosthesis	Total No. of Components	Compared with the Three Best Performing Prostheses with Follow-up of ≥ 5 Years		
		Better	Same	Worse
Unicompartmental femoral	4	0	2	2
Unicompartmental tibial	4	0	2	2
Cementless femoral	5	0	4	1
Cementless tibial	4	0	3	1
Cemented femoral	6	0	6	0
Cemented tibial	5	0	3	2
Total	28	0	20	8

There were 266 new hip and knee (167 hip and ninety-nine knee) prostheses introduced to the Australian market in the five-year period between January 1, 2003, and December 31, 2007. Most of these new prostheses were not used in large numbers of procedures; only 22.9% were used in more than 100. This low use rate was evident for both new hip and new knee prostheses, with only 19.8% of the hip implants and 28.3% of the knee implants used in more than 100 procedures.

Of 33 new THA implants 23 had same results as older systems, 10 worse
Of 28 new TKA implants 20 had same results as older systems, 8 worse

Result of one cemented THA system

80.401 patients – 20 years survival ~ 93.5%





- How can we prevent the M-o-M to happen in the future?
- Premarket approval process (510K) seems insufficient.

FEATURE

MEDICAL DEVICE REGULATION

How a fake hip showed up failings in European device regulation

As Peter McCulloch puts it in a linked editorial, patient safety and not trade should take centre stage of the system to regulate medical devices

“The regulatory framework for implants varies worldwide, but has been generally much less rigorous than for drugs. Widespread surveillance of existing implants is urgently needed.”

Carr et al. Lancet 2012

ISAR

International Society of Arthroplasty Registries
(www.isarhome.org)

(NORE Network of Orthopedic Registries Europe)



Aim

1. Support network for established and developing registries
2. Encourage cooperation and sharing of information
3. Encourage collaborative activities
4. Fifth International Congress in Manchester, UK, May, 2016



ISAR

International Society of Arthroplasty Registries
(www.isarhome.org)



Future, next decade

1. International harmonization
2. Increased sharing of information
3. Global **Unique Device Identification**
4. Increased transparency and quality metrics



Acta Orthopaedica 2015; 86 (1): x–x

Guest Editorial

The next critical role of orthopedic registries

Malchau, Graves, Porter, Harris, Troelsen

Guest Editorial

The next critical role of orthopedic registries

- To increase innovation and to ensure that innovation is effective and beneficial, the role of registries should be expanded.
- The registries should not undertake the role of a regulatory authority, but in compliance with the industry and the orthopedic community they should ensure that a more cautious approach is used when new technology is introduced.

Guest Editorial

The next critical role of orthopedic registries

- This could lead to a better balance between the inborn conservatism that a registry represents and the continuous need for innovation.

Guest Editorial

The next critical role of orthopedic registries

- We propose a structured model for clinical trials involving 4 levels:
- (1): A pure observational study using reoperation data from multiple registries, as shown in several papers by the Nordic Arthroplasty Register Association (NARA).

Guest Editorial

The next critical role of orthopedic registries

- (2): Patient-reported outcome measures, either from national implant registries or from other registries for specific studies.
- (3): Radiographic data plus other parameters such as blood levels of metal ions, based on specific needs for a new technology.

Guest Editorial

The next critical role of orthopedic registries

- (4): Options for randomized studies with use of, for example, RSA in the evaluation.
- The cornerstone in this structural model should be the expanded use of existing and future registries with a high degree of coverage and completeness.

“Nested Clinical Studies”

Winds of Change in Europe UK



The CE mark is “Compliance”. We are suggesting that sometimes and perhaps often, companies go “Beyond Compliance” and enter a more stringent process before their product is made widely available

<http://www.beyondcompliance.org.uk>

What have we learned in the past 30 years with respect to primary THA?

- Aseptic loosening has decreased, but is still the main reason for revision.
- Follow up of THA is due to the high volume best performed through regional and national registries.
- New and unproven technology need careful monitoring.
- Keep on cementing

The next decade?

- Use registries with high coverage and completeness for documentation when new technology is introduced.
- “Nested clinical Trials” with data collection and mining through an Academic Contract Research Organization (ACRO).

The next decade?

- Depending on the specifics of the clinical trial, all type of clinical and radiographic data can be collected.
- This model could even include randomization.
- If these prophecies are fulfilled the result will be a profound effect on clinical practice

And finally:

A new orthopedic journal with focus on observational studies and Registry results

Thank you



The Harris Orthopaedic Laboratory
Massachusetts General Hospital
Boston, USA



Department of Orthopedics
Sahlgrenska University Hospital
Gothenburg, Sweden



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY



INTERNATIONAL COMBINED MEETING
British Hip Society
Società Italiana dell'Anca
26-27 November 2015
MILAN, ITALY



Establishing a complete National data base of implants

M. Torre

Italian Arthroplasty Registry

National Centre of Epidemiology, Surveillance and Health Promotion

Istituto Superiore di Sanità – Rome (Italy)

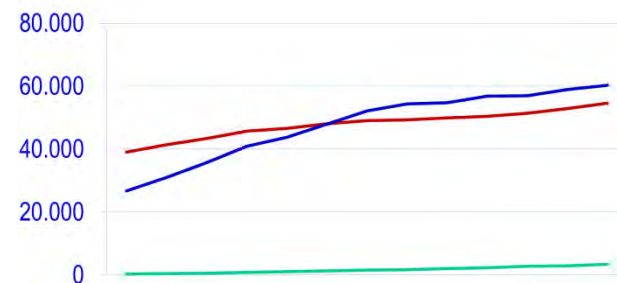
Disclosures

The Italian Arthroplasty Registry (RIAP) project is completely funded by the Ministry of Health (DG Medical devices and pharmaceutical service).

No conflict of interest to be declared

Joint replacements in Italy

Source: HDR DB (2001-2013)



Cod.	Procedure	2001	2003	2005	2007	2008	2009	2010	2011	2012	2013	% (°)
Hip												
81.51	Total hip replacement	45.792	51.311	55.599	58.650	58.786	59.528	59.764	60.712	62.361	64.056	2,8
	" w/out fracture	39.144	43.419	46.561	49.104	49.289	49.923	50.394	51.422	52.940	54.624	2,8
81.52	Partial hip replacement	20.768	21.020	22.402	22.326	23.069	22.542	23.953	24.177	24.324	24.998	1,6
(*)	Resurfacing	-	-	-	-	-	303	476	157	94	96	-25,0
(**)	Revision	6.015	6.528	6.960	7.273	7.219	7.606	7.919	7.897	8.302	8.249	2,7
	Total Hip	72.575	78.859	84.961	88.249	89.074	89.979	92.112	92.943	95.081	97.399	2,5
Knee												
81.54	Total knee replacement	26.787	35.799	43.785	52.116	54.395	54.778	56.808	56.977	58.979	60.261	7,0
(***)	Revision	1.269	1.904	2.472	3.007	3.311	3.850	3.953	3.996	4.235	4.502	11,1
	Total Knee	28.056	37.703	46.257	55.123	57.706	58.628	60.761	60.973	63.214	64.763	7,2
Shoulder												
81.80	Total shoulder repl.	695	934	1.455	2.036	2.175	2.515	2.965	3.444	3.793	4.421	16,7
81.81	Partial shoulder repl.	844	917	1.051	1.203	1.234	1.242	1.333	1.211	1.352	1.432	4,5
	Total Shoulder	1.539	1.851	2.506	3.239	3.409	3.757	4.298	4.655	5.145	5.853	11,8
Other Joints		871	1.062	1.940	1.915	1.696	1.665	1.623	1.739	1.674	1.720	5,8
TOTAL		103.041	119.475	135.664	148.526	151.885	154.029	158.794	160.310	165.114	169.735	4,2

(°) % Average yearly increase

Hip: (*) 00.85, 00.86, 00.87 (**) 81.53, 00.70, 00.71, 00.72, 00.73

Knee: (***) 81.55, 00.80, 00.81, 00.82, 00.83, 00.84

Other Joints: 81.56, 81.57, 81.59, 81.73, 81.84, 81.97

>750 hospitals

MD General Repository at Ministry of Health

General Repository of all MD marketed in Italy located at the Ministry of Health established in 2007

The General Repository of all the medical devices marketed in Italy is **continuously updated by the manufacturers (mandatory)**.

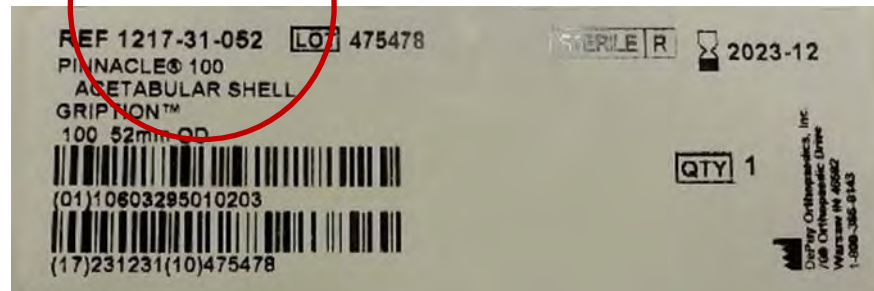


Very comprehensive database



ID of General Repository refers to a «family» and not to the single REF code → NO traceability

PROGRESS FABBRICANTE_ASSEMBLATORE	CODICE_CATALOGO_FABBR_ASS	DENOMINAZIONE_COMMERCIALE
312909 DEPUY ORTHOPAEDICS	121731XXX, 121732XXX	COPPA ACETABOLARE PINNACLE GRIPTION



High number of different devices

2015 (I) Ministry MD General Repository (18/8/2015)

HIP

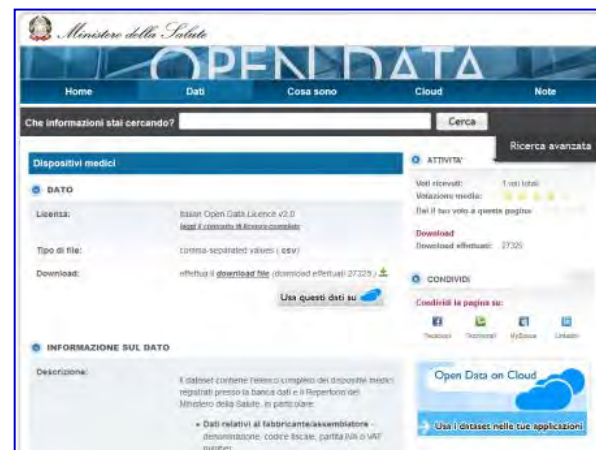
- 4.645 registrations (cups)
- 88 manufacturers registered (CND P090803)
- 5.662 registrations (stems)
- 90 manufacturers registered (CND P090804)

KNEE

- 1.647 registrations (femoral components)
- 55 manufacturers registered (CND P09090301)
- 1.242 registrations (tibial components)
- 55 manufacturers registered (CND P0909030201)

SHOULDER

- 308 registrations (glenoid components)
- 31 manufacturers registered (CND P090103)
- 981 registrations (omeral components)
- 40 manufacturers registered (CND P090104)

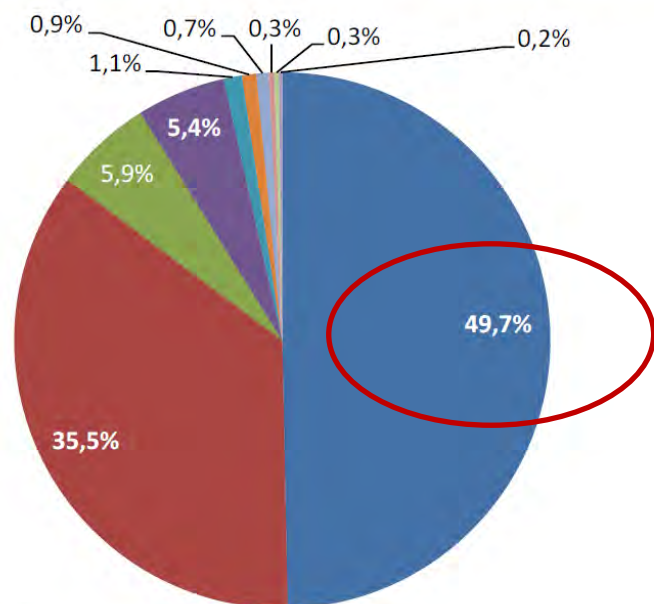


NHS hospitals: expenditures for MD report (2013) (www.salute.gov.it)

Tabella 12 - "Primi 20 gruppi CND a maggiore spesa (Anno 2013)"

N°	Tipologie CND	Spesa rilevata	%	% cumulata
1	P09 PROTESI ORTOPEDICHE E MEZZI PER OSTEOSINTESI E SINTESI TENDINEO-LEGAMENTOSA	353.471.291	10,9%	10,9%

Figura 23 - "Dispositivi Protetici impiantabili e prodotti per osteosintesi (CND P): composizione delle CND"



P - DISPOSITIVI PROTETICI IMPIANTABILI E PRODOTTI PER OSTEOSINTESI

- P09-Protesi ortopediche e mezzi per osteosintesi e sintesi tendineo-legamentosa
- P07-Protesi vascolari e cardiache
- P90-Dispositivi protesici impiantabili-vari
- P03-Protesi oculistiche
- P05-Protesi esofagee e gastrointestinali
- P06-Protesi mammarie
- P08-Protesi urogenitali
- P01-Protesi facciali ed odontoiatriche
- P02-Protesi otorinolaringoiatriche
- P04-Protesi per apparato respiratorio



50% of implantable MD expenditure, 10% on total MD expenditure!

Registers for Medical devices traceability



2009 - 2014


Proposal for a Regulation of the European Parliament and of the Council on medical devices and amending Directive 2001/83/EC, Regulation (EC) No 178/2002 and Regulation (EC) No 1223/2009.

Approved by the Council 19/6/2015

Article 83 Device registers

The Commission and the Member States shall take all appropriate measures to encourage the establishment of registers for specific types of devices to gather post-market experience related to the use of such devices **setting common principles to collect comparable information.**

Such registers shall contribute to the independent evaluation of the long-term safety and performance of devices **and/or to the traceability of implantable devices.**

 Council of the European Union

Brussels, 11 June 2015
(OR. en)

9769/15

Interinstitutional File:
2012/0266 (COD)

PHARM 26
SAN 176
MI 391
COMPET 304
CODEC 858

NOTE

From: Presidency
To: Council

No. prev. doc.: 9238/15 PHARM 22 SAN 155 MI 347 COMPET 259 CODEC 775 + COR1
No. Cion doc.: 14493/12 PHARM 71 SAN 215 MI 597 COMPET 600 CODEC 2305 + COR 1

Subject: Proposal for a Regulation of the European Parliament and of the Council on medical devices and amending Directive 2001/83/EC, Regulation (EC) No 178/2002 and Regulation (EC) No 1223/2009

Delegations will find in the Annex to this document a consolidated text for the Articles of the proposed Regulation mentioned above prepared by the Latvian Presidency with a view to the meeting of the Council (EPSCO) on 19 June 2015.

At its meeting on 10 June 2015, the Permanent Representatives Committee agreed to forward the text in the Annex to this Note to the Council with a view to reaching a Partial General Approach (excluding recitals).

New text compared to the Commission proposal is written in *bold italics*. Deletions are marked by ~~strike~~through.

9769/15 DGB 3B LES/ms 1
EN

1st phase of data collection (2007-2009)

MD manual input

- 795 different Manufacturers names (officially registered in the Ministry database only 77)
- the same manufacturer typed in different ways:
75 DePuy - J&J vs. 4 BD/RDM
40 Smith & Nephew vs. 3 BD/RDM
- name of distributor/vendor instead of manufacturer
- 4% of the 400,000 medical devices registered without ref code

**Impossible to identify >50%
of the registered MD!!**

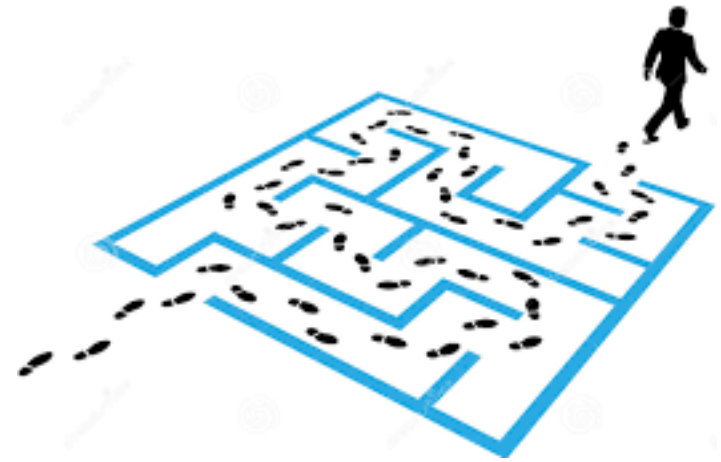
DAPUY
DE PUY
DE PUY BIOSTOP
DE PUY ITALIA SPA
DE PUY ITALIA SRL
DE PUY SRL
De Puy-Johnson & Joh
deduy
DEDPUY INT
DEPOI
deduy
DEPOY
Depui
DEPUY
De-Puy
DEPUY FRANCE SAS
DEPUY INC.
DEPUY INT. LTD
depuy international
DEPUY INTERNATIONAL LTD.
DEPUY ITALIA
DEPUY ITALIA SRL
DEPUY ORTHOPAEDICS
DEPUYJOHNSON
DEPUYY
DEPYU
Depuy

JOHNSON-JOHNSON
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JOHNSON & JOHNSON S.
JOHNSON & JOHNSON SP
JOHNSON E JOHNSON
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Johnson Johnson
JOHNSON MEDICAL SPA
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JOHNSON&JOHNSON
JOHNSON&JOHNSON MEDI
JOHNSON&JOHNSON SPA
JOHNSON&JOHNSON*H441
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JOHNSON&JOHNSON
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Smith&Nephew
SMITH & NEPHEW
SMITH AND NEPHEW
SMITH & NEPEW S.J.
SMITH & NEPHEN
SMITH & NEPHER
SMITH & NEPHEW
SMITH & NEPHEW INC
SMITH & NEPHEW ORTHO
SMITH & NEPHEW ORTHOPAEDICS AG
SMITH & NEPHEW ORTHOPAEDICS LTD
SMITH & NEPHEW S.P.A.
SMITH & NEPHEW S.R.L
SMITH & NEPHEW SRL
SMITH + NEPHEW
SMITH AND NEPHEW
SMITH AND NEPHEW S.R
SMITH AND NEPHEW SRL
SMITH E NEPHEW
SMITH E NEPHEW SRL
SMITH NEPHEW
SMITH NEPHEW S.R.L
smith & nephew
SMITH&LABEL
smith&nephew
smith&nephew
SMITH&NEPHEW
smith&nephew testa
SMITH&NEPHEW vite
smith&nephew codle
smith&nephew insert
SMITH&NEPHEW S.R.L.
SMITH&NEPHEW SRL
smith&nephew steig
smith&nephew testa
smith&nephew vite
smith&nephew
smith&nephew
SMITH-NEPHEW
smith&nephew
smith&nephew
SMITH&NEPHEW
SMITH&NEPHEW
SMITH&NEPHEW
SMITH&NEPHEW S.R.L
SMITH&NEPHEW S.R.L
SMITH&NEPHEW SRL
SMITHY&NEPHEW
SMITH AND NEPHEW SRL
SMITH&NEPHEW



The solution...



To set up a comprehensive components database able to:

- **Identify** the implanted prostheses → Traceability
- **Characterise** the implanted prostheses → Technical attributes for statistical analyses and comparison

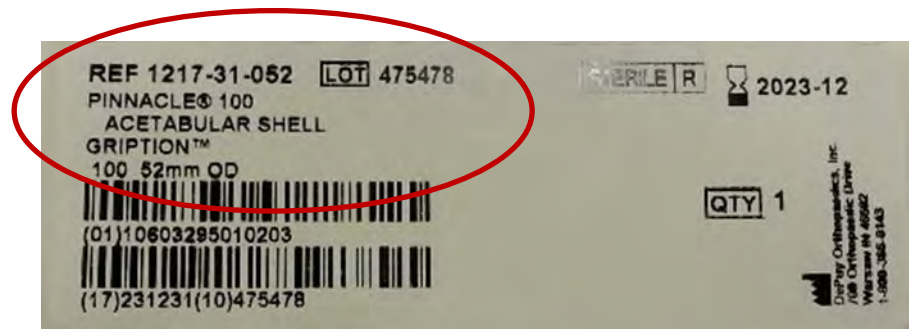
Involvement of manufacturers to build the RIAP Component DB

20th June 2011

5 information requested

as available from the sticker:

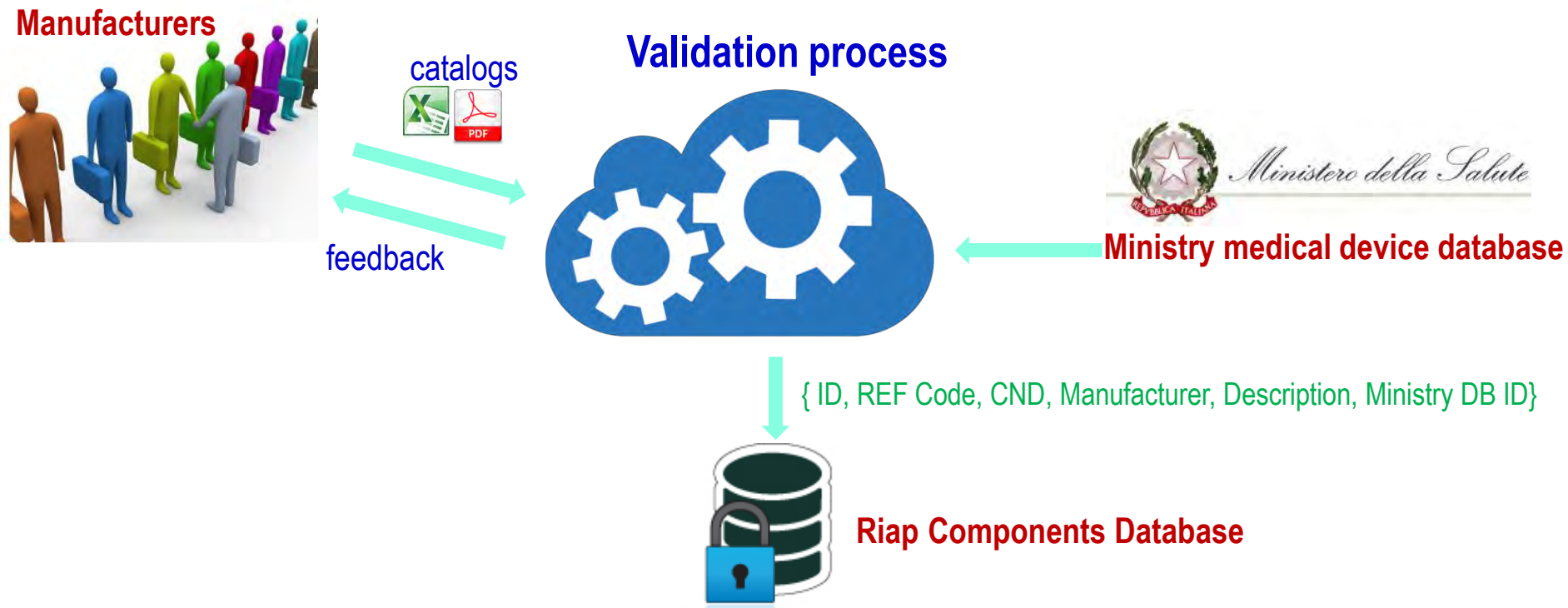
1. Catalog code (REF)
2. Description
3. Manufacturer name



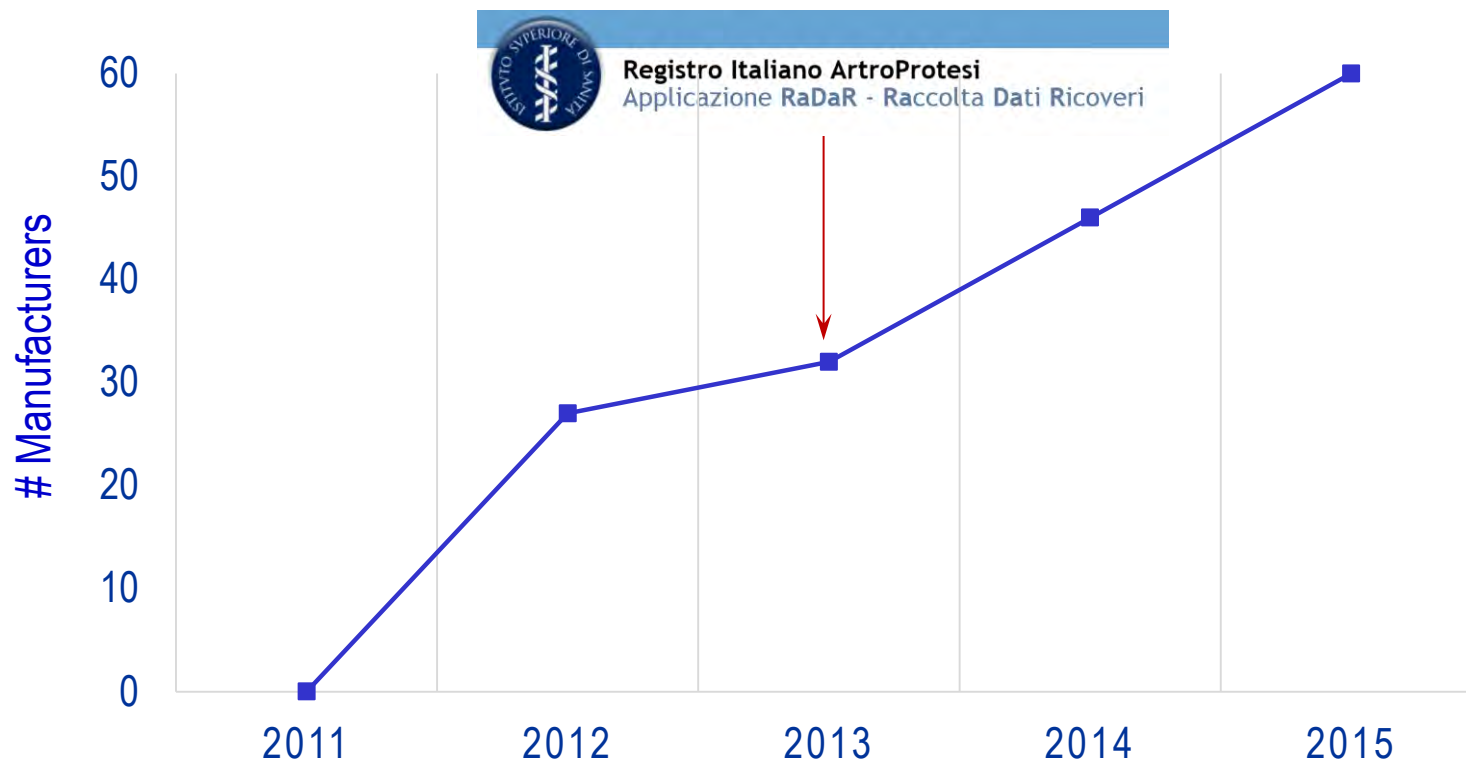
and:

1. ID code of the National Database at Ministry of Health
2. Code of the National Classification of medical devices (CND)
Introduced by law in 2007 to register the devices in the National DB

The Riap Component Database: validation protocol



Manufacturers feeding the RIAP Component DB



1/7/2013 RaDaR web application:
Request components

Registro Italiano ArtroProtesi
Applicazione RaDaR - Raccolta Dati Ricoveri

Home >> Lista Richieste >> Richiesta

Nome Page: []
Nuova Scheda MDS []
Lista Scheda MDS []
Cerca Scheda MDS []
Diccionario CMD []
Diccionario dispositivi []
Lista richiesta inserimento DM []
Report []
Modifica password []
Modifica recapiti utente []
Guida al sistema []
Contatti []
Logout []

Richiedi inserimento nuovo Dispositivo nel dizionario

Codice prodotto (NEFF): * []
Fabbrica: * []
Disposizione: * []

Testo di richiesta: []
Testo di risposta: []

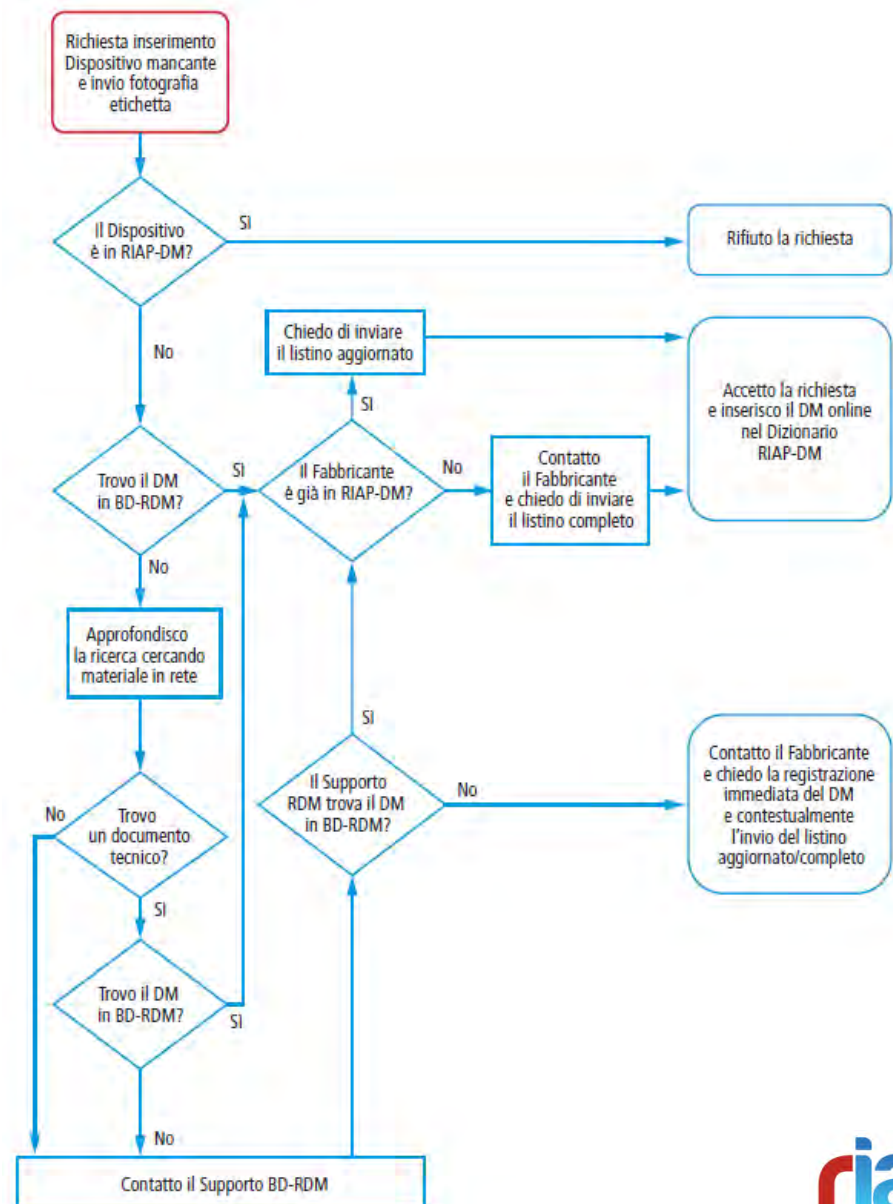
Allegato: []
Foto o scansione: []

Inviare la fotografia o la scansione dell'etichetta del dispositivo a riap@unife.it

Invia richiesta [] Annulla []

RaDaR application: dataflow for requested components

- Every requested component is cross-checked with the National Ministry General Repository
- Information is collected surfing the net
- Manufacturer is contacted and asked to sent the list of information for all their catalogs (hip, knee, shoulder)



RIAP Component DB:

Some figures

- 60 Manufacturers
- 55,000 Ref codes
- >80% of the implanted devices



Complete list of the Manufacturer



Data provided by another Manufacturer



Online input of the requested item

AAP Biomaterials GmbH
Adler Ortho S.r.l
Aesculap AG
AMPLITUDE
Aristotech Implant
BENOIST GIRARD
Biomet France Sarl
Biomet Orthopedics Inc USA
BIOMET ORTHOPEDICS SWITZERLAND
Biomet Orthopedics, Inc.
Biomet Spain
Biomet Spain Orthopedics S.L
Biomet UK Ltd
BIOTECHNI
CERAMTEC AG
Ceraver
CITIEFFE S.R.L.
Corin Limited
DEDIENNE SANTÉ
DEPUY (IRELAND) LTD.
DePuy Orthopaedics
European Medical Contract Manufacturing B.V.
EVOLUTIS
EXACTECH Inc.
FINSBURY ORTHOPAEDICS
Groupe Lépine
Gruppo Bioimpianti s.r.l.
HERAEUS MEDICAL GMBH
HIT MEDICA
HOWMEDICA OSTEONICS CORP. (STRYKER ORTHOPAEDICS)

IMPLANTCAST GMBH
ISOTIS ORTHOBIOLOGICS INC.
Limacorporate S.p.A.
MAKO SURGICAL CORP.
MATHYS AG BETTLACH
Medacta International SA
MEDICAL BIOMAT
MERETE MEDICAL GmbH
O.M.T. GMBH
OHST Medizintechnik AG
PERMEDICA SPA
SERF Dediennne santé
SIGNATURE ORTHOPAEDICS
Smith&Nephew Inc, US
Smith&Nephew Ltd, UK
Smith&Nephew Orthopaedics AG, CH
Società Azionaria Materiale Ospedaliero S.a.m.o. Spa
Spierings Orthopaedics BV
STEMCUP MEDICAL PRODUCTS AG
Symbios Orthopédie SA
SYNIMED
TECRES S.P.A.
TEKNIMED S.A.S.
TORNIER S.A.S.
TRANSYSTÈME
Waldemar Link GmbH & Co.
Wright Medical Technology
Zimmer GmbH
Zimmer Inc
Zimmer TMT

“Italy in our top ten list of Best Countries in the World...”

It is a mixture of thoughts of surprise and wonderful sensations...”

RIAP Participants

- 9 regions
- 2 provinces autonomous
- Livio Sciutto Foundation

■ Regional registry

■ Data collection integrated in HDR

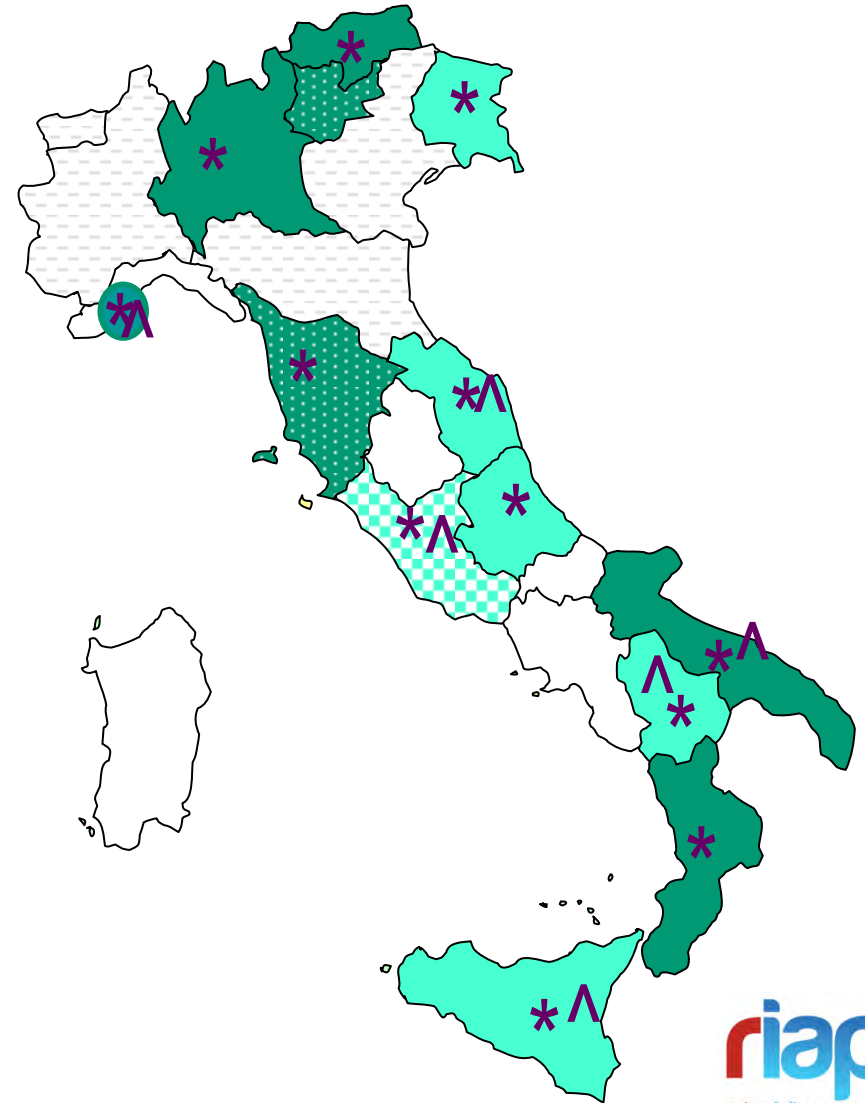
■ Using the RIAP platform

■ Integration in HDR (not implemented)

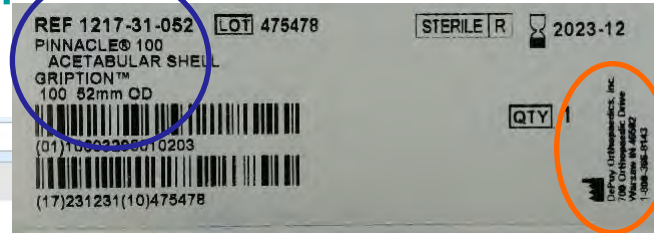
■ Participating in a first phase

* Hip and knee

^ Shoulder (to be implemented in 2016)



RIAP Component DB on the web: the Webservice RiDi



ap/ridi/



Registro Italiano ArtroProtesi (RIAP)

(IT) EN Responsabile: [Marina Torre](#)

Sei in: [ISS](#) > [RIAP](#) > Ricerca dispositivi

In questo sito...

- Home
- Il progetto
- Regioni e istituzioni partecipanti
- Statistiche
- Eventi
- In rilievo
- Pubblicazioni
- Pazienti
- Documenti
- Aree riservate
- Protesi Metallo-Metallo
- Ricerca dispositivi

Utilità

Contattaci

Link

Visualizzazione



Ricerca dispositivi

Ricerca

Il Dizionario RIAP-DM è stato sviluppato per supportare l'identificazione dei dispositivi medici impiantati negli interventi di protesi di anca e ginocchio. Questa pagina web, sviluppata dal Settore Informatico dell'Istituto, mostra un esempio di accesso al Dizionario RIAP-DM mediante il web service (RESTful) RiDi (Ricerca Dispositivi). Il codice javascript utilizzato in questa pagina può essere inserito in un qualsiasi sistema informatico che supporti tale linguaggio. Inserire almeno le prime 3 cifre del **Codice dispositivo**, indicato nell'etichetta come REF o CAT o EDI, senza utilizzare caratteri speciali (per esempio: spazio, #, -, ".", ...).

Codice dispositivo

12173105

R

Pubb

121731050; 121731050; 312909; PINNACLE GRIPTION; P090803010201; DePuy Orthopaedics; 20140212
121731052; 121731052; 312909; PINNACLE GRIPTION; P090803010201; DePuy Orthopaedics; 20140212
121731054; 121731054; 312909; PINNACLE GRIPTION; P090803010201; DePuy Orthopaedics; 20140212
121731056; 121731056; 312909; PINNACLE GRIPTION; P090803010201; DePuy Orthopaedics; 20140212
121731058; 121731058; 312909; PINNACLE GRIPTION; P090803010201; DePuy Orthopaedics; 20140212

Condividi:

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[Twitter](#) Tweet 0

[G+](#) 0

[f](#) Mi piace 0



RIAP Component Database: features



- Integrated in the RaDaR application
- Integrated as *RESTful web-service* in the regional health information systems
- Operating on Cloud 24/7



Next step: characterisation



Ministero della Salute



HIP

- 2006 – 2007 Preliminary study – Definition of the model
- 2007 – 2009 Implementation of the model with the 3 existing regional registries
- 2009 – 2011 Extension of the model to other regions (8 new enrolled)
- 2012 – 2013 Data collection in the participating region and enrolment of new regions
- 2012 – 2013 Introduction of QoL at regional level (Puglia)

KNEE

- 2010 – 2012 Definition of the model; implementation in 3 of the existing regional registries
- 2013 – 2014 Extension of the model to other regions

SHOULDER

- 2014 – 2015 Definition of the model; implementation in selected regions

REGISTRY

- 2015 – 2017 Definition of local systems interoperability

MEDICAL DEVICES

2013 – 2014 Procedures for medical device identification and characterization

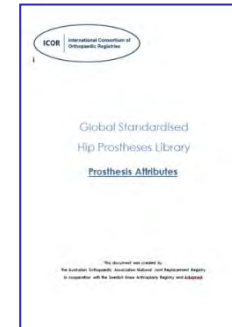
2015 – 2016 Empowerment of RIAP-DM Dictionary. ICOR Collaboration

Selecting the technical attributes: cooperation with ICOR



20-24 August 2015 Joint meeting RIAP – AOANJRR
To share data of the ICOR Global Standardization
Database and of the RIAP Component Database

<http://www.icor-initiative.org>



ICOR Global Standardization Database

Develop global, standardized classification system of hip and knee implantable devices based on their clinical attributes and characteristics to advance the implementation of UDI and FDA postmarket surveillance

ICOR International Consortium of Orthopaedic Registries

Implant Catalog Search

Component Type: ☐ Hip ☒ Knee

Manufacturer:

Catalog Number:

Description:

Material: Size: Thickness:

Stability: Mobility: Modularity:

Cement Fixation: Coating:

193 Search Results

MANUFACTURER	CATALOG	JOINT TYPE	COMPONENT	FIXATION	CEMENT FIXATION	FIXATION	MODULARITY	LATERALITY	MODULARITY	COATING
Depuy	11779180	HIP	FSM COMP	LCS	Cemented	Fixed	Right	Custom Chrome	No Coating	
DESCRIPTION	LCS-HIP-REV-CEM-FSM-SMALL-RIGHT-SMALL									
MATERIAL	Monobloc	Size	Small							
DESCRIPTION	11779180	HIP	FSM COMP	LCS	Cemented	Fixed	Right	Custom Chrome	No Coating	
DESCRIPTION	LCS-HIP-REV-CEM-FSM-SMALL-LEFT-SMALL									
MATERIAL	Monobloc	Size	Small							
DESCRIPTION	11779180	HIP	FSM COMP	LCS	Cemented	Fixed	Right	Custom Chrome	No Coating	
DESCRIPTION	LCS-HIP-REV-CEM-FSM-SMALL-LEFT-SMALL									
MATERIAL	Monobloc	Size	Small							
DESCRIPTION	11779180	HIP	FSM COMP	LCS	Cemented	Fixed	Right	Custom Chrome	No Coating	
DESCRIPTION	LCS-HIP-REV-CEM-FSM-SMALL-RIGHT-SMALL									

INTERNATIONAL COMBINED MEETING
British Hip Society
Società Italiana dell'Anca
26-27 November 2015
MILAN, ITALY



Thank you!



www.iss.it/riap

riap@iss.it



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY





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MIX AND MATCH IS IT A REAL PROBLEM?



KEITH TUCKER
PETER HOWARD
ASHLEY BLOM
CLAIRE NEWELL
MARTIN PICKFORD
LINDA HUNT



NATIONAL JOINT REGISTRY



DECLARATION OF INTERESTS

KEITH TUCKER:- In the past received money from J&J orthopaedics, all of which were paid into a research fund. Shareholder Accentus.

ASHLEY BLOM:- Not in receipt of any remuneration etc but his department research fund benefits from funding from DePuy, Stryker

PETER HOWARD:- No conflict of interest

MARTN PICKFORD:- No conflict of interest

CLAIRE NEWELL:- No conflict of interest

LINDA HUNT:- No conflict of interest



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MIX AND MATCH IS IT A REAL PROBLEM?

A PROBLEM FOR PATIENTS?
A PROBLEM FOR SURGEONS?
A PROBLEM FOR LAWYERS AND
INSURANCE COMPANIES?
A PROBLEM FOR MANUFACTURERS?



MILAN 2015

PROBLEM FOR MANUFACTURERS

?

NO!

- MANUFACTURERS' IFU.....INSTRUCTIONS FOR USEwith their own stem/head/ cup
- QUITE HAPPY TO SELL A MASS OF CUPS OR STEMS WITHOUT CORRESPONDING COMPONENTS



PROBLEM FOR PATIENTS

?

NO / YES

- HARD ON SOFT USUALLY **NO**
- ? METAL ON METAL **ALL BAD** WHETHER M&M OR NOT
- CERAMIC / CERAMIC **NO EVIDENCE** (YET)

The Daily Telegraph

October 6th 2014

**“Thousands of patients could
have unapproved 'mix match'
metal on metal hips say
lawyers”**



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HOW MANY HAVE BEEN DONE UP UNTIL 2013?

TOTAL NUMBERS

APPROX NUMBER OF THR _s IN NJR	620,000
--	---------

APPROX NUMBER OF MIX AND MATCH	>93,000
--------------------------------	---------

- FEMORAL STEM
- FEMORAL HEADS
- ACETABULAR COMPONENTS
- TWO OR THREE MANUFACTURERS

(Both hard on soft, metal on metal and ceramic)

HOW MANY HAVE BEEN DONE UP UNTIL 2013?

HARD ON SOFT (MIX AND MATCH)

- CEMENTED STEM v CEMENTED CUP 48,156
- CEMENTED OR UNCEMENTED STEM 38,840
v METAL BACKED UNCEMENTED MODULAR
POLY CUP
- CERAMIC HEAD ON A POLY CUP 7,894



HOW MANY HAVE BEEN DONE UP UNTIL 2013?

HARD ON HARD (MIX AND MATCH)

- METAL ON METAL 4,131
- CERAMIC ON METAL 49
- CERAMIC ON CERAMIC 3,861



RESULTS

“HARD ON SOFT”

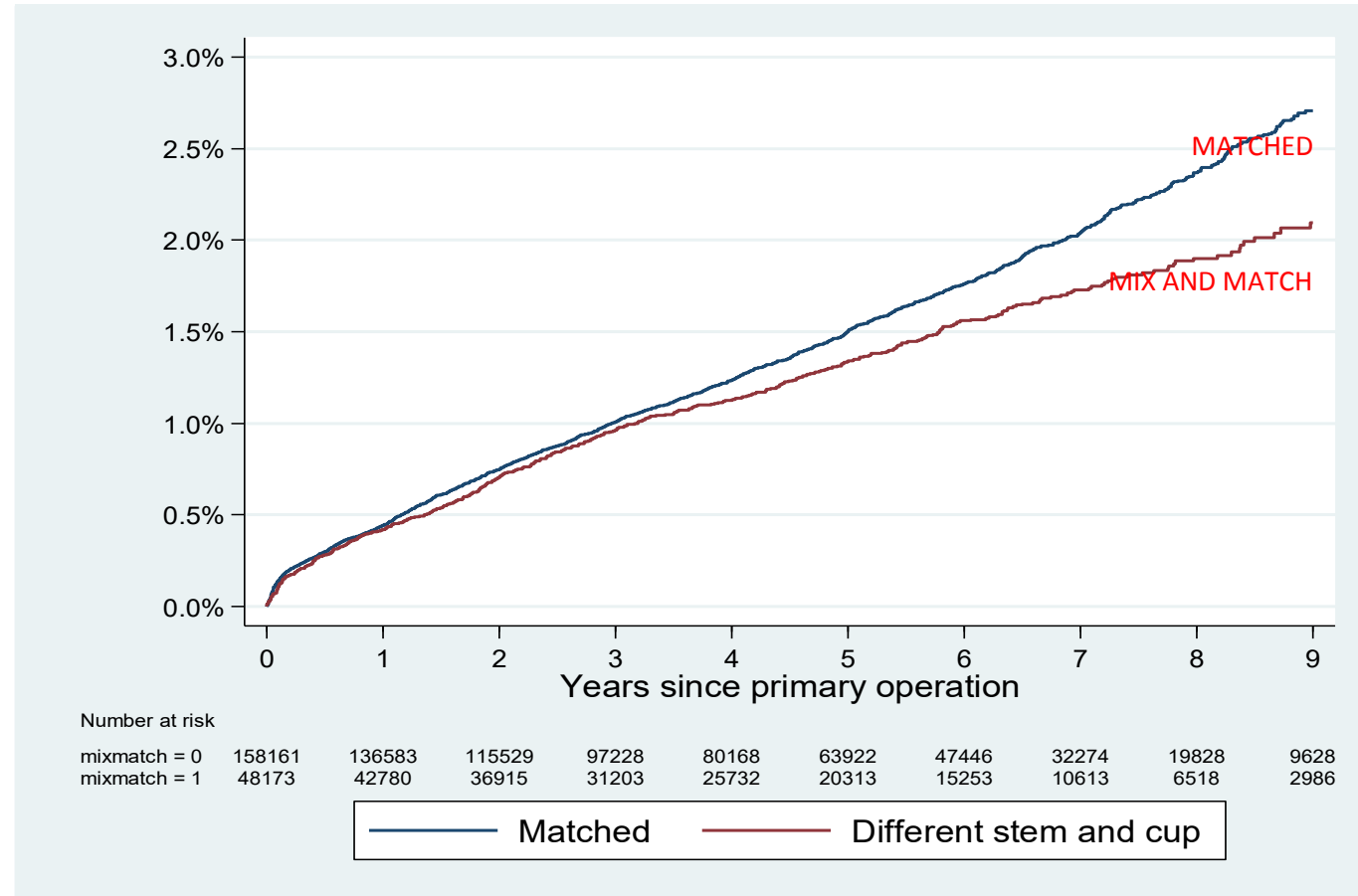
CEMENTED STEM WITH POLYTHENE MONOBLOC CUP

CEMENTED STEM WITH POLYTHENE MODULAR CUP

CEMENTLESS STEM WITH POLYTHENE MODULAR CUP

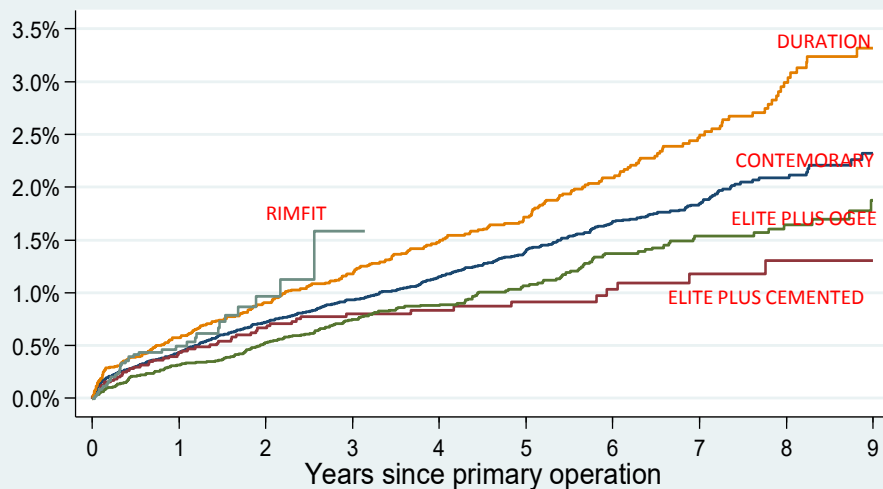
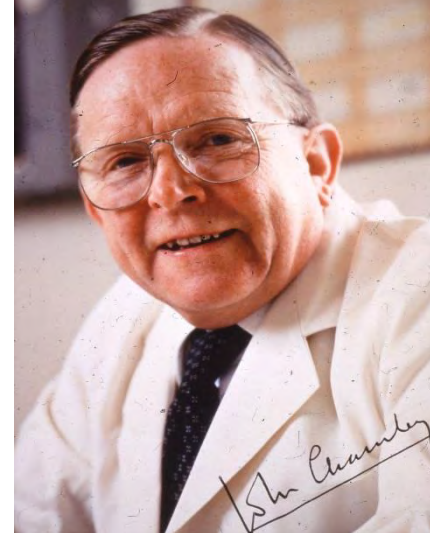
METAL HEADS

METAL HEADS ON POLY (MONOBLOC OR MODULAR STEMS OR CUPS) SAME AND DIFFERENT MANUFACTURERS MIXED WINS!



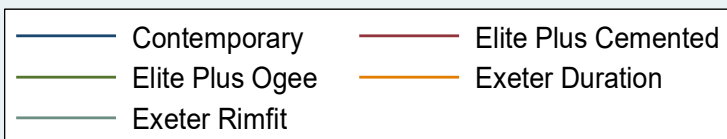


HARD ON SOFT EXETER AND CHARNLEY COMBINED GIVES THE BEST RESULTS IN NJR



Number at risk

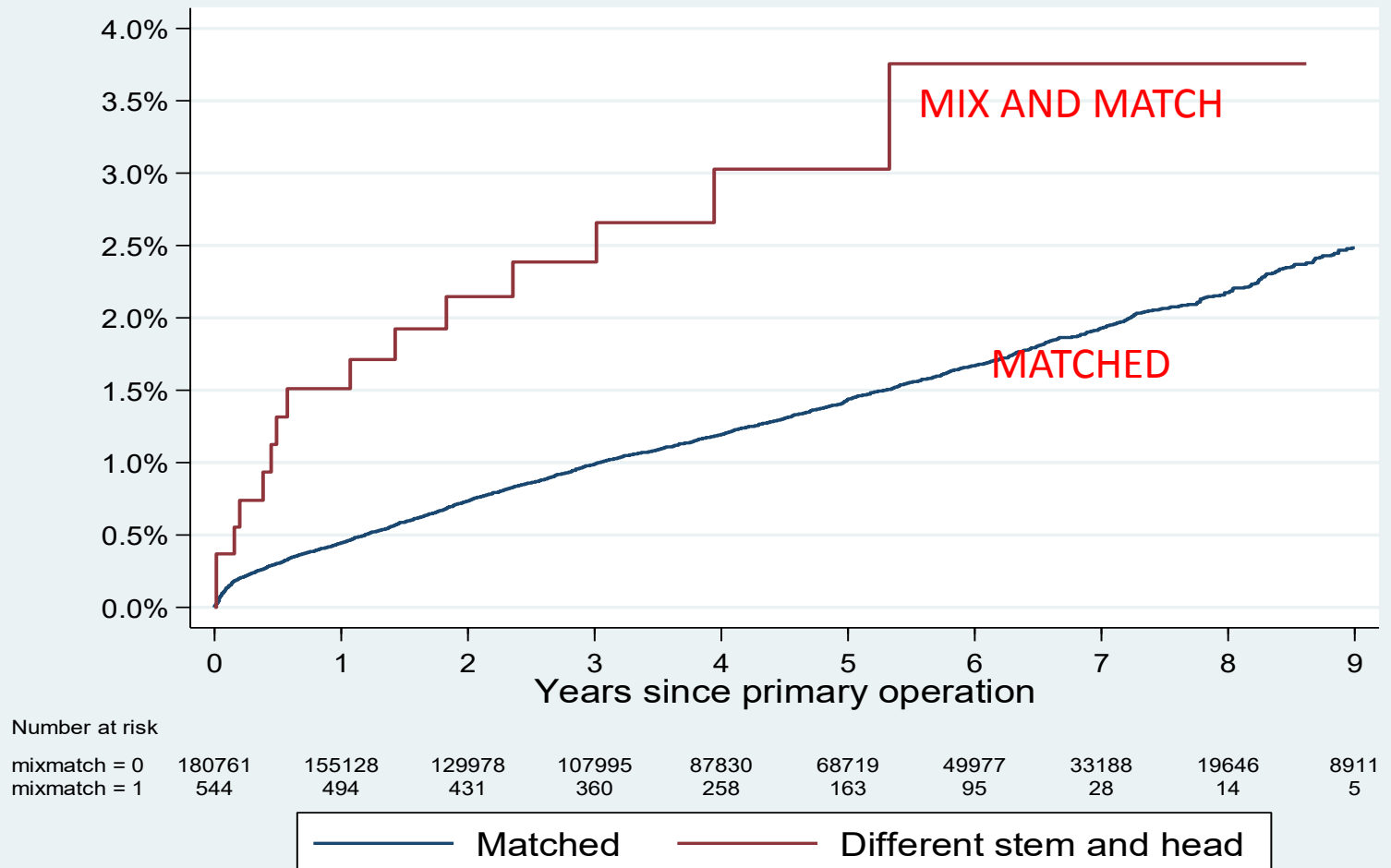
Contemporary	61055	51453	42186	34152	26428	19433	12941	7639	3854	1392
Elite Plus Cemented	6526	5689	4661	3673	2914	2186	1624	1087	689	363
Elite Plus Ogee	18297	16217	14142	12060	10030	7908	5959	4094	2367	928
Exeter Duration	14272	12981	11566	10028	8506	6933	5129	3565	2163	958
Exeter Rimfit	6186	2947	791	15	0	0	0	0	0	0



HARD ON SOFT

MISMATCH OF STEM AND HEAD

(NUMBERS SMALL)





HARD ON HARD

**CEMENTED or CEMENTLESS STEM WITH METAL HEAD ON
A METAL LINER / MODULAR CUP**

**CEMENTED STEM OR CEMENTLESS STEM WITH METAL
HEAD ON A METAL RESURFACING CUP**

**METAL HEADS
(CERAMIC HEADS)**

HARD ON HARD.....METAL ON METAL THE EFFECT OF M&M

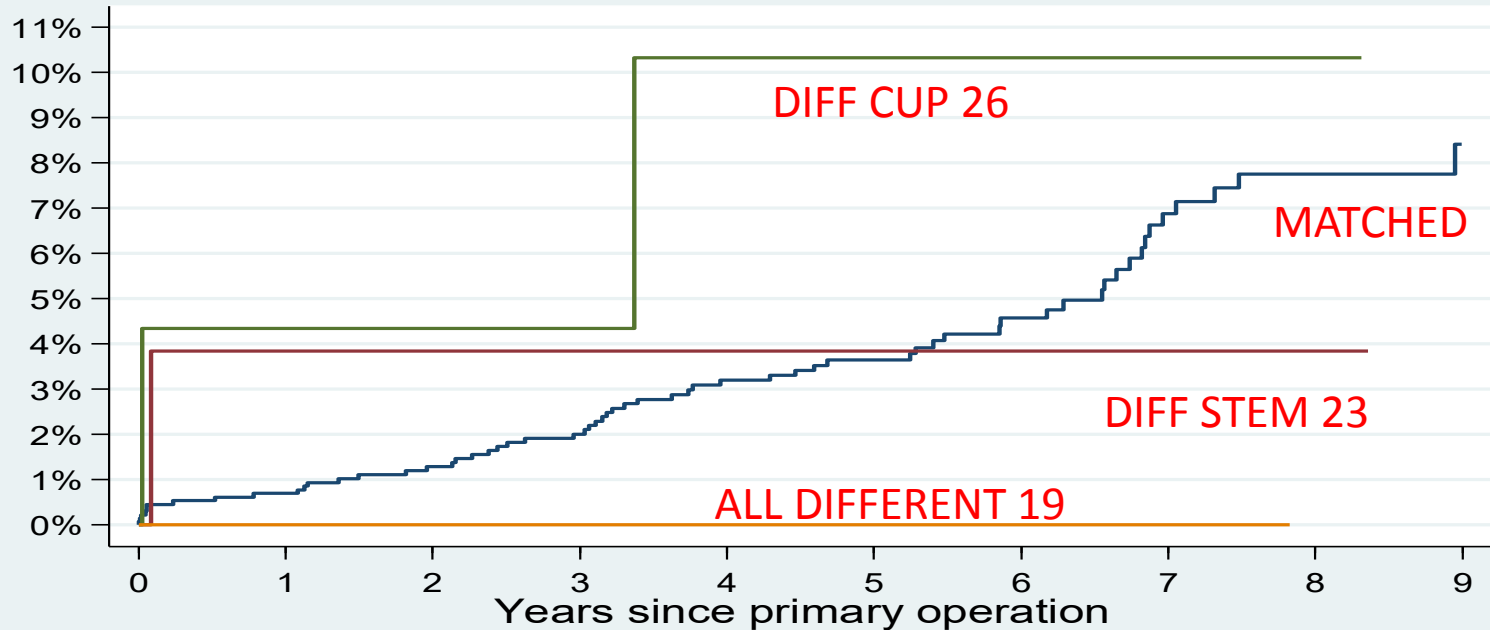
STATISTICAL DIFFERENCE

- CEMENTED STEM / HEAD / AND NON RESURFACING CUP NIL
- CEMENTLESS STEM / HEAD / AND NON RESURFACING CUP NIL
- CEMENTED STEM / HEAD / AND RESURFACING CUP NIL
- CEMENTLESS STEM / HEAD / AND RESURFACING CUP NIL

HARD ON HARD MoM M&M (Gp PTIR 0.42)

NOT RESURFACING

(Stem cemented)

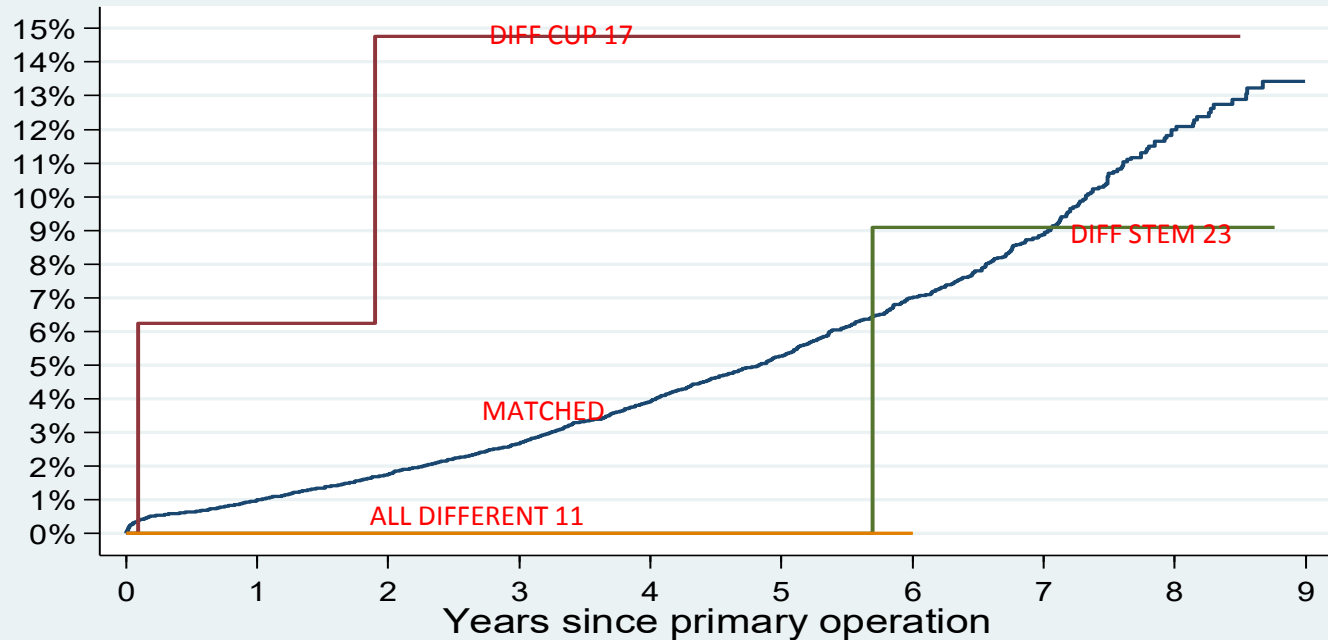


Number at risk

mixmatch = all matched	1314	1211	1123	1038	914	769	520	356	222	137
mixmatch = diff cup	26	23	20	20	18	13	9	5	3	1
mixmatch = diff stem	23	21	18	16	13	10	5	4	4	3
mixmatch = mixed	19	13	8	4	4	4	3	2	0	0

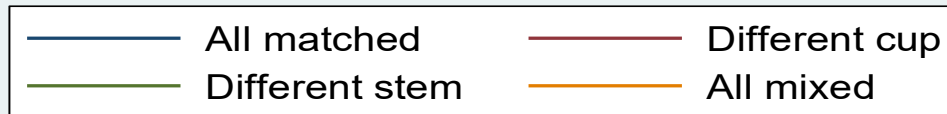
— All matched	— Different cup
— Different stem	— All mixed

HARD ON HARD MoM M&M NOT RESURFACING (Gp PTIR Hybrid 0.42) (Stem un-cemented)



Number at risk

mixmatch = all matched	15862	15472	15081	14437	11991	8469	5069	2547	1007	234
mixmatch = diff cup	17	15	9	4	3	3	3	2	1	0
mixmatch = diff stem	23	23	23	22	19	13	10	7	5	0
mixmatch = mixed	11	9	4	2	2	1	1	0	0	0



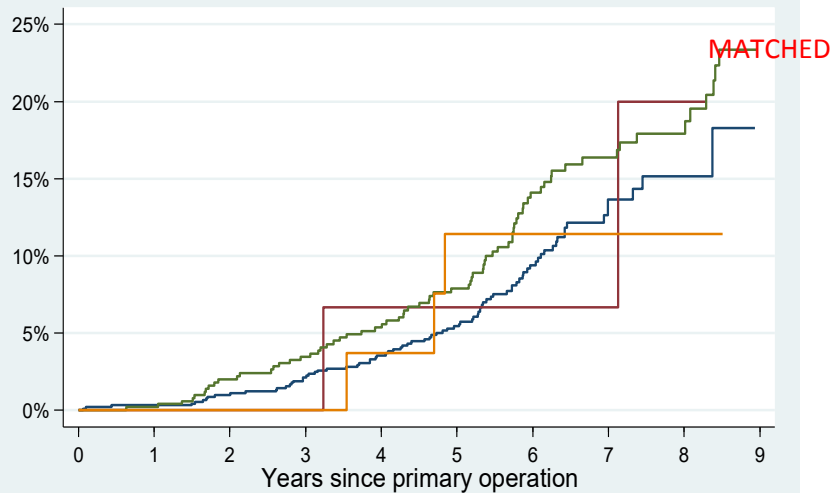
UNCEMENTED STEM / METAL HEAD AND METAL MONOBLOC RESURFACING CUP (Gp PTIR 1.28)

Stem fixation	Mix-and-match status	n (%)	%Male	Age (y) at primary operation Median (IQR)	Head size (mm) Median (IQR)	Observed revisions	Expected Revisions *	Approx. pt-yrs (x100)	PTIR [95%CI] per 100 pt-yrs
(ii) Uncemented (n=12,847)	All matched	11,108 (86.5%)	55.5%	61.1 (54.1-67.5)	46 (44-50)	1,486	1385.2	577.3	2.57 [2.45-2.71]
	Different cup	93 (0.7%)	50.5%	59.9 (53.3-65.1)	46 (42-50)	9	17.5	6.3	1.43 [0.74-2.75]
	Different stem	1,569 (12.2%)	55.6%	61.2 (53.6-67.4)	46 (44-50)	116	201.8	84.0	1.38 [1.15-1.66]
	All mixed	77 (0.6%)	62.3%	61.6 (51.9-67.1)	50 (46-50)	7	13.5	5.0	1.39 [0.66-2.92]

METAL ON METAL USING RESURFACING CUPS

Cemented femoral stems / metal heads

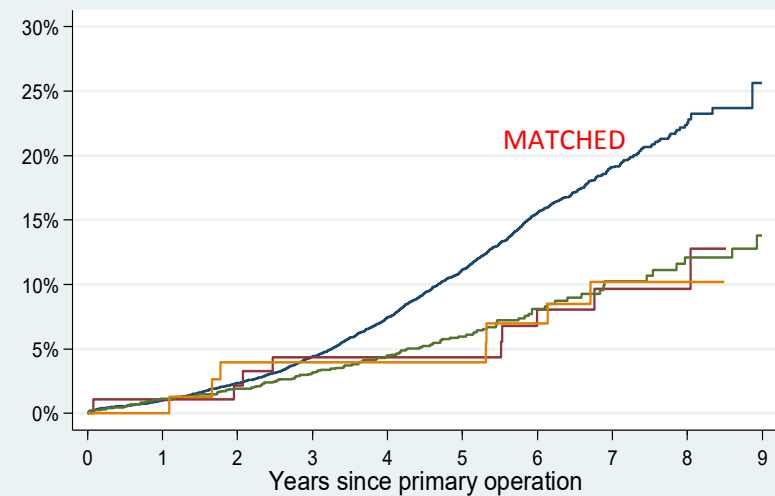
Cementless stems / metal heads



Number at risk

	922	908	885	853	767	648	388	169	45	14
mixmatch = all matched	16	16	16	15	14	14	13	7	3	0
mixmatch = diff cup	502	498	482	467	427	378	252	173	102	45
mixmatch = diff stem	27	27	27	25	23	18	14	7	0	0

— All matched — Different cup
— Different stem — All mixed



Number at risk

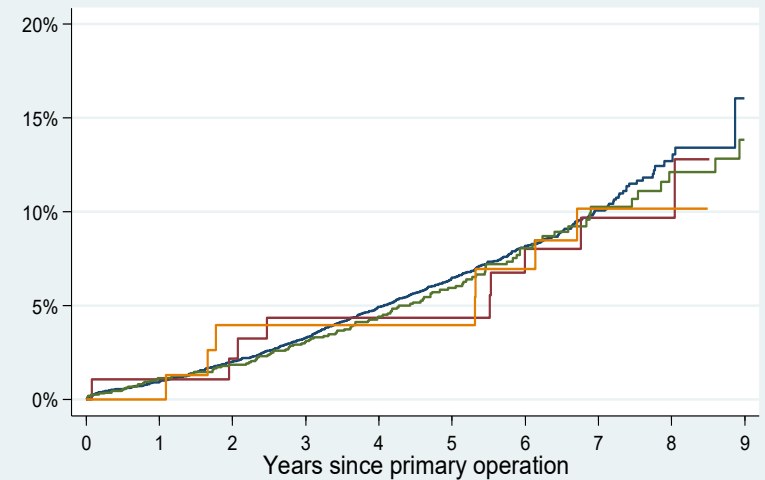
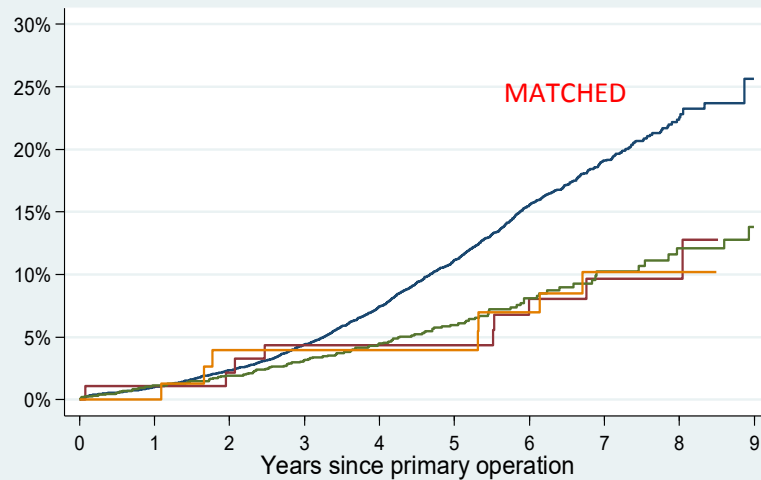
	11108	10915	10663	10059	8704	6315	3546	1536	361	26
mixmatch = all matched	93	91	89	85	83	82	72	52	29	0
mixmatch = diff cup	1569	1536	1514	1434	1217	871	486	251	175	83
mixmatch = diff stem	77	77	72	68	66	65	61	38	19	0

— All matched — Different cup
— Different stem — All mixed

Un-cemented stems with metal RESURFACING CUPS

with ASR

without ASR



CERAMIC ON CERAMIC

MATCHED AND M&M

Stem fixation	Mix and matched status	n	PTIR	Significant difference ?
Cemented	Matched	14,836	0.31	
	Different head and Cup	1,209	0.16	NO
Un-Cemented	Matched	68,459	0.59	
	Different head and Cup	2,652	0.65	NO



HOW MANY HAVE BEEN DONE UP UNTIL 2013?

DIFFERENT COMBINATIONS

- MATCHED COMBINATIONS 820
- NUMBER THAT WERE MIX AND MATCH 487
- ALL THE BIG COMPANIES ARE INVOLVED



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MIX AND MATCH IS IT A REAL PROBLEM?

A PROBLEM FOR PATIENTS?

A PROBLEM FOR LAWYERS AND
INSURANCE COMPANIES?



MILAN 2015



PROBLEM FOR PATIENTS

?

NO / YES

- HARD ON SOFT USUALLY **NO**
- ? METAL ON METAL **ALL BAD** WHETHER M&M OR NOT
- CERAMIC / CERAMIC **NO EVIDENCE** (YET)



LAWYERS AND INSURANCE COMPANIES

MIX AND MATCH

- LAWYERS THINK THERE ARE GROUNDS FOR COMPENSATION
- SURGEONS USING IMPLANTS “OF LABEL”
- SURGEONS.....

“DESIGNING THEIR OWN IMPLANTS”



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MIX AND MATCH IS IT A REAL PROBLEM?

A PROBLEM FOR SURGEONS?

ONLY IF IT IS...

A PROBLEM FOR PATIENTS?

OR

A PROBLEM FOR LAWYERS AND
INSURANCE COMPANIES?



- **M&M METAL ON POLY LONG ESTABLISHED AS GOOD**
- **MIX AND MATCH OK IN REVISIONS**
- **MEDICAL INSURANCE COMPANIES HAVE BEEN CONSULTED YEARS AGO**
- **MANUFACTURERS HAPPY TO SELL ONE SIDE OF A HIP**
- **IT SEEMED THE BEST FOR A GIVEN PATIENT AT THAT TIME**



WHY DID WE MIX AND MATCH.... METAL ON METAL?

- PATIENTS CAME ASKING FOR SURFACE REPLACEMENTS
- THEY HAD SEEN THE ADVERT IN “GOLFERS MONTHLY” AND THE WAITROSE JOURNAL
- WE WORRIED ABOUT NECK FRACTURES
- WE TOLD PATIENTS THAT WE WOULD DO A SURFACE REPLACEMENT UNLESS THE “BONE LOOKED POOR”, IN WHICH CASE WE WOULD DO A STEMMED METAL ON METAL
- THEY WERE HAPPY AS THEY KNEW THEY WOULD GET THE WONDERFUL LARGE HEAD METAL ON METAL
- THEY COULD NOW PLAY JUDO!
- LEADING AUTHORITIES SAID IT WOULD BE OK



- FOLLOW UP ESSENTIAL
- FOCUSED FOLLOW UP AN OPTION
- WE NEED TO UPDATE THE BOA /BHS “BLUE BOOK”



- CONCLUSIONS ARE VERY SENSITIVE TO ACCURACY OF REVISION REPORTING



WHAT DO YOU THINK?

PLEASE CONTACT ME WITH YOUR
VIEWS

ktucker77@aol.com



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www.njrcentre.org.uk

THANKS to my co-authors

And
To all the patients who have
allowed us to track their records





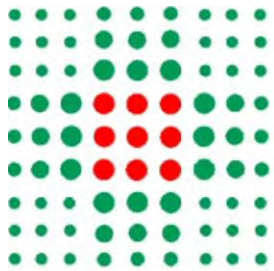
INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY





**SERVIZIO SANITARIO REGIONALE
EMILIA - ROMAGNA**

**Istituto Ortopedico Rizzoli di Bologna
Istituto di Ricovero e Cura a Carattere Scientifico**



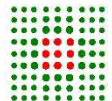
CAUSES OF FAILURE IN A REGIONAL ARTHROPLASTY REGISTRY

Susanna Stea, Barbara Bordini, Aldo Toni

Istituto Ortopedico Rizzoli, Bologna, Italy

Susanna Stea

No disclosures



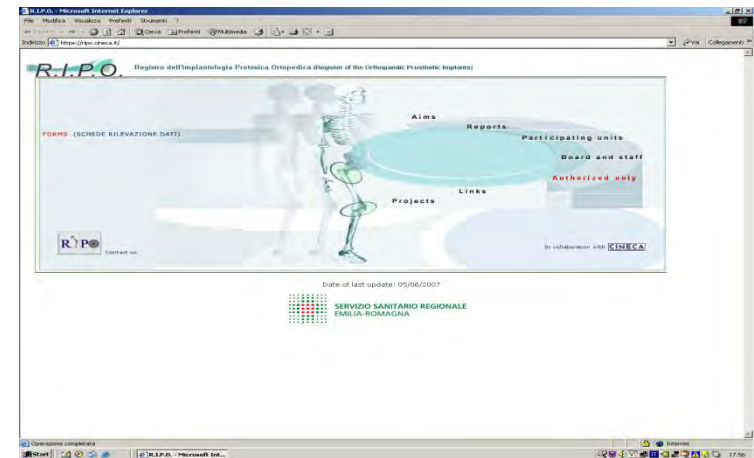
RIPO Register started in 2000

(Hip, Knee and Shoulder implants)

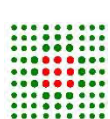
Emilia-Romagna Region



<https://ripo.cineca.it/>



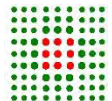
Number of hip procedures in Ripo 140,000
(89,000 primary stemmed THR) completeness >95%



A Regional Register

Weak point: possibile loss to follow up

How to overcome it?





Survival analyses only for resident patients

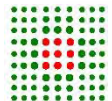
89,000 THR

Resident in Emilia-Romagna



65,063 THR

75% of cases



Regional Register

Weak point: possibile loss to follow up

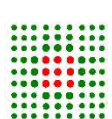
How to overcome it?

Survival analyses only for resident patients

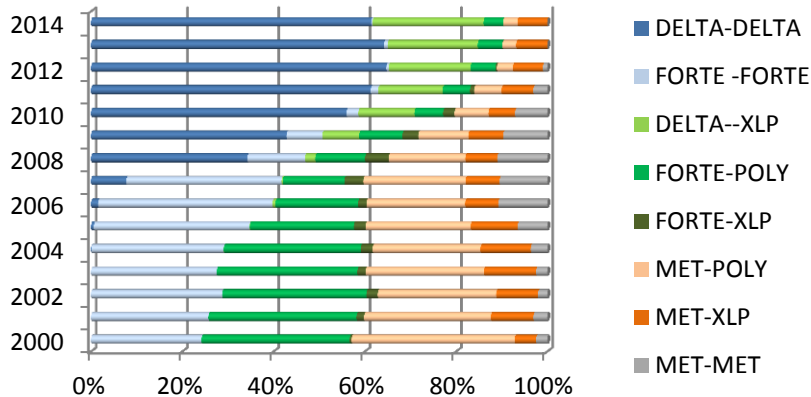
Strenght: close contact with orthopedic surgeons and hospitals

How to exploit it?

Improve the usefulness of the Register according to Orthopedic suggestions

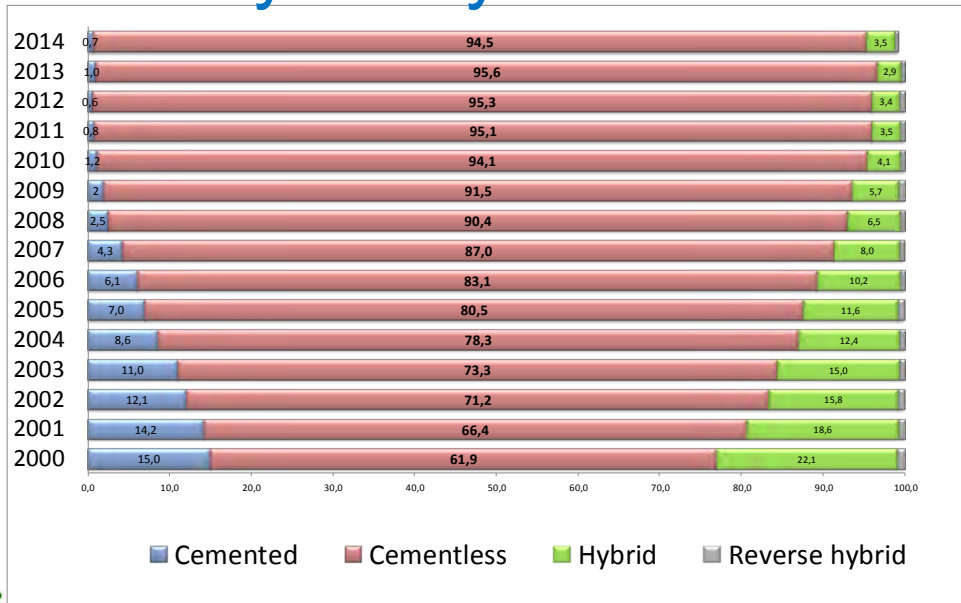


Peculiarities of primary THAs in RIPO

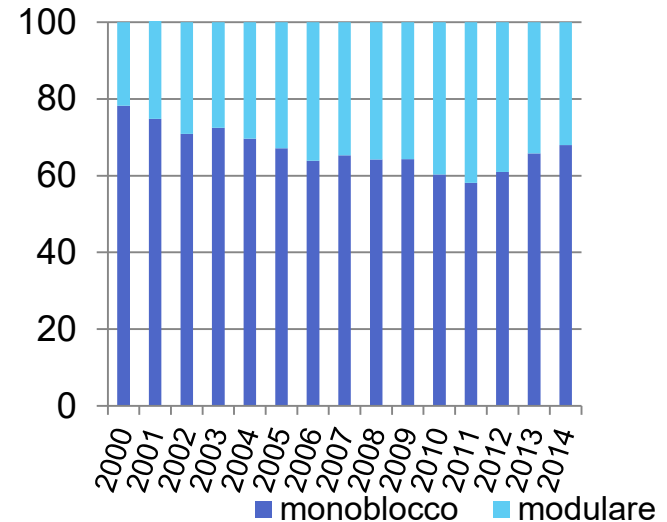


60% cer-cer

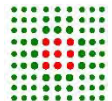
Nearly always cementless



30% of stems have exchangeable neck



Results



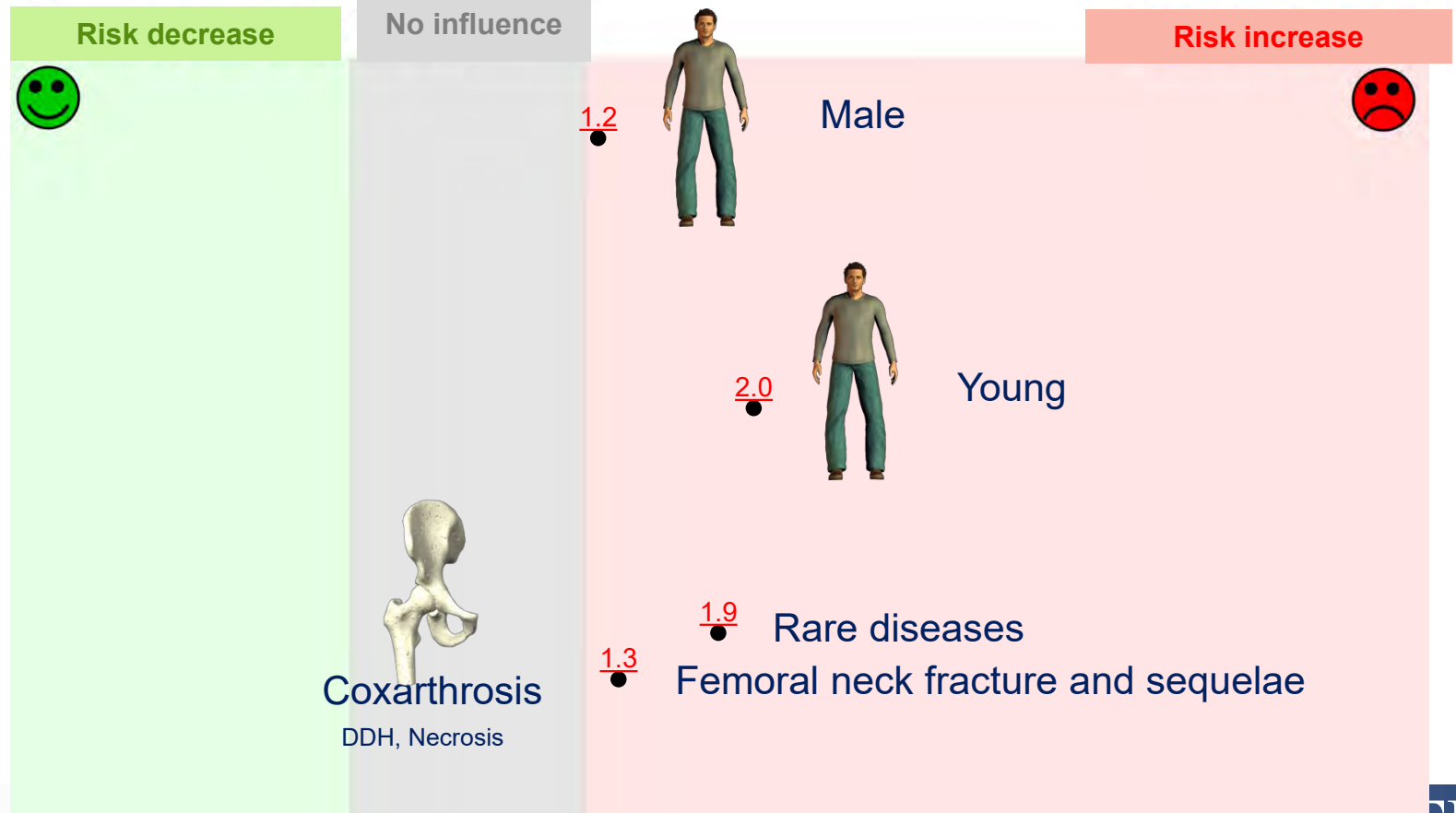
Multivariate analysis Hip Prosthesis Survival



Primary THA



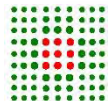
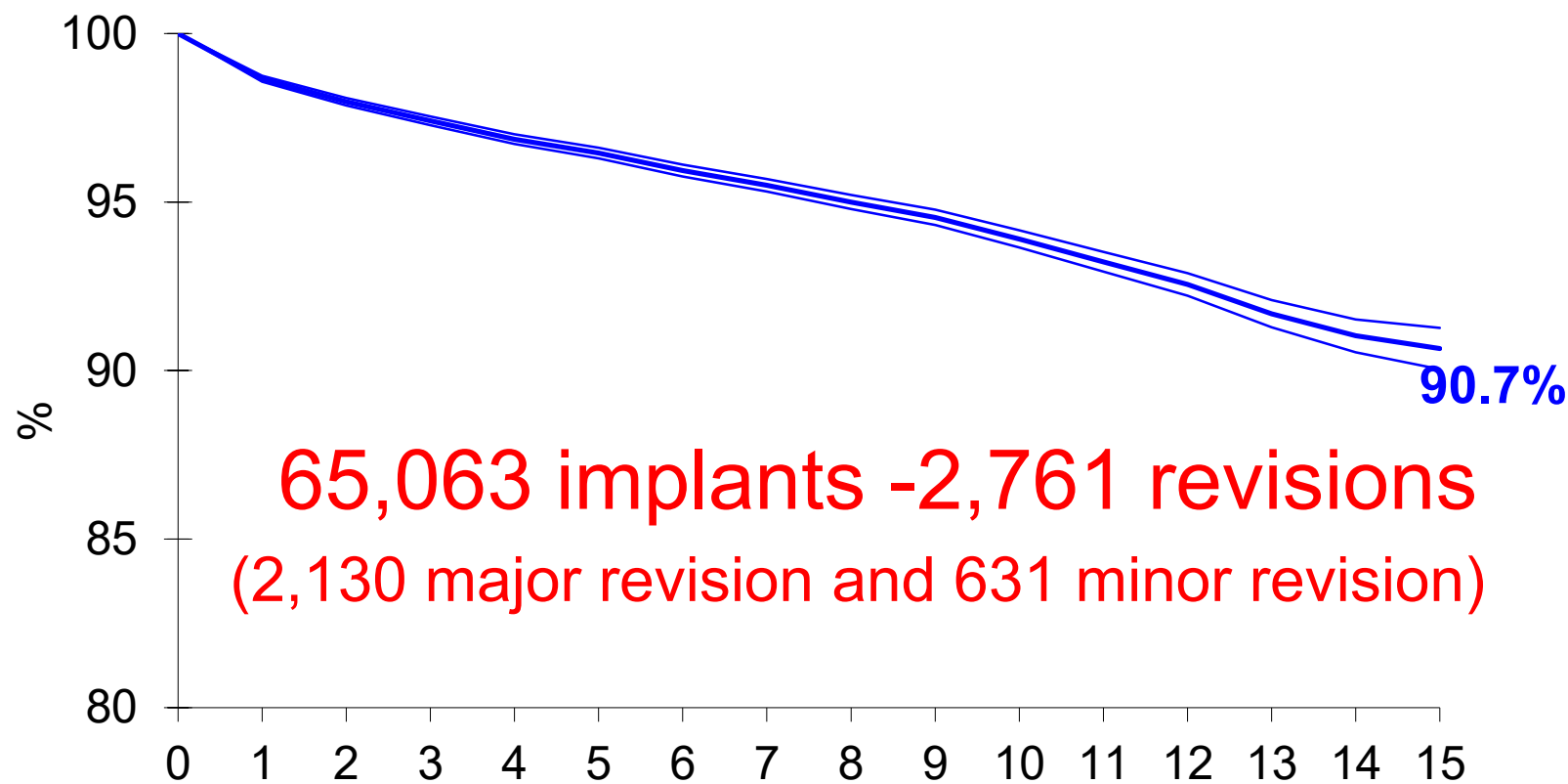
Revision for any reason



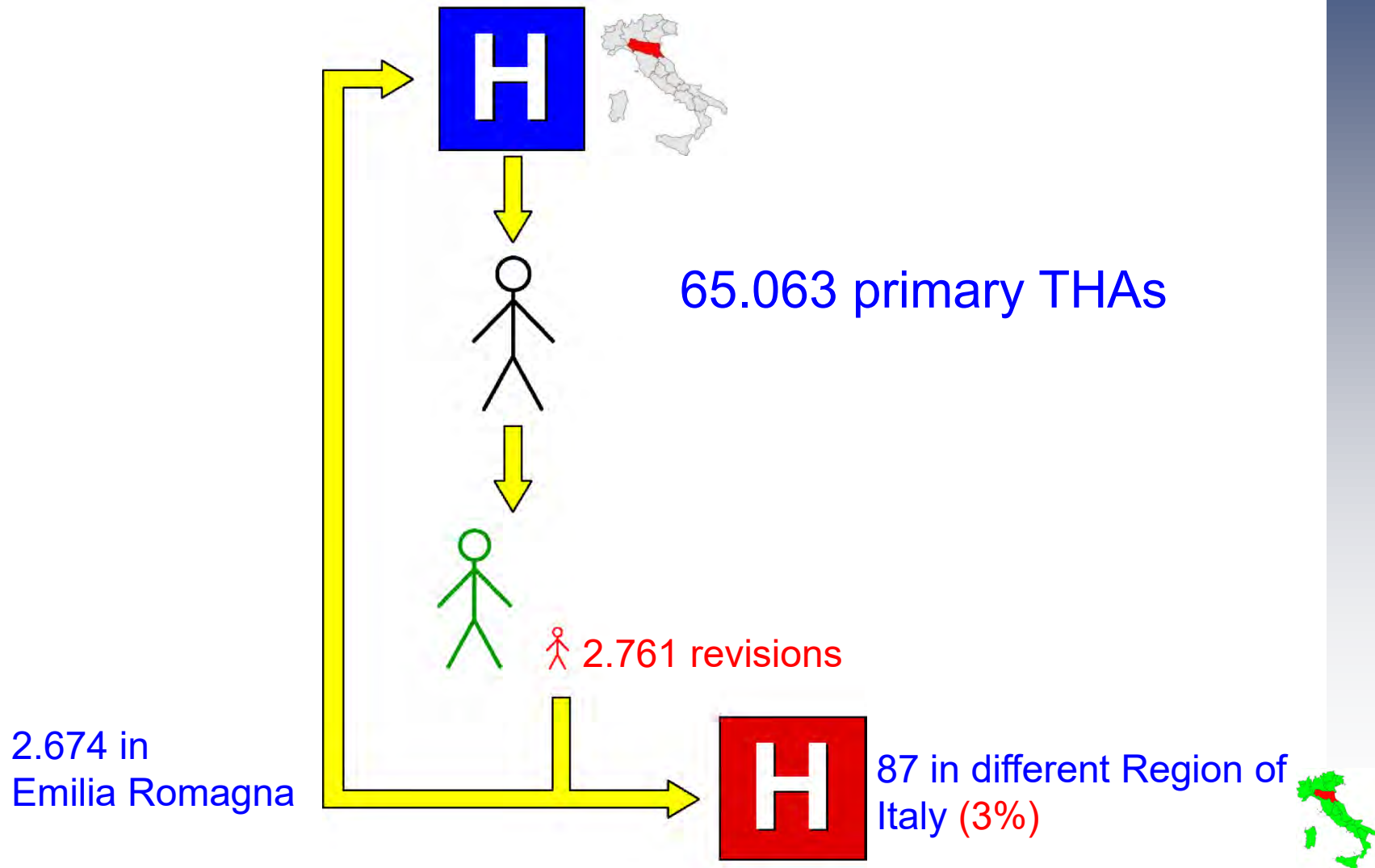


Survival curve of THA

(all diagnosis, all causes for revision)



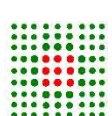
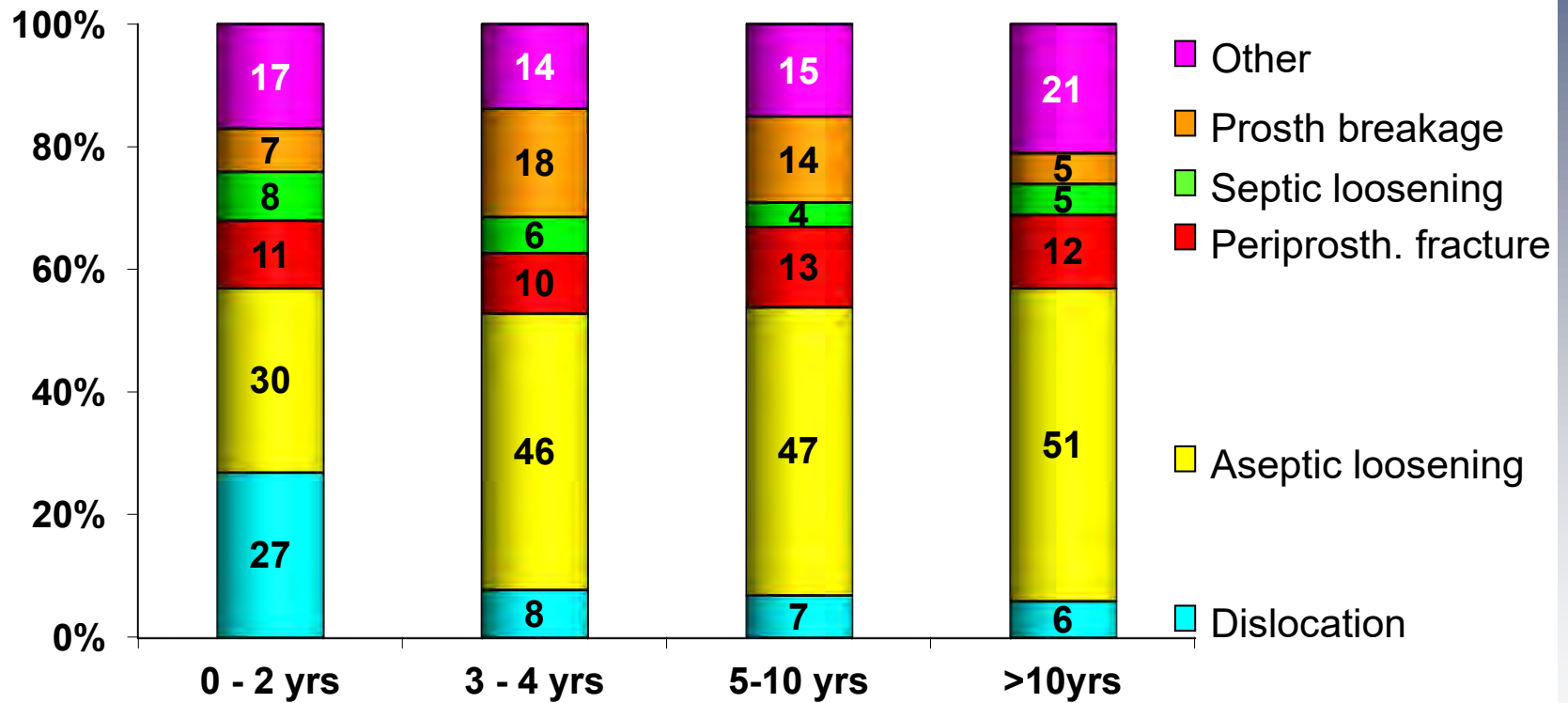
WHERE the revision?





WHY (and WHEN) the revision?

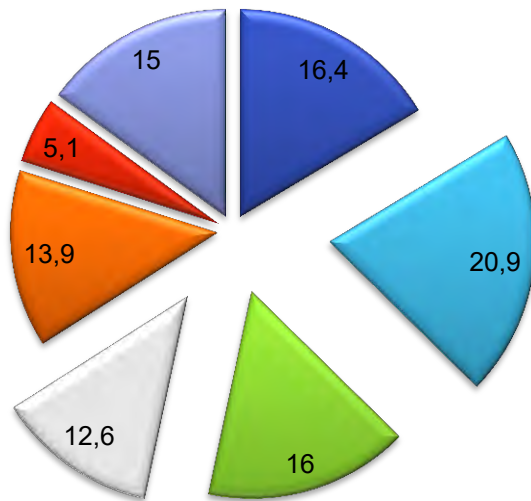
Percentual distribution



WHY the revision?

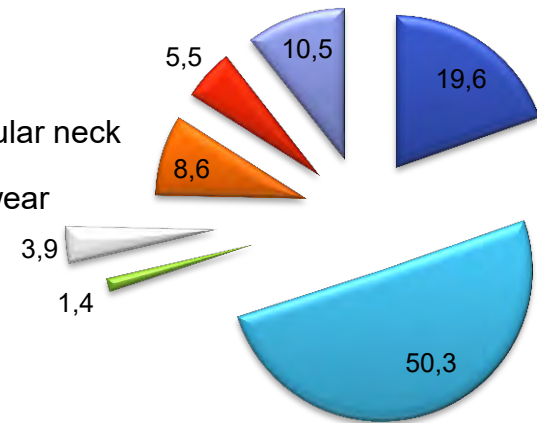
Percentual distribution

Cer-cer



Met-pol

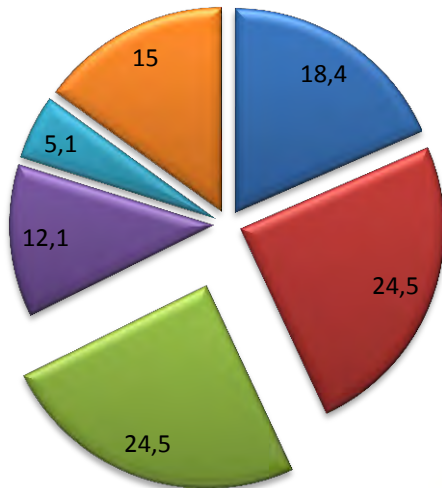
- Recurrent dislocation
- Aseptic loosening
- Breakage of the stem / Modular neck
- Breakage of ceramic/ Poly wear
- Periprosthetic fracture
- Septic loosening
- Other



WHY the revision?

Percentual distribution

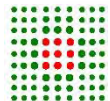
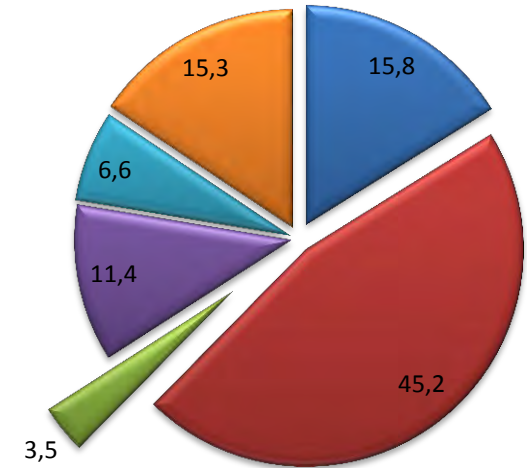
Modular neck



- Recurrent dislocation
- Aseptic loosening
- Prosthesis breakage
- Periprosthetic fracture
- Septic loosening
- Other

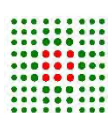
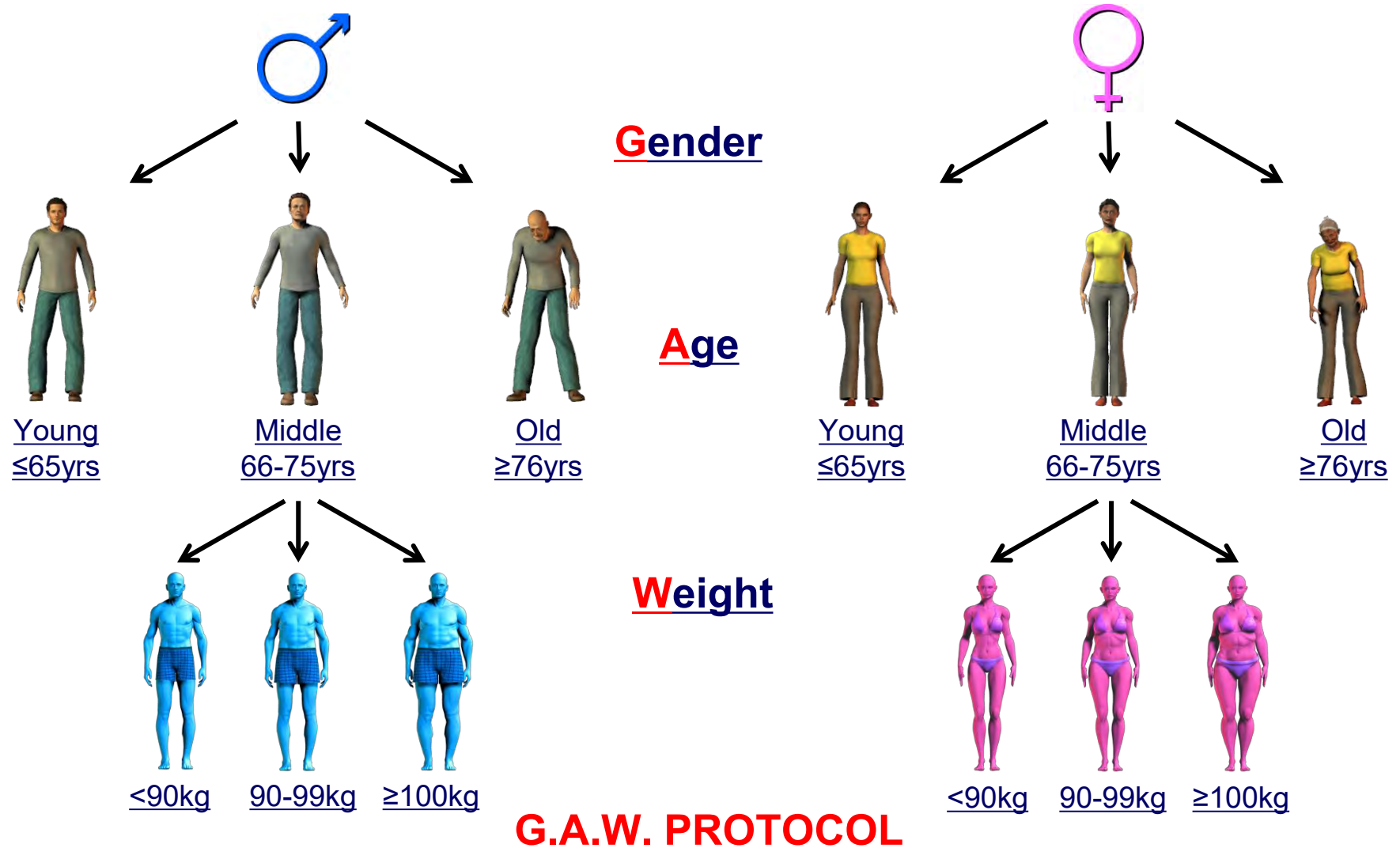


Fixed neck



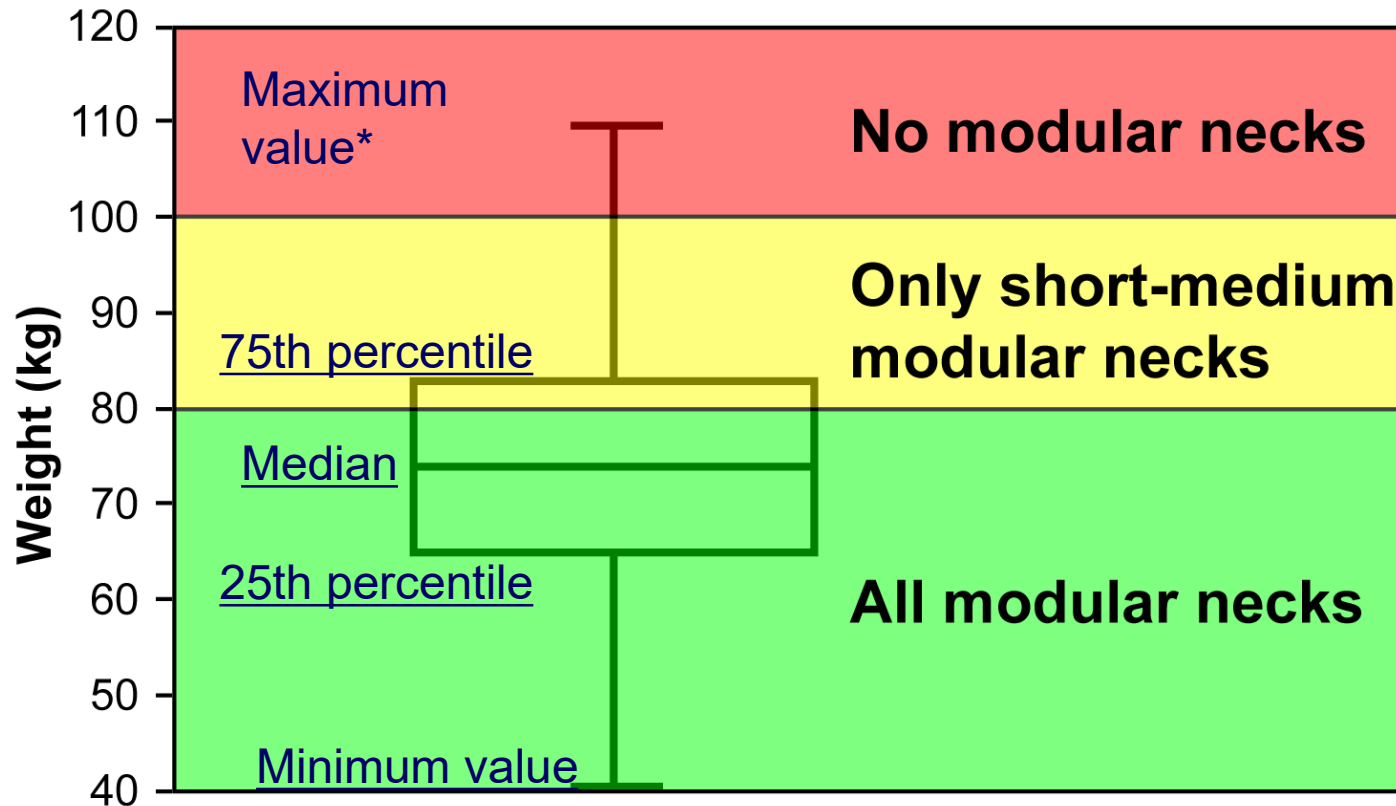
Protocol to reduce Risk of fracture for Modular Necks

Based on experience with 1st Generation Desing

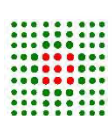


HOW the Register can help to solve a problem

Body weight and use of modular neck

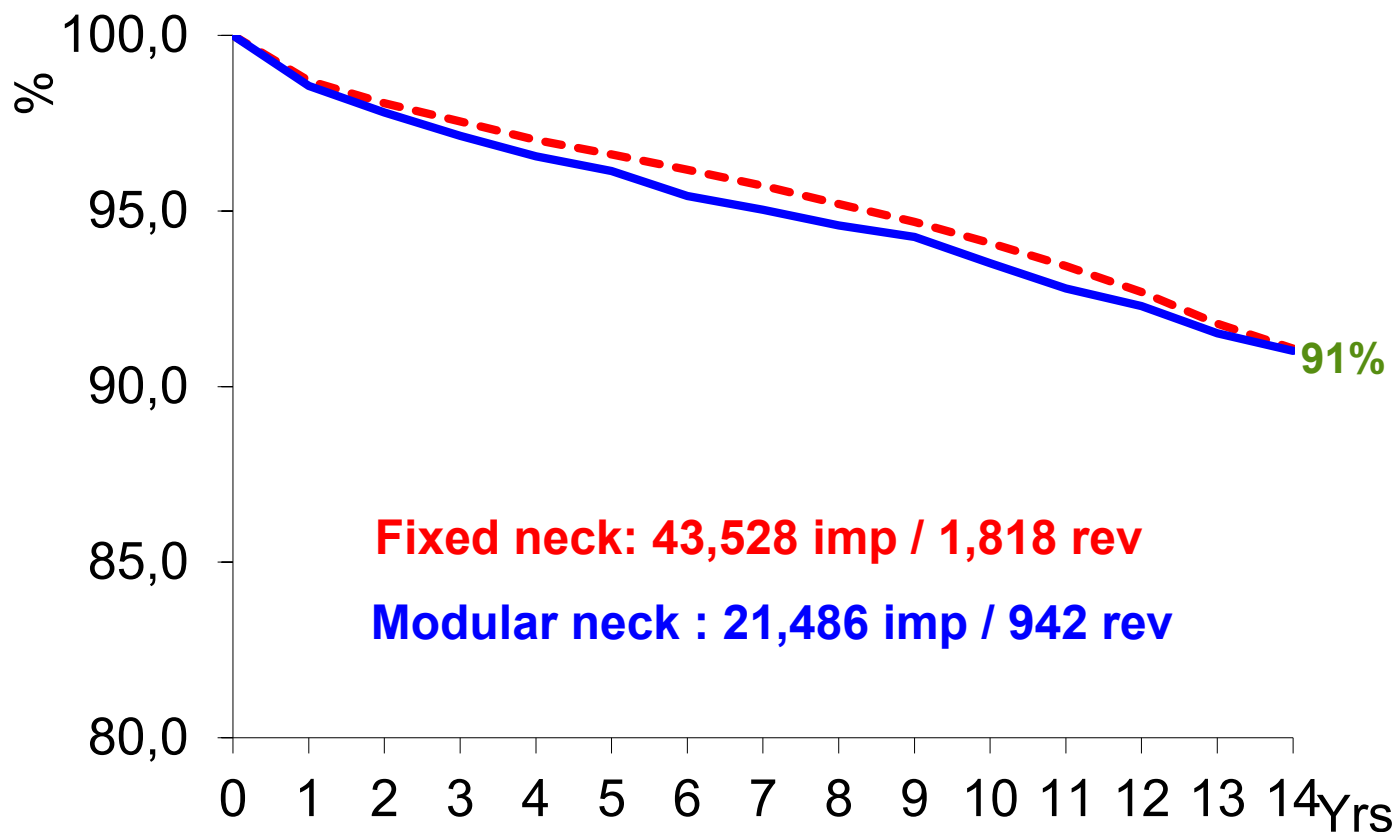


* Excluded outlier values

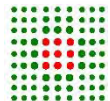




Modular vs fixed neck



Nearly all modular neck are made of Titanium



A comparison...



YES

Causes of failure are mutually exclusive

NO

YES

Failure of single component

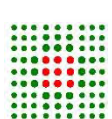
NO

Revision rate (n failed/. Implants)	Cause for revision	Revision rate Per 1,000 patient-years
1.6	Aseptic loosening	1.39
0.1	Pain without loosening	1.23
0.7	Dislocation	0.96
0.3	Infection	0.78
0.1	Mal alignment	0.44
0.5	Periprosthetic fracture	0.65
	Lysis	0.30
0.1	Implant wear	0.27
0.4	Implant fracture	0.17
0.3	Other	1.64

Pain

Take home message

- National Registry is always the gold standard
- Regional Registry may have some advantages over a National registry, due to a closer contact with local reality and problems
- Capture rate and completeness are essential requirements



Thank You



Picture of the very first orthopaedic surgery performed at the Rizzoli Institute on 1896



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BRITISH HIP SOCIETY
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MILAN, ITALY



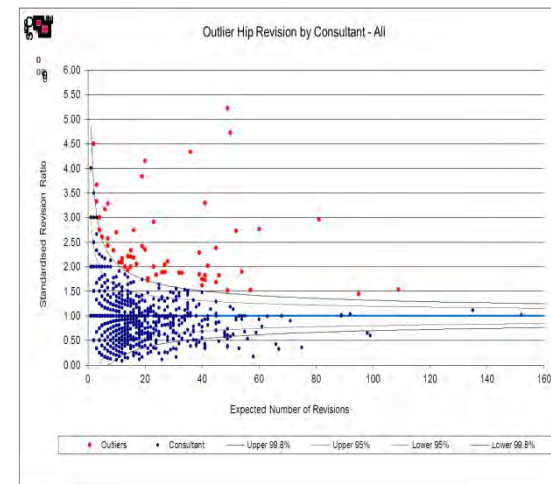
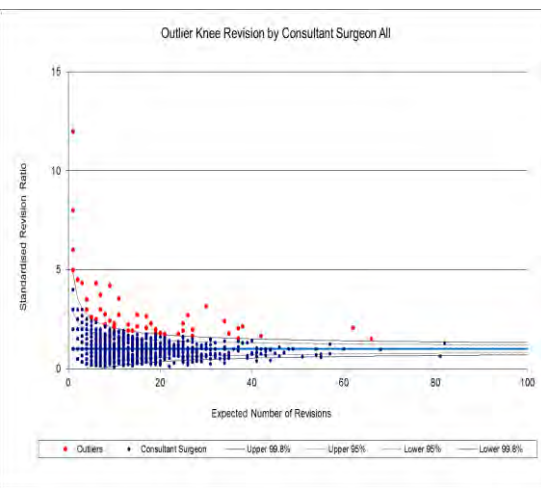
How to identify and manage outliers

Peter W Howard

Consultant Orthopaedic Surgeon, Derby, UK

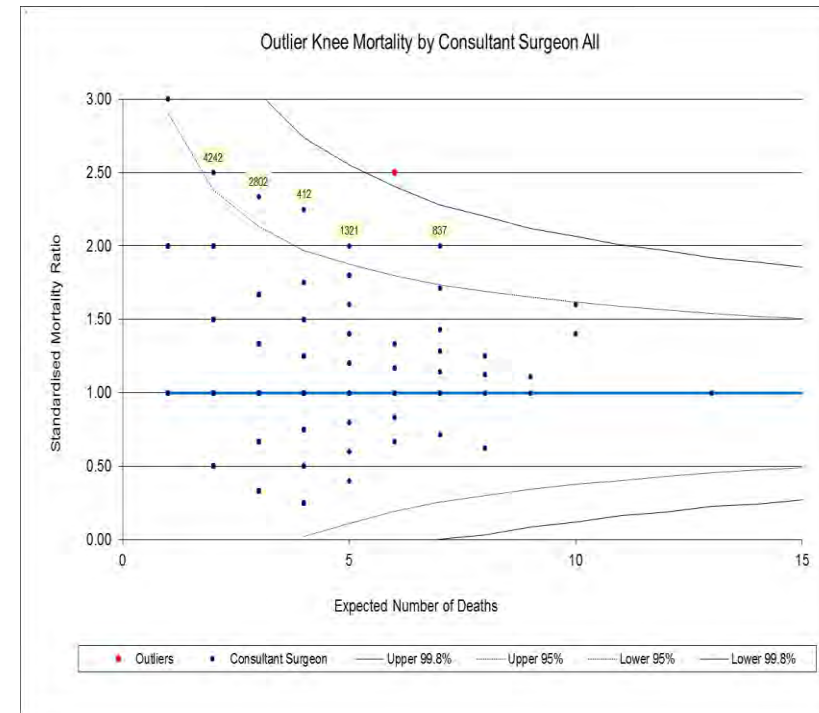
Chair Surgeon Outlier Committee

Chair Implant Performance/Scrutiny Group



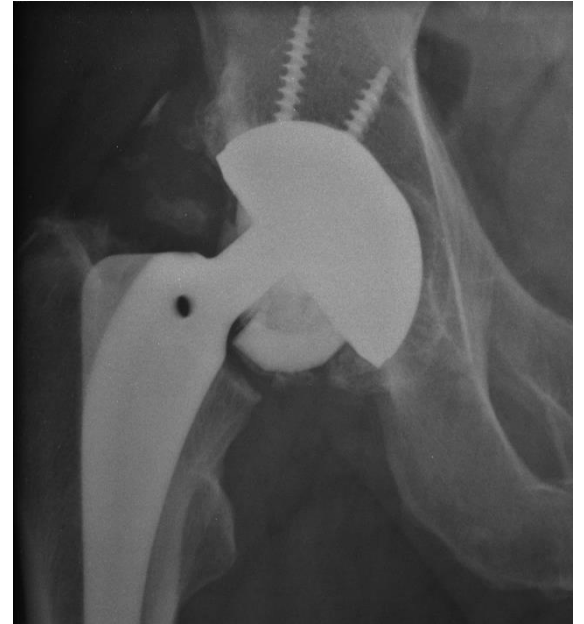
What is an outlier?

- An ugly term!
- Not a fixed percentage of all surgeons
 - There need not be outliers
 - Statistically expect some by chance
- Boundaries
 - Control limits 95% & 99.8%
 - Confidence intervals 95% & 99.8%
 - Standard deviations 2 & 3



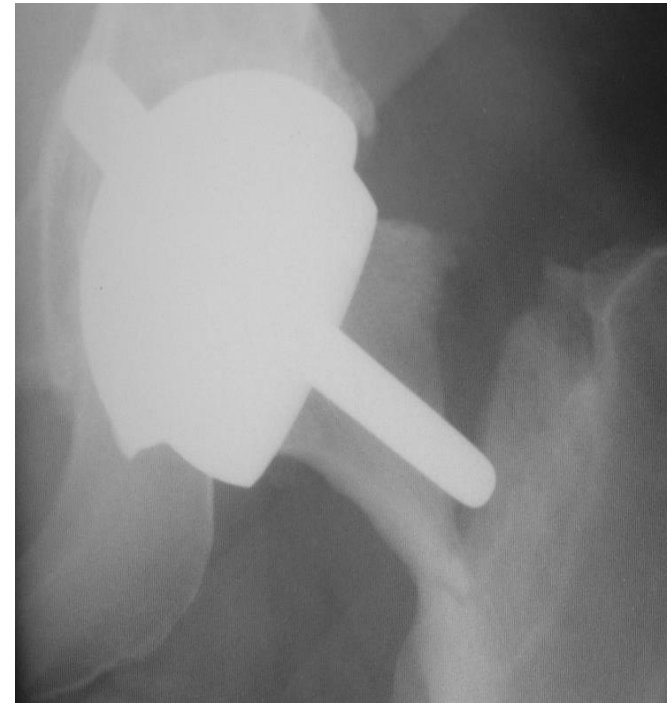
Revision rates

- All cause revisions
- All revisions
 - Part or whole of implant removed *or*
 - Extra implant added (eg patella button, PLAD)
- Not re-operations without revision
- Time to revision
- Length of follow up for unrevised cases, or to death



Revision rates

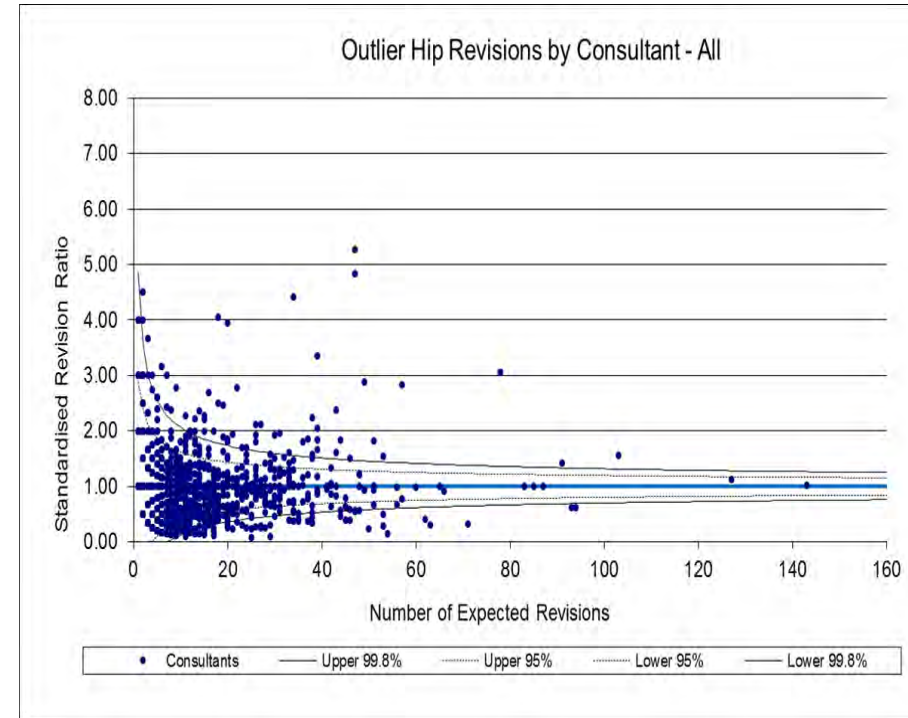
- PTIR
 - Patient/prosthesis time incidence rate
 - Revisions per 100 patient years
 - Mean 0.55 for hips, 0.50 for knees
- Expected number of revisions
 - $(\text{Total patient time}) \times (\text{mean PTIR})$



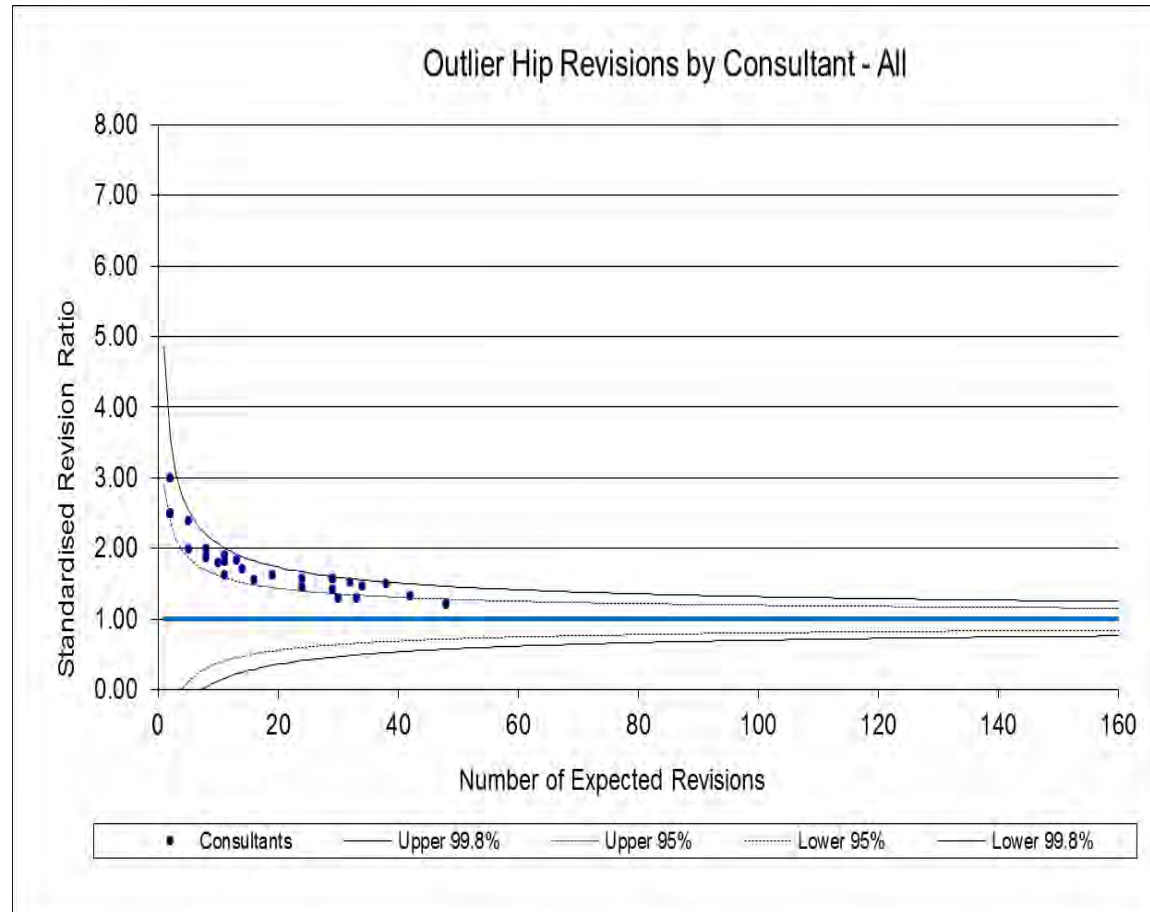
Standardised Revision Ratio

SRR – expected versus observed revisions

- $SRR = 1$ is as expected
- $SRR = 2$ twice as many as expected
- $SRR = 0.5$ half as many as expected
- Expected number of revisions rises both with time and increased cases
- Adjusted for age, gender, diagnosis



Unadjusted outliers, not outliers overall
Knees 4 in 59 out, hips 0 in 39 out



All cause revision – for all surgeons

- “Minor & major” revisions
 - Local audit can distinguish
 - Separating has been discussed
 - Any type can indicate a problem
 - Recorded reason might be inaccurate
- Peri-prosthetic fractures – included because:-
 - Intra-operative fractures which later extend
 - Loose components more likely to fracture
 - Implant design



Case complexity

- No reliable assessment method
 - “Complex primary” tab withdrawn after overuse (abuse!)
- Most failures are in uncomplicated cases
 - Metal on metal
 - Dislocation
 - Infection
 - Early aseptic loosening



Main factors affecting revision rate

- Case selection
- Implant selection
- Surgical technique
- Revision threshold
- Overall rate affected by replacement type
 - High proportion resurfacing/MoM = higher overall rate
 - Same for high proportion partial knees



Revisions for all hip/knee replacements presented together

and with their “group PTIR”

Revision for all sub-types presented separately

Hips revision PTIR

- All hips PTIR
- Cemented
- Cementless
- Hybrid

0.5

0.3

0.5

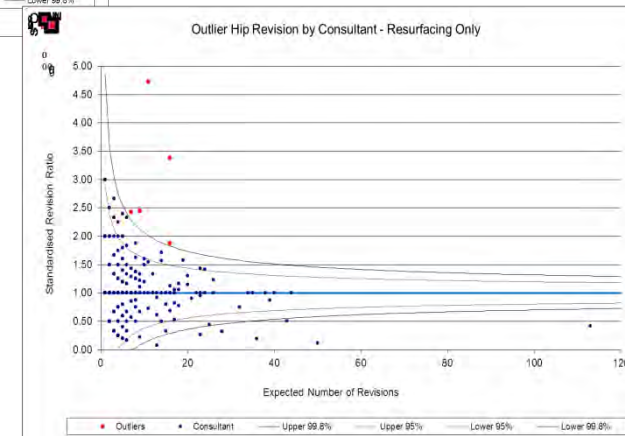
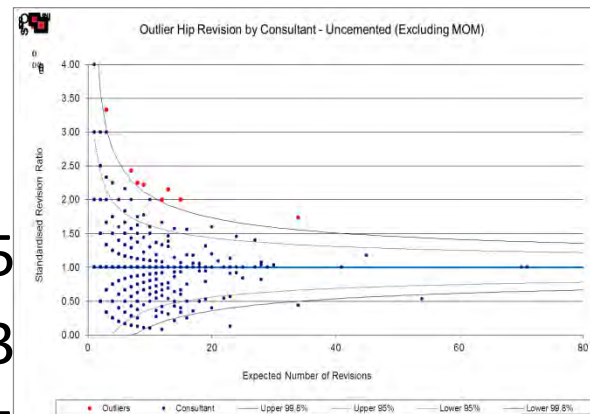
0.38

➤ Resurfacing

1.07

➤ Stemmed MoM

1.86

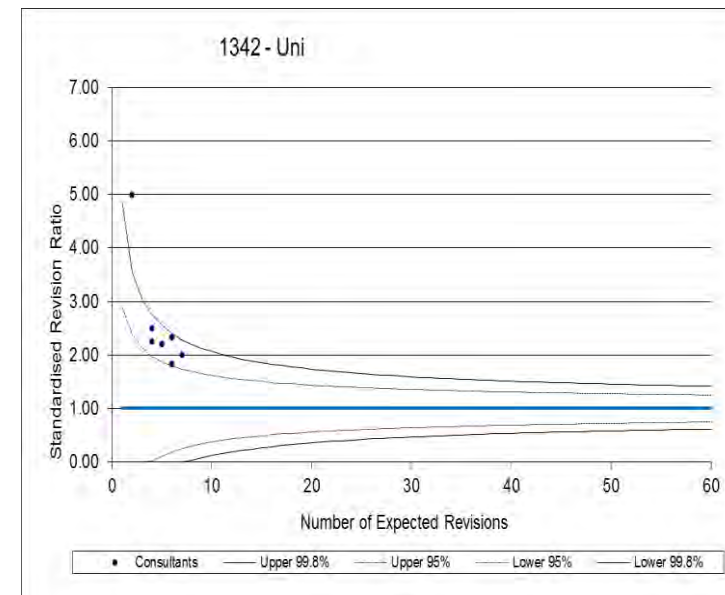
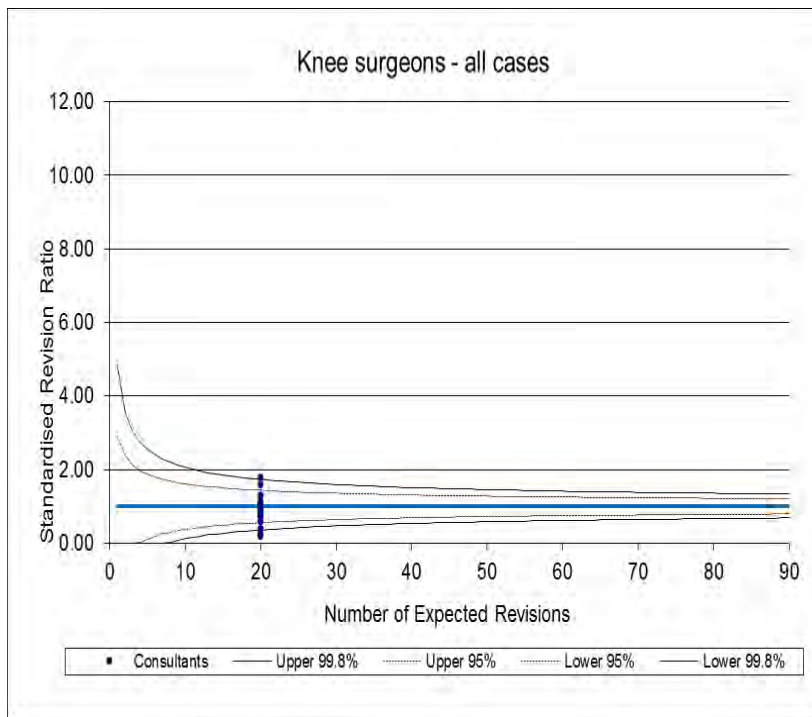


Mortality presented for all hip/knee replacements together only

- Knee mortality 0.32
- Hip mortality 0.41
- 0.4 in 2003 – 04
- 0.6 in 2003 – 04
- 0.2 in 20012 - 13
- 0.3 in 2012 - 13

How many more revisions to reach outlier status?

- 20 expected revisions
- 26 surgeons
- 477 – 1599 primaries
- 1 outlier with 36 revisions (Surgeon 1342)
- 16 uni revisions



Analysis of new potential outlier for revisions

- Anonymous
- Trend over last 5 years all cases
- Trend over last 5 years in procedure sub-types
- Situation as lead surgeon and consultant in charge
- 1, 3, 5, 7 year revision rates with 95% confidence intervals
- Raw data on revisions examined

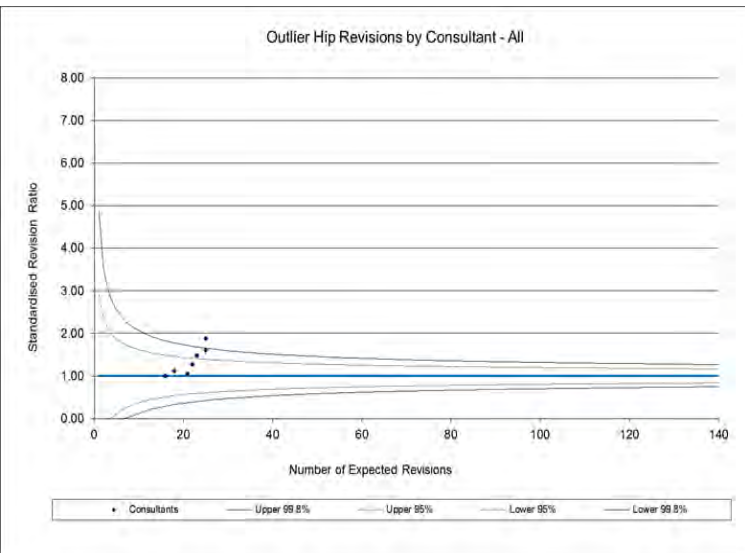
Process

- Surgeon contacted to notify of situation
 - Any apparent reasons from analysis are given
- request to verify data
- support offered

- CEO notified after 6 week interval

- All surgeons can access their own data
 - Should come as no surprise

Conclusions



- Reaching outlier status is multifactorial
- Surgical technique plays a relatively small part
- Be grateful to outliers
 - For making life easier for the rest of us



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY





Is Registry Data Validated and Can We Afford To Publish Surgeon Level Data?

Martyn Porter
Consultant Orthopaedic Surgeon
Centre for hip surgery
Wrightington Hospital
Medical Director NJR
President ISAR

Declaration of Interests

NJR Medical Director

NJR



- The NJR is the largest Joint Replacement Register in the world
- 12 years old
- Over 2 Million Records
- Growing by nearly 200,000 cases per year
- Outcomes include revision, death, PROMs etc
- Routine linkage with national data: (HES and ONS)
- Specific linkage with other data sources eg: Implant Retrieval Centre, GPRD, Cancer registry etc
- Facilitating post market surveillance (“Beyond Compliance”)

Uses of NJR Data

Public	Annual Report Public and Patient Guide Consultant outcome publication Hospital Dashboards
Hospital	Annual Report for Trusts Price Benchmarking Data
Surgeon	Clinician Feedback Funnel Plots Consultant Level Report
Industry	Supplier Feedback Beyond Compliance
Regulator	Implant Outlier
Research	Publications
Service	GIRFT CQC Specialised commissioning



Questions???

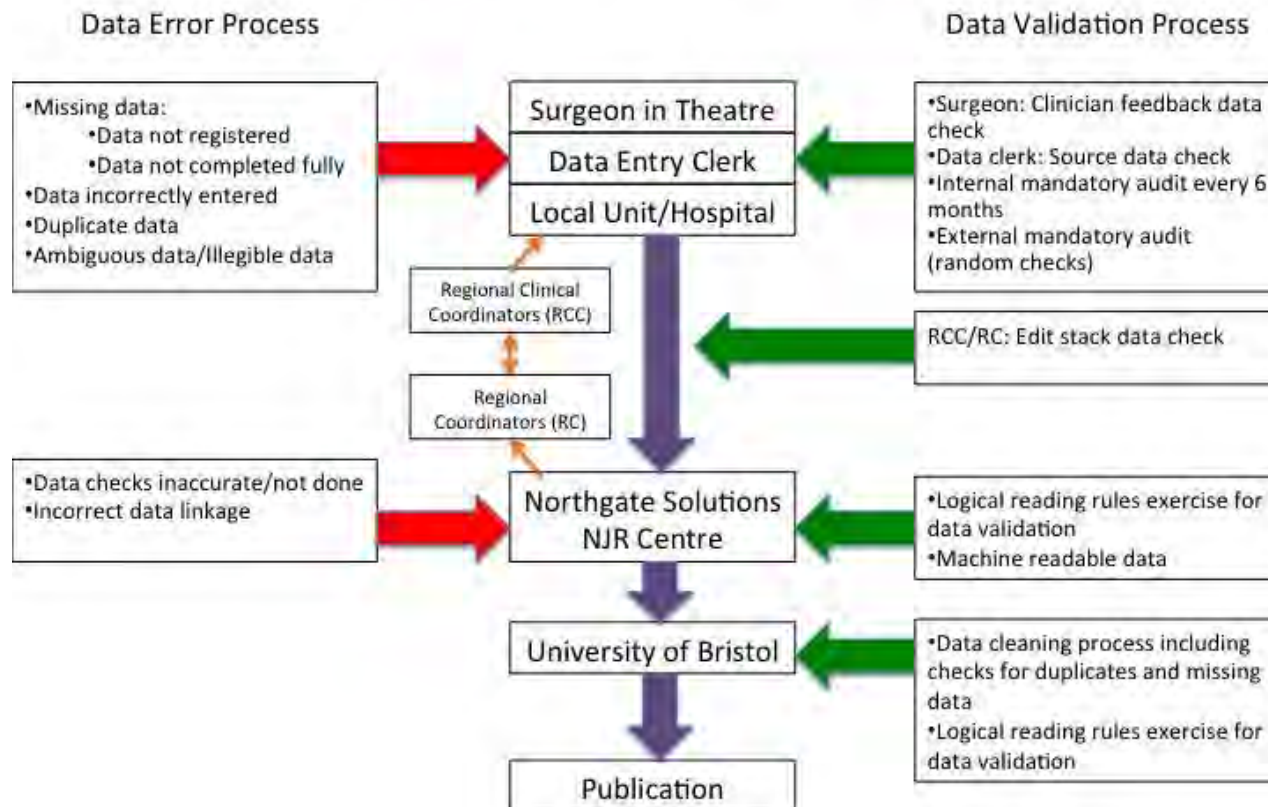
- So we are using and increasingly relying on NJR data but is the data robust?
- Is the data of sufficient quality?
- Is the data validated?
- Are NJR outputs accurate?
- But then again does this apply just to the NJR: what the implications to ALL of the presentations made at this meeting???
- Do we need (should we demand) transparent data declarations for all research and audit activity?
- If so how should this be agreed and how should this be regulated??

What is Data Quality?

- Missing Record (case ascertainment)
- Duplicate Record
- Missing data field
- Incorrect data field
- Statistical methods and standards
- Risk adjustment methodology?

What is the Current Situation?

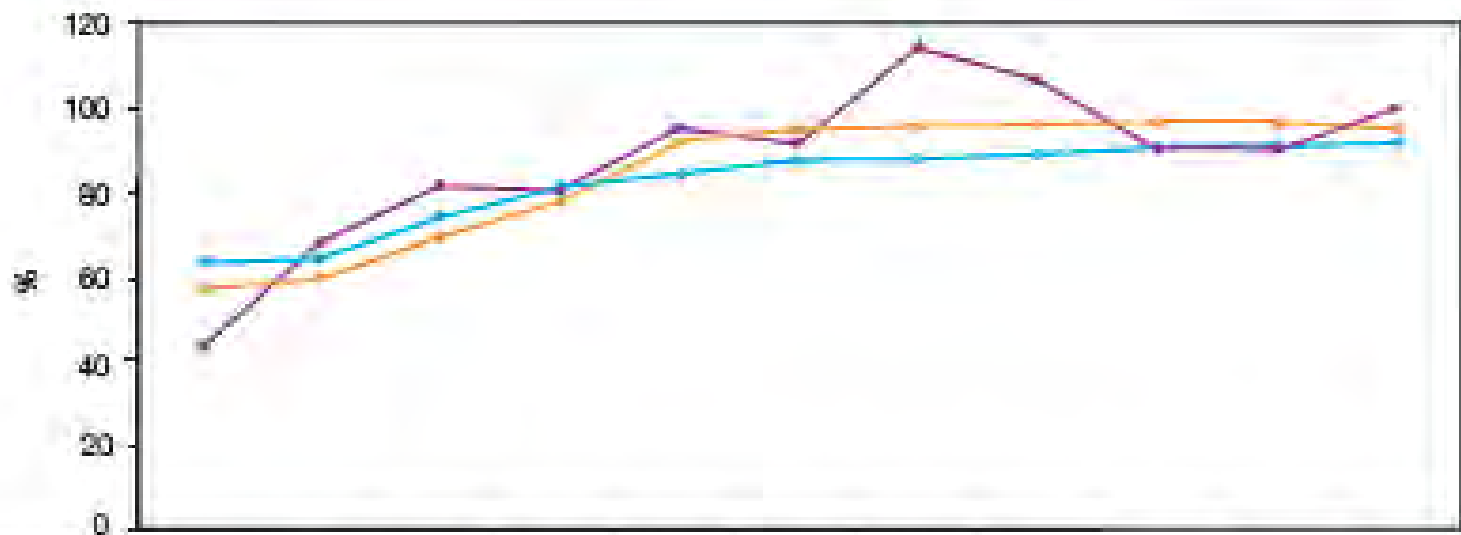
Flowchart of data validation process in the NJR



How Complete is the NJR?

Compliance, Consent, and Linkability Rates from 2003 to 2014.

Source: Procedures entered into the NJR 1 April 2003 to 31 March 2014 and levy submissions to the NJR by implant suppliers.

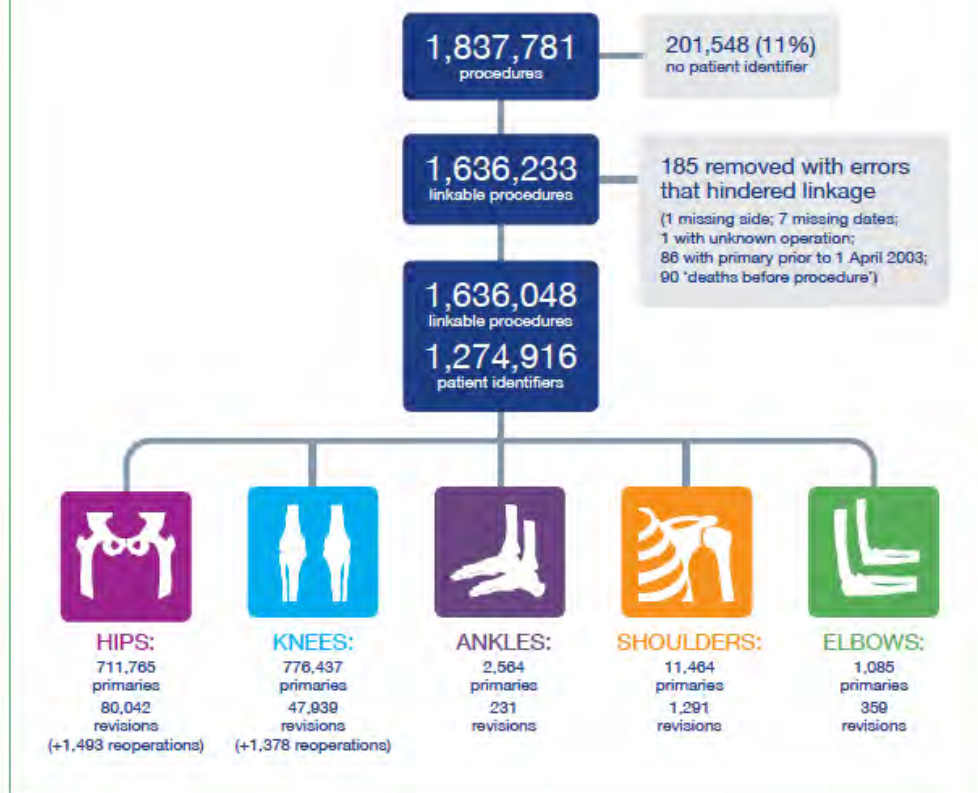


Financial year	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Compliance	43.4	68.3	81.6	80.5	95.2	91.5	114.0	106.6	89.9	89.9	99.6
Consent	63.3	64.3	74.0	81.2	84.4	87.6	87.8	89.0	90.5	91.3	91.8
Linkability	57.3	59.6	69.6	78.0	91.8	94.8	95.5	95.9	96.4	96.4	95.1

How does the data enter the survivorship Analysis?

Figure 3.1

Initial numbers of procedures for analysis.



LIRC Validation

- 929 explant cases from LIRC matched to 67,045 Primary MoM arthroplasties on the NJR database
- 61% linked
- 99.9% complete data fields
- Brand correct 100%
- Catalogue error rate 0.68% for cup and 4.98% for stem
- 16.6% error in outcome field (under reporting of revisions)

Current Situation

- The NJR reports on a large sample of all activity but procedures are lost if they are not entered in the first place or if there is insufficient data to allow linkage (85% then 11% ?? 75%)
- “Most” of the data in the NJR is valid
- Revisions may be underestimated by about 15%
- Conclusions based on the analysis of “large” datasets are likely to be valid assuming that missing revisions are missing by chance rather than systematic reasons
- Conclusions based on “small” datasets (COP) are much more problematic and should be used with caution

What is the NJR doing?

1. Surgeons can validate “linked” revisions using data available from clinician feedback (2003-2015)
1. Hospitals can validate submissions through a national validation programme (2014/15). (mainly missing submissions)
2. Pilot of submitted data accuracy (verification of NJR data fields)
3. Developing high level view of data quality by using HES (and other data) for retrospective assurance. (imputation, exclusion and variation)

Summary

- NJR has missing data (how much data do we need?)
- Data within the NJR has high degree of accuracy
- Comprehensive national validation programme is underway
- Present data quality probably supports reporting on large numbers but more problematic at low numbers and at individual surgeon level
- NJR can afford to publish descriptive data on surgeons but not outcome data
- What are the implications for all registries?
- What are the implications for orthopaedic research and publication?



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UNIVERSITÀ
DEGLI STUDI DI BARI
ALDO MORO

*Dipartimento di Scienze mediche di base, neuroscienze ed
organi di senso*

Azienda Ospedaliero-Universitaria «Policlinico»

U.O. ORTOPEDIA E TRAUMATOLOGIA

Direttore: Prof. B. Moretti



INTERNATIONAL COMBINED MEETING
BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA



**The Puglia Register of Hip
Prosthetic Implants.
A Five-Years Experience.**

Milan 27.11.2015

**Maccagnano G., Solarino G., Mudoni S., Balducci MT,
Carrozzo M., Germinario C., Moretti B.**

Trends in Total Hip Arthroplasty

- Fundamentals have not changed
- Major challenge \Rightarrow Implant longevity
 - ▣ Broader indications
 - ▣ Younger, more active patients
 - ▣ Higher functional demands/patient expectations



Historical Causes of THA failure

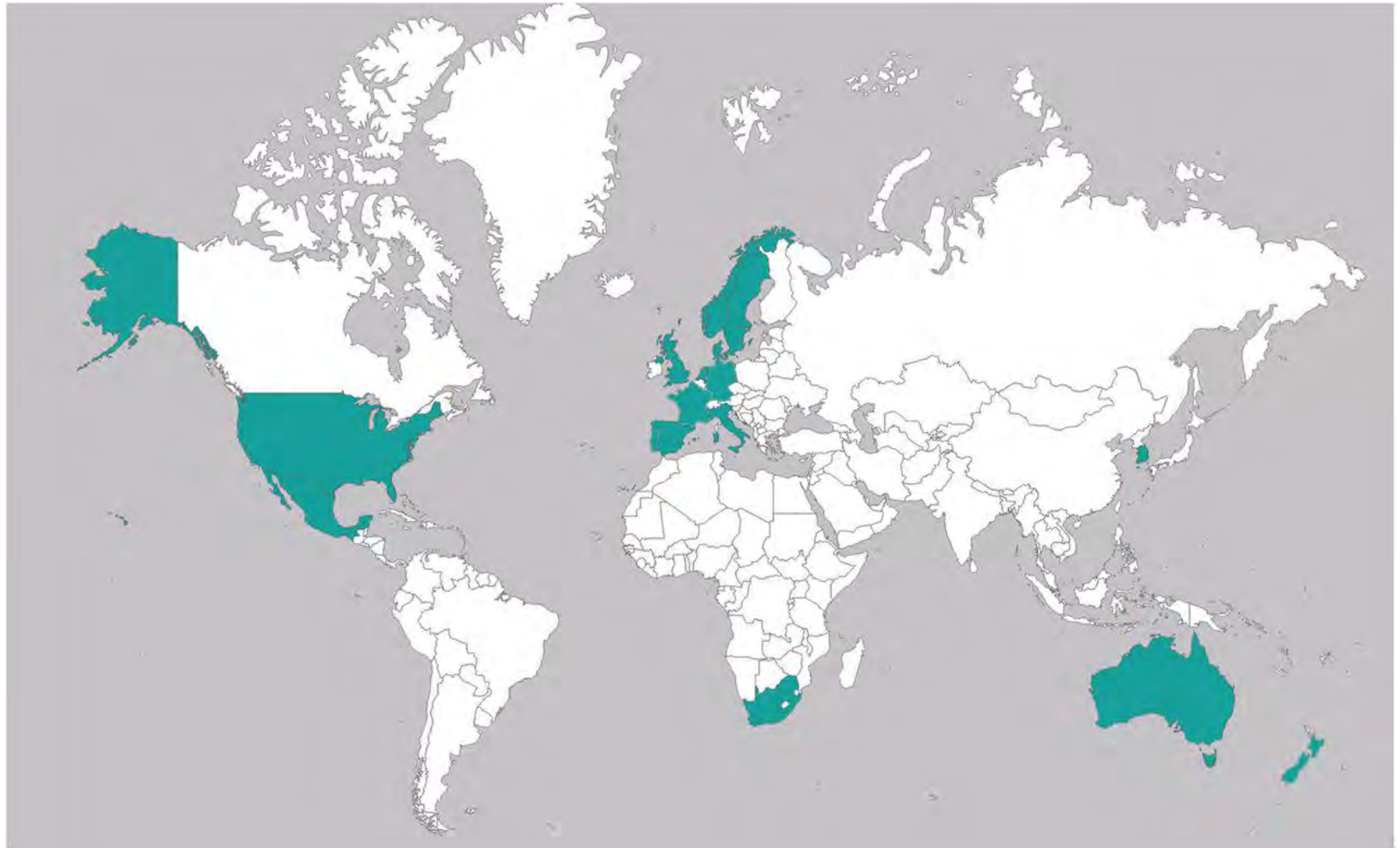
- Problems addressed
 - ▣ Infection
 - ▣ Implant Fixation
- Current challenge
 - ▣ Wear rates in total hip arthroplasty



To prevent the failure...

**"Mistake is
the Best Teacher"**

Worldwide registries...



Puglia registry since 2010



REGIONE
PUGLIA



4.087.000 (28 feb 2015)

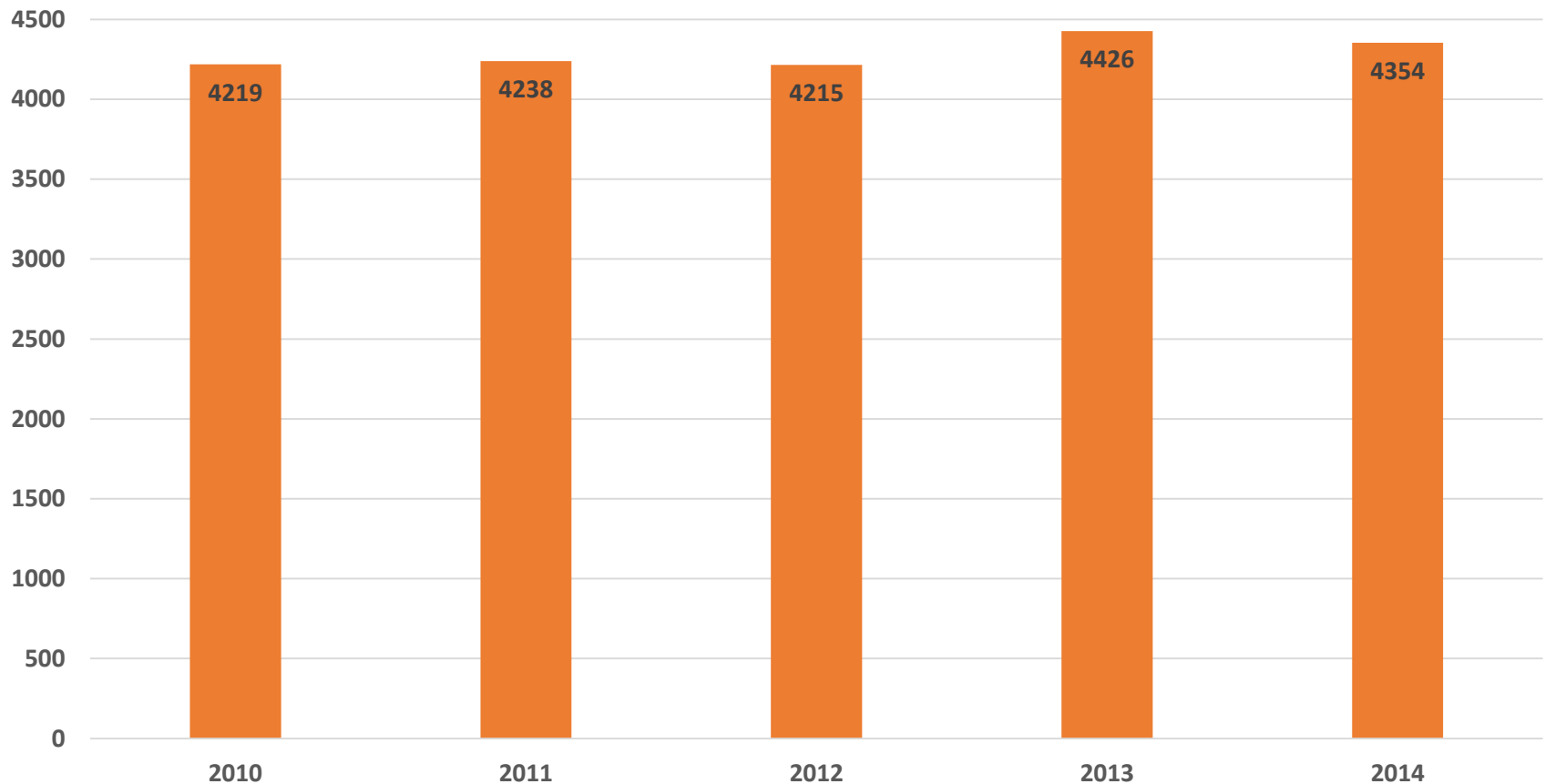


NEW ZEALAND

4.471.000 (31 mar 2015)

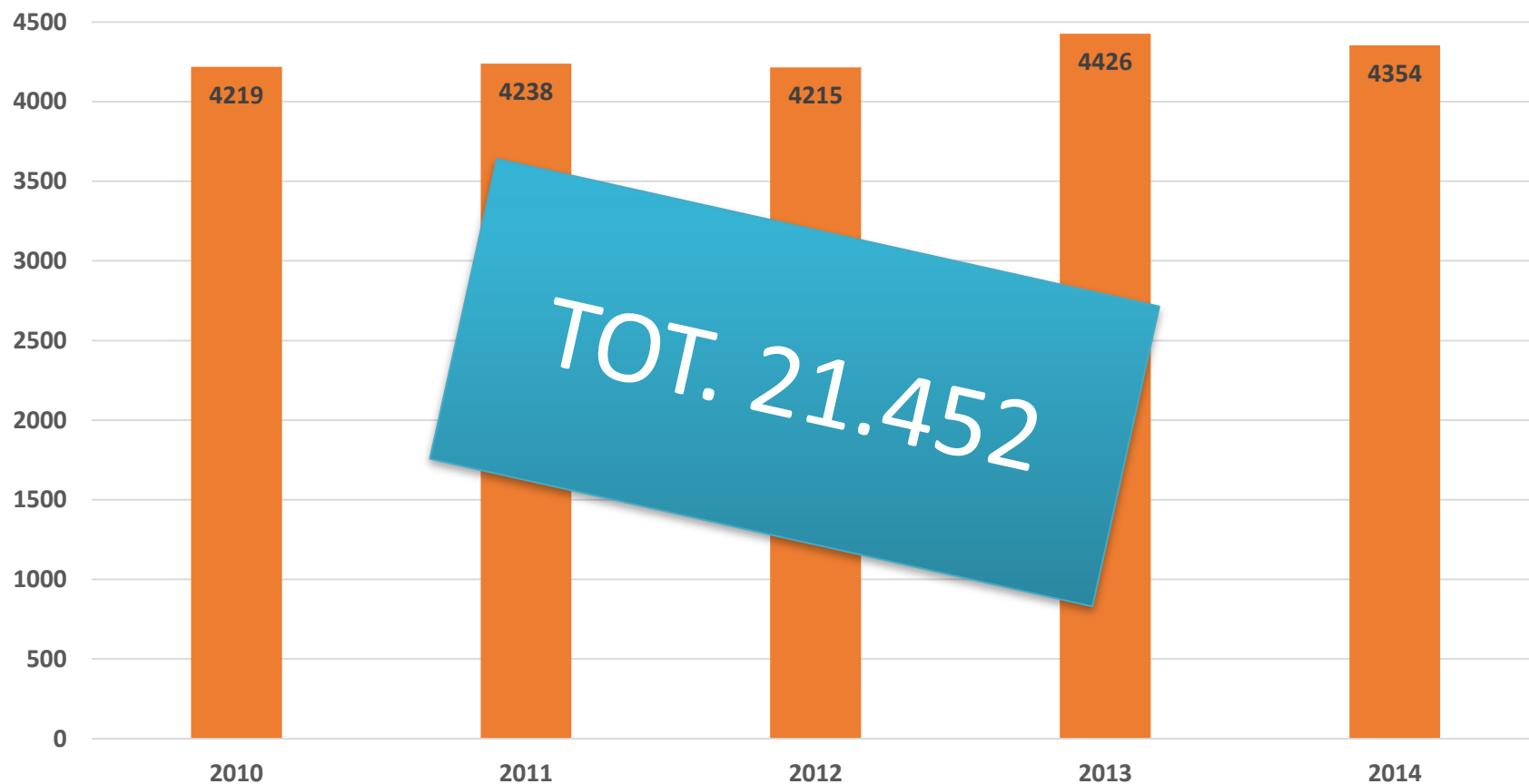
Results

Number of hip replacement.



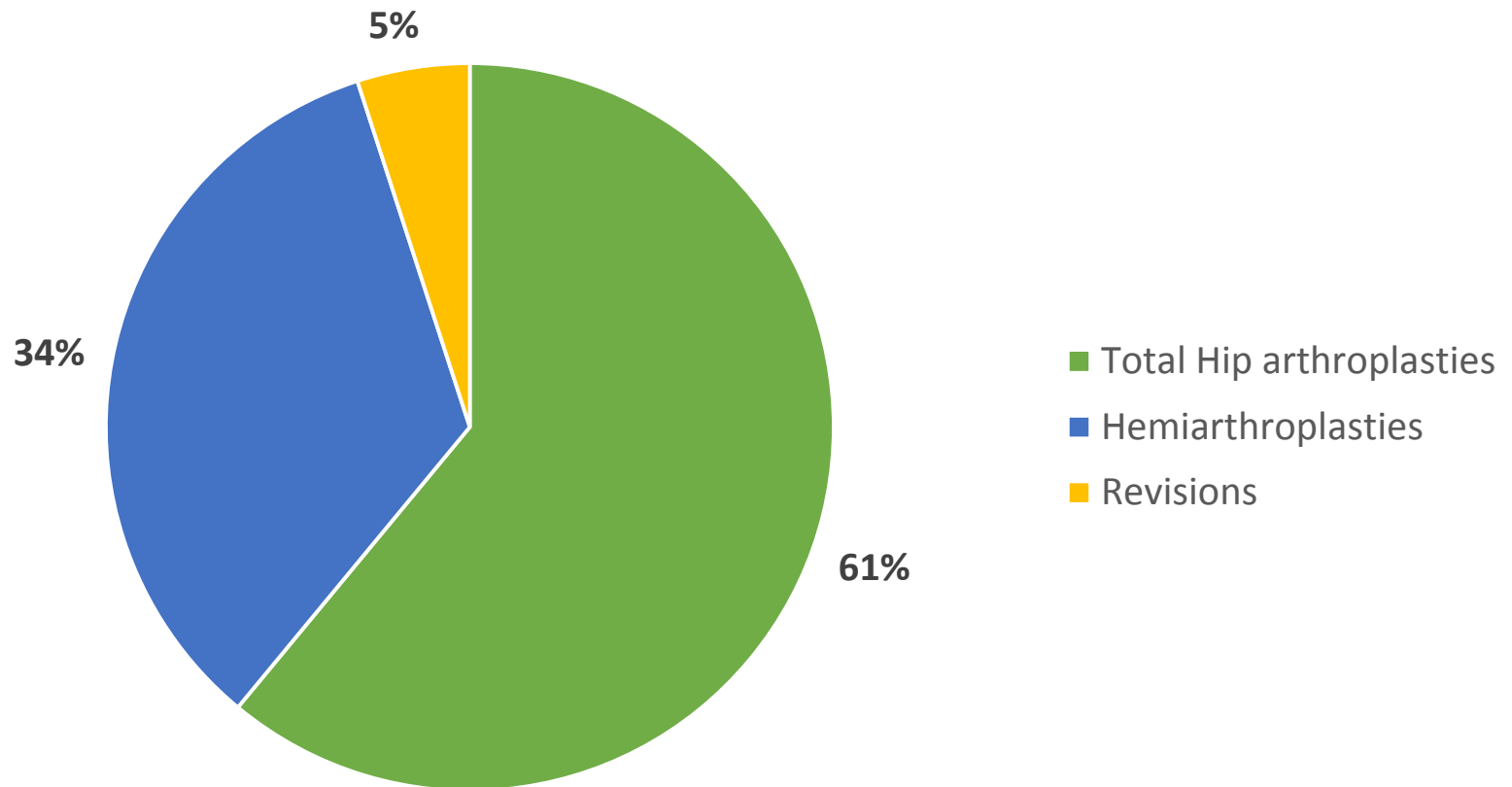
Results

Number of hip replacement.

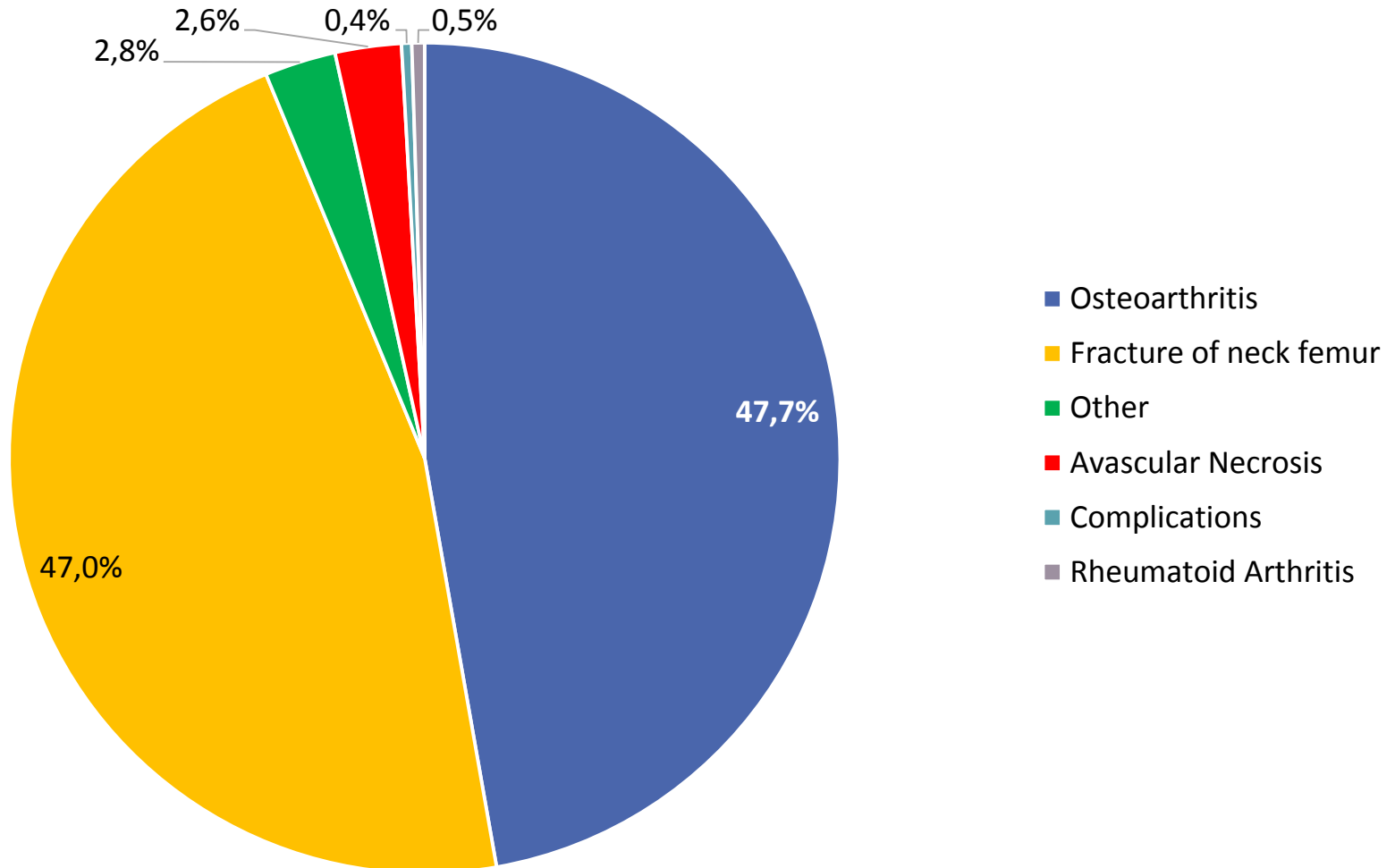


Results

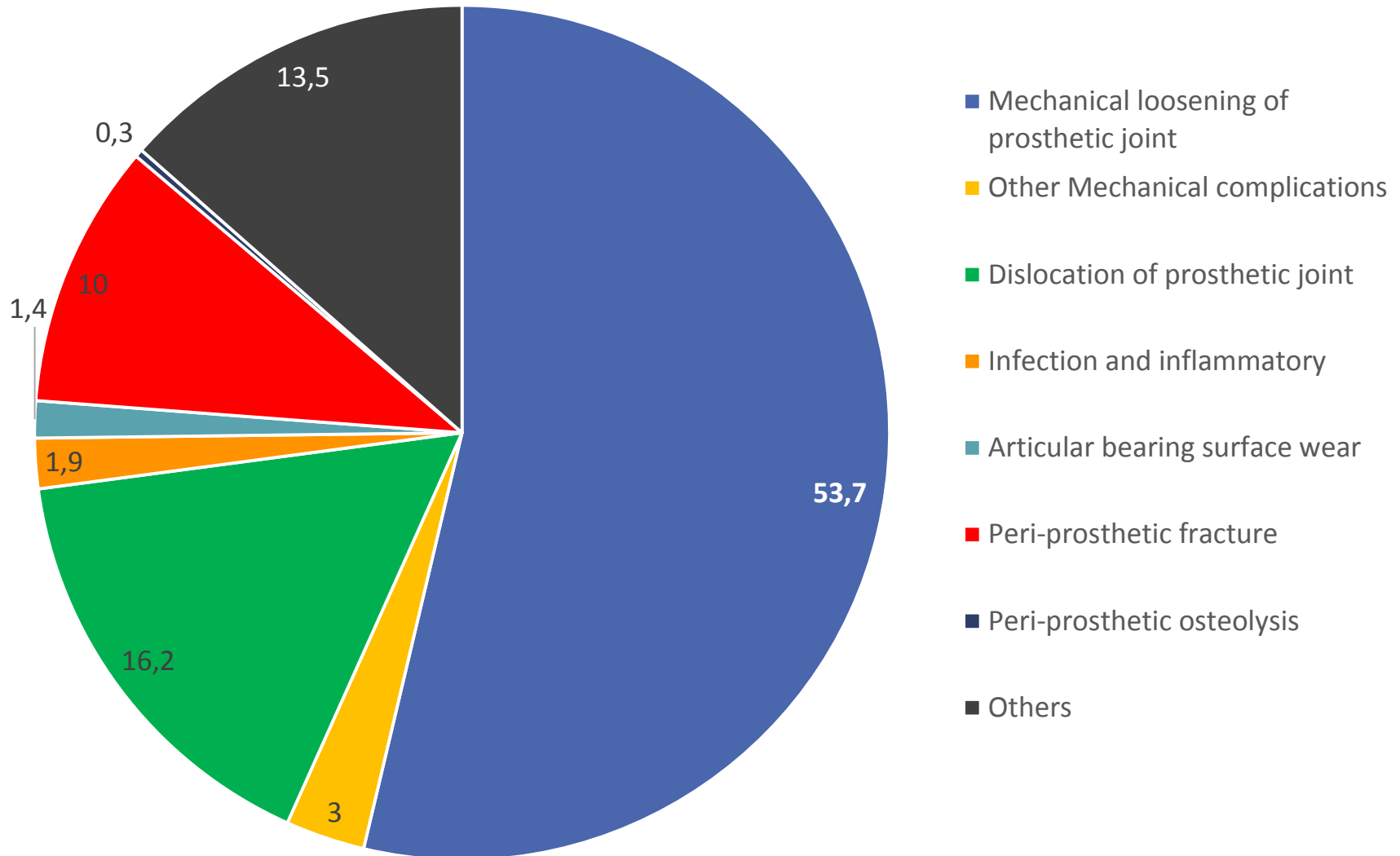
Tipology of hip replacement.



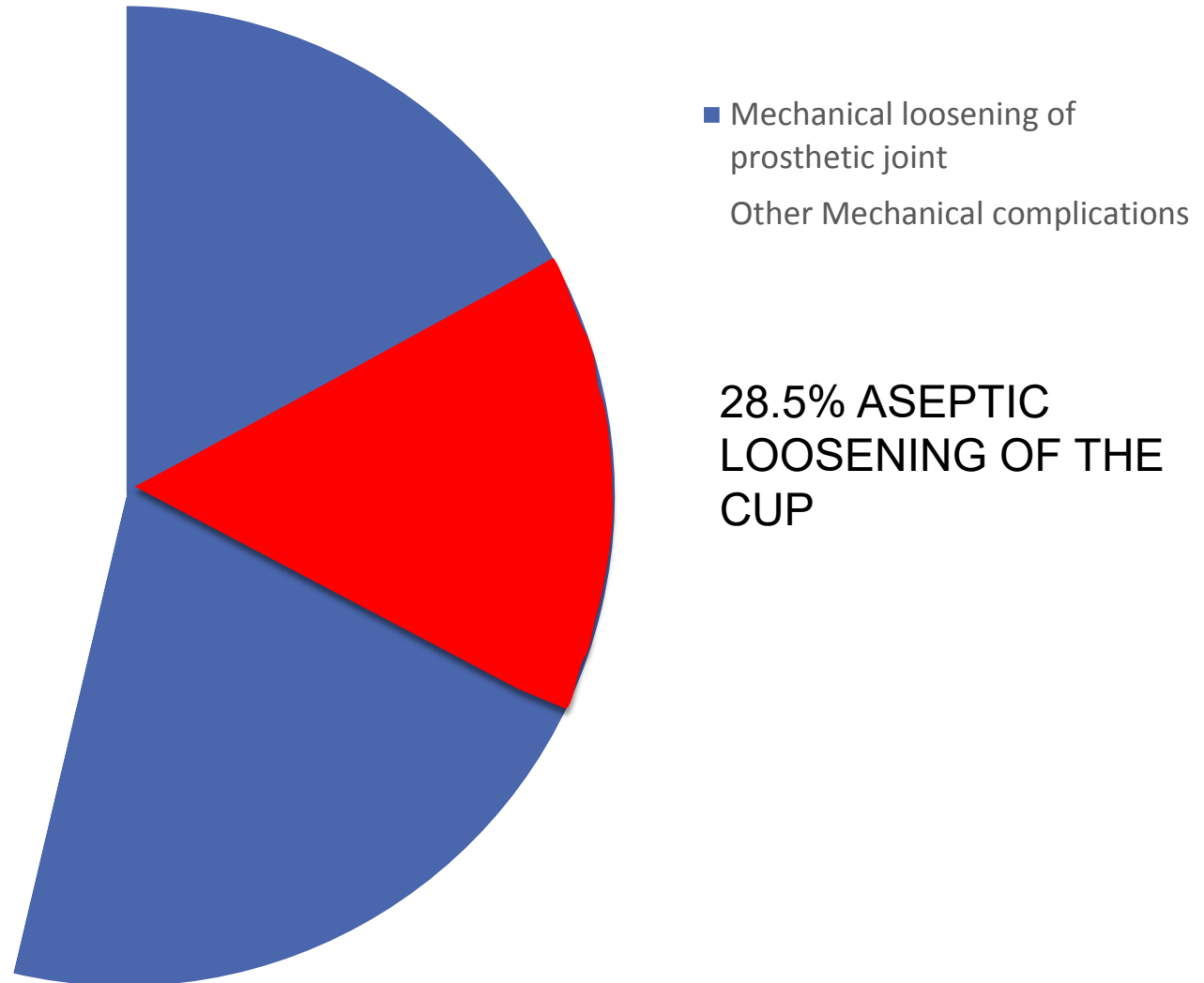
DIAGNOSIS FOR HIP ARTHROPLASTY PROCEDURES (n=20257)



DIAGNOSIS FOR HIP REVISION PROCEDURES (n=1195)

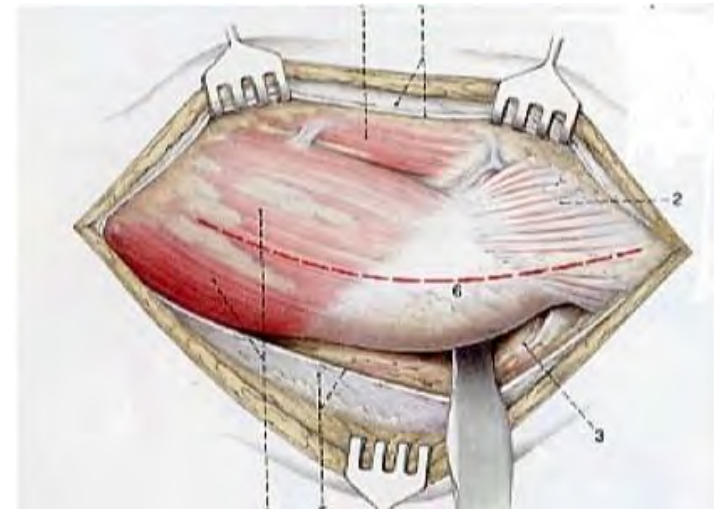


DIAGNOSIS FOR HIP REVISION PROCEDURES (n=1195)



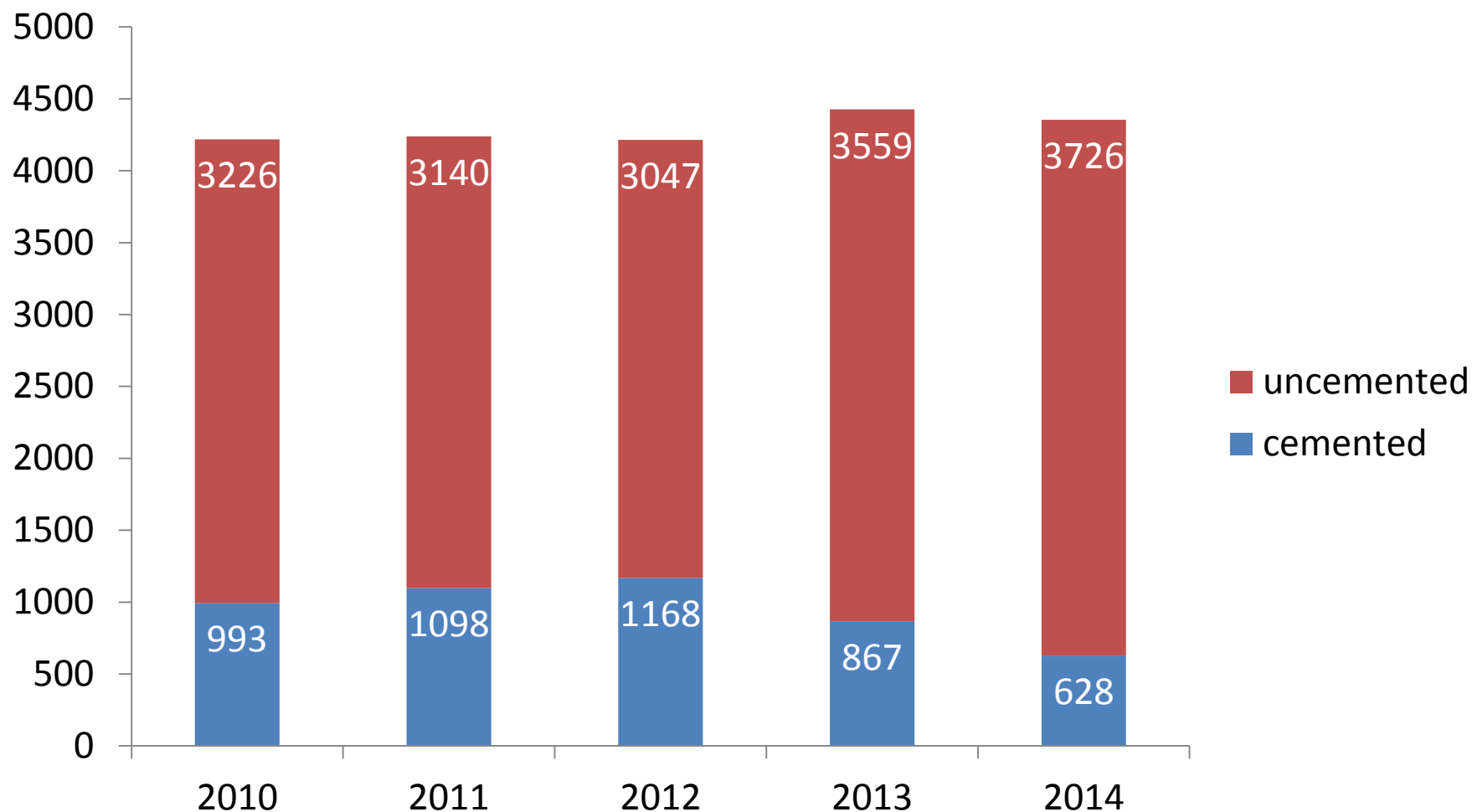
Results

APPROACH	
LATERAL	64,8%
POSTERO-LATERAL	33,7%
ANTERO-LATERAL	0,9%
ANTERIOR	0,6%

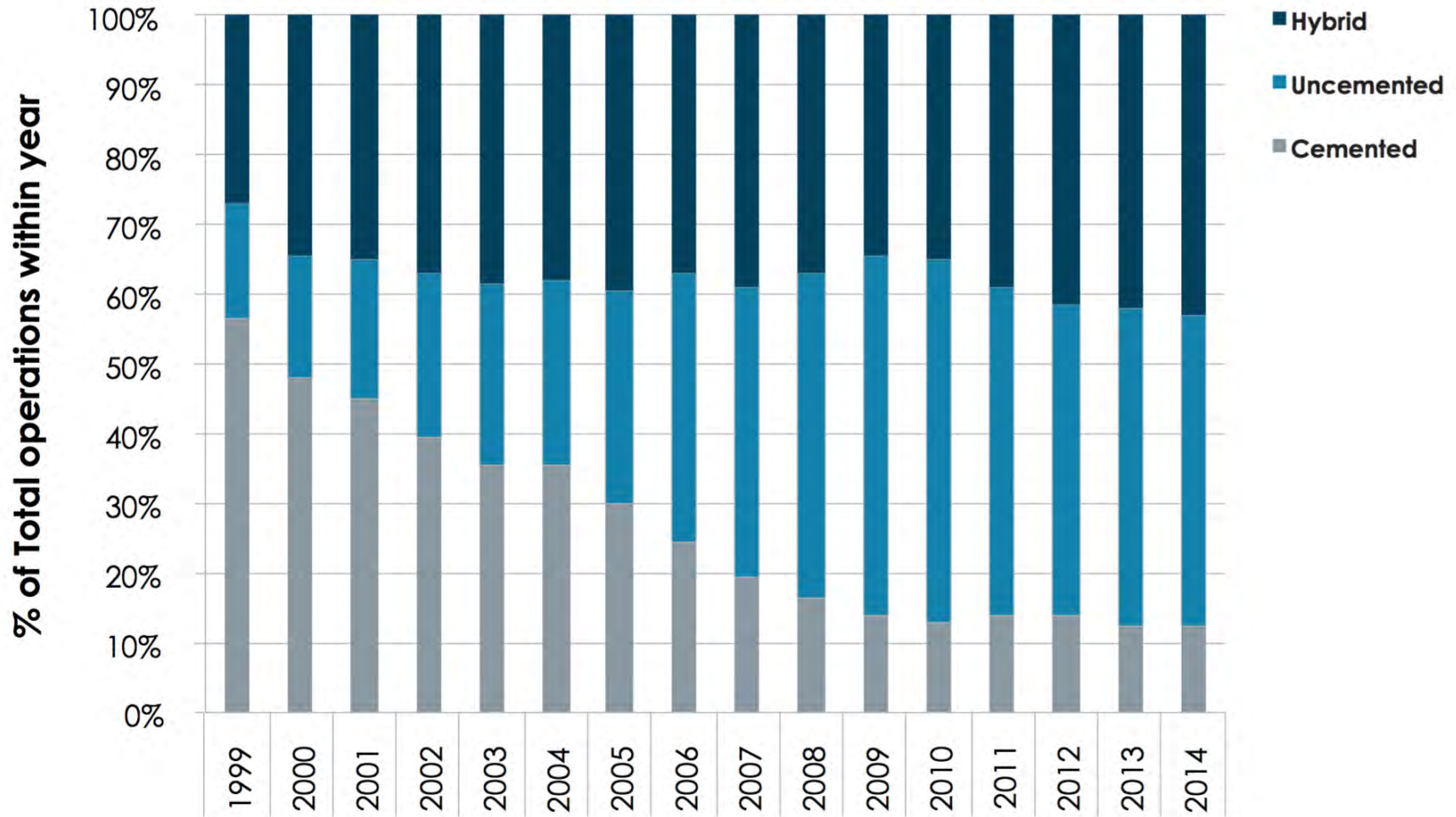


Results

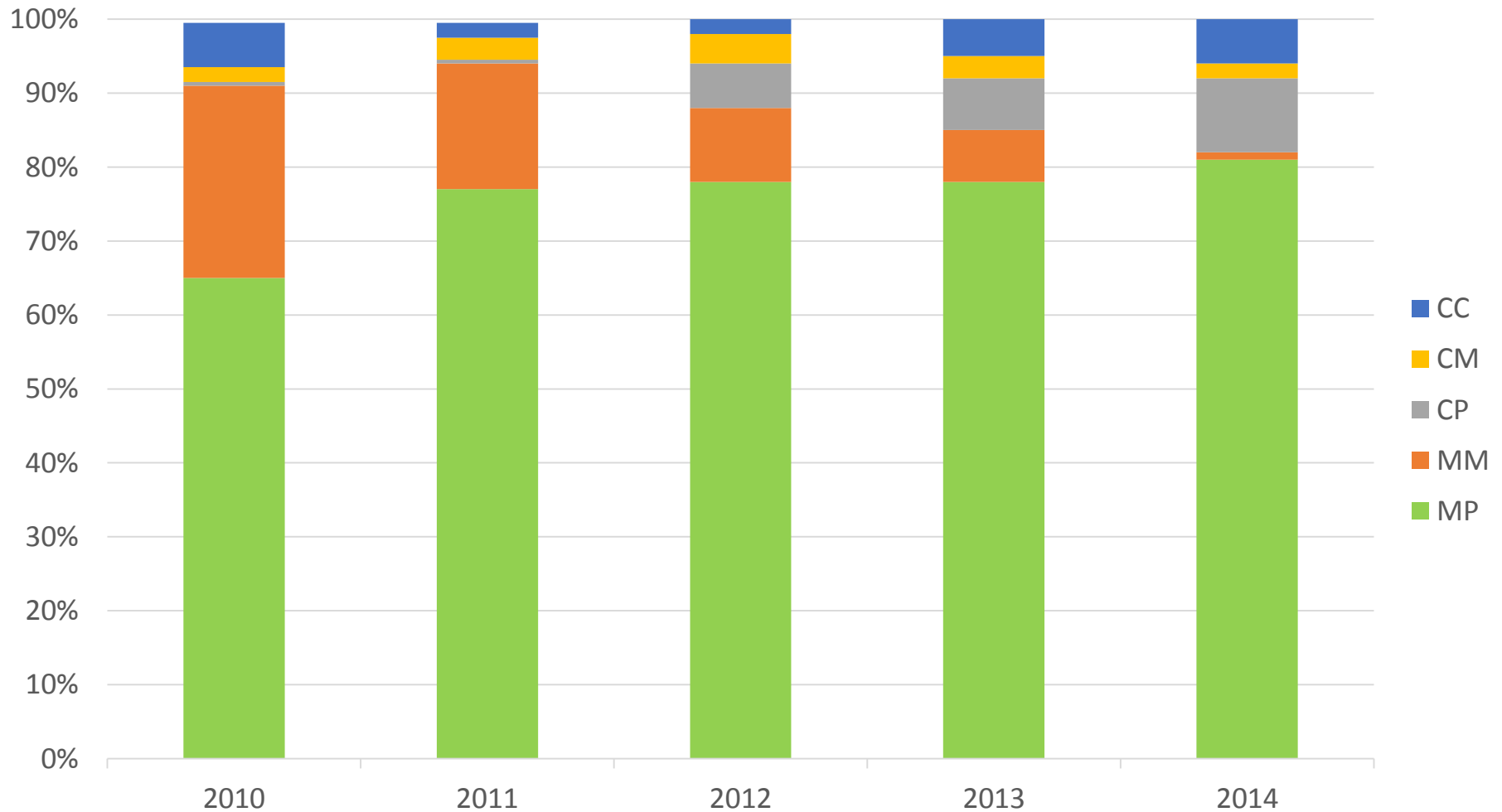
Hip replacement. Puglia, years 2010-2014



Results



Results

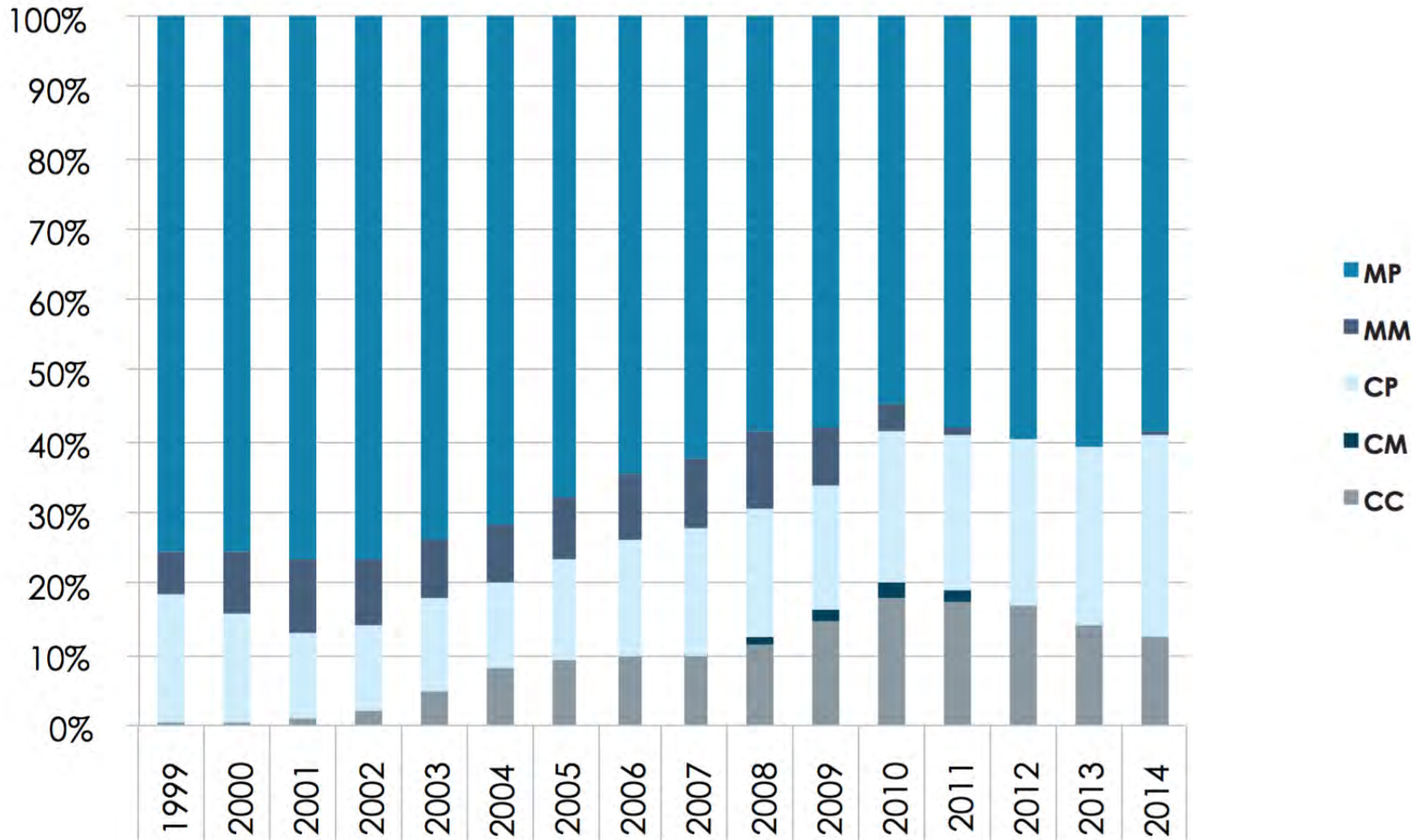


CC=ceramic-ceramic - CM=ceramic-metal - CP=ceramic-polyethylene - MM=metal-metal - MP=metal-polyethylene

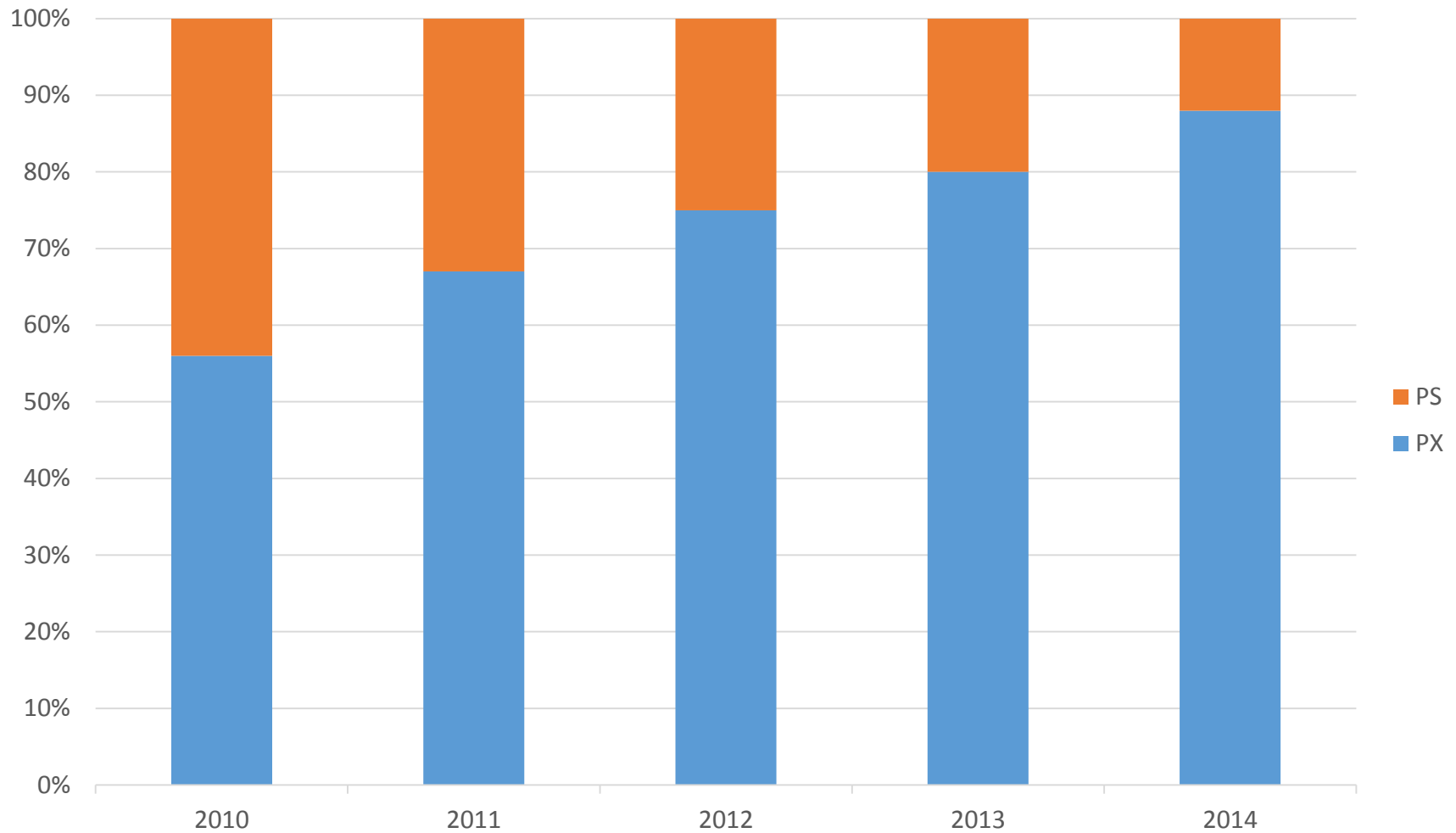
Results



% of Total operations within year

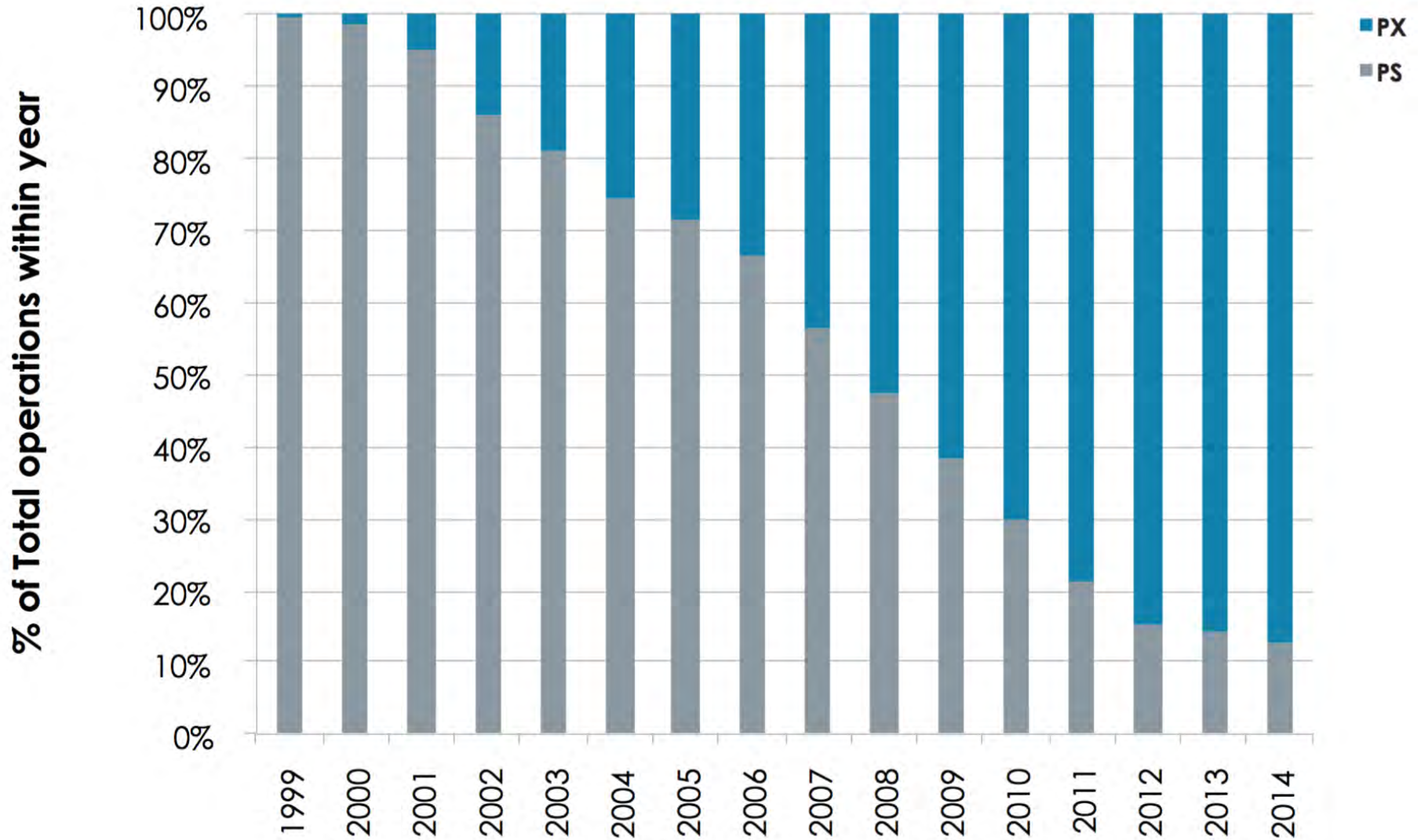


Results



PS = standard & PX = cross linked polyethylene

Results



Conclusion

Data recording of prosthetic hip implants are important both for the patients and specialists.

Can help to make a decision regarding the best bearing surface for the patient

Future studies with longer follow up need to evaluate questions pertaining to alternative bearings and longevity of the implants



Thanks!



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY



Best Practice in Total Hip Arthroplasty: Review of surgical practice based on the British National Joint Registry Standardised Revision Ratio"

W. Manning, P. Baker, P. Gregg, P. Howard , J. Holland

The Newcastle upon Tyne Hospitals 
NHS Foundation Trust

South Tees Hospitals 
NHS Foundation Trust

Derby Teaching Hospitals 
NHS Foundation Trust

National Joint Registry for England, Wales and Northern Ireland
 National Joint Registry
www.njrcentre.org.uk
Working for patients, driving forward quality

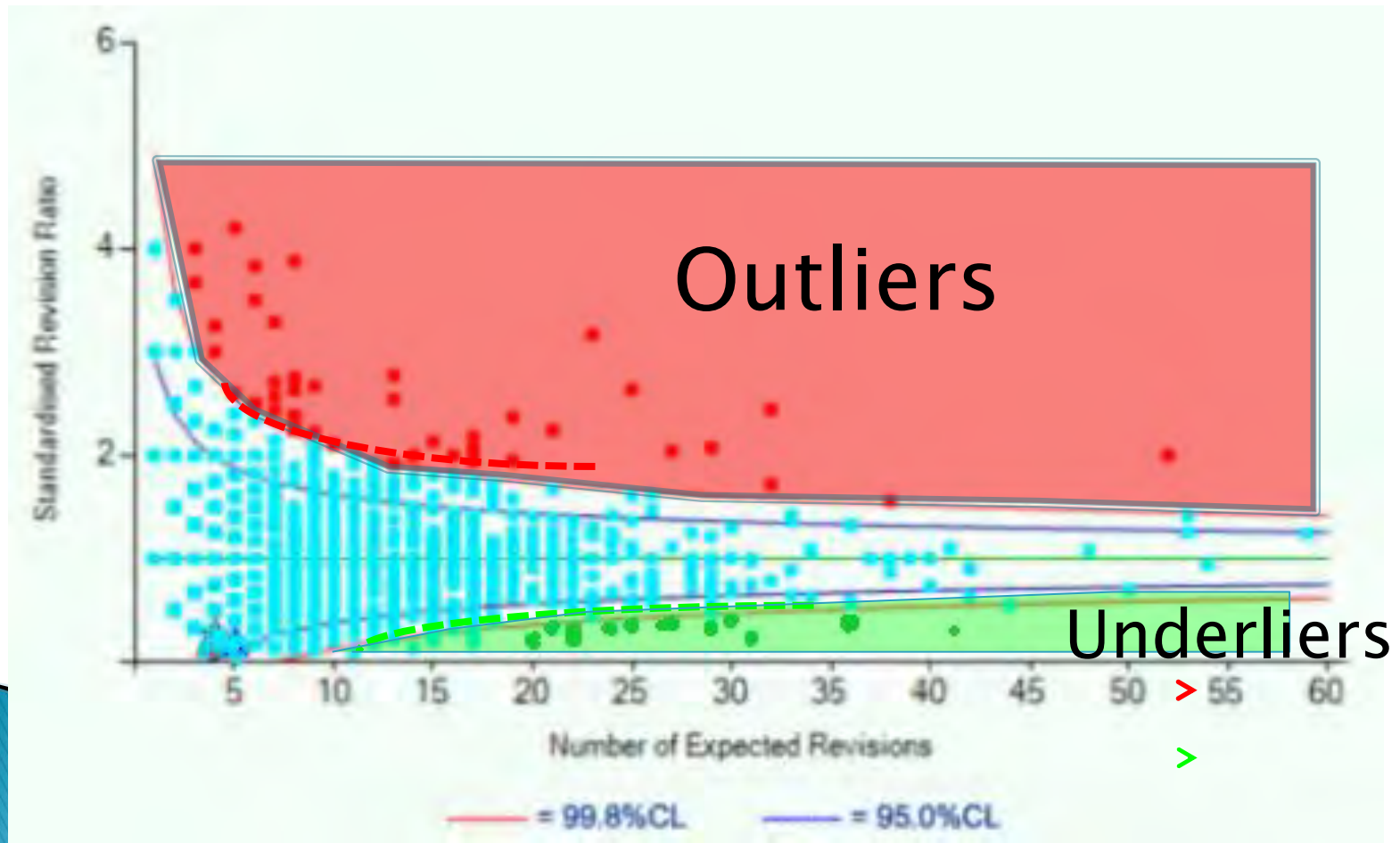
Background

- 5–20% Risks of Revision 10 years Post THA
- Level of THA Revision ↑ 49% last 5 year
- Success of primary THA optimum combination
 - surgeon, implant patient and hospital team.
- Current evidence:
 - individual implants, fixation technique, patient demographics, surgical techniques , surgical experience.
- No assessment of overall practice against a standard based on national averages.
- NJR 12y data with 800,000 THA. Asses the Model of Surgeon Practice Produces Lowest– Highest Revision Rate



Standard Revision Ratios

- SRR – Number of Revision/ Number of expected Revisions
 - Risk Adjusted for case load. (age, gender, diagnosis)
 - Confidence intervals dependent THA volume
 - +/– 2 SD m– 95% 3 SD 99.8%



Method

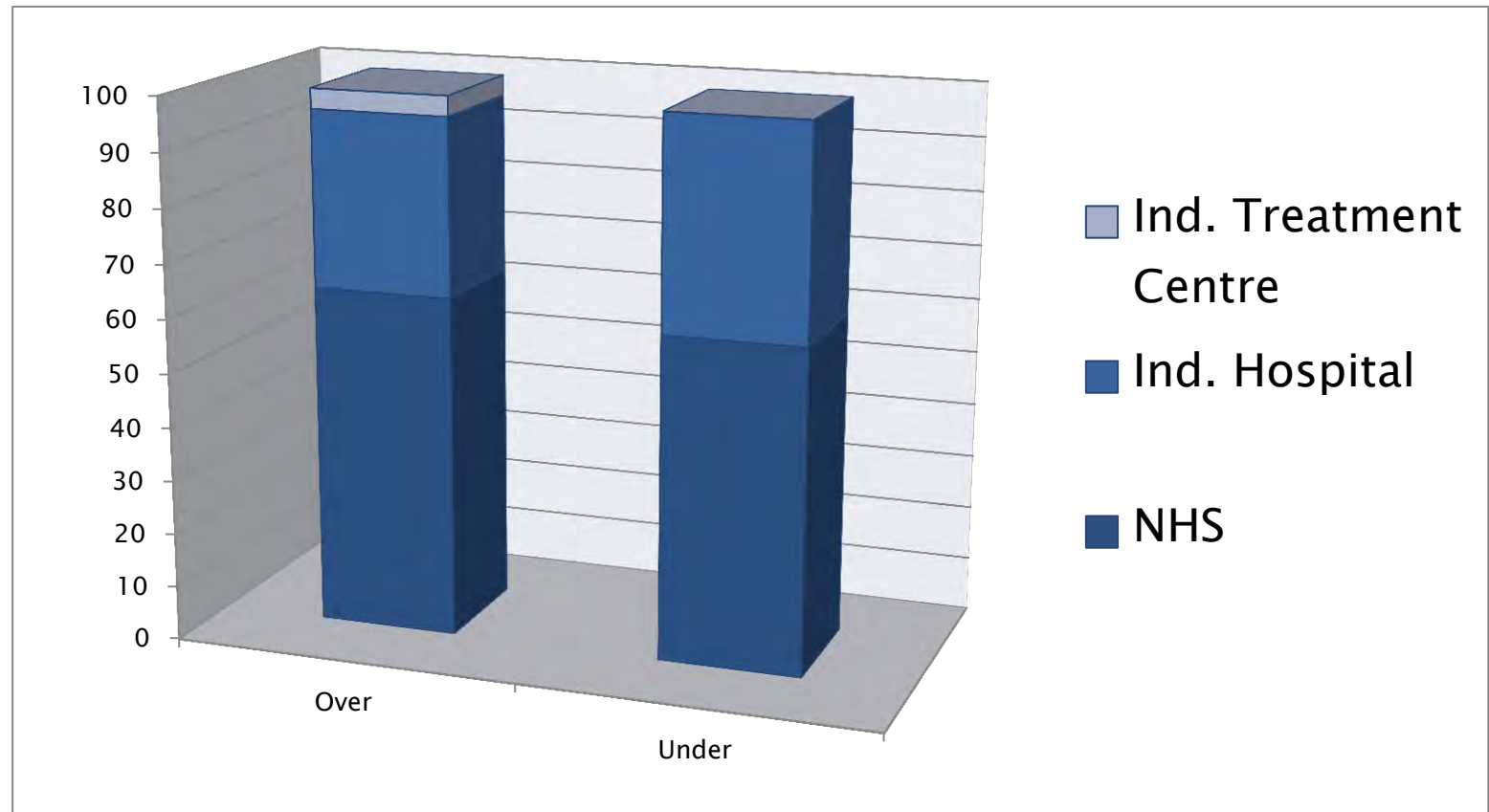
- ▶ Retrospective NJR THA Cohort 2003–14
- ▶ NJR funnel plot SRR was utilized to identify two Surgeon Groups
 - . \pm 3 SD Special Cause Variation
- Underliers, Outliers
- ▶ Comparisons
 - patient demographic
 - implant choice (cement, non-cement, bearing, head size)
 - surgeon factors (surgeon level, case load, surgical approach).
- ▶ Statistical analysis using RF Software
 - Combination of t -tests for continuous data, Fisher's and chi-squared tests for categorical data
- ▶ Excluded MoM bearing,
- ▶ Ethical and NJR approval.

Results

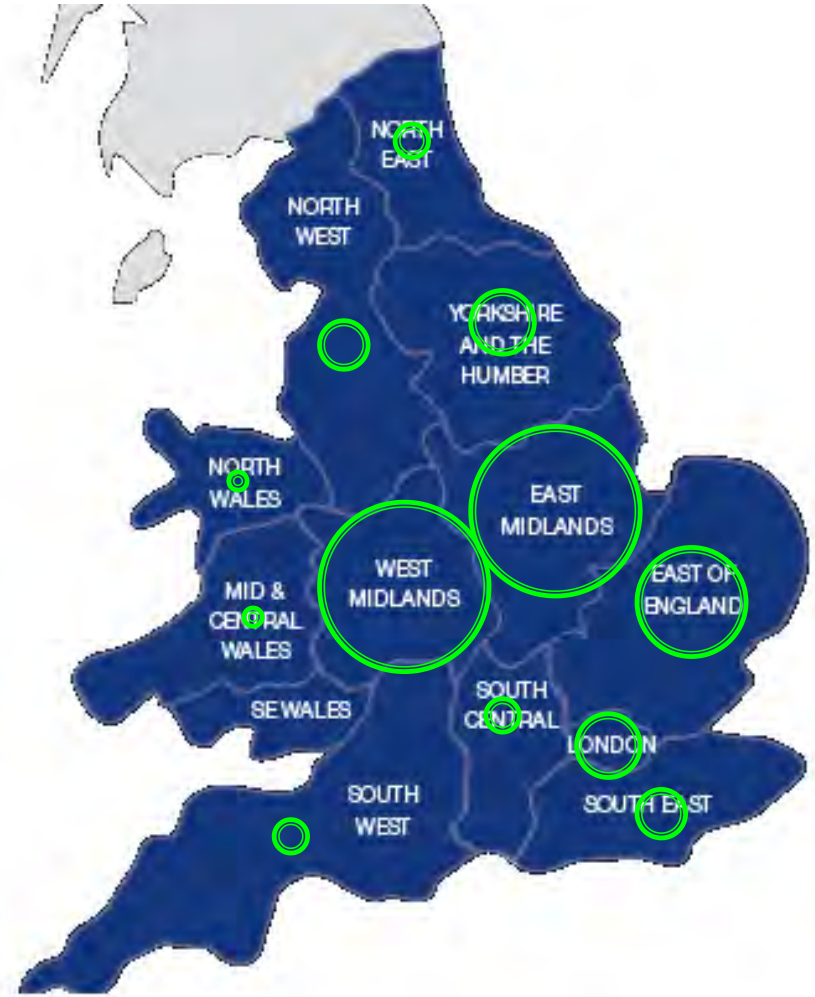
❖ 116 Surgeons, 120,000 THA, 214 Institutions.

		Outliers	Underliers
Surgeons		65	51
Years NJR		11.2	12.4
% Complex Primary		3.04	3.96
THA Totals		57,410	62,094
Procedure/year			
	THA	66 (10–312)	101 (42–378)
	TKA	43 (0–148)	54(1–123)
	E/S/A	0.3 (0–6)	0.02 (0–2)
Hospital Volume		135 (8.5–760)	155 (12–911)

Institution type



Geographical Variation

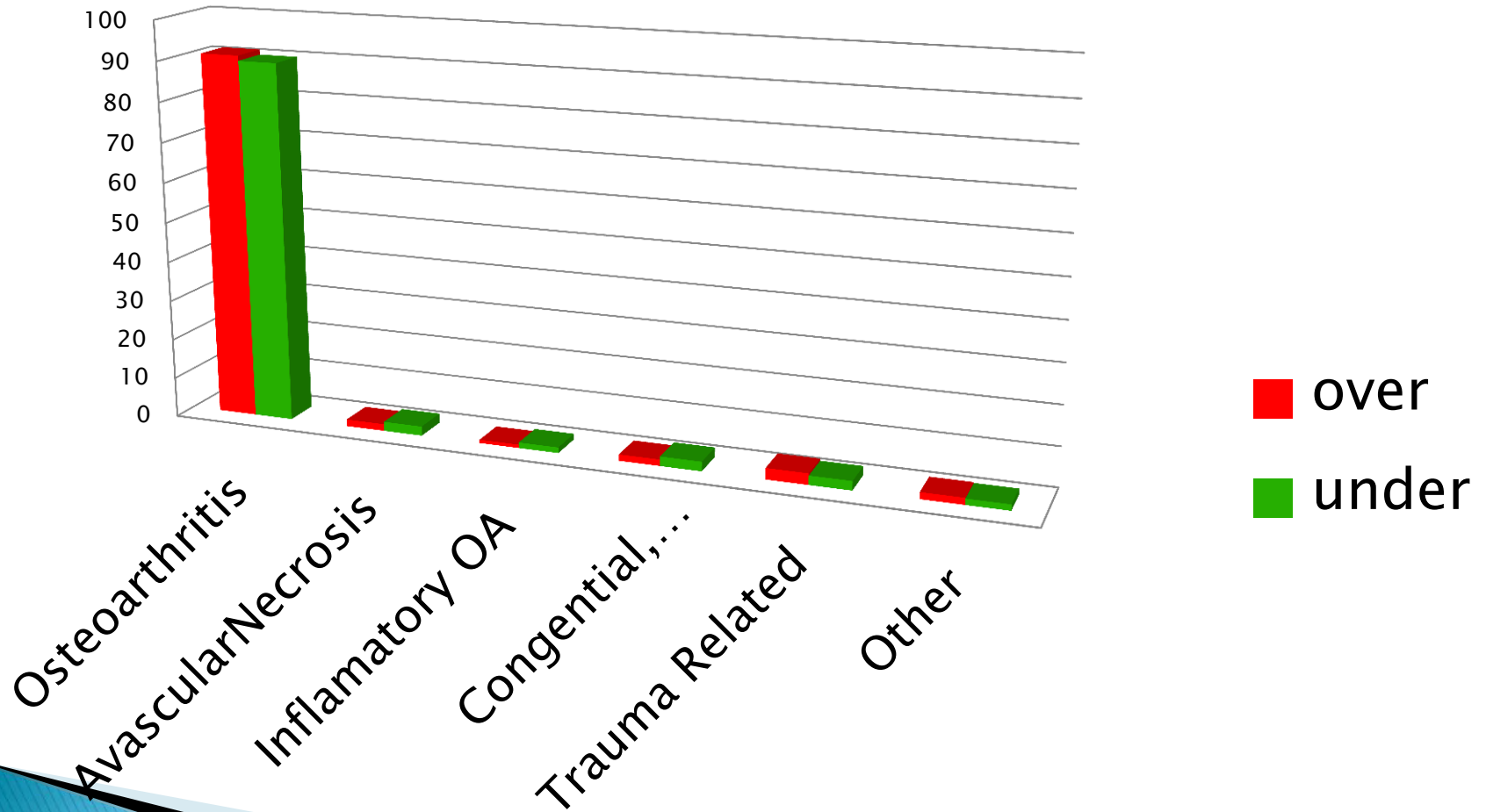


Patient Demographics

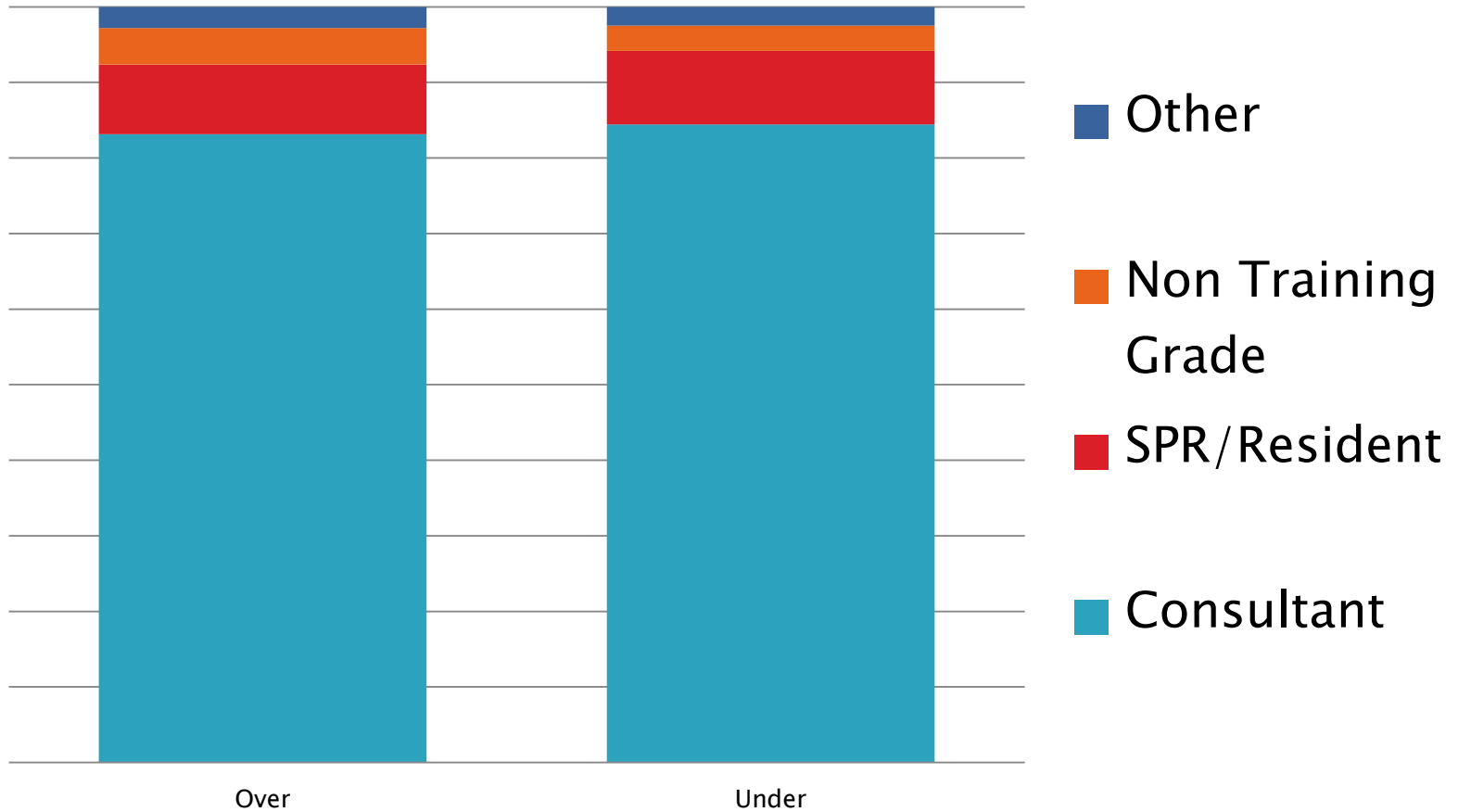
Study cohort			
Variables	Overlies (n =57,410)	Underliers (n =62,094)	p-value
Mean (SD) age (yrs)	67.5 (11.9)	66.7 (12)	< 0.001
Mean (SD) BMI (kg/m ²)	29.2 (14.2)	29.2 (17.4)	
BMI category n(%)	(n=30468)	(n=32846)	
20 to 25 kg/m ²	7285 (22)	6333 (21)	0.005
25 to 40 kg/m ²	22381 (74)	22381 (72)	
40 to 60 kg/m ²	1195 (3.4)	1111 (3.9)	
Gender (n, %)			
Female	34230 (60)	37457 (57)	0.001
Male	23179 (40)	26546 (43)	

ASA grade N (%)			
1	13484 (23)	14990 (24)	0.001
2	36468(63)	39985(64)	
3	7130(12)	6889 (11)	
4	313(0.6)	227(0.3)	
Side (%)			
Left	46	46	0.969 (ns)
Right	54	54	

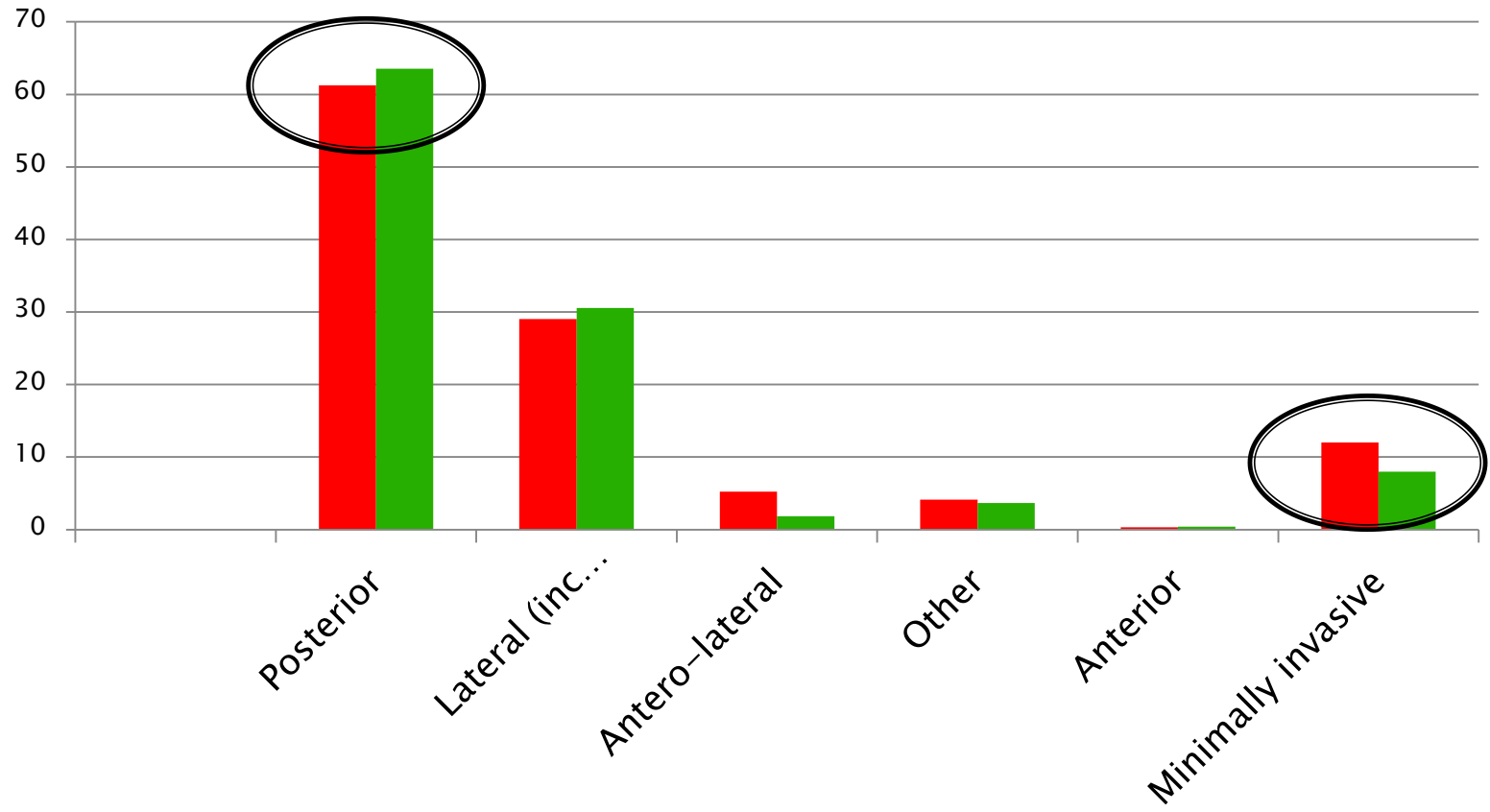
THA Indications



Surgical grade



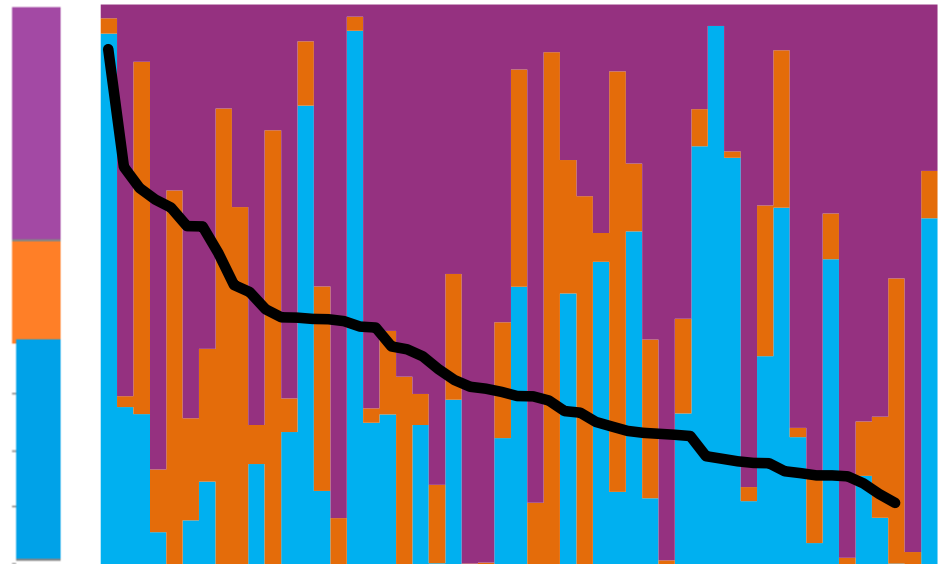
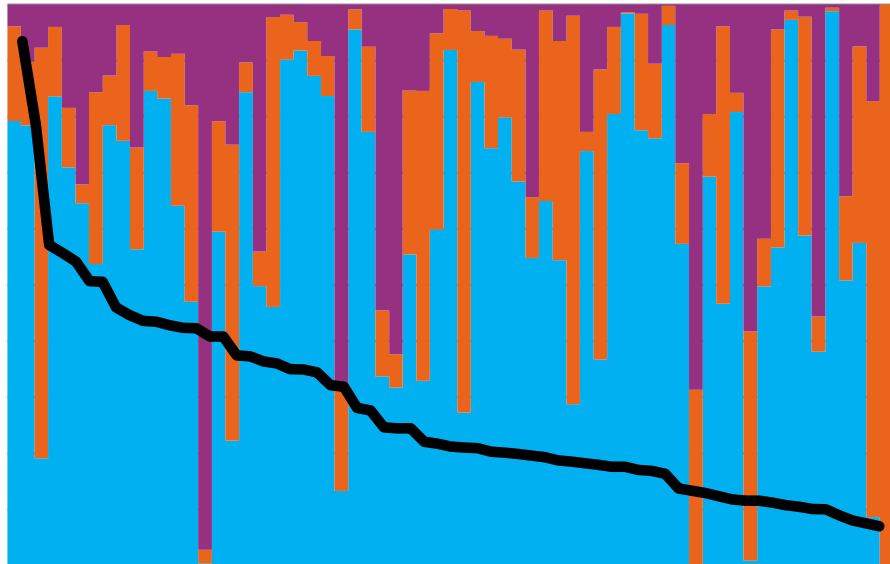
Approach



THA Fixation % of Practice

Outlier

Underlier



Uncemented

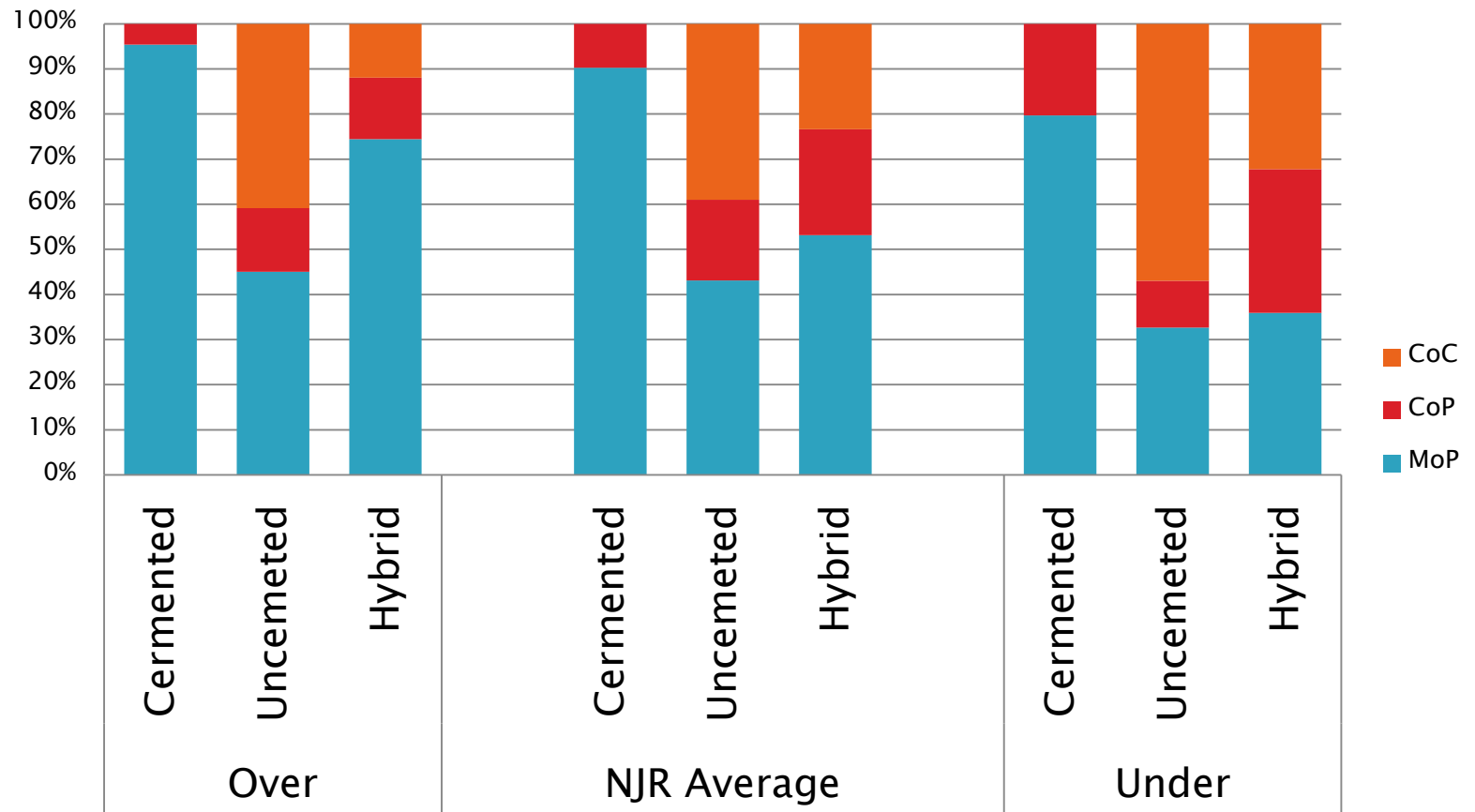
Cemented

Hybrid

Stemmed MOM usage 0.43% of underliersvs 8.5% of outliers

Resurfacing 9% both groups

Bearing Surface



Summary

▶ Surgeon Low SRR

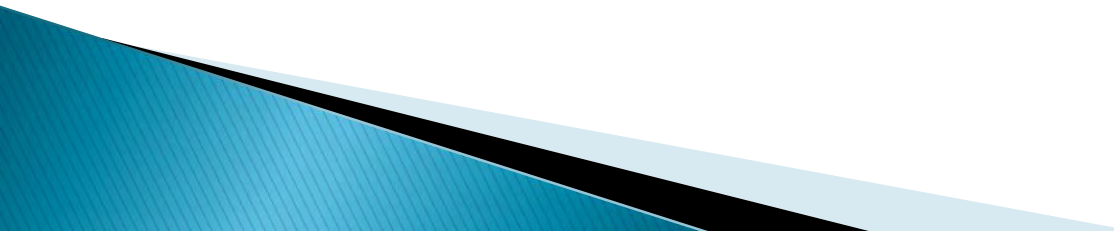
- Primary surgeon grade. Age, Gender, BMI, ASA, surgery complexity, and indication for surgery
- Small but statistically significant differences.

▶ Higher Volume Surgeons and Centres

▶ Highly significant Preference for Cemented Stems

- Primary MoP – Higher % Ceramic

▶ The Midlands hold 40% of all Underliers.

- Avoid minimally invasive surgery.
 - Lower threshold for bone grafting
 - Higher usage of Aspirin with lower adoption of newer agents
- 

Thank You

QUESTIONS





INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
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26-27 NOVEMBER 2015

MILAN, ITALY



Survey of UK consultant orthopaedic surgeons on surgeon specific data in orthopaedic surgery: a pilot study

U Ahmed MBBS PhD MRCS¹

S Malik¹, O Jarrall², Z Shah³, W Hart⁴, D Dunlop¹

1 - Royal Orthopaedic Hospital NHS Foundation Trust, Birmingham UK

2 - Imperial College, London, UK

3 - Guy's & St Thomas' NHS Foundation Trust, London, UK

4 - Royal Wolverhampton Hospitals NHS Trust, Wolverhampton, UK

Surgeon specific data

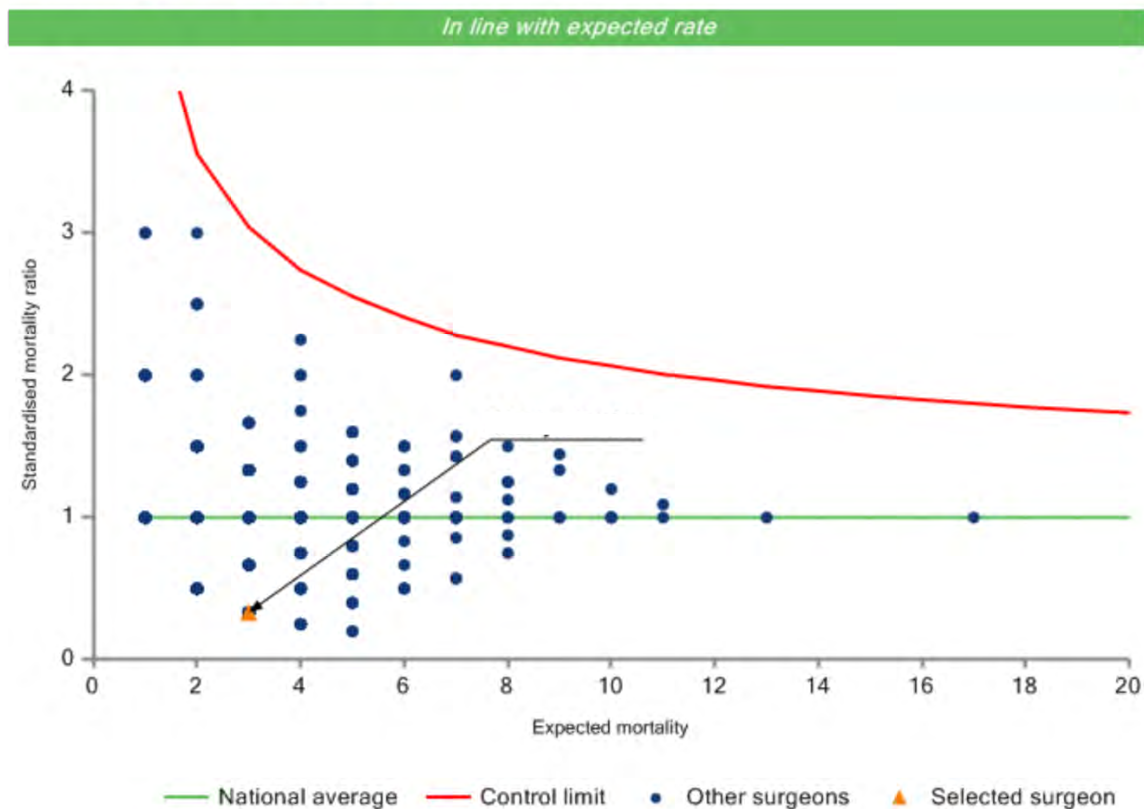


- To improve safety & standards
 - Reinforce trust
 - Create transparency
-
- Lack of essential data and consideration of variables
 - Usage of inappropriate outcome
 - Misguided focus (i.e. surgeon vs institution)
 - Risk aversion → Impact on training & innovation

Orthopaedic Data Publication

Data for 1st April 2003 to 31st July 2014

Surgeon risk adjusted 90-day mortality



Our study



- Based on the National Survey of Cardiothoracic Surgeons
- Adjustment of their validated questionnaire
- To guide debate & future policy decisions
- Likert scale answers with free text responses
- 6 themes – 27 questions

“What do you think the likelihood of surgeon specific mortality data being misinterpreted is by patients?

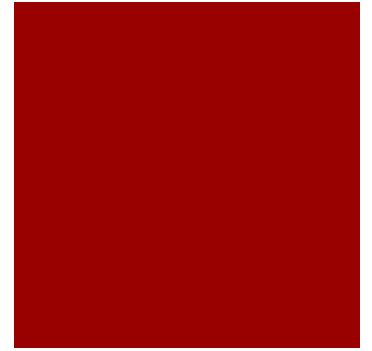
Extremely unlikely / unlikely / neutral / likely / extremely likely”

Pilot Data



- 25 surgeons participated from 3 hospitals
- Questionnaire completed online using Qualtrics anonymously
- Statistical analysis on SPSS v.22 (planned for analysis of data following more extensive distribution)

Pilot Data Summary



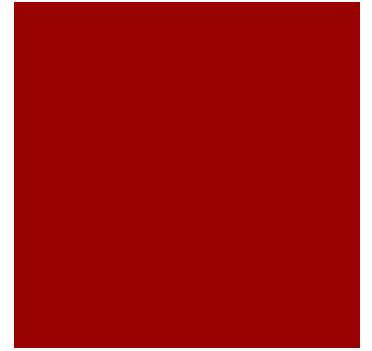
72%

Unit Specific Data

40%

Surgeon Specific Data

Pilot Data Summary

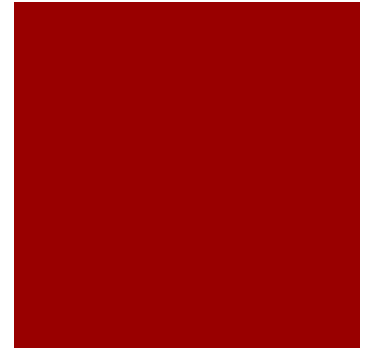


Misinterpretation of Data

84% by Patients

80% by Physicians

Pilot Data Summary



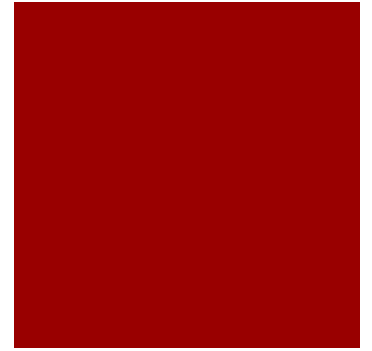
72%

Innovation

76%

Training

Pilot Data Summary

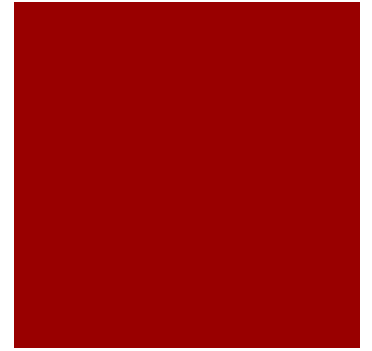


Risk Aversion

63% - Patient Selection

67% - Management

Pilot Data Summary



PROMS

Infection

Dislocation

84% - Insufficient Resources

52% - No Improvement

Conclusions



- Government Aims \neq Improvement in Patient Care
- Significant implications on innovation and training
- The publication of unit specific data is more favourable

HOSPITAL STRIKE CRISIS

DOCS IN FIRST WALKOUT IN HISTORY OF THE NHS

98% back action over Jeremy Hunt's 'dangerous' new contracts

REBUKED
Mr Cameron
& colleague
Mr Hunt



BY ANDREW GREGORY

JUNIOR doctors have voted to stage their first total walkout in NHS history.

Around 98% of the medical staff supported the strike action over a contract being introduced by Jeremy Hunt which staff warn will endanger patients.

One critic said the planned walkout proved David Cameron's Tories were guilty of 'appalling stewardship of the NHS'.

FULL STORY: PAGES 44-5

weekend



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY



Assessing Hospital Cost of Joint Arthroplasty

F Boniforti
HSRG Cefalu

Patients report
improvements in function
and pain relief after joint
arthroplasty

**TJR demand is
projected to substantial
growth**



Hypothesis

Reimbursement from the Regional Health Service can **cover the entire service** in a district Italian hospital.

Materials and methods

Gross costs for primary hip or knee replacement.
pre-admission, surgical procedure, in patient.

Costs and surgical activity for TJR over 3 months period
86 primary procedures, single surgeon in a single operating
theatre.

> **300** joint arthroplasty per year.

Reimbursement by the RHS for TJR was **8861,77** euro for
each procedure.

results

PreAdmission: 3.7 hours in our out patient clinic. All received orthopedic surgeon, anesthesiologist and nurse consultations. X-rays, blood samples, ECG and urine test were taken. Fifteen patients suffered for **co-morbidities** and specific evaluation was needed: 4 vascular, 6 cardiac, 3 diabetes and 2 respiratory disease. Clinical evaluations, notes set-up, tests and indirect costs for PA have been evaluated in **115 euro for each patient.**



Surgical Procedure antibiotic prophylaxis, vein lines, and urinary catheters. Epidural anesthesia. Wraps, gowns and gears 35 euro. Drugs, needles, catheters, drains, fluids 27 euro. Bone cement, surgical lavage, power bone saw and surgical drains 185 euro. av **240 euro**.

Average **time** 75 minutes. +45 minutes recovery.

two surgeons, anesthesiologist, scrubbed and runner and anesthesiologist nurse.

finance and personnel hospital department

880 euro/h SP

450 euro/h admission and recovery stages.

prosthesis cost: **2001euro**
1850 knee - 2175 hip

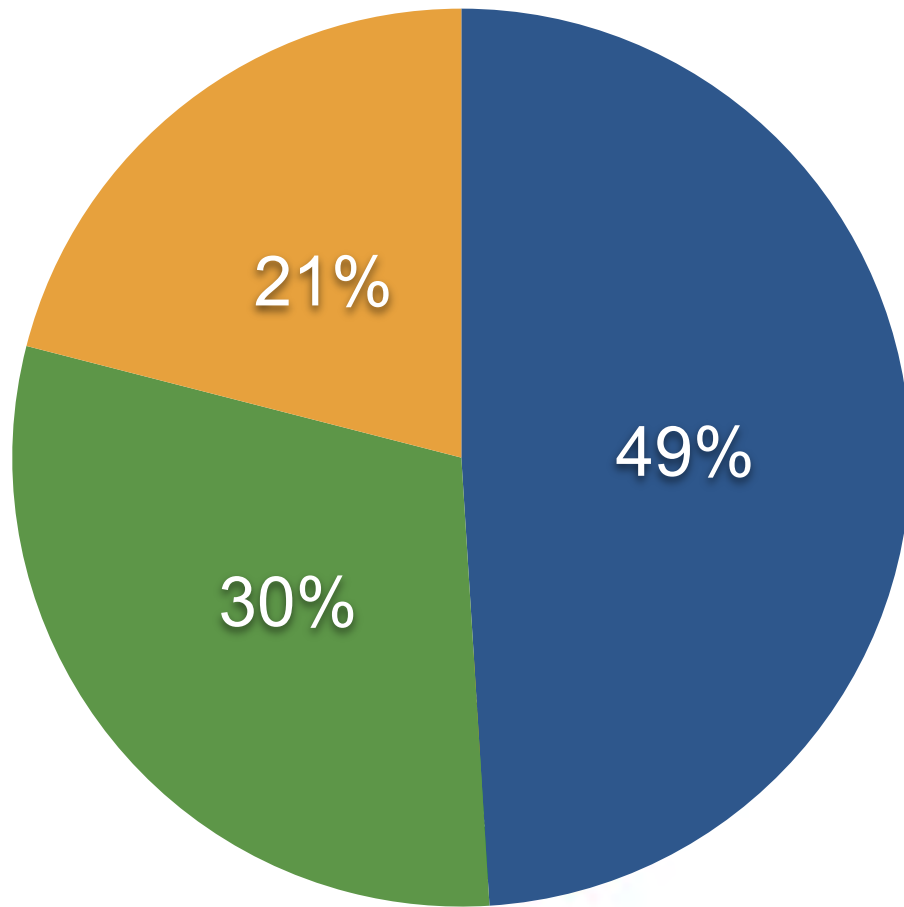
Gross surgical procedure step
cost
3798 euro for each patient.



InPatient

- **IP stage** has accounted on clinical assessments, fluids and drugs. One unit of blood has been transfused in 11 cases. An average 3 blood tests per patient, 2 ECG, one x ray of the operated joint, 2 surgical site dress, 3 bedsheets changes and 18 meals have been offered during IP.
- The stage has taken an average of **6 days**.
- Drugs and disposables pharmacy cost 39 euro each.
- Meals average of 113 euro each, logistic and administrative 28 each, laboratory test 107 each.
- To recover joint function, physiotherapy assisted sessions, doctors, nurses and health personnel support of the hospital unit cost **2637** each.
- The **IP stage cost 2924 euro each**.

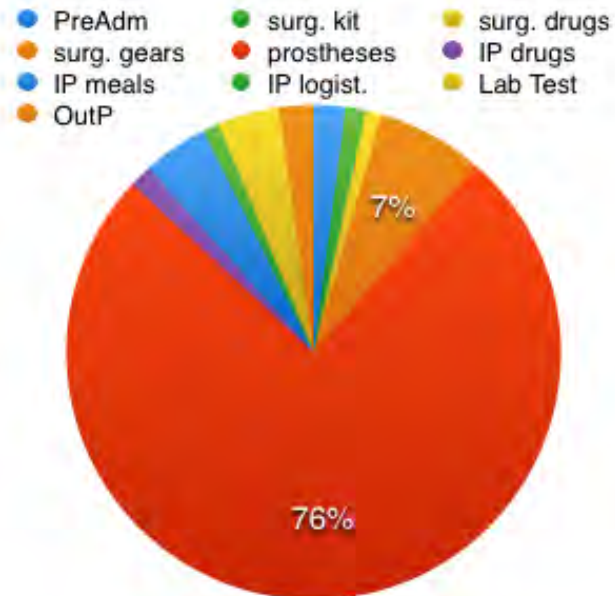
■ staff ■ gears ■ over



The gross cost of TJA
procedure at HSRG has been
esteemed in **6952** euro in front
of 8861,77 euro of
reimbursement

Fig. 1: Costs percentage on joint arthroplasty procedure reimbursement for staff, gears and other. Personnel and staff is half of the pie and 20% (other) should consider long term followup, innovation, investments and clinical complications.

PreAdm	55
surg. kit	35
surg. drugs	27
surg. gears	185
prostheses	2001
IP drugs	39
IP meals	113
IP logist.	28
Lab Test	107
OutP	60
TOTAL	2650



Tab 2: Cost of gears and instruments in euro for one patient procedure track. The implant price is 3/4 of the total amount.

Gears and instruments rely for 2650 euro and prosthesis is 2/3 of the costs.

discussion

Bumpass et al. reported **QUALY measurement** for hip and knee replacement describing big value and captured all the meaningful differences in costs and outcomes between the intervention and comparators.

limitation of our study. We considered only two clinical pathways, primary total **hip and knee** replacement.

Ideally, all elements of the care process would be tracked, but this is not always practical in a public health system given array of elements in the care process and the **complex system of care delivery.**



Standardized clinical pathway can reduce cost.

Our results showed the big amount of resource needed for personnel and staff involved in the PPT. Consequently, initiative such as fast-track surgery, enhanced rehabilitation programs, multidisciplinary clinical pathways and **standardized clinical care achieve hospital cost reductions** of nearly 20% (17,18).

The rate of **hospital volume** is also significant considering costs for TJA in front of hospital with volume under 100 implant a year (19, 20).



The **price of prostheses** was nearly steady in the last decade.

Development of National Registries and the Registro Italiano Artroportesi (RIAP) support the **standardization of implant selection**. Our Regional Health Service provide more than 12000 implant in a year and when purchases operate in equipment as a network rather than individual needed, further saving are possible.

With the continuing economic downturn and health **budgets reducing**, more effort to compensate the **need of innovation and saving** should contain the new pressure to already strained finances.

conclusion

Personnel resource fee ~50% of all reimbursement.

Stakeholder has to consider **network** rather than individual **purchases**.

High-quality data are essential to drive resource allocation and robust methodologies should be used to pave the way of the patient performance track.



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY





National Joint Registry

www.njrcentre.org.uk

Working for patients, driving forward quality



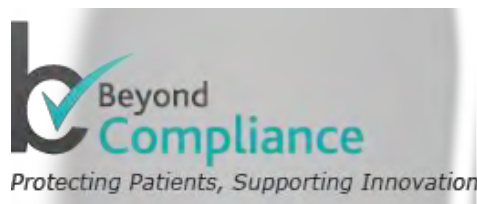
HOW GRANULAR DO YOU WANT YOUR REGISTRY DATABASE TO BE?

KEITH TUCKER

NJR IMPLANT PERFORMANCE COMMITTEE

ODEP

BEYOND COMPLIANCE



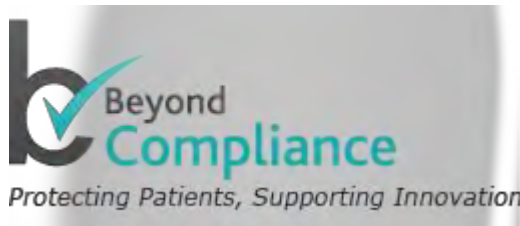
MILAN 2015



CONFLICT OF INTERESTS

- CHAIR ODEP
- CHAIR BEYOND COMPLIANCE
- MEMBER NJR IMPLANT PERFORMANCE COMMITTEE (EX CHAIR)
- I HAVE MY EXPENSES PAID FOR THE ABOVE ACTIVITIES BUT NO SALARY
- MEMBER ISAR COMMITTEE
- MEMBER ICOR COMMITTEE
- STOCK HOLDER ACCENTUS MEDICAL (AGLUNA)

- MARTYN PORTER
 - RICHARD ARMSTRONG (Northgate)
 - CLAIRE NEWELL (Northgate)
 - MARTIN PICKFORD (Northgate)
-
- EPRD





WHO LOOKS AT THE DATA?

HOW GRANULAR DO YOU WANT YOUR REGISTRY DATABASE TO BE?

NJR IMPLANT PERFORMANCE COMMITTEE SUPPLIER FEEDBACK ODEP BEYOND COMPLIANCE UDI

HOW GRANULAR DO YOU WANT YOUR REGISTRY DATABASE TO BE?

NJR IMPLANT PERFORMANCE COMMITTEE

- SCANS NJR DATA BASE EVERY 6 MONTHS FOR IMPLANT OUTLIERS
- NJR HAS MISSED SOME OUTLIER DEVICES
- MAINLY DUE TO “CAMOUFLAGE”

“CAMOUFLAGE”

- WHERE BIG DATA CAMOUFLAGES OR OBSCURES A MODIFICATION WITHIN A RANGE
- EXAMPLE:-
- 10,000 RECORDS OF A WELL KNOWN AND EXCELLENTLY PERFORMING TKR WITH AN OVERALL PTIR OF 0.32 (GROUP AVERAGE 0.43)
- A VARIANT WITHIN THE RANGE HAS A PTIR OF 5.0 (n 450)
- THE VARIANT DOES NOT REALLY INFLUENCE THE OVERALL PTIR



National Joint Registry

www.njrcentre.org.uk

Working for patients, driving forward quality

SUPPLIER FEEDBACK

- COMPANIES HAVE ACCESS TO THEIR DATA
- **COMPANIES WON'T FIND OUT ALL ABOUT THEIR PRODUCTS UNLESS ADEQUATE GRANULARITY AND ADEQUATE LIST OF ATTRIBUTES**

USE OF ODEP BENCHMARKS (HIPS)



Basket 'spreadsheet'

Type	Bearing Mobility	c o d e	Dishing Variant	Tibia Type	Tibia Material	c o d e	Tibia surface finish	Tibia Fixation	Insert Material	c o d e
TKR CR	Fixed or mobile		Standard dished	All Poly or MB	TiAlV or CoCr		Polished or matt	Cement porous plus HA	Poly or cross linked	
TKR PS	Fixed or mobile		Standard PS	All Poly or MB	TiAlV or CoCr		Polished or matt	Cement porous plus HA	Poly or cross linked	
UNI	Fixed or mobile		Standard	All Poly or MB	TiAlV or CoCr		Polished or matt	Cement porous plus HA	Poly or cross linked	
PFJ	Fixed or mobile		N/A	N/A	N/A		N/A	N/A	N/A	
Bi Condylar	fixed		standard	All Poly or MB	TiAlV or CoCr		Polished or matt	Cement porous plus HA	Poly or cross linked	



- LARGE LIST OF ATTRIBUTES
- SET IN A MATRIX
- AGREED DEFINITIONS
- INTERNATIONALLY AGREED



EXAMPLES OF ATTRIBUTES ACETABULUM

H1.1		Acetabular Component		Business Rules
	Type	Type	Modular Monobloc Surface replacement cup Preassembled Prefixed Reconstruction shell Dual mobility	Single selection
		Sub Type	Revision specific	Single selection
	Material	Bone Facing Composition	Polyethylene Cobalt-Chrome Titanium/titanium alloy Stainless steel Al ₂ O ₃ - ceramic ZrO ₂ - ceramic Al ₂ O ₃ / ZrO ₂ - ceramic Tantalum Porous metal Other Other description	Single selection 'Other description' is free text and must be completed if 'Other' selected. Option only available if 'Other' is selected

Hips				
H1.1	Acetabular Component		Business Rules	
		Polyethylene Modification	No cross-linking Moderately cross-linked (<50kG) Highly cross-linked (>=50kG) Heated treated on or above melting point Heated treated below melting point Vitamin antioxidant Chemical antioxidant Other Other description None	Multiple selection If 'None' selected then no other options can be selected Only one of the following 3 can be selected: 'No cross-linking', 'Moderately cross-linked (<50kG)', 'Highly Cross-linked (>=50kG)' Only one of the following can be selected: 'Heated Treated on or above melting point' 'Heated Treated below melting point' 'Other description is free text and must be completed if 'Other' selected. Option only available if 'Other' is selected Only applicable if 'Composition of articulating substrate' = Polyethylene
	Fixation	Primary Fixation Method	Cemented Cementless MILAN 2015	Single selection

EXAMPLES OF ATTRIBUTES

H1. Femoral Component			Business Rules
5			
		Texture	Polished (Ra <=0.1um) Smooth (Ra >0.1 to <=0.4um) Satin (Ra >0.4 to <=1.0um) Matt (Ra >1.0 to <=2.5um) Rough (Ra >2.5 to <=12.5um) Textured (Ra >12.5) Porous structured Macro structured Other Other description
		Shape	Straight Curved Anatomical Anteverted Collared Slotted Single taper Double taper Triple taper Locking screws High offset Standard offset Other Other description





- 2015 BUILDING SYSTEM
- GLOSSARY
- SPRING 2016 TESTING
- AUTUMN 2016 GO LIVE IN NJR LAND AND GERMANY
- BIGGEST REGISTRY IN THE WORLD



- LOADING UP.....

NOT AT ALL!

ALL THE DATA LIES BEHIND THE COMPONENT
CATALOGUE NUMBER



HOW WILL IT AFFECT MANUFACTURERS

- TAKES LONGER TO POPULATE DATABASE
(Glossary will help)
- SUPPLIER FEEDBACK MUCH RICHER
- ONCE DONE IS DONE FOR GERMANY AND NJR



UDI

- SWIPE THE BARCODE
- SEE THE BASIC DATA
- LINK TO THE WEB
- SEE THE REGISTRY DATA
- SEE THE NUMBERS USED AND THE ODEP RATING



MY VIEW

GO GRANULAR ++

USE THE GRANULARITY FOR EVALUATION

HOW GRANULAR DO YOU WANT YOUR REGISTRY DATABASE TO BE?



WHAT DO YOU THINK?

HOW GRANULAR DO YOU WANT YOUR REGISTRY DATABASE TO BE?



INTERNATIONAL COMBINED MEETING

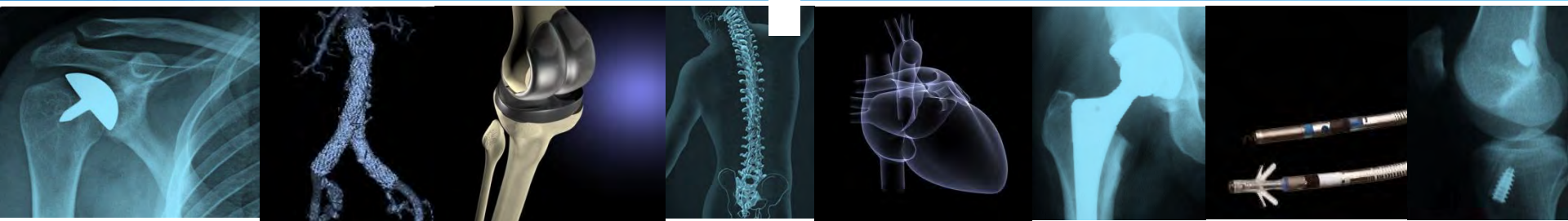
BRITISH HIP SOCIETY
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26-27 NOVEMBER 2015

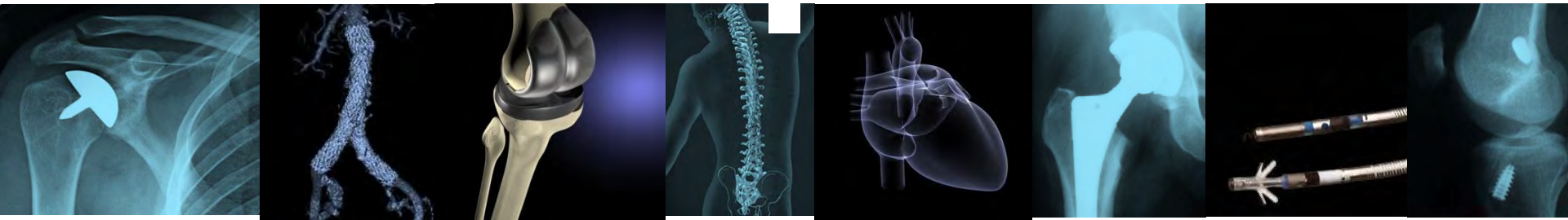
MILAN, ITALY



SIDA BHS COMBINED MEETING



Outcomes of 629 Revision Total Hip Arthroplasties



Monti Khatod, M.D.,
Inacio Ph.D., Alan L. Schepps, MS, Elizabeth W. Paxton, MA, .
., Guy Cafri, Ph.D., Maria C.S.

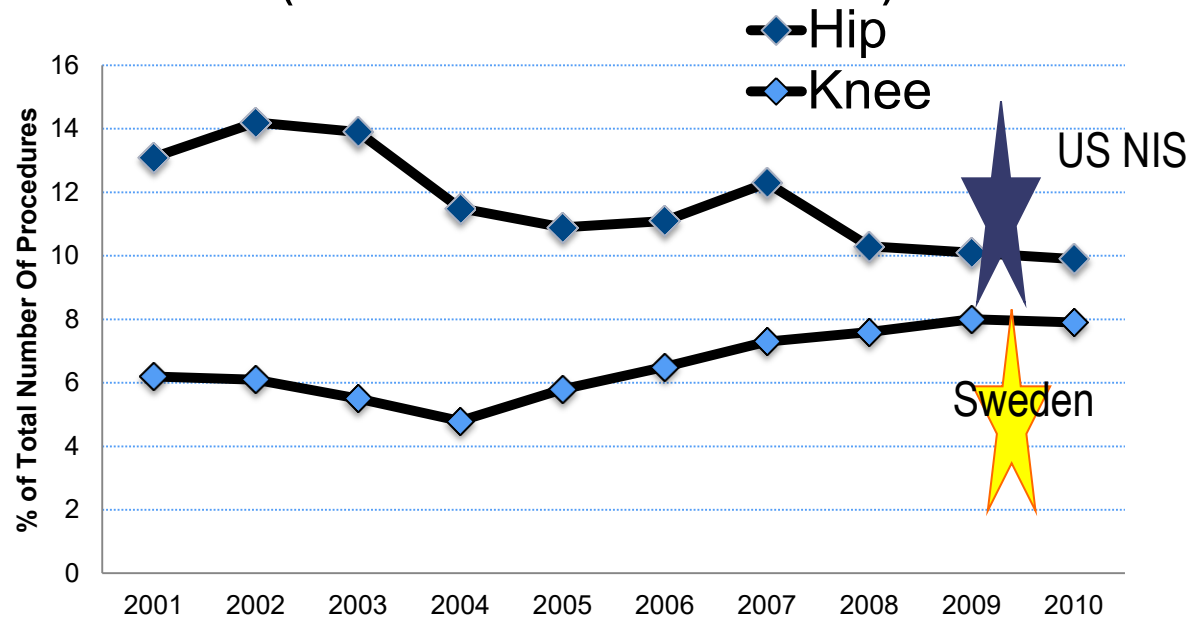
Study Author associations

- Stefano A. Bini, MD
 - Health Care Advisory Board, NOKIA
 - Medical Advisory Board, CaptureProof.com
 - AAHKS Board (Chair International Committee)
 - AAOS Biomed. Eng. Committee
 - Arthroplasty Today, Associate Editor (international)
 - Journal of Arthroplasty, Editorial Board
 - Reviewer JBJS, CORR, Acta

- Co-authors have no conflicts

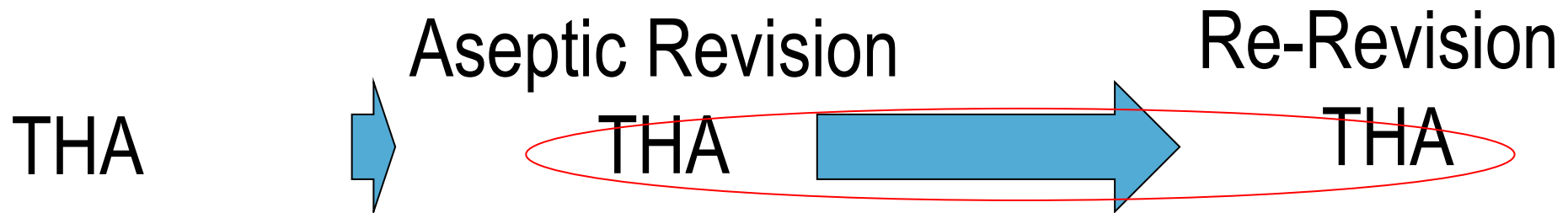
Background

- The incidence of revision Total Hip Arthroplasty (rTHA) is an ongoing concern in the United States
 - 13.7% 2009 (J. Drew AAHKS 2013)



Purpose

- To identify risk factors associated with the re-revision of a total hip arthroplasty previously revised for aseptic reasons



Methods

- U.S. based Total Joint Replacement Registry was utilized
- 44 medical centers
- 177 surgeons
- 6 U.S. Geographical regions
- Demographically representative of the US Population
 - Slightly older
 - Fewer Hispanics

Methods

■ Inclusion Criteria

- Primary and initial Revision surgery performed within KP and recorded in
- Initial revision performed for aseptic causes

■ Outcome of Interest

- Re-revision surgery for ANY reason (rTHA)

Methods

- Exposures of Interest
 - Patient factors:
 - Age, Gender, Race, BMI, ASA
 - Diagnosis: Instability as reason for initial revision
 - Implant factors:
 - Fixation type, Component(s) replaced, Bearing surface, Head size, use of constrained liner
 - Surgeon factors:
 - Average yearly volume of rTHA
 - Running total of rTHA

Statistical Analysis

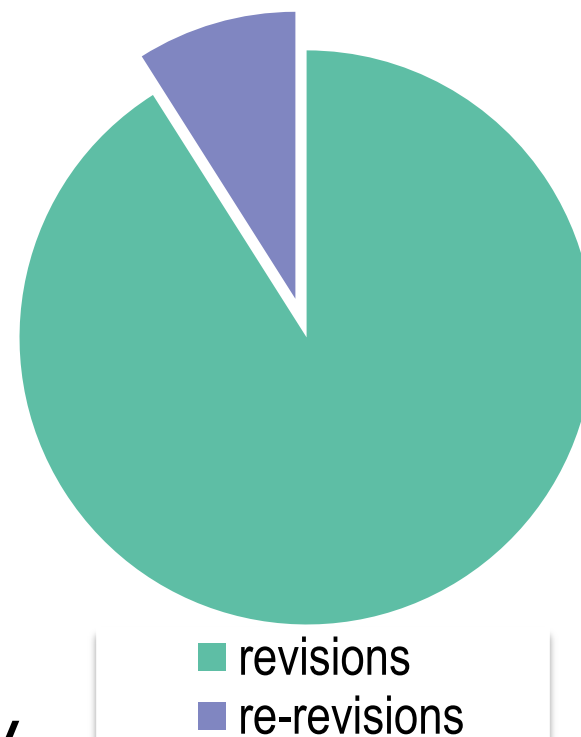
- Frequencies proportions means and standard deviations were used to describe the study sample
- After using multiple imputation for missing data, a multivariable Cox regression model using the robust standard error approach to account for clustering by surgeon was generated.
- The response variable was time to revision in years, with loss to follow up treated as censored cases
- Significance testing for proportional hazards was performed
- Alpha = 0.05 was used as the threshold for statistical significance

Implant and procedure characteristics

- 97.3% of revision implants were uncemented
- 54.2% involved revision of the femur only
- 60.6% used metal on HXLPE
- 51.3% used heads smaller than 36mm
- 79.8% of revision cases were performed by surgeons doing less than 10 revisions per year

Results

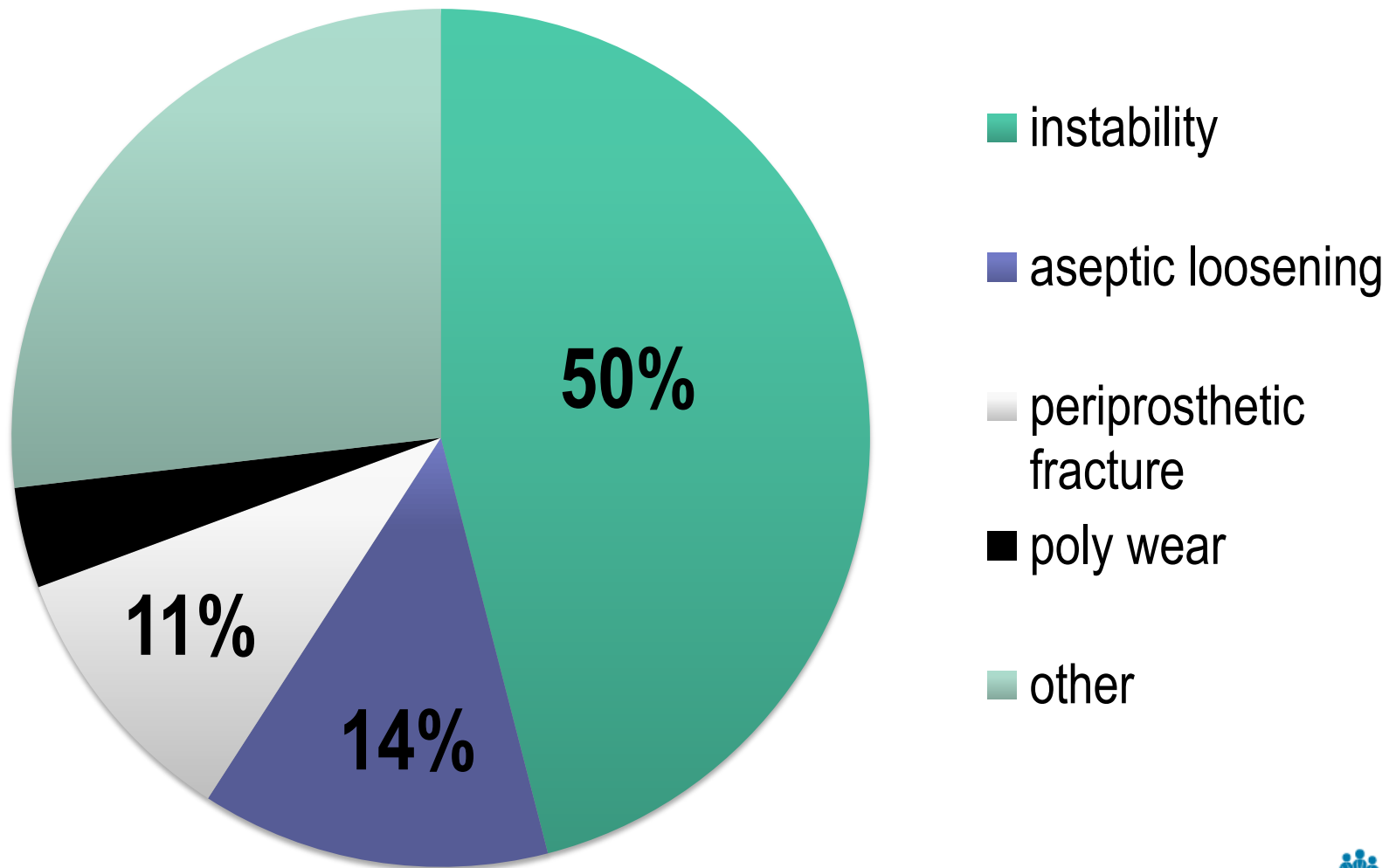
- **629** aseptic revision THAs
- Median f/u of **2.2** years
- Crude re-revision rate **10%**
- Infection rate **2.9% (18)**
- KM survivorship at 5 years **86.8%**



Results: Reasons for Revision

	<i>Revision</i> (N=629)	<i>Re-Revision</i> (N=63)
	N (%)	N (%)
Instability	315 (50.1)	27 (42.9)
Aseptic Loosening	90 (14.3)	6 (9.5)
Peri-prosthetic Fracture	70 (11.1)	2 (3.2)
Other	69 (11.0)	2 (3.2)
Femoral Fracture	36 (5.7)	1 (1.6)
Polyethylene Insert Wear	26 (4.1)	1 (1.6)
Leg Length Inequality	22 (3.5)	0 (0.0)

Reason for initial aseptic THA revision (N=629)

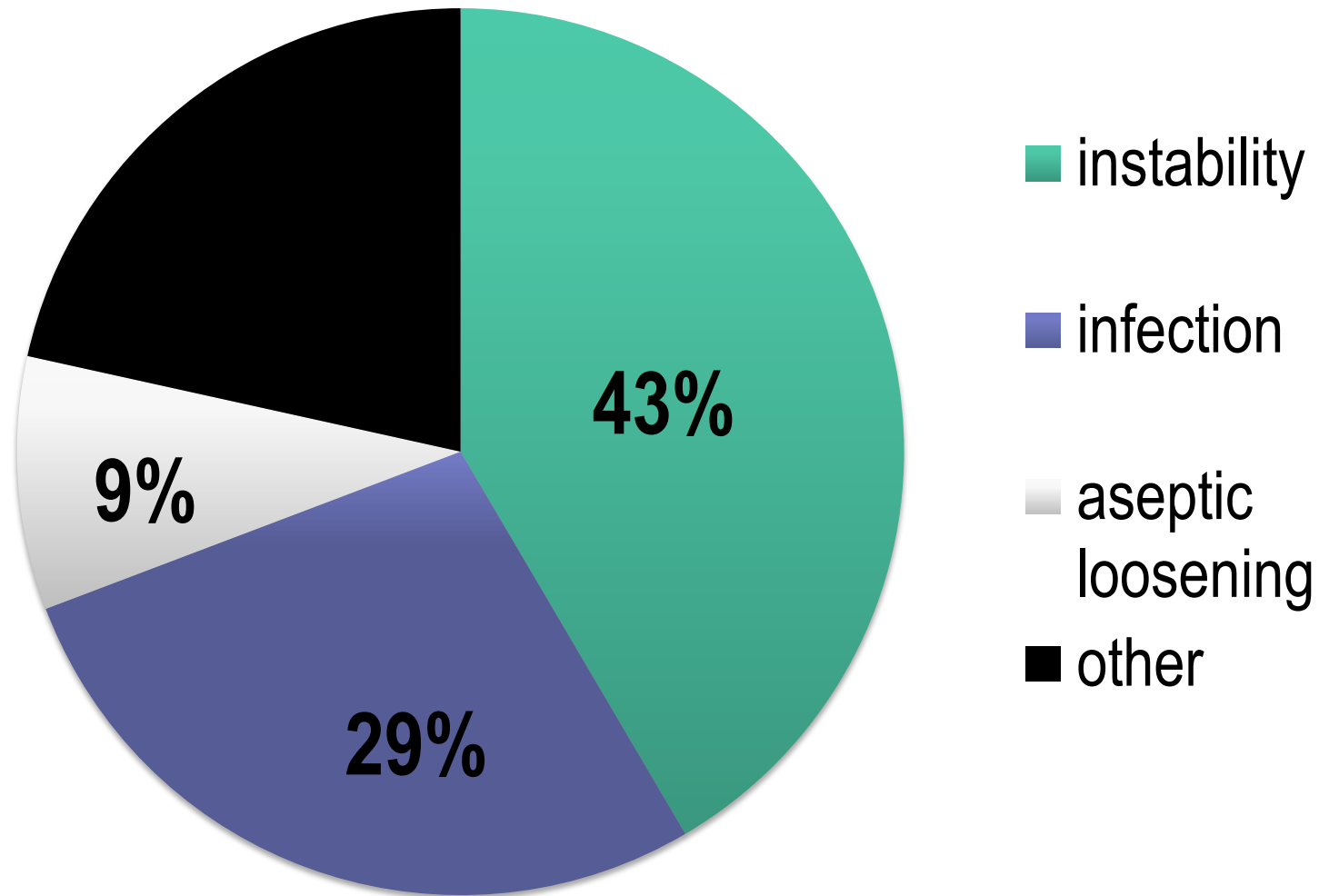


Results: Reasons for Re- Revision (N=63)

	<i>Revision</i> (N=629)	<i>Re-Revision</i> (N=63)
	N (%)	N (%)
Instability	315 (50.1)	27 (42.9)
Aseptic Loosening	90 (14.3)	6 (9.5)
Peri-prosthetic Fracture	70 (11.1)	2 (3.2)
Other	69 (11.0)	2 (3.2)
Femoral Fracture	36 (5.7)	1 (1.6)
Polyethylene Insert Wear	26 (4.1)	1 (1.6)
Leg Length Inequality	22 (3.5)	0 (0.0)
Osteolysis	11 (1.7)	0 (0.0)
Component Fracture	10 (1.6)	2 (3.2)
Cup Malposition	9 (1.4)	0 (0.0)
Metallosis	8 (1.3)	0 (0.0)
Hematoma	8 (1.3)	0 (0.0)
Acetabular Fracture	6 (1.0)	3 (4.8)
Wound Drainage	3 (0.5)	3 (4.8)
Seroma	1 (0.2)	0 (0.0)
Wound Dehiscence	1 (0.2)	0 (0.0)
Infection	0 (0.0)*	18 (28.6)

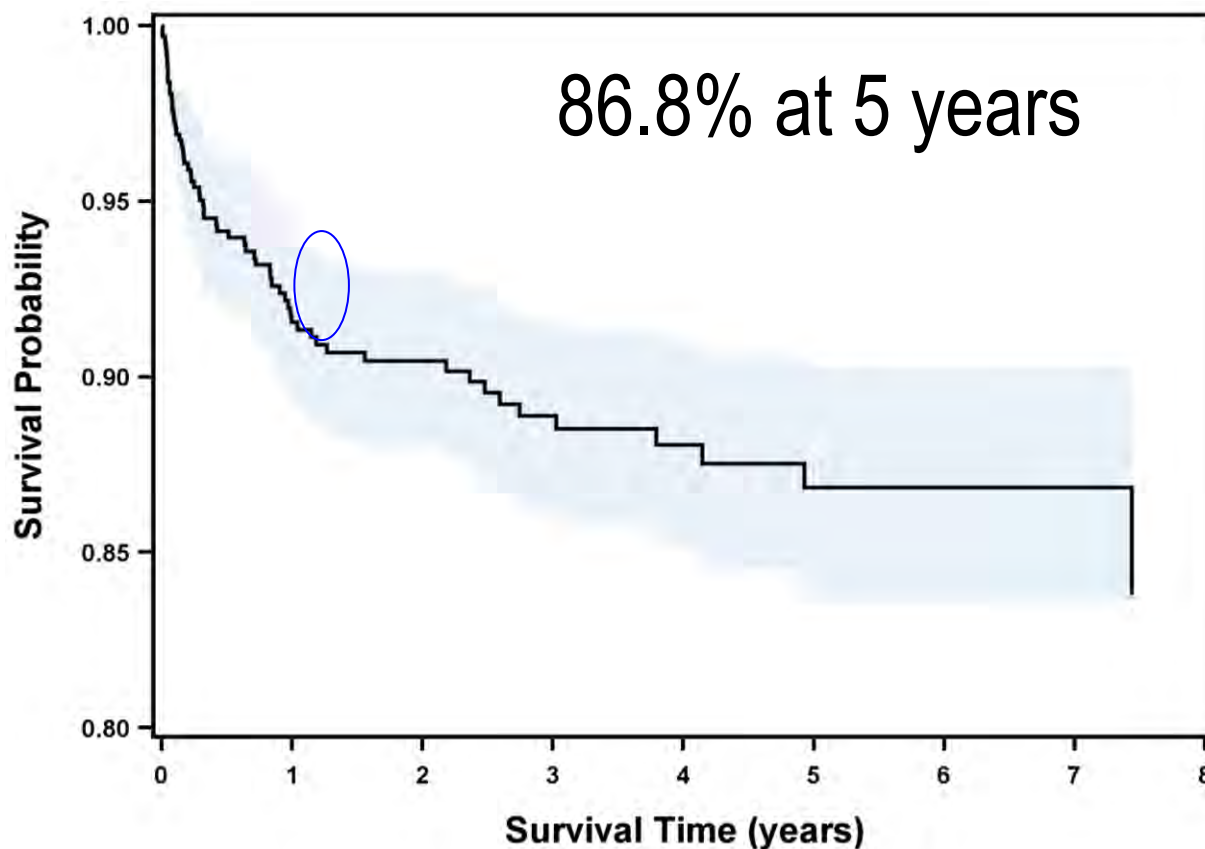
*Only aseptic revisions were included in the sample.

Reason for Re-Revision



Results

- Kaplan Meier Survival for Revision Hip Arthroplasty to Re-Revision Surgery



Cox Regression Significant Results

- **Lower Risk of re-revision**
- **Patient age**
 - 10 year increase HR 0.72 (95% CI: 0.58 – 0.90, $p=0.004$)
- **Surgeon experience**
 - 5 case increase in experience HR 0.93 (95%CI: 0.86-0.99, $p=0.049$)
- **Bearing surface**
 - COP vs MOP HR 0.32 (95% CI: 0.11-0.95, $p=0.040$)
 - Head size NS (end point revision, not dislocation)



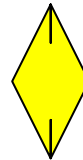
Cox Regression

- **Higher** risk of re-revision
- Cemented stem vs. Uncemented stem HR 3.19 (95% CI 1.22-8.38; $p = 0.018$)
- Constrained vs. HXLPE HR 3.32 (95% CI 1.16-9.48; $p = 0.025$)
 - Non const 11% rev rate; Const. 42% rev rate



COX REGRESSION

- No statistically significant impact on risk of revision
 - Gender
 - Race
 - BMI
 - ASA



Discussion: Strengths & Limitations

■ Limitations

- A lack of patient reported outcomes and radiographic outcomes
 - A revision THA may be functioning poorly but has not been re-revised
 - Consistent with other registry data

■ Strengths

- Multivariate analysis: patient, implant, and surgeon factors.
- Using a large cohort of U.S. total joint patients representative of the larger U.S. population
- Multiple medical centers and multiple community-based joint surgeons increase the applicability of the findings
- Highly accurate data due to the methodology of data collection and validation through chart review

Conclusions

- The mid term survivorship of revision THA is promising for (86%)
 - Early failures (infection and instability)
- How to improve short term outcomes (10% revision rate)
 - Improve post operative stability (43%)
 - Reduce infection rates (18%)
 - Aseptic loosening (10%)
 - Refer to surgeons with experience (HR 0.93)

Thank You Grazie

References

1. Kurtz S, Ong K, Lau E, Mowat F, Halpern M. Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030. *J Bone Joint Surg Am.* Apr 2007;89(4):780-785.
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3. Ong KL, Lau E, Suggs J, Kurtz SM, Manley MT. Risk of subsequent revision after primary and revision total joint arthroplasty. *Clin Orthop Relat Res.* Nov 2010;468(11):3070-3076.
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6. McGrory B, Barrack R, Lachiewicz PF, et al. Modern metal-on-metal hip resurfacing. *J Am Acad Orthop Surg.* May 2010;18(5):306-314.



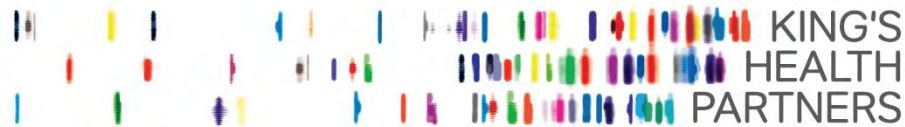
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London's Academic Health Sciences Centre

Pioneering better health for all

Functional outcomes of total hip arthroplasty in patients aged 30 years or less

R Walker, M Gee, F Wong, M George,
MJK Bankes, A Ajuied

No Disclosures





L

Aim

- To quantify the clinical effect of total hip arthroplasty (THA) in the extremely young population 30yo or less
- To analyse the effect of fixation and bearing surfaces on clinical outcomes

Method

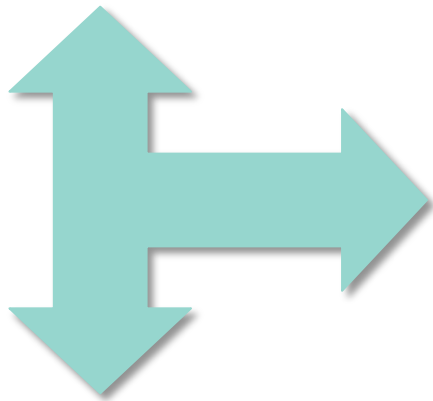
- Systematic review of the literature and meta-analysis

Inclusion Criteria

- All patients 30 years old or less
- Minimum 2 year follow-up
- Pre- and post-operative Harris Hip Scores
- Conventional THA (not resurfacing or large head MoM)
- 5 or more cases per series

953 articles identified from database search

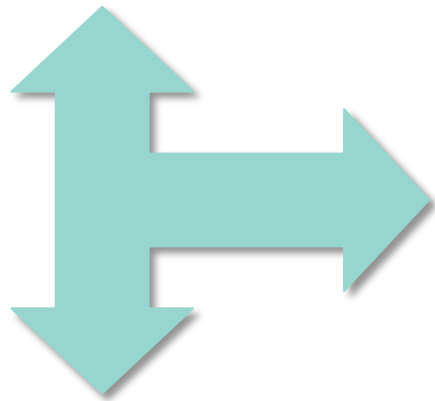
5 articles identified from references



912 articles excluded on abstract

46 full text articles retrieved for more detailed evaluation

46 full text articles retrieved for more detailed evaluation



32 Articles excluded

Patients older than 30 (n= 16)

Incomplete Harris Hip Scores (n = 11)

Duplicate series (n = 2)

MoM (n=1)

Inadequate follow up (n=1)

Conference abstract (n=1)

14 articles selected for analysis

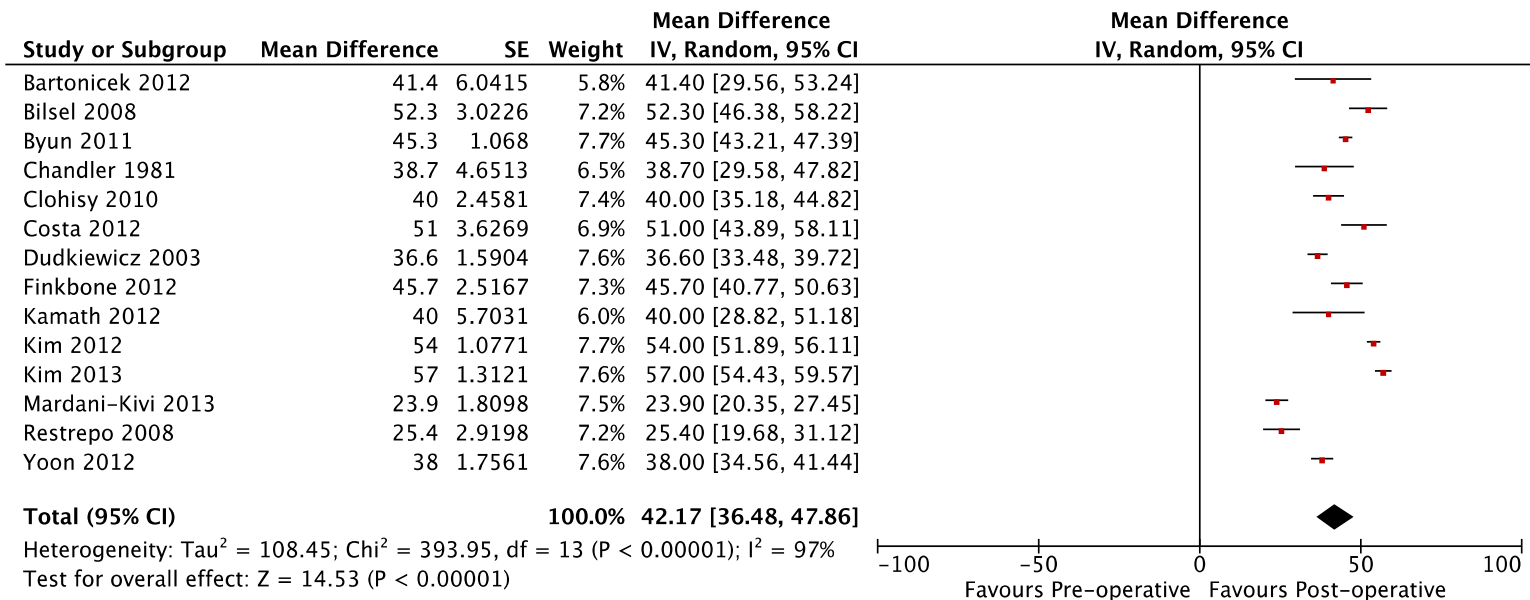
Studies Included

- 14 papers
- **743** THAs in **593** patients
- Weighted mean patient age 22.7
 - range 12 to 30 years
- Weighted mean follow up 8.4 years
 - range 2 to 16.8 years

Diagnosis	%
Avascular necrosis	38.6
Developmental dysplasia of the hip	14.0
Juvenile rheumatoid arthritis	11.1
Post-traumatic arthritis	9.1
Childhood hip sepsis	7.9
Legg-Calvé-Perthes disease	5.8
Slipped upper femoral epiphysis	3.3
Multiple epiphyseal dysplasia	1.9
Other	8.3

Harris Hip Score

- Weighted mean difference of 42.2 points out of 100 in favour of surgery
 - (95% CI 36.5 to 47.9 points, $p < 0.001$) in unrevised hips



Revisions and Complications

- 37 hips (5%) revised at average 8.4 years follow up
- 38 hips (5.1%) with radiographic loosening
- 9 hips (2.1%) with radiographic poly wear (n=425)
- 14 hips (1.9%) dislocated
- 2 hips (0.5%) with ceramic fractures (n=401)

Fixation

- 676 stems (91%) were uncemented
- 660 cups (89%) were uncemented
- 8 papers reported a total of 457 exclusively uncemented THAs in 360 patients
- Uncemented fixation articles have similar improvement in HHS for unrevised hips, but lower rates of revision...

	Whole cohort	All uncemented
Patients	593	360
Hips	743	457
Mean pooled follow up	8.4 years	9.9 years
Mean difference in HHS	42.2	42.1
Revisions	37 hips (5%) 0.59% pa	6 hips (1.3%) 0.13% pa
Loosening	38 hips (5.1%)	1 hip (0.2%)

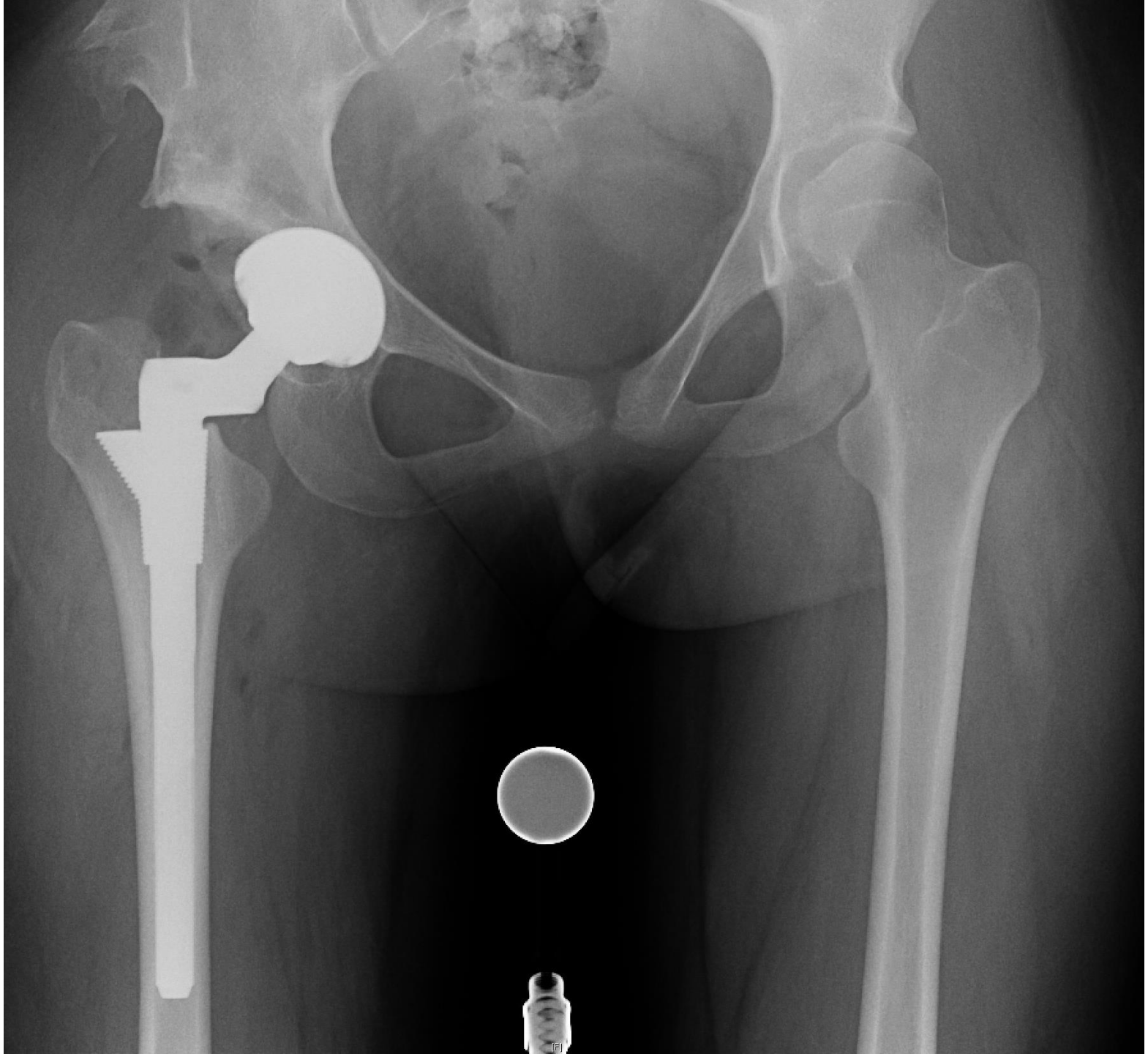
Uncemented fixation

HoS vs CoC

- 4 papers reported exclusively HoS bearings in 164 hips
- 3 papers reported exclusively CoC bearings in 258 hips
- Both groups have very low annualised revision rates, with no significant difference:
 - HoS 0.17% per annum
 - CoC 0.06% per annum

Conclusions

- THA is an effective treatment in patients 30 years or younger with hip arthritis
- Mean improvement in HHS is 42.2 points
- Revision rate 5% at 8.4 years
- Uncemented fixation produces the lowest revision rates with additional benefit of CoC bearing
- Analysis does not support cemented fixation in this patient group





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Acute Kidney Injury in Post-Operative Arthroplasty Patients

KB Ferguson, A Winter, L Russo,
M MacGregor, A Khan & G Holt

University Hospital Crosshouse,
Kilmarnock Scotland

Definition of AKI

- The Acute kidney Injury Network criteria define AKI as 50% rise in baseline creatinine (over 48hrs)
- The RIFLE criteria classify (over 7 days)
 - RISK (creatinine >50% or U.O. <50mls/kg 6 hrs)
 - INJURY (2 x baseline or U.O. <50 mls/kg 12 hrs)
 - FAILURE (3 x baseline or <30mls/kg 24 hrs)

(Coca SG, Peixoto AJ, Garg AX, Krumholz HM, Parikh CR. The prognostic importance of a small acute decrement in kidney function in hospitalized patients: a systematic review and meta-analysis. Am J Kidney Dis 2007 Nov;50(5):712-720.)

Scottish Arthroplasty Project Report 2014: Acute Renal Failure at 30 Days

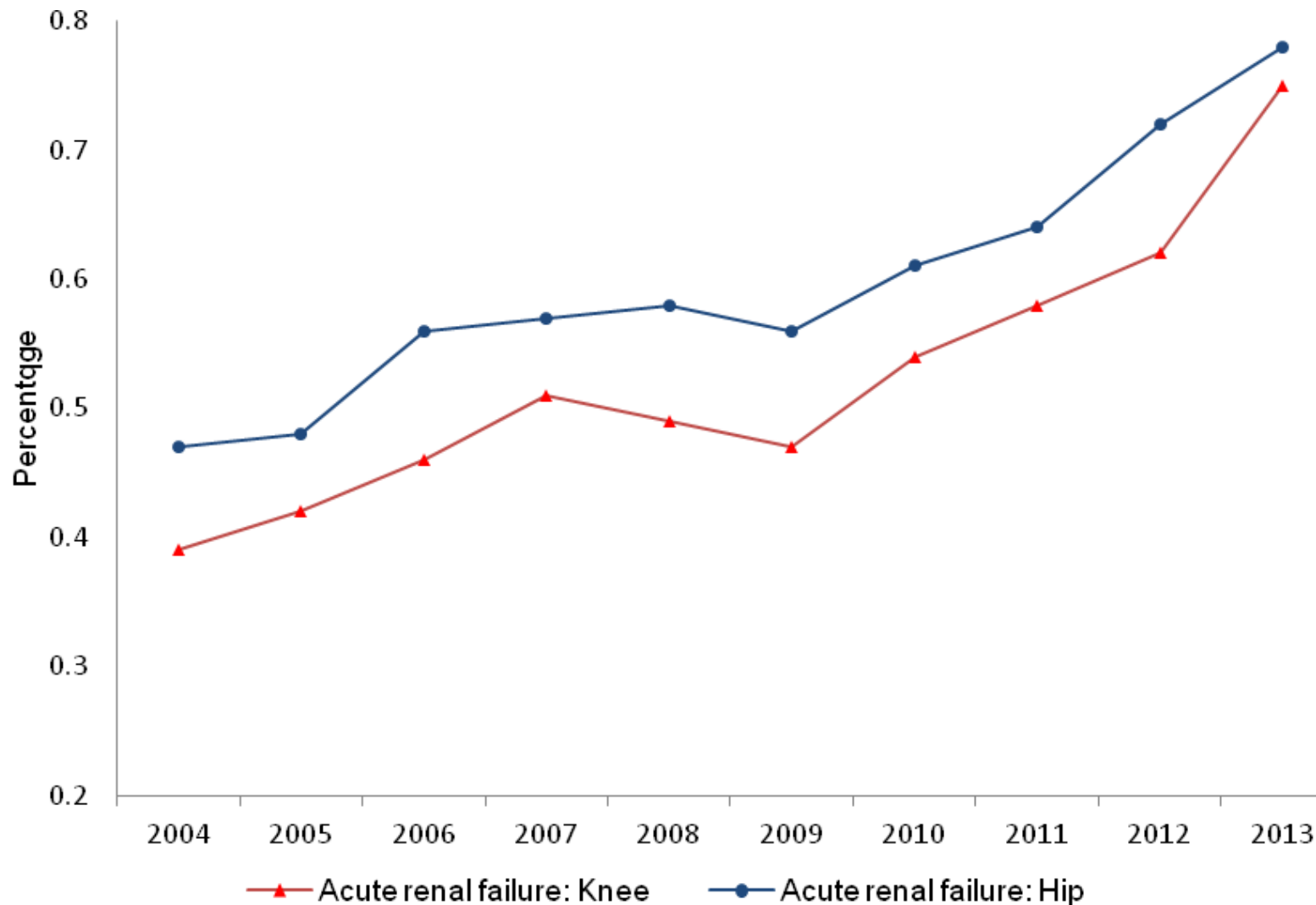
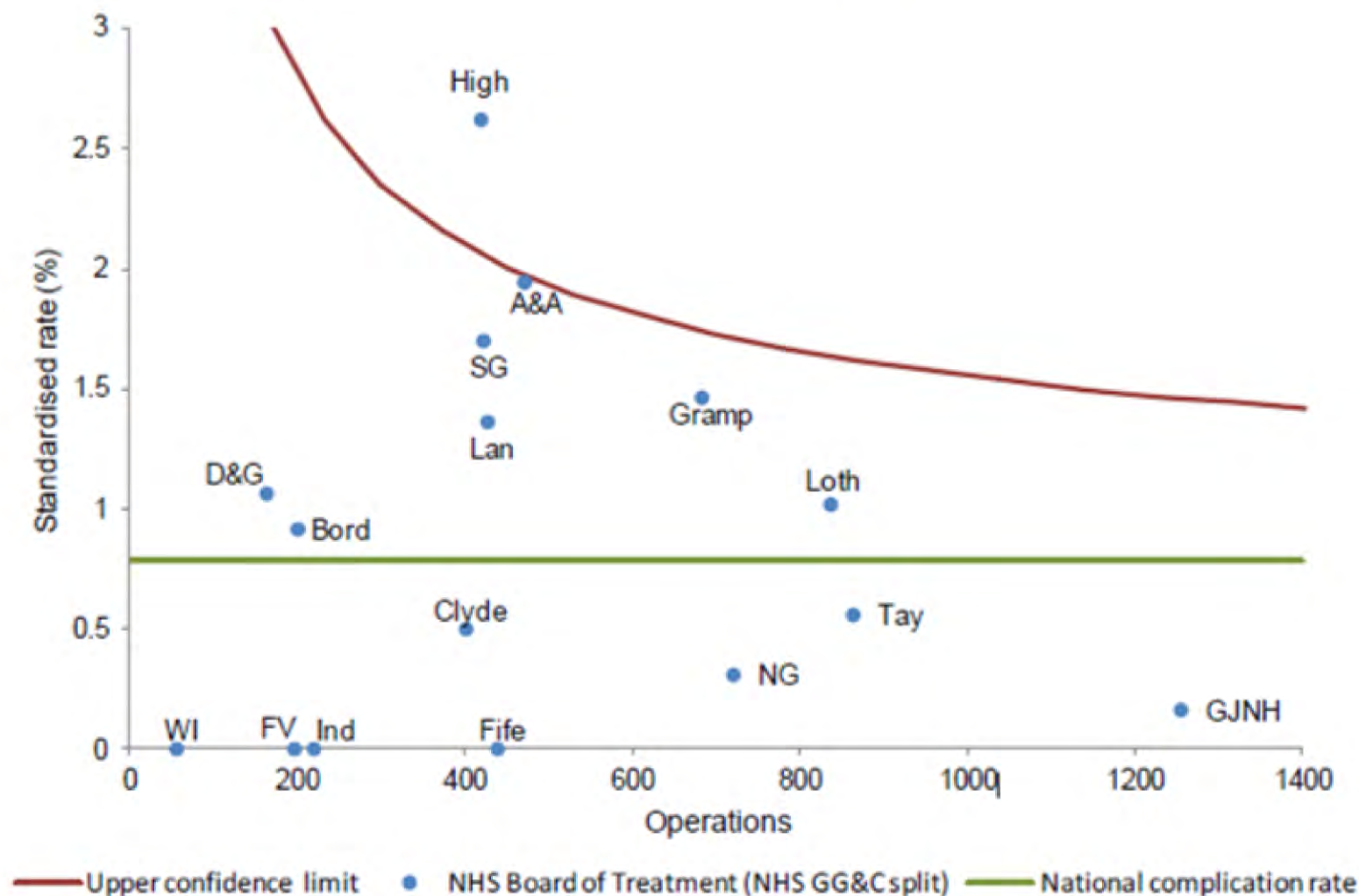


Figure 18 - Percentage of 2013 hip arthroplasty patients with subsequent acute renal failure within 30 days.



Average, funnel and standardisation calculated on 5-years data 2009 -2013.

Why is AKI important?

- Increased relative risk of death.
- AKI is a risk factor for future renal disease, even with previously normal renal function.
- Increased risk of AKI in subsequent surgeries.

Aim

- To determine the prevalence of acute renal impairment following hip/knee arthroplasty surgery.
- To identify high risk groups.
- To determine modifiable causative factor(s).

Methods

- Mixed retrospective and prospective review
- All primary total hip and total knee arthroplasty patients included
- Data collected on potential pre-operative, intra-operative and post-operative risk factors for AKI
- Independent statistician performed multivariate regression analyses

Data Collected

- 413 patients (October 2013 – October 2014)
- 45% (187) THR/ 55% (226)TKR.
- 41% (168) Male/59% (245) Female.
- Median age: 68 years (range 21–89, mean 66.5 years)

Results

- Out of 413 patients
- 34 (8%) patients developed AKI
- But what has caused this?

Uni-Variable Analysis: Pre-Operative Characteristics

Pre-Operation Characteristics	Mean \pm SD		P*
Age: AKI (n=34)	71.1 \pm 10.4		0.009
Age: No AKI (n=379)	66.1 \pm 10.80		
	Number with AKI	AKI Prevalence	
Gender	Male (n=15/168)	8.9%	0.67
	Female (n=19/245)	7.8%	
Diuretic	None (n=26/318)	8.2%	0.99
	Loop (n=3/35)	8.6%	
	Thiazide/Potassium Sparing (n=5/60)	8.3%	
CKD	Yes (n=9/52)	17.3%	0.025 [†]
	No (n=25/361)	6.9%	
ACE inhibitor or ARB	Yes (n=15/150)	10.0%	0.32
	No (n=19/263)	7.2%	
Diabetes	Yes (n=5/58)	8.6%	0.80 [†]
	No (n=29/355)	8.2%	
NSAID	Yes (n=12/137)	8.8%	0.78
	No (n=22/276)	8.0%	

Uni-Variable analysis: Intra and Post Operative Characteristics

Intra/Post -Op Characteristics	Number with AKI	AKI Prevalence	P*
Procedure	Hip (n =20/187)	10.7%	0.10
	Knee (n = 14/226)	6.2% (14/226)	
Intra-Op Fluids	< 1 L (n = 20/211)	9.5%	0.54
	1 – 2 L (n = 9/145)	6.2%	
	>2 L (n = 5/57)	8.8%	
Intra-Op NSAID	No (n = 33/370)	8.9%	0.24†
	Yes (n = 1/43)	2.3%	
Antibiotics	Teic/Gent or other (n = 19/202)	9.4%	0.40
	Cefuroxime (n = 15/211)	7.1%	
Tranexamic Acid	No (n = 3/28)	10.7%	0.62
	Yes (n = 31/385)	8.1%	
Transfusion	Yes (n = 2/26)	7.7%	0.92
	No (n = 32/387)	8.3%	
Post-Op Fluids	None/< 1 Litre (n = 22/339)	6.5%	0.006
	> 1 litre (n = 12/74)	16.2%	
Post-Op NSAID	No/Stopped pre-op (n = 23/263)	8.7%	0.54†
	Yes (new) (n=3/56)	5.4%	
	Yes (pre op)(n = 6/82)	7.3%	
	Yes (pre op + new) (n = 2/12)	16.7%	

Multi-Variate Analysis

	B±S.E.	p	Exp(B) (95% CI)
Age in decades	0.480±0.19	.012	1.62 (1.11,2.35)
> 1 litre post-op fluids	1.00±0.39	.011	2.71 (1.26,5.82)
Constant	-5.95±1.37	.000	.003

Results: Length of Stay

	Range	Mean	Median	P value
No AKI	2 – 20	4.75	4	
> 150%	3 - 12	5.88	6	P < 0.001

Conclusion

- AKI is multifactorial
- Number factors identified on univariable analysis: (non-modifiable)
 - Age
 - Pre-existing renal failure
- 50% Increase Length of Stay with renal failure
- Age only factor on multivariate analysis
 - Every decade of age increases the relative risk of renal failure by 1.62
- Teicoplanin (400mg) & Gentamicin (3mg/kg) vs Cefuroxime has no increased risk in developing AKI.



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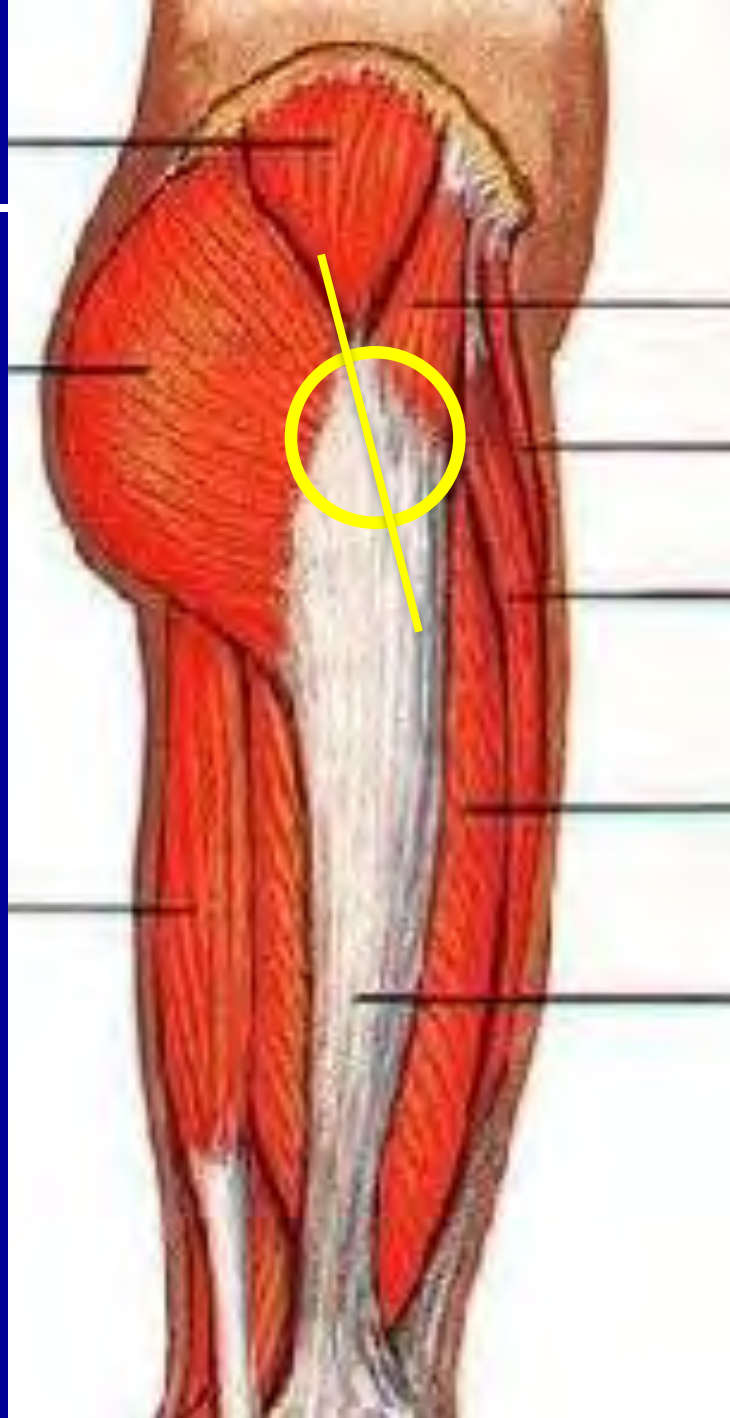
Direct Superior Approach

Frank Kolisek MD

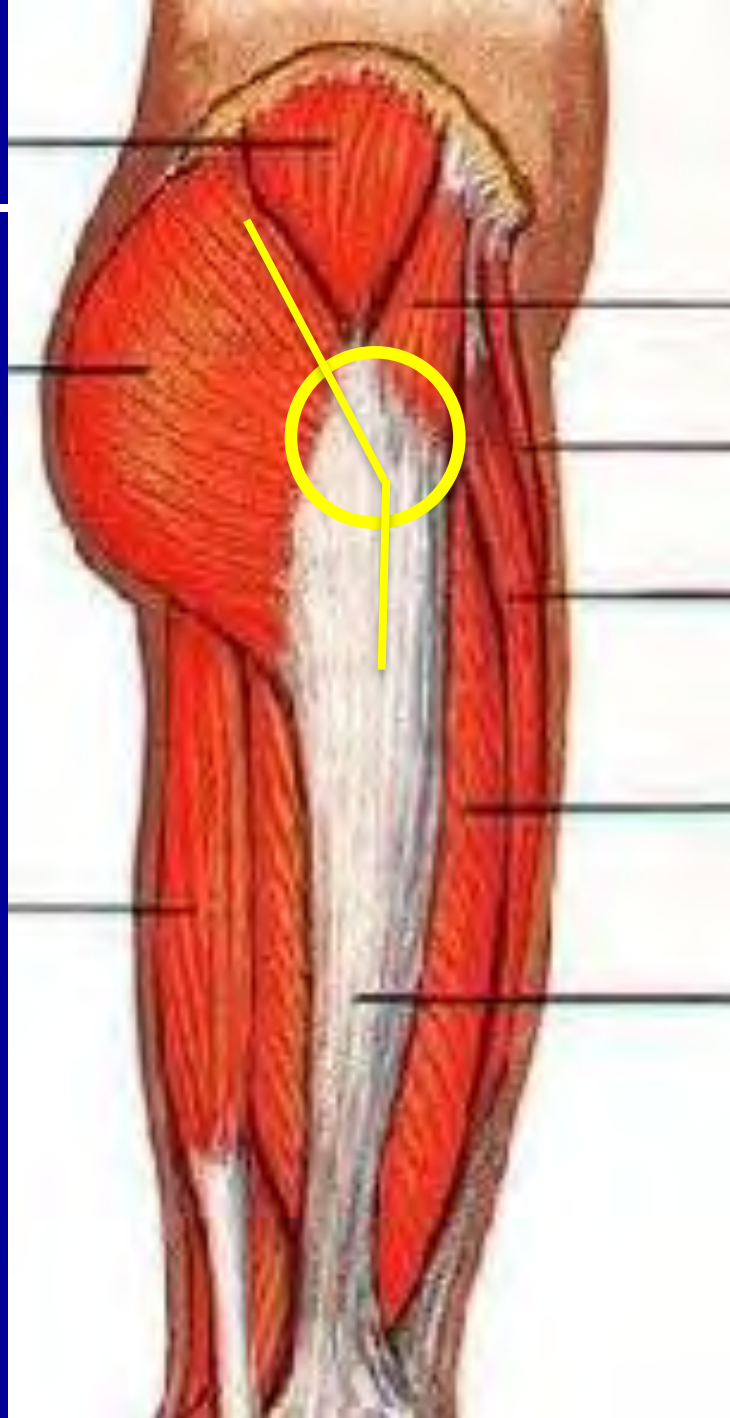
FRK History

- 1991-92 all surgical hip approaches-Dr. Dimon
- 1993-2002, standard posterolateral, ITB cut
- 2003-04, DA
- 2004-05, two incision (Garry Heynen)
- 2006-07, mini posterolateral, ITB cut
- 2008-present, direct superior, ITB spared (Doug Roger transpiriformis approach)

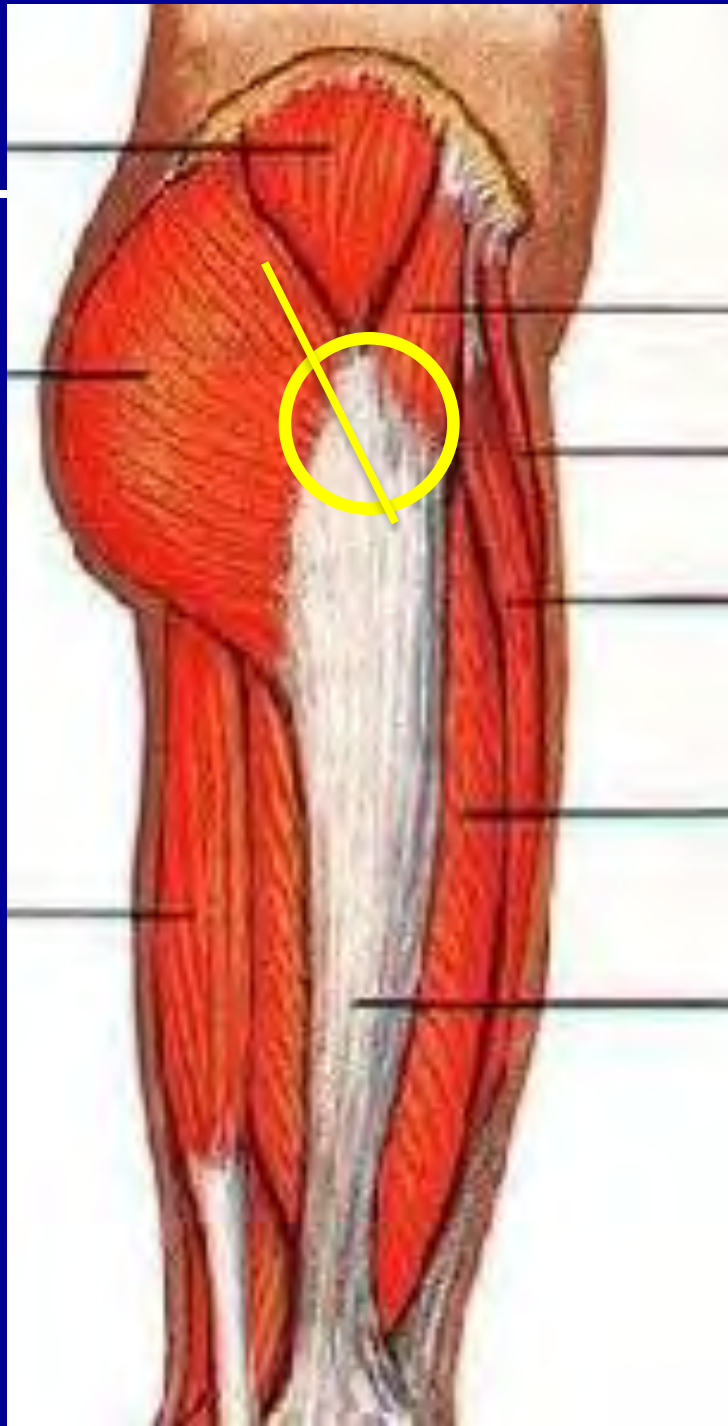
Direct lateral



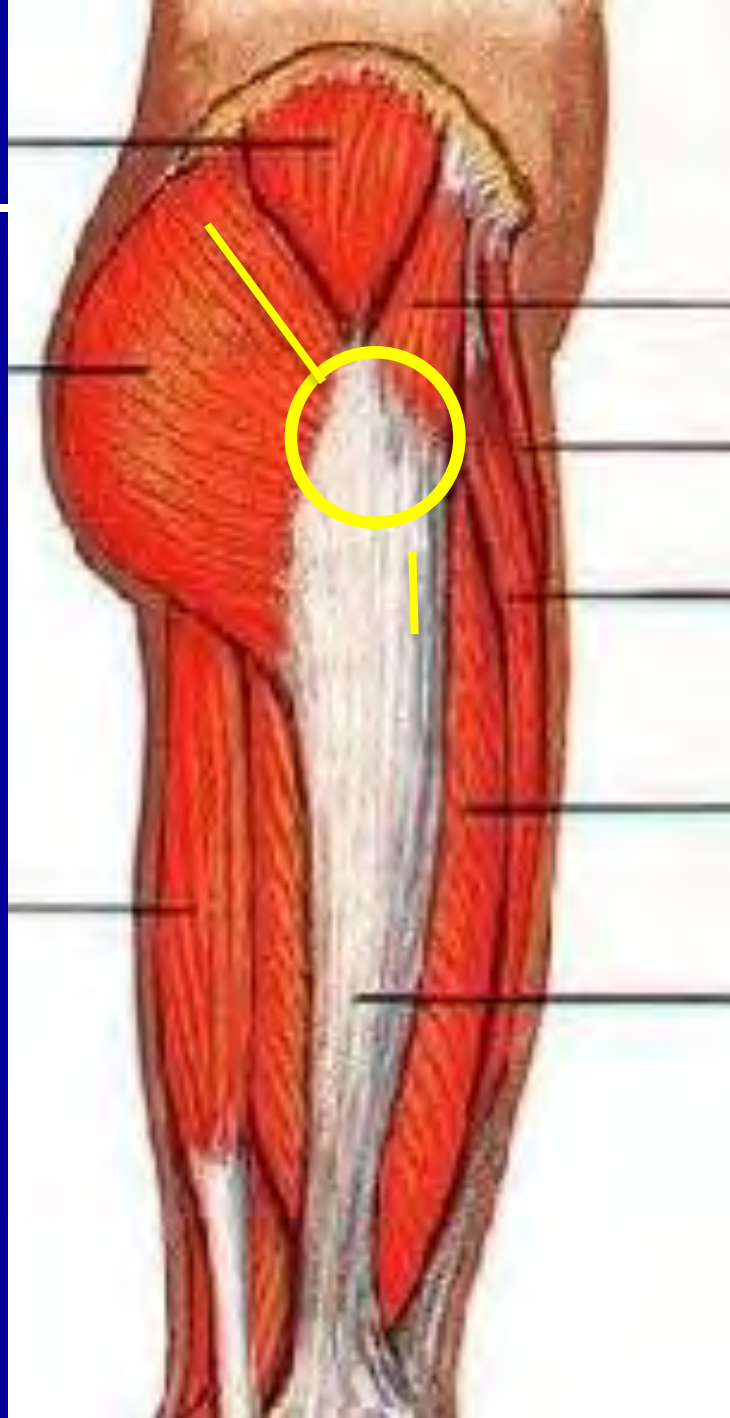
Posterior



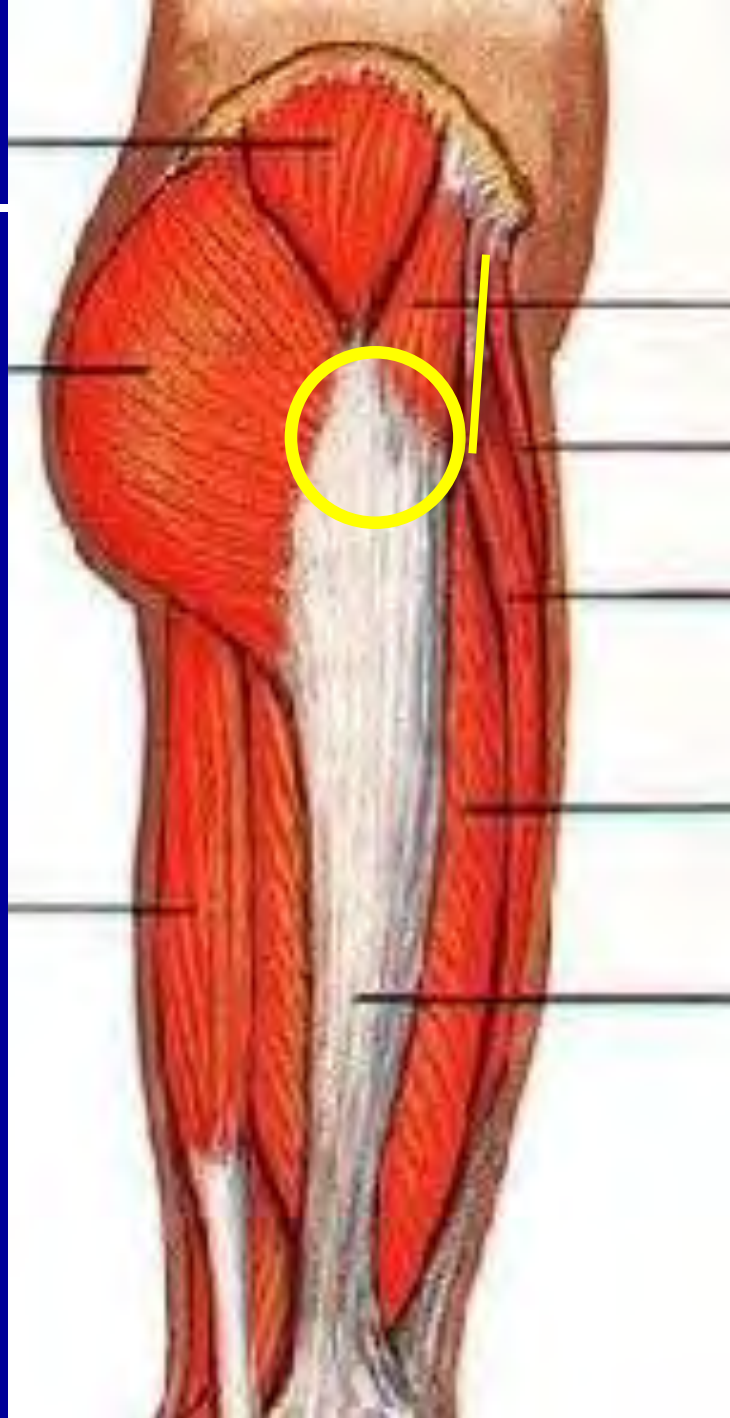
Mini Posterior



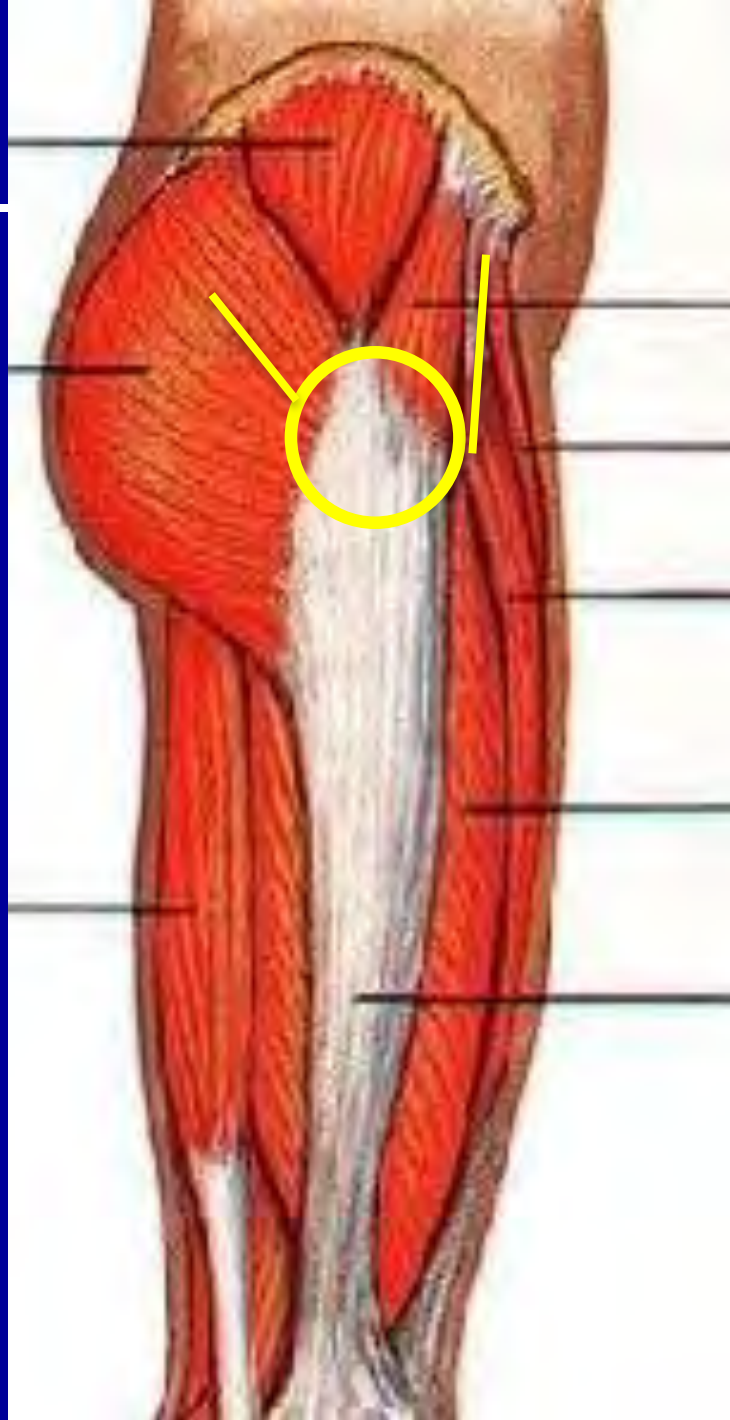
PATH



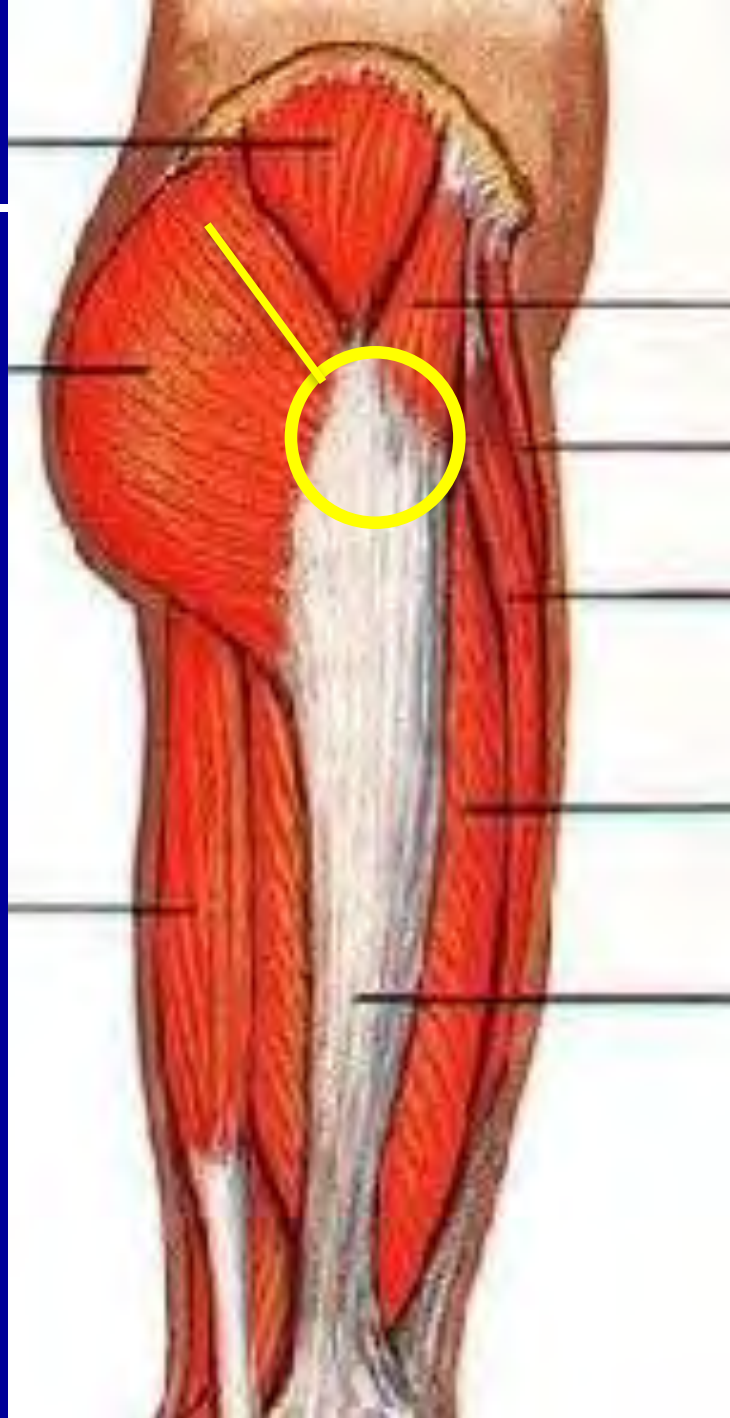
DA

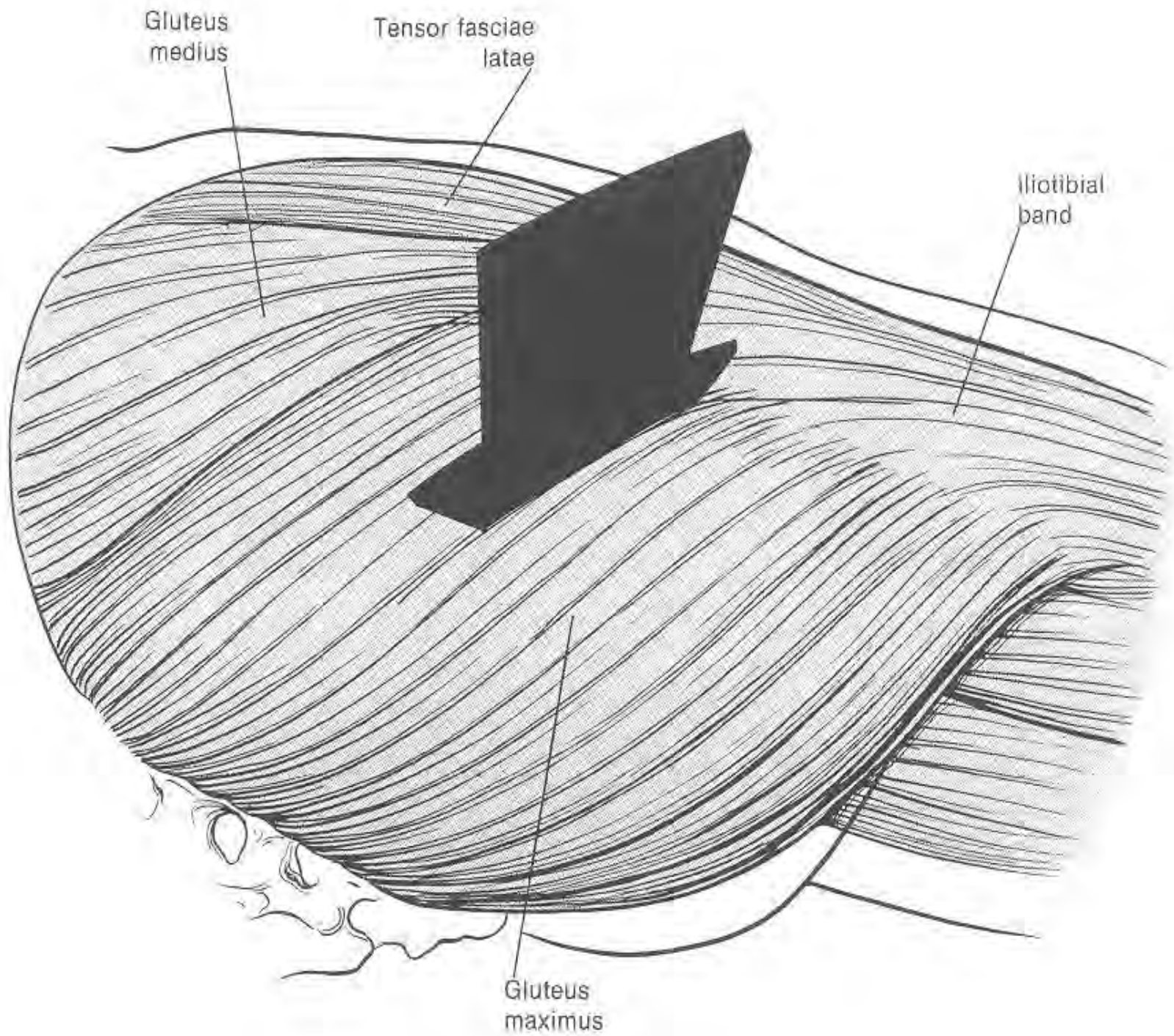


2 Incision



DS





IT band Sparing

- **Direct Anterior**
- **Two Incision**
- **Direct Superior**
- **PATH**
- **Super Cap**

My observations

- **When I stayed out of the ITB, the patients returned to function sooner and with less pain as compared to when I incised the ITB.**

Minimally Invasive THA Using a Transpiriformis Approach

- **Douglas Roger MD**
- **CORR Jan 2012**
- **Modification of the PATH technique(Brad Penenberg 2008)**

Doug Roger results

- 135 patients(Jan 2009-July 2010)
- Ave age 72
- Ave BMI 27(19-40, none excluded)
- Ave F/U 22 months, HHS 96
- Average OR time 57 minutes
- EBL 354cc, 8% transfusion rate
- LOS 2.0, 67% home, 33% SNF
- 0 dislocations, 1 intraop femur fracture
- 2 postop stem revisions 1 for LLD and 1 for low offset/subluxation

Kolisek Direct Superior Approach 2008

- 92 hips min 5 year F/U
- Ave age 63.6 (19-89)
- EBL 289, 0% transfusions
- BMI all <36
- LOS 2.1 days, all discharged to home
- Op time 43 minutes
- 0 intra-op complications, 0 dislocations
- 5 yr HHS 89
- 5 year SF 12, PCS=42, MCS=52

Kolisek and Roger AAOS 2015

- **Early Results of Minimally Invasive THA using the DSA**
- **173 consecutive DSA THAs between June 2012 and June 2013**
- **84 male, 89 female, ave age 69 (41-90)**
- **Ave OR time 49 minutes, EBL 266cc, 4.6% transfusion rate**
- **LOS 1.9 days, HHS at 1 year 95**
- **0 intraop complications**
- **3 postop complications: 1 infection, 2 traumatic dislocations**

Direct Superior Cadaver Lab

Dr. Doug Roger

Pagnano,et al cadaver study AOA 2015

- **Compared muscle damage in DA vs DS surgical approaches in 8 cadaver specimens.**
- **Summary: The extent and location of inadvertent muscle/tendon damage after THA done by expert surgeons was substantially greater after DA THA than after DS THA.**
- **Specifically, there was more damage to the gluteus minimus muscle and tendon, the TFL and the rectus femoris in DA vs DS.**

Optimizing Patient Outcomes

- Pre-op teaching, education and expectations
- Pre-op pain management
- Anesthesia
- Operative technique
- Inpatient therapy and nursing
- Discharge disposition
- 90 days post-op

Pre-op Meds

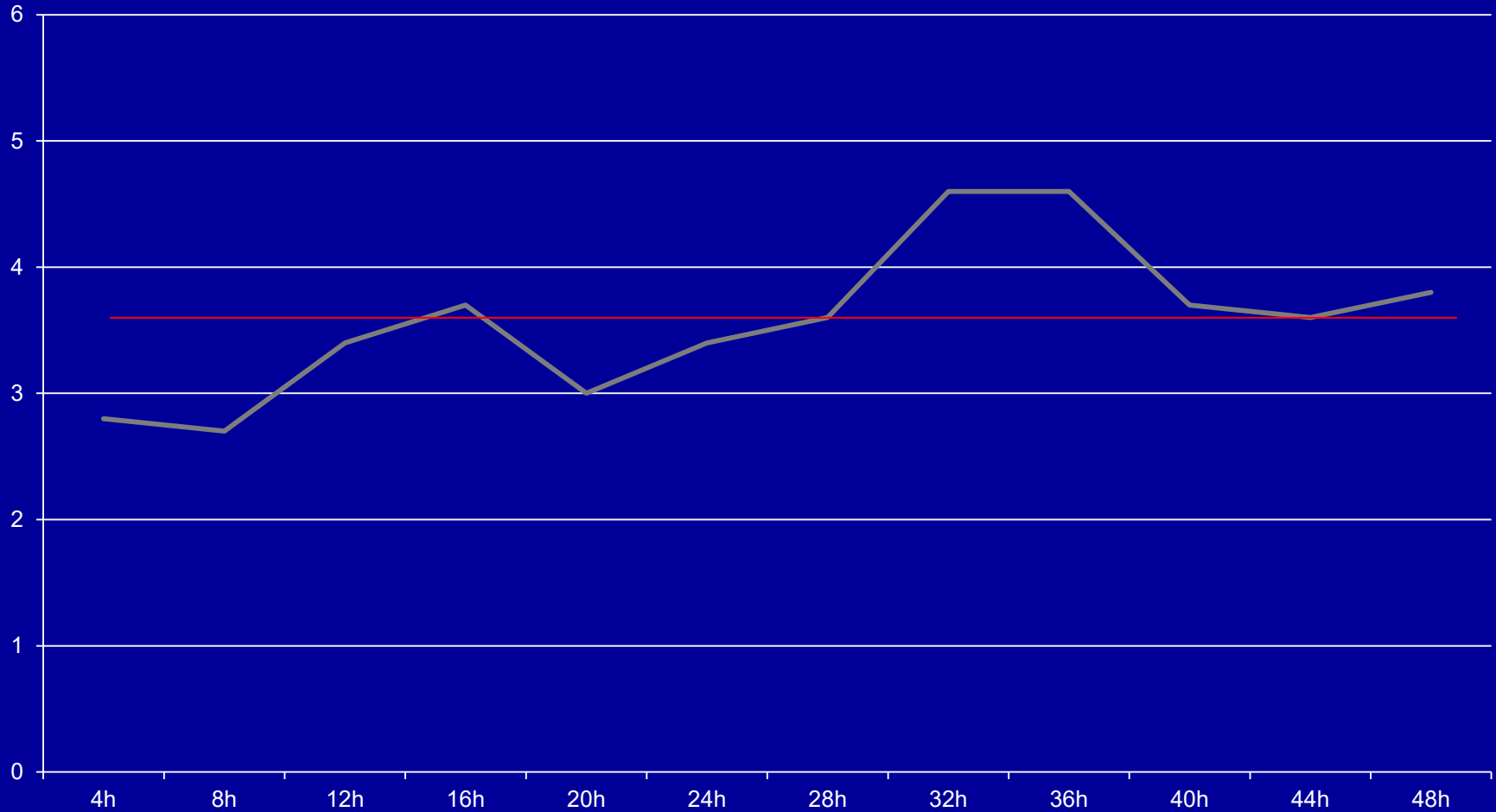
- Decadron 8mg IV if not diabetic
- Zofran 4mg IV
- Celebrex 400mg PO
- Pepcid 20mg PO
- Oxycontin 10mg PO

Post-op Meds

- Ultram 50 mg prn
- Norco 5-10mg (Hydrocodone) prn
- Percocet 5-10mg (Oxycodone) prn
- Oxy IR 5 mg (breakthrough pain) prn
- Toradol 30mg IM q 6hrs prn (max 3 doses)

TKA pain scores

OC ADD KOLFR



Anesthesia

- **THA: Fascia iliaca block using 60cc of 0.5% mepivacaine (carbocaine)**
- **TKA: adductor canal block using 10cc of 0.5% ropivacaine (naropin)**
- **General**

Surgical Technique

- **Avoid ITB for THA**

Periarticular Injection

- **Efficacy of Multimodal Perioperative Analgesia Protocol With Periarticular Medication Injection in Total Knee Arthroplasty: A Randomized, Double-Blinded Study**
- **Todd C. Kelley, MD, Mary Jo Adams, BSN, Brian D. Mulliken, MD, David F. Dalury, MD**
- **The Journal of Arthroplasty 28 (2013) 1274–1277**

Injection Cocktail

- Ropivacaine 0.5%, 49.25ml
- Epinephrine 0.5mg
- Toradol 30mg
- Clonidine 80mcg

Physical Therapy

- **Walking and bed mobility DOS**
- **ADLs for hips**
- **ADLs and ROM for knees (Kolisek et al, J of Arthroplasty. 2000;15(8): 1013-1016. SAFTE approach to rehab after TKA)**
- **Communicate with post-discharge staff**



RIGHT

R

b

Date 09/29/2011 08:25:02
ORTHO INDY SOUTH



0004501E10A3014900010.17621M2A.371

STAND Pelvis AP - %

Summary

- Choose an approach that you are comfortable with and try to be as good as you can be.
- Avoid the ITB if at all possible.
- Long term function is most important so don't compromise the long term result for a brief short term gain.
- Stay in your comfort zone.
- Pay attention to the entire patient experience.
- Collect data and measure what you do.

Thank You

- FRK



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THA Posterior Approach



G Zatti

Surgical approach, component design and materials are important factor for patient outcome.



Petis, Stephen, et al. "Surgical approach in primary total hip arthroplasty: anatomy, technique and clinical outcomes." Canadian Journal of Surgery 58.2 (2015): 128.

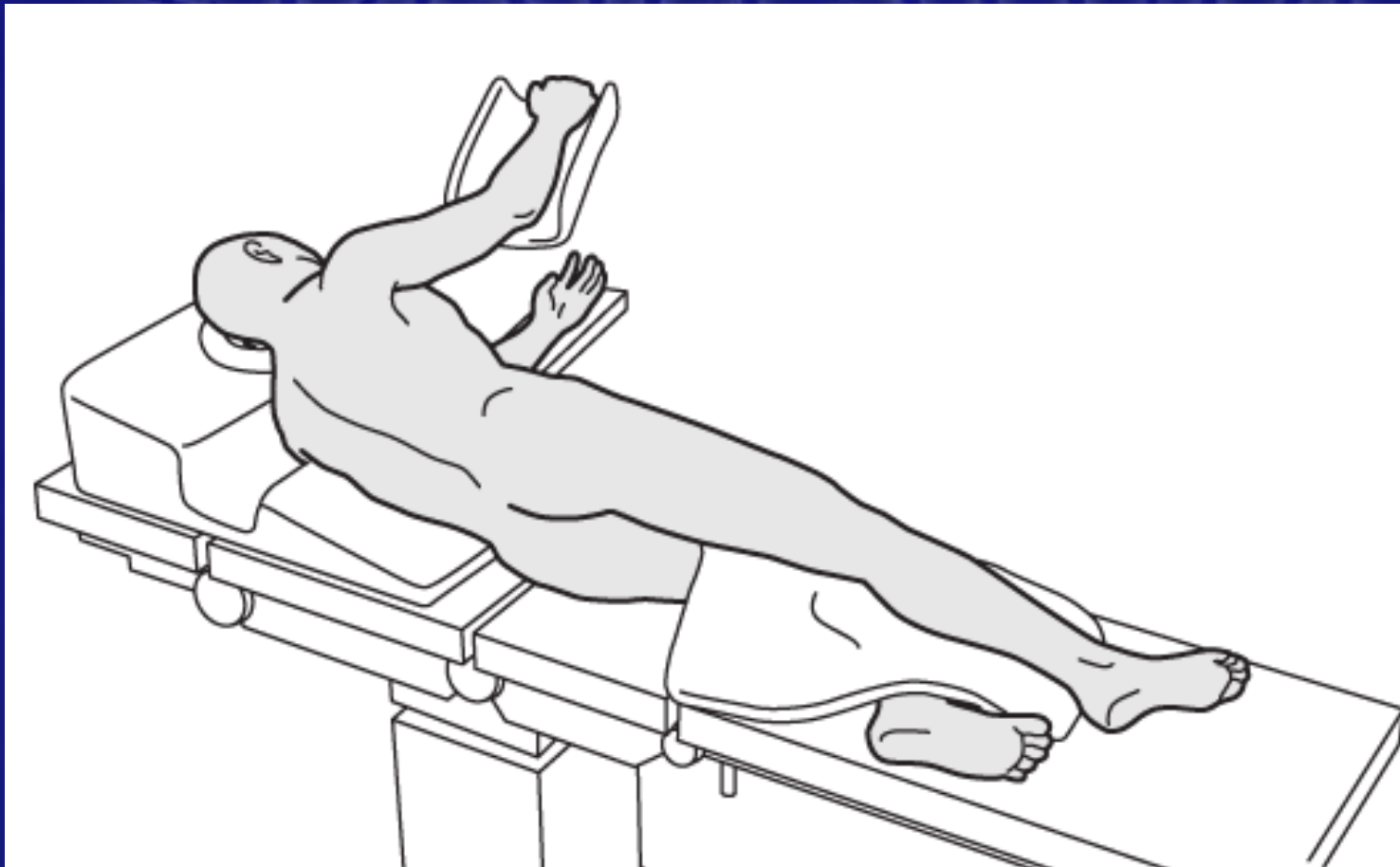
History

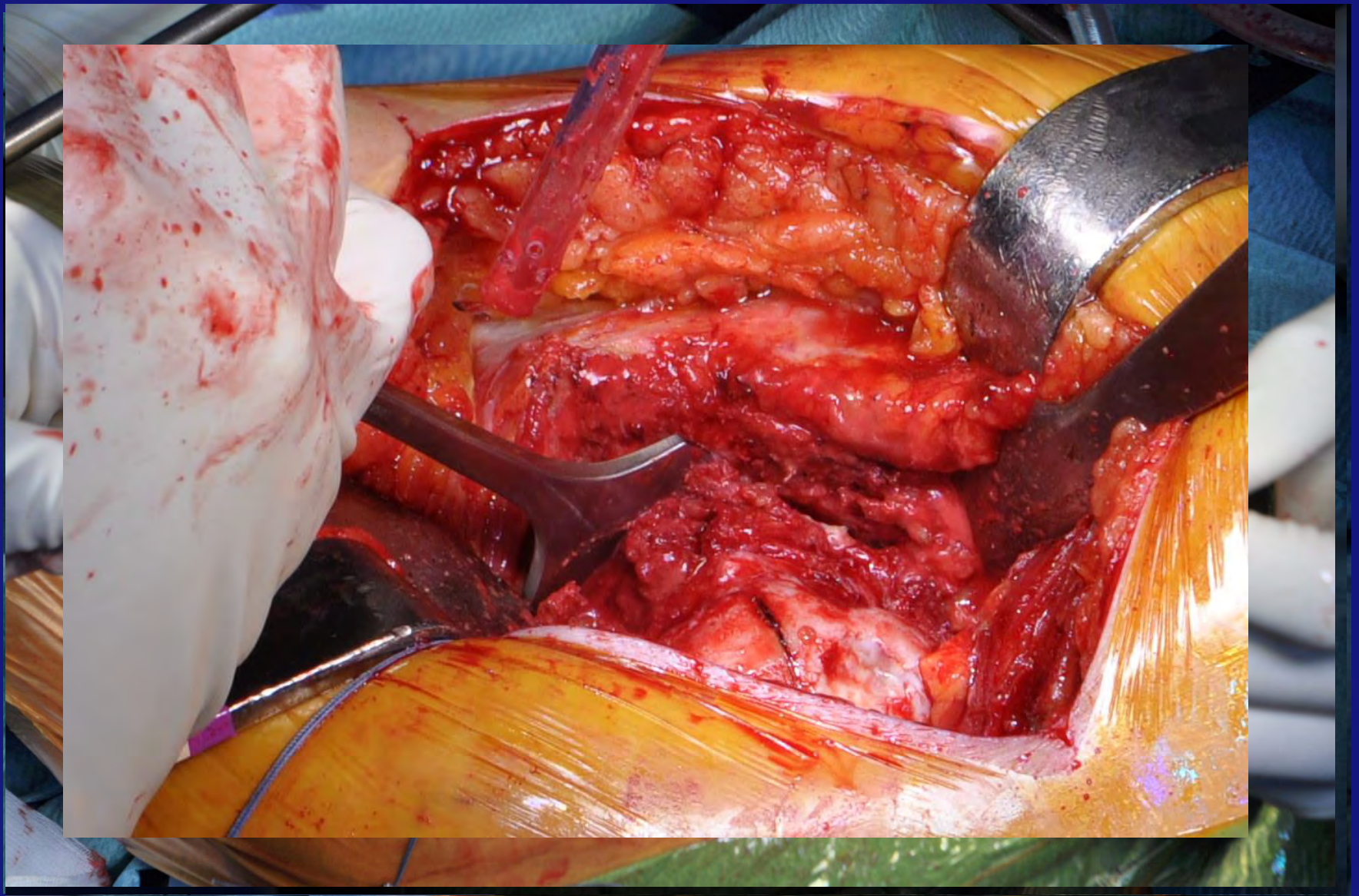


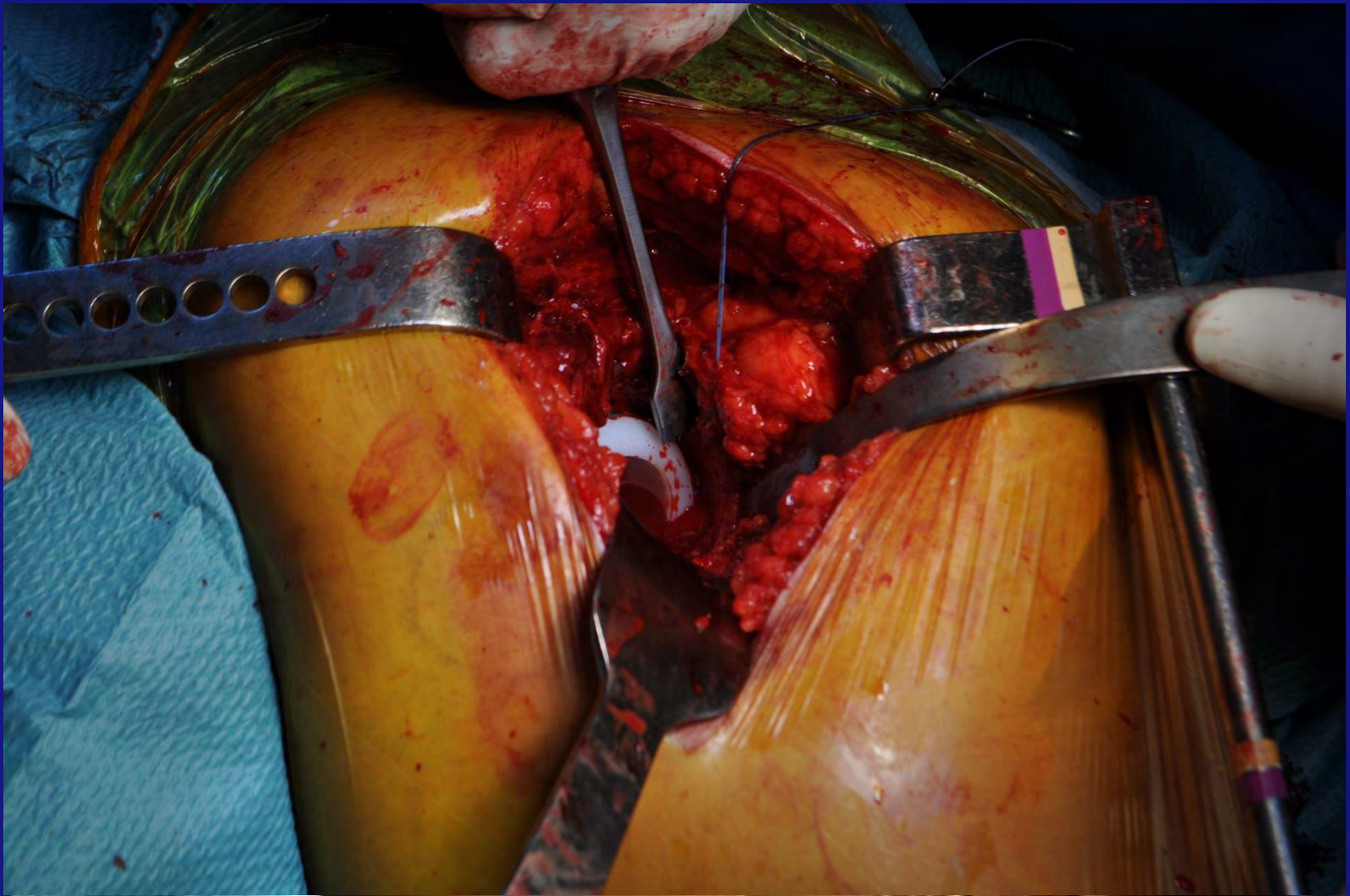
Emil Theodor Kocher (1841-1917)
Orthopaedic surgeon and the first Nobel Prize
winner

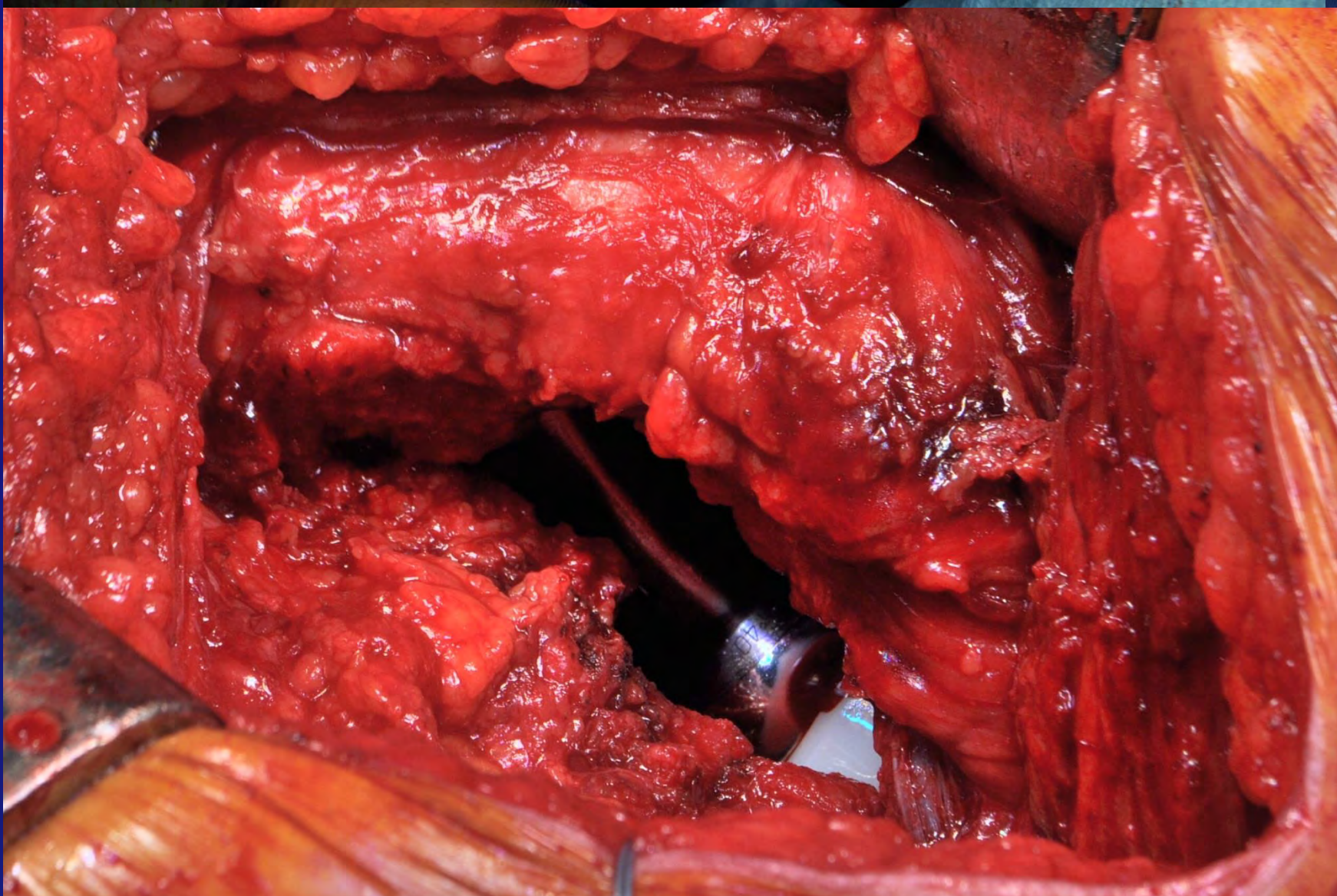
The posterior approach to the hip was popularized by Moore in the 1950s.

Chechik, Ofir, et al. "Surgical approach and prosthesis fixation in hip arthroplasty world wide." Archives of orthopaedic and trauma surgery 133.11 (2013): 1595-1600.







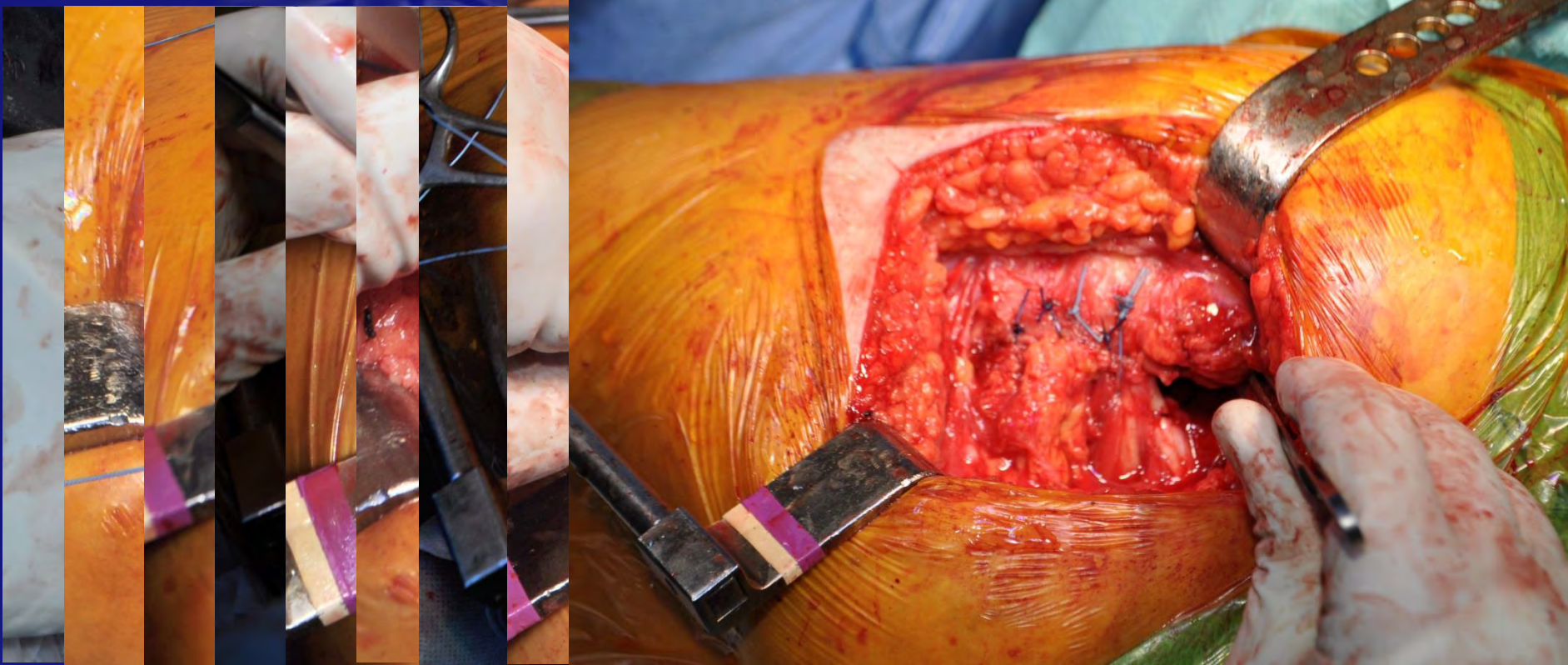


The combined anteversion angle is the summation of acetabular and femoral anteversion angles.

	Male	Female	Total
Acetabular Antiversion (AA)	24.8° , SD 5.93°	27.3° , SD 7.14°	-
Femural Neck Antiversion (FNA)	13.5° , SD 7.97°	15.5° , SD 7.80°	-
Combined Antiversion Angle	38.3° , SD 10.39°	42.8° , SD 10.83°	40.1° , SD 10.76°

Dong, Nick, Jim Nevelos, and Stefan Kreuzer. "Combined acetabular and femoral version angle in normal male and female populations from CT data." Bone & Joint Journal Orthopaedic Proceedings Supplement 95.SUPP 15 (2013): 168-168.

Posterior soft tissue



Transosseous or transmuscular repair (...), no difference in dislocation rate.

Spaans, Elsa A., et al. "The result of transmuscular versus transosseous repair of the posterior capsule on early dislocations in primary hip arthroplasty." *Hip international: the journal of clinical and experimental research on hip pathology and therapy* (2015): 0-0.

dislocation

bleeding

pain

Complications...

failure of

fracture

ous lesion

st-operative



Dislocation

Rate of dislocation in the posterior approach: 1%-5%

Kwon, Michael S., et al. "Does surgical approach affect total hip arthroplasty dislocation rates?." Clinical orthopaedics and related research 447 (2006): 34-38.

X8 risk of dislocation when soft tissue repair was not performed.

Kwon MS, Kuskowski M, Mulhall K, et al. Does surgical approach affect total hip arthroplasty dislocation rates? Clin Orthop Relat Res. 2006;447:34-8



Calcifications

(incidence to 3months from surgery)

7%

Posterior Approach



Witzleb, W. C., et al. "Short-term outcome after posterior versus lateral surgical approach for total hip arthroplasty-A randomized clinical trial." Eur J Med Res 14.6 (2009): 256-63.

Infections

Incidence:

0.2% **posterior**
approach



Christensen, Christian P., Tharun Karthikeyan, and Cale A. Jacobs. "Greater prevalence of wound complications requiring reoperation with direct anterior approach total hip arthroplasty." The Journal of arthroplasty 29.9 (2014): 1839-1841.

Nervous Lesion



1.3%

Posterior approach

sciatic nerve

Schmalzried TP, Amstutz H, Dorey F. Nerve palsy associated with total hip replacement: risk factors and prognosis. J Bone Joint Surg Am. 1991;73:1074–80.



Abductor Muscles weakness

lower posterior approach

Masonis, John L., and Robert B. Bourne. "Surgical approach, abductor function, and total hip arthroplasty dislocation." Clinical orthopaedics and related research 405 (2002): 46-53.

Intraop Fracture

Lower

Posterior approach

Hendel, David, et al. "Fracture of the greater trochanter during hip replacement." Acta Orthopaedica 73.3 (2002): 295-297.
Jewett, Brian A., and Dennis K. Collis. "High complication rate with anterior total hip arthroplasties on a fracture table." Clinical Orthopaedics and Related Research® 469.2 (2011): 503-507.

Posterior Muscle Damage

Posterior

100% short external rotators

18% gluteus minimus

0% TFL

0% rectus femori

Meneghini RM, Pagnano M, Trousdale R, et al. Muscle damage during MIS total hip arthroplasty: Smith-Peterson versus posterior approach. Clin Orthop Relat Res. 2006;453:293–8

Goals of treatment in THA: no pain, improved quality of life and restoration of function.

Learmonth ID, Young C, Rorabeck C. The operation of the century: total hip replacement. Lancet. 2007;370:1508–19.

Posterior

Clinical outcome (HHS, WOMAC, SF-36)

Low rate of abductor insufficiency

Witzleb WC, Stephan L, Krummenauer F, et al. Short-term outcome after posterior versus lateral surgical approach for total hip arthroplasty: a randomized clinical trial. Eur J Med Res. 2009;14:256–63.

Jolles, Brigitte M., and Earl R. Bogoch. "Posterior versus lateral surgical approach for total hip arthroplasty in adults with osteoarthritis." The Cochrane Library (2006).

Outcomes Posterior

Posterior



Early clinical outcome and functional recovery



Length of stay in hospital



Surgery time



No BMI controindication

Long term outcome

Barrett WP, Turner S, Leopold J. Prospective randomized study of direct anterior vs posterolateral approach for total hip arthroplasty. J Arthroplasty. 2013;28:1634–8.

Martin CT, Pugely A, Gao Y, et al. A comparison of hospital length of stay and short-term morbidity between the anterior and the posterior approaches to total hip arthroplasty. J Arthroplasty. 2013;28:849–54

Clin Rehabil. 2014 Jan 23;28(7):658-668. [Epub ahead of print]

Task-oriented exercises and early full weight-bearing contribute to improving disability after total hip replacement: a randomized controlled trial.

Monticone M¹, Ambrosini E², Rocca B³, Lorenzon C³, Ferrante S⁴, Zatti G⁵.

Efficacy of an in-hospital program based on task oriented exercises associated with early full weight-bearing in patients with multiple comorbidities undergoing total hip replacement

Clin Rehabil. 2014 Jan 23;28(7):658-668. [Epub ahead of print]

Task-oriented exercises and early full weight-bearing contribute to improving disability after total hip replacement: a randomized controlled trial.

Monticone M¹, Ambrosini E², Rocca B³, Lorenzon C³, Ferrante S⁴, Zatti G⁵.

	Experimental group	Control group
Age	69.5	68.8
Gender (m/f)	18/32	22/28
BMI	27.7	27.4
Pain duration before surgical intervention	20.5	17.6
Days after surgery at admission	5.2	5.3
Comorbidity		
Cardiac disease	24	25
Respiratori disease	13	13
Gasetroenteric disease	7	4
Other	6	8
Pain (Scores)	60.2	57.4
Stiffness (Scores)	56.5	57.0
Physical function (scores)	48.7	47.6
Functional Indipendence Measure	82.8	81.8
P-value > 0.1		

Clin Rehabil. 2014 Jan 23;28(7):658-668. [Epub ahead of print]

Task-oriented exercises and early full weight-bearing contribute to improving disability after total hip replacement: a randomized controlled trial.

Monticone M¹, Ambrosini E², Rocca B³, Lorenzon C³, Ferrante S⁴, Zatti G⁵.

Task-oriented exercises associated with early full weight-bearing improve disability, pain, activities of daily living, and quality of life after total hip replacement.

- anatomic (lefts and rights)

- neck angle 130°

- offset: 37-53mm

- Anteverted neck version

- stem length: 85-125mm

- Normalizations

- 8 sizes

- V40 taper

- TMZF

- Gritblast HA



1985-89: ABG

- anatomic (lefts and rights)

- neck angle 130°

- offset: 37-53mm

- Anteverted and neutral neck versions

- stem lengths: 85-102mm

- normalizations

- 8 sizes

- V40 taper

- Ti-6Al-4V

- CpTi

- HA



2010-14: ANATO

ABG: Good results to long term 92-97% to 10-15 yrs

Nourissat C, Asencio G, Berteaux D. ABG Results at more than 10yrs for patients bellow 50yrs of age. Nov 2004.

ABG Scientific Group. International Multicentric Studiea – CUP end Stem. 2004.

Anderson J, Foster A. ABG Experience (stem and cup). June 2004.



Loosening

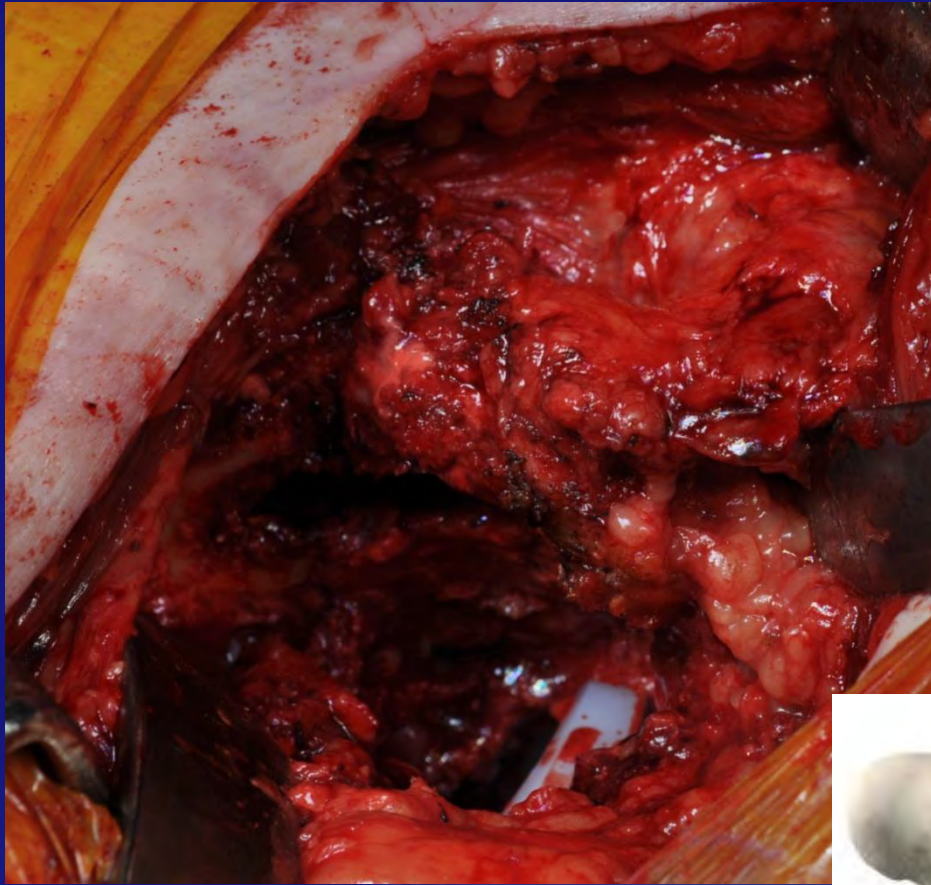


Bone remodeling

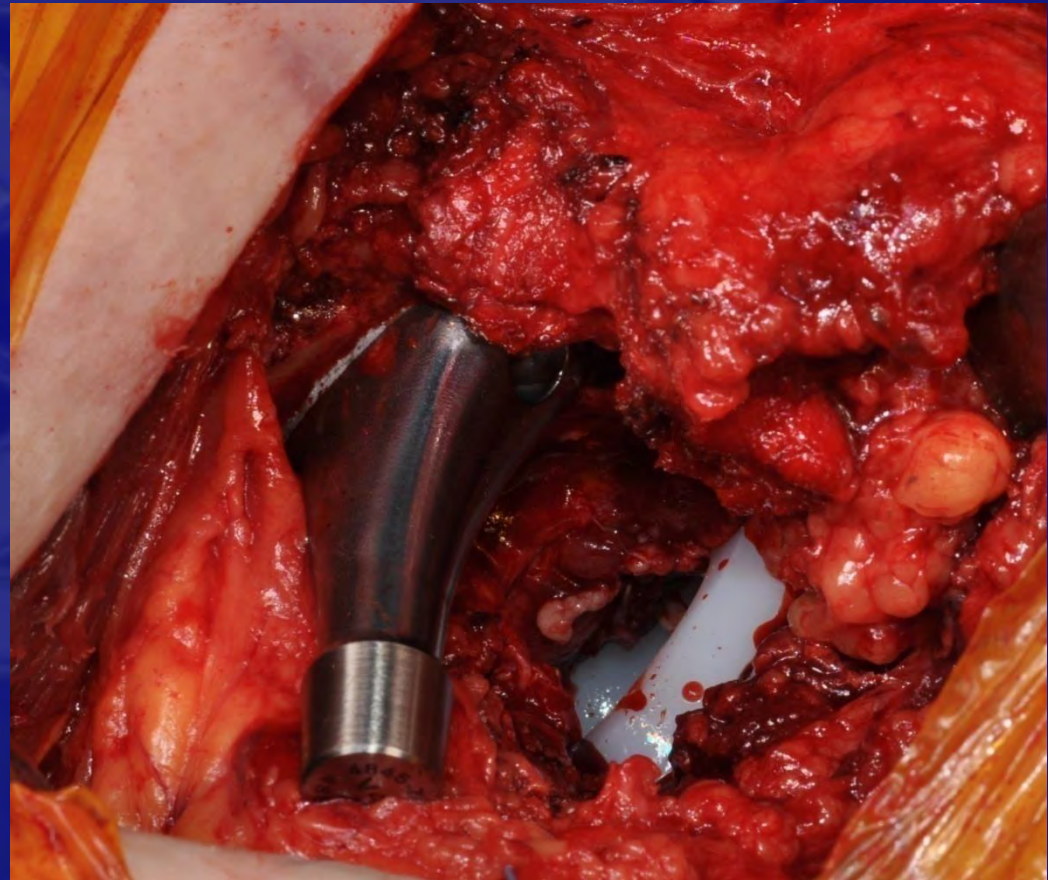
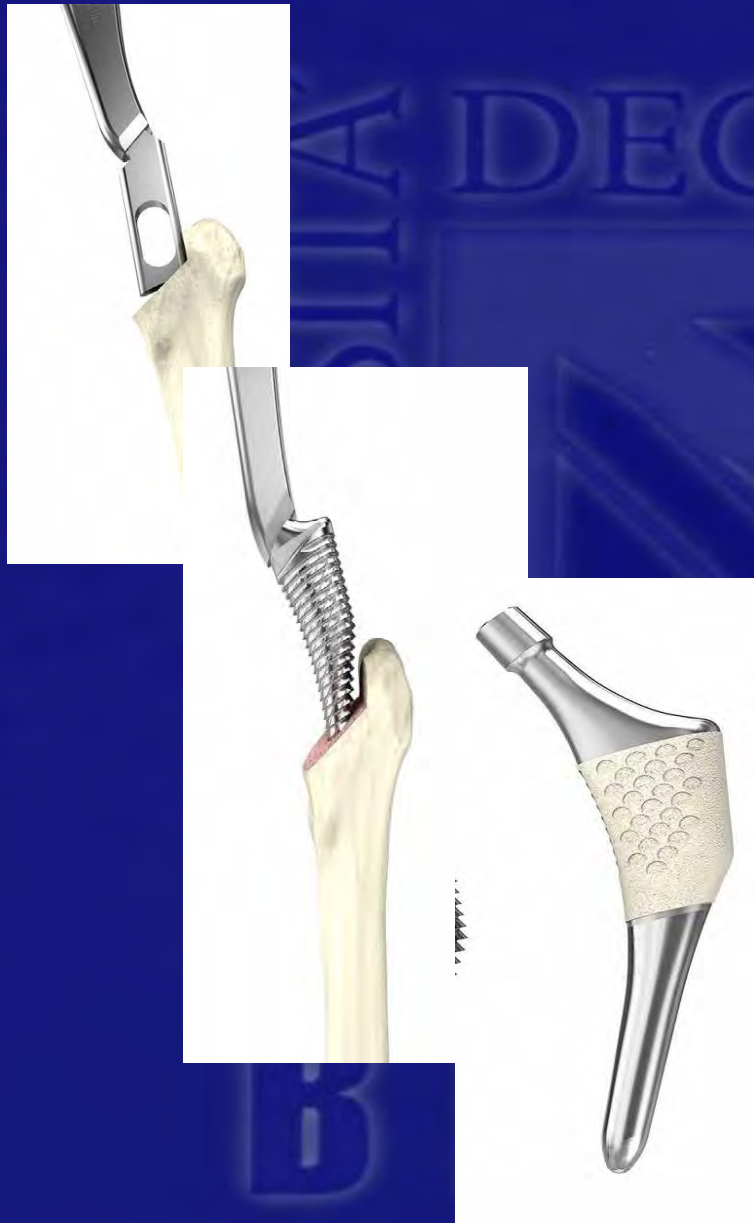
Van der Wal BCH, et al. The influence of implant design on periprotetic bone remodelling of two type of uncemented HA coated hip stems. A two yrs follow up study using DEXA. JOR 2004.

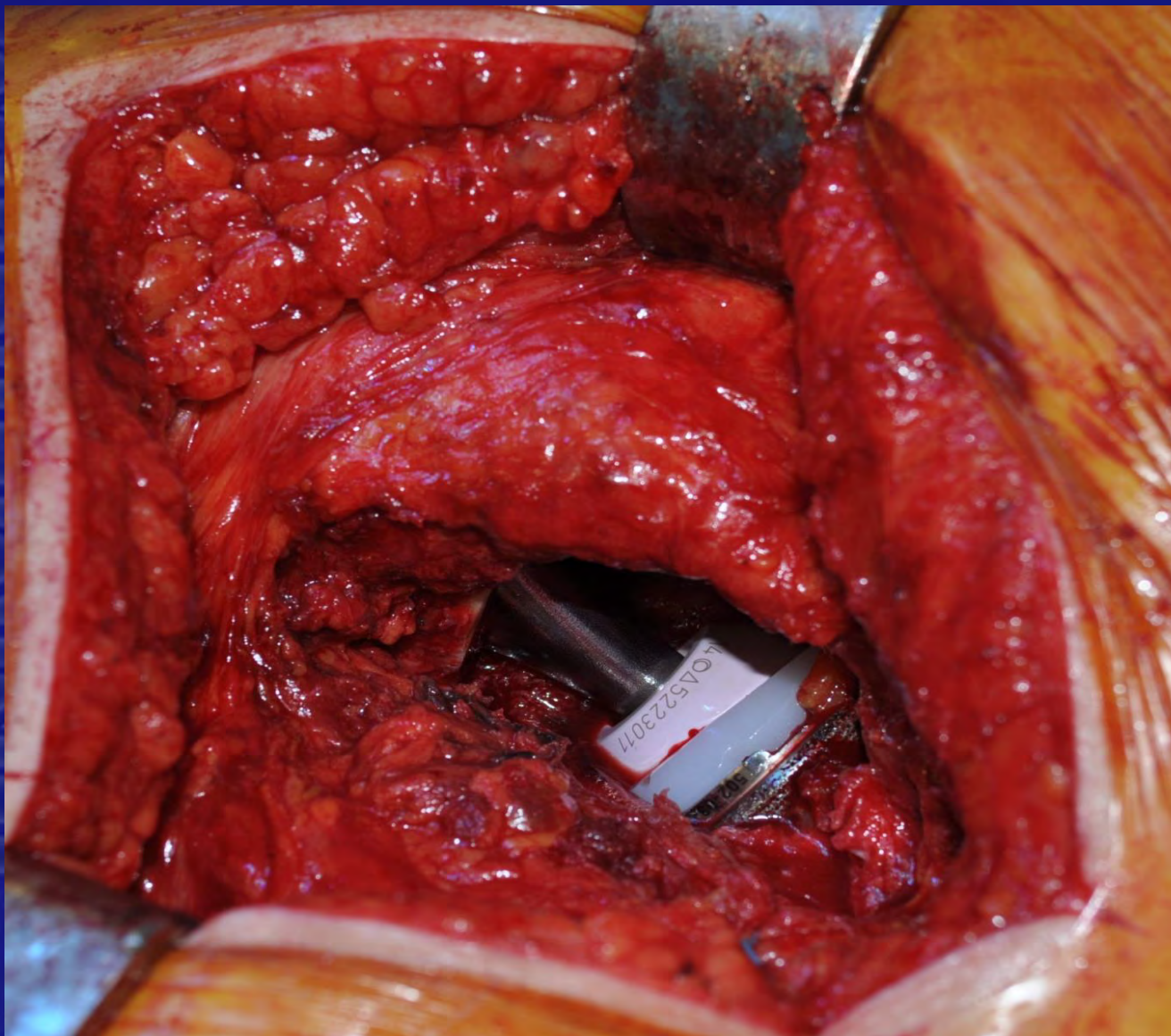
Pinisello Sebastia JJ et al. Changes in periprotetic bone remodelling following ABG stem design. Densitometric study. Jouerna of arthroplasty 2004.

Positioning stem (1)



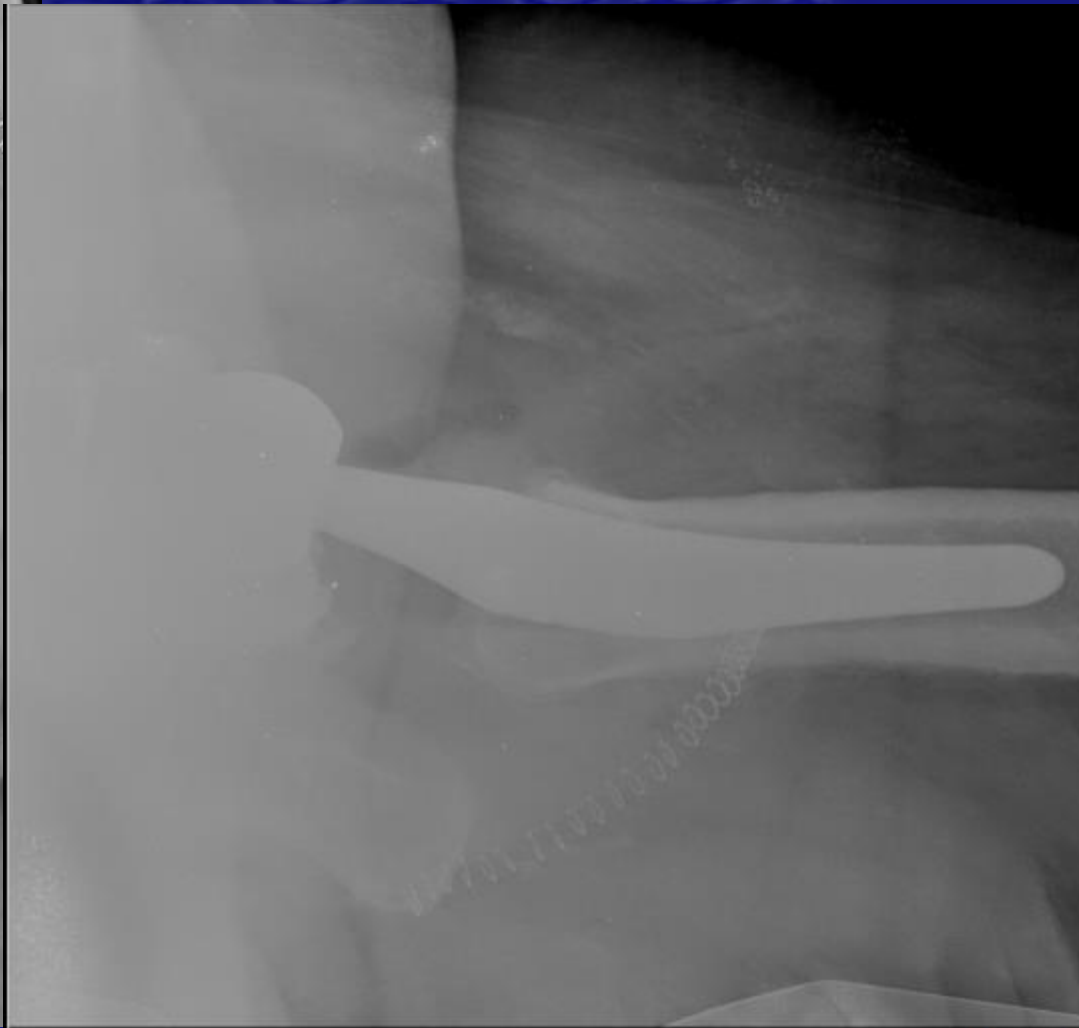
Positioning stem (2)





PID:11128928
18/04/1946
069Y
F

ILI STUDI



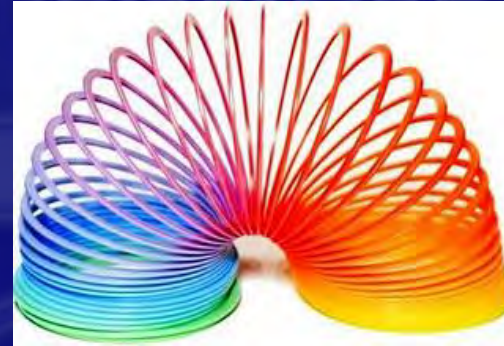
Anato stem:

History

User friendly

Various surgical approaches
allowed.

Stability:
Optimal shape to fill proximal
femur



CONCLUSIONS

Surgical approach in THA is still an area of debate .

Each approach has advantages and disadvantages.

All surgical approaches enable to perform a safe and clinically effective THA.

Every surgeon should choose the preferred approach.

Petis, Stephen, et al. "Surgical approach in primary total hip arthroplasty: anatomy, technique and clinical outcomes." Canadian Journal of Surgery 58.2 (2015): 128.

CONCLUSIONS

Surveys of surgeons from around the world suggest that the posterior approach was and still is the most common surgical approach for THAs

Chechik, Ofir, et al. "Surgical approach and prosthesis fixation in hip arthroplasty world wide." Archives of orthopaedic and trauma surgery 133.11 (2013): 1595-1600.

Viktor L, Goran et al. The type of surgical approach influences the risk of revision in total hip arthroplasty. Acta Orthop Dec 2012.

Witzleb WC et al. Short-term Outcome after Posterior vs Lateral surgical approach for THA – a randomized clinical trial. European journal of medical research 2009.

Takamura KM et al. Survivorship of standard vs modified posterior surgical approaches in MoM hip resurfacing. Bone Joint Res 2014.

Comstock C et al. A clinical and radiographic study of the safe area using the approach alteral for total hip artroplasty. J arthropasty 1994.

Baker AS et al. Abductor function after total hip replacement. An electromyographic and clinical review. JBJS 1989.

THANKS





INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY





Università degli Studi dell' Insubria – Varese
Clinica Ortopedica e Traumatologica
Dipartimento Biotechnologie e Scienze della vita (DBSV)

ALOT – Anterior Longitudinal Osteotomy of greater Trochanter and prevention of early dislocation in Total Hip Arthroplasty: Updated Results

M.F.Surace, F. Buggè, L. Monestier



Early Dislocation

- **Incidence 1-7% of THA**
- **45% occurs during first 4 weeks**



Journal of Orthopaedic Surgery 2010;18(2):179-83



Risk Factors

- **Inappropriate positioning of the prosthetic components**
- **Surgical approach (posterior-lateral)**
- **Patient related factors (compliance, obesity, age, neurological pathologies, alcohol abuse)**
- **Impingement**



G.I.O.T. 2004;30:37-42

Fattori di rischio pre-operatori per la stabilità protesica nella protesi d'anca

Pre-operating risk factors for the prosthetic stability in total hip replacement

F. Franchin
F. Sanguineti
S. Briano
M. Stella



INAPPROPRIATE POSITIONING



It is mostly due to a macroscopically inappropriate surgical technique



Intra-operative surgical errors and components malpositioning represent the main etiopathogenetic factor for instability and consequent, possible THA dislocation



Arch Orthop Trauma Surg (2003) 123 : 219–222
DOI 10.1007/s00402-003-0482-3

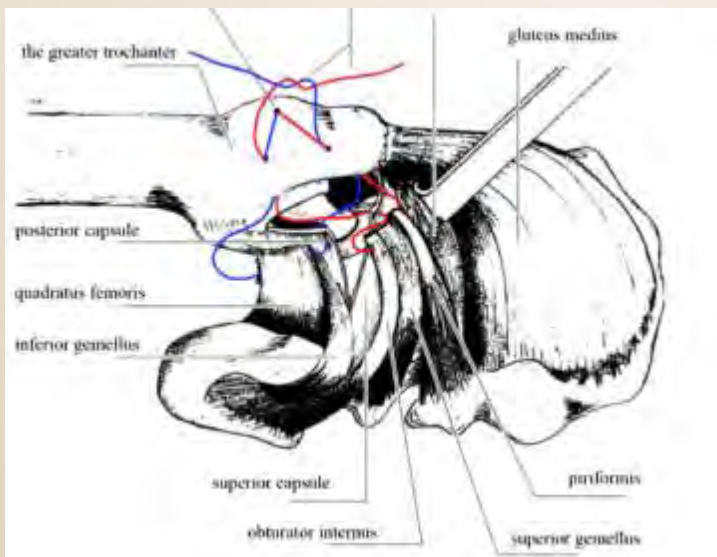
ORIGINAL ARTICLE

G. M. J. van Stralen · P. J. Struben · C. J. M. van Loon

The incidence of dislocation after primary total hip arthroplasty using posterior approach with posterior soft-tissue repair



SURGICAL APPROACH



Incidence 1,36%

91% during first 6 weeks



Obesity

Prevalence and Trends in Obesity Among US Adults, 1999-2008

Katherine M. Flegal, PhD

Margaret D. Carroll, MSPH

Cynthia L. Ogden, PhD

Lester R. Curtin, PhD

JAMA, January 20, 2010—Vol 303, No. 3

At present, in the USA, prevalence of obesity (BMI > 30) is 33.9%



Obesity in total hip replacement

J. G. Andrew, J. Palan,

J Bone Joint Surg [Br]
2008;90-B:424-9.

Arthritis & Rheumatism (Arthritis Care & Research)
Vol. 59, No. 5, May 15, 2008, pp 738-745

Outcomes of Obese and Nonobese Patients Undergoing Revision Total Hip Arthroplasty

ANNE LÜBBEKE,¹ KAREL G. M. MOONS,² GUIDO GARAVAGLIA,¹ AND PIERRE HOFFMEYER¹

**Obesity (especially severe, BMI > 40) Is a significant and independent risk factor for THA dislocation.
Causes are NOT completely clear.**



Obesity

Clin Orthop Relat Res (2013) 471:971–980
DOI 10.1007/s11999-012-2512-3

Clinical Orthopaedics
and Related Research®
A Publication of The Association of Bone and Joint Surgeons®

BASIC RESEARCH

Morbid Obesity May Increase Dislocation in Total Hip Patients: A Biomechanical Analysis



Contact between thigh and thigh/abdomen during hip flexion/extension movements generates forces directed laterally on the hip prosthesis, predisposing for joint dislocation



IMPINGEMENT ?!

**Contact phenomenon that might occur during movement.
Could happen between prosthetic components, prosthetic component/bone or bone/bone (bony impingement)**



INTRA-ARTICULAR



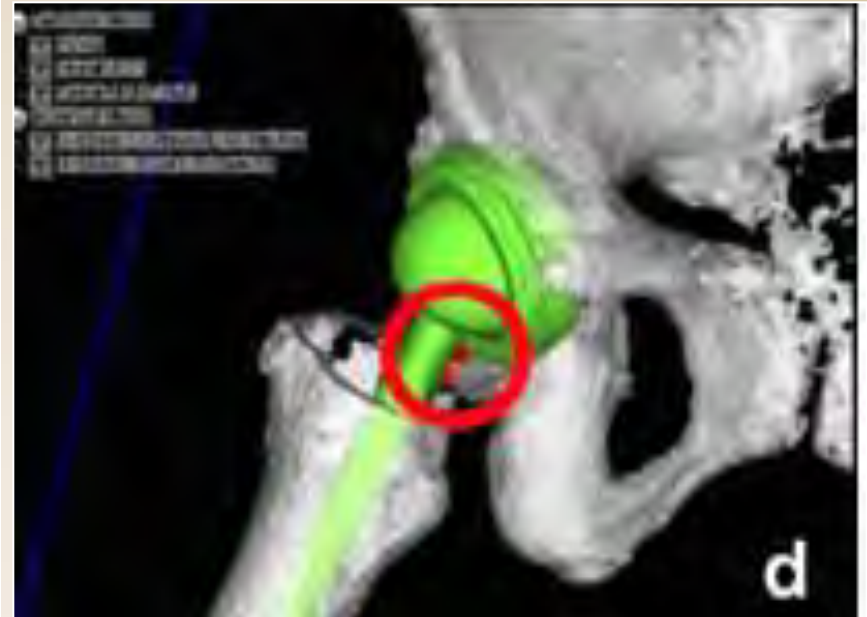
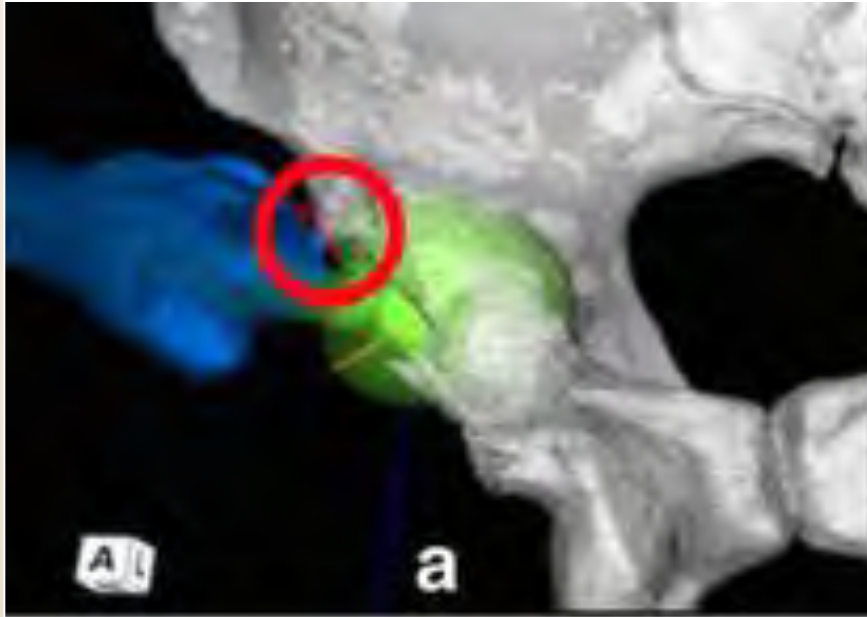
EXTRA-ARTICULAR

**IMPINGEMENT AND DISLOCATION IN TOTAL HIP ARTHROPLASTY:
MECHANISMS AND CONSEQUENCES**

The 2012 OREF Clinical Research Award Paper
Thomas D. Brown, PhD ^{1,2}, Jacob M. Elkins, MD PhD ^{1,2}, Douglas R. Pedersen, PhD ^{1,2}, and John J. Callaghan, MD ^{1,2,3}



Intra-articular Impingement



Extra-articular Impingement



The Journal of Arthroplasty Vol. 25 No. 4 2010

Factors Affecting Bony Impingement in Hip Arthroplasty

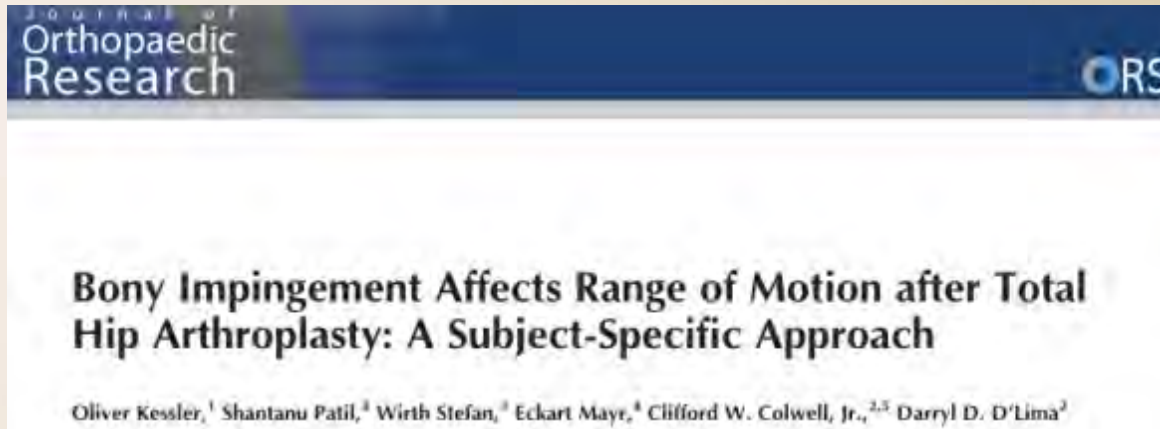
William B. Kurtz, MD,* Timo M. Ecker, MD,† William M. Reichmann, BS,‡ and
Stephen B. Murphy, MD§

INTRA-ARTICULAR

Caused by:

- **Defective reconstruction of articular geometry**
(socket inclination and anteversion, femoral *off-set and anteversion*,)

Surgeon dependent



EXTRA-ARTICULAR

- **Femoral head diameter >32mm**
- **Not accurate acetabular preparation** (*e.g. osteophytes removal*)
- **Individual factors (anatomy of the femur and pelvis)**



Systematic Review

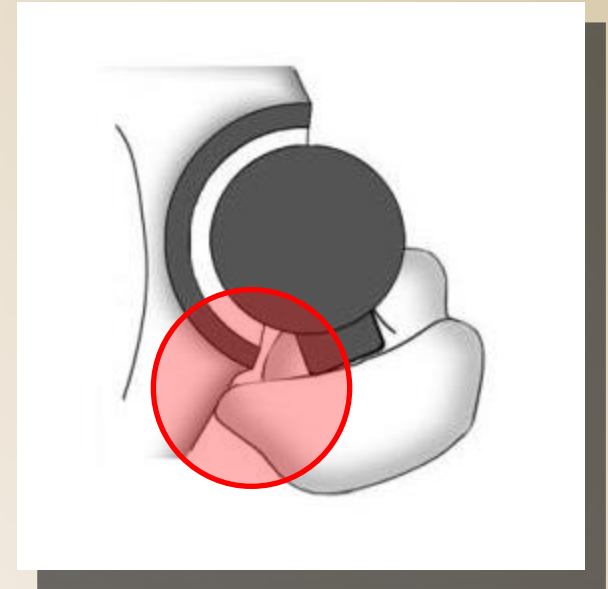
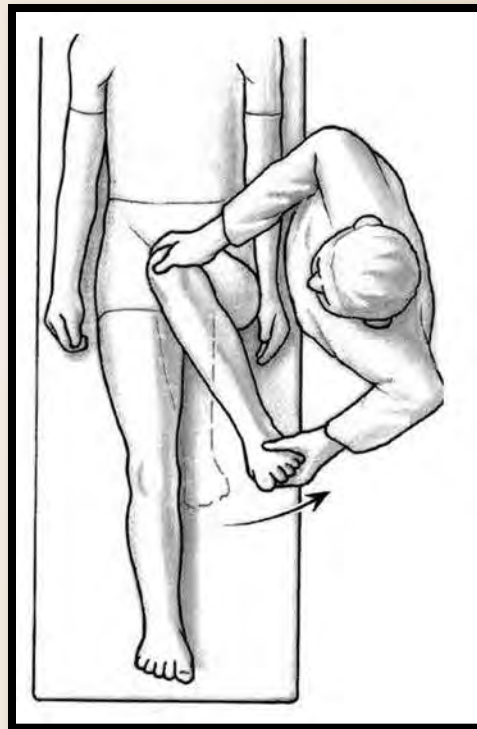
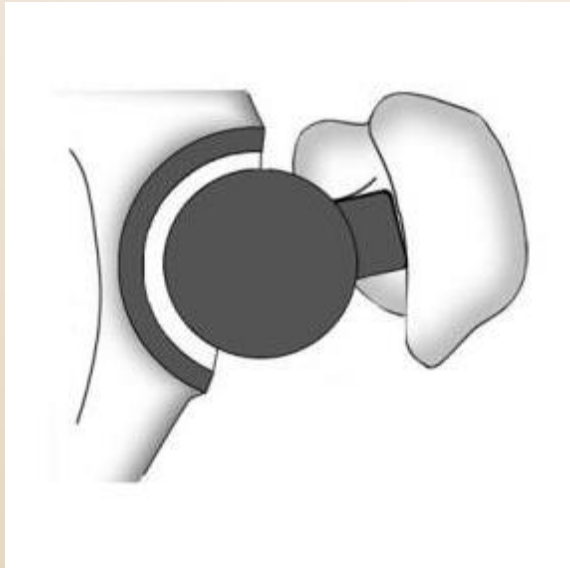
Extra-Articular Hip Impingement: A Systematic Review Examining Operative Treatment of Psoas, Subspine, Ischiofemoral, and Greater Trochanteric/Pelvic Impingement

Darren de SA, M.D., Hussain Alradwan, M.B.B.S., F.R.C.S.(C),
Stephanie Cagnelli, M.D. Cand., Zoyah Thawer, M.D. Cand., Nicole Simunovic, M.Sc.,
Edwin Cadet, M.D., Nicolas Bonin, M.D., Christopher Larson, M.D., and
Olufemi R. Ayeni, M.D., M.Sc., F.R.C.S.(C)

Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol 30, No 8 (August), 2014: pp 1026-1041



EXTRA-ARTICULAR BONY IMPINGEMENT BETWEEN THE ANTERIOR EDGE OF GREATER TROCHANTER AND ILEUM, WITH OR WITHOUT SOFT TISSUE INTERPOSITION



WELL KNOWN BUT UNDERESTIMATED CAUSE FOR EARLY THA DISLOCATION



ALOT – Anterior Longitudinal Osteotomy of greater Trochanter

Clinical and x-ray prospective trial

- **189 patients underwent THA between June 2011 and June 2014**
- **Single Surgeon performing THA**
- **2 different implant types (uncemented and hybrid)**
- **F 107 M 82**
- **Modified posterior-lateral approach**
- **A.L.O.T. Anterior Longitudinal Osteotomy of greater Trochanter**
- **Clinical and x-ray follow-up at 1, 3, 6 and 12 months**



ALOT – Anterior Longitudinal Osteotomy of greater Trochanter **Surgical technique**

Orthopedics. 2015 Aug;38(8):490-3. doi: 10.3928/01477447-20150804-04.

Anterior Longitudinal Osteotomy of the Greater Trochanter in Total Hip Arthroplasty.

Surace MF, Regazzola GM, Vulcano E, Monestier L, Cherubino P.

Abstract

The extra-articular impingement of the greater trochanter against the ileum is an underrated cause of early dislocation in total hip arthroplasty. In this preliminary study, the authors assess the effectiveness of an anterior longitudinal osteotomy of the greater trochanter for preventing dislocation. A total of 115 patients underwent a total hip arthroplasty through a posterolateral approach. All patients underwent clinical and radiological follow-up at 1, 3, and 6 months. No dislocation was reported. All patients demonstrated fast recovery of range of motion and walking. No trochanter fractures were observed. The osteotomy of the greater trochanter is an effective surgical technique that decreases anterior impingement and consequently lowers the dislocation rate in primary total hip arthroplasty. [Orthopedics. 2015; 38(8):490-493.].

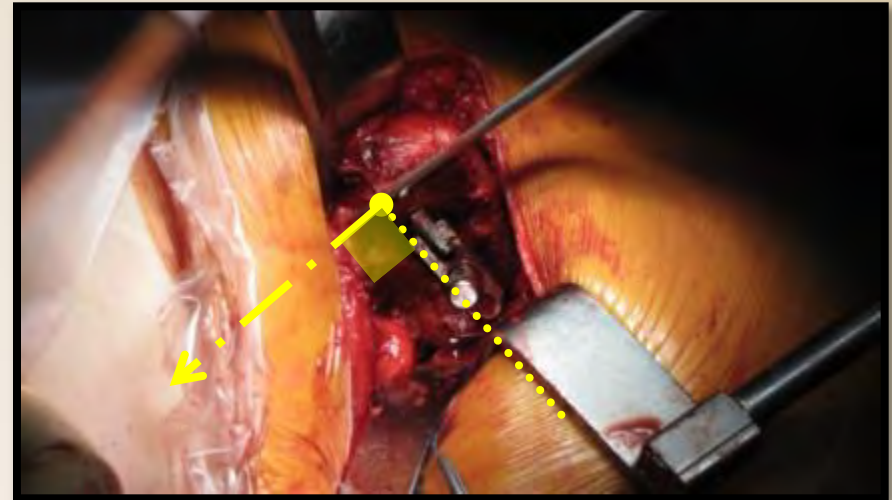
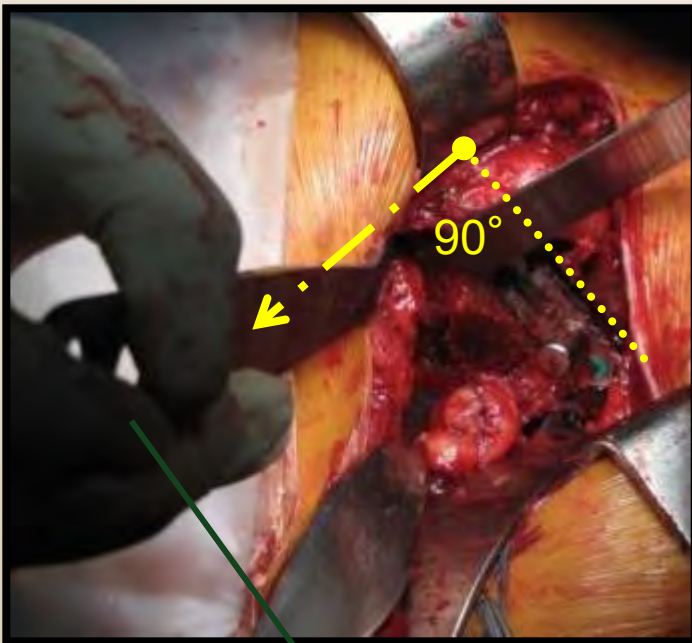
Copyright 2015, SLACK Incorporated.

PMID: 26313167 [PubMed - in process]



ALOT – Anterior Longitudinal Osteotomy of greater Trochanter Surgical technique

Osteotomy is performed at least 90° (depending on the GT shape) of the femoral stem anteversion plane

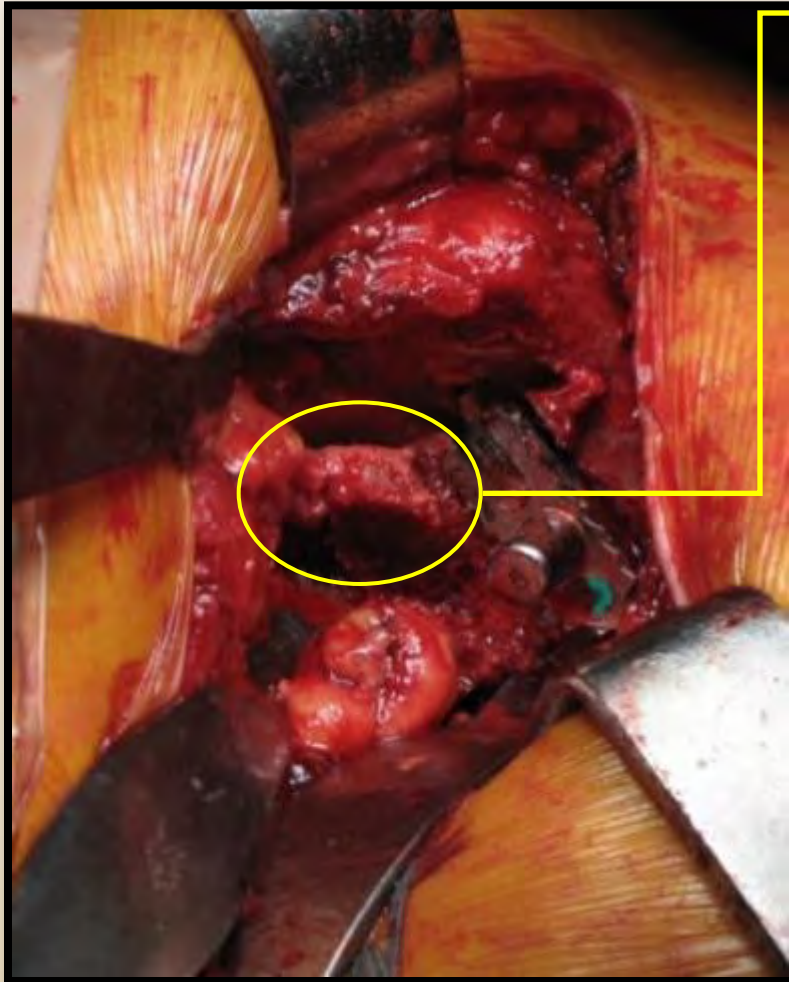


Osteotomy of the GT performed along the anterior edge of the femoral stem, in order to remove the most anterior part of GT that could potentially generate impingement

A blunt Hohmann retractor is positioned anteriorly to protect ST.



ALOT – Anterior Longitudinal Osteotomy of greater Trochanter Surgical technique



**Bone chunk from GT is removed
detaching soft tissues with EC.
Abundant capsule is also removed
if generating impingement.**



ALOT – Anterior Longitudinal Osteotomy of greater Trochanter Surgical technique



Capsule and ER tendons are reinserted with transosseous sutures (if detached)





ALOT – Anterior Longitudinal Osteotomy of greater Trochanter

RESULTS

- **Early clinical recovery (ROM, walking ability)**
- **Average HHS = 80.15 a 3 months, 95.70 a 6 months**
- **No fractures of the GT**
- **1 early dislocation (anterior – non related to surgical technique – revised with constrained liner)**
- **1 superficial wound infection**
- **No significant differences between implant types**



ALOT – Anterior Longitudinal Osteotomy of greater Trochanter

CONCLUSIONS

Early dislocation rate in THA without A.L.O.T. = 1.1%

(same surgeon previous 387 consecutive cases)

Vs.

Early dislocation rate in THA with A.L.O.T. = 0.53%



A.L.O.T. reduced by 52% early dislocation rate



ALOT – Anterior Longitudinal Osteotomy of greater Trochanter

CONCLUSIONS

The **A.L.O.T.** proved to be:

- **Effective**
- **Safe**
- **Fast**
- **Cheap**
- **Outcome comparable to best reports in literature.**



Thanks A.L.O.T.



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY





CAPSULE REPAIR IN THP USING A POSTERIOR APPROACH

TRANSOSSEOUS 'OVER THE TOP' RECONSTRUCTION OF CAPSULE AND
TENDONS AND THE PREVENTION OF DISLOCATIONS

MILAN 2015

INTRODUCTION

- -DISLOCATION REMAINS MAJOR PROBLEM IN THP, ESPECIALLY WHEN USING A POSTERIOR APPROACH
- SEVERAL FORMS OF REPAIR/RECONSTRUCTION OF CAPSULE HAVE BEEN DESCRIBED
- CONFLICTING EVIDENCE CONCERNING THEIR EFFICACY: EARLY FAILURE, TROCHANTERIC FRACTURE

INTRODUCTION

- TEN YEARS EXPERIENCE WITH CURRENT TECHNIQUE, WITH EXCELLENT CLINICAL RESULTS
- BASED ON A CADAVERIC EXPERIMENT
- ADAPTED TO THE CLINICAL SITUATION

POSTERIOR TRANSOSSEOUS CAPSULOTENDINOUS REPAIR IN TOTAL HIP ARTHROPLASTY

A CADAVER STUDY

BY W. SIOEN, MD, J.P. SIMON, MD, PHD, L. LABEY, IR, AND R. VAN AUDEKERCKE, MSC, PHD

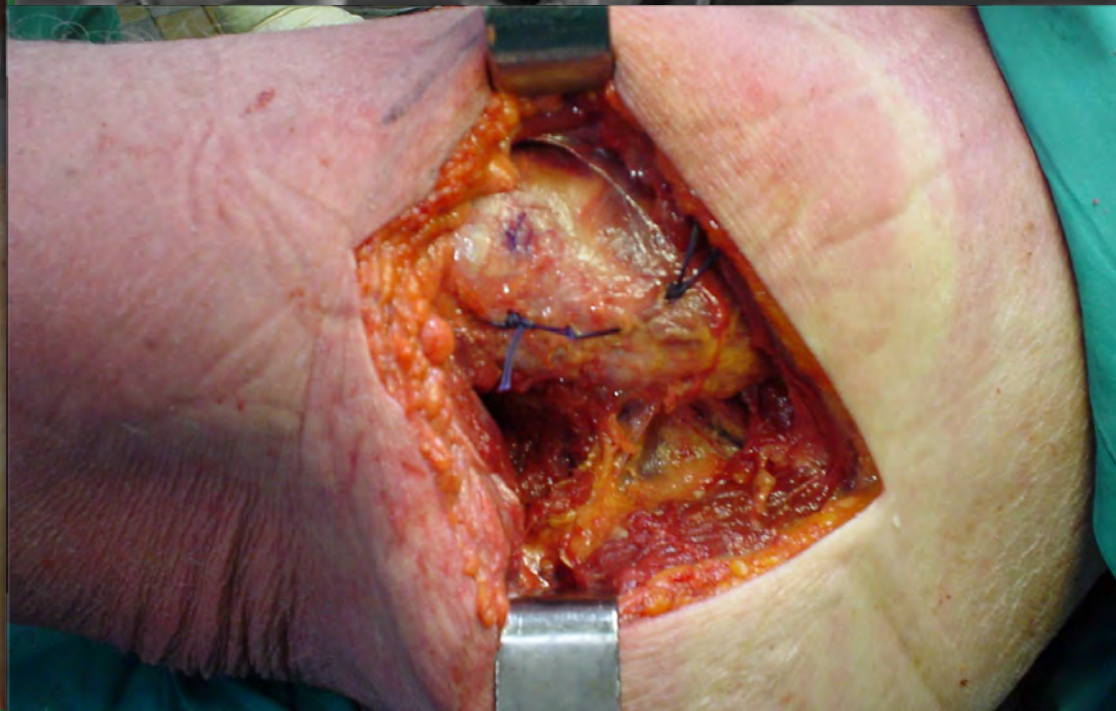
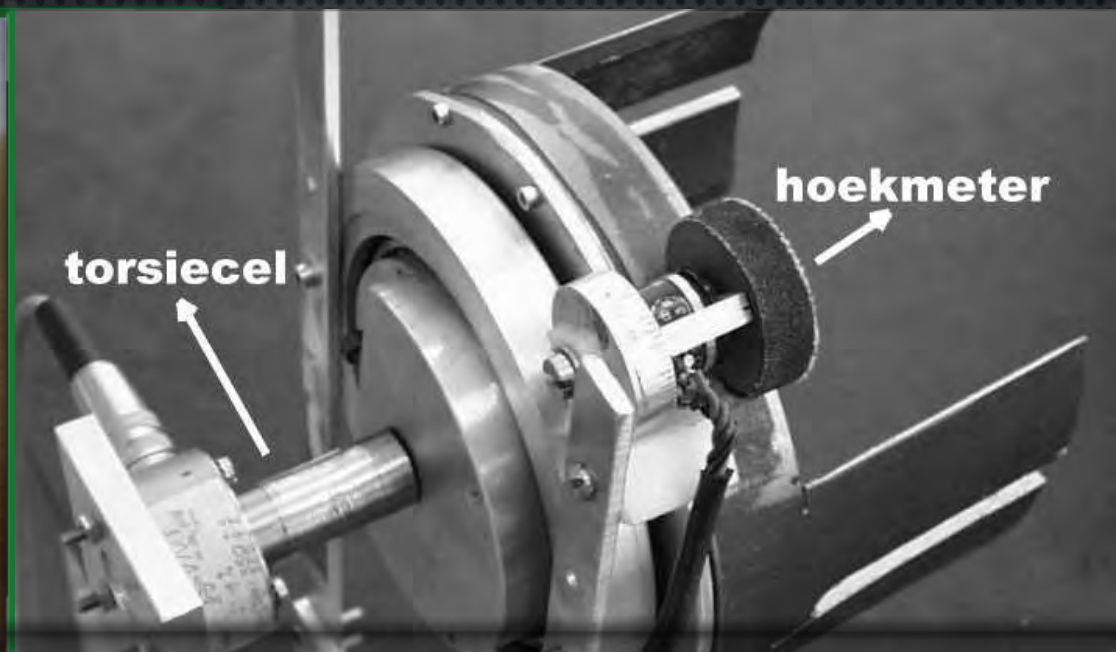
Investigation performed at the Department of Orthopaedics, University of Louvain, Louvain, Belgium

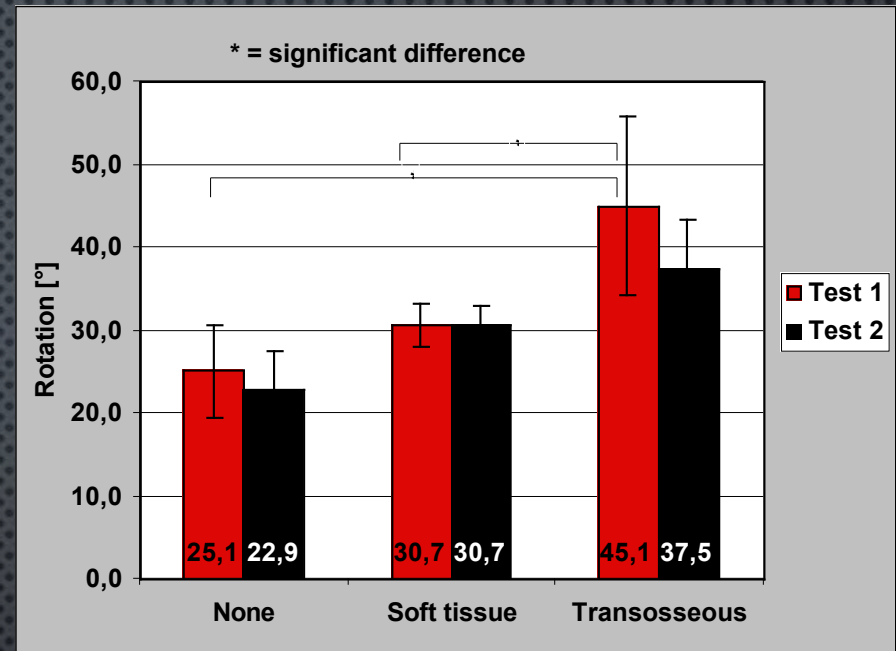
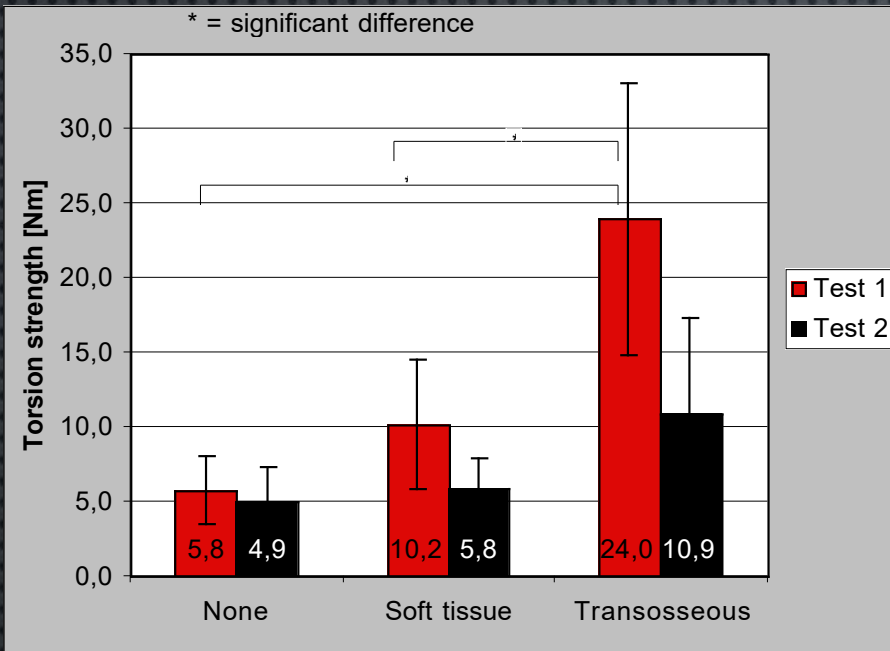
Background: While recent clinical articles have reported a dramatic reduction in rates of total hip dislocation after posterior transosseous repair, we are not aware of any published biomechanical data to support this finding. The objectives of this study were to investigate the functional anatomy of the posterior transosseous repair and its effect on stability after total hip replacement.

Methods: Six total hip prostheses were implanted into three fresh cadavera. Three different repair situations (no repair, soft-tissue repair, and transosseous fixation) were then consecutively tested on each hip. Values for torque resistance and the angular range of motion at dislocation were recorded. Each repair was tested twice, yielding a total of thirty-six torque values and thirty-six angles of rotation.

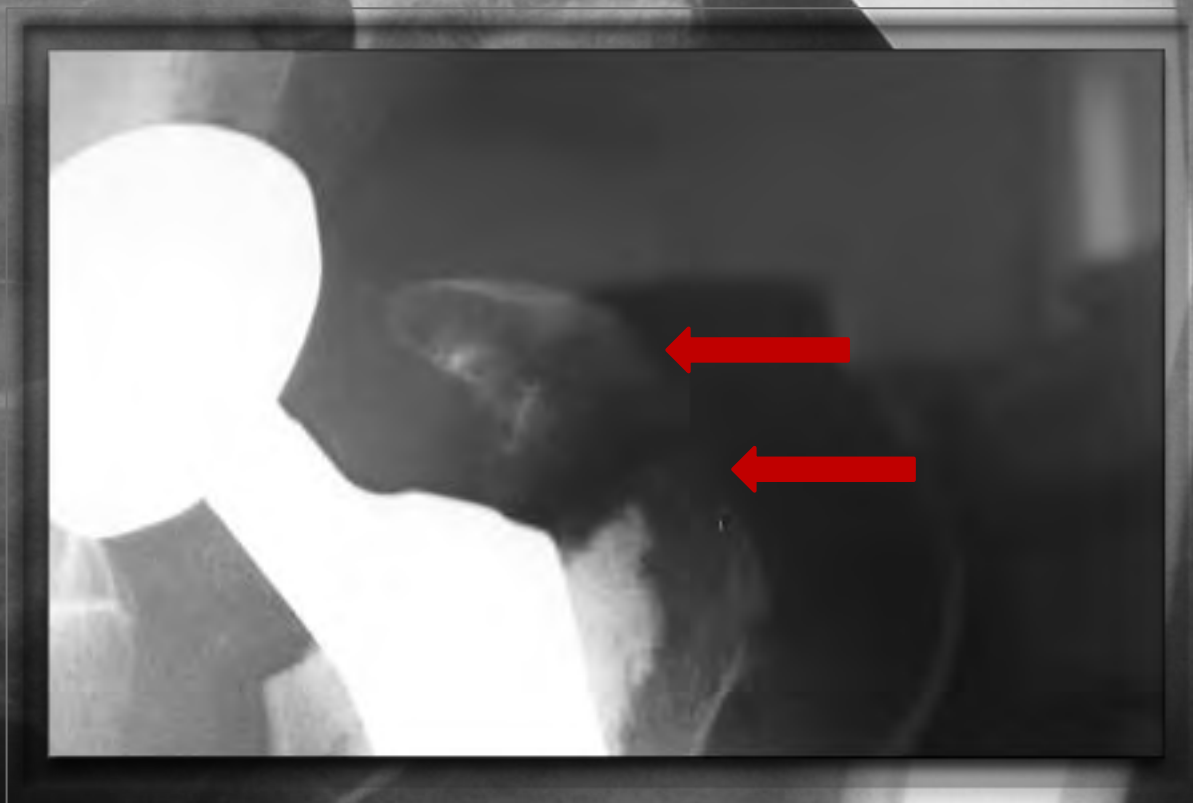
Results: The transosseous repair was superior with regard to both torsion strength (four times stronger than that after no repair [$p = 0.0002$] and more than twice as strong as that after soft-tissue repair [$p = 0.002$]) and the magnitude of the angle of rotation observed prior to dislocation (an increase of 83% in comparison with that after no repair [$p = 0.0005$] and an increase of 46% in comparison with that after soft-tissue repair [$p = 0.004$]).

Conclusions: In a cadaver model, posterior transosseous repair provides superior stability of a total hip replacement. Optimal surgical technique with a slightly modified approach allows greater retention of capsule and tendon length and a more anatomical reinsertion of the soft tissues.





- CONCLUSION: TRANOSSEOUS REPAIR RESULTS IN MOST STABLE RECONSTRUCTION
- KNOWLEDGE AND RESPECT OF FUNCTIONAL ANATOMY IS IMPORTANT

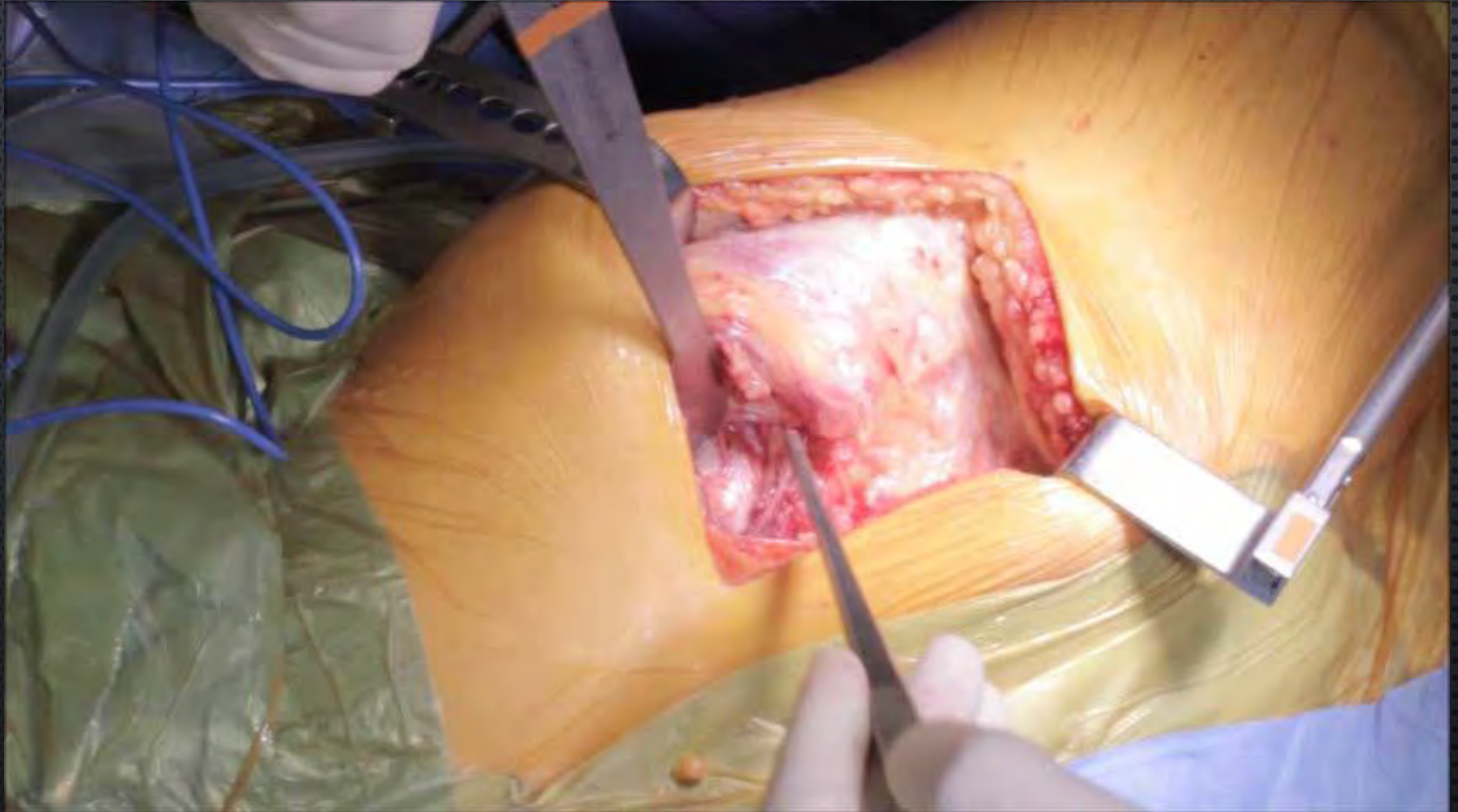




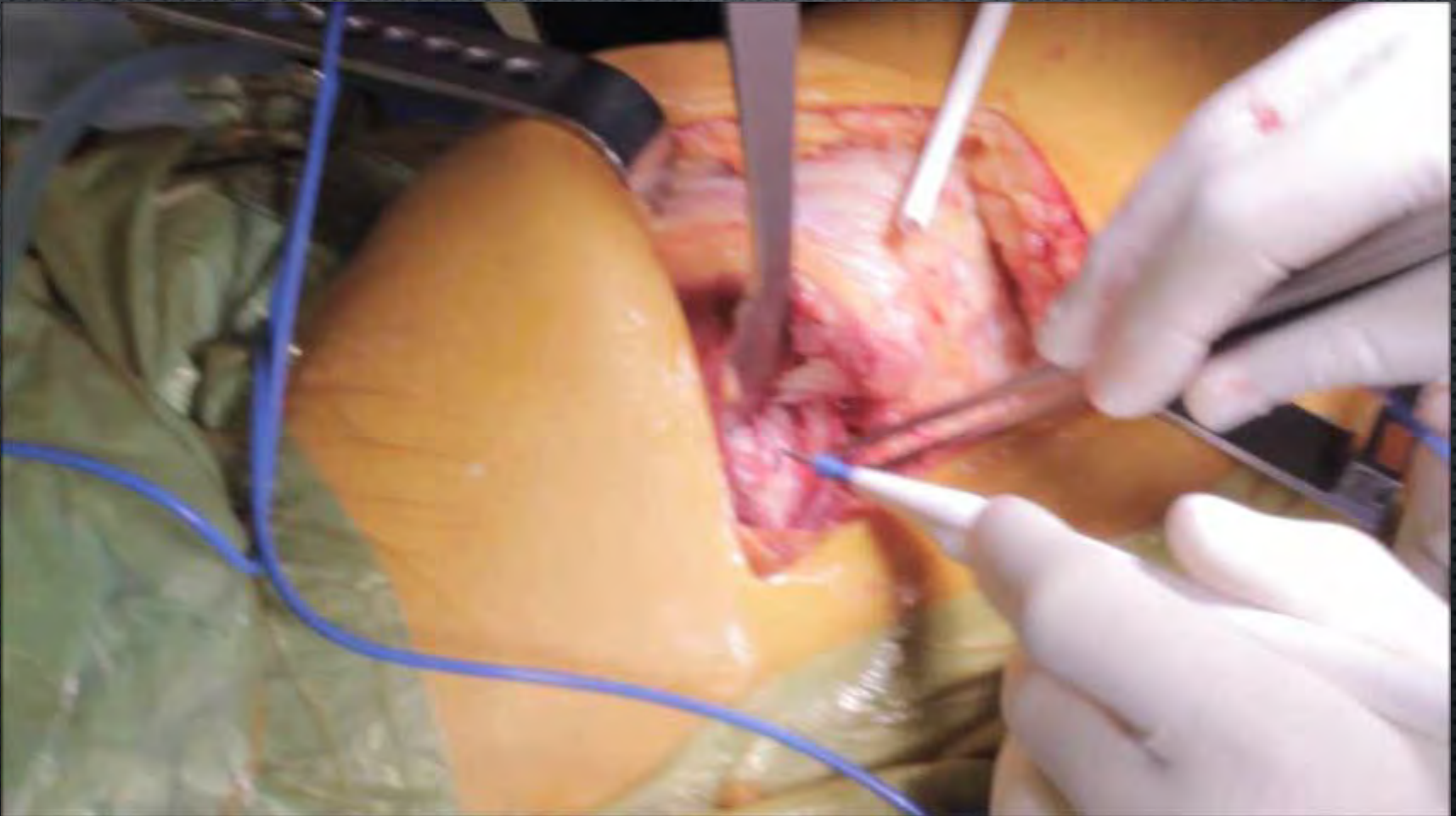
CURRENT OPERATIVE TECHNIQUE

- STANDARD POSTERIOR APPROACH
- ANATOMICAL RELEASE AT TENDON INSERTION
- MINIMAL INCISION OF CAPSULE
- TRANSOSSEOUS REPAIR WITH ONE DRILL HOLE

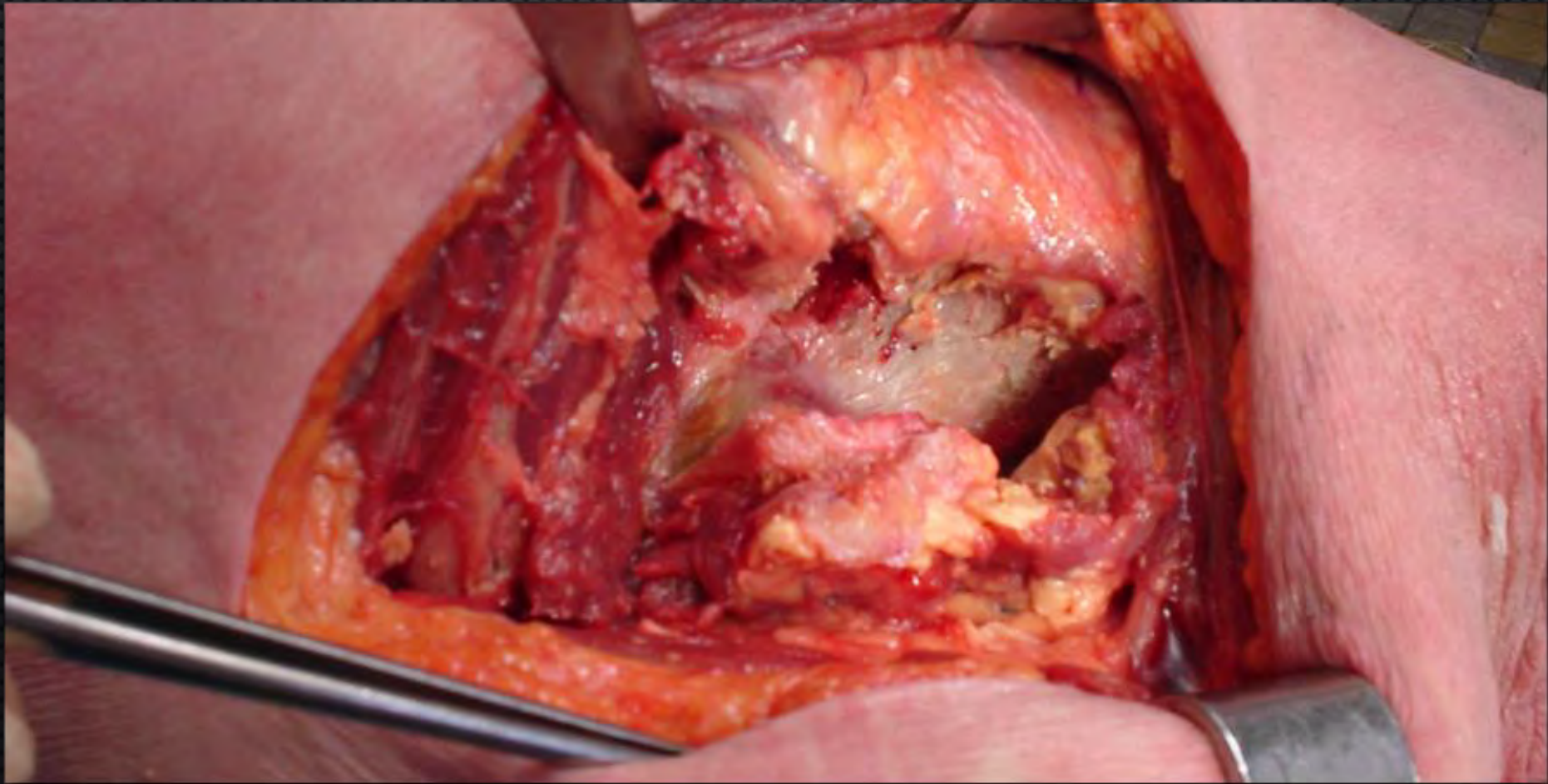
1 IDENTIFICATION OF PIRIFORMIS AND CAPSULE



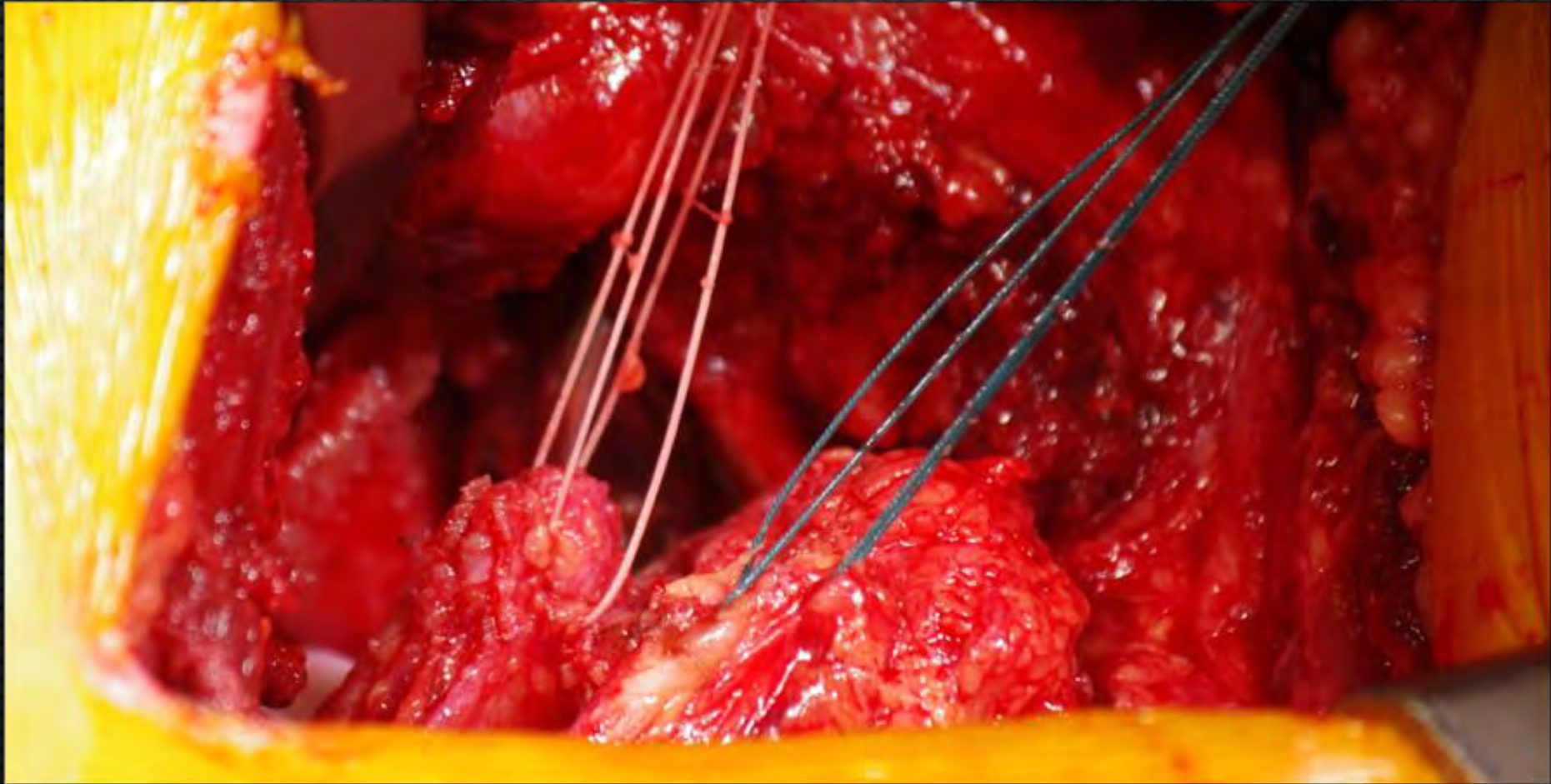
2 RELEASE AS CLOSE TO INSERTION AS POSSIBLE



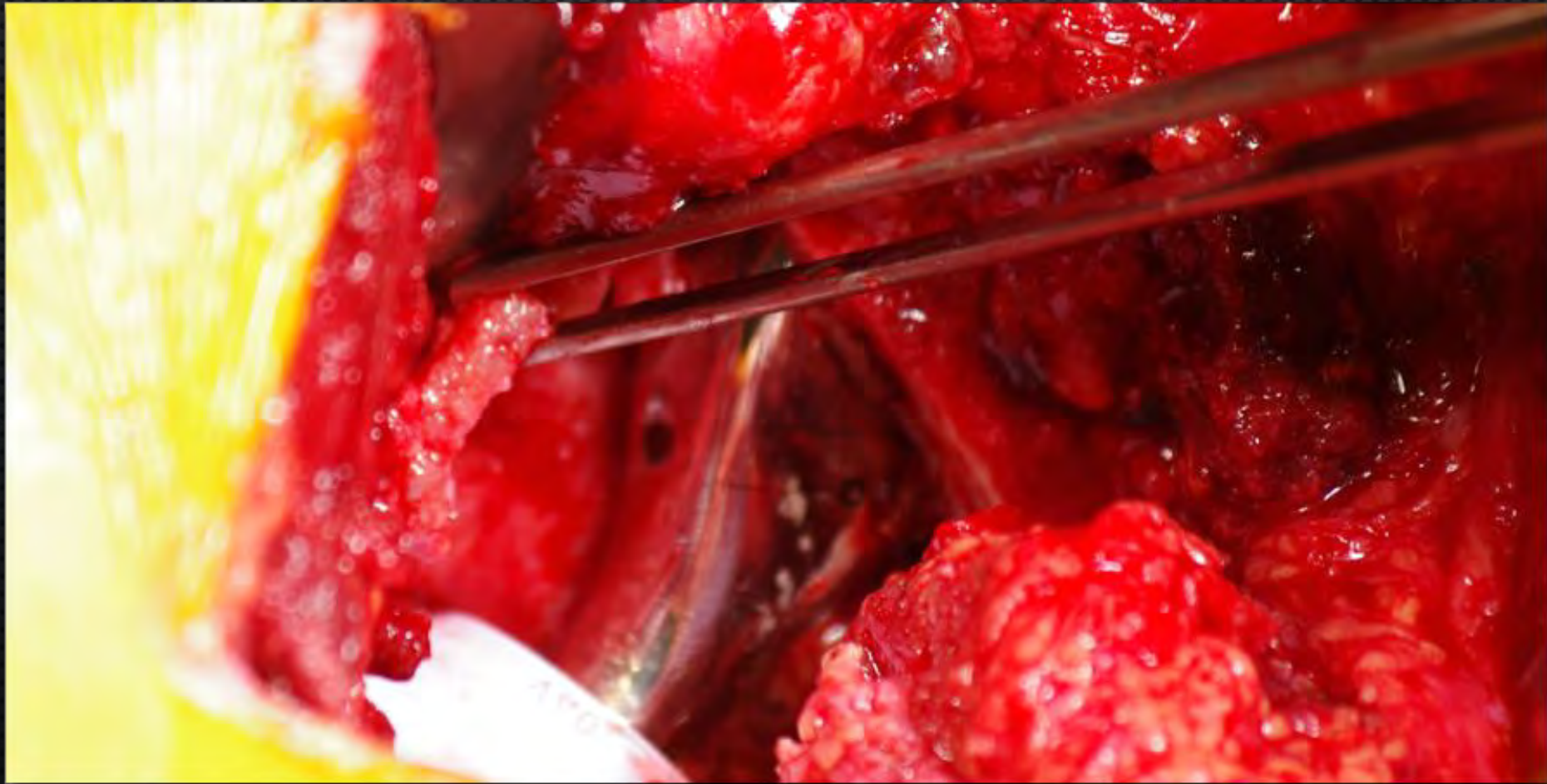
3 PREPARATION OF CAPULE AND TENDON FLAP

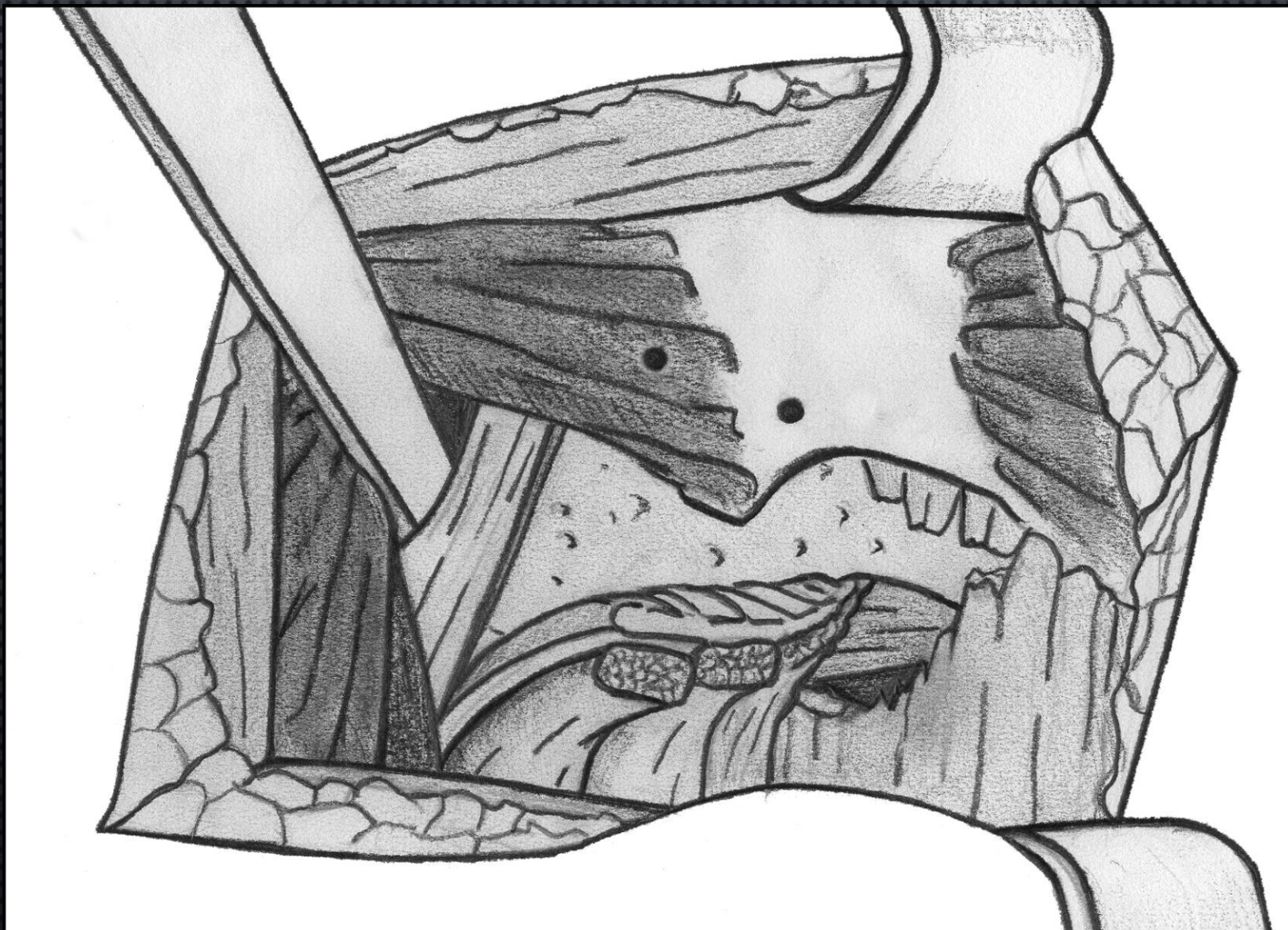


3 PREPARATION OF CAPULE AND TENDON FLAP

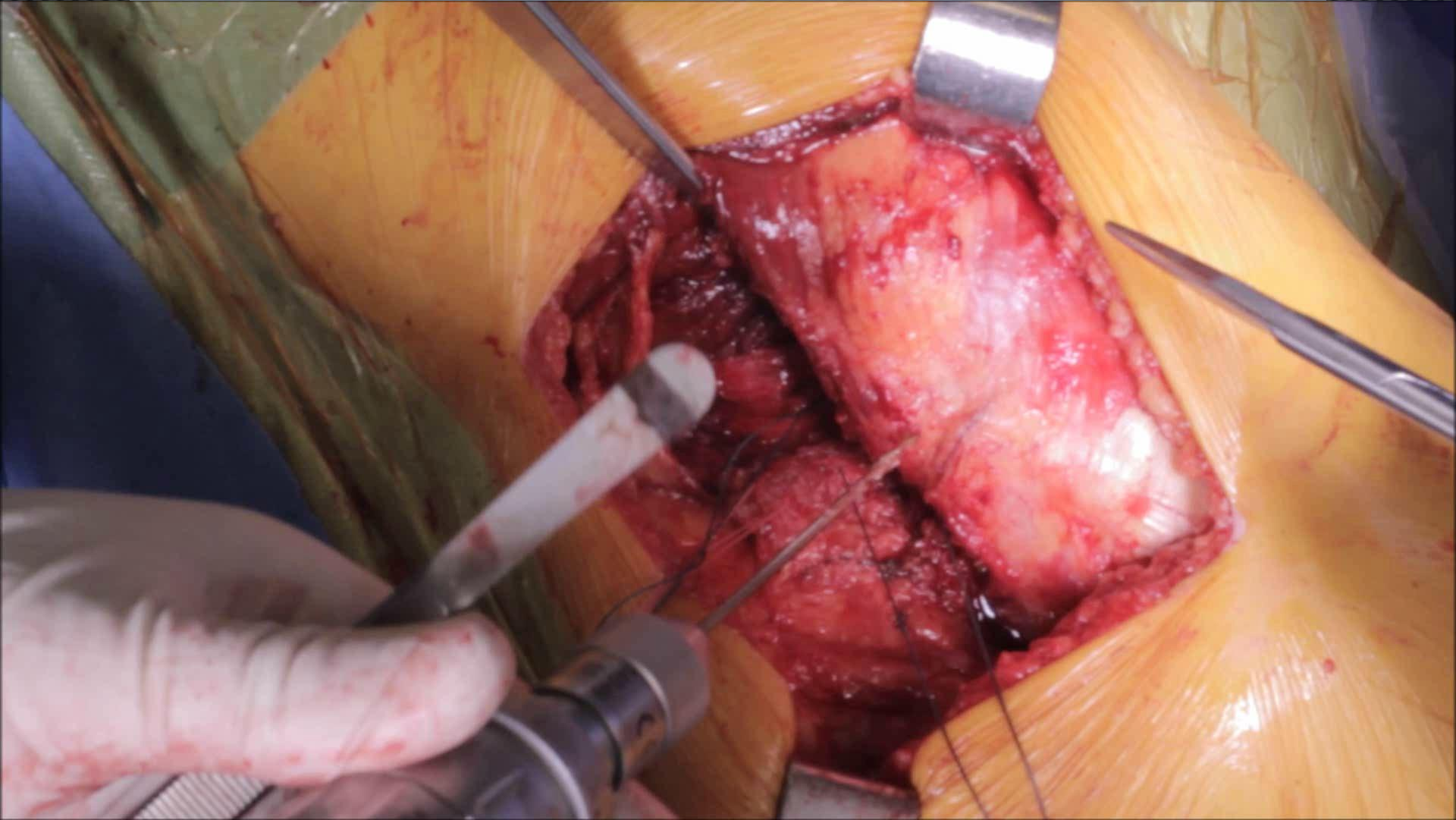


4 REINSERTION OF POSTERIOR CAPSULE FLAP ONTO ANTERIOR CAPSULE

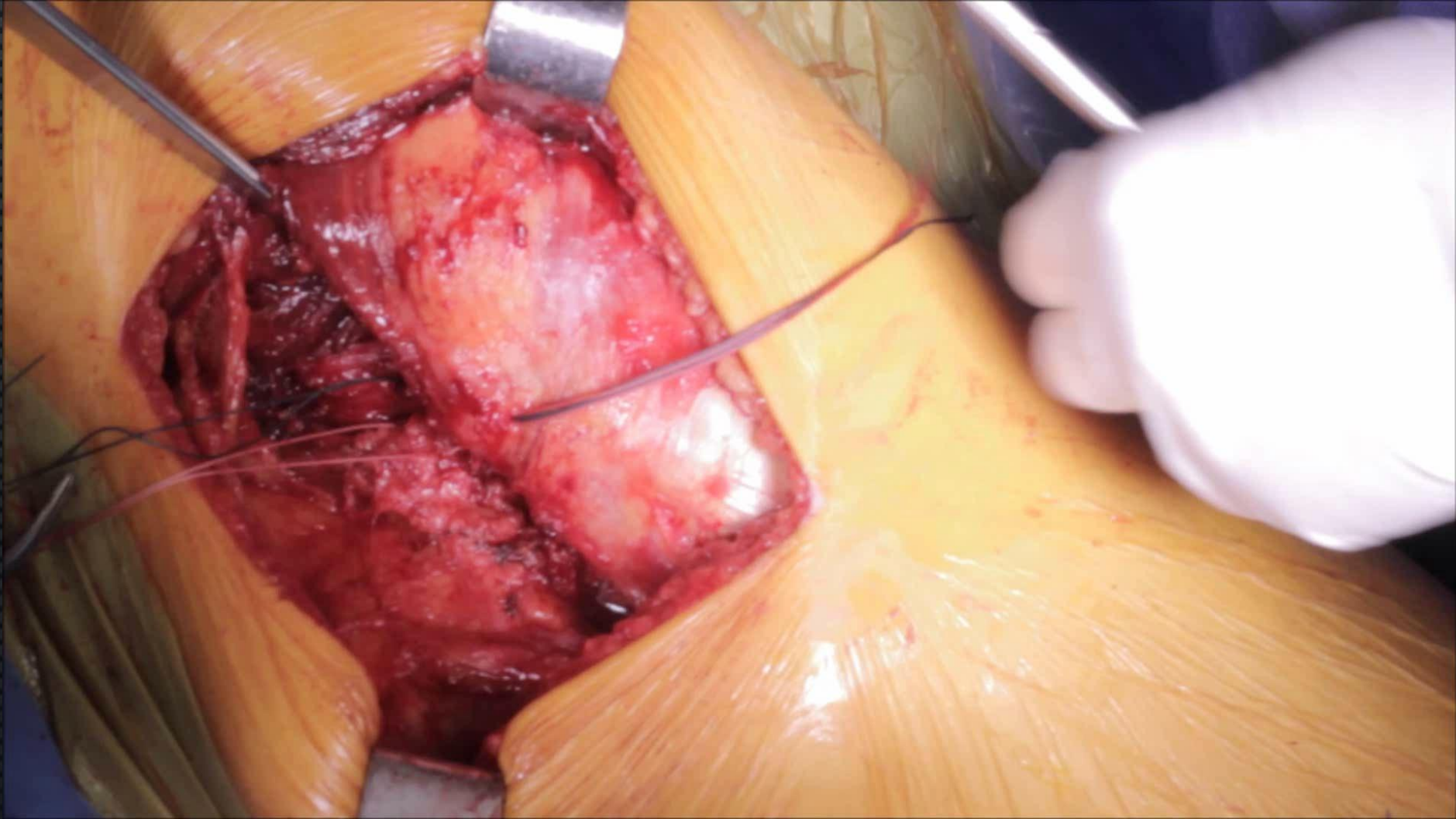




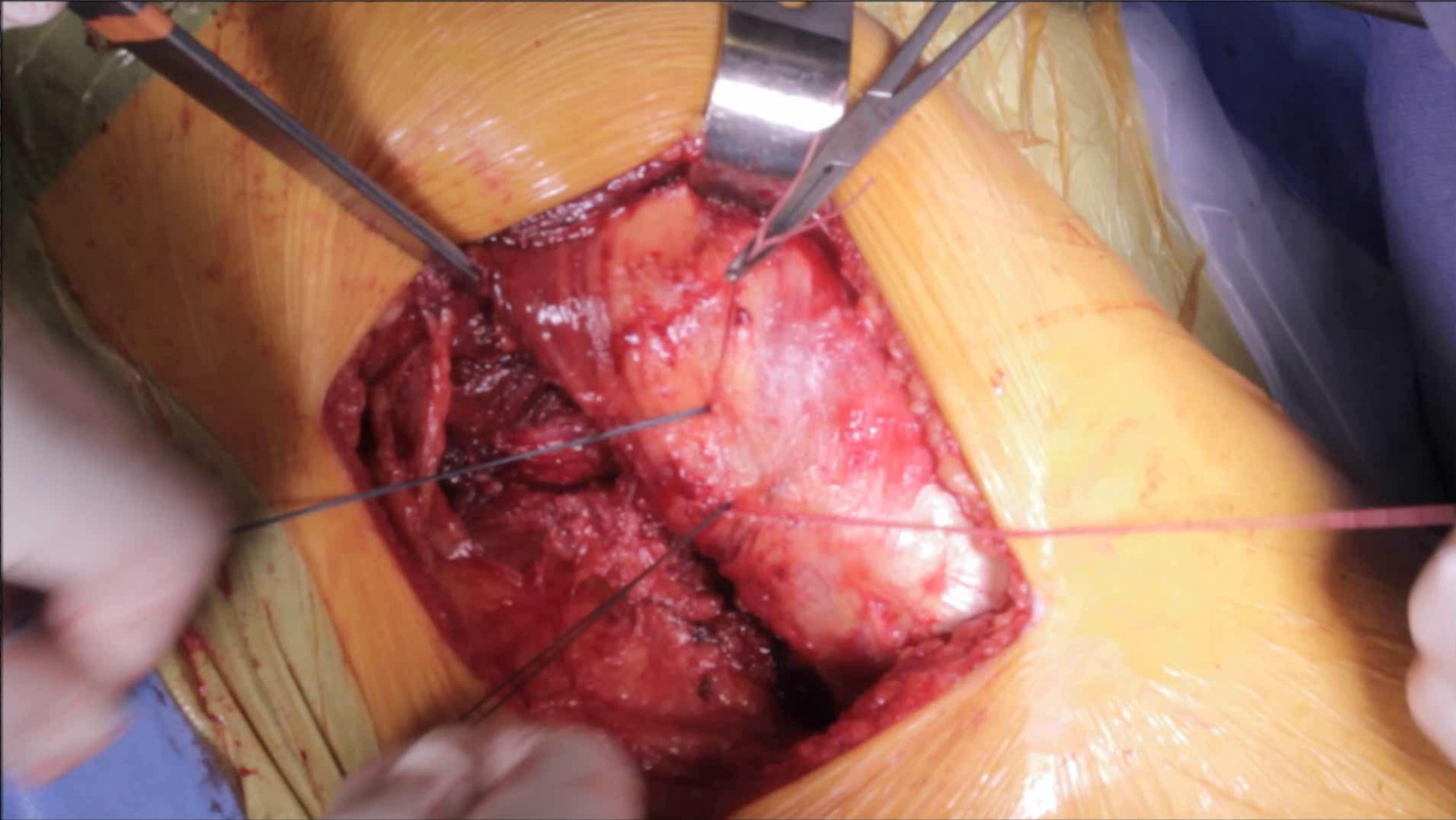
5 TRANSOSSEOUS DRILL HOLE



6 'OVER THE TOP' POSITIONING OF SECOND SUTURE



7 TRANSOSSEOUS SUTURE AND TESTING OF STABILITY



RESULTS

- CLINICAL COHORT ANALYSIS FROM 1-1-2004 TILL 31-12-2013
- 1085 THP INCLUDED; 677 VIA ANTEROLATERAL APPROACH (CONTROL GROUP), 408 VIA POSTERIOR APPROACH AND CAPSULE REPAIR
- DISLOCATION AT OR BEFORE 3 MONTHS

RESULTS

- 15 DISLOCATIONS IN CONTROL GROUP (2,2%)
- ONLY 1 DISLOCATION IN STUDY GROUP (0,2%)
- Z-TEST: SIGNIFICANT DIFFERENCE ($P = 0,009$)
- NO COMPLICATIONS RELATED TO THE TECHNIQUE (NO GREATER TROCHANTER FRACTURES)

CONCLUSION

- A CAREFULL REPAIR OF TENDONS AND CAPSULE AFTER THP CAN CONTRIBUTE TO POSTOPERATIVE STABILITY AND REDUCE DISLOCATION RATE IN THP



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY





Minimally invasive superior capsulotomy: new frontiers for total hip arthroplasty. A preliminary experience

Nicola Capuano M.D.

Angelo Del Buono M.D.

Nicola Capuano M.D.

Chief Department of Orthopedics and Traumatology

S. Luca Hospital - Vallo della Lucania (SA)

Randomized controlled trial

MIS group (TSPS): 132 patients (69 males and 63 females)

Standard group (postero-lateral): 130 patients (67 males and 63 females)

Patients were controlled using Harris, Oxford and WOMAC hip scores.

Results

Table 1: Perioperative and Hemodynamic features.
Values are given as average with range in brackets

	MIS Group (TSPS)	Standard Group (Postero-lateral)	Inter-group differences
Length of incision (cm)	7.1±0.9 (6-9)	10.7±1.6 (9-15)	P < 0.0001
Length of surgery (minutes)	48.6±10.6 (33-81)	59.0±11.1 (47-92)	P < 0.0001
Length of hospitalization (days)	5.2±1.1 (4-9)	10.0±1.8 (7-13)	P < 0.0001
VAS pain at discharge	2.1±1.0 (1-5)	4.0±1.6 (2-7)	P < 0.0001
Blood Loss (ml)	266.6±83.8 (220-680)	450.2±81.6 (400-810)	P < 0.0001
Number of patients transfused	16 (12.1%)	40 (30.8%)	P=0.0002

Results

Table 2: Score assessment and inter-group differences.

3 Months			1 Year			Last Follow-up		
MIS group	Standard group	P Value	MIS group	Standard group	P Value	MIS group	Standard group	P Value
95.0±5.0 (80-100)	91.0±6.9 (73-100)	< 0.0001	98.7±2.4 (88-100)	95.0±4.1 (86-100)	< 0.0001	98.6±2.6 (88-100)	97.5±3.4 (90-100)	0.23
94.0±5.4 (80-100)	90.0±6.8 (72-100)	< 0.0001	96.9±3.6 (86-100)	94.0±4.9 (80-100)	< 0.0001	97.0±3.5 (88-100)	96.5±3.3 (89-100)	0.12
57.0±3.0 (47-60)	54.0±3.8 (46-60)	<0.0001	59.0±1.4 (53-60)	56.0±3.9 (47-60)	<0.0001	58.9±1.2 (55-60)	58.4±1.8 (51-60)	0.09

Results

Table 3: return to sport in the MIS group

	Sport activity before symptoms	Sport activity at last follow-up
1	High level amateur soccer player	High level amateur soccer player
2	Recreational skier	Recreational skier
3	Recreational Runner	Recreational Runner
4	High level amateur tennis player	High level amateur tennis player
5	High level amateur basketball player	High level amateur basketball player
6	Recreational swimmer	Recreational swimmer
7	Recreational cyclist	Recreational cyclist
8	High level amateur soccer player	Low level amateur soccer player
9	Recreational rugby player	Recreational rugby player
10	Recreational skier	Recreational skier
11	High-level amateur runner	Swimmer
12	Amateur soccer player	Amateur soccer player
13	High level amateur soccer player	Low level amateur soccer player
14	Recreational tennis player	Recreational tennis player
15	Recreational cyclist	Recreational cyclist
16	Professional basketball player	Professional basketball player
17	High level amateur volleyball player	High level amateur volleyball player
18	Recreational soccer player	Recreational soccer player
19	Recreational basketball player	Recreational basketball player
20	Recreational skier	Recreational skier
21	Low level amateur surfer	Low level amateur surfer
22	Recreational snowboarder	Recreational snowboarder
23	Recreative golfer	Recreative golfer
24	Recreational golfer	Recreational golfer
25	High level recreational swimmerr	High level recreational swimmer

Table 4: return to sport in the standard group

	Sport activity before symptoms	Sport activity at last follow-up
1	Recreational skier	Recreational skier
2	Recreational golfer	Recreational golfer
3	High level amateur soccer player	Lower level amateur soccer player
4	High level amateur swimmer	High level amateur swimmer
5	Amateur tennis player	Amateur tennis player
6	Recreational rugby player	Recreational rugby player
7	Recreational snowboarder	Recreational snowboarder
8	Recreational soccer player player	Recreational soccer player
9	Recreational volleyball player	Recreational volleyball player
10	Recreational swimmer	Recreational swimmer
11	Amateur skier	Amateur skier
12	High level amateur golfer	Lower level amateur golfer
13	Low level amateur soccer player	Retired
14	High level volleyball player	Low level volleyball player
15	High level soccer player	Low level soccer player
16	High level amateur runner	Amateur Swimmer
17	Recreational soccer player	Retired
18	Recreational skier	Recreational skier
19	High level amateur rugby player	Lower level amateur rugby player
20	Recreational runner	Recreational runner
21	High level amateur tennis player	Lower level amateur tennis player
22	Low level basket player	Retired
23	Recreational tennis player	Recreational cyclist
24	Recreational volleyball player	Recreational volleyball player
25	Recreational soccer player	Recreational swimmer
26	Recreational skier	Recreational skier

Conclusions

Tissue Sparing Posterior Superior approach (TSPS) offers significant benefits in the early post operative period compared with a standard postero-lateral approach

Thank you for the attention



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

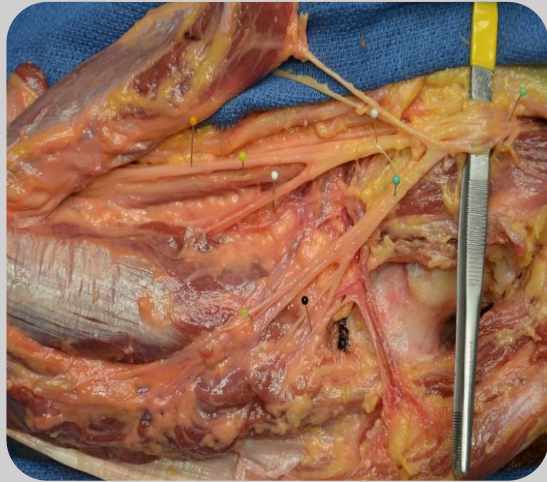
26-27 NOVEMBER 2015

MILAN, ITALY



Distal Extension of the Direct Anterior Approach

A Cadaveric Study



Dr. Ghijselings Stijn



26/11/15 - Milan

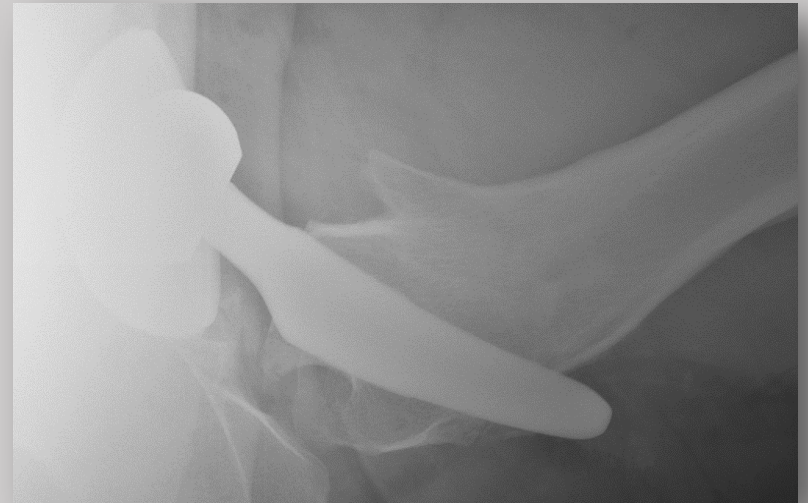
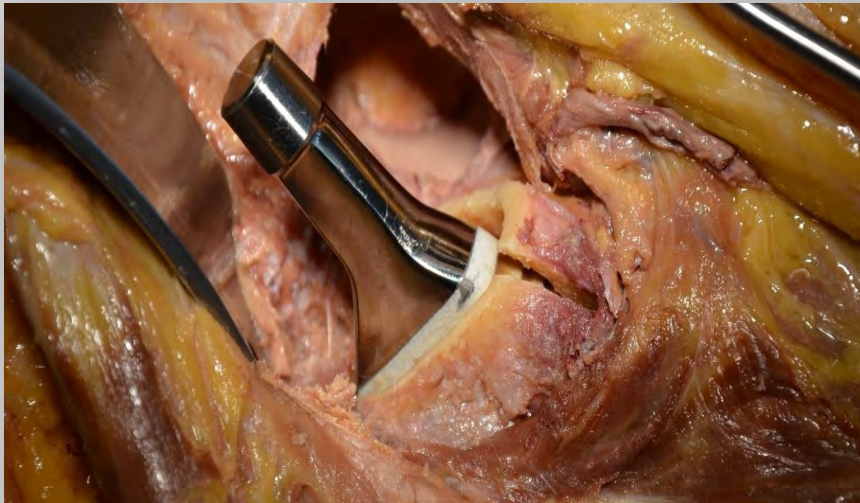
RESEARCH QUESTION

✗ DAA is associated with an increased incidence of intraoperative complications during the learning

curve



**Distal femoral extension of the
DAA ?**



Anatomic Cadaveric Study

20 hips - 17 human
cadavers

14 formalin-fixed & 6
fresh frozen

No previous surgery to
the hip

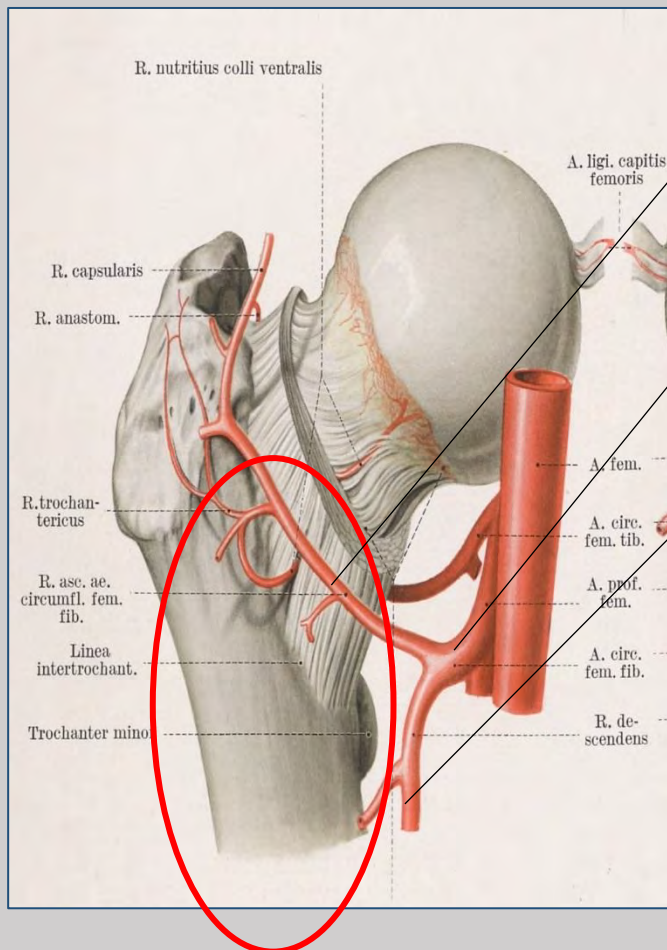
Age: 84,5 y

Male 8 / Female 12

Right 13 / Left 7



FEMORAL ANATOMY



Ascending branch

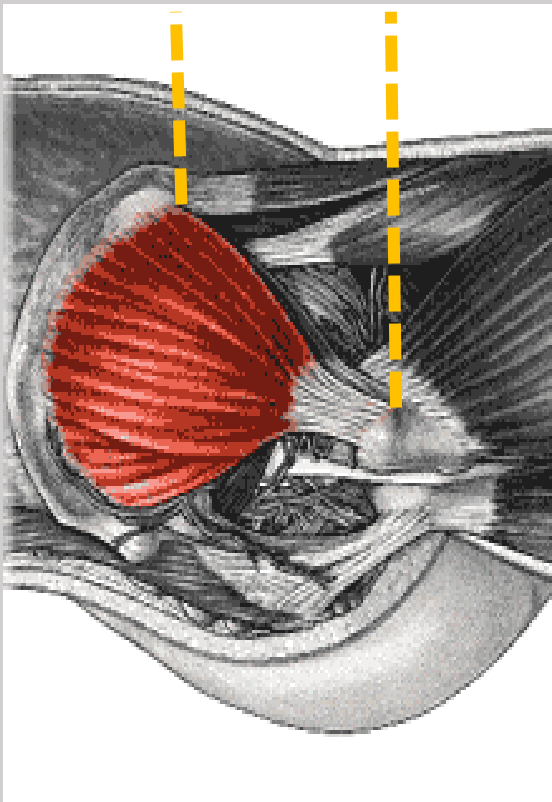
Lateral femoral circumflex artery

Descending branch

Motor nerve to the Vastus Lateralis (MNVL)

Lateral femoral circumflex artery (LFCA)

Anatomical Landmarks



Anterior Superior
Iliac Spine

Gluteus Minimus
Insertion

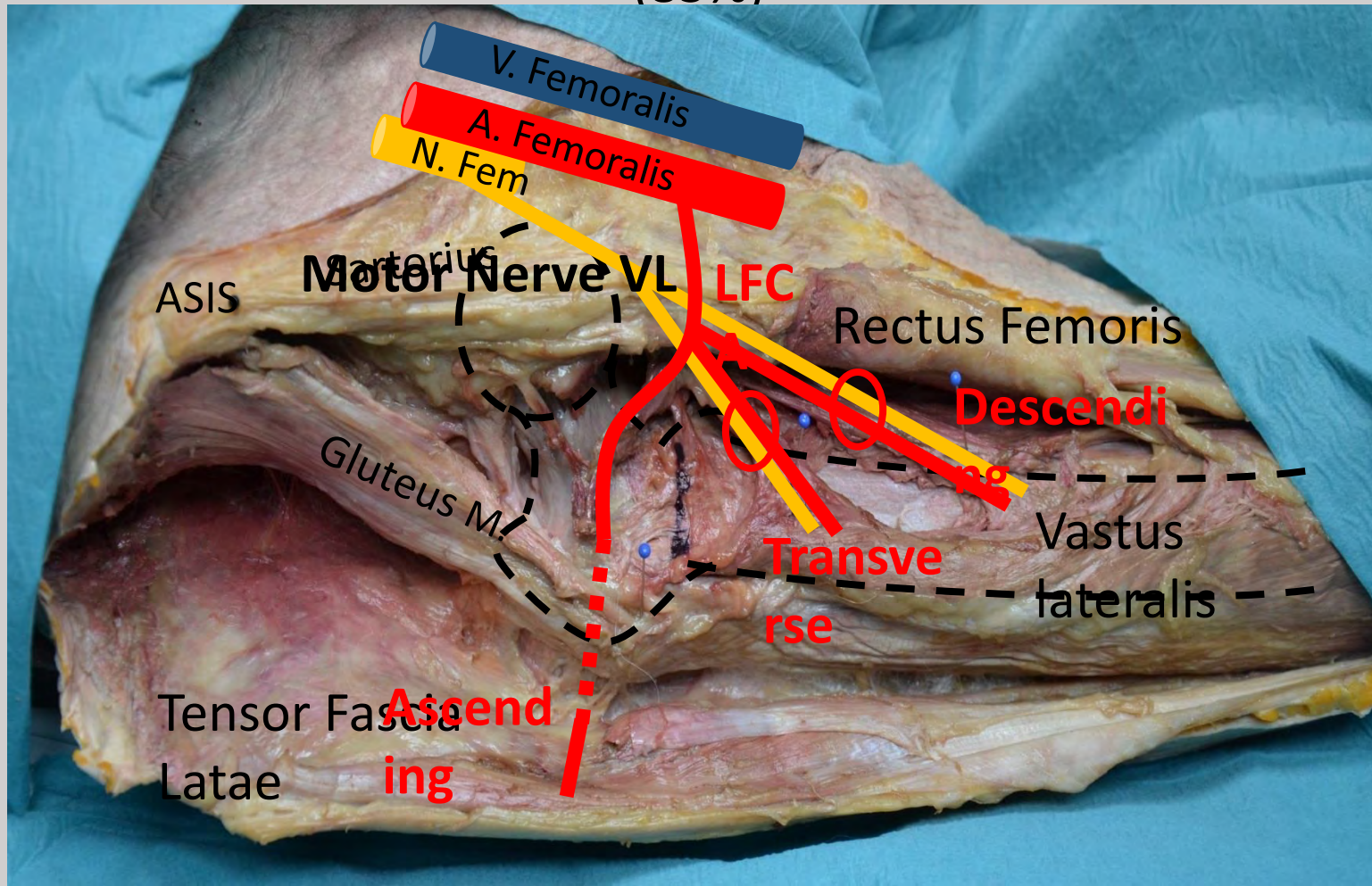
Lesser
Trochanter



RESULTS

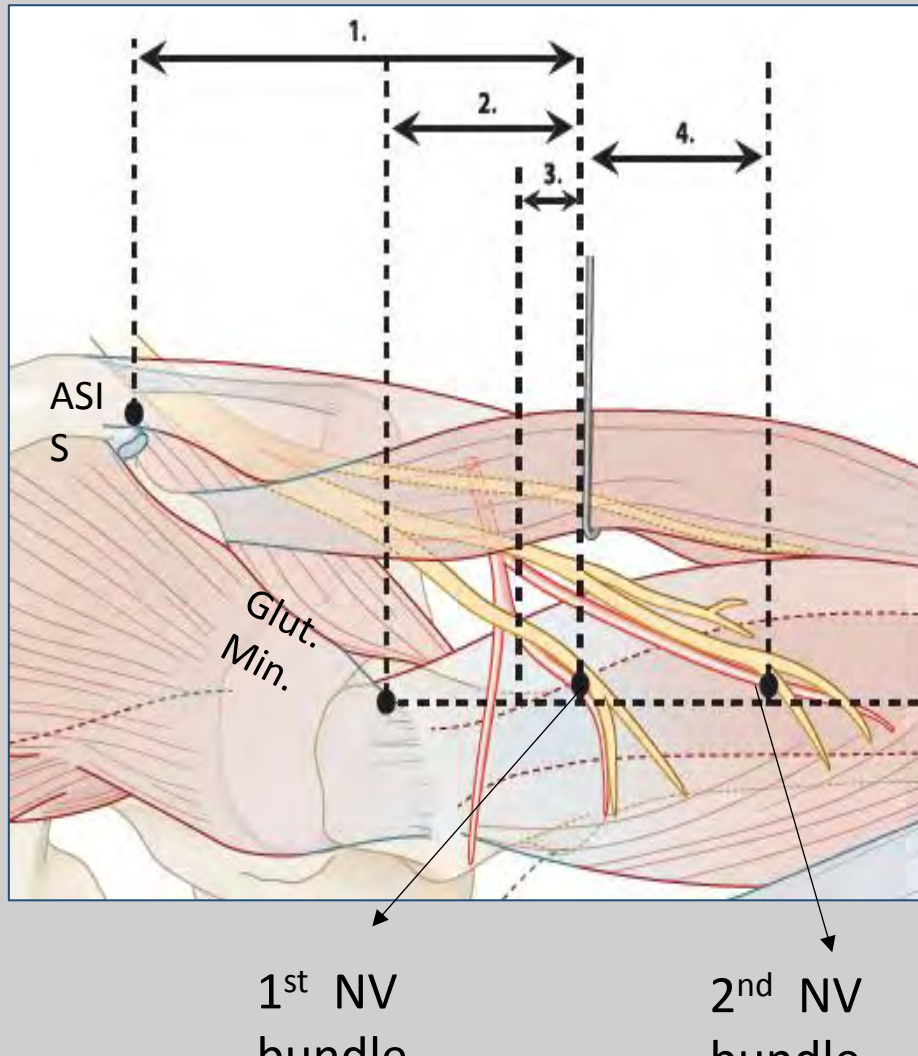
2 clearly distinguishable neurovascular bundles 17/20
(85%)

RIGH
T
HIP



Distal

RESULTS



1. ASIS – 1st bundle : 12.3 cm

(range 9.7–14.5)

2. Glut. Min. – 1st bundle : 3.2 cm

(range 2.2–4)

3. LT – 1st bundle : 1.6 cm

(range 0.7–2.8)

4. 1st bundle – 2nd bundle : 3.3 cm

(range 1.8–6.1)

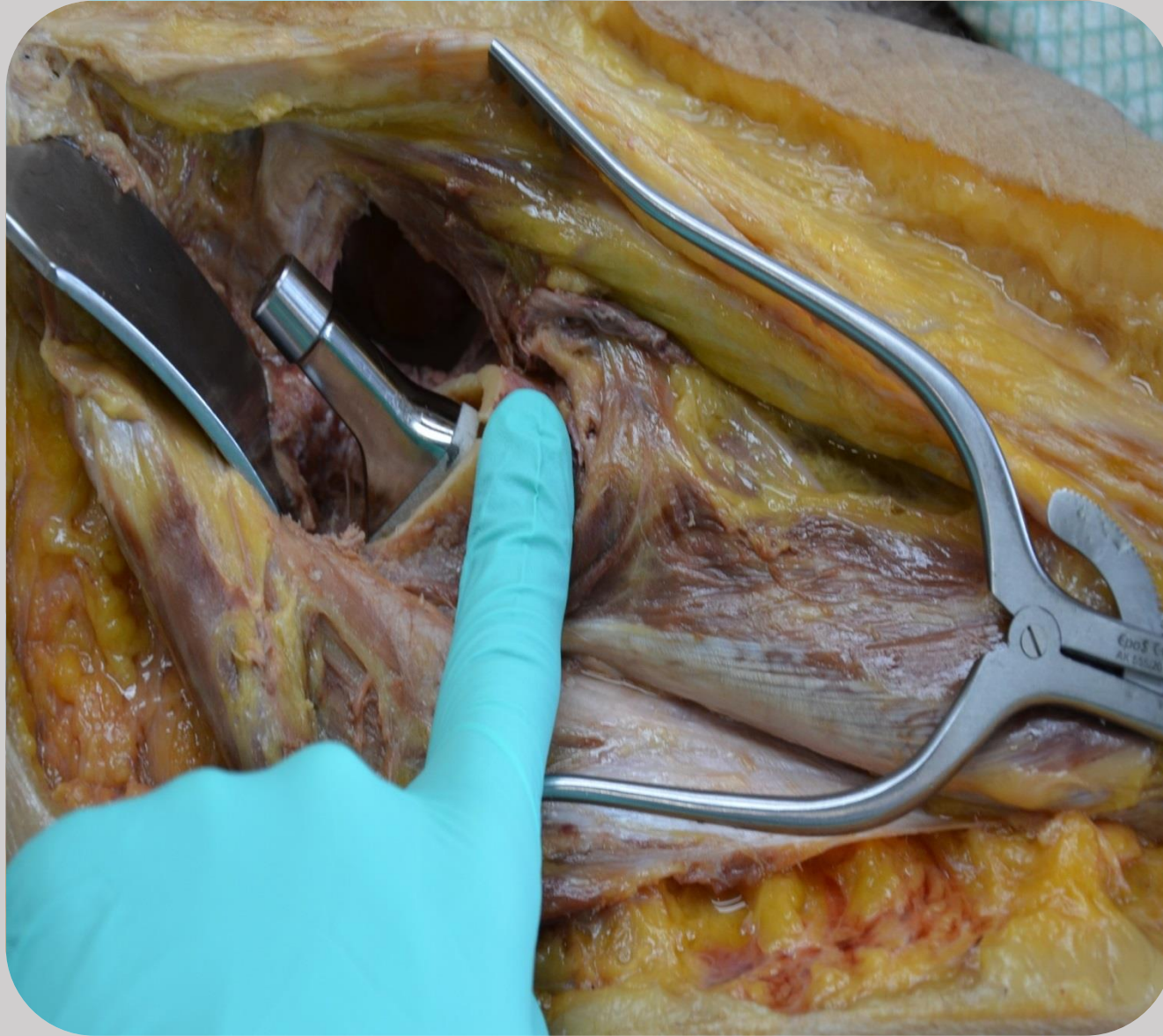
CLINICAL CASE

Intraoperative fracture



CLINICAL CASE

Intraoperative fracture



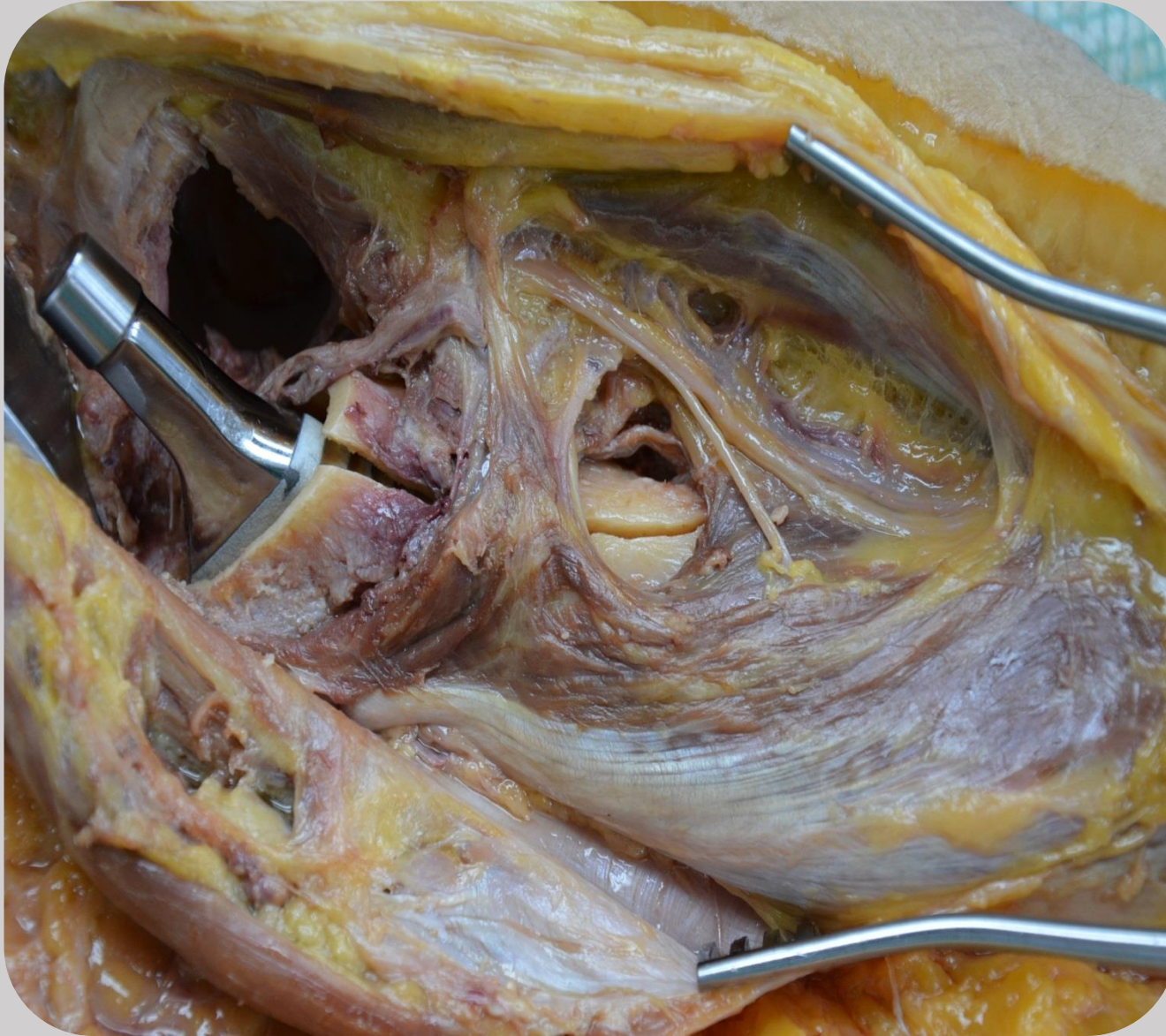
CLINICAL CASE

Intraoperative fracture



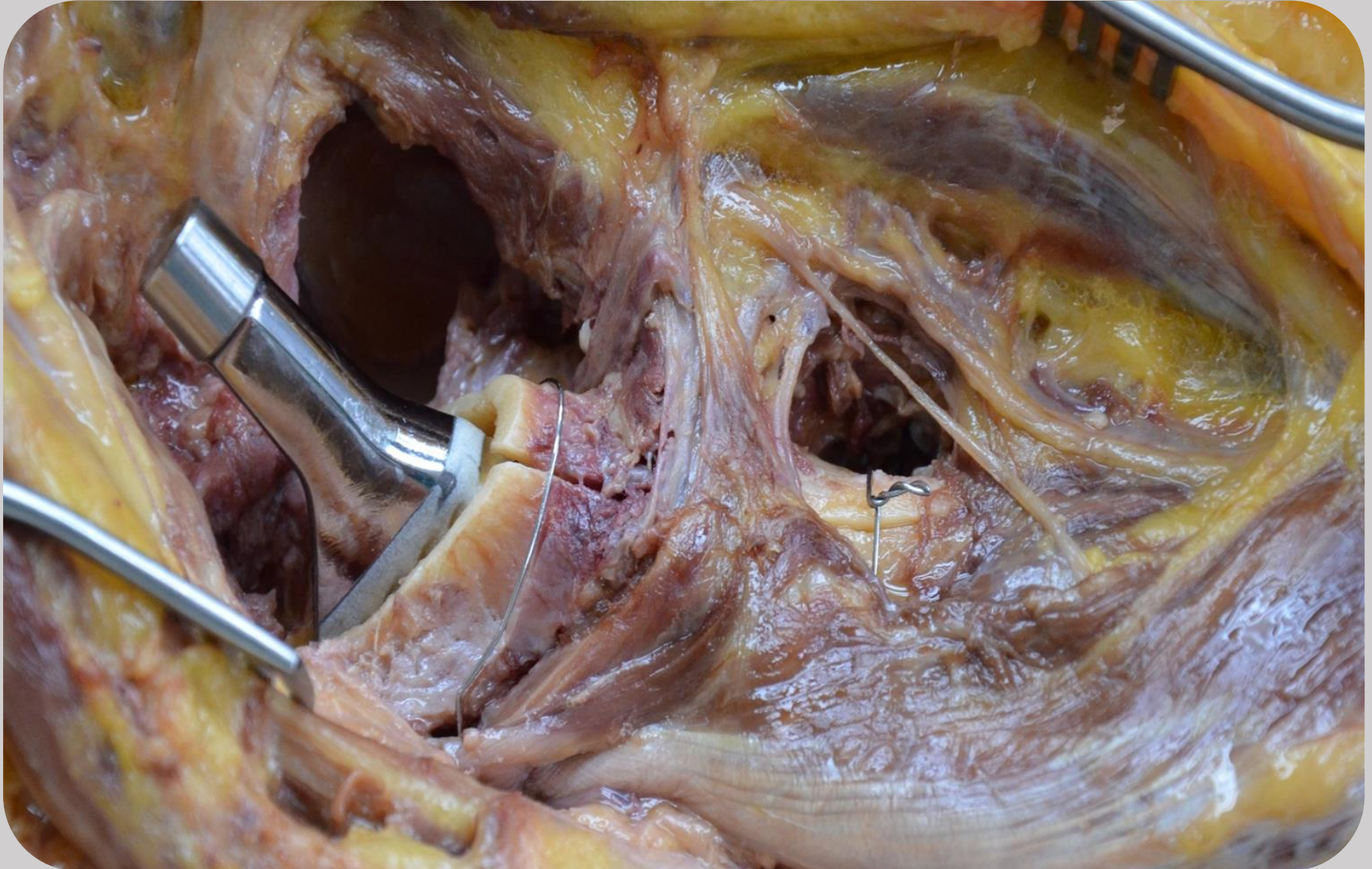
CLINICAL CASE

Intraoperative fracture



CLINICAL CASE

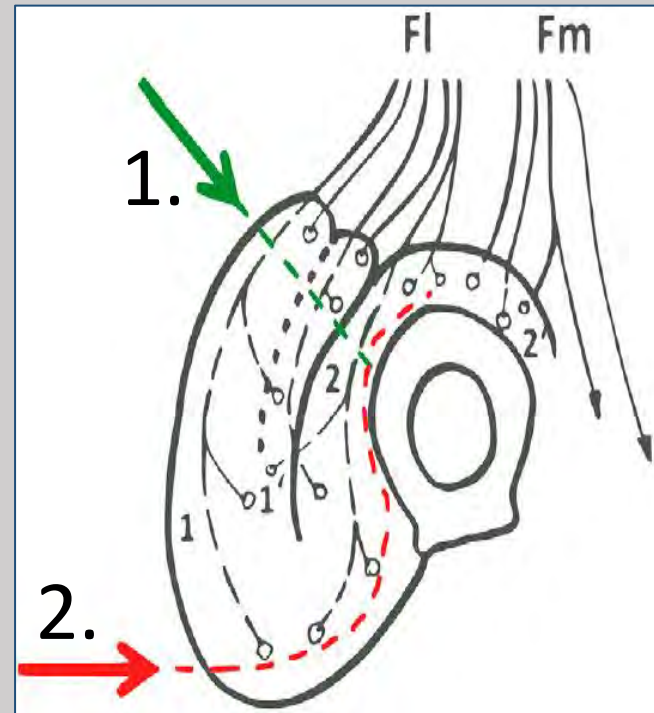
Intraoperative fracture



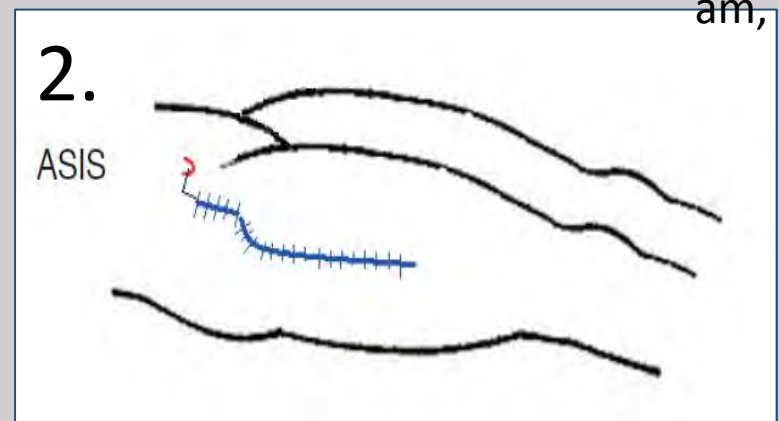
DISCUSSION

How to extent the DAA distally?

1. Through the Vastus Lateralis Muscle
2. Subvastus with S – shape skin incision



Grob et al. JBJS am, 2015

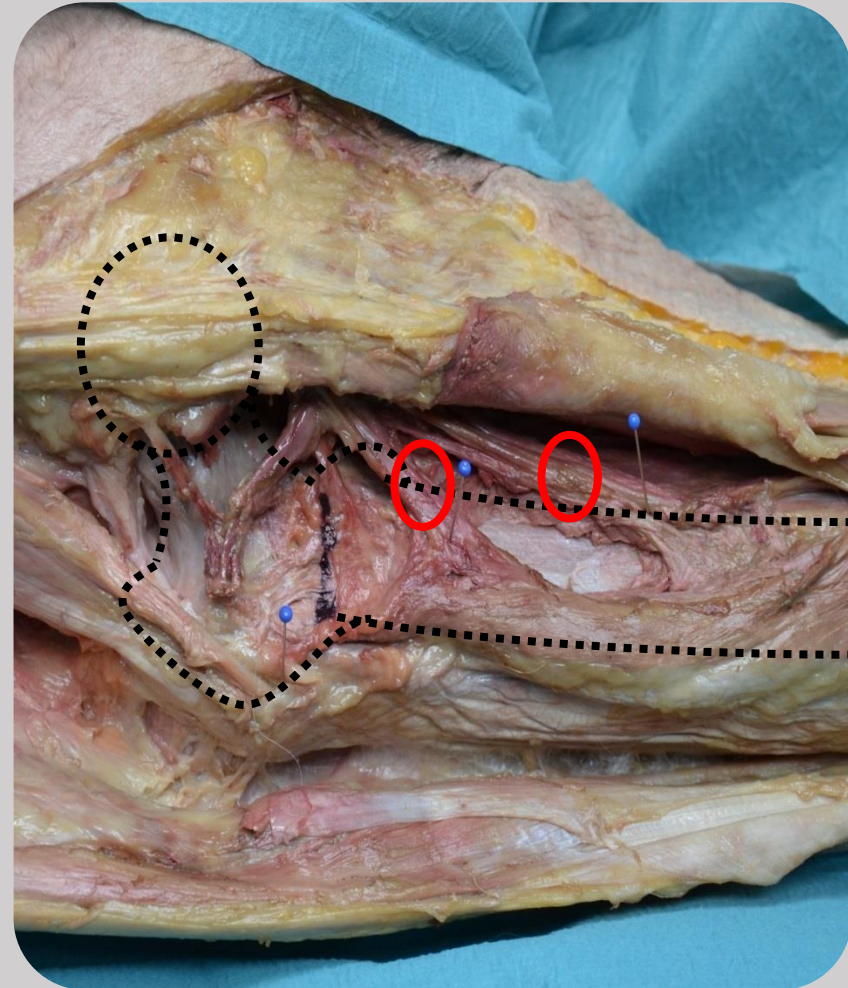
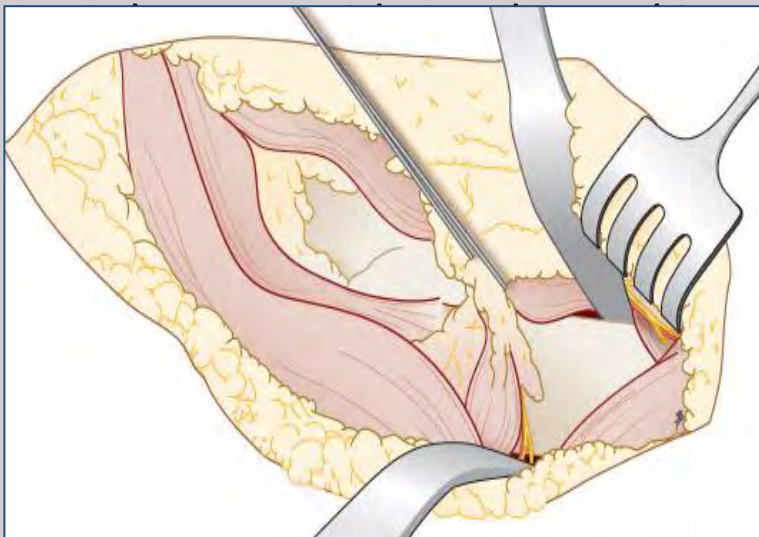


DISCUSSION

How to extent the DAA distally?

1. Through the Vastus Lateralis

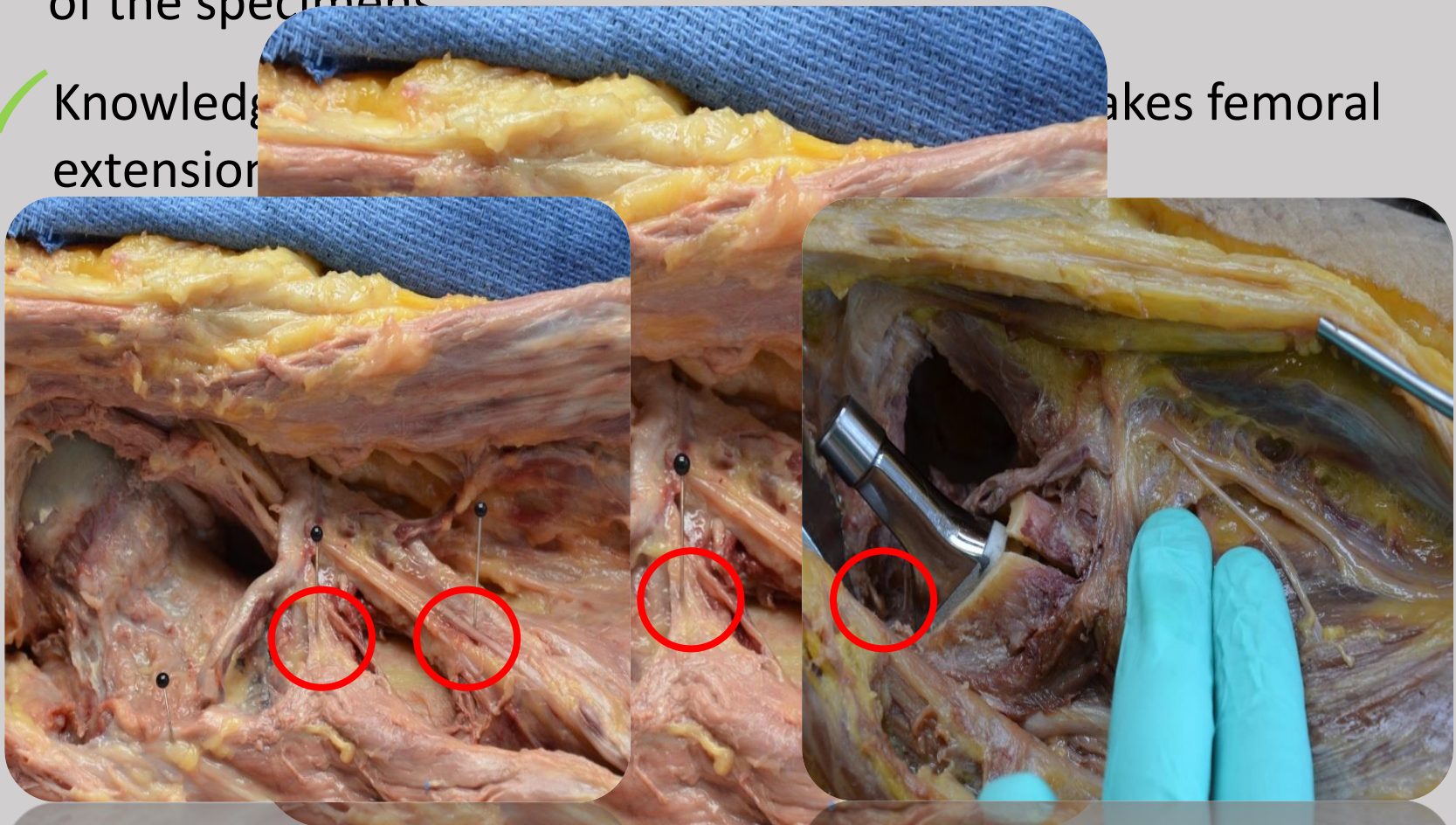
Muscle





CONCLUSION

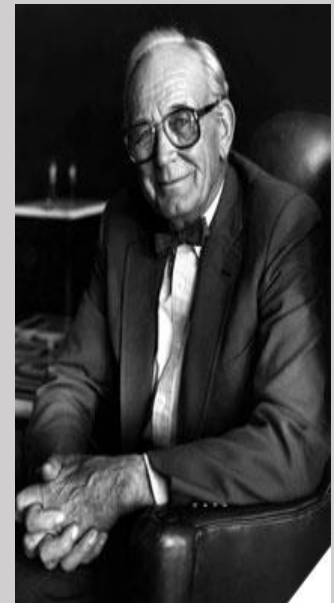
- ✓ Consistent anatomy with 2 clearly distinguishable bundles in 85% of the specimens
- ✓ Knowledge of the anatomy of the muscle makes femoral extension



THANK YOU

Orthopaedics is all about
anatomy ...

Plus a little bit of common
sense



Jack C. Hughston



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY



Hip abductor muscles function: surface-EMG analysis after Antero-Lateral vs Direct Anterior minimally invasive approaches in THA



MARCO VILLANO

ORTHOPAEDIC CLINIC - UNIVERSITY of FLORENCE

Director: Prof. M. Innocenti

Minimally Invasive Surgery (MIS) in THA

- ***Riduced skin incision***
- ***Lower blood loss***
- ***Less pain, faster recovery....***
- ***Bone stock preservation***
- ***Avoid periarticular soft tissue damage***

Respect of the Anatomy
Restore the Function

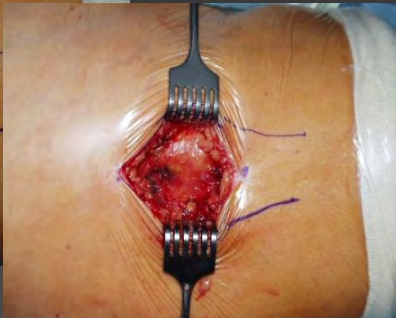
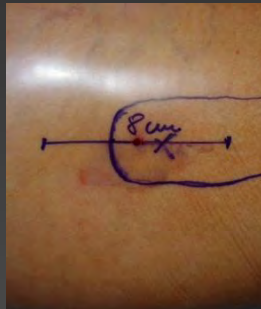


MIS

Antero Lateral (AL) & Direct Anterior (DA)

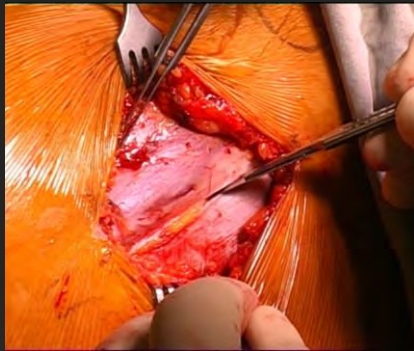
These are the only ones that reflect at best these features in the surgical approaches scenario

The others approaches violate muscles both with the MIS as well with the standard surgery.



AL

Tensor Fascia Latae
Gluteus Medius

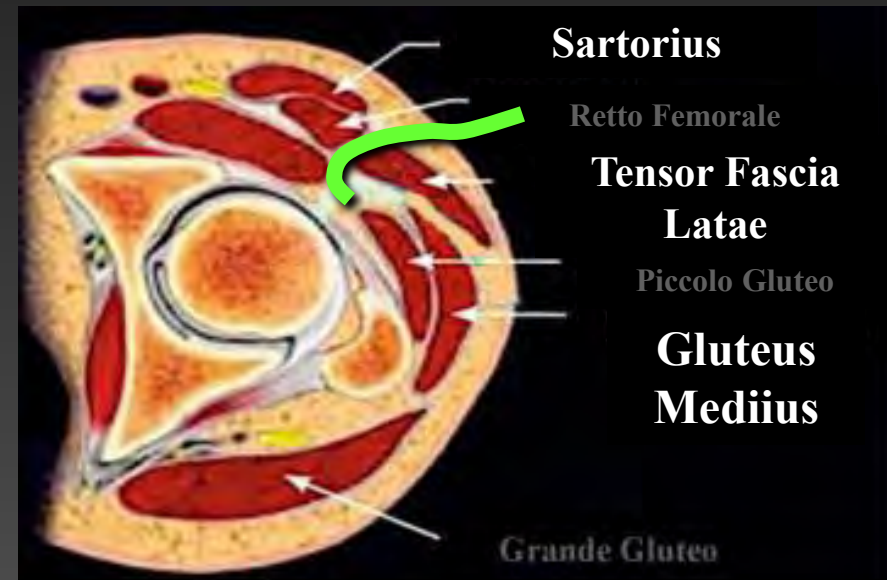
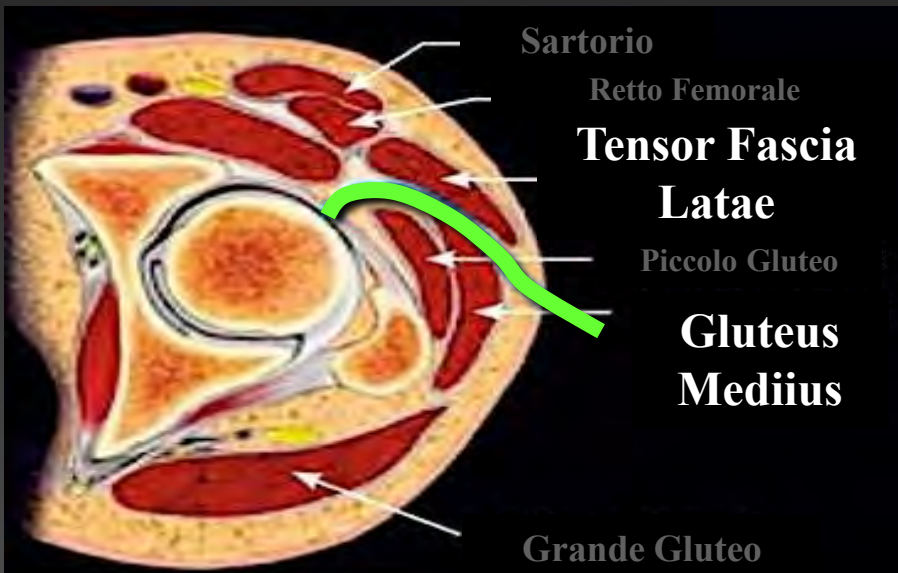


**Intermuscular
Interval**

ABDUCTORS

DA

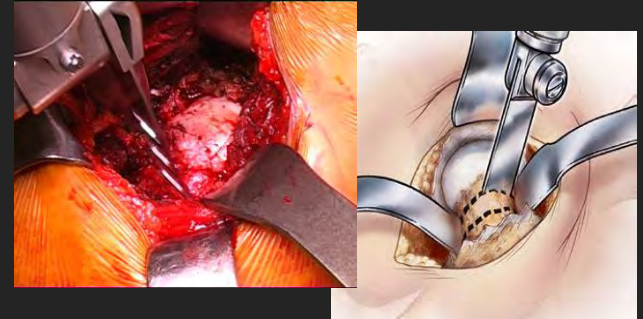
Tensor Fascia Latae
Sartorius
Gluteus medius (deeper)



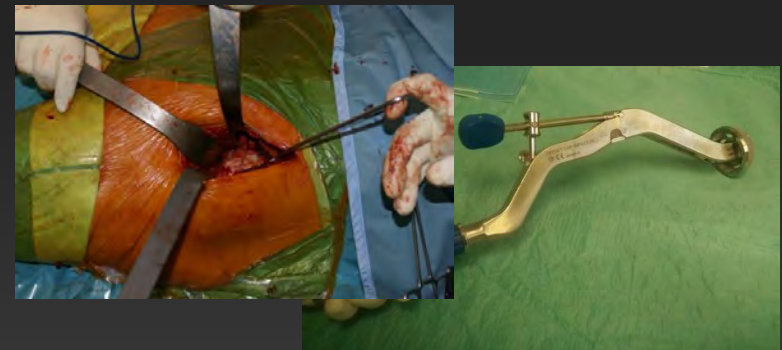
TISSUE SPARING SURGERY !

Avoid excessive tractions on abductors

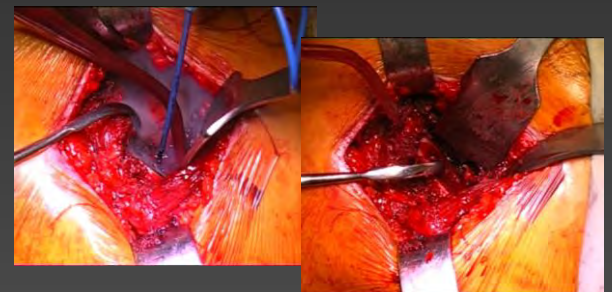
- ***Neck Osteotomy***
(better in situ, single or double)



- ***Positioning Instruments***
(dedicated distractors, reamers, rasp holder , positioners)

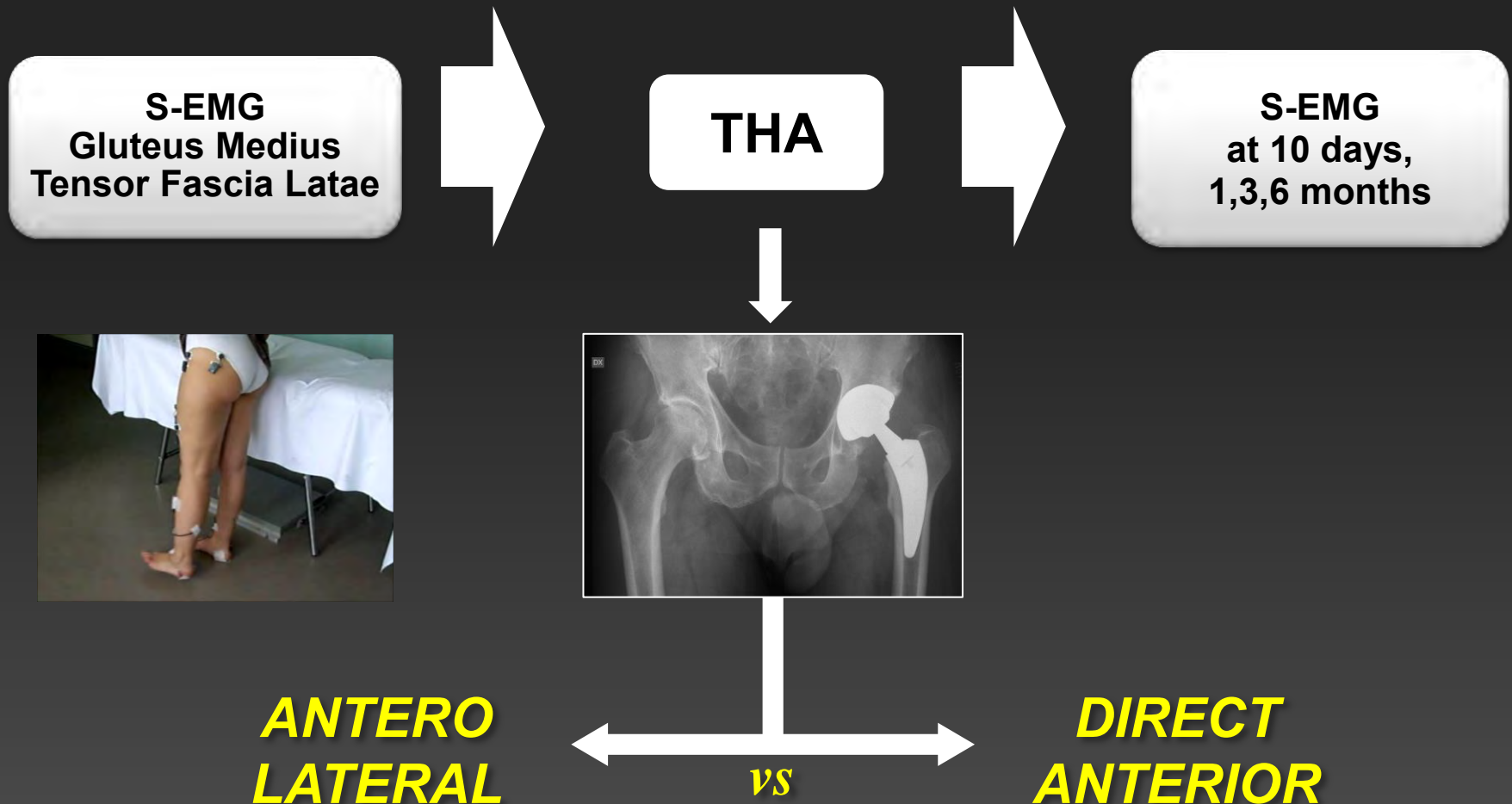


- ***During femoral exposure***
(perform the femoral traction with a hook through a progressive capsular release)



AIM OF THE STUDY

*To compare Surface Electromyography (**s-EMG**) data about abductor muscles after AL *vs* DA in THA*



DEMOGRAPHIC

	<i>AL</i>	<i>DA</i>
<i>Patients</i>	22	22
<i>Mean Age</i>	68	69
<i>Female</i>	11	12
<i>Male</i>	11	10
<i>Weight (Kg)</i>	74.3 ± 9.11	76.6 ±8.56
<i>BMI</i>	26.51 ±4.16	28.83 ±6.21
<i>HHS</i>	46.71 ±14.4	47.52 ±13.24

***No statistically
significant
differences
($p>0,05$)***

- ***All patients were affected by severe osteoarthritis of the hip***
- ***All patients received standard post-operative management of anesthesia, pain and physical therapy protocols***

MATERIALS

METHODS

EXCLUSION CRITERIA

- **Rheumatoid arthritis**
- **Hip Dysplasia**
- **Leg length discrepancy over 1,5cm**
- **Previous fracture**
- **Inflammatory polyarthritis**
- **Neurological diseases that could prevent
electromyographic evaluation**

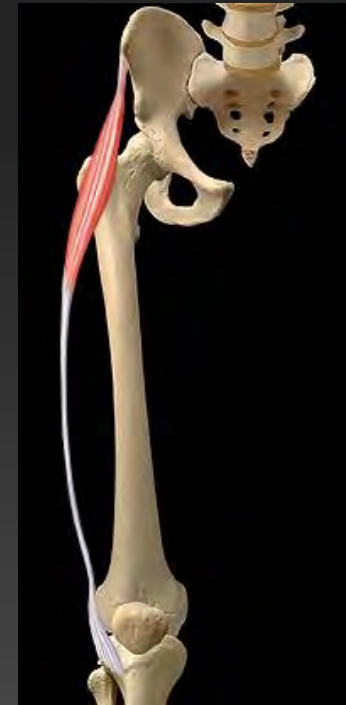
S-EMG - myoelectric activity

Myoelectric activity of abductor muscles was registered by means of the Surface Electromyography FREEEMG system (BTS Bioengineering, Italy)

Gluteus Medius



Tensor Fascia Latae





Electrodes placement



Tensor fasciae latae

2 cm ventral at the greater trochanter

Gluteus medius

6 cm distal at the iliac crest midpoint

Electrodes were placed on each muscle according to the European Recommendations for Surface Electromyography (SENIAM) to limit crosstalk from surrounding muscles



Standards for surface electromyography: the European project "Surface EMG for non-invasive assessment of muscles (SENIAM)"

D.F. Stegeman^{1,3}, H.J. Hermens²

¹Institute of Neurology, Department of Clinical Neurophysiology, University Medical Centre Nijmegen, and Graduate Institute for Fundamental and Clinical Human Movement Sciences, ²Roessingh Research and Development, Enschede, The Netherlands, ³FB Motorik, Institute for Pathophysiology, Friedrich-Schiller-University Jena, Germany

S - EMG evaluation

Myoelectrical activity Tests at 30° abduction



***3 Submaximal Voluntary
Isometric Contractions (SVIC)***



***3 Concentric Contractions
(15 repetitions)***

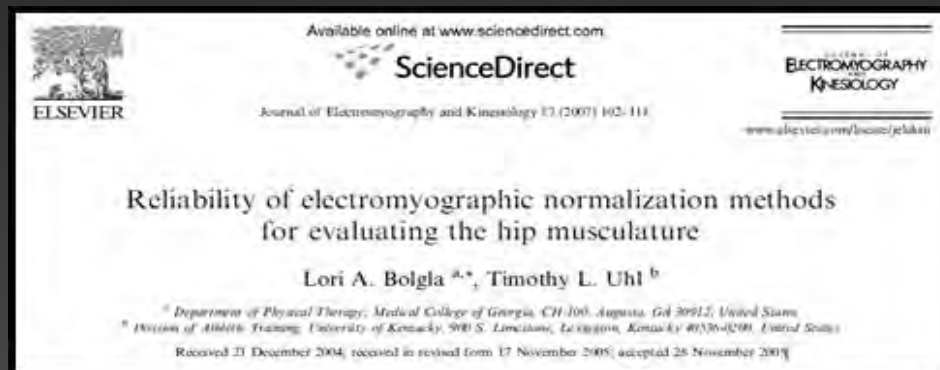
DATA COLLECTION

- *Pre op*
- *F.up 10 days, 1, 3, 6 months*

S - EMG evaluation

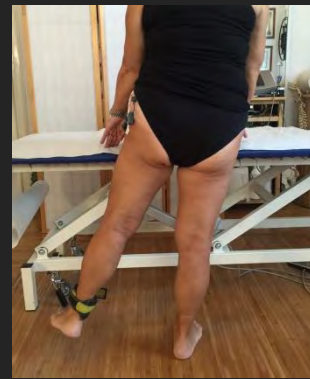
Validated Normalization method

***Mean EMG amplitudes (mV) during
Submaximal Voluntary Isometric Contraction (SVIC)
were recorded for each muscle and used
as the 100% reference value for normalization of EMG
intensities during dynamic exercises (% of SVIC)***



S-EMG RESULTS

*Mean values (mV) during
Submaximal Voluntary Isometric Contractions*



<i>Approach</i>	<i>Pre op</i>	<i>10 days</i>	<i>1 month</i>
DA			
<i>GM</i>	0,14 ±0,02	+ 0,12 ±0,04	*+ 0,18 ±0,07
<i>TFL</i>	0,13 ±0,04	0,10 ±0,01	0,13 ±0,04
AL			
<i>GM</i>	0,14 ±0,06	0,09 ±0,02	0,12 ±0,04
<i>TFL</i>	0,14 ±0,03	0,11 ±0,02	0,13 ±0,07

- * significantly different from pre operative time levels ($P < 0.05$)
- + significantly different from the other group ($P < 0.05$)

S-EMG RESULTS

SVIC data (mV)

Approach	3 months		6 months	
DA				
GM	*0,20	±0,06	*0,19	±0,02
TFL	*0,14	0±,07	*0,15	±0,03
AL				
GM	*0,18	±0,04	*0,20	±0,02
TFL	*0,15	±0,03	*0,16	±0,09

* significantly different from pre operative time levels ($P < 0.05$)

+ significantly different from the other group ($P < 0.05$)

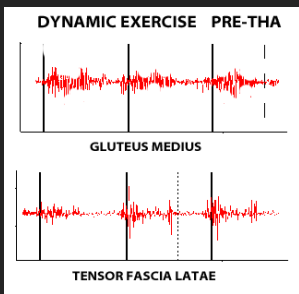
S-EMG RESULTS

Mean normalized values during Dynamic exercise
(% of SVIC)



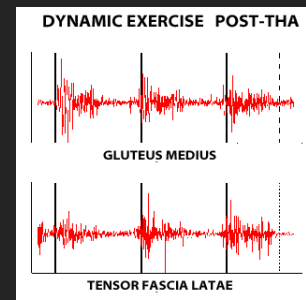
Approach	pre		10 days		1 month	
DA						
GM	45,3	±9,44	+44,12	±5,04	+53,2	±7,86
TFL	24,24	±4,75	22,10	±6,01	30,37	±4,12
AL						
GM	46,8	±8,26	40,09	±0,02	45,56	±8,53
TFL	25,88	±5,15	20,11	±4,02	25,56	±5,01

- * significantly different from pre operative time levels ($P < 0.05$)
- + significantly different from the other group ($P < 0.05$)



S-EMG RESULTS

Dynamic exercise values (% of SVIC)



Approach	3 months		6 months	
DA				
GM	*55,1	±6,56	*58,7	±7,56
TFL	28,42	±4,66	29,32	±4,41
AL				
GM	*52,12	±7,48	*56,89	±6,84
TFL	30,10	±5,63	31,18	±4,23

- * significantly different from pre operative time levels ($P < 0.05$)
- + significantly different from the other group ($P < 0.05$)

CONCLUSIONS

- *DA approach revealed a better myoelectrical activity of the gluteus medius at 10 days and 1 month post-op compared to the AL.*
- *No differences about TFL results were registered in the two groups at the F-up and compared to pre-op results*
- *DA and AL had no significant differences at 3 and 6 months with improved results compared to pre-op*
- *DA and AL approaches allow to restore a similar hip abductor muscles function.*



Thank you





INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
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26-27 NOVEMBER 2015

MILAN, ITALY



Anterior Minimally Invasive Surgery For Total Hip Replacement: Experience And Outcomes Of A District General Hospital Surgeon

Odei Shannak
Amit Kumar
Edward Crawford

Anterior Minimally Invasive Surgery

- Recent widespread uptake throughout the world

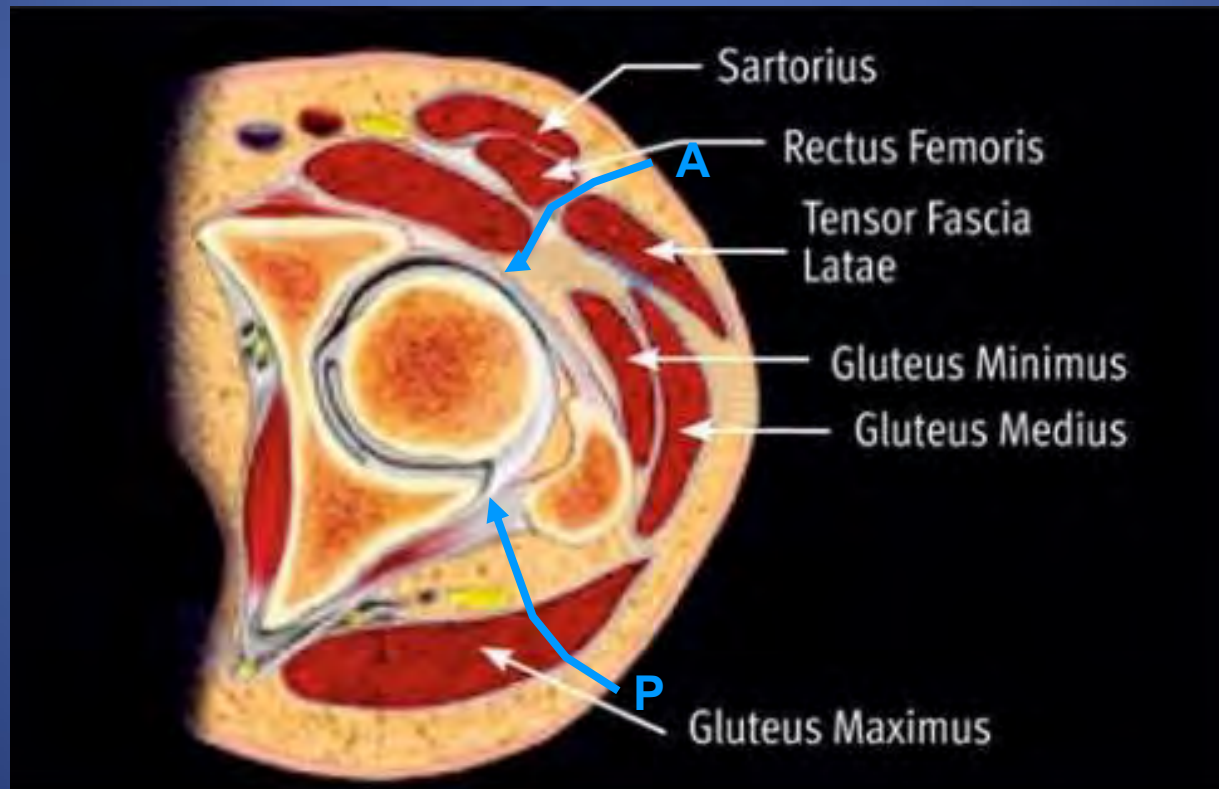
Kennon RE, Keggi JM, Wetmore RS, Zatorski LE, Huo MH, Keggi KJ. Total hip arthroplasty through a minimally invasive anterior surgical approach. J Bone Joint Surg Am. 2003;85(Suppl 4):39–48.

Masonis J, Thompson C, Odum S. Safe and accurate: learning the direct anterior total hip arthroplasty. Orthopedics. 2008;31(Suppl 2):1417–1426.



Anterior Minimally Invasive Surgery

- MIS: no muscles or tendons cut





Anterior Minimally Invasive Surgery

- ADVANTAGES

- Reduced pain
- Faster recovery
- Reduced risk of dislocation
- Use of intra-operative fluroscopy

1. J Matta et al, Single incision anterior approach for THA, CORR, 441, 2005.
2. Rathod et al, Does fluoroscopy with anterior hip arthroplasty decrease acetabular cup variabilit, CORR, 472, 2014.
3. Mini-incision anterior approach does not increase dislocation rate: a study of 1037 total hip Replacement; T Siguier et al; Clin Orthop Relat Res, 2004 Sep, (426): 164-73



Anterior Minimally Invasive Surgery

- DISADVANTAGES

- Learning curve

“50 or more procedures need to be performed by a surgeon before the rate of revision is no different from performing 100 or more procedures”

Clin Orthop Relat Res
DOI 10.1007/s11999-015-4565-6

Clinical Orthopaedics
and Related Research[®]
A Publication of The Association of Bone and Joint Surgeons[®]



SYMPOSIUM: 2014 INTERNATIONAL HIP SOCIETY PROCEEDINGS

What Is the Learning Curve for the Anterior Approach for Total Hip Arthroplasty?

Richard Noel de Steiger MBBS, FRACS, Michelle Lorimer BSc(Math & Comp Sci) (Hons), Michael Solomon MBChB, FRACS

Aims

- To assess outcomes of patients undergoing AMIS for THR under a single surgeon at a District General Hospital

Mr Edward Crawford

Consultant Surgeon, Northampton General Hospital, UK

- Hip & Knee arthroplasty
 - >100 THRs/year
 - Visits to R.Field, F. Laude
 - First AMIS: 2013
-
- AMIS trainer
 - Over 100 cases in last 3 years



Methods

- Prospective data collection (2013 – ongoing)
- All THR's performed/supervised by the senior surgeon
- Collected data on:
 - Length of stay
 - Blood loss
 - Surgery time
 - Oxford hip scores
 - Complications

Methods

- Compared with posterior approach
- Statistical Analysis:
 - Minitab 15
 - 2 sample t-test
 - P-value < 0.05

Methods

- Inclusions:
 - THR for OA initially
 - Fracture NOF and AVN
- Exclusions:
 - Large body habitus (initially)
 - Protrusio
 - Osteoporosis
 - Over 80 years requiring cemented implant

Methods: Surgery

AMIS® MOBILE LEG POSITIONER





Results

	AMIS	Posterior	
Total number	63	47	p-value
Age*	68 years; 8	69 years; 7	
Length of stay*	3.6 days; 1.5	5.5 days; 2.45	0.005
Blood Loss*	529 mls; 311	n/a	
Surgery Time*	85 mins; 18	91 mins; 23	0.107
Indication	60 OA 1 Fracture NOF 2 AVN		

* mean; SD

Outcomes- Oxford Hip score at 6 weeks

	AMIS	Posterior	
Total number	31	32	P-value
Pre-op OHS*	17; 9	12; 5	0.05
Post-op OHS*	41; 7	38; 10	0.114
Change in OHS at 6 weeks*	25; 10	26; 12	0.834

* mean; SD

Complications



Complications

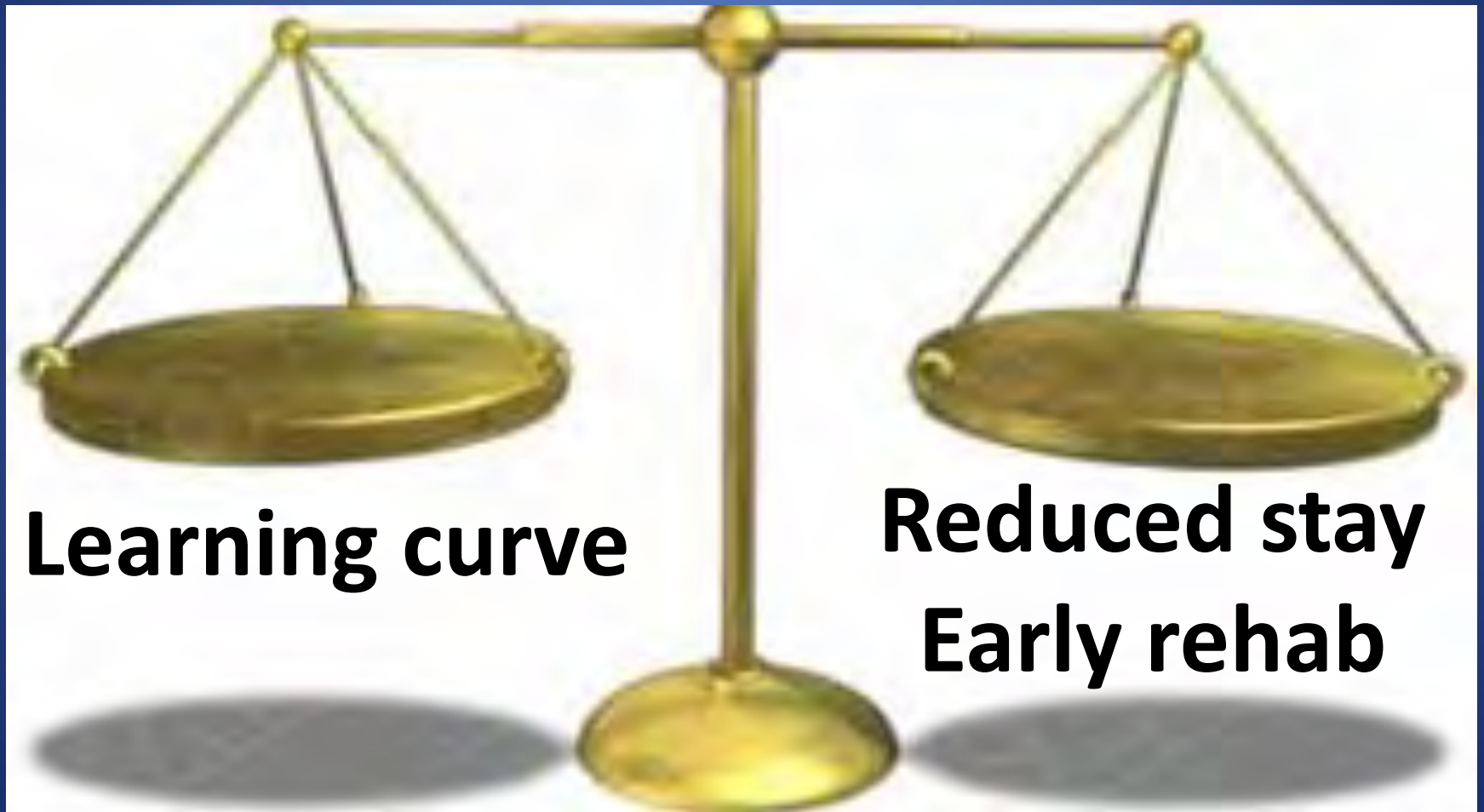
Intra-operative (n=2)	1 Calcaneal fracture 1 Lateral cortex breach
------------------------------	---

Peri-prosthetic fracture (n=2)	1 Retained stem, cable plate fixation 1 Stem revised
---------------------------------------	---

Complications

Wound infections (n=3)	2 Superficial 1 Deep
Neurological (n=3)	3 Anterior thigh numbness
Dislocations (n=0)	0

Is it worth it?



Learning curve

**Reduced stay
Early rehab**

Thank you

Questions?



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY





General Hospital **Slovenj Gradec, Slovenia**
Traumatology and Orthopaedics Department

AMIS - What We Learned In The Past 7 Years

Stanislav Ovnič MD

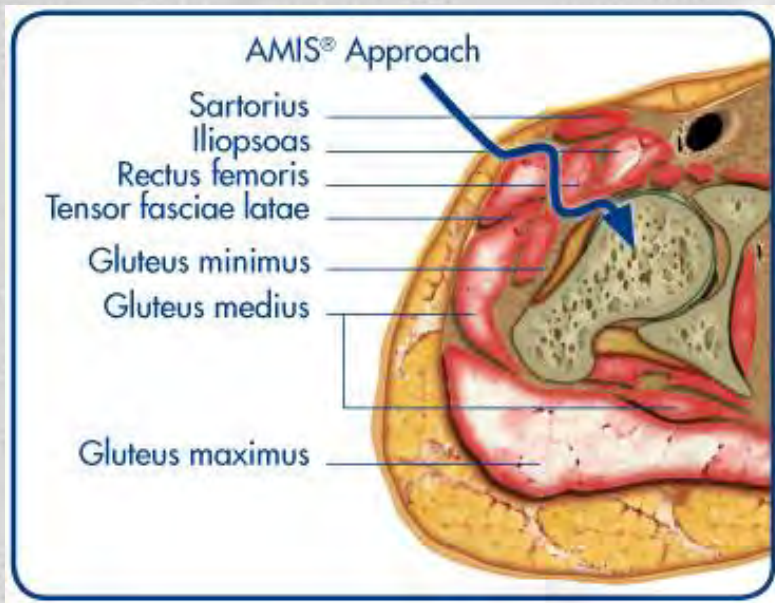
Ivo Bricman MD

Jaka Merkač MD

Vasja Kašnik MD

AMIS® – Anterior Minimally Invasive Surgery

- Started with AMIS® operative technique in May 2007 (internervous & intermuscular plane)
- AMIS® traction table



Objectives

- Observed period (May 2007 – March 2014)
- Regional General Hospital Slovenj Gradec, Slovenia
- 2 surgeons
- 148 primary THR and 1 revision THR with AMIS®
- Selected patients: 47 male, 102 female
- Mean age 68,52 years (range:45,07y – 82,96y)

Implants used

- Implants (Medacta[®], Quadra H cementless stem with HA and VersafitCC cementless cup)
- Severe osteoporosis (LINK SP2[®] stem, PE cup)
- Sometimes: press fit cup (Zimmer, Allofit[®])

Are There Any Differences ?

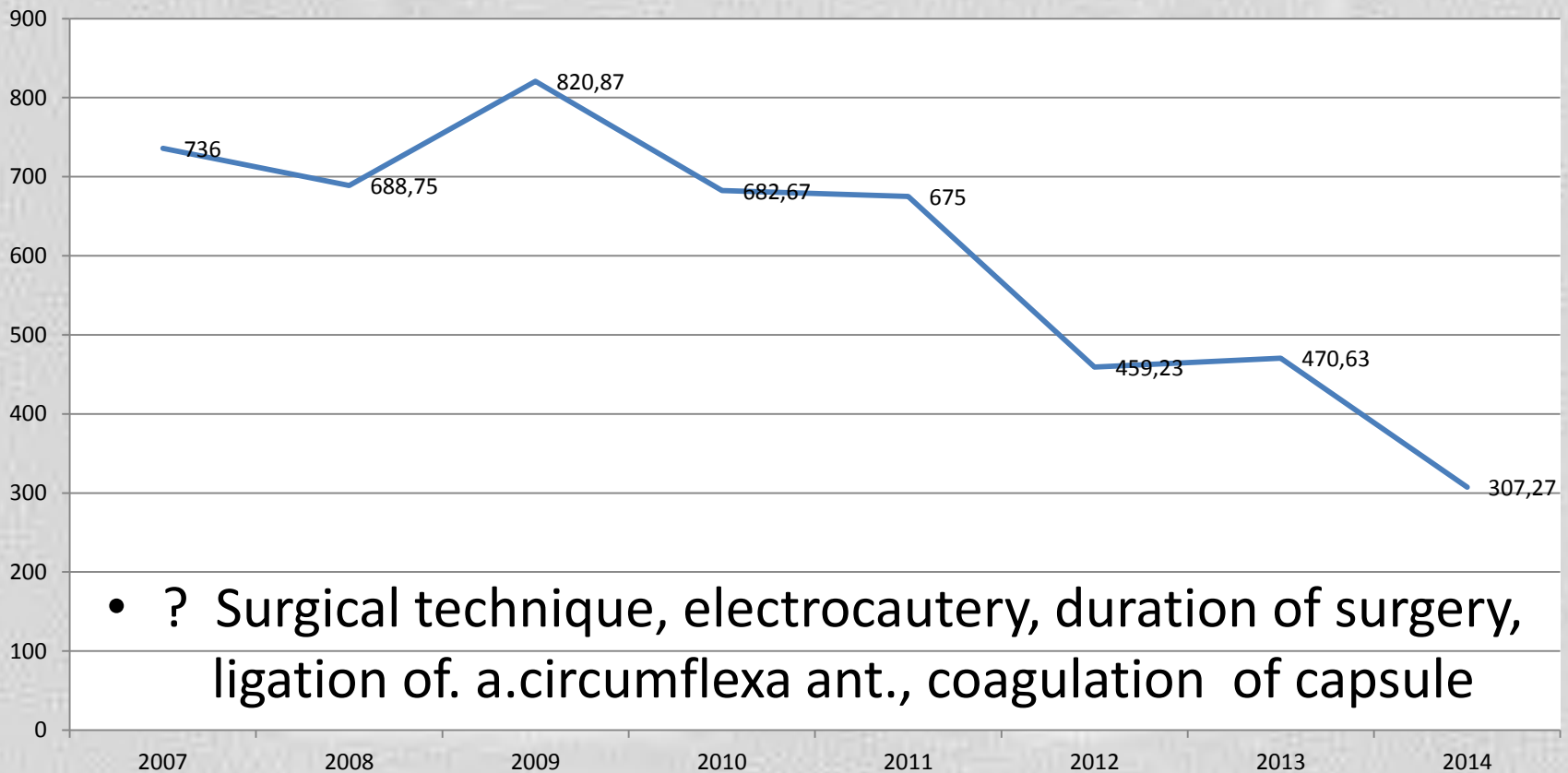
- surgical technique
- early postoperative ambulation
- limb lengthening
- intraoperative and postoperative complications

Analyzed parameters

- ✓ operative blood loss
- ✓ drainage from operative wound
- ✓ volume of blood reinfusion by OrthoPAS[®] system
- ✓ volume of blood transfusion
- ✓ duration of surgery
- ✓ duration of hospitalization
- ✓ postoperative limb length equality

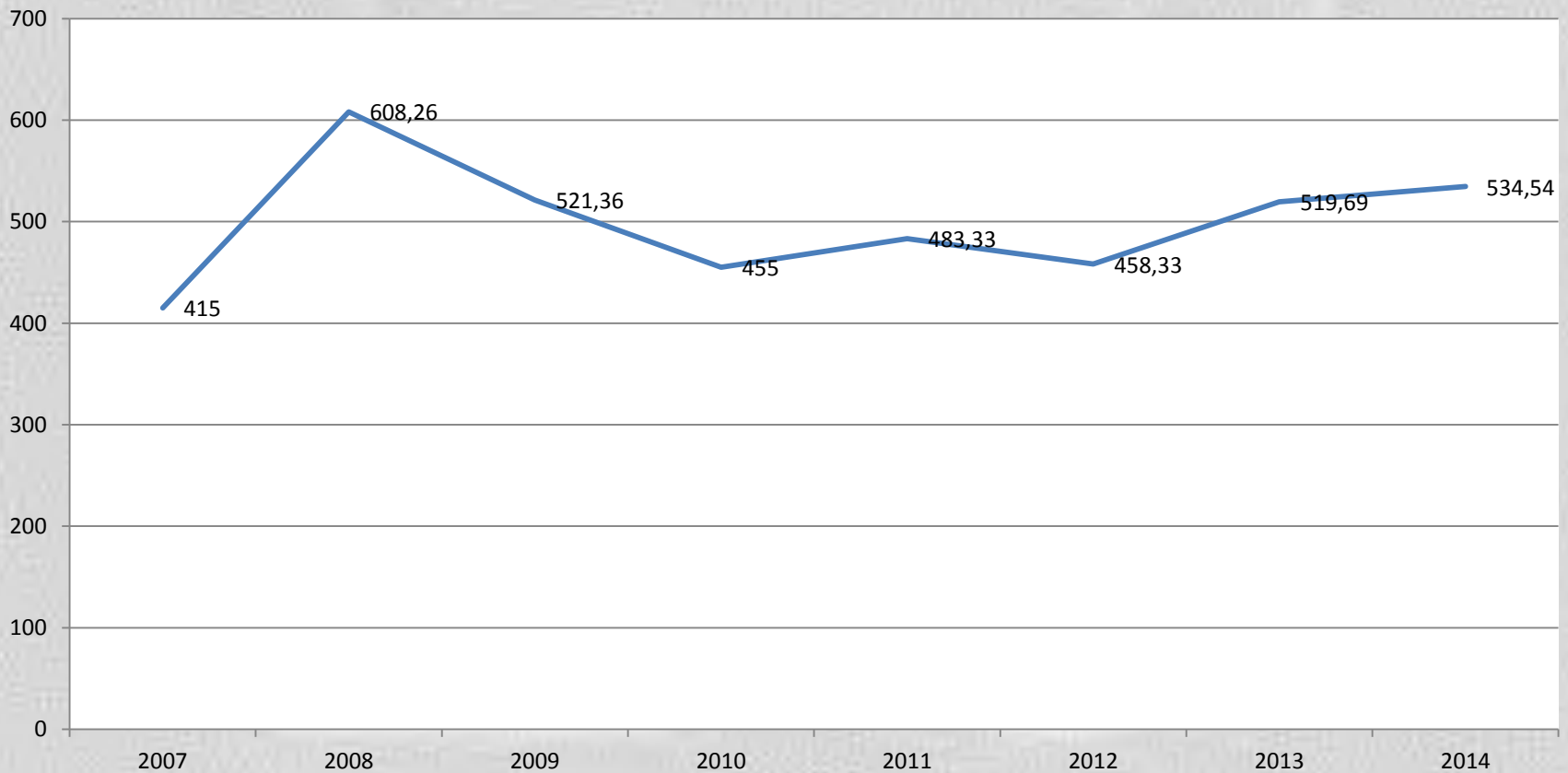
Operative blood loss

blood loss (ml)



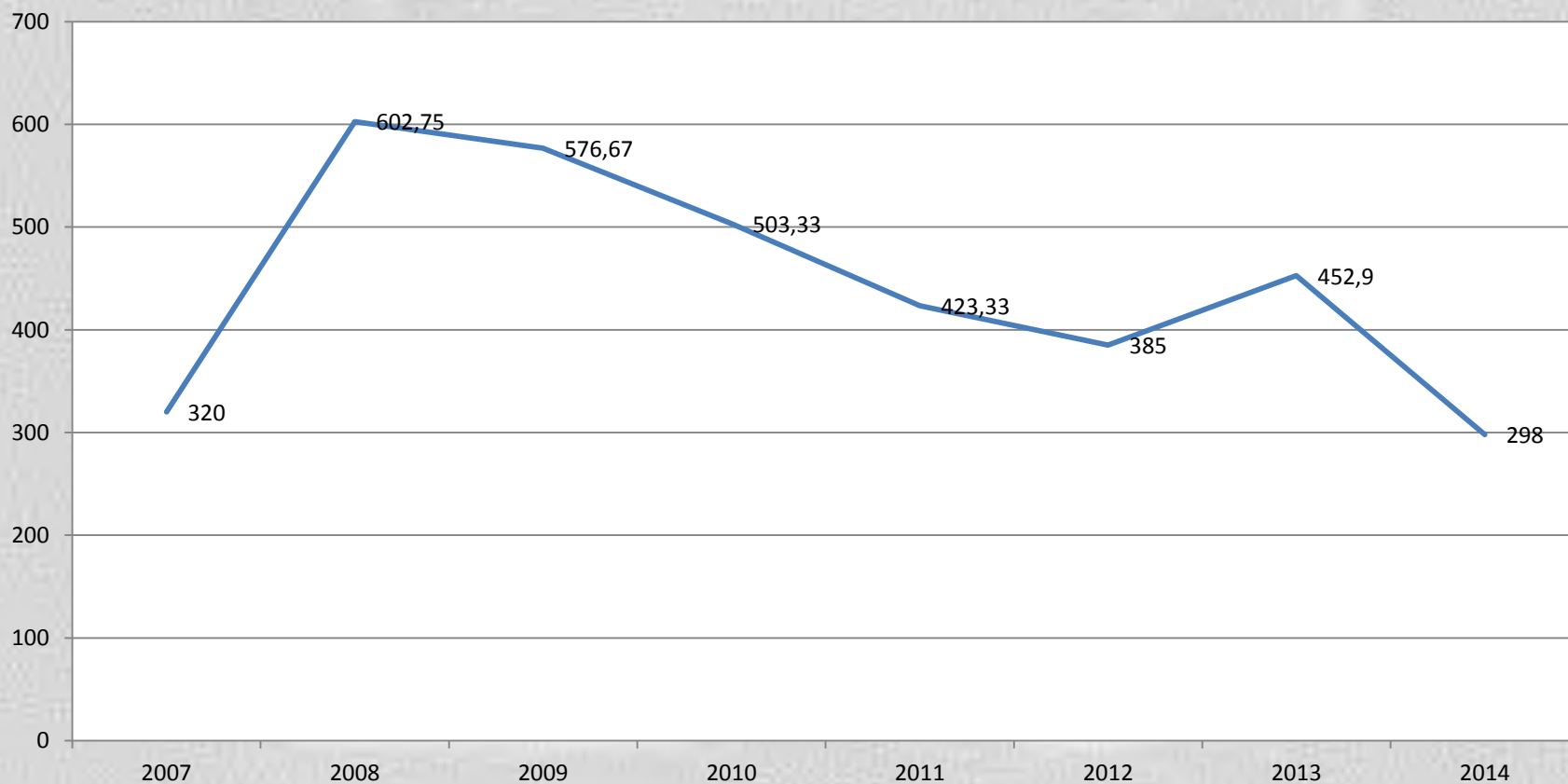
Drainage from operative wound

Drainage (ml)



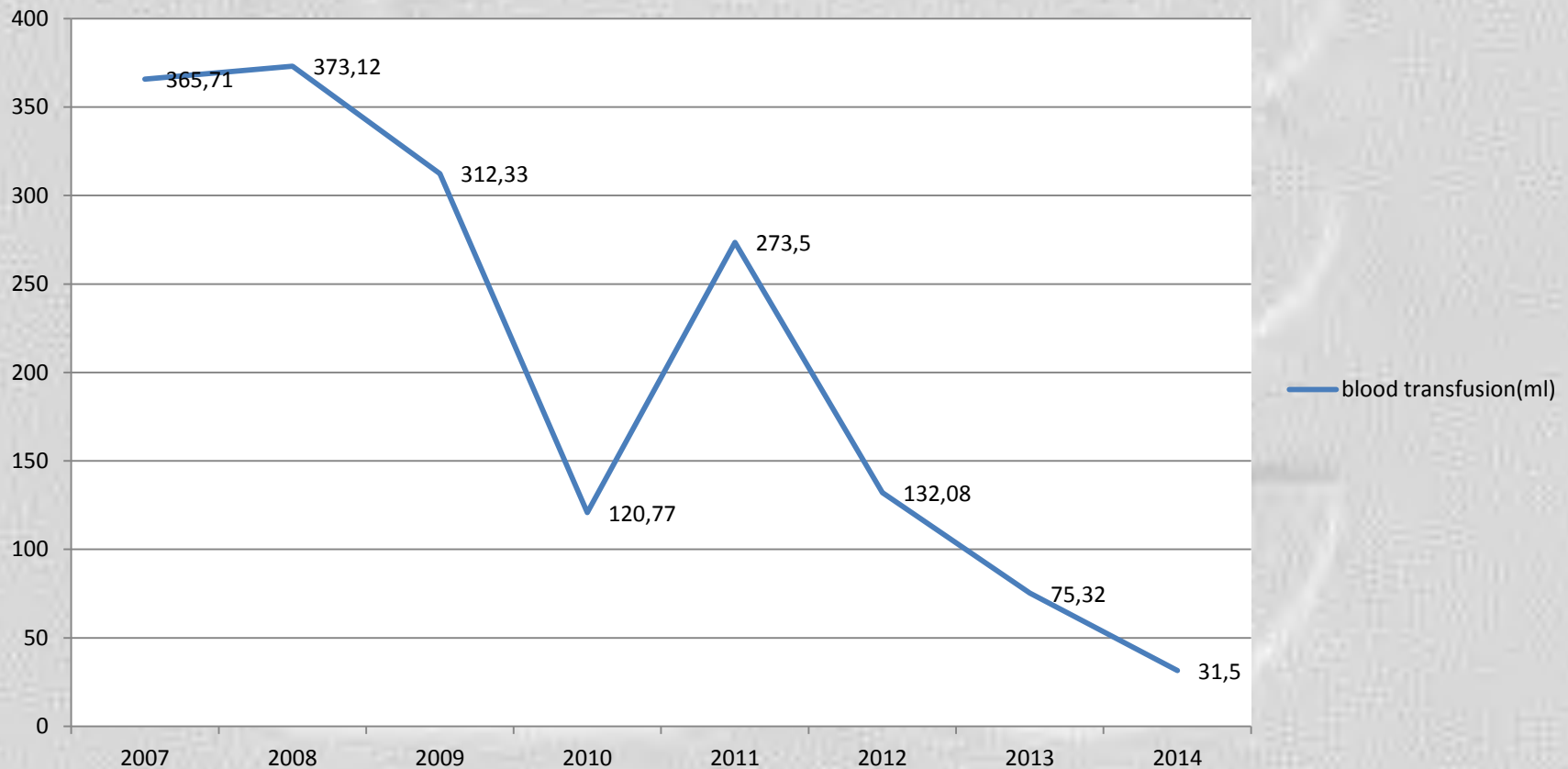
Blood reinfusion by OrthoPAS®

Blood reinfusion by OrthoPAS (ml)



Blood transfusion

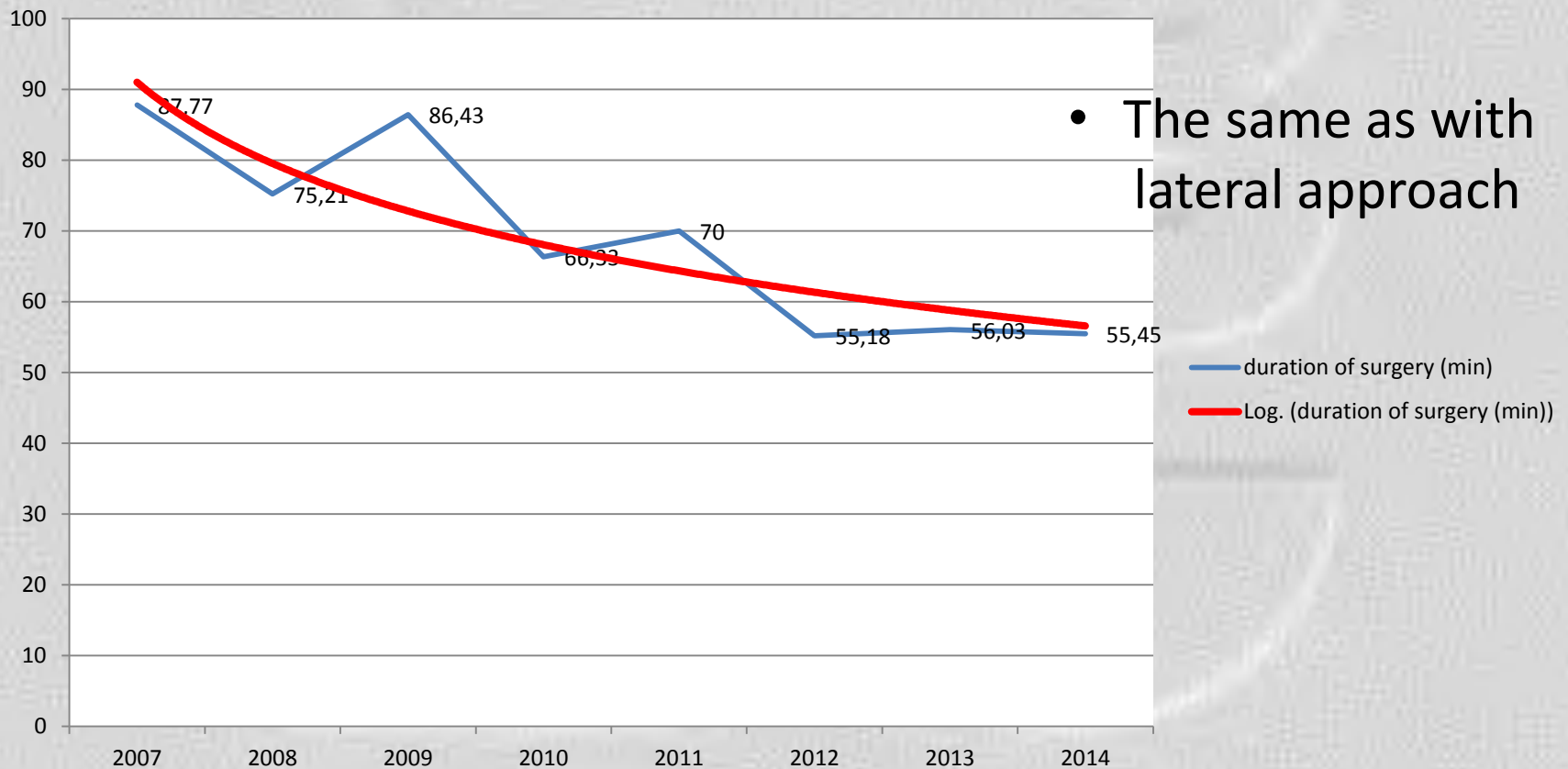
blood transfusion(ml)



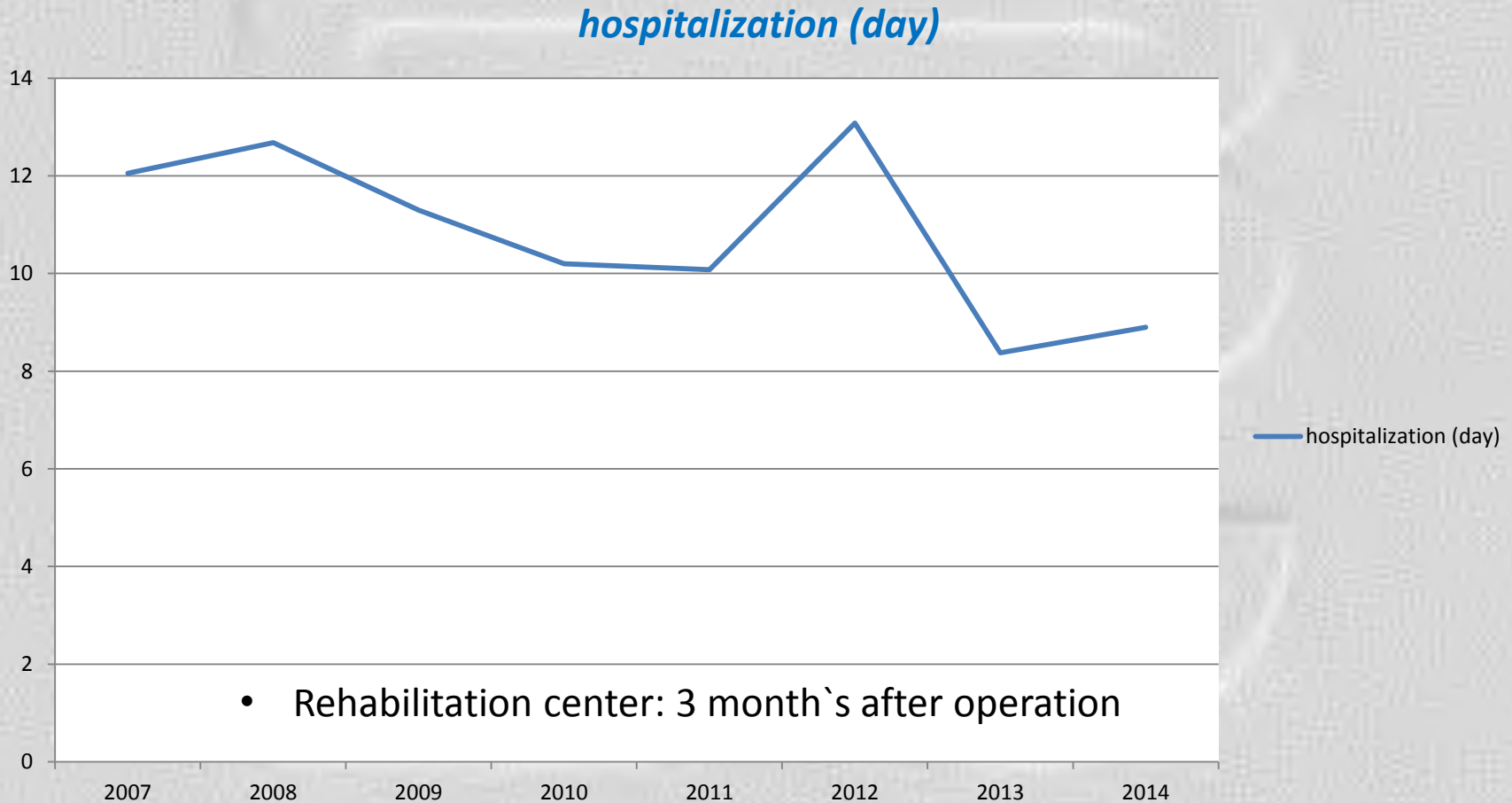
- Since 2013, very rare, iron supplements, ↑ risk of infection

Duration of surgery

duration of surgery (min)

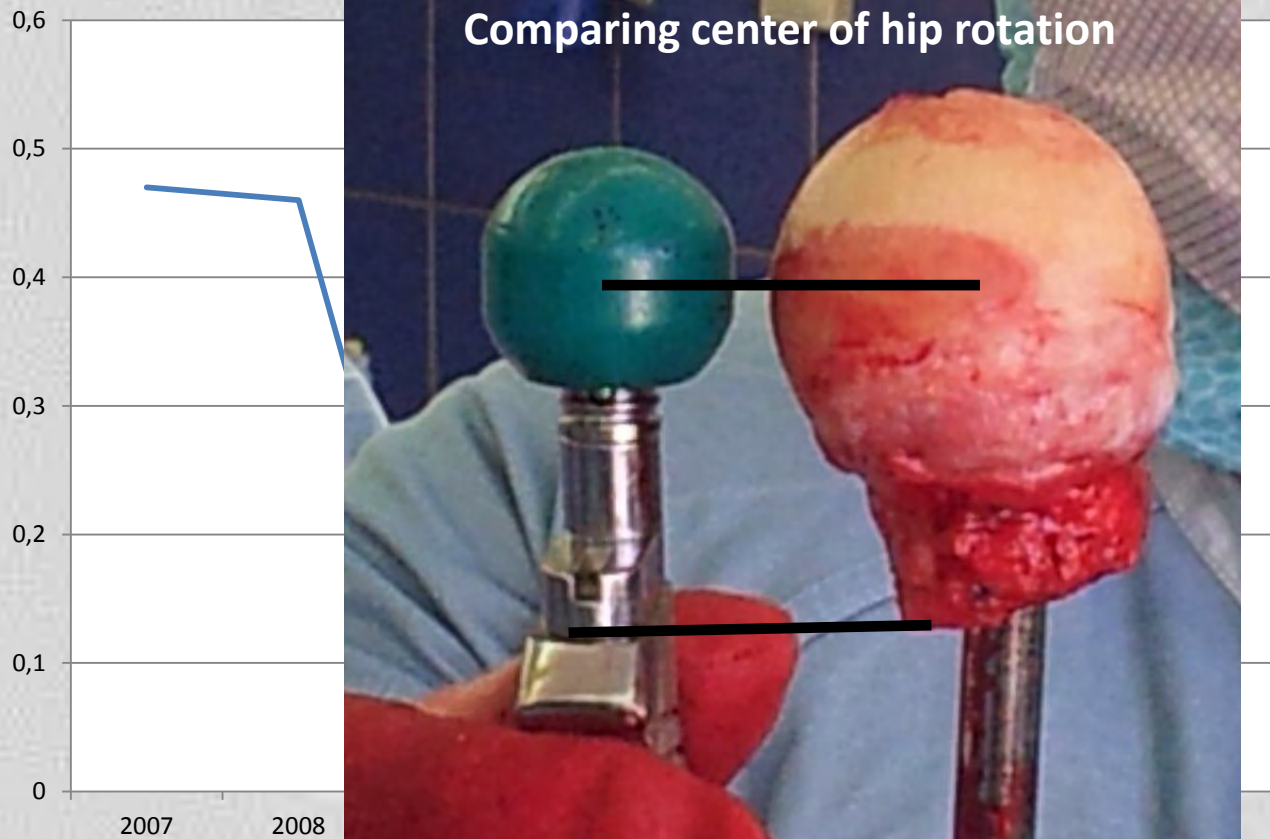


Hospitalization (days)



- Politics of health insurance companies (6 th day after surgery)

Postoperative limb length discrepancy



- Predominantly using small head

3 major intraoperative complications

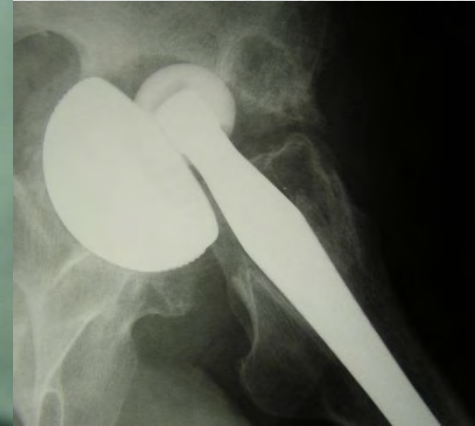
- 2 x acetabular protrusion
- 1 x intraoperative femur fracture
- 1 x low grade infection

Intraoperative acetabular protrusion

december 2007



Post OP, 18.12.2007



2 months after surgery

The patient was sent to Orthopaedic Hospital Valdoltra

Intraoperative acetabular protrusion

december 2007



September 2014, with permission of dr.R. Trebše, Orthopaedic Hospital Valdoltra, Slovenia

INTERNATIONAL COMBINED MEETING BRITISH HIP SOCIETY SOCIETA' ITALIANA DELL' ANCA, 26. – 27. NOVEMBER 2015, MILANO, ITALY

6,5 years after acetabular reconstruction

76 y male,
6,5 years after
intraoperative
acetabular
protrusion



Acetabular protrusion

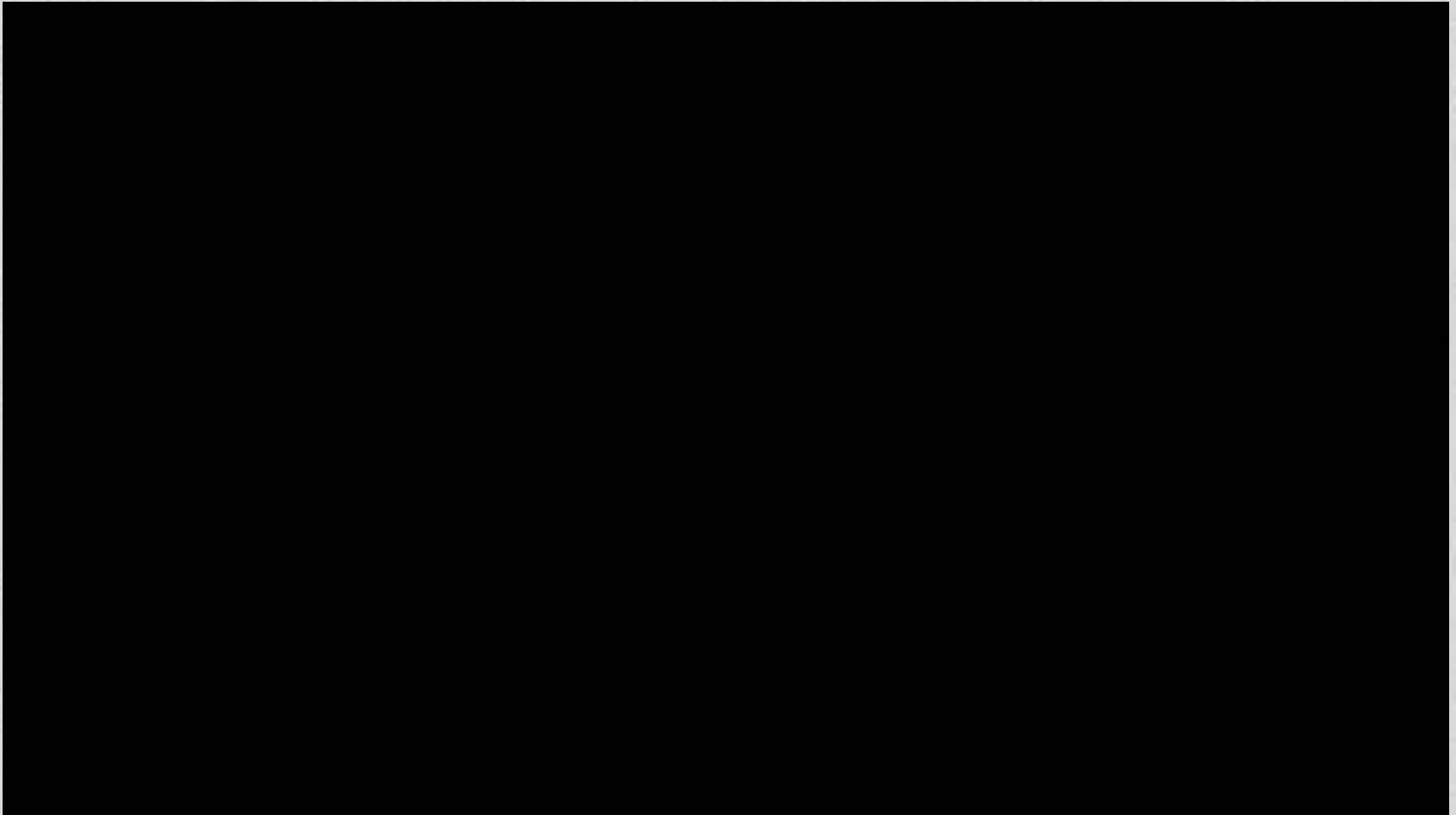


Post OP, 5.2.2009



September 2014

5 years after acetabular reconstruction



Intraoperative femor fracture

- Iatrogenic abruption of trochanter minor
- Fracture of femoral dyaphysis



Intraoperative femor fracture



2011, 2 years after OP

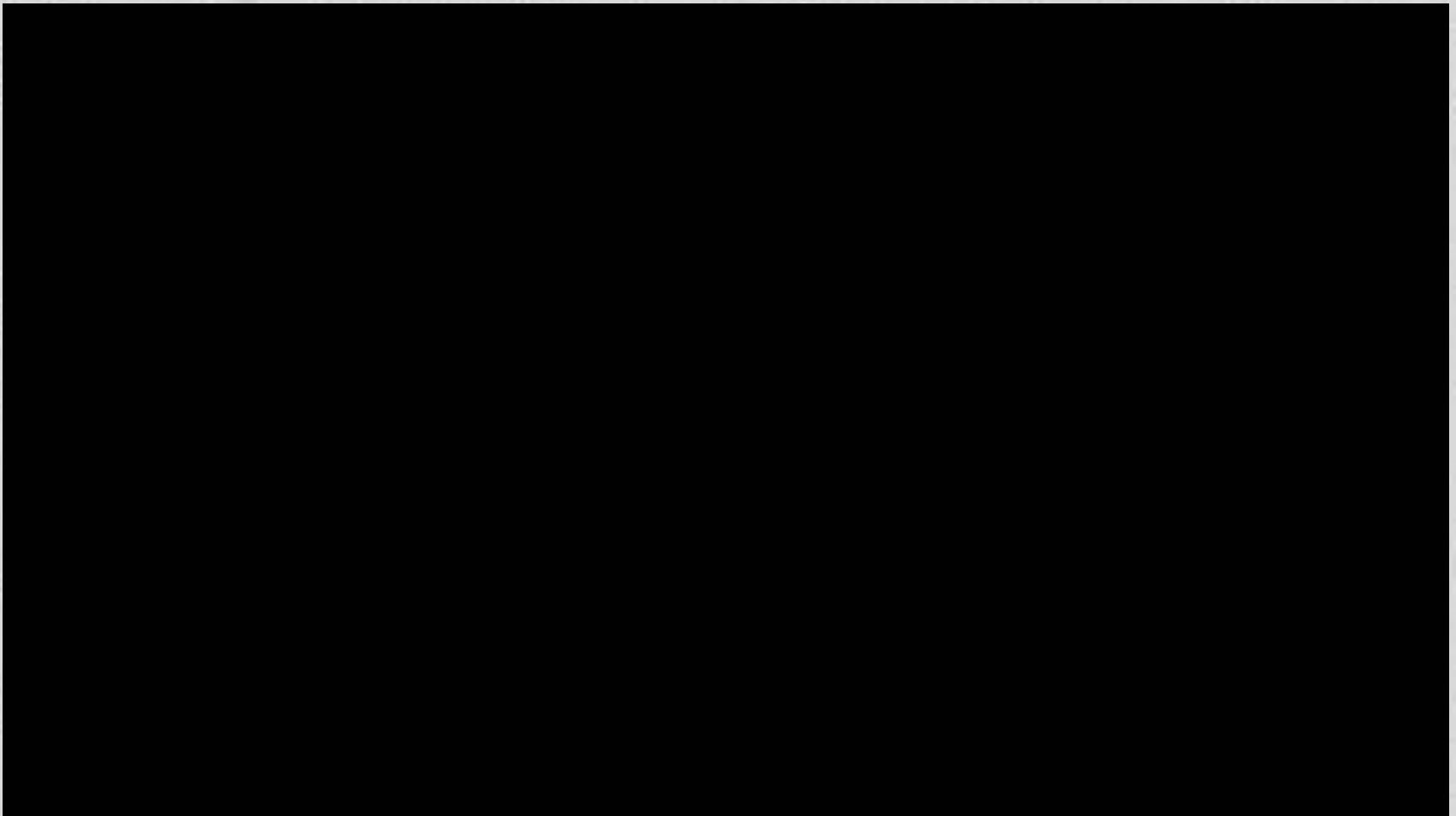


2014, subsidence of femoral stem, osteolysis

Aseptic loosening of femoral stem 5 years after intraoperative periprotetic fracture



5 years after periprotetic fracture and 2 months after femoral stem exchange



Revision THR: Low grade infection

- THR, 23.4.2009
- Low grade infection (
- 2 step THR exchange
- Reimplantation, 20.1
- Avgust 2014: painfree



Cases: Extreme osteoporosis

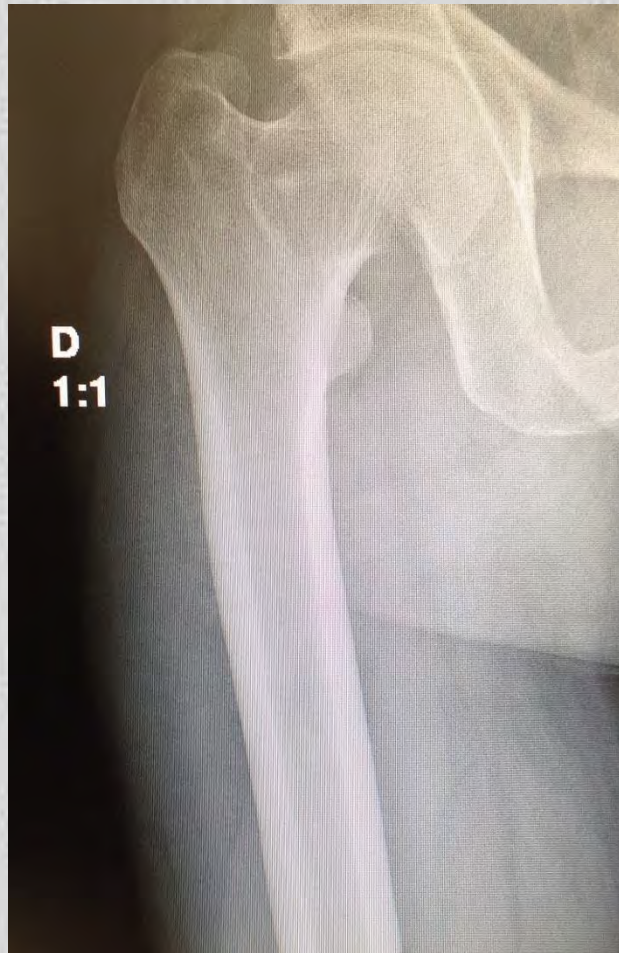
- 76y male, op 16.1.2014
- cementless THR planned
- intraoperatively extreme
- Cemented THR



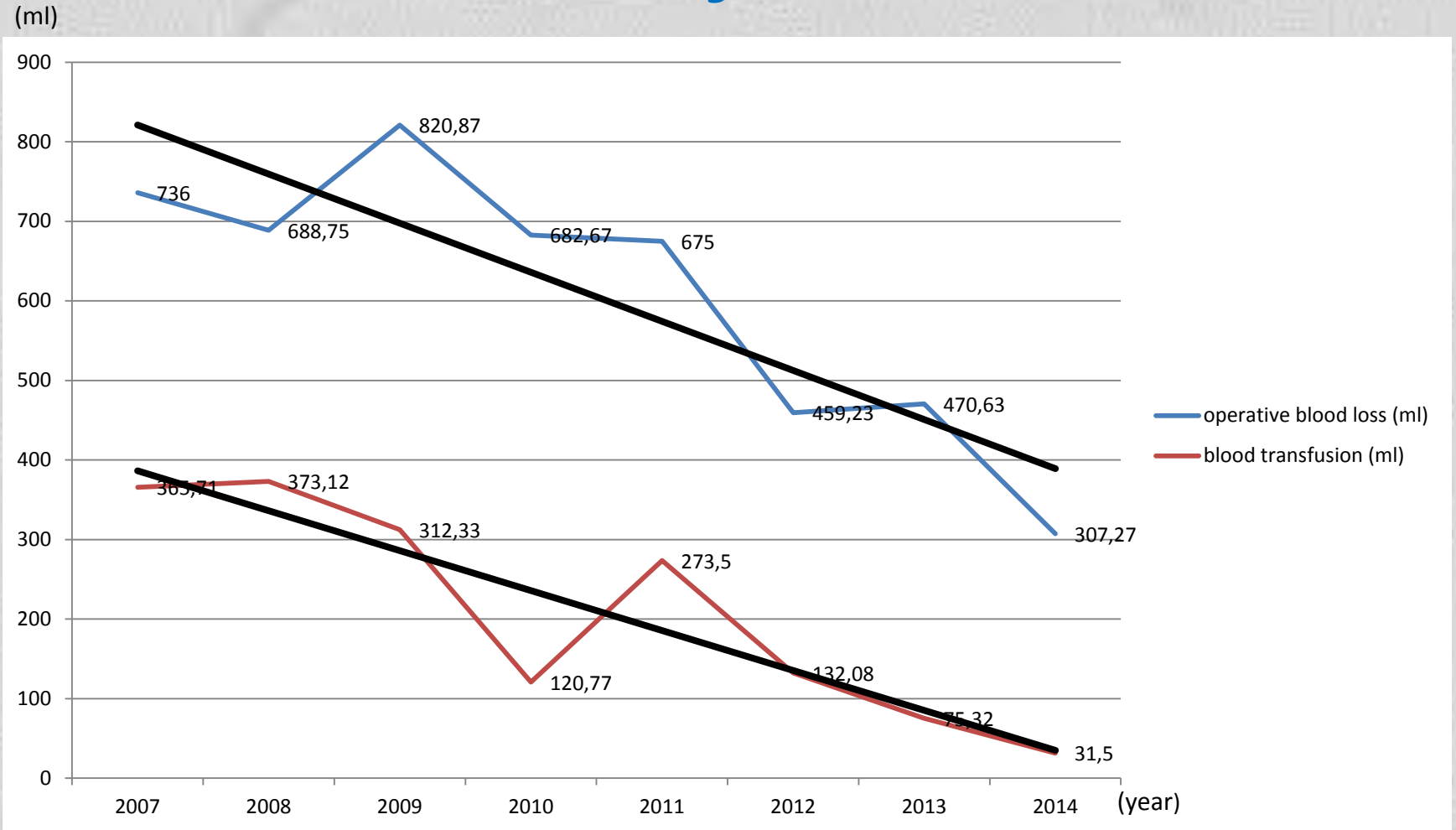
Cases: Dysplastic hip



Cases: Varus hip



Operative blood loss and blood transfusion



CONCLUSION

- Real advantage: ***preservation of hip musculature***
- Satisfied patients
- With learning curve: shorter surgery time, less blood loss, almost no blood transfusion , less postoperative limb length discrepancy
- Fast postoperative rehabilitation
- Future: AMIS® technique as a standard approach



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
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MILAN, ITALY



DIRECT ANTERIOR APPROACH IN TOTAL HIP REPLACEMENT: COMPLICATIONS AND EARLY RESULTS IN SERIES OF 209 PATIENTS

AZIENDA OSPEDALIERA PAPA GIOVANNI XXIII - BERGAMO

DIPARTIMENTO DI EMERGENZA E URGENZA
Direttore: Prof. Claudio CASTELLI

Luigi RIZZI, Claudio CASTELLI

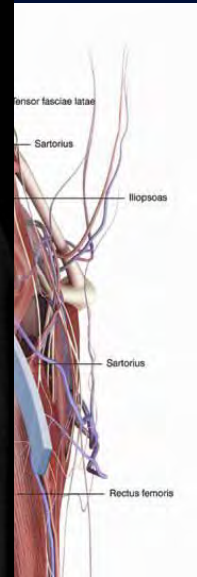


INTERNATIONAL COMBINED MEETING
BRITISH HIP SOCIETY
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26-27 NOVEMBER 2015
MILAN, ITALY



No conflict of interest

INTRODUCTION



- **Internal**
- **Minimal**
- **Rapid**

High number of surgical complications

et al, 2012

AIM OF THE STUDY

- Early results and complications
- THA performed by a single surgeon (including the learning curve)
- Anterior approach with the positioning table

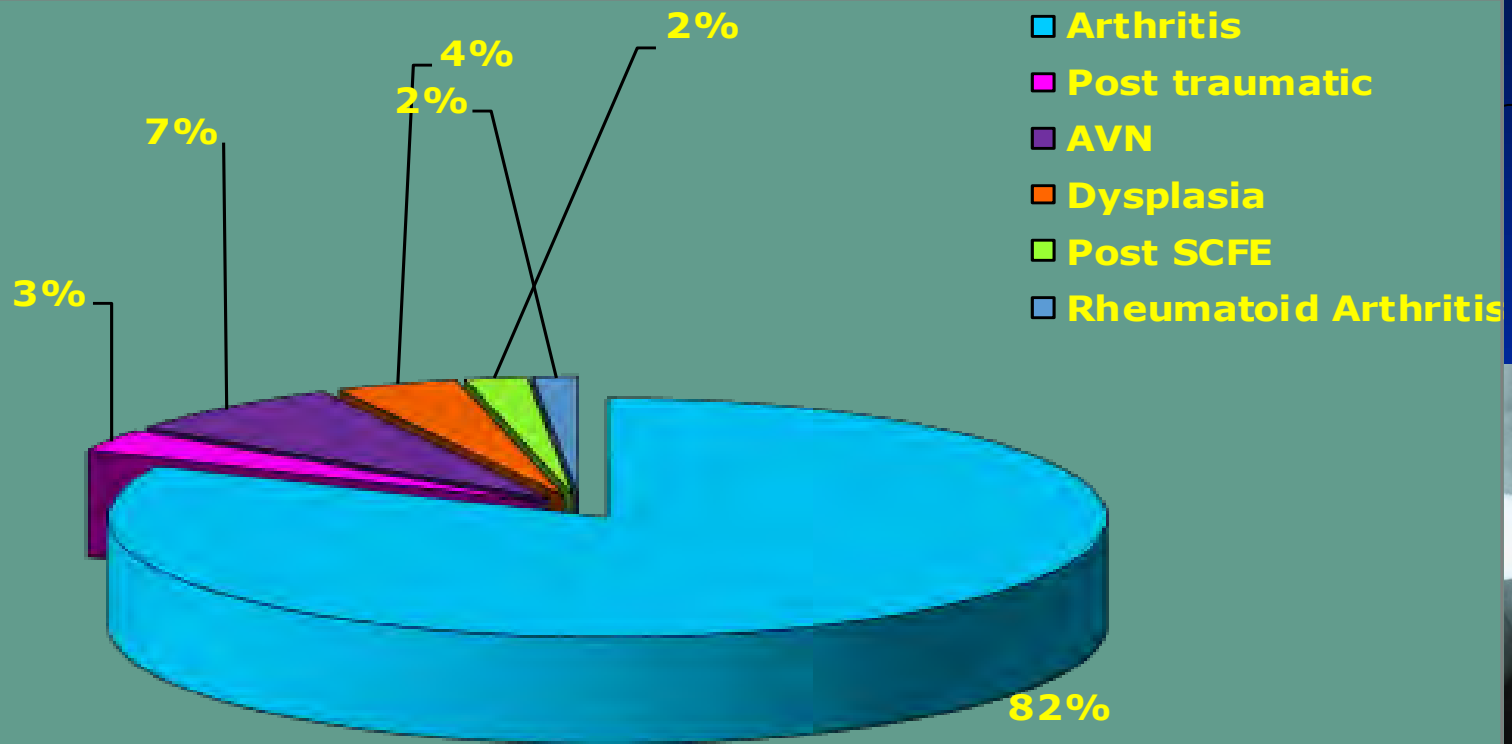


PATIENTS

209 PATIENTS

2010-2014

Male
Female



SINGLE STAGE BILATERAL THA: 3 CASES

RESULTS

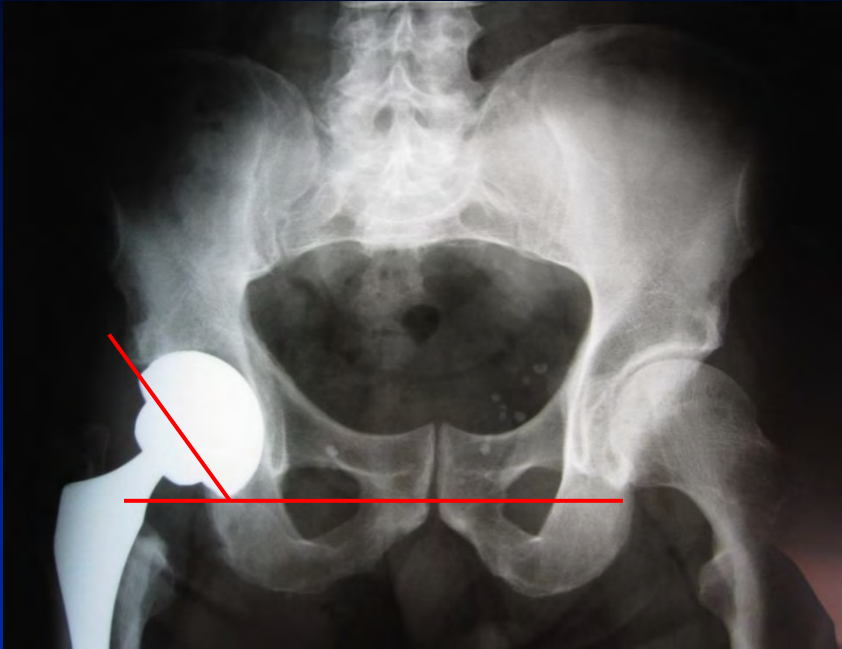
CLINICAL OUTCOMES (HHS)	
Preoperative (SD)	55,5 (\pm 16,6)
Follow up: 44 (\pm 12) days	95 (\pm 6,4)*
Follow up: 39,3 (\pm 17) months	98,3 (\pm 2,4)*

Ttest * $p < 0,001$

LENGHT OF SKIN INCISION: 10,3 (\pm 1,6) cm

Discharge at home: 73 (34,9%)

RESULTS



Inclination of the cup: $43^{\circ} (\pm 5^{\circ})$

Subsidence of the stem: 6 (2,8%) [Revision: 1]

FLUOROSCOPY DURING SURGERY

COMPLICATIONS

Wound problems	12 (5,7%)	Post-operative anemia	3 (1,4%)
LCFN hypoesthesia	9 (4,3%)	Paralysis ESP nerve	2 (0,9%)
Urinary tract infection	6 (2,8%)	Acute coronary syndrome	2 (0,9%)
Femoral fracture	6 (2,8%)	Heterotopic ossification	2 (0,9%)
Greater trochanter fracture	5 (2,3%)	Cephalalgia	2 (0,9%)
Inguinal pain	5 (2,3%)	Nausea and vomit	2 (0,9%)
Crural pain	5 (2,3%)	Acute respiratory failure	2 (0,9%)
Dislocation	4 (1,9%)	Pulmonary embolism	1 (0,4%)
Post-operative hypotension	4 (1,9%)	Diarrhea	1 (0,4%)
Deep infection	3 (1,4%)	Pneumonia	1 (0,4%)
Fever	3 (1,4%)	Transient confusion	1 (0,4%)

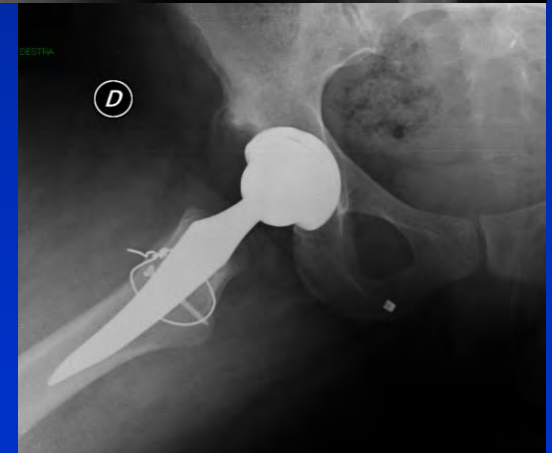
INCIDENCE 39,1%

CLASSIFICATION OF COMPLICATIONS

	DINDO-CLAVIEN CLASSIFICATION
I	54 (65,1%)
II	13 (15,7%)
III	9 (10,8%)
IV	7 (8,4%)
V	0



I	A complication that requires no treatment and no deviation from routine follow up
II	A deviation that requires outpatients treatment
III	A complication that is treatable, but requires surgical intervention or unplanned hospital admission without long term morbidity
IV	A complication that is life threatening, requires ICU admission, or is not treatable with potential for permanent disability
V	Death



TYPE OF COMPLICATIONS

	ORTHOPAEDIC
I	29 (53,7%)
II	6 (46,1%)
III	9 (100%)
IV	3 (42,8%)
V	0

	GENERAL
I	25 (46,3%)
II	7 (53,9%)
III	0 (0%)
IV	4 (57,2%)
V	0

Chi square: n.s

Revision: 6 (2,8%)

- **Femoral fracture: 2**
- **Recurrent dislocation: 1**
- **Loosening of the stem: 1**
- **Deep infection: 1**
- **Wound problem: 1**



AGE AND ASA CLASSIFICATION

	< 60 yo	
I	15 (27,7%)	
II	3 (23,1%)	
III	5 (11,1%)	
IV	6 (85,8%)	
V	0	

DINDO-CLAVIEN CLASSIFICATION	ASA I	ASA II	ASA III	ASA IV
I	1	43	10	-
II	1	10	2	-
III	-	7	2	-
IV	-	2	5	-
V	-	-	-	-



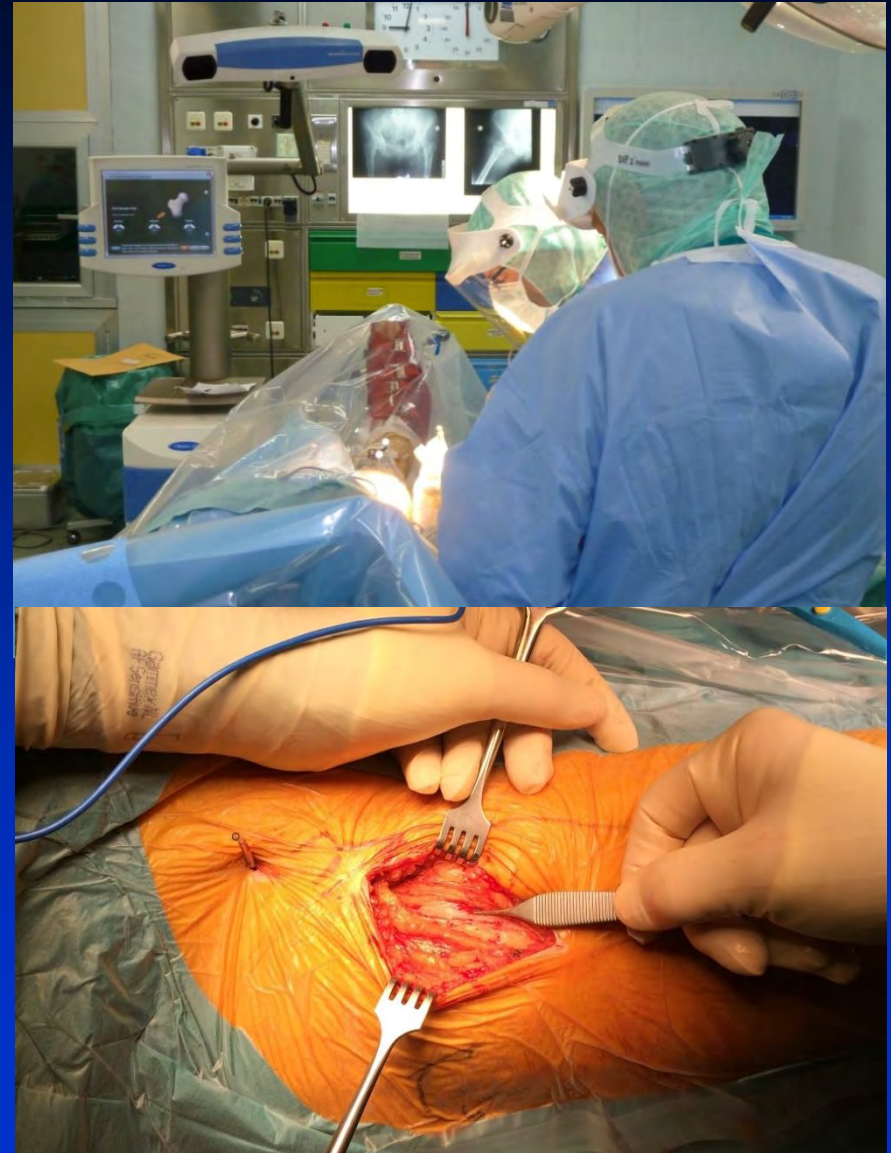
Chi square: n.s

LEARNING CURVE

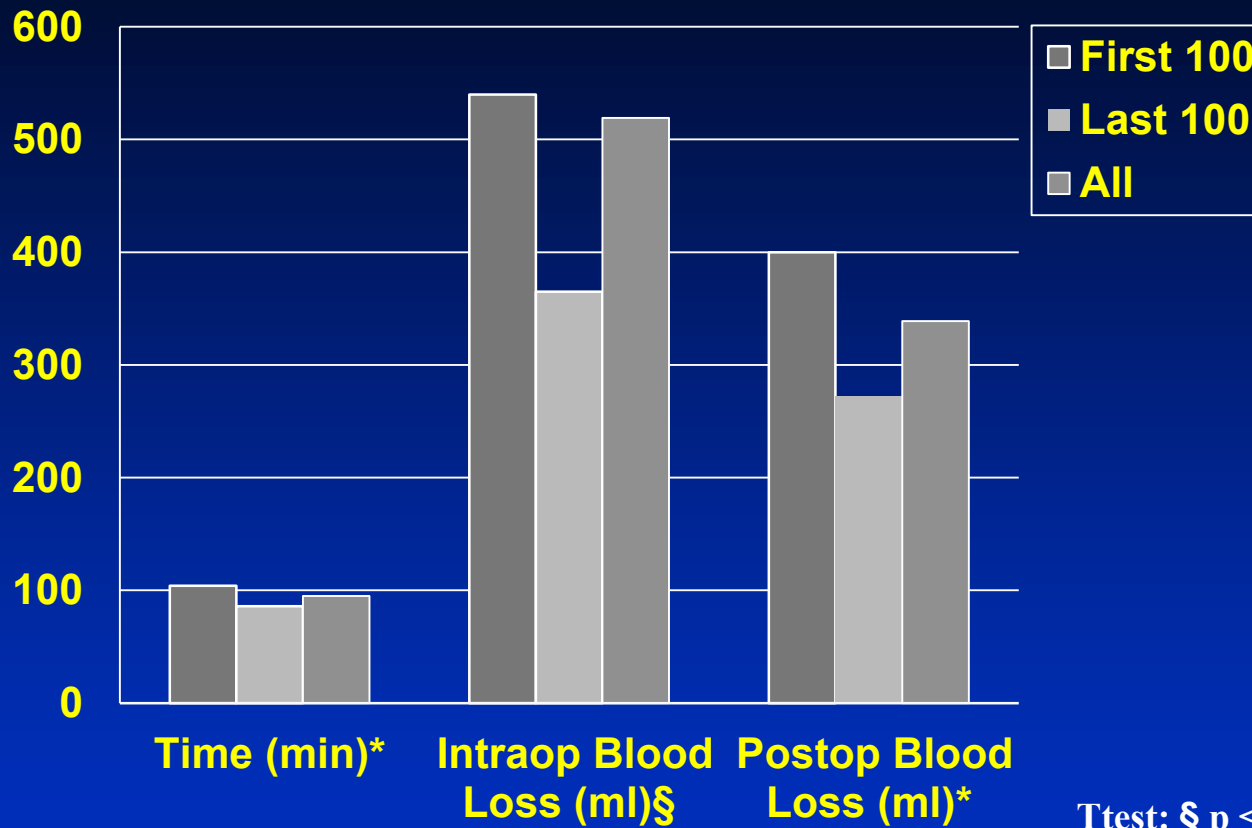
	First 100 cases
I	22 (40,8%)
II	8 (61,6%)
III	4 (44,4%)
IV	1 (14,2%)
V	0

	> 100 cases
I	32 (59,2%)
II	5 (38,4%)
III	5 (55,6%)
IV	6 (85,8%)
V	0

Chi square: n.s



LEARNING CURVE

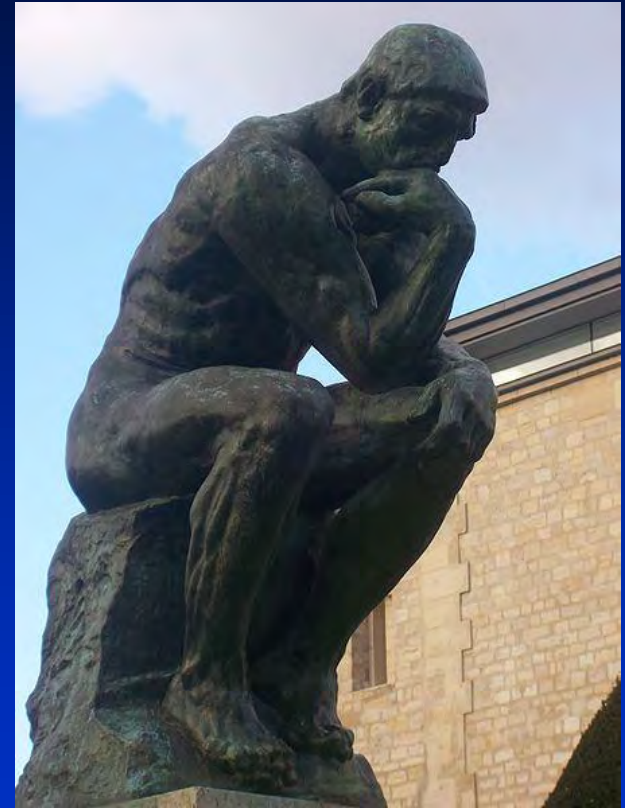


TRANSFUSIONS (n. units)	0	1	2	>2
Patients	132 (63%)	7 (3%)	47 (23%)	23 (11%)

Cut off: Hb < 10 g/dl

CONCLUSION

- **DAA is safe, effective and reliable with a low rate of complications and excellent results**
- **Positioning table makes the surgery reproducible and standardized with a limited number of surgeons**
- **Learning curve influences only the time of surgery and blood loss without any correlation to the incidence of complications**



AZIENDA OSPEDALIERA PAPA GIOVANNI XXIII - BERGAMO

DIPARTIMENTO DI EMERGENZA E URGENZA
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26-27 NOVEMBER 2015

MILAN, ITALY





INTERNATIONAL COMBINED MEETING

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SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY





Orthopaedics & Traumatology 1 Department – Pisa

Chief: Prof M. Lisanti



Direct Anterior Approach vs Postero-Lateral approach with a same implant in 60 patients. Clinical and Radiological findings and Review of Literature



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA



E. Bonicoli,

I. Castellini, L. Andreani, E. Neri, V. Zarra, M. Lisanti
Milan, November 26-27, 2015

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Education

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Expert Courses

HIP EXPERT TRAINING COURSES 2015

Short Hip Expert Training

- June 26, Centre of Anatomy, Hanover / Germany
- September 11, Centre of Anatomy, Hanover / Germany
- October 30, Centre of Anatomy, Berlin / Germany

Hip Expert Training – Direct Anterior Approach (DAA)

- May 8, Centre of Anatomy, Berlin / Germany

Once about 10 years for the anterior approach to perform on TUB

BioSkills

Practical Aspects of

Zimmer Anterior Supine Approach without use of extension table

Medical University Innsbruck

Monday 27th - Tuesday 28th April 2015



Zimmer Institute
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4TH ANNUAL ANTERIOR HIP COURSE

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...also the literature...

Orthop Clin North Am. 2009 Jul;40(3):321-8. doi: 10.1016/j.ocl.2009.01.003.

Direct anterior approach for total hip arthroplasty.

Bender B¹, Nogler M, Hozack WJ.

2009

DAA **TODAY**
BETTER THAN
YESTERDAY**PL**

Rev Med Brux. 2011;32(6 Suppl):S76-83.

2011

[Total hip arthroplasty by mini-approach: review of literature and experience of direct anterior approach on orthopaedic table].

International Orthopaedics (SICOT)
DOI 10.1007/s00264-015-2803-x

2015

ORIGINAL PAPER

Fluoroscopy assessment during anterior minimally invasive hip replacement is more accurate than with the posterior approach

Weifeng Ji^{1,2} • Nathaniel Stewart³

Lower Dislocation Rate Following Total Hip Arthroplasty *via* Direct Anterior Approach than *via* Posterior Approach: Five-Year-Average Follow-Up Results

Sachiyuki Tsukada^{*} and Motohiro Wakui

2015

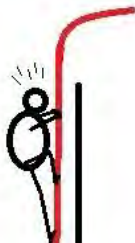
For all these reasons we started our experience with the DAA, although we had been very successful with the PL approach...

...we started in 2010..

...at the beginning it was not easy...



Warning!
Steep
Learning
Curve



Clin Orthop Relat Res
DOI 10.1007/s11999-015-4565-6

Clinical Orthopaedics
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SYMPOSIUM: 2014 INTERNATIONAL HIP SOCIETY PROCEEDINGS

What Is the Learning Curve for the Anterior Approach for Total Hip Arthroplasty?

Richard Noel de Steiger MBBS, FRACS, Michelle Lorimer BSc(Math & Comp Sci) (Hons), Michael Solomon MBChB, FRACS

2014

After more consecutive 50 cases ...



**This depend on the fact that the learning curve is
long and difficult**

Orthopaedics & Traumatology I Department of Pisa

November 2013 – March 2015

**60 patients: Group A (Direct Anterior Approach o DAA) e Group B
(Postero-Lateral Approach o PL)**

MATERIALS & METHODS

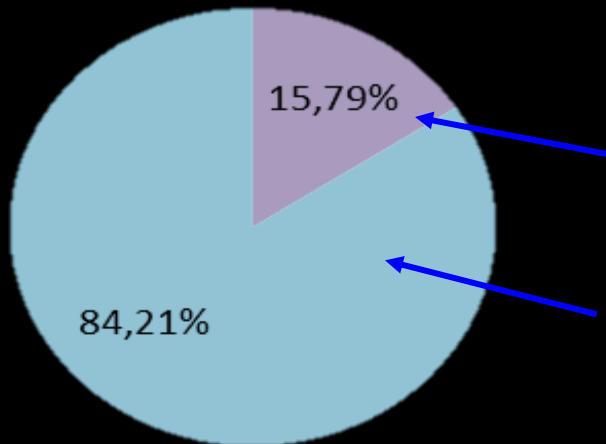


Group A: 30 pz (DAA)

- 19 F
- 11 M
- age max 78 aa
- age min 36 aa
- average age 64,70 aa

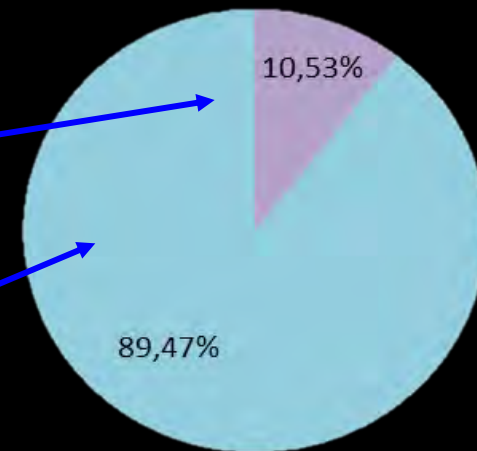
Group B: 30 pz (PL)

- 17 F
- 13 M
- age max 79 aa
- age min 43 aa
- average age 63,10 aa



Aseptic necrosis of
femoral head

Hip arthrosis



MATERIALS & METHODS



Preop

T 1 month

T 3months

T 12months



✓ **Blood Loss (Hb)**

- **Intraoperative blood loss index**
- **Need of blood transfusion**

✓ **Length of stay (LoS)**

✓ **Harris Hip Score (HHS)**

1. **Pain expressed in 4 grades 0-44 points**
2. **Functional capacity expressed in 4 grades 0-47 points**
3. **Absence of deformity 4 points**
4. **Range of movement 5 points**

✓ **Visual Analogue Scale (VAS)**

1. **0 no pain**
2. **3 pain responsive to NSAID drugs**
3. **10 unbearable pain**



MATERIALS & METHODS



T 1month

T 6months

T 12months



✓ **X-Ray**

- **Correct positioning of stem in varus/valgus**
- **Restoration of articular geometry (offset)**
- **Dysmetria evaluable at X-Ray study**
- **Correct orientation of acetabular cup**
- **Heterotopic ossification**

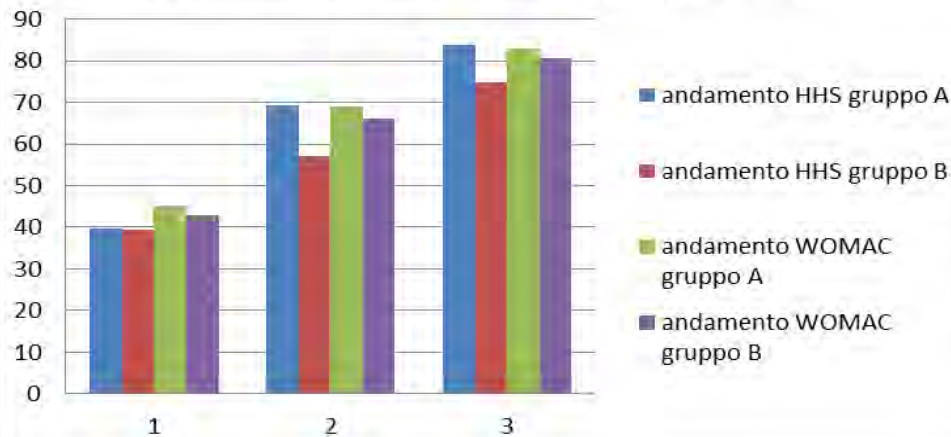
✓ **Complications**

All Patients underwent the same antithromboembolic prophylaxis, analgic therapy and rehabilitation protocol.

RESULTS



Confronto medie HHS e WOMAC



HH\$ & Womac scores

- T 3 months
- T 6 months
- T 12 months

DAA Group

HH\$ at T 3months: 70

HH\$ at T 6months: 79

HH\$ at T 12months: 85

PL Group

HH\$ at T 3 months: 60

HH\$ at T 6months: 62

HH\$ at T 12months: 84

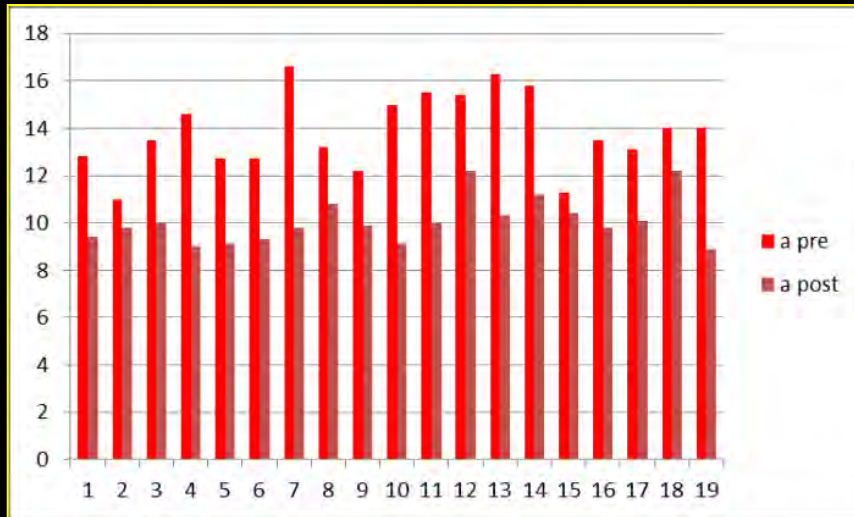
HH\$



RESULTS

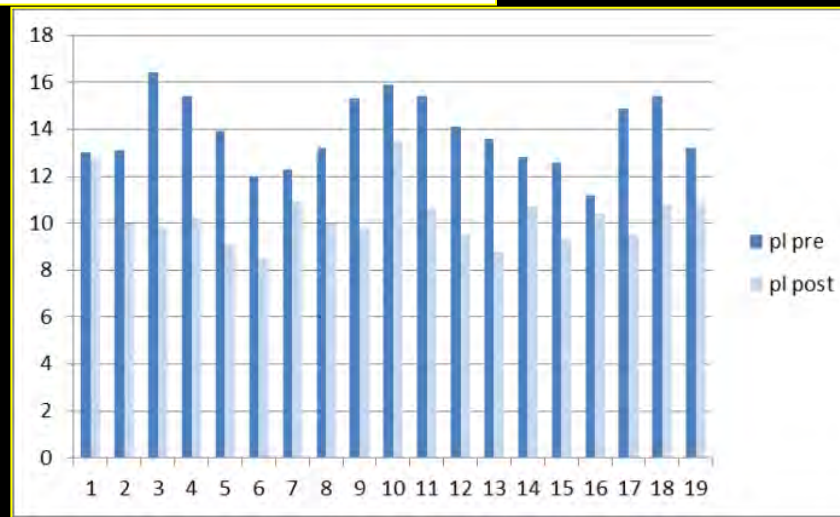


- Hb levels at T0 and T5 days do not show any significant difference, even if it has been evaluated a high use of blood transfusion in group A rather than group B



DAA Group

Hb values before and after surgery



PL Group

RESULTS



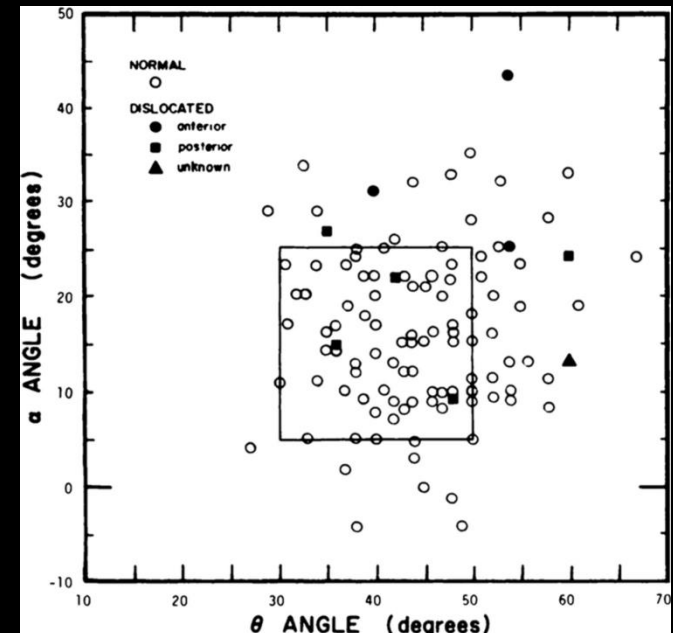
✓ X-Rays

	Heterotopic Ossifications	Acetabular cup orientation	Stem positioning (underestimation)	Wrong offset restoration
A Group	15,7%	0%	10,52%	0%
B Group	10,52%	0%	5,26%	0%

Wrong acetabular cup positioning

Criteria:

- ✓ "Safe zone"
- ✓ Anteversion $15^{\circ} \pm 10^{\circ}$
- ✓ Inclination $40^{\circ} \pm 10^{\circ}$



RESULTS



- ✓ No significant differences analyzing **VAS** results
- ✓ **Complications**
 - ✓ **A Group (DAA):**
 - ✓ 1 intraoperative trochanteric fracture treated with circlage
 - ✓ 1 haematoma
 - ✓ 4 patients (12%) with dysesthesia at femoral-cutaneous lateral nerve innervation area (FCLN)
 - ✓ **B Group (PL):**
 - ✓ 1 dysmetria in plus of 1 cm



PERSONAL CONSIDERATIONS

PROS

Direct Anterior Approach

- ✓ Well established now
- ✓ Very good early results after good execution
- ✓ Better cup positioning
- ✓ Lower dislocation rate $< 1\%$

CONS

Direct Anterior Approach

- ✓ Long learning curve
- ✓ Not simple approach doing a THA
- ✓ Dedicated strummentations



CONSIDERATIONS

PROS

Posterolateral Approach

- ✓ *More “safe” surgical approach*
- ✓ *Better stem positioning*
- ✓ *Low operating time*

CONS

Posterolateral Approach

- ✓ *Slow functional recovery because of major muscles injury*
- ✓ *risk of dislocation ?? (remember preservation and reattachment of post cap and ER)*



Lower Dislocation Rate Following Total Hip Arthroplasty *via* Direct Anterior Approach than *via* Posterior Approach: Five-Year-Average Follow-Up Results

Sachiyuki Tsukada* and Motohiro Wakui

2015

139 DAA & 177 PL

CONCLUSION

The dislocation rate of THA *via* DAA was lower than THA *via* PA. DAA might be preferable to PA to reduce the dislocation.

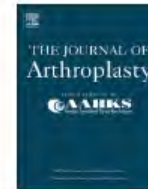


ELSEVIER

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The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org



2013

87 pz

Prospective Randomized Study of Direct Anterior vs Postero-Lateral Approach for Total Hip Arthroplasty

William P. Barrett, MD ^a, Shelly E. Turner, CRC ^a, John P. Leopold, MS ^b

^a Proliance Surgeons, Renton, Washington

^b Contract Statistician, Claypool, Indiana

**Randomized
Prospective**

score and the HHS percent walking unlimited distance continued to be significantly higher at three months, and there were no significant differences in outcomes between surgical approaches at later time points. This confirms previous reports that the benefits of the direct anterior approach are primarily realized in the early phases of recovery and rehabilitation.

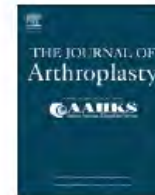
No long term difference!



Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org



Similar Improvement in Gait Parameters Following Direct Anterior & Posterior Approach Total Hip Arthroplasty

Parthiv A. Rathod, MD^a, Karl F. Orishimo, MS^b, Ian J. Kremenec, MEng^b,
Ajit J. Deshmukh, MD^a, José A. Rodriguez, MD^a

A B S T R A C T

We compared gait parameters prior to, at 6 months and 1 year following total hip arthroplasty (THA) performed via direct anterior approach (DAA) and posterior approach (PA) by a single surgeon in 22 patients. A gait analysis system involving reflective markers, infrared cameras and a multicomponent force plate was utilized. Postoperatively, the study cohort demonstrated improvement in flexion/extension range of motion (ROM) ($P = 0.001$), peak flexion ($P = 0.005$) and extension ($P = 0.002$) moments with no differences between groups. Internal/external ROM improved significantly in the DAA group ($P = 0.04$) with no change in the PA group. THA performed via DAA and PA offers similar improvement in gait parameters with the exception of internal/external ROM which might be related to the release and repair of external rotators during PA THA.

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2014

11 DAA & 11 PL

Gait Analysis



Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org



2014

2302 pz in 17
studies

Anterior vs. Posterior Approach for Total Hip Arthroplasty, a Systematic Review and Meta-analysis



Brendan T. Higgins, MD, MS ^{a,b}, Daniel R. Barlow, MS ^{b,c}, Nathan E. Heagerty, MPH ^b, Tim J. Lin, MD, MS ^{a,b}

Review e metha-analysis

Recommendations

This review emphasizes the need for methodologically rigorous, multi-centered, prospective, randomized controlled trials with pre-defined reporting, standardized follow-up intervals, outcome measures, anesthesia and rehabilitation protocols and reporting of pre-operative indication. Additionally, while we acknowledge that blinding of the surgeon is impossible, blinding of assessors is imperative and short-term blinding of patients with dummy dressings could be beneficial. In accordance with the efforts of several large joint arthroplasty registries to identify outcome measures that have high levels of validity, reliability and responsiveness we suggest utilization of the SF-12 [17] for general health, the Oxford Hip Score [25] for disease specific health and the UCLA Activity Scale [24] as a measure of overall activity. Due to the heterogeneity of results of the included studies, we are unable to provide a firm recommendation as to whether the anterior or posterior approach to THA is overall superior. Thus, until further research is available, we recommend that the approach for THA be based on patient characteristics, surgeon experience and surgeon and patient preference.

SYMPOSIUM: 2014 HIP SOCIETY PROCEEDINGS

Direct Anterior versus Miniposterior THA With the Same Advanced Perioperative Protocols: Surprising Early Clinical Results

Kirsten L. Poehling-Monaghan MD, Atul F. Kamath MD,
Michael J. Taunton MD, Mark W. Pagnano MD

CORR 2015

Pagnano says :

constant over the past 5 years and so sought to compare miniposterior THA with direct anterior THA. We were somewhat surprised to find that direct anterior THA did not result in a faster return to activities of daily living at 2 days, 2 weeks, or 2 months as compared with miniposterior THA; that direct anterior THA had a lower risk of minor wound problems early after surgery; and there was not a difference seen in the radiographic parameters of component position, leg length, or hip offset when direct anterior with fluoroscopy was compared with miniposterior THA without intraoperative fluoroscopy.

Conclusions



?????



**USE IT
IT'S FREE!!!**

We continue our experience with DAA for sure

- Avoiding useless fanathisms**
- Making rational choices**

“If we already have good results, is it necessary to change surgical approach in order to obtain the same results ??”





Orthopaedics & Traumatology 1 Department – Pisa

Chief: Prof M. Lisanti



THANKS



INTERNATIONAL COMBINED MEETING
BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA



Milan, November 26-27, 2015



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY



International combined meeting

British Hip Society and Società Italiana dell'Anca
26-27 November 2015 Milan, Italy

One-stage bilateral total hip
arthroplasty through a minimally
invasive anterior approach (AMIS):
Functional outcomes and
complications in 20 patients

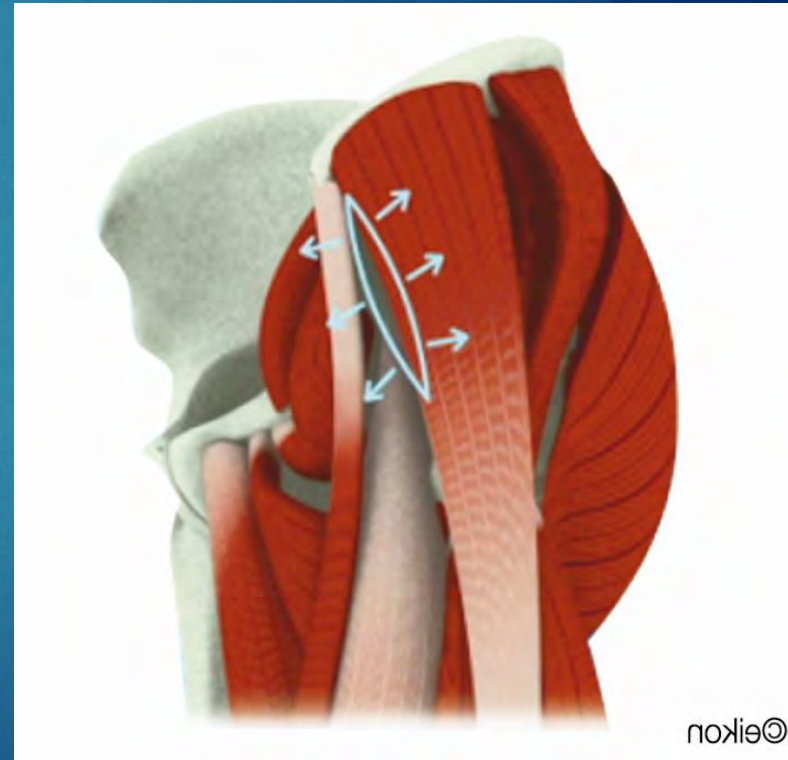
Dr. med. Gerasimos Petridis

Dr. med. Martin Nolde

ORTHOPRAXX

Zentrum für Orthopädie im Forum Bogenhausen

Munich, Germany



One-stage bilateral THA using a minimally invasive anterior approach (AMIS)

- ▶ Two surgical centres in Germany (Sanaklik Solln München & Klinikum Starnberg)
- ▶ Same lead surgeon
- ▶ Same surgical team
- ▶ 20 patients bilateral THA, mean age 56 years (range 35-77)
- ▶ 420 patients unilateral THA
- ▶ Cellsaver intraop.
- ▶ General anaesthesia
- ▶ June 2011 – August 2013
- ▶ Retrospective analysis
- ▶ Quadra/AMIS-stem (Medacta)
- ▶ Versafitcup system: ceramic hip joint head with polyethylene cup



Data

- Operative time
- ASA score
- Intraoperative blood loss
- Length of hospital stay
- Number of homologous blood transfusions
- Preop. and 1.postop. day haemoglobin levels
- Complications
- Functional outcomes (HAAS, HHS, FLZ)

Assessment schedule

Assessment	Preop.	Intraop.	Postoperative			
			1 week	6 weeks	6 months	1 year
Informed consent	X					
Demographics	X					
Surgery		X				
Clinical assessment (HHS)	X			X	X	X
HAAS	X				X	X
X-ray assessment	X		X		X	X
Adverse events		X	X	X	X	X
Quality of life (FI 7)	X				X	X

Inclusion criteria

- ▶ Low-risk patients,
ASA category 1 or 2 disease
- ▶ No evidence of infection
- ▶ Bilateral hip disease

Exclusion criteria

- ▶ History of hip fusion
- ▶ ASA category 3 or greater
- ▶ Revision surgery
- ▶ Evidence of infection
- ▶ Osteoporosis
(T-score $> -2,5$)
- ▶ Severe obesity (BMI > 35)

Potential advantages of one-stage vs. two-stage bilateral THA

- Single hospital stay
- Reduced costs
- Reduced total rehabilitation times

Higher incidence of surgical/medical complications?

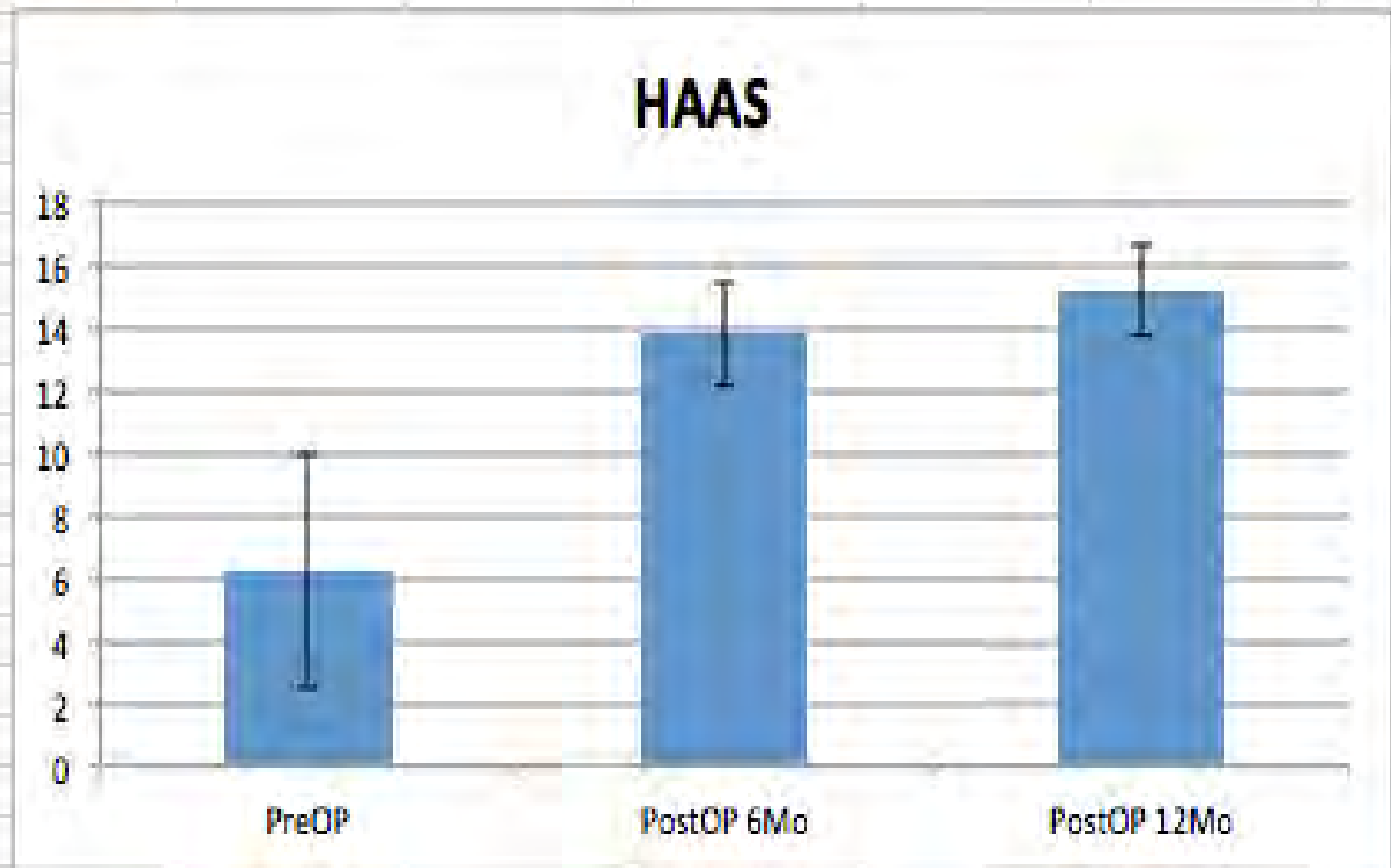
CAVE: 10% of patients require contralateral THA within a year of their first THA operation!!!!

Results

- Mean length of hospital stay: 10.4 days (6-18 d)
- Mean duration of operation: 148 min (92-185 min)
- Mean intraoperative blood loss: 687.5 ml
- Mean 1.postop. day haemoglobin levels: 11 g/dL by mean preop. Hb levels: 14.3 g/dL
- 14x patients received an autologous blood transfusion (Cellsaver) and 4x one unit (800ml) of homologous blood
- No complications/no deaths
- HHS preop. 39.45 \pm 17.49 \rightarrow postop. 98.45 \pm 2.04
- HAAS preop. 6.20 \pm 3.75 \rightarrow postop. 15.20 \pm 1.47
- General FLZ preop. 62.25 \pm 10.14 \rightarrow postop. 71.15 \pm 7.34
- Health FLZ preop. 60.90 \pm 8.87 \rightarrow postop. 73.10 \pm 5.23

Preoperative and 6-month and 12-month postoperative High Activity Arthroplasty scores

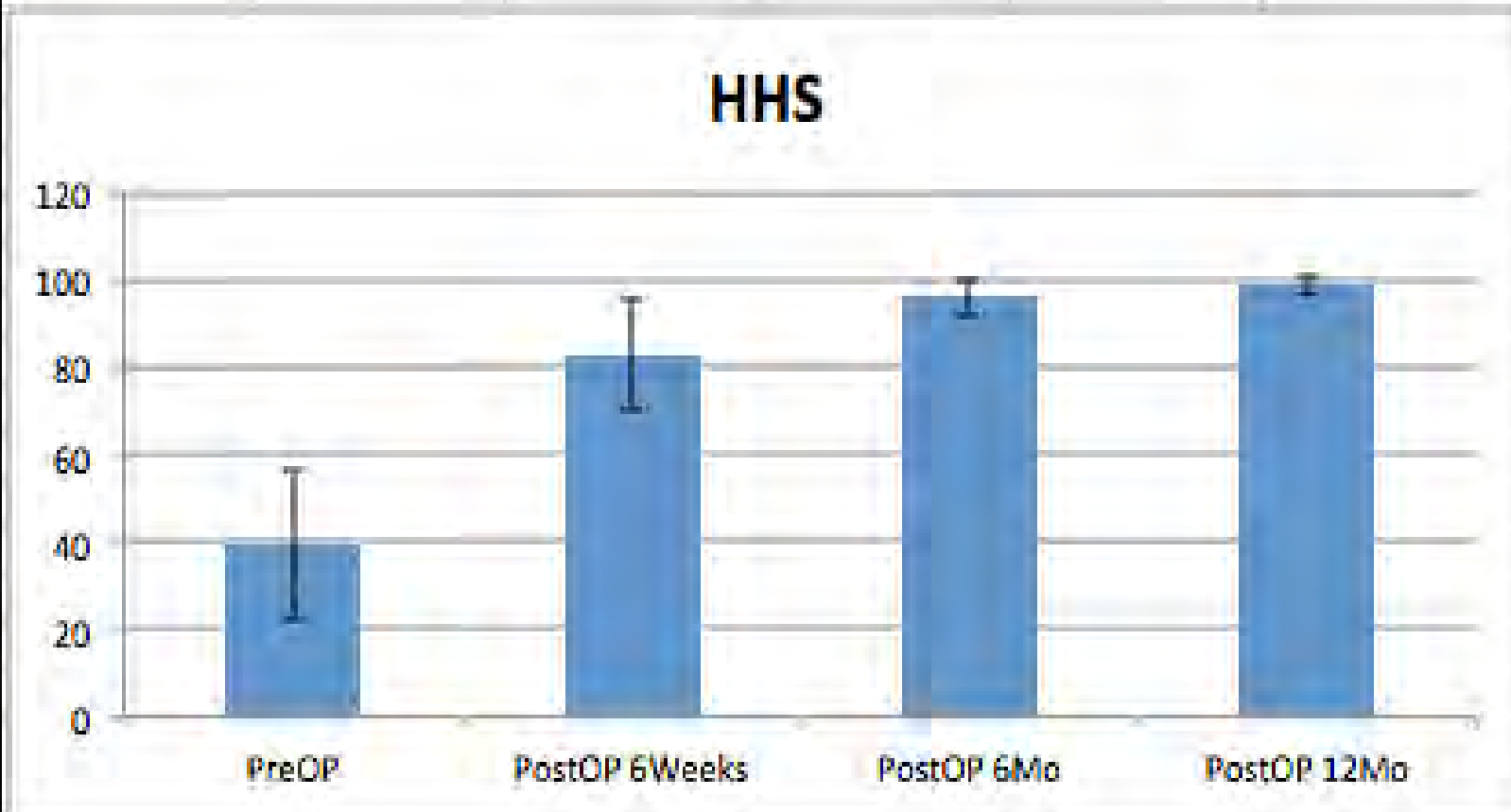
HAAS	preop	postop 6mo	postop 12mo
mean	6,20	13,80	15,20
dev.st	3,75	1,67	1,47



Preoperative and 6-month and 12-month postoperative Harris Hip scores

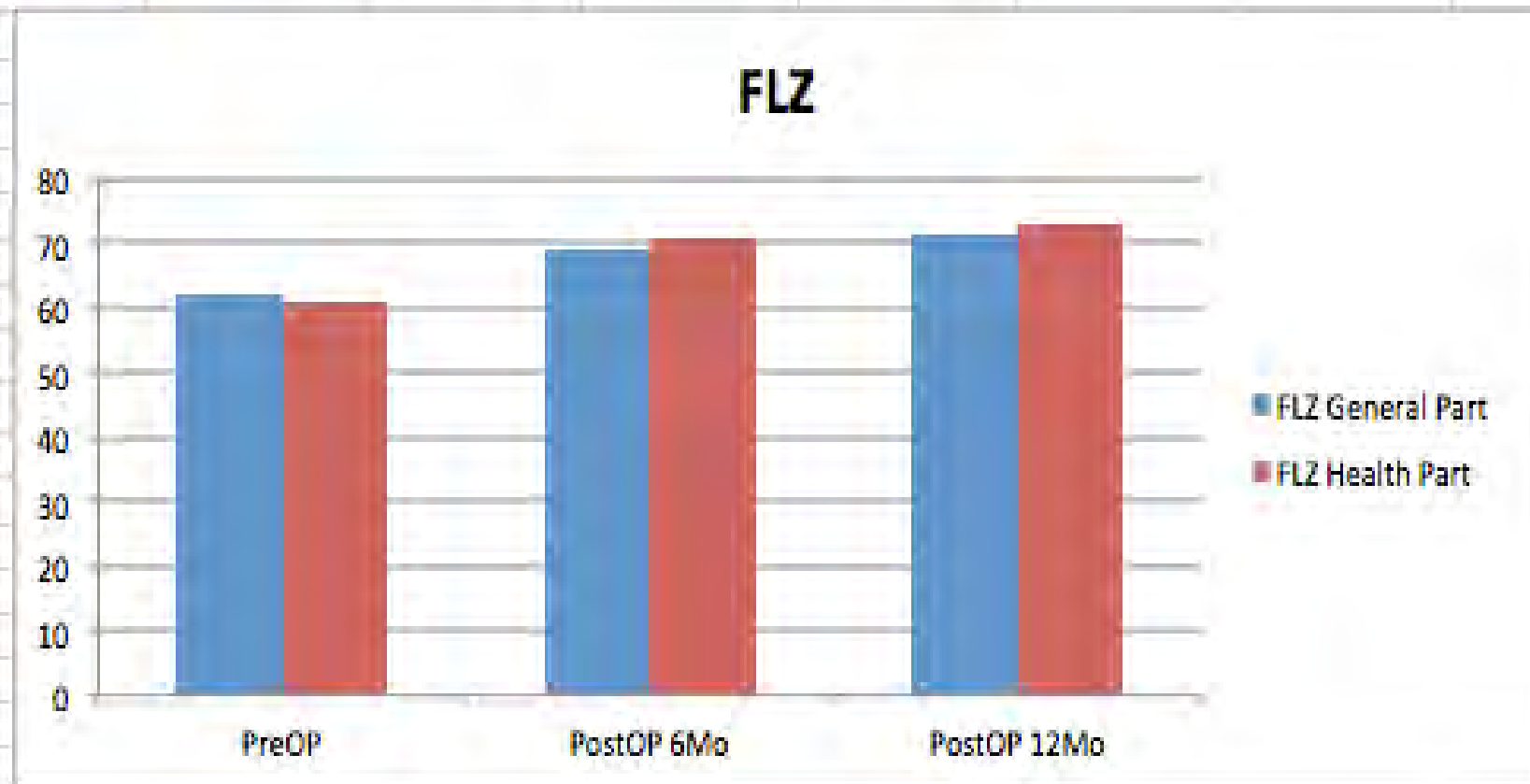


HHS	preop	postop 6 week	postop 6mo	postop 12mo
mean	39,45	82,65	95,85	98,45
dev.st	17,49	12,56	4,25	2,04



Preoperative and 6-month and 12-month postoperative FLZ General and Health scores

		preop	postop 6mo	postop 12mo			
FLZ general	mean	62,25	69,20	71,15			
	dev.st	10,14	8,22	7,34			
FLZ health	mean	60,90	70,45	73,10			
	dev.st	8,87	6,35	5,23			



No complications

reported, including:

- ▶ Infection
- ▶ Dislocation
- ▶ Pulmonary embolism
- ▶ Deep vein thrombosis
- ▶ Leg length discrepancy
- ▶ Other intra-/postoperative complications

Blood-sparing strategy for bilateral THA

- ▶ Preop. iron supplementation per os 0-1-0
- ▶ Preop. EPO (Hb<12 g/dL)
- ▶ Intraop. cellsaver (autologous blood transfusion)
- ▶ Postop. iron therapy per os/ i.v.
- Homologous blood transfusion rates **< 20%**
(Lit. 20-40%)

Discussion

One-stage vs. Two-stage bilateral THA

- ▶ Optimizes functional outcomes (HHS & HAAS scores)
- ▶ High subjective satisfaction of patients (FLZ scores)
- ▶ Decreases costs
- ▶ Shortens rehabilitation times
- ▶ No increase in complication rates

Lit.: Aghayev et al., Saito et al., Wykman et al.,
Lorenz et al., Jaffe et al., Tsiridis et al., Babis et al.

Costs clinic in Germany

► DRG THA x2 – 25%

TABELLE 3

Kosten-Ertrags-Rechnung gemäß Landesbasisfallwert (LBFW) Hessen und Fallpauschalen-Katalog (INEK) 2009 als Mittelwerte

	Bilaterale Hüftendoprothese (DRG 136Z)	2 x Unilaterale Hüftendoprothese (DRG 147B)	Differenz
LBFW (€)	2 868,50	2 x 2 868,50	
Rel. Gewicht x	3,344	2,366	–
Ertrag (€)	9 592,26	13 573,74	3 981,48
INEK Kosten (€)	– 8 765,76	– 12 406,06	3 640,30
Erlös (€)	826,50	1167,76	341,18

DRG, „Diagnosis Related Group“

Limitations

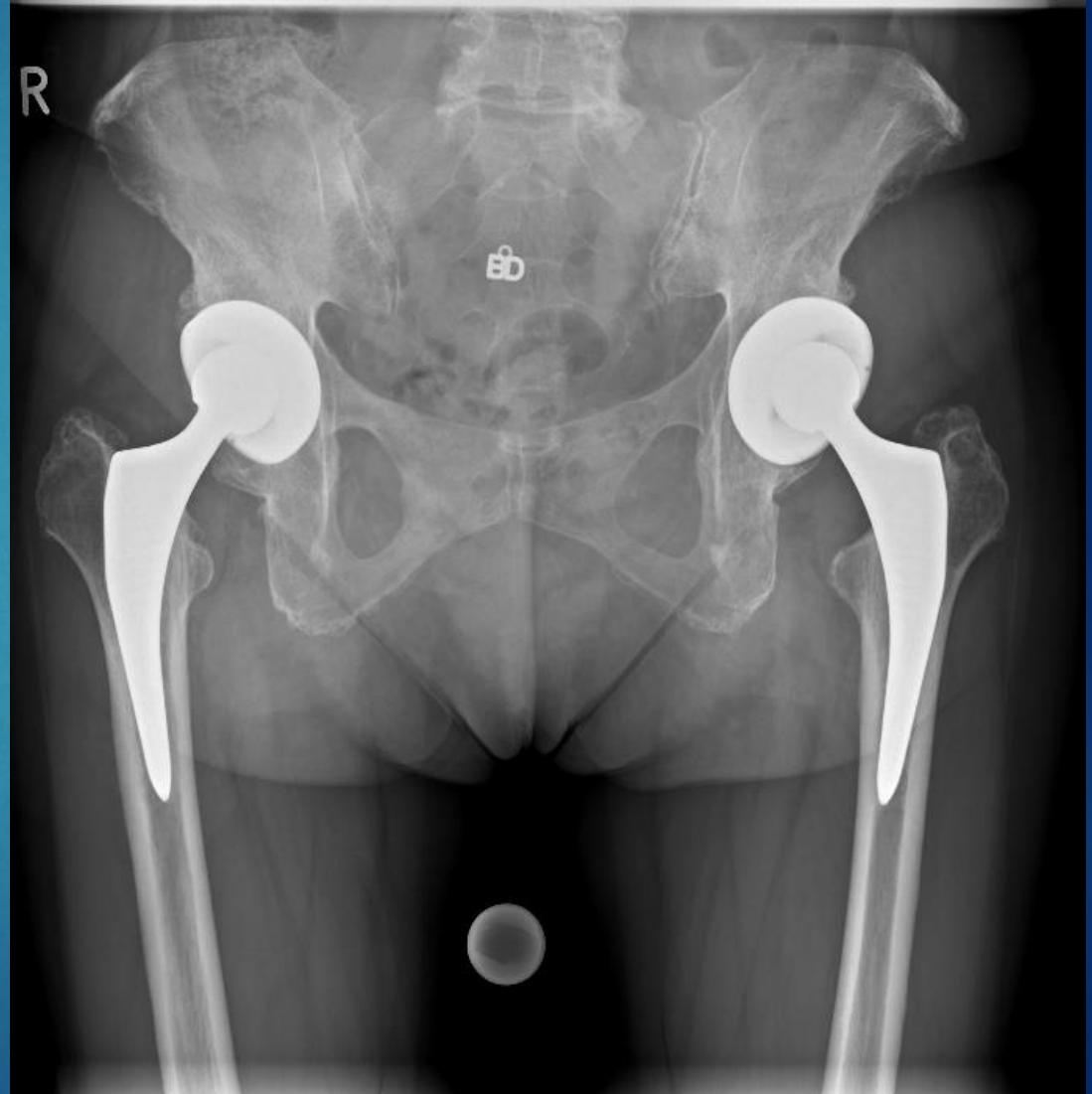
- ▶ Retrospective design
- ▶ Absence of cost evaluation
- ▶ Small sample size

Therefore.....

Larger + prospective studies
required !!!

Conclusion

One-stage bilateral THA via an anterior minimally invasive approach is a valid alternative to two-stage bilateral THA in carefully selected patients with a preoperative haemoglobin level of approximately 14 g/dL, particularly as no complications were reported.



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- ▶ 2. Alfaro-Adrian J, Bayona F, Rech JA, Murray DW (1999) One- or two-stage bilateral total hip replacement. *J Arthroplasty* 14 (4):439-445
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- ▶ 4. Berend ME, Ritter MA, Harty LD, Davis KE, Keating EM, Meding JB, Thong AE (2005) Simultaneous bilateral versus unilateral total hip arthroplasty an outcomes analysis. *J Arthroplasty* 20 (4):421-426. doi:10.1016/j.arth.2004.09.062
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- ▶ 8. Haverkamp D, van den Bekerom MP, Harmse I, Schafroth MU (2011) [One-stage bilateral total hip arthroplasty: a systematic review and meta-analysis]. *Ned Tijdschr Geneeskde* 155 (36):A3256
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- ▶ 10. Jaffe WL, Charnley J (1971) Bilateral Charnley low-friction arthroplasty as a single operative procedure. A report of fifty cases. *Bull Hosp Joint Dis* 32 (2):198-214
- ▶ 11. Kim YH, Kwon OR, Kim JS (2009) Is one-stage bilateral sequential total hip replacement as safe as unilateral total hip replacement? *J Bone Joint Surg Br* 91 (3):316-320. doi:10.1302/0301-620X.91B3.21817
- ▶ 12. Lorenze M, Huo MH, Zatorski LE, Keggi KJ (1998) A comparison of the cost effectiveness of one-stage versus two-stage bilateral total hip replacement. *Orthopedics* 21 (12):1249-1252



Thank you for your attention!!!



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY



Biomechanical Restoration of Hip Parameters is successful using the Direct Anterior Approach with a Tapered Wedge Stem

C. Trevisan, R. Klumpp, S. Piscitello, R. Compagnoni, P. Leone

UOC di Ortopedia e Traumatologia Ospedale Bolognini Seriate

Aim of the Study



To evaluate the degree of biomechanical restoration achieved with a Tapered Wedge Stem optimized for DAA and characterized by a size specific medial curvature implanted using DAA.

Patients

A consecutive series of 30 patients underwent total hip arthroplasty (THA) with DAA approach

♂ 23

♀ 7

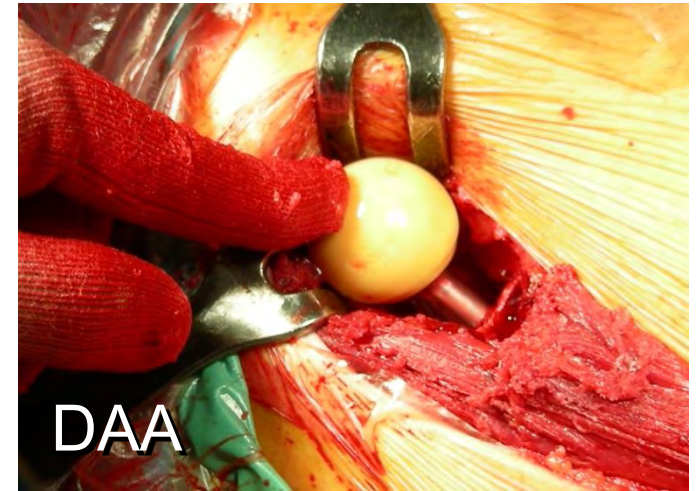
OA 28

AVN 2

RH 19

LH 11

Mean Age 66 yrs old (range 43-83)



PreOP 2D planning with TraumaCad[®] software

Same Surgeon (CT)

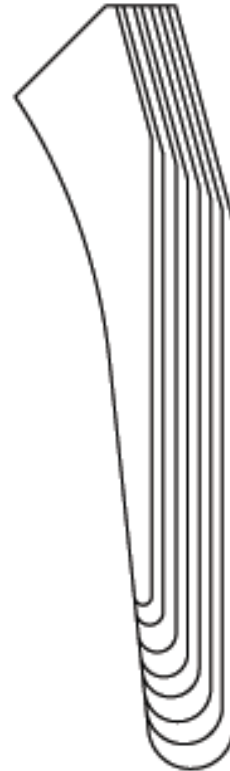
IntraOP ampliscope evaluation of trial for stem position

Material

SOMA Technology



Accolade II



Tapered Wedge Stems

Biomechanical reconstruction of the hip: comparison between modular short-stem hip arthroplasty and conventional total hip arthroplasty

Florian Schmidutz • Marc Beirer • Patrick Weber •
Farhad Mazoochian • Andreas Fottner •
Volkmar Jansson

vFO = vertical femoral offset

hFO = horizontal femoral offset

vHCR = vertical hip centre of rotation

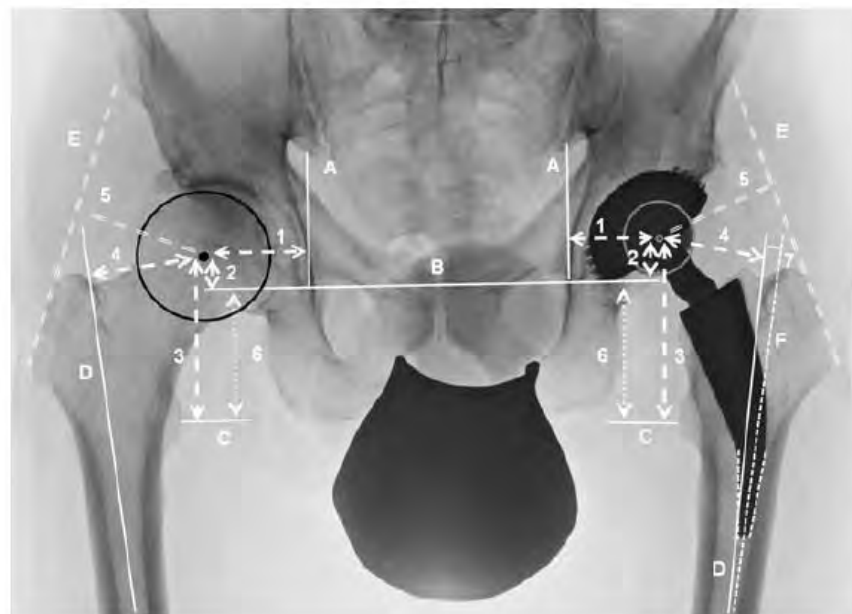
hHCR = horizontal hip centre of rotation

ABD = abductor lever arm

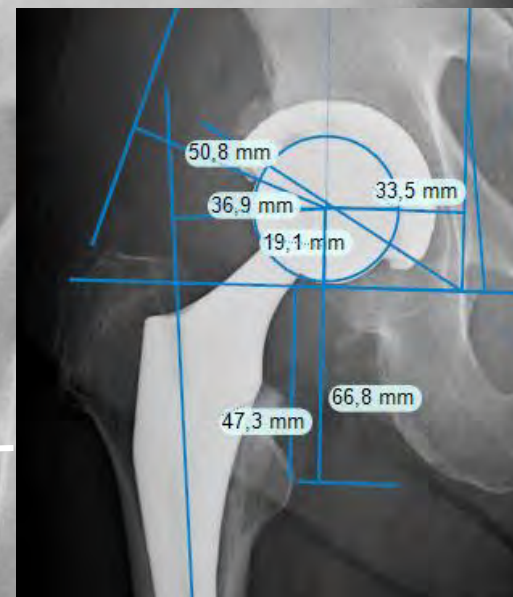
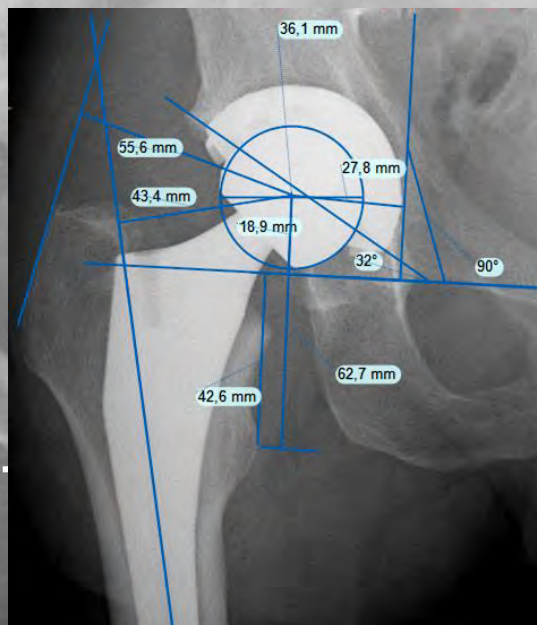
LL = leg length

ssAx = stem-shaft axis

CUP = cup inclination



Results



Implant Positioning - CUP

Degrees, avg. (range)

42° (32°- 51°)

N. out Levineek range (35°- 55°), % 2 (6,7%)

Implant Positioning - STEM

Degrees, avg. (range) -0.4° (-3° VARUS; 2° VALGUS)

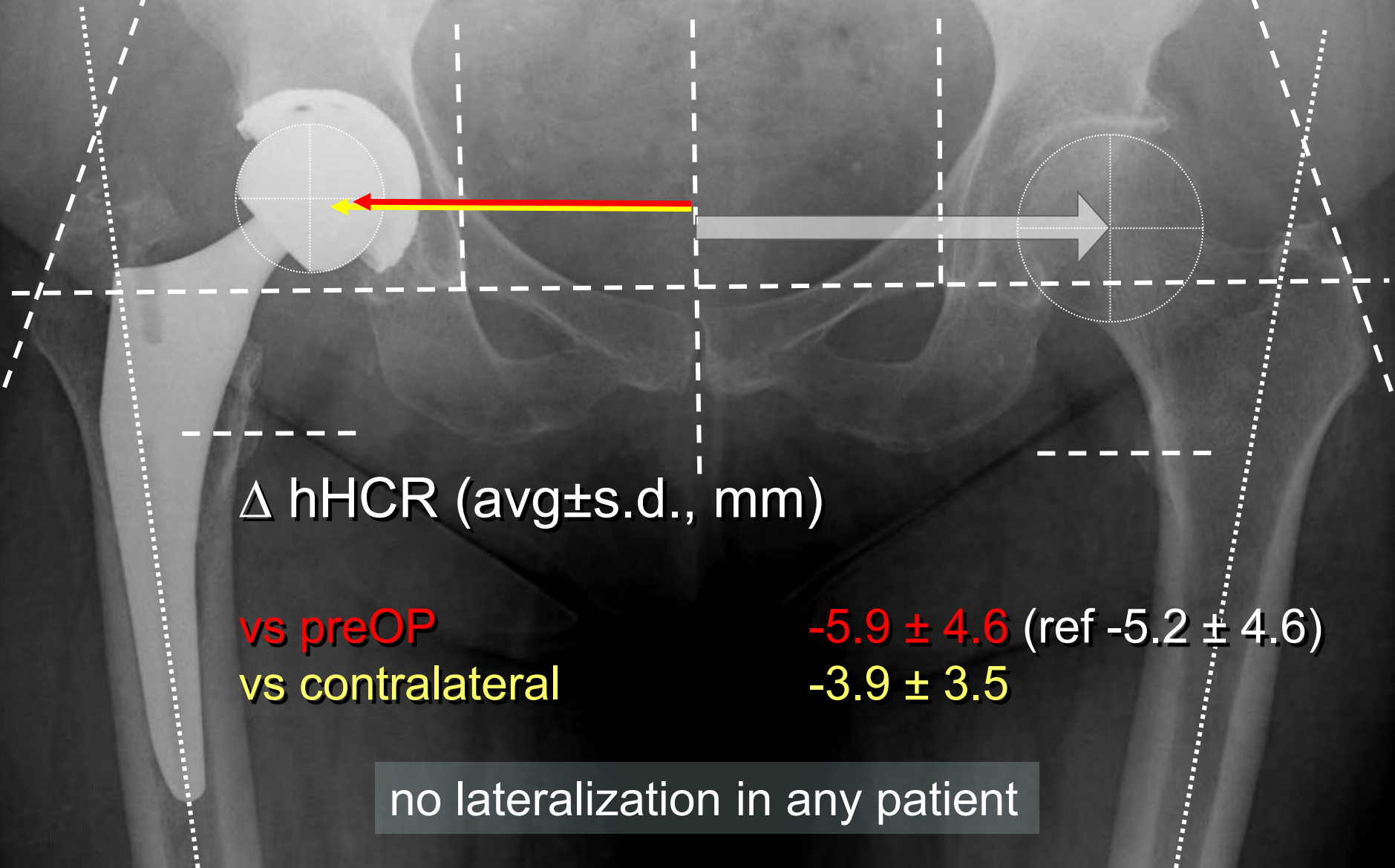
N. $>3^{\circ}$ VARUS/VALGUS

0

DX

Results

hHCR = horizontal Head Center of Rotation



Results

hFO = horizontal Femoral Offset

Δ hFO (avg \pm s.d., mm)

vs preOP
vs contralateral

+2.2 \pm 6.7 (ref 6.2 \pm 6.5)
-3.9 \pm 3.5

hFO increase vs. preOP in 20 out of 30 pts (67%)
hFO decrease >15% in 2 pts (6,7%)

Results

ABD = Abductor Lever Arm

Δ ABD (avg \pm s.d., mm)

vs preOP

vs contralateral

+0.5 \pm 5.8 (ref -1.1 \pm 5.1)

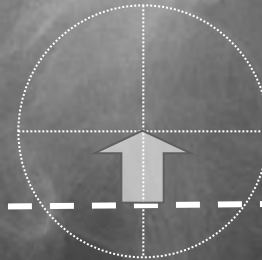
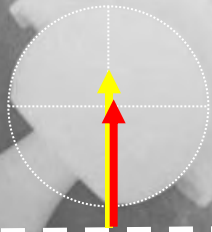
+0.5 \pm 5.6

ABD increase vs. preOP in 18 out of 30 pts (60%)

ABD decrease >15% in 1 pts (3,3%)

Results

vHCR = vertical Head Center of Rotation



Δ vHCR (avg \pm s.d., mm)

vs preOP

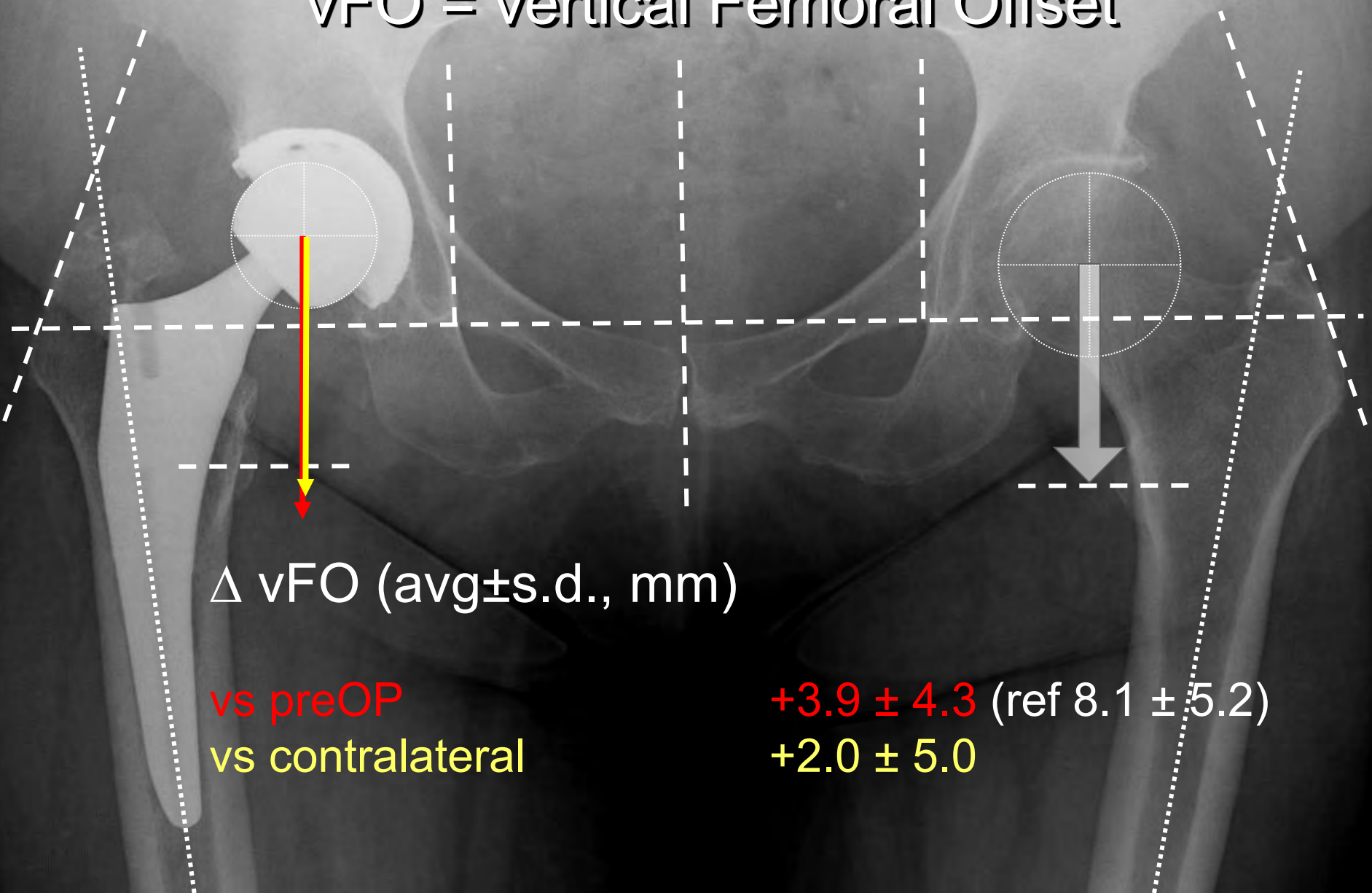
vs contralateral

+2.0 \pm 3.1 (ref 0.2 \pm 3.3)

+3.3 \pm 3.7

Results

vFO = vertical Femoral Offset



Δ vFO (avg \pm s.d., mm)

vs preOP

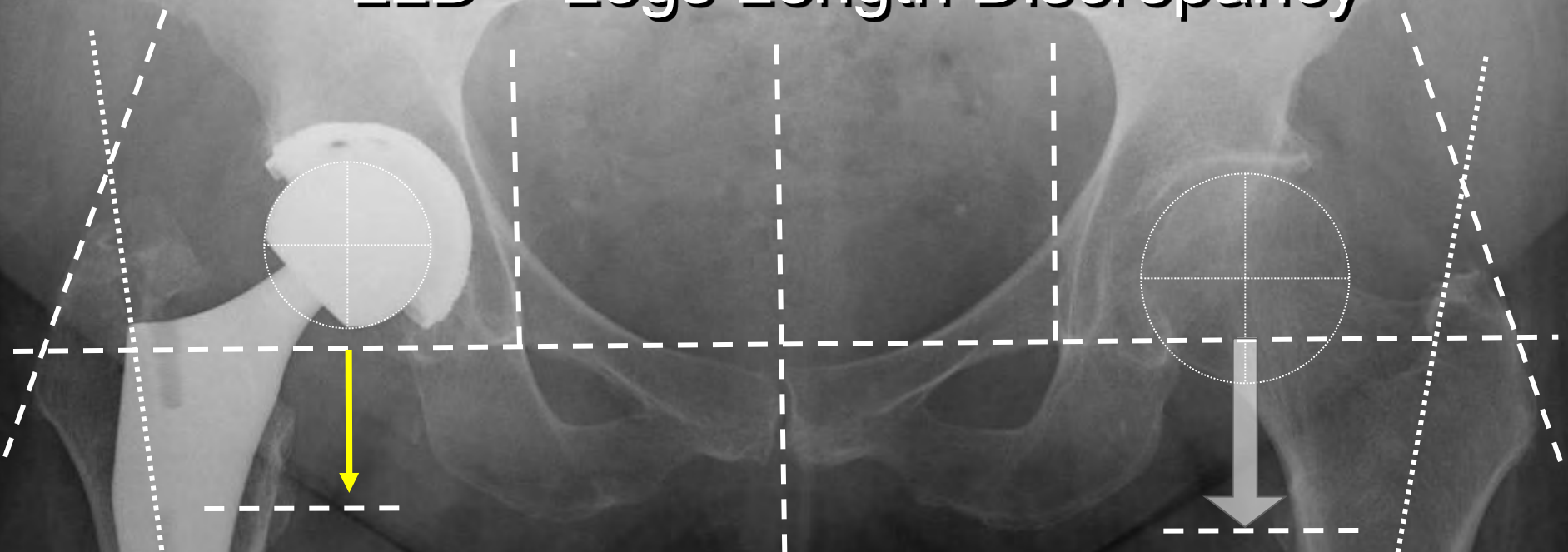
vs contralateral

+3.9 \pm 4.3 (ref 8.1 \pm 5.2)

+2.0 \pm 5.0

Results

LLD = Legs Length Discrepancy



LLD (avg \pm s.d., mm)

Obtained correction - Desired correction -1.4 ± 7.1 (ref 3.3)

LLD within 5mm in 24 out of 30 pts (77%)

Conclusions

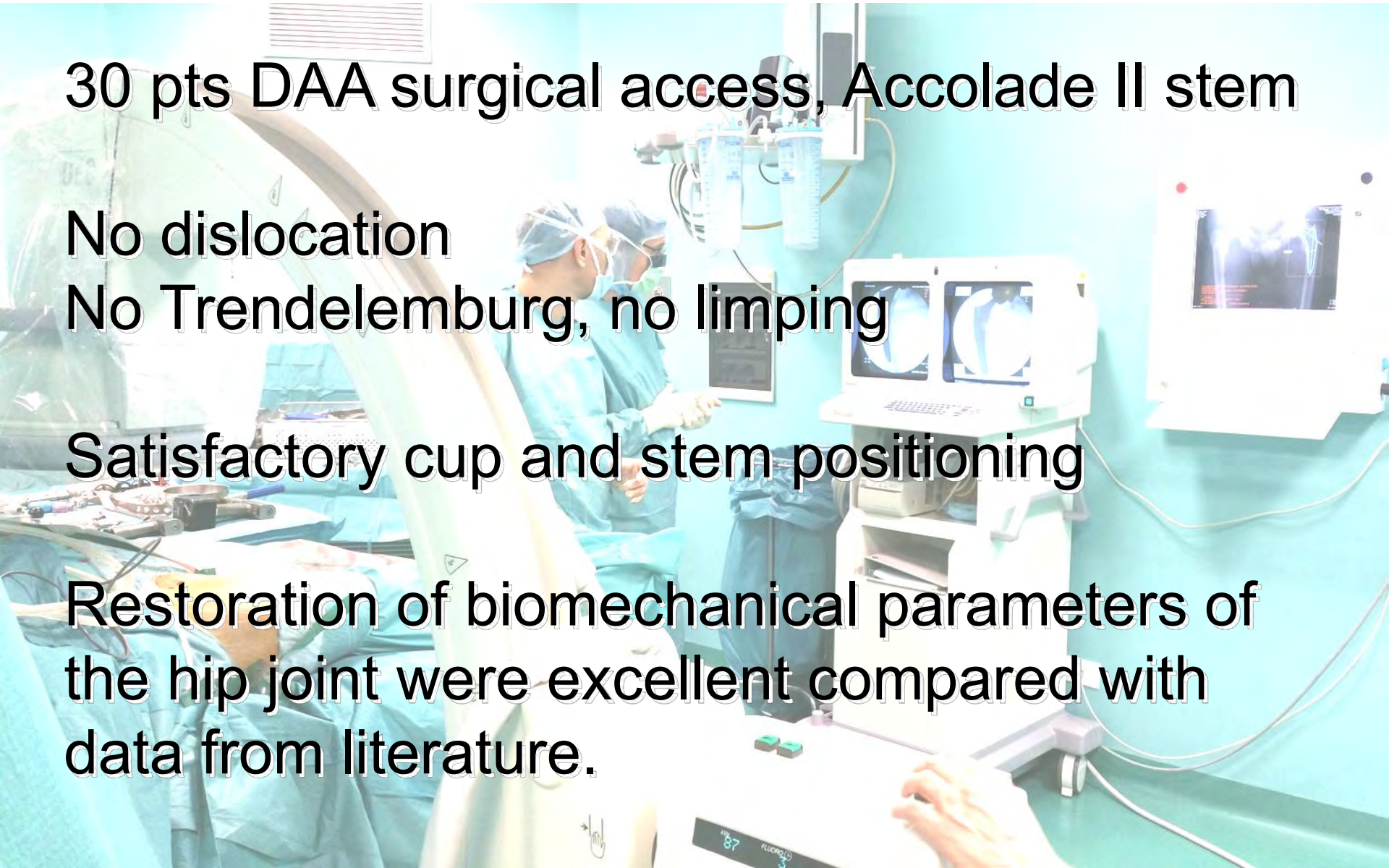
30 pts DAA surgical access, Accolade II stem

No dislocation

No Trendelenburg, no limping

Satisfactory cup and stem positioning

Restoration of biomechanical parameters of the hip joint were excellent compared with data from literature.





Thank You



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY



The posterior approach

Andrew Manktelow

University Hospital
Nottingham
UK



Combined BHS SIDA Meeting
Milan

Thursday 26th November 2015

Disclosures

Zimmer Biomet

Design and education
contract

Matortho

Design contract

Goals in surgical exposure

Release soft tissue contractures

Preserve soft tissue envelope

Maintain muscle function

Restore soft tissue balance

Excellent ('180' degree) acetabular exposure

Safe femoral mobilisation and exposure

Facilitate 'perfect' component fixation and orientation

Sound closure with minimal wound concern

Choosing ideal surgical approach

- Simple
- Reliable
- Versatile
- Extensile intra operatively
- Good pain control
- Rapid safe rehabilitation



Does not limit options at potential revision

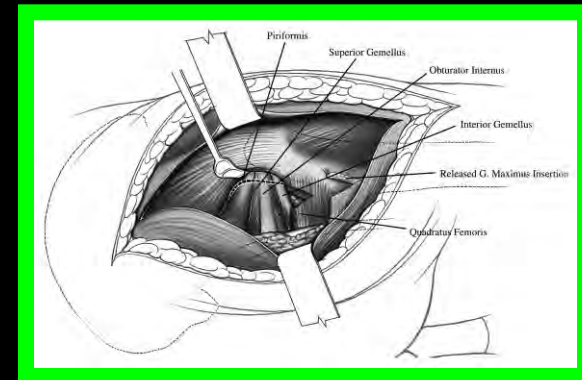
Posterior approach allows all the above

‘Posterior approach’

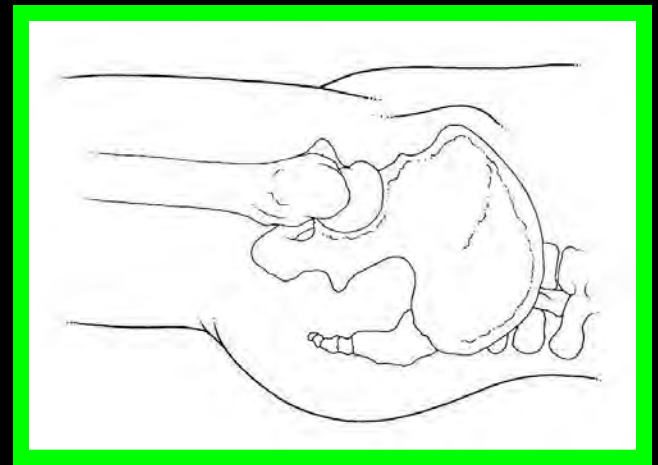
Changed over time

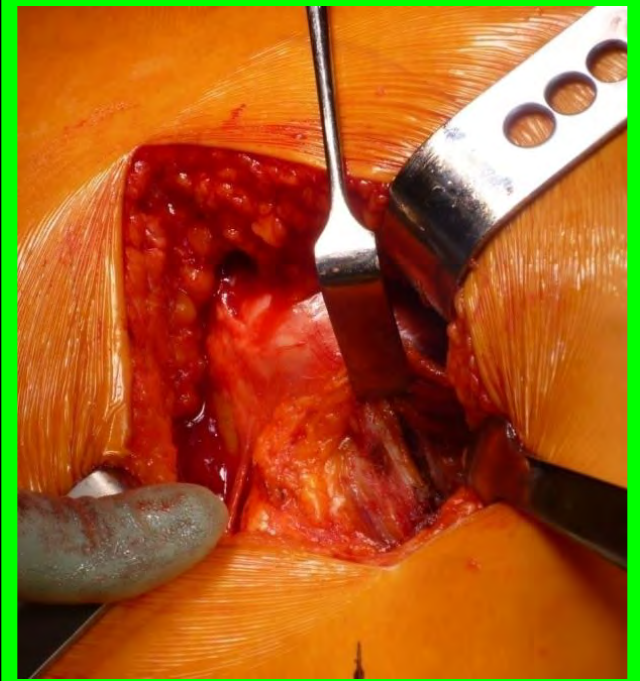
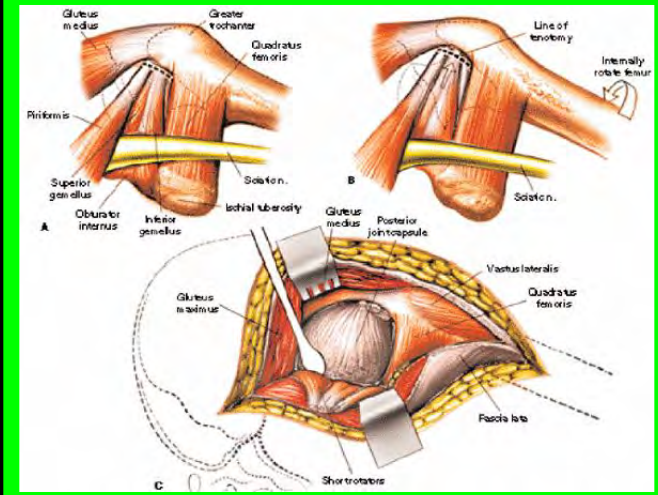
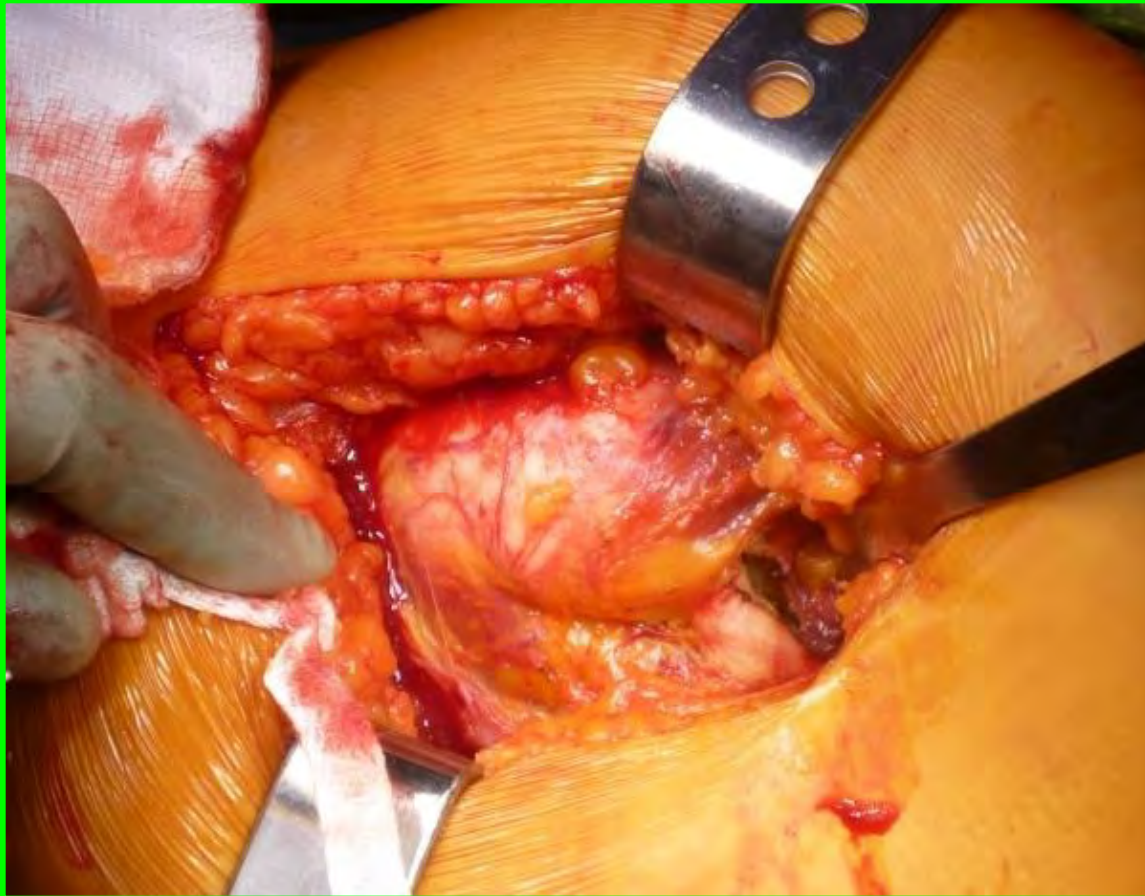
Differences in incision, extent, release and closure

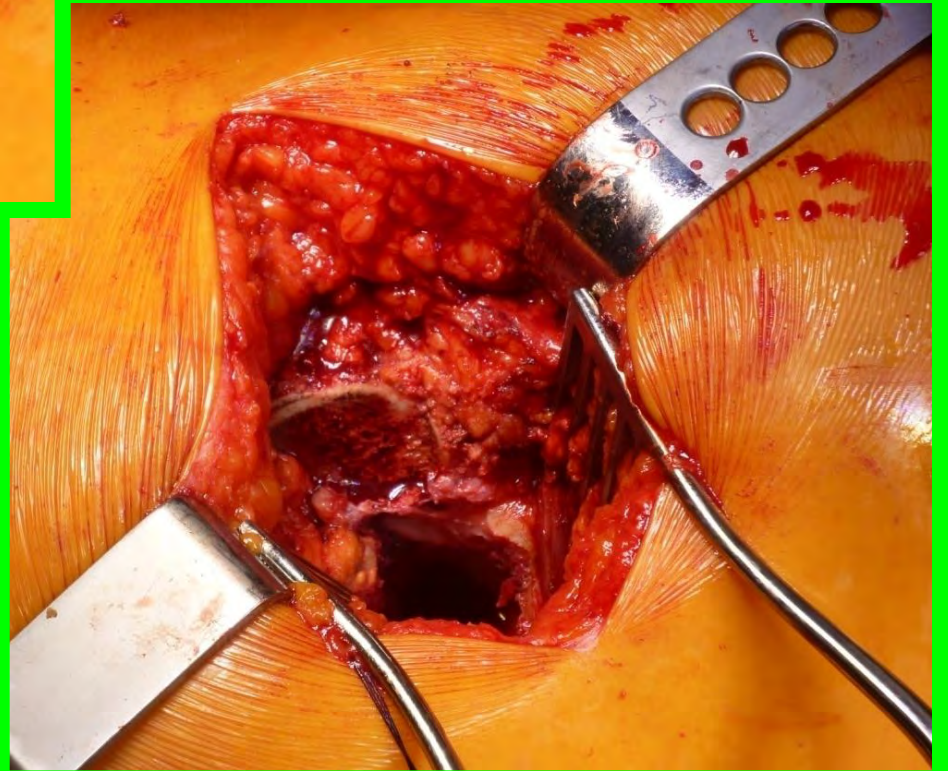
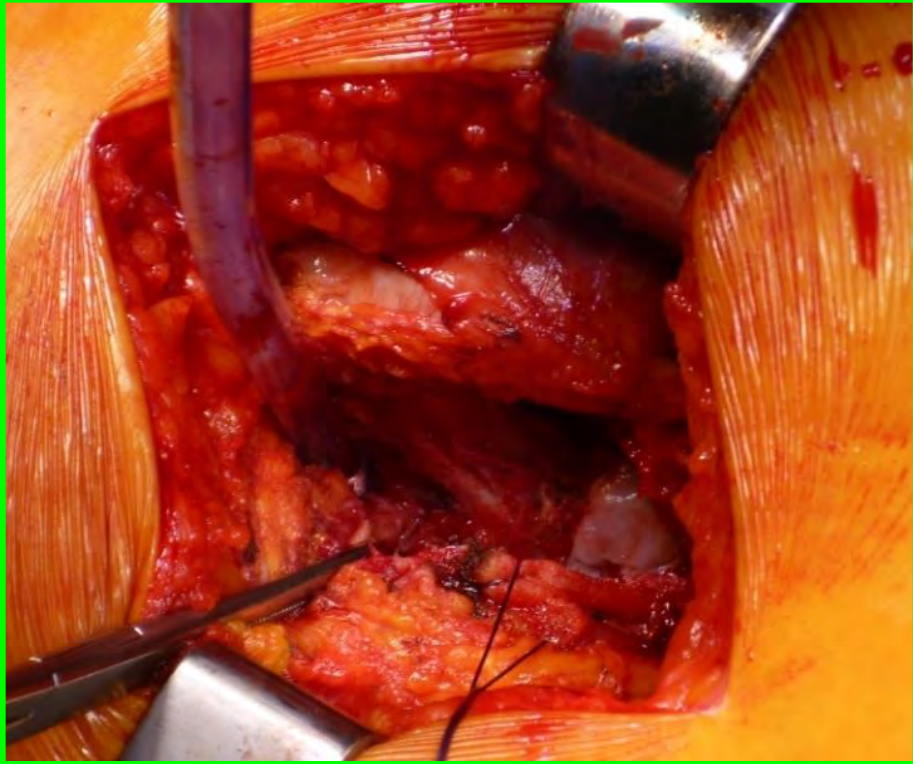
Numerous nuances ‘tips and tricks’

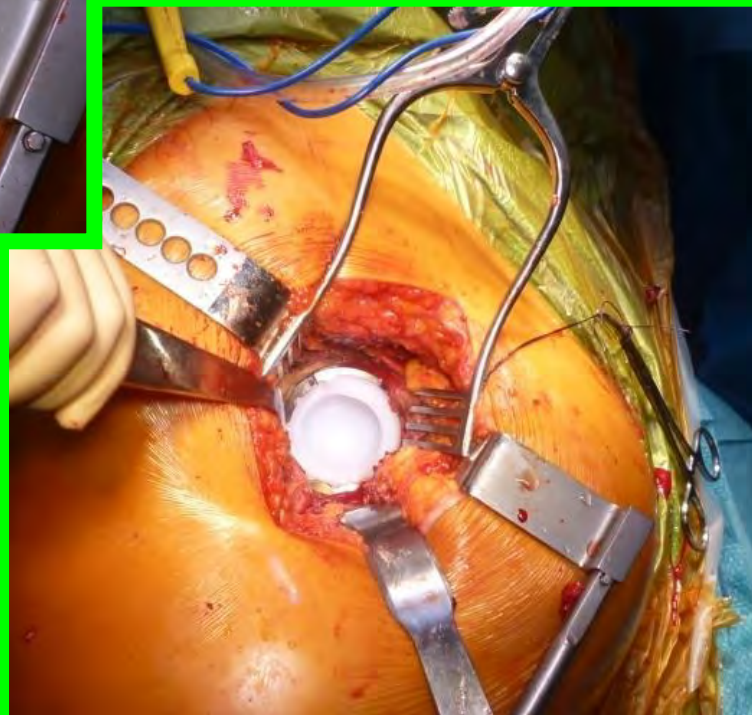
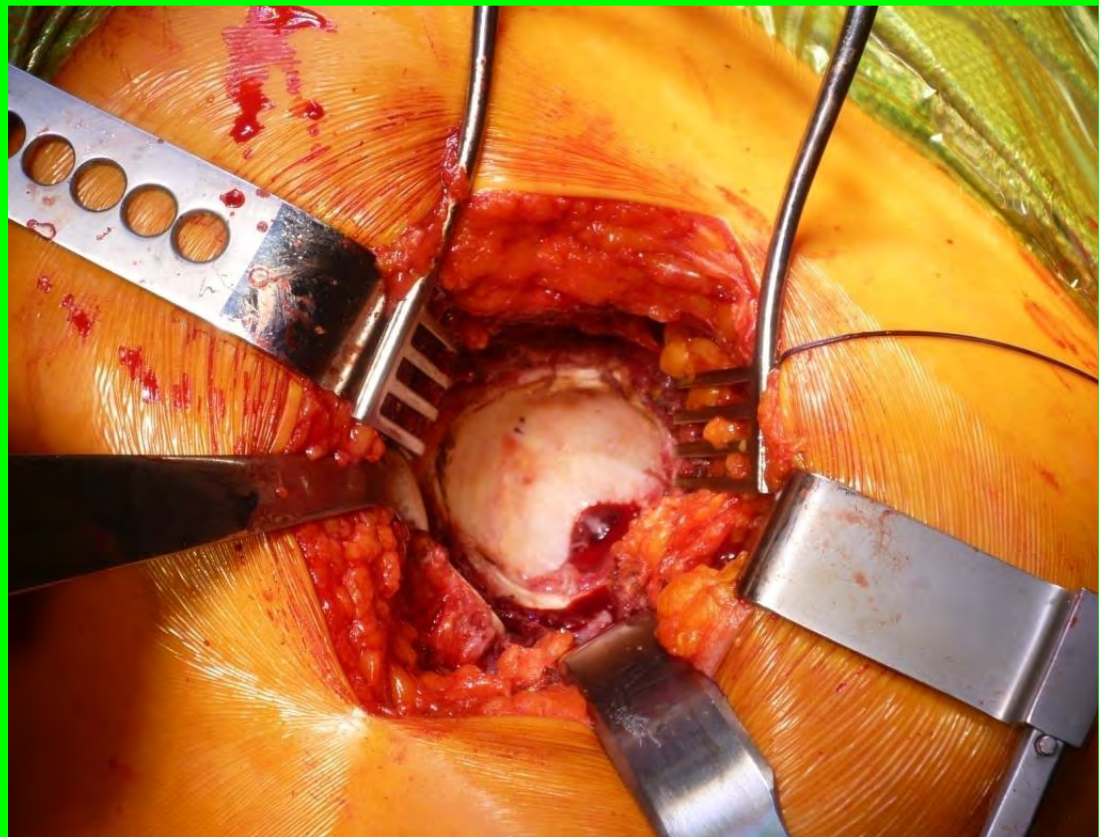


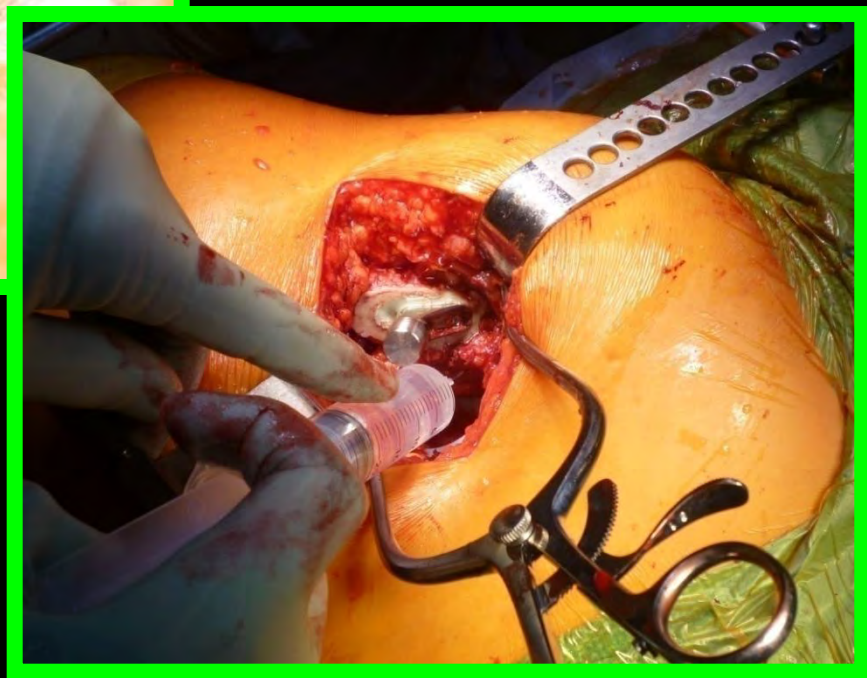
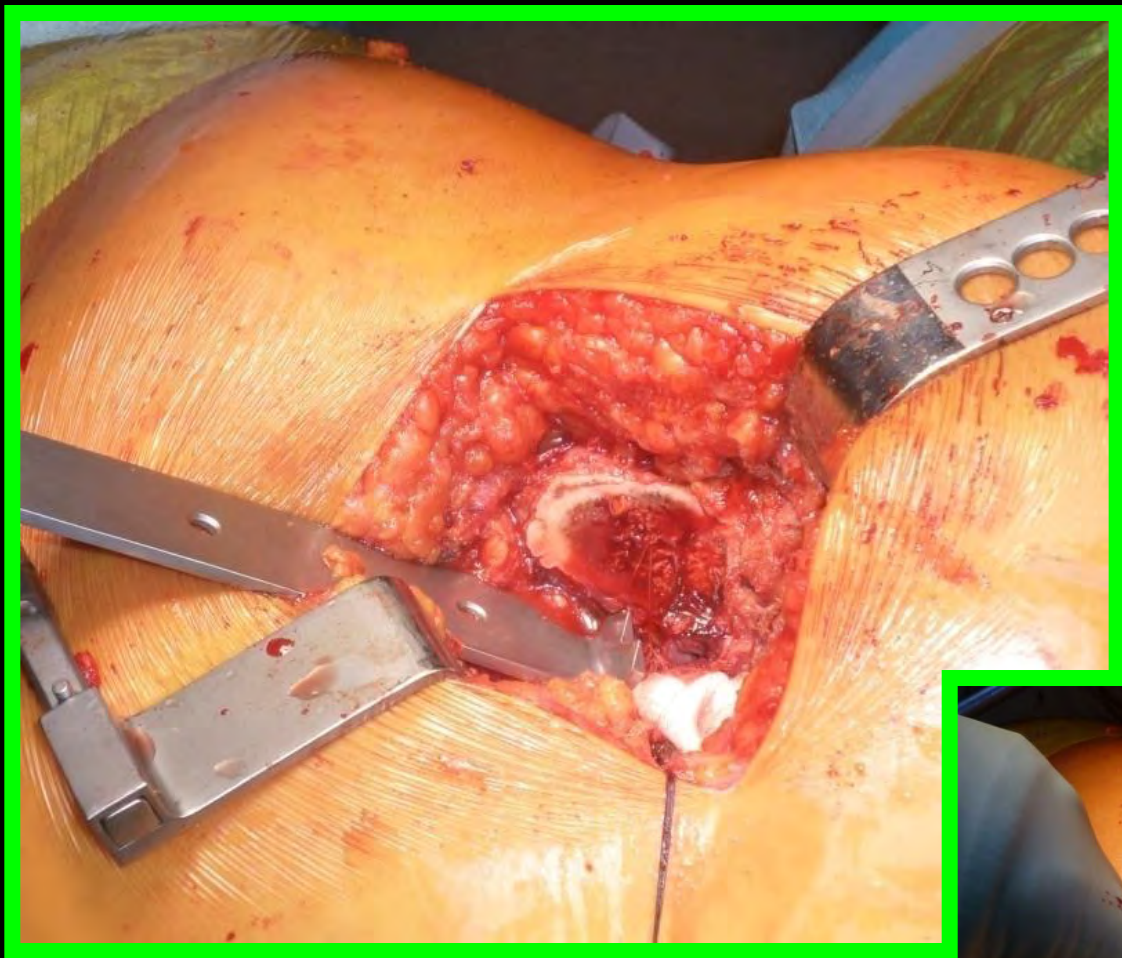
What is ‘my (standard) posterior approach’

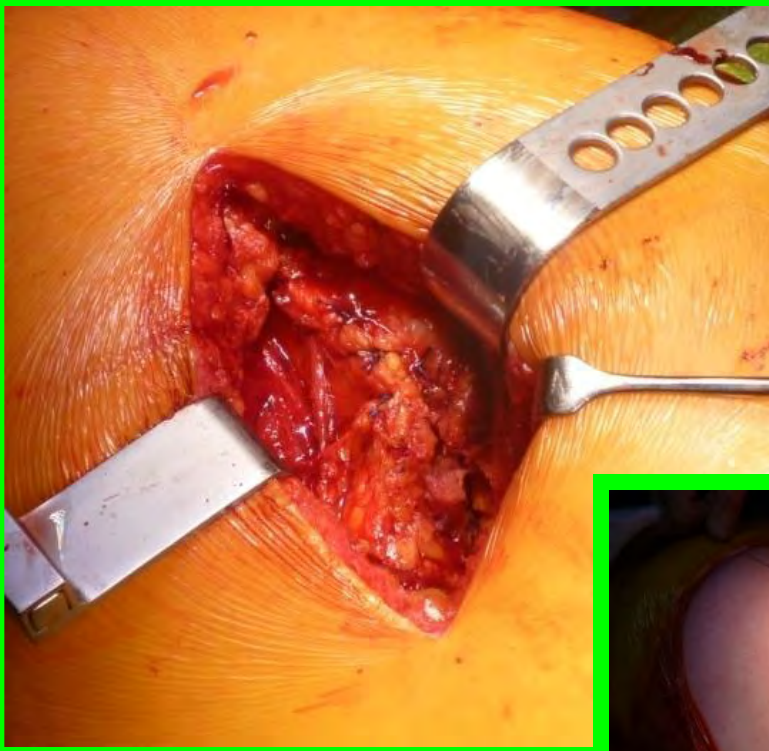
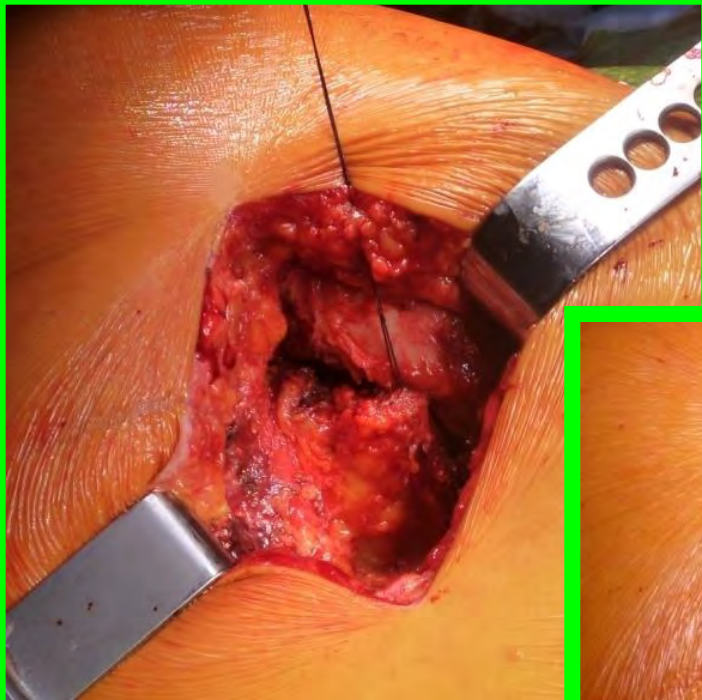












Posterior approach versatility

Variable proximally

Piriformis sparing

Gluteal elevation

Variable distally

Quadratus extent / Gluteus max

Readily extensible (femur and acetabulum)

Excellent peri-acetabular exposure
with more complex cases

(Harder work for assistant !!)

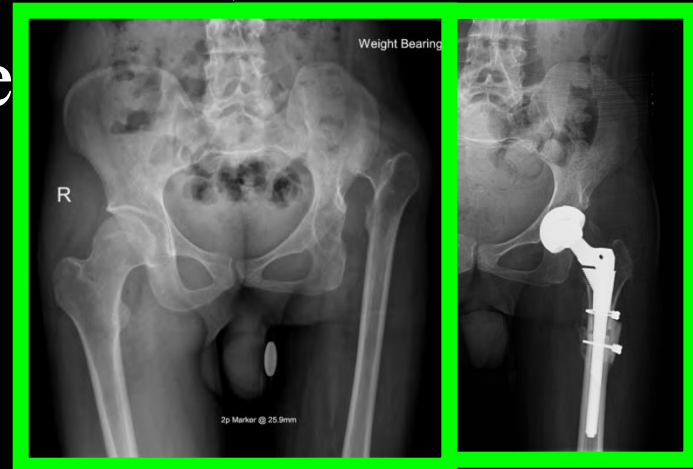


Table 2.7 Surgical technique for primary hip replacement patients in 2012.

	Primary total prosthetic replacement using cement		Primary total prosthetic replacement not using cement		Primary total prosthetic replacement not classified elsewhere (e.g. hybrid)		Primary resurfacing arthroplasty of joint		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total hip primaries	25,316	33%	34,143	45%	15,907	21%	1,082	1%	76,448	
Patient position										
Lateral	22,965	91%	31,864	93%	15,303	96%	1,077	100%	71,209	93%
Supine	2,351	9%	2,279	7%	604	4%	5	<1%	5,239	7%
Incision										
Lateral (inc. Hardinge)	10,131	40%	10,878	32%	4,092	26%	133	12%	25,234	33%
Posterior	13,731	54%	21,185	62%	11,157	70%	916	85%	46,989	61%
Trochanteric osteotomy	310	1%	26	<1%	11	<1%	13	1%	360	<1%
Other	1,144	5%	2,054	6%	647	4%	20	2%	3,865	5%
Minimally-invasive surgery										
Yes	478	2%	2,884	8%	365	2%	14	1%	3,741	5%
No	24,838	98%	31,259	92%	15,542	98%	1,068	99%	72,707	95%

© National Joint Registry 2013

Table L3 Univariable and multivariable analyses.

Cox 'proportional hazards' models of 90-day mortality:

Variable		(i) Univariable (adj. for gender and age)				
		n	Hazard rate ratio			
Year of primary operation	2003-5	73,009				
	2006-8	154,231	0.88 (0.77-0.99)			
	2009-11	181,856	0.65 (0.57-0.74)			
ASA	P1	79,098	1 (referent)	1 (referent)	1 (referent)	
	P2	275,671	1.18 (0.99-1.41) P=0.058	1.31 (1.09-1.58) P=0.004	1.28 (1.02-1.60) P=0.031	
	P3	52,419	2.79 (2.32-3.36) P<0.001	3.09 (2.55-3.76) P<0.001	2.08 (1.64-2.63) P<0.001	
	P4/P5	1,908	6.31 (4.60-8.67) P<0.001	6.83 (4.95-9.42) P<0.001	2.57 (1.77-3.75) P<0.001	
Approach*	Posterior	207,466	0.78 (0.71-0.86) P<0.001	0.82 (0.74-0.91) P<0.001	0.82 (0.73-0.92) P=0.001	
	Other	201,599	1 (referent)	1 (referent)	1 (referent)	
Mechanical prophylaxis**	No	58,550	1 (referent)	1 (referent)	1 (referent)	
	Yes	349,321	0.76 (0.67-0.86) P<0.001	0.84 (0.74-0.96) P=0.011	0.85 (0.74-0.96) P=0.001	
Chemical prophylaxis**	None	49,451	1 (referent)	1 (referent)		
	Aspirin(only)	50,203	0.88 (0.73-1.05) P=0.16	0.90 (0.75-1.08) P=0.27	0.92 (0.75-1.10) P=0.37	
	Heparin (+/-aspirin) only	262,043	0.79 (0.69-0.90) P=0.001	0.80 (0.69-0.92) P=0.002	0.79 (0.66-0.94) P=0.001	

Four treatment variables were associated with decreased mortality: spinal anaesthetic or a combination of spinal and another anaesthetic, posterior approach, the use of mechanical thromboprophylaxis and the use of chemical thromboprophylaxis (Table L3). The use of all four of these measures has increased steadily with time

Retrospective cohort study

2 commonest cemented/uncemented combinations

Lateral vs post approach

38,000 procedures

No difference in complication rates

No difference in all cause revision

or dislocation at 12 mths

3881 linked to PROMS data

Post approach better OHS and EQ5D improvement scores in both cemented and uncemented groups

Jameson et al J Arthrop 2014

126 DAA Vs 96 Mini post

Matched age, sex, BMI, HSS

2 and 8 week review

VAS pain, complications, functional milestones

No difference LOS (2.2 days), complications,
analgesia req'd, max dist walked

At 2 weeks	DAA	MP
Walking aids	92%	68% $p<0.0001$
VAS Max pain	5.3	3.8 $p<0.0001$

Kanath, Pagnano AAHKS 2013 Paper 32

At 8 weeks

Higher HHS in DAA

FEWER wound concerns with DAA

No difference in aids, pain, ADL,
walking .5 miles



Recent advances in pain management with
accelerated rehab more significant in
outcomes than surgical approach ?

Kanath, Pagnano AAHKS 2013 Paper 32

Getting it right for the patient

Consistent perfection is our goal in hip surgery

Shouldn't compromise in exposure

Ensure sound fixation, perfect orientation,
optimal biomechanics

Sound and careful soft tissue repair

Small incisions do not (always) equal minimally
invasive

Posterior approach is simple, versatile and extensible

Supportive clinical outcome data

Still the answer in my hands

Thank you



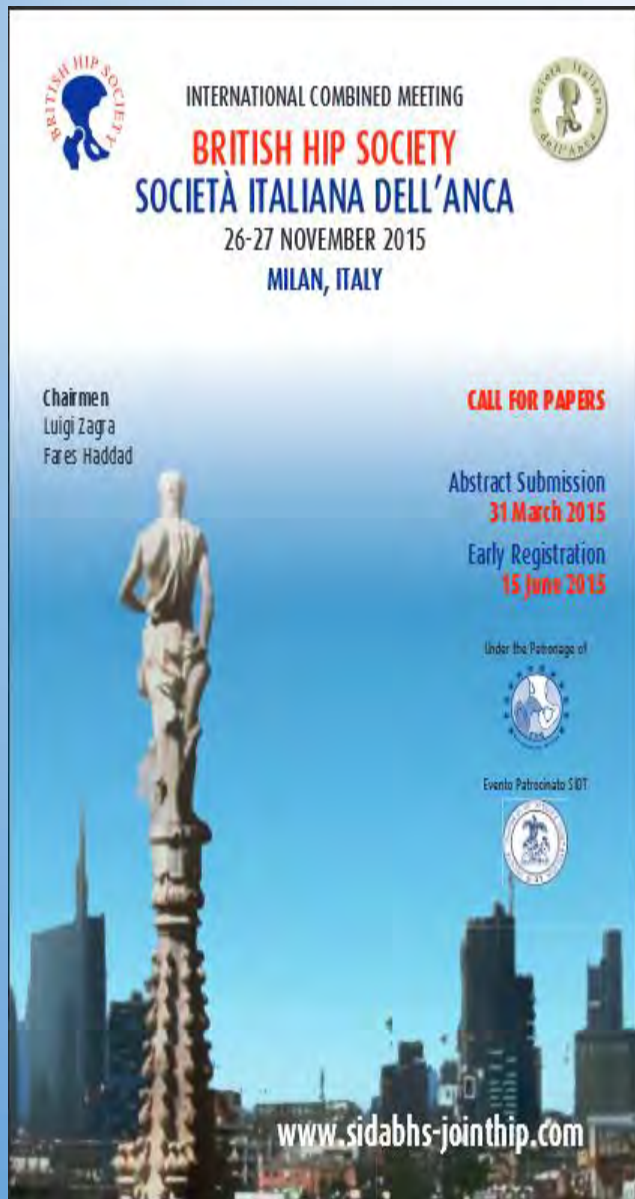
INTERNATIONAL COMBINED MEETING

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MILAN, ITALY





Minimally Invasive posterolateral approach with superior capsulotomy vs conventional posterolateral approach in medial femoral neck fracture in elderly. A retrospective study.

N. Capuano*, **F. Carbone****, A. Del Buono***, **F. Sadile******

*Director of Department of Orthopaedics and Traumatology, San Luca Hospital, Vallo della Lucania Italy

**MD at the Orthopaedics and Traumatology Unit «Federico II» University Hosital, Napoli, Italy

*** MD at the Department of Orthopaedics and Traumatology, San Luca Hospital, Vallo della Lucania Italy

****M.D. Associate Professor at the Orthopaedics and Traumatology Unit «Federico II» University Hosital, Napoli, Italy

Materials and Methods

- Retrospective study , 208 patients
- Mean age of 76 years (Range 45-106 years)
- Inclusion Criteria: medial femoral neck fracture (Type III-IV of Garden Classification) undergone total hip arthroplasty from 2008 and 2010, assessed at an average follow-up of 5 years.
- All Cementless acetabular cups and stems.
- 2 Groups
 - MIS group of 104 patients (59 M 45 F)
 - Standard Group included 104 patients (57 M 47 F)

Methods

Harris hip score (HHS),
Oxford hip score (OHS),
Western Ontario and
McMaster Universities
Osteoarthritis Index
(WOMAC)

Standard pelvis
radiographs

Radiographic features



1 day before surgery

3 months f.u.

1 year f.u.



acetabular cup inclination
and anteversion angle
varus/valgus femoral stem
Osteolysis

Flavio Carbone M.D. – Federico II University
Francesco Sadile M.D. – Federico II University



Results

- The mean duration of surgery and hospitalization, the mean blood loss and the number of patients who needed for blood transfusions were significantly lower in the MIS group.
- The incision length averaged 6.8 cm in the MIS group, and 11.2 cm in the standard group.
- After 2 weeks, MIS group more able to independently get out of bed (90 in the MIS group vs 67 in the standard group; $P=0.002$)
- Climb stairs (82 in the MIS group vs 60 in the standard group; $P=0.002$), and use the toilet independently (95 in the MIS group vs 78 in the standard group; $P=0.001$).

Results

- At 1-year follow-up, the average score improved significantly in both groups compared to 3 month follow-up scores, with still better scores for patients in the MIS group.
- At imaging assessment, the mean socket inclination angle was 40.1° in the MIS group (SD= 7.1) and 45.3° in standard group (SD= 8.3); the mean socket anteversion angle was 17.1° in the MIS group (SD= 3.5), and 19.8° in the standard group (SD= 4.3)

Conclusions

Following a medial femoral neck fractures, a minimally invasive total hip arthroplasty performed through a posterior-lateral approach, with superior capsulotomy, offers significant benefits within the early postoperative period compared with the standard posterior-lateral approach.



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Hip Direct Anterior Approach - A natural evolution From Watson-Jones to Anterior Approach with Bikini incision For Total Hip Replacement



Orthopaedics and Traumatology Service
of Hospital Garcia de Orta, **Almada**
Hip Arthroplasties and Arthroscopy Unit



Clínica Lambert, Lisboa
Hip Pathology Unit



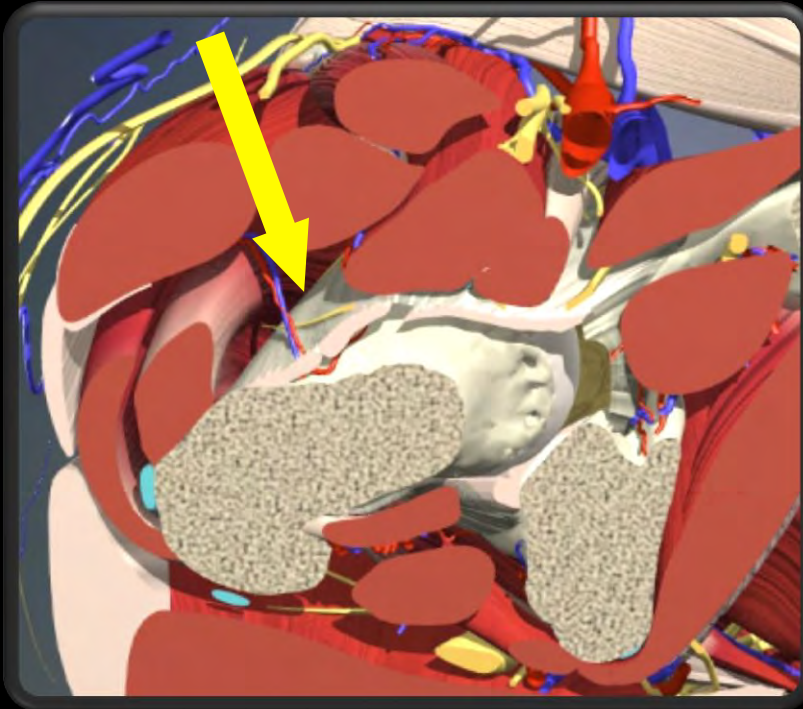
João Sarmento Esteves¹, Pedro Simas², José Pinto¹, João Protásio¹, Ricardo Ferreira¹, Mário Tapadinhas³

Registrar¹ of Orthopaedics and Traumatology Service of Hospital Garcia de Orta
Medical doctor² of Clinica Lambert: Orthopaedics, Traumatology and Sports Medicine
Medical doctor³ of Orthopaedics and Traumatology Service of Hospital Garcia de Orta

ANT. APPROACHES

Smith-Peterson; Hueter; ASI; “modifications”

- Inter-nervous interval supine or inter-muscular
- Joint approach for its “front”



OUR EXPERIENCE



- **1991-2011 (20 years) Watson-Jones** supine with fluoroscopy:
 - Iatrogenic injuries of the gluteus medius
 - Trochanteritis
 - Postoperative transfusion support
 - No dislocations and low revision rate (excluding large diameters)

- **2012 ASI:**

- Difficulty on femur exposure
- Iatrogenic lesions of the TFL
- Less need for transfusion support
- Hypertrophic scars



OUR EXPERIENCE



- **2012 Side ASI** - lateral to the TFL (inter-muscular not inter-nervous):
 - Ease on femur exposure
 - No iatrogenic muscle injuries and increased protection of the FCN
 - Rapid functional recovery - walking without crutches in 2/3 weeks
- **2013-2015 Incision "bikini"** extension of the inguinal crease:
 - Even greater ease on femur exposure
 - Very rarely transfusion support
 - Best cosmetic - imperceptible scars



OR SET DISPOSAL



IMPLANTS

– Femoral stem

- Cementless stem HA coated Corail J&J Depuy ®
- Cementless stem HA coated Taperloc Microplasty Biomet ®



– Acetabular cup

- Cementless cup Pinnacle Gription J&J Depuy ®
- Cementless cup G7 Biomet ®



– Liner

- UHMW cross-linked liner Marathon J&J Depuy ®
- E-poli Biomet ®

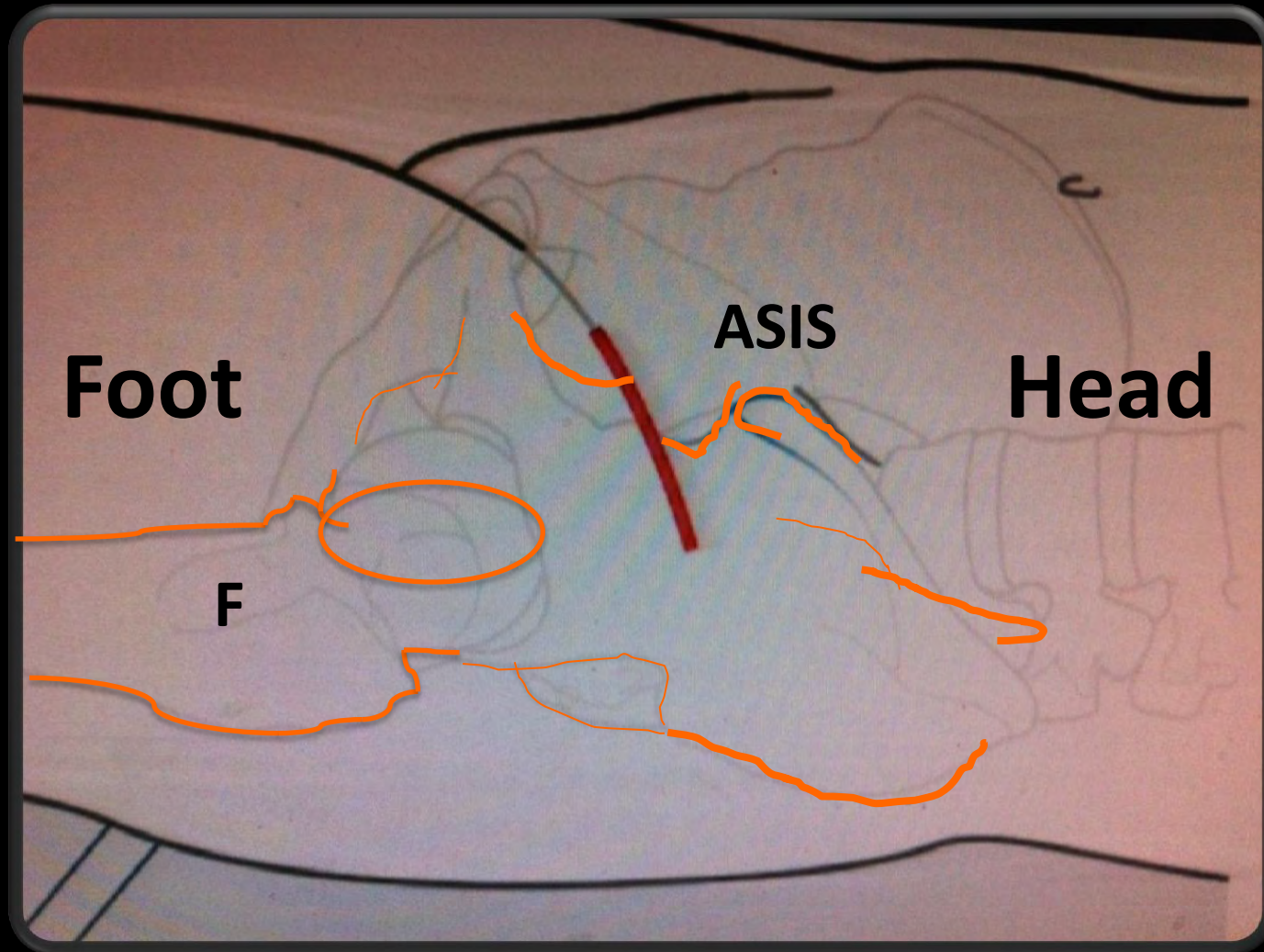


– Head/ Neck

- Head Articul-eze (metal) or BioloX delta (ceramic) Ceramtec Ag ®



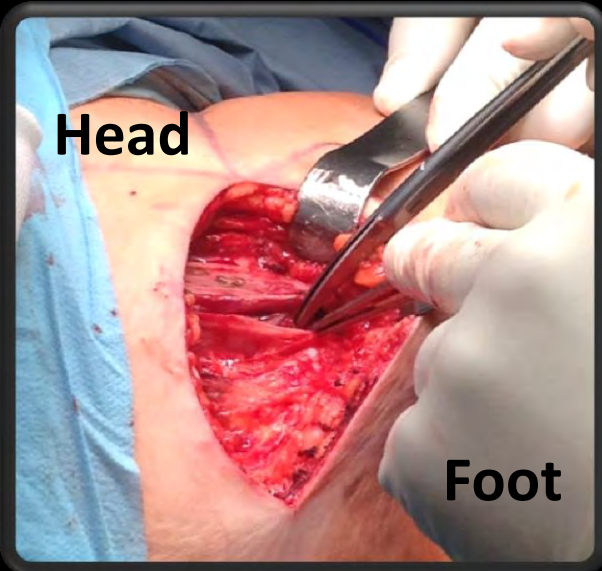
SKIN INCISION



HIP APPROACH & OSTEOTOMY



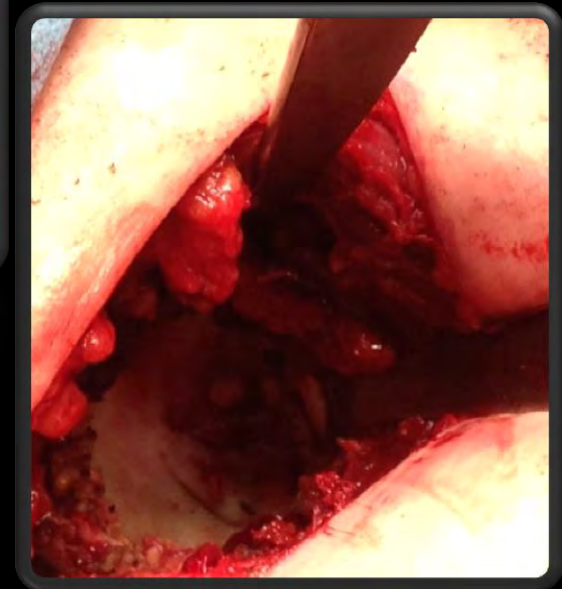
Incision



Neck Osteotomy



Acetabular 360° view



FEMORAL & ACETAB REAMING



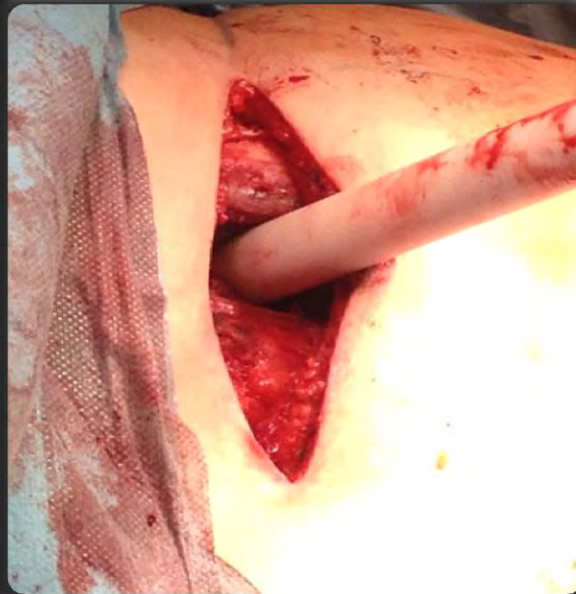
Femoral reaming



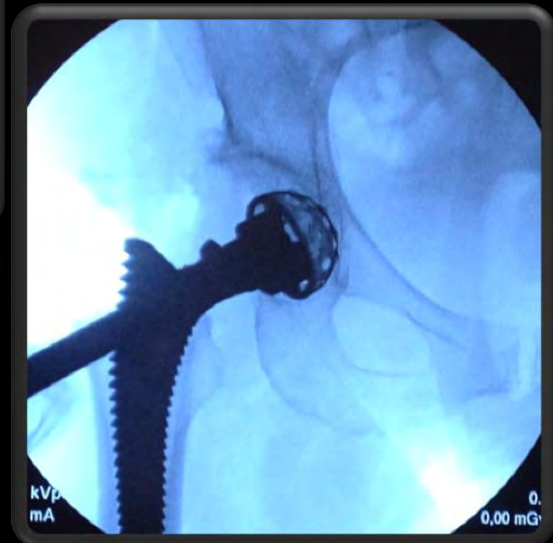
Capsule release

“Finger test”

Acetabular reaming



Fluoroscopy control



LINER INSERTION

Liner insertion

THR reduced

Final view



OUTPATIENT CLINIC



International Combined Meeting BHS - SIDA Nov. '15



2 weeks Post-op

OUTPATIENT CLINIC



4 weeks Post-op

PRE & POST-OP

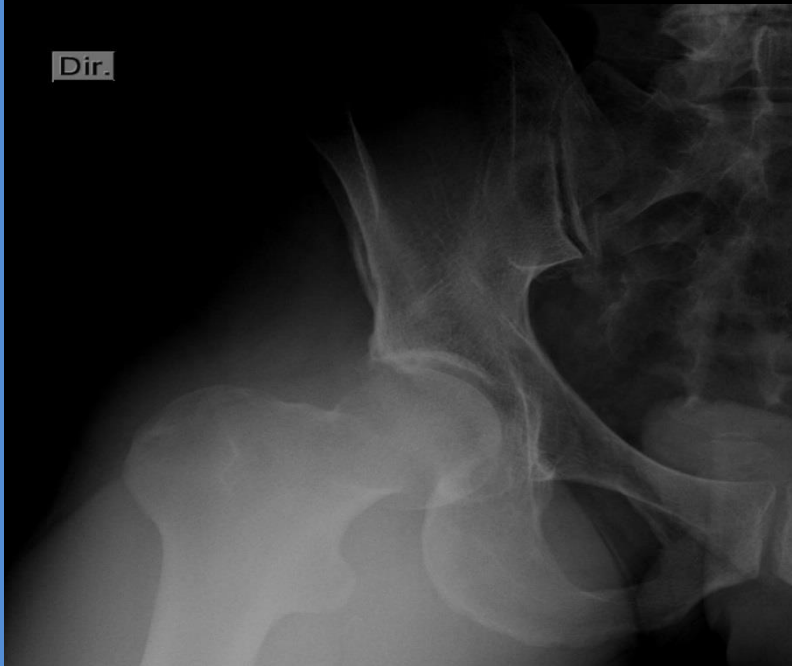


Pre-op

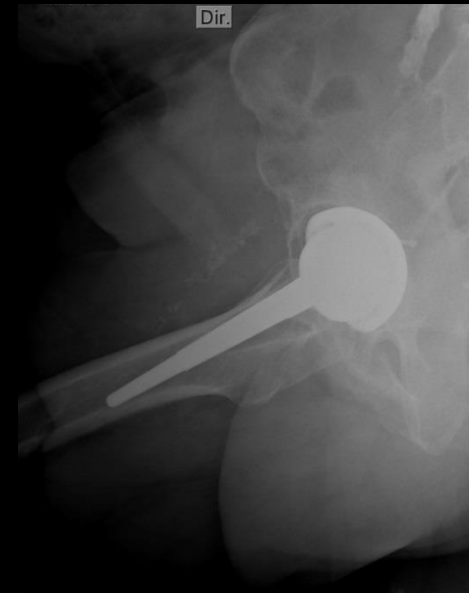


Post-op

PRE & POST-OP



Pre-op



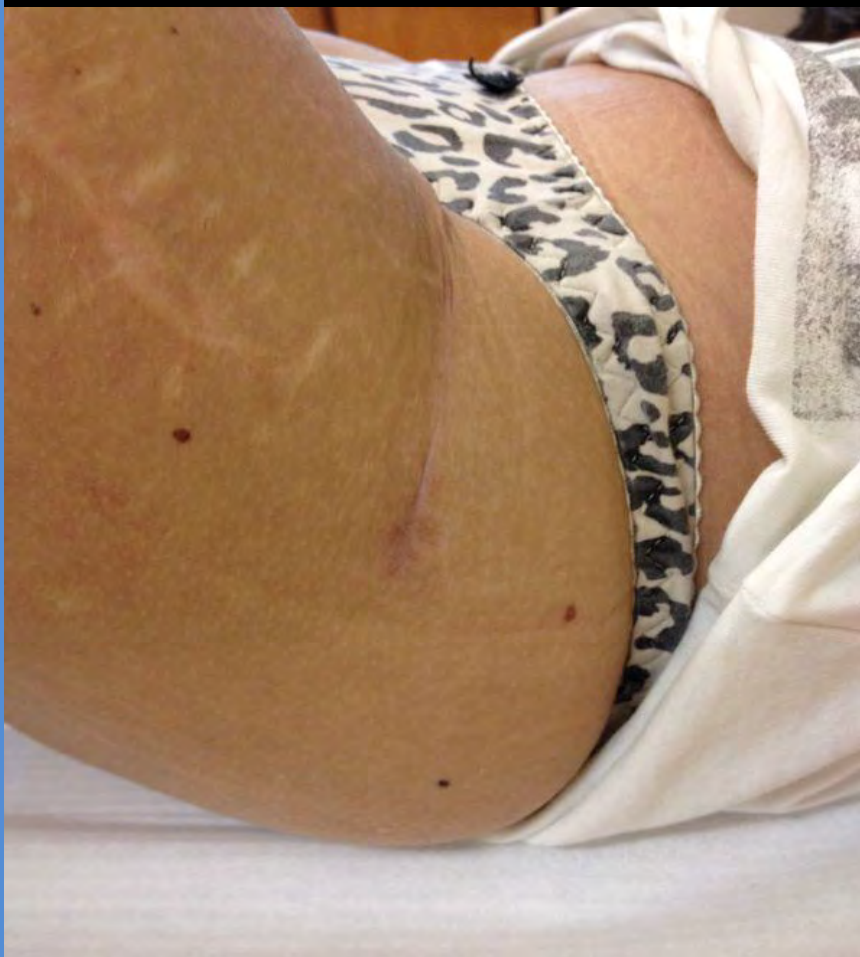
Post-op

PRE & POST-OP



6 weeks Post-op

PRE & POST-OP



3 months Post-op

ADVANTAGES



- **Anatomical**
 - intermuscular
 - inter-nervous
 - superficial approach
- **Supine decubitus**
 - added value of fluoroscopy
 - better for anesthesia
 - easier to check limb length

DISADVANTAGES



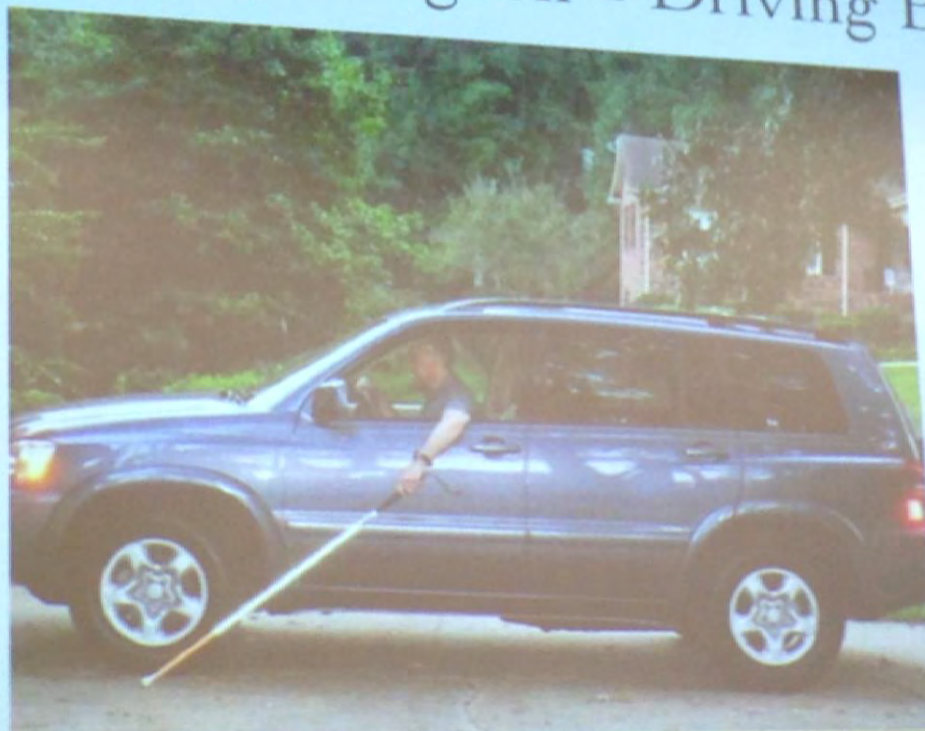
- **Learning curve**
 - femoral exposure
 - femoral fractures
 - femoral perforations
- **Fluoroscopy**
 - radiation exposure
- **Others**
 - special implants, table fracture, 2 assistants?
(we don't use)

POST. HIP SURGEON



Prof. Dr. Kristoff Corten ®

Posterior Hip Surgeon = Driving Blind



ANT. HIP SURGEON



With fluoroscopy = Driving “Matrix”



CONCLUSIONS



- Anterior approach - without muscle injury
- Bikini incision - patients satisfaction, cosmetic, imperceptible scars
- Supine decubitus - added value of fluoroscopy
- Good results - but can optimize function and longevity
- Learning curve - femur exposure
- Hip surgeon - "way of comfort" but only that?



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26-27 NOVEMBER 2015 MILAN, ITALY

IS MINIMALLY INVASIVE ANTERIOR APPROACH TO THE HIP RELATED TO HIGH RISK OF HETEROTOPIC OSSIFICATION? A CLINICAL AND RADIOGRAPHIC ASSESSMENT

M. Basso¹, M. Formica¹, C. Concina², V. Alecci², F. Franchin¹



¹*Clinica Ortopedica - IRCCS Azienda Ospedaliera
Universitaria San Martino – IST*

²*Ospedale San Polo di Monfalcone*



Minimally Invasive Direct Anterior Approach

- Less postoperative pain
- Less postoperative blood loss¹
- Less soft tissue damage²
- Faster recovery and discharge to home
- Cost reduction of hospitalization ³



1 Alecci V et al. Comparison of primary total hip replacements performed with a direct anterior approach versus the standard lateral approach: perioperative findings. *J Orthop Traumatol*. 2011 Sep

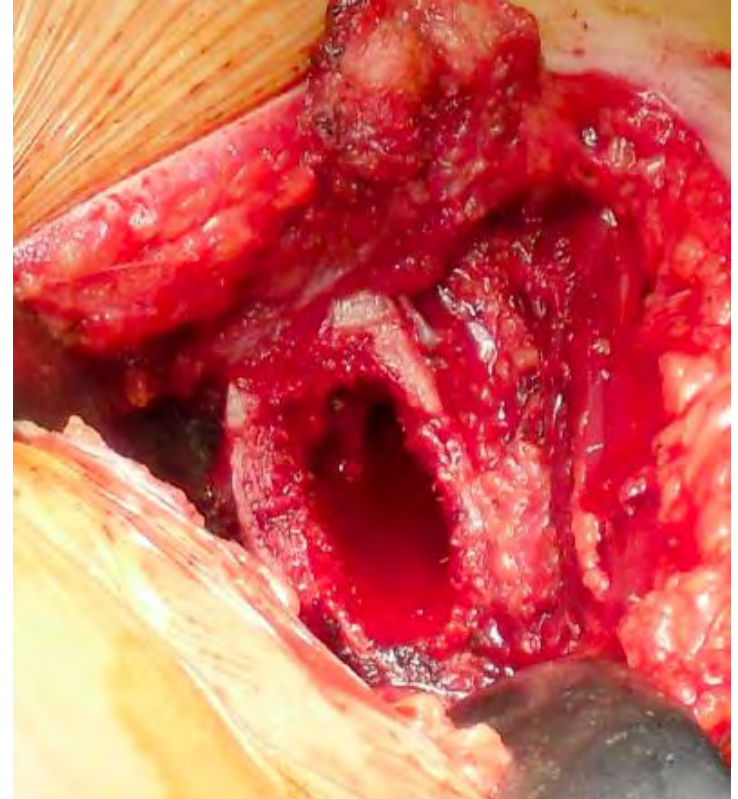
2 Meneghini RM et al Muscle damage during MIS total hip arthroplasty: Smith Petersen versus posterior approach. *Clin Orthop Relat Res* 2006

3 Matta JM et al. Single-incision anterior approach for total hip arthroplasty on an orthopaedic table. *Clin Orthop Relat Res* 2005

Rationale of the study

Etiopathogenesis of Heterotopic Ossification (HO) is still unclear: from bone or muscles?

- Uncemented stem: more release of bone debris → higher incidence of HO⁴



4 Maloney WJ et al. Incidence of heterotopic ossification after total hip replacement: effect of the type of fixation of the femoral component. J Bone Joint Surg Am 1991

Rationale of the study

Etiopathogenesis of Heterotopic Ossification (HO) is still unclear: from bone or muscles?

- Uncemented stem: more release of bone debris → higher incidence of HO⁴

- Radiation therapy before surgery: less soft tissue osteoinductive power → decreased incidence of HO⁵



4 Maloney WJ et al. Incidence of heterotopic ossification after total hip replacement: effect of the type of fixation of the femoral component. J Bone Joint Surg Am 1991

5 Pellegrini VD et al. Preoperative irradiation for prevention of heterotopic ossification following total hip arthroplasty. J Bone Joint Surg 1996

Aim of the study

- Minimally Invasive Direct Anterior Approach is related with lower incidence of HO?
- Type of stem used could be related with lower incidence of HO? ⁶



Known in literature

Incidence of HO in Direct Anterior Approach **33-48.8%**⁷

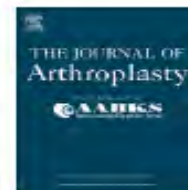
The Journal of Arthroplasty 29 (2014) 1835–1838



Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org



Incidence of Heterotopic Ossification in Direct Anterior Total Hip Arthroplasty: A Retrospective Radiographic Review



Duane M. Tippetts, DO^a, Anton V. Zaryanov, DO^b, W. Vincent Burke, MD^b, Preetesh D. Patel, MD^a, Juan C. Suarez, MD^a, Erin E. Ely, MD^a, Nathania M. Figueroa, MD^a

^a Cleveland Clinic Florida, Weston, Florida

^b Broward Health Medical Center, Ft. Lauderdale, Florida

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total hip arthroplasty
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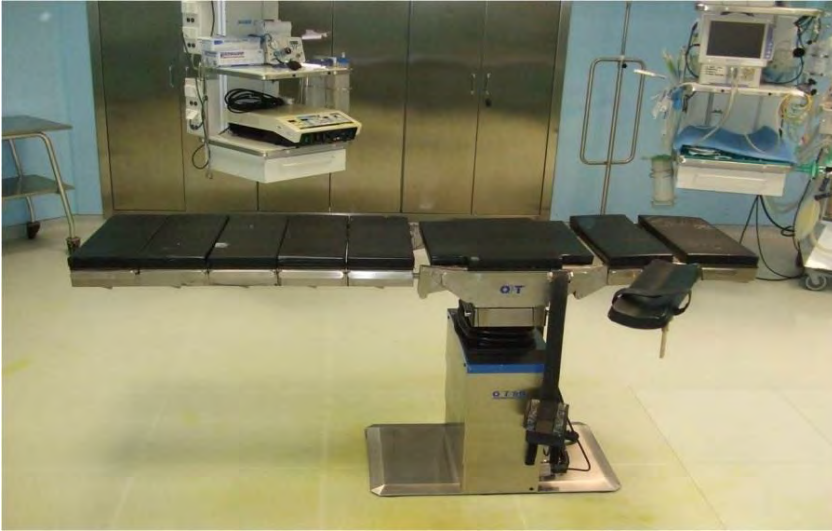
ABSTRACT

Heterotopic ossification (HO) is a complication following total hip arthroplasty (THA) with traditional approaches. The direct anterior approach (DAA) has become a popular approach for THA; however, no study has evaluated HO formation following DAA THA. We examined the incidence of HO in a consecutive series of THA using the DAA in two separate hospitals. Standard preoperative radiographs were examined to determine the type of degenerative arthritis, and follow-up radiographs of at least 6 months after surgery were evaluated for the presence and classification of HO. The overall incidence of HO after DAA THA in this study was 98/236, or 41.5%, which falls within the reported range from recent studies involving more traditional approaches to the hip.

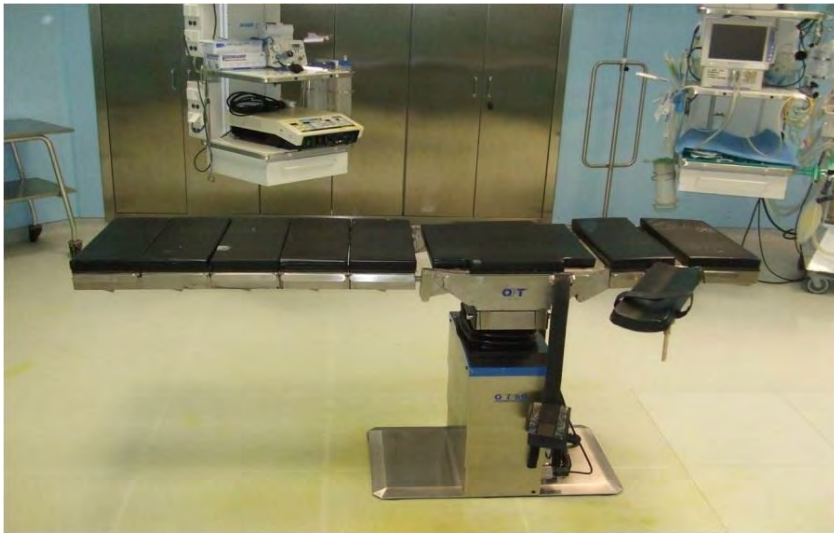
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7 Tippetts DM et al. Incidence of heterotopic ossification in direct anterior total hip arthroplasty: a retrospective radiographic review. J Arthroplasty. 2014 September

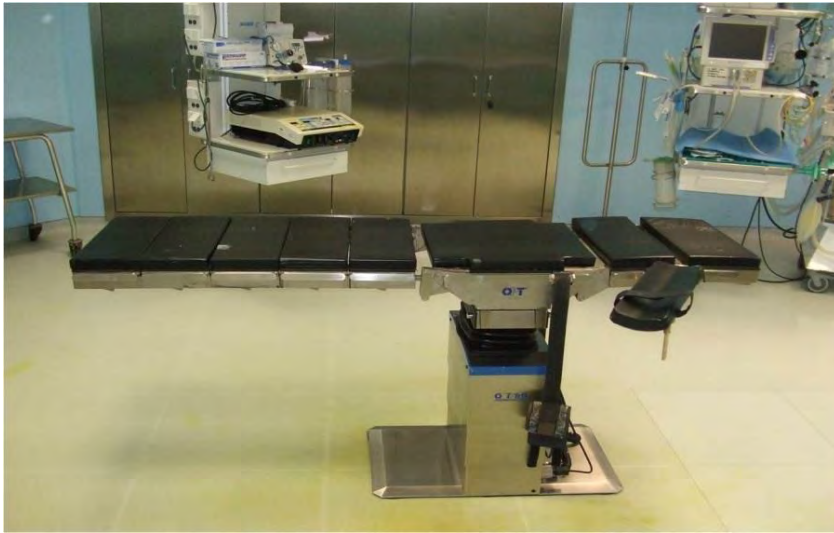
Tips and Tricks of Surgical Technique



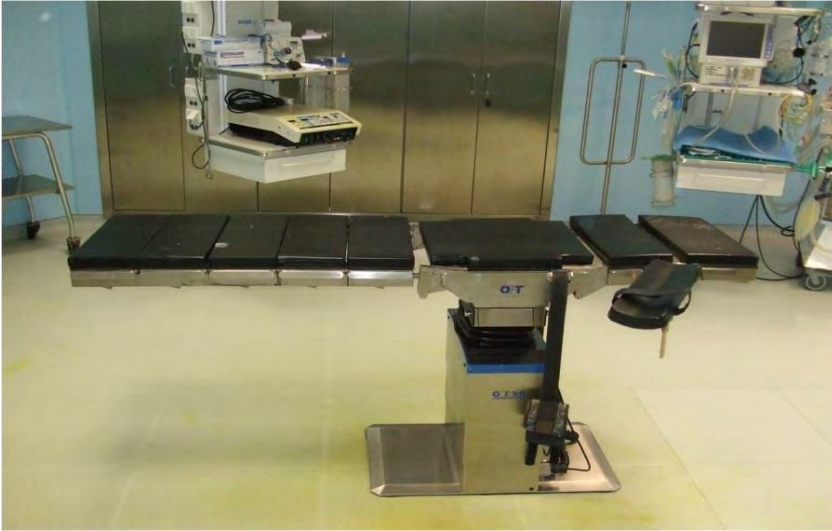
Tips and Tricks of Surgical Technique



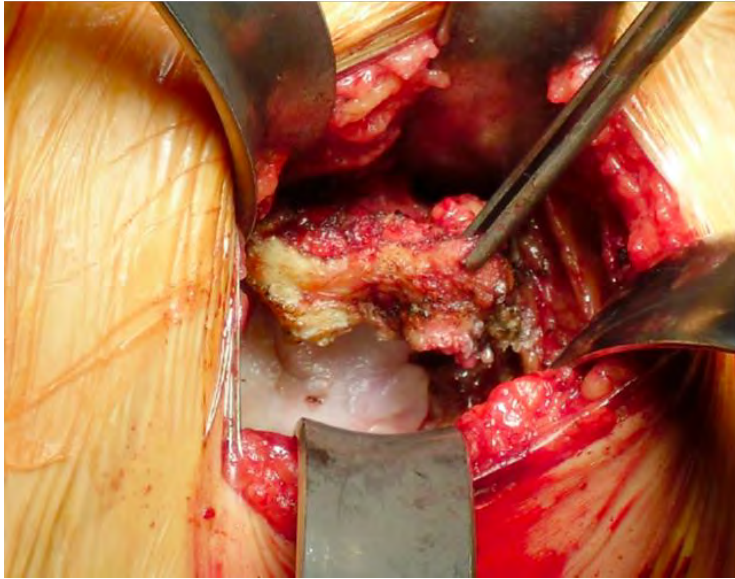
Tips and Tricks of Surgical Technique



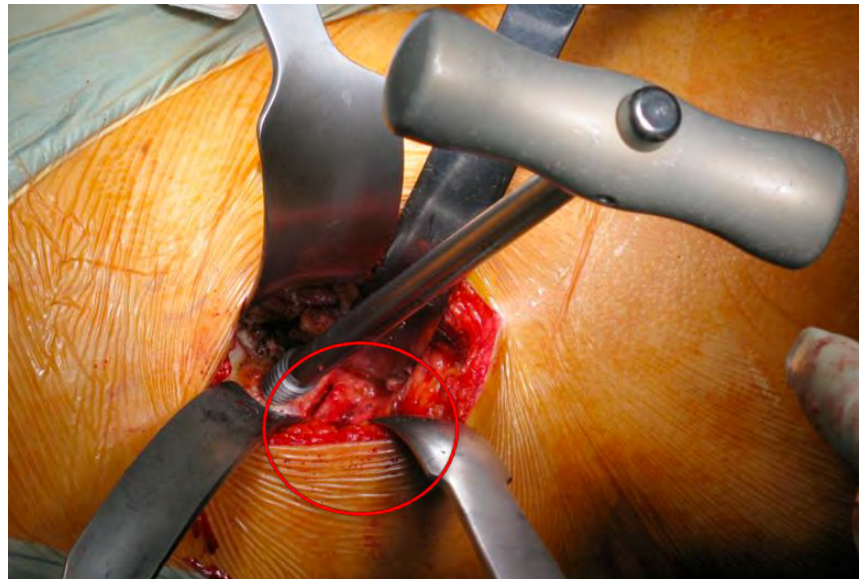
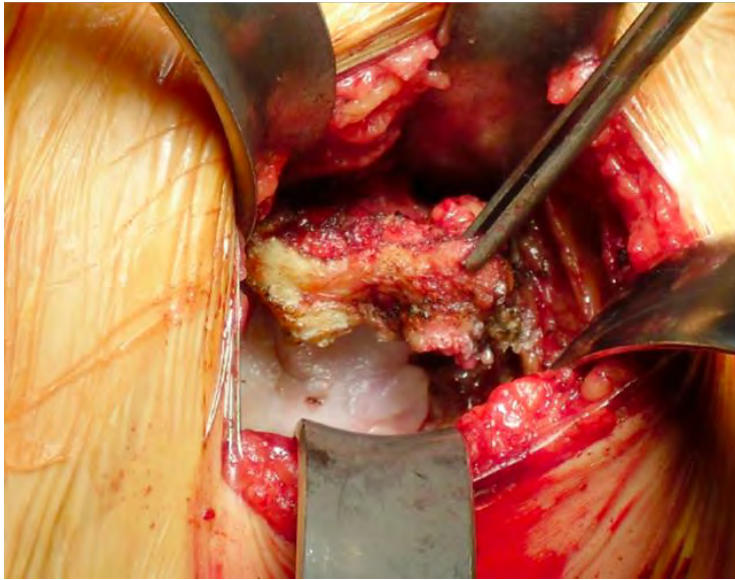
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Tips and Tricks of Surgical Technique



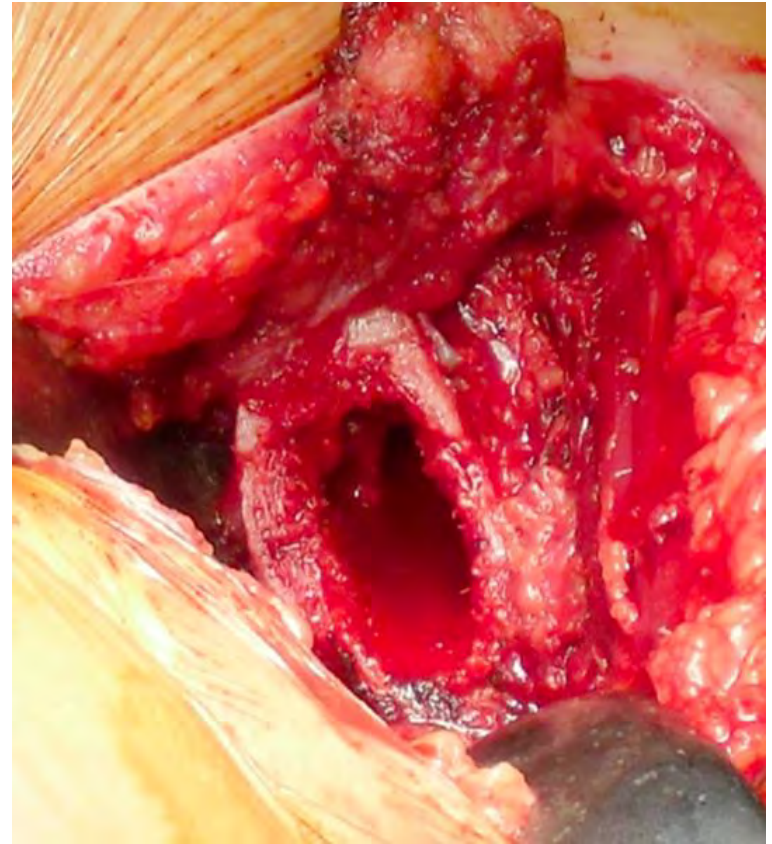
Tips and Tricks of Surgical Technique



Tips and Tricks of Surgical Technique

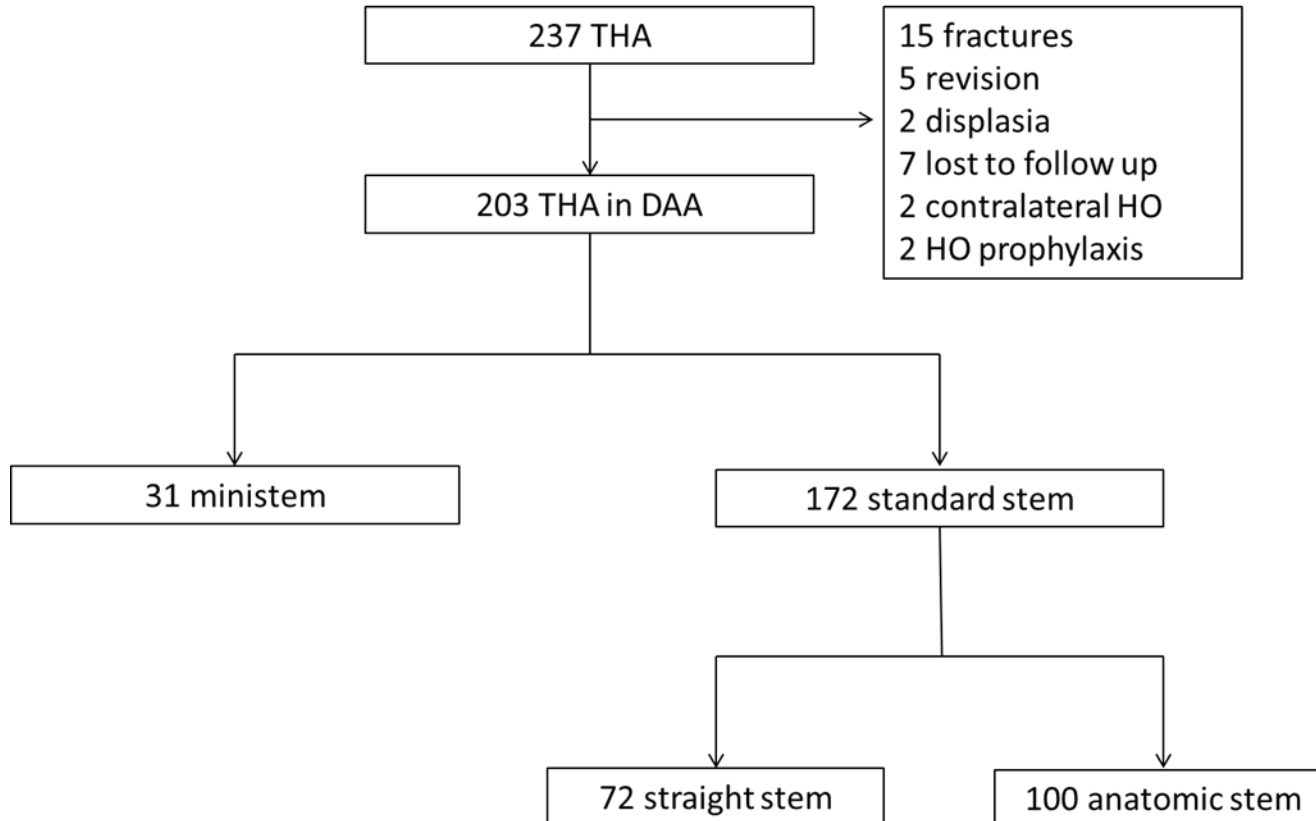


Tips and Tricks of Surgical Technique



Materials and Methods

- From January 2013 to January 2014



Materials and Methods

Clinical Outcome:

- Pre-operative and post-operative VAS;
- Harris Hip Score;
- Range of hip flexion (1 yr fu);

Radiological Outcome:

- Brooker's Classification of HO



Description of Population Studied

	Average age	Incidence of HO (%)	Average age in patients with HO
Total Population (203)	68.9	21.7	72.8
♂ (94)	71.2	28.7	71.6
♀ (109)	67.8	15.6	74.6

Description of Population Studied

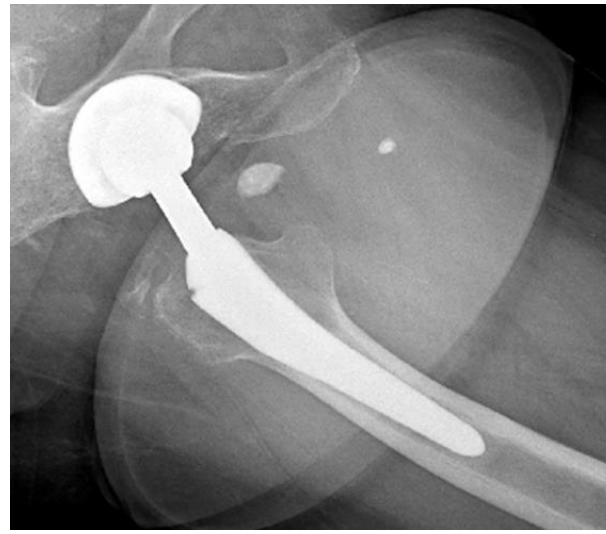
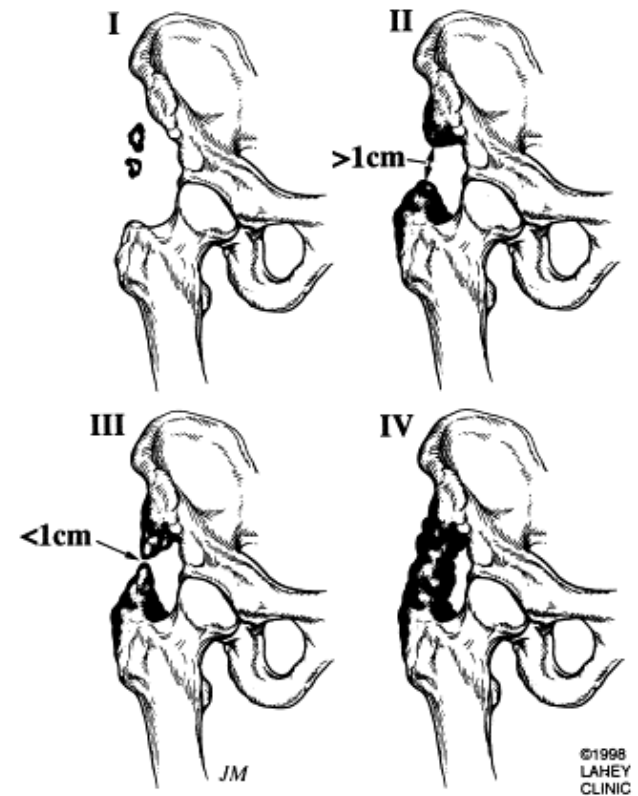
	Average age	Incidence of HO (%)	Average age in patients with HO
Total Population (203)	68.9	21.7	72.8
♂ (94)	71.2	28.7	71.6
♀ (109)	67.8	15.6	74.6

Straight Stem (72)	69.3	26.4	72.8
Anatomical Stem (100)	68.9	17	73.1
Mini Stem (31)	61.1	25.8	62

P<0.05

Radiological Outcome

Brooker Classification	Incidence of HO (%)	Average age
I	20 45.5 %	74.1
II	18 40.9 %	71.2
III	5 11.3 %	72.2
IV	1 2.3 %	78



Clinical Outcome related to severity of HO

Severity of HO	Harris Hip Score (>1 y fu)	Preoperative VAS	Postoperative VAS	Hip flexion (°)
Moderate (I-II)	88.7	7.8	1.3	97.4
Severe (III-IV)	90.6	6.7	0.7	95

Clinical Outcome related to severity of HO

Severity of HO	Harris Hip Score (>1 y fu)	Preoperative VAS	Postoperative VAS	Hip flexion (°)
Moderate (I-II)	88.7	7.8	1.3	97.4
Severe (III-IV)	90.6	6.7	0.7	95

- No relationship was found between the grade of HO and the clinical outcome (as confirmed by literature)⁸

Conclusion

- Minimally Invasive Direct Anterior Approach is not associated to decreased HO incidence;

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- We found a slight lower incidence compared to literature (21.6% vs 33-48.8%);

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- Mini stems are not related to decreased incidence of HO compared to other stems;

Conclusion

- Minimally Invasive Direct Anterior Approach is not associated to decreased HO incidence;
- We found a slight lower incidence compared to the literature (21.6% vs 33-48.8%);
- Female had lower incidence of HO compared to male;
- Mini stems are not related to decreased incidence of HO compared to other stems;
- Straight stems demonstrated a significative increased incidence of HO.



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Thank you for
attention!!!



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26-27 NOVEMBER 2015

MILAN, ITALY



Clinical and Functional Outcomes Following Primary Total Hip Replacement Using a Minimally Invasive Lateral Approach

S Jain, D Leeder, N Shah, A George
Calderdale Royal Hospital, UK, 2015



MIS THR Surgery

Advantages	Disadvantages
Faster rehabilitation	Steep learning curve
Less hospital stay	Inadequate exposure
Less blood loss	Implant malpositioning
Less pain	Periprosthetic fracture
Cosmesis	Specialist instrumentation

Objectives

- Evaluate clinical and functional outcomes of THR
- MIS modification of a lateral Hardinge type approach with no specialist equipment
- Primary OMs
 - Oxford hip score
 - Pain rating scale (0-10)
- Secondary OMs
 - Mean OR time
 - Blood loss (drop in Hb, drain output, transfusion)
 - Length of hospital stay
 - Complications

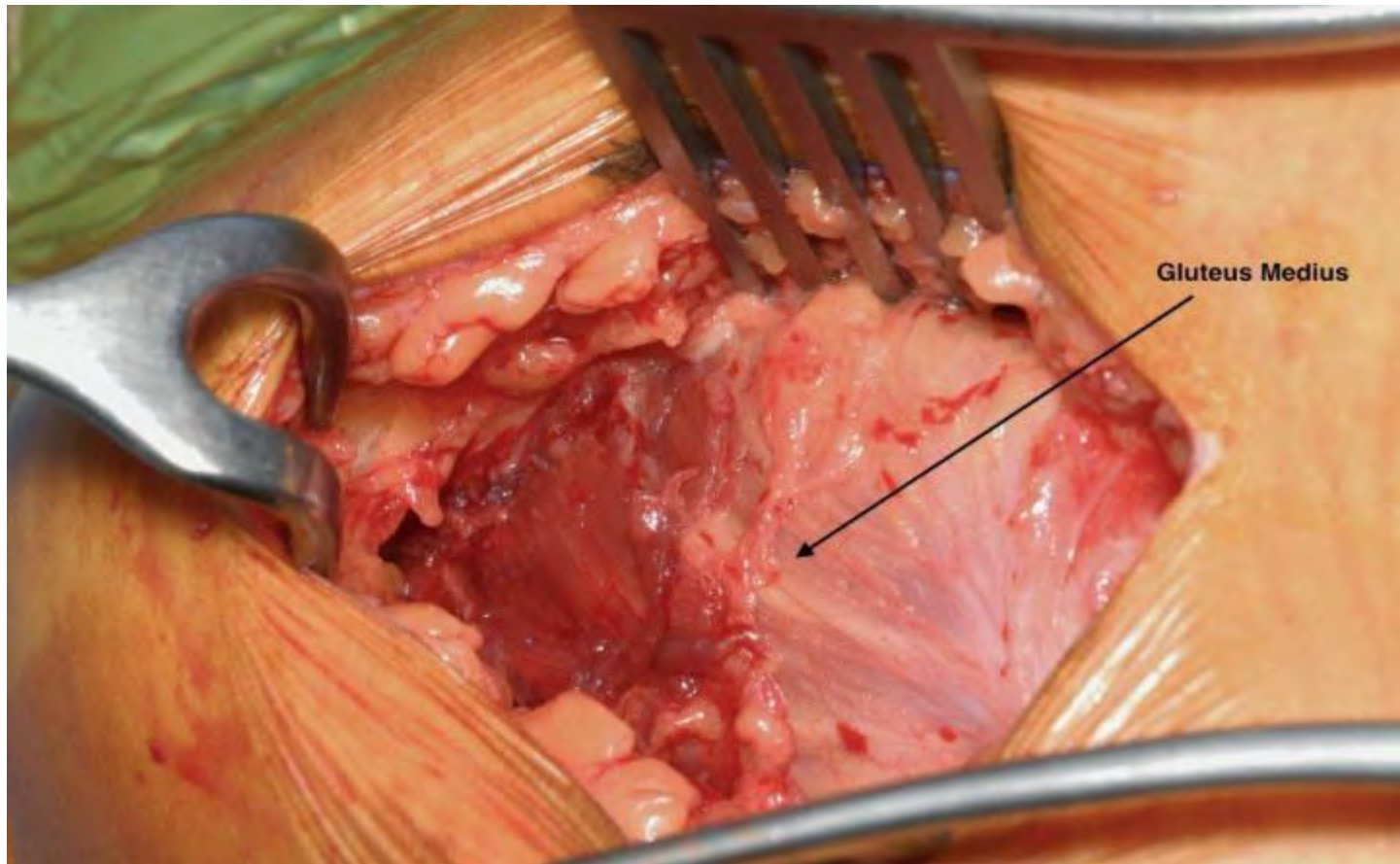
Methods

- Retrospective service evaluation
- Consecutive pts identified through clinical audit team and information services
- Primary OMs via telephone interview
- Secondary OMs via casenote review

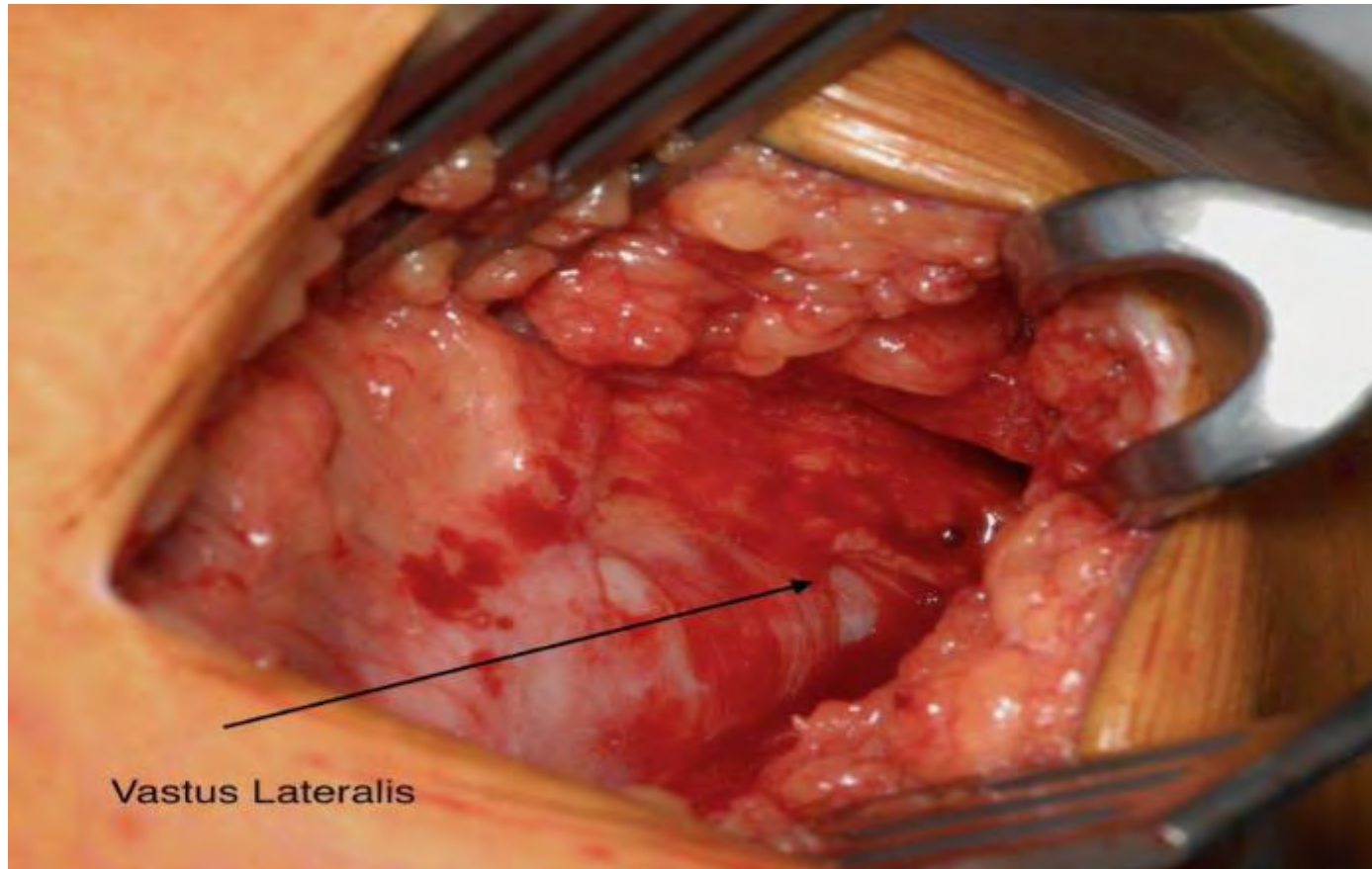
Skin Incision



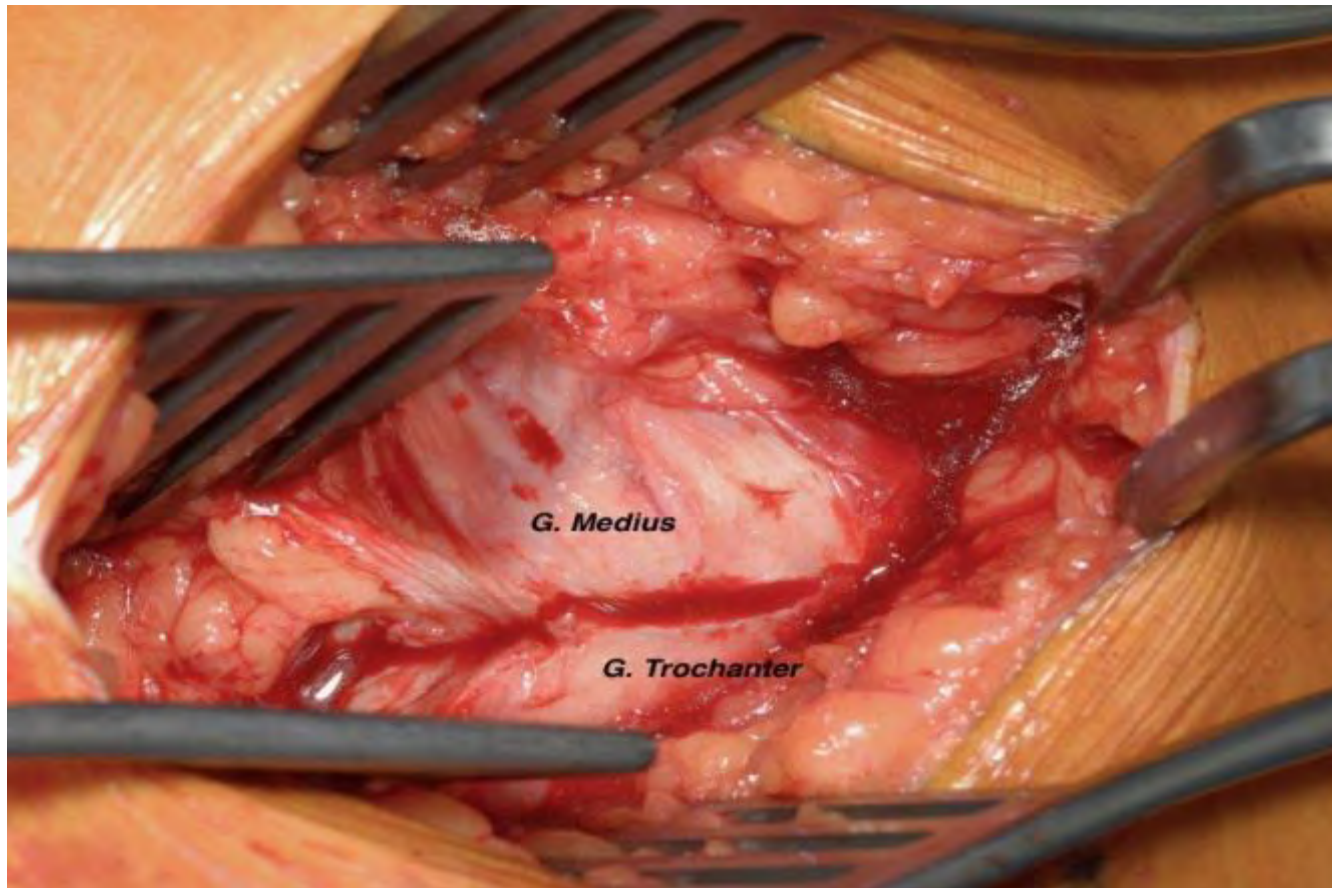
Proximal Aspect



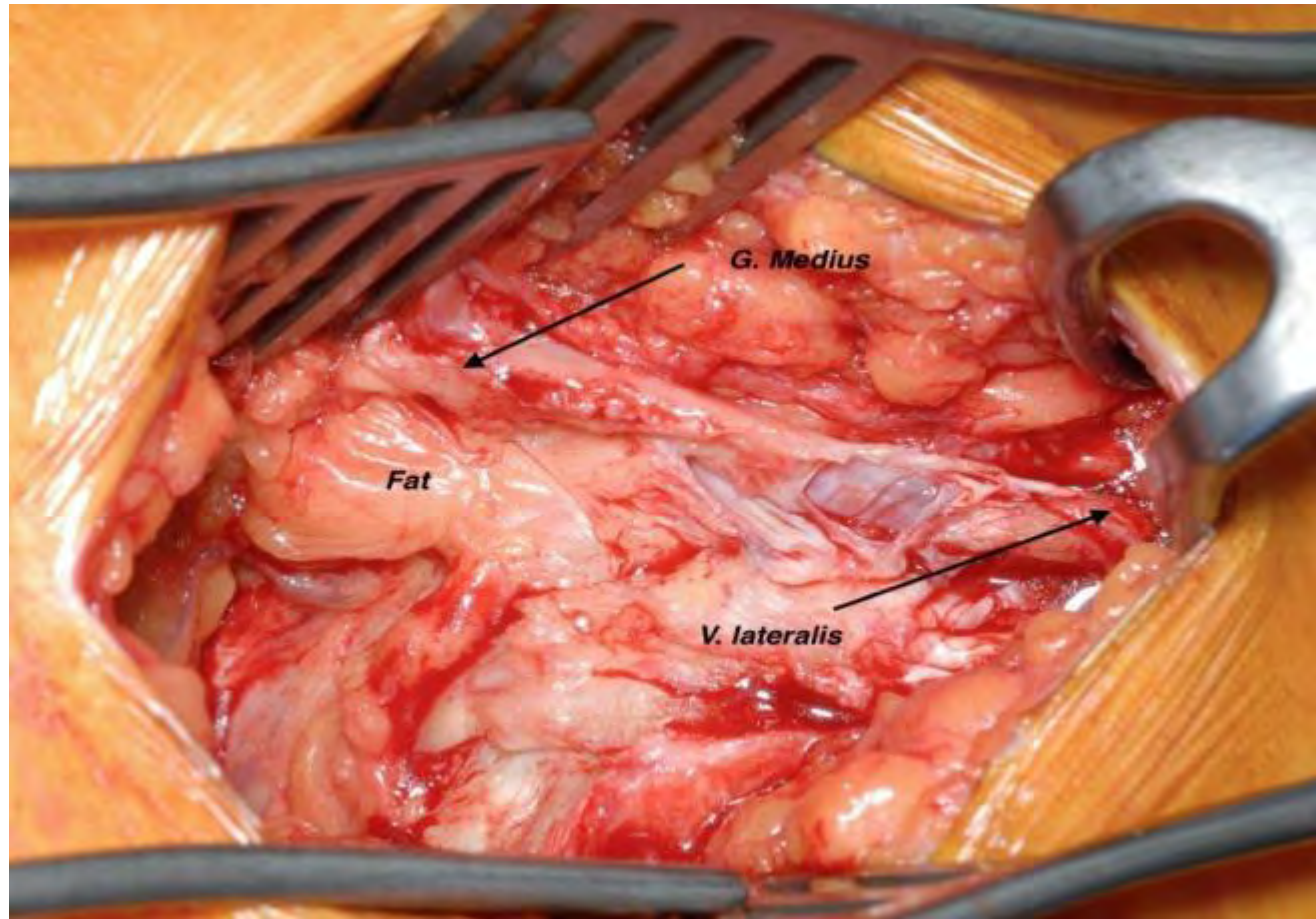
Distal Aspect



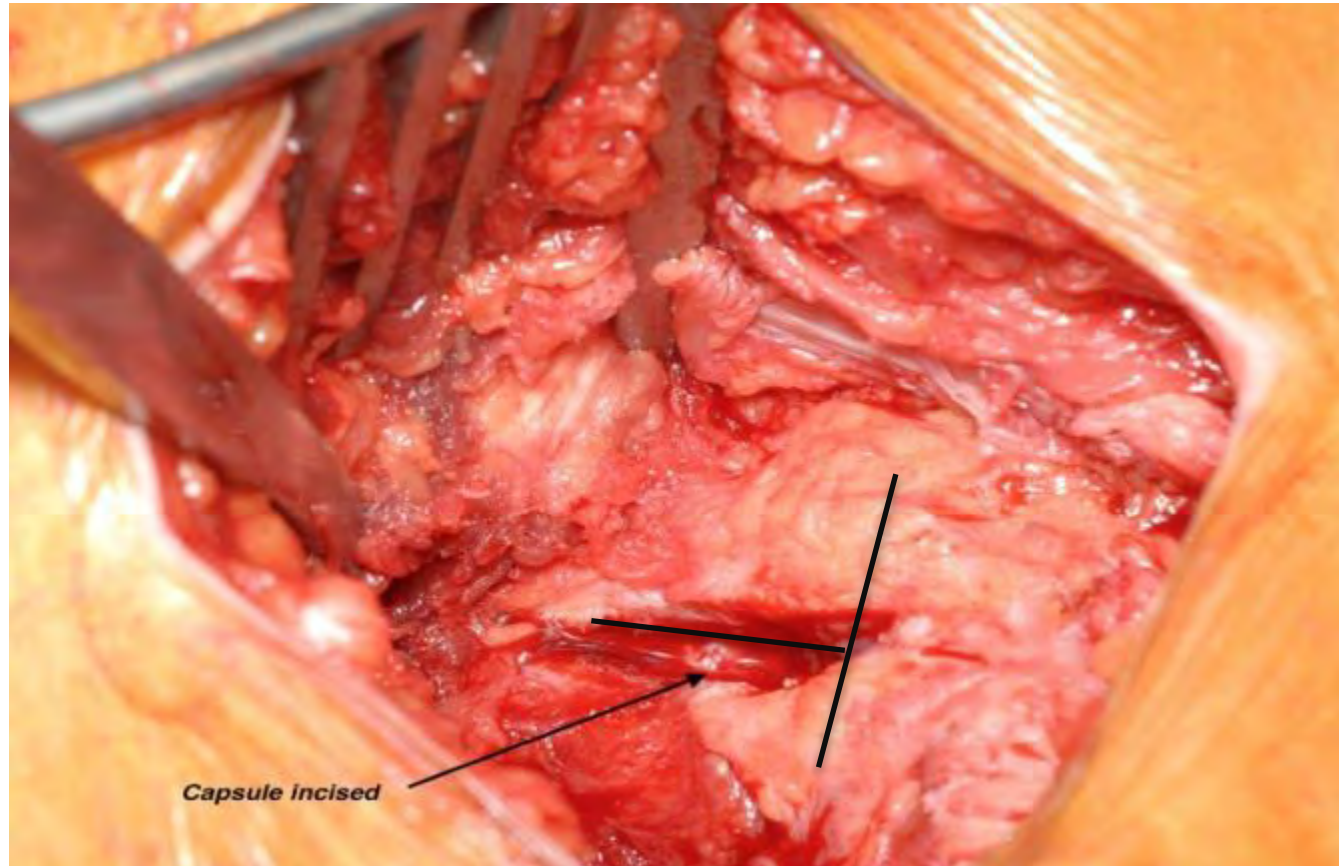
Gluteus Medius



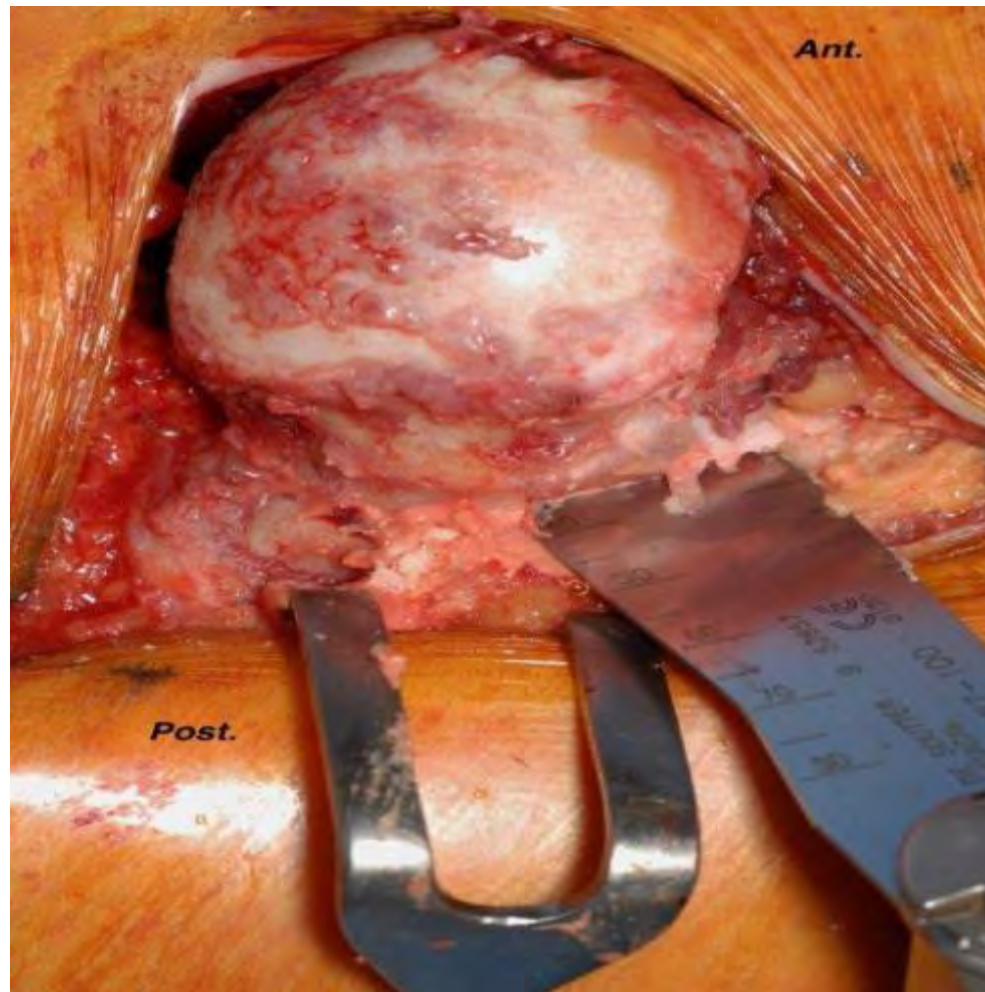
Anterior Leaf



Capsulotomy



Hip Dislocated



Patient Cohort

- 65 patients (2011/2012)
- Mean age: 74 yrs (range, 51-92)
- 20 male; 45 female
- Right 37; Left 28
- Mean follow-up **28 months** (range, 18-40)
- Consultant (43) and trainee (22)

LTFU – 14/65 (**21%**) incl 2 deaths (unrelated)
i.e. unable to contact via telephone

Patient Cohort

- Indication: 63 OA; 2 AVN

- Fixation:

Cemented	75%
Uncemented	22%
Hybrid	3%

- ASA:

1	3%
2	72%
3	20%
4	2%
NR	3%

Results

- Primary OMs (mean)

Oxford Hip Score

45/48 (range, 38-48)

Pain rating scale

0.5 (range, 0-5)

Results

- Secondary OMs (mean)

OR time: **108 min** (range, 50-165)

Drop in Hb: **26 mg/dL** (range, 9-46)

Drain output at 24hrs: **253 mls** (range, 30-600)

Transfused: **6 pts** (9%, mean 2.5 units)

Hospital stay: **5.6 days** (range, 2-21)

Complications

Three complications (4.6%)

- Systemic:

DVT – symptomatic, warfarin 6/12

Chest infection – 1/52 po ABX

- Local:

Sciatic nerve palsy – permanent footdrop, NCS showed severe neuropraxia, OHS 38

No re-operations

Strengths

- Consecutive pts
- Simple modification of familiar approach
- Reproducible technique ... easy to learn
- No specialist equipment or theatre staff training required
- Validated PROMs
- Results favourable with respect to current evidence ...
- HES data (2010/11) mean post-op OHS **37.9**

Limitations

- Retrospective service evaluation
- No pre-op data
- No control group
- OR time – surrogate for surgical time
- Drain output/drop in Hb/transfusion requirements – surrogate for blood loss
- 21% LTFU - unable to contact via telephone

Conclusions

- MIS lateral approach gives excellent functional results and pain relief at 2 yr f/u
- Does not appear to lead to short OR time, low LOS or low blood loss ... multifactorial
- Low complication rate but concern about sciatic nerve injury

Thank You





INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY





THE EVOLUTION OF HIP SURGERY AND NEW INSIGHTS

*Evaluation Of
Outcomes In 2015*



Sujith Konan

MBBS, MD(res), MRCS, FRCS (Tr&orth)

Orthopaedic Surgeon
University College London Hospitals NHS Trust London

Acknowledgements

- UCH Research Team/ physiotherapy department/ Out patients
- Patients/ Participants



Talk Summary

- Historical perspective
- Drawbacks of subjective & objective measures
- Rationale for functional measures & evidence
- The UCH functional scores (Hip)
 - Development
 - Validation
- Functional Score in Practice & future studies
- Psychosocial scores & Patient experience

Historical Perspective

- Limited Indications for arthroplasty
- Outcomes
 - Radiographic
 - Clinical
 - Lab (kinesiology)

Because We say so!

- Surgeon reported success
 - Historical ? OR
 - Extremely valuable
- BUT – Evolution!
 - Surgeon
 - Implants
 - Patient Expectations



Surgeon - Evolution

- Better at arthroplasty !
- Newer approaches
 - Hip
 - DAA, min Invas
- Decreasing surgical times
- Tailored to pathology
- Expectations have changed



Implant Evolution

- Tribology
- Metallurgy
- Manufacturing/
Machinery
- PE
- Ceramic, CoCr, resurfacing
- Compartment specific
designs
- Navigation/ Robotics
- Patient specific implants



Patient -Evolution

- Changing demographics/age
- Higher demands
- Younger age group
- Driving ability
- Return to specific sports
- Lifestyle
- Attitude to pain?



What else has changed?

- Governing bodies
- Regulating bodies
- Policy makers
- NJR
- Sub-speciality groups
- Investigation modalities
- Surgeon shopping!



Drawbacks of subjective & objective measures

- PROMS
- Patient Experience
- Gait Labs
- Sensors
- CO2 Consumption
- Treadmill
- Static Cycle
- EKG
- Muscle Performance
- Cardiac Performance
- Pulmonary Function
- Endurance testing
- Blood markers
- Dynamic MRI



■ INSTRUCTIONAL REVIEW: KNEE

The assessment of outcome after total knee arthroplasty

ARE WE THERE YET?

F. S. Hossain,
S. Konan,
S. Patel,
E. C. Rodriguez-
Merchan,
F. S. Haddad

*From University
College London
Hospitals, London*

The routine use of patient reported outcome measures (PROMs) in evaluating the outcome after arthroplasty by healthcare organisations reflects a growing recognition of the importance of patients' perspectives in improving treatment. Although widely embraced in the NHS, there are concerns that PROMs are being used beyond their means due to a poor understanding of their limitations.

This paper reviews some of the current challenges in using PROMs to evaluate total knee arthroplasty. It highlights alternative methods that have been used to improve the assessment of outcome.

Cite this article: *Bone Joint J* 2015;97-B:3–9.

Drawbacks

- Lack of long-term studies documenting the usefulness of outcome measures
- Lack of published psychometric evidence validating scores
- Clinician bias

Drawbacks

- Differences in age, health or personal issues
- Patient co-morbidities
- Objective interpretation by a subjective individual
- Certain questions lack clarity or are irrelevant
- Difficult for responder to answer
- Categorise pain into a single category, ? always possible

Drawbacks

- Cultural differences between patients
- 'Floor' and 'ceiling' effects
- Computer program is necessary for scoring

Rationale & Evidence for Performance Based Functional Measures



■ SPECIALTY UPDATE

Measuring function after hip and knee surgery

THE EVIDENCE TO SUPPORT PERFORMANCE-BASED FUNCTIONAL OUTCOME TASKS

S. Konan,
F. Hossain,
S. Patel,
F. S. Haddad

*From Department of
Orthopaedics,
University College
London, London,
United Kingdom*

Accurate, reproducible outcome measures are essential for the evaluation of any orthopaedic procedure, in both clinical practice and research.

Commonly used patient-reported outcome measures (PROMs) have drawbacks such as 'floor' and 'ceiling' effects, limitations of worldwide adaptability and an inability to distinguish pain from function. They are also unable to measure the true outcome of an intervention rather than a patient's perception of that outcome.

Performance-based functional outcome tools may address these problems. It is important that both clinicians and researchers are aware of these measures when dealing with high-demand patients, using a new intervention or implant, or testing a new rehabilitation protocol.

This article provides an overview of some of the clinically-validated performance-based functional outcome tools used in the assessment of patients undergoing hip and knee surgery.

Rationale for Performance Tasks

- Function at the crux of arthroplasty
- Pain relief alone not sufficient
- Compare
 - Surgeons
 - Approaches
 - Implants
 - Rehabilitation protocols

Rationale for Performance Tasks

- Self-reported measures of function
 - PATIENT perceptions
 - strongly overlapped by pain
 - ? relate to actual ability
 - Stratford 2006, Van Hermet 2009
- Limited ability in detecting change in function when discordant
 - tendency to overstate

Measuring Function

- No singular gold standard for the assessment of physical function.
 - “the ability to move around”
 - “the ability to perform daily activities”
- Classified as Activities
 - WHO International Classification of Functioning, Disability and Health (ICF) model

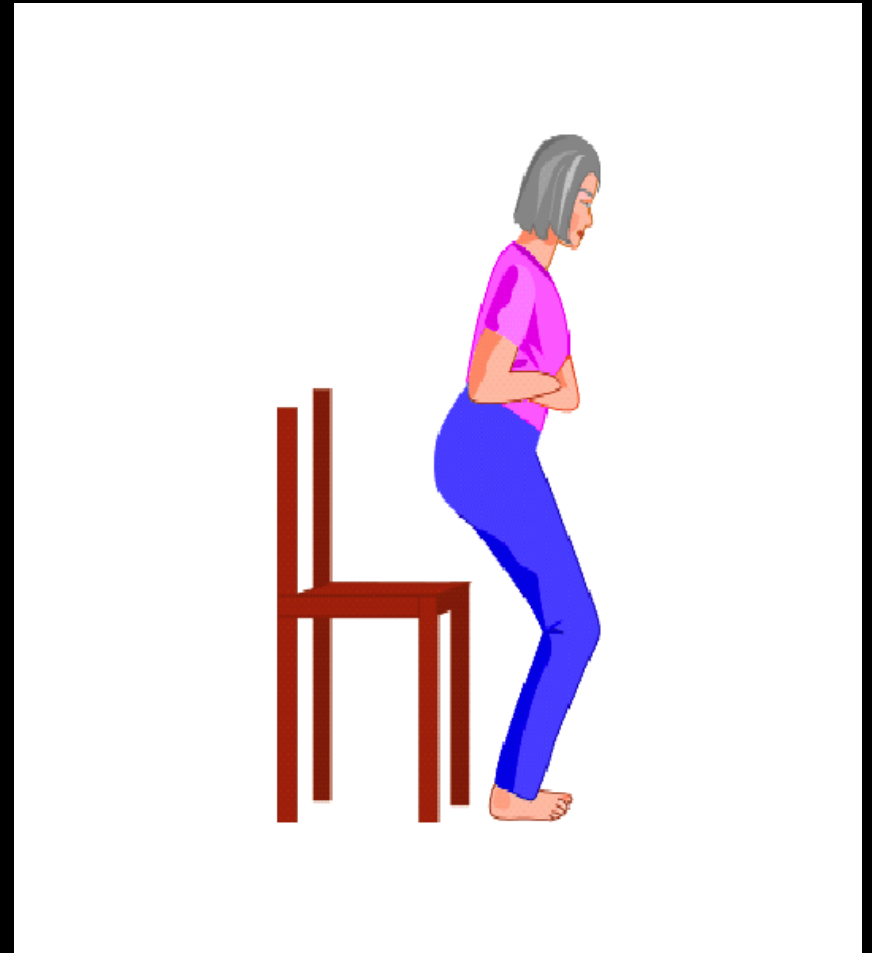
What Function Can We Measure?

- There were two main types of walk tests
- Those over short distances (<100 m)
 - nine different short-distance walk tests with variations
 - set pace (self-paced, fast-paced)
 - distance walked (range)
 - functional measure (time, speed, distance, quality grading)
 - incorporated turns
- Those over long distances (>100 m)
 - The 6-min walk test



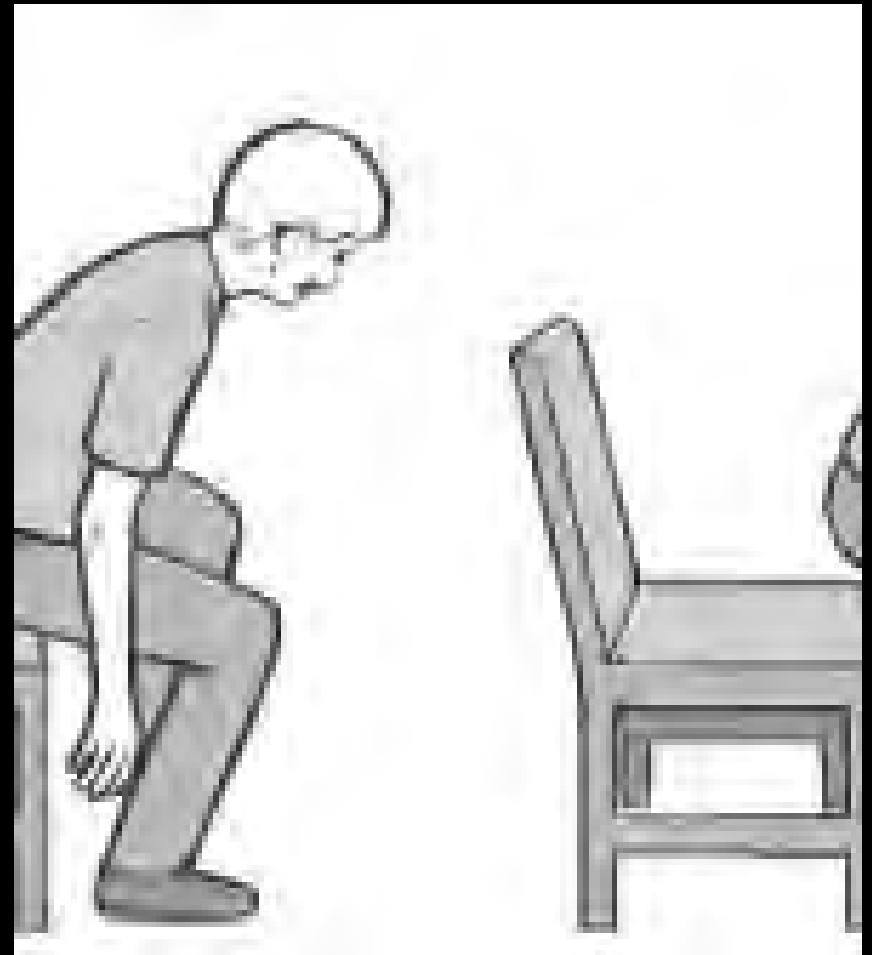
Sit To Stand Test

- Stand tests (& variations)
 - height of chair (standard and high)
 - Incorporated walking and/or turning components
 - timed up and go test, walking 3 m, turning and returning to sit down
 - get up and go test, walking 20m with no return



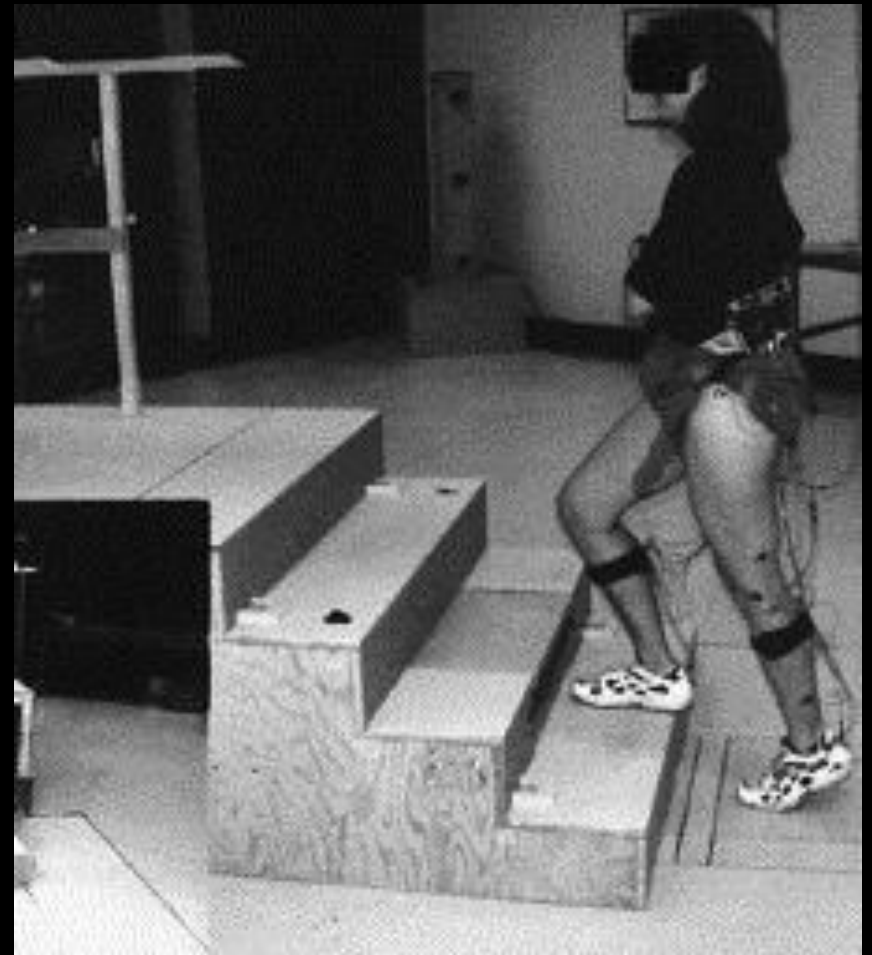
Timed Get up & Go test

- Task: Rise up from a chair, walk 3 m, turn around, walk back and sit down
 - The time taken to complete the activity (seconds)
 - Evidence:
 - Previously used reliably as a quantifiable measure of function



Stair Negotiation

- Stair negotiation tests (& variations)
 - number of stairs
 - ascend only
 - Descend only
 - Both
- Hand-rail support
- Leading limb step pattern



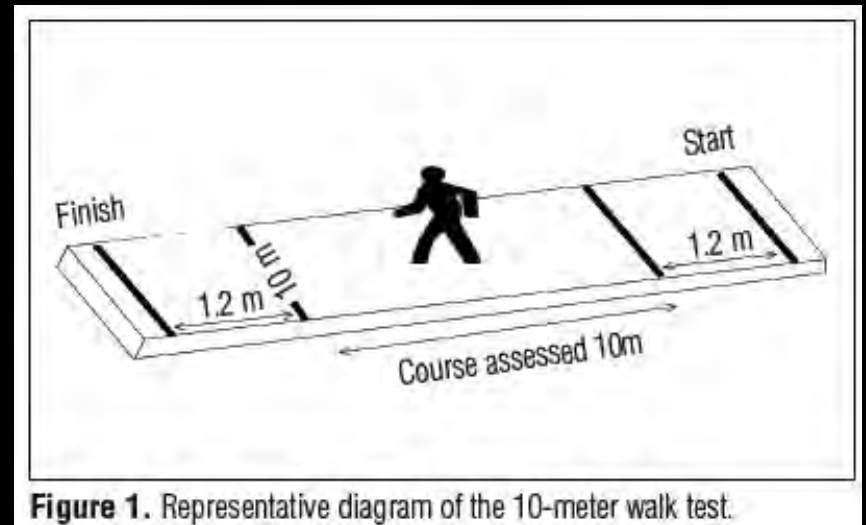
Balance & Proprioception test

- Task: Stand unsupported only on the test limb until failure
 - (dropping the contra-lateral foot/ using hand to achieve support)
 - Evidence:
 - Standing balance affected with increasing postural sway in OA
 - Valid measure of neuromuscular performance in patients with knee OA



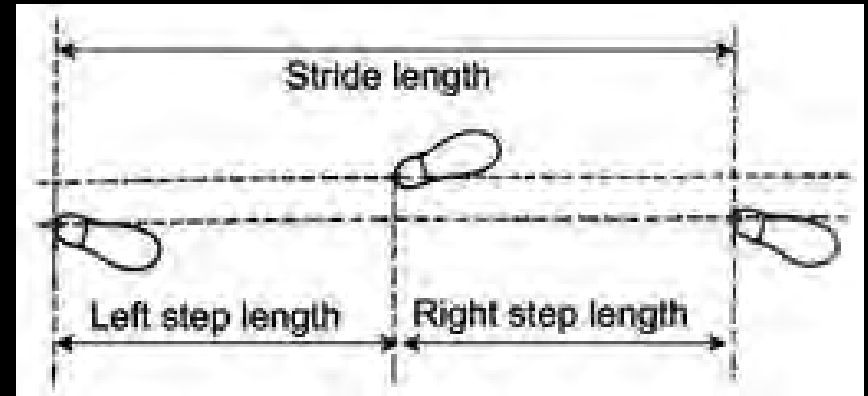
Timed 10 m walk

- Task: Walk at a self selected pace on a 10 m flat surfaced walkway. Time taken measured in seconds.
 - Evidence:
 - Walking velocity is an important gait parameter reduced OA
 - Important determinant of function after TKA



Stride length/ Cadence/ Step length

- Measured in centimetres during the 10 m walking test as described by
 - Evidence:
 - Gait analysis work has shown these spatiotemporal parameters to be indicators of worsening function in patients with knee OA



Single hop distance/ Triple hop distance/ Timed 6 m hop

- Task: Hop on the test limb on walkway marked at the 6 m interval
 - Single hop (starting point heel to landing point heel in cm)
 - Repeated after three consecutive hops on the test limb
 - Hop for a distance of 6 m (time taken in seconds)
 - Evidence:
 - Representative of demands comparable to high level sports
 - Reliable performance measure of the ACL rehab



Aim

- Development performance based outcome instrument
 - easy to use
 - practical performance based
 - Pain component
 - assessment of function/ high demand activities
- Validation

The UCH functional Hip score

The Development and Validation of a More Discriminating Functional Hip Score for Research

Sujith Konan, MRCS · Jenni Tahmassebi, BSc · Fares S. Haddad, MCh(Orth) FRCS(Orth)

Received: 9 December 2011/Accepted: 5 July 2012/Published online: 21 September 2012
© Hospital for Special Surgery 2012

Abstract *Background:* Total hip arthroplasty (THA) is a commonly performed procedure with increasing frequency in the young adult. While most available outcome measures can document postoperative improve-

Keywords outcomes · functional scores · hip outcomes · young adult hip

The UCH Functional Hip Score

Appendix

Functional Hip score			
NAME		DATE OF BIRTH	
HOSPITAL NUMBER		OPERATION	right / left
PRE / POST OF TIME	PRE-OP / 6/52 / 2/10 / 6/12 / 1 YEAR / 2 YEARS / 3 YEARS +	TODAY'S DATE	

1) Single leg stance (3 minutes)

- Number of times feet / hand down for balance:
 - <3 (1 point)
 - 3-5 (2 points)
 - 6-8 (3 points)
 - >8 (4 points)
- How difficult was that activity on a scale of 1-10, with 1 being not at all difficult and 10 being impossible to achieve

1
2
3
4
5
6
7
8
9
10
- How painful was that activity on a scale of 1-10, with 1 being not at all painful and 10 being the most painful

1
2
3
4
5
6
7
8
9
10

2) Timed stair climb a 10 stairs

- <3.9 seconds (1 point)
- 4-7.9 seconds (2 points)
- 8-11.9 seconds (3 points)
- >12 seconds (4 points)
- How difficult was that activity on a scale of 1-10, with 1 being not at all difficult and 10 being impossible to achieve

1
2
3
4
5
6
7
8
9
10
- How painful was that activity on a scale of 1-10, with 1 being not at all painful and 10 being the most painful

1
2
3
4
5
6
7
8
9
10

3) Lateral step up onto stairs

- Balance assist required
 - None ☐
 - 1 n hand ☐
 - 2 n hands ☐
 - Unable ☐
- Number of steps

- How difficult was that activity on a scale of 1-10, with 1 being not at all difficult and 10 being impossible to achieve

1 2 3 4 5 6 7 8 9 10

- How painful was that activity on a scale of 1-10, with 1 being not at all painful and 10 being the most painful

1 2 3 4 5 6 7 8 9 10

4) Three Forward jumps, standing up between each

Unable to do (4 points)

Stop midway (3 points)

Can do but painful (2 points)

Can do and no pain (1 point)

- How difficult was that activity on a scale of 1-10, with 1 being not at all difficult and 10 being impossible to achieve

1 2 3 4 5 6 7 8 9 10

- How painful was that activity on a scale of 1-10, with 1 being not at all painful and 10 being the most painful

1 2 3 4 5 6 7 8 9 10

5) Three Sideways jumps, standing up between each

Unable to do (4 points)

Stop midway (3 points)

Can do but painful (2 points)

Can do and no pain (1 point)

- How difficult was that activity on a scale of 1-10, with 1 being not at all difficult and 10 being impossible to achieve

1 2 3 4 5 6 7 8 9 10

- How painful was that activity on a scale of 1-10, with 1 being not at all painful and 10 being the most painful

1 2 3 4 5 6 7 8 9 10

Validation of UCH Hip Score

Table 1 Internal consistency of the individual tasks of the functional hip score

	Cronbach's alpha
All hip patients	
Single leg stance	0.76
Timed stair climb	0.77
Lateral step up stair	0.81
Forward jump	0.83
Sideways jump	0.83
Osteoarthritis preoperative patients	
Single leg stance	0.67
Timed stair climb	0.74
Lateral step up stair	0.71
Forward jump	0.85
Sideways jump	0.77
Post-THA patients	
Single leg stance	0.76
Timed stair climb	0.74
Lateral step up stair	0.69
Forward jump	0.71
Sideways jump	0.78

Table 2 Comparison between the three scoring systems

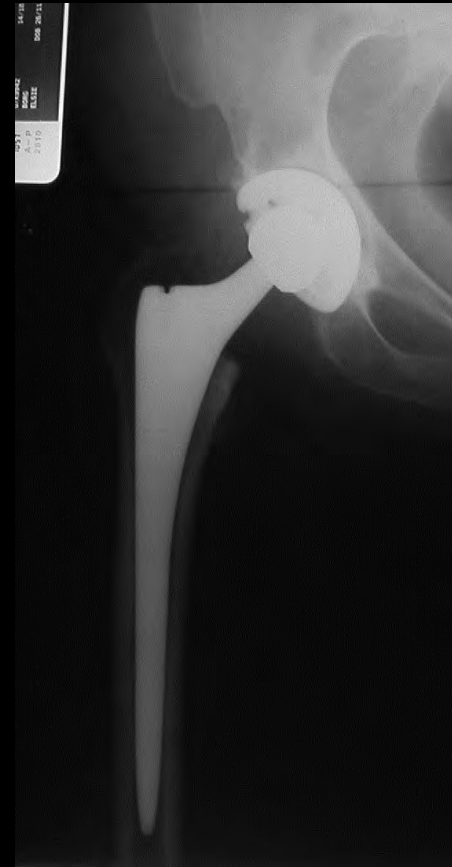
	Preoperative scores (standard deviation)	Postoperative scores (standard deviation)	Cohen's <i>d</i> (effect size correlation)	Two-tailed <i>t</i> test (<i>p</i> value)
Functional hip score				
Function	78.53 (11.58)	82.94 (15.82)	2.51 (0.28)	<0.01
Difficulty	72.11 (8.93)	46.83 (15.53)	1.99 (0.21)	<0.01
Pain	76.53 (7.44)	21.29 (12.54)	5.36 (0.94)	<0.01
WOMAC				
Pain	30.70 (8.02)	14.76 (7.26)	2.23 (0.24)	<0.01
Disability	23.31 (5.19)	12.71 (6.37)	2.42 (0.27)	<0.01
Stiffness	75.11 (17.33)	33.94 (14.90)	1.82 (0.67)	<0.01
SF-36				
Physical component	26.18 (5.92)	35.69 (9.97)	1.16 (0.30)	0.01
Mental component	42.68 (13.47)	50.91 (13.00)	0.62 (0.30)	0.01

What Can we learn?

What Can we learn?

- Function is measureable
- Reproducible
- It is possible to have a functional score
- It is possible to take this beyond the lab!

Hip Resurfacing vs THR?





■ HIP

A prospective comparative study of cementless total hip arthroplasty and hip resurfacing in patients under the age of 55 years

A TEN-YEAR FOLLOW-UP

F. S. Haddad,
S. Konan,
J. Tahmassebi

*From University
College London
Hospitals, London,
United Kingdom*

The aim of this study was to evaluate the ten-year clinical and functional outcome of hip resurfacing and to compare it with that of cementless hip arthroplasty in patients under the age of 55 years.

Between 1999 and 2002, 80 patients were enrolled into the study: 24 were randomised (11 to hip resurfacing, 13 to total hip arthroplasty), 18 refused hip resurfacing and chose cementless total hip arthroplasty with a 32 mm bearing, and 38 insisted on resurfacing. The mean follow-up for all patients was 12.1 years (10 to 14).

Patients were assessed clinically and radiologically at one year, five years and ten years. Outcome measures included EuroQol EQ5D, Oxford, Harris hip, University of California Los Angeles and University College Hospital functional scores.

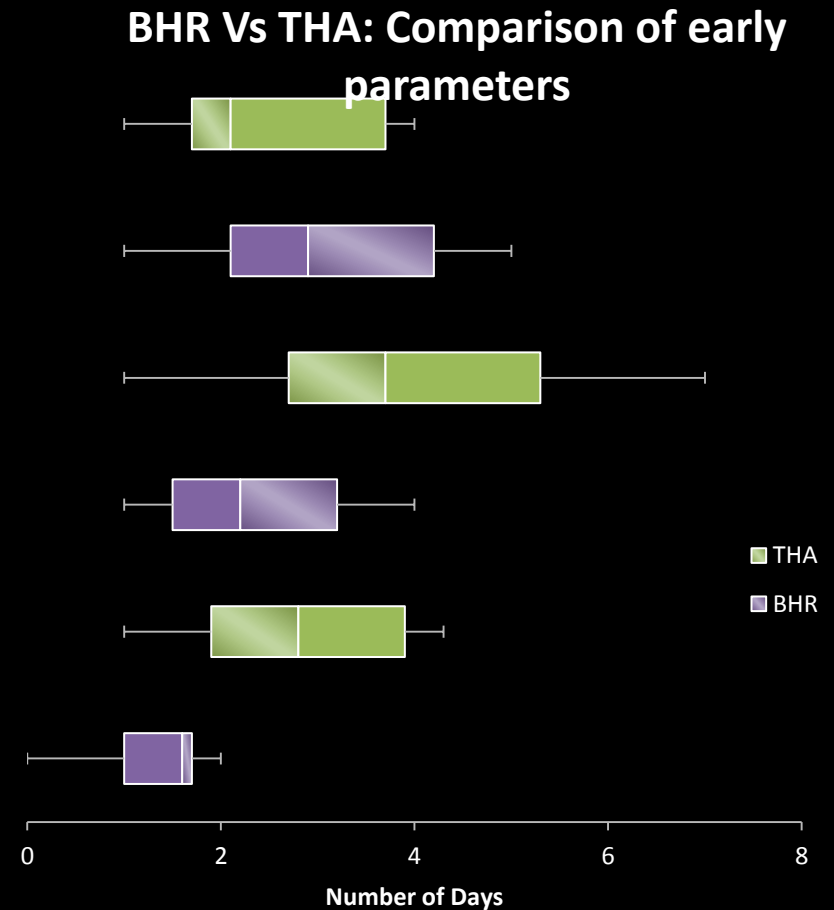
No differences were seen between the two groups in the Oxford or Harris hip scores or in the quality of life scores. Despite a similar aspiration to activity pre-operatively, a higher proportion of patients with a hip resurfacing were running and involved in sport and heavy manual labour after ten years.

We found significantly higher function scores in patients who had undergone hip resurfacing than in those with a cementless hip arthroplasty at ten years. This suggests a functional advantage for hip resurfacing. There were no other attendant problems.

Cite this article: *Bone Joint J* 2015; 97-B:617–22.

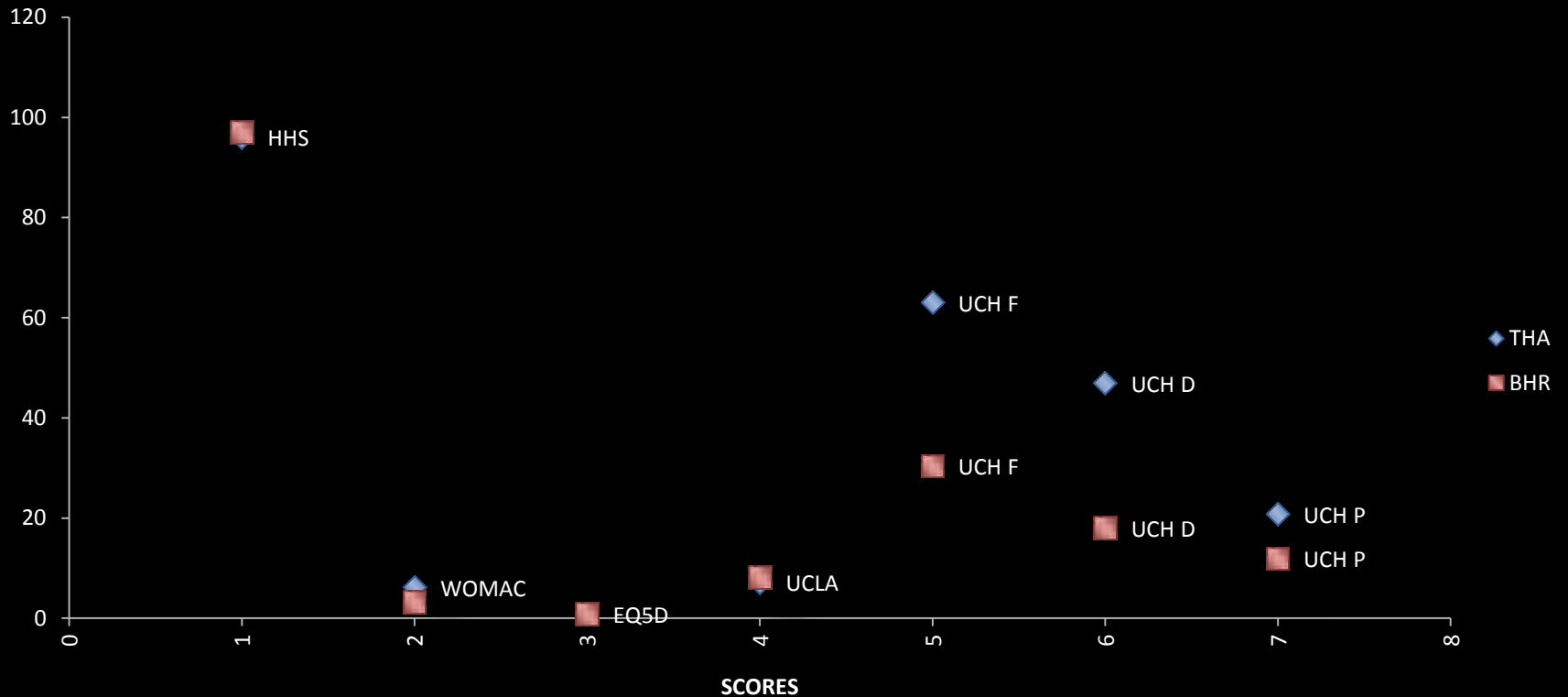
Hip Resurfacing vs THR

- Faster
 - 1st stair climb
 - 20 metre walk
- Slower
 - SLR
- Shorter length of stay
 - 4.3 (2-10) vs 6 (3-10)

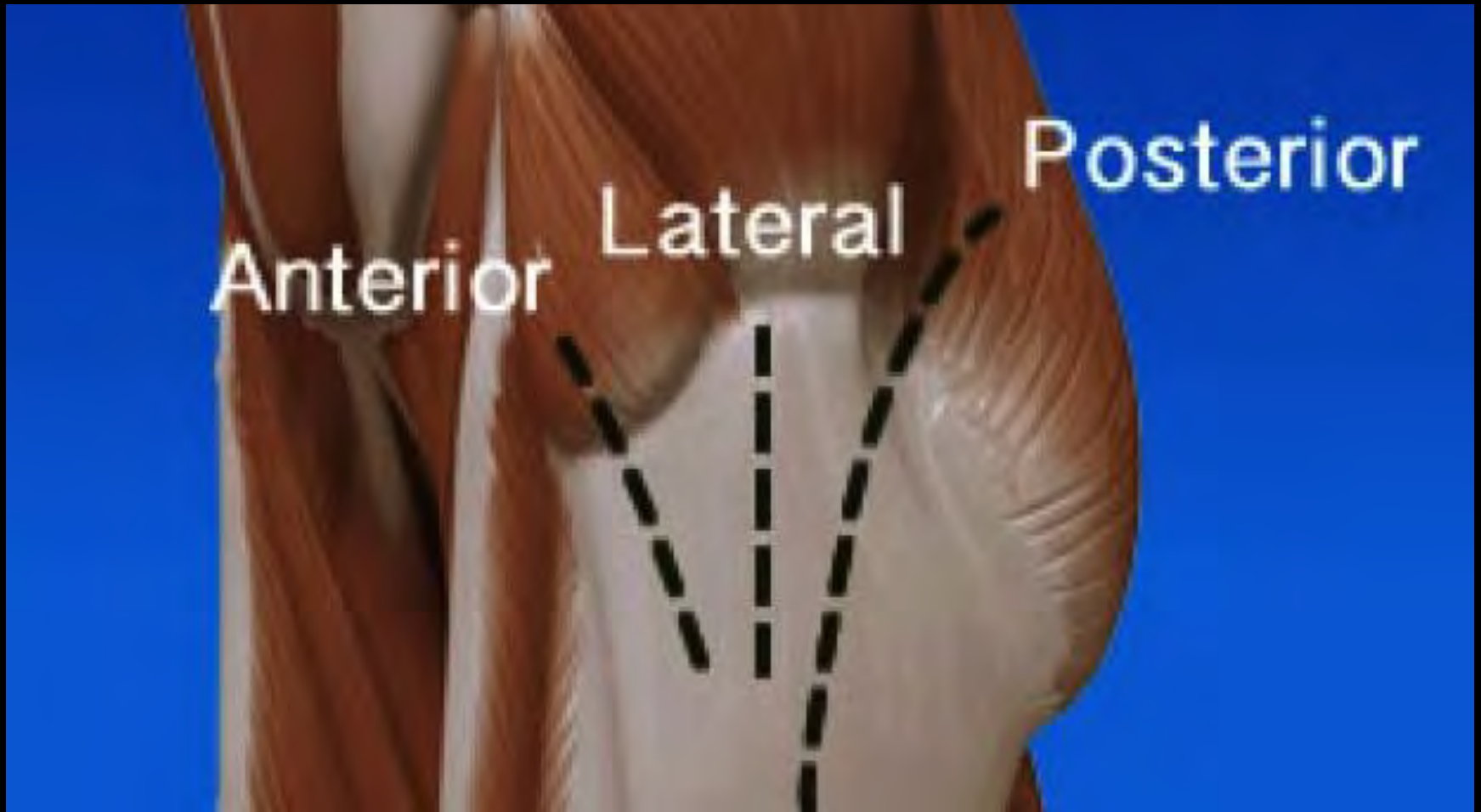


Function scores BHR vs THA

UCH score demonstrated a difference in function between BHR & THA groups



Compare Approaches

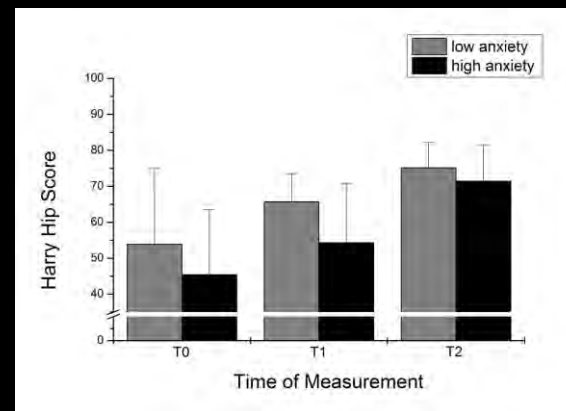
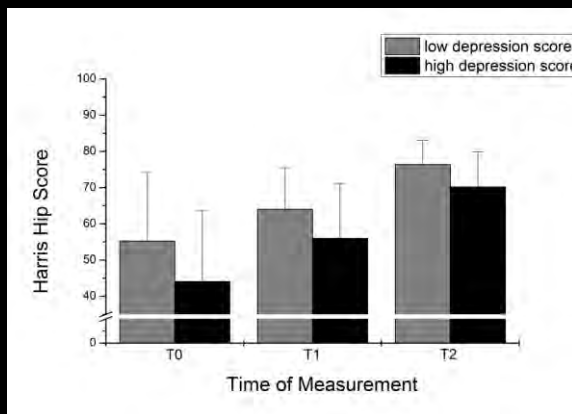


Compare Rehab protocols

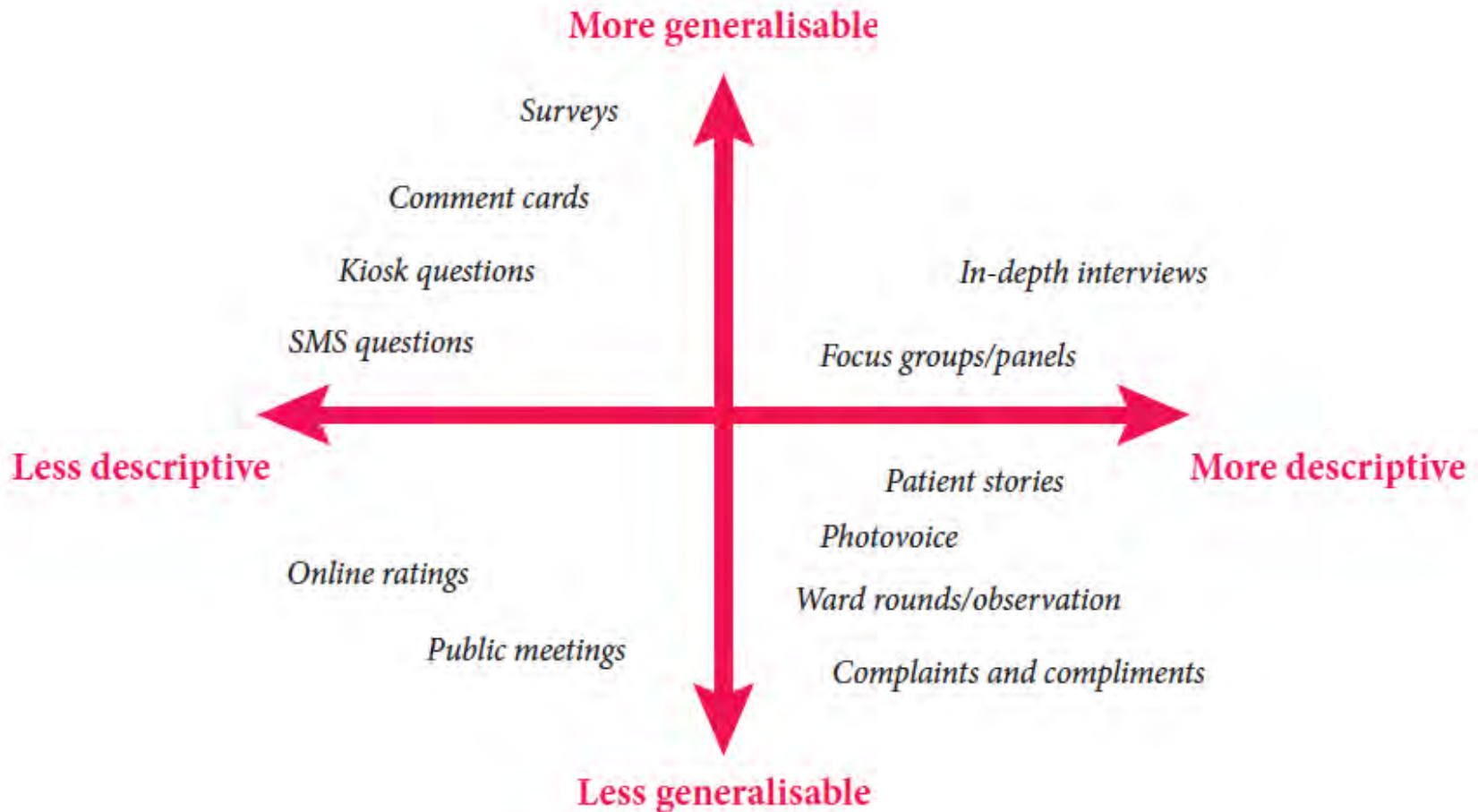


Psychosocial Health

- SF-12/36 vs function scores
- Decreased levels of depression and anxiety
 - Improved early THA function
 - Predicting early outcome after THA



Patient Experience



Conclusion

- Outcome Measures Evolving
- Subjective/ Objective/Functional/ & Beyond
- Compliment subjective and objective scores
- Beyond research tool

Chapter Title	Outcomes Assessment in Young Hip Disease	
Copyright Year	2014	
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Author	Family Name	Konan
	Particle	
	Given Name	Sujith
	Suffix	
	Division	Department of Orthopaedics and Trauma
	Organization	Chelsea and Westminster Hospital
	Address	London, UK

THANK YOU



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
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MILAN, ITALY



The Swindon Hip Complexity Score Validation

Kareem Elsorafy, Tamer Kamal, M Hassanein
Sunny Deo, Jan-Herman Kuiper



Why Another Classification ?



Introduction

- * No robust criteria to differentiate between performance of different hospitals.
- * Main target is to operate within 36 hours of admission.
- * Anaesthetists and scrub team are not trained to judge surgical complexity
- * Swindon stratifies care according to The Hip Complexity Classification

Aim

- ♦ The Aim was to validate the Swindon Hip fracture Classification System¹ which showed that mortality correlates with complexity at a local level.
- ♦ This was achieved by retrospectively classifying a cohort of patients from Leicester according to the SHCS and correlating the classification with mortality. Results were then used to validate the Swindon Hip Complexity System.

¹Elsorafy, Kareem, et al. "A Simple Classification System for Hip Fractures." Open Journal of Orthopedics 2014 (2014).

Hip Complexity Classification

- C0 → Well*; uncomplicated #
- C1 → Well*; complicated #
- C2 → Unwell*; uncomplicated #
- C3 → Unwell*; complicated #

*# multi-fragmentary unstable fracture patterns or pathologic fractures.
Locally, any other bone or soft tissue abnormality which Inc. the surgical time*

** Denotes medical fitness. “Unwell” currently defined as 1+ uncontrolled comorbidity, ASA ≥ 3 , ≥ 3 controlled comorbidity, MMTS ≤ 7*

Methods

354 consecutive hip fracture patients admitted to the Leicester Royal Infirmary were classified retrospectively according to the Hip Complexity Classification, and results compared with a cohort of 273 patients from The Great Western Hospital, Swindon.

Basic demographics were noted including sex, age, MTS

Outcomes measured were; Length of hospital stay, 30-day and 1-year mortality.

Outcome measures were gathered from prospective data submitted to National Hip Fracture database.

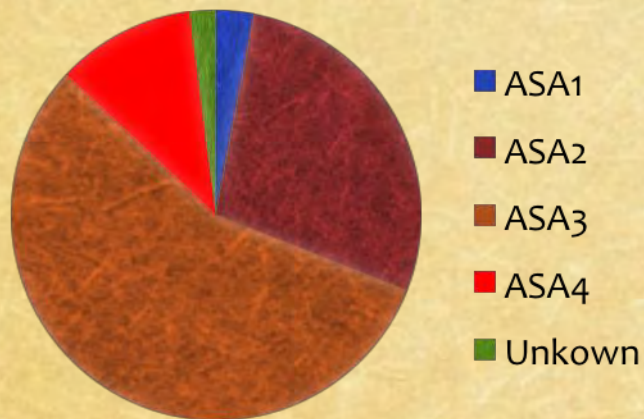
Logistic regression analysis for predictive value.

Demographics

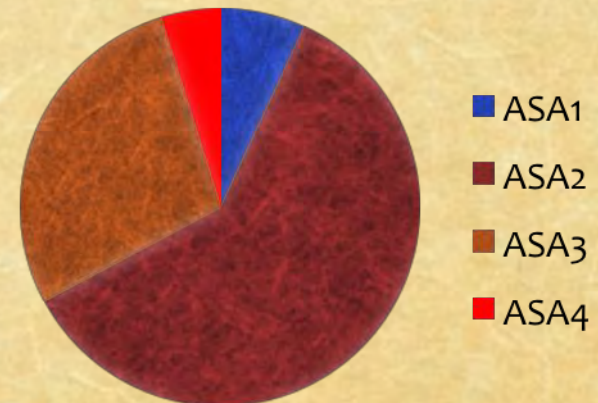
	Leicester	Swindon
• Females	76 %	80 %
• Mean Age	81.3 %	81.3 %

ASA Comparison

Leicester

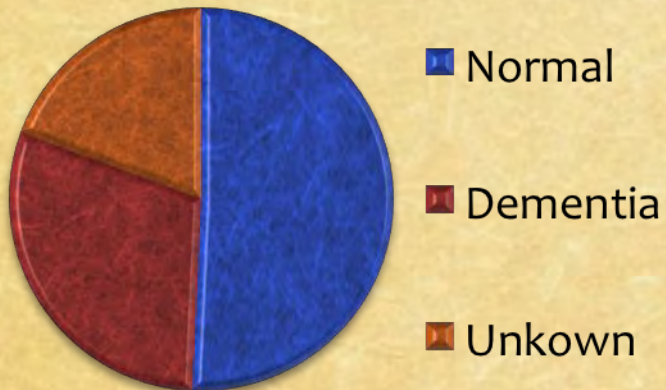


Swindon

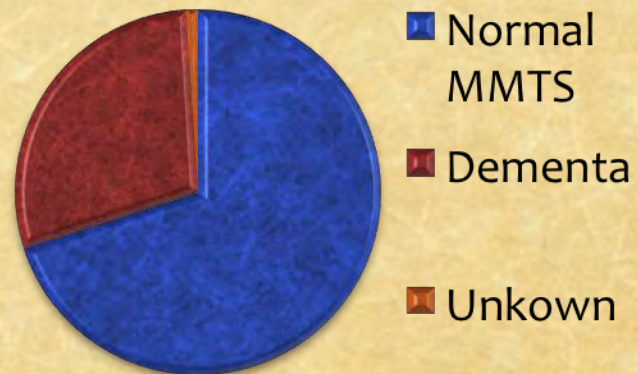


Preoperative MMTS

Leicester

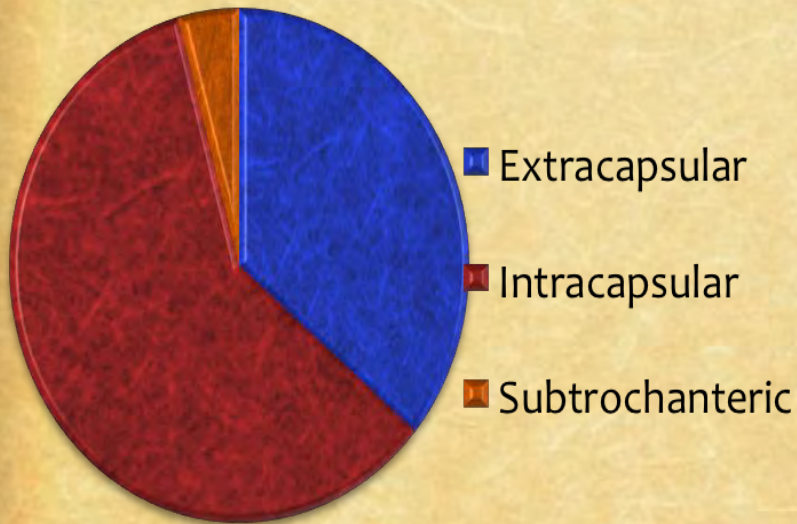


Swindon

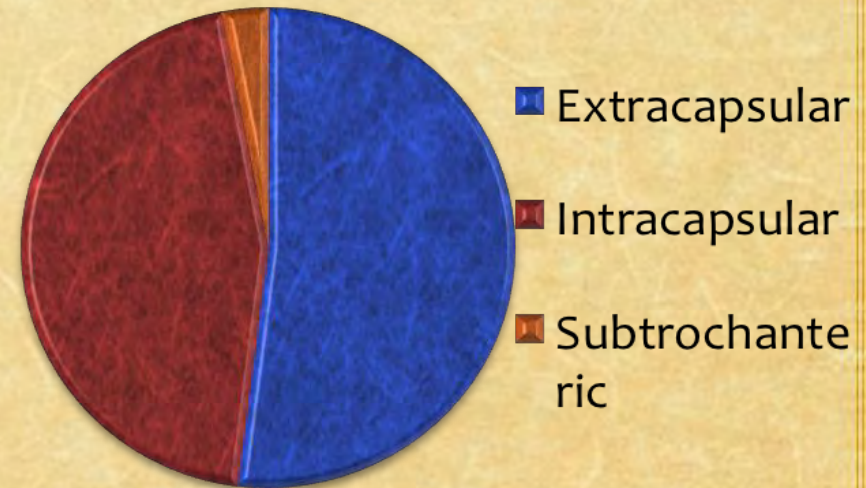


Fracture types

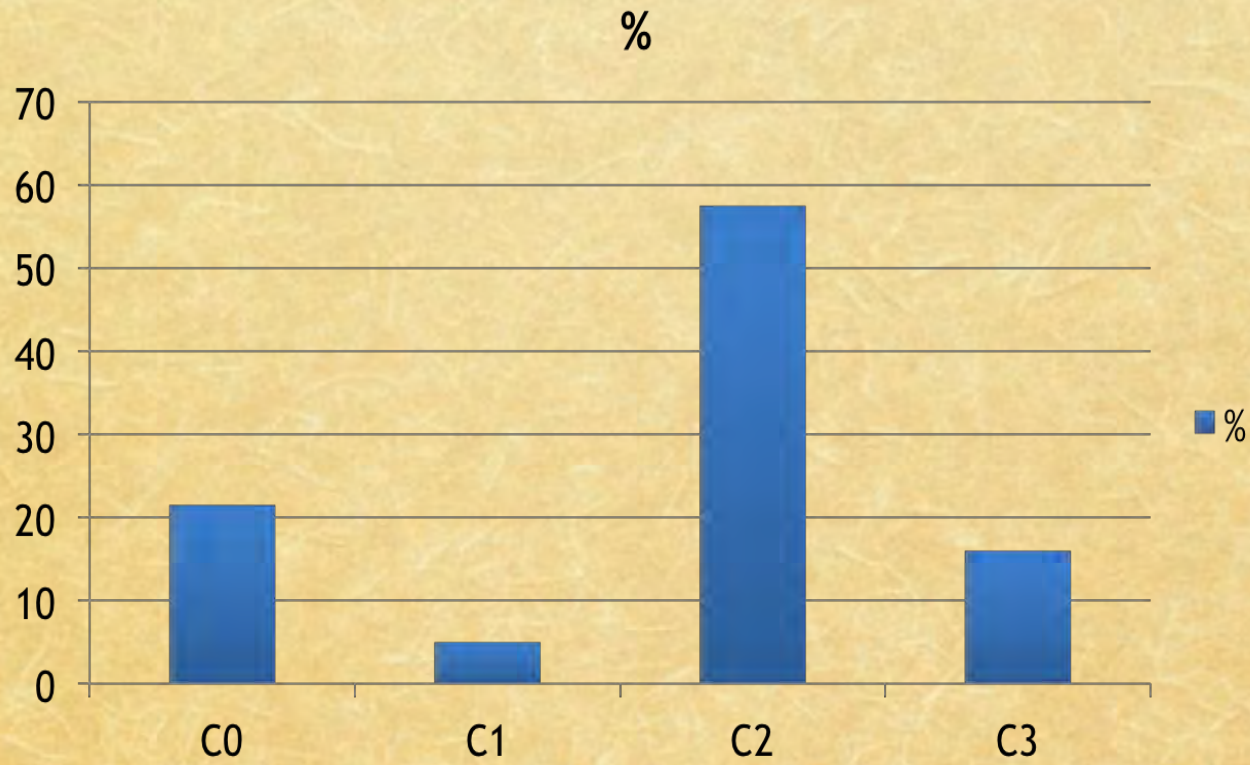
LRI



Swindon

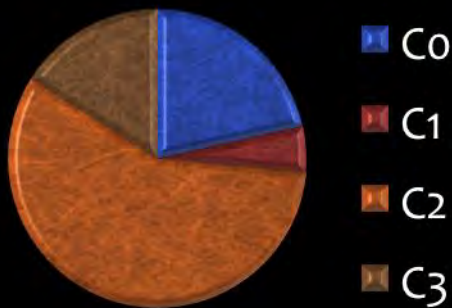


Leicester Complexity

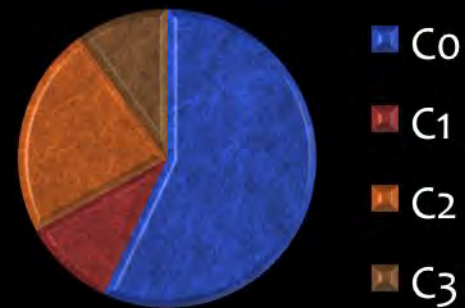


Complexity Comparison

Leicester



SWINDON



Mortality

Swindon

- ♦ 30 Day Mortality 4.4%
- ♦ 1 year mortality 20 %

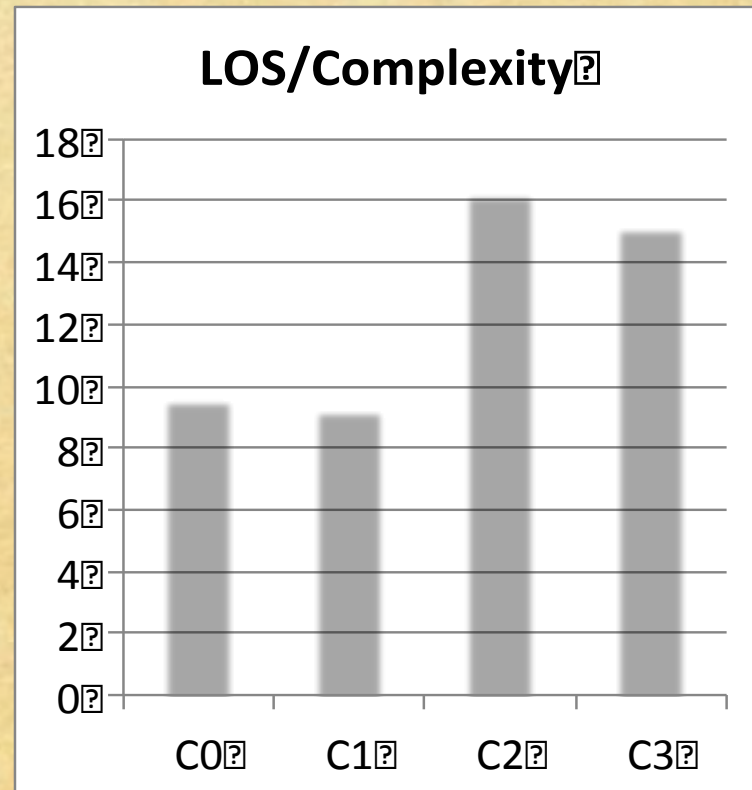
Leicester

- ♦ 30 Day Mortality 6.8%
- ♦ 1 Year Mortality 23.6%

In Swindon 67 % are C0-C1 compared to 26 % is the difference in mortality a coincidence ?

Length Of Stay

- ♦ Mean LOS for cohort 14.3
- ♦ Median 11
- ♦ Range 0-80
- ♦ ANOVA P -Value 0.001



Validation

- * Multi-logistic regression analysis on Swindon data to check for a predictive value.
- * For the 30-day mortality Age and Complexity were found to be the most significant variables with a concordance 0.74
- * For 1-year mortality Age, Male sex and Complexity were most significant $C=0.8$
- * Predictions were checked for Leicester with $C=0.73$ and 0.76 respectively

Conclusion

* To predict 30 day Mortality:

$$\text{Risk} = 0.04 * \text{Age} + 0.64 * \text{Complexity}$$

* To Predict 1-year mortality:

$$\text{Risk} = 0.08 * \text{Age} + \text{Male} + 0.78 * \text{Complexity}$$

Conclusion

- ♦ We can predict 30 and 1 year mortality with this model
- ♦ Easy Classification
- ♦ Helps stratify patient care
- ♦ Should expand use
- ♦ Possible comparison with Nottingham Hip score



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY





MRI evaluation as preoperative exam for predicting post-operative unsatisfactory results in patients with total hip arthroplasty

*"Sapienza" Università di Roma – II Facoltà di Medicina e Psicologia
Ospedale Sant'Andrea
Centro di Traumatologia dello Sport "Kirk Kilgour"*

***A. Vadalà, P. Serlorenzi, L. Proietti, R. Alonzo, P. Di Sette,
S. De Sanctis, C. D'Arrigo, A. Ferretti***



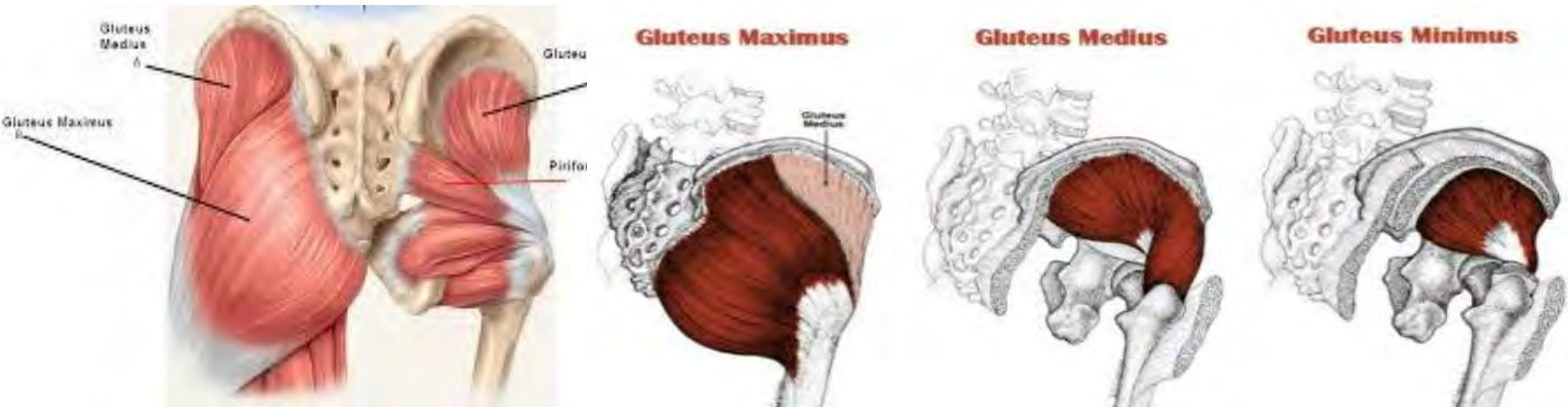
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**AZIENDA OSPEDALIERA
SANT'ANDREA**
FACOLTÀ DI MEDICINA E
PSICOLOGIA



INTRODUCTION

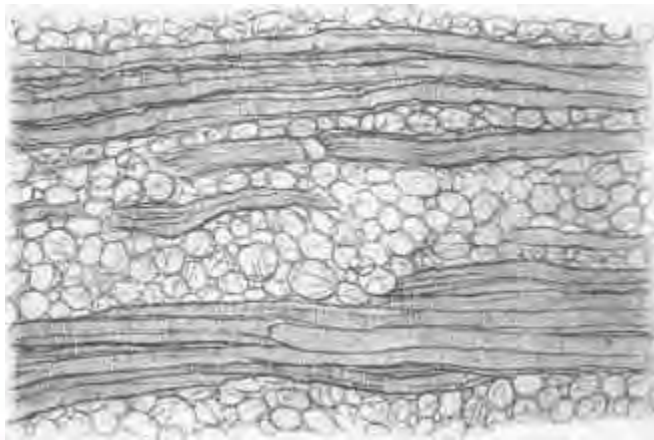
Gluteus muscle trophism is an important factor for satisfactory clinical outcome after total hip replacement.



INTRODUCTION

Fatty infiltration and tendon degeneration are very common in elderly patients

Their incidence may significantly affect clinical outcome after THR



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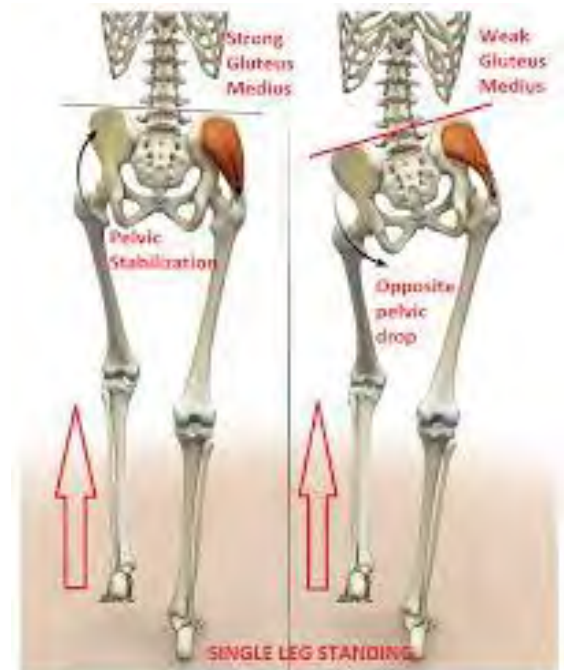
INTRODUCTION

The lack of assessing muscle gluteus degeneration prior to THR may create false expectations in terms of functional recovery

Gait symmetry



Trendelenburg limp



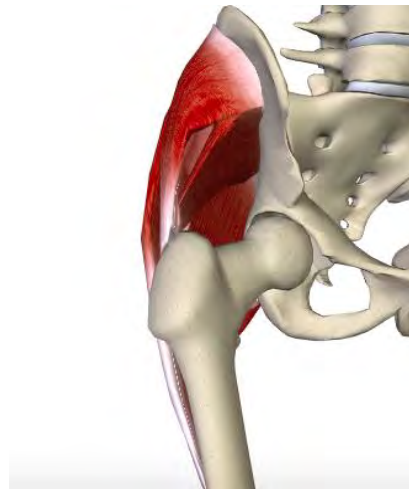
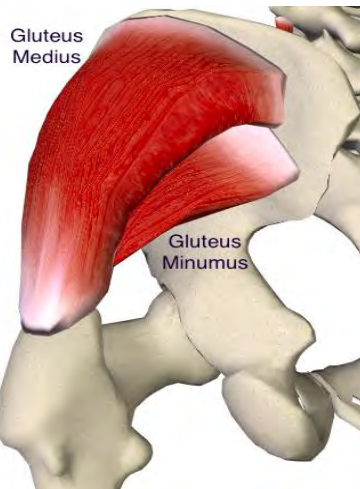
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INTRODUCTION

The aim of the study was to verify a correlation between preoperative amount of fat degeneration of the maximus, medius and minimus gluteus muscles and postoperative clinical outcome.



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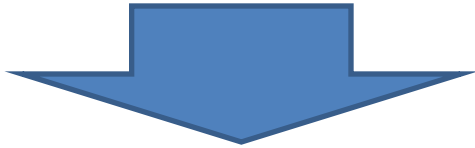
METHODS

- We prospectively followed-up 21 patients with primitive hip OA.
- Pre and post operative clinical examination (Oxford, WOMAC, Harris and HOOS scale).



METHODS

- Pre-operative MRI exam.



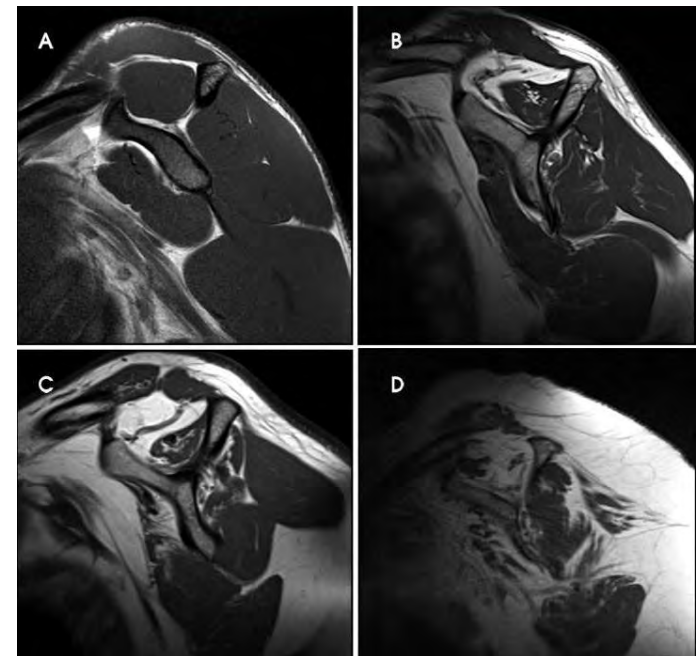
Fat degeneration of the maximus (MXG), medius (MDG) and minimus (MNG) gluteus muscles were classified according to Goutallier et al. and to the Quartile system proposed by Engelken et al.



METHODS

Goutallier classification system

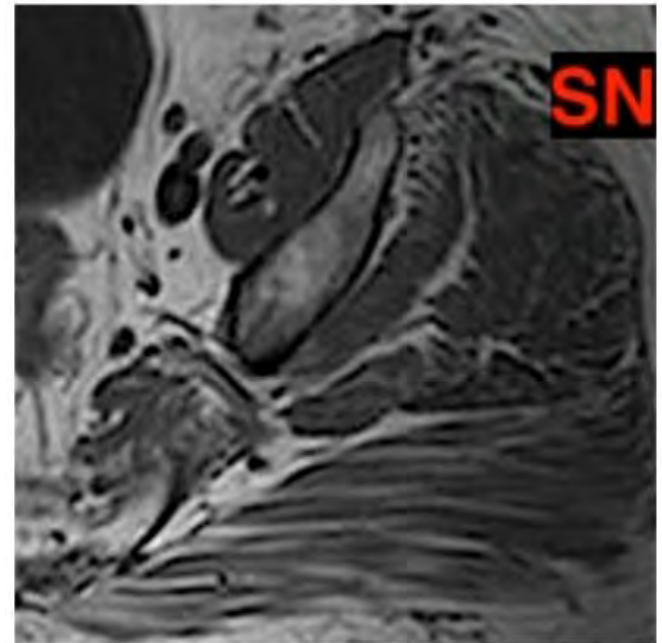
Grade	Amount of fat in muscle
Grade 0	Normal muscle
Grade 1	Muscle contains some fatty streaks
Grade 2	Fatty infiltration, but still more muscle than fat
Grade 3	Equal amount of fat and muscle
Grade 4	More fat than muscle



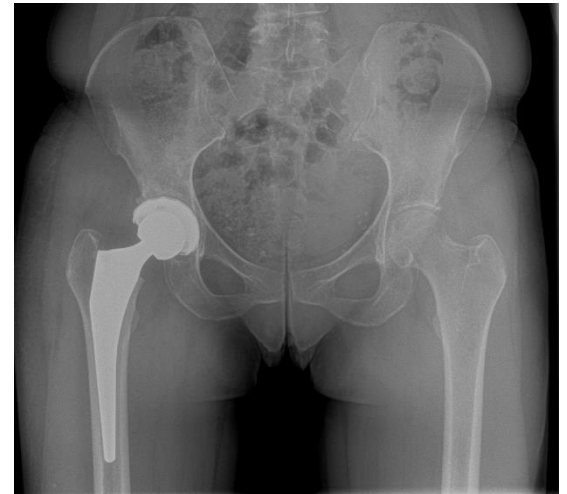
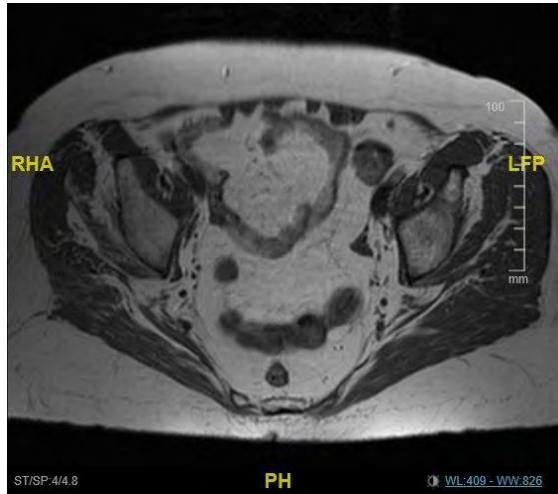
METHODS

Quartile classification system

Grade	Percentage of fat in muscle
Grade 0	Normal muscle
Grade 1	Amount of fat 1-25%
Grade 2	Amount of fat 25-50%
Grade 3	Amount of fat 50-75%
Grade 4	Amount of fat 75-100%



METHODS



Inclusion criteria: primitive OA
minimum follow-up of 12 months

Exclusion criteria: patients with contralateral affections
patients with systematic diseases (RA, Lupus)

RESULTS

All patients were followed-up at 12 months after surgery

Evaluation scales	pre-op	post-op	<i>p</i>
HHS	43	89	0,01
WOMAC	36,2	85,5	0,01
Oxford	18	41	0,01
HOOS	41,2	85,9	0,01



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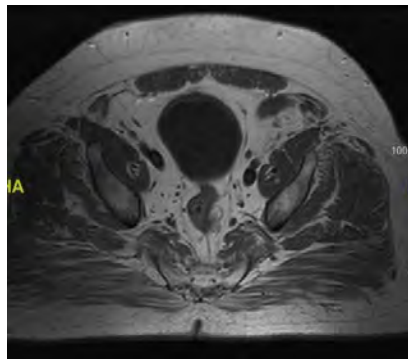
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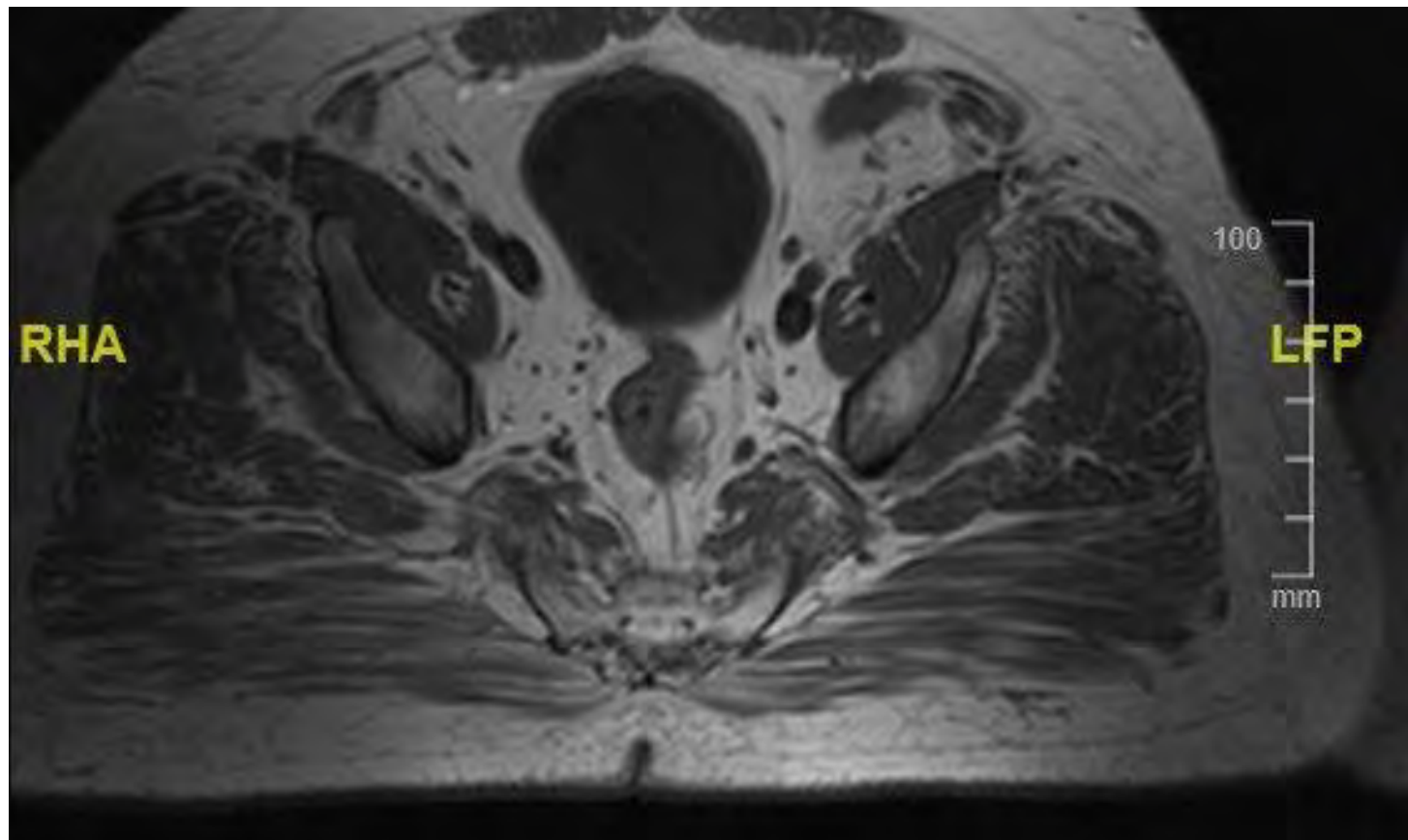
RESULTS

All patients were followed-up at 12 months after surgery

	Goutallier		p	Quartile		p
	Affected side	Healthy side		Affected side	Healthy side	
MNG	1,18	1,27	<0.05	1,18	1,27	<0.05
MDG	1,18	1	<0.05	1,09	0,9	<0.05
MXG	2	1,9	>0.05	1,81	1,81	>0.05



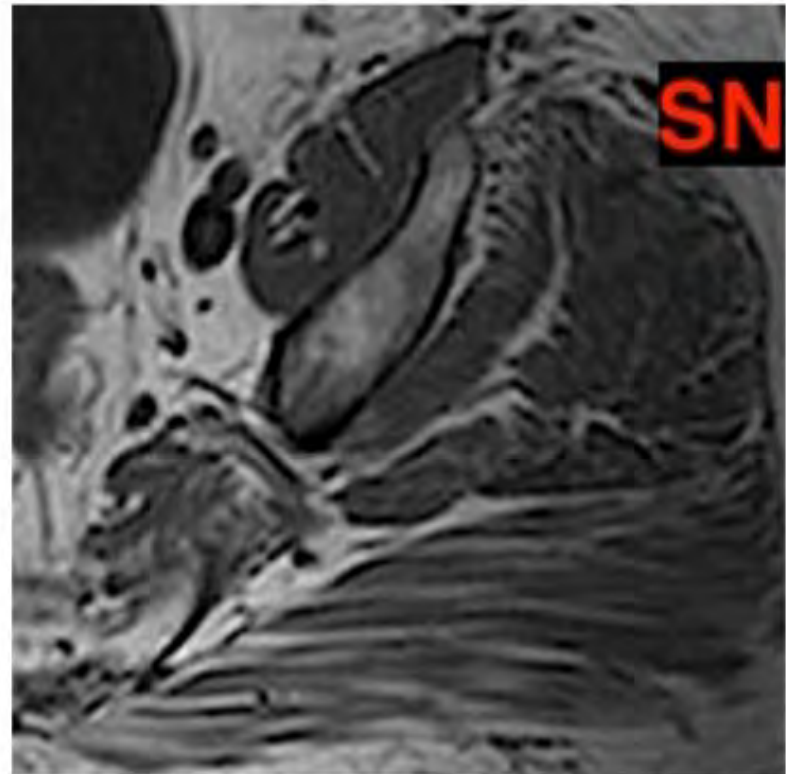
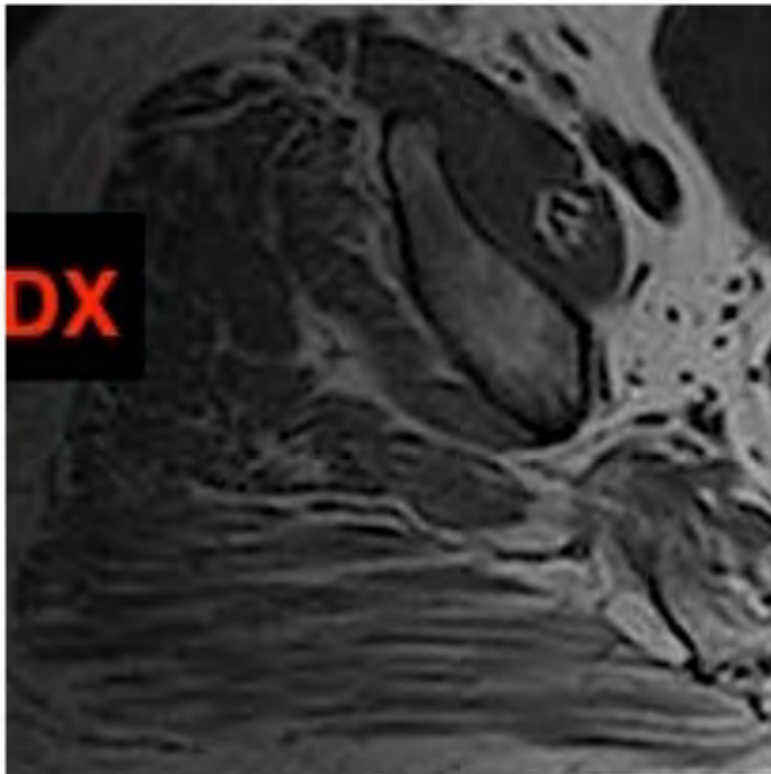
RESULTS



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RESULTS



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RESULTS

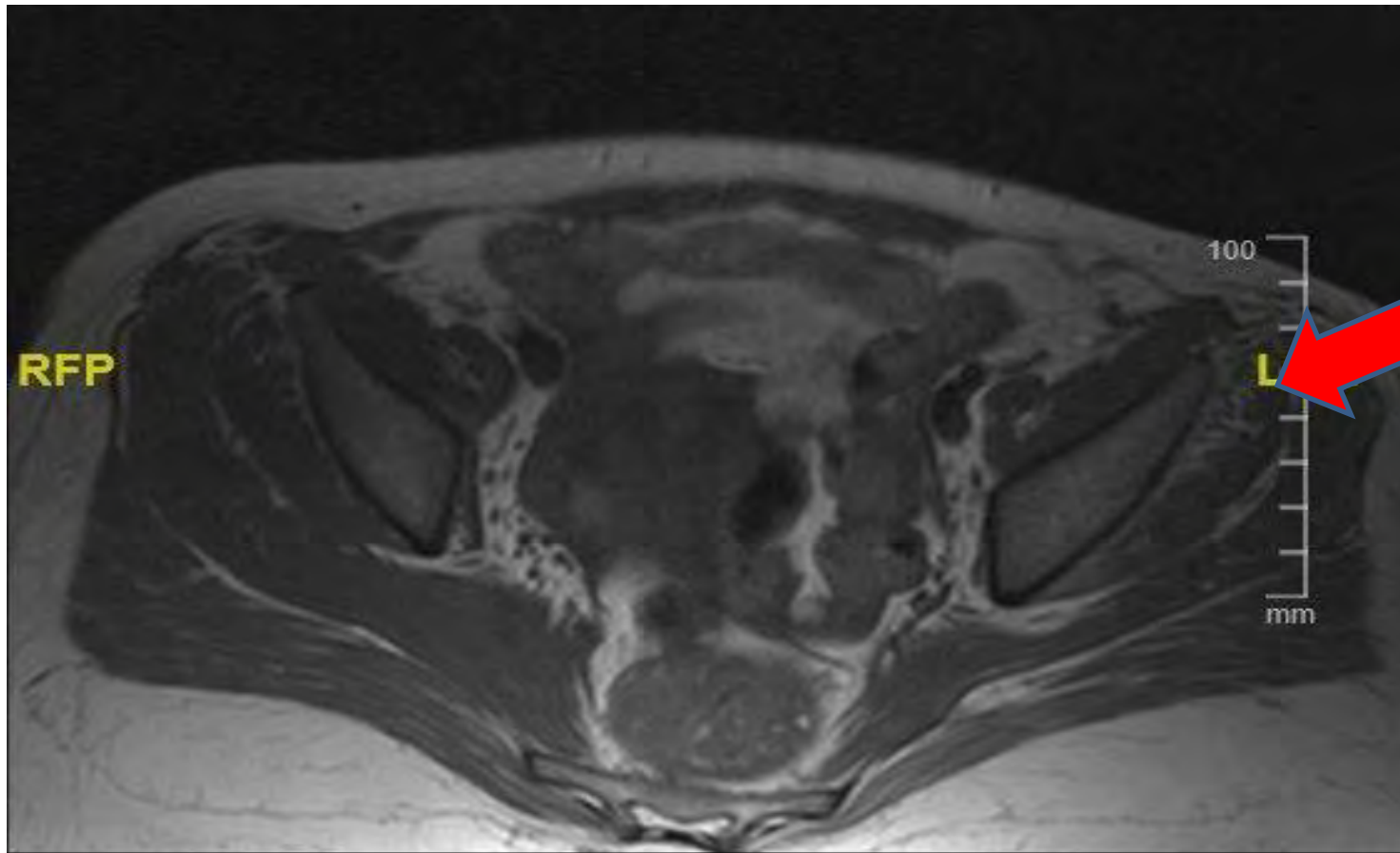
- Pearson's coefficient evaluation showed a moderate linear correlation between values of preoperative fat degeneration and clinical results according to all the evaluation scales used ($\rho_{xy} > 0$) in regard to

MNG ($p: 0.4$) and MDG ($p: 0.5$),

while an inverse correlation ($p: -0.9$) was found in regard to MXG



DISCUSSION



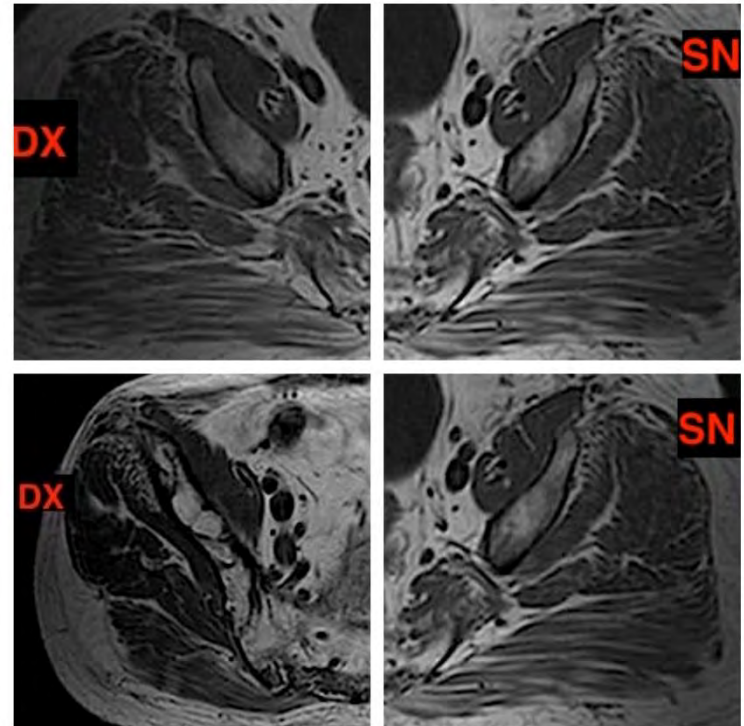
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CONCLUSION

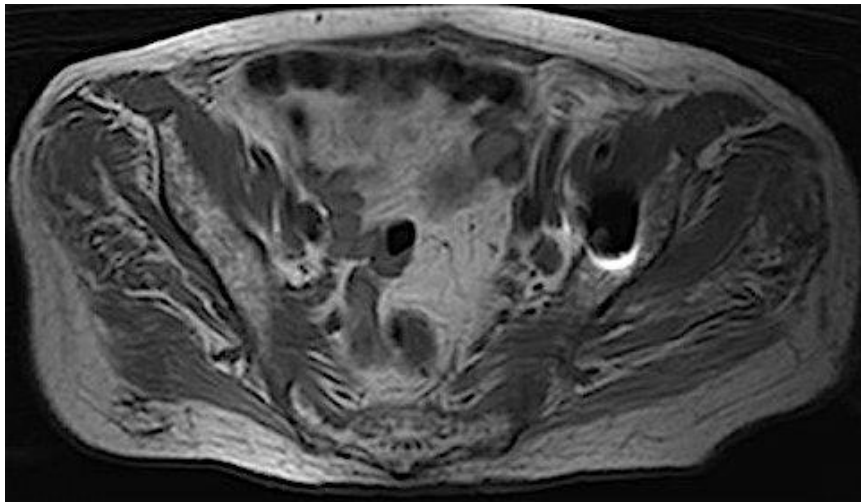
Maximus gluteus is the first muscle to start suffering from fat degeneration in hip arthritis.

A severe fatty infiltration is present in 80% of patients undergoing hip replacement



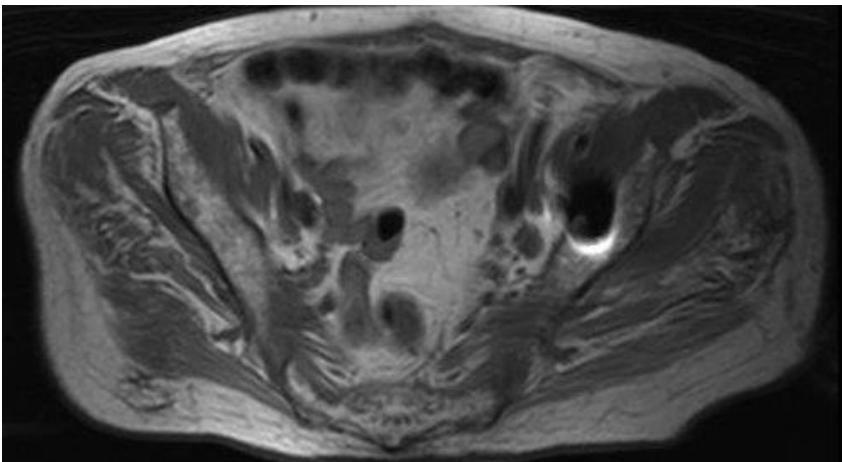
CONCLUSION

Persistent limping is more frequent in patients with higher preoperative fat infiltration in **Medius Gluteus**, suggesting that this muscle is the most involved in determining post-operative persistence of gluteal insufficiency.



CONCLUSION

Preoperative MRI evaluation of gluteus fatty infiltration seems to provide important data for future clinical outcomes and postoperative potential limping



CONCLUSION

*Acta
Orthopaedica*

Outcome of total hip arthroplasty, but not of total knee arthroplasty, is related to the preoperative radiographic severity of osteoarthritis.

Tilbury C et al, Acta Orthop., Oct 2015

“The decrease in pain and improvement in function in THA patients was positively associated with the preoperative radiographic severity of OA”.



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Thank you



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INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY





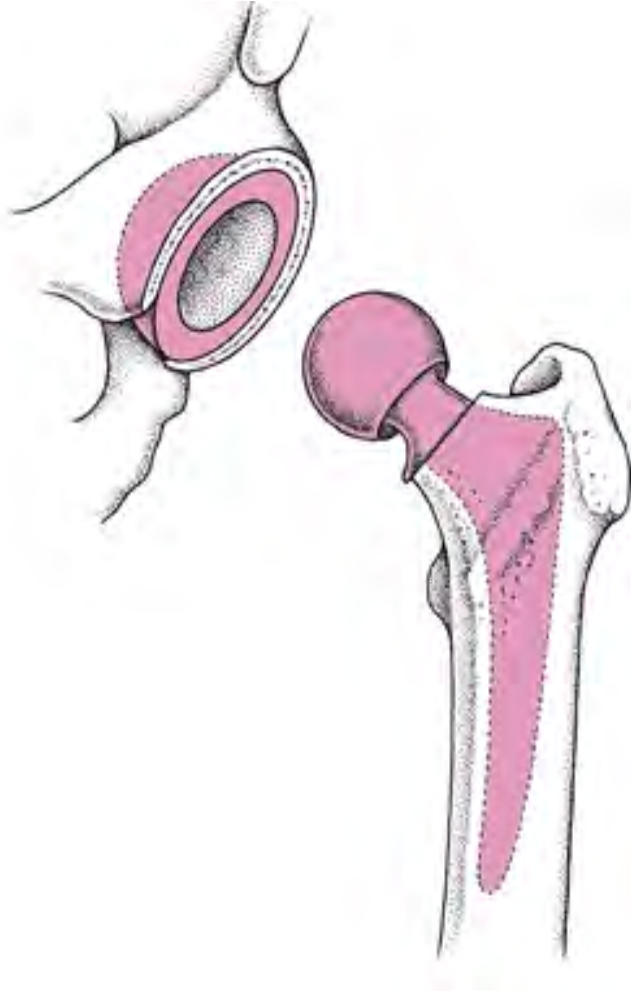
INTERNATIONAL COMBINED MEETING
BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

**ITALIAN VERSION OF UCLA ACTIVITY SCORE:
TRANSLATION AND CROSS-CULTURAL
ADAPTATION**

A. Calistri, L. Di Martino, **M.D. Gurzi**, M.Bove, K. De
Smet, C.Villani.

26-27 NOVEMBER 2015 MILAN, ITALY

Introduction



**WOMAC
&
HHS**



**JOINT PAIN
& FUNCTION**

**Which the level of physical activity can the patient
attain ?**

**Could the patient return to high performance
activity and sports ???**

UCLA activity score

The Aim Of Our Study



UCLA Activity Score	Hip ID: _____
	Study Hip: <input type="checkbox"/> Left <input type="checkbox"/> Right
	Examination Date (MM/DD/YY): / /
	Subject Initials: / /
	Medical Record Number: _____

Interval: _____

Check one box that best describes current activity level.

- ☐ 1: Wholly Inactive, dependent on others, and can not leave residence
- ☐ 2: Mostly Inactive or restricted to minimum activities of daily living
- ☐ 3: Sometimes participates in mild activities, such as walking, limited housework and limited shopping
- ☐ 4: Regularly Participates in mild activities
- ☐ 5: Sometimes participates in moderate activities such as swimming or could do unlimited housework or shopping
- ☐ 6: Regularly participates in moderate activities
- ☐ 7: Regularly participates in active events such as bicycling
- ☐ 8: Regularly participates in active events, such as golf or bowling
- ☐ 9: Sometimes participates in impact sports such as jogging, tennis, skiing, acrobatics, ballet, heavy labor or backpacking
- ☐ 10: Regularly participates in impact sports



UCLA Activity Score

Paziente ID: _____
 Lato: ☐ Sinistro ☐ Destro
 Data Esame (GG/MM/AA): / /
 Iniziali Paziente: / /
 Numero di Registrazione Pz: _____
 FOLLOW-UP: _____

Contrassegnare la casella che meglio descrive il livello di attività attuale.

- 1 Totalmente inattivo, dipendente dagli altri, e non può lasciare la propria abitazione
- 2 Per lo più inattivo o limitato alle attività minime della vita quotidiana.
- 3 A volte partecipo alle attività fisiche modeste, come camminare, lavori domestici limitati e fare shopping limitato.
- 4 Regolarmente partecipa ad attività fisica modesta.
- 5 A volte partecipa ad attività fisiche moderate come il nuoto o fare i lavori domestici o fare shopping senza limiti.
- 6 Regolarmente partecipa ad attività fisiche moderate
- 7 Partecipa regolarmente ad attività come andare in bicicletta.
- 8 Partecipa regolarmente ad attività, come il golf o il bowling.
- 9 A volte partecipa a sport di impatto, come jogging, tennis, sci, acrobazie, danza, lavori pesanti o zaino in spalla.
- 10 Regolarmente partecipa a sport di contatto.

Patient Selection



- ✓ MAN
- ✓ OSTEOARTHRITIS
- ✓ < 65 YEARS
- ✓ HIGH ACTIVITY DEMAND



Our Study Sample



201
0



201
2

- ✓ PROSPECTIVE STUDY
- ✓ CONSERVE PLUS RHA
- ✓ POSTERO – LATERAL APPROACH

Variabile	Pazienti
Pazienti	65
Age range (years)	39-70
Mean age(anni)	54,5
gender	Male
BMI range	19,3-32,3
Mean BMI	26,7
Follow-up Range- follow-up	0-24 (3.76)
Diagnosi	
O.A	46
DDH	7
Perthes	3
AVN	4
Epyfisiolysis	5



Fast- track recovery

Days of hospitalization range 2-5 days

Patients who were admitted in a post-operation rehabilitation center = 1/65

Need for trasfusion = 2 patients received 1 unit of blood

No complications overall

Same rehabilitation protocol



Material And Methods



"SAPIENZA" UNIVERSITÀ DI ROMA
DIPARTIMENTO SCIENZE DELL'APPARATO LOCOMOTORE
ORTOPEDIA E TRAUMATOLOGIA EACOS
SERVIZIO ANCA

DATA: _____
NOME: _____
COGNOME: _____
DATA DI NASCITA: _____
PESO: _____
ALTEZZA: _____
NO. CARTELLA CLINICA: _____
DATA DI RICOVERO: _____
PATC: _____
TIPO: _____
DATI: _____
QUE: _____
S.A. _____

QUESTIONARIO SULLO STATO DI SALUTE

Il Questo questionario intende valutare con Lei prima della Sua salute. Le informazioni fornite di essere sempre aggiornati su come si sente e su come riesce a svolgere le Sue attività.

Si domanda del questionario indicando la Sua risposta come momento di volta in volta della risposta, effettuata la scelta che comunque Le sembra migliore.

che la Sua salute è:

1/2	1/3	1/4	1/5
Molto buona	Buona	Passabile	Scadente

alcune attività che potrebbe svolgere nel corso di una qualsiasi giornata, e nello svolgimento di queste attività?

SI, nel limite possibile	SI, nel limite parzialmente	NO, non nel limite per nulla
1/1	1/2	1/3
1/1	1/2	1/3

richiedi sul lavoro o nelle altre attività quotidiane, a

SI	NO
1/1	1/2
1/1	1/2

questionario WOMAC:

zioni.

7. Segue il riferimento alla quantità di dolore che prova attualmente a causa anca.

ne elencata descriva il grado di dolore provato cerchiando il numero appropriato.

	Nessuno	Lieve	Medio	Forte	Fortissimo
1. In movimento	1	2	3	4	5
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3. Al mattino	1	2	3	4	5
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de una sensazione di restrizione o maggiore lentezza nel muovere l'anca.

mate descriva il grado di rigidità cerchiando il numero appropriato.

	Nessuno	Lieve	Medio	Forte	Fortissimo
5. In movimento	1	2	3	4	5
6. In quiete	1	2	3	4	5

sono fanno riferimento alla sua funzione fisica.

intende la capacità di muoversi ed essere autosufficiente.

azioni elencate descriva il grado di difficoltà provata il numero appropriato.

	Nessuno	Lieve	Medio	Forte
7. In movimento	1	2	3	4
8. In quiete	1	2	3	4
9. Al mattino	1	2	3	4
10. Al sera	1	2	3	4

UCLA Activity Score

Contrassegnare la casella che meglio descrive il livello di attività attuale.

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UC active score

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1/1	1/2	1/3

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1/1	1/2

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1/1	1/2

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UC active score

Material & Methods



J Clin Epidemiol. 2013 Sep 28. pii: S0895-4356(13)00305-3. doi: 10.1016/j.jclinepi.2013.07.013. [Epub ahead of print]

Cross-cultural adaptation of the Health Education Impact Questionnaire: experimental study showed expert committee, not back-translation, added value.

Epstein J¹, Osborne RH, Elsworth GR, Beaton DE, Guillemin F.



CROSS-CULTURAL ADAPTATION AND
TRANSLATION WAS PRODUCED AS
RECOMMENDED BY THE WHO AND FOLLOWING
GUILLEMIN AND BEATON CRITERIA

Material & Methods



2 PROFESSIONAL
TRANSLATORS



(**FORWARD TRASLATIONS**)



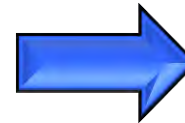
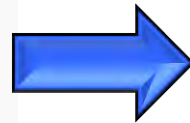
BACK TRANSLATION

EXPERT COMMITTEE

S

RESOLVE
ANY
DISCREPANCIES

S



UCLA Activity Score

Paziente ID: _____

Lat 1 2 Sinistro Destro

Data Esame (GG/MM/AA): _____

Iniziali Paziente: _____

Numero di Registrazione Pz: _____

FOLLOW-UP: _____

Contrassegnare la casella che meglio descrive il livello di attività attuale.

- 1 Totalmente inattivo, dipendente dagli altri, e non può lasciare la propria abitazione
- 2 Per lo più inattivo o limitato alle attività minime della vita quotidiana.
- 3 A volte partecipo alle attività fisiche modeste, come camminare, lavori domestici limitati e fare shopping limitato.
- 4 Regolarmente partecipo ad attività fisica modesta.
- 5 A volte partecipo ad attività fisiche moderate come il nuoto o fare i lavori domestici o fare shopping senza limiti.
- 6 Regolarmente partecipo ad attività fisiche moderate
- 7 Partecipo regolarmente ad attività come andare in bicicletta.
- 8 Partecipo regolarmente ad attività, come il golf o il bowling.
- 9 A volte partecipo a sport di impatto, come jogging, tennis, sci, acrobazie, danza, lavori pesanti o zaino in spalla.
- 10 Regolarmente partecipo a sport di contatto.

UCLA Activity Score

Paziente ID: _____

Lafo: ☐ Sinistro ☐ Destro

Data Esame (GG/MM/AA): / /

Iniziali Paziente:

Numero di Registrazione Pz: _____

FOLLOW-UP: _____

Contrassegnare la casella che meglio descrive il livello di attività attuale.

- 1 Totalmente inattivo, dipendente dagli altri, e non può lasciare la propria abitazione.
- 2 Per lo più inattivo o limitato alle attività minime della vita quotidiana.
A volte partecipa alle attività minime in casa, come camminare, lavori domestici limitati e fare shopping limitato.
- 4 Regolarmente partecipa ad attività fisica modesta.
- 5 A volte partecipa ad attività fisiche moderate come il nuoto o fare i lavori domestici e fare shopping moderati.
- 6 Regolarmente partecipa ad attività fisiche moderate.
Partecipa regolarmente ad attività come andare in bicicletta.
- 8 Partecipa regolarmente ad attività come il golf o il bowling.
- 9 A volte partecipa a sport di impatto, come jogging, tennis, sci, acrobazie, danza, lavori pesanti o zaino in spalla.
- 10 Regolarmente partecipa a sport di contatto.

Is the questionnaire we produced valid ?

Is the questionnaire construct coherent?

What is the efficiency of our questionnaire when compared to other questionnaires already in use?

Reliability

Reproducibility
Internal consistency

Validity

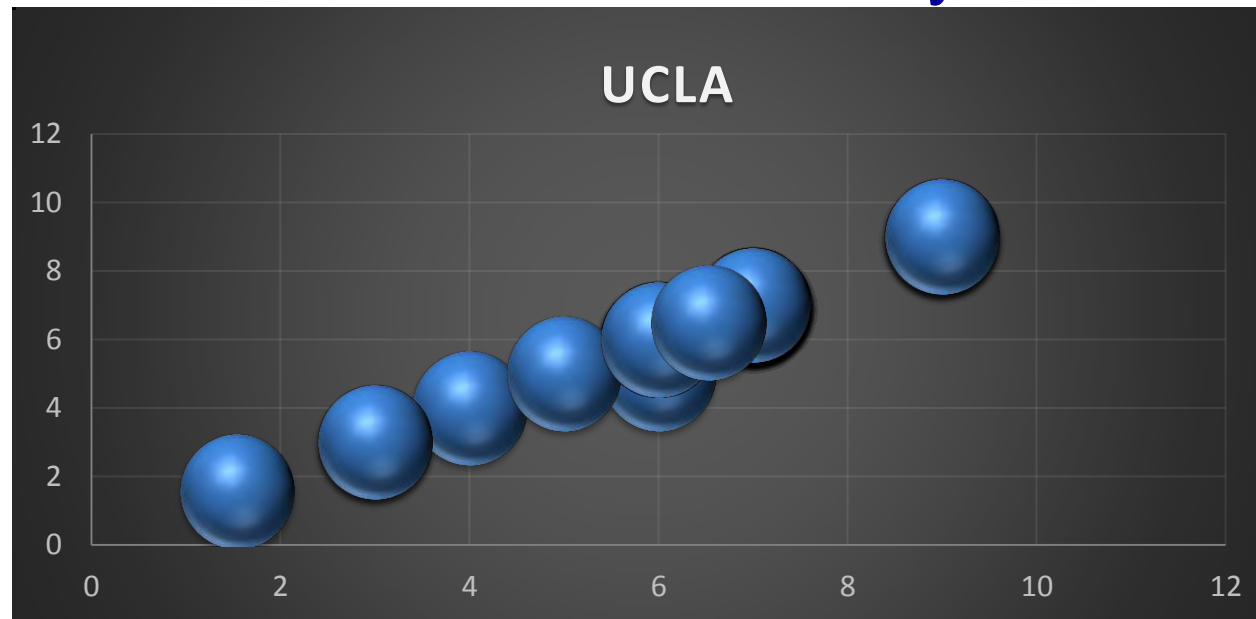
Construct validity
Responsiveness



Reproducibility



test-retest reliability



intra-class correlation coefficient (ICC)

ICC coefficient							
Misure medie	I.C.C.	C.I. 95%		Test F con il valore 0 Vero			
		lower	higher	value	df1	df2	Sig
	,997	,994	,999	344,543	35	35	,000

Internal Consistency



UCLA Activity Score

Paziente ID: _____

Left / ☐ Score ☐ Date _____

Data (name OGUMMA) _____

Intervista Paziente (_____) _____

Numero di Registrazione Pt: _____

FOLLOW UP: _____

Contrassegnare la casella che meglio descrive il livello di attività attuale.

1. Totalmente passivo, dipendente dagli altri, e non può lasciare la propria abitazione.
2. Per lo più inattivo o limitato alle attività minime della vita quotidiana.
3. A volte partecipa alle attività fisiche moderate, come camminare, lavori domestici limitati e fare shopping limitato.
4. Regolarmente partecipa ad attività fisica moderata.

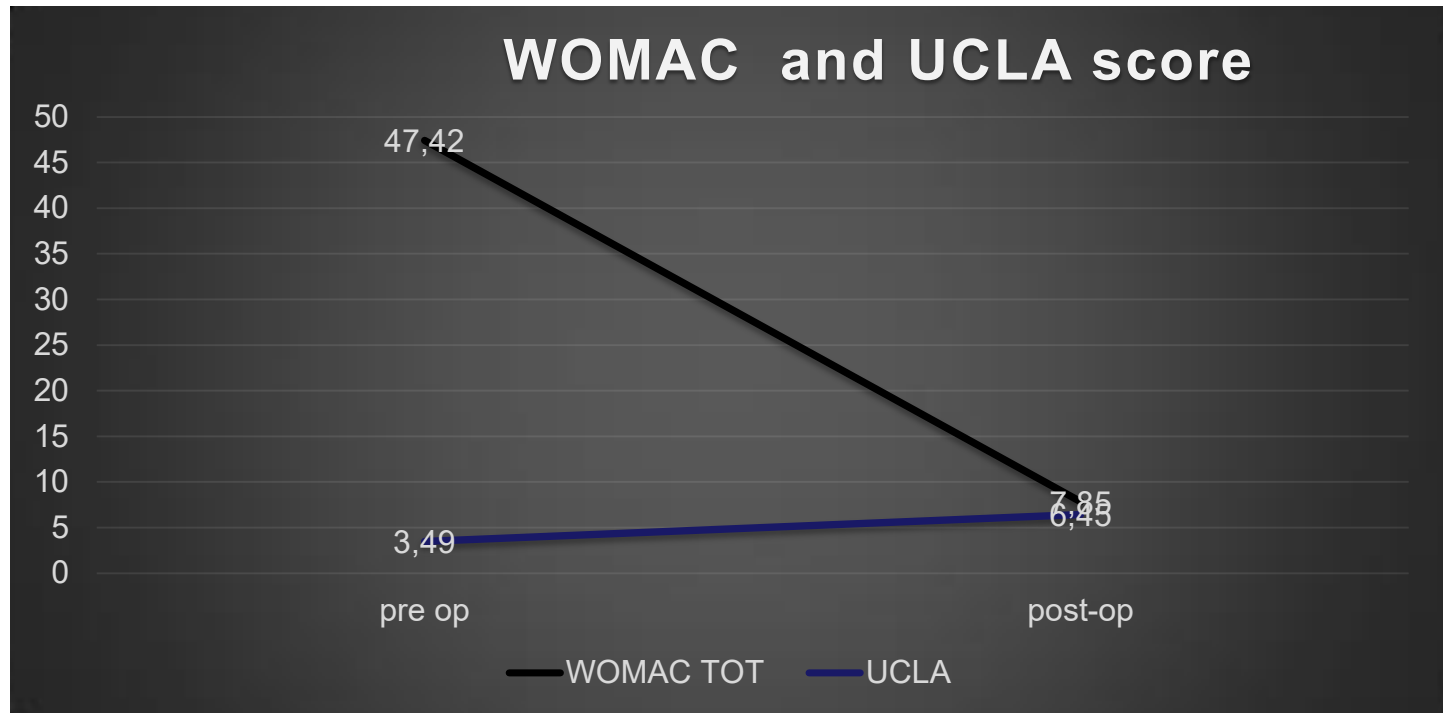
Cronbach's Alfa	Cronbach's Alfa on standardized items	N of item
,997	,997	2

9. A volte partecipa a sport di impatto, come jogging, tennis, sci, acrobazie, danza, lavori pesanti o zaino in spalla.

10. Regolarmente partecipa a sport di contatto.



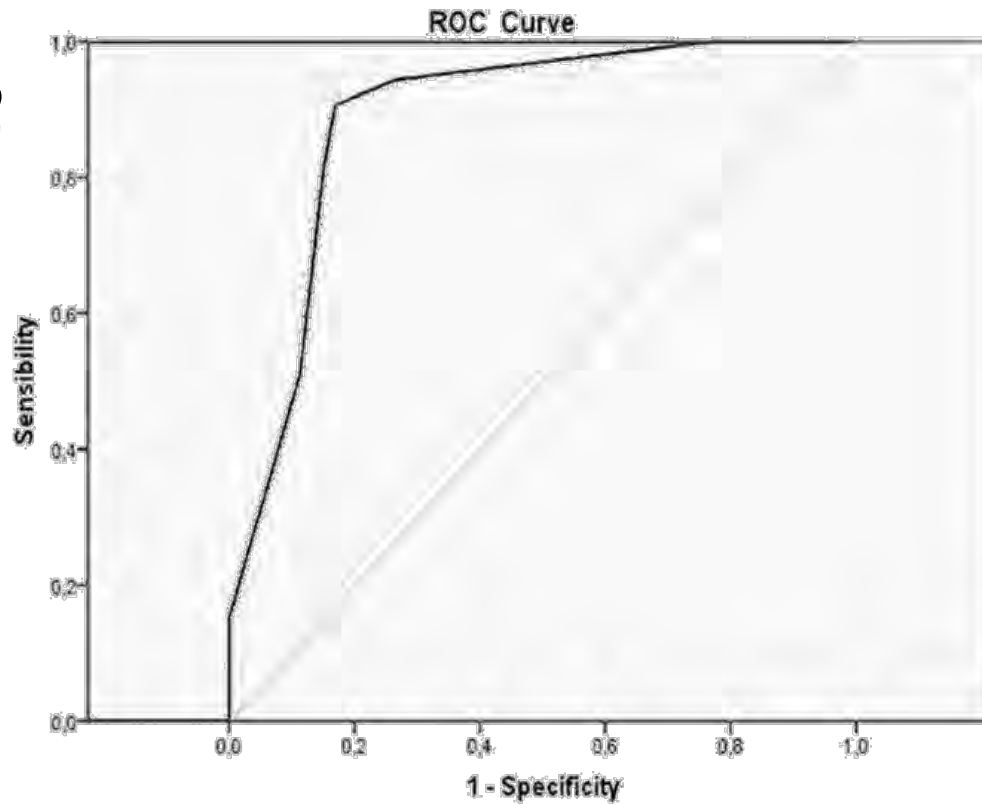
Construct Validity



		womac pain	womac STIFF	womac func	womac tot	HHS	OXFOR D	VAS	PCS 12	MCS12
UCLA	Pearson correlation	-,458	-,277	-,595	-,619	,379	-,488	-,334	,345	,368
	P value	,001	,059	,000	,000	,009	,001	,022	,018	,011
	N	65	65	65	65	65	65	65	65	65

$$ES = 0.705$$

AUC (UCLA) = 0.899
(95% CI: 0.83, 0.92)



AUC (WOMAC) = 0.983
(95% CI: 0.99, 0.1)

ROC curve Between our version of UCLA activity score and WOMAC PRE-OP E 3 MM POST-OP

Discussion



- ✓ OUR VERSION OF THE UCLA ACTIVITY SCORE IS A **SIMPLE, REPRODUCIBLE AND VALID TOOL FOR ASSESSING THE RETURN TO PHYSICAL ACTIVITY AND SPORTS**
- ✓ IT MEETS **EXPECTATIONS AND CONCERNS** OF **YOUNGER AND MORE ACTIVE PATIENTS**
- ✓ IT IS **IN COMPLIANCE WITH THE INTERNATIONAL SCIENTIFIC COMMUNITY**



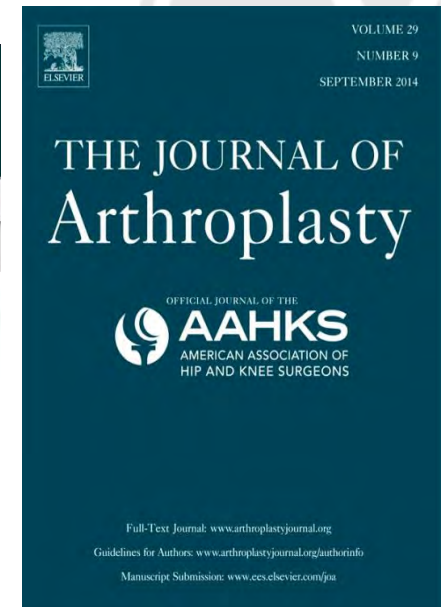
Conclusion



**LACK OF FEMALE
PATIENTS
STRICT PROCEDURE
GOOD SAMPLE FOR SIZES
CONSISTENCY AS AGE AND
TREATMENT**



**↓ BIAS
RISK**



**LEVELS OF RELIABILITY AND VALIDITY COMPARABLE TO THE ENGLISH
VERSION**

THANKS FOR THE ATTENTION





INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY



The Relationship Between Patient Educational Attainment and Total Hip Arthroplasty Outcome

Luke Conway, Wei Leong, Nicola Goodson, Nancy Prospero, Janardhan Rao



Background

- Hip arthroplasty = common!
- 83,125 in 2014
- Socioeconomic factors affect outcomes

Method

- Questionnaire
- Demographics, comorbidity, OHS
- Census data
- Educational attainment
- Index of multiple deprivation
- Association between EST and outcome

Method

- Tertiles of relative EST
- Pre-op Oxford Hip Scoring
- 6 months post-op OHS
- Improvement ≥ 5 points
- Any decrease in Oxford score

Method

- Logistic regression
- Multivariate models
- Adjusted for pre-op OHS
- Adjusted for comorbidity

Results: Demography

- 2010-2014
- 8,251 patients
- Mean age 69 (SD 9.9)
- 43% Male

Results: Univariate Analysis

Oxford Score Increases ≥ 5 Points

		Age- and Gender-Adjusted		
EST Category		OR _{adj}	95% CI	
Highest	1	1.00	1.00	1.00
	2	0.80	0.64	1.00
Lowest	3	0.61	0.49	0.76

Results: Univariate Analysis

Oxford Score Decrease

		Age- and Gender-Adjusted		
EST Category		OR _{adj}	95% CI	
Highest	1	1.00	1.00	1.00
	2	1.02	0.72	1.43
Lowest	3	1.44	1.04	1.99

Results: Multivariate

Oxford Score Increases ≥ 5 Points

EST Category		OR _{adj}	95% CI	
Highest	1	1.00	1.00	1.00
	2	0.76	0.61	0.95
Lowest	3	0.56	0.45	0.69

*Adjusted for age, gender, pre-op OHS and comorbidities (renal, PVD, depression)

Results: Multivariate

Oxford Score Decreases

EST Category		OR _{adj}	95% CI	
Highest	1	1.00	1.00	1.00
	2	1.07	0.75	1.52
Lowest	3	1.63	1.17	2.27

*Adjusted for age, gender, pre-op OHS and comorbidities (PVD, depression)

Discussion

- Lower relative EST = poorer outcome
- Delays in referrals
- Pain perception differences
- Smoking, alcohol and nutrition
- Importance of rehab
- Lower relative EST = greater need for THA
- Is there a solution?

Discussion

- Pre-op education
- Interface with allied professionals
- Improve access to AHP
- Earlier identification of patients
- More study needed

Conclusion

- Lower relative educational attainment is associated with poorer THA outcome
- Solutions yet to be found

Thank you

Acknowledgements to:

- Countess of Chester Hospital
- My supervisor Mr. Janardhan Rao
- Additional help from Mr. Leong, Dr. Goodson, Ms. Prospero
- Chester Orthopaedic Research Fund



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Information on Total Hip Arthroplasty

TR Bowers, MB Dodd, DJ Woodnutt
Arthroplasty Service Unit, Morriston Hospital, Swansea, UK

Remuneration

- I have *not* received payment for this work or presentation
- I have *not* received money to cover expenses

Overview

- YouTube is a potentially valuable resource in modern patient education
- Approximately 2 billion annual users
- Content can be generated readily without need for specialist equipment

Assessing Content Accuracy

- No standards for grading accuracy of online content
- Recommendations and guidelines are available:
 - Centers for Disease Control
 - General Medical Council

General
Medical
Council

The standards expected of doctors do not change because they are communicating through social media rather than face to face or through other traditional media. However, using social media creates new circumstances in which the established principles apply.

 Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Keep Your Video Content Simple, Short, and Engaging:

- ◊ Use of jargon, technical information, or detailed charts and graphs should be avoided.
- ◊ Simple, easy-to-follow "stories" work best, with a single message or call to action.
- ◊ DMB recommends that most CDC videos should be 3 minutes or shorter.

Why Investigate Content

- Our own department is keen to develop media resources for patients to aid their understanding of surgical procedures
- Current all-Wales consent guidelines include provision of patient information in multimedia formats
- Can existing content be built and improved upon?

Local Context

- National Health Service Hospital
- Centrally funded
- Five consultant surgeons performing THA
- Posterior approach is standard practice
- No centrally mandated prosthesis choice
- Typical inpatient hospital stay of 4-5 days



Methods

- Rationale: Most basic available search using lay terms for procedure
 - Basic “most relevant” search criteria
 - Search term: “Total Hip Replacement”
- Search performed on a single day and URLs for all videos noted for further review

Methods

- Videos reviewed in full by Orthopaedic Registrar
- Basic metrics noted:
 - Length
 - View Count
 - Likes/Dislikes
 - Highest-available resolution

Methods

- We also reviewed:
 - Source of video
 - Country of origin
 - Intended audience
 - Impression of video accuracy

Our Accuracy Criteria

	Highly Accurate	Mostly Accurate	Mostly Inaccurate	Highly Inaccurate
Procedure	Demonstrates an established technique. All stages of procedure shown.	Demonstrates an established technique. Minor variance in usual sequence or some steps edited out completely.	Several elements vary from established practice. Many steps edited out.	Demonstrated technique not one used within established practice or potentially causing harm.
Understandability	Information presented in a clear and understandable manner.	Some information unclear or not fully understandable.	Most information unclear or not fully understandable.	No clear or understandable information.
Patient Expectations	Fully reflects patient expectations.	Mostly reflects patient expectations.	Some reflection of patient expectations.	Poor reflection of patient expectations.
Risks and Benefits	Complete information regarding benefits and risks of procedure.	Most information regarding benefits and risks of procedure.	Scant information regarding benefits and risks of procedure.	Poor or no information regarding benefits and risks of procedure.

Results

- In total approximately 76,000 hits
- 46/50 videos contained information relevant to total hip replacement in humans

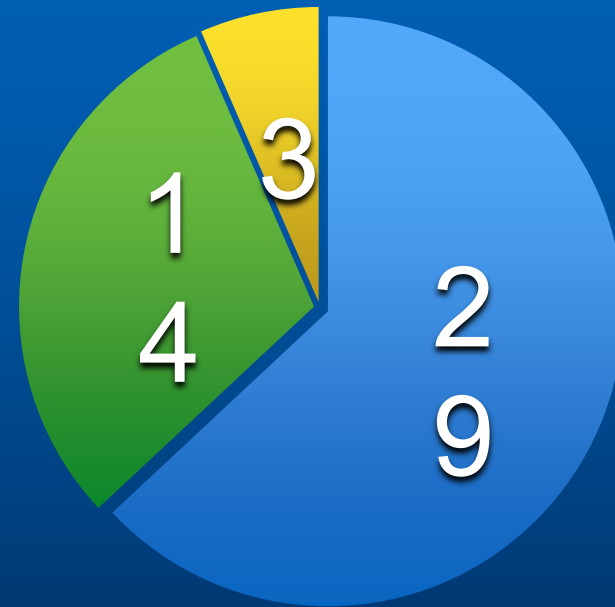
Results

- Total view count for all relevant videos:

3,480,107

Results

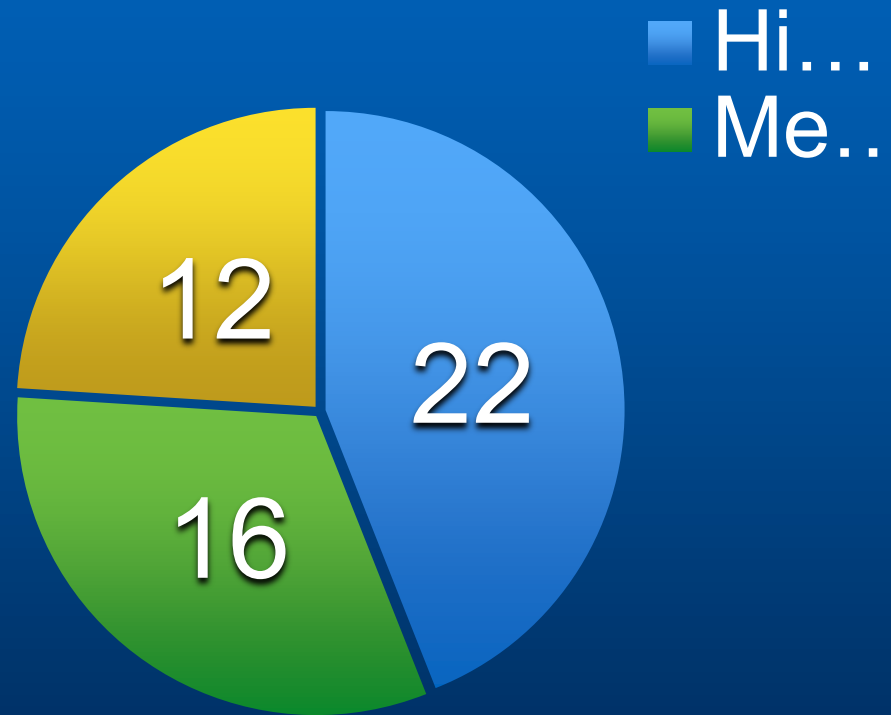
- Almost all videos watched by our observer were felt to be “mostly” or “highly” accurate
- Three videos did not contain enough direct information to judge accuracy



■ Highly...

Results

- Mean video length 9m 39s
(Range: 1m 25s to 1h 29m)
- Over half not presented in HD format

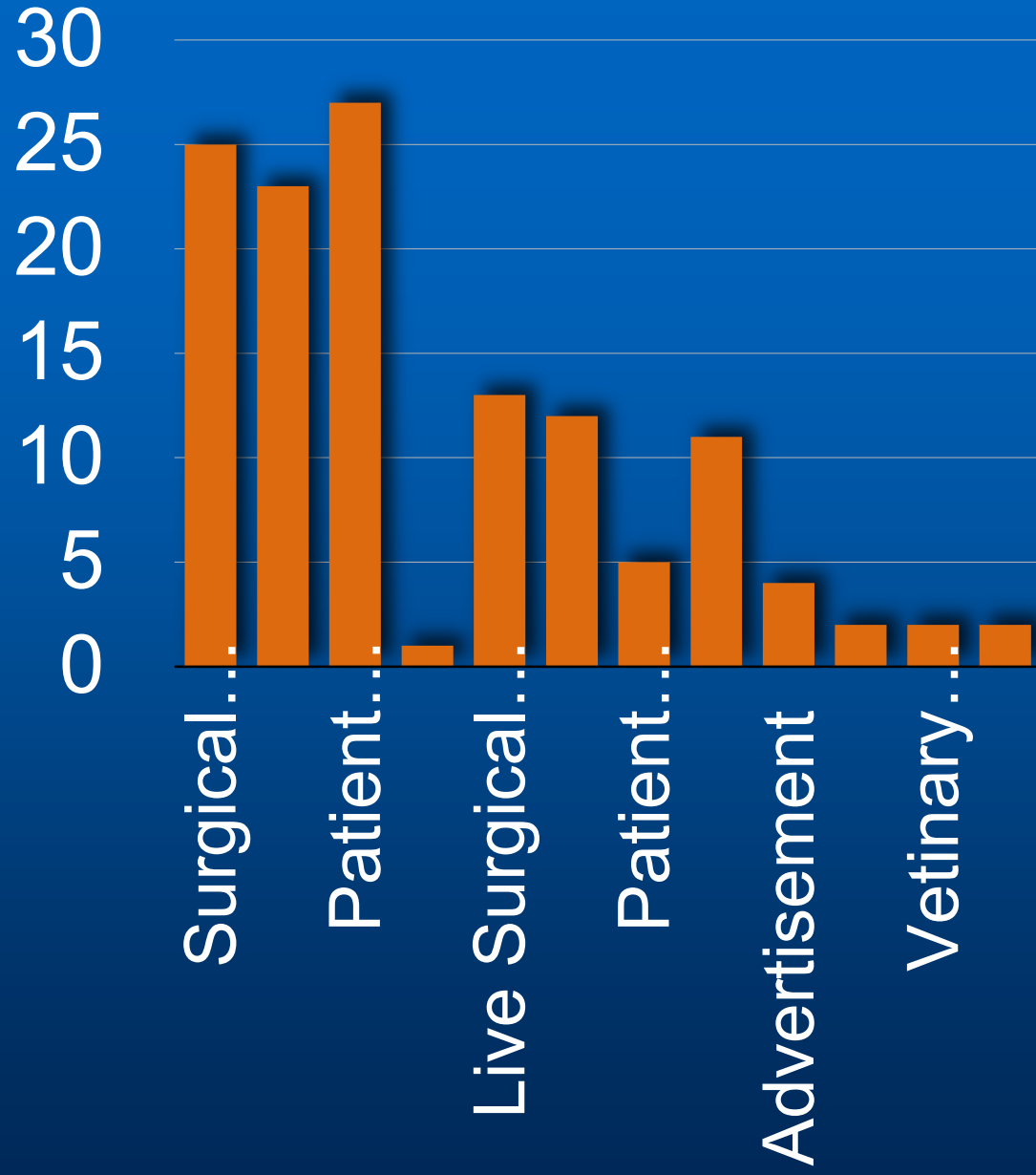


Results

- Majority of videos surgeon-produced
- Most videos originated from the USA (38/50)
- Just over half were live or simulated demonstrations of surgical techniques



down of Conte nt



Discussion

- Accuracy of existing content encouraging
- Video length on average potentially too long
- Video resolution low given availability of high speed data connections and HD-ready devices

Discussion

- Has been demonstrated to show benefits in terms of reducing patient's physiological stress in surgery ⁽¹⁾
- Debate as to whether video information improves patient understanding of surgical procedures ⁽²⁾

1. Videotape preparation of patients before hip

2. Patient understanding and satisfaction in
replacement surgery reduces stress. Doering S,
informed consent for total knee arthroplasty: a
Katzelberger F, Rumpold G, et al.

randomized study. Johnson MR, Singh JA.
Psychosom Med. 2000 May-Jun;62(3):365-73.

Stewart T, Gine TJ. Arthritis Care Res (Hoboken)

Conclusions

- If producing video content institutions should strive for it to be:
 - Accurate
 - Concise
 - High quality
 - Tailored to their local patient group

Thank you

References

- CDC Online video guidelines:
<http://www.cdc.gov/socialmedia/tools/guidelines/onlinevideo.html>
- GMC: Doctors use of social media: <http://www.gmc-uk.org/>



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