PROTESI PRIMARIA

1. Is there effect of Hydroxyapatite coating on the migration of the SL_PLUS hip stem?
2. Tantalum Monoblock Acetabular Cup in Primary THA: 10 to 15 year Follow-up
3. Thirty years of THR: an overwiev
4. There is a Place for Hip Resurfacing -Affirmative-
5. Resurfacing. Is There Still An Indication? No
6. Standard stems for total hip replacement
7. A concise overview on hip surgery in Italy
8. Clinical Outcome and Survival of Total Hip Arthroplasty after Acetabular Fracture: A Case-Control Study
9. Hip Arthroplasty Cups in Dysplasia
10. THA in DDH. The femur
11. Five Year Outcome of the 15 Degree Face-Changing Cup in Secondary Osteoarthritis of Dysplastic Hips
12. Guides and Specific Implants for Complex Acetabular Reconstructions
13. MODULUS stem for developmental hip dysplasia: Long-term follow-up
14. Total hip arthroplasty with shortening osteotomy in CROWE type III-IV developmental dysplasia
15. Long term results of the Charnley LFA with bulk autograft of the femoral head for developmental dysplasia of the hip
16. Clinical Outcome of Total Hip Arthrosplasty (THA) After Iliofemoral Distraction In Hip Dislocations
17. Dare you still use screws?
18. Modular trabecular titanium cups in complex primary cases
19. Our experience in primary THA using Delta Cup TT
20. Minimum three-years clinical & radiographic results of a new press-fit tapered hip stem
21. Second Generation Tapered Femoral Cementless Hip Stem in Total Hip Arthroplasty: A Minimum 15-Year Follow-Up Study
22. 10 - 20 year outcomes following THR with the Muller Low Profile Cup

PROTESI PRIMARIA

23. Densitometric evaluation of periprosthetic bone resorption after surgical placement of Accolade I TMZF stem at 3 years
24. Long-term Results Of Total Hip Replacement In Healthy Under-30 Patients. Results at a minimum of 10 years
25. THA implant choice in young active patients under 60 years. Evidence in the last ten years
26. Total hip arthroplasty in juvenile idiopathic artrhitis: a long term follow up with custom made implants
27. Outcome Of Charnley Total Hip Replacements - Single Centre Experience
28. Our experience of hip replacement using the Mako-Rio System (MAKOPLASTY)
29. Indications and Early Functional Outcomes of a Metaphyseal Short Stem
30. The Silent hip neck only prosthesis in primary hip arthroplasty: a prospective study with a minimum 2 year follow up
31. A prospective study of a novel neck preserving stem: early clinical results
32. Bone remodelling around short metaphiseal implant in THA: a DEXA study with three years of follow up
33. MiniHip arthroplasty: a review of clinical outcomes at a UK centre.
34. Fitmore hip Stem: X-Ray, clinical and functional results at mid-term follow-up
35. Fourth generation cementing tecnique with a novel short-stem in primary total hip arthroplasty
36. Mid term results of a short cemented femoral component
37. Early results of a conservative hip stem
38. Mid Terms Results Of 486 Conserve Plus® Hip Resurfacings.
39. The Short-Term and Long-Term Research Findings at the Endoprosthesis Replacement of Hip Joint with NIITO Endoprosthesis Components

SCORE Slotervaart Center of Orthopedic Research & Education

Is there effect of Hydroxyapatite coating on the migration of the SL_PLUS hip stem?

RSA prospective double blind randomized controlled trial

Daniel Hoornenborg, Inger Sierevelt, Joost Spuijbroek, Harm van der Vis, Daniel Haverkamp

Disclosure

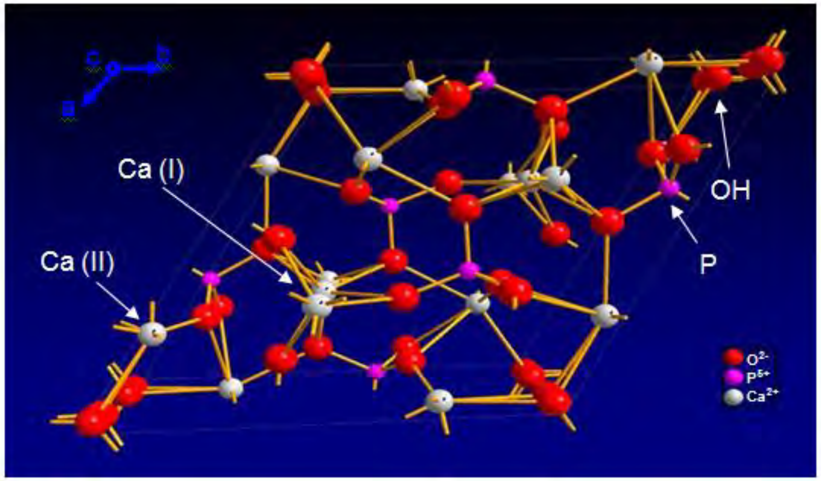
- Research Support from:
  - Implantcast
  - Mathys Medical
  - Carbylan
  - Imove Medical
  - Cotera

Daniel Hoornenborg

MC Slotervaart

SCORE

Introduction:



◎Hydroxyapatite(Cal0[PO4]6[OH]2)

◎Furlong and Osborn

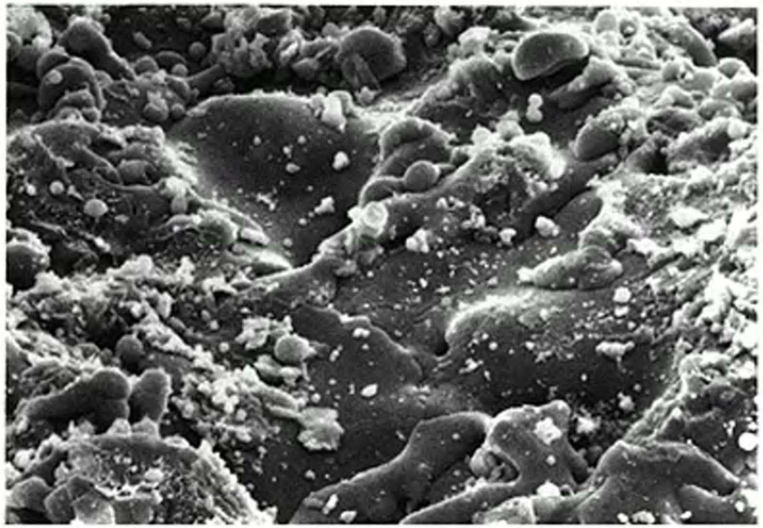
Furlong, R. J., and **Osborn, J. F.:** Fixation of hip prostheses by hydroxyapatite ceramic coatings. *J. Bone and Joint Surg.,* 73-B(3):741-745,1991

◎Geesink

Geesink, R. G.: Experimental and clinical experience with hydroxyapatite-coated hip implants. *Orthopedics,* 12:1239-1242,1989

Introduction:

- Does hydroxyapatite coating enhances ingrowth and longevity of a femoral stem in total hip arthroplasty?



Methods

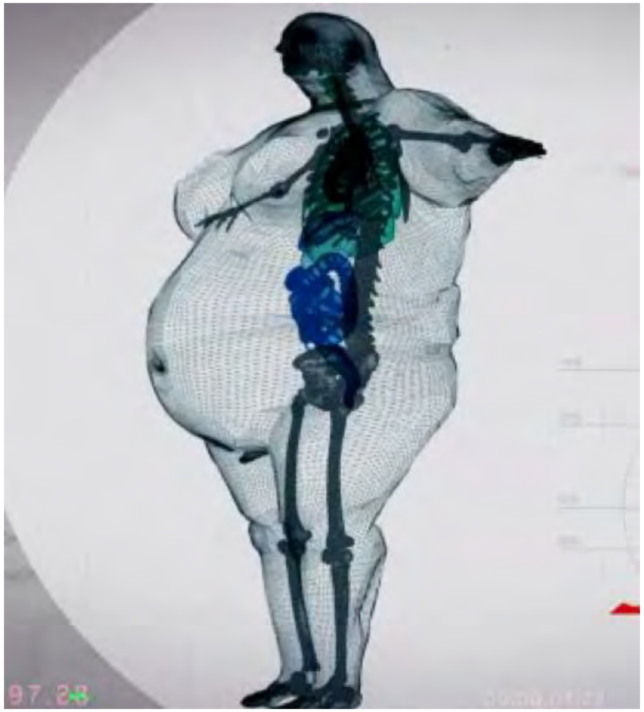
- Single centre prospective double blind randomized trial
- Hydroxyapatite (HA)-coated SL-PLUS stem VS Standard (non-coated) SL-PLUS stem
- Primary objective early migration
  - Radio Steriometric Analysis (RSA)
- Medical ethical committee approval

Methods

- Inclusion criteria:
  - *Primary osteoarthritis*
  - *Avascular necrosis*
  - *Femoral neck fracture*
  - *Hip dysplasia*
  - *Aged 50-80*
  - *Male and female*

Methods

- Exclusion criteria:
  - *Post-traumatic OA*
  - *Previous infection*
  - *Prior osteotomy*
  - *Bisphosphonate or cortisone medication*
  - *Body mass index higher than 35*



Methods

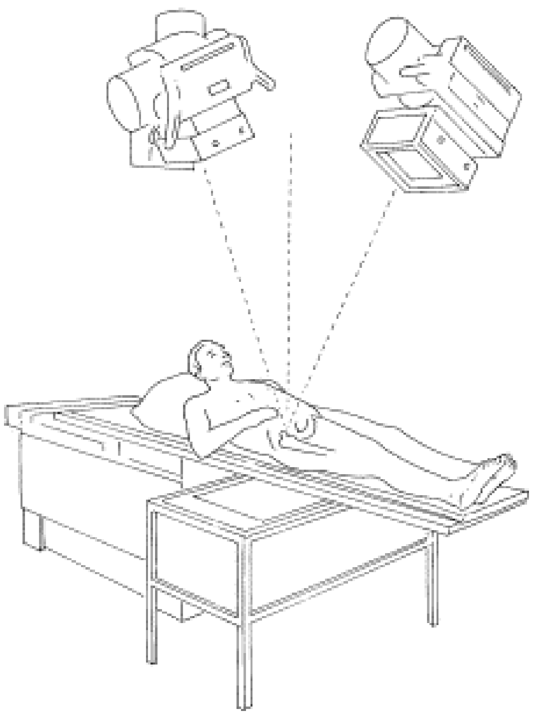
- Surgical technique
  - Direct Lateral Transgluteal Approach
  - Uncemented cup
  - 5 markers installed
  - Randomization
  - SL-PLUS® stem

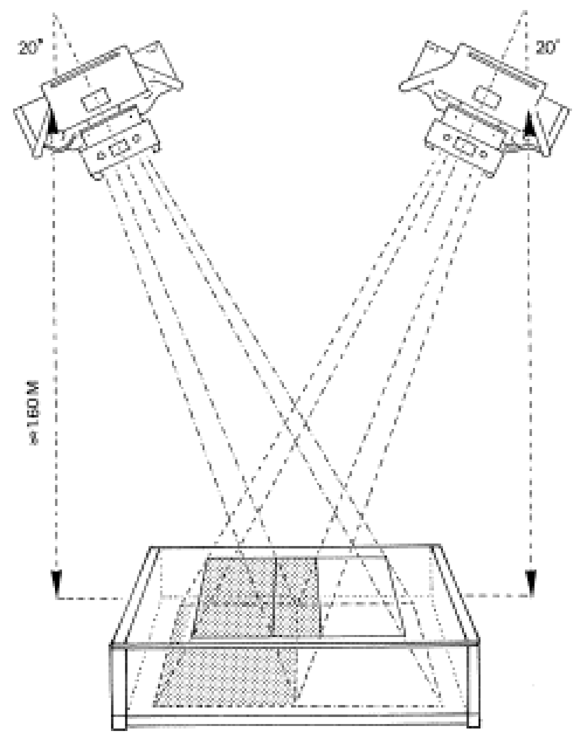
Methods

- RSA evaluation
  - day 1
  - 6 weeks
  - 3 months
  - 6 months
  - 12 months
  - 24 months

Methods

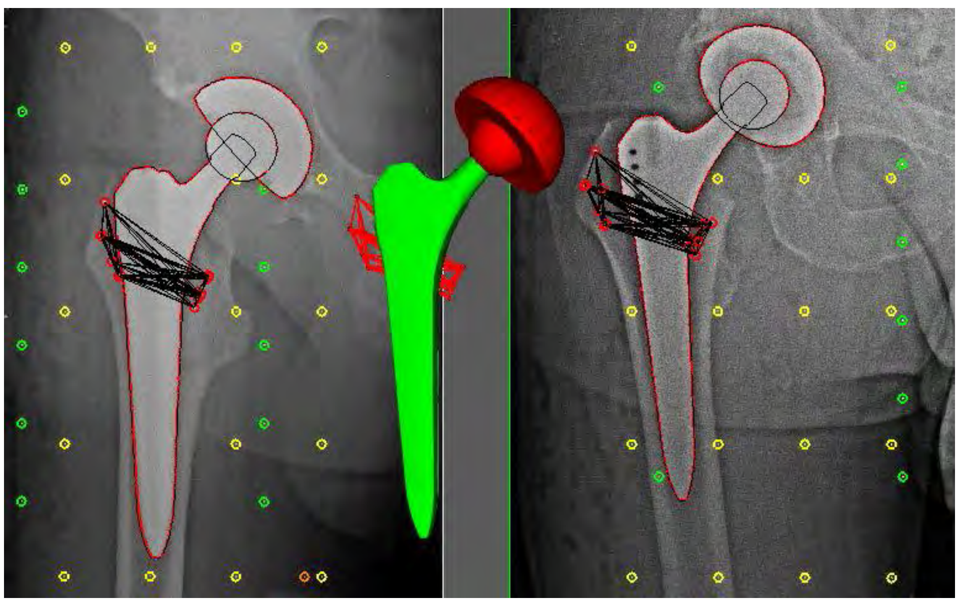
- RSA setup

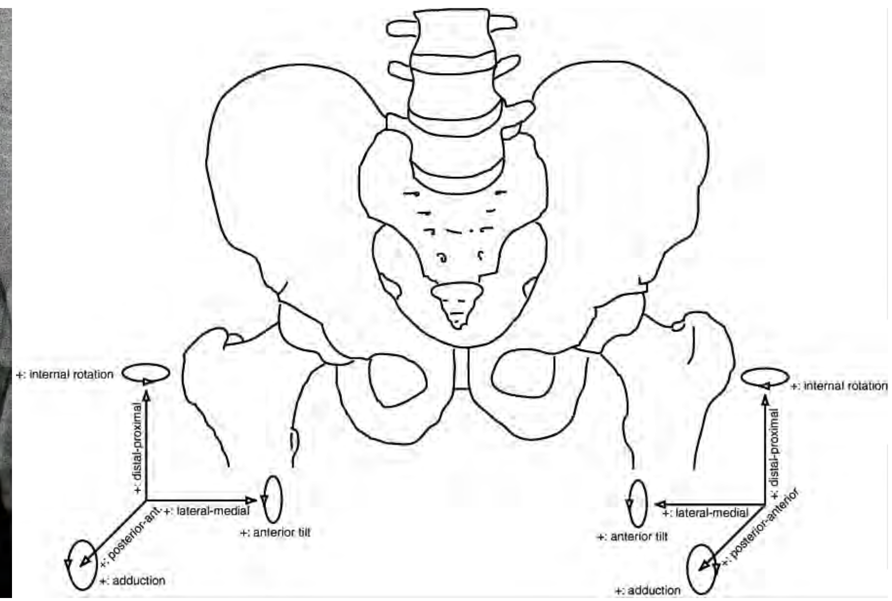




Methods

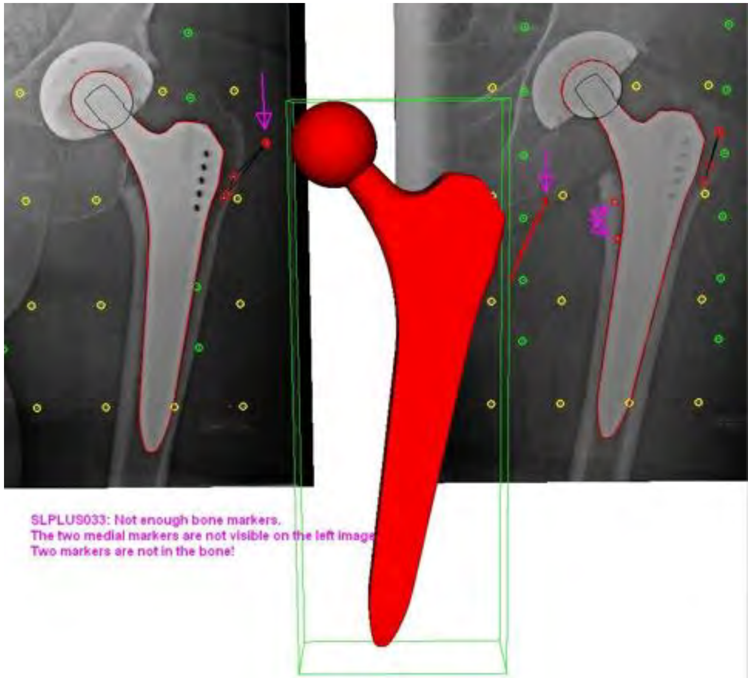
- Translation Accuracy 0.05 and 0.5 mm
- Rotation Accuracy 0.15° and 1.15°





Results

- 49 patiënts included
- 7 patiënts lost to follow up
    - 2 because of insufficiënt markers
    - 1 because of infection
    - 4 withdrawal after 6-12 months



Results

Demography

	Total (n=49)	HA+ (n=28)	HA- (n=21)	p-value
Gender, n (%)				
Female	29 (60%)	18 (64%)	12 (57%)	0.61
Male	19 (40%)	10 (36%)	9 (43%)	
Age at OK, mean (SD)	68.6 (4.8)	69.4 (4.8)	67.5 (4.6)	0.21
BMI, mean (SD)	27.0 (3.1)	26.7 (3.3)	27.4 (SD 3.0)	0.53

Results

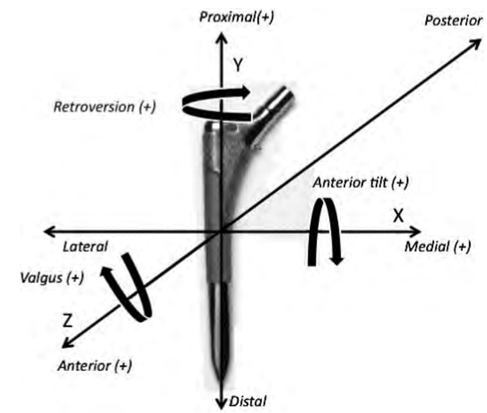
- Patient Related Outcome

- HOOS_ADL improved (p=0.88)
  - 41.2 (24.5) HA+ group
  - 42.5 (19.8) HA- group

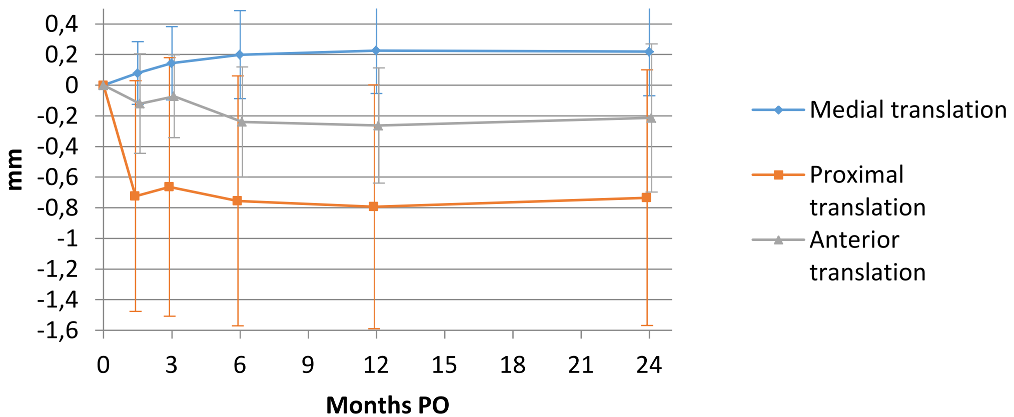
- HOOS_pain improved (p=0.48)
  - 36.6 (23.8) HA+ group
  - 42.3 (16.3) HA- group

Results

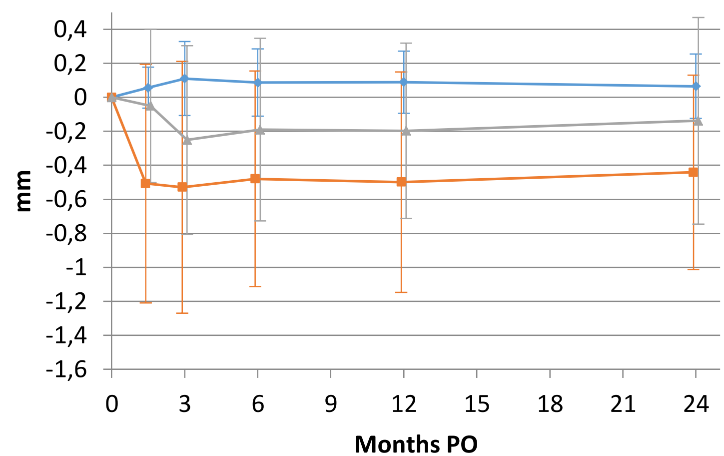
- Mean translation



SLPLUS HA-

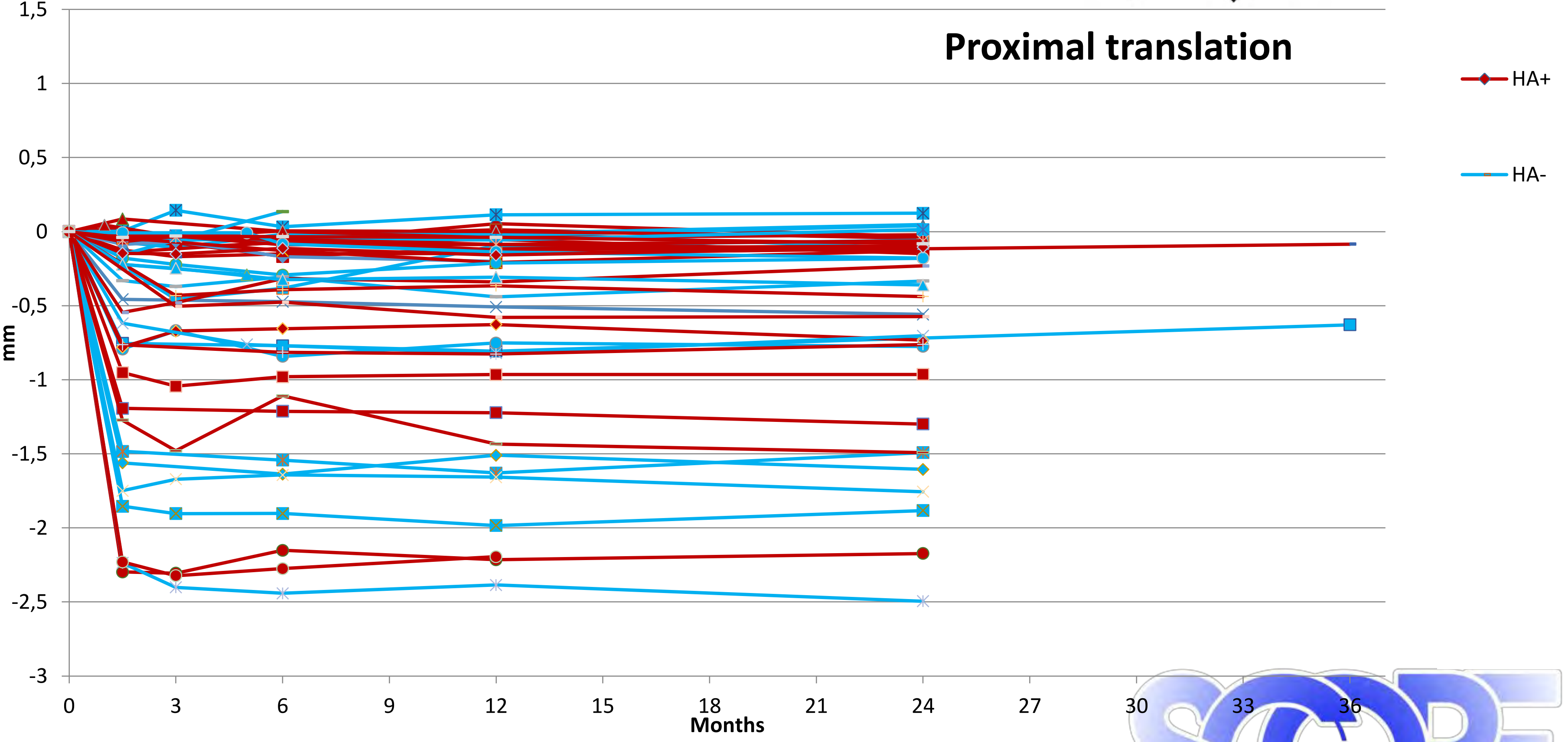


SLPLUS HA+



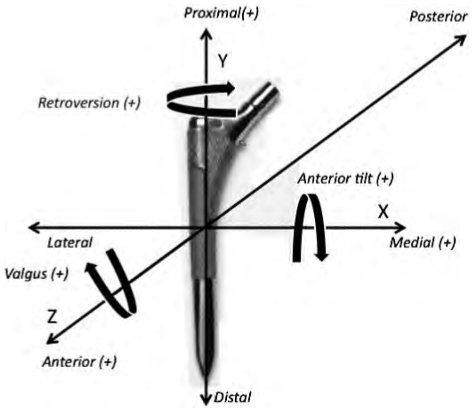
Results

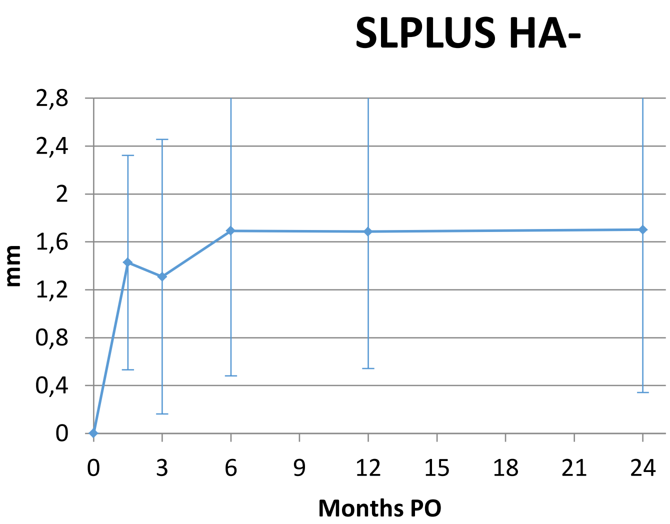
- Subsidence

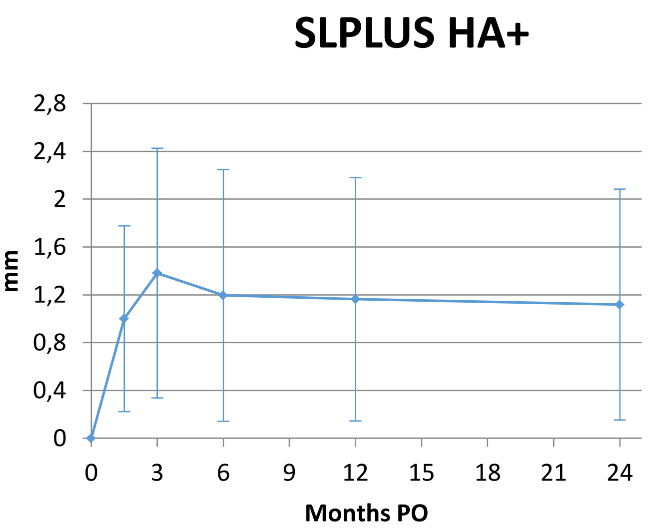


Results

- Maximal total points motion (MTPM)







Discusion

- MPTM shows no significant difference

- Translation and rotation are minimal in both groups

- Both groups show stabilisation after initial setting

Conclusion

- Adding Hydroxyapatite coating to a Zweymuller type stem has no positive impact on the 2 year roentgen outcome of SL-PLUS hip stem.

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

UMG

Magna Græcia University Catanzaro (Italy)

Orthopædic department

dubium sapientiæ initium

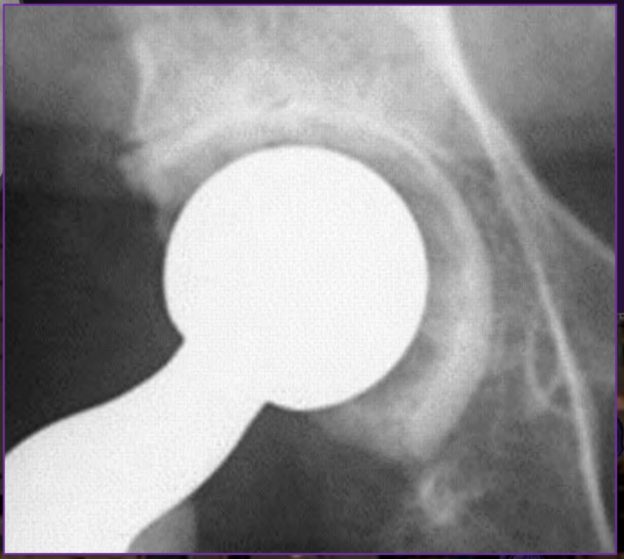
head: prof. Giorgio Gasparini

Tantalum Monoblock Acetabular Cup in Primary THA: 10 to 15 year Follow-up

R. Russo, I. De Martino, V. Mastroianni, L. Tarducci, O. Galasso, G. Gasparini

cemented all-polyethylene (PE) cups

- technically difficult to implant
- high rate of loosening



Ritter MA, Thong AE: *The role of cemented sockets in 2004: is there one?* J Arthroplasty. 2004 Jun;19(4 Suppl 1):92-4.

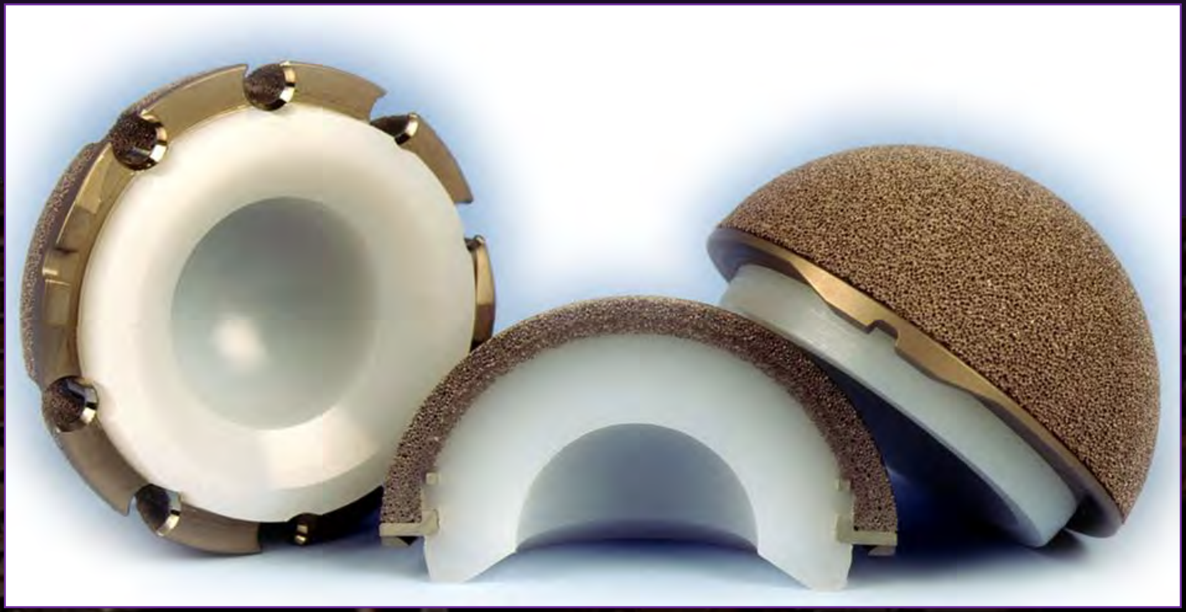
modular cementless cups

- poor locking mechanisms: liner dislodgement, PE wear from backside & from locking ring
- screw-hole fretting: metal debris
- holes: conduit for PE & metal debris

Young AM et al, JBJS Am 2002;84-A:58-63
Chen PC et al, CORR 1995;(317):44-56
Fehring TK et al, CORR 1999;(367):306-314
Gonzalez Della Valle A et al, JBJS Am 2001;83-A:553-559
Schmalzried TP et al, Proc Inst Mech Eng H 1999;213:147-153

monoblock cementless cup

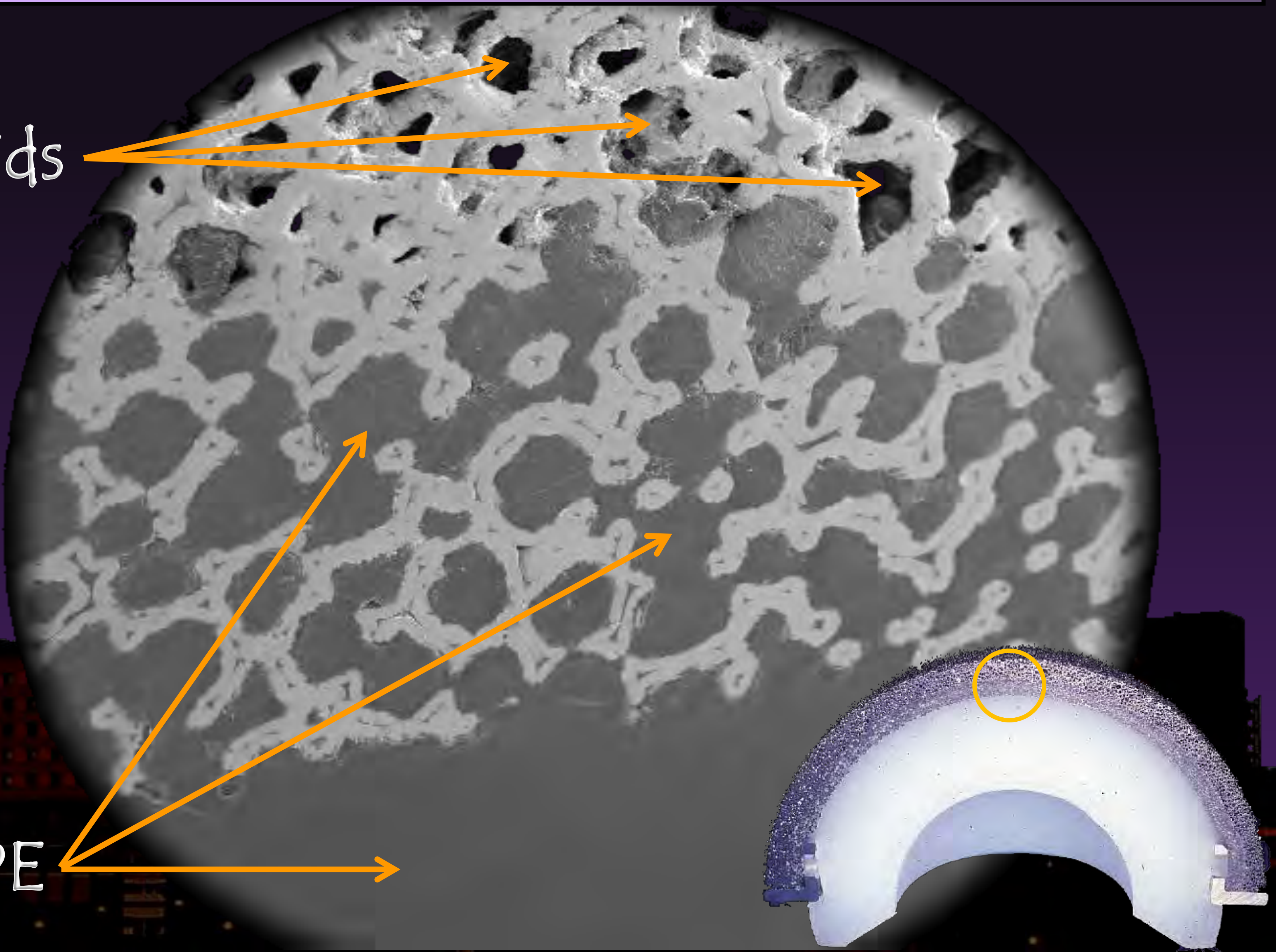
- alternative to cemented PE and cementless modular cups
- enhance initial fit and reduce osteolysis



eliminates metal-PE interface

- PE compression molded into the shell
- no PE wear from backside
- no PE wear from locking rings
- no holes impairing bone/metal interface

trabecular tantalum cup

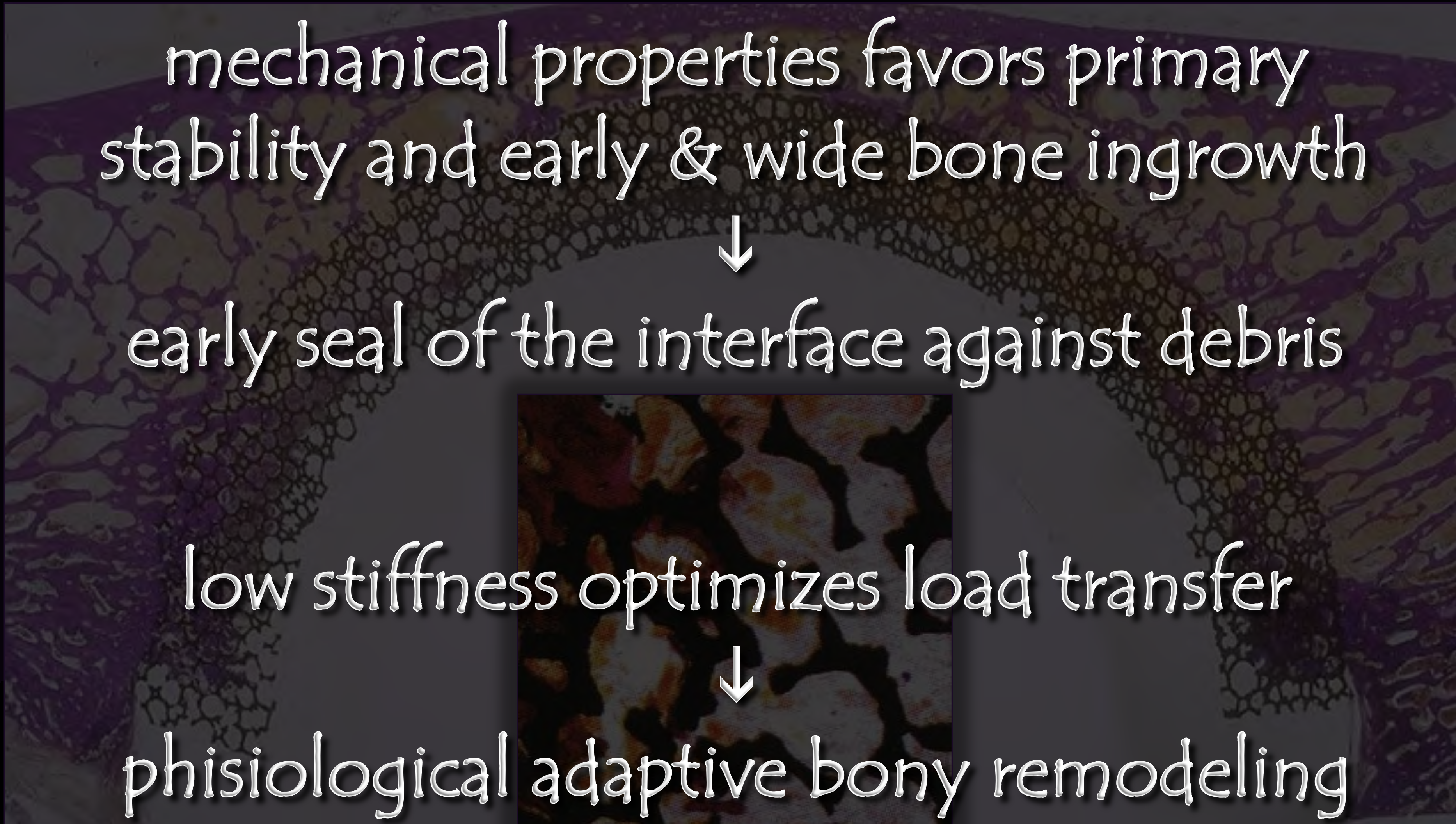


properties of porous tantalum

- osteoconductive
- elastic modulus between spongy bone & PE
- high coefficient of friction
- pores size 400-600 µm
- 75-80% fully interconnected porosity

elliptical cup + spherical reamer

trabecular tantalum cup



mechanical properties favors primary stability and early & wide bone ingrowth

↓

early seal of the interface against debris

low stiffness optimizes load transfer

↓

phisiological adaptive bony remodeling

Bobyn JD et al: Characteristics of bone ingrowth and interface mechanics of a new porous Tantalum biomaterial. JBJS, 81B, 907-914, 1999

to evaluate

- clinical results
- rates of progressive periacetabular radiolucent lines, acetabular osteolysis and acetabular loosening
- modes of failure (infection, aseptic loosening, dislocation)

- monoblock elliptical tantalum cup
- 28 mm CoCr femoral head
- straight cementless stem
- PE thickness: at least 7mm in all cases

eligible

- consecutive series of pts (1998-2003) at a single institution
- primary THA

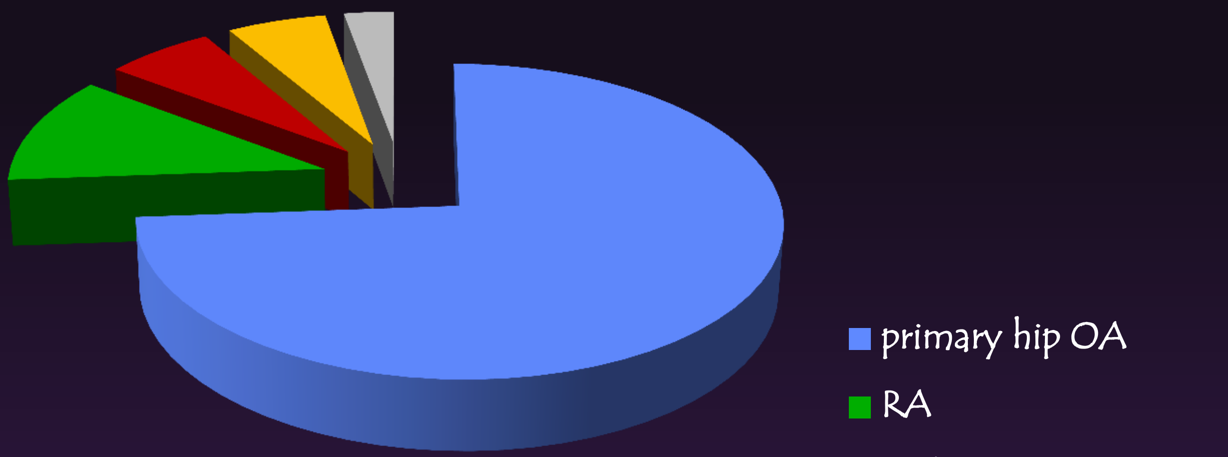
excluded

- acetabular dysplasia Crowe 3 & 4
- acetabular bone loss requiring screws

- clinical examination (HHS)
- AP and lateral X-ray: polar gaps, progressive radiolucent lines, osteolysis, loosening

- data prospectively collected
- 10-15 (mean 12) years or until failure

results

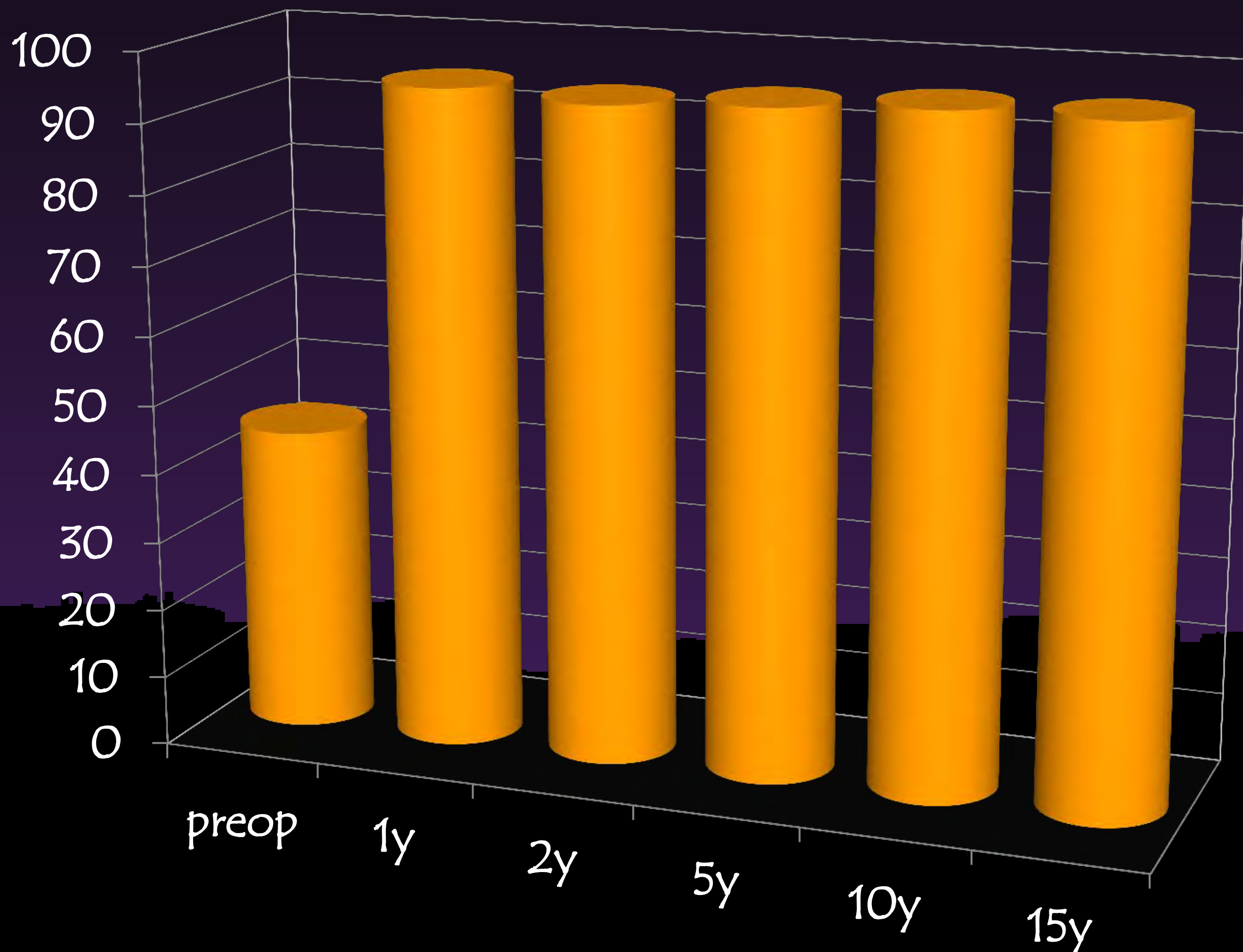


n. pts (n.THAs)	182 (188)
lost at follow-up	21 (21)
remaining pts (THA)	161 (165)
M/F	63/98
mean age at surgery	63 years (33-81)
BMI	25 (17-33)
mean follow-up	12 years (10-15)

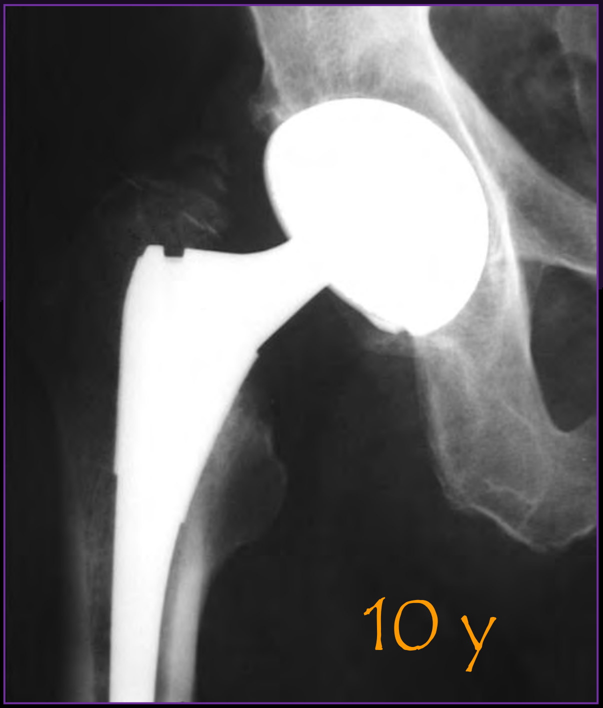
10-15 years survival rate was 99.4%, with revision for any reason as end point

1 cup was revised for deep infection

HHS



- radiolucent lines: 1.9%
  <1mm in width, non-progressive, zone I
- no acetabular component had complete radiolucent line




13 y

discussion

Study (year)	Number of primary hips	Mean age of patients (years)	Mean follow-up (range)	Cup Revised for Loosening and Osteolysis (rate)
Gruen et al. (2005)	414	65	2.75 years (2 to 4.8 years)	0 (0%)
Mulier et al. (2006)	40	48	3.8 years	0 (0%)
Komorasamy et al. (2006)	112	57	2.7 years (1.5 to 4.5 years)	0 (0%)
Macheras et al. (2006)	86	63	7.3 years (7 to 7.5 years)	0 (0%)
Malizos et al. (2008)	240	56	5 years (3-9.3 years)	0 (0%)
Macheras et al. (2009)	156	60	8 to 10 years	0 (0%)
Xenakis et al. (2009)	253	61	5 years	0 (0%)
Noiseaux et al. (2014)	383	62	3.5 years (2 to 10 years)	0 (0%)
Wegrzyn et al. (2015)	45	60	12 years (11 to 13 years)	0 (0%)
present study	165	63	12 years (10 to 15 years)	0 (0%)

weakness

- exclusion of cases in which screws should be used
- use of conventional X-ray

strength

- long term follow-up

10-15 years FU in primary THA

- no cup revisions for aseptic loosening
- no progressive radiolucent lines
- no cup migration
- no gross PE wear

thank you

raffaella.anna.russo@virgilio.it

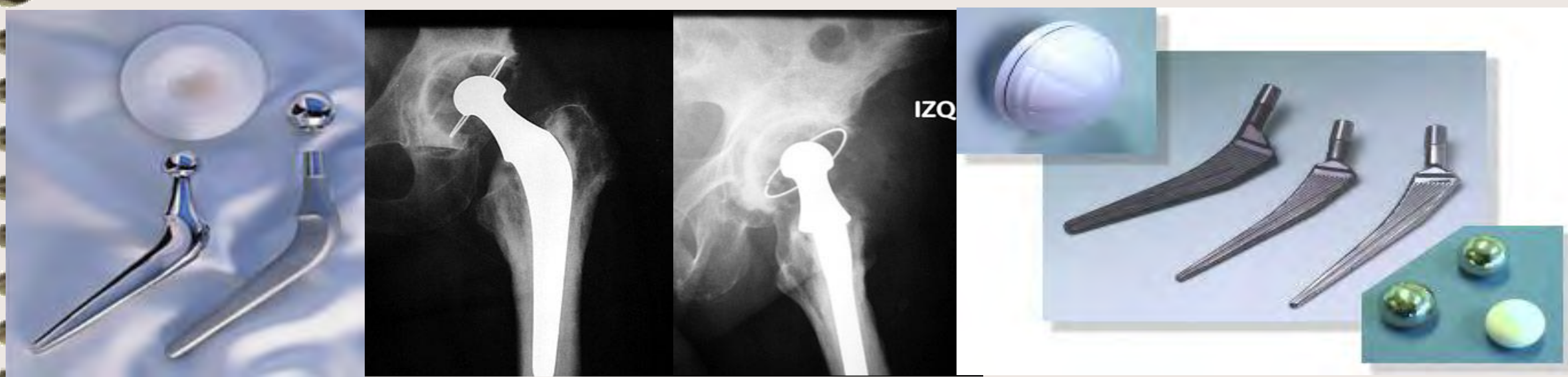
INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

In the Sixties and Seventies Cemented Prosthesis



CLINICAL ORTHOPAEDICS AND RELATED RESEARCH
Number 417, pp. 148–156

Long-Term Function After Charnley Total Hip Arthroplasty

Jay D. Keener, MD; John J. Callaghan, MD; Devon D. Goetz, MD; Douglas Pederson, PhD; Patrick Sullivan, MD; and Richard C. Johnston, MD

SWEDISH 2013
HIP REGISTER

Most commonly used implants 2012–2013

	2013 number	%	2012 number	%
Cemented prosthesis				
Lubinus – Lubinus	5,128	*47.9*	5,026	*46.1*
Exeter – Marathon	1,299	*12.1*	1,401	*12.9*
Exeter – Exeter Rim-fit	1,199	*11.2*	1,071	*9.8*
Uncemented prosthesis				
Corail – Pinnacle 100	311	*10.5*	302	*12.1*
CLS – Continuum	206	7.0	155	*6.2*
CLS – Trilogy	182	6.2	255	*10.2*
Hybrid				
Exeter – Trident hemi	104	*26.4*	83	*24.9*
Lubinus – Trilogy	50	*12.7*	68	*20.4*
MS30 – Continuum	32	*8.1*	17	*5.1*
Reversed hybrid				
Corail – Lubinus	484	*22.6*	487	*22.2*
Corail – Marathon	450	*21.0*	540	*24.6*
Corail – Contemporary Hooded Duration	186	*8.7*	151	*6.9*
Resurfacing				
BHR all variants	70	*100*	70	*97.2*

Table 5. Most commonly used implant combinations during 2013. The corresponding proportion for 2012 is shown for comparison.

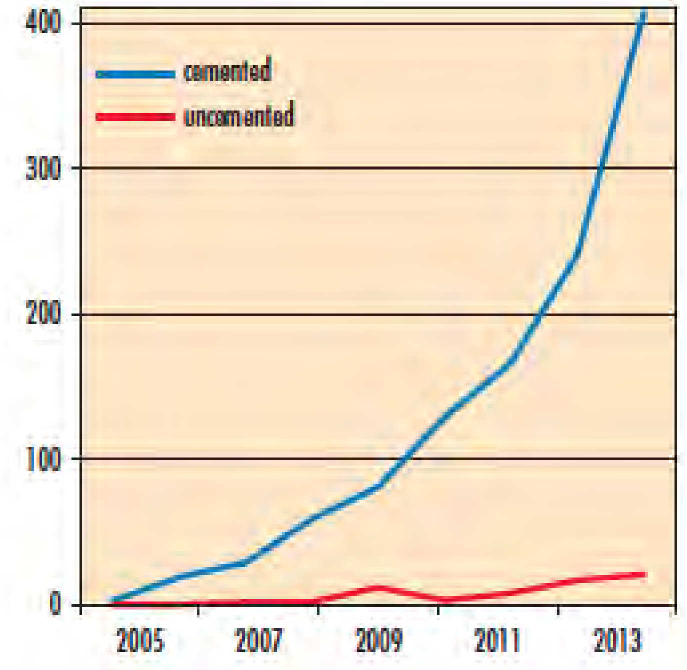


Figure 11. Number of reported operations where dual articular cups were used 2005–2013.


R.E

Table 3.3 Numbers and percentage of primary hip replacements of each type of fixation and within each fixation sub-group, by bearing surface.*

Fixation	Number (%)	Bearing surface within fixation group	Number (%)
All cases	708,311 (100%)		708,311 (100%)
All cemented	255,926 (36.1%)	MoP	224,779 (87.8%)
		MoM	1,148 (0.5%)
		CoP	24,360 (9.5%)
		Others/unsure	5,639 (2.2%)
All uncemented	276,432 (39.0%)	MoP	104,028 (37.6%)
		MoM	28,658 (10.4%)
		CoP	43,056 (15.6%)
		CoC	93,873 (34.0%)
		CoM	2,162 (0.8%)
		Others/unsure	4,655 (1.7%)
All hybrid	121,068 (17.1%)	MoP	77,396 (63.9%)
		MoM	2,218 (1.8%)
		CoP	19,707 (16.3%)
		CoC	19,633 (16.2%)
		Others/unsure	2,114 (1.8%)
All reverse hybrid	17,267 (2.4%)	MoP	11,670 (67.6%)
		CoP	5,504 (31.9%)
		Others/unsure	93 (0.5%)
All resurfacing	37,579 (5.3%)	(MoM)	37,579 (100%)
Unsure	39 (<0.1%)	Unsure	39 (not applicable)

*The percentages in the right-hand column have been calculated within each fixation group.

Table 3.4 and Figure 3.2 (over the page) show the distributions across fixation groups for each year of primary operation and Figures 3.3 (a) to (d) show distributions across bearing surface of each fixation group. Trends of implant usage are interesting in that the decline in cemented implants between 2003 and 2009 has arrested and is now stable at around a third of cases. Conversely uncemented implants have decreased in popularity since 2010, but remain the most popular choice. Hybrid implants continue to steadily increase in popularity and now account for a quarter of cases.

With regard to bearing surface, ceramic-on-polyethylene continues to gain in popularity and usage of ceramic-on-ceramic is declining. The use of metal-on-metal stemmed implants has virtually ceased and the proportion of metal-on-metal resurfacing implants has decreased from a peak in 2006 to account for only 1% of implants in 2014.

AUSTRALIAN HIP REGISTER 2014

AOA
AUSTRALIAN ORTHOPAEDIC ASSOCIATION

Prostheses Types

There are 2,362 different stem and acetabular combinations for primary total conventional hip replacement recorded by the Registry. This includes metal/metal with head size larger than 32mm. The cumulative percent revision of the 91 combinations with more than 500 procedures is listed in Tables HT12 – HT14. Although the listed combinations are a small proportion of the possible combinations, they represent 78.1% of all primary total conventional hip replacements.

The 'Other' group is the combined outcome of all prostheses combinations with less than 500 procedures. This group accounts for 21.9% of all primary total conventional hip replacement procedures.

There are 10 total conventional stem and acetabular combinations with more than 500 procedures using cement fixation. The MS30/Low Profile Cup and the Exeter V40/Exeter have the lowest 10 year cumulative percent revision of 2.9% and 4.2% respectively (Table HT12).

There are 56 cementless total conventional stem and acetabular combinations listed. Of the six combinations reported with a 13 year cumulative percent revision, the Secure-Fit Plus/Trident (Shell) and VerSys/Trilogy combinations have the lowest cumulative percentage revision both at 4.7% (Table HT13).

There are 25 combinations of total conventional hip replacement with hybrid fixation. The Exeter V40/Vitalock has the lowest cumulative percent revision at 10 years (3.2%) Eight other combinations have a cumulative percent revision less than 5.0% at 10 years (Table HT14).

RIPO 2013 PROTESI DI ANCA

Registro Implantologia Protesica Ortopedica

Total hip procedures between January 1th 2000 and December 31th 2013

Implant fixation

Modalità di fissazione	Artroprotesi	%	Reimpianti totali	%
Protesi non cementata	68.292	84,6	2.671	73,4
Ibrida (stelo cem. e cotile non cem.)	7.411	9,2	281	7,7
Protesi cementata	4.424	5,5	193	5,3
Stelo non cementato e cotile cementato	553	0,7	494	13,6
Totale*	**80.680**	**100,0**	**3.639**	**100,0**

*Il dato non è stato comunicato in 190 interventi primari e in 12 interventi di reimpianto totale.

THE MORPHOLOGY OF THE PROXIMAL FEMUR

A THREE-DIMENSIONAL RADIOGRAPHIC ANALYSIS

P. J. RUBIN, P. F. LEYVRAZ, J. M. AUBANIAC, J. N. ARGENSON,
P. ESTÈVE, B. DE ROGUIN

From Lausanne Orthopaedic Hospital and Aix-Marseille University

The Anatomic Basis of Femoral Component Design

PHILIP C. NOBLE, M.S., JERRY W. ALEXANDER, B.S., LAURA J. LINDAHL, B.S.,
DAVID T. YEW, B.S., WILLIAM M. GRANBERRY, M.D., AND HUGH S. TULLOS, M.D.

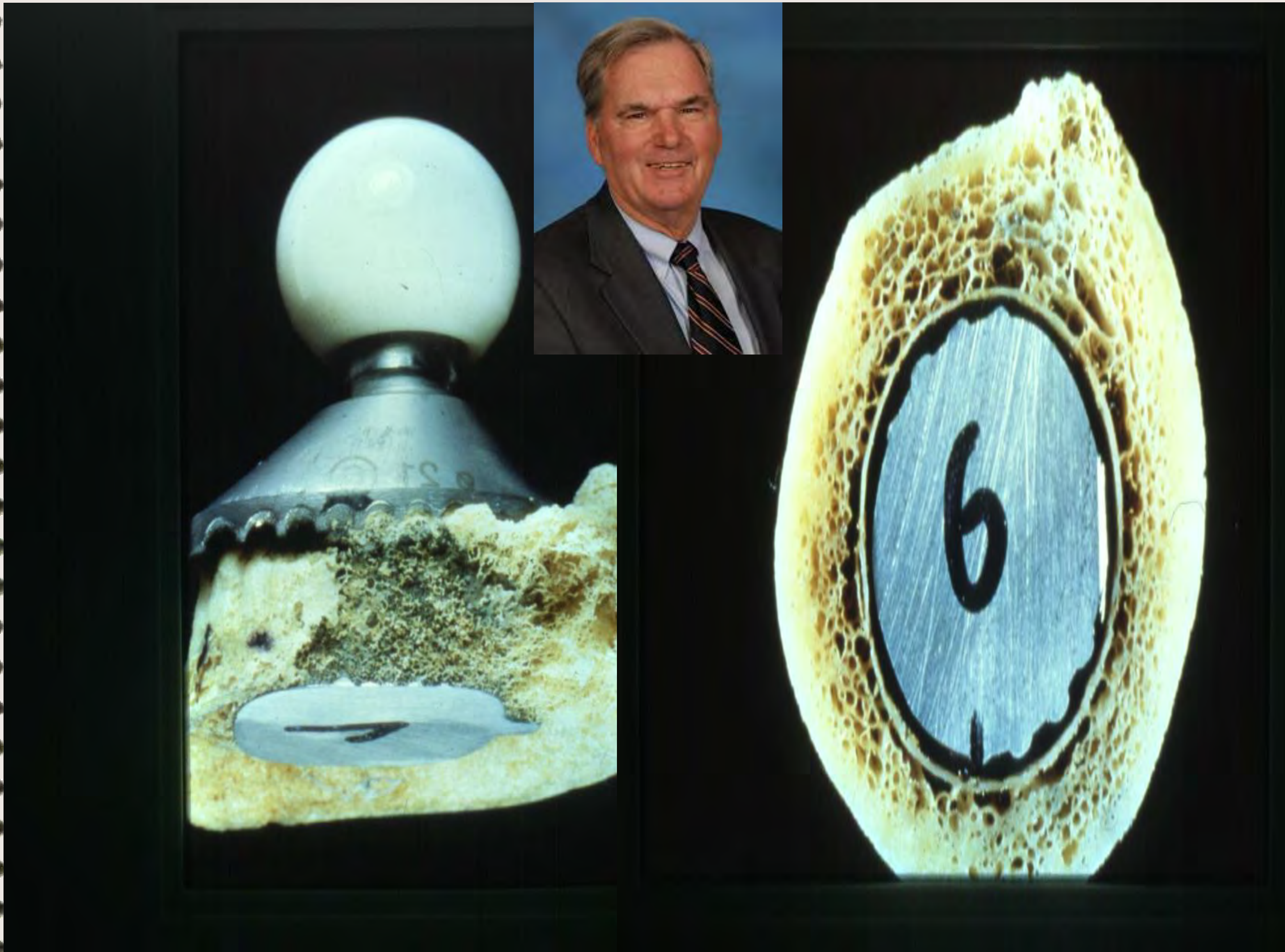
From the Division of Orthopedic Surgery, Baylor College of Medicine, Houston, Texas.

Presented at the Proceedings of the Open Meeting of The Hip Society, Atlanta, Georgia, February 7, 1988.

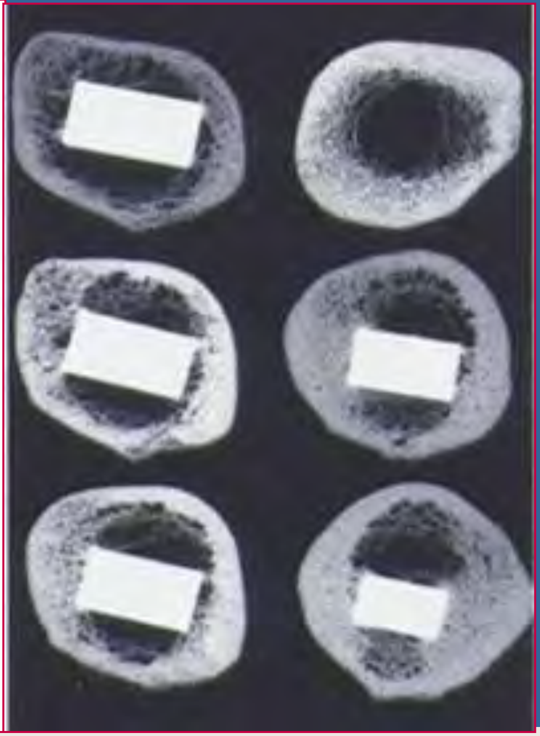
Recipient of the Frank Stinchfield Award.

Reprint requests to Phillip C. Noble, M.S., 6560 Fannin St., Suite 2070, Houston, TX 77030.

Received: March 2, 1988.

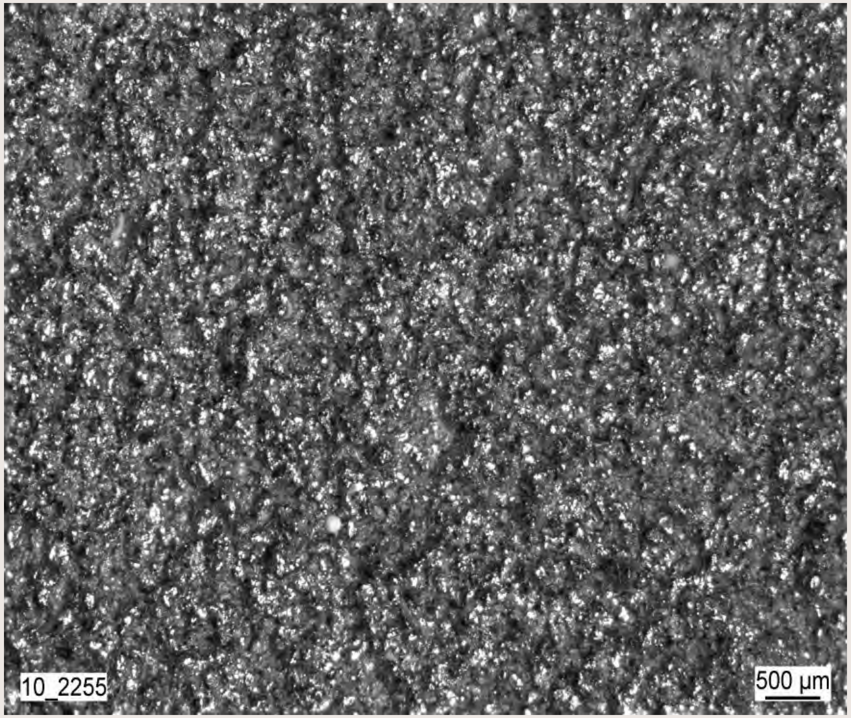


- Cortical diaphyseal/metaphyseal press – fit due to the conical shape
- Rectangular section
- Medullary canal filling is avoided
- Endostel blood supplay allowed
- Bone growth around enhanced




SAND-BLASTED SURFACE ENHANCE BONE INGROWTH

- Developed in Winterthur by Sulzer in the early 80’s
  - Alloclassic, CLS, Wagner, …



BIOLOGIC FIXATION OF A PRESS-FIT TITANIUM HIP JOINT ENDOPROSTHESIS

- "The average surface roughness of 3 – 5 µm, with which the entire prosthesis length is structured, supports this osseointegration. This micro roughness is, therefore, totally sufficient for the primary and secondary stabilization of the implant."
- K.A. Zweymüller et al, CORR, 235, 1988, p. 195

SAND-BLASTED SURFACE

My personal experience started in 1996 with Thurst Plate Prosthesis (76 implants)

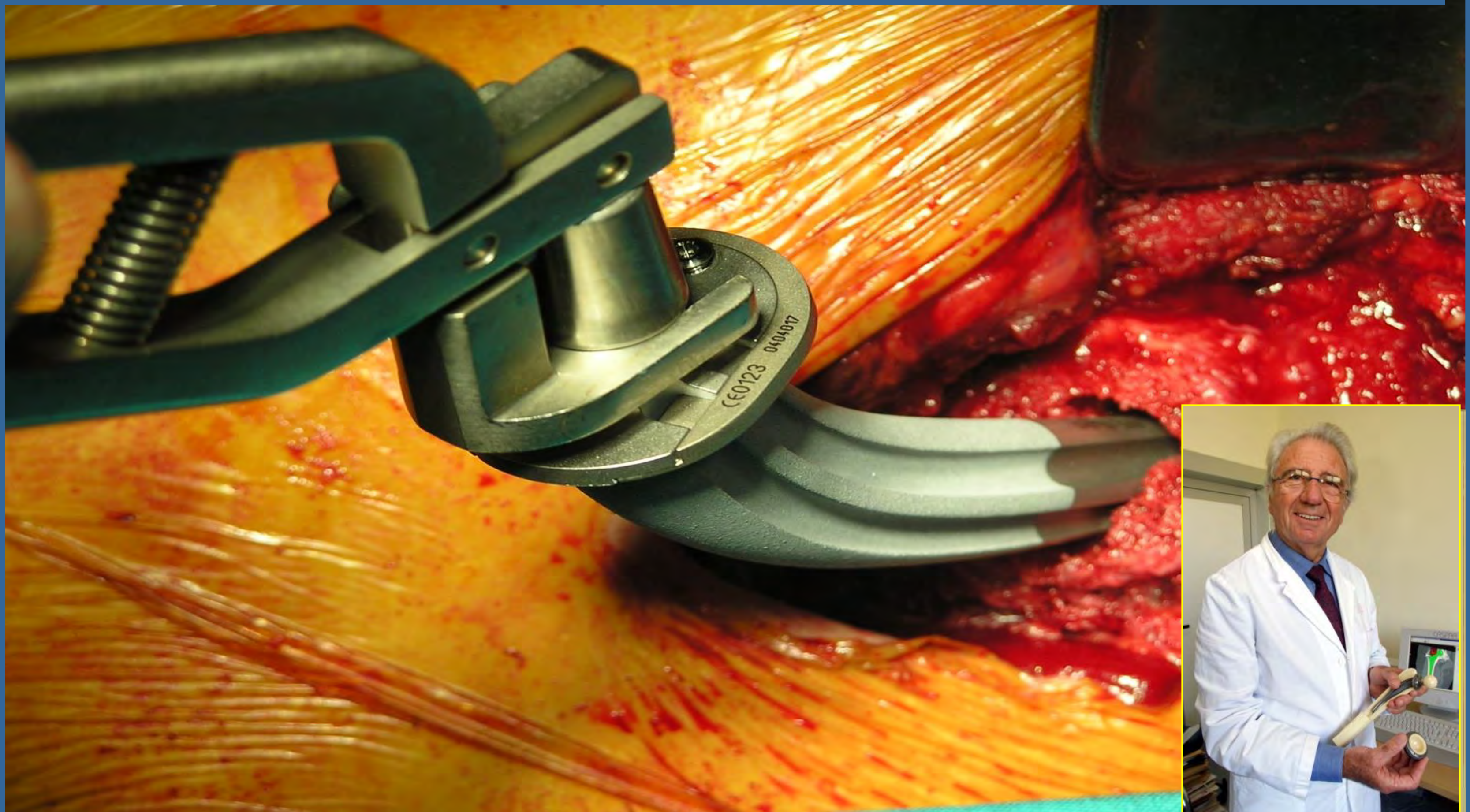
(Hugler e Jacobs, Balgrist University, Zurich)

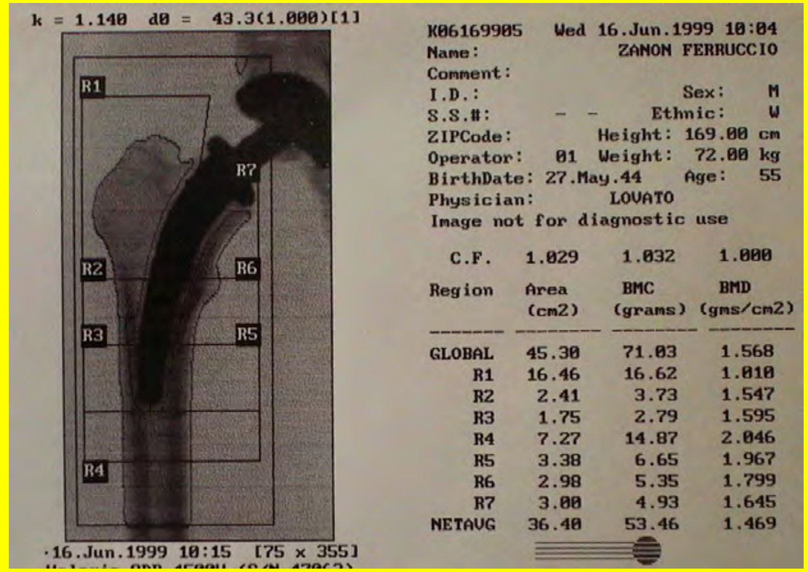
CA w 74y 16y f.u.

HYDROXYAPATITE COATINGS PLASMA SPRAY

- Developed in Netherlands in the early 80's
  - **Composition: $Ca_5(OH)(PO_4)_3$**
  - **Typical thickness: 100 µm**
  - **First implantation: 1986**

Coating+neck preservation improve primary fixation enhancing bone ingrowth

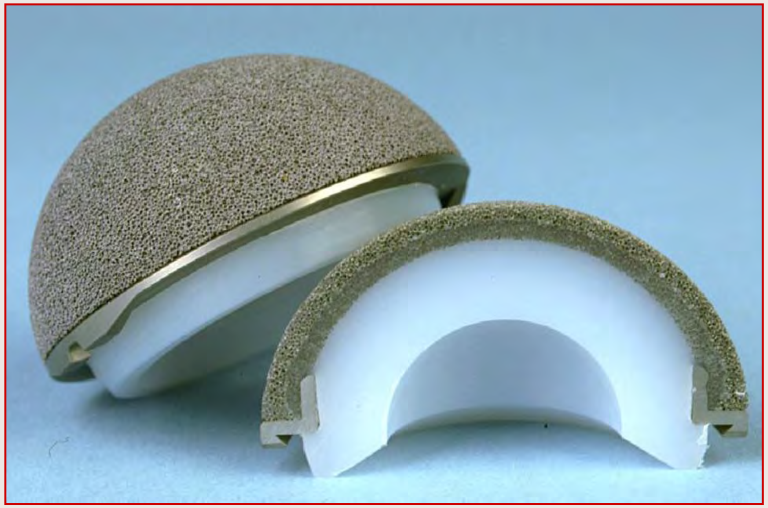




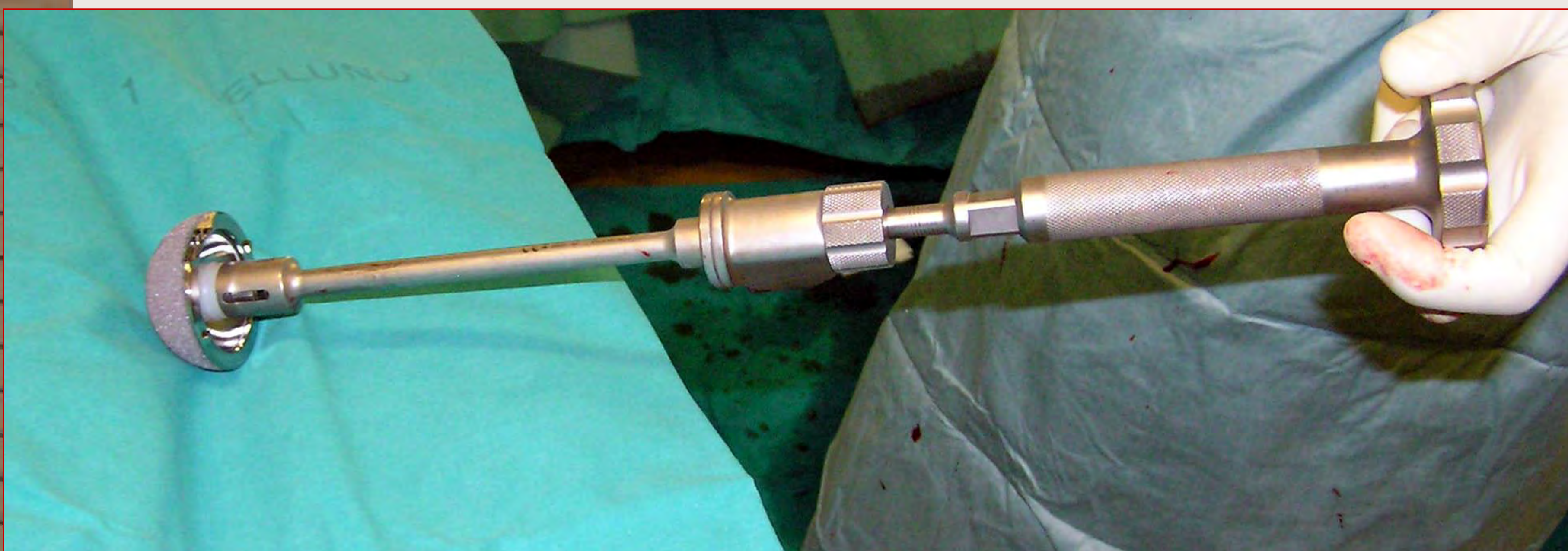
7 YEARS RESULTS

	SF 55	FV 63	ZF 59	TS 69	BV 67	TB 57	FV 73	CG 58	AM 68	MF 58
R1	-4%	-17,62%	-5,24%	-26,64%	4,00%	2,95%	-14,56%	-11,65%	-10,80%	-17,50%
R2	9,10%	-9,20%	2,53%	35,88%	12,50%	20,09%	-10,45%	-33,12%	-6,90%	-5,00%
R3	7,30%	2,30%	-0,93%	27%	5,05%	68,68%	-0,34%	-5,65%	5,25%	-3,70%
R4	3,31%	-1,80%	-3%	-4,48%	4,67%	7,05%	-1,45%	-9,16%	-1,46%	-4,60%
R5	5,13%	-0,38%	5,90%	0,16%	4,12%	0,66%	-4,67%	-3,98%	-2,14%	-2,00%
R6	-0,65%	-4,70%	10,67%	28,37%	7,42%	18,80%	-8,90%	-26,10%	-19,12%	-6,70%
R7	-13,20%	-38,12%	-1,65%	-11,81%	-24,45%	-8,76%	-34,67%	-46,76%	-7,48%	-9,40%
MEDIA	-4,32%	-9,21%	-1,32%	-2,42%	3,84%	7,28%	-8,40%	-17,80%	-8,74%	-7,32%

About Cup

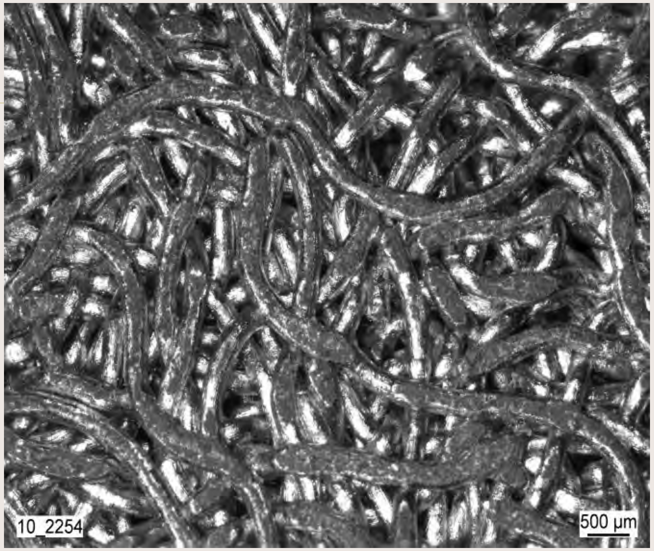


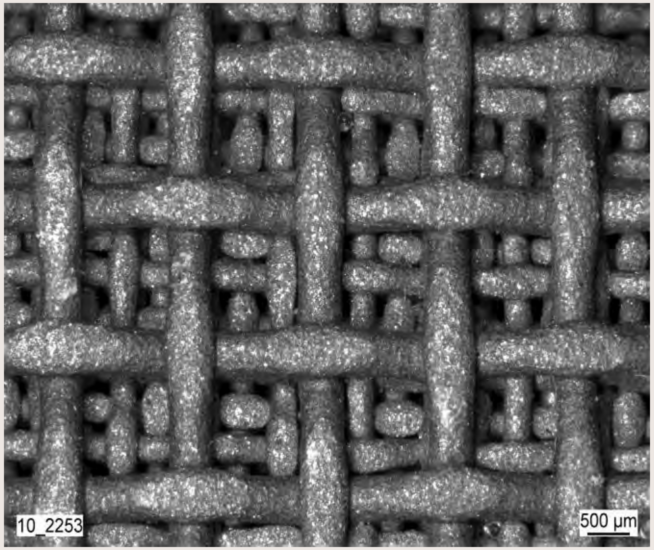

1 BELLUNO
U.L.S.S. 1



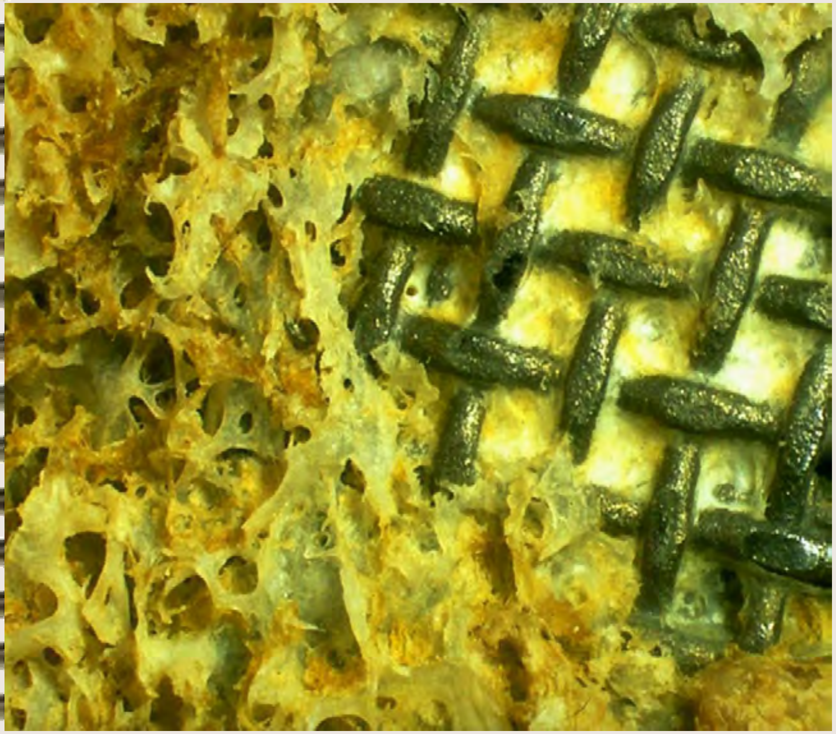
METALLIC MESHES

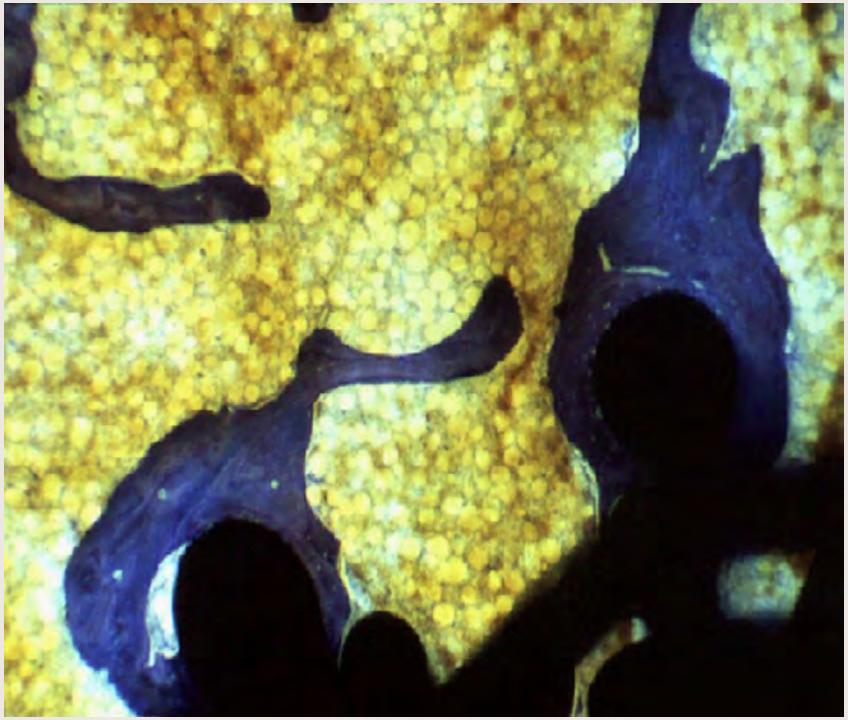
- Developed in the US by Zimmer in the mid 70’s:
  - Fibermesh used for the Harris-Galante cup and for the Miller-Galante TKA
- Similar development done in Winterthur:
  - Sulmesh used for the Press-fit / Fitek cups





METALLIC MESHES



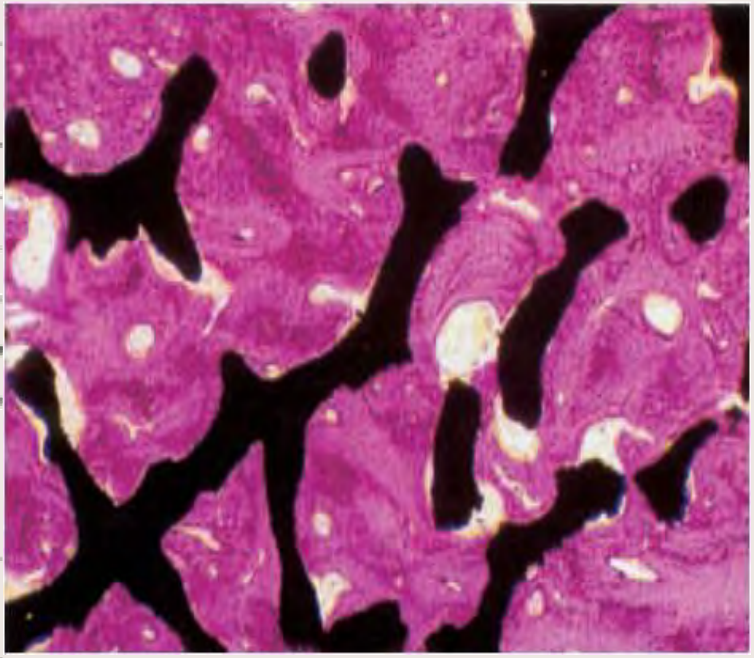


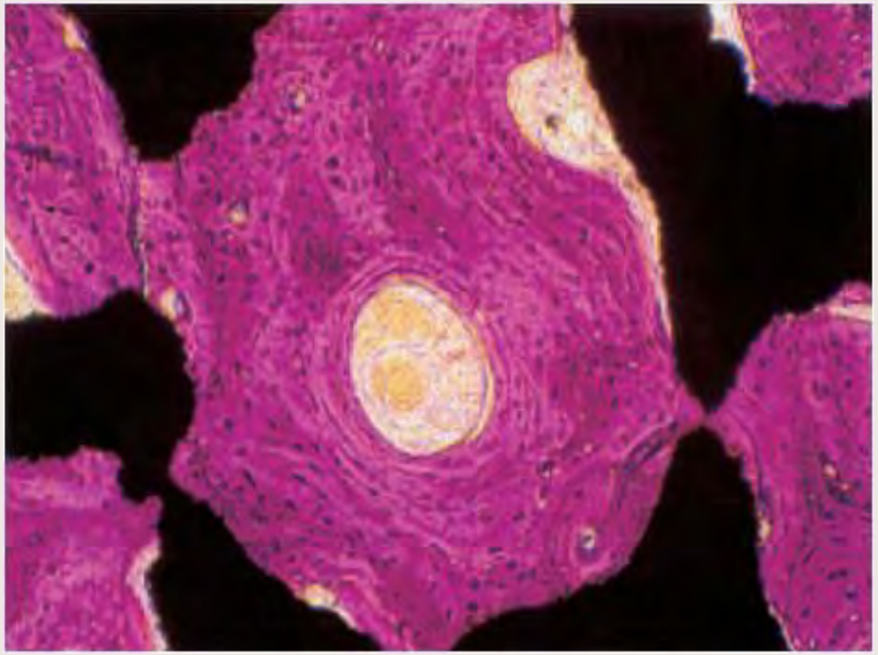
Fitek cup / 24 months in-vivo

CHARACTERISTICS OF BONE INGROWTH AND INTERFACE MECHANICS OF A NEW POROUS TANTALUM BIOMATERIAL

- “Our study has given an initial characterization of the response of bone to a new porous tantalum biomaterial in a canine transcortical model. Substantial filling of the pores with new bone to 40% to 50% occurred by four weeks with implants of both pore sizes.”
- J.D. Bobyn et al, JBJS, 81B, 1999, p. 907

TRABECULAR METAL



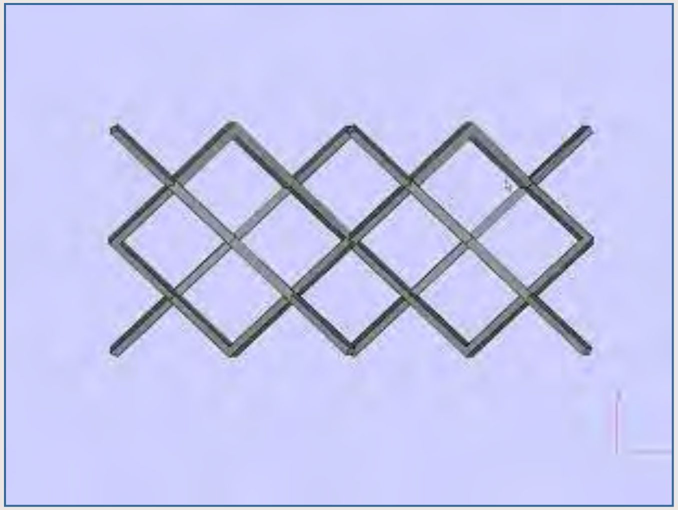


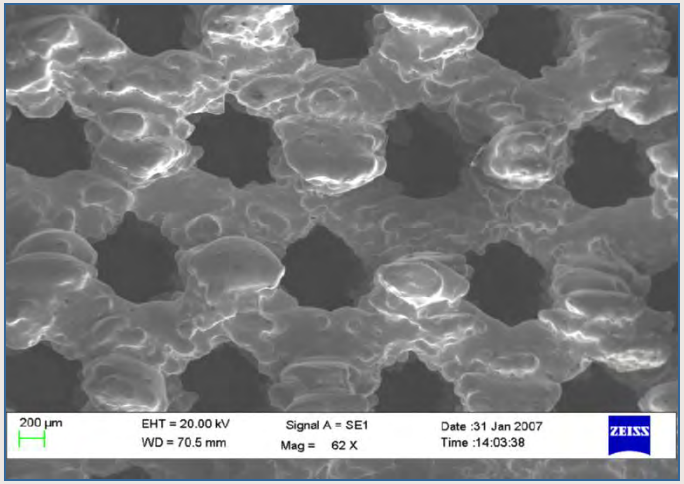
Canine study / one year

volumetric osseointegration: 63 – 80%

The Trabecular *Titanium*™

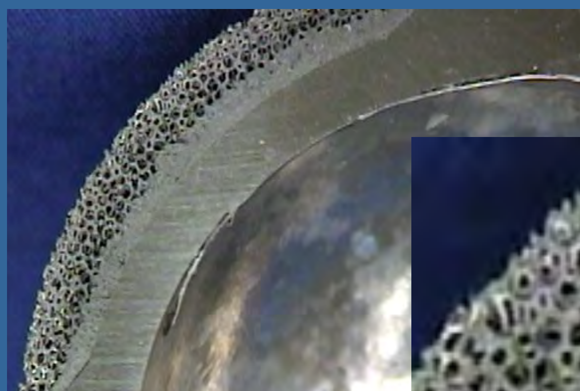
- Alveolar strucure composed by a plurality of 3D complex shape hexagonal cells
- **Ti6Al4V** (ISO 5832-3)
- **C.P. Titanium** (ISO 5832-3)

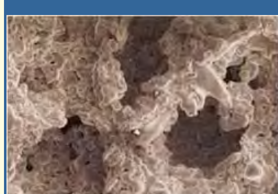




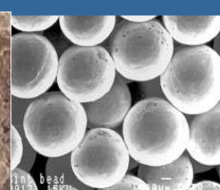
Trabecular Titanium

Can be utilized for both structural construct and coating





CSTi

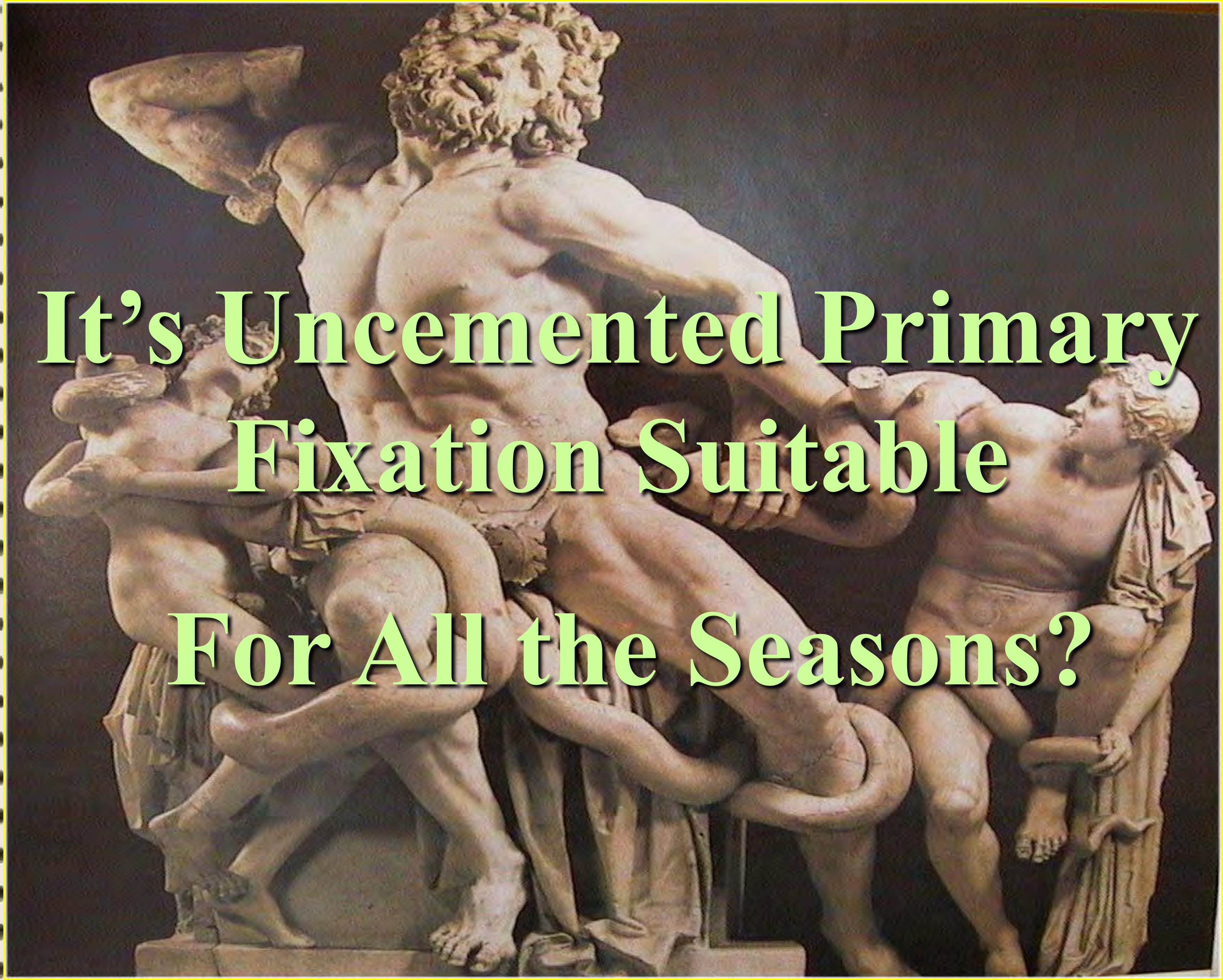


Beads

Fiber Mesh

It’s Uncemented Primary Fixation Suitable

For All the Seasons?



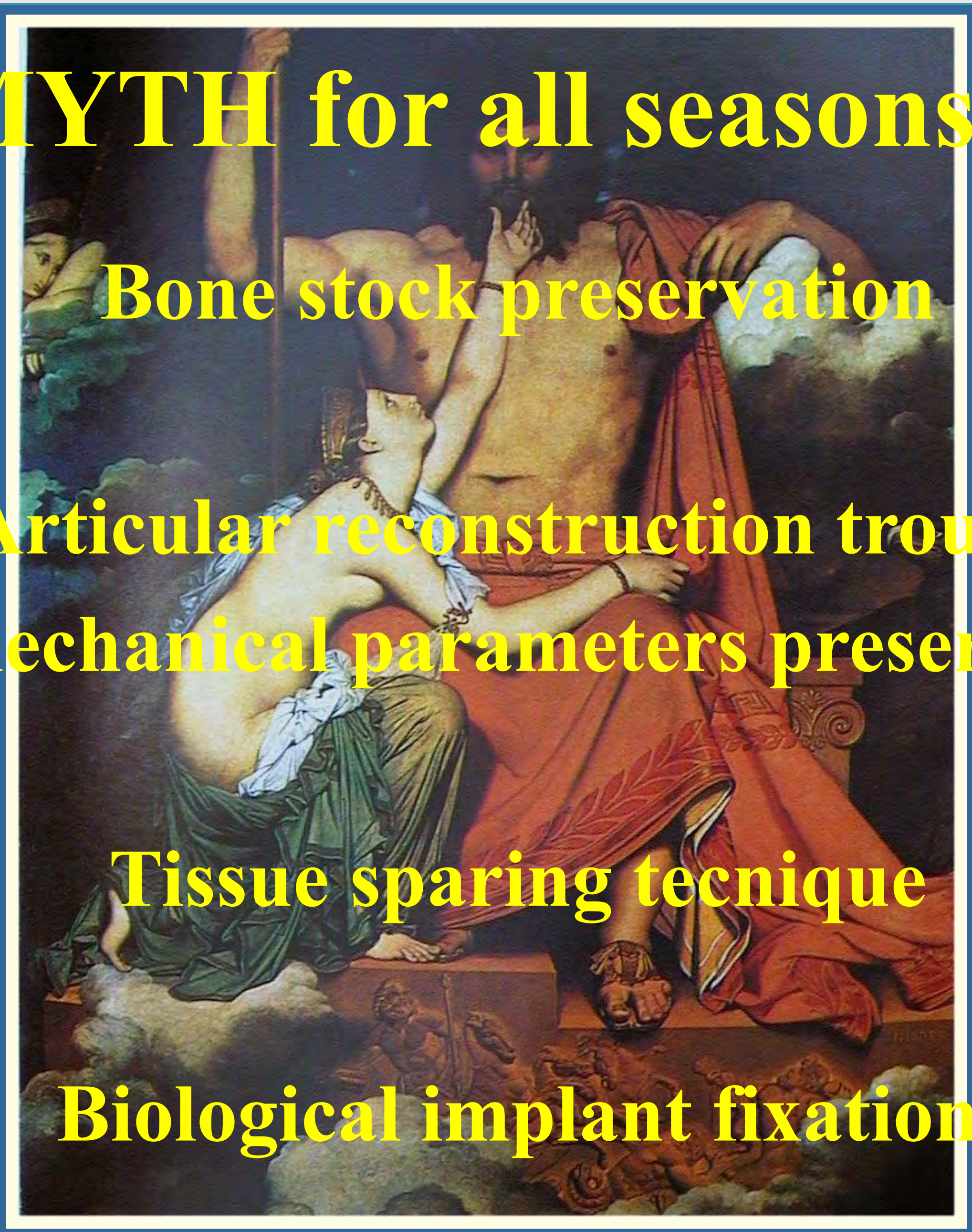
Only all poly component

Exeter School

Tecnique

Round or anatomical design, smooth surfaces, Cro/Co alloy

MYTH for all seasons



Bone stock preservation

Articular reconstruction trough biomechanical parameters preservation

Tissue sparing tecnique

Biological implant fixation


Dx
Sn
15 Y

Gruppo Policlinico di Monza

Istituto ad Alta Specializzazione

Dipartimento di Ortopedia e Traumatologia

Direttore Scientifico: Prof. Francesco Biggi

Grazie

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY


There is a Place for Hip Resurfacing -Affirmative-

Ronan Treacy

The Royal Orthopaedic Hospital
Birmingham, England

Milan, November 2015

THE ROYAL ORTHOPAEDIC HOSPITAL BIRMINGHAM

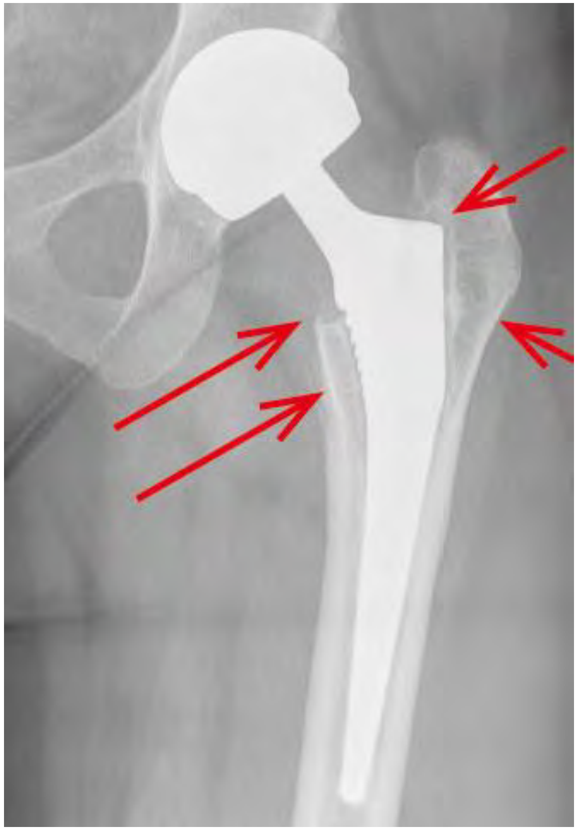
UNIVERSITY OF BIRMINGHAM

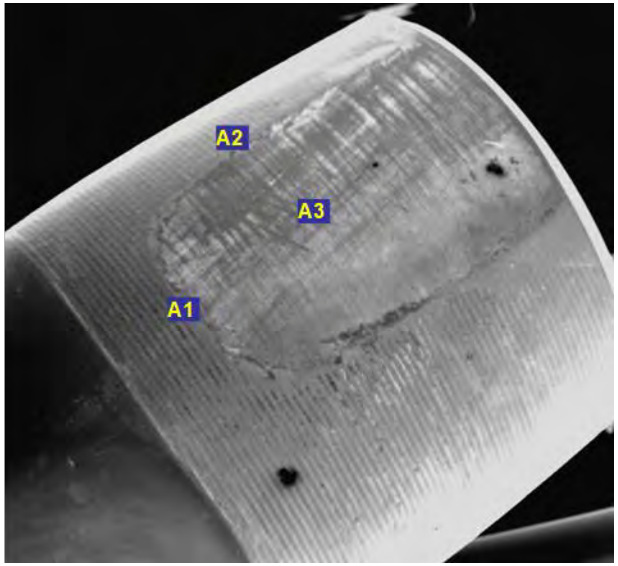
Hip resurfacing ignites bitter tribal rivalries even in discussion between perfectly reasonable colleagues

This is fuelled by *negative* perceptions of hip resurfacing based on…

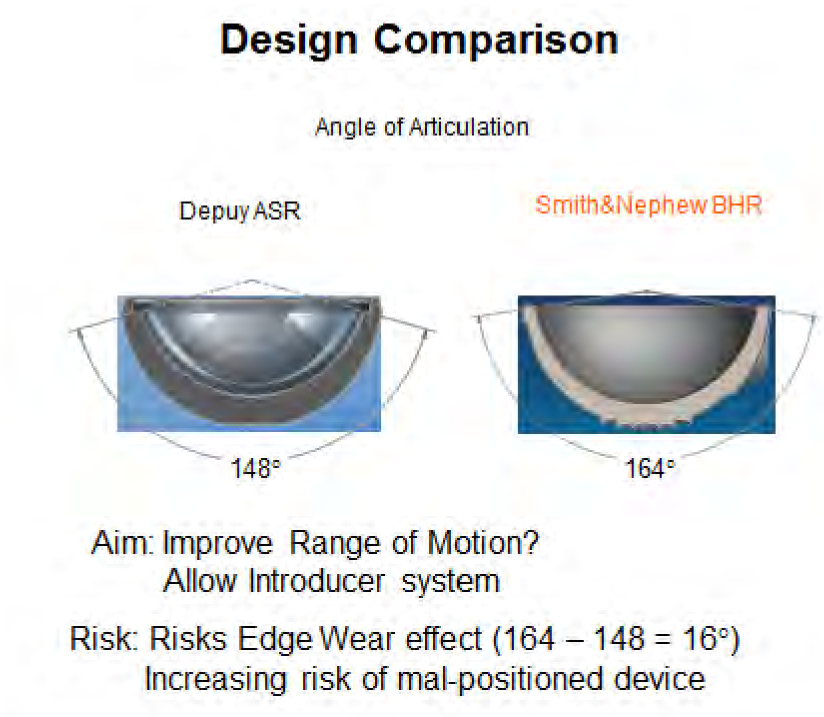
- Failed resurfacing devices (a gift from DePuy)
- Failure of trunnion design (a gift from the ceramic industry)
- Fear of metal debris (a gift from Oxford)
- Fear of cancer (a gift from Bristol)

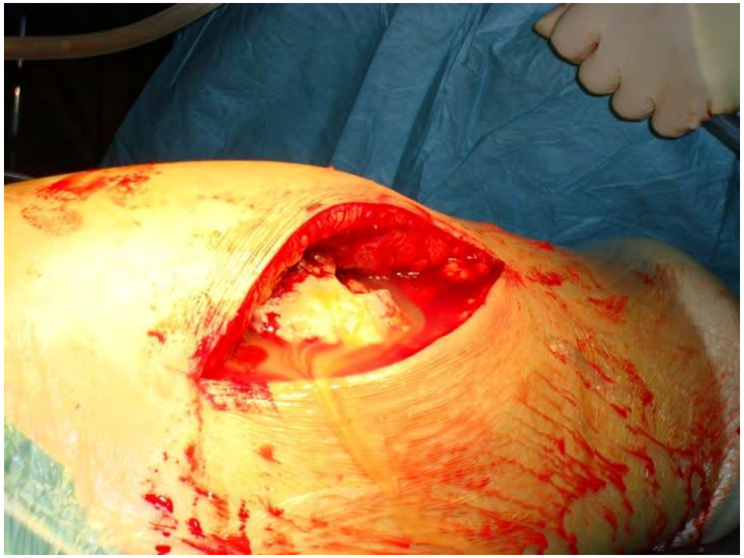
MoM THR with trunnion wear generates cobalt rich debris with catastrophic biological sequeli. 38% revision @ 7yr



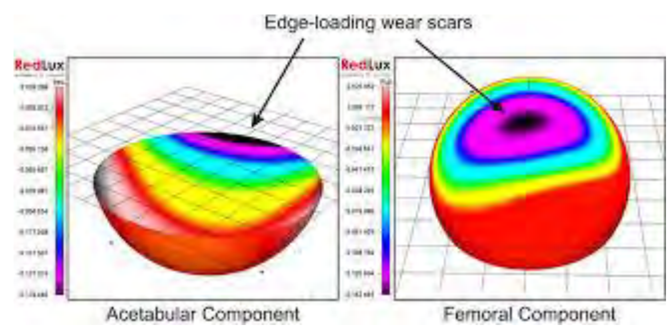


Excess Cobalt and Chromium debris can be generated by poorly designed Hip Resurfacings



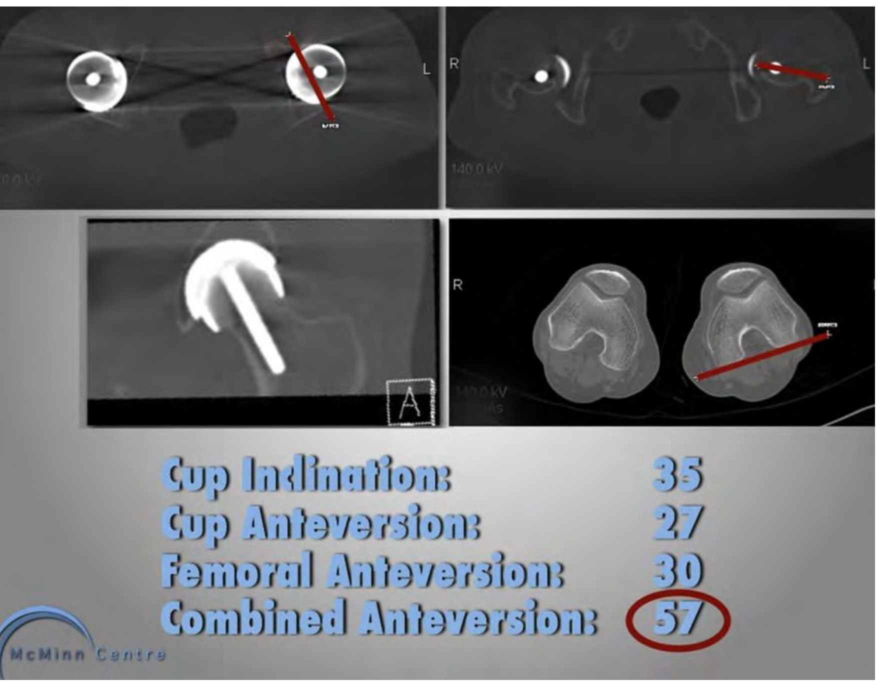


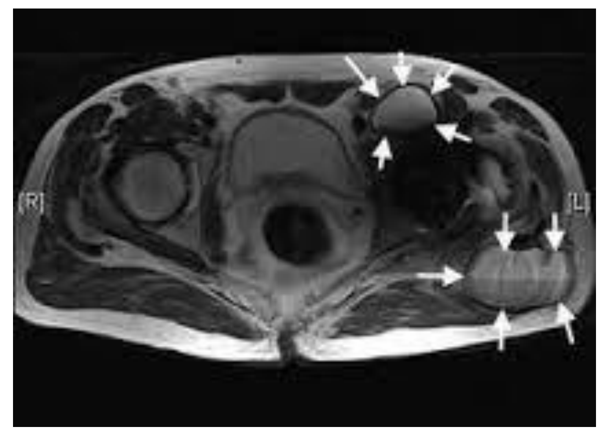
Equally, poorly positioned implants will cause edge wear generating metal debris



In female patients/small sizes, there is little margin for error

- Cup inclination
- Combined anteversion





Outstanding Published Results in Males with Osteoarthritis

- Treacy 100% 14y UK BJJ
- McMinn 99% 13y UK BJJ

■ HIP

The outcome of the Birmingham Hip Resurfacing in patients aged < 50 years up to 14 years post-operatively

G. S. Matharu,
C. W. McBryde,
W. B. Pynsent,
P. B. Pynsent,
R. B. C. Treacy

We report the long-term survival and functional outcome of the Birmingham Hip Resurfacing (BHR) in patients aged < 50 years at operation, and explore the factors affecting survival. Between 1997 and 2006, a total of 447 BHRs were implanted in 393 patients (mean age 41.5 years (14.9 to 49.9)) by one designing surgeon. The mean follow-up was 10.1 years (5.2 to 14.7), with no loss to follow-up. In all, 16 hips (3.6%) in 15 patients were revised,

- Non- Designer Series
- De Smet 99% 12y Belgium BJJ
- Oxford 99% 10y UK BJJ
- Shimmin 99% 10y Australia BJJ
- Haddad 99% 10y UK BJJ
- Brooks 100% 5y USA AAOS

Mixed Published Results in Females with Osteoarthritis

- McMinn 99% 13y UK BJJ
- Treacy 93% 14 y UK BJJ

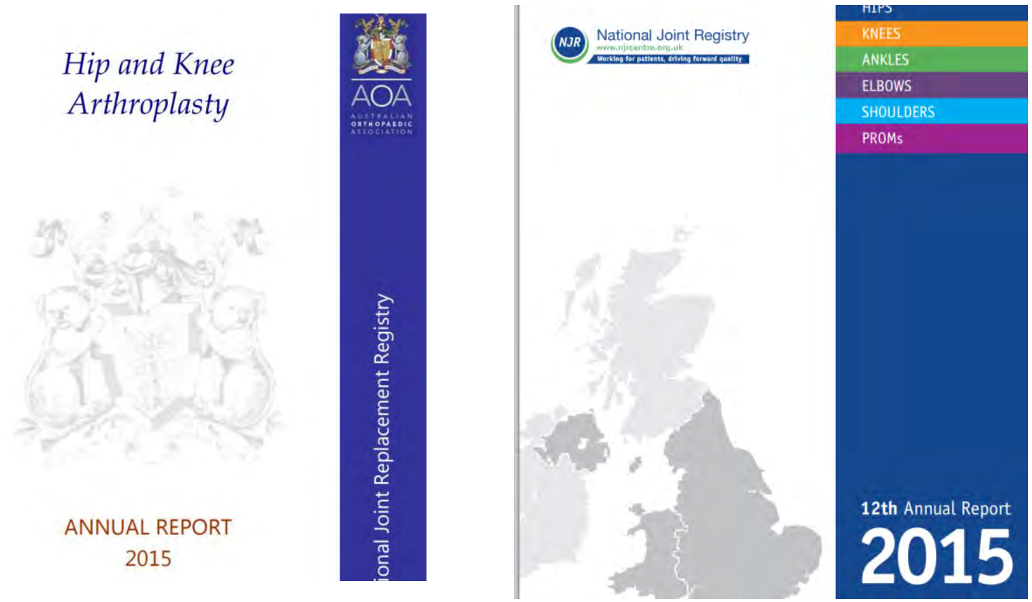
- Non- Designer Series
- Shimmin 90% 10y Australia BJJ
- A N Other UK Centre 74 % 10y UK JBJS

What do the registries say ?

No direct comparison BHR vs THR

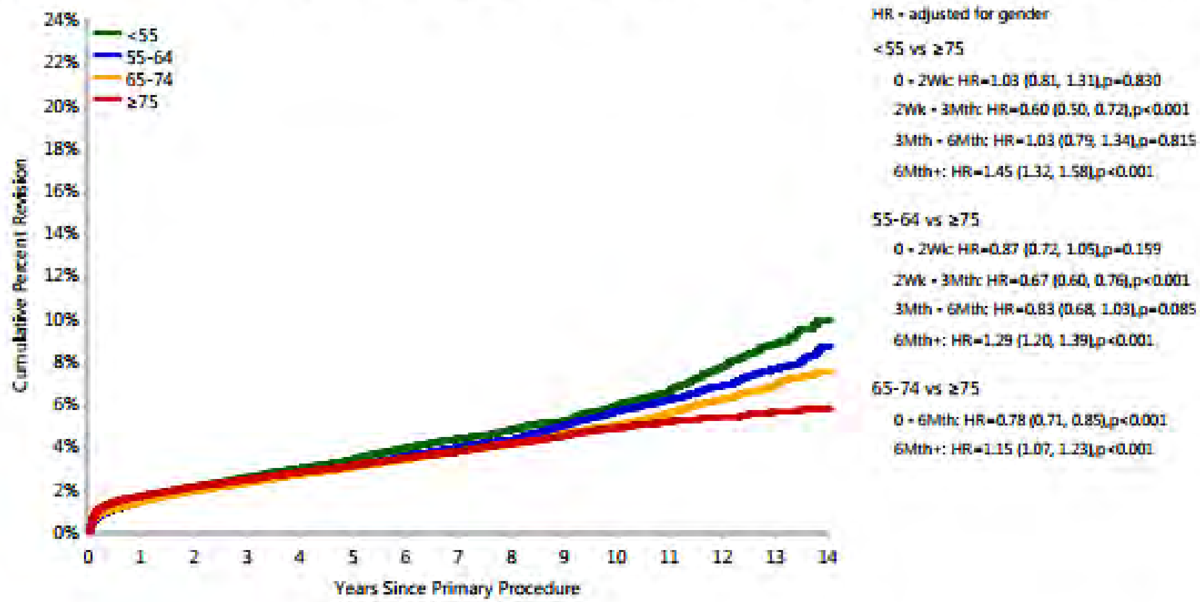
- Implant specific
- Age specific
- Diagnosis specific
- Gender specific

- (Activity specific)



THR performs poorly in younger patients

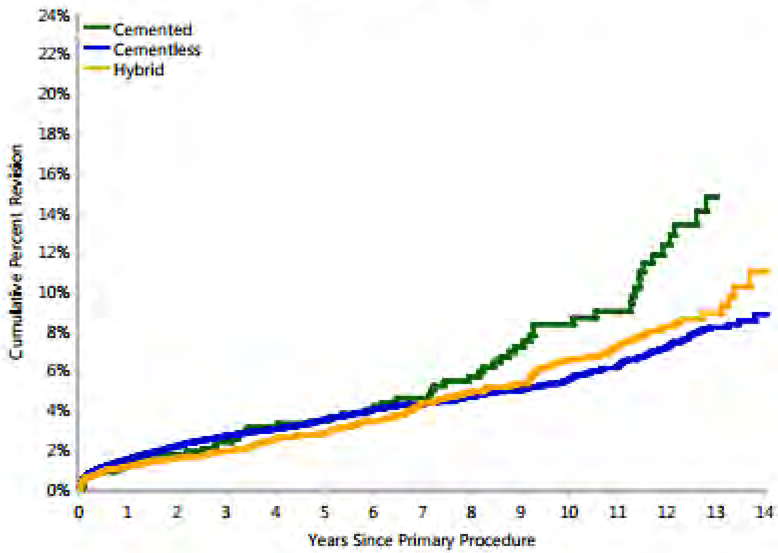
Figure HT7 Cumulative Percent Revision of Primary Total Conventional Hip Replacement by Age (Primary Diagnosis OA)



Cemented THR in younger patients performs worst

(not implant specific)

Figure HT12 Cumulative Percent Revision of Primary Total Conventional Hip Replacement for Patients Aged <55 Years by Fixation (Primary Diagnosis OA)



HR - adjusted for age and gender

Cemented vs Hybrid

Entire Period: HR=1.40 (1.05, 1.88),p=0.022

Cementless vs Hybrid

0 - 3Mth: HR=1.37 (0.95, 1.96),p=0.089

3Mth - 6Mth: HR=1.22 (0.65, 2.29),p=0.528

6Mth - 1.5Yr: HR=1.44 (0.94, 2.19),p=0.094

1.5Yr - 2.5Yr: HR=2.45 (1.31, 4.57),p=0.005

2.5Yr+: HR=0.70 (0.57, 0.87),p=0.001

Cementless vs Cemented

0 - 3Mth: HR=0.98 (0.64, 1.49),p=0.912

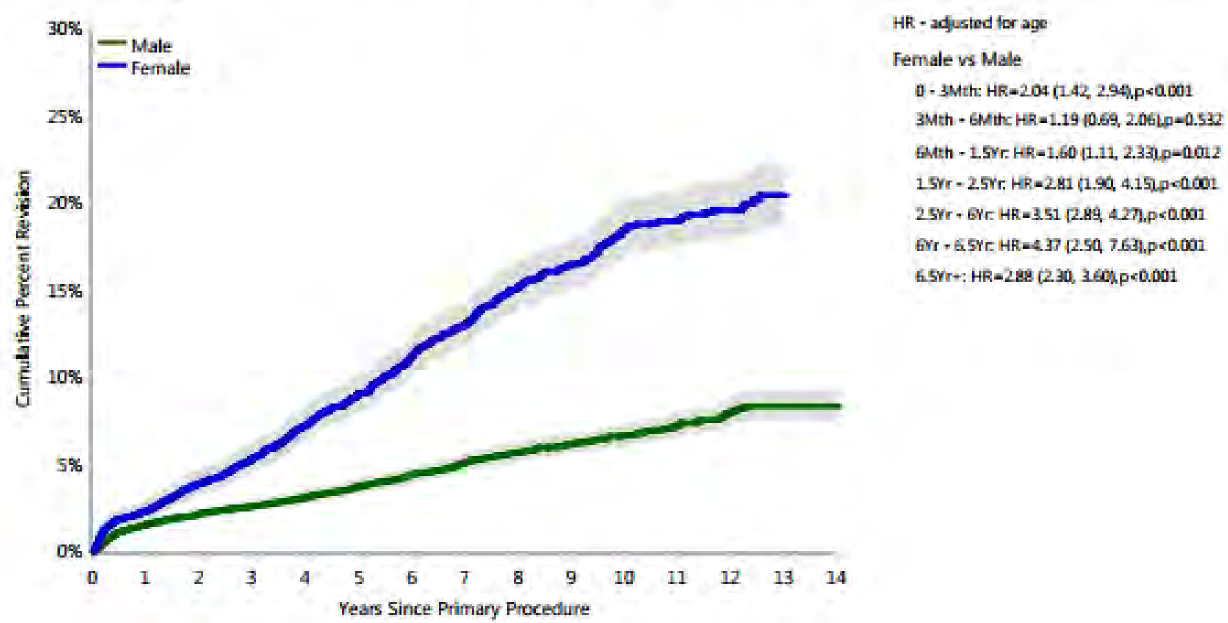
3Mth - 2.5Yr: HR=1.15 (0.79, 1.68),p=0.472

2.5Yr+: HR=0.50 (0.38, 0.67),p<0.001

Resurfacing performs poorly in females
BUT
performs very satisfactorily in males

(not implant specific)

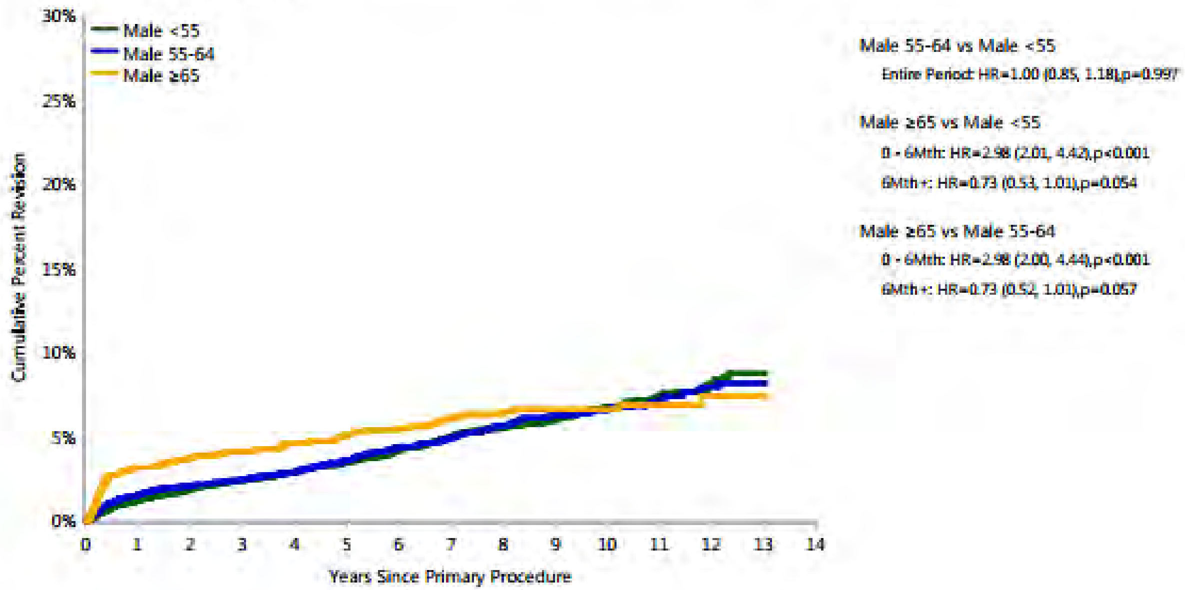
Figure HT60 **Cumulative Percent Revision of Primary Total Resurfacing Hip Replacement by Gender (Primary Diagnosis OA)**



Male HR satisfactory in all age groups

gender, diagnosis, age (not BHR specific)

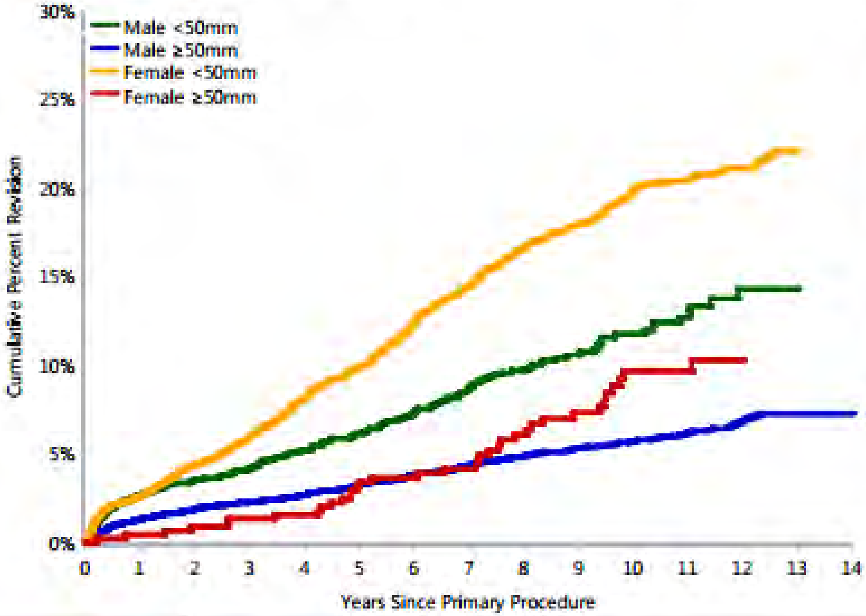
Figure HT62 **Cumulative Percent Revision of Primary Total Resurfacing Hip Replacement for Males by Age (Primary Diagnosis OA)**



90% males 50+ mm Heads; 95% at 14years

(not age or BHR specific)

Figure HT65 Cumulative Percent Revision of Primary Total Resurfacing Hip Replacement by Gender and Head Size (Primary Diagnosis OA)



HR - adjusted for age

Male <50mm vs Male ≥50mm
Entire Period: HR=2.06 (1.74, 2.45),p<0.001

Male ≥50mm vs Female ≥50mm
0 - 1.5Yr: HR=1.44 (0.83, 2.50),p=0.197
1.5Yr - 3Yr: HR=0.83 (0.46, 1.50),p=0.532
3Yr - 5Yr: HR=0.67 (0.38, 1.19),p=0.171
5Yr+: HR=0.50 (0.32, 0.79),p=0.003

Male <50mm vs Female <50mm
Entire Period: HR=0.60 (0.50, 0.71),p<0.001

Female <50mm vs Female ≥50mm
0 - 5Yr: HR=3.08 (1.83, 5.18),p<0.001
5Yr+: HR=2.05 (1.31, 3.20),p=0.001

We’ve already got the message

79.7% less than 2005. Resurfacing hip replacement represents 0.9% of hip replacements performed in 2014.

The principal diagnosis is osteoarthritis (95.2%), followed by developmental dysplasia (2.4%) and osteonecrosis (1.6%) (Table HT48).

In 2014, 97.6% of resurfacing hip replacements were undertaken in males (Figure HT54).

Figure HT54 Primary Total Resurfacing Hip Replacement by Gender

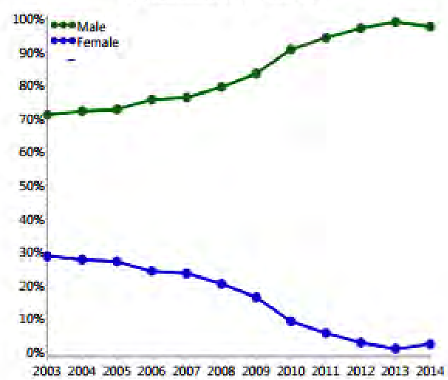
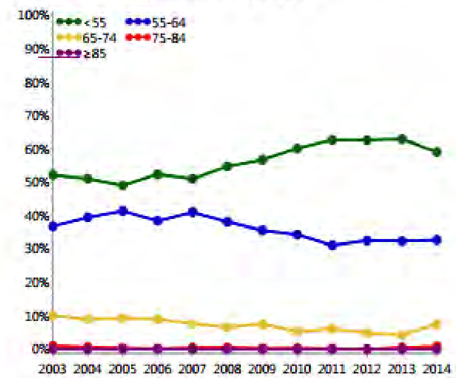


Figure HT55 Primary Total Resurfacing Hip Replacement by Age



All total resurfacing procedures in 2014 used hybrid fixation.

There were only two resurfacing prostheses used in 2014 with the BHR accounting for 75.3% of procedures (Table HT47).

Table HT47 Most Used Resurfacing Heads in Primary Total Resurfacing Hip Replacement

2003		2011		2012		2013		2014	
N	Model	N	Model	N	Model	N	Model	N	Model
1359	BHR	445	BHR	341	BHR	267	BHR	281	BHR
58	Durom	93	Mitch TRH	90	Adept	126	Adept	92	Adept
43	ASR	27	Adept	10	Mitch TRH	5	Icon		
42	Cormet	10	Cormet	7	ACCIS	4	Cormet		
38	Cormet 2000 HAP	10	Durom	4	Cormet				
7	Conserve Plus	3	Recap						
		2	ACCIS						
		2	Bionik						

What about other outcomes ?

THR vs HR – RCT

(poor choice of implant, poor surgical approach

BMJ

BMJ 2012;344:e2147 doi: 10.1136/bmj.e2147 (Published 19 April 2012)

RESEARCH

Total hip arthroplasty versus resurfacing arthroplasty in the treatment of patients with arthritis of the hip joint: single centre, parallel group, assessor blinded, randomised controlled trial

Matthew L Costa *professor of trauma and orthopaedic surgery*[1], Juul Achten *senior research fellow*[2], Nicholas R Parsons *trial statistician*[2], Richard P Edlin *senior lecturer in health economics*[3], Pedro Foguet *consultant orthopaedic surgeon*[4], Udai Prakash *consultant orthopaedic surgeon*[4], Damian R Griffin *professor of trauma and orthopaedic surgery*[2], Young Adult Hip Arthroplasty team

Better activity with HR

(ceiling effect of studies using HHS Oxford score)

- Patients With One Resurfacing and One Replacement Hip Show Which Hip Functions Better Without Selection Bias
- **Justin Cobb*, Adeel Aqil, Victoria Manning Sarah K Muirhead-Allwood**
- Hip resurfacing seems to allow for greater levels of function using hill walking and speed walking on a treadmill as a surrogate.
- There appears to be a functional advantage of having a HRA over THA in patients wishing to return to levels of activity more rigorous than walking at slow speeds on the flat.

- Bull NYU Hosp Jt Dis. 2009;67(2):116-9.
- **Resurfacing matched to standard total hip arthroplasty by preoperative activity levels - a comparison of postoperative outcomes.**
- Zywiel MG[1], Marker DR, McGrath MS, Delanois RE, Mont MA.
- **CONCLUSIONS:**
- The results of this study suggest that patients treated with hip resurfacing arthroplasty have a significantly higher postoperative activity level, as compared to those treated with conventional THA, when controlled for preoperative factors.

- relationship between activity and implant failure

- relationship between activity and patient survival

Would we compare the performance of these cars by the numbers seen on the road 10 years after purchase ?

THR..

BHR...

Flawed Assessment

relying on implant survival alone has prejudiced all conclusions concerning implant choice in the last 20 years

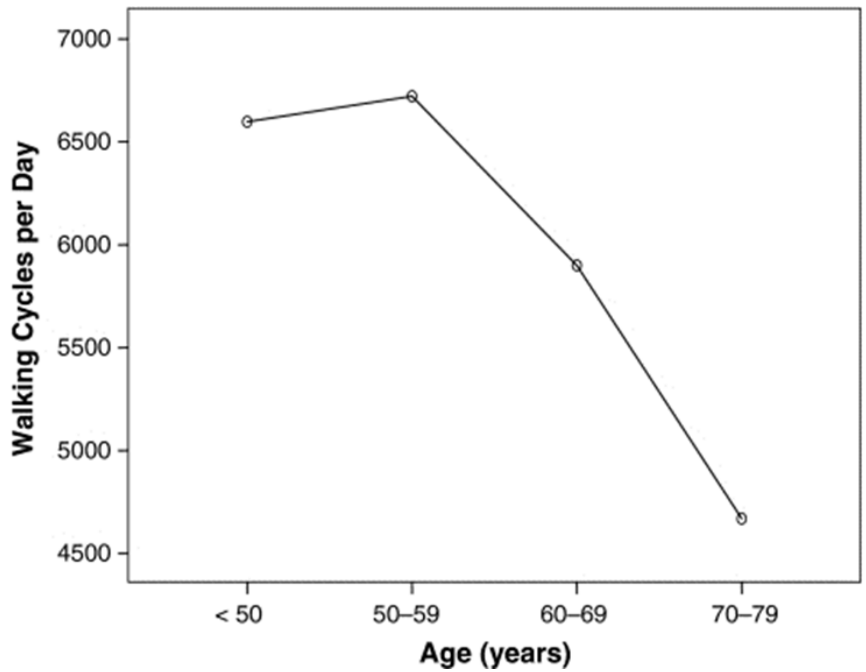
- Activity
- Implant Survival

Patient survival

We acknowledge the role of activity in preclinical implant testing

Activity related to age

up to 14 x differences have been observed

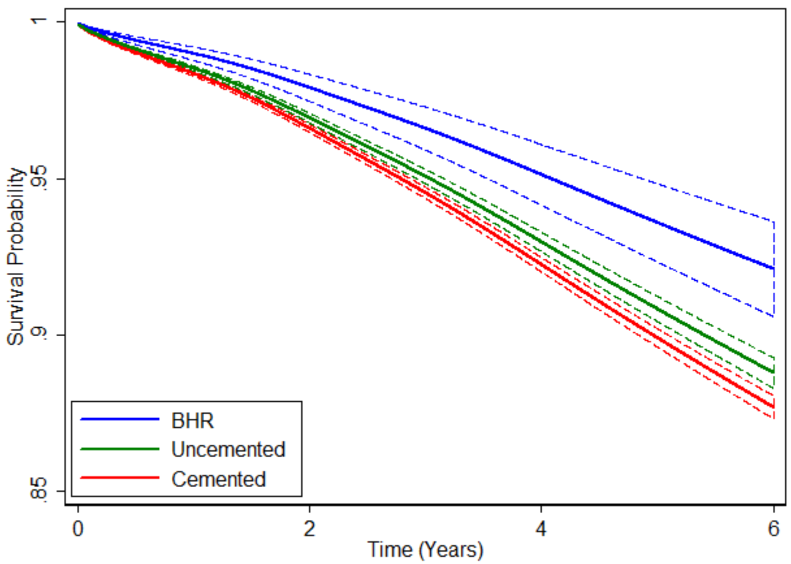


The Missing Link:
Inverse relationship between activity and mortality

- Physical activity, all-cause mortality, and longevity of college alumni.
- Paffenbarger, Ralph S.; Hyde, Robert T.; Wing, Alvin L.; Hsieh, Chung-cheng
- The New England Journal of Medicine, Vol 314(10), Mar 1986, 605-613.http://dx.doi.org/10.1056/NEJM198603063141003
- **ABSTRACT**
- Examined the physical activity and other lifestyle characteristics of 16,936 male Harvard alumni (aged 35–74 yrs) for relations to rates of mortality from all causes and for influences on length of life. A total of 1,413 Ss died during 12–16 yrs of follow-up**. Exercise reported as walking, stair climbing, and sports play related inversely to total mortality, primarily to death due to cardiovascular or respiratory causes.** With or without consideration of hypertension, cigarette smoking, extremes or gains in body weight, or early parental death, alumni mortality rates were significantly lower among the physically active. Relative risks of death for individuals were highest among cigarette smokers and Ss with hypertension, and attributable risks in the community were highest among smokers and sedentary Ss. By the age of 80 yrs, the amount of additional life attributable to adequate exercise, as compared with sedentariness, was 1 to more than 2 yrs. (40 ref) (PsycINFO Database Record (c) 2012 APA, all rights reserved)
-

Mortality

extra deaths with THR vs BHR



BMJ

BMJ 2012;344:e3319 doi: 10.1136/bmj.e3319 (Published 14 June 2012)

RESEARCH

Mortality and implant revision rates of hip arthroplasty in patients with osteoarthritis: registry based cohort study

D J W McMinn *consultant orthopaedic surgeon*[1], K I E Snell *PhD student*[2], J Daniel *director of research*[1], R B C Treacy *consultant orthopaedic surgeon*[3], P B Pynsent *director of research and teaching centre*[3], R D Riley *reader in biostatistics*[4]

Assessment of Performance following Hip Arthroplasty Requires Radical Revision

My Practice

BHR & THR: different expectations:different jobs

	BHR	**Corail/ Pinnacle**	**Exeter/Ogee**
• Mean age	55	• 66	75
• 10y life expect	95%	• 82%	55%
• Annual Cycles	2.2m	• 1.5	1.0
• Implant survival	95%	• 95%	97%



May be better to describe revisions relative to activity

BHR dominates

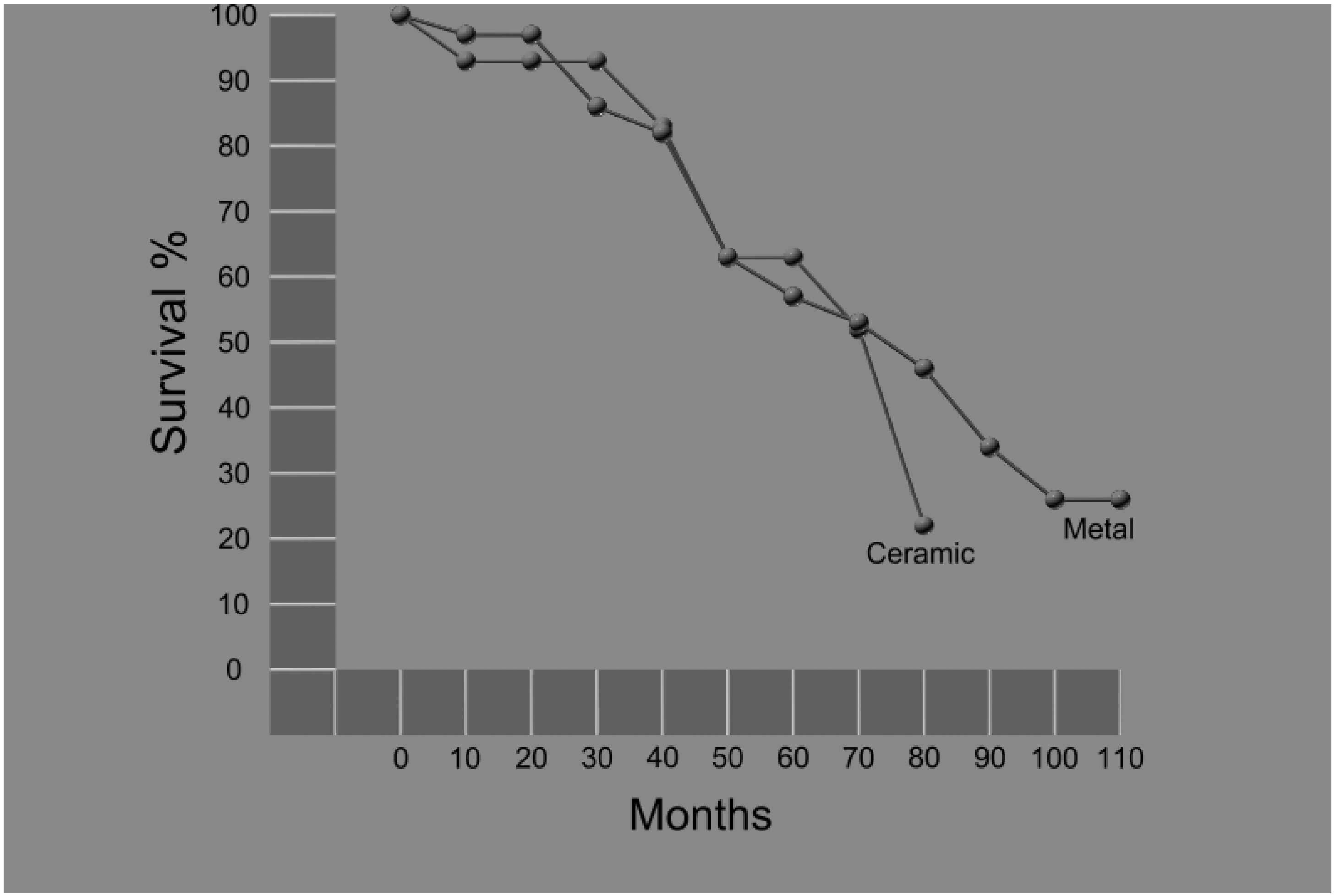
Relative Number of Revisions at 10y per Mcycles

- BHR 2.27
- C/P 3.30
- Exeter 3.0

Relative Number of Mcycles to failure

- BHR 4.4
- C/P 3.0
- Exeter 3.3

We have forgotten the advance that has been made since last generation of resurfacing



A few brands exceeded our expectations
Most didn't….

Metallurgy

Clearance

Cup fixation

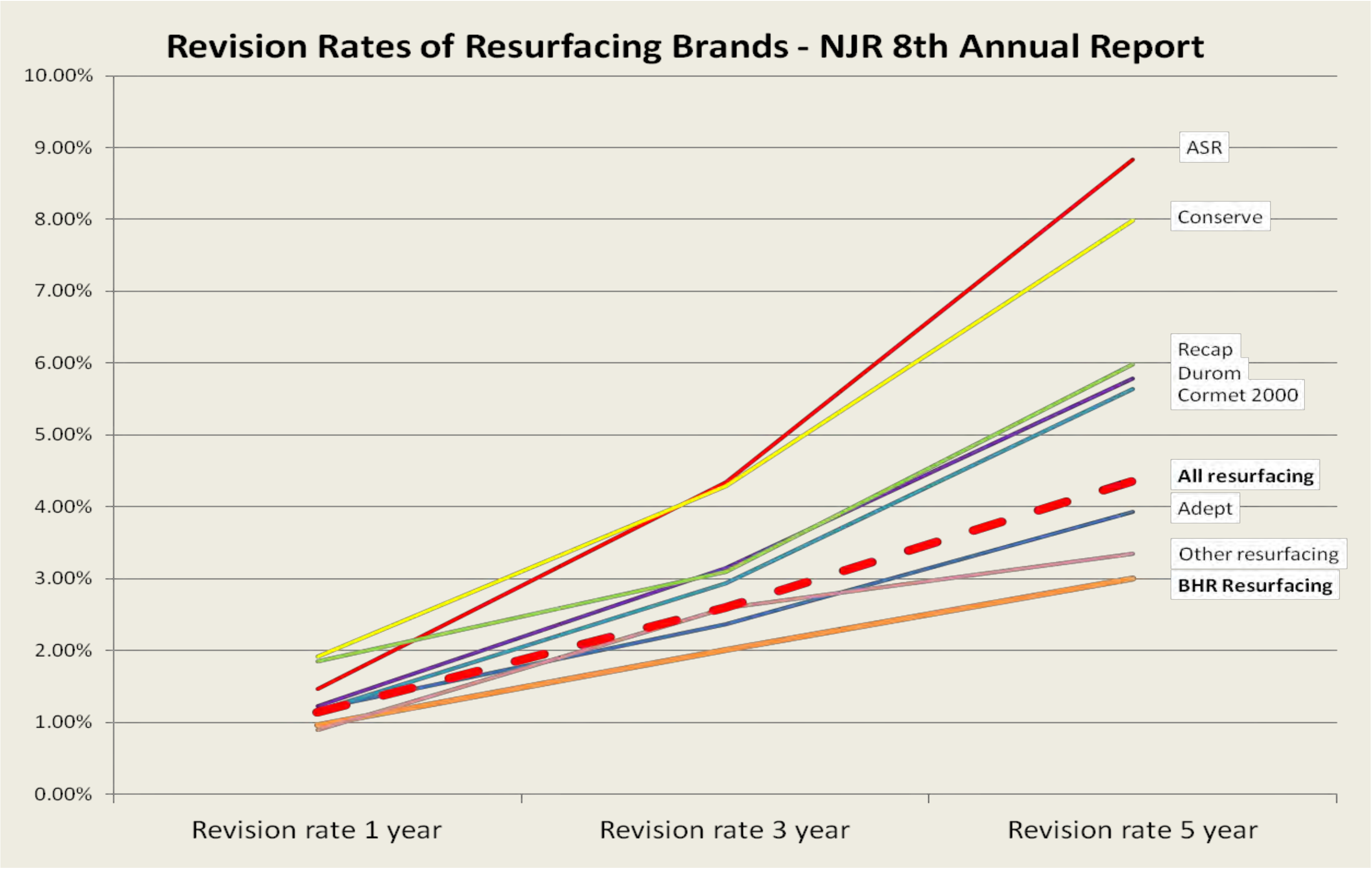
Sector Angle

Stem design

Cementation philosophy

The brand with the best marketing had the *worst* results

This has dominated the perception of this technology

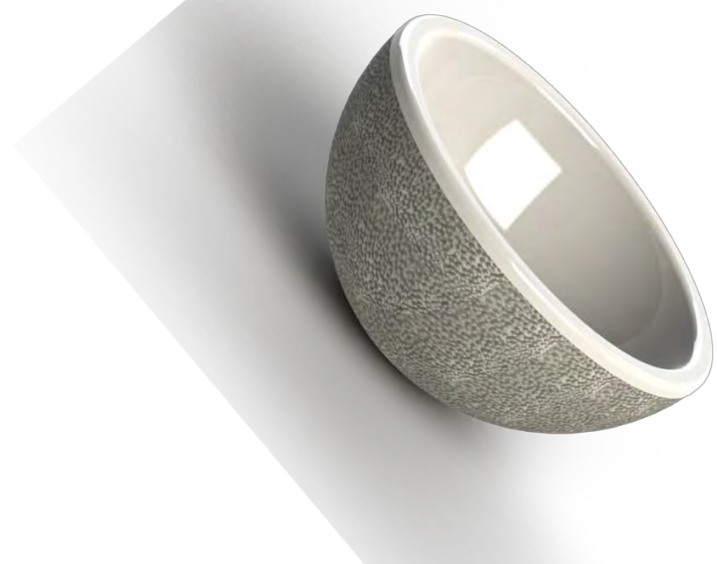


The Resurfacing community failed to convincingly demonstrate

superiority in function
reproducible results
benign nature of failure
lack of ion toxicity
ease of revision
satisfactory stem option
acceptance of mortality papers

Next time round we must ..

- Avoid using a controversial bearing
- Spend less time criticising eachothers' resurfacings
- Spend more time differentiating between HR and THR



I promise you that next speaker will fill your brains with…

- Metallosis
- Pseudotumours
- Chromosomal translocations
- Cancer
- Blindness and Congenital deformation

Hip International 2012 22;633-640

Revisions for Unexplained Pain

Matharu, Revell,Treacy et al.

3000 pts


HIP | HIP International

Home | Contents | Authors | Reviewers | Subsc

< Vol. 22 Issue 6 | Nov-Dec 2012 | pp. 585 - 691

A review of hip resurfacings revised for unexplained pain

Article Details | Full Text | Authors List | Article Metrics

A review of hip resurfacings revised for unexplained pain
Hip Int 2012; 22(6): 633 - 640
Article Type: ORIGINAL ARTICLE
DOI:10.5301/HIP.2012.10368

Authors
Gulraj S. **Matharu**, Matthew P. **Revell**, Paul B. **Pynsent**, Ronan B.C. **Treacy**

Abstract
Background: Adverse reaction to metal debris (ARMD) has come to prominence as a mode of failure for metal-on-metal hip resurfacings. These patients frequently present with unexplained groin pain. Aims: 1) To review all metal-on-metal hip resurfacings revised for unexplained pain seeking evidence for ARMD; 2) To determine the clinical outcome following revision arthroplasty. Methods: The hospital database was

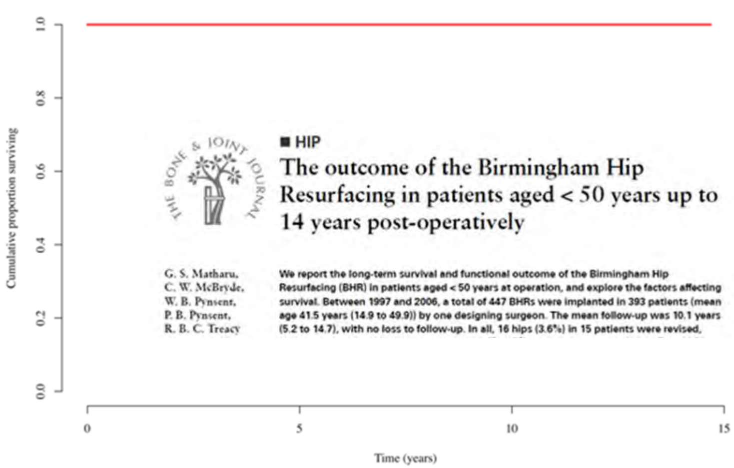
No case of solid tumour

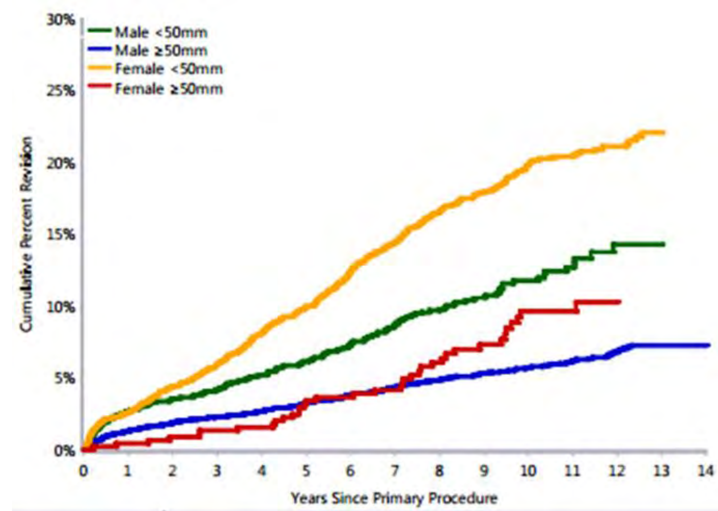
No case macro muscle necrosis

No case neurovascular damage

Please be clear in your mind of the difference between successful Hip Resurfacing

- MoM Total Hip Replacement
- Failed Hip Resurfacing designs
- Poorly performed Hip Resurfacing
- Scientifically supported fact and conjecture..





Is there a future for Resurfacing ?

OF COURSE THERE IS !

both with current devices for careful indications and newer bearings that will expand indications




INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Azienda Ospedaliera
Papa Giovanni XXIII
Bergamo

RESURFACING
IS THERE STILL AN INDICATION?
NO

Claudio C. Castelli
Chief of Department of Orthopaedic Surgery

12th Annual Report
2015
National Joint Registry for England, Wales, Northern Ireland and the Isle of Man
Surgical data to 31 December 2014

Table 3.3 Numbers and percentage of primary hip replacements of each type of fixation and within each fixation sub-group, by bearing surface.*

Fixation	Number (%)	Bearing surface within fixation group	Number (%)
All cases	708,311 (100%)		708,311 (100%)
All cemented	255,926 (36.1%)	MoP	224,779 (87.8%)
		MoM	1,148 (0.5%)
		CoP	24,360 (9.5%)
		Others/unsure	5,639 (2.2%)
All uncemented	276,432 (39.0%)	MoP	104,028 (37.6%)
		MoM	28,658 (10.4%)
		CoP	43,056 (15.6%)
		CoC	93,873 (34.0%)
		CoM	2,162 (0.8%)
		Others/unsure	4,655 (1.7%)
All hybrid	121,068 (17.1%)	MoP	77,396 (63.9%)
		MoM	2,218 (1.8%)
		CoP	19,707 (16.3%)
		CoC	19,633 (16.2%)
		Others/unsure	2,114 (1.8%)
All reverse hybrid	17,267 (2.4%)	MoP	11,670 (67.6%)
		CoP	5,504 (31.9%)
		Others/unsure	93 (0.5%)
All resurfacing	37,579 (5.3%)	(MoM)	37,579 (100%)
Unsure	39 (<0.1%)	Unsure	39 (not applicable)

*The percentages in the right-hand column have been calculated within each fixation group.

HR 5.3 %

ANNUAL REPORT 2015

- 16,154 total resurfacing hip replacement procedures reported to the Registry
- 384 procedures reported in 2014 (0.9% of hip replacement procedures)
- In 2014, the number of total resurfacing procedures is 7.2% less than in 2013 and 79.7% less than 2005.
- Resurfacing hip replacement represents 0.9% of hip replacements performed in 2014.

Swedish Hip Arthroplasty Register

Annual Report 2013

FOR YEAR 2013

15 most common resurfacing components

(most used the past 10 years)

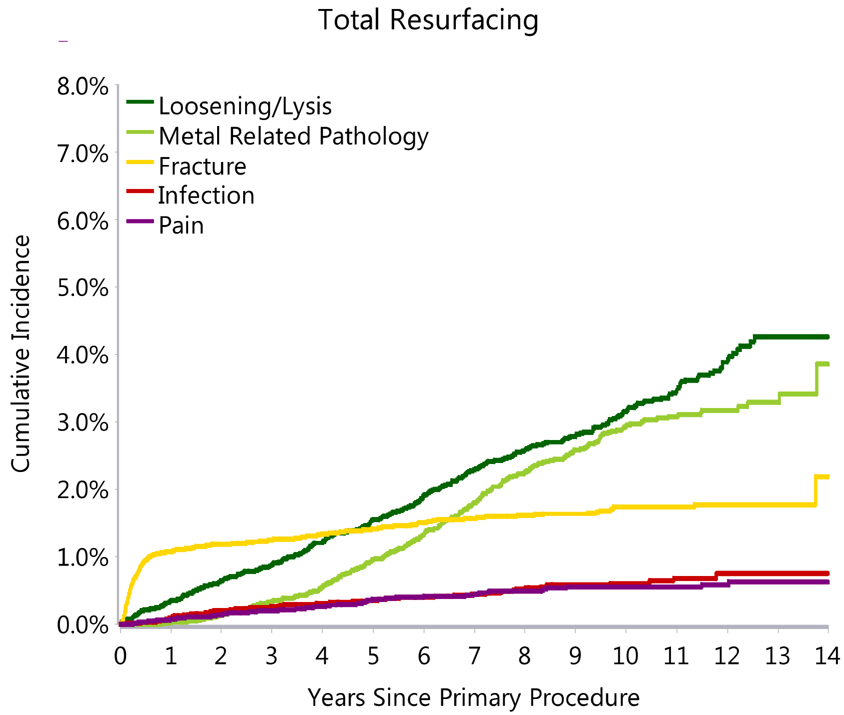
Cup (Stem)	1979–2008	2009	2010	2011	2012	2013	Total	Proportion[1)]
BHR Acetabular Cup (BHR Femoral Head)	647	137	137	125	60	61	1,167	54.6%
ASR Cup (ASR Head)	286	82	28	0	0	0	396	20.6%
Durom (Durom)	329	28	5	0	0	0	362	16.2%
Adept (Adept Resurfacing Head)	15	0	34	25	1	0	75	3.9%
BHR Acetabular Cup (BMHR VS)	0	2	6	11	9	9	37	1.9%
Durom studiecup (Durom)	13	2	0	0	0	0	15	0.8%
BHR Dysplasia Cup (BHR Femoral Head)	10	1	1	3	1	0	16	0.7%
ReCap Cup (ReCap Head)	7	0	2	0	0	0	9	0.5%
BHR Acetabular Cup (BMHR)	5	0	0	0	0	0	5	0.3%
Zimmer MMC Cup (Durom)	0	0	0	3	1	0	4	0.2%
ReCap HA Cup (ReCap Head)	3	0	0	0	0	0	3	0.2%
ASR Cup (BHR Femoral Head)	1	0	0	0	0	0	1	0.1%
BHR Dysplasia Cup (BMHR VS)	0	0	1	0	0	0	1	0.1%
Unknown resurfacing cup (Unknown resurfacing head)	1	0	0	0	0	0	1	0.1%
Cormet 2000 resurf (Cormet 2000 HA resurf)	2	0	0	0	0	0	2	0%
Others (2)	11	0	0	0	0	0	11	
Total	1,330	252	214	167	72	70	2,105	

1) *Refers to the proportion of the total number primary total hip replacements performed during the last 10 years.*

From 1330 to 70 implants in 10 Years

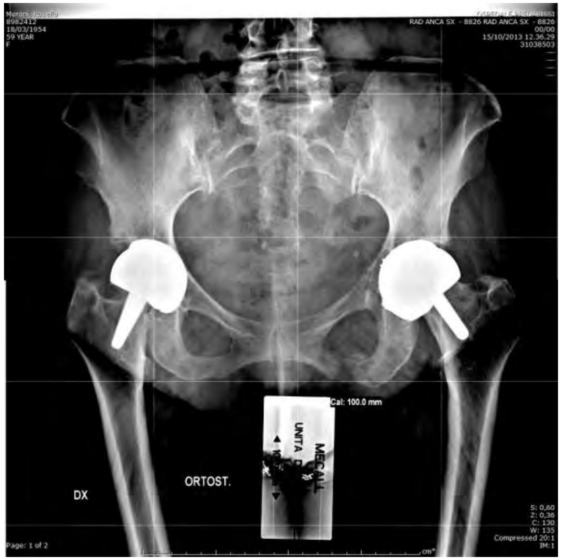
1.8 %

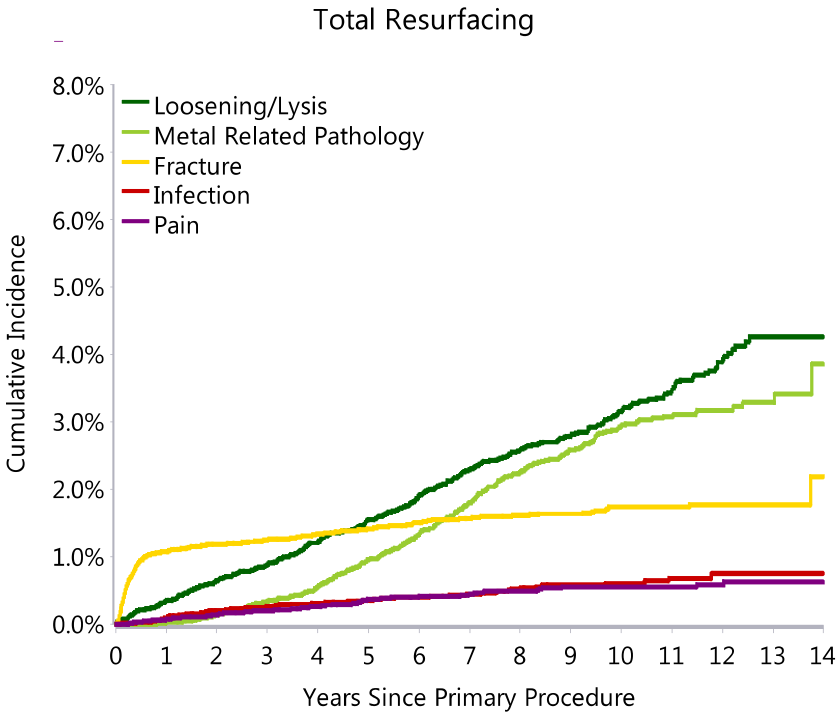
Figure HT57 Cumulative Incidence Revision Diagnosis of Primary Total Resurfacing Hip Replacement



- The cumulative incidence of **fracture** increases rapidly **in the first year**, after this time the incidence increases at a slower rate.

Figure HT57 Cumulative Incidence Revision Diagnosis of Primary Total Resurfacing Hip Replacement

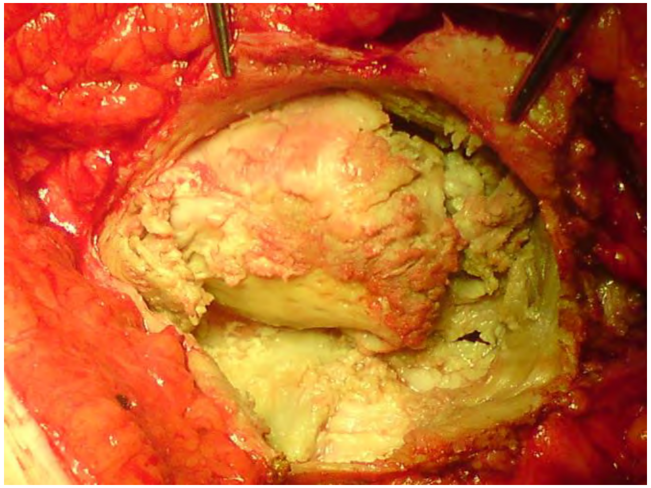


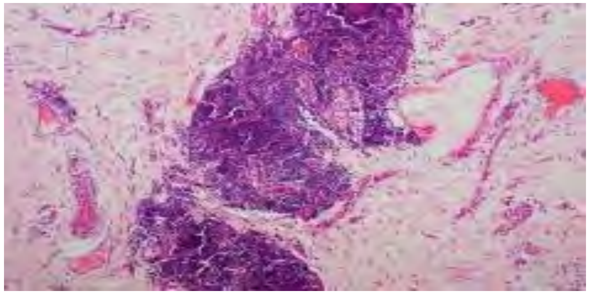


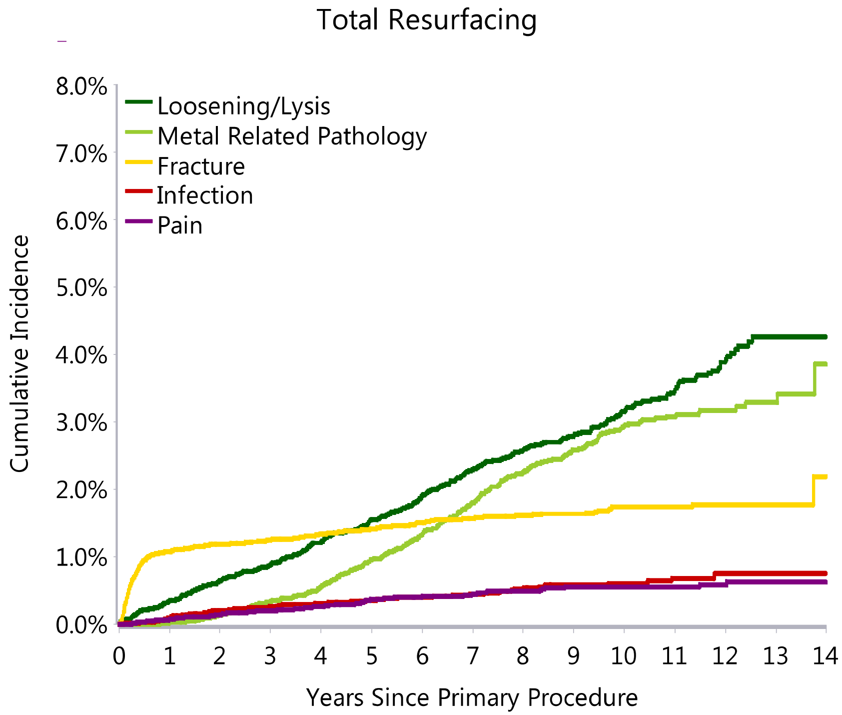
- **Loosening/lysis** shows a linear increase and **at five years** exceeds fracture to have the highest cumulative incidence.

National Joint Replacement Registry

Figure HT57 Cumulative Incidence Revision Diagnosis of Primary Total Resurfacing Hip Replacement







- The cumulative incidence of **metal related pathology** continues to increase to be the second most common reason for revision **after six years**

National Joint Registry
www.njrcentre.org.uk
Working for patients, driving forward quality

12th Annual Report
2015
National Joint Registry for England, Wales, Northern Ireland and the Isle of Man
Surgical data to 31 December 2014

SURVIVORSHIP

	Cumulative percentage probability of revision (95%CI) at:						
Fixation/bearing types	n	1 year	3 years	5 years	7 years	10 years	11 years
All cases*	708,311*	0.76 (0.74-0.78)	1.61 (1.58-1.64)	2.61 (2.57-2.66)	3.86 (3.80-3.93)	5.64 (5.52-5.75)	6.20 (6.04-6.36)
All cemented	255,926	0.47 (0.45-0.50)	1.04 (1.00-1.09)	1.53 (1.47-1.58)	2.09 (2.01-2.16)	3.13 (3.00-3.26)	3.63 (3.43-3.83)
All uncemented	276,432	1.00 (0.96-1.04)	2.05 (2.00-2.11)	3.39 (3.31-3.48)	5.19 (5.06-5.32)	7.60 (7.35-7.85)	8.25 (7.90-8.62)
All hybrids	121,068	0.67 (0.63-0.72)	1.23 (1.16-1.30)	1.87 (1.78-1.97)	2.59 (2.46-2.73)	3.71 (3.47-3.97)	4.18 (3.82-4.56)
All reverse hybrids	17,267	0.83 (0.70-0.98)	1.52 (1.33-1.74)	2.11 (1.85-2.39)	2.80 (2.42-3.22)	4.18 (3.23-5.40)	*4.18 (3.23-5.40)*
All resurfacing (MoM)	37,579	1.25 (1.15-1.37)	3.12 (2.94-3.30)	5.67 (5.43-5.92)	8.68 (8.37-9.01)	12.63 (12.14-13.12)	13.42 (12.85-14.01)

National Joint Registry
www.njrcentre.org.uk
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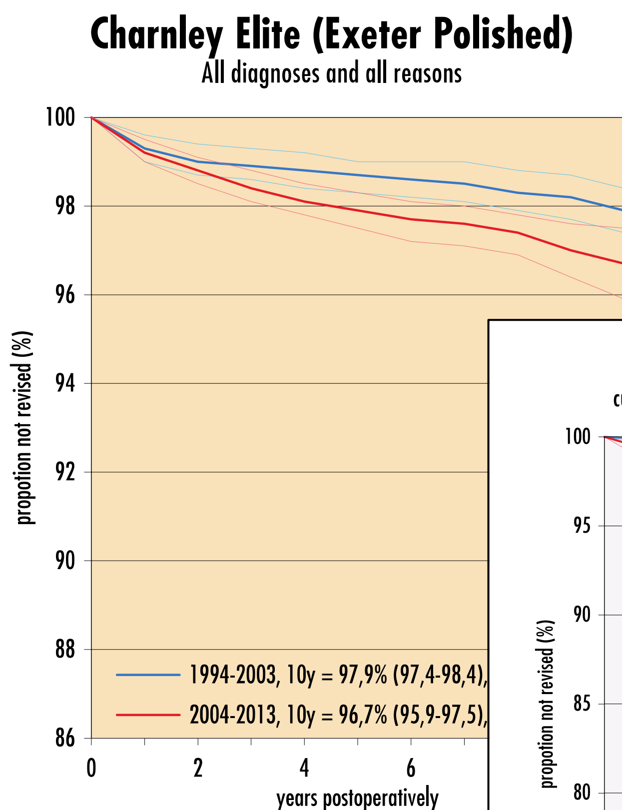
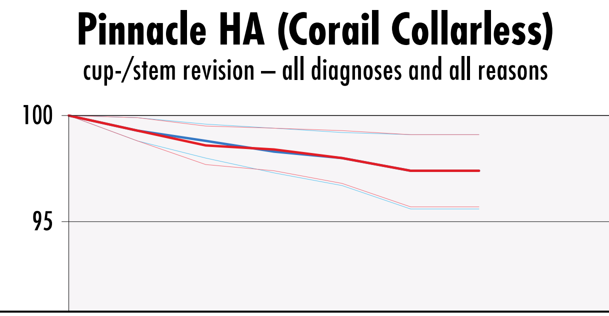
SURVIVORSHIP

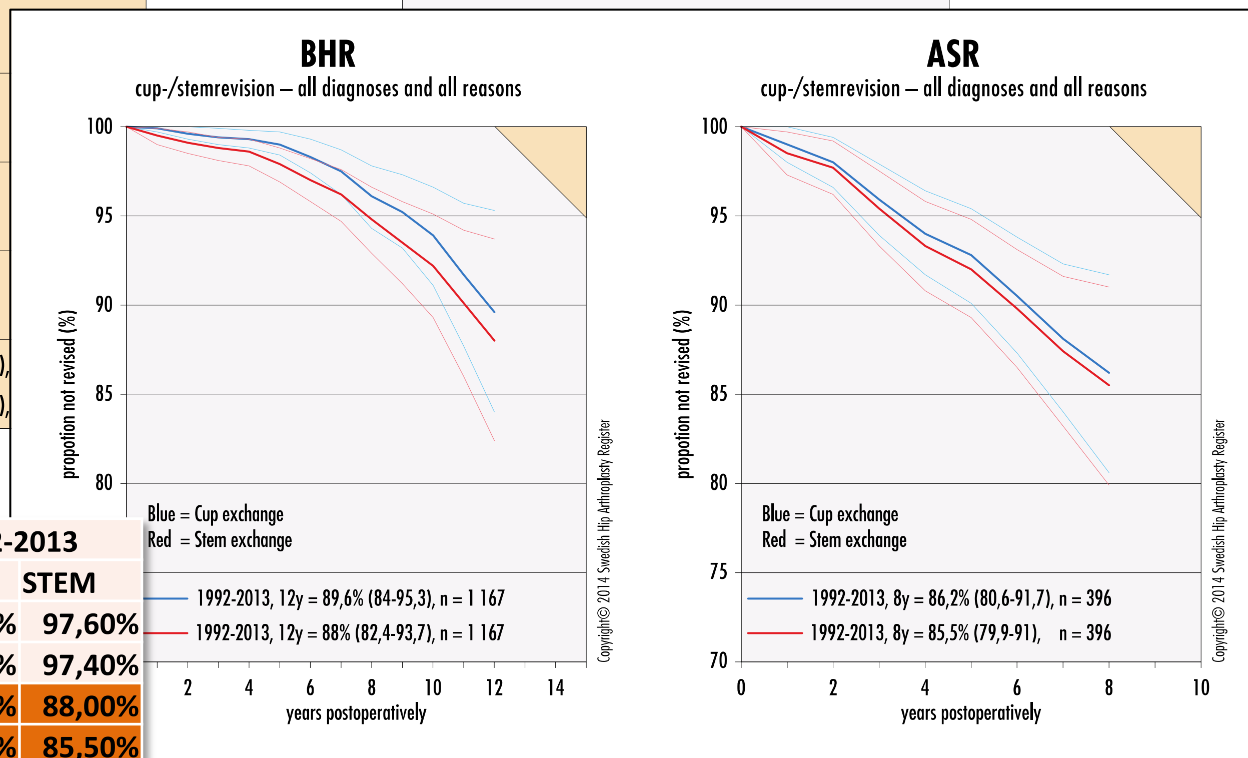
Stem/cup brand	n	Median (IQR) age at primary	Percentage (%) males	Cumulative percentage probability of revision (95% CI) at:				
				1 year	3 years	5 years	7 years	10 years
Resurfacing								
Adept Resurfacing Cup	3,469	54 (48-60)	71%	1.16 (0.85-1.58)	2.54 (2.06-3.13)	4.60 (3.92-5.40)	6.94 (5.99-8.04)	-
ASR Resurfacing Cup	3,031	55 (49-60)	68%	1.62 (1.22-2.13)	5.99 (5.20-6.90)	13.69 (12.51-14.97)	21.57 (19.80-22.82)	*28.28 (26.21-30.48)*
BHR Resurfacing Cup	19,629	55 (49-60)	72%	1.07 (0.93-1.22)	2.40 (2.19-2.63)	3.84 (3.57-4.13)	5.57 (5.23-5.94)	8.85 (8.31-9.42)
Cormet 2000 Resurfacing Cup	3,651	55 (48-60)	65%	1.43 (1.09-1.87)	3.55 (2.99-4.20)	7.57 (6.75-8.49)	12.67 (11.57-13.88)	19.02 (17.32-20.85)
Durom Resurfacing Cup	1,692	55 (49-60)	70%	1.36 (0.91-2.04)	3.71 (2.90-4.73)	5.77 (4.74-7.02)	8.28 (6.98-9.81)	*8.99 (7.57-10.68)*
Recap Magnum	1,767	54 (49-60)	73%	1.82 (1.29-2.56)	3.48 (2.71-4.46)	5.58 (4.56-6.83)	8.12 (6.79-9.71)	-
Conserve Plus Resurfacing Cup	1,340	56 (50-61)	63%	2.02 (1.39-2.93)	5.19 (4.13-6.53)	8.33 (6.95-9.97)	11.58 (9.84-13.59)	*15.93 (12.83-19.69)*

COMON STEMS								
Corail / Pinnacle	95,702	66 (59-73)	44%	0.81 (0.76-0.87)	1.74 (1.65-1.83)	2.89 (2.75-3.03)	4.75 (4.51-5.00)	7.94 (7.10-8.88)
Exeter V40 / Trident	42,263	68 (60-75)	39%	0.57 (0.50-0.65)	1.05 (0.95-1.16)	1.46 (1.32-1.61)	1.98 (1.78-2.20)	2.30 (2.04-2.60)

SURVIVORSHIP
(End-point revision surgery)







	1992-2013	
	CUP	**STEM**
Charnley Elite/Exeter Polished	**98,20%**	**97,60%**
Pinnacle/Corail	**97,40%**	**97,40%**
BHR	**89,60%**	**88,00%**
ASR	**86,20%**	**85,50%**

Clin Orthop Relat Res (2010) 468:351–357
DOI 10.1007/s11999-009-1157-3

SYMPOSIUM: PAPERS PRESENTED AT THE HIP SOCIETY MEETINGS 2009

Hip Resurfacing Data from National Joint Registries

What Do They Tell Us? What Do They Not Tell Us?

Kristoff Corten MD, Steven J. MacDonald MD, FRCSC

REGISTRY DATA LIMITATIONS ?

HIP
ISSN 1120-7000

Hip Int 2015; 25 (5): 394-401
DOI: 10.5301/hipint.5000239
REVIEW

Quality of outcome data in total hip arthroplasty: comparison of registry data and worldwide non-registry studies from 5 decades

Christof Pabinger[1], Anna Bridgens[2], Andrea Berghold[3], Paul Wurzer[1], Nikolaus Boehler[4], Gerold Labek[5]

LIMITED EVIDENCE EXISTS FROM NON REGISTRY STUDY REGARDING OUTCOMES (REVISION RATE) EVEN 5 DECADES AFTER MARKET INTRODUCTION

AUGUST 2015 VOL. 38, N. 8

Hip Resurfacing Implants

MATTEO CADOSSI, MD, PHD; GIUSEPPE TEDESCO, MD;
ANDREA SAMBRI, MD; ANTONIO MAZZOTTI, MD;
SANDRO GIANNINI, MD

- ideal candidate for hip resurfacing
- active male,
- younger than 65 years
- primary (or post traumatic osteoarthritis)
- femoral head diameter larger than 50 to 54 mm.

HIP
ISSN 1120-7000

Hip Int 2015; 00 (00): 000-000
DOI: 10.5301/hipint.5000288
REVIEW

Current expert views on metal-on-metal hip resurfacing arthroplasty. Consensus of the 6th advanced Hip resurfacing course, Ghent, Belgium, May 2014

Catherine Van Der Straeten[1], Koen A. De Smet[2]

[1] Ghent University Hospital, De Pintelaan, Ghent - Belgium
[2] ANCA Medical Centre, Xavier De Cocklaan, Deurle, Ghent - Belgium

Hip resurfacing should be limited to high volume hip surgeons, experienced on HR or trained to performed HR in a specialist centre

Hip resurfacing arthroplasty was introduced as a result of theoretical advantages

BONE PRESERVATION

Surface Replacement of the Hip Can Result in Decreased Acetabular Bone Stock

Michael Tanzer MD, FRCSC, Dylan Tanzer DEC, Karen Smith CRA

Clin Orthop Relat Res (2012) 470:541–546

“When compared to Tha , hip resurfacing arthroplasty commonly results in additional acetabular bone resection»

The Journal of Arthroplasty 30 (2015) 1799–1803

Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

Comparison of Acetabular Bone Resection, Offset, Leg Length and Post Operative Function Between Hip Resurfacing Arthroplasty and Total Hip Arthroplasty

Michael C. Parry, BSc, MBChB, MD, FRCS, James Povey, BSc,
Ashley W. Blom, MD, PhD, FRCS, Michael R. Whitehouse, BSc, MBChB, MD, PhD, FRCS

Muculoskeletal Research Unit, University of Bristol, Level 1 Learning and Research Building, Southmead Hospital, Westbury-on-Trym, Bristol, UK

SAME

FUNCTIONAL OUTCOMES ?

Resurfacing Versus Conventional Total Hip Arthroplasty

Review of Comparative Clinical and Basic Science Studies

David R. Marker, B.S., Kyle Strimbu, B.S., Mike S. McGrath, M.D., Michael G. Zywiel, M.D., and Michael A. Mont, M.D.

CLINICAL DATA

Table 3 Literature Review of Studies Comparing Clinical Data for Resurfacing and Conventional Total Hip Arthroplasty

Study	Procedure	No.of patients (hips)	Follow-up (months)	Mean clinical scores in points (range)	Complication and Reoperation rates	Conclusions	Advantage
Pollard, et al. (2006)[2]	THA	54 (54)	80	OHS: 18.5 (12-41) UCLA: 6.8 (3-10)	8%	Similar Oxford Hip Scores and failure rates. Resurfacing associated with higher activity levels.	RHA
	RHA:	54 (54)	61	OHS: 15.9 (12-42) UCLA: 8.4 (4-10)	6%		
Vail, et al. (2006)[18]	THA	84 (93)	36	HHS: 93 Activity score: 12.7	Reoperation: 4.3% Complication: 14%	RHA associated with significantly higher HHS, ROM subscore, activity subscore, and function subscore.	RHA
	RHA	52 (57)	36	HHS: 98 Activity subscore: 14	Reoperation: 3.5% Complication: 5.3%		
Girard, et al. (2008)[30]	THA	79	—	P-M: 17 ± 0.4 WOMAC: 11.7 ± 11.4	—	Similar clinical scores.	Similar
	RHA	69	—	P-M: 17 ± 0.35 WOMAC: 9.2 ± 15.1	—		
Haddad, et al. (2008)[22]	THA	40 (40)	24	Hop test: 0.03 meters 3 step-ups in 15 seconds Lateral step score: 2.5 (3 = poor)	—	Resurfacing associated with higher levels of function at all follow-up times.	RHA
	RHA	40 (40)	24	Hop test: 0.32 meters 7 step-ups in 15 seconds Lateral step score: 0.7 (3 = poor)	—		
Lavigne, et al. (2008)[31]	THA	103	24	Hospital length of stay: 6.1 days	Isolated dislocations in 3 hips. 1 revision for recurrent dislocation.	Similar clinical scores, satisfaction rates, and complication rates. THA was associated with higher dislocation rates.	Similar
	RHA	107	24	Hospital length of stay: 5.0 days	2 revisions for head collapse		

Table 3 Continued

Study	Procedure	No.of patients (hips)	Follow-up (months)	Mean clinical scores in points (range)	Complication and Reoperation rates	Conclusions	Advantage
Lavigne et al. (2008)[20]	THA	71 (71)	12	Overall activity: 12.7 points WOMAC: 9.8 ±10.9 points UCLA: 6.75 ± 1.71 points	—	Pre-operative activity scores of the two groups were similar. RHA associated with more frequent and more intense sports activities postoperatively.	RHA
	RHA	81 (81)	12	Overall activity: 17.9 points WOMAC: 8.1 ± 13.1 points UCLA: 7.17 ± 2.8 points	—		
Lavigne et al. (2008)[32]	THA	62	12 (min)	Total arc of motion: 196° Arc of rotation: 44.3° Flexion-extension arc:120° Abduction-adduction arc: 43°	—	No statistically significant range-of-motion differences were found between THA and RHA patients.	Similar
	RHA	60	12 (min)	Total arc of motion: 204° Arc of rotation: 48° Flexion-extension arc:118° Abduction-adduction arc: 43°	—		
Stulberg et al. (2008)[21]	THA	266 (266)	24	—	—	RHA: greater pain score (and lower HHS) at 6 weeks. HHS statistically similar at 6, 12, and 24 months.	Similar
	RHA	337 (337)	24	—	—		
Mont et al. (2009)[19]	THA	54 (54)	39	HHS: 91 (62-100) Satisfaction: 8.8 (0-10) Activity: 7 (0-20)	Two revisions	Midterm clinical outcomes and satisfaction scores similar. Resurfacing patients had higher activity scores, but also had higher preop activity scores.	Similar
	RHA	54 (54)	39	HHS: 90 (50-100) Satisfaction: 9.2 (2-10) Activity: 11.7 (0-32)	Two revisions		

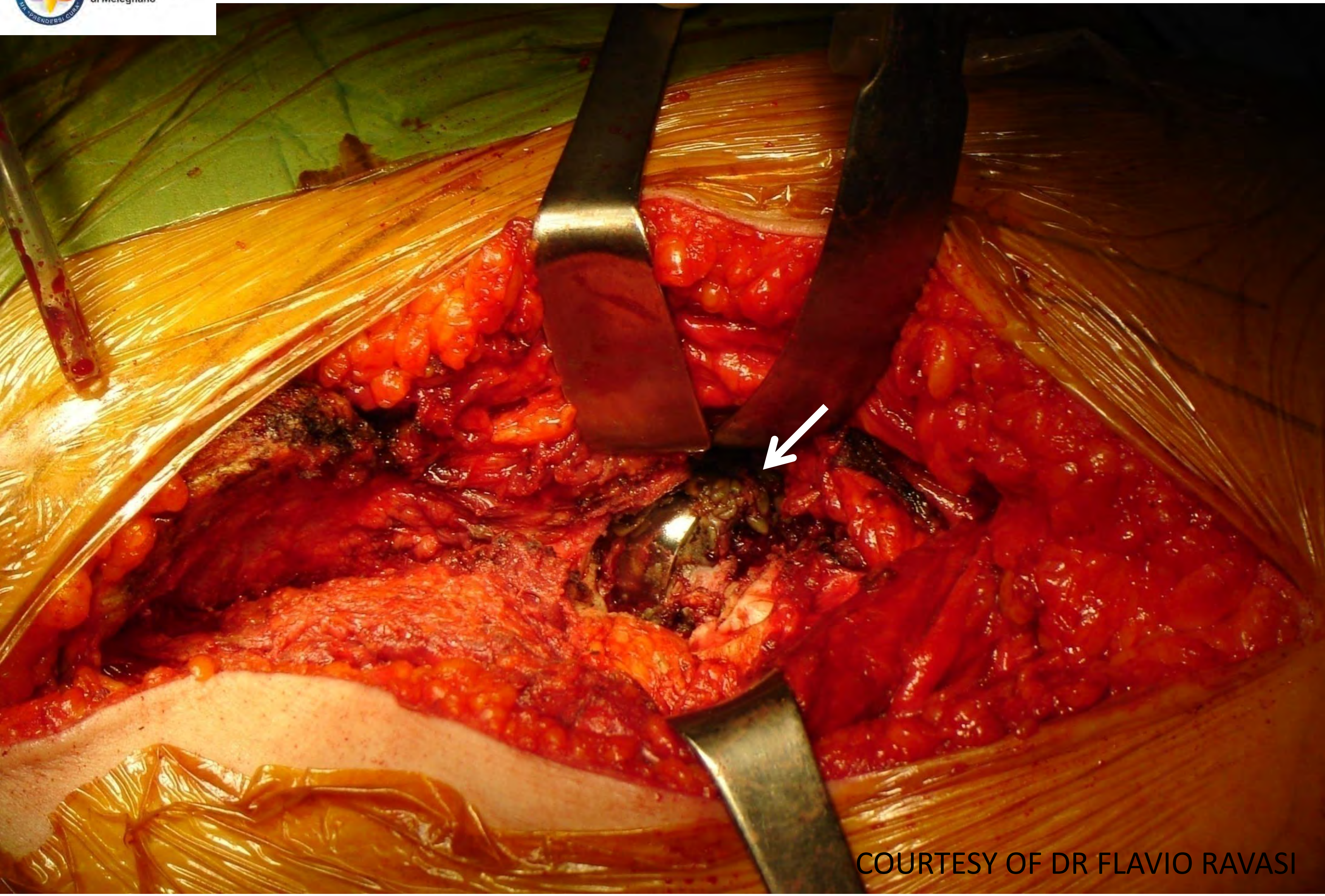
BEST SCENARIO

COMPARABLE RESULTS

REDUCED WEAR ?

ADVERSE SOFT TISSUE REACTIONS
(ARMD)

Azienda Ospedaliera
Ospedale di Circolo
di Melegnano



EASE FUTURE REVISION ?

Clin Orthop Relat Res (2015) 473:3458–3464
DOI 10.1007/s11999-015-4215-z

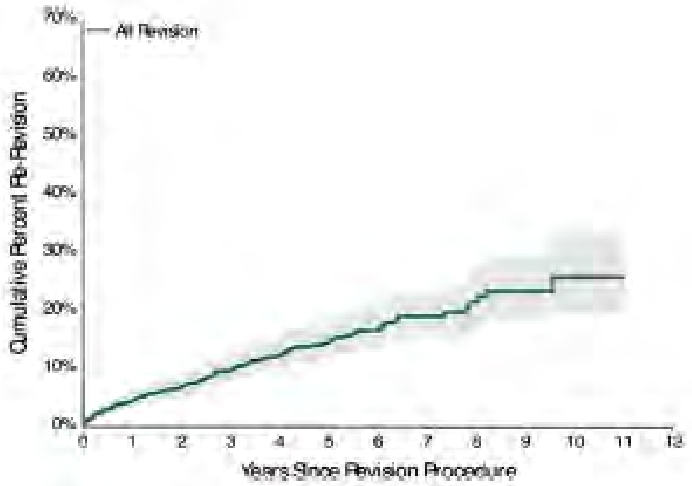
Clinical Orthopaedics and Related Research®
A Publication of The Association of Bone and Joint Surgeons®

CrossMark

SYMPOSIUM: 2014 MEETING OF INTERNATIONAL SOCIETY OF ARTHROPLASTY REGISTERS

What Is the Rerevision Rate After Revising a Hip Resurfacing Arthroplasty? Analysis From the AOANJRR

James Min-Leong Wong MBBS, FRCS,
Yen-Liang Liu M App Stats, Stephen Graves MBBS,
Richard de Steiger MBBS, FRACS, FA OrthoA



Revision of a primary hip resurfacing arthroplasty is associated with a high risk of rerevision

MY INDICATIONS IN 2002

male 49 y at time of HR, former. boxer, very active

HHS 98 13 y FU

MY INDICATIONS IN 2005

Male 54 y old, at time of HR (ASR)
Post traumatic proximal femur deformity
10 y FU
HSS 95.85
MR (MARS) normal
Co 0.8 ppb
Cr 0.3 ppb

MY INDICATIONS IN 2015

NONE

THANK YOU

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Standard stems for total hip replacement

Jonathan Miles
Joint Reconstruction Unit
Royal National Orthopaedic Hospital

Introduction

We have many successful hip stems but we want more:

more natural loading characteristics

easier 'revisibility'

quicker recovery

SMALLER APPROACHES

HOWEVER, orthopaedic history is littered with unintended consequences

Unintended consequences -

1 malposition

2 metallosis

3 fracture

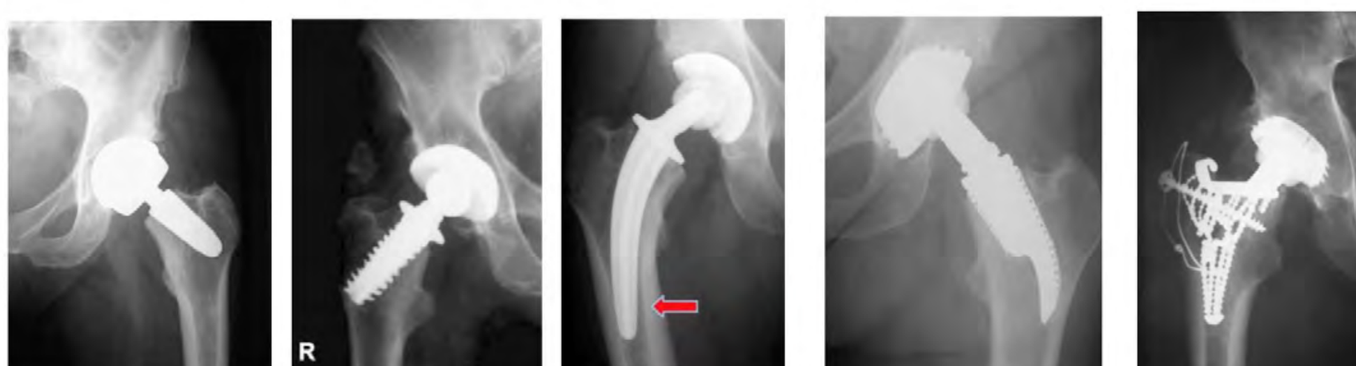
4 sinkage

Materials

Geometries

Fixations

Approaches



Stems by Anchoring Principles
Gulow et al 2007

Type A – resurfacing

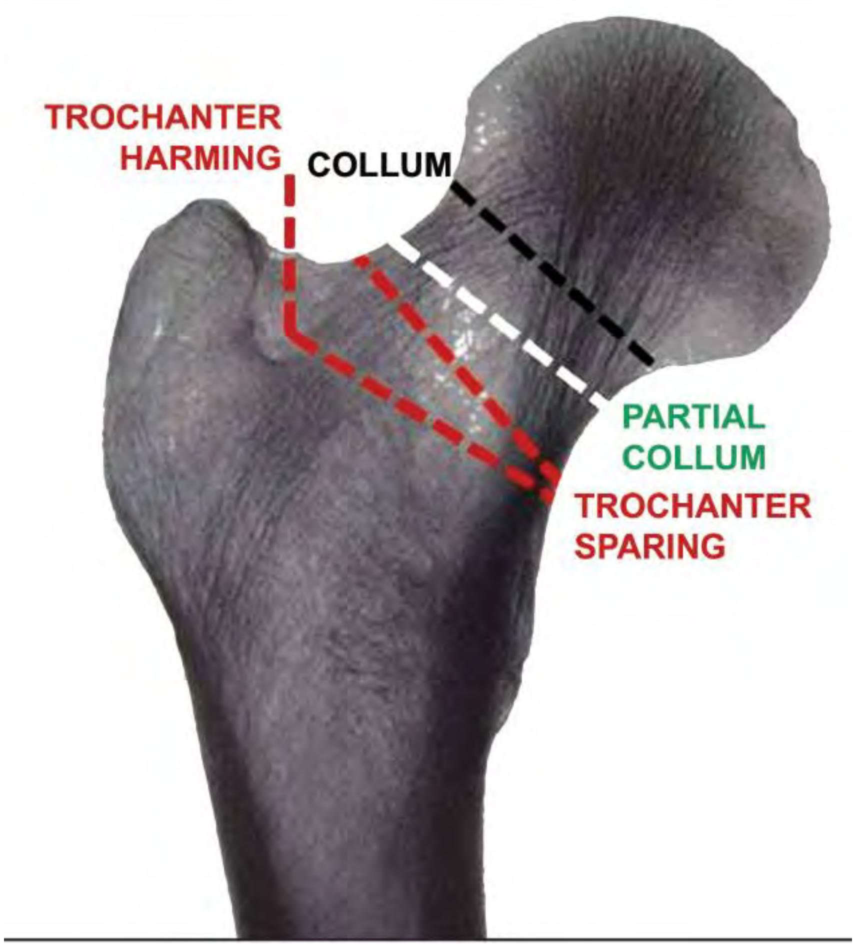
Type B – metaphyseal only

Type C – metaphyseal + short diaphyseal

Type D – standard length stem

Stem by neck cut – Feyen & Shimmin 2014

- Collum (neck retaining)
- Partial collum
- Trochanter sparing
- Trochanter harming



JISRF Classification of stems 2012

1. Head Stabilized
   1A resurfacing
   1B mid-head stem

JISRF Classification of stems 2012

2. Neck Stabilized
   - 2A short, curved
   - 2B short lateral engaged
   - 2C neck plugs





JISRF Classification of stems 2012

3. Metaphyseal Stabilized
   - 3A taper stem
   - 3B fit & fill







JISRF Classification of stems 2012

4. Metaphyseal & Diaphyseal Stabilized

Smaller femoral components

lower area of implant to bone contact

less surface available to allow bone ongrowth or ingrowth

3 point fixation option is not available

It is CRITICAL to get perfect fit against good bone

Undersizing

There is a less positive feel

Increased risk of undersizing

Gustke 2012 Florida orthopaedic centre 1st 500 fitmore stems study

- Of his first 100, 34% subsided: mainly undersized, some in varus too.

Initial stability

Sinkage >1.5mm at 2 years highly predictive for late aseptic loosening in uncemented stems

Kaipel et al (2015) studied 49 nanos short stems

10 migrated >1.5mm

None yet revised but is this a ticking time bomb?

Malposition

Short stems have less direction control and are more prone to malpositioning in any direction

Challenges of positioning

Plug implants have a tendency to valgus positioning which leads to

- reduced offset
  - ➢ Instability
- reduced calcar loading
  - ➢ calcar resorption

Ishaque et al. Eight-year results of the femoral neck prosthesis ESKA-CUT [in German]. *Z Orthop Unfall*. 2009; 147(2):158–165

a tendency to valgus with femoral offset decrease and calcar atrophy with an unacceptable failure rate of nearly 50% at 8 years

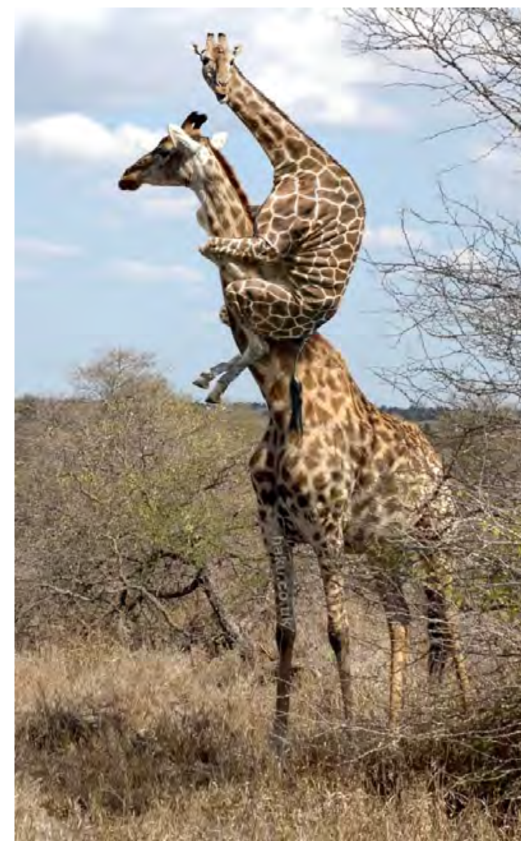
Neck retention effects

- The femoral neck has an effect on implant position in neck retention. Planning in both planes becomes vital.

- The neck cut must be accurate or it will force the implant into malposition .

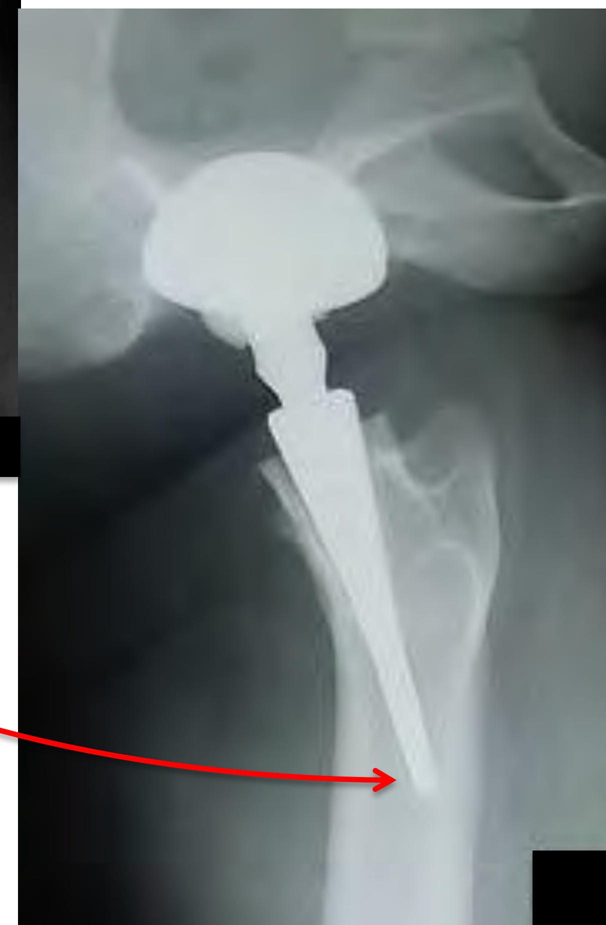
- It is better avoided in cases of:

  – Severe coxa valgus
  – Moderate to severe anteversion
  – Coxa varus with protrusio



Anteverted neck retention

- Implant will follow anteversion
- Can very easily lead to exaggerated ‘front to back’ positioning
- Poor loading
- Higher risk of fracture



Coxa vara neck retention with protrusio

- Neck retention would force neck lengthening and consequent leg lengthening

- Better to neck sacrifice and control length through distal position of implant

Valgus neck retention

- Metha is designed for tip to fit against lateral femur
- Templating of valgus, short neck with Metha prosthesis.
- It would force the tip of stem too medially

Studies on positioning

- Ghera and Pavan (2009):
  - 65 Proxima stem implantations
  - 15 in varus and 6 in valgus

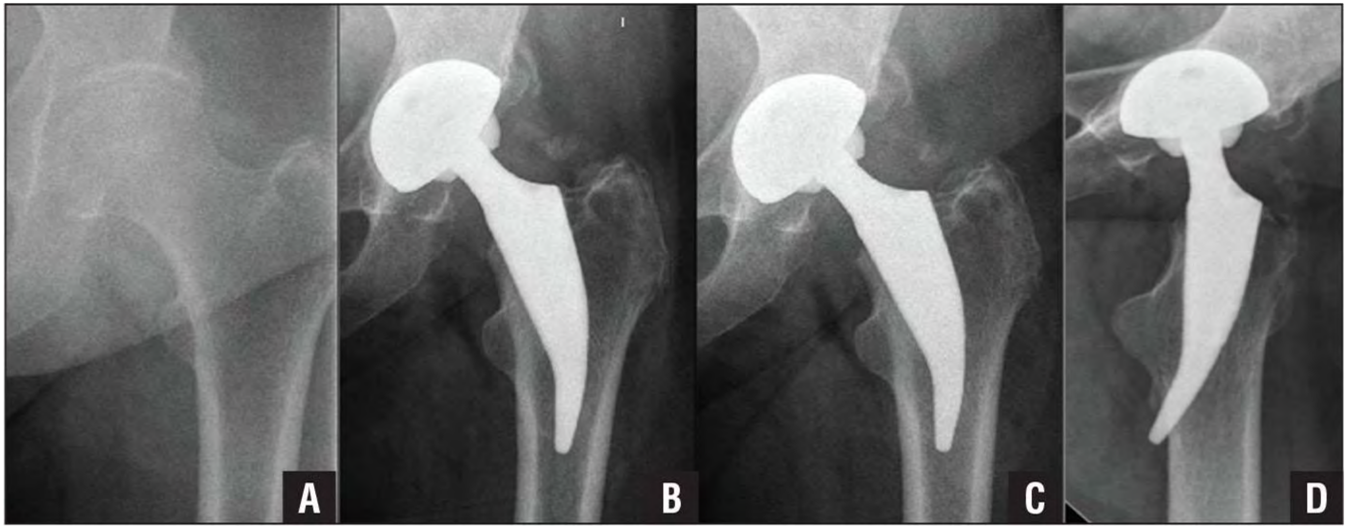
- Gilbert et al (2009)
  - 34 Mayo short stems implanted
  - 19 in varus and 11 in valgus position

- Toth and Sohar (2013)
  - 50 Proxima stems
  - 2 found in severe varus and 9 in moderate varus

Periprosthetic fractures

- Intraoperative and postoperative risk in all designs

- High rates in low volume surgeons and early in series



Conclusions

Advantages of short stems to conserve bone and allow for innovative approaches are offset by early failures.

The majority work but is that enough?

The balance of risk remains in favour of standard stem lengths

"Nothing risked, nothing gained"

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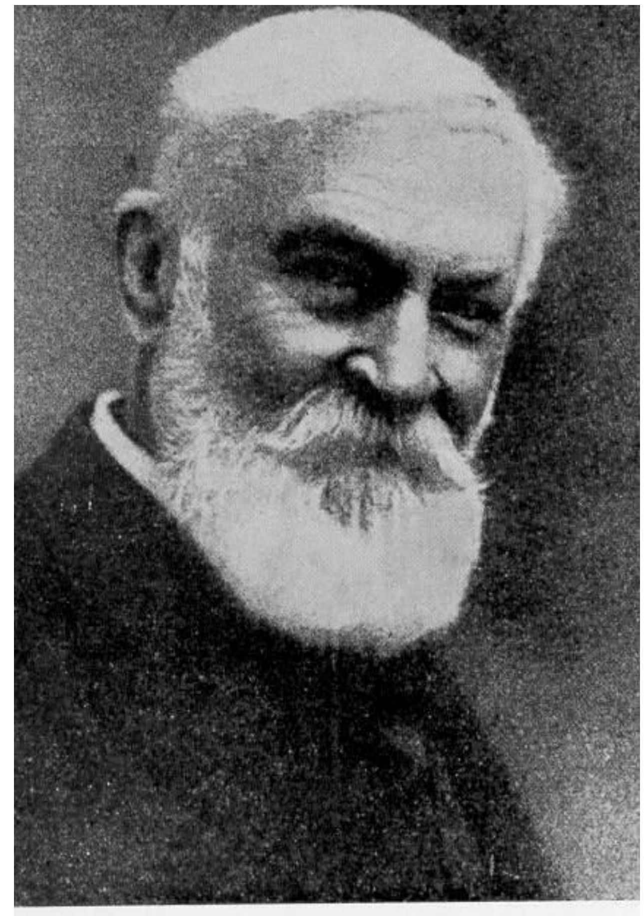
A concise overview on hip surgery in Italy

Roberto Giacometti Ceroni

ISTITUTO ORTOPEDICO GALEAZZI
Istituto di Ricovero e Cura a Carattere Scientifico

We can start our small gallery with Agostino Paci, who at the same time with Lorenz, devised a classic approach to the treatment of DDH. Both of them claimed the authorship, and finally the technique was known as "Paci- Lorenz".

Agostino **Paci** 1845 - 1902

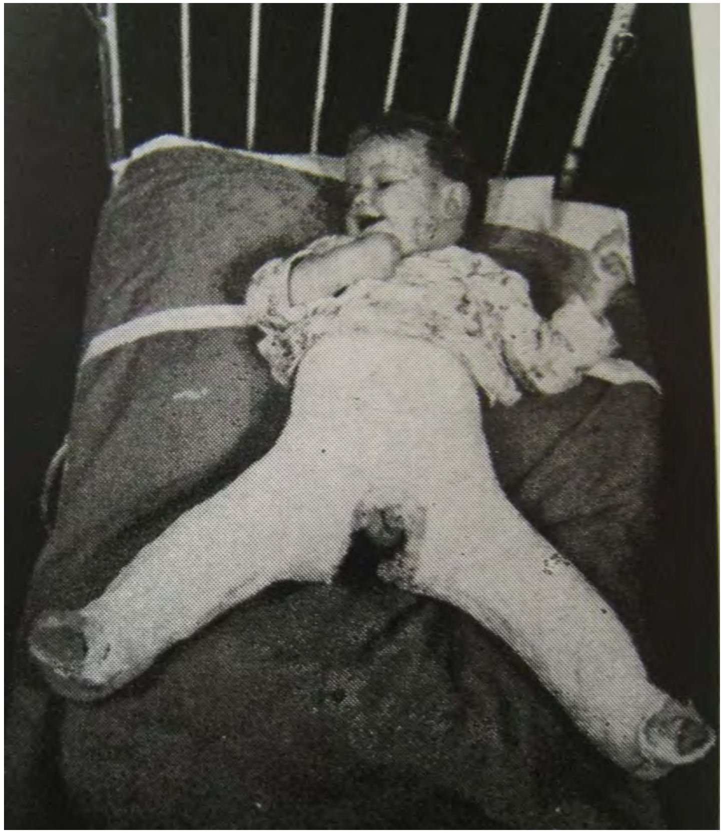


A. **Lorenz** 1854 - 1946

The treatment consists in a closed reduction of the congenitally dislocated hip, and immobilisation in three consecutive casts in different positions.

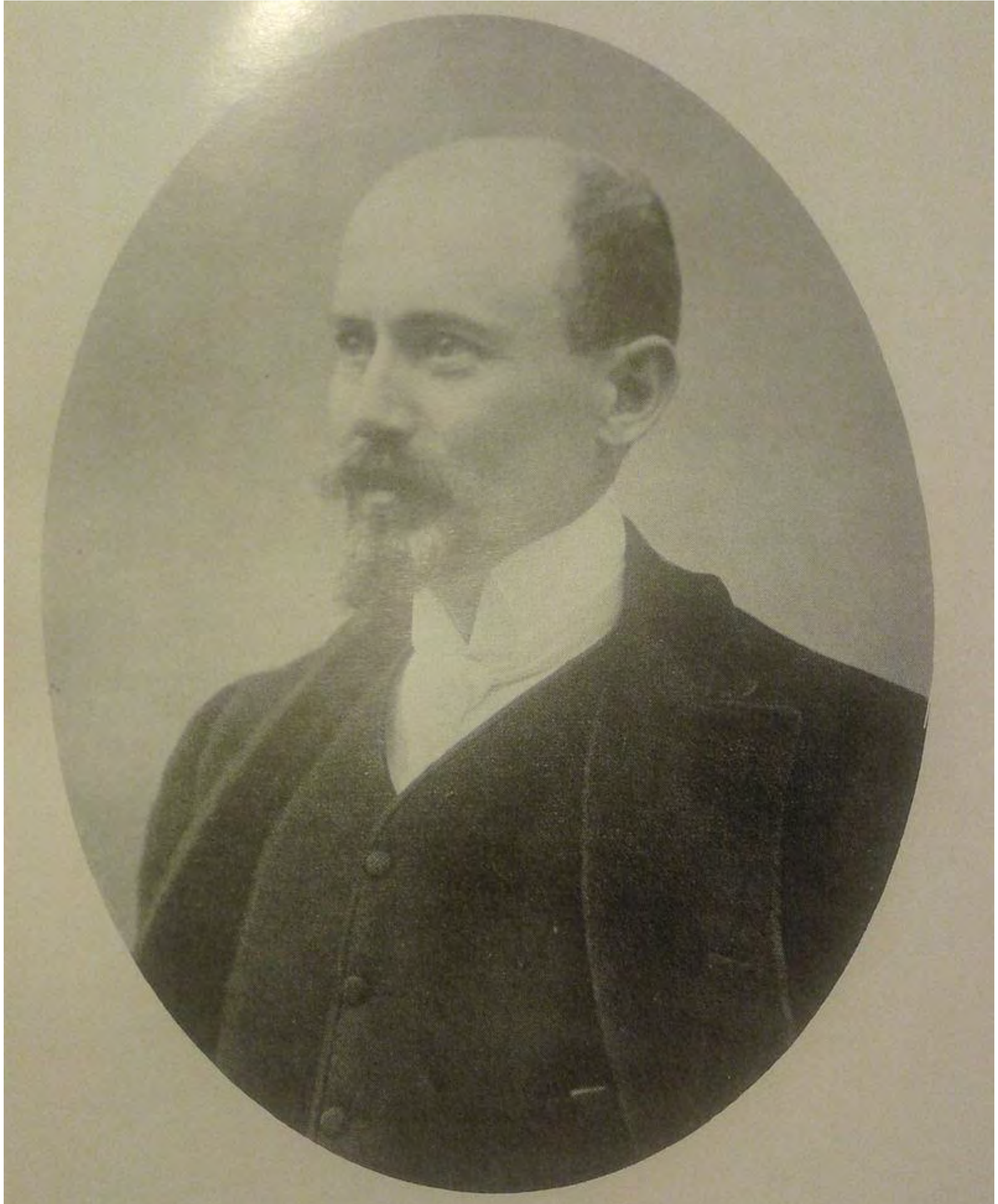
The long term results were awful.

Of course, today, this method is completely abandoned.



Francesco **Rizzoli** 1809 - 1890

Francesco Rizzoli, an influential general surgeon in Bologna, established in 1886 the "Istituto Rizzoli" cradle of, at least Italian, orthopaedics



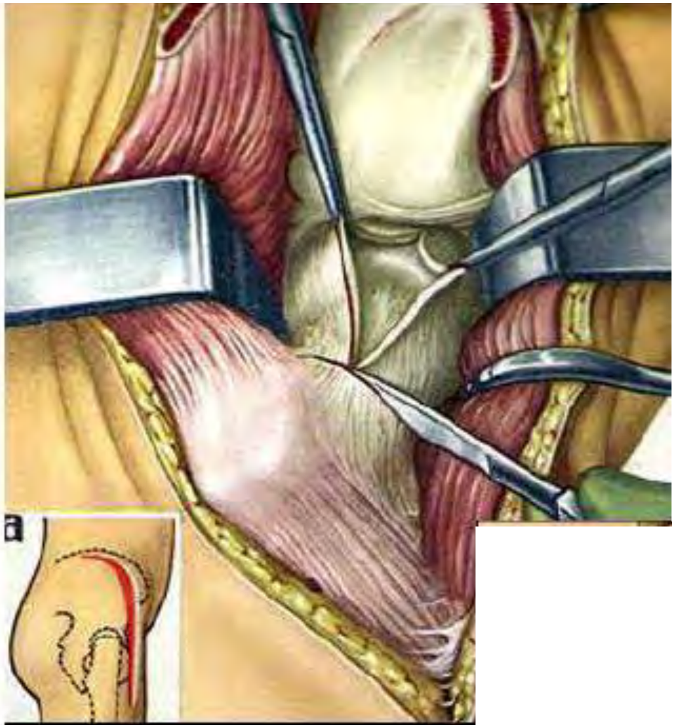
Alessandro **Codivilla** 1861 - 1912

Alessandro Codivilla, became director of Istituto Rizzoli, in 1899 and he took the structure to the excellence.

Vittorio Putti, director of “Rizzoli” after Codivilla, is considered by many, as the father of the Italian orthopaedics.

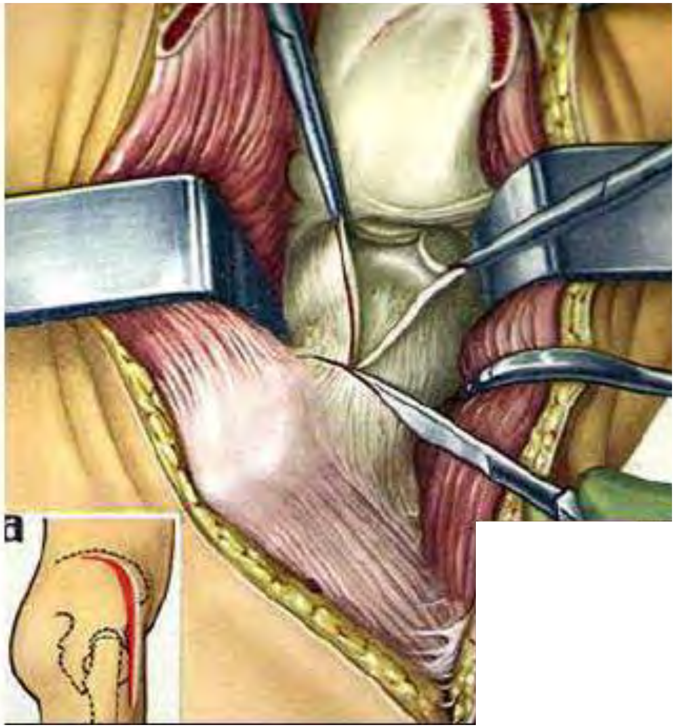
Vittorio **Putti** 1880 - 1940

One of the procedures he introduced, the “biological” arthroplasty.



from Ghisellini

The “biological” arthroplasty, one of the procedures he introduced.



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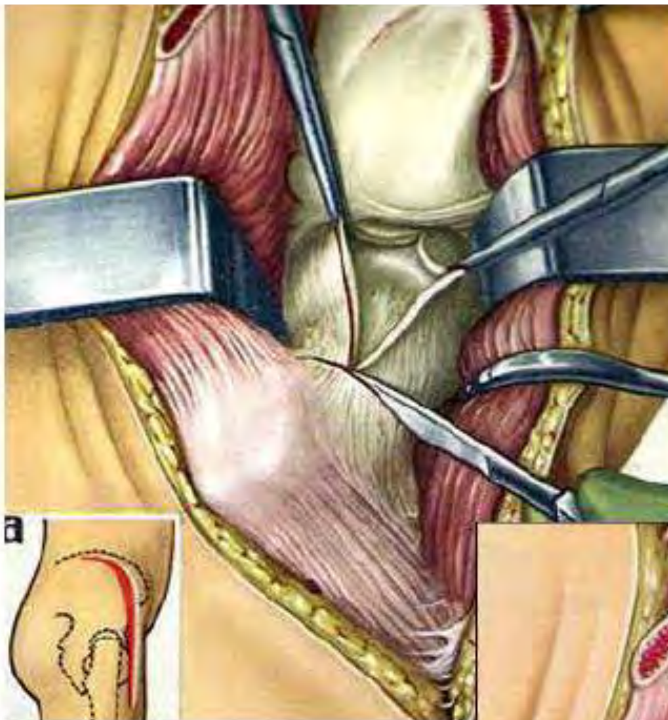

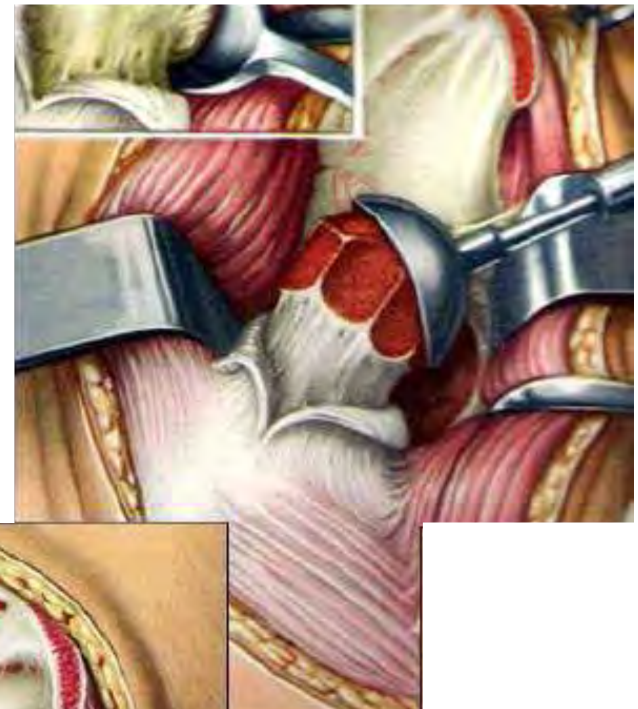

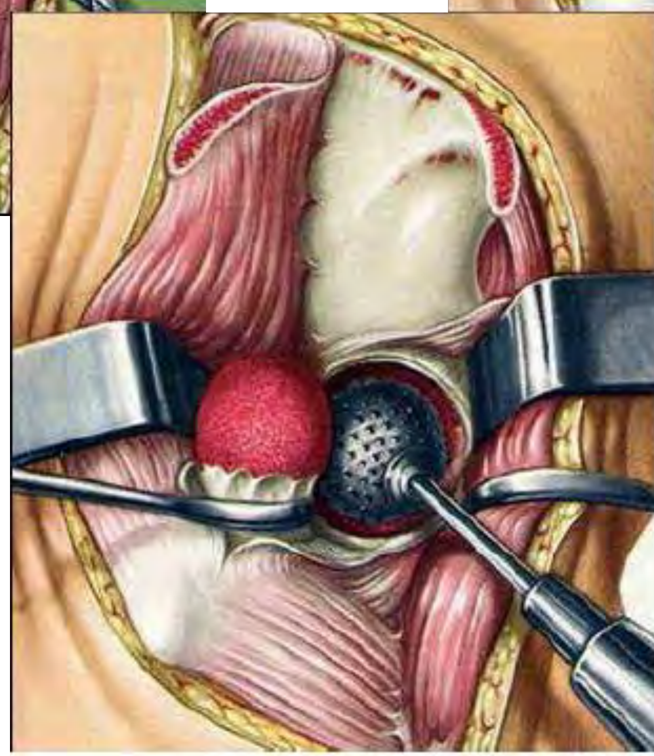

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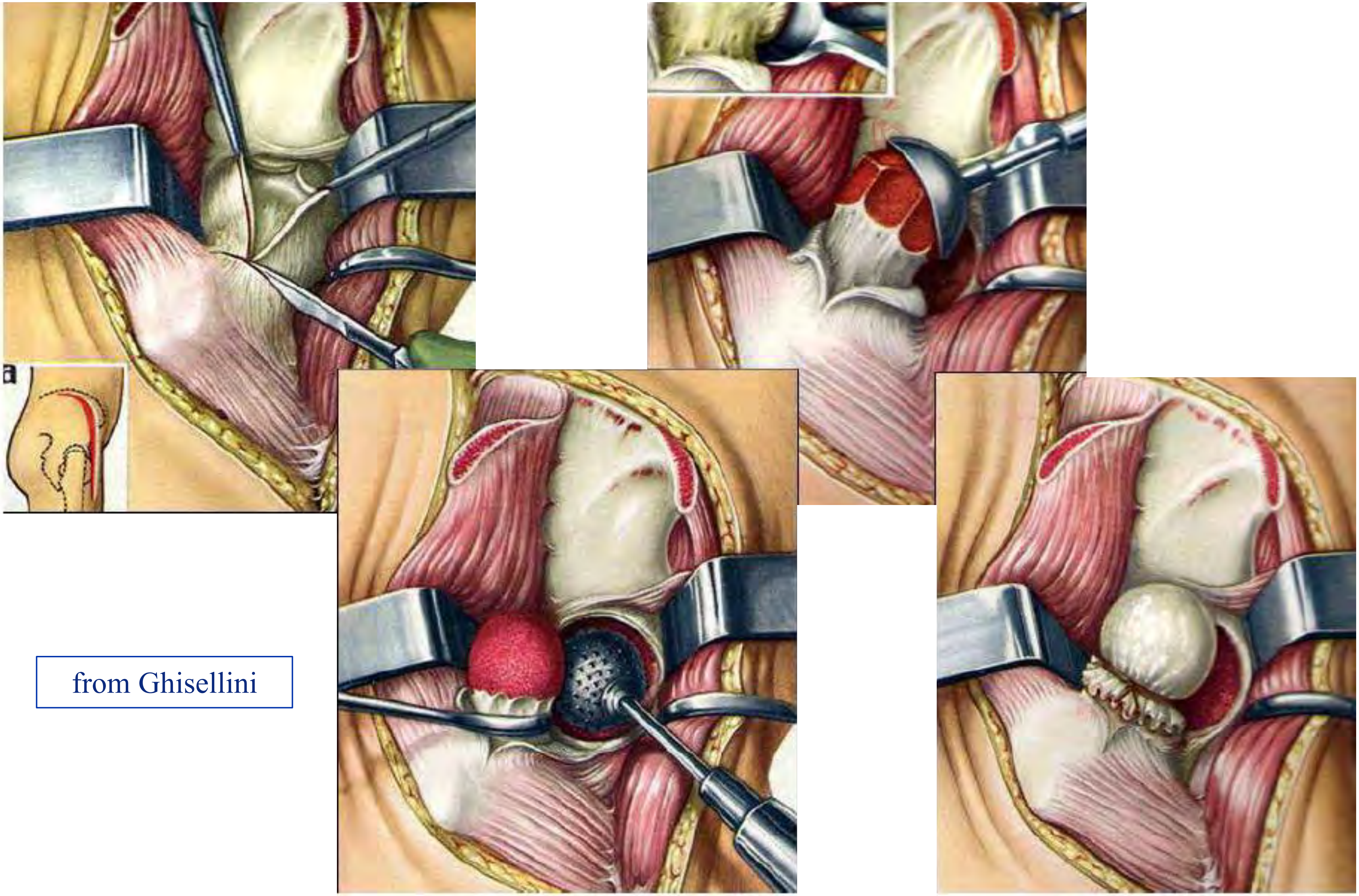
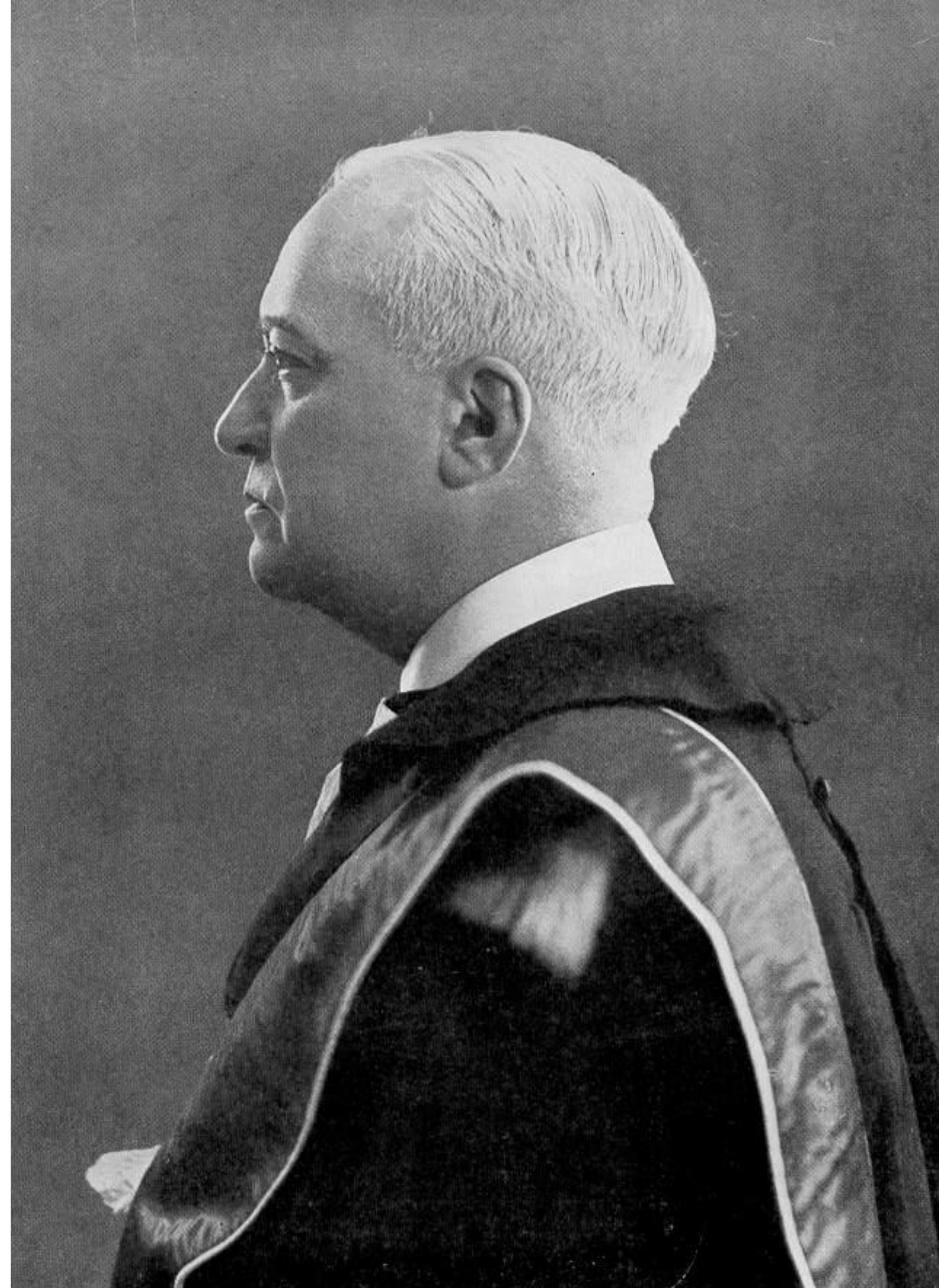


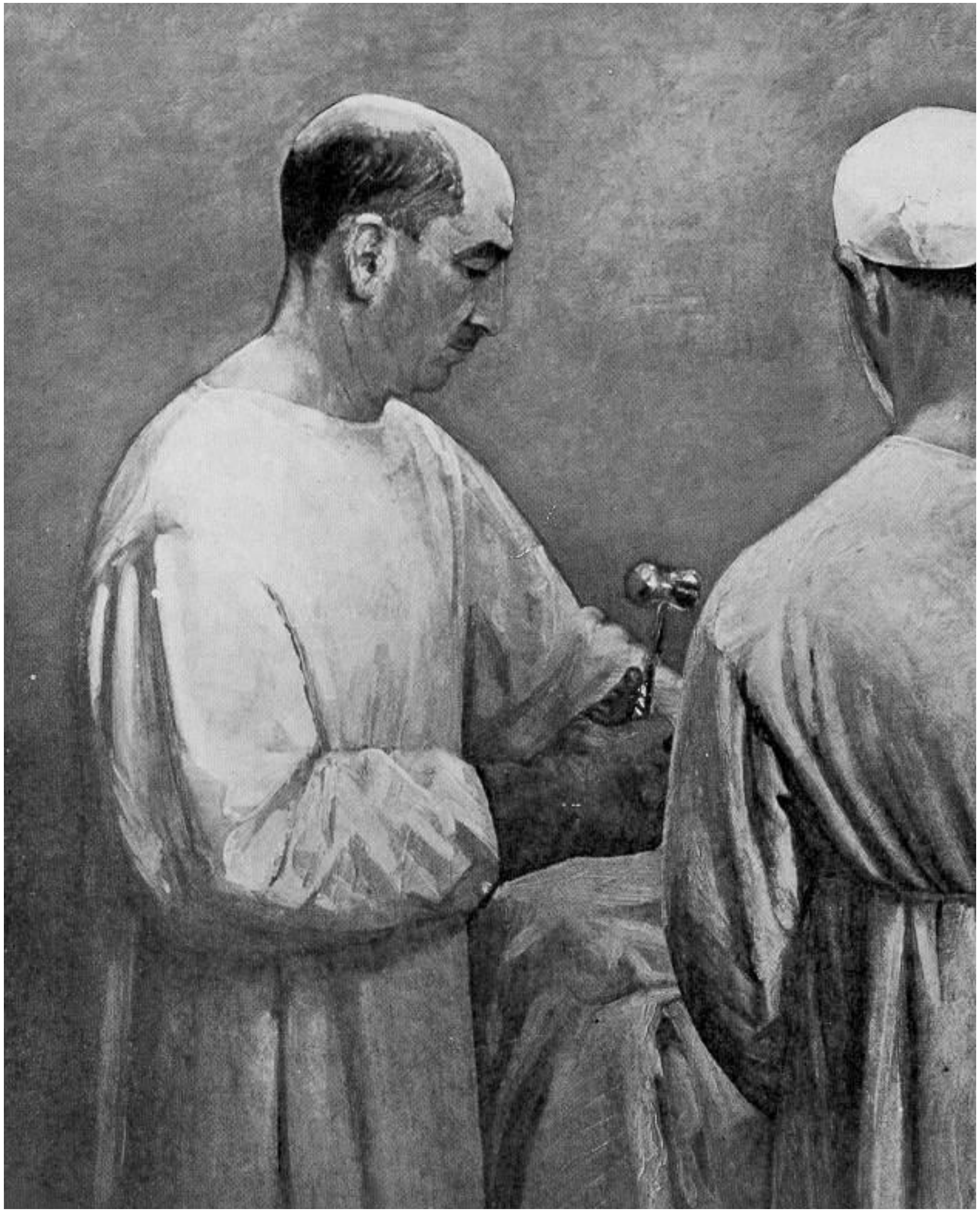
from Ghisellini

Putti was an handsome and charming man, and a sofa, still existing in his office at Rizzoli, was the silent witness of victories, not exactly in orthopaedics.



Riccardo **Galeazzi** linked his name, not only to the forearm fracture, but also to the Galeazzi (Allis) test, for the early detection of DDH.

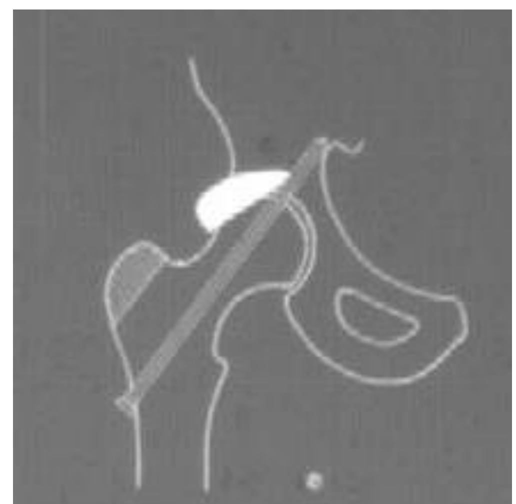
Riccardo Galeazzi 1866-1952

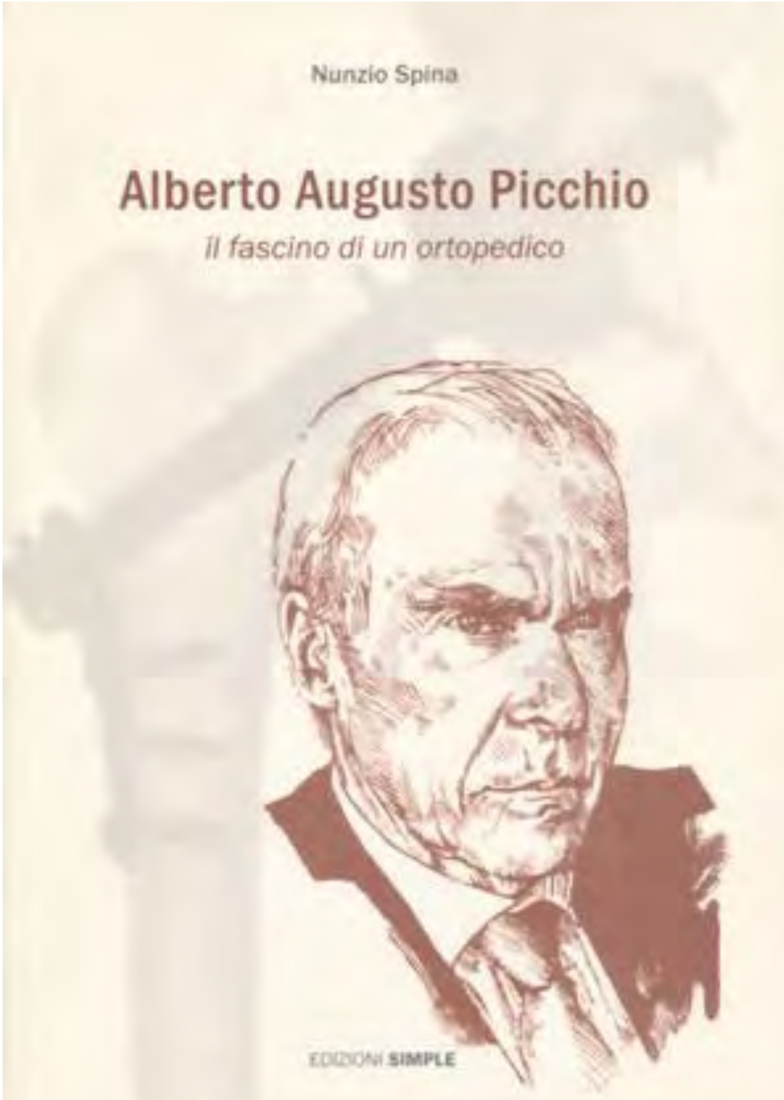


Francesco **Delitala** 1883 - 1983

Francesco Delitala, was the director after Putti.
He proposed a metallic roof for the containment of the head, in the treatment of DDH.

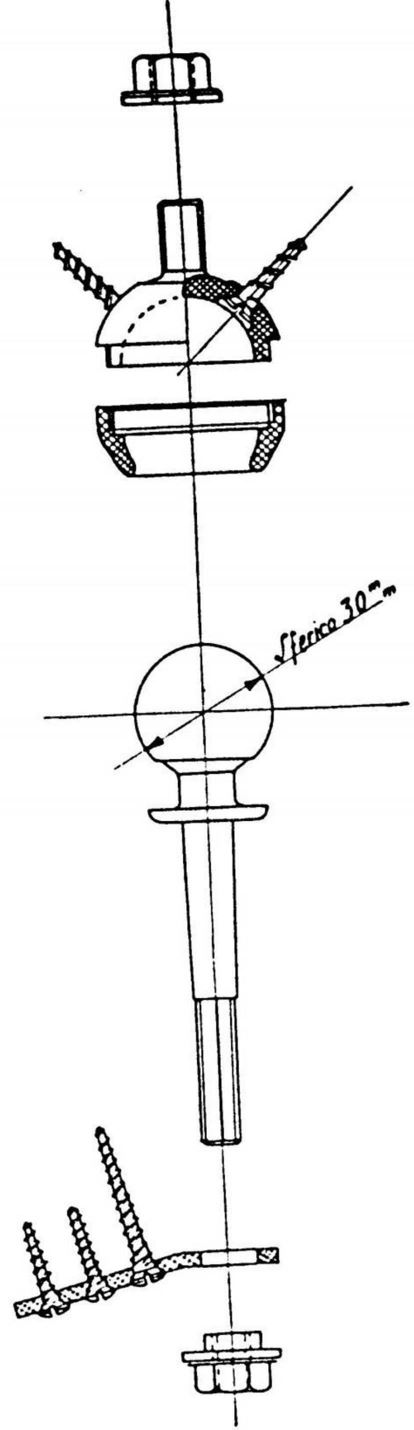
Also he introduced an original technique for hip fusion



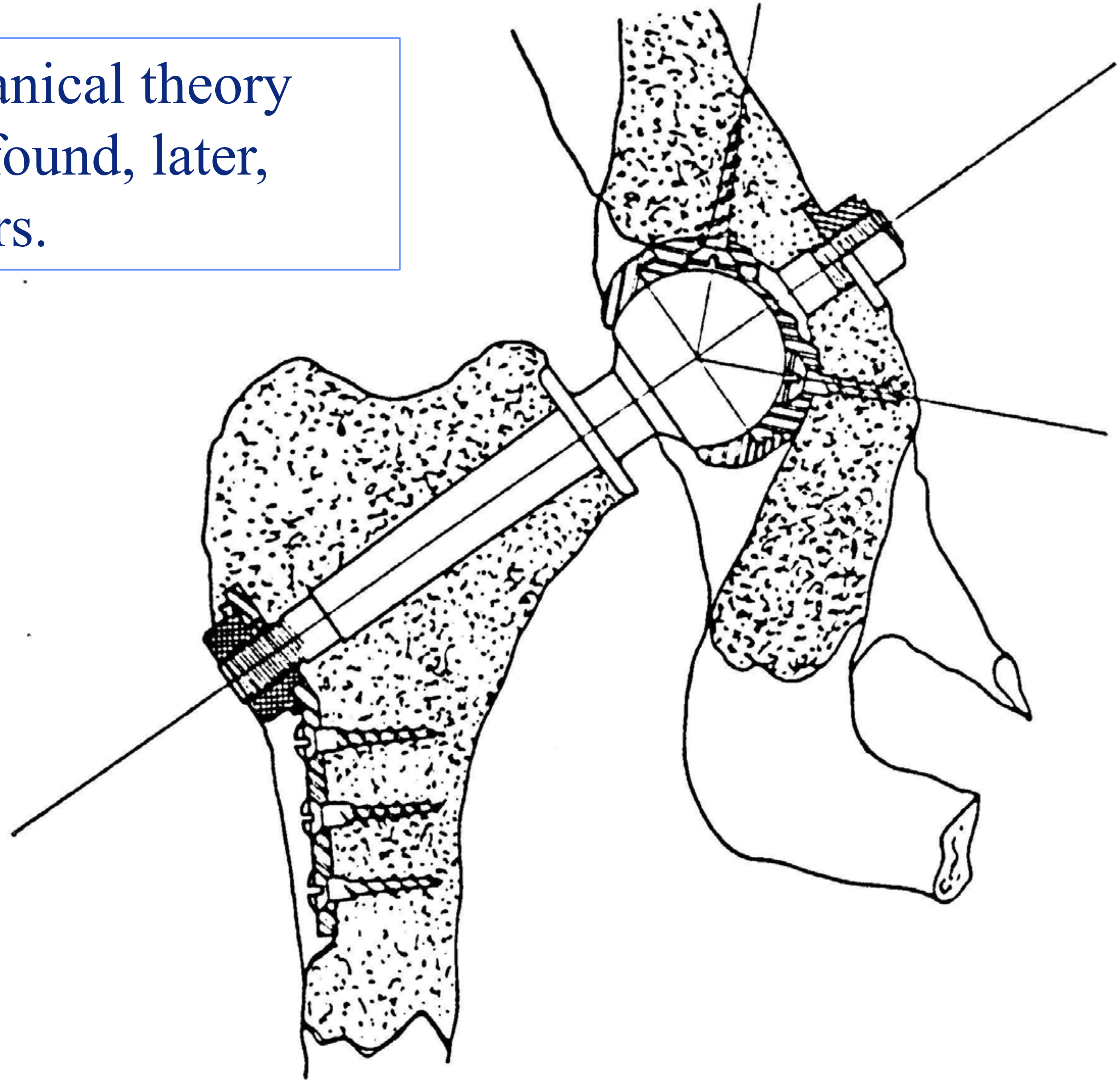


Alberto Augusto Picchio was an orthopaedic surgeon nor very known abroad.

In 1957, he introduced a fully new, non cemented, total hip prostheses.



His bio-mechanical theory (thrust plate) found, later, many followers.



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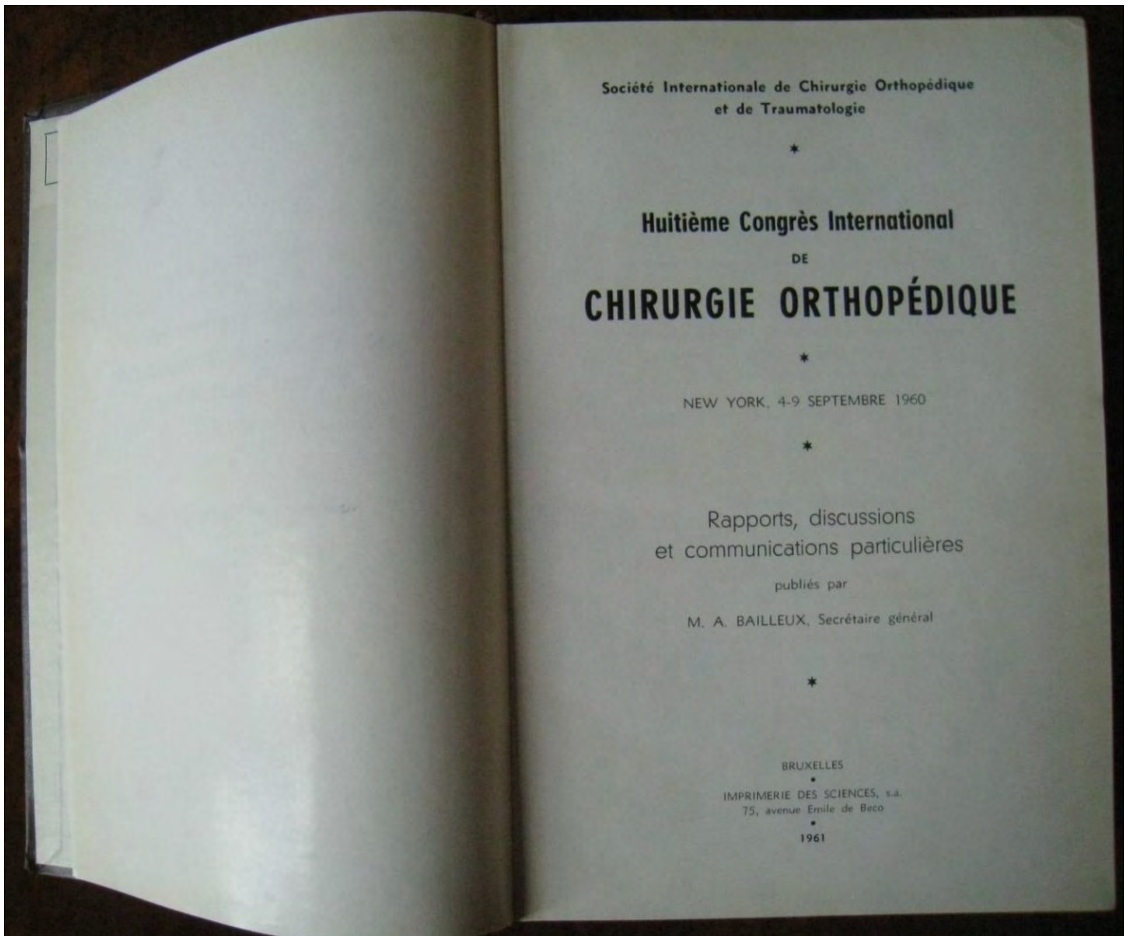
A bizarre story happened at the 8th International SICOT meeting in New York in 1960, dedicated to the DDH



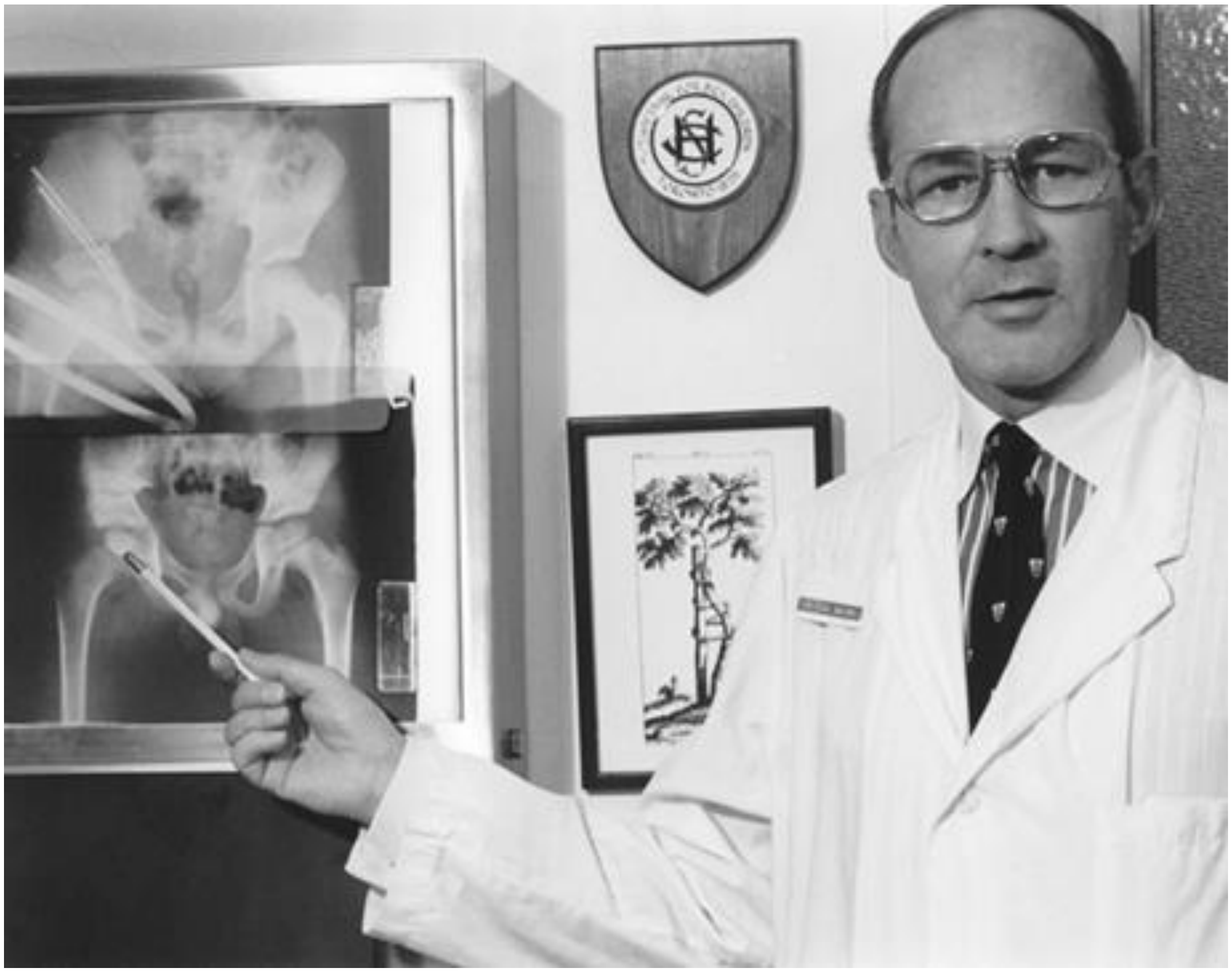
Oscar **Scaglietti** (1906-1993), an outstanding Putti's pupil, was appointed to the biggest task, a 70 pages paper.

Immediately after, Marino **Ortolani,** (the one of “Ortolani” (Barlow) sign for the early detection of DDH), gave his substantial contribution with an hefty paper.

Marino Ortolani 1904-1083

The ironic part of this story is that the only contribution, present in the thick proceedings book, still valid today, is the one page paper, of an young Doctor, from Toronto.

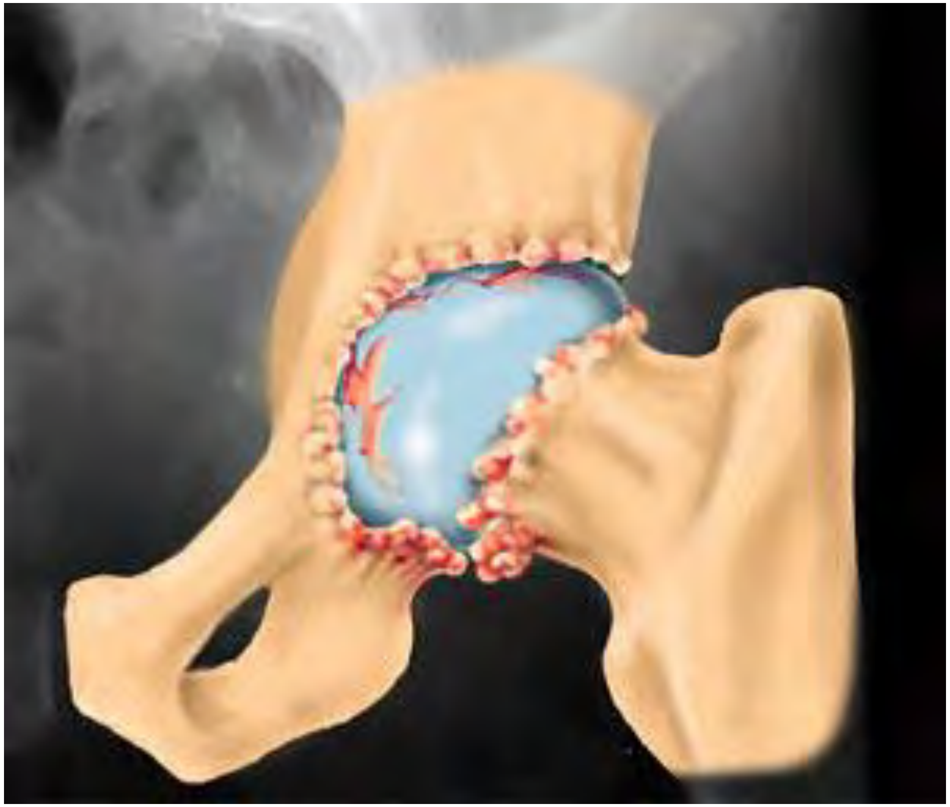
Robert **Salter** showing his innominate osteotomy



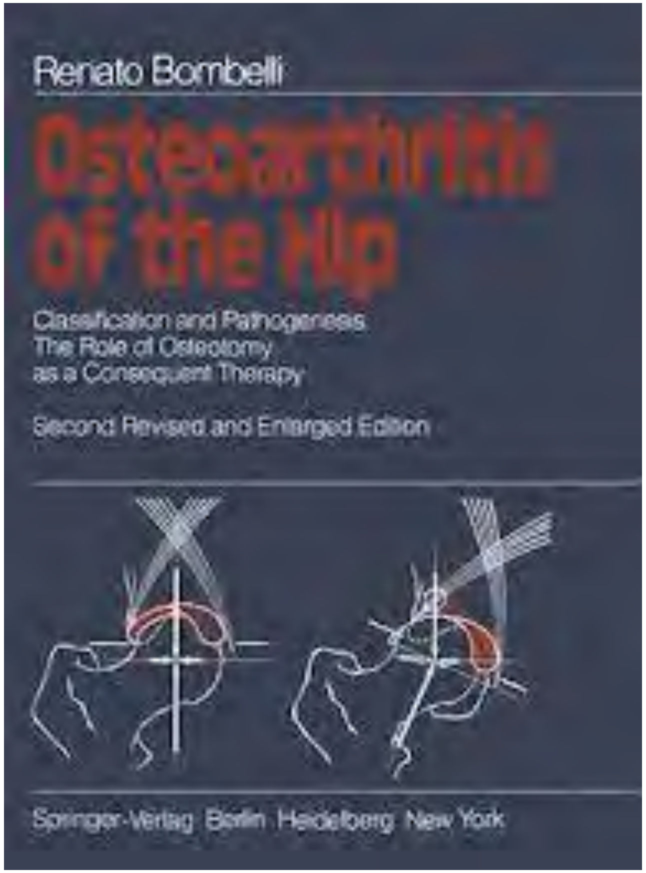
Paltrinieri – Trentani, both from “Rizzoli” as well,

Introduced in 1972 the first, modern, total hip,

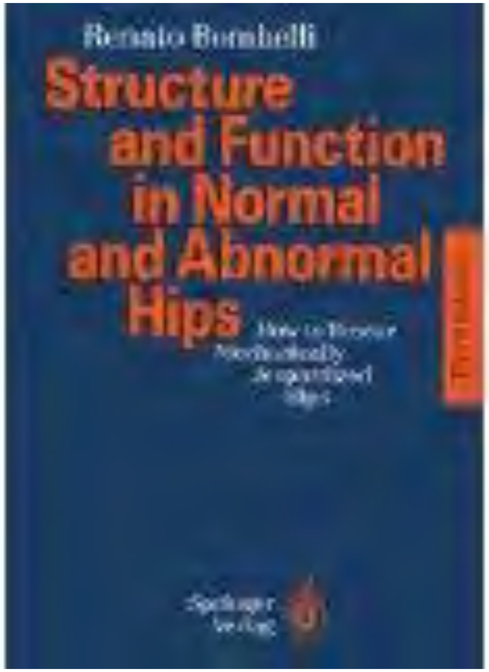
resurfacing prostheses.



Renato **Bombelli**



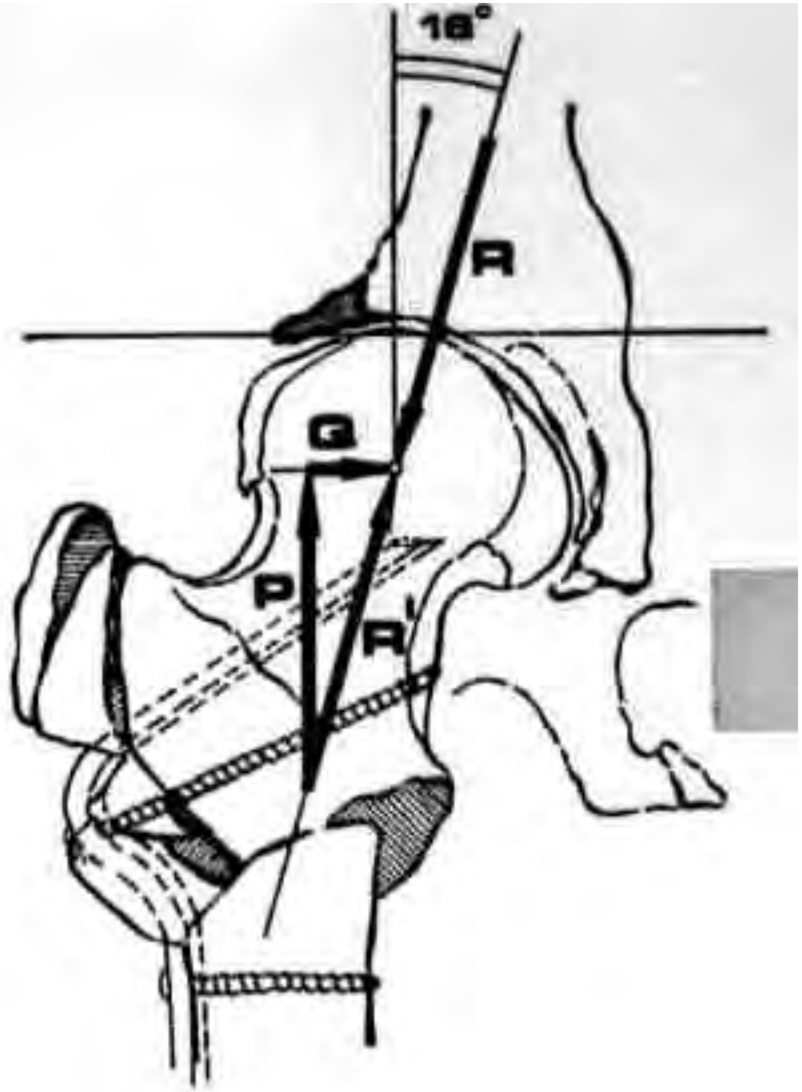
He wrote many relevant books on biomechanics of the hip and aetiology of arthritis.



He also introduced a particular osteotomy, called

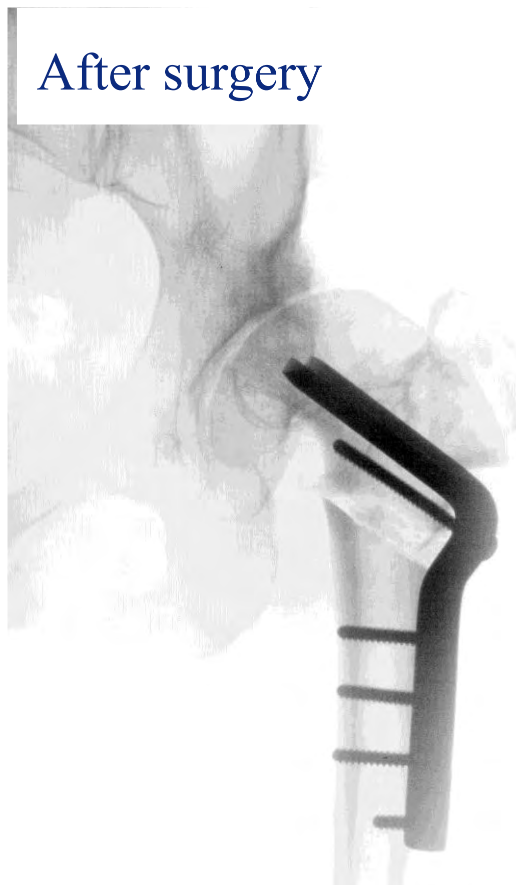
Valgus
Extension
Osteotomy

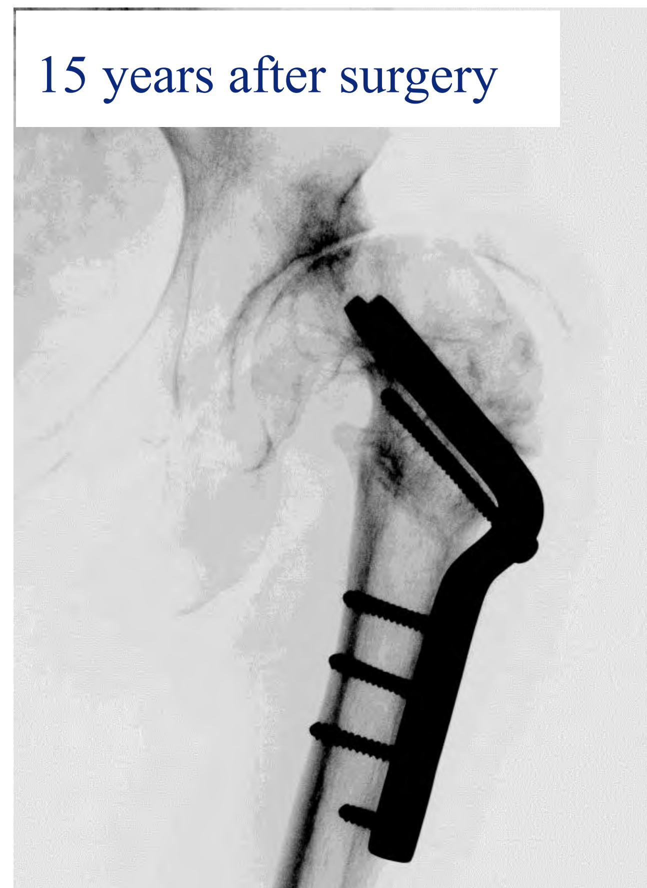
for the treatment of degenerative arthritis of the hip.



This procedure led, usually, to a reduction of pain, but unfortunately, often, of the ROM.

Here a clinical example of VEO with a 15 years follow up.





Lorenzo **Spotorno**, (1940-2013)

a very active and capable surgeon

In 1983 he designed an innovative stem

C L S

CLS became the gold standard for the non cemented stems
(100 % of survival at 10 years, in a series of the Swedish register)

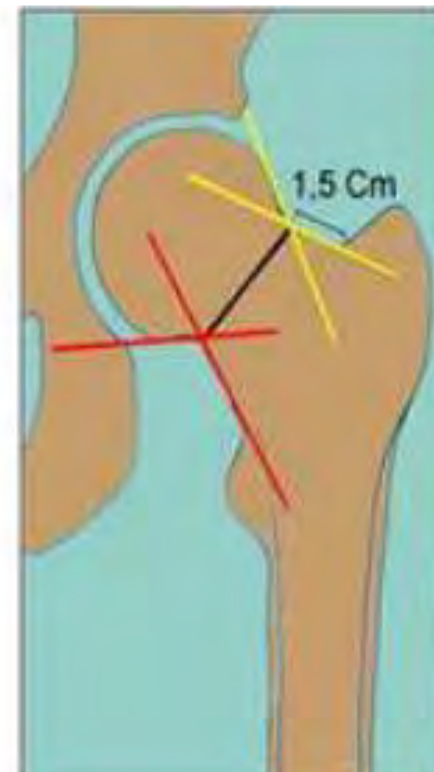
20 years
after surgery

Francesco **Pipino**
1931-2015

Francesco Pipino was a strong supporter of the tissue-sparing surgery, and according with this theory he designed his

Collum
Femoris
Preserving

a short, non cemented stem



Francesco Saverio **Santori**, starting 1995, with PROXIMA, took the concept of mini stem to the extreme. The goal was also to load the lateral aspect of the proximal femur with the shoulder of the device.

Francesco **Benazzo**

MODULUS, introduced in 2000, is a modular modification of Wagner's CONUS, particularly effective in avoiding leg length discrepancies and off-set changes, in dysplastic hips.

Thank you

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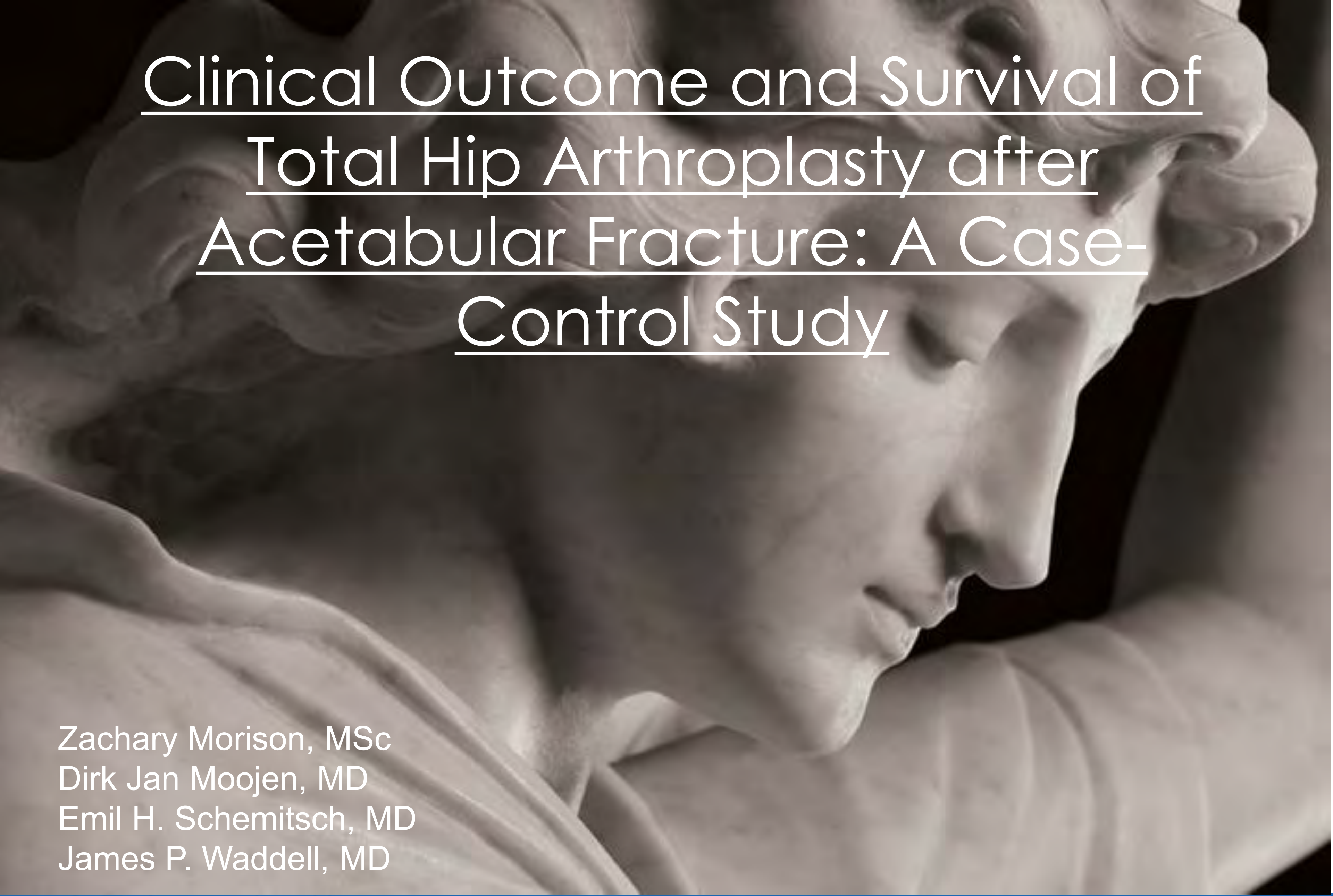

Clinical Outcome and Survival of Total Hip Arthroplasty after Acetabular Fracture: A Case-Control Study

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St. Michael's
Inspired Care. Inspiring Science.

UNIVERSITY OF TORONTO

No financial relationship to disclose

Acetabular Fractures

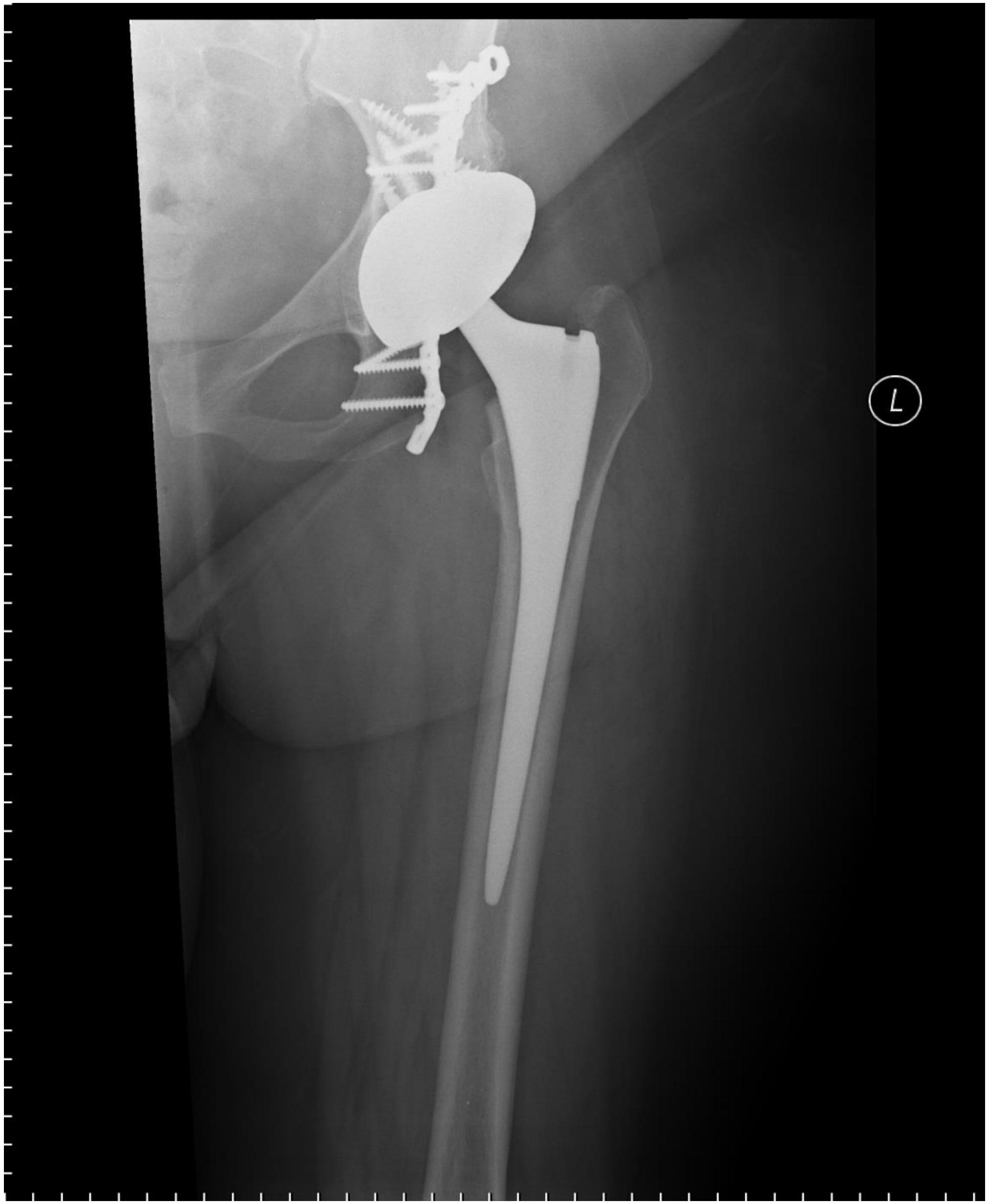
Meta-analysis conducted by Giannoudis et al

- Despite satisfactory reduction (≤ 2 mm) with ORIF, the incidence of osteoarthritis was 13.2% (76 of 577 patients)
- If the reduction was not satisfactory (> 2 mm), the incidence was markedly increased to 43.5%


30 y.o Female – PW fracture
L


L


L
3 years post-ORIF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Methods

Retrospective Case-Control Study

- Eighty patients were identified from those who presented with an acetabular fracture between January 1, 1987 and March 31, 2011 and who subsequently underwent THA

- One control patient was selected for each study patient and was matched for preoperative diagnosis, date of operation, age, gender, and type of prosthesis

Patients

- 80 patients per group
  - 55 Male : 25 Female
- Mean age approx. 53 Years
- Primarily uncemented stems
- Mean follow-up time >8 years

	Study Group	Control Group
n=	80	80
Mean Age (Years)(Range)	52.3 (25 to 85)	53.1 (30 to 83)
Male:Female	55:25	55:25
Mean Follow-up (Years)(Range	8.1 (2-23)	10.8 (2-24)
Implant Fixation		
Cemented	6	6
Hybrid	4	4

Acetabular Fractures

- **Most fractures treated with ORIF**
- equal split between elementary and associated fractures
- Most common – posterior wall fractures

	Study Group
	N(%)
Treatment for Acetabular Fracture	
ORIF	60 (75%)
Conservative	18 (22.5%)
Acute THA	2 (2.5%)
Elementary	
Anterior Column	3 (3.8%)
Posterior Column	5 (6.3%)
Posterior Wall	25 (31.3%)
Transverse	6 (7.5%)
Total	39
Associated	
Anterior+Posterior Hemitransverse	5 (6.3%)
Both Columns	13 (16.3%)
Posterior Column +Posterior Wall	8 (10.0%)
Transverse + Posterior Wall	7 (8.8%)
T-type	8 (10.0%)
Total	41

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Acetabular Fractures

No significant difference in the mean interval time between the initial treatment and total hip replacement

- Patients with ORIF (6.2 years, SD, 5.5 years)
- Patients treated conservatively (5.8 years SD, 12.9 years) (p=0.941)

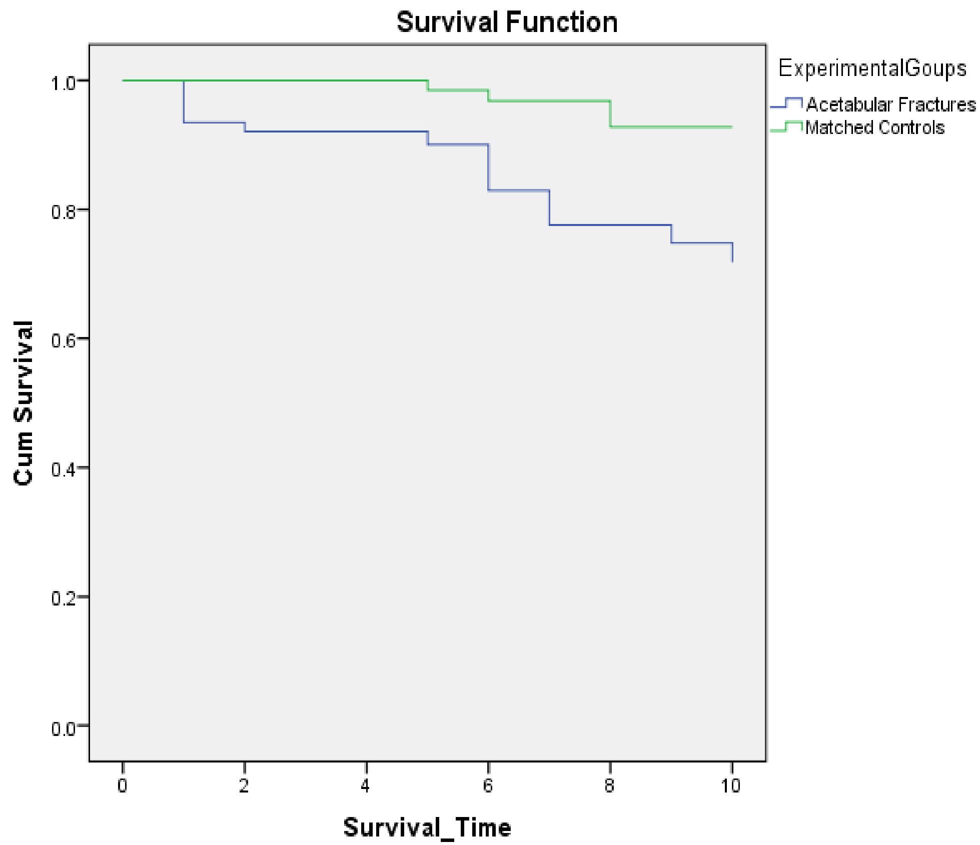
Revisions

There were significantly more revisions for patients with THA after acetabular fracture

The primary cause for revision in both cohorts was loosening of the acetabular component

KM Survival

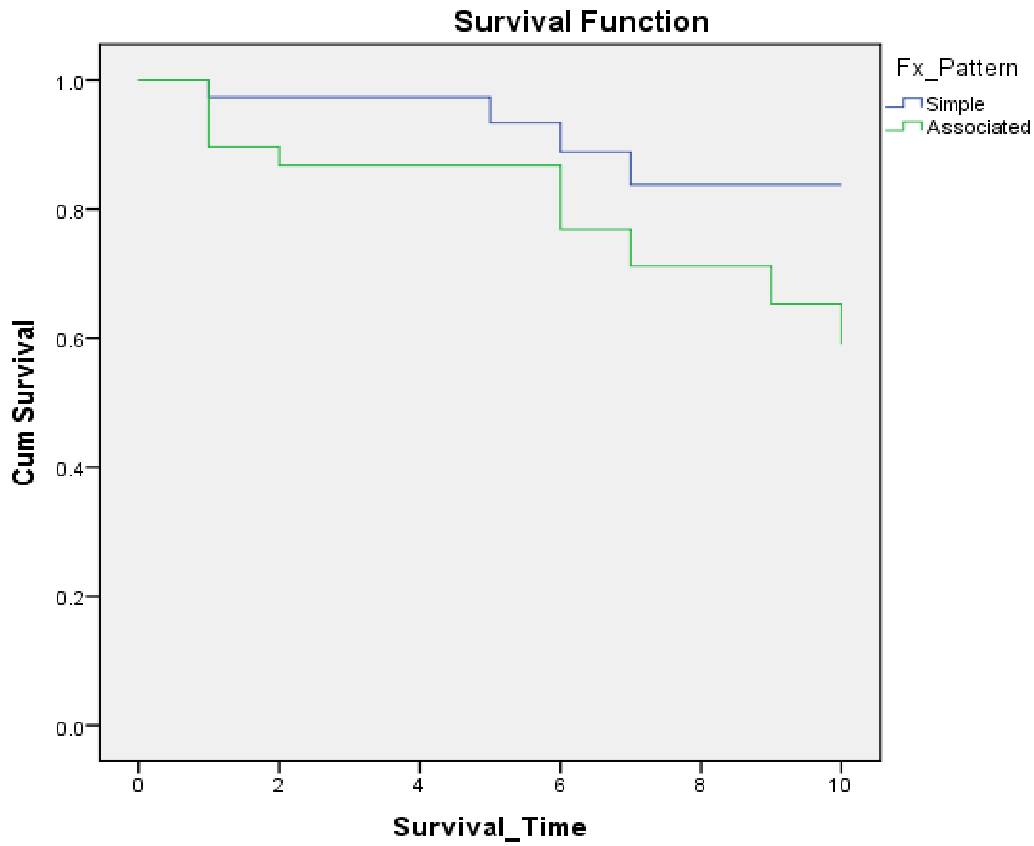
- Overall survival of the two cohorts of patients
- Revision as endpoint



10-year survival was 71.8% in those patients with a previous acetabular fracture whereas the matched cohort for THA was 90.4 %, ($p < 0.001$)

KM Survival

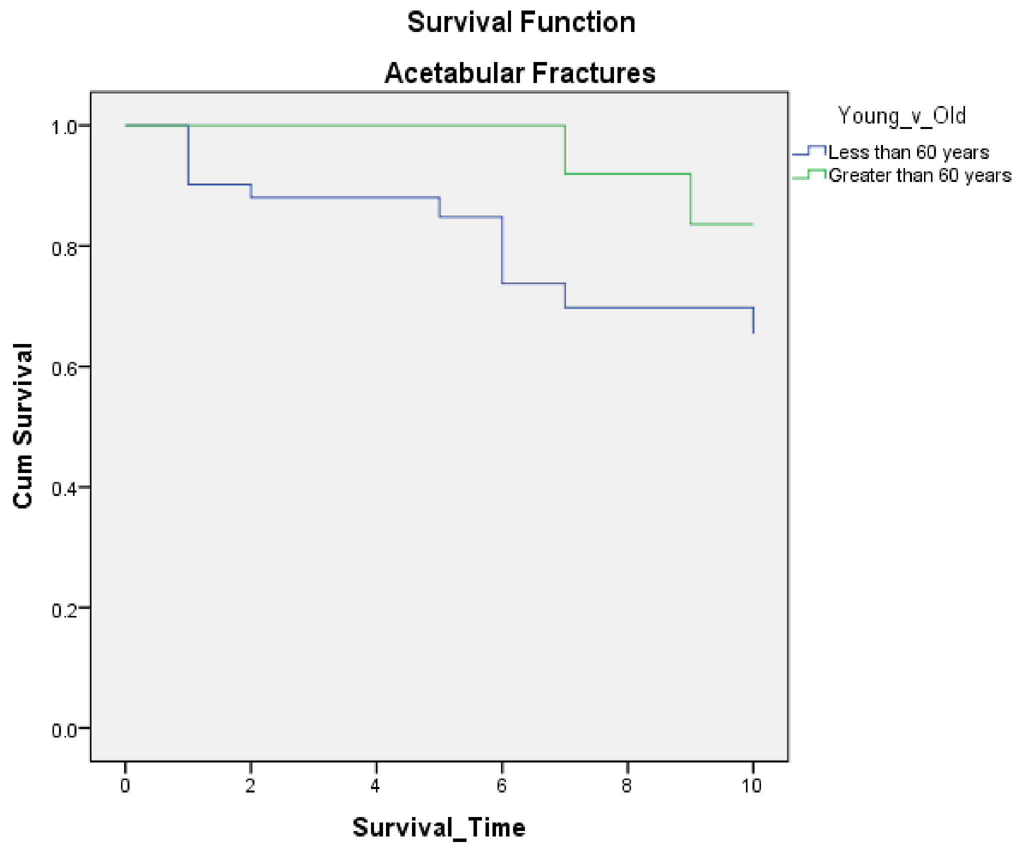
Patients with acetabular fractures stratified by fracture type



The 10-year survival for THA after a simple acetabular fracture was 83.2% as compared to 60.0% for Associated fractures (p=0.032)

KM Survival

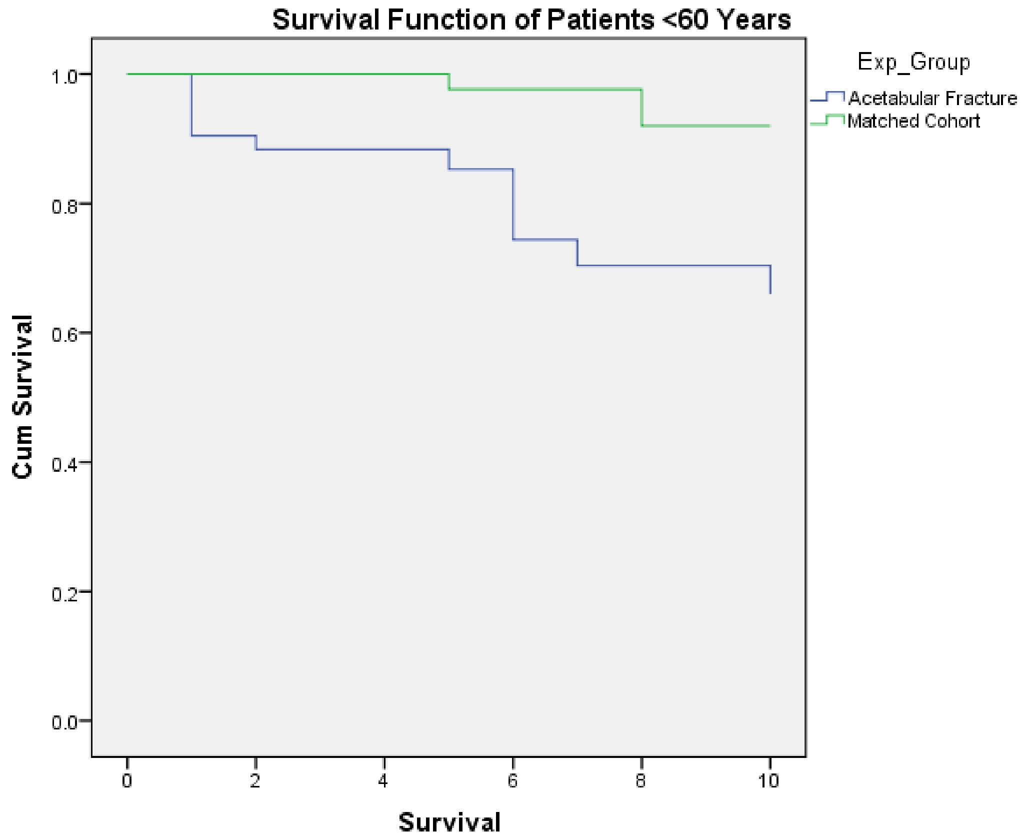
Patients with acetabular fractures stratified by age



The 10-year survival for THA after acetabular fracture for young patients was 60.5% as compared to 80.3% in patients over 60yo (p=0.038)

KM Survival

Survival for Matched cohort stratified by Age

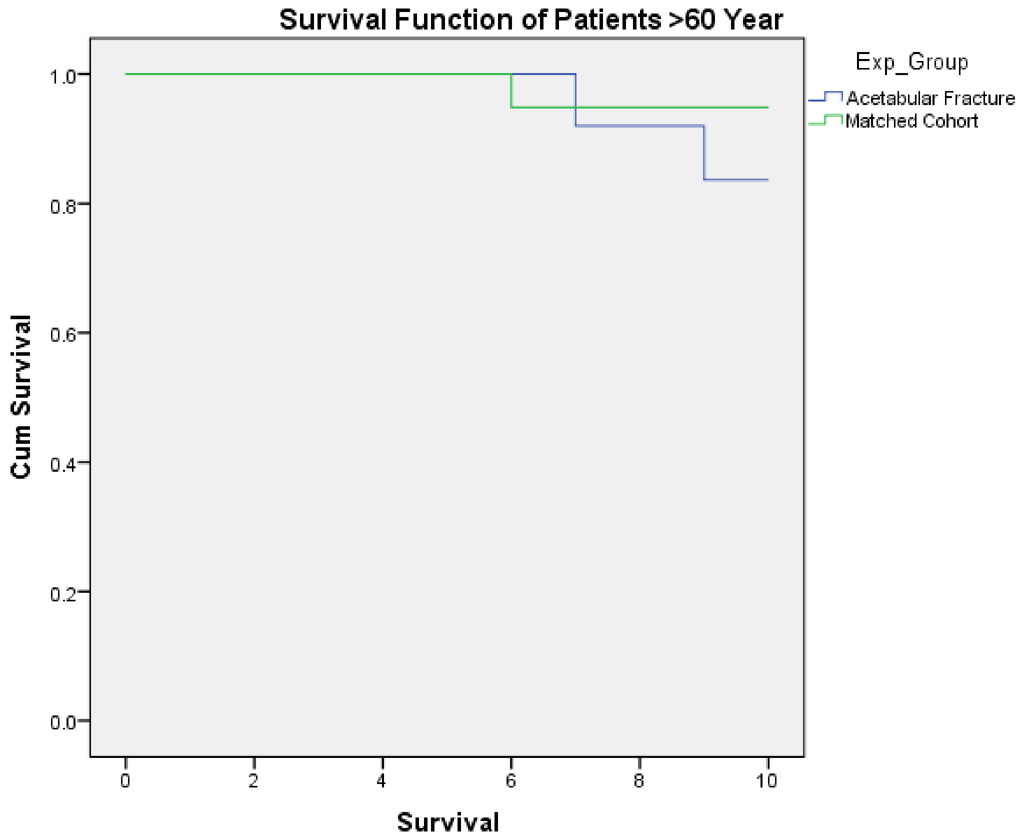


The 10-year survival for THA in patients less than 60yo with acetabular fx was 60.5% as compared to 91.9% in matched cohort.

- Significant difference between groups (p<0.001)

KM Survival

Survival for Matched cohort stratified by Age



The 10-year survival for THA in patients greater than 60yo with acetabular fx was 80.3% as compared to 95.7% in matched cohort.

- No difference between groups

Time to revision

There was a significant difference in the time from the initial THA to the revision

- Patients with previous acetabular fracture (7.7 years; SD, 5.1 years)
- Matched cohort (12.8 years; SD, 5.9 years; p=0.015)

Functional Outcome

The functional outcome was assessed using a standardized hip score (SMH Score)

- Outcomes significantly higher in the matched cohort than the acetabular fracture group at:
  - Two year post-operative (Mean Score; 22 vs. 19, $p<0.01$)

Complications

- Patients with previous acetabular fracture had a 6.25% rate of infection and a 10% dislocation rate

- No infections and a 2.5% dislocation rate in the matched group

- 10 patients in the acetabular fracture group had a sciatic nerve lesion prior to the THA, 1 additional patient had a lesion after the THA. No patients in the control group had a sciatic nerve lesion.

Conclusion

1. Patients with a prior acetabular fracture had significantly worse 10 year survival rate than the matched cohort

2. Revision THA occurred on average 5 years earlier than those without a prior acetabular fracture

3. THA after acetabular fracture have worse outcomes in younger patients

4. Primary reason for revision is acetabular loosening

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26-27 NOVEMBER 2015

MILAN, ITALY

Hip Arthroplasty Cups in Dysplasia

J N O'Hara
Birmingham
UK

Socket Placement

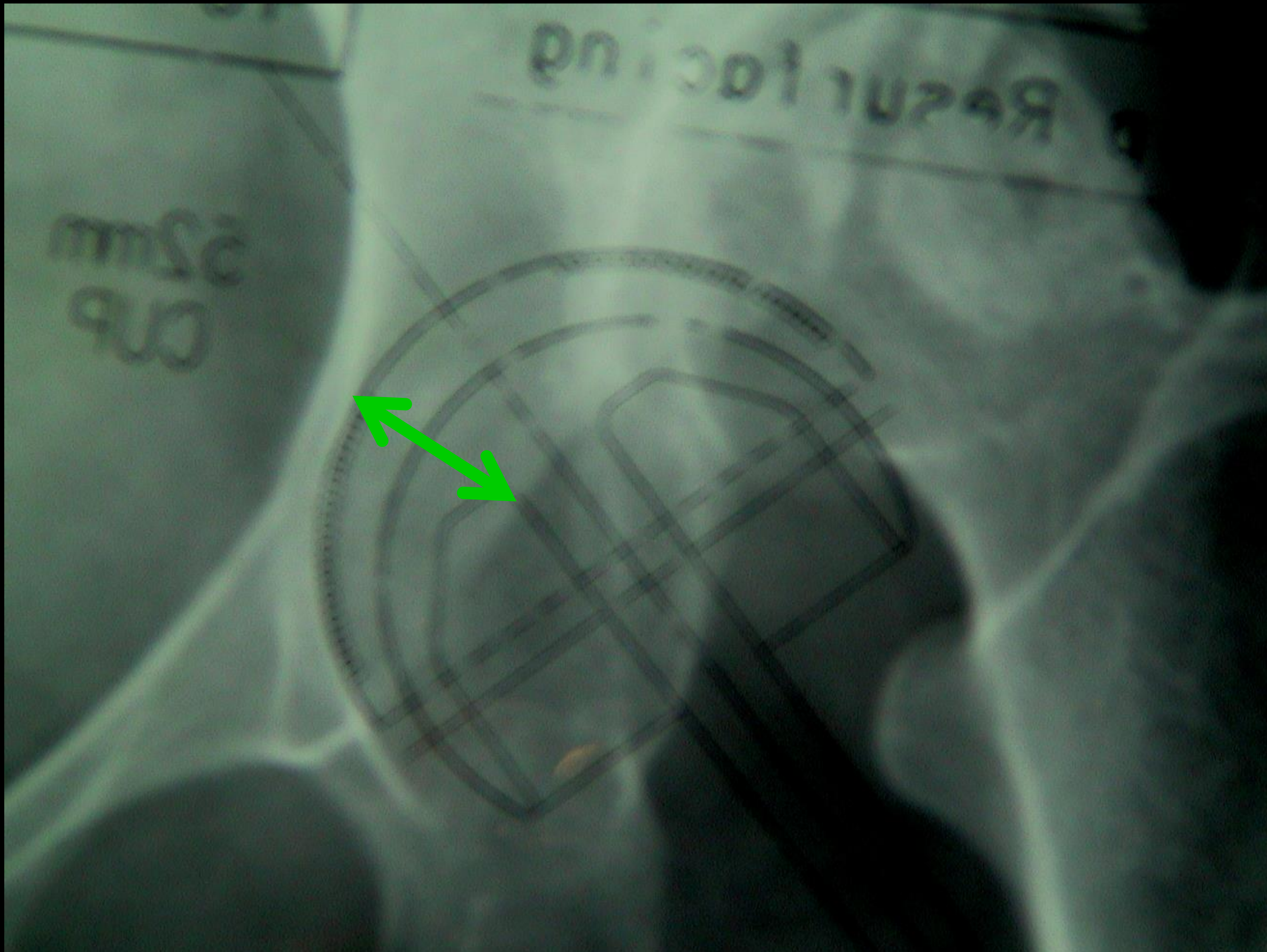
Most all hip disease results in

mild subluxation- anteriorly and proximally in most cases of dysplasia

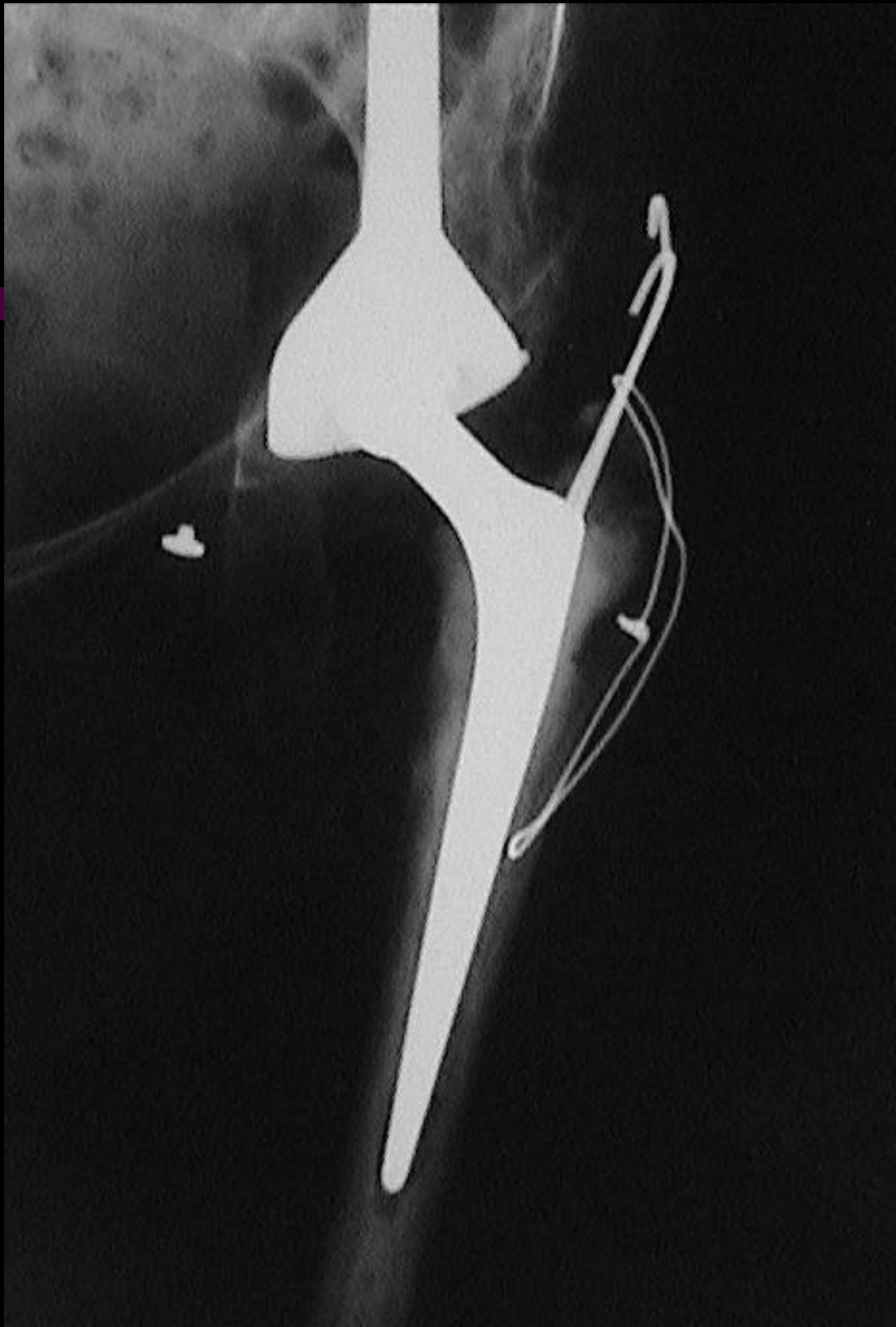
Most sockets need deepening and often moving posteriorly.

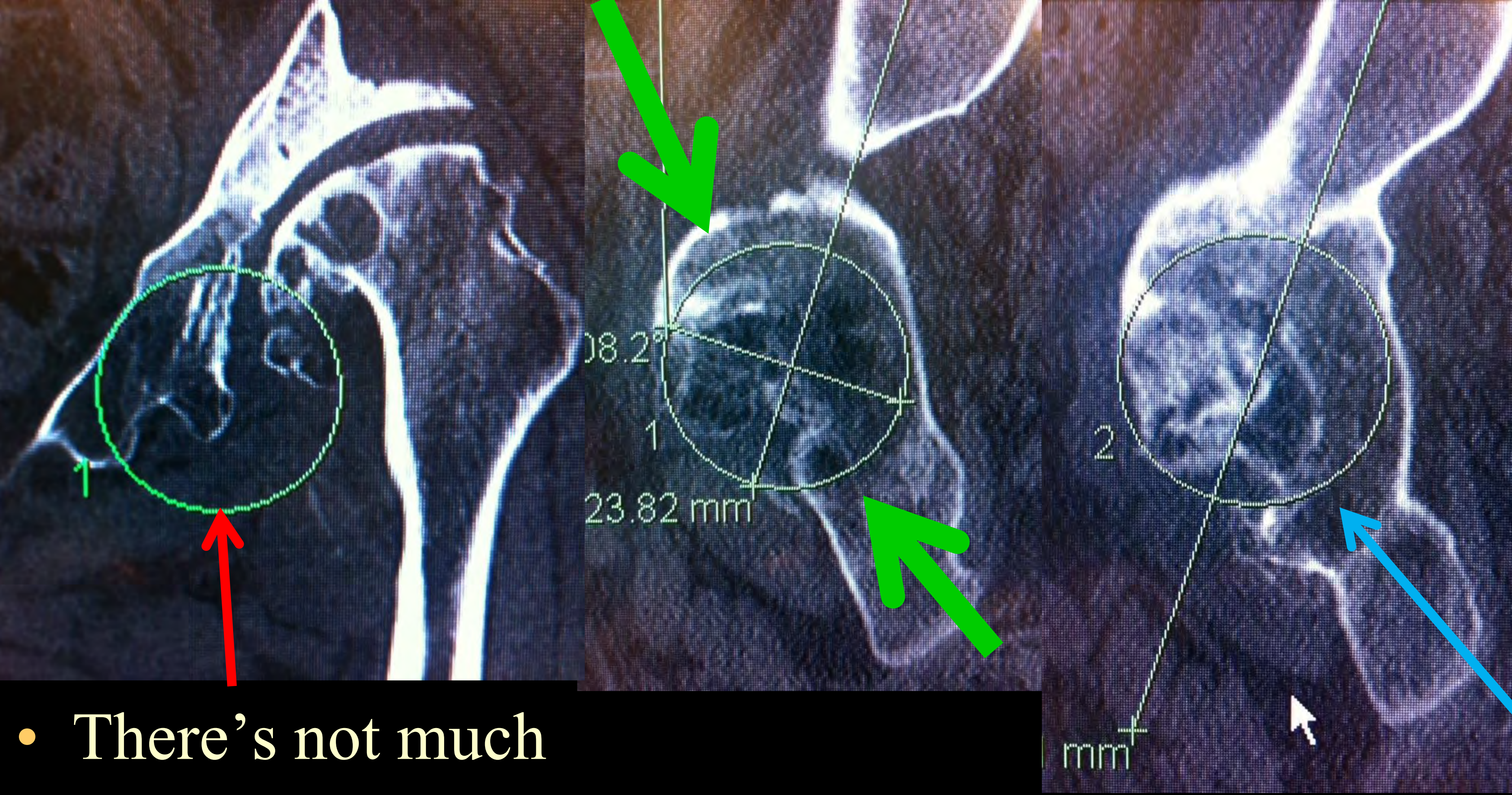
>>better cover/grip

>>less need for special/Dysplasia cups


Resurfacing
32mm
Cup

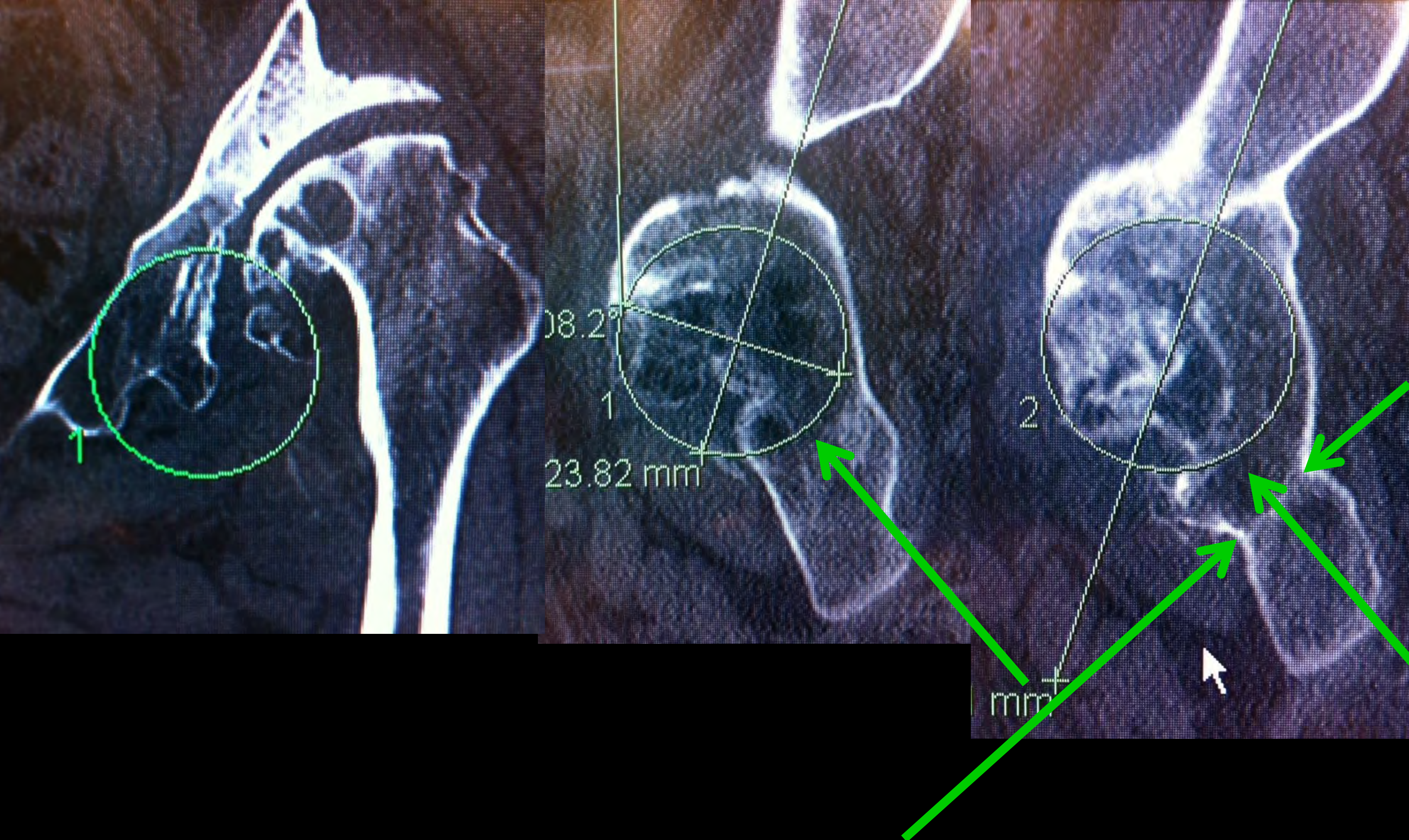
Adult dislocation





- There's not much grip here!

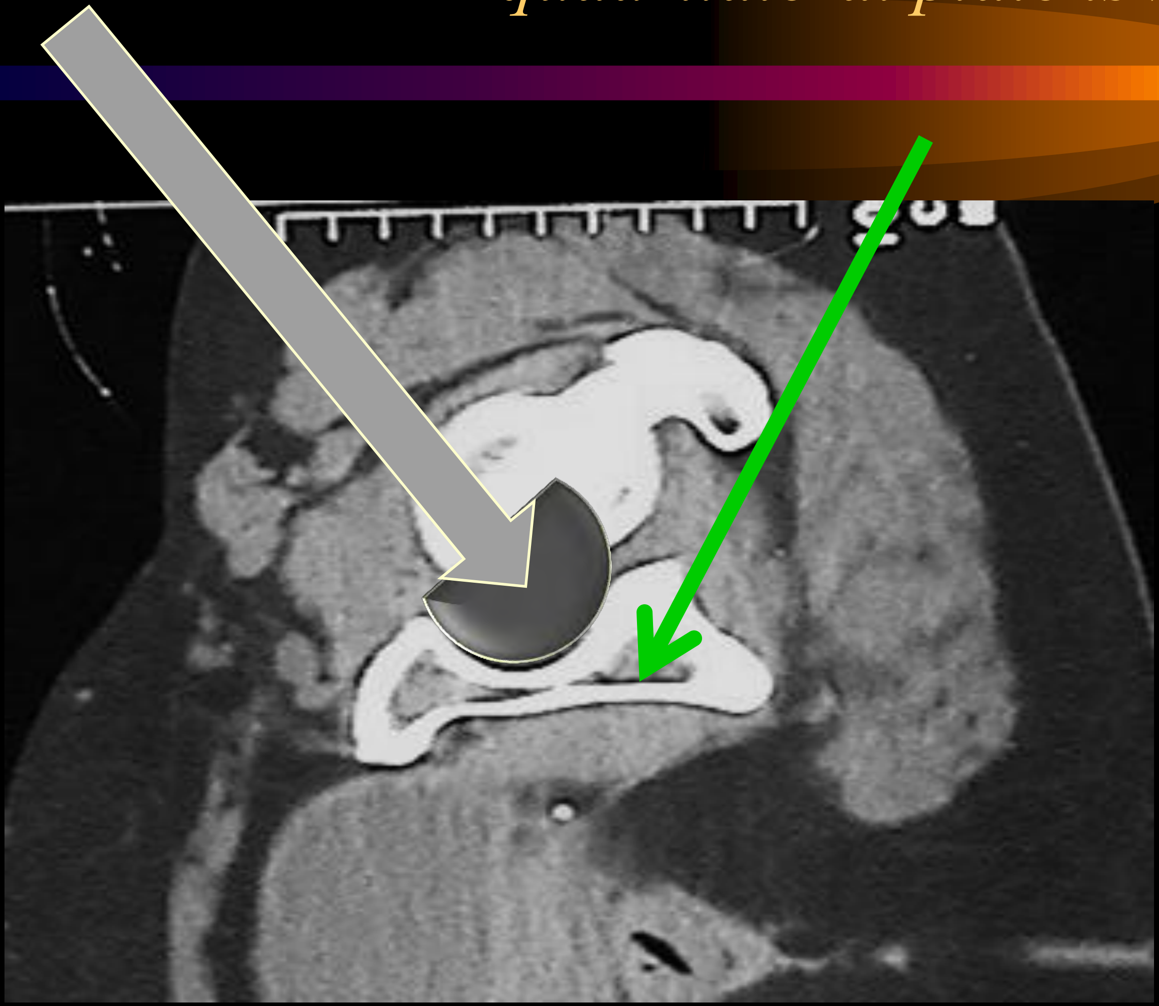
Most available grip is between the ischium and the anterior inferior iliac spine


1
08.2°
1
23.82 mm
2
mm

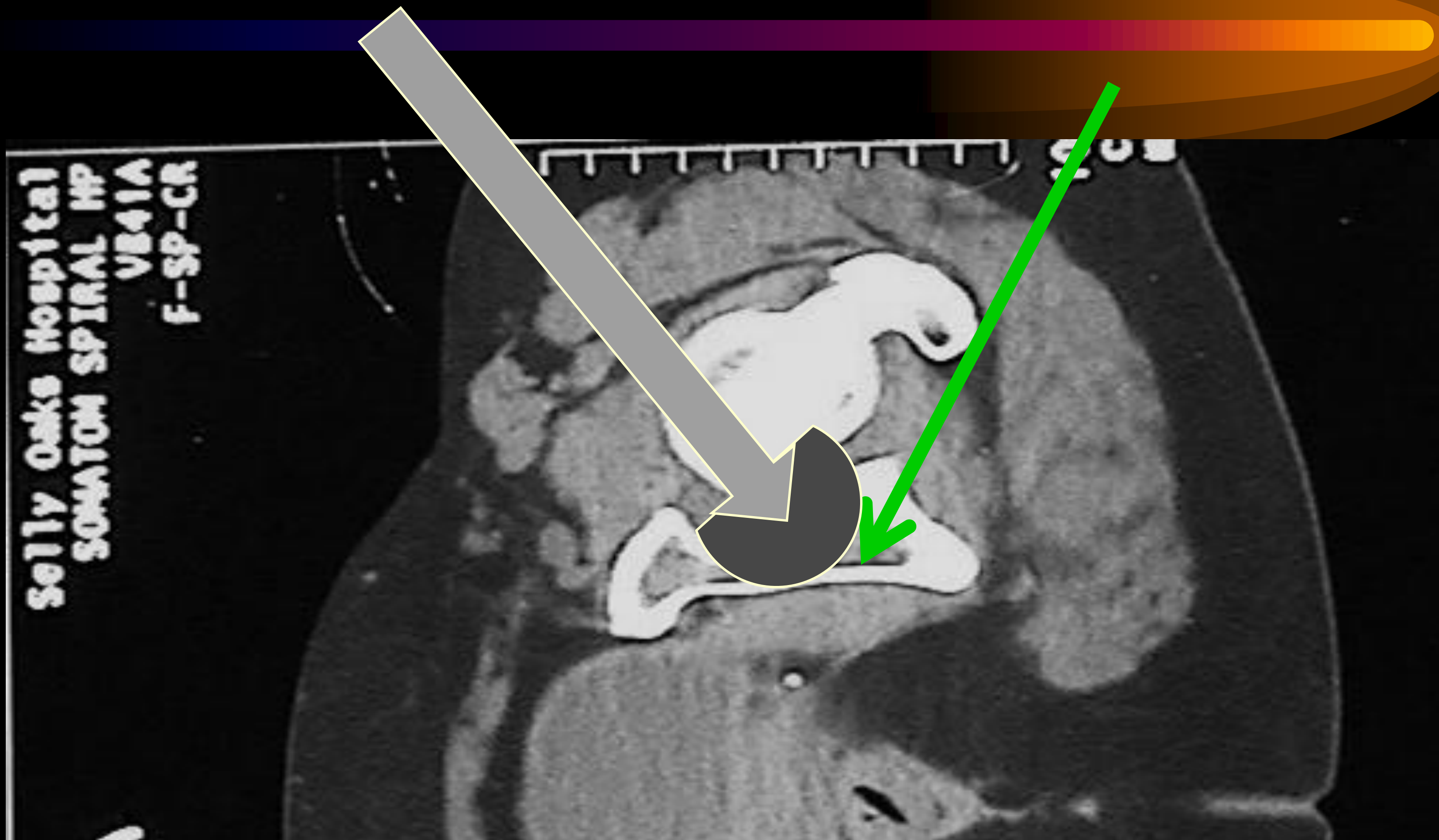
To limit posterior drift, Put a nail in the sub-cotyloid groove, standard anterior retraction

A single drill hole in the floor of the socket will indicate the depth available to ream

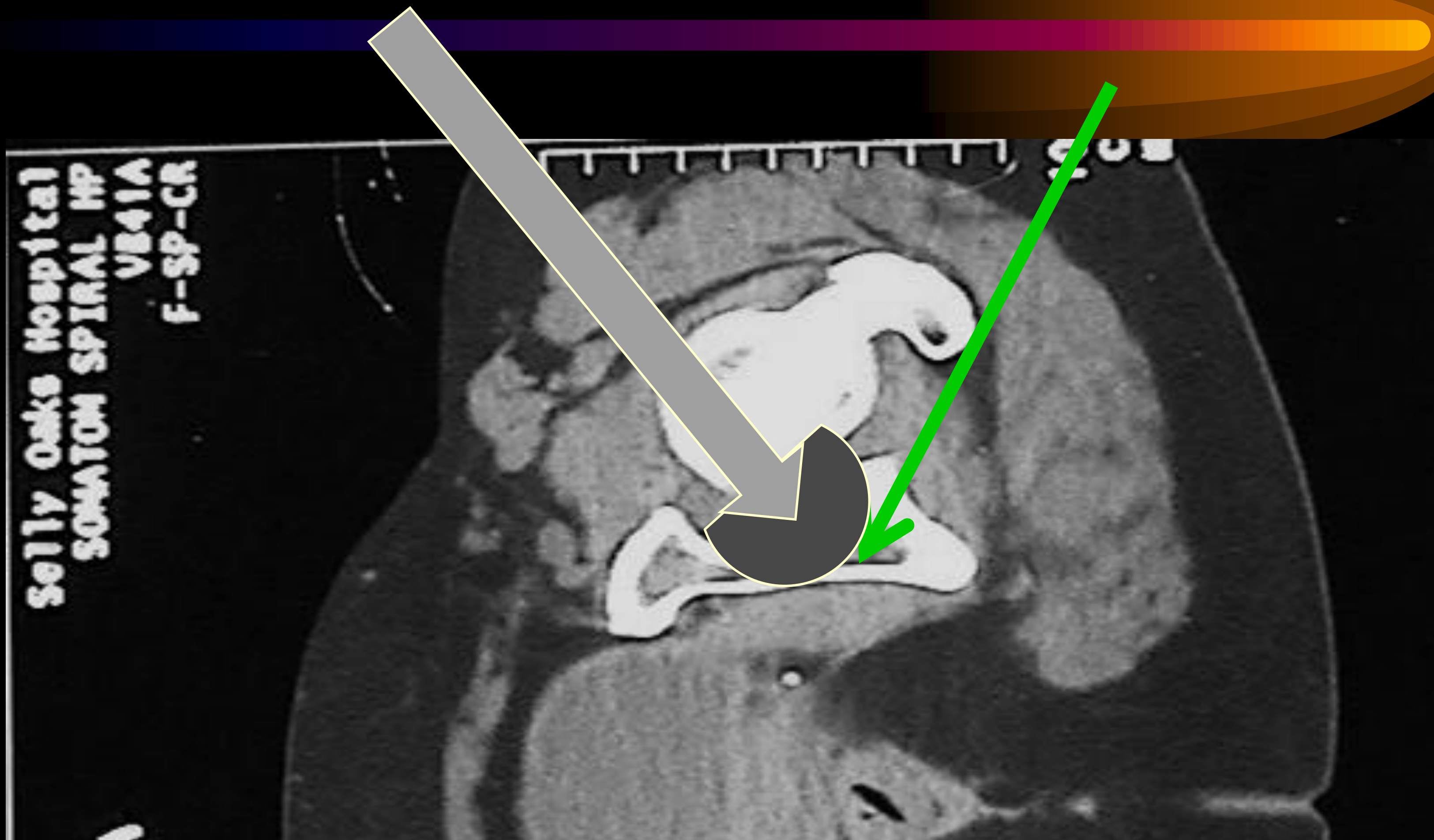
Reaming should be medially and backwards, completely avoiding the anterior column until the quadrilateral plate is seen

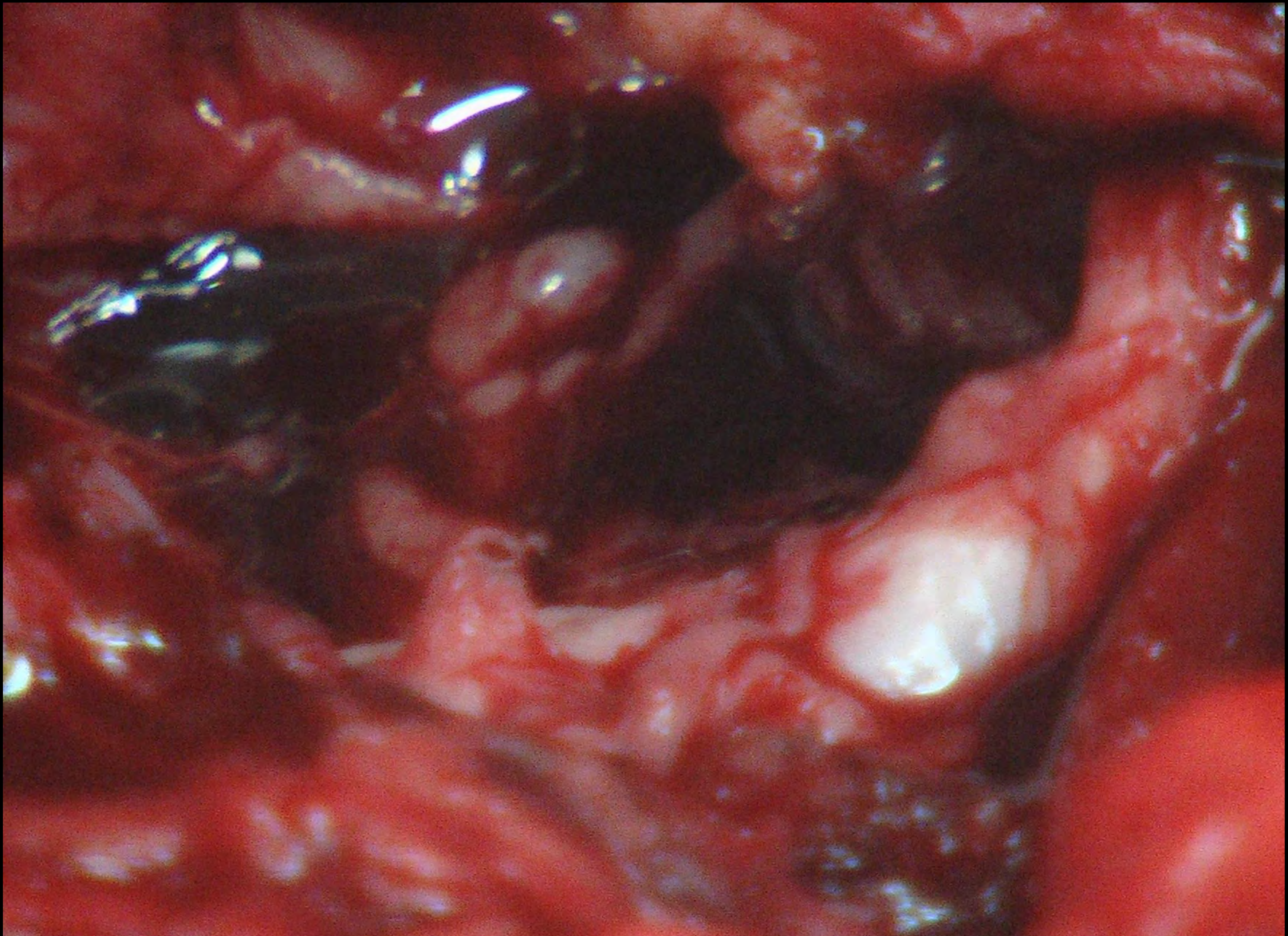


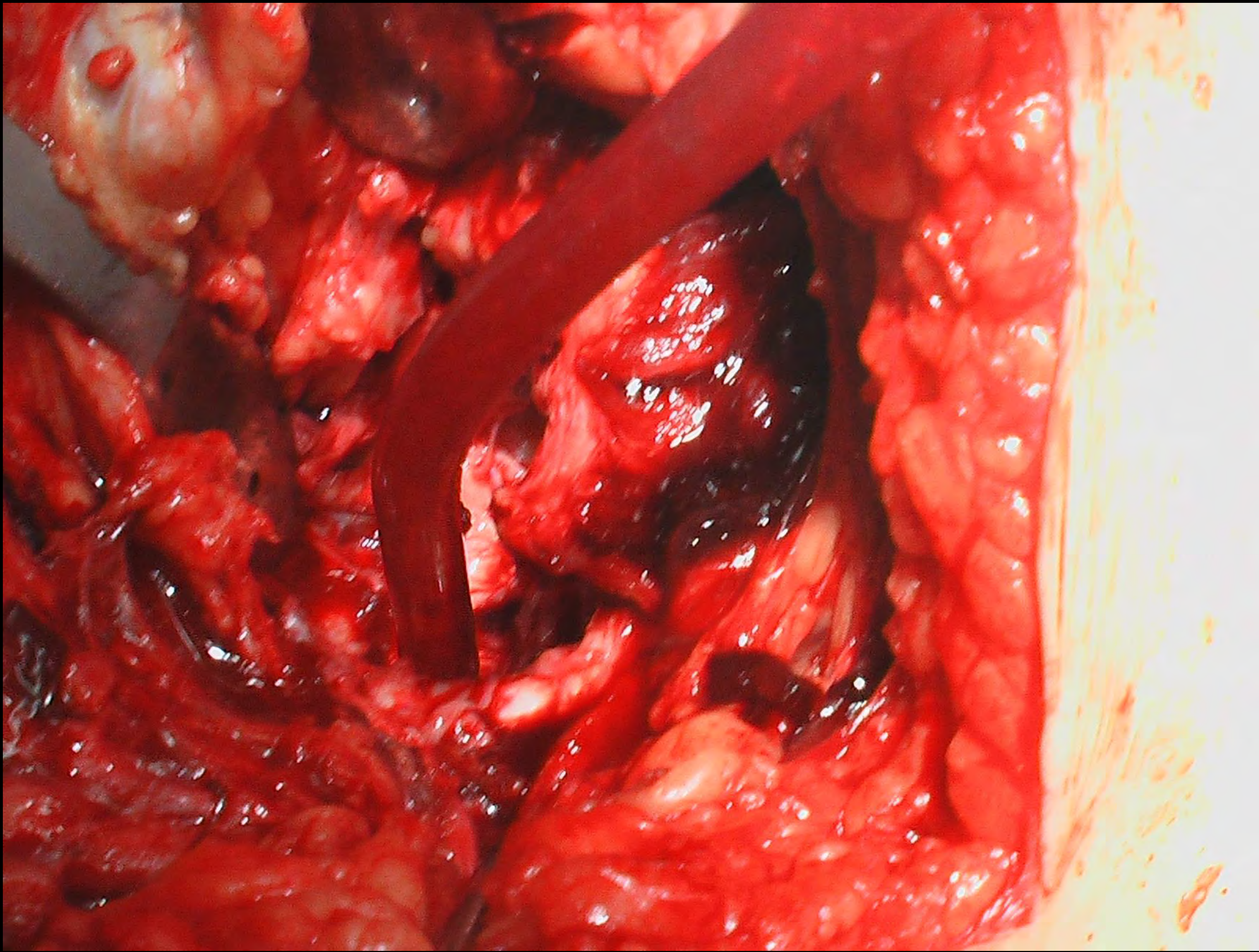
Reaming should be medially and backwards, completely avoiding the anterior column until the quadrilateral plate is seen

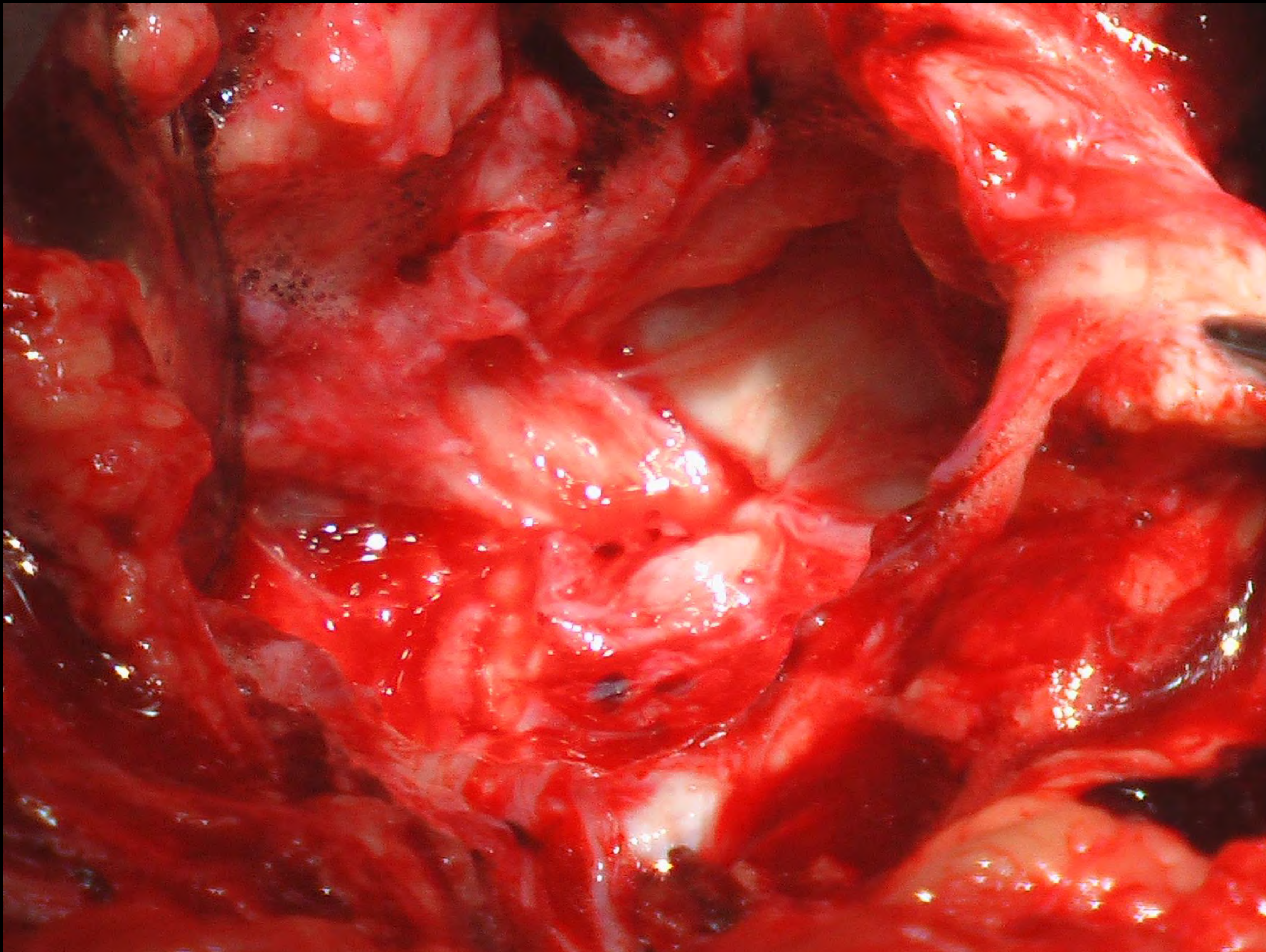


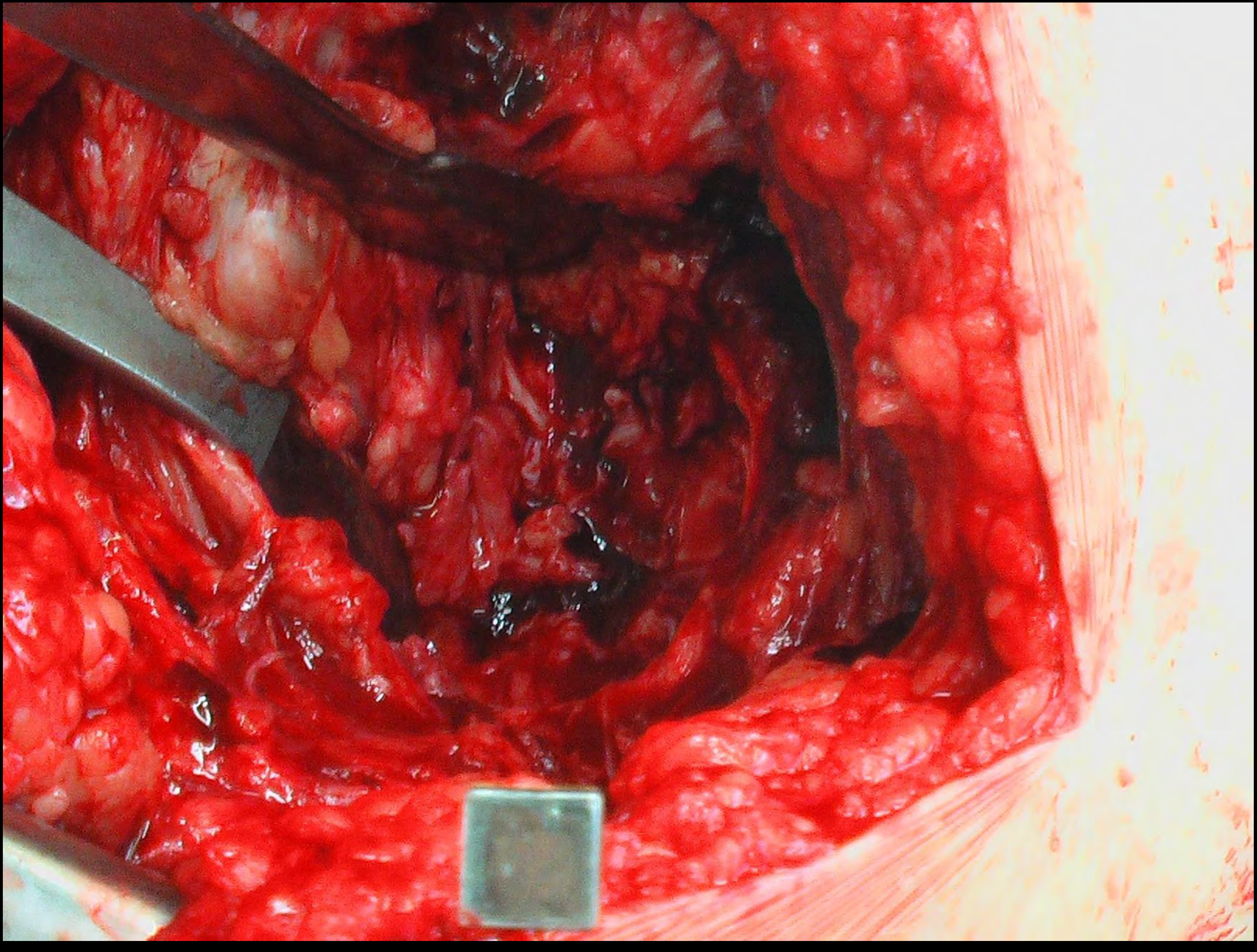
Reaming should be medially and backwards, completely avoiding the anterior column until the quadrilateral plate is seen and the nail it touched

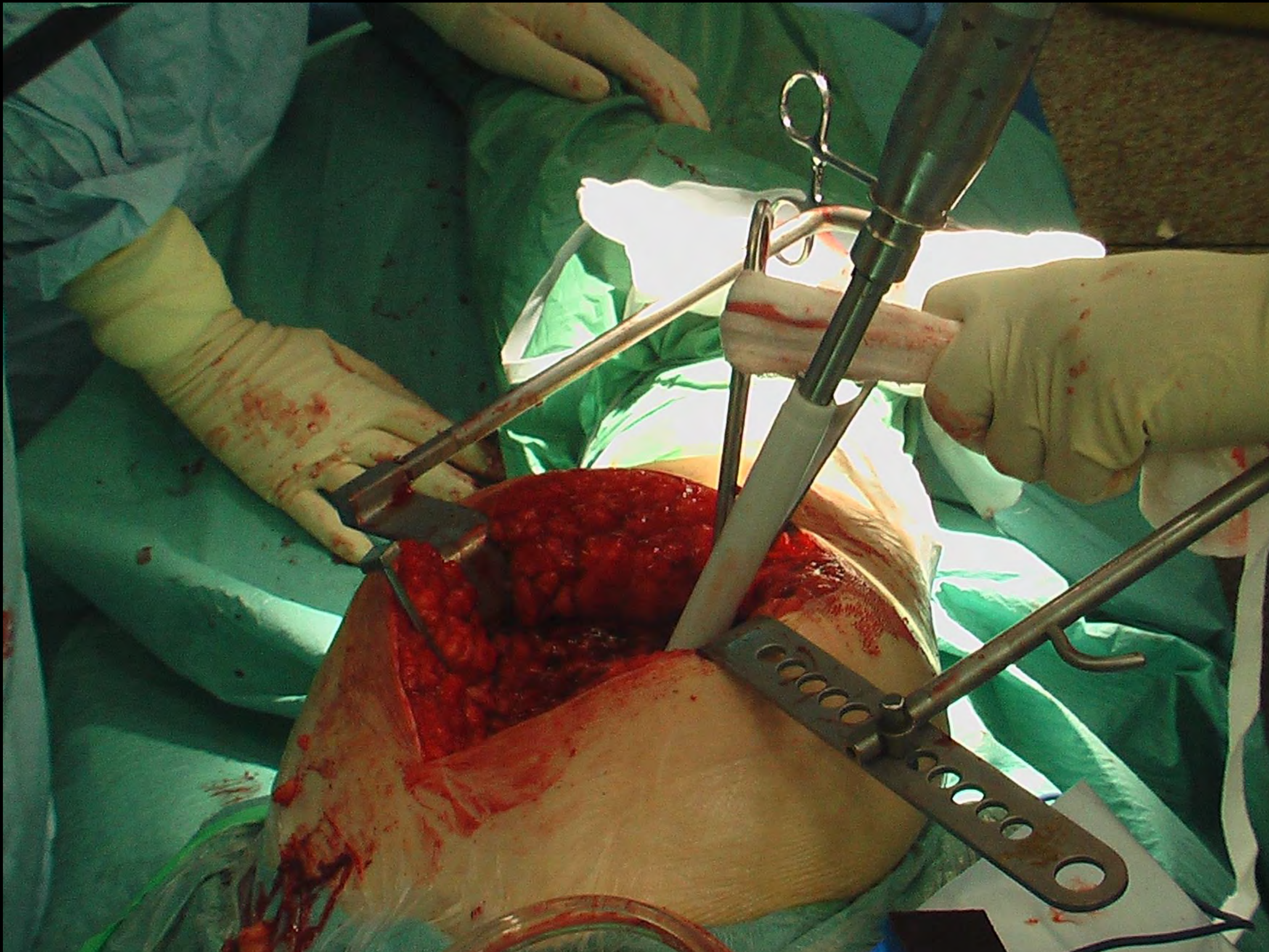


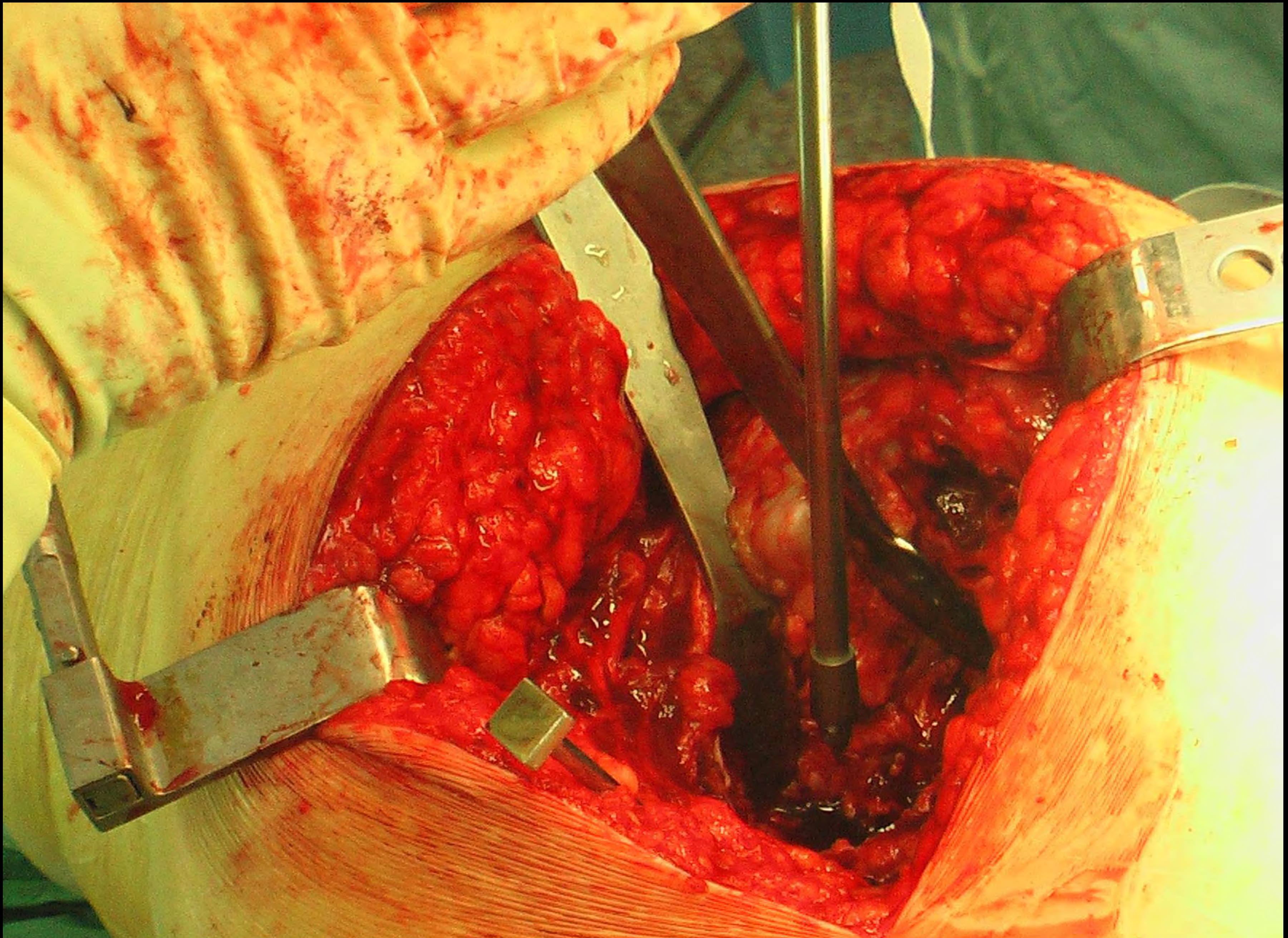


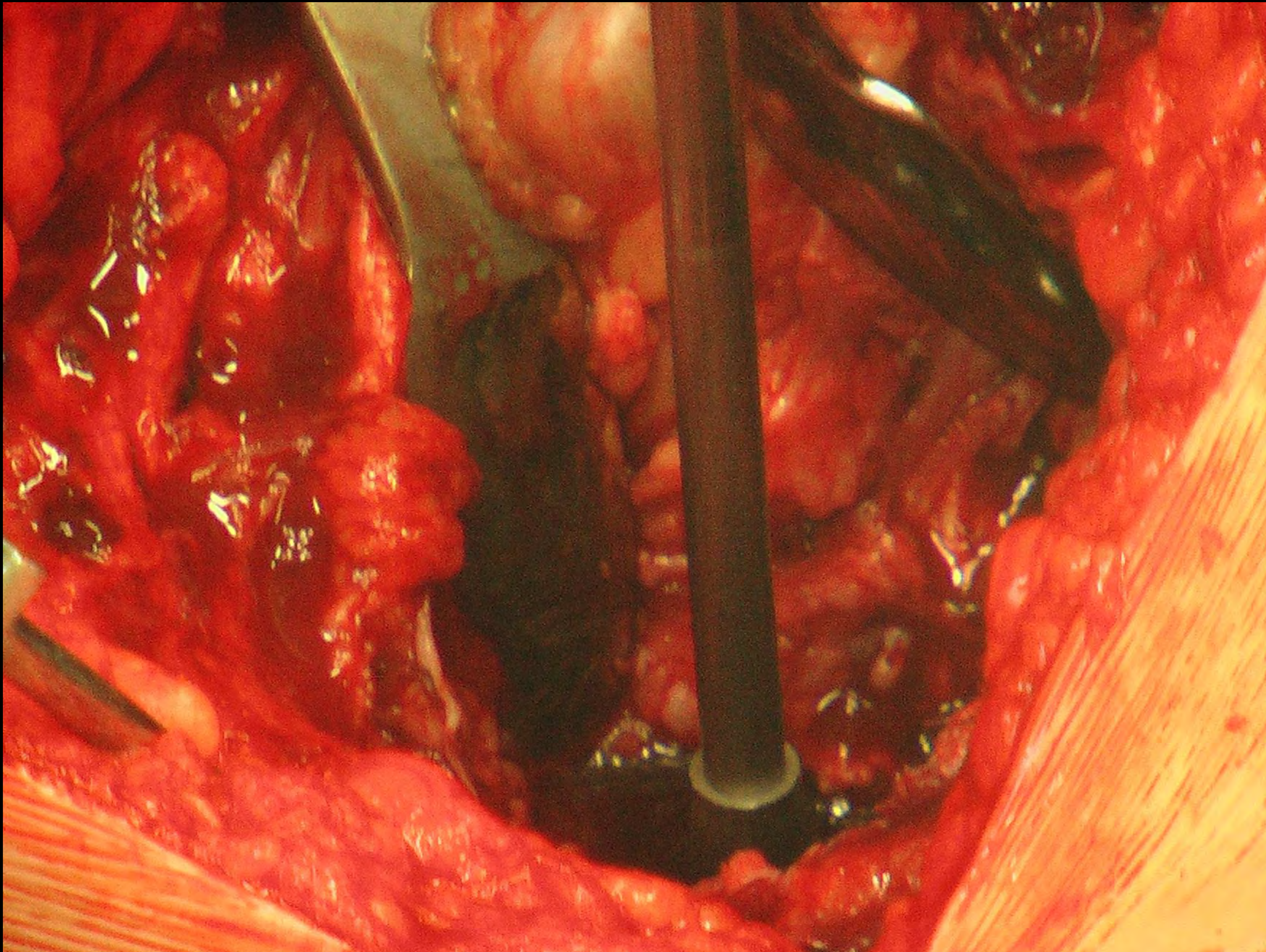


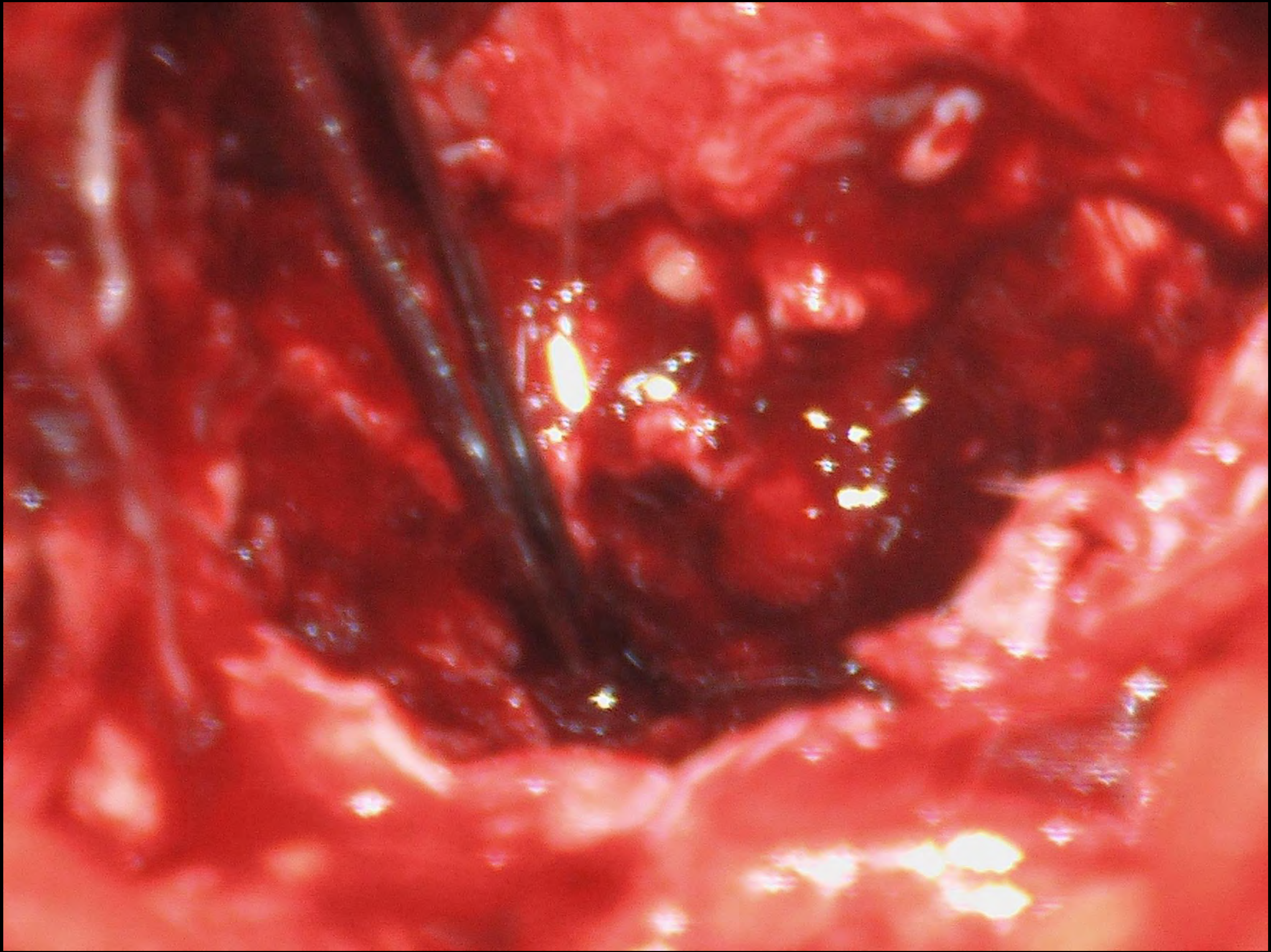




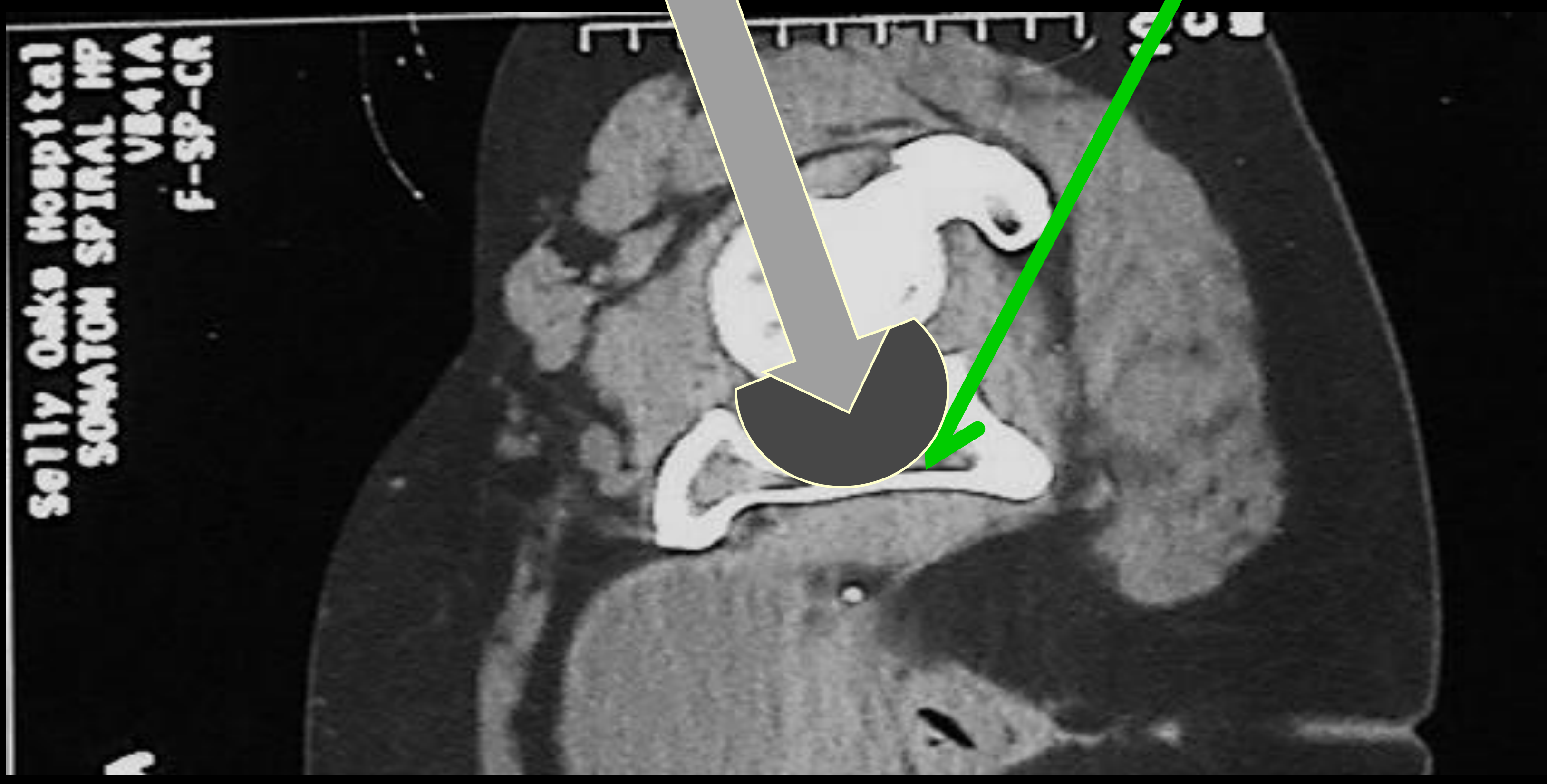




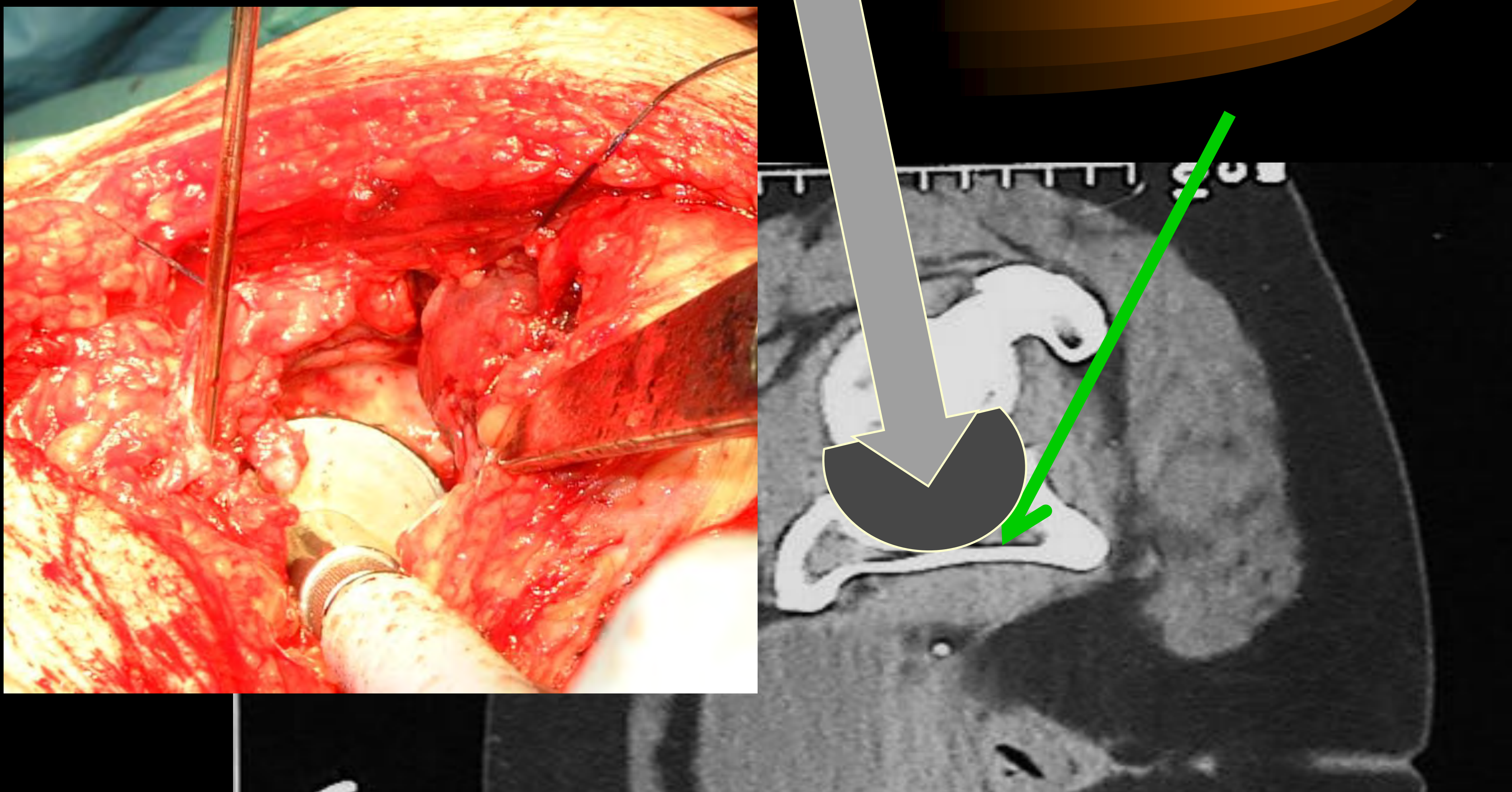


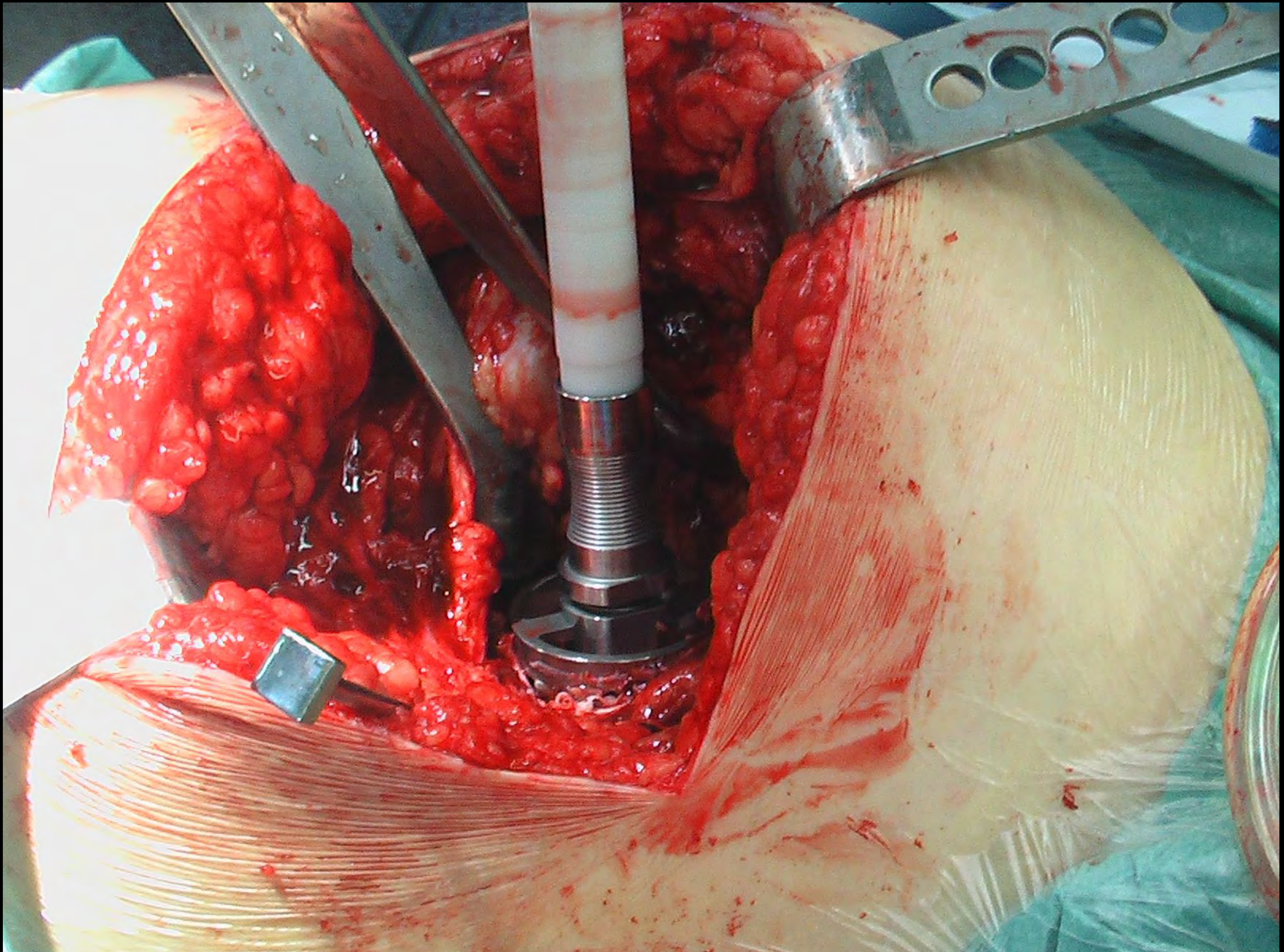


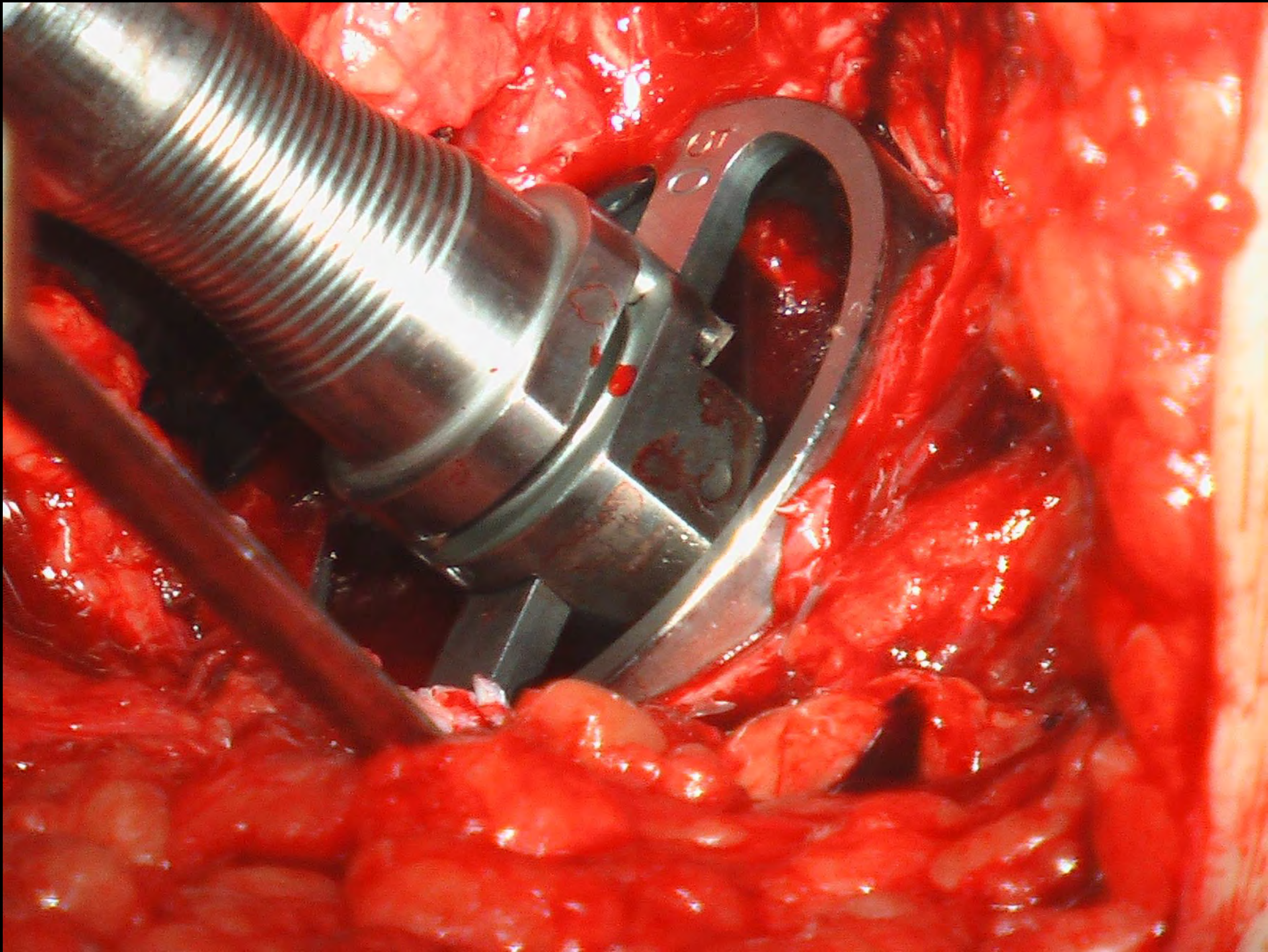
Reaming should be medially and backwards, completely avoiding the anterior column until the quadrilateral plate is seen and the nail it touched, only then is it turned into the normal alignment and expanded

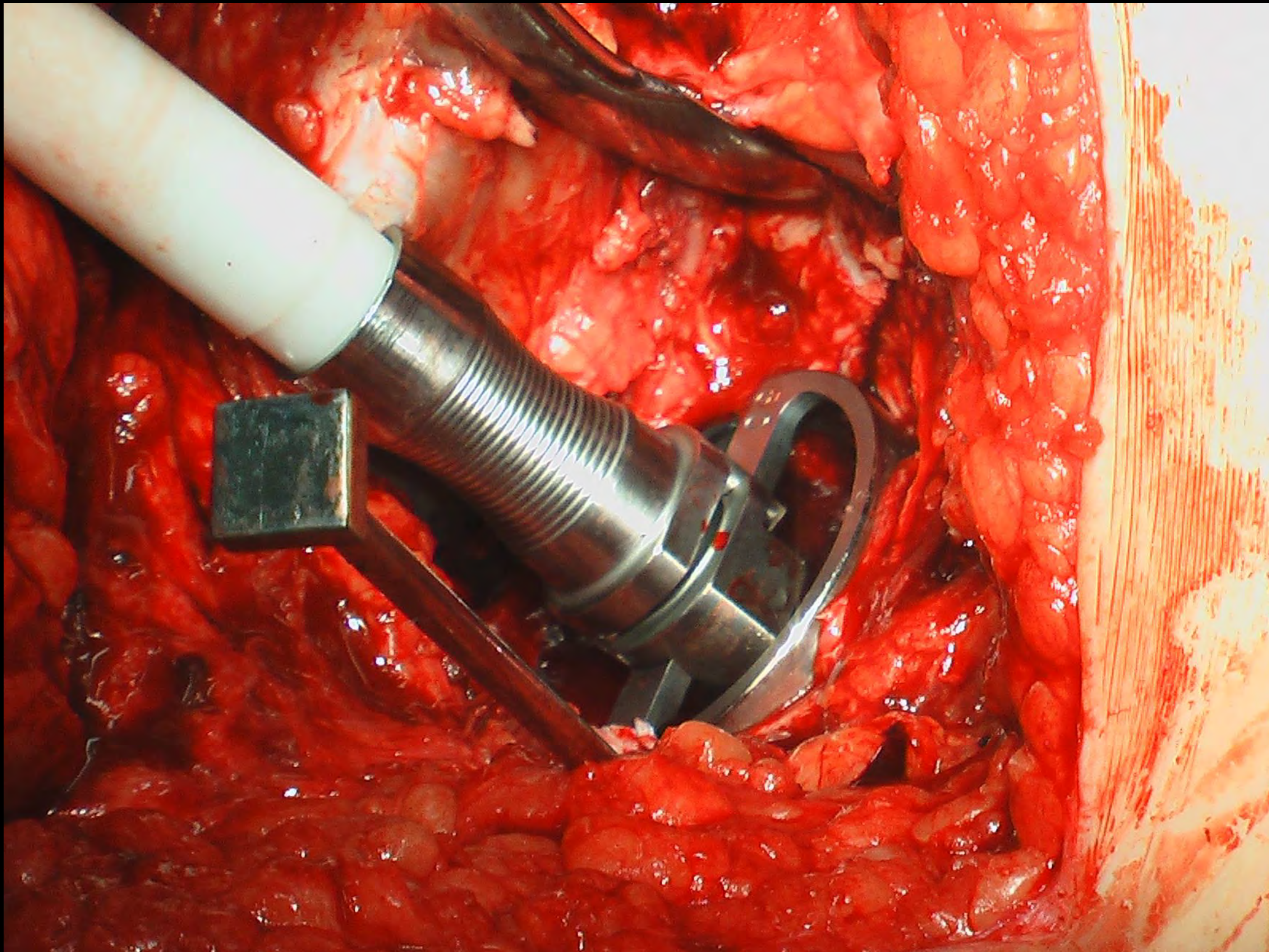


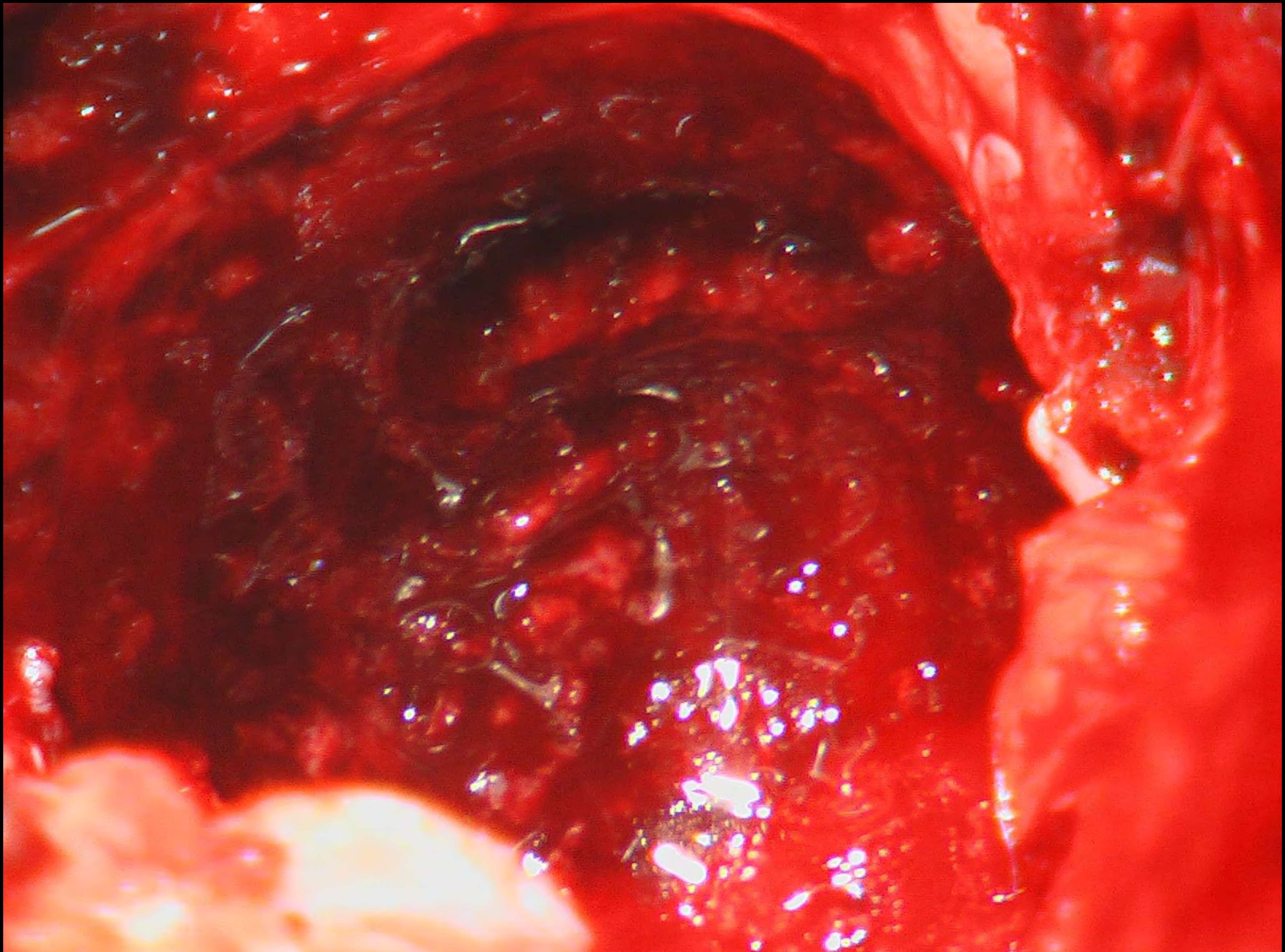
Reaming; only then is it turned into the normal alignment and expanded to encroach on the anterior column

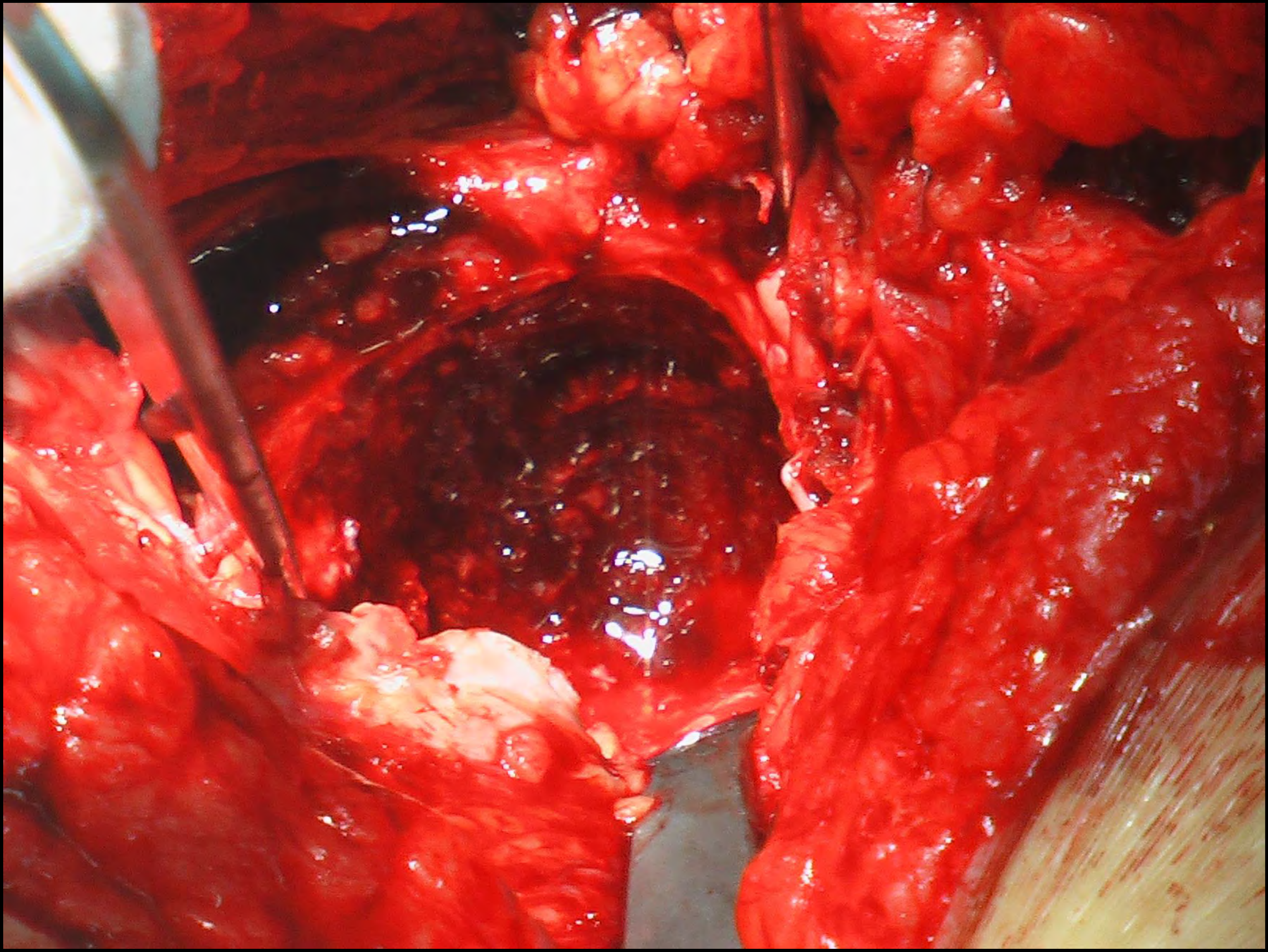


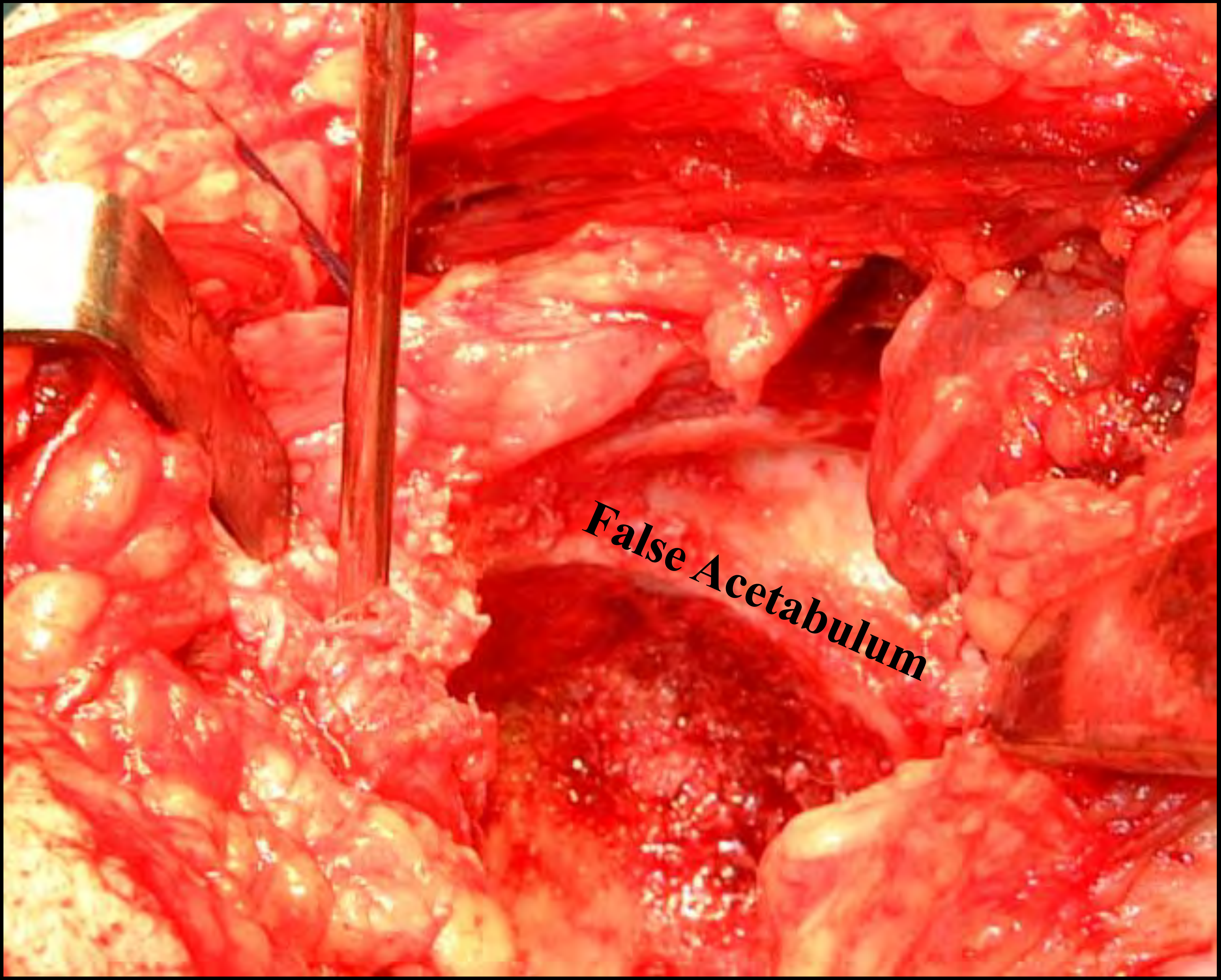


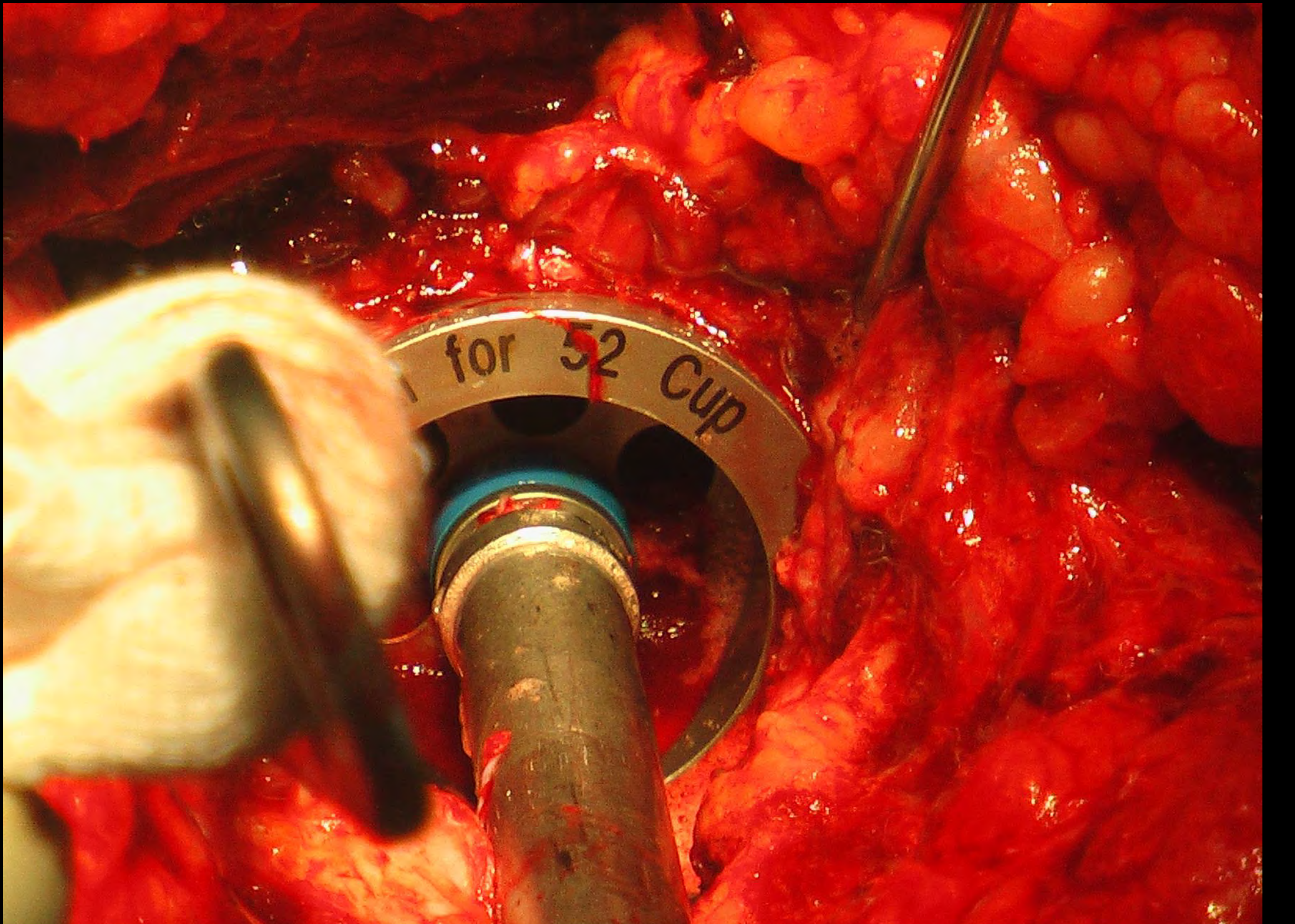

50

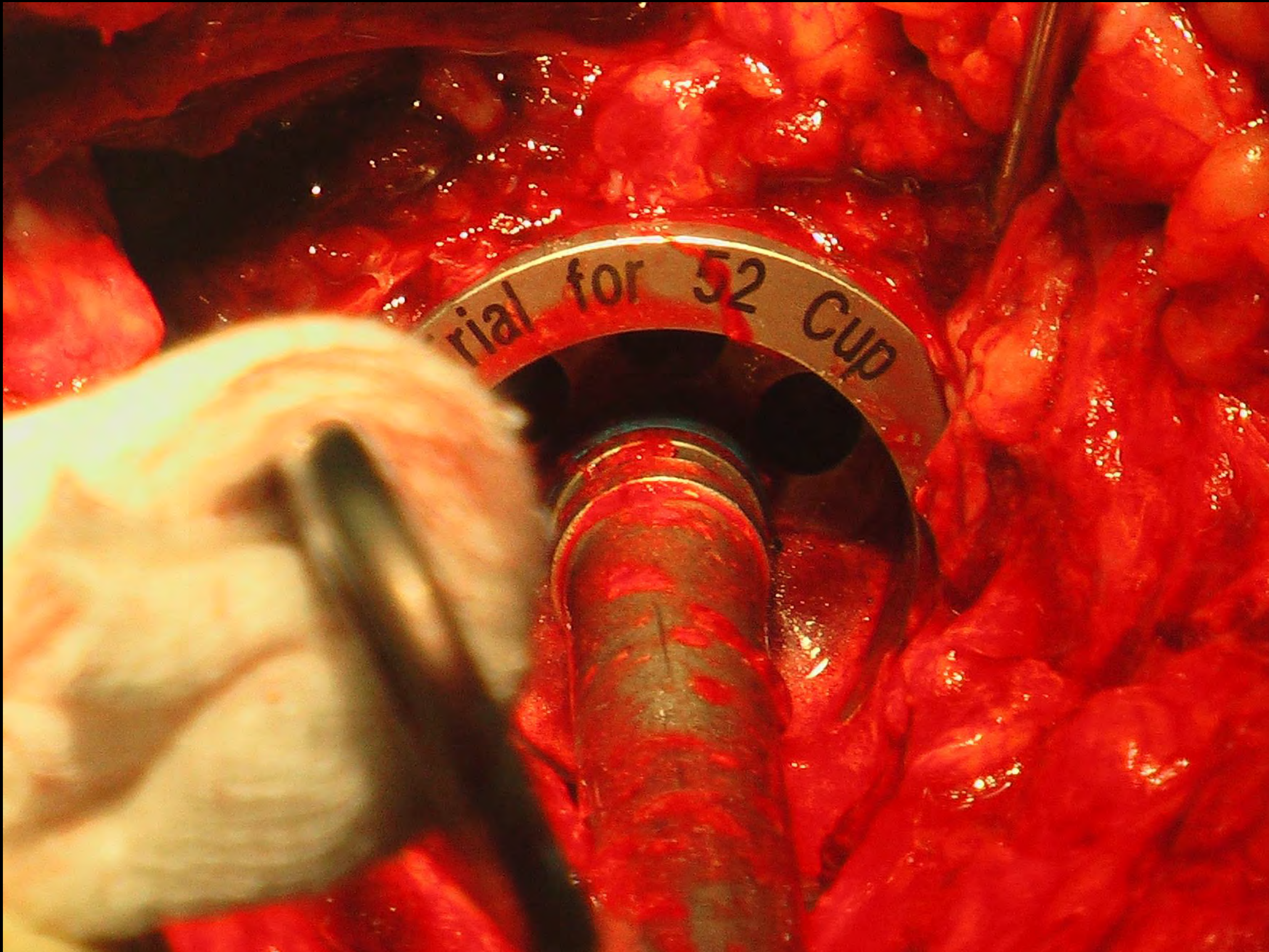


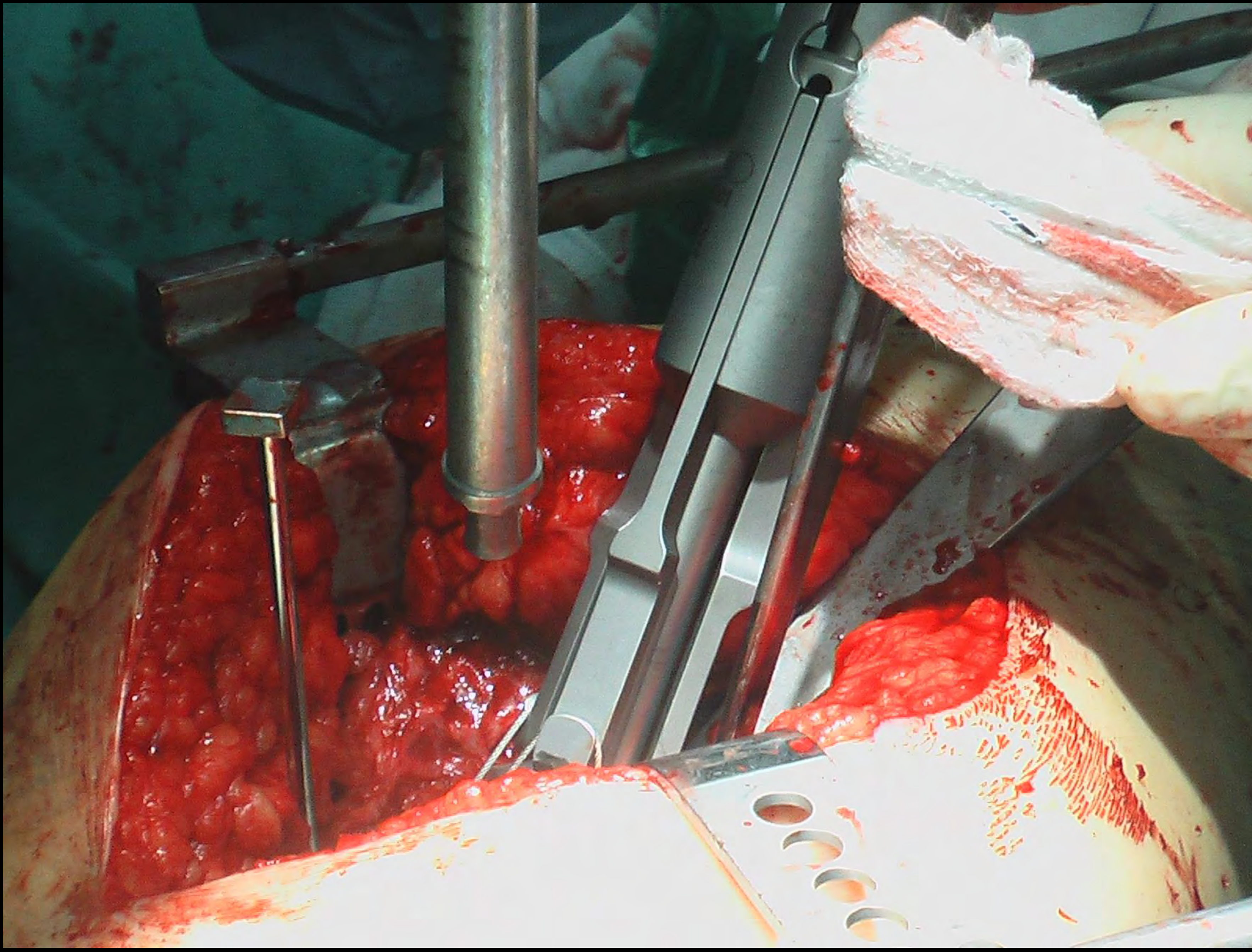


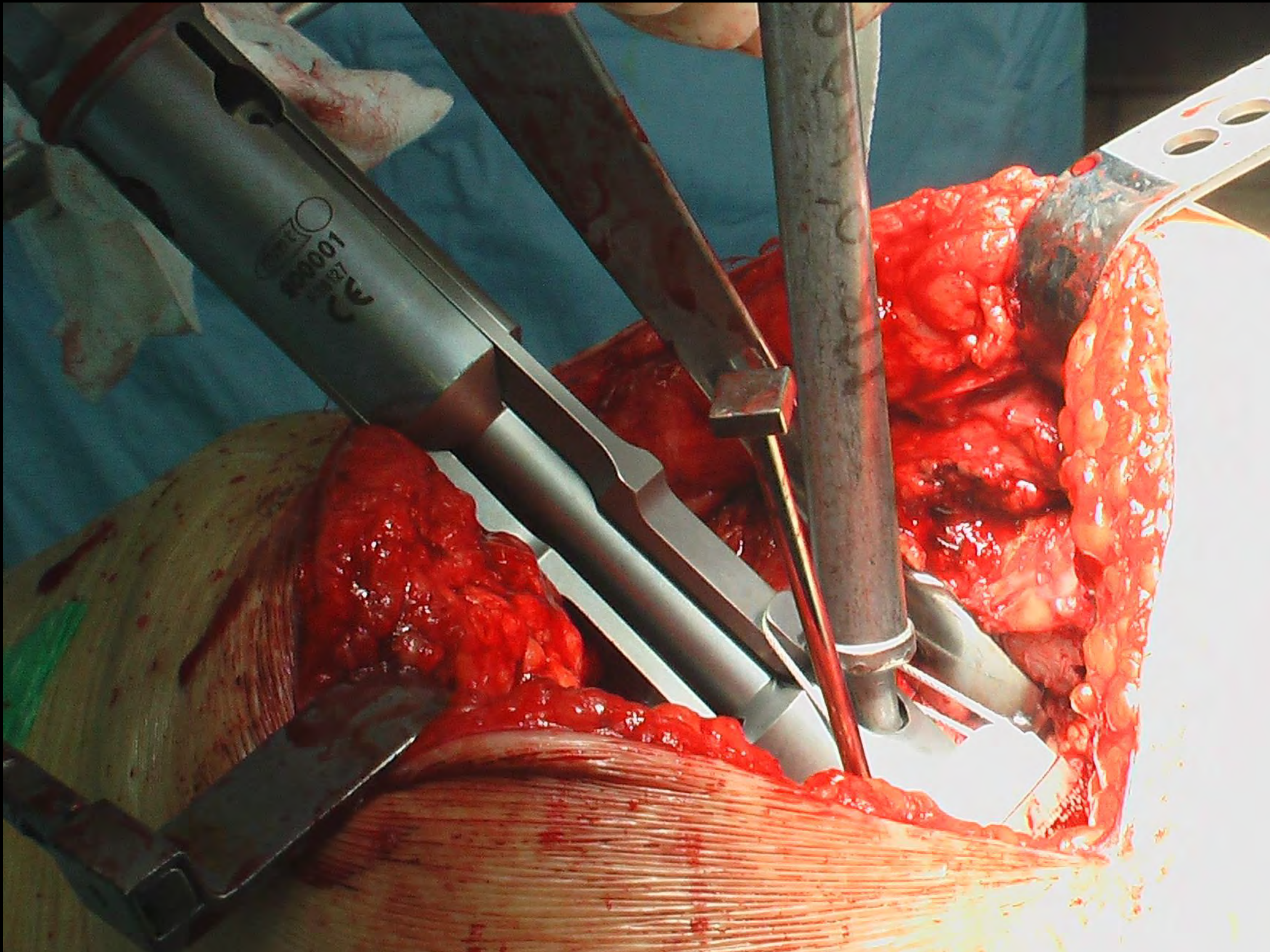


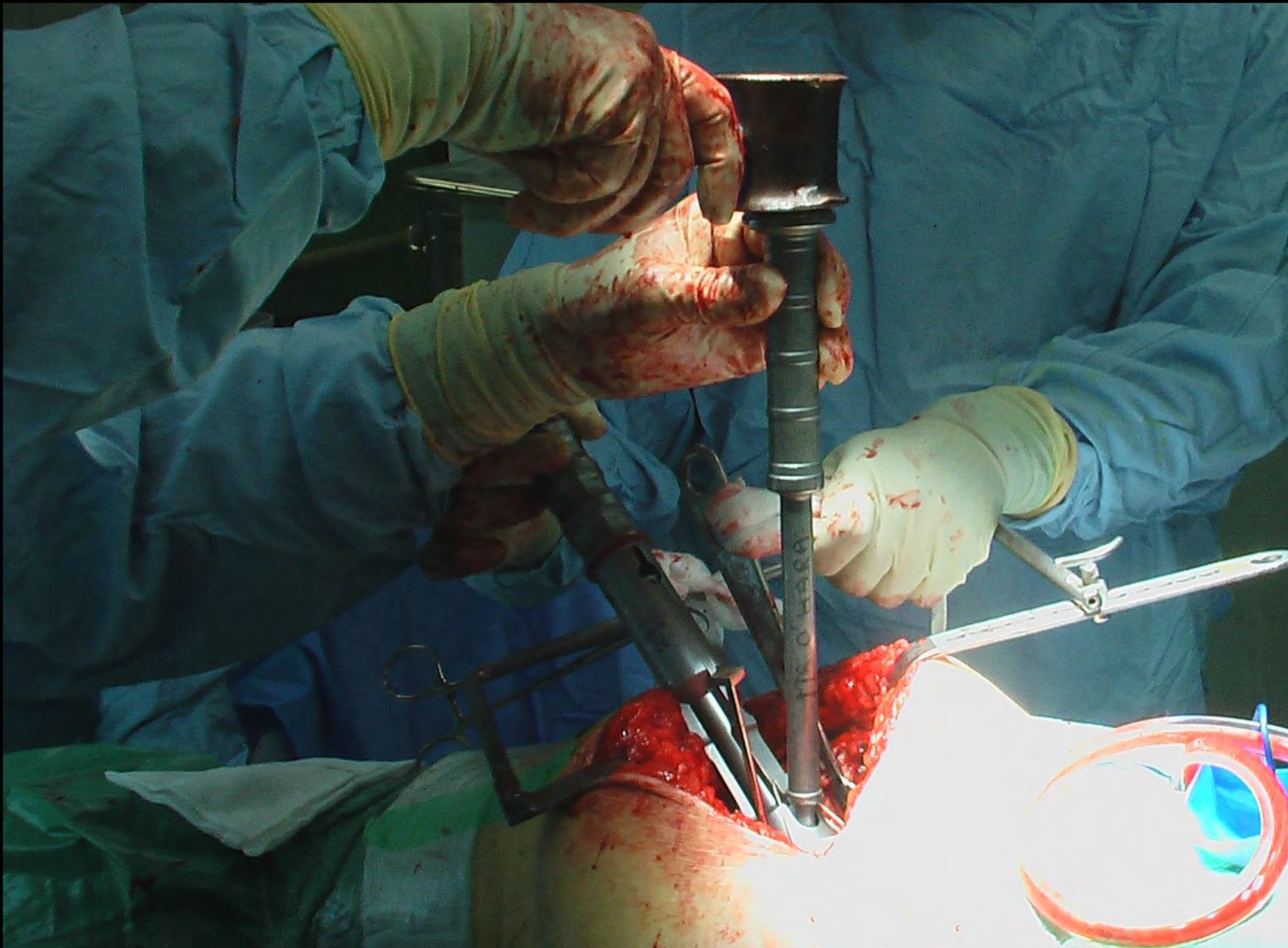

False Acetabulum

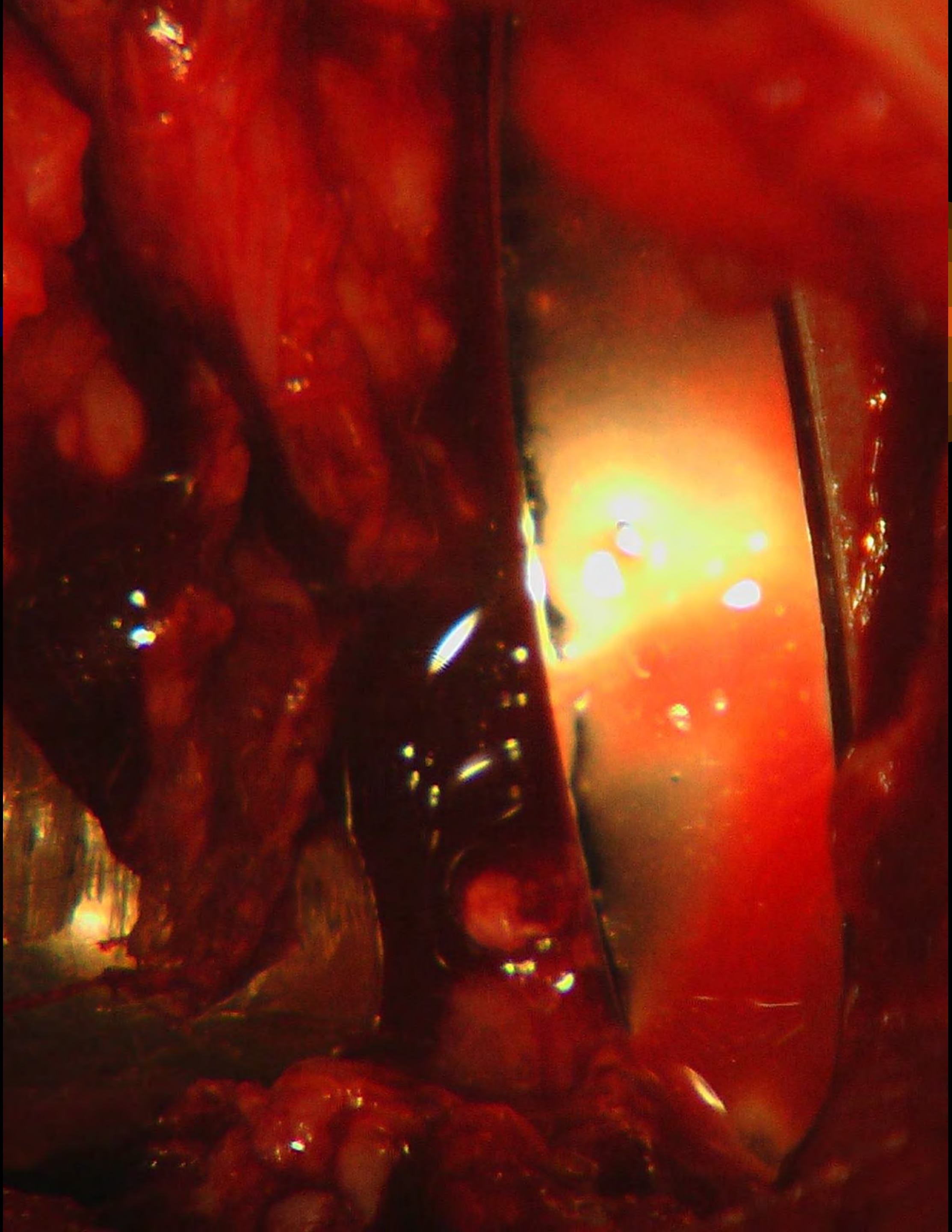

for 52 Cup

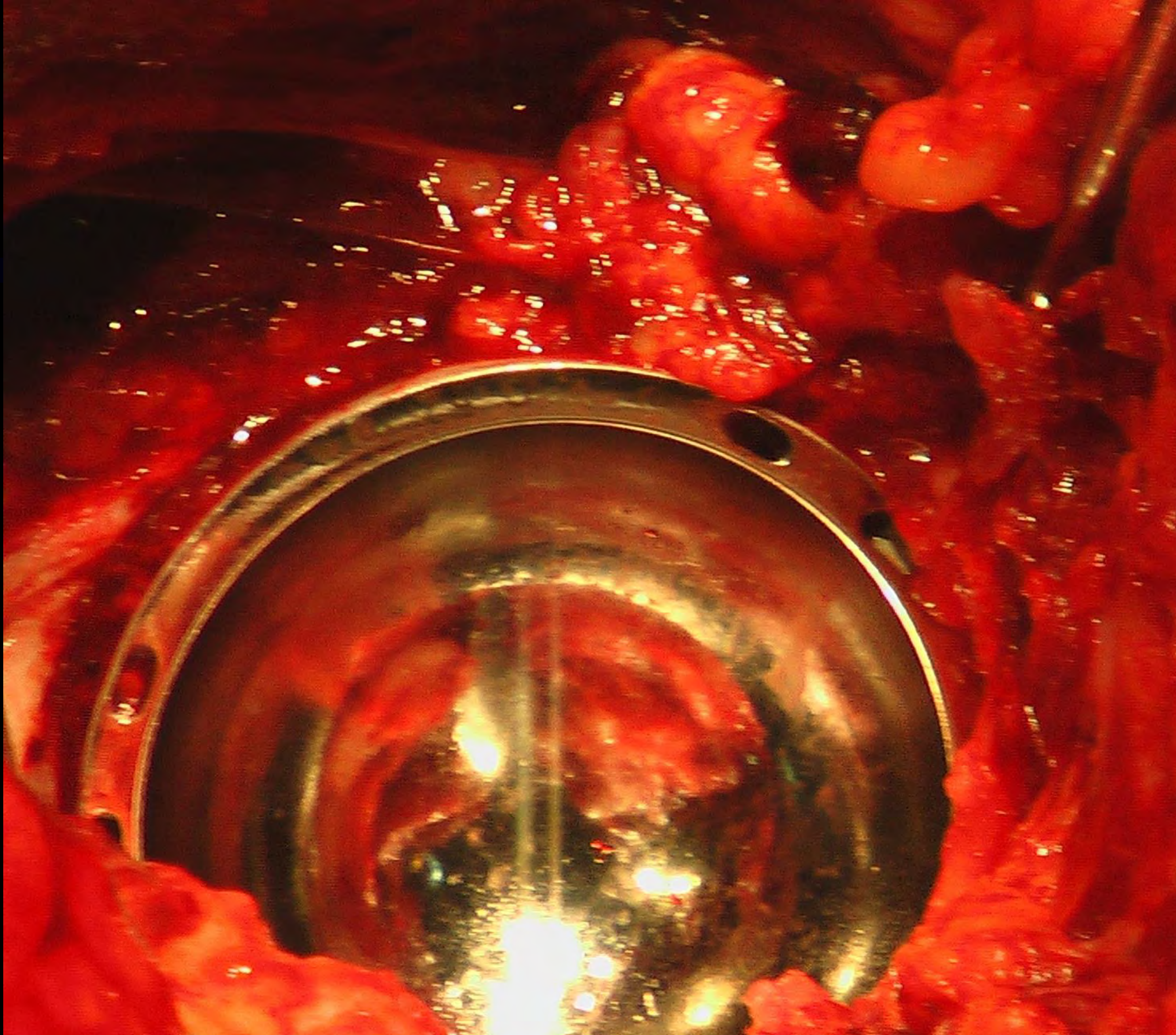

rial for 52 Cup

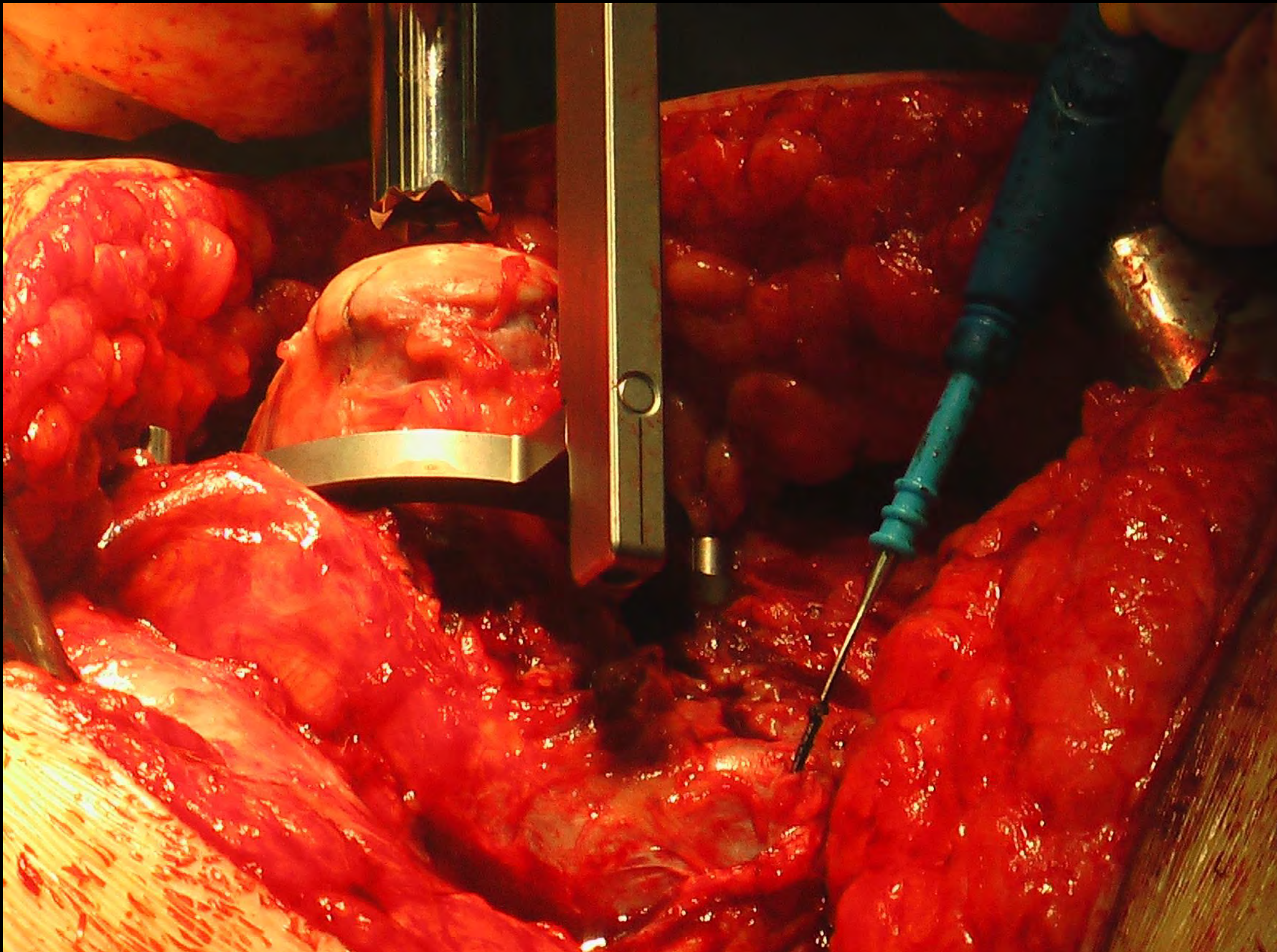


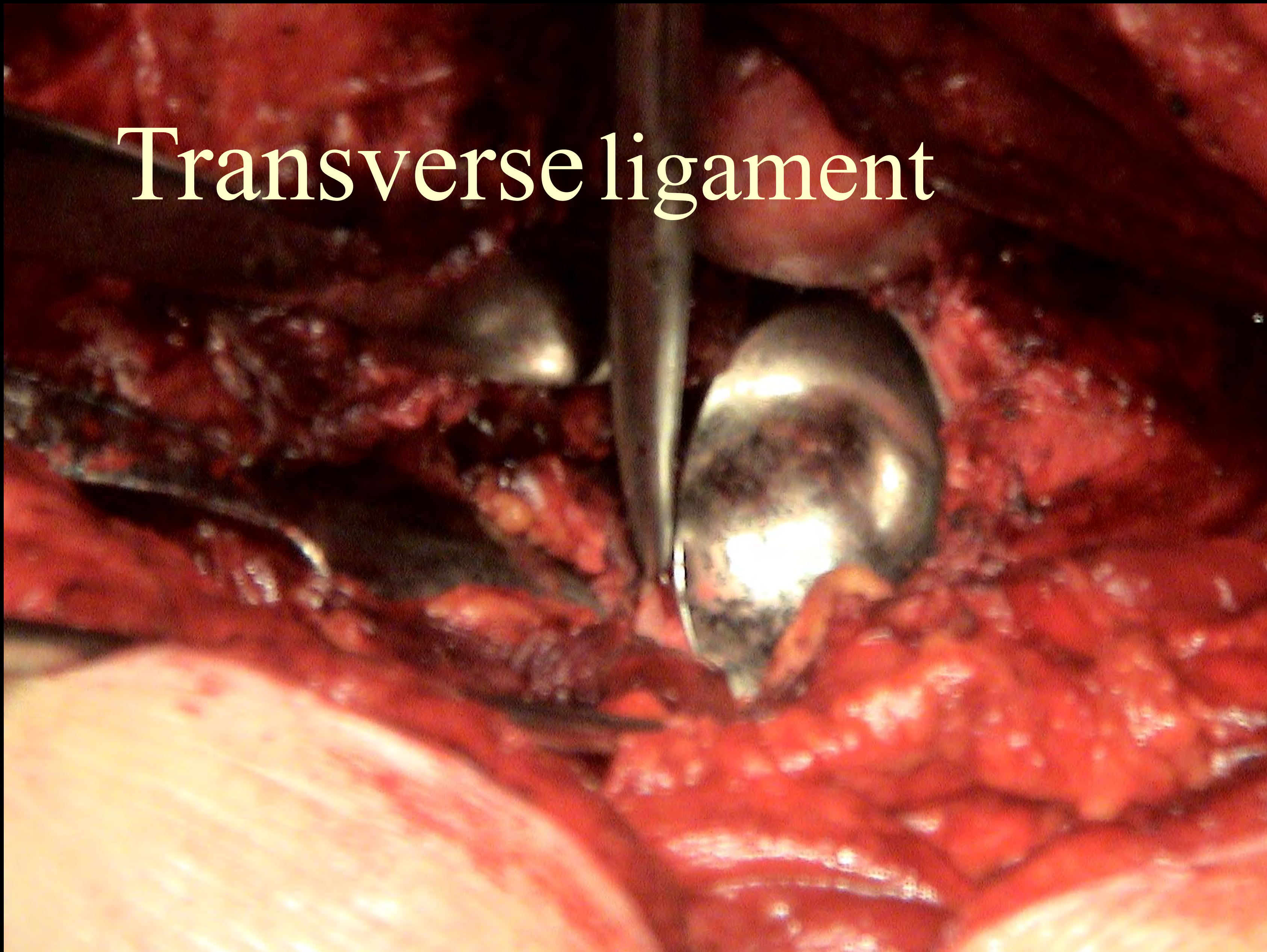


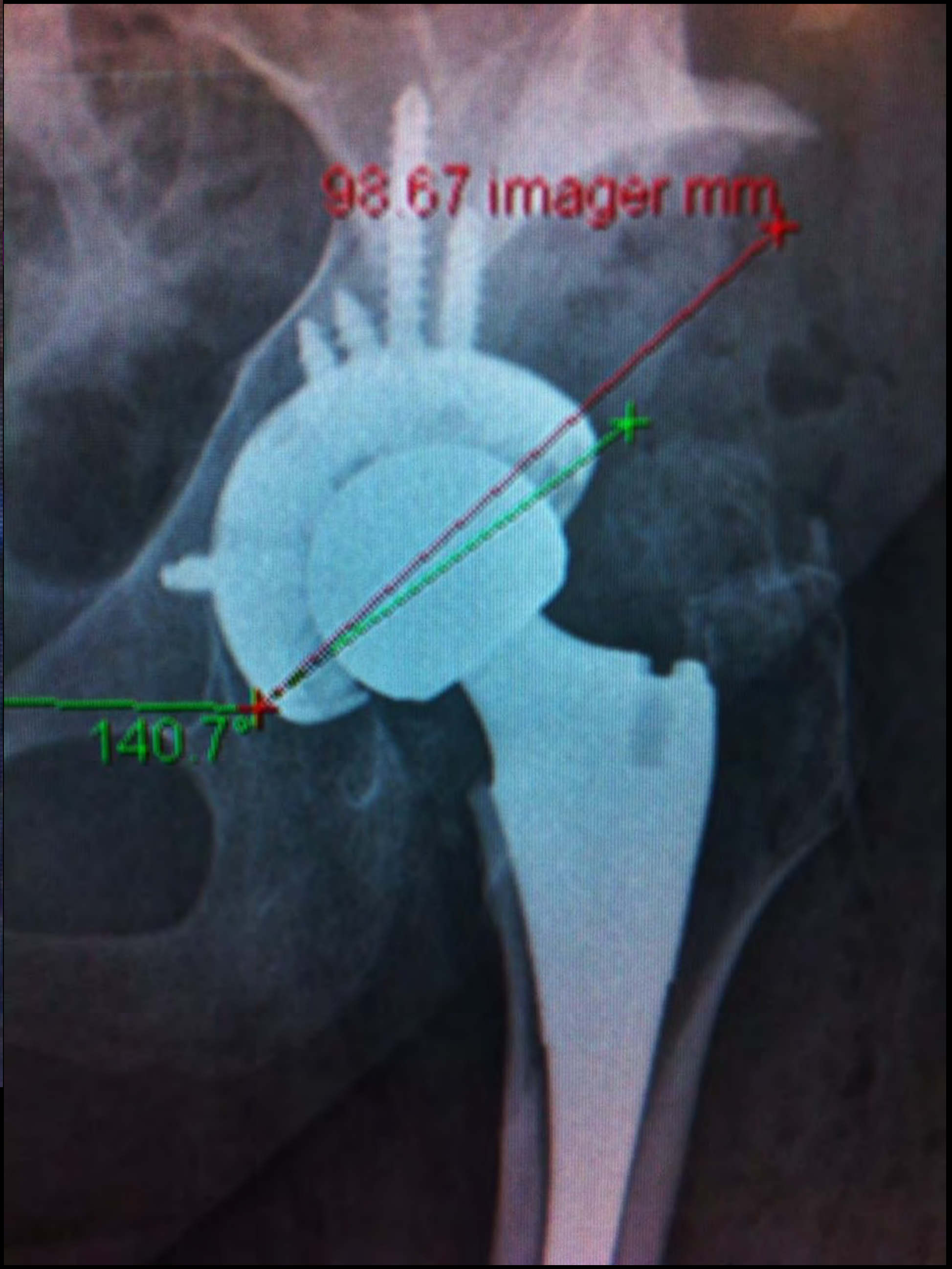




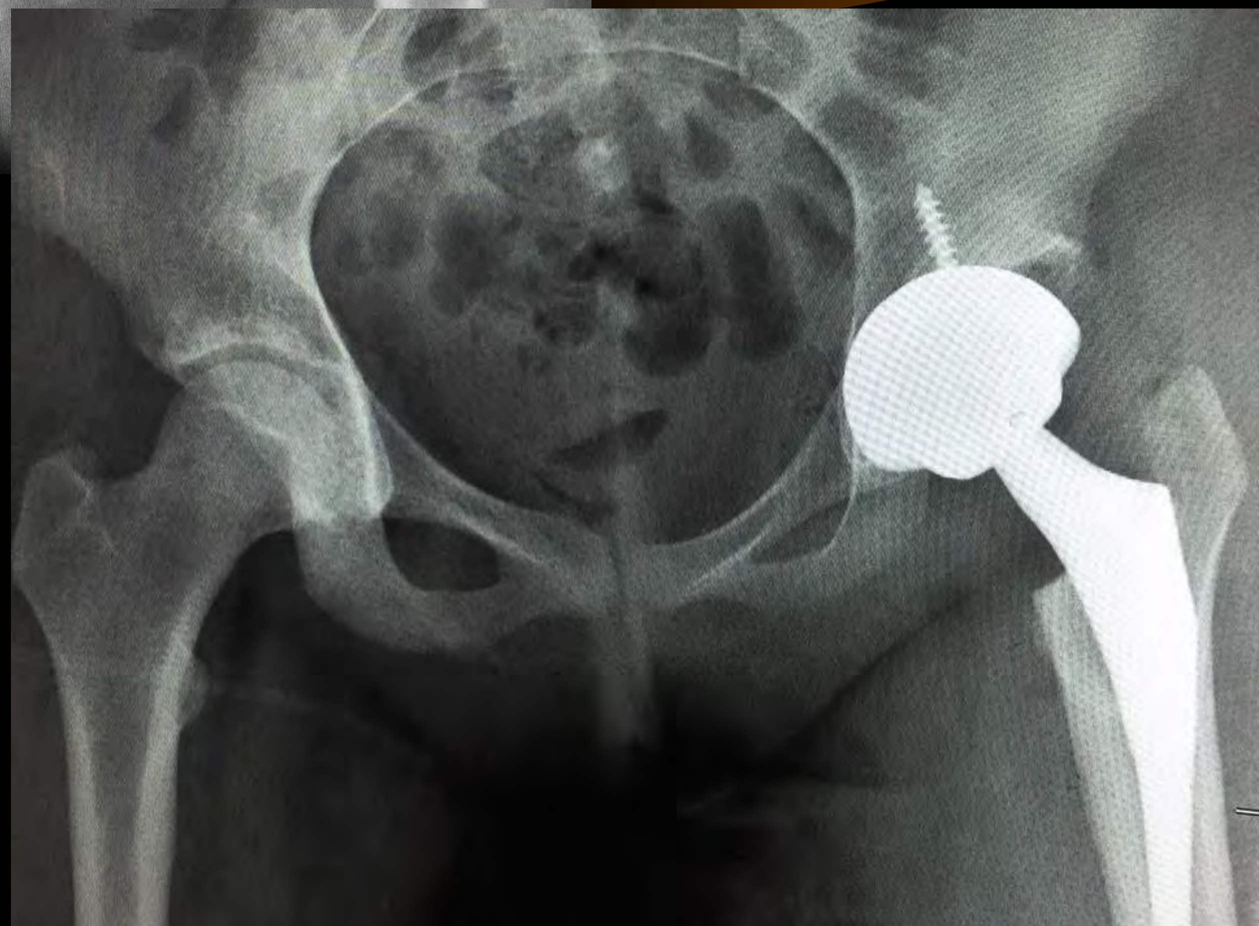





Transverse ligament

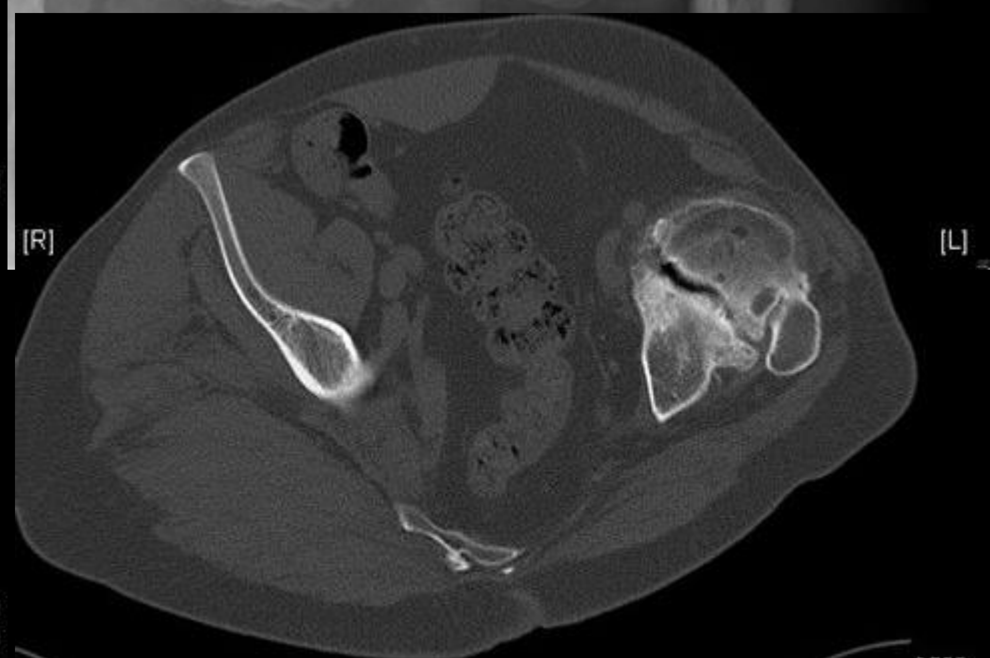


98.67 imager mm
140.7°

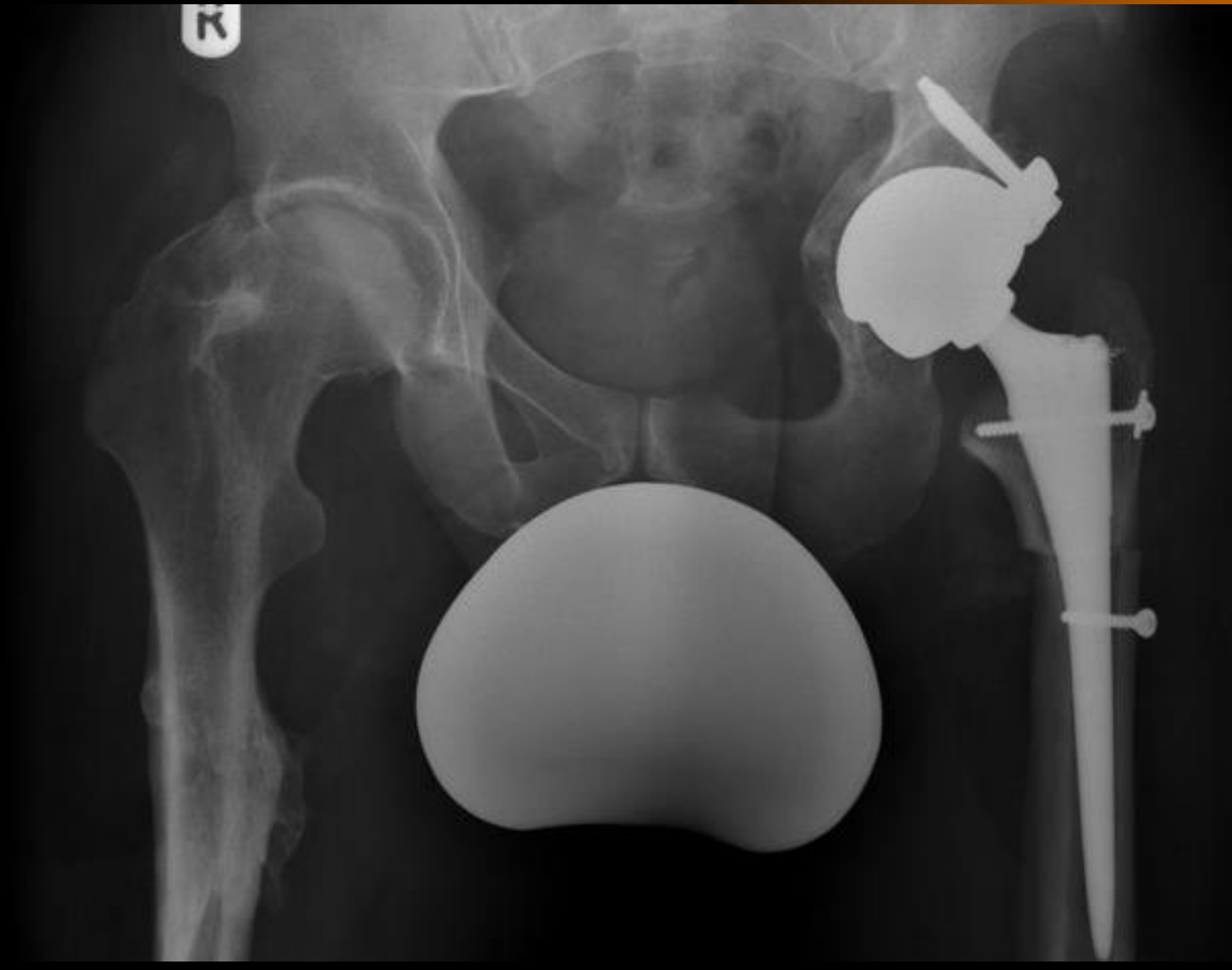

R


Custom stem for femoral shortening, with plate fixation

Childhood infection



Femoral shortening over a stem with interference fit screws, removed later

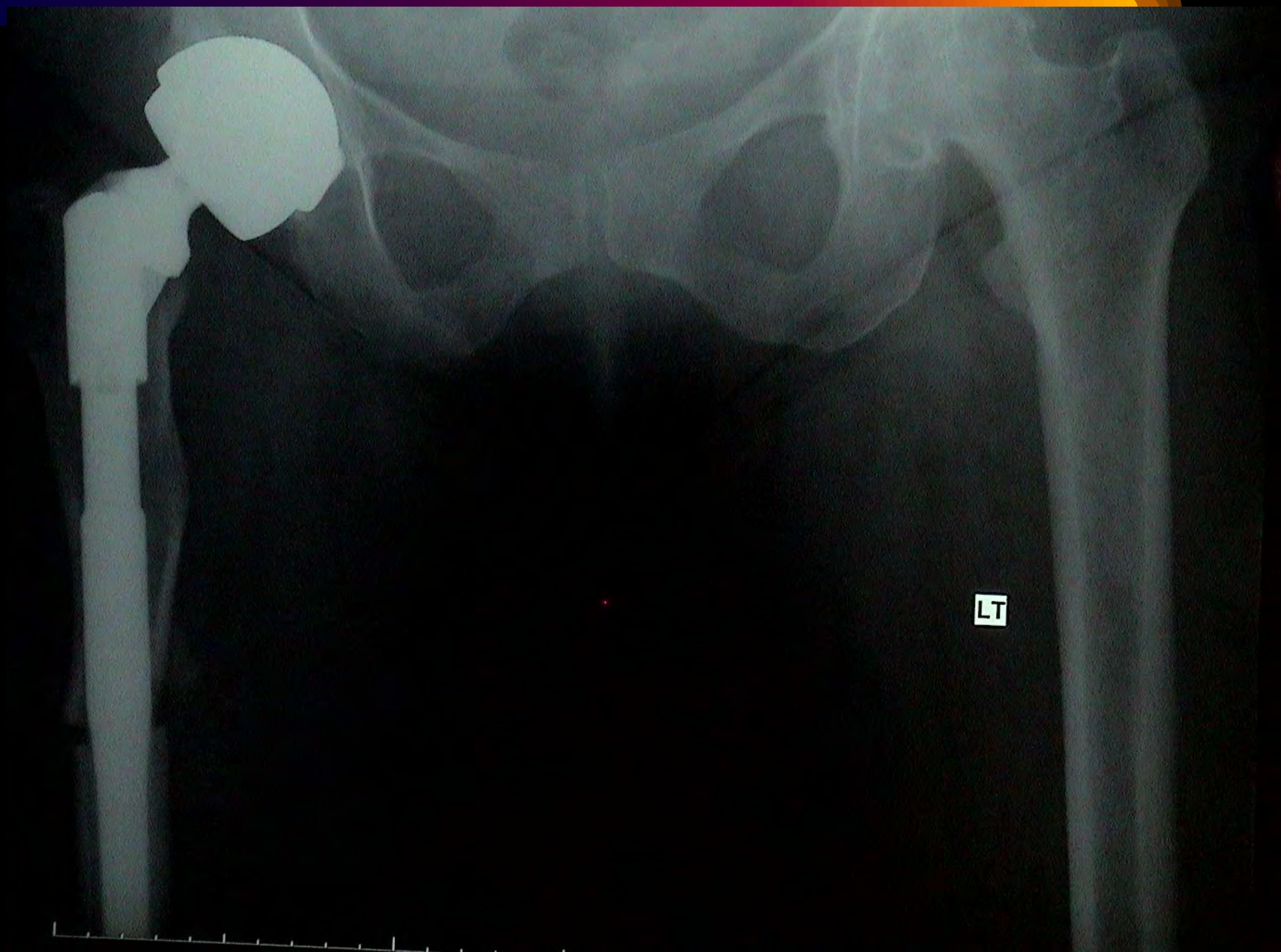


Long Stem Applications

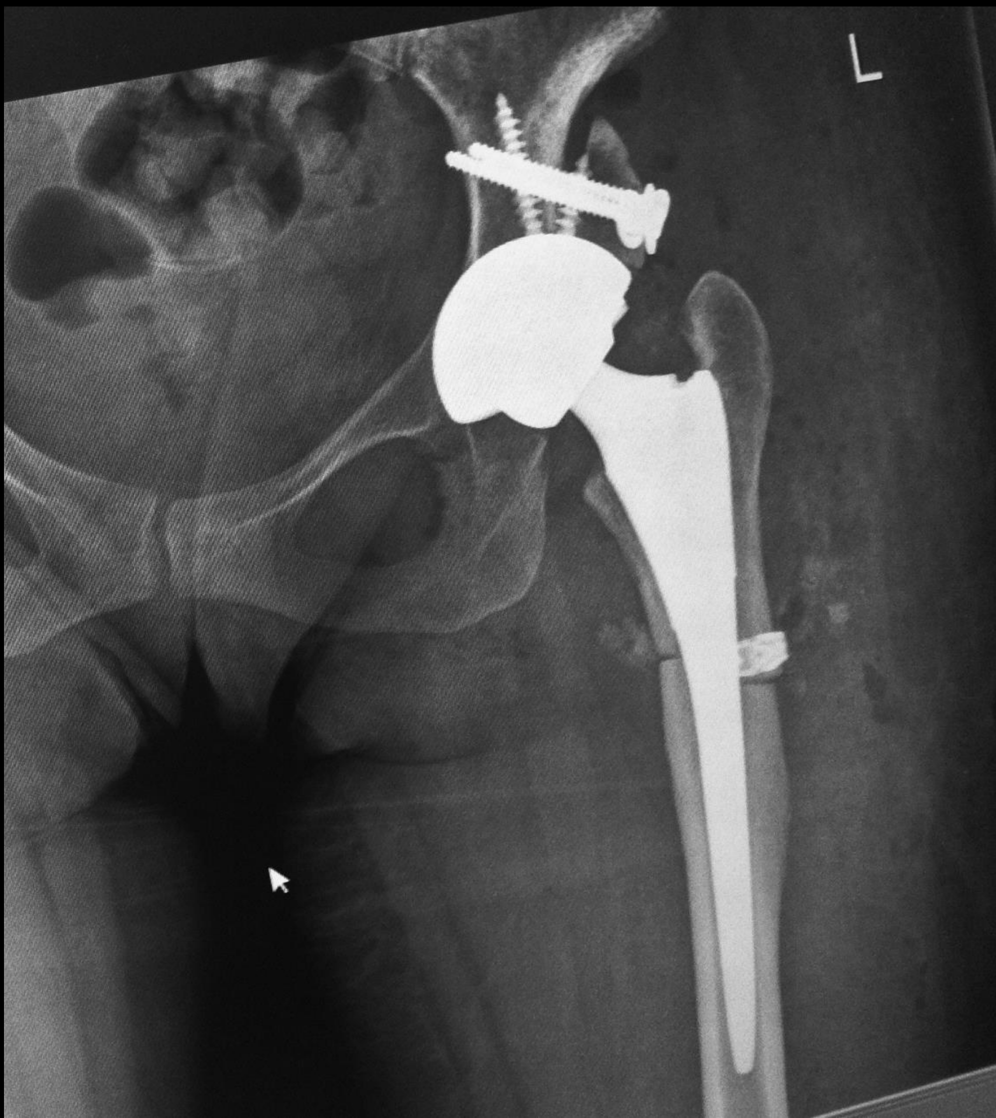
Unusual deformity

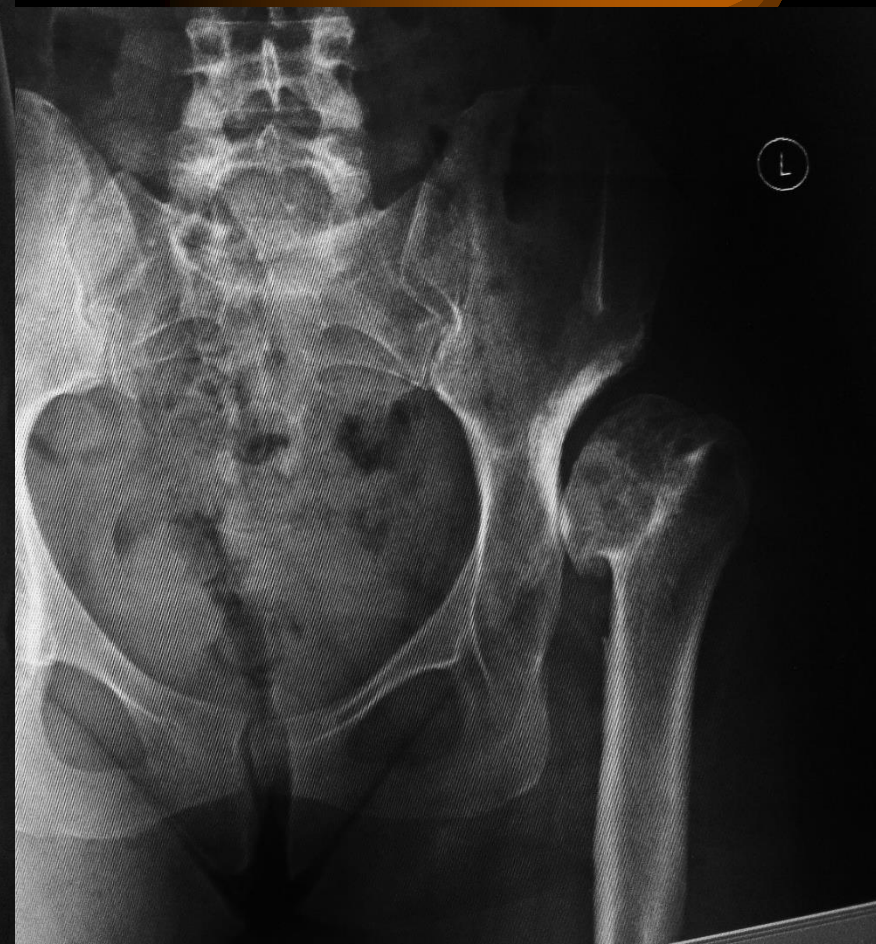
- F, 60 yrs, h/o immobilisation on prone frame 18/12[!]

Solution!

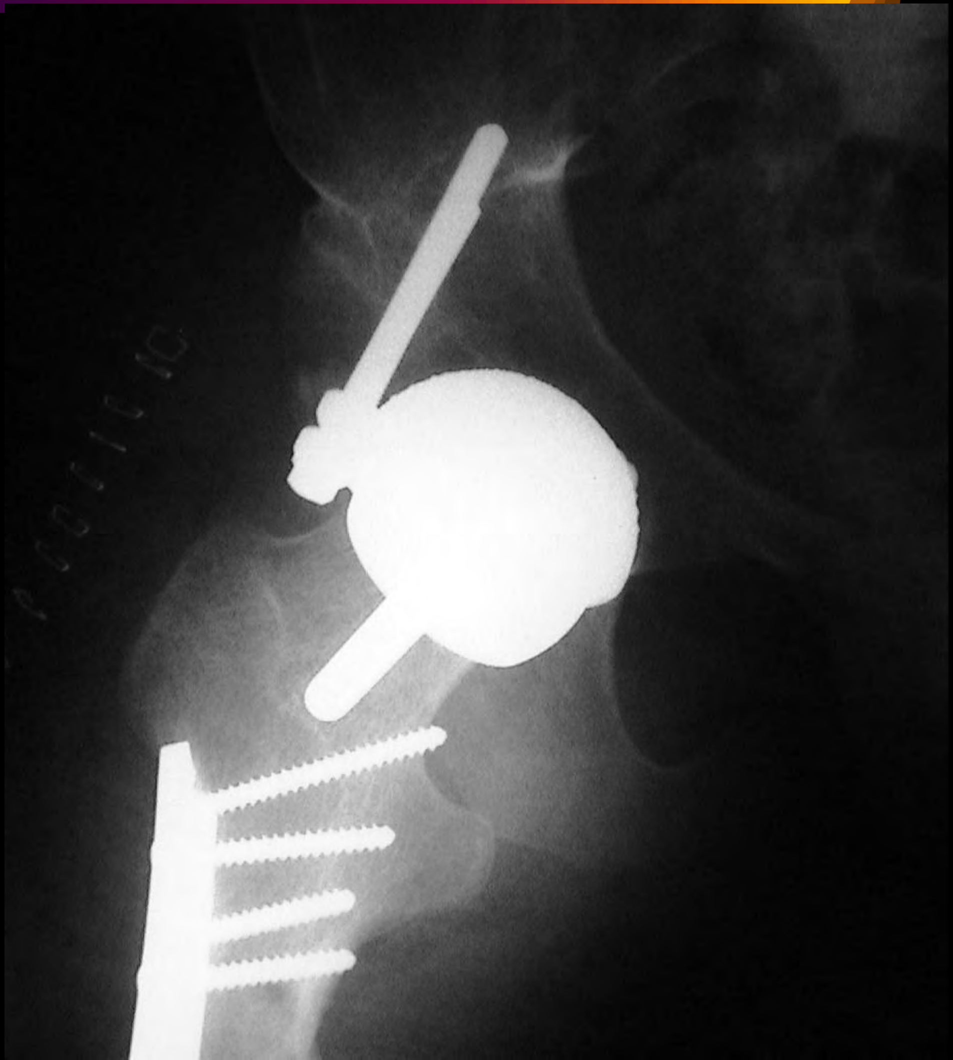


*Custom stem proposed, but **step** femoral shortening done over a standard stem*

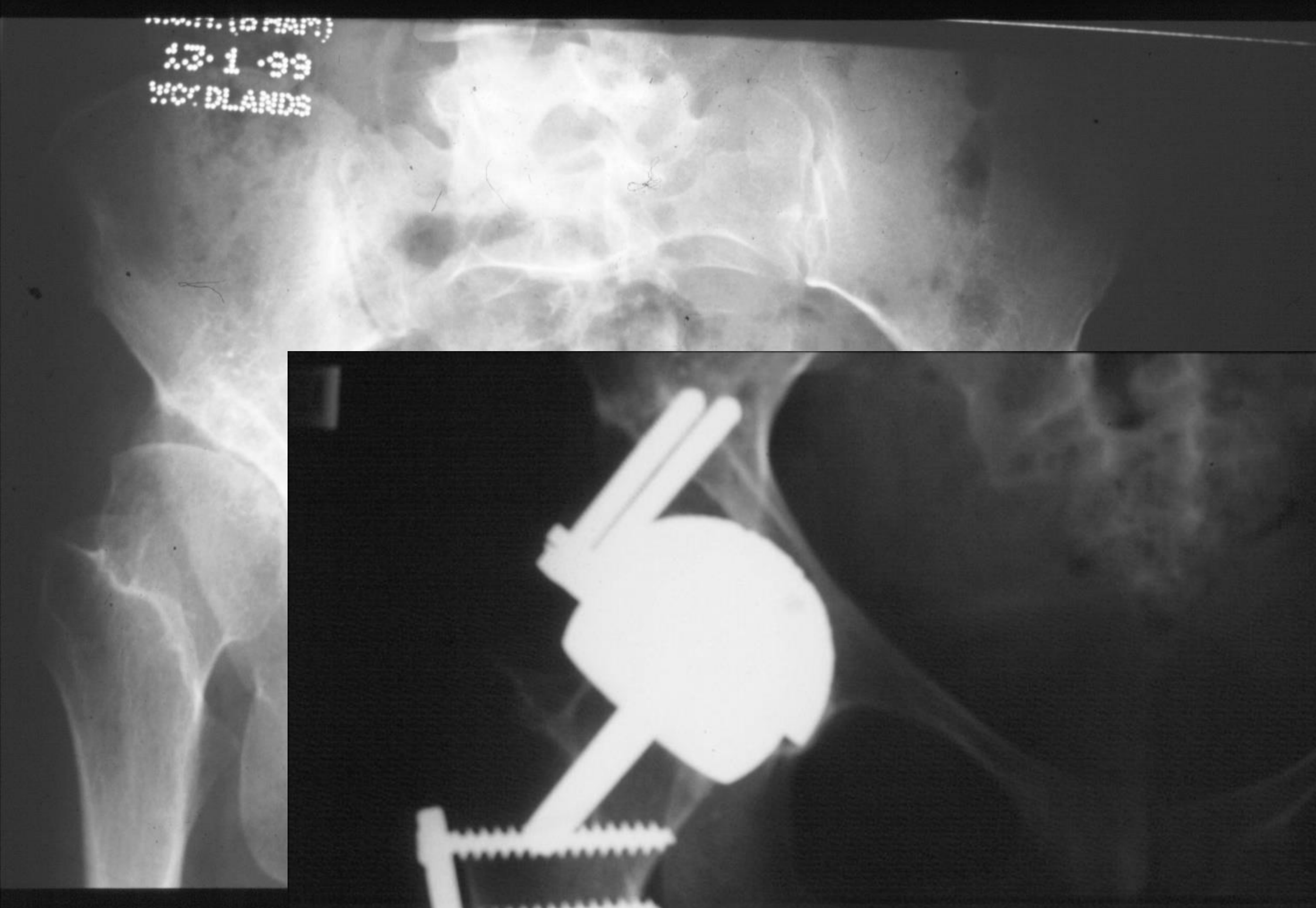


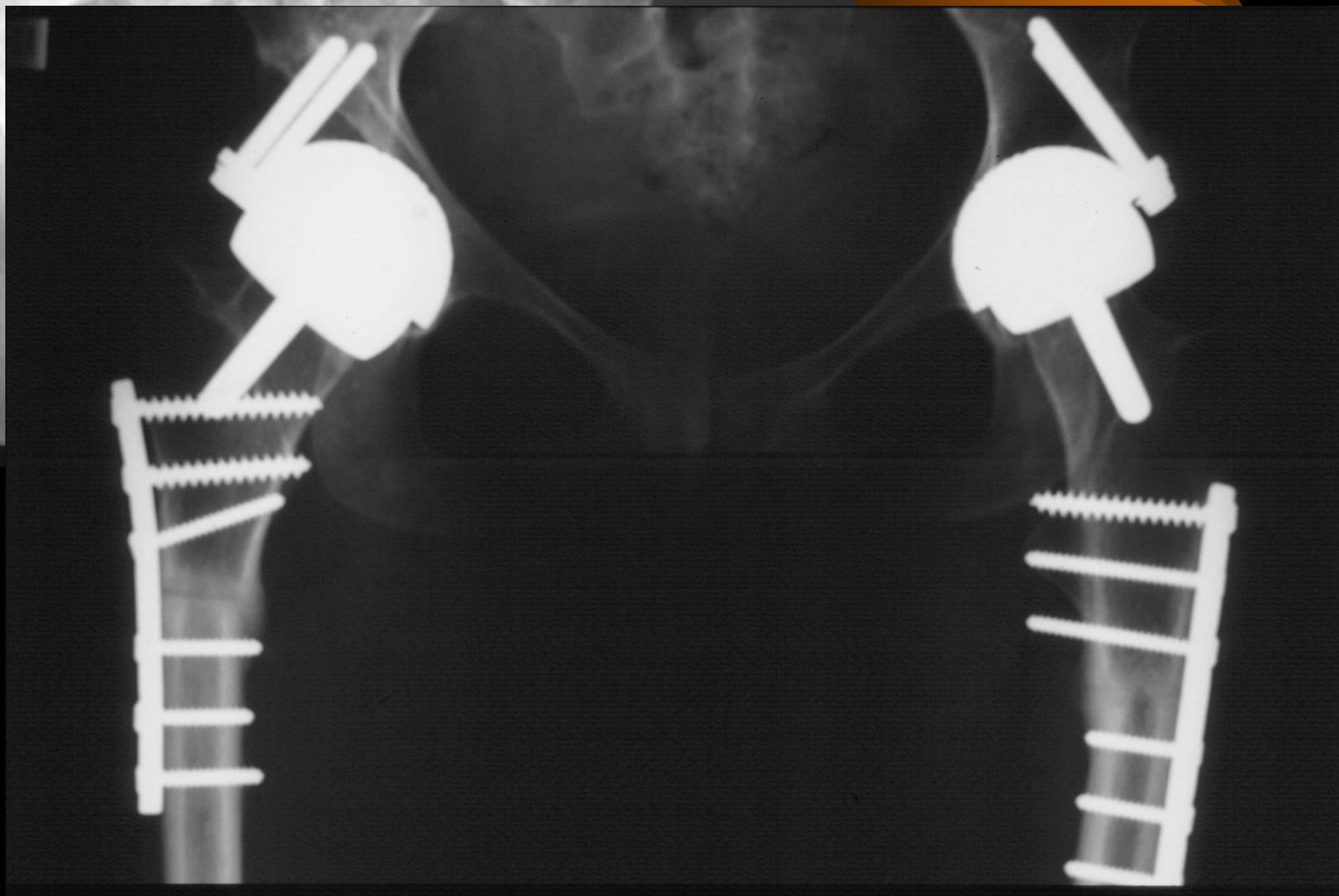


Some resurfacings……………………



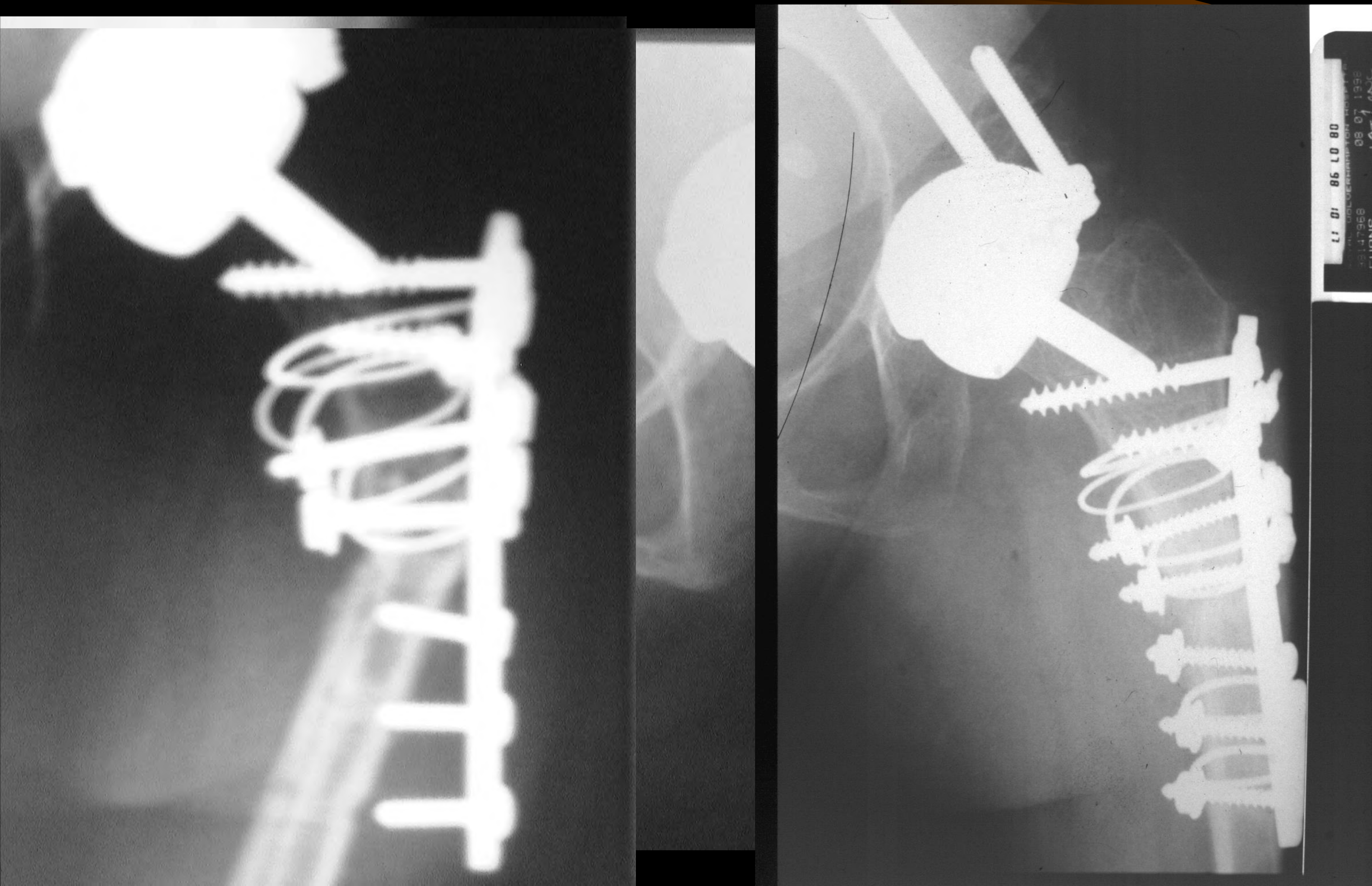
acings[2]





case 45yo CP/dl hip

Ist case post-op



Conclusions

- Judicious use of available bone will usually provide good enough **A-P** grip to allow remarkably normal cups to be used in primary hip replacement in surprisingly unpromising anatomy.

Thank you

[don’t try this at home,folks]

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY

SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

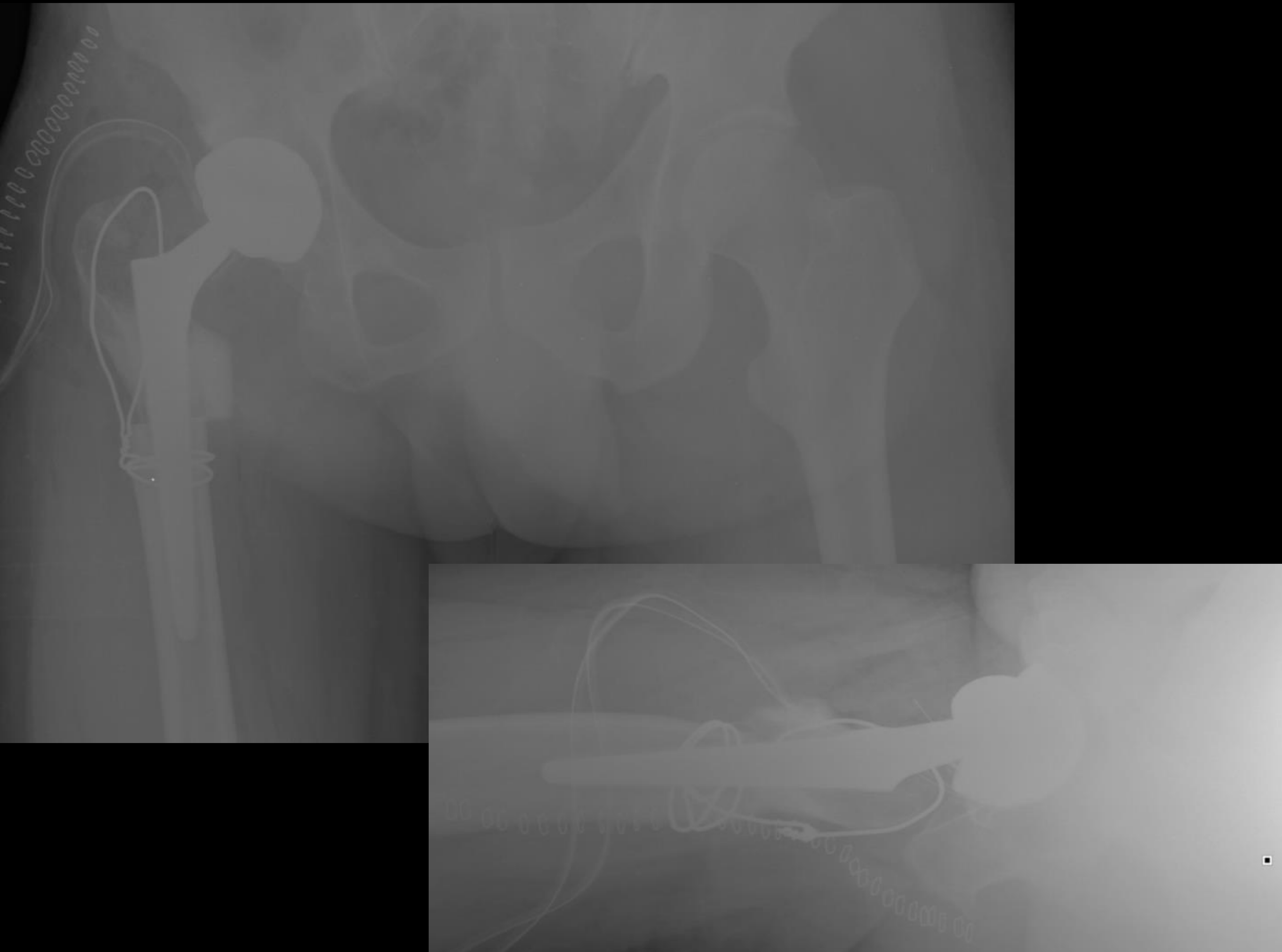
MILAN, ITALY

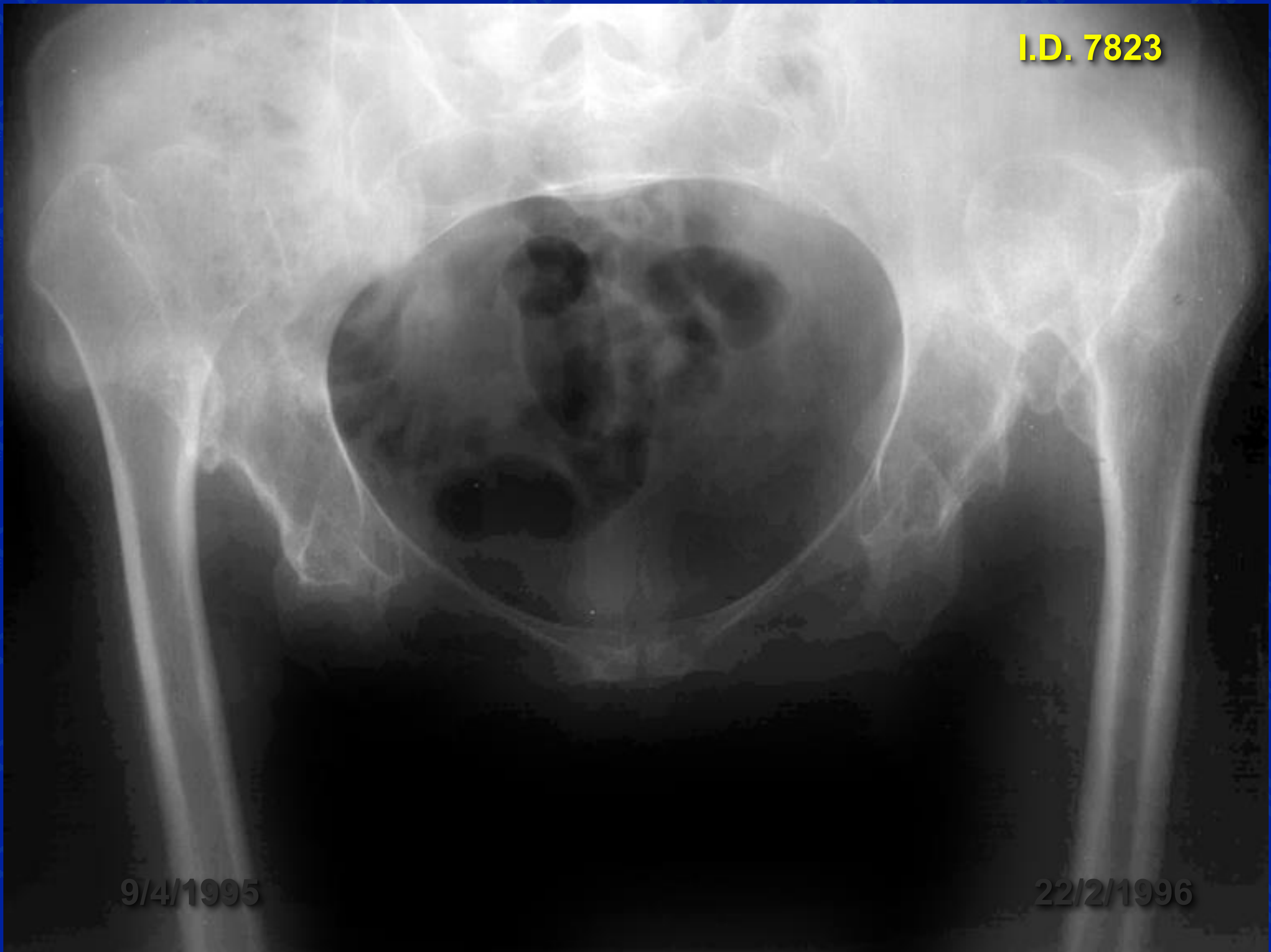
HUMANITAS
RESEARCH HOSPITAL

U.O. chirurgia dell'anca;
protesica anca e ginocchio

direttore: Guido Grappiolo

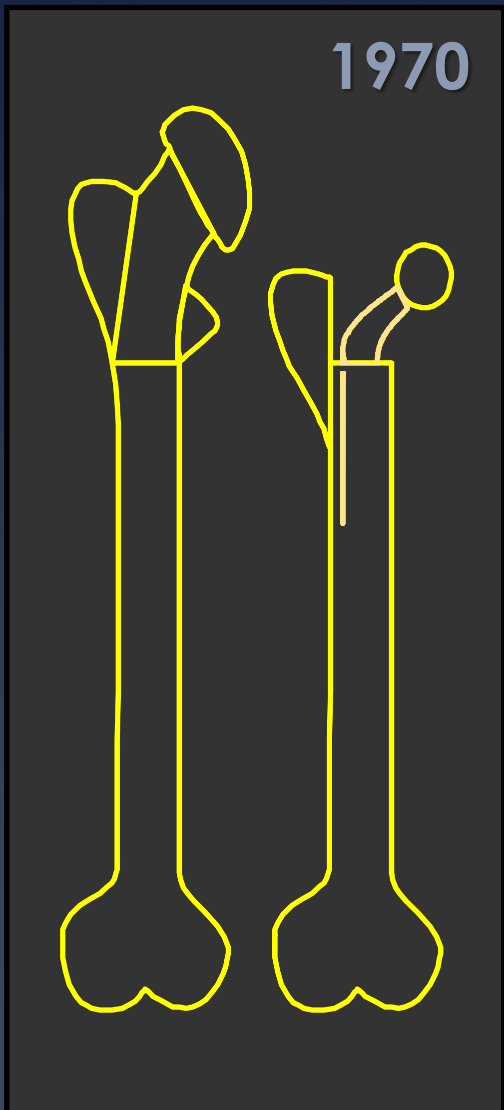
Instructional Course
THA IN DDH
THE FEMUR

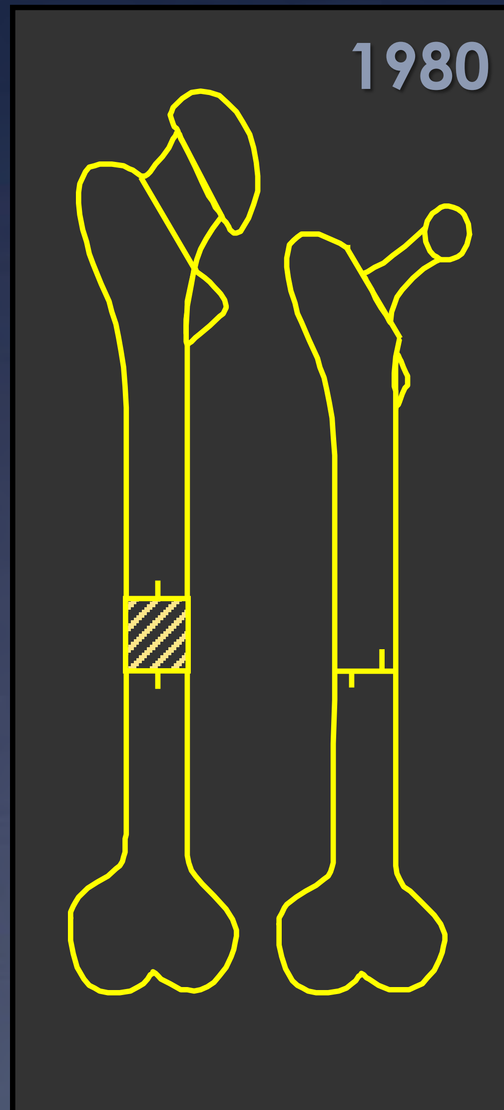



I.D. 7823
9/4/1995
22/2/1996

I.D. 7823 20 ys F. up

Surgical technique evolutions



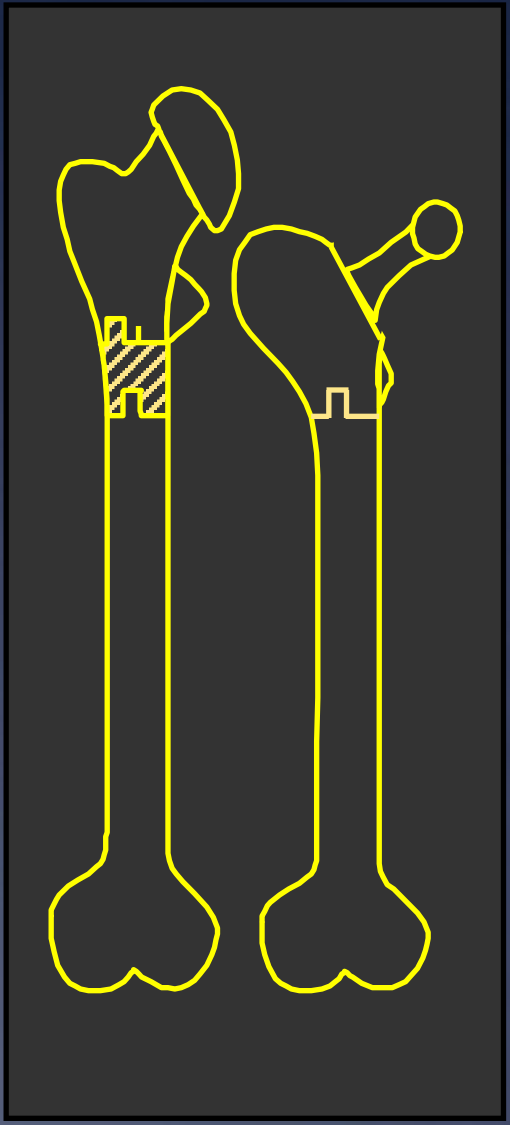


80's

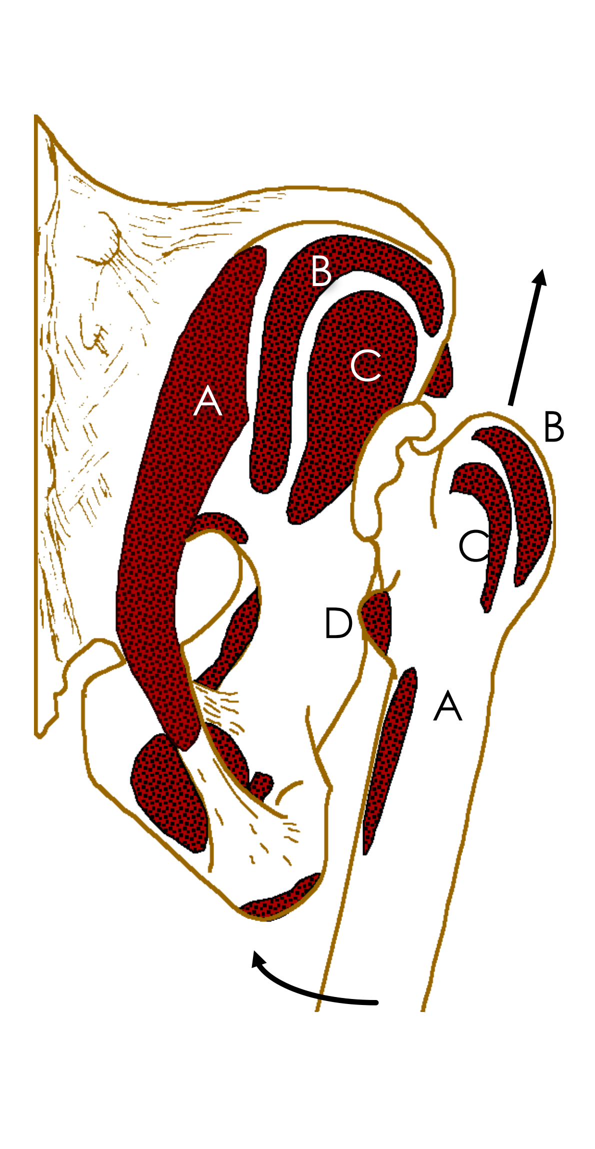
Distal shortening Osteotomy and femoral derotation

our surgical technique: metaphyseal shortening osteotomy

- Faster and safer bone healing
- Accurate control of femoral derotation
- Retentioning of “Deltoid muscles” thigh
- Release of Sartorius, adductor Longus



The Surgeon has to keep in mind the local and peripheral abnormal anatomy of CDH



A = gluteus maior

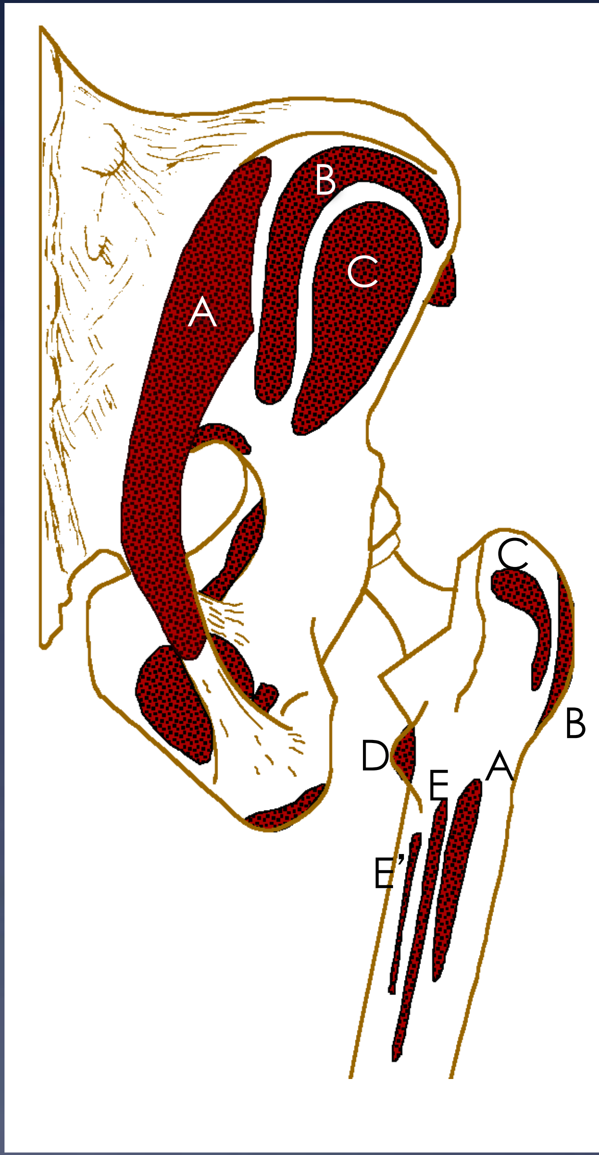
B = gluteus medius

C = gluteus minor

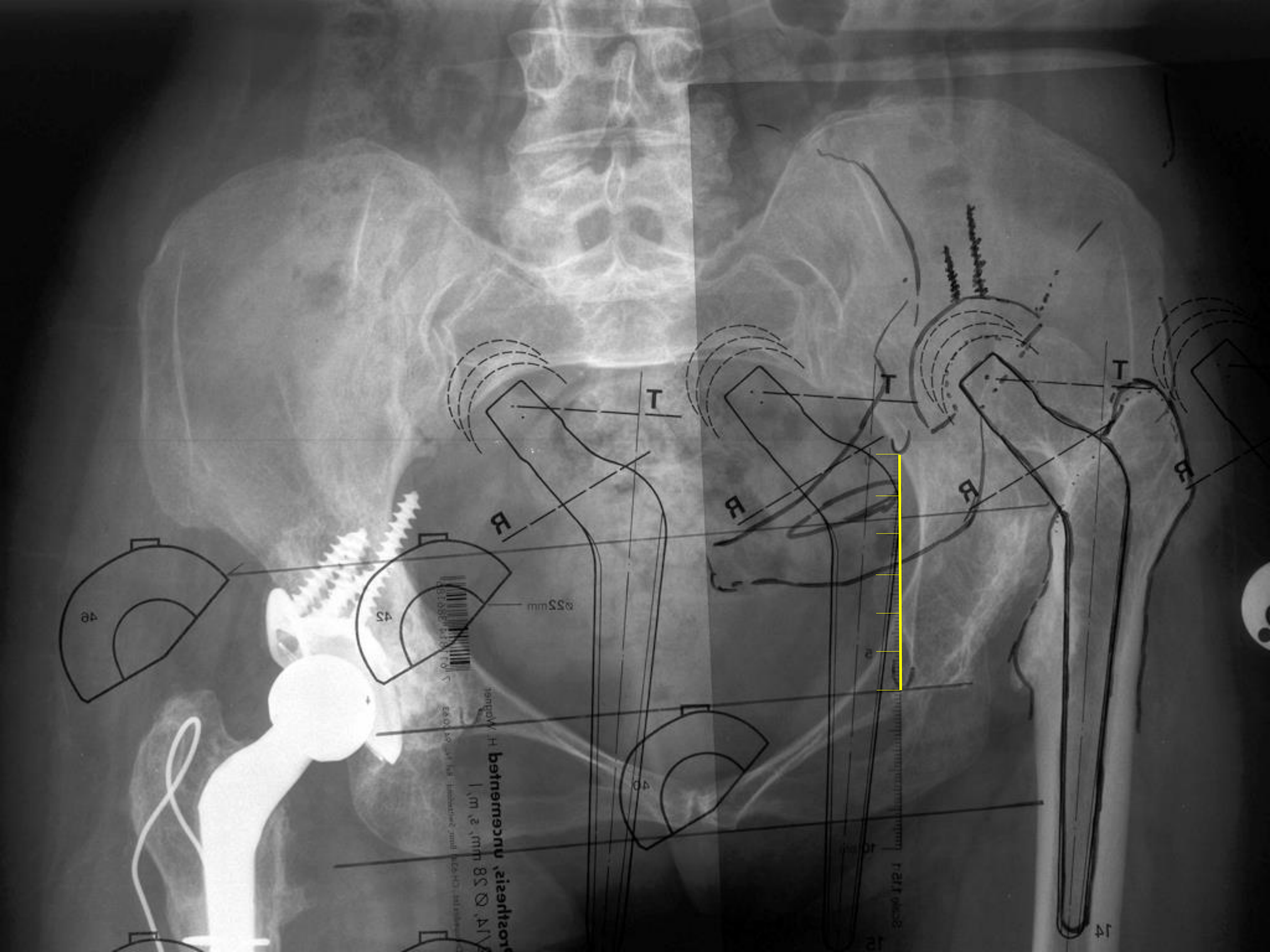
D = ileopsoas

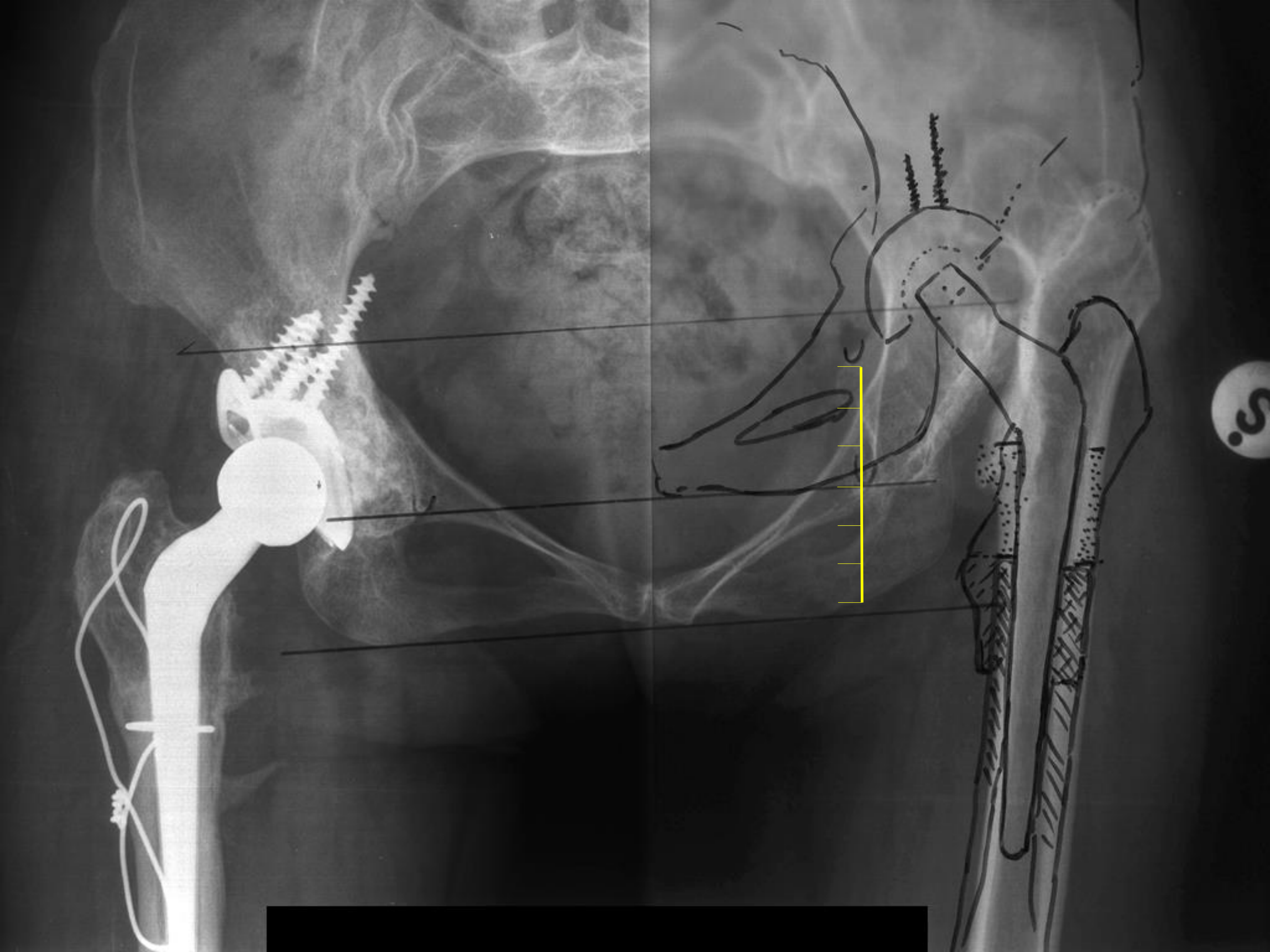
E = short adductor

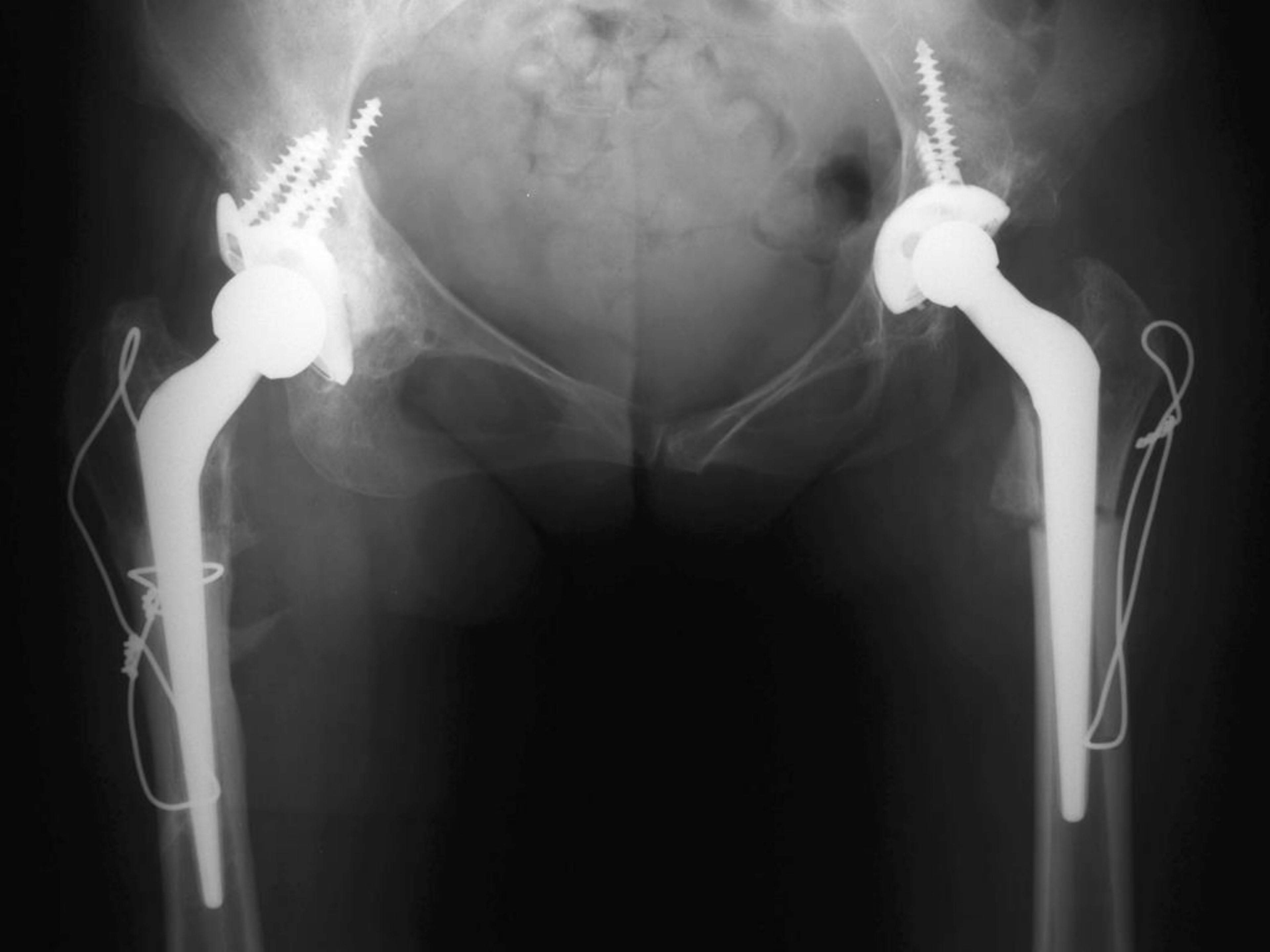
E' = long adductor



and try to *restore the normal hip biomechanics*


T
R
46
42
40
14


S



HUMANITAS
RESEARCH HOSPITAL

info@fondazione.it

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

FIVE YEAR OUTCOME OF THE 15 DEGREE FACE-CHANGING CUP IN SECONDARY OSTEOARTHRITIS OF DYSPLASTIC HIPS

Manoj Puthiya Veettil

Anthony J Ward

Evert J Smith

Southmead Hospital, Bristol, UK

INTRODUCTION

- Total Hip Arthroplasty (THA) in developmental dysplasia (DDH) remains a surgical challenge
- DDH is associated with increased failure rates
- Results vary depending on the severity of the abnormal anatomy:
    - Acetabular
    - Femoral
    - Combined Defects
- Various methods have been used to reconstruct acetabular deficiencies:
    - Bulk femoral head graft
    - Impaction bone grafting

DDH - BEST REPORTED RESULTS - PRINCIPLES

1. Acetabular cup placed in the true acetabulum
2. Medial wall has been maintained
3. No more than 5mm, or less than 30%, of the cup has been left uncovered

SUPPORTING BEST PRINCIPLES

We present the mid-term outcome of the

15 degree face-changing acetabular cup

in THA due to secondary OA in DDH

EXCEED ABT15° FACE CHANGING ACETABULAR CUP-(15° FC CUP)

- Permits initial fixation i.e. primary stability in:
  - Shallow sockets
  - Dysplasia
  - CDH – 'Low Dislocation'
- Hemispherical design
- Taperfit shell
- Minimal deformation (~17um)

15^{O} FC CUP

- Restores orientation of the bearing surface
- Improves the extent of porous coverage to host bone
- Less superior edge wear
- Reduces contact stress and stripe wear
- Allows anatomic reconstruction of the centre of rotation

Zahos K, Ward A, Smith E 2012
J Bone Joint Surg (Br)

PATIENTS AND METHODS

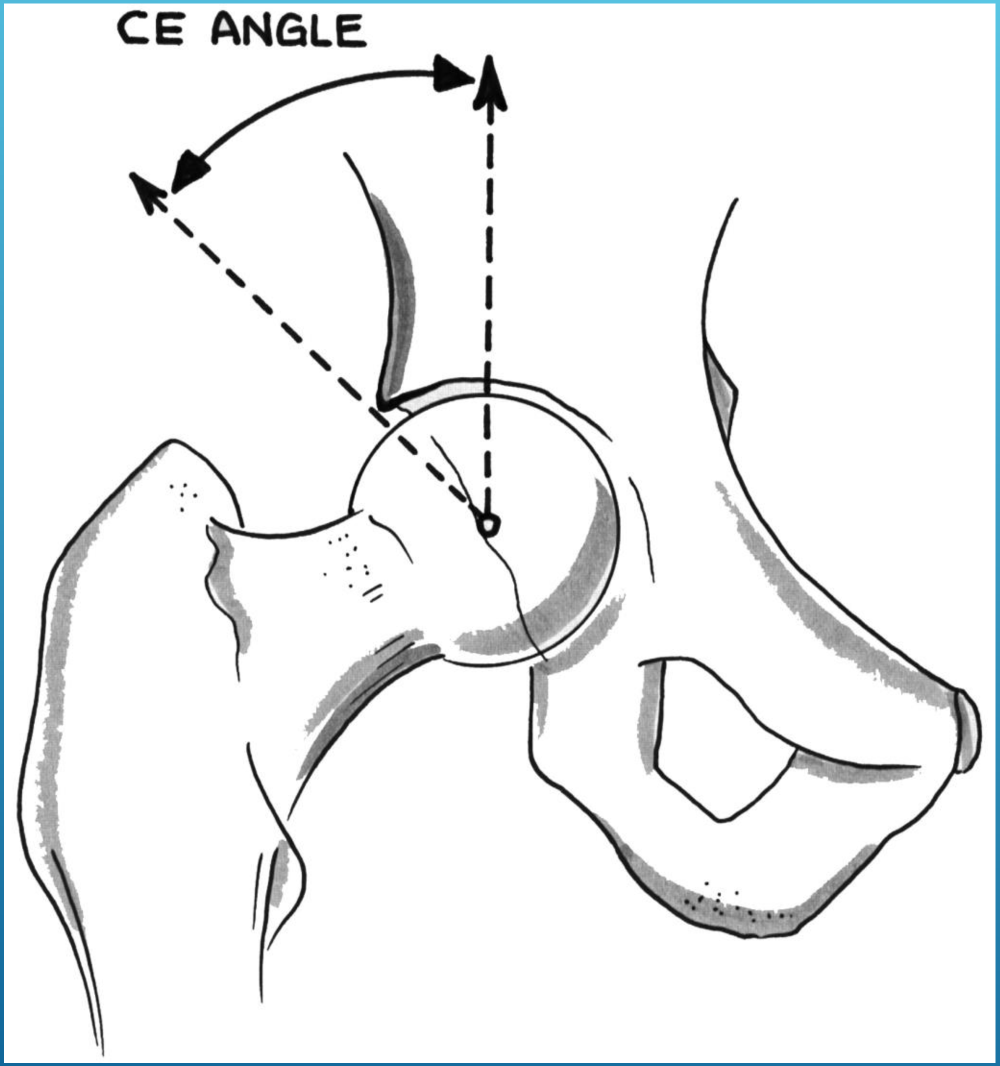
Our total study cohort consists of more than 130 hips implanted with the 15 degree FC Cup

The 5 year outcome cohort consists of:

- 28 hips in 26 patients underwent THA using the 15 degree FC cup between May 2007 and September 2010
- Secondary OA due to acetabular dysplasia
- 26 dysplastic hips and 2 low dislocations
- 20 females and 6 males
- Mean age 52 years (range 33-68 years)
- Mean follow-up 50 months (range 36-76 years)

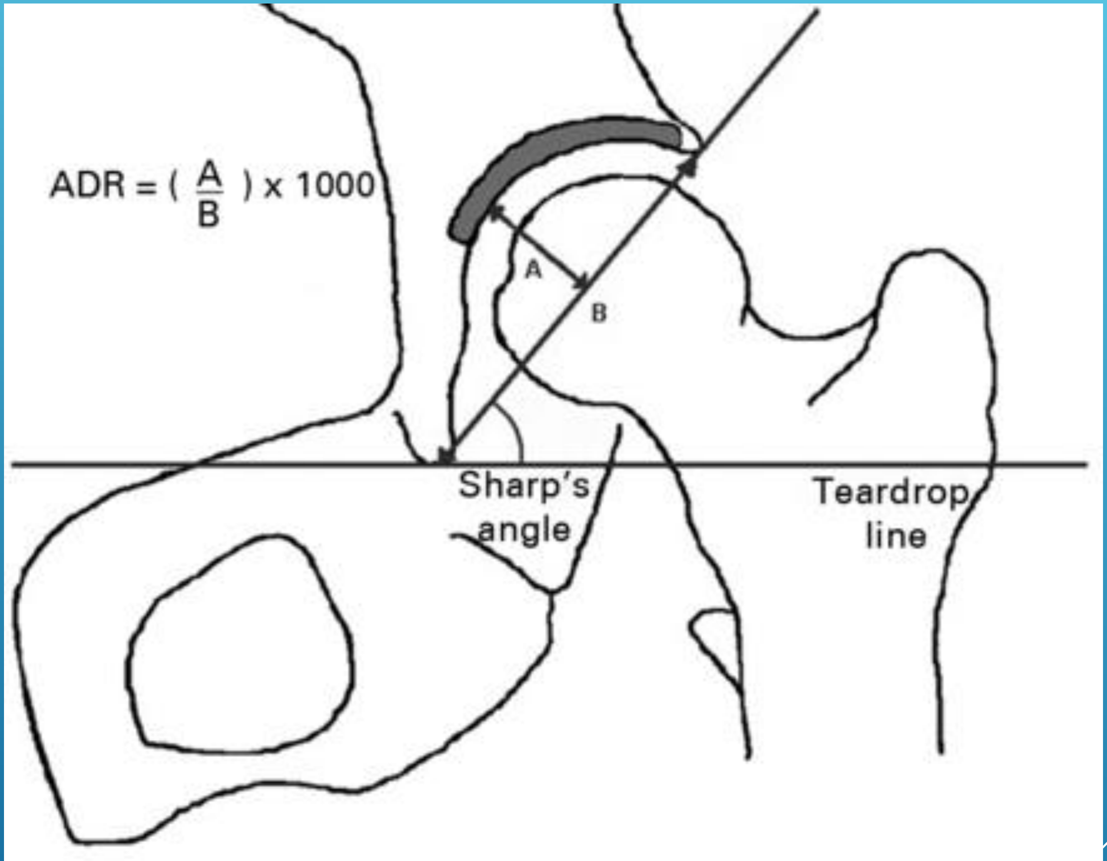
PRE-OP CE ANGLE

19 degrees (9-34^0)



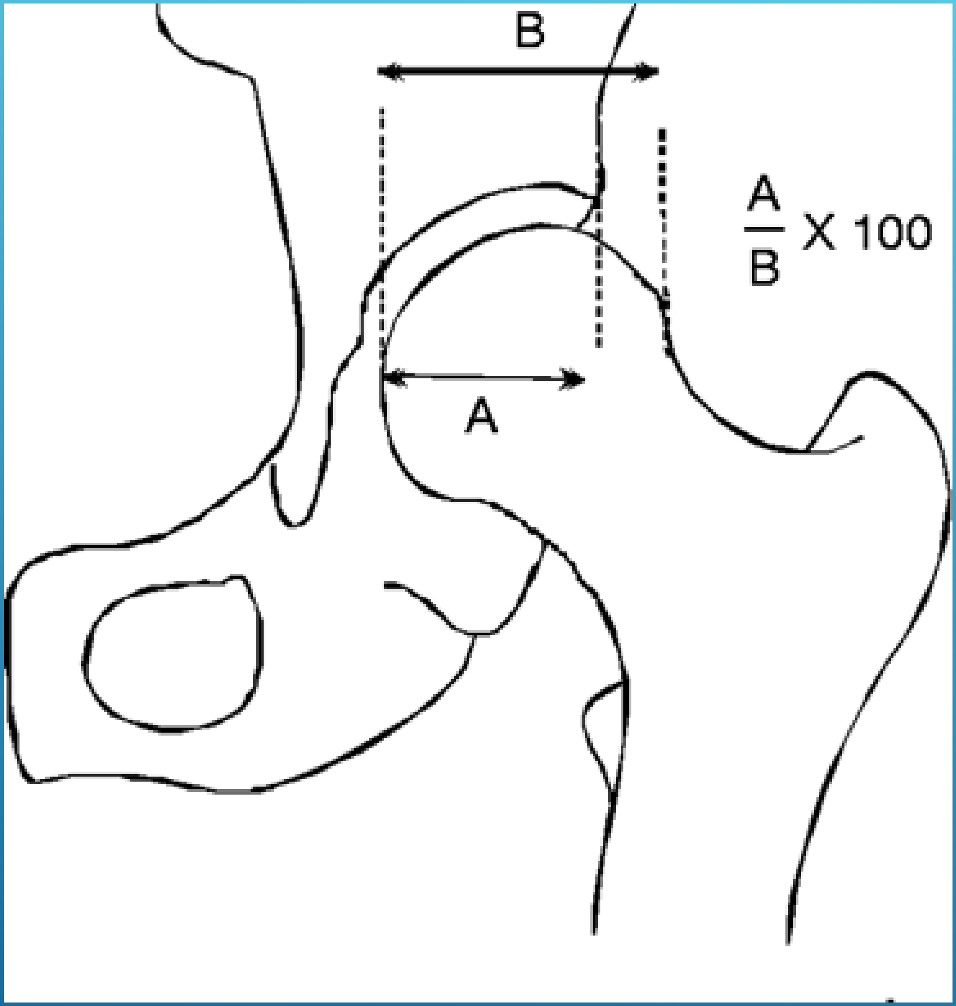
SHARP ANGLE

46 degrees (39-51^0)



FEMORAL HEAD EXTRUSION

32% (20-47%)



PRE-OP HIP SCORES

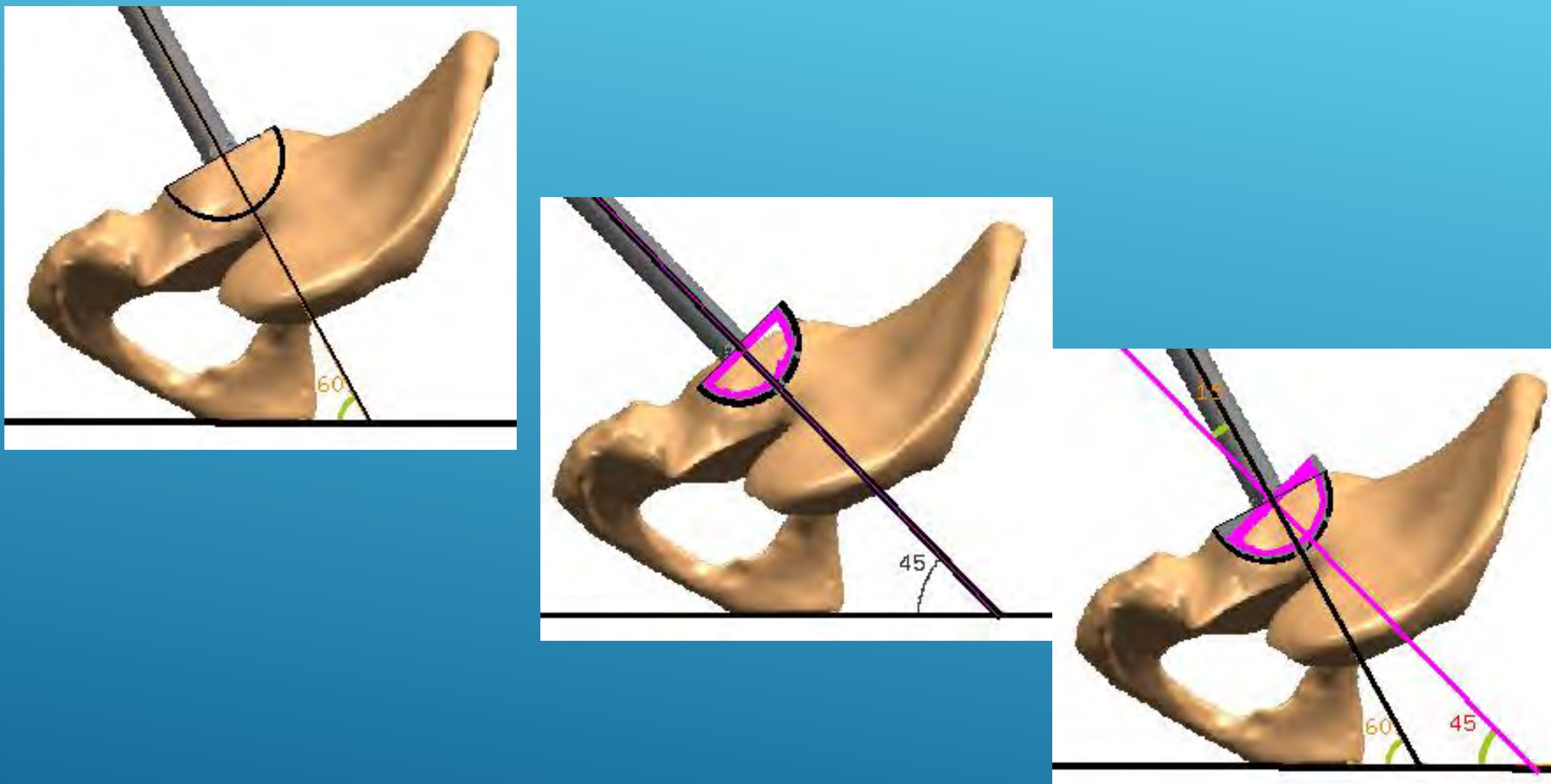
Harris Hip Score (HHS)

- 43 (range 13-58)

Oxford Hip Score (OHS)

- 16.4 (12-39)

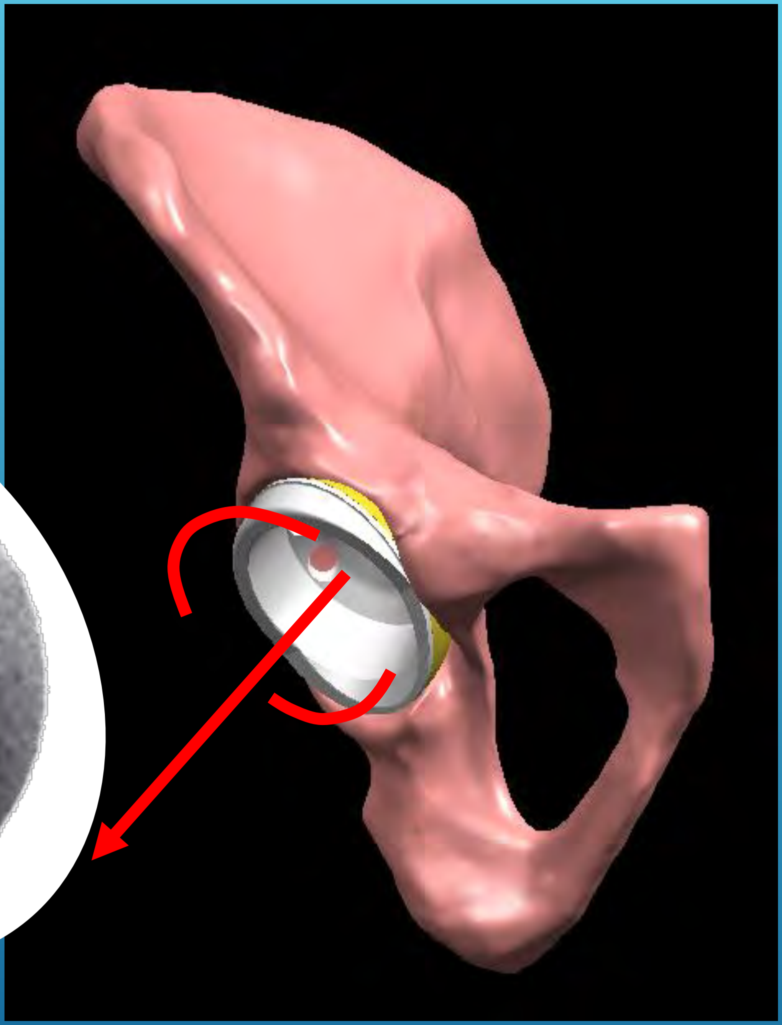
15° FACE CHANGING CUP



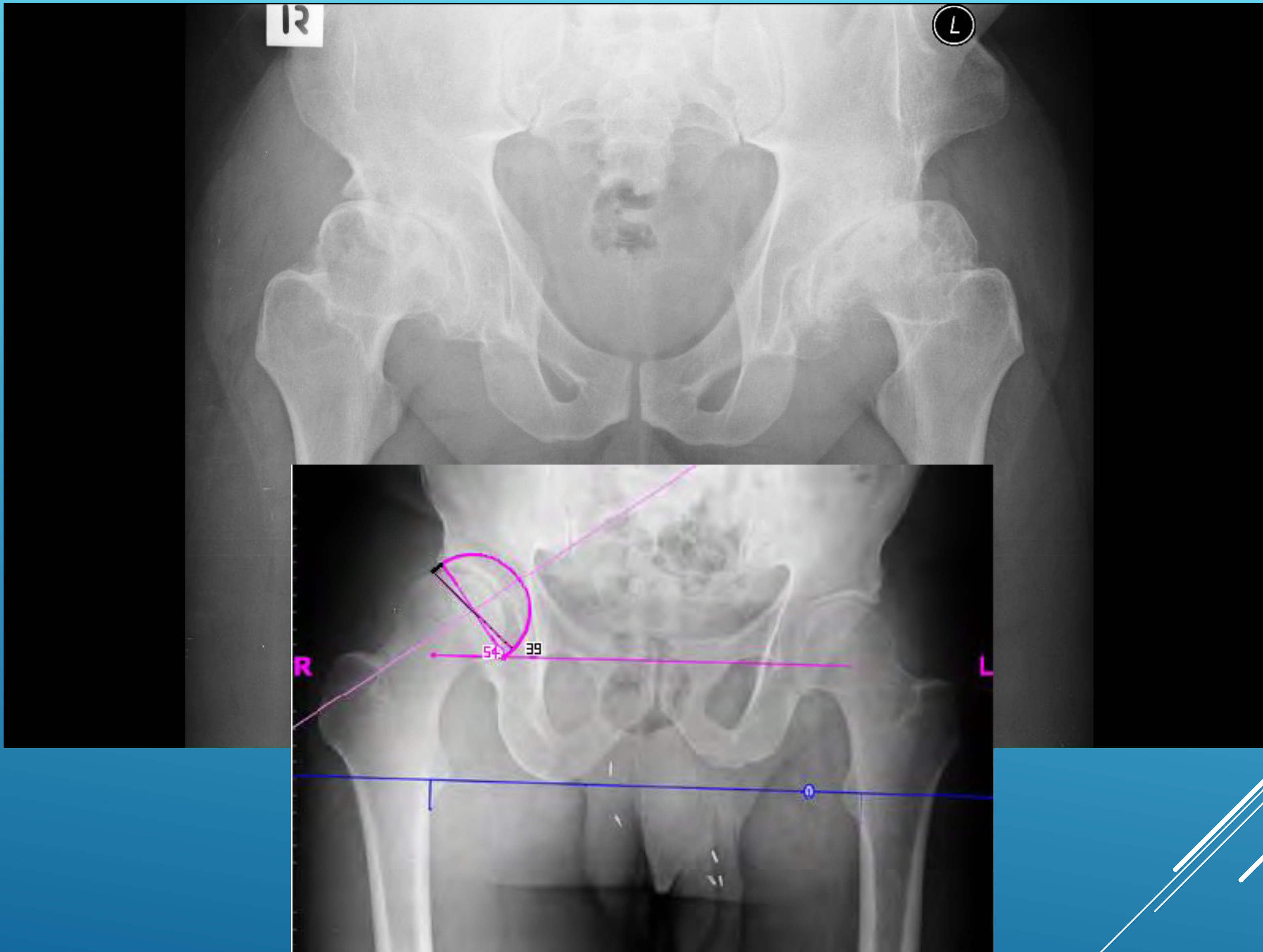
15º Cup – Optimum Inclination

Can be utilised for:

- Shallow sockets
- Dysplasia
- CDH 'low dislocation'



- Reduces contact stress & stripe wear
- Less superior edge wear


R
L
54
39
R
L
0

OPERATIVE TECHNIQUE

- Posterior approach
- Cementless Exceed ABT 15 Face-changing cup with ceramic liner (Biomet UK Ltd, Bridgend UK)
- Shell can be placed in 60 degrees of abduction angle, so that the porous coated surface is fully covered by host bone.
- This aligns the ceramic liner in the optimal position of 45 degrees of abduction.
- The design of the shell positions the liner at 15 degrees less than the acetabular shell position
- This facilitates optimal positioning of the articular surfaces and provides fixation in the shallow native acetabulum with no need for a bone graft.

FEMORAL COMPONENT

Stem

Taperloc – Cementless (Biomet UK Ltd)

Or

Exeter Cemented (Stryker UK Ltd)

Head

28 or 32mm Biolox Delta ceramic

- No patients received bone grafts
- All patients started full weight-bearing the next day

POST-OPERATIVE RADIOGRAPHS

- Integration of the cup showed no signs of loosening or osteolysis
- Acetabular liner inclination angle was 36^0 (range $24\text{-}46^0$)

RESULTS

1. Average clinical and radiological follow-up was for 50 months (range 36-76 months)

1. HHS - mean improved from 43 to 94

2. OHS - mean improved from 16.4 to 44

3. There were no infections or dislocations in the series.

SURVIVORSHIP

- **100%** survivorship of the hip joint with either femoral component
- One case of transient sciatic nerve palsy recovered completely within 3 months

CONCLUSION

1. Clinical results support the use of the cementless Exceed ABT 15 degree face-changing acetabular cup in the dysplastic acetabulum
2. The principle of utilising the available cancellous bone for bony ingrowth is achieved in most situations by placing the shell at 60 degrees of abduction instead of 45 degrees
3. Not designed or recommended to treat cases of high dislocation with a poorly developed acetabulum.

THANK YOU..

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Guides and Specific Implants for Complex Acetabular Reconstructions

Kris Govaers , MD , PhD

Joris Robberecht

Department of Orthopaedic Surgery

St Basius Hospital

Dendermonde

Belgium

Kris Govaers , MD , PhD

- Smith & Nephew
- Biomet
- 3M
- Mobelife
- Eusapharma
- Patents
  - Mobelife
  - Lambortho

Introduction

3D Printing in Primary THA

3D Printing in Revision THA

Conclusion

Meccano

The Toy
of the
Century
MECCANO
MADE IN ENGLAND BY MECCANO LTD

3D Printing

Introduction

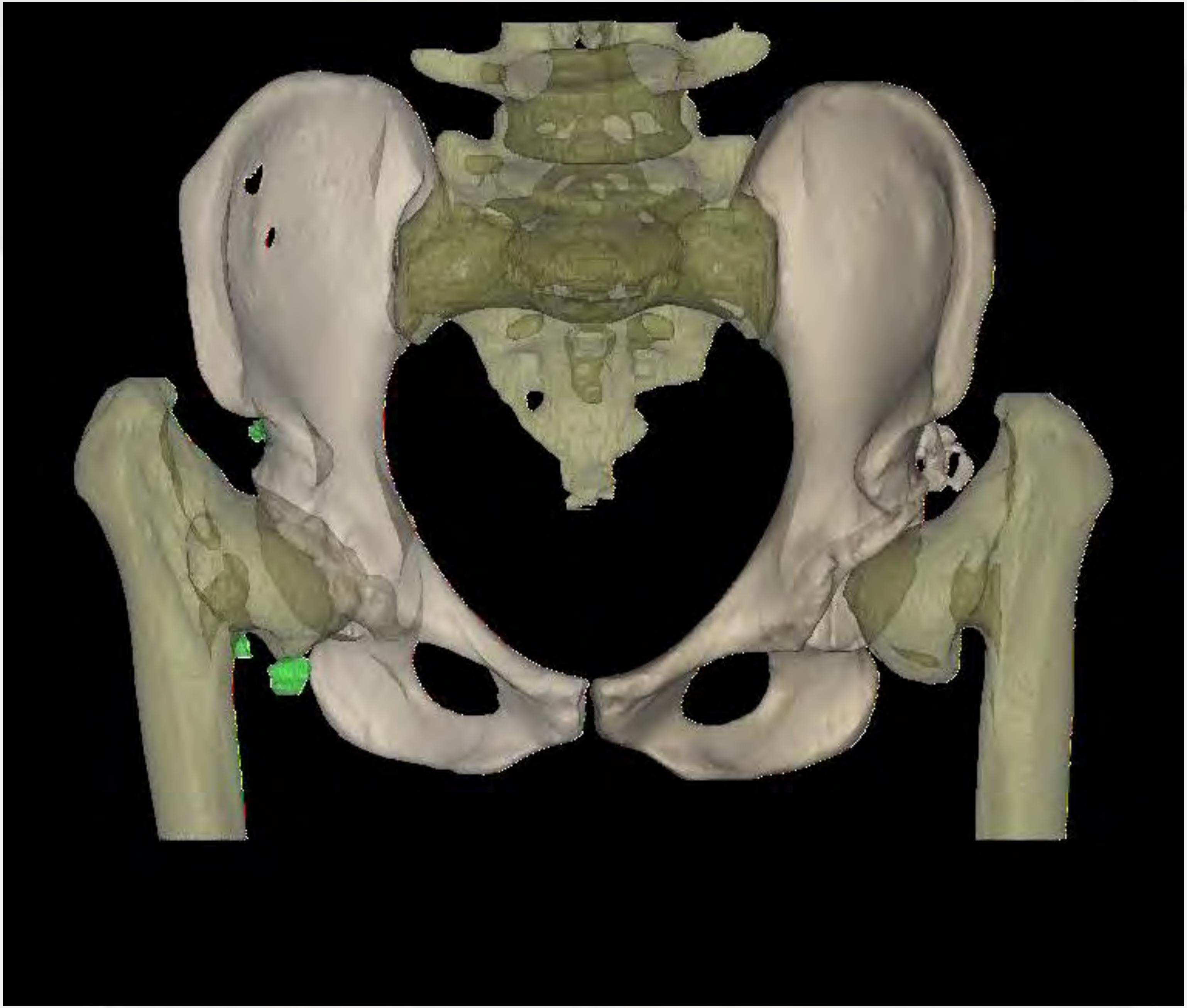
3D Printing in Primary THA

3D Printing in Revision THA

Conclusion

Only One Indication

The femoral head is insufficient to be used as an autograft

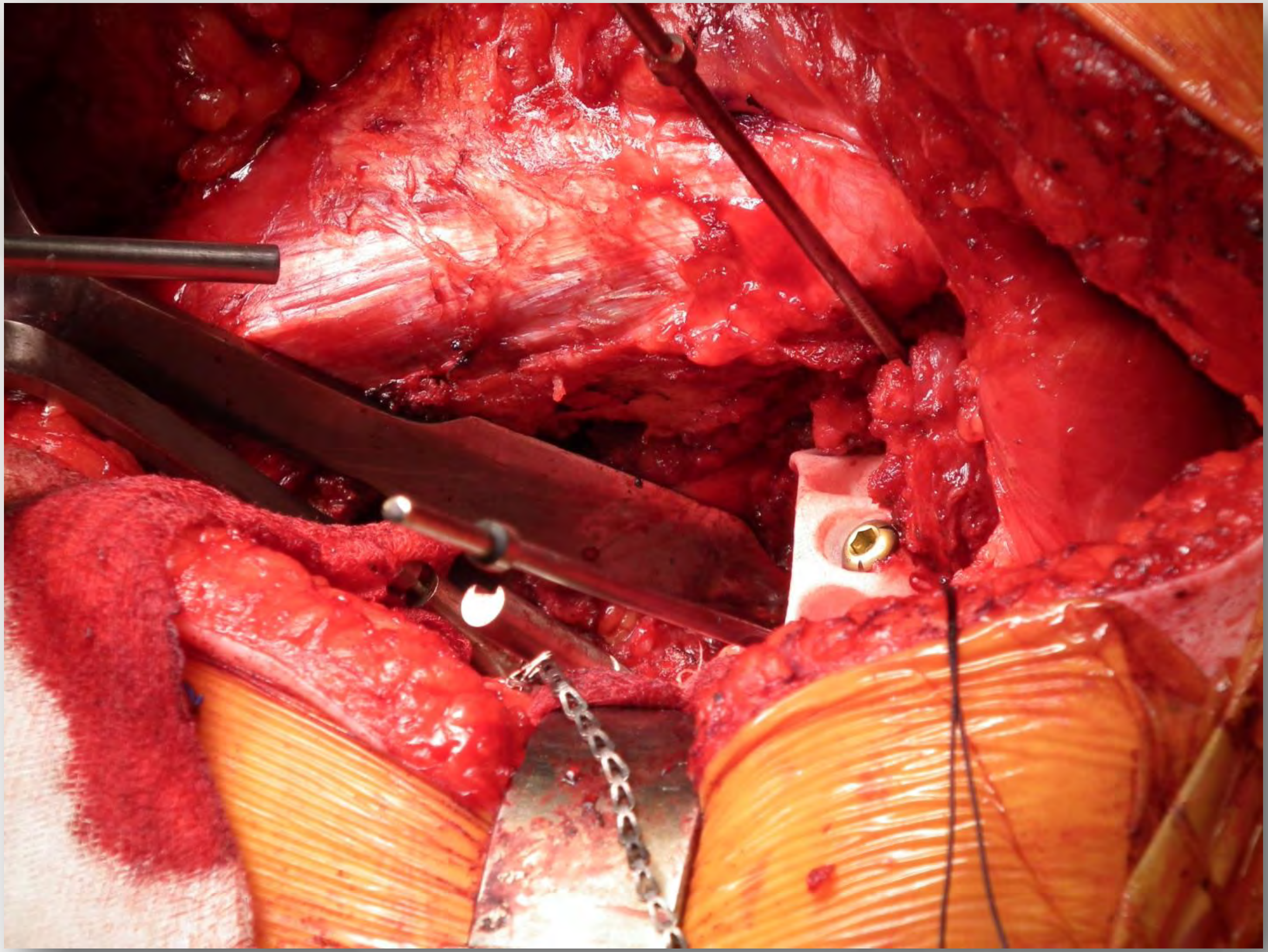


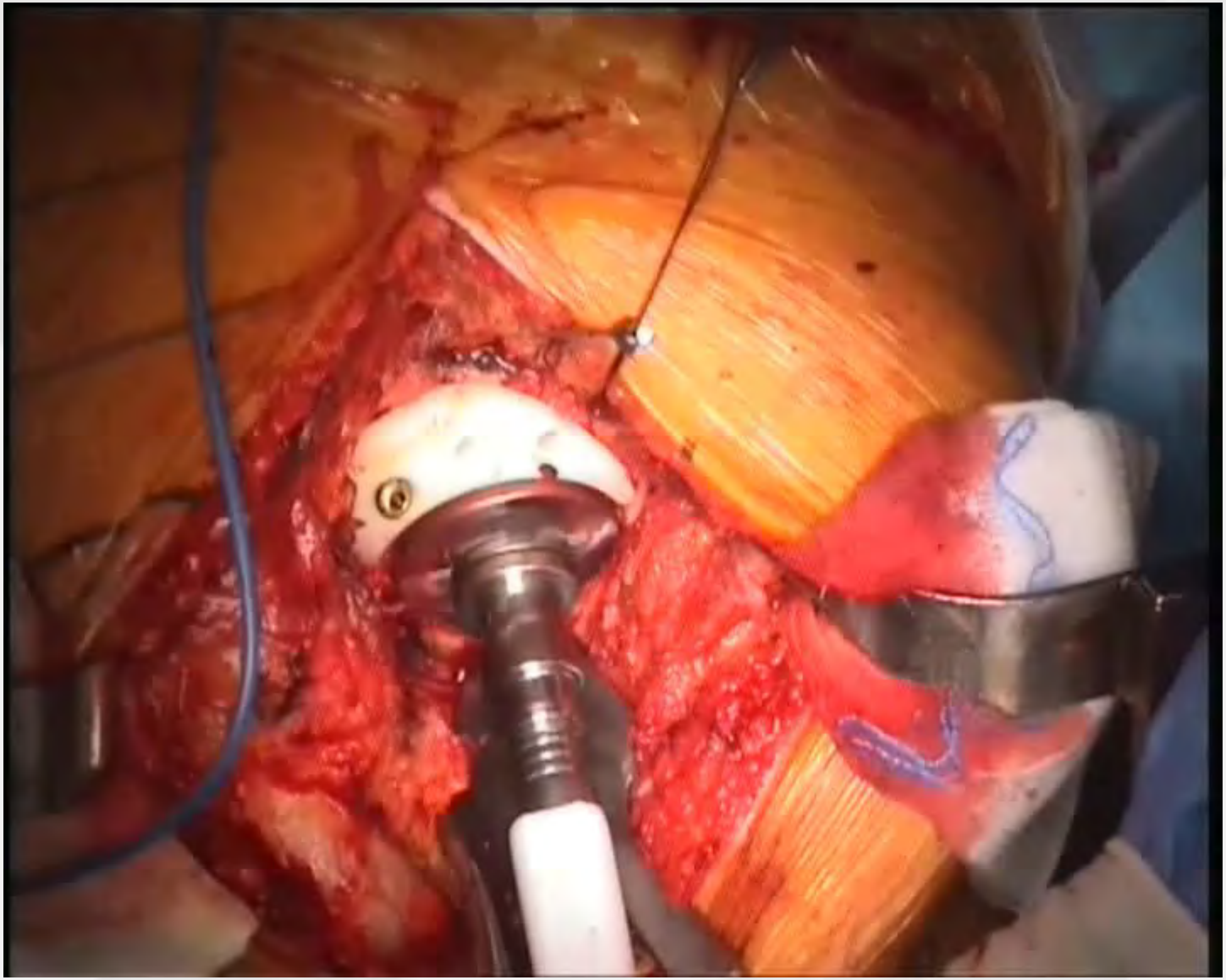
3D printed Instruments

Custom Made Reconstructie

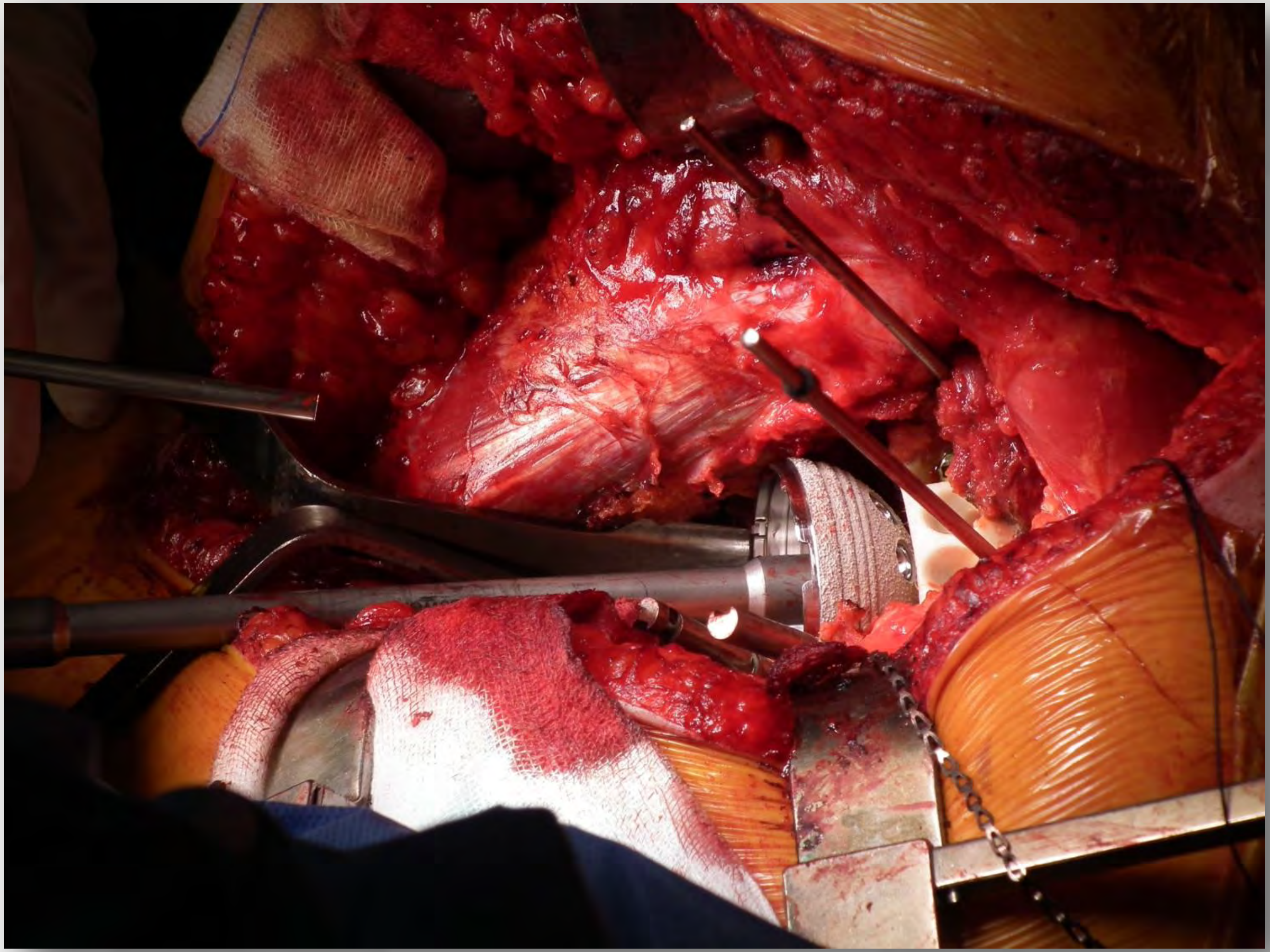
Sterile Model

Trial Augment

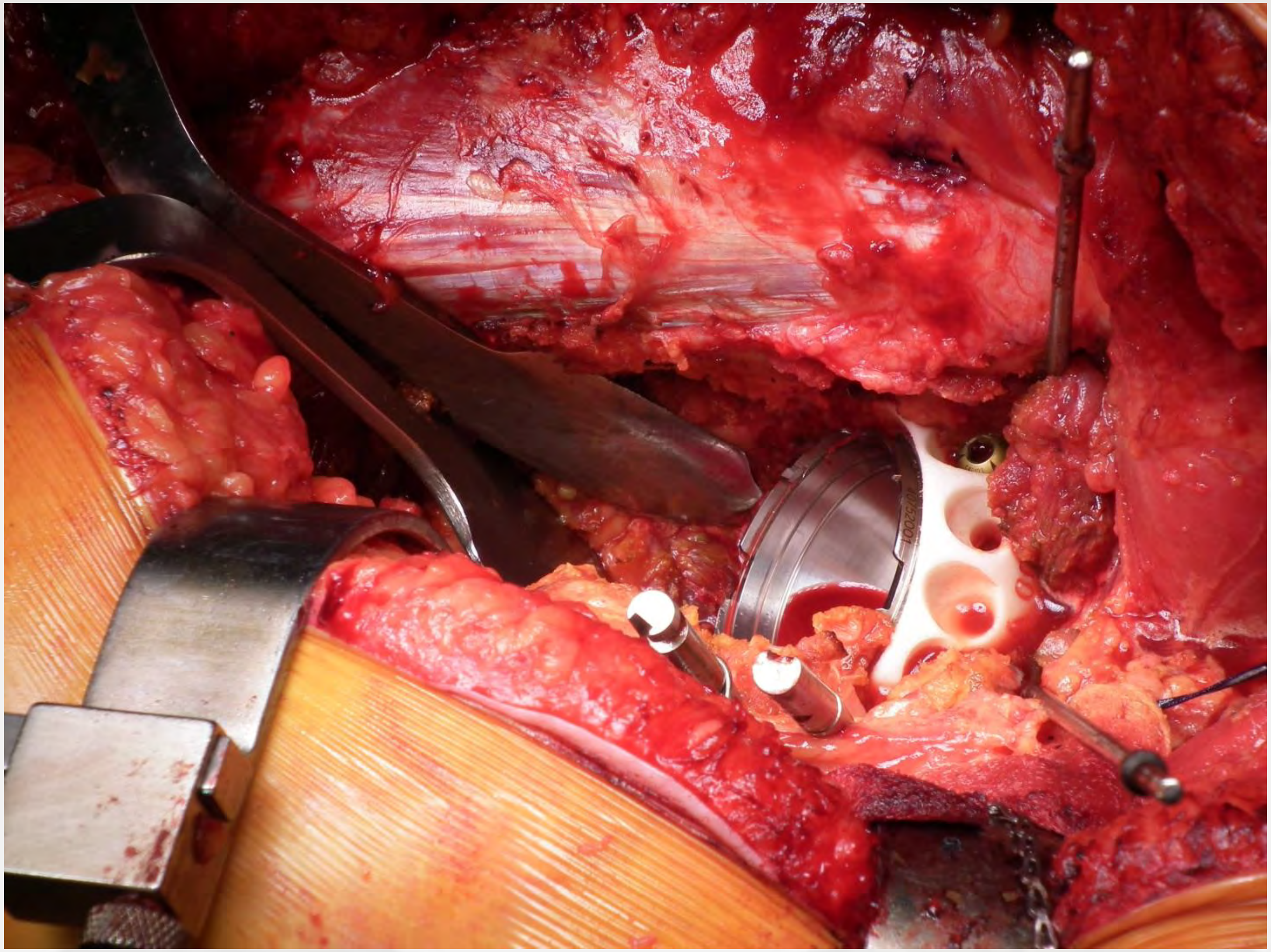




Cup Positioning

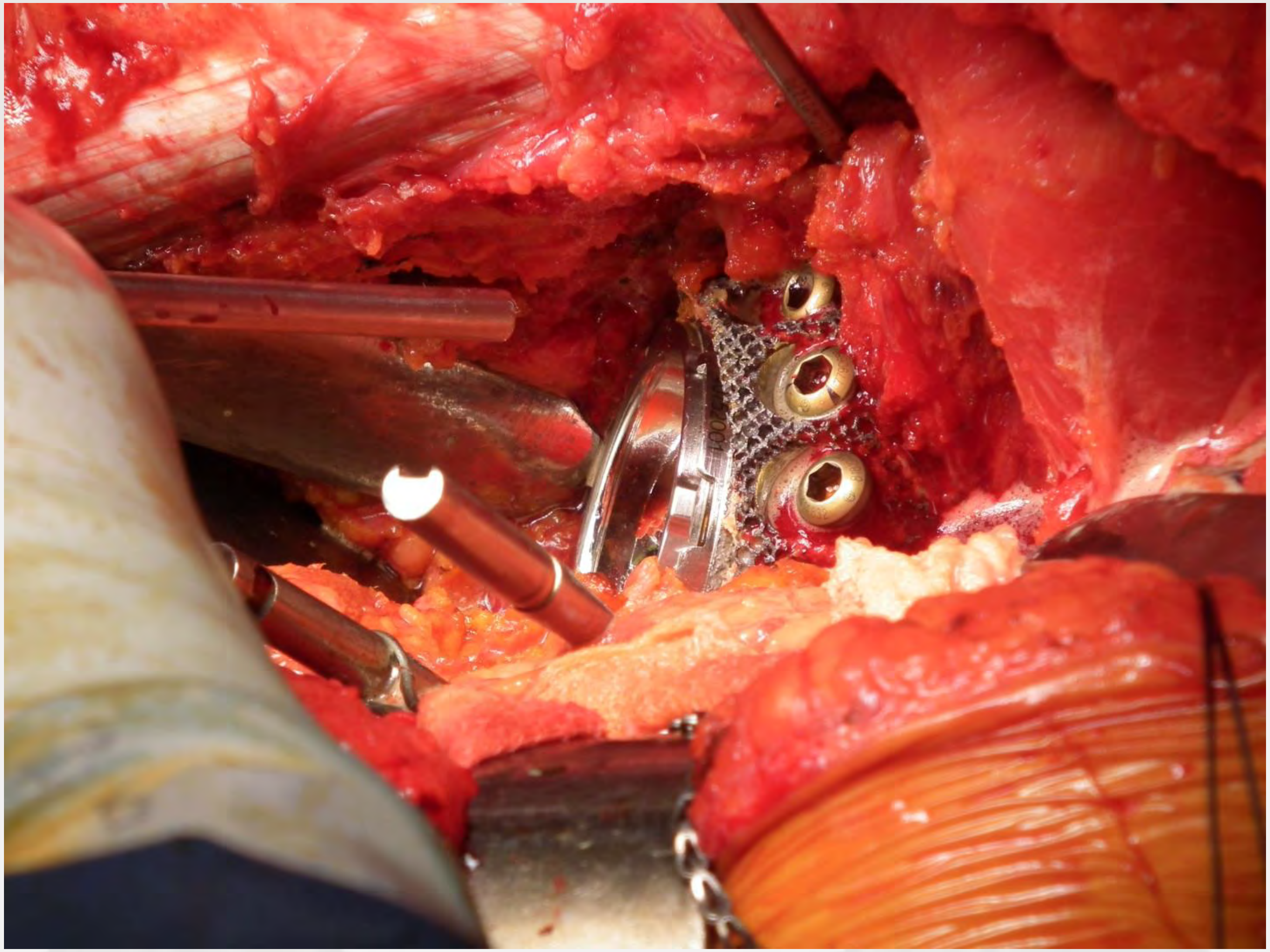


Cup Aligned with Augment



3D Printed Augment

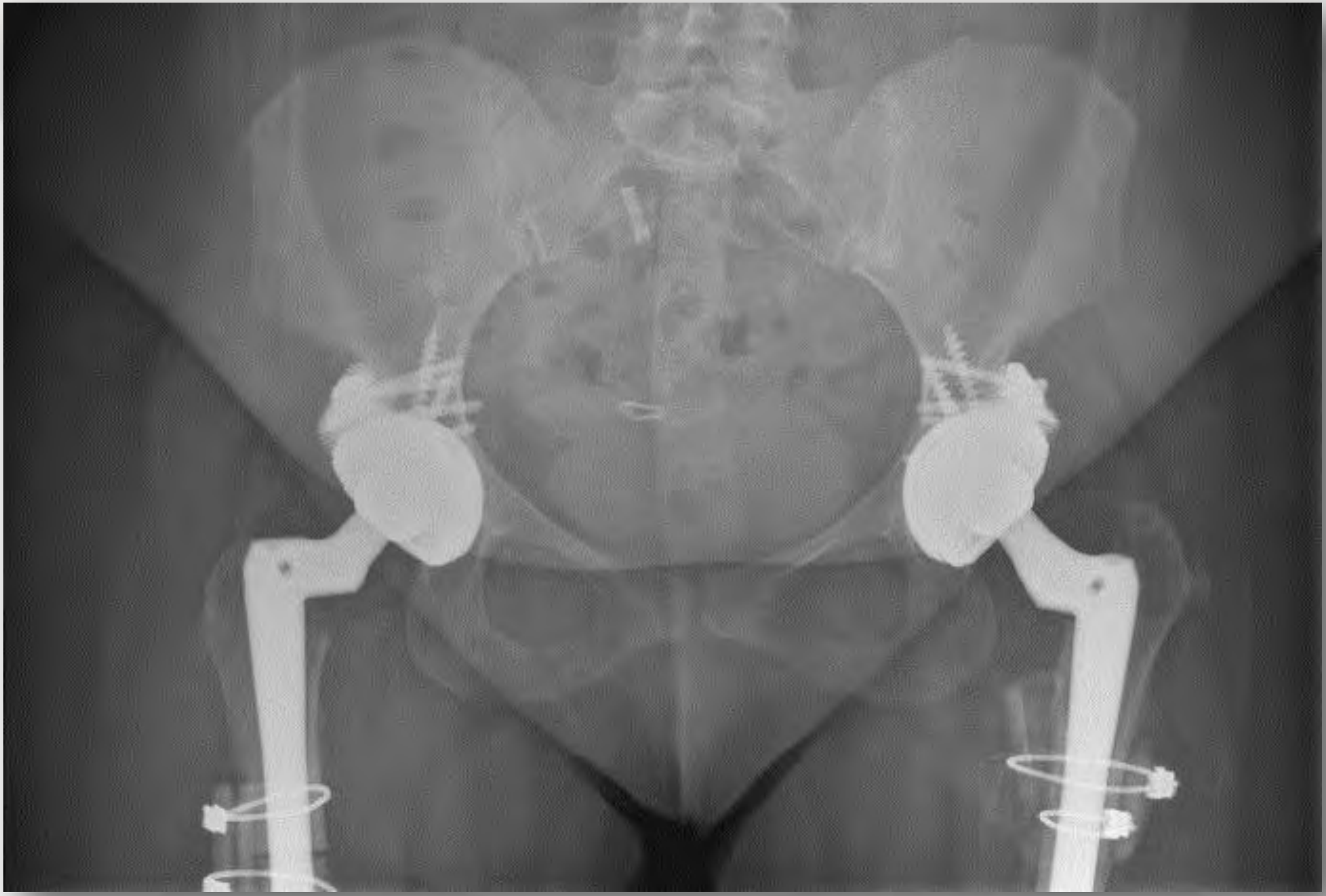
Final Construct



Post-op

CT scan +3D reconstruction

POSTOP : dual mobility L + R



Introduction

3D Printing in Primary THA

Conclusion

Results

10 augments

Results

No re revisions

1 periprosthetic fracture

Acceptable coverage on all cups

No infections

Limitations

Cost

Cost

Cost

Introduction

3D Printing in Primary THA

Conclusion


'So leicht zu machen. Vater'

Thank You

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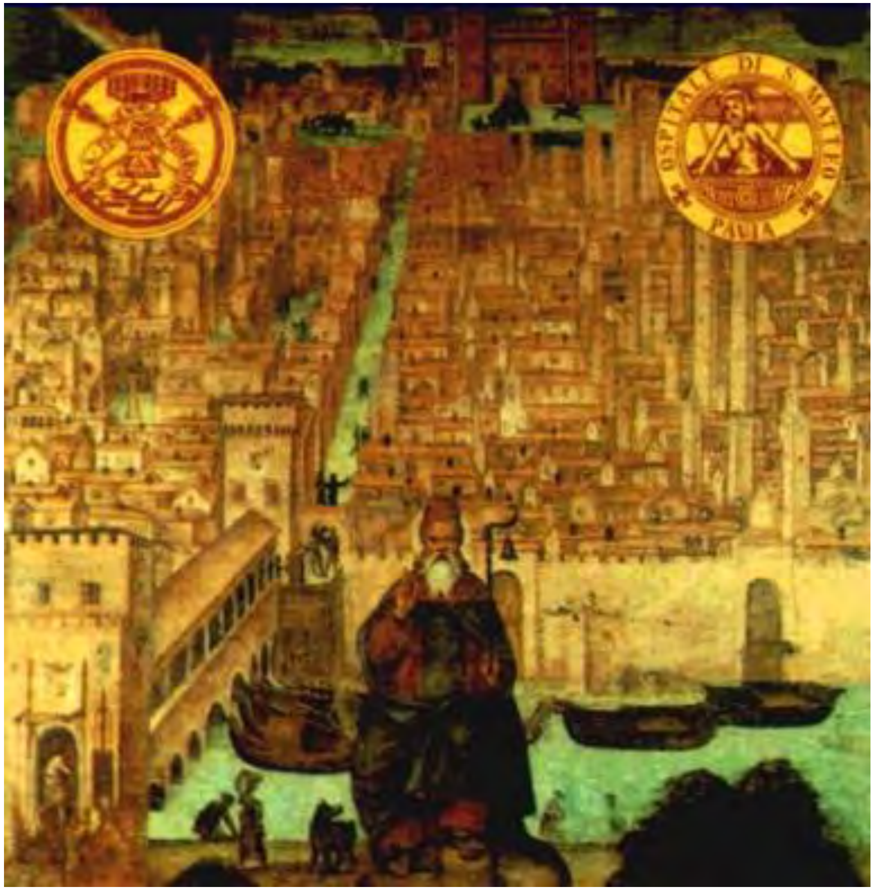
26-27 NOVEMBER 2015

MILAN, ITALY

Clinica Ortopedica e
Traumatologica
Università degli Studi di Pavia

Fondazione
IRCCS Policlinico
San Matteo

Chairman: Prof. F. Benazzo



MODULUS stem for developmental hip dysplasia: Long-term follow-up

L. Perticarini, S.M.P. Rossi, F. Benazzo

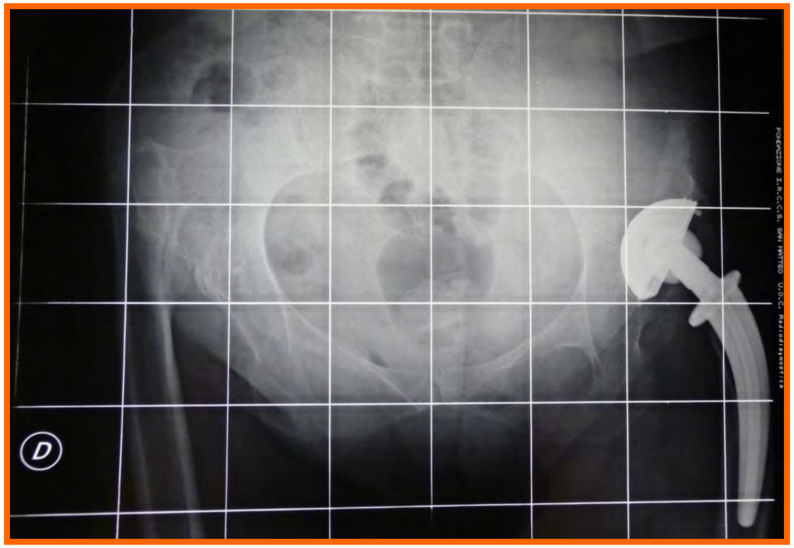
DEVELOPMENTAL DYSPLASIA OF THE HIP (DDH)

Abnormal anatomy of the acetabulum

- Small
- High
- Shallow
- steep roof, no roof

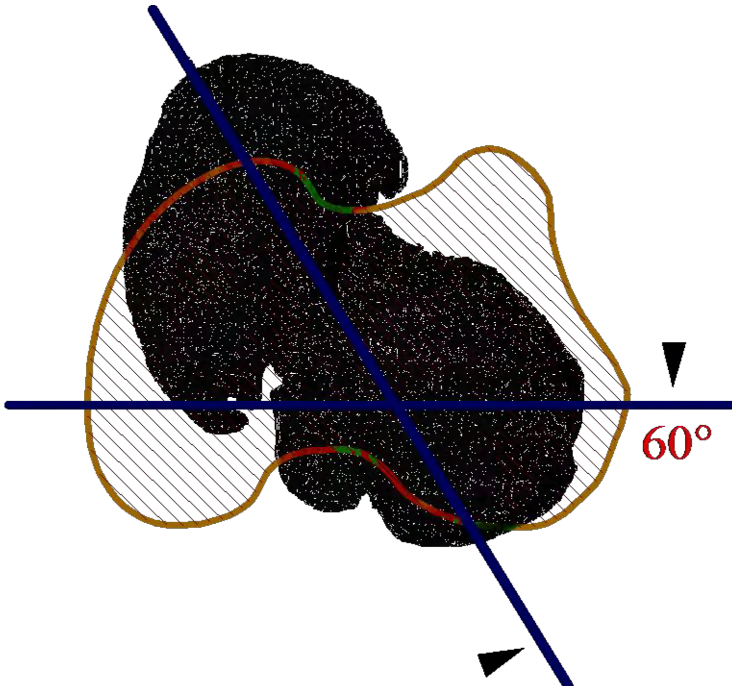
Neoacetabulum:

- high iliac riding head



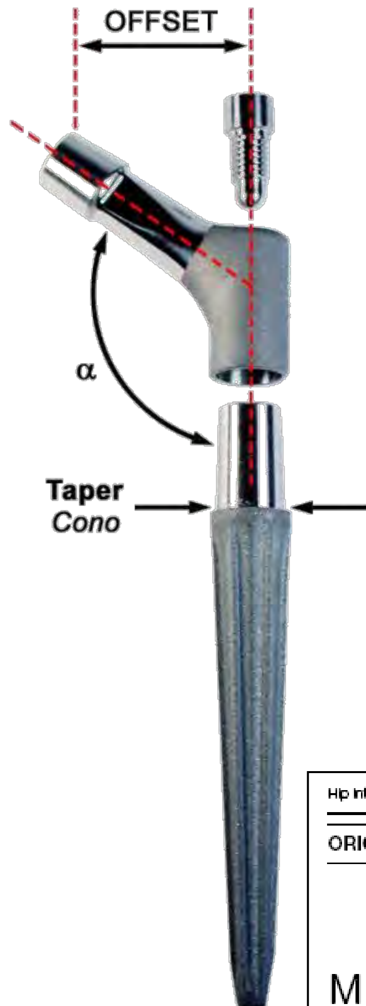
Femur deformities

- hypoplasia
- excessive neck anteversion
- valgus neck-shaft angle
- metaphyseal-diaphyseal mismatch
- posteriorly displaced greater trochanter
- narrow femoral canal



Our solution: conical stem + modular neck

Conical taper



Neck Modularity

MODULUS

Hip Int 2010; 20 (04): 427 - 433

ORIGINAL ARTICLE

Mid-term results of an uncemented femoral stem with modular neck options

Francesco Benazzo [1], Stefano M.P. Rossi [1], Davide Cecconi [1], Lucio Piovani [1], Flavio Ravasi [2]

[1] Clinica Ortopedica e Traumatologica, University of Pavia, Fondazione IRCCS Policlinico San Matteo, Pavia - Italy
[2] Department of Orthopaedics and Traumatology, Melegnano Hospital, Hospital of Melzo, Melzo - Italy

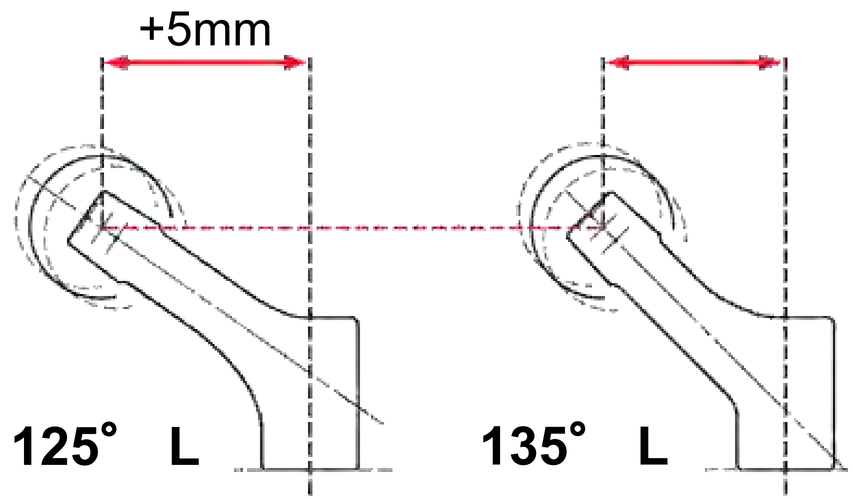
Why Modulus could be the Ideal solution?

Many different solutions with few components

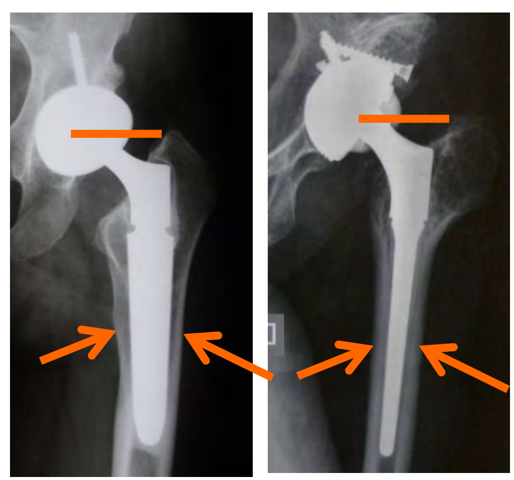
4 necks , 14 stems (13-26mm)

NECK (STD/LARGE) OFFSET

135° SHORT	31 mm
125° SHORT	36 mm
135° LONG	39 mm
125° LONG	44 mm



The version is free

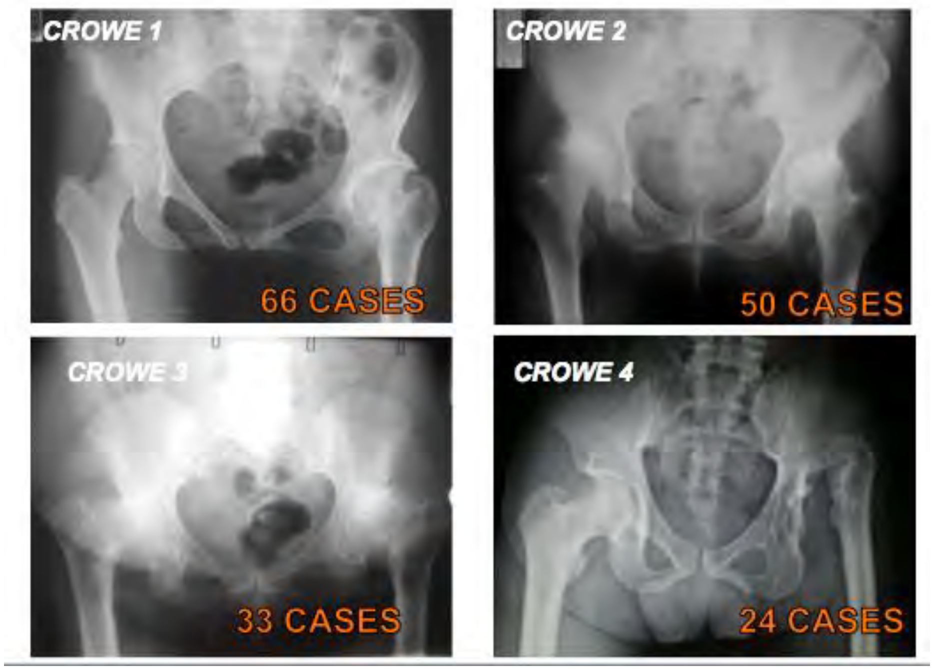


No relation beetween
stem diameter/neck angle/offset

Our experience

Oct 2001 - Dec 2010

173 Modulus Stem (143 patients)
- 29 m, 114 w
- Age: 55 yrs (21-81yrs)



Mean follow-up: 87 months (range 36-146)

The Journal of Arthroplasty 30 (2015) 1747–1751

Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

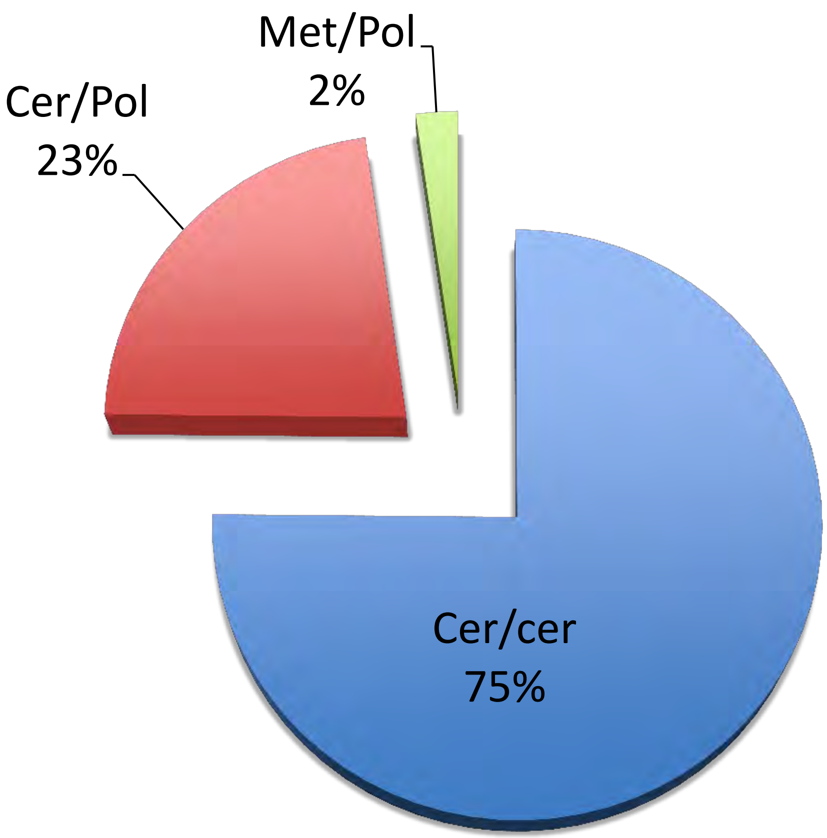
MODULUS Stem for Developmental Hip Dysplasia: Long-term Follow-up

Francesco M. Benazzo, MD, Lucio Piovani, MD, Alberto Combi, MD, Loris Perticarini, MD

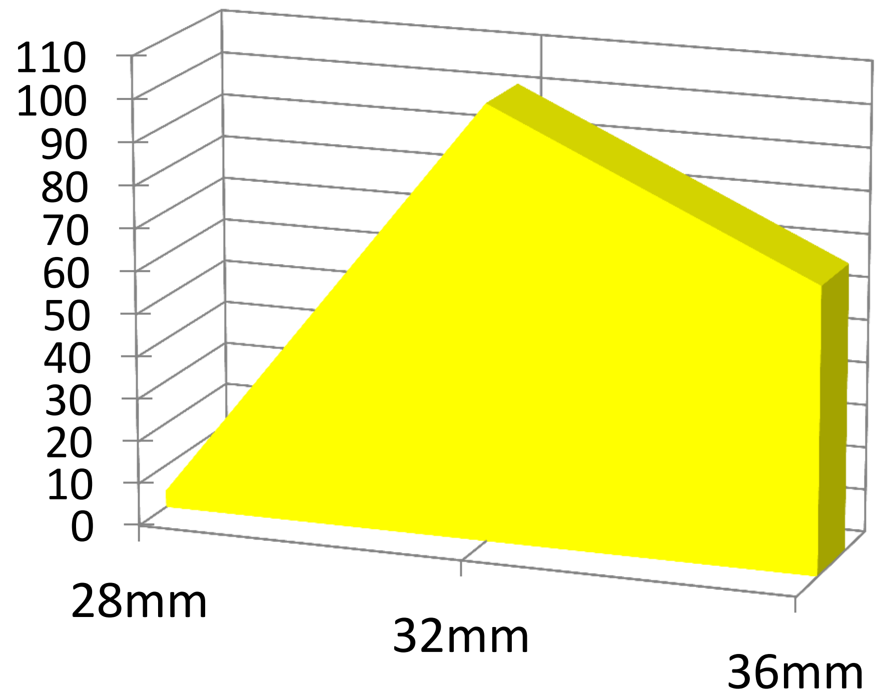
Clinica Ortopedica e Traumatologica, Università degli Studi di Pavia, Fondazione IRCCS Policlinico San Matteo, Italy

Our experience

Coupling



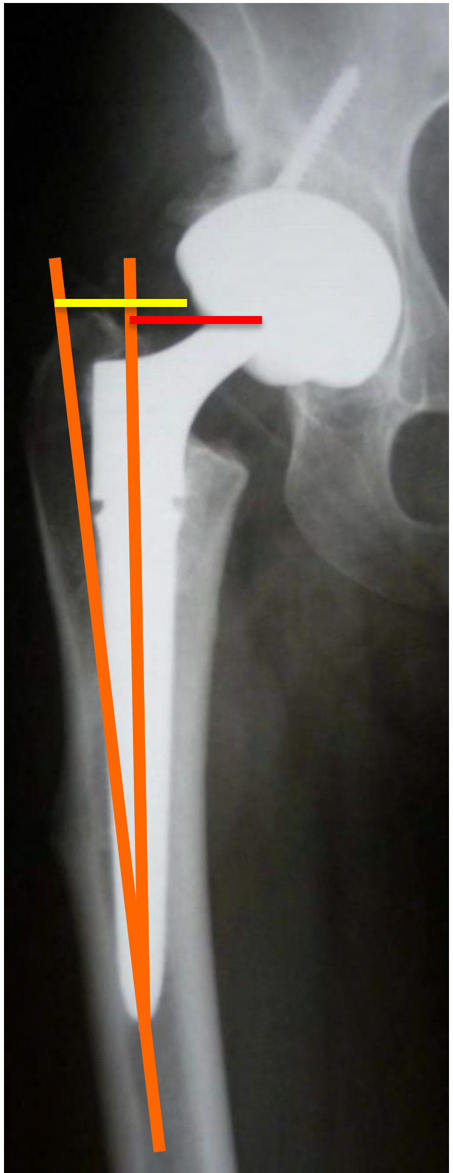
Head

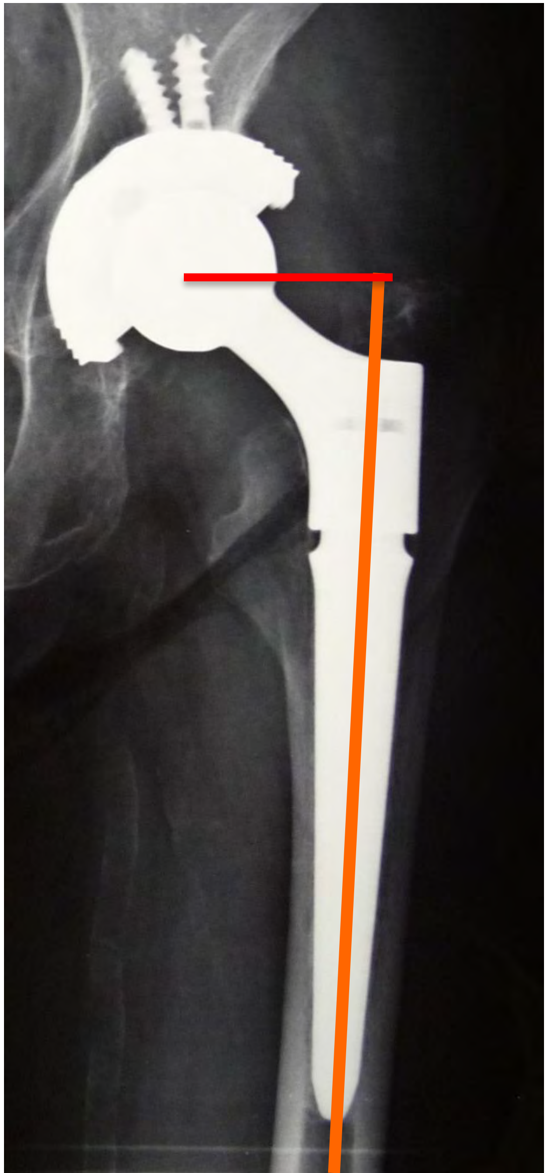


Stem positioning

Radiographic evaluation

- 129 (74.6%) neutral alignment
- 22 (12.7%) in slight varus
- 16 (9.2%) in slight valgus
- 4 (2.3%) in varus
- 2 (1.2%) in valgus





Results

Radiographic evaluation

- The physiological biomechanical parameters were restored:
  Post-op mean 38 mm (range: 27–48 mm)

- 1 case of stem subsidence (8 mm) due to aseptic loosening
  The patient refused revision surgery

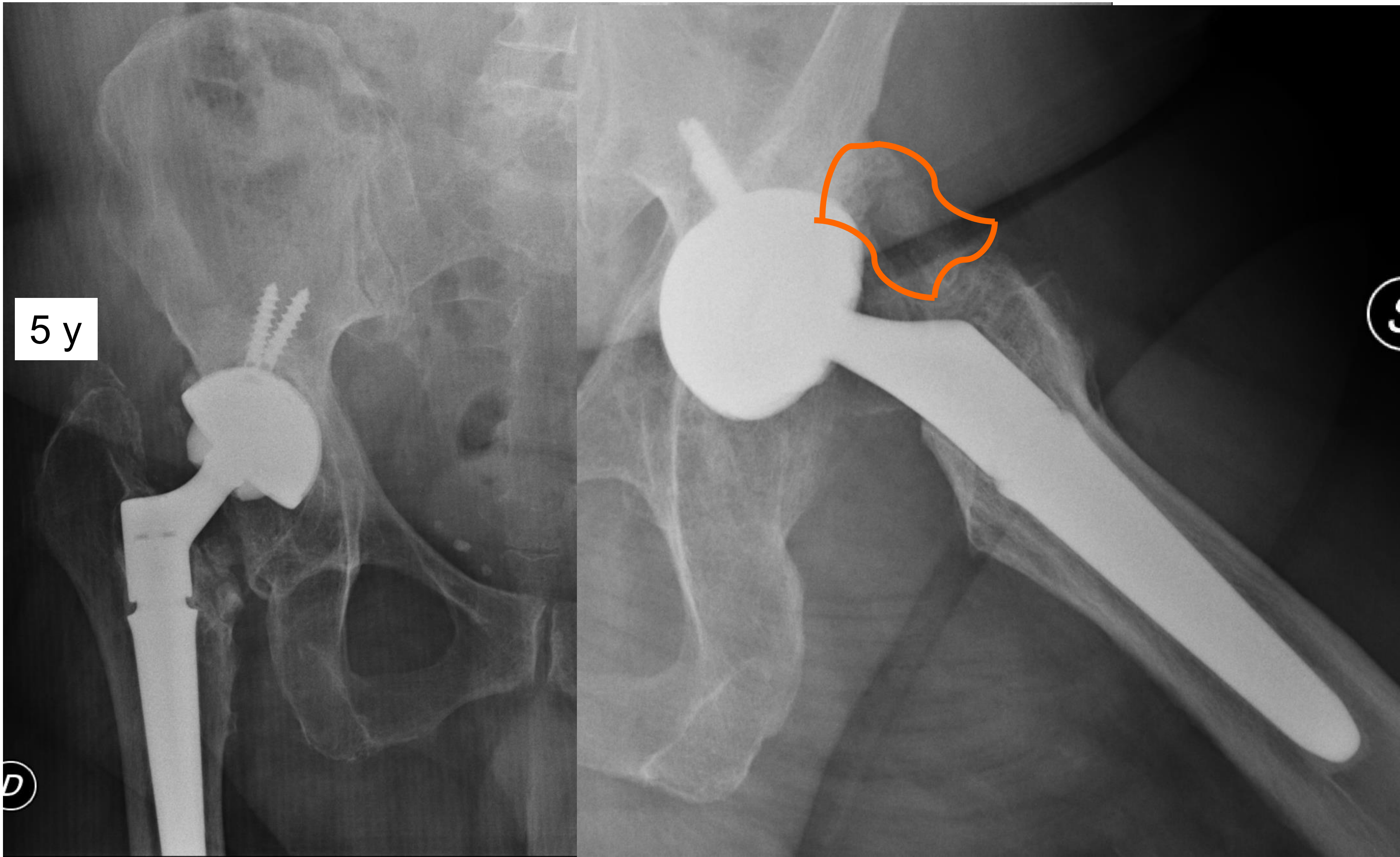
- There were no other cases of subsidence exceeding 2 mm

- Cortical hypertrophy was evident in 5 (2.9%) cases after 6 months and showed no changes over time

Heterotopic Ossifications: 7 cases

Stage 1: 3
Stage 2: 3
Stage 3: 1

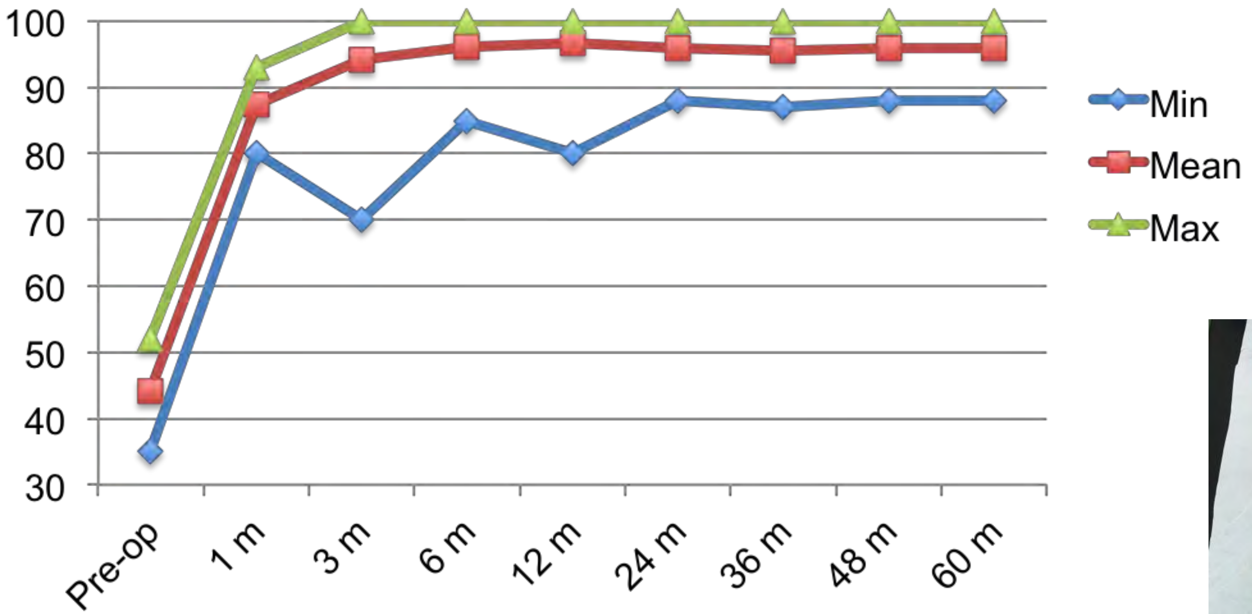
C.F., M, 61 y



Results

Harris Hip Score

- Pre-op 42 ± 5.4 SD (range 23-65)
- Final Follow up 92 ±3.5 SD (range 76-100)



The average leg-length discrepancy (LLD) decreased from 1.7 cm (range: 0–8 cm) preoperatively to 0.6 cm at the final follow-up.

HHS and Crowe Classification

Harris Hip Score (HHS) Distribution According to Crowe Grade of Developmental Dysplasia of the Hip (DDH).

DDH	HHS (Preoperative)	HHS (Last Follow-Up)	HHS Δ
CROWE I	51 (41–65)	97 (91–100)	+46
CROWE II	44 (36–53)	90 (85–95)	+46
CROWE III	33 (29–37)	88 (81–89)	+55
CROWE IV	28 (23–34)	85 (76–100)	+57

Results

- 8 patients died (causes unrelated to surgery)
- 131 (91.6%) patients did not have a limp at the final follow-up
- 12 (8.4%) patients showed a slight limp

- 137 (95.8%) patients had no or experienced occasional pain at the final clinical examination

Survival

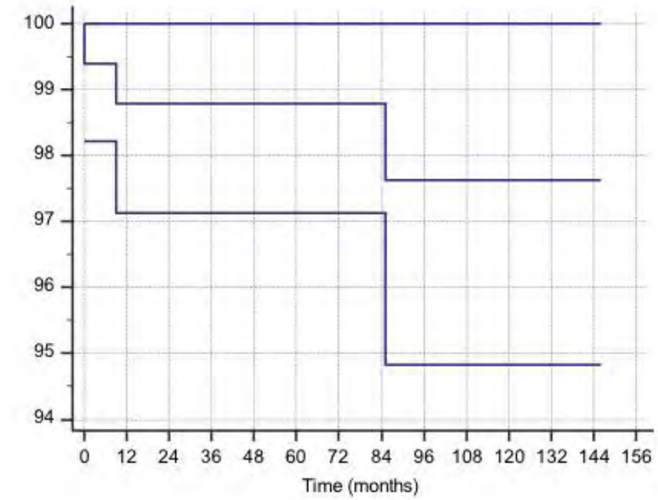
- 2 stem revision

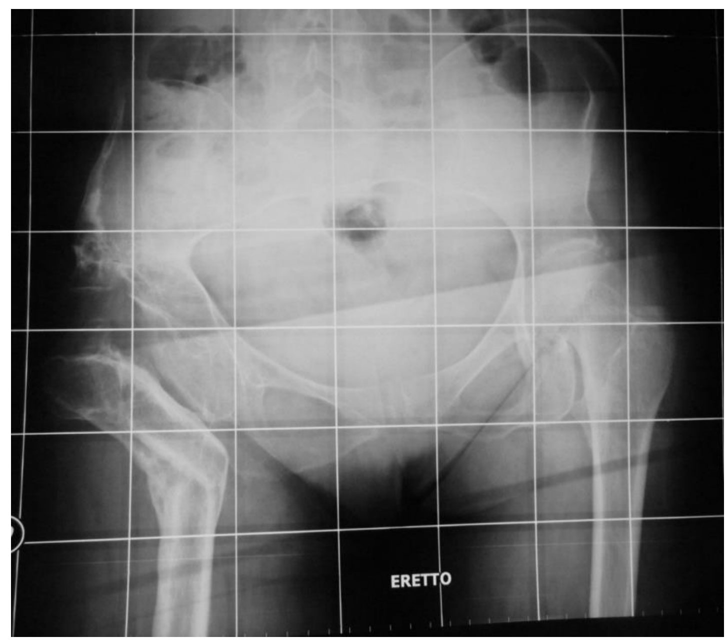
(1 Vancouver 2B periprosthetic fracture, 1 stem subsidence following an intraoperative femoral split)

- 2 cup revision (aseptic loosening)

Survival analysis

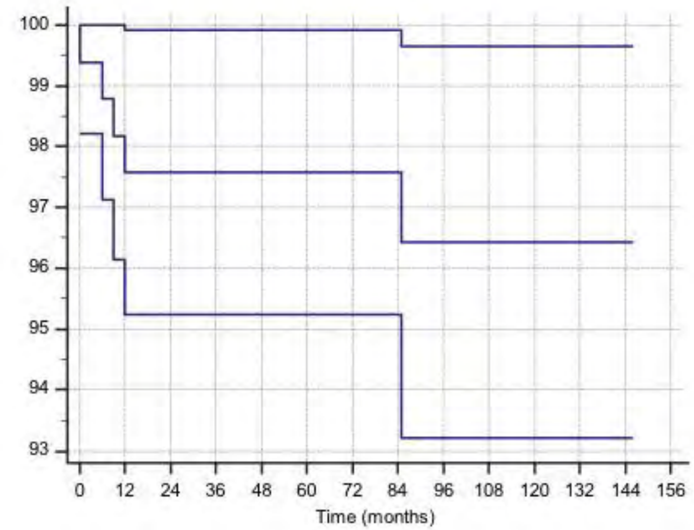
Kaplan-Meier survival analysis with failure of the femoral component for any reason as the endpoint was 97.6% (95% CI: 94.8%–100.0%) at 8 years

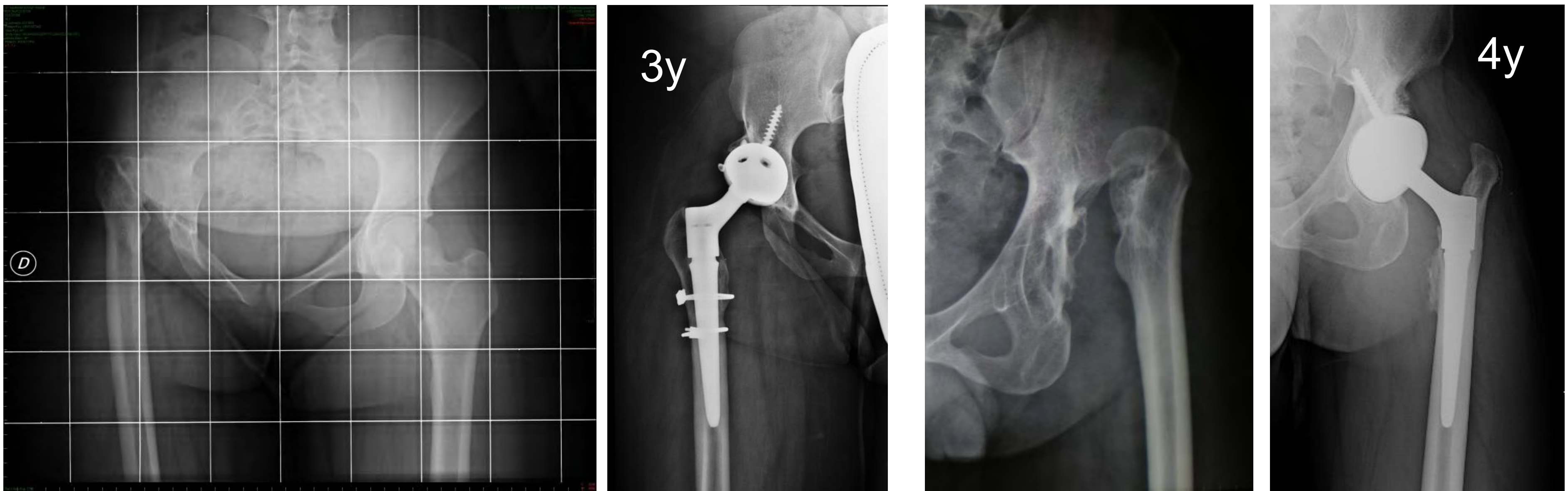




Survival analysis

Kaplan-Meier survival analysis with failure of of any implant component for any reason as the endpoint was 96.4% (95% CI: 93.2%–99.7%) at 8 years





Conclusions

- ✓ Treating the symptomatic sequelae of DDH with THA can be challenging
- ✓ THA can be very effective in improving patients' quality of life
- ✓ Modularity is a reliable solution for restoring correct hip joint biomechanics in DDH
- ✓ Design of the modular system is based on the concept of adapting the prosthetic implant to the anatomy (and not the other way round)
- ✓ Very successful in "difficult" patients

INTERNATIONAL COMBINED MEETING

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MILAN, ITALY

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

Dipartimento di Scienze mediche di base, Neuroscienze ed Organi di senso
Azienda Ospedaliera-Universitaria «Policlinico»

U.O DI ORTOPEDIA E TRAUMATOLOGIA
Direttore: Prof. B. Moretti

Total hip arthroplasty with shortening osteotomy in CROWE type III-IV developmental dysplasia

Milan, 27.11.2015

*G. Vicenti, G. Rollo, **G. Picca,** M. Carrozzo, B. Moretti, G. Solarino*

Introduction

THA reconstruction remains the **standard of care** in patients with **Crowe type III and IV DDH** when **OA** leads to significant **pain and loss of function.**

The **durability** of the arthroplasty in these patients is **better** with restoration of an **anatomic hip center.**

Bone Joint J. 2013 Nov;95-B(11 Suppl A):31-6. doi: 10.1302/0301-620X.95B11.32899.

The dysplastic hip: not for the shallow surgeon.

Gustke K[1].

Femoral shortening

Restoration of the **hip center** typically **requires** some **form of femoral shortening** to allow hip reduction and to avoid excessive limb lengthening.

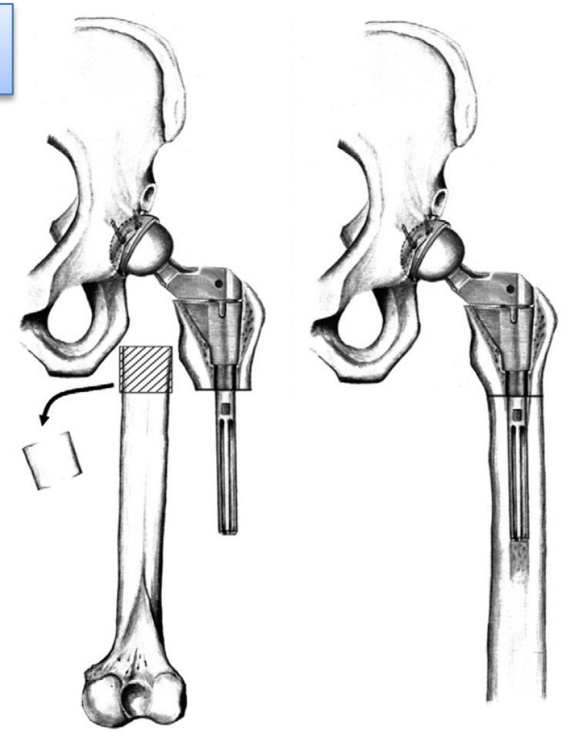
Femoral shortening

Restoration of the **hip center** typically **requires** some **form of femoral shortening** to allow hip reduction and to avoid excessive limb lengthening.

SHORTENING SUBTROCHANTERIC OSTEOTOMY

ADVATANGES

- Simultaneous shortening and correction of the rotational abnormalities, restoring the abductor lever.
- Preservation of the proximal femoral metaphysis.
- Facilitates the placement of an uncemented femoral component, providing increased torsional stability.
- Avoids the need for a GT osteotomy.



Our experience

Between January **2000** and December **2006**

18 primary THA in **15 patients** with unreduced congenital hip dislocation:

- **9 women / 6 men**
- **3 Crowe III / 15 Crowe IV**
- Average age: **38.6** y/o (19-67)
- **12 unilateral** DDH / **3** cases of **bilateral** DDH
- **1** previous **bilateral Schanz osteotomy**
- Average **per-op. leg length discrepancy**: **45 mm** (38 – 80)

Indications for THA:

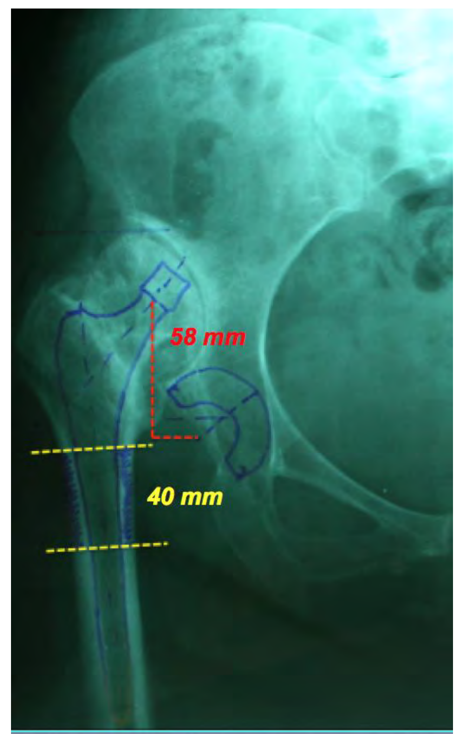
- Severe hip pain
- Considerable difficulty in walking and performing DA

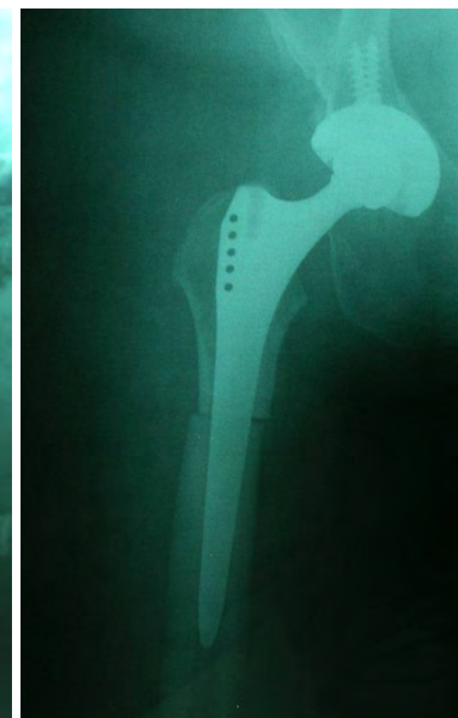
Surgical Procedure

In **ALL** cases the **ACETABULUM** was placed at its **NATURAL LEVEL**

FEMUR was correspondingly **INFERIORIZED**

The amount of **femoral shortening** was determined by an amount that would **NOT** lengthen the leg **> 40 mm** to avoid stretching of the sciatic nerve





Surgical Procedure

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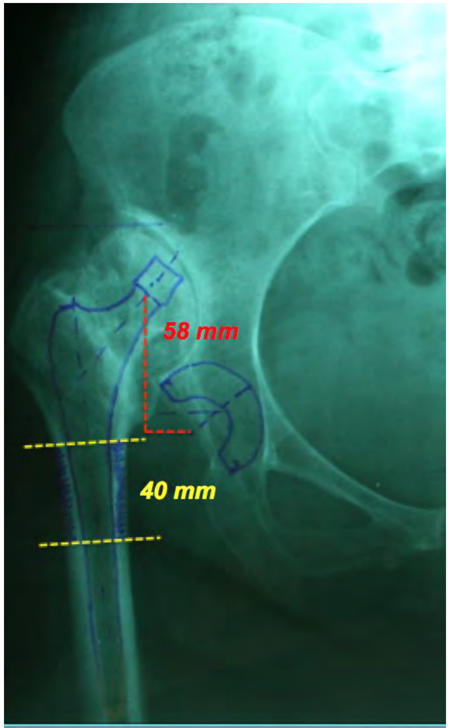
15 HIPS (84%) ST osteotomy

- **TRANSVERSE** osteotomy (**n.8**)
- **STEP-CUT** osteotomy (**n.7**)



Surgical Procedure

In **ALL** patients a **METAL ON POLYETHYLENE - CEMENTLESS THA**

DIRECT LATERAL ACCESS

S-ROM® Modular Hip System (DePuy)

- N. **14** cases

Stem SL – REVISION (Smith & Nephew)

- N.**4** cases

Surgical Procedure

In **ALL** patients a **METAL ON POLYETHYLENE - CEMENTLESS THA**

DIRECT LATERAL ACCESS

- Average **CUP** size: **44 mm**
- Average **HEAD** size: **26 mm**
- Average **STEM** size: **5**

BULK FEMORAL HEAD AUTOGRAFT

- N. **4** hips

PROXIMAL FEMUR WIRING

- N. **6** hips

Follow-up

Average FOLLOW-UP: 91 months (74-134 months)

AFTER SURGERY:

Patients **with SSO: partial weight-bearing** (15-20Kg) during the **first 3 months**, with progression to full WB the following weeks.

Patients **without SSO:** immediate weight-bearing

Clinical follow-up

– HHS / Trendelenburg sign

Radiological follow-up

– AP /LL X-ray

1 – 3 – 6 – 12 months

then every 1-2 year

Results

Harris Hip Score:

PRE-OP: **53.1** (32-51) → Last FU: **85.5** (77-93)

Limp/Trendelenburg sign

PRE-OP: Limp in **ALL** patients
Trendelenburg + in **14** pt

→

Last FU: **4** pt MODERATE limp
Trendelenburg + in **2** pt

Results

Average **femoral shortening**: 41 mm (2 – 6)

Average **leg lengthening**: 30 mm (1 – 4)

Average **leg length discrepancy**: 12.2 mm (45 mm PRE-OP)

13 osteotomies healed at an average of **4.9 months** (2-5 months)

- N.**1 delayed union** (transverse osteotomy) healed at 7 month
- N.**1 non-union** (transverse osteotomy): plate + graft

NO cases of NERVE PALSY, infection and early dislocation.

Author	Case	Osteotomy	Mean resected bone length (cm)	Nerve palsy	Nonunion
Takao et al.[7)]	33	Step-cut	3.1 (2.0–4.5)	0	0
Reikeras et al.[10)]	65	Transverse	5.0 (2.0–8.0)	2	1
Nagoya et al.[11)]	20	Transverse	2.1 (0–4.0)	0	0
Krych et al.[12)]	28	Transverse	4.0 (2.0–8.0)	0	2
Makita et al.[13)]	11	Step-cut	3.9 (2.0–5.0)	1	0
Masonis et al.[14)]	21	Transverse	3.8 (2.0–6.0)	0	2
Park et al.[15)]	24	Transverse	3.4 (2.0–4.2)	0	3

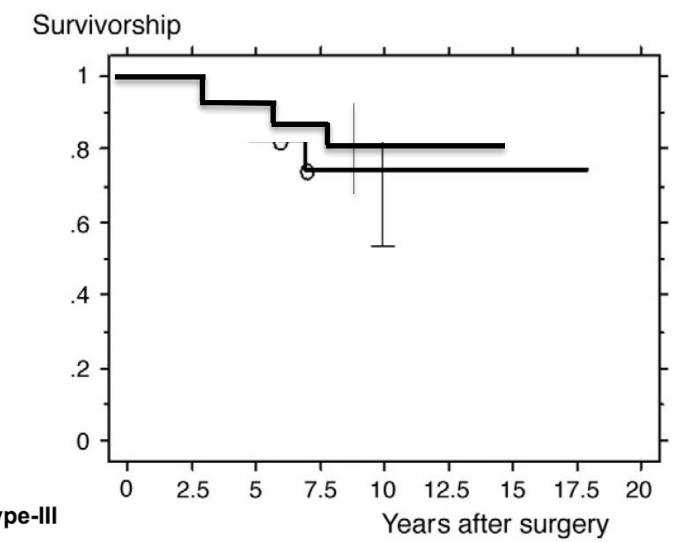
Results

REVISION in 3 HIPS

- **1 STEM LOOSENING** + SEVERE TIGH PAIN at **2** y/post-op
- **2 POLY WEAR OSTEOLYSIS** at **7,8** y/post-op

KAPLAN- MEIER survivorship analysis*:*

- **92.2% at 5 years (95% IC)**
- **81.8% at 8 years (95% IC)**



J Arthroplasty. 2015 Jun;30(6):1019-23. doi: 10.1016/j.arth.2015.01.045. Epub 2015 Feb 2.

Transverse Subtrochanteric Shortening Osteotomy During Cementless Total Hip Arthroplasty in Crowe Type-III or IV Developmental Dysplasia.

Sofu H[1], Kockara N[1], Gursu S[2], Issin A[1], Oner A[3], Sahin V[1].

89% at **5 years**

J Arthroplasty. 2007 Sep;22(6 Suppl 2):145-50. Epub 2007 Jul 27.

Total hip arthroplasty requiring subtrochanteric osteotomy for developmental hip dysplasia: 5- to 14-year results.

Bernasek TL[1], Haidukewych GJ, Gustke KA, Hill O, Levering M.

75% at **14 years**

Conclusions

Subtrochanteric shortening osteotomy (SSO) combined **with cementless THA** is a **safe and reliable procedure** for restoring the **anatomic hip center** in selected patients with **DDH**.

Nurological complications can be avoided not lengthening the leg > 40 mm.

It is critical to achieve **rotational stability** of the osteotomy site **to avoid non-union**, and it can be obtained with a **diaphyseal locking press-fit stem** (with either extensive porous coating or sharp anti-rotation flutes).

Achieving **good bone contact** at the osteotomy site is important **to avoid nonunion**. For this reason, if needed, the **bone ends should be trimmed** to optimize apposition.


Thank you for your attention

INTERNATIONAL COMBINED MEETING

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26-27 NOVEMBER 2015

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Long term results of the Charnley low-friction arthroplasty with bulk autograft of the femoral head for developmental dysplasia of the hip

D Shaw,

BM Wroblewski, P Bobak, VV Raut , PA Fleming, PD Siney

John Charnley Research Institute
Centre for Hip Surgery
Wrightington Hospital, UK.

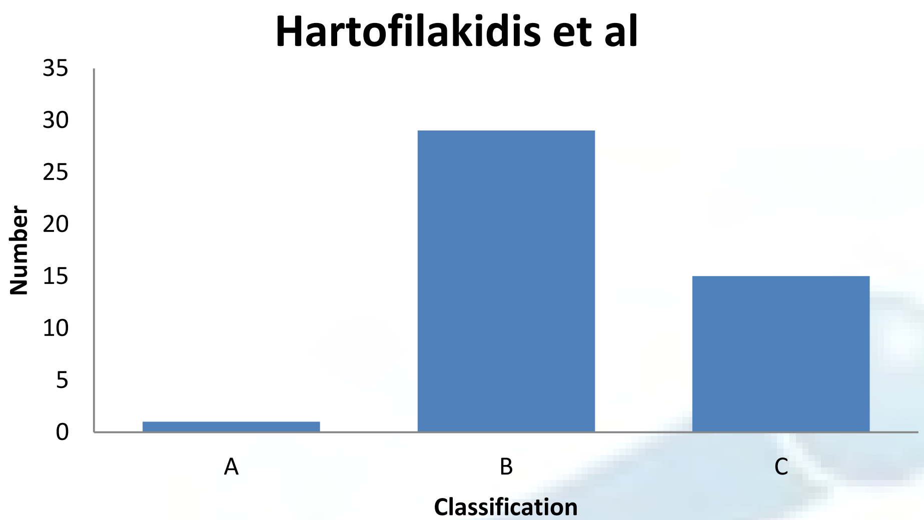
Background

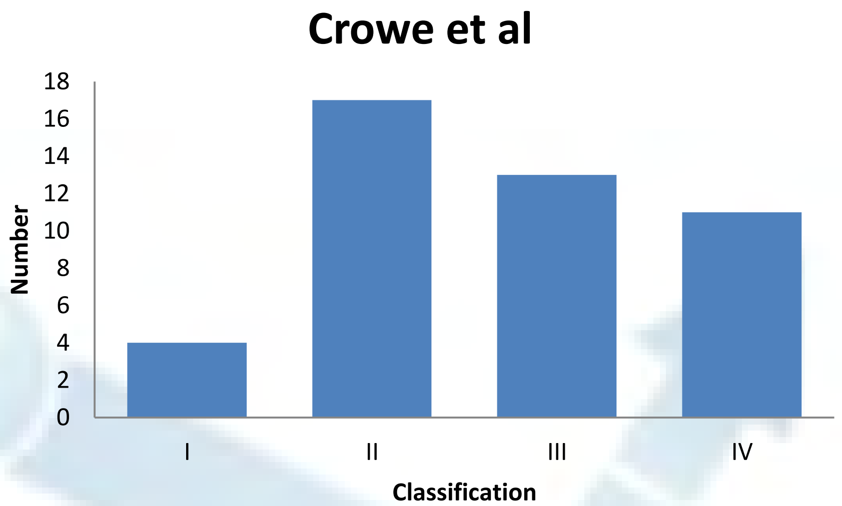
- Long term follow up of primary Charnley LFAs with femoral head autograft in patients with DDH
- Short and mid term results of cohort previously reported

Patients

- 41 patients (45 hips)
- Mean age 46 years (24-77)
- All had a primary diagnosis of DDH classified according to Crowe and Hartofilakidis

Crowe/ Hartofilakidis





Technique

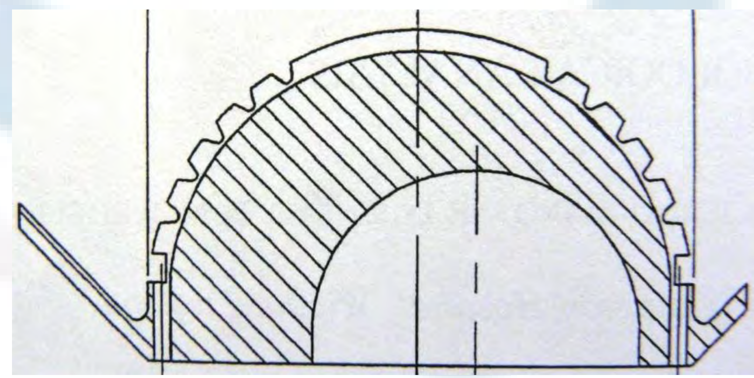
- Single surgeon
- Transtrochanteric approach
- Charnley gouges to prepare acetabulum
- Socket placed at level of teardrop
- Femoral head autograft prepared
- Screws and washers

Bone preparation

- Recipient acetabulum cleared of soft tissue but subchondral surface preserved
- Cancellous surface of donor bone

Components used

- Acetabulum
- Offset bore cup (35mm) - 9
- Small (40mm) – 1
- Standard (43mm) – 35



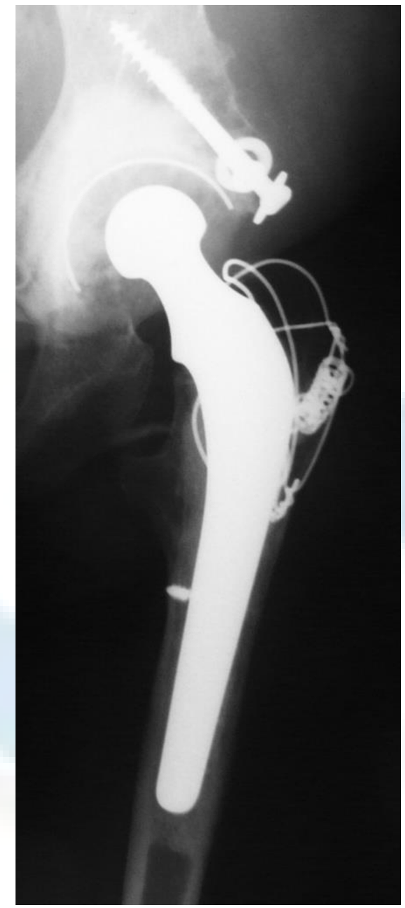
Offset –bore cup 38mm diameter

Components used

- Acetabulum
- Bone Screws
  - 1 screw – 9
  - 2 screws – 31
  - 3 screws – 5

Components

- Femur - Charnley stem
  - ¾ neck – 23
  - Standard – 17
  - Custom made - 5



¾ Neck

Post op regime

- Mobilise within one week
- Partial weight bearing 3 months
- Review at 3 months, one year and every two years after

Outcomes

	Number	Mean FU years	Range years
Deaths	12	12	1 - 25
Revisions	13	19	11 - 26
Still attending FU	20	23	16 - 30

Deaths

- 13/41 patients
- 5 deaths within first 10 years post op
- Mean follow up 12.4 years (1-25)

Complete Follow-up


Pre-op 1986


Post-op 1987


2007

Revisions

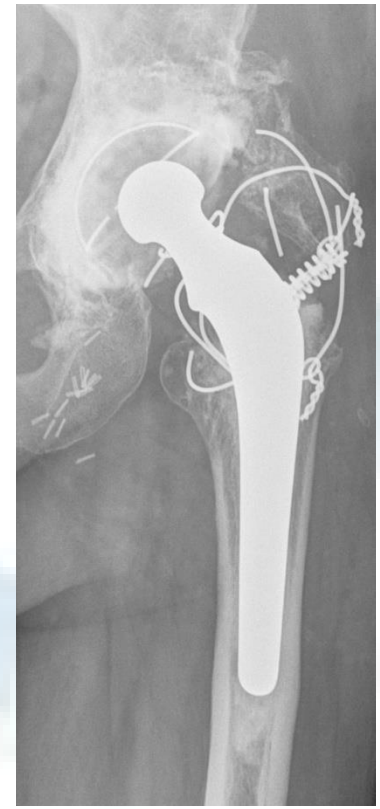
- 13/45 hips
- Reasons for revision
  - Loose socket - 10
  - Loose stem - 2
  - Infection - 1

Revision at 20 years

Pre-op 1988

Post-op 1988

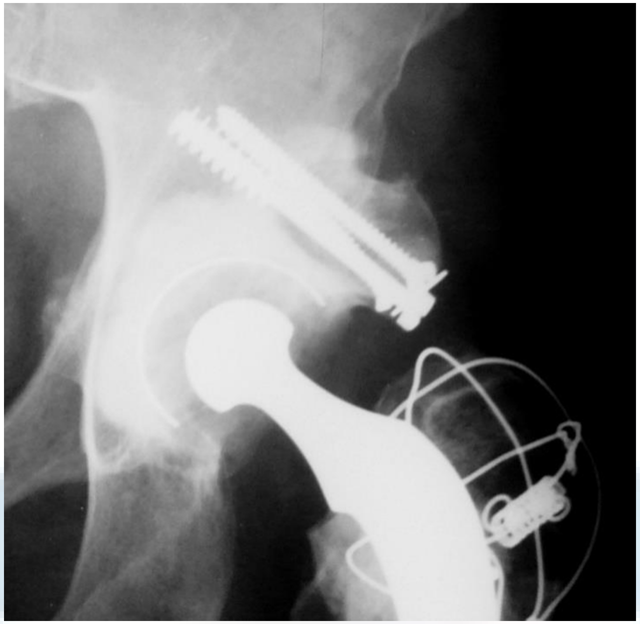
Pre-revision 2008

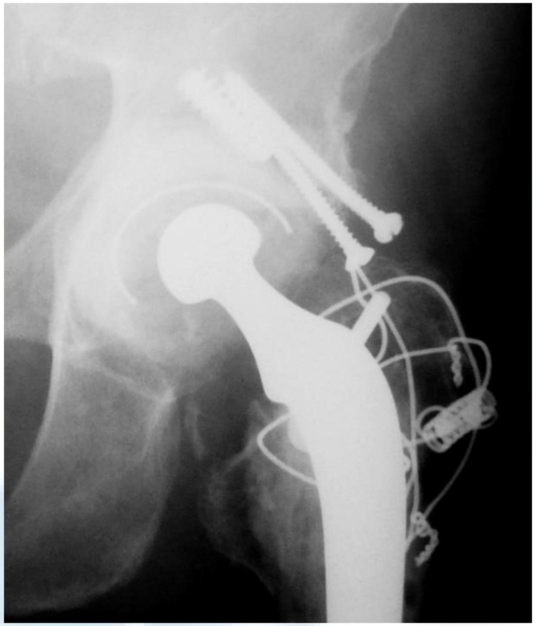


Latest FU 2014

Long term Follow-up


Pre-op 1986


Post-op 1986


Latest FU 2006

Conclusions

- Valuable technique
- Excellent early to mid-term results
- Encouraging long term results up to 30 years follow up
- Emphasises value of long term follow up

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Clinical Outcome of Total Hip Arthrosplasty (THA) After Iliofemoral Distraction In Hip Dislocations

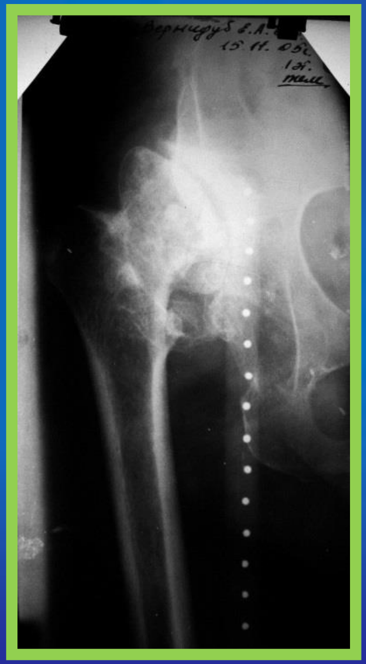
Stanislav Bondarenko, MD, Mandus Akonjom, MD,
Volodymyr Filipenko, MD

SYTENKO INSTITUTE OF SPINE AND JOINT PATHOLOGY
NATIONAL UKRAINIAN ACADEMY OF MEDICAL SCIENCES
KHARKIV, UKRAINE

Introduction

High dislocation of the hip

DDH



Fracture dislocation

Introduction

The problems and technical difficulties of THA:

- Dislocation of the proximal femur
- Defects and deformities of the acetabulum
- Scarring and adhesions

Consequences:

- Difficulty of insertion of the cup in the true acetabulum
- Difficulty with reducing the implant head into the cup
- High risk of posttraumatic nerve palsies in dislocations exceeding 3 cm
- Increased risk of deep vein thrombosis
- High risk of infection
- Increased risk of revision

Treatment Options

- Different types of shortening osteotomies of the femur

Lund KH et al. (1985)
Hartofilakidis G et al. (1998)
Krych AJ et al. (2010)
Starker M et al.(2011)
Charity JA et al.(2011)
Oe K et al. (2013)
Zagra L et al. (2015)

- Soft-tissue distraction with the use of external fixation

Baumgart R et al. (2005)
Lai KA et al. (2005)
Holinka J et al. (2011)

Aim of Study

- To retrospectively evaluate the clinical outcome of THA following iliofemoral distraction in hip dislocations.

Material and Methods

- 10 patients (10 hips) with hip dislocations
- 8 males(80%), 2 females(20%)
- Average age: 36,4 (22-56) years old
- Diagnosis:
  - 5 patients - unilateral Crowe Type IV hip dislocation
  - 2 patients – nonunion of femoral neck fractures with high dislocation (>6cm) of the proximal femur
  - 2 patients - consequences of non-reduced acetabular fracture with migration of the femoral head into the pelvis with pelvic discontinuity
  - 1 patient - posttraumatic ankylosis at the false acetabulum

Material and Methods

- Iliofemoral distraction using monolateral and bilateral external fixator was done in all cases for an average duration of 68 (54-82) days

- 7 uncemented, 2 cemented and one reverse hybrid THA

- In 7 cases acetabular reconstruction was perfomed using autografts

Results

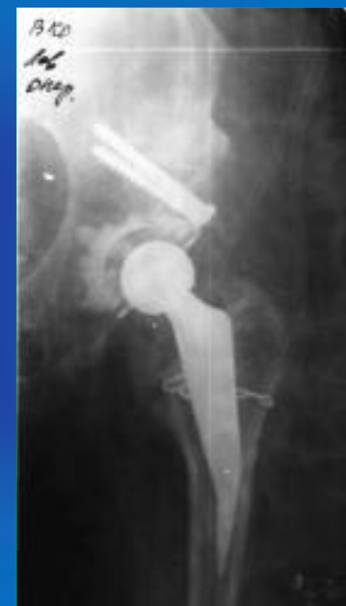
- The average medium duration of follow up was 5,4 years (range 3 to 11 years)
- The Harris Hip Score improved from 32 to 80
- The average length gained was 5,9 (2,6-9,7) cm
- There were no instances of components migration
- Bone graft incorporation: 7/7 (100%)
- 5 complications (5/10, 50%):
  2(20%) pin track infection
  1(10%) pin breakage during distraction
  2(20%) deep infection with implant revision

Clinical case:

Patient R., 49 y.o. Crowe Type IV Hip Dislocation

Prior to surgery

The first stage of treatment



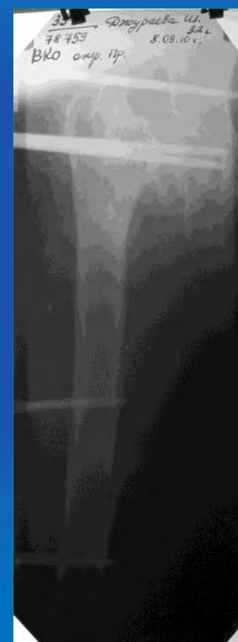
The second stage of treatment

7 years after surgery

Clinical case:

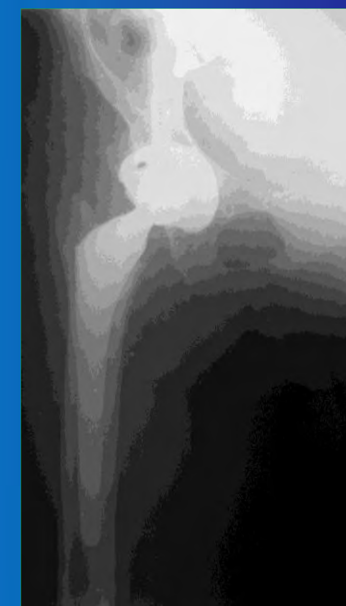
Patient D., 32 y.o. Nonunion of femoral neck fracture with dislocation of the proximal femur

Prior to surgery



First stage of treatment

After distraction



5 years after THA

Clinical case:

Patient B., 22 y.o. Fracture-dislocation of the right hip with pelvic discontinuity.

Prior to surgery

First stage of treatment

After distraction

After THA

5 years after THA

Conclusion

- Two staged procedure following iliofemoral distraction before THA is a viable treatment option for hip dislocation especially in Crowe Type IV with severe limb length discrepancy.

- Iliofemoral distraction is indicated to restore limb length without nerve palsy and to reduce the technical difficulties associated with intraoperative adhesions and scarring.

Thank you!

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

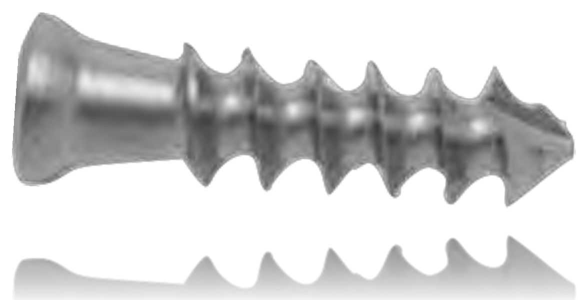
26-27 NOVEMBER 2015

MILAN, ITALY

DARE YOU STILL USE SCREWS?

Prospective Densitometric Study On Trabecular Titanium™ With Screw Fixation

Periacetabular Osseointegration:Outcomes At 1-year Follow-UP



MASAKI MIZUSHIMA

YONEMORI HOSPITAL , JAPAN

米盛病院
Yonemori Hospital

about COI

Disclosure of conflict of interest

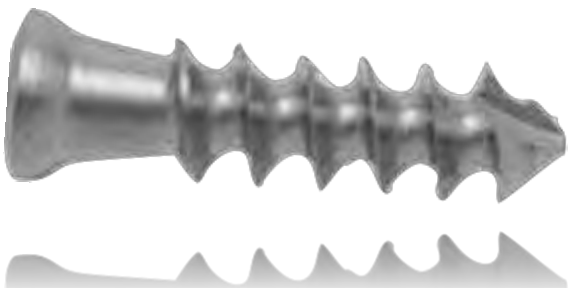
We have nothing to declare for this study.

MASAKI MIZUSHIMA

YONEMORI HOSPITAL , JAPAN

Adjuvant screws

for initial fixation



We generally tend to rely on screws

to reduce the risk of loosening or migration of the cup.

Introduction

Trabecular Titanium™

is a three-dimensional, multi planar, regular, hexagonal cell structure characterised by high open porosity that imitates the morphology of the trabecular bone.

Marin E et al :J Mech Behav Biomed Master.2010

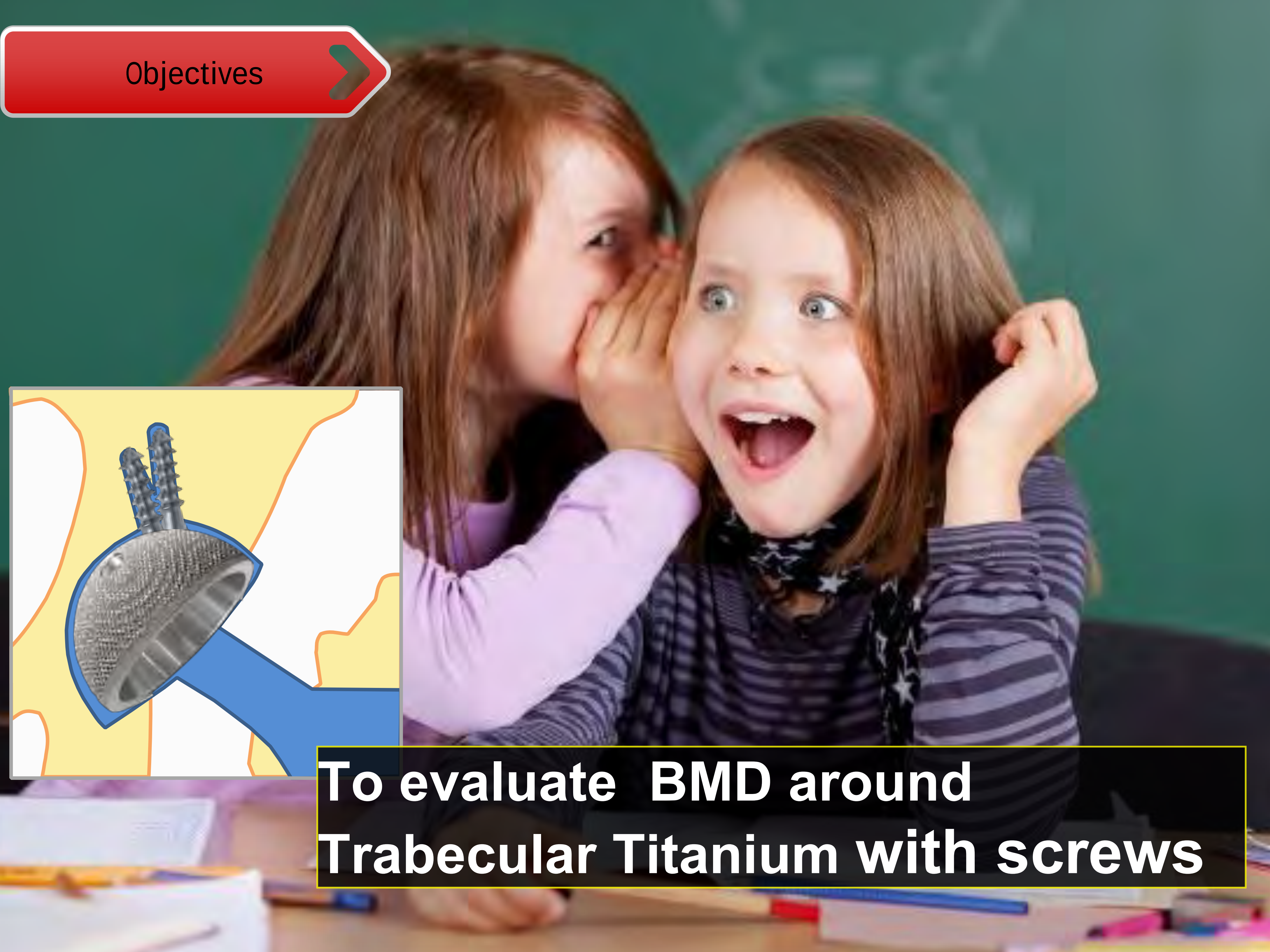
may contribute to more stable initial fixation

Osseointegration

Introduction

There are no reports about Bone Densitometric Study On Trabecular Titanium with screws

Objectives



To evaluate BMD around Trabecular Titanium with screws

Materials

May.2013 - Jun.2014

31 patients undergone primary THA

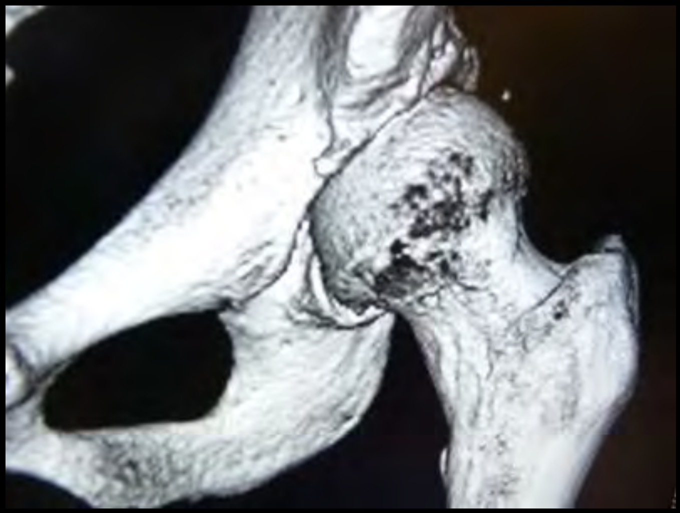
all TT cups implanted with 2 screws

1-year follow-up	
sex	26 females, 5males
age	48 y.o.~84y.o.(67.1y.o)
BMI	17.3 ~31.7 (23.2)
Diag.	OA 29, RA 1, SLE 1
R/L	R 17, L 14
surfaces	30 C on P, 1 M on P

Materials

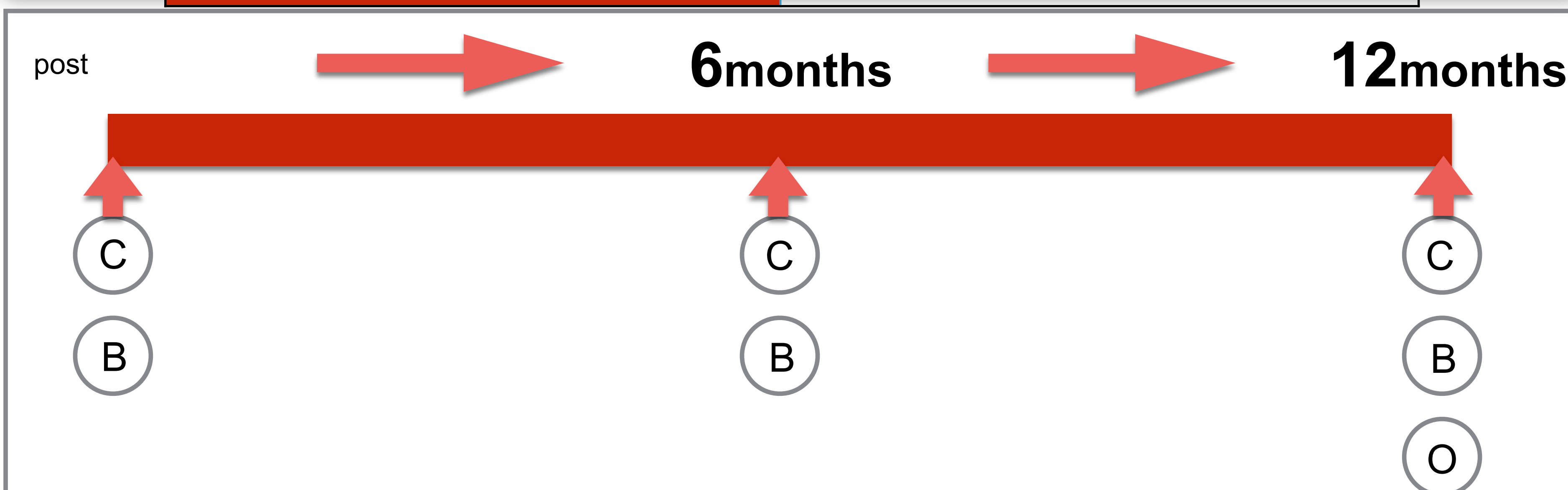
31 patients undergone primary THA

Zweimuller type



Evaluations

C	**CLINICAL score**	**JOA score** (JOA:Japanese Orthopedic Association)
B	**BMD**	**DEXA** with DeLee and Charnley 3 ROIs
O	**OSSEOINTEGRATION**	**Radiographic signs** by Moore



Evaluations

JOA hip score

(JOA:Japanese Orthopedic Association)

ADL	20
walking ability	20
ROM	20
pain	40
total	100

疼痛	右	左
股関節に関する愁訴がまったくない.	40	40
不定愁訴（違和感、疲労感）があるが，痛みはない.	35	35
歩行時痛みはない（ただし歩行開始時あるいは長距離歩行後疼痛を伴うことがある）.	30	30
自発痛はない．歩行時疼痛はあるが，短時間の休息で消退する.	20	20
自発痛はときどきある，歩行時疼痛があるが，休息により軽快する.	10	10
持続的に自発痛または夜間痛がある.	0	0
具体的表現		

可動域		右	左
屈曲			
伸展			
外転			
内転			
点数注）	屈曲		
	外転		

注）関節角度を 10° 刻みとし，屈曲には 1 点，外転には 2 点与える．ただし屈曲 120° 以上はすべて 12 点，外転 30° 以上はすべて 8 点とする．屈曲拘縮のある場合にはこれを引き，可動域で評価する.

歩行能力	
長距離歩行，速歩が可能．歩容は正常.	20
長距離歩行，速歩は可能であるが，軽度の跛行を伴うことがある.	18
杖なしで，約 30 分または 2 km歩行可能である．跛行がある，日常の屋外活動にほとんど支障がない.	15
杖なしで，10 ～ 15 分程度，あるいは約 500 m 歩行可能であるが，それ以上の場合 1 本杖が必要である．跛行がある.	10
屋内活動はできるが，屋外活動は困難である．屋外では 2 本杖を必要とする.	5
ほとんど歩行不能.	0
具体的表現	

日常生活動作	容易	困難	不可
腰かけ	4	2	0
立ち仕事(家事を含む) 注1）	4	2	0
しゃがみこみ・立ち上がり 注 2）	4	2	0
階段の昇り降り 注3）	4	2	0
車，バスなどの乗り降り	4	2	0

注 1）持続時間約 30 分．休息を要する場合困難とする．5 分くらいしかできない場合，不能とする.
注 2）支持が必要な場合，困難とする.
注 3）手すりを要する場合は困難とする.

病名：　治療法：　手術日：　年　月　日

カテゴリー：　A：　片側　B：両側　C：多関節罹患

表記方法：

$$\frac{\text{右, 左}}{\text{両側の機能}} \cdots \frac{\text{疼痛+可動域}}{\text{歩行能力+日常生活動作}}$$

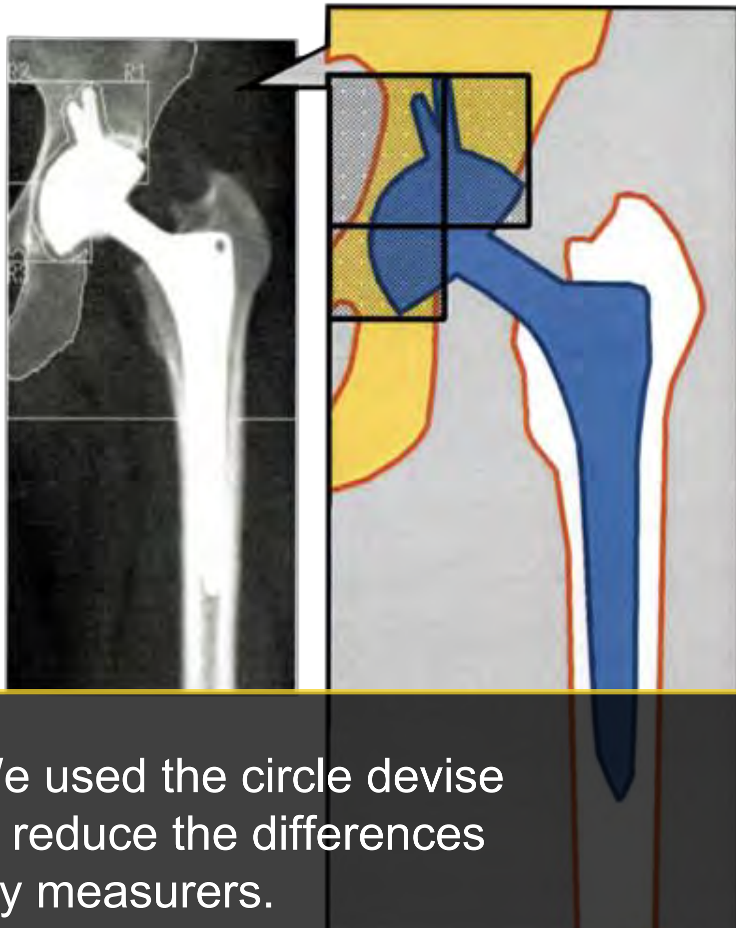
総合評価	右	左

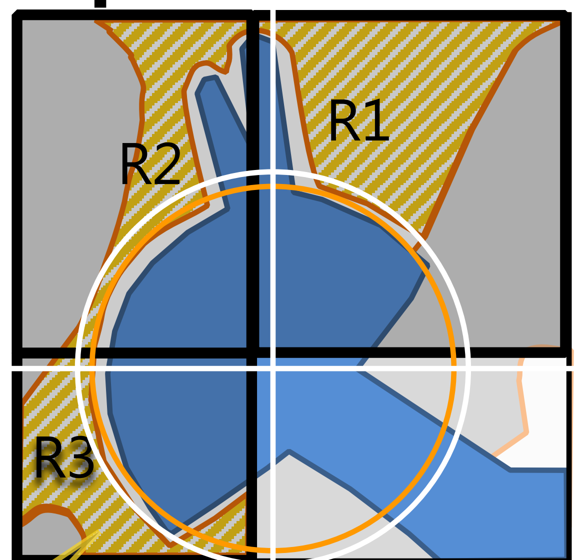
IMURA et al: J. Jpn. Orthop. Assoc.,1995

Evaluations

according to the types
by DeLee,Charnley J:CORR1976

How to measure BMD around the acetabular component with screws





We used the circle devise
to reduce the differences
by measurers.

QD-R DELPHI W(13.3.0.1)

Evaluations

CLINICAL ORTHOPAEDICS AND RELATED RESEARCH
Number 444, pp. 176–183

Radiographic Signs of Osseointegration in Porous-coated Acetabular Components

Milan S. Moore, MD; James P. McAuley, MD†; Anthony M. Young, MSE†; and Charles A. Engh, Sr., MD†*

absence of radiolucent line

a superolateral buttress

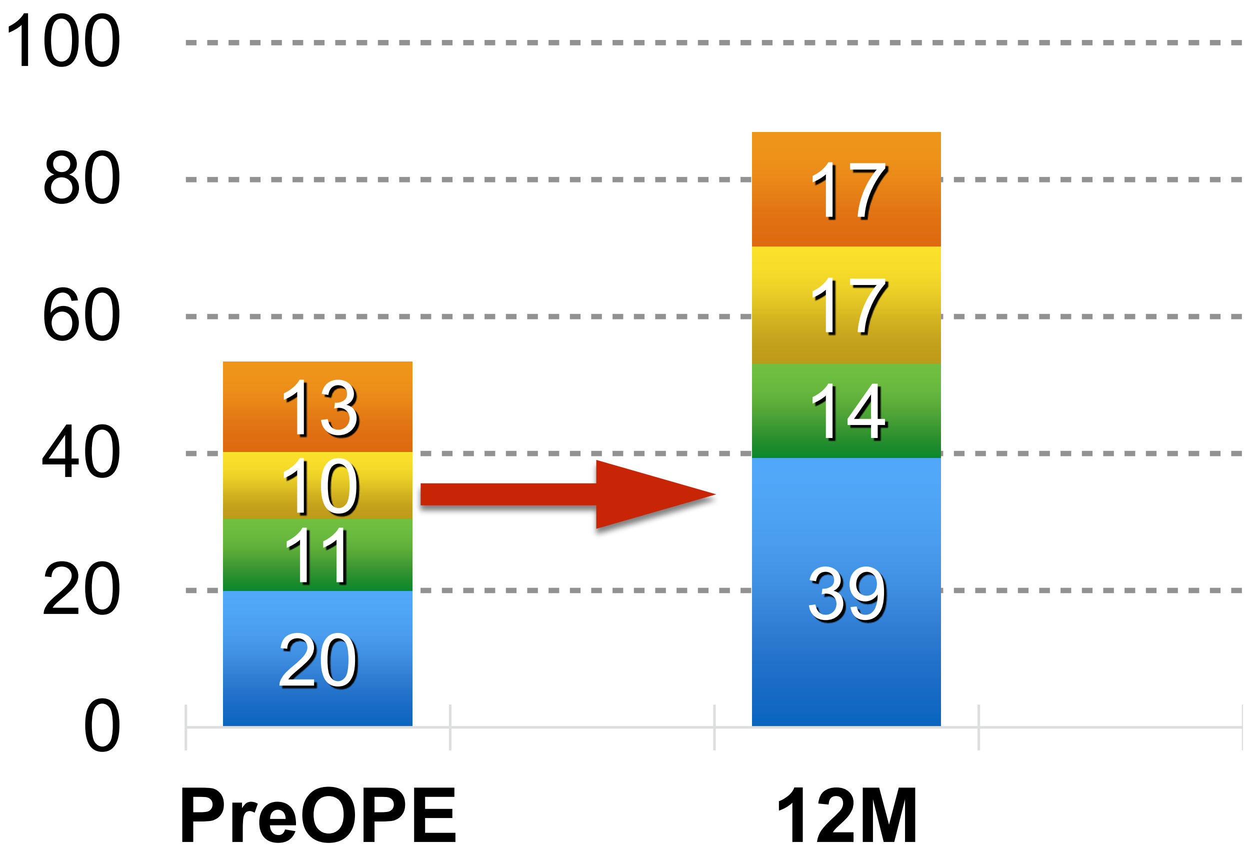
medial stress-shielding

high positive predictive value for bone ingrowth

radial trabecurae

an inferomedial buttress

Results



53.4 86.9

JOA hip score
(JOA:Japanese Orthopedic Association)

ADL	20
walking ability	20
ROM	20
pain	40
total	100

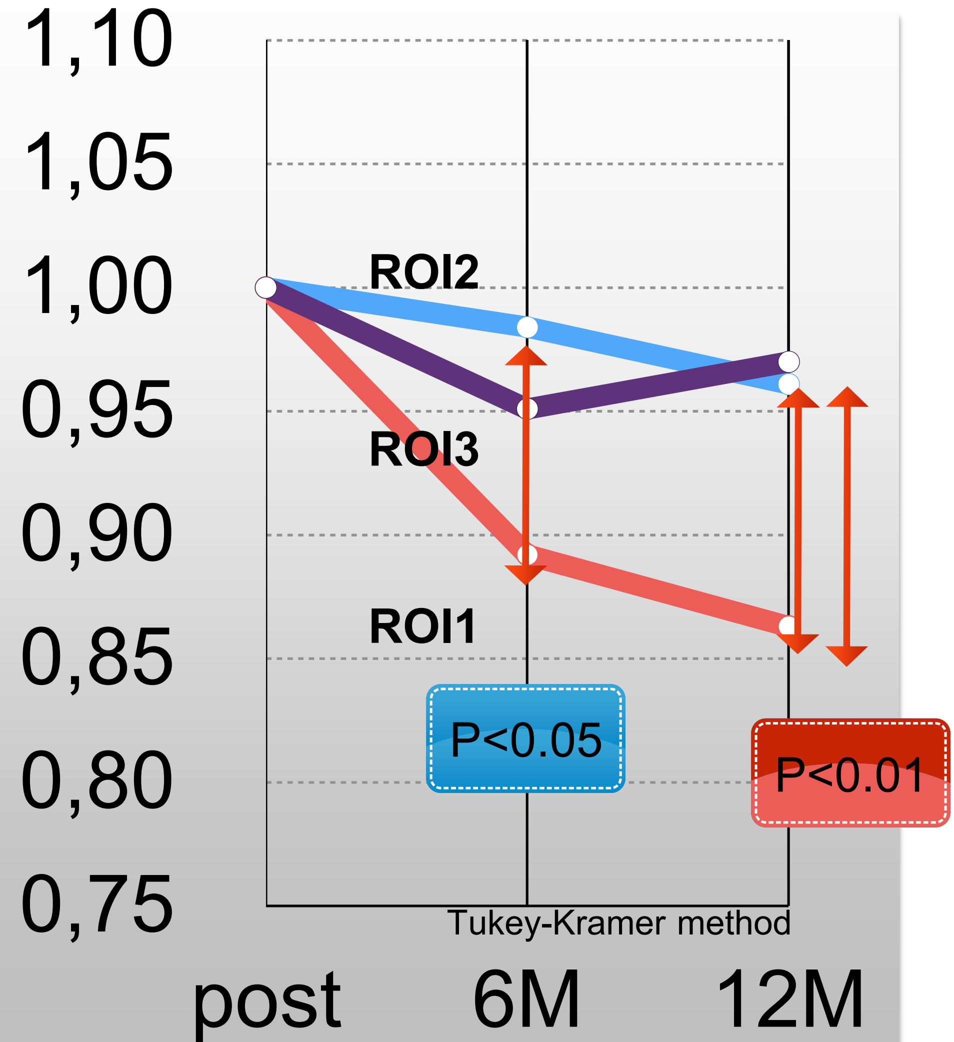
Results

Materials

May.2013 - Jun.2014

31 patients undergone primary THA
all TT cups implanted with 2 screws

	postope	6M	12M
ROI1	*1*	*0.892*	*0.863*
ROI2	*1*	*0.984*	*0.961*
ROI3	*1*	*0.951*	*0.970*



BMD reduction : ROI1 > ROI2 (6M/post)

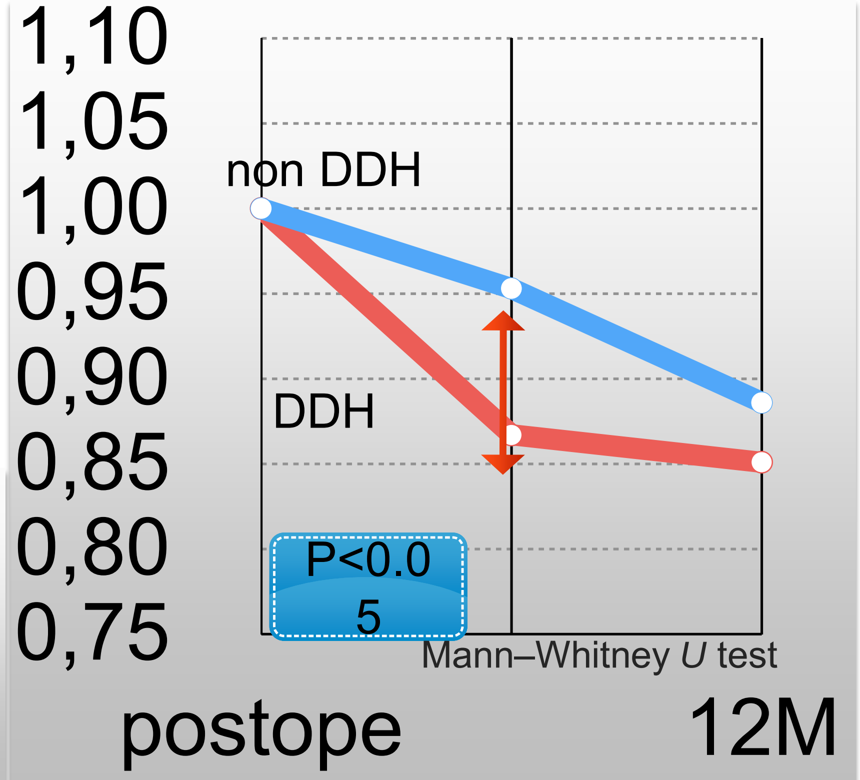
BMD reduction : ROI1 > ROI2 & ROI3 (12M/post)

Results

Materials

DDH vs OA(non DDH)

ROI1	postope	6M	12M
DDH	1	0.867	0.851
OA (nonDDH)	1	0.953	0.886



BMD of ROI 1 reduction : DDH > nonDDH (6M/post)

Materials

Osteoporosis vs non Osteoporosis

No statistical significance between two groups

Results

100%

absence of radiolucent line

81%

a superolateral buttress

42%

medial stress-shielding

45%

radial trabecurae

no radiolucent lines and cup migrations

55%

an inferomedial buttress

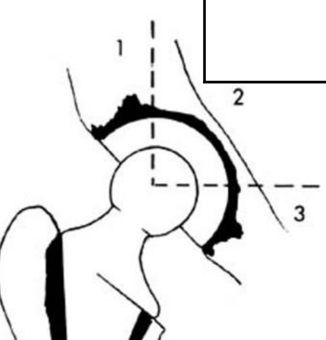
BUT…

We can’t achieve sufficient signs of osseointegration at 1-year follow up

without screws

The Previous reports about cementless cups according to DeLee-Charnley's 3-ROIs

First author	FU(years)	Hips N	BMD changes
Field(2006)	2	11	ROI 1 ±0% ROI 2 ±0% ROI 3 -14%
Kim(2007)	5	100	ROI 1 20% ROI 2 -25% ROI 3 1%



BMD reduction proximal medially(ROI2,3).

BMD increase proximal laterally(ROI1).

Discussion

It is controversial as to whether screws are necessary in THA

The Journal of Arthroplasty Vol. 25 No. 2 2010

Cementless Acetabular Fixation With and Without Screws

Analysis of Stability and Migration

Richard Iorio, MD,* Brian Puskas, MD,† William L. Healy, MD,*
John F. Tilzey, MD,* Lawrence M. Specht, MD,* and Michael S. Thompson, MD*

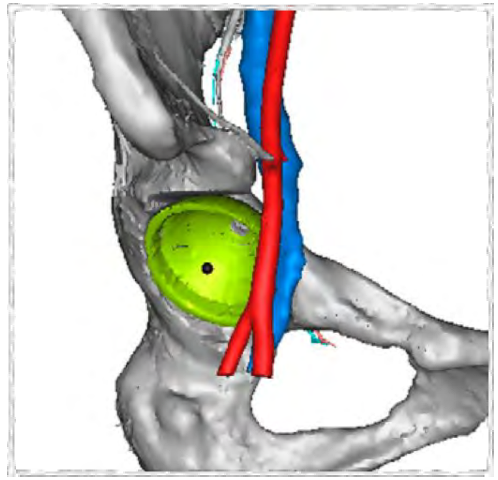
509 cups with screws VS 266 cups without screws

Abstract: The purpose of this study was to compare initial stability and late migration of 775 cementless acetabular components with and without screw fixation. Screw fixation was used in 509 cups and no screws in 266 cups. Average follow-up in the screw fixation group was 6.32 years (range, 2-10 years) and 6.9 years (range, 2-10 years) in the no-screw group. One component (0.2%, osteolysis) in the screw group and one (0.4%, loss of fixation) in the no-screw group required revision. Osteolytic lesions more than 4 cm^2 were noted in 8 (1.6%) screw fixation cups and 2 (0.75%) no-screw fixation cups. No cups in either cohort had radiographic evidence of migration. Screw fixation did not have a favorable or adverse effect on the outcome of acetabular reconstruction. **Keywords:** cementless, acetabular, fixation, with screws, without screws.

Cups can be successfully stabilized and fixed with or without screw fixation.

Disadvantages of Screw Fixation of Acetabular Components

promote osteolysis?

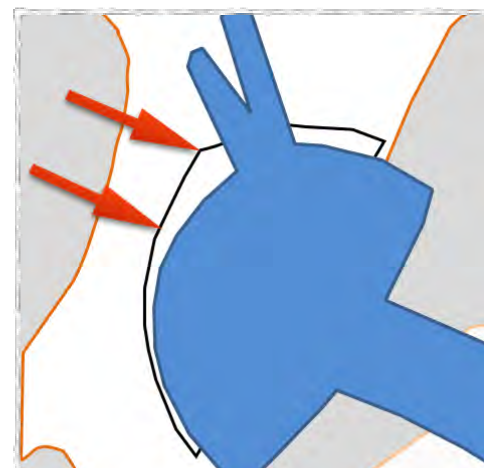


vascular and nerve injury

difficulty in revision

cost

time

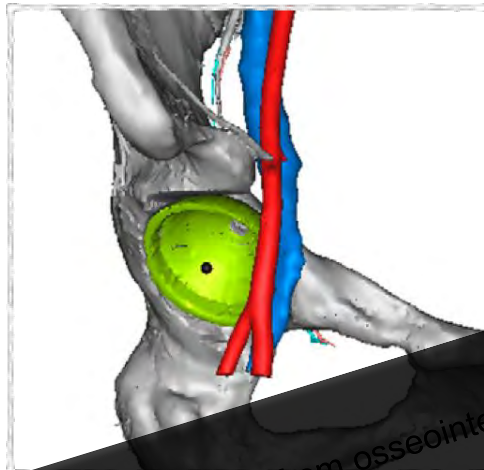


lift cup up

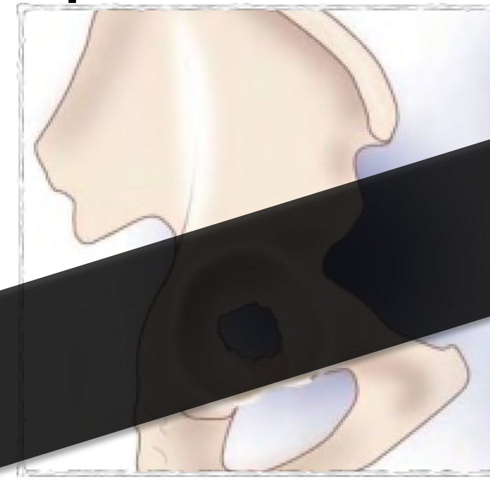
Discussion

Disadvantages of Screw Fixation of Acetabular Components

promote osteolysis?



vascular and nerve injury

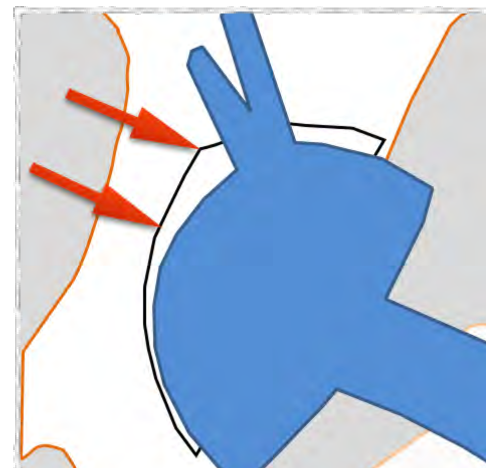


difficulty in revision

the possibility of prevention from osseointegration?

cost

time



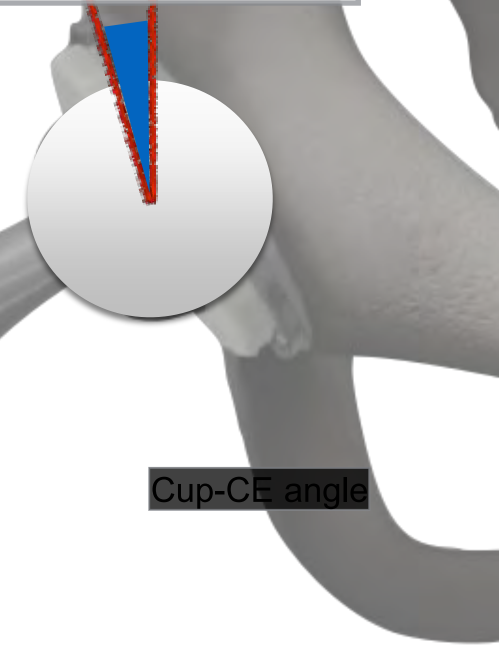
lift cup up

Discussion

to keep
from screws

The Results of a Press-Fit-Only Technique for Acetabular Fixation in Hip Dysplasia

- 98 hips,Trilogy Cup
- 7.4 y follow up(6-11y)
- Crowe Type Ⅰ/Ⅱ/Ⅲ:68/16/16%
- Cup-CE angle:**8.4**-49.9(26.3)°
- No revision!

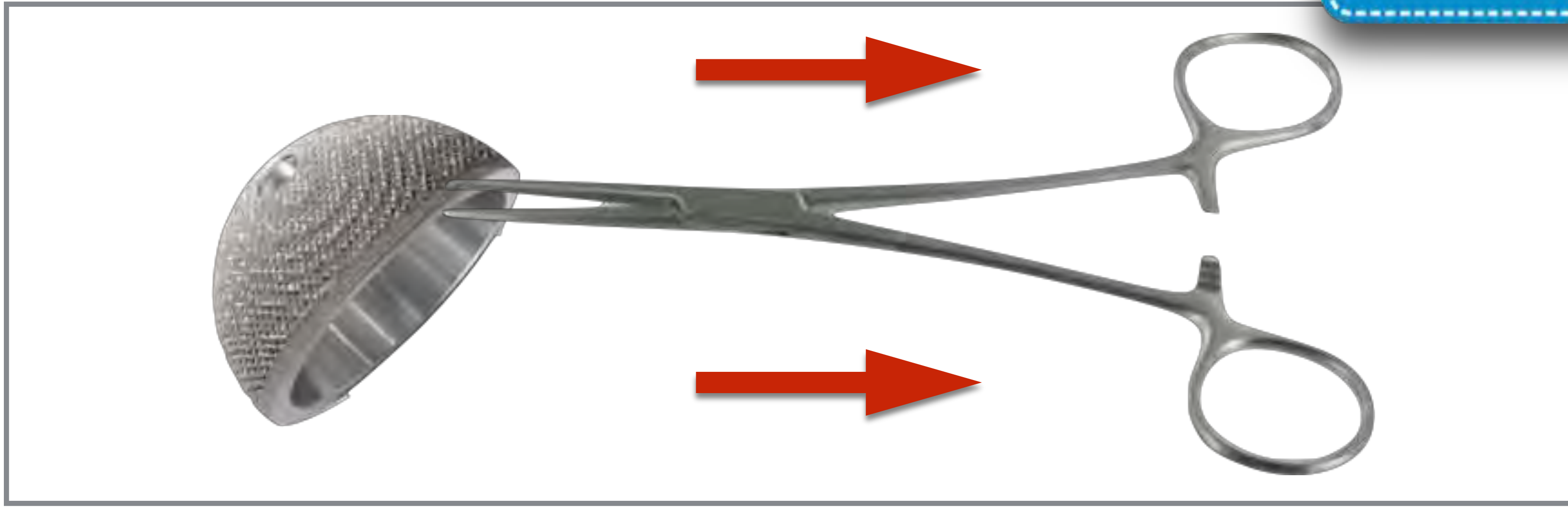


CUP-CE>=8.4°
WE NEED NOT USE ANY SCREWS

(Takao:J. Arthroplasty , 2011)

Discussion

to keep from screws



underreaming

choosing cup without holes

implantation with a straight holder

test by pulling on the rim with a Kocher clamp

It's easy to practice

The Journal of Arthroplasty Vol. 25 No. 2 2010

Cementless Acetabular Fixation With and Without Screws

Analysis of Stability and Migration

Richard Iorio, MD,* Brian Puskas, MD,† William L. Healy, MD,* John F. Tilzey, MD,* Lawrence M. Specht, MD,* and Michael S. Thompson, MD*

My opinion

WHY BMD reduction in ROI1 in using screws?

1. destroying the structure of bone by screws
2. changing the mechanisms of loading stress
3. the existence of the path for the debris
4. mismeasuring

⋮

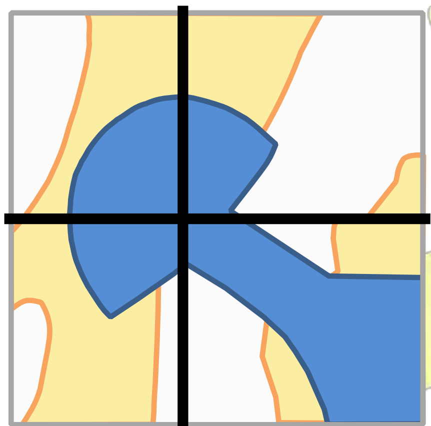
5. only due to my technique ?

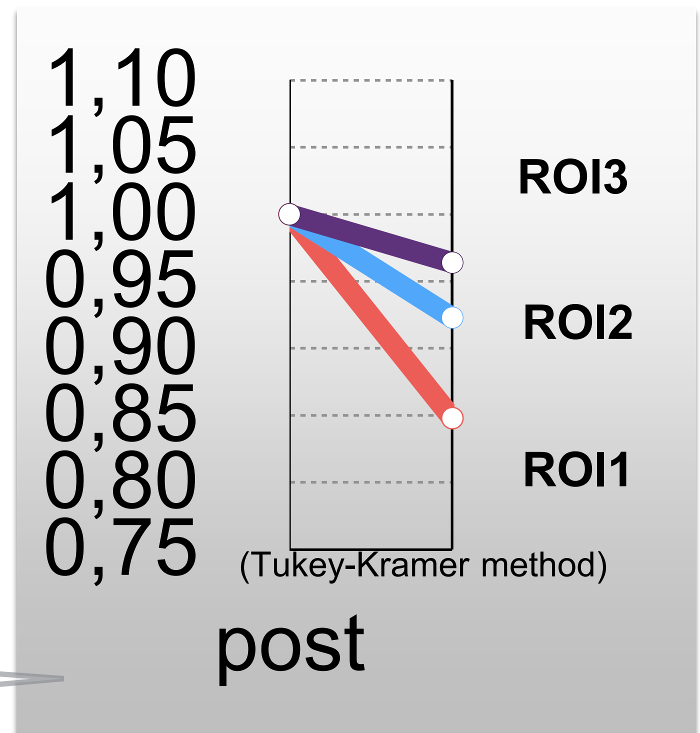
More study is needed to analyze the results.

Further study

Mar.2015 –

We are now collecting data about …
BMD around cups without screws





<u>no statistical significance at 6M</u>
among ROI1,ROI2 and ROI3

Conclusions

Adjuvant screws may cause the decreasing of BMD of ROI 1.

My opinion

FOR BONE PRESERVATION

If component stability is enough,
the surgeon should have a high threshold for using screws.

more questions and discussions

contact

don't hesitate to contact me

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INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Modular trabecular titanium cups in complex primary cases

Assoc. Prof. MUDr. Boris Šteňo, PhD.

II. University Department of Orthopaedics and Trauma Surgery, Comenius University Medcial School, Bratislava, Slovakia

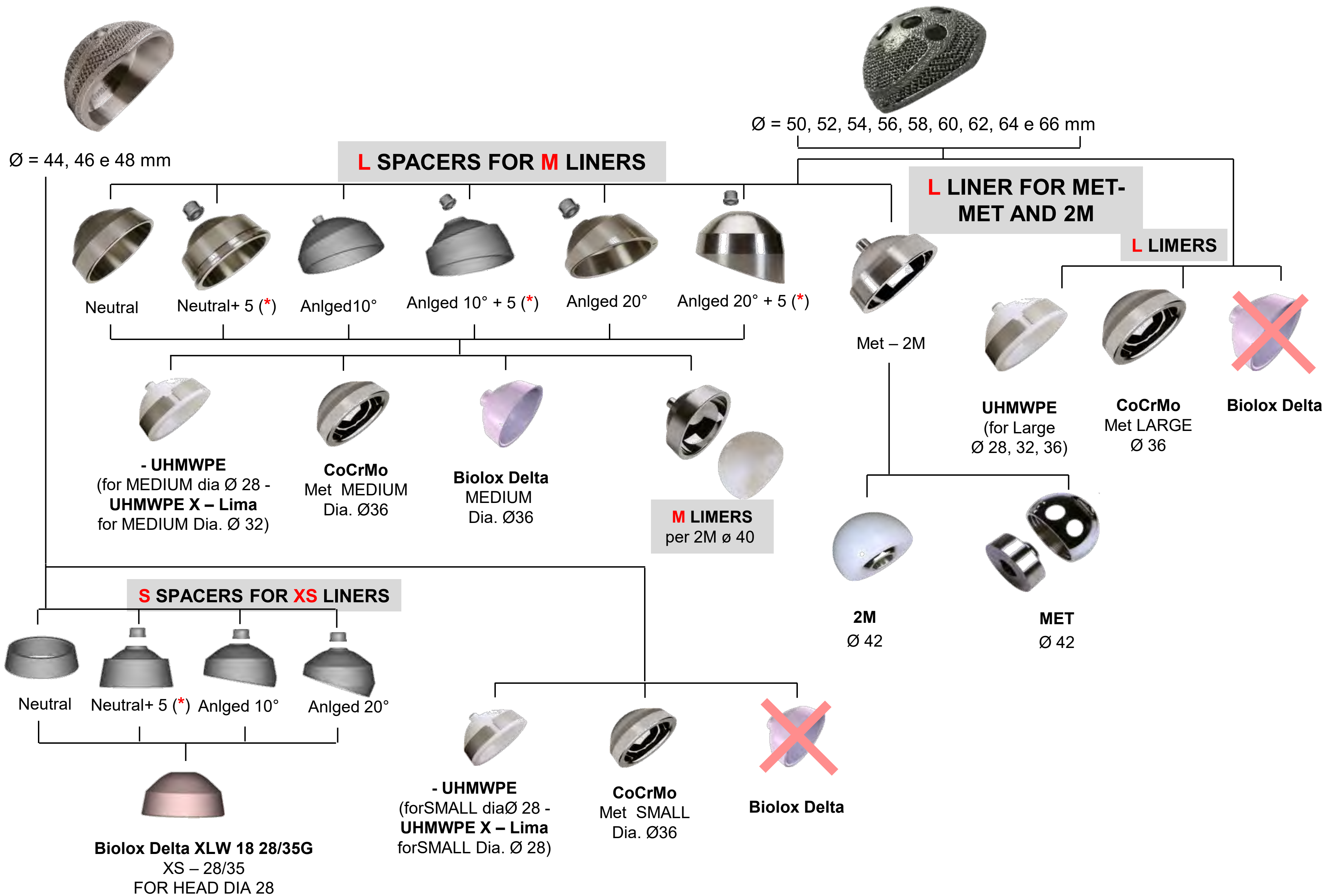
Cementless acetabular cups

- Over 3 decades of success in primary cases
- Limitation of their use in complex cases

Trabecular titanium cups (TT) with internal and external modularity

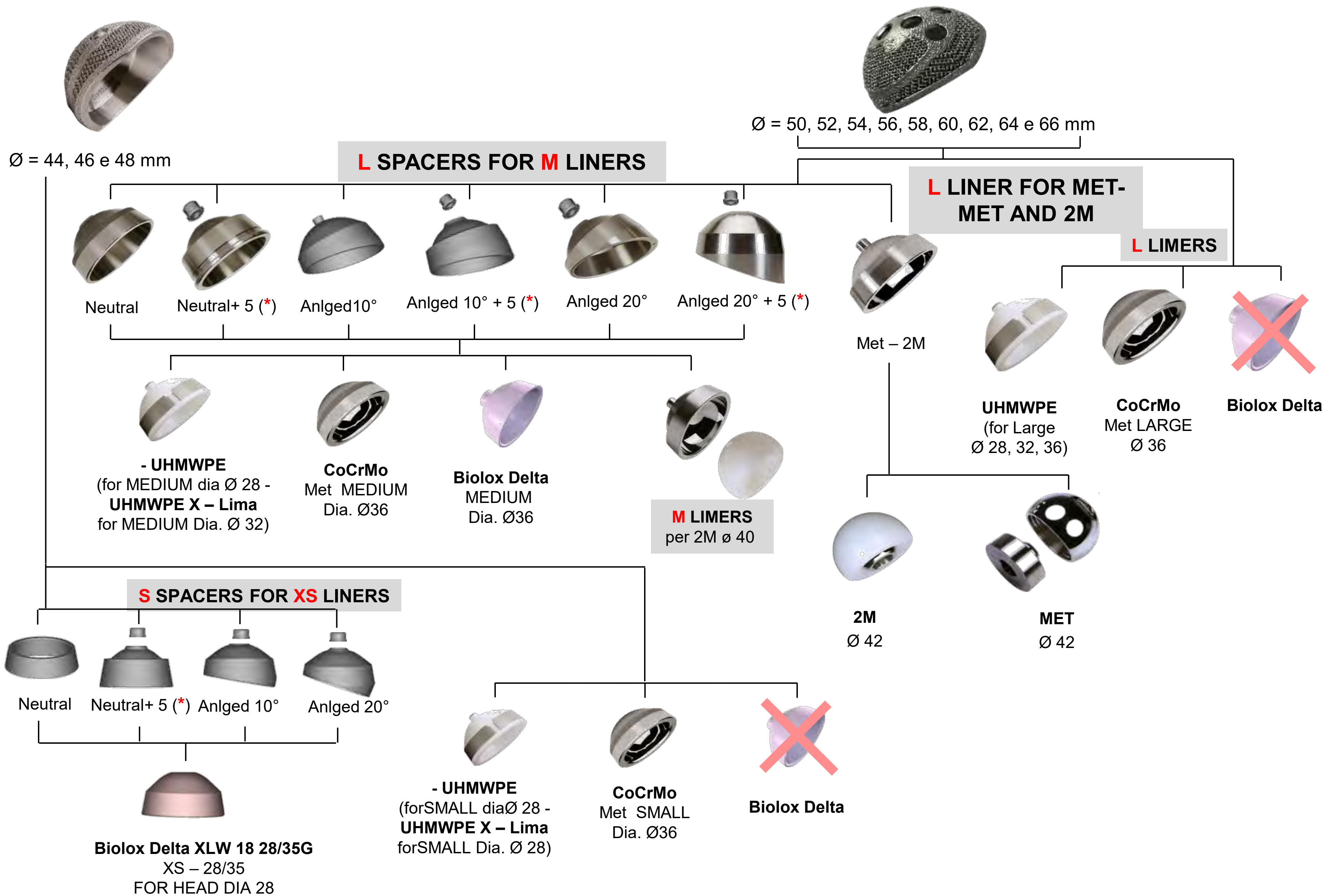
- Advantage intraoperatively to cover the head
- Lower risk of dislocation
- Modularity in tribological surface
  - COC
  - MOP
  - MOM
  - Double mobility (DM)

DELTA ONE TT



Ø = 44, 46 e 48 mm
Ø = 50, 52, 54, 56, 58, 60, 62, 64 e 66 mm
L SPACERS FOR M LINERS
Neutral
Neutral+ 5 (*)
Anlged10°
Anlged 10° + 5 (*)
Anlged 20°
Anlged 20° + 5 (*)
L LINER FOR MET-MET AND 2M
L LIMERS
Met – 2M
- UHMWPE
(for MEDIUM dia Ø 28 -
UHMWPE X – Lima
for MEDIUM Dia. Ø 32)
CoCrMo
Met MEDIUM
Dia. Ø36
Biolox Delta
MEDIUM
Dia. Ø36
M LIMERS
per 2M ø 40
UHMWPE
(for Large
Ø 28, 32, 36)
CoCrMo
Met LARGE
Ø 36
Biolox Delta
2M
Ø 42
MET
Ø 42
S SPACERS FOR XS LINERS
Neutral
Neutral+ 5 (*)
Anlged 10°
Anlged 20°
Biolox Delta XLW 18 28/35G
XS – 28/35
FOR HEAD DIA 28
- UHMWPE
(forSMALL diaØ 28 -
UHMWPE X – Lima
forSMALL Dia. Ø 28)
CoCrMo
Met SMALL
Dia. Ø36
Biolox Delta

DELTA ONE TT



Ø = 44, 46 e 48 mm
Ø = 50, 52, 54, 56, 58, 60, 62, 64 e 66 mm
L SPACERS FOR M LINERS
Neutral
Neutral+ 5 (*)
Anlged10°
Anlged 10° + 5 (*)
Anlged 20°
Anlged 20° + 5 (*)
L LINER FOR MET-MET AND 2M
L LIMERS
Met – 2M
UHMWPE (for Large Ø 28, 32, 36)
CoCrMo Met LARGE Ø 36
Biolox Delta
- UHMWPE (for MEDIUM dia Ø 28 - UHMWPE X – Lima for MEDIUM Dia. Ø 32)
CoCrMo Met MEDIUM Dia. Ø36
Biolox Delta MEDIUM Dia. Ø36
M LIMERS per 2M ø 40
2M Ø 42
MET Ø 42
S SPACERS FOR XS LINERS
Neutral
Neutral+ 5 (*)
Anlged 10°
Anlged 20°
Biolox Delta XLW 18 28/35G XS – 28/35 FOR HEAD DIA 28
- UHMWPE (forSMALL diaØ 28 - UHMWPE X – Lima forSMALL Dia. Ø 28)
CoCrMo Met SMALL Dia. Ø36
Biolox Delta

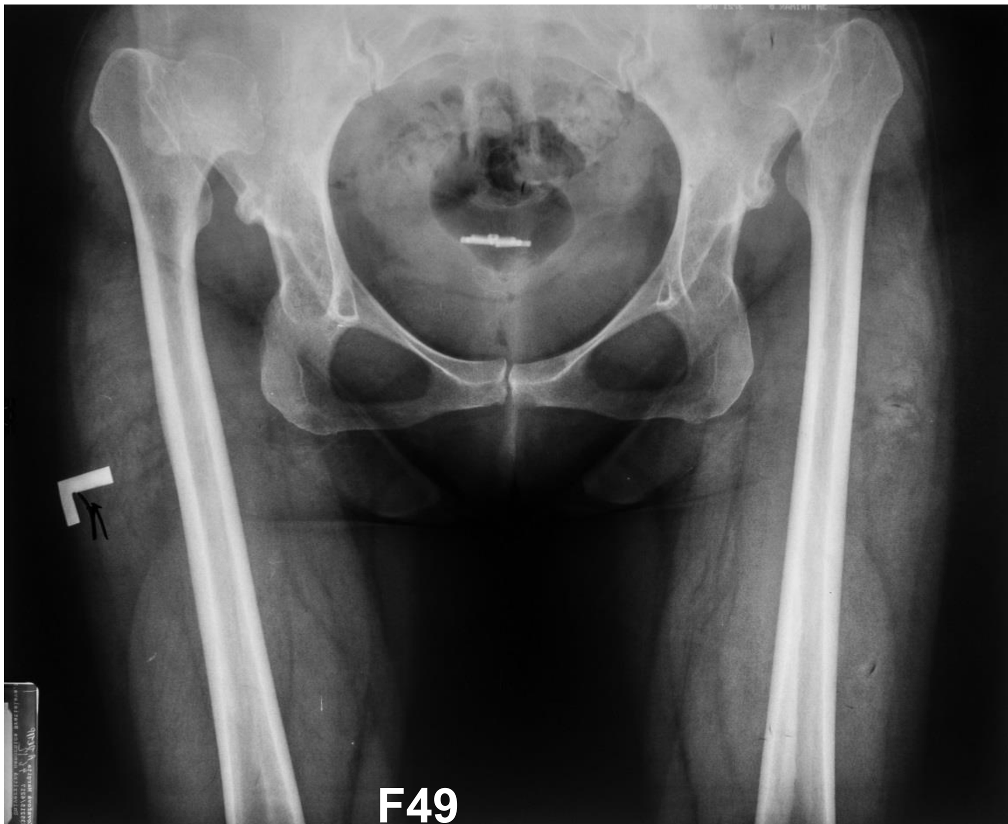
April 2010-December 2014 a modular TT acetabular cup

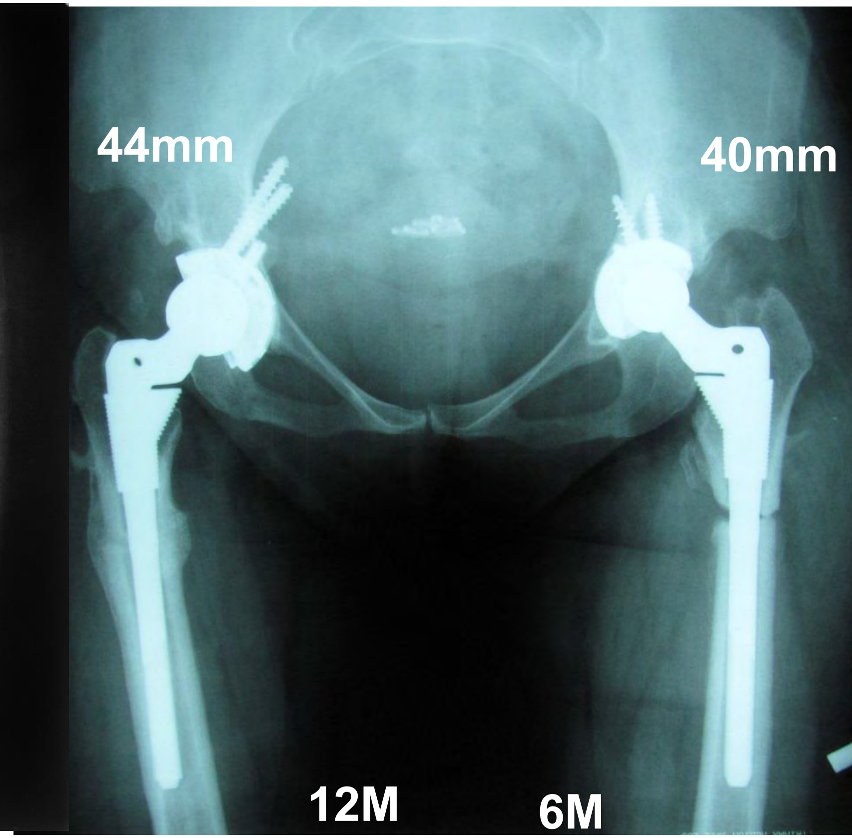
- 112 Pts.
- Male 27 Pts. 30-81Y, Ø 52Y
- Female 85 Pts. 27-86Y, Ø 59Y
- Aim of the study – evaluation of early results of modular TT cups
- FU 3-60 M (Ø 28M) – *data to April 2015*

Indications for modular TT cups

Dysplasia total Nr.			75
Dysplasia-Crowe 1979	Crowe I.	11	
	Crowe II.	27	
	Crowe III.	32	
	Crowe IV.	5	
Epiphyseolysis–postoperatively			3
Meningomyelocele -protrusion			3
Posttraumatic OA			11
Protrusion			8
AVN + protrusion			8
TB acetabular destruction			3
Great acetabular cyst			1

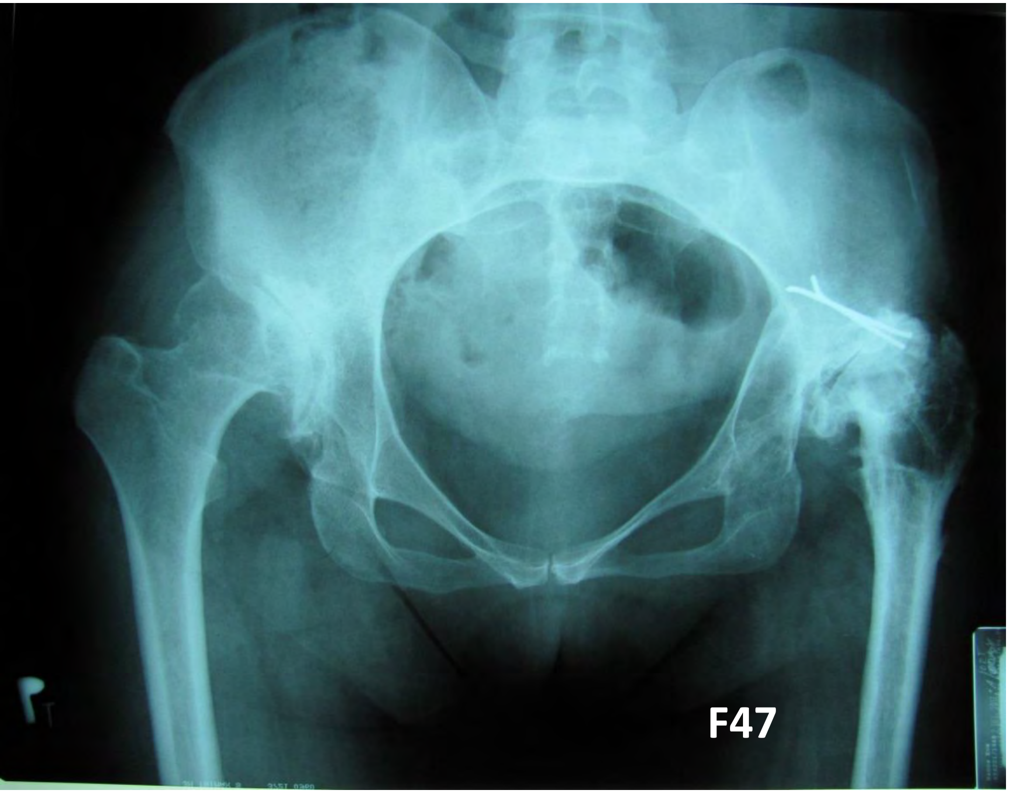
Crowe IV. Is usualy for components <40mm

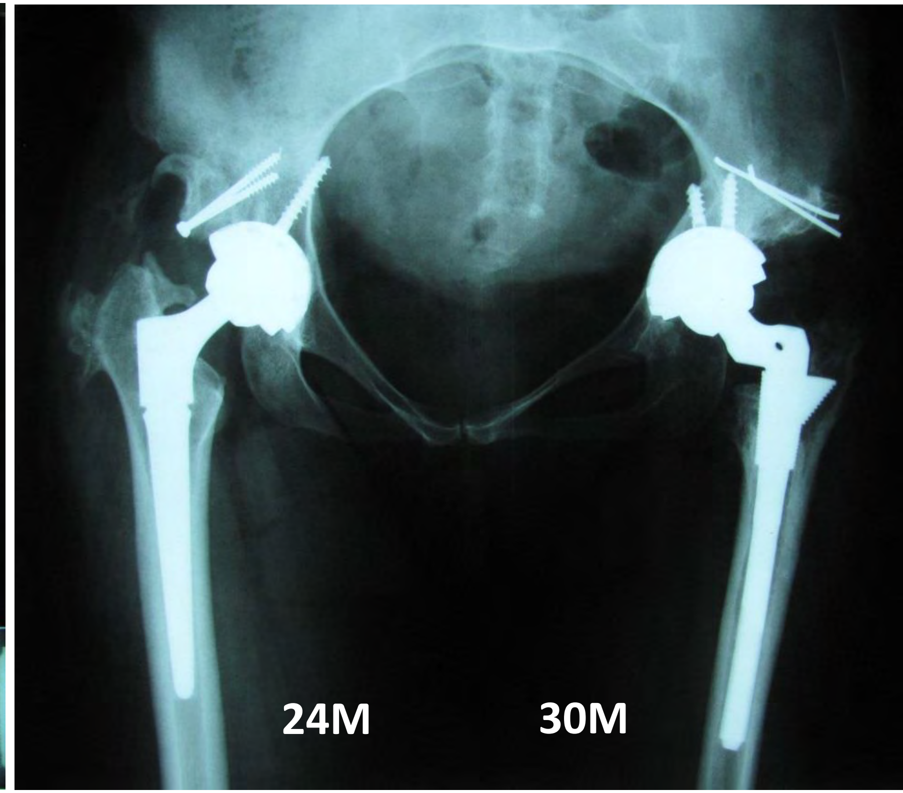


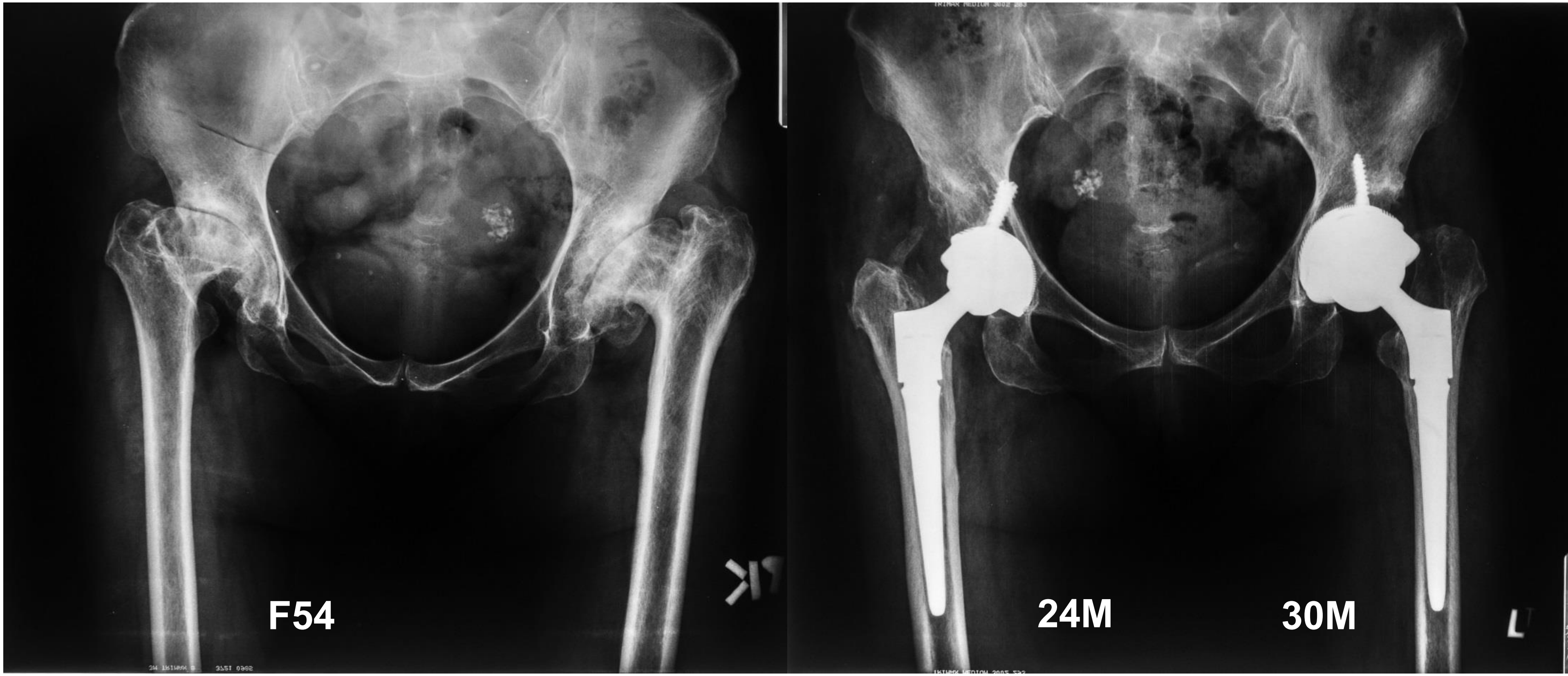



M57

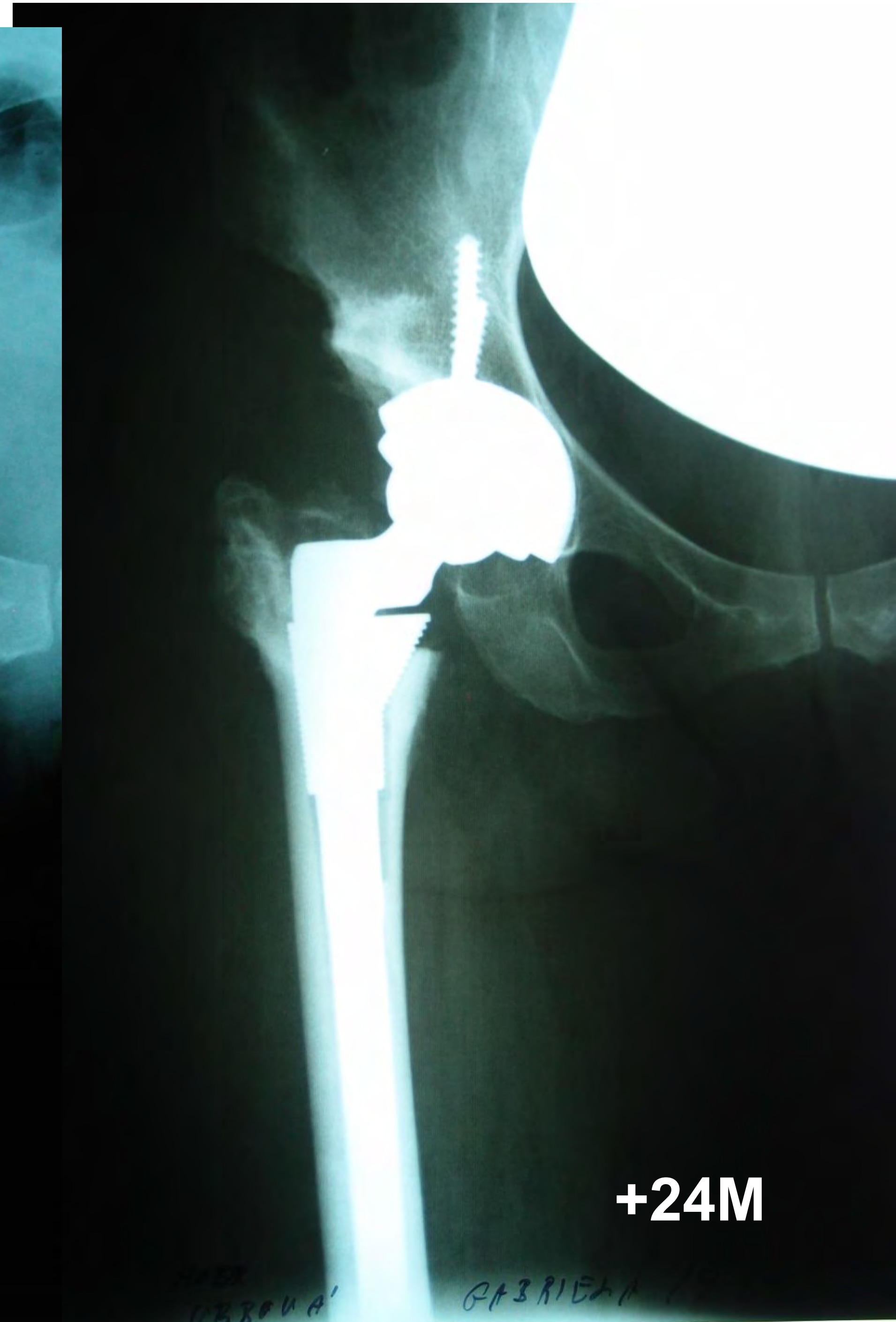

36 M

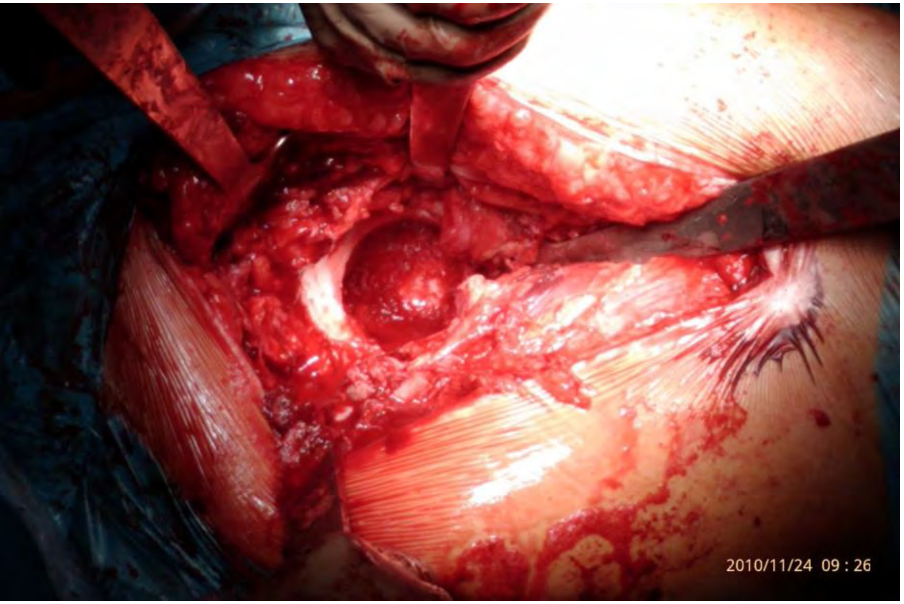

F47

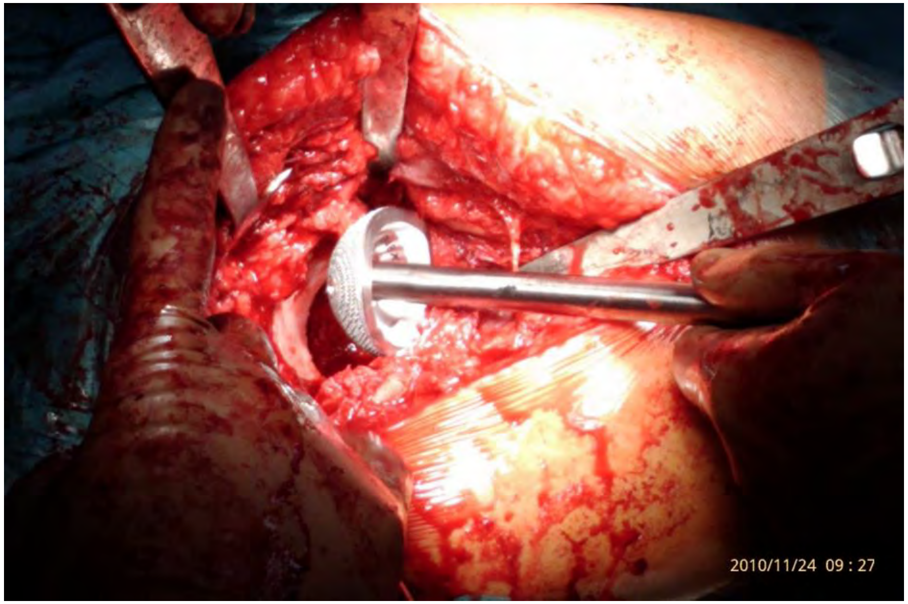

24M
30M

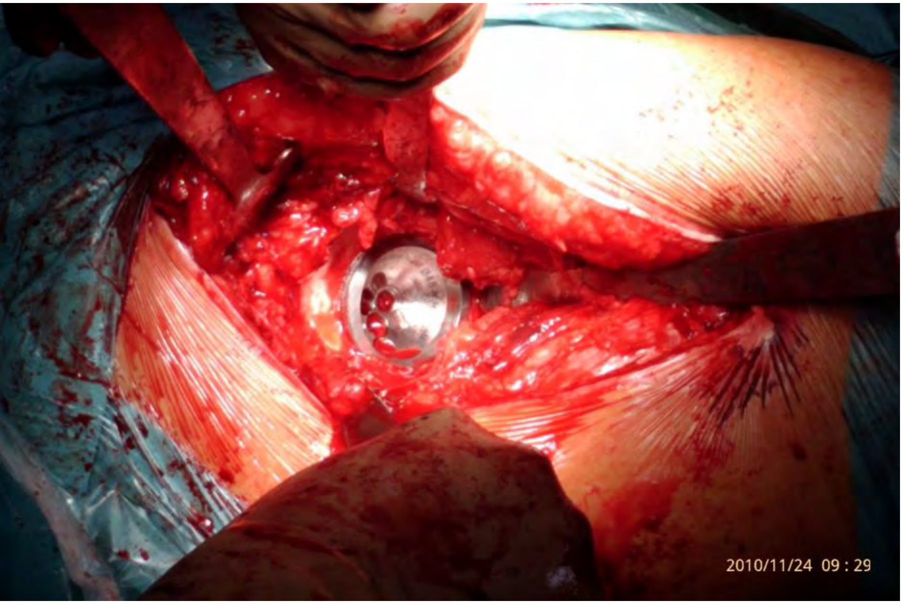


F54
24M
30M

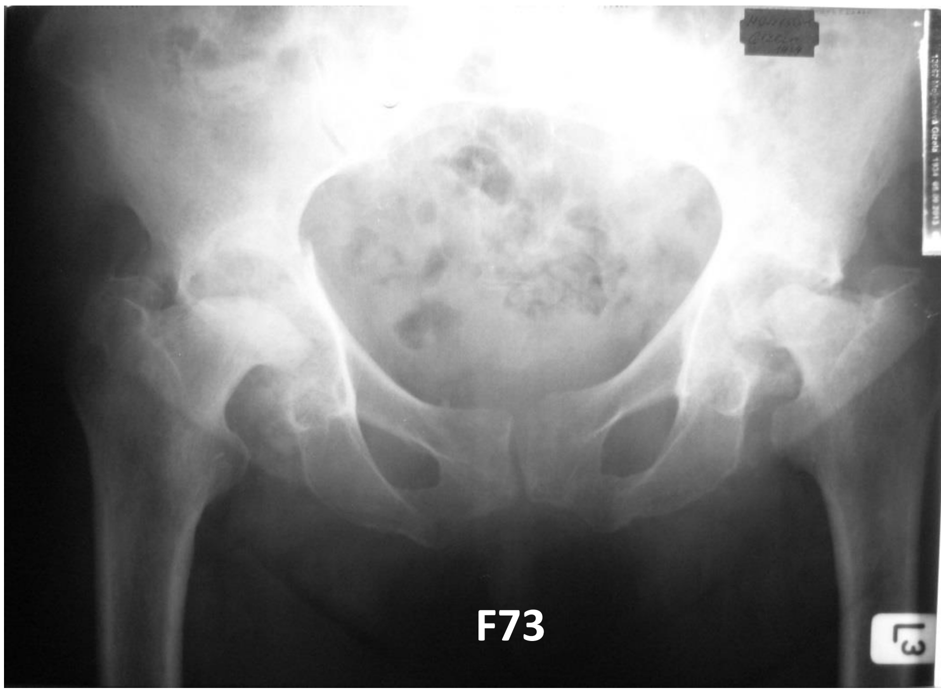

F41

+24M

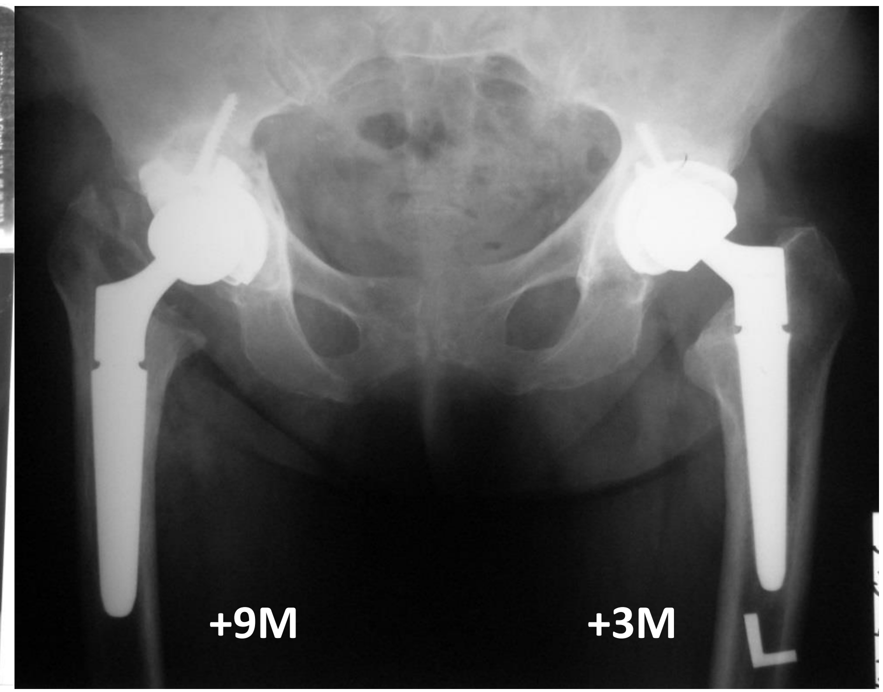

2010/11/24 09 : 26


2010/11/24 09 : 27

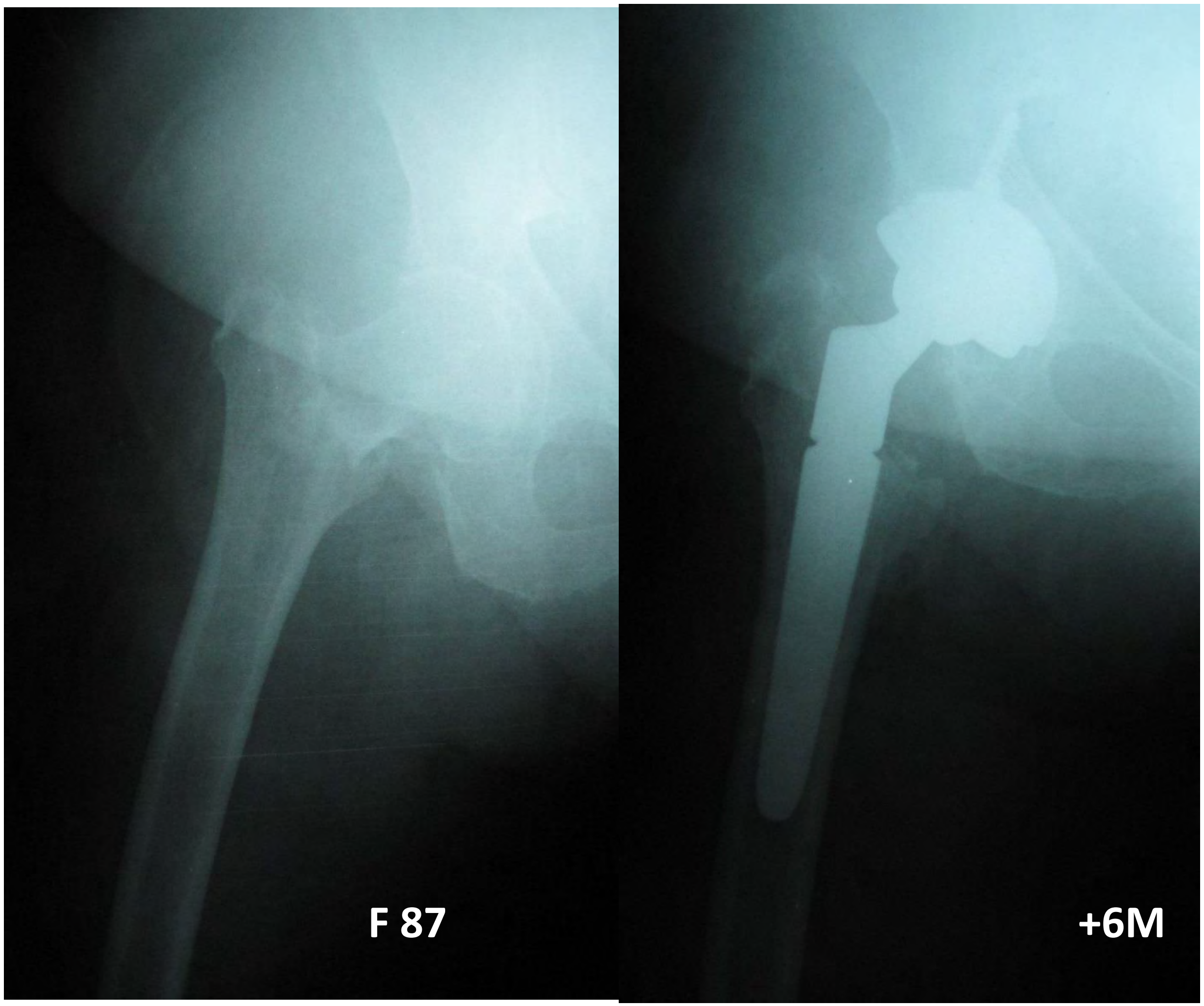

2010/11/24 09 : 29

R.A. – acetabular protrusion



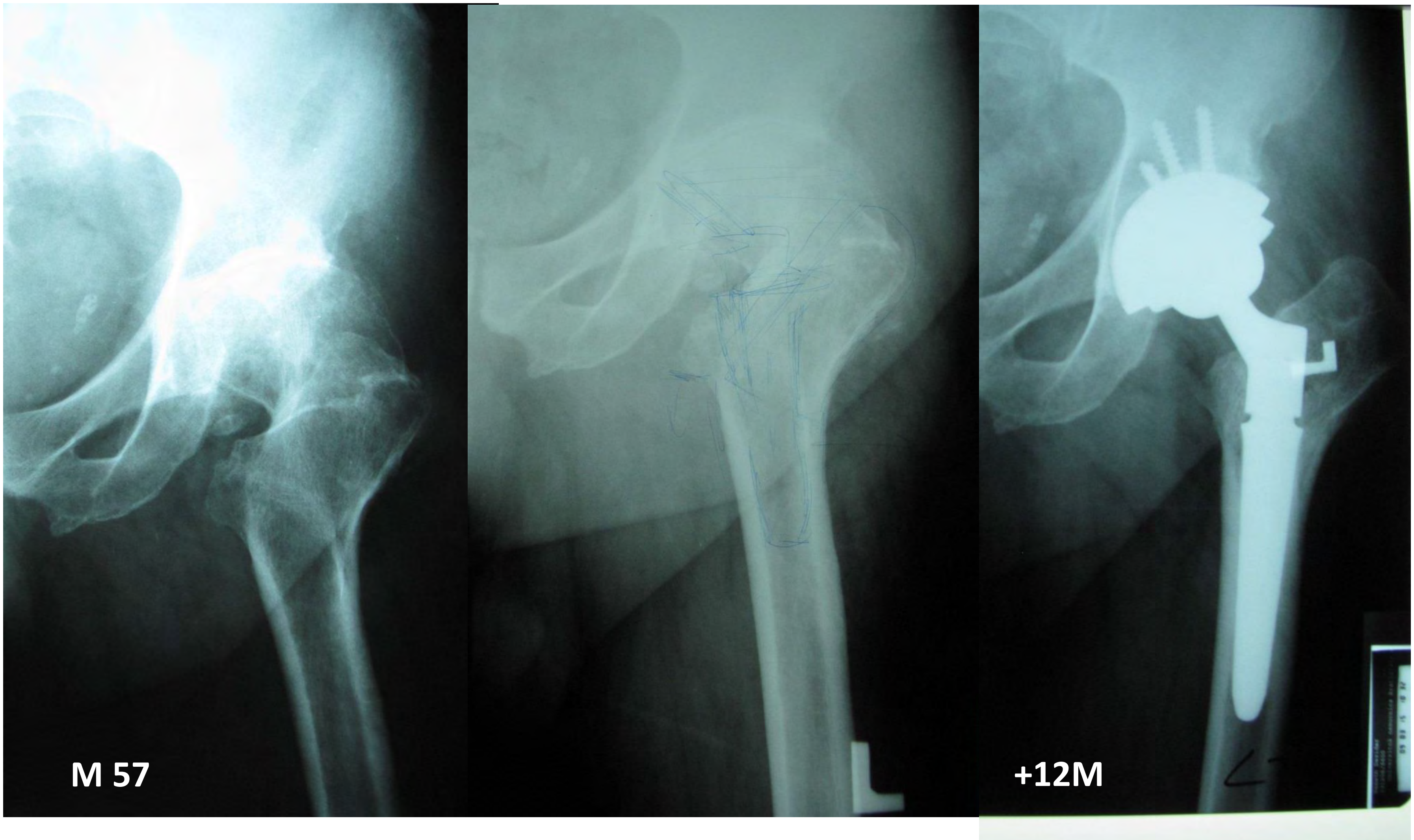


“Femoral“ indication for use of modular TT



Pseudoarthrosis – basicervical fracture – 2 years, new trochanteric fracture

“Femoral“ indication for use of modular TT



Imhausser osteotomy in adolescence, O.A., triplanar femoral deformityshallow and steep acetabulum

Bone grafts used

- Bone femoral head autograft 15
- Bone donor allograft (fresh frozen) 8

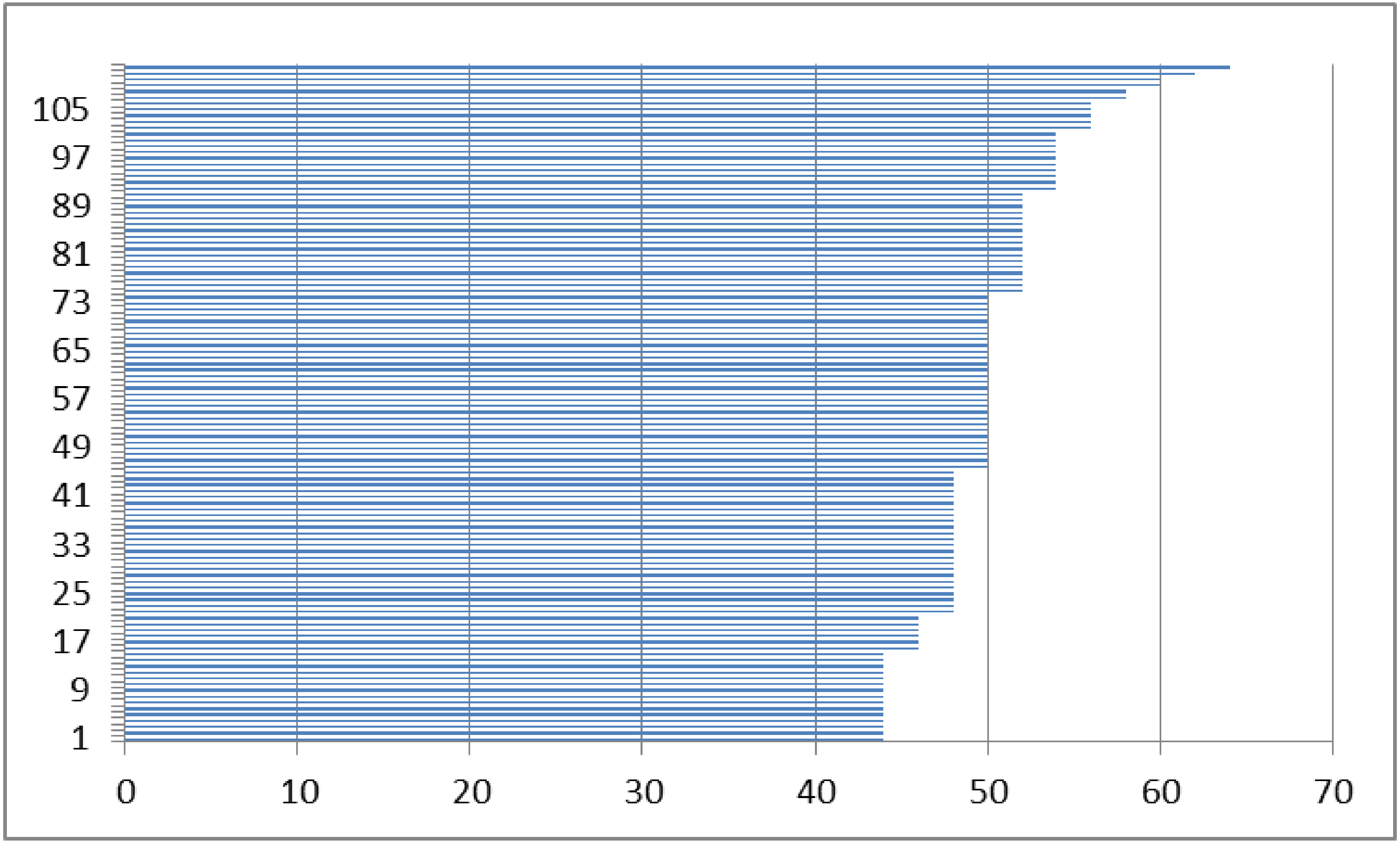
Internal modularity

- Internal augmentation by an augment of the TT cup was used in 56 of 112 Pts.
- Special design of DOTT cup enables the use of the cup in complex primary cases

Cups, augment and inserts used

DOTT		97
DTT		15
Ceramax inserts		70
PE inserts		39
DM		3
Hemicranial module 12 mm		3!!!
Augments	Metal +20DGR	30
	Metal +10DGR	13
	PE +20DGR	13

TT cup diameters (44-64mm), Ø50mm



Results

• Internal modularity complication	0
• Hemicranial module complication	0
• Fracture of proximal femur (revised)	1
• Infraction on X-Ray postop. (no revision)	1
• Dislocation, closed reduction at week 5 without further dislocation at 18M F.U.	1
• TT cup instability (over 2mm/5DGR)	0

Conclusions

- Modular acetabular TT cups designed for revision and complex primary cases show promissing results in short term follow-up
- Design of TT cups for dysplastic condition–part of a hemisphere–and internal modularity of implant lead to excelent implant stability in conditions of complex primary THR (dislocation)
- Design of modular acetabular TT cups enables primary and secundary stability

Thank You for Your Attention!

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY

SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

OSPEDALE SANTA CORONA

AZIENDA SANITARIA LOCALE Nº 2 SAVONESE

OUR EXPERIENCE IN PRIMARY THA USING DELTA CUP TT

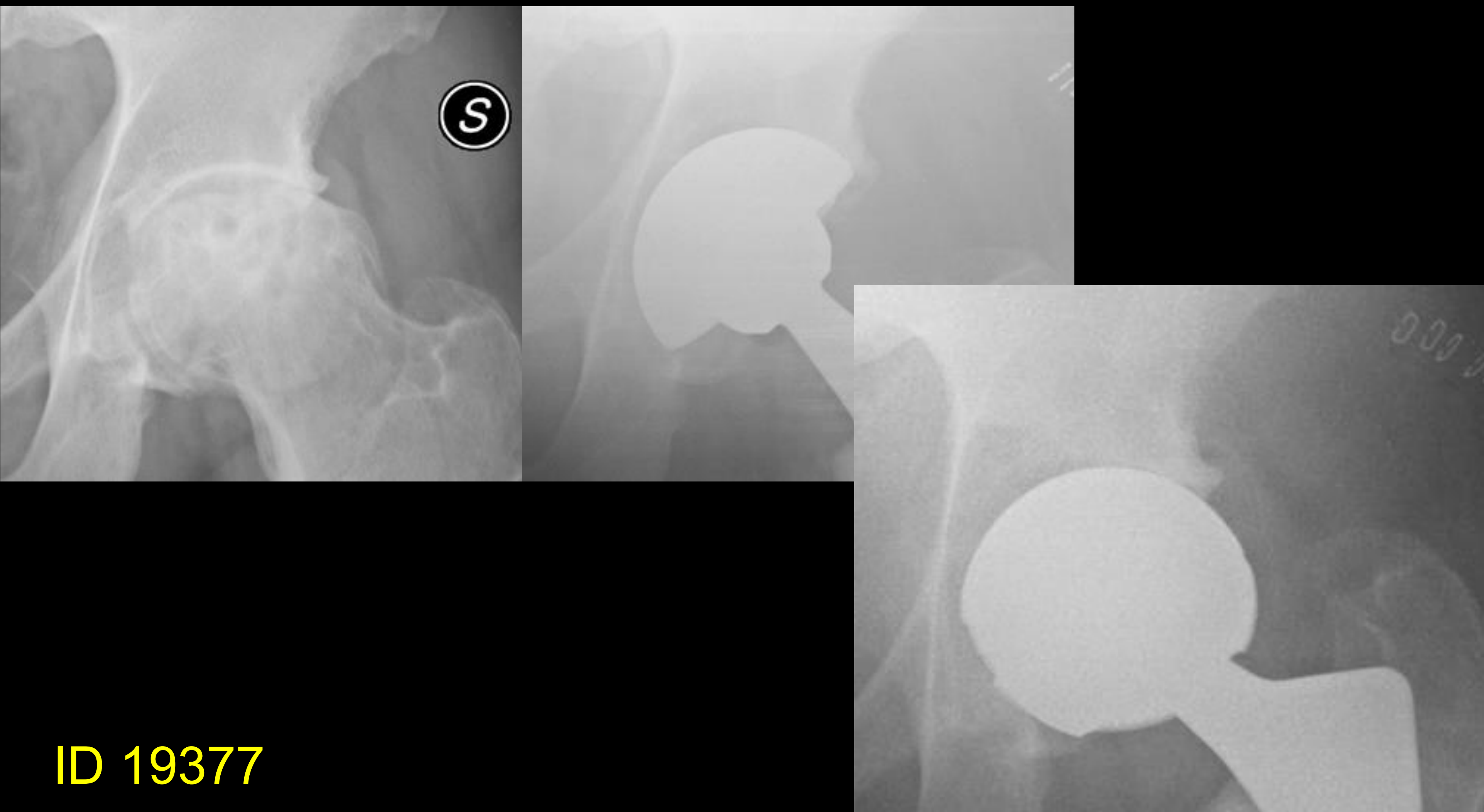
M. Gramazio - G. Cattaneo

E. Carriere – A. De Caro

FONDAZIONE LORENZO SPOTORNO


Disclosure:
Lima Corporate

WHY TRABECULAR TITANIUM?



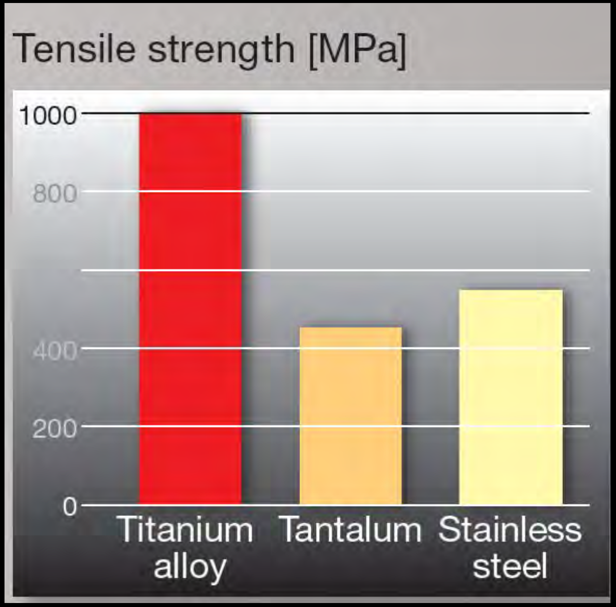
ID 19377

TRABECULAR TITANIUM™

BIOCOMPATIBILITY

TITANIUM

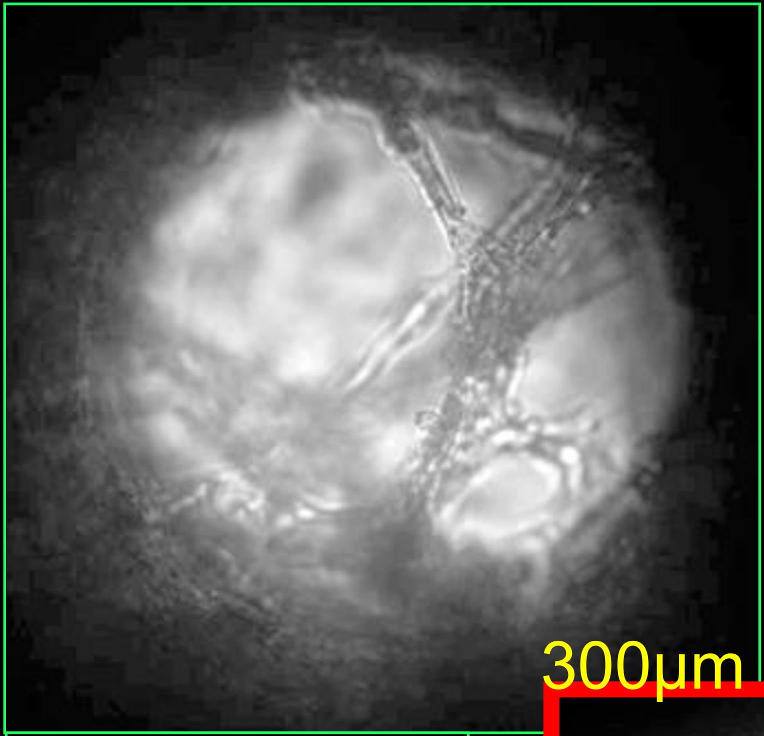
MECHANICAL FEATURES



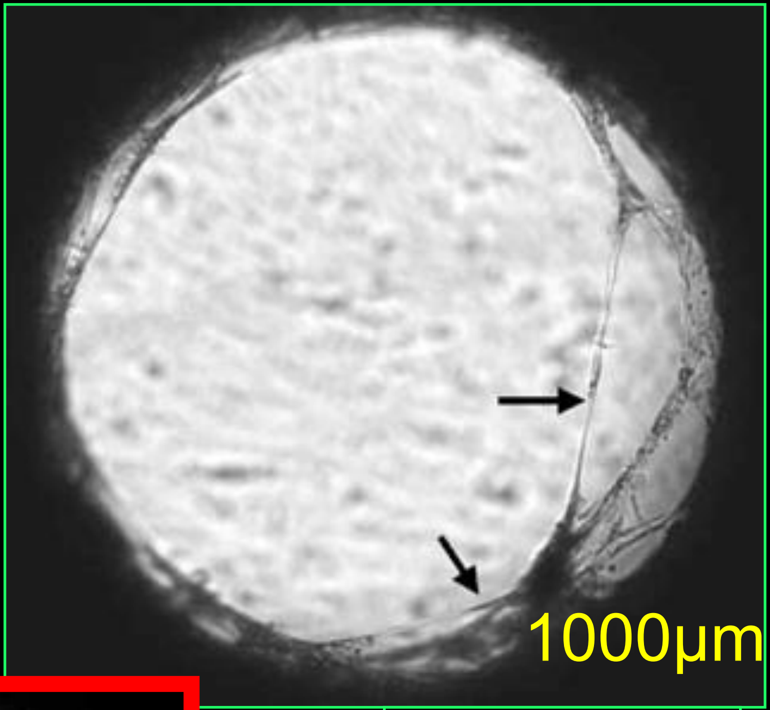
Porosities and pore sizes of metal scaffolds for bone

Porous surface technique	Pore size (μm)	Porosity (%)	Application	References
N/A (sintered titanium fiber meshes)	250	86	Rat bone marrow stromal cells ex vivo and cranial defects in rats	[78,79]
N/A (sintered titanium fiber meshes)	250	86	TGF-β1 delivery in cranial defects in rabbits	[80]
N/A (self-propagating high temperature synthesized nitinol implants)	259 and 505	66 and 47	Femoral defects in rats	[105]
	353, 218 and 179	43, 54 and 51	Cranial defects in rabbits	[111]
N/A (laser perforated titanium implants)	50, 75, 100, 125		Femoral defects in rabbits	[35]
Sintering	50–200	35		[77]
Plasma-spraying	200–400	50–60	Femoral defects in dogs	[60]
		56–60	Femoral condyles in dogs	[38]
Diffusion	350	45	Hip arthroplasty in dogs	[37]
Laser-texture	100, 200 and 300		Femoral defect in rabbits	[109]
Electrochemical oxidation	<8	13–24	Tibia defects in rabbits	[40–42]
Machining	Submicron to 10			[77]
Shot-blasting	<10			[77]
		44 and 48	Mandible and femoral defects in dogs	[33]
Acid-etching	Submicron to 1			[77]
			Femoral defects in rabbits	[39]
Deposition through polystyrene latex beads	0.4, 13 and 40		Human bone derived cells in vitro	[76]

How much does metal porosity influence osteointegration process??

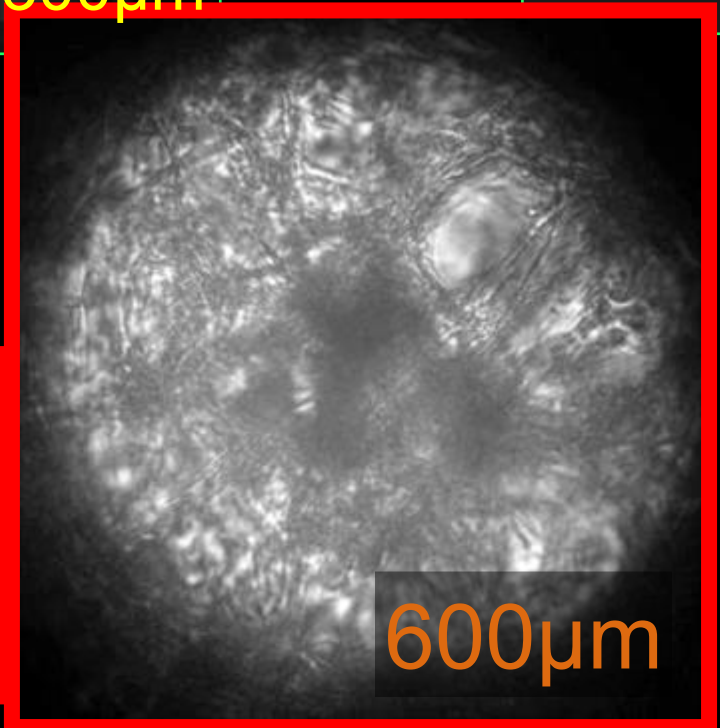


Frosch et al.
2003



Type 1
Spoke-shaped

Type 3
Incomplete
Peripheral
growth



Type 2
Complete
Peripheral
growth

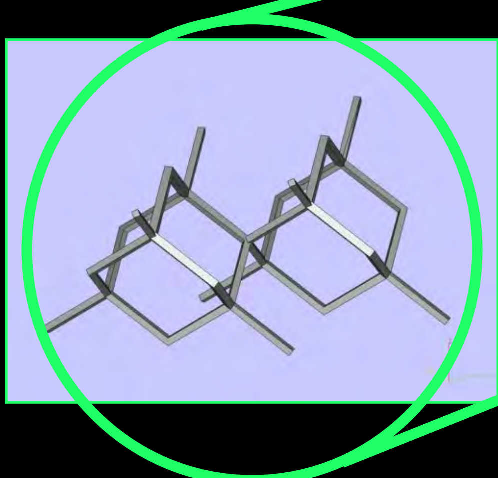
TRABECULAR

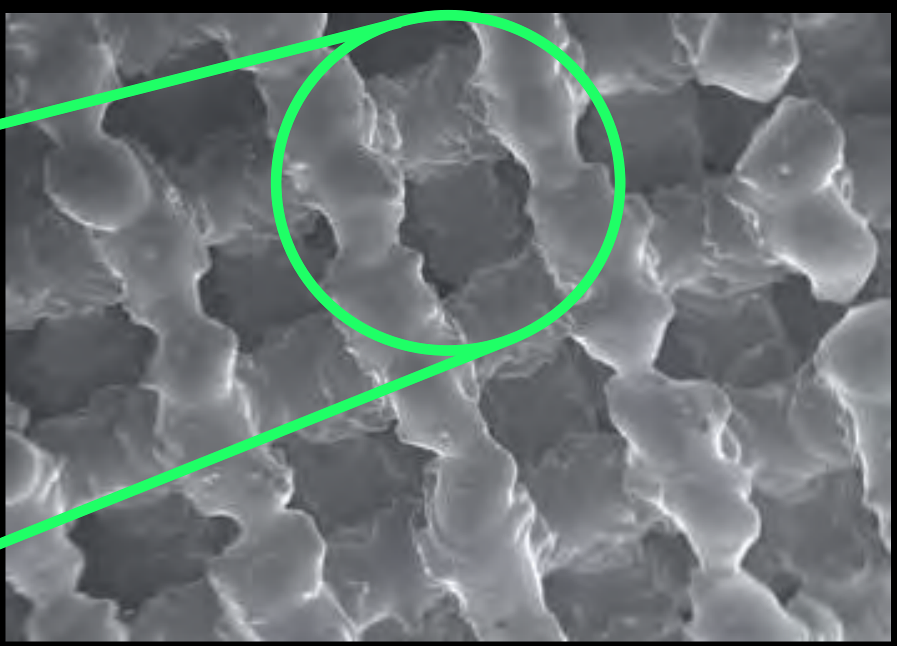
TITANIUM™

65% open porosity

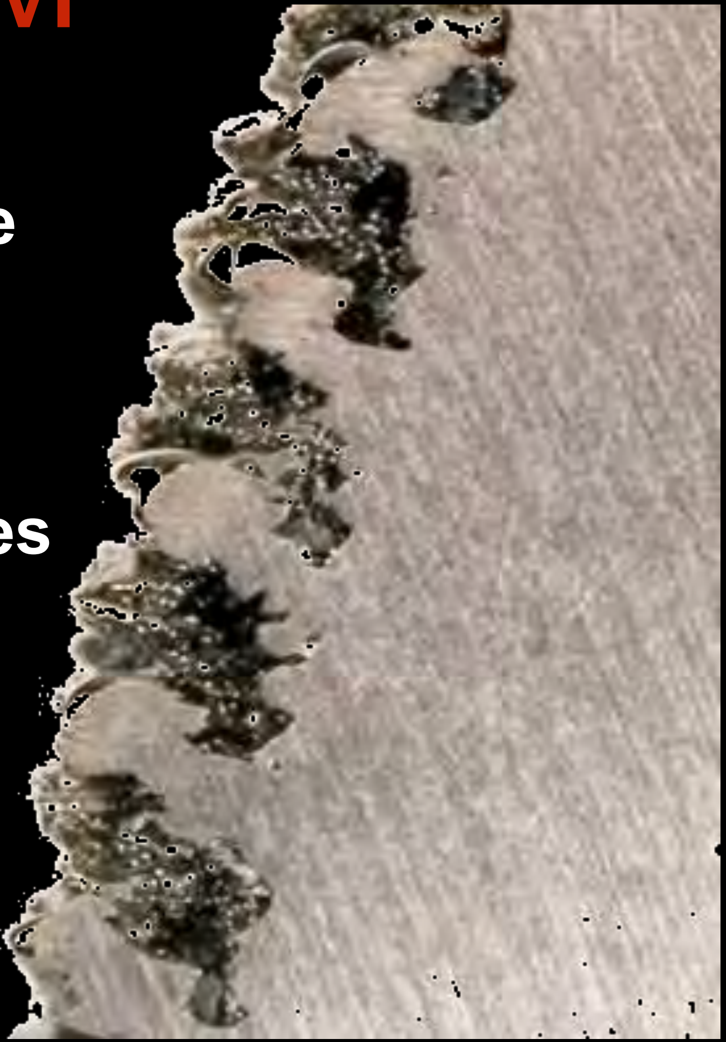
Cells geometry
is exactly repeated
in all component parts

640 µm
pore diameter





TRABECULAR TITANIUM™



Benefits of a continuum structure

Take advantage of titanium features

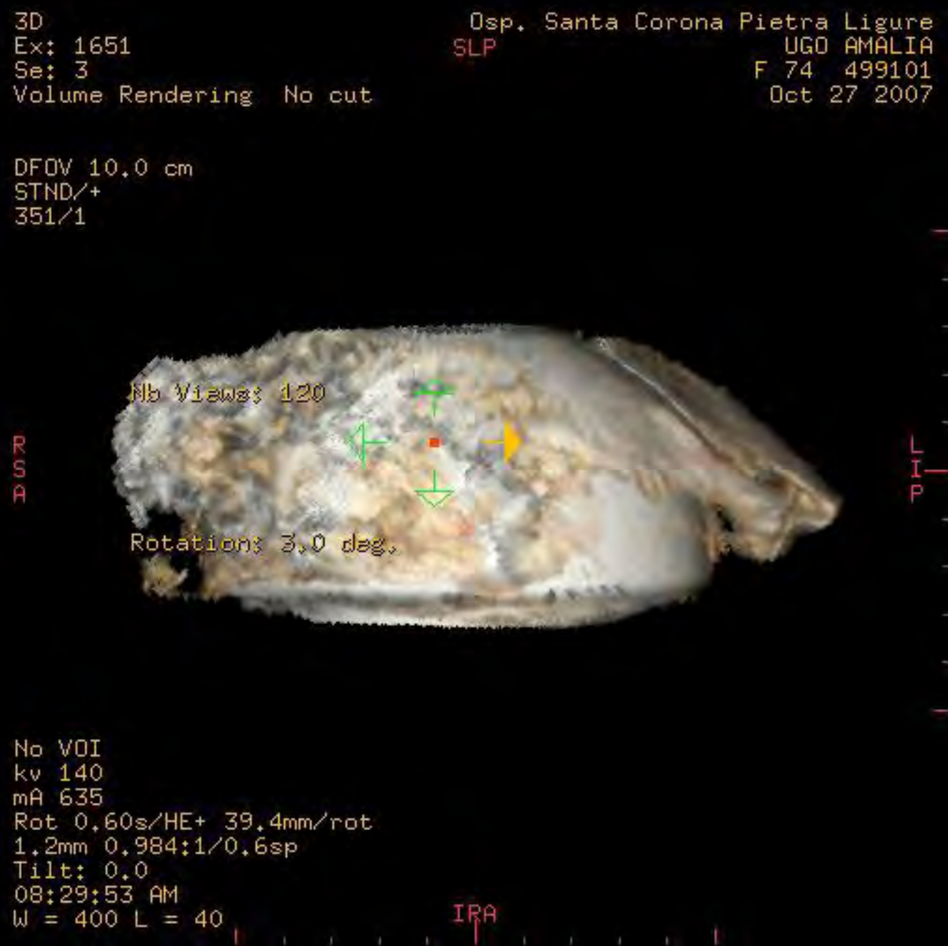
Mechanical resistance

Elastic modulus

74 aa

U.A. - ID 19653

♀ 74


3D
Ex: 1651
Se: 3
Volume Rendering No cut
Osp. Santa Corona Pietra Ligure
SLP
UGO AMALIA
F 74 499101
Oct 27 2007
DFOV 10.0 cm
STND/+
351/1
Nb Views: 120
Rotation: 3.0 deg.
R
S
A
L
I
P
No VOI
kv 140
mA 635
Rot 0.60s/HE+ 39.4mm/rot
1.2mm 0.984:1/0.6sp
Tilt: 0.0
08:29:53 AM
W = 400 L = 40
IRA

Delta TT

Titanium Alloy - Ti6Al4V

Trabecular Titanium ™

Press Fit Cup

1 mm Press Fit

3 holes for screws

Sizes 44 – 48 —> diam 32

50 – 52 —> diam 36

54 – 64 —> diam 40

Cer/Cer

Delta TT

Firm grip shell and

high open porosity structure

PRIMARY

even in poor quality

bone or partial segmentary defect

Our experience
Santa Corona H.- Pietra Ligure (SV)

693 Delta TT cups for Primary THA

2007-2014

623 patients

158 ♂ 465 ♀

average age 59 yrs

(min 17-max 88)

FONDAZIONE
LORENZO
SPOTORNO

Primary OA:	590 (85,2%)
Hip dysplasia secondary OA:	48 (6,9%)
Femural head idiopathic osteonecrosis:	27 (3,9%)
Post-trauma OA:	19 (2,7%)
Femural pathological fractures:	5 (0,72%)
Rheumatoid arthritis:	4 (0,58%)

In 97% we utilized CER-CER tribology.

FONDAZIONE
LORENZO
SPOTORNO

Results

Average FUP 3 yrs and 8 mm

HHS increased from 55.2 - pre op at 96.4

Pre.op VAS 6,3 out of 10 and 0,5 in the post.op

97% of patients are satisfied or very satisfied

COMPLICATIONS

- 6 dislocations

  (within 5 months after surgery 5 of them replacement of acetabular cup)

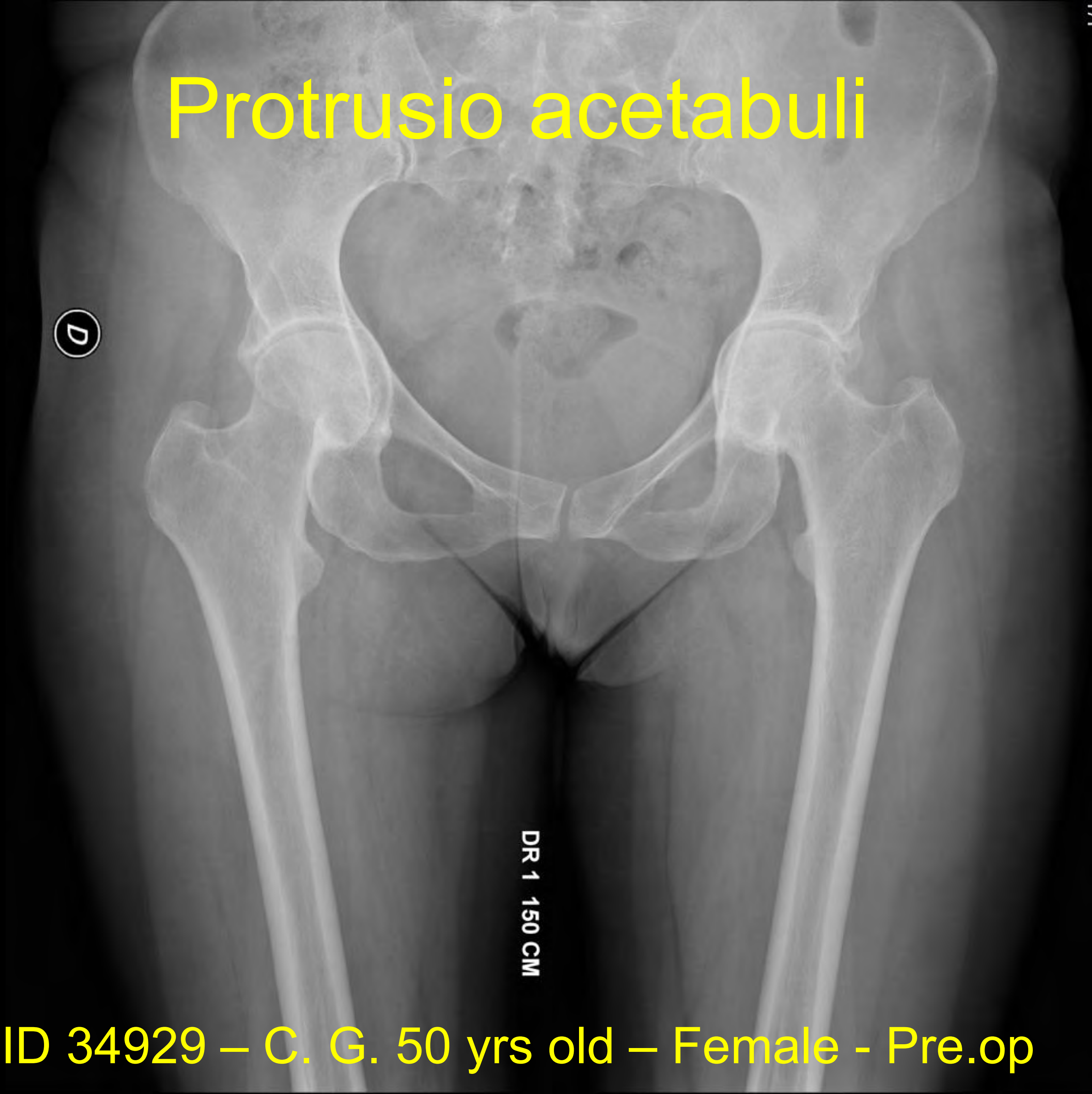
- 1 aseptic mobilization

- No squeaking

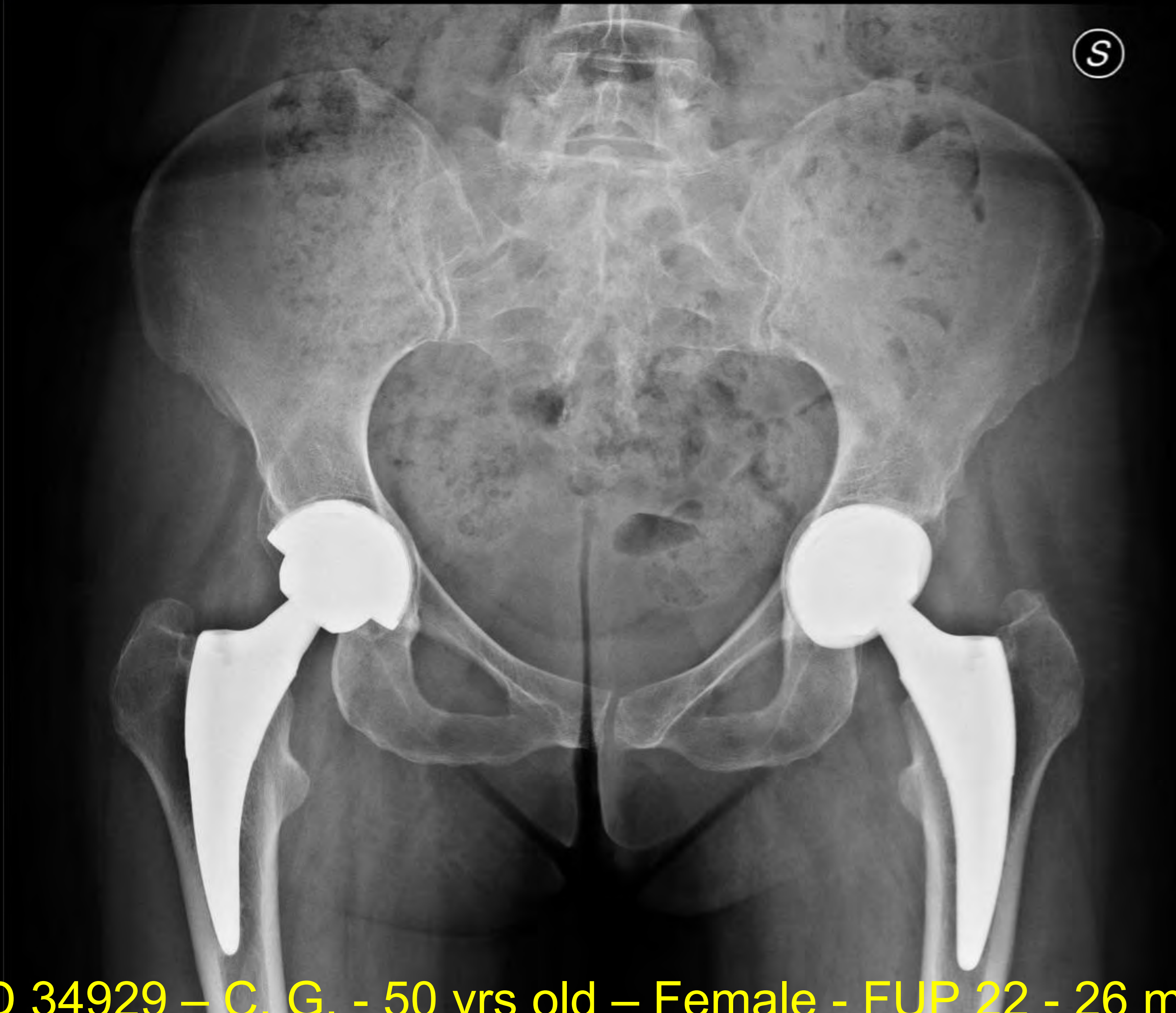
- No ceramic breakage

- No infections

Protrusio acetabuli

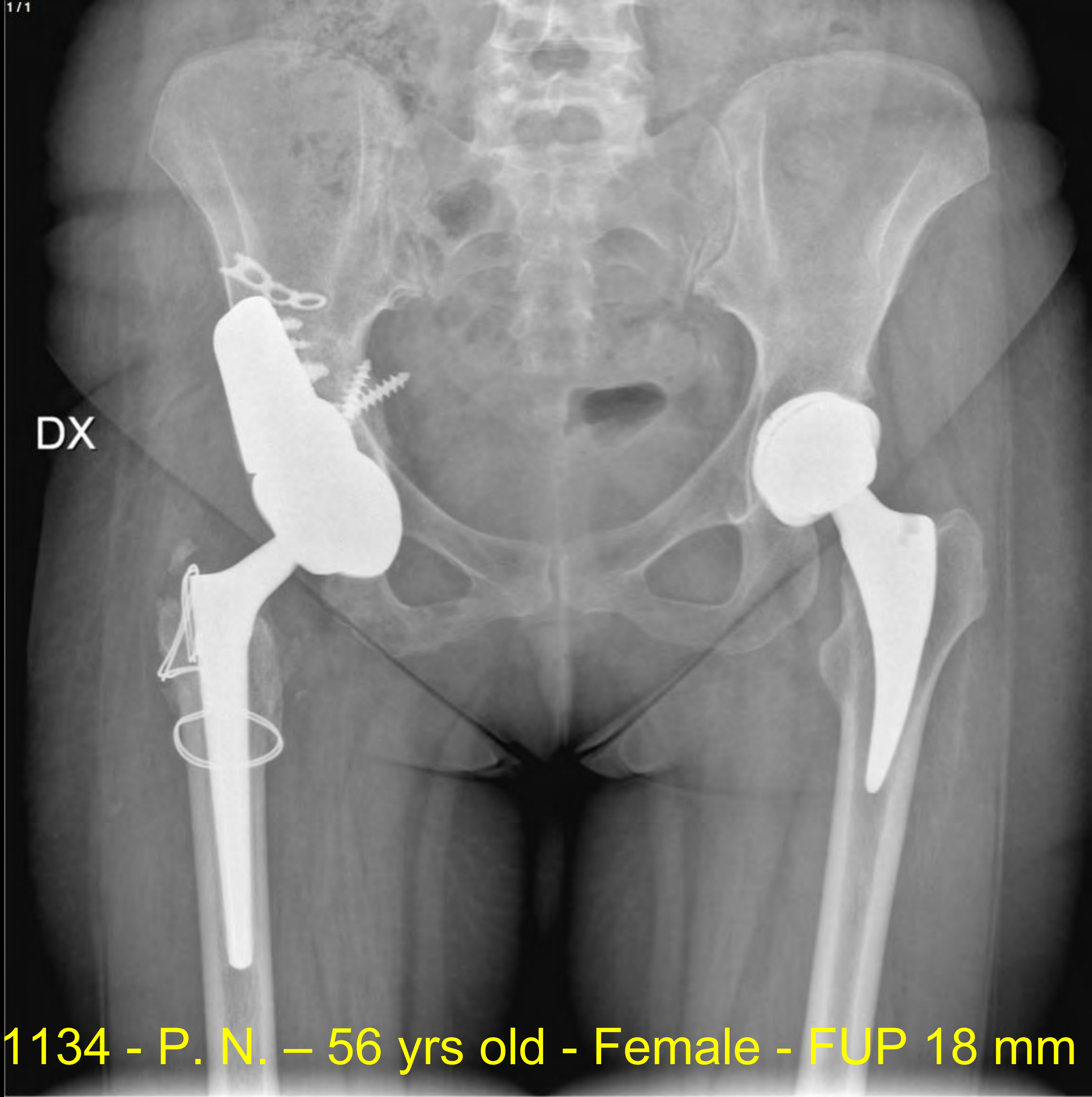


ID 34929 – C. G. 50 yrs old – Female - Pre.op



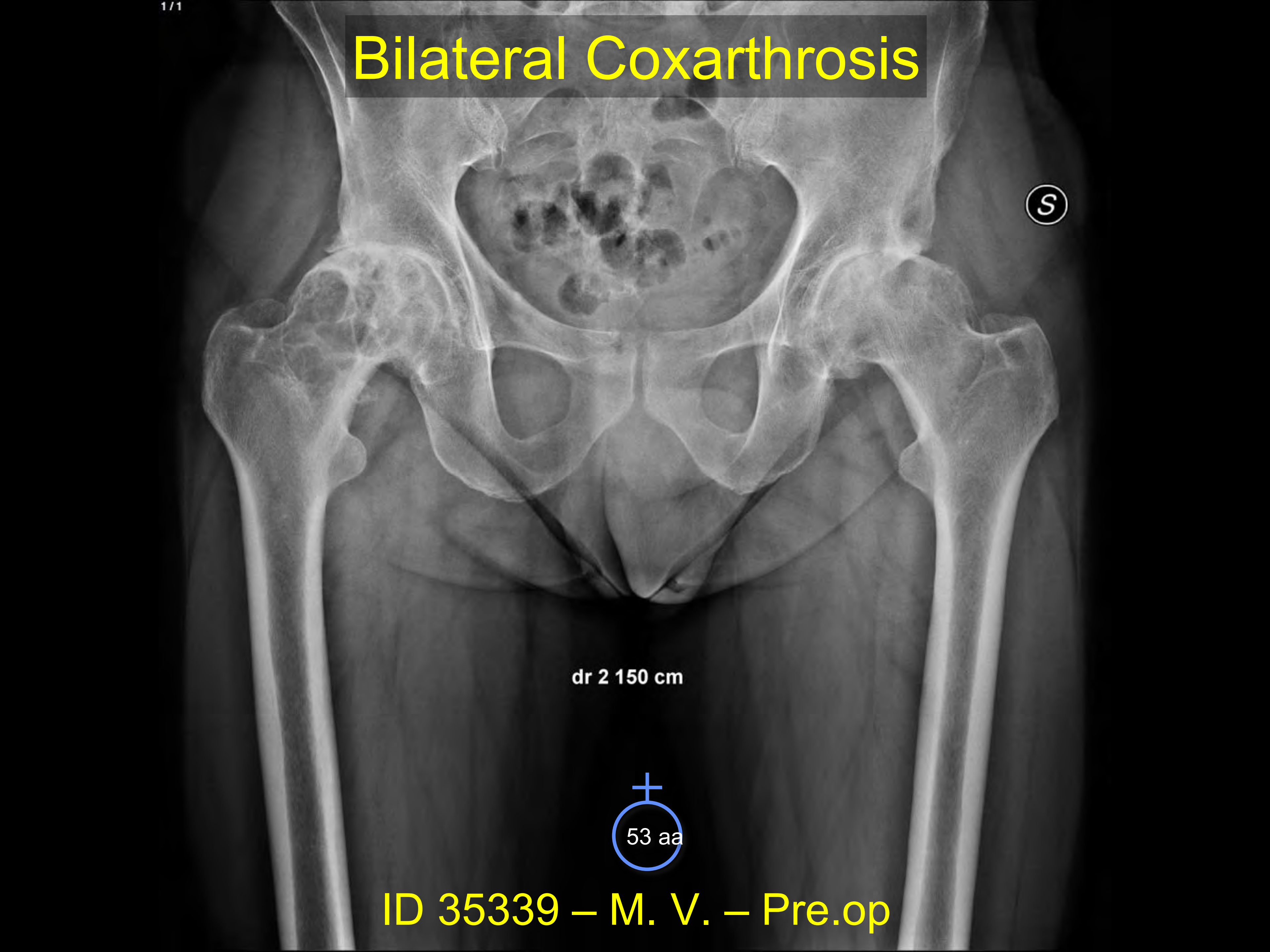
ID 34929 – C. G. - 50 yrs old – Female - FUP 22 - 26 mm

ID 31134 – P. N. – 56 yrs old - Female - Pre.op

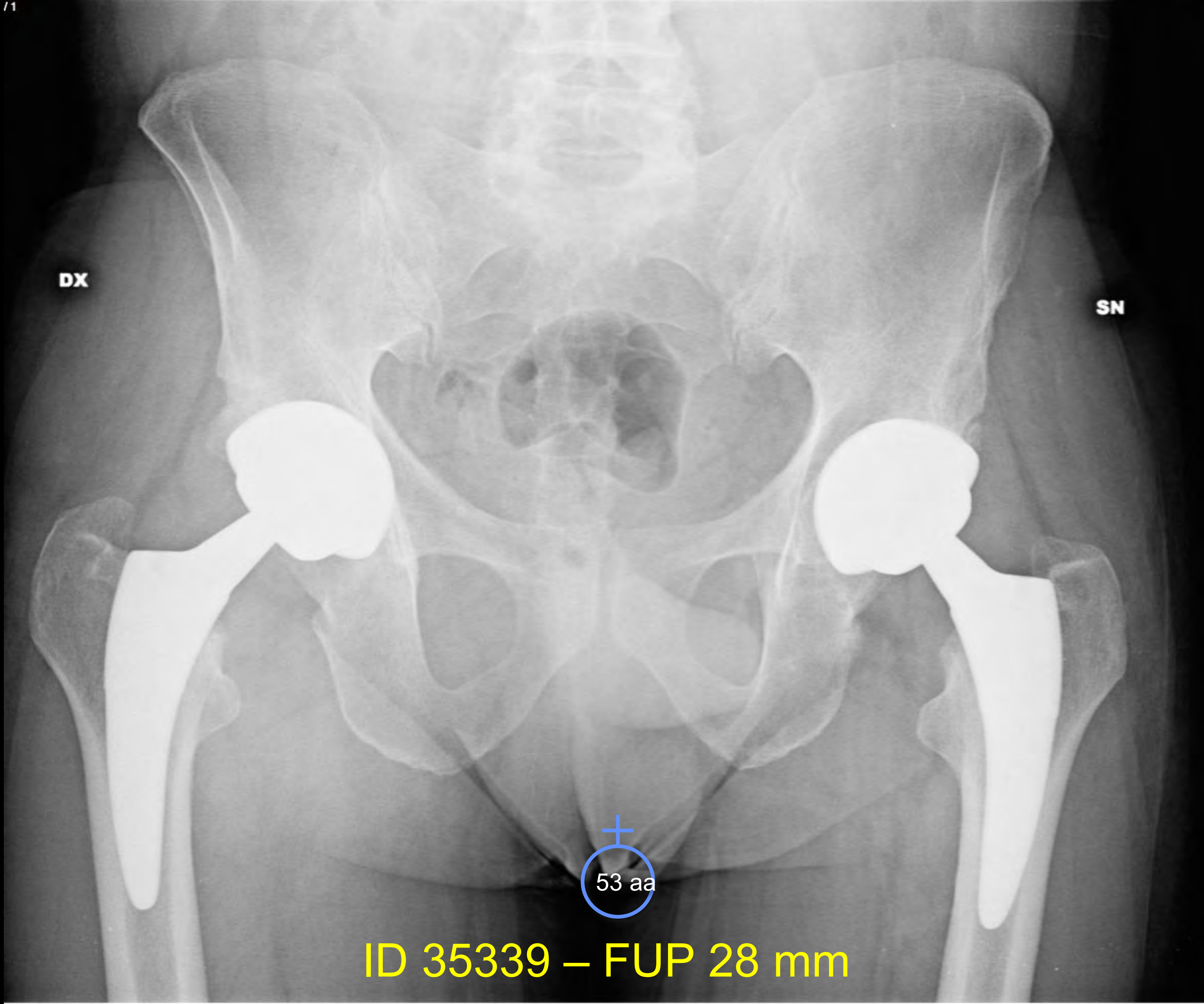


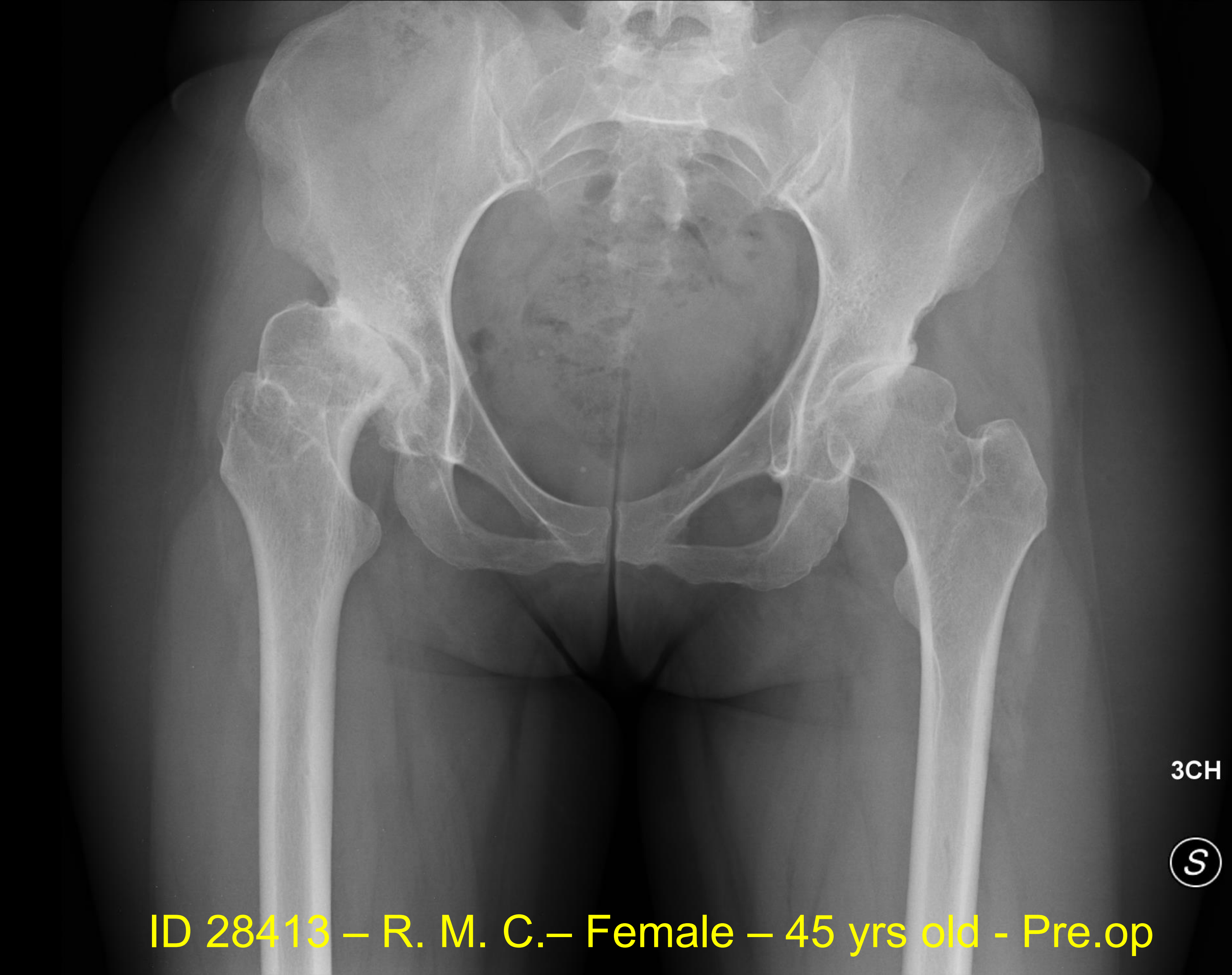
ID 31134 - P. N. – 56 yrs old - Female - FUP 18 mm a SN

Bilateral Coxarthrosis



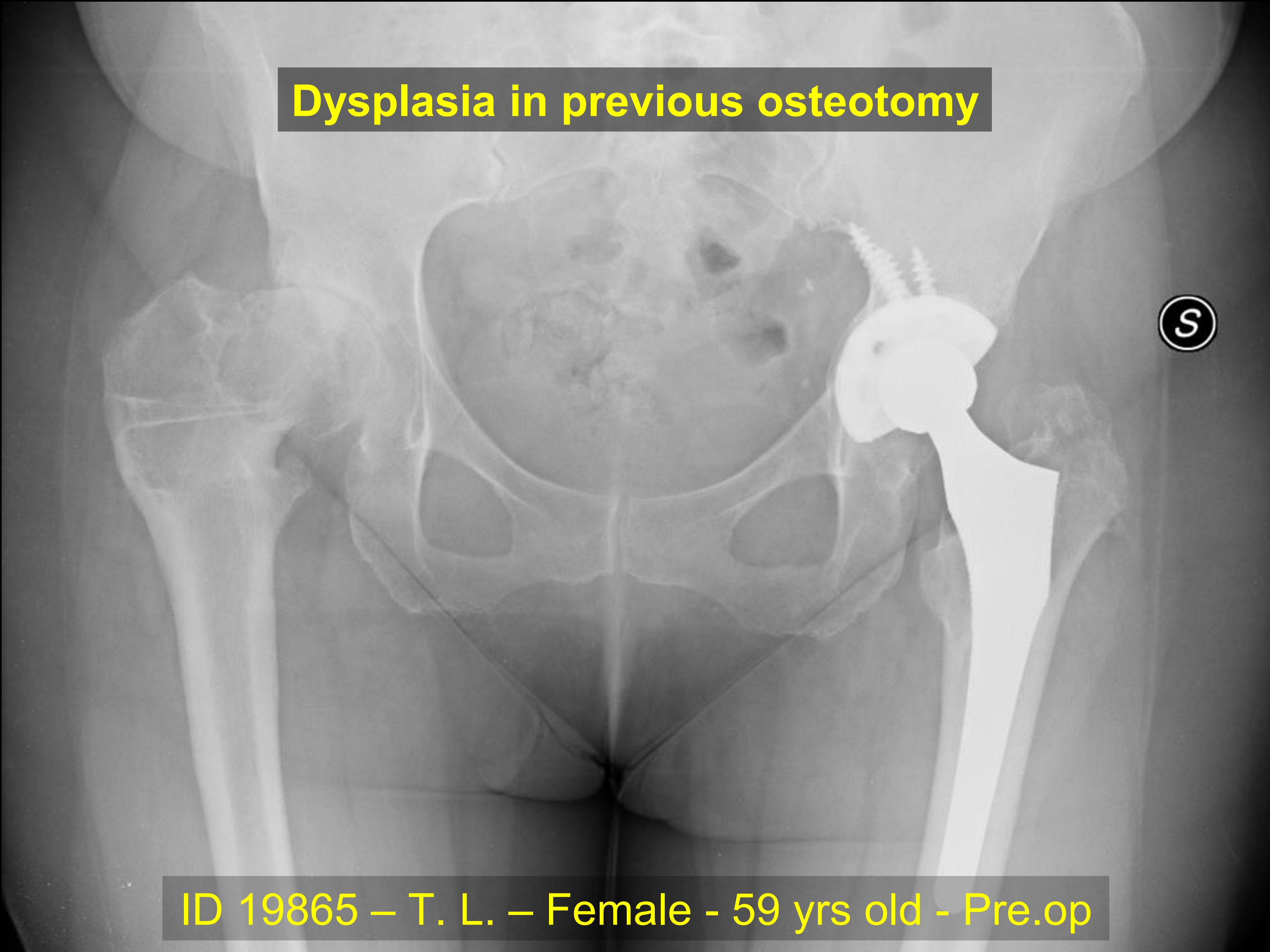
ID 35339 – M. V. – Pre.op

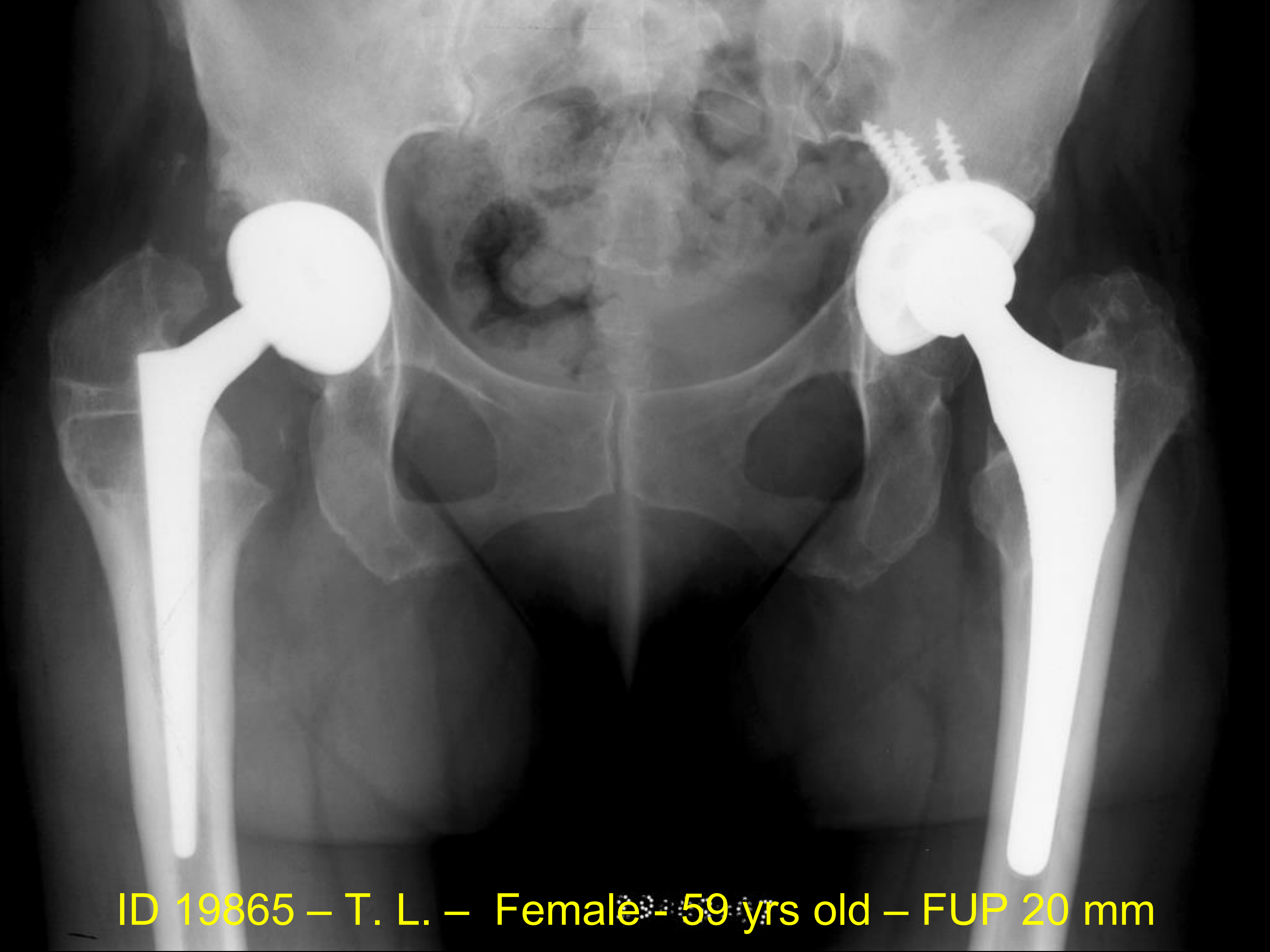

/1
DX
SN
53 aa
ID 35339 – FUP 28 mm



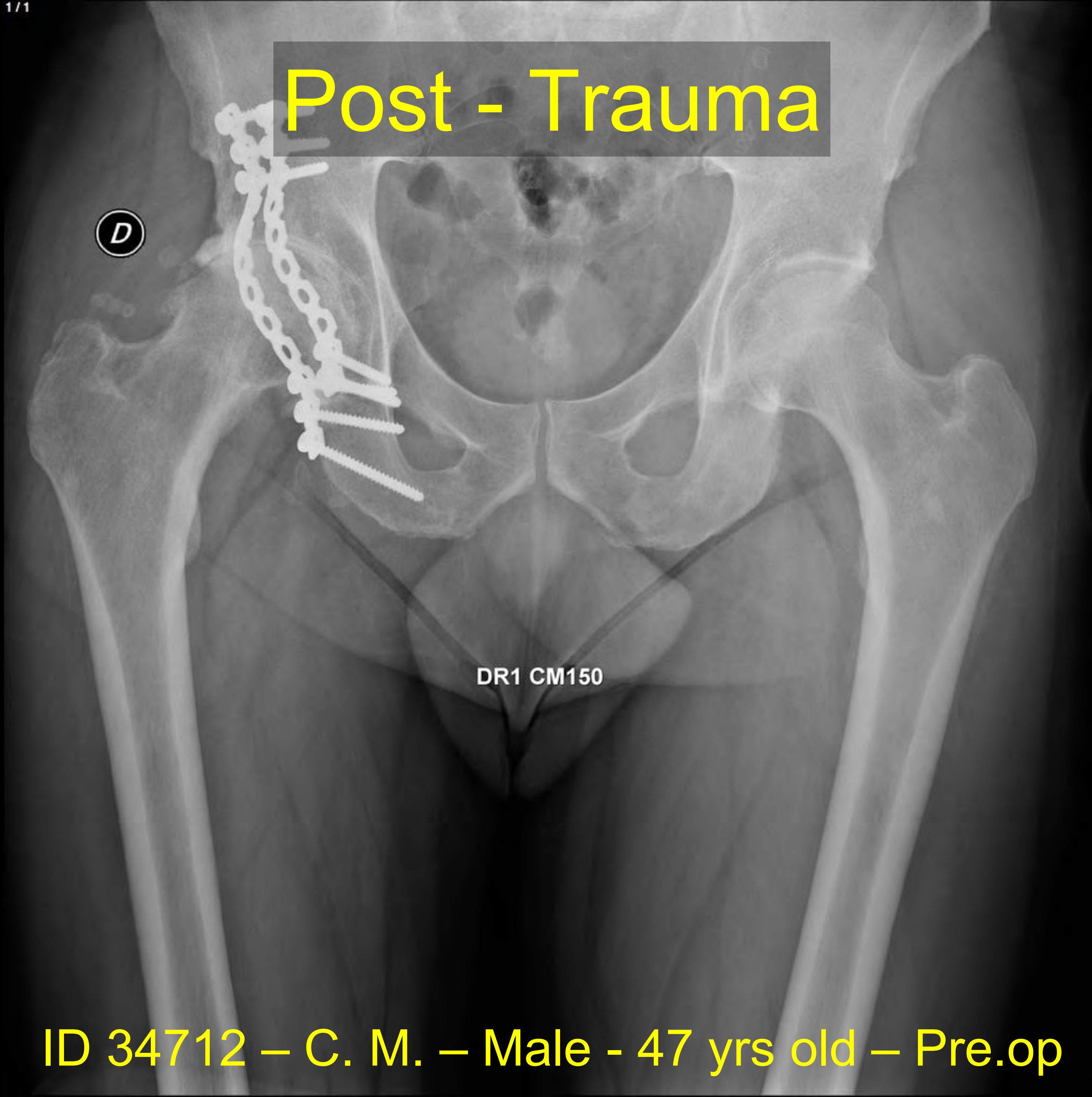
ID 28413 – R. M. C.– Female – 45 yrs old - Pre.op

ID 28413 – R.M.C. - Female – 45 yrs old - FUP 42 mm

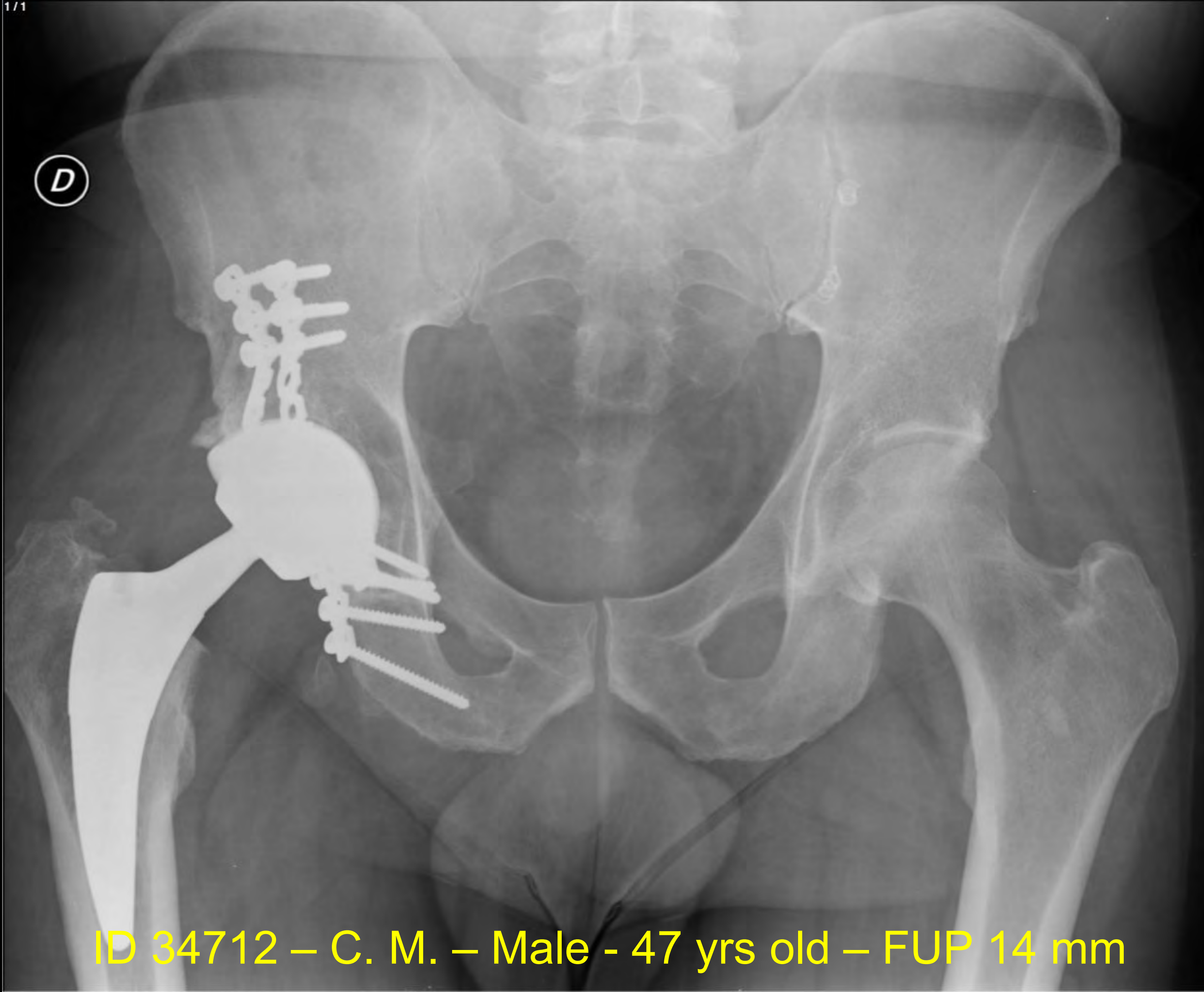

Dysplasia in previous osteotomy
S
ID 19865 – T. L. – Female - 59 yrs old - Pre.op


ID 19865 – T. L. – Female - 59 yrs old – FUP 20 mm

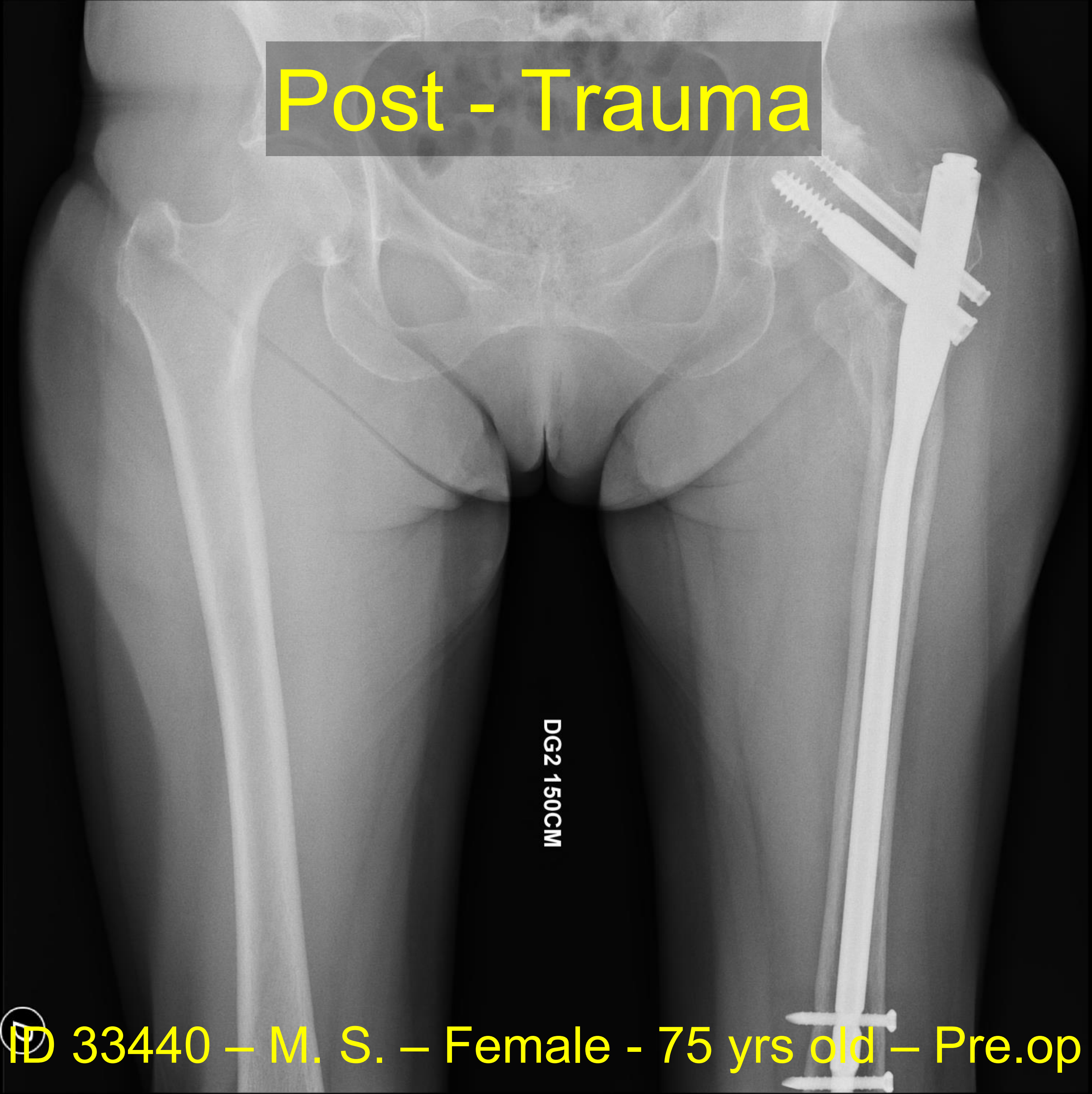
Post - Trauma

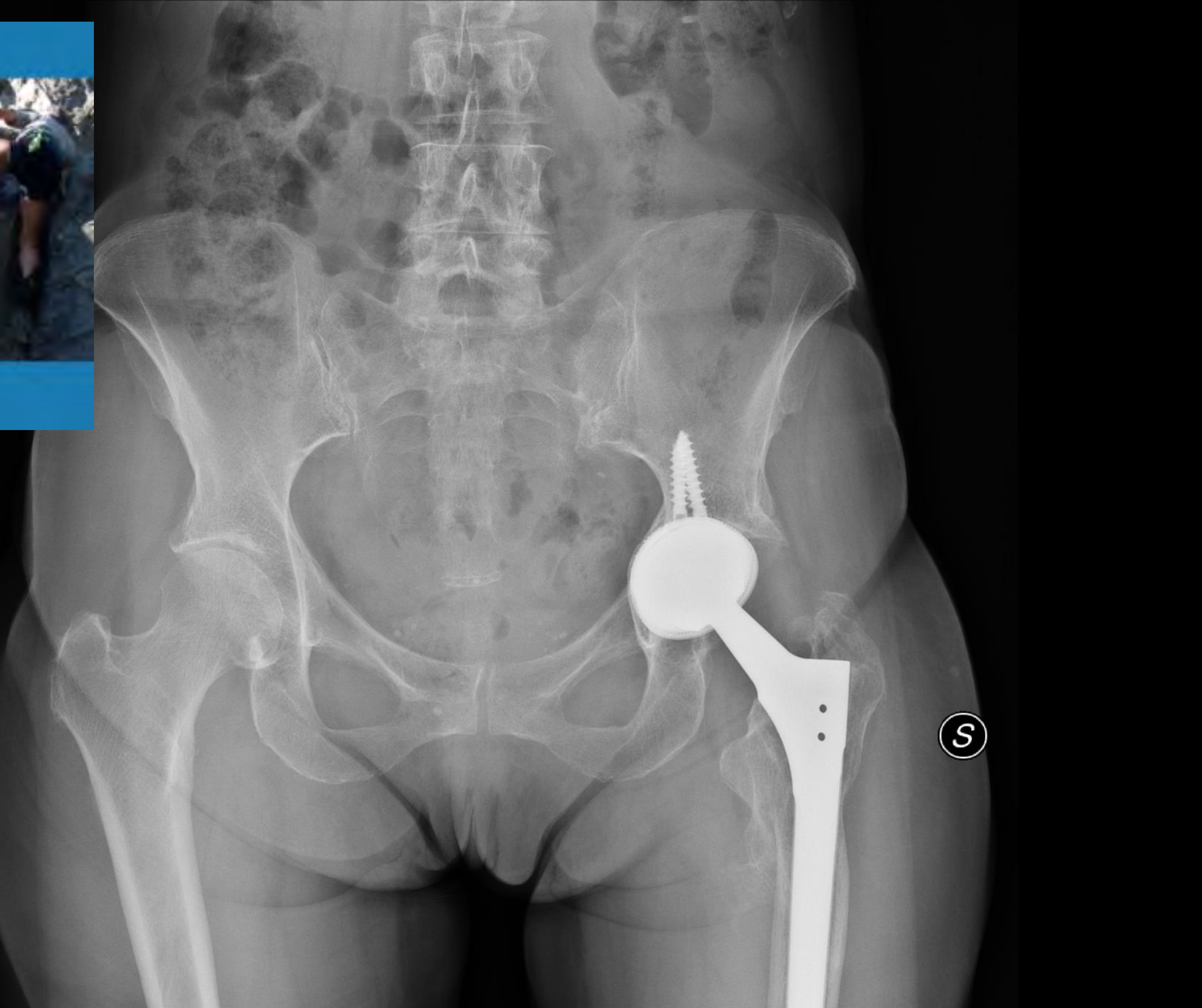


ID 34712 – C. M. – Male - 47 yrs old – Pre.op



ID 34712 – C. M. – Male - 47 yrs old – FUP 14 mm


Post - Trauma
DG2 150CM
ID 33440 – M. S. – Female - 75 yrs old – Pre.op



ID 33440 – M. S. – Female - 75 yrs old – FUP 8 mm

CONCLUSIONS

TT is a reliable material and option in hip primary prosthetic replacement.

Great compliance since the beginning of rehabilitation thanks to ideal osteoconductive characteristics of the TT.

Possibility of using large diameter head in small metal-back (female).

Good clinical results in mid-term follow-up encourage us in implanting this cup.

Do not forget this is an ITALIAN BRAND…

Thank You

for your kind

attention

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

BHS – SIA INTERNATIONAL COMBINED MEETING, 26-27 NOVEMBER 2015, MILAN ITALY

MINIMUM THREE-YEARS CLINICAL & RADIOGRAPHIC RESULTS OF A NEW PRESS-FIT TAPERED HIP STEM

Anastasios Lilikakis, E.P. Kritharis, E. Michelinakis[+]
Athens, Greece

LEADER® STEM

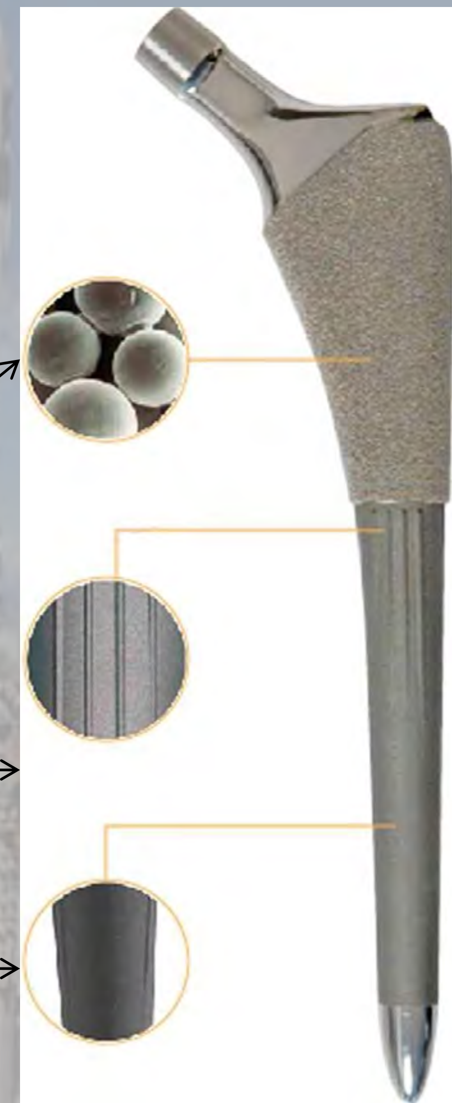
Material: Ti6Al4V

Design: Double taper

Metaphysis: Porous coating for bone ingrowth [titanium microspheres (porosity 35-40%, pore size 80-250 μm)]

Metaphysis – diaphysis junction:
Ribs for fixation and rotational stability

Diaphysis: Grit blasted surface for bone ongrowth



LEADER STEM

12/14 taper

Neck geometry: ↑ range of motion & ↓ impingement

Design: minimal stress shielding

Polished & short distal tip: prevents cortical impingement & thigh pain

LEADER STEM

Finite Element Analysis:
maximum stress concentration: in the proximal part of the stem across the sintered bids porous coating

Mechanical tests have confirmed the above computational analysis

DUAL TAPERED STEMS


Leader®


Summit®


VerSys®


Synergy®


Novation®

Patients

- June 2010 – May 2012
- First 49 patients (53 THRs) [learning curve]
- 20 males / 29 females
- Mean age 66 ±13 years
- OA 39 (41 THRs)
- DDH 6 (8 THRs)
- AVN 2
- Chondrolysis 2

Methods

- Posterior Approach - two hip surgeons
- Harris Hip Score
- Oxford Hip Score
- X-Rays anteroposterior + lateral
- Preoperatively & yearly thereafter
- Metal on Poly 22 THRs
- Ceramic on Poly 23 THRs
- Ceramic on Ceramic 8 THRs

Results

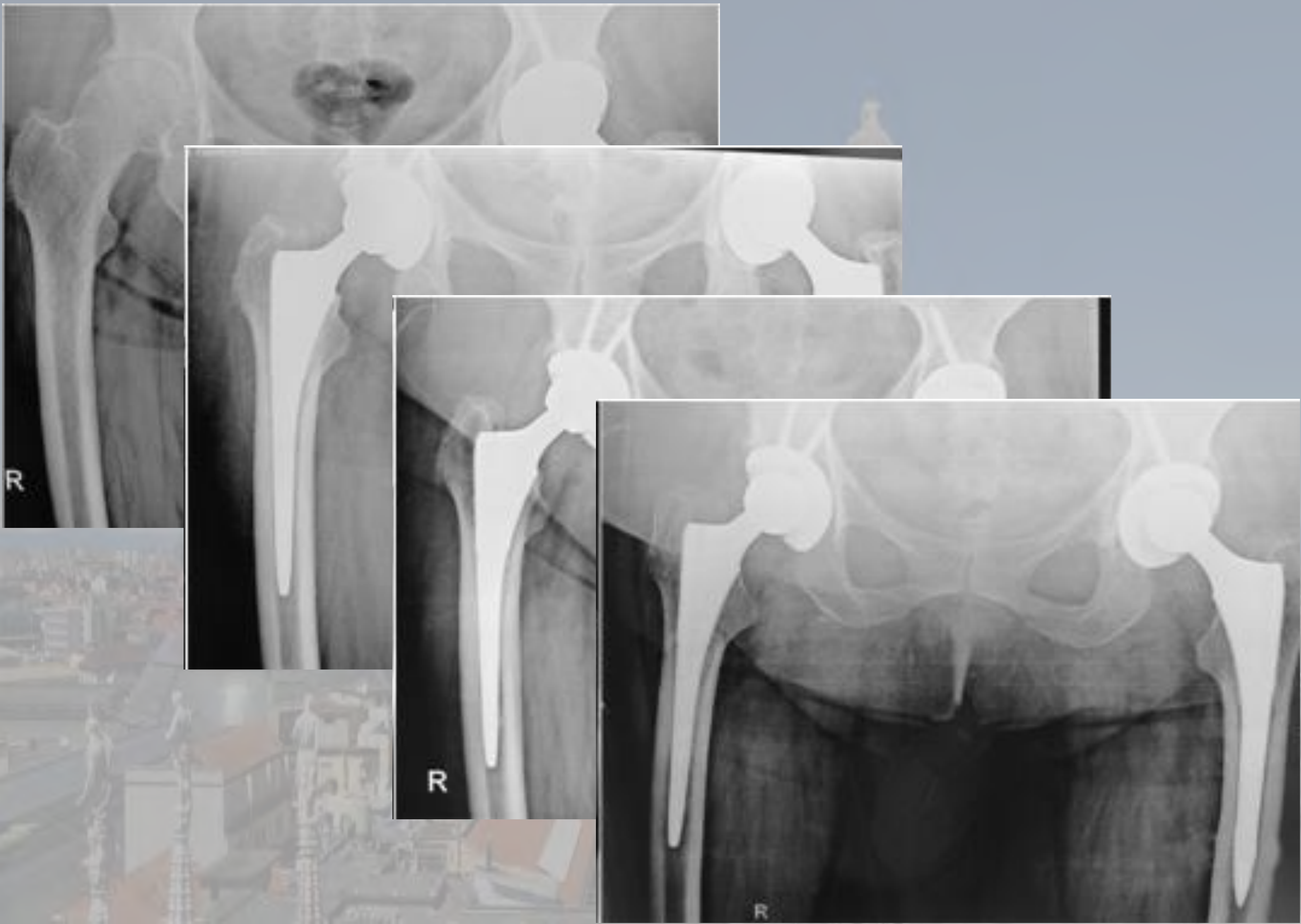
- Follow-up minimum 3 years
- Mean 50 months follow-up
- Six patients / THRs lost to follow-up
- One patient deceased – stable, untroubled prosthesis
- One PP# - stable prosthesis – ORIF

Results

- No revision (to our knowledge)
- Three patients thigh pain (resolved)
- No stem subsidence
- No radiolucent lines (any Gruen zone)
- Cortical hypertrophy two patients

Results

	Pre-THR (53)	1 year (49)	2 years (48)	3 years (46)	5 years (5)
HHS	34±13	84±13	89±13	89±13	87±15
OHS	13±5	40±7	41±7	41±7	40±6


R
R
R

Conclusion

- Preliminary results of a new stem
- First 50 stems – learning curve
- Very good clinical results
- Very good radiological results
- Irrespective of age, gender, BMI
- Original instrumentation needed improvement
- Following THRs: improved surgical technique
- Longer follow-up obviously needed
- Draw-back: large number lost to follow-up


THANK YOU

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY

SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Second Generation Tapered Femoral Cementless Hip Stem in Total Hip Arthroplasty: A Minimum 15-Year Follow-Up Study

Ivan De Martino, M.D. (1)
Peter Sculco, M.D. (1)
Rocco D'Apolito, M.D. (2)
Vincenzo De Santis, M.D. (2)
Giorgio Gasparini, M.D. (3)

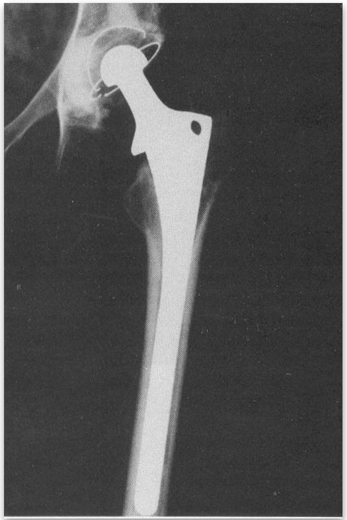
[1]Hospital for Special Surgery, New York, NY, USA
[2]Catholic University of the Sacred Heart, Roma, Italy
[3]Magna Graecia University, Catanzaro, Italy

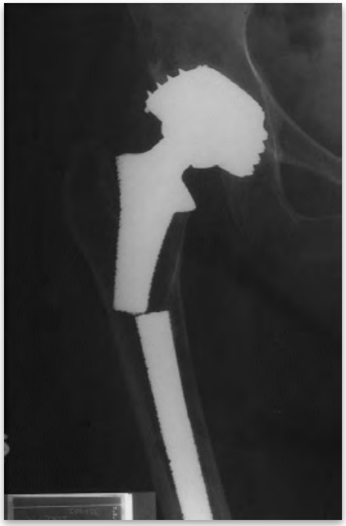
INTERNATIONAL COMBINED MEETING
BRITISH HIP SOCIETY - SOCIETÀ ITALIANA DELL'ANCA
26-27 NOVEMBER 2015, MILAN, ITALY

Why a new tapered stem?

1st generation cementless stems: poor results

- ✓ **PCA (anatomic: 24% revisions @ 7 yrs)**
- ✓ **Lord (cylindrical: 31% stress-shielding)**
- ✓ **Mittelmeier (cylindrical: 18% thigh pain)**
- ✓ **Harris-Galante (cylindrical: 20% loosening @ 6yrs)**





Why a new tapered stem?

The causes for failures

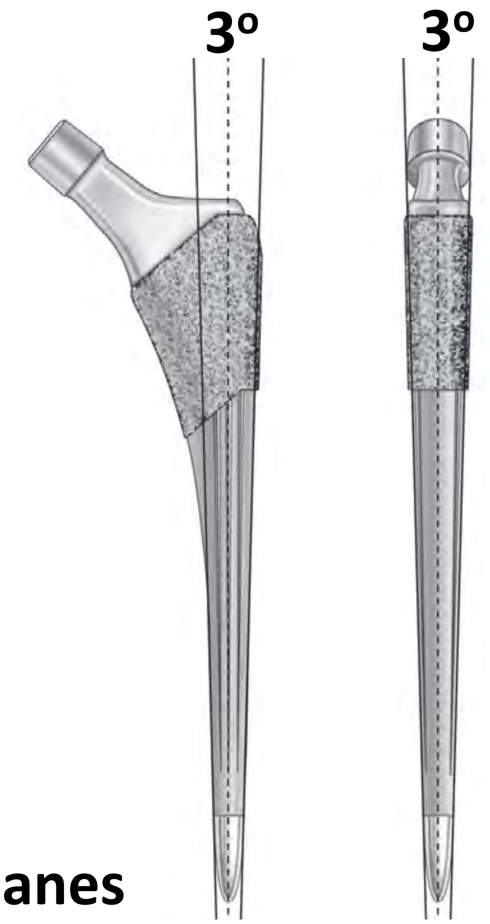
- ✓ **Loosening: 5-10% @ 2-5 Yr. F/U**
- ✓ **Thigh pain: 15-21% (AML=21%)**
- ✓ **Osteolysis: 20-29% (HGP=29% @ 7 yrs)**
- ✓ **Stress-shielding: 15-50%**
- ✓ **Fractures: 2-10%**
- ✓ **Dislocations: 5-10%**
- ✓ **Leg-length discrepancies > 1cm: 15-30%**

SYNERGY stem

The Synergy stem was introduced in 1996

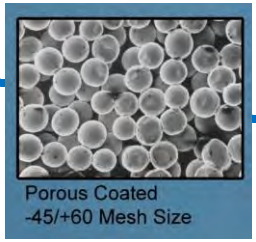
SYNERGY stem

- ✓ Straigh
- ✓ Ti-6AL-4V
- ✓ Neck angle 131°
- ✓ Tapered
- ✓ Porous or HA coated
- ✓ Proximal fins
- ✓ Low-profile neck
- ✓ 3 degree taper in both the A/P and M/L planes



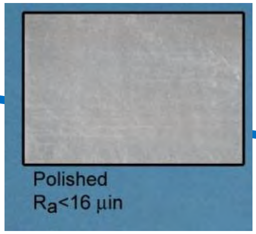
SYNERGY stem - coating features

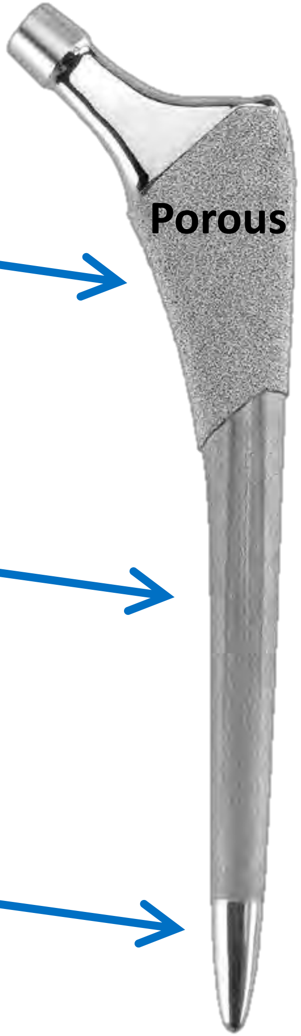
In-growth



On-growth

No-growth





Materials and Methods

- ✓ Retrospective, cohort study
- ✓ November 1996 - October 1998
- ✓ 112 primary THAs in 102 patients
- ✓ Mean age at surgery: 61 years (range 18-82 years)
- ✓ Mean follow-up: 16.3 years (range 15-17 years)
- ✓ Lost at FU: 17 patients (18 hips) for reason not related to the replaced hip
- ✓ Patient selection: Dorr types A and B femurs

Materials and Methods

Clinical results of the 94 THAs with minimum 15-year FU

- ✓ Clinical and radiographic evaluation preop. and postop. at 5, 10 and 15 years (Harris Hip Score, WOMAC and SF12)
- ✓ Thigh pain frequency (daily, weekly, monthly) and intensity (0 to 10 on a visual analogue score)

Radiographic Analysis

- Stem alignment (normal within 3° from anat. axis)
- bone in-growth (according to Gruen)
- Radiolucent lines: presence, width and progression over time (Gruen)
- Stress shielding: cortical reactions, proximal resorption and spot welds around stem tip
- presence of pedestal at distal end of the stem (Engh)
- presence of heterotophic ossification (Brooker)

Statistical Analysis

- ✓ **SPSS 17.0 (SPSS Inc., Chicago, IL, USA)**
- ✓ **Student paired t test to assess the pre and postop scores (Harris Hip score, WOMAC score, SF-12 mental and physical scores) at 5-, 10- and 15-year follow up (P value <0.05 stat. significant)**
- ✓ **Kaplan-Meier survival analysis with revision for any reason or stem related revision as an endpoint**

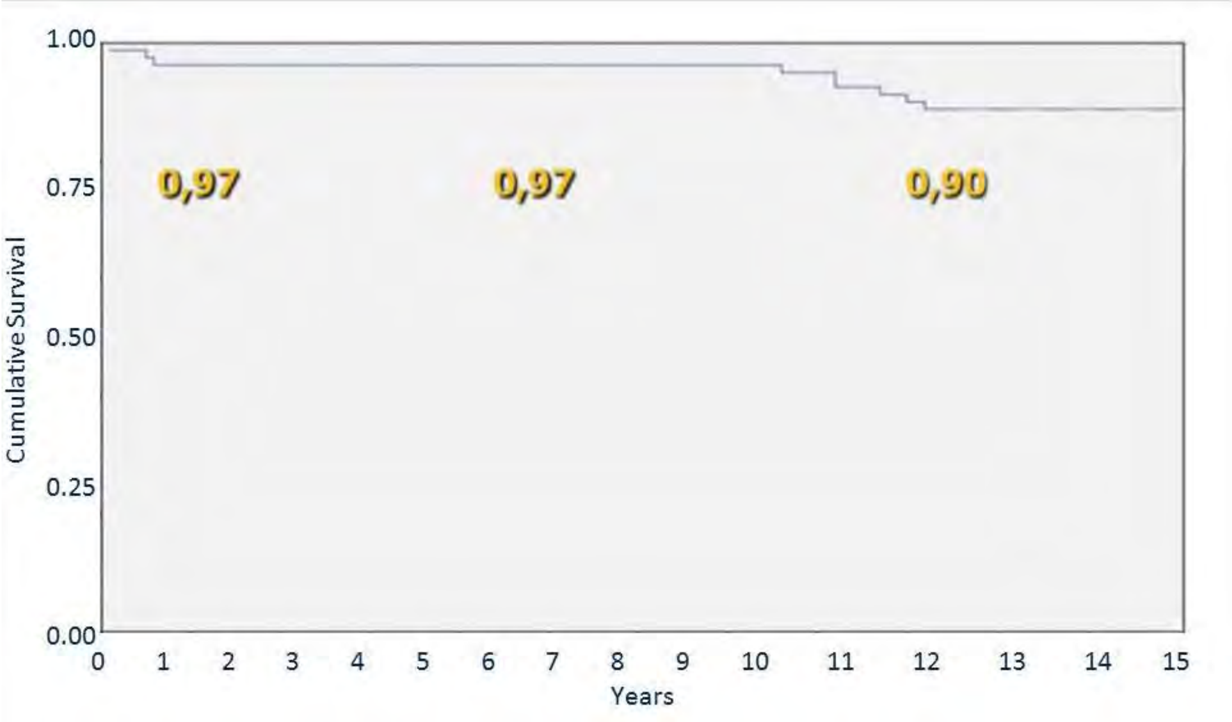
Results

	Preoperative	5 years	15 years
SF 12 Mental	31	38 P= 0,11	30 P= 0,6
SF 12 Physical	30,55	52,23 P= 0,001	53,21 P= 0,001
WOMAC	40,59	79,09 P= 0,001	79,99 P= 0,001
Harris Hip Score	47,82	89,81 P= 0,001	89,71 P= 0,001

thigh pain: 5 patients (5,3%), not constant

Kaplan-Mayer Survival Analysis

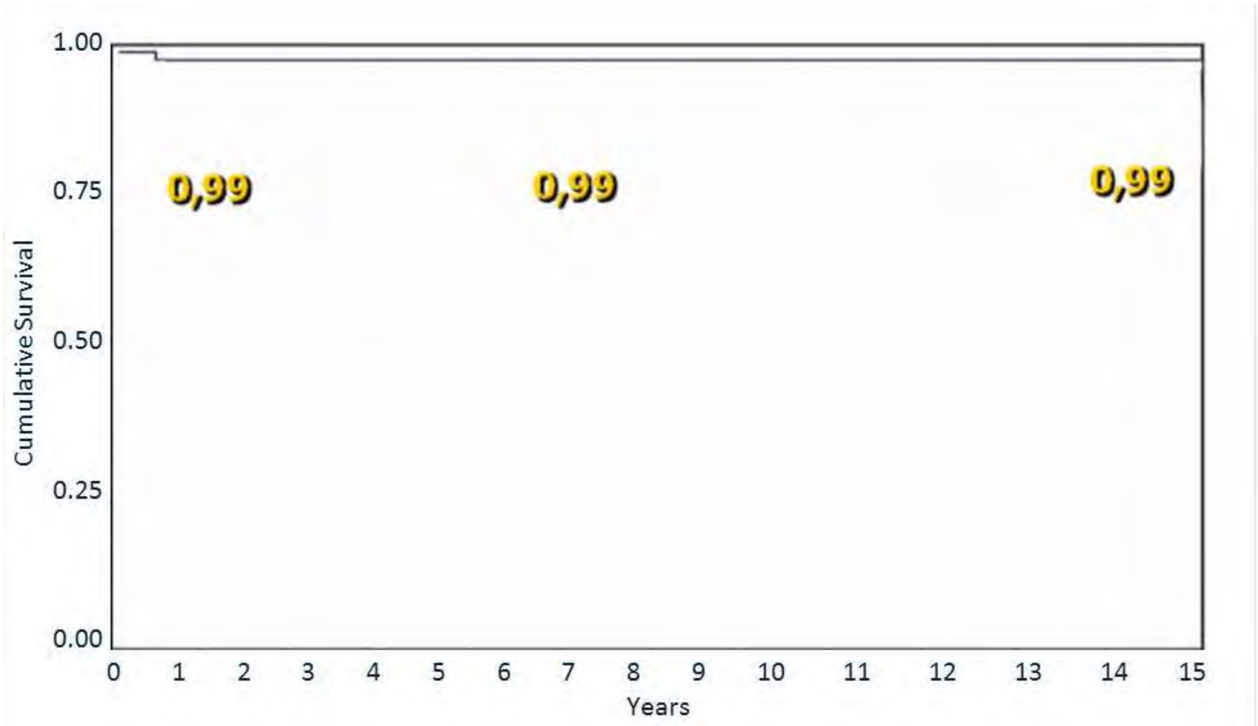
revision for any reason: 9 (10%)
(3 poly wear, 2 late periprosthetic fractures, 1 instability, 2 late infection and 1 subsidence)



cumulative survival: 97% @ 5 years, 90% @ 15 years

Kaplan-Mayer Survival Analysis

stem related early revision: 1 (1%)
(occult intraop. calcar crack subsidence)



cumulative survival @ 15 years: 99%

Radiographic Results

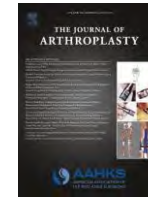
- ✓ **alignment was in varus in 5 cases and in valgus in 1**
- ✓ **bone ingrowth was observed in 93 hips (99%)**

Radiographic Results

- ✓ stress-shielding was present as cortical reaction in 5 femurs in Gruen zones 3 & 5
- ✓ radiolucent lines were uncommon, non progressive, < 2 mm, in Gruen zones 2 & 6
- ✓ HO (grade I and II in 12 cases and grade III in 3 cases) were observed in 15 hips

Discussion

Comparing the Long-Term Results of Two Uncemented Femoral Stems for Total Hip Arthroplasty



2015

Petis SM, Howard JL, McAuley JP, Somerville L, McCalden RW, MacDonald SJ

- 325 Synergy Stems
- 97.5% survivorship at 10 years (stem revision as end-point)
- Thigh pain 5.3%

Discussion

Annual Report 2014

AUSTRALIAN ORTHOPAEDIC ASSOCIATION
NATIONAL JOINT REPLACEMENT REGISTRY

Femoral Component	Acetabular Component	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	13 Yrs
Synergy	R3	70	3161	1.6 (1.2, 2.2)	2.4 (1.8, 3.0)	2.9 (2.2, 3.9)			
Synergy	Reflection (Shell)	265	7605	1.5 (1.3, 1.8)	2.3 (2.0, 2.7)	2.6 (2.3, 3.0)	3.1 (2.7, 3.5)	4.3 (3.7, 4.9)	5.4 (4.5, 6.4)

Conclusion

- ✓ **Excellent clinical and radiographic results at 15 years**
- ✓ **Survivorship (with stem revision as end point) was 99% at 15 years**
- ✓ **Thigh pain was uncommon**
- ✓ **Bone ingrowth was observed in all stems and radiolucent lines were “benign”**

Thank You

demartinoi@hss.edu

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

10 - 20 year outcomes following THR with the Muller Low Profile Cup

Mr Ashwin Unnithan MSc, FRCS (Tr & Orth)
Mr James Nutt MRCS
Mr Philip Mitchell FRCS (Tr & Orth)
Mr John Rosson MSc, FRCS

Background

- Total number of primary THR’s recorded on NJR = 708,311.
- Ceramic on Polyethylene (CoP) account for 9.5% of total THRs but popularity is rising in recent years.
- Cemented THR’s account for 36% of total.

Methods

- Retrospective study
- Cemented Low Profile Muller cup
- Bearing surface Ceramic on Poly

- (All 28mm internal diameter)

- Operation >10 years ago

Methods continued

- Patients routinely followed up every 2 years with radiographs and clinical assessment.
- Oxford scores obtained on most recent visit.
- Most recent radiograph scored by independent experienced orthopaedic surgeon from different centre.

Surgical details

- All procedures done under supervision of single surgeon.
- Posterior approach.
- 360 degree view of acetabulum.
- Anchorage holes drilled (minimum of 4).
- Boney landmark used for placement of acetabular component.

Results

- Total number of hips = 106
- Mean age = 60 years (range 50 – 68)
- RIP = 13
- Excluded = 23 (moved, no response after 5 attempts)
- Total number included in the study = 70

Results

- Mean Oxford score = 46.2 (48 – 36).
- Mean time to obtaining Oxford score = 14 years (21 – 10 years).
- No patient required revision surgery.

Results

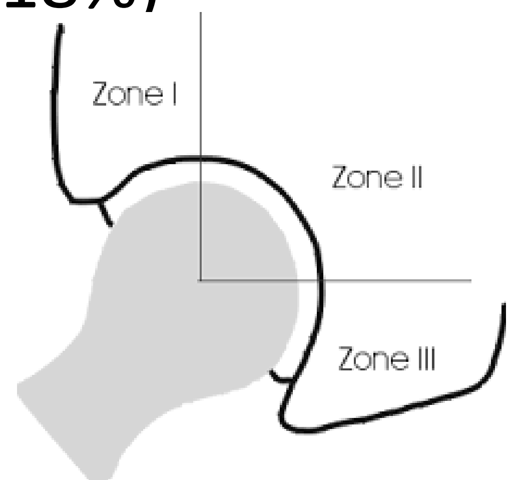
- Mean time from surgery to latest radiograph = 12 years. (Range 5 – 18)

- Average inclination = 39.0 degrees

- Number of patients with radiological appearances of loosening at latest x-ray= 13 (18%)

Of those

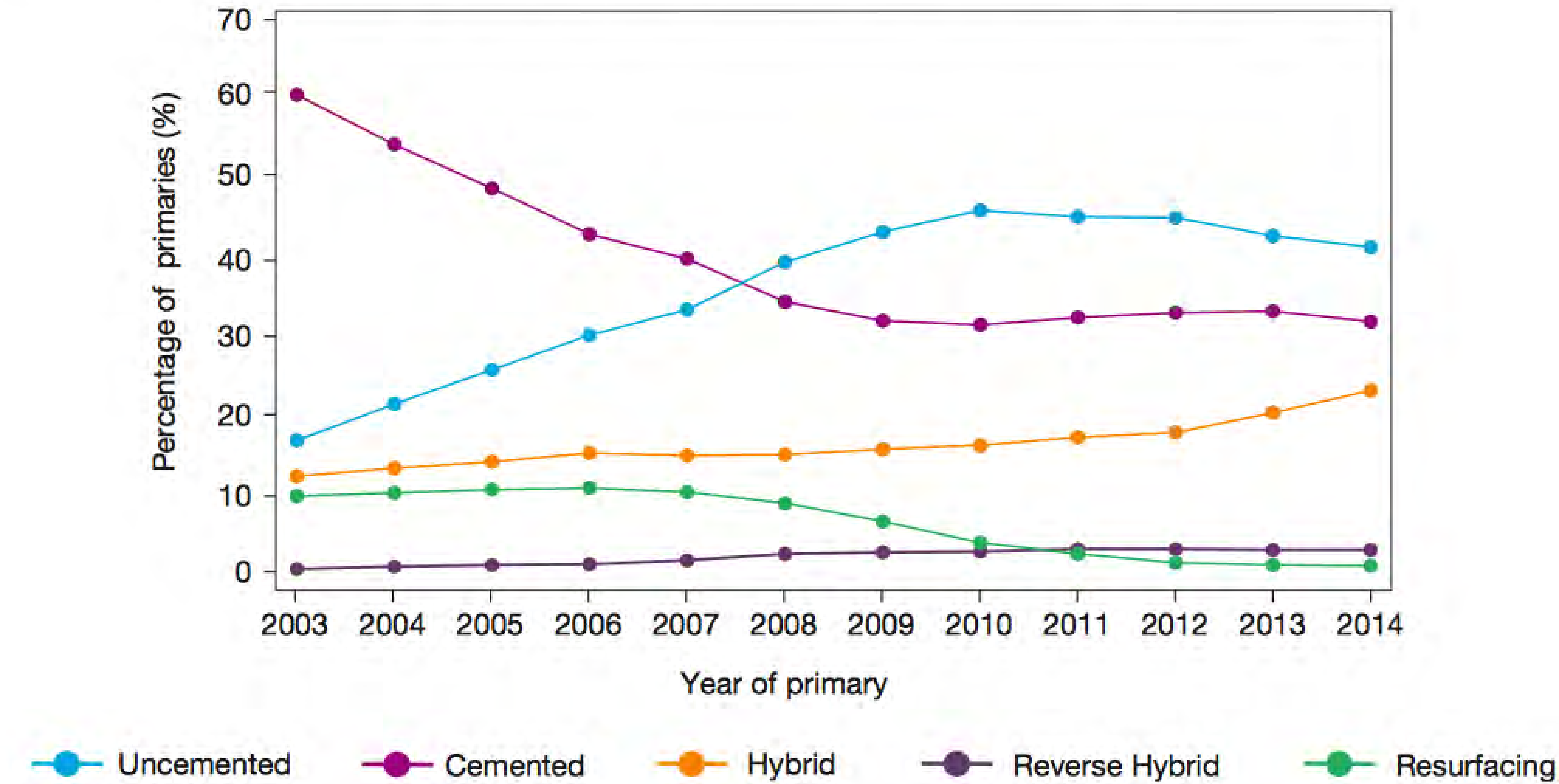
- Zone 1 = 13
- Zone 2 = 2
- Zone 3 = 3



Discussion

- 80,000 THR's done annually costing NHS £64m.
- Average un-cemented implant costs £3000 - £4000.
- Cost of this system £1200

Temporal changes in percentages of each fixation method used in primary hip replacements.

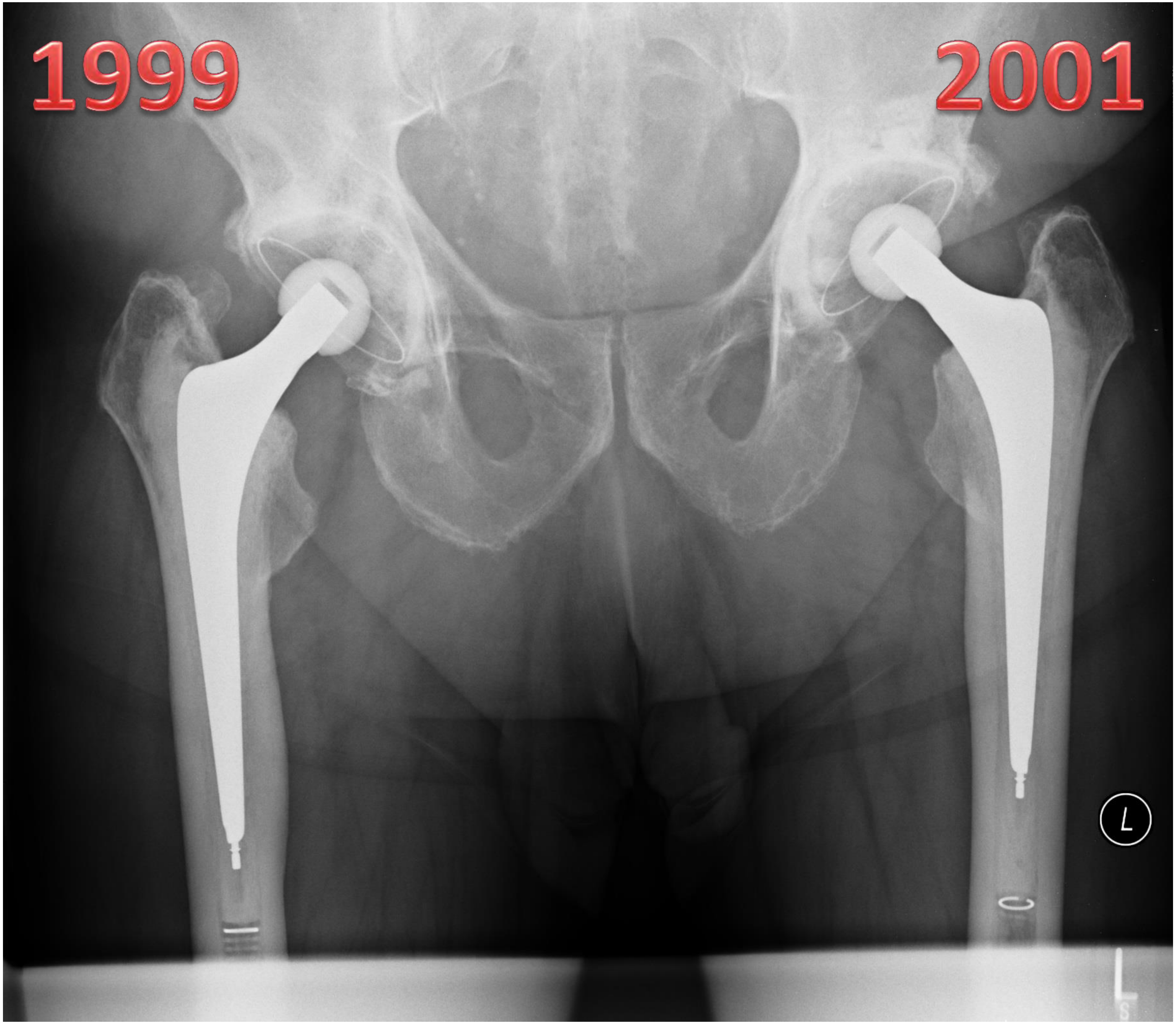


From the NJR

Fixation/bearing types	Cumulative percentage probability of revision (95%CI) at:						
	n	1 year	3 years	5 years	7 years	10 years	11 years
All cases*	708,311*	0.76 (0.74-0.78)	1.61 (1.58-1.64)	2.61 (2.57-2.66)	3.86 (3.80-3.93)	5.64 (5.52-5.75)	6.20 (6.04-6.36)
All cemented	255,926	0.47 (0.45-0.50)	1.04 (1.00-1.09)	1.53 (1.47-1.58)	2.09 (2.01-2.16)	3.13 (3.00-3.26)	3.63 (3.43-3.83)
Cemented by bearing surface							
MoP	224,779	0.48 (0.45-0.51)	1.04 (1.00-1.09)	1.51 (1.45-1.57)	2.02 (1.95-2.10)	3.06 (2.92-3.20)	3.51 (3.31-3.72)
MoM	1,148	0.71 (0.35-1.41)	2.65 (1.85-3.80)	6.28 (4.96-7.95)	12.10 (10.12-14.45)	*18.33 (15.27-21.93)*	*18.33 (15.27-21.93)*
CoP	24,360	0.40 (0.32-0.49)	0.93 (0.80-1.08)	1.35 (1.18-1.55)	1.75 (1.53-2.01)	2.17 (1.85-2.55)	2.98 (2.20-4.02)
Others/unsure	5,639	0.55 (0.38-0.78)	1.09 (0.84-1.41)	1.65 (1.31-2.07)	2.42 (1.95-2.99)	3.47 (2.70-4.45)	*4.98 (3.50-7.06)*

Conclusion

- Cost effective system
- PROM's excellent at 10 years
- 10 year revision rate 0%
- Middle aged subset of patients.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INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

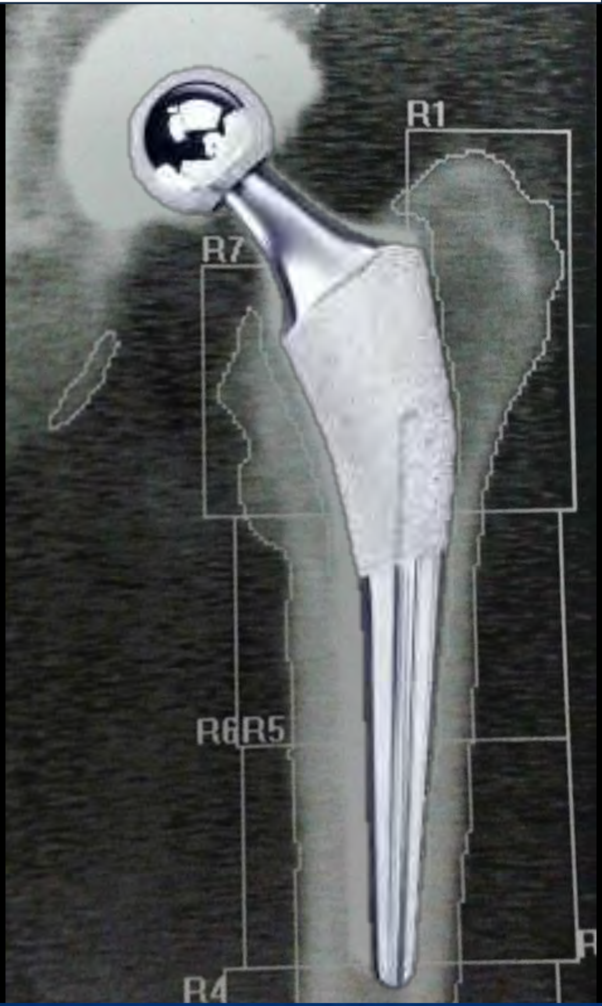
University of Pisa

Ist Orthopedic Division

Chair Prof. Michele Lisanti

UNIVERSITÀ DI PISA

Densitometric evaluation of periprosthetic bone resorption after surgical placement of Accolade I TMZF hip stem at 36 months



P.D. Parchi, G. Ciapini, C. Mannucci, I. Castellini, S. Marchetti, S. Maffei*, M. Lisanti

*

ISTITUTO DI FISIOLOGIA CLINICA

INNOVATION FOR BETTER PATIENT CARE

IFC CNR

INTERNATIONAL COMBINED MEETING

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26-27 NOVEMBER 2015

MILAN, ITALY

introduction

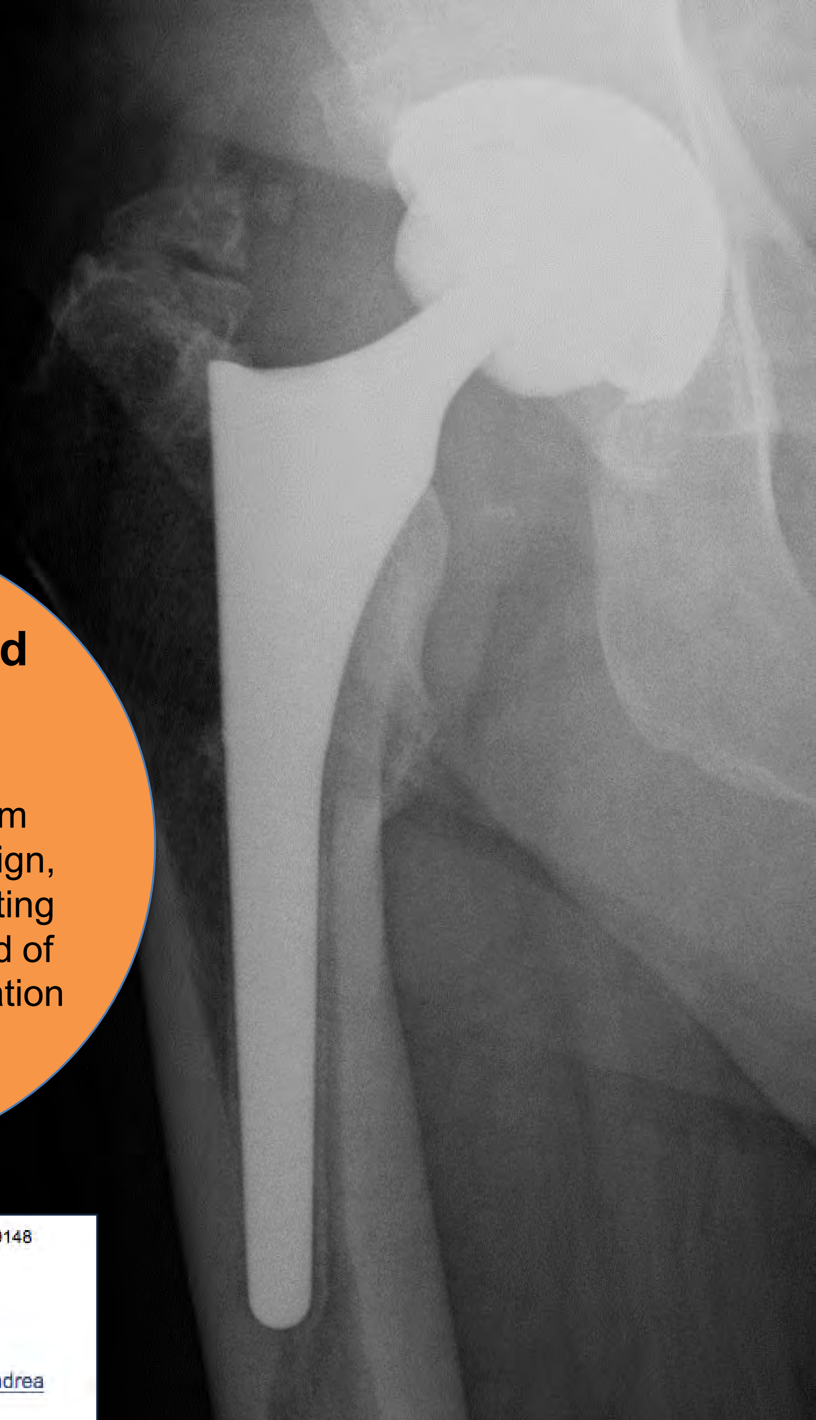
Remodeling patterns around a femoral stem

Patient-Related Factors

such as gender, age, initial femoral bone stock, patient activity, and underlying-diseas

Implant-related Factors

type of fixation, stem length, stiffness, design, the extent of the coating area, and the method of femoral bone preparation



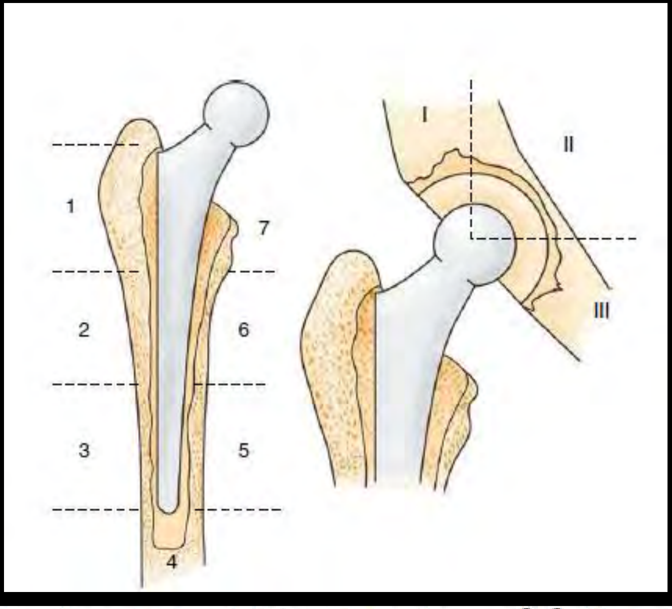
Clin Cases Miner Bone Metab. 2014 Sep-Dec; 11(3): 226–231.
Published online 2014 Dec 10.
PMCID: PMC4269148

Densitometric evaluation of periprosthetic bone remodeling

Paolo Domenico Parchi, Valentina Cervi, Nicola Piolanti, Gianluca Ciapini, Lorenzo Andreani, Iacopo Castellini, Andrea Poggetti, and Michele Lisanti

introduction

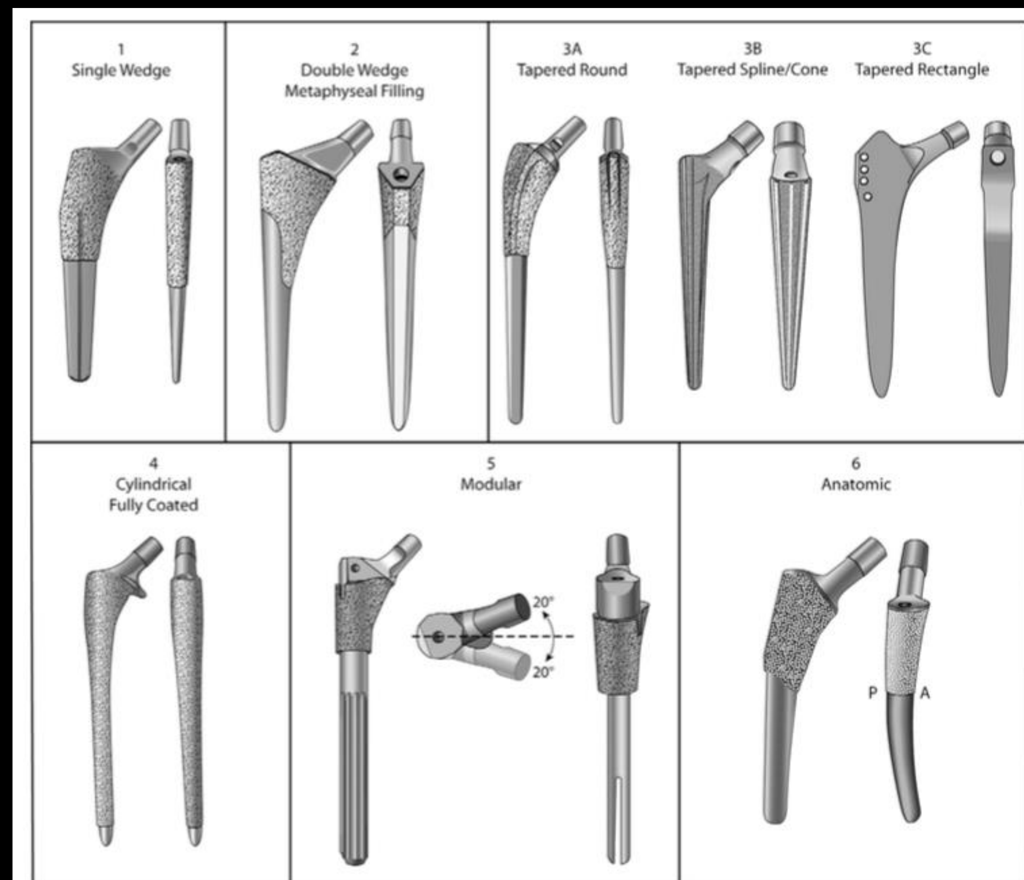
One of the first authors that studied periprosthetic bone quality and the reaction of bone to the prosthesis was Gruen in 1979.



Gruen TA, McNiece GM, Amstutz HC: "Modes of failure" of cemented stem-type femoral components: A radiographic analysis of loosening. Clin Orthop Relat Res 141:17-27, 1979.

introduction

The pattern of BMD changes is influenced by the region of the stem fixation on bone and thereby where stress is created on the surrounding bone (Wolff's Law).

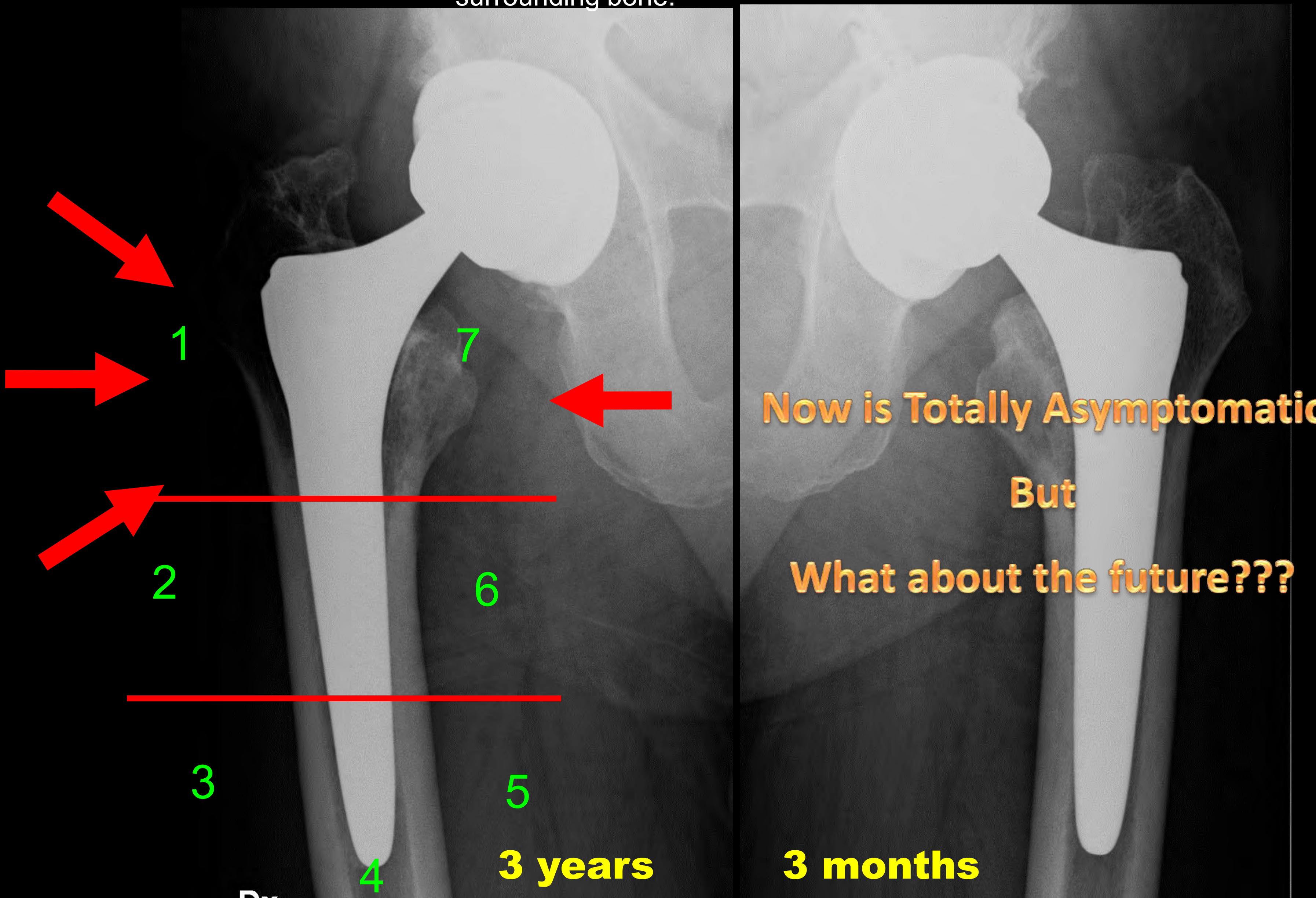


Cementless Femoral Fixation in Total Hip Arthroplasty

Harpal S. Khanuja, Jeffrey J. Vakil, Maria S. Goddard and Michael A. Mont
J Bone Joint Surg Am. 2011;93:500-509. doi:10.2106/JBJS.J.00774

introduction

The pattern of BMD changes is influenced by the region of the stem fixation on bone and thereby where stress is created on the surrounding bone.



introduction

HOW STUDY

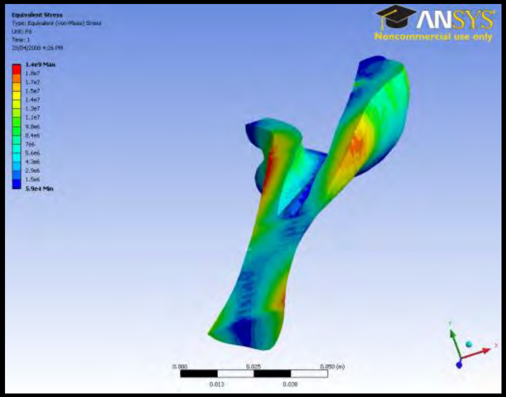
THE PERIPROSTHETIC BONE QUALITY
AND
THE REACTION OF BONE TO THE PROSTHESIS

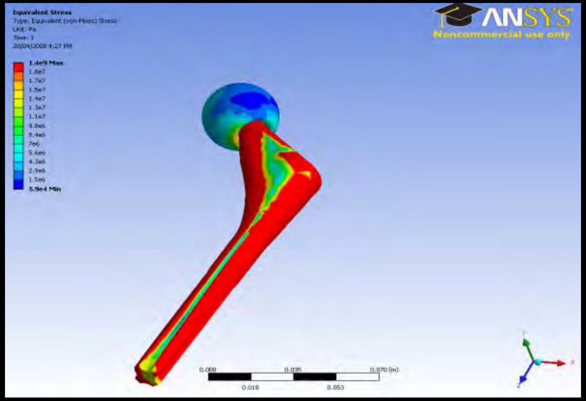
?

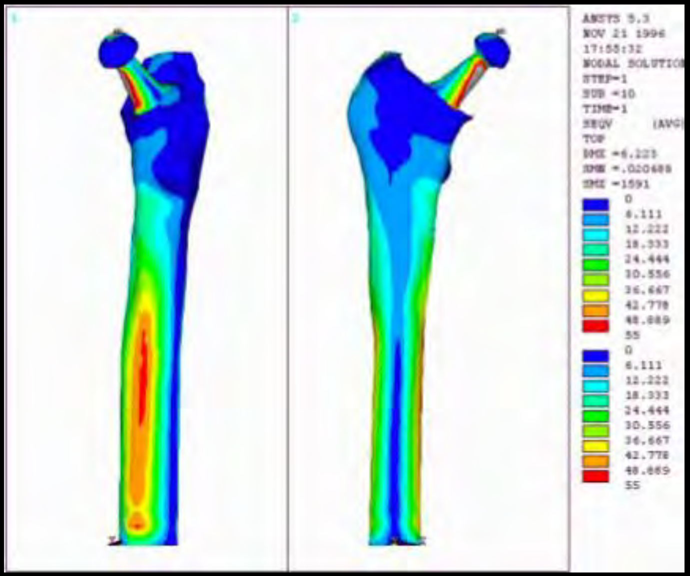
introduction

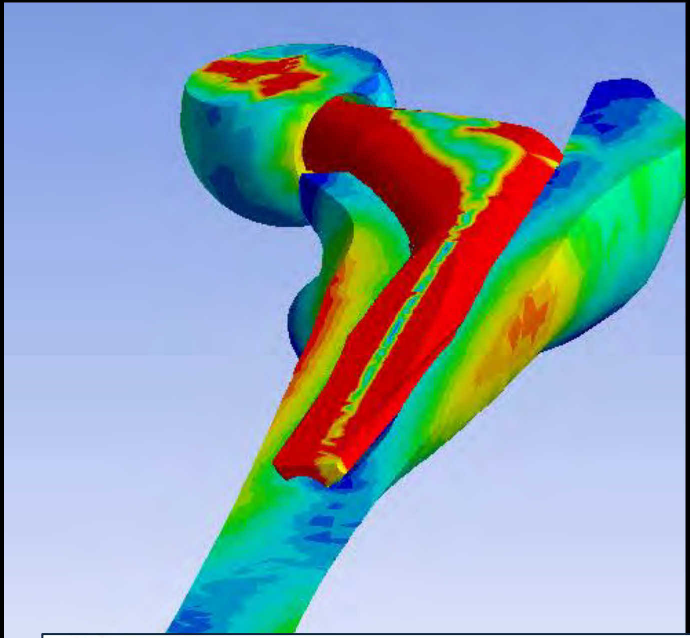
We can study the effects of stem design on periproshtetic bone remodelling:

in vitro with FINITE ELEMENTS ANALYSIS









Pawlikowski, Skalski and Haraburda, 2003

Kayabasi, O. and Ekici, B. (2007) The effects of static, dynamic and fatigue behavior on three-dimensional shape optimization of hip prosthesis by finite element method. Materials & Design 28(8):2269-2277.

Mann, K. A., Damron, L. A., Miller, M. A., Race, A., Clarke, M. T., and Cleary, R. J. (2007) Stem-cement porosity may explain early loosening of cemented femoral hip components: experimental-computational in vitro study. Journal of Orthopaedic Research, 25:340-350.


JRRD
Journal of Rehabilitation Research & Development
Volume 40 Number 2, March/April 2003
Pages 131 — 146

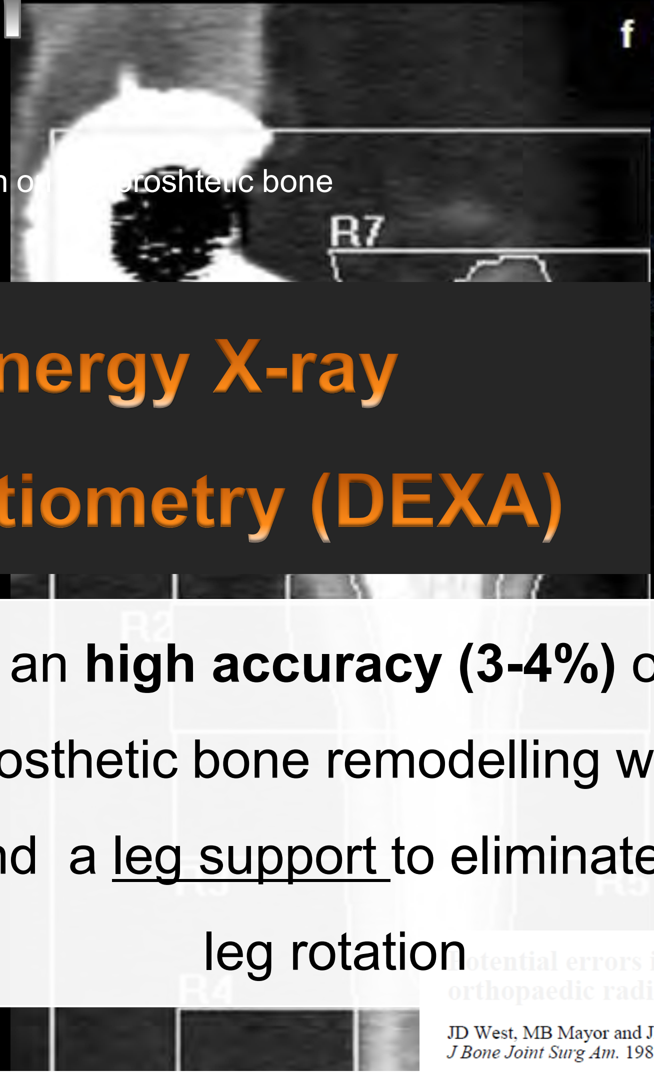
Failure analysis of composite femoral components for hip arthroplasty

Chaodi Li, PhD; Christopher Granger, MS; H. Del Schutte Jr., MD; Sherrill B. Biggers Jr., PhD; John M. Kennedy, PhD; Robert A. Latour Jr., PhD

Department of Bioengineering and Department of Mechanical Engineering, Clemson University, Clemson, SC; Department of Orthopaedic Surgery, Medical University of South Carolina, Charleston, SC

introduction

We can study the effects of stem design o… roshtetic bone remodelling:



In VIVO: **Dual-energy X-ray absorptiometry (DEXA)**

Studies reported an **high accuracy (3-4%)** of the DEXA in the evaluation of periprosthetic bone remodelling when is used a metal removal software and a leg support to eliminate errors related to the leg rotation

THE GOLD STANDARD

Potential errors inherent in quantitative densitometric analysis of orthopaedic radiographs. A study after total hip arthroplasty

JD West, MB Mayor and JP Collier
J Bone Joint Surg Am. 1987;69:58-64.

Clin Orthop Relat Res. 1994 Aug;(305):178-89.

Correlation of computed finite element stresses to bone density after remodeling around cementless femoral implants.

Skinner HB, Kilgus DJ, Keyak J, Shimaoka EE, Kim AS, Tipton JS.

Department of Orthopaedic Surgery, University of California, San Francisco 94143-0728.

Calcif Tissue Int. 1993 Sep;53(3):158-61.

Dual X-ray absorptiometry for the evaluation of bone density from the proximal femur after total hip arthroplasty: analysis protocols and reproducibility.

Trevisan C, Bigoni M, Cherubini R, Steiger P, Randelli G, Ortolani S.

Istituto di Scienze Mediche, Università degli Studi, Ospedale Maggiore di Milano, Italy.

Materials and methods

AIM OT THE STUDY IS:

The in vivo evaluation of the effects of *different philosophies* cementless stem designs on periprosthetic bone remodellig

- **Stryker HIPSTAR**:
  Rectangular tapered design (Type 3C)

- **Stryker Accolade**
  Tapered-wedge design (Type 1)

- **B-Braun Metha**
  Neck preserving short stem design

Study Approved by Local Ethics Committee N 2930

Materials and methods

STUDY PROTOCOL

- Clinical Evaluation (HHS sco
- Radiographic Evaluation
- Densitometric Evaluation

T0 between 0 to 6 weeks

T1 at 12 months Stryker HIPSTAR

T2 at 24 months Stryker Accolade

T3 at 36 months B-Braun Metha

T4 at 48 months

Approved by Local Ethics Committee N 2930

The study is made in collaboration with the CLINICAL PHYSIOLOGY INSTITUTE of the NATIONAL RESEARCH COUNCIL CENTER of PISA

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P94 Evaluation of periprosthetic bone resorption secondary to first total hip replacement with Metha® short hip stem: follow-up examination results at 48 months
G. Ciapini, P.D. Parchi, C. Mannucci, I. Castellini, N. Piolanti, L. Andreani, S. Maffei, M. Lisanti (Italy)

Materials and methods

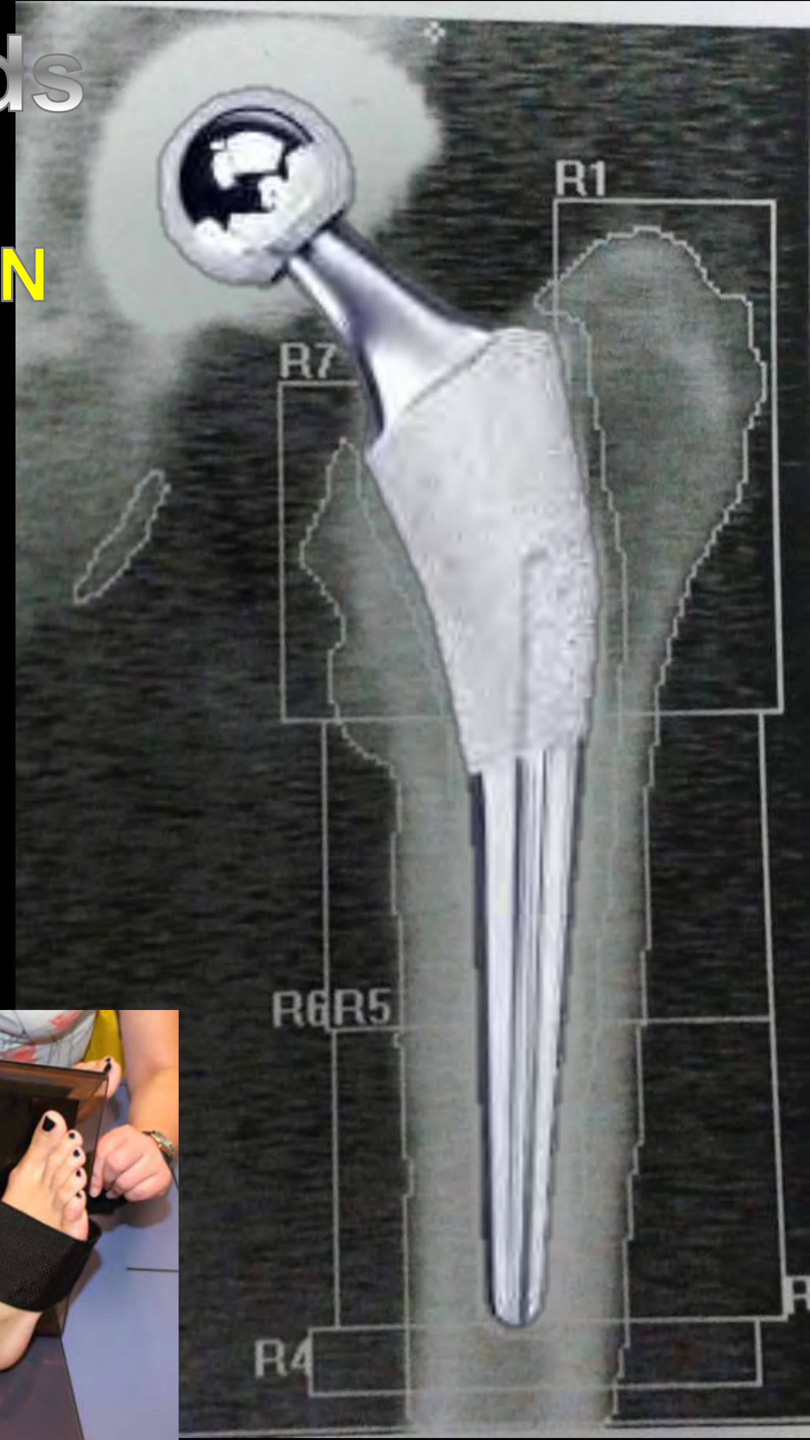
DENSITOMETRIC EVALUATION

DEXA HOLOGIC EXPLORER

- Metal Removal Hip Analysis Package
- Standard knee and foot support provided by the manufacturers
- BMD was calculated in seven regions of interest (ROI), surrounding the femoral component (GRUEN ZONES)

Precision of Periprosthetic Bone Mineral Density Measurements Using Hologic Windows Versus DOS-Based Analysis Software

Nitin R. Shetty, Andrew J. Hamer, Ian Stockley, Richard Eastell, J. Mark Wilkinson



Materials and methods

31 Patients were enrolled in the ACCOLADE Group

25 Patients reached T3 (36 months) [6 drop-out]

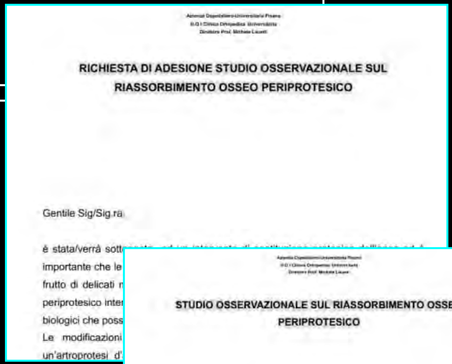
11 male- 14 female average age: 66 years (50-76)

INCLUSION CRITERIA

- Patients who underwent Primary **THA** between **Jan 2009** and **Dec 2010**
- Patients that can give a written consent.

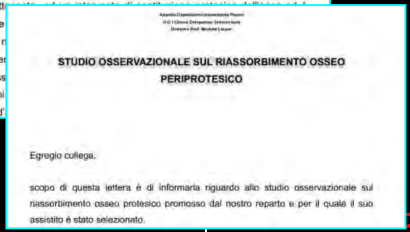
EXCLUSION CRITERIA

- Previous hip surgery
- Previous hip fractures
- Documented defects of bone metabolism
- Periprosthetic fractures
- Patients with tumors or infections
- Patient with severe malabsorption disease (ex. celiac desease...)



RICHIESTA DI ADESIONE STUDIO OSSERVAZIONALE SUL RIASSORBIMENTO OSSEO PERIPROTESICO

Gentile Sig/Sig.ra



STUDIO OSSERVAZIONALE SUL RIASSORBIMENTO OSSEO PERIPROTESICO

Egregio collega,

scopo di questa lettera è di informarla riguardo allo studio osservazionale sul riassorbimento osseo protesico promosso dal nostro reparto e per il quale il suo assistito è stato selezionato.

Same surgeon
Same surgical technique
Posterolateral approach

Results T3 (36 months)

- **Clinical Evaluation**

  HHS preop 64 → postop 93 ($p < 0.001$)

  NO major complications

  NO REVISIONS

  NO DISLOCATIONS

- **Radiographic Evaluation**

  No Signs Of Mobilization (Rdiolucent lines)

  No Fractures

  2 Non-symptomatic Heterotopic Calcifications

J Arthroplasty. 2011 Sep;26(6):838-41. doi: 10.1016/j.arth.2011.02.010. Epub 2011 Apr 5.

Primary total hip arthroplasty with an uncemented femoral component five- to nine-year results.

Casper DS[1], Kim GK, Restrepo C, Parvizi J, Rothman RH.

Author information

Abstract

This study reports the outcome of total hip arthroplasty
consecutive patients (214 hips) undergoing total hip ar

Hip Int. 2015 Oct 13;25(5):447-51. doi: 10.5301/hipint.5000238. Epub 2015 Apr 21.

Prospective evaluation of short and mid-term outcomes of total hip arthroplasty using the AccoladeTM stem.

Pierce TP[1], Jauregui JJ[1], Cherian JJ[1], Elmallah RD[1], Robinson K[2], Mont MA[3].

Author information

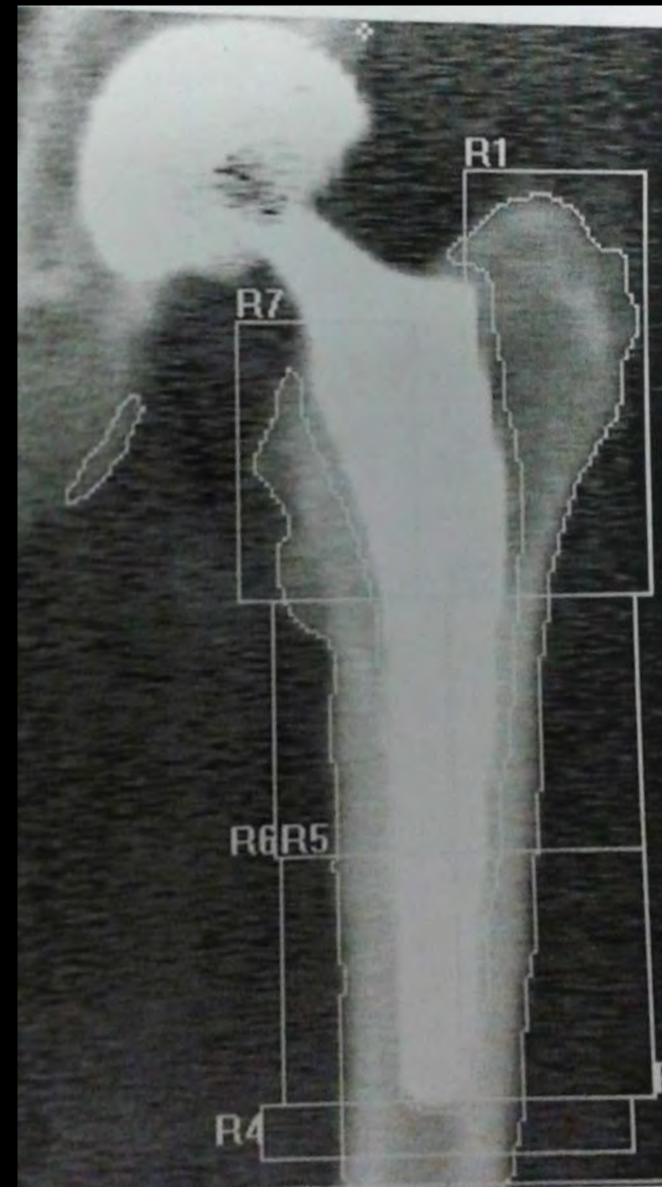
Abstract

PURPOSE: Cementless press-fit total hip arthroplasty (THA) with the Accolade stem (Stryker AccoladeTM TMZF, Mahwah, New Jersey) has
demonstrated variable implant survivorship and outcomes. The purpose of this study was to analyse the: 1) implant survivorship; 2) complications;

Results T3 (36 months)

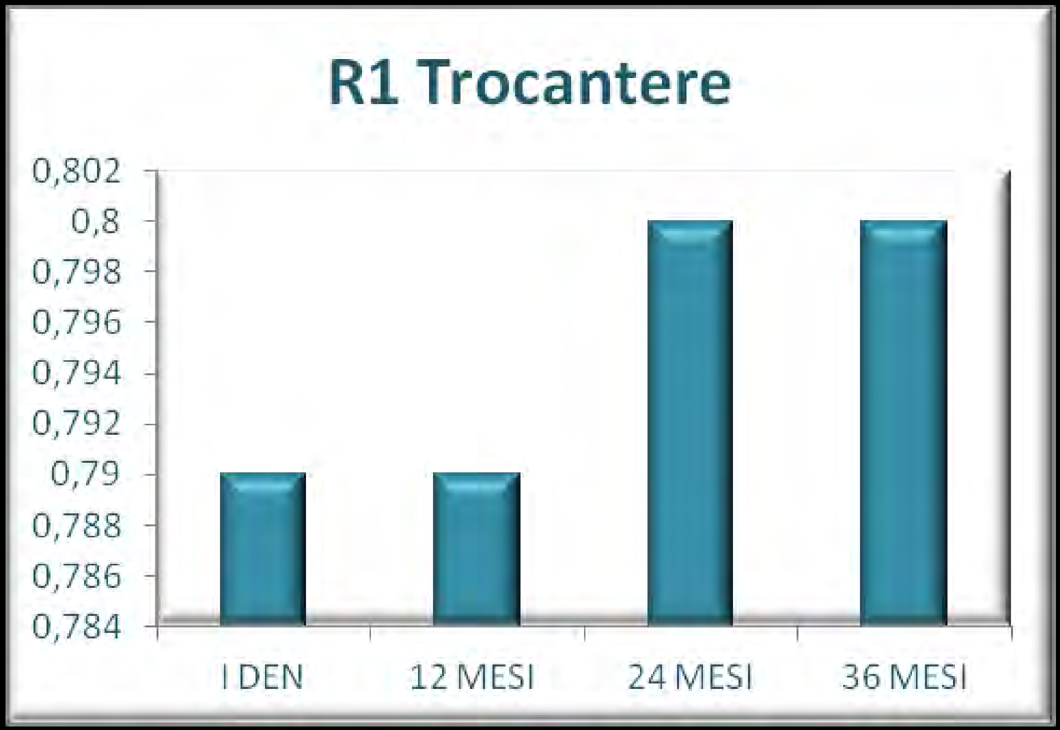
DENSITOMETRIC EVALUATION

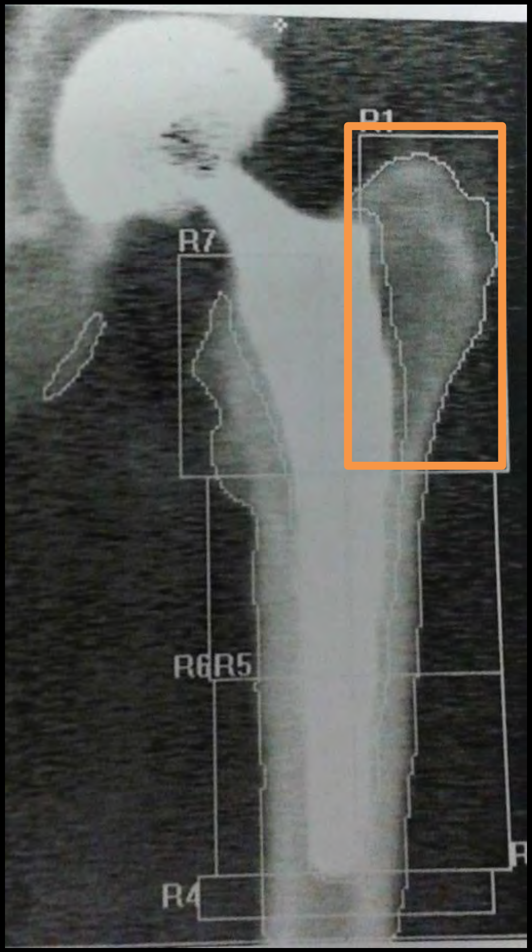
	T0	T12	T24	T36
R1 Trochanter	0,79	0,79	0,8	0,8
R2 Lat Sup	1,29	1,24	1,29	1,3
R3 Lat Inf	1,5	1,51	1,52	1,52
R4 Apice	1,61	1,63	1,69	1,71
R5 Med Inf	1,52	1,54	1,58	1,63
R6 Med Sup	1,35	1,37	1,43	1,46
R7 Calcar	1,03	1,03	1,01	1



Results T3 (36 months)

DENSITOMETRIC EVALUATION





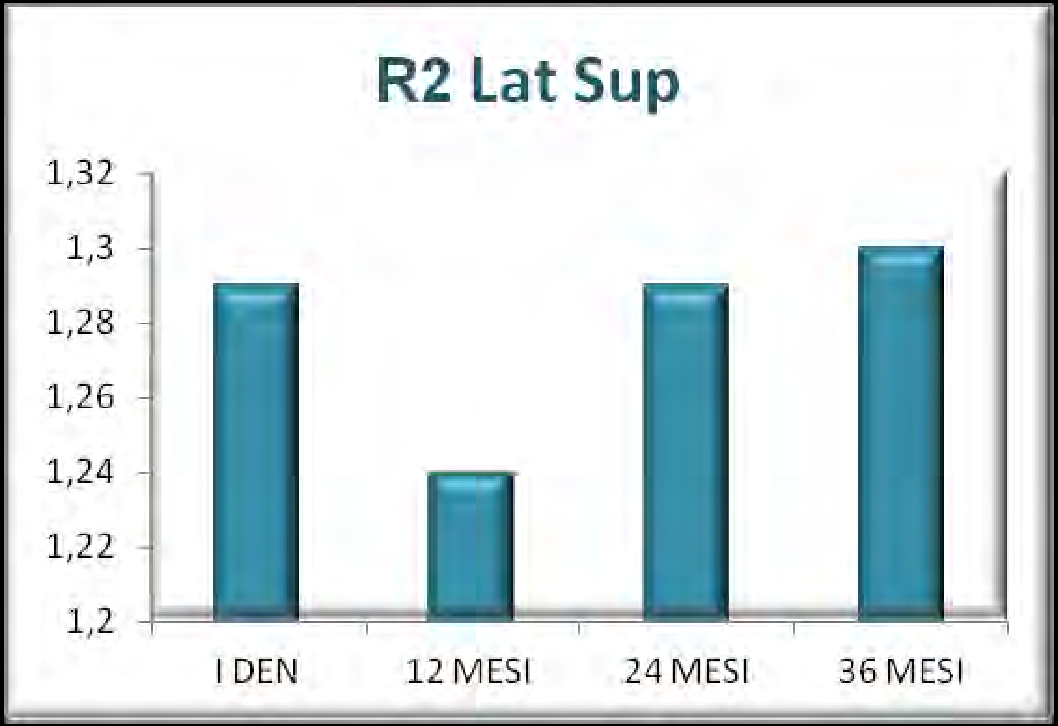
	T0	T12	T24	T36
R1 Trochanter	0,79	0,79	0,8	0,8

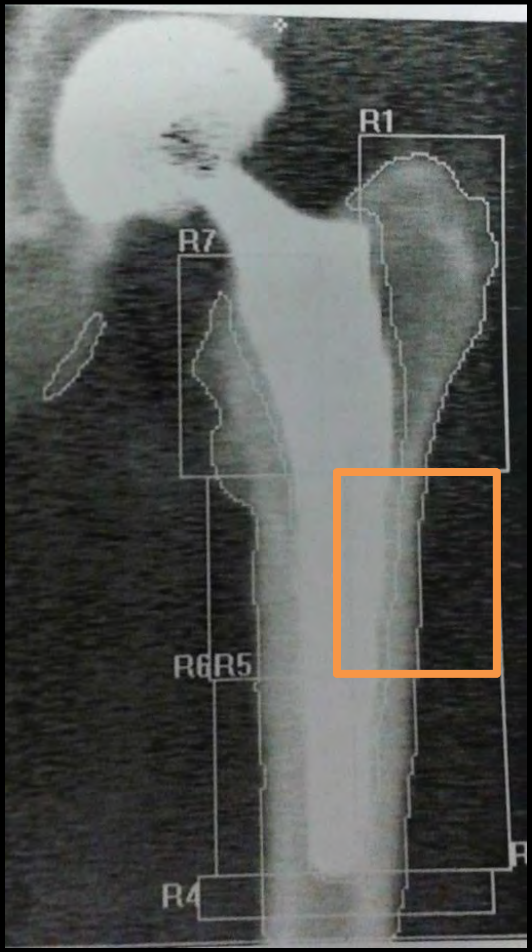
+ 1,27 %

0,01 gr/cm²

Results T3 (36 months)

DENSITOMETRIC EVALUATION





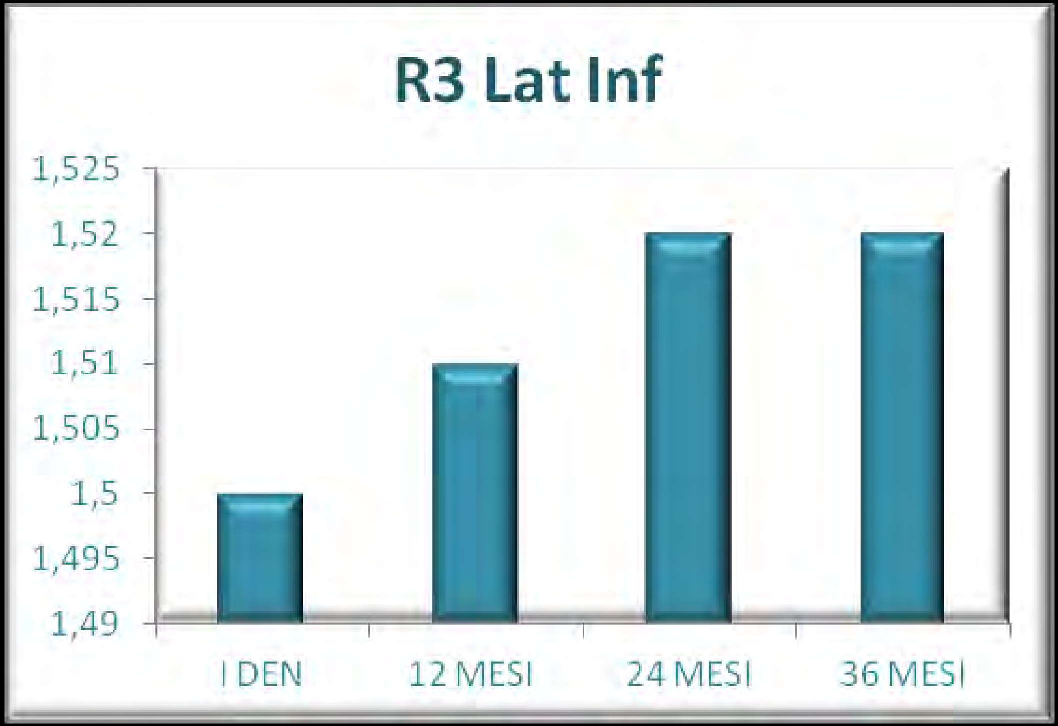
	T0	T12	T24	T36
R2	1,29	1,24	1,29	1,3

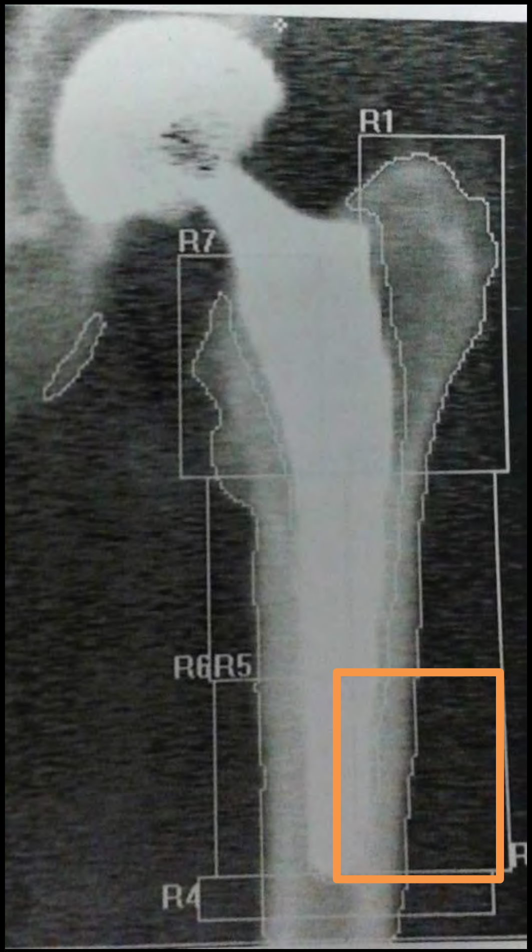
+ 0,78 %

0,01 gr/cm²

Results T3 (36 months)

DENSITOMETRIC EVALUATION





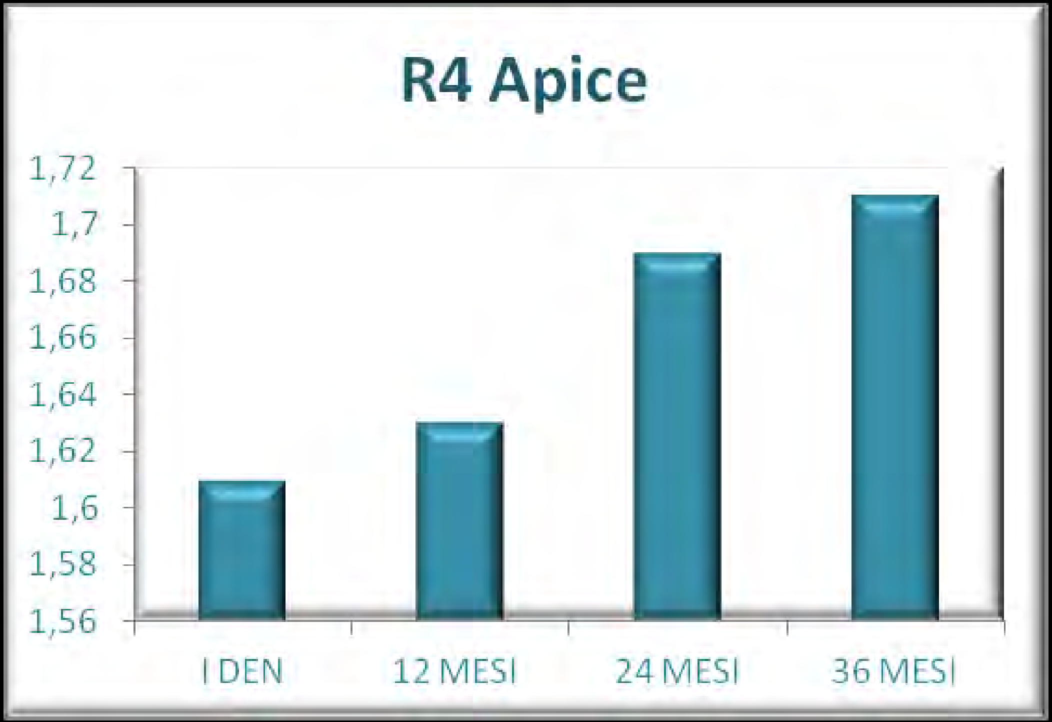
	T0	T12	T24	T36
R3	1,5	1,51	1,52	1,52

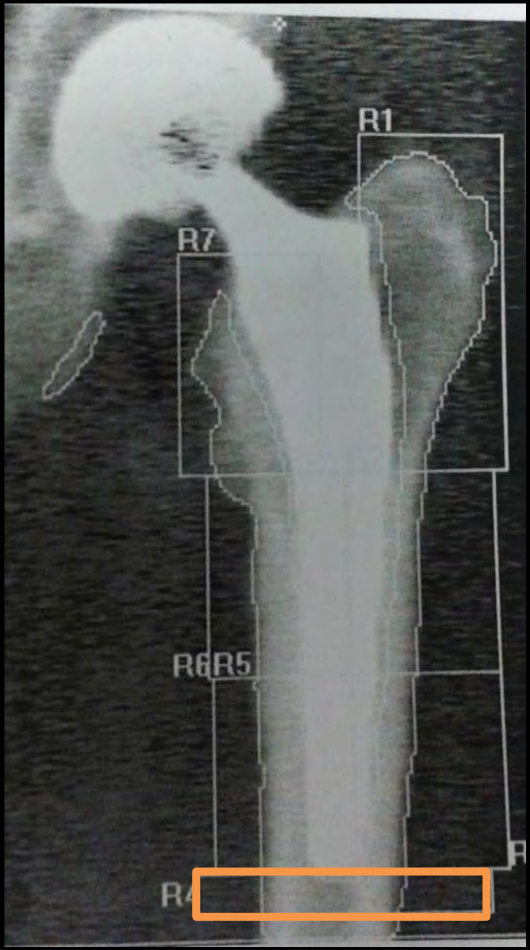
+ 1,34 %

0,02 gr/cm²

Results T3 (36 months)

DENSITOMETRIC EVALUATION





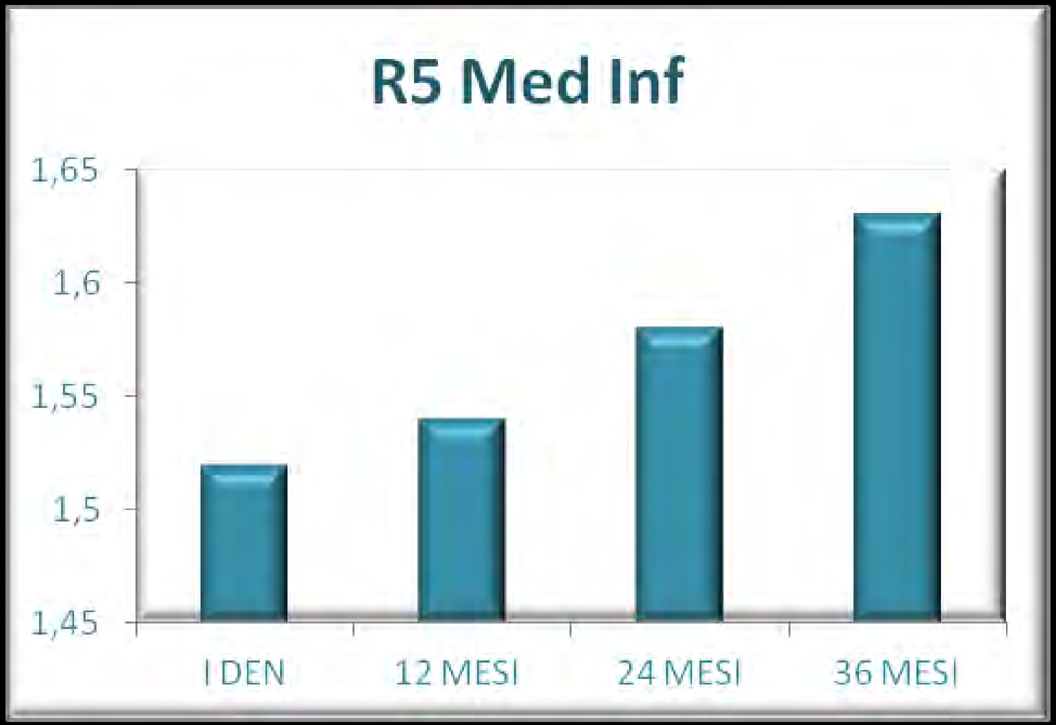
	T0	T12	T24	T36
R4	1,61	1,63	1,69	1,71

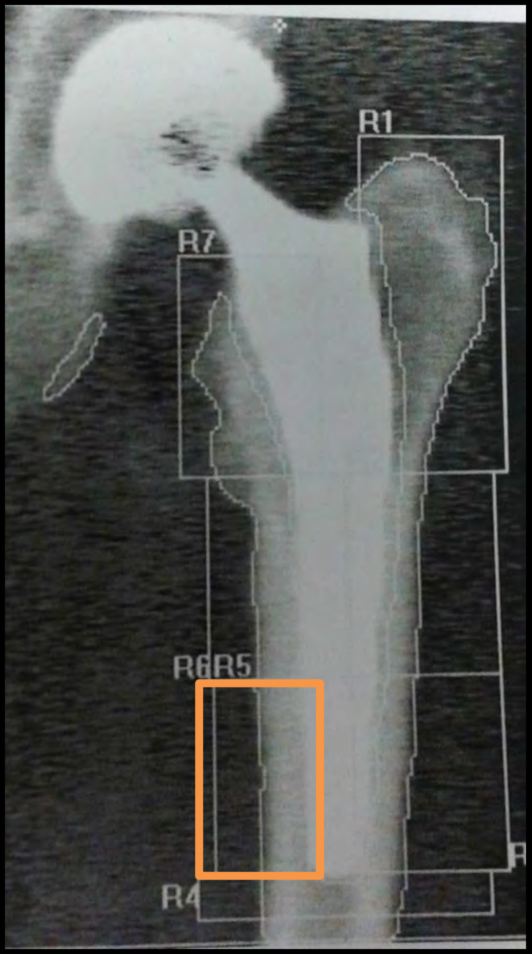
+ 6,2 %

0,10 gr/cm²

Results T3 (36 months)

DENSITOMETRIC EVALUATION





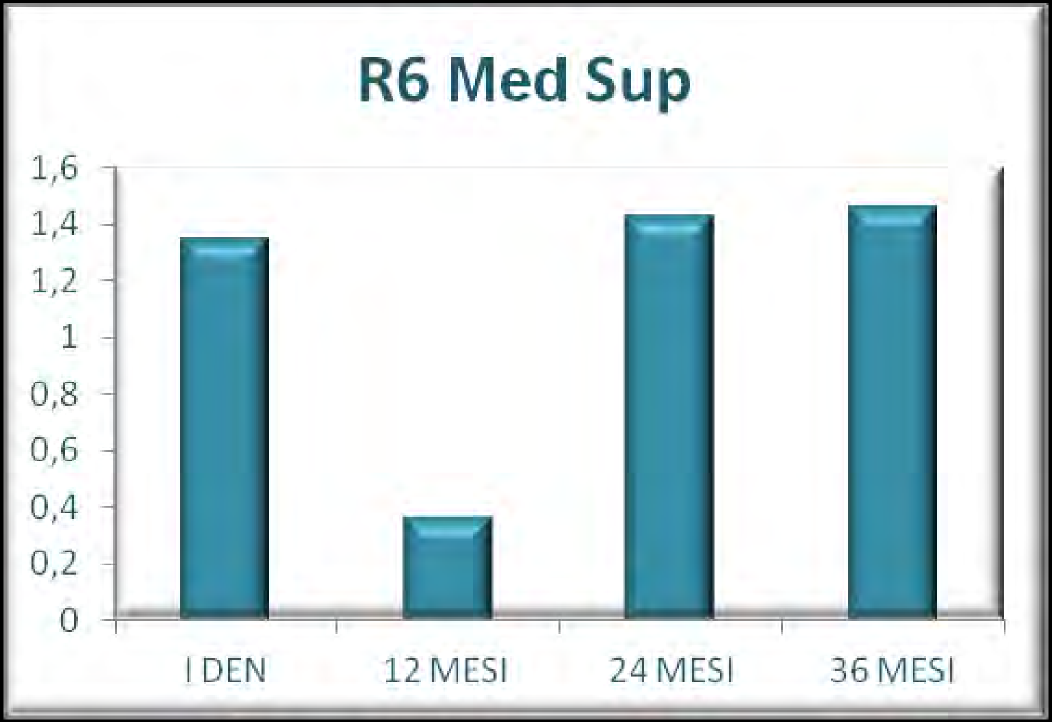
	T0	T12	T24	T36
R5	1,52	1,54	1,58	1,63

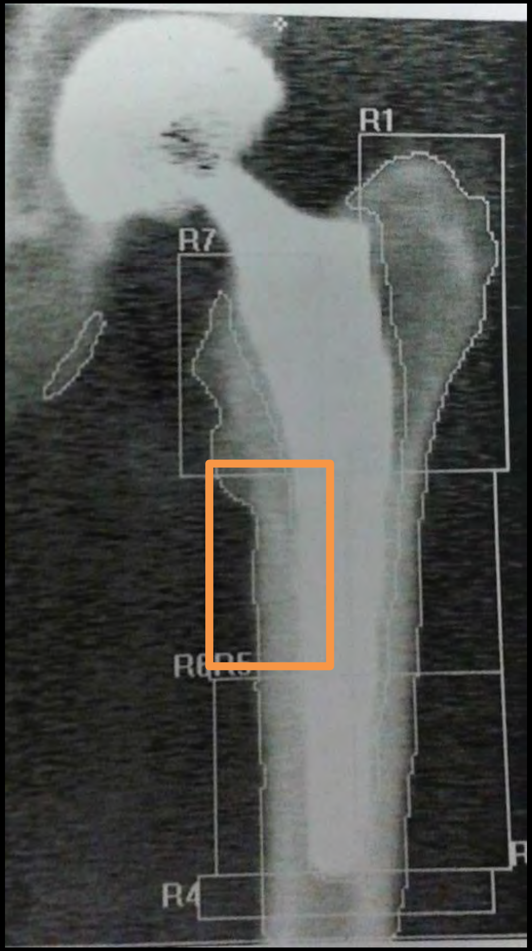
+ 7,2 %

0,11 gr/cm²

Results T3 (36 months)

DENSITOMETRIC EVALUATION





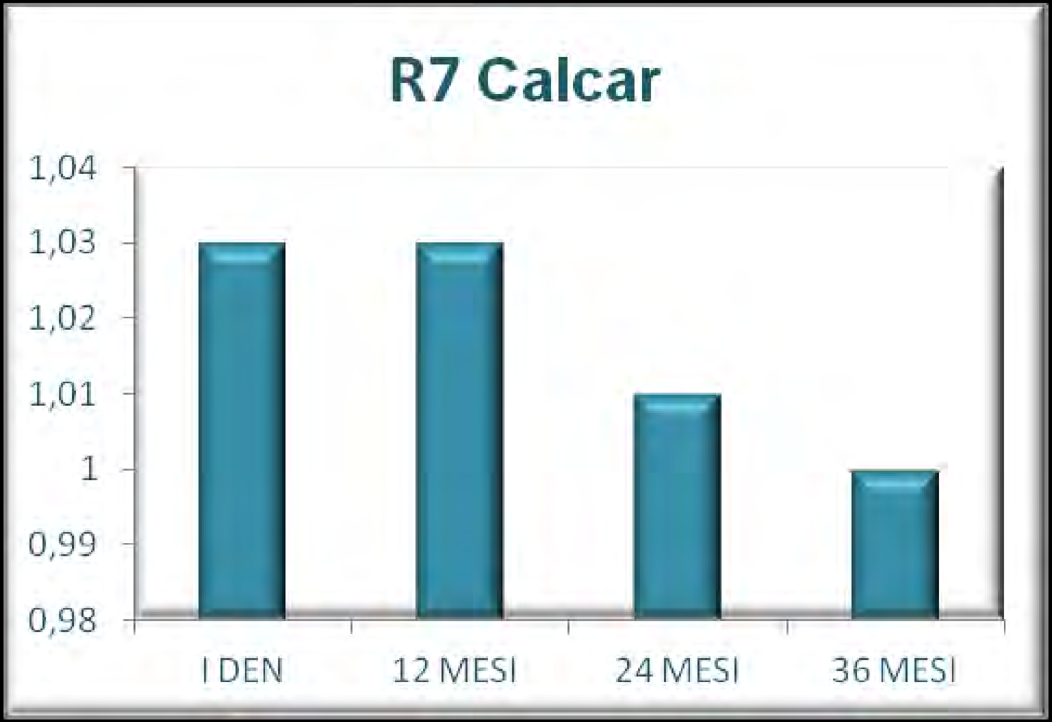
	T0	T12	T24	T36
R6	1,35	1,37	1,43	1,46

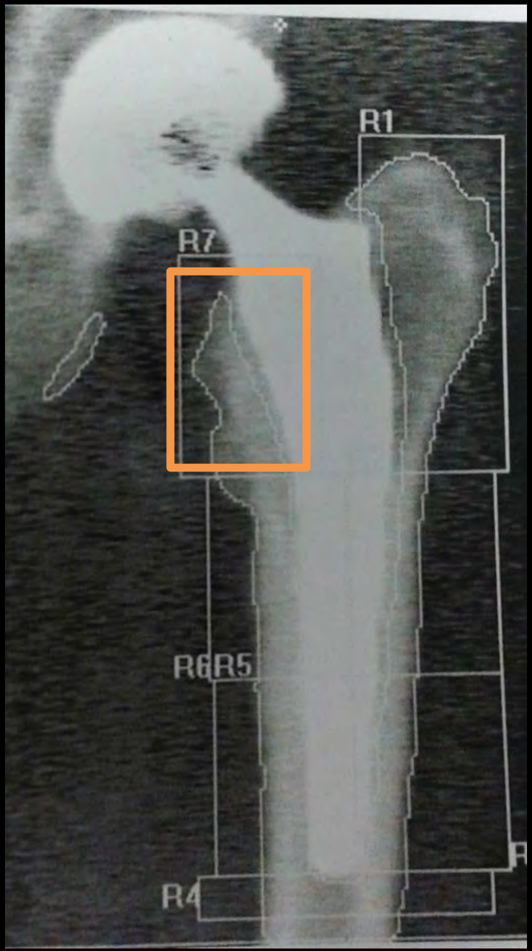
+ 8,15 %

0,11 gr/cm²

Results T3 (36 months)

DENSITOMETRIC EVALUATION





	T0	T12	T24	T36
R7	1,03	1,03	1,01	1

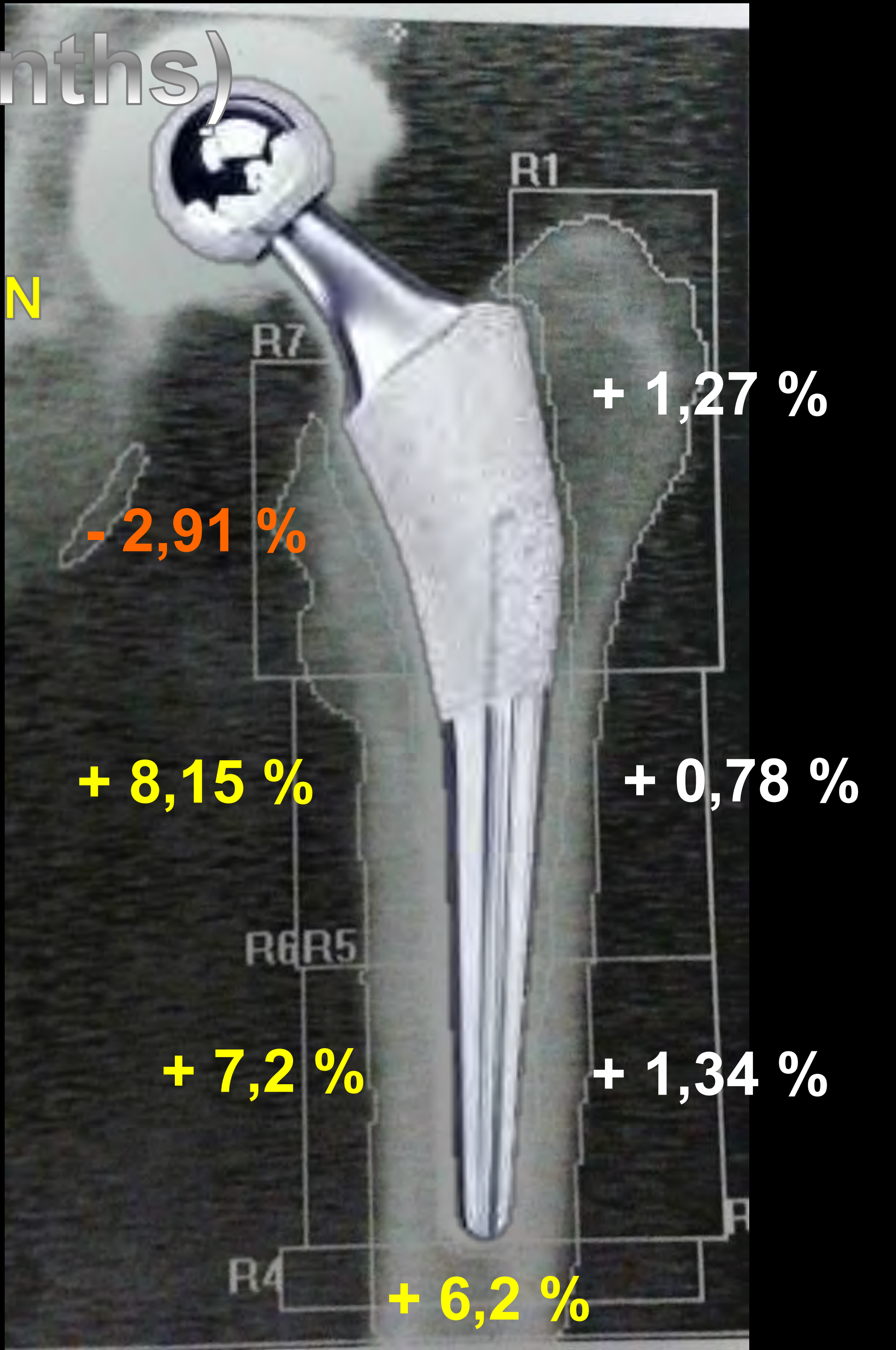
- 2,91 %

0,03 gr/cm²

Results T3 (36 months)

DENSITOMETRIC EVALUATION

THE STATISTICAL ANALYSIS, USED **WILCOXON SIGNED-RANKS TEST,** SHOWED STATISTICALLY SIGNIFICANT CHANGES IN R4, R5, R6 AT 24 AND 36 MONTHS.



Discussion: letterature review

Type 1 (single-wedge) and Type 2 (double-wedge) stem are designed to engage the metaphyseal with a proximal load transfer

A significative decrease of BMD in the CALCAR REGION is reported with single wedge desings.

CLS® Spotorno® (Zimmer)
Roth - 19% at 1 year
Sabo - 12% at 2 years
Gibbons - 20% at 4 years

AML® (DePuy Synthes)

Clin Cases Miner Bone Metab. 2014 Sep-Dec; 11(3): 226–231. PMCID: PMC4269148
Published online 2014 Dec 10.

Densitometric evaluation of periprosthetic bone remodeling

Paolo Domenico Parchi, Valentina Cervi, Nicola Piolanti, Gianluca Ciapini, Lorenzo Andreani, Iacopo Castellini, Andrea Poggetti, and Michele Lisanti

Discussion: letterature review

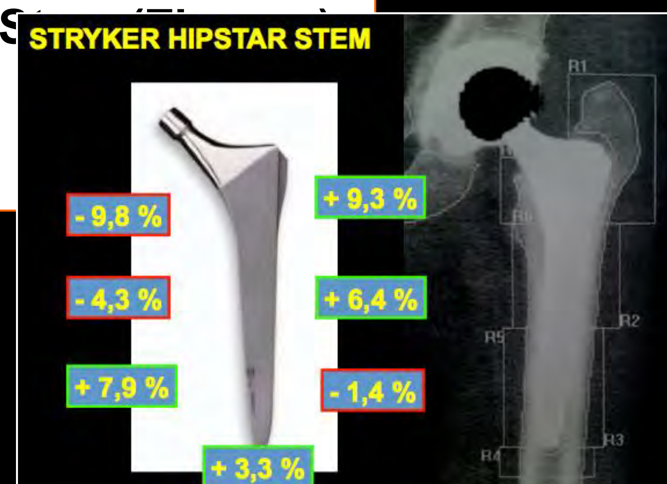
Straight stem are associated to a more distal load transfer with a progressive bone loss in the proximal region

3C

Tapered Rectangle

Significative bone loss in zone 7 (calcar)
Significative increase of BMD value in zone 4

Alloclassic® Zweymüller® S
Korovessis – 7% at 4 years
Brodner -14% at 4 years



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Discussion

The Accolade stem allows a metaphyseal fixation with a physiological load transfer to the proximal femoral regions

Stem design:

Single-Wedge

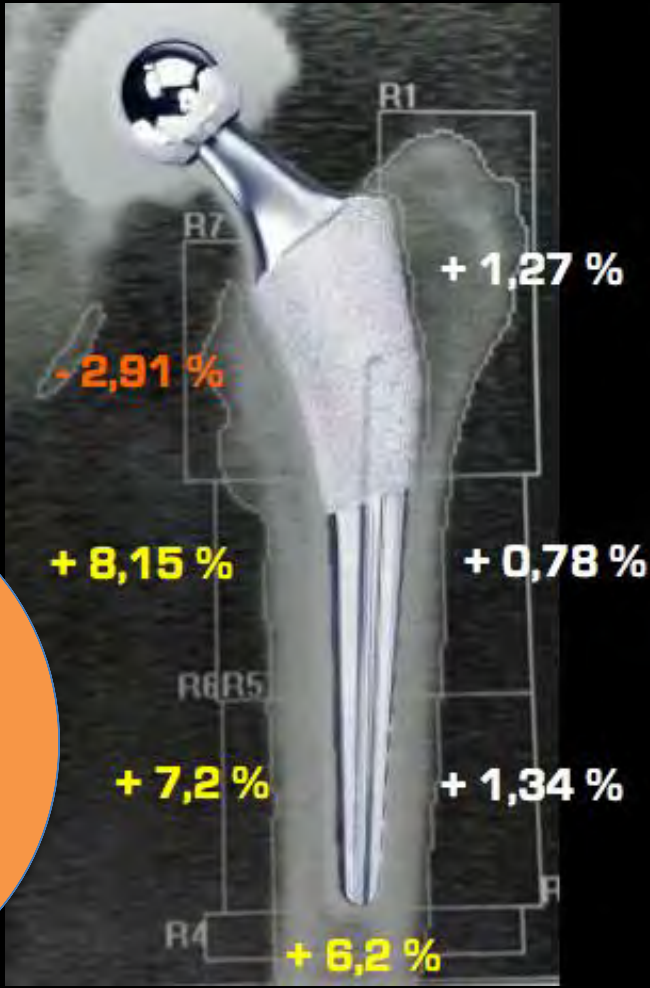
Material:

TMZF TITANIUM ALLOY

Proximal circumferential double coating: **PUREFIX™ HA** (50μM) **PLASMA SPRAY** (TITANIUM)

Prosthesis-related factors

type of fixation, stem length, **stiffness, design, the extent of the coating area**, and the method of femoral bone preparation



Evaluation of the effects of the stem design on periprosthetic bone remodelling in total hip arthroplasties

P.D. Parchi*[1], G. Ciapini[1], J. Castellini[1], A. Vigorito[1], S. Marchetti[1], S. Maffei[2], M. Lisanti[1]

[1] I Clinica Ortopedica Universitaria (Pisa, IT);
[2] Istituto Fisiologia Clinica, CNR (Pisa, IT)

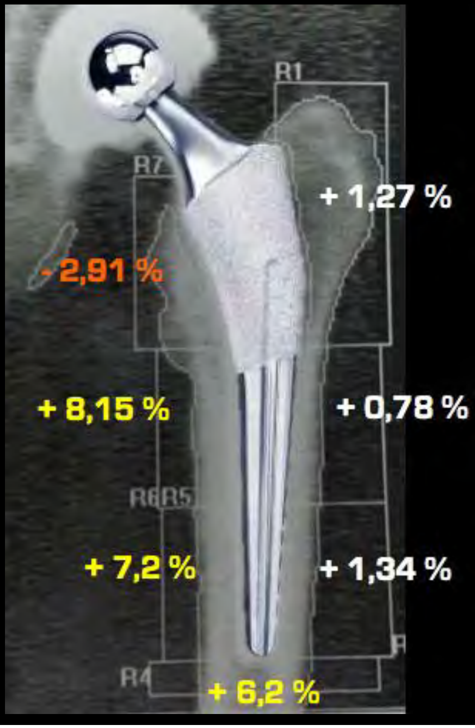
Conclusion

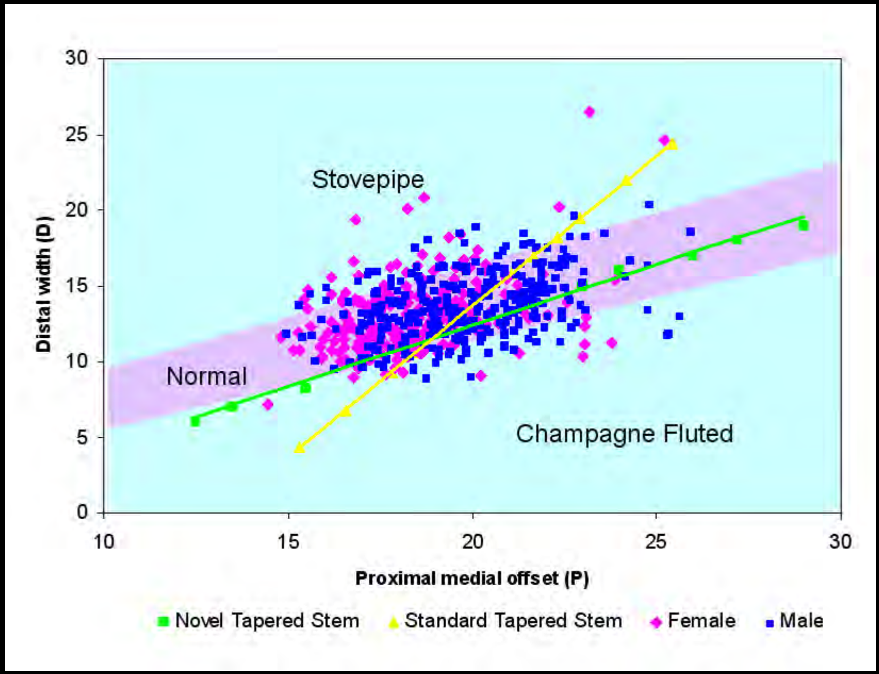
Dexa is a valid and reliable methods to study in vivo the periphrostetic bone remodelling

The ACCOLADE is a standard stem suitable for a routinary use in most of the patients

It allows a physiological load transfer to the proximal femoral regions

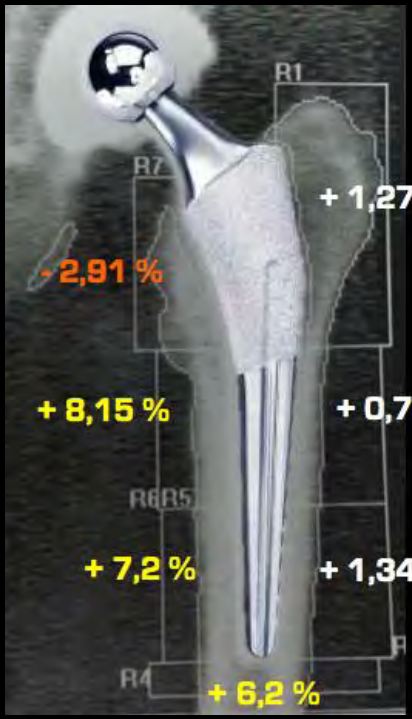
With good and reproducible clinical and radiographic results

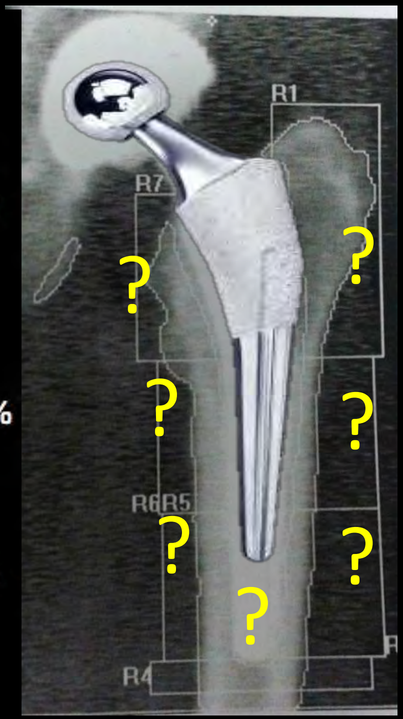




Future Perspectives

Evaluate the differences in periprosthetic bone remodelling between the **ACCOLADE I design** and the new **ACCOLADE II** design





stryker

Research Proposal Application

Investigator Initiated Studies

In order for us to process your Research Proposal please refer to the Guidelines provided on the reverse and complete (typed and in English) all sections of this form. Additional sheets can

Section 1

Contact and Site Details	
Principal investigator's name:	Prof.Michele Lisanti

Section 2

Study Title	STUDY OF THE PERIPROSTHETIC BONE MINERAL DENSITY OF THE HIP: EVALUATION OF THE INFLUENCE THAT THE STRYKER ACOOLADE II STEM HAS ON THE REGIONAL BONE REMODELING AND COMPARISON WITH THE PREVIOUS ACCOLADE STEM
Brief Backgr	

Timeline Estimation	3 YEARS Beginning date: June 2014 Ending date: June 2017


3
thank you
I Clinica Ortopedica Università di PISA

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY

SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

INTERNATIONAL COMBINED MEETING

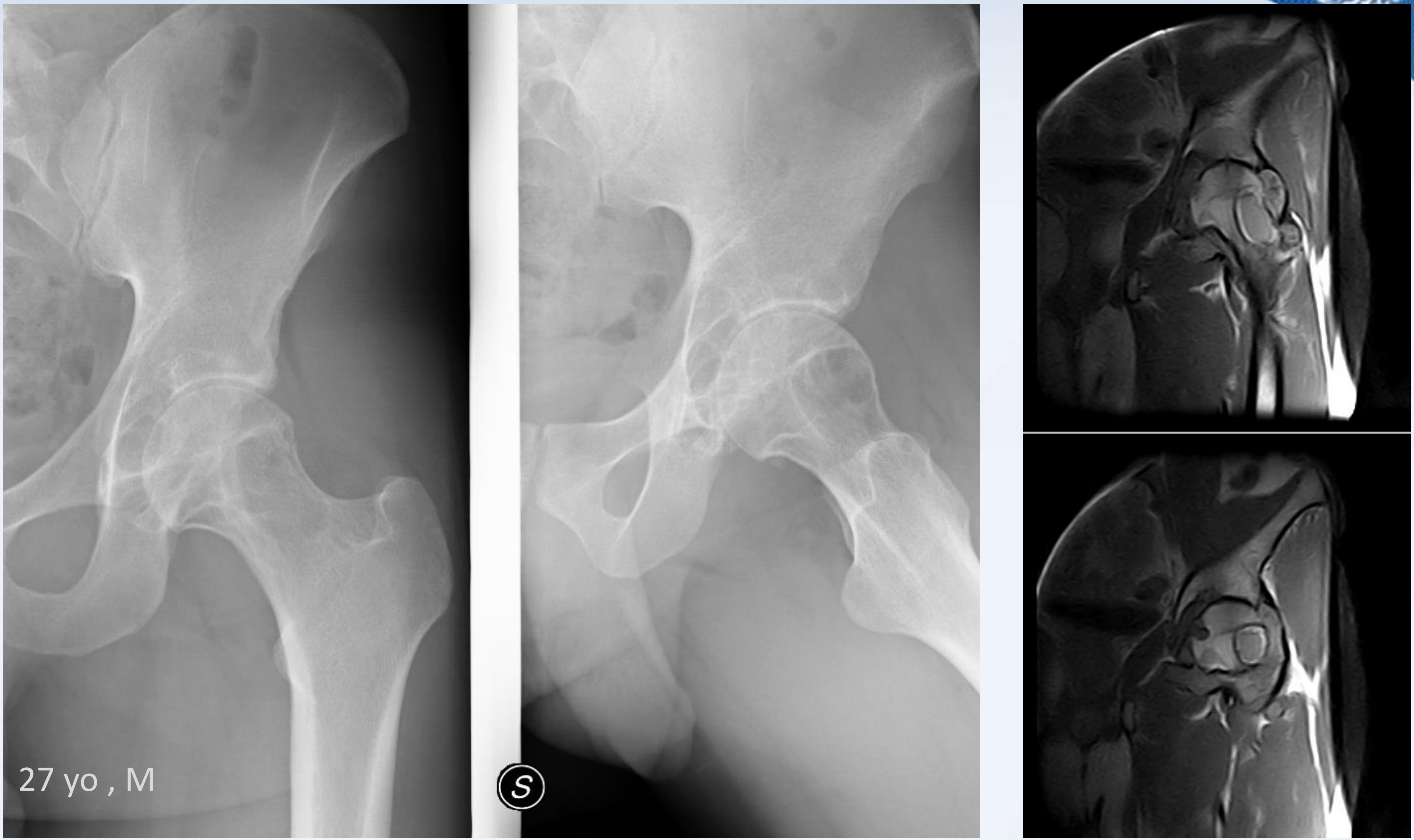
BRITISH HIP SOCIETY

SOCIETÀ ITALIANA DELL'ANCA

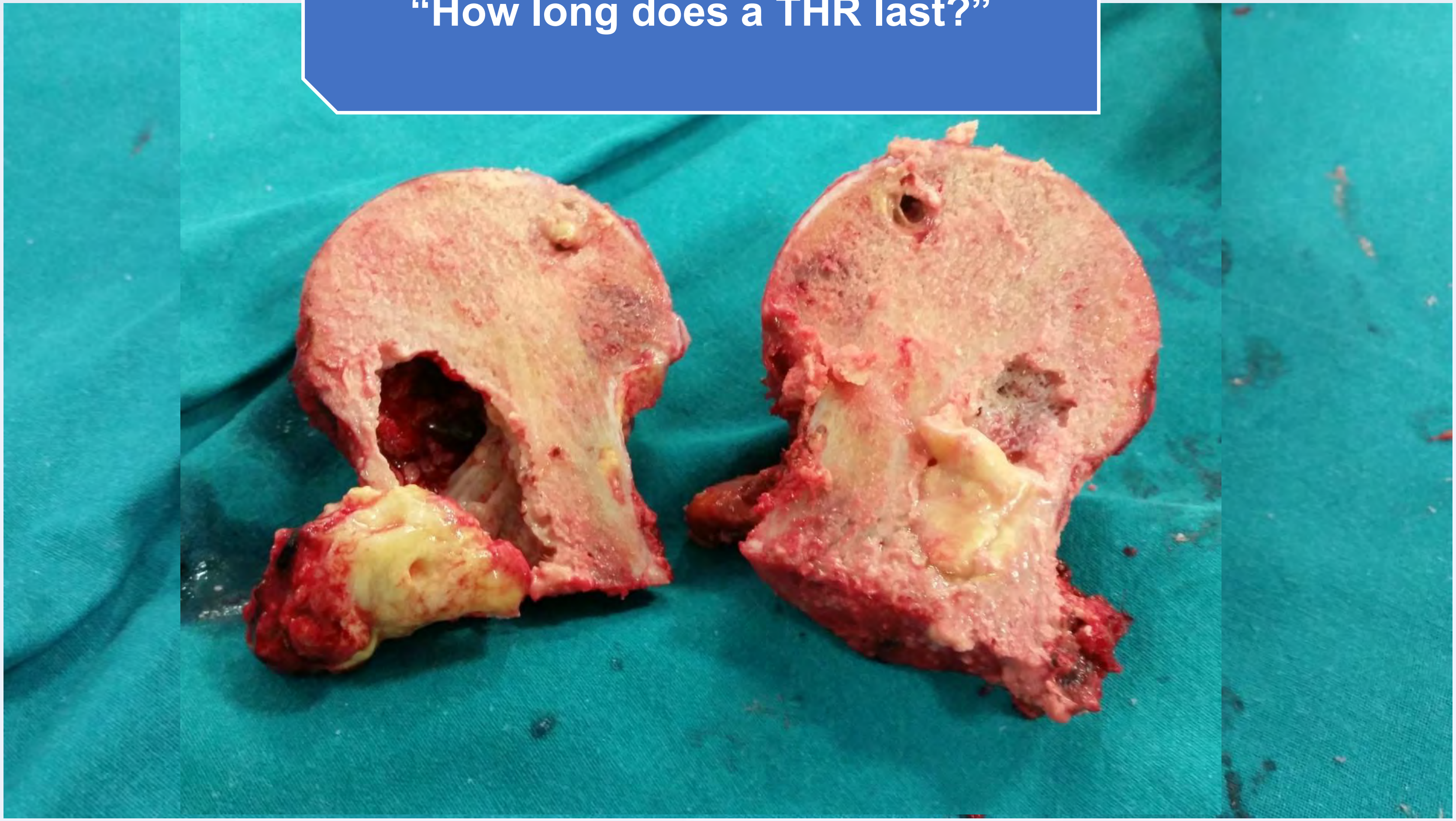
"LONG-TERM RESULTS OF TOTAL HIP REPLACEMENT IN HEALTHY UNDER-30 PATIENTS. RESULTS AT A MINIMUM OF 10 YEARS"

D. Tradati, L. Gala, V. Fogliata, A.M. Querenghi, B.M. Marelli

Azienda Ospedaliera
Istituto Ortopedico
GAETANO PINI


27 yo , M
S

“How long does a THR last?”

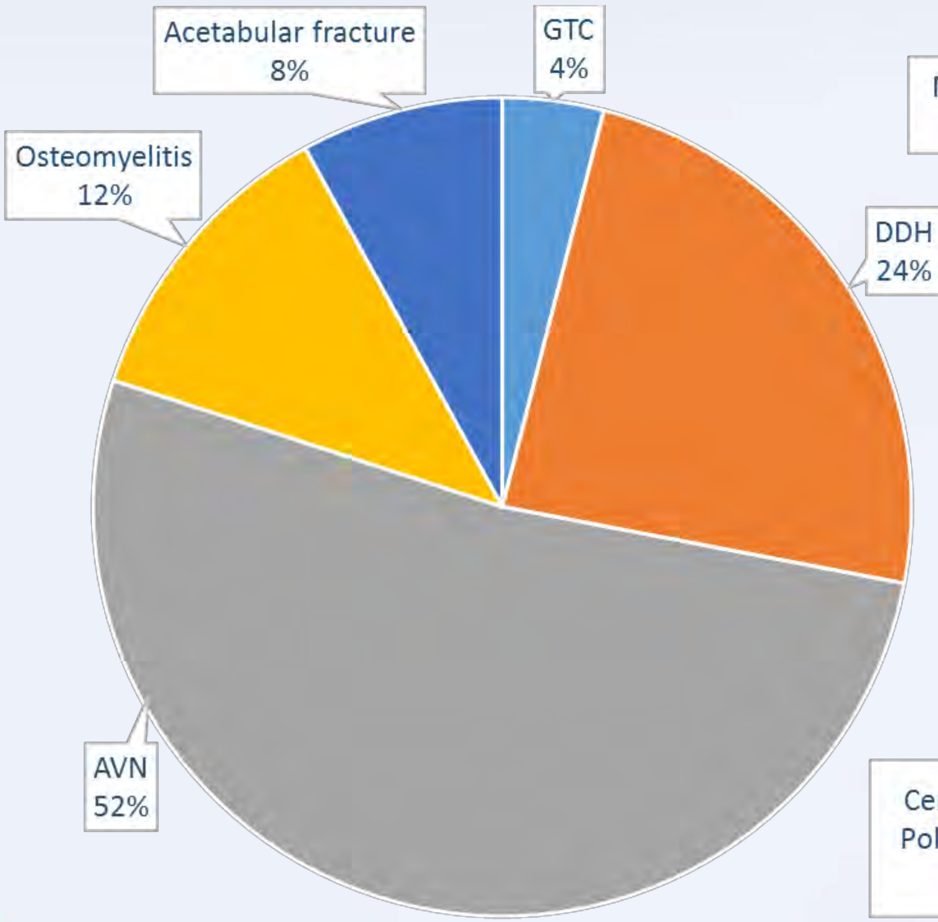


Population

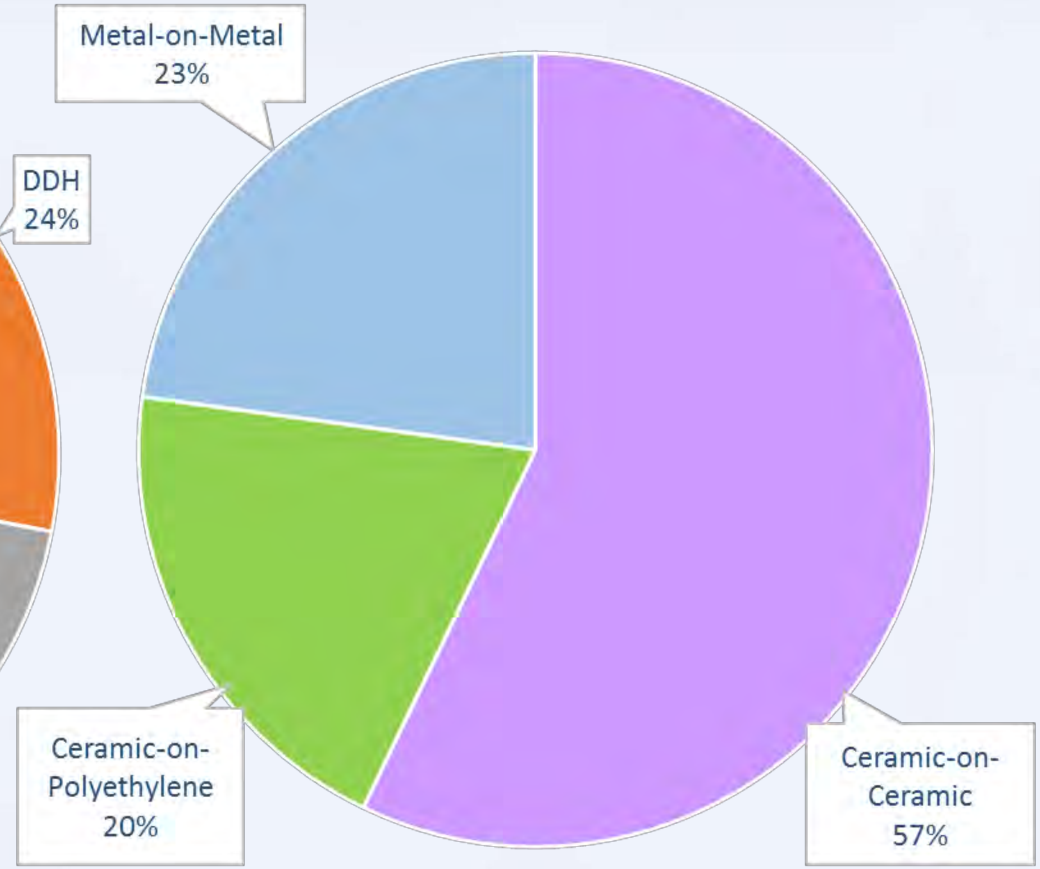
- 25 patients (29 hips)
- 18-30 yo (avg 27 yo)
- 23 F 12 M
- Surgical procedure: 2002-2005
- Mean FU 11y 7 m (10-13 ys)
- Direct lateral approach
- Cementless

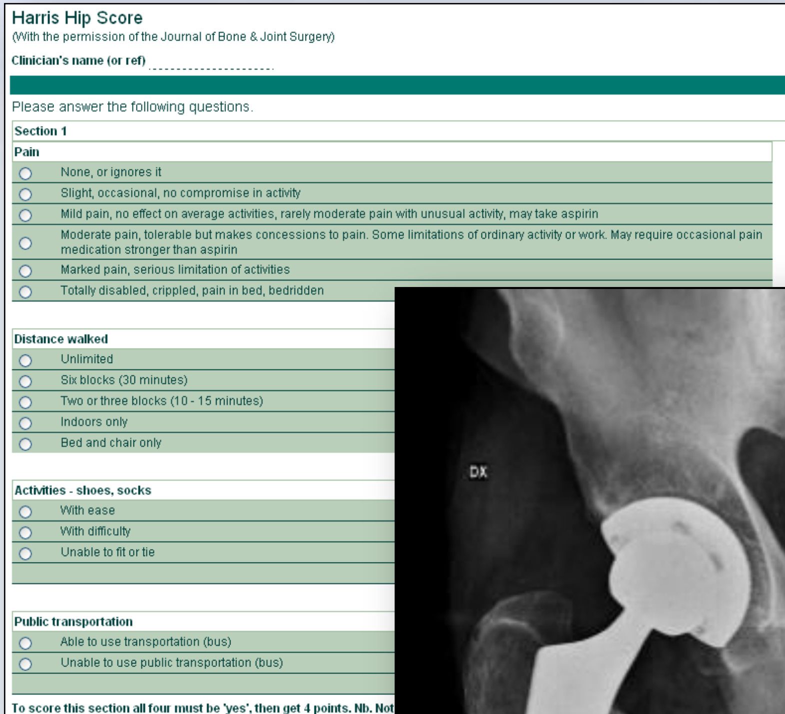
Control Group
(50-60 yo)

Etiology



Bearing surface




Harris Hip Score
(With the permission of the Journal of Bone & Joint Surgery)

Clinician's name (or ref) ....

Please answer the following questions.

Section 1

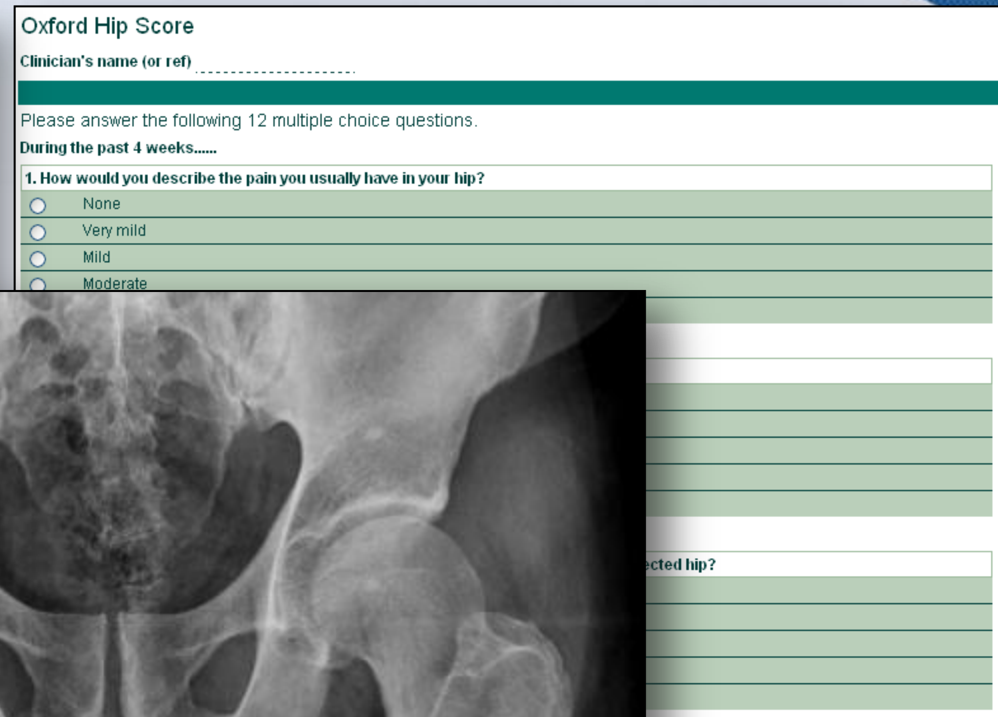
Pain
- None, or ignores it
- Slight, occasional, no compromise in activity
- Mild pain, no effect on average activities, rarely moderate pain with unusual activity, may take aspirin
- Moderate pain, tolerable but makes concessions to pain. Some limitations of ordinary activity or work. May require occasional pain medication stronger than aspirin
- Marked pain, serious limitation of activities
- Totally disabled, crippled, pain in bed, bedridden

Distance walked
- Unlimited
- Six blocks (30 minutes)
- Two or three blocks (10 - 15 minutes)
- Indoors only
- Bed and chair only

Activities - shoes, socks
- With ease
- With difficulty
- Unable to fit or tie

Public transportation
- Able to use transportation (bus)
- Unable to use public transportation (bus)

To score this section all four must be 'yes', then get 4 points. Nb. Not


Oxford Hip Score

Clinician's name (or ref) ....

Please answer the following 12 multiple choice questions.

During the past 4 weeks......

1. How would you describe the pain you usually have in your hip?
- None
- Very mild
- Mild
- Moderate

...cted hip?

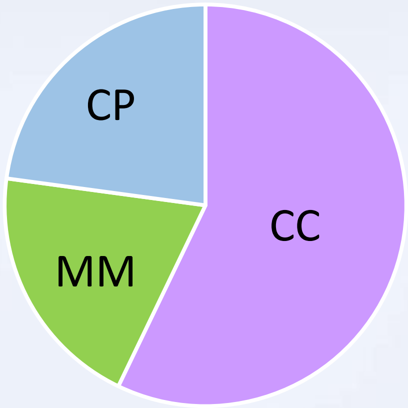
Functional Scores (>10 years)

HARRIS HIP SCORE	***OXFORD HIP SCORE***
Under-30yo: 92,3	Under-30yo: 42,8
Control Group: 94,8	Control Group: 44,2
(p= n.s.s)	(p= n.s.s)

Patient complain about….

- Putting on a pair of socks, stockings or tights
- Washing and drying themself
- Climbing stairs

Bearing surface



- ❑Harris Hip Score
- ❑Oxford Score

<u>No significative differences in functional score</u>

Radiographic assessment

- Higher incidence of revision in patient under-30 yr (10,34% vs. 4,7 % ; p= <0,01)
- Aseptic loosening of the acetabular component (2 patients)
- Polyethylene wear (1 patient)
- Acetabular radiolucent signs without clinical manifestation (1 patient)

Young patients and THA

- Cementless fixation provide good stability
- THA can restore a good ROM (⇩ER/IR)
- High patient satisfaction

<u>But....higher revision rate ....</u>

Young patients and revision surgery

- ⇧ Activity Level
- ⇧ Functional needs
- ⇧ Expectations! (patient/surgeon)
- Markedly musculo-skeletal deficiencies (or deformations) which could influence the stability of the surgical implants thus leading to early loosening

Conclusion

- Total hip replacement can restore a good range of motion
- It’s a good pain-free solution
- Long-term results are influenced by age, activity level, functional needs and expectations
- Higher revision surgery rate in young patients
- Patient education (before and after surgery)

Thanks for your attention

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

G.L. SACCHETTI
OPA NIGRISOLI, BOLOGNA
ITALY

THA IMPLANT CHOICE IN YOUNG ACTIVE PATIENTS UNDER 60 YEARS. EVIDENCE IN THE LAST TEN YEARS

THA in young , active patients under 60 y

Sir J Charnley in 1970's conceived and designed his prosthesis mainly for **old and sedentary people**

Nowadays a **younger** and **active population** need a THA replacement changing the skyline of modern implants

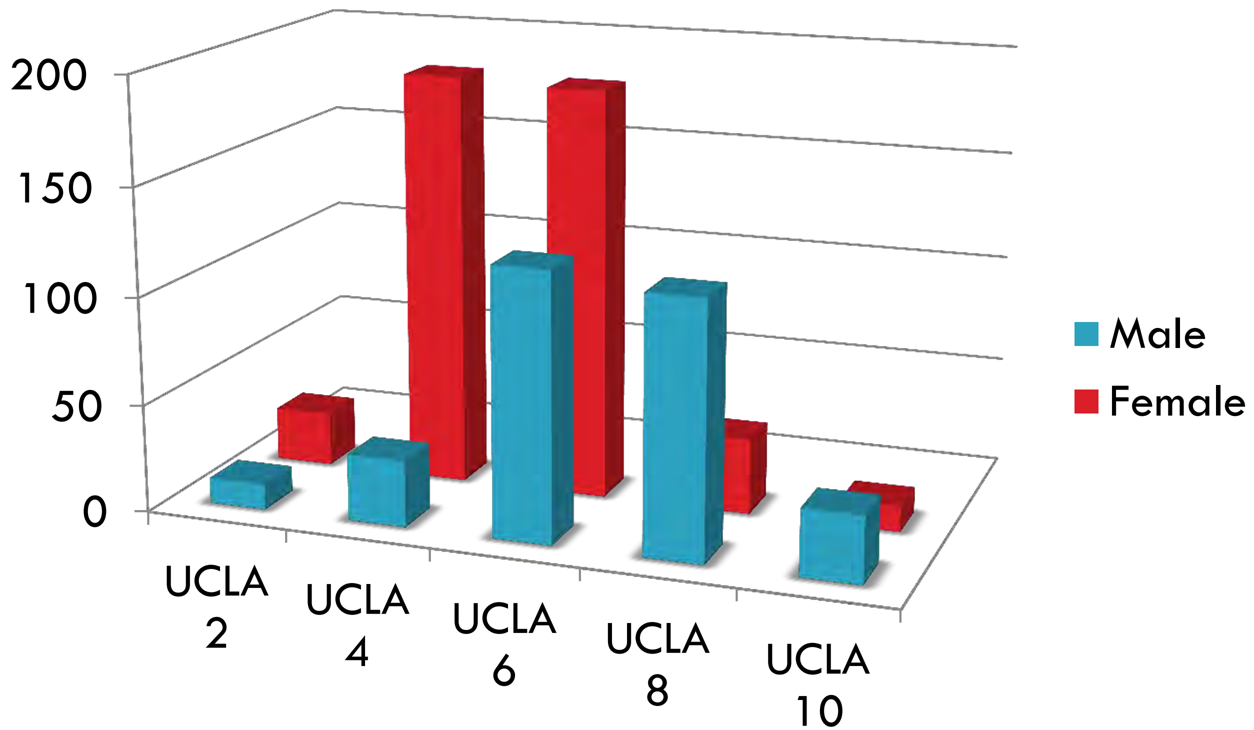
KURTZ S et alii
Future young patient demand for primary and revision joint replacement
National Projection from 2010 to 2030
CORR 2009 Level II

YOUNG ACTIVE PATIENT

Implications are significant & even greater when the main aim of surgery ia a **return to sport** rather than pain relief

JA Keeney et alii
Are younger patients undergoing THA appropriately characterized as active?
Clin Orthop 2014 Level III

Level of activity under 60 y (UCLA activity score)



YOUNGER PATIENTS

Better Outcomes

Less Mortality or Major Complication

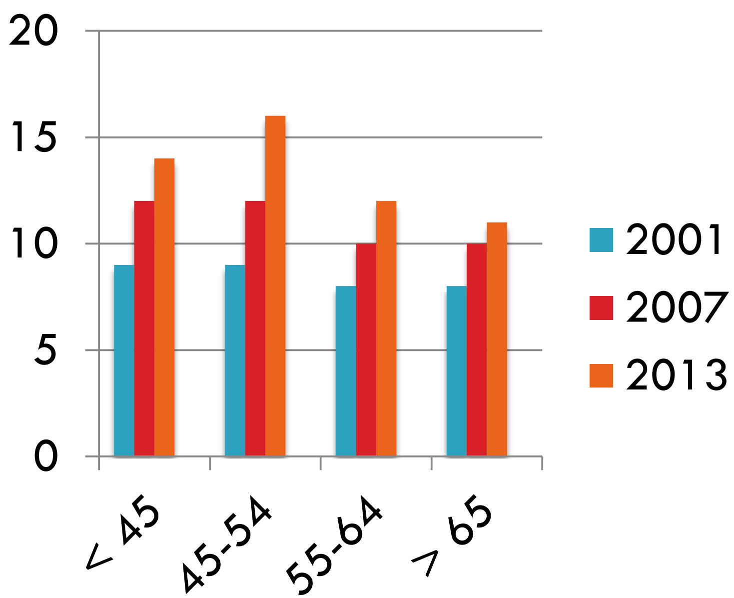
BUT

higher risks of revision at 8-15 years

Le Duff MJ and Amstutz HC
The relationship of sporting activity and implant survivorship after Hip Resurfacing
JBJS Am 2012 Level III

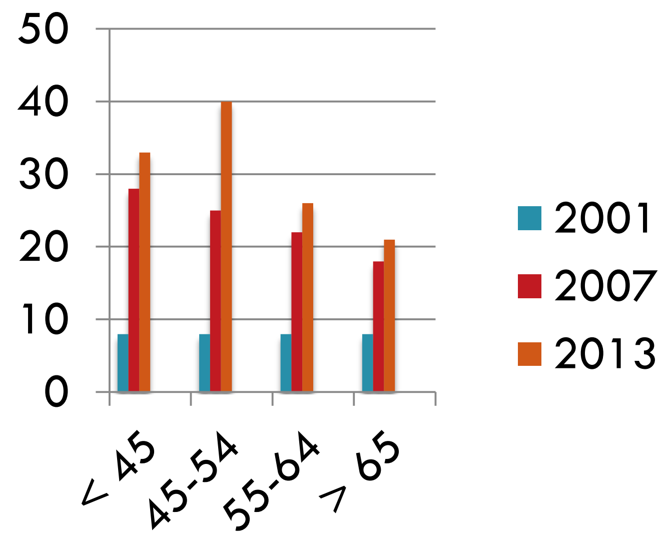
TRENDS of GROWTH for age class in TJR in RIAP

HIP



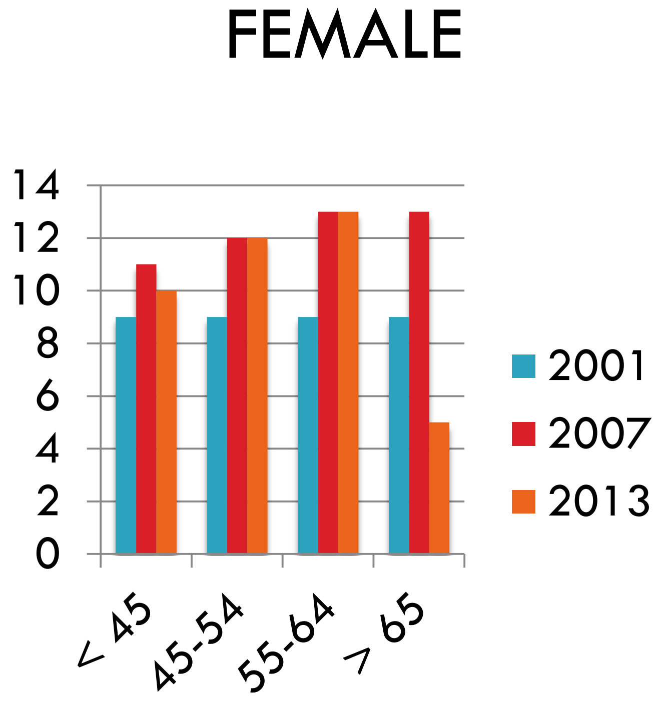
The trend is 1,7 fold in 45-54 y

KNEE



The trend is 3,4 fold for < 45 and 4 fold in 44-54 y

Trends of growth in THA for age-class and sex



In the last 13th y young male(< 60 y) has doubled hip implants

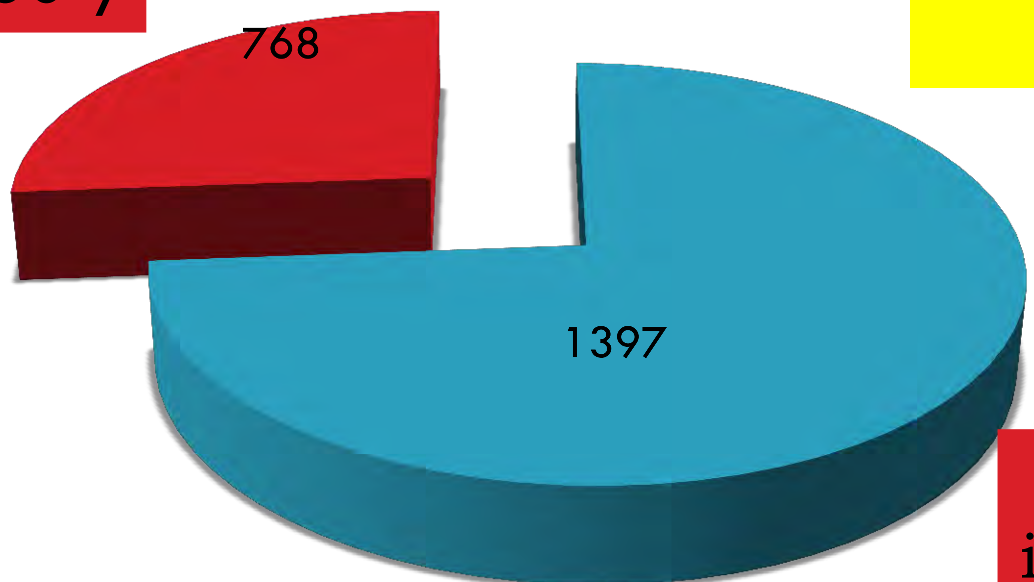
Possible Explanations

- **More** arthritic patients in younger age(sports-related, post-traumatic)
- **More** performing implants for an active population
- **More** patients demanding
- **More** surgeons proposing
- **More** successfull outcomes

Orthopaedic Dpt University of Modena(2004-2011) OPA Nigrisoli, Bologna (2011-2013)

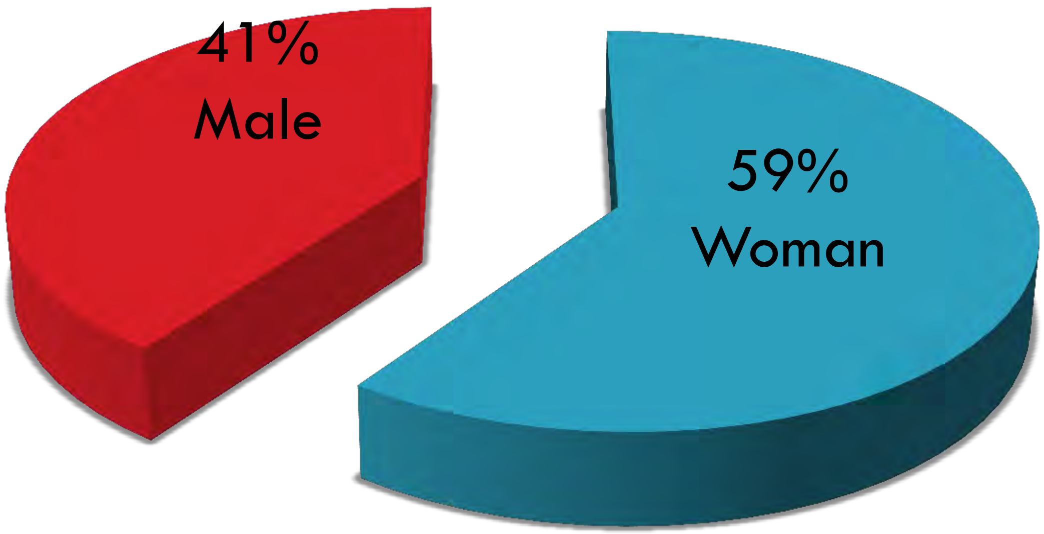
35%
under 60 y

2165 THR
in 10 years



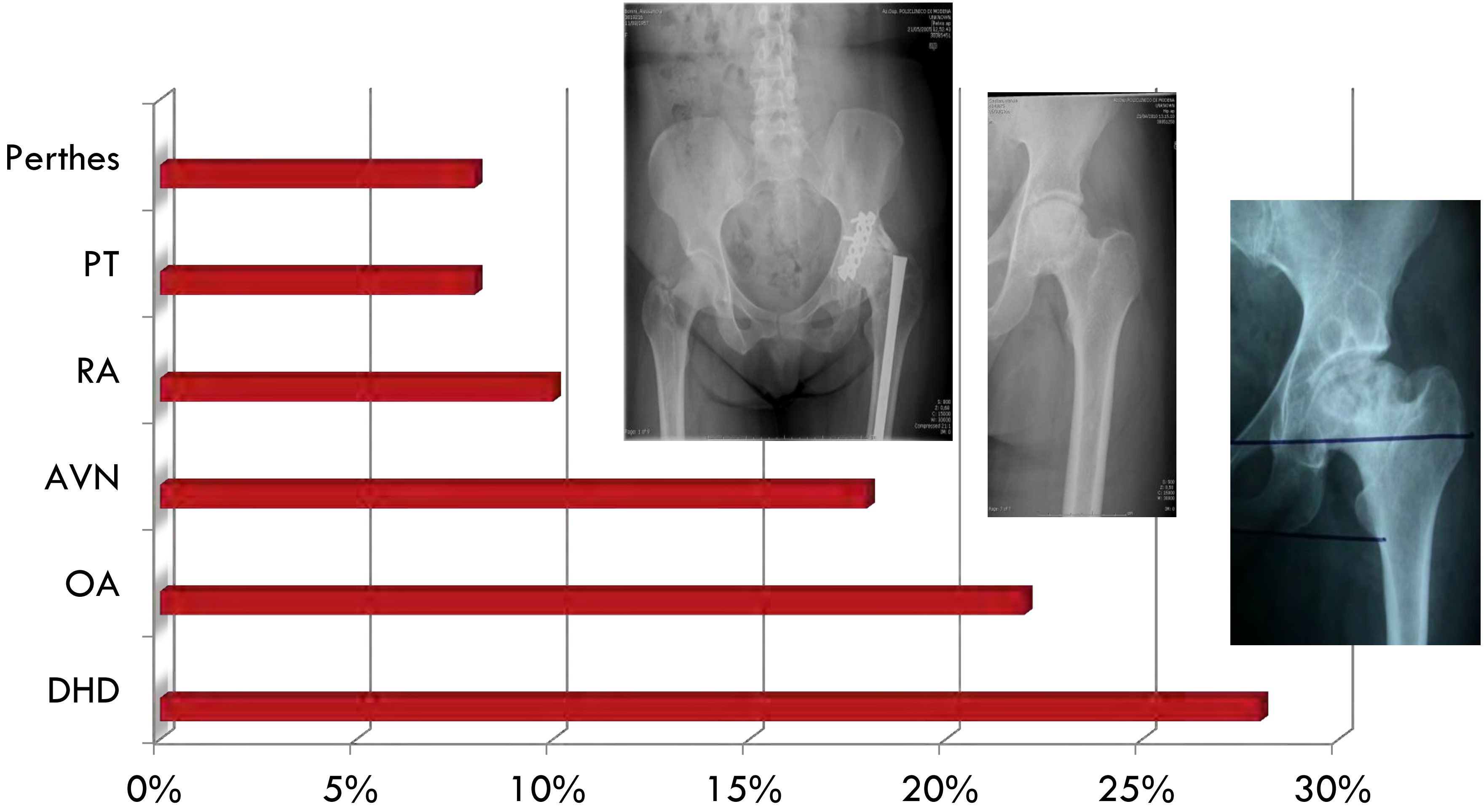
In RER 26% TKA in patients under 60 y of age

Sex distribution under 60 y



Mean Age: 53,8 (18-60)

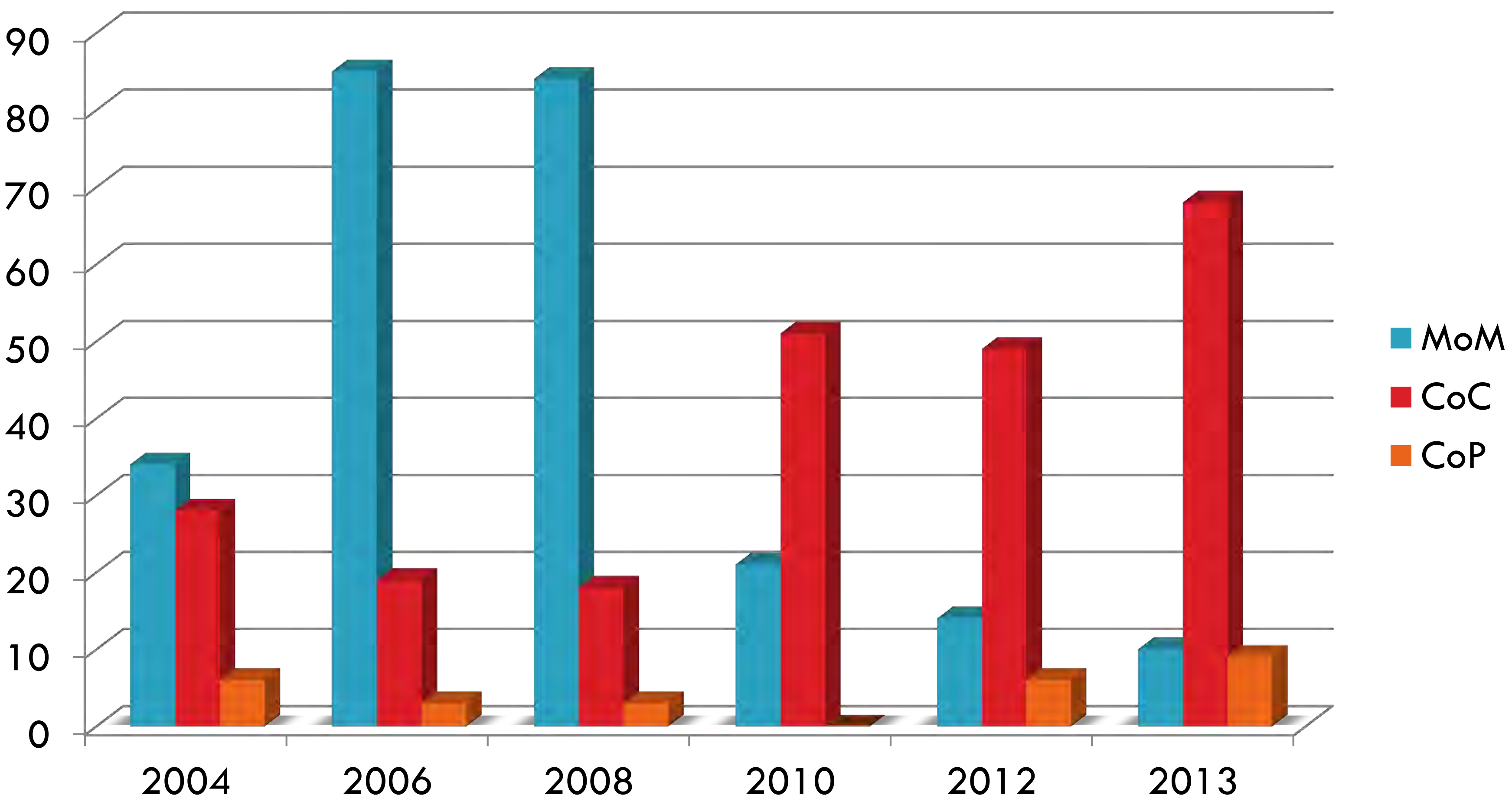
THA under 60 y(etiology)



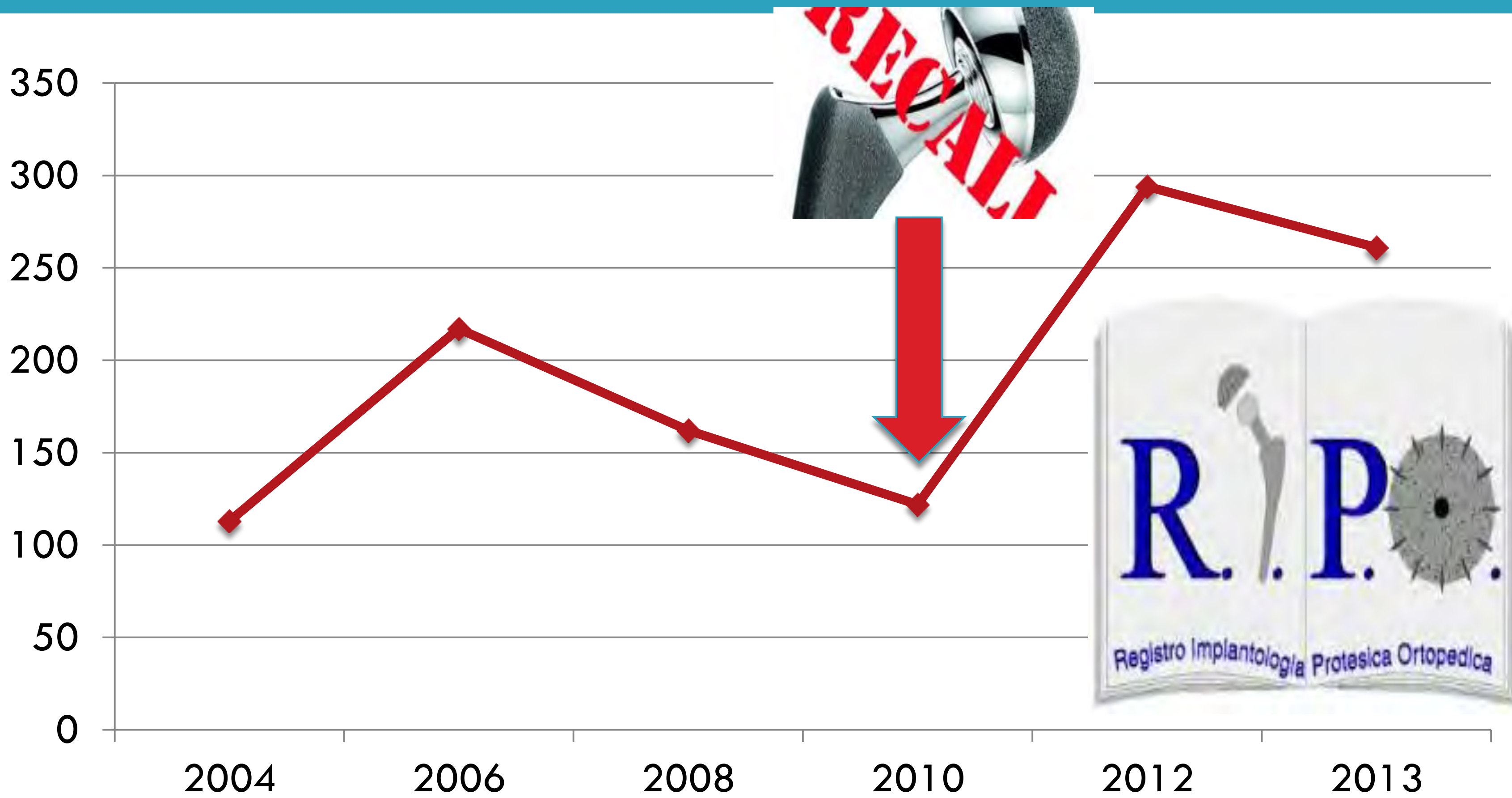
THA BEARING SURFACES

ME Cabanela, RT Trousdale et alii
There are no differences in short- to mid-term survivorship among THA bearing surface options: a network meta-analysis
Clin Orthop 2014 Level I

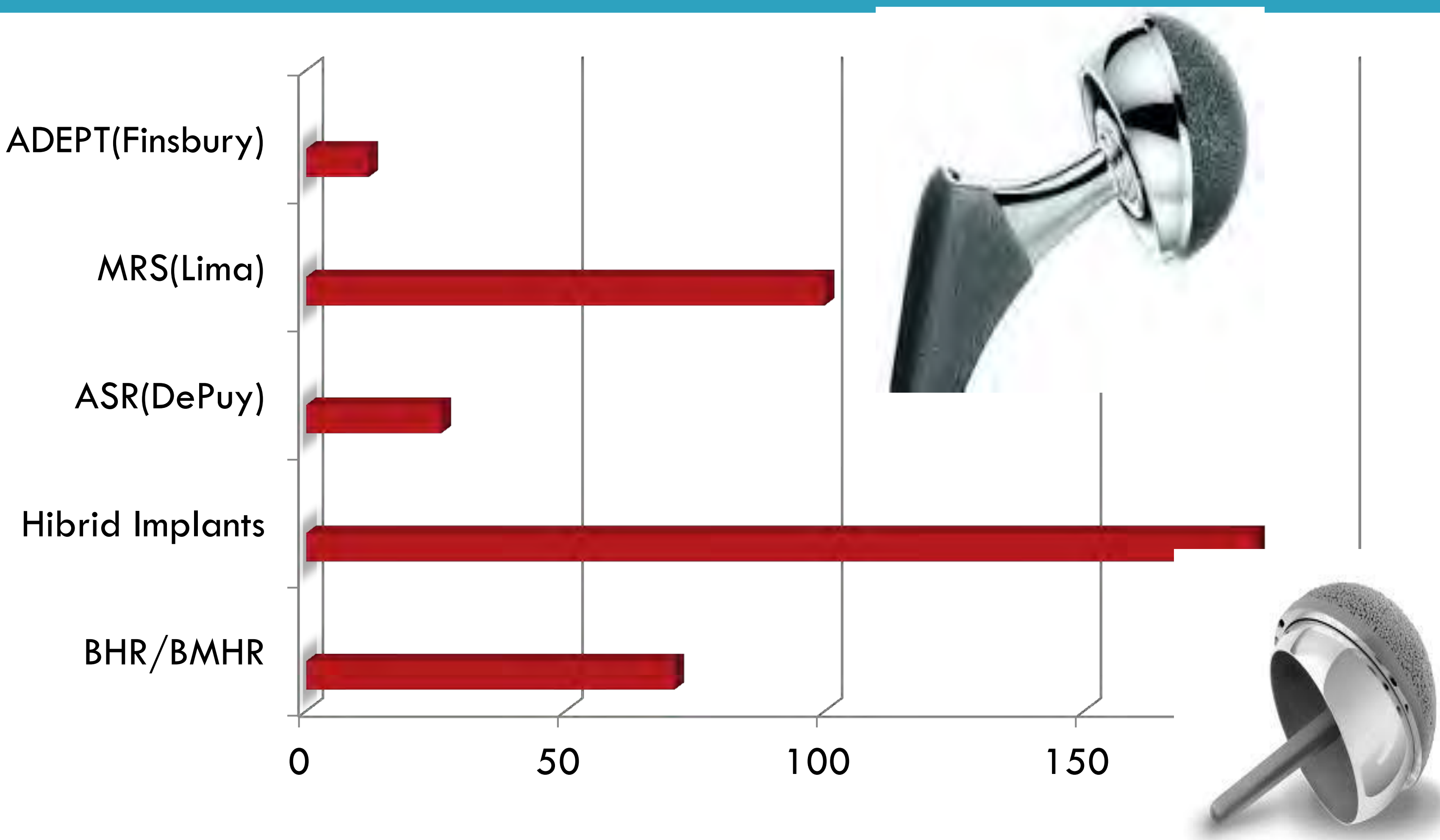
Bearing surfaces distribution(2004-2013)



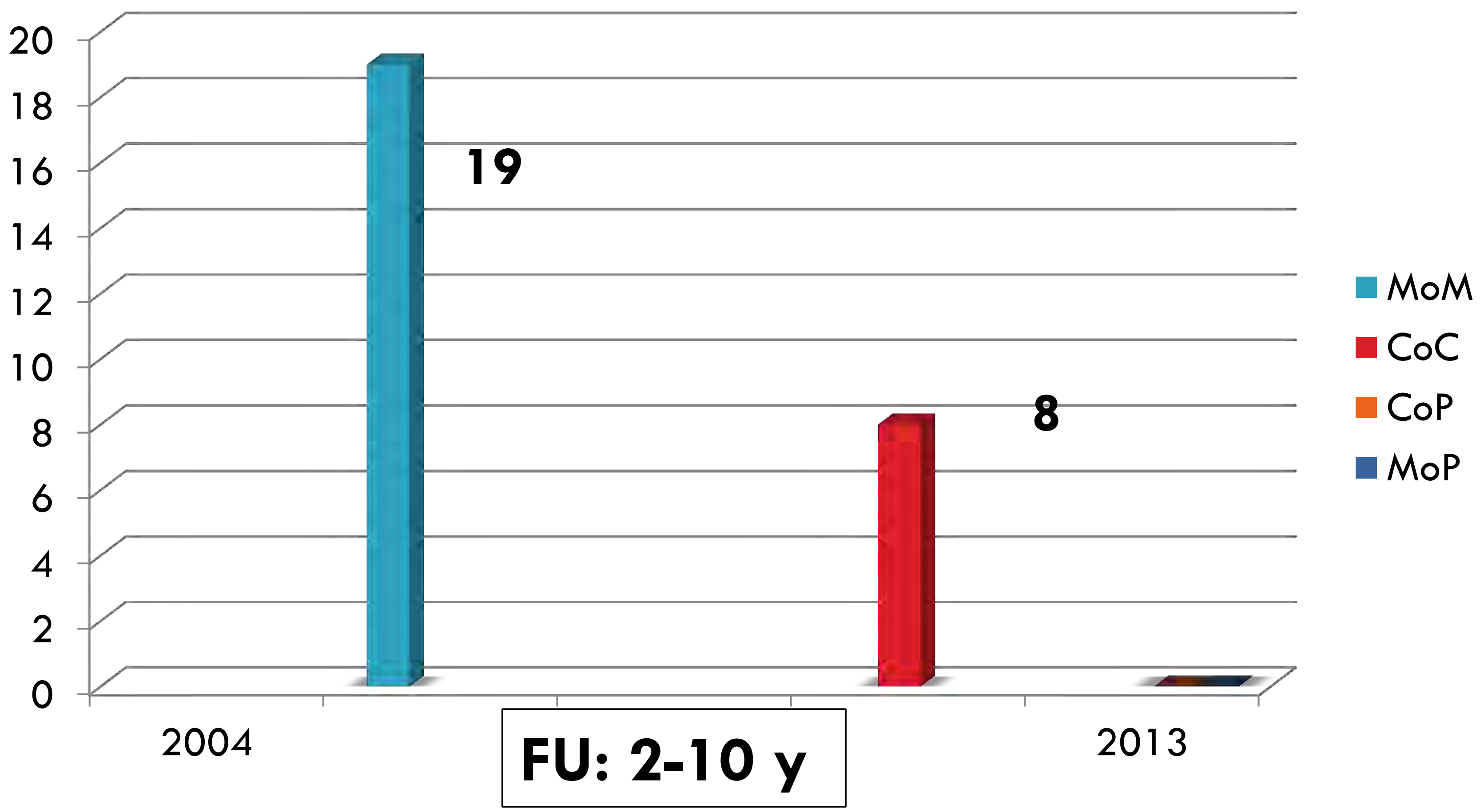
Resurfacing implanted in RER (RIPO data)



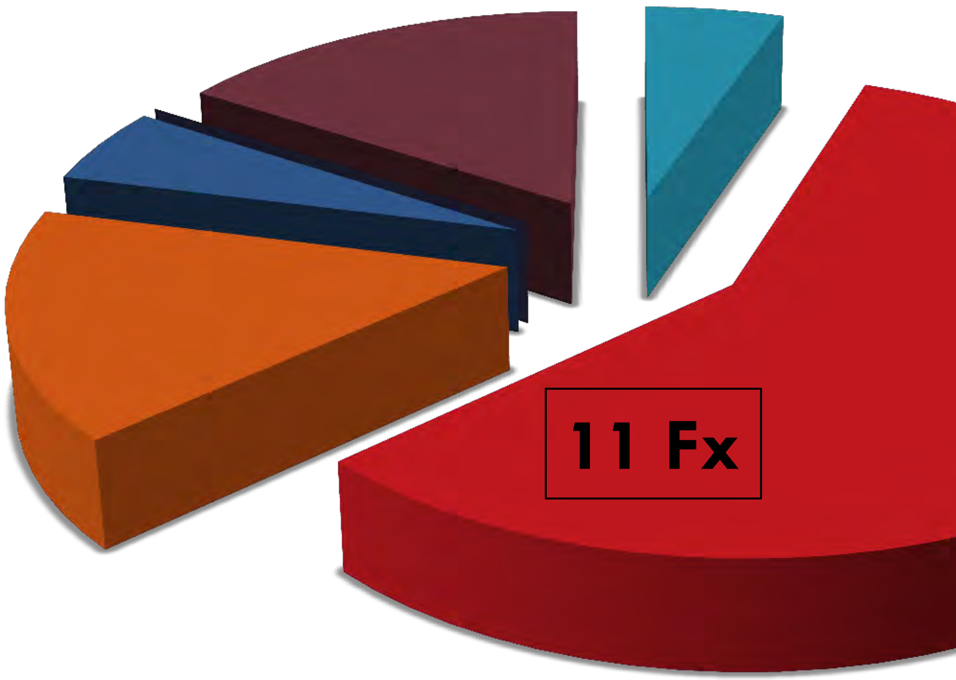
MOM IMPLANTS



27 Failures of 768 (revision as end-point)= 3,5%



Causes of failure (27)



- Instability
- Fracture
- Asepting loos
- Septic loos
- Breakage
- Pain

MoM: 19

CoC: 8

MOM-THA RESURFACING TODAY

Wear is a function of use, not time
Schmalzried et alii, CORR 2000

2 phases

Running-in phase (high wear): 0,5-2 x 10 m Cycles

Steady-state phase(constant & lower)

TP Schmalzried, MA Mont et alii
Survival of Hard-on Hard bearings in THA: a systematic review
Clin Orthop 2011 Level II

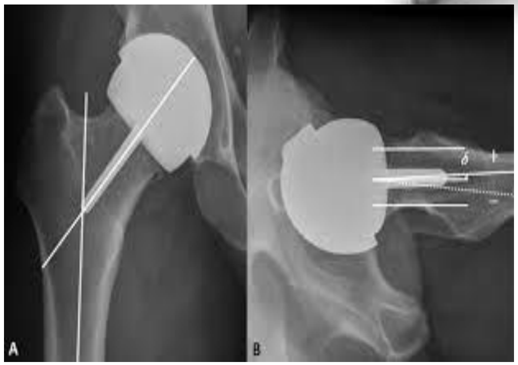
MOM-THA RESURFACING TODAY

Correct choice of the patient

Correct choice of the implant (tribology)

BHR

Correct surgical technique



OUR CHOICE TODAY for MOM Resurfacing

Man
< 50-55 years
Very active in sport(UCLA 10)
BMD normal
Head diameter > 48 mm
No metal-ions allergy
Informed
Motivated
No eterometry
No morphologic abnormality

High-level phisical demanding

STEMS

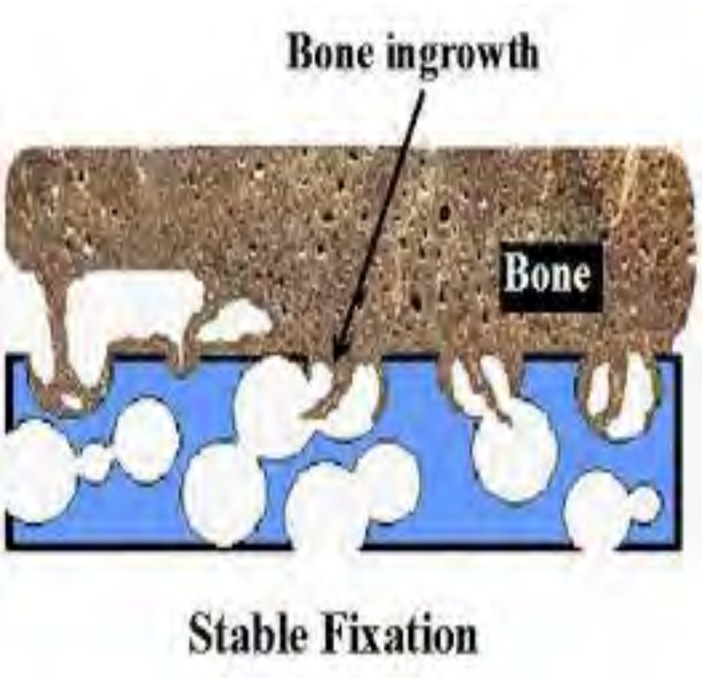
Neck Preserving Stem

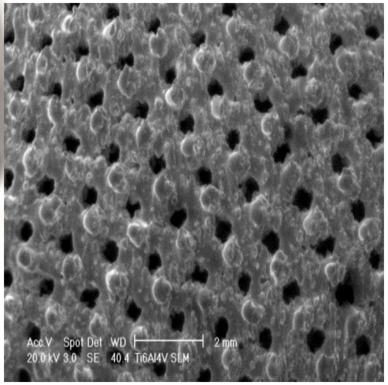
Short Stem

Conic Stem

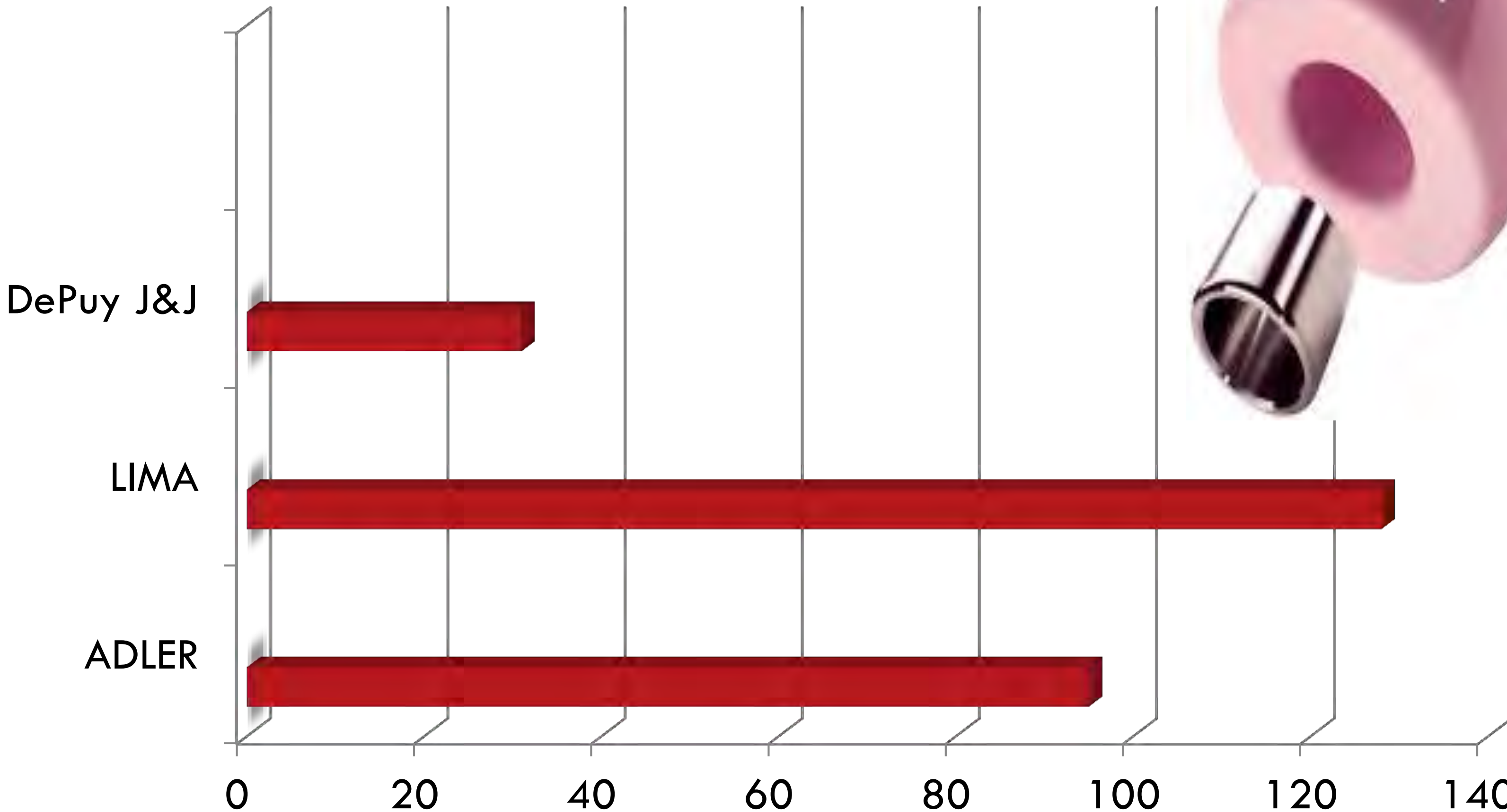
BIO-MATHERIAL INTERFACE

Porous Titanium

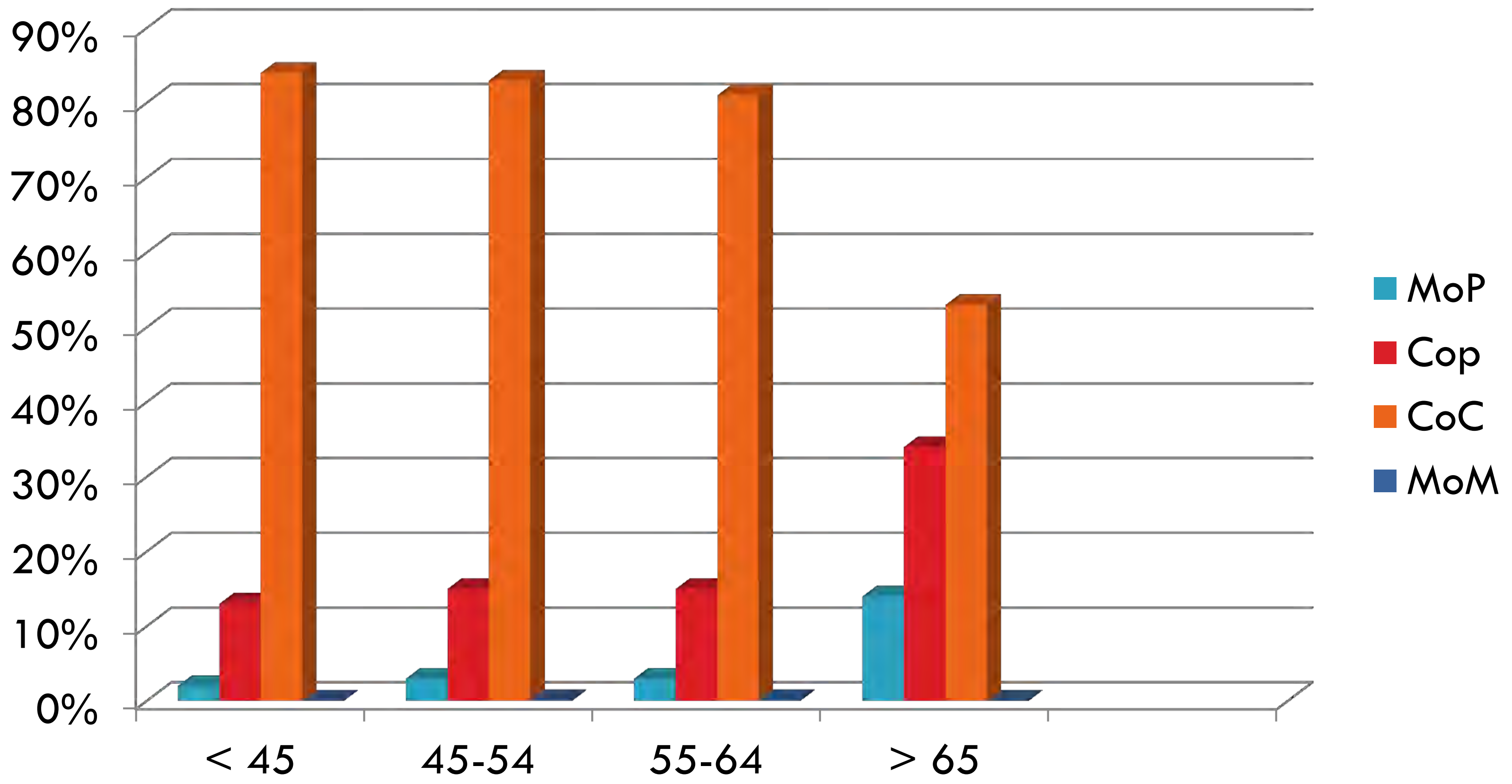




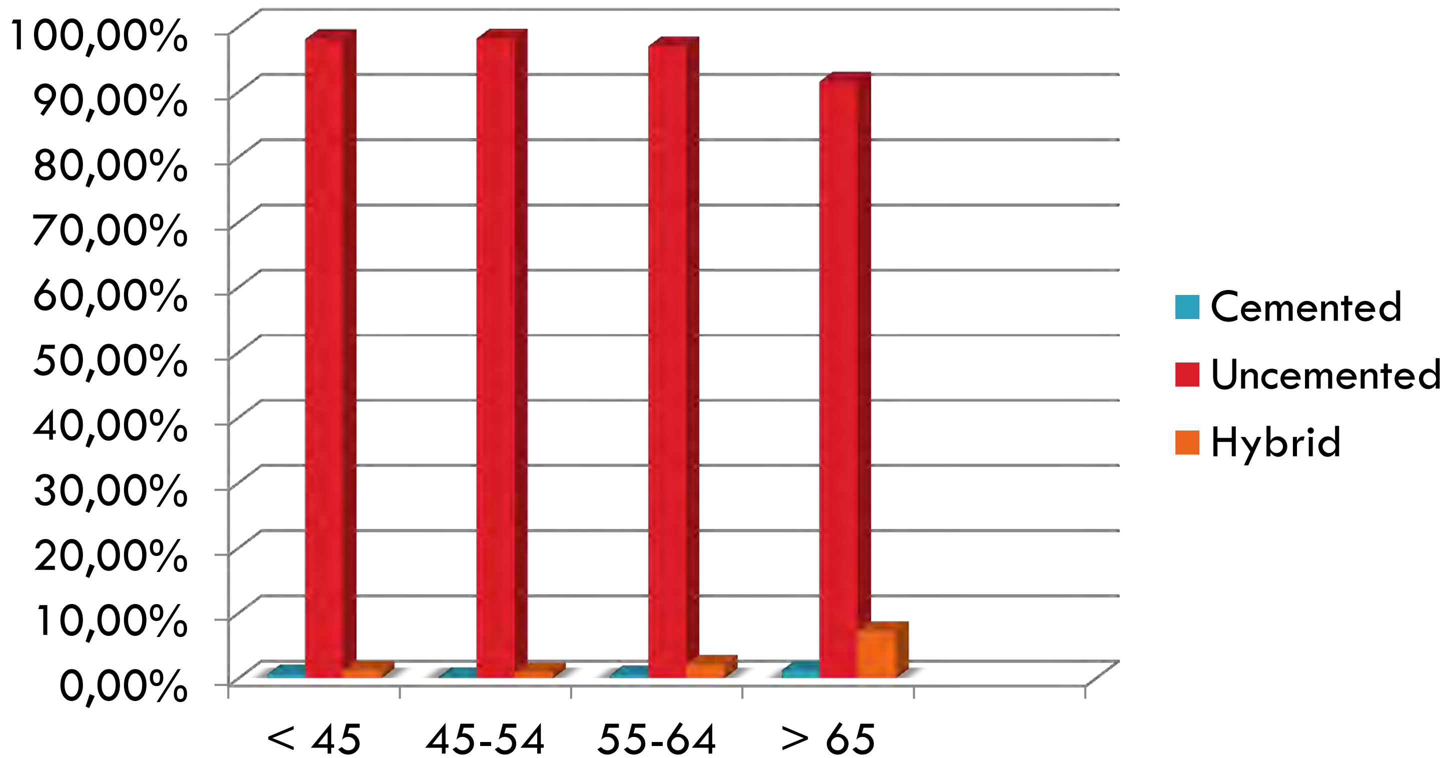
COC IMPLANTS



RIPO RER trend in 2013 report



Cemented vs uncemented



All uncemented implants

OUR CHOICE TODAY is for COC(biolox Delta)

All other clinical setting

THANK YOU 4 YOUR ATTENTION

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

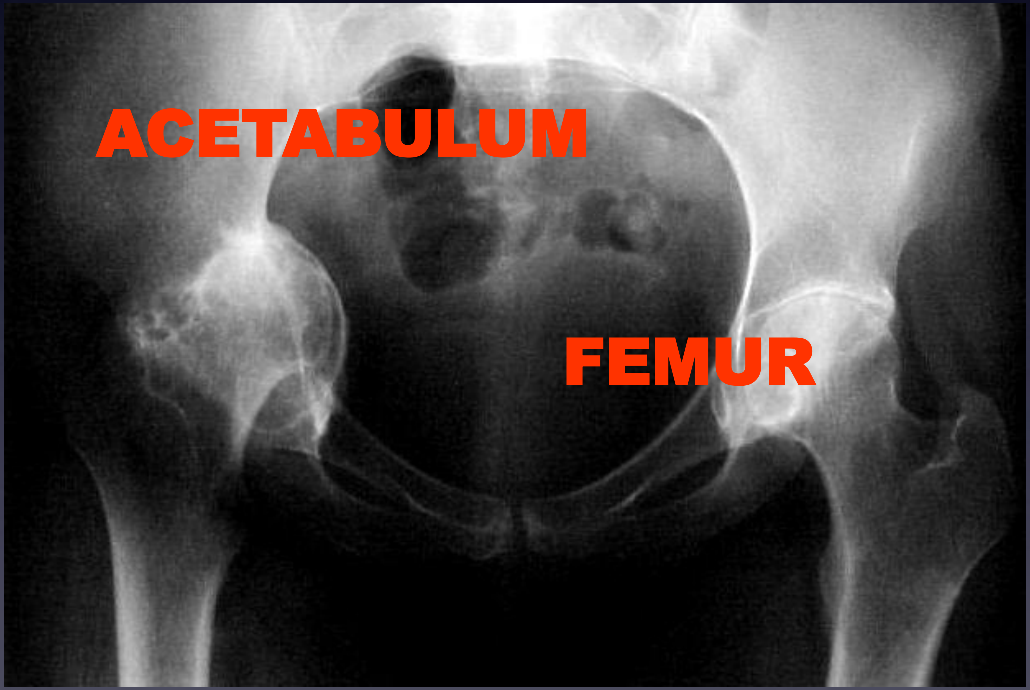
TOTAL HIP ARTHROPLASTY IN JUVENILE IDIOPATHIC ARTRHITIS: A LONG TERM FOLLOW UP WITH CUSTOM MADE IMPLANTS

Dr. FOSSALI A., Dr.ssa DE MARTINIS S., Dr. IORI S., Dr. VIGANO' R.

S.C. CHIRURGIA dell'ARTRITE REUMATOIDE
Istituto Ortopedico Gaetano Pini - Milano

HIP INVOLVEMENT IN JUVENILE IDIOPATHIC ARTRHITIS (JIA)

5 - 15 %



- Deformity
- Poor bone quality
- Young patients
- Poliarticolar

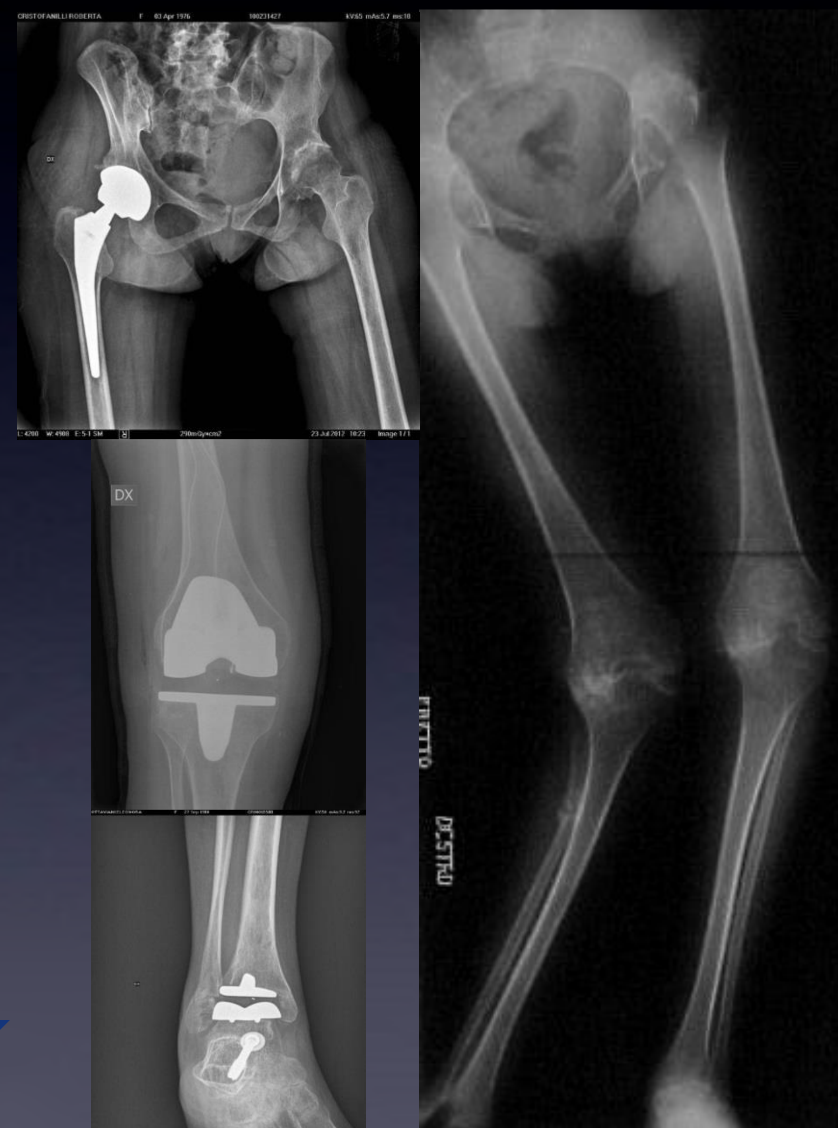
Rheuma Surgery

JUVENILE IDIOPATHIC ARTRHITIS

POLIARTICULAR

SURGERY

(“TIMING”)

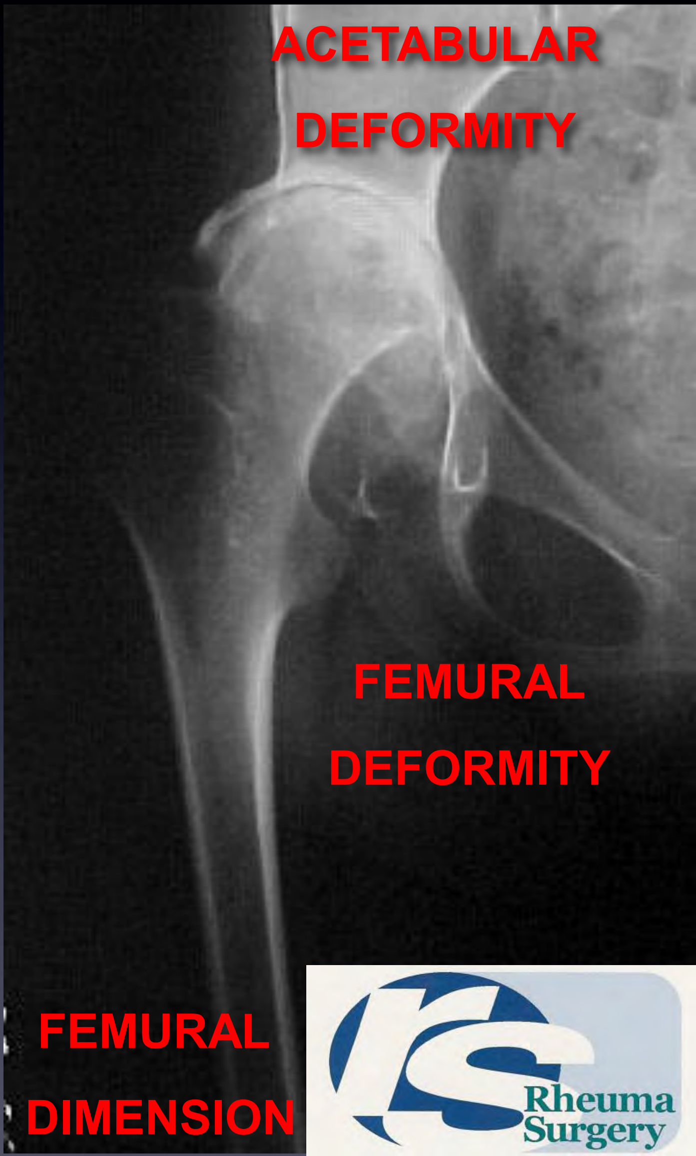


IMPLANT CHOICE

POOR BONE QUALITY

AGE AND ANATOMY

F 17 y JIA



Correct deformity

Bone saving

Choice of the femural stem for every patient

CUSTOM MADE IMPLANTS

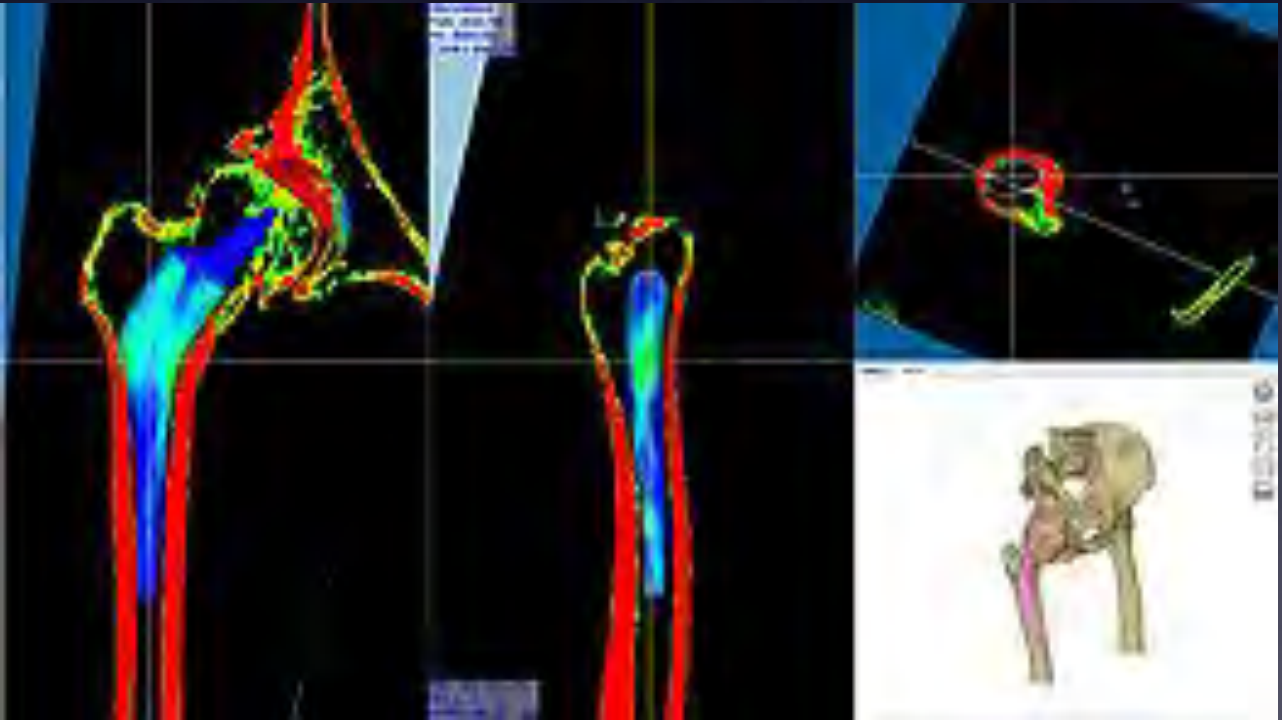
Rheuma Surgery

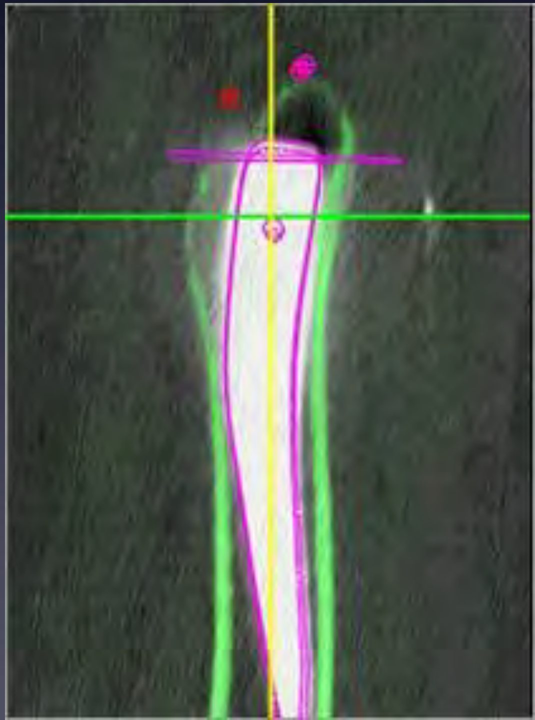
Standard
XRay
3-D CT Scan

Femural anatomy

Extramedullary
morfology

COMPUTER ASSISTED RECONSTRUCTION





CREATION OF CANCELLOUS BONE IMPACTORS AND CUSTOM MADE STEM

CASISTICS

- from 2001 to november 2004
- 10 tha in 5 JAI patients
- mean age 26 y (17 – 36)
- mean weight 37,4 kg (26 – 50)
- follow up 12,1 y (10 – 13)
- femural stem custom Symbios ® cementless

Rheuma Surgery

CLINIC EVALUATION

- WOMAC

  Pain

  Walking free

  Functionality

- FJS

  "Forgotten Joint Score"

- PATIENT SATISFACTION

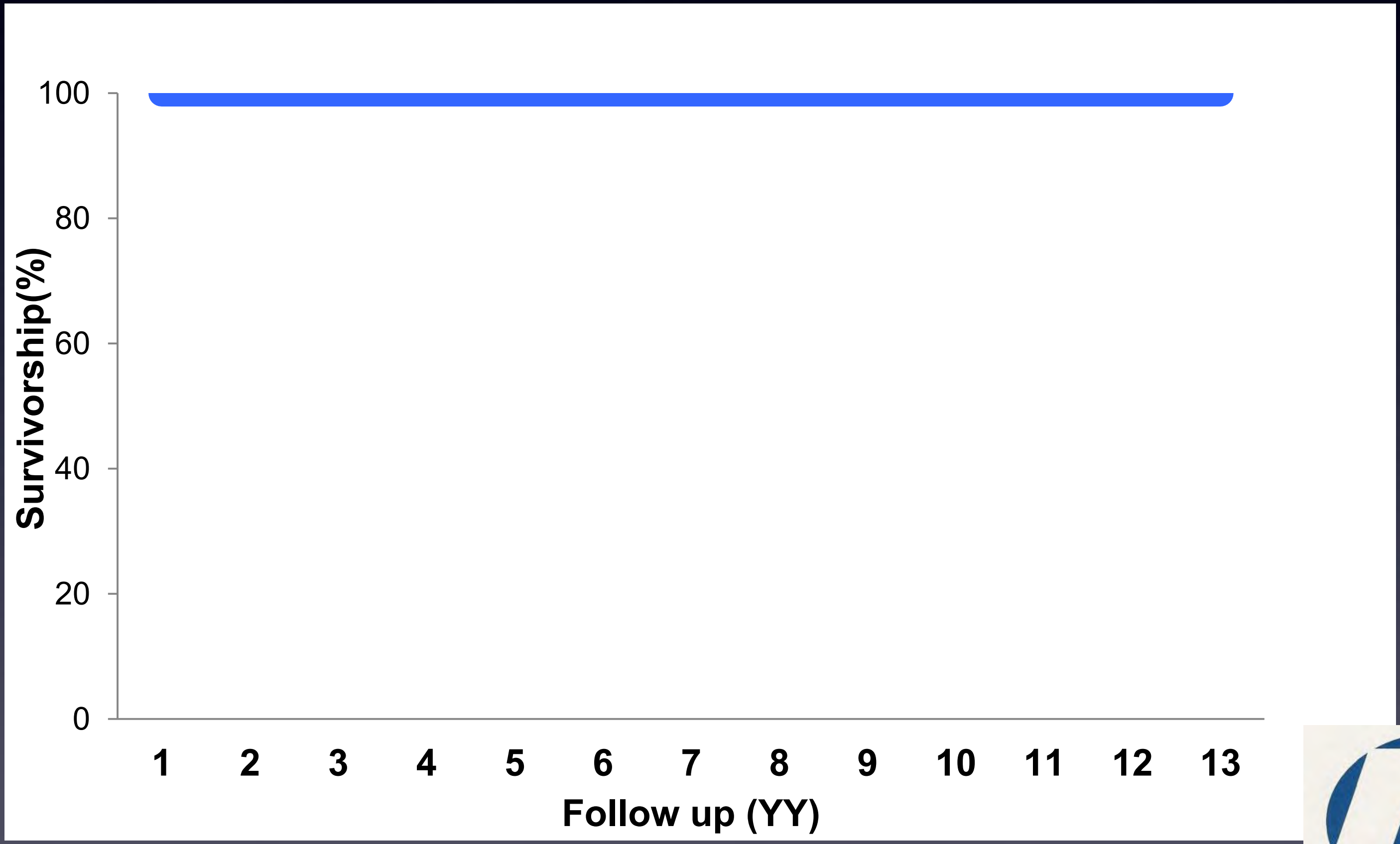
X-Rays EVALUATION

Rheuma Surgery

RESULTS

SURVIVORSHIP

100%



Rheuma Surgery

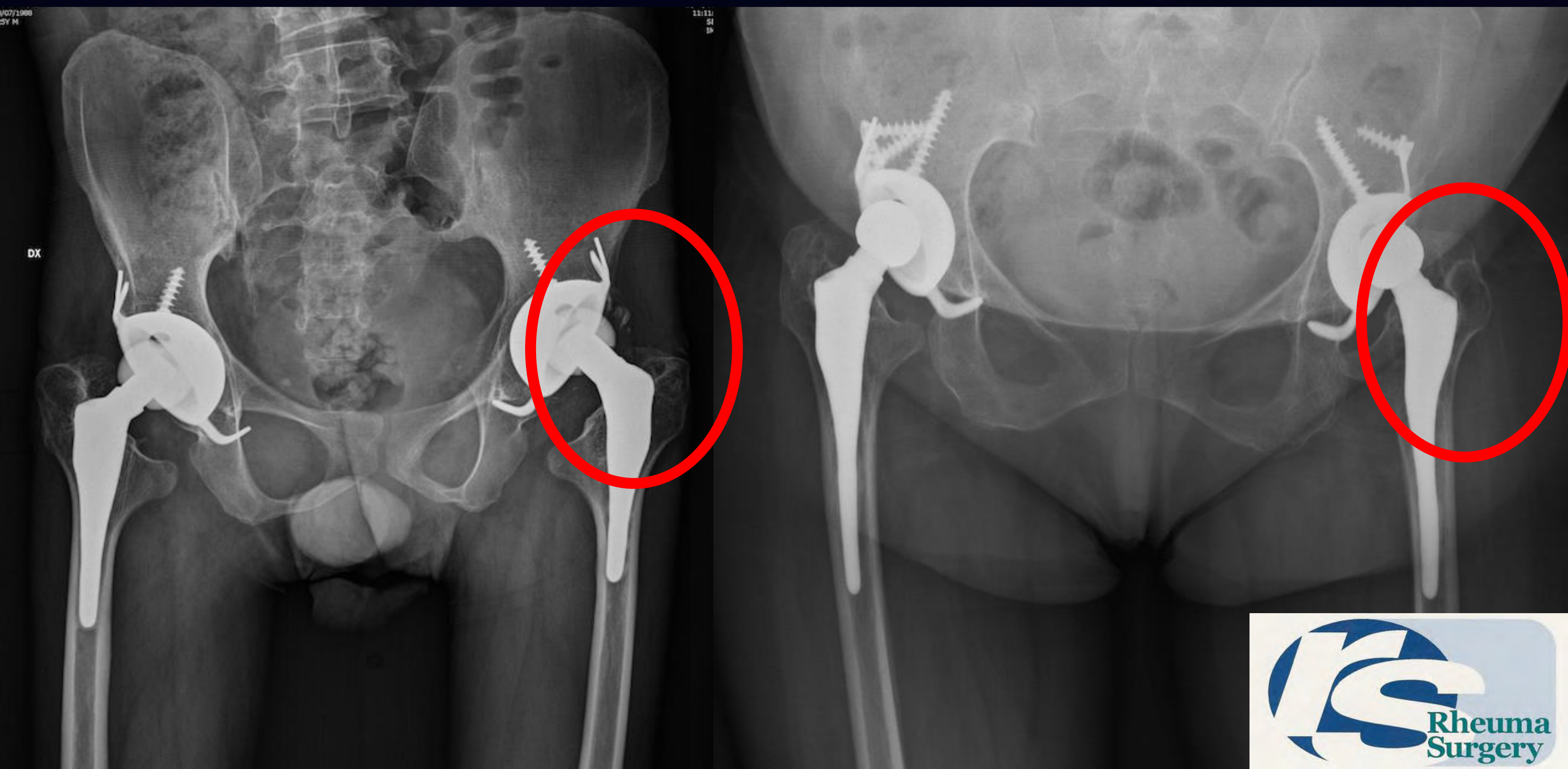
RESULTS

	10 y follow up
WOMAC	78,3 (46,1 – 88,7)
NRS	3,1 (0 – 2)
FJS	68,17 (15,9 – 100)

- PAIN IMPROVEMENT
- FUNCTIONAL IMPROVEMENT
- 4/5 «FORGOTTEN JOINT SCORE»
- PATIENTS SATISFACTION 100%

X-Rays RESULTS

No prosthesis mobilization



CONCLUSIONS

- Good results in use of custom made femoral stem in JIA patients

- It can be considered BEST PROCEDURE to respect bone morfology and bone structure

- The stem must be adapted to the patient not the patient to the stem

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

OUTCOME OF CHARNLEY TOTAL HIP REPLACEMENTS - SINGLE CENTRE EXPERIENCE

Miss Kohila Sigamoney, Miss carol Brignall

Cumberland Infirmary Carlisle

CONTENT

- Introduction
- Objectives
- Methods
- Results
- Conclusion

Introduction

- Charnley Total Hip Replacements have had good reported outcomes in the past but not always the choice.
- One of our surgeons uses this prosthesis.
- January 2000, the department of health (UK) issued a report stating that there was little justification for the use of other prostheses in older patients. (recommendation currently: prosthesis with revision rates of 5% or less at 10 years)
- It costs less and the revision rates at 10 to 20 years were low.

What does the literature say…

- A lot of studies
- In 1994, Neumann et al – Charnley prosthesis gives excellent long-term results.
- 1996, Marston et al reported – that conventional cemented THRs give acceptable results.
- 2006, Allami et al – 95.4% survisorship at 10 years

Objectives

- To look at the outcome in our practice of usage of Charnley Total Hip Replacements.
- Single surgeon
- Small sample of patients who had the surgery

Surgical technique

- Patient supine
- Anterolateral approach
- No trochantheric osteotomy
- No lavage
- Cemented
- Standard prosthesis

Methods

- Database - Charnley Total Hip Replacements
- Under the care of the senior author
- From 1993 to 2003
- Oxford hip score questionnaires were sent out to the patients.

Results

- We looked at a group of 23 patients who have had 33 hip replacements.
- Portion of cases that were provided by the audit department.
- 10 had bilateral Charnley hip replacements and 13 had one side done.
- The average age was 62.4 (range was 51 to 82)
- All of the patients had the surgery for primary osteoarthritis except one who had it for posttraumatic osteoarthritis

Results - cont

- In the case of 24 hip replacements (72.7%), there was no change to mobility status but all these patients were able to mobilise with the maximum aid of one stick.
- In 6, (18.1%), there was improvement by a single level in terms of mobility.
- And in 3, there was a deterioration by a single level of mobilisation (9.1%).
- Overall post-operative complication rate was 12.1%.

Results - Cont

- Average OP follow – up time was 15.3 years with a range of 4 to 20 years.
- With this follow up period, no patient required revision surgery.
- There was also no radiological evidence of heterotopic ossification.

Results - Cont

- There were 28 questionnaires returned by 18 patients.
- 1 patient had died and there was no returns from the rest of the patients.
- The average Oxford Hip Score was 47 out of 48 .

Limitations

- Small study
- Only patients who had surgery by senior surgeon
- Looking at our performance against national standards
- Retrospective study and no pre-op Oxford Hip Score.

Conclusion

- We concluded that the usage of Charnley Hip Replacements is very much justified as per advice from the department of health (UK).
- Small study to comment on survivorship but good reports in literature.
- Good long-term outcome in this study (clinically and from patient satisfaction)

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Our experience of hip replacement using the Mako-Rio System (MAKOPLASTY)

PG. Perazzini - A. Marangon - M. Montanari - P.Sembenini- F. Alberton

MILANO, 27.11.2015

CORE
Centro di Ortopedia Robotica Europeo

CASA DI CURA SAN FRANCESCO
VERONA
UNITA' FUNZIONALE DI ORTOPEDIA - TRAUMATOLOGIA
Resp.: Dott. Piergiuseppe Perazzini

Orthopaedic Surgeons aim to have a “perfect” implant for hip artrhoplasty

<u>Human performances have limits</u>

especially inserting a mechanical device in a biological system

Robotic assisted total hip arthroplasty using the MAKO platform.

R Tarwala, LD Dorr. Curr Rev Muscoloskelet Med (2011)

Literature Review

The Epidemiology of Revision Total Hip Arthroplasty in the United States

THE JOURNAL OF BONE & JOINT SURGERY

JBJS

Kevin J. Bozic, Steven M. Kurtz, Edmund Lau, Kevin Ong, Thomas P. Vail and Daniel J. Berry
J Bone Joint Surg Am. 2009;91:128-133. doi:10.2106/JBJS.H.00155

Clinical, demographic, and economic data was analyzed from 51,345 revision THA procedures (average age: 67.1, 42.9% male) from Oct 2005 to Dec 2006
Most common causes of revision include:

- Instability/dislocation (22.5%) (Also accounted for 33% of acetabular-only revisions)
- Mechanical Loosening (19.7%)
- Infection (14.8%)

Average billed charges for revision procedures were $54,553 (range: $42,245-$69,380)
$42,245 to exchange head and liner ONLY
Dislocation (cup exchange) results in extra charges

WHY SHOULD WE USE THE ROBOT?

- **REPRODUCIBILITY**
- **PRECISION**
- **RELIABILITY**

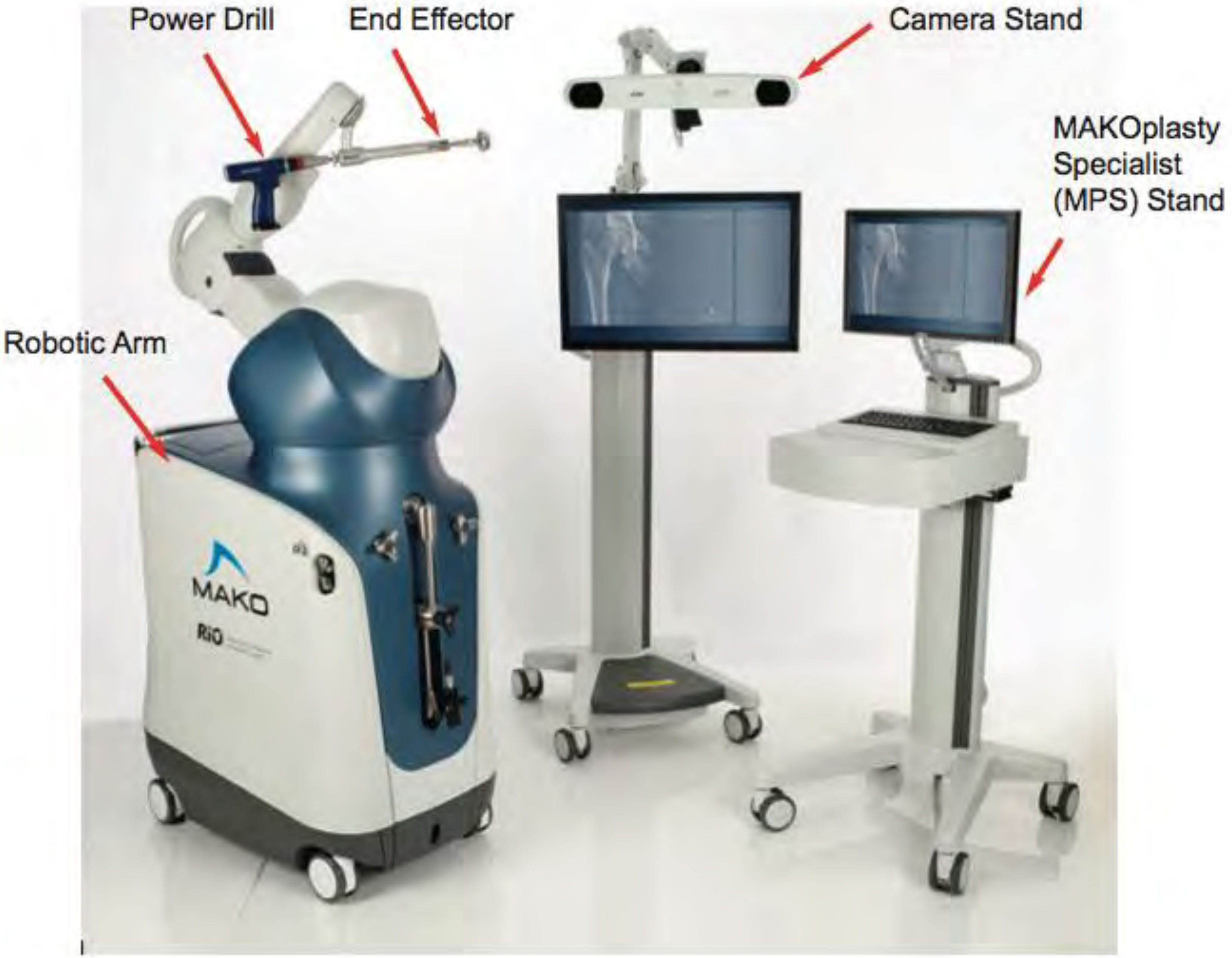
MAKOPLASTY enables surgeons to be extremely precise and reproducible in prosthesis implantation

Benefits of robotic technology in prosthetic hip surgery

- **Restoring a correct <u>center of rotation of the hip</u>**
- **Determining the <u>resection level of the femoral neck</u>**
- **Measuring the <u>rotation of the femoral stem</u>**
- **Maximum precision in positioning the <u>cup</u>**
- **Determination of the correct length hip = <u>reduced amount of leg lenght discrepancy</u>**
- **Optimization of the <u>muscular forces</u>**
- **Lower risk of dislocation = faster rehabilitation**

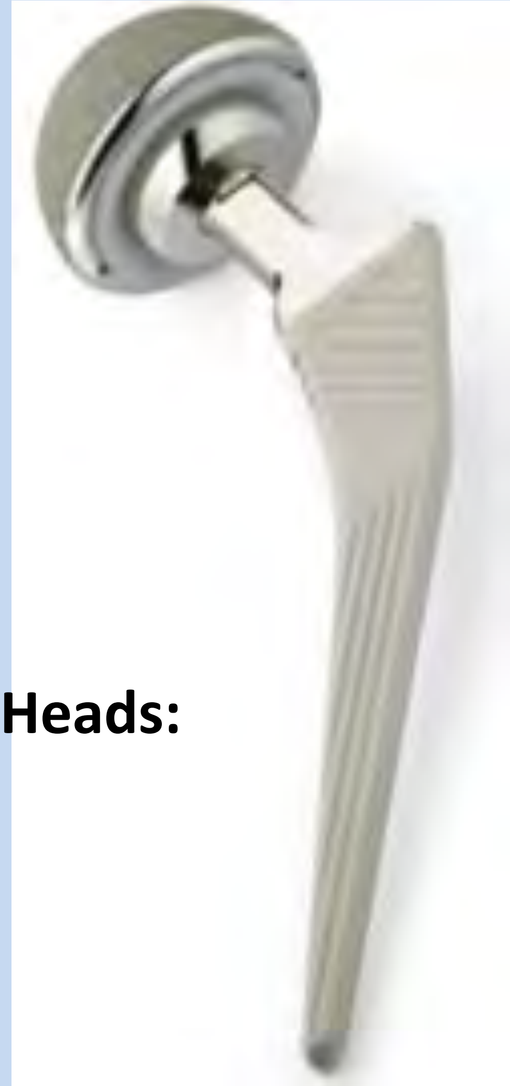
OPERATIVE TECHNIQUE

R
O
B
O
T



Power Drill
End Effector
Camera Stand
MAKOplasty
Specialist
(MPS) Stand
Robotic Arm
MAKO
RIO

MAKOplasty Total Hip Application can be currently used with a modular acetabular cup system comprised of a <u>pressfit acetabular shell</u> and highly-crosslinked polyethylene liner and a <u>Corail-philosophy (hydroxyapatite-coated) femoral stem</u> with CoCr and Delta ceramic heads.



Acetabular Cup Shells: 46 mm - 64 mm

Highly Cross-linked Poly Liners

Standard 4 mm elevated wall
+ 4 mm offset
+ 4 mm oblique

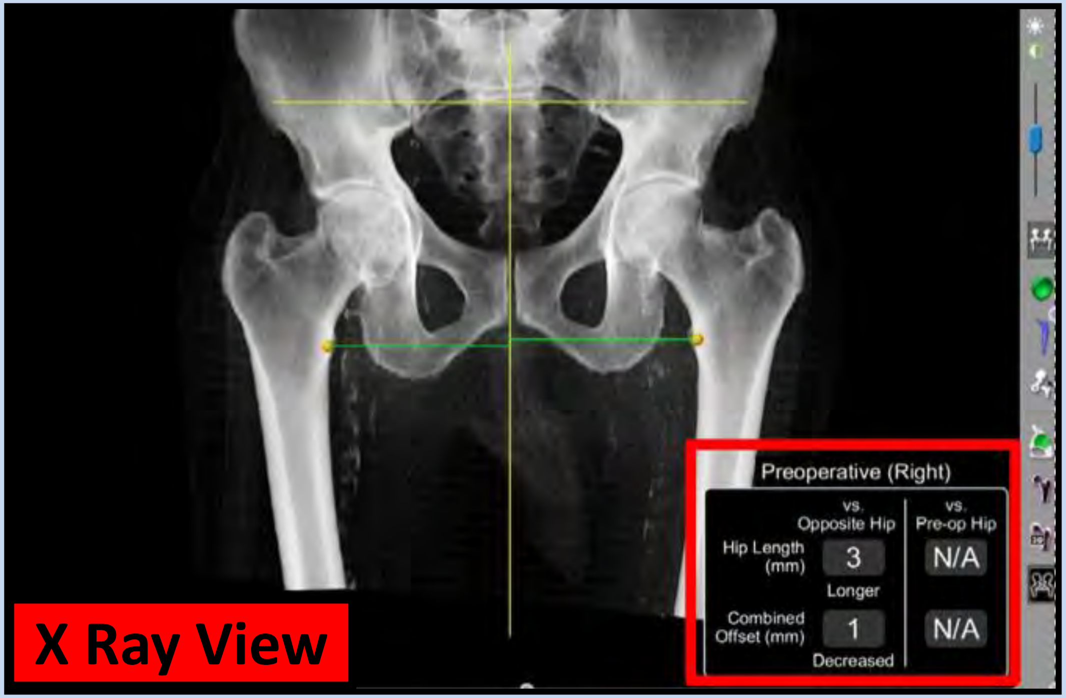
CoCr Femoral Heads:

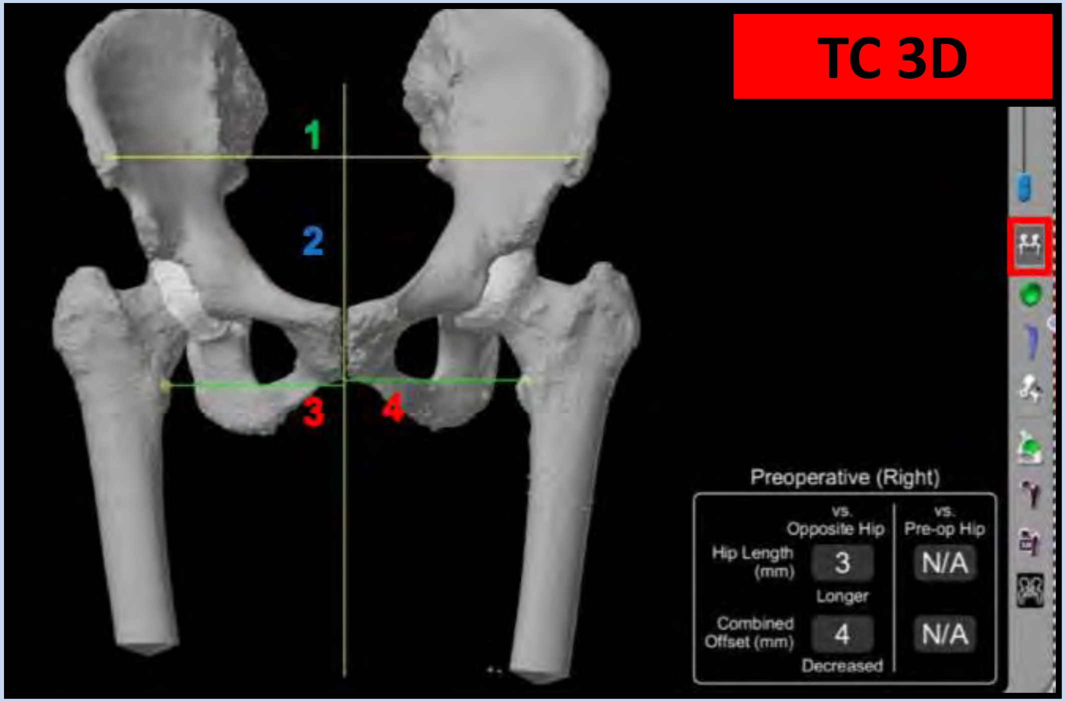
28 mm (-3,5, 0, + 3,5)
32 mm (-4.0, 0, + 4.0)
36 mm (-4.0, 0, + 4.0)
40 mm (-4.0, 0, + 4.0)

DELTA Ceramic Femoral Heads:

28 mm (-3,5, 0, + 3,5)
32 mm (-4.0, 0, + 4.0)
36 mm (-4.0, 0, + 4.0)

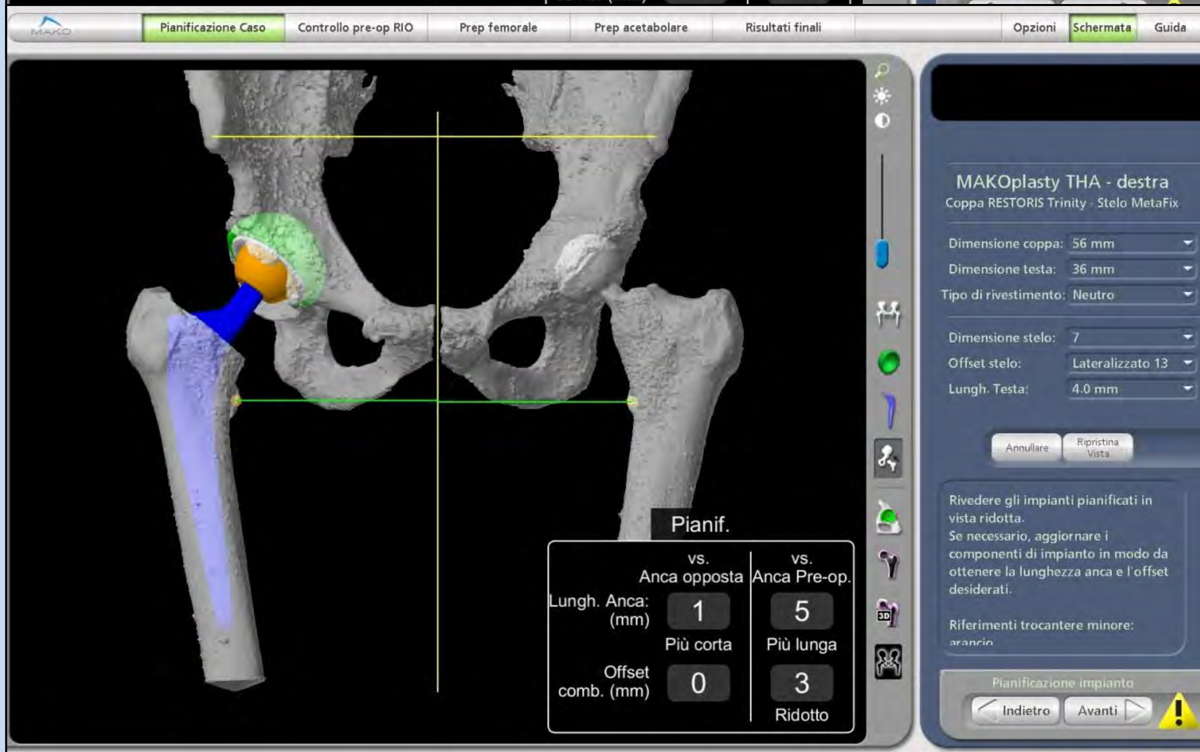
Pre-operative planning



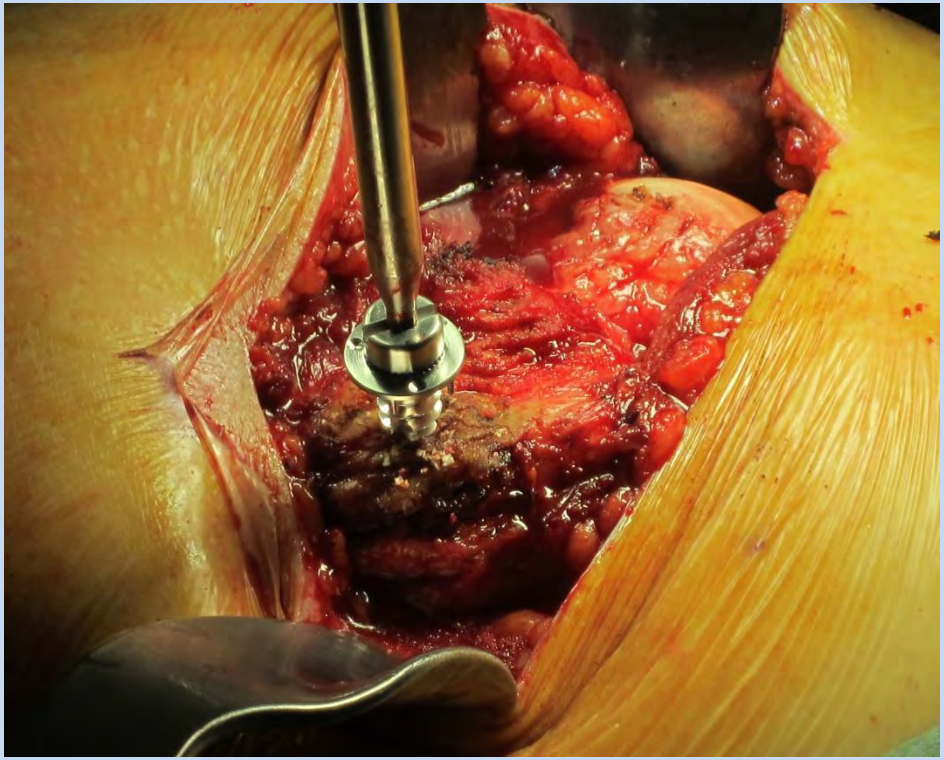


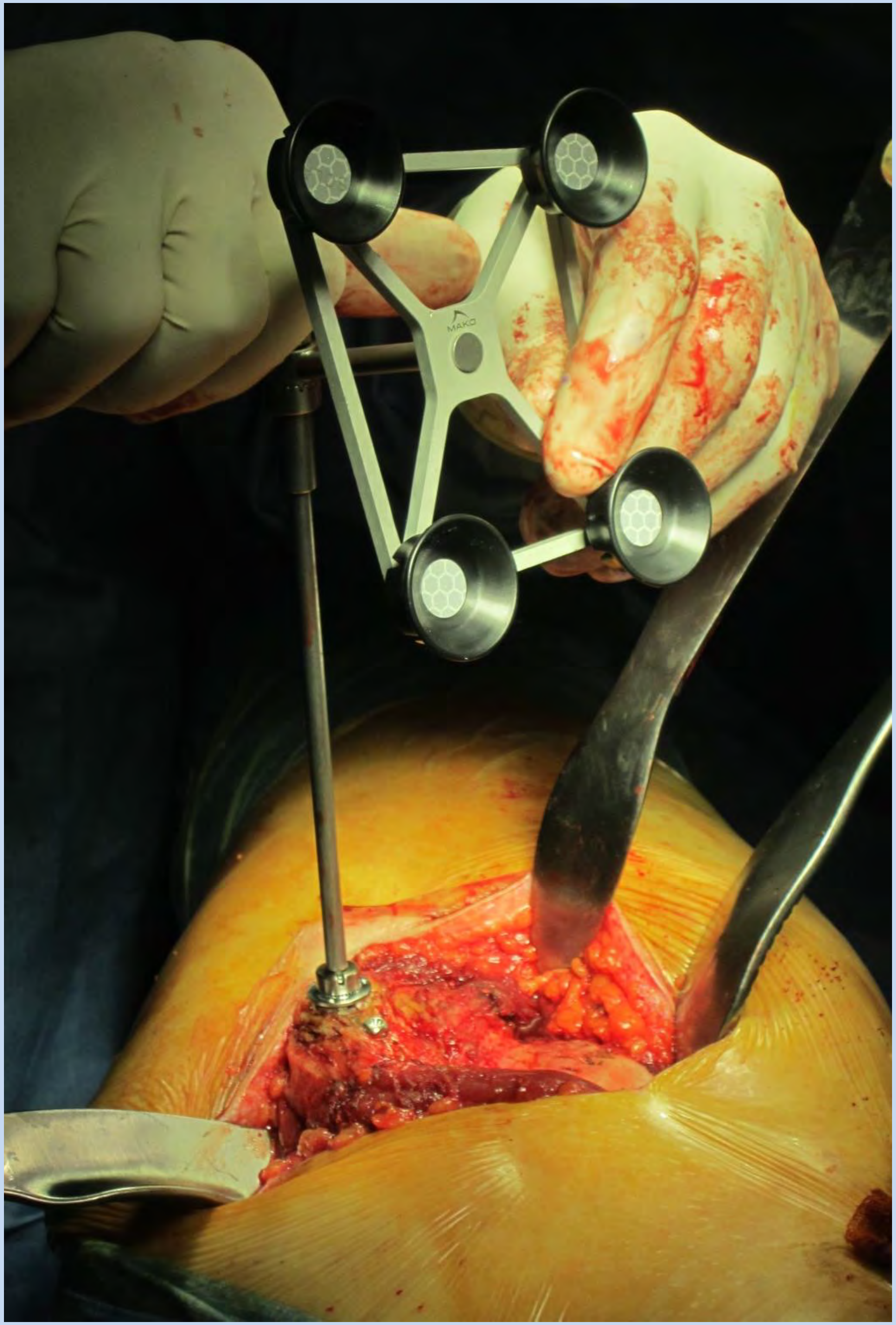
1 line through ASIS
2 midline
3-4 hip lenght

Prosthetic implant-preoperative planning



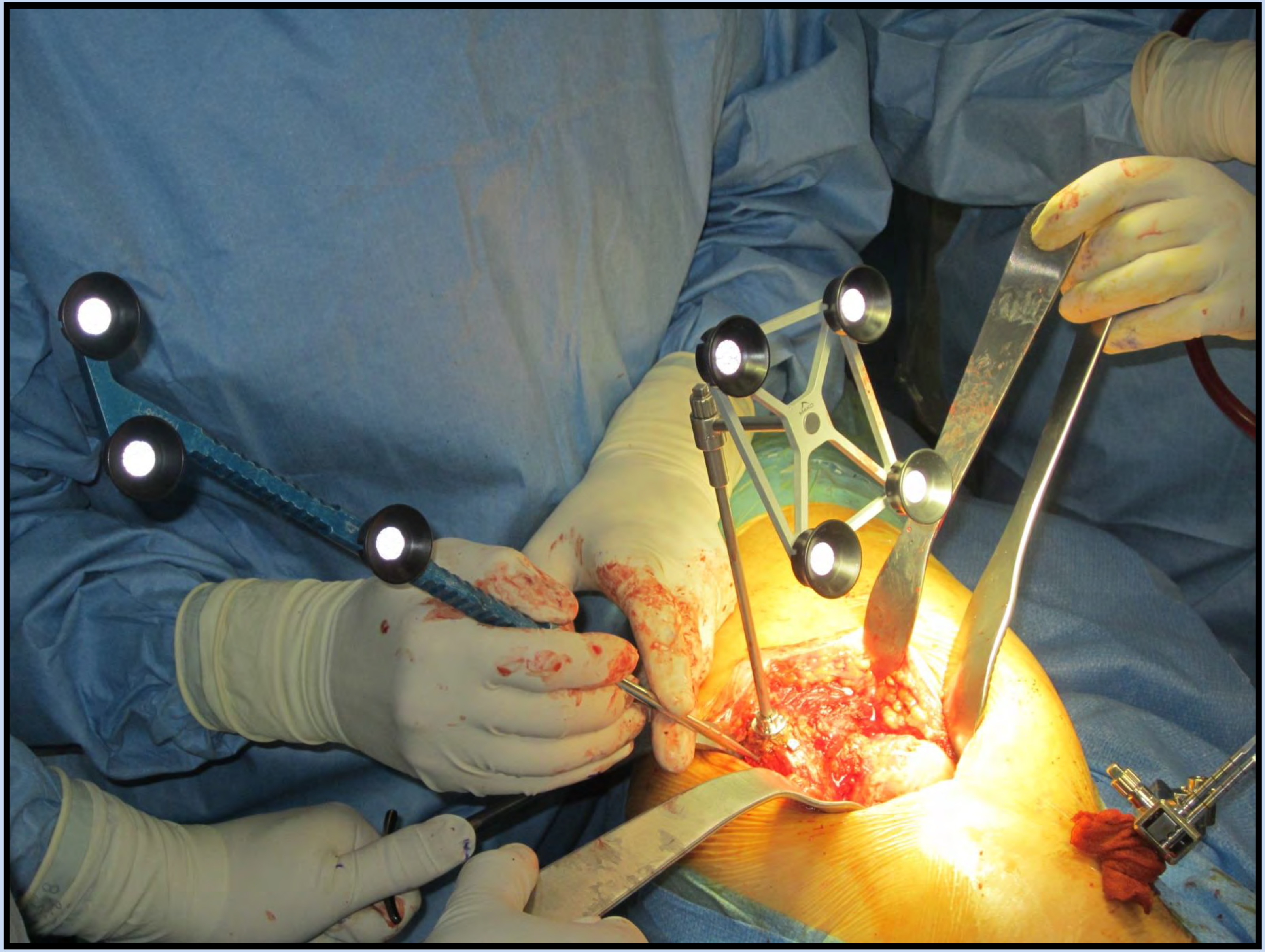
View of the Femur to be operated (with final components) and contralateral



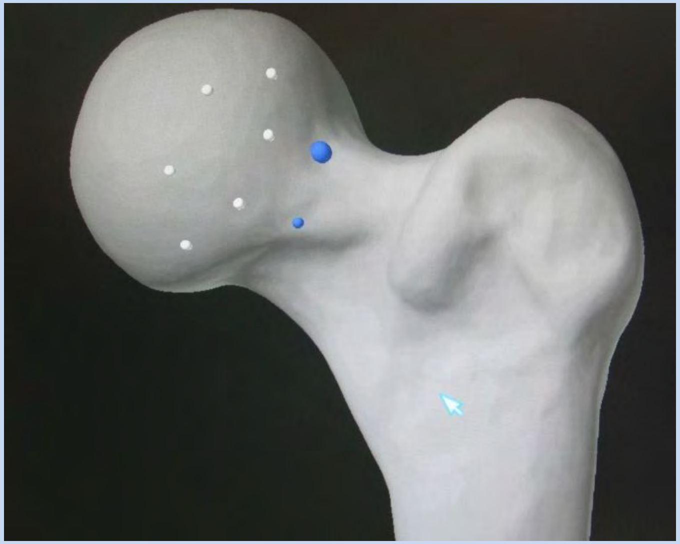


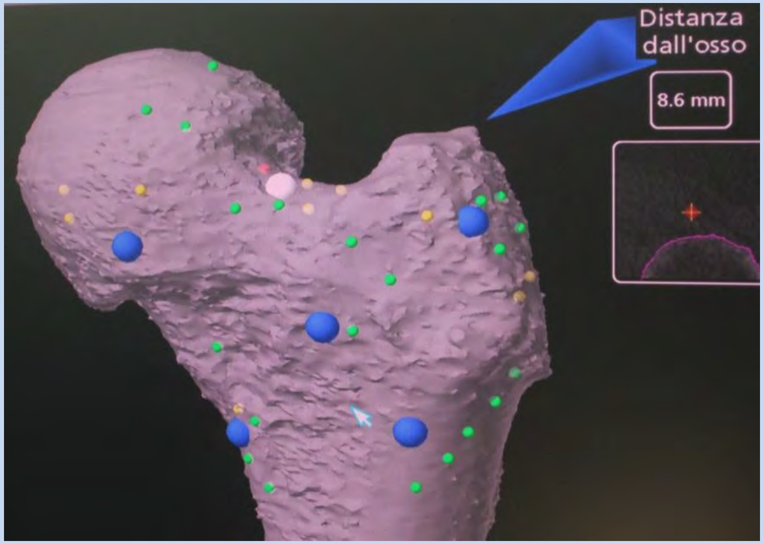
- Implantation of the screw in the greater trochanter
- Femoral array positioning

Mapping / Matching

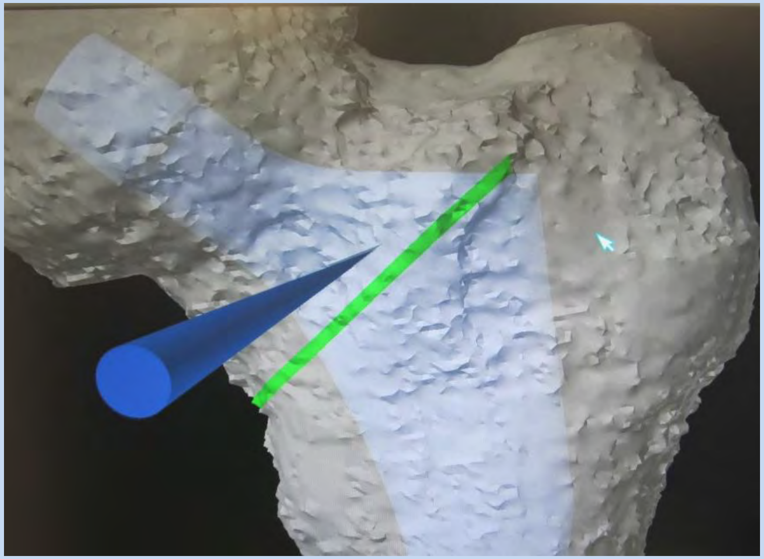


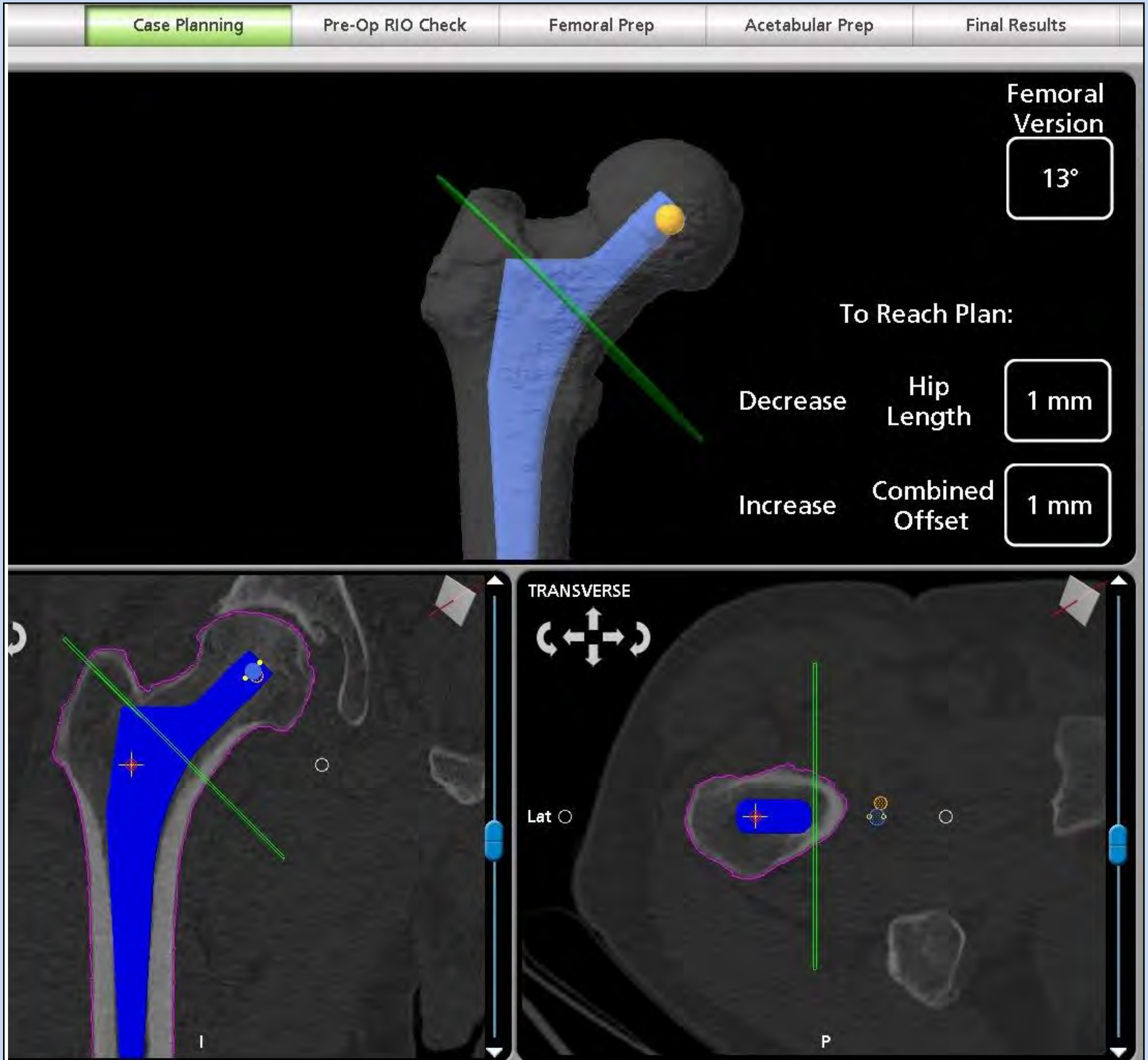
Screen view (mapping)



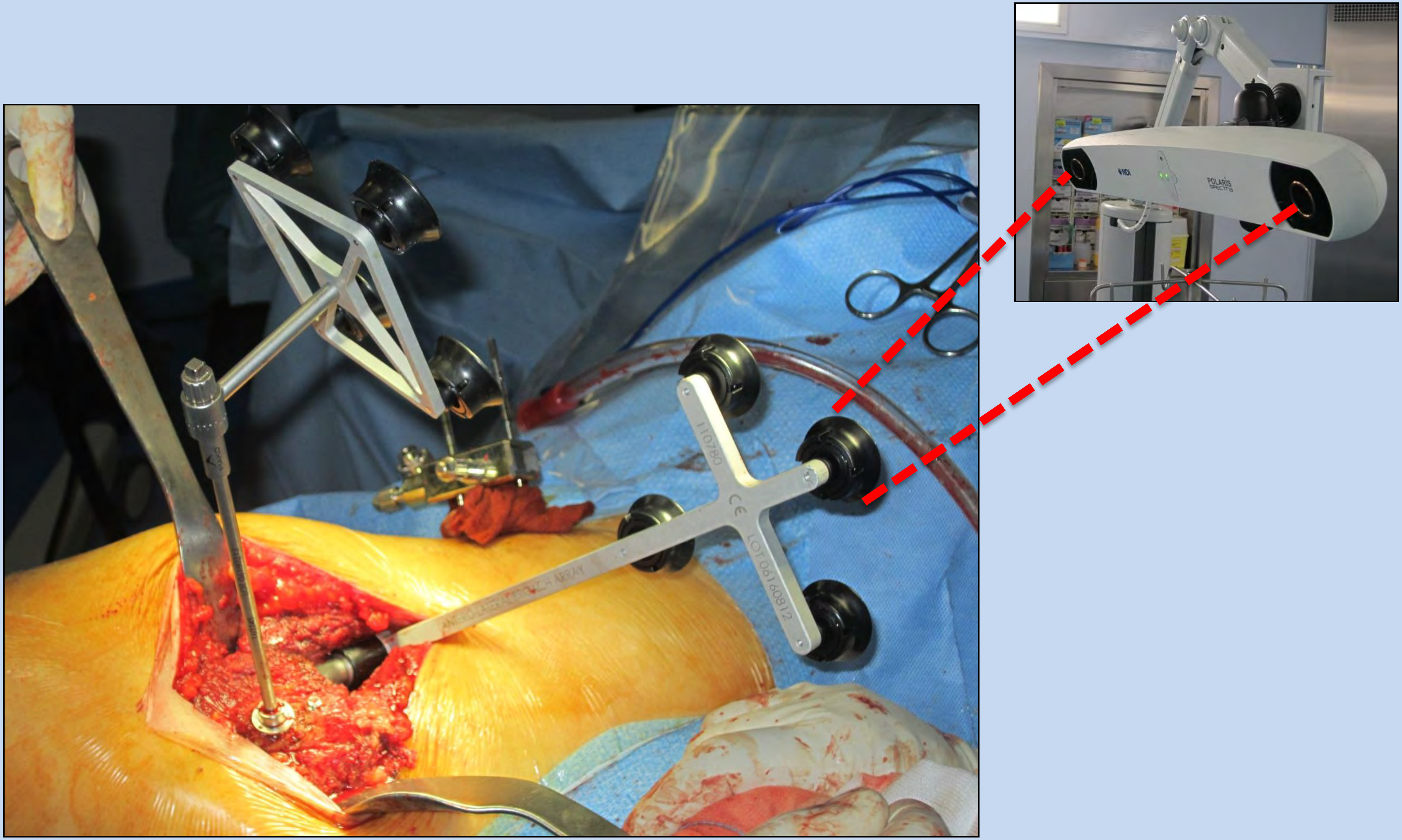


Osteotomy line

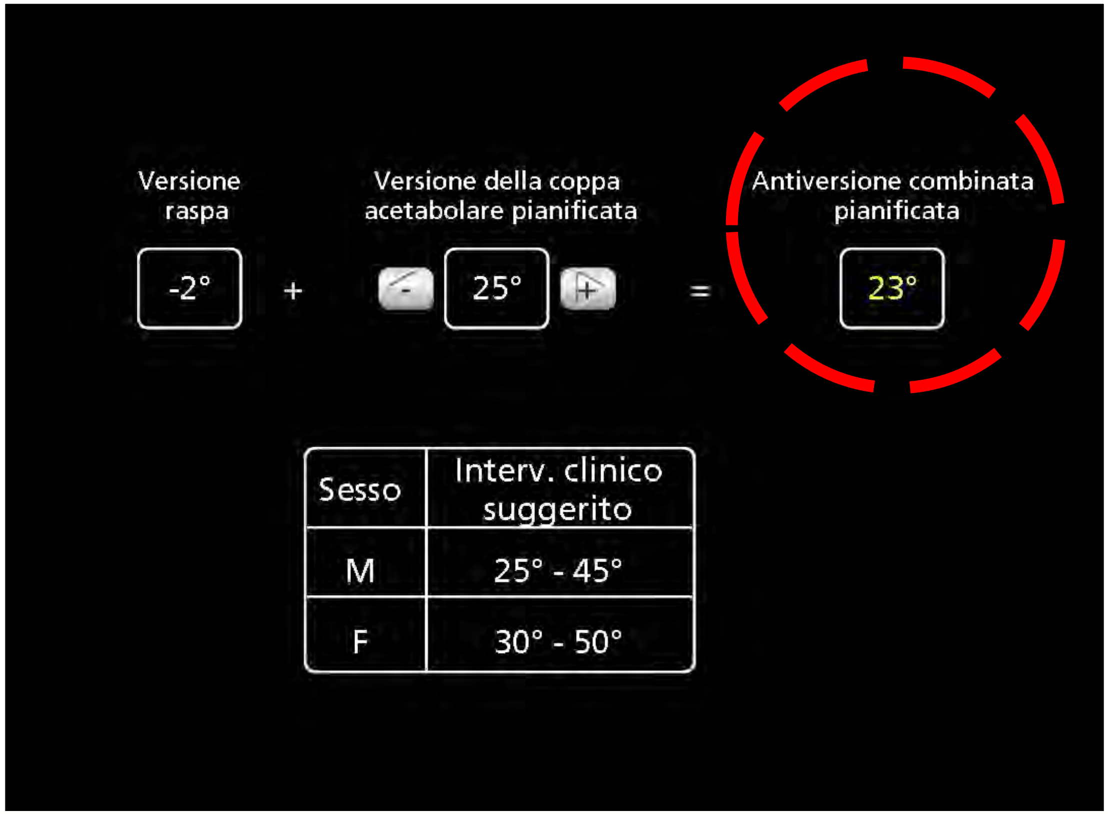



Case Planning
Pre-Op RIO Check
Femoral Prep
Acetabular Prep
Final Results
Femoral Version
13°
To Reach Plan:
Decrease
Hip Length
1 mm
Increase
Combined Offset
1 mm
TRANSVERSE
Lat
I
P

Checking femoral stem version



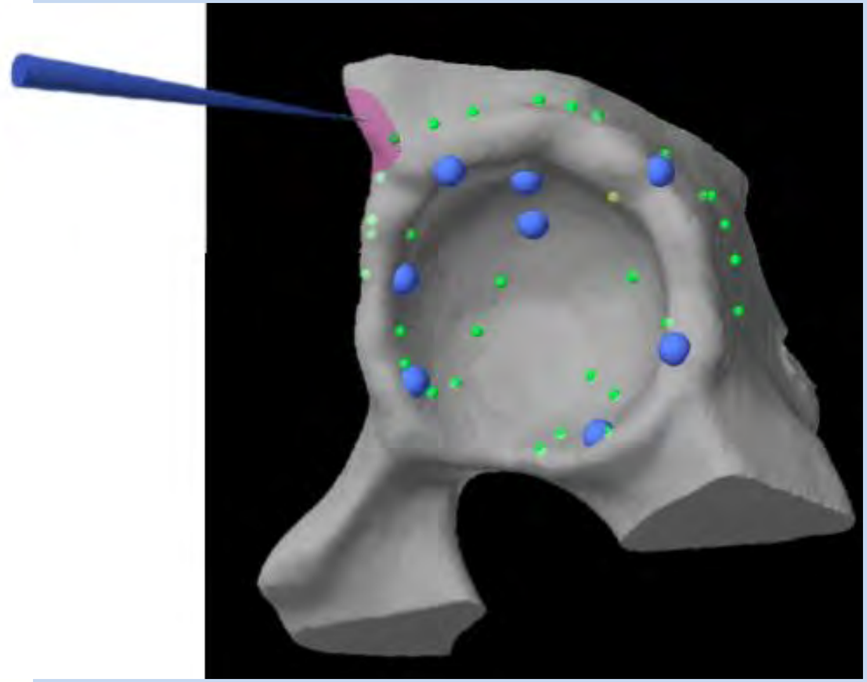
Combined Anteversion



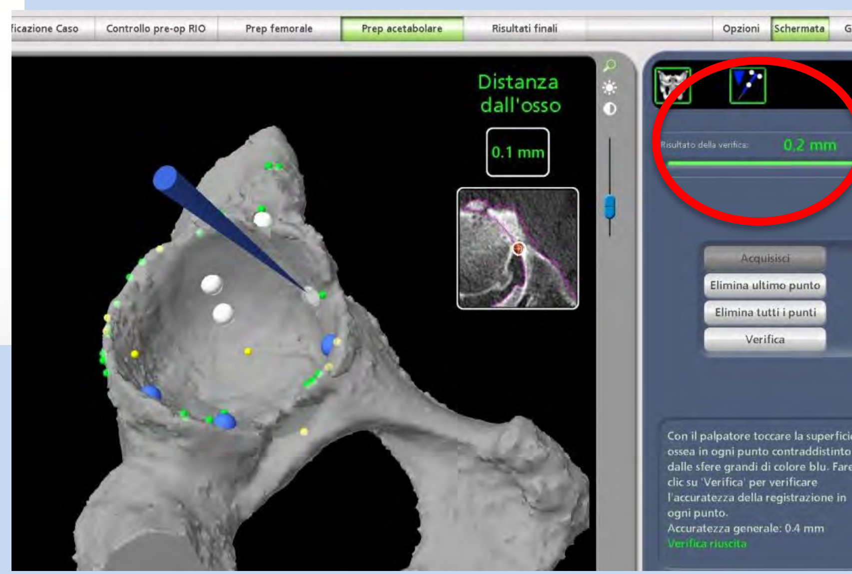
A Combined Anteversion Technique for Robotic Arm Guided Total Hip Arthroplasty

Author: Lawrence D. Dorr, M.D., Medical Director, Total Joint Reconstruction, Dorr Arthritis Institute, Good Samaritan Hospital

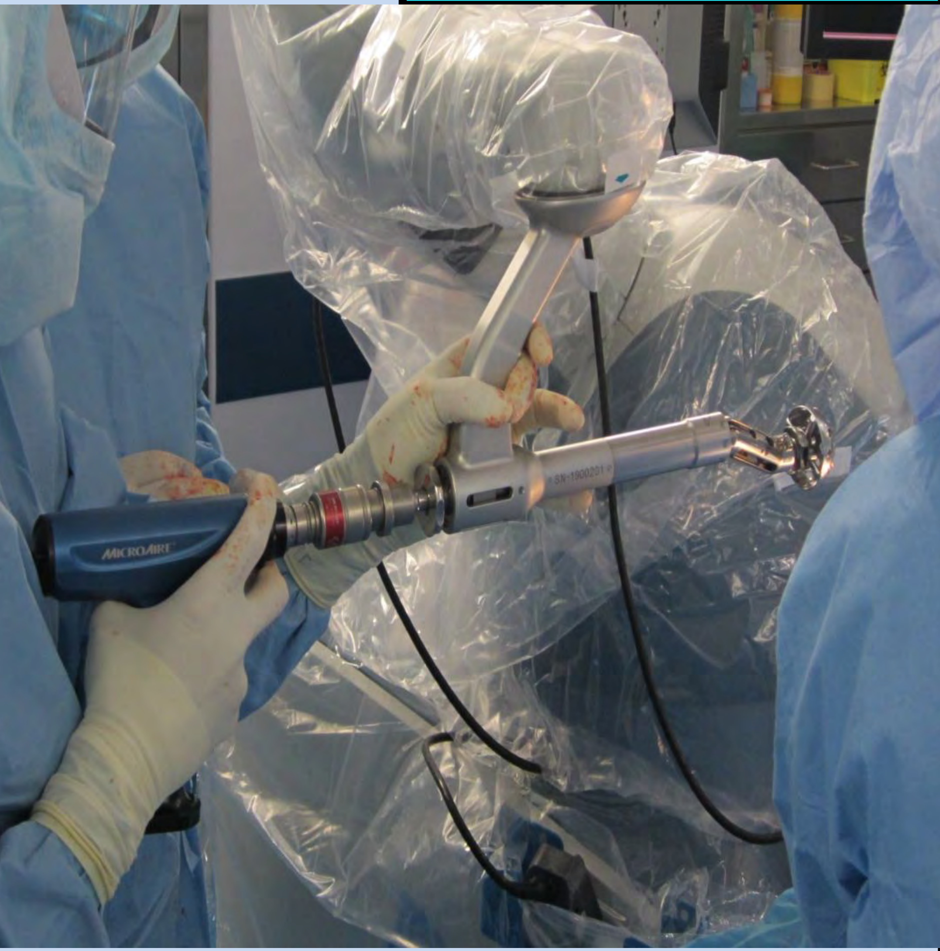
Mapping acetabular bone

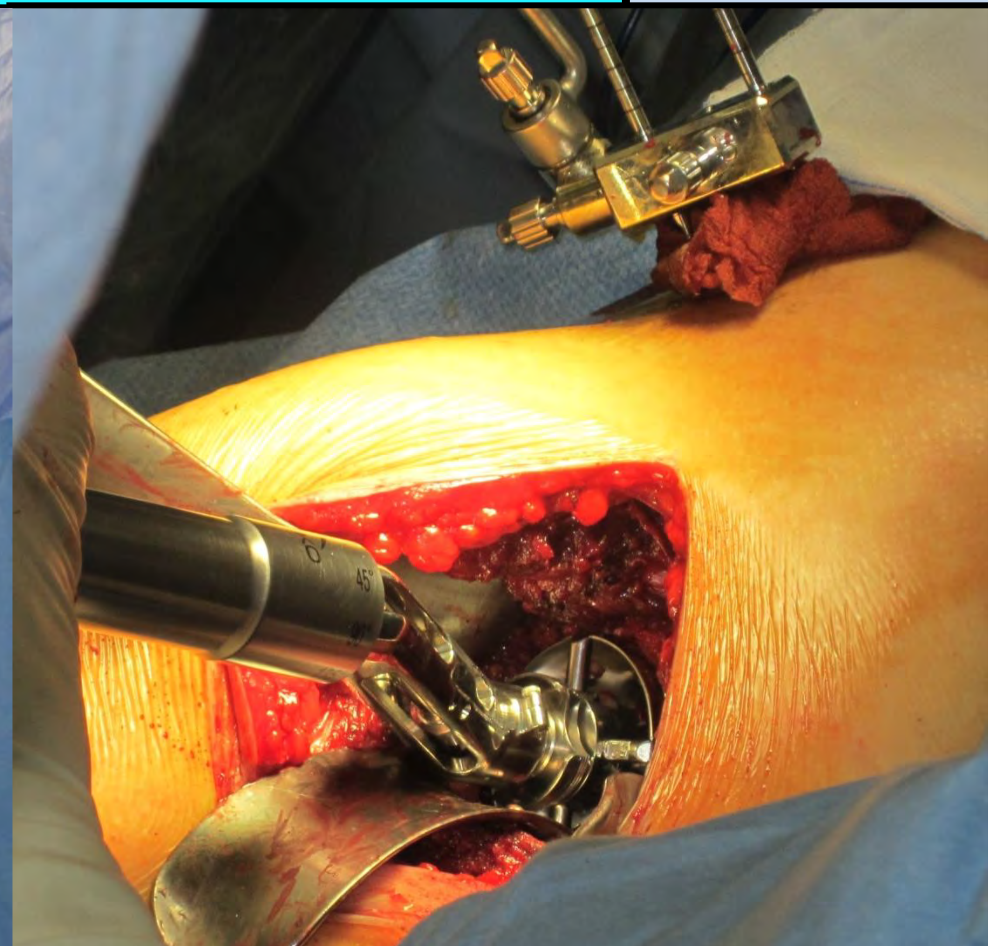


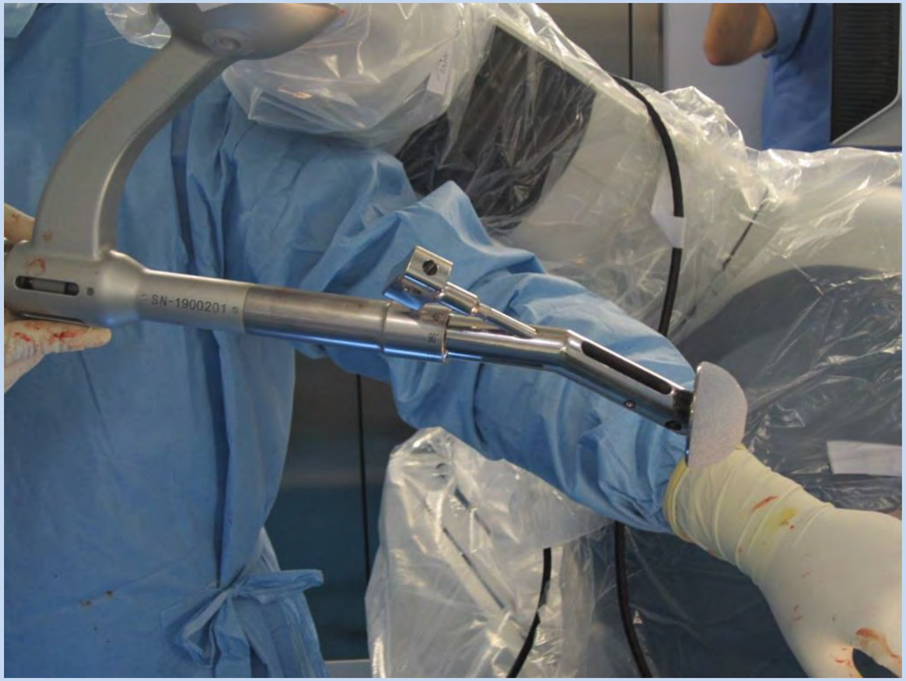
0,2 mm



Reaming



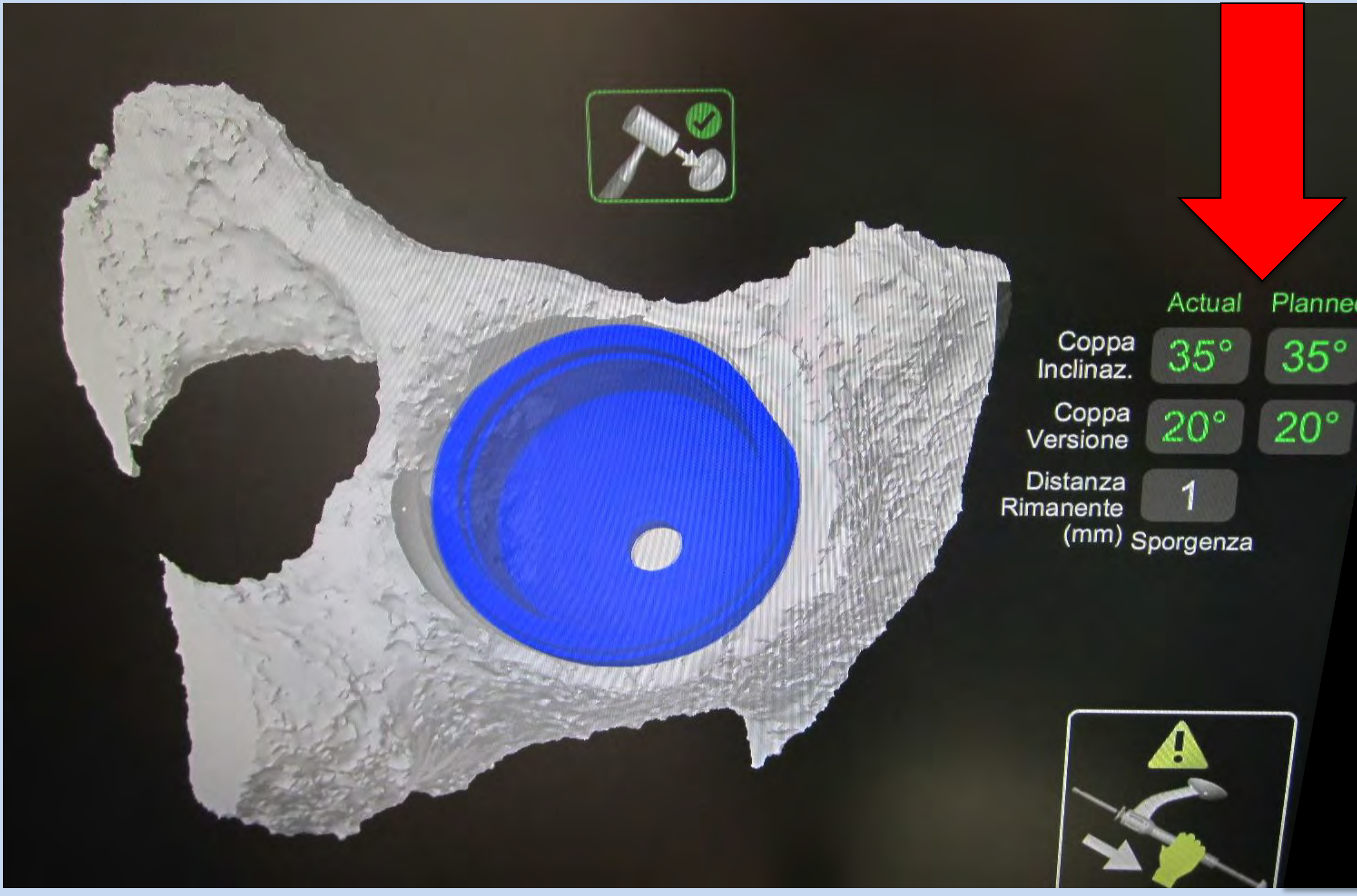




Insertion of the cup (with robotic arm)


stryker

System check
(Inclination-Version)



Our experience

- **Number of implants : 199 from December 2012 to July 31, 2015**
- **Age: range 34 - 85**
- **M: 80 - F: 66**
- **R: 94 - L: 105**
- **Average procedure time : 89' ; Average robotic time : 51'**

Our experience

- **Average cup inclination :**

definitive 41,3° ; planned : 39° Gap: 2,3°

- **Average cup version :**

definitive : 21,9° ; planned 21,5° Gap: 0,4°

- **Average stem version :**

definitive 3,4° ; planned 3,6° Gap: 0,2°

Our experience

difference between:

Planned vs operated

average hip length : 0,9 mm

Complications

- **Infections** (2 cases): 1%
- **Dislocations** (1 case): 4 months after surgery 0,5%
- **Aseptic loosening** (1 case): 30 months after surgery 0,5%
- **Sciatic Nerve Palsy** (2 cases): 1%
- **Greater trochanter fracture** (4 cases): 2%

Clinical cases -1

Date of Surgery : **28/07/2015**

F.T.

Male

Age: 49 yo

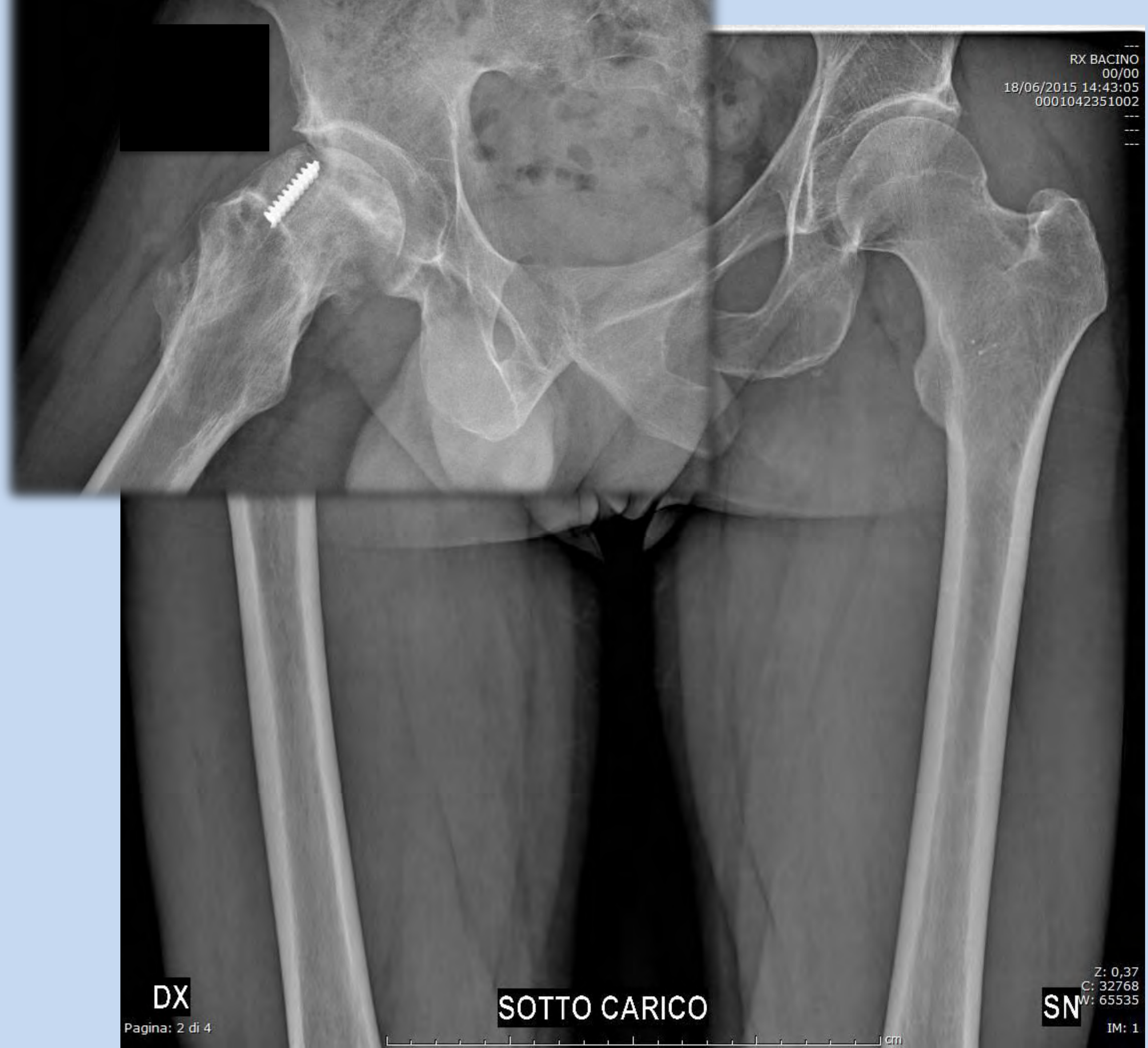
Secondary necrosis of the femoral head

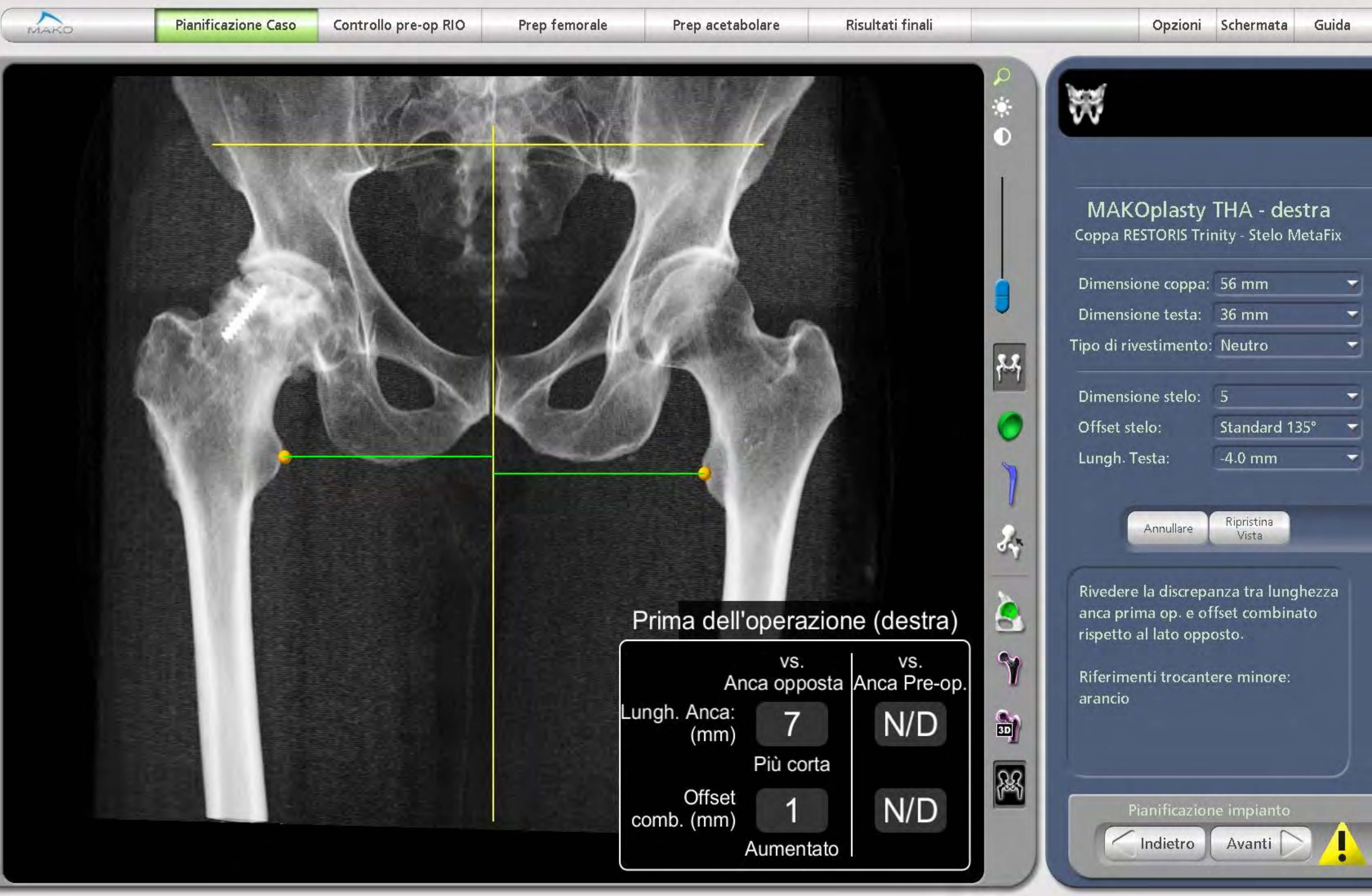
(femoral neck fracture 2003,treated with screws)

2014 (Castiglione D.S.): screws removal

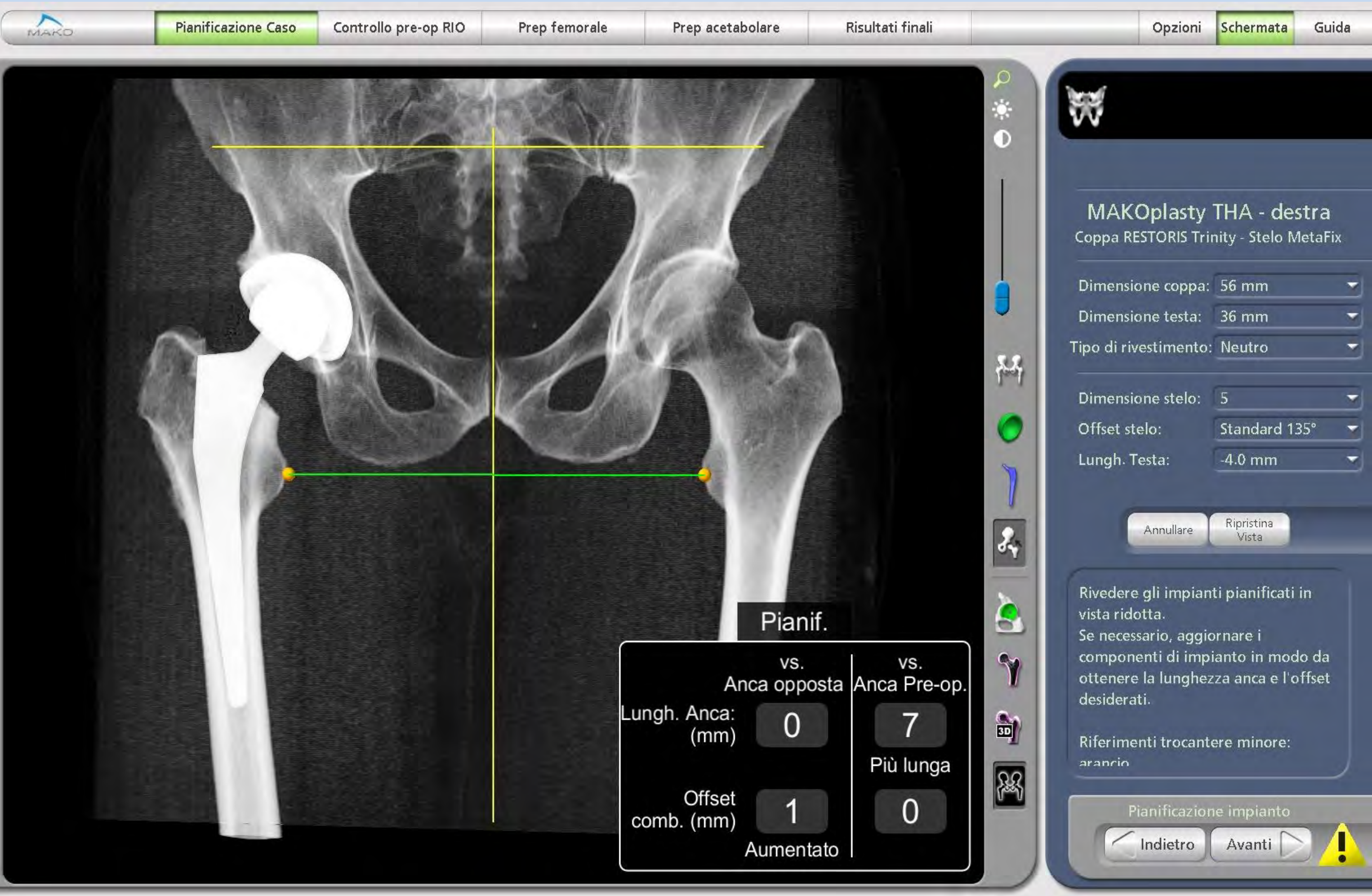
Treated with hyperbaric therapy : no benefit

Clinical examination: **leg length discrepancy 2 cm (R<L)**

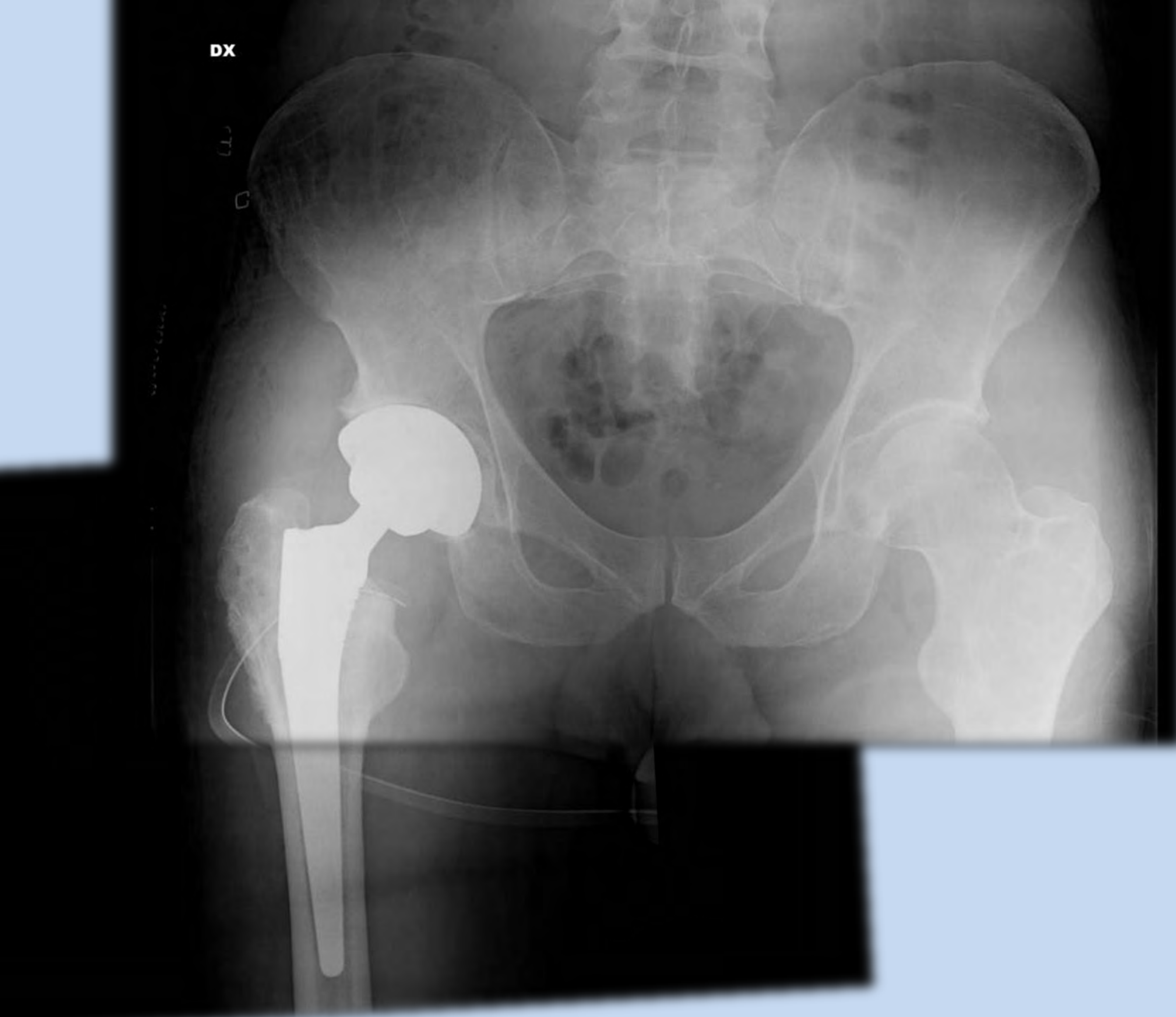

RX BACINO
00/00
18/06/2015 14:43:05
0001042351002
DX
Pagina: 2 di 4
SOTTO CARICO
SN
Z: 0,37
C: 32768
W: 65535
IM: 1
cm



MAKO
Pianificazione Caso
Controllo pre-op RIO
Prep femorale
Prep acetabolare
Risultati finali
Opzioni
Schermata
Guida
MAKOplasty THA - destra
Coppa RESTORIS Trinity - Stelo MetaFix
Dimensione coppa: 56 mm
Dimensione testa: 36 mm
Tipo di rivestimento: Neutro
Dimensione stelo: 5
Offset stelo: Standard 135°
Lungh. Testa: -4.0 mm
Annullare
Ripristina Vista
Rivedere la discrepanza tra lunghezza anca prima op. e offset combinato rispetto al lato opposto.
Riferimenti trocantere minore: arancio
Pianificazione impianto
Indietro
Avanti
Prima dell'operazione (destra)
vs. Anca opposta
vs. Anca Pre-op.
Lungh. Anca: (mm)
7
N/D
Più corta
Offset comb. (mm)
1
N/D
Aumentato
3D



MAKO
Pianificazione Caso
Controllo pre-op RIO
Prep femorale
Prep acetabolare
Risultati finali
Opzioni
Schermata
Guida
MAKOplasty THA - destra
Coppa RESTORIS Trinity - Stelo MetaFix
Dimensione coppa: 56 mm
Dimensione testa: 36 mm
Tipo di rivestimento: Neutro
Dimensione stelo: 5
Offset stelo: Standard 135°
Lungh. Testa: -4.0 mm
Annullare
Ripristina Vista
Rivedere gli impianti pianificati in vista ridotta.
Se necessario, aggiornare i componenti di impianto in modo da ottenere la lunghezza anca e l'offset desiderati.
Riferimenti trocantere minore: arancio
Pianificazione impianto
Indietro
Avanti
Pianif.
vs. Anca opposta
vs. Anca Pre-op.
Lungh. Anca: (mm)
0
7
Più lunga
Offset comb. (mm)
1
0
Aumentato
3D


DX

3 months a.s.

FINAL RESULTS (vs PLANNED):

Cup Version : **19˚** (**20˚**)
Cup Inclination: **39˚** (**37˚**)
Combined anteversion: **18˚** (**18˚**)
Stem Version: **-1˚** (**-2˚**)

Gap between operated and contralateral hip length: **2 mm**
Combined offset vs contralateral: **0˚**

Surgical time :

Skin to skin: **78'**
Robotic: **50'**

Cinical cases - 2

Dates of Surgery:

Left Hip 23/01/2015

Right Hip 08/06/2015

L.F.

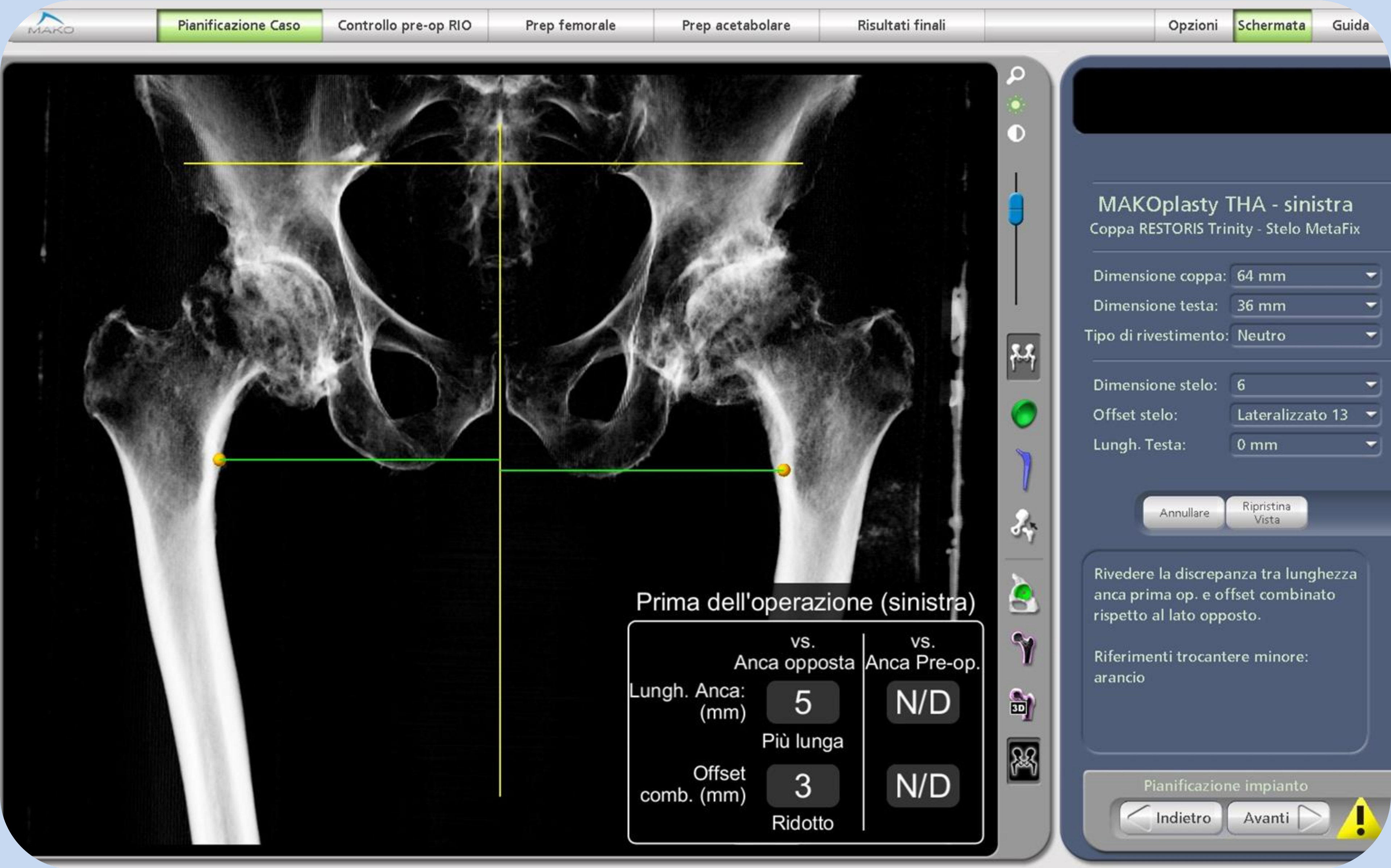
Male

Age: 60 y.o.

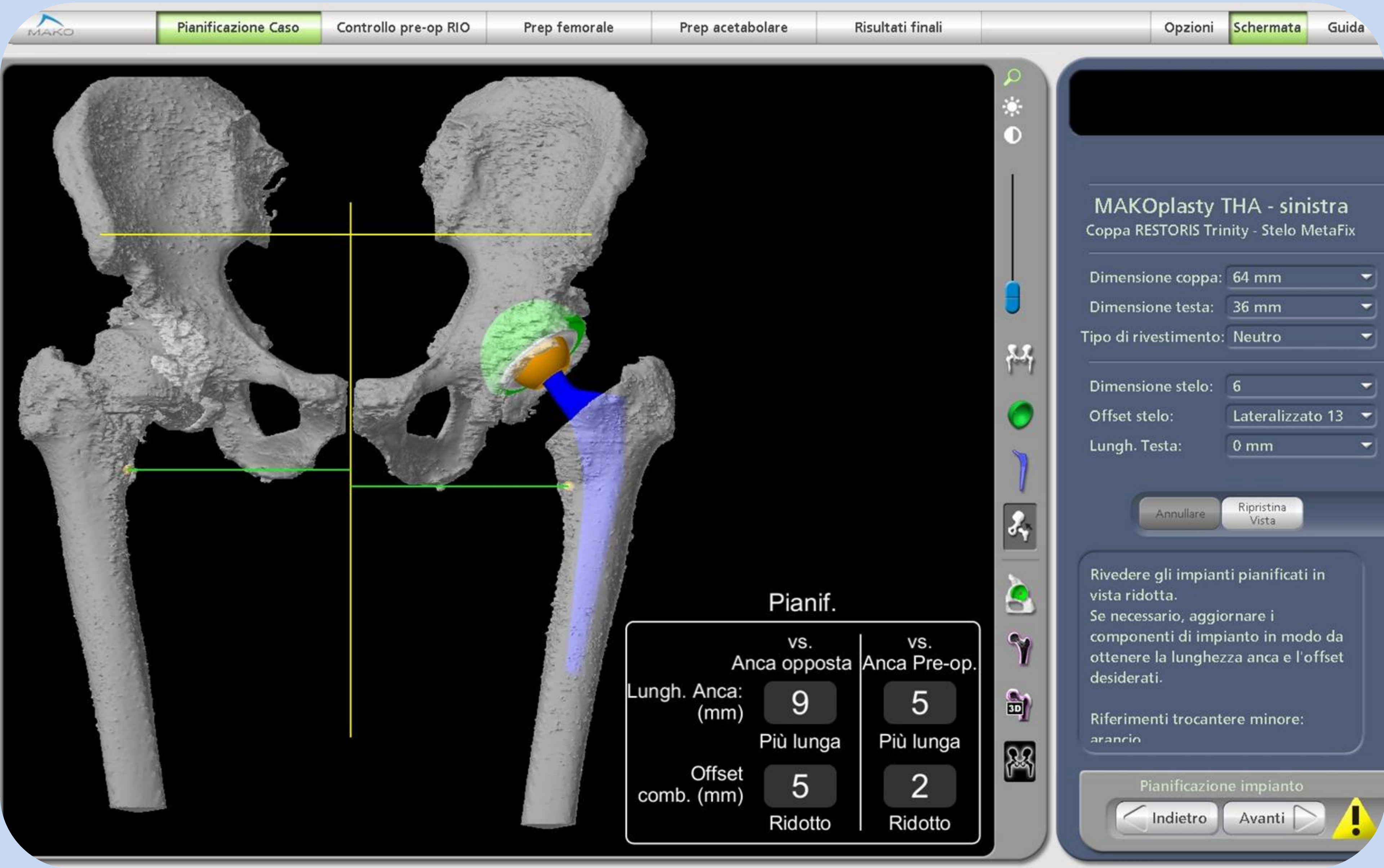
Bilateral severe coxarthrosis; ankylosis of R hip

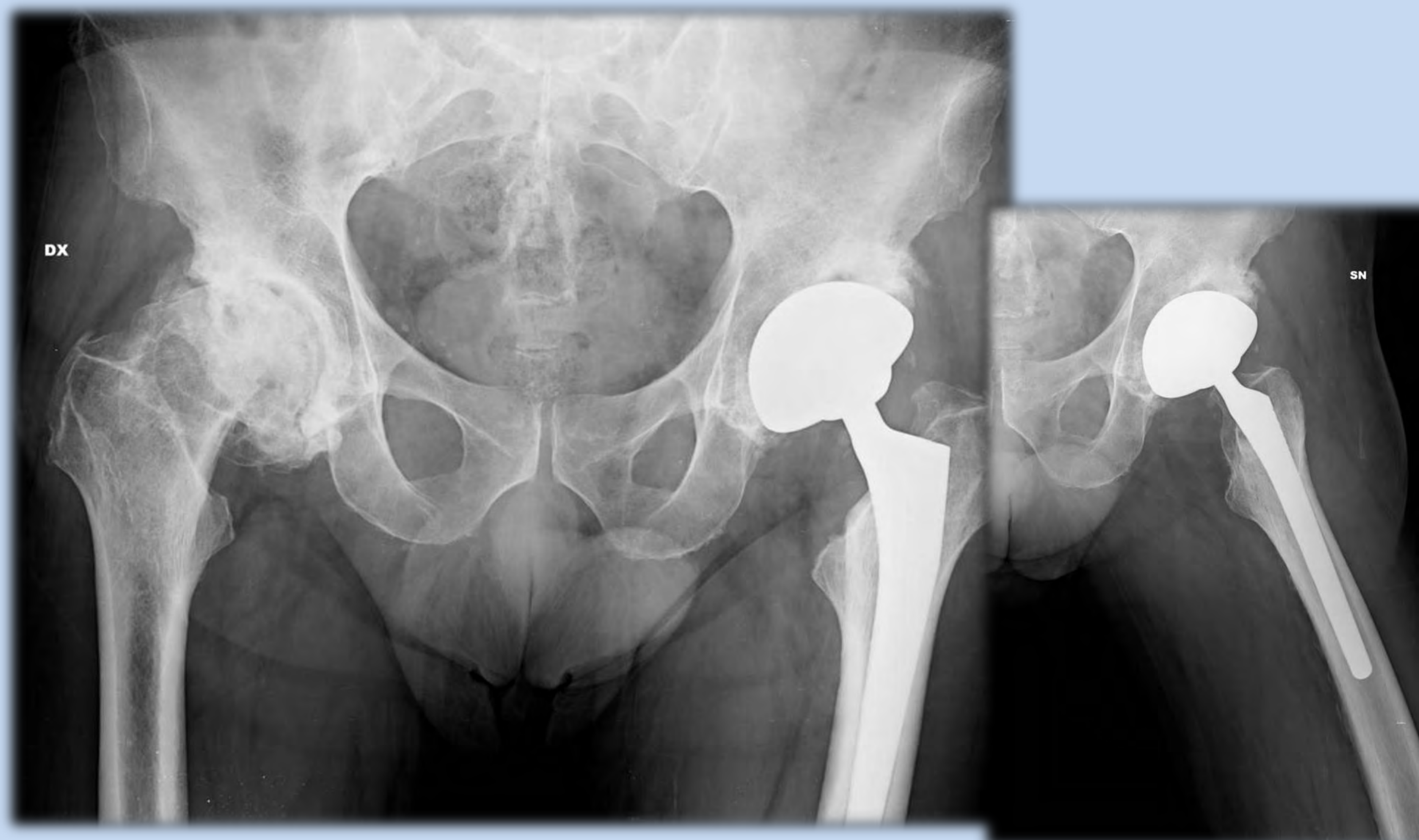
Clinical examination: severe lameness, severe functional limitation of R hip

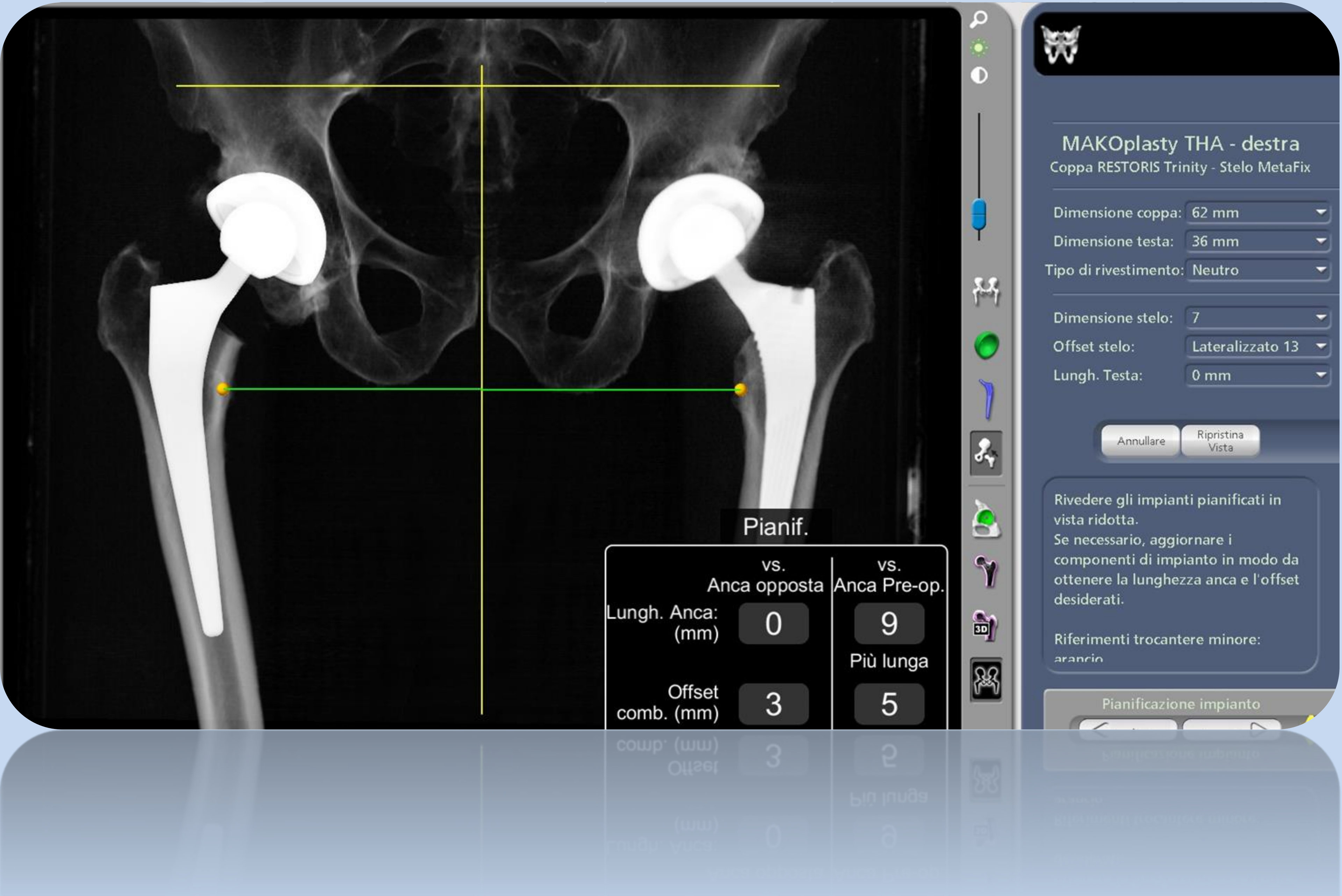

DX



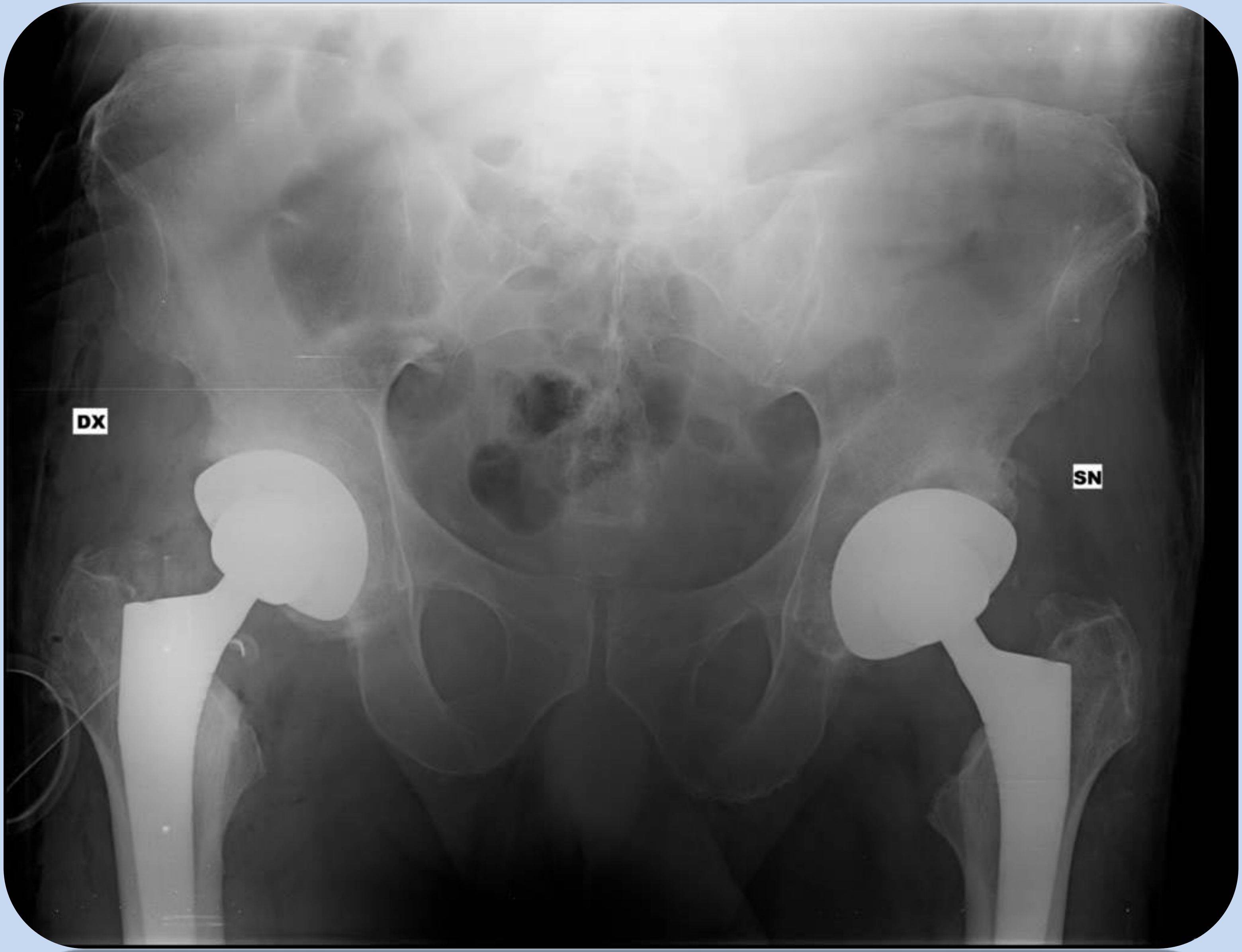
Pianificazione Caso
Controllo pre-op RIO
Prep femorale
Prep acetabolare
Risultati finali
Opzioni
Schermata
Guida
MAKOplasty THA - sinistra
Coppa RESTORIS Trinity - Stelo MetaFix
Dimensione coppa: 64 mm
Dimensione testa: 36 mm
Tipo di rivestimento: Neutro
Dimensione stelo: 6
Offset stelo: Lateralizzato 13
Lungh. Testa: 0 mm
Annullare
Ripristina Vista
Rivedere la discrepanza tra lunghezza anca prima op. e offset combinato rispetto al lato opposto.
Riferimenti trocantere minore: arancio
Pianificazione impianto
Indietro
Avanti
Prima dell'operazione (sinistra)
vs. Anca opposta
vs. Anca Pre-op.
Lungh. Anca: (mm)
5
Più lunga
N/D
Offset comb. (mm)
3
Ridotto
N/D


MAKO
Pianificazione Caso
Controllo pre-op RIO
Prep femorale
Prep acetabolare
Risultati finali
Opzioni
Schermata
Guida
MAKOplasty THA - sinistra
Coppa RESTORIS Trinity - Stelo MetaFix
Dimensione coppa: 64 mm
Dimensione testa: 36 mm
Tipo di rivestimento: Neutro
Dimensione stelo: 6
Offset stelo: Lateralizzato 13
Lungh. Testa: 0 mm
Annullare
Ripristina Vista
Rivedere gli impianti pianificati in vista ridotta.
Se necessario, aggiornare i componenti di impianto in modo da ottenere la lunghezza anca e l'offset desiderati.
Riferimenti trocantere minore:
Pianif.
vs. Anca opposta
vs. Anca Pre-op.
Lungh. Anca: (mm)
9
Più lunga
5
Più lunga
Offset comb. (mm)
5
Ridotto
2
Ridotto
Pianificazione impianto
Indietro
Avanti


DX
SN



MAKOplasty THA - destra
Coppa RESTORIS Trinity - Stelo MetaFix
Dimensione coppa: 62 mm
Dimensione testa: 36 mm
Tipo di rivestimento: Neutro
Dimensione stelo: 7
Offset stelo: Lateralizzato 13
Lungh. Testa: 0 mm
Annullare
Ripristina Vista
Rivedere gli impianti pianificati in vista ridotta.
Se necessario, aggiornare i componenti di impianto in modo da ottenere la lunghezza anca e l'offset desiderati.
Riferimenti trocantere minore:
Pianificazione impianto
Pianif.
vs. Anca opposta
vs. Anca Pre-op.
Lungh. Anca: (mm)
0
9
Più lunga
Offset comb. (mm)
3
5


DX
SN

FINAL RESULTS (vs PLANNED):

	L	R
Cup Version:	17° (17°)	22° (20°)
Cup inclination:	40° (40°)	36° (37°)
Combined anteversion:	26° (25°)	30° (29°)
Stem Version:	9° (8°)	8° (9°)
Hip lenght vs contralateral :	-1 mm	2 mm
Combined offset vs contralateral :	6°	-6°

		L	R
Surgical Time	Skin to Skin:	70’	95’
	Robotic time:	44’	50’

Limits

- The prosthetic implant currently used in Europe (Restoris Metafix stem and Restoris Trinity cup) allows to perform Makoplasty not with all the patients (stem, cementless implant)

- Ceramic insert still not available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MAKO™ ENABLED.
2016
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ANATO®
ACCOLADE® II
MDM® X3®
Modular Dual Mobility

Limits

- **Long Learning curve (35 cases)**


Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

The Learning Curve Associated With Robotic-Assisted Total Hip Arthroplasty

John M. Redmond, MD [a], Asheesh Gupta, MD [a], Jon E. Hammarstedt, BS [a], Alexandra E. Petrakos, BA [a], Nathan A. Finch [a], Benjamin G. Domb, MD [a,b,c]

Conclusions

- The planning based on 3D CT allows a precise choice of the size and positioning of the components
- The robotic arm improves the **accuracy** of the acetabular reaming and allows you to monitor the cup positioning
- With the ability to identify the ideal positioning of the cup and the accuracy of the technique, the surgeon can **reproduce** almost "perfectly" this surgery
- Is it possible to reduce the risk of certain complications, **adapting** the length and the offset to individual patient (conditions for a longer-lasting implant)

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

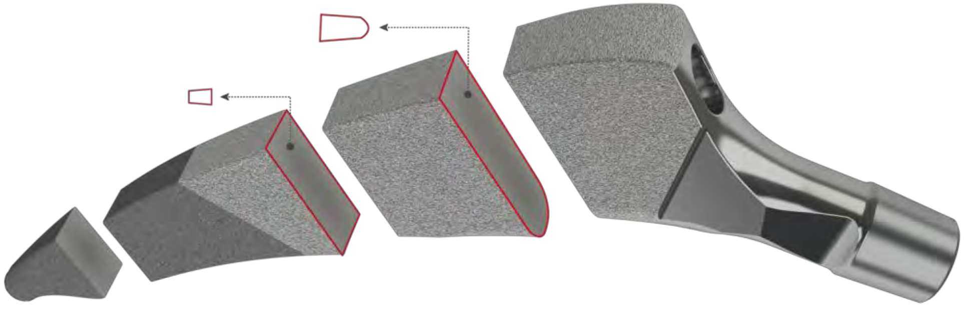
Indications and Early Functional Outcomes of a Metaphyseal Short Stem

M.Giannini, L.Bianchi, L.Zagra

ISTITUTO ORTOPEDICO GALEAZZI
Istituto di Ricovero e Cura a Carattere Scientifico
Milan, Italy

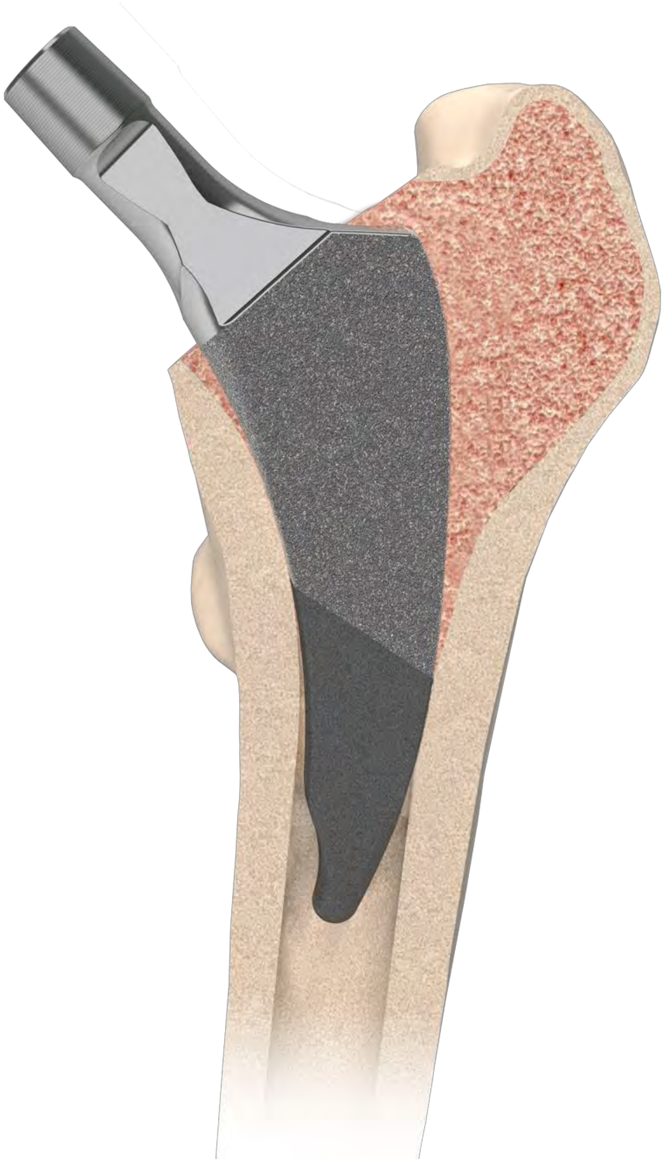
Methaphyseal "short" stem
(Minima ^{TM} Lima Corporate)

- Tapered with trapezoidal cross section with high rotational stability
- Load transfer to the proximal femur (to avoid proximal stress-shielding and distal thigh pain)
- High roughness in the upper part



Indications

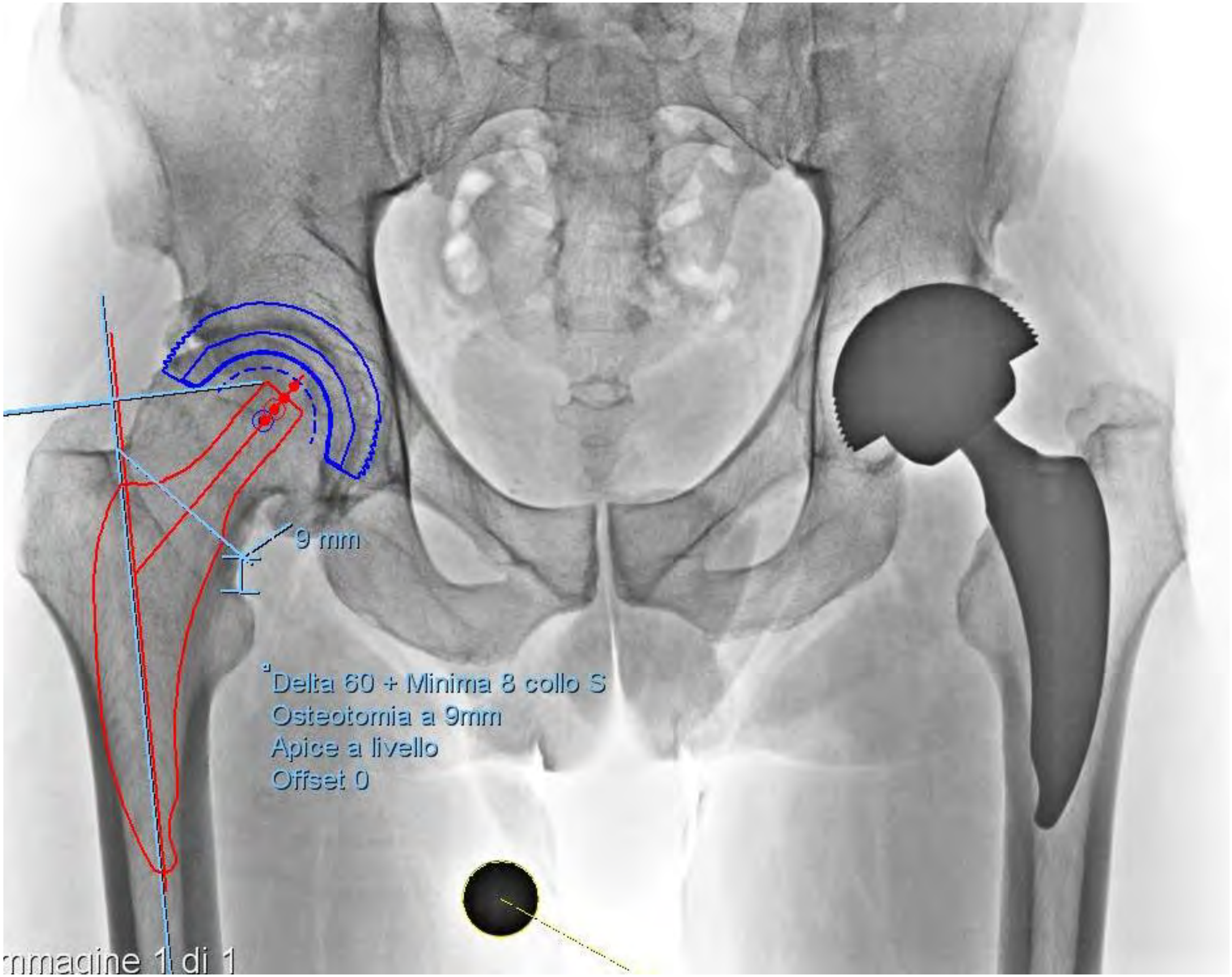
- Young patients (less than 70 years)
- Good bone quality (good primary stability)
- Trumpet shape canal (relatively)
- <u>Following pre-op plan</u>



Pre-operative x-rays

Male, 49 years old

Pre-operative plan



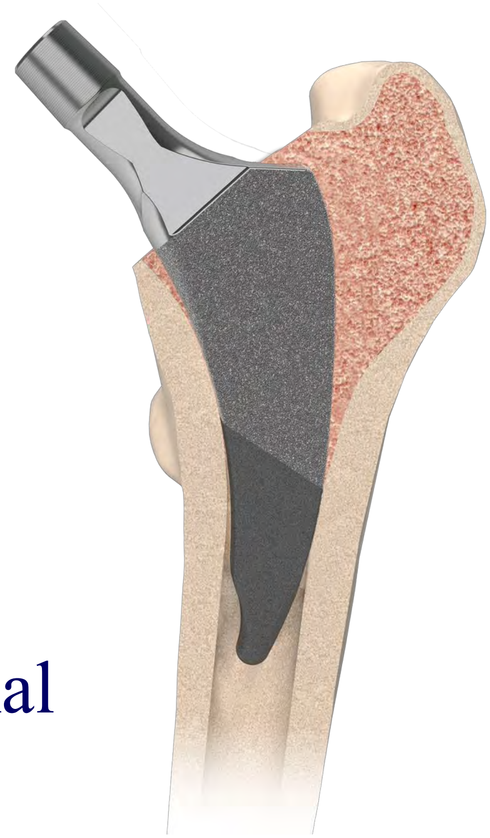
Post-operative x-rays

1 year post op

2 years post op

Contra-indications

- Osteoporotic bone
- Previous surgeries (osteotomy, fixation)
- DDH (Developmental Dysplasia of the Hip) and major deformities of the proximal femur



Limitations

- Extreme valgus neck (curved shape) with high hip center (risk of shortening of the limb)
- Extreme sizes small/large (bad fit to the femur)
- Narrow canal with low hip center (risk of elongation of the limb)

OBSERVATIONAL PROSPECTIVE STUDY

- 80 hips in 76 patients requiring a primary THA (4 bilateral prosthesis) (Total Hip Arthroplasty)

- Enrolled between Sept 2013 - Feb 2015
  Mean FU 14 months (6-24)

Study activities

<u>Clinical and radiographic evaluation</u>

	Preop	Intraop	Discharge	6 wks.	6 mo.	1 yr.	2 yr.	5 yr.
Radiographic evaluations	x		x	x		x	x	x
VAS	x			x	x	x	x	x
TUG	x			x	x	x	x	x
HOOS	x			x	x	x	x	x
UCLA	x			x	x	x	x	x
HHS	x			x	x	x	x	x
Surgery and implant data		x						

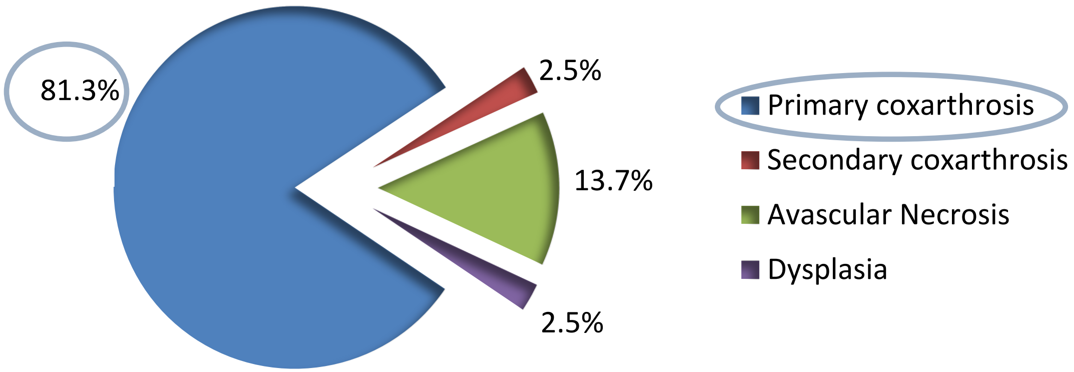
Patients

Demographics	
Age	54±9.8 (31-71)
Weight	80.8±11.6 (54-110)
Height	173.4±8.5 (150-200)
BMI	26.9±3.8 (18-39.5)
Gender	
Male	72.5%
Female	27.5%
Job Status	
Active	71.3%
Retired	28.2%
Activity Level	
Sedentary	22.1%
Normal	74.0%
Intense	3.9%

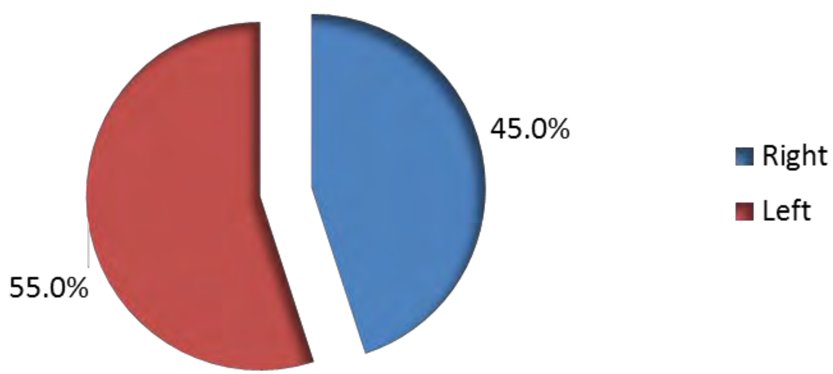
Data are reported as Mean± St. Dev. (Min.-Max) and %

Pre-operative data

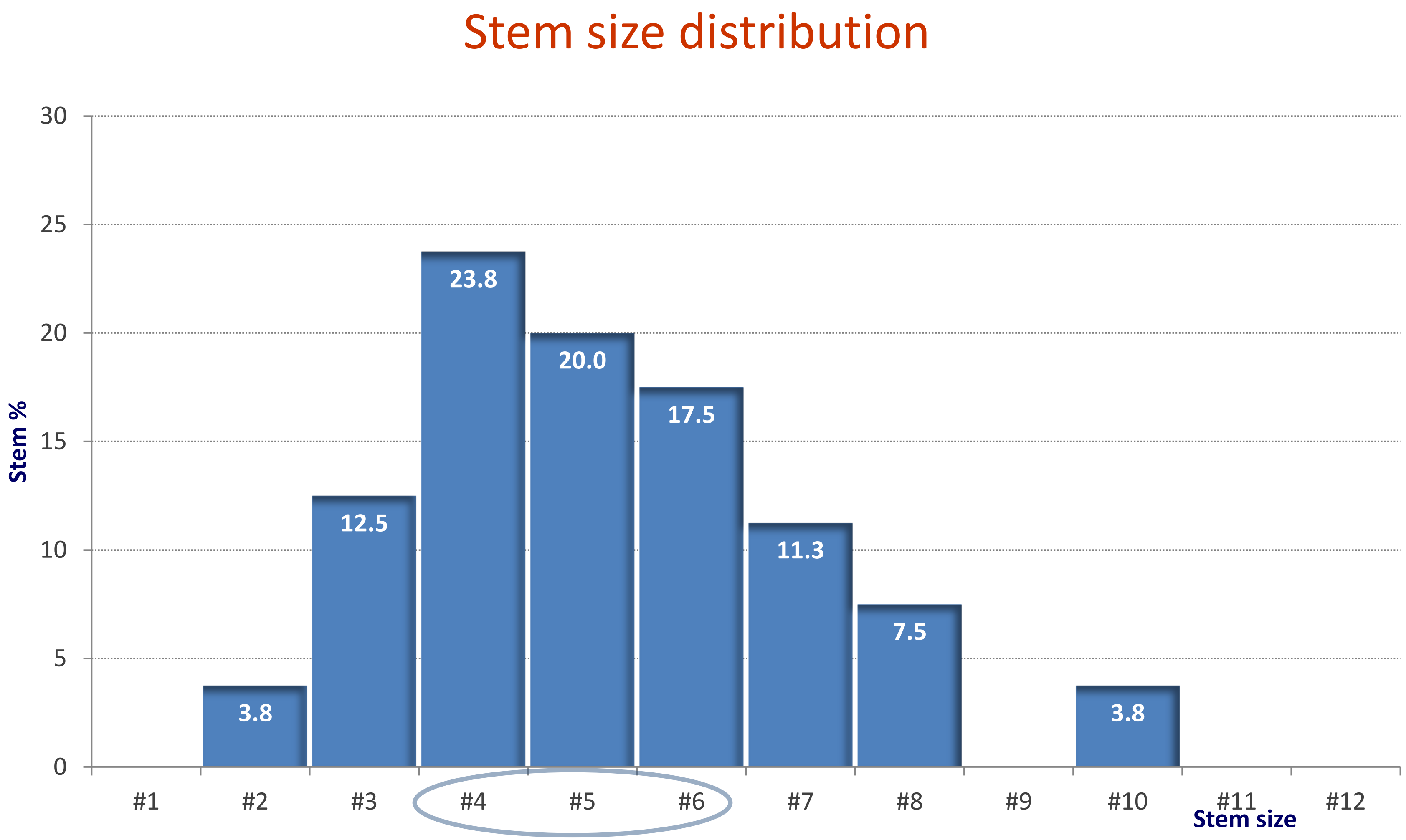
Diagnosis



Side affected



Intra-operative data



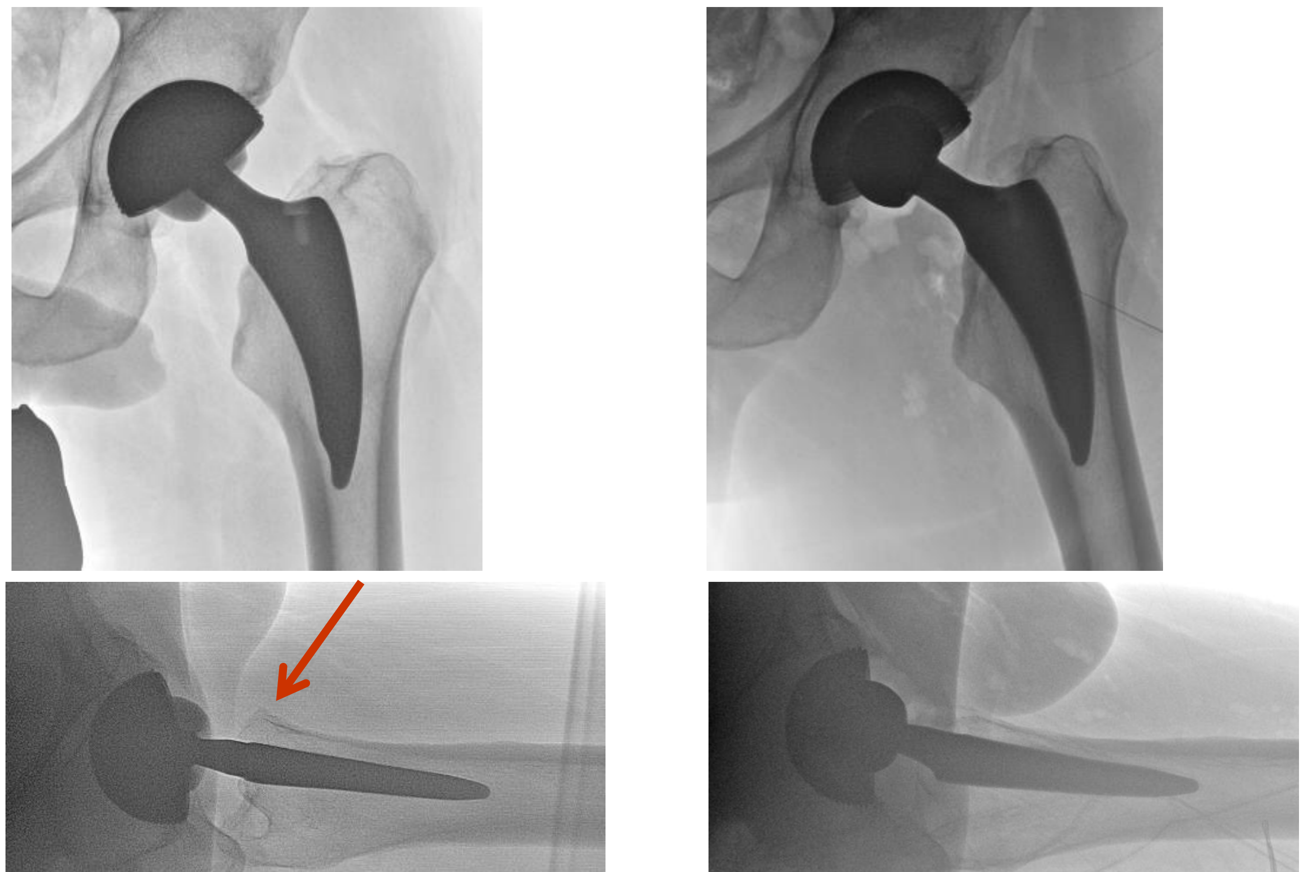
Early results

No major complications:

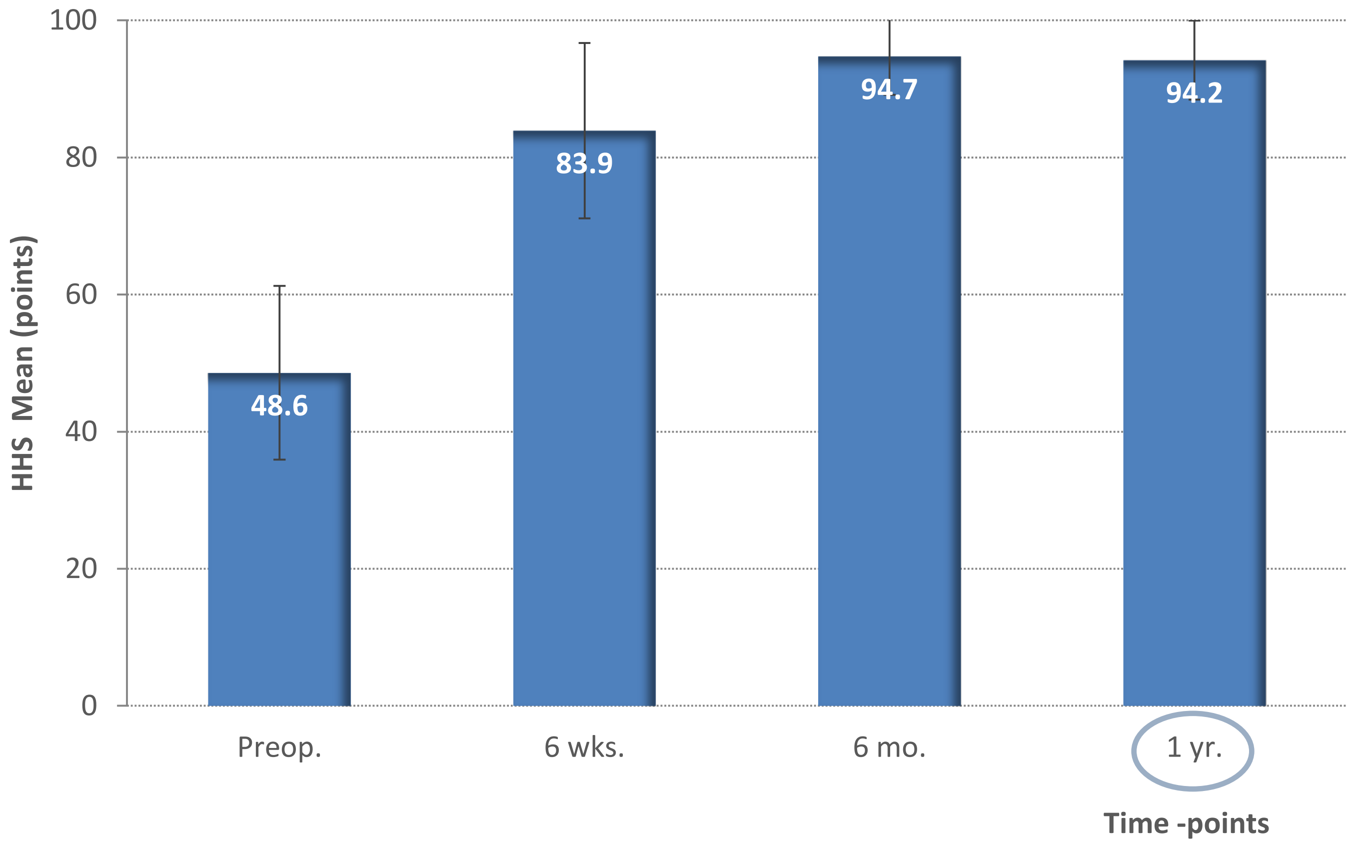
- No infections
- No dislocations
- No loosening
- No periprosthetic fractures (intra- and post-op)

Early results

1 reoperation 1.5 years after, due to squeaking and groin pain
• liner and head exchange, reshaping of the neck (internal impingement) and ileopsoas tenotomy, but stable implant retained



HHS (Harris Hip Score)

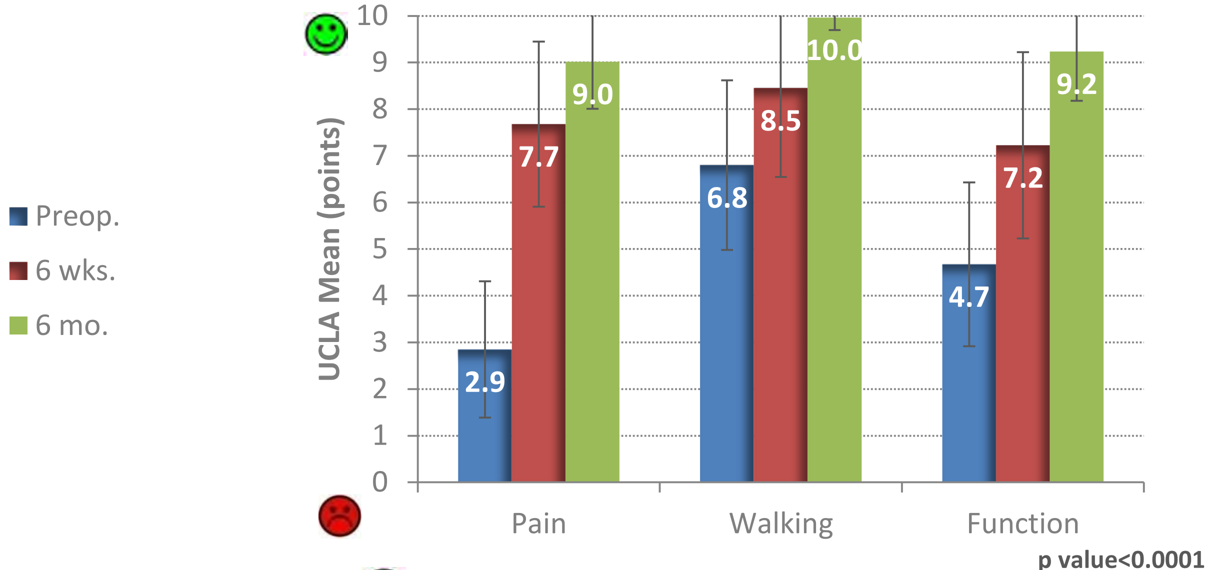


p value<0.0001

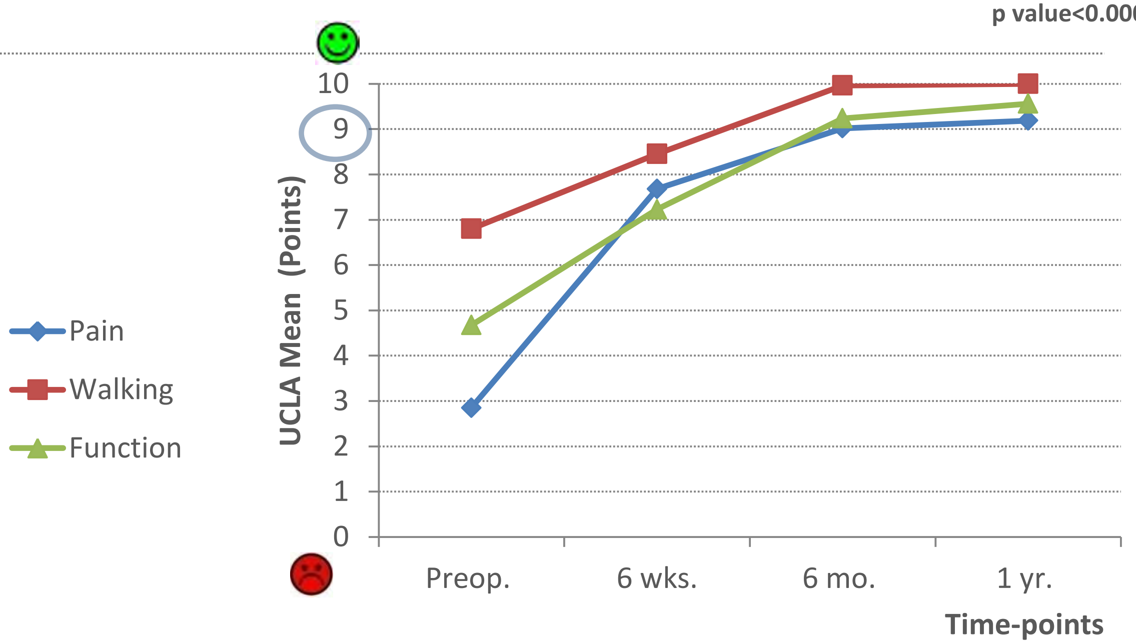
Harris WH. Traumatic arthritis of the hip after dislocation and acetabular fractures: treatment by mold arthroplasty. An end-result study using a new method of result evaluation. J Bone Joint Surg Am. 1969 Jun;51(4):737-55.

UCLA Activity Level

Global scores



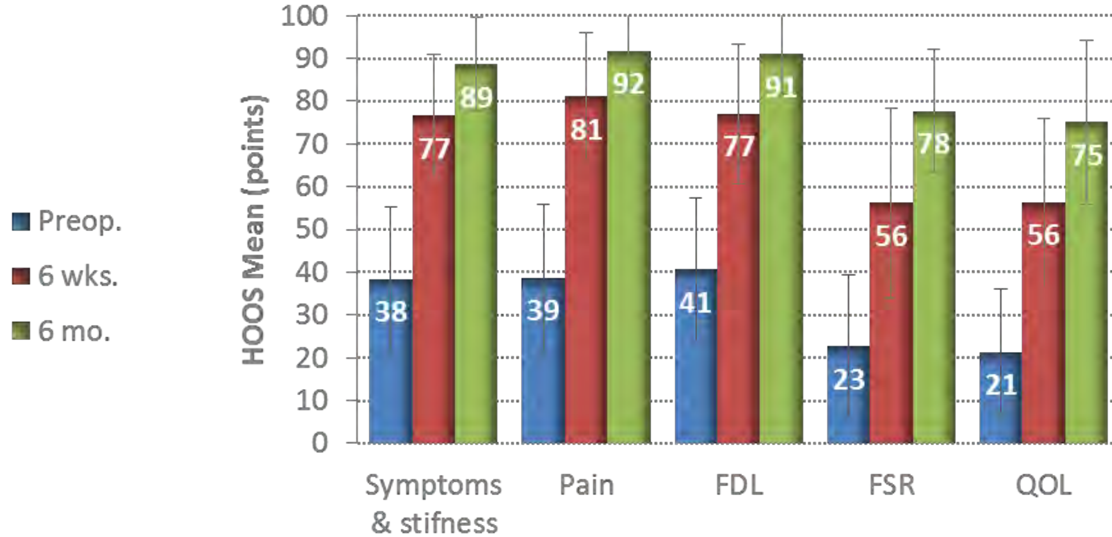
Subtotal scores



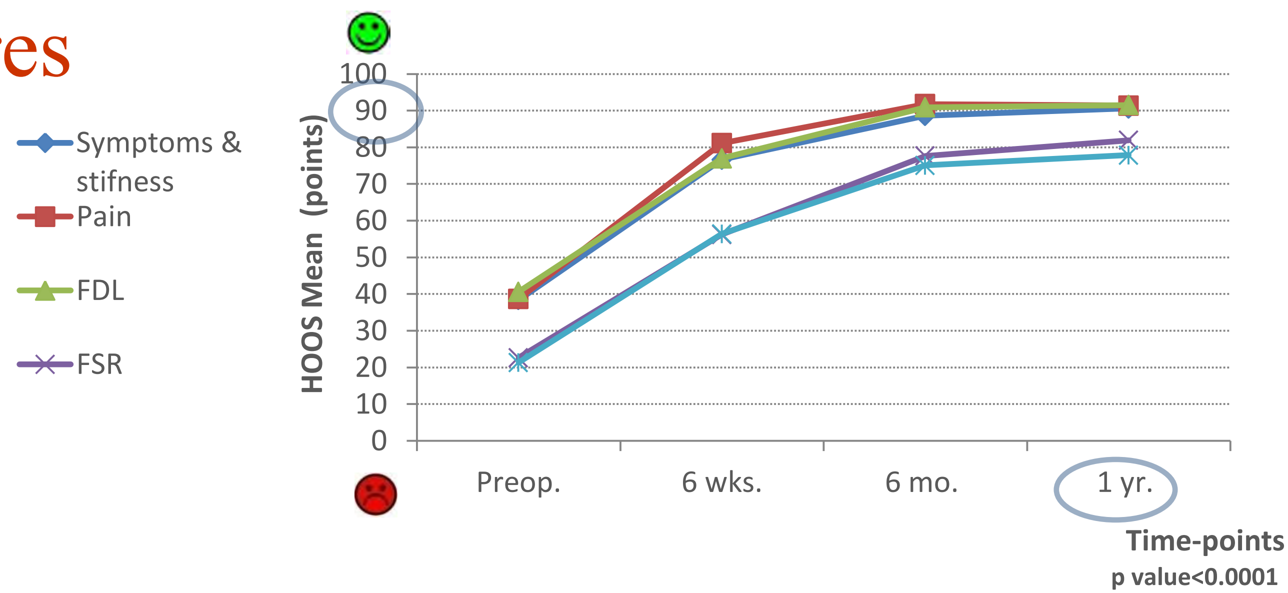
Amstutz HC, Thomas BJ, Jinnah R, Kim W, Grogan T, Yale C. Treatment of primary osteoarthritis of the hip. A comparison of total joint and surface replacement arthroplasty. J Bone Joint Surg Am. 1984 Feb;66(2):228-41

HOOS (Hip disability and Osteoarthritis Outcome Score)

Global scores

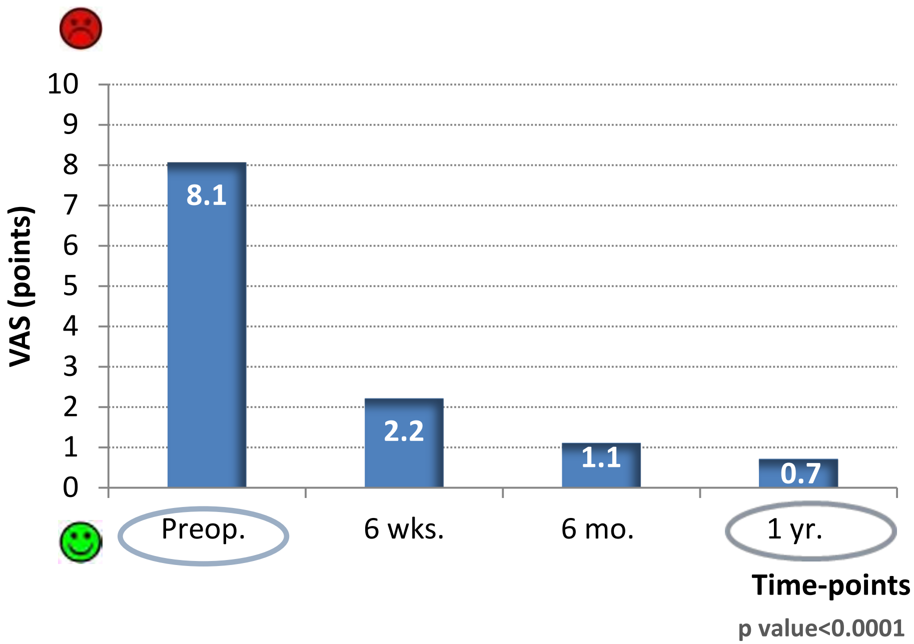


Subtotal scores

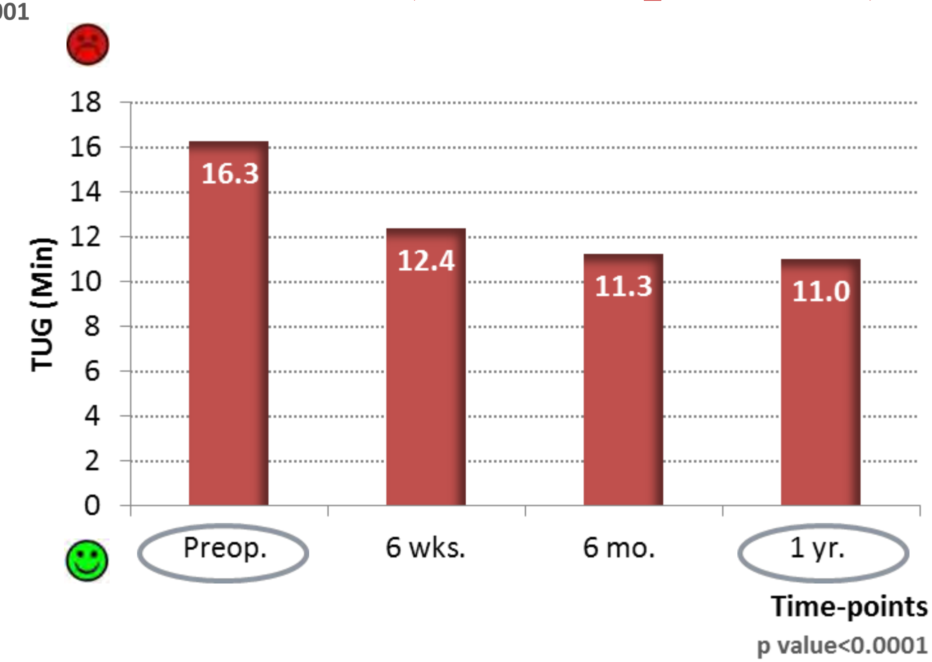


Klassbo M, Larsson E, Mannevik E. Hip disability and osteoarthritis outcome score. An extension of the Western Ontario and McMaster Universities Osteoarthritis Index. Scand J Rheumatol. 2003;32(1):46-51.

VAS (Visual Analogue Scale)

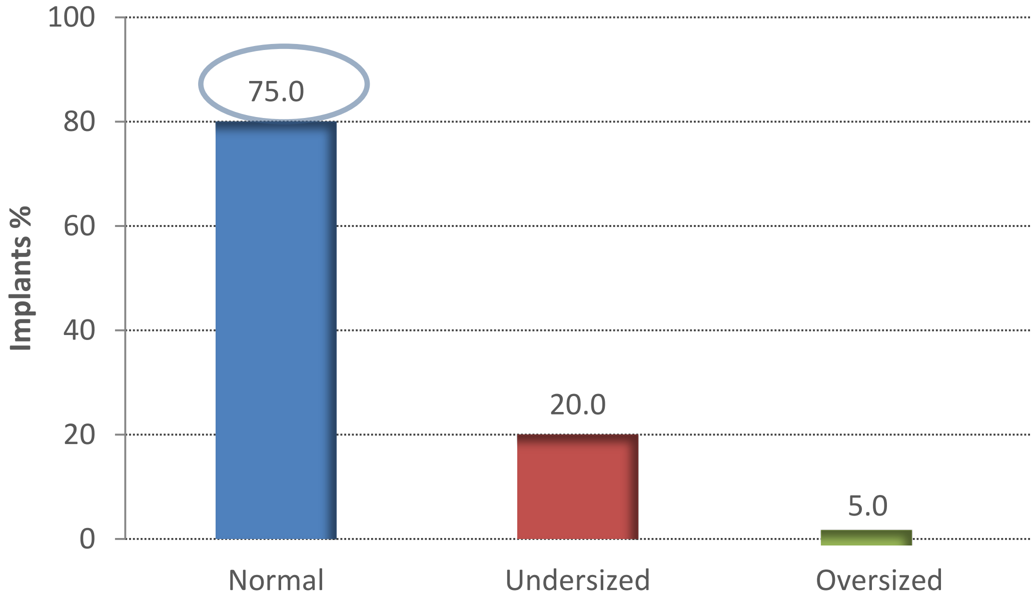


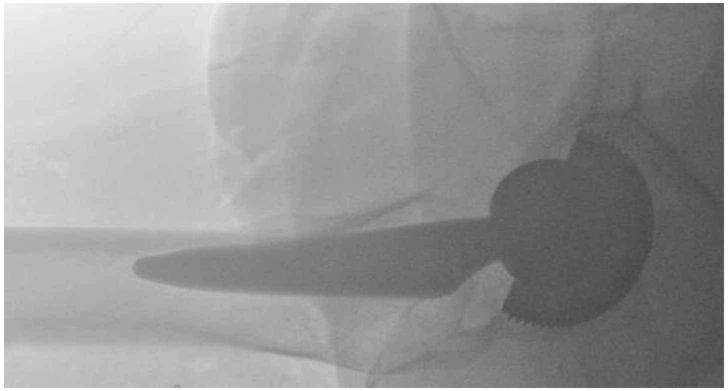
TUG (Time Up & Go)

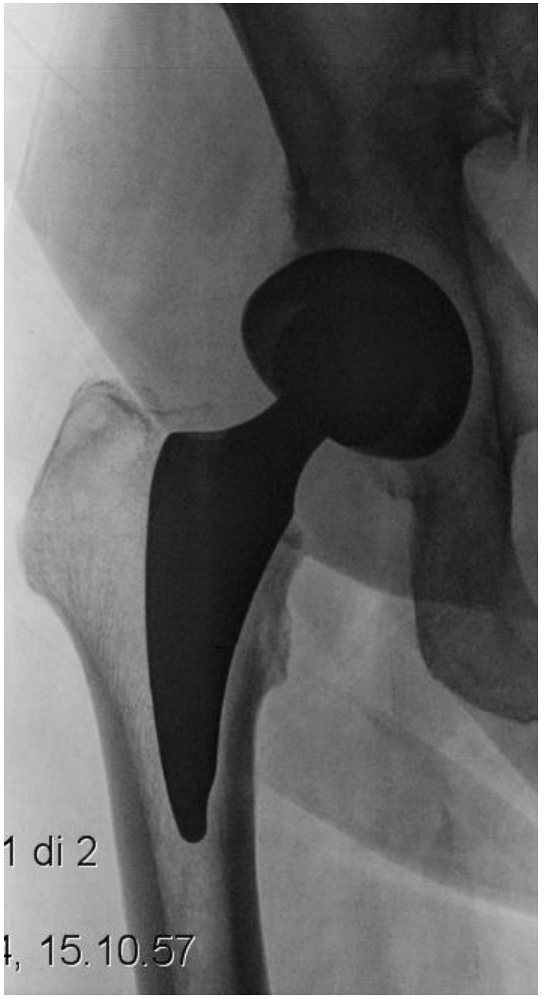


Radiographic evaluation

Stem sizing

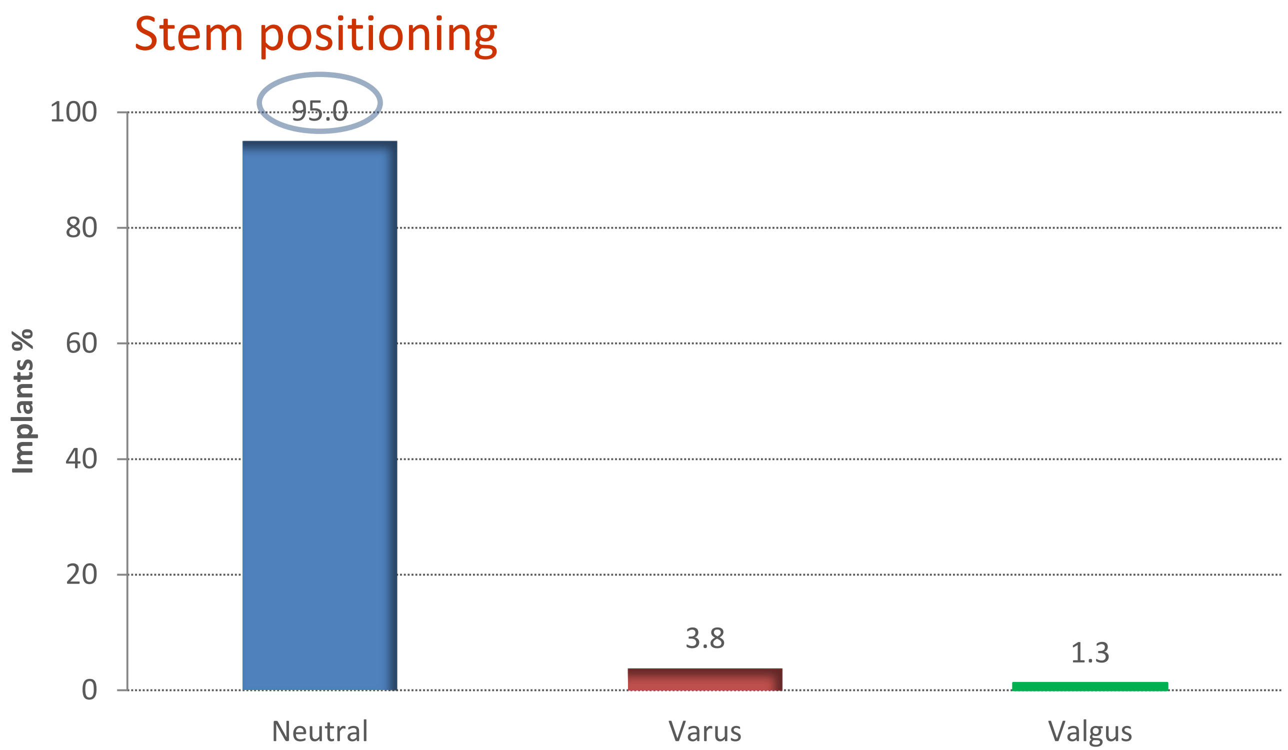






6 months post op

Radiographic evaluation



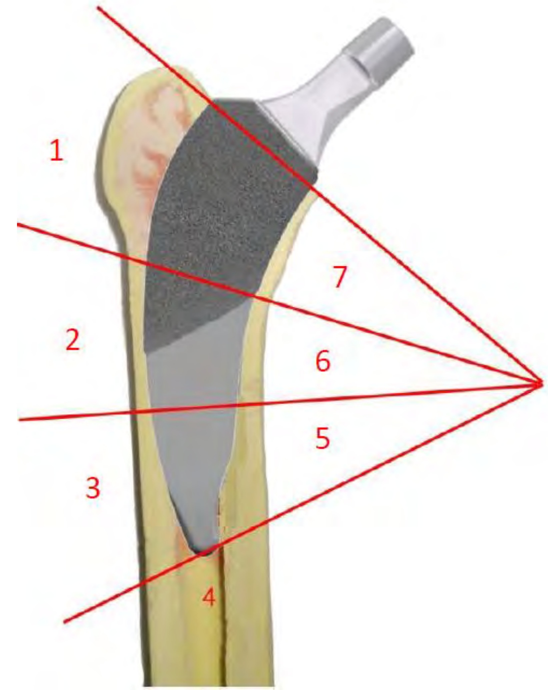
3 months post op

1 year post op

Radiographic evaluation

Radiolucent Lines	None
Cortical Hypertrophy	6 cases in zone 2-3 and 5-6 at 1 year FU
Osteolysis	None
Atrophy	None

Medial-lateral tilt	No
Description of the trochanter	Normal
Pedestal	None
Calcar Resorption	None
Subsidence	None



Modified Gruen zone*

*Gruen TA, McNeice GM, Amstutz HC."Modes of failure" of cemented stem-type femoral components: a radiographic analysis of loosening. Clin Orthop Relat Res. 1979 Jun;(141):17-27.

Conclusions

- The follow-up is short, but no stem failures nor complications so far

2 months postop


1 year postop

Conclusions

- The follow-up is short, but no stem failures nor complications so far
- The recovery is very rapid, early clinical outcomes and PROMS very satisfying

Conclusions

- The follow-up is short, but no stem failures nor complications so far
- The recovery is very rapid, early clinical outcomes and PROMS very satisfying
- Correct indication and patients selection are important as well as the surgical technique

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

THE SILENT™ HIP NECK ONLY PROSTHESIS IN PRIMARY HIP ARTHROPLASTY
A PROSPECTIVE STUDY WITH A MINIMUM 2 YEAR FOLLOW UP

MR L.JEYASEELAN, MR S.KUTTY

DEPARTMENT OF TRAUMA & ORTHOPAEDICS

PRINCESS ALEXANDRA HOSPITAL,HARLOW, UK

Barts and The London
School of Medicine and Dentistry

The Princess Alexandra Hospital NHS
NHS Trust

DISCLOSURES

SK	Consultant Smith & Nephew
Hospital	DePuy Synthes - research funding

Introduction

Demographics of hip osteoarthritis is changing

Younger patients

Design focus on prostheses that :

- Bone stock preservation
- Physiological loading
- Longevity

Short, bone-conserving cementless stems

Features of the Silent™ Hip System

Manufactured by Depuy Synthes

Original design concept by Dr Mathhius Honl, in Germany 1997

Straight short stem, neck only, femoral prosthesis with 12/14 Taper

DuoFix™ – hydroxyapatite coated beads

Literature

Waller et al. 2003

15 hips in 14 patients, average age 56 years

Combined Silent with uncemented ASR cup and XL metal head.

- Harris Hip score improved from 52 to 95.4
- Oxford score improved from 23 to 44.2
- No radiographic loosening, subsidence, migration, or radiolucent lines
- 6 metallosis, 1 DVT

Literature

Pilot Clinical Study 2003 using Radiostereometric Analysis (RSA)

To demonstrate implant stability – 41 hips

- RSA shows prosthesis achieves stability, with no continuing patterns of movement
- Only 1 hip showed more than 1mm movement in any direction, due to proximal bone resorption due to infection

Phase II recruited 100 hips (8 surgeons/7 international centres)

2005 - 2008

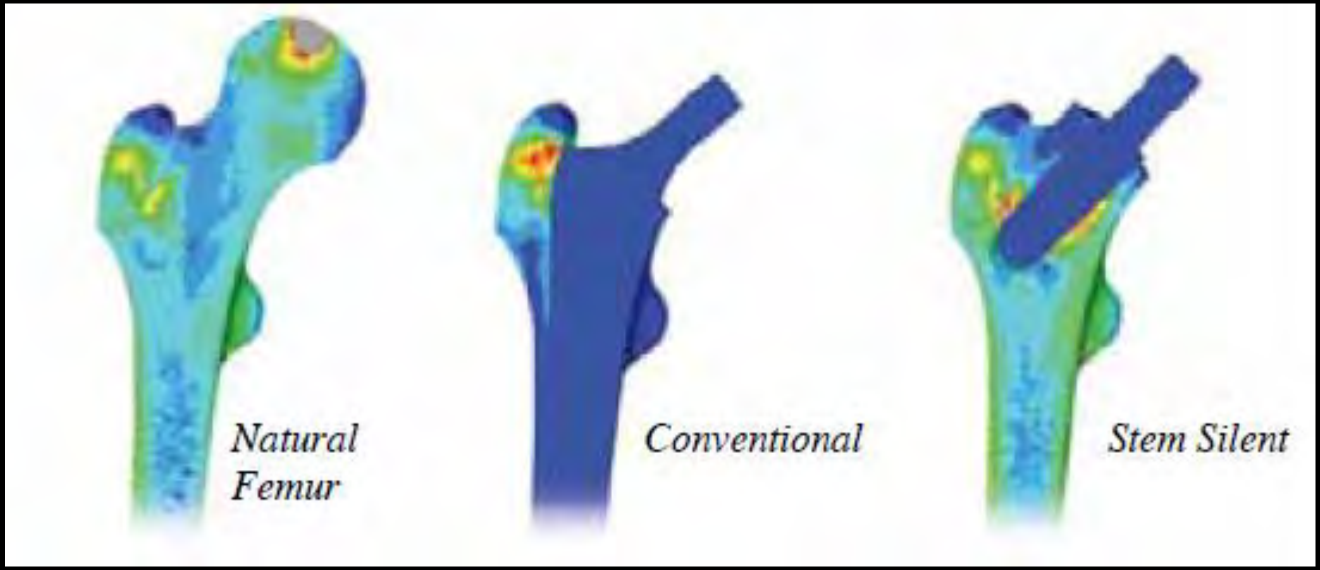
In total 141 hips :

- 4 revision
- 3 periprosthetic fractures
- 1 deep infection
- Combine Kaplan-Meier Survivorship based on revision 97% (CI 94 – 100%) at 3 years

Finite Element Analysis (FEA)

More Physiological Loading

Less Stress Shielding



Patients & Methods

Prospective study performed between October 2010 and March 2013

Post Market clinical study (2 centres)

29 hips in 28 patients

Silent stem combined with DePuy Gription^{TM}, with a ceramic on ceramic articulation

Follow-up intervals 6 weeks, then 3,6,12 and 24 months

Prospectively collected PROMs :	Oxford Hip Score EuroQol 5D
Radiographs assessed for :	Loosening Subsidence Migration Presence of radiolucent lines

DOTS

DePuy Outcomes Tracking System

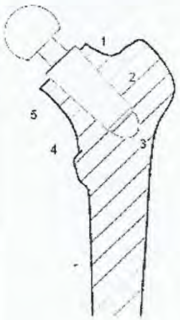
SILENT POST-OP HIP RADIOGRAPHIC EVALUATION

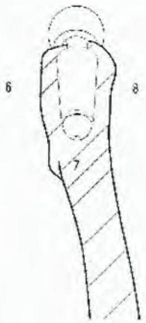
Date of Radiograph: ______ DD-MMM-YYYY

Site No.	Subject No.	Subject Name/Initials	Date of Birth	Side
		Last name, first name or FML initial		☐ Right ☐ Left

NORMAL RADIOGRAPHIC EVALUATION: ☐ Yes ☐ No - complete the rest of the evaluation.

AP Femoral View





1. Radiolucencies:

☐ No

	Zone 1:	Zone 2:	Zone 3:	Zone 4:	Zone 5:
☐ Yes - specify	☐	☐	☐	☐	☐
length (mm)					
width (mm)					

2. Osteolysis:

☐ No

	Zone 1:	Zone 2:	Zone 3:	Zone 4:	Zone 5:
☐ Yes - specify	☐	☐	☐	☐	☐
length (mm)					
width (mm)					

LATERAL Femoral View

3. Radiolucencies:

☐ No

	Zone 6:	Zone 7:	Zone 8:
☐ Yes - specify	☐	☐	☐
length (mm)			
width (mm)			

4. Osteolysis:

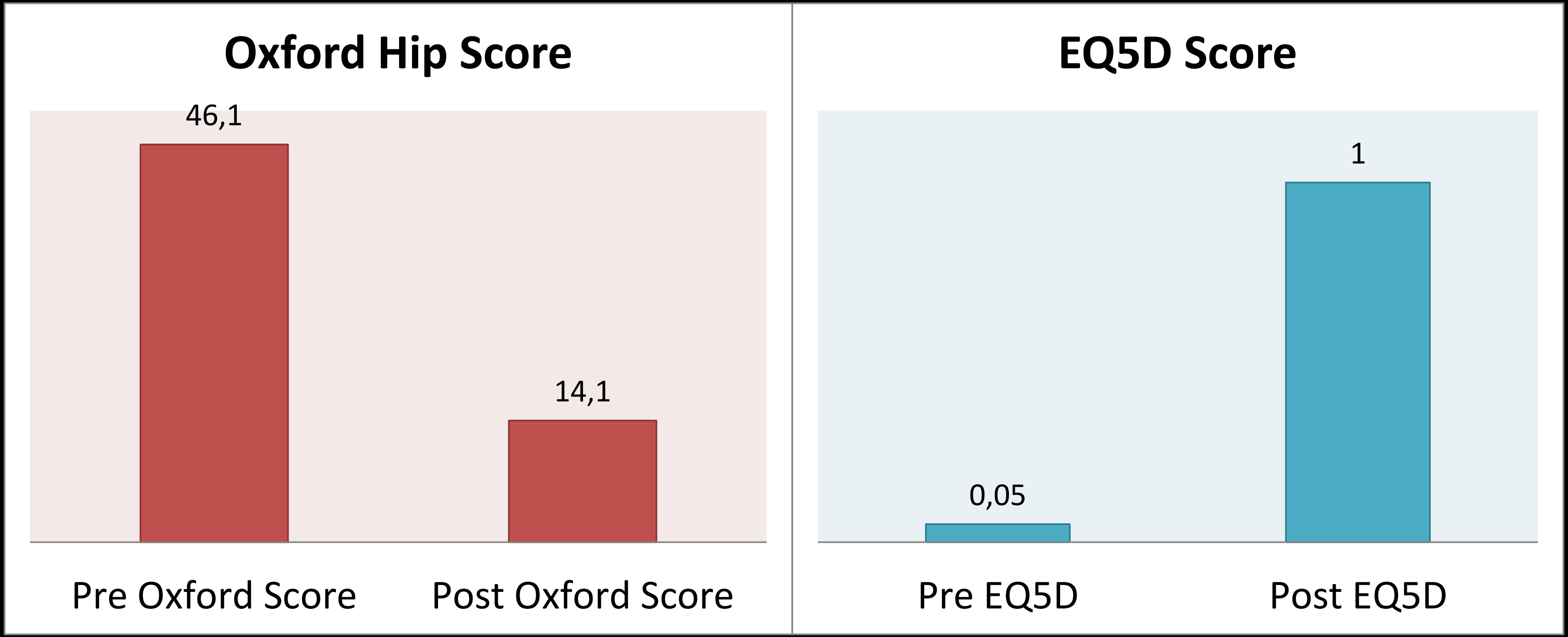
☐ No

	Zone 6:	Zone 7:	Zone 8:
☐ Yes - specify	☐	☐	☐
length (mm)			
width (mm)			

Results

24 males and 4 females

Mean age 44.3 years (36-52 years)



Results

No radiographic evidence of loosening, subsidence, migration or radiolucency.

There were no cases of revision.

One patient (7%) developed a post-operative deep venous thrombosis

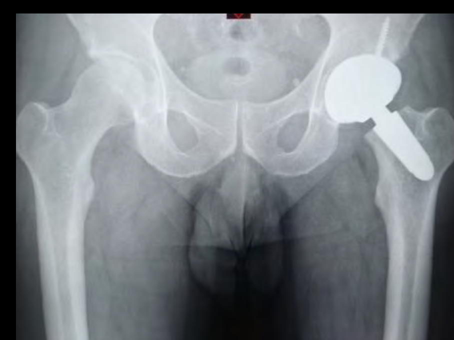
- commenced on low molecular weight heparin.
- developed a heamatoma
- required a wound washout and settled.

Patient Cases

Patient cases

VARUS

VALGUS



Discussion

- Silent™ neck only prosthesis offers excellent patient reported outcomes

- Confers the benefits of conservation of proximal bone stock.
  - especially useful in young patients requiring primary arthroplasty
  - those with proximal sub-trochanteric deformities.

- Growing body of evidence supporting the use of short stem prostheses.

INTERNATIONAL COMBINED MEETING

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26-27 NOVEMBER 2015

MILAN, ITALY

A prospective study of a novel neck preserving stem: early clinical results

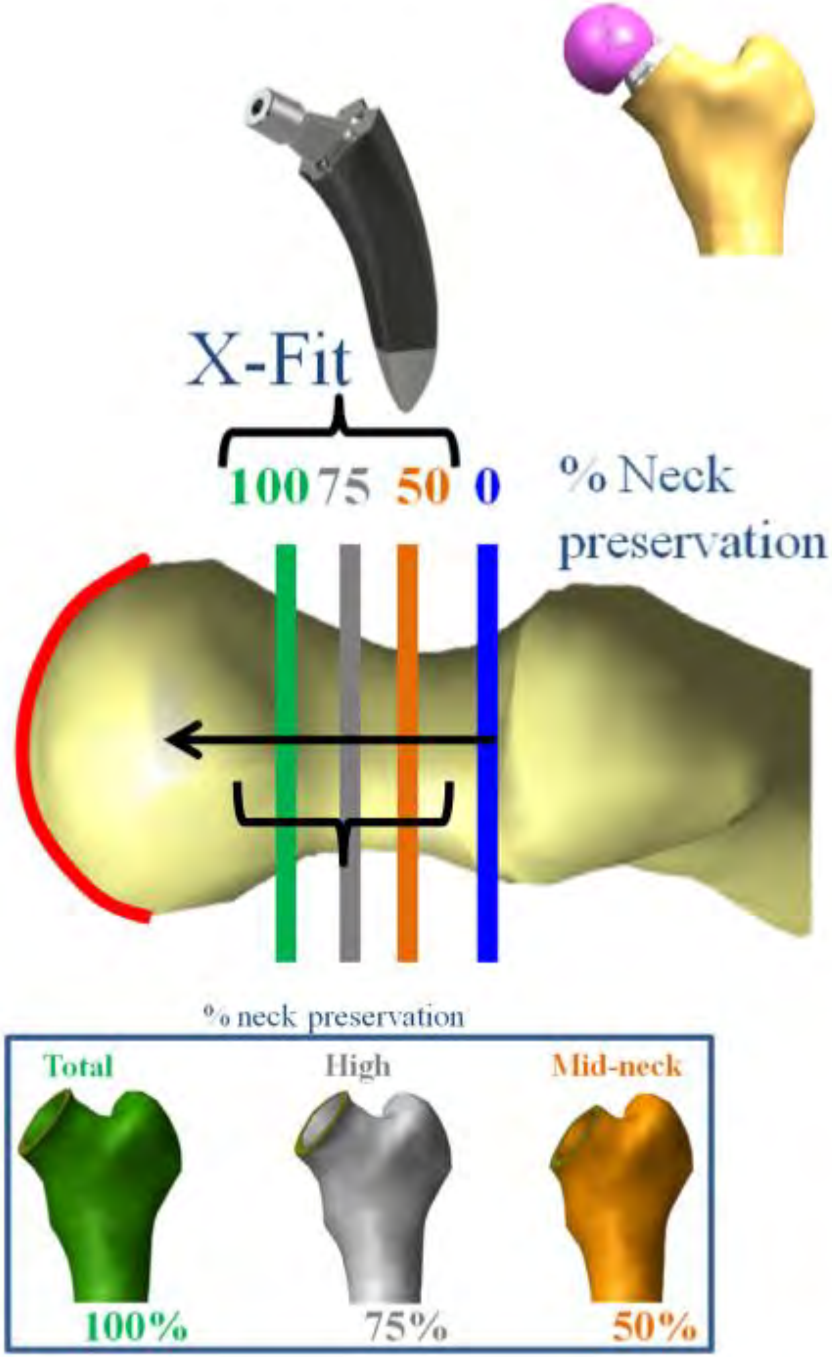
Dott Domenico Signorelli
on behalf of the X-Fit study group:
P. Budassi, D. Signorelli, F. Falez, L. Marega, A. Massè

Introduction: X-FIT stem

FEATURES

• mid-to-total femoral neck preservation.
•metaphyseal invasiveness minimization
•Modular necks
•Ti plasma spray + HA

Indications

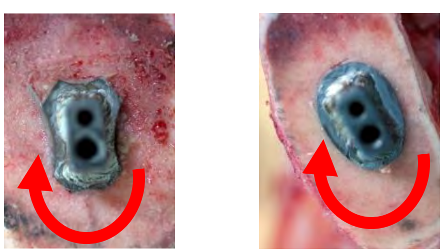


mid-to-total femoral neck preservation

Innovative grooved sections benefits

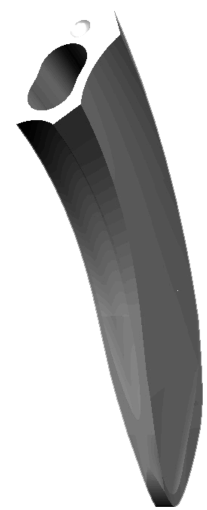
grooved cross-section for
-high torsional stability (+30% vs full rounded section)
-spongious bone preservation (+34% vs full without grooves)

X-Fit Cross section
vs a standard ovoid cross-section



+30%
torsional stability

Enhanced bone preservation

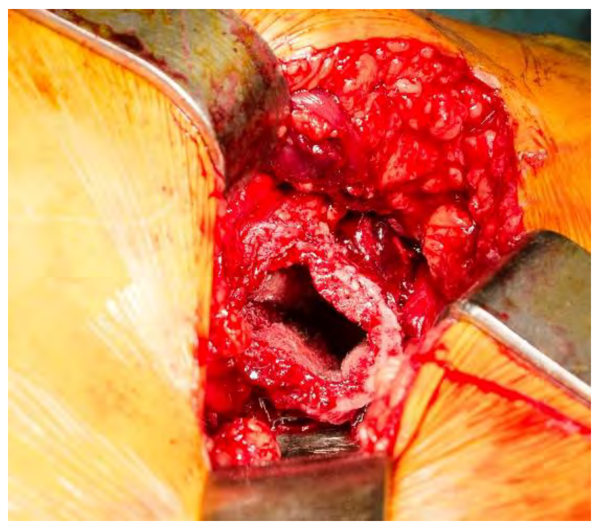


X-Fit
Novel section

Ovoidal
Cross-Section

Objective

To present the early clinical results of a running prospective multicentric study, approved by Ethics Committees.



Methods

The **multicentric** EC-approved prospective study is ongoing in 4 italian centers :

- **Dr. P. Budassi**, Istituti Ospitalieri di Cremona, Cremona, Italy
- Prof. F. Falez, Ospedale Santo Spirito, Roma, Italy
- Dr. L. Marega, Ospedale San Camillo, Trento, Italy
- Prof. A. Massè, San Luigi Gonzaga, Orbassano, Italy

TARGET:

100 cases followed at minimum 1 year follow-up

Methods

The patient outcome is evaluated through:

- The Harris Hip Score HHS
(pre-op, 1 month, 6 months and 12 months)

- X-ray images analysis

STATUS:

68 patients enrolled (2 bilateral cases), 70 cases with average age 54,2 years; most frequent diagnosis was primary coxarthrosis in 59 cases, followed by 6 AVN and 1 post-traumatic cases.

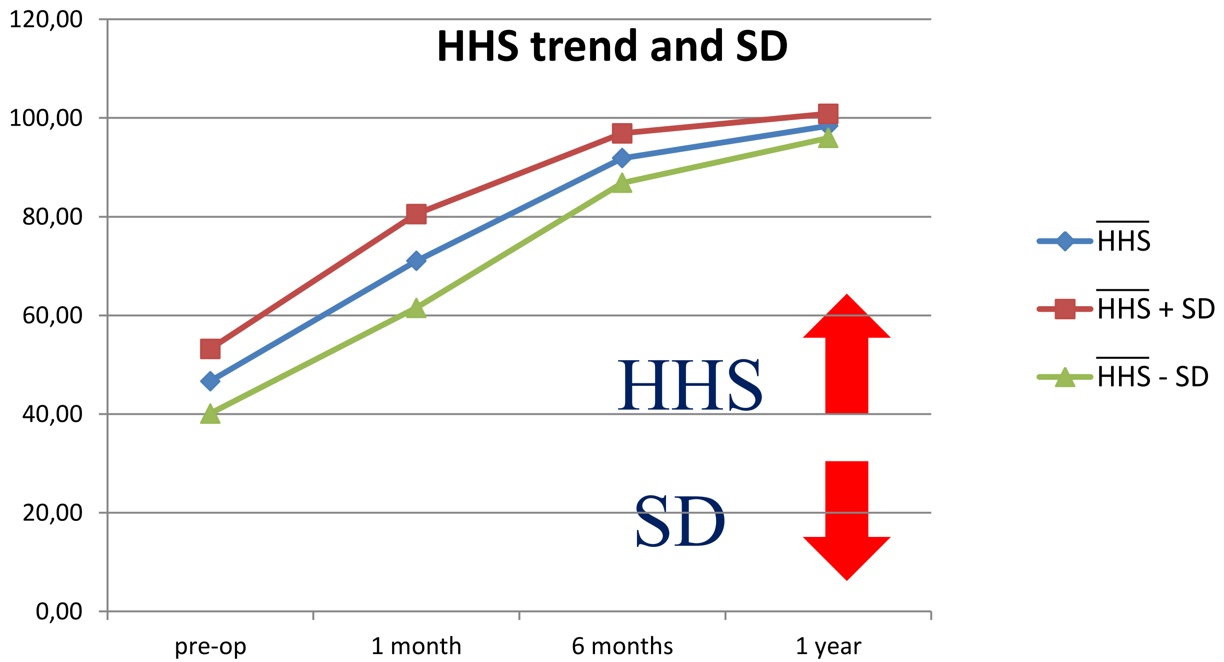
Results: Harris Hip Score

Average follow-up 22 months (1 – 36 months)

- Average pre-op HHS 47,2
- Average 1 month HHS 71,0
- Average 6 months HHS 92,7
- Average 12 months HHS 98,6

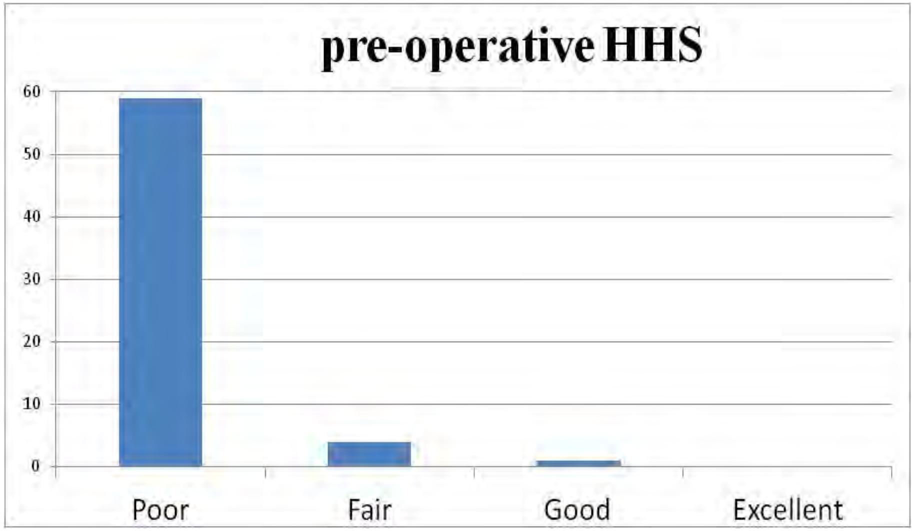
HHS increment +51,4

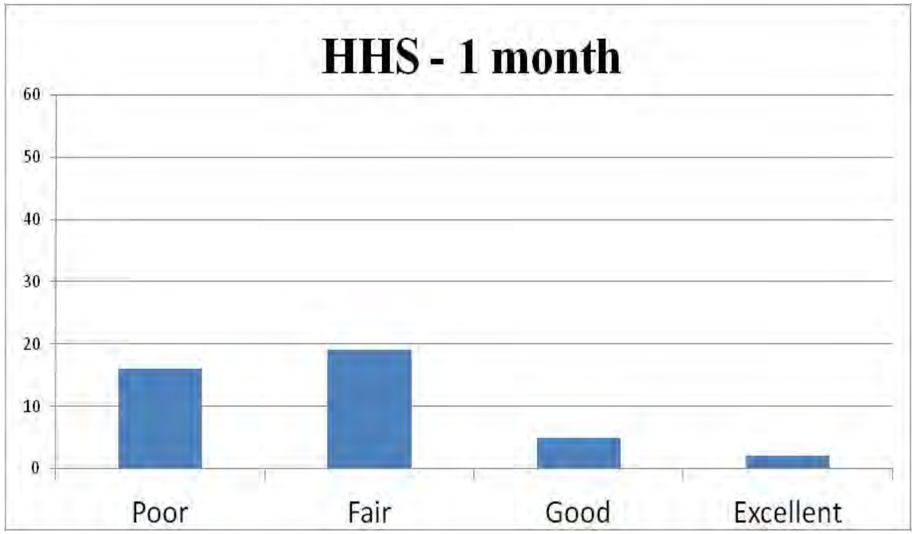
Gain HHS: +109%

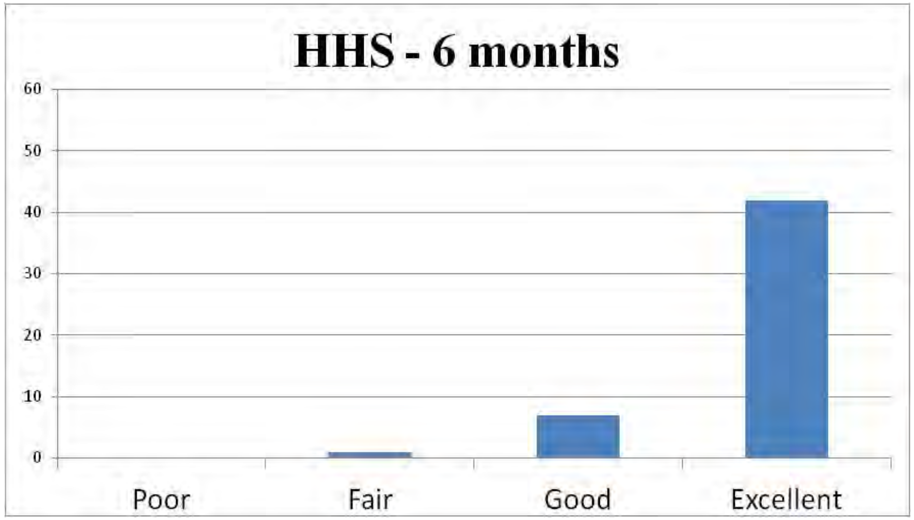


Results: Harris Hip Score

Classification at different timepoints







Results: radiological evaluation

Results: radiological evaluation

No radiolucency observed

No infections

No dislocation

No post-operative adverse events (nerve injury or DVT)

No revision case

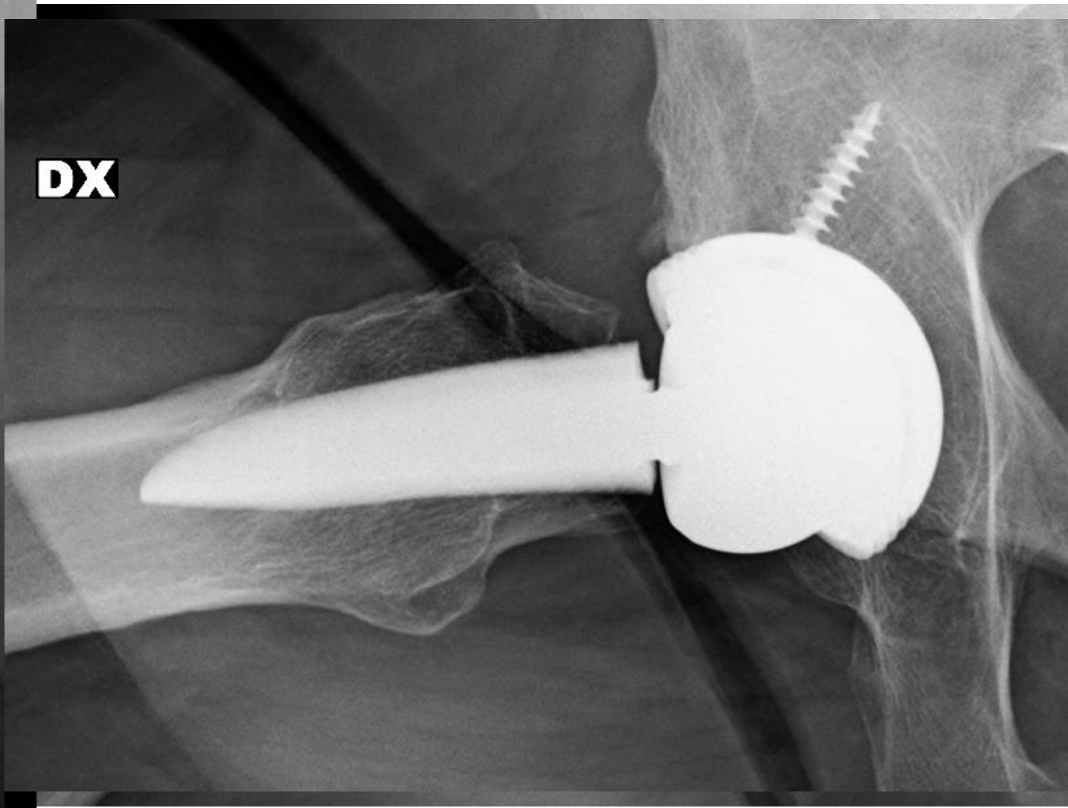
100% cup and stem survivorship
at 1 year follow-up

Results: radiological evaluation

- E.g. 64 y – man

1 year follow-up

Post-op

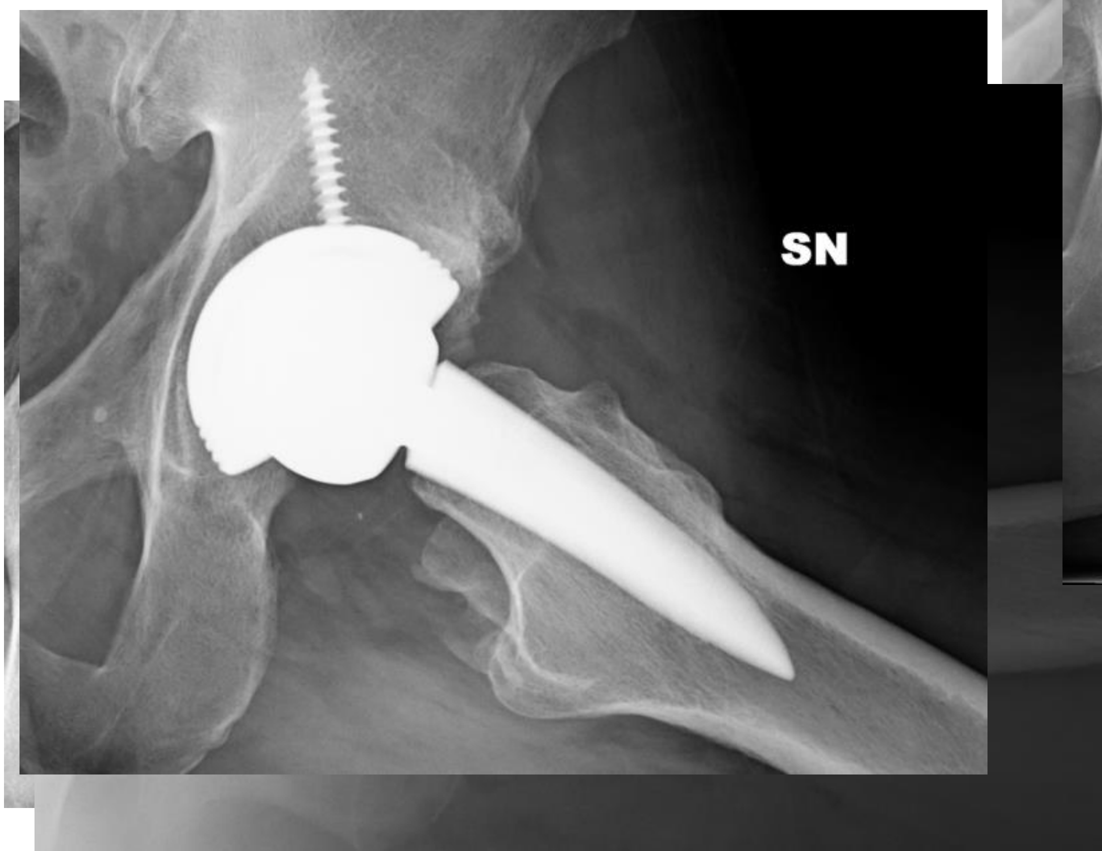


Results: radiological evaluation

- E.g. 47 y – man

Postop

1 year follow-up



Conclusion

At 1 year of follow-up all patients have excellent HHS and a 100% survivorship.

The X-Fit neck-preserving stem short term follow-up looks clinically promising.

A longer follow-up and a larger study cohort are required in order to support its mid-term outcomes.

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BRITISH HIP SOCIETY
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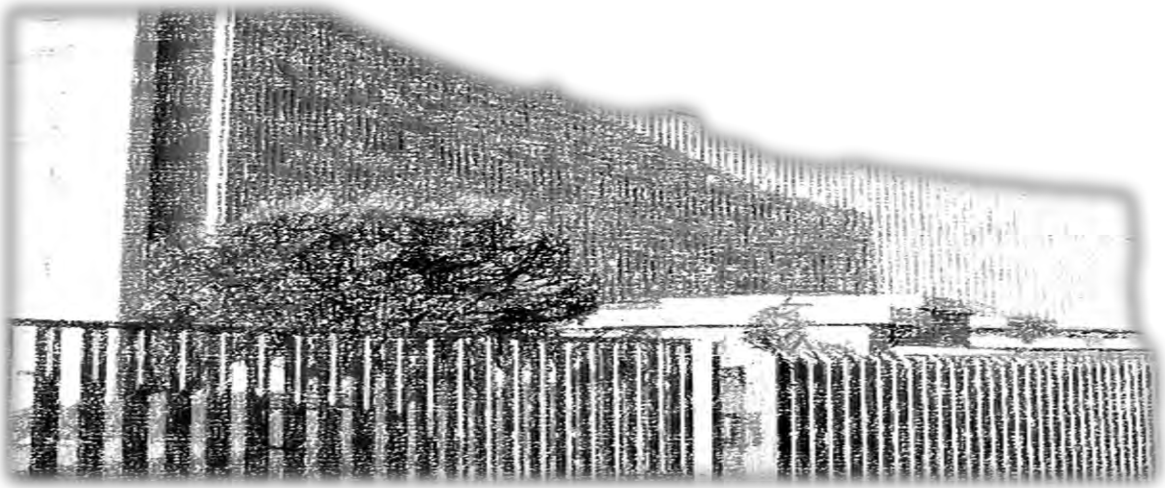

Bone remodelling around short metaphiseal implant in THA: a DEXA study with tree years of follow up

R. Alonzo, S. Scapellato, Frontini, S. De Sanctis, C. D'Arrigo, A. Ferretti

"Kirk Kilgour" Sports Injury Center, S. Andrea Hospital,

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"Sapienza" University of Rome, Italy

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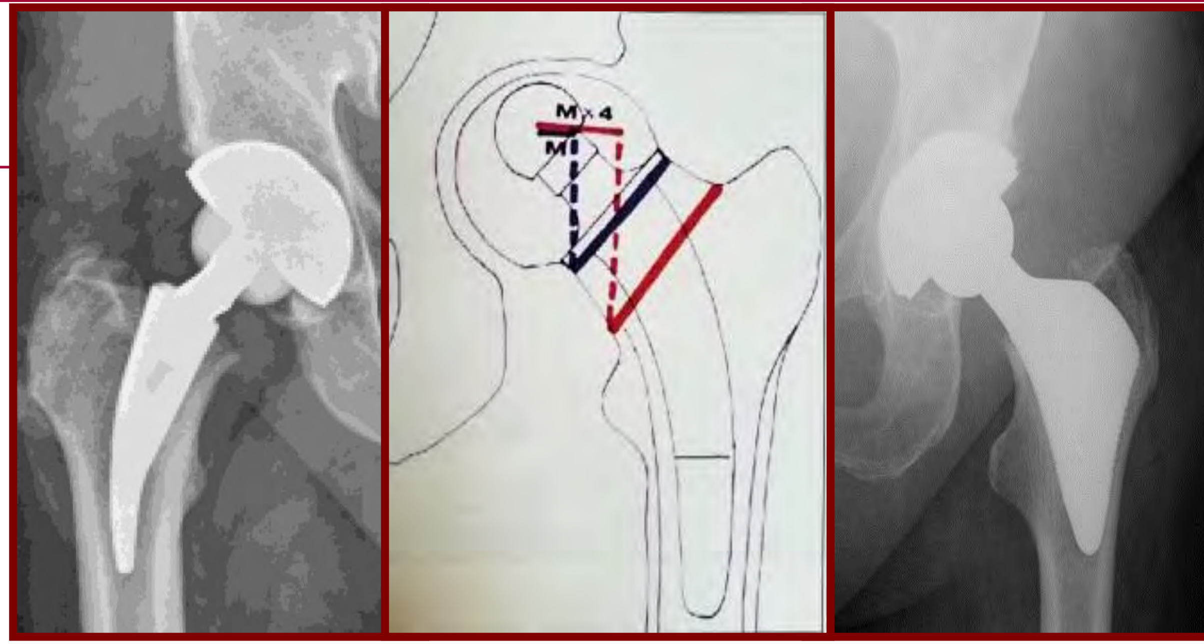
Short stems



Bone conservation:

✓ taking less bone at the time of the surgery

✓ optimizing the physiological loading of the proximal femur to preserve bone in the longer term

Choice of implant

The ***Proxima Stem*** reduce the shear stresses at the fixation interface and optimizes load transfert in the metaphysis

The lateral flare allows the fisiological loading transfer :

- ✓Increses the distribution of loading to the lateral column and to the medial surface of the femur
- ✓Increases the implant stability
- ✓Reduces the sinking risk

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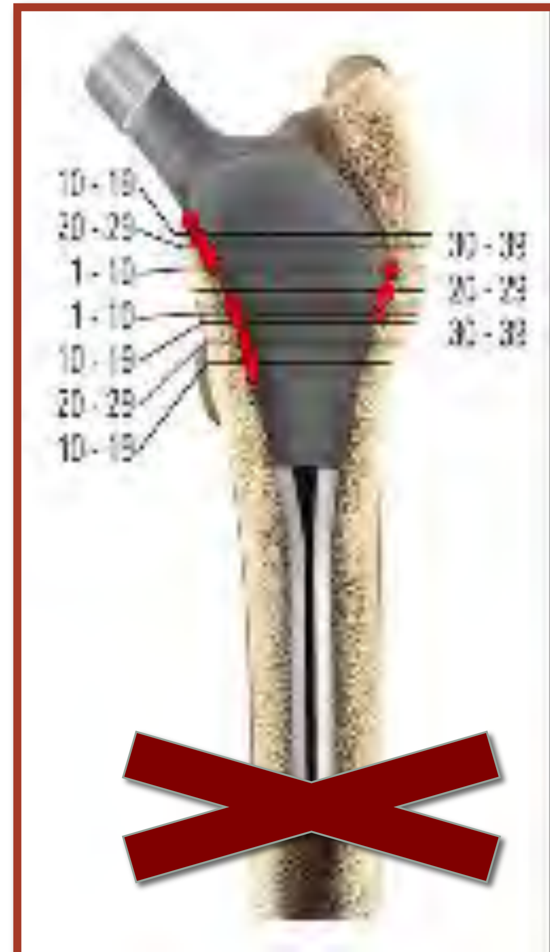
Renkawitz T. et al; BMC Musculoskeletal Disorders 2008, 9:147

Stress shielding and tight pain:

Making possible to remove from the design of the implant the remaining part of the stem reducing the risk of stress shielding and tight pain



J, Leali A.; J Orthop Sci (2002) 7:724-730
Leali A., Fetto J.; Int. Orthop.(SICOT) 2002, 26:166-169.

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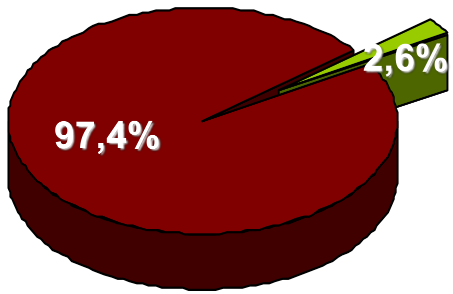
Methods

OUR EXPERIENCE	
Our series	289 Proxima Stem 2008-2013
Hips evaluated	141 (Minimum follow up 3 years)
Sex	58 M – 83 F
Mean age	68 (range 33–84 aa)



The DIAGNOSIS was :

- **Idiopathic Hip arthrosis** ***in 97,4% of cases***
- ***Necrosis of the femoral head*** ***in 2,6 %***

Follow up 3 Years (mean 3-5)

1. **Clinical outcome** → • *Harris Hip Score (HHS)*

2. **Radiographic control** → *RX AP/LL*

1, 3, 6 months, 1, 3 years

To evaluate alignment, osteolysis, subsidence

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DEXA at 3 years

[DELPHI W(S/N 70556)]

Exclusion criteria:

✓**Patients with desease of controlateral hip**
(Hip arthrosis, RA or osteoporosis)

46 Patients evaluated with DEXA

In comparison with the contralateral hip

Subregion Array Hip Analysis

k=1.126 d0=48.5 t=7.023

C.F.	1.028	0.995	1.000
Regione	Area(cm²)	BMC(g)	BMD(g/cm²)
GLOBALE	25.38	36.09	1.422
R1	8.52	6.98	0.819
R2	5.88	5.47	0.929
R3	4.96	6.77	1.364
R4	7.19	11.15	1.550
R5	24.95	35.08	1.406
NETAVG	24.95	35.08	1.406

Delphi W SN 70556
Versione 13.3 7 11.03.2013 13:55

Subregion Array Hip Analysis

k=1.130 d0=47.1 t=5.893

C.F.	1.028	0.995	1.000
Regione	Area(cm²)	BMC(g)	BMD(g/cm²)
GLOBALE	71.80	88.53	1.233
R1	6.93	6.90	0.995
R2	13.31	12.34	0.927
R3	12.01	14.98	1.247
R4	8.30	11.95	1.439
R5	71.48	88.03	1.232
NETAVG	71.62	88.23	1.232

Delphi W SN 70556
Versione 13.3 7 11.03.2013 13:51

Methods

2,6%

✓The BMD (gr/cm2) of the operated hip was measured using the “metal-removal hip” scanning mode

✓Due to the geometry of the implant the Gruen's zones were reduced from 7 to 5
(the Gruen's zones 3 and 5 were eliminated)

✓ Thus, a 5-ROI protocol of analysis was developed

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Albanese C. et al.; Acta. Orthop. 2009; 80 (3): 291-297

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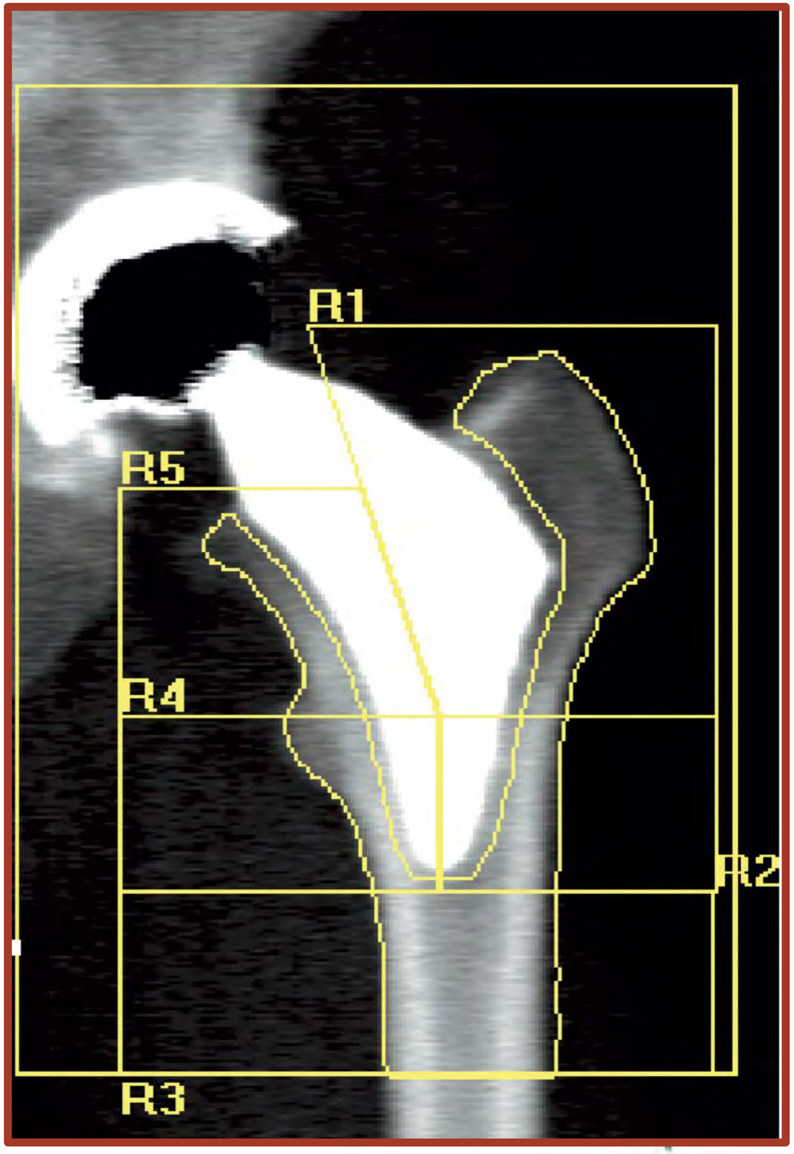
DEXA - Dual-Energy X-ray Absorptiometry

- The stem has been devided in 5 regions:

✓ 2 lateral (ROI 1 e ROI 2)
✓ 2 medial (ROI 4 e ROI 5)
✓ 1 inferior (ROI 3)



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DEXA - *Dual-Energy X-ray Absorptiometry*

The BMD (g/cm^2) formula:

(BMD of operated hip/BMD not operated hip) × 100

✓The result of BMD has been registrated for each ROI in both hips in an indipendent way

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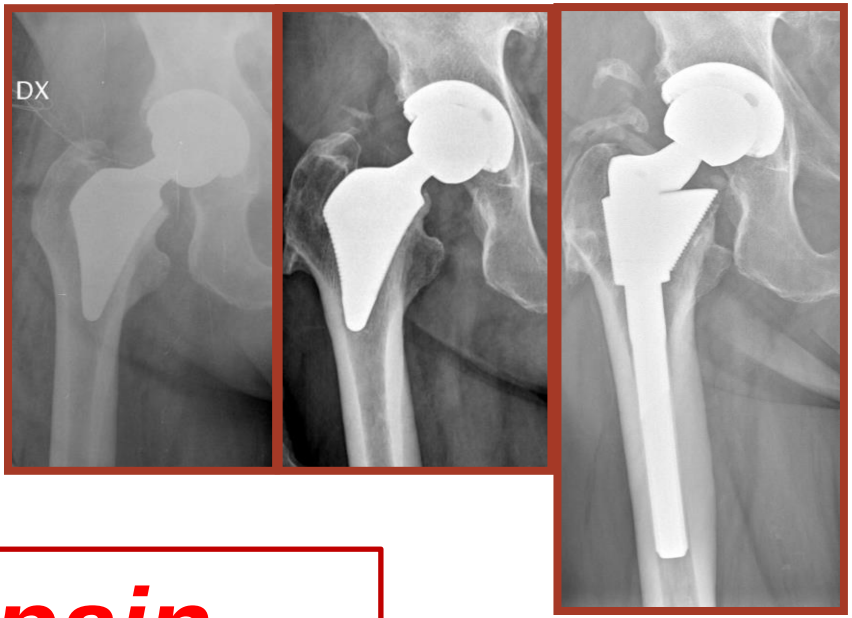
PSICOLOGIA

Results

HHS 134 Patients (7 were looses at the latest control)	
Pre-operat.	Post-operat.
50,25 (range 7,61 – 84,24)	88,58 (range 61,87 – 96,64)

Survival rate End point revision
99.3 (1revision)



No Tight pain

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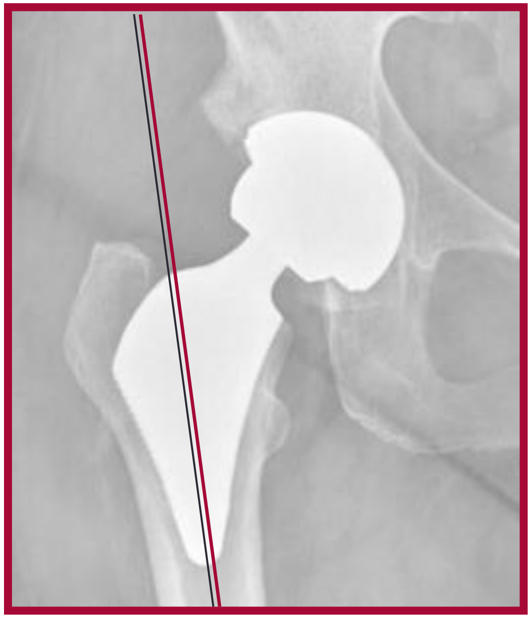
Stem alignment	
Neutral	90 (67,1 %)
Varus	39 (29,2 %)
Valgus	5 (3,7 %)



Neutral

Varus

Valgus

= stem axis

= femur axis

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DEXA EVALUATION

	BMD (mean value, g/cm^2)	BMD (mean value %)
ROI I	*1,255*	**+ 25 %** *p < 0,001*
ROI 2	*1,385*	**+ 38 %** *p < 0,001*
ROI 3	*1,45*	**+ 45 %** *p < 0,001*
ROI 4	*1,11*	+ *11 % p > 0,001*
ROI 5	*1,07*	+ *0,7 % p > 0,001*

$$(\text{BMD of operated hip} / \text{BMD not operated hip}) \times 100$$

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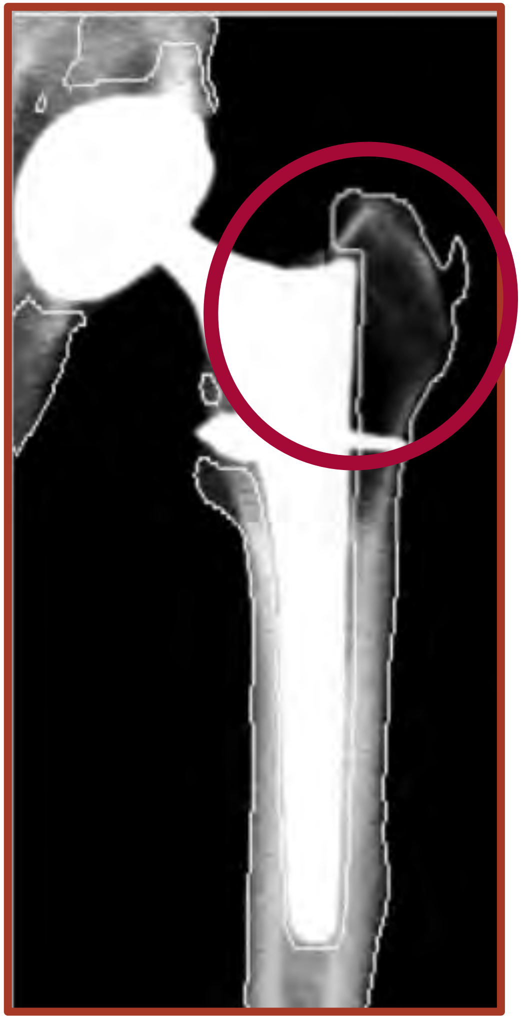
Discussion

✓Osteolysis and reduced BMD around the prothesis has been described in most type of femoral stems as a result of load transfer

✓In other studies stress shielding is reported as an early phenomenon occurred tipically in first three years



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Padgett DE, Warashina H.; Clin Orthop Relat Res. 2004;420:72-9.

Learmonth ID, Grobler GP, Dall DM, et al. ; J Arthroplasty. 1995;110:257-63.

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Conclusion

✓In our study at 3 years of follow up BMD was surprisingly increased in all periprostetic ROIs as a possible result of a succesfull osteointegration between the bone and the implant, even in older patients population of a mean age of 74 years old

Conclusion

This increased periprosthetic BMD, suggest that the metaphyseal implant could provide

✓a good proximal fit
✓physiological load distribution

in periprosthetic bone interface regardless of the age of patients

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

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MILAN, ITALY

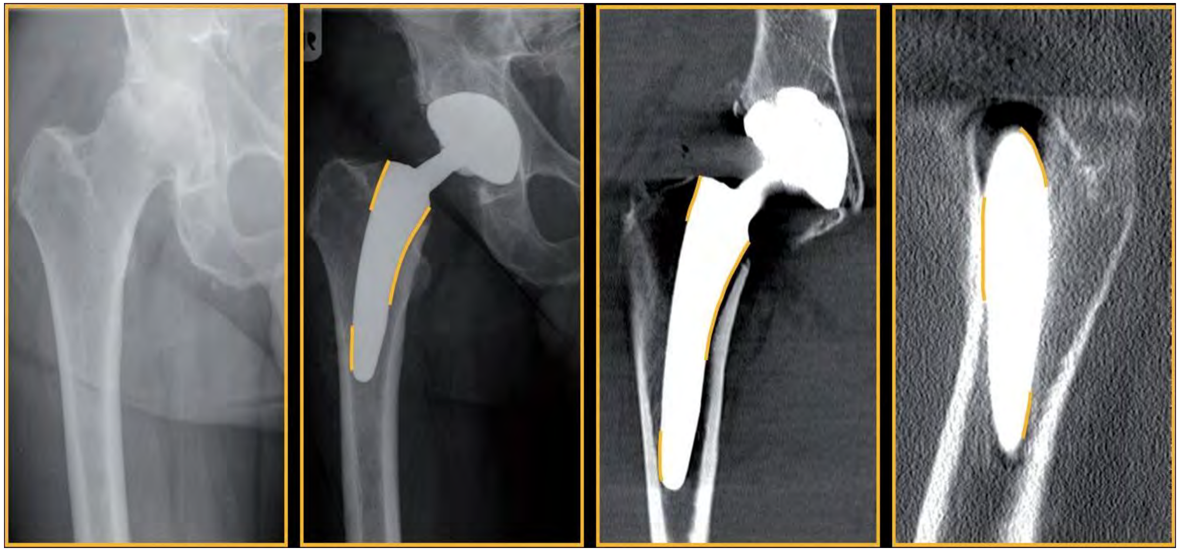
MiniHip arthroplasty: A review of clinical outcomes at a UK centre.

Goswami K, Howard D, Harvey K, Masters J, Hill C, King R, Cronin M, Prakash U, Krikler SJ, Foguet P

University Hospitals Coventry and Warwickshire NHS Trust.

The 'MiniHip'

- Preserves femoral neck and proximal bone stock



- ODEP 3A

- Uncertainty regarding long term clinical outcomes, implant survival and complication rates

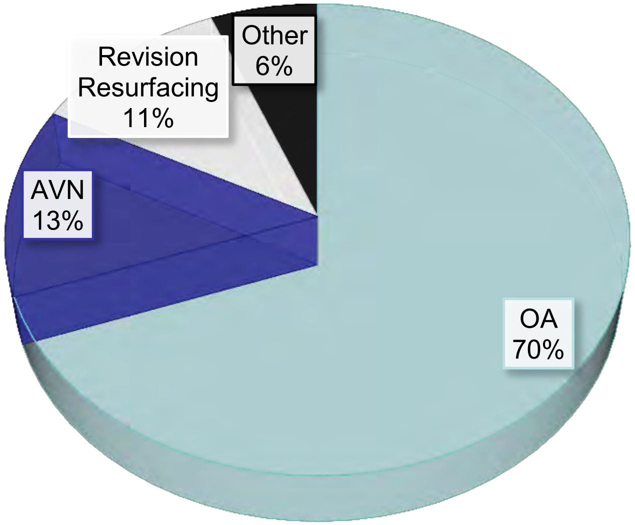
Objectives & Methods

- Assess local clinical outcomes of MiniHip arthroplasty using patient reported outcomes (PROMs) and identifying adverse events
- Case series
- July 2009 – February 2013
- Prospective PROMs (Pre vs. Post)
  - OHS
  - EQ-5D (EuroQoL)
  - UCLA (physical activity)
- PROMs data excluded for bilateral same day surgery

Results

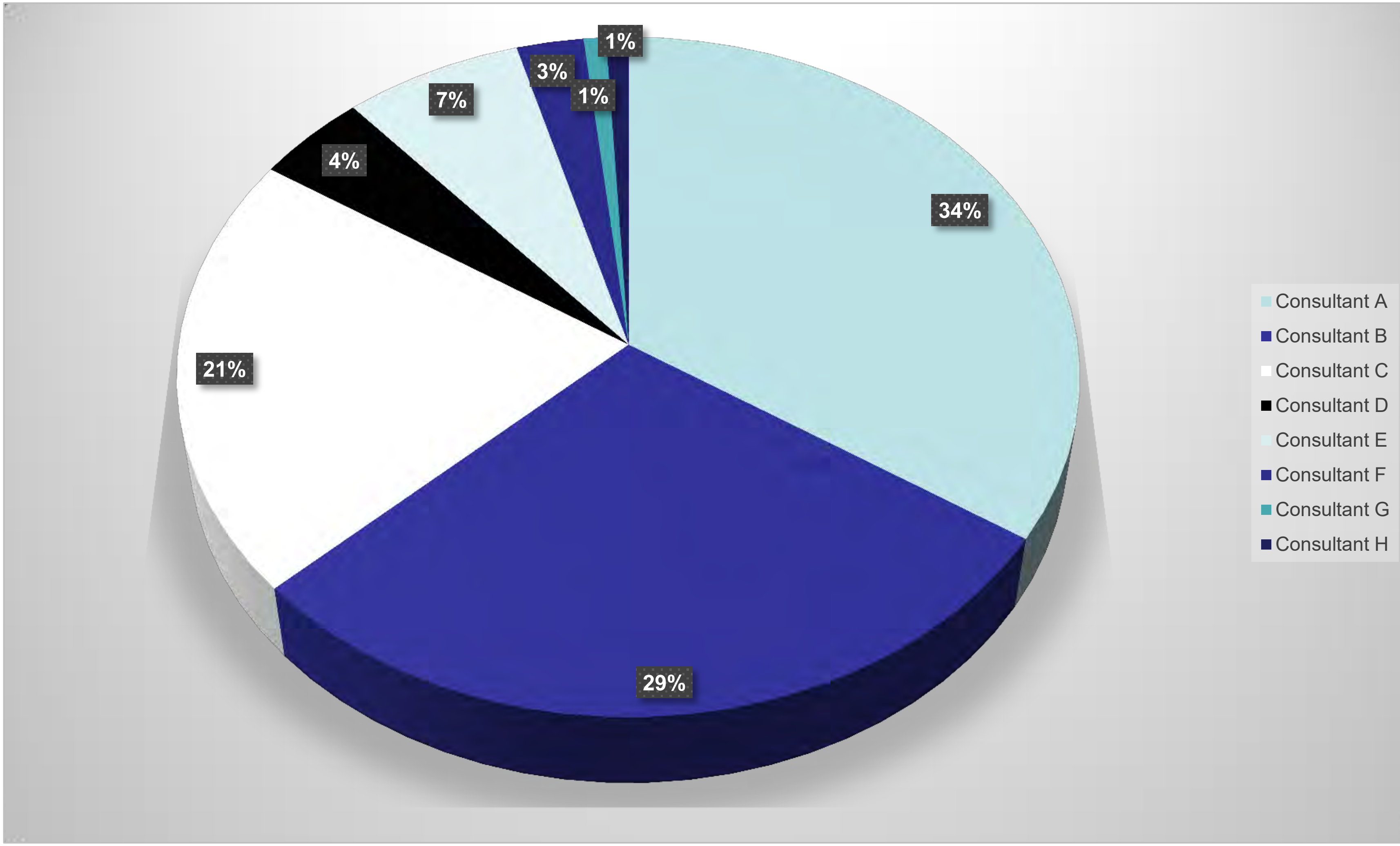
- 115 MiniHip cases
- 109 patients
- Mean age = 52.9 (19-72)
- Female 70.8%, R=51%, L=49%
- Local follow-up = 99.1%
- Mean time to last follow-up 22.5 months

Results: Indication



- OA = 69.6% (n=80)
  - Mean age 55.7
- AVN = 13.0% (n=15)
  - Mean age 37.2
- Revision of Resurfacing =11.3% (n=13)
  - Mean age 56.5
- Other = 6.1% (n=7)
  - Mean age 46.4

Consultant cases



Results: Oxford Hip Score (%)

	Patients	Median	Range
Pre-op	63 (56.8%)	37.0%	4 - 75
Post op	82 (73.9%)	90.5%	25 - 100
Change		53.5%	
Change	**48** (43.2%)	**50.0**%	0 - 93
Time to scoring	48	14.1 months	11.8 – 49.4

NJR	Uncemented	43.75% (21/48) at 6 months

Results: EuroQoL (EQ-5D)

	Patients	Median	Range
Pre-op	62 (59.5%)	0.597	0.167 - 0.827
Post op	73 (65.8%)	0.827	0.077 - 1.0
Gain		+0.230	
Gain	**41** (36.9%)	**+0.292**	-0.289 to +0.729
Time to scoring	41	12.6 months	10.3 – 19.0

NJR Uncemented +0.380 at 6 months

Results: UCLA

	Patients	Mean	Range
Pre-op	32 (28.8%)	3.81	2 - 10
Post op	82 (73.9%)	6.05	1-10
Gain	**24** (43.2%)	**+2.37**	-1 to +8
Time to scoring	24	12.6 months	10.3 – 19.0

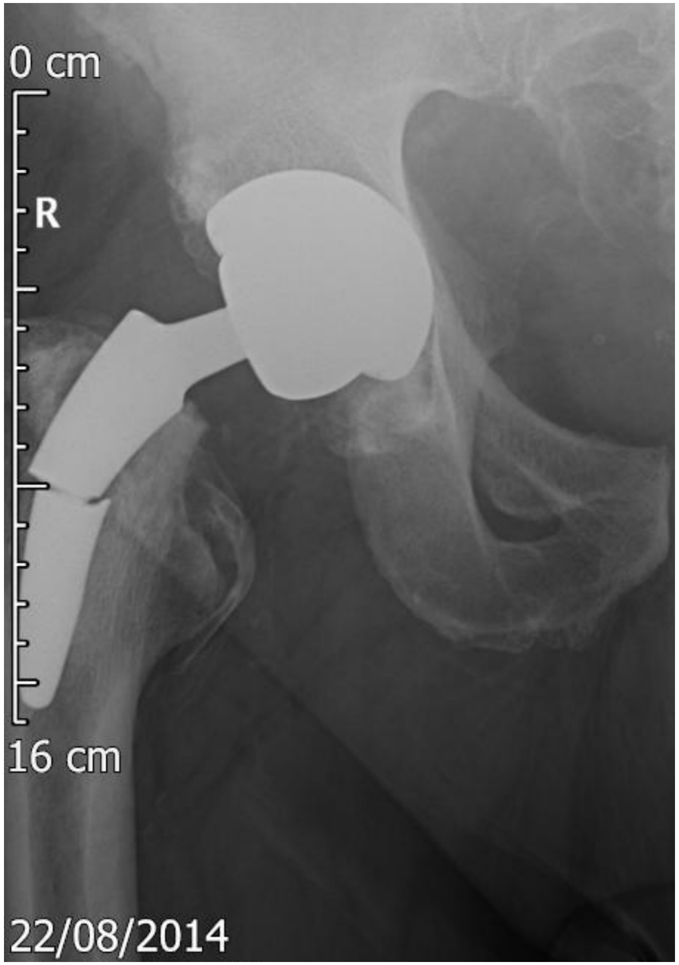
Primary vs. Revision of resurfacing

- OHS difference = +47.2 (+39 to +63)
  - Non resurfacing groups +47.5 (0 to +93)
- No revision complications found at time of study

Complications

Malaligned stem (n=1).	Revised @ day 4
Stem Failure (n=1).	Revised @ 3yr 4month
Aseptic Loosening (n=1).	Revised @ 7months
Infection (n=1).	Revised @ 1year
Intra-op fracture (n=2).	2nd & 15th case
Dislocation (n=1)	8th case.

Broken stem
Pre & Post-revision



Stem malpositioning
Pre & Post-revision

Limitations

- Single centre
- Incomplete PROMs data
- Subsidence not measured
- Different bearing combinations
- Still relatively short follow-up data

Summary

- Higher than expected complication rate
- Mixed picture of patient reported outcomes
- Relative inexperience with short stems
- Learning curve
- Awaiting longer term follow-up data

Thank You

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INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY

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26-27 NOVEMBER 2015

MILAN, ITALY

AZIENDA SANITARIA PROVINCIALE

U.O. Ortopedia e Traumatologia

Ospedale "San Francesco di Paola" Paola (CS)

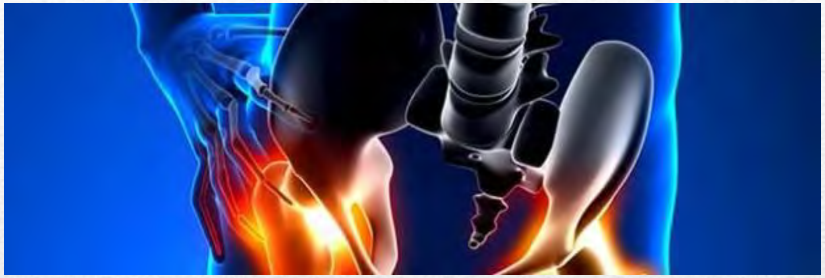
Direttore Dott. Massimo Candela

Fitmore hip Stem: X-Ray, clinical and functional results at mid-term follow-up

Candela M., Cundari A., Gentile G., Martire F., Crerscibene A.

Background

- An increasing number of younger patients undergo hip surgery

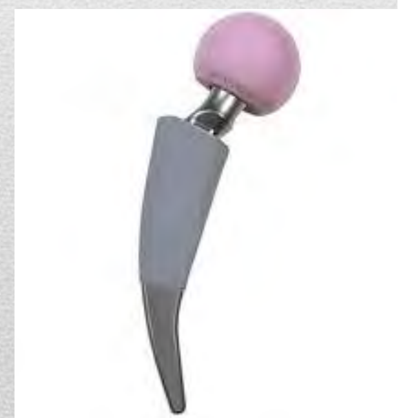


- need for minimal invasive approach and the use of short, bone preserving femoral stem

Background

- Various short hip stems with different implant concepts of femoral fixation and implant length

- A lack of clear and accepted definition for implant length and extent of bone preservation in the metaphyseal and diaphyseal femur



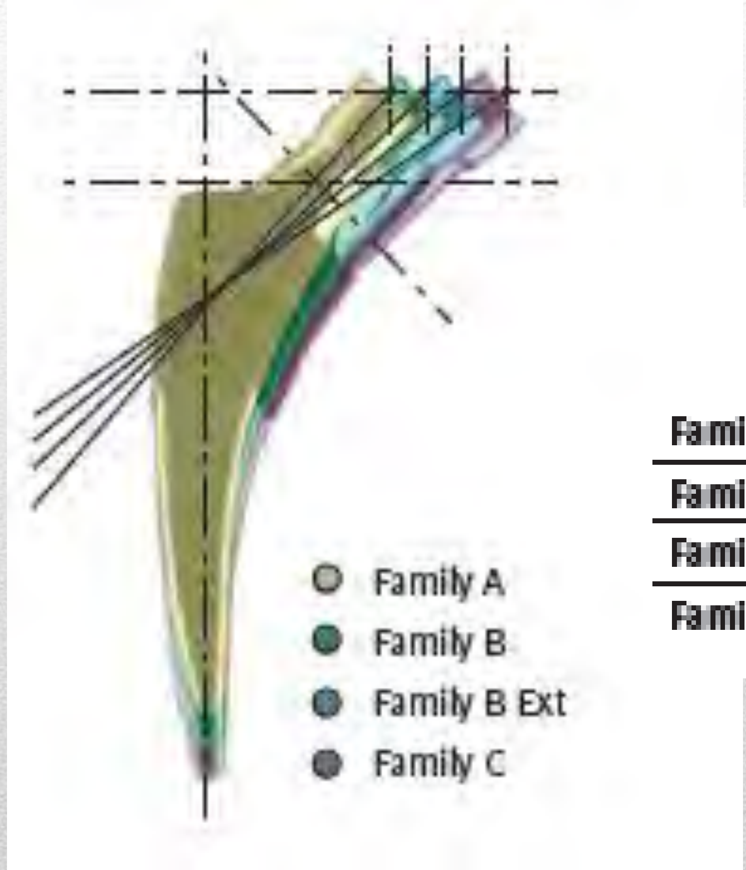
Current concepts, classification, and results in short stem hip arthroplasty. Falez F, Casella F, Papalia M, *Orthopaedics 2015*

Background

- survivorship comparable to traditional stems.
- by removing as little bone as possible, short stems leaves more options for any potential future revision

Current concepts, classification, and results in short stem hip arthroplasty. Falez F, Casella F, Papalia M, *Orthopaedics 2015*

Background



	Neck Angle	Offsets	Stem Length
Family A	140º	31-39mm	87-123mm
Family B	137º	37-45mm	90-129mm
Family B Ext	129º	44-52mm	90-129mm
Family C	127º	51-59mm	96-135mm

Background

- the triple taper design with proximal Ti-Plasma coating creates a press fit which is supported by the apposition in the calcar region

- primary fixation and rotational stability in ensured by the trapezoidal cross-section of the stem, apposition in the calcar region and the lateral cortex in the sutrochanteric region

study aims

- functional evaluation of hip arthroplasty using Fitmore stem

- stem osseointegration

- patient's satisfaction for the surgical procedure

Materials and methods

• retrospective case series (from Genuary 2008 to June 2014)

•128 hips operated

• all operation performed by the same surgeon

•minimum follow-up of 12 months (mean 4.2 years)

Materials and methods

- 10 of 128 were lost at the follow-up leaving 118 patients

- 60 M and 58 F

- 80 patients affected by osteoarthritis and 38 patients affected by osteonecrosis

- mean age: 54,5 years-old; (42-65)

Material and methods

- pre-operative and postoperative ROM

- pre-operative and post-operative Harris Hip Score

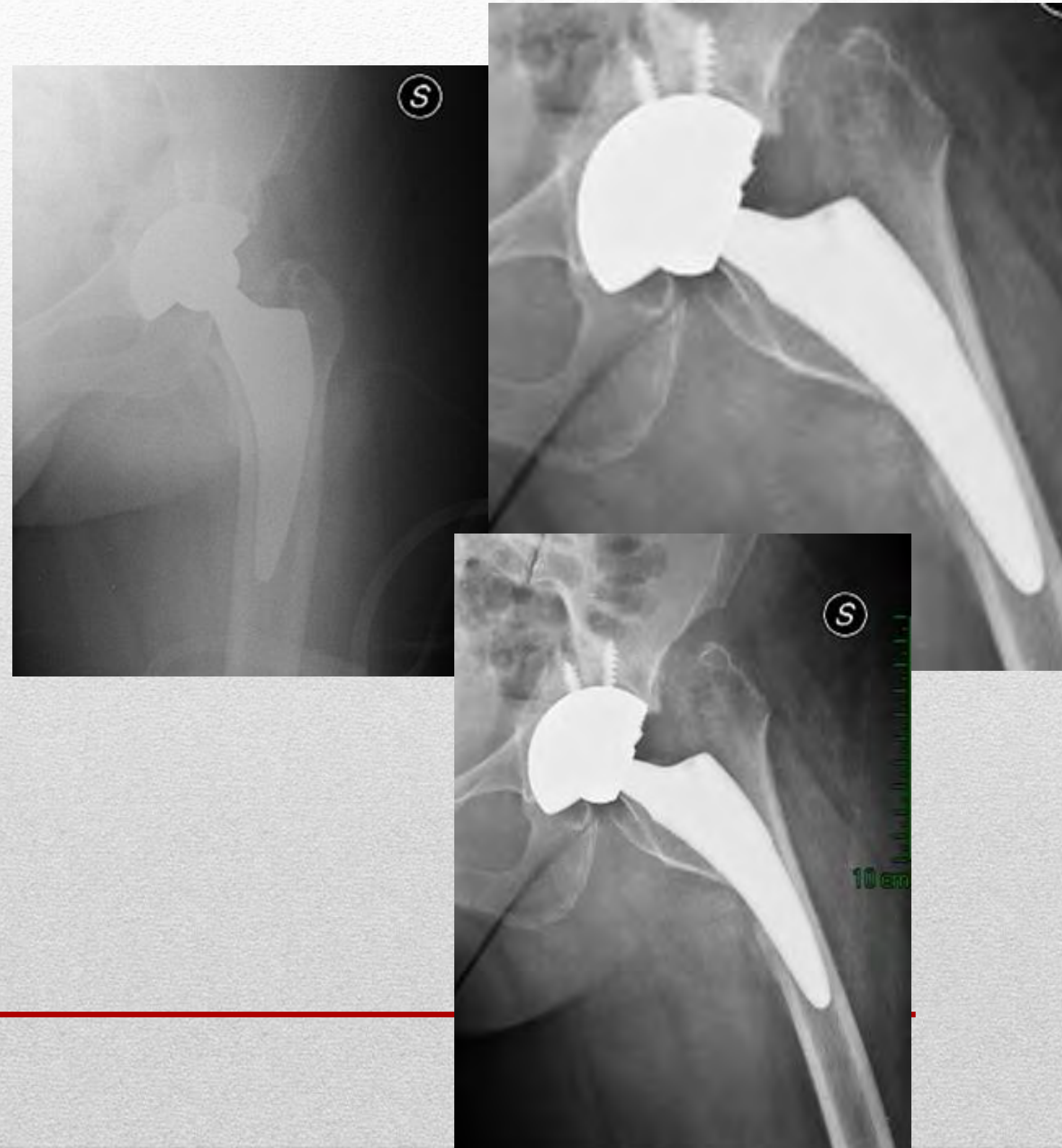
- pre-operative and post-operative plain radiographs

- patient's satisfaction

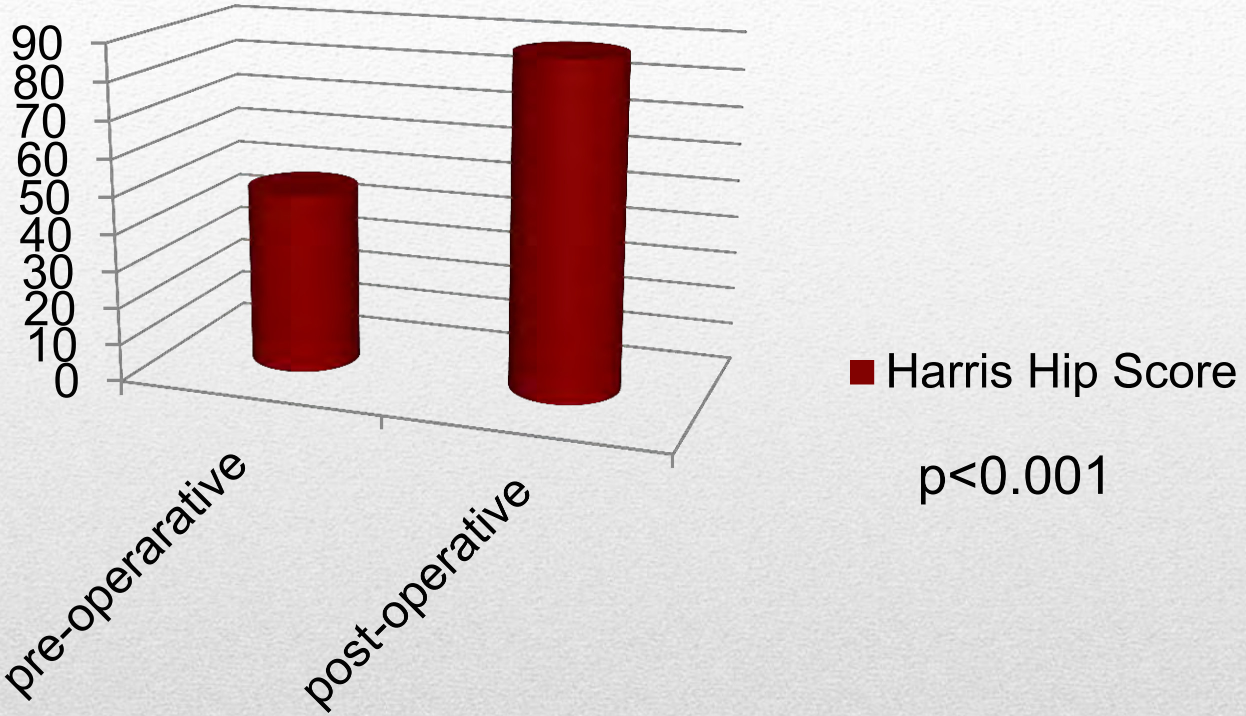
Traumatic arthritis of the hip after dislocation and acetabular fractures: treatment by mold arthroplasty. An end-result study using a new method of result evaluation. Harris WH. *J Bone Joint Surg Am.* 1969 Jun;51(4):737-55.

Results- failure

- No case of massive bleeding, infection or wound complication
- two patients (0.017%) were re-operated



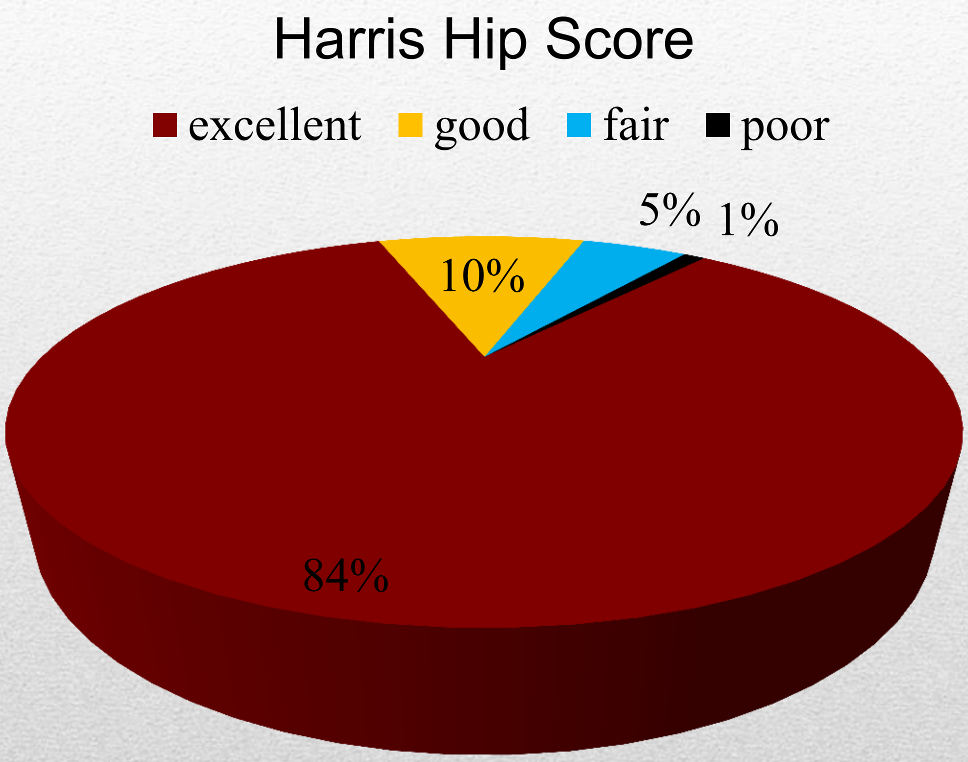
Functional results



p<0.001

Everage value of Harris hip score improves from pre-operative (48.32) to post-operative (88.63)

Functional results



Traumatic arthritis of the hip after dislocation and acetabular fractures: treatment by mold arthroplasty. An end-result study using a new method of result evaluation. Harris WH. *J Bone Joint Surg Am.* 1969 Jun;51(4):737-55.

Functional results

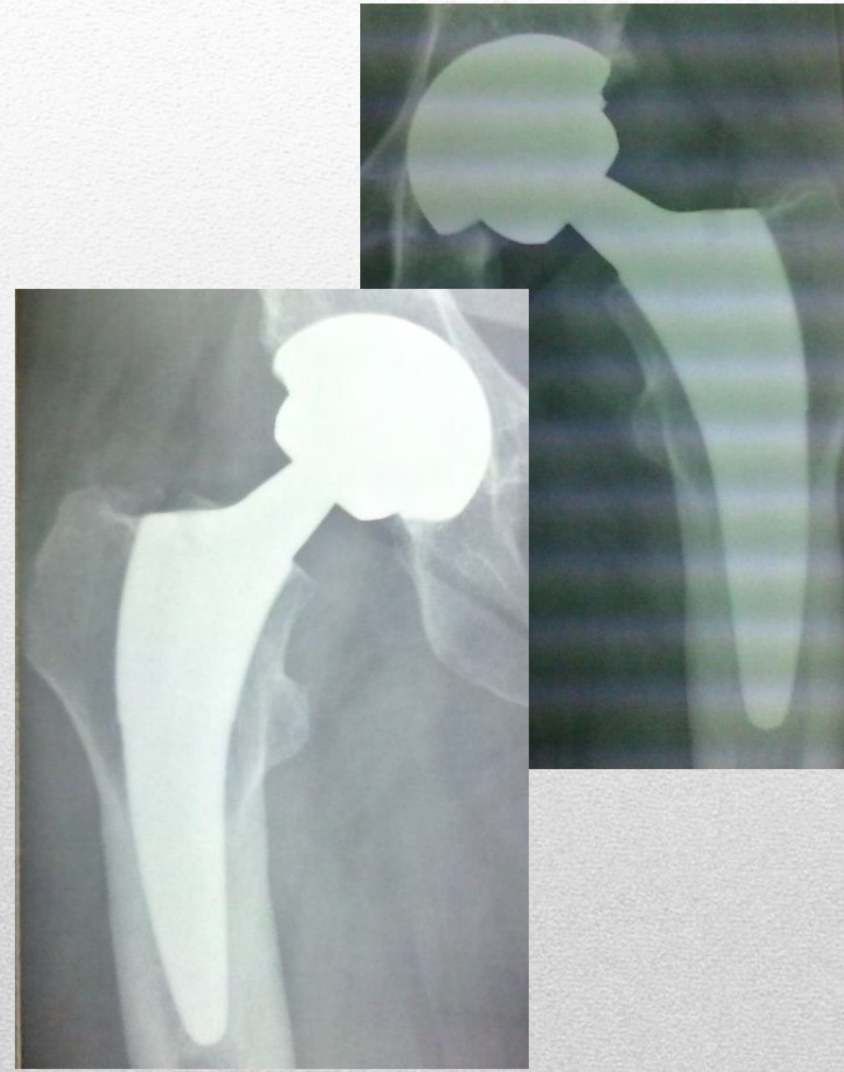
ROM	Pre-operative	Post-operative
Flexion	82.5±7.2	107.3±3.2
Extension	14.1±3.7	26.7±2.0
External rotation	7.3±6.8	34.0±3.8
Internal rotation	8.1±6.1	32.9±6.7
Adduction	7.9±5.1	18.3±1.2
Abduction	13.6±5.2	39.6±3.1

$p<0.001$

X-ray results

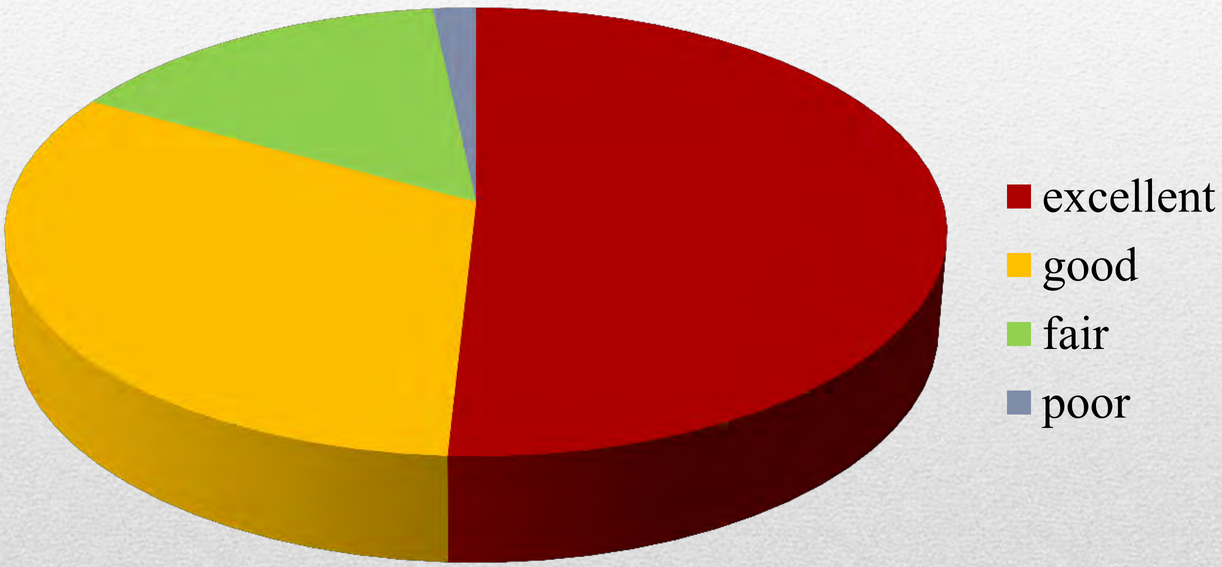
- No signs of stress shielding are visible on plane radiographs at the last follow-up

- Body Mass Density through Dual energy X-Ray absorbiometry wasn't mesured



Lower periprosthetic bone loss and good fixation of an ultra-short stem compared to a conventional stem in uncemented total hip arthroplasty. Salemyr M, Muren O, Ahl T, Boden H, Eisler T, Stark A, SkÖidenberg O. Acta Orthop 2015

Patient's satisfaction



Discussion

- Short femoral stems have been increasingly used in total hip arthroplasty.

- few clinical studies evaluating the outcomes of these stems and comparing them to their regular-sized counterparts.

- Encouraging functional results at a mid-term follow up

Discussion

• two hip revised

•Statistically significant improvement of ROM

•Statistically significant improvement of Harris Hip Score

• functional results similar or higher than other study with the same follow-up

•High patient's satisfaction

Short stems for total hip arthroplasty: initial experience with the Fitmore stem. Gustke K. J Bone Joint Surg Br 2012

Discussion

• no X-ray sign of stress shielding

• no BMD quantification was done in the different peri-prosthetic areas

•future study

limitations

- no evaluation of BMD
- no correlation between functional and X-Ray data
- relatively short follow-up
- small cohort of patients

Conclusionion

• Fitmore stem gives good funtctional results at a mid-term follow-up

•Throught bone spearing offers the possibility to use a standard stem in case of revision

•More case-control studies with a longer follow-up can be useful

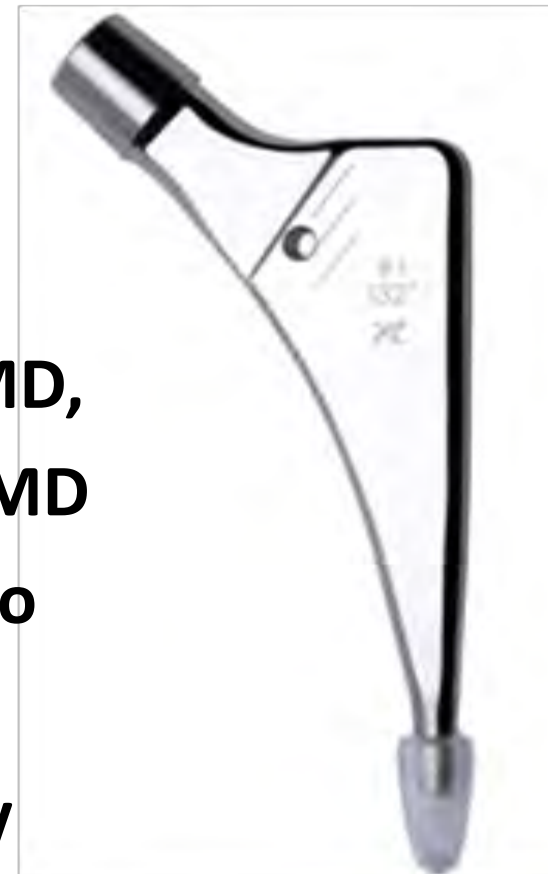
INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

FOURTH GENERATION CEMENTING TECNIQUE WITH A NOVEL SHORT-STEM IN PRIMARY TOTAL HIP ARTHROPLASTY



Luca Marega MD,

Pietro Gnagni MD

Istituto Clinico

S.Anna

Brescia- Italy

MY DISCLOSURE

- Consultant for Lima
- Royalties from Lima
- Consultant for Smith&Nephew
- Consultant for De Puy
- Consultant for Samo

I have a conflict of interest for this presentation

CEMENTED STEMS

- Still widely used expecially in elderly patients
- Unparalleled clinical results
- Technically more demanding
- More time consuming
- Difficult to revise
- Adverse reaction at implantation

SHORT CEMENTLESS STEMS WORK

- If cementless short stems work why shouldn't a short cemented stem not work

Professor
Francesco Saverio Santori

SHORT CEMENTED STEM

- Easier to revise
- Minimize stress shielding
- Reduced risk of cement adverse reactions
- Equally reliable than a standard cemented stem?

THE STUDY

- 100 CONSECUTIVE PATIENTS
- 3 SURGEONS
- 1 HOSPITAL (Istituto Clinico S.Anna Brescia)
- FROM MAY 2011 TO OCTOBER 2012
- FOLLOW UP REQUESTED FROM TUV

  2 YEARS
- PRESENT FOLLOW UP MINIMUM 3 YEARS

Evaluations

- **Time-points:** preoperative, at discharge, at 45 days, at 6 months, at 1, 2 and 5 years

- **Clinical and functional outcomes:**
  - Harris Hip Score (HHS)
  - Range of Motion (ROM)

- **Health-related quality of life:**
  - Oxford Hip Score (OHS)

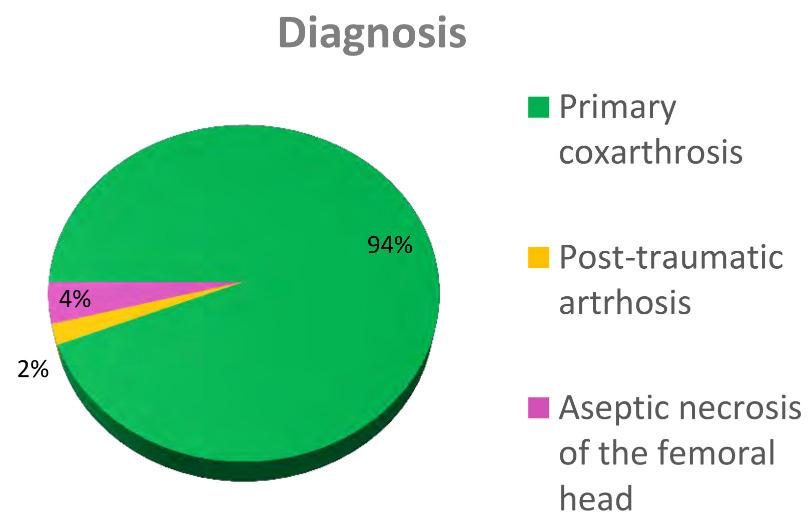
- **Radiographic assessment:**
  - Implant positioning
  - Radiolucent lines (DeLee & Charnley, Gruen zones)
  - Stem subsidence or medial/lateral tilt, stress shielding, calcar resorption, hypertrophy, osteolysis
  - Incidence of loosening, migration, failure of cement-ste interface or cement mantle, fracture, dislocation

- Incidence of **complications** and **failures**

Patients

From June 2011 to October 2012:

- **100 cases** (96 patients – 4 bilateral) of primary THA with Friendly short stem
  - 40 males
  - 60 female
- Mean **Age** 72.6 ± 6.2 (59-85) years
- Mean **BMI** 26.6 ± 3.9 (18.7- 35.7) kg/cm^2
- Diagnosis: **primary coxarthrosis** (94%)



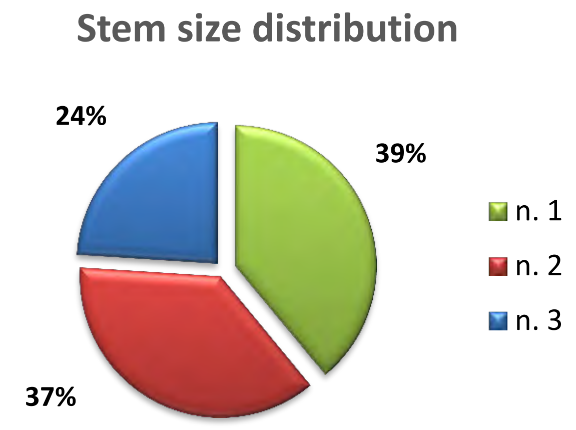
- Mean Follow-up: 2 years

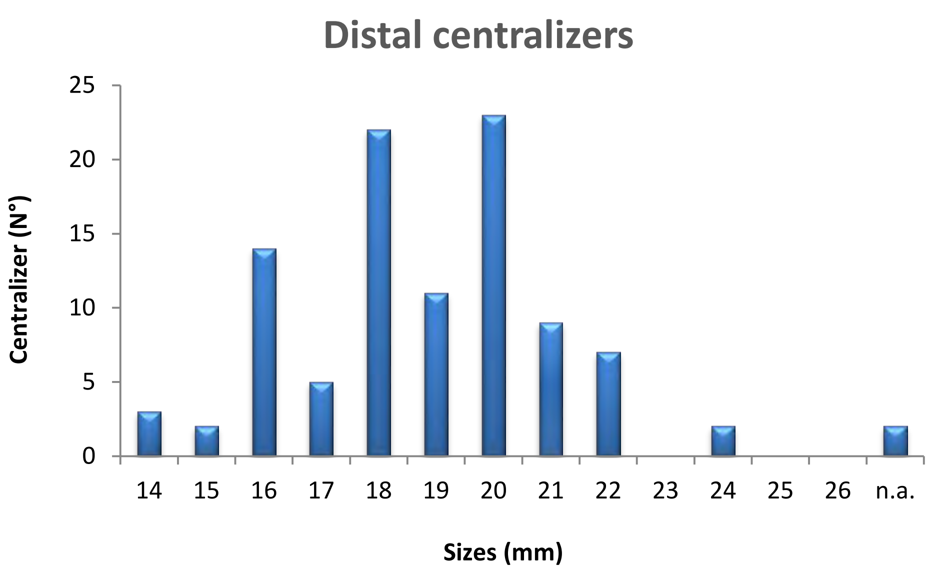
Intraoperative data

- Postero-lateral approach (Gibson-Moore) was used in all patients
- Spinal anesthesia and standard antibiotics prophylaxis in all patients
- Hemispherical press fit cup in all cases (Delta PF)
- Surgery time 58.8 ± 12.6 (40- 105) min
- Blood loss 276.47 ± 86.37 (200-600) cc

Implant data analysis

Stem sizes are equally distributed between the three sizes available





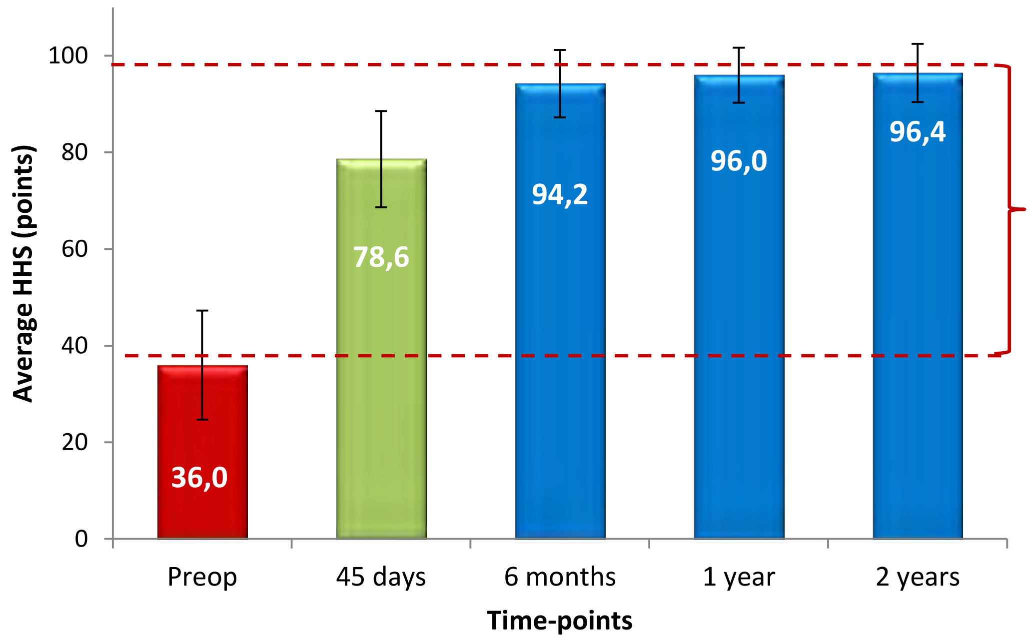
Most frequently used distal centralizers are 18 and 20 mm

Proximal centralizers were used in only 8 patients

Smartmix Cemvac GHV Gentamicin (Depuy) used in all the patients

Clinical results

Harris Hip Score

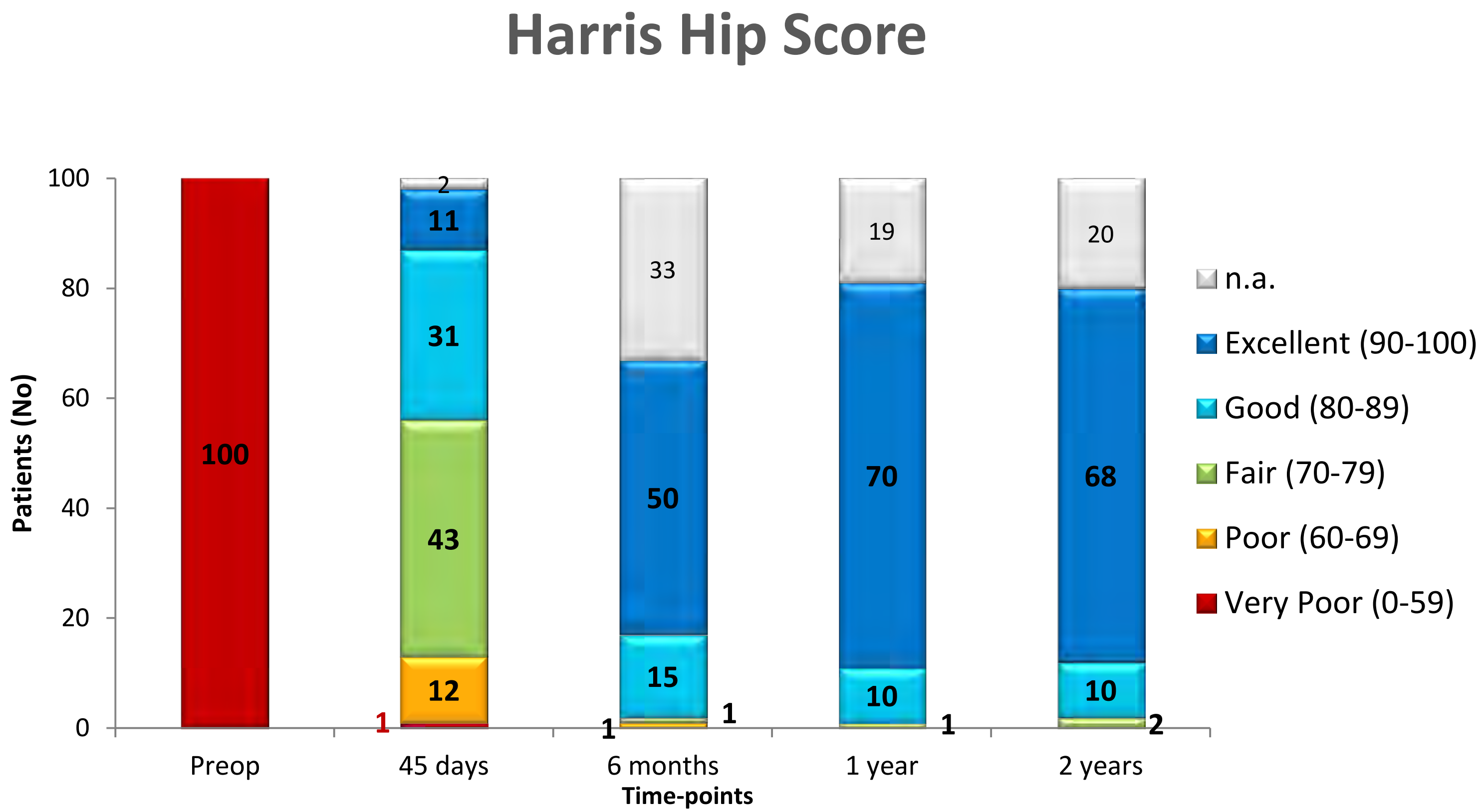


Δ (2 years FU - Preop)
60.4 points

Average **Harris Hip Score** increased from 36.0 preoperatively up to 96.4 after 2 years.

Excellent results were observed already at 6 months FU (94.2 points)

Clinical results

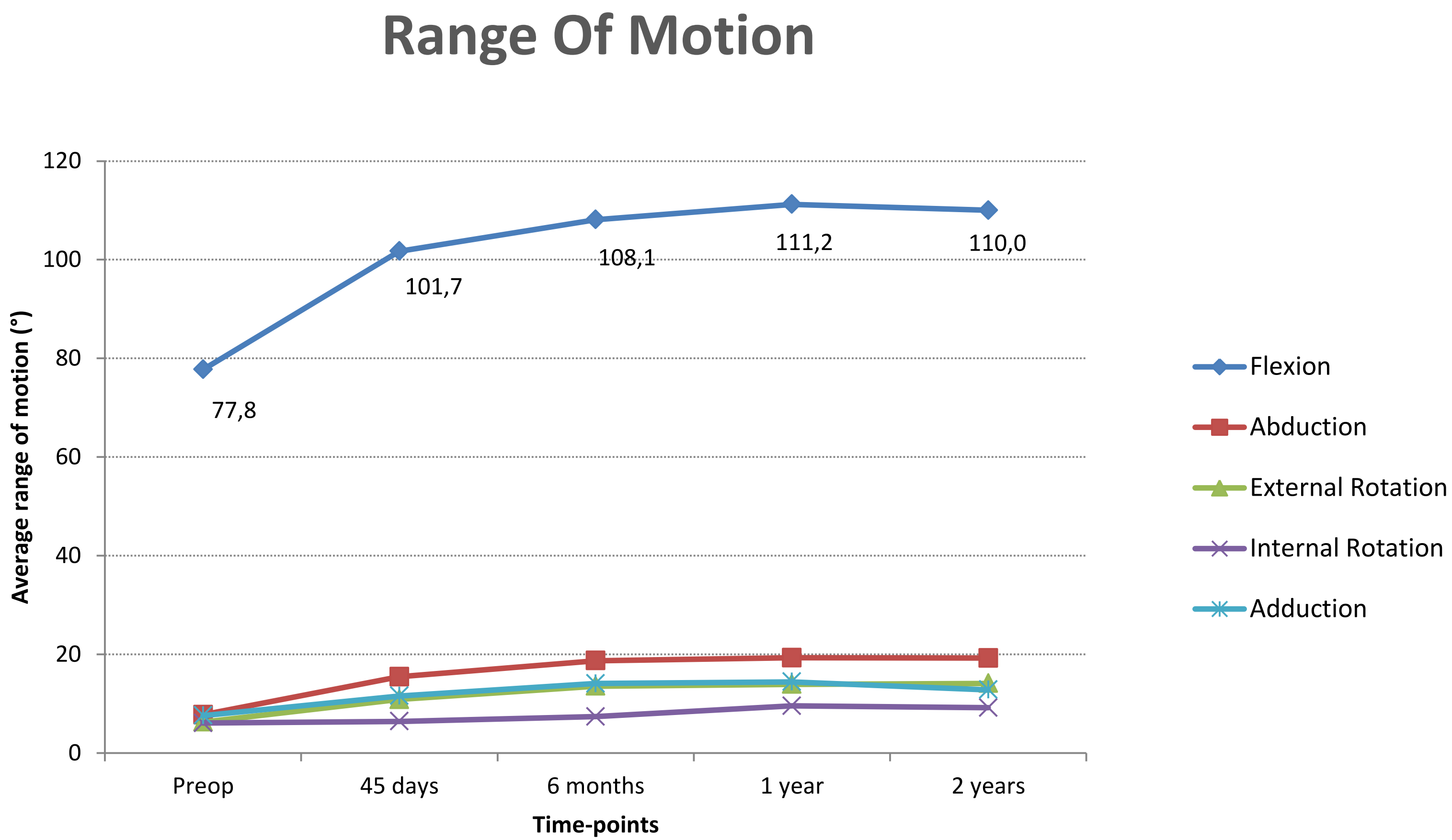


78% of the patients had a satisfactory HHS result (>80) after 2 years.

2 cases of fair result are due to comorbidities:

- 1 case of bilateral hip and knee replacement
- 1 case of controlateral THA

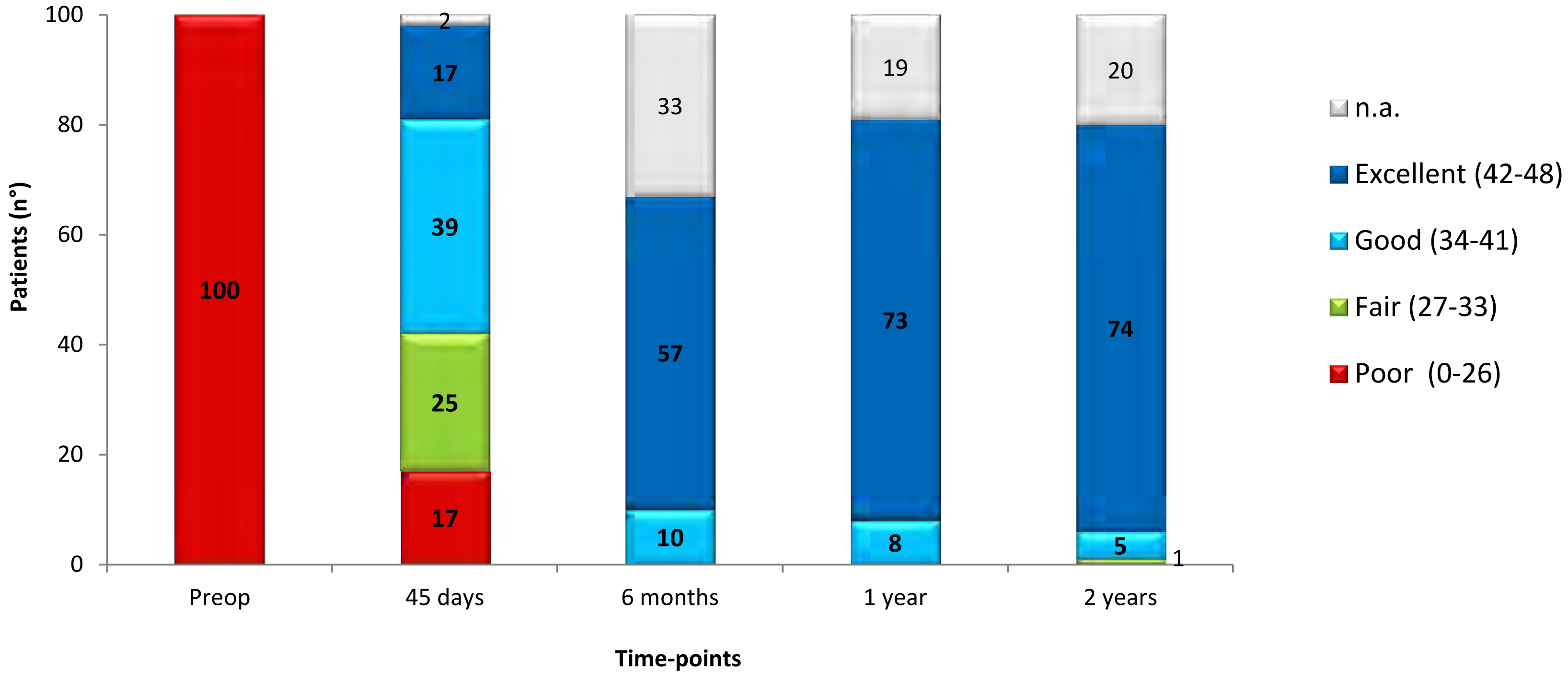
Clinical results



Average ROM significantly improved from preoperative to 1 year F.U. and then stabilized in all terms of motion

Clinical results

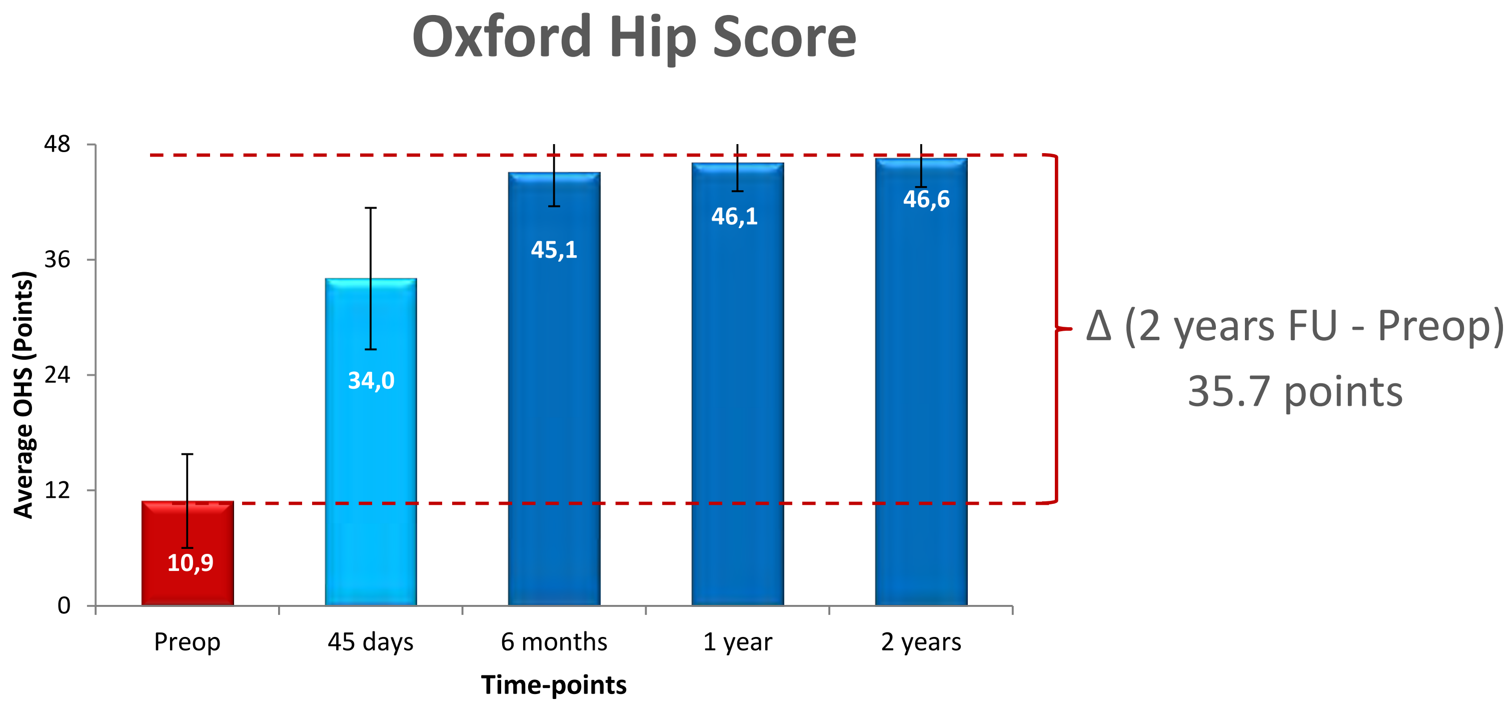
Oxford Hip Score



79% of the patients reported a significant improvement in terms of quality of life after 2 years.

Only 1 case of fair result: patient affected by Alzheimer’s disease

Clinical results

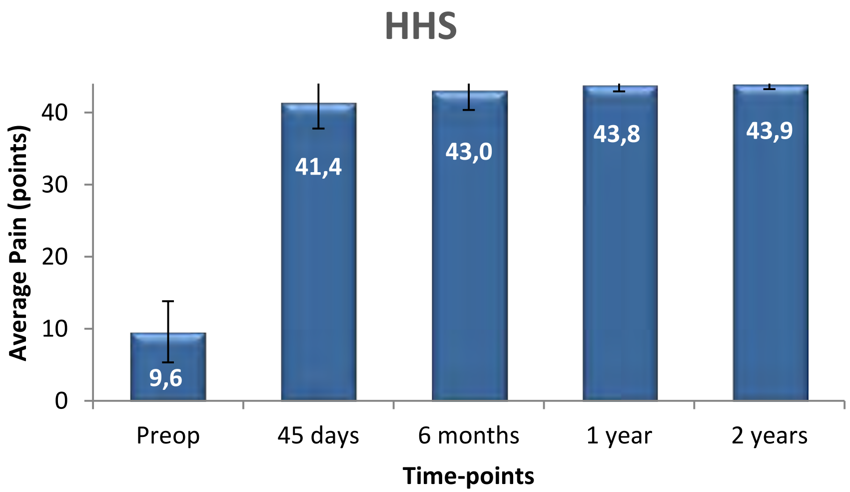


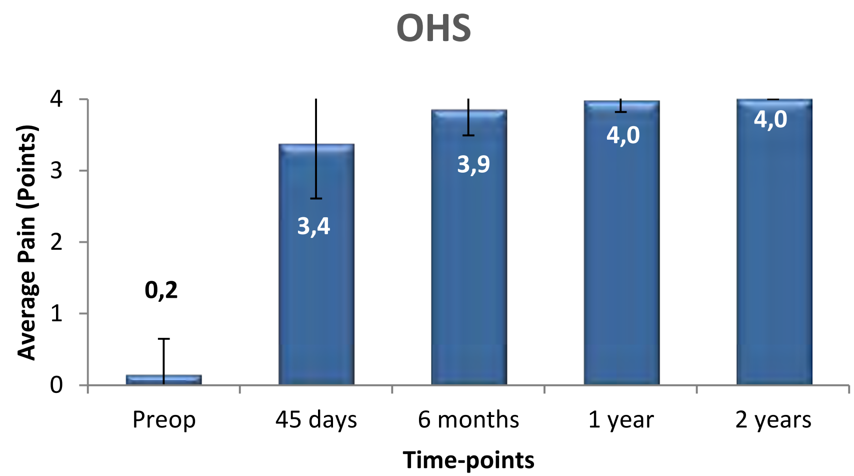
Average **Oxford Hip Score** increased from 10.9 preoperatively up to 46.6 after 2 years.

Excellent results were observed already at 6 months FU (45.1 points)

Clinical results

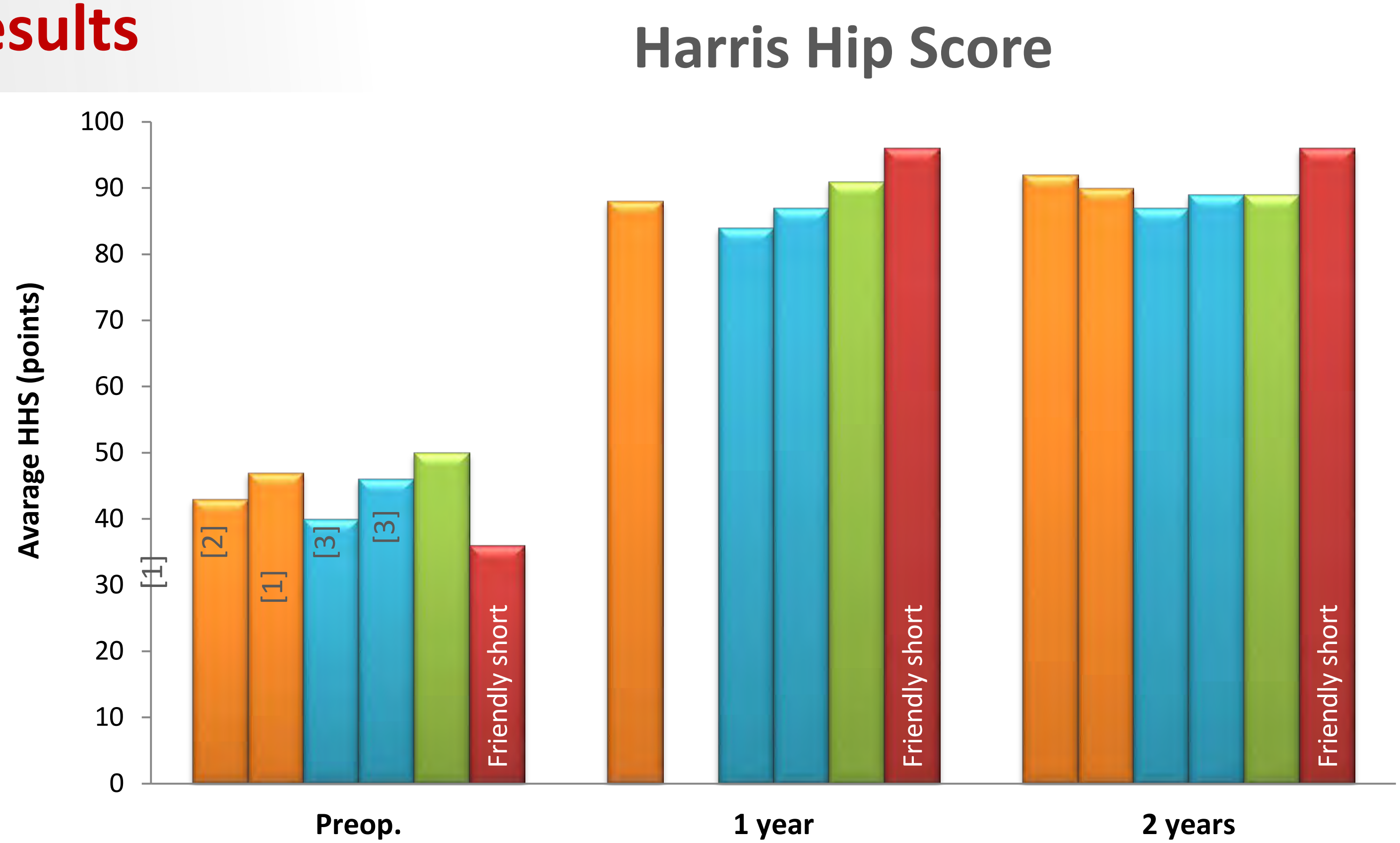
PAIN SUBSCORE





Excellent results in terms of pain relief: patients feel better already at 45 days postoperatively and have no pain at 2 years FU

Clinical results



Average HHS results are comparable to those found in literature for similar products but Friendly short have a greater change in the average HHS between preop. and 2 year F.U. results (60.4 points)

Orange: C stem Ek et al J. Arth 2005 Orange: C stem Sundberg et al JBJS 2005
Light blue: Exeter Ek et al JBJS 2005 Light blue: Exeter McCalden et al JBJS 2010Verde: CPCS (McCalden et al JBJS 2010

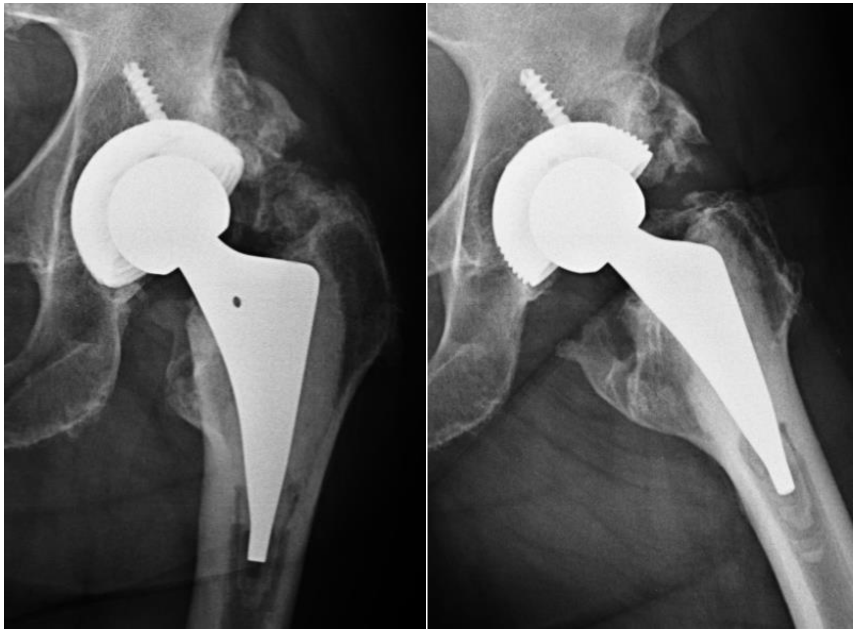
Radiographic results

- ✓ Good restoration of biomechanical parameters
- ✓ Good implant stability
- ✓ Stem sizing 100% Normal
- ✓ Diaphyseal axis-stem angle 2.86 ± 3.06 (0 – 10)
- ✓ Stem position: 59% Neutral, 29% Varus and 14% Valgus
- ✓ No migration, no subsidence, nor tilt
- ✓ No osteolytic area, nor loosening
- ✓ No cement fracture
- ✓ 1 case of radiolucent line <1mm
- ✓ 1 case of moderate athrophy

Complications

- ✓ 14% ossification at 2 years FU:
  - 6 cases of Brooker class I
  - 7 cases of Brooker class II
  - 1 cases of Brooker class III

  no major functional disabilities caused by heterotopic ossification



- ✓ 4%: 4 cases cerclage (old broach handle)

- ✓ 18% cases of cement voids not affecting the implant stability

Brooker *et al*. 1973

Conclusion

- ✓ Clinical (HHS) and patient subjective (OHS) results are very satisfactory and indicate a **significant functional improvement**
- ✓ The Friendly short stem demonstrate to achieve results comparable to standard cemented stem
- ✓ The design of the stem and the cementing technique achieves **primary stability**
- ✓ Radiographic outcomes indicate a **good implant stability** in the short term
- ✓ **Survival rate** of **100%**

RELIABILITY OF A LONG CEMENTED STEM

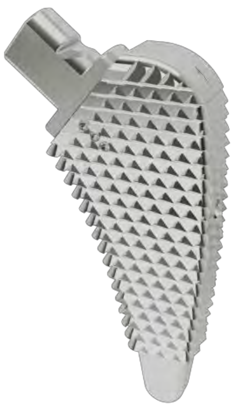
5.400 N Load
10.000.000 cycles

Embedding medium PMMA

CRITICAL POINT OF A SHORT CEMENTED STEM

- Perfect cementing tecnique
- Canal brushing and drying
- Distal restrictor/centralizer
- Distal cap on the stem (subsidence)
- Proximal seal and pressurization
- Proximal centralizer (optional)

MINIMALLY INVASIVE

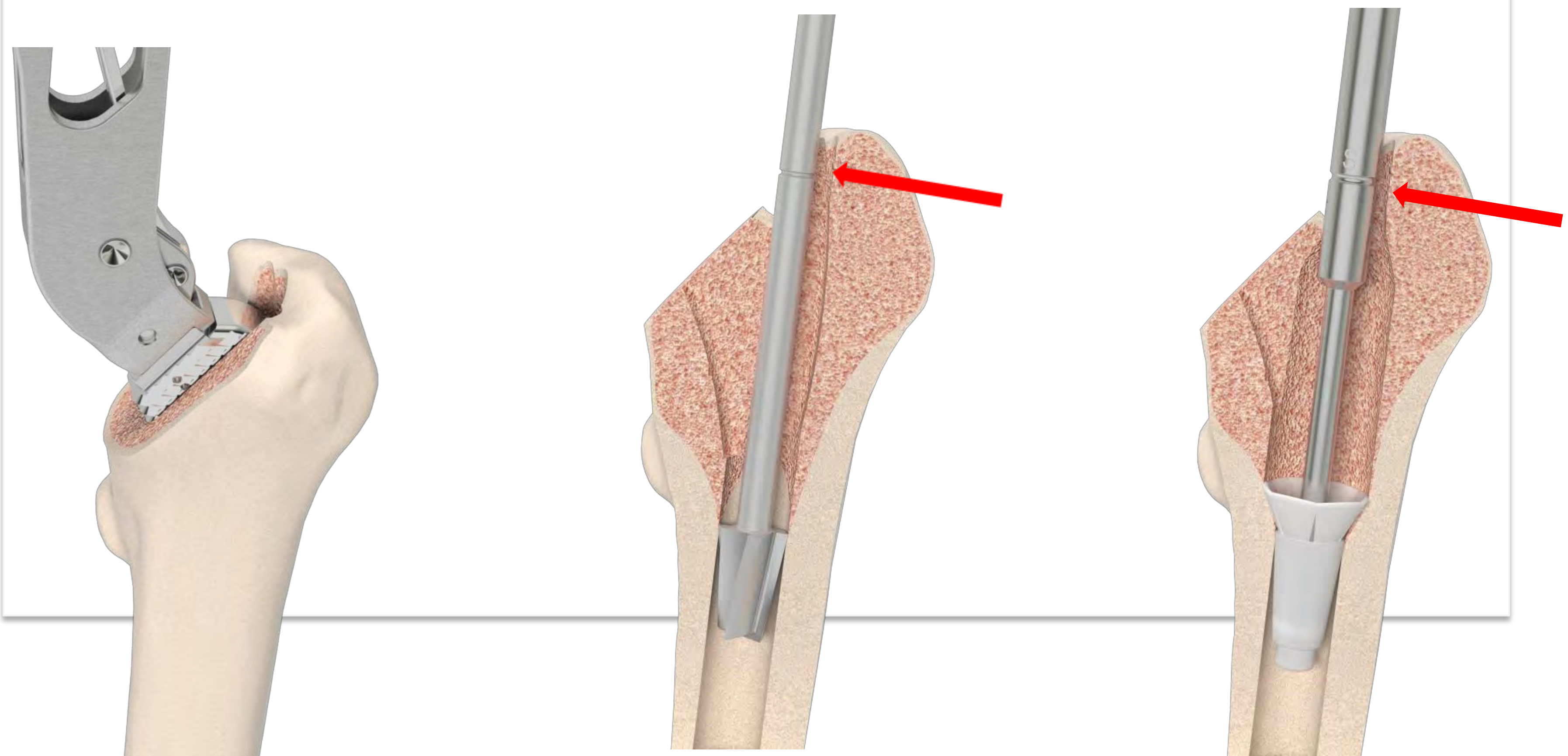


CEMENT MANTLE

2 mm per side of cement mantle

7 cm length

Perfect alignment
+
Controlled sinking



FRIENDLY SHORT

Bilateral patient:
Male 70 years old Primary coxarthrosis

Preop

1year FU
right hip

2years FU
right hip;
3years FU
left hip

FRIENDLY SHORT OFFICIAL LAUNCH

Friendly Short

EFORT NEWS

17th EFORT Annual Congress, Geneva, Switzerland (01-03 June 2016) | REGISTER NOW!

THANK YOU

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

Mid term results of a short cemented femoral component

N. Santori

D. Potestio

A. Bertino

F.S. Santori

Rome - Italy

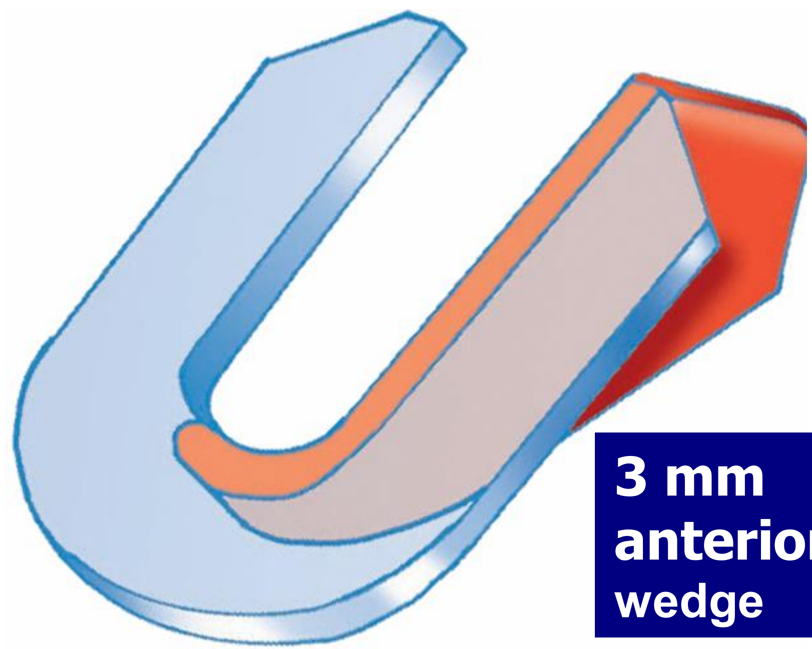
Friendly

Lima Corporate
Orthopaedic emotion

Polished
Collarless
Double-taper

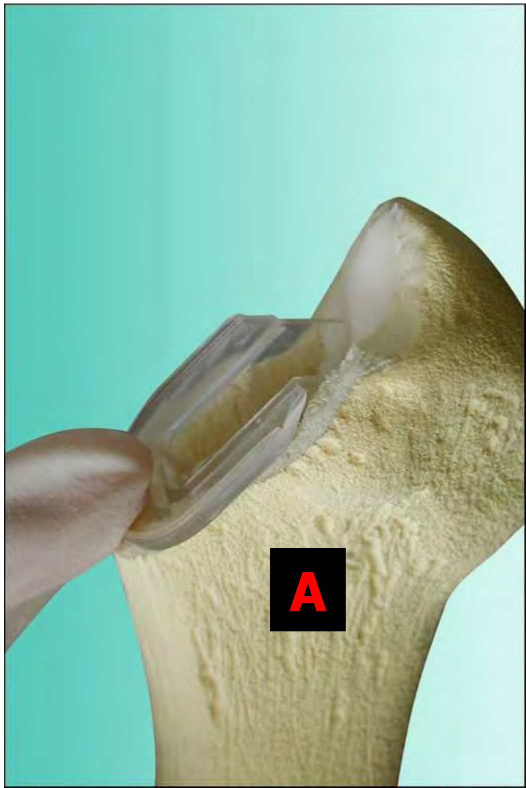
Friendly

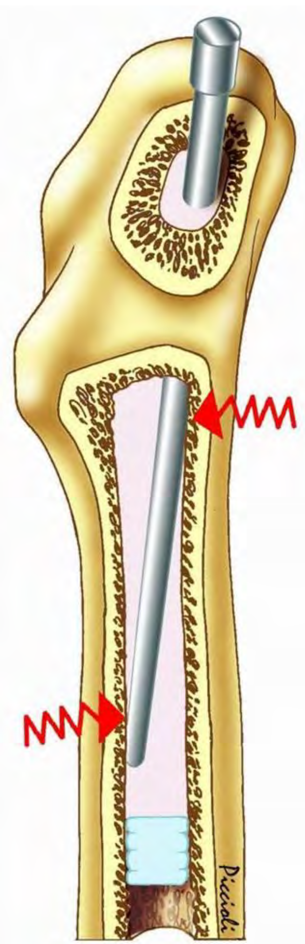
Proximal asimmetrical centralizer

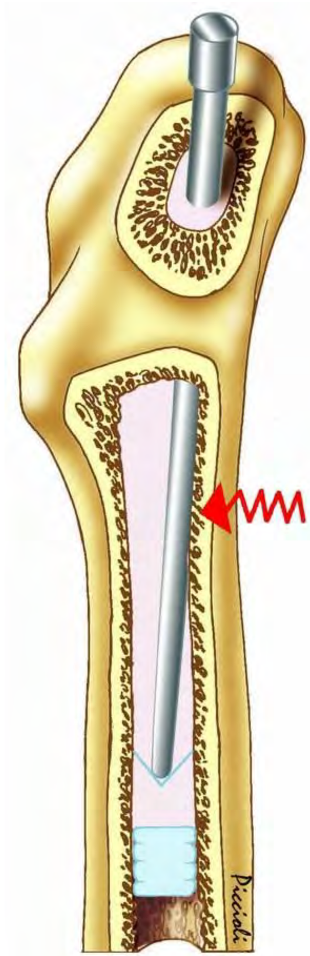


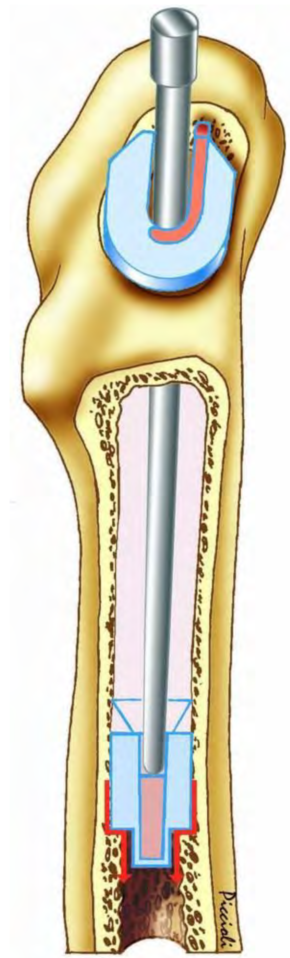
3 mm anterior wedge

4 mm medial wedge

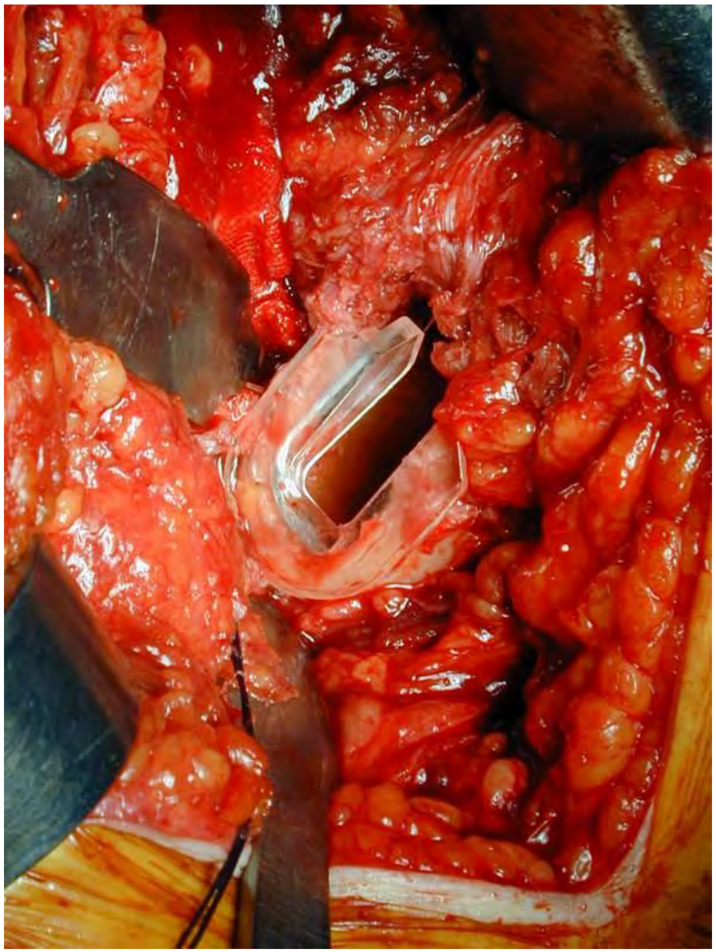


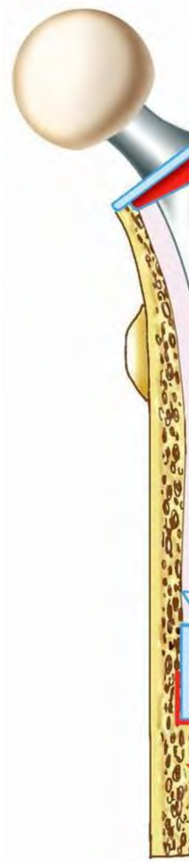




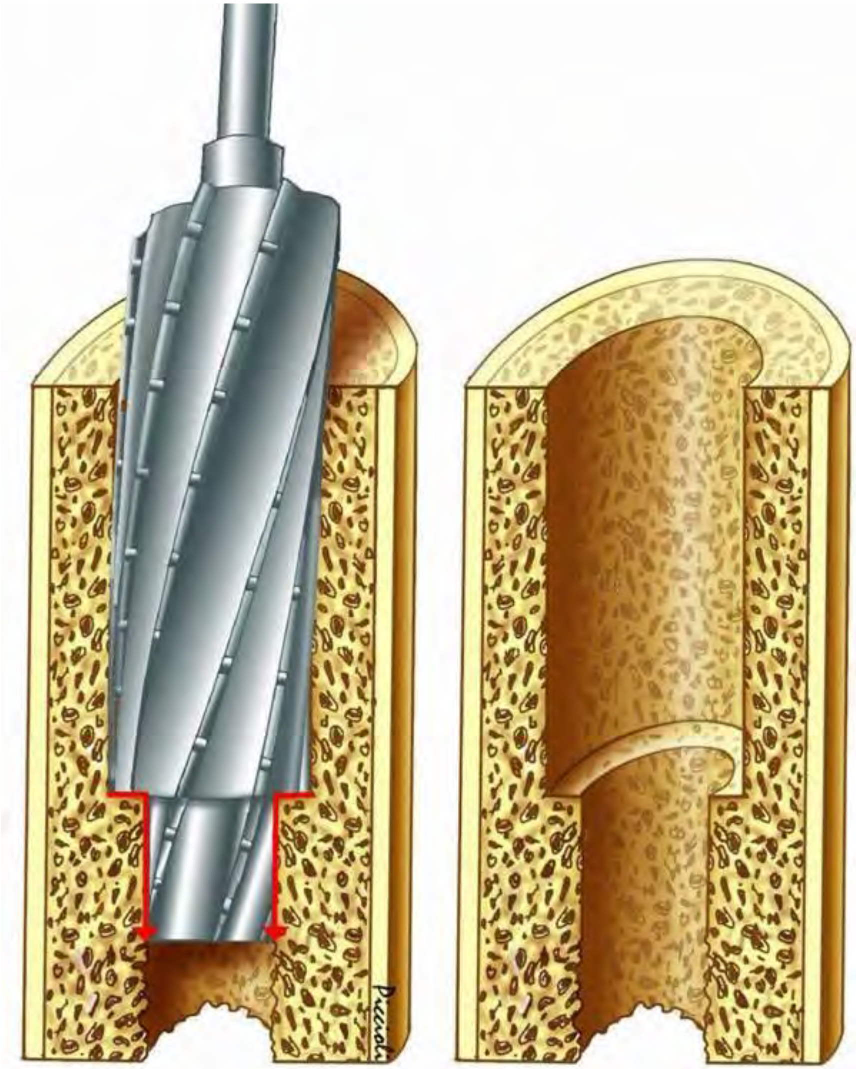


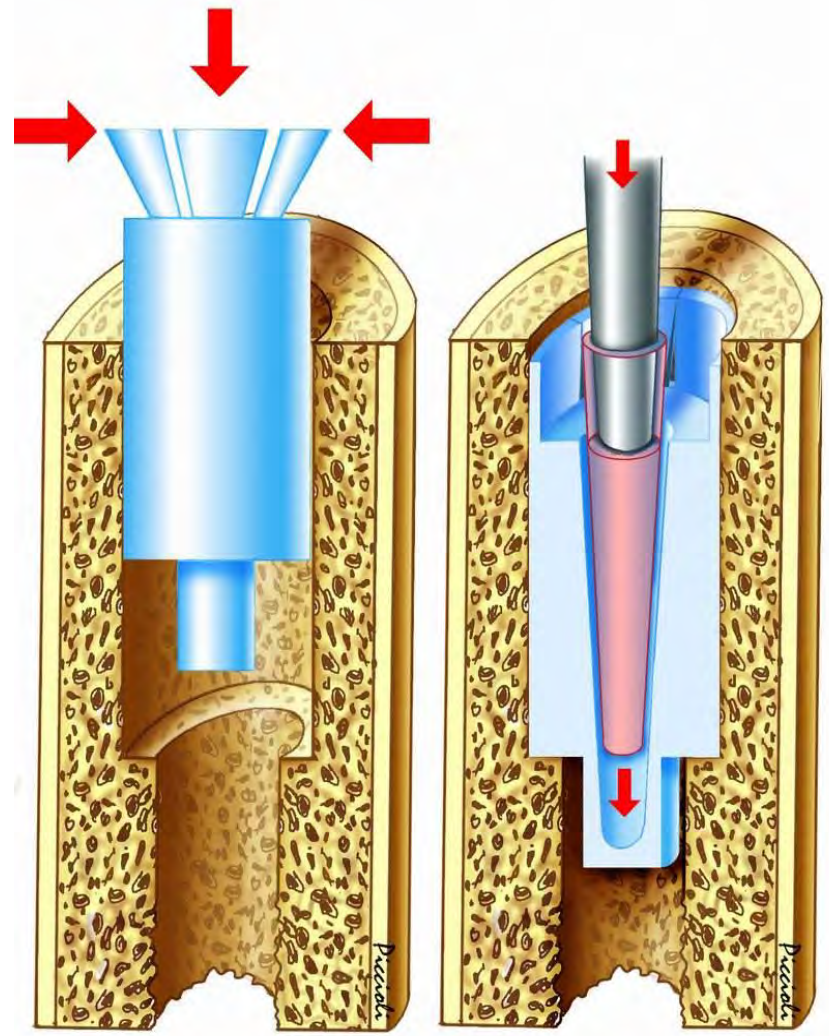
Medial wedge provides calcar cement thickness

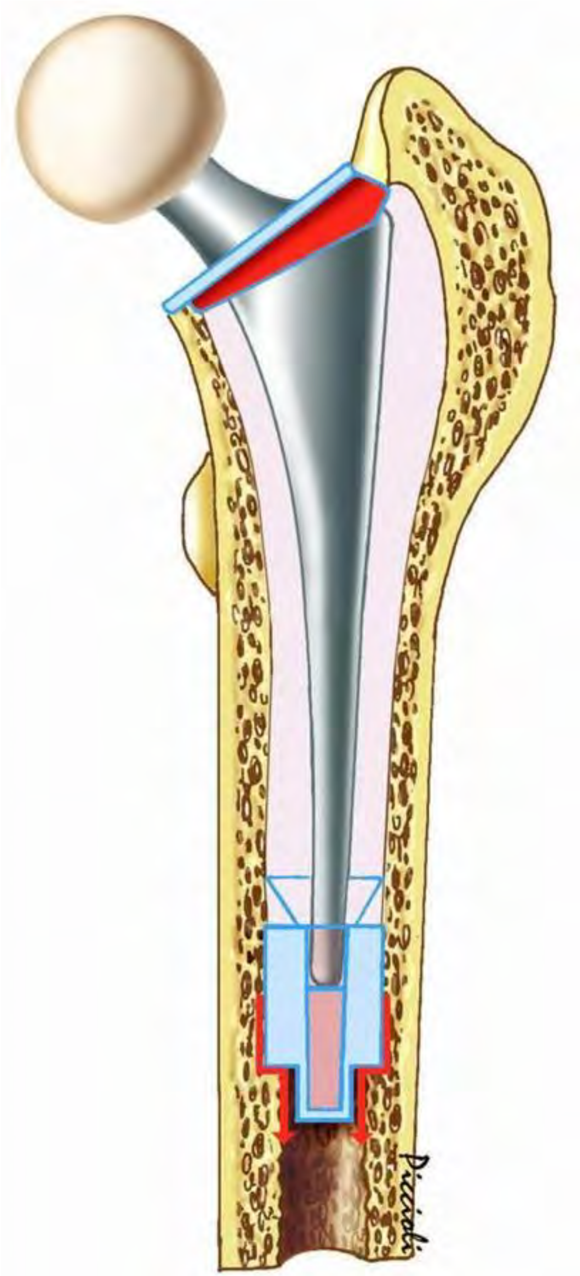




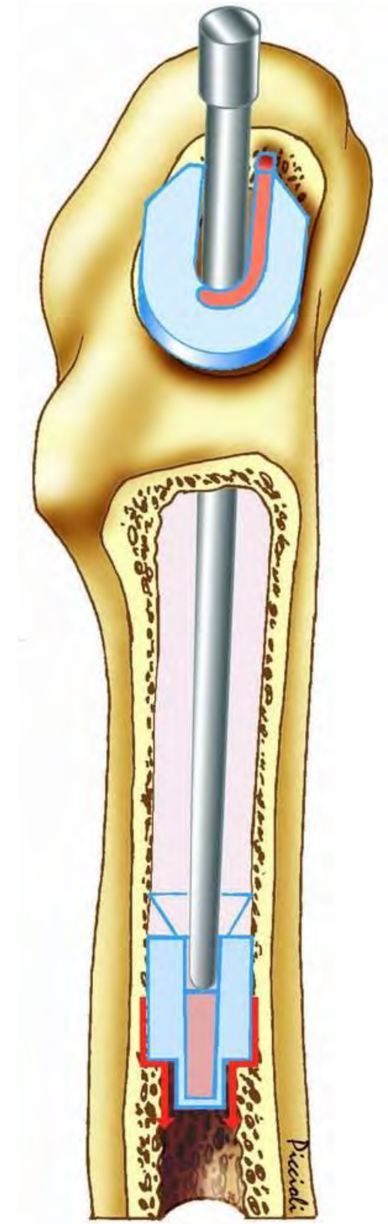
The distal plug is "seated" and acts as a centralizer

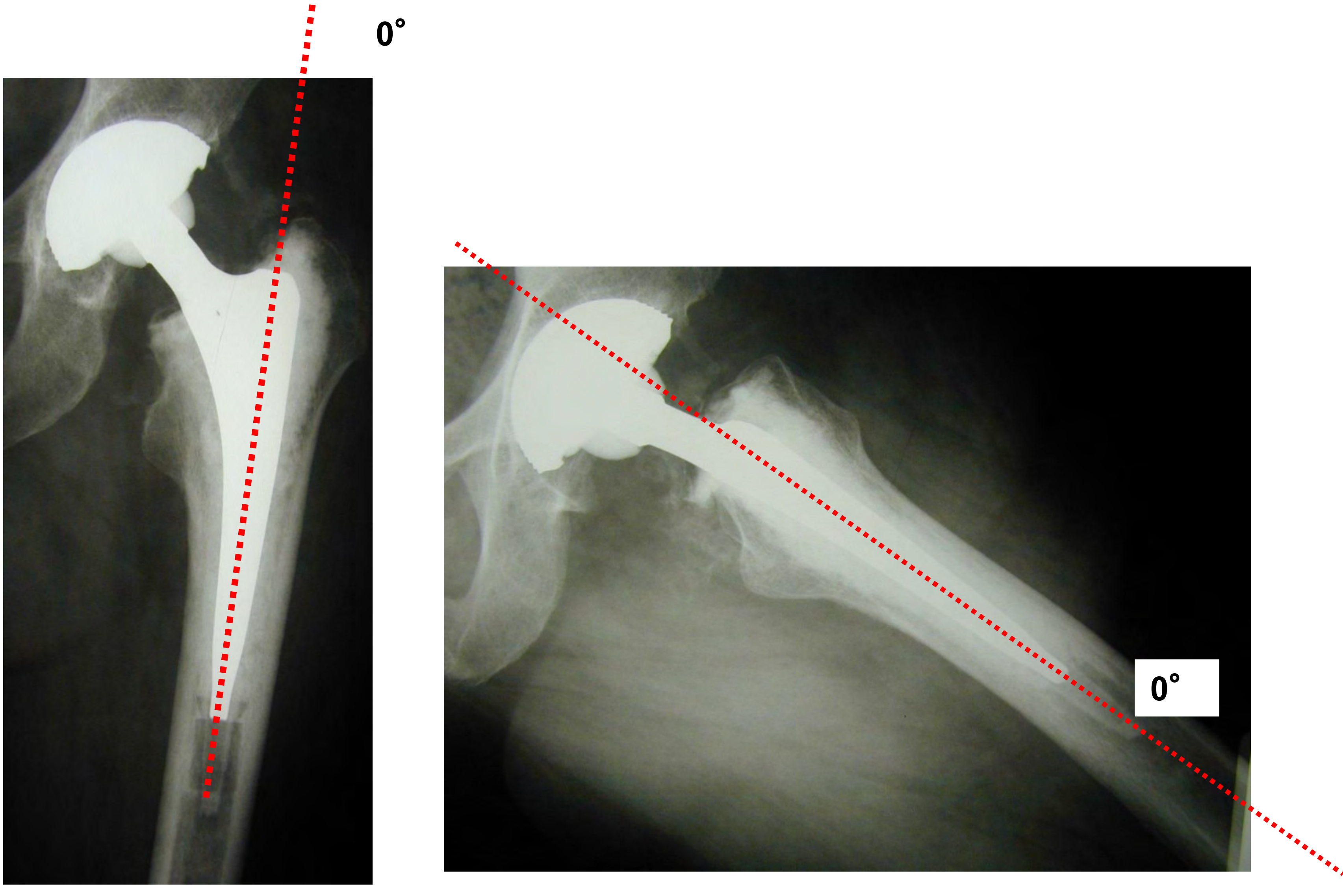






Fully guided implant




0°
0°

12 yrs FU

The Exeter **femoral stem continues to migrate during its first decade** after implantation: 10-12 years of follow-up with radiostereometric analysis (RSA).

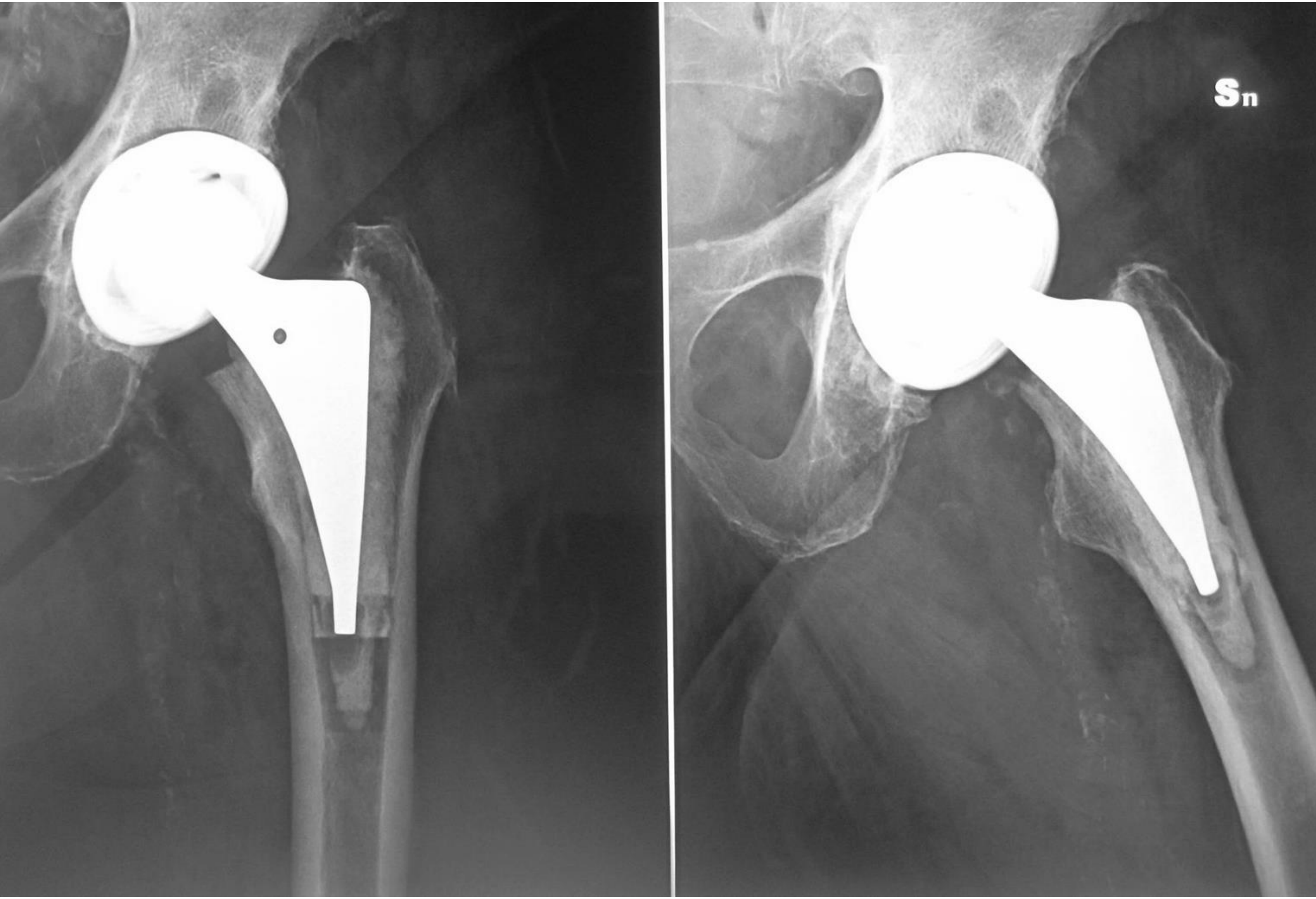
Nieuwenhuijse et al Acta Orthop. 2012

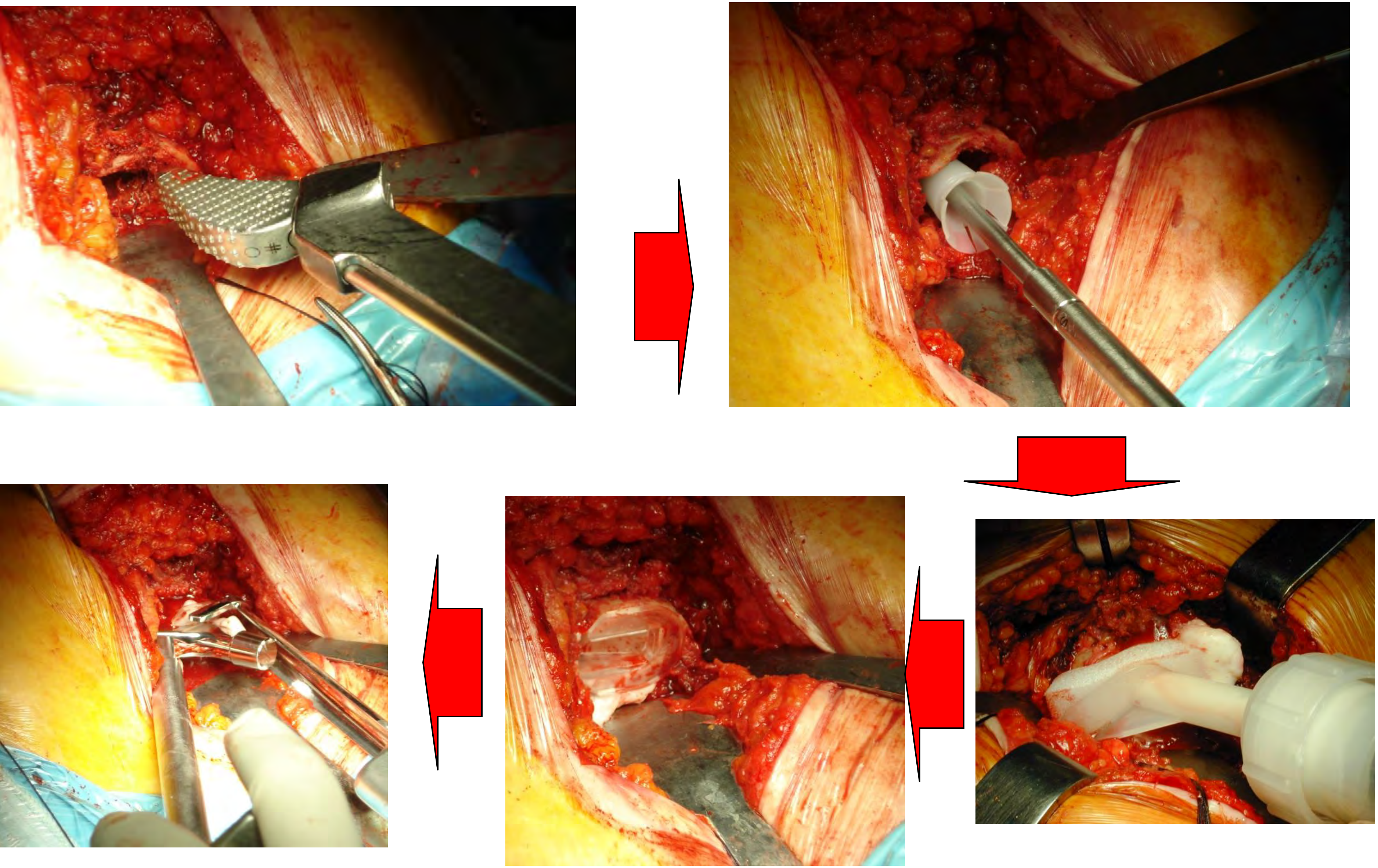
- continuous but small migration between 2 and 12 years of follow-up.
- Continued subsidence of 0.08 mm/year
- continued rotation in retroversion of 0.07° /year

2004- short version

3 sizes

(8.5 – 10 cm)


Sn



January 2005 >> January 2008

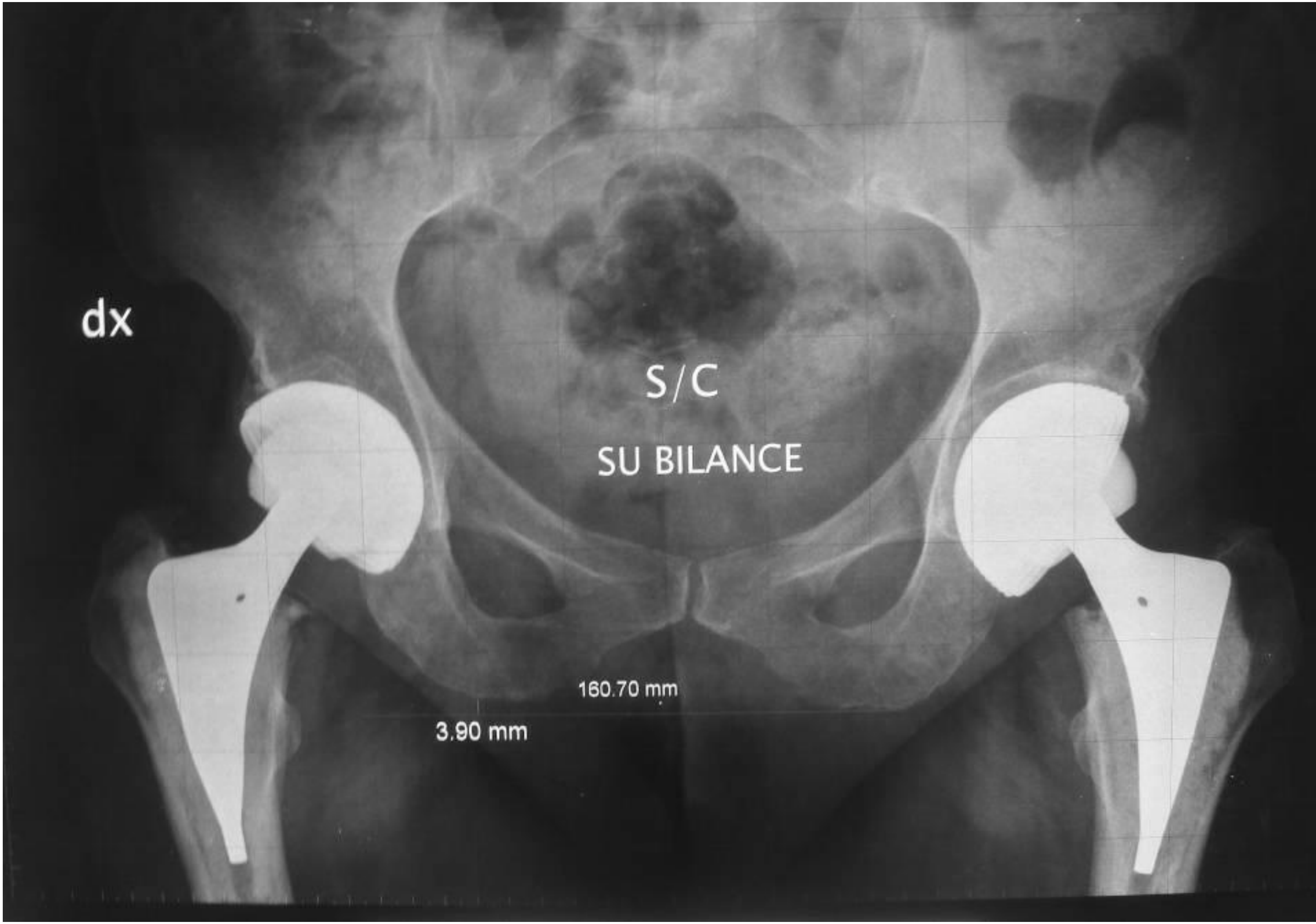
- 43 hybrid THR
  - Uncemented cup
  - Short polished cemented stem
- mean age 79 years (71 to 86)
- mean follow-up 7.9 years (7 to 10)

Clinical evaluation

HHS and WOMAC

Radiographic evaluation

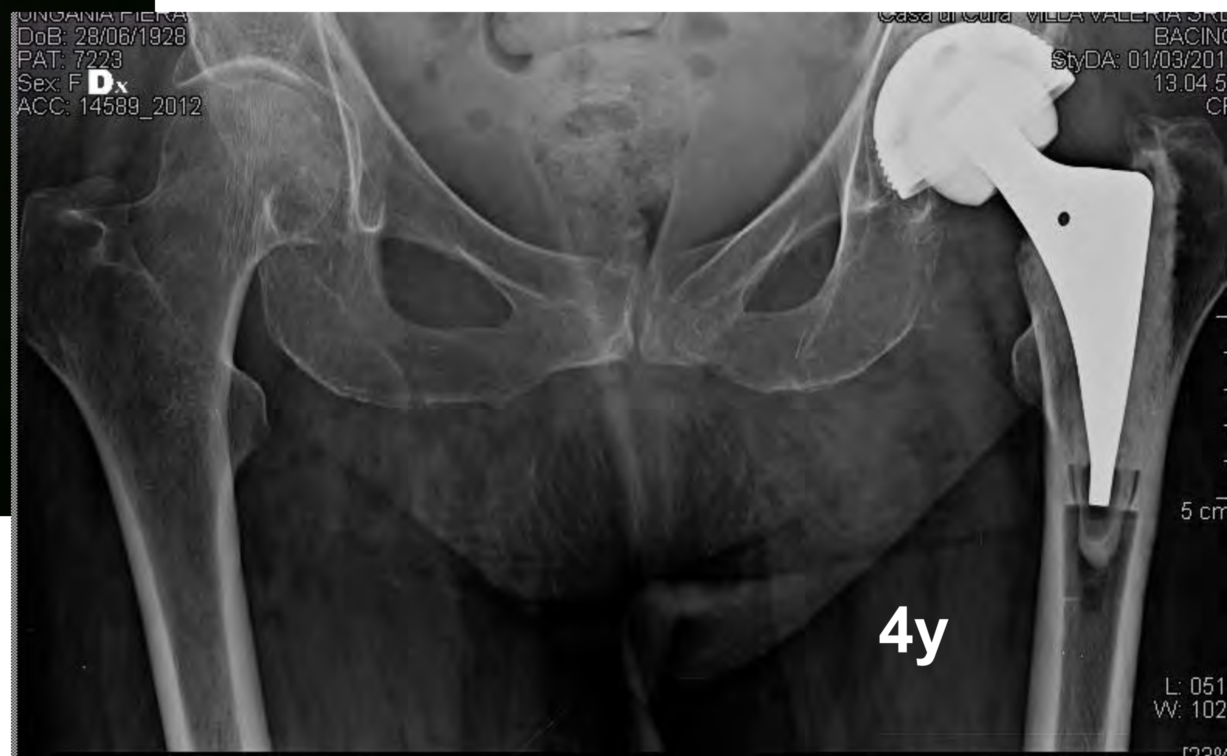
- Cement mantle quality (Barrak)
- Alignment


dx
S/C
SU BILANCE
160.70 mm
3.90 mm

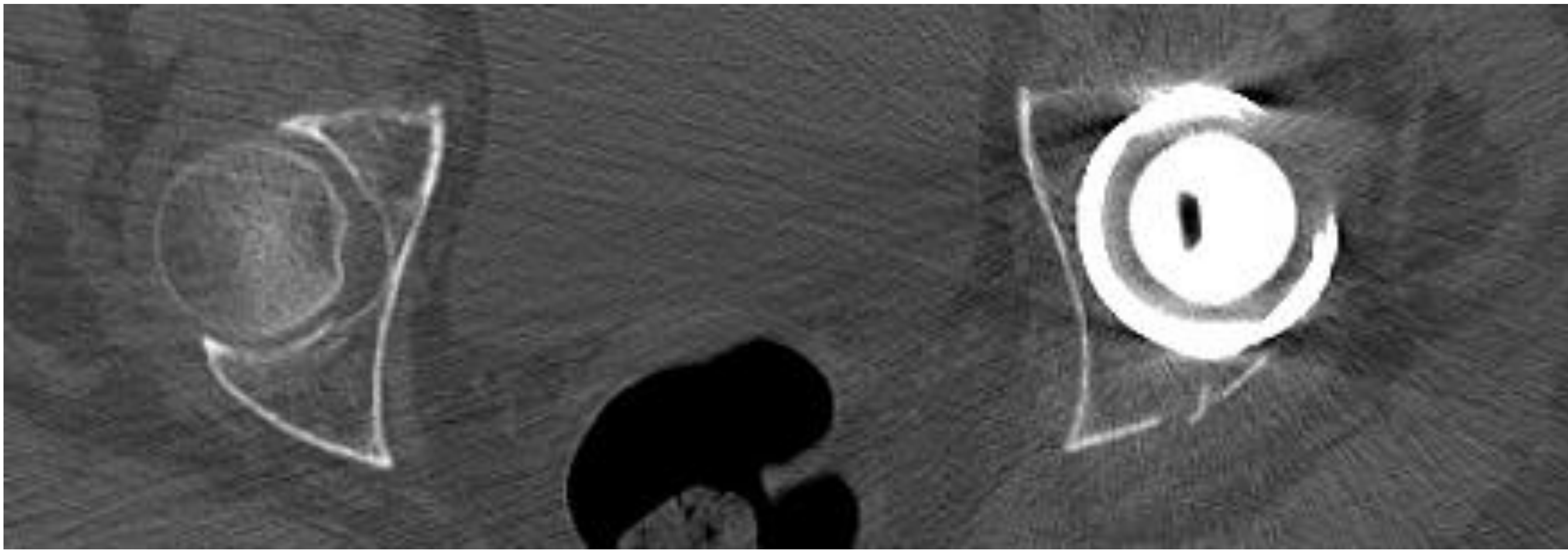

8 y

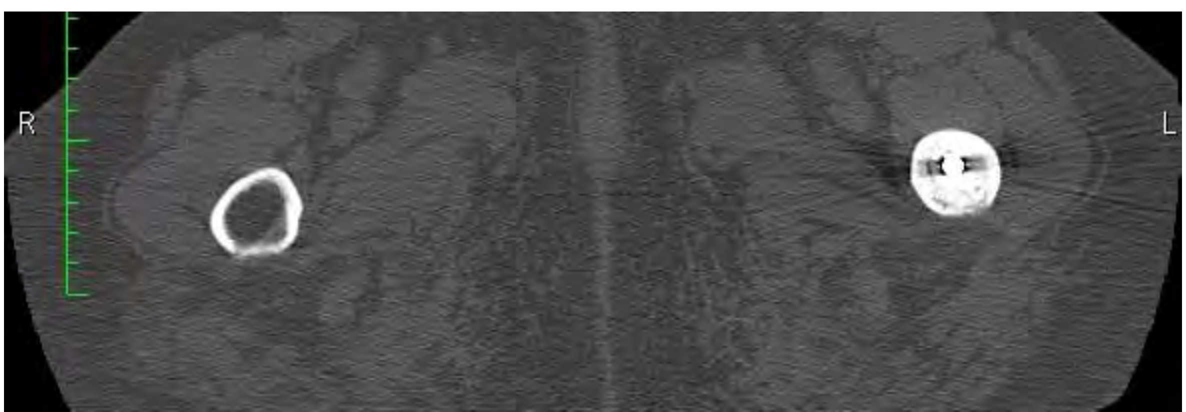

9 y

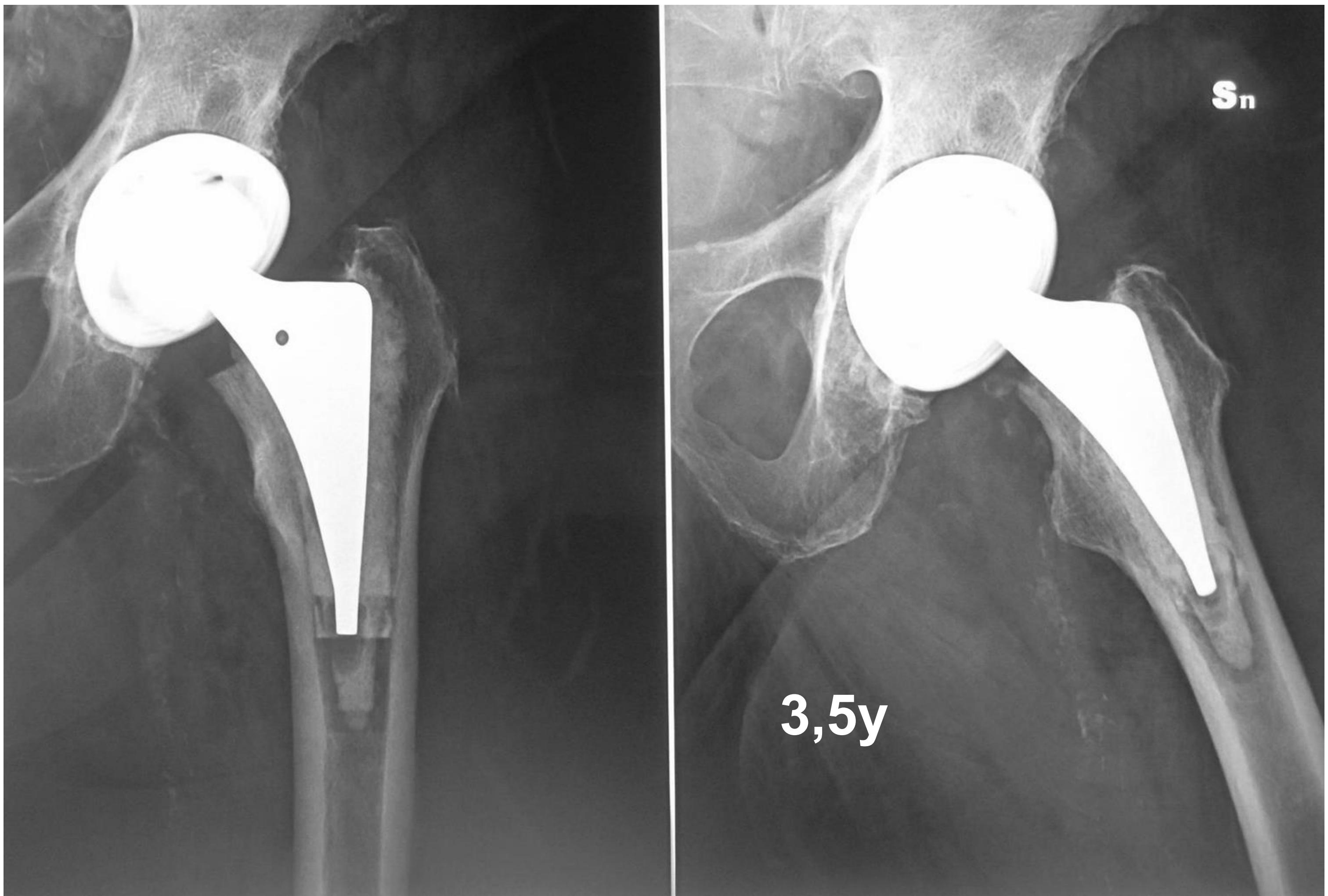
86 yrs femoral neck fracture



Trauma 5 yrs after surgery

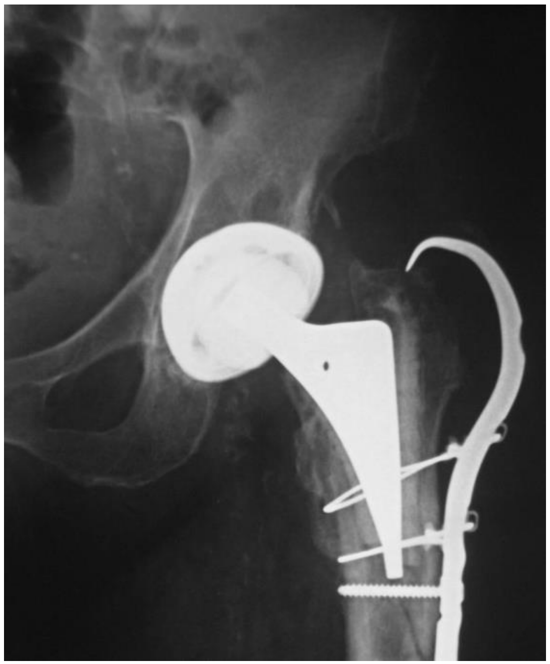


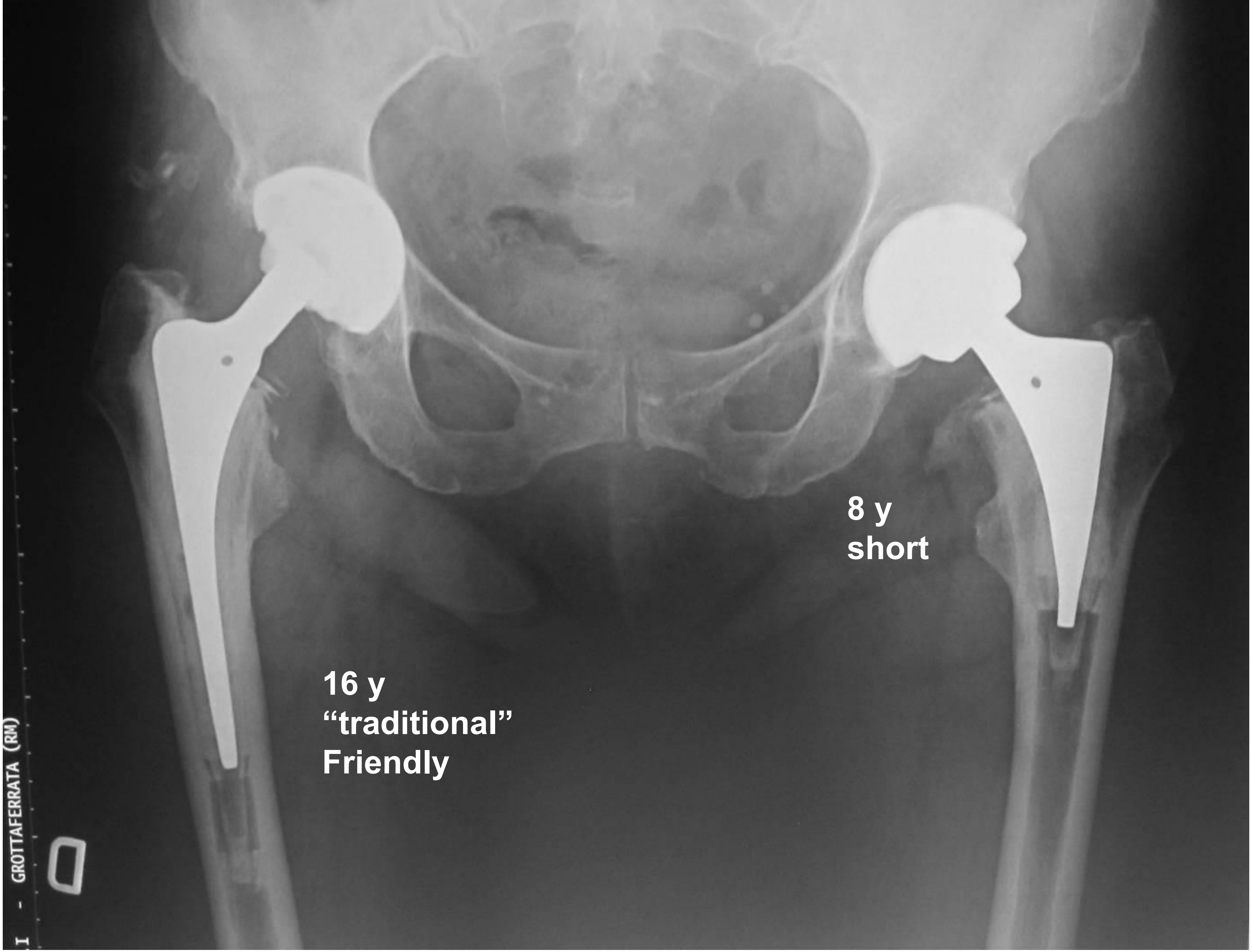



Sn
3,5y

Fall at home 4 yrs after surgery

92 yrs




8 y
short
16 y
“traditional”
Friendly
GROTTAFERRATA (RM)

Results - CLINICAL

- 11 pts died
- Complete FU for 32 hips
  - » 23 female
  - » 9 male
- No loosening

Considering 5 yrs as minimum

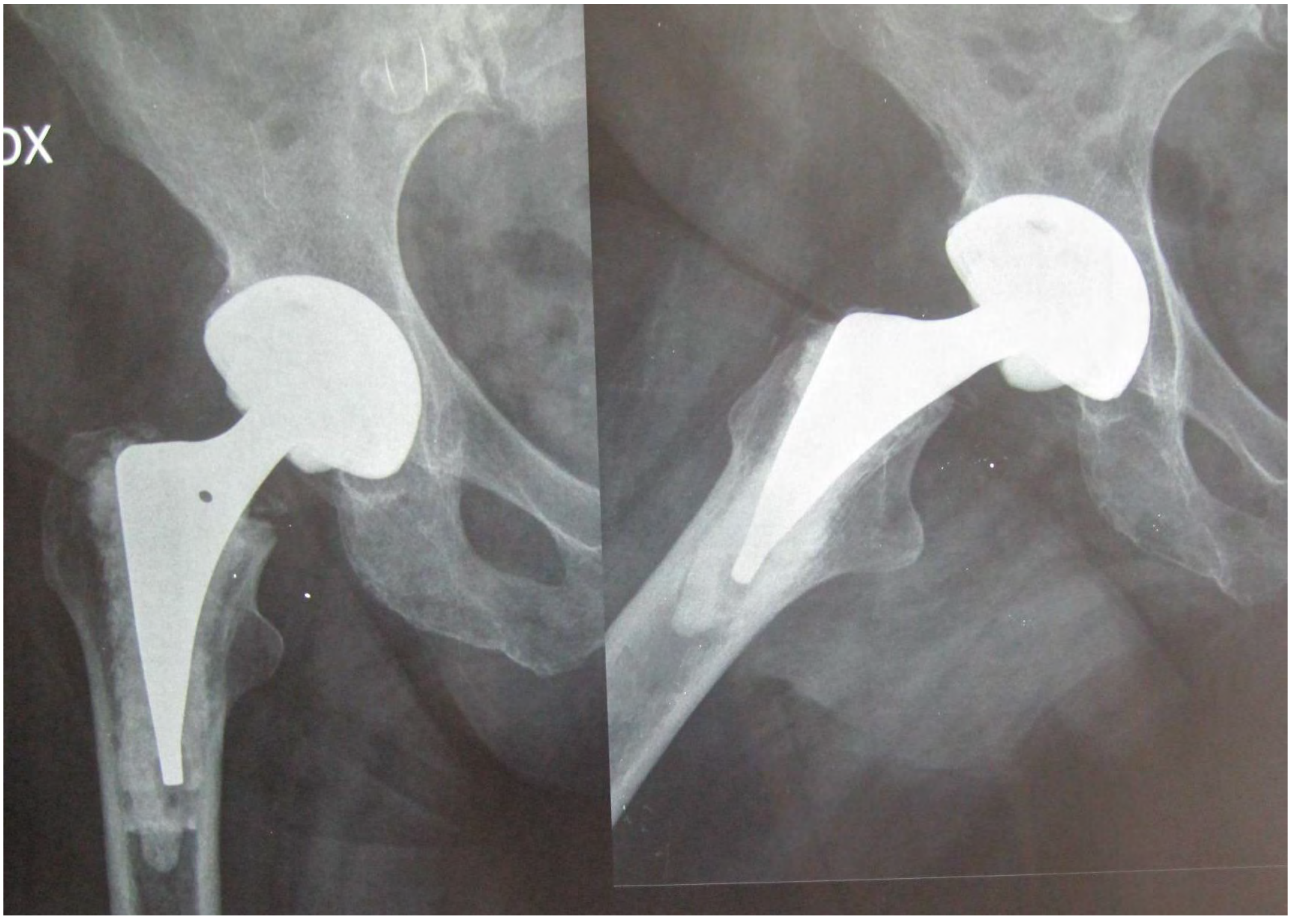
- 6/43 pts died before 5 yrs
- Complete FU for 37 hips
    - » 24 female
    - » 13 male
- No loosening
- HHS 45 » 93
- WOMAC 55 » 90

Results - radiological

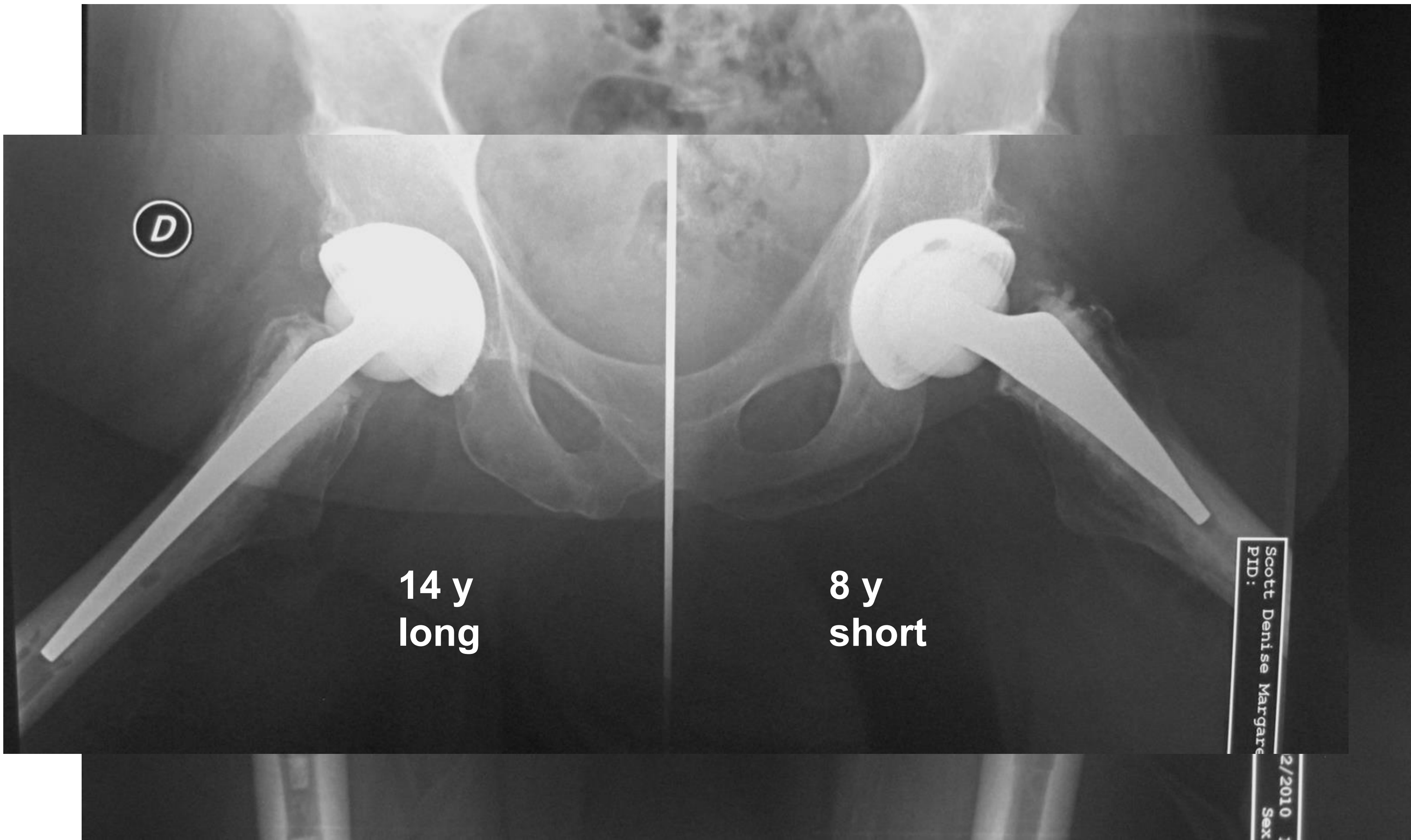
Bone - cement interface
according to Barrack and Harris
JBJS The Journal of Bone and Joint Surgery 1992

- Barrak A (white - out) 37/37
- Subsidence whitin the cement mantle 16/37
- Plug migration 0/37
- Cement leakage 0/37
- Axial malalignment (>3°) 0/37
- Osteolysis 0/37
- Radiolucent lines > 2mm 0/37
- Cortical hypertrophy 0/37
- Calcar resorption 0/37
- Plug malposition 1/37
- Communication breakdown 1/37

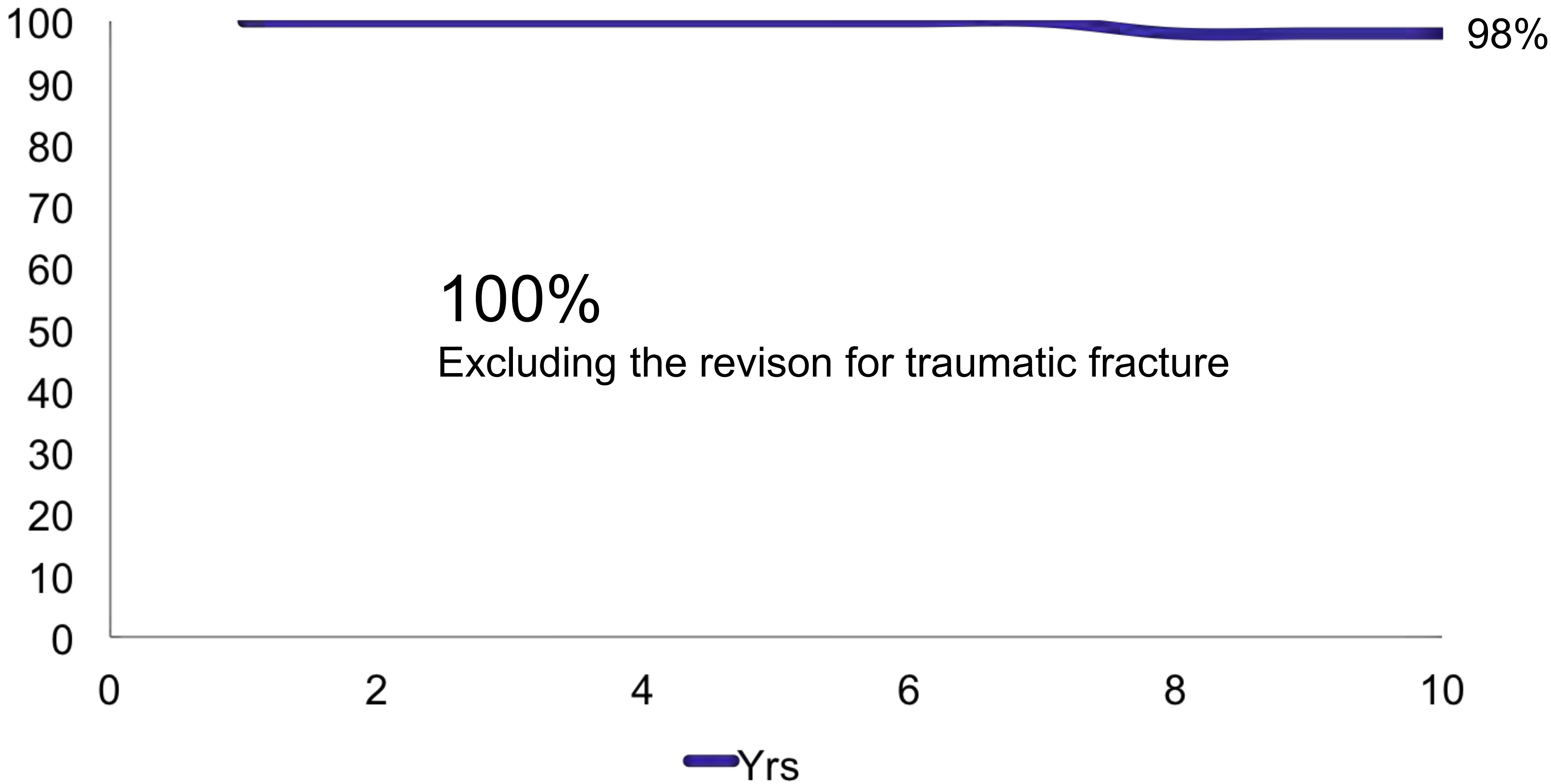
Plug too distal



“communication breakdown“



% survival considering stem revision as end point



conclusion

- Fully guided – surgeon proof technique
- Perfect cement mantle at mid term
- Huge advantages in case of future revision

thank you

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

"FEDERICO II" UNIVERSITY
Naples - Italy
Department of Orthopaedic Surgery

EARLY RESULTS OF A CONSERVATIVE HIP STEM

M. Rizzo, A. Bernasconi, S. Cerbasi, P. Recano, G. Grillo, M. Mariconda

CONSERVATIVE FEMORAL STEMS

The use of short stems in THA is growing.
Initial short and mid-term follow up studies of a number of these stems suggest that stable, durable fixation and excellent clinical outcomes can be achieved.

Trochanter-sparing stems

↓

METAPHYSEAL STABILIZATION

GTS STEM

The GTS stem design is based on the three-dimensional tapered stem philosophy, similar to the cementless CLS stem

FEATURES

Tapered wedge design → Metaphyseal stabilization through cancellous bone compaction

Elliptic octagonal stem cross-section → Torsional stability

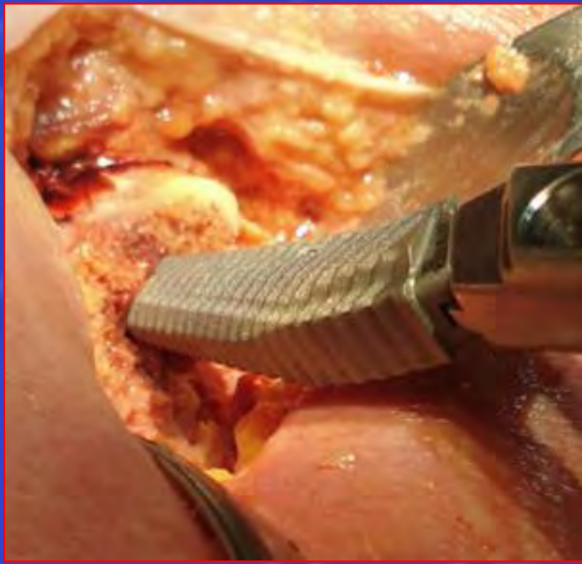
Longitudinal fins → Improved torsional stability

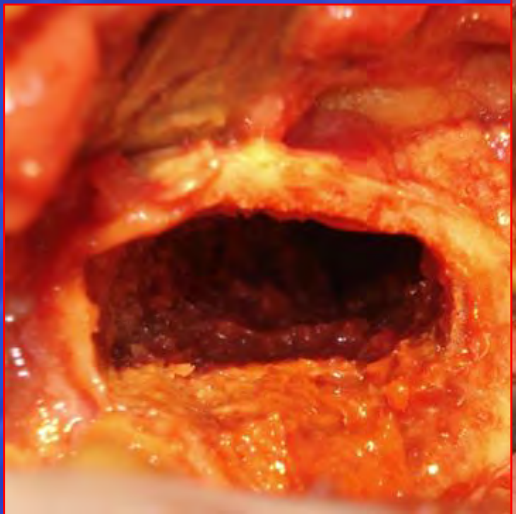
Reduced lateral shoulder → Bone tissue sparing

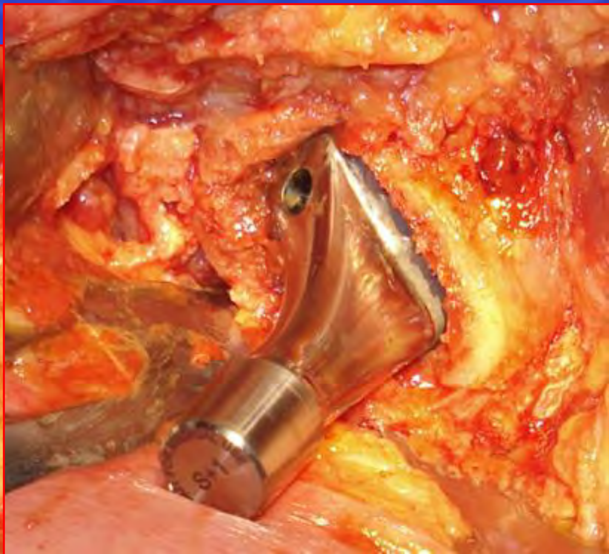
Great Trochanter Saving

- The femoral neck cut is an oblique cut

- This stem allows us to reach the top of spinal canal and to orient it correctly







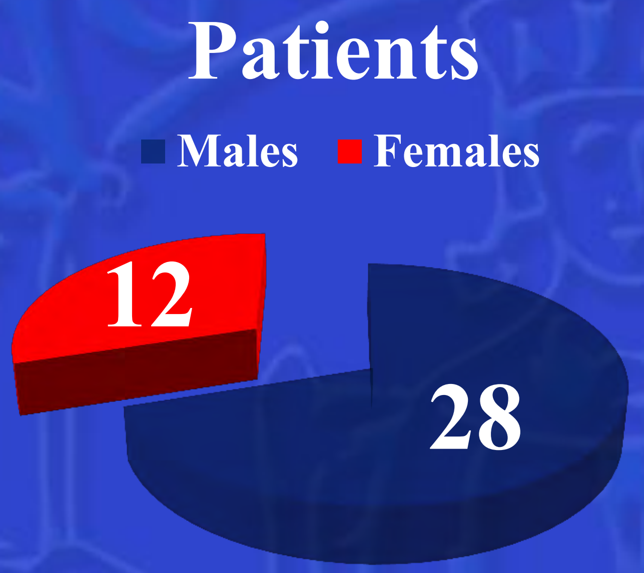
AIM OF THE STUDY

To report short-term clinical and radiographic results of the GTS® stem.

Materials and Methods

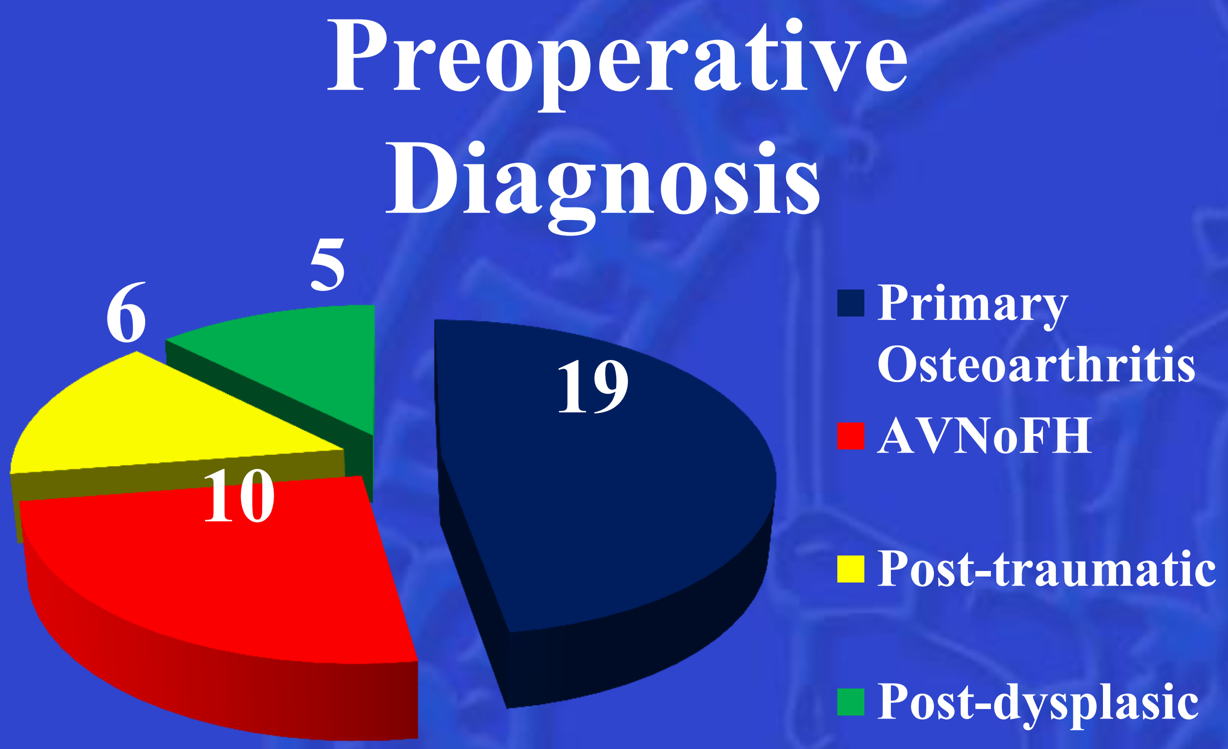
Retrospective study of prospectively collected data

40 patients who underwent Total Hip Arthroplasty with a Biomet GTS stem from the years 2011 to 2013.



Mean age: 48.5 y (31-81)
Mean Follow-up: 26.3 months (15 -40)

Materials and Methods

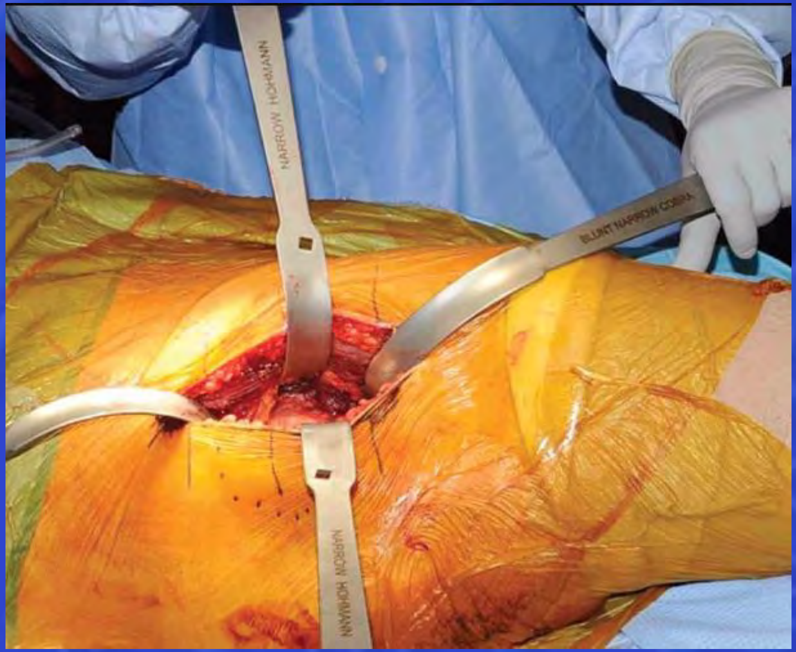


Materials and Methods

- Postero-lateral approach

- Acetabular component:
Exceed ABT emispherical cup with 10° E polyrim

- 32 ceramic, 8 metal heads



Materials and Methods

Clinical assessment

• Harris Hip score (HHS)
•Complications

Patient-oriented evaluation

•WOMAC score (Italian official version)
• SF -36 HEALTH : quality of life at follow up

Radiographic analysis

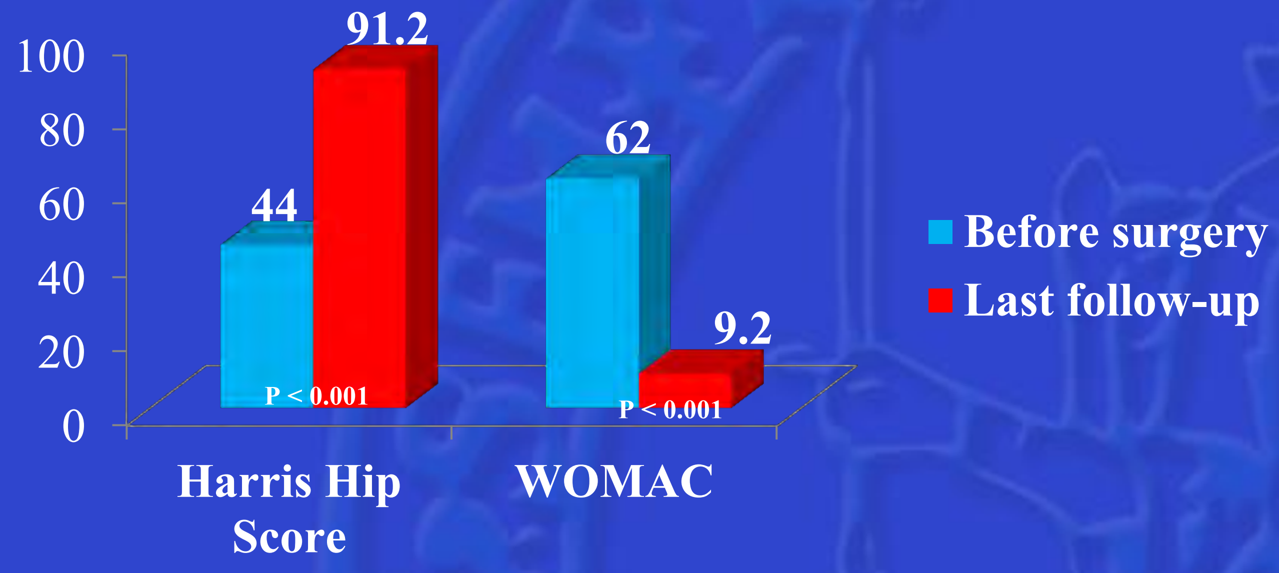
•Radiolucencies
•Osteolysis
•Heterotopic ossifications (Brooker scale)
•Stem frontal alignment
•Subsidence

Mean comparison

•t-test for paired data

Results

At follow-up functional ability increases but disability decreases



•pre-operative HHS
•44 ± 13.7 (*17 - 61.2*)
•HHS at follow-up:
•91.2 ± 5.1 (*82 - 99.6*) (p<0.001)

•pre-operative **WOMAC score**
62 ± 18.8 (*32 – 100)*
•WOMAC score at follow-up
•9.2 ± 11.6 (0 – 47) (p<0.001).

QUALITY OF LIFE
SF-36 RESULTS AT FOLLOW-UP
Normative data comparison (Apolone et al., 1998)

SF-36 DOMAINS	AGE (YEARS)					
	35-44 *(n=13)*		45-54 *(n=15)*		55-64 *(n=10)*	
	Pats	Norm	Pats	Norm	Pats	Norm
Physical Functioning	86± 19.2	93.2± 11.4	77.1± 34.3	88.7± 14.9	81.3± 22.5	79.1± 22.3
Physical Role	100± 0.00	85± 28.9	78.6± 26.8	81.7± 30.3	68.8± 37.5	72.5± 34.6
Bodily Pain	100± 0.00	77.4± 23.2	73± 25.2	75.3± 24.1	69± 24.7	68.3± 25.9
General Health	75.4± 5.4	70.1± 17.6	71.7± 25.6	66.4± 17.5	77.5± 8.3	60.1± 20.6
Vitality	85± 3.5	64.1± 17.4	70± 28.1	63.4± 18.2	62.5± 12.6	58.7± 20.2
Social Role	87± 0.00	79.3± 20.5	74.8± 26	78.4± 20.4	78± 15.9	76.3± 22.4
Emotional Role	100± 0.00	79.1± 34.7	71.3± 35.8	79.2± 33.6	58.3± 50	69.7± 69.7
Mental Health	87.2± 4.38	68± 19.7	77.1± 10.5	67.8± 18.2	66± 12.4	63.2± 20.2

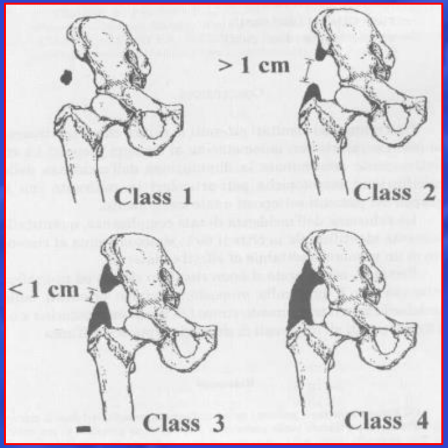
QUALITY OF LIFE
SF-36 RESULTS AT FOLLOW-UP:
SUMMARY COMPONENTS

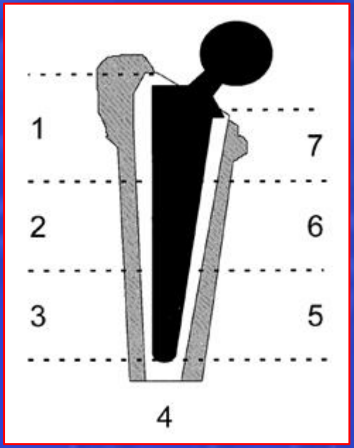
AGE(Years)	PCS		MCS	
	CASES	NORMATIVE (Apolone et al., 1998)	CASES	NORMATIVE (Apolone et al., 1998)
35-44	55.2±3,4	52.9± 6.5	56.8±2.5	46.7± 10.7
45-54	50.3±12.8	51.3± 7.3	49.8±8.6	47.1±9.4
55-64	54.3±10.5	47.7±9.1	44.5±7.6	45.4± 10.3
Mean	**52.4±9.5**		**51.3±7.9**	

No complications were observed.
No revision was carried out

Metaphiseal conservative stems are designed for use in young patients but also for active patients over 50 .

RADIOGRAPHIC ANALYSIS (LAST FOLLOW-UP)





- 28 stems in neutral alignment, 9 in valgus alignment, 3 in varus alignment (≤ 5 °)

- Non significant (i.e. < 1mm) radiolucent lines in 3 cases (2 in Gruen zone 1 and 1 in **Gruen** zone 5).

- One heterotopic ossification (Booker 1)

- No loosening, osteolysis, and subsidence exceeding 5 mm.

ClinicalCases

D.G. – Female - 51 yy - Post Traumatic Osteoarthritis		
	Preoperative	**Follow-up (24 months)**
HHS	26	97.01
WOMAC Score	44	28

Pre-operative

Follow-up

L.H.B.– Female - 37 yy - Primary Osteoarthritis		
	Preoperative	**Follow-up (36 months)**
HHS	46,62	99,65
WOMAC Score	57	0

Pre-operative

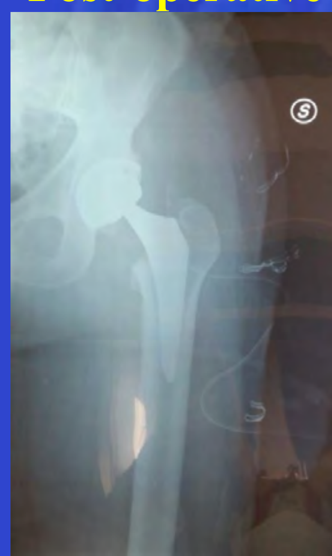
Post-operative

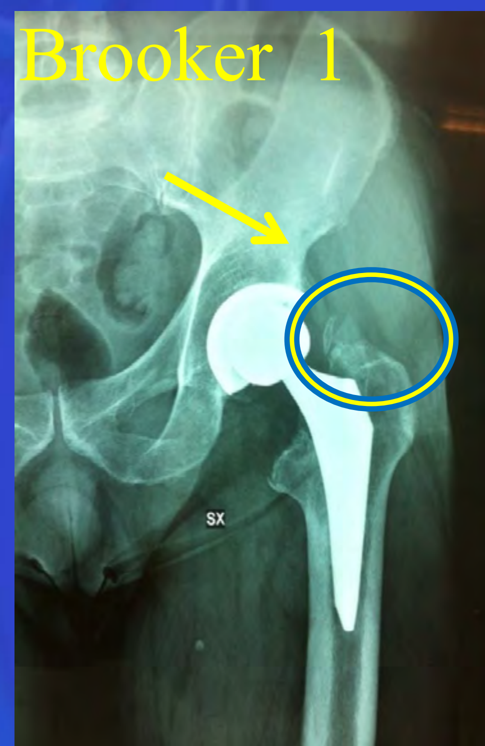
Follow-up

M. C.– Male - 64 yy - Primary Osteoarthritis		
	Preoperative	**Follow-up (36 months)**
HHS	45,72	98,65
WOMAC Score	59	20

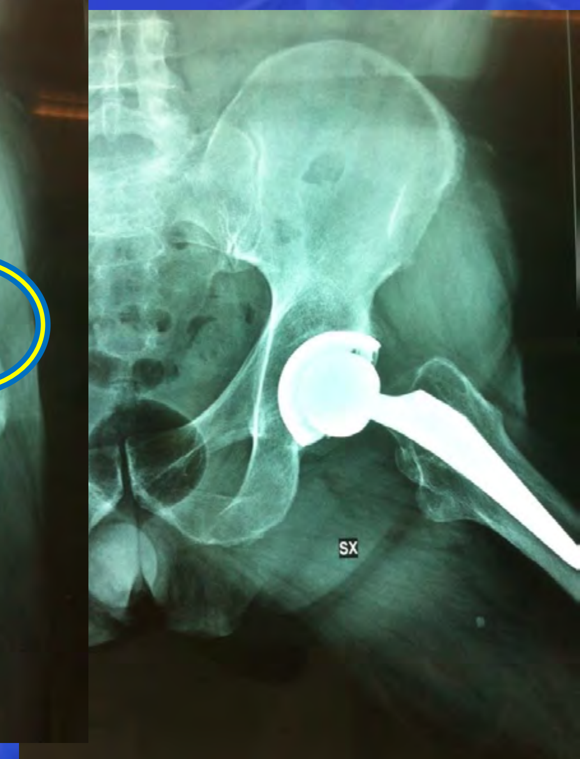
Pre-operative

Post-operative





Follow-up



The GTS stem can be used as a primary indication in THA.

✓The conservative GTS stem has good short-term clinical and radiographic results.

✓ We did not observe intraoperative femoral fractures that were reported in other series of short stems.

✓GTS stem provides good short-term primary stability, with no subsidence over the follow-up.

A longer follow-up is needed to evaluate if these satisfactory early results are confirmed on a longer term.

THANK YOU

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

MID TERMS RESULTS OF 486 CONSERVE PLUS® HIP RESURFACINGS. MEDIUM FOLLOW UP AT 7.2 YEARS.

Bellotti V., Cardenas C., Astarita E., Moya E., De Meo F.*, Ribas M.

ICATME – Institut Català de Traumatologìa i Medicina de l'Esport
Instituto Universitario Quiron Dexeus
Barcelone – Spain

** Istituto Franco Faggiana – Giomi*
Reggio Calabria - Italia

HR: started in 2003 in our institution

Viable alternative
for young active patients

Hip Unit – Dexeus Barcelone

<u>Theoretical advantages:</u>

Preserve bone stock
Restore anatomy
Improved stability

Physiological load transfer
Impact activities allowed
"Relative" easy conversion to THA

How we start

Following some principles:

1. Proper selection
2. Preoperative planning
3. Accurate technical execution
    - restoring head-neck junction (CAM – ostheophites resection)
    - respect femoral vessels
    - avoid notching
    - adequate capsular release and pocket
    - second generation cementing technique - suction

Series 2003 - 2008

(revised in 2014)

450 patients
(36 bylateral)

486 impiants

Follow up

Medium 7,2 years

(6 – 11,4)

DEMOGRAPHIC CHARACTERISTICS OF THE STUDY GROUP

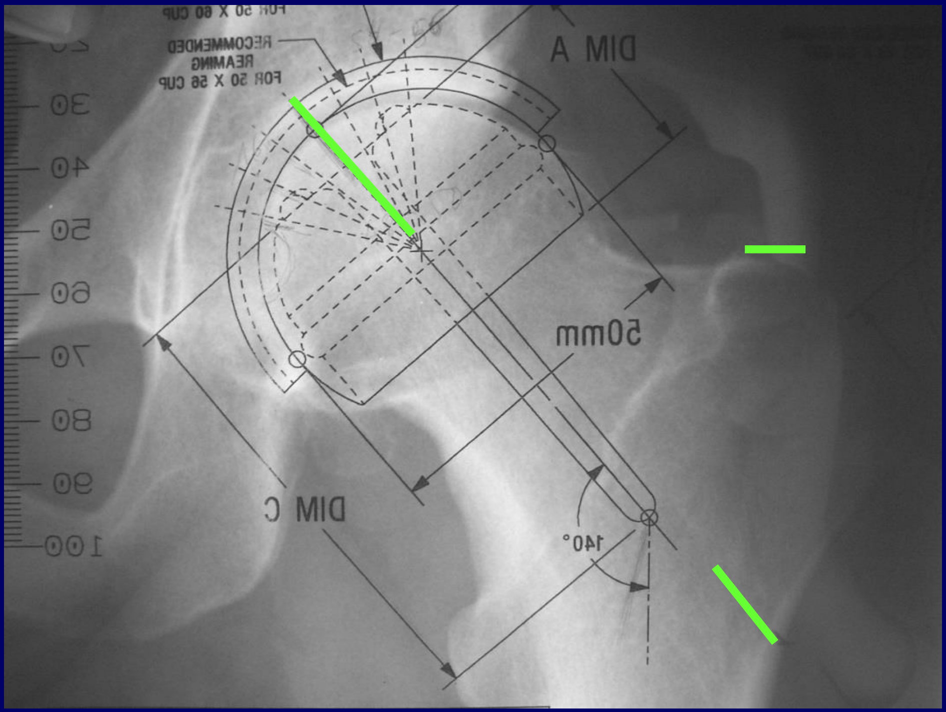
Patient characteristic	**Mean values (range) or count (percent)**
Age at surgery (years)	46.6 (16-69)
Weight (kg)	72.6 (44-115)
Height (cm)	171.6 (142-185)
Body Mass index (kg/m²)	25.8 (20-38)
Male/Female ratio	364 (80.9%)/86 (19.1%)
Aetiology	
Osteoarthritis	380 (78.2%)
Developmental dysplasia of the hip	45 (9.3%)
Trauma	37 (7.6%)
Inflammatory	24 (4.9%)

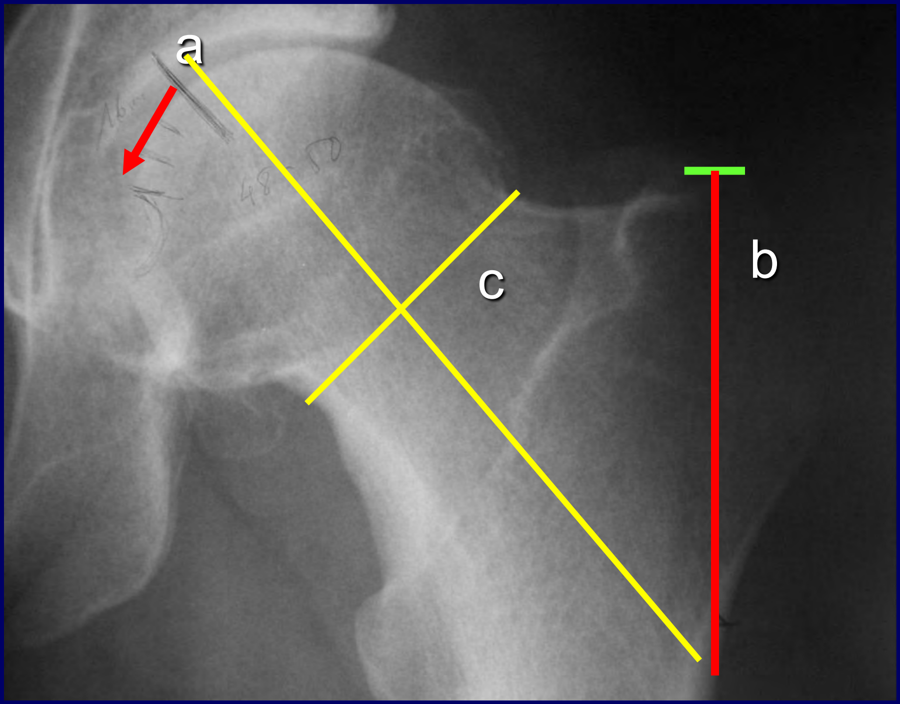
Indication

IDEAL	RELATIVE	CONTRAINDIC.
Active	DDH	Osteoporosis
Bone quality	Short neck	Cortisone dependent
< 65 years old M	Geodic cavities	Renal Insuf.
< 55 years old W	Childbearing women	Tumors
	AVN	Metal sensitivity
	Inflamatory	
	Length discrepancy > 2 cms	

Shimmin W, Beaule PE, Campbel P *Clin. Orthop. Rel. Res. 2008*

Planning





The small as possible cup paired to the smaller femoral size avoiding notch

Planning

Goals:

Leg lenght

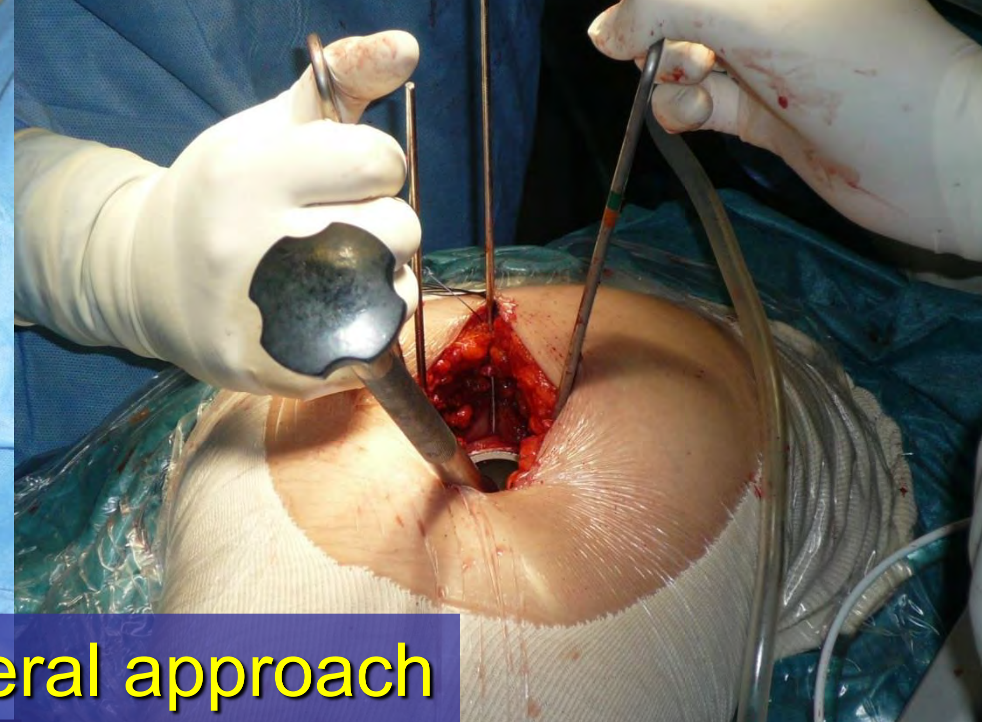
Center of rotation

Soft tissues balance

Offset

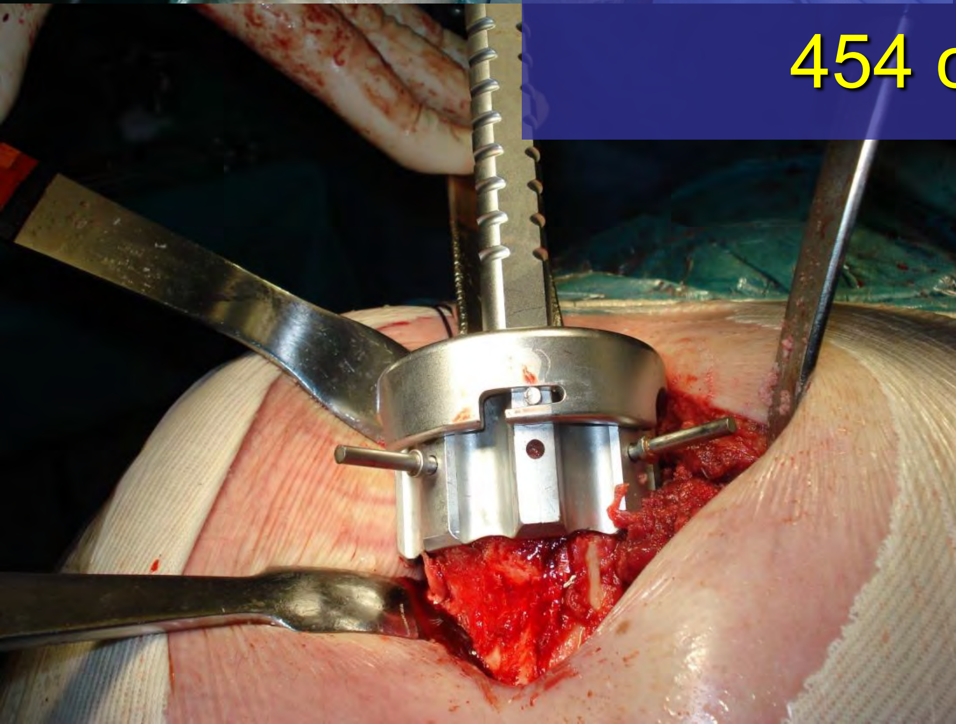
Planning

Adapt the implant to bone morphology
Not the opposite.

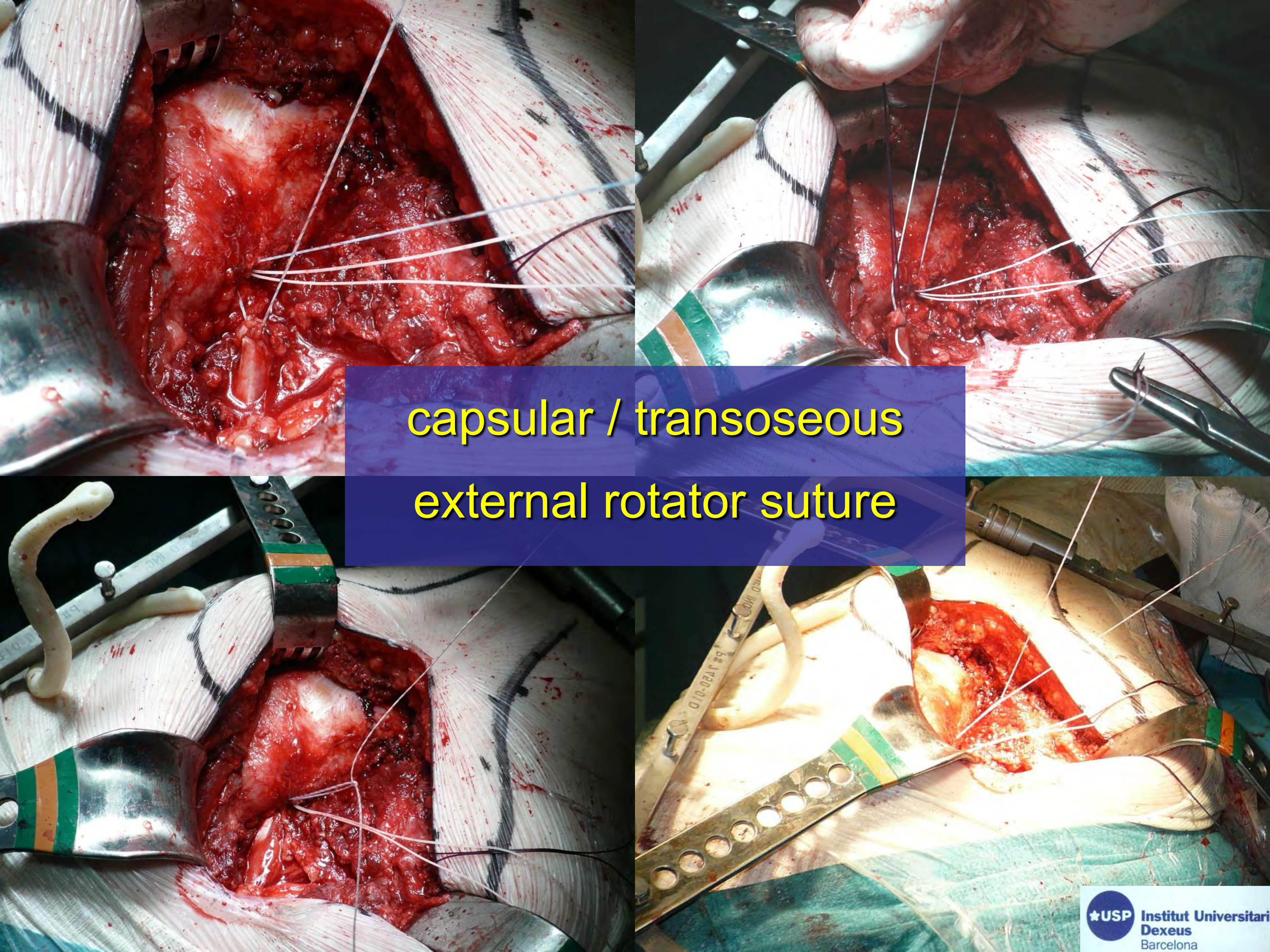


postero lateral approach

454 cases




direct anterior
32 cases


capsular / transoseous
external rotator suture
USP Institut Universitari
Dexeus
Barcelona

Collected Data

- Surgical time
- Hospital Stay
- Merle d’ Aubigné-Postel, WOMAC, Harris scores
- Components orientation / x-ray
- Complications
- Revisions

Results

Mean Surgical time 1h 50' (1h15'-2h30')

Mean hospital stay

3.6 (3-5) days - anterior approach

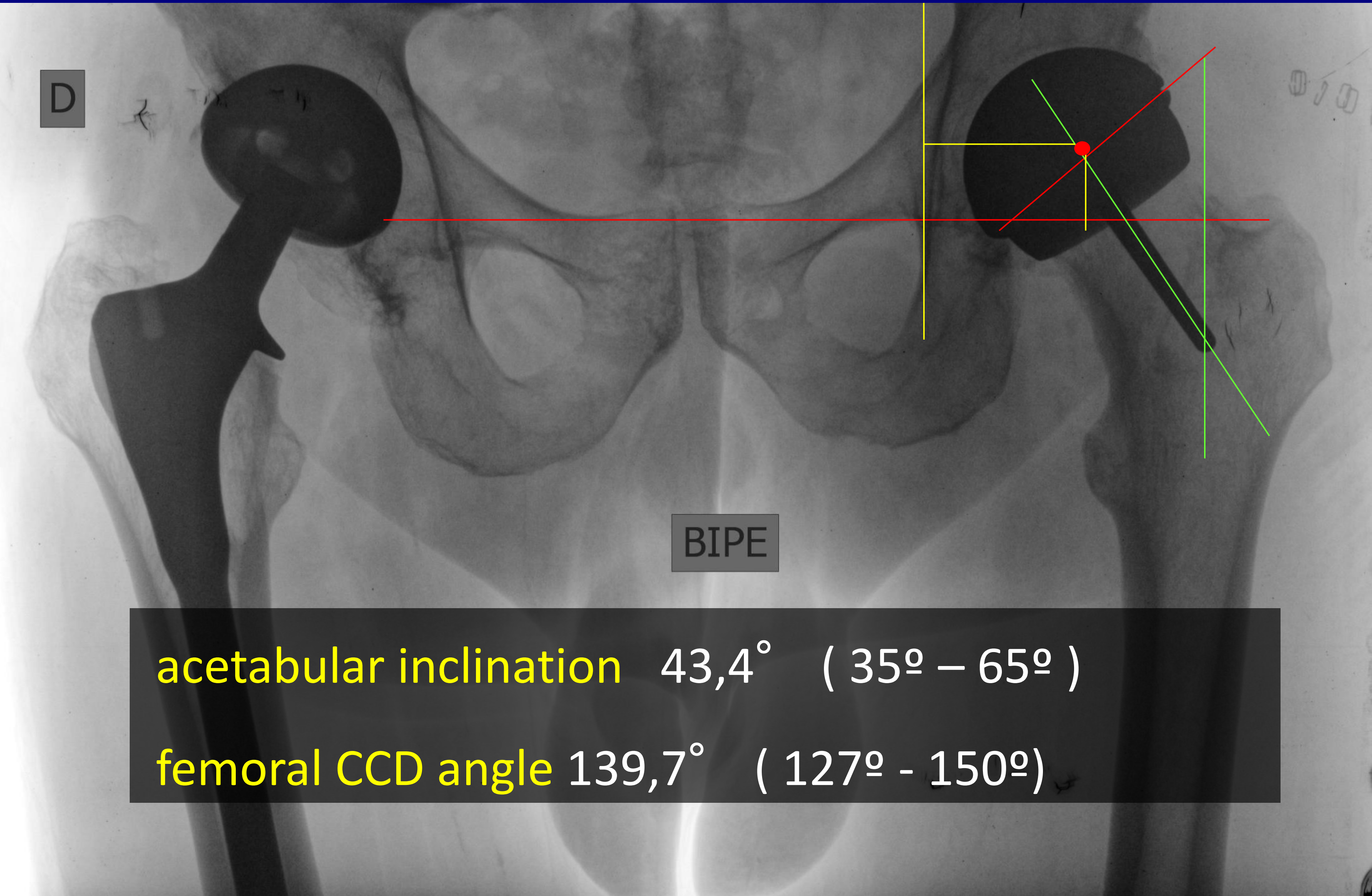
4.5 (4-6) days - posterior approach

MEAN PREOPERATIVE AND POSTOPERATIVE SCORES

Score	Preoperative score	Last follow-up score	p value
Merle d'Aubigné	12.9 (11-14)	17.4 (15-18)	$p<0.001$
Harris	52.3 (42-60)	96.7 (89-98)	$p<0.001$
WOMAC	46.2 (19-67)	93.2 (79-100)	$p<0.001$

Global improvement

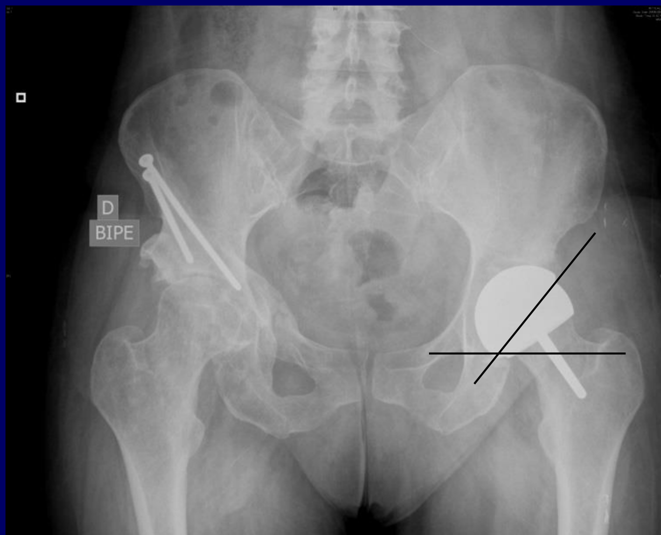
Component orientation / x-ray



acetabular inclination 43,4° (35º – 65º)

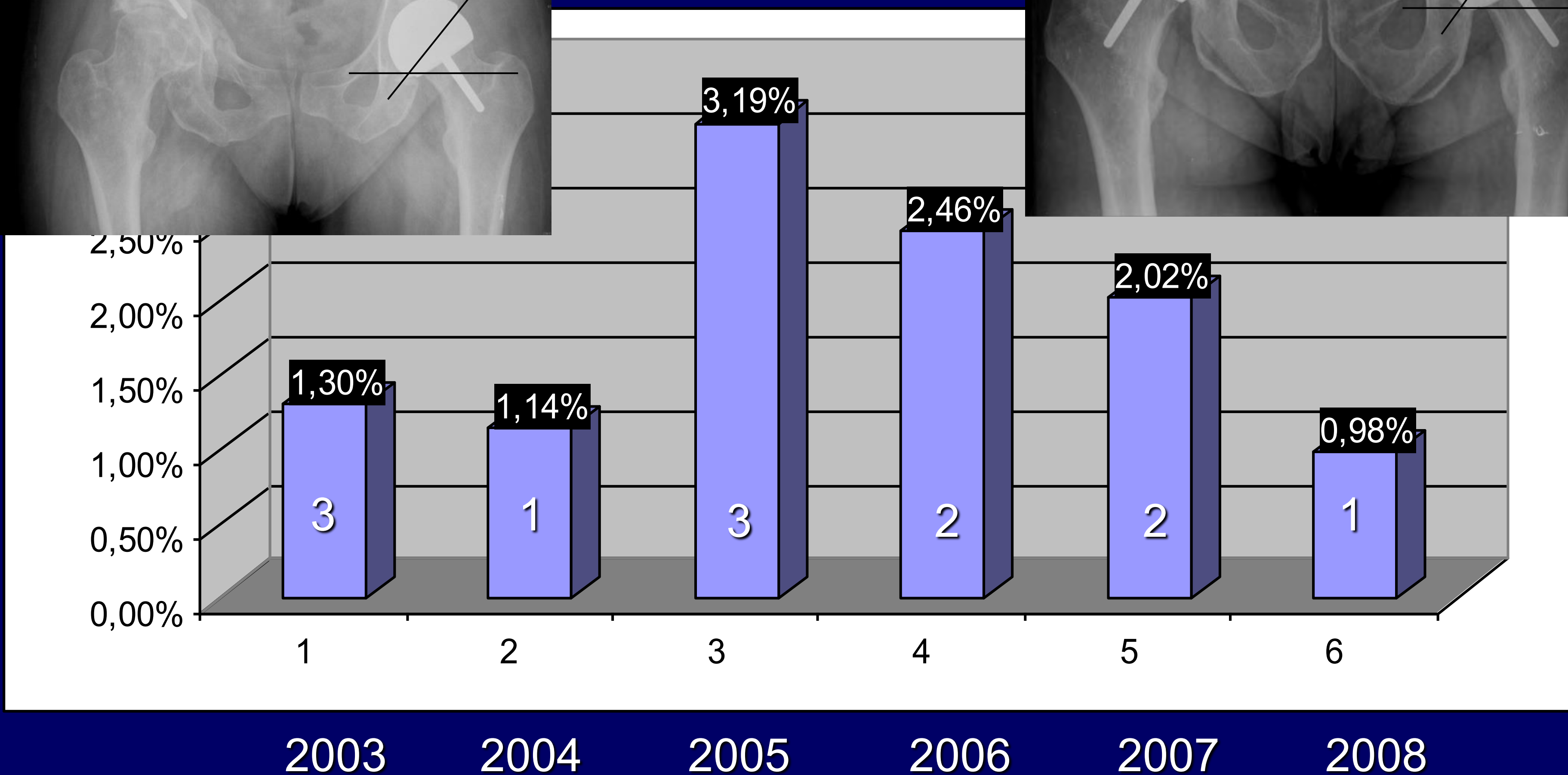
femoral CCD angle 139,7° (127º - 150º)

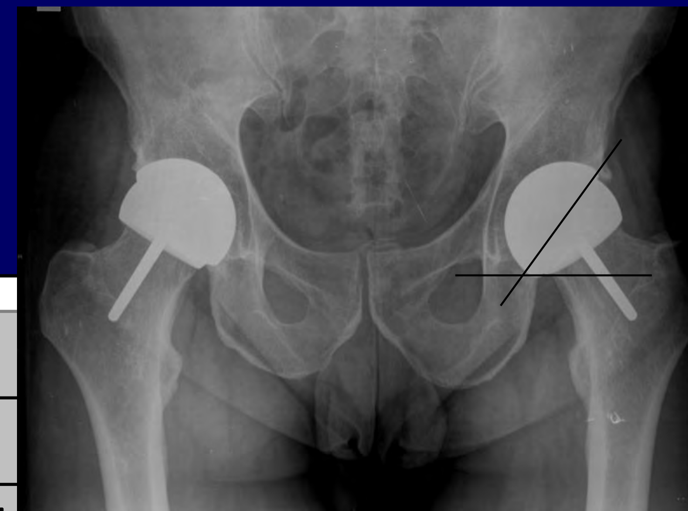
Cups at risk (45-60°)



12 cases

→ monitoring





Complications

2 Haematoma (drained by ultrasound echography)

4 Transient crural paresis (retractors)

12 Lateral femorocutaneous nerve hypoesthesia (anterior approach patients)

2 deep venous thrombosis

1 femoral arterial thrombosis

11 psoitis

1 deep infection

Revisions: 10 / 486 = 2,1%

	Fracture	Colapse	Acet.> 60º	Narrowing	Infection	Pseudotumor
1° year	2	2	1	0	1	
2° year	0	2	0	0	0	
5° year	0	0	0	1	0	
6° yeat						1

2 femoral fracture

4 femoral head colapse → Revision. Stem + Big MoM Head…?

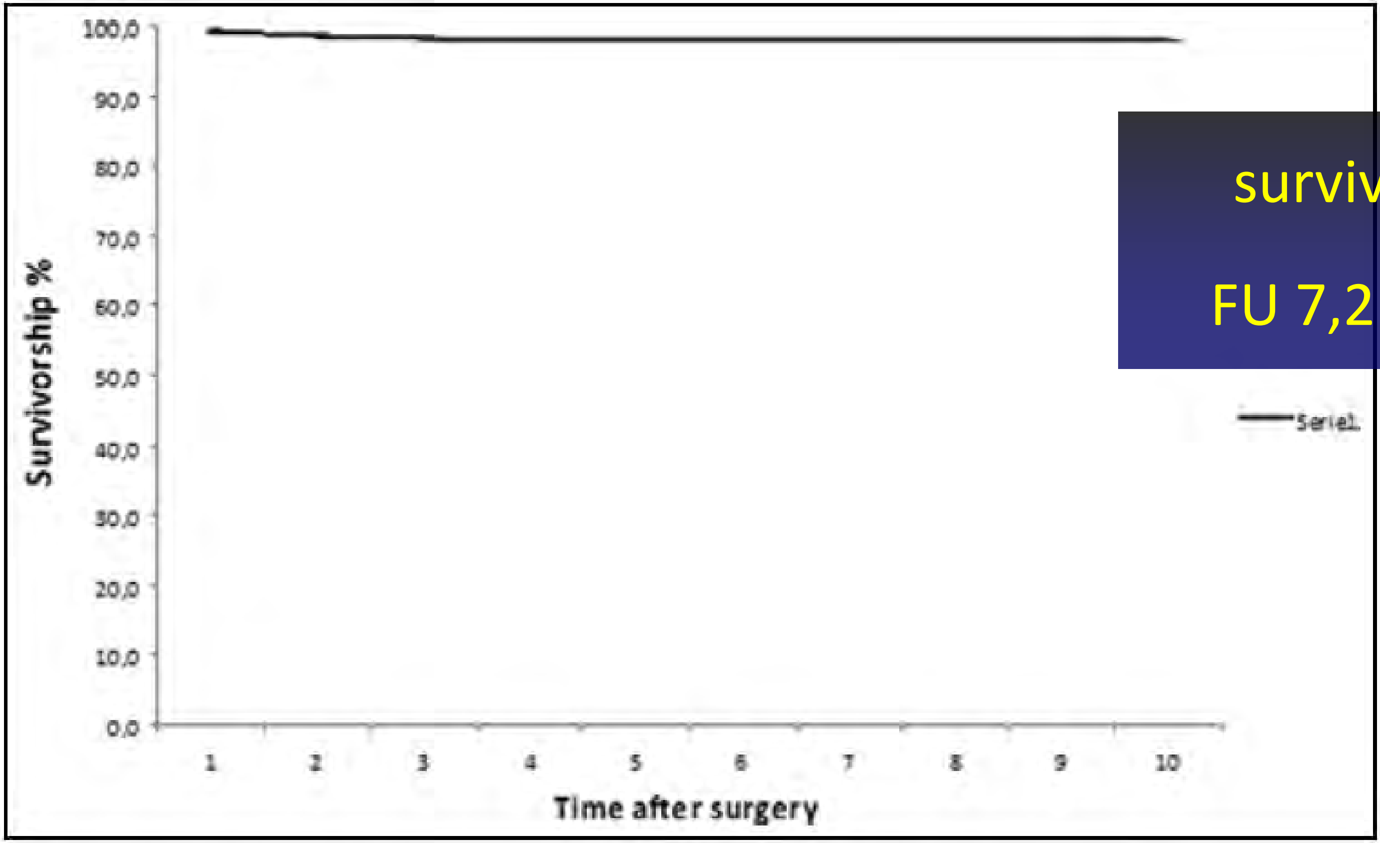
1 vertical cup 65° → Reoriented

1 narrowing → Revision. THR Cer / Cer

1 infection → Revision Two Stage. Cer / Cer

1 pseudotumor → Revision. THR Cer / Cer

Revision: 10 / 486 = 2,1%



survivorship 97,9 %

FU 7,2 years (6-11,4)

Kaplan-Meier survivorship curves of the first 486 hips operated. The time to revision surgery for any reason was used as the end point.

Results

J Arthroplasty. 2014 Aug 13. pii: S0883-5403(14)00579-8. doi: 10.1016/j.arth.2014.08.005. [Epub ahead of print]

Clinical results of the Conserve Plus metal on metal hip resurfacing: An independent series.

Zylberberg AD, Nishiwaki T, Kim PR, Beaulé PE.

548 cases

Follow up 6.6 years 30 revisions (5,4%) Survivorship KM 94,5%

Bone Joint J. 2013 Aug;95-B(8):1045-51. doi: 10.1302/0301-620X.95B8.31811.

The Canadian Arthroplasty Society's experience with hip resurfacing arthroplasty. An analysis of 2773 hips.

Canadian Arthroplasty Society.

2773 implants Follow up 3,4 aa (2-10)

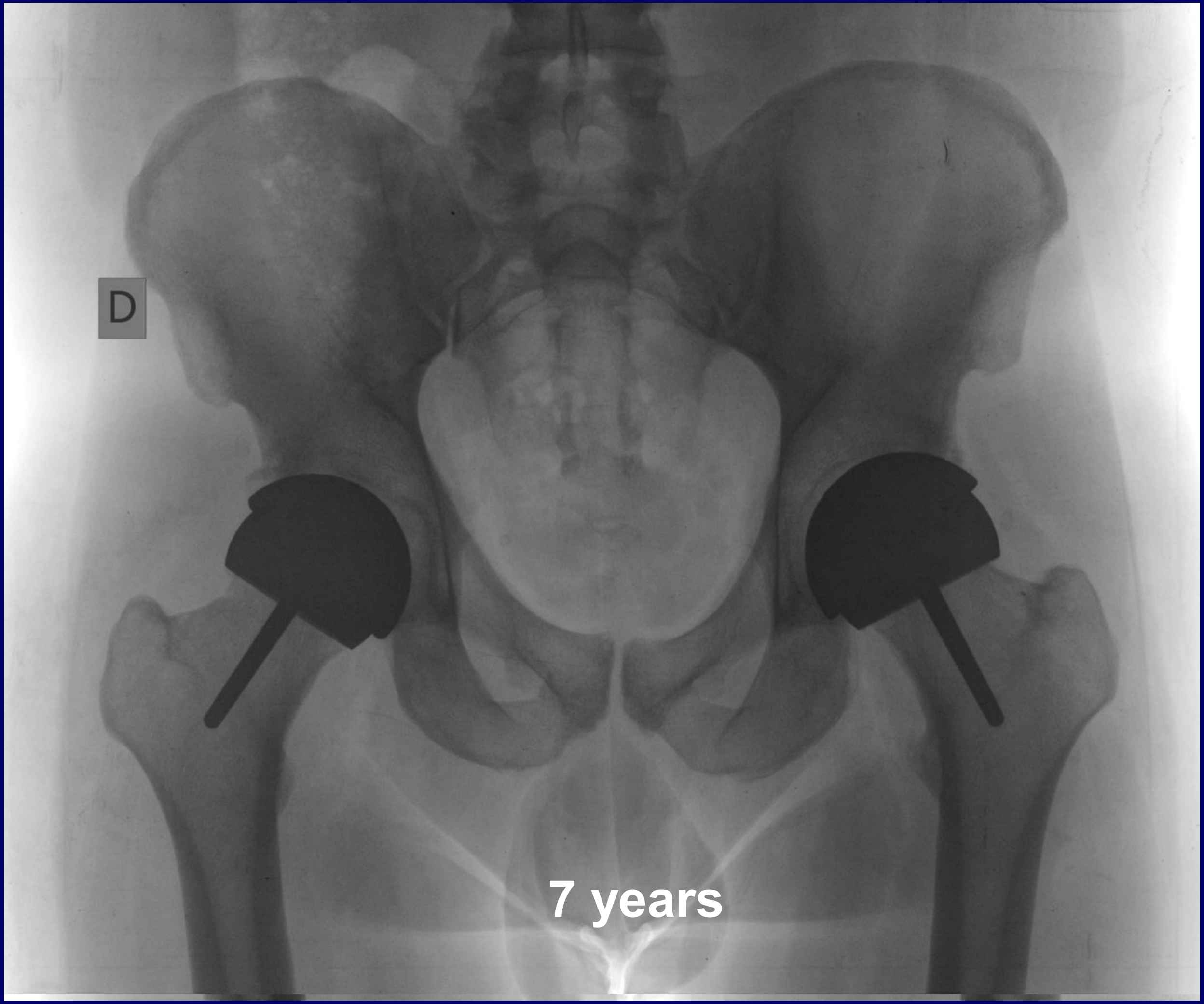
101 revision (3,6%).

Survivorshi global KM 96,4% :

men 97,4% women 93,6%

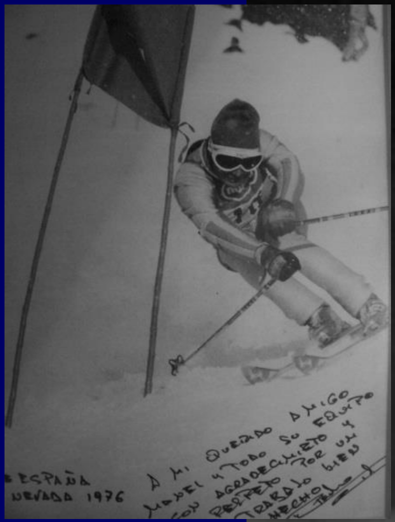
Conclusion: continue to implant. Exceptional in woman.

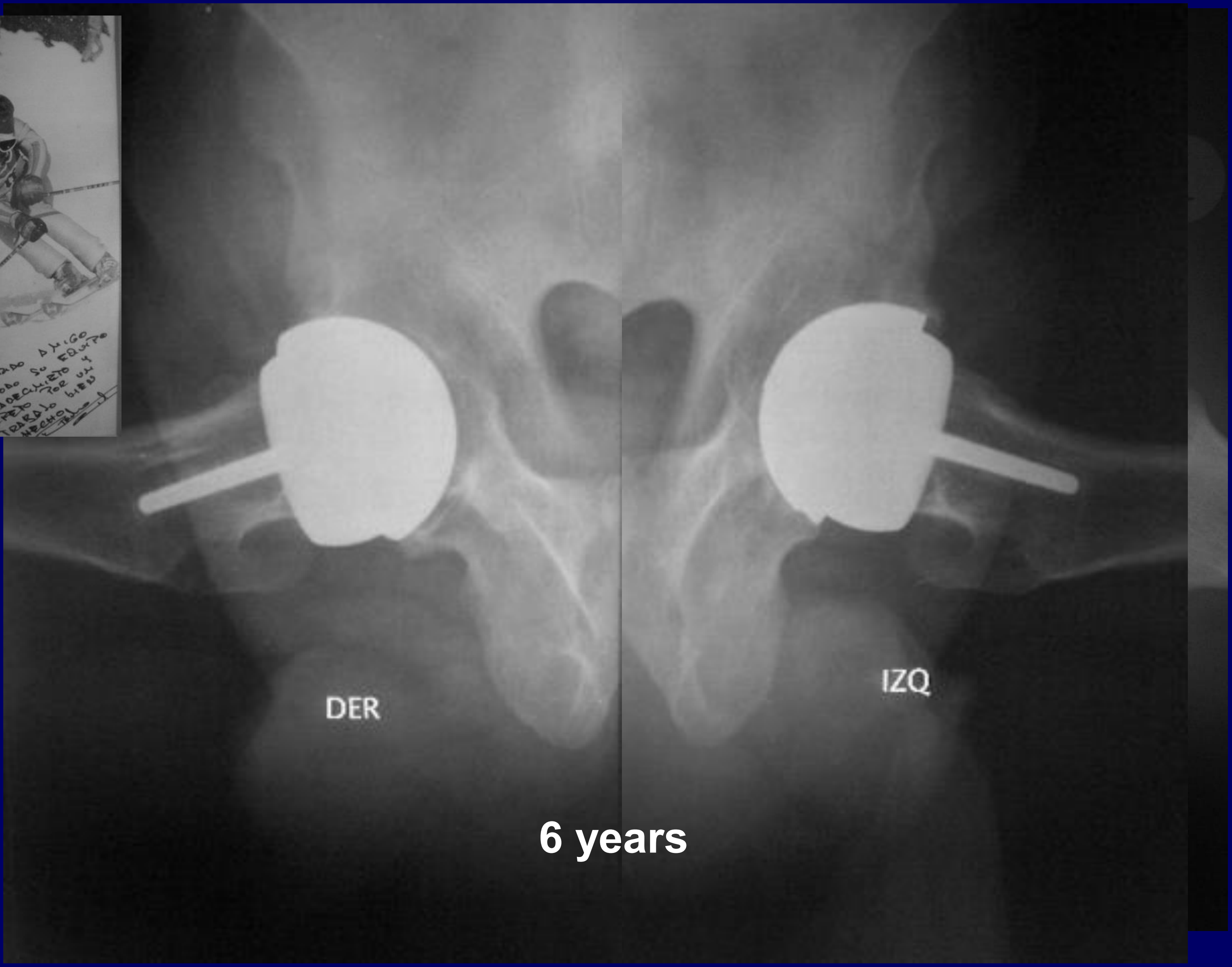
Case 1



47 years old man

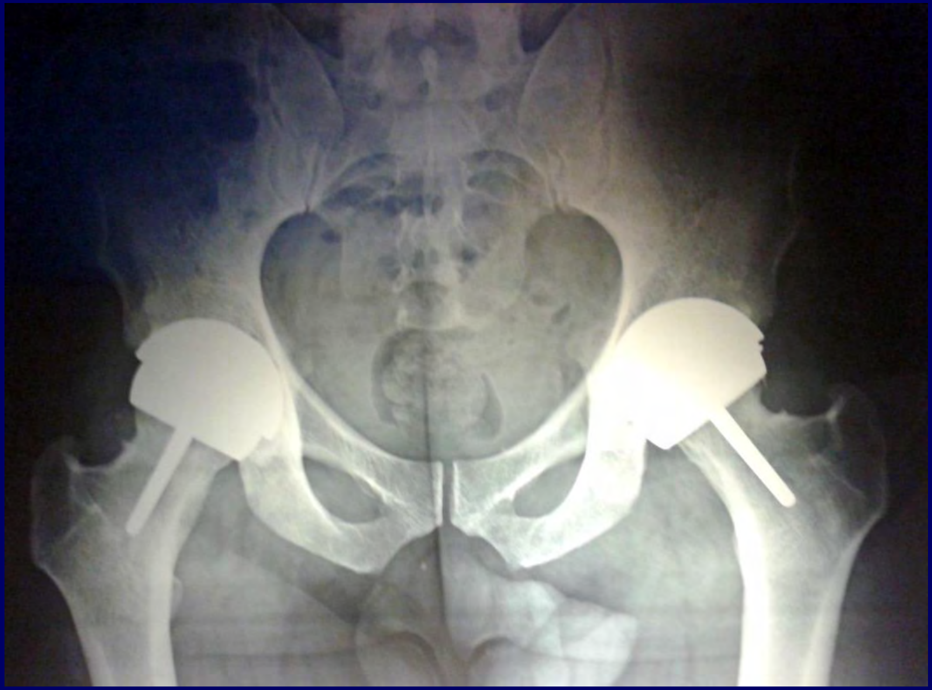
Case 2

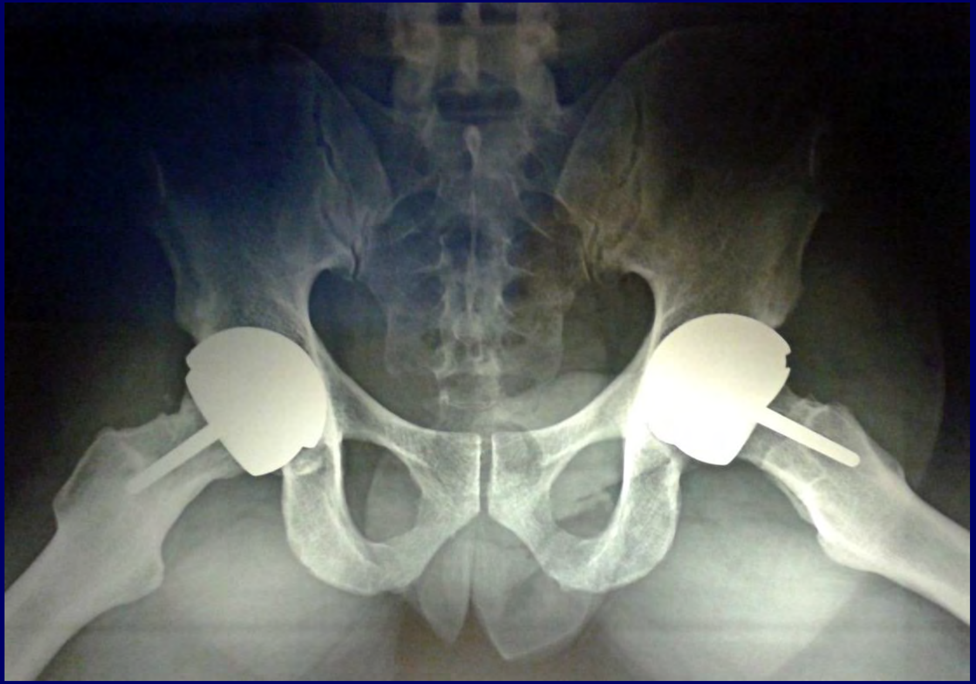




50 years old man

Case 3



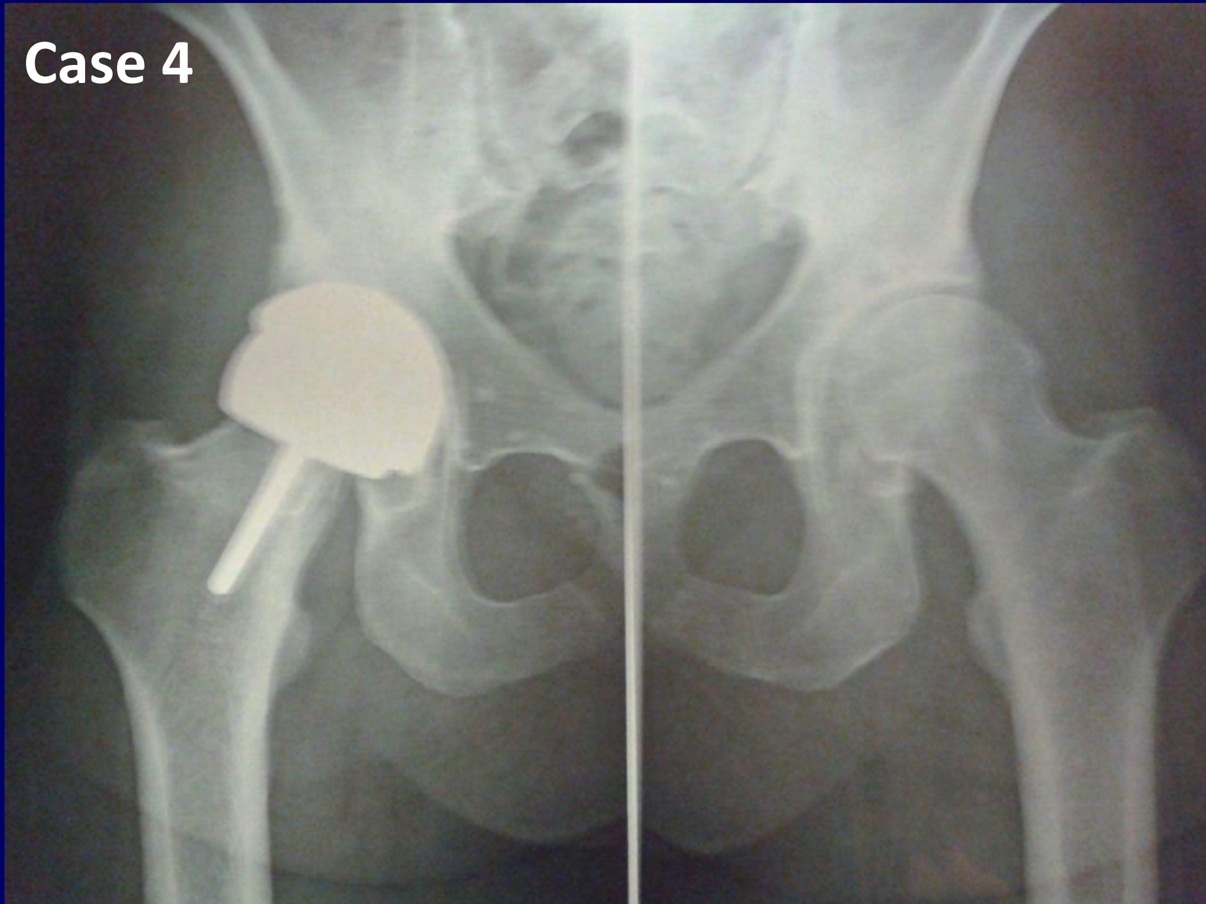


30 years old man 5 years postop

Bilateral adquired notch

Hypermobility – capoeira player

Cr – Co normals

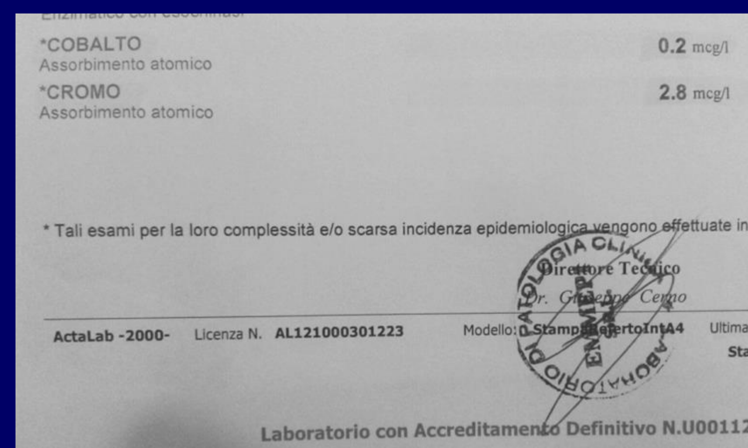


40 years old woaman5 years postop

Sport involved

Stable narrowing

Cr – Co normals



*COBALTO Assorbimento atomico	0.2 mcg/l
*CROMO Assorbimento atomico	2.8 mcg/l

* Tali esami per la loro complessità e/o scarsa incidenza epidemiologica vengono effettuate in S

Direttore Tecnico

Dr. Giuseppe Cerno

ActaLab -2000- Licenza N. AL121000301223 Modello: 0 StampaRefertoIntA4 Ultima m

Stam

Laboratorio con Accreditamento Definitivo N.U00112

Revision case

6 years postop

Pain and Bursitis (solid – fluid mass)

Cr e Co normal

RMN MARS: pseudotumor

Revision THR cer – cer

AP: ALVAL

Delayed reaction to metals.

Conclusions

- HR gave us good clinical and functional results
- survivorship in our series is 97,9%
- metal problems are a reality
- actually indicated for young male informed patient


micadera.es
La web de la patología de la cadera en el adulto joven

Thanks

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

TRAUMATOLOGY AND ORTHOPAEDICS RESEARCH INSTITUTE (NIITO),
ASTANA MEDICAL UNIVERSITY JSC
DEPARTMENT OF TRAUMATOLOGY, ORTHOPAEDICS

"The Short-Term and Long-Term Research Findings at the Endoprosthesis Replacement of Hip Joint with NIITO Endoprosthesis Components"

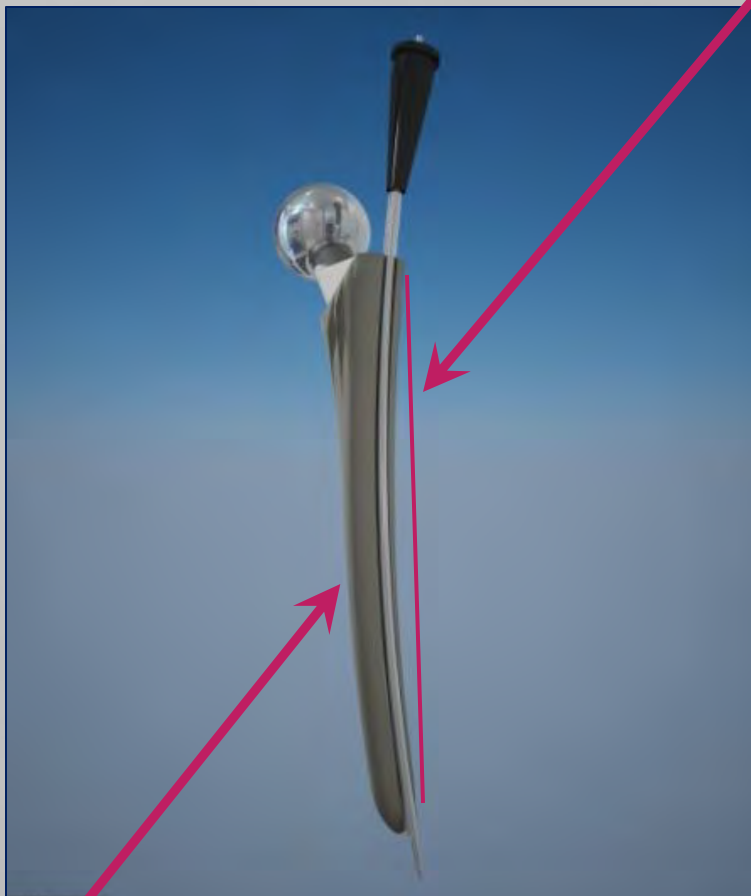
MD., prof., N.D. Batpenov, MD., Sh.A. Baimagambetov
Doctor PhD A.N. Batpen

.

DESIGN FEATURE OF THE ENDOPROSTHESIS

anatomic bend

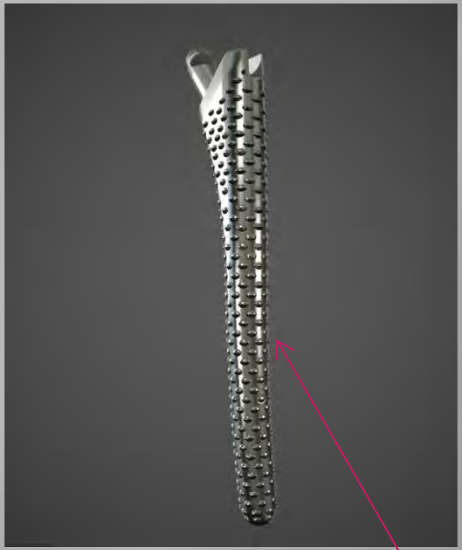
through slots

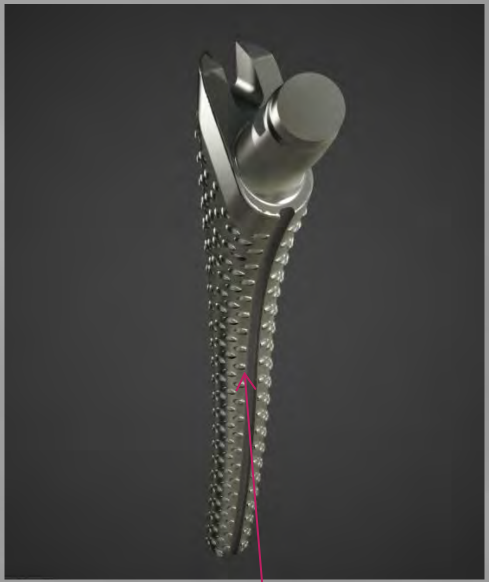


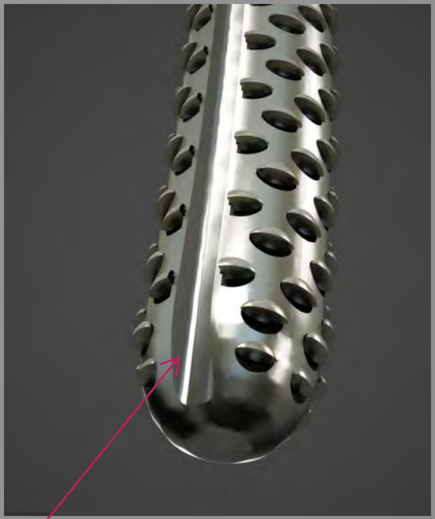
canal on the outer surface of the femoral component

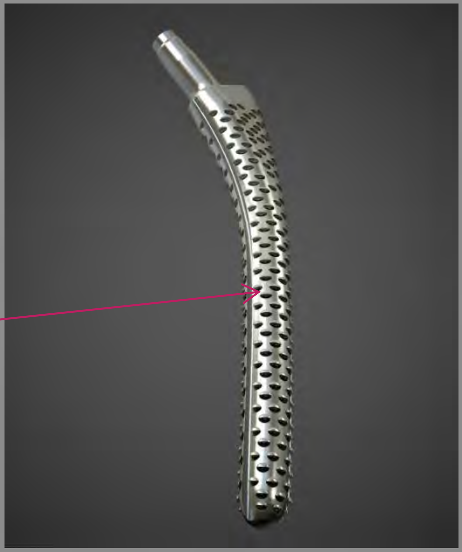
bladder worms

DESIGN FEATURE OF THE FILE





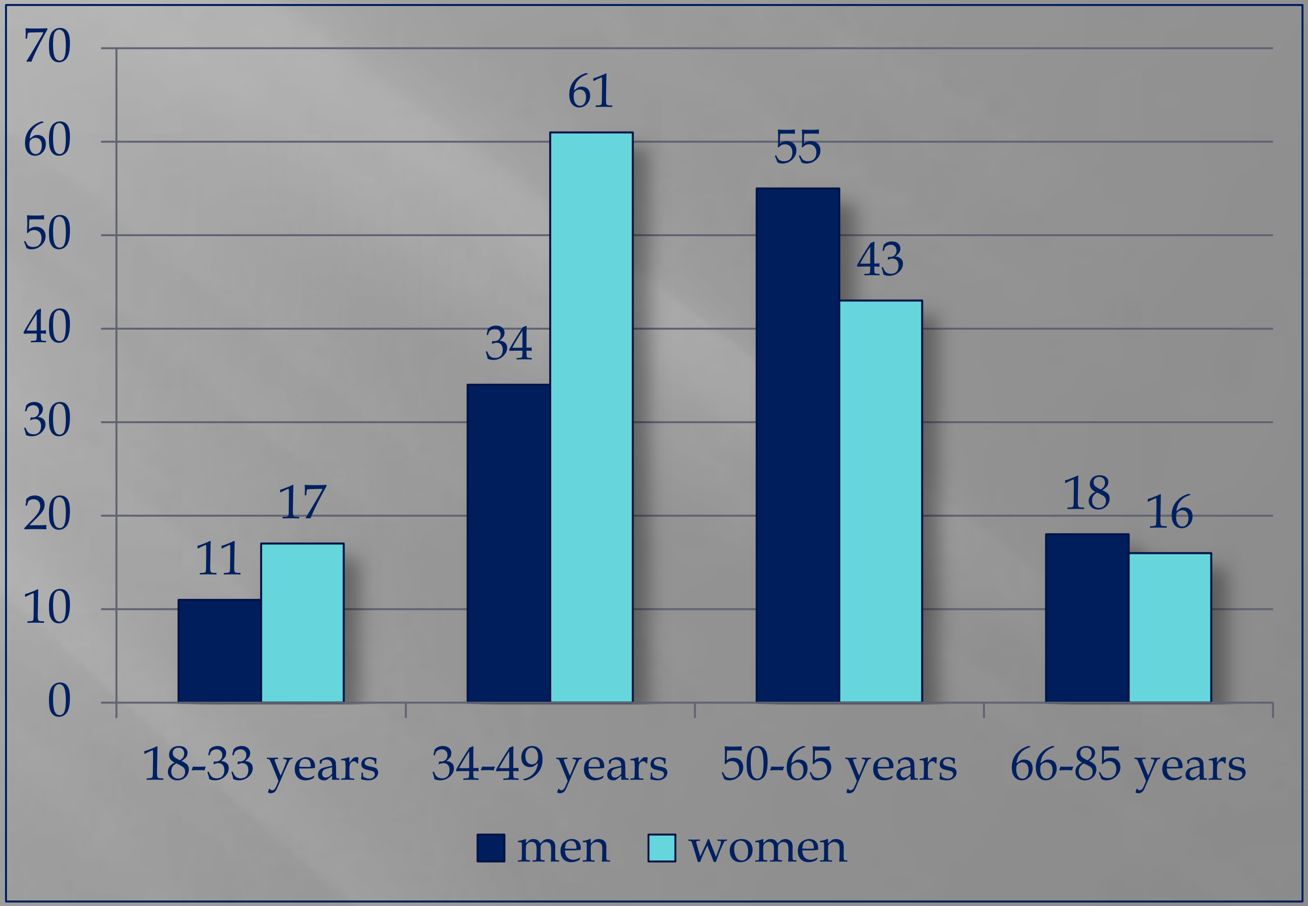


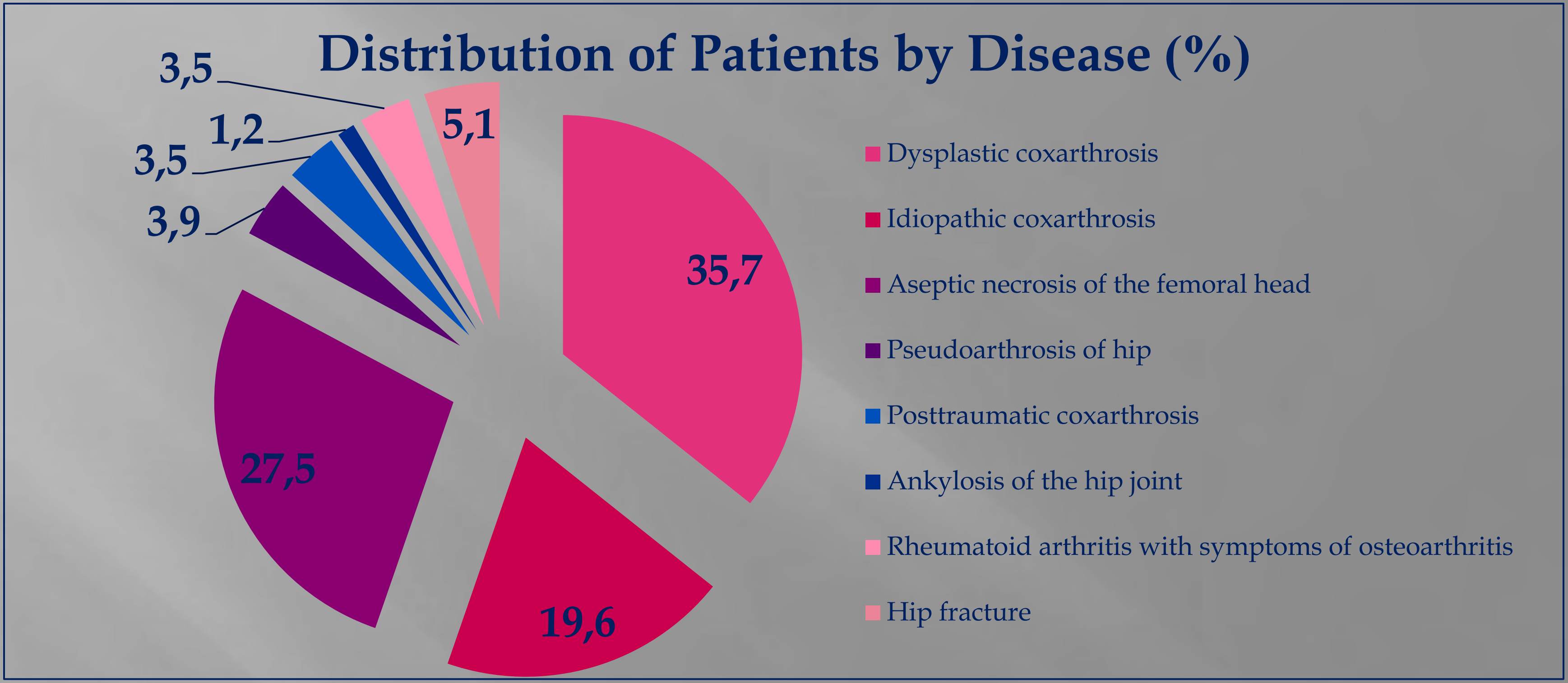


anatomic bend

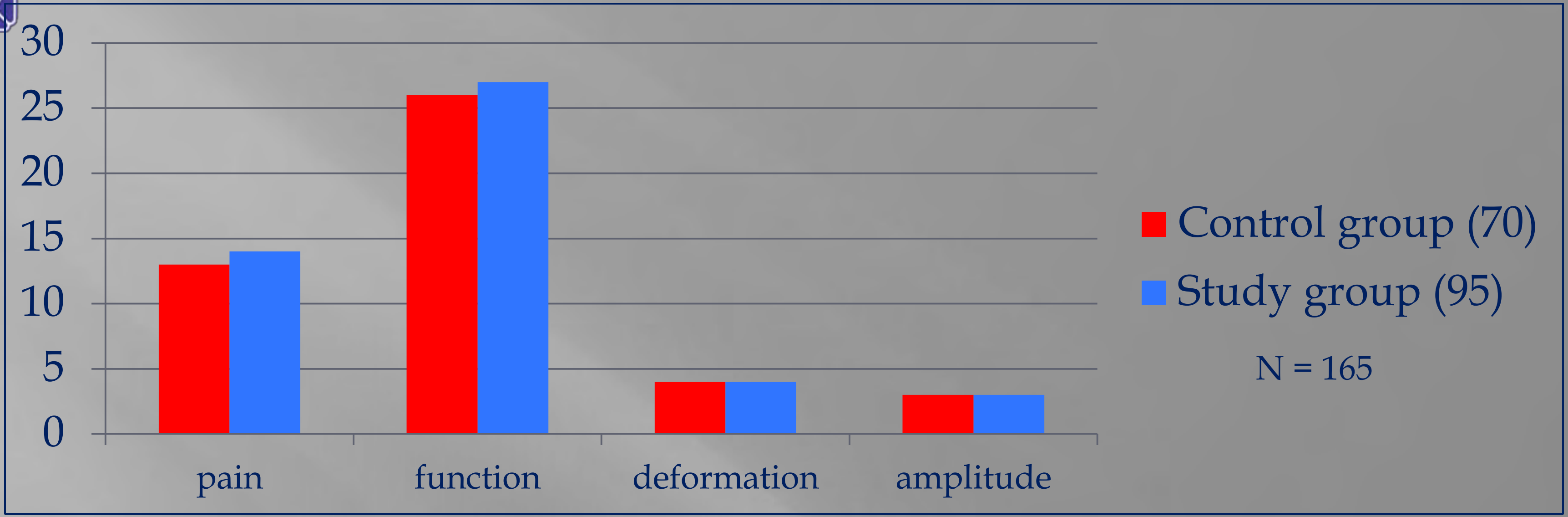
canal along the inner surface of the femoral component

Study Materials

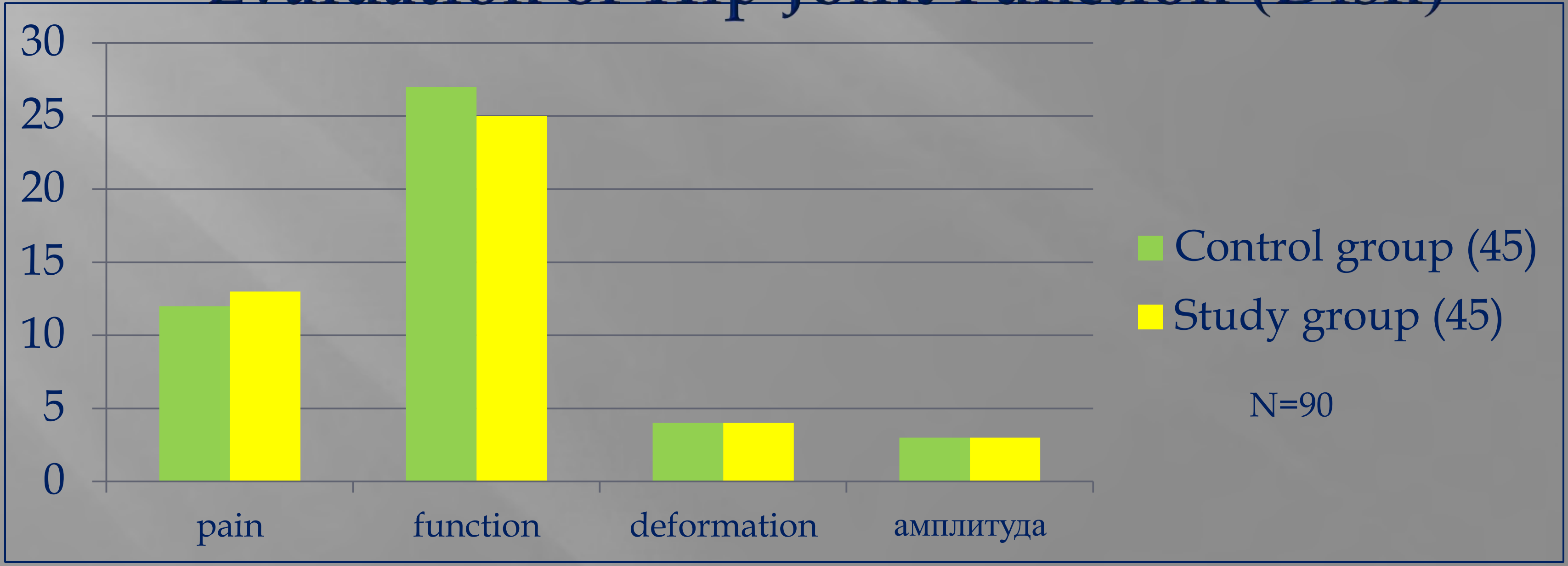



Distribution of Patients by Disease (%)
35,7
19,6
27,5
3,9
3,5
1,2
3,5
5,1
Dysplastic coxarthrosis
Idiopathic coxarthrosis
Aseptic necrosis of the femoral head
Pseudoarthrosis of hip
Posttraumatic coxarthrosis
Ankylosis of the hip joint
Rheumatoid arthritis with symptoms of osteoarthritis
Hip fracture

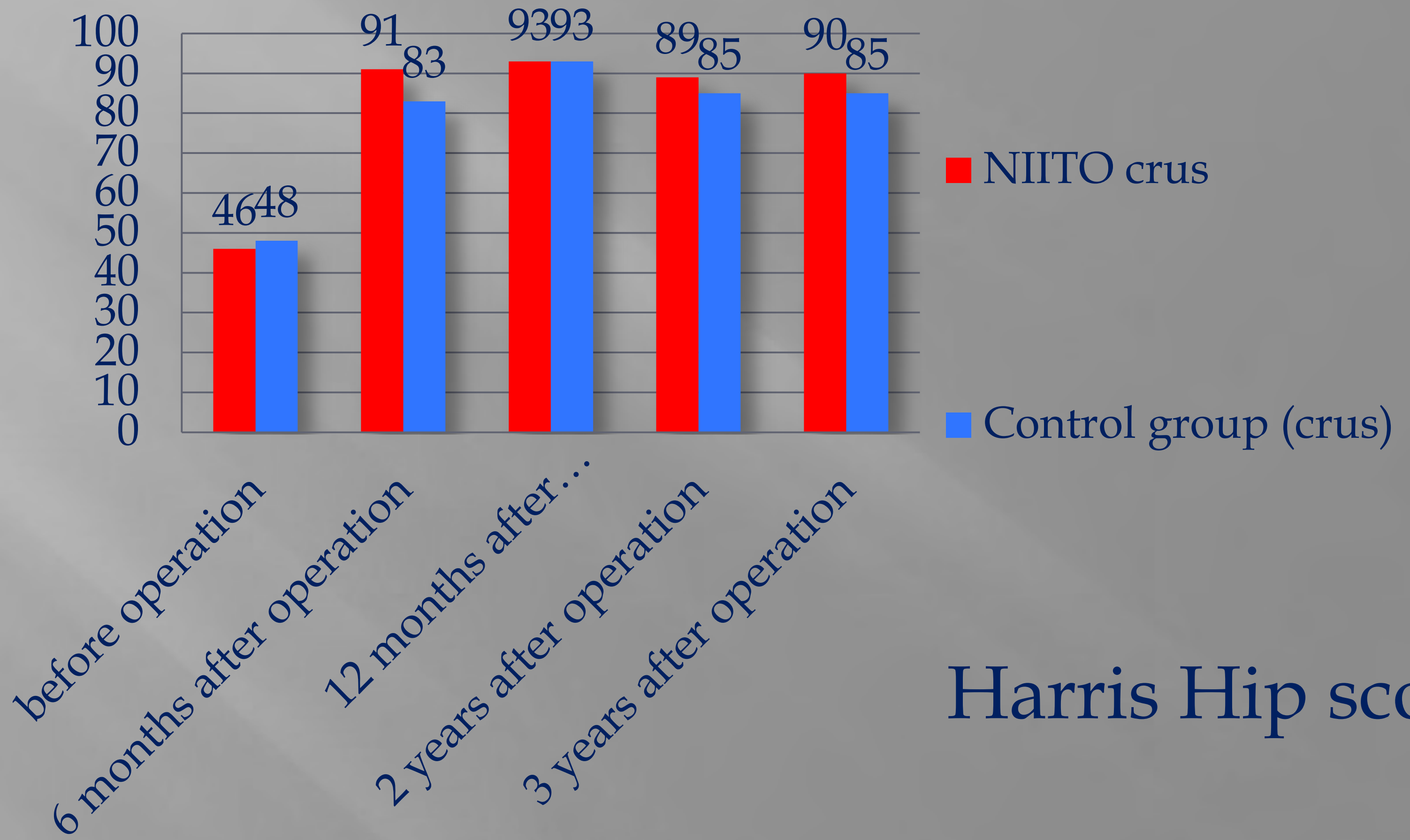
Evaluation of Hip Joint Function (Crus)



Evaluation of Hip Joint Function (Dish)

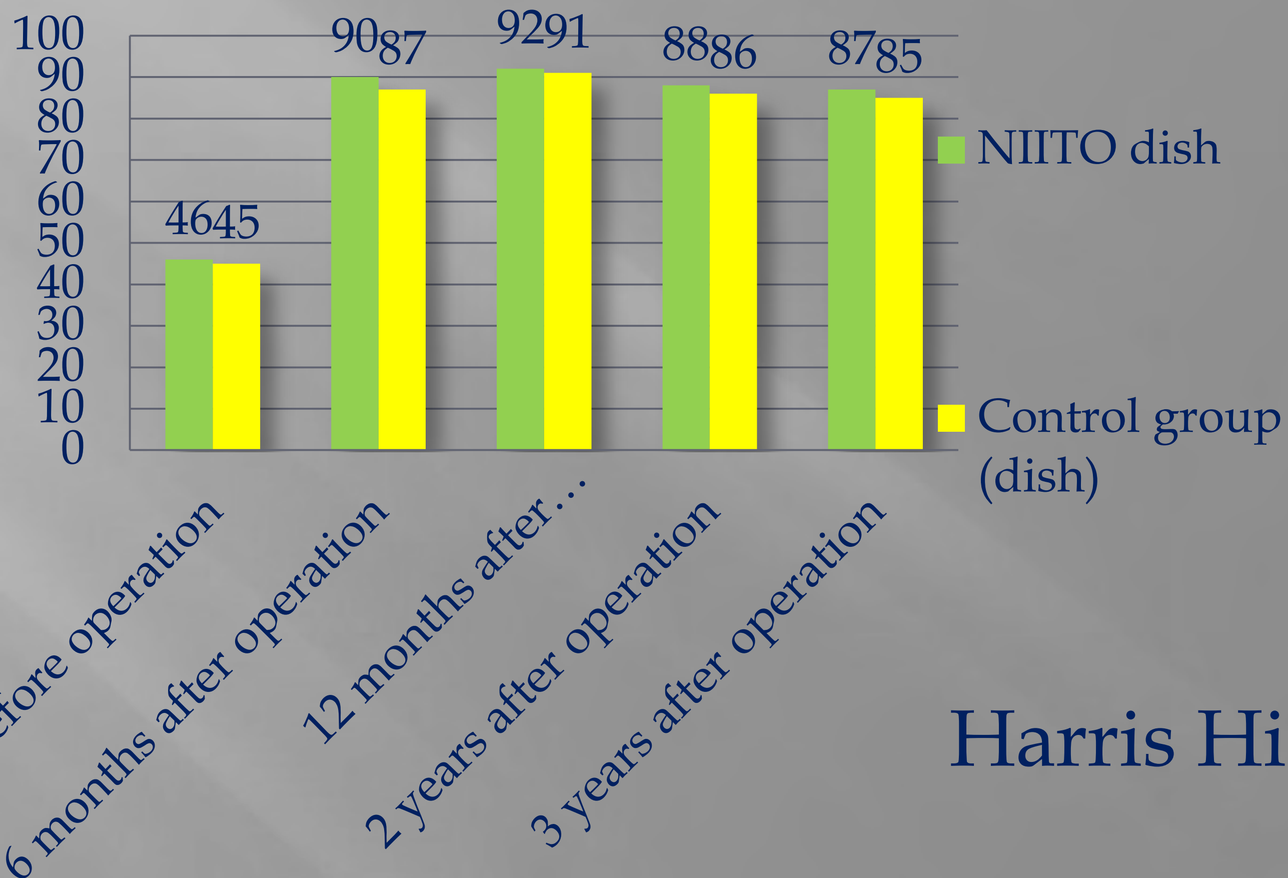


Evaluation of Hip Joint Function after Implantation of the Femoral Component



Harris Hip score

Evaluation of Hip Joint Function after Implantation of the Acetabular Component



Harris Hip score

Mis-Actions and Complications

No.	Type of complication	Control group	Study group
1.	Intraoperative periprosthetic fractures	2	0
2.	Iliofemoral thrombosis	3	0
3.	Wound abscess in the early postoperative period	1	0
4.	Fat embolism, pulmonary embolism	2	0
5.	Dislocation of the femoral head in the early postoperative period	0	0
6.	Aseptic loosening of the endoprosthesis up to 2 years	3	2
	Total	11	2

Mis-Actions and Complications

No.	Type of complication	Control group	Study group
1.	Intraoperative periprosthetic fractures	2	1
2.	Iliofemoral thrombosis	1	0
3.	Wound abscess in the early postoperative period	0	1
4.	Fat embolism, pulmonary embolism	1	0
5.	Dislocation of the femoral head in the early postoperative period	0	0
6.	Aseptic loosening of the endoprosthesis up to 2 years	2	1
	Total	6	3

Clinical Example

Patient P. 49 years old

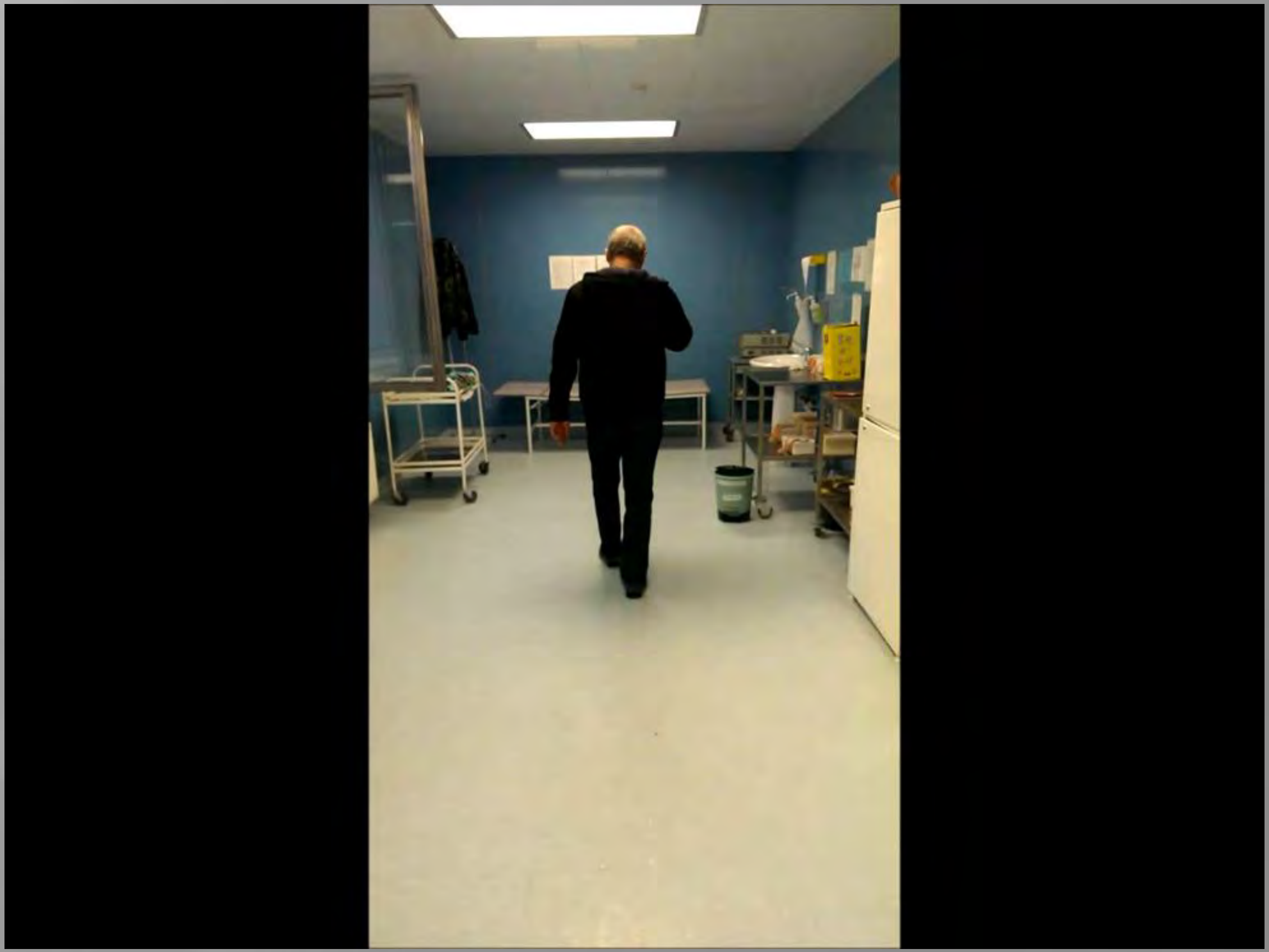
Clinical Example

Patient P. 49 years old

Clinical Example

Patient P. 50 years old

Clinical Example



Conclusions.

1. Comparative evaluation of short-term findings of hip joint endoprosthesis replacement using the modified femoral component allowed us to obtain good results in 78 (82.1%) of patients, satisfactory results - in 17 (17.9%) compared with the control group and there were no cases of intraoperative and postoperative complications. Average Harris Hip score was 91. There were complications in the control group in 11.4% of patients. Average Harris Hip score was 85.
2. Comparative evaluation of the findings of hip joint endoprosthesis replacement using a new acetabular component allowed us to obtain good results in 37 (82.2%) of patients, satisfactory results - in 6 (13.3%), poor - in 2 (4.5%). Average Harris Hip score was 90. There were good results in the control group in 34 (75.5%) of patients, satisfactory - in 7 (15.5%), poor - in 4 (9%). Average Harris Hip score was 90. Thus, it allowed to lower the frequency of unsatisfactory results in 2 times.

Thank you for attention!