REVISIONI

1. Multicentre clinical study for evaluation of a collagen-hydroxyapatite composite scaffold in revision hip surgery
2. Uncemented femoral revisions: 20 years of experience
3. Impaction Bone Grafting Technique In Revision – Cemented
4. Impaction Bone Grafting Technique In Revision – Cementless
5. Revisions of hip resurfacing from an independent specialist centre
6. Revision of Cold-Welding Hip Implants; Is Isolated Femoral Head Exchange a Simple Procedure?
7. Our early experience of the Reclaim modular hip system
8. Modular proximal femoral endoprosthetic replacement for non-neoplastic conditions
9. Trabecular metal cups for acetabular revision surgery
10. Four Year Results With A Minimum Of Three Year Follow Up Of A Modular Trabecular Metal Cup In Management Of Acetabular Reconstruction following Adverse Reaction to Metal Debris with ALVAL from Single Surgeon In The United Kingdom
11. Acetabular revision with Trabecula Metal cup: clinical and radiographic results at ten years follow-up
12. Metallic augments with cemented sockets and impaction grafting in acetabular reconstruction
13. Bone Impaction Grafting with a Trabecular Metal Revision Cup Show Promising Early Results
14. Minimum 12 Month Follow-up of Trabecular Titanium Cups for Acetabular Revisions with Cavitary Defects
15. Acetabular revisions of total hip replacement by cementless Pinnacle Gription revision cup and augments and Chronos vivify allografts filled with PRP/MSCs
16. Results of modular polyaxial iliac screw cup in patients with previous acetabular revisions
17. Unusual Complications After Total Hip Arthroplasty
18. One fifth of revision acetabular components re-revised for symptomatic aseptic loosening do not meet radiological criteria of loosening

REVISIONI

19. An algorithmic approach to acetabular component removal in case of intra-pelvic cup migration
20. The use of balloon catheter into the infrarenal aorta for prevention of massive hemorrahage during revision hip replacement at high risk: a case report
21. Multiple Revision Hip Arthroplasty: 30 Years of Aseptic Loosening
22. The use of Dual Mobility components in Revision Total Hip Arthroplasty
23. Uncommon surgical solutions to treat lower limbs dismetries exceeding 4 centimeters, subsequent to multiple prosthetic failures
24. A minimum of 10-years follow-up of the Burch-Schneider cage and bulk allografts for the revision of acetabular bone loss
25. Trabecular metal for acetabular defects in hip revision surgery. Short term clinical and radiographic evaluation
26. Late results of Acetabular Impaction Grafting in Revision Hip Replacement using Whole Femoral Head Allograft retaining the Articular Cartilage
27. Dual mobility acetabular components for revision of metal on metal total hip arthroplasty
28. Megaprostheses of the proximal femur: could functional outcome be comparable between oncology and complex revision?
29. Cages and related solutions
30. Is iliac stability still an option?
31. Cementless solutions including augmentation: a critical review
32. Surgical technique with reinforced cement under pressure
33. Customization of the acetabular implant: the near future ?

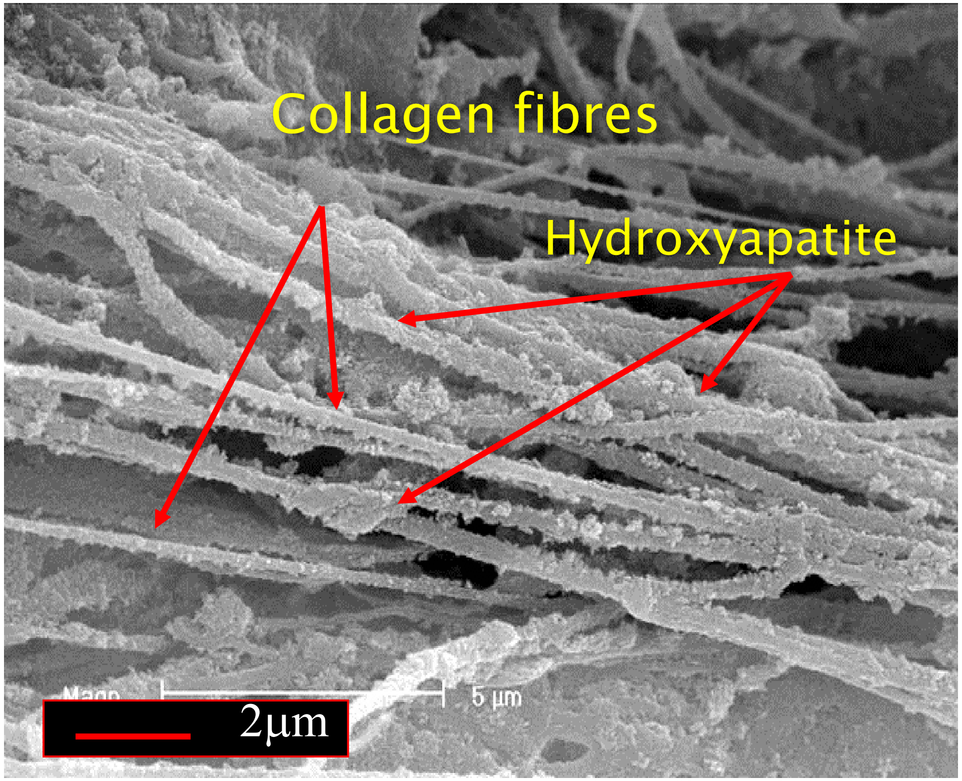
Multicentre clinical study for evaluation of a collagen-hydroxyapatite composite scaffold in revision hip surgery

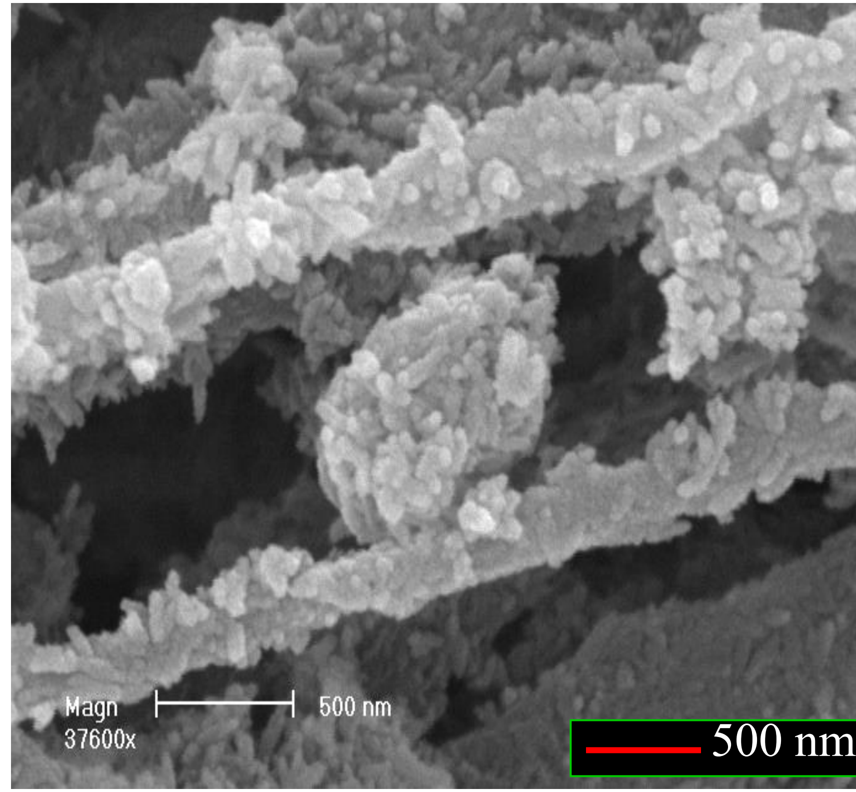
HEYRAC – Hull and East Yprkshire Regional Arthrplasty Centre, UK
R Raman, G Johnson

Istituto Ortopedico Rizzoli, Chirurgia di Revisione della protesi dell'Anca (CRA),
I Andreolli, M Bussaca, G Pigniatti

Regenoss is
a nanostructured collagen-hydroxyapatite
synthetic bone graft
that can perfectly fit the anatomic curvature
of the application site.

During surgery, this osteostimulative, composite biomaterial can be easily adapted to the defect dimension and save time





REGENOSS
Flexible Bone Substitute

(Mg-HA nucleated on type I collagen fibers)

Human bone

Micro-Structure (SEM image)

Methods

- Study approved in Aug 2012
- Estimated n=100 (70 +30)
- First case: Aug 2012 – per revised protocol

Study plan

	Pre-surgery evaluation visit V1	Surgery V2	6 weeks post-op. V3	6 months follow-up visit V4	12 months follow-up visit V5	24 months follow-up visit V6
Demographic data	X					
Patient information letter and signed informed consent collection	X					
Medical History (defect classification, lesion site, diagnostic examination, origin of the lesion, etiology of revision, revision number)	X					
Inclusion/Exclusion criteria evaluation	X					
Harris Hip Score	X			X	X	X
Qualitative clinical evaluation			X	X	X	X
Surgery report (material, prosthesis, associated surgery, diagnostic examination, type of revision, support associated with prosthesis)		X				
X-Ray	X			X		X
CT-Scan or MRI			X		X	
Adverse Events and or Complications		X	X	X	X	X

Methods

- Acetabular defects – Contained (after debridement
- Concomitant use of mesh
- No allograft or autograft
- Stem defects (not part of study)

Methods

- Pre op CT
- Pre op Xray
- Post op Xray
- Post op CT : 6/52 to 3/12, 1yr, 2 yr

Results

- 127 cases recruited
- 97 cases- per protocol (30 excluded after op)
- 51 Male: 46 female
- Revision Procedure: 1-64, 2:21, 3-12

Defect classification

- Paprosky IIA: 17
- IIB: 52
- IIC: 12
- IIIA: 12
- IIIB: 4

Revision Etiology

- Aseptic Loosening: 54/67
- Dislocation: 2/67
- Septic loosening: 3/67
- Other (Fracture etc…): 8/67

Results

- Cup revised 67/67, Stem: 9/67
- 50-72mm cups
- 61/64- needed screw augmentation (2-5 screws)
- CoC: 53, CoP: 11, MoP: 3

Regenoss

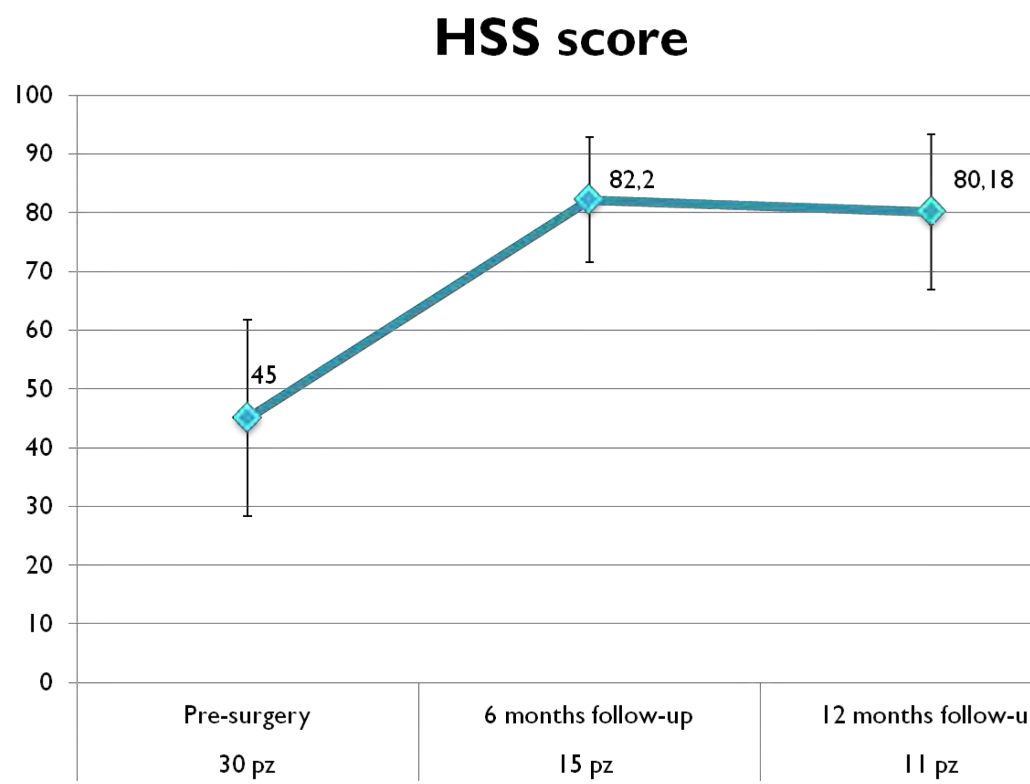
- 3.5x3.5 : 52
- 12.5x2.5: 35
- 7.5x7.5: 19
- Usage: 2-5

QOL

- EQ 5D:
  - 1 yr – 36 to 78 (sd 9.4)
- Complete recovery: 53/67
- Marked Improvement: 9/67
- Slight Improvement: 1/67
- No change: 1/67
- Worsening:3/67

HHS

- Pre op : 29-61
- Post op
  - 1 yr: 56-94 sd – 11.4



Complications

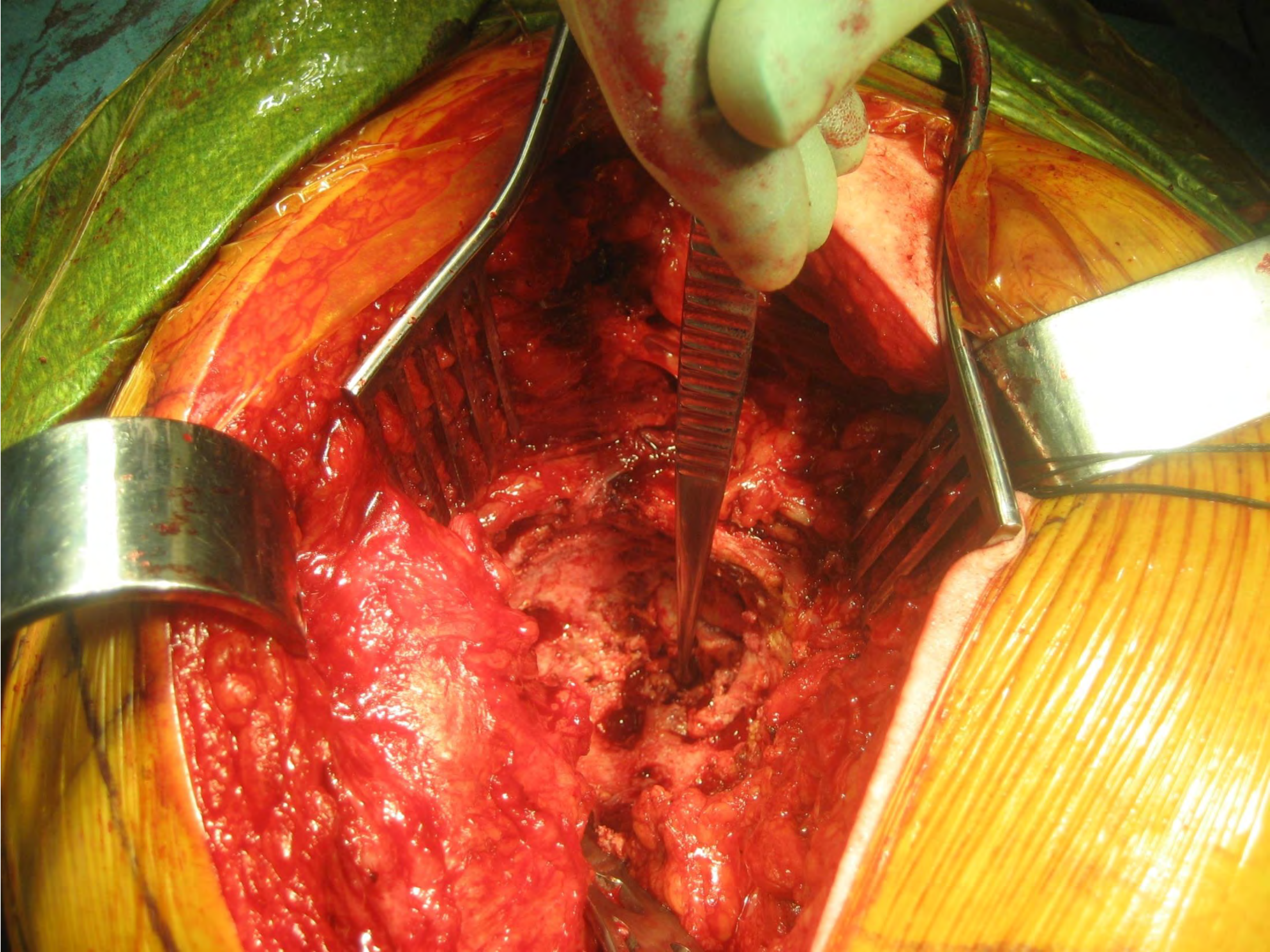
- Infection : 4
- Dislocation: 1
- Re revision: 2
- Deaths : 2
- DVT: 1

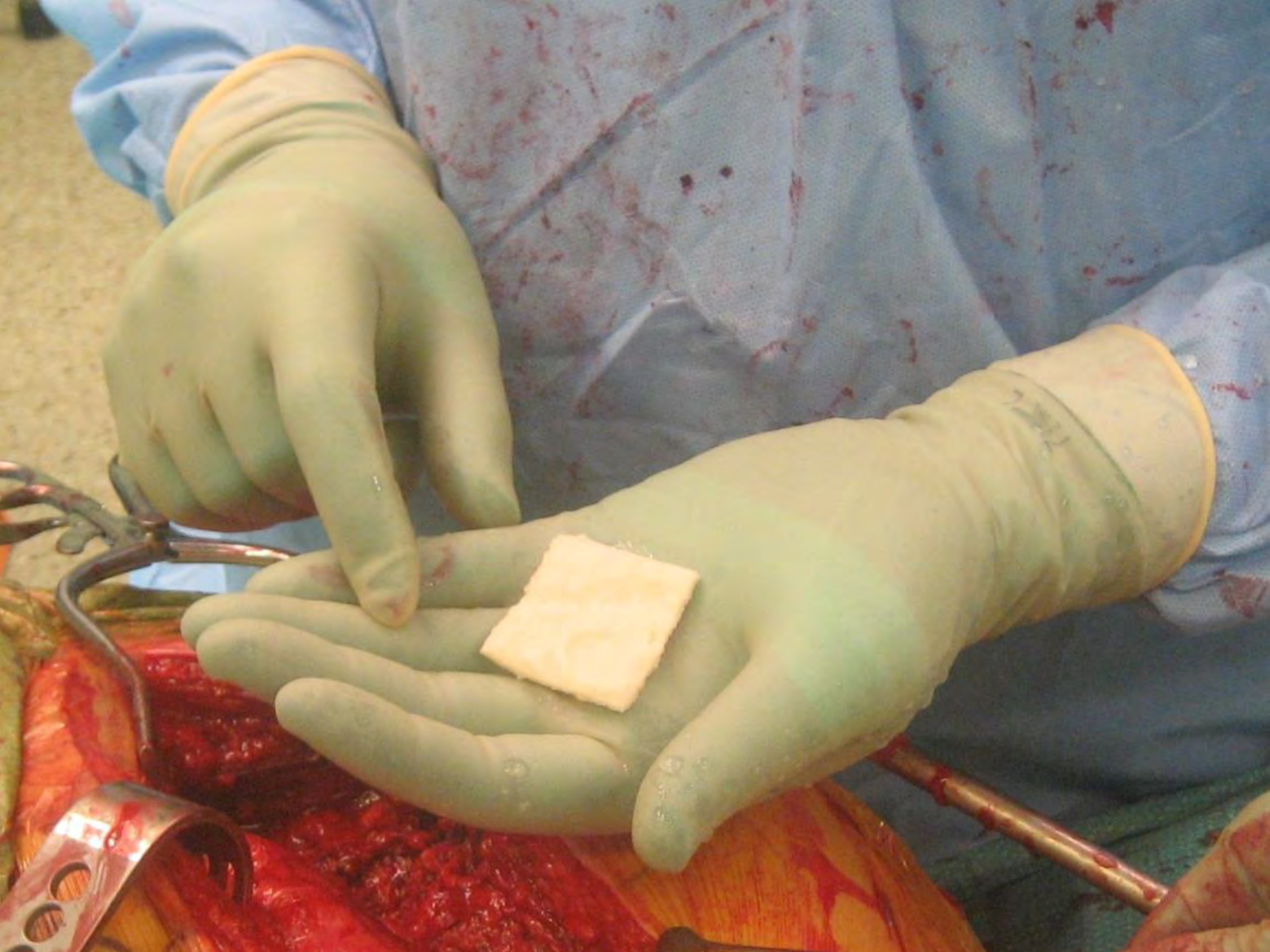
Case 1


0000490588701
Aquisiti
R
P
L
A
l.20
FIRMARY

0000490588701
Aquisitic
R
P
L
A
I1399

0000490588701
Aquisition
R
P
L
A
l.28
FIRMARY





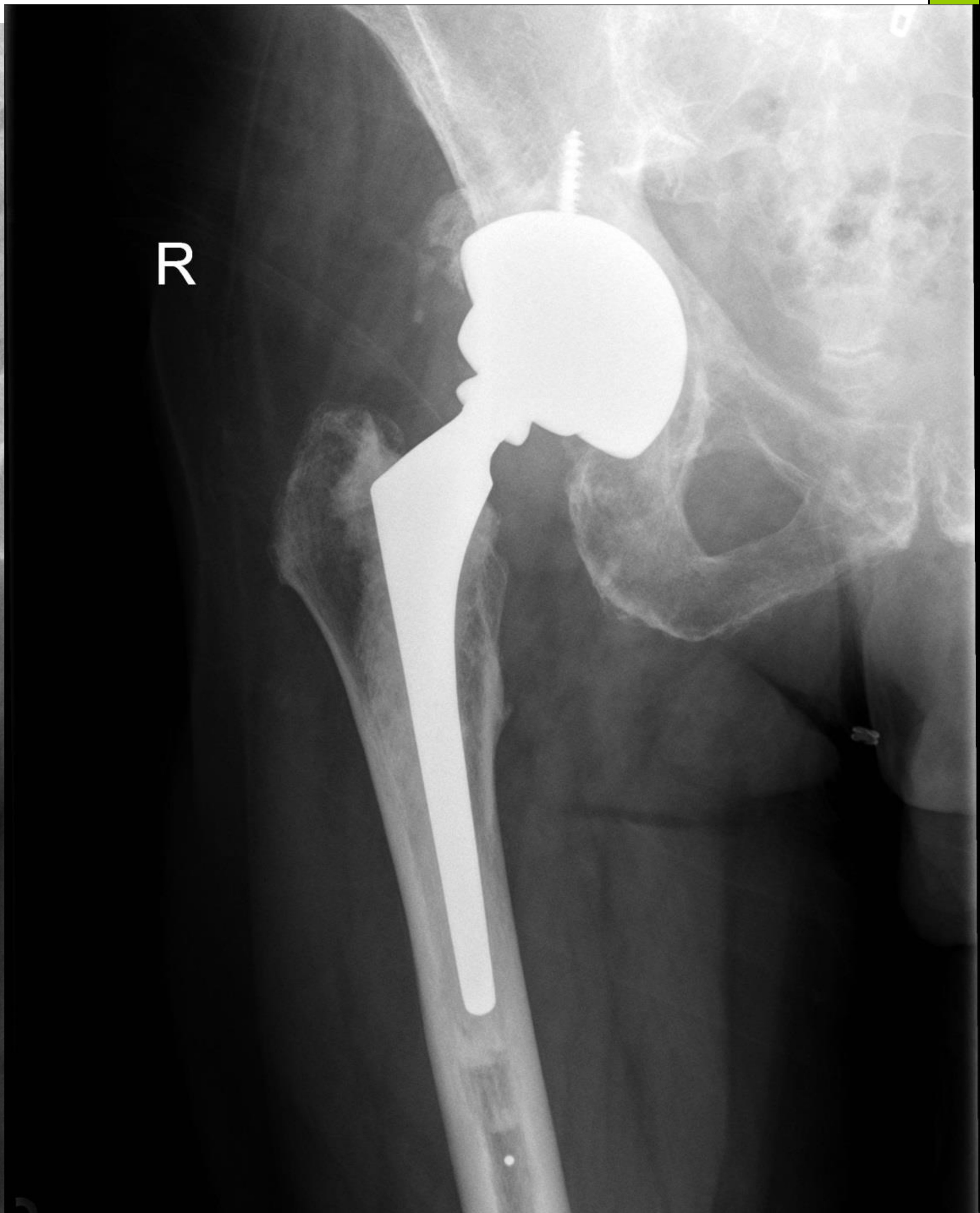

L
ACC#:RWA0


ACC
L

Case 2

18 months

- Case 3

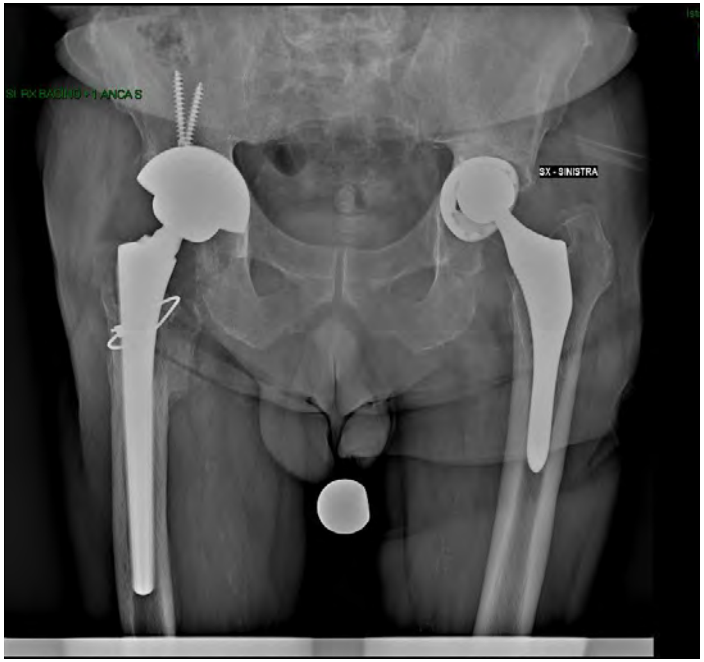


♂

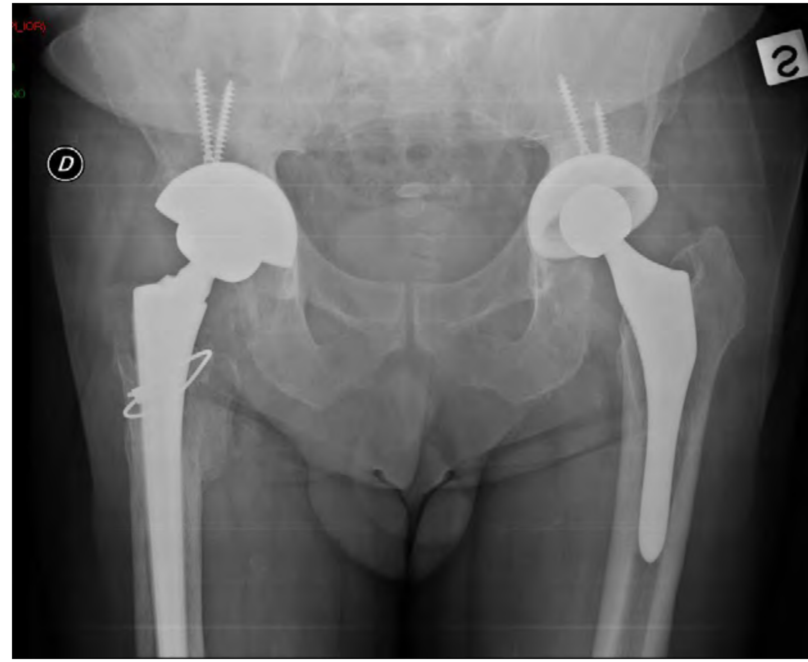
74 yy

II B Paprosky

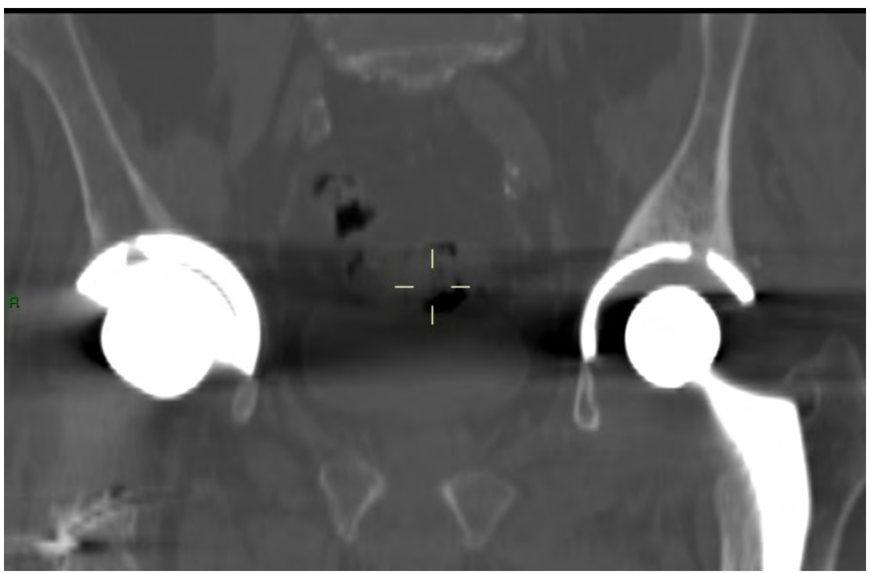
I° revision



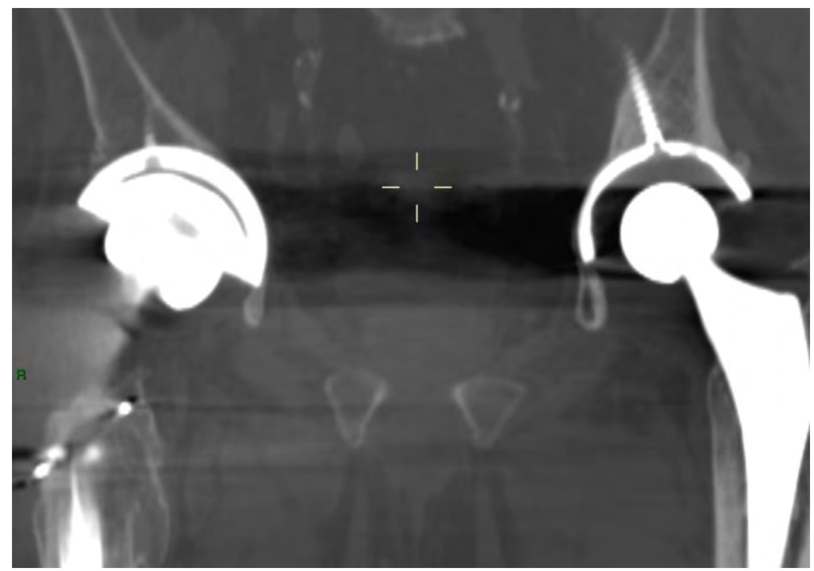
Pre-op RX HHS = 46



12 months post-op RX HHS = 94

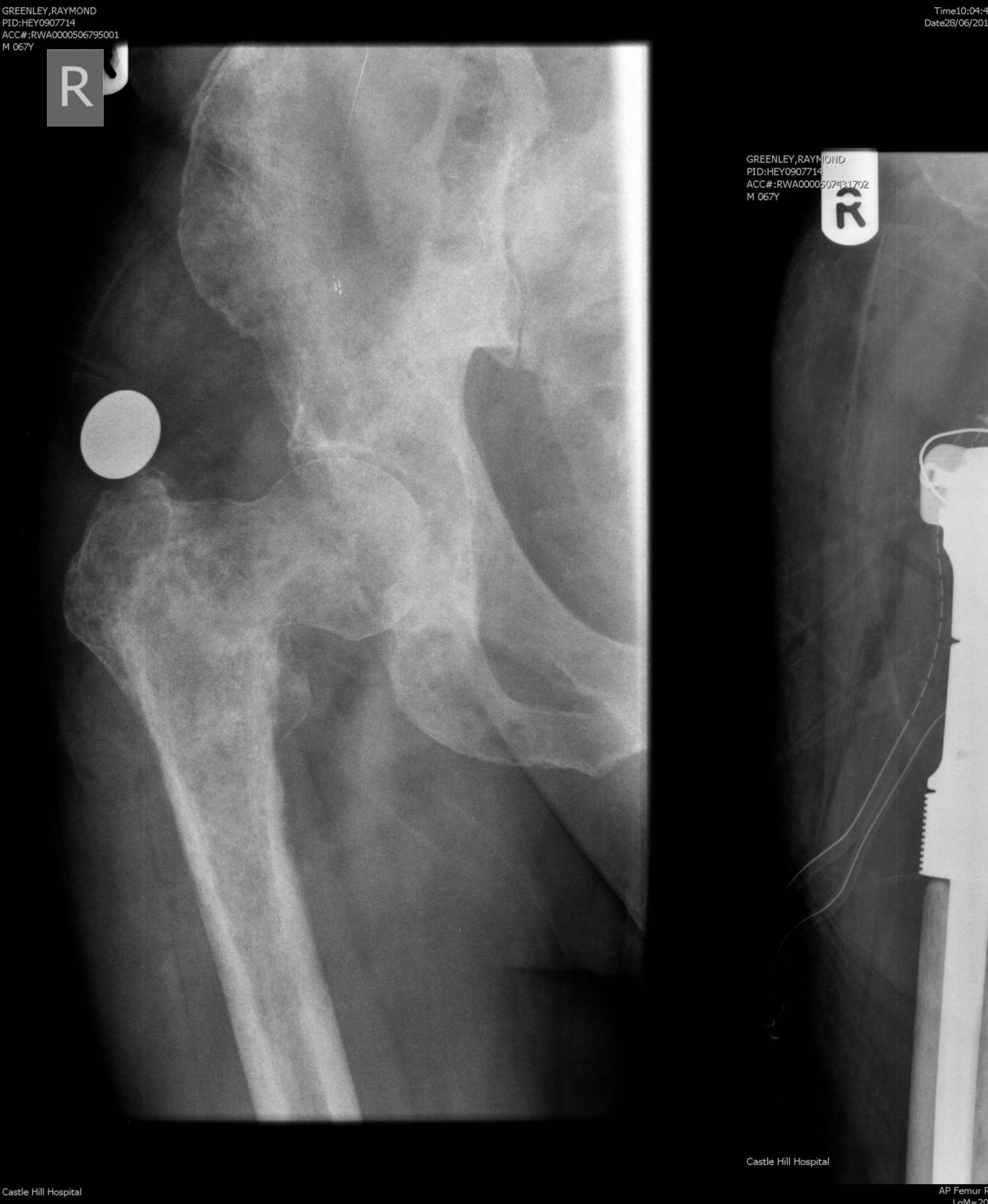


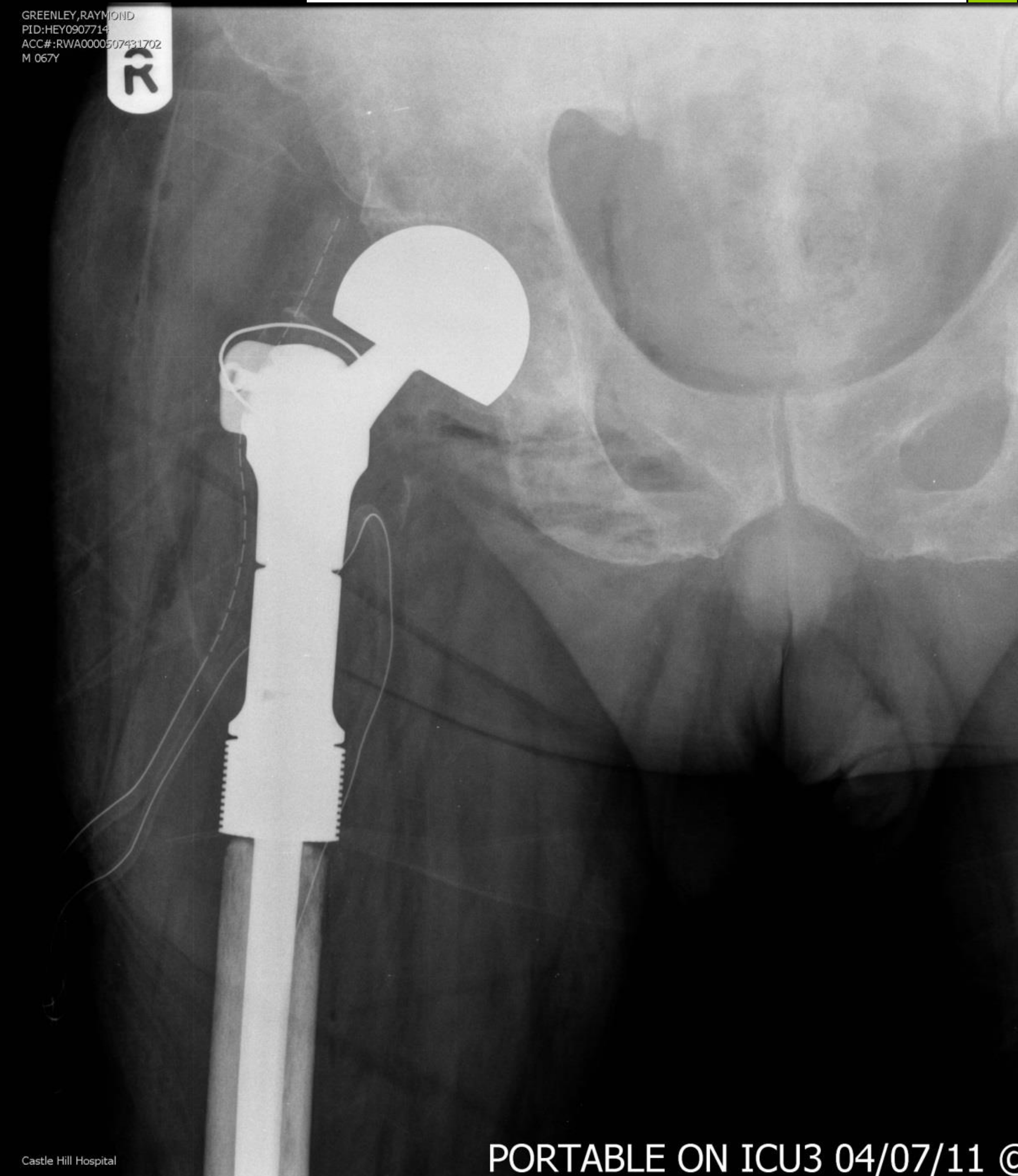
6 weeks post-op CTscan



12 months post-op CTscan

- Megaprosthesis





PORTABLE ON ICU3 04/07/11 ©


R


GREENLEY,RAYMOND
PID:HEY0907714
ACC#:RWA0000566162101
M 068Y
R


GREENLEY,RAYMOND
PID:HEY0907714
ACC#:RWA0000525949602
M 067Y
R
Time11:17:24
Date11/01/2012
GREENLEY,RAYMOND
PID:HEY0907714
ACC#:RWA0000525949601
M 067Y
R
Hull Royal Infirmary


30/03/2011
19:59:03
ACC#:RWA0000498219401
R
LgM=134

Conclusions

Easy to **Restore acetabular** defects

The preliminary data suggest that RegenOss is a **valid and safe** alternative to **restore acetabular bone stock** in total hip arthroplasty revision.

The use of RegenOss coupled with Uncemented cup ensured **good primary stability** and lead to **excellent osteointegration**.

Safe, easy to handle and readily available – off the shelf .

Flexible and elastic

Mg-Ha nucleated on collagen fibers → Chemical and Geometrical Biomimetism

Resorption cell- and enzyme-mediated (6-12 months)

INTERNATIONAL COMBINED MEETING

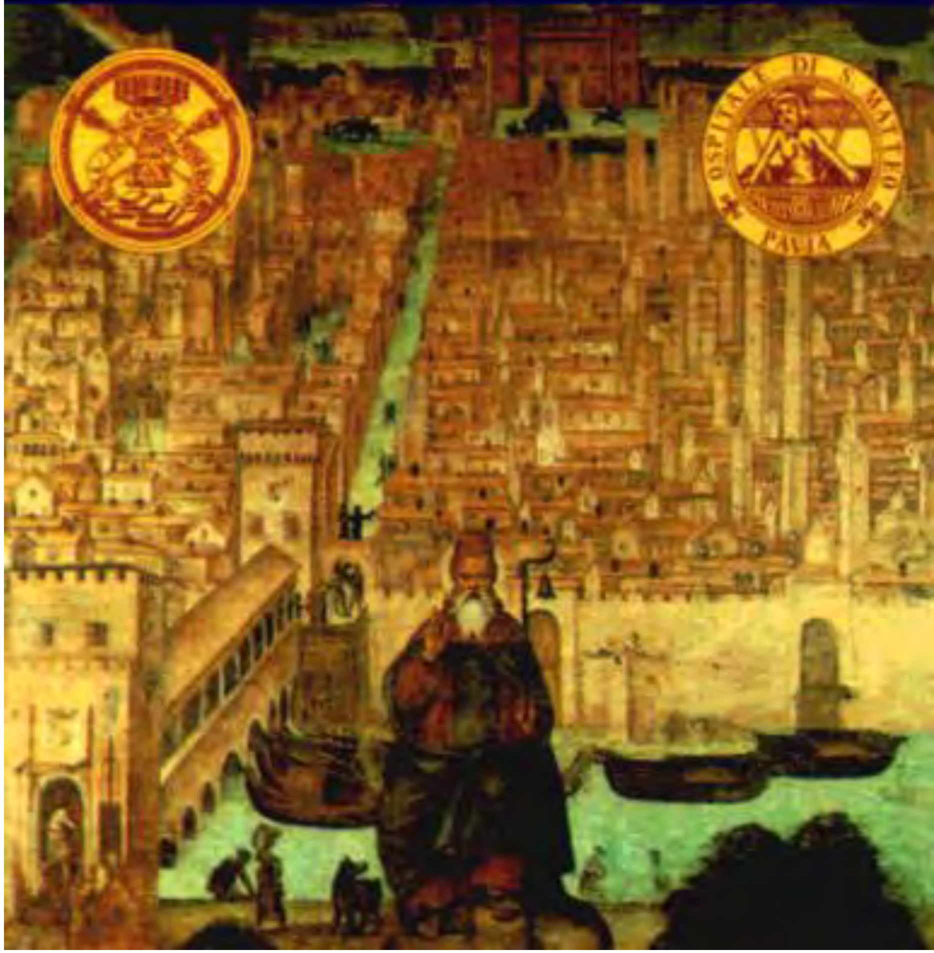
BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Clinica Ortopedica e Traumatologica
Università degli Studi di Pavia
Fondazione I.R.C.C.S Policlinico San Matteo

Chairman: Prof. F. Benazzo



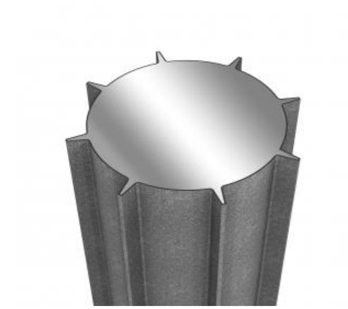
Uncemented femoral revisions: 20 years of experience

F. Benazzo, L. Perticarini

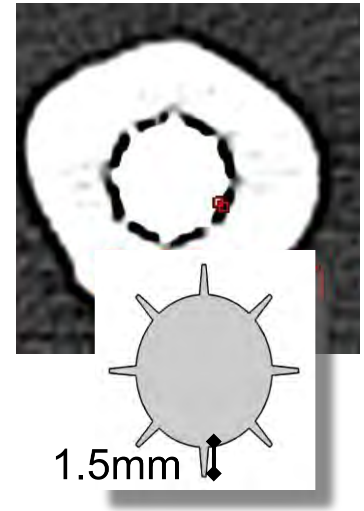
REVISION STEM

- The ‘Revision’ is a hip conical <u>modular</u> system designed for uncemented applications
- Born in 1996
- Suitable for severe hip revisions
- Can be implanted with the trans-femoral approach or the close femoral approach
- “Evolution” of Wagner SL-Revision

FEATURES: Conicity, Fins, Rough surface



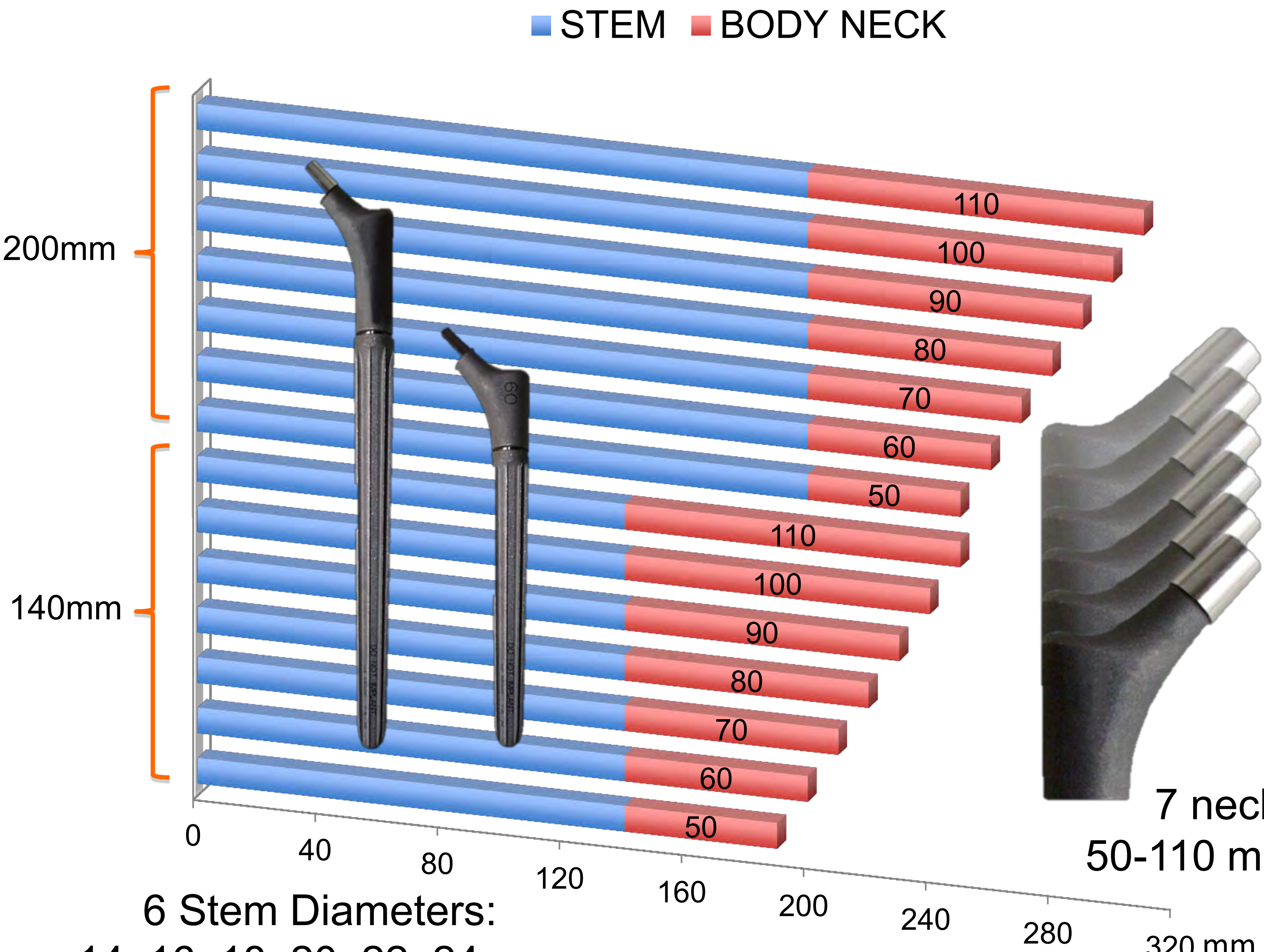
✓ 2° of conicity



✓ According to Wagner, the stem is provided with 8 fins which penetrate the inner cortex

✓ The rough surface allows the bone ingrowth for the biological fixation

FEATURES: Modular stem



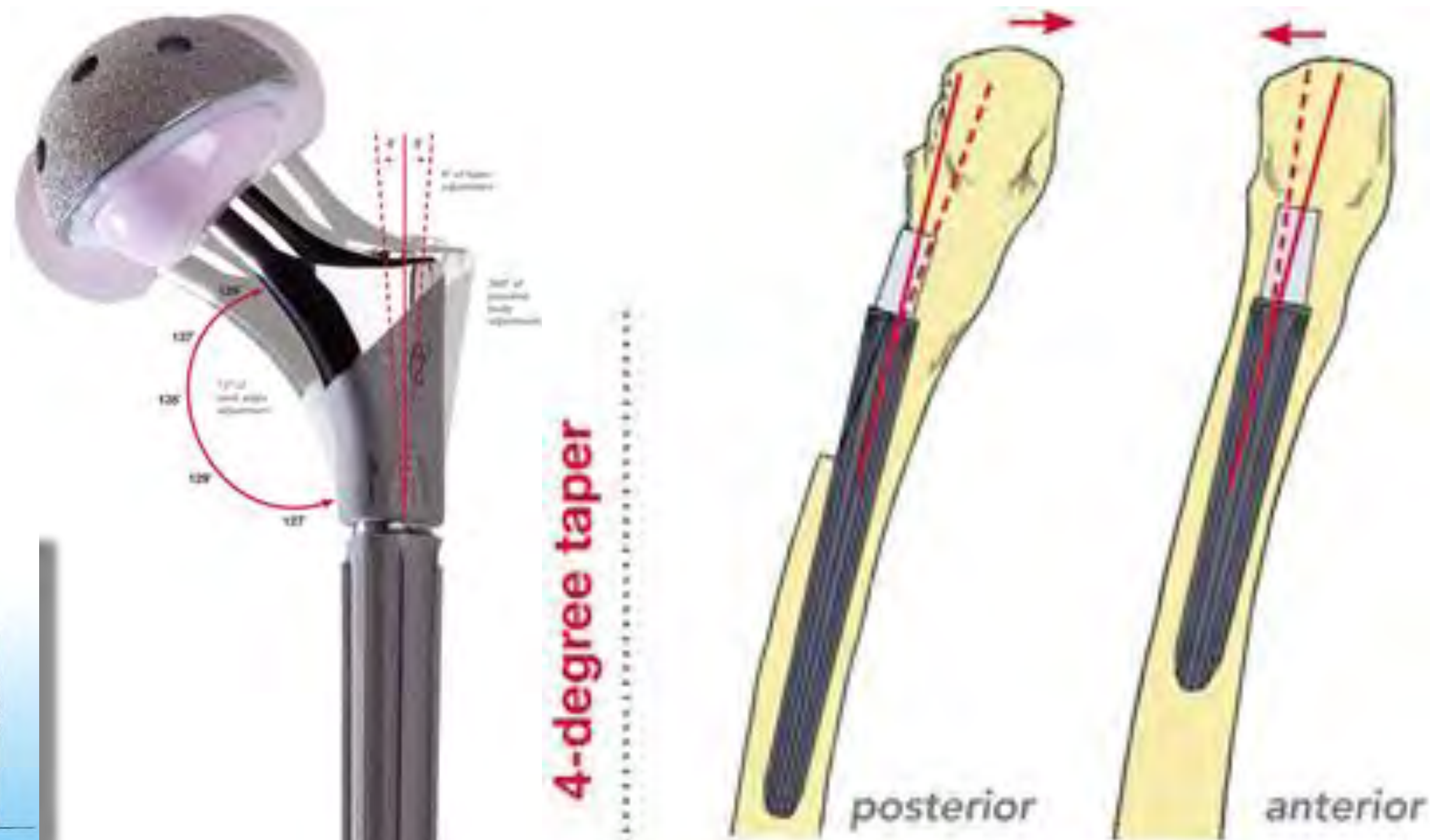
6 Stem Diameters:
14, 16, 18, 20, 22, 24 mm

7 neck lenghts:
50-110 mm (STD,LAT)

FEATURES: 4-degree taper

Proximal taper angle:

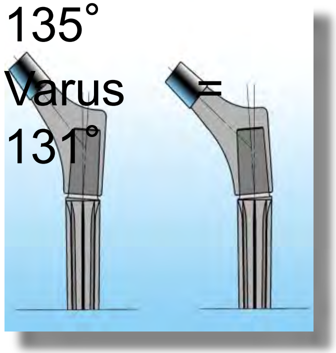
- to the anterior/posterior planes to recreate the femur's natural anterior bow
- to the medial/lateral planes to provide offset options (varus or valgus neck)



Valgus = 139°

Neutral = 135°

Varus = 131°



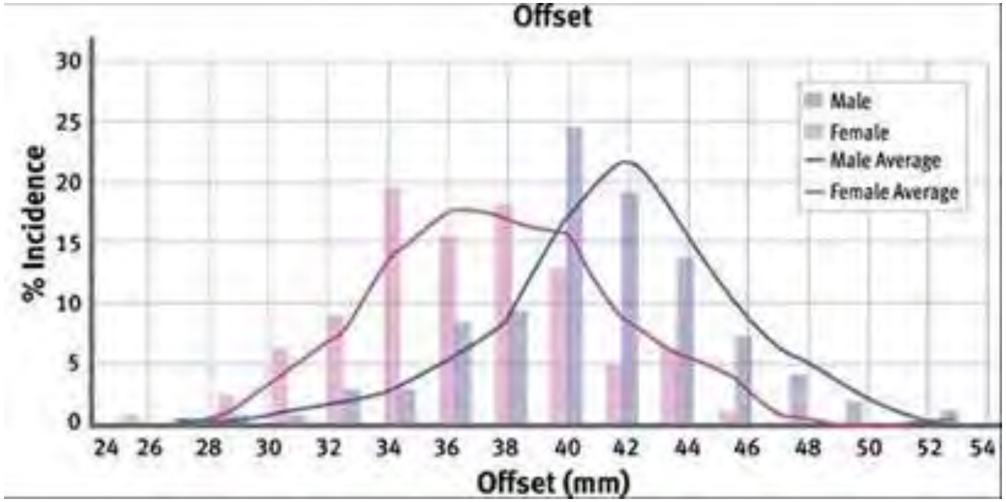
FEATURES: Offset

Standard neck:
- offset ranging from 27.9 to 48.9mm.

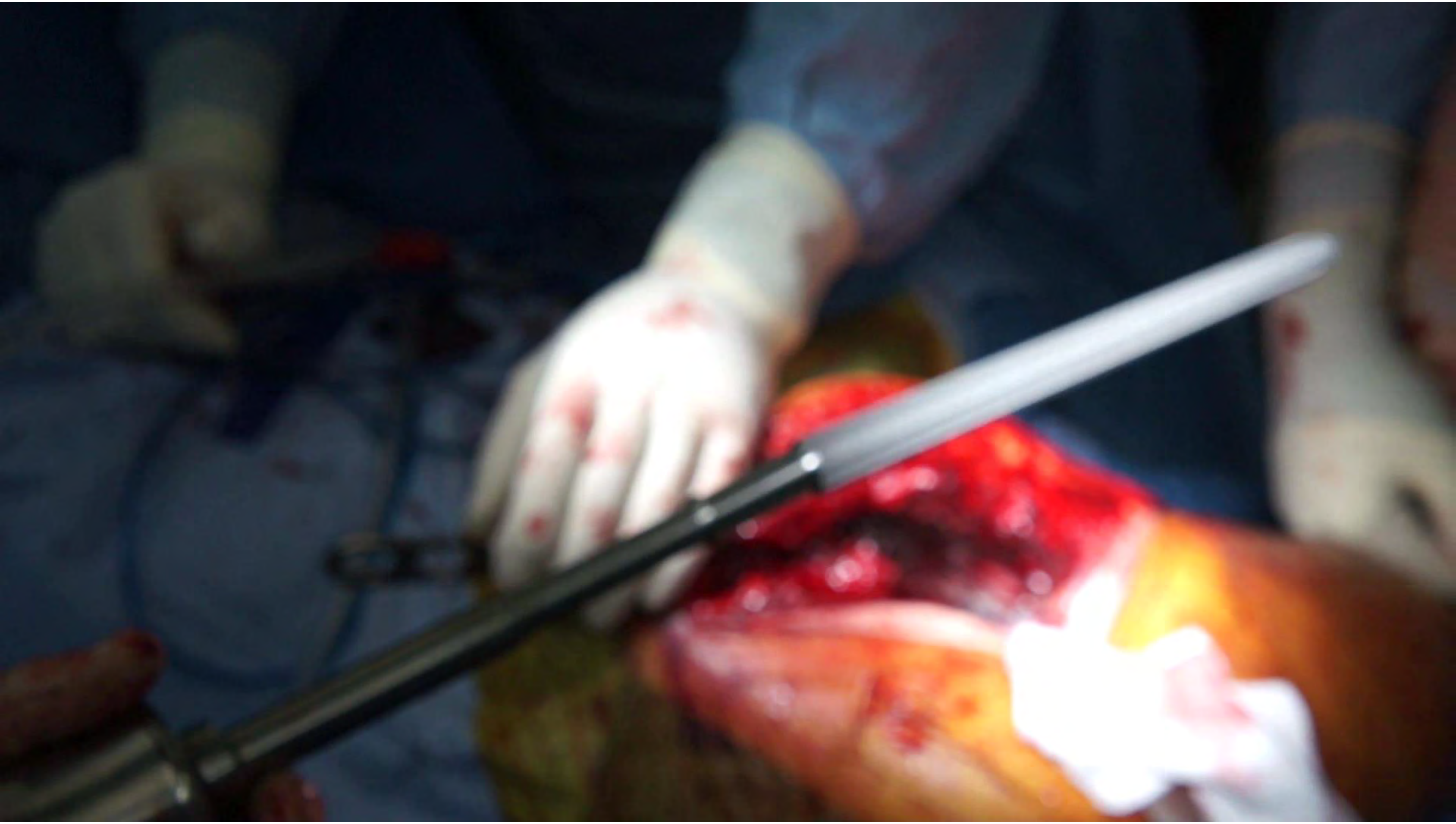
cover the female offset spectrum

Lateralized neck:
-can reach an offset of 53.9mm

covering the male offset spectrum



(J Bone Joint Surg Am. 2009;91 Suppl 6:121-8)



Our Experience

Between May 2001 and December 2014, 148 patients (78 W, 70 M) underwent hip revision surgery with Revision stems:

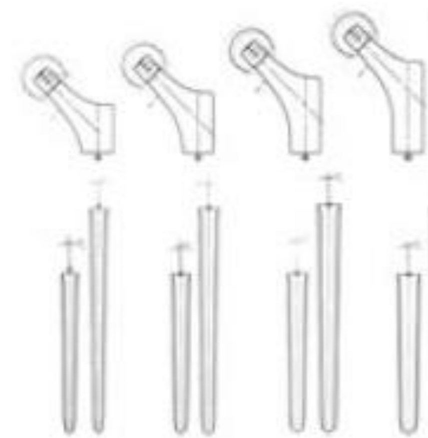
- aseptic loosening: 111 cases (75.0%)
- periprosthetic fractures/
  sequels of fractures: 30 cases (20.0%)
- infections: 7 (4.8%)

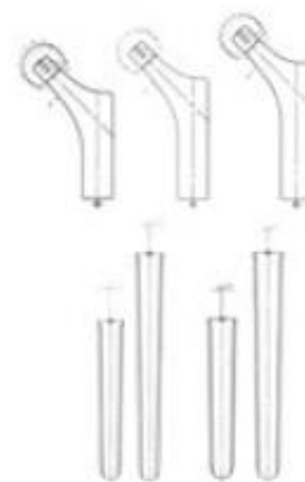
Acetabular revision associated in 75 (52.0%) cases

Mean Follow-up: 85 m (range 8m – 14y)

Component used

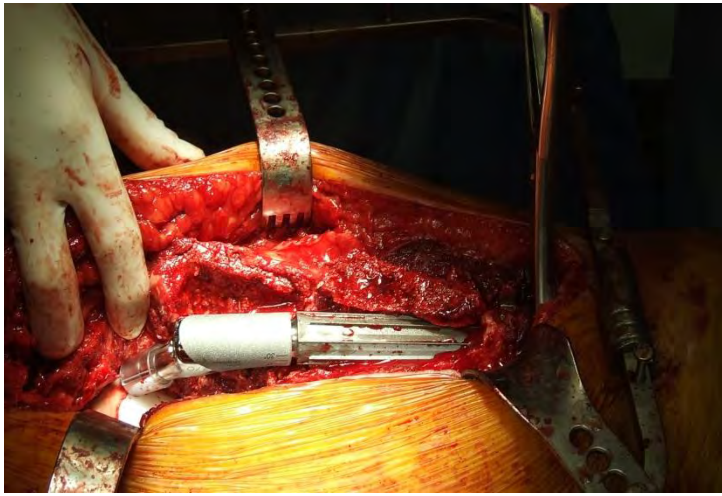
- 200 mm in 94 cases
- 140 mm in 11 cases
- all diameters, neck length, std and lat version were used
- bone femoral graft in 9 cases (8.5%)





Approach to remove the stem

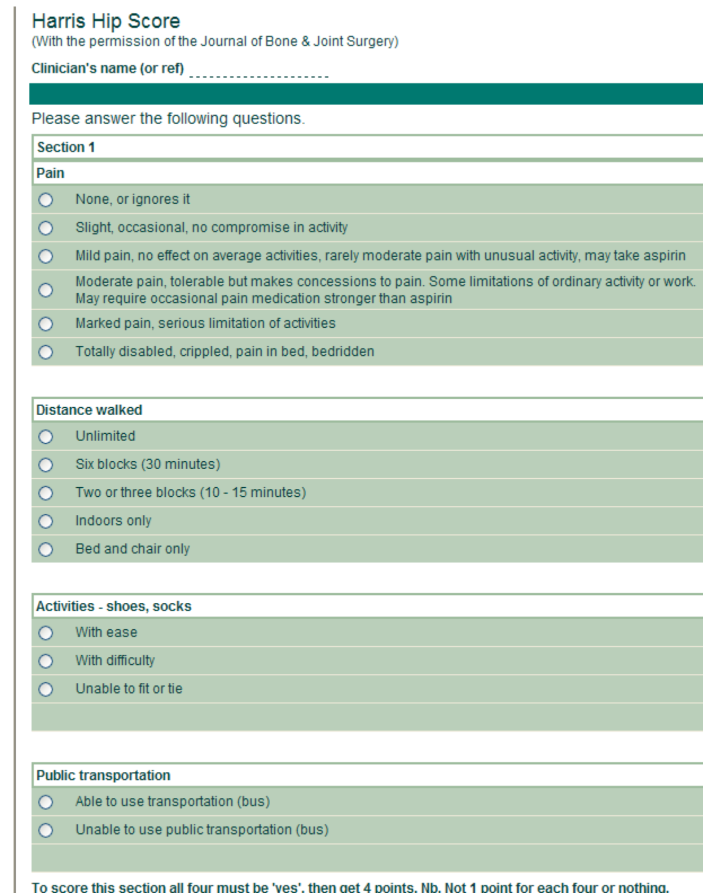
- Wagner technique: 98 cases
- No opening: 22 cases
- Across fracture: 28 cases



Our Experience - Results

- 4 patients died
- 7 patients have not been reached
- HHS improve from 42 (range 30-65) to 86 (range 67-99)
- 80% of satisfactory results

(> age, comorbidity, other disabilities)



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

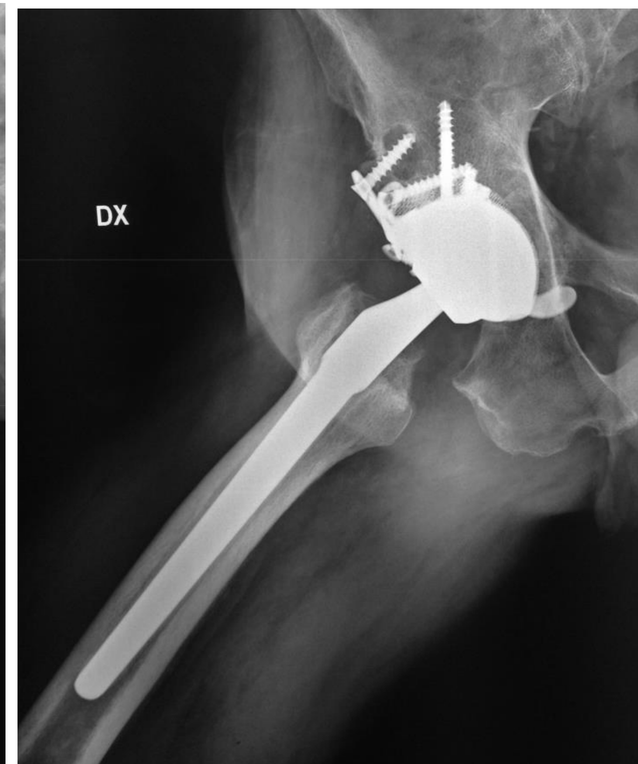
- ○ Able to use transportation (bus)
- ○ Unable to use public transportation (bus)

To score this section all four must be 'yes', then get 4 points. Nb. Not 1 point for each four or nothing.

Our Experience - Results

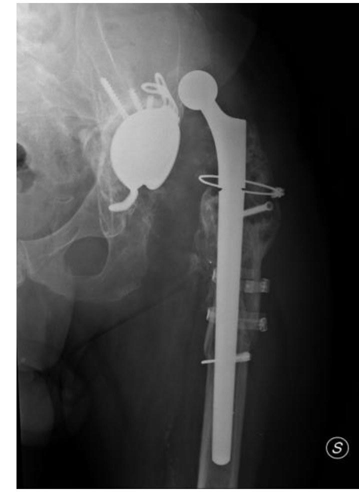
- ✓ No length leg discrepancy greater than 1 cm (modular neck)

  (only 1 case from 5.5 cm pre-op to 2.5 post-op)
- ✓ No stem revisions occurred – no neck breakage
- ✓ 6 months: bone formation in Wagner osteotomy

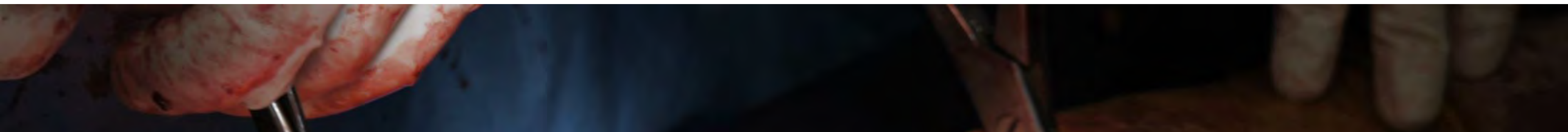
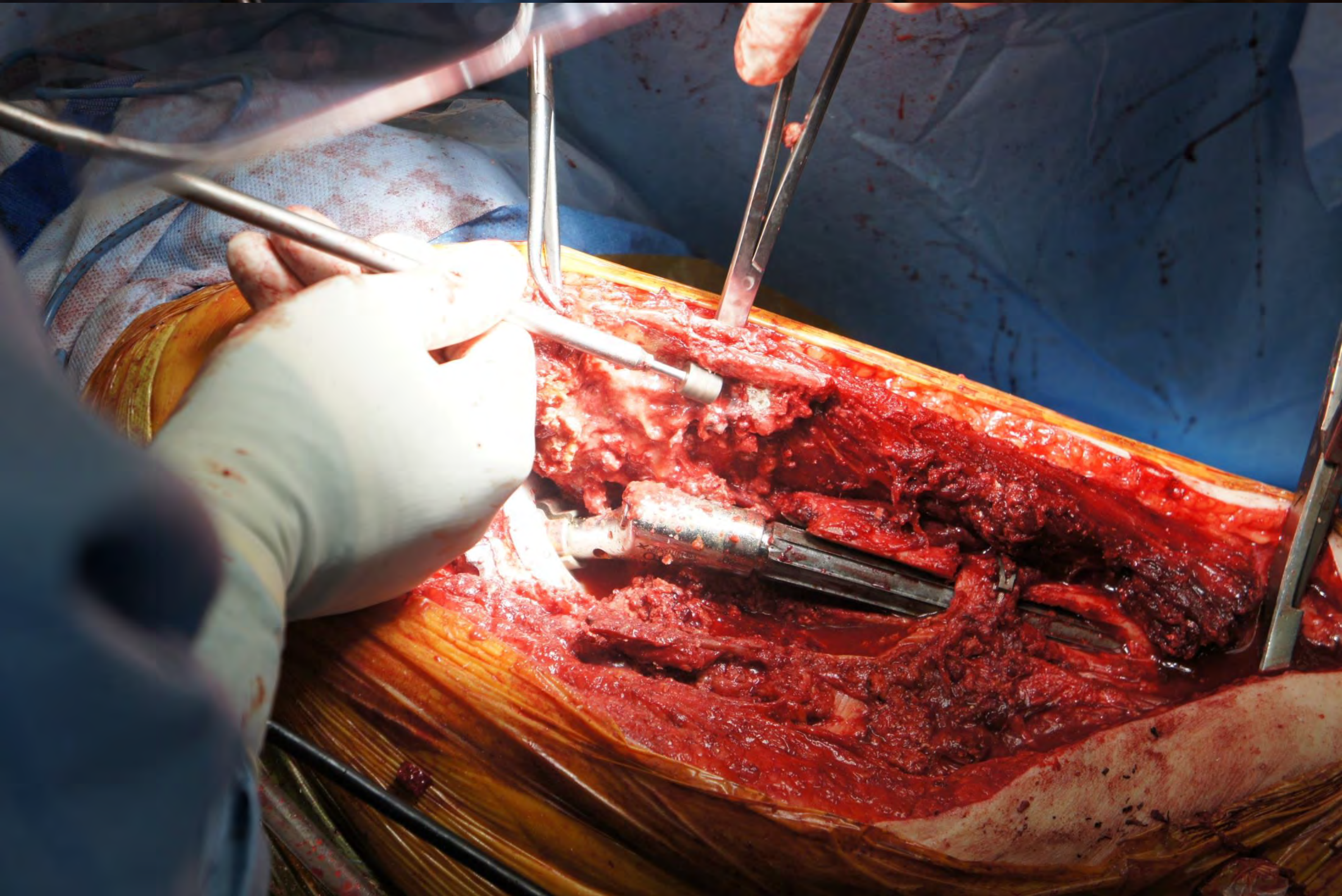


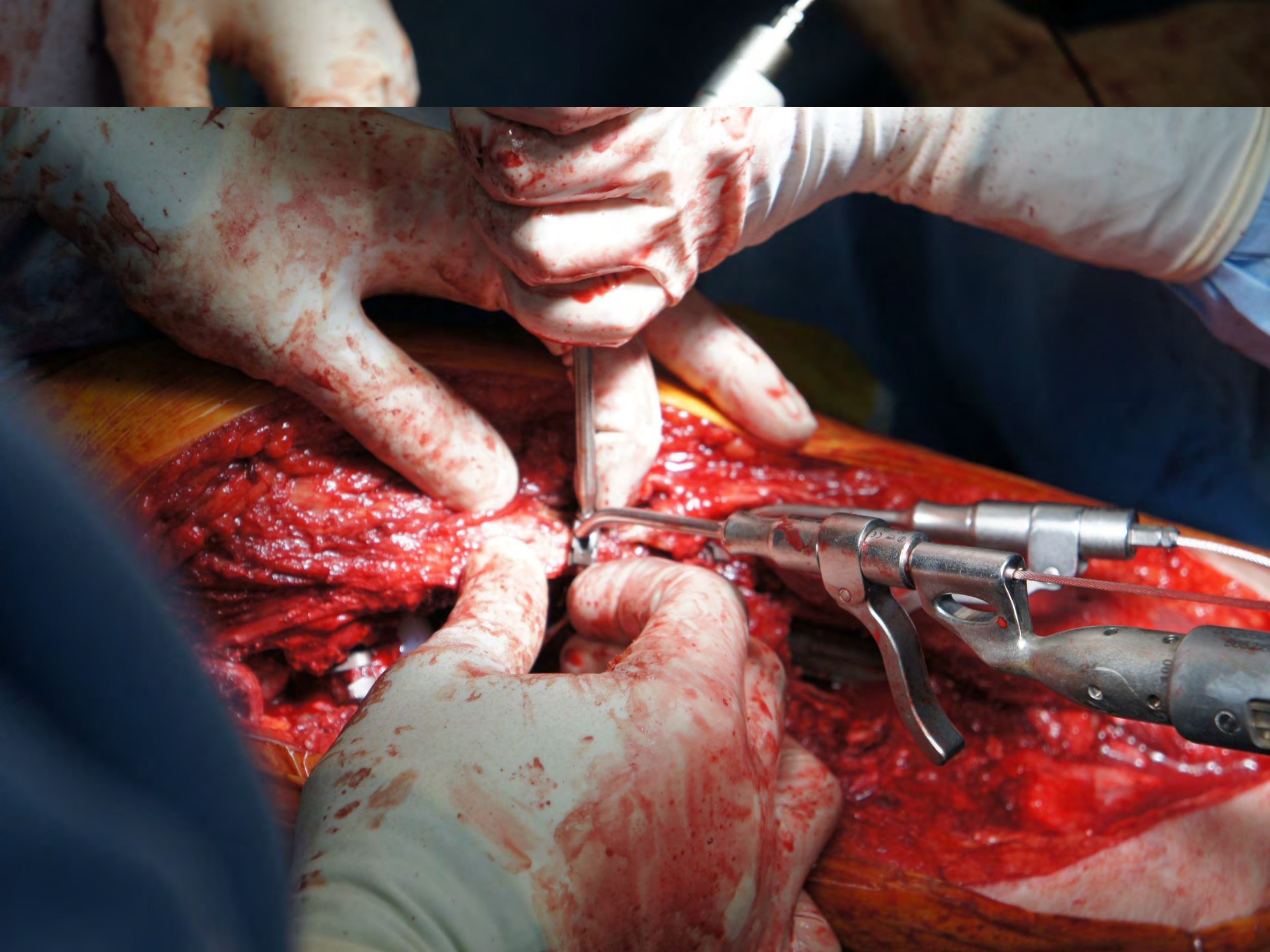
Our Experience - Complications

- Intra-operative:
  - ✓ 7 methaphyseal fractures during explantation
- Post-operative:
  - ✓ 3 dislocations, treated conservatively
  - ✓ 3 periprosthetic fractures, addressed with wiring/plates
  - ✓ 2 subsidence, self limited
  - ✓ 1 infection

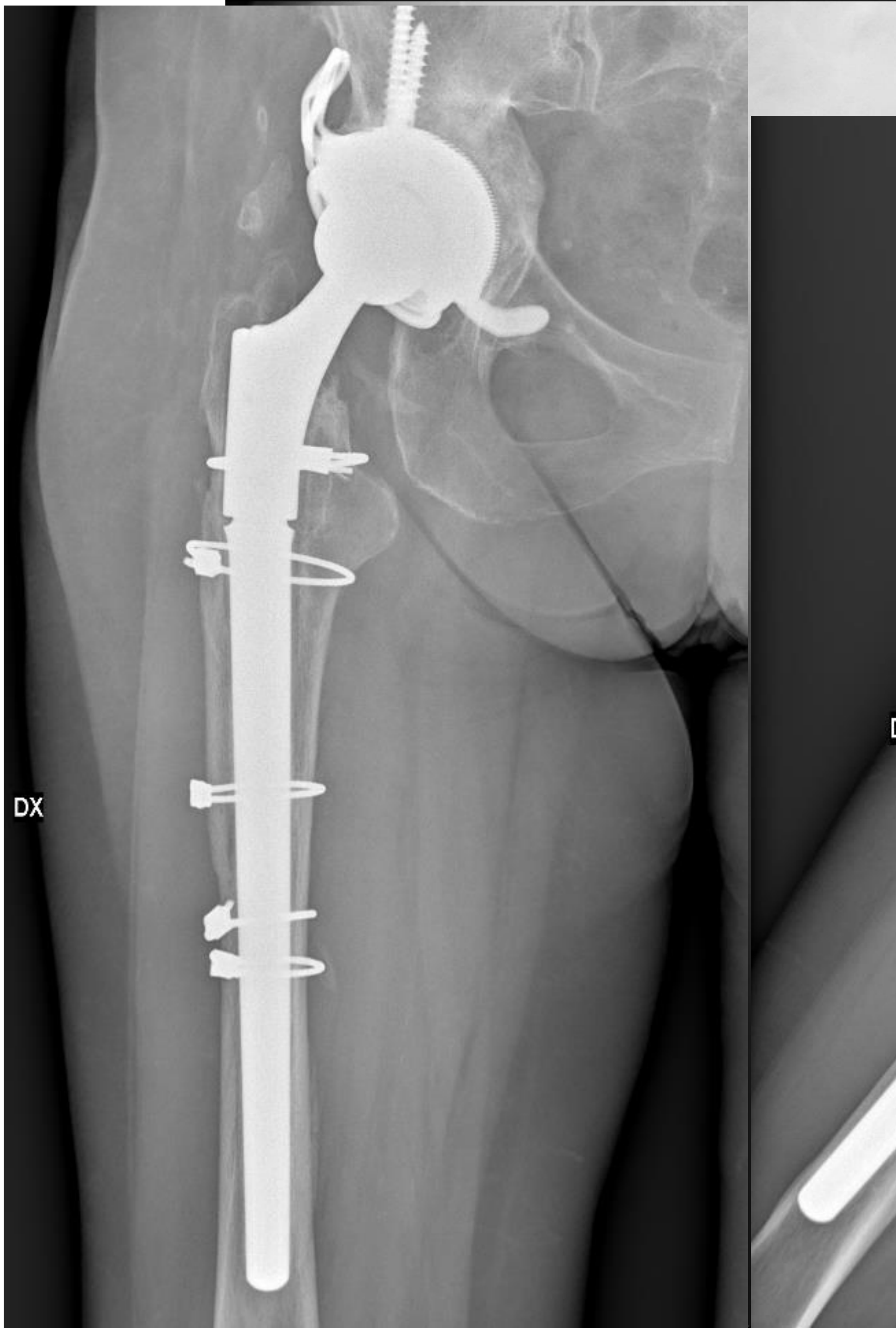



B.L., F, 65y

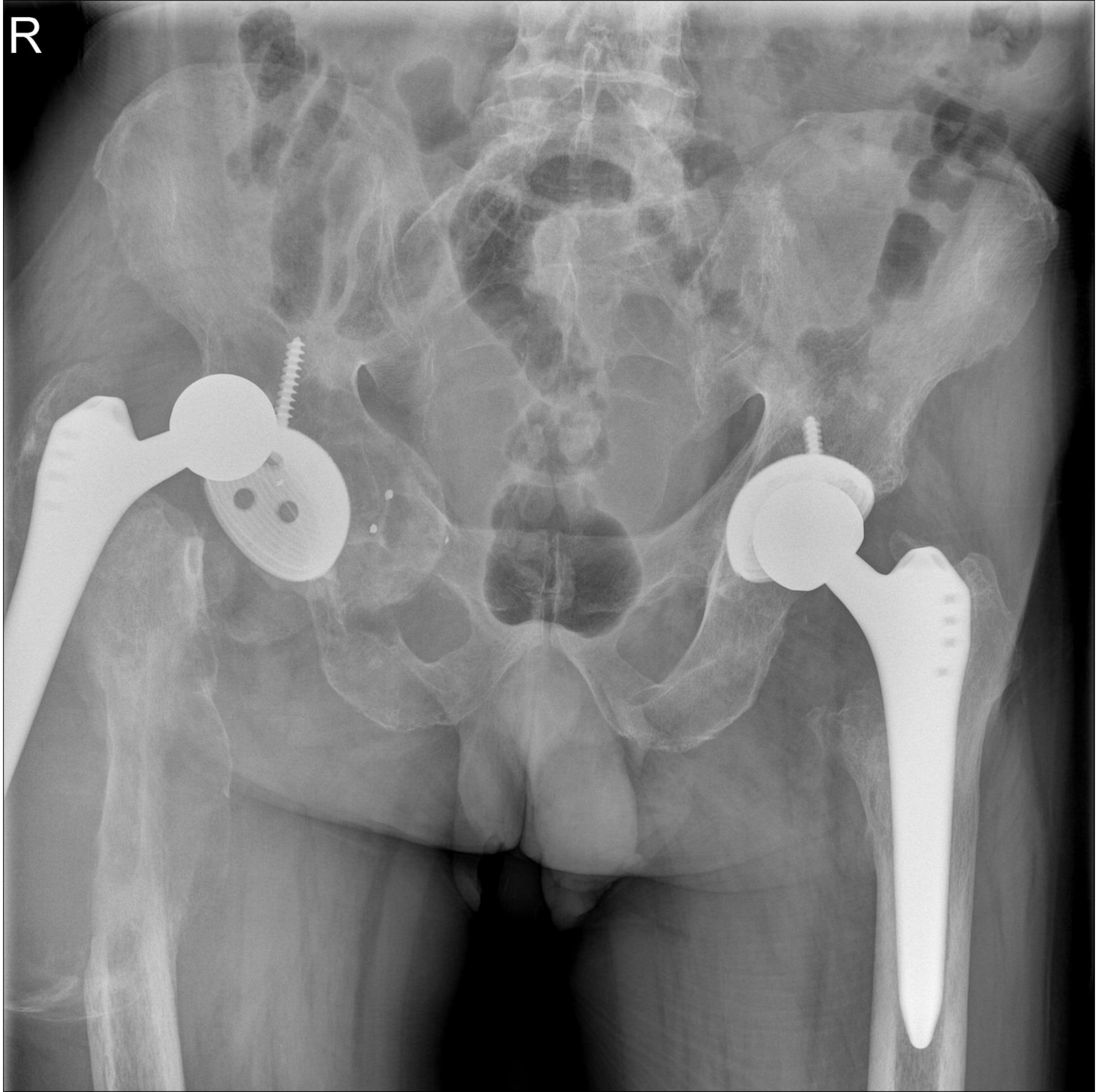


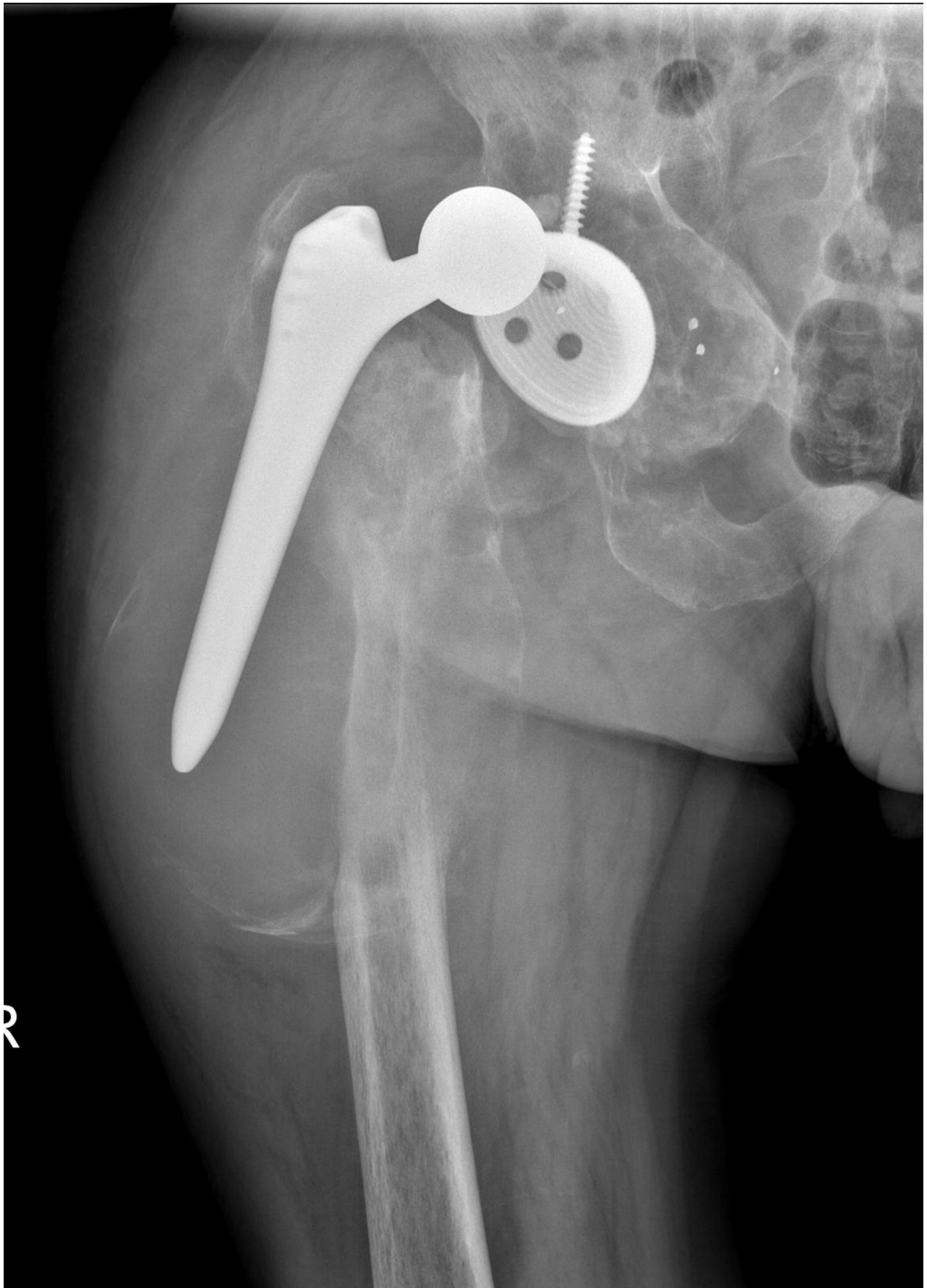
5 y

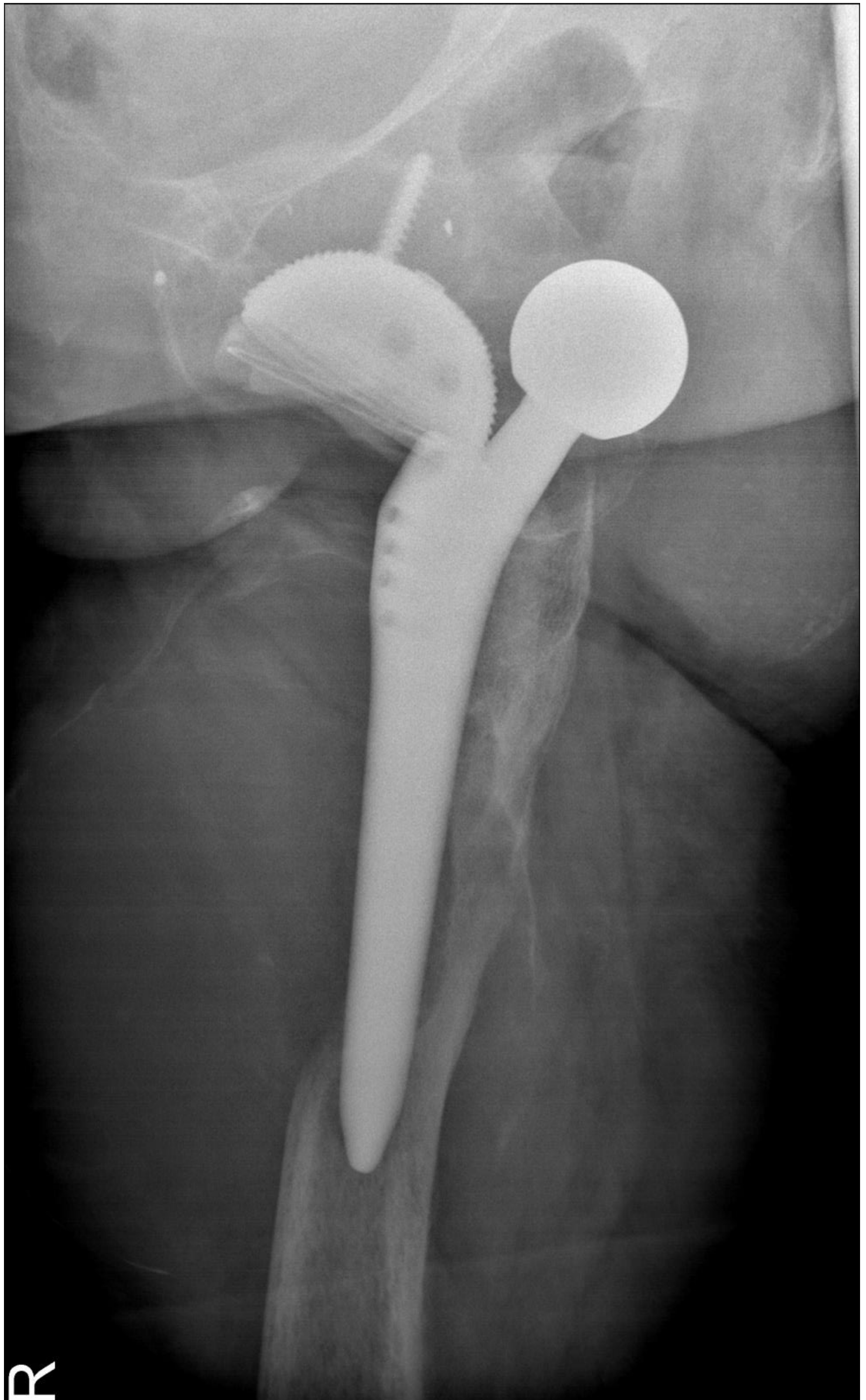


B.G.,M, 67 y

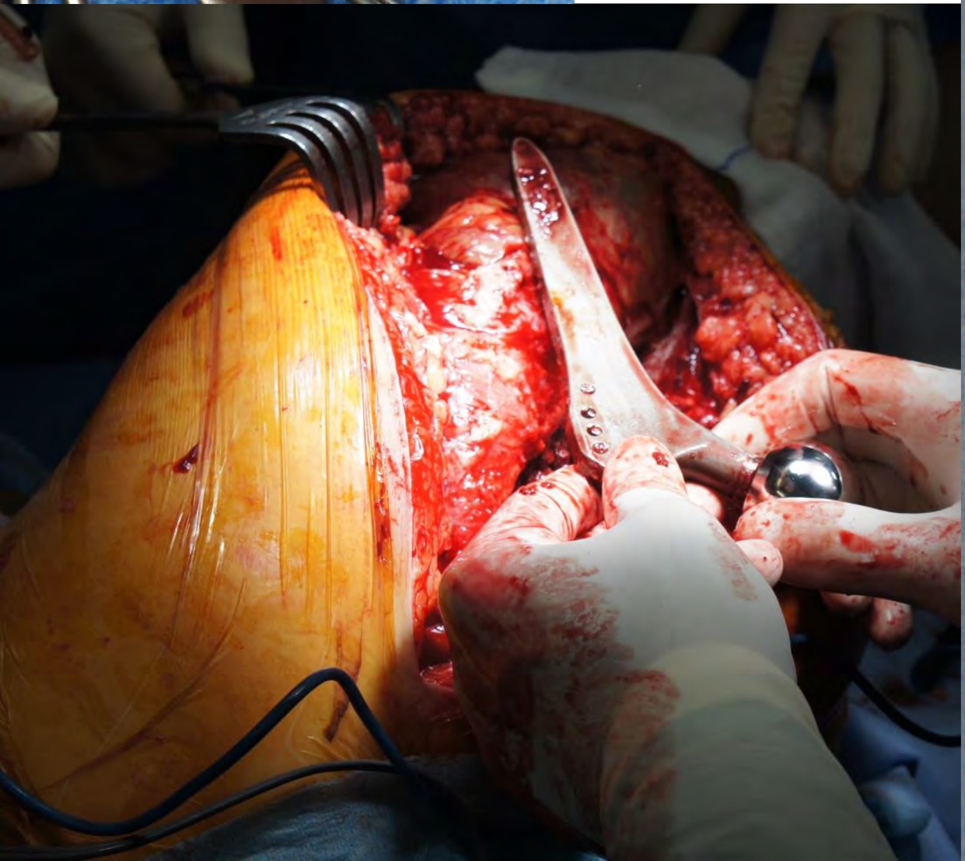
- THA 6y before

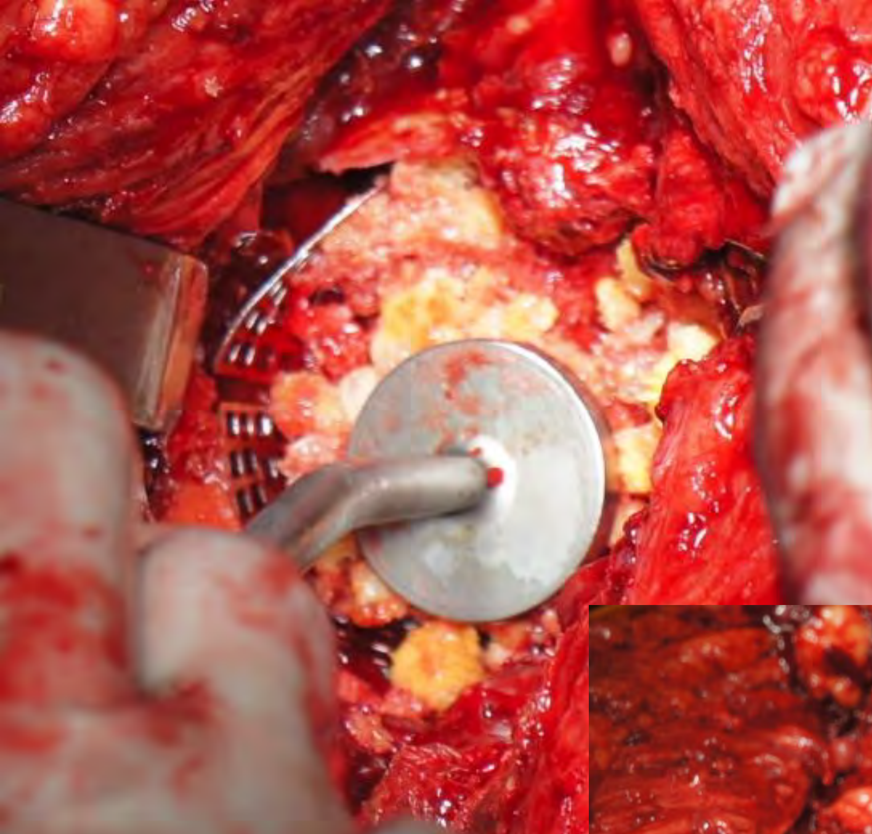
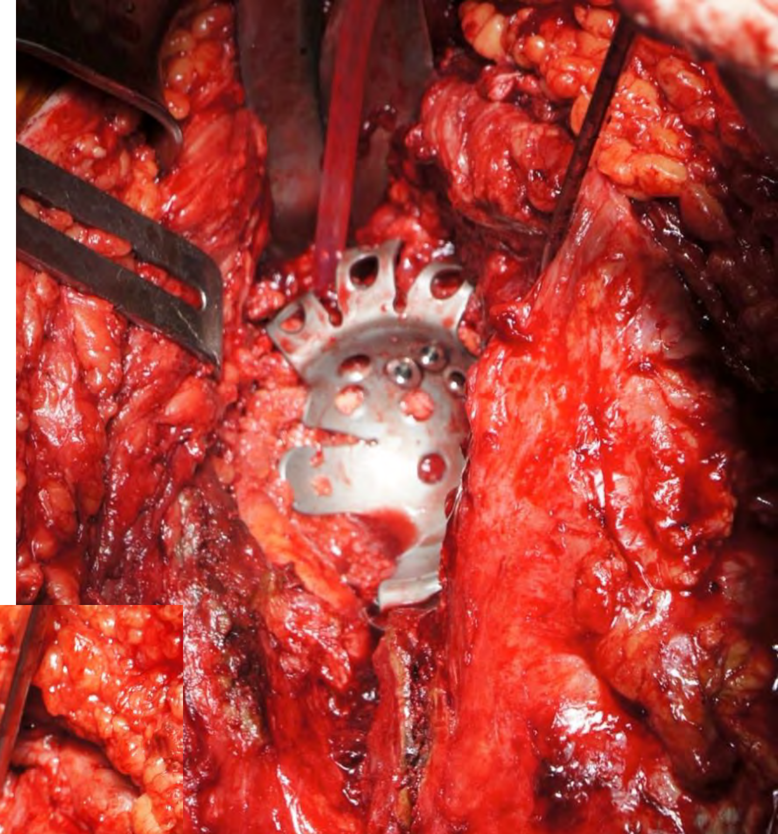
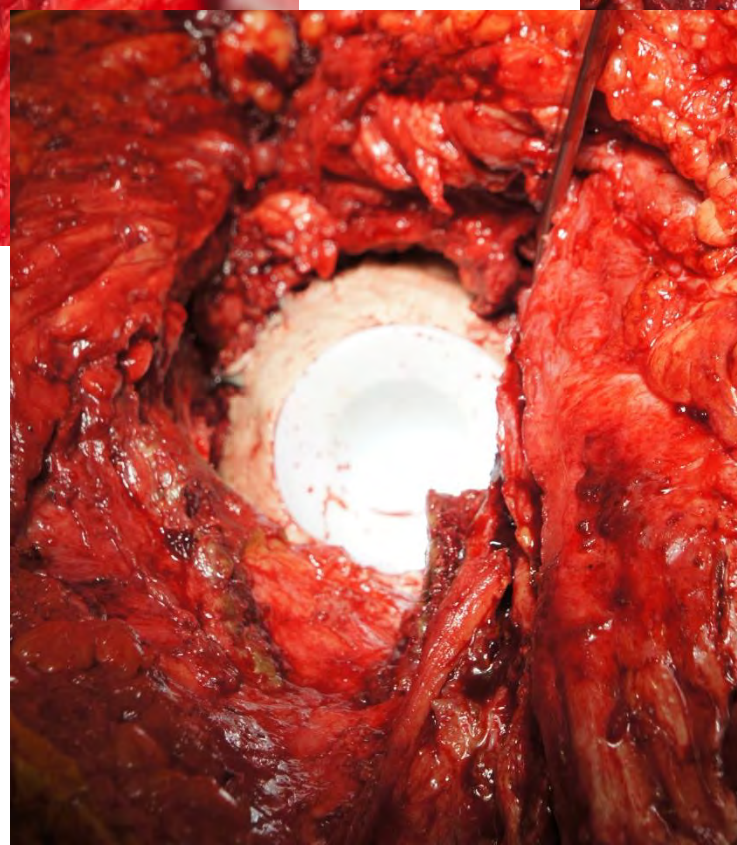

R

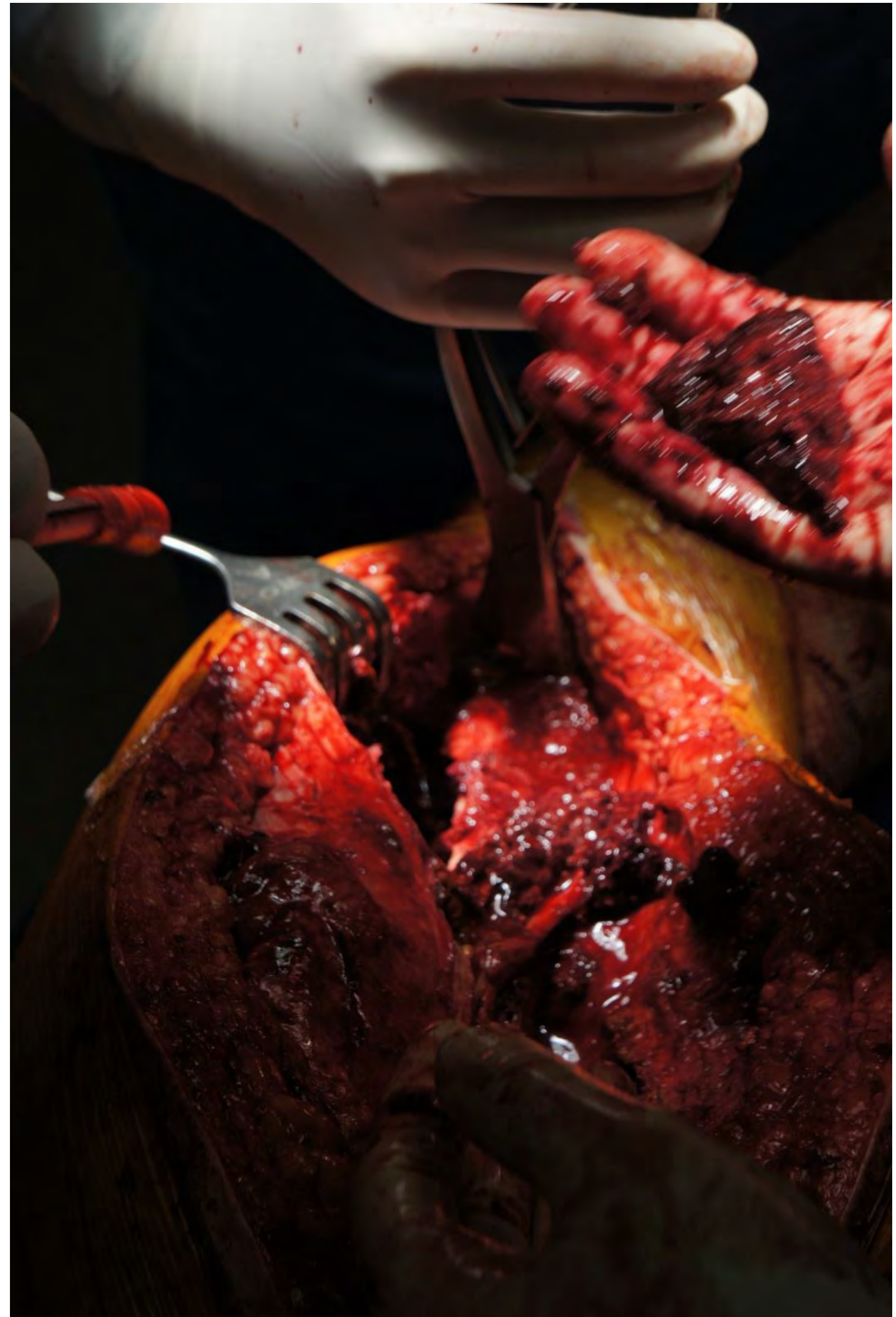

R

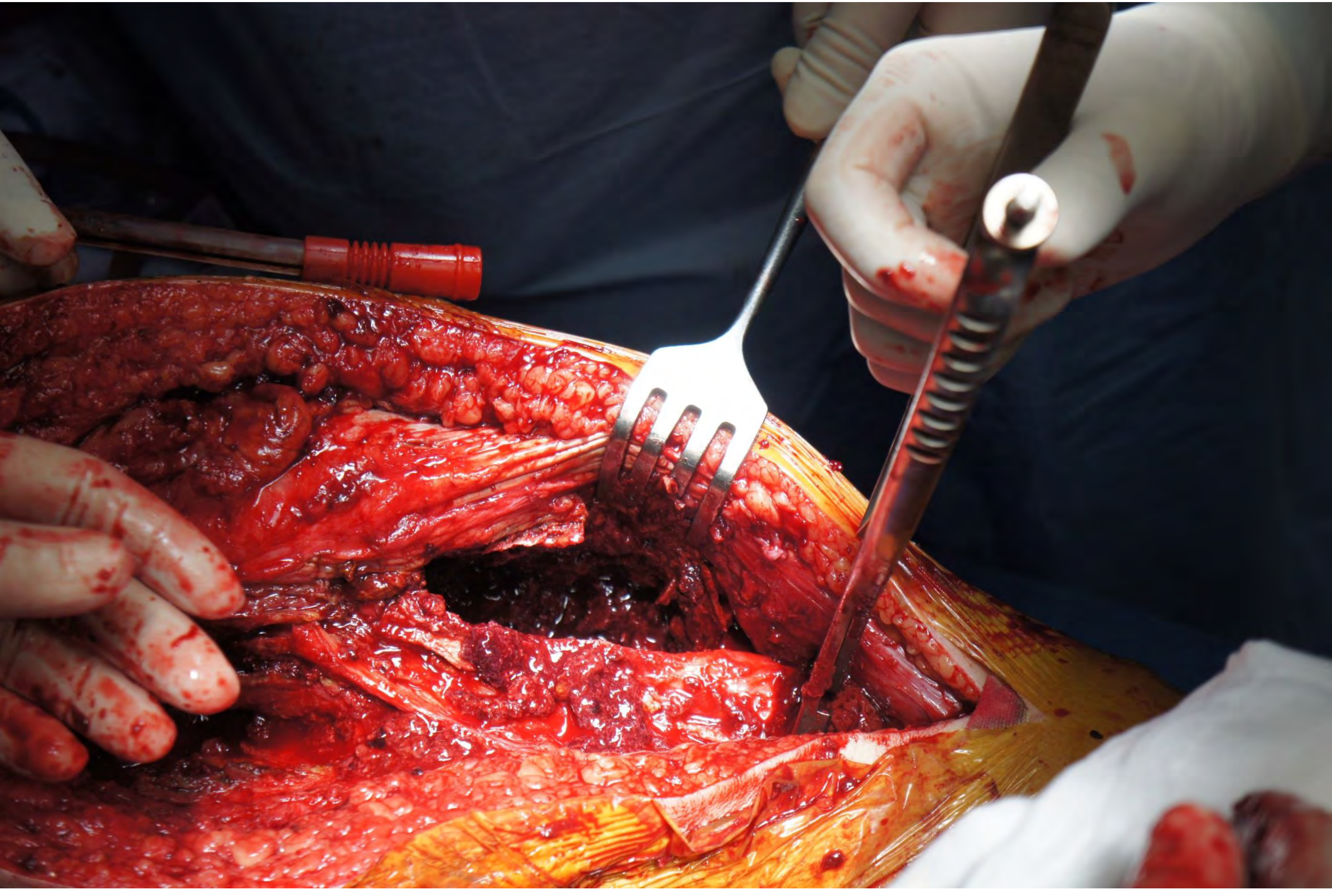

R

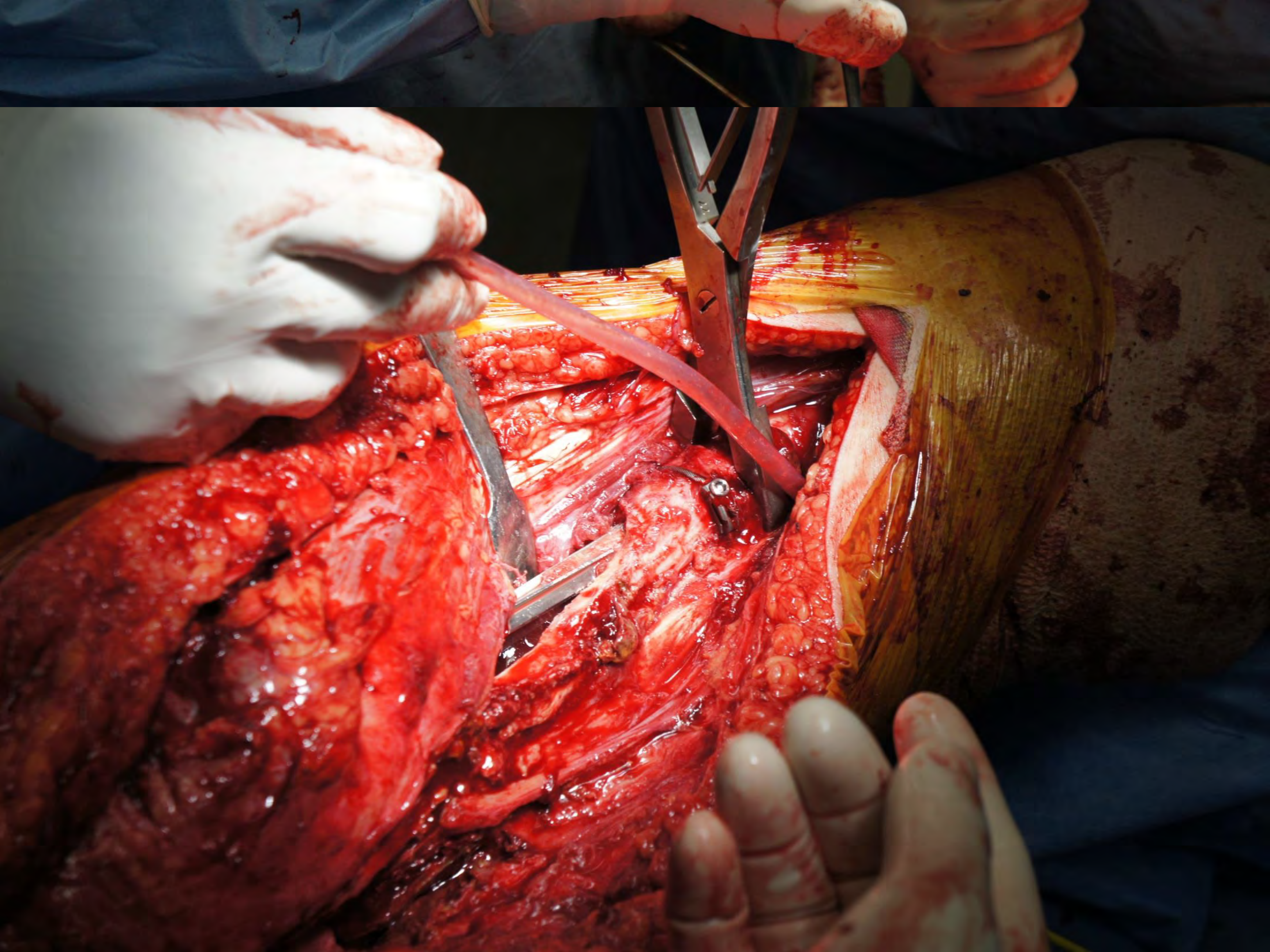

Spin: 2
Tilt: 0
A
Spin: 2
Tilt: 0
A
R
R



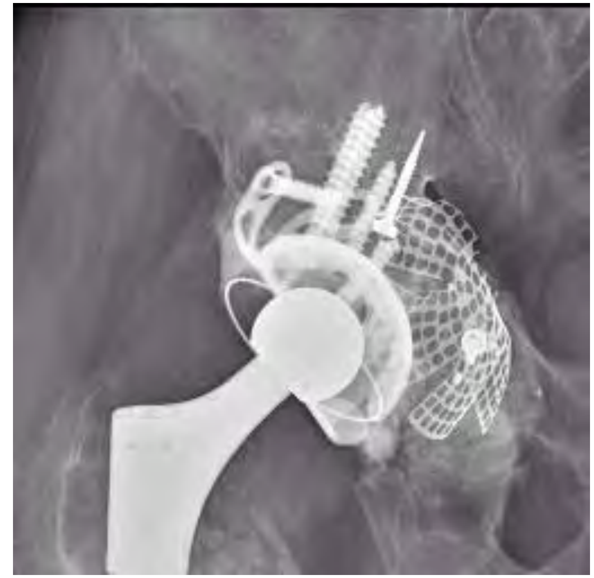




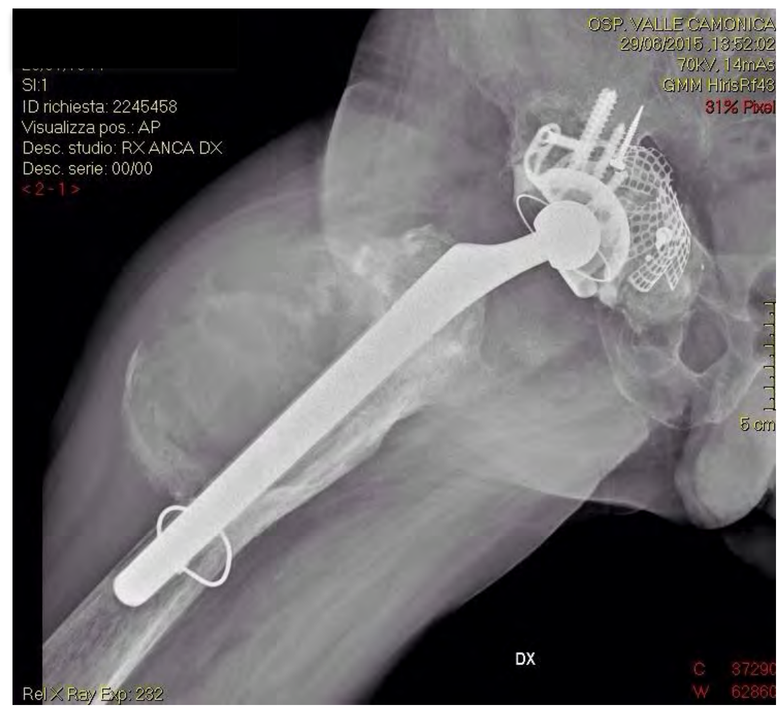








DX




OSP. VALLE CAMONICA
29/06/2015 18:52:02
70KV, 14mAs
GMM HirisRf43
31% Pixel
SI:1
ID richiesta: 2245458
Visualizza pos.: AP
Desc. studio: RX ANCA DX
Desc. serie: 00/00
< 2 - 1 >
5 cm
DX
C 37290
W 62860
Rel X Ray Exp: 232

9 m


DX


11M,M,108237
07/1944
richiesta: 2245458
ualizza pos.: AP
sc. studio: RX ANCA DX
sc. serie: 00/00
29/06/2015 ,13:52:0
70KV, 14mA
GMM HirisRf4
31% Pix
DX
X Ray Exp: 232

Conclusion

- The Revision stem with all the available solutions (length, diameter) is able to address loosening related problems

- Primary stability to be achieved in order to favor bone reconstruction and osteointegration

- Early weight bearing possible

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

IMPACTION BONE GRAFTING TECHNIQUE IN REVISION

CEMENTED

John Nolan

Orthopaedic Surgeon

Norfolk and Norwich University Hospital

Conflicts of Interest

None

History
Technique
Science
Outcomes

History:

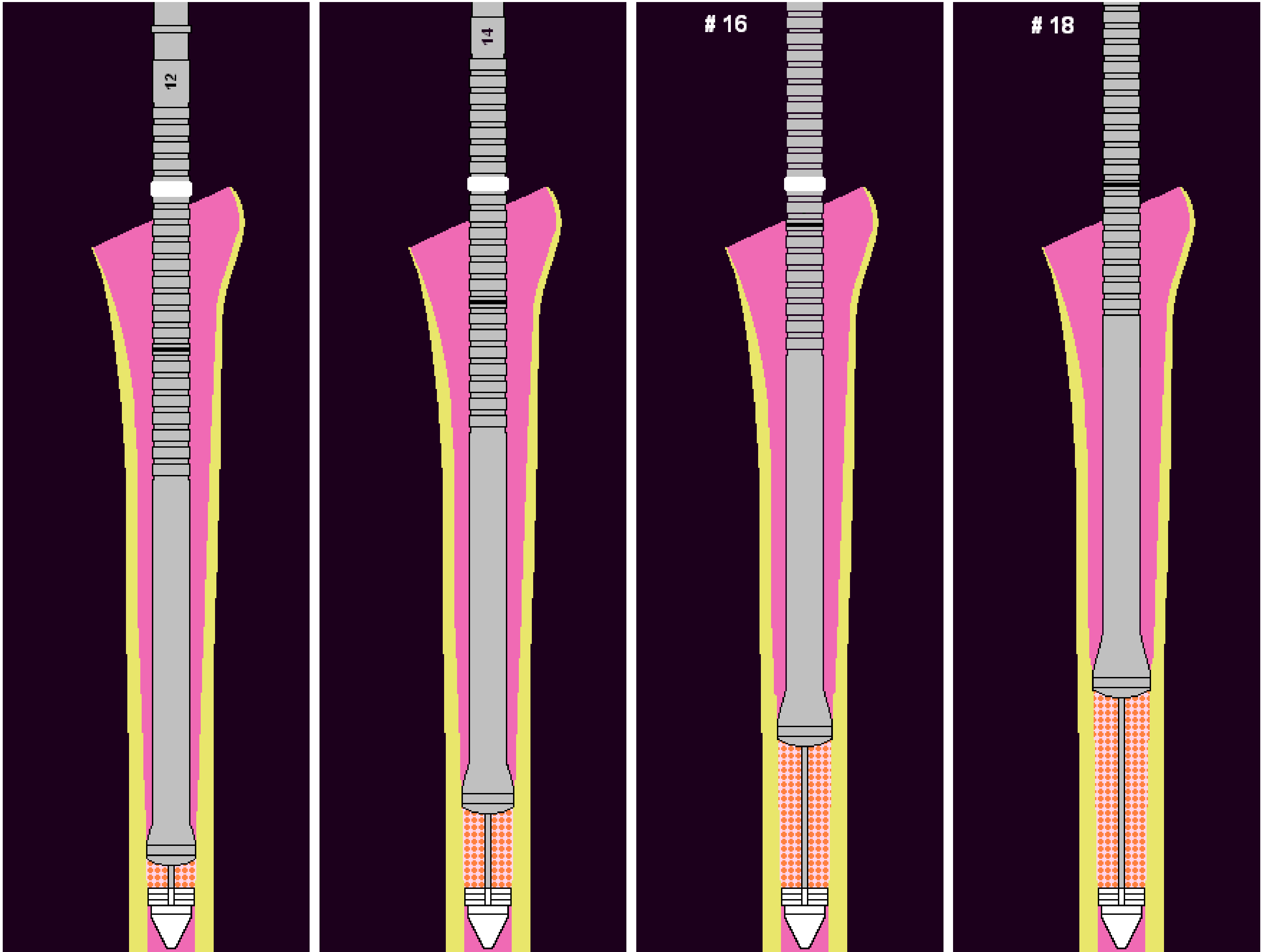
- Acetabulum
  - Slooff et al. *Nijmegen*. 1984
- Femur
  - Ling et al. *Exeter*. 1993

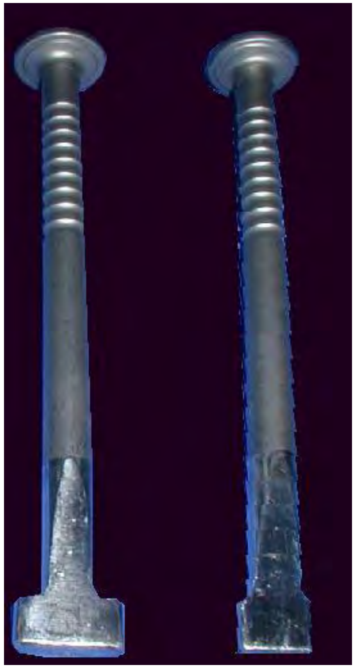
Aim:

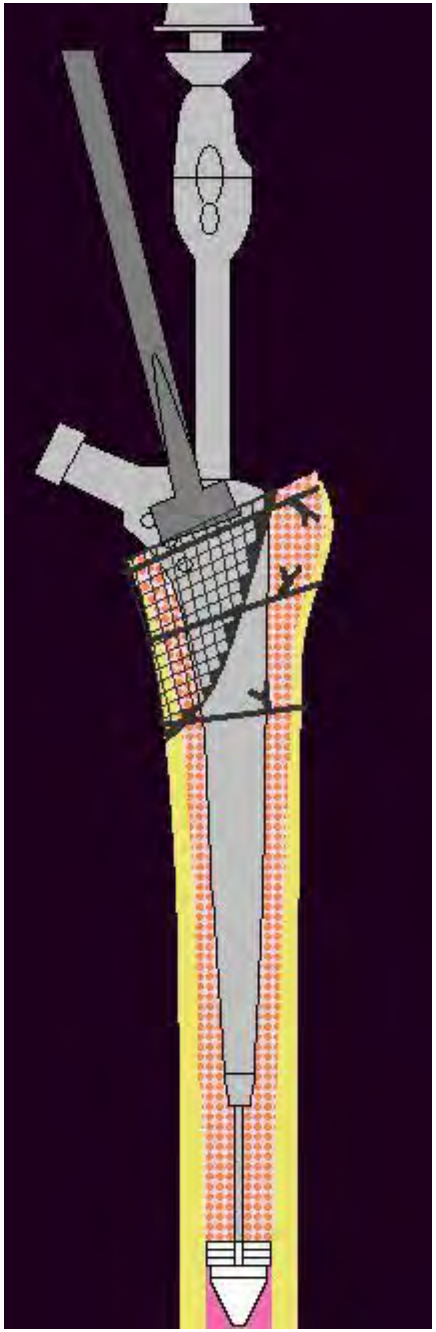
- Restore bone stock
- Re-establish bone-cement interface
- Achieve graft containment
- Primary implant stability

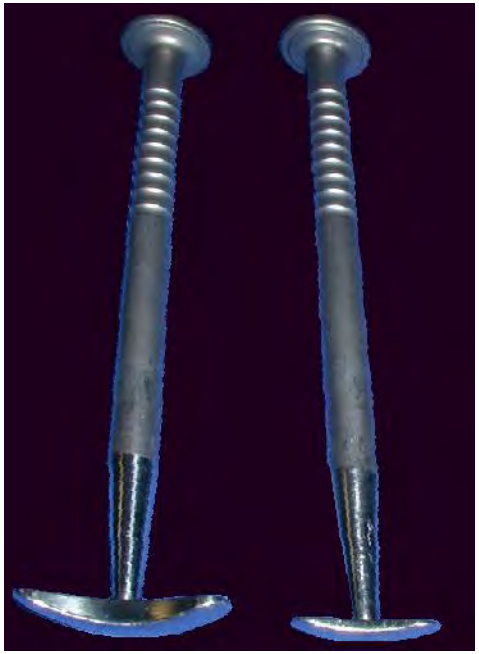
Results:

- Exeter and Nijmegen (100% @ 10.4yrs)
- Elsewhere (28% @15.3yrs)


12
14
16
18







Block

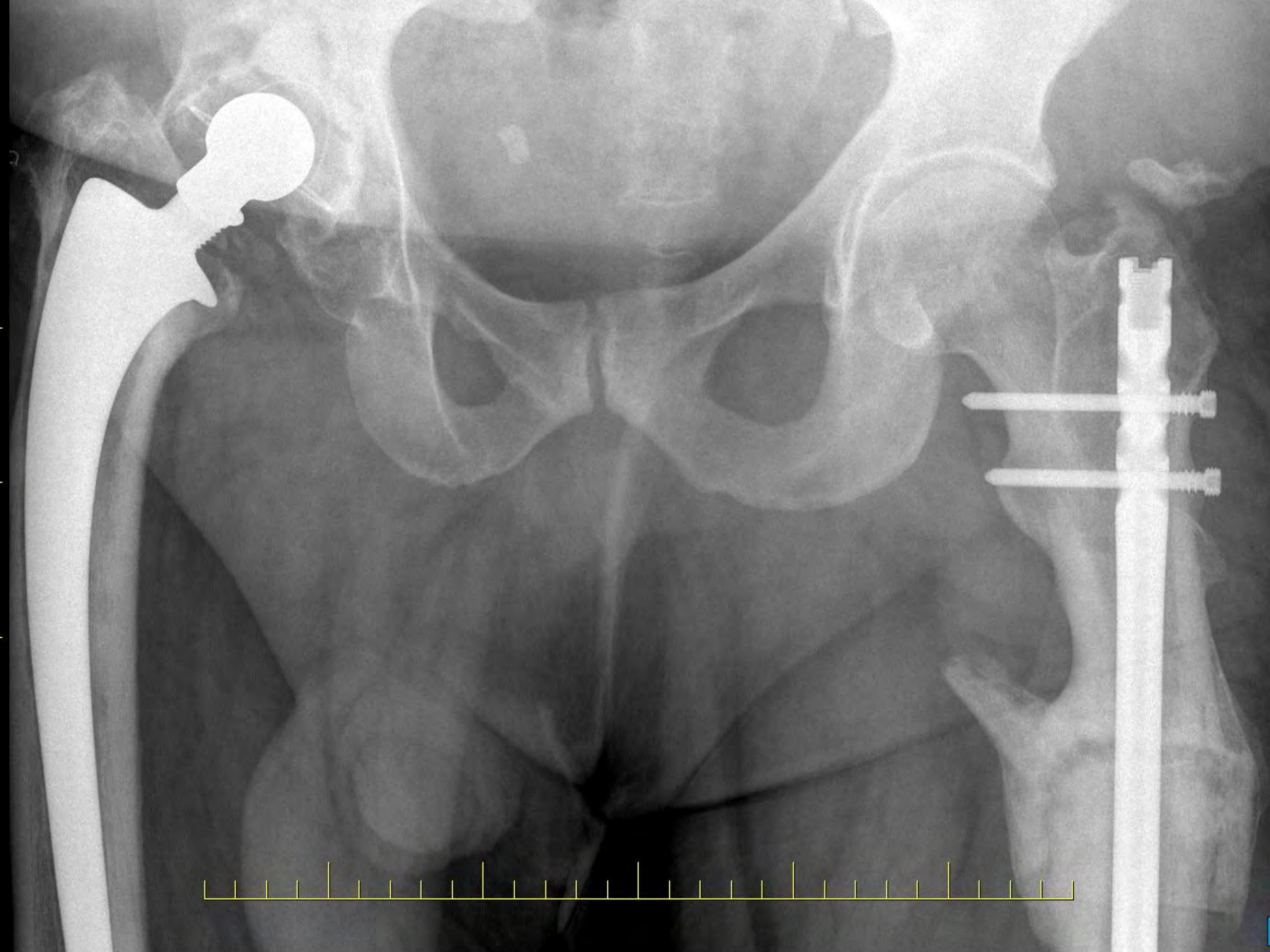
Half-
moon

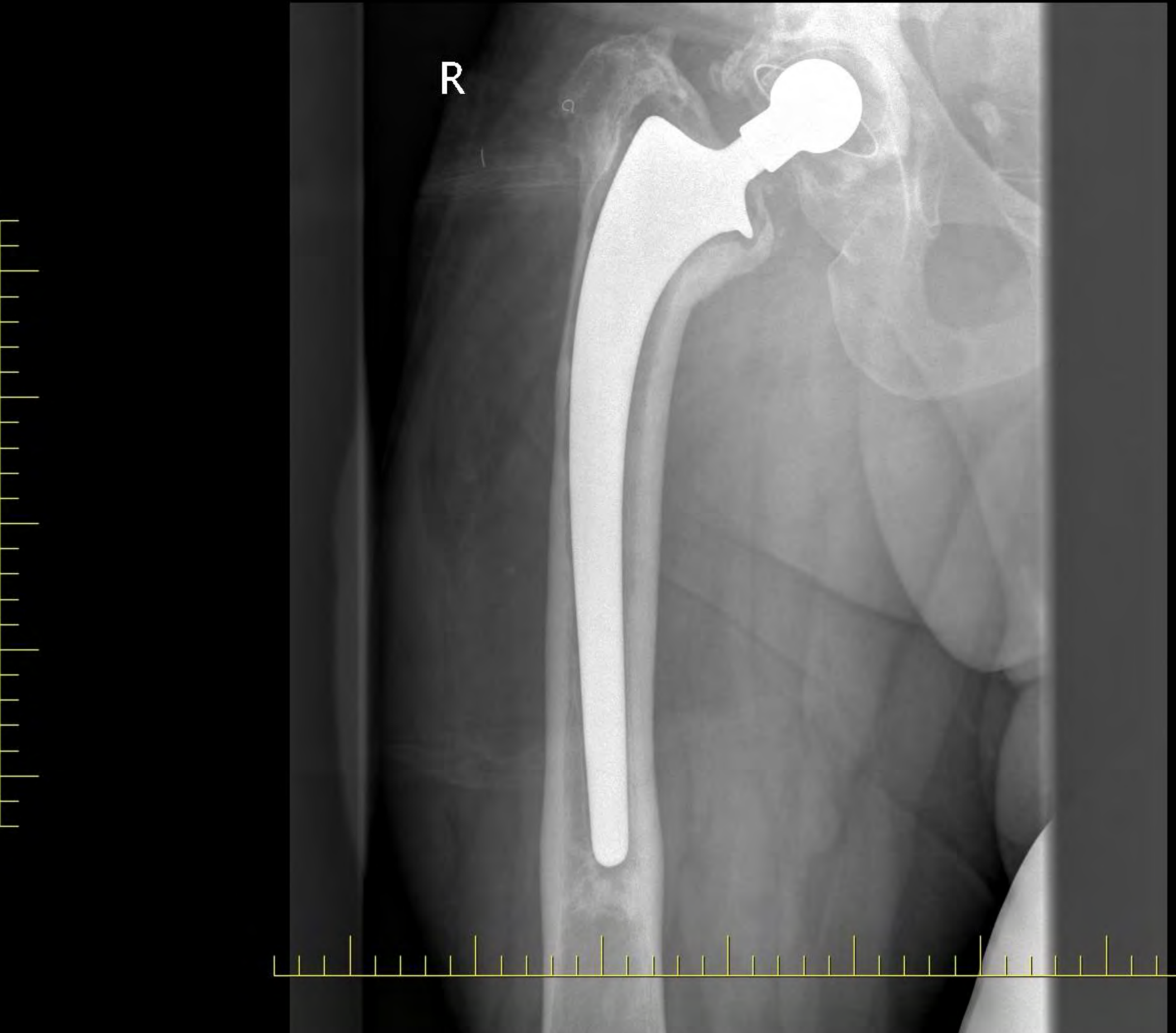
Bone Bank:

- Fresh frozen femoral head allograft
- Morcellised
  - acetabular (7-8mm)
  - femoral (3-4mm)

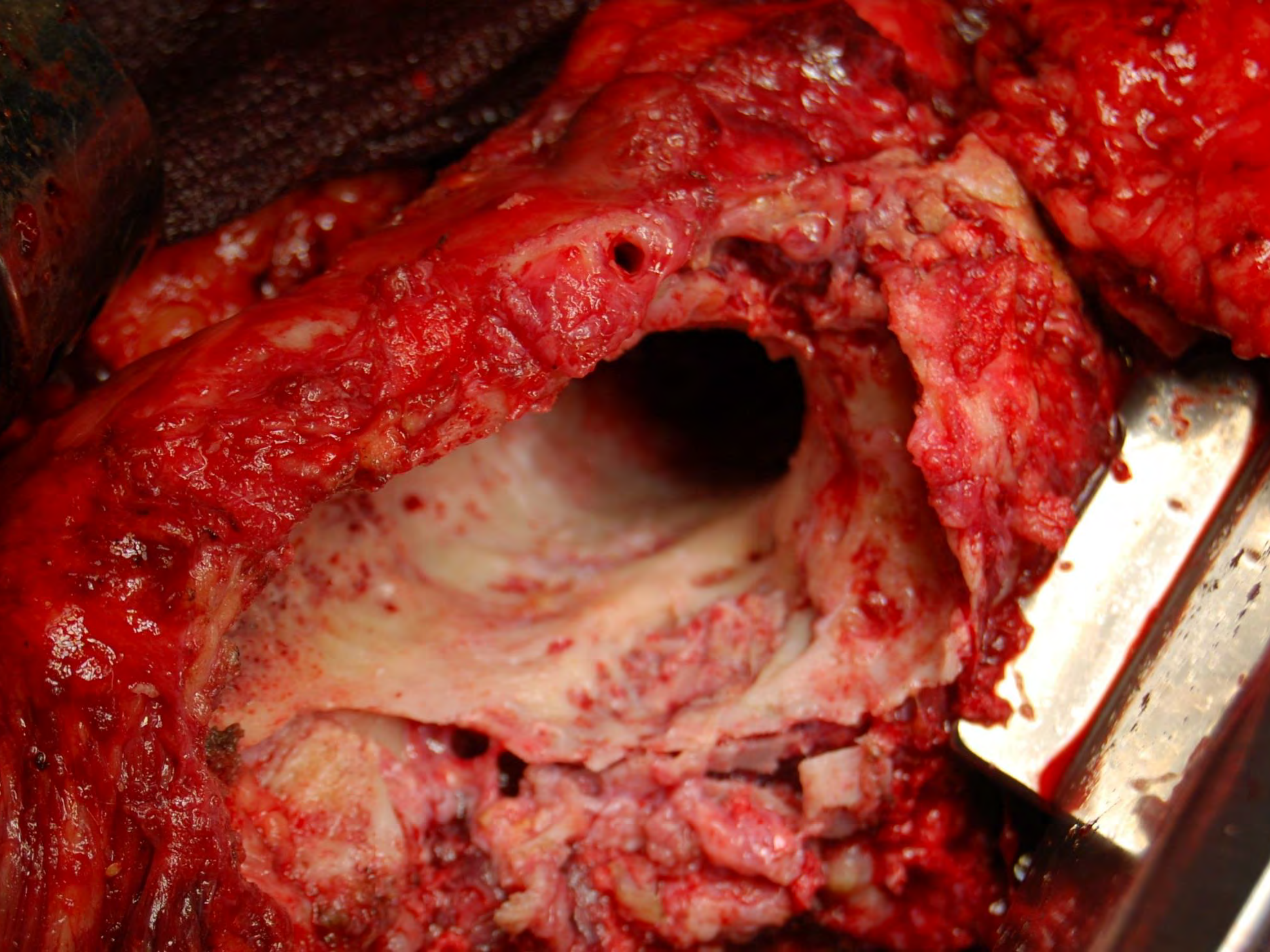
Rinsing of graft:

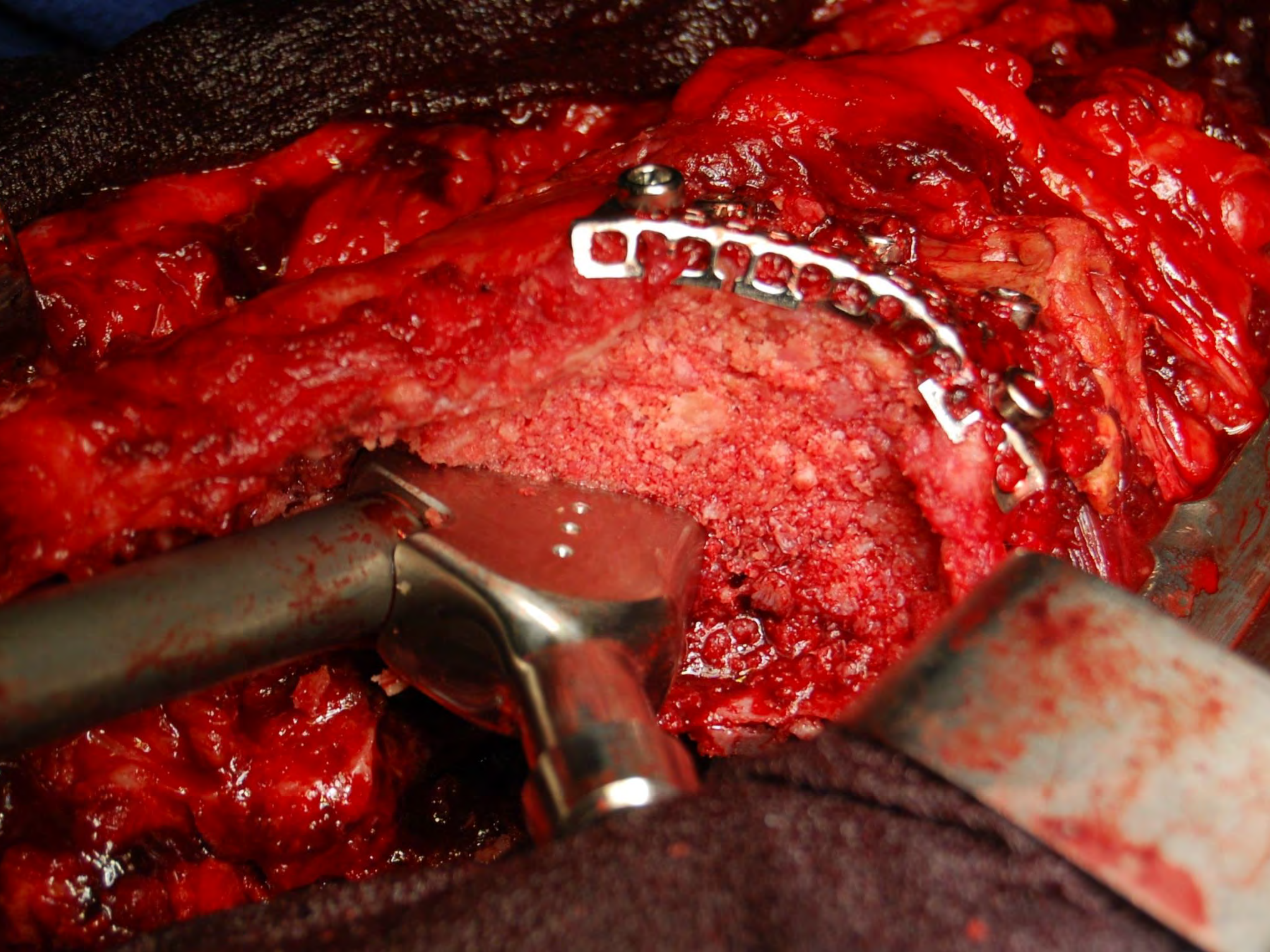
- Removes fat and marrow fluid
- $\uparrow$shear strength of graft $\rightarrow$ $\downarrow$migration
- $\uparrow$bone in-growth
- $\downarrow$immunogenic load and risk of disease transmission

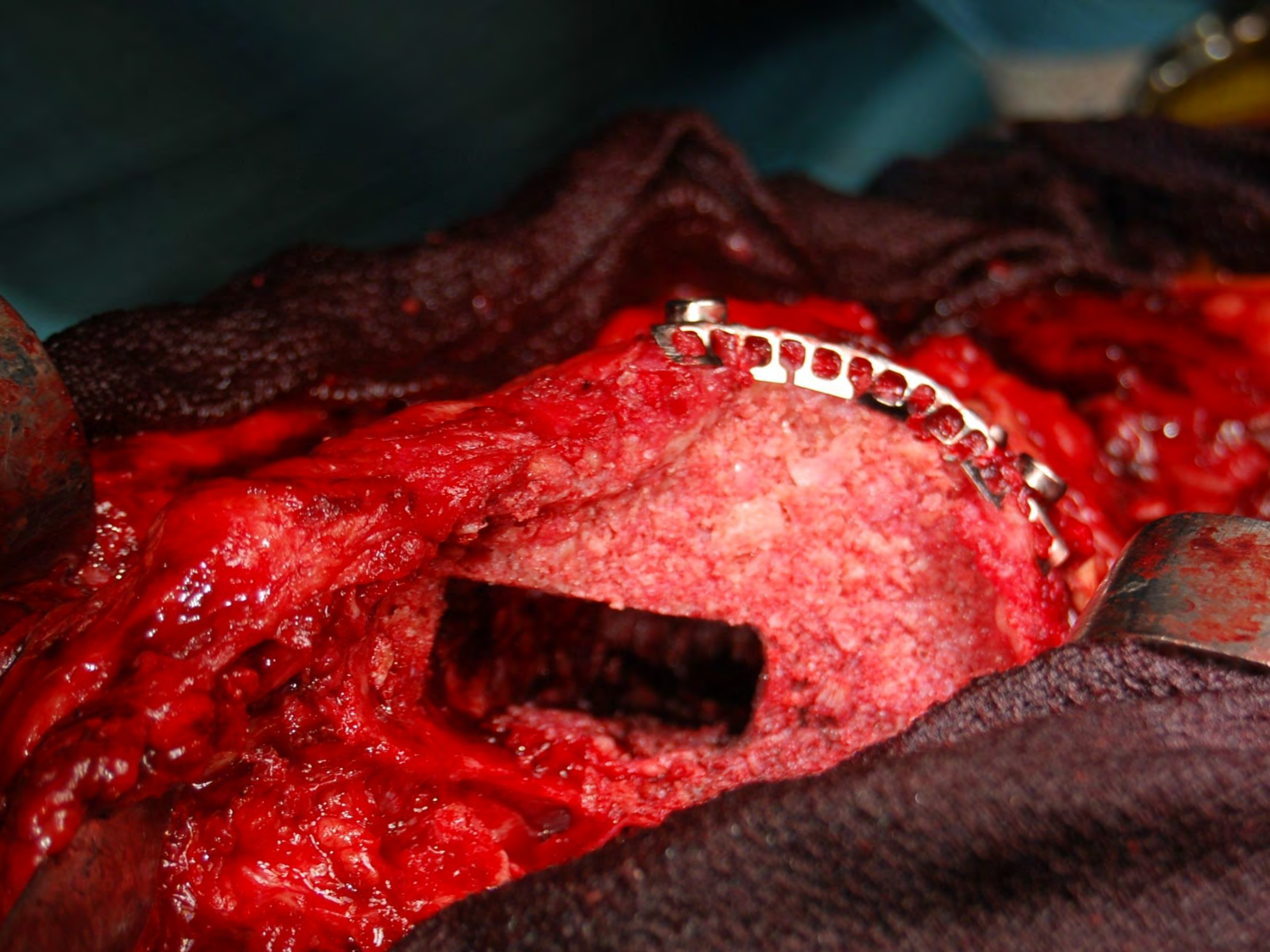


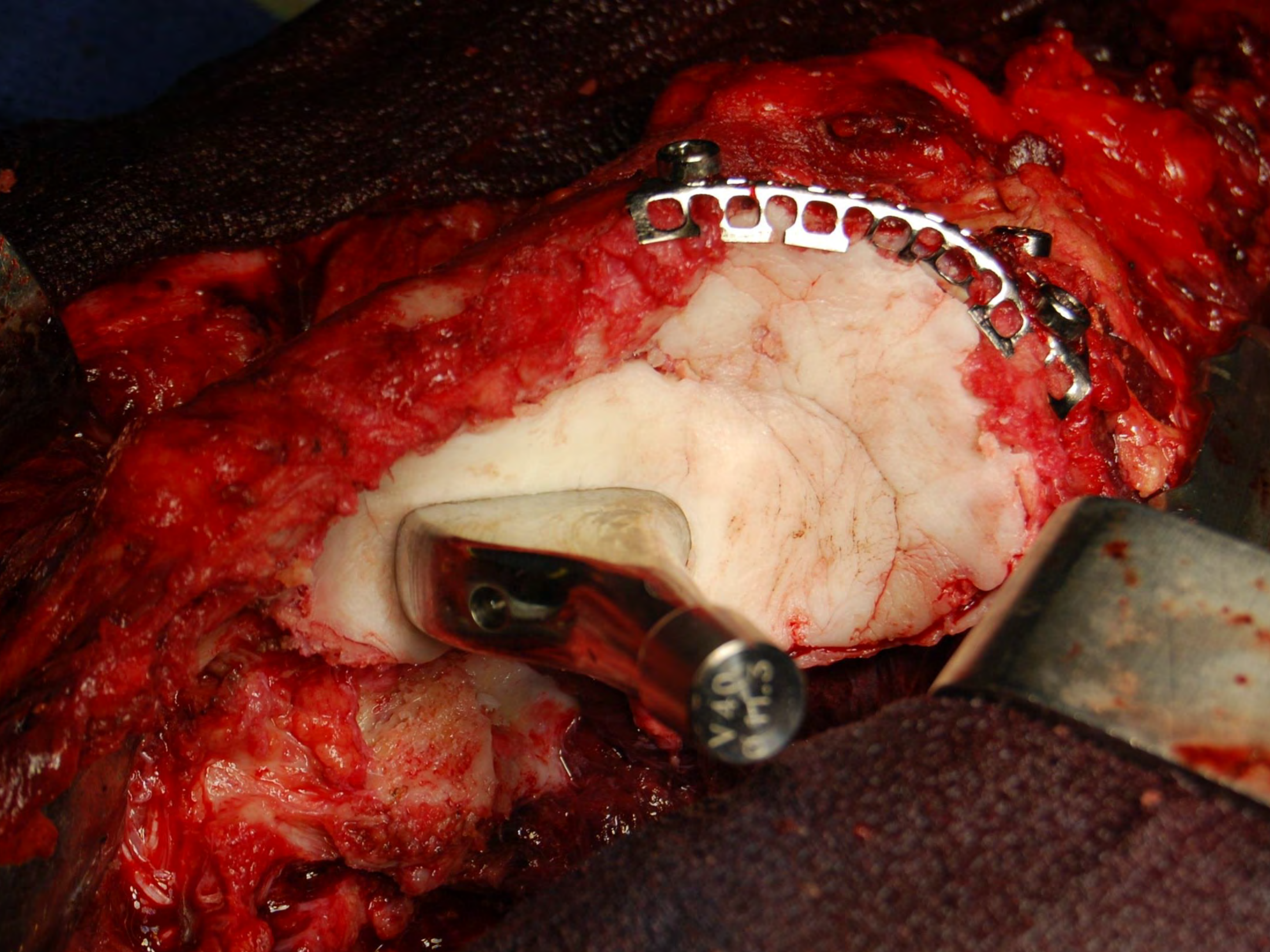

R

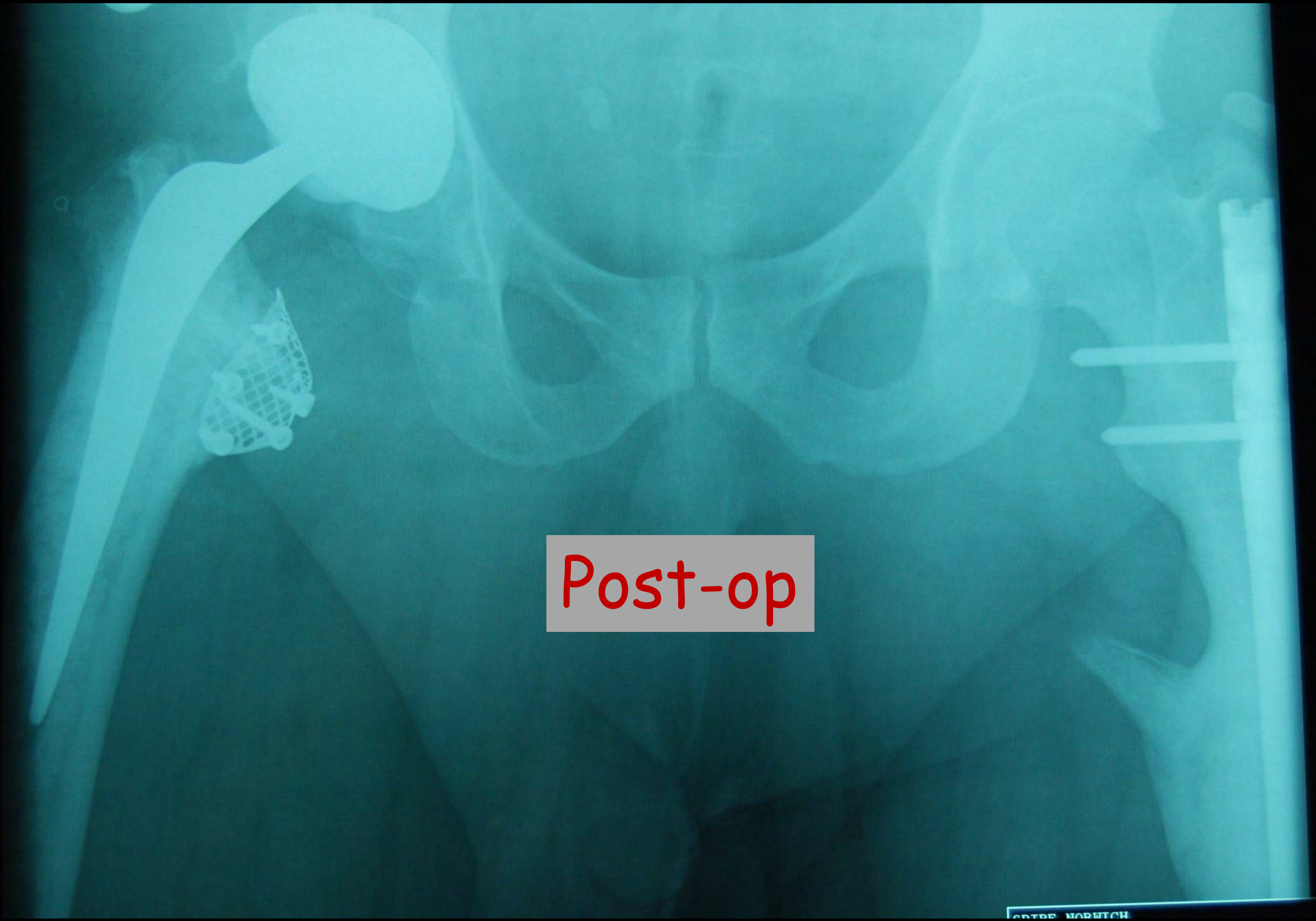

Cotton

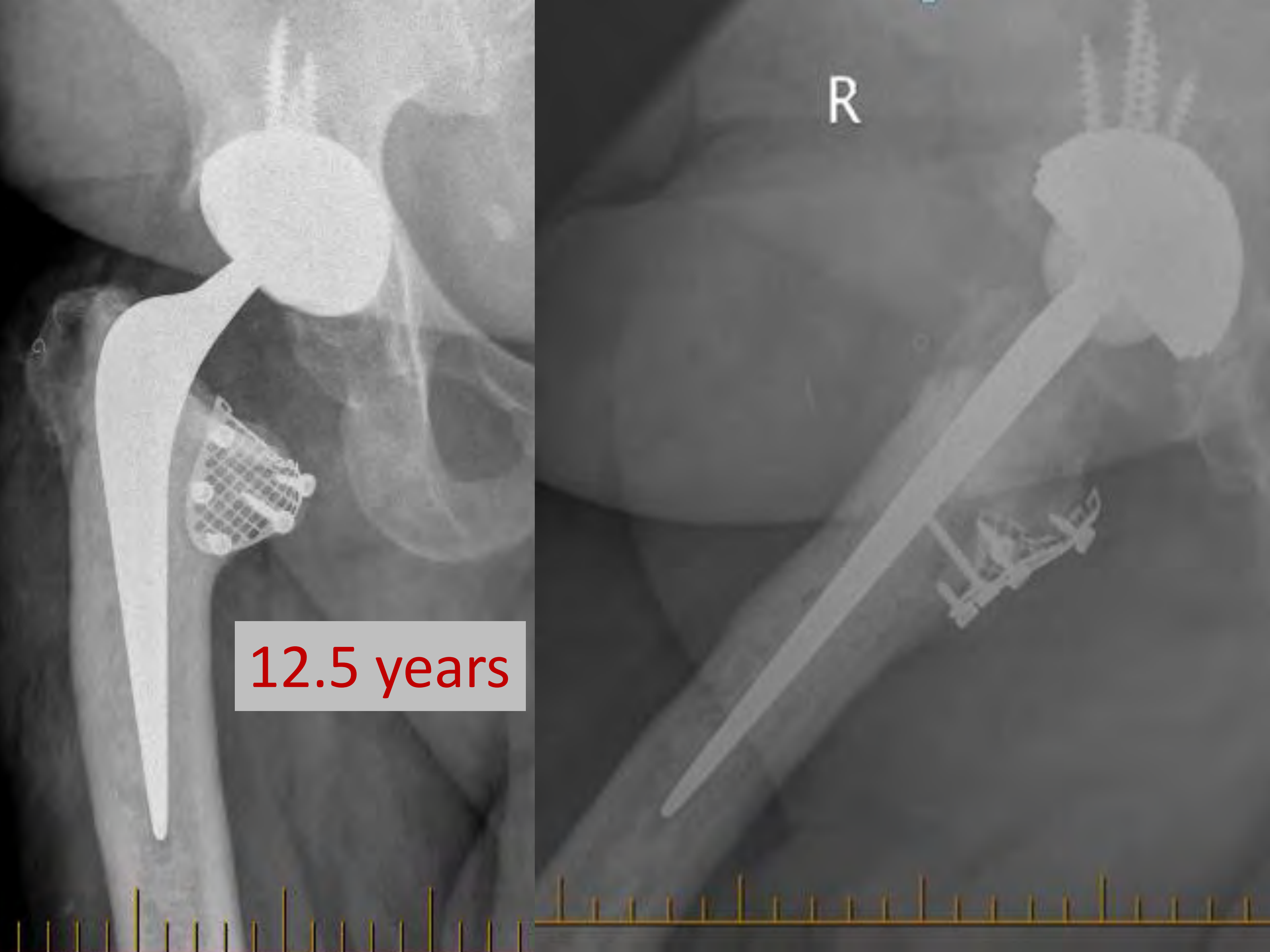







V40

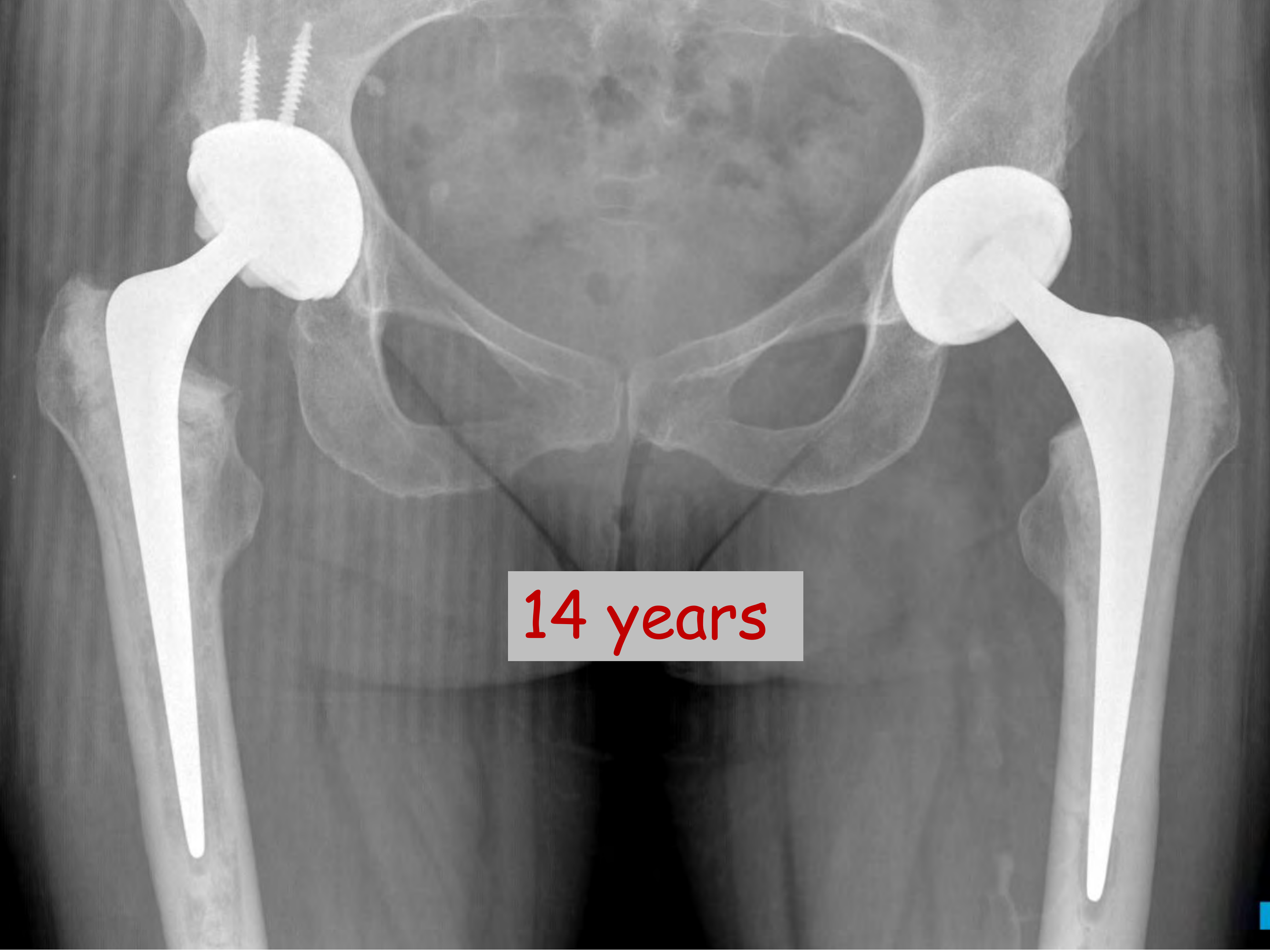

Post-op


12.5 years
R

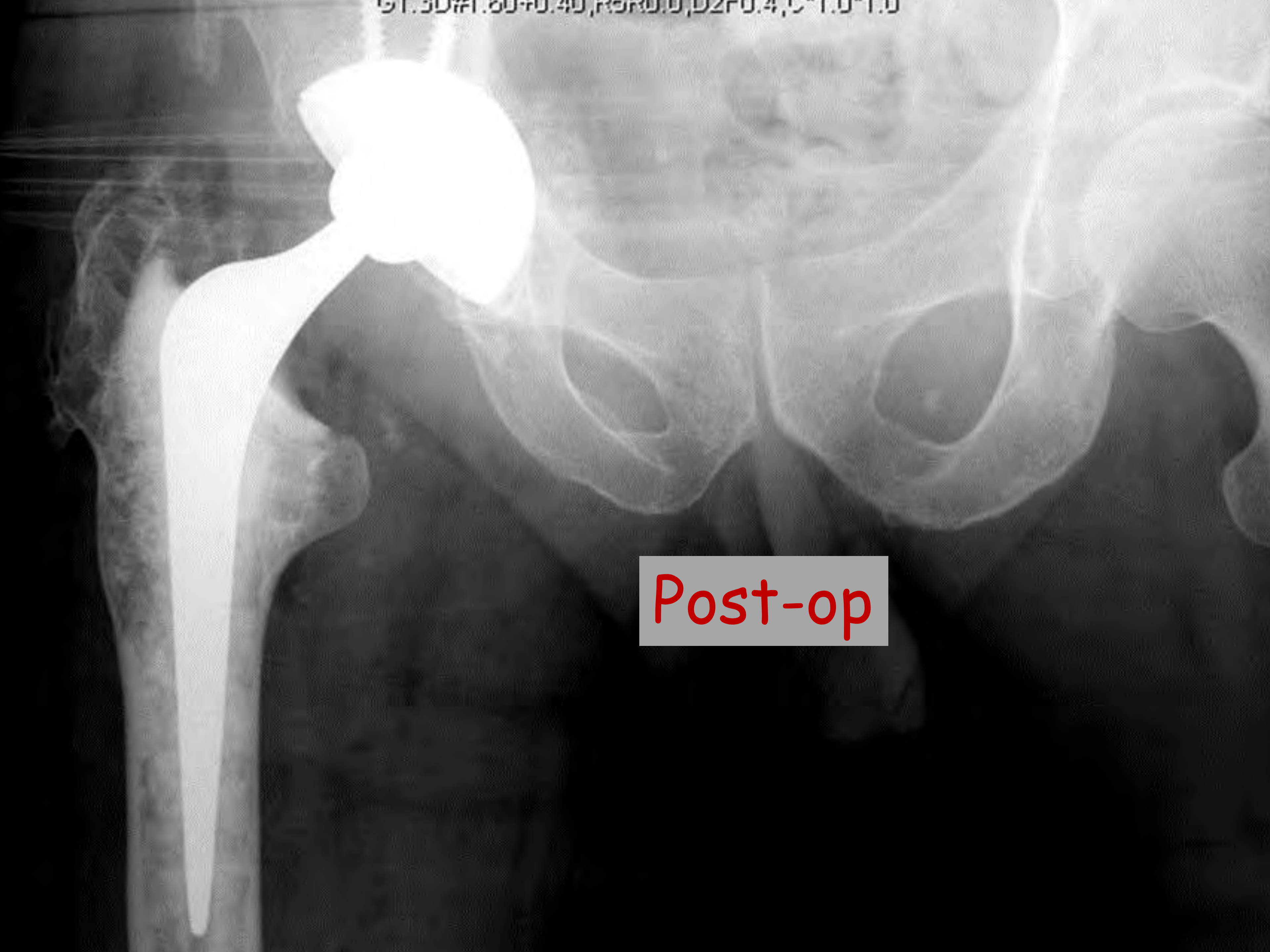

2 years

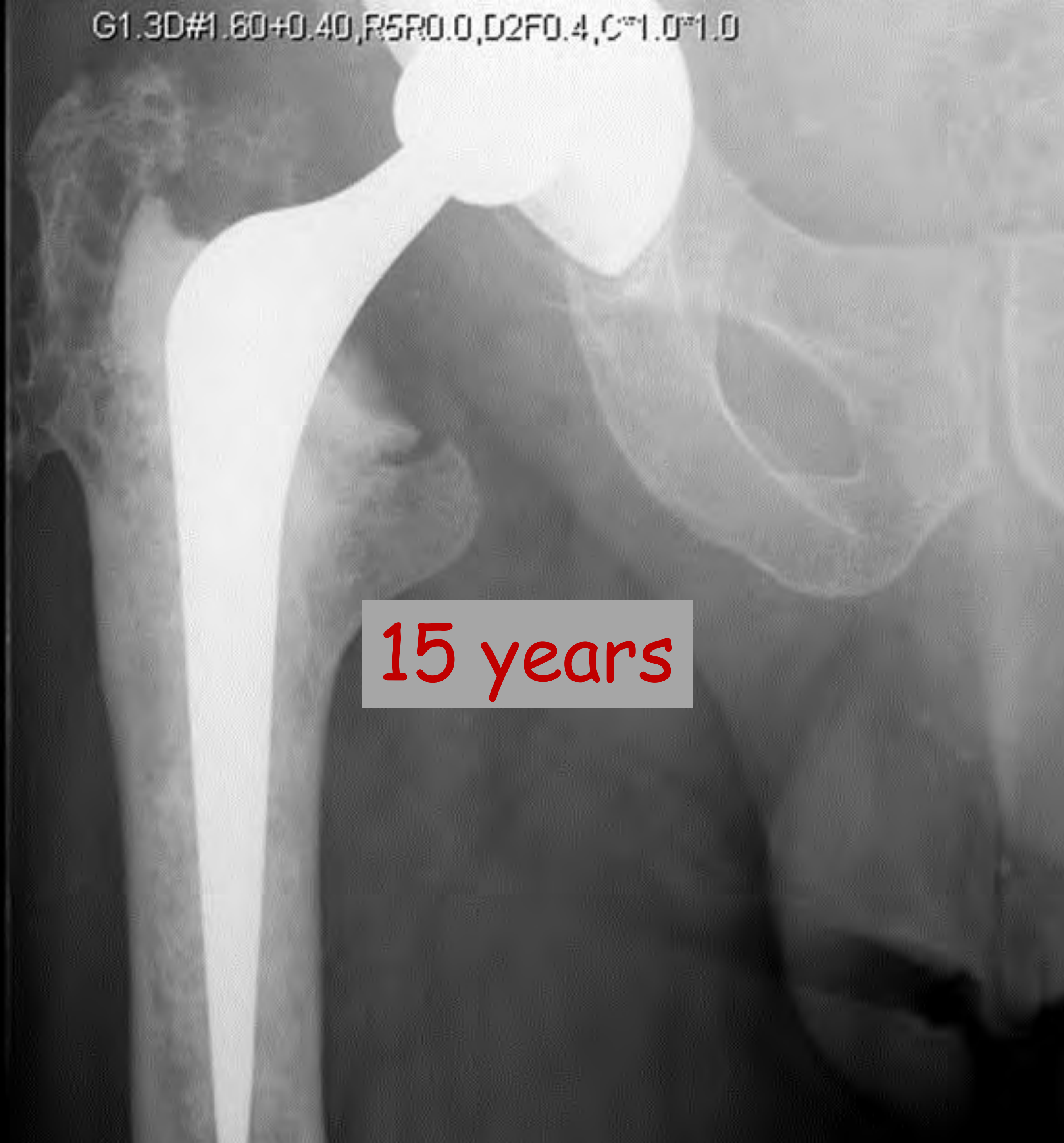

18 years

6/12 post-op


14 years


G1.3D#1.60+0.40,R5R0.5,D2F0.4,C*1.0*1.0
R

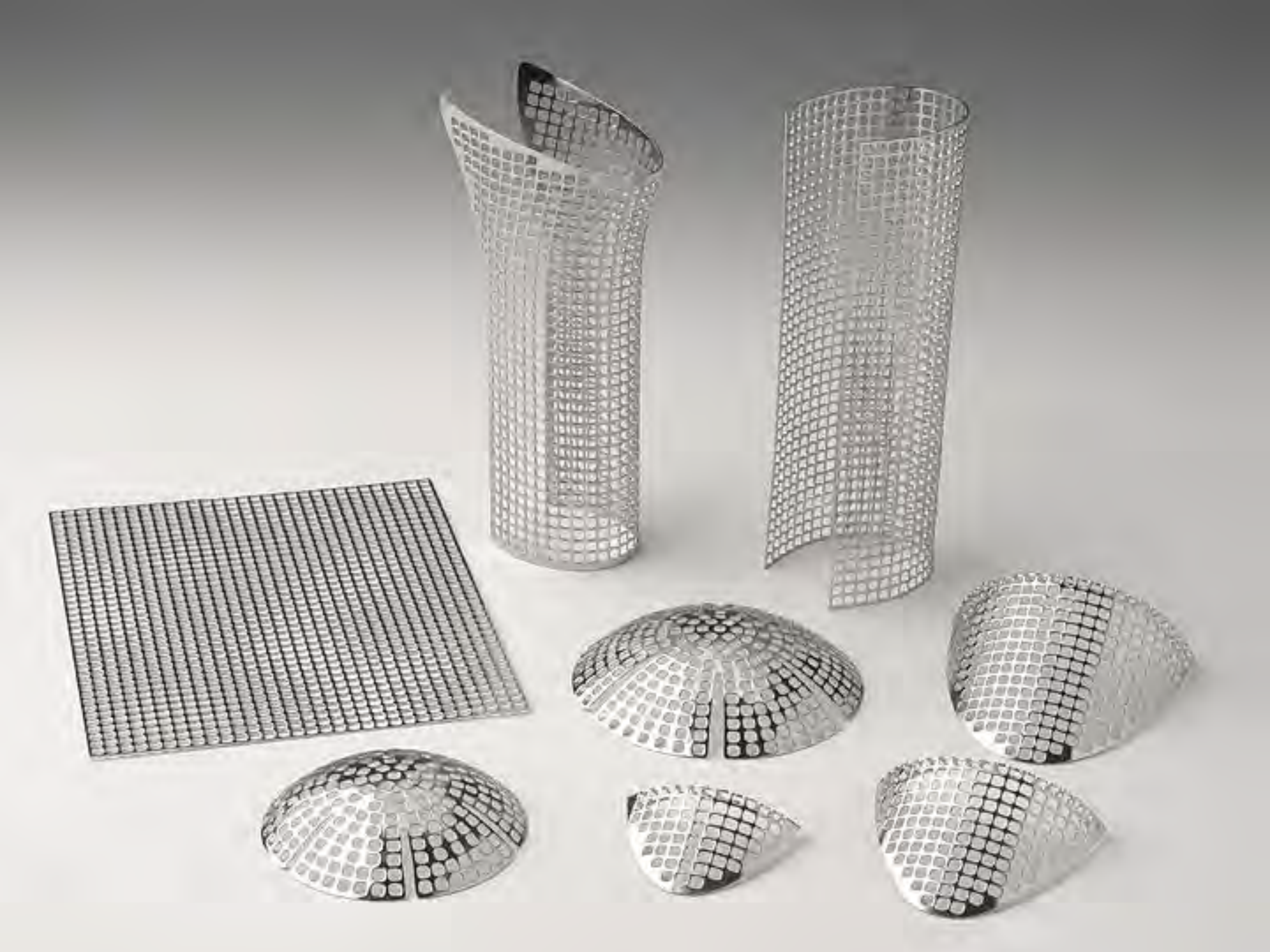

Post-op

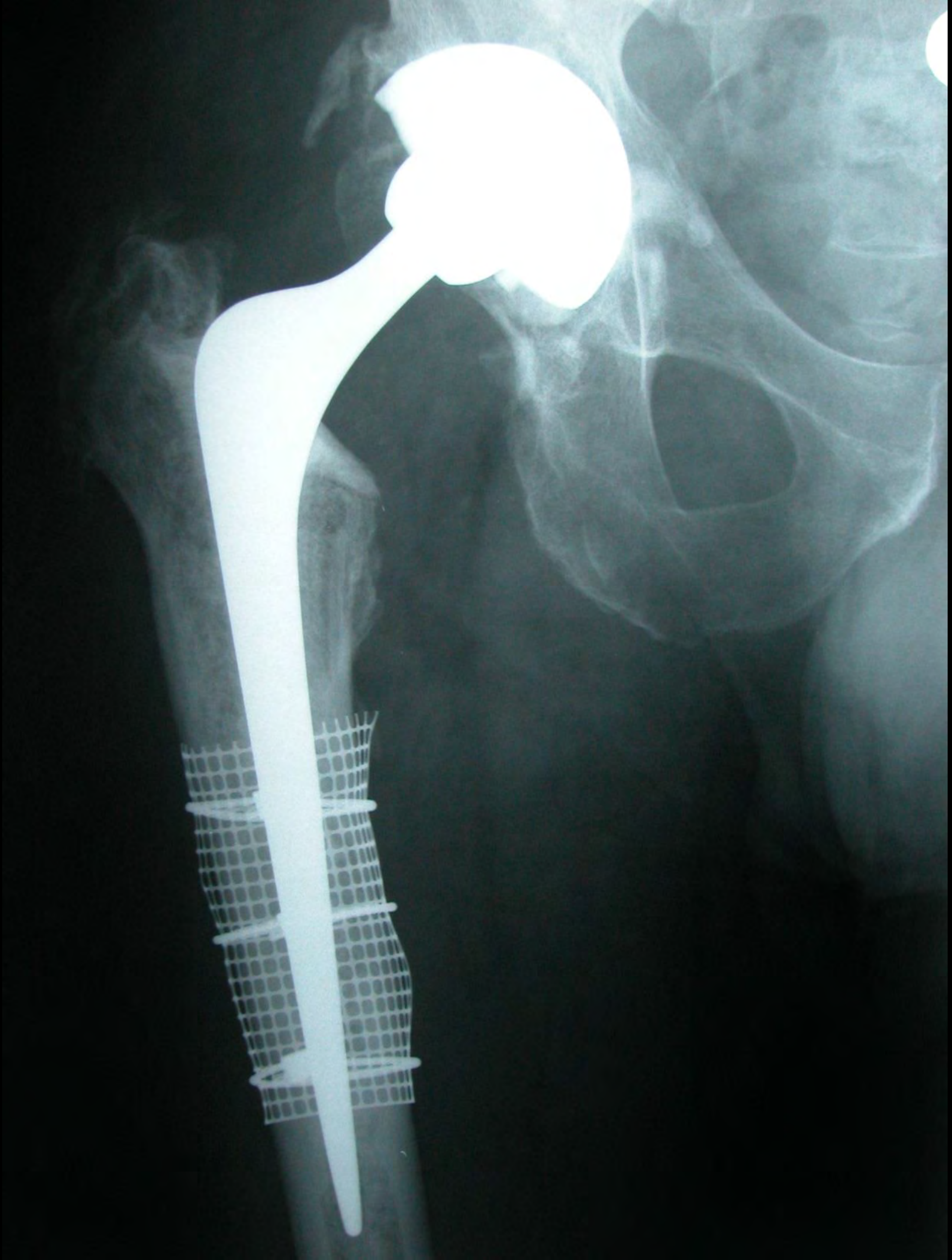

15 years

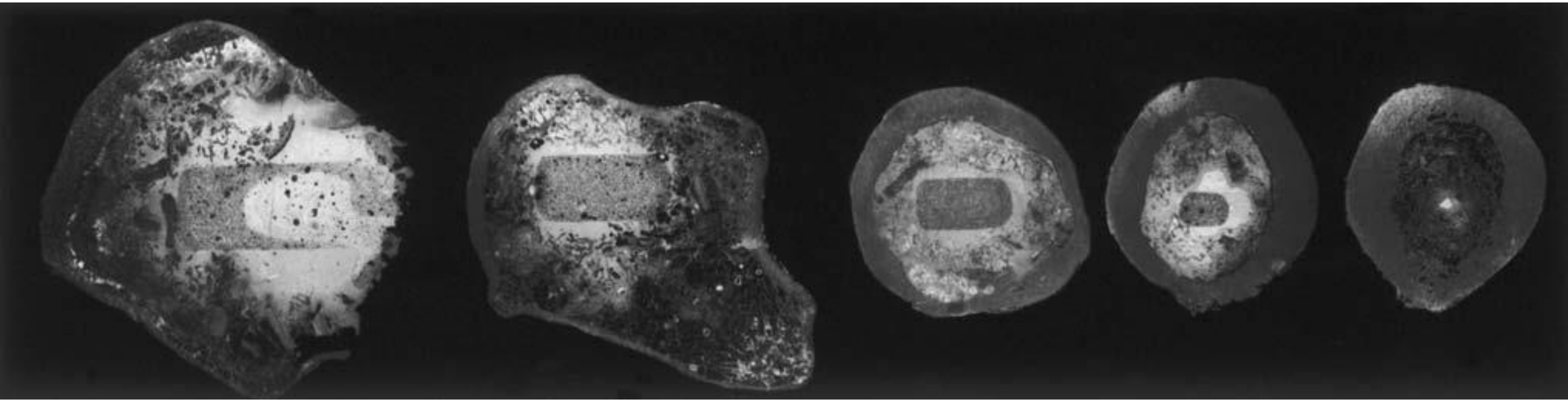

G1.3D#1.60+0.40,R5R0.0,D2F0.4,C*1.0*1.0

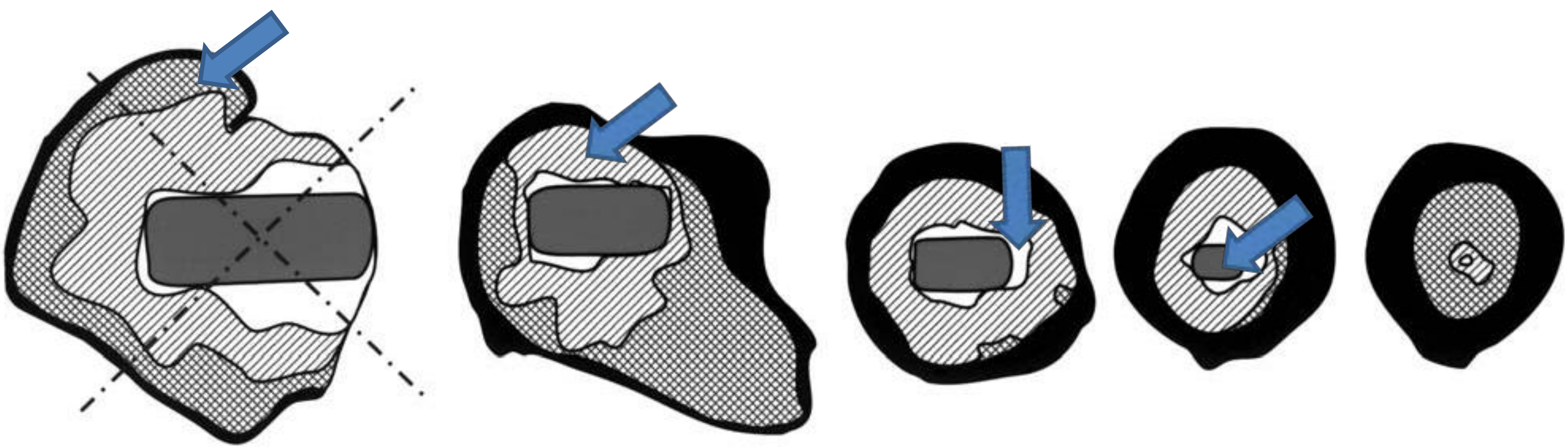

R
cm

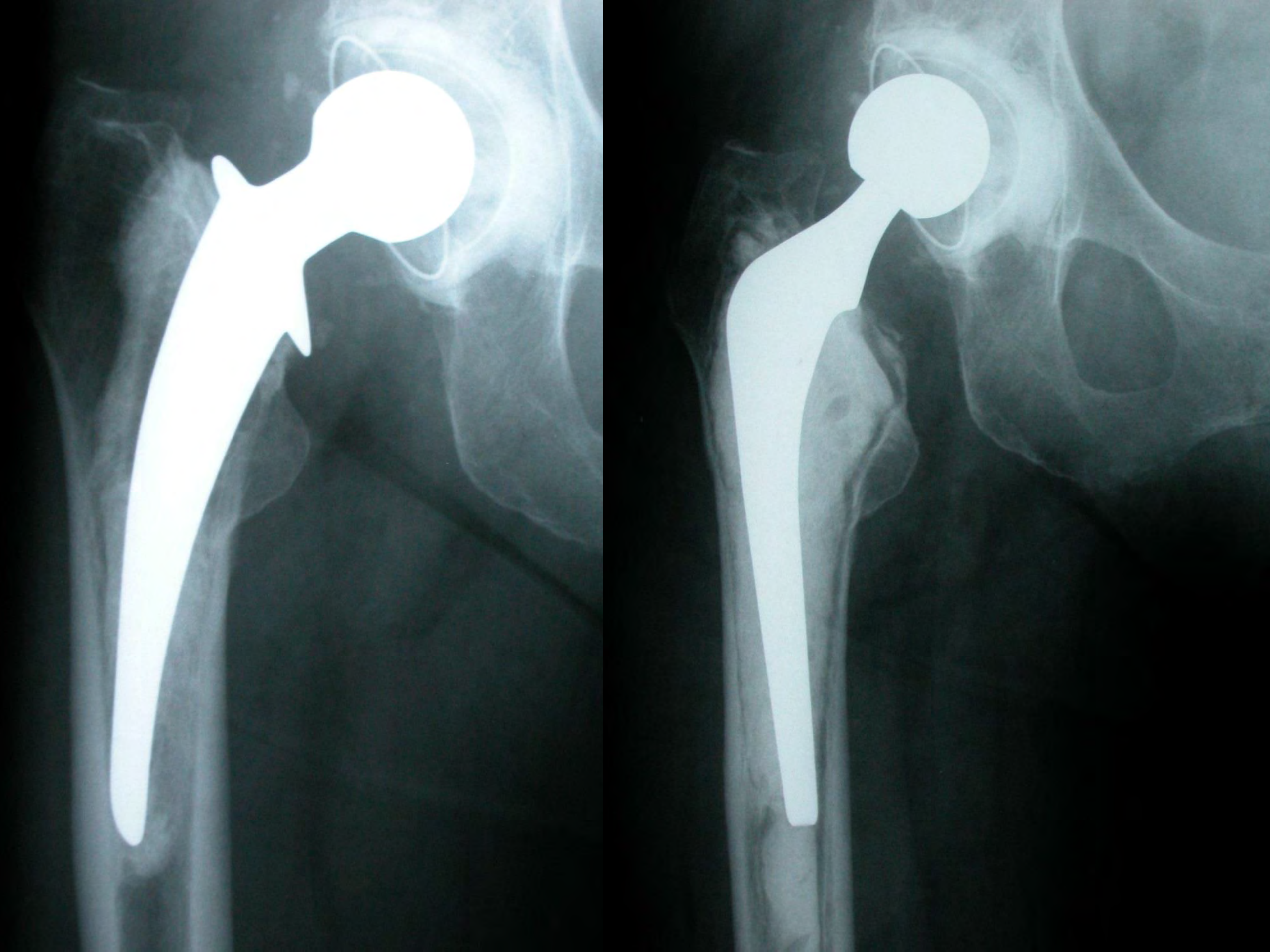

9 years
R

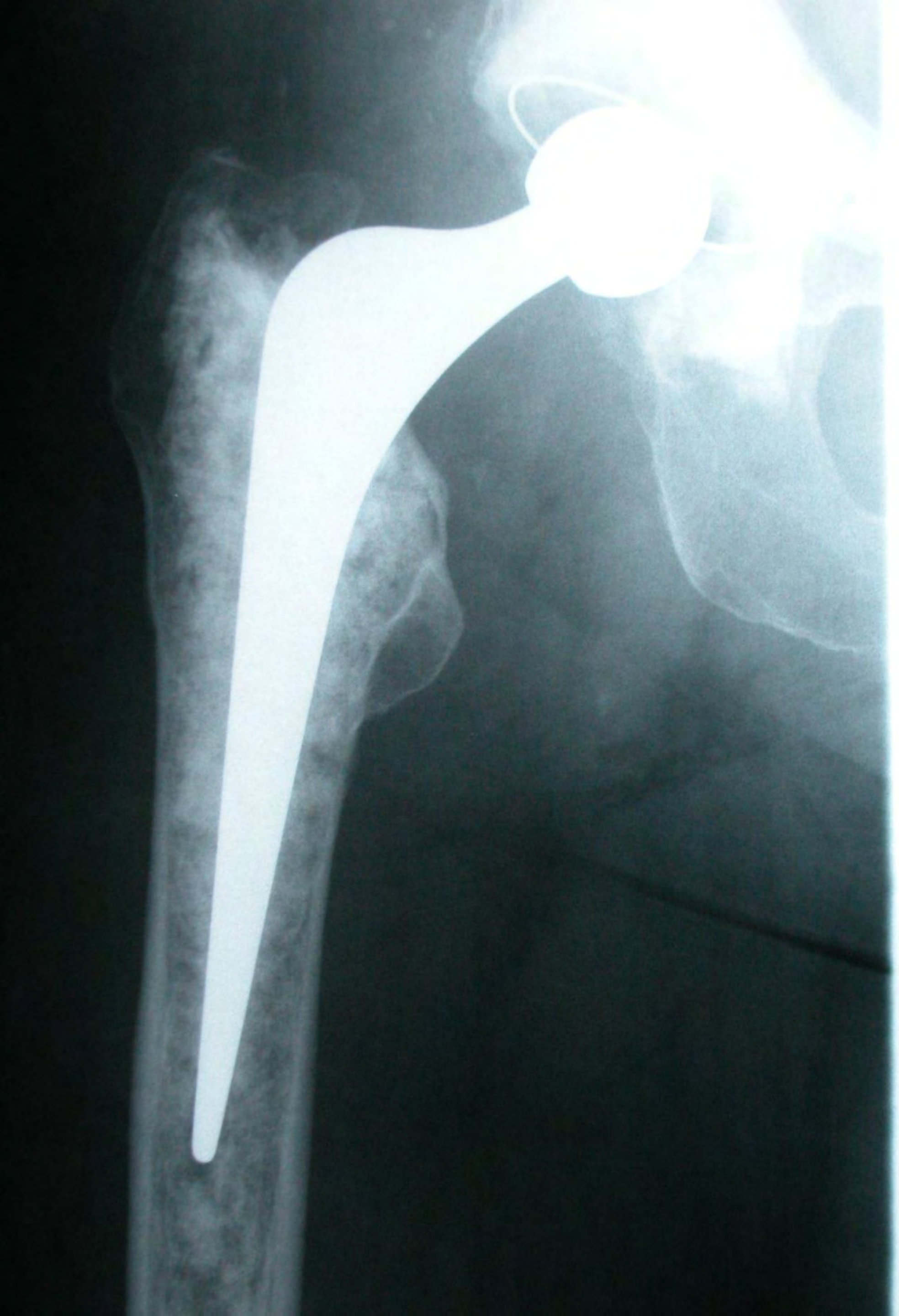






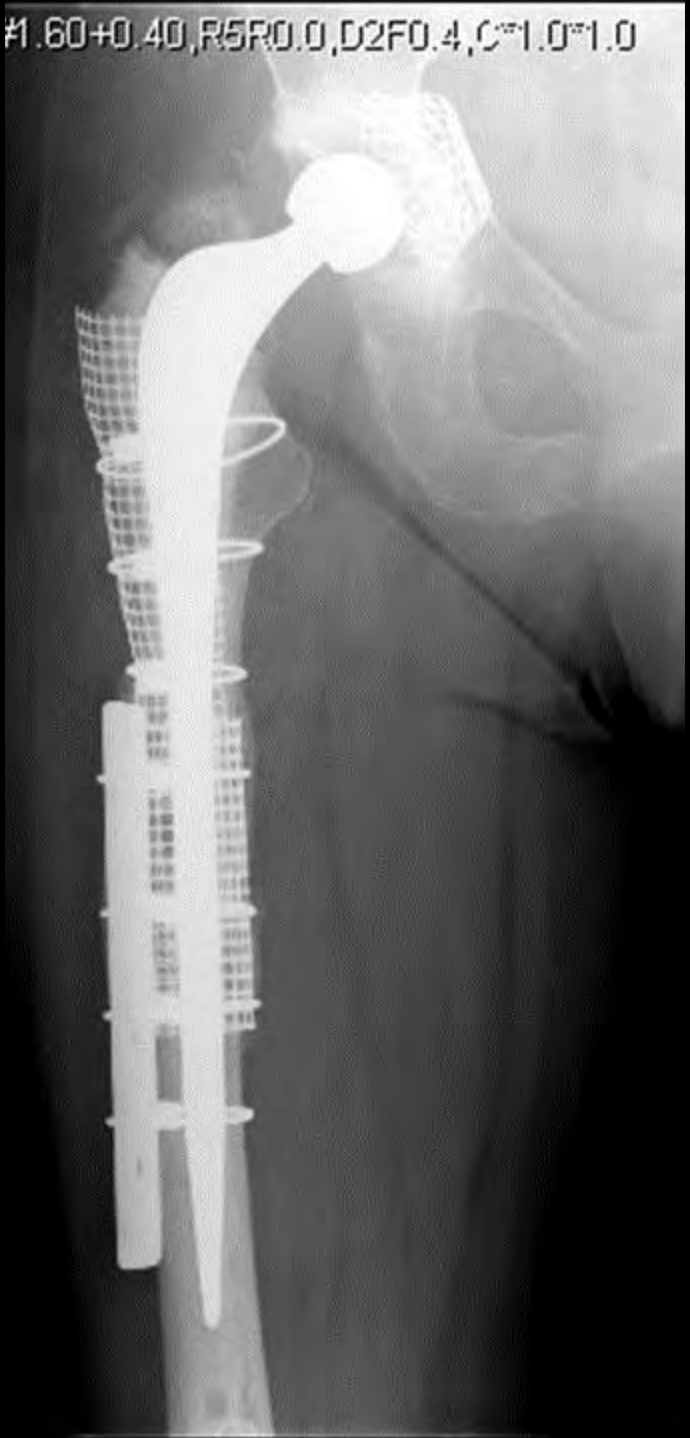




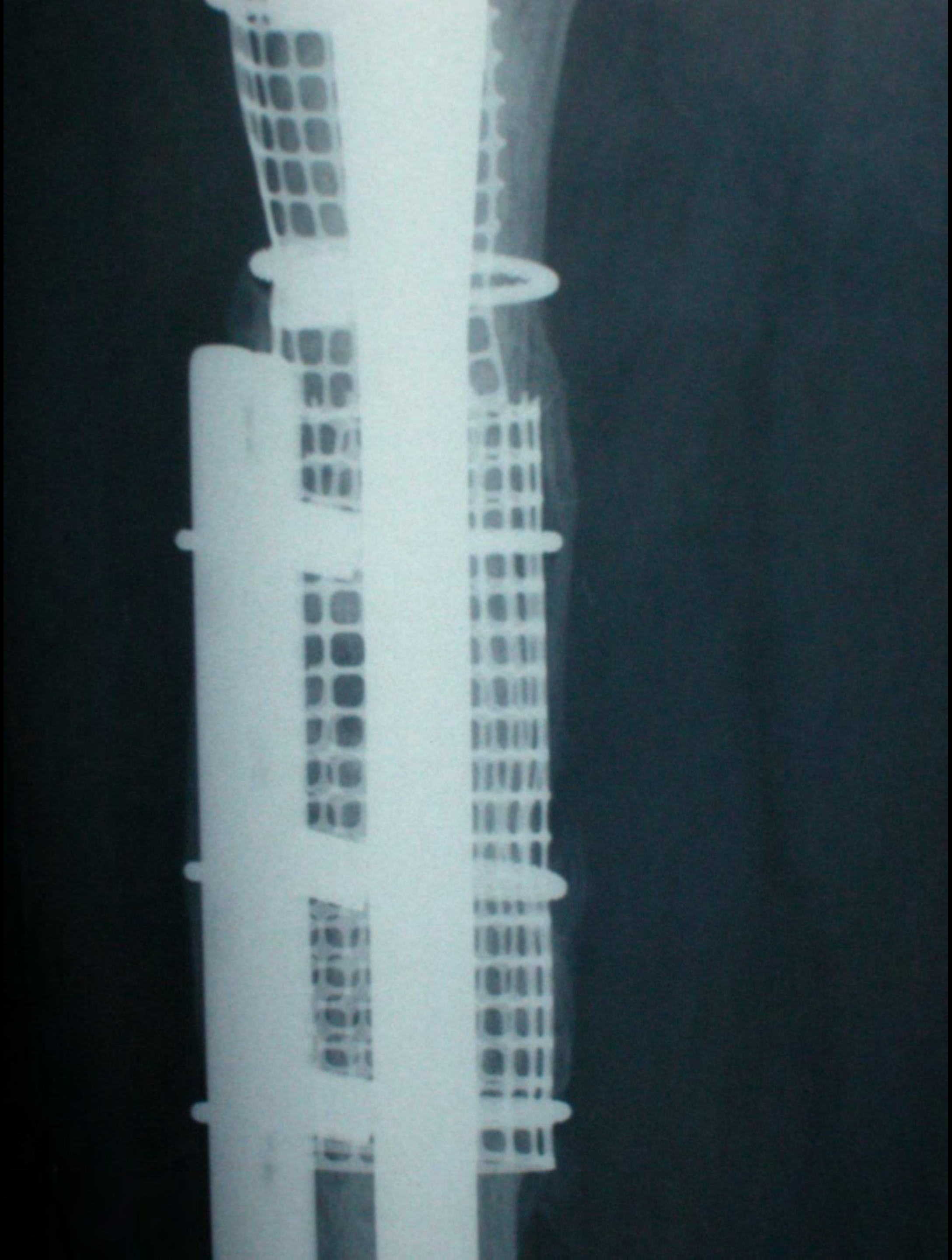




59



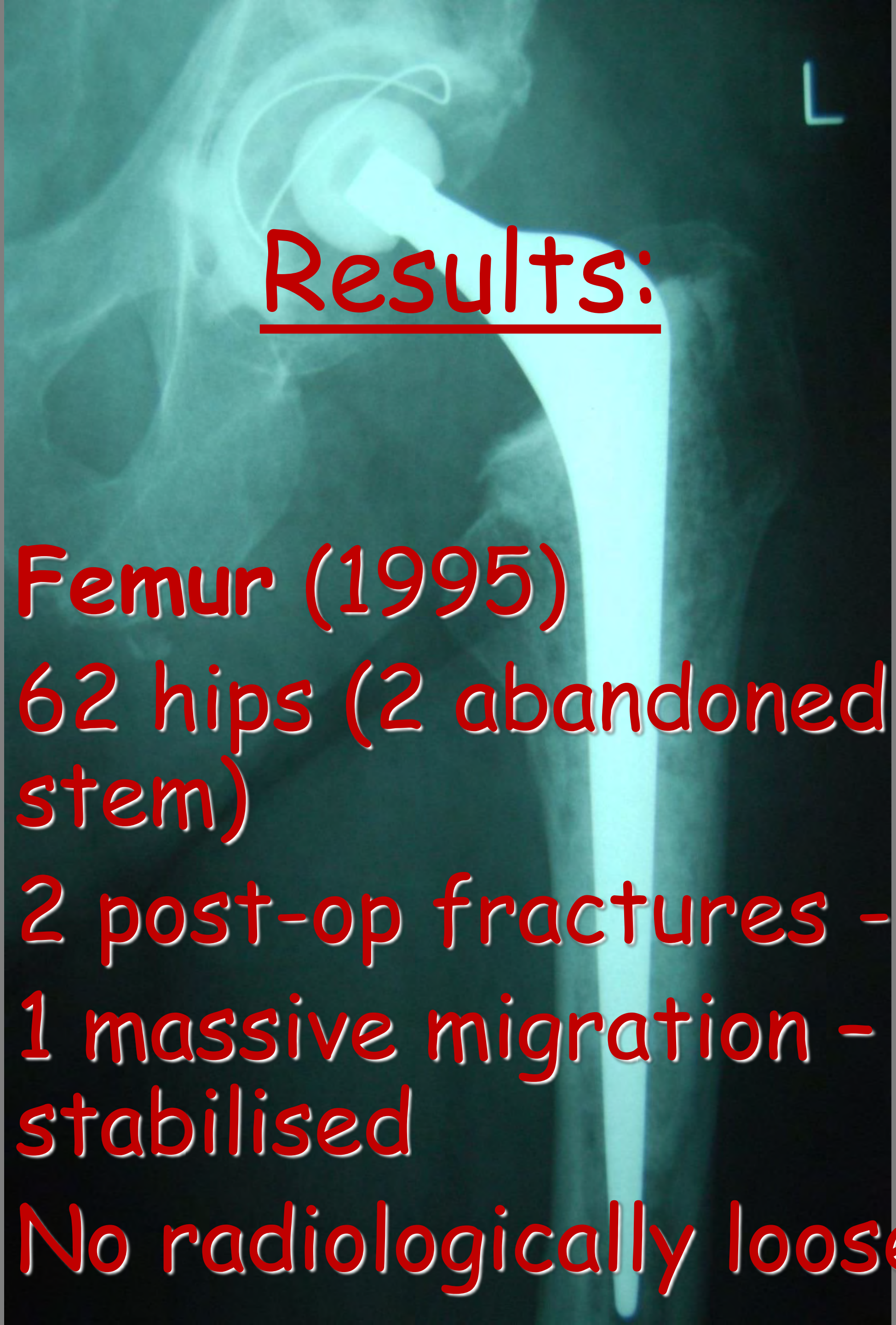
1.60+0.40,R5R0.0,D2F0.4,C*1.0*1.0




cm


L
cm


9 years
cm



Results:

- **Femur** (1995)
- 62 hips (2 abandoned to long stem)
- 2 post-op fractures - revised
- 1 massive migration – 11mm - stabilised
- No radiologically loose

The Bone & Joint Journal
Formerly known as *JBJS (Br)*

Home Archive Info for... Education Mul

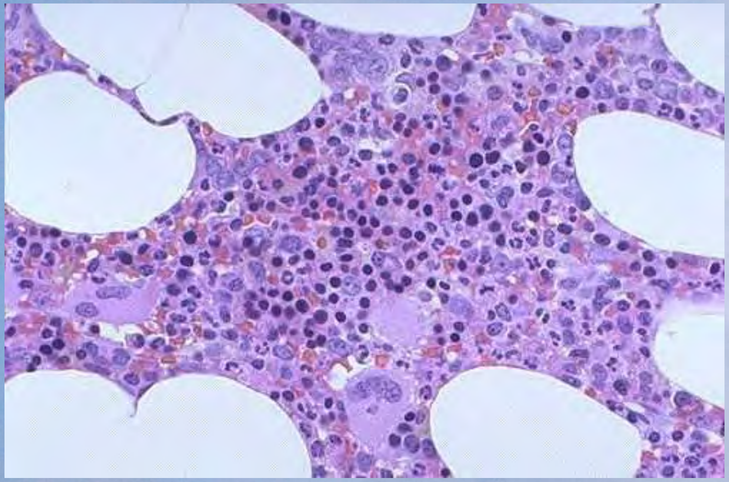
The outcome of femoral component revision arthroplasty with impaction allograft bone grafting and a cemented polished Exeter stem

A prospective cohort study of 208 revision arthroplasties with a mean follow-up of ten years

M. A. J. te Stroet, MD, Resident in Orthopaedic Surgery[1]; W. H. C. Rijnen, MD PhD, Orthopaedic Surgeon, Department of Orthopaedics[1]; J. W. M. Gardeniers, MD PhD, Orthopaedic Surgeon, Department of Orthopaedics[1]; A. van Kampen, MD PhD, Professor of Orthopaedic Surgery, Department of Orthopaedics[1]; and B. W. Schreurs, MD PhD, Orthopaedic Surgeon, Department of Orthopaedics[1]

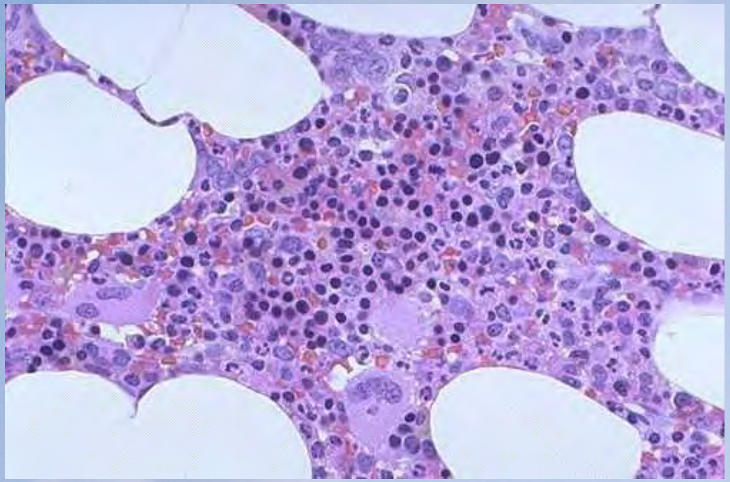
Histology:

- 1/12 - fibrous stroma and woven bone
- 4/12 - living bone and osteoid in dead trabeculae
- 48/12 – mixture of dead and fully mature bone



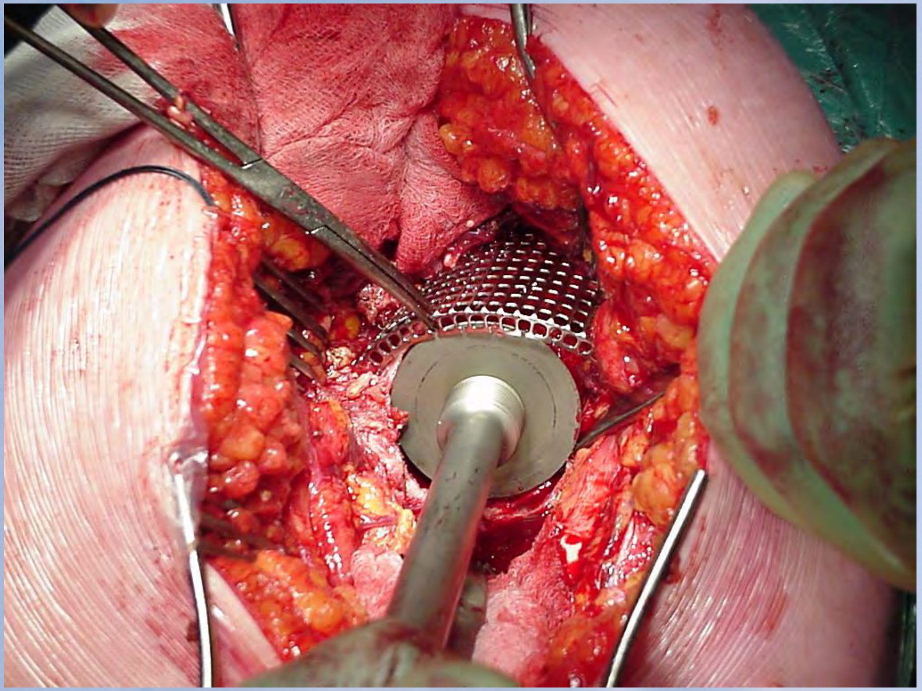
Histology:

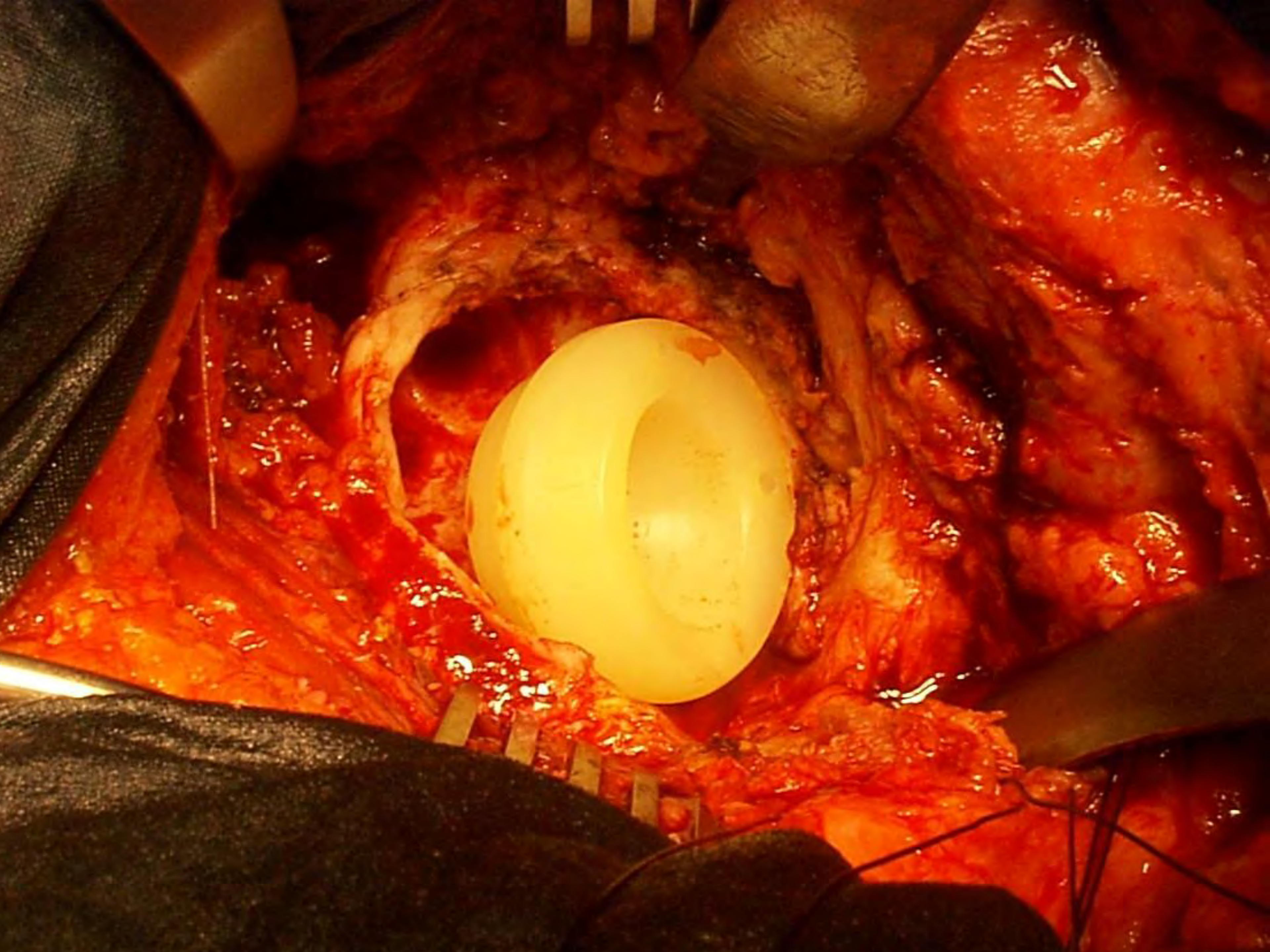
- Allograft largely replaced by viable bone
- Cement-bone interface as 1^0 THR
- Remodelling (DEXA / PET)

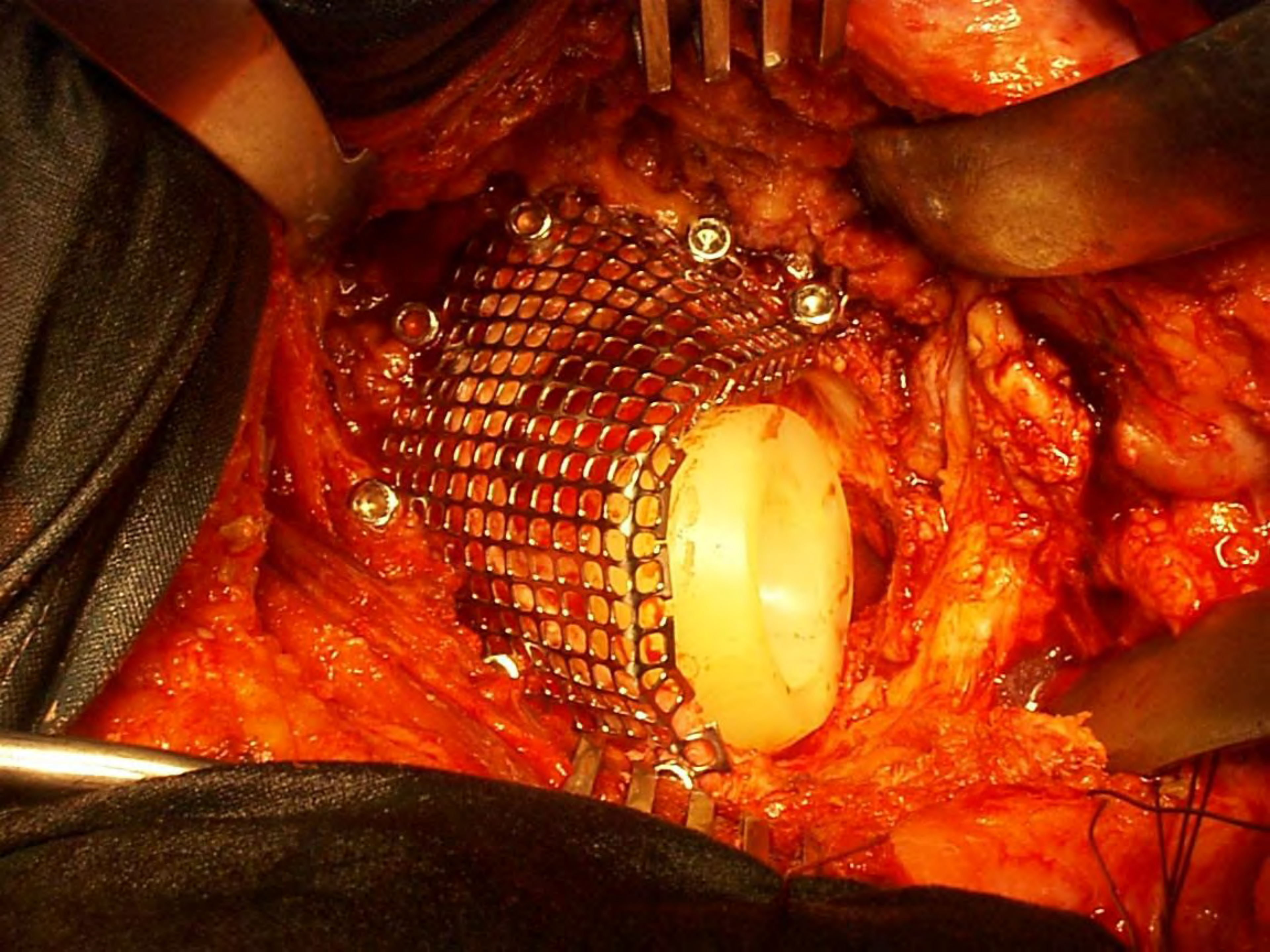


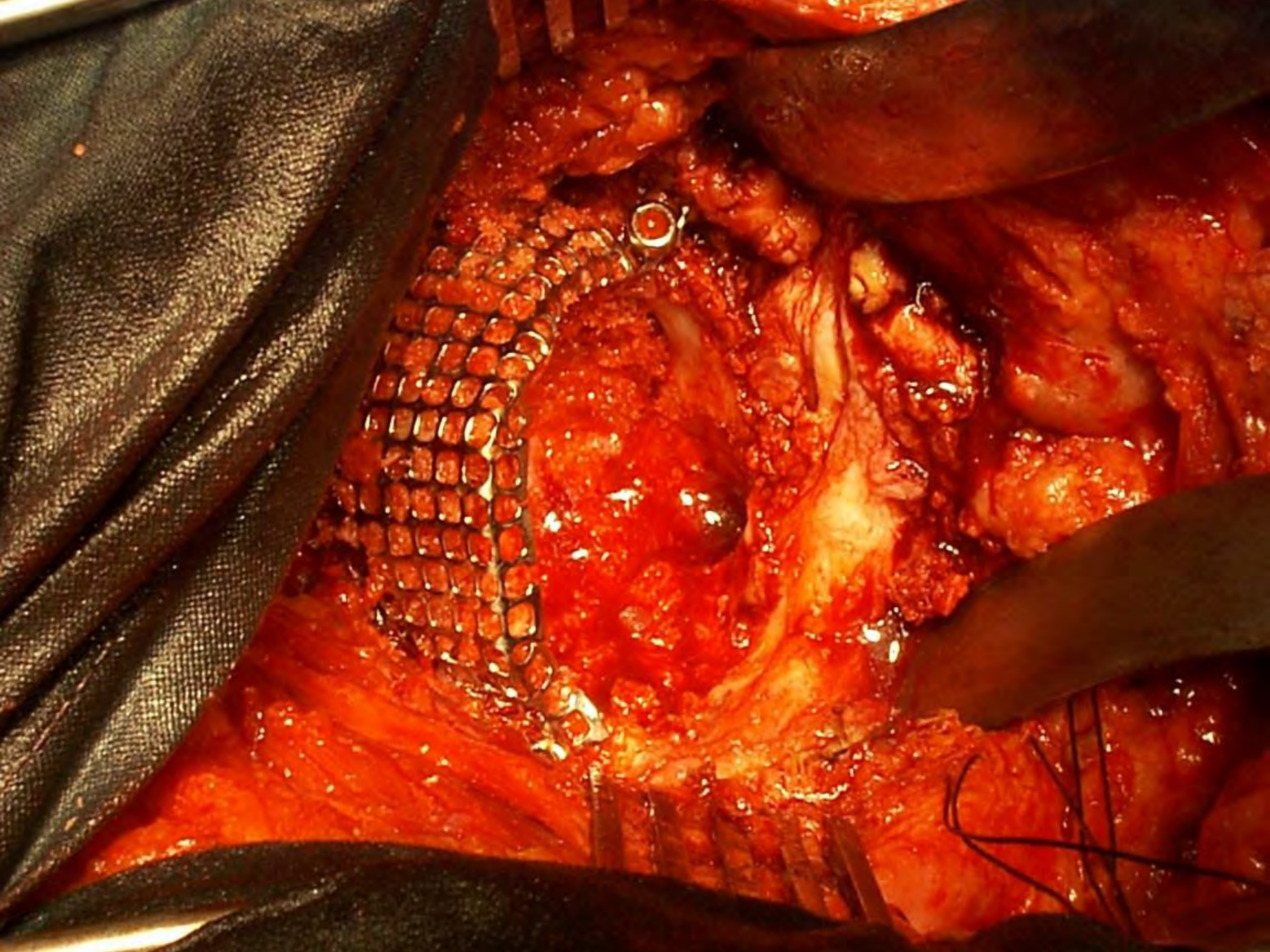
Acetabulum:

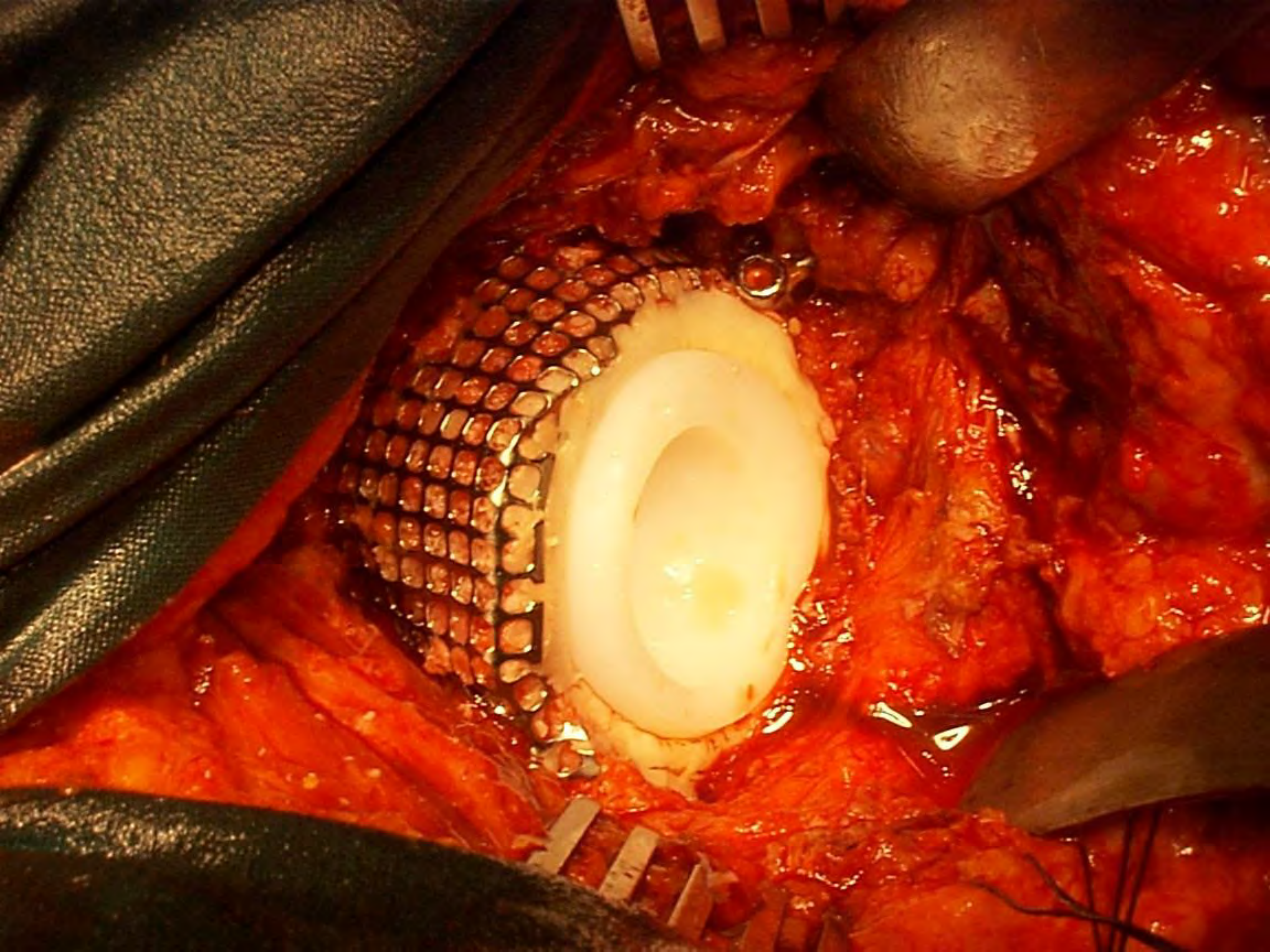
- Stability
- Anatomical
- Restore bone stock

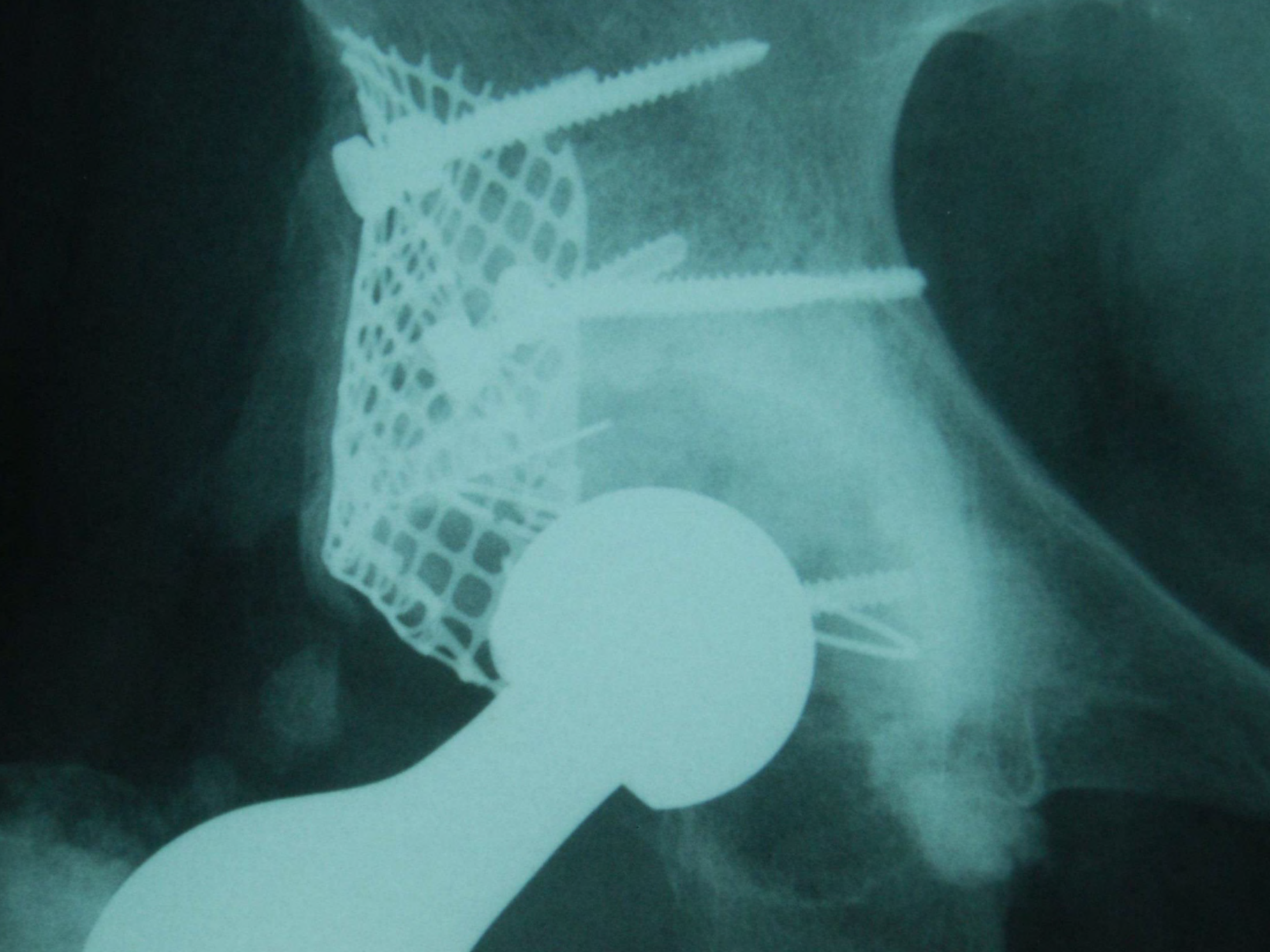


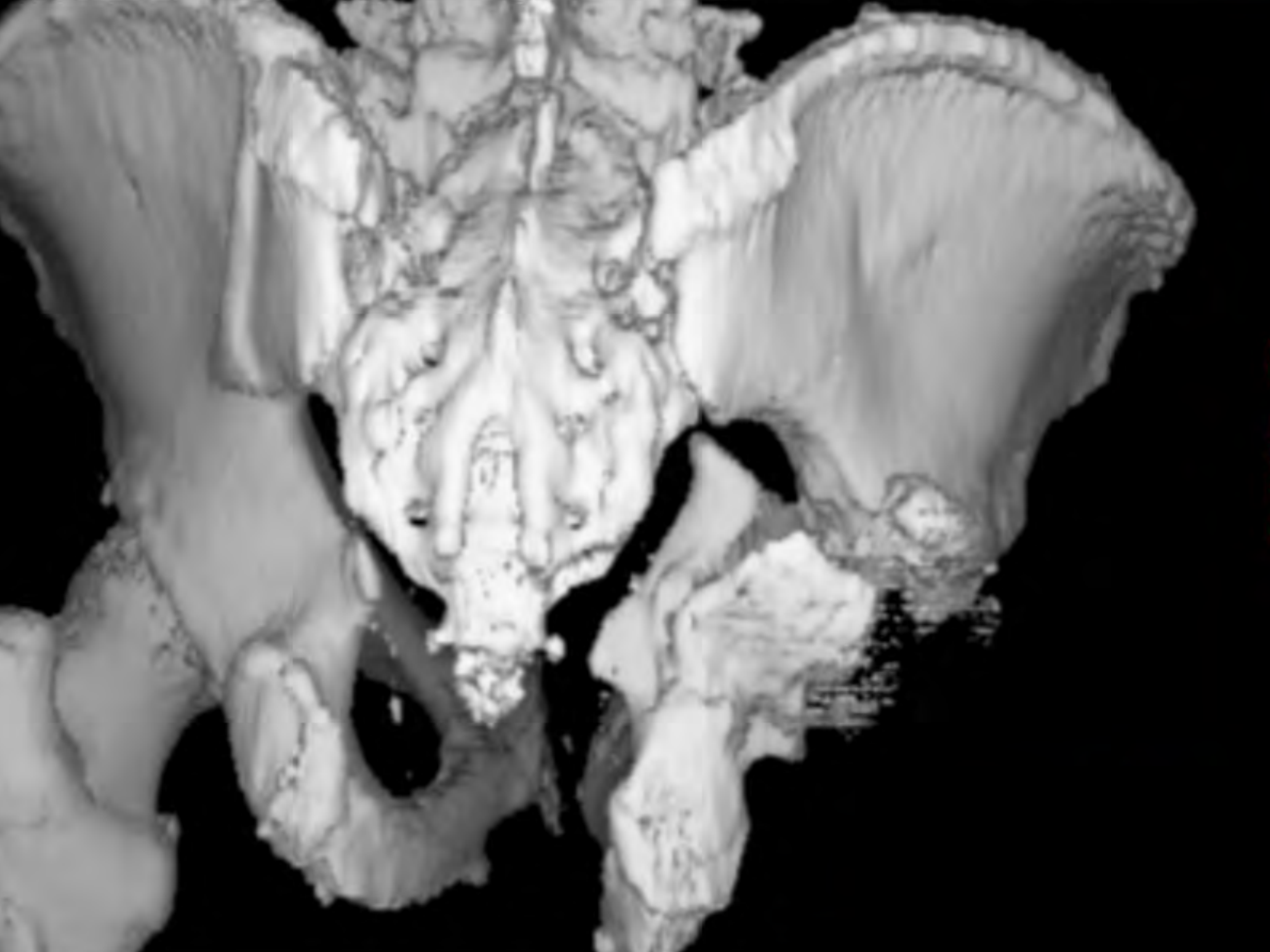


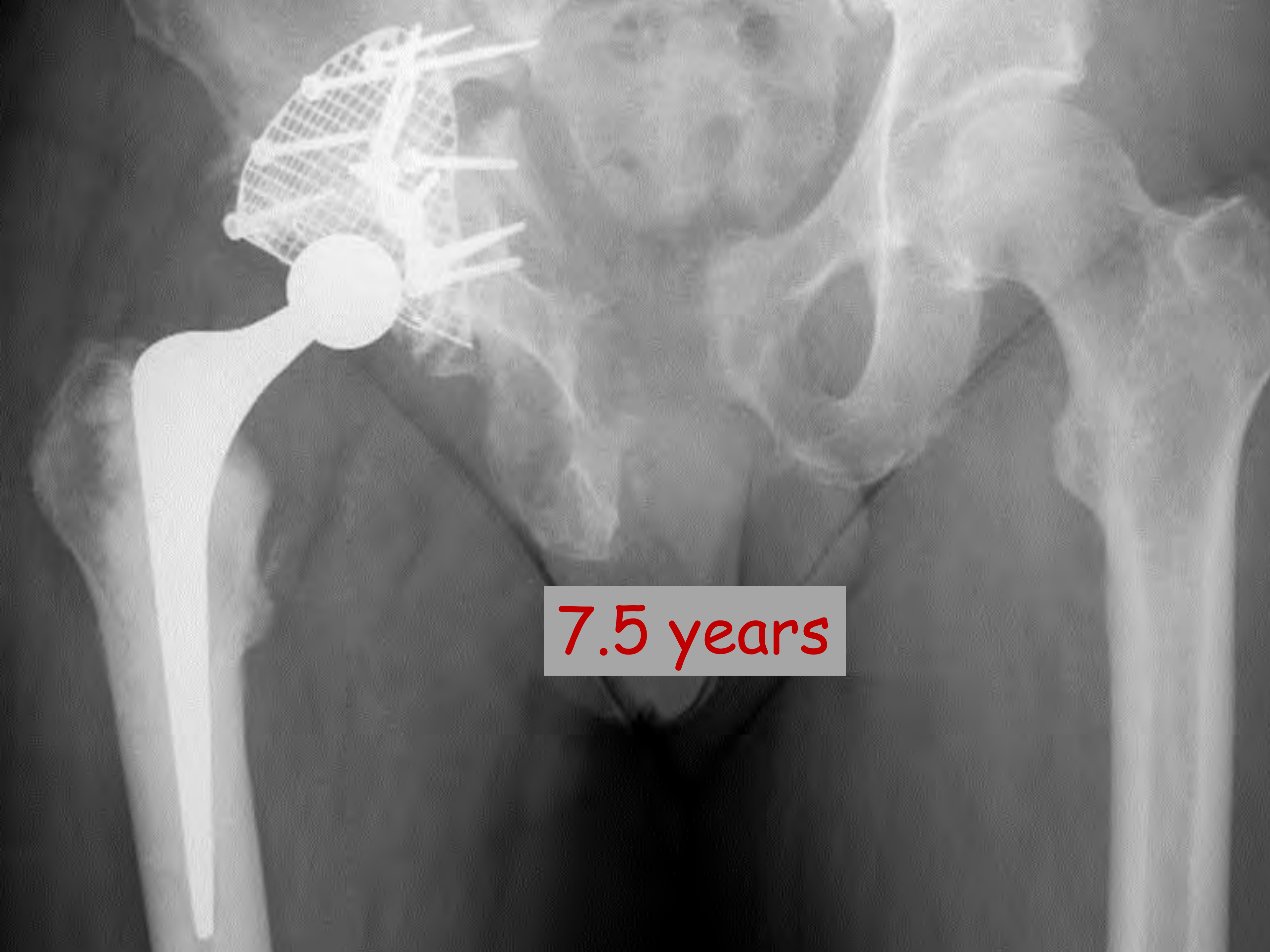











7.5 years

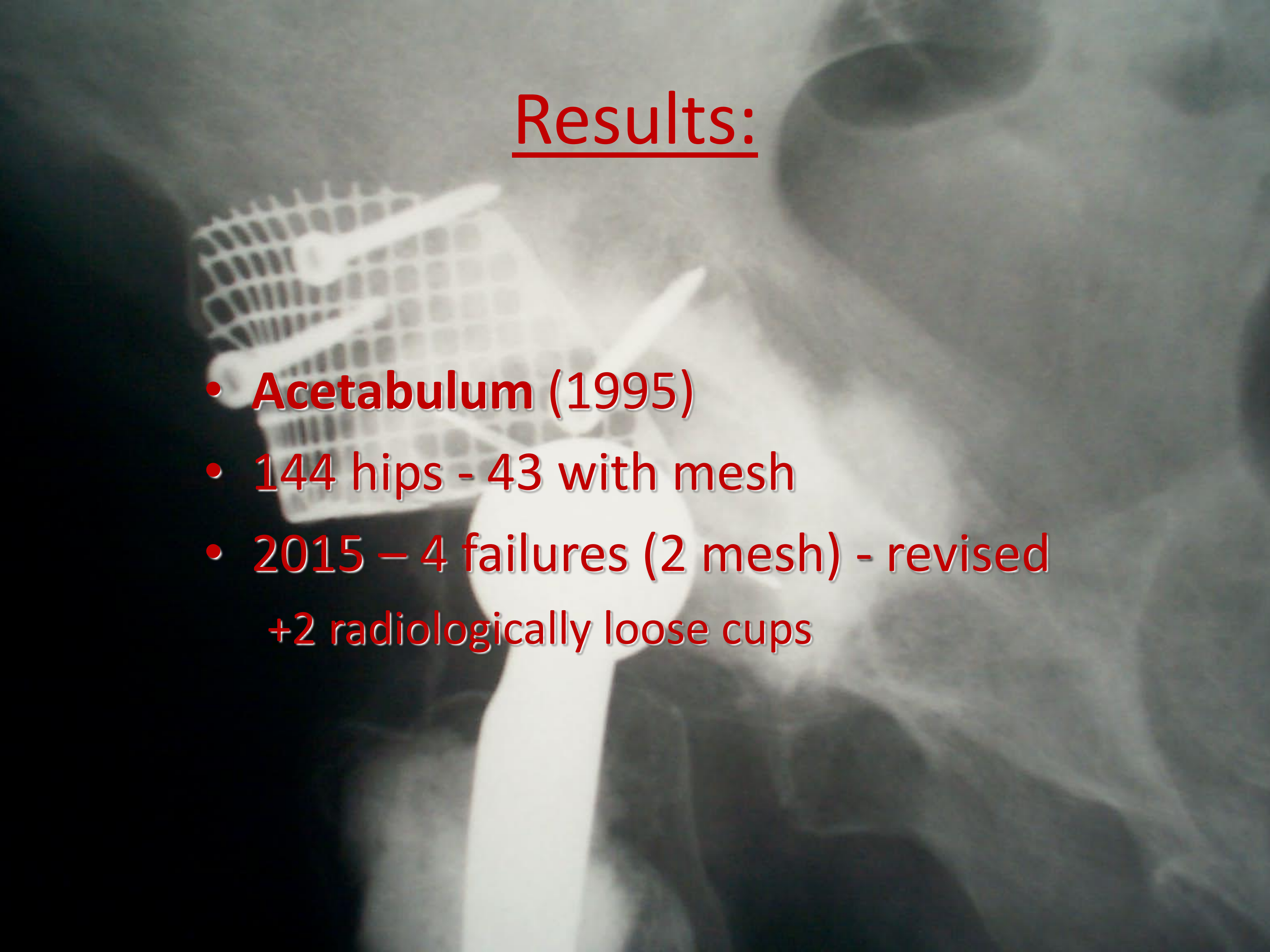

G1.3D#1.60+0.40,R5R0.5,D2F0.4,C*1.0*1.0
R


G1.3D#1.60+0.40,R5R0.5,D2F0.4,C*1.0*1.0
8 years


R


R


R



Results:

- **Acetabulum** (1995)
- 144 hips - 43 with mesh
- 2015 – 4 failures (2 mesh) - revised

  +2 radiologically loose cups

Infected cases:

- 2 stage only
- Vancomycin rinse / 1g per femoral head mix

The
Bone & Joint
Journal
Formerly known as *JBJS (Br)*

Acetabular revision with impaction bone grafting and a cemented polyethylene acetabular component

comparison of the Kaplan–Meier analysis to the competing risk analysis in 62 revisions with 25 to 30 years follow-up

M. A. J. te Stroet, MD, Resident in Orthopaedic Surgery, [1]; J. C. Keurentjes, MD, PhD, Statistical Medical Consultant,[1]; W. H. C. Rijnen, MD, PhD, Orthopaedic Surgeon,[1]; J. W. M. Gardeniers, MD, PhD, Orthopaedic Surgeon,[1]; N. Verdonschot, MD, PhD, Professor of Orthopaedic Surgery,[1]; T. J. J. H. Slooff, MD, PhD, Emeritus Professor of Orthopaedic Surgery,[1]; and B. W. Schreurs, MD, PhD, Orthopaedic Surgeon, Department of Orthopaedics[1]

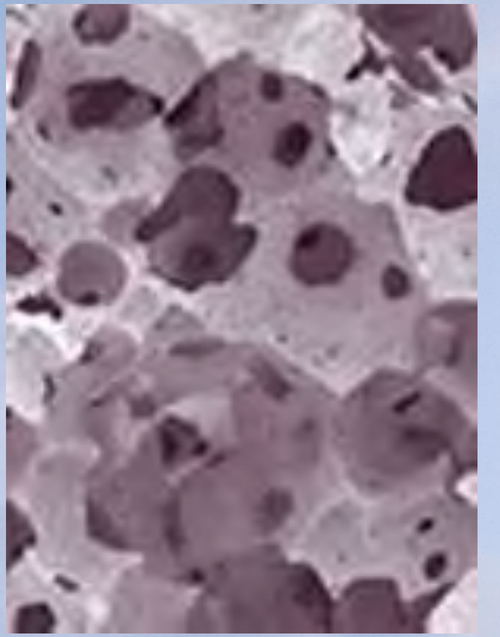
Hip Int. 2013 Nov-Dec;23(6):522-8. doi: 10.5301/hipint.5000053. Epub 2013 May 10.

Results using Trabecular Metal™ augments in combination with acetabular impaction bone grafting in deficient acetabula.

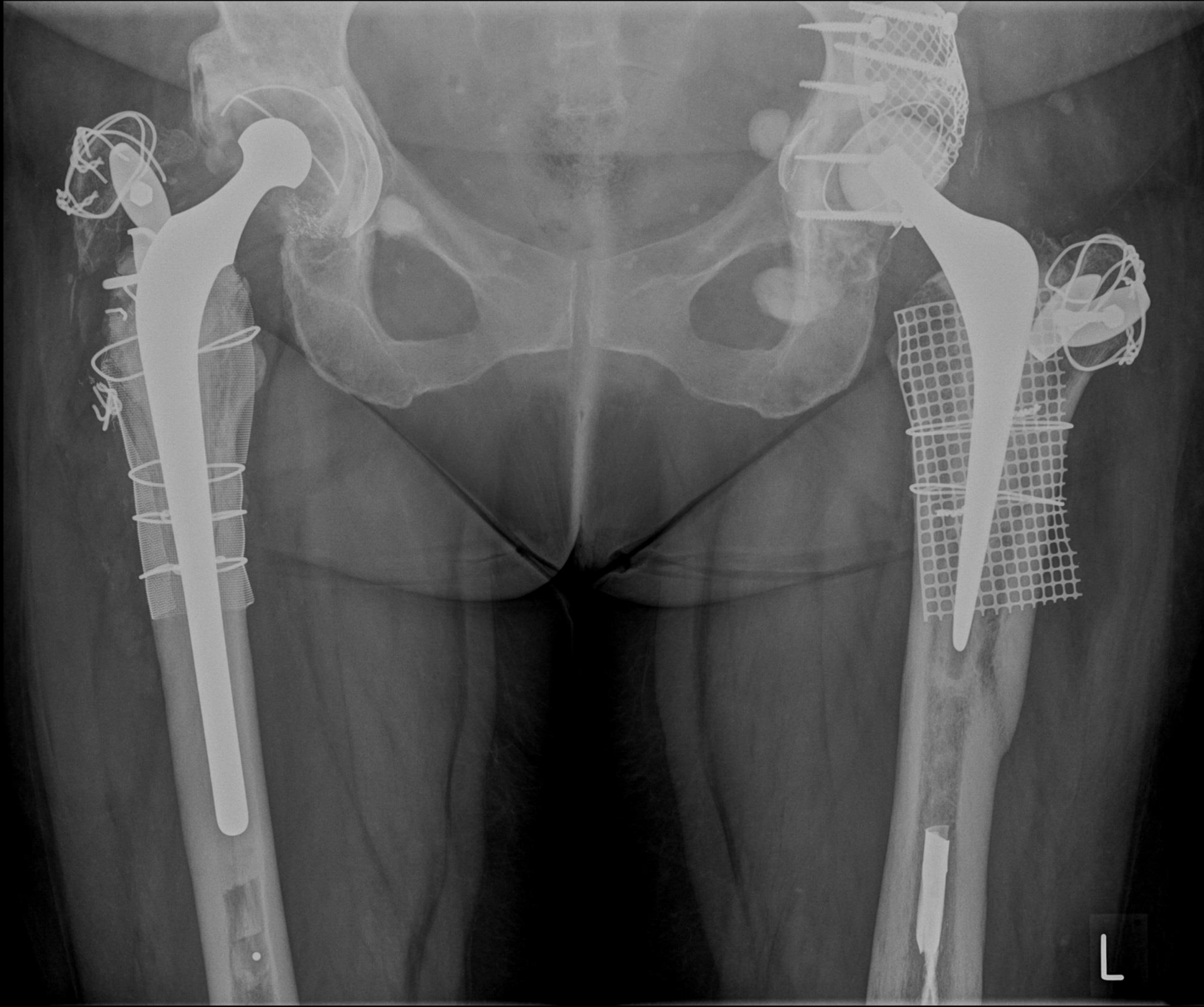
Gill K[1], Wilson MJ, Whitehouse SL, Timperley AJ.

Bone substitutes (50:50):

- Shear strength $\uparrow$ with small bioglass particles (TCP - HA) $\rightarrow$ $\uparrow$implant stability
- More difficult to handle
- ? $\uparrow$risk femoral #
- ? incorparation $\uparrow$ by BMP's / biphosphonates



Technique and Implant Dependent


L

Thank you!

INTERNATIONAL COMBINED MEETING

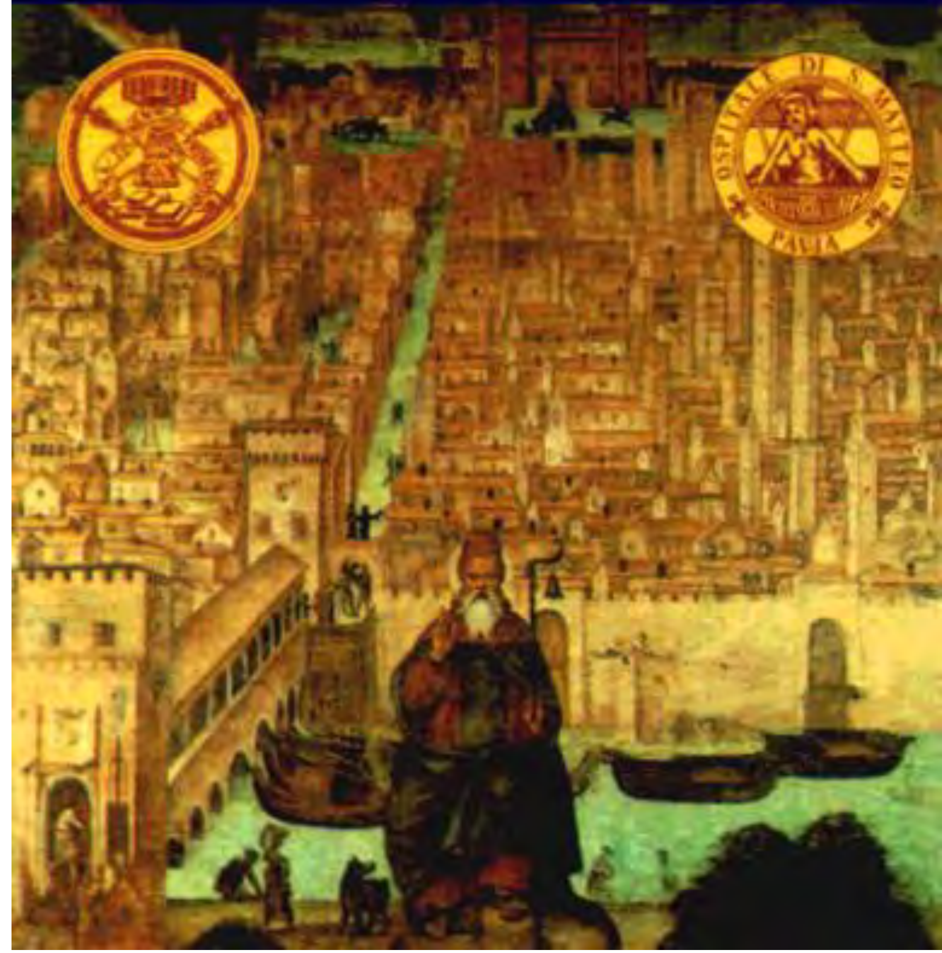
BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Clinica Ortopedica e Traumatologica
Università degli Studi di Pavia
Fondazione I.R.C.C.S Policlinico San Matteo

Chairman: Prof. F. Benazzo



Cementless

F. Benazzo

Acetabular uncemented reconstruction

- **B.I.G.**
- Structural graft
- **Porous Material**
- **Augments**

- Jumbo cup
- **Cup Cages**, Mesh, etc.
- **Custom devices**
- Combinations of the above listed solutions

Porous Material

"Biomaterial with a porous structure and optimal mechanical features for the bone, to obtain high grip for good primary stability, and fast and durable bone growth"

Hip implants/ Bone recostructions

M. S. Ibrahim,
S. Raja,
F. S. Haddad

From University College Hospital, London, United Kingdom

THE REVISION HIP

Acetabular impaction bone grafting in total hip replacement

VOL. 95-B, No. 11, NOVEMBER 2013

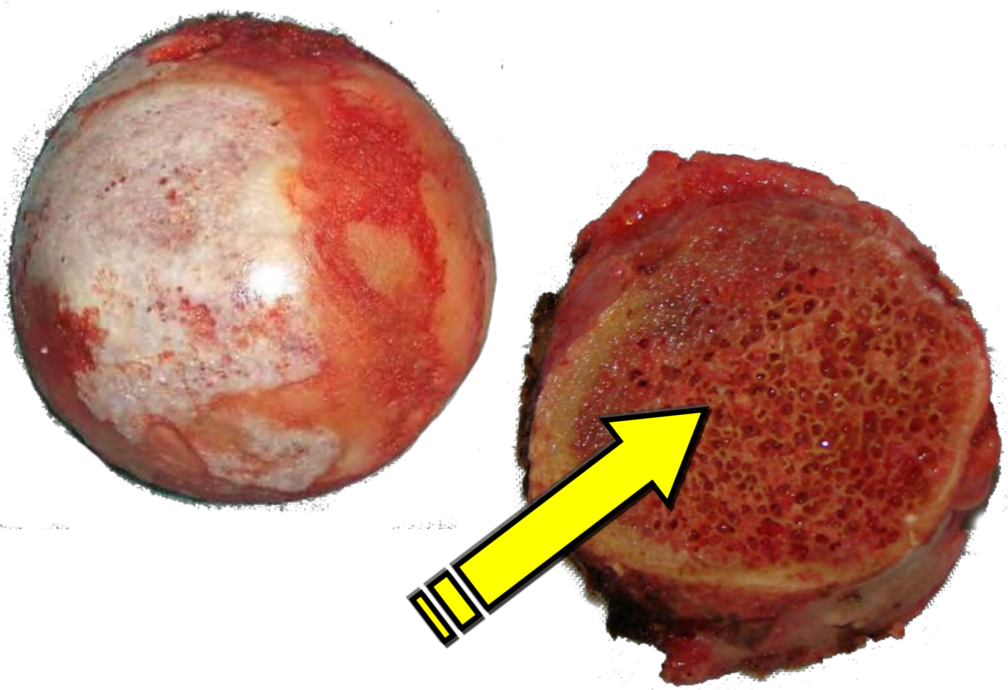
B.I.G and Porous Cups

- ✓ **Indicated** for defects that can be contained, rendered contained, or where rim fixation can be achieved.

- ✓ **Contraindicated** where bony in-growth and initial stability is not possible, such as severe osteoporosis, osteonecrosis, irradiation, metabolic bone disorders, tumours and pelvic discontinuity [*]

What kind of bone?

- Chips (4-6 mm) of femoral head from Bone Bank
- No structural bone graft
- No Bone substitutes
- No Growth factors, BMP, other…



What kind of bone defects?

Table 1

American Academy of Orthopaedic Surgeons Classification of Acetabular Deficiencies[10]

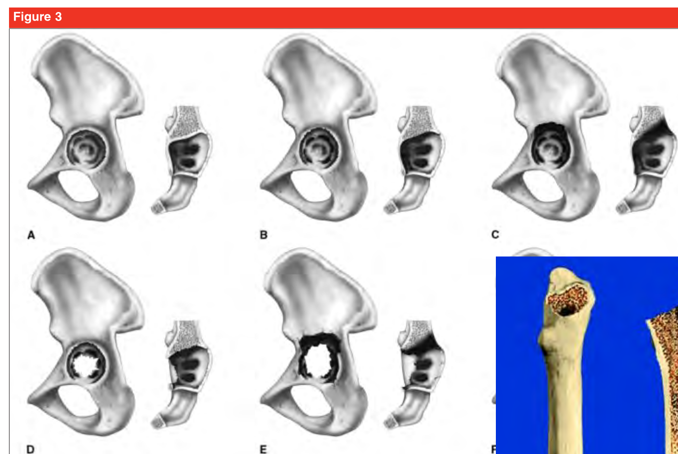
Type	Description
I	Segmental defect
II	Cavitary defect
III	Combined segmental and cavitary defect
IV	Pelvic discontinuity
A	Discontinuity with mild segmental or cavitary loss
B	Discontinuity with moderate to severe segmental or cavitary loss
C	Discontinuity with prior pelvic irradiation
V	Hip arthrodesis

Table 2

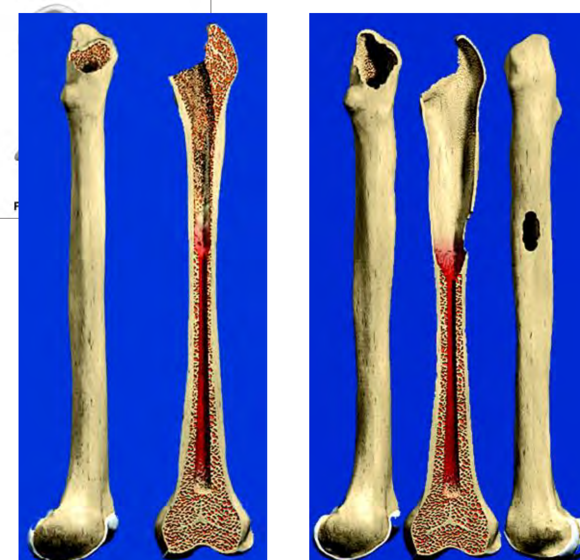
Paprosky Classification of Acetabular Bone Loss[11]

Type	Femoral Head Center Migration	Ischial Osteolysis	Kohler Line	Teardrop
I	None	None	Intact	Intact
IIA	Mild (<3 cm)	None	Intact	Intact
IIB	Moderate (<3 cm)	Mild	Intact	Intact
IIC	Mild (<3 cm)	Mild	Disrupted	Moderate lysis
IIIA	Severe (>3 cm)	Moderate	Intact	Moderate lysis
IIIB	Severe (>3 cm)	Severe	Disrupted	Severe lysis

Figure 3



Femoral: type I or II



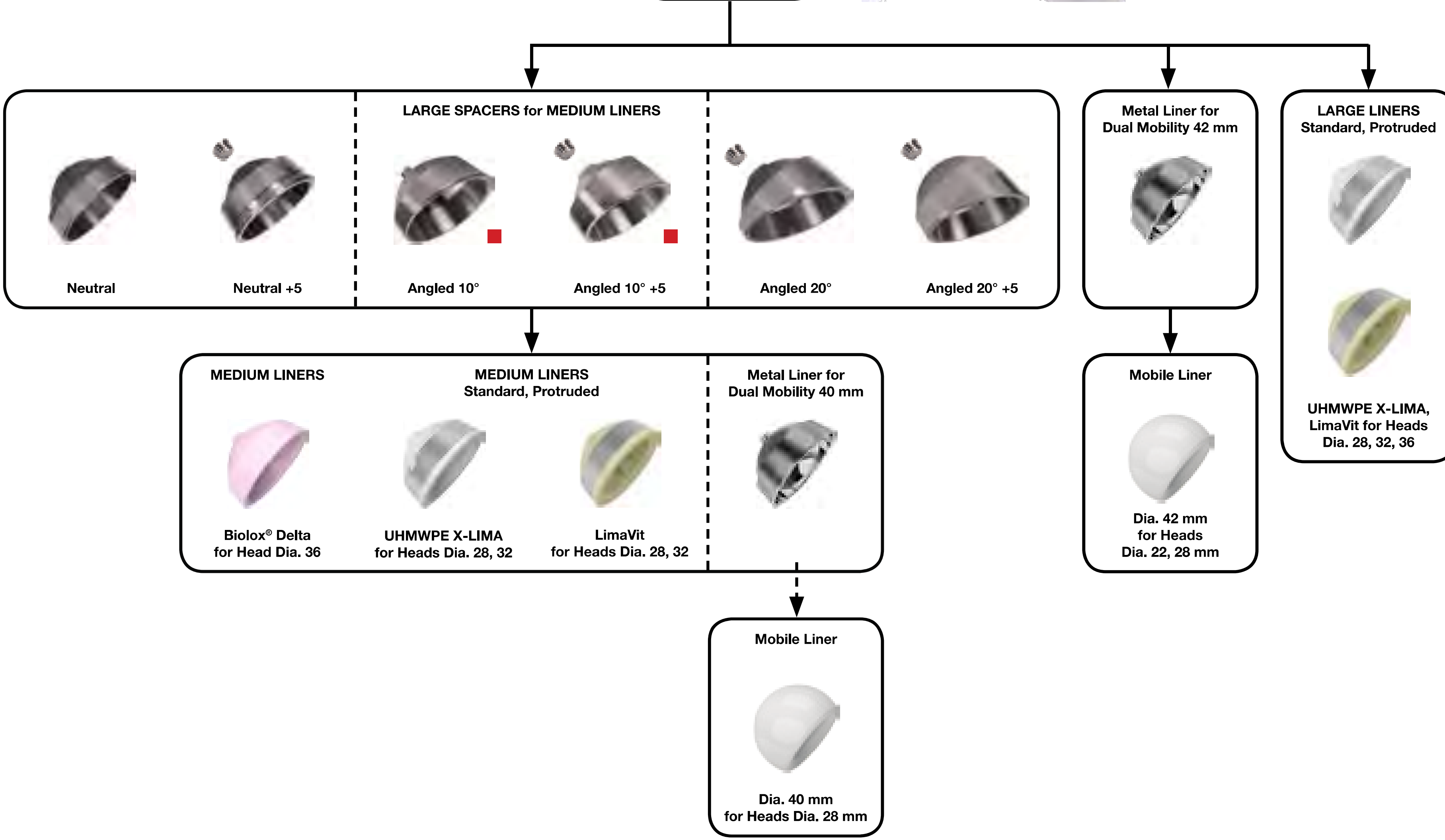
What porous material I use?
Trabecular Titanium ^{TM}

- Alveolar structure composed by a plurality of 3D complex shape hexagonal cells
- Pores average diameter 640 μm
- 65% open porosity

EBM technology

Hardware

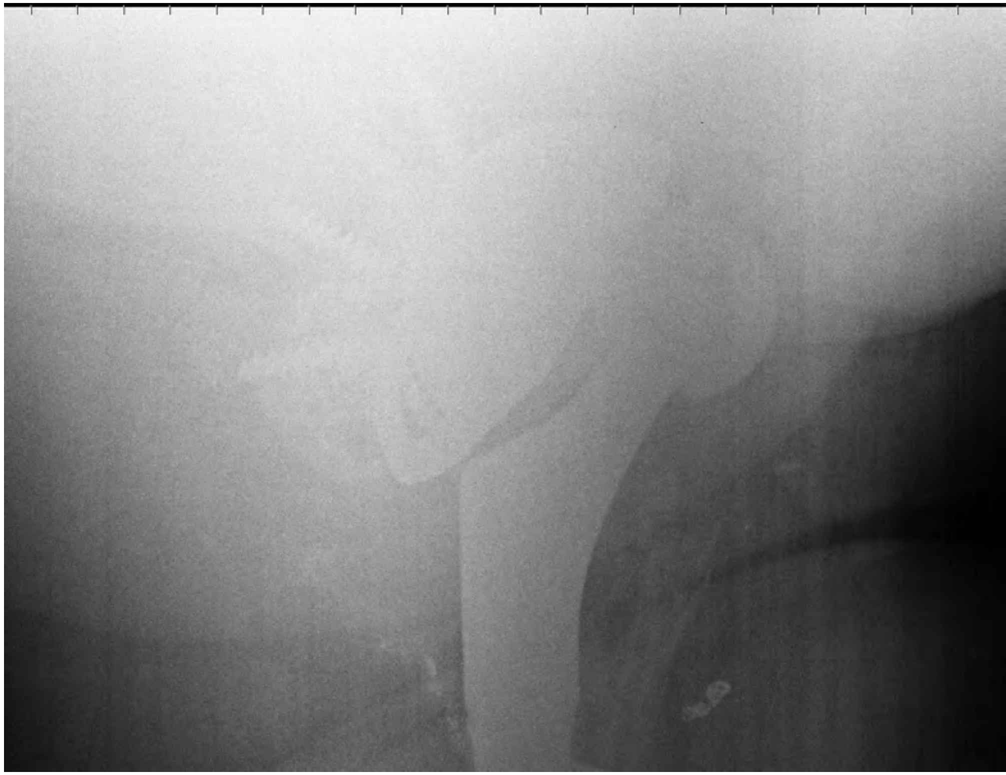
Dia. 50, 52, 54 mm



LARGE SPACERS for MEDIUM LINERS
Neutral
Neutral +5
Angled 10°
Angled 10° +5
Angled 20°
Angled 20° +5
Metal Liner for Dual Mobility 42 mm
LARGE LINERS Standard, Protruded
UHMWPE X-LIMA, LimaVit for Heads Dia. 28, 32, 36
MEDIUM LINERS
MEDIUM LINERS Standard, Protruded
Biolox® Delta for Head Dia. 36
UHMWPE X-LIMA for Heads Dia. 28, 32
LimaVit for Heads Dia. 28, 32
Metal Liner for Dual Mobility 40 mm
Mobile Liner
Dia. 42 mm for Heads Dia. 22, 28 mm
Mobile Liner
Dia. 40 mm for Heads Dia. 28 mm

Surgical technique: cup

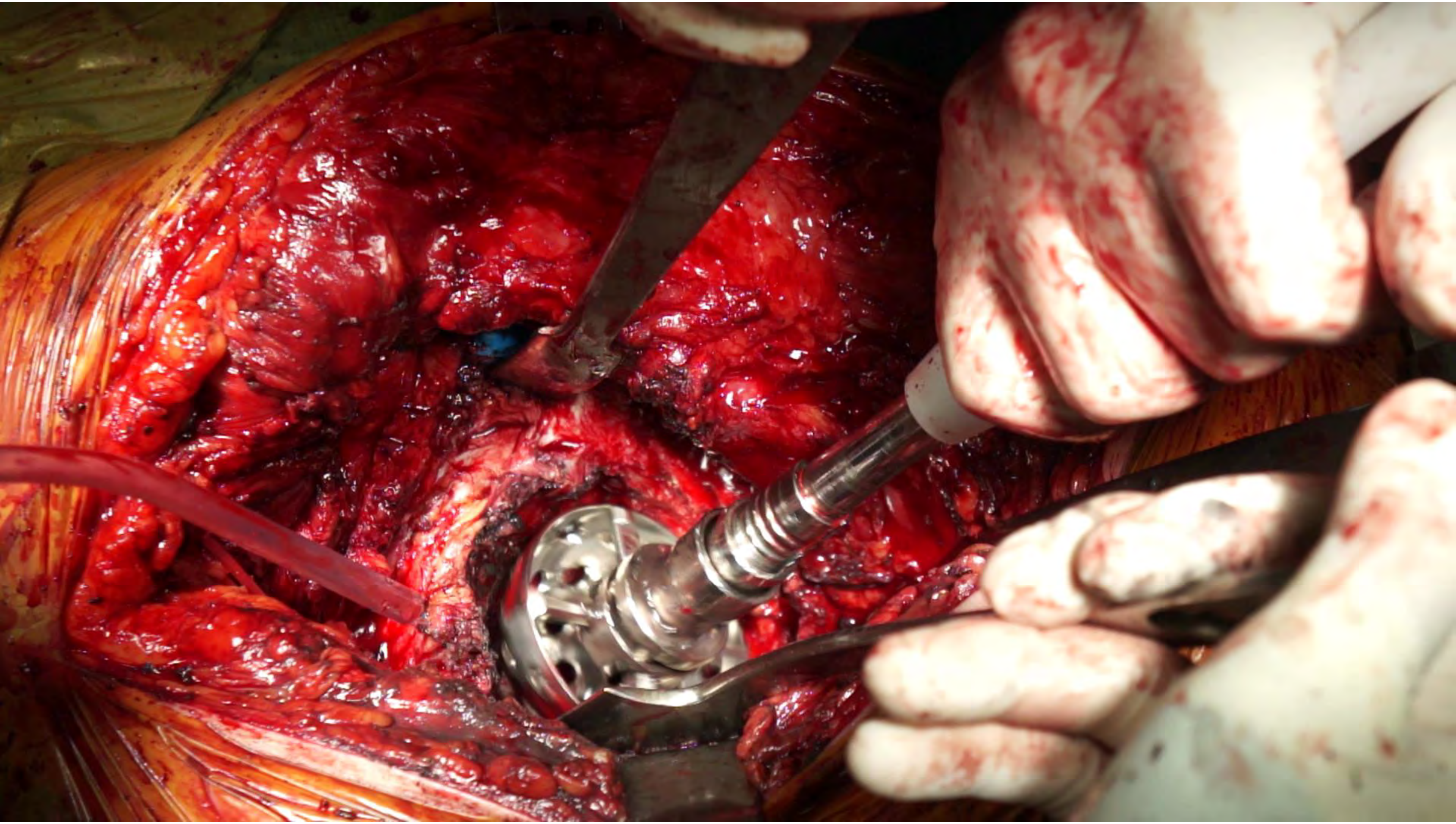
Porous cup + augment loosening

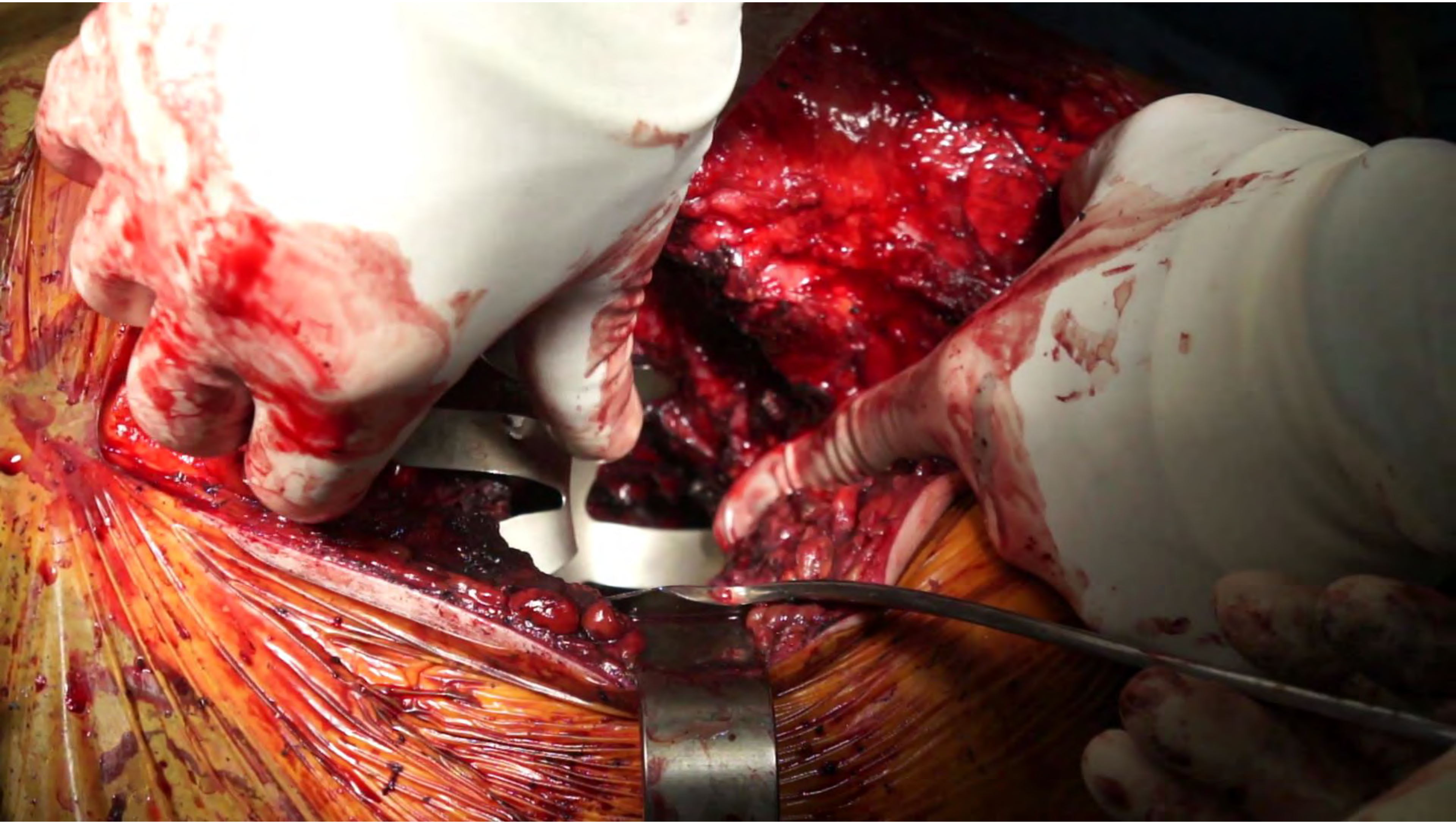


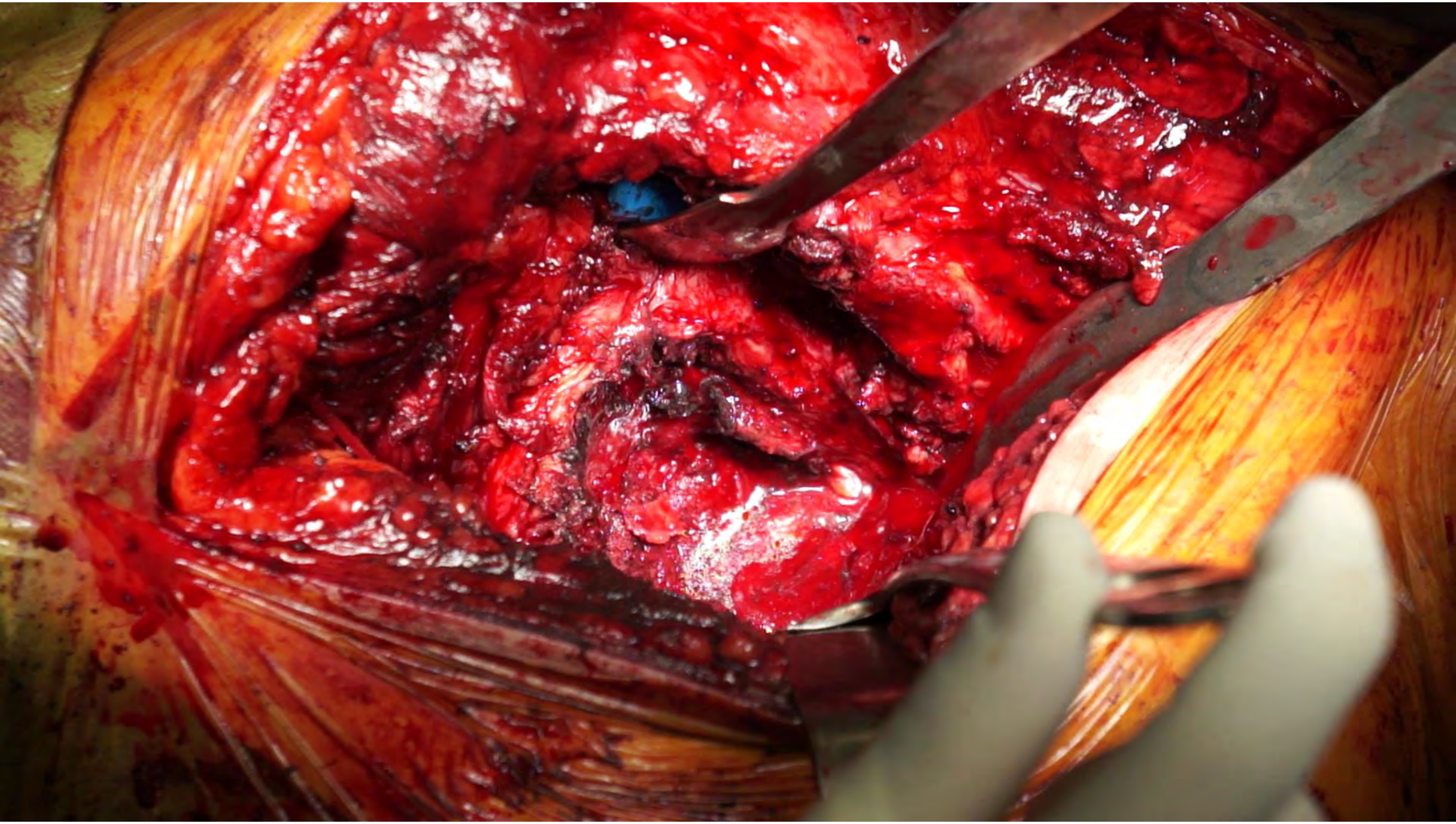
To visualize the acetabulum:

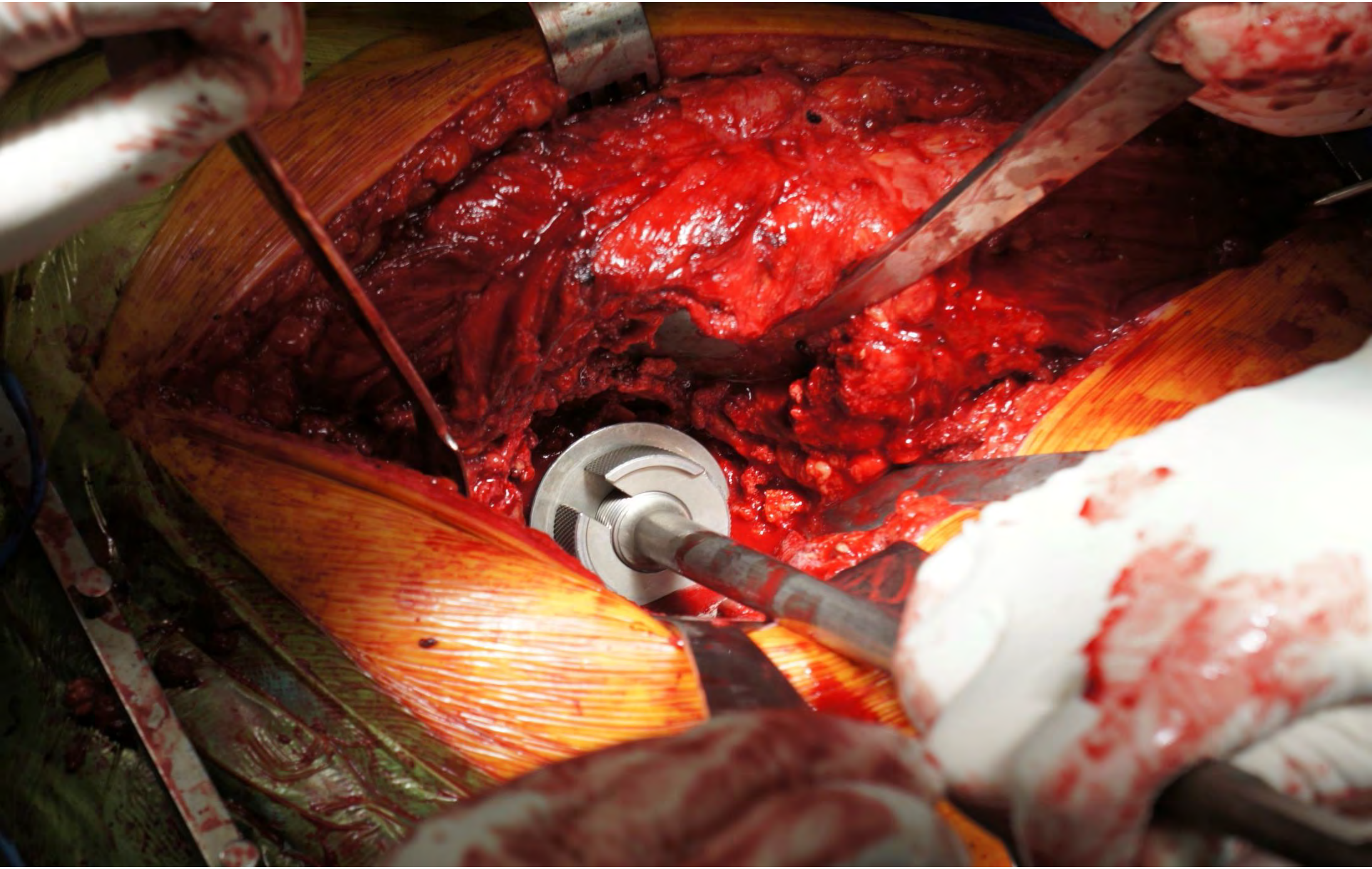
- a soft tissue sleeve including the gluteus minimus and medius is elevated of the ilium
- a Steinman pin or Hohman retractor was placed superiorly
- the posterior capsule is elevated of the posterior acetabular rim to visualize the posterior defect
- an Aufranc Retractor medially

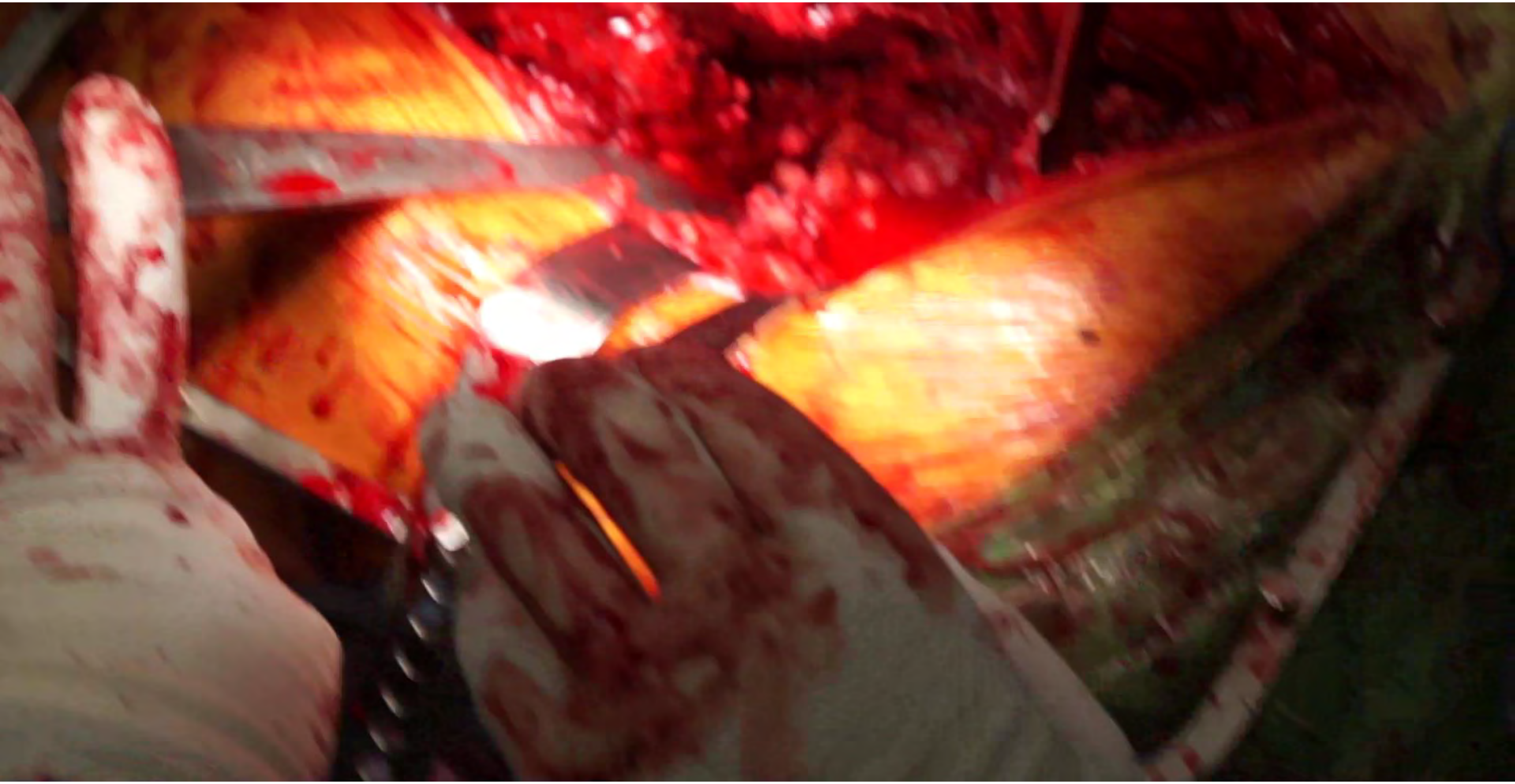
Remove the cup

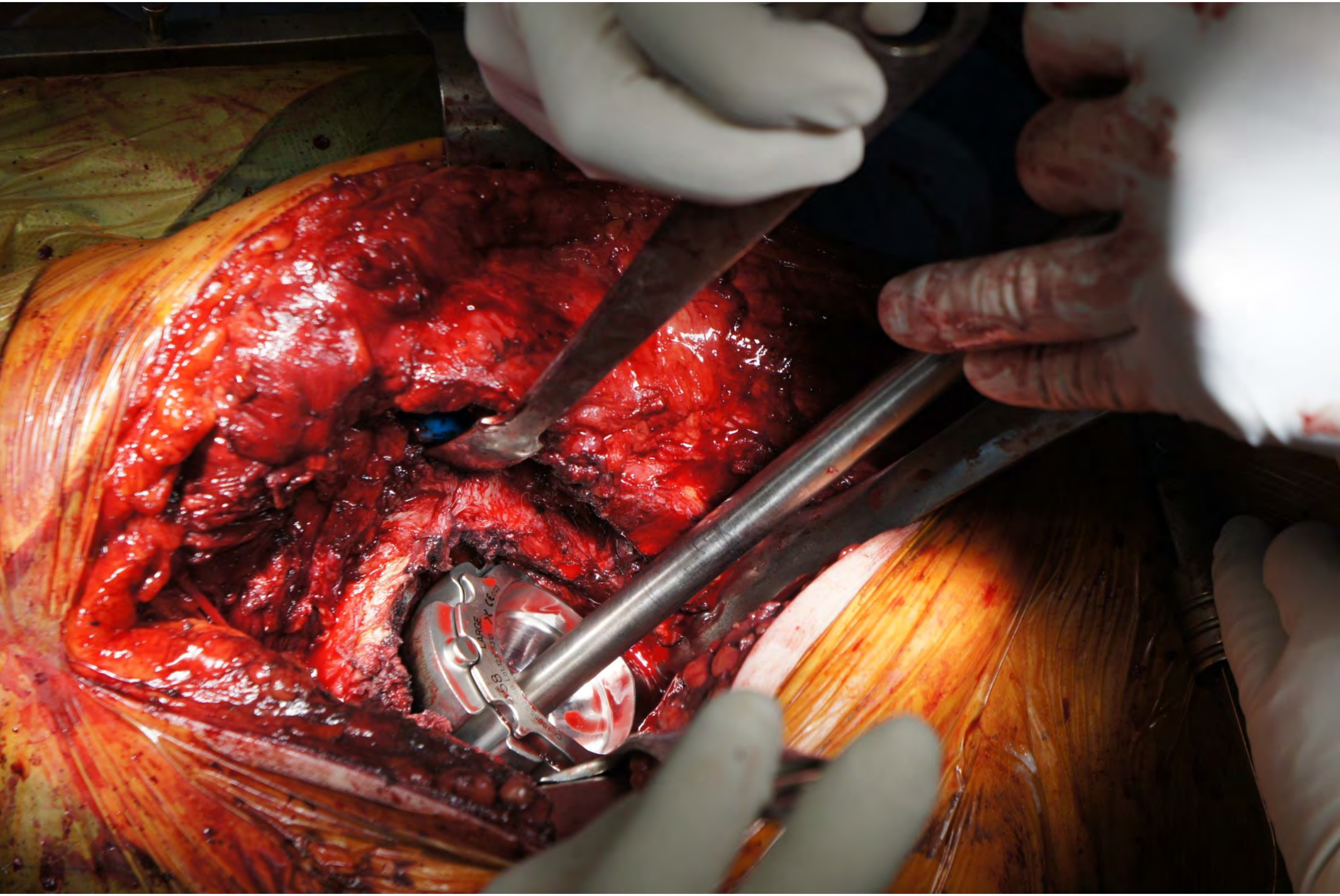


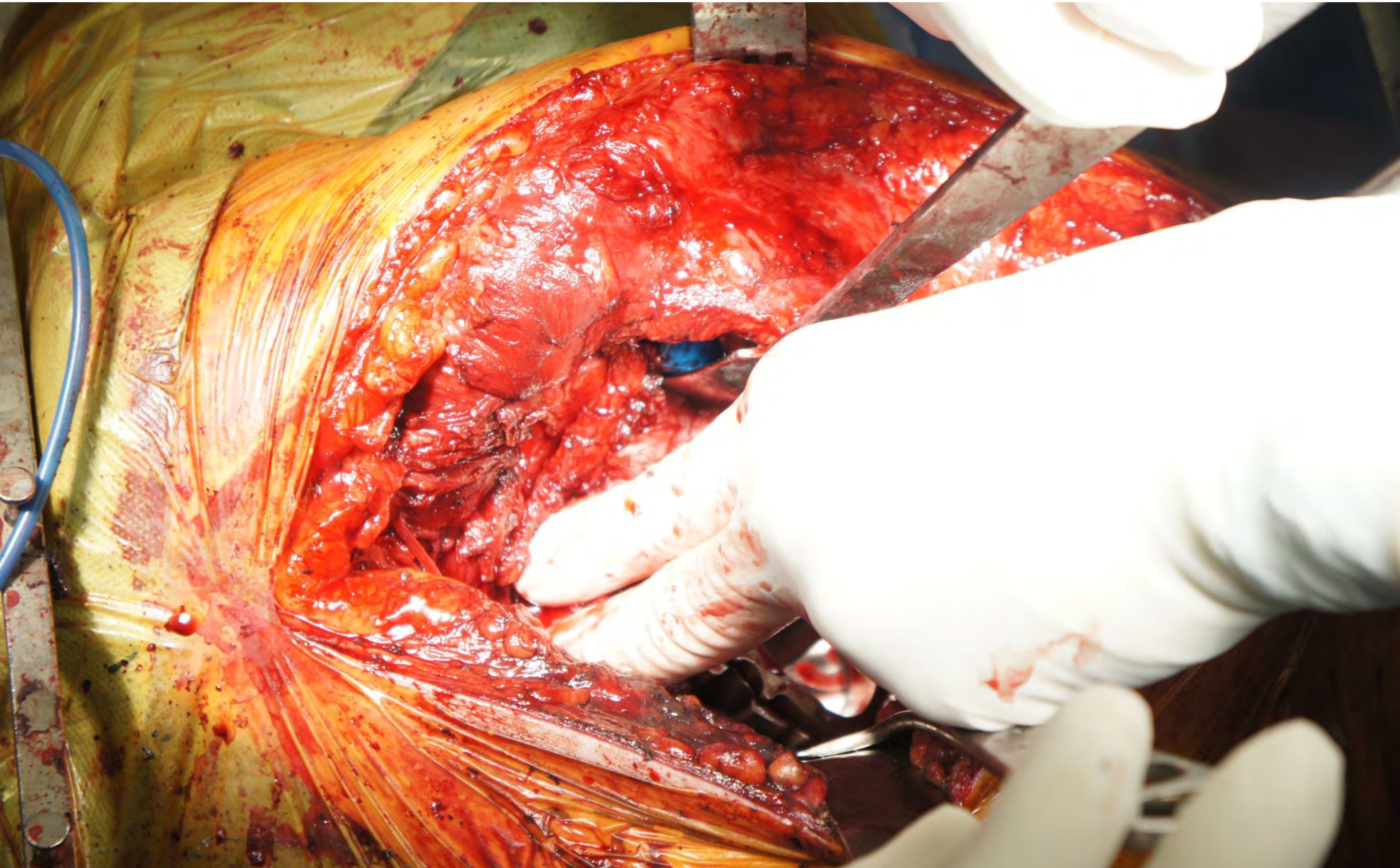


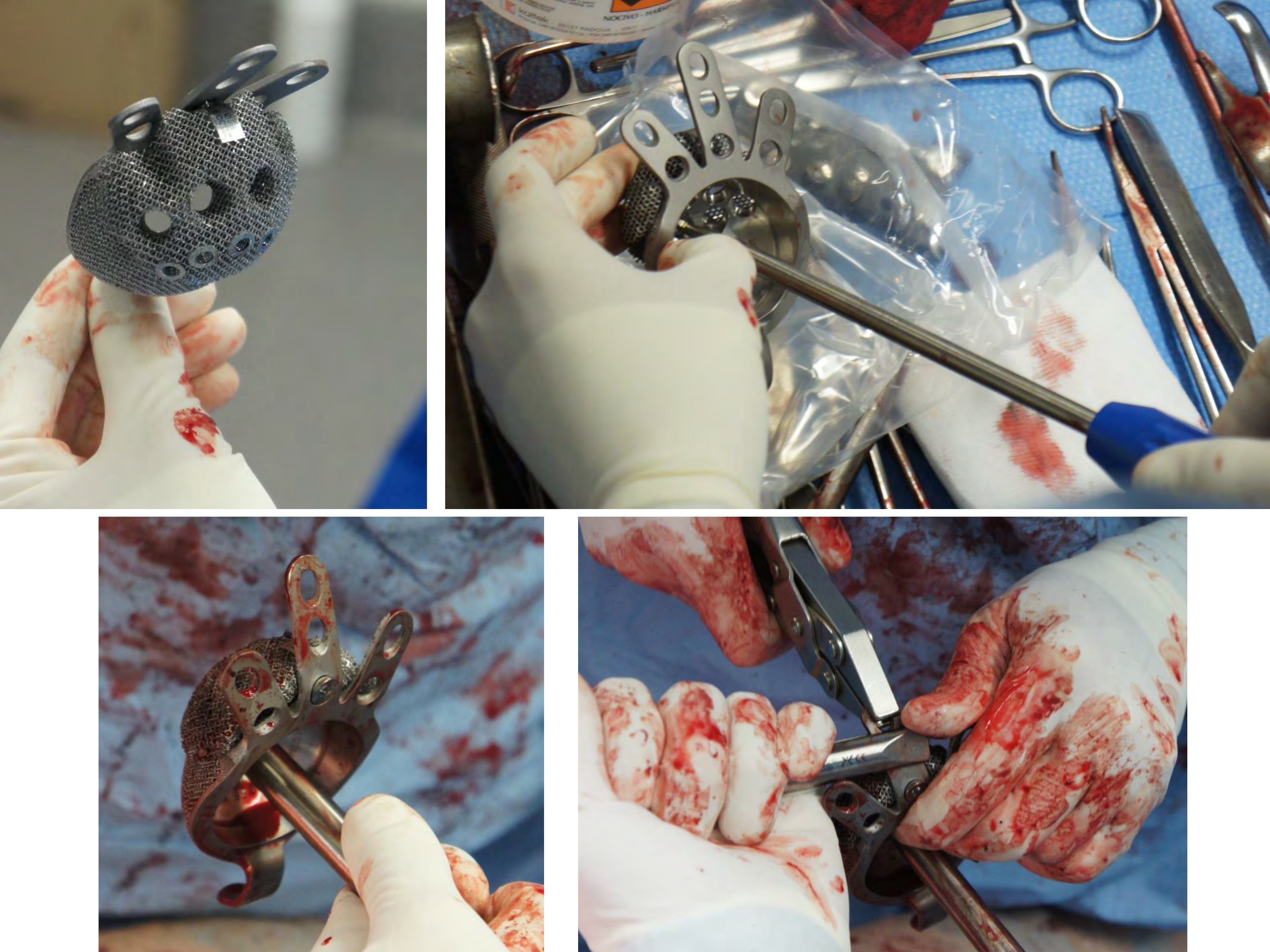


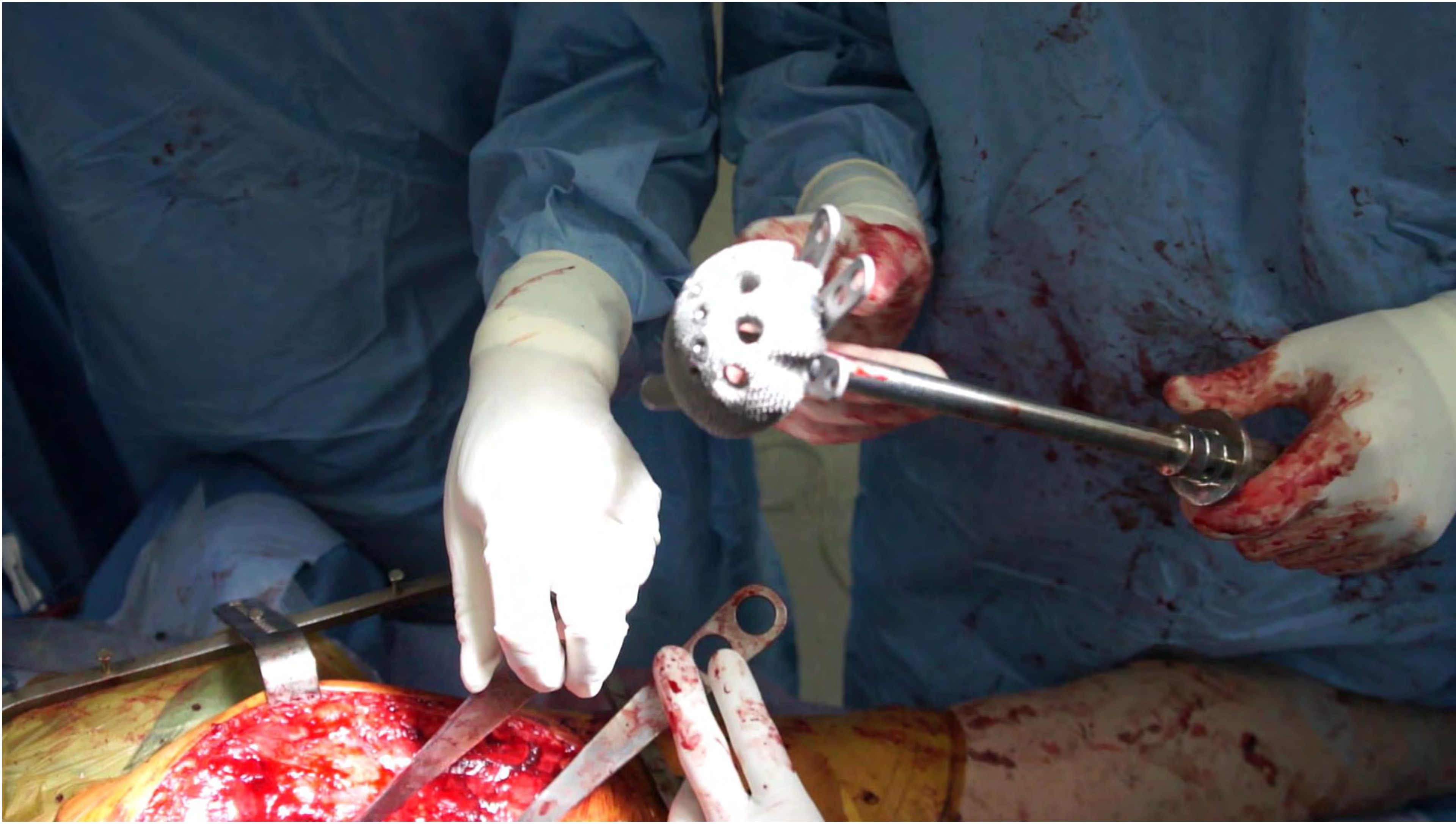


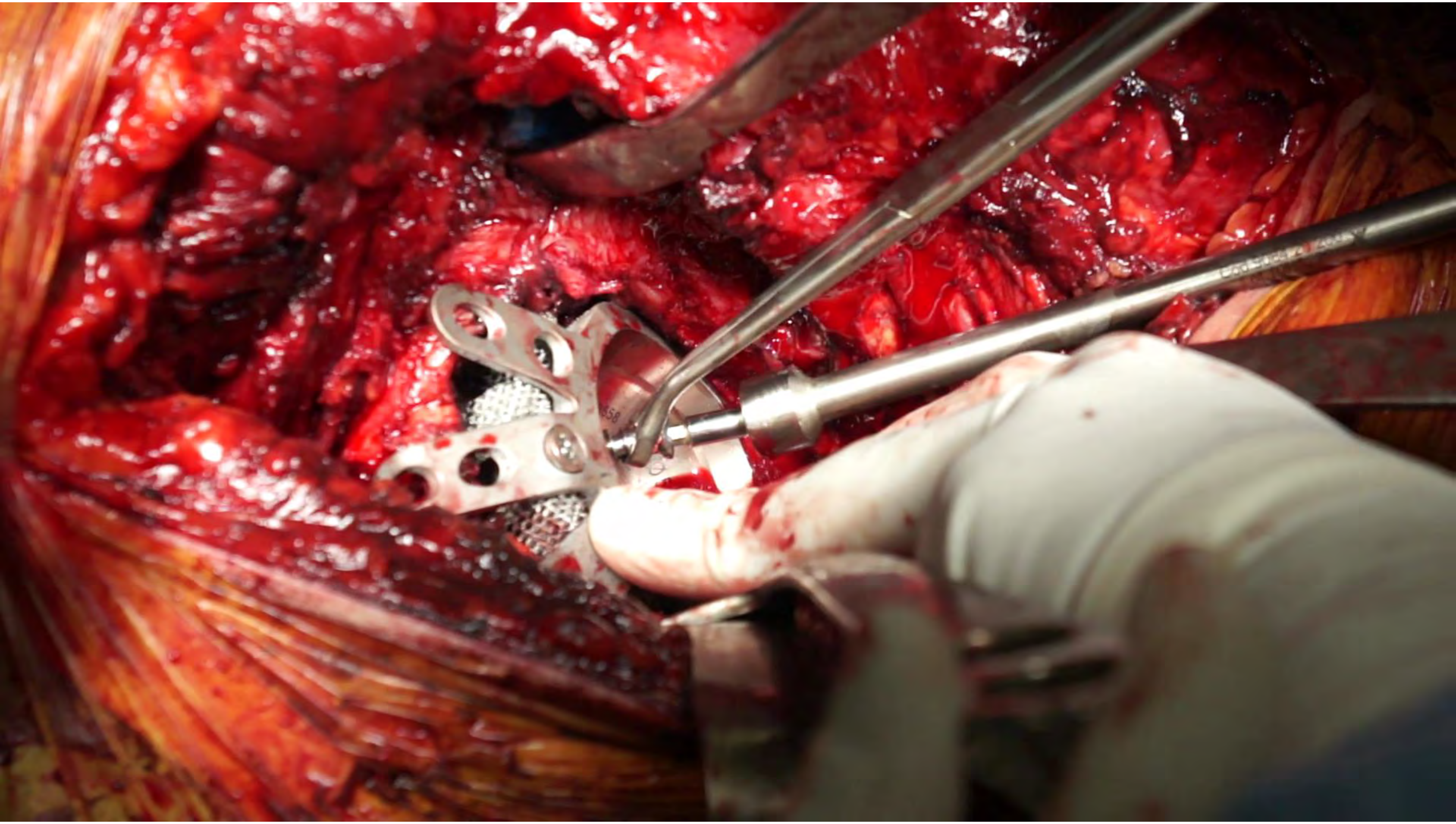


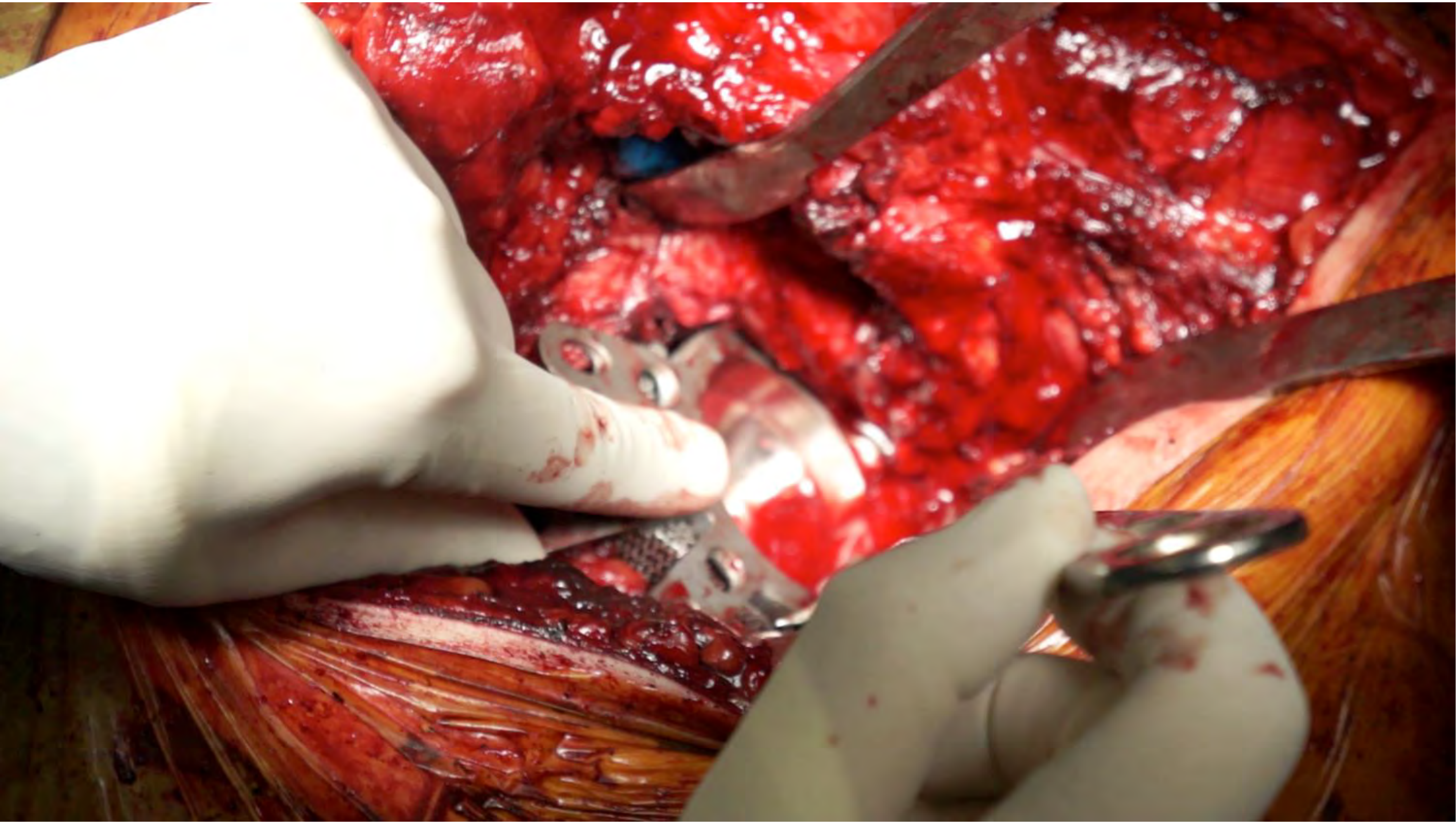

LARGE

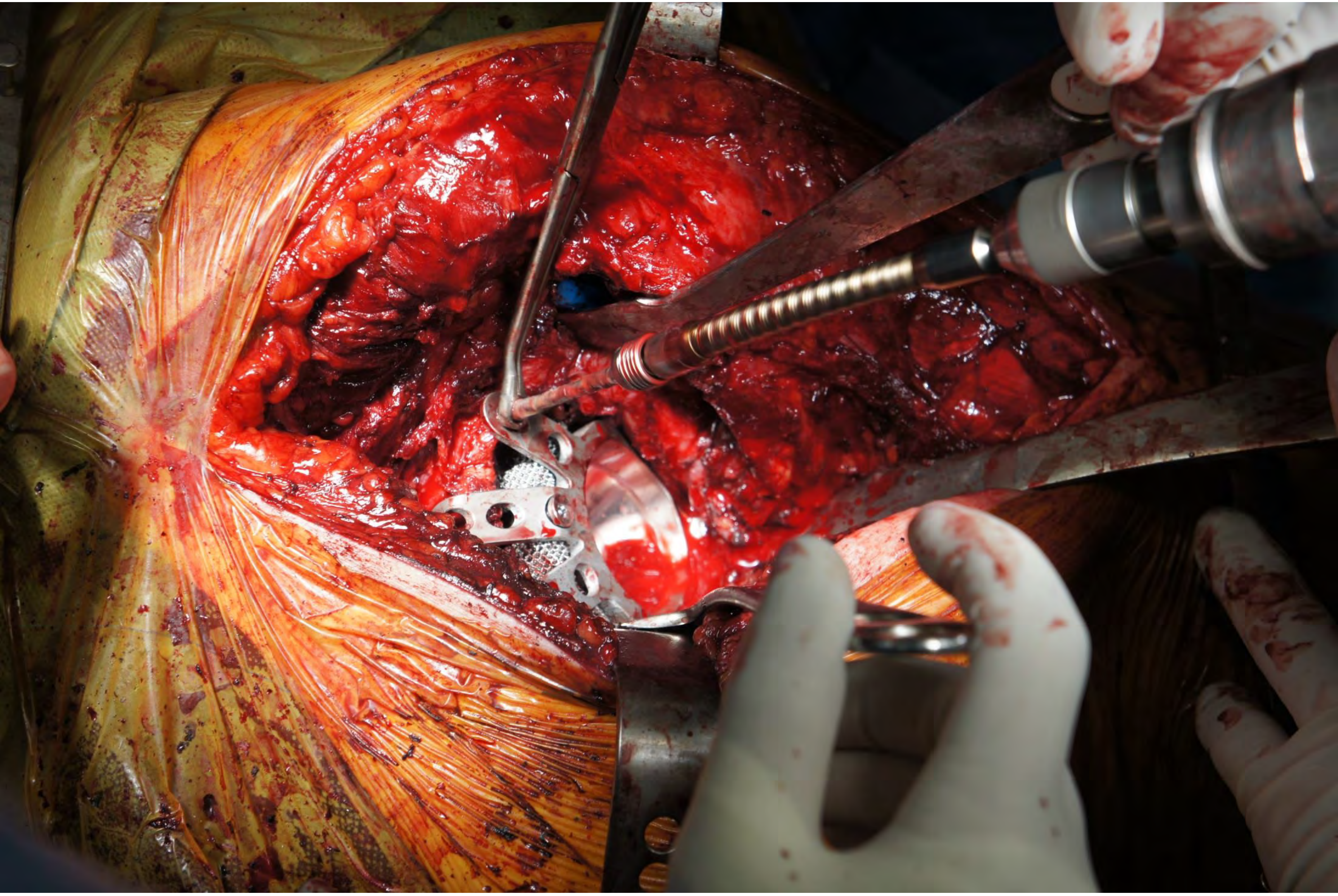


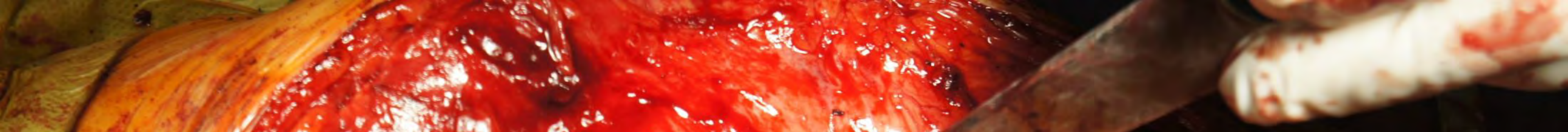


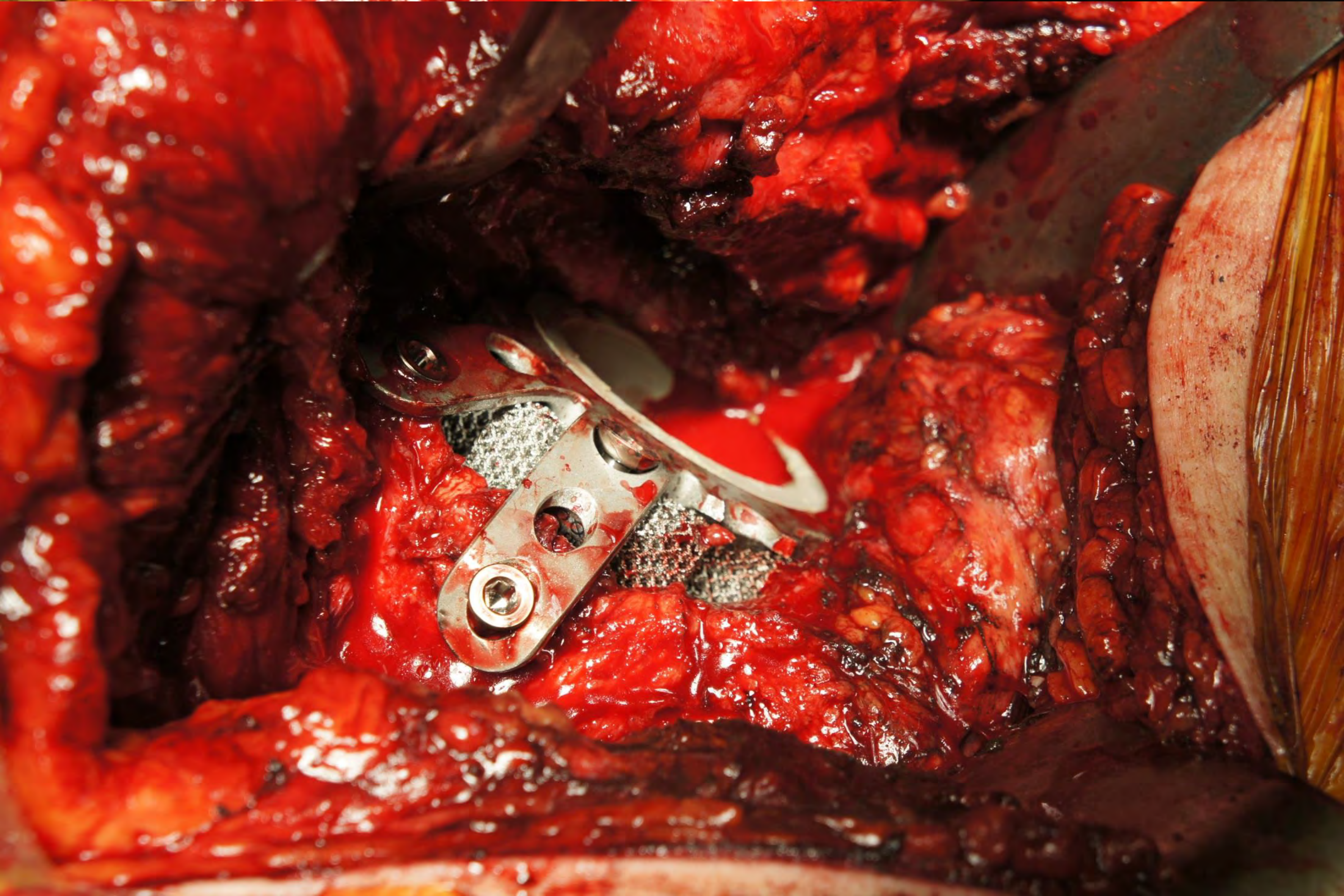


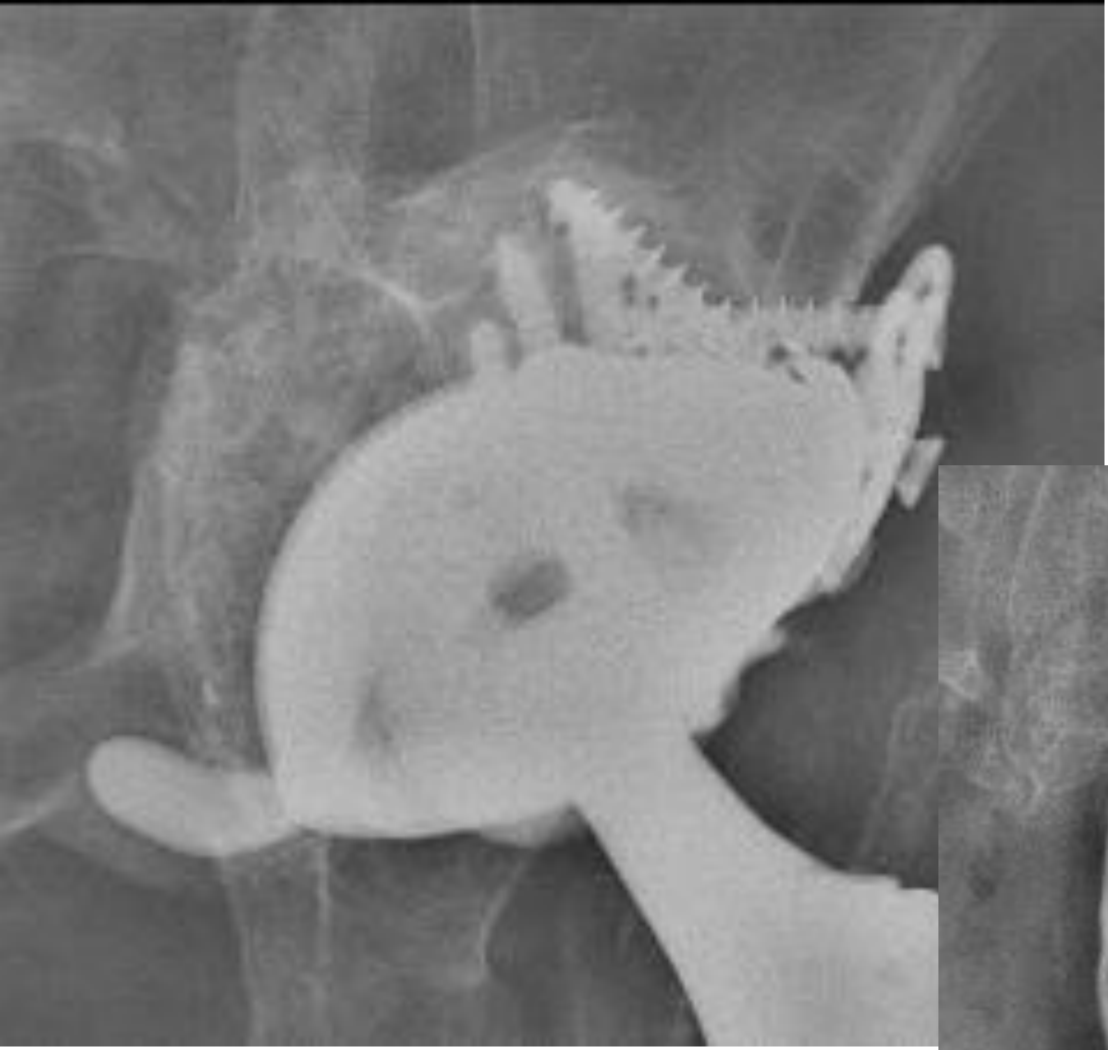
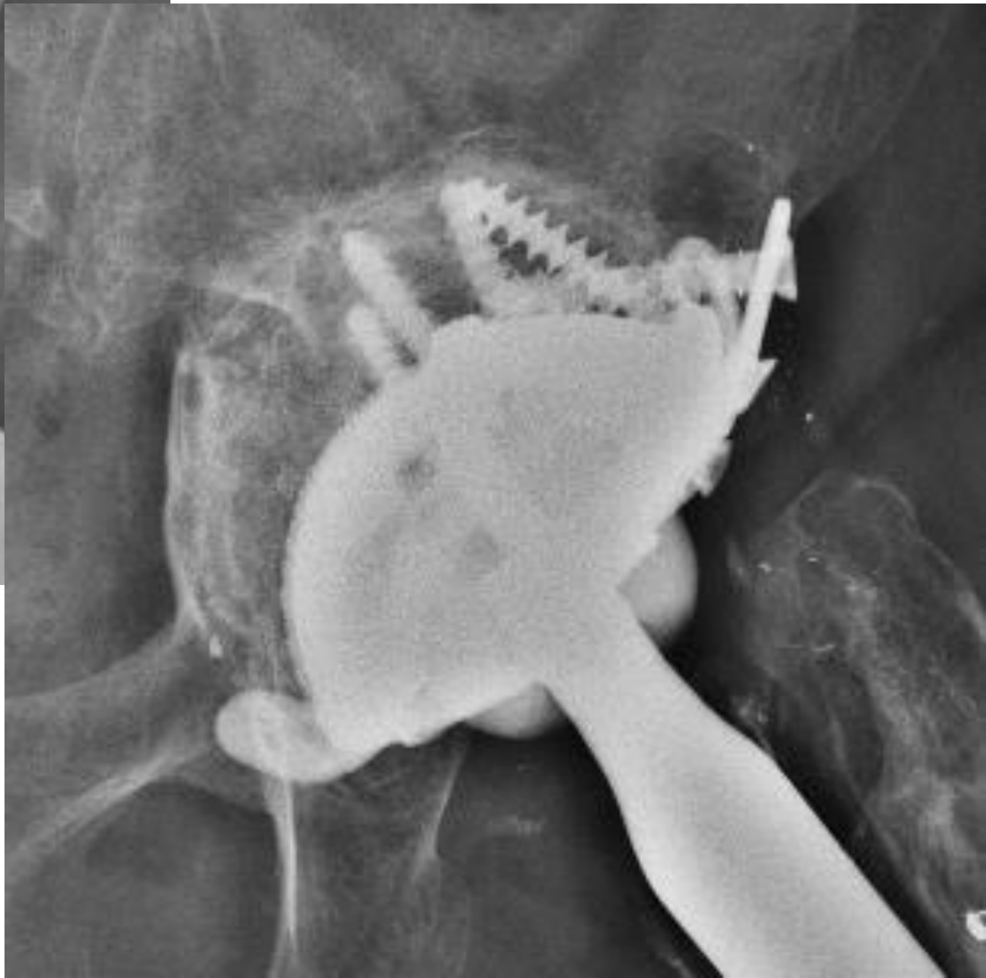






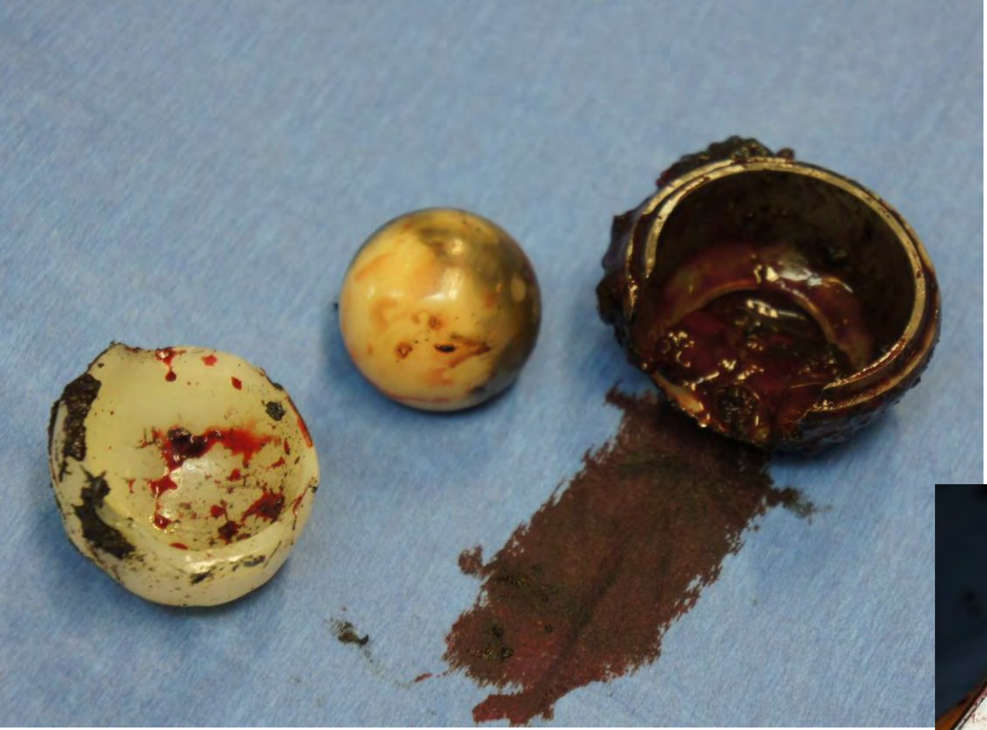


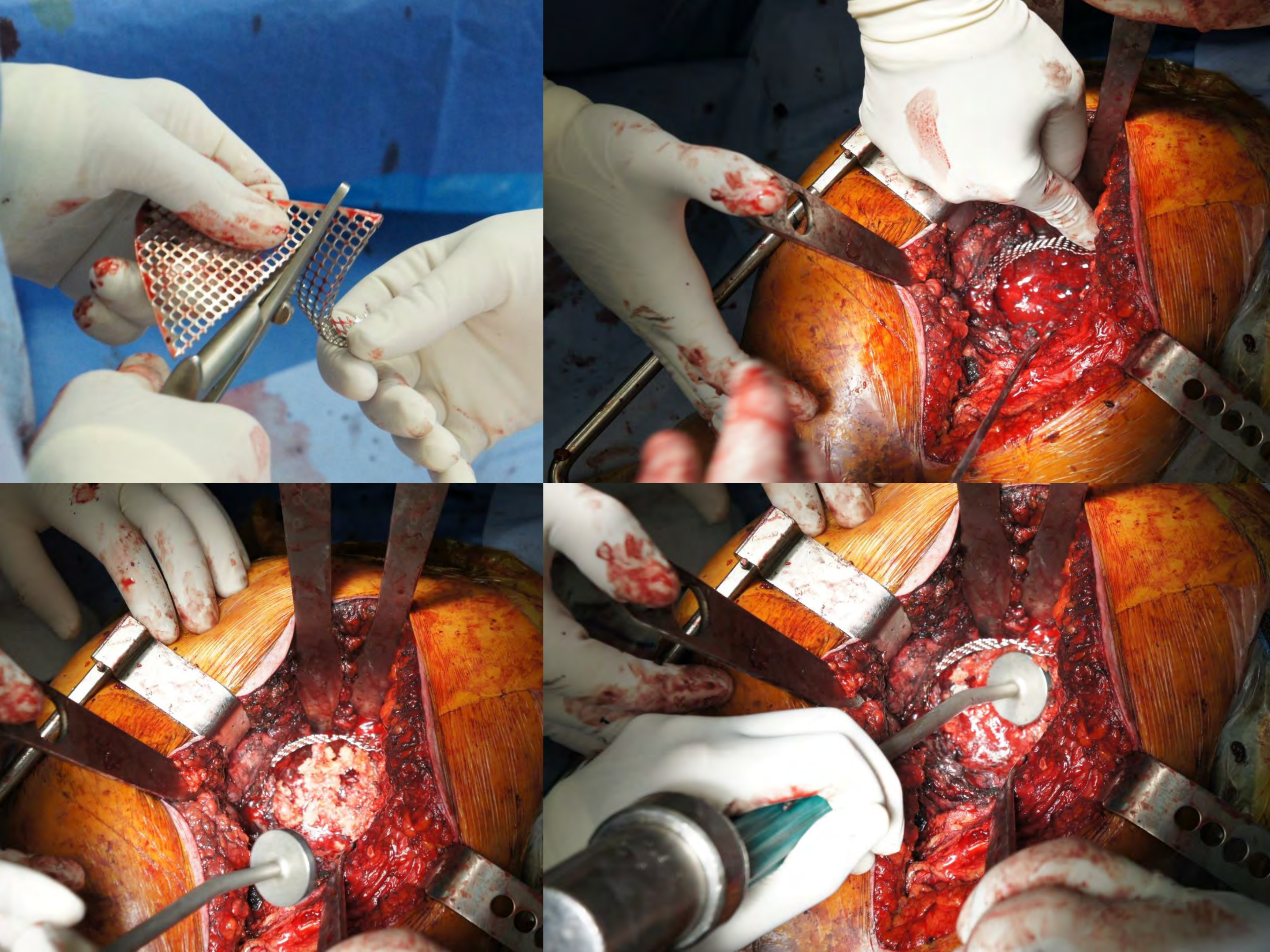


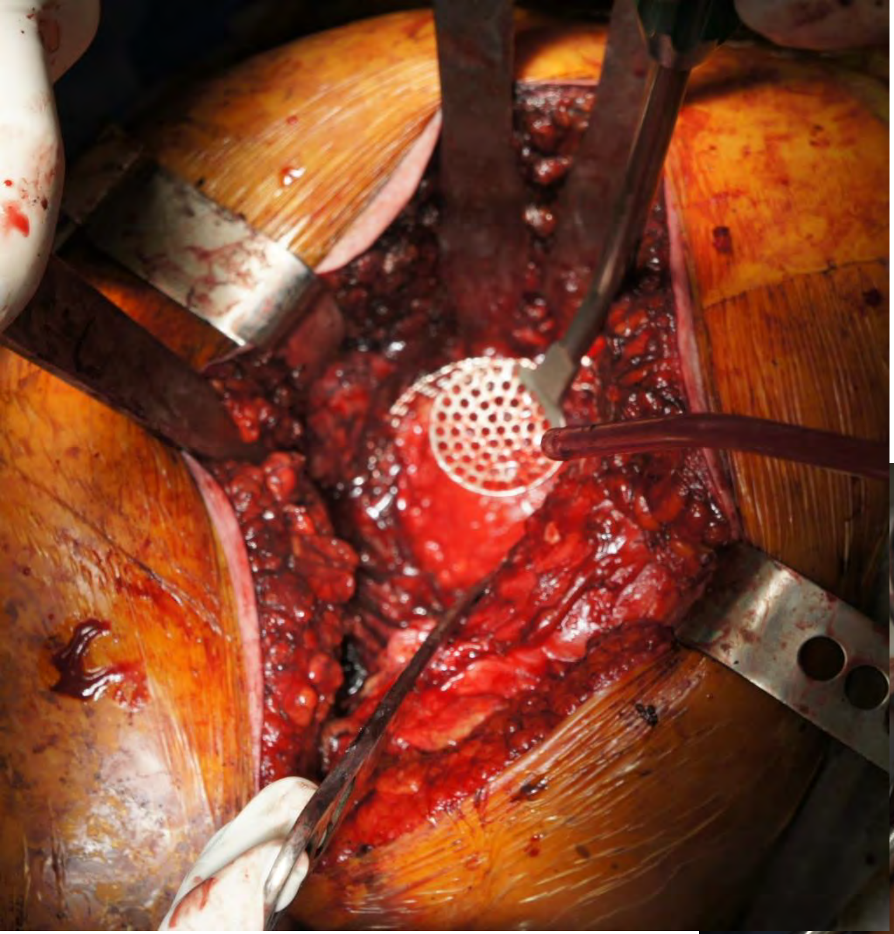



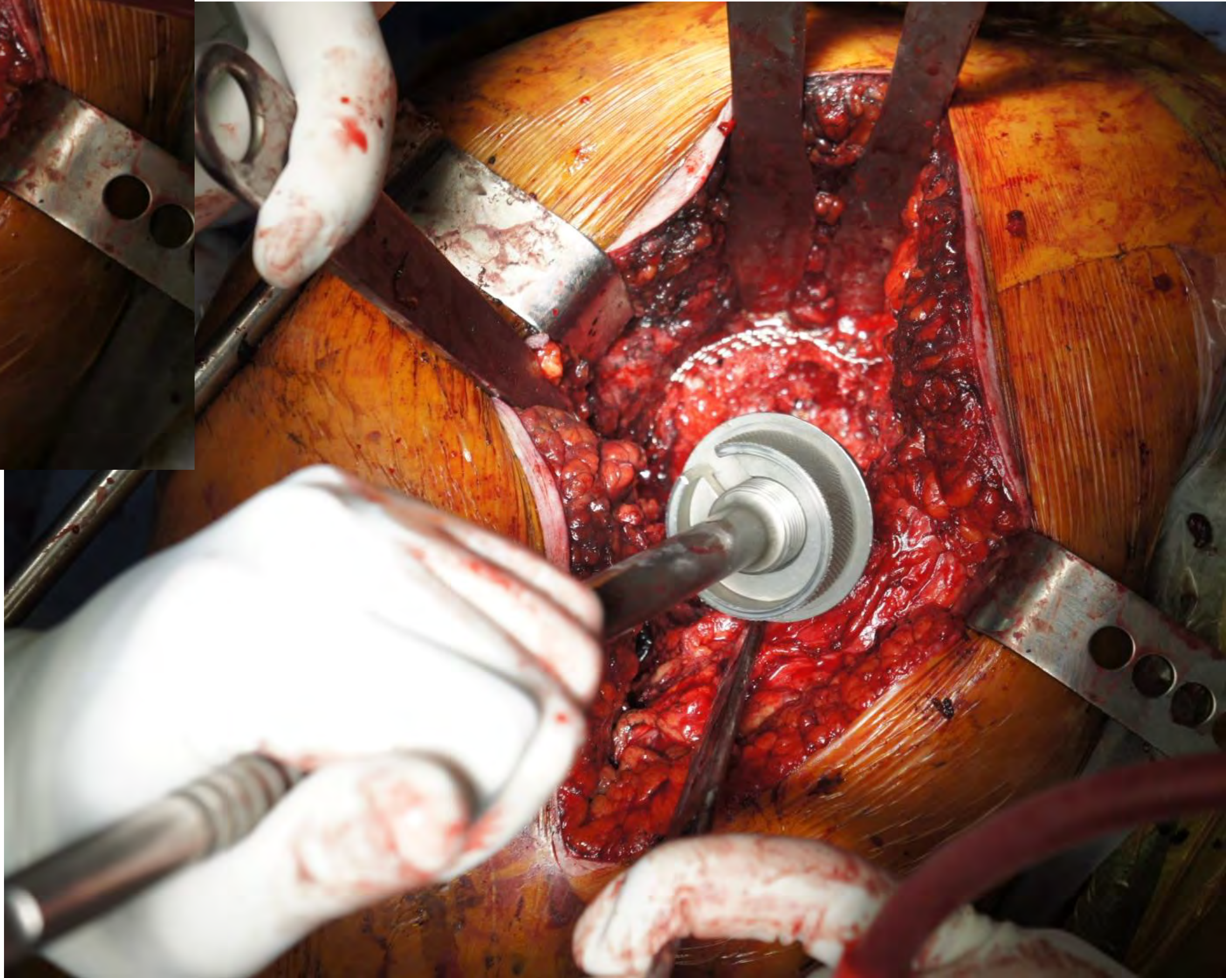
3 y f-up

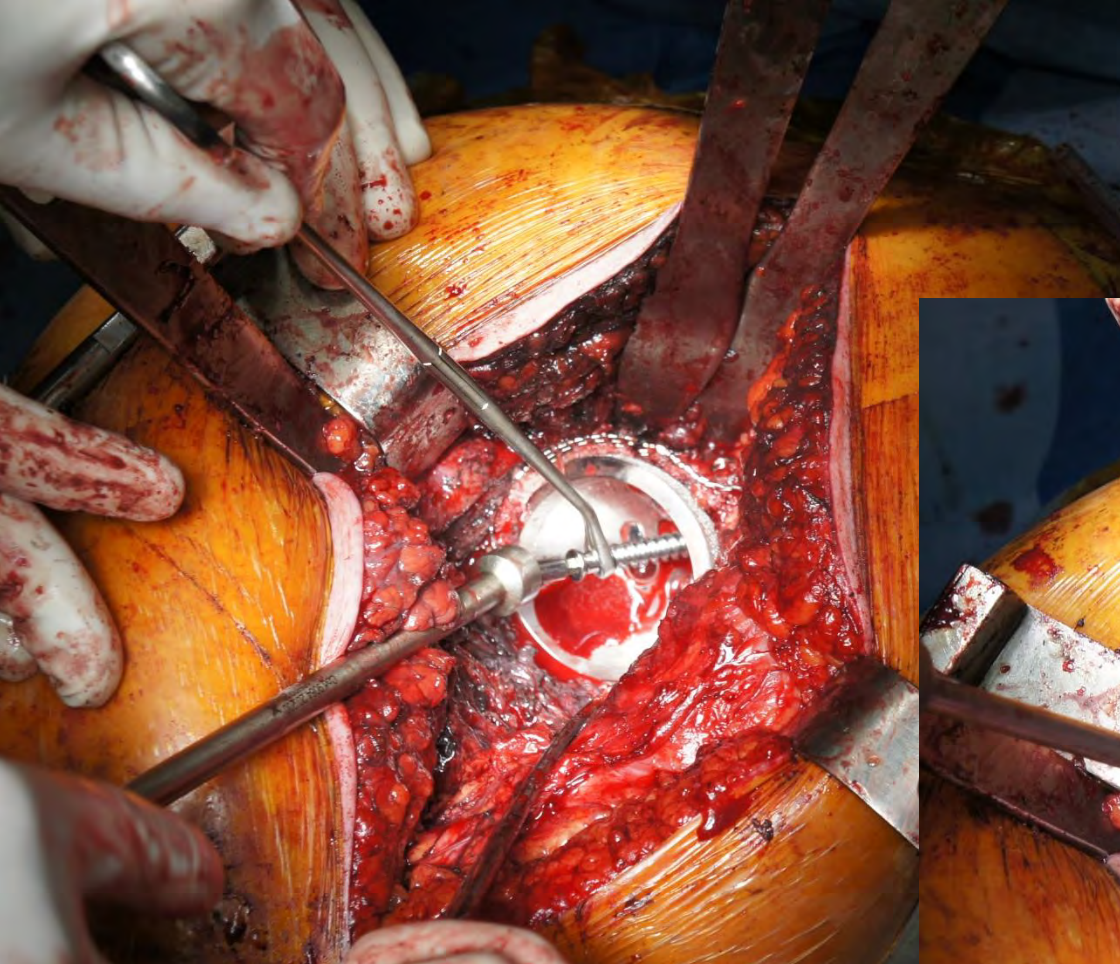
Surgical technique: mesh + BIG + uncemented Cup

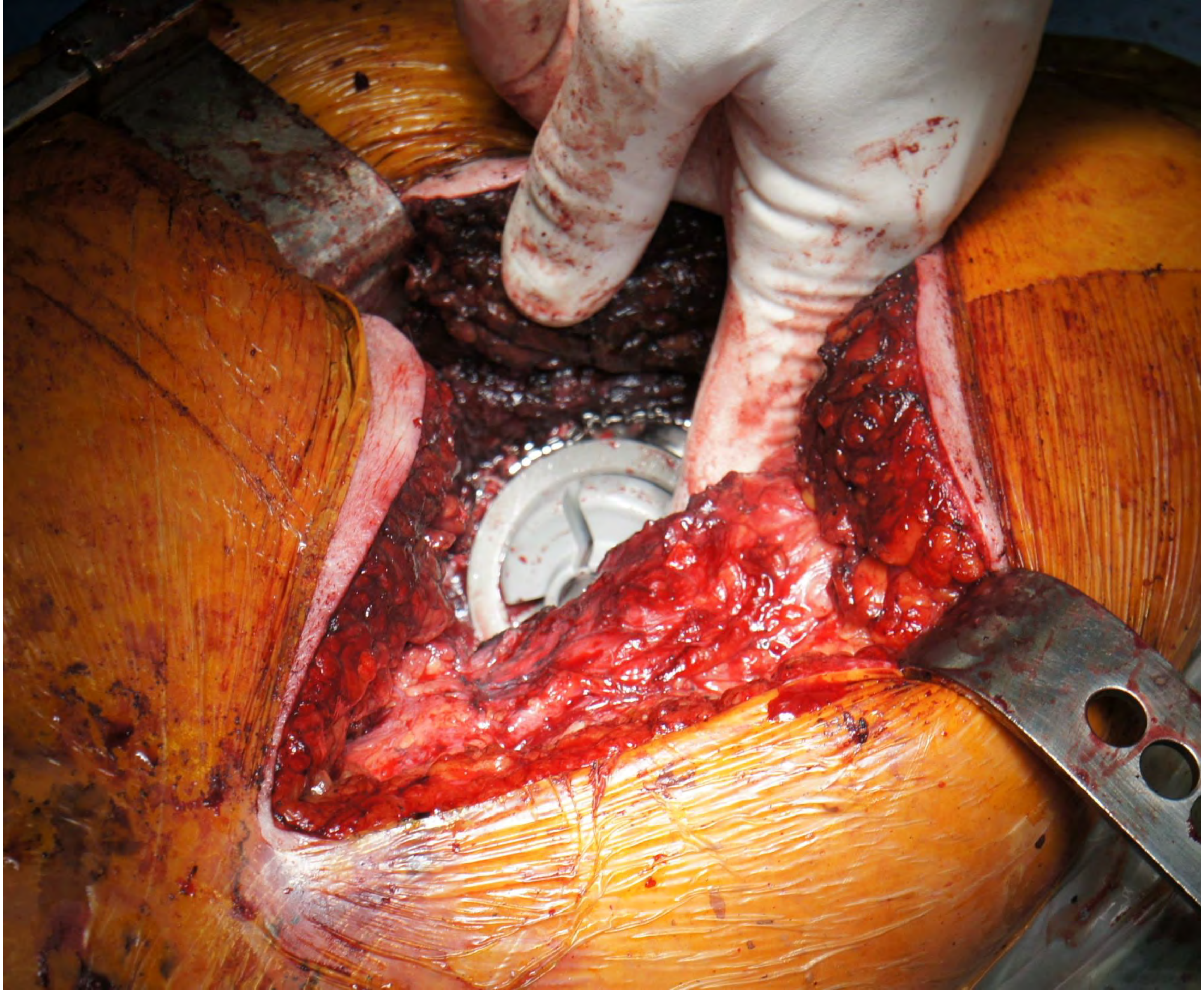


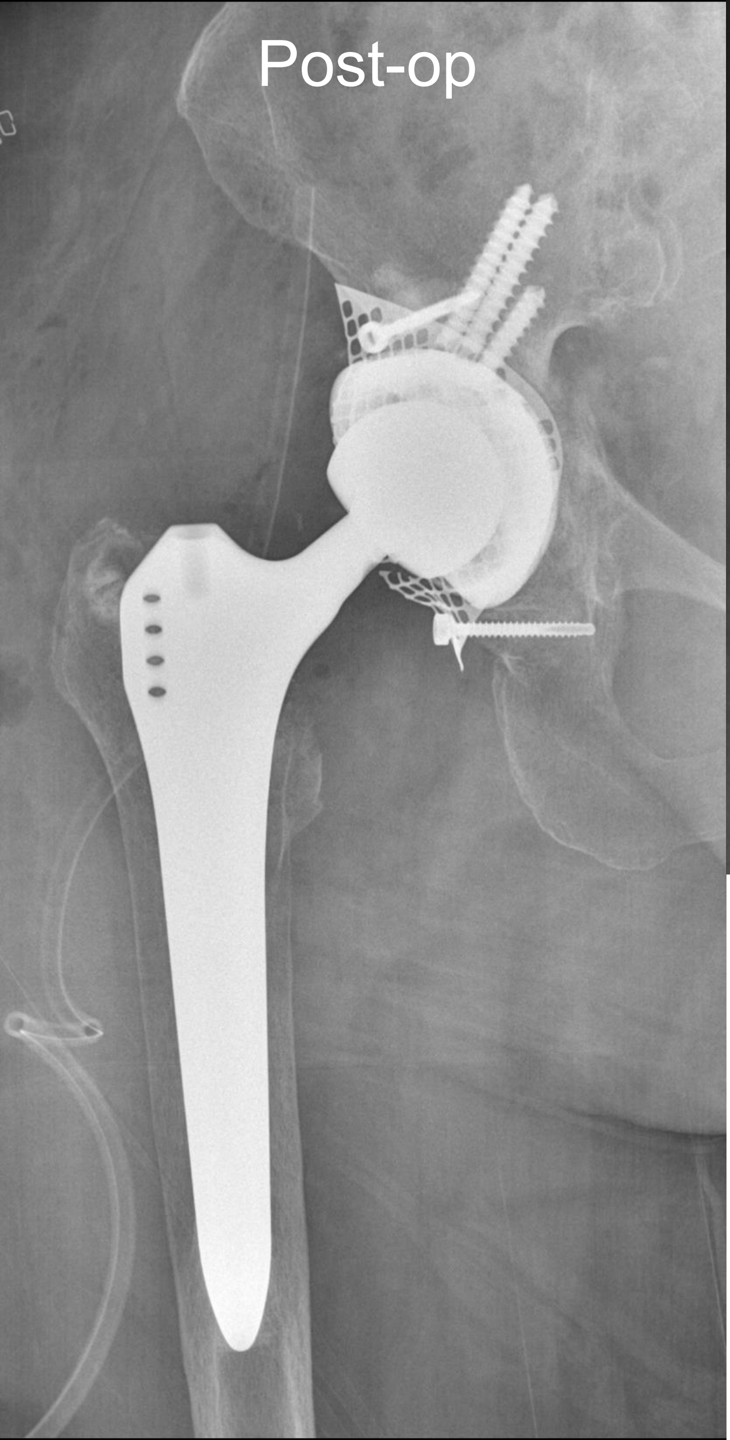


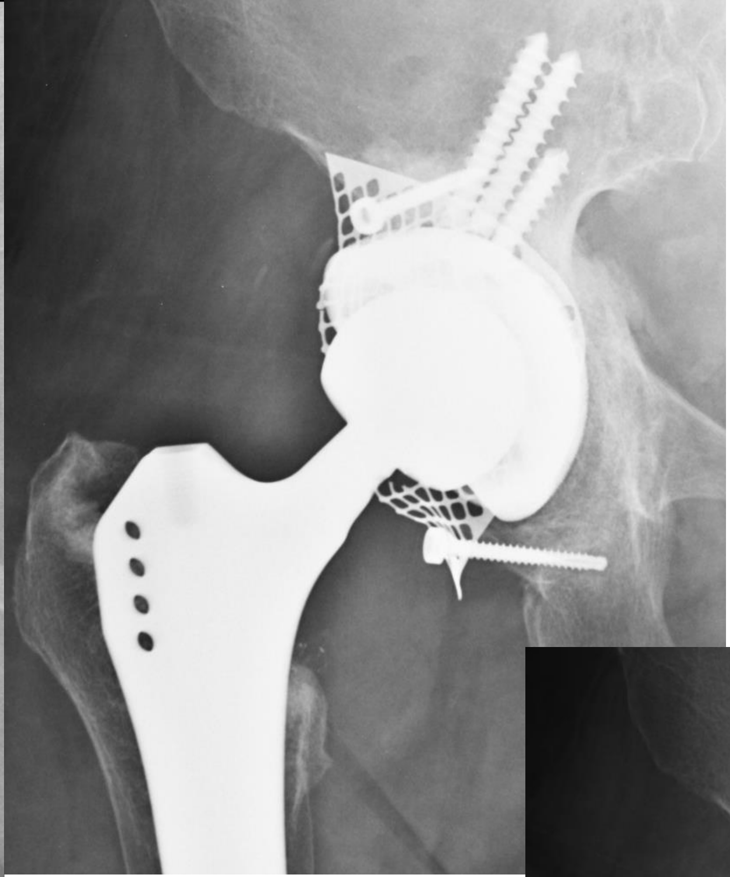




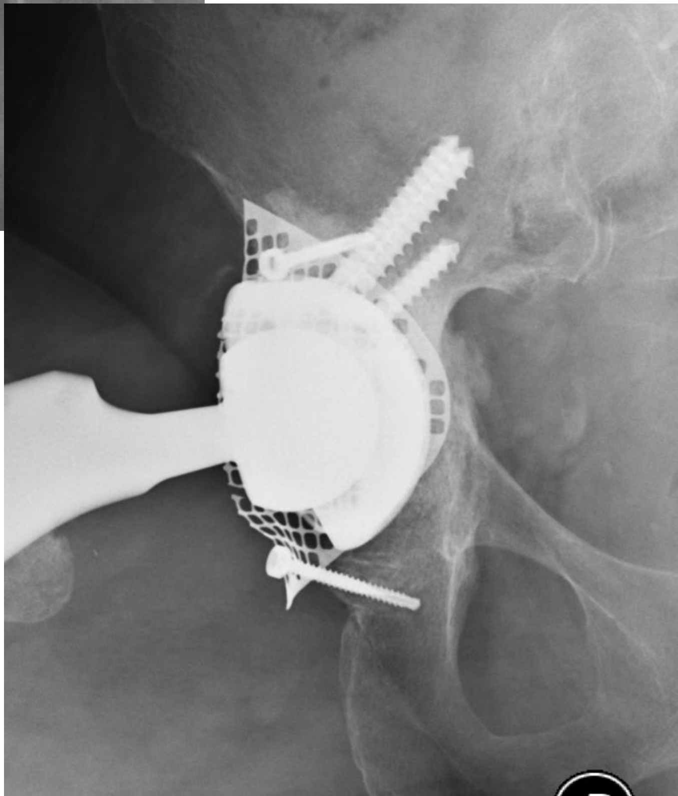




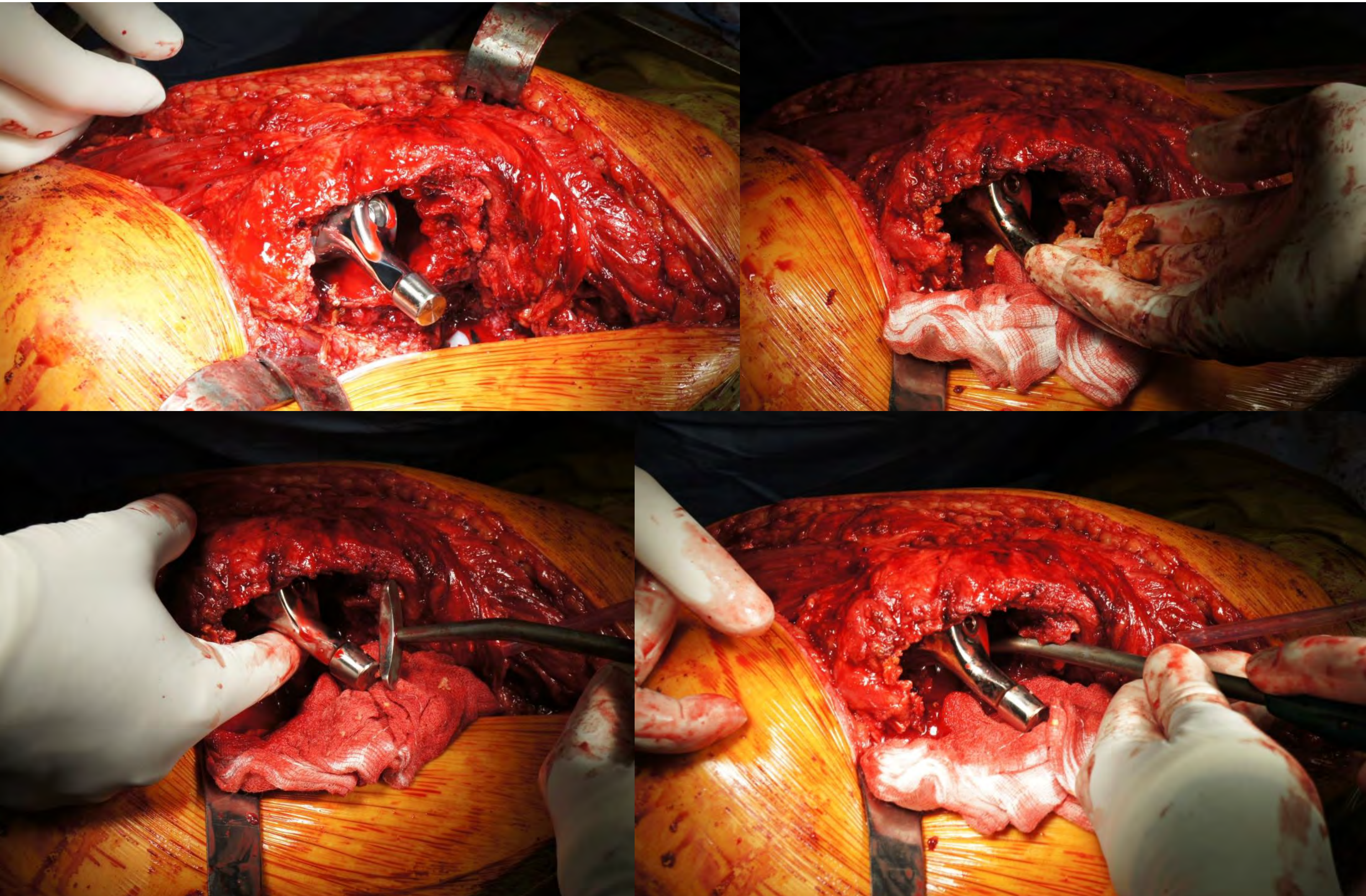




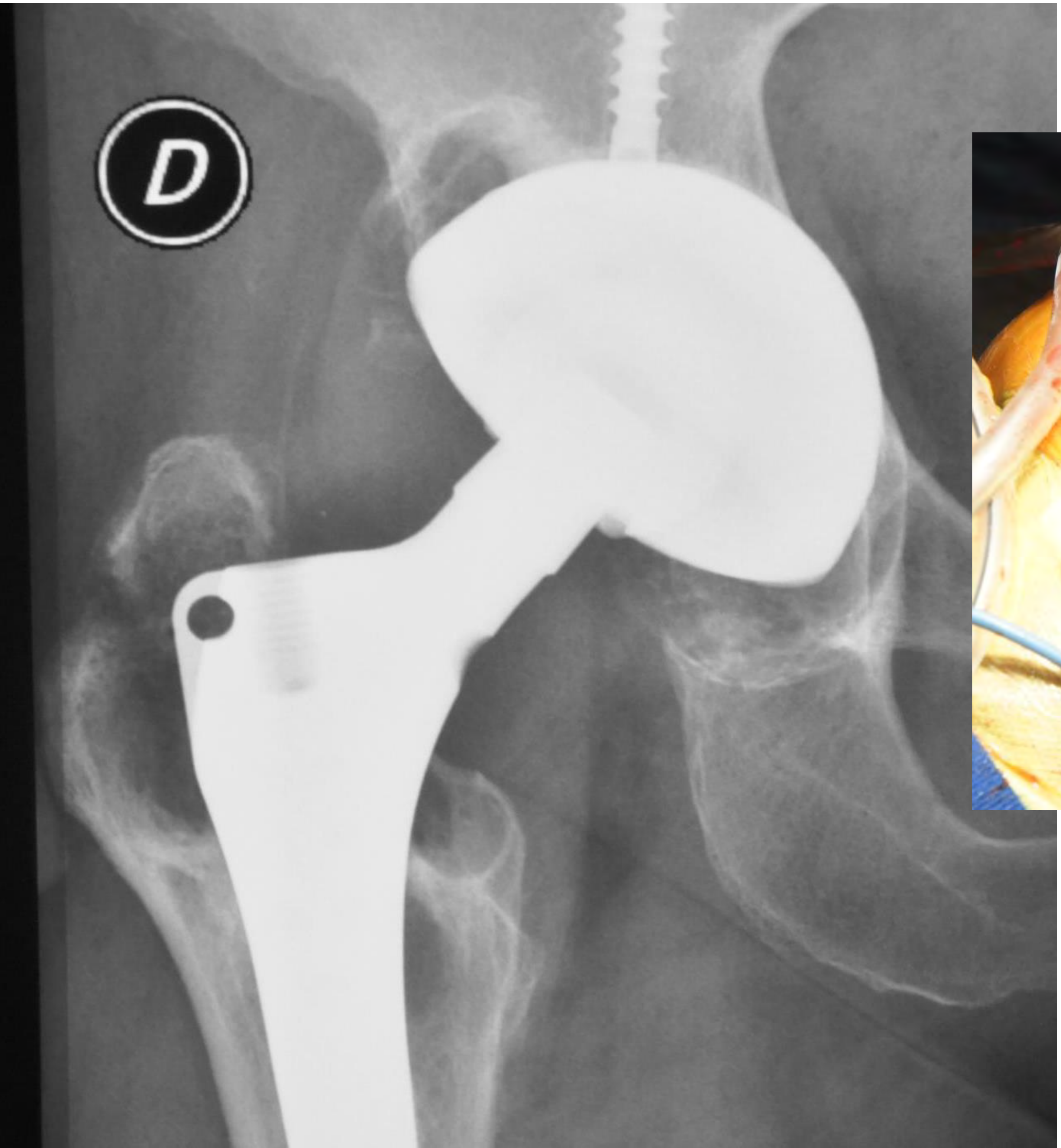
4 m

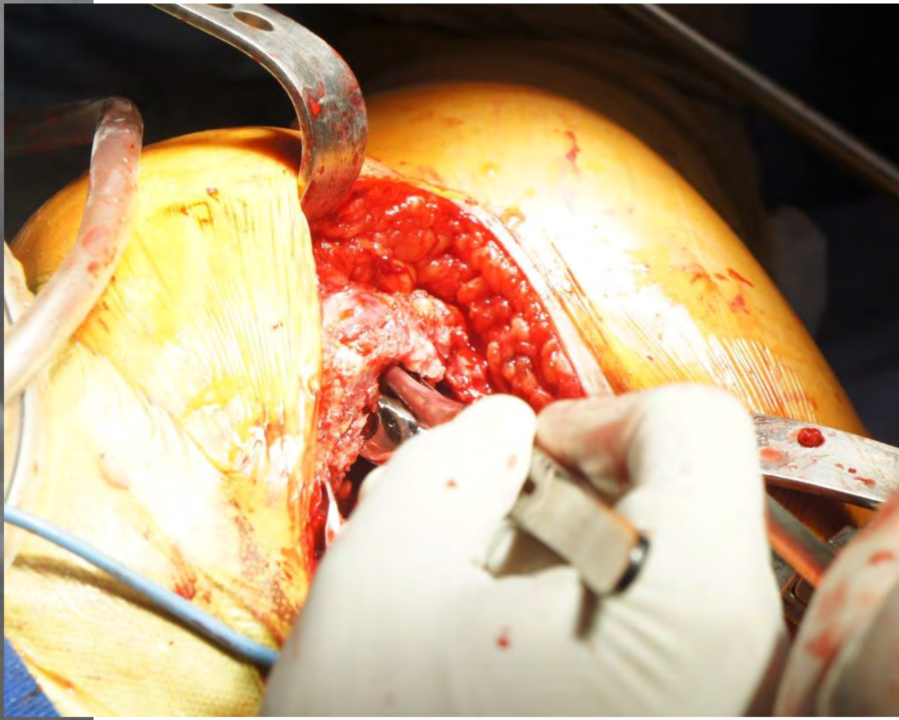


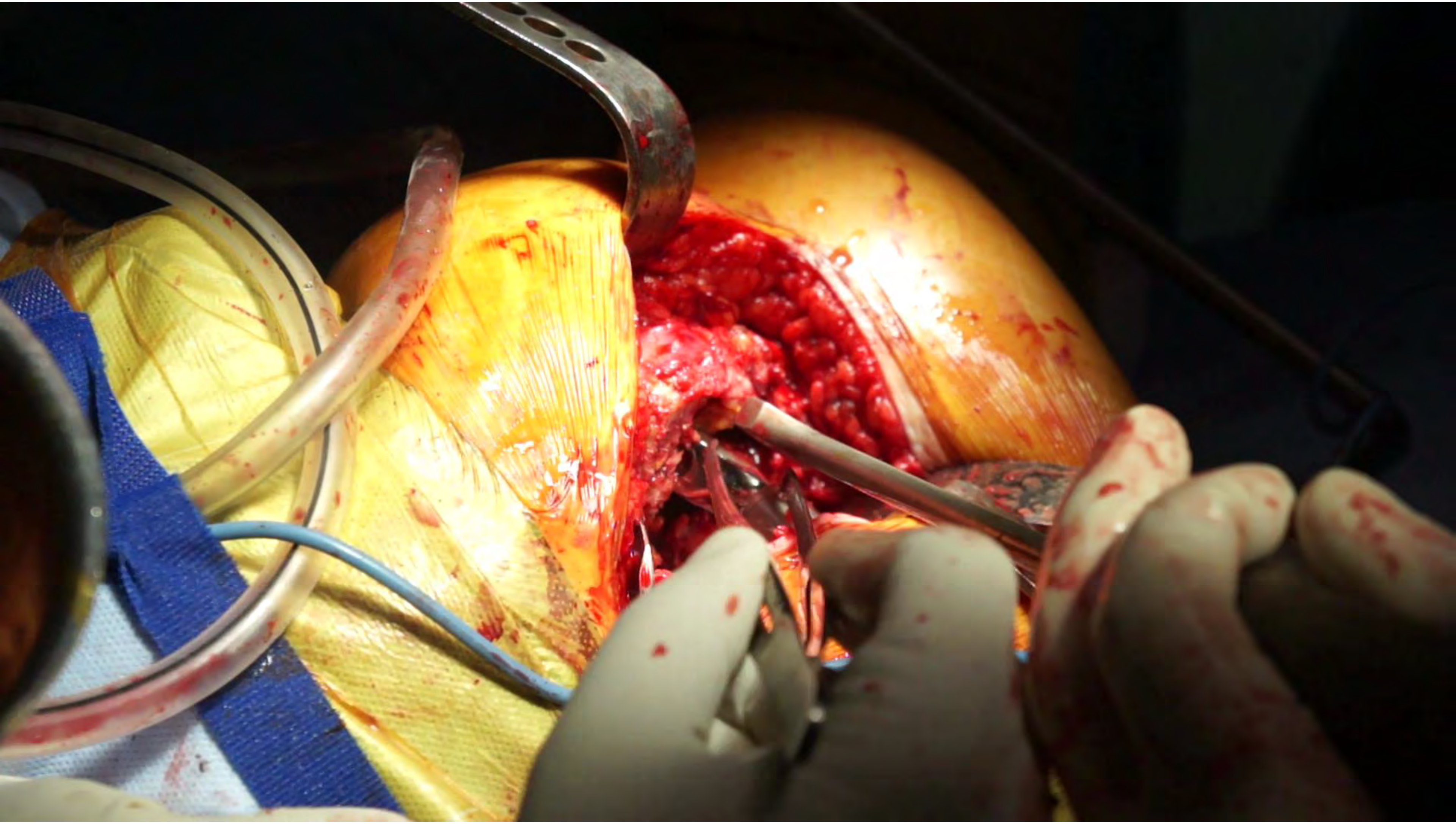
Surgical technique: femur (1)

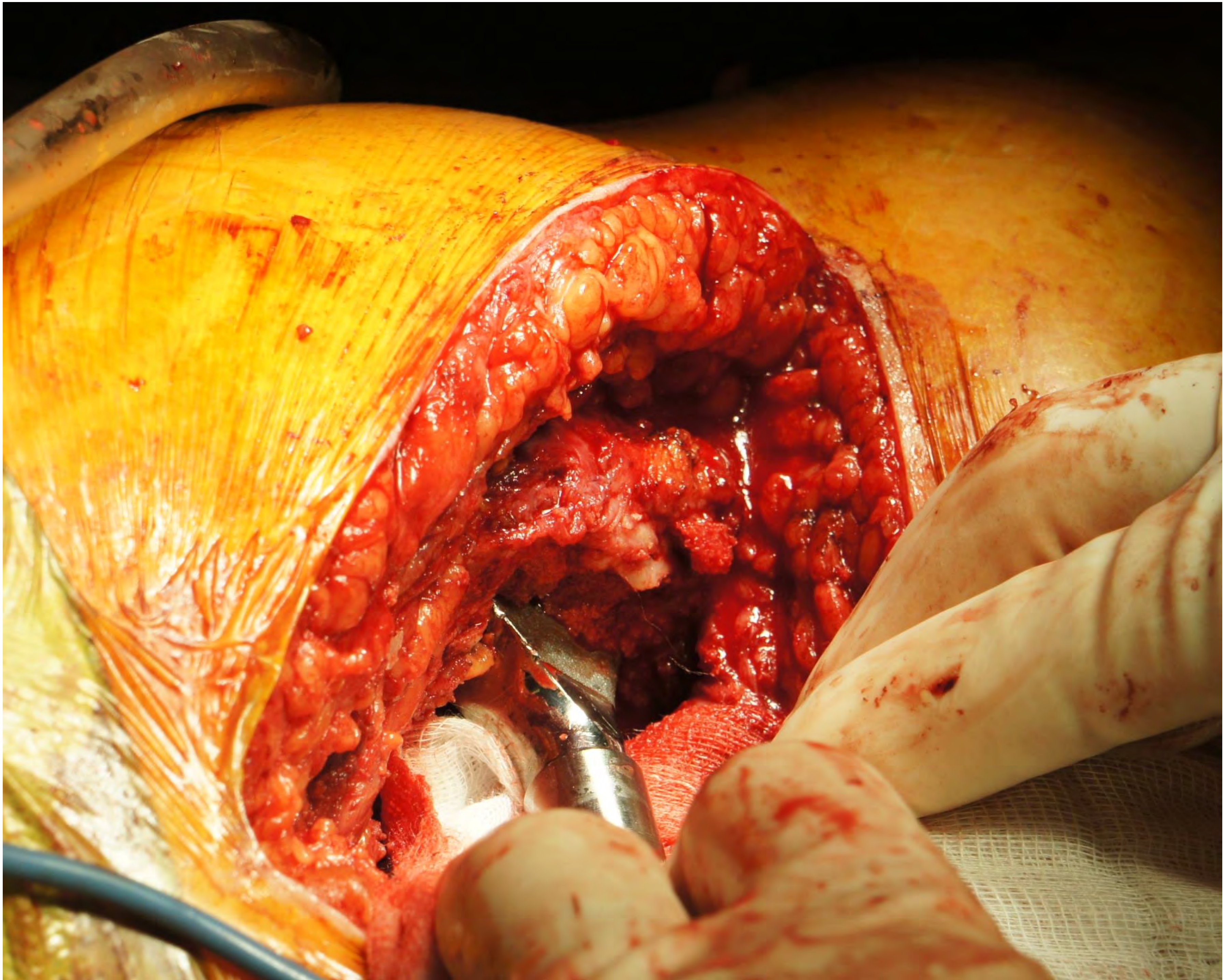


Surgical technique: femur (2)

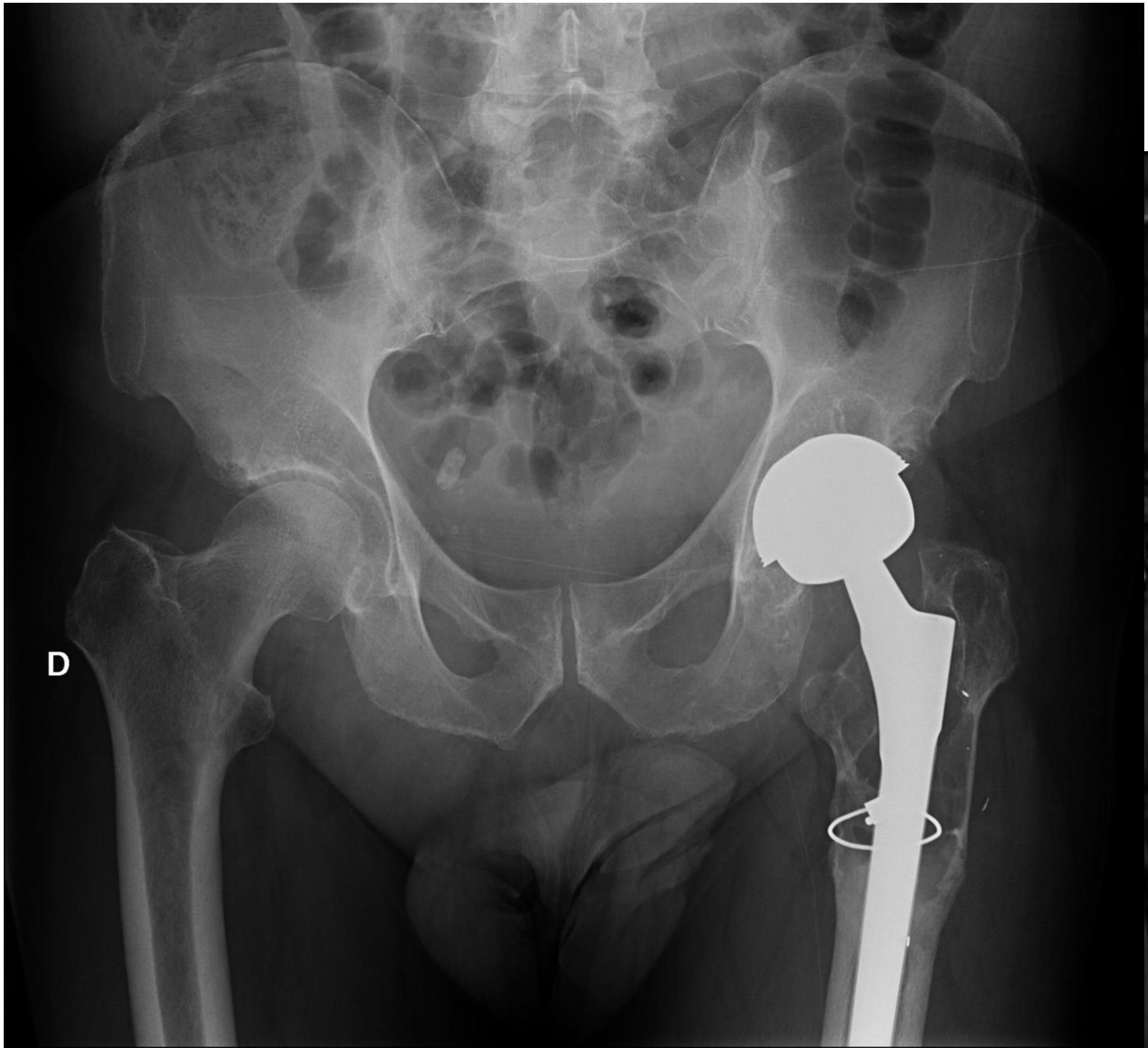


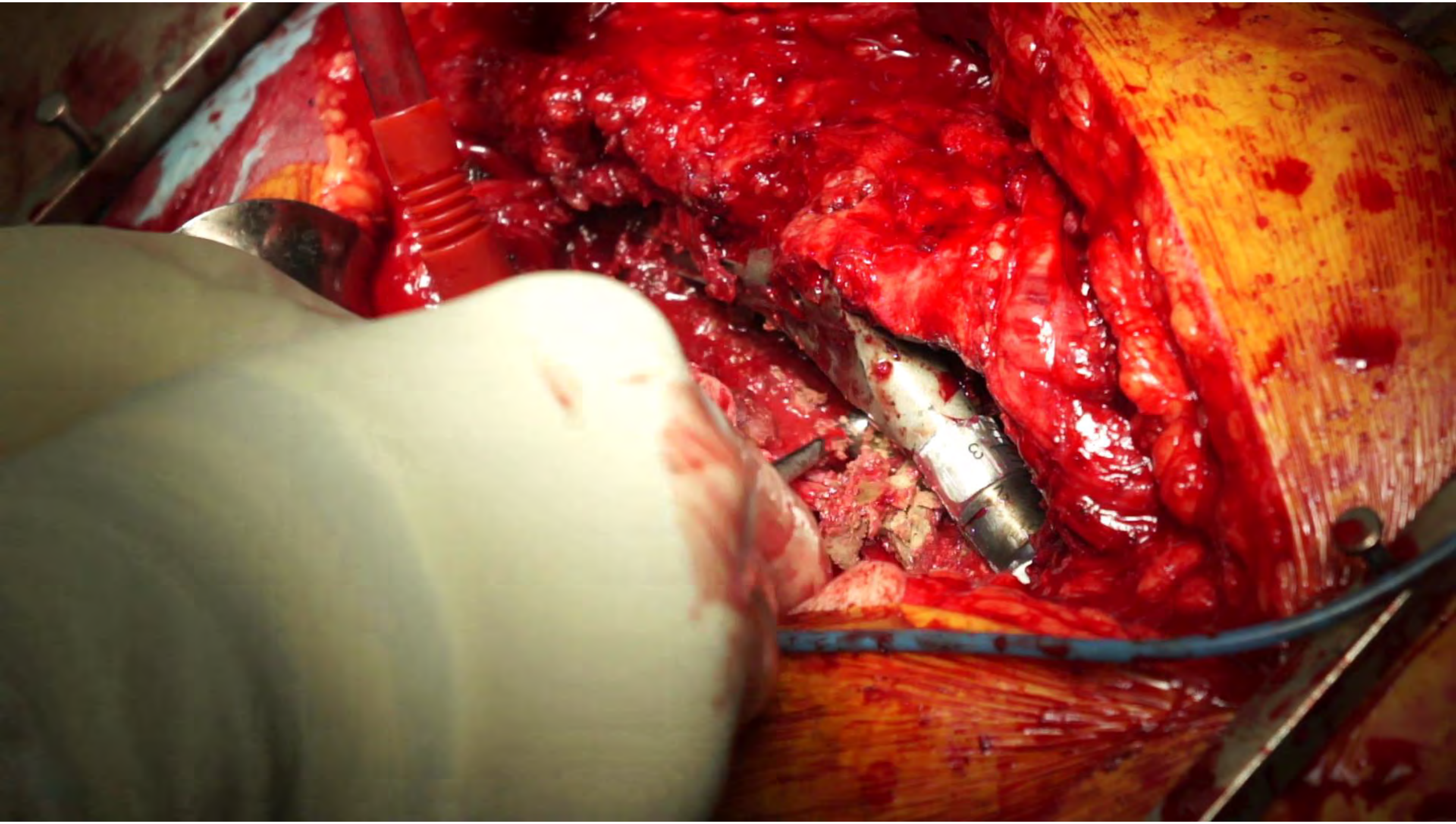


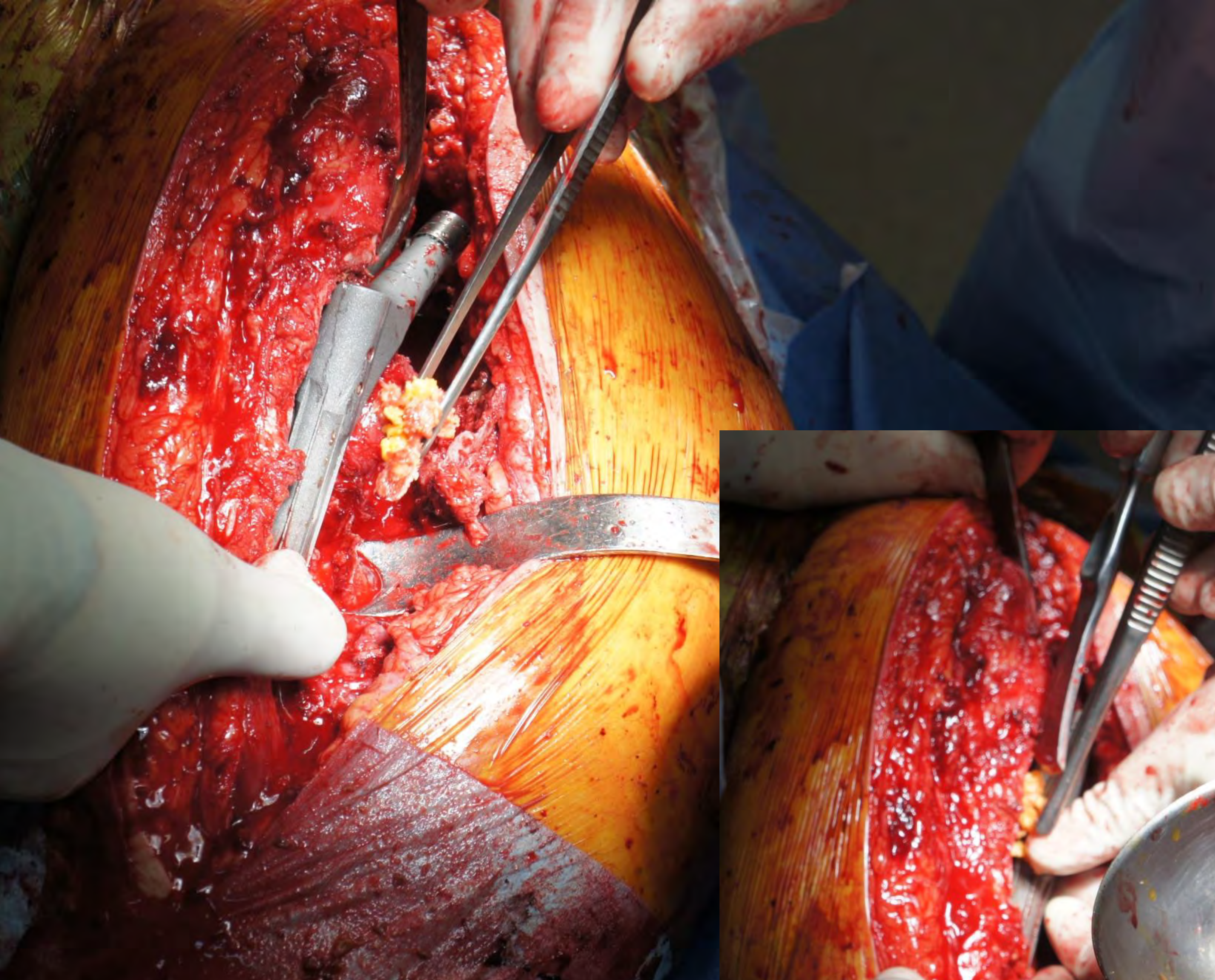


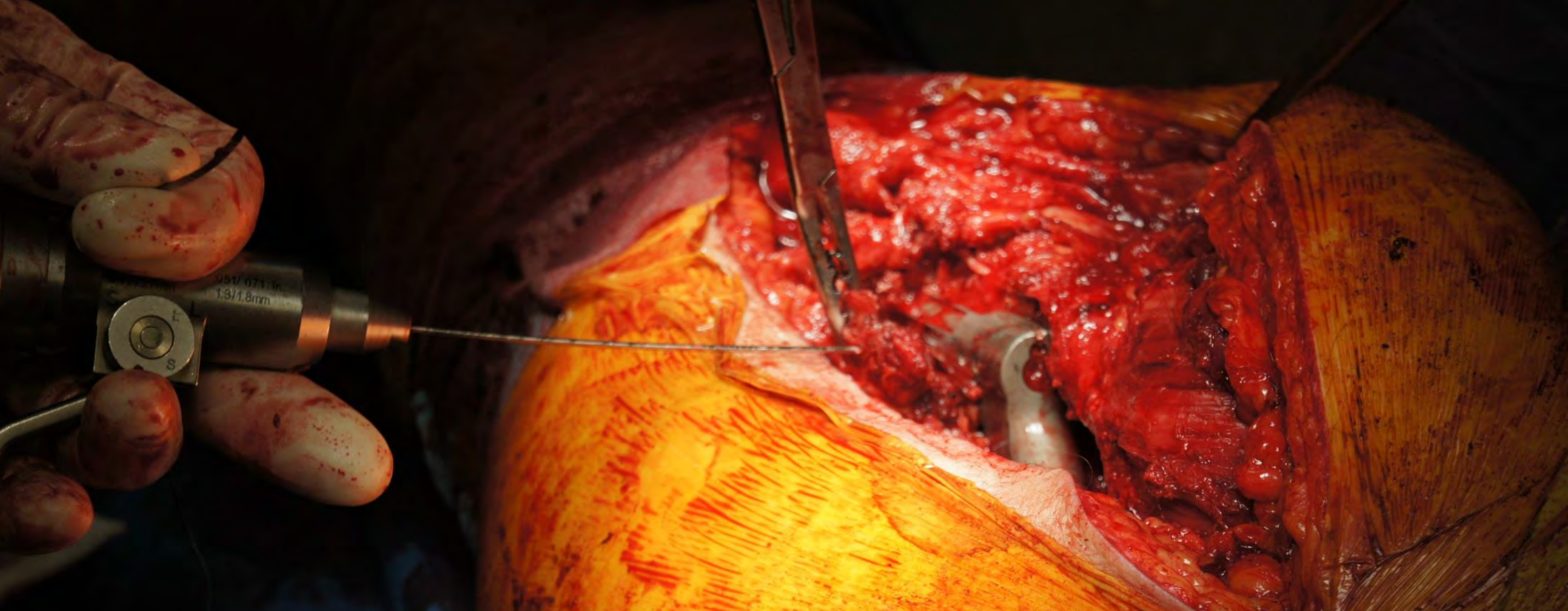
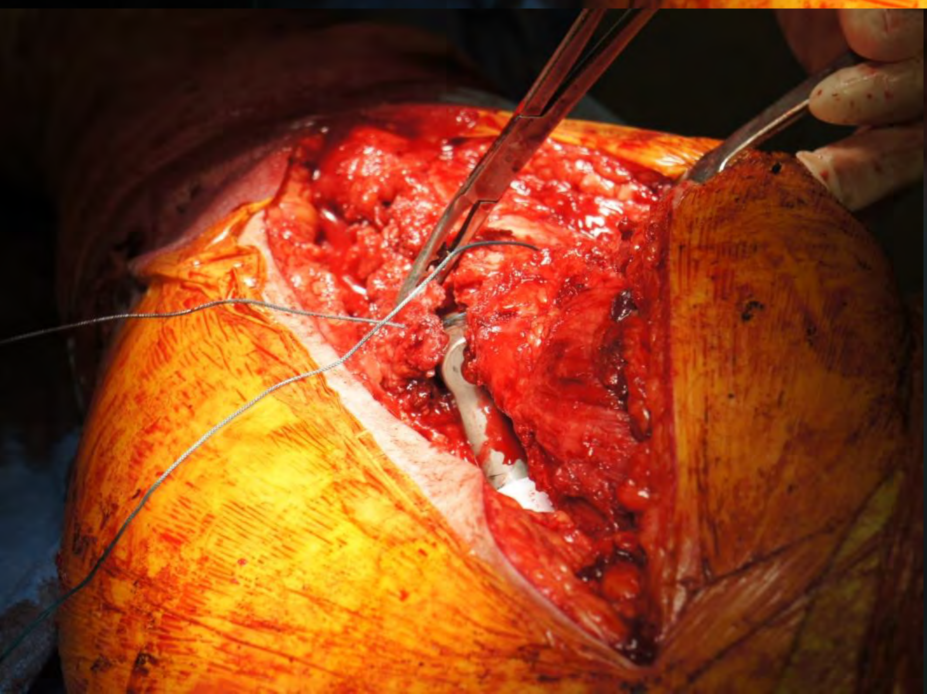


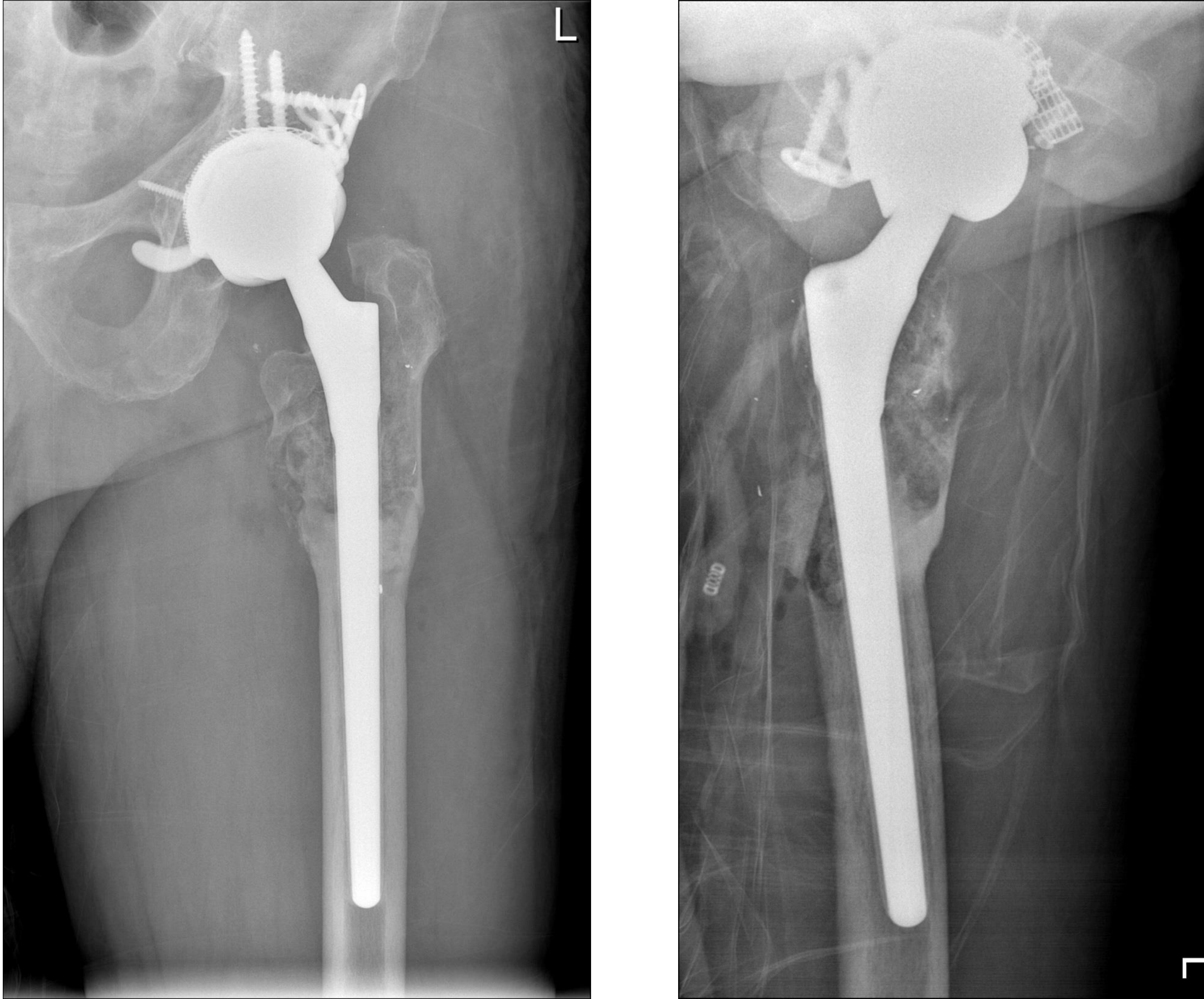
Surgical technique: femur (3)



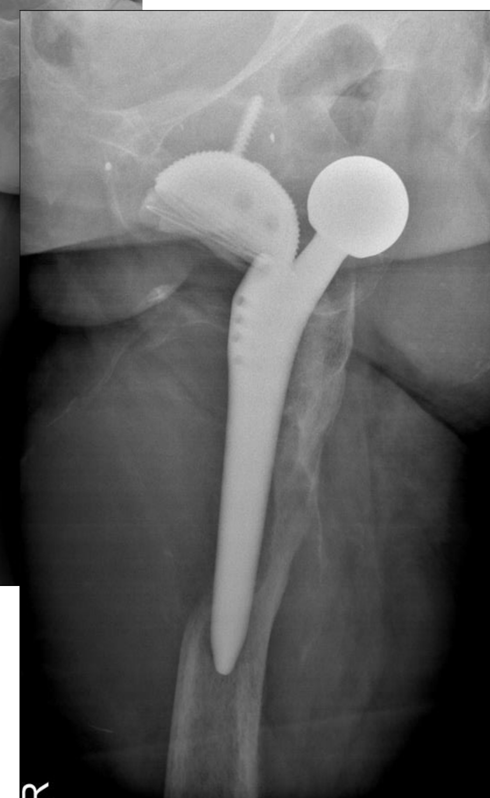


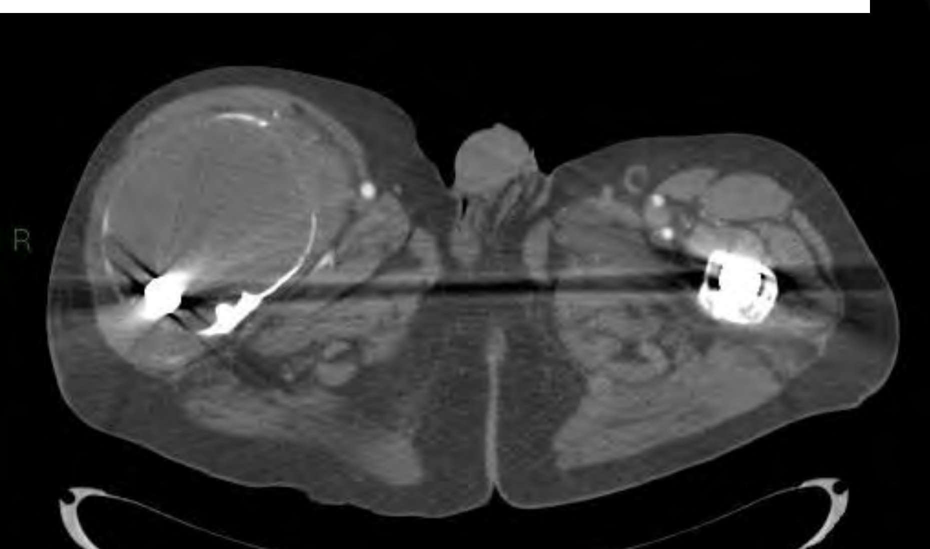


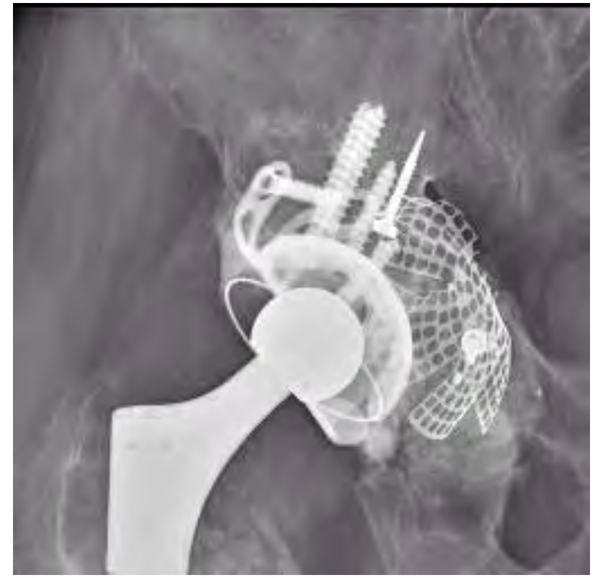


L

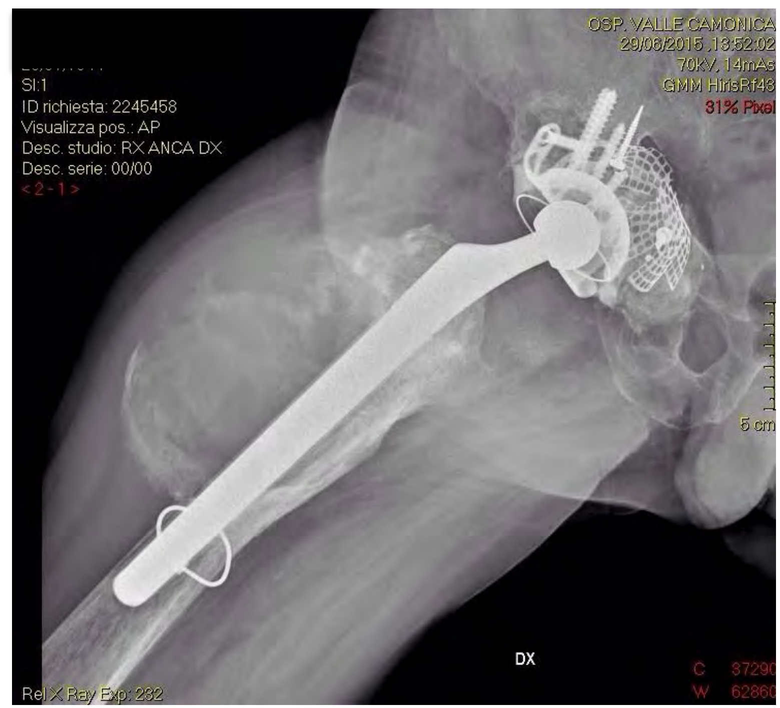
Surgical technique: femur (4)






DX




OSP. VALLE CAMONICA
29/06/2015 ,18:52:02
70KV, 14mAs
31% Pixel
SI:1
ID richiesta: 2245458
Visualizza pos.: AP
Desc. studio: RX ANCA DX
Desc. serie: 00/00
< 2 - 1 >
5 cm
DX
Rel X Ray Exp: 232

9 m

OS
DX

S 11M,M,108237
07/1944
richiesta: 2245458
ualizza pos.: AP
sc. studio: RX ANCA DX
sc. serie: 00/00
- 1 >
29/06/2015 ,13:52:0
70KV, 14mA
GMM HirisRf4
31% Pix
5 c
DX
X Ray Exp: 232
C 3729
W 628

Trabecular Titanium™
Multiholes Cup (cut out cup) + Cup Cage

September 2011 - August 2015

Cases: 96

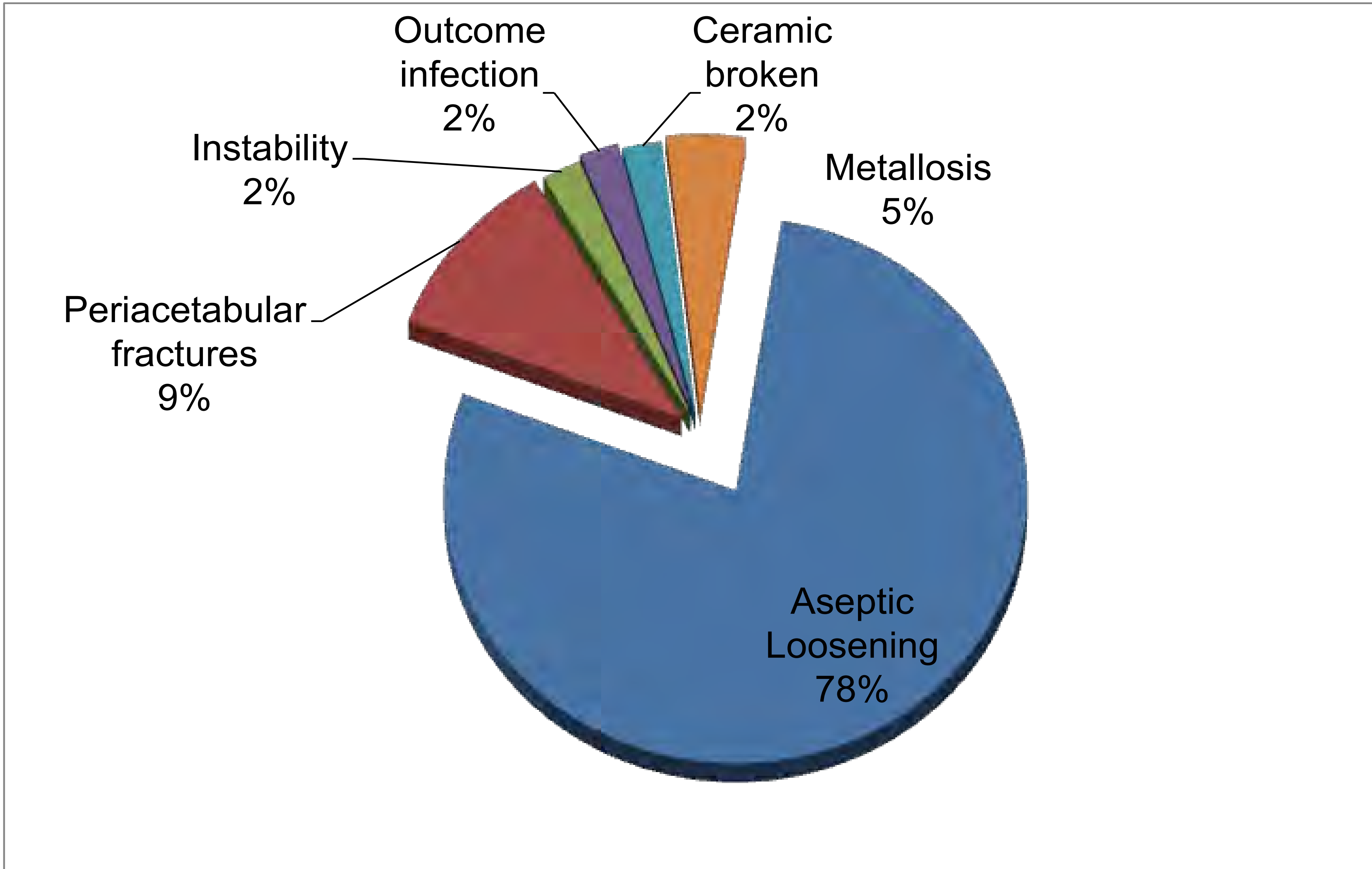
- 50 multiholes cup: bone defects AIR II-III

- 46 cup cage: bone defects AIR III-IV

Mean age: 71.3 y (30-92 y)

Mean Follow-up: 40 m (1-80)

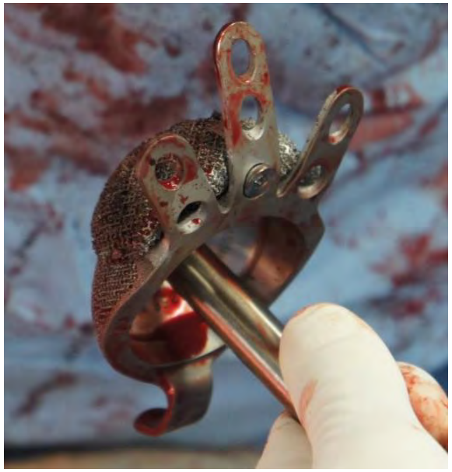
Diagnosis



Outcome infection 2%
Ceramic broken 2%
Instability 2%
Metallosis 5%
Periacetabular fractures 9%
Aseptic Loosening 78%

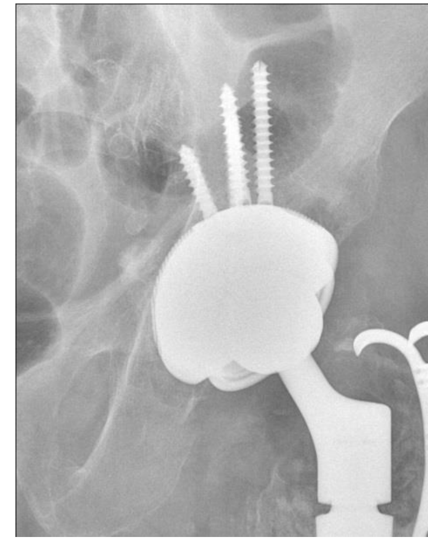
Implanti/Modularità

- **BIG: 60/96 cases**
- Augments: 20/96 cases
- Modular liners: 60/96 cases
- Double mobility: 9/96 cases
- Stem Revision: 28/96 cases

Outcome

- Harris Hip Score: from 39.9 to 82.7 at last follow-up
- Leg-Length Discrepancy < 1 cm
- No progressive radiolucent lines < 2mm in 5 cases
- Graft integrated in all cases



Conclusions

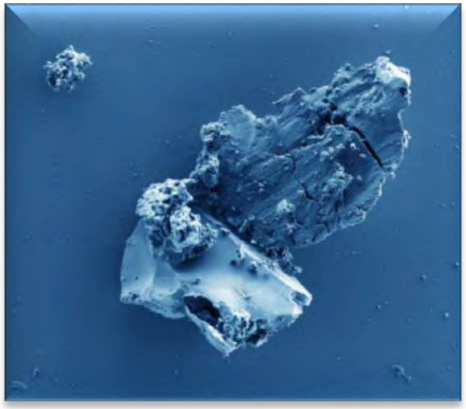
- B.I.G. + Porous Material: reliable option in hip revision
- Available product/cup is important (modularity, hook, fins)
- Correct surgical tecnique is mandatory

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY



REVISIONS OF HIP RESURFACING FROM AN INDEPENDENT SPECIALIST CENTRE

Catherine Van Der Straeten[1], Alessandro Calistri[2], George Grammatopoulos[3], Gulraj Matharu[3], Bart De Roest[2] Koen De Smet[2]

[1]MSK Lab, Department of Surgery and Cancer, Imperial College, London, UK

[3]Department Orthopaedics, Oxford University, Oxford, UK

[2]ANCA Medical Centre, Ghent, Belgium and Rome, Italy

BHS-SIDA meeting Milan 2015

REVISIONS OF HIP RESURFACINGS FROM AN INDEPENDENT SPECIALIST CENTRE

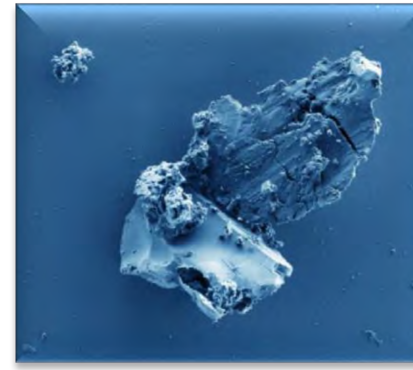
Presenter: Catherine Van Der Straeten, MD, PhD

MSK Lab Imperial College London

The study was performed at the ANCA Medical Centre, Deurle, Belgium

The authors declare that the research for and communication of this independent body of work does not constitute any financial or other conflict of interest.

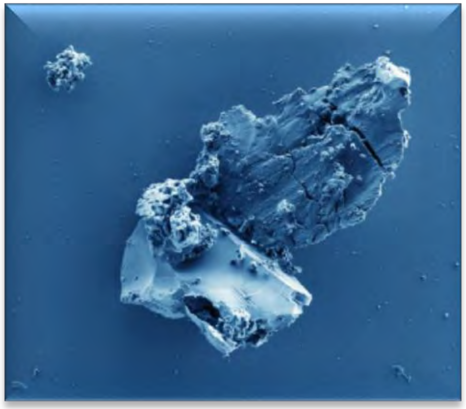
HRA Revision Series
ANCA CLINIC GHENT (KDS)



Consecutive Revision Study ANCA Clinic : 1st report (de Haan et al JBJSBr 2008): 42 HRA revisions

- Complications: **n = 8 (19%)**
  including 4 dislocations (PT - THA δ 36mm CoC)
- Re-revisions: **n = 5 (12%)**: 2 Cup-only- 1 Fem –2 THA

- Increased awareness of problems > routine metal ions
- Lessons learned > modified surgical practice



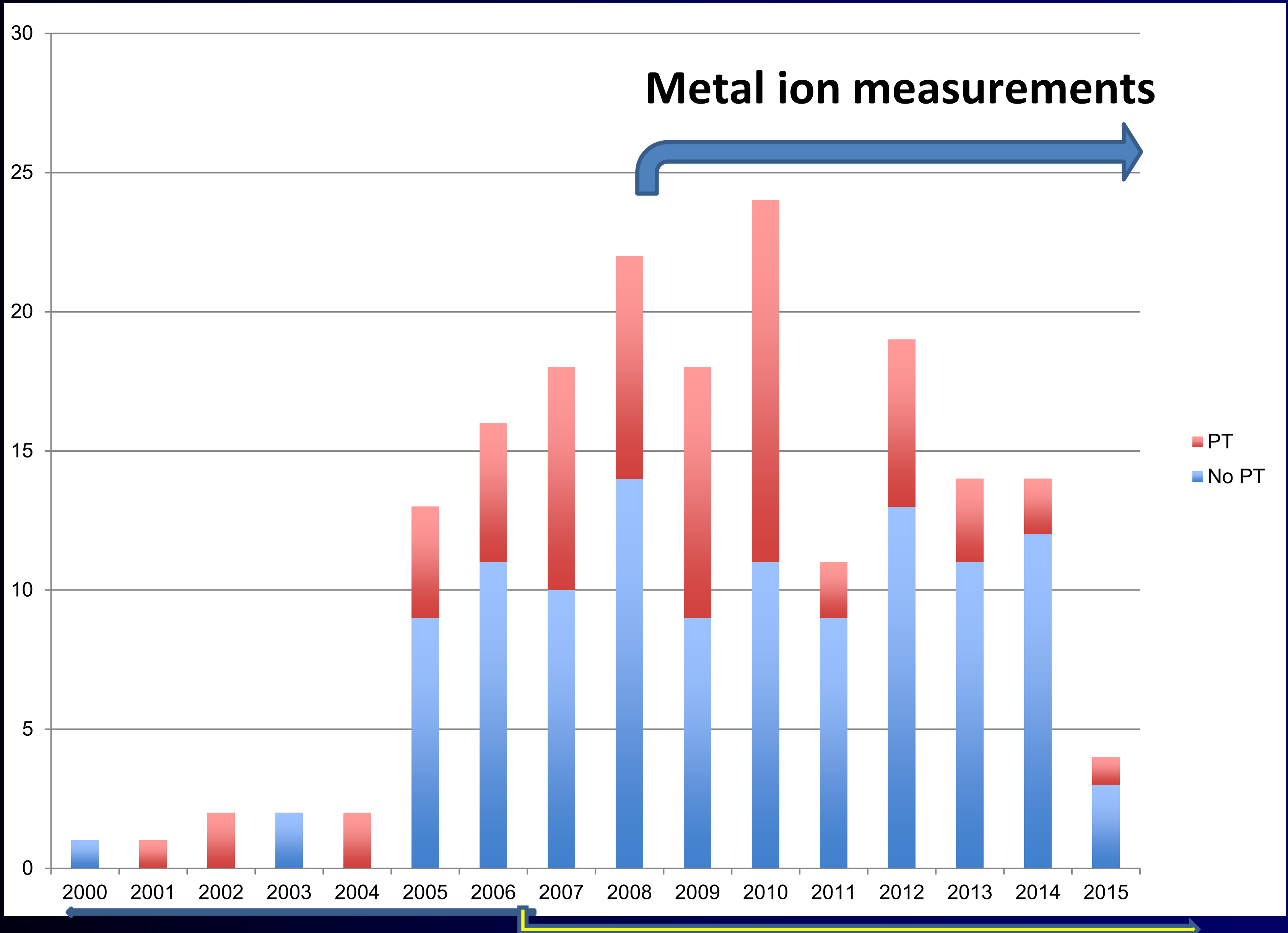
181 HRA REVISIONS

TOTAL HRA 4269 (17Y)

ASR	20
DUROM	12
Cormet	4
ADEPT	7
BHR BHR dysplasia	94 1
C+	31
C+Aclass	1
McMinn	2
RECAP	8
ACCIS	1
Total KDS	**100**
Total	**181**

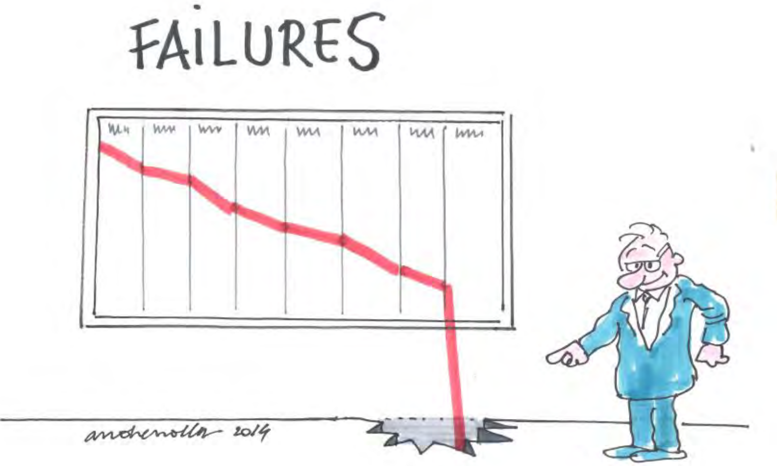
Patient demographics

- 181 revisions in 178 patients (3 bilateral)
- 80 Males / 98 Females (3 bilateral)
- Mean age at primary HRA : 54 years old (18-72)
- Time to revision = Mean 47 months (0-160)
- Primary Diagnosis
  - OA (n=159) – CDH (n=9) – AVN (n=10) – RA (n=1)



Initial group: N=42

Later group: N=139



Intraoperative findings	N
Metallosis	52
Adverse soft tissue reaction	68
Osteolysis	53
Impingement	42

Reasons for revision	N
Femoral Neck Fracture	8
Infection	8
MIsmatch	1
Pain	48
Cup malpositioning	69
Cup loosening	19
Head malpositioning	15
Head loosening	26
Osteolysis or radiolucent lines	39
Elevated metal ion levels	78/131
Systemic toxicity symptoms	**3**

MOST COMMON REASON FOR REVISION

COMPONENT MALPOSITIONING (48%)

=> WEAR

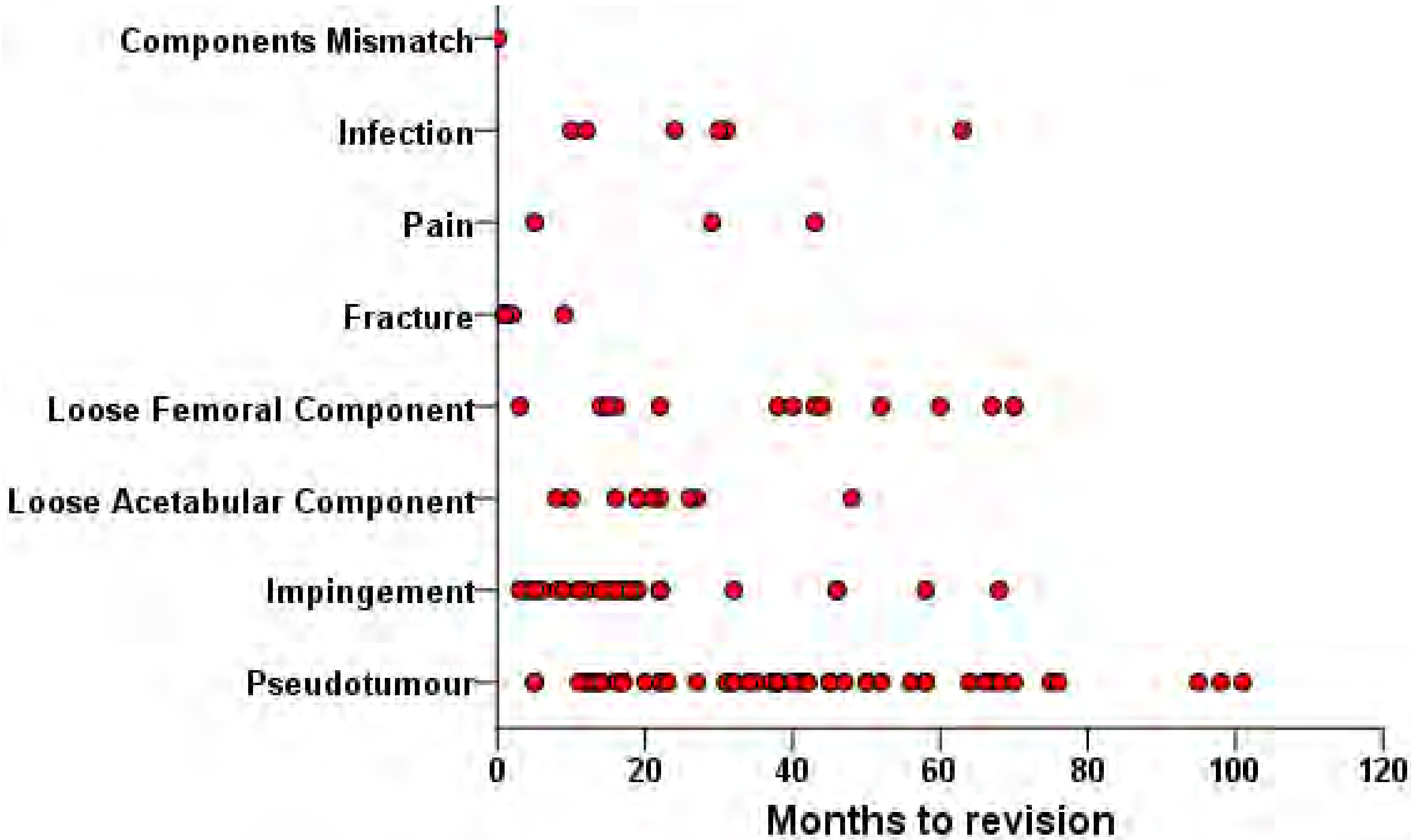
=> HIGH METAL IONS (62%)

Cr: Mean 24.1 ppb (median 9.6 – range 0.5 – 146)

Co: Mean 25.6 ppb (median 6.7 – range 0.5 – 171)

Time to revision

- Mean time to revision 47 months (0-160) – 88% <5 years

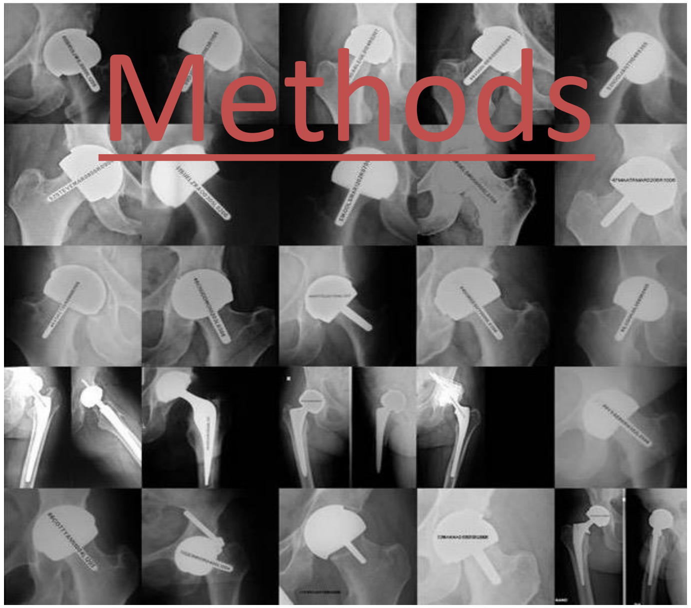


Gender Differences

- More revisions in females
- Similar cup placement between genders (p =0.4)
- Females had smaller size components (p= <0.001)
- Females had higher ion levels (p=0.004)
- Higher incidence of ALTR and loose femoral component (p=0.002)

181 HRA REVISIONS

- Clinical outcome: HHS FU – ΔHHS preop – last FU
- Metal ion levels
- Revision procedure
- Femoral head diameter
- Complications
- Re-revisions



181 HRA REVISIONS

- Revision Procedures :

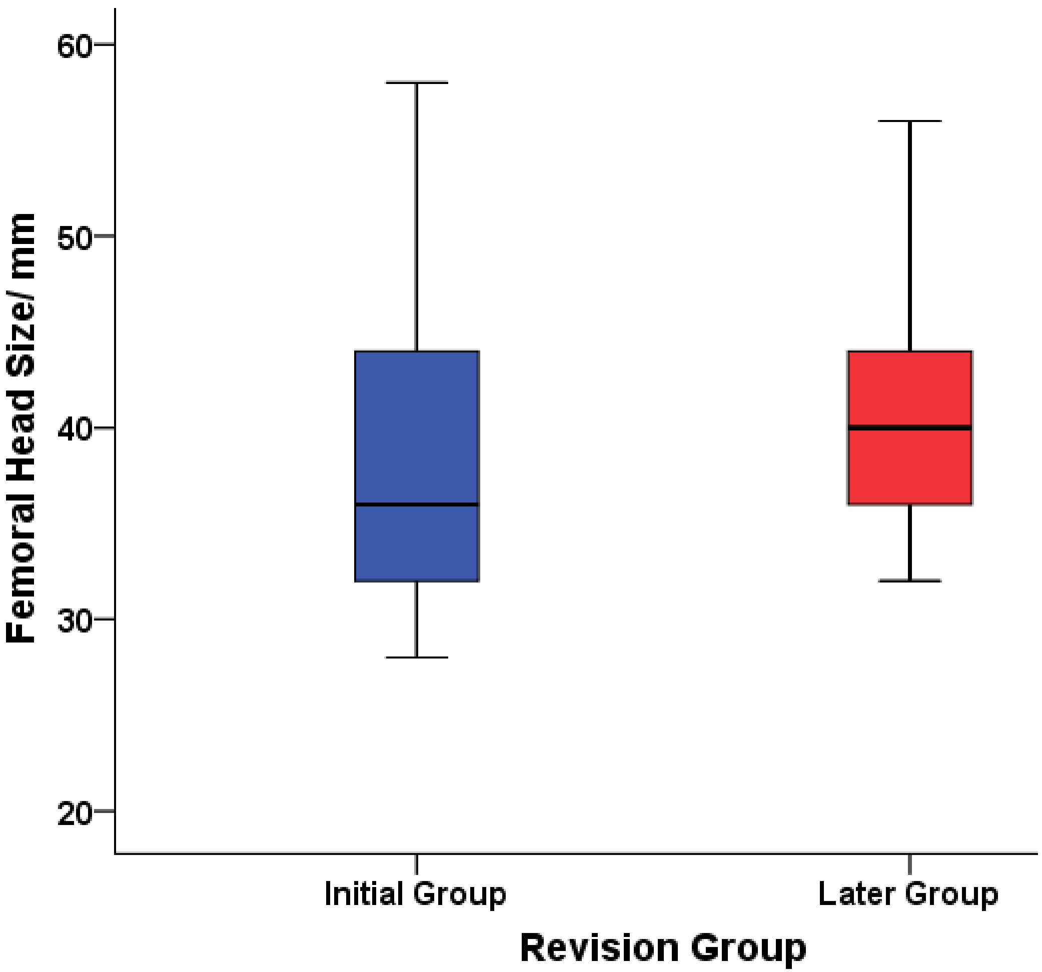
  - non-cemented THA: n = 130 (CoC)

  - cemented THA: n = 13

  - acetabulum only revisions: n = 13

  - Stem + Femoral head only: n = 25 (MoM)

Revision Procedures



Femoral head diameters of revision components :

Mean: 39,8mm (28 – 58mm)

Later Group:
Larger diameter head
(p=0.01)

181 HRA REVISIONS

Modified practice: surgery

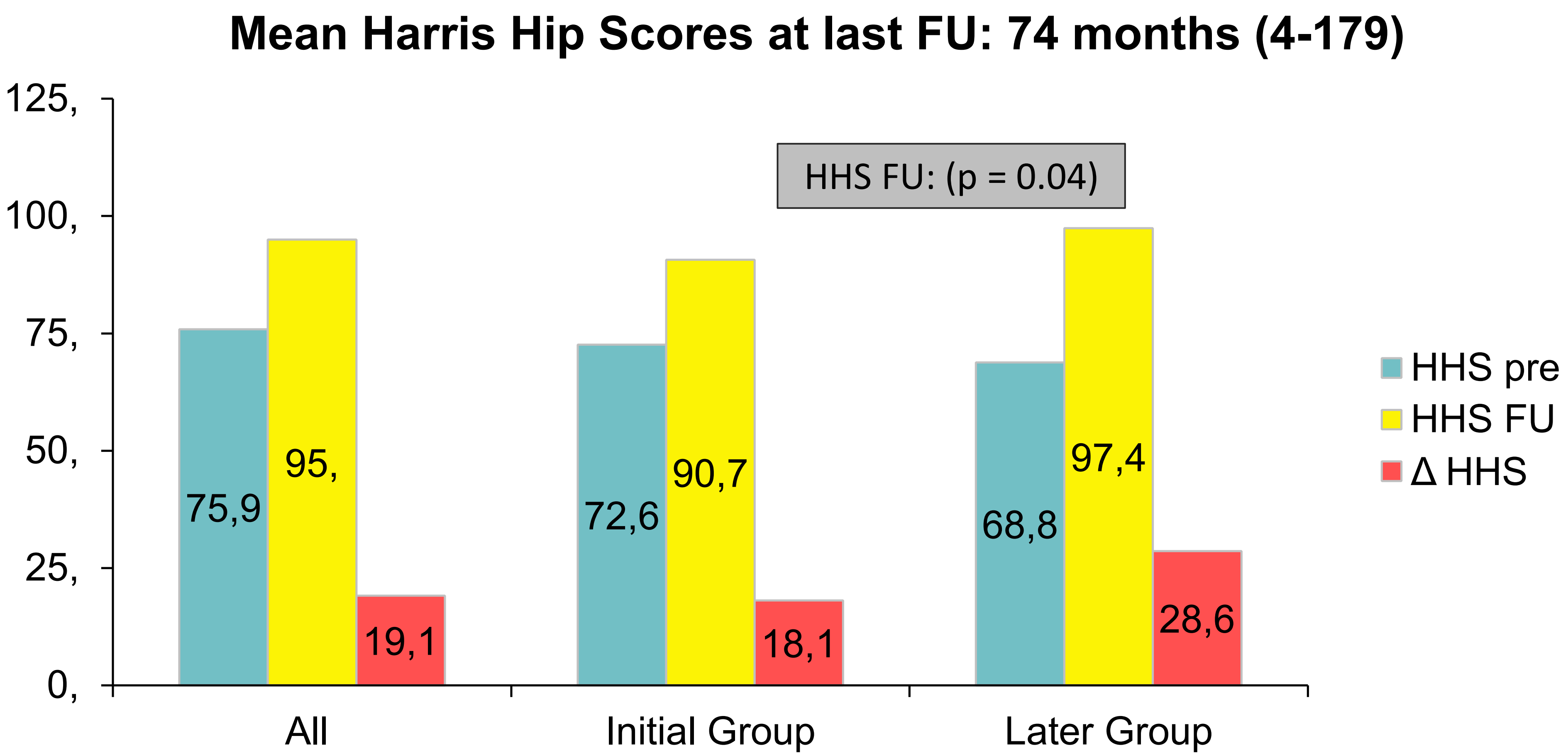
Avoid further exposure to CoCr:

- Significantly fewer 1 component-only revisions
- Hybrid THA → Non-cemented (NC) Ti THA
- Ceramic-ceramic bearings

Ensure post-revision hip stability

- PT: Careful dissection – tissue preservation
- Large diameter femoral heads (≥36mm)
- Patient education – (abduction brace)

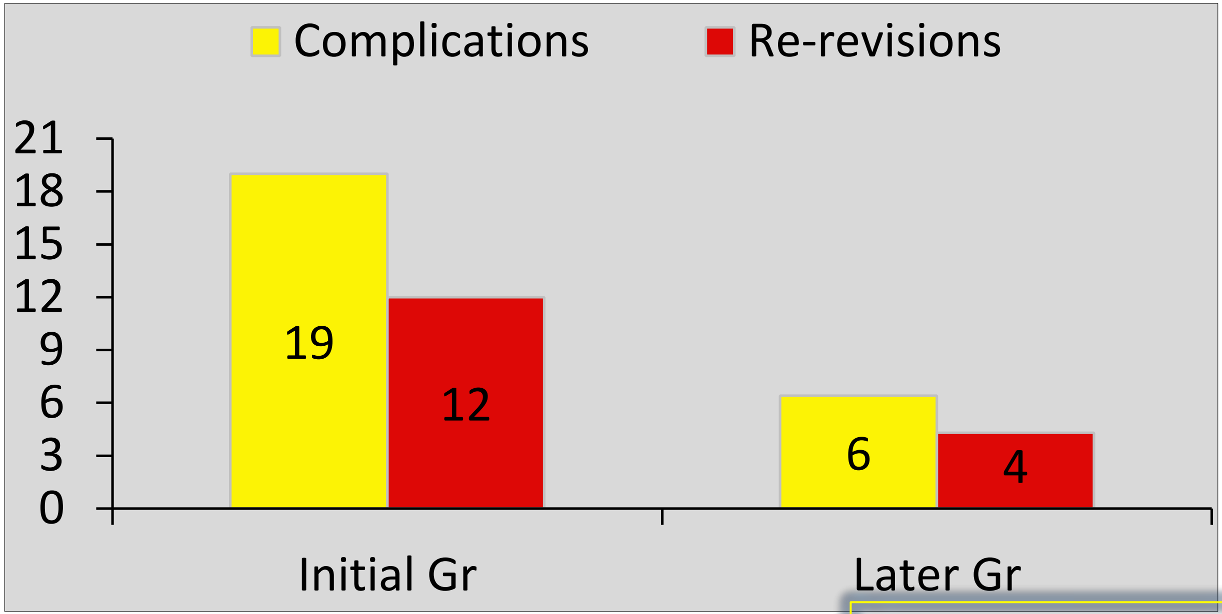
Results: Clinical outcome



Total n Complications (17) and re-revisions (11)

Complications	Initial Group	Re-revised	Later Group	Re-revised
Dislocation	4	1	4	2
Component loosening	2	2	1	1
Infection	1	1	2	1
Metal sensitivity/ARMD	1	1	2	2
Total	8 (19%)	5 (12%)	9 (6.4%)	6 (4.3%)

Significant reduction in complication and re-revision rate in Later Group (p = 0.01)



Outcome revision procedures and bearing surfaces

- No difference in clinical outcome between revision procedures
- Higher re-revision rate with single component revision (12.5%) compared to both components (2.5%)
- Higher re-revision rates with MoM THA vs CoC THA in cases other than fractures (9.5% vs 2.6%)

181 HRA REVISIONS

Modified practice: detection

<u>Algorithm / use of metal ion levels</u>

NOT ONLY for painful MOM but for all MOM

Also for normal check up

1 year 2 years 5 years (7) 10 years 20 years

Results: Subgroups Ions

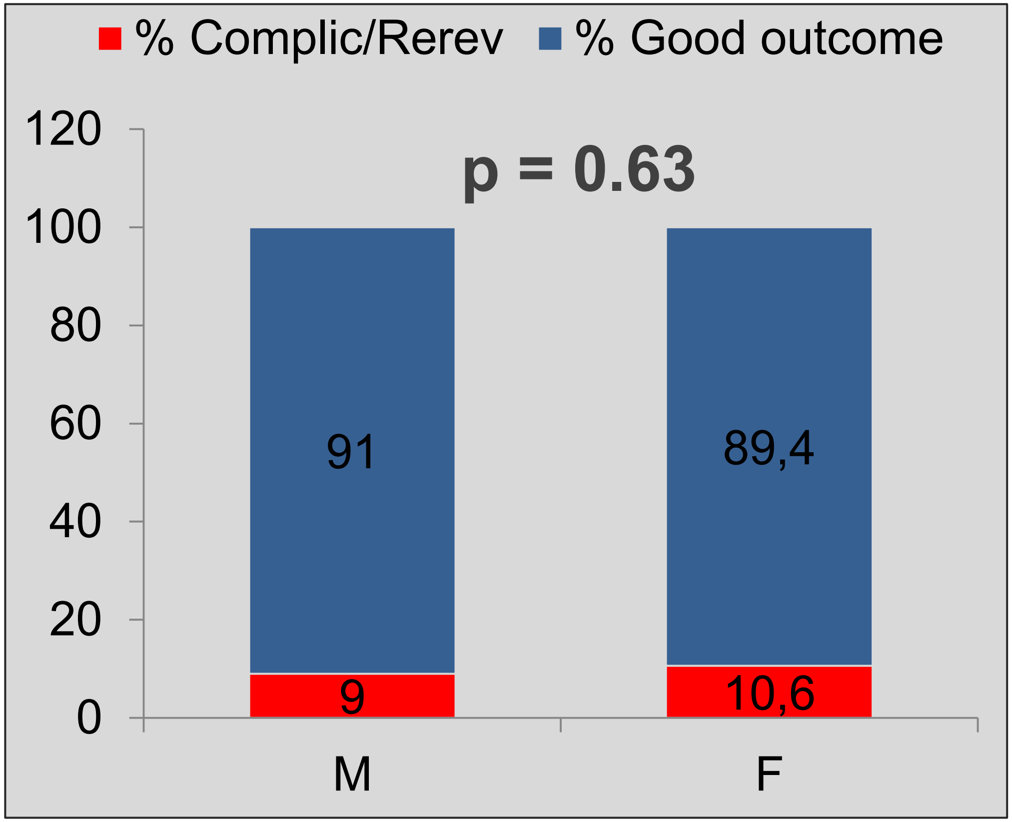
- No difference in HHS FU or Δ HHS

- Significantly less complications (6% vs 17%): $p = 0.001$
- Sign. less re-revisions: $p = 0.005$

Ions-measured Group

Gender differences?

NO DIFFERENCE in outcome of revisions



Results: Subgroups PT - no PT

(pseudotumour / ALTR)

- Overall: NO difference in outcome with or without PT

- Later Group + PT: n = 51 vs Initial Group + PT: n = 17

No difference HHS FU

Significantly reduced

- complication rate: p = 0.005

- re-revision rate: p = 0.016

Conclusions

Initial study: Increased awareness of risks

↓

Earlier detection: metal ions, additional imaging (MRI)

↓

Earlier revision with less soft tissue destruction

↓

Modified surgical practice

↓

Improved outcome Later group even with PT

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Revision of Cold-Welding Hip Implants; Is Isolated Femoral Head Exchange a Simple Procedure?

Robert K. Whittaker[1], Ahmed Zaghloul[1], Imran A. Siddiqui[1], Harry S. Hothi[1], Gordon W. Blunn[2], John A. Skinner[1], Alister J. Hart[1]

[1]Institute of Orthopaedics and Musculoskeletal Science, University College London and the Royal National Orthopaedic Hospital, Stanmore, United Kingdom
[2]Institute of Biomedical Engineering (University College London)
Royal National Orthopaedic Hospital

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

UCL

LIRC
London Implant Retrieval Centre

Royal National Orthopaedic Hospital NHS
NHS Trust

Funding

Institutional support from 9 companies

Furlong Foundation

British Hip Society

Depuy ASR Retrieval Program

Stryker Global Modular-Neck retrieval program

EPSRC

Technology Strategy Board

NIHR portfolio

HM coroner

Gwen Fish Charity

Our patient donors

The Rosetrees trust

Dunhill Medical Trust

London Implant Retrieval Centre

Directors
Alister Hart, John Skinner, Gordon Blunn

Engineers
Harry Hothi, Jay Meswania, Danielle de Villiers

Researchers
Reshid Berber[2], Anna Panagiotidou[2], Kevin Ilo[2]
Shiraz Sabah[2], Robert Whittaker[2]
Anna Di Laura[2], Elizabeth Ellis[2], Danielle de Villiers[2]

Technicians
Siva Mahindan[2], Akram Hoque[2]

Patient Advisor
Gwynneth Lloyd[2]

Imaging
Johann Henckel[1]

MRI radiologists:
Dr Michael Khoo[1], Dr Adam Mitchell
Dr Keshthra Satchithananda

Other Surgeon advisers
Martyn Porter[3], S Muirhead-Allwood[1]

Histopathology:
Prof Adrienne Flanagan[2], Jozef Zustins

Key Collaborators
Antti Eskelinen, Phil Noble, Daniel Kendoff

[1]Royal National Orthopaedic Hospital, Stanmore
[2]University College London
[3]Wrightington Hospital
[4]Baylor College, Houston, USA
[5]EPSRC centre for advanced metrology, UK

Since 2007 we've collected **6,000** components from **25** countries and published over **70** papers

Visit us at – www.LIRC.co.uk

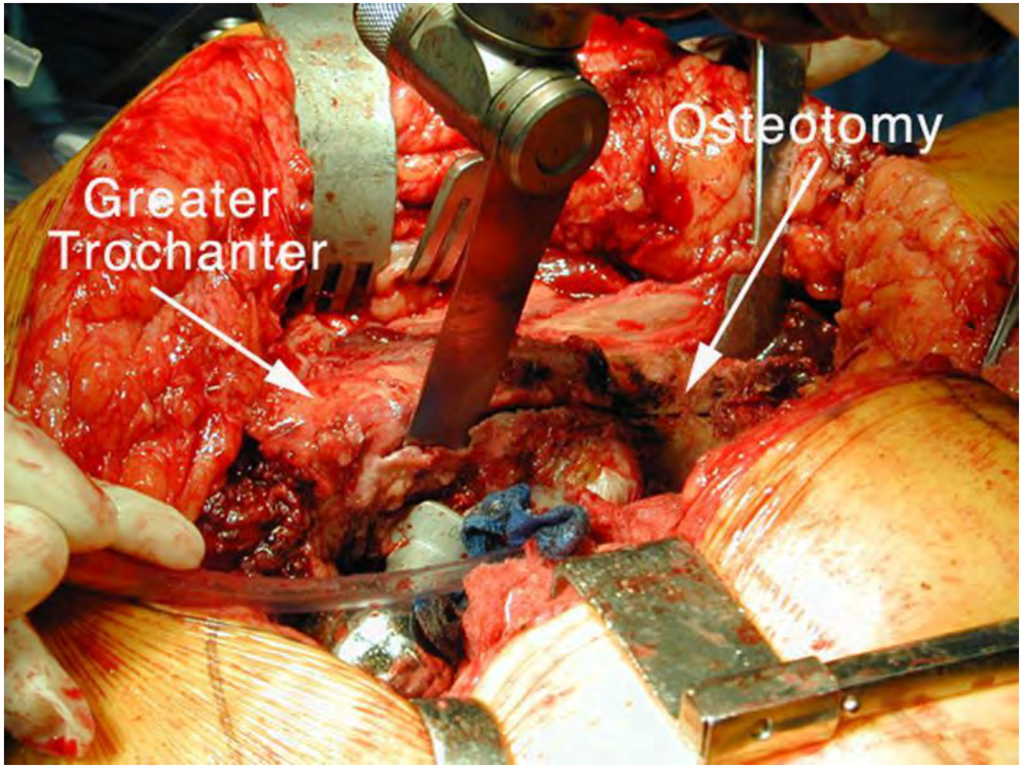
Introduction

Introduction

A head or taper sleeve that is 'clinically cold-welded' to a stem is one of the commonest reasons for unplanned removal of the stem

Introduction

As a result the stem is removed –



- Often requiring specialized instruments
- An Extended Trochanteric Osteotomy
- And a new stem with diaphyseal fixation

Image from - http://www3.aaos.org/product/images/05315b.jpg, http://www3.aaos.org/product/images/05315b.jpg

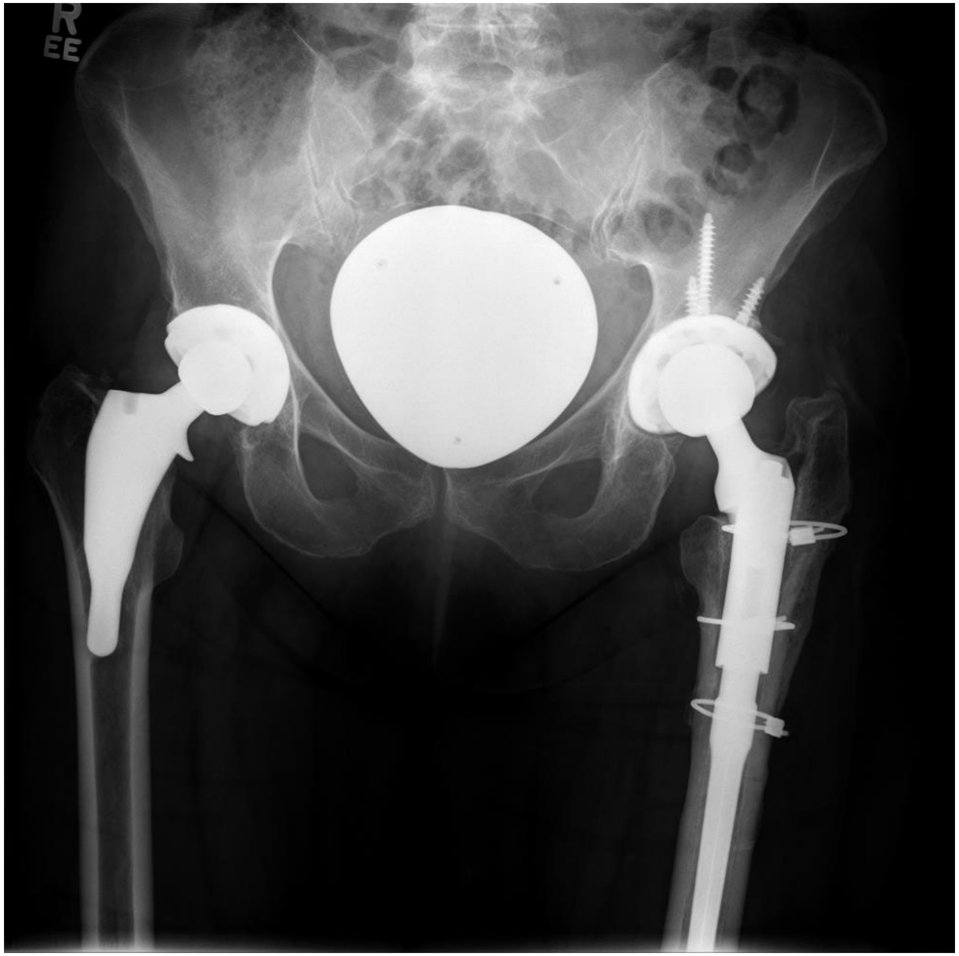
Example Case

- Patient was admitted due to painful hip
- Surgery was arranged for a bearing exchange with the well fixed stem to be left in situ
- Once the components were reached the surgical team were unable to remove the head from the stem
- Patient was closed and sent for second opinion

Example Case

- ETO was needed to remove the stem
- Long stem was needed to obtain fixation

Example Case



- One year post op
- Femur healed with good results
- Long stem was needed to obtain fixation

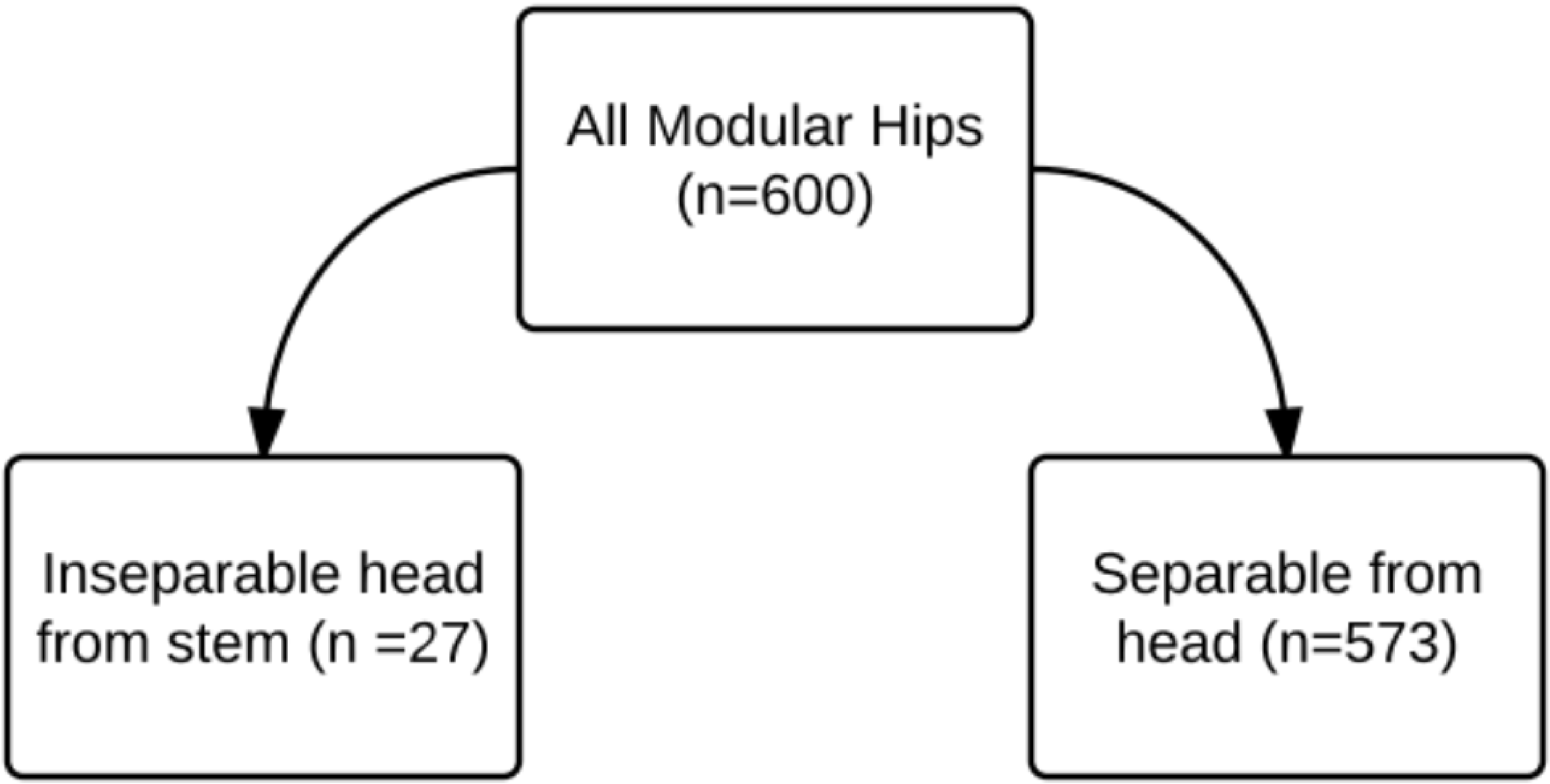
Aim of Study

The purpose of this study was to:

(1) Report on the extent of cold-welding in our collection of retrieved THR of the stem / head junction

(2) Determine the efficacy of different head/stem separators and which implant design is at greatest risk

Methods


All Modular Hips (n=600)
Inseparable head from stem (n =27)
Separable from head (n=573)

Methods

Bearings and Stems received un-separated:

- Biomet M2A Magnum paired with Type 1 taper (n=13)
- X DePuy ASR XL / Corail (n=6)
- Corin Cormet / Corin Zweimuller (n=4)
- Mitch / Exeter (n=1)
- Sulzer Allopro / Sulzer Allopro (n=1)
- DePuy Pinnacle S-ROM (n=1)
- DePuy Pinnacle Corail (n=1)

Methods

We attempted disassembly using 2 methods:

- Manually in the first instance using commercially available femoral head-neck separators (n=5) by two surgeons

- Secondly using an Instron mechanical testing machine which also enabled measurement of the force required to separate.

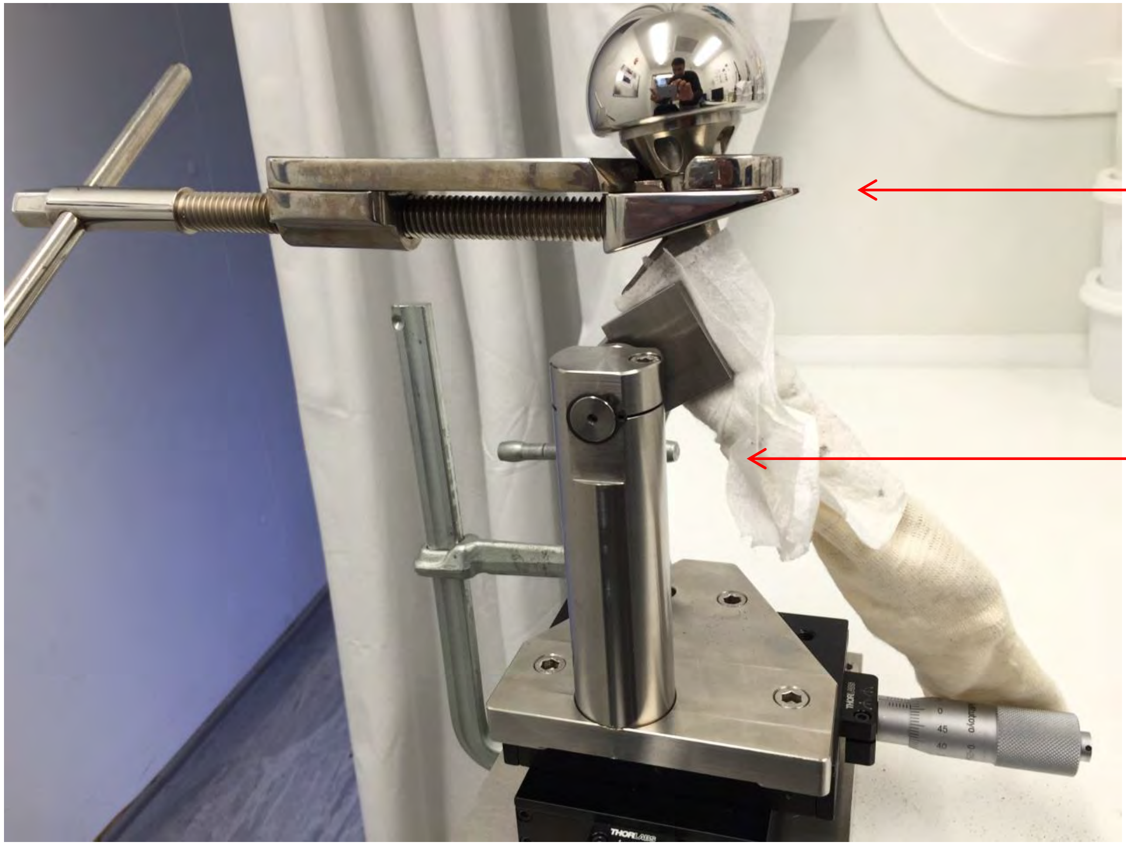
Methods

Head – Neck Separator Manufacturers

- JRI
- Stryker
- Biomet
- Smith&Nephew (n=2)

Methods

First Method: Head – stem separators



Head – Stem separator

Stem held in place using clamp

Methods

Second Method: Instron Machine

Force applied from top up to a maximum of 5000 Newtons

Head clamped to base

Results

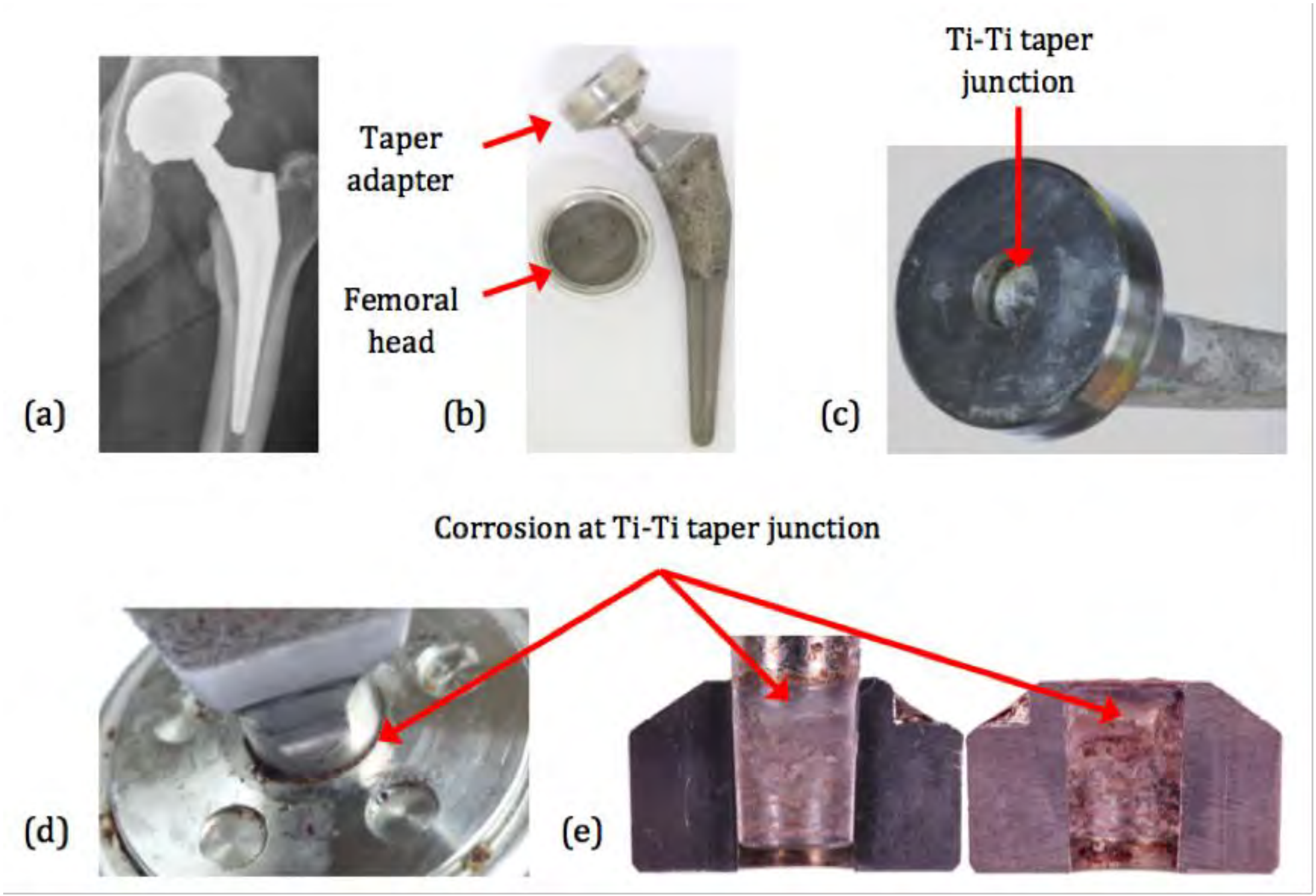
- The overall success rate for dis-assembly of the femoral heads was 11/27 using head/neck separators
- The JRI femoral head separator was the most successful, separating 10 out the 11 separated specimens
- The Biomet Magnum/Type 1 Taper combination was most difficult to dis-assemble with only 2/13
- Forces up to 5000N were still unable to dis-assemble the head/neck junction in the Magnum/Type 1 Taper

Results

- The pairing of the Biomet Magnum femoral head with the Taperloc or Bi-Metric femoral stem were such that the taper junction consisted of a titanium-titanium (Ti-Ti) interface

- All other head-stem junctions had a cobalt-chromium-titanium (CoCr-Ti) material combination.

Discussion



Taper adapter
Femoral head
Ti-Ti taper junction
(a)
(b)
(c)
Corrosion at Ti-Ti taper junction
(d)
(e)

Discussion

- Trunnion of Ti-Ti once cold-welded taper sleeve removed
- Macroscopically shows signs of damage
- Would you have reused this stem?

LIRC
London Implant Retrieval Centre

Royal National Orthopaedic Hospital NHS
NHS Trust

UCL

Conclusion

1. We have shown that clinical cold-welding is most prevalent in Ti-Ti combinations of the stem and taper, with approximately 25% of these cases cold-welded

2. The incidence of cold-welding of THR received at our centre was 4.5%

3. The JRI head – neck separator was the most effective

4. Surgeons should be aware of this potential complication when revising a Ti-Ti stem/taper junction

Thank You

Thank you for your attention

For further information contact –

R.Whittaker@ucl.ac.uk
A.Hart@ucl.ac.uk

Visit us at – www.LIRC.co.uk

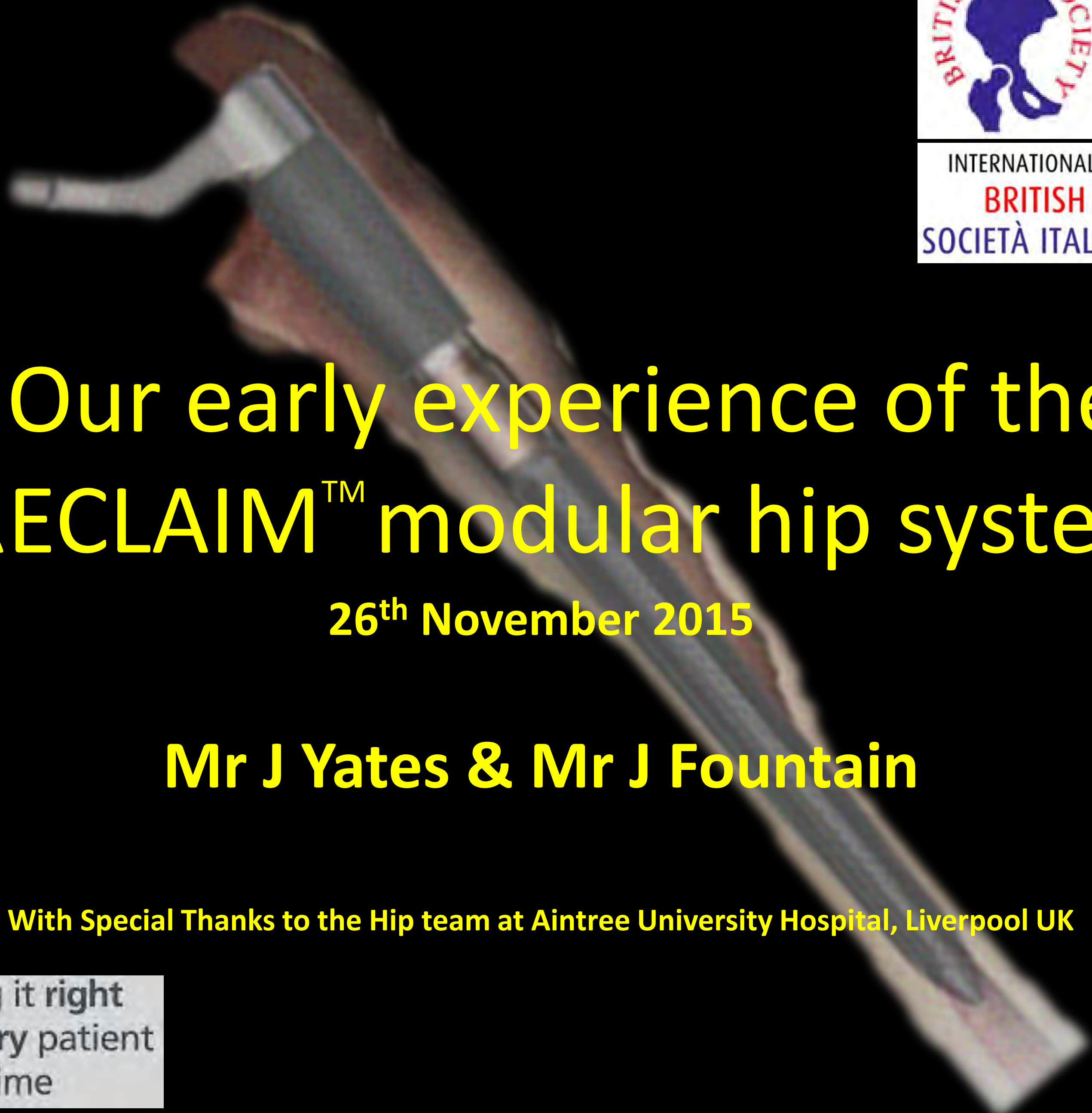
INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

INTERNATIONAL COMBINED MEETING
BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA



Our early experience of the RECLAIM™ modular hip system

26th November 2015

Mr J Yates & Mr J Fountain

With Special Thanks to the Hip team at Aintree University Hospital, Liverpool UK

Getting it **right**
for **every** patient
every time


Wrightington
LIVERPOOL


corbis


Aintree
University
Hospital
NHS

Introduction

RECLAIM™ Modular Hip System

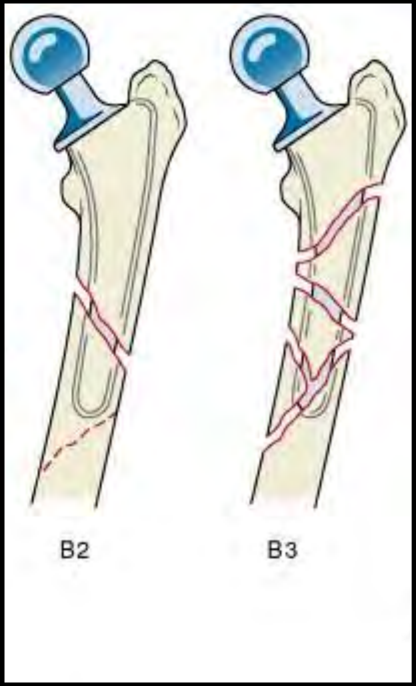
- Cementless
- Modular: Body & Stem
- Compatible with Depuy's range of acetabular components
- For femoral defects
  - Paprosky type 2 and above
- For periprosthetic fractures
  - Vancouver type B2 & B3

Paprosky Classification

- For **<u>Femoral</u>** & Acetabular defects

Vancouver Classification

- Type B2 or B3



Introduction

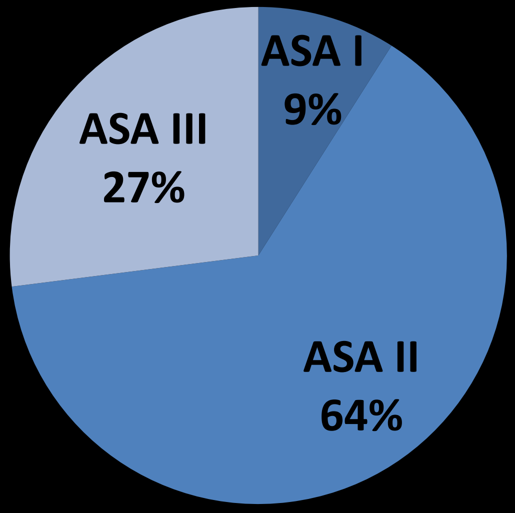
- Used in our unit for past 3 years
- Recent UK guidance on monitoring newer implants
- Prospective data on each case

Methods

- Created implant database
- Retrospective case note review
- Prospective post-operative scoring in clinic
- Review clinics and radiograph review
- Telephone appointments

Demographics

- **25 implants in 24 patients**
- 15 Male (60%)
- Average age of 70 years (47-86)
- 16 Right side
- Average follow up 24 months
  (Range 5-37 months)



Indications

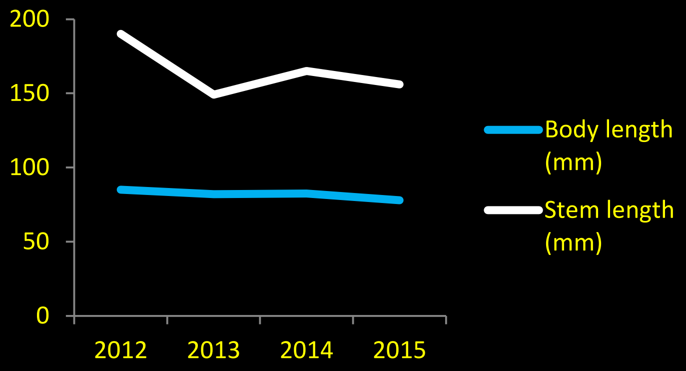
- 19 patients were revisions
- 6 patients admitted with periprosthetic fracture
- Of the devices previously implanted
  - 20 Charnley (Oldest was 30 years)
  - 5 newer designs
    - 2 Corail, 3 ETS

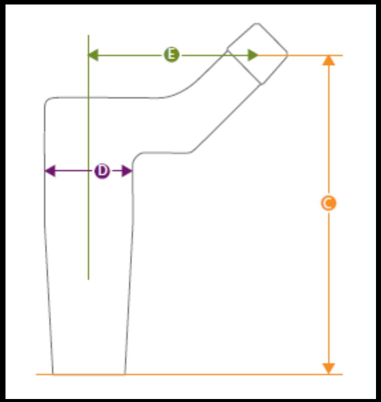
Surgical

- Posterior approach with ETO
- Median length of stay 8 days
  - Revisions 9 days (3-20)
  - Fracture 29 days (9-99)
- 17 of revisions had pre-operative aspirates
- 21 of 25 had tissue samples taken intra-operatively
- All managed on specialist orthopaedic wards

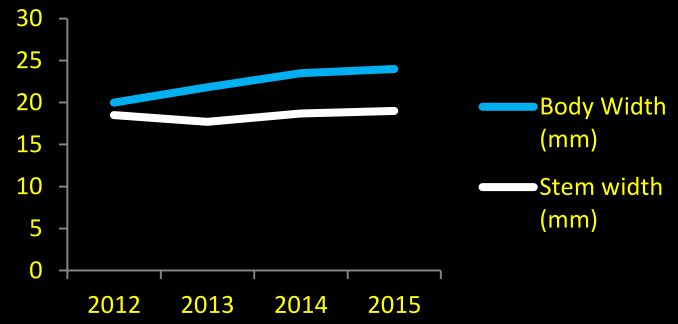
Implant sizes

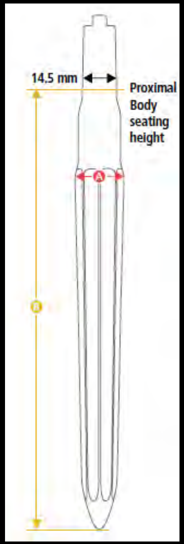
- Shorter length of implants over time





- Larger width of implants over time





Complications

- No deaths in cohort
- No intra-operative complications
- No fractures
- 3 implants explanted to date
  - 2 for early infections
  - 1 for late infection at 11 months

Revision One

- 77 year old lady
- 1st op 2007
- Pain & dislocation
- 11 months
  - Wound breakdown
  - Pus
- Megaprosthesis

Revision Two

- 82 year old male
- 1st op 1984
- Pain
- 1st month
  - Wound oozing
  - Multiple washouts
- Proximal femoral replacement (2 stage)

Patient Reported Outcome Measures (PROMs)

- Oxford Hip Score (OHS)
  - 12 questions (Max. score of 48)
  - High score = Better function
  - Subjective

- EuroQol-5D
  - Patient self assessment
  - 5 domains
  - Low score = Better quality of life
  - Visual Analogue score for health

PROMs (averages)

Patient reported outcome measure (PROM)	Pre-operative	Post-operative
Total Oxford Hip Score	18.7	30.6
EQ5D – Mobility	3.3	2.7
EQ5D – Self-care	2.7	2.3
EQ5D – Usual Activities	3.1	2.4
EQ5D – Pain / Discomfort	3.7	2.4
EQ5D – Anxiety / Depression	1.9	2.0
EQ5D – Visual Analogue Score for Health	52.5	68.5

All PROMS shown to improve
except EQ5D Anxiety / Depression

PROMs (Improvements)

Patient reported outcome measure (PROM)	Average Improvement	Ranges
Total Oxford Hip Score	**21.1**	8-32
EQ5D – Mobility	[illegible]	0-2
EQ5D – Self-care	**0.55**	0-3
EQ5D – Usual Activities	**0.88**	0-3
EQ5D – Pain / Discomfort	**1.77**	0-4
EQ5D – Anxiety / Depression	[illegible]	-2-2
EQ5D – Visual Analogue Score for Health	**30.8**	5-70

Qualitative results

- Post-operative pain was “worse” and “recovery longer” than their primary
  - Multiple co-morbidity
  - Few alternatives

- Only one patient has said they wouldn’t have it again

Conclusions

- Use of the RECLAIM™ system for revision and peri-prosthetic fracture…

    - **Surgeon friendly**
    - **Safe**
    - **Leads to improved patient outcomes**

Getting it right for every patient every time

INTERNATIONAL COMBINED MEETING
BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

Thanks

Grazie

- Della Velle, Craig J., Paprosky, Wayne G. "Classification and an Algorithmic Approach to the Reconstruction of Femoral Deficiency in Revision Total Hip Arthroplasty." J Bone Joint Surg Am. 2003; 85: 1-6.
- Depuy Revision solutions RECLAIM revision hip system product manual (http://www.gsortho.org/files/dpy_reclaim_surgical_technique_0612-21-511.pdf)
- Van Hout B, Janssen MF, et al. Interim scoring for the EQ-5D-5L: Mapping the EQ-5D-5L to EQ-5D-3L value sets. Value in Health 2012 Jul-Aug;15(5):708-15
- Dawson,Jill; Fitzpatrick, Ray;Carr, Andrew;Murray,David. Questionnaire on the perceptions of patients about total hip replacement. British Journal of Bone and Joint Surgery. March 1996; 78-B(2): 185-190

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

Modular proximal femoral endoprosthetic replacement for non-neoplastic conditions

Mr A Khajuria, Mr D McDonald, Mr M Parry and Prof L Jeys

Royal Orthopaedic Hospital, NHS Foundation Trust

Birmingham, UK

Disclosure

Arun K. Khajuria

No relevant financial conflict

Proximal femoral EPR

- EPR – First performed for the proximal femur
- Malignant tumor of proximal femur
- Metastatic lesions

- Salvage surgery following
  - failed trauma
  - peri- prosthetic fractures and
  - failed multiple revisions with severe bone loss.

Functional outcome following EPR for failed internal fixation of the proximal femur

Dean et al (Int Orthop. 2012)

- 8 cases (2001-2008)

- Mean age: 67.5 (range 50-79) years
- Mean F/U: 16.5 (6-36) months
- Mean time (first surgery to EPR): 34 (6-102) months
- EPR- one/ two stage: 6/2 cases

- Mean HHS: 71.4 (range 64-85)
- No surgical Complications.

Femoral replacement for salvage of periprosthetic fracture around a total hip replacement.

McLean et al (Injury 2012)

- 20 cases (2001-2008)

- Mean age: 72 (range 36-91) years
- Mean F/U: 48 (12-116) months
- Mean time from Primary THR to definitive EPR 12.5 years

- Mean TESS: 68 (range 32-98)
- Complications (30%):
    - 3 dislocations
    - 2 deep infection
    - 1 periprosthetic fracture

Proximal Femoral Replacement in Patients with Non-Neoplastic Conditions

Parvizi et al (J Bone Joint Surg Am. 2007)

- 48 cases from two institutions

- Mean age: 73.8 (42-97) years
- Mean F/U: 36.5 months
- Mean time from first to definitive EPR 17.5 (1-37) years

- Mean HHS: Pre-op 37.1, Post-op 64.9
- Complications (23%):
  - 6 dislocations
  - 4 failure of acetabulum component
  - 1 deep infection

Proximal femoral EPR

Objectives:

Clinical & Functional outcome of proximal femoral EPR in Non-neoplastic conditions of hip.

Proximal femoral EPR

Methods:

- Retrospective study (2007-2014)
- Patients operated by single surgeon
- Clinical and Functional outcome
  - Oxford Hip Score
- Complications

Proximal femoral EPR

Exclusion Criterion:

- Neoplastic (Primary or metastatic conditions)
- Patients who died < 3months
- Patients lost to follow-up

Proximal femoral EPR

Patient demographics

- n:36 (2007 – 14)
- M/F: 14/22

- Median age: 80 (range 49-92) years
- Comorbidities>3 (range 3-7) : 28 patients

Proximal Femoral EPR

Midterm outcome experience

Indications:

- Failed Trauma, n=13
- Failed multiple revisions with severe bone loss, n=8
- Periprosthetic fractures with failed reconstruction, n=8
- Recurrent periprosthetic infections with severe osteolysis, n=7

Methods

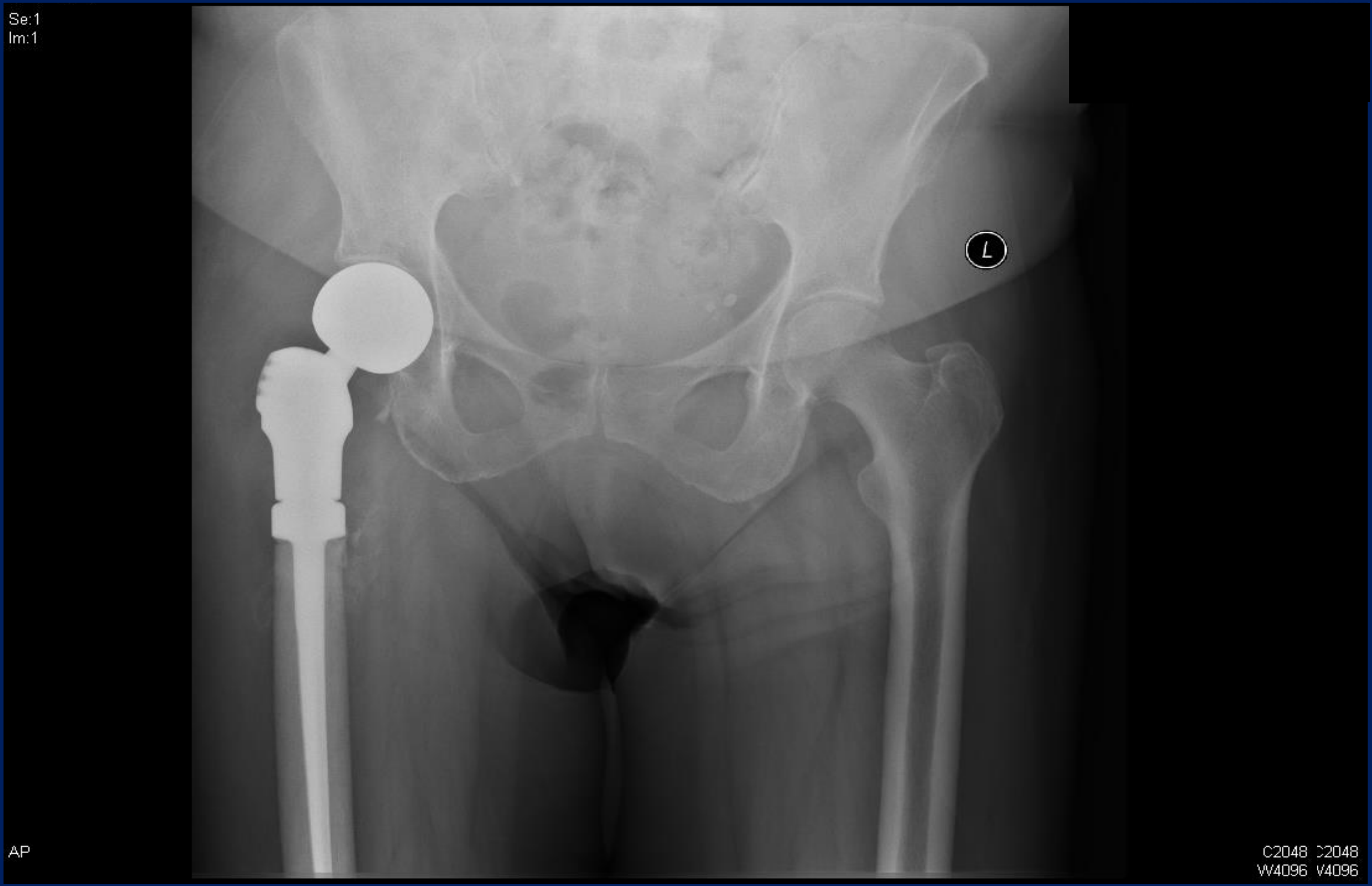
Modular EPR

- METS, Stanmore Implants
- MUTARS, Implantcast

- Postero-lateral approach
- Single/Two stage
- Silver coated Implants

Proximal Femoral EPR
Failed trauma

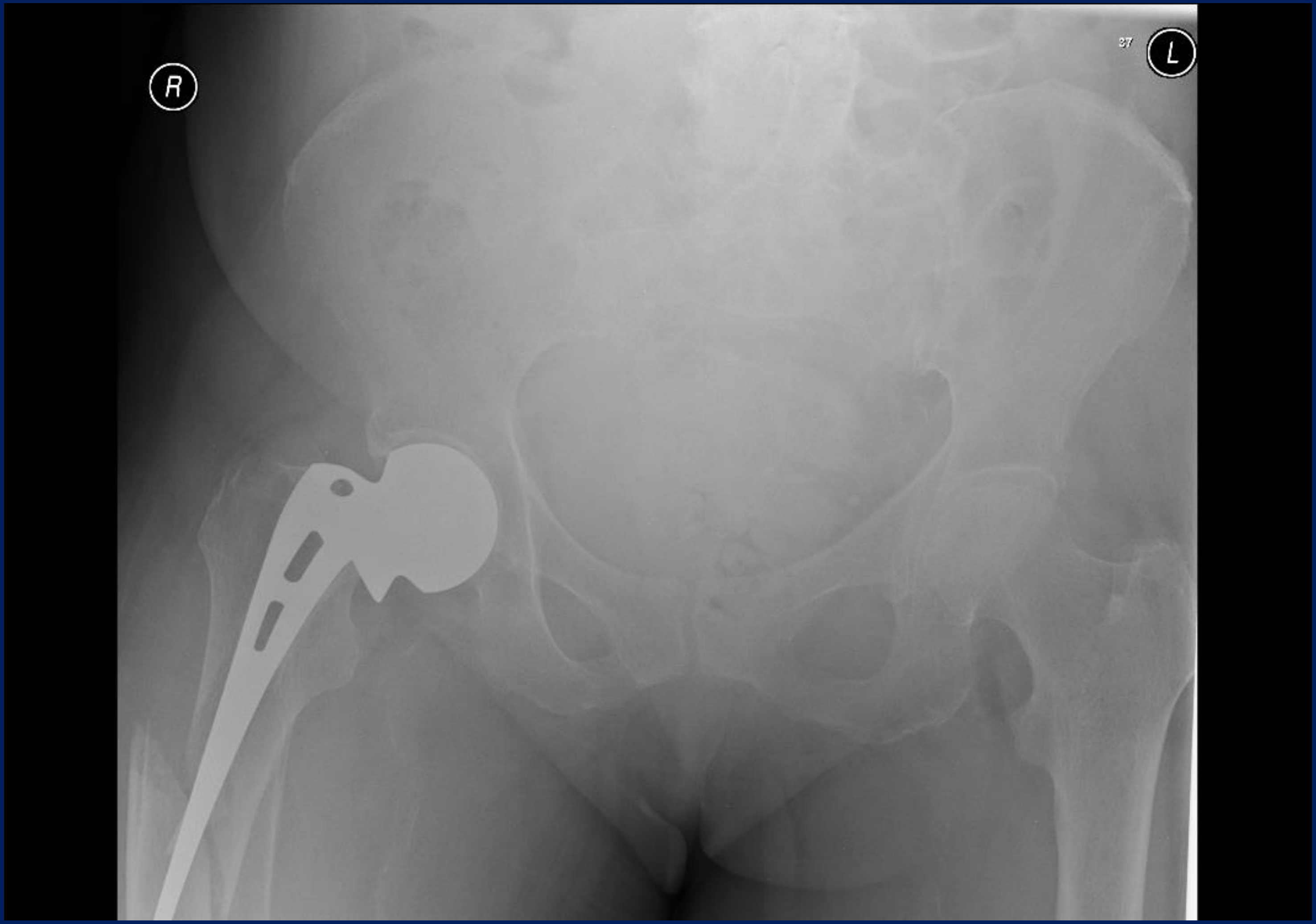
Proximal Femoral EPR
Failed Trauma



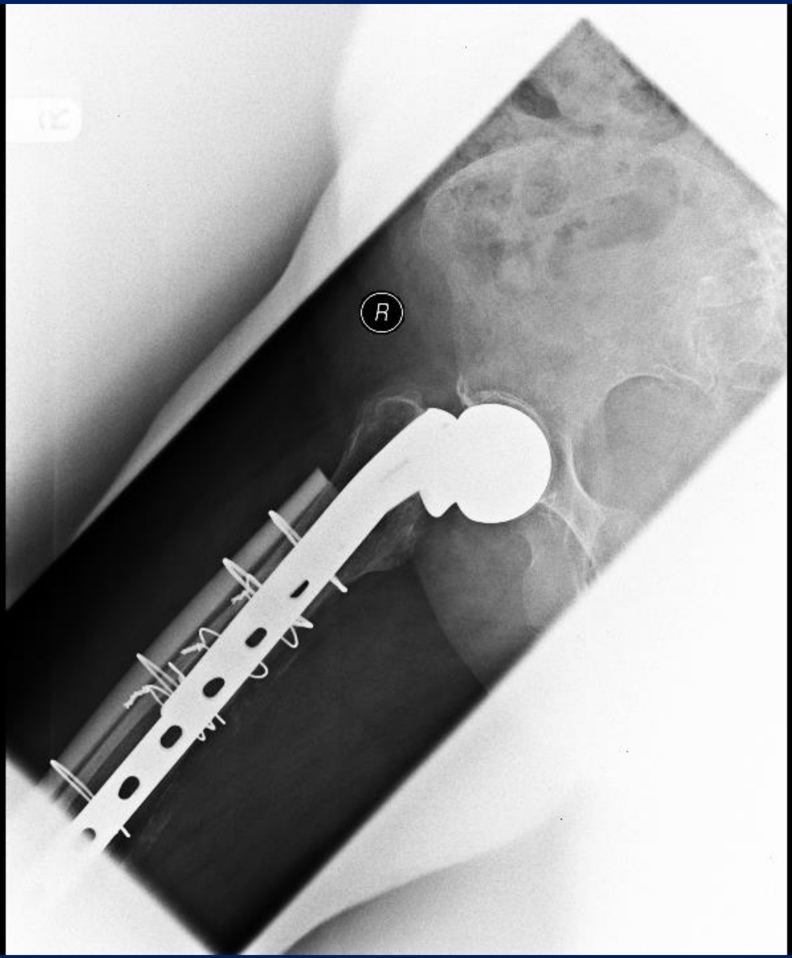
Proximal Femoral EPR
Failed Trauma

Proximal Femoral EPR
Failed Trauma

Proximal Femoral EPR Periprosthetic Fracture



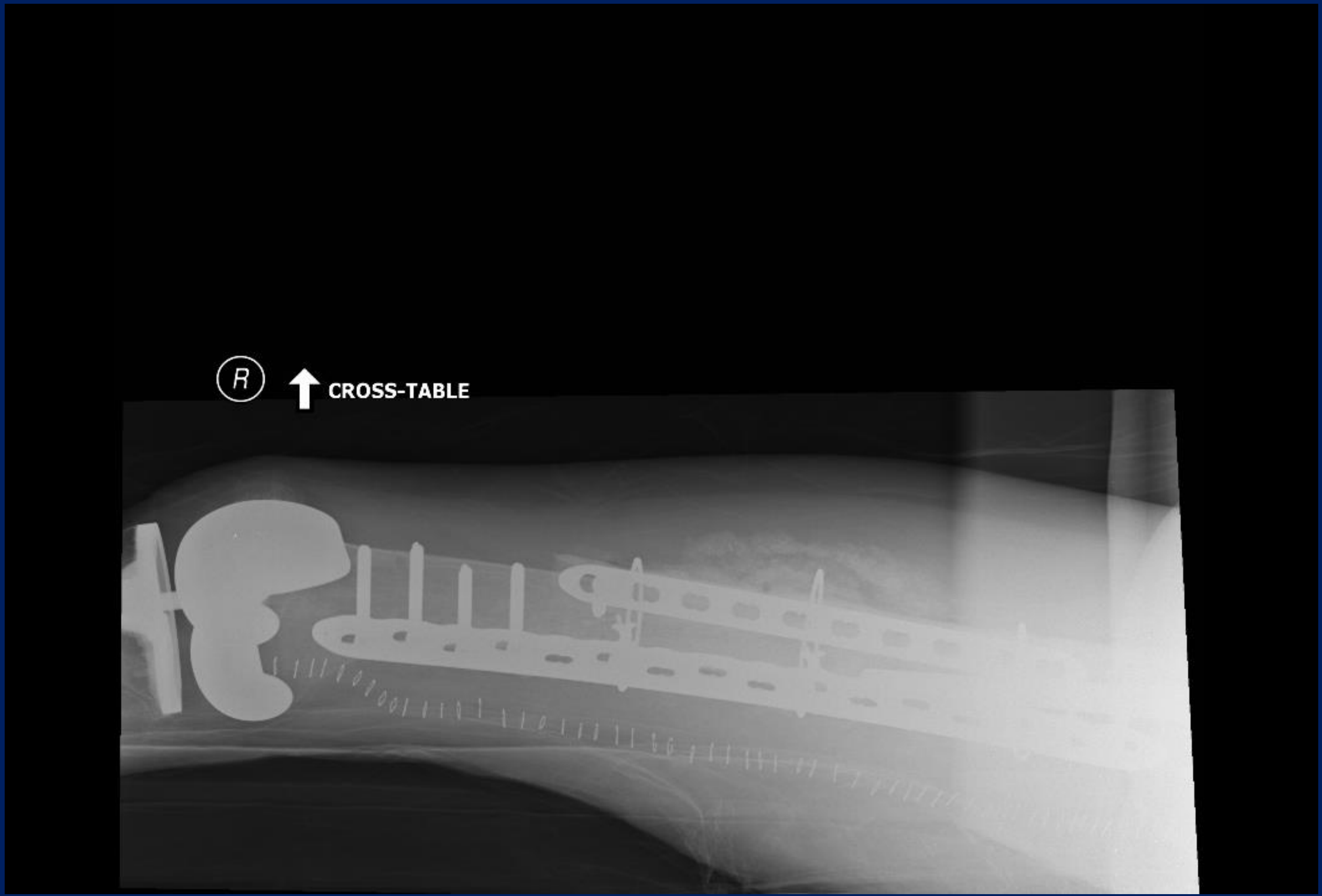

R


R


R

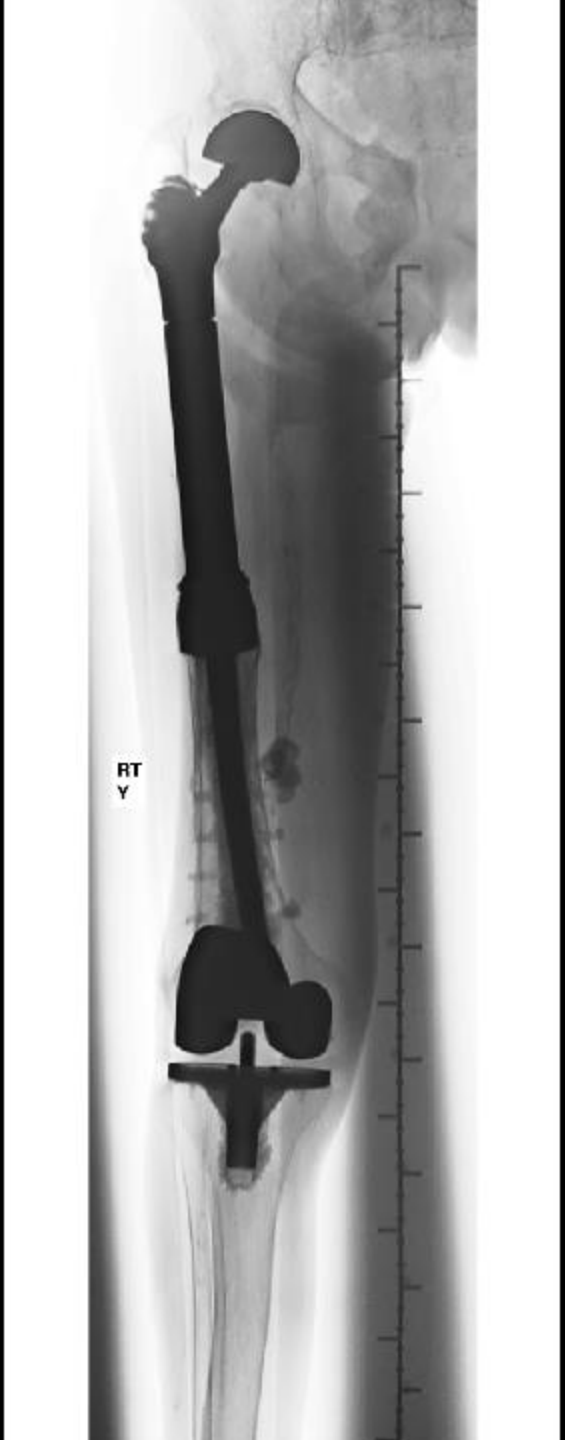

R


R

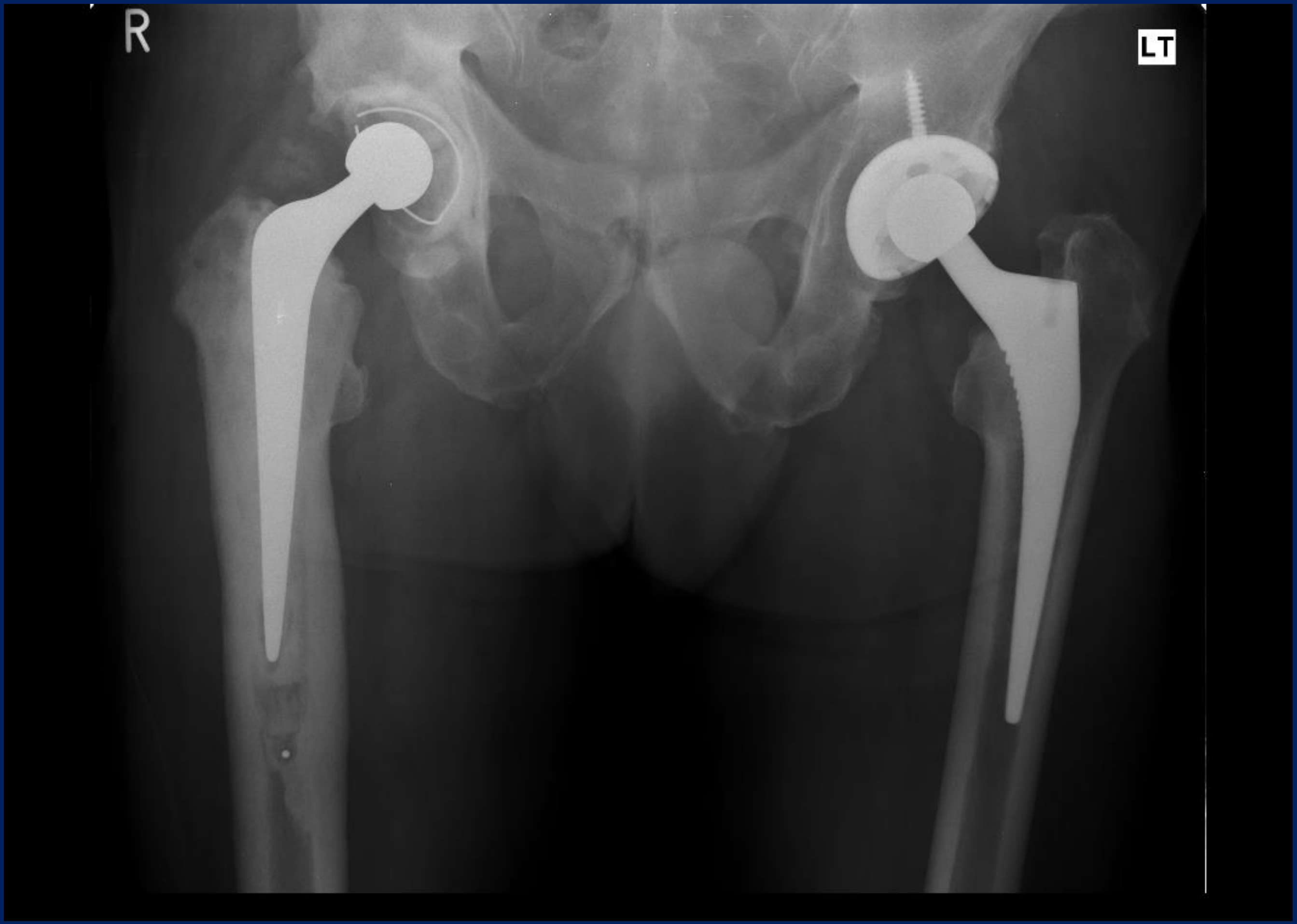

R
CROSS-TABLE

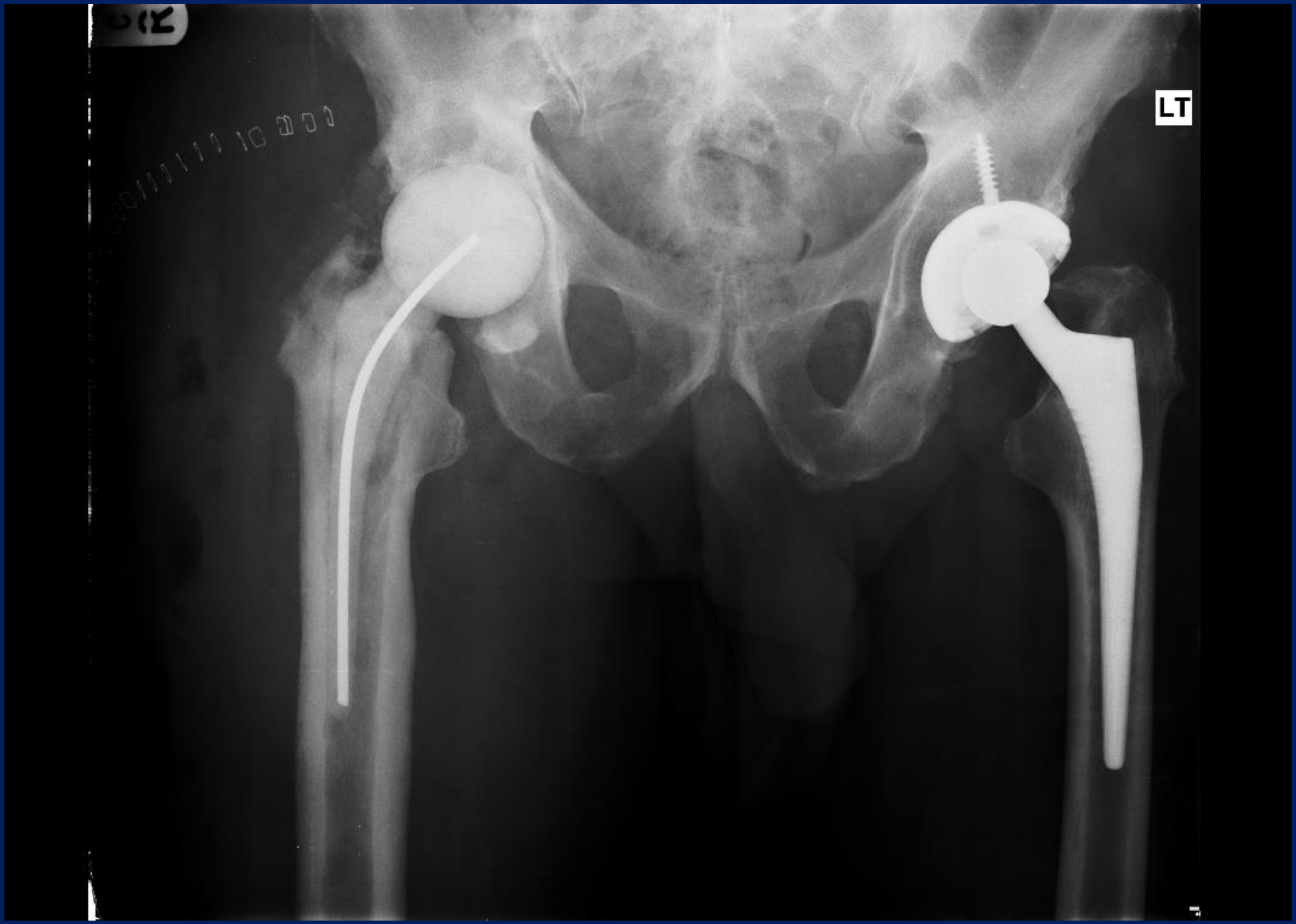

R
Hip Turned Lateral

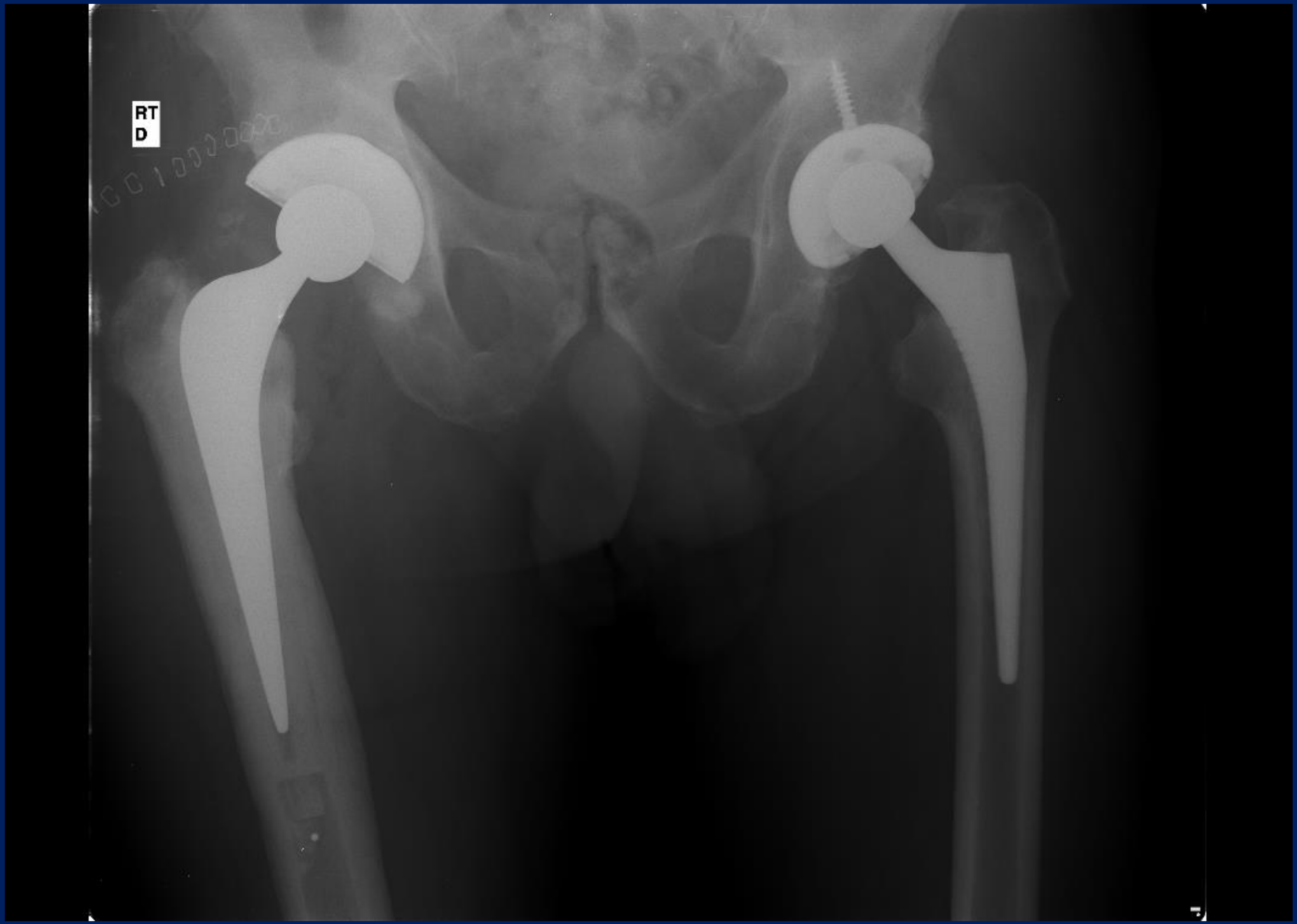

R

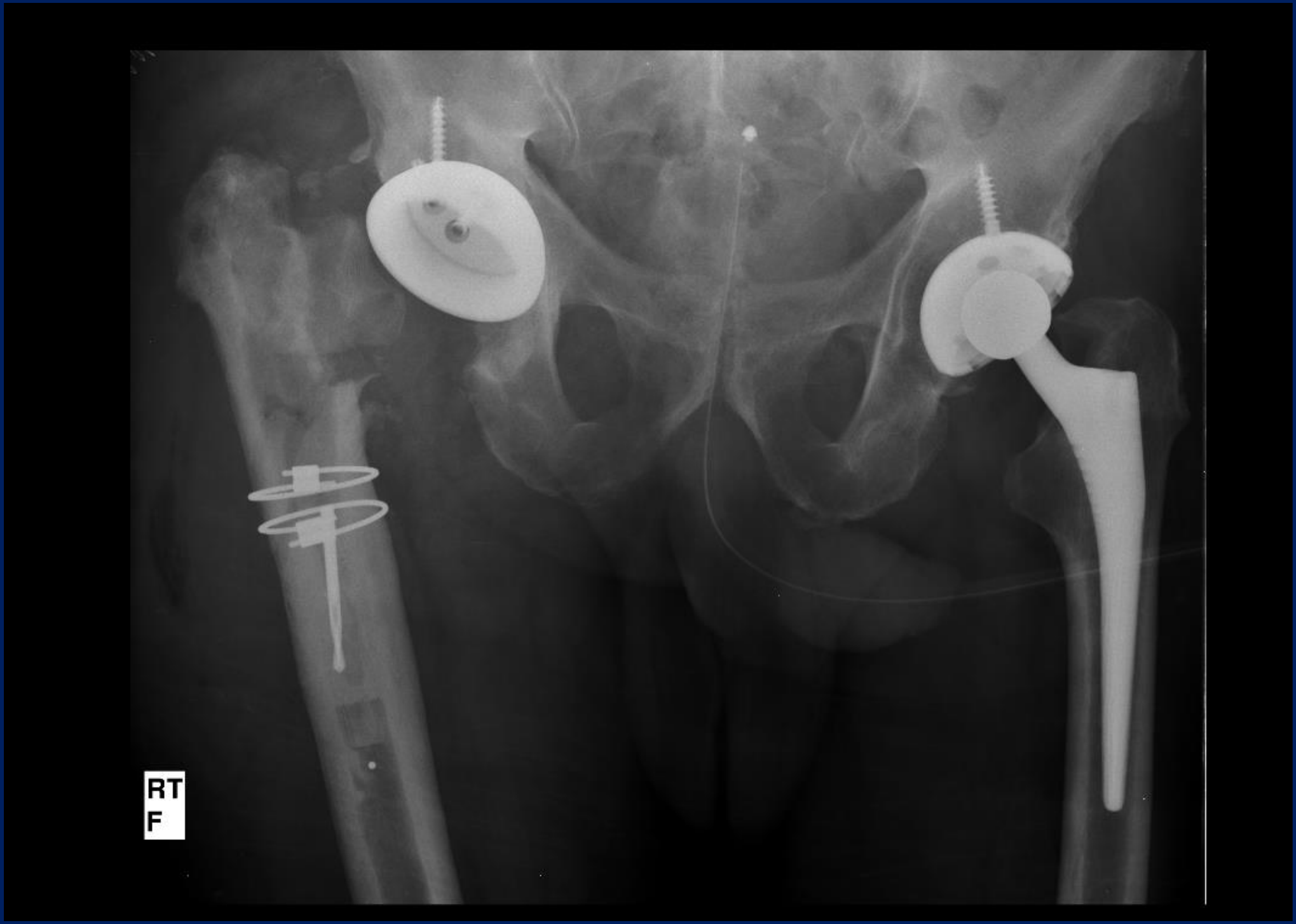

RT
Y

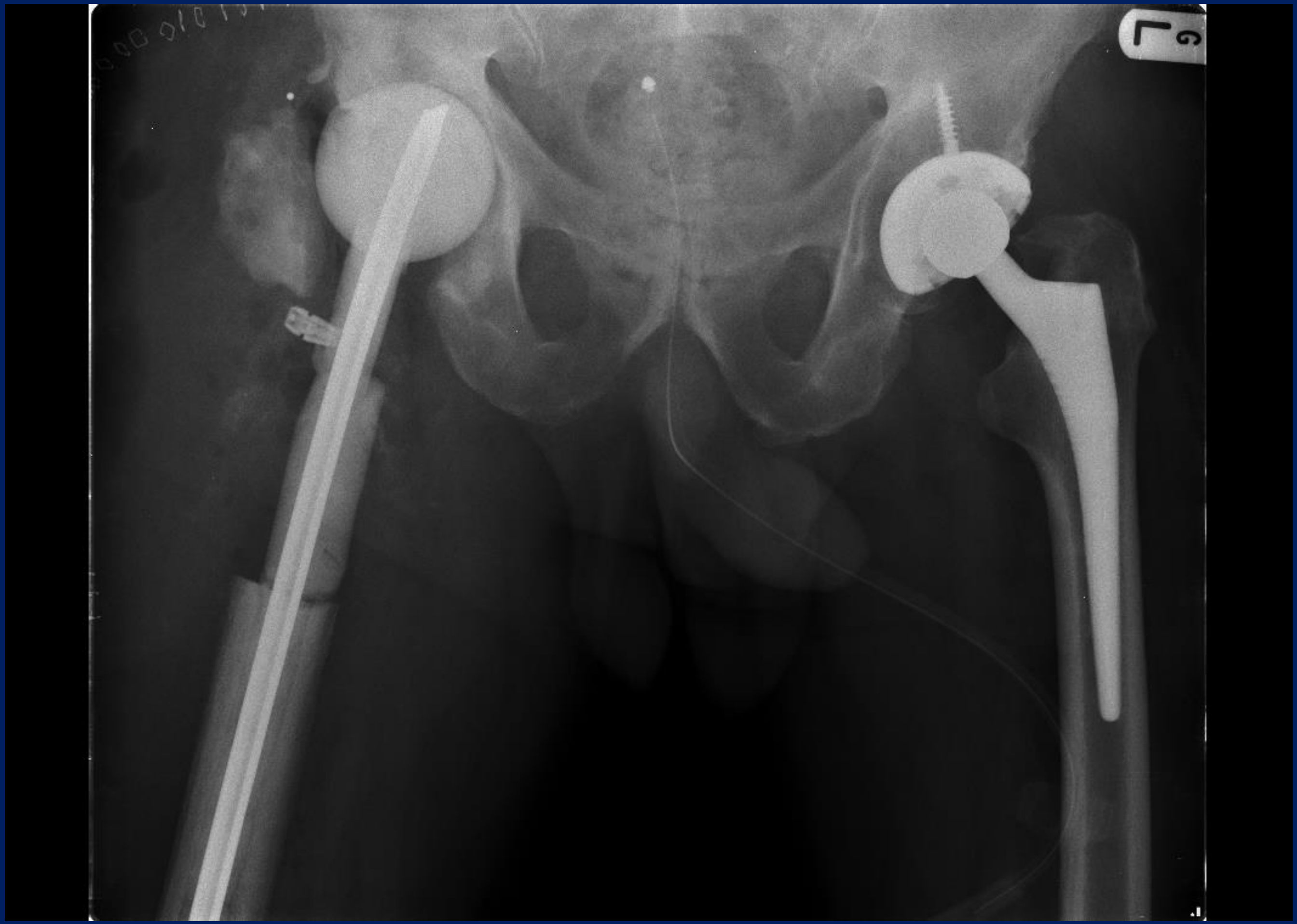
Proximal Femoral EPR
Periprosthetic Infections

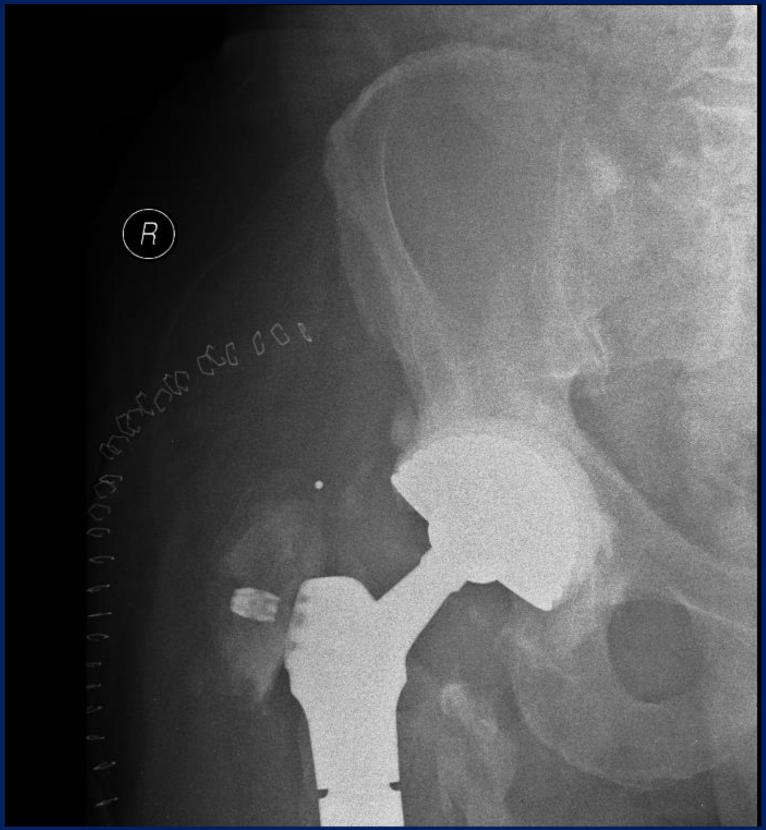



LT


RT
D


RT
F

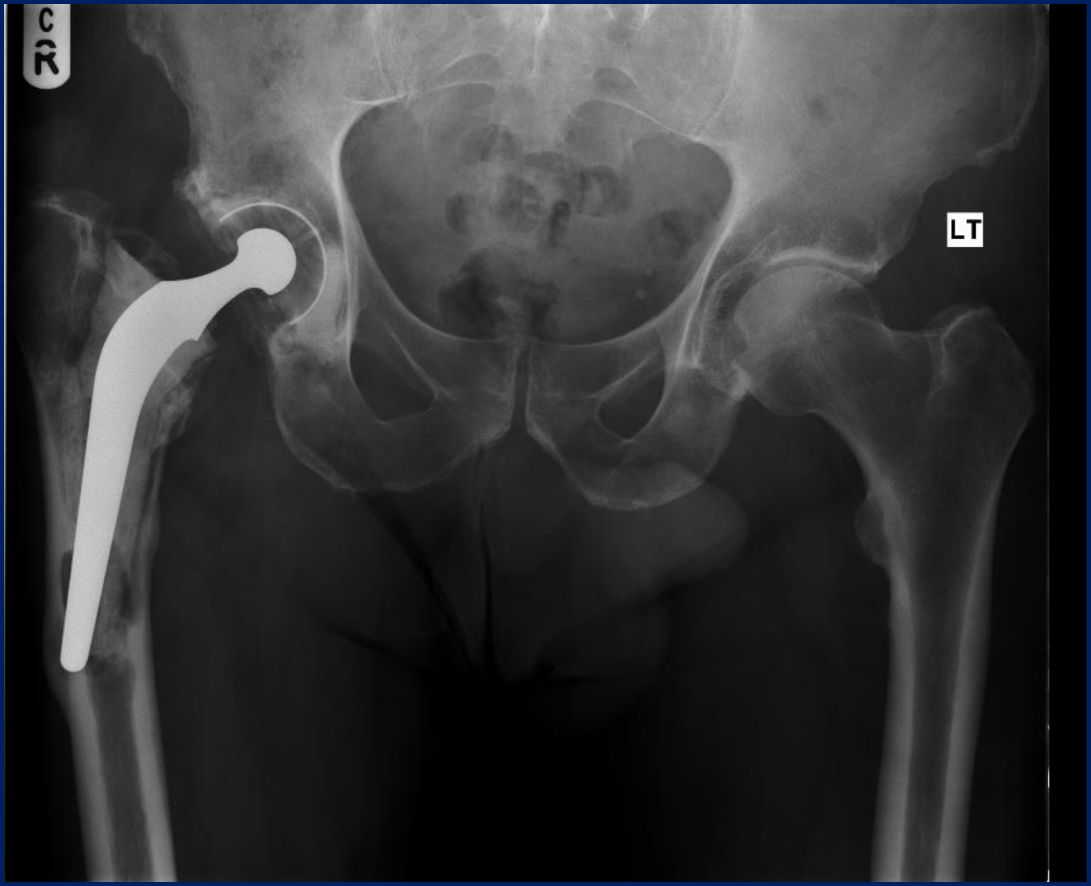


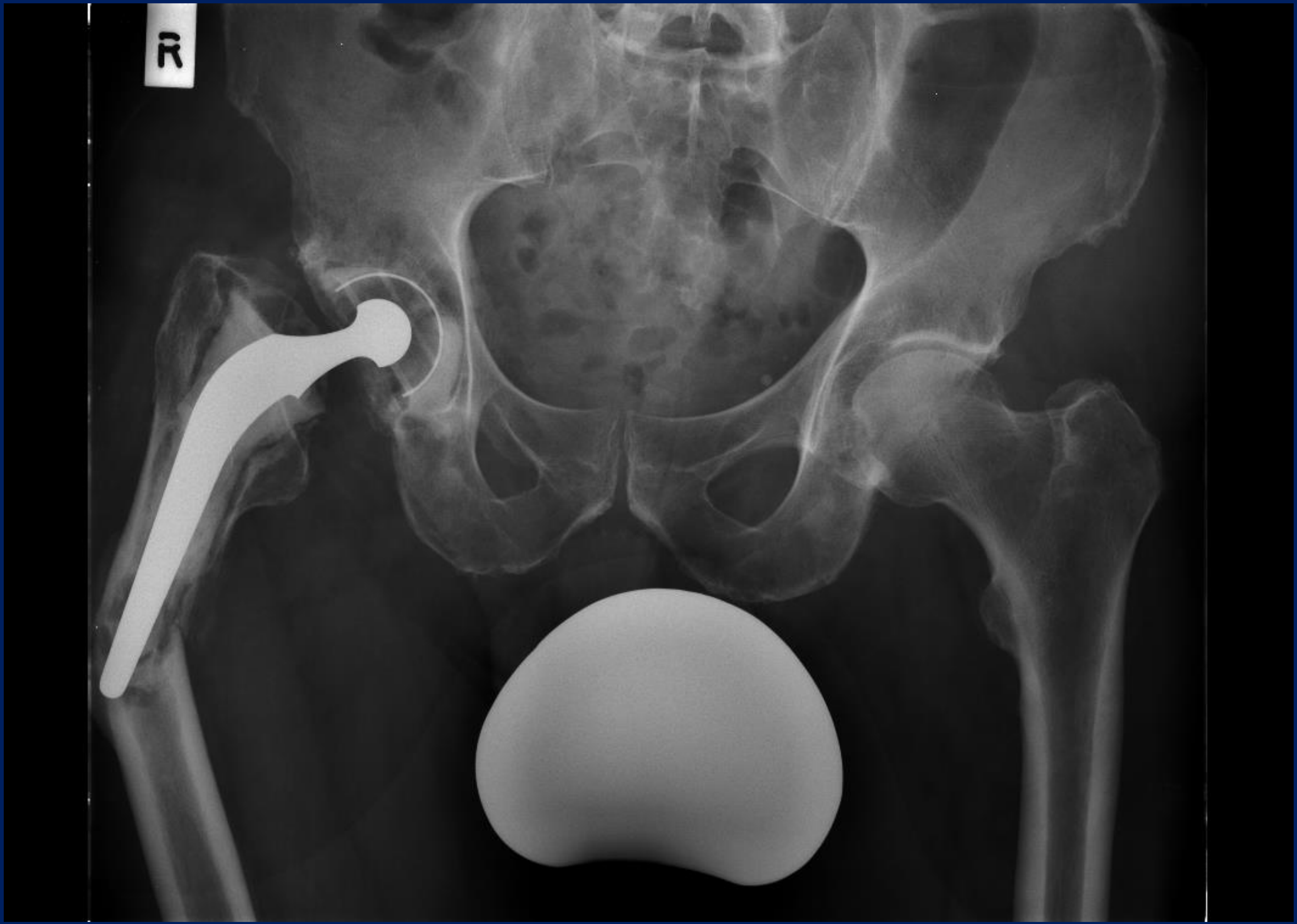

R

L


R
L
E

Proximal Femoral EPR
Failed Revision

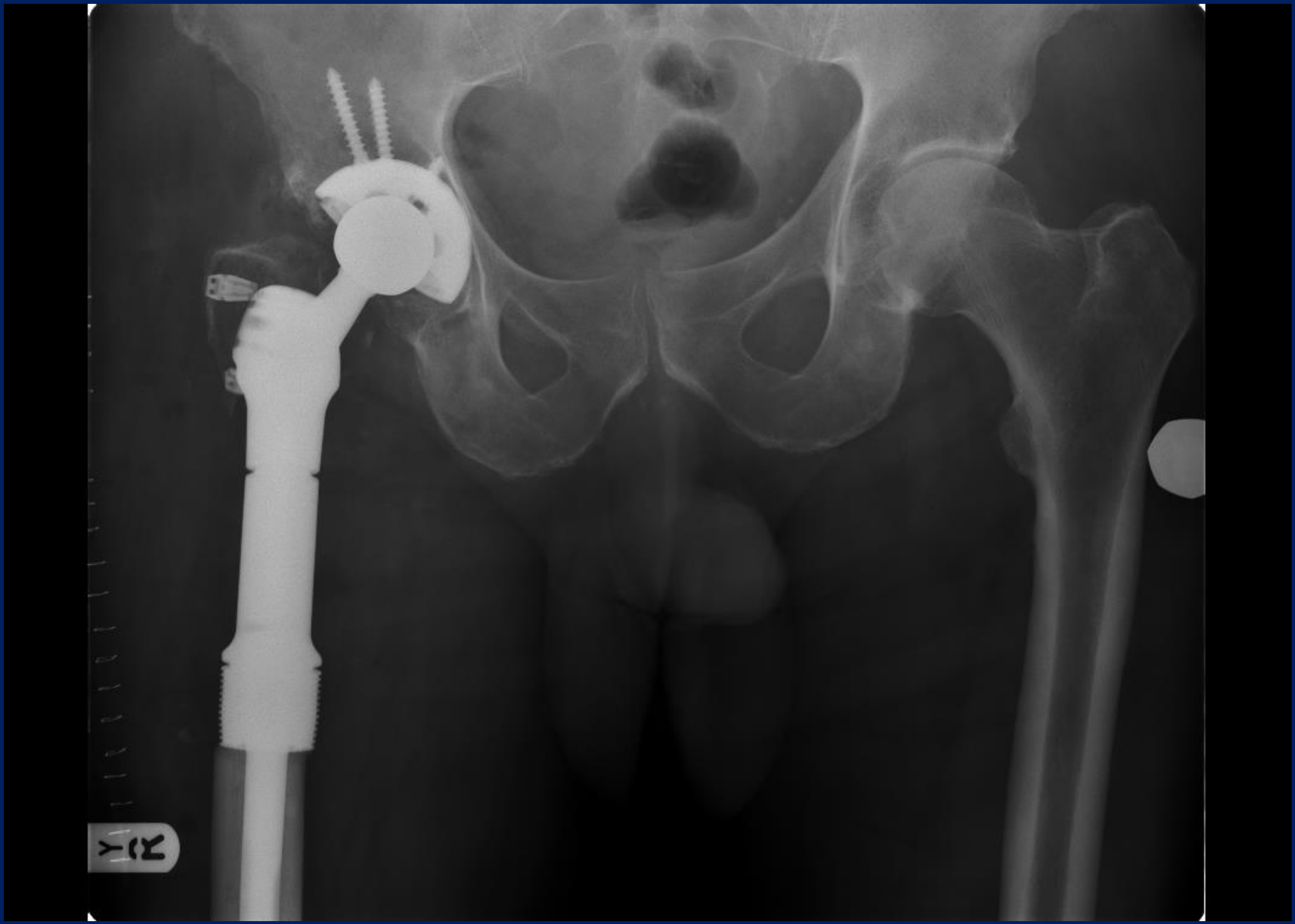



R


L

R


L



Proximal Femoral EPR

Methods (Continued):

- Mean time from first surgery to definitive EPR 29 (6-102) months
- Average number of previous procedures: 2.5 (range 1-9)
- EPR - one stage in 28 (77.8%) cases
  - two stage in 8 (22.2%) cases
- Mean Operative time: 140 (68-212) minutes

Proximal Femoral EPR

Articulations :

- Bipolar, n=7
- Unipolar, n=5
- Total hip arthroplasty, n=24
  - Uncemented shell, n=6
  - Cemented with constrained liner, n=18

Proximal Femoral EPR

Results:

Mean OHS:

- Pre-op: 8 (range, 0 to 16) points
- Post-op 31 (range, 19 to 40)

Proximal Femoral EPR

Complications (8%):

- Infections: 2
- Dislocation: 1

Proximal Femoral EPR

Summary :

- Effective salvage procedure with good results
- Good pain relief
- Immediate weight bearing and restoration of functions
- Minimal complications.

Thank you!

Questions?

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Dipartimento di
Scienze Mediche di Base,
Neuroscienze ed Organi di Senso

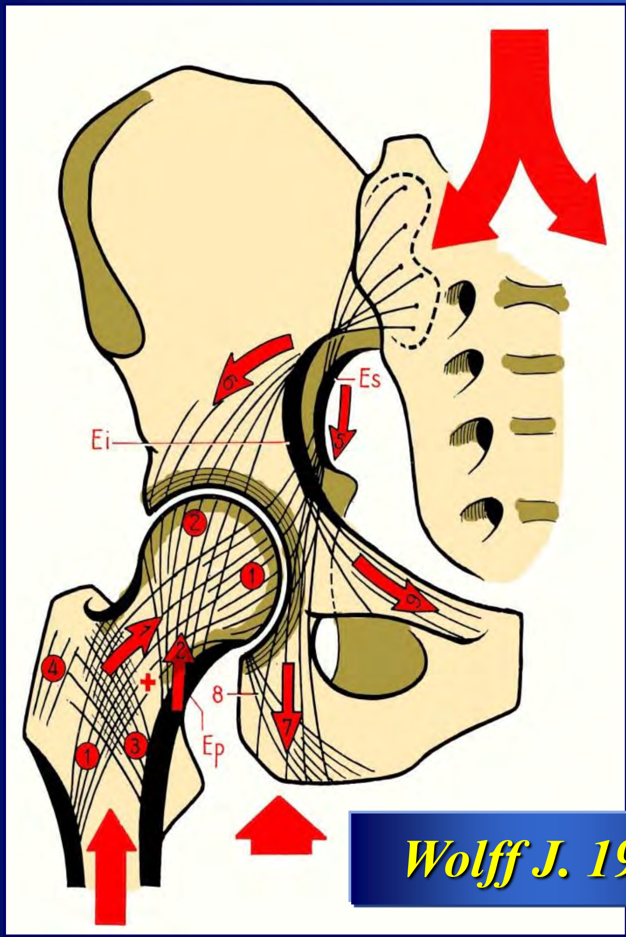
UU.OO. ORTOPEDIA E TRAUMATOLOGIA
Direttore: Prof. B. Moretti

TRABECULAR METAL CUPS FOR ACETABULAR REVISION SURGERY

G. Solarino,
G. Vicenti, L. Montenegro, A. Piazzolla, A. Panella, B. Moretti

INTRODUCTION

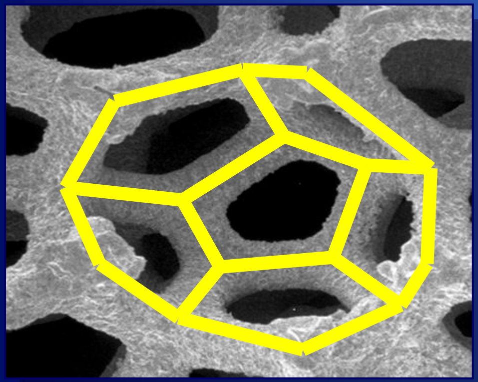
Aims in revision hip surgery

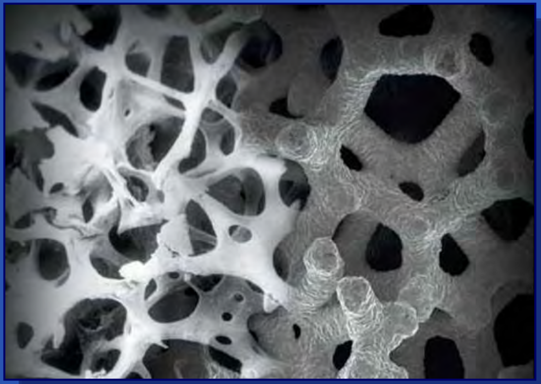


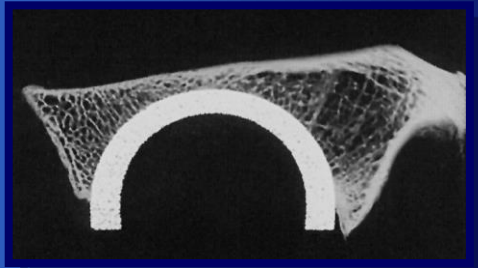
Wolff J. 1986

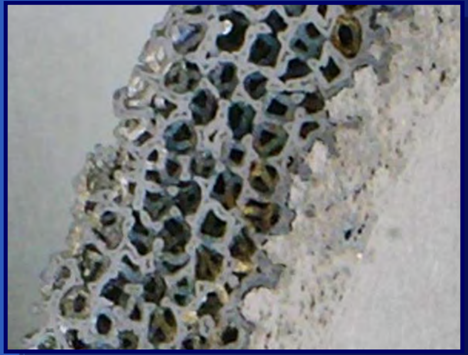
- **Clinical:** good function of the hip joint
- **Biomechanical:** center of rotation
- **Anatomical:** fill bone defects
- **Biological:** graft incorporation

- Tantalum metal for orthopaedic use was initially **introduced in 1997**
- Trabecular metal has an unusually large and **interconnecting porous surface** which corresponds to between 75%and 80% of its total volume
- The average pore diameter of the porous tantalum shell is **550 μm**
- The microtexture of trabecular metal is **osteoconductive**
- Tantalum metal for the acetabular component in THA was developed to enhance the fixation properties





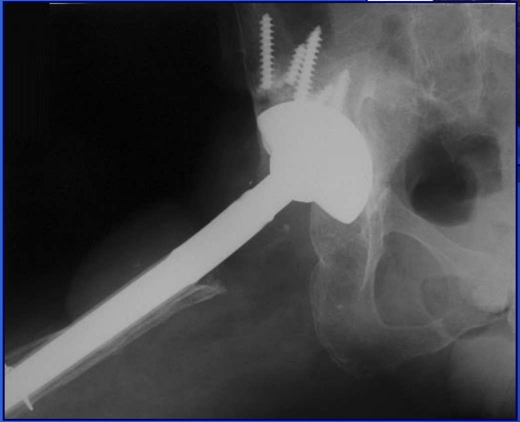


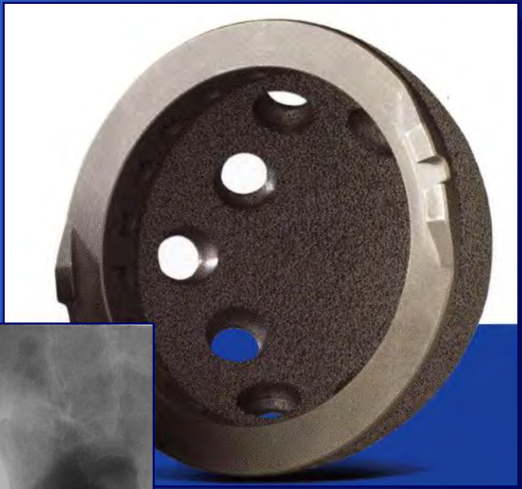


Th. A. Xenakis et al., International Orthopaedics (SICOT) 2009; 33:911–916
G. A. Macheras et al., J Bone Joint Surg [Br] 2006;88-B:304-9

- **Gaining optimum peripheral press-fit stability maximises initial component macro-fixation, allowing for subsequent biological fixation *(in-growth/on-growth)***

- **Gaining optimum peripheral press-fit stability maximises initial component macro-fixation, allowing for subsequent biological fixation *(in-growth/on-growth)***





C.T. ♀ a. 55

Our Experience

- 52 patients , 38F 14M, avg. age 70yrs
- 48 aseptic loosening
- Preop. avg. HHS 30
- Avg. 10 yrs after primary THA
- 39 acetabular & femoral revision
- Paprosky: I 6 - IIA 4 - IIB 7 - IIC 6 - IIIA 17 - IIIB 12

- All patients were operated on in the lateral decubitus position
- We routinely used a lateral direct approach
- Transtrochanteric in complex acetabular revisions

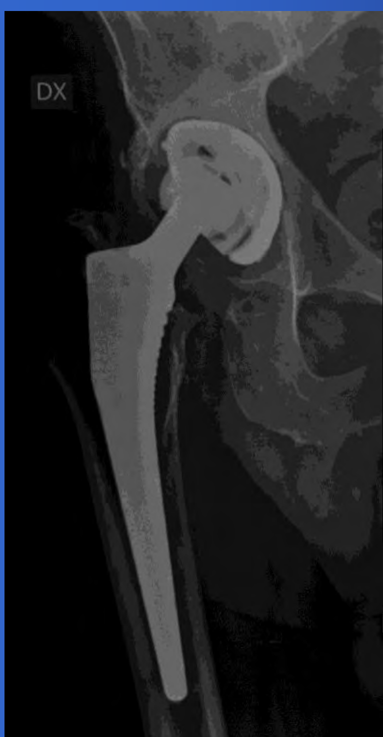
(if necessary the slide was extended distally to remove the femoral stem)

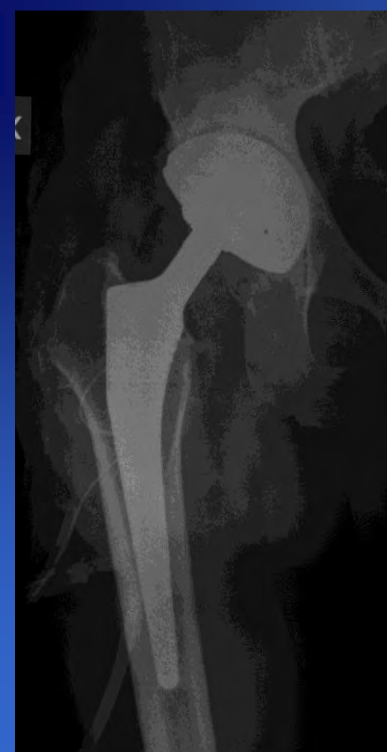
- We used the acetabular reamers in increasing diameters

to obtain the best possible press-fit of the trial shells between the anterior and posterior walls of the acetabulum

Table 1 Paprosky classification of acetabular defects

Type of defect	Radiographic and intraoperative findings
Type-I	Acetabular rim, anterior-posterior column intact Implies near primary situation with >90% host bone support of cup
Type-II	Less than 3 cm superior migration Distorted acetabular rim. Intact anterior and posterior columns Adequate stability with Trial. Greater than 50% contact surface
IIA	Superior and medial cavitation defect. Intact rim
IIB	Segmental supero-lateral defect (less than 1/3 of circumference)
IIC	Medial defect with cup medial to Kohler's line (Protrusio)




IIIA "Up and Out"	Lateral to Kohler's line. Intact medial support Moderate ischial lysis (<15 mm below superior obturator line) Medial limb of teardrop is intact Superior and lateral migration "up and out" Contact of trial with bone over 40–60% Intact ilioischial and iliopubic
IIIB "Up and In"	Broken Kohler's line. No medial or superior supportn Extensive ischial osteolysis (>15 mm below superior obturator line) Complete destruction of tear drop Superior and medial migration "up and in" Under 40% contact surface. High risk of occult pelvic discontinuity
Pelvic discontinuity	Fracture line through columns Broken Kohler's line or obturator foramen asymmetry on AP pelvis Superior and inferior hemipelvis separation

- The most common locations of the defects were **superolateral and posterosuperolateral**
- Definitive **decision to use an augment** was made intraoperatively if an oblong bone defect was recognized that could not support the hemispheric component

Type IIIA CAVITARY DEFECT

"Up and out"

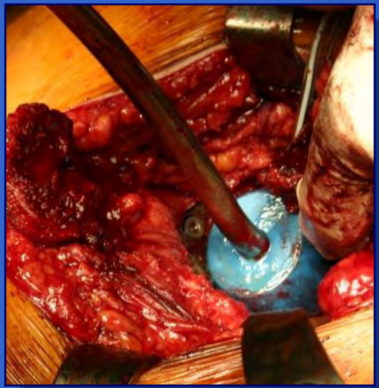
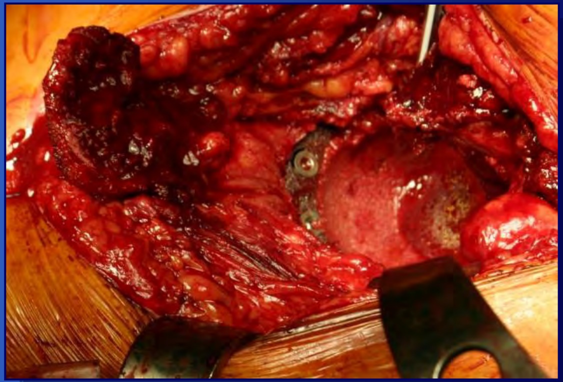
- Kohler's Line: Intact
- Tear Drop & Ischial Lysis: Minimal
- Vertical Migration > 3cm

G. A. a. 77 ♂

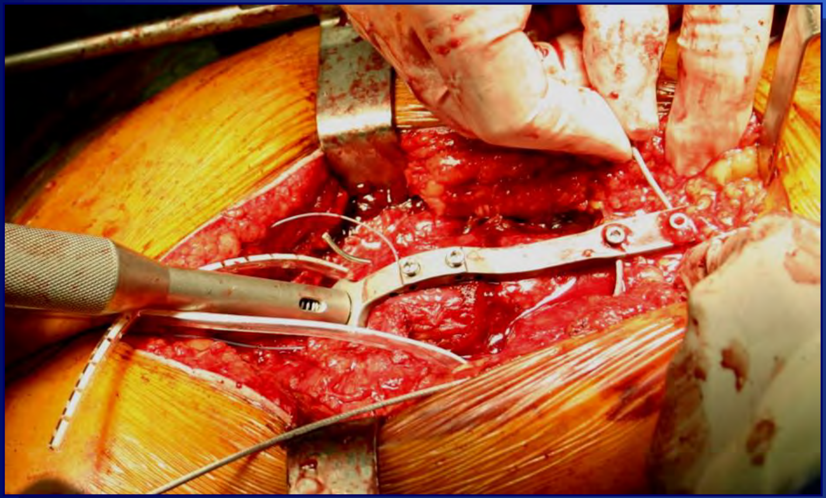
- In most cases we did <u>not</u> use bone cement between the augment and the cup *Siegmeth et al. Clin Orthop Relat Res (2009) 467:199–205*

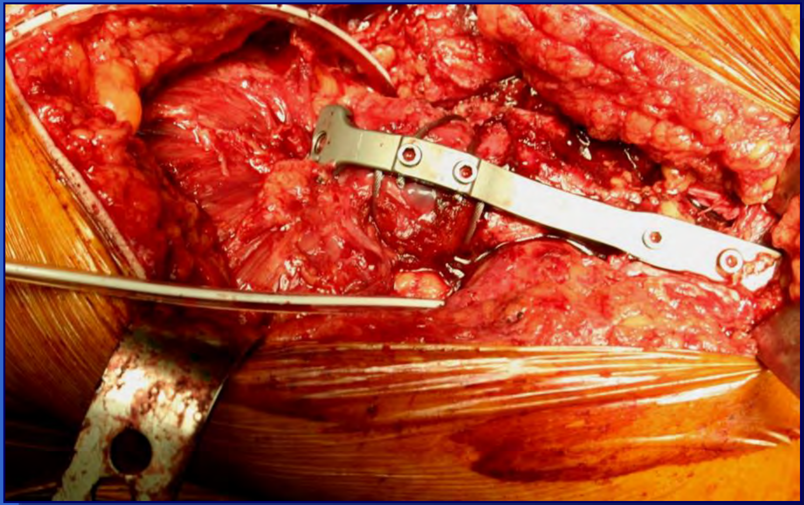

- **Morcellized bone allograft** was placed to fill the medial defect and within the augment



- Ev. revision of the stem
- Trocantheric fixation with plate

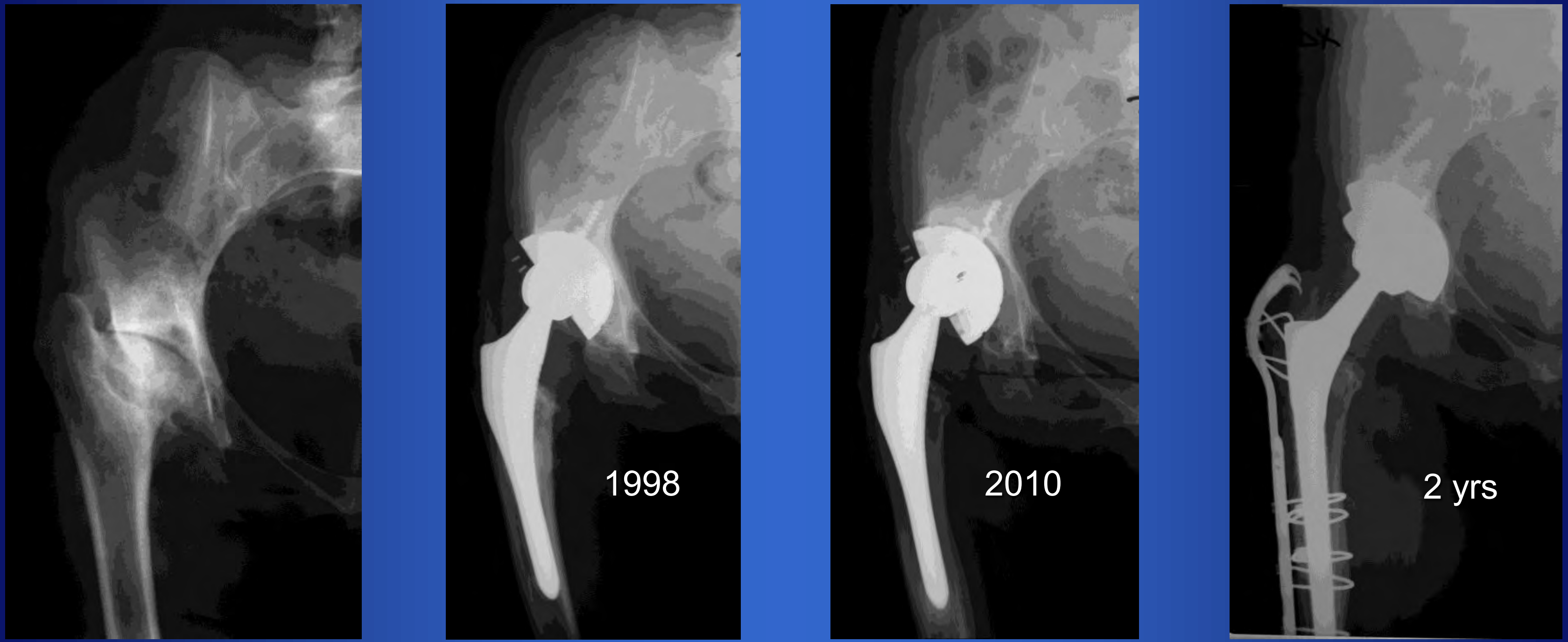




Type IIIA CAVITARY DEFECT

“Up and out”

- **Kohler’s Line: Intact**
- **Tear Drop & Ischial Lysis: Minimal**
- **Vertical Migration > 3cm**

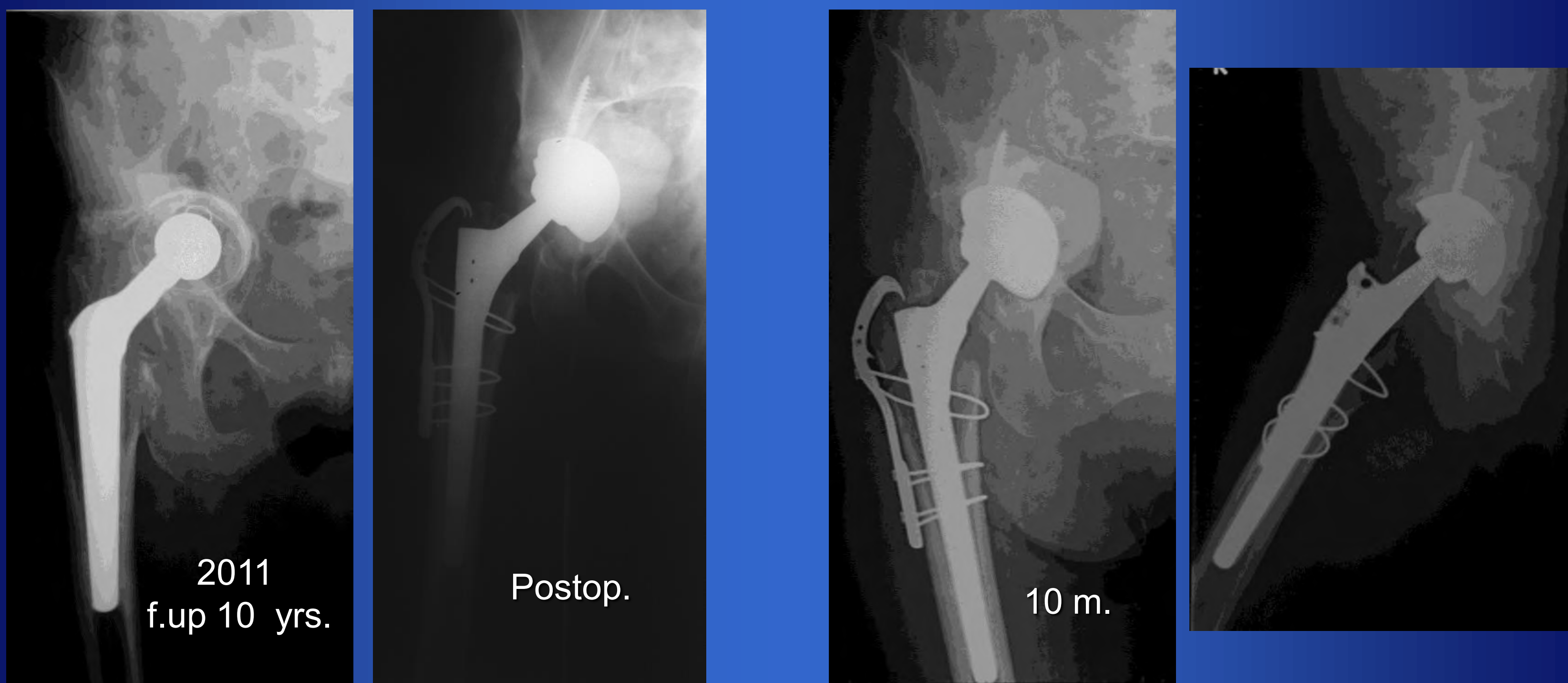


L. A. a. 47 ♀

Type IIIB MEDIAL DEFECT

"Up and in"

- Kohler's Line: Violated
- Tear Drop & Ischial Lysis: Severe
- Vertical Migration: Severe, > 3cm



E. T. a. 81 ♀

Type IIIB MEDIAL DEFECT

"Up and in"

- Kohler's Line: Violated
- Tear Drop & Ischial Lysis: Severe
- Vertical Migration: Severe, > 3cm

L. M. a. 80 ♀

CONCLUSIONS

Clin Orthop Relat Res (2015) 473:521–527
DOI 10.1007/s11999-014-3861-x

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

SYMPOSIUM: 2014 HIP SOCIETY PROCEEDINGS

Continued Good Results With Modular Trabecular Metal Augments for Acetabular Defects in Hip Arthroplasty at 7 to 11 Years

Michael R. Whitehouse PhD, MSc(Orth Eng), FRCS(Tr&Orth), Bassam A. Masri MD, FRCS(C), Clive P. Duncan MD, MSc, Donald S. Garbuz MD, MHSc

Conclusions The results of the acetabular trabecular metal augments continue to be encouraging in the medium to long term with low rates of revision or loosening in this complex group of patients. We continue to recommend the use of these augments in the reconstruction of complex acetabular defects.

The Journal of Arthroplasty 30 (2015) 1024–1029

Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

ELSEVIER

Trabecular Metal Augments for the Management of Paprosky Type III Defects Without Pelvic Discontinuity

Guido Grappiolo, MD [a], Mattia Loppini, MD [b], Umile Giuseppe Longo, MD, PhD, Msc [b], Francesco Traverso, MD [a], Giuseppe Mazziotta, MD [a], Vincenzo Denaro, MD [b]

Fifty-five hips undergoing acetabular reconstruction with trabecular metal (TM)-coated cup and TM augments were reviewed at an average follow up of 53.7 months (36–91). Bony defects were Paprosky type IIIA in 42 and type IIIB without pelvic discontinuity in 13 hips. The average HHS increased from 40 (27–52) preoperatively to 90.5 (61–100) postoperatively ($P < 0.0001$). Four (7.3%) of 55 hips underwent acetabular components revision: three cases of loosening (5.4%), and one of recurrent instability (1.8%) were reported. Survival rate at 2 and 5 years was 96.4% and 92.8%. In conclusion, the use of TM-coated cups and augments could be considered an effective management of Paprosky type III defects without pelvic discontinuity providing good clinical and radiographic outcomes in the mid term.

BARI

CONCLUSIONS

Eur J Orthop Surg Traumatol (2014) 24:911–917
DOI 10.1007/s00590-013-1354-3

ORIGINAL ARTICLE

Porous tantalum shells and augments for acetabular cup revisions

Andrej Moličnik · Marko Hanc · Gregor Rečnik ·
Zmago Krajnc · Mitja Rupreht · Samo K. Fokter

Conclusion While awaiting longer-term follow-up studies, trabecular metal components show sufficient primary stability and appear suitable for revision hip arthroplasty with acetabular bone loss.

26 *Acta Orthopaedica* 2015; 88 (1): 26–31

Short-term survival of the trabecular metal cup is similar to that of standard cups used in acetabular revision surgery

Analysis of 2,460 first-time cup revisions in the Swedish Hip Arthroplasty Register

Maziar MOHADDES, Ola ROLFSON, and Johan KÄRRHOLM

Interpretation — Our data support continued use of TM cups in acetabular revisions. Further follow-up is necessary to determine whether trabecular metal cups can reduce the re-revision rate in the long term, compared to the less costly porous press-fit and cemented designs.

CONCLUSIONS

Higher friction coefficient of porous tantalum on bone compared to other porous surfaced biomaterials.

International Orthopaedics (SICOT) (2011) 35:289–298
DOI 10.1007/s00264-010-1198-y

ORIGINAL PAPER

Cementless acetabular revision: past, present, and future

Revision total hip arthroplasty: the acetabular side using cementless implants

Luis Pulido · Sridhar R. Rachala · Miguel E. Cabanela

Table 2 General characteristics of highly porous metal coatings for acetabular revision

Biomaterial properties	Trabecular metal	Tritanium	Regenerex	Stiktite	Gription
Metal coatings	Tantalum	Titaniuim	Titanium	Titanium	Titanium
Modulus of elasticity (GPa)	2.5–3.9	106–115	1.6	NA	NA
Average pore size	550 μm	616 μm	300 μm	200 μm	300 μm
Porosity	75%	60%	67%	60%	63%
Coefficient of friction	0.88	0.65	NA	96–100	1.2

"Change is one thing, progress is another"

Bertrand Russell (1872–1970)

Thank you

www.ortopedia1.uniba.it

giuseppe.solarino@.uniba.it

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

BRITISH HIP SOCIETY

SIDA/BHS November 25th-27th
Milan 2015

"Four Year Results With A Minimum Of Three Year Follow Up Of A Modular Trabecular Metal Cup In Management Of Acetabular Reconstruction following Adverse Reaction to Metal Debris with ALVAL from Single Surgeon In The United Kingdom."

Mr. Simon West, Mr.Mohammed Mussa,
Mr. Shyju Parakambalath
BMI Three Shires Hospital, Northampton

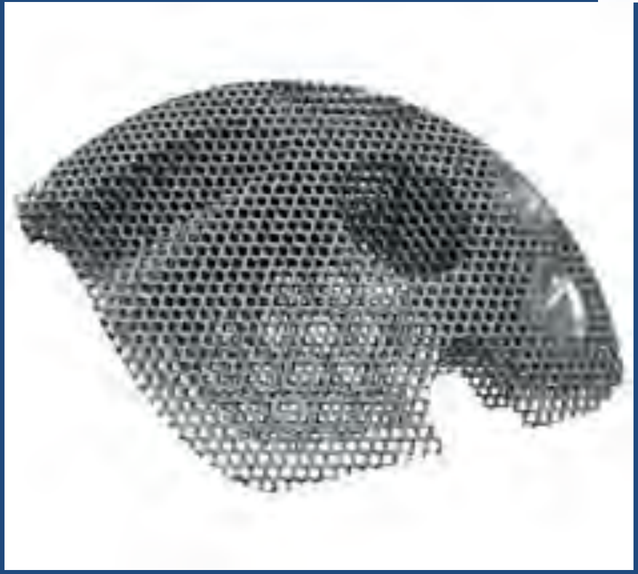
BMI Healthcare
Serious about health.
Passionate about care.

Disclosures

- DePuy/ Synthes
- Lima Corporate

Introduction

- Reconstruction In patients with ARMD and ALVAL remains a major challenge.
- We reviewed our use of the Delta One Cup system (LIMA Corporate).
- The system utilises internal augments for optimal orientation and external augments to allow maximum purchase in host bone.



Lima Corporate
Orthopaedic emotion

Objectives

- To review our use of this modular trabecular cup system with internal and external augments in management of acetabular deficiency following ARMD and ALVAL.

Methods

- A retrospective review of 48 revisions.
- Indication for revision was ARMD on MARS MRI and/or raised metal ions.
- Minimum follow up was 36 months.


R

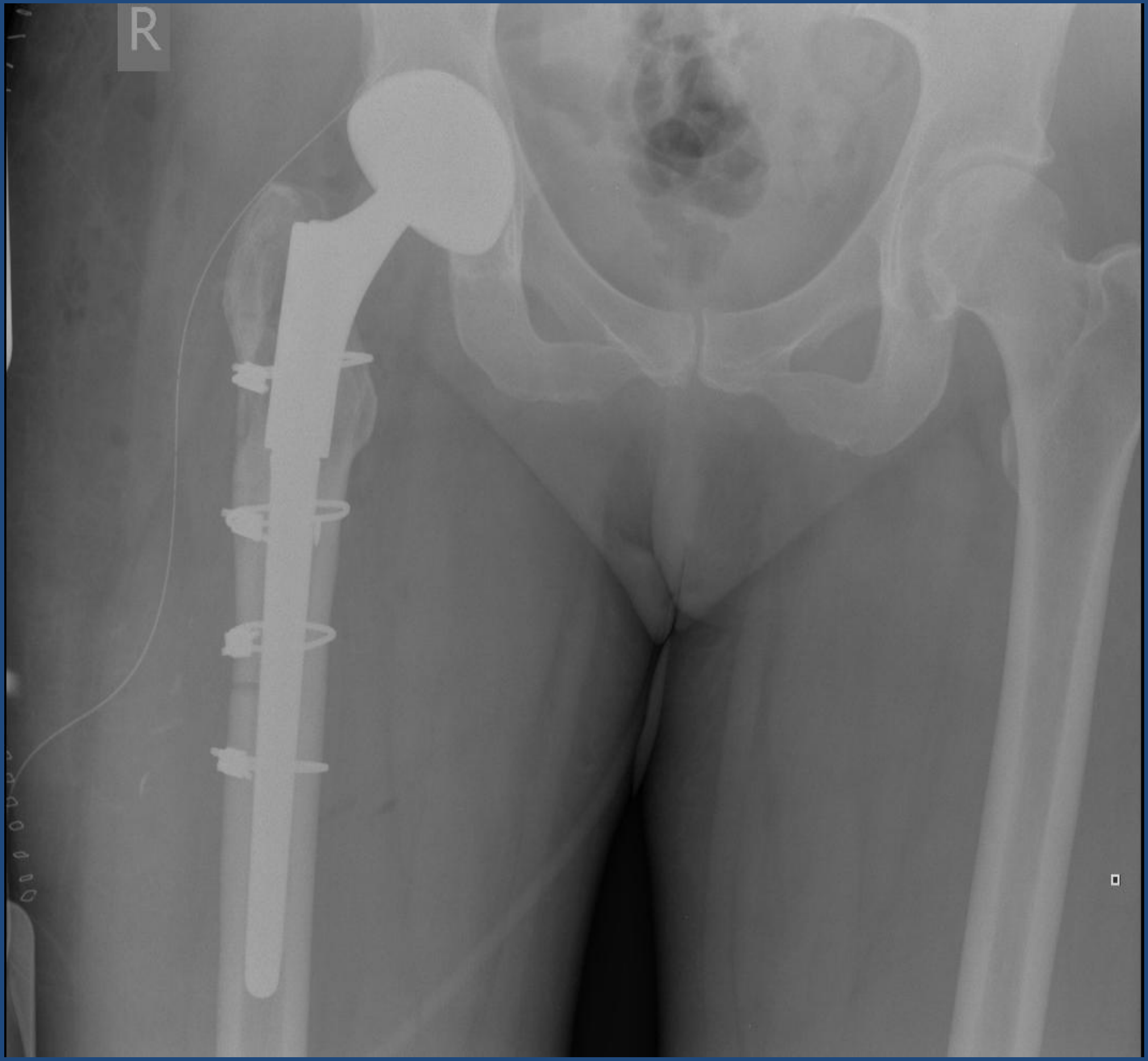
R

Results

- No failures seen at 36 months.
- In all 48 cups there were no lucent lines with excellent fixation.
- Average Harris hip scores increased from 55 preoperatively to 76 postoperatively.
- Initial dislocation rate with unipolar bearing was high 15% (3 in 20 cases).

Results

- With conversion to Dual Mobility bearing there have been no further dislocations.
- 5 cases involve use of an external augment and 3 an internal augment (face changer).
- All cases showed poor bone with evident ARMD.


R

Conclusions

- The ability to utilise internal or external augments is a valuable option in revision associated with ARMD and ALVAL.
- This trabecular titanium cup provides excellent hold in ARMD and additional screws were not necessary.
- Dual Mobility bearings are recommended to reduce dislocation rate in revision as a consequence of ARMD and ALVAL.

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Acetabular revision with Trabecular Metal™ Cup: Clinical and Radiographic results at 10 years follow-up

*- F. Bassini, E. Miani, **A. Regeni**, A. Belloni (Italy) -*

REGIONE AUTONOMA FRIULI VENEZIA GIULIA
azienda per l'assistenza sanitaria
3 Alto Friuli, Collinare, Medio Friuli

U. O. Ortopedia Tolmezzo

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

Acetabular revision with Trabecular Metal™ Cup: Clinical and Radiographic results at 10 years follow-up

- F. Bassini, E. Miani, **A. Regeni**, A. Belloni (Italy) -

REGIONE AUTONOMA FRIULI VENEZIA GIULIA
azienda per l'assistenza sanitaria
3 Alto Friuli, Collinare, Medio Friuli

U. O. Ortopedia Tolmezzo

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

Higly Porous Metals (HPM)

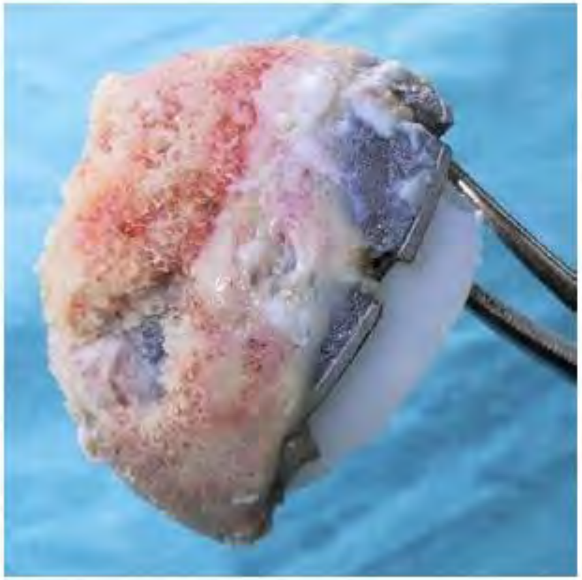
	TMT ™	TT ™	Tritanium™	Regenerex™	Stikite™	Gription™
Material	Tantalio	Ti6Al4V	Titanio	Titanio	Titanio	Titanio
Elastic	2,5 – 3,9	1,1 – 4,3	4	1,6	NR	1,2
Pore size	550 mm	650 mm	616 mm	300 mm	200 mm	300 mm
Porosity	75% - 80%	63%	60%	67%	60%	63%
Friction	0,88	2,5	0,65-1,01	ND	96 – 100	1,2

- High **Porosity.**
- High **Friction.**
- Low Modulus of **Elasticity.**

Good bone ingrowth

Trabelucar Metal (TMARS)

- Augments, Restrictors, Buttress, Shims and Cup Cages.
- Extra Screws.



Purpose

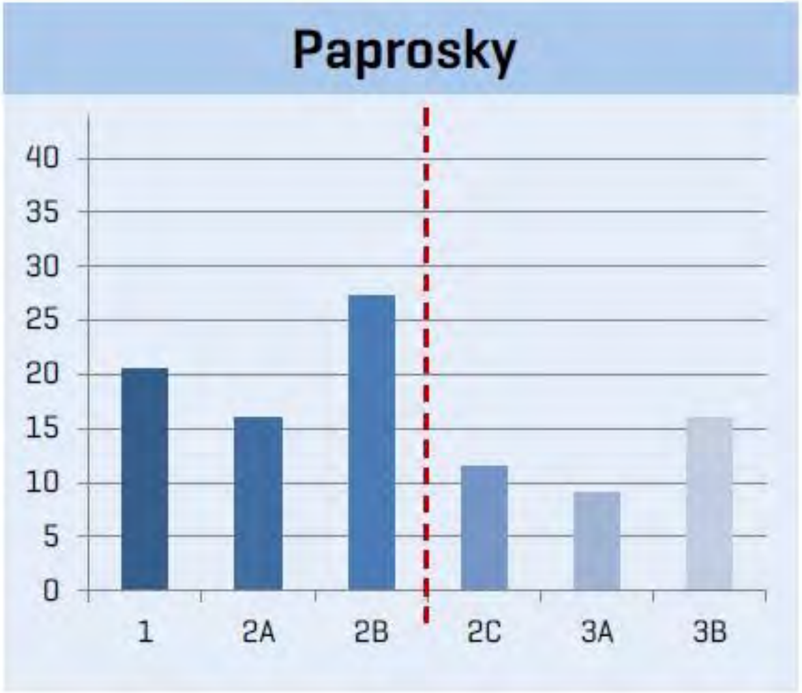
Author/year	N° di anche	Follow-up anni (range)	Sopravvivenza (asettica) %	Migrazione coppa >5 mm (%)	Paprosky		
					1	2	3
Sporer et al. (2006)	13	2,6 (1–3)	100	NR	0	0	3B: 13
Weeden et al. (2007)	43	2,8 (2–4)	100	2	0	0	3A: 33 3B:10
Flecher et al. (2008)	23	2,9 (2 to 4,2)	100	0	0	0	3A: 17 3B: 6
Sporer et al. (2008)	28	3,1 (1–4)	100	NR	0	0	3A: 28
Seigmeth et al. (2009)	34	2,8 (2–4,6)	94,1	5,9	0	2A: 4 2B: 2 2C: 1	3A: 19 3B: 8
Lingaraj et al. (2009)	23	3,4 (2–5,2)	100	4,3	0	0	3A: 16 3B: 7
Jafari et al. (2010)	81	3 (2–5,3)	94	NR	55 (1 → 2B)		26 (2C → 3B)
Davies et al. (2011)	46	4,2 (2,3–6,3)	100	NR	0	2C: 10	3A: 21 3B:11
Del Gaizo et al. (2012)	37	5 (2,2–8,8)	97,3	2,7	0	0	3A: 37
Sterheim et al. (2012)	53	6 (5–8,5)	92,5	3,8	Contatto componente-osso ospite < 50%		
Batuyong (2014)	24	3,1 (2-5,5)	88	NR	0	0	3A: 19 3B:3+2
Whitehouse et al. (2015)	40	9,2 (7,3-10,7)	92%	NR	0	2A: 6 2B: 9 2C :2	3A: 28 3B: 11

Materials and Methods

- **Between 2002 and 2015:** 144 cases.

  We revisited the cases from 2002 to 2008 (70).

- **Total:** 44 cases (17 deceased and 9 lost at follow up).
  - **Average age:** 68 y (30 - 83).
  - **Follow up:** 9.3 y (7-13).
  - **Paprosky:**
    - *64% minor bone defect (1, 2A, 2B).*
    - *36% major bone defect (2C or higher).*



Materials and Methods

Clinical Result:

- Womac Score.
- Merlè D'Aubignè Score.
- PROMs (Patient satisfaction).

Radiographic Result:

- Osteolysis / Radiolucent line.
- Cup mobilizzation or migration (>3mm, >8°).

Survival of the Cup:

- ***Exchange or removal*** of the Cup.

Materials and Methods

- **Average cup size:**

  - 58mm (50 – 70mm).

- **Screws:**

  - None 3, One 1, Two 18, three 20 four 2.

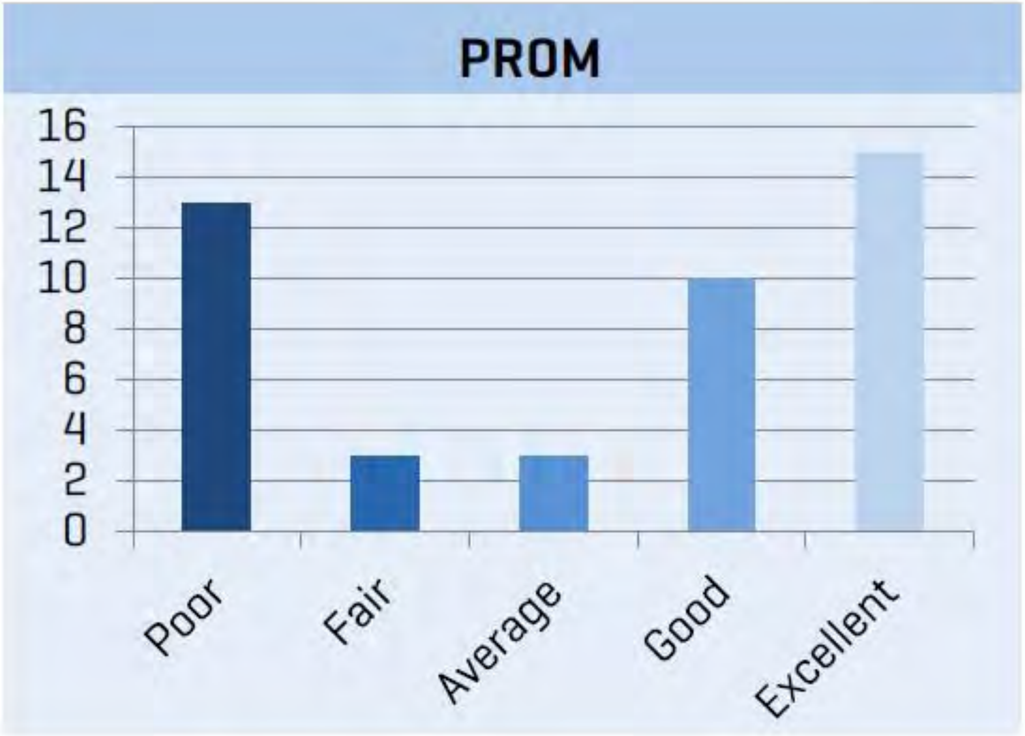
- **Structural bone graft:** 0.
- **Morselized bone graft:** 19 (43%).
- **Augments:** 3 (7%).

Augment?

Hanssen AD et al Orthopedics. 2004
Lakstein D et al Clin Orthop Relat Res. 2009

Clinical results

- **WOMAC:**
  - 45 (SD17).
- **Merle D'Aubigne:**
  - *15 excellent.*
  - *10 good.*
  - *3 average.*
  - *3 fair.*
  - *13 poor.*



X-ray results

- No lysis or migration.

Complications

- **Dislocation** → 5 (11,36%)

  - 2 closed reduction.

  - 2 changed liner and head.

  - 1 changed head.

- **Periprosthetic Femoral Fracture** → 2 (4,54%)

  - ORIF.

- **Infection** → 1 (2,27%)

  - Gilderstone.

Survival

97.73%

Conclusion

- **Reliability**:

  - *Also in long term.*

- **“Easier” Surgery:**

  - *Less cages.*

  - *No structural bone grafts.*

  - *<50% host bone contact.*

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY

SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

METALLIC AUGMENTS WITH CEMENTED SOCKETS AND IMPACTION GRAFTING IN ACETABULAR RECONSTRUCTION

[Metallica potenziati con cementato prese e innesto in impaction acetabolare ricostruzione]

C Jakaraddi
N Lokikere
T Board
N Shah
H Wynn-Jones

26 & 27 November 2015
Milan, ITALY

- Introduction
- Aim
- Methods
- Results
- Limitations
- Conclusions

DISCLOSURE

- No conflict of interest

Introduction

- Managing bone loss – Segmental & cavitary.
- Combined defects - a technical challenge.
- Options –

  Structural graft - failure to incorporate.

  Rim mesh - breakage, cup migration.

  Jumbo sockets - high hip centre.
- Augments & Impaction bone grafting (IBG)

  Ingrowth potential and versatility.

  Restores bone stock & hip centre.

Ultra Porous Metal Augments

- Structurally similar to cancellous bone
- Bone ingrowth potential
- Sizes and shapes to suit defects
- Scaffold for IBG
- Structural support to the implant
- Use in cemented and uncemented revision

Aim

To evaluate the outcomes of the technique combining porous metal augments with impaction bone grafting (IBG) for segmental and cavitary defects in cemented socket revisions.

Materials and Methods

- Retrospective review
- All cemented revisions with Augments + IBG 2008-14.
- Defects graded as per Paprosky classification.
- Primary endpoint: Acetabular re- revision for any reason.

Demographics

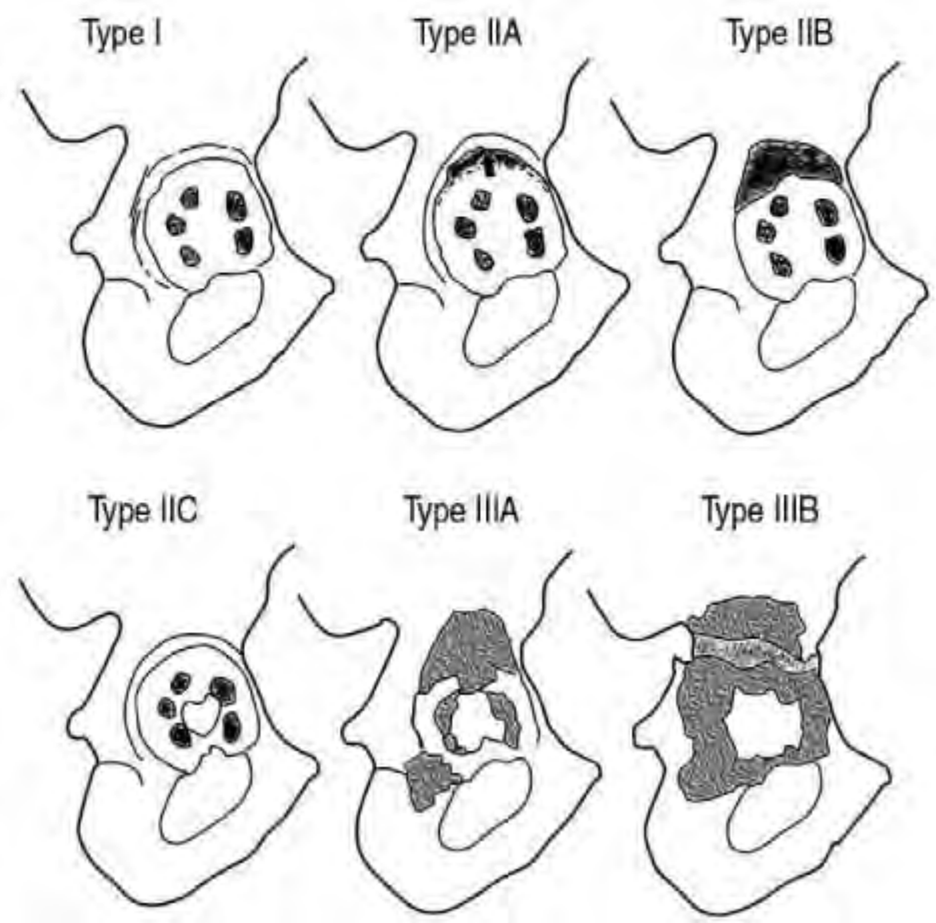
- Number of patients - 31 (Hips: 32).
- Male: female - 21:10.
- Average age at revision THR - 70.5years (21-85).
- Number of previous surgeries - 1-5.

Indications for revision

- Aseptic loosening - 25.
- Infection (2nd stage) - 3.
- Recurrent dislocation - 2.
- Periprosthetic fracture - 1.
- Adverse reaction to metal debris (ARMD) - 1.

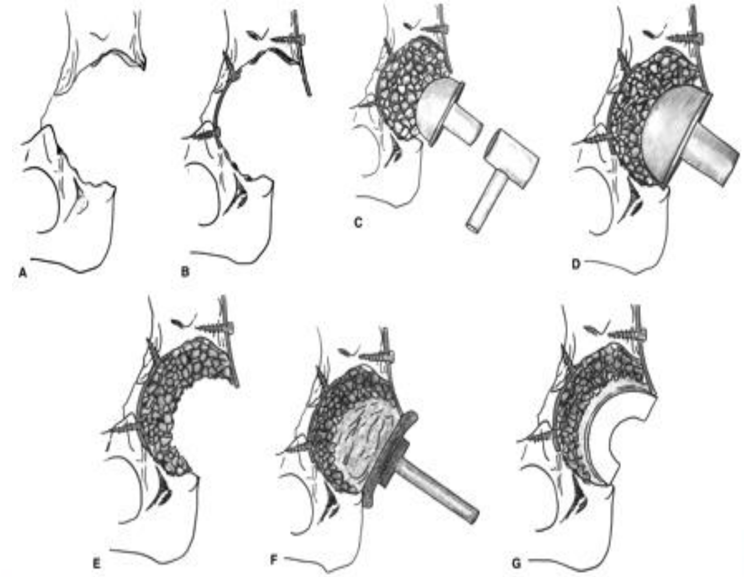
Paprosky Classification

- Paprosky 2B – 4
- Paprosky 3A – 14
- Paprosky 3B – 14



Surgical Technique

- Component extraction
- Assessment of bone loss
- Augment trialled & fixed
- IBG with femoral head allograft
- Cemented cup reconstruction
- +/- Femoral stem revision



Courtesy: Schreurs BW et al, *Instr Course Lect* 2001

Type of augments

- TM Augment (Zimmer) - 21.
- Gription (DePuy) - 11.
- 3 hips required 2 augments.
- Cemented cups in all.

Follow up

- Clinical and radiological data till latest follow-up.
- Average follow-up : 26.8 months (12-76).

Results

- Successful incorporation of the bone grafting.
- 1 re- revision (Recurrent dislocation)
- No deep infections.
- No socket migration or augment failure .
- 1 cup loosening (asymptomatic).

Complications

- 4 dislocations - 2 needed stem revision.
- 1 post-operative peri-prosthetic fracture of femur - treated non-operatively.

L– revision for infection
R– for recurrent dislocation

Re-revision due to recurrent dislocation

Literature Evidence

- **Use of porous trabecular metal augments with impaction bone grafting in management of acetabular bone loss.**

  W Steven Borland et al, Acta Orthopaedica, 2012; 83 (4): 347–352

  24 patients with median 5 (3-7) yr F/U

  15 3A and 9 3B Paprosky defects

  1 re-revised for augment failure

  No dislocations; 2 asymptomatic cup loosening

- **Acetabular revision in THA using tantalum augments combined with impaction bone grafting**

  Thorsten Gehrke et al, Hip Int, 2013, 23 (4): 359-365

  46 pts with 46 mths avg f/u

  28 type-2B and 18 type-3A Paprosky defects

  2 re-revision for aseptic loosening

  4 dislocations (1 revised); 2 asymptomatic cup loosening

Limitations

- Retrospective study.
- Small cohort of patients.
- Short to medium term follow up.

Conclusion

- A promising option for combined bone defects.
- Hip centre restoration with better biomechanics.
- Cost effective alternative to uncemented cups.
- Reproducible & “straightforward” technique.
- Long term results needed.

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Bone Impaction Grafting with a Trabecular Metal Revision Cup Show Promising Early Results

Maziar Mohades, Bita Shareghi,Johan Kärrholm

Sahlgrenska University Hospital, Swedish Hip Arthroplasty Register,
Sahlgrenska Academy, University of Gothenburg, Sweden
maziar.mohaddes@gmail.com

Background

- Cup loosening - periacetabular bone loss

- Small bone defects – uncemtened cups

Pulido et al. 2011

- Large bone defects – different approaches

Dearborn and Harris 2000
Gross 2006
Schreurs et al. 2009

Maziar Mohaddes MD PhD
Sahlgrenska University Hospital, Swedish Hip Arthroplasty Register,
Sahlgrenska Academy, University of Gothenburg, Sweden
maziar.mohaddes@gmail.com

Background

During the last decade the trabecular metal cups have gained popularity in acetabular revisions

Gross and Goodman 2005
Sporer and Paprosky 2006
Ballester and Sueiro 2009
Davies et. al. 2011
Abolghasemian and Tangsataporn 2013
Beckman et. al. 2014
Whitehouse & Masri 2015

Maziar Mohaddes MD PhD
Sahlgrenska University Hospital, Swedish Hip Arthroplasty Register,
Sahlgrenska Academy, University of Gothenburg, Sweden
maziar.mohaddes@gmail.com

Background

Early proximal migration of revision cups measured with radiostereometry (RSA) is a predictor of aseptic loosening

HIP
ISSN 1120-7000

Hip Int 2015; 00 (00): 000-000
DOI: 10.5301/hipint.5000246
ORIGINAL ARTICLE

High early migration of the revised acetabular component is a predictor of late cup loosening: 312 cup revisions followed with radiostereometric analysis for 2-20 years

Tina Klerken[1], Maziar Mohaddes[1], Szilard Nemes[2], Johan Kärrholm[1]

Maziar Mohaddes MD PhD

Sahlgrenska University Hospital, Swedish Hip Arthroplasty Register,
Sahlgrenska Academy, University of Gothenburg, Sweden
maziar.mohaddes@gmail.com

Patients & methods

42 cup revisions performed during years **2007 – 2012 with** less than 50% host bone implant contact

randomized

Bone impaction grafting

Trabecular metal

n=23

Cemented

n=19

Patients & methods – follow-up

- Harris Hip Score, EQ-5D, Pain VAS
  Preoperative and 2 years postop
- Conventional radiography & RSA
  Postoperative (5±3 days), 3 & 6 months, 1 and 2 years

Patients & methods

No differences in base-line demographics or preoperative bone defects*

Larger amount of bone graft in the cemented group

*Age, sex, primary diagnosis, number of previous revisions, bone defect (Gustilo-Pasternak classification),

Results – Clinical

Re-revision

TM	**0**
Cemented	**1 due to dislocation, at 17 month**

Results – Clinical

Re-revision

TM	0
Cemented	1 due to dislocation, at 17 month

Deceased

TM	1, at 21 month
Cemented	1, at 5 month

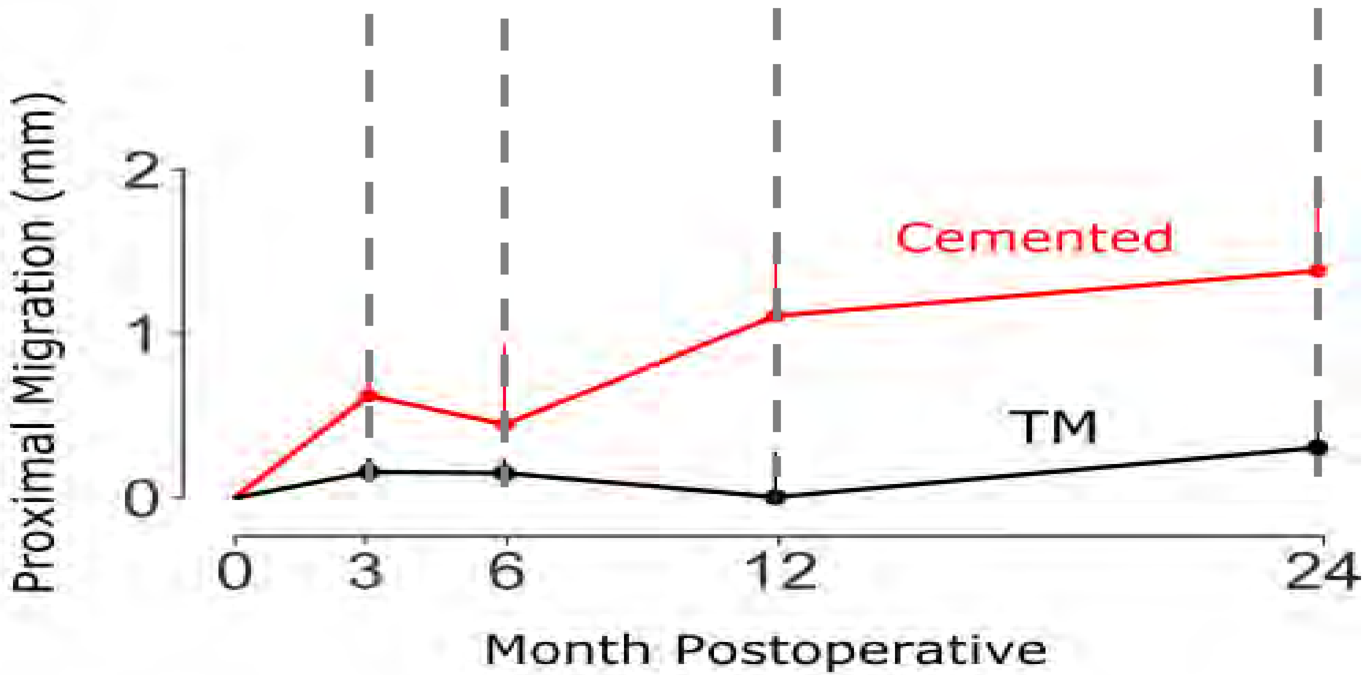
Results – Clinical

TM greater improvement in EQ-5D index at 2 years ($p=0.02$)

No difference in other clinical data ($p>0.07$)

Results – RSA

p=0.02*

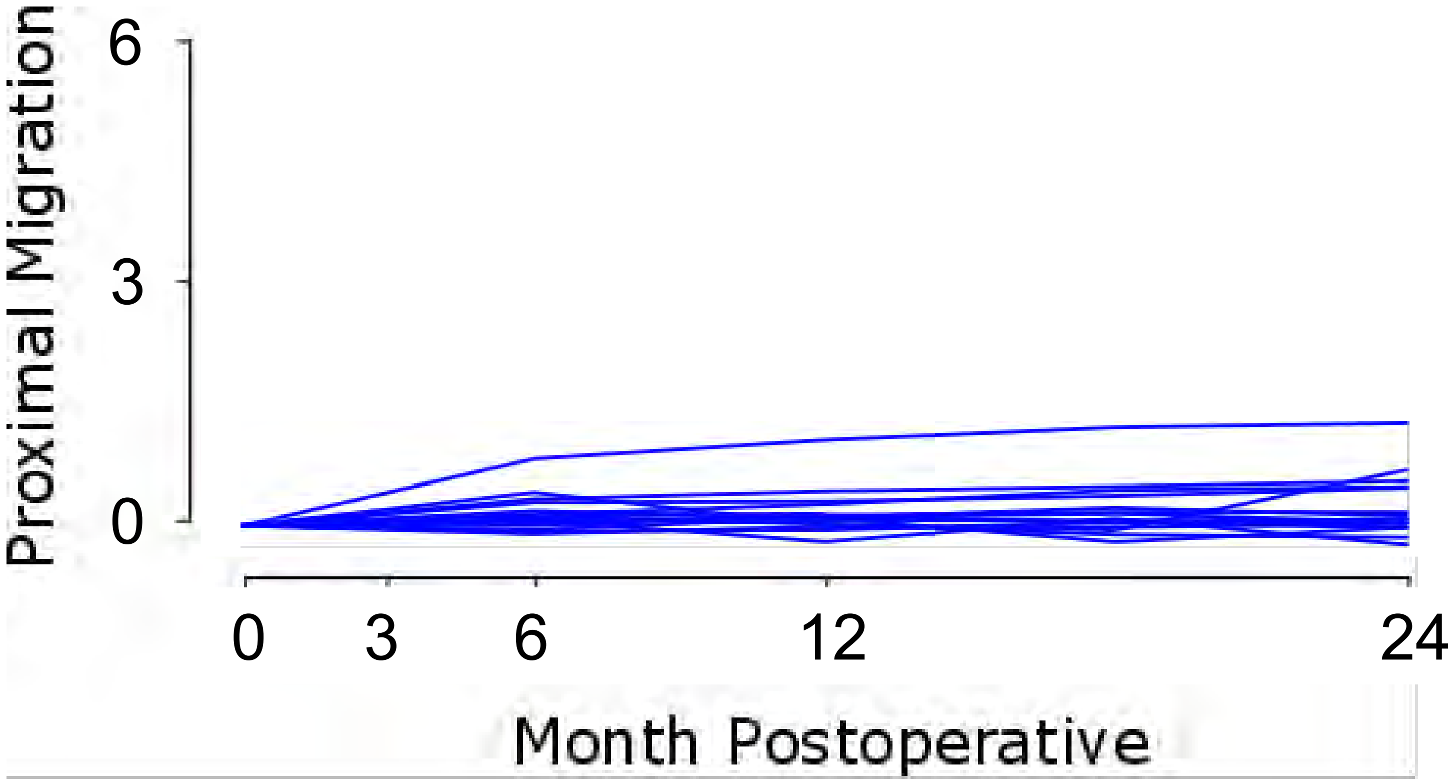


Number of observations

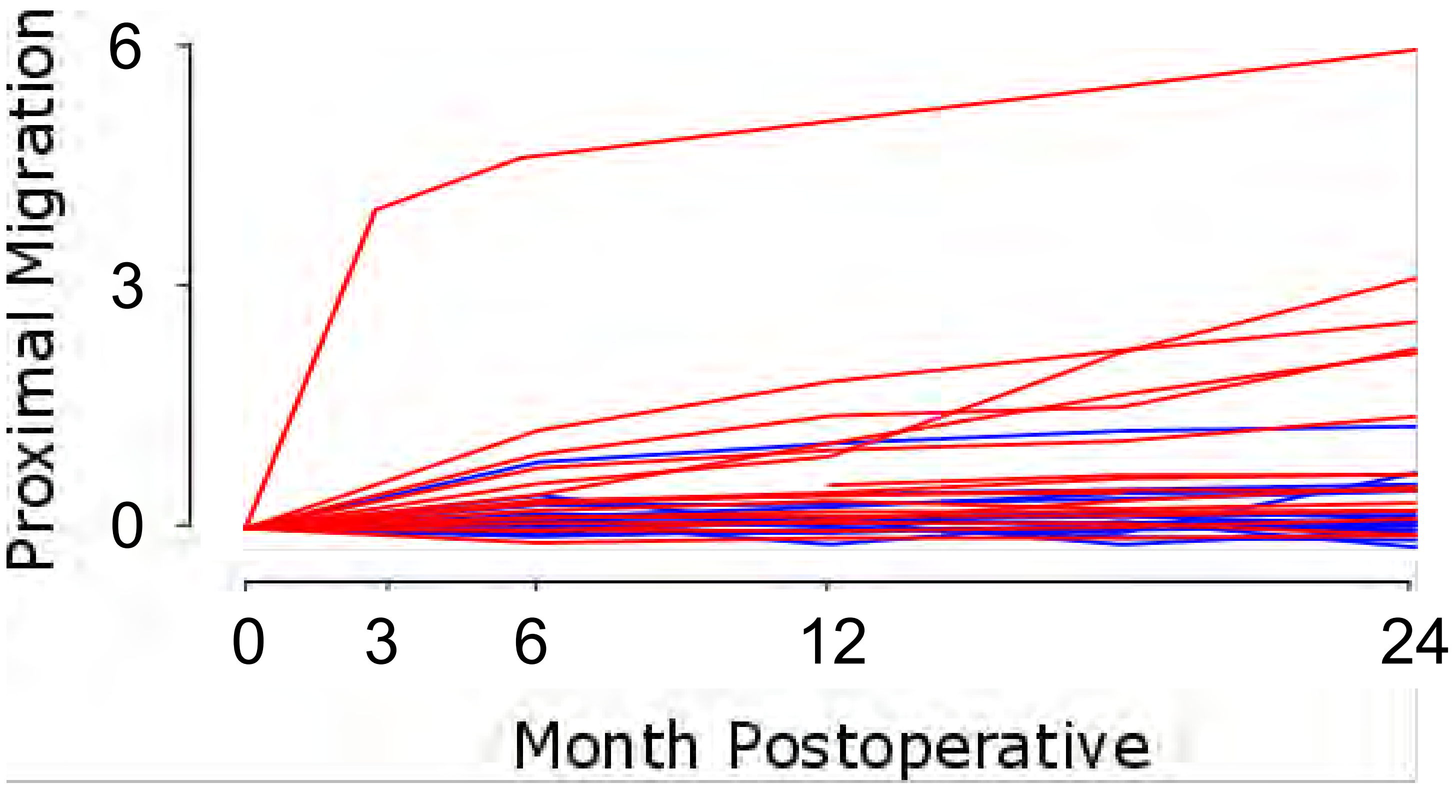
	3	6	12	24
Cemented	17	19	18	17
TM	21	19	19	18

*Repeated-measure ANOVA

Results – RSA, *individual plots*



Results – RSA, *individual plots*



Discussion

- Larger amount of bone graft in cemented cups
- Different pattern of early migration in cemented cups?

Conclusion

- Our data indicate lower risk of aseptic loosening when TM cup is used in revisions with large bone defects
- Further follow up is needed to prove whether the TM cup has superior performance in the long-term perspective

Thank you for listening

Maziar Mohaddes MD PhD

Sahlgrenska University Hospital,
Swedish Hip Arthroplasty Register,
Sahlgrenska Academy, University
of Gothenburg, Sweden
maziar.mohaddes@gmail.com

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

MINIMUM 12 MONTH FOLLOW-UP OF TRABECULAR TITANIUM CUPS FOR ACETABULAR REVISIONS WITH CAVITARY DEFECTS

M Umar, AJ Soler, S Burns, A Sharma, Y Kalairajah

Luton & Dunstable Univeristy Hospital

Introduction

- 8,856 THR Revisions in 2014[1]
  - Single stage – 8209
  - Two stages - 647
- Acetabular Revision – 71%
  - Cup only – 26%
  - Both cup and stem – 45%
- Most common indication -- Aseptic loosening followed by pain, dislocation and infection

National Joint Registry, 2015

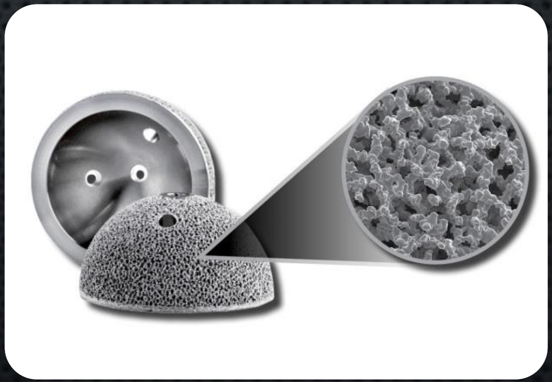
- Cavitary defects remains a challenge in acetabular revision
  - Deficient bone stock
  - Concern regarding initial revision implant stability
  - Patient co-morbid factors

- Possibilities
  - Bone grafting
  - Structural bone grafting
  - Cemented / Uncemented components

- **Structural Femoral Head Allograft**
  - Concerns about resorption and subsequent implant instability
  - Defect may be too large
  - Need for augmentation

- **Cup Cage Constructs**
  - Failures due to screw cutout and metalwork fracture
  - Not osseointegrated

- **Trabecular Metal (Tantalum)**
  - Highly porous implant made of Titanium
  - Pore size, density and depth adequate for osseous integration
  - Very promising results of osseointegration, initial stability and medium and long term results



Tantalum Cups

- Advantages:
  - Good initial stability
  - Modularity
  - Good reported outcomes

- Disadvantage
  - Need to interpose cement between cup and augment
  - Not possible to fix cup screw through augment into pelvis

Issack, P. S. (2013). Use of porous tantalum for acetabular reconstruction in revision hip arthroplasty. The Journal of Bone and Joint Surgery (American), 95(21), 1981–1987. doi:10.2106/JBJS.L.01313

LIMA TRABECULAR TITANIUM CUP (DELTA TT)

- High porosity
- High modularity
- Augments
- No need for cement interposition between cup and augment
- Whole construct can be screwed into pelvis

Lima Corporate
Orthopaedic motion

METHODS

- N=51 consecutive acetabular revisions with Delta TT cups
- Single surgeon
- Incusion criteria:
  - No infections: CRP, ESR, aspiration and biospy, bone scan +/- WCC scan
  - Age>18
  - End-stage disease with frank radiographic signs of loosening
  - No history of trauma
  - No peri-prosthetic fracture

- Data:
  - Patient Demographics
  - Paprosky classification of acetabular defects
  - Use of bone graft
  - Use of acetabular augment
  - Moore's index of osseointegration
- Minimum 12-month follow up

MOORE'S INDEX OF OSSEOINTGRATION

- N=119
- Radiographic analysis to determine osseointegration
- Defined 5 radiographic signs:
    - absence of radiolucent lines
    - presence of a superolateral buttress
    - medial stress-shielding
    - radial trabeculae
    - inferomedial buttress
- Each sign had a high PPV for the presence of bone ingrowth (range, 92.2-96.3%)
- When three or more signs were present, the PPV of the radiographic test was 96.9%, the sensitivity was 89.6%, and the specificity was 76.9%

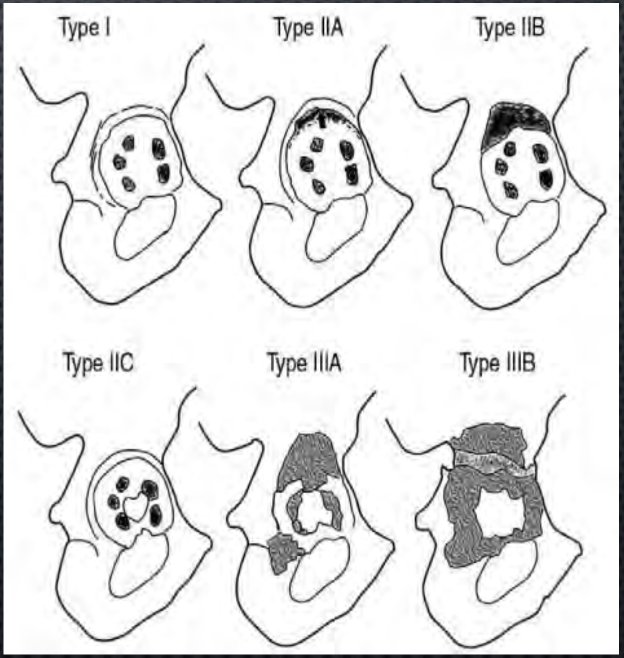
Moore MS, McAuley JP, Young AM, Engh CA Sr., Radiographic signs of osseointegration in porous-coated acetabular components,Clin Orthop Relat Res. 2006 Mar;444:176-83.

- Most sensitive signs of bone ingrowth:
  - absence of radiolucent lines
  - presence of superolateral buttresses
  - presence of medial stress-shielding
- 97% of cups with three to five signs were bone ingrown
- 83% of the cups with one or no signs were unstable

PAPROSKY CLASSIFICATION OF ACETABULAR DEFECTS

Table I: Paprosky classification of acetabular bone loss[7]

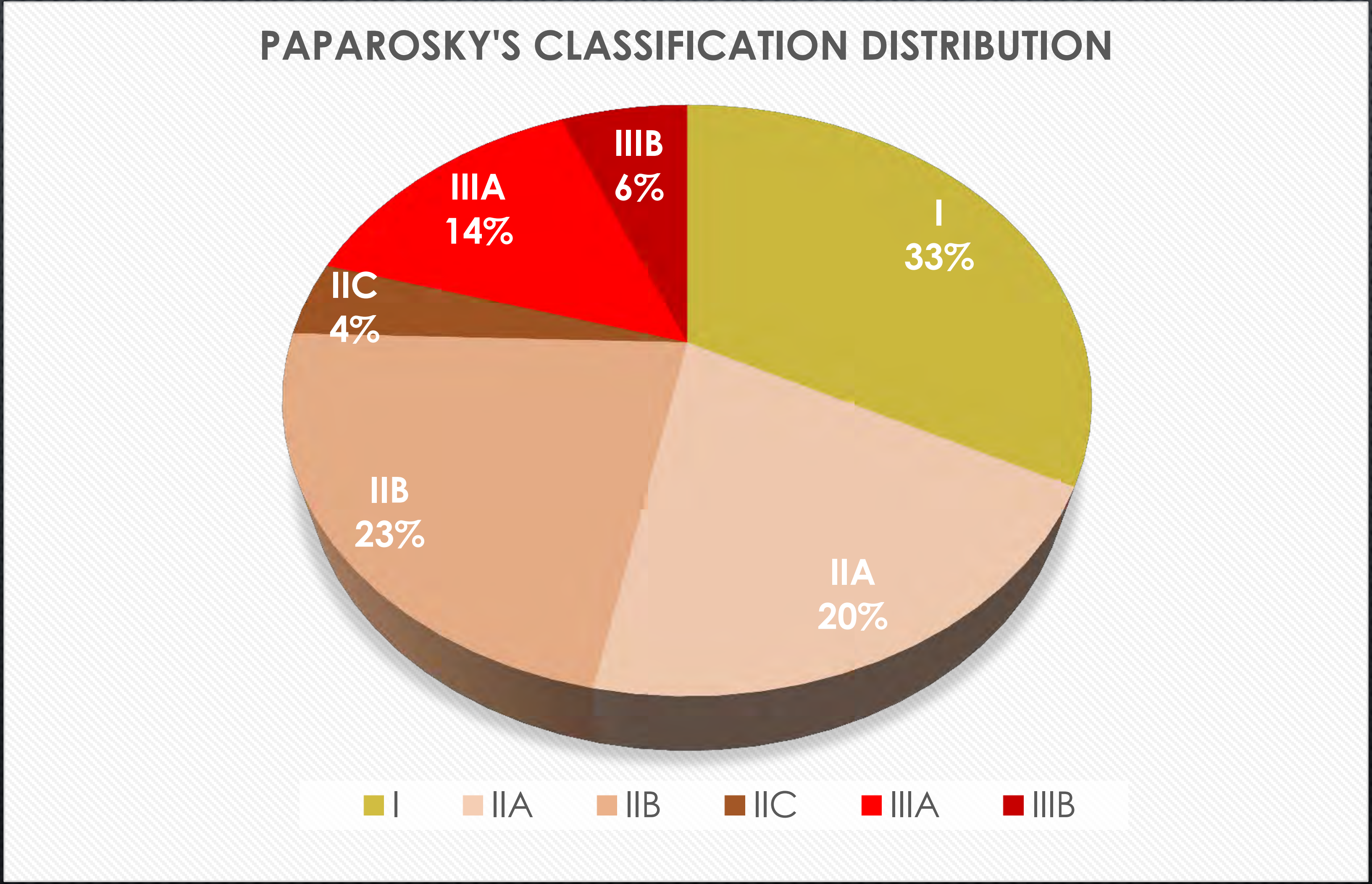
	X-ray findings	Intra-operative findings
Type I Minimal bone loss	No migration Minimal lysis	Supportive rim
Type II Columns intact and supportive	**A** Superior migration <2 cm Teardrop intact no ischial lysis	Superior dome deficient Superior rim intact
	B Superolateral migration <2cm Teardrop intact no ischial lysis	Superior rim compromised
	C Medial migration Teardrop obliterated	Medial wall absent
Columns non-supportive	**A** Superolateral migration >2 cm ('up and out') Teardrop partly intact	Rim deficiency 10–2 o'clock
	B Superomedial migration >2 cm ('up and in') Teardrop obliterated	Rim deficiency 9–5 o'clock



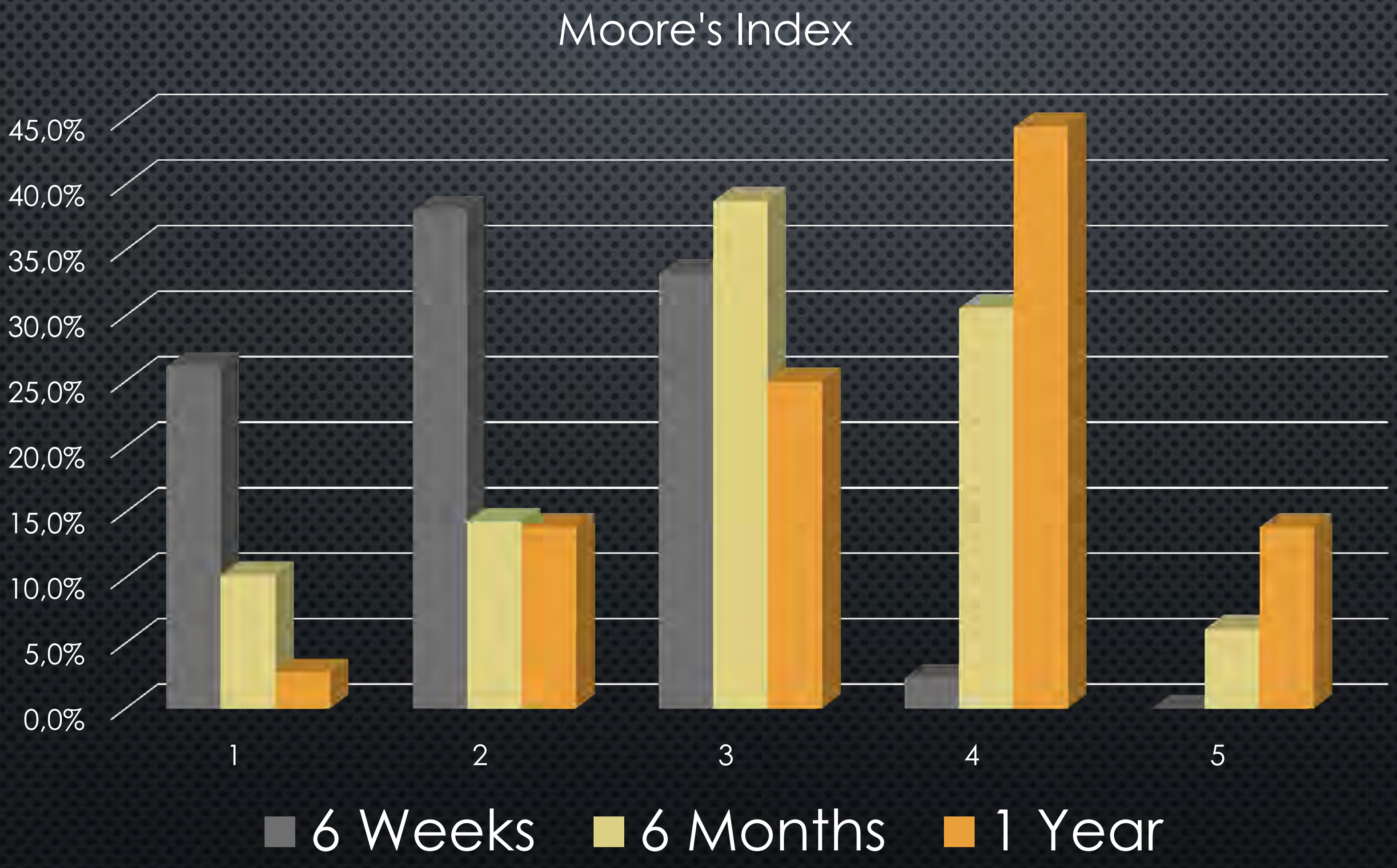
RESULTS

- Average age = 73 (range 50-91)
- F= 31
- M=20
- Augments used in 18 patients
- 2 Patients lost to follow up because of death unrelated to surgery

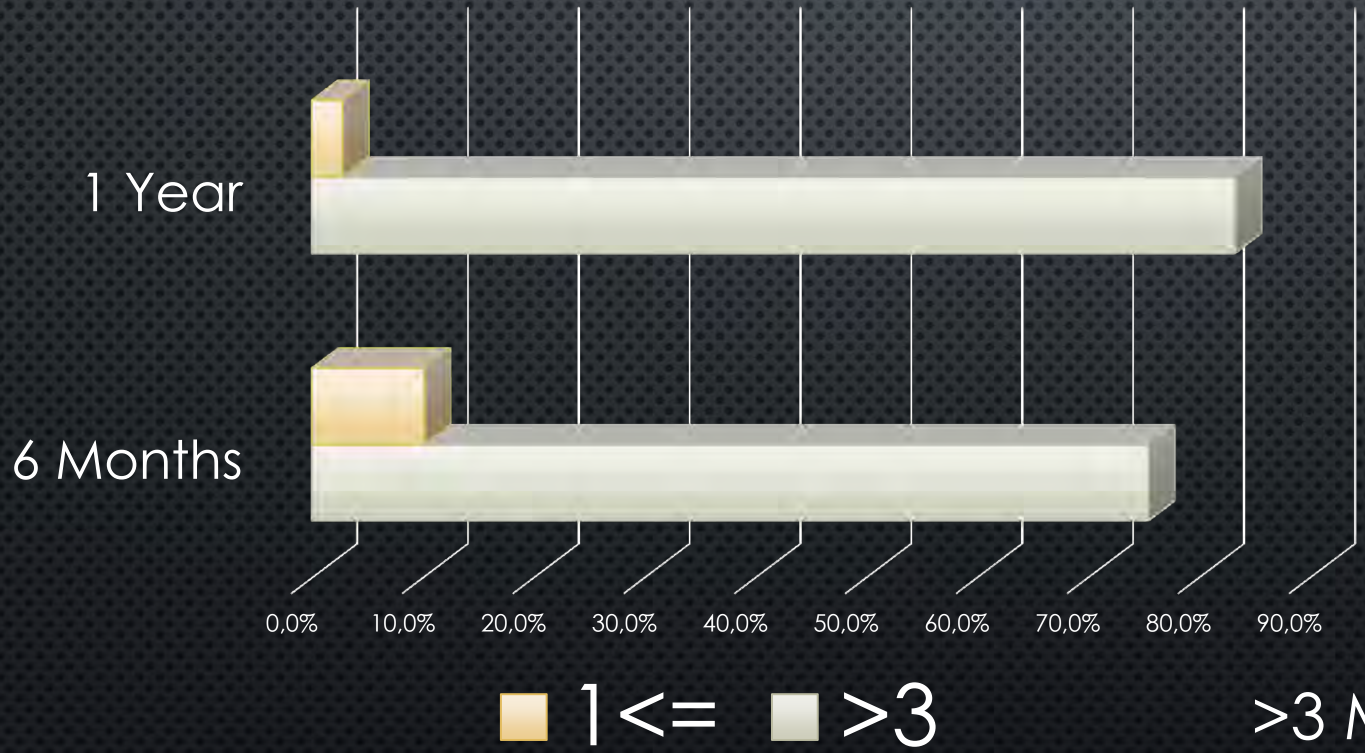
PAPROSKY CLASSIFICATION DISTRIBUTION



MOORE'S INDEX



SUMMARY



- **Lima cup for acetabular revision**
  - 6 Months – 75.5%
  - 1 Year – 83.3%

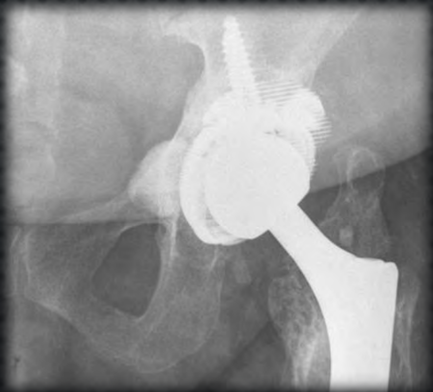
>3 Moore's Index
PPV 96.6%
for Osseointegration

DISCUSSION

- Acetabular revisions remains a challenge, particularly when there are cavitary defects

- Success depends on:
  - Solid fixation at the time of implantation
  - Good, rapid osseointegration onto the cup

- Implant stability
  - Need for implants that are capable of filling the defects
  - Have good porosity
  - Enough surface roughness to achieve early stability



- Delta TT cup
  - Very high porosity and surface roughness
  - Good and stable fixation on table

- Augments (which are directly screwed onto the cup, not cemented) did not affect the initial stability of the implant.

CONCLUSION

- The Trabecular TitaniumTM cup demonstrates good initial stability at implantation and excellent osseointegration in radiographic studies at a minimum twelve month follow up
- Comparable results to tantalum designs with the advantage that the augments do not need cementation with the cup
- Further long term studies are welcome and we continue to monitor this group of patients.

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

26-27 NOVEMBER 2015

MILAN, ITALY

British Orthopaedic Association

Caring for Patients: Supporting Surgeons

UNIVERSITY & RESEARCH HOSPITALS

VILLA ERBOSA

Acetabular revisions of total hip replacement by cementless Pinnacle Gription revision cup and augments and Chronos vivify allografts filled with PRP/MSCs

STEFANO ZANASI

VILLA ERBOSA HOSPITAL

GRUPPO SAN DONATO

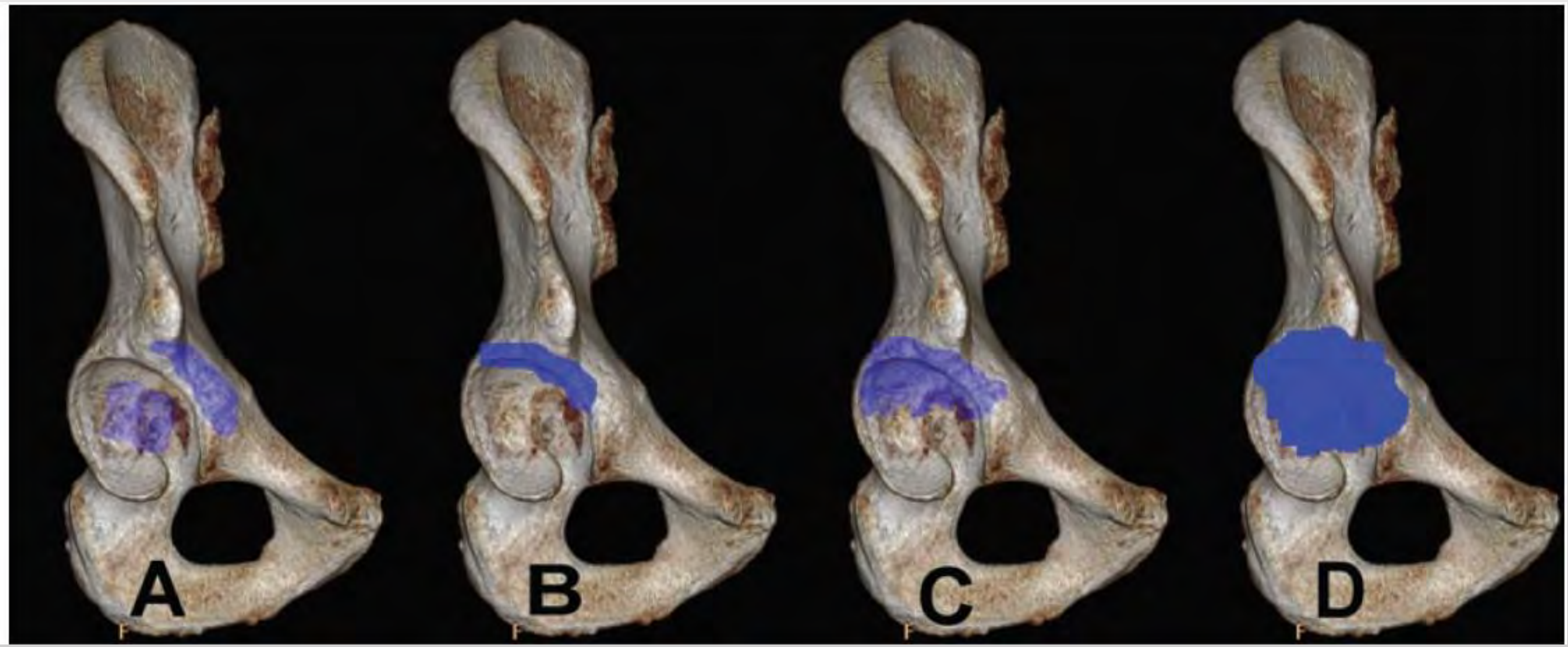
ORTHOPAEDICS DEPARTMENT

IIIRD DIVISION – JOINT ARTHROPLASTY OPERATIVE CENTER

CHIEF: STEFANO ZANASI M.D.

The appropriate technique for revising a failed acetabular component in total hip replacement (THR) depends on the severity of bone loss

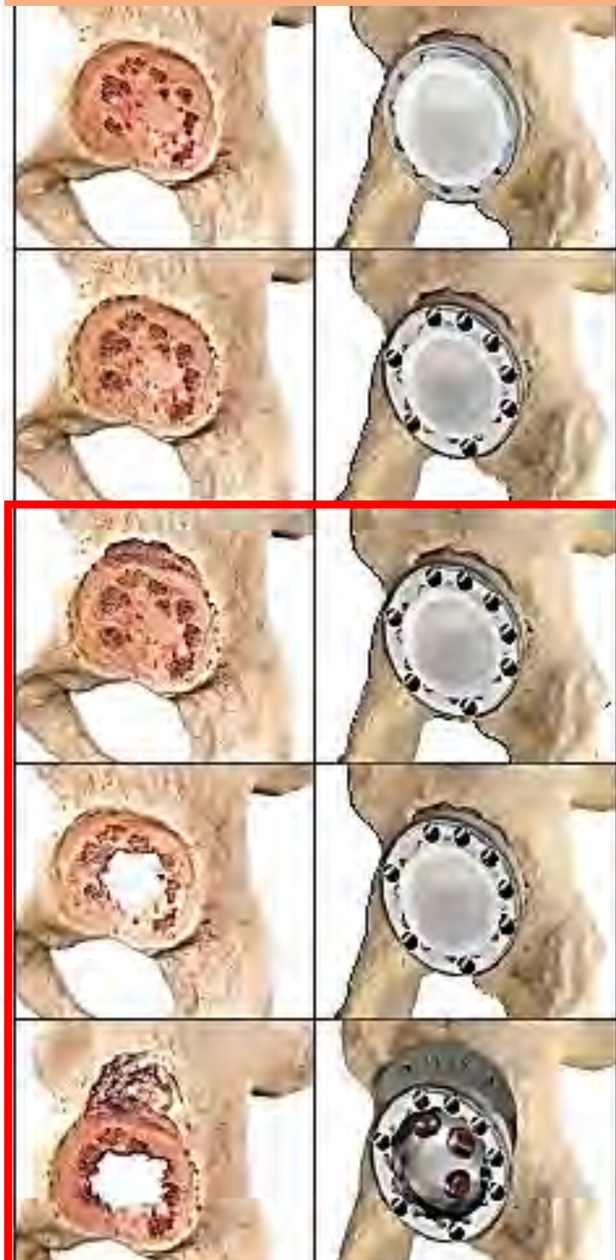
AAOS AND PAPROSKY ACETABULAR DEFECT CLASSIFICATION SYSTEMS



In general the higher the classification category is, the more extensive the involvement of the acetabulum and surrounding bone

A. PAPROSKY I o IIA – CAVITARY
B. PAPROSKY IIB – SEGMENTAL
C. PAPROSKY IIIA -COMBINED
D. PAPROSKY IIIB - COMBINED

According to the defect type we resort to a specific solution by PINNACLE GRIPTION REVISION SYSTEM



Type 1
Solution: PINNACLE GRIPTION® Shell

- Anterior/posterior columns are intact and supportive
- Greater than 70 percent of host bone to hemispherical shell contact

Type 2A
Solution: PINNACLE GRIPTION Multi-hole/ Revision Shell

- Anterior/posterior columns are intact and supportive
- Superior migration less than 2cm
- Up to 30 percent of the shell may be uncovered superiorly

Type 2B
Solution: PINNACLE GRIPTION Multi-hole/ Revision Shell Potential GRIPTION® TF Augment

- Superior migration less than 2cm
- Anterior/posterior columns are supportive
- Greater than 50 percent of host bone to hemispherical shell contact

Type 2C
Solution: PINNACLE GRIPTION Multi-hole/ Revision Shell Potential GRIPTION TF Augment

- Rim is intact but distorted
- Medial wall defect and superior head center migration (<2cm)
- Teardrop is obliterated

Type 3A
Solution: PINNACLE GRIPTION Multi-hole/ Revision Shell Potential GRIPTION TF Augment

- 30-60 percent of rim unsupportive
- Greater than 2cm superior migration
- Less than 50 percent of host bone to hemispherical shell contact

GRIPTION® TF AUGMENTS

Catalog Code	Description
1217-10-150	GRIPTION TF Augment size 50/52 x 10
1217-10-154	GRIPTION TF Augment size 54/56 x 10
1217-10-158	GRIPTION TF Augment size 58/60 x 10
1217-10-162	GRIPTION TF Augment size 62/64 x 10
1217-10-166	GRIPTION TF Augment size 66/68 x 10
1217-10-170	GRIPTION TF Augment size 70/72 x 10
1217-15-250	GRIPTION TF Augment size 50/52 x 15
1217-15-254	GRIPTION TF Augment size 54/56 x 15
1217-15-258	GRIPTION TF Augment size 58/60 x 15
1217-15-262	GRIPTION TF Augment size 62/64 x 15
1217-15-266	GRIPTION TF Augment size 66/68 x 15
1217-15-270	GRIPTION TF Augment size 70/72 x 15
1217-20-350	GRIPTION TF Augment size 50/52 x 20
1217-20-354	GRIPTION TF Augment size 54/56 x 20
1217-20-358	GRIPTION TF Augment size 58/60 x 20
1217-20-362	GRIPTION TF Augment size 62/64 x 20
1217-20-366	GRIPTION TF Augment size 66/68 x 20
1217-20-370	GRIPTION TF Augment size 70/72 x 20
1217-30-450	GRIPTION TF Augment size 50/52 x 30
1217-30-454	GRIPTION TF Augment size 54/56 x 30
1217-30-458	GRIPTION TF Augment size 58/60 x 30
1217-30-462	GRIPTION TF Augment size 62/64 x 30
1217-30-466	GRIPTION TF Augment size 66/68 x 30
1217-30-470	GRIPTION TF Augment size 70/72 x 30

The Pinnacle Revision Acetabular Cup System

The Pinnacle Revision Acetabular Cup System consists of the
Standard Profile,
Deep Profile (DPx)

a Multi-hole shell
that feature:

• Allowance for mechanical fixation in the rim or dome
• Dome screw holes that can angulate up to 34 degrees for intra-operative flexibility and to optimize bony purchase

• Sizes 38 to 80mm
to address the need for
-enhanced stability and
-biomechanical optimization while
-providing immediate and long-term fixation.

Standard and Deep Profile (DPx) shells feature

Standard Profile and Multi-hole shells

Presents a full 180-degree hemisphere
for unsurpassed rim friction fit
to enhance immediate cup stability

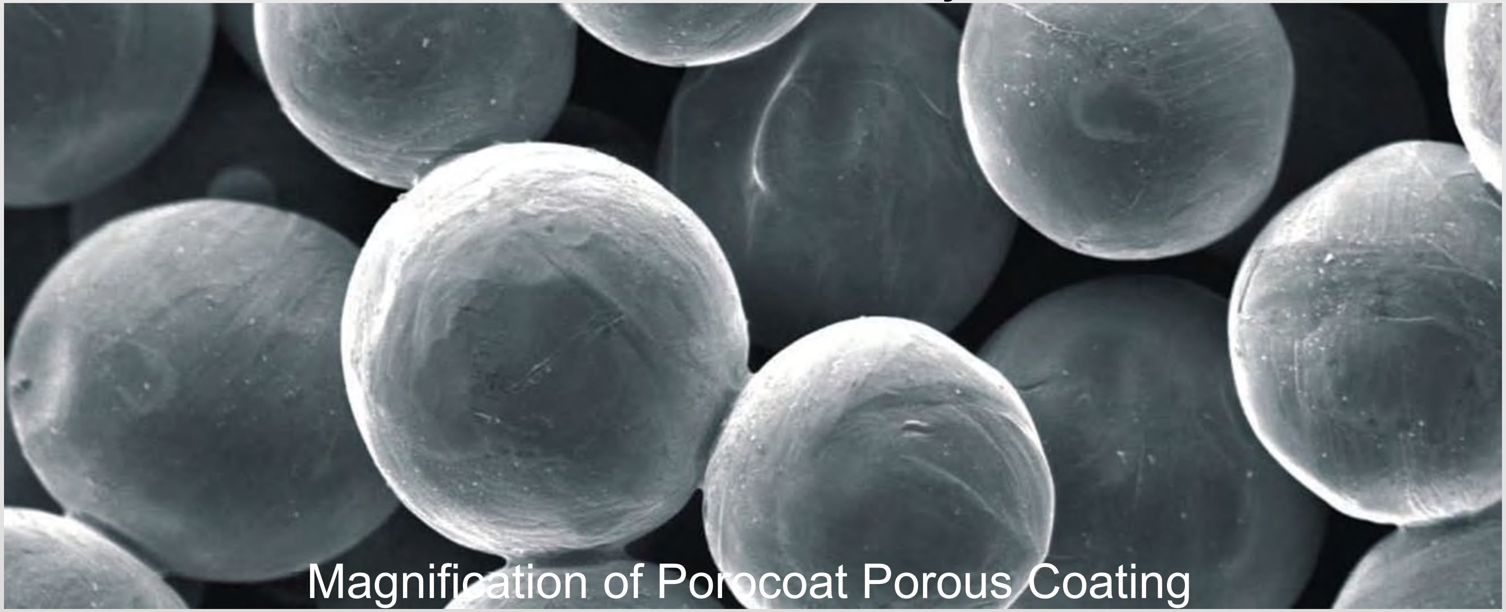
Deep Profile (DPx) shells

presents variable, progressive lateralization
that increases with shell size
to ensure proper medial defect fill
in a graduated proportional manner

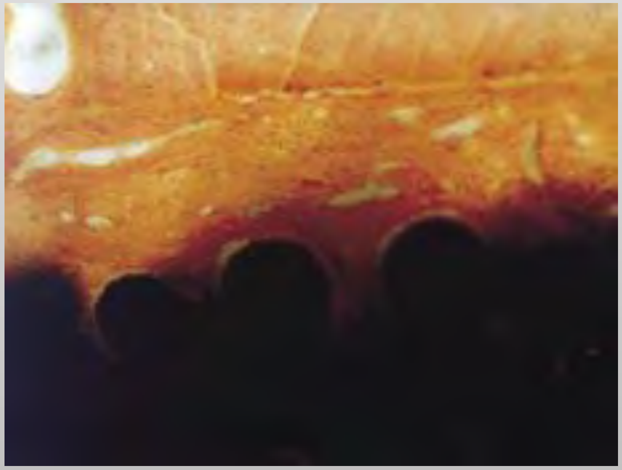
DPx Cup Size (mm)	Lateralization (mm)
54-58	**4**
60-66	**5**
68-72	**6**

Porocoat Porous Coating

The Porocoat Porous Coating on the back of all Pinnacle acetabular shells is a **porous pure titanium sintered metal beads multi-layered construct allowing for initial press-fit through a high-friction that maximizes the surface area for bony ingrowth and immediate stability**

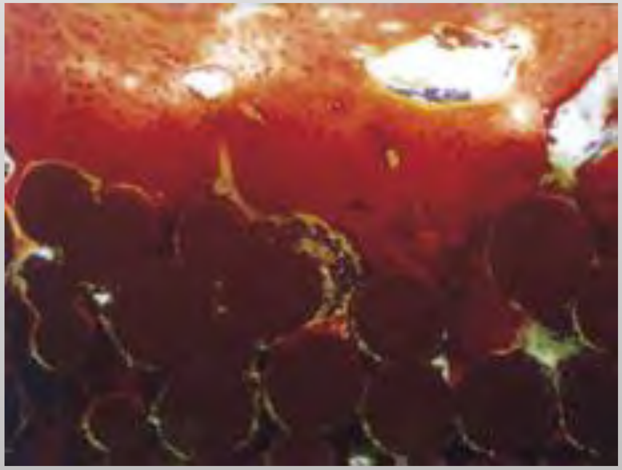


Magnification of Porocoat Porous Coating



In-growth – 4 weeks

In-growth – 8 weeks



In-growth – 12 weeks

Sometimes, there is so much acetabular bone loss
that adequate fixation with a hemispherical cup is impossible.

This occurs with:

•Irregular defects
•Major bone deficiency
•Poor bone stock
•Fractures or nonunions
•Irradiated bone

In those cases,

we use augments as modular adjuncts to the hemispherical cup.




GRIPTION® TF

This material is conductive to bone formation,

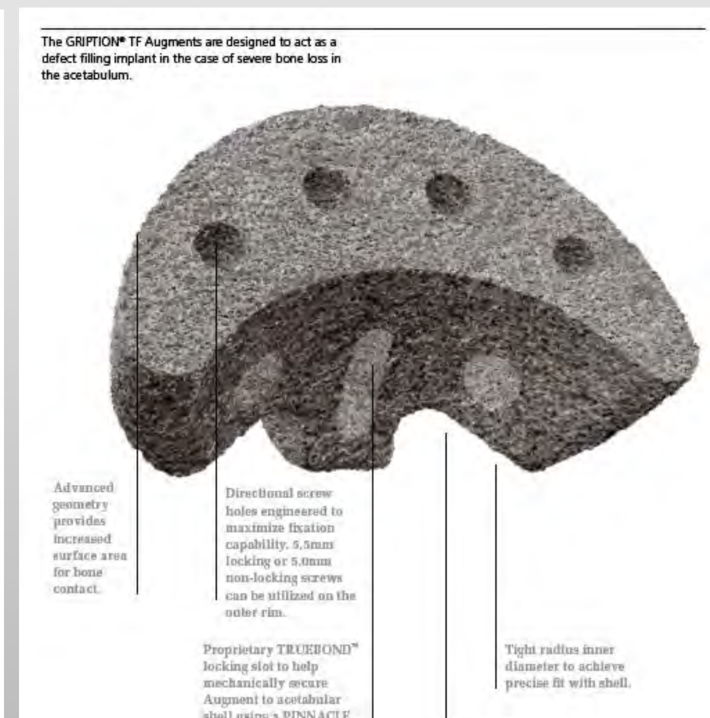
<u>enabling rapid and extensive bone ingrowth</u>.

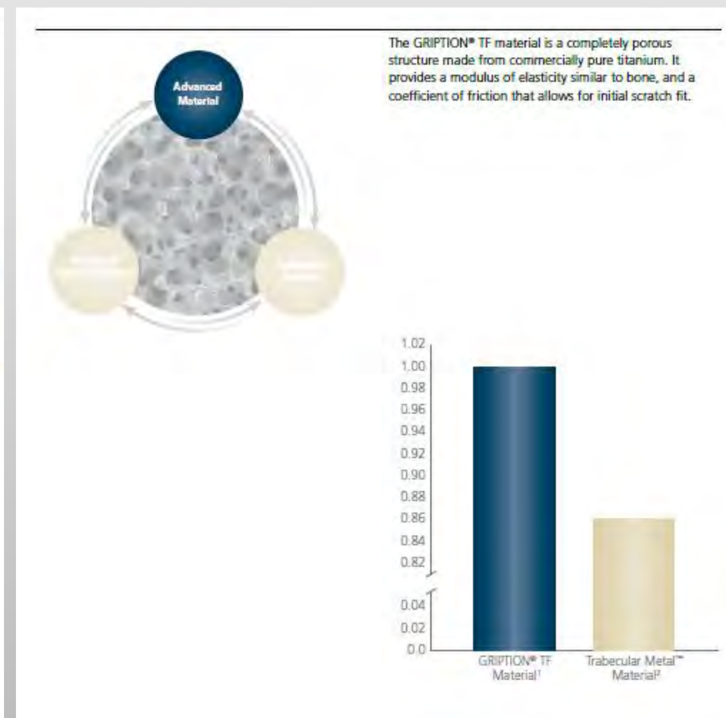
The combination of these characteristics makes the Gription shells suitable for the treatment of bone loss in revision surgery.

Another advantage of porocoated metal is the ability to manufacture metallic augments of different sizes and shapes in order to compensate for different-sized bone defects.

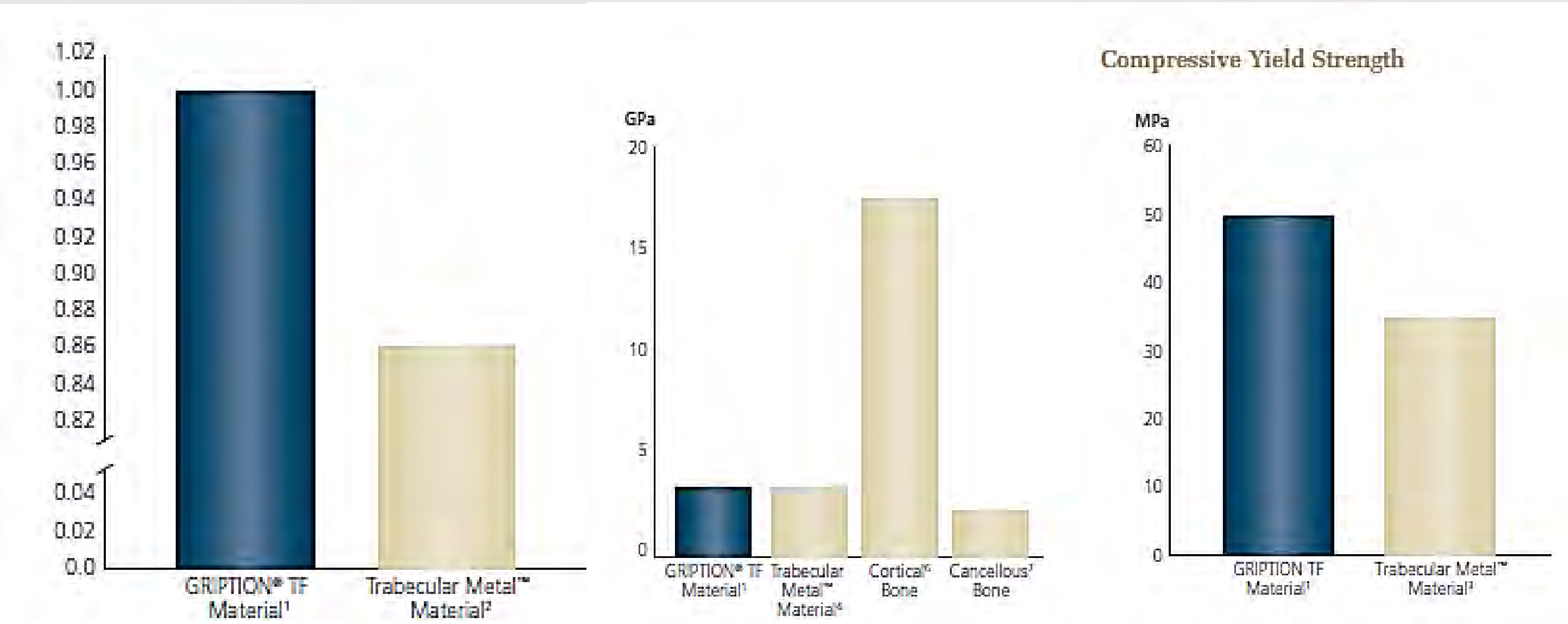
The augment is stable after bone ingrowth

and serves as a <u>structural support without risk of resorption</u>.

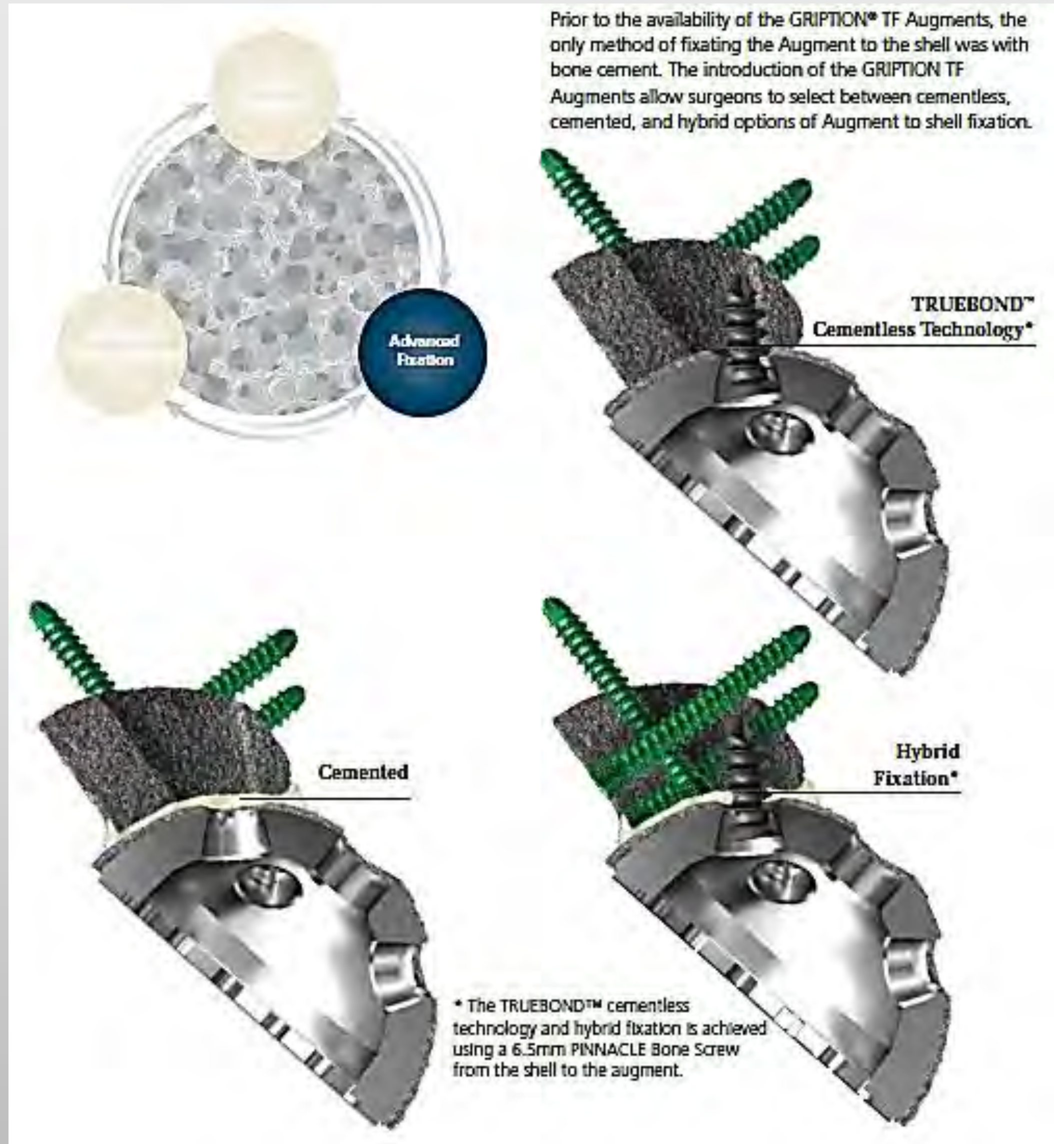




THE GRIPTION TF MATERIAL IS A COMPLETELY POROUS STRUCTURE MADE FROM PURE TITANIUM THAT PROVIDES
- A MODULUS OF ELASTICITY SIMILAR TO BONE AND
- A COEFFICIENT OF FRICTION ALLOWING FOR INITIAL SCRATCH FIT



CEMENTED, CEMENTLESS OR HYBRID FIXATION OPTIONS RECONSTRUCTION SYSTEM



MATERIAL AND METHODS 1

- **single surgeon (SZ) cases serie of 54 consecutive pts. (37m and 17f) operated for acetabular revision surgery using Pinnacle Gription revision cup between**
- **March 2012 and February 2015**
- The mean age at revision was 68 years (32–84 years).
- and the **mean follow-up was 24.5 months** (6 to 41), with all successful hips surviving> 12 months.
- The mean number of hip THRs before this revision was 2.3 (1 to 8).
- The indication for revision was aseptic loosening of the Acetabular component in 39 hips, failure of a cage in 9 patients, two-stage revision for infected THR in 3, and previous resection arthroplasty for infection in 3.

MATERIAL AND METHODS 2

Paprosky acetabular bone loss classification

N°patients revised
6 for type 1,
8 for type 2A,
13 for type 2B,
6 for type 2C,
10 for type 3A
11 for type 3B
acetabular defects

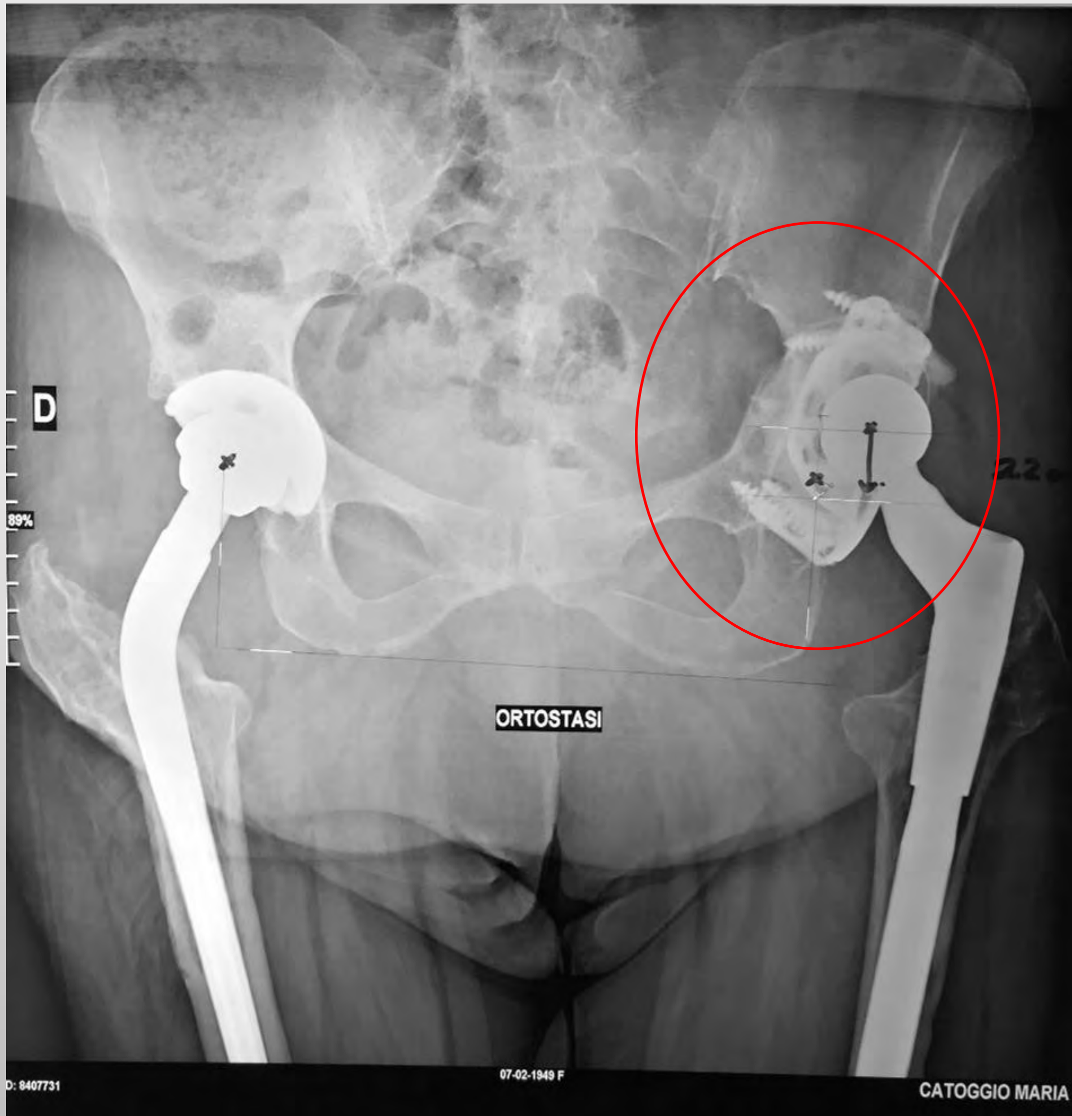
- **The augments were used in 23 of the 54 cases**
- Frozen morselised bone omografts were used in 50 cases
- Chronos strip allografts in 39 cases

Review of clinical records and evaluation of the patients have been by other surgical equipe
Main outcomes:

1. Harris Hip Score (HHS)
2. Mobility scoring system
3. Moore et al classification of osteo-integration of the shell
4. Augment stability
5. Position of HRC relative to the references lines and unaffected side (Component Migration)

Exemplificative Cases serie

Case 1: CATOGGIO MARIA f 65yrs old



7 Yrs F. Up

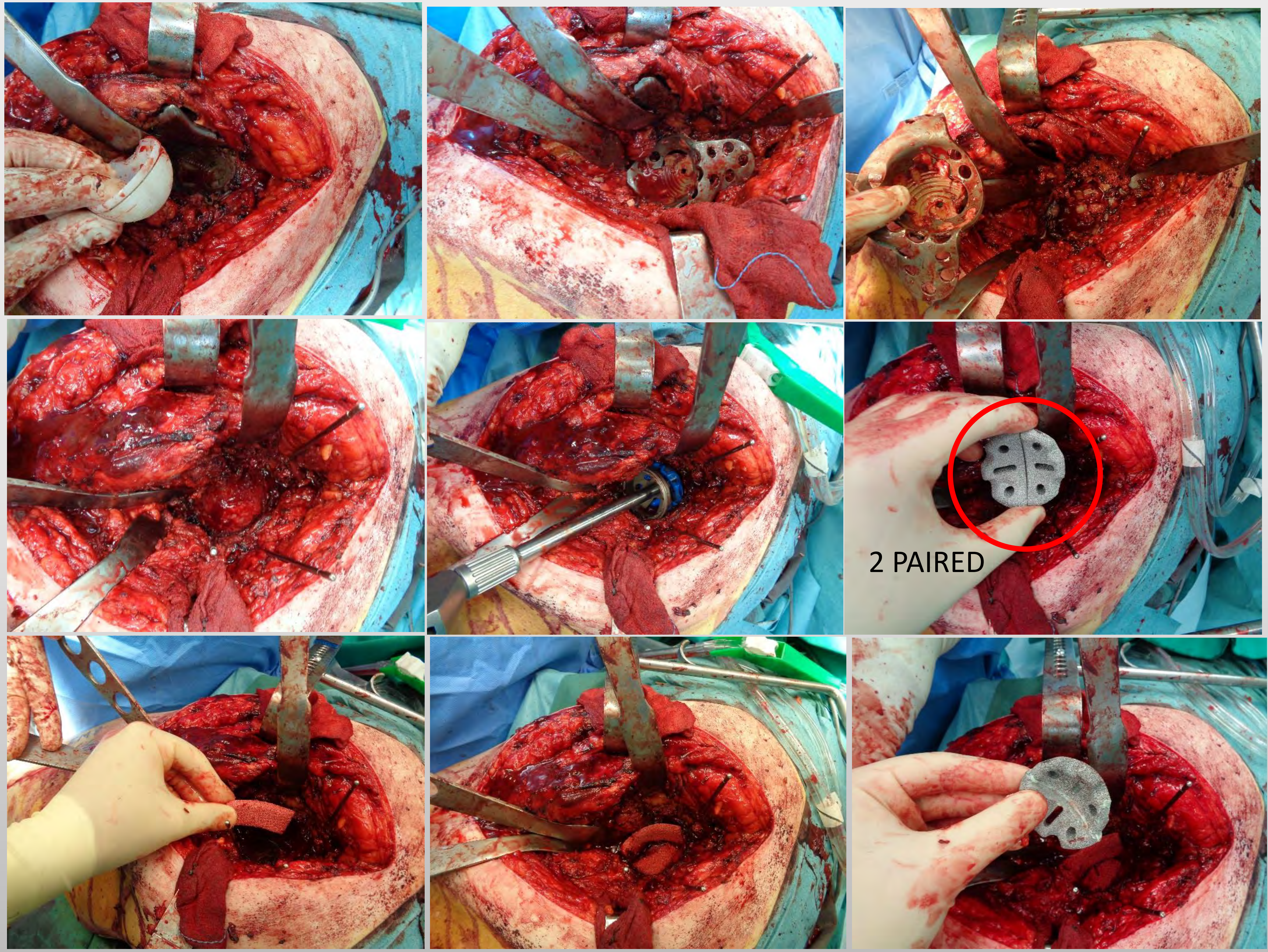
Paprosky
3A

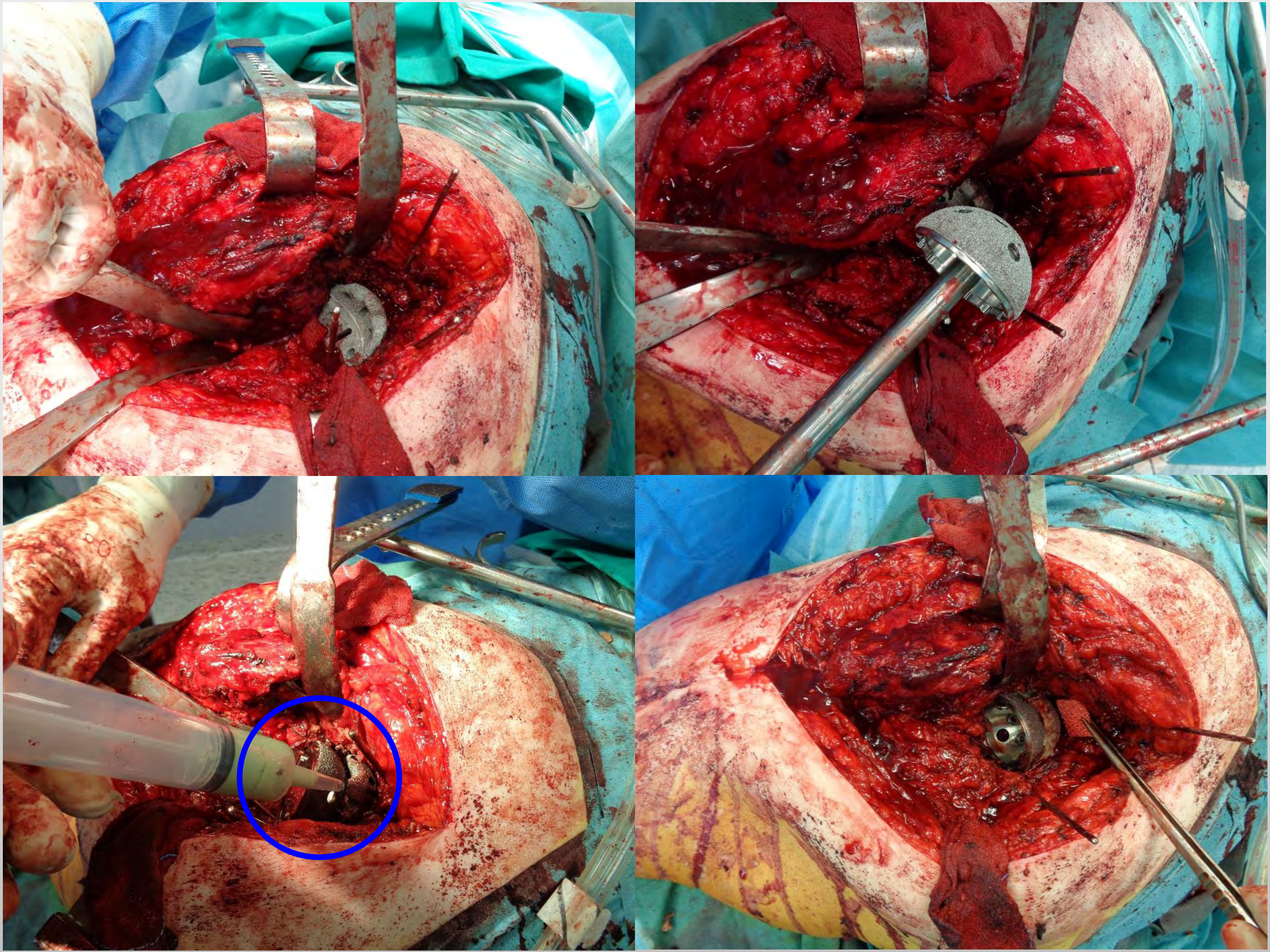
preop. HHS
39

AMBULATORY SCORE
3

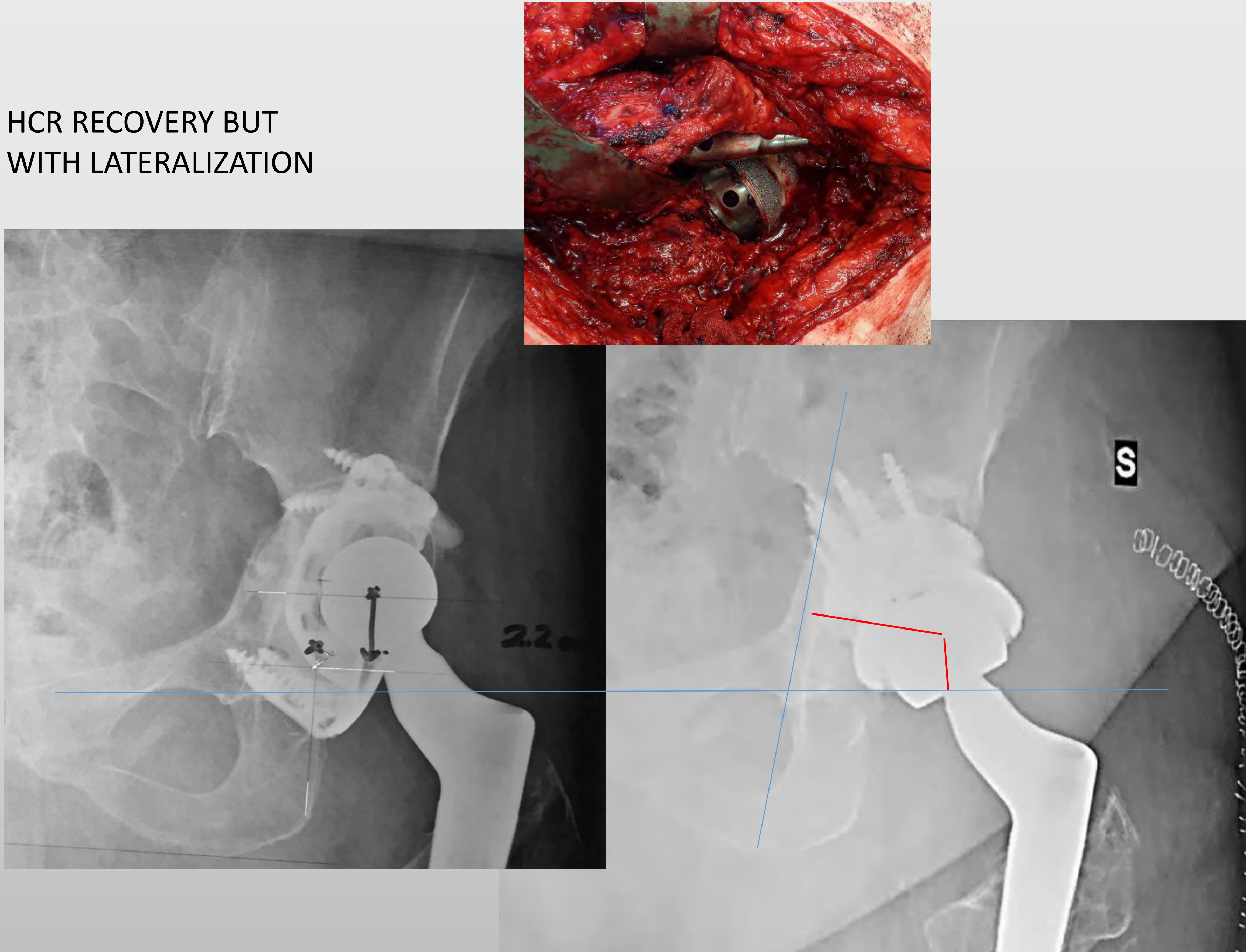
MOORE
4

HCR
+14

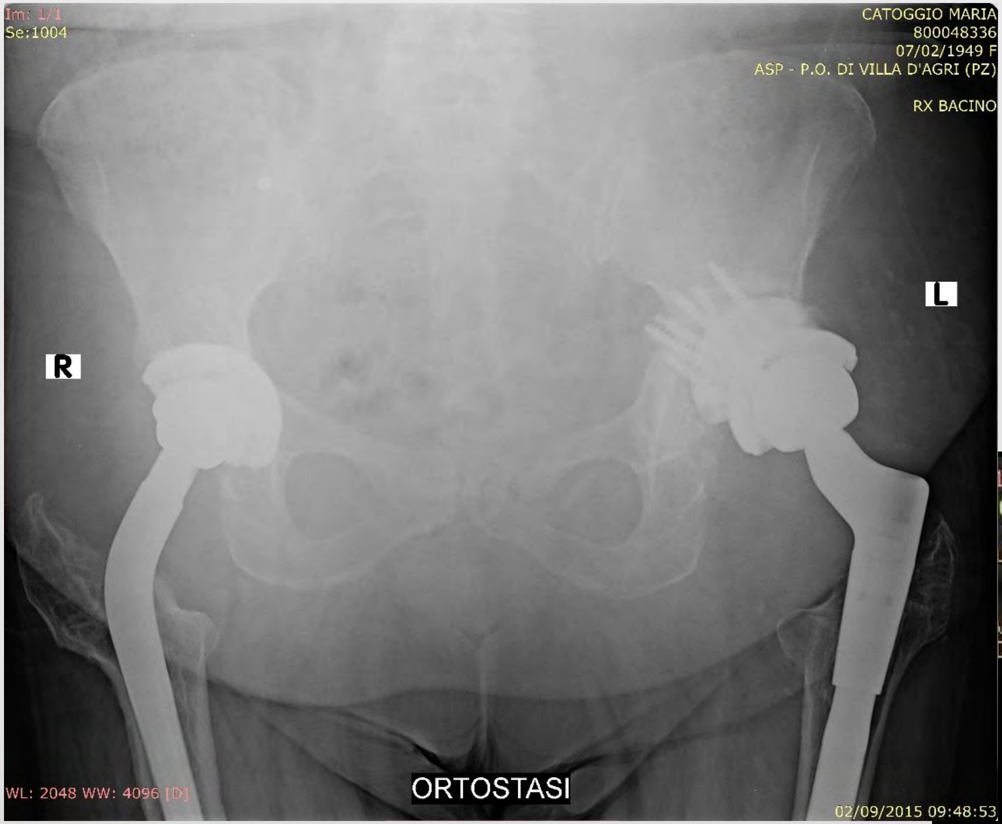

2 PAIRED



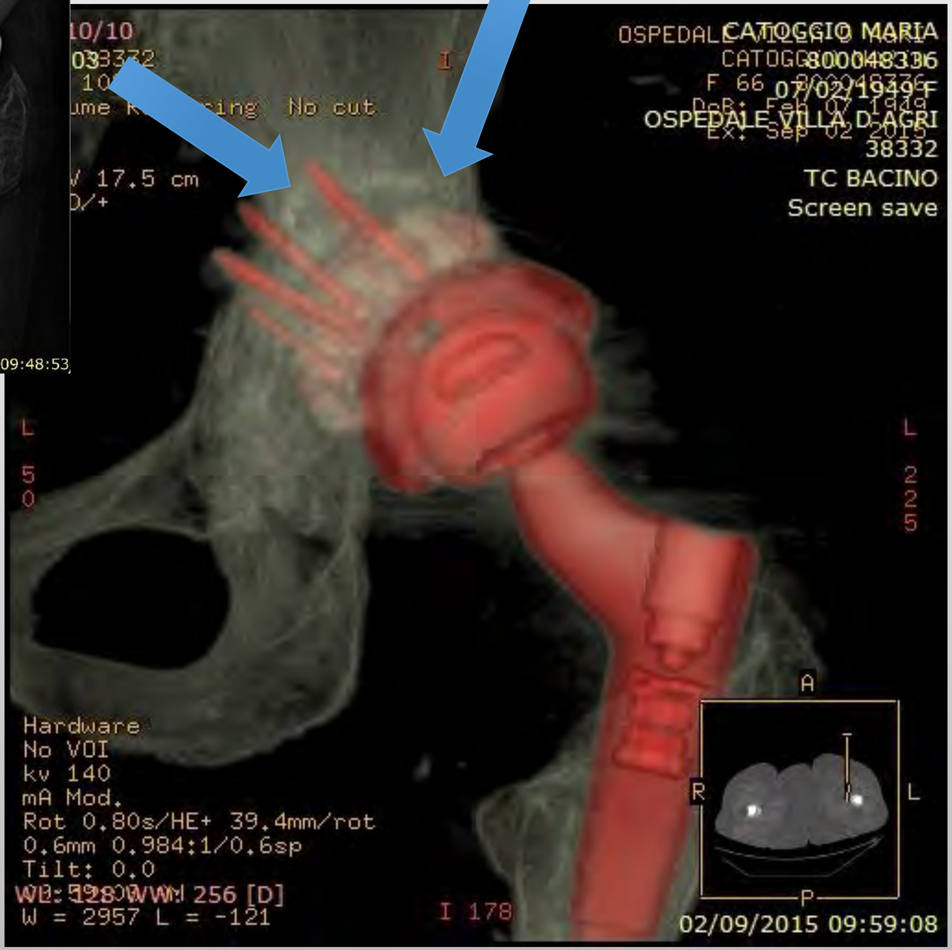
HCR RECOVERY BUT
WITH LATERALIZATION

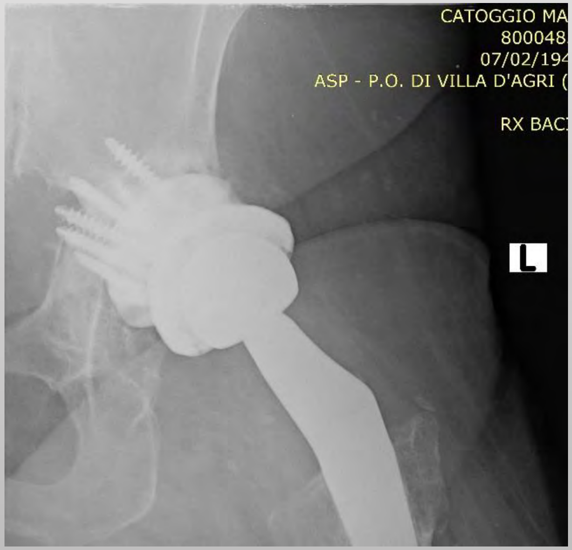


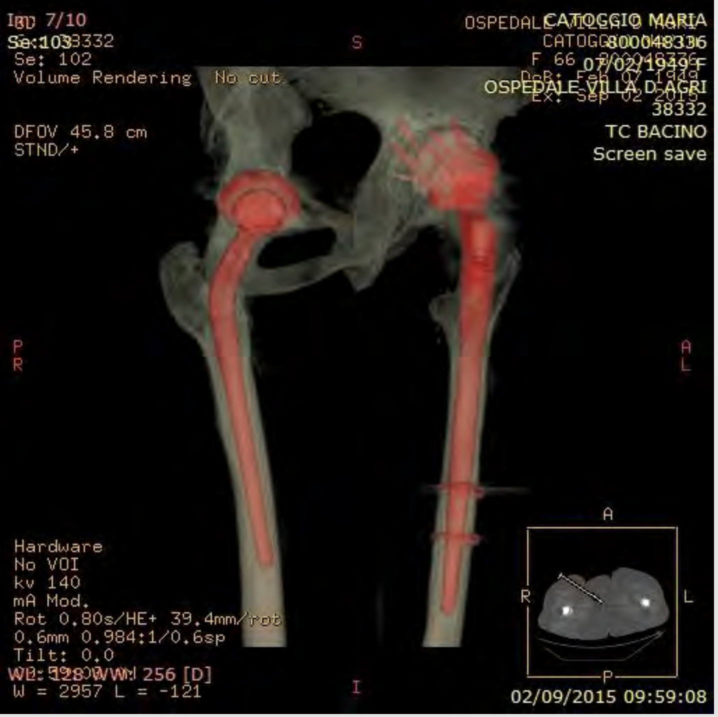
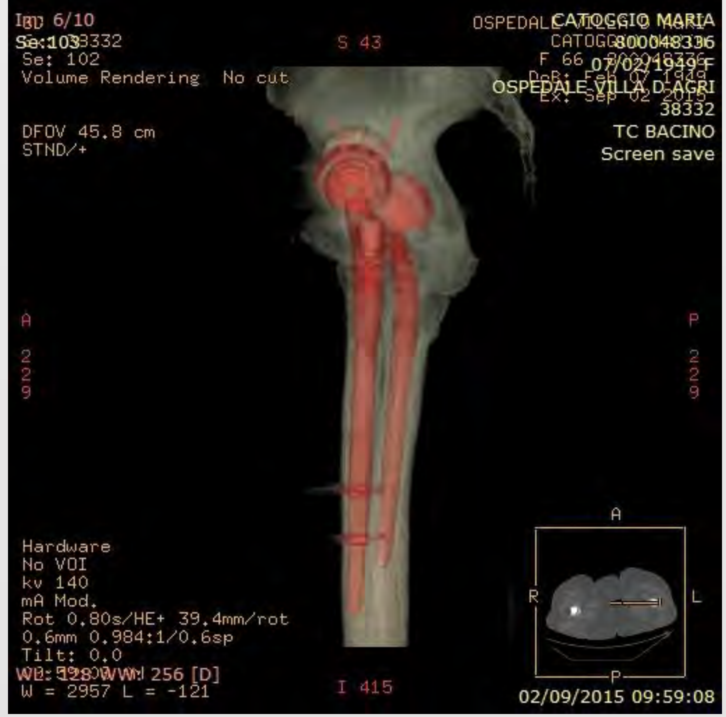
C.M. f 65yrs old: 24 ms f.up



TOTAL OSTEOINTEGRATION



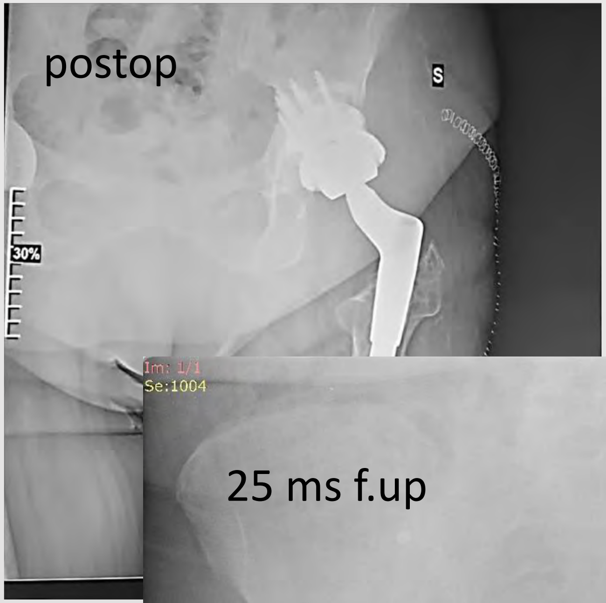


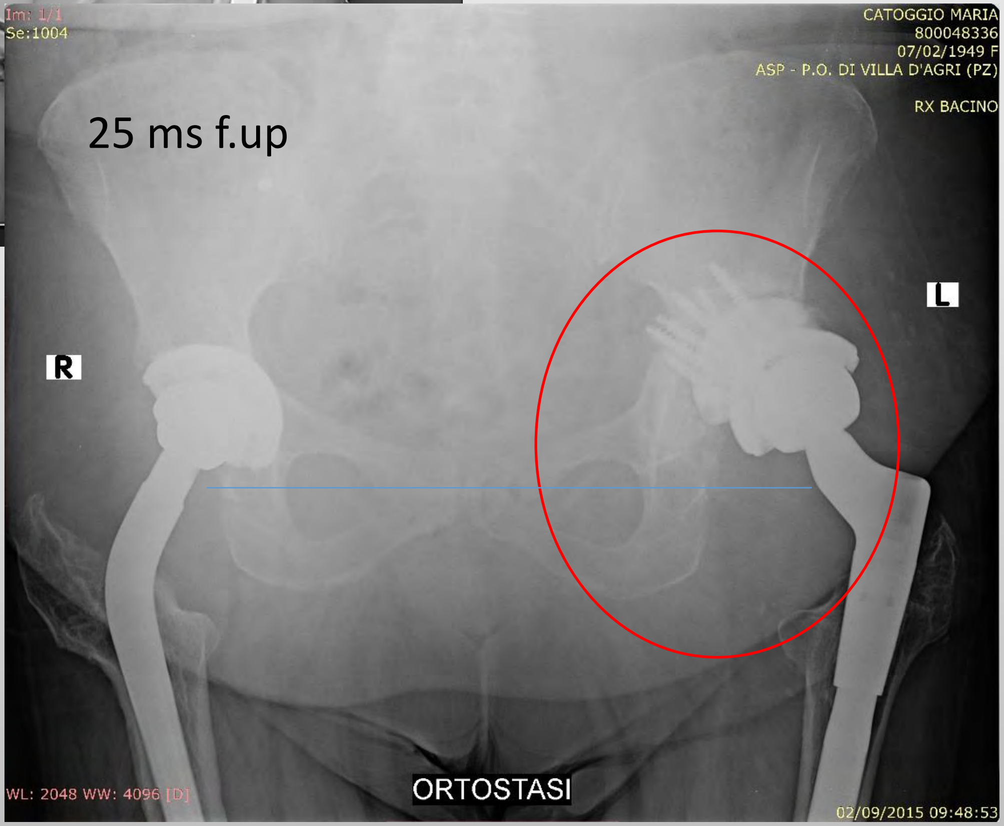

CATOGGIO MARIA
800048336
07/02/1949 F
OSPEDALE VILLA D'AGRI
38332
Se: 102
Volume Rendering No cut
DFOV 45.8 cm
STND/+
TC BACINO
Screen save
Hardware
No VOI
kv 140
mA Mod.
Rot 0.80s/HE+ 39.4mm/rot
0.6mm 0.984:1/0.6sp
Tilt: 0.0
W = 2957 L = -121
02/09/2015 09:59:08

CATOGGIO MARIA
800048336
07/02/1949 F
OSPEDALE VILLA D'AGRI
38332
Se: 102
Volume Rendering No cut
DFOV 45.8 cm
STND/+
TC BACINO
Screen save
Hardware
No VOI
kv 140
mA Mod.
Rot 0.80s/HE+ 39.4mm/rot
0.6mm 0.984:1/0.6sp
Tilt: 0.0
W = 2957 L = -121
02/09/2015 09:59:08

CATOGGIO MARIA
800048336
07/02/1949 F
OSPEDALE VILLA D'AGRI
38332
Se: 102
Volume Rendering No cut
DFOV 45.8 cm
STND/+
TC BACINO
Screen save
Hardware
No VOI
kv 140
mA Mod.
Rot 0.80s/HE+ 39.4mm/rot
0.6mm 0.984:1/0.6sp
Tilt: 0.0
W = 2957 L = -121
02/09/2015 09:59:08

CATOGGIO MARIA
800048336
07/02/1949 F
OSPEDALE VILLA D'AGRI
38332
Se: 102
Volume Rendering No cut
DFOV 45.8 cm
STND/+
TC BACINO
Screen save
Hardware
No VOI
kv 140
mA Mod.
Rot 0.80s/HE+ 39.4mm/rot
0.6mm 0.984:1/0.6sp
Tilt: 0.0
W = 2957 L = -121
02/09/2015 09:59:08

Case 1: CATOGGIO MARIA f 65yrs old





25 ms F. Up

Paprosky
-----

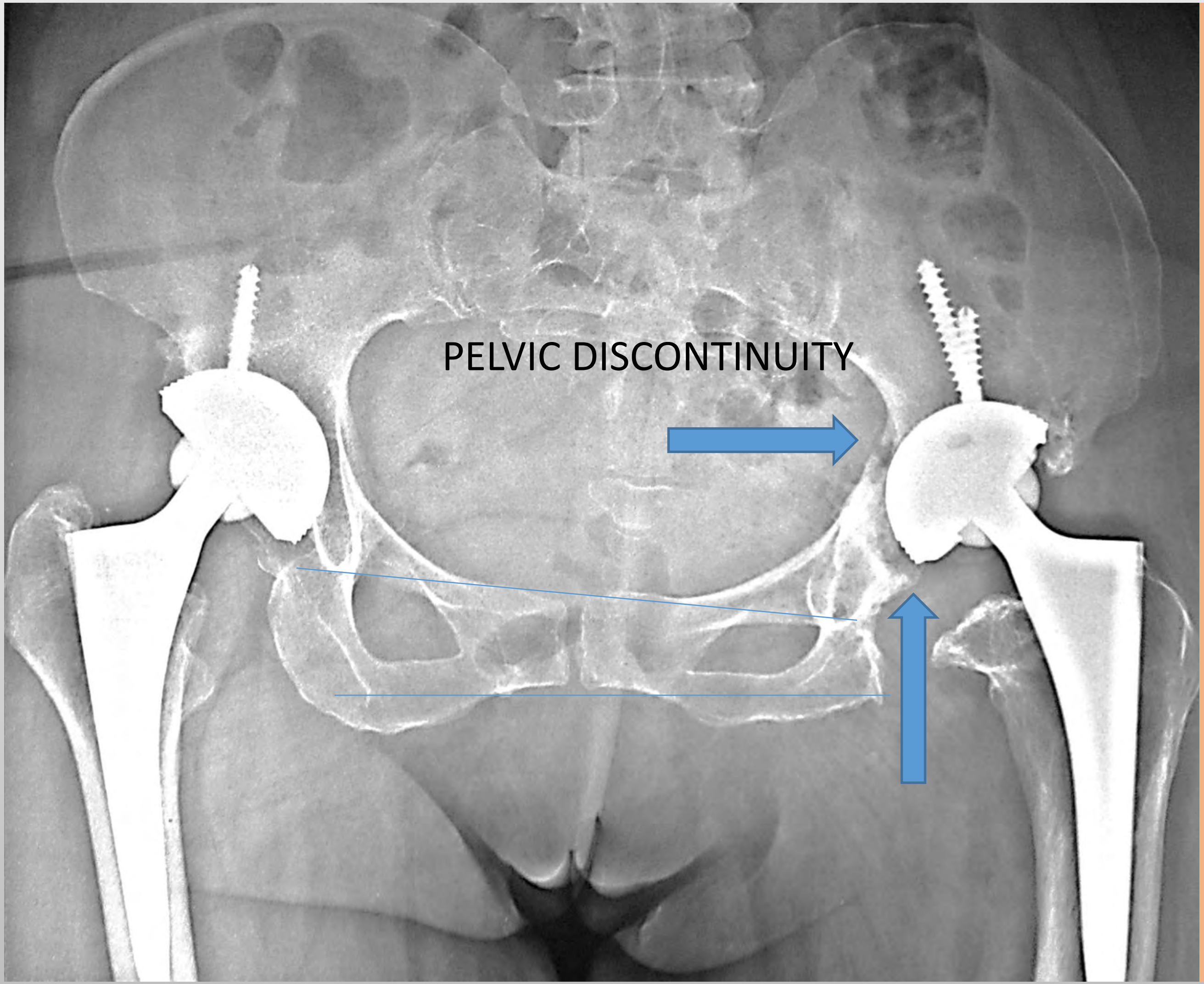
postop. HHS
82

AMBULATORY SCORE
2

MOORE
1

HCR
+14 lat

CASE 2: POLIZZI ROSALIA f. 45 yrs old



8 Yrs F. Up

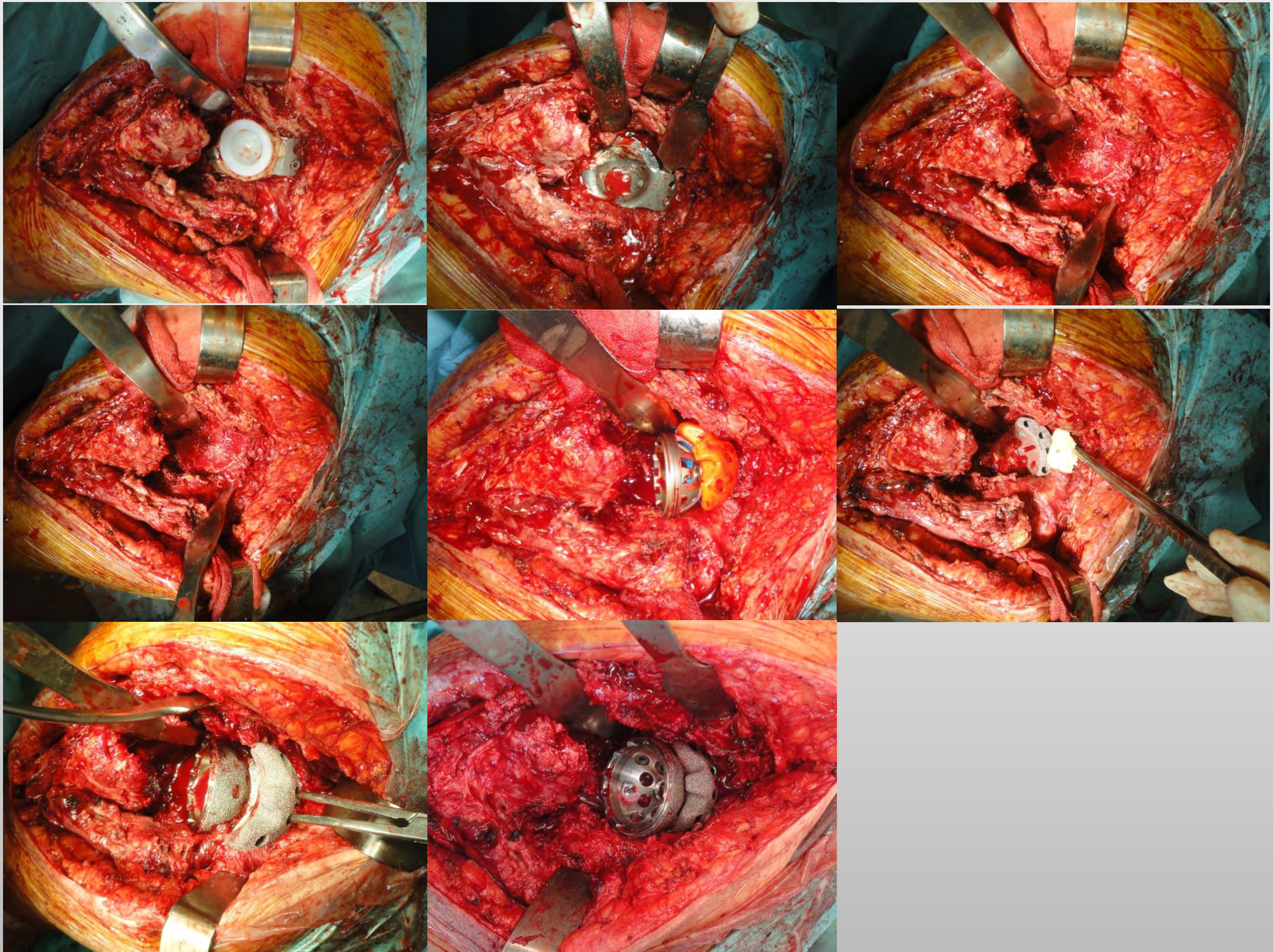
Paprosky
3B

preop. HHS
32

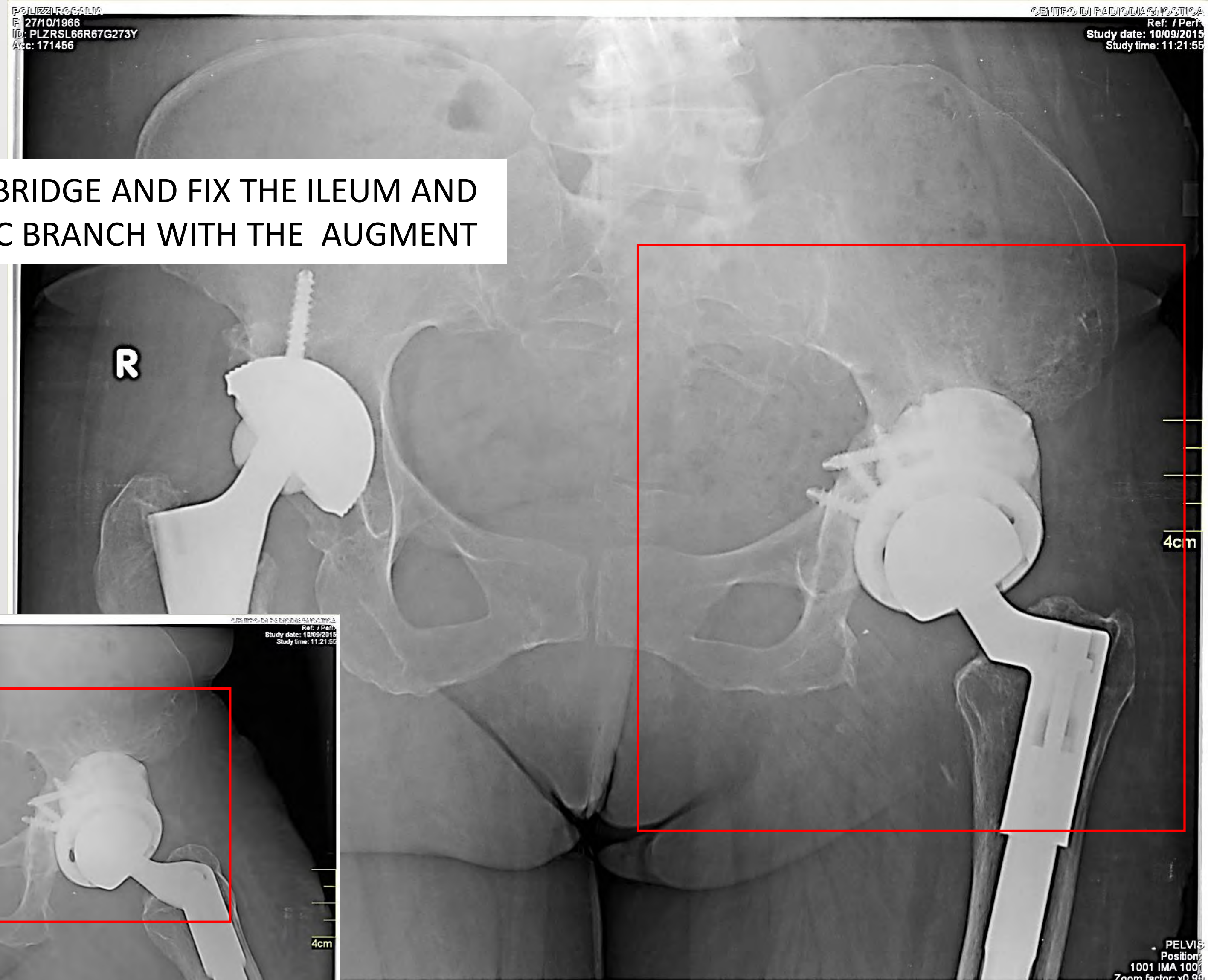
AMBULATORY SCORE
3

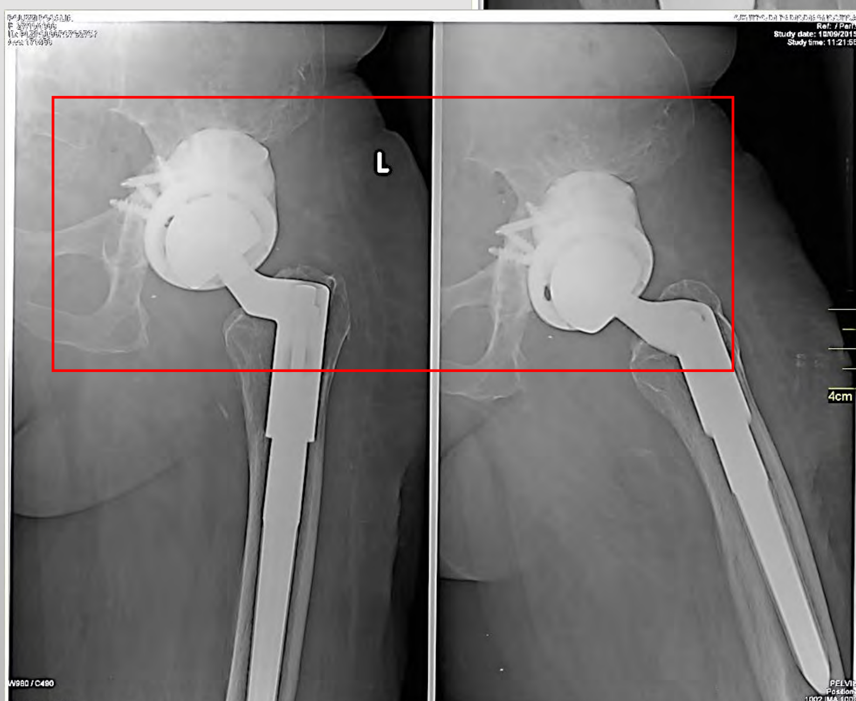
MOORE
4

HCR
+11



SCREWS TO BRIDGE AND FIX THE ILEUM AND ISCHIO-PUBIC BRANCH WITH THE AUGMENT

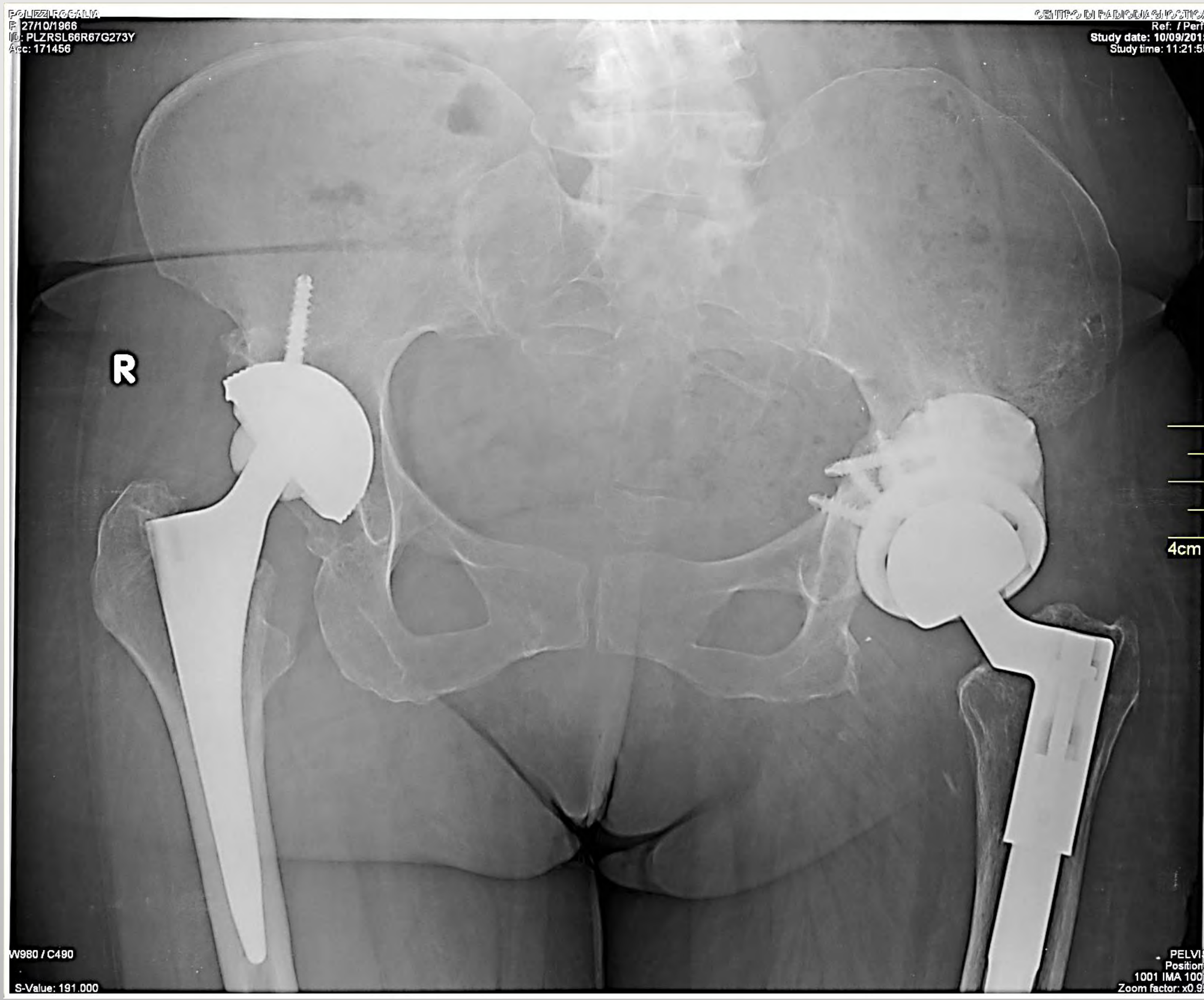




POLIZZI ROSALIA f. 45 yrs old

24 ms f.up

CASE 2: POLIZZI ROSALIA f. 45 yrs old



24 ms F. Up

Paprosky
-----

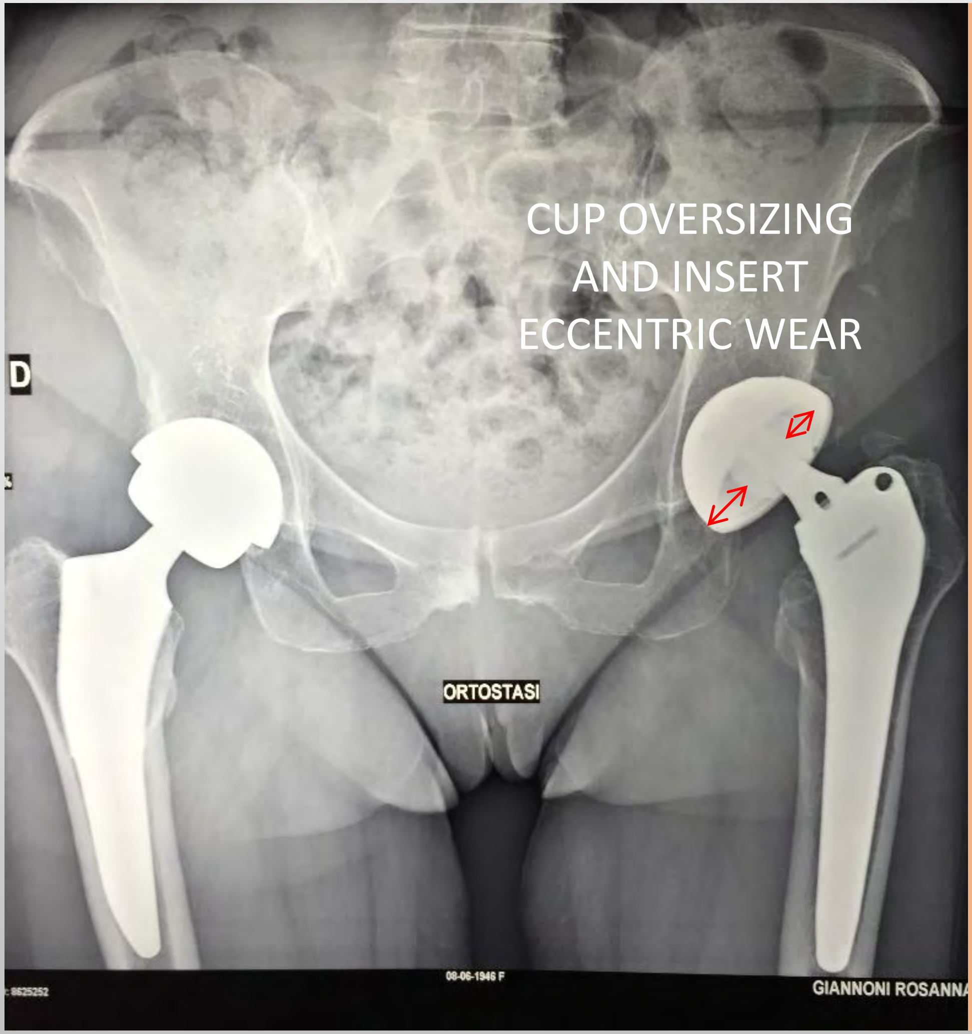
postop. HHS
90

AMBULATORY
SCORE
1

MOORE
1

HCR
0

Case 3 : GIANNONI ROSANNA f. 68 yrs old



6 Yrs F. Up

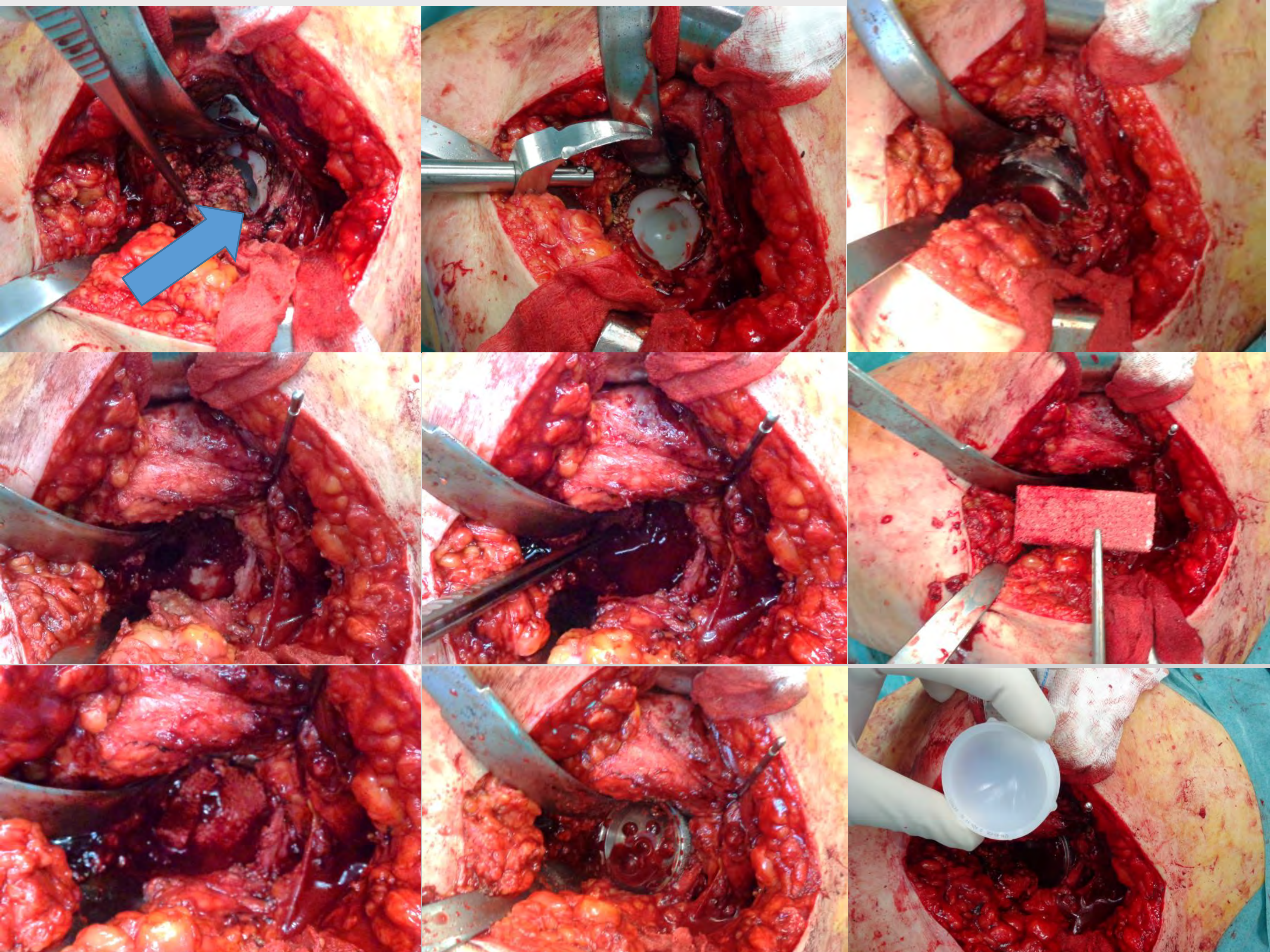
Paprosky
1

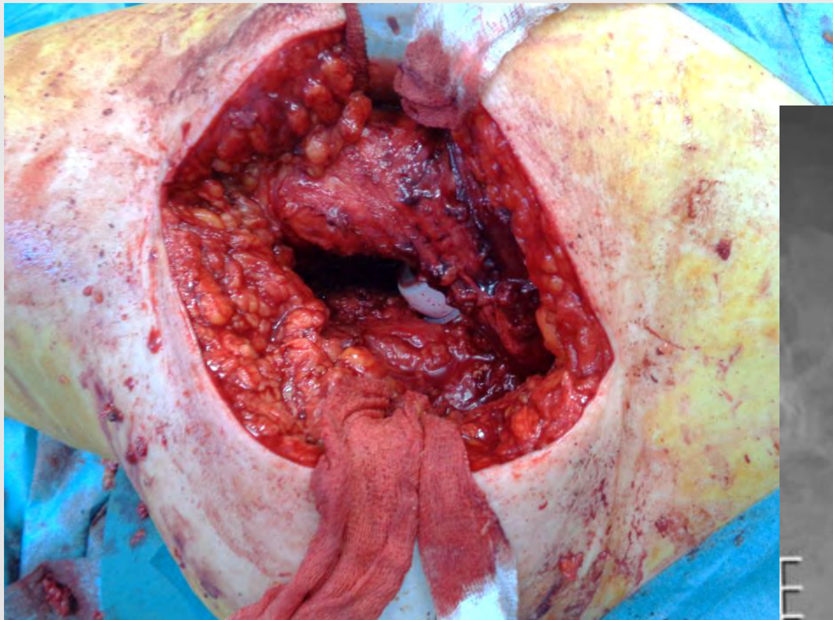
preop. HHS
46

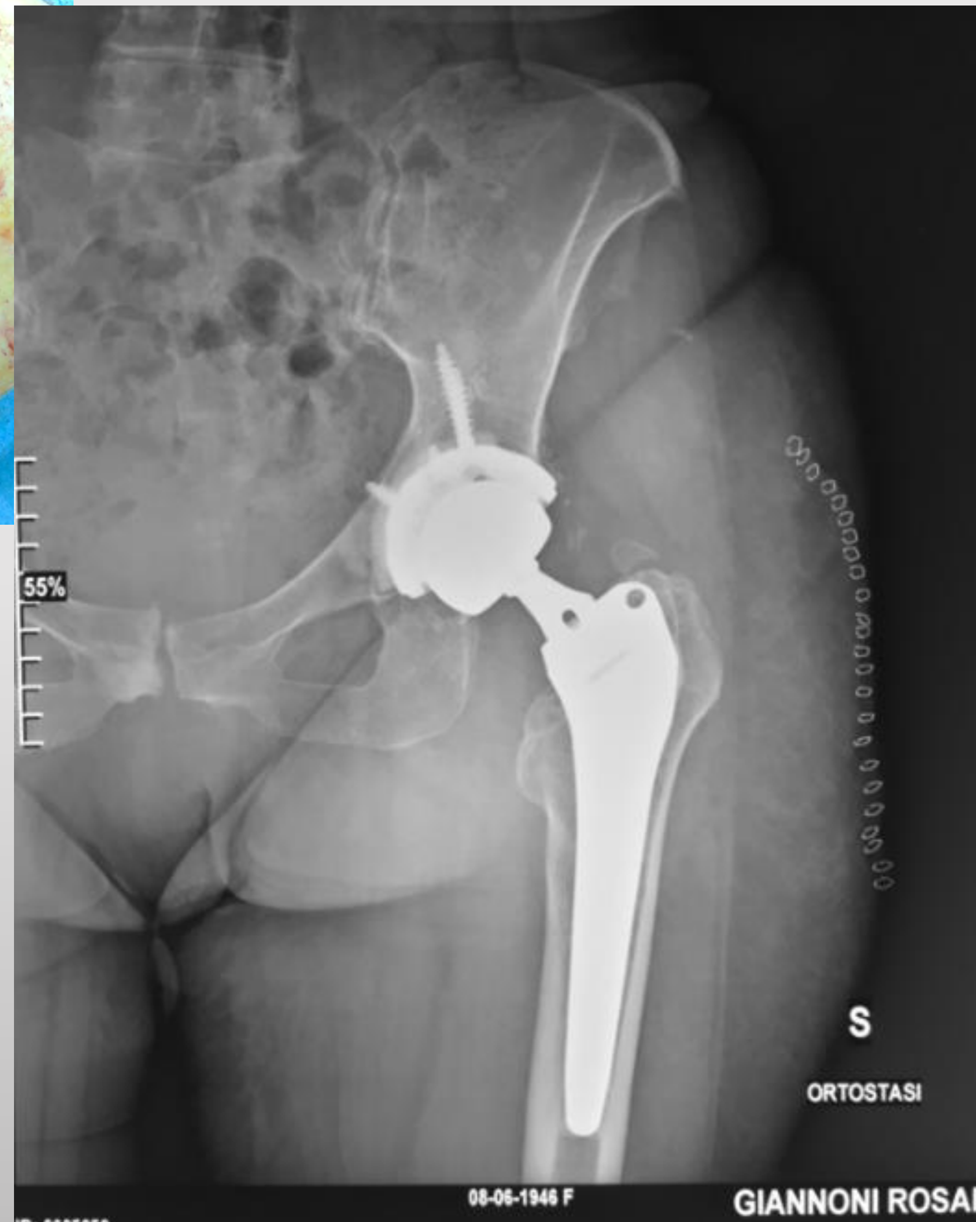
AMBULATORY SCORE
2

MOORE
3

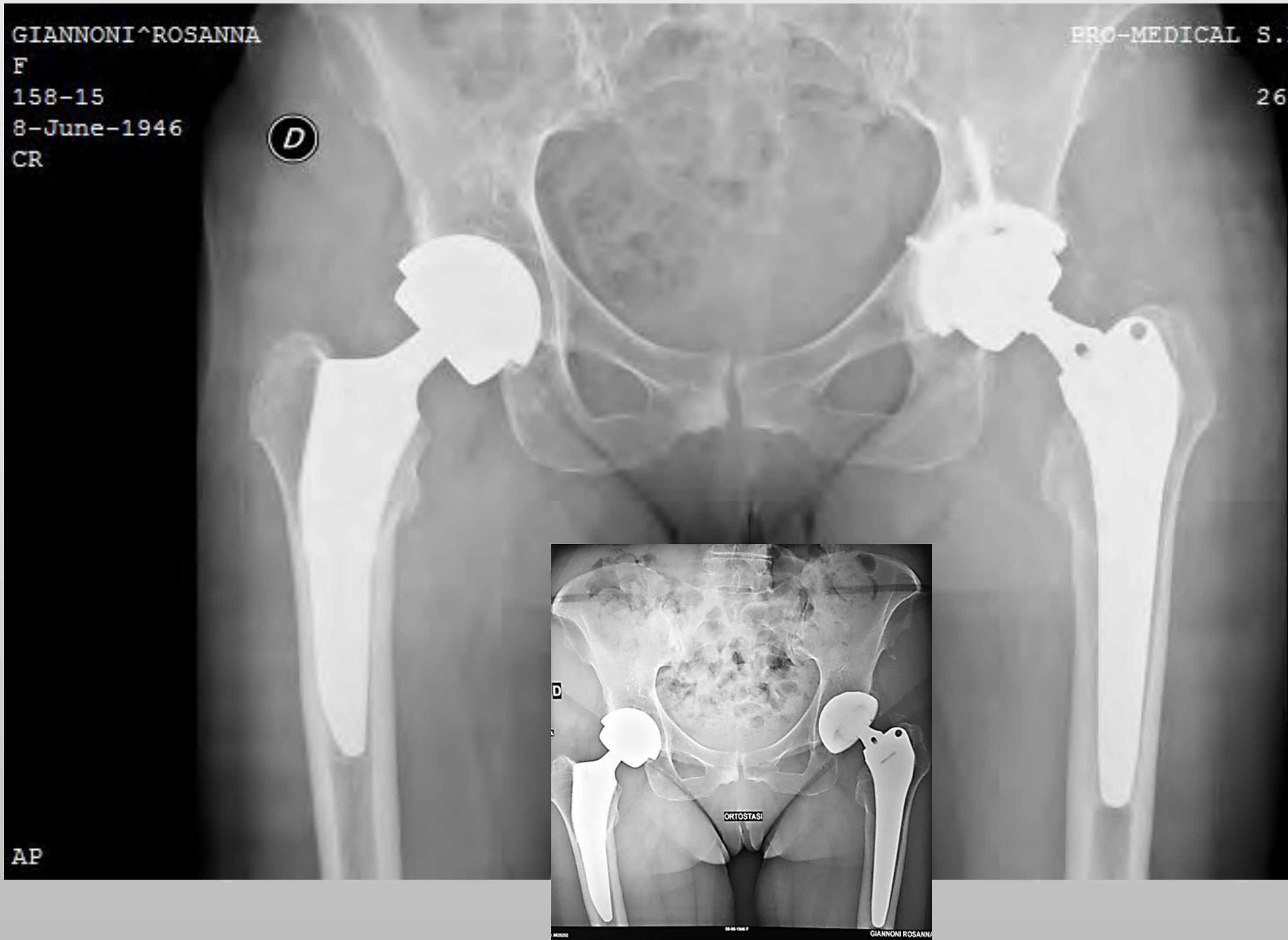
HCR
+5 lat






55%
S
ORTOSTASI
08-06-1946 F
GIANNONI ROSAN
ID: 8625252

GIANNONI ROSANNA f. 68 yrs old



14 ms F. Up

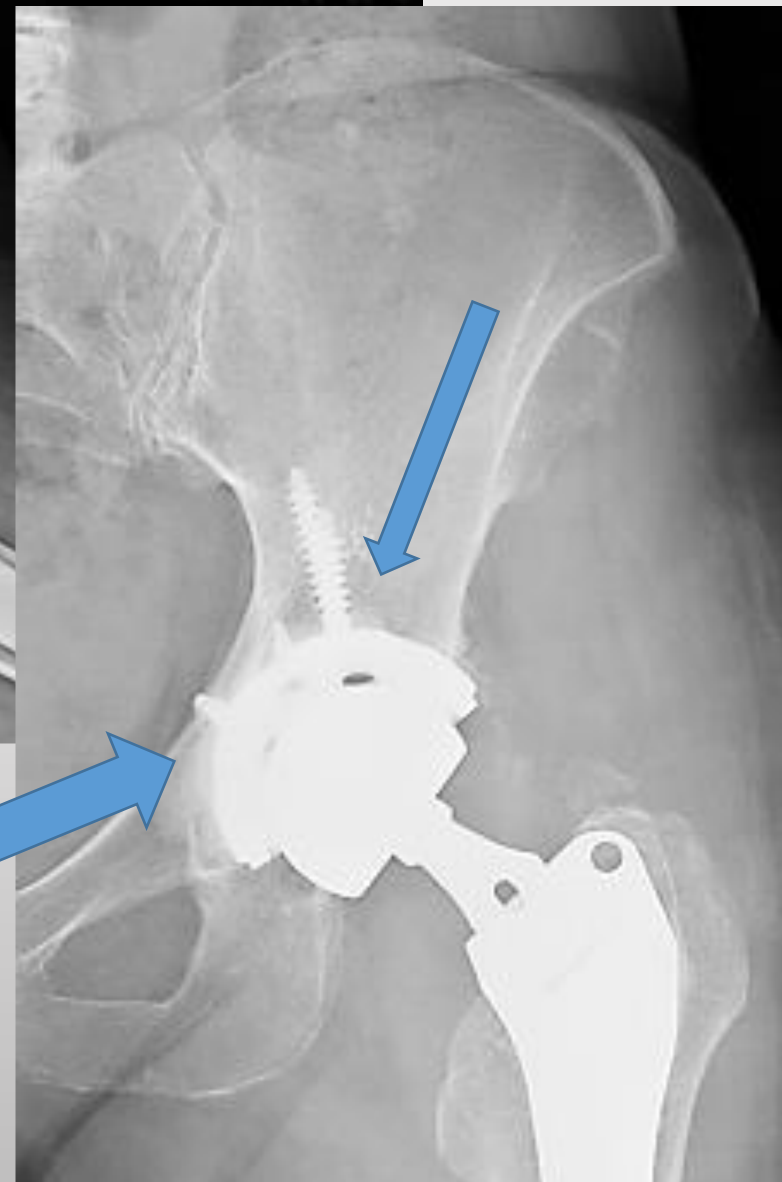
Paprosky
---

postop. HHS
92

AMBULATORY
SCORE
1

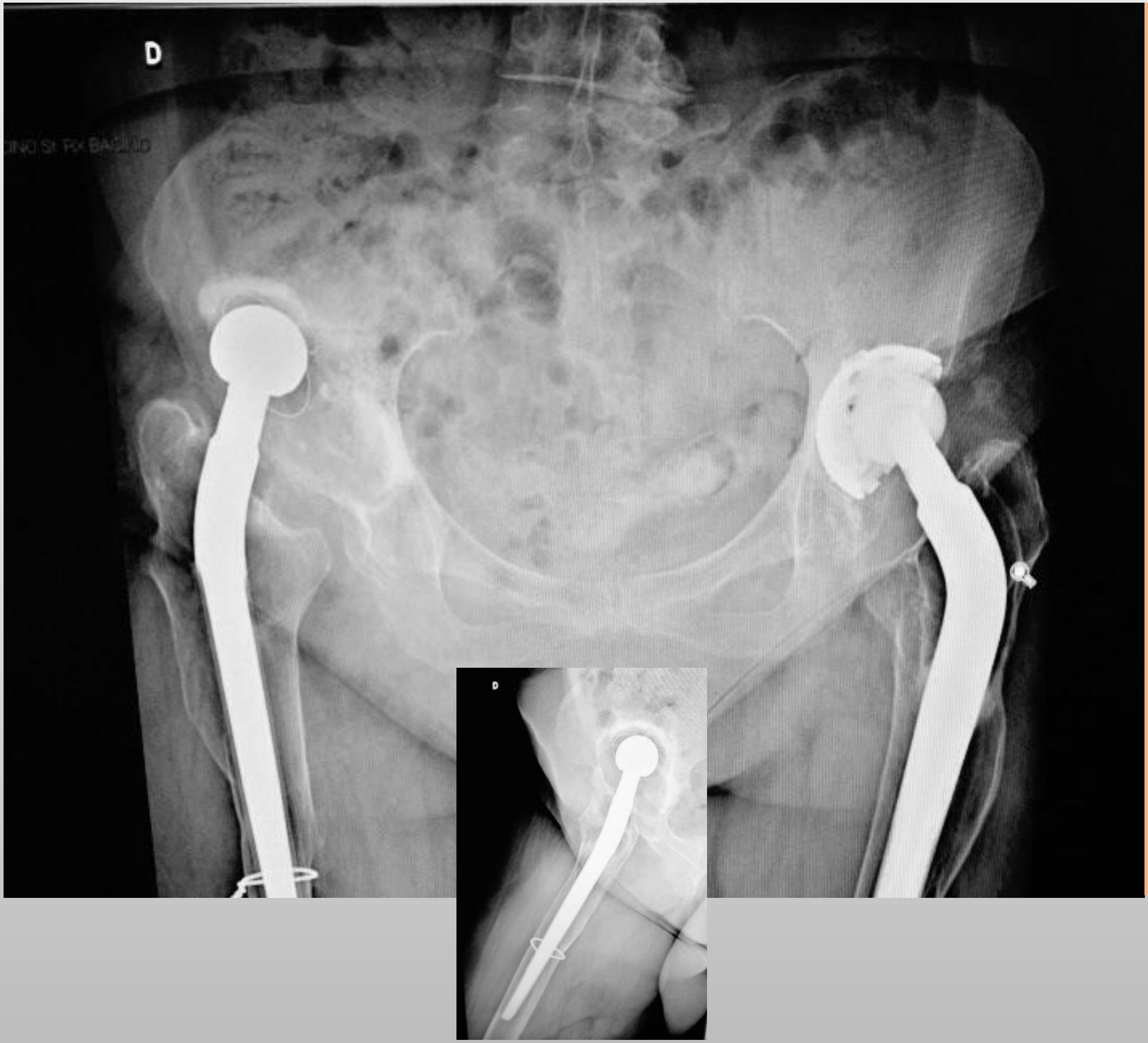
MOORE
1

HCR
--



COMPLETE INTEGRATION WITH RESORBTION AND REPLACING BY BONE OF THE SCAFFOLD

Case 4:DE MICHELIS ANNA MARIA f. 67 yrs old



5 Yrs F. Up

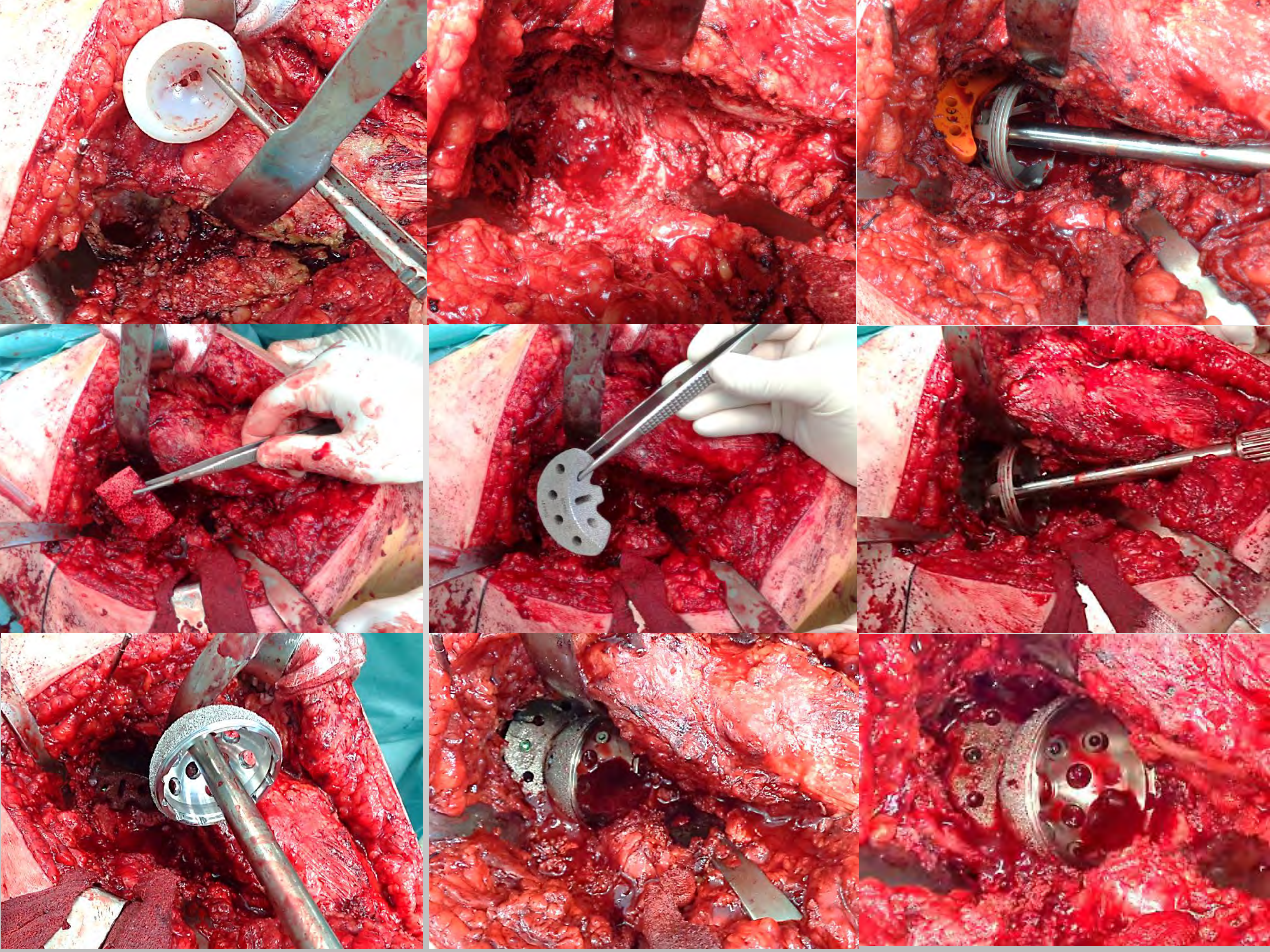
Paprosky
2B

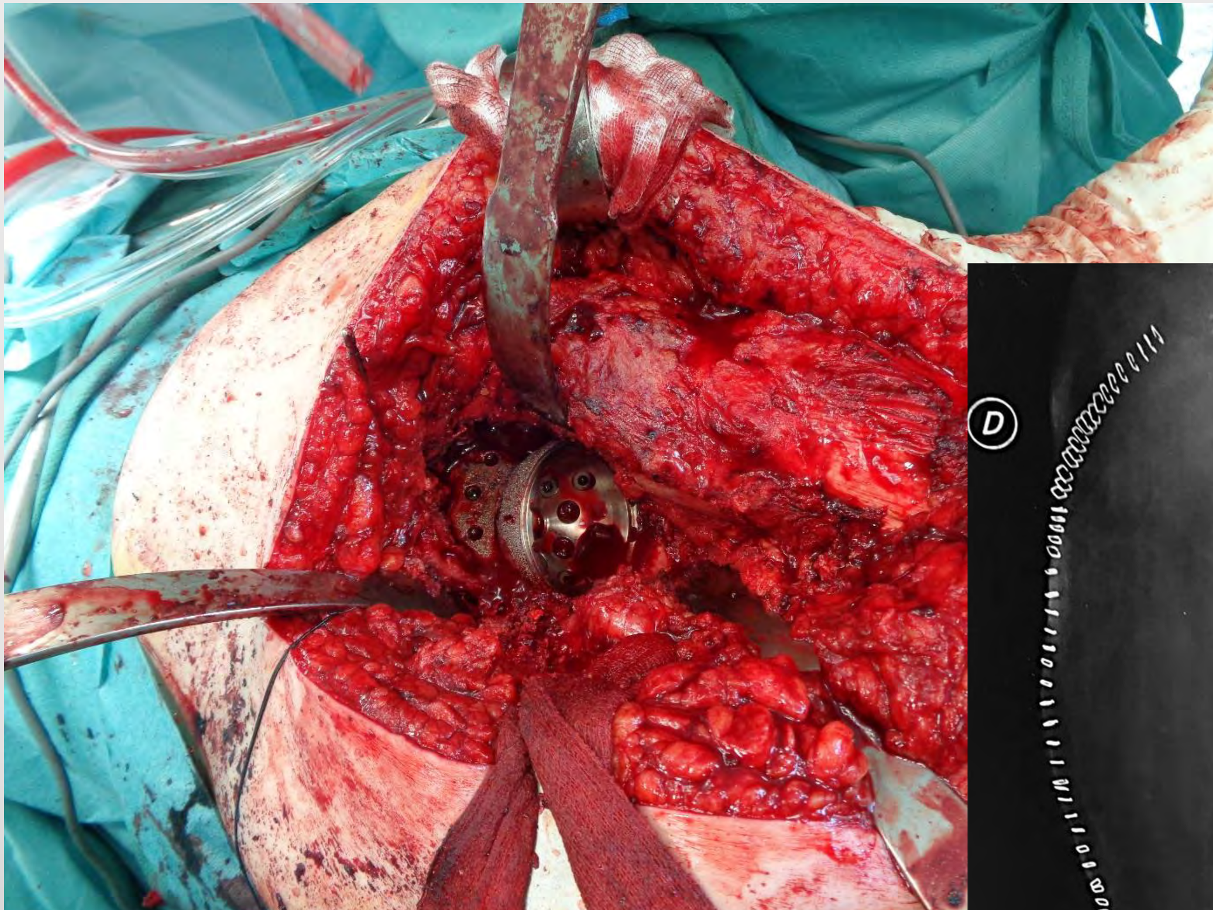
preop. HHS
30

AMBULATORY SCORE
4

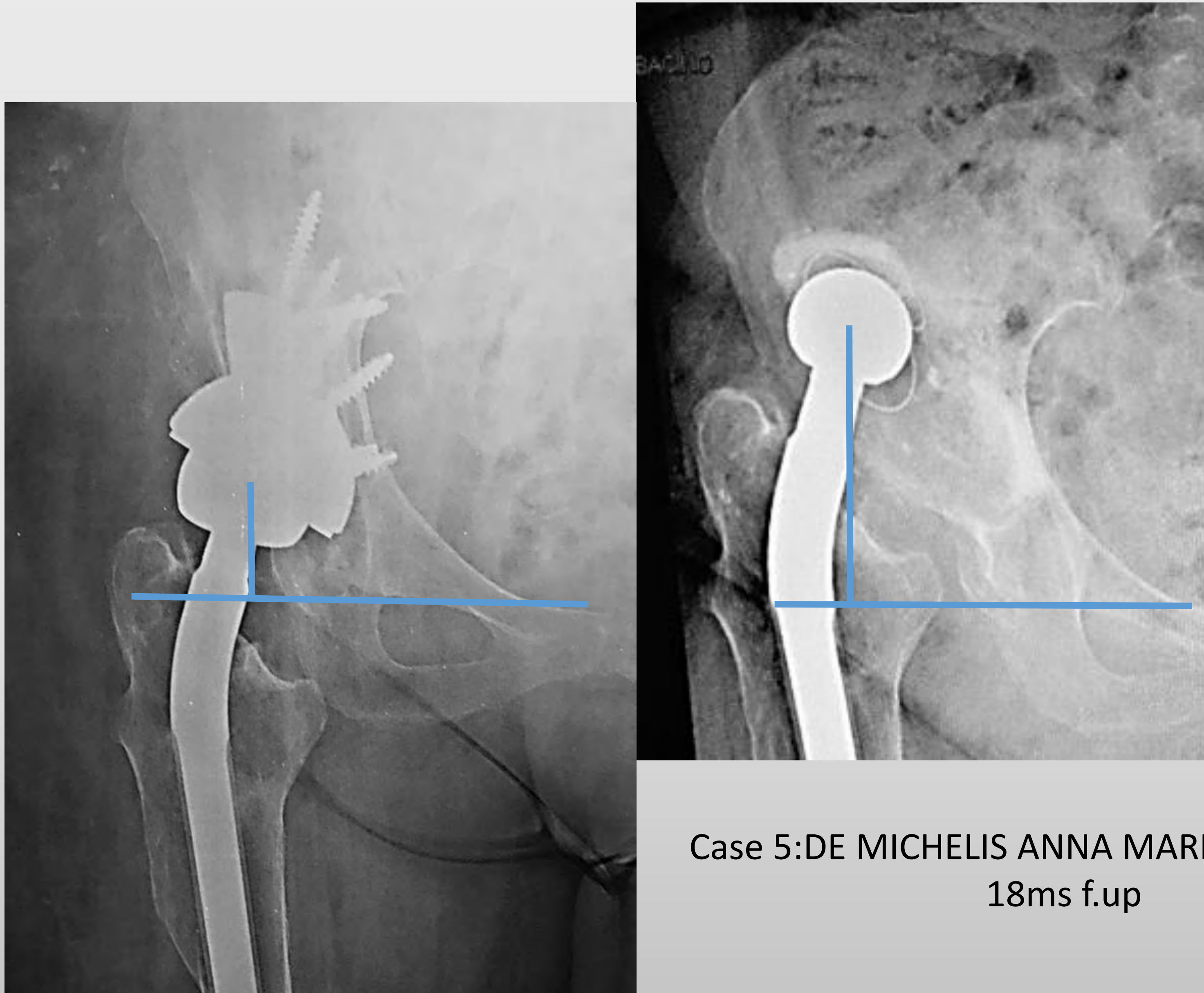
MOORE
4

HCR
+41






D
CASA DI CURA VILLA ERBOSA DE MICHELI,MARIA 8657534 20/02/1947 F 10/06/2015 09:34



Case 5:DE MICHELIS ANNA MARIA f. 67 yrs old
18ms f.up

Case 5:DE MICHELIS ANNA MARIA f. 67 yrs old

18 ms F. Up

Paprosky
---

postop. HHS
92

AMBULATORY SCORE
1

MOORE
1

HCR
+4

RESULTS 1: HARRIS HIP SCORE

The mean pre-operative HHS functional score was **37 (29-54)**
The mean post-operative HHS functional was **84 (76-91)**
at the time of last follow up

Augments were used in 23/54 cases
Preop. HHS 32
Postop HHS 81
Frozen morselised bone omografts were used in 50/54 cases
Preop. HHS 38
Postop. HHS 83
Chronos strip allografts in 29/54 cases
Preop. HHS 35
Postop. HHS 87

We defined clinical failure as revision as a result of
septic or aseptic loosening of the acetabular component, or an HHS < 27 points
by evaluating post-operative anteroposterior pelvic and lateral hip radiographs
obtained at the last follow-up visit.

RESULTS 2: MOBILITY SCORING SYSTEM

The modified ambulatory score

Walking aid	**Ambulatory score**
None	1
One stick	2
Two sticks or one elbow crutch	3
Frame and wheeled walker	4
Two elbow crutches	5
Wheelchair	6

The mean ambulatory score
pre-operatively was 2.87 (1 to 6),
and improved
post-operatively to 1.48 (1 to 2)
($p < 0.001$, Wilcoxon's matched-pairs signed ranks test).

Of the revised patients, a total of 5 required a walking stick, and one patient with ankylosing spondylitis required two sticks. Two patients required the use of a walking frame

RESULTS 3: MOORE CLASSIFICATION OF OSTEO-INTEGRATION OF THE SHELL

<u>The classification of Moore et al</u>

was used to assess the probability of osteo-integration of the shell.

This classification uses five different radiological signs, including:

1) the absence of radiolucent lines (RRLs);
2) the presence of a superolateral buttress
3) medial stress-shielding;
4) radial trabeculae;
5) an inferomedial buttress.

According to Moore's criteria the presence of three or more signs has a 97% accuracy rate in predicting osteointegration, and fewer than two signs predicts lack of osteointegration in 83%.

Using the Moore criteria,
7 showed 5 signs of osteo-integration,
29 showed 4 signs,
13 showed 3 signs and
5 showed 2 signs
91% were found to be osteo-integrated

Except for two of the failed cases,
all augments were found to be osteo-integrated.
Metal debris shedding NOT was found in the early post-operative radiographs

RESULTS 4: AUGMENT STABILITY

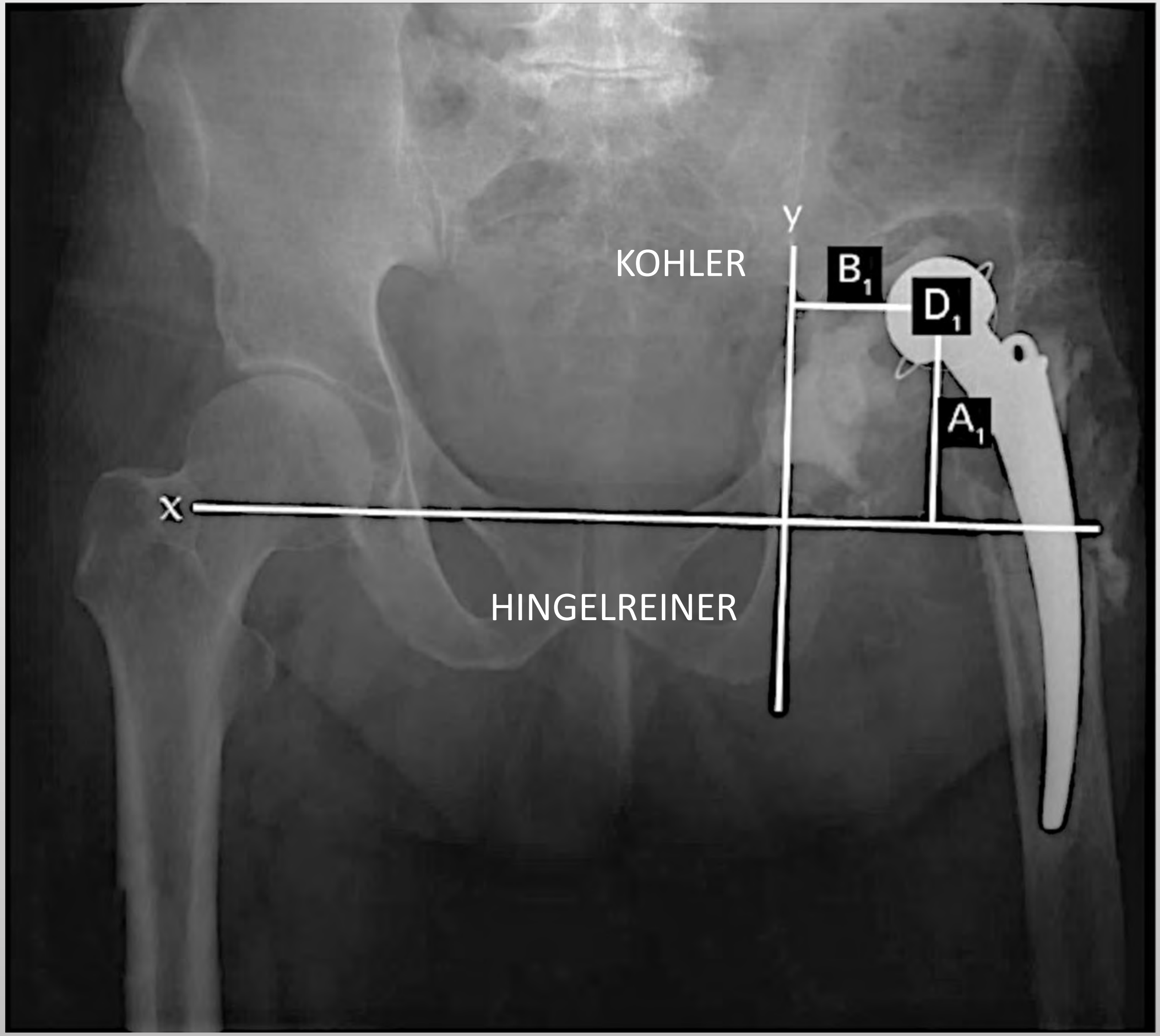
Augments were considered unstable if we detected:

- 1) > 3 mm migration compared with the early post-operative radiograph;
- 2) an RLL at the augment–bone interface;
- 3) RLLs around all screws;
- 4) screw fracture

Augments were used in 23/54 cases
14 OUT OF 23CASES WERE PAIRED
22 out of 24 augment were stable

1 out of 24 due to traumatic car accident was instable as well as the cup that was revised at 23 ms f.up

RESULTS 5: POSITION OF HRC



RESULTS 5

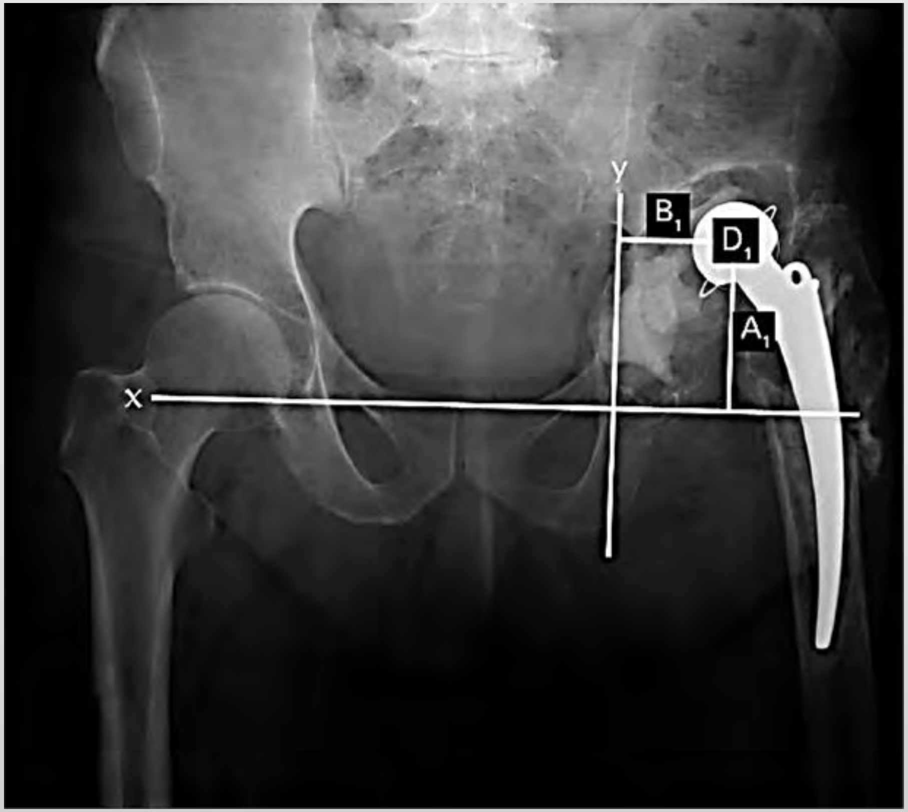
The ability of this technique to restore the normal HRC was assessed

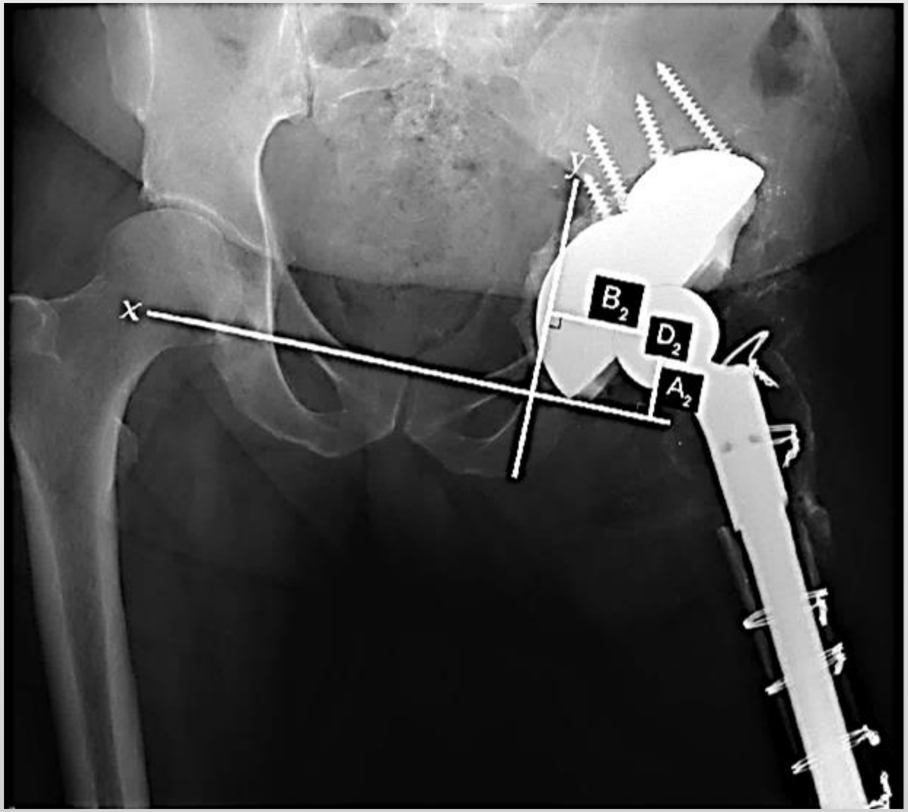
- According to the normal HCOR, which we could determine in 54 hips using the opposite hip as a reference,

the pre-operative level of the prosthetic centre of rotation was located at a point

superior to the position of the anatomical HRC by a mean of 28.8 mm (-3 to 79) and lateral to it by a mean of 13.3 mm (-21 to 35).

RESULTS 5: POSITION OF HRC (COMPONENT MIGRATION)





The position improved in both axes after revision, so that the mean location of the HRC moved to a point

21 mm (10 to 46) vertical (46% mean improvement) and

34.5 mm (15-49) horizontal to the anatomical centre.

COMPLICATIONS

- **1 superficial wound infection**
- **1 deep infection** was detected four months after the third revision in an 80-year-old patient. After debridement and lavage, suppressive antibiotic therapy was initiated and 3 ms later there was no indication of infection, at which time the patient had an HHS of 72, still being on antibiotics
- **6 hips with heterotopic ossification** as measured by Brooker’s classification. There were

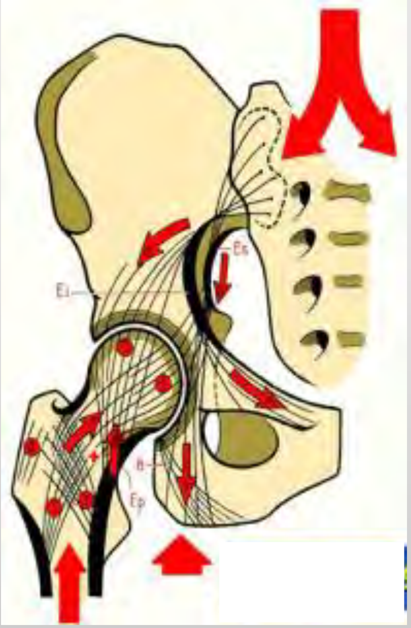
  four cases with type I and

  two cases with type II heterotopic ossification

  without any loss of movement.
- **1TVP**
- **1 greater trochanter avulsion**.
- **1 postraumatic loosening with component migration >5mm**

CONCLUSIONS:
AIMS IN REVISION HIP ARTHROPLASTY
Wolff J. 1986

- **Clinical**: good function of the hip joint
- **Biomechanical** : center of rotation (HRC)
- **Anatomical**: filling of bone defects
- **Biological**: graft incorporation



1.CONCLUSIONS: FUNCTIONAL SCORE

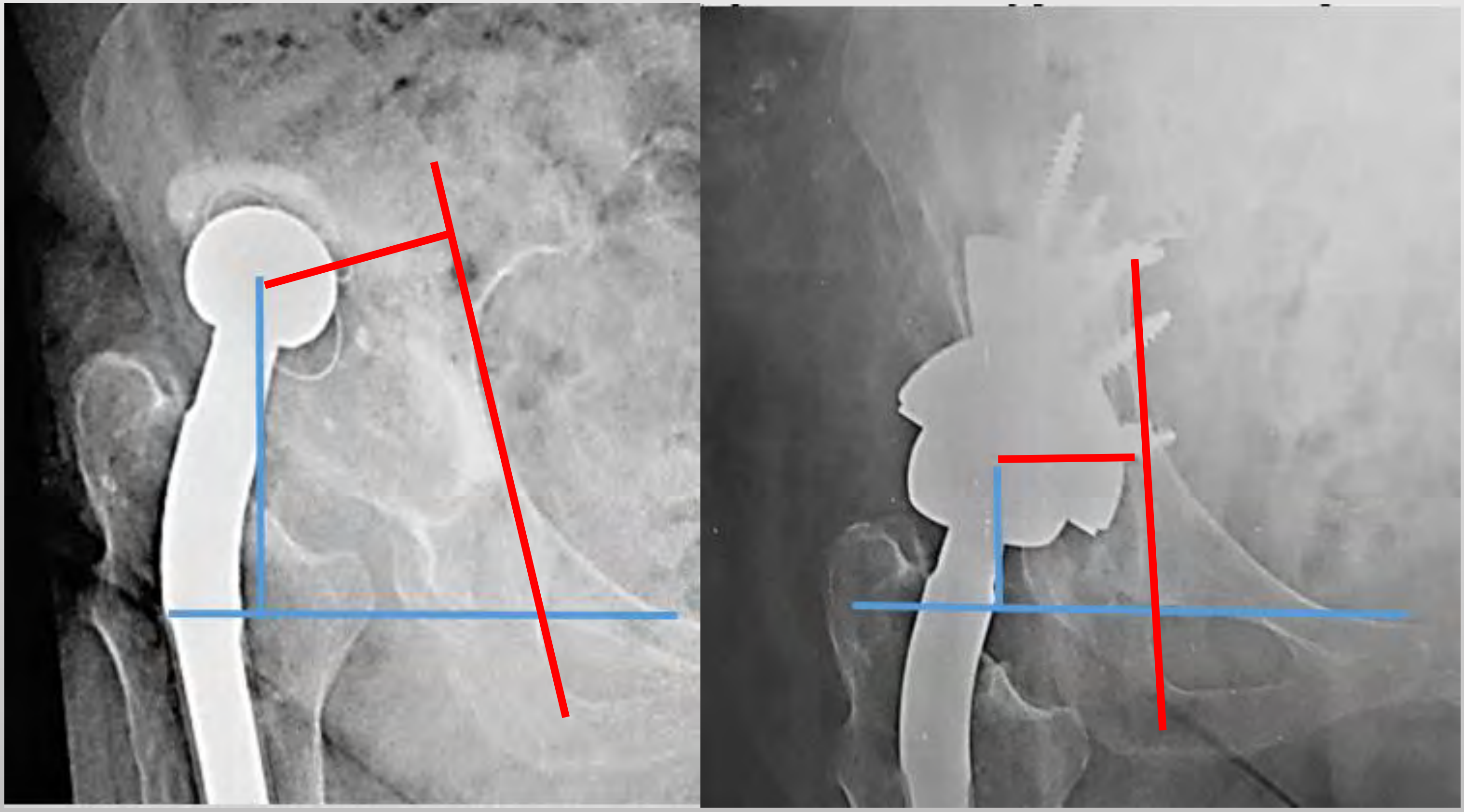
The mean pre-operative HHS functional score was **37 (29-54)**

The mean post-operative HHS functional was **84 (76-91)** at the time of last follow up

IMPROVEMENT OF 227 %

2.CONCLUSIONS: HRC

The position improved in both axes after revision, so that
the mean location of the HRC moved to a point
21 mm (10 to 46) vertical (46% mean improvement)
and 34.5 mm (15-49) horizontal (21% mean improvement)
to the anatomical centre.



3. CONCLUSIONS FILL BONE DEFECTS

- The use of a shelf allograft to reconstruct the acetabulum with a minor column defect has been reported to fail in almost one-third of the hips at 15 years' follow-up
- Use of bilobed (oblong) components has been discouraged bysome authors because of a high failure rate in short-term follow-up.
- Jumbo components have shown more favourable results, with a 92% survival rate at 14 years.
- In our study, none of the reconstructions in patients with minor column defects failed. Pinnacle Gription revision cups, hemispherical modules and augments facilitate reliable and reproducible biological fixation in acetabular revision surgery with excellent results.

- **ACTUAL TREATMENT FOR MAJOR COLUMN DEFECTS INCLUDES THE USE OF STRUCTURAL ALLOGRAFT AND AUGMENTS**

even though a long or mid-term f.up are not yet available and reported with this technique

- Extended follow-up is necessary to evaluate the long-term performance of these modular implants

3B.CONCLUSIONS: AUGMENTS

- **The use of an augment in our series improved the location of the HRC in 24 hips, restoring it to a mean 9.9 mm above normal.**

Biomechanical studies have shown that up to 20 mm superior displacement of the HCOR does not significantly affect the joint reaction and abductor muscle forces.

(***Delp SL, Wixson RL, Komattu AV, Kocmond JH***. *How superior placement of the joint center in hip arthroplasty affects the abductor muscles. Clin Orthop Relat Res 1996;328:137–146*)

- **Our results support the use of augments to support shells in the bone-deficient acetabulum**

without the reported risk of resorption ascribed to structural allografts.

- However, there are some disadvantages to the use of augments, as they do not restore bone stock for any subsequent revision.

4a. CONCLUSIONS: HOMOGRAFT

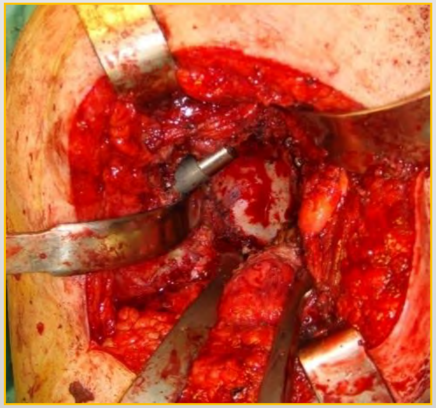
The use of morcellized HOMOGRAFT

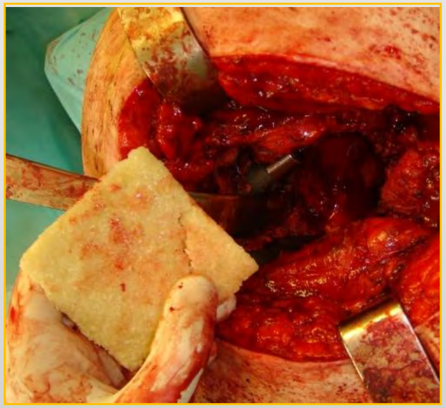
(Tissue bank bone pasta)

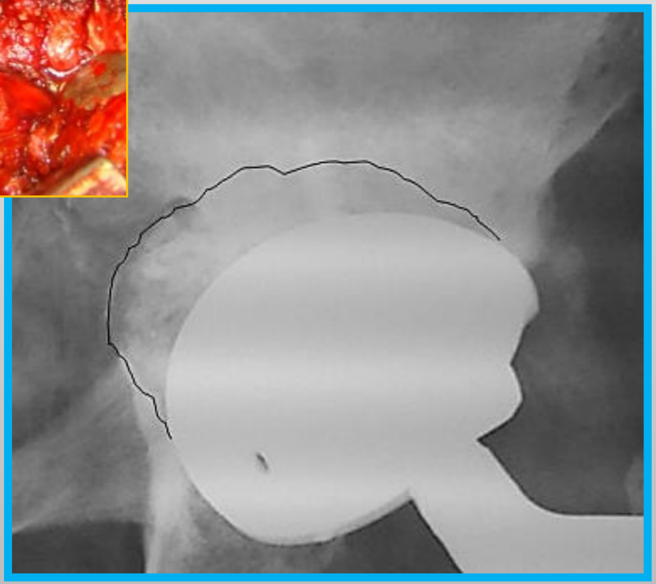
in our series showed

Minimal resorbption

Host bone - Gription osteointegration



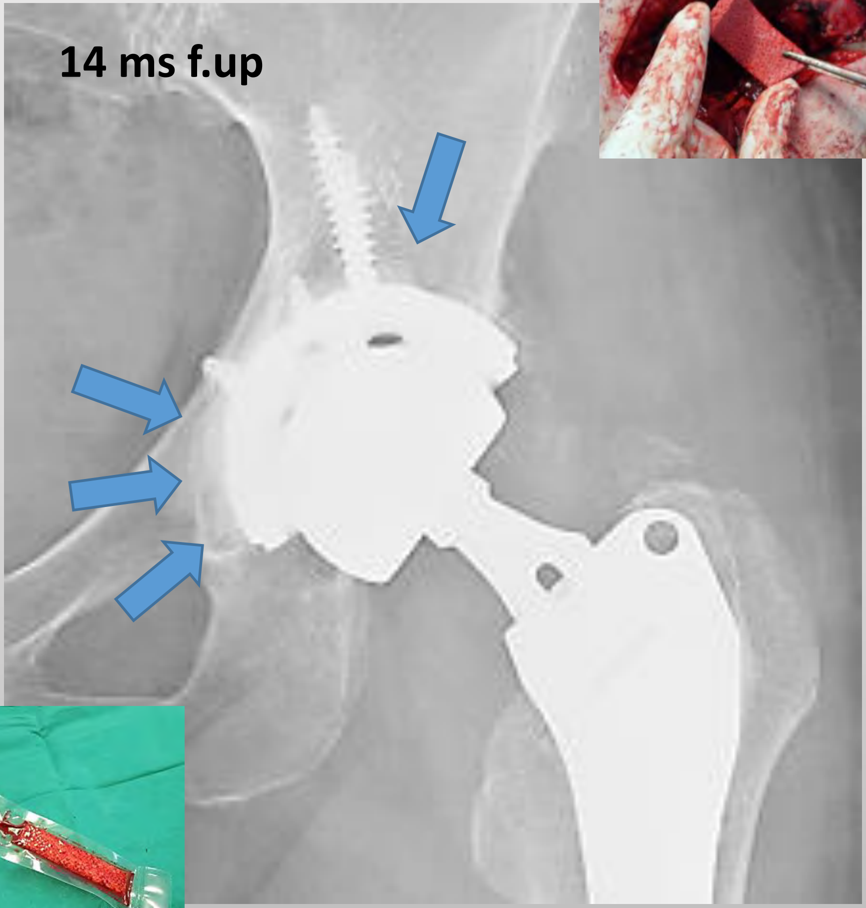




4b. CONCLUSIONS: CHRONOS ALLOGRAFT

Osteoconductive b-TCP ceramic scaffold

The use of chronOS ALLOGRAFT in our series showed in all cases

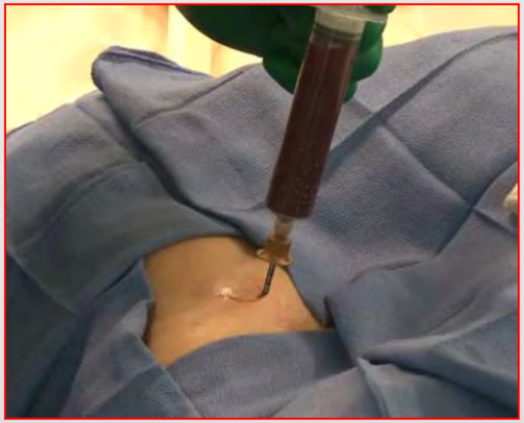


1. Optimal resorbption and reconstruction/replacement by host bone

during healing process
that takes about 6 –to 18 ms

2. Good initial structural stability
Good bone filling

Each strip is sterile-packaged in a perfusion pack, allowing easy perfusion with autologous bone marrow or blood



Perfusion with bone marrow aspirate provides a favourable environment for bone ingrowth

Recommended volumes for perfusion of chronOS Strip

Strip Size (mm)	Perfusion Volume Range (cc)
50 x 25 x 3	4–10
100 x 25 x 3	7–20
50 x 25 x 6	7–10
100 x 25 x 6	15–20
47 x 18 x 3 (2 strips)	5-10

5. CONCLUSIONS

BETTER INTRAOPERATIVE PRESS-FIT
BETTER BIOLOGICAL FIXATION - BONE IN GROWTH
FASTER WEIGHT-BEARING
SHORTER SURGICAL TIME

Significative improvement of biomechanics
Significative improvement of function (ROM,stability, geometry)

Presumable increasing of survivorship

- Even though at this data we do not have any
  NO LONG TERM RESULTS

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

RESULTS OF MODULAR POLYAXIAL ILIAC SCREW CUP IN PATIENTS WITH PREVIOUS ACETABULAR REVISIONS

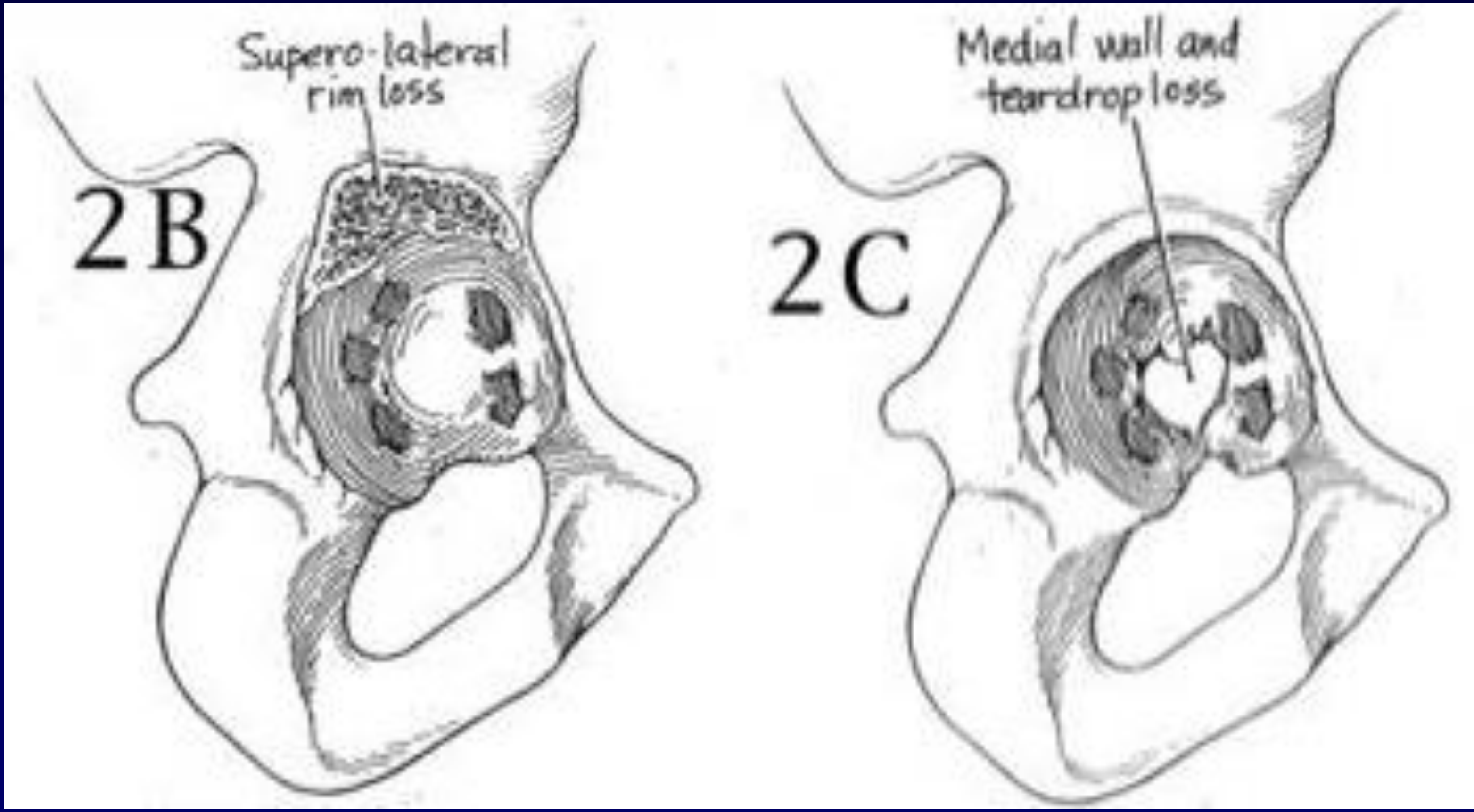
A. Sambri, M. Cadossi, G. Tedesco, F.L. Garcia, M. Tabaza, A. Mazzotti, G. Pignatti

Istituto Ortopedico Rizzoli
Bologna – Italy

MULTIPLE ACETABULAR REVISIONS

Bone loss

< 3 cm superior migratiion

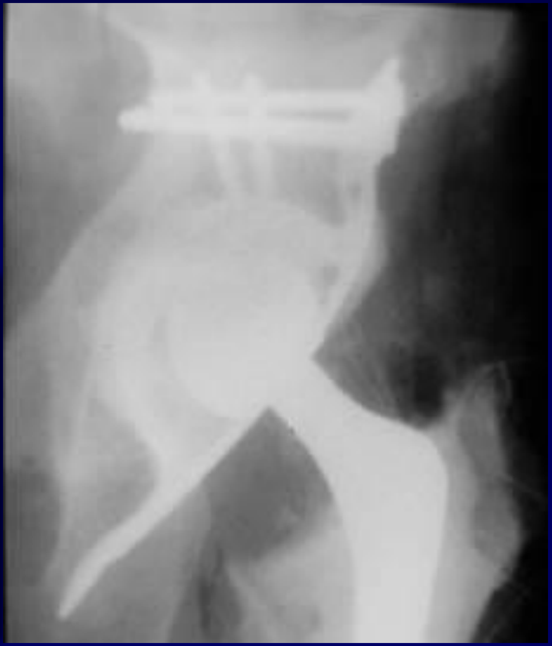


Paprosky et al. J Arthroplasty 1994

MULTIPLE ACETABULAR REVISIONS

- Small cemented cups
- Mueller reinforcement rings
- Burch Schneider reconstruction rings

- Bone grafting

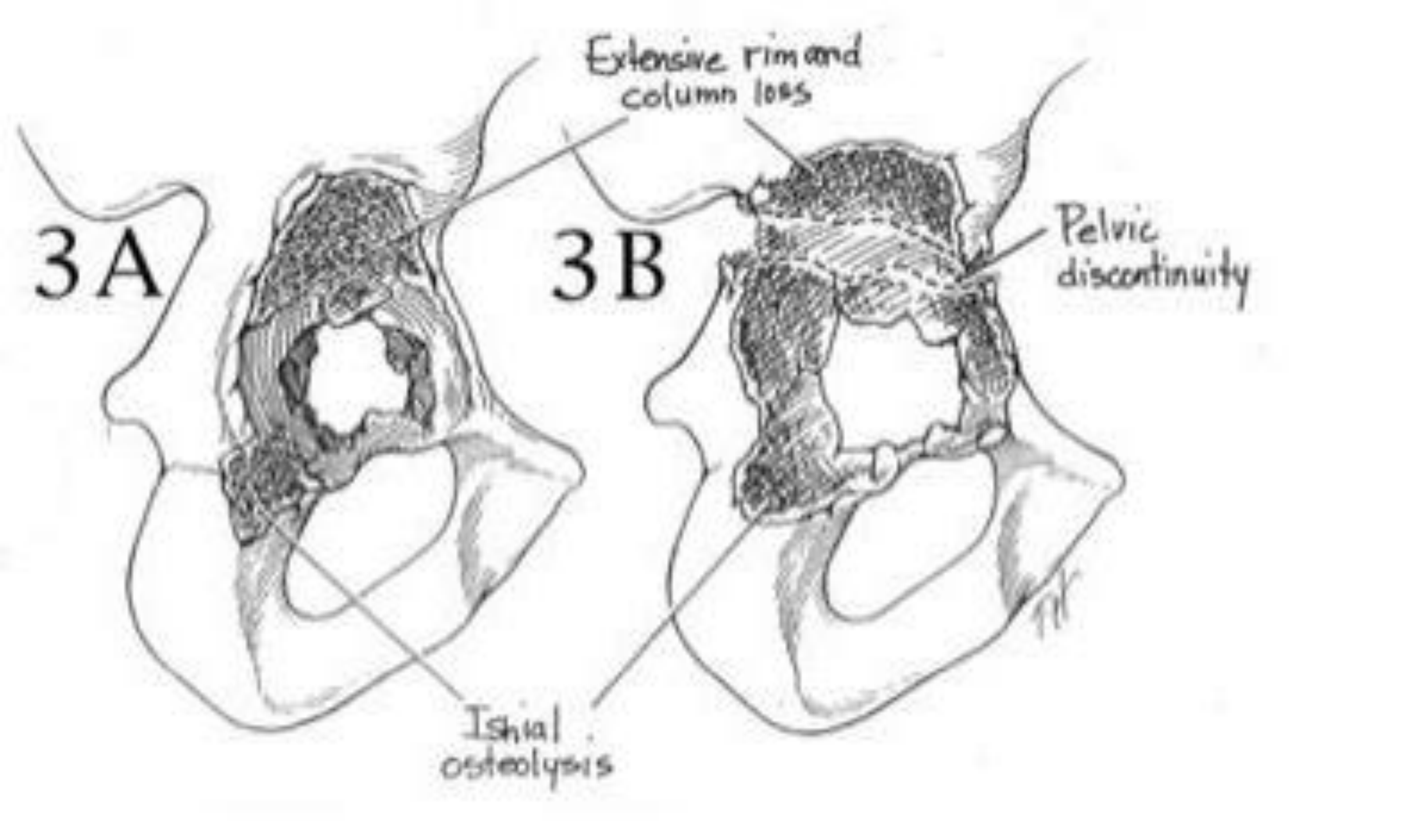


Sembrano et al. Clin Ort Rel Res 2008
Schlegel et al. Acta Orthop 2006

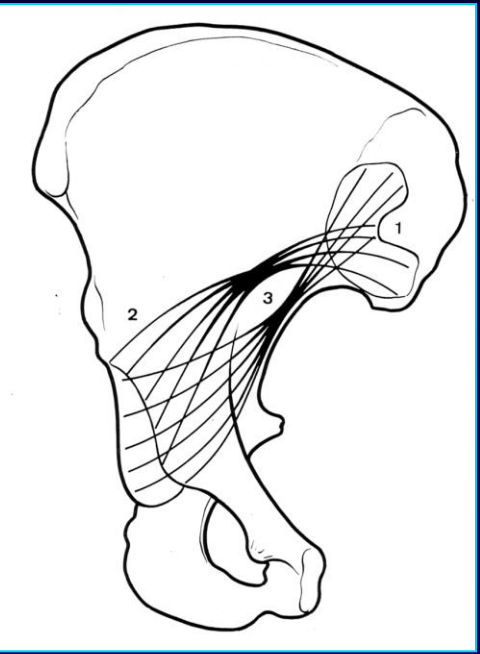
MULTIPLE ACETABULAR REVISIONS

Severe bone loss

- 3 cm superior migratiion
- PELVIC discontinuity

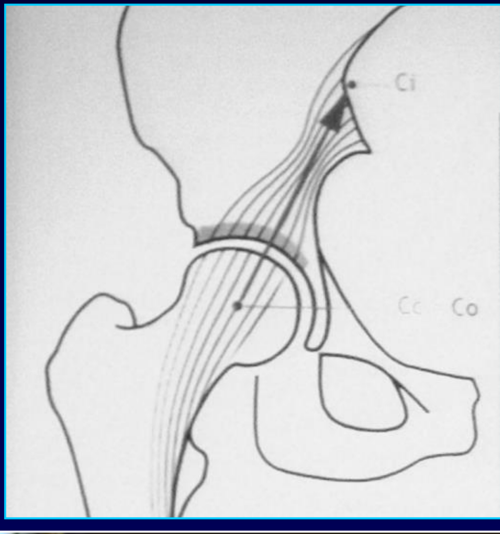


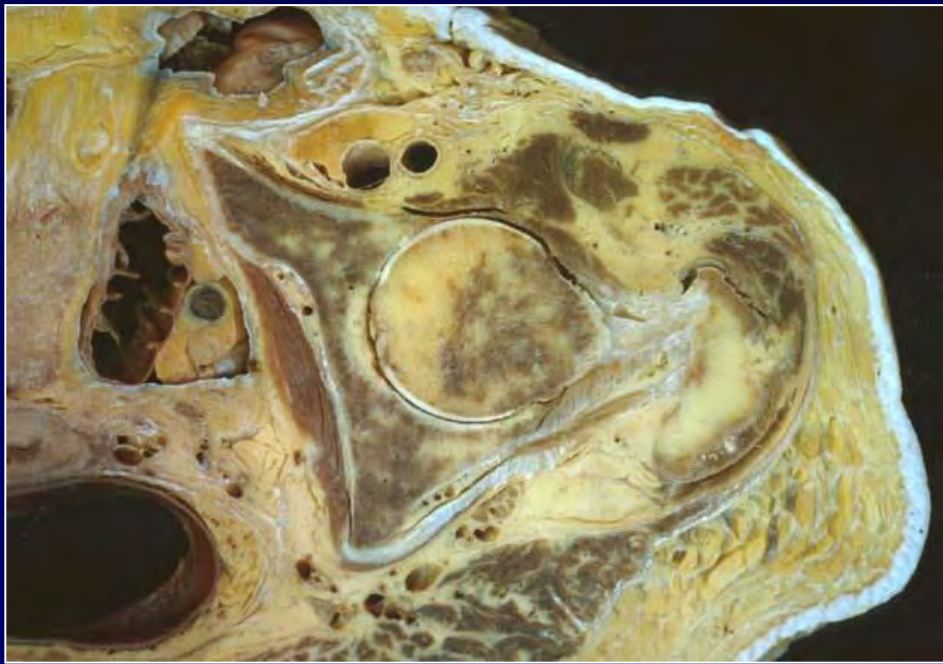
MULTIPLE ACETABULAR REVISIONS



POSTERIOR COLUMN

Usually preserved





CT study to evaluate the iliac bone thickness

IMPLANT CHARACTERISTICS

- New design
- Old concept

- Polar screw: diameter 10 - 12 - 14 mm
  length 40 - 60 - 80 mm. <u>50° of freedom</u>
- Locking washer
- Additional peripheral screw fixation

Ring J Bone Joint Sur Br 1968

McMinn J Bone Joint Sur Br 1993

PATIENTS AND METHODS

July 2008 – July 2013

127 Sansone cups

124 patients (3 bilateral)

At least 2 previous acetabular revisions

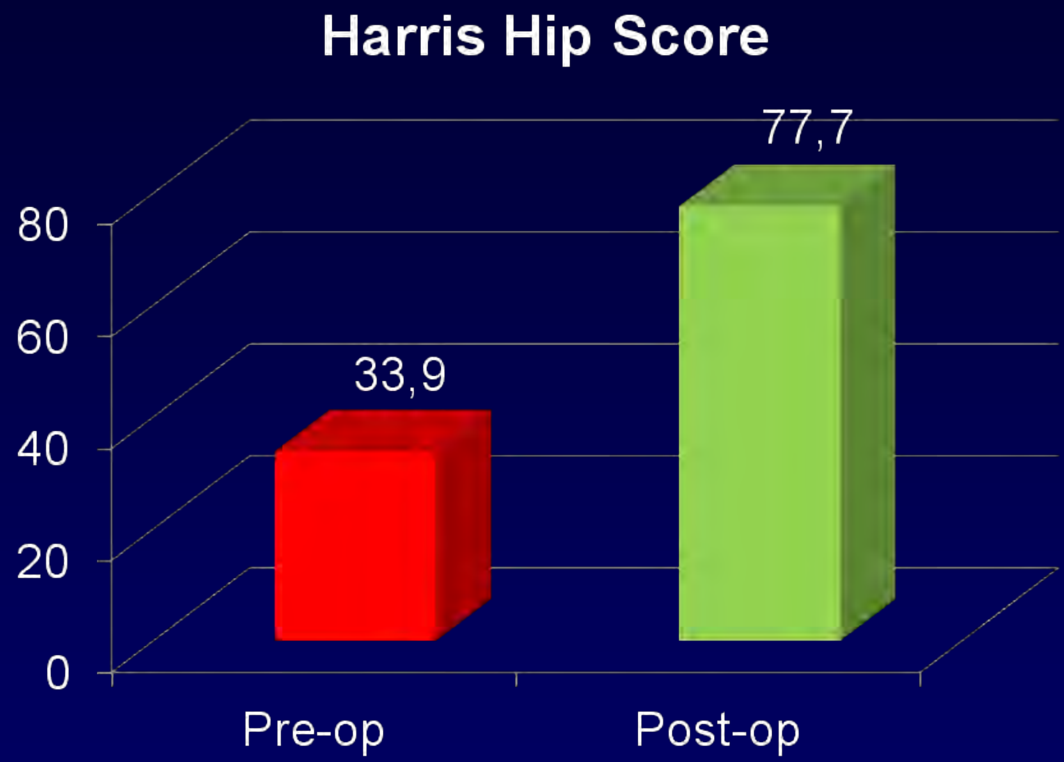
23 patients (24 hips)

PATIENTS AND METHODS

Sex	3 M; 20 F
Age	Mean 75 years (range 50-89)

Infection	4
Aseptic loosening	20
Paprosky classification	2B: 5 2C: 2 3A: 8 3B: 9

CLINICAL RESULTS



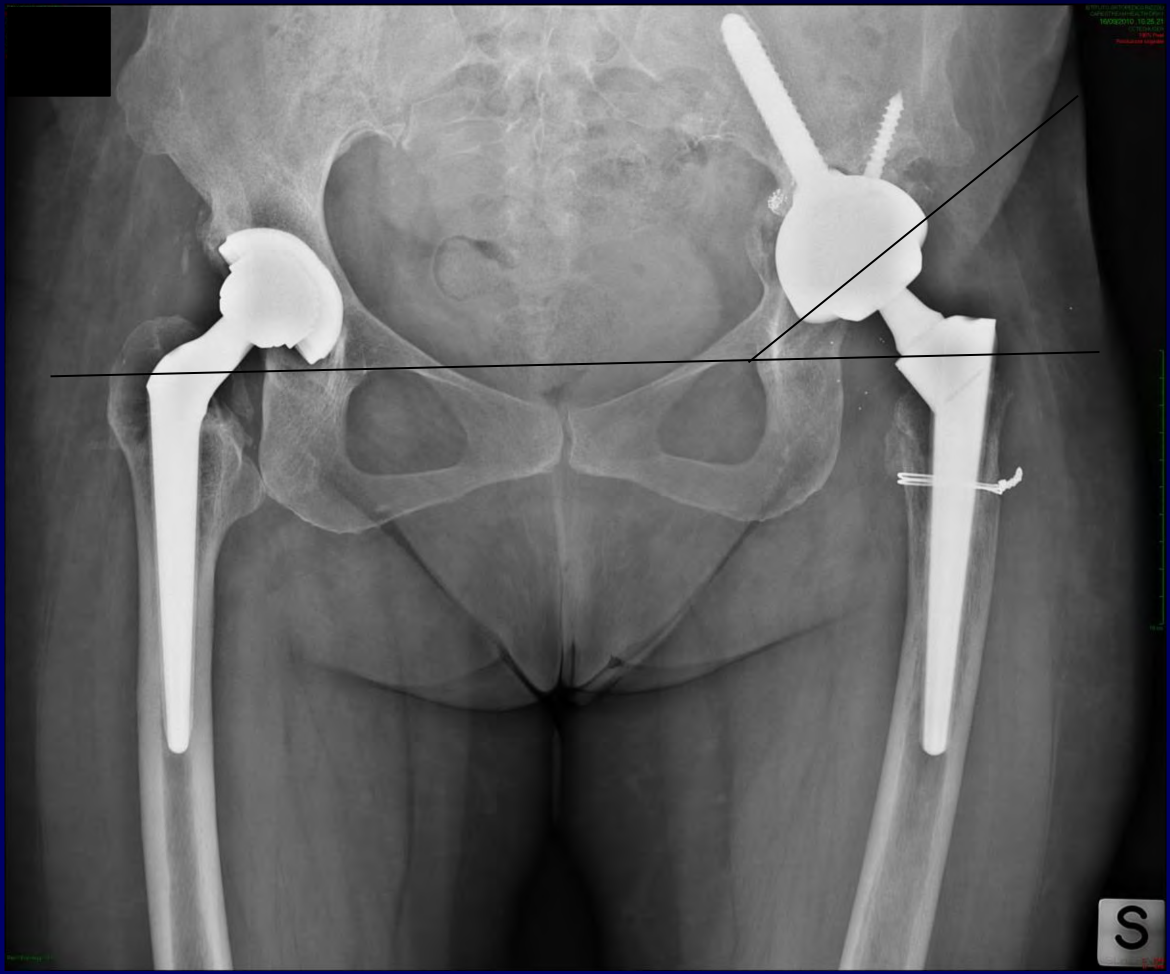
Mean Follow-up: 64 months

Complications:

- 1 sciatic nerve palsy
- 1 recurrent dislocation: Girdlestone after 14 months

RADIOGRAPHIC RESULTS

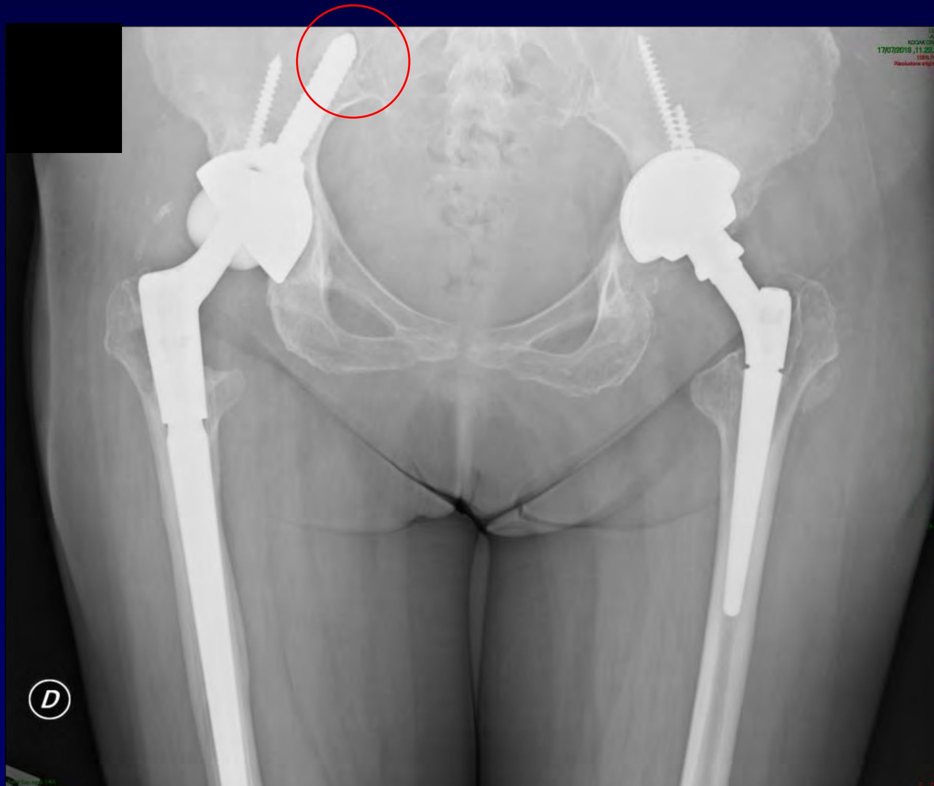
Mean Cup inclination: 37°



RADIOGRAPHIC RESULTS

Radiolucencies < 2 mm in 4 cases

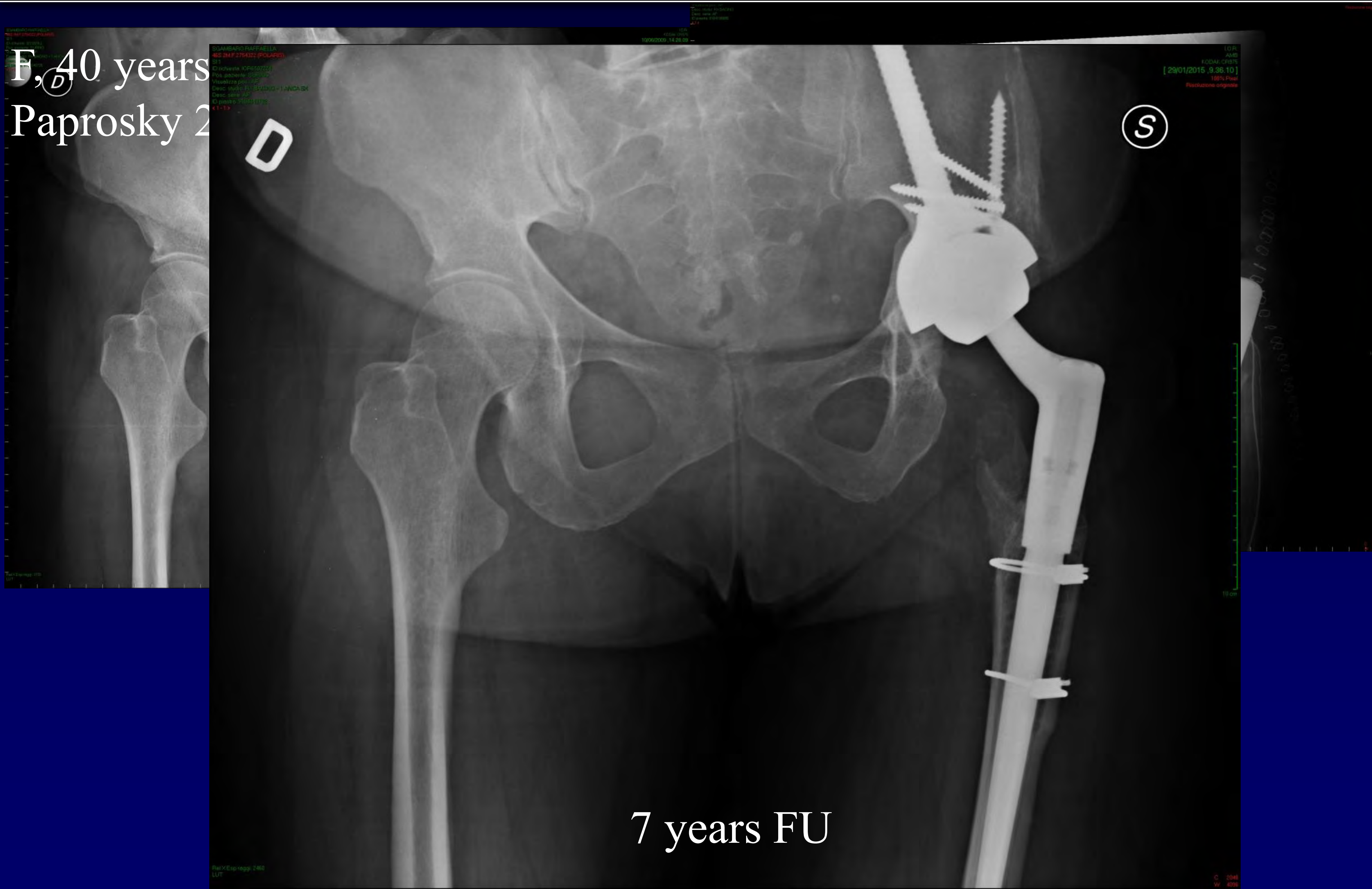
Post-op



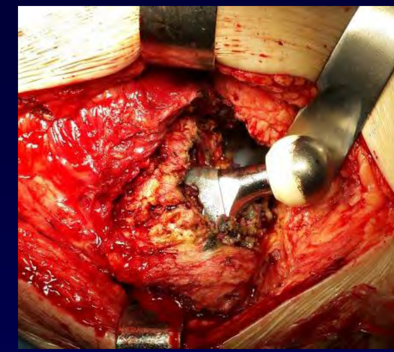
5 years F.U.

CASE 1

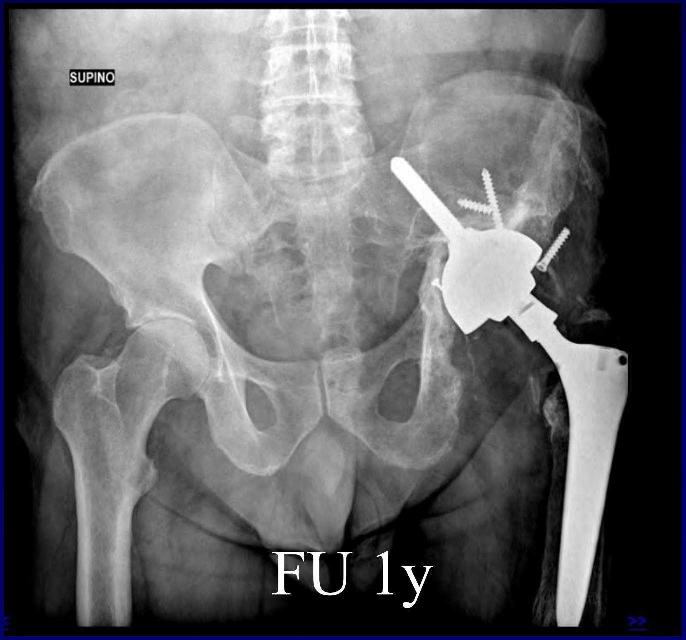
CASE 2



CASE 3



S.G.F. m. 54 y.

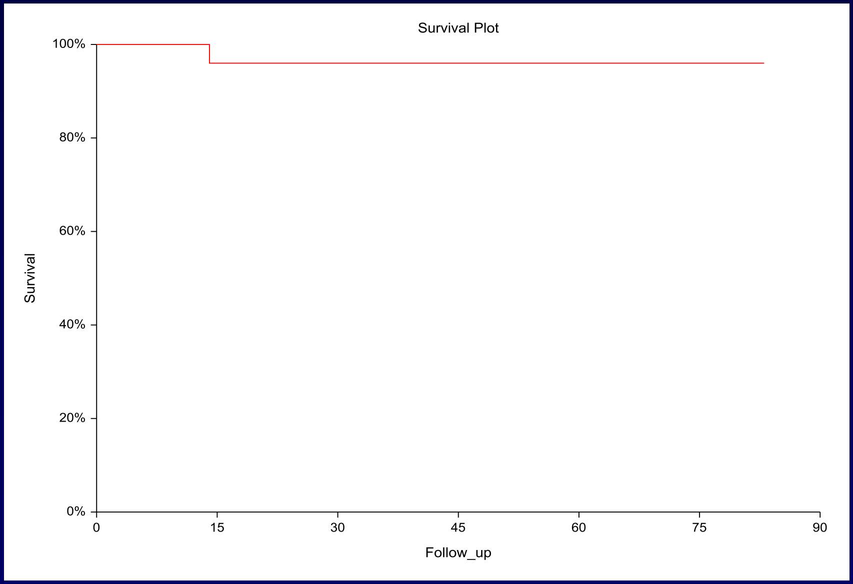


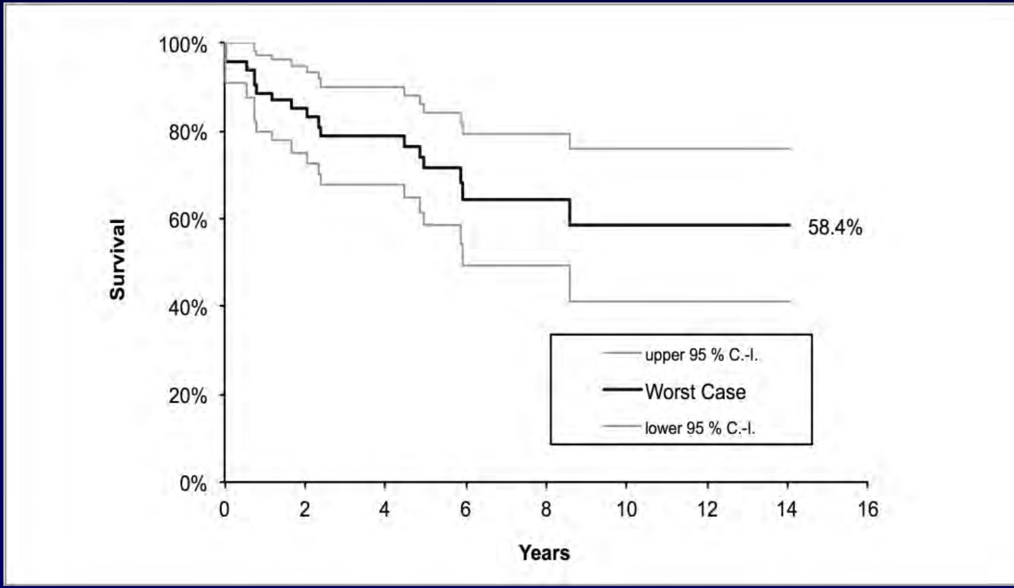
C-C coupling

DISCUSSION

Sansone Cup

Cemented PE cup
Roof reinforcement ring
Reconstruction ring





1 failure out of 24 cases
Estimated survival 96% (C.I.95%: 88-100%)

17 failures out of 52 cases
Estimated survival 58,4%

Bischel et al., Open Orthop J, 2012

CONCLUSIONS

- Learning curve
- X-ray exposure/ image intensifier

CONCLUSIONS

- Stress shielding…..??

- High center of rotation

- Low demanding patients
- Young active patients
- Return to daily activities

Larger series and long term follow-up

Sansone cup reconstruction is safe and effective, particularly in large bone defects with promising mid-term results


Opening cerimony
Rizzoli Orthopedic Institute
28th June 1896
Thank you

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

UNUSUAL COMPLICATIONS AFTER TOTAL HIP ARTHROPLASTY

Gershon Volpin, Jeris Hakim

EMMS Medical Center, Nazareth, Israel, The Galilee Faculty of Medicine, Zfat, Bar Ilan University, Israel

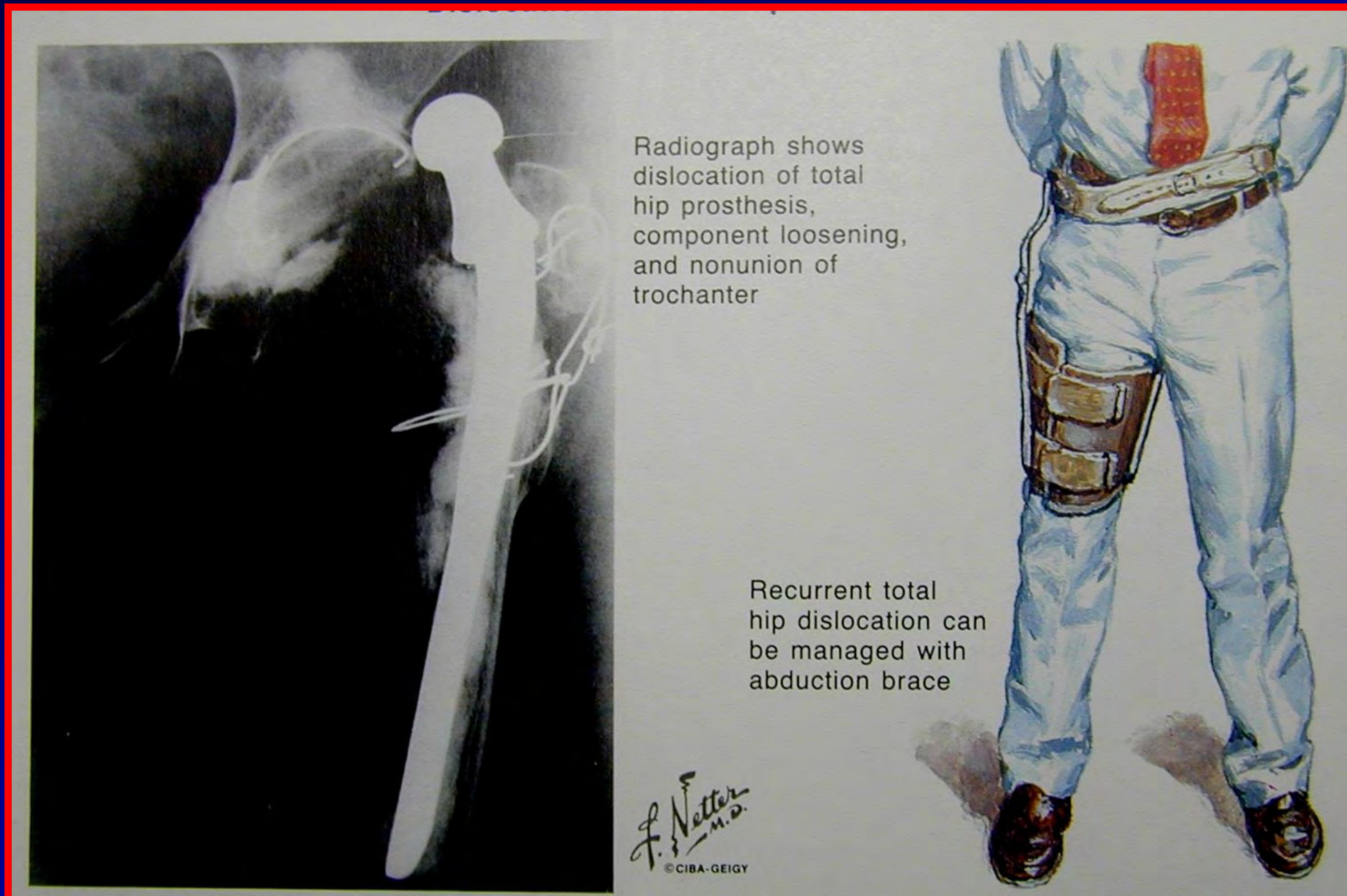
Combined Meeting BHS-SIDA, Milan, Italy 26-27/11/15

DISLOCATION OF HIP

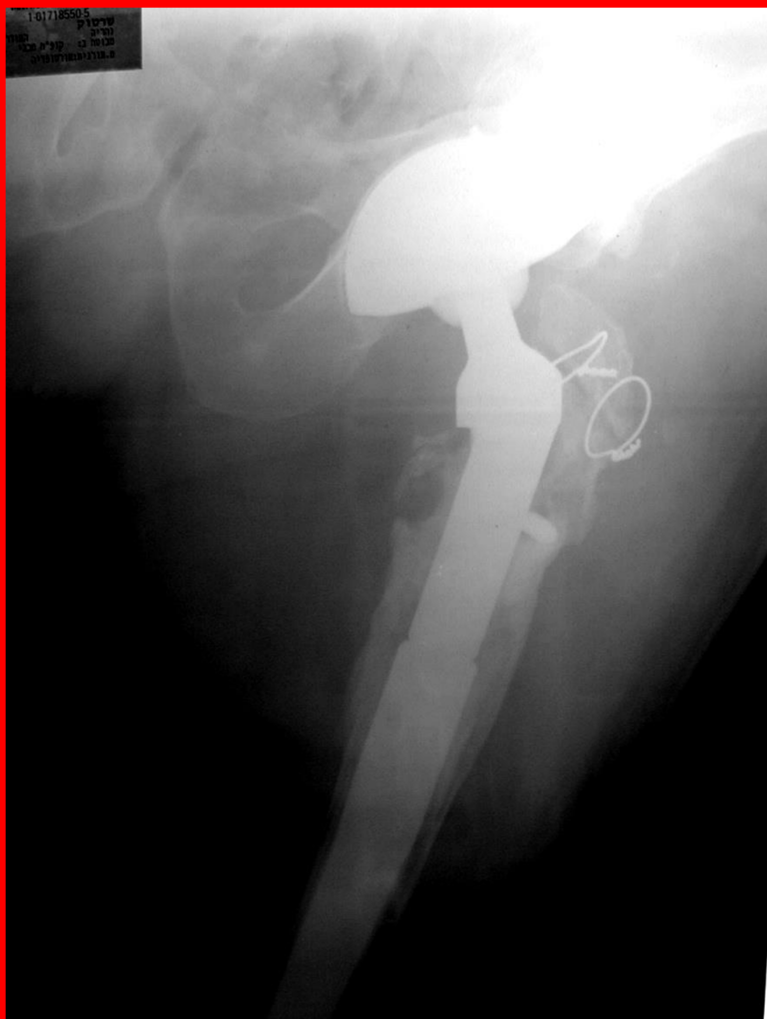
DISLOCATION OF HIP

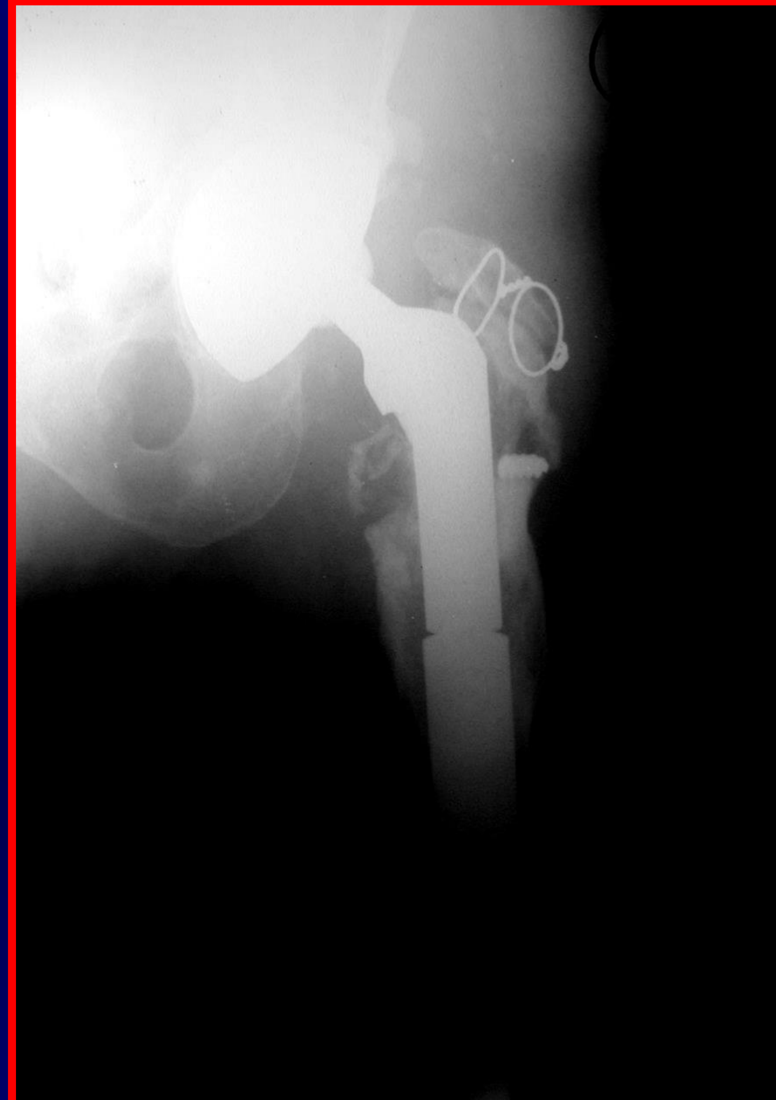
LOOSENING AND DISLOCATION OF HIP

DISLOCATION OF T.H.R



LOOSENING OF HIP

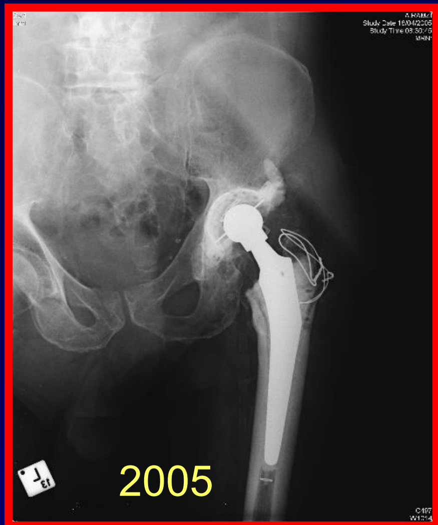


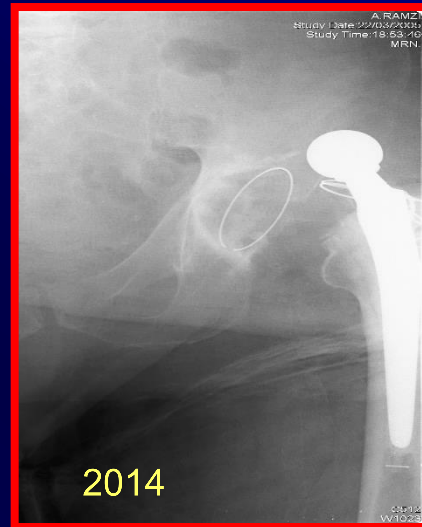


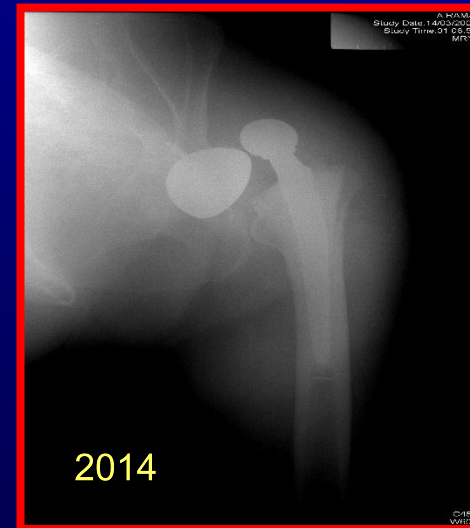
LOOSENING OF PROSTHESIS

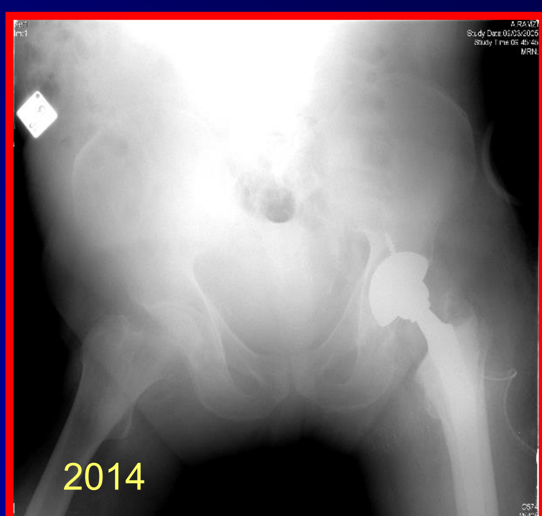
LOOSENING OF PROSTHESIS

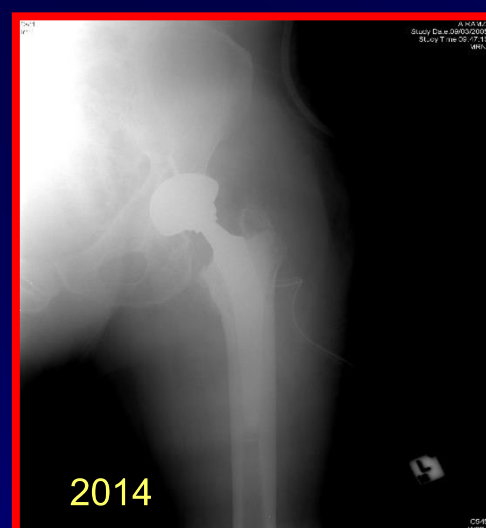
LOOSENING AND DISLOCATION OF HIP









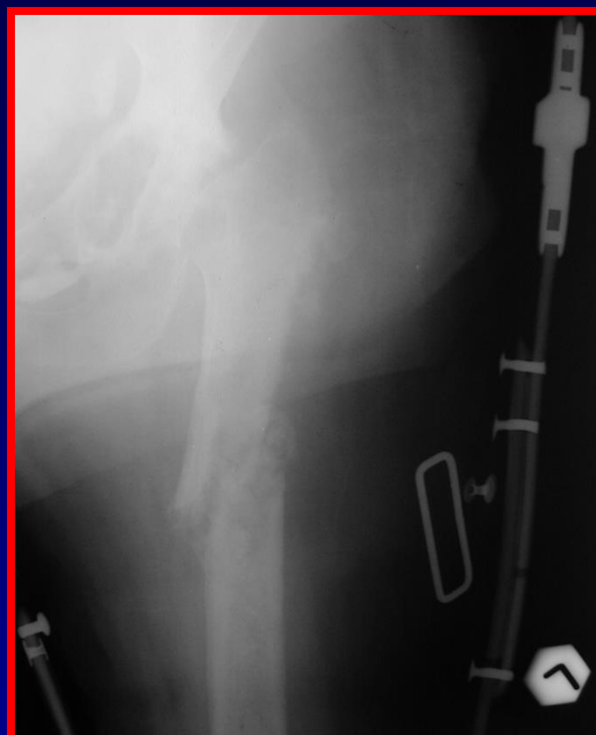


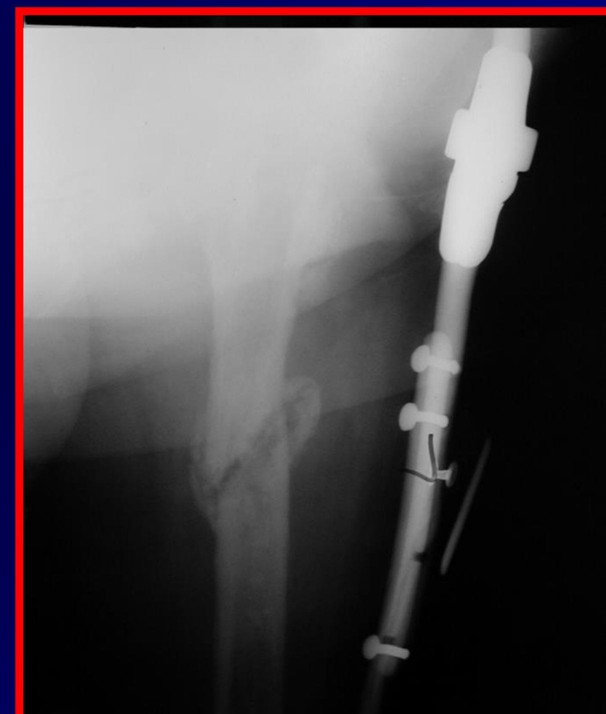
INFECTED T.H.R

Loosening of component due to infection; note bone lysis around stem

Girdlestone resection arthroplasty may be required after removal of total hip prosthesis

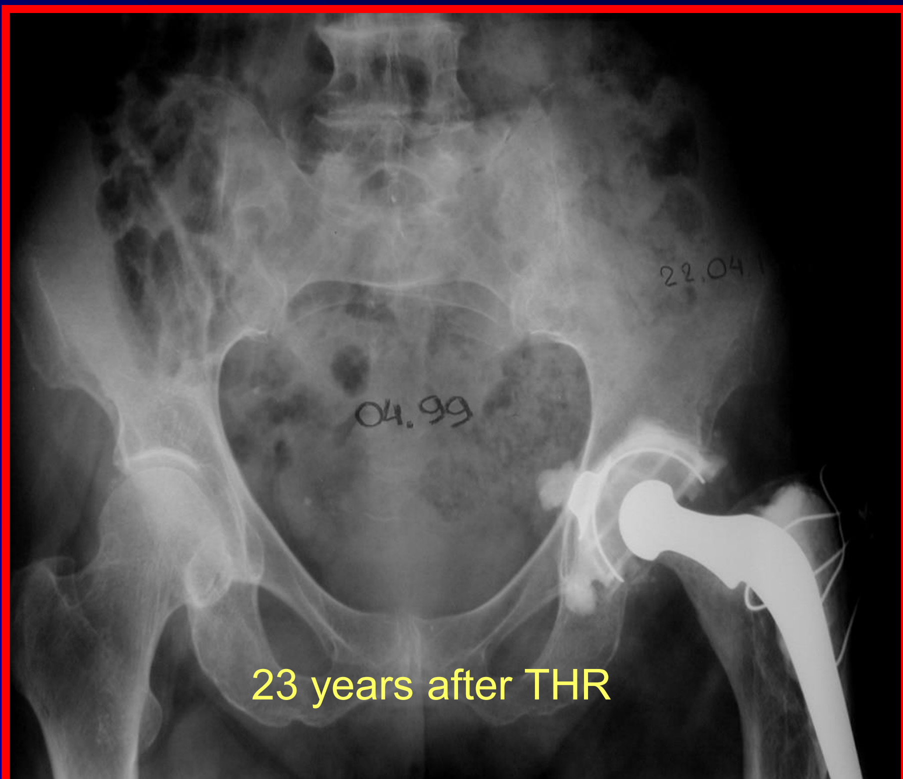
Girdlestone Op. for Infection followed later by # of femur



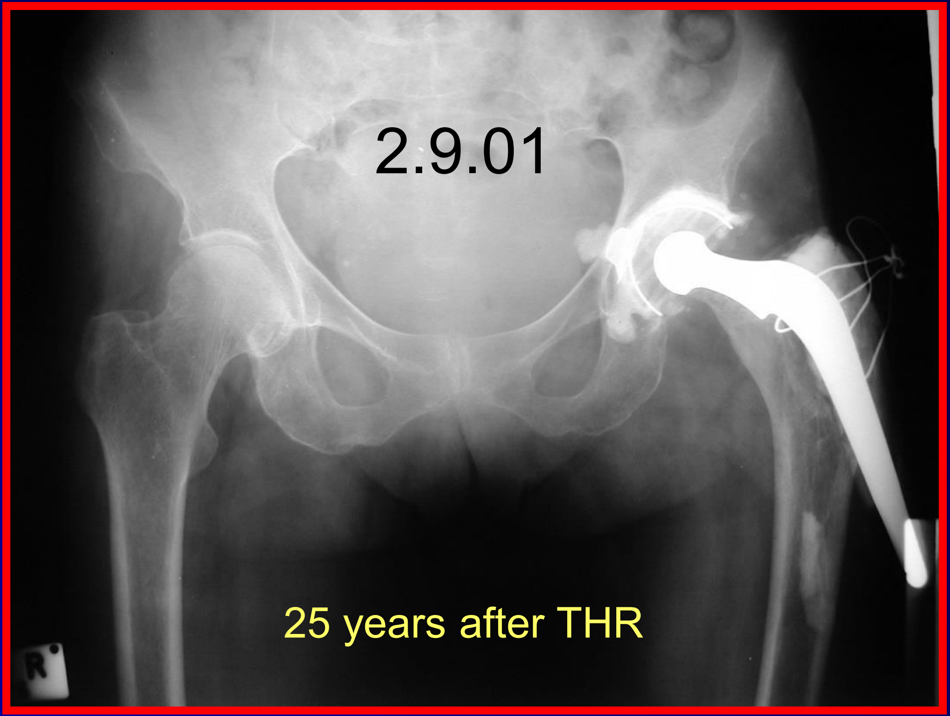


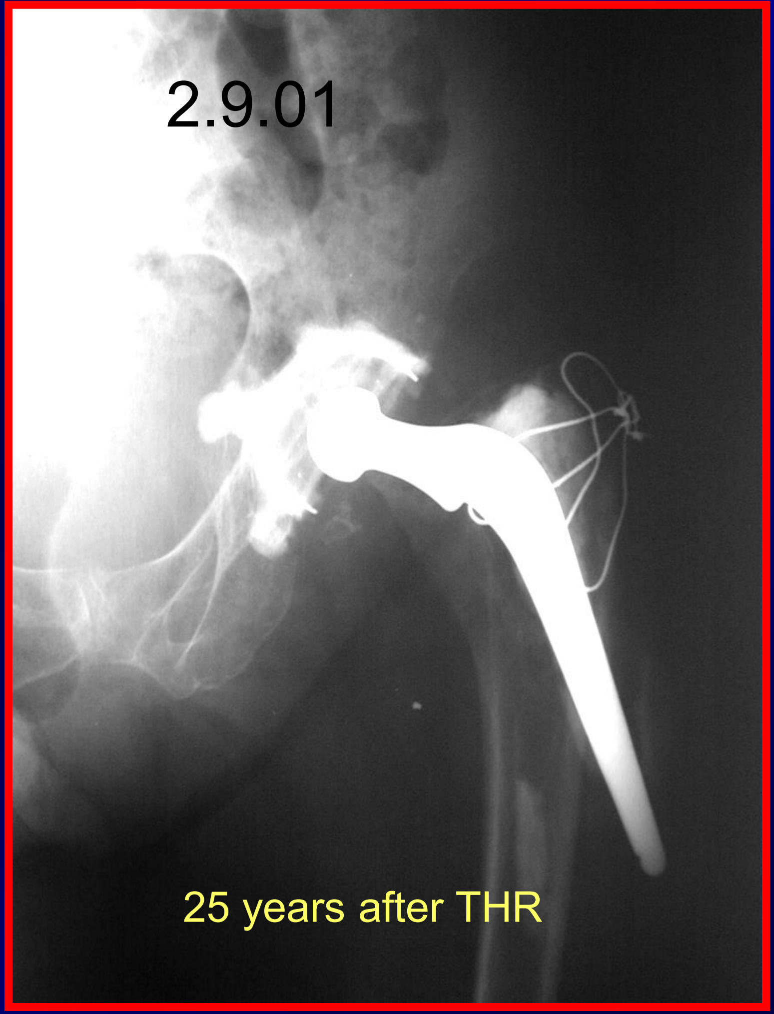
Iatrogenic Failure During THR (1976)
(25 years ago -elsewhere)

Perforation of femoral shaft
by the stem of the endoprosthesis



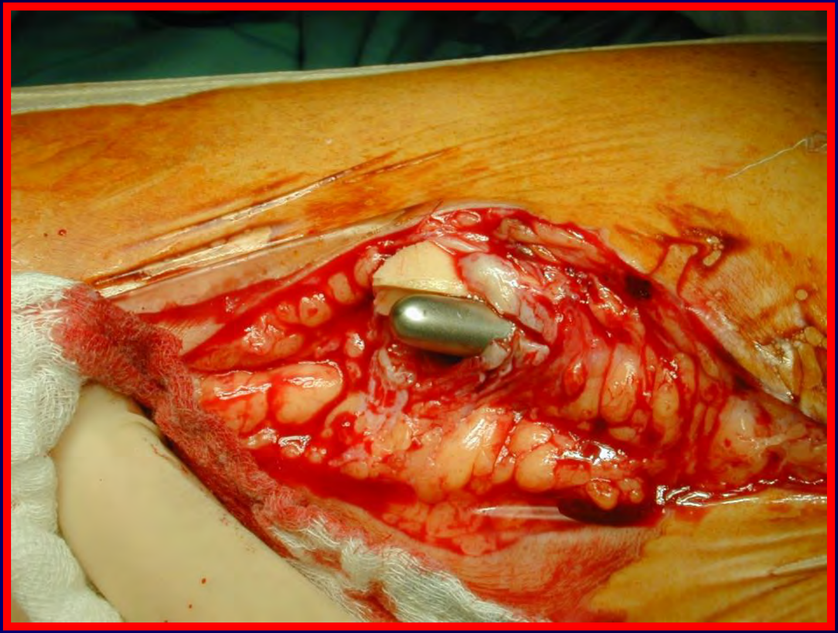
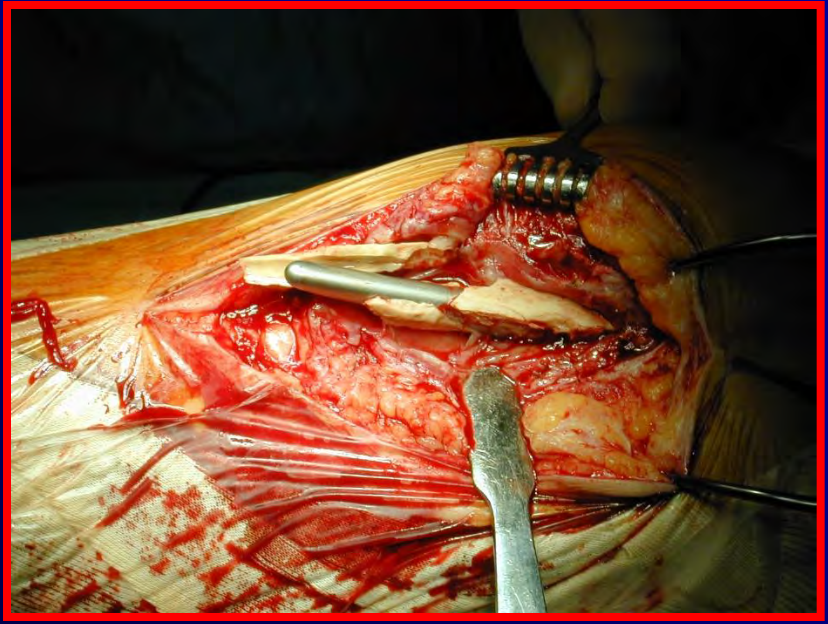
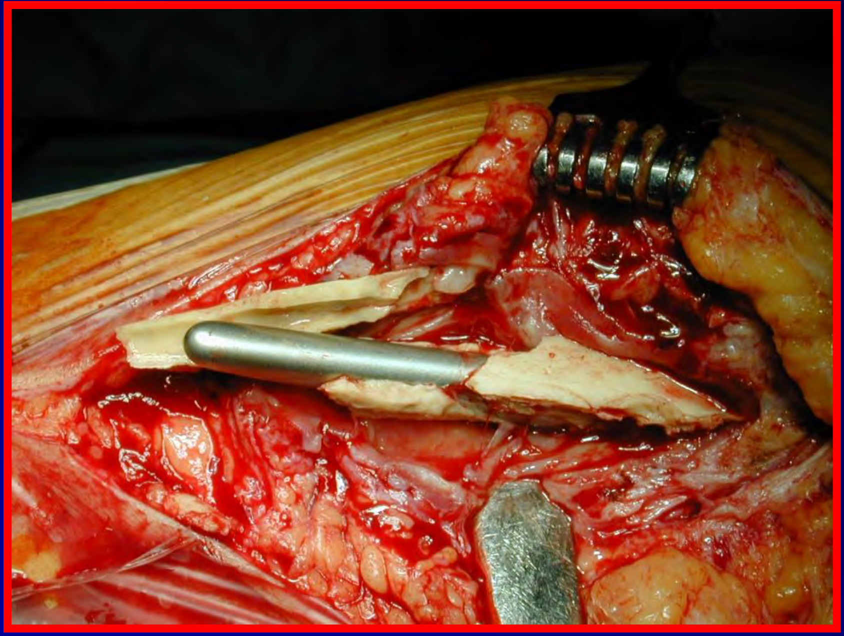
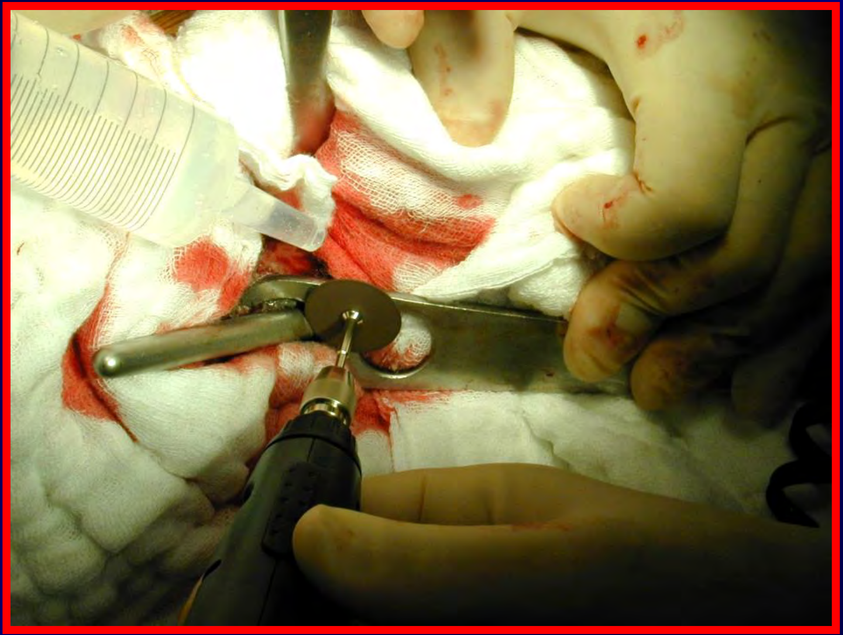
Iatrogenic failure (25 years)





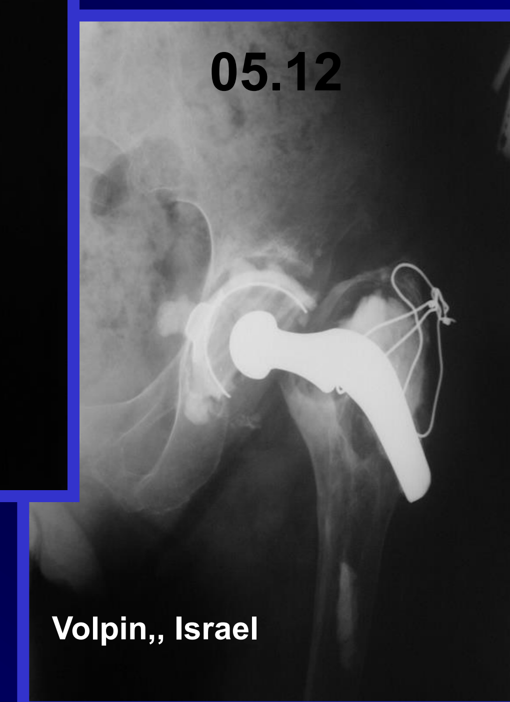
2.9.01

25 years after THR

Iatrogenic failure (25 years)

Iatrogenic failure (25 years)



25 years after THR

Loosening and Proximal Migration of Prosthesis

10 years post THR

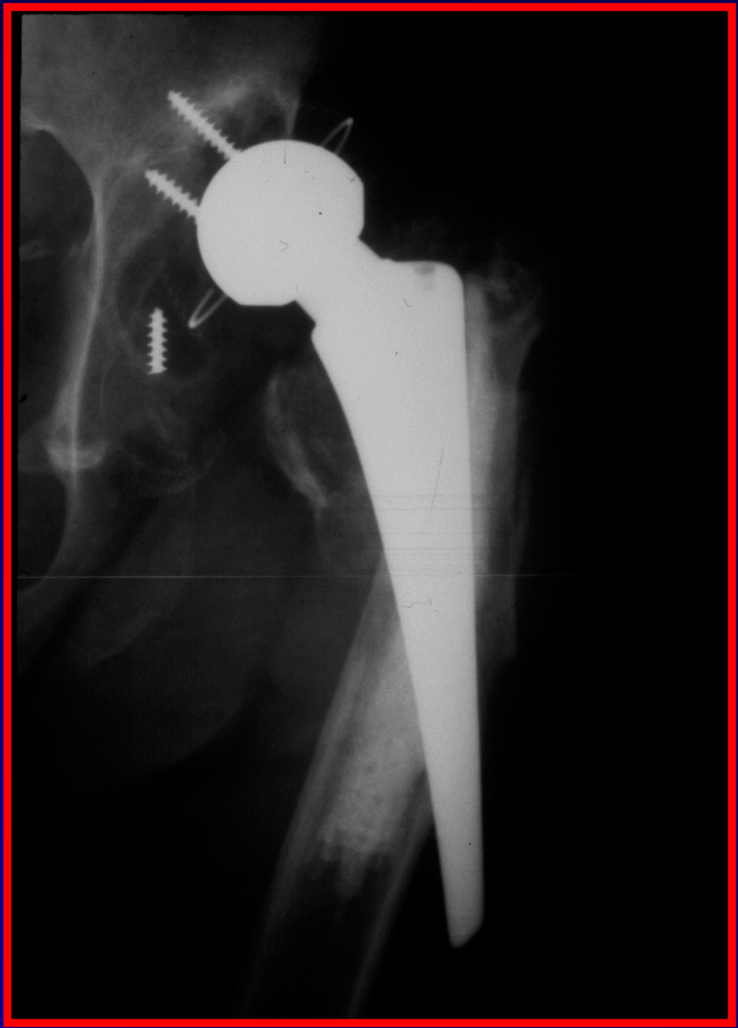
Complete Migration & Dislocation of Prosthesis

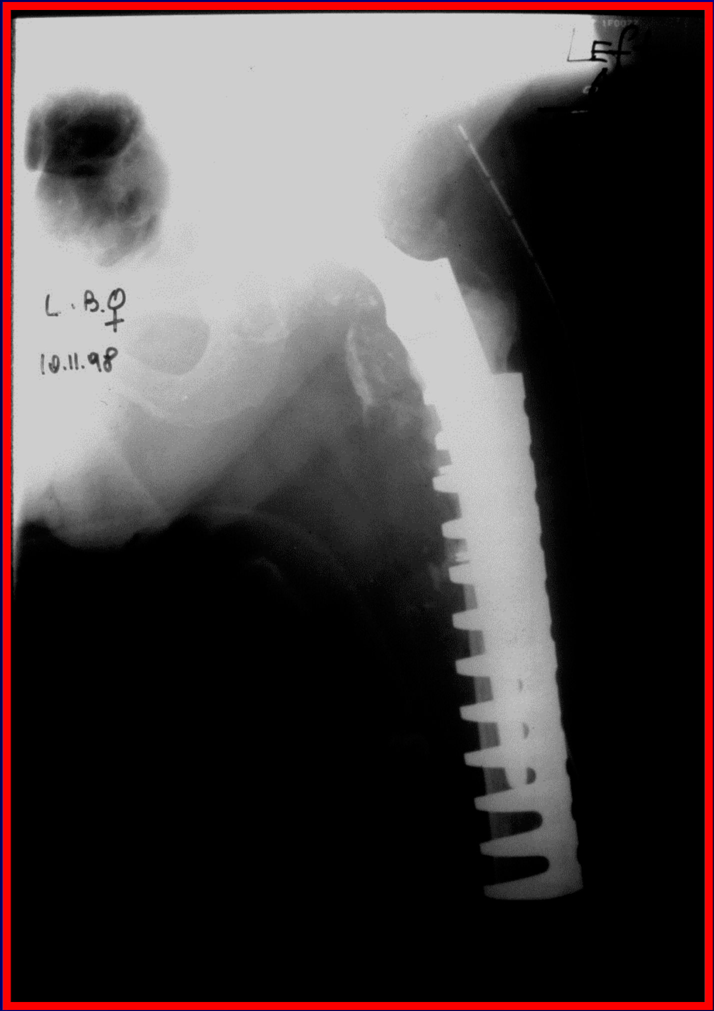
Complete Migration & Dislocation of Prosthesis

FRACTURE OF FEMUR BELOW THR

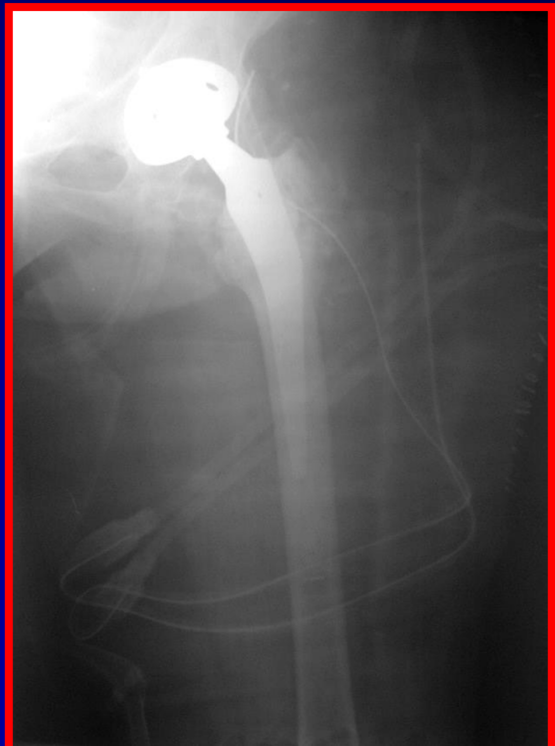
Fracture of femur 5 Y following THR

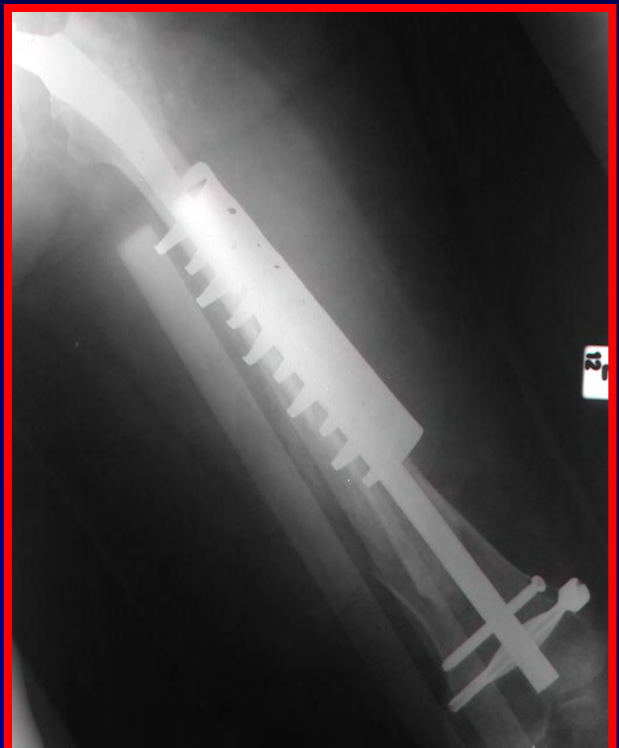
Fracture of femur 5 Y following THR
Treated by Menen's plate





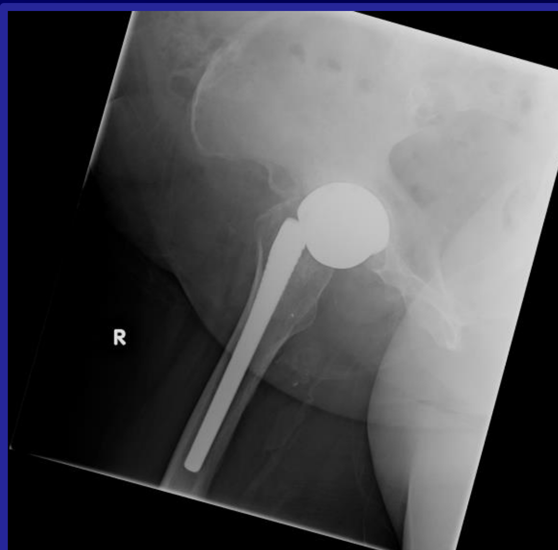
Fracture Femur Following THR
For Non Union Subcapital Fracture
(66Y ; F)

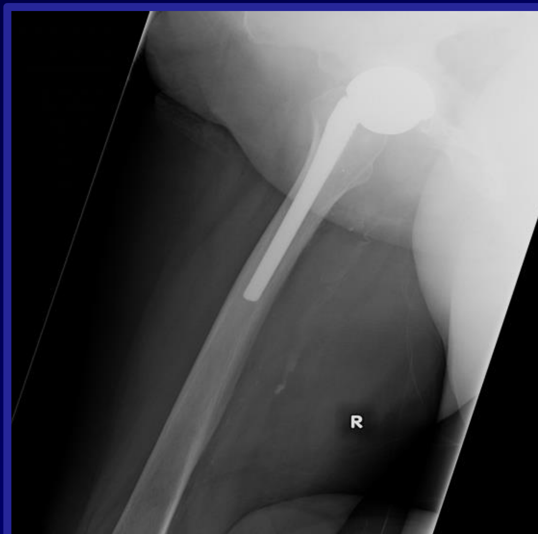




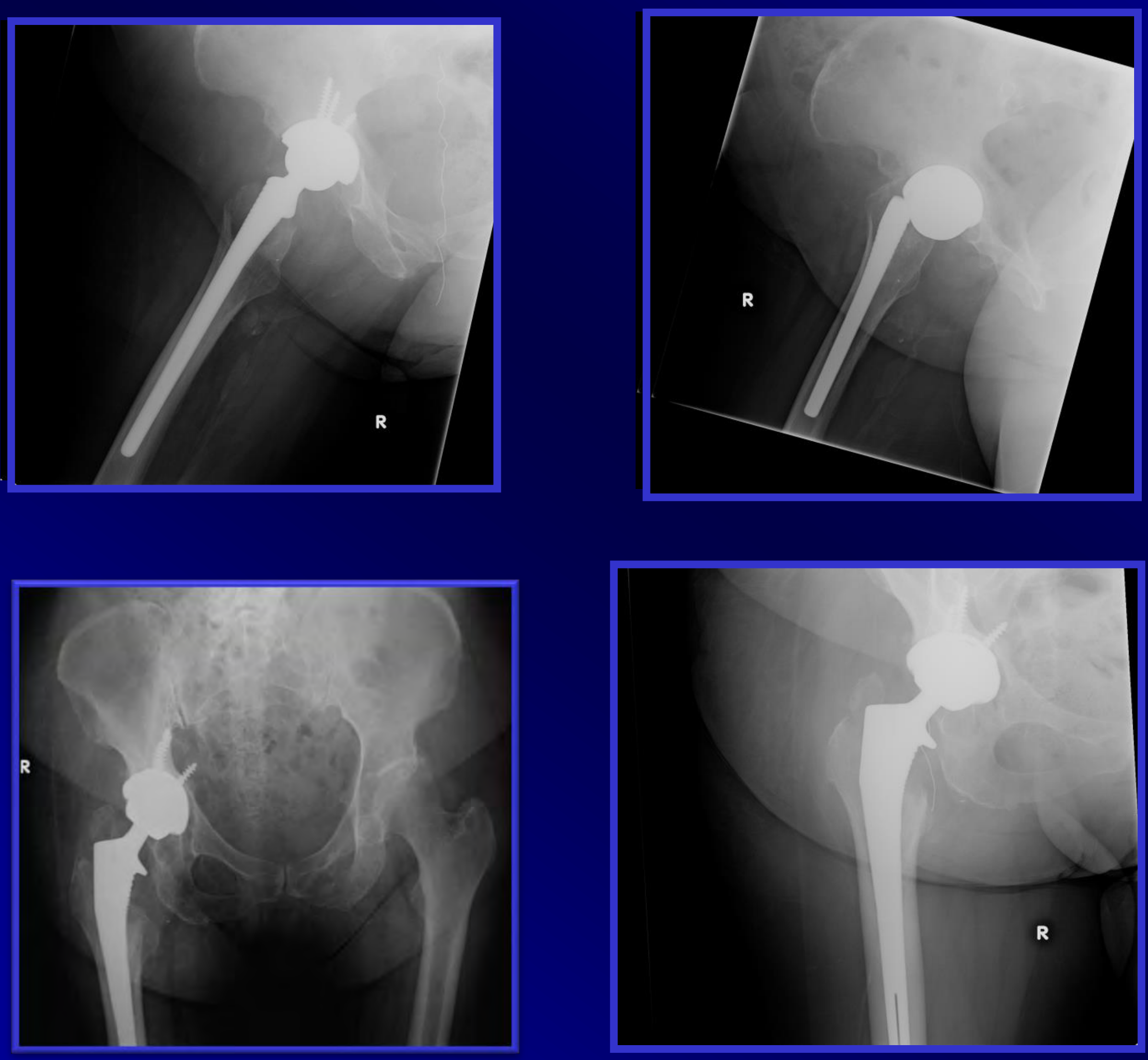
BROKEN FEMORAL STEM

BROKEN NECK OF THE FEMORAL STEM



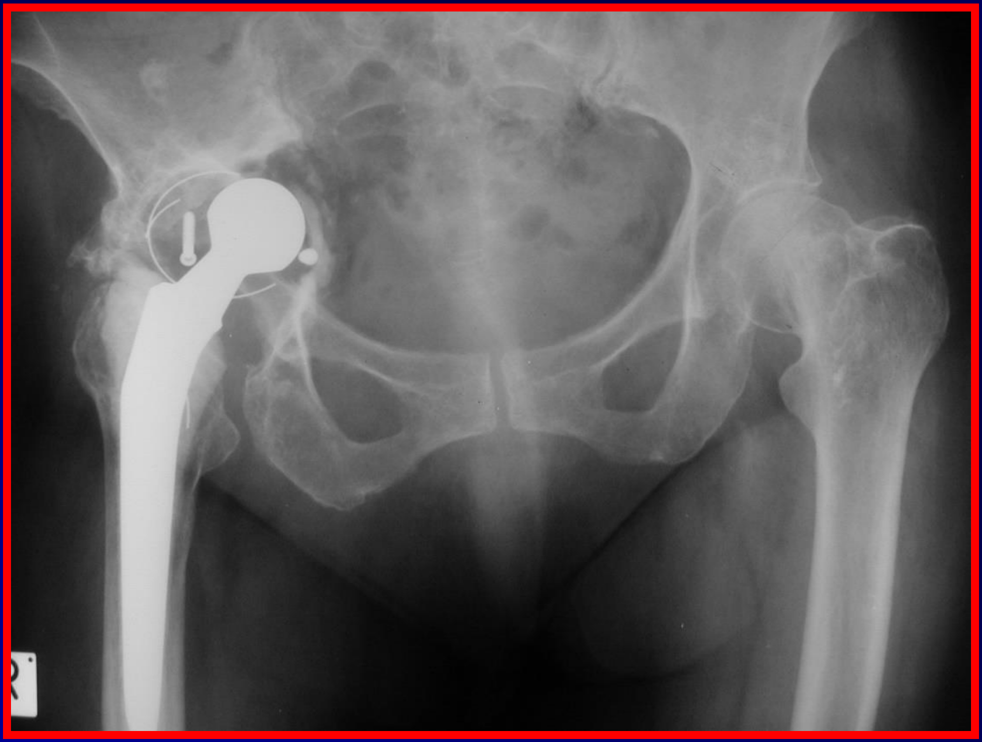


BROKEN NECK OF THE FEMORAL STEM



Protrusion of endoprosthesis

Protrusion of endoprosthesis




THANK YOU
FOR YOUR
ATTENTION

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

ONE FIFTH OF REVISION ACETABULAR COMPONENTS RE-REVISED FOR SYMPTOMATIC ASEPTIC LOOSENING DO NOT MEET RADIOLOGICAL CRITERIA OF LOOSENING

SUB CRUCE LUMEN

THE UNIVERSITY of ADELAIDE

CENTRE FOR ORTHOPAEDIC AND TRAUMA RESEARCH

SOUTH AUSTRALIA

Government of South Australia

SA Health

Carmine De Ieso*, Stuart Callary, Kerry Costi, John Abrahams, Lucian Bogdan Solomon, Donald Howie

*Catholic University of Sacred Heart of Rome, Orthopaedic and Trauma Institute

Discipline of Orthopaedics and Trauma and Centre for Orthopaedic and Trauma Research, University of Adelaide

Department of Orthopaedics and Trauma, Royal Adelaide Hospital

THE UNIVERSITY of ADELAIDE

CENTRE FOR ORTHOPAEDIC AND TRAUMA RESEARCH

Government of South Australia

SA Health

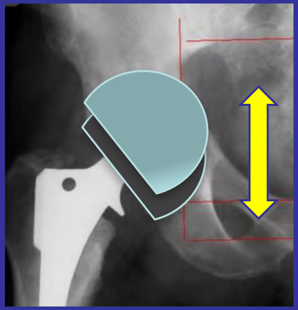
Revision Total Hip Replacement

- Most common cause of re-revision is loosening
- New prostheses and techniques being introduced
- Clinical studies limited by lack of sensitive outcomes to monitor new techniques and prostheses
- Radiographic criteria for acetabular loosening are used to report outcomes

Radiographic Criteria for Loosening

A. Proximal Migration > 5.0 mm

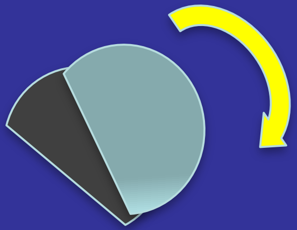
Trumm BN et al, J of Arthroplasty, 2014



B. Change in inclination > 5 ^{o}

Haenle M et al Surg Radiol Anat. 2007;

Kalteis T et al Eur J Radiol. 2006;



C. New progressive radiolucency in <u>all three</u> DeLee Charnley Zones > 2.0 mm

DeLee JG, Charnley J.. Clin Orthop Relat Res. 1976

Some studies have used a combination of this criteria others have modified the limits used (Paprosky et al - > 6mm and 10°) Paprosky et al. J Arthroplasty. 2006

Radiographic Criteria for Loosening

- Limited by inaccurate manual measurements
  - Variation in pelvic tilt
  - Magnification and measurement error
  - **Inaccuracy of proximal translation**
    - **4 - 6 mm****

*** Malchau et al, Acta Orthop Scand 1995*

- Radiolucency criteria originally described for cemented cups, unclear how this applies to uncemented cups

Intraoperative Criteria For Loosening

- Limited previously because of inadequate description

- Description published by Howie et al, 1990

  0 = no loosening

  1 = fluid movement only at interface

  2 = slight movement, requires hammering or strong leverage

  3 = loose, removal by hand or gentle leverage

Aim

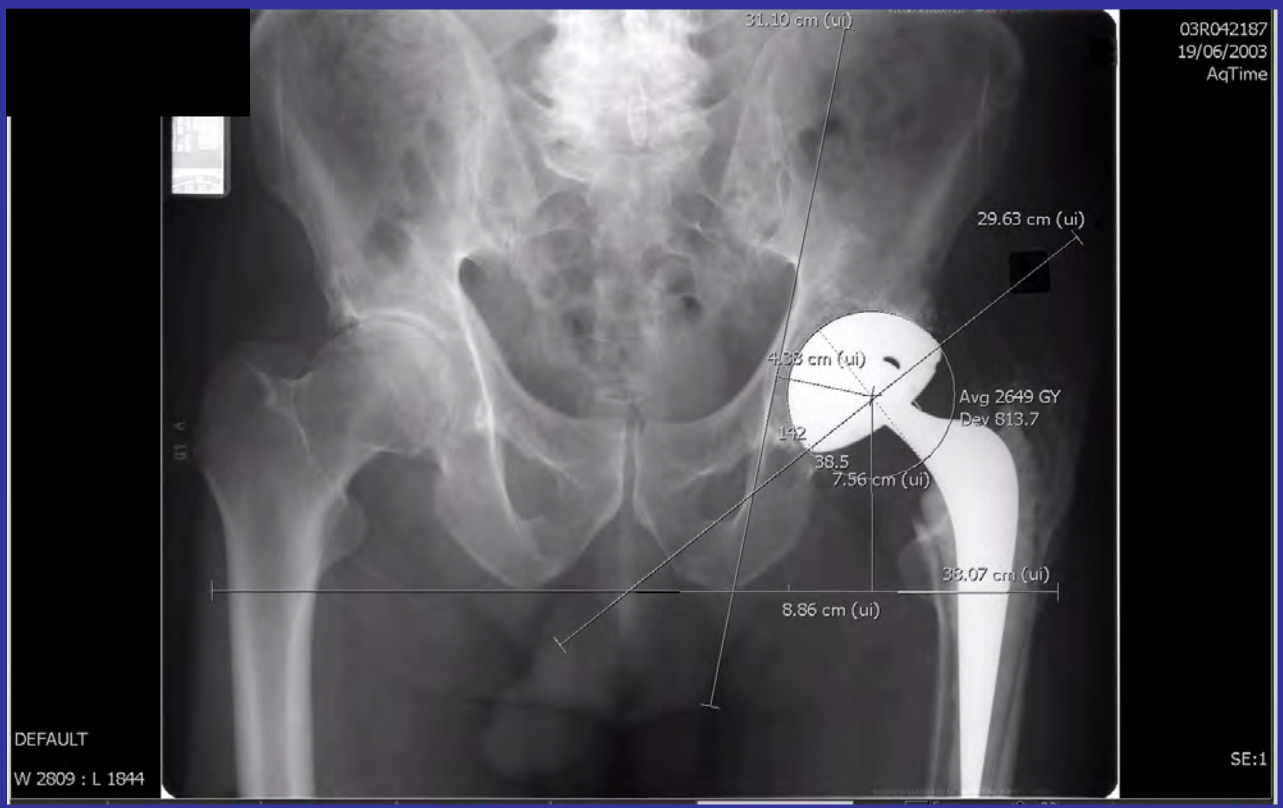
To determine the sensitivity of radiographic criteria for loosening in a cohort of revision acetabular components confirmed loose at **re-revision** surgery

Method

- All cases of re-revision THR between Jan 1978 and Oct 2014
- Inclusion criteria: Re-revision for isolated aseptic loosening confirmed intraoperatively
- Exclusion criteria:
  - Infections
  - Pre-op bone fractures
  - Recurrent dislocation

Method

- Performed manual measurements using the modified Nunn method on IMPAX software



Results

Cohort Demographics

- 45 hips (39 patients)
- 9 cemented cases, 36 uncemented cases
- Median age at procedure 58 years (range: 27 to 78)
- Mean radiological follow-up 106 months (range 3 – 256)

Sensitivity of Proximal Migration

	Intraoperative Loosening			
		Grade 2 (n=23)	Grade 3 (n=19)	All Cases (n=42)
Number of Cases Migration >5mm		13	13	26
Sensitivity (%)		57	68	62

Sensitivity of Proximal Migration

	Intraoperative Loosening			
	Grade 1 (n=3)	Grade 2 (n=23)	Grade 3 (n=19)	All Cases (n=45)
Number of Cases Migration >5mm	2	13	13	28
Sensitivity (%)	66	57	68	62

Sensitivity of Sagittal Rotation

	Intraoperative Loosening Grade			
		2 (n=23)	3 (n=19)	All Cases (n=42)
Number of Cases Rotation > 5°		11	15	26
Sensitivity %		48	79	62

Sensitivity of Sagittal Rotation

	Intraoperative Loosening Grade			
	1 (n=3)	2 (n=23)	3 (n=19)	All Cases (n=45)
Number of Cases Rotation > 5°	2	11	15	28
Sensitivity %	66	48	79	62

Combined Sensitivity

	Intraoperative Loosening Grade			
	1 (n=3)	2 (n=23)	3 (n=19)	All Cases (n=42)
Number of cases with **either** rotation or migration		17	16	33
Sensitivity (%)		74	84	79

Combined Sensitivity

	Intraoperative Loosening Grade			
	1 (n=3)	2 (n=23)	3 (n=19)	All Cases (n=45)
Number of cases with **either** rotation or migration	3	17	16	36
Sensitivity (%)	100	74	84	80

Uncemented Cases

Sensitivity of Proximal Migration in Uncemented Cases

	Intraoperative Loosening Grade			
	1 (n=2)	2 (n=19)	3 (n=15)	All Cases (n=36)
Number of Cases Migration >5mm	1	12	12	25
Sensitivity (%)	50	63	80	69

Sensitivity of Sagittal Rotation in Uncemented Cases

	Intraoperative Loosening Grade			
	1 (n=2)	2 (n=19)	3 (n=15)	All Cases (n=36)
Number of Cases Rotation > 5°	2	9	13	24
Sensitivity (%)	100	47	87	67

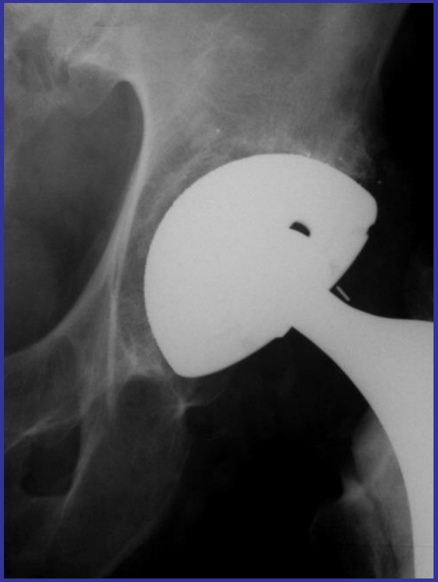
Combined Sensitivity in Uncemented Cases

	Intraoperative Loosening Grade			
	1 (n=2)	2 (n=19)	3 (n=15)	All Cases (n=36)
Number of cases with **<u>either</u>** rotation or migration	2	15	14	31
Sensitivity (%)	100	79	93	86

Example

Case did not meet any radiographic criteria for loosening but was found to have grade 2 loosening intraoperatively

Initial Post-op



Prior to re-revision

7 year follow-up

Discussion

- Only 1 other prior study in published literature reported 64% sensitivity of radiographic criteria *(Carlsson et al, 1984)*
  - However included only 34 **cemented primary** hips
  - Did not define amount of migration
  - Did not consider grade 1 or 2 loosening

Limitations

- Variety of prostheses
  - Uncemented and cemented
  - Different manufacturers
- Manual measurements of migration may over estimate or underestimate amount of migration
- Specificity unknown

Future

- Larger project examining the ability of early migration to predict later loosening of revision components

  - Currently analysing cases found not loose intraoperatively

  - Measuring migration using EBRA (more accurate technique)

Conclusion

In this study radiographic criteria for loosening had a sensitivity of 80% in re-revised components confirmed to be loose intraoperatively

Thank you

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

An algorithmic approach to acetabular component removal in case of intra-pelvic cup migration

R. Civinini

V. Berti, C. Corvino, M. Villano, M. Innocenti

Orthopedic Department – University of Florence, Italy

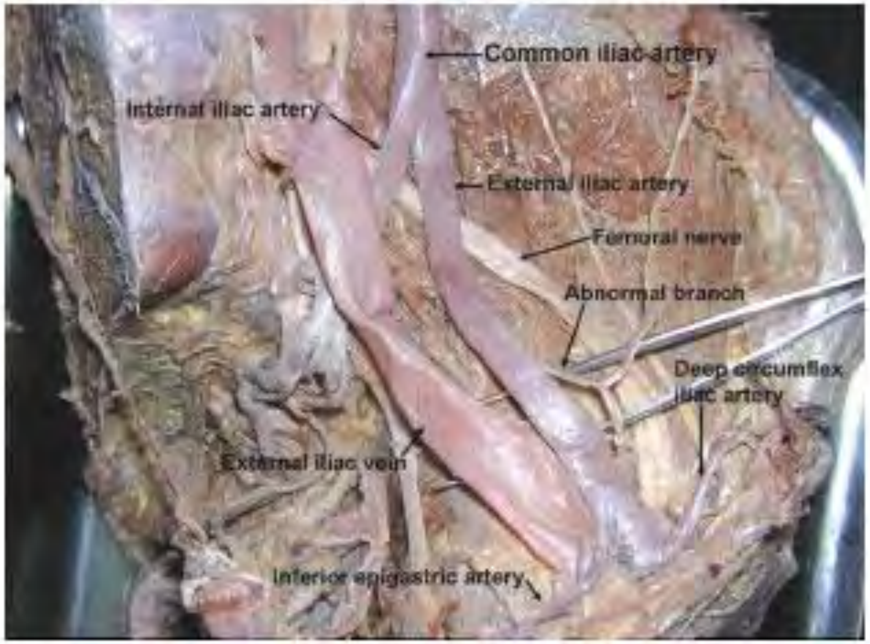
Intrapelvic protrusion of the acetabular component

Intrapelvic protrusion of the acetabular component is an uncommon, but severe complication after THA

Intrapelvic protrusion of the acetabular component

In retrieval of the socket **<u>you run the risk of severe complications</u>**

- **Vascular injuries:**
- **Nerve injuries:**
- **Urogenital injuries**



RISK → Risk management process

Intrapelvic protrusion of the acetabular component

Managing THA loosening with pelvic migration, is a perfect model to apply risk management

Risk → Risk management process

The first step is to identify and assess the risk

RISK MATRIX

Risk matrix assess the likehood of occurrence of any event

Risk Matrix

Likelihood

N.B. For more details regarding use of this matrix / definitions refer to final page of this document

Consequence

	Rare	Unlikely	Possible	Likely	Almost Certain
Severe *Eg. Potential Fatality or Injury or Illness with permanent disability*	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
Major *Eg. Potential Lost Time Injury (but non-permanent disability)*	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
Moderate *Eg. Potential Medical Treatment injury or illness (but no lost time)*	LOW	LOW	MEDIUM	MEDIUM	HIGH
Minor *Eg. Potential First Aid injury*	LOW	LOW	LOW	MEDIUM	MEDIUM
Minimal *Eg. Hazard or near miss requiring reporting and follow up action*	LOW	LOW	LOW	LOW	LOW

Combined with the severity of the consequence

The medical risk matrix

LEGEND	
E	Extreme risk, immediate action required
H	High risk, prioritised action required
M	Moderate risk, planned action required
L	Low risk, actioned by routine procedures

Risk Process

***I**dentify* the hazards or risks of the work.

***A**ssess* the likelihood and consequences from the hazards or risks.

***C**ontrol* the hazards or risks using the Control Options.

LIKELIHOOD \ CONSEQUENCE	**Insignificant** No Injury 0 - Low $ Loss	**Minor** First Aid Injury Low - Medium $ Loss	**Moderate** Medical Treatment Medium - High $ Loss	**Major** Seroius Injuries Major $ Loss	**Catastrophic** Death Huge $ Loss
Almost Certain is expected to occur at most times **1 in 10**	H - 40	H - 48	E - 72	E - 84	E - 100
Likely will probably occur at most times **1 in 100**	M - 24	H - 44	H - 56	E - 80	E - 96
Possible might occur at some time **1 in 1,000**	L - 12	M - 28	H - 52	E - 76	E - 92
Unlikely could occur at some time **1 in 10,000**	L - 8	L - 20	M - 36	H - 64	E - 88
Rare May occur in rare circumstances **1 in 100,000**	L - 4	L - 16	M - 32	H - 60	H - 68

Orthopedic department
University of Florence

32 patients acetabular revisions, performed from 2010 to 2013, in which the acetabular components was beyond the ilio-ischial line, were retrospectively evaluated

Demographics	
Age	69 yrs (51 – 82)
Gender	18 ♀, 15♂
Side	20 L, 13 R
BMI	27,2 (22 – 31)
Time to Revision	9,4 yrs (2 - 18)
Preop. HHS	48 (22 - 77)

Paprosky Classification		
Type 1	1	3,0 %
Type 2 A	7	21,2 %
Type 2 B	9	27,3%
Type 2 C	5	15,2 %
Type 3 A	7	21,2 %
Type 3 B	4	12,1 %

Based on this experience we described an algorithmic approach for a safe removal of the cup and screws when the acetabular component had migrated medial to Kohler's line.

Algorithmic approach for a safe removal of the cup

Four parameters were identified to create a risk matrix:

1) The percentage of the cup beyond the ilio-ischial line as measured on X-rays.

2) The proximity of cup and hardware to vessels in the Ct-angiogram.

3) The timing of protrusion.

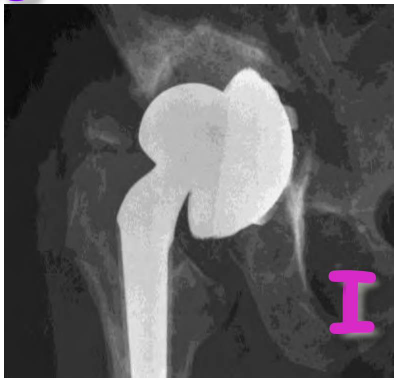
4) The presence of signs of infection

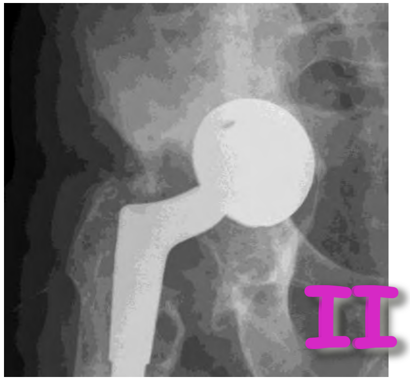
1) The percentage of the cup beyond the ilio-ischial line as measured on X-rays

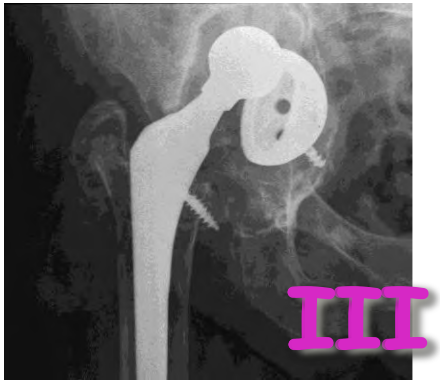
I. < 50% of the radius

II. 50% - 100%

III. > 100%

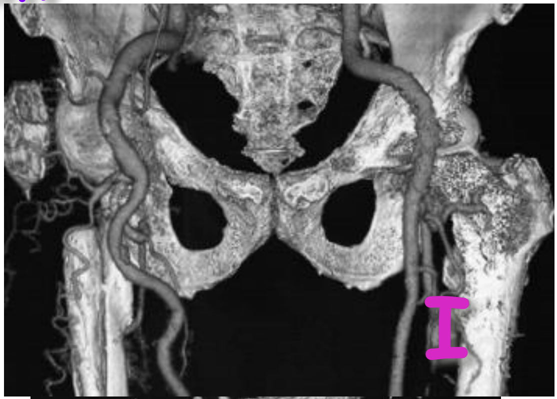






2) The relationship between cup and hardware to vessels in the Ct-angiogram

I. No contact or proximity



II. Contiguity or displacement,

III. Entrapment, pseudoaneurysm or arteriovenous fistula.

3) Timing of protrusion

1. < 6 months

2. > 6 months

4) Presence of signs of infection

"The inflammation associated with the infection makes the perivascular tissues friable and thus more prone to injury during acetabular component extraction in spite of meticulous separation of the acetabular component from the underlying tissue bed"

External Iliac Artery Injury from Migrated Antibiotic Hip Spacer: A Case Report. J Arthroplasty 2010

RISK MATRIX

	CT angiogram		
	No Contact	Contiguity	Entrapment, pseudoaneurysm AV fistula
Protrusio < 50%	**Low risk**	**Medium Risk**	**High risk**
Protrusio 50%-100%	**Low risk**	**Medium Risk**	**High risk**
Protrusio >100%	**High risk**	**High risk**	**High risk**

Risk category is increased of one step by the presence of infection

RISK MATRIX

	CT angiogram		
	No Contact	Contiguity	Entrapment, pseudoaneurysm AV fistula
Protrusio < 50%	**Low risk**	**Medium Risk**	**High risk**
Protrusio 50%-100%	**Low risk**	**Medium Risk**	**High risk**
Protrusio >100%	**High risk**	**High risk**	**High risk**

Risk category is increased of one step by the long duration of the protrusio

Level one: low risk

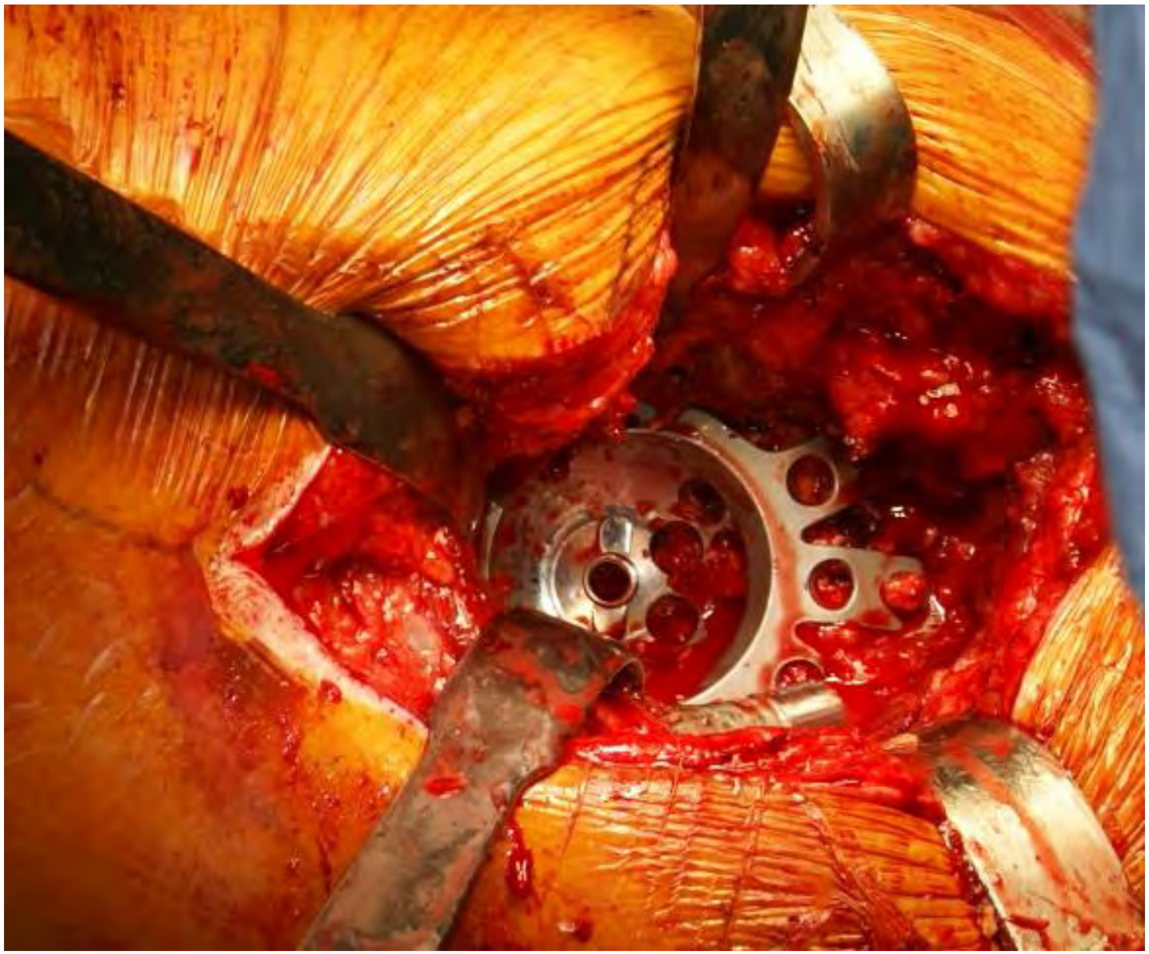
(8 cases 25%)

	CT angiogram		
	No Contact	Contiguity	Entrapment, pseudoaneurysm AV fistula
Protrusio < 50%	Low risk	Medium Risk	High risk
Protrusio 50%-100%	Low risk	Medium Risk	High risk
Protrusio >100%	High risk	High risk	High risk

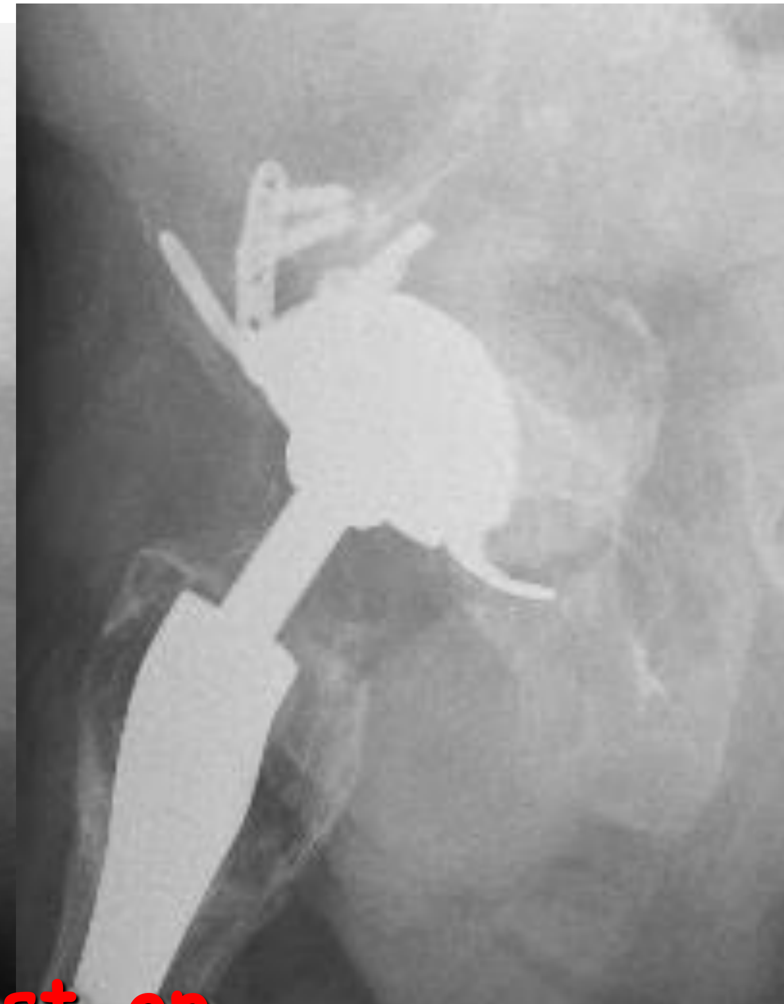
✓ **Protrusio below 50% -100 %**

✓ **Angiogram is negative**

No priority action was required !



- Pre-op



- Post-op

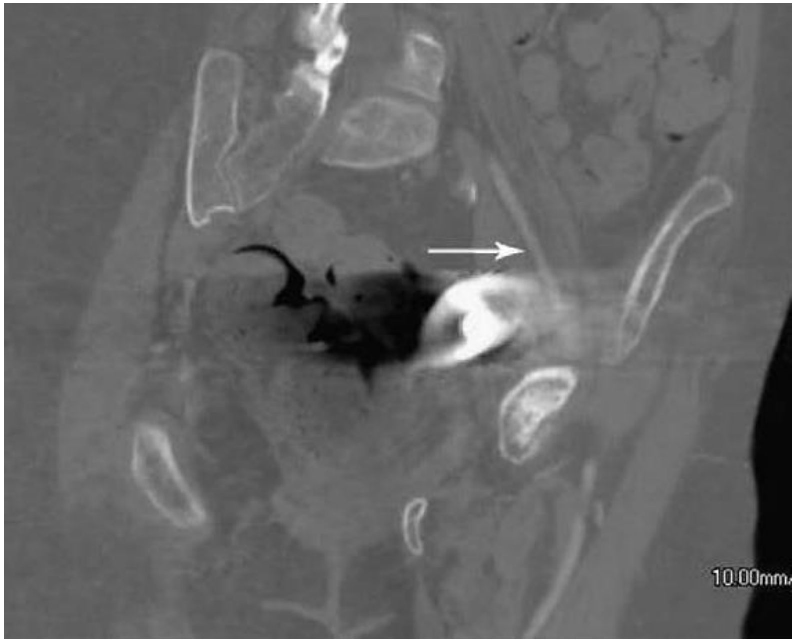
Level II: medium risk (14 cases 44%)

	CT angiogram		
	No Contact	Contiguity	Entrapment, pseudoaneurysm AV fistula
Protrusio < 50%	Low risk	Medium Risk	High risk
Protrusio 50%-100%	Low risk	Medium Risk	High risk
Protrusio >100%	High risk	High risk	High risk

- ✓ Cup is beyond the ilio-ischial line
- ✓ Only Contiguity on angiograms

Level II: medium risk

- ✓ No angiogram sign of kinking or entrapment of any relevant structures



Level II: medium risk

1. Vascular instruments sets is sterilized
2. The vascular surgeon is alerted
3. Standard revision surgery

L.T. female, third revision
Paprosky 3b


RefPhys:

- Pre-op

- Post-op 3 mesi

- Post-op 1 anno

Level III: High risk

10 cases 31%

Cup is well beyond the ilio-ischial line <u>and</u> angiogram shows contact with vessels

	CT angiogram		
	No Contact	Contiguity	Entrapment, pseudoaneurysm AV fistula
Protrusio < 50%	Low risk	Medium Risk	High risk
Protrusio 50%-100%	Low risk	Medium Risk	High risk
Protrusio >100%	High risk	High risk	High risk

A priority action was required !

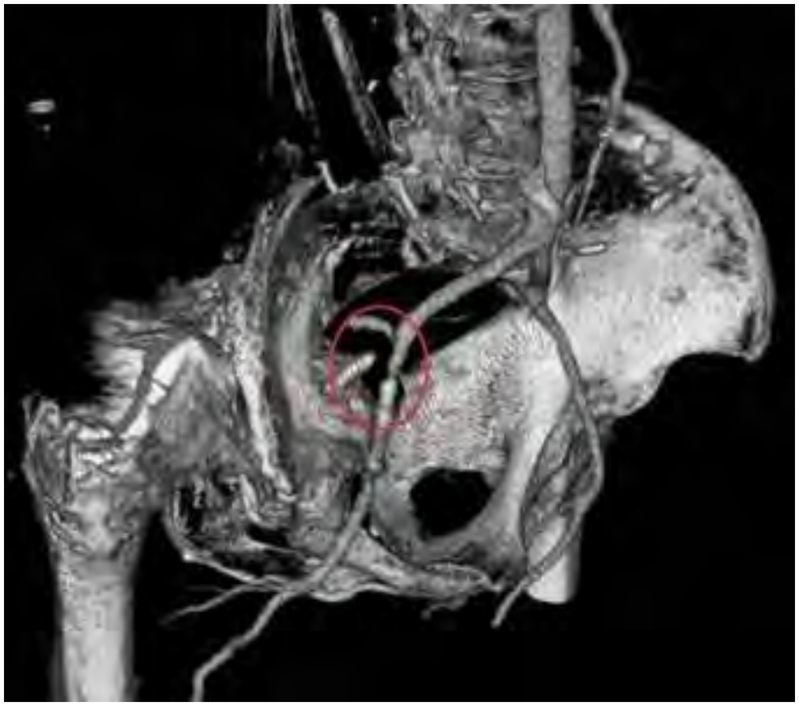
Level III: High risk

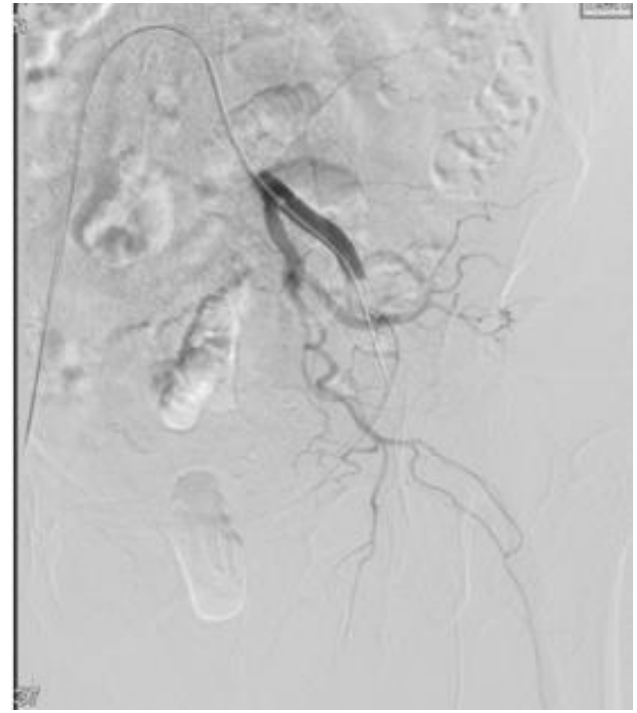
(Type A: protrusio < 100%)

	CT angiogram		
	No Contact	Contiguity	Entrapment, pseudoaneurysm AV fistula
Protrusio < 50%	Low risk	Medium Risk	High risk
Protrusio 50%-100%	Low risk	Medium Risk	High risk
Protrusio >100%	High risk	High risk	High risk

Level III: High risk

(Type A: protrusio < 100%)





1. Catheter balooning

Level III: High risk

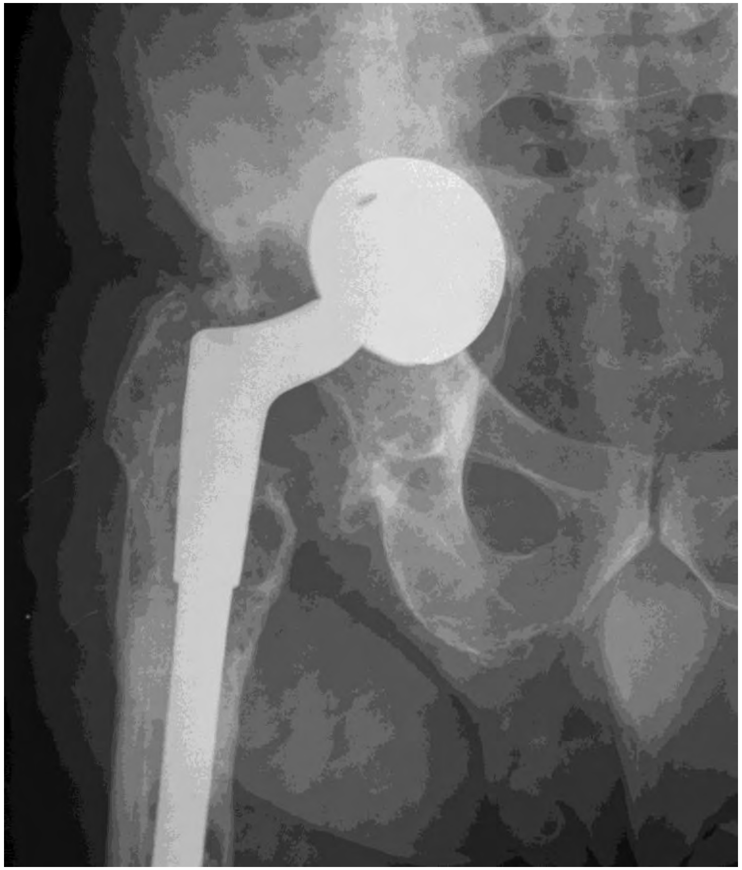
(Type A: protrusio < 100%)

Angiogram shows vessels entrapment or dislocation, pseudoaneurysm or AV fistula

2. Specialized approach (retroperitoneal) were necessary for vessels mobilization and protection

Level III: High risk

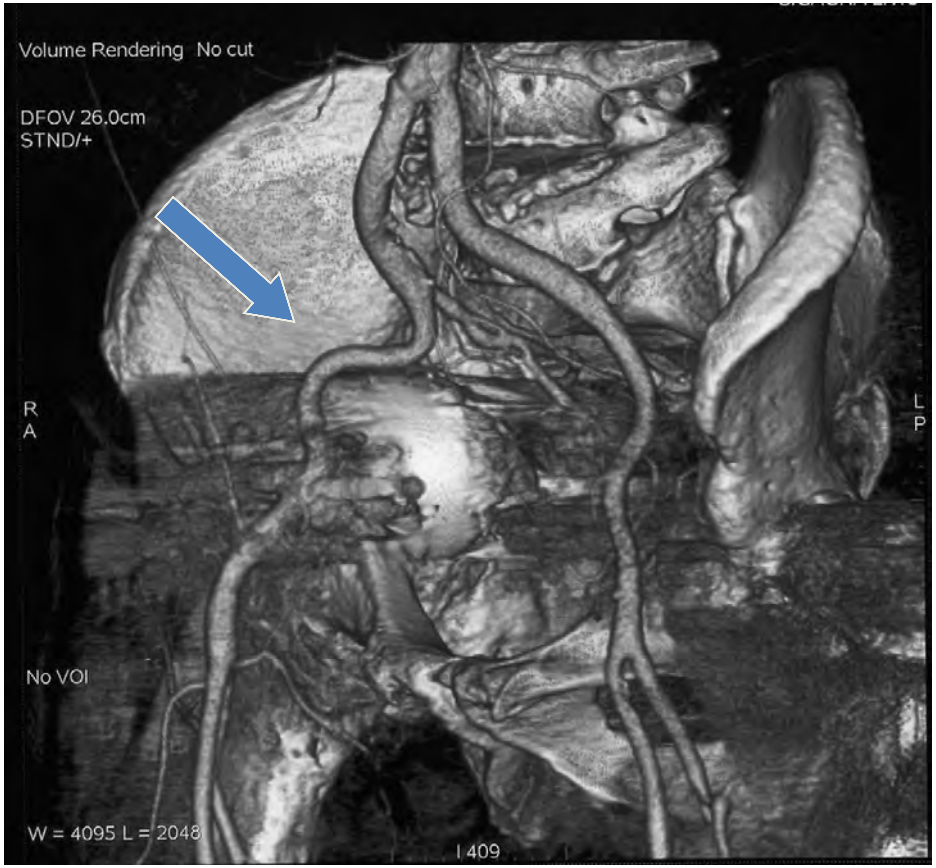
(Type A: protrusio < 100%)



Level III: High risk

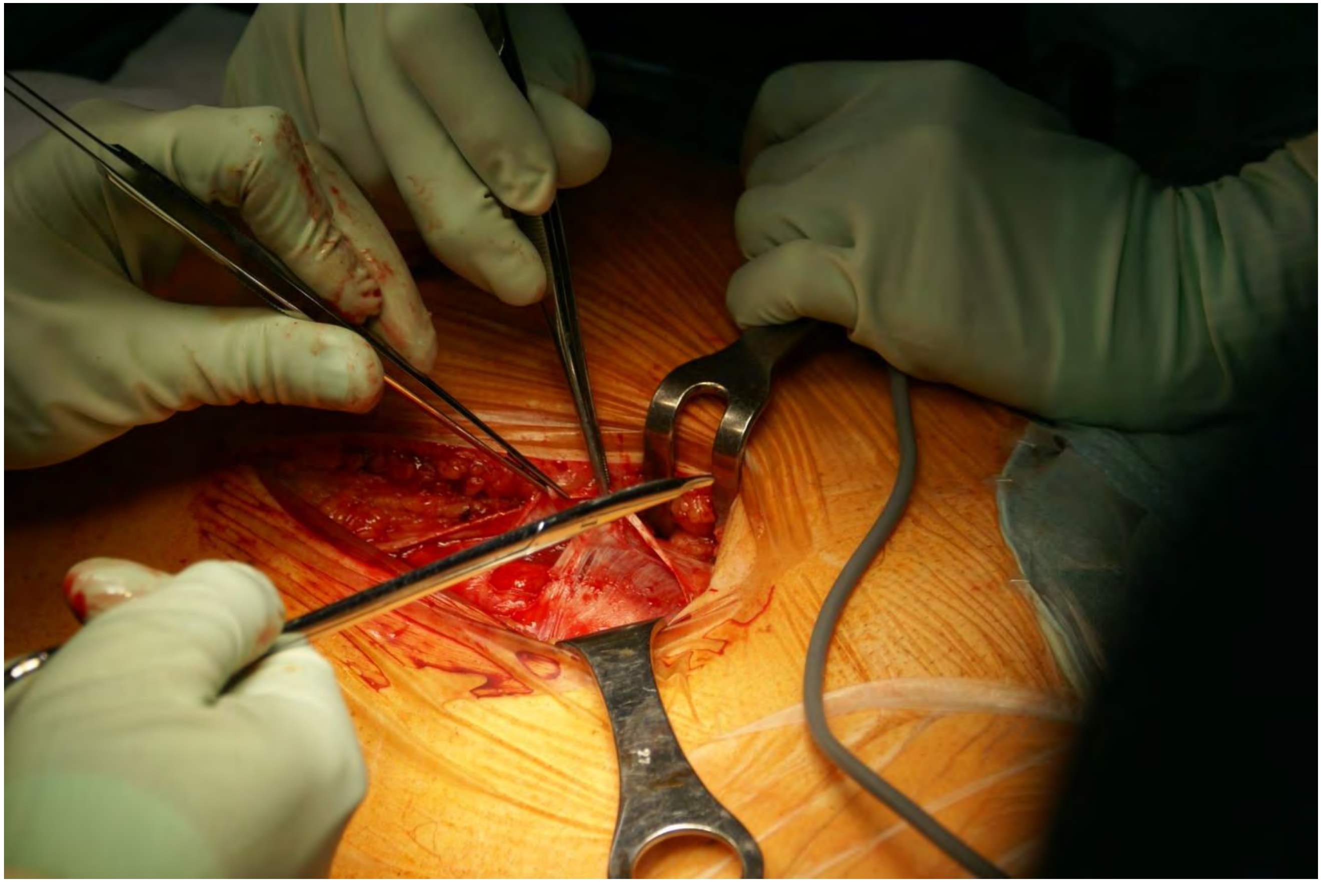
(Type A: protrusio < 100%)

Angiogram revelead an adhesion of the cup on External Iliac Artery with kinking of the vessel

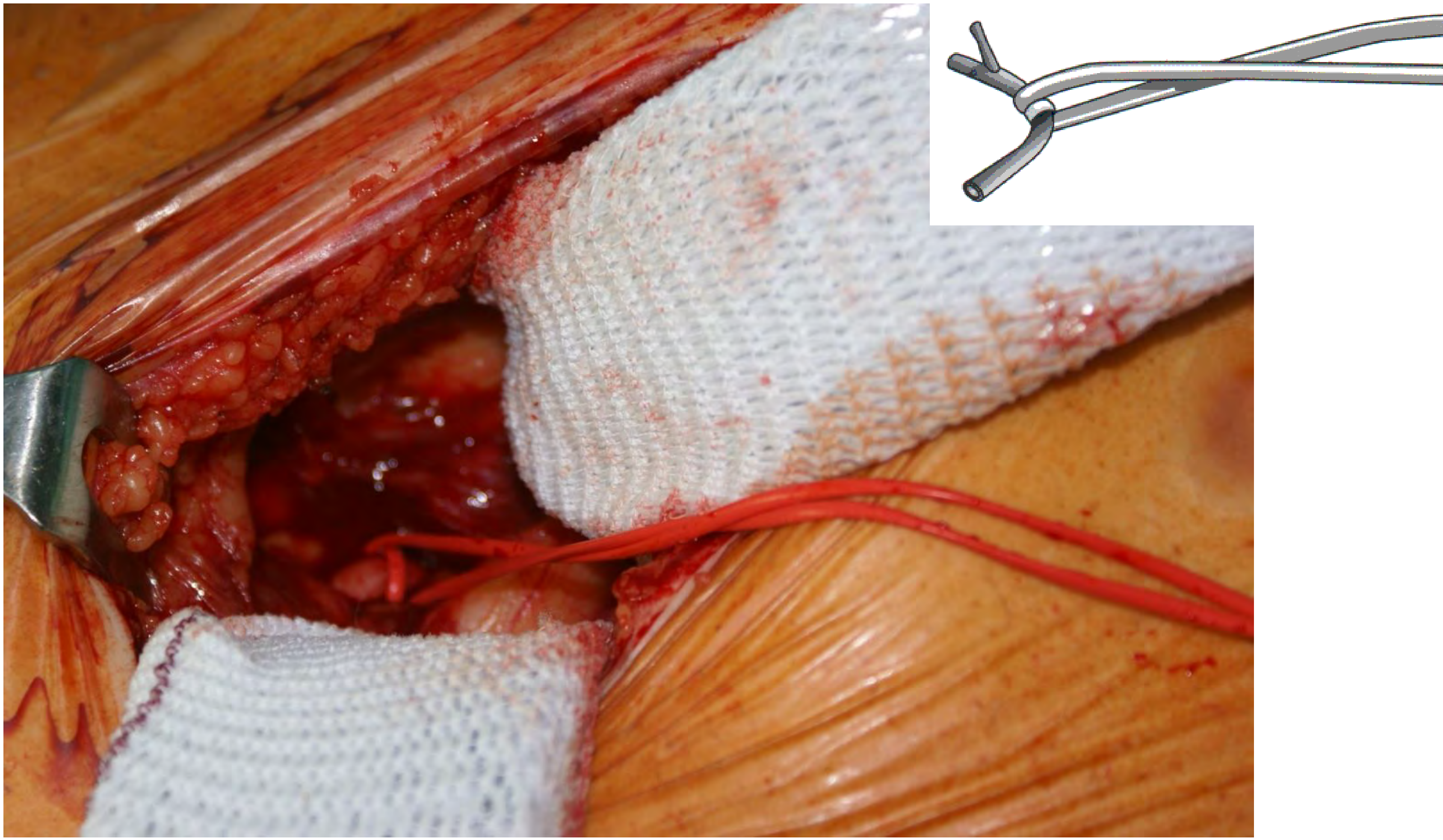


✓I step: Retroperitoneal Approach

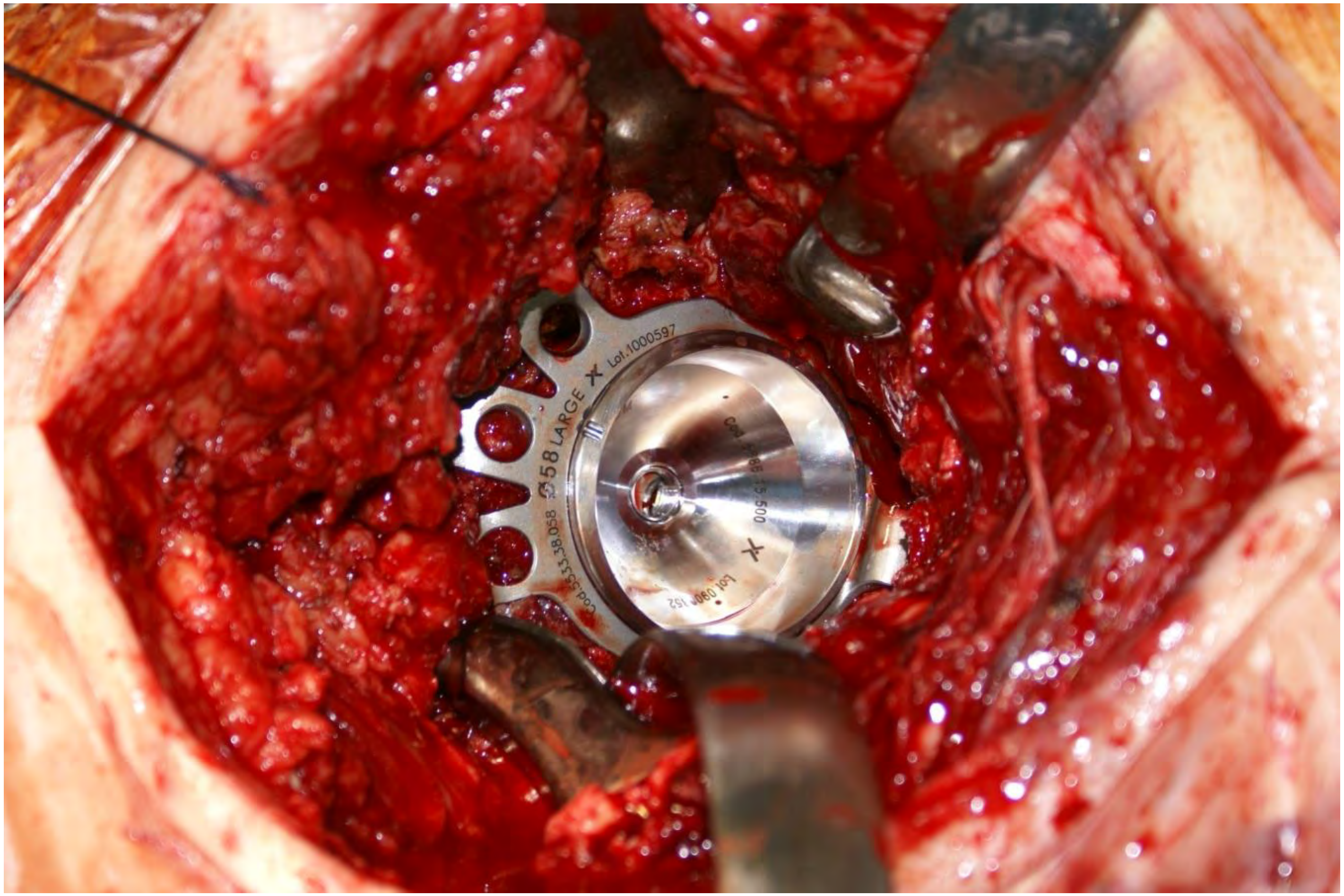
✓ the external and internal obliques and the transversus abdominus muscle are divided to enter the retroperitoneum.



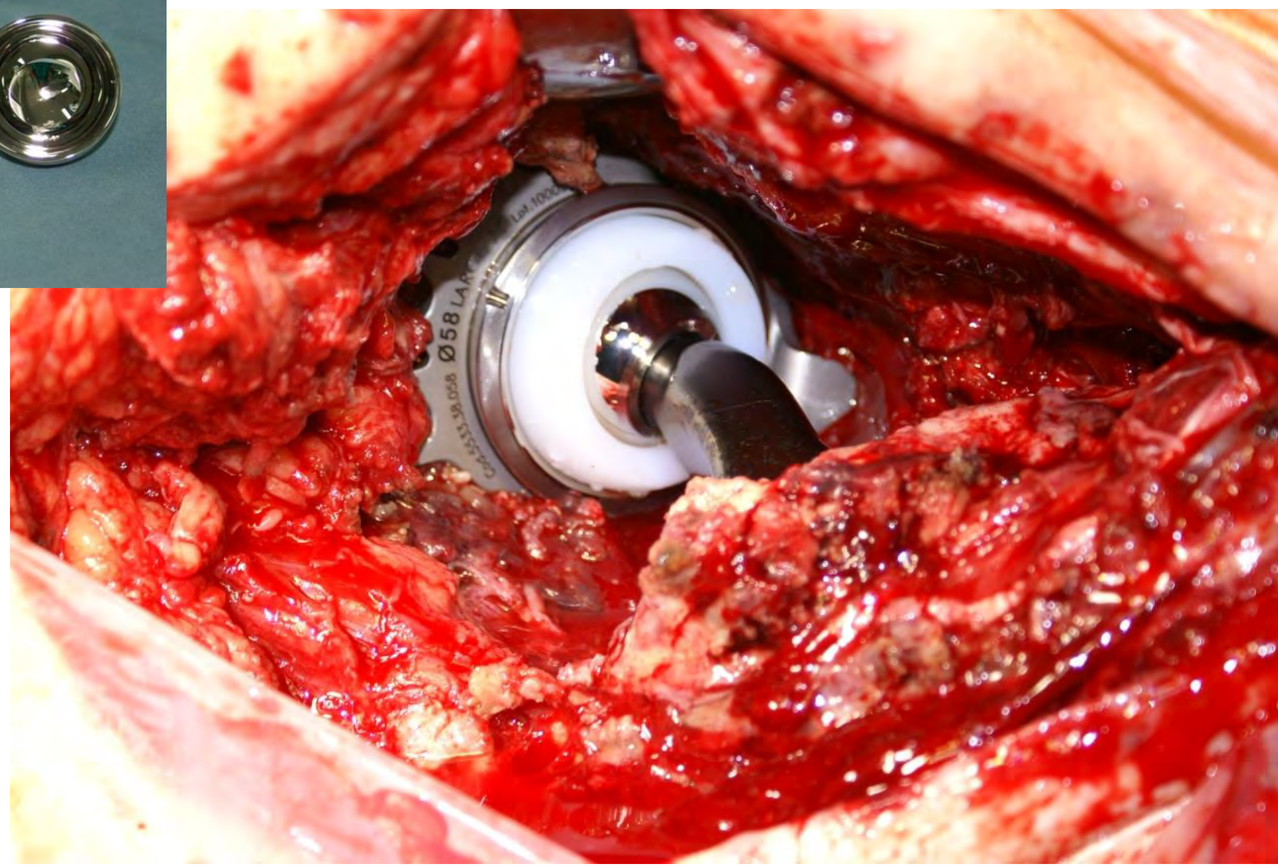
- ✓ The branches of the iliac artery vein area are exposed, ligated, and divided to prevent avulsion during implant or cement extraction. The Silicone loops are placed around the iliac artery.



✓ II Step: Acetabular reconstruction with a Trabecular Titanium cage



✓ II Step: We utilized a doble mobility insert



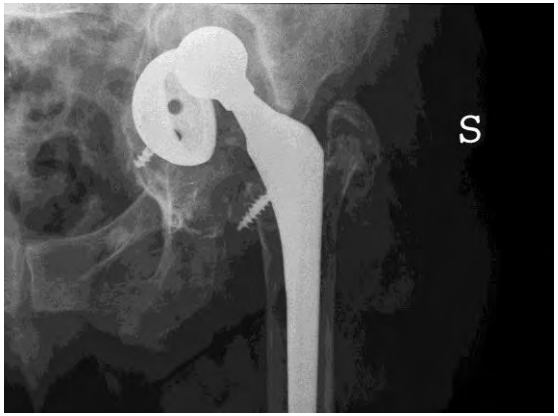
Pre-op

6 months

Level III: High risk

(Type B protrusio > 100%)

	CT angiogram		
	No Contact	Contiguity	Entrapment, pseudoaneurysm AV fistula
Protrusio < 50%	Low risk	Medium Risk	High risk
Protrusio 50%-100%	Low risk	Medium Risk	High risk
Protrusio >100%	High risk	High risk	High risk



The removal of the migrated hardware required a specialized surgical approach

Level III: High risk

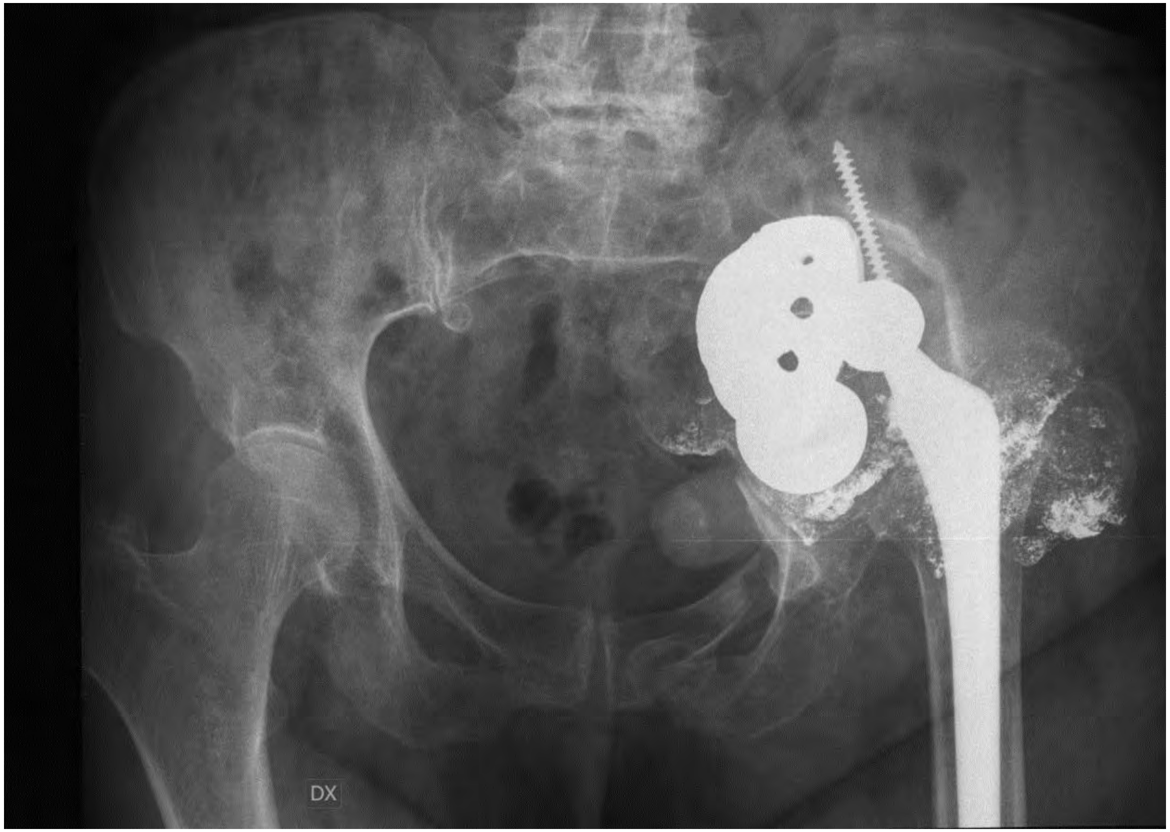
(Type B: protrusio < 100%)

	CT angiogram		
	No Contact	Contiguity	Entrapment, pseudoaneurysm AV fistula
Protrusio < 50%	Low risk	Medium Risk	High risk
Protrusio 50%-100%	Low risk	Medium Risk	High risk
Protrusio >100%	High risk	High risk	High risk

1. **Specialized (transabdominal) approaches were necessary for removal of the intrapelvic socket too**

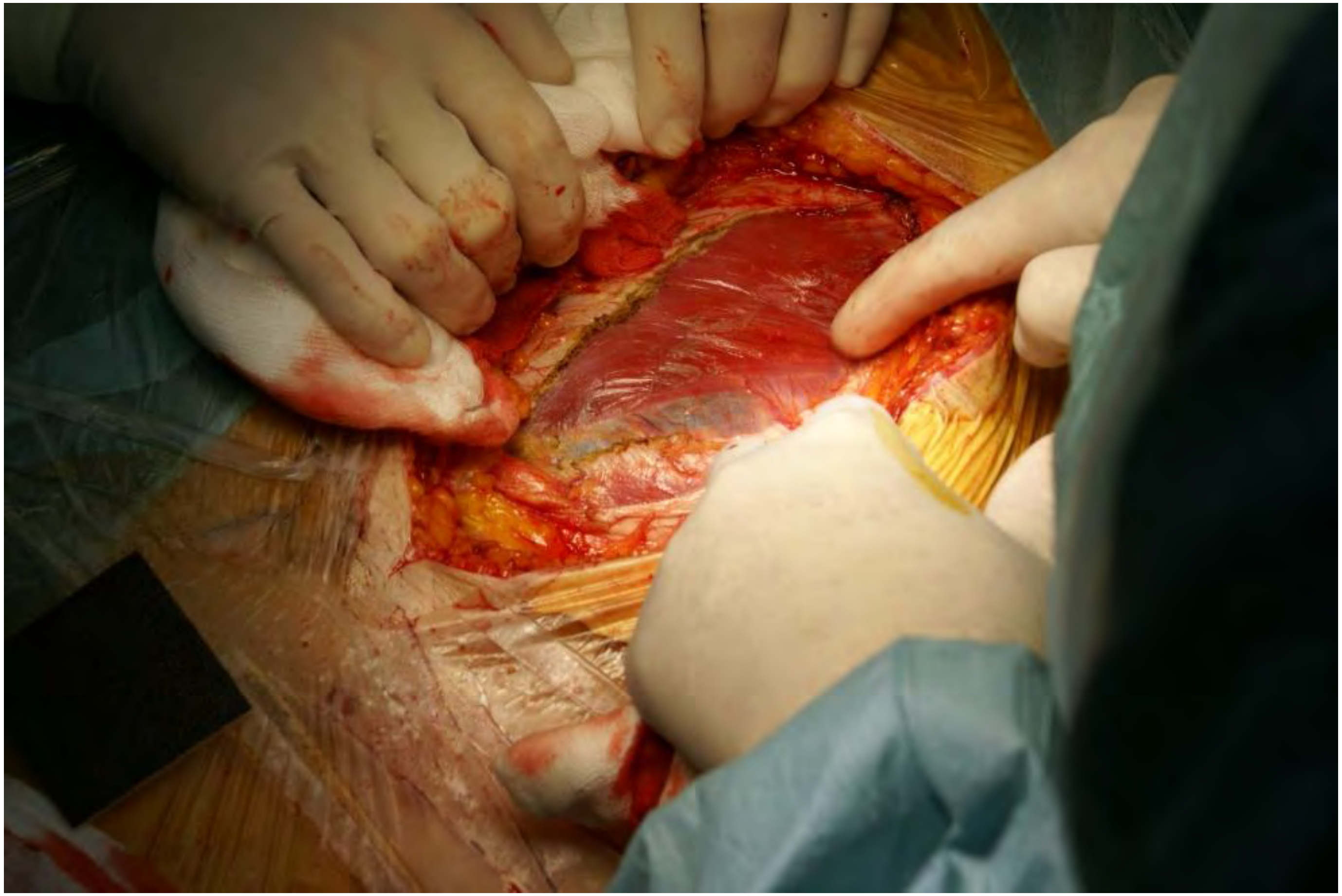
Level III: High risk

(Type B protrusio > 100%)



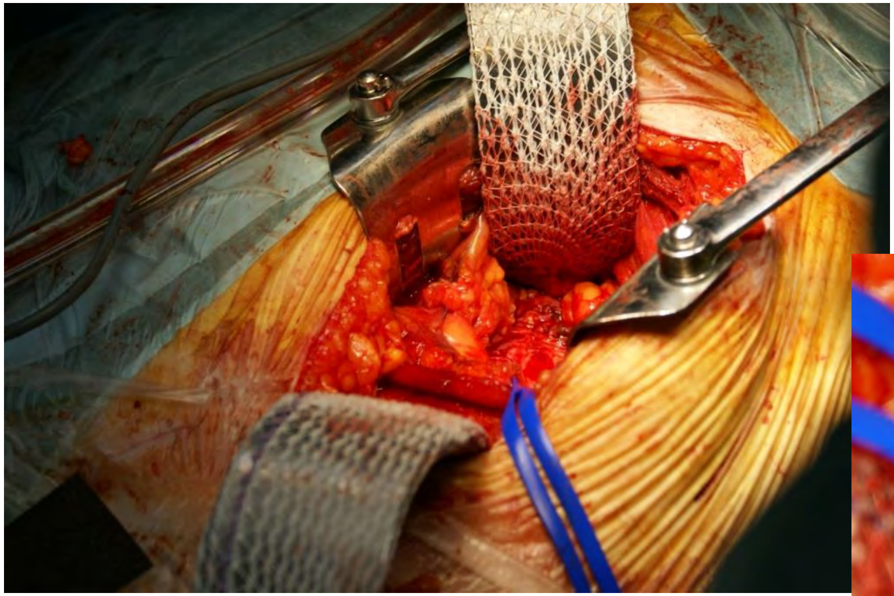
no comment

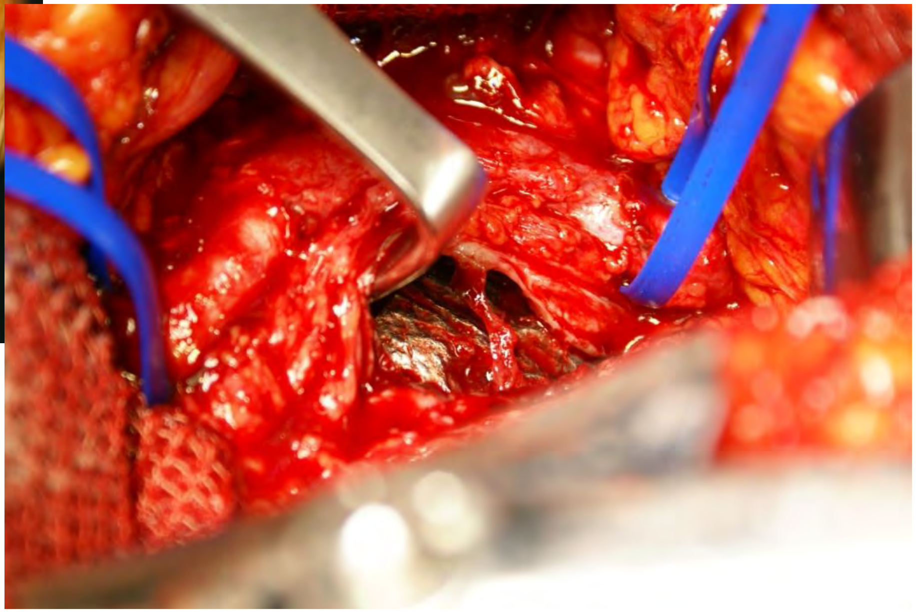
I Stage: transabdominal approach



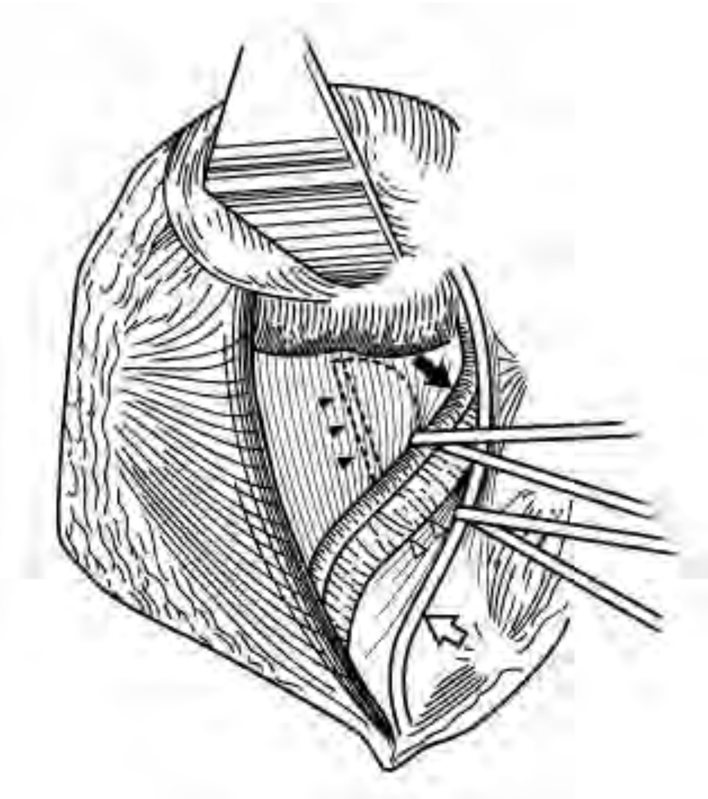
The posterior peritoneum was opened

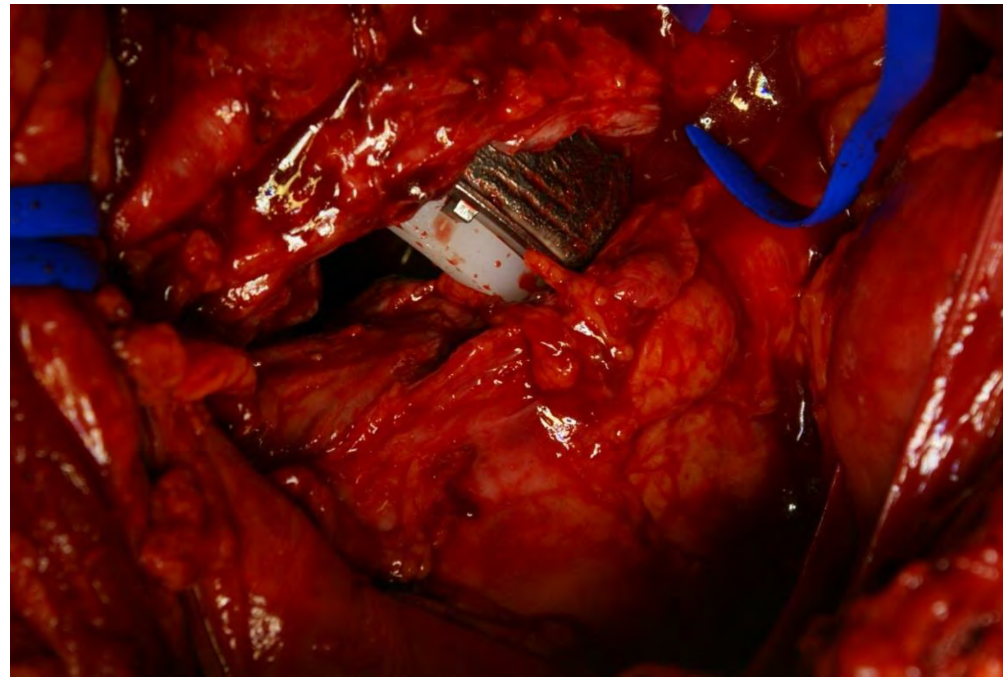
The ureter and the external iliac artery were identified





The ureter and the external iliac artery were mobilized and looped

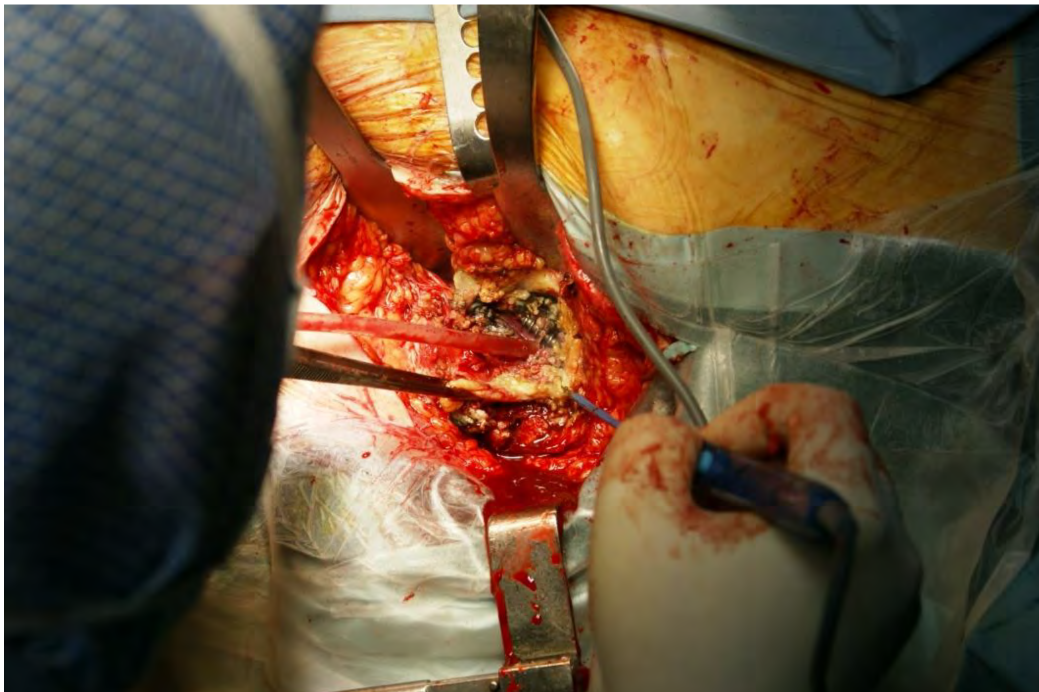




The acetabular component were adherent to the iliac muscle

The acetabular component and the hardware were carefully removed through the trans-abdominal approach

II incision: Standard orthopedic approach



Pre-op

6 months

CONCLUSIONS

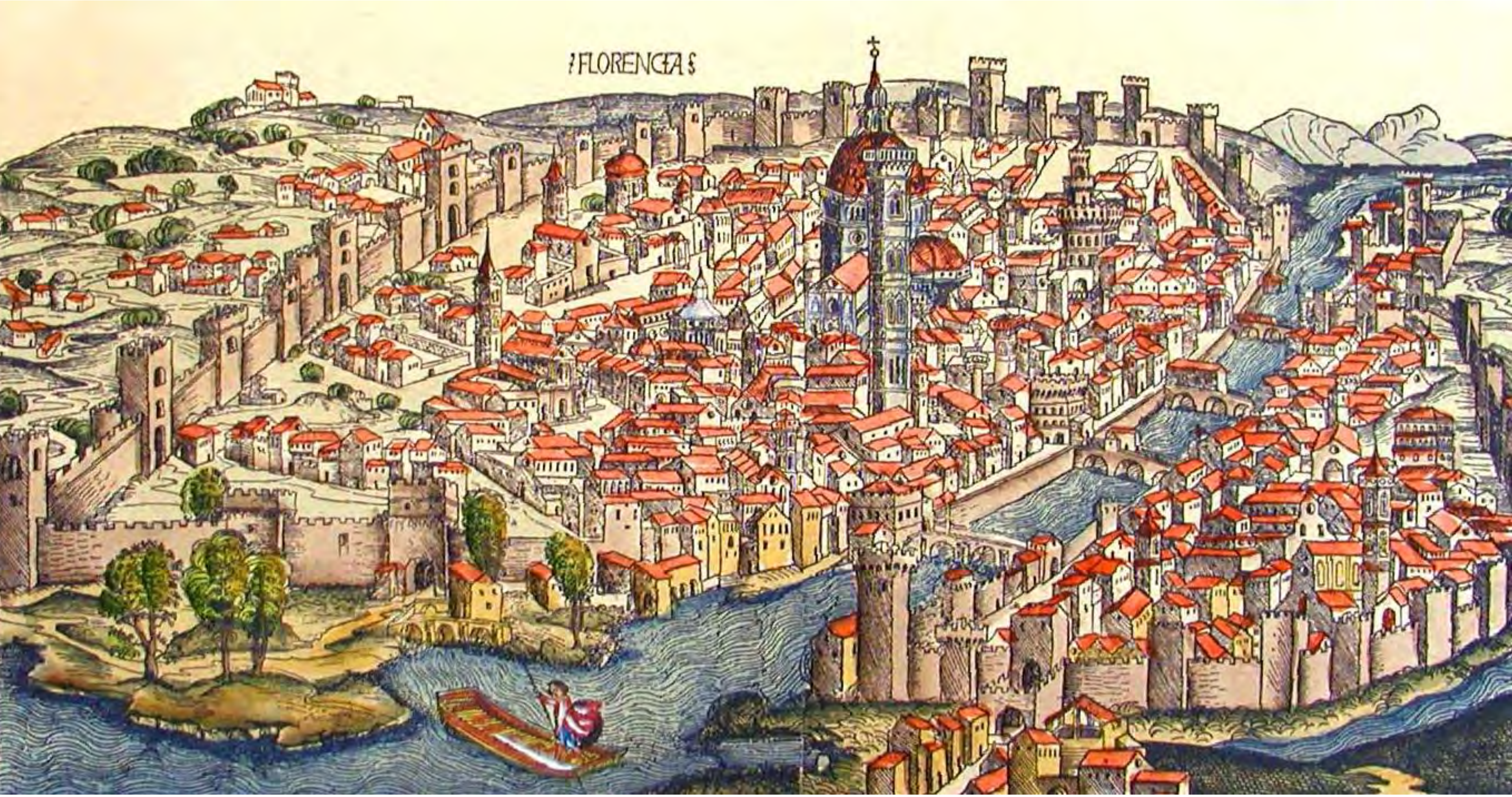
Conclusions

- We identified an algorithmic approach to acetabular component removal to elaborate a risk matrix for safe removal of the hardware

	CT angiogram		
	No Contact	Contiguity	Entrapment, pseudoaneurysm AV fistula
Protrusio < 50%	**Low risk**	**Medium Risk**	**High risk**
Protrusio 50%-100%	**Low risk**	**Medium Risk**	**High risk**
Protrusio >100%	**High risk**	**High risk**	**High risk**

Conclusions

- Once the risk matrix was created, priority actions, and mitigation planning could be identified to define the proper surgical strategy.



Thank for your attention

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

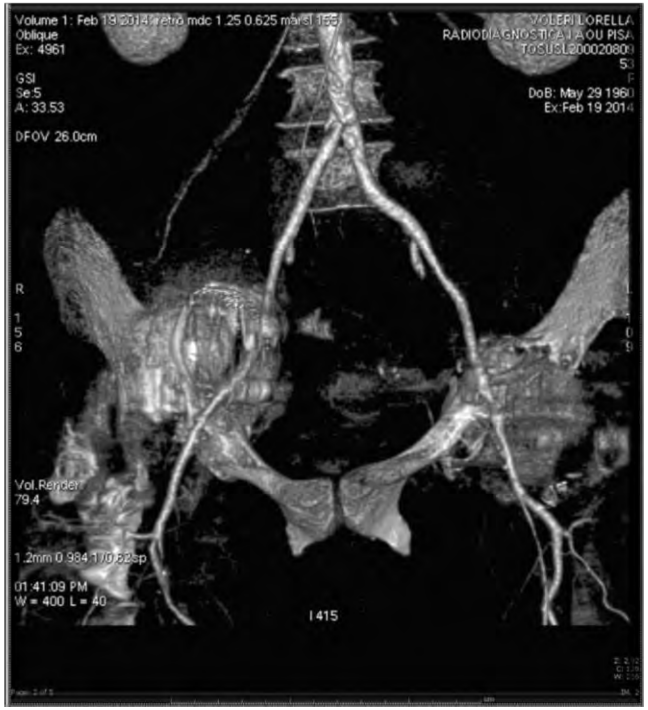
26-27 NOVEMBER 2015

MILAN, ITALY

UNIVERSITY OF PISA
ORTHOPAEDICS & TRAUMATOLOGY 1 DEPT.
CHIEF: PROF. MICHELE LISANTI

The use of balloon catheter into the infrarenal aorta for prevention of massive hemorrahage during revision hip replacement at high risk: a case report

F. Niccolai, P.D. Parchi, E. Bonicoli, L. Andreani, M. Lisanti



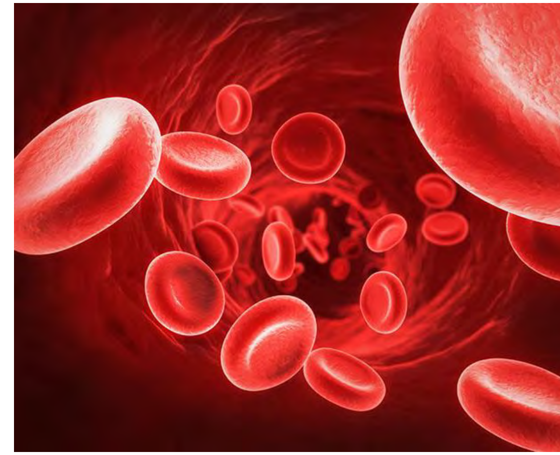
Bleeding is one of the major concern in Revision Surgery

The Journal of Arthroplasty Vol. 26 No. 6 2011

Case Report

A Late Vascular Complication Due to Component Migration After Revision Total Hip Arthroplasty

Waqas M. Hussain, MD,* Haroon M. Hussain, BA,†
Mohammed S. Hussain,‡ and David W. Manning, MD*



Am Heart J. 2013 Mar;165(3):427-33.e1. doi: 10.1016/j.ahj.2012.11.005. Epub 2013 Jan 8.

Thrombotic and bleeding complications after orthopedic surgery.

Oberweis BS[1], Nukala S, Rosenberg A, Guo Y, Stuchin S, Radford MJ, Berger JS.

Rev Esp Anestesiol Reanim. 1992 Jan-Feb;39(1):49-51.

[Hemorrhagic shock caused by rupture of the iliac vein. A very rare complication of hip arthroplasty].

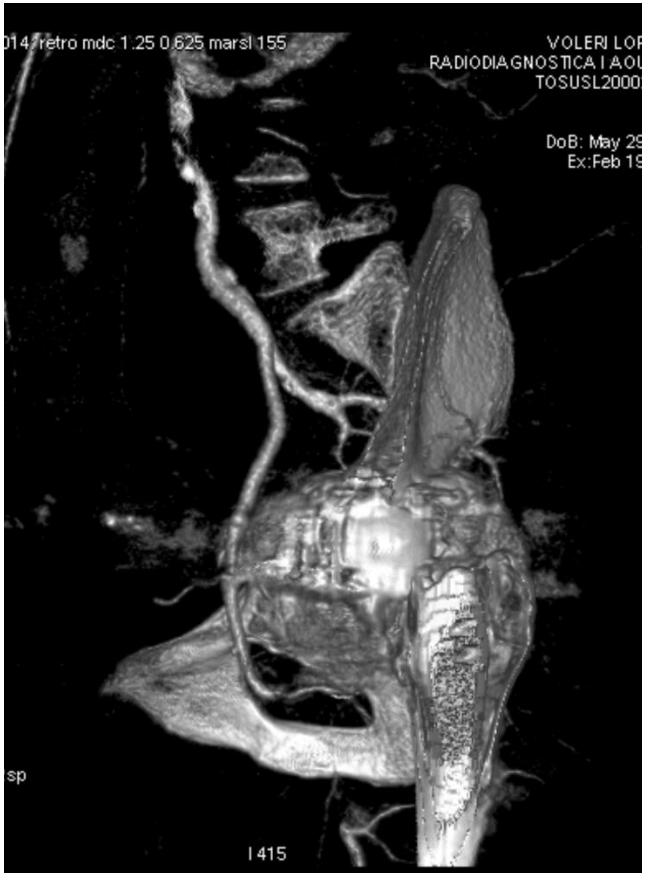
[Article in Spanish]

Sáenz-Martínez J[1], Ibáñez R, Unceta-Barrenechea B, Aizpurua MJ.

Int Orthop. 1994 Feb;18(1):29-31.

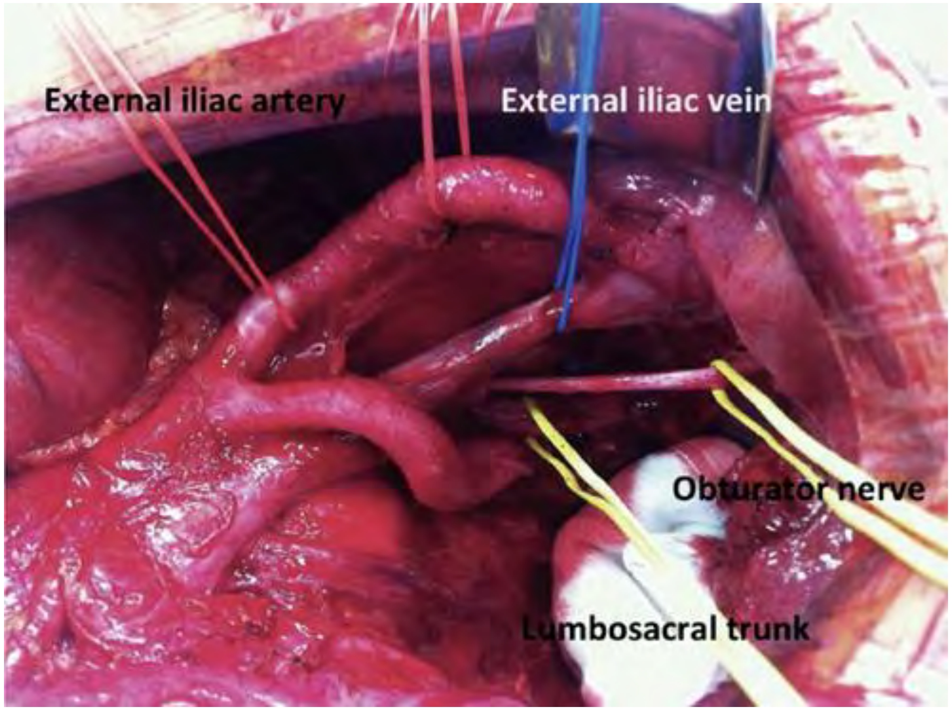
Vascular injury during total hip arthroplasty: the anatomy of the acetabulum.

Hwang SK[1].



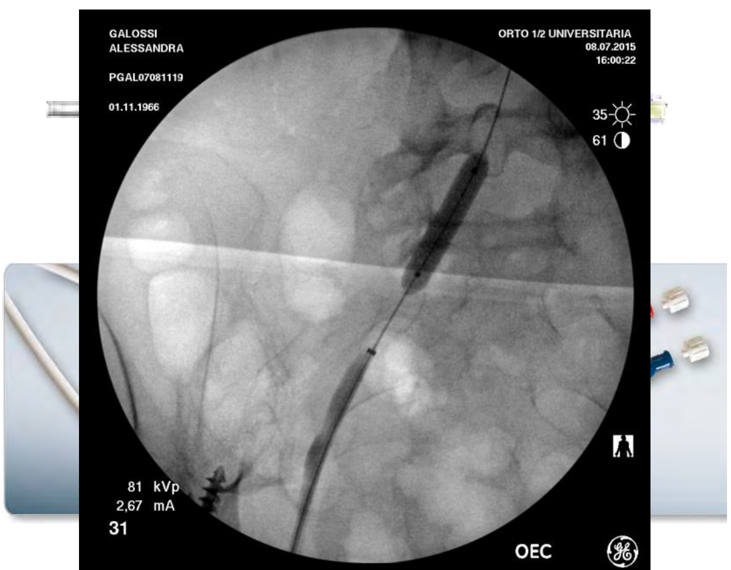
In those cases, where we have a cup intrapelvic migration with "fibrotic" adhesion to a major artery vessel, generally were used to call a vascular surgeon to isolate the iliac vessels for prevention of breakage

Iatrogenic traumatic injury



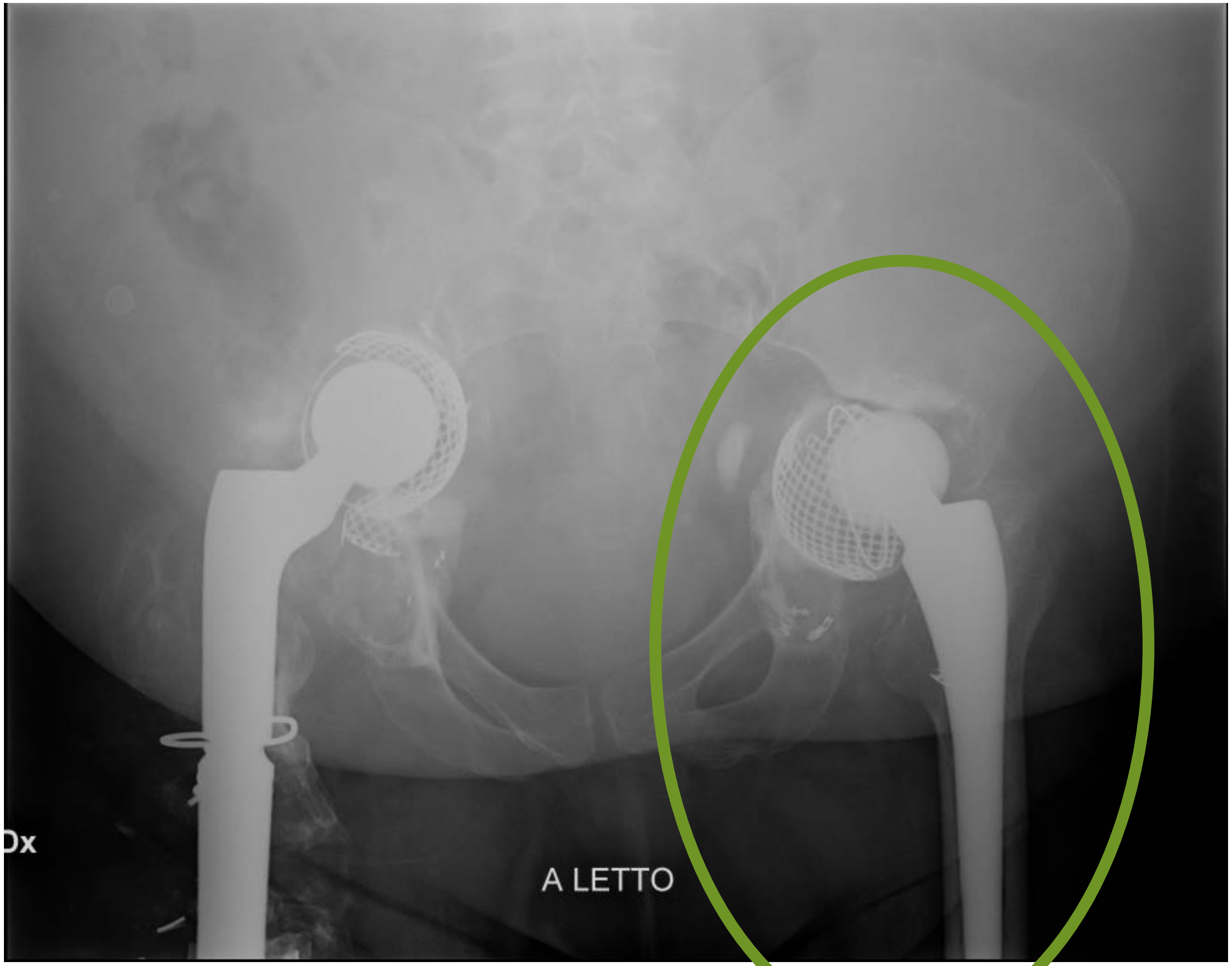
New Method

The interventional radiologist with the catheterization of the contralateral femoral artery places an intravascular ballon upstream the concerned artery.



During surgery, we can ask the radiologist to stop the artery flow downstream in case of vascular lesion to avoid massive bleeding.

Case Report A



V.L.
55 yrs

Aseptic Loosening

Case Report A Pre-operative Planning

External iliac artery in close proximity with the acetabular cup

High risk of major bleeding

Case Report A

Post-operative X-Ray

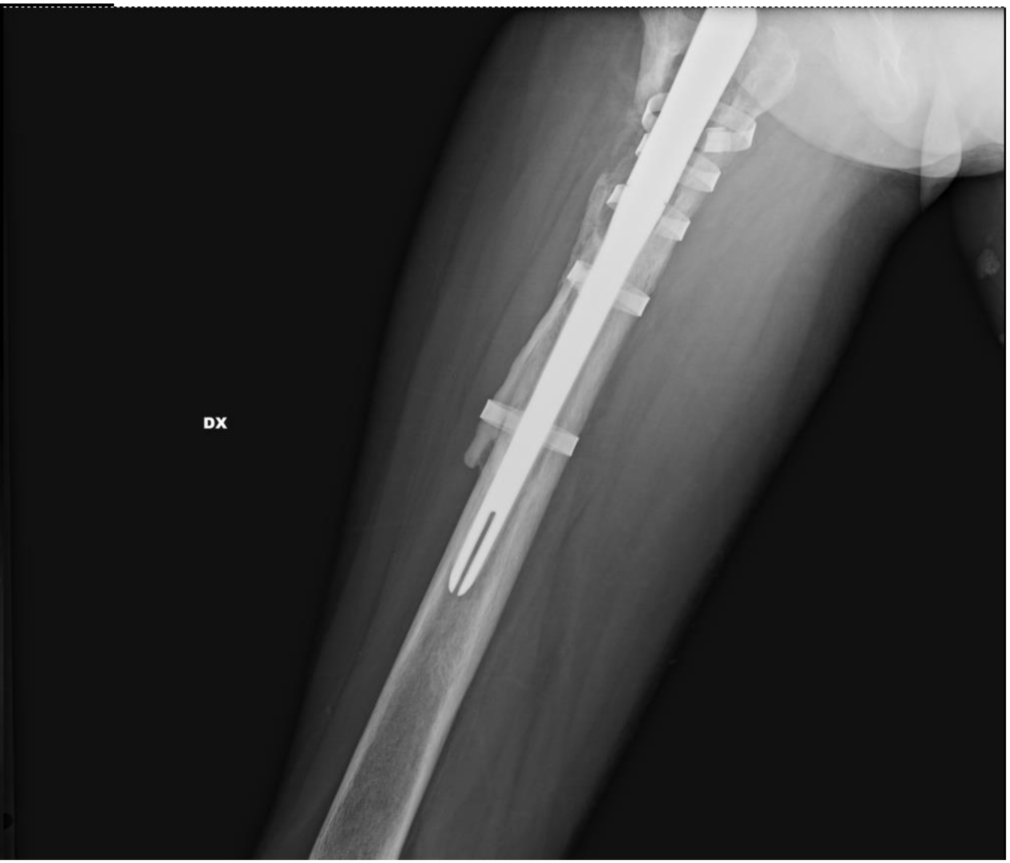
Before the operation a heparinized catheter in infrarenal aorta was placed with the help of an interventional radiologist.

During revision surgery the radiologist was ready to activate an intravascular balloon in order to stop bleeding.

Case Report B

G.A. 49yrs

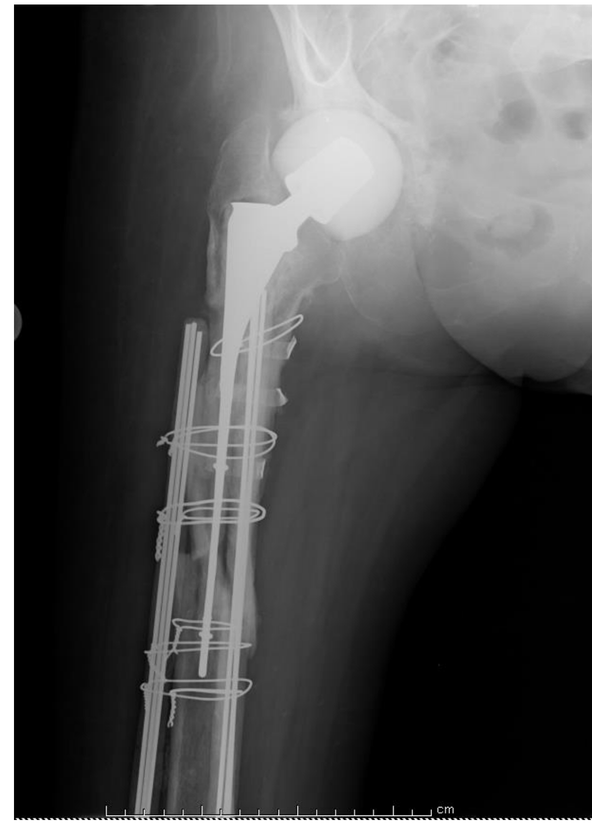
Septic Loosening of the Stem



Case Report B

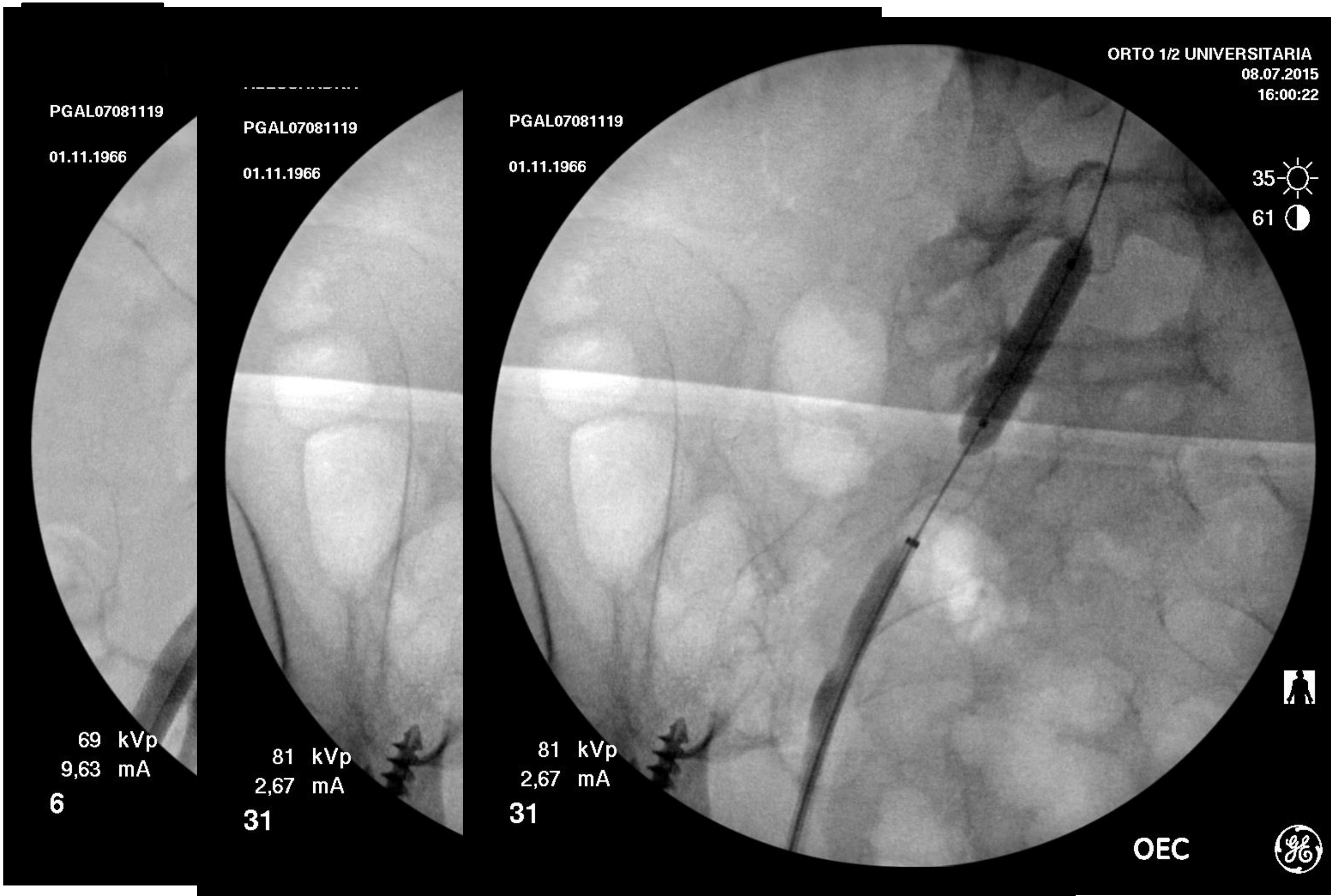
First Surgery: Positioning Antibiotic Spacer

Complication: intraoperative bleeding from a perforator artery



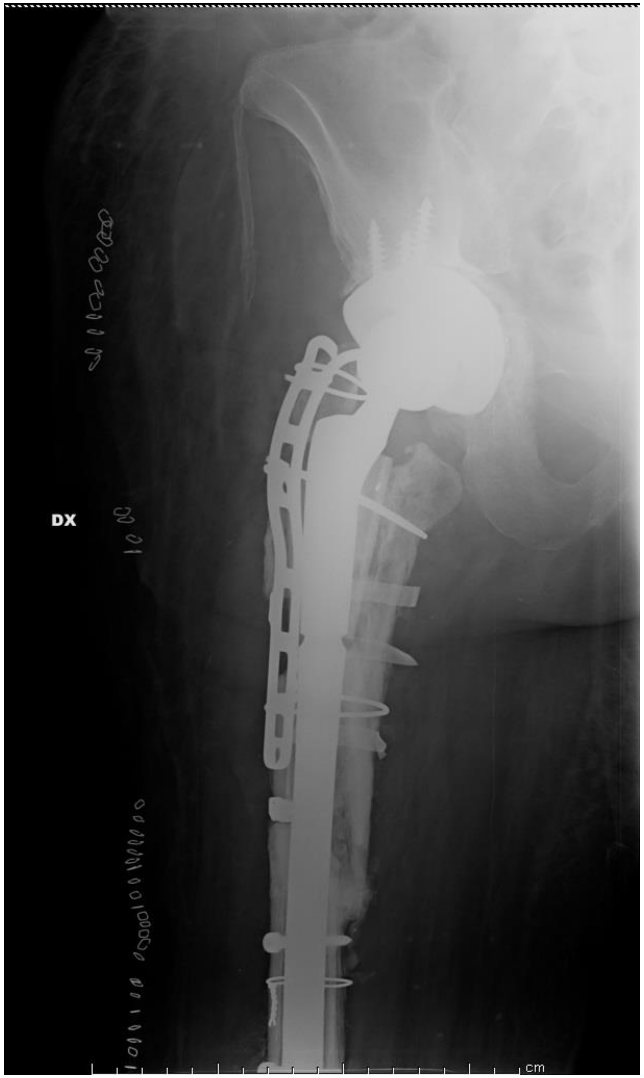
Case Report B

Second Surgery: implant revision prosthesis



Case Report B

Post operative X-Ray



Discussion

A few of literature

No agreement in time for occlusion/deflate

Complications of catheterization (Thrombosis, catheter dislocaton)

J Clin Anesth. 2011 Feb;23(1):71-4. doi: 10.1016/j.jclinane.2009.10.023.

Intravascular balloon to minimize blood loss during total hip replacement in a Jehovah's Witness.

Mangar D[1], Shube S, Omar H, Kolla J, Karlnoski RA, Camporesi EM.

J Orthop Trauma. 2012 Jun;26(6):e54-7. doi: 10.1097/BOT.0b013e31822c51b8.

Use of temporary partial intrailiac balloon occlusion for decreasing blood loss during open reduction and internal fixation of acetabular and pelvis fractures.

Siebler J[1], Dipasquale T, Sagi HC.

J Orthop Trauma. 2005 Jul;19(6):415-9.

Temporary partial intra-iliac balloon occlusion for the treatment of acetabulum fracture in a Jehovah's Witness: a case report.

DiPasquale T[1], Greiwe RM, Simmons P, Zweibel B, Bernasek T, Steinberg J, Mangar D.

Conclusions

- ✓ The use of this “protection” has allowed the team to perform the surgery with less anxiety and stress.

- ✓ Further studies are needed to evaluate the procedure and its complications

- ✓ In our opinion this is a safe and reproducible method usefull in selected cases at risk of major bleeding

UNIVERSITY OF PISA
ORTHOPAEDICS & TRAUMATOLOGY 1 DEPT.
CHIEF: PROF. MICHELE LISANTI

Thank You

frniccolai@icloud.com

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Royal National Orthopaedic Hospital NHS
NHS Trust

Multiple Revision Hip Arthroplasty: 30 Years of Aseptic Loosening

Presenting Author: Anil Haldar,
ST3, South East Thames Rotation, UK

S Khan, J Davidson, S Kantharuban, A Sharma, JM Jagiello,
R Pollock, J Miles, R Carrington, W Aston, J Skinner, TWR Briggs

Royal National Orthopaedic Hospital, Stanmore, UK

International Combined Meeting
British Hip Society & Societa Italiana Dell'Anca
Milan, 27th November 2015

Introduction

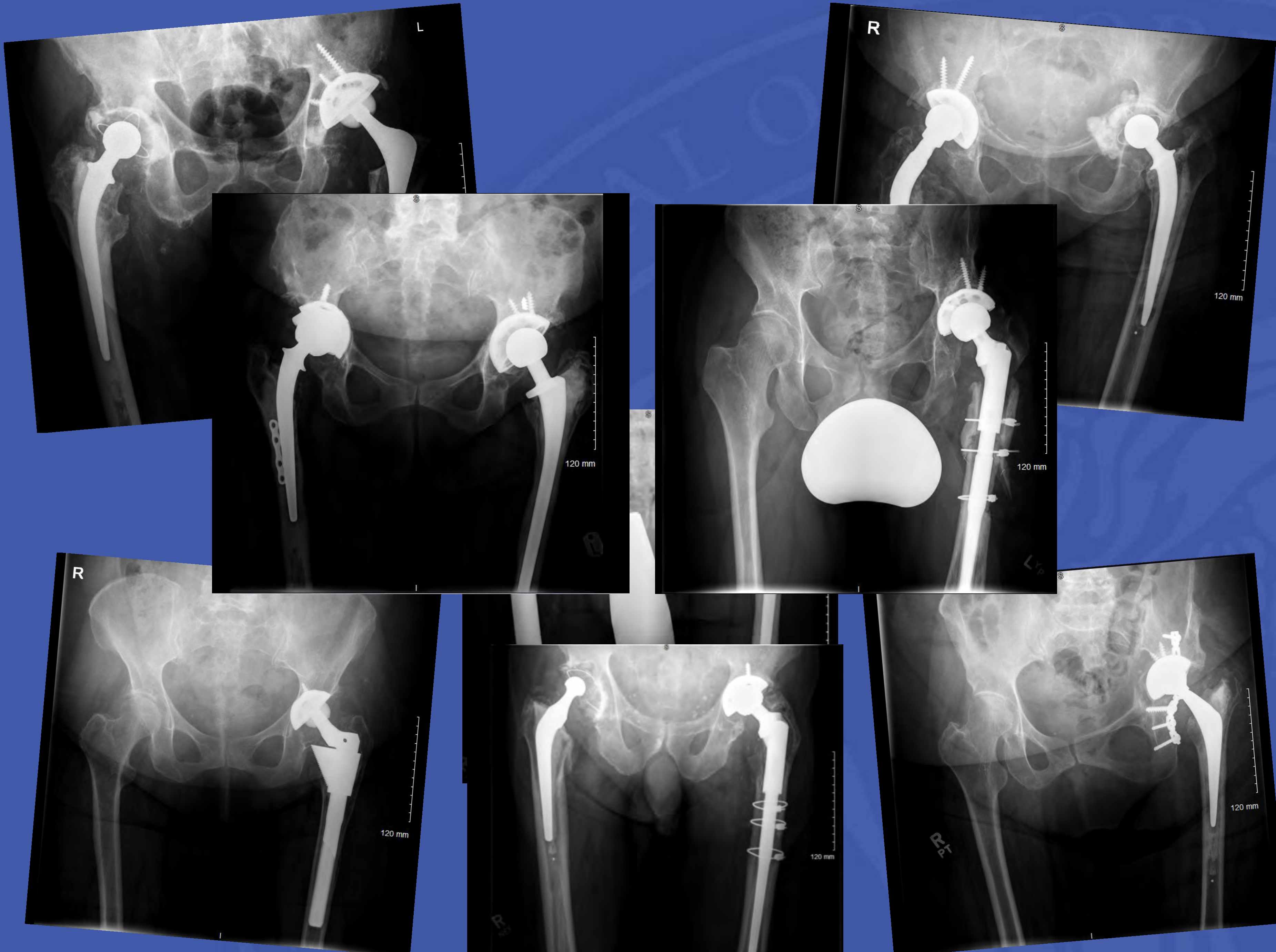
Incidence of revision total hip arthroplasty is increasing worldwide[1]

Re-revision surgery is also a growing phenomenon[1]

Less is known about large cohorts of patients who have had multiple revision hip arthroplasties

Our centre has significant experience in treating these complex patients

1) Khatod M et al, Revision Total Hip Arthroplasty: Factors Associated with Re-Revision Surgery, J Bone Joint Surg Am. 2015 Mar 4;97(5):359-66.


L
R
120 mm
120 mm
120 mm
R
120 mm
120 mm
120 mm

Objectives

To assess indications for each revision and time periods between subsequent revisions in patients who have had multiple revision hip arthroplasties

To look at a subset of patients who have had aseptic loosening as a cause of their first revision hip surgery

Methods

Data collected retrospectively from hospital notes of a sample of patients who had revision hip surgery at our centre between January 2003 and July 2015

A revision was defined as a completed single or two-stage procedure

Only patients who had a history of multiple (2 or more) revisions after their primary hip surgery were included

Results

143 hips were multiply revised

133 had complete data sets

Oldest primary total hip arthroplasty 1971

Most recent primary total hip arthroplasty 2010

Oldest revision hip arthroplasty 1980

Most recent revision hip arthroplasty July 2015

1st Revision Surgery Indications

1st Revision Surgery Indications	Number of Revisions	% of Revisions
Aseptic Loosening	75	56.4
Infection	12	9.02
Dislocation	10	7.52
Metal on Metal Complications	3	2.26
Misplaced Components	3	2.26
Poly Wear	2	1.50
Periprosthetic Fracture	2	1.50
Ceramic Head Fracture	1	0.75
Record Unavailable	25	18.8
Total	133	
Mean Time from Primary to 1st Revision	7.63 years (0.02 -35.4 years)	

1st Revision for Aseptic Loosening Subgroup

n=75

56.4% of all multiple revision patients

Mean Time for Primary Hip Surgery to

1st Revision for Aseptic Loosening 9.34 years (0.68-35.4 years)

2nd Revision Surgery Indications in Aseptic Loosening Subgroup

2nd Revision Surgery Indications	Number of Revisions	% of Revisions
Aseptic Loosening	45	60.0
Infection	9	12.0
Dislocation	6	8.00
Pain	5	6.67
Periprosthetic Fracture	2	2.67
Component Failure	1	1.33
Record Unavailable	7	9.33
Total	75	
Mean Time from 1st Revision to 2nd Revision	6.75 years (0.06-19.3 years)	

3rd Revision Surgery Indications in Aseptic Loosening Subgroup

3rd Revision Surgery Indications	Number of Revisions	% of Revisions
Aseptic Loosening	8	34.8
Infection	8	34.8
Dislocation	2	8.70
Record Unavailable	5	21.7
Total	23	
Mean Time from 2nd Revision to 3rd Revision	4.93 years (0.04-27.1 years)	

4th Revision Surgery Indications in Aseptic Loosening Subgroup

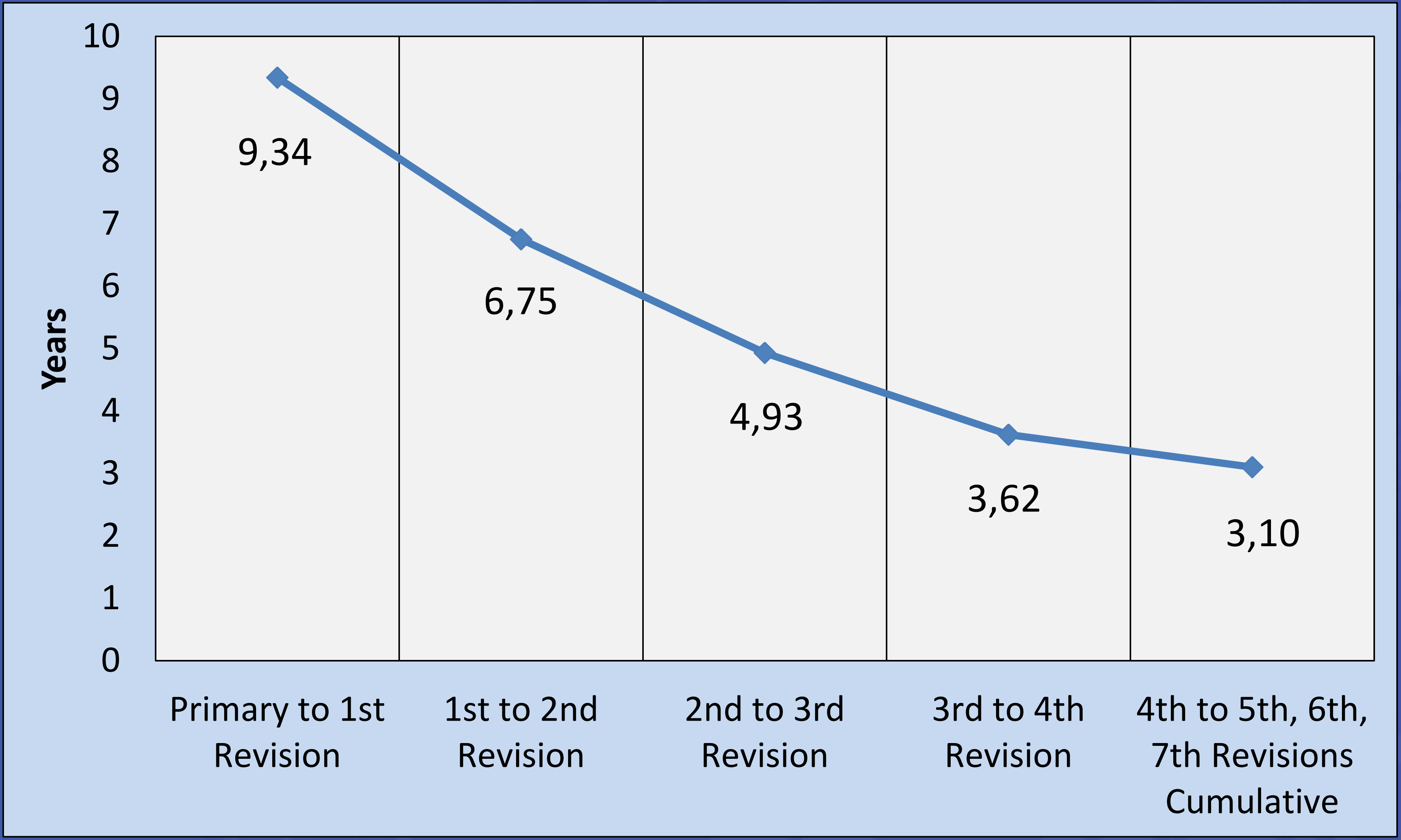
4th Revision Surgery Indications	Number of Revisions	% of Revisions
Aseptic Loosening	2	28.6
Infection	3	42.9
Dislocation	1	14.3
Record Unavailable	1	14.3
Total	7	
Mean Time from 3rd Revision to 4th Revision	3.62 years (0.32-7.48 years)	

5th, 6th and 7th Revision Surgery Indications in Aseptic Loosening Subgroup

5th, 6th & 7th Revision Surgery Indications	Number of Revisions	% of Revisions
Aseptic Loosening	2	28.6
Infection	3	42.9
Dislocation	1	14.3
Record Unavailable	1	14.3
Total	7	
Mean Time to next revision between 5th, 6th & 7th Revisions	3.10 years (0.08-13.7 years)	

Percentage of Revisions for Infection in Aseptic Loosening Subgroup

Mean Time to Next Revision in Aseptic Loosening Subgroup



Conclusions

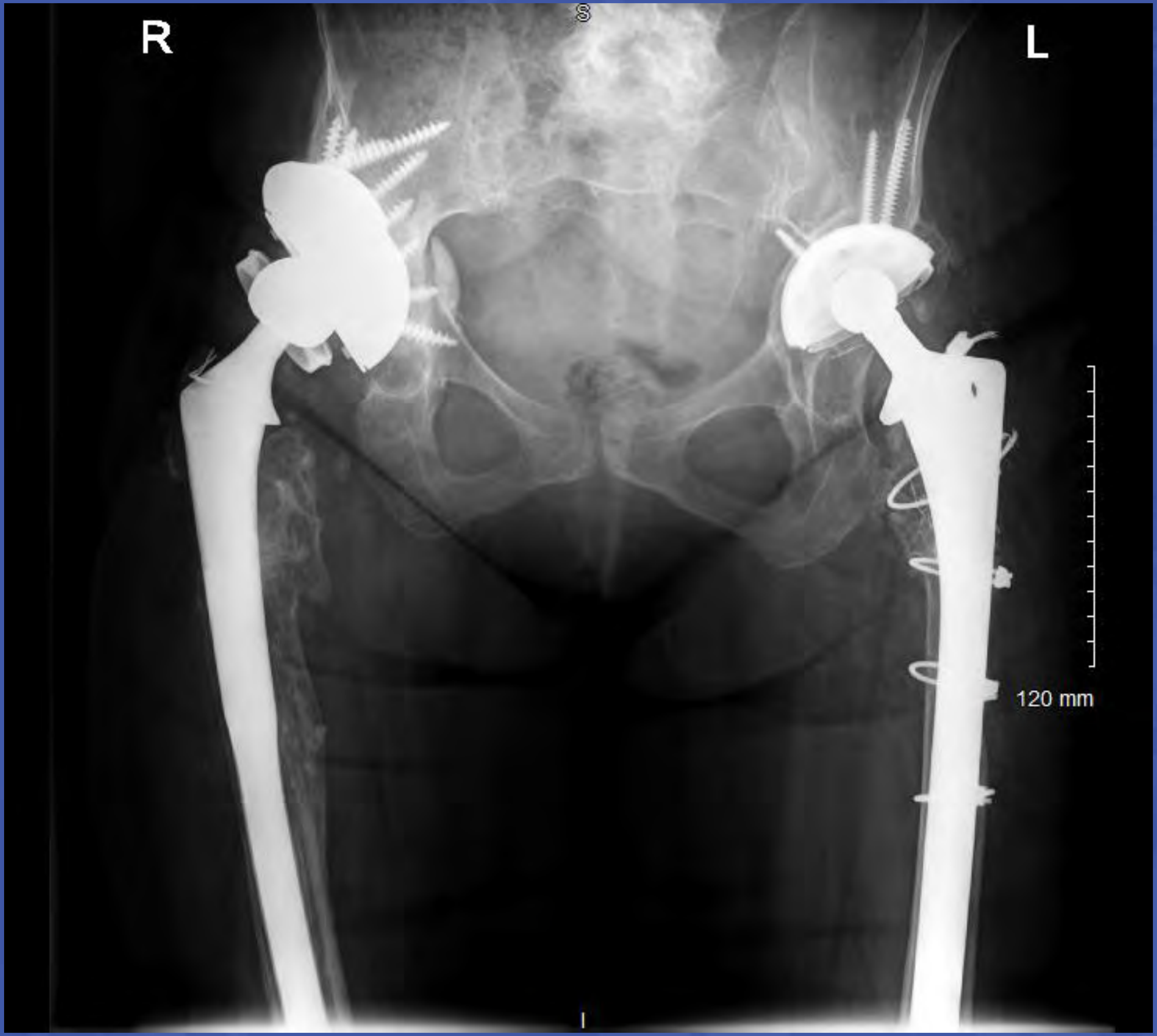
Management of hip arthroplasties requiring multiple revisions is challenging and complex

Aseptic Loosening is the most common cause of first revision surgery

When patients require multiple revisions, risk of infection is greater with each subsequent revision

When patients require multiple revisions, time to subsequent revisions decreases with each encounter

Thank You for Listening



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

The use of Dual Mobility components in Revision Total Hip Arthroplasty

G. Anania, A. Todesca, M. Penna, F. Simeoni, J. Bejui-Hugues

Istituto Chirurgico Ortopedico Traumatologico - Latina (Italy)

BHS-SIdA 26/27.XI.2015

Introduction

- Instability is considered the most common cause of failure in revision hip arthroplasty:

  a) abductor muscle insufficiency

  b) degree of bone loss and poor bone quality

  b) rotational hip center

  c) optimal off-set

Dual Mobility (DM) Components

- Provide for an additional articular surface, with the goal of improving ROM and posterior horizontal dislocation distance
- Avoid the risk of late dislocation in case of progressive pelvis retroversion in the elderly patients

DM Cup Anatomical Design

- A chrome-cobalt alloy acetabular shell
- Conventional UHMWP liner
- Heads CrCo/ Ce, size 22,2 / 28 mm

Retrospective study of 68 acetabular revisions

- January 2008 through January 2012
- 65 patients (3 bilateral cases)
- 48 females, 17 males
- Mean age 65 years (range 32 to 88)
- Average follow-up 4.2 years (3.1 to 6.7)

Indication for revision

- 48 aseptic loosening
- 3 hip instability
- 6 osteolysis
- 11 infection (two stage)
- 6 re-revision

Clinical results in 59 cases

- HHS improved from 42.3 points (range 29.1 to 69.5) to 76.6 points (range 55.4 to 91.0)

Radiographic Results 26 cases of DM Cup Alone (not cemented)

- Paprosky type I, IIa, IIb
- No early or late dislocations
- No radiographic evidence of loosening

Non cemented DM Cup alone

- M. F. female, 76 years
- 22.7 years F-U   3.2 years F-U

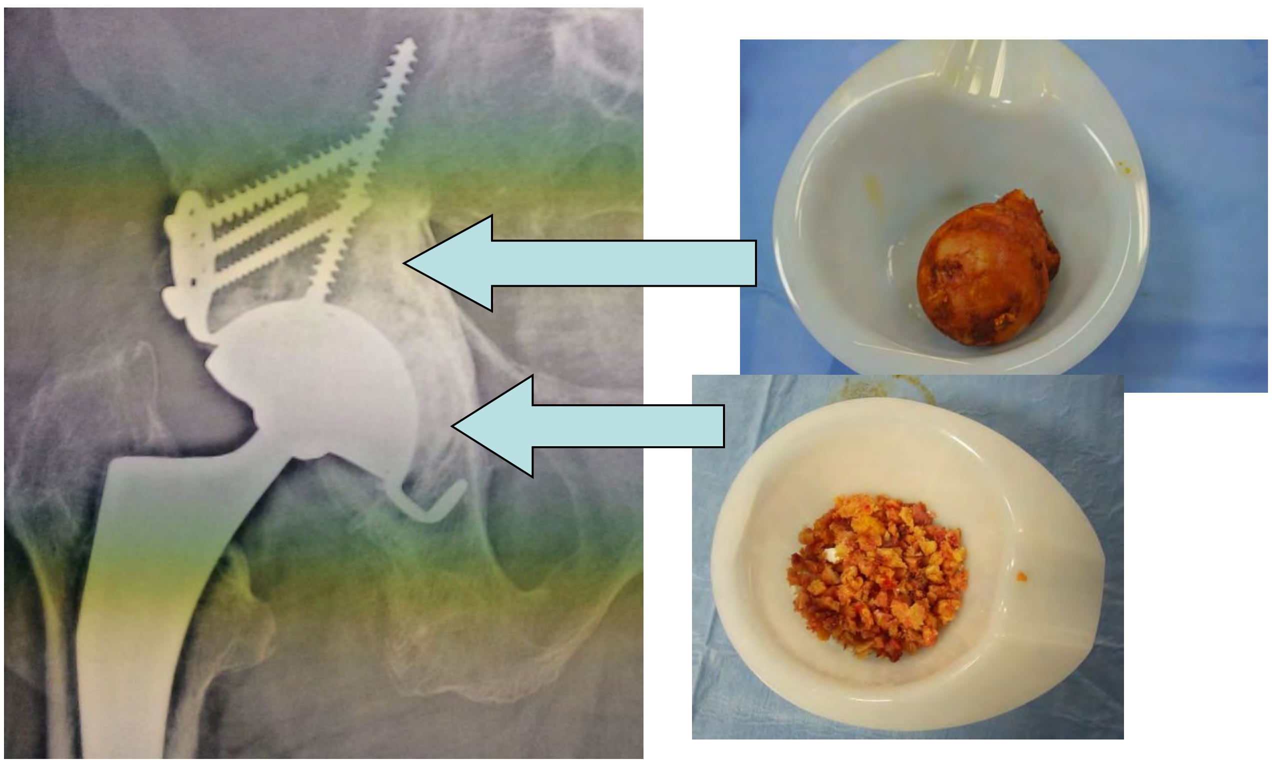
23 cases Cemented Cup-Cage (structural allogarft)

- Paprosky type IIb, IIc, IIIa, IIIb
- 2 early dislocations, 1 surgically revised
- 2 cases were revised at 2.1 and 3.5 years for aseptic loosening with cage fracture and bulk allograft resorption

Cemented Cup-Cage
Bulk and Morcellized Graft

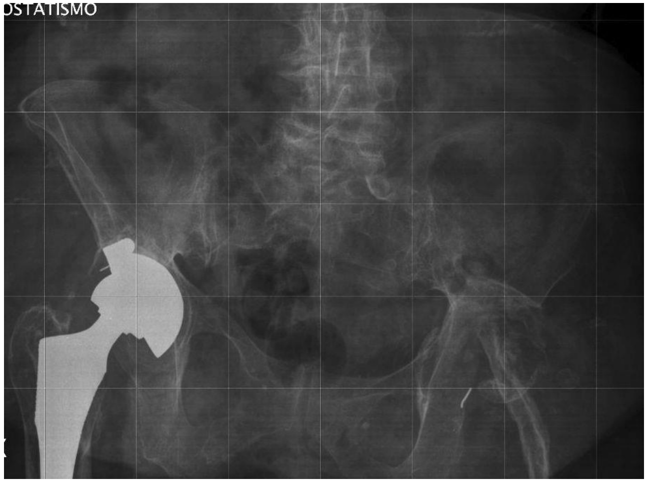
- P.F. male, 57 years old
- 6.1 years Follow-Up



Z.T., female, 72 years old

5.9 years Follow-Up

A.B., female, 77 years old
Two-Stage for Septic Loosening



2.6 years F-U

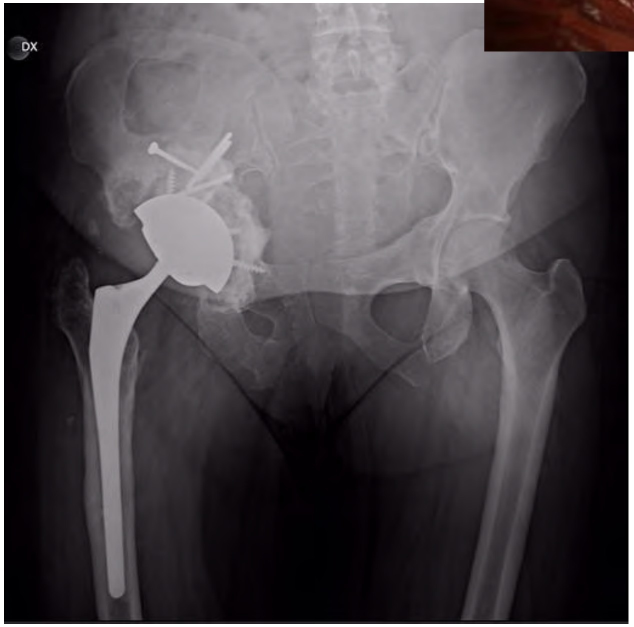
TM CUP + Cemented DM
(Augment and Morcellized Graft)

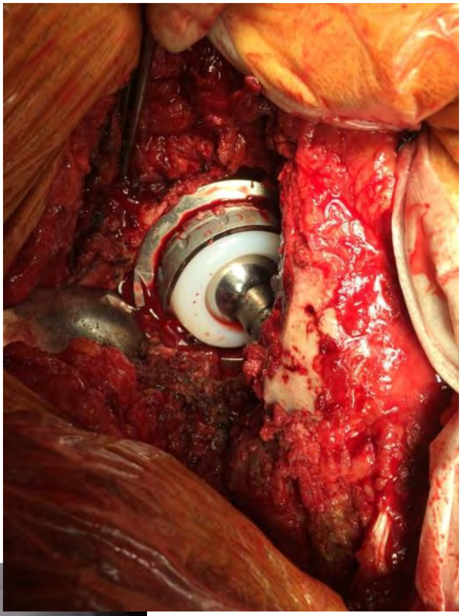
10 cases of TM Jubo-Cup with Cemented DM

- Paprosky IIb, IIIa, IIIb
- Pelvic discontinuity Stabilized with a Plate
- 1 early dislocation (conservative treat.)
- No radiographic loosening

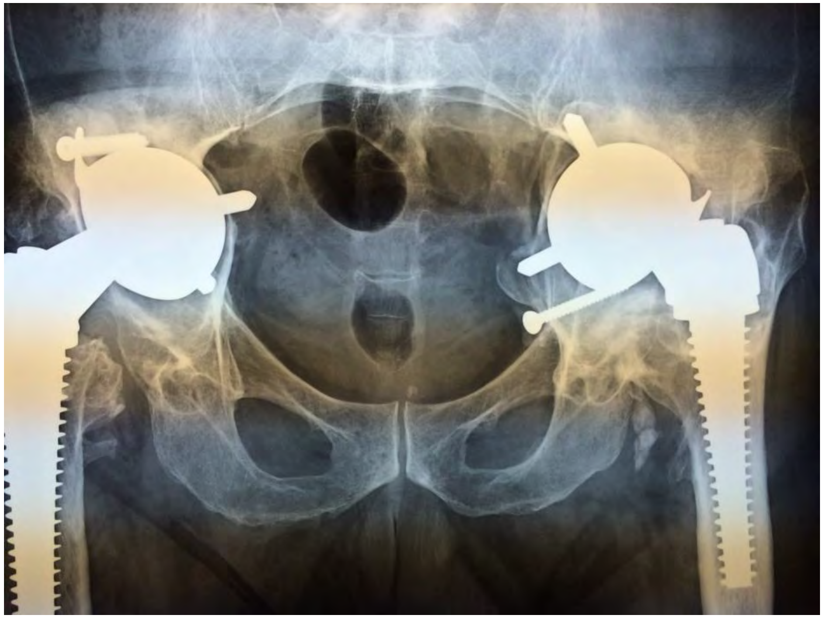
P.G.,female, 74 years old
3.5 years Follow-Up

2.1 years F-U



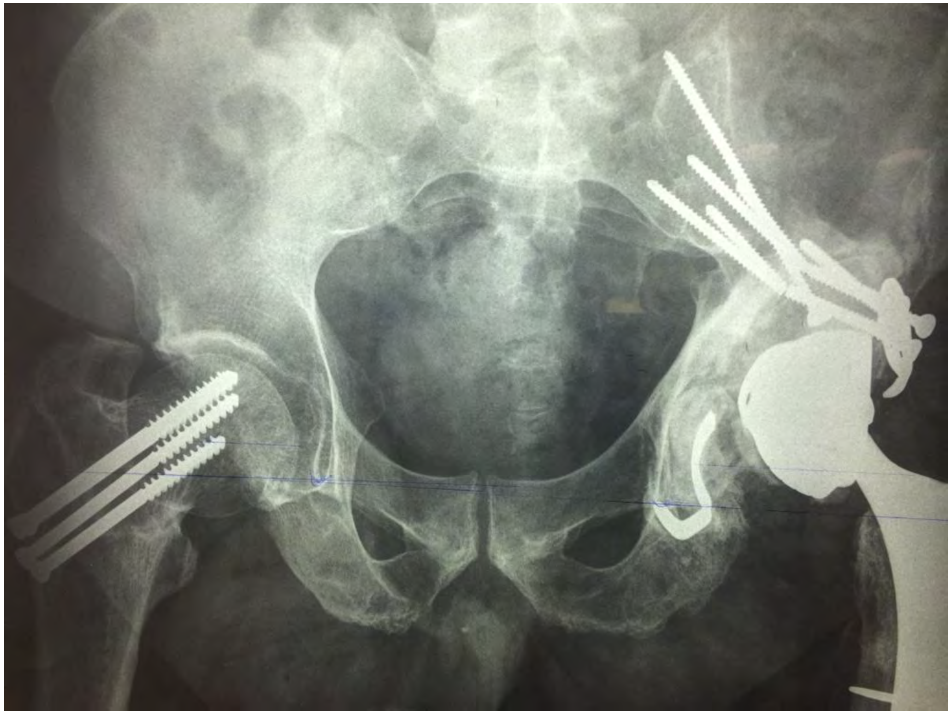


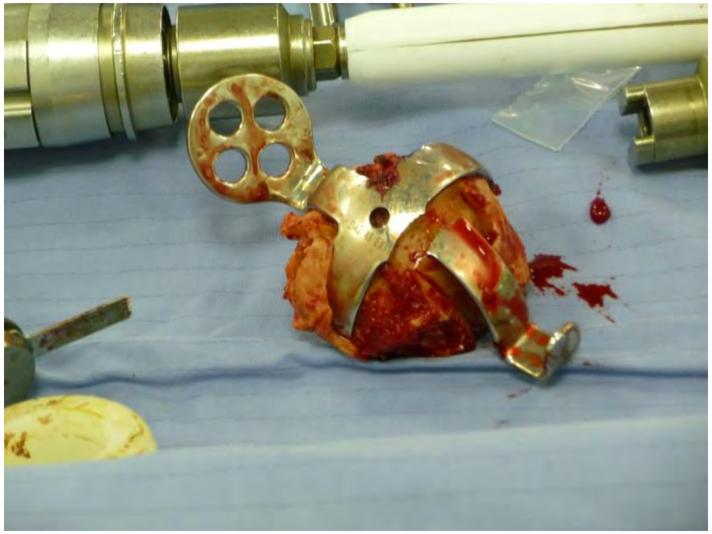
T.L., male, 68 years old
25 years Follow.Up

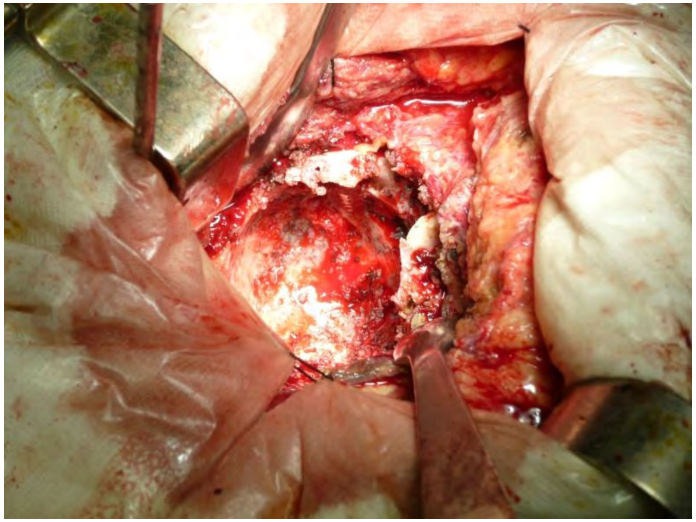


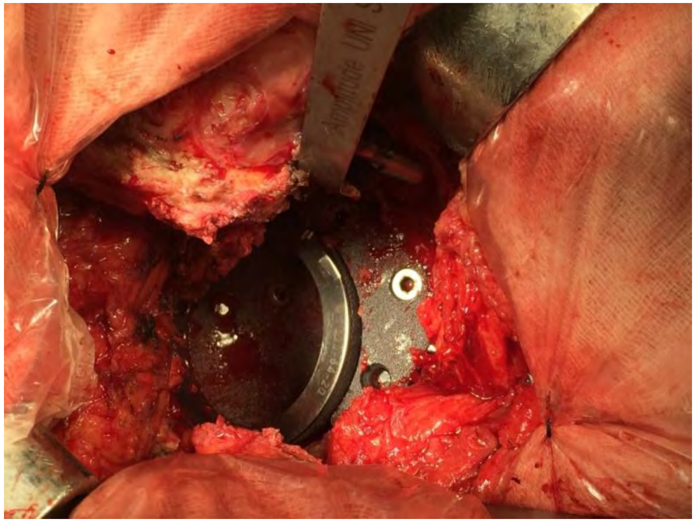
2.1 years F-U

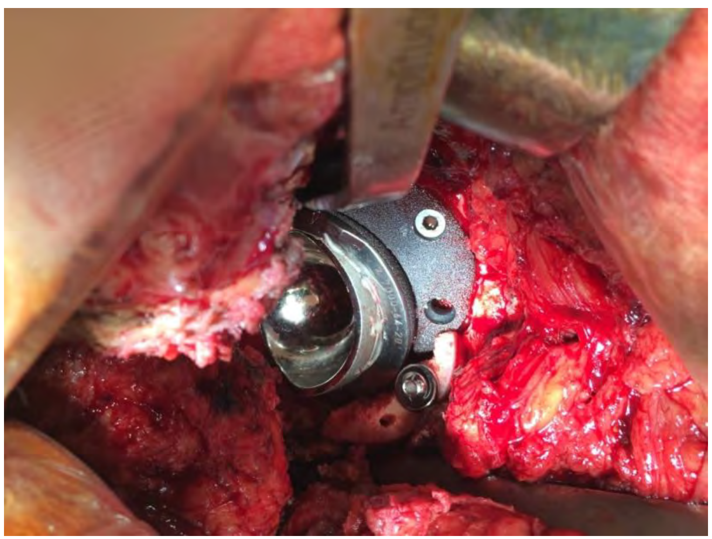
R.G., male,78 years old
2.1 Follow-Up



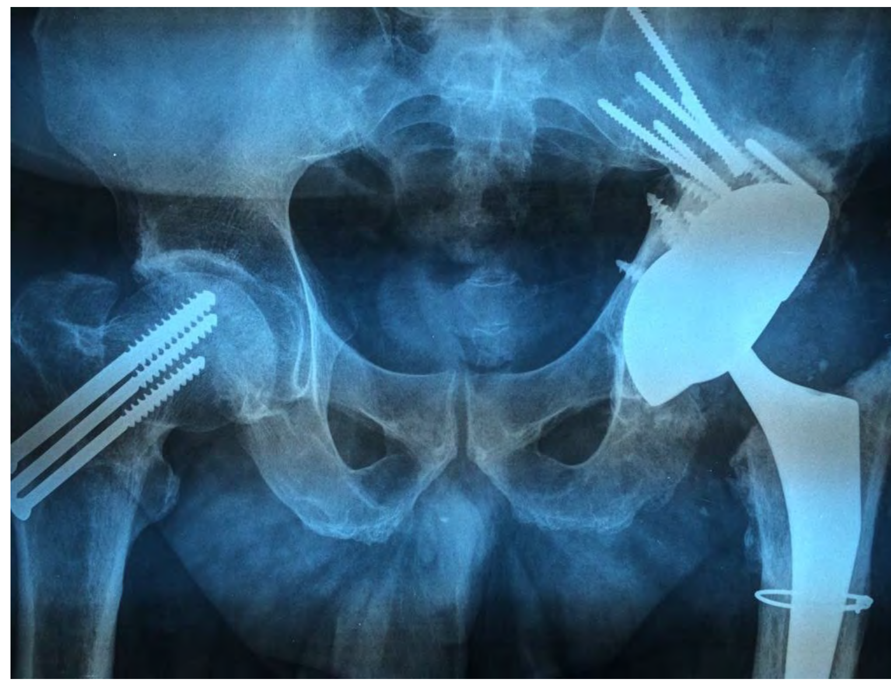








2.3 years Follow-Up



Survivorship of 59 revisions

- 94.9% at 50 months follow-up

  (re-revision for aseptic loosening or recurrent instability as end-points)

Conclusion @ 68 revisions

- No dislocation was reported after the first 3 post-operative months
- In cup-cage construct concerns exist regarding the potential for bulk graft resorption and loosening
- TM jumbo-cup with cemented DM seems promising
- Long term follow-up studies are needed

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

Section of Oncologic Orthopaedics and Traumatology
Department of Biomedical and Dental Sciences and Morphofunctional Imaging
School of Orthopaedics and Traumatology
University Hospital "G. Martino", University of **Messina**, ITALY

Uncommon surgical solutions to treat lower limbs dismetries exceeding 4 centimeters, subsequent to multiple prosthetic failures

L. La Verde, D. Ortolà Morales, **D. Fenga**, A. Merenda, G. Miloro, M.A. Rosa (Italy)

Multiple Prosthetic Failures…

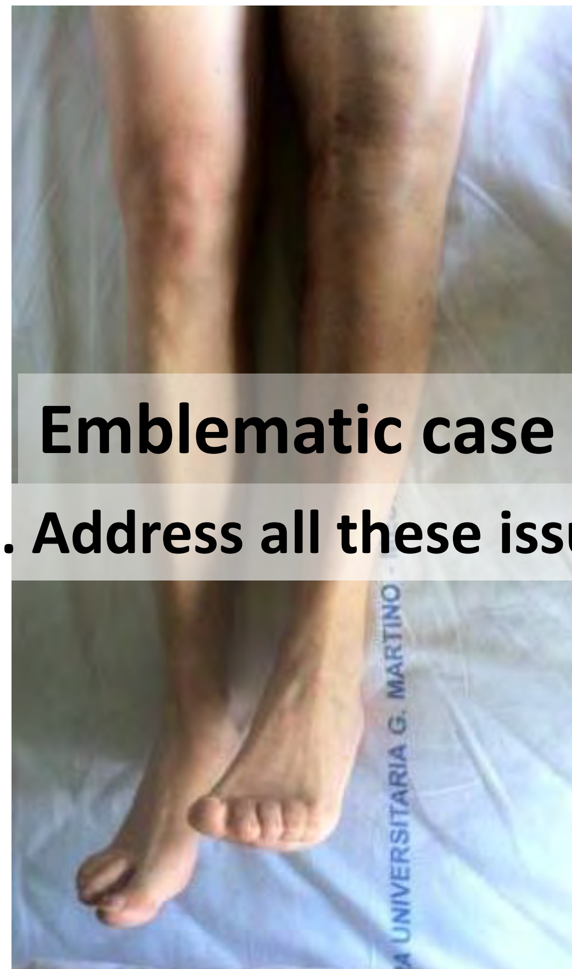
- Manage various complications

Infection

Inadequate bone stock

Post surgical dysmetria

Poor General Conditions



Emblematic case

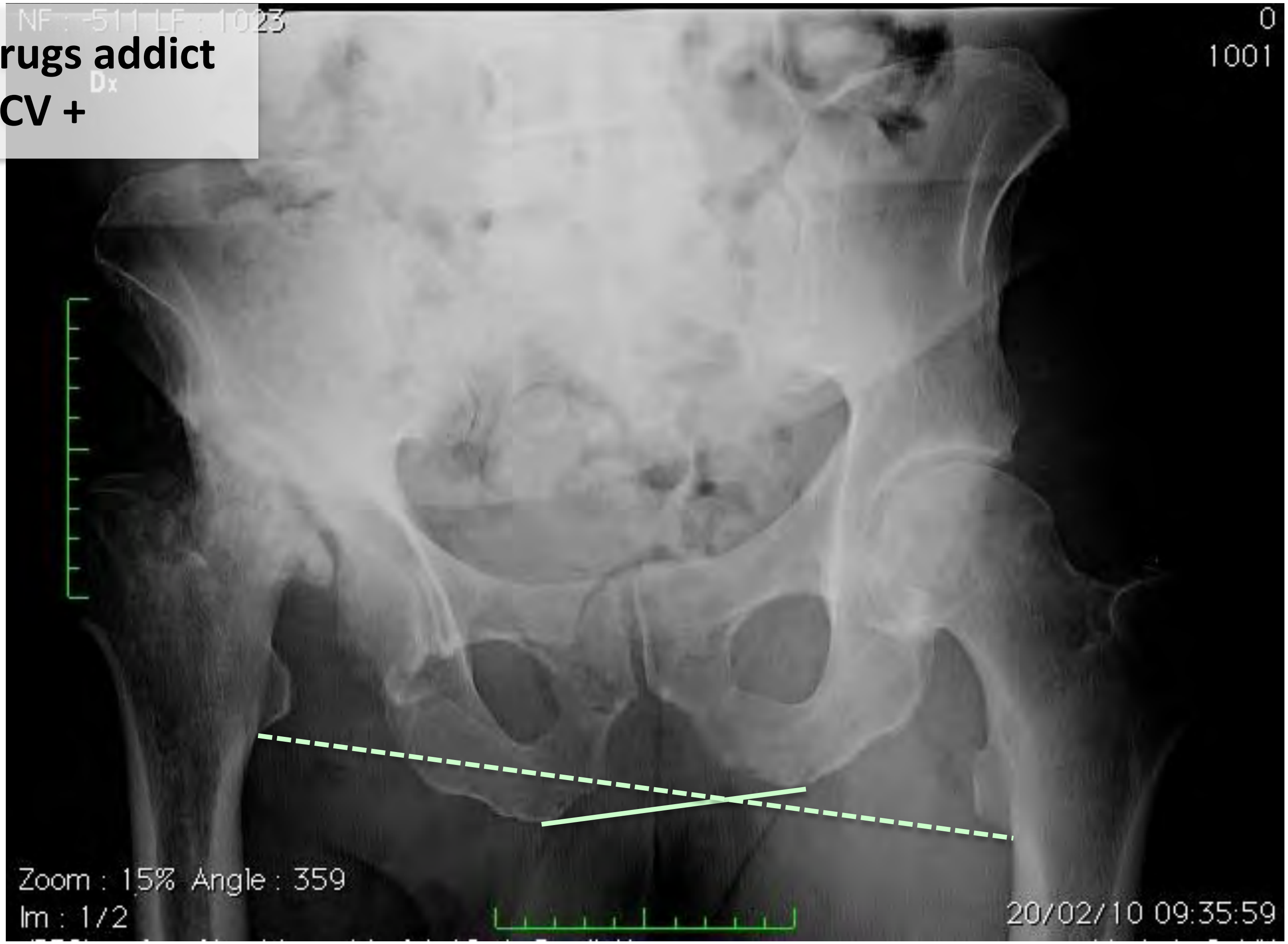
… Address all these issues

Pz: R.M.

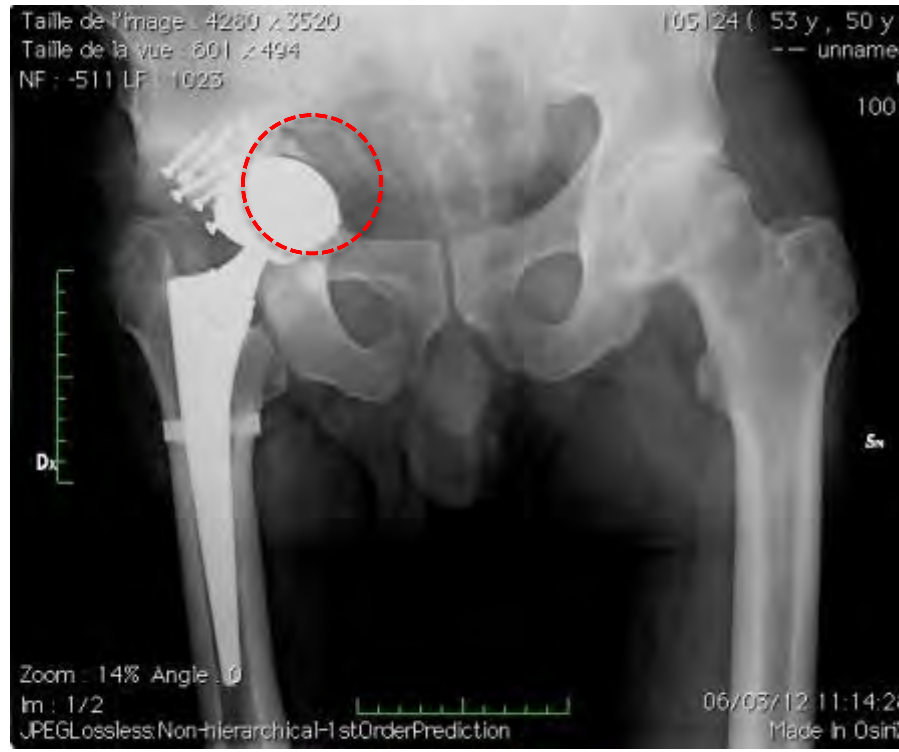
Age: 53

Sex: M

- **Drugs addict**
- **HCV +**



…withdrawal syndrome

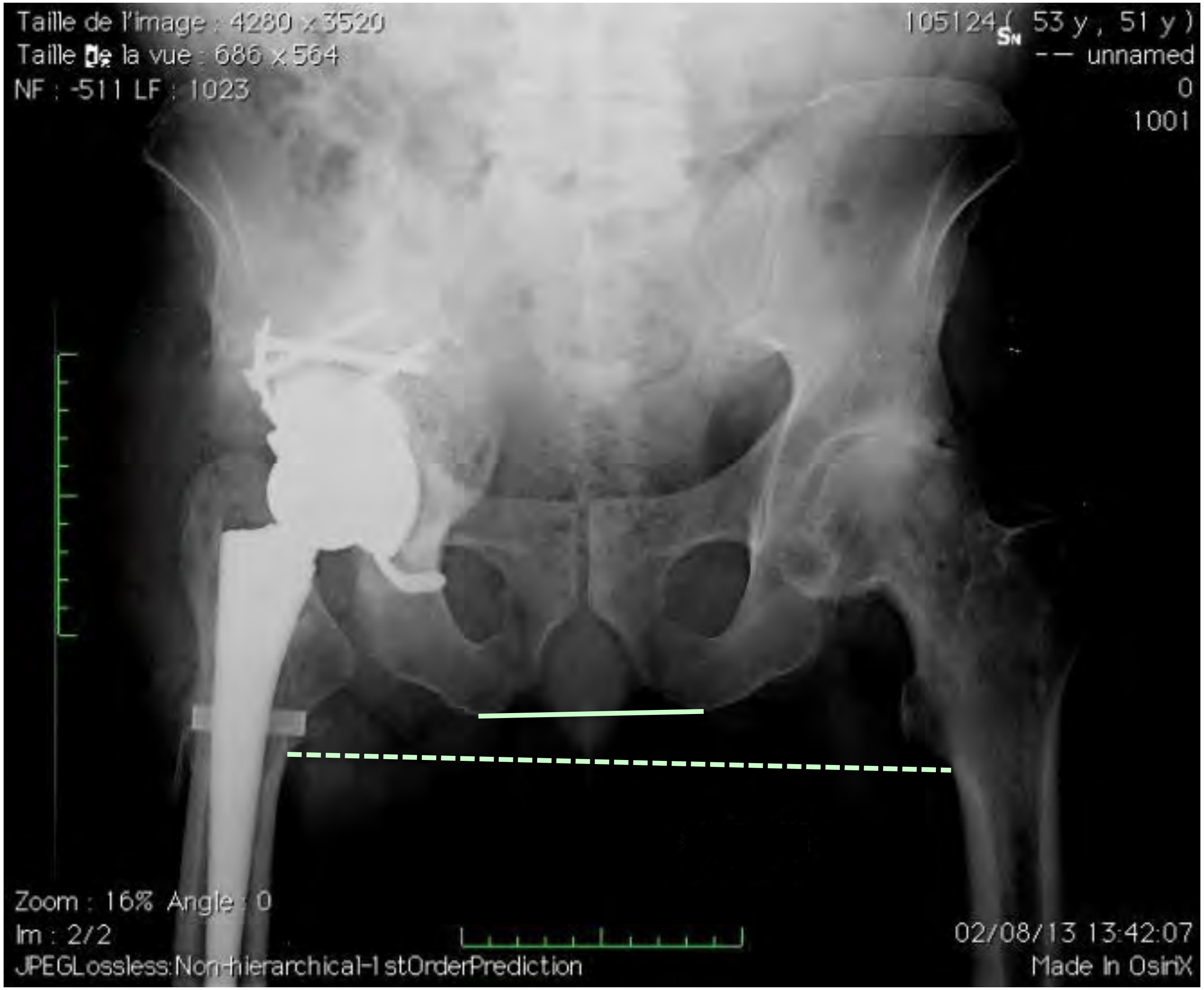


THR and acetabuloplasty

…breakthrough of the acetabulum

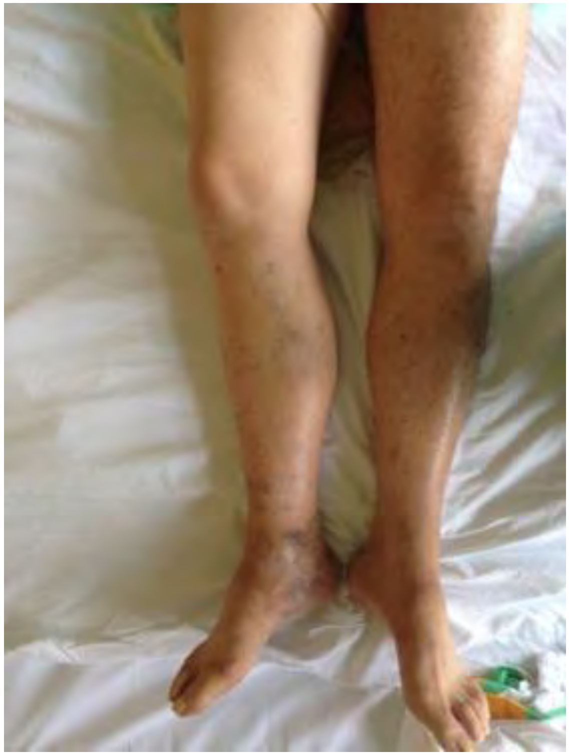
2010

2012

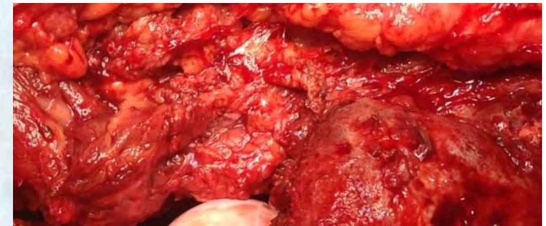
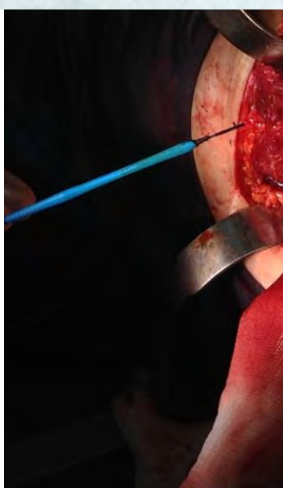

Taille de l'image : 4280 x 3520
Taille de la vue : 686 x 564
NF : -511 LF : 1023
105124 (53 y , 51 y)
-- unnamed
0
1001
Zoom : 16% Angle : 0
Im : 2/2
JPEGLossless:Non-hierarchical-1stOrderPrediction
02/08/13 13:42:07
Made In OsiriX

2014

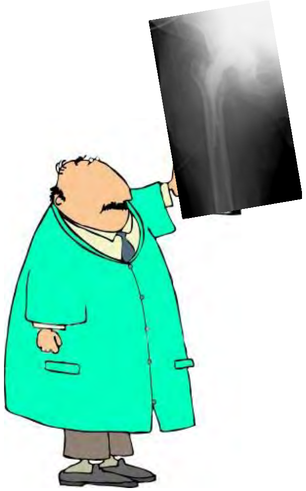
- **Pain**
- **Fistula**
- **Dysmetria**



BIOTIC LOADED SPACER

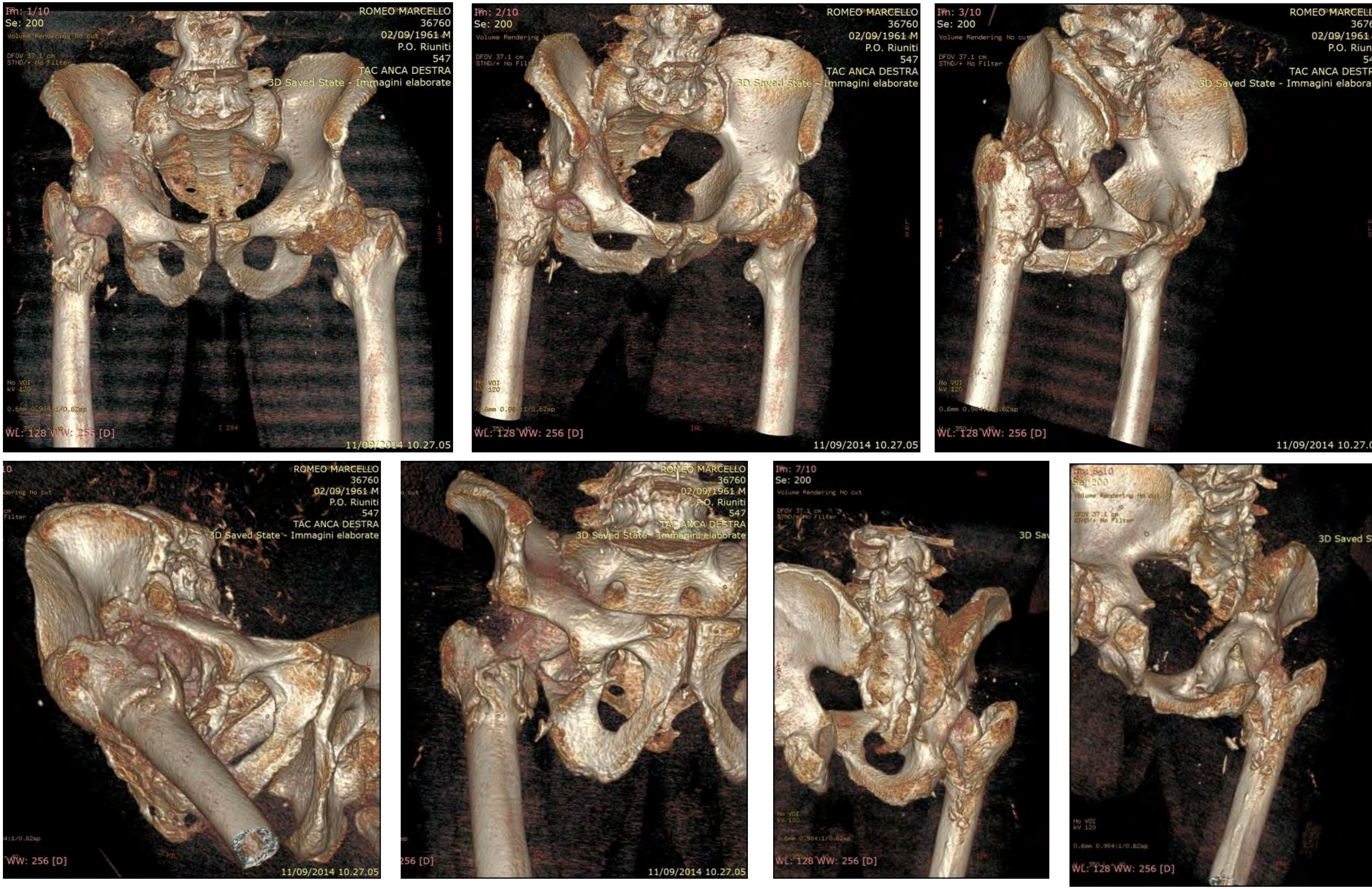





POST-OP X-RAY



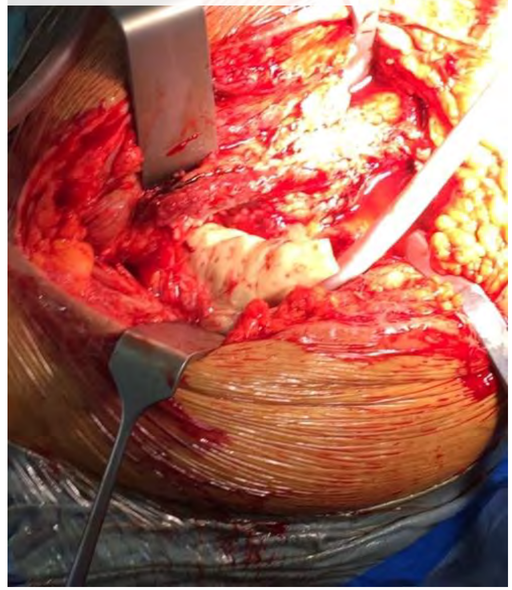
40 DAY POST-OP X-RAY

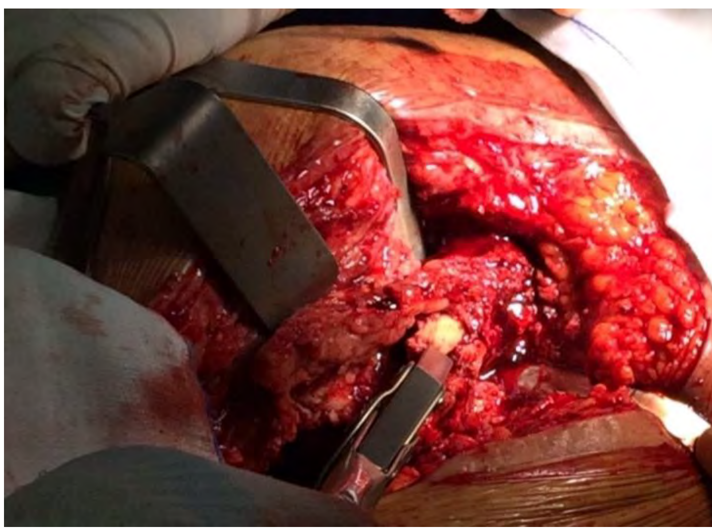
CT SCAN


Im: 1/10
Se: 200
ROMEO MARCELLO
36760
02/09/1961 M
P.O. Riuniti
547
TAC ANCA DESTRA
3D Saved State - Immagini elaborate
WL: 128 WW: 256 [D]
11/09/2014 10.27.05
Im: 2/10
Se: 200
ROMEO MARCELLO
36760
02/09/1961 M
P.O. Riuniti
547
TAC ANCA DESTRA
3D Saved State - Immagini elaborate
WL: 128 WW: 256 [D]
11/09/2014 10.27.05
Im: 3/10
Se: 200
ROMEO MARCELLO
36760
02/09/1961 M
P.O. Riuniti
547
TAC ANCA DESTRA
3D Saved State - Immagini elaborate
WL: 128 WW: 256 [D]
11/09/2014 10.27.05
ROMEO MARCELLO
36760
02/09/1961 M
P.O. Riuniti
547
TAC ANCA DESTRA
3D Saved State - Immagini elaborate
WW: 256 [D]
11/09/2014 10.27.05
ROMEO MARCELLO
36760
02/09/1961 M
P.O. Riuniti
547
TAC ANCA DESTRA
3D Saved State - Immagini elaborate
11/09/2014 10.27.05
Im: 7/10
Se: 200
WL: 128 WW: 256 [D]
WL: 128 WW: 256 [D]

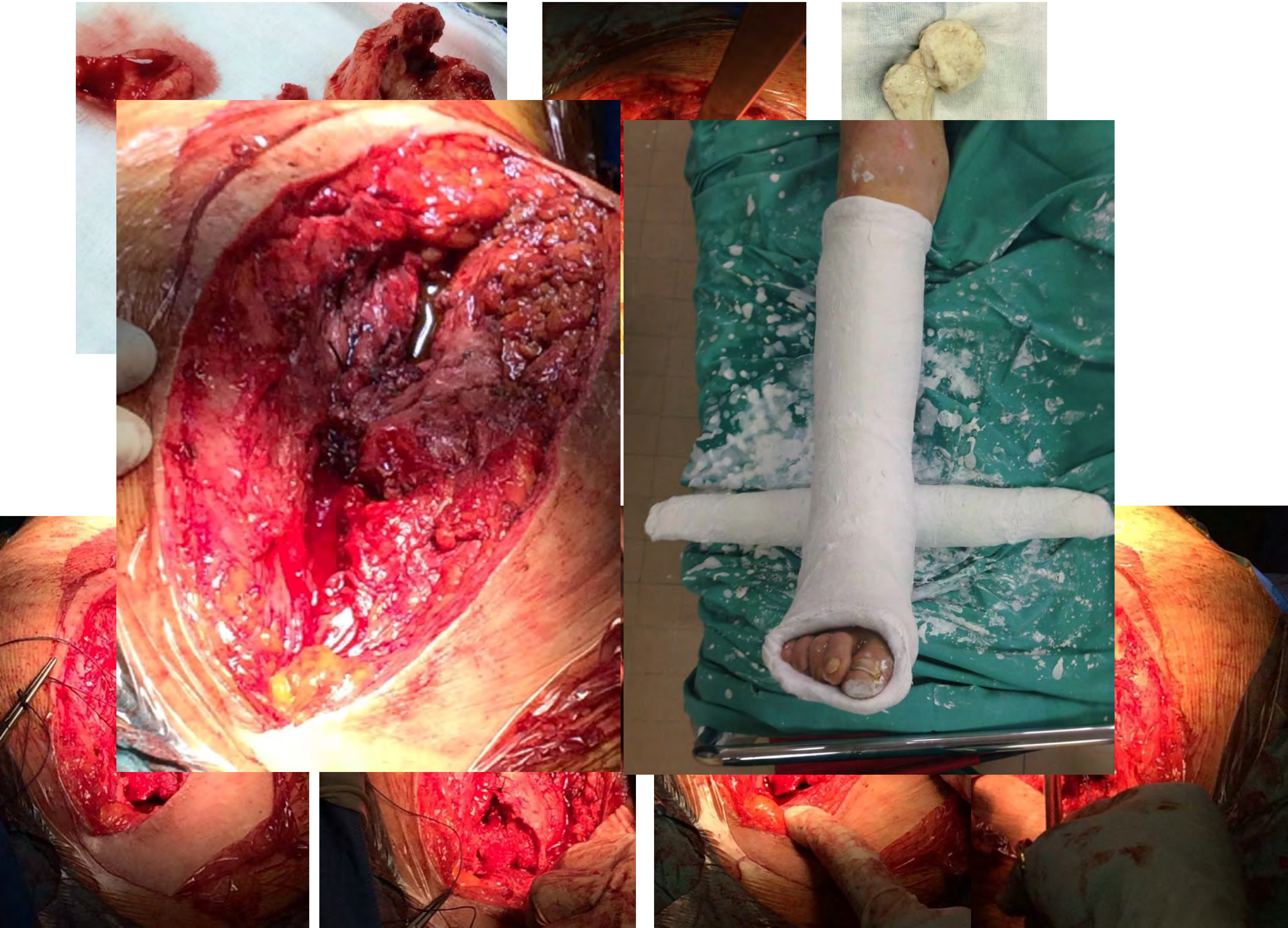
SURGERY

No normalization of inflammatory markers



December 3, 2014



I.V. ANTIBIOTIC THERAPY

•PRE-OP ANTIBIOTIC THERAPY: CEFAZOLIN 2G

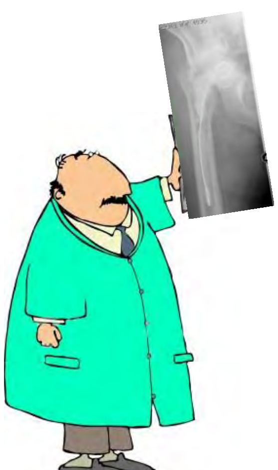
•DALACIN 300MG 1 x 3

•RIFADIN 600 MG 1 cp

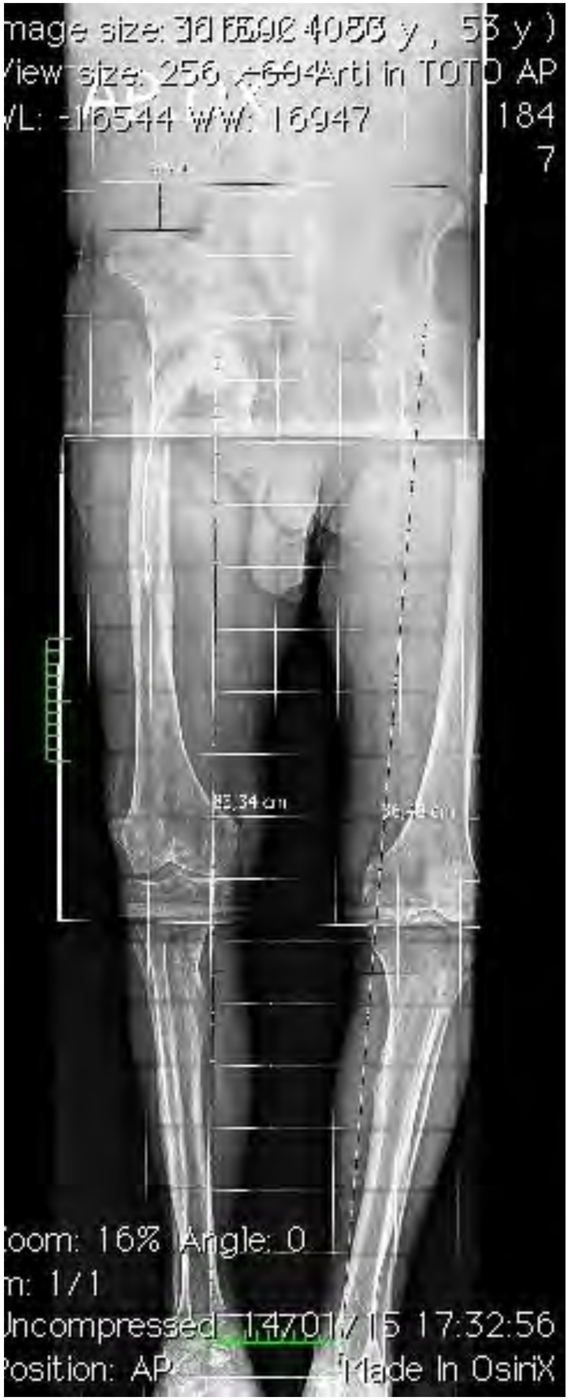
X-RAYS

2500
00000000 (53 y , 53 y)
-- AP
0

Image size: 2048 x 2500
View size: 494 x 604
WL: -2048 WW: 4096
00000000 (53 y , 53 y)
-- AP
0
D
Zoom: 24% Angle: 0
Im: 1/2

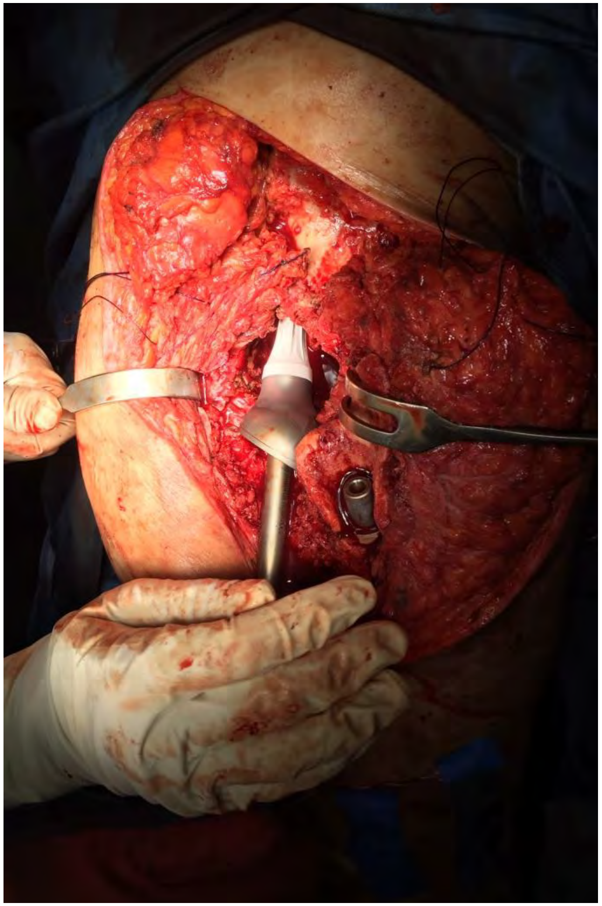


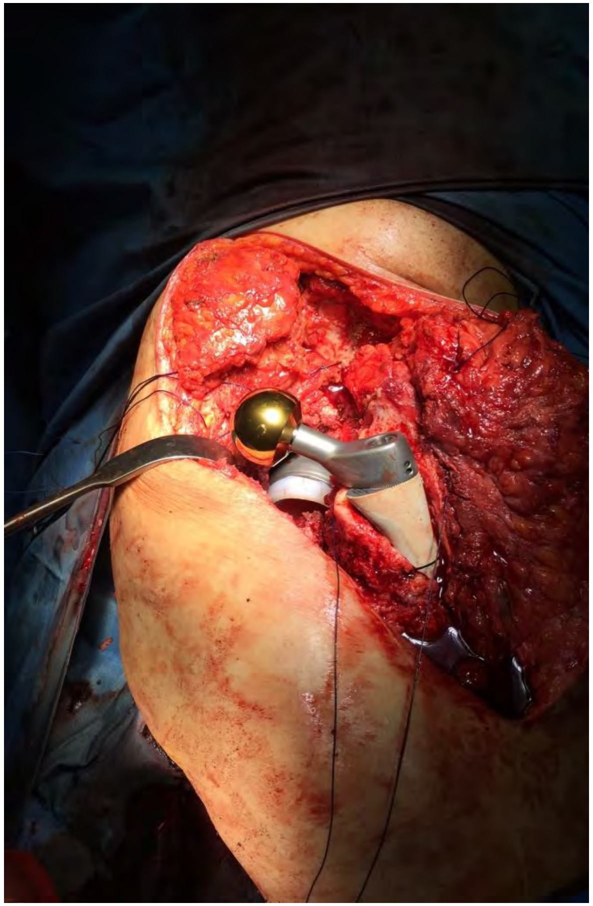
FOLLOW-UP

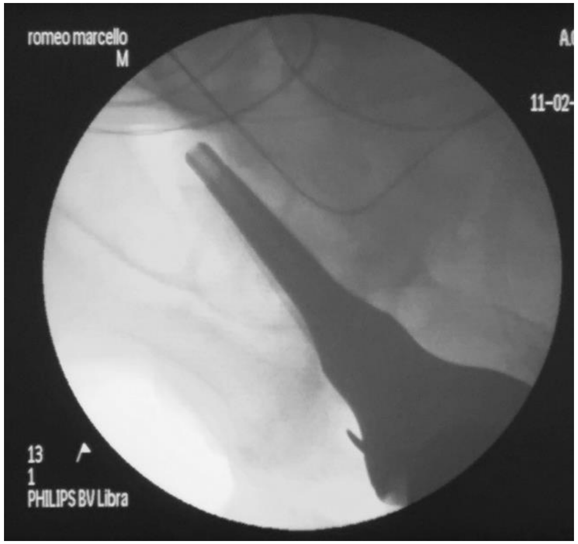


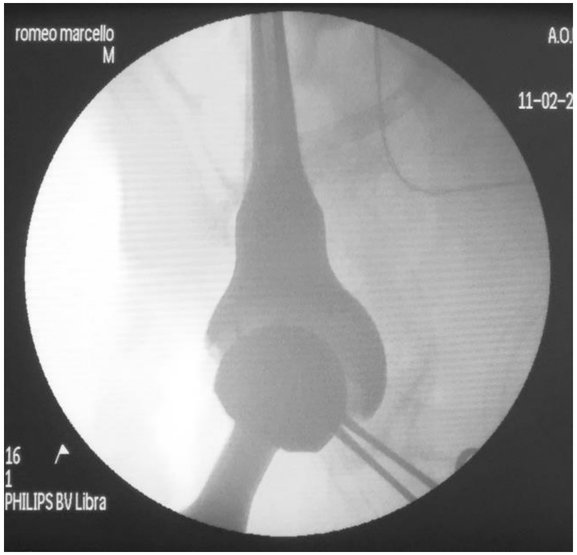
Persistence of asimmetry

SURGERY: SPACER REMOVAL AND NEW PROSTHESIS IMPLANT



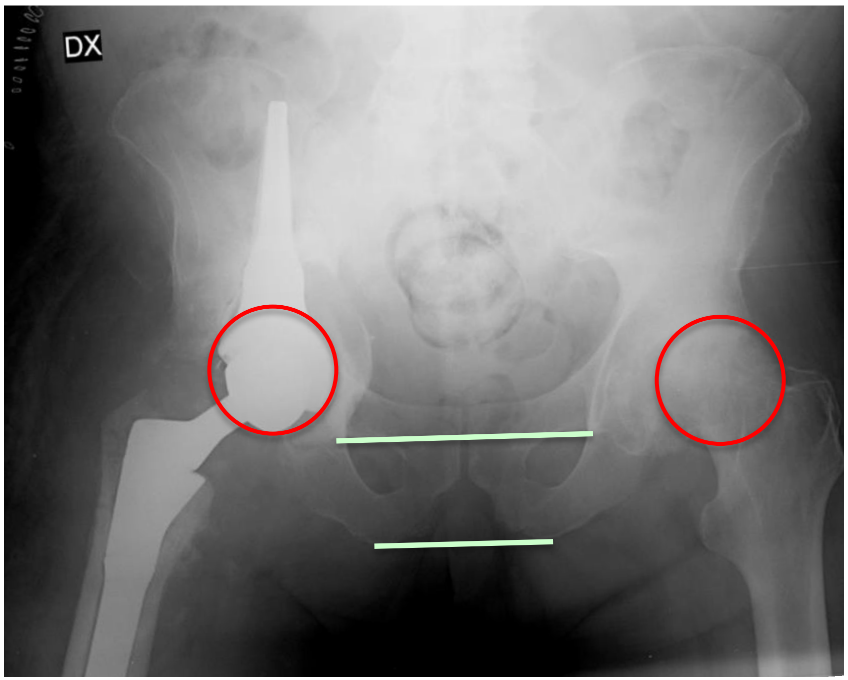


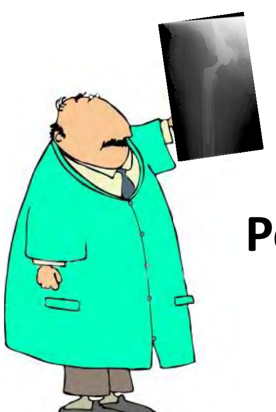




February, 2015

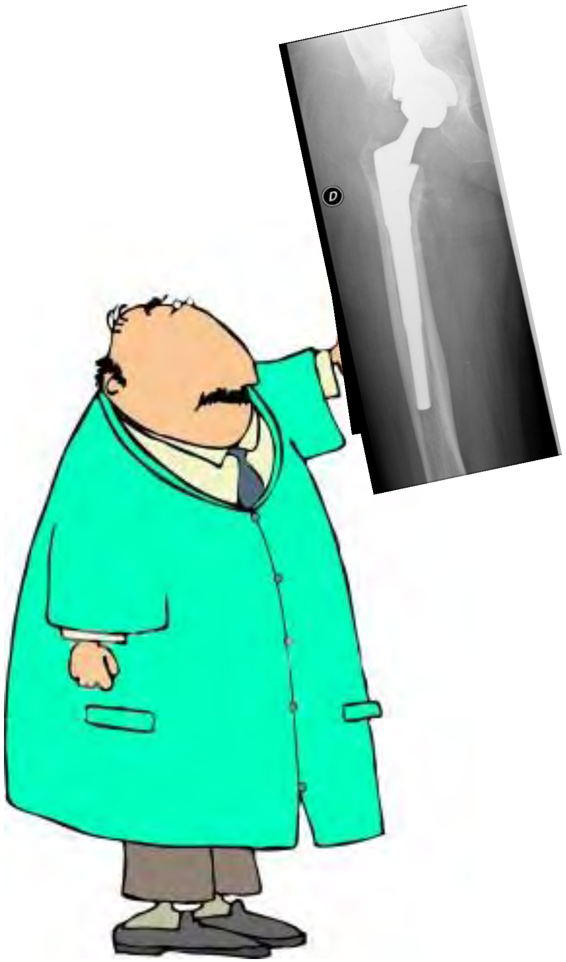
POST-OP X-RAY





Persistence of a mild leg length discrepancy

February, 2015


D


D


D

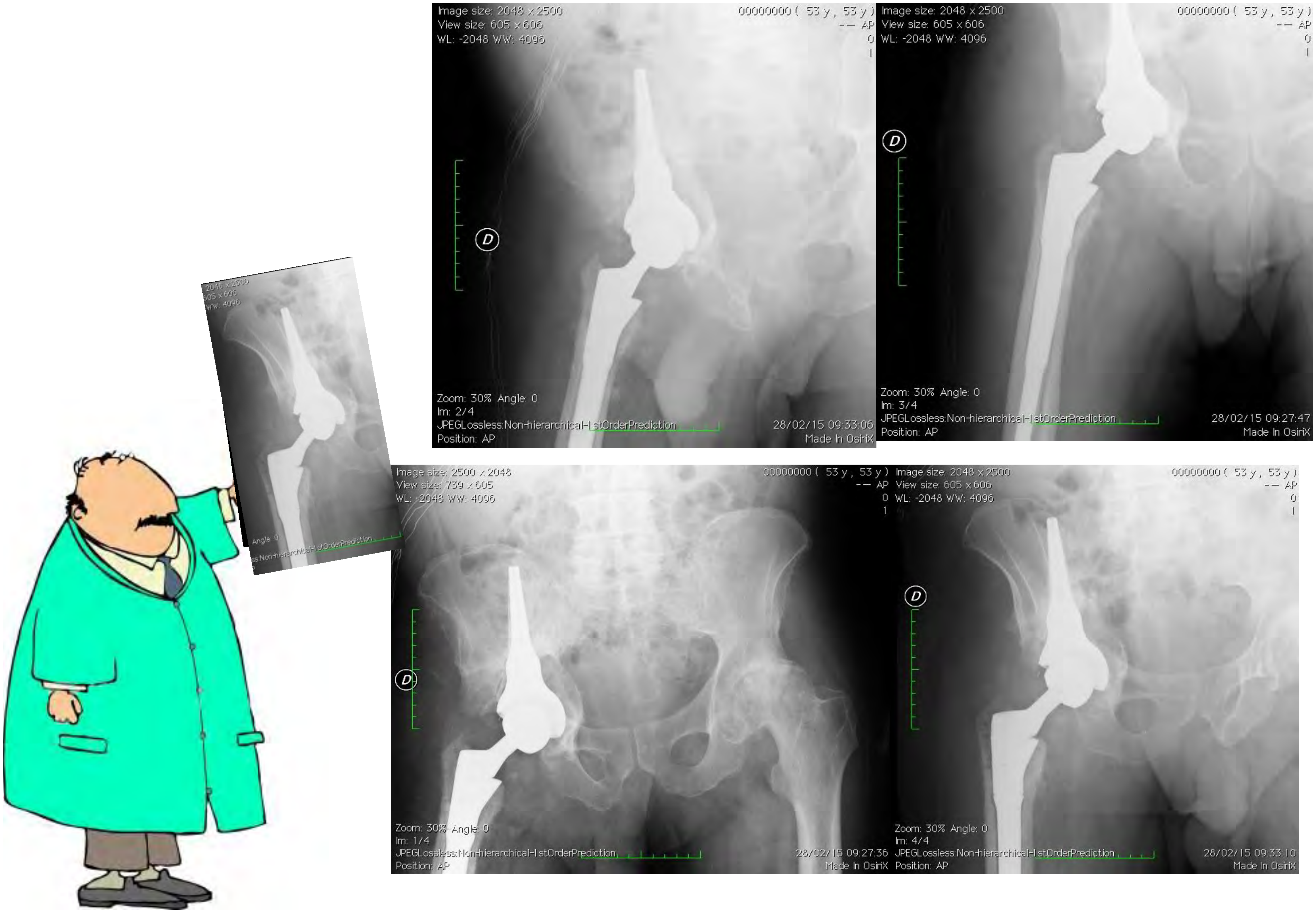


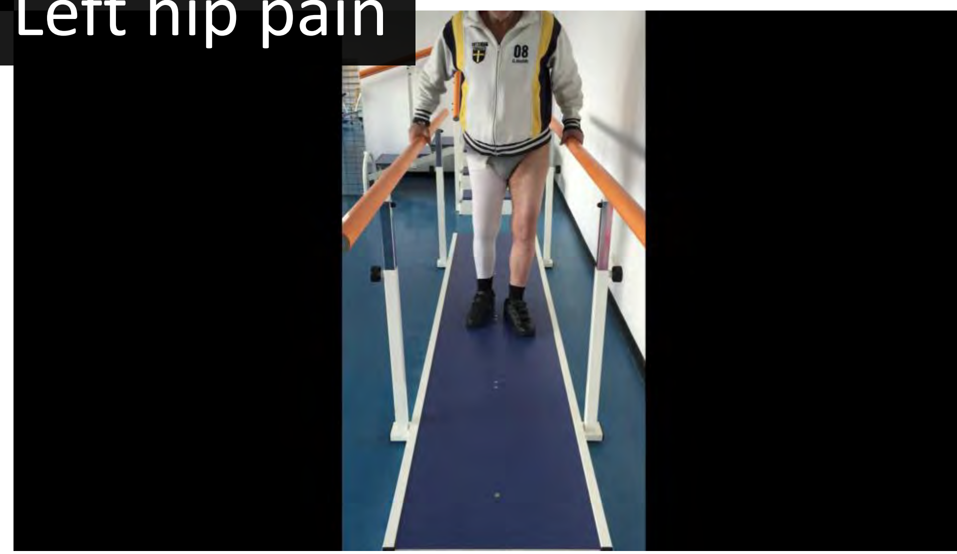
Image size: 2048 x 2500
View size: 605 x 606
WL: -2048 WW: 4096
00000000 (53 y , 53 y)
-- AP
D
Zoom: 30% Angle: 0
Im: 2/4
JPEGLossless:Non-hierarchical-1stOrderPrediction
Position: AP
28/02/15 09:33:06
Made In OsiriX
Image size: 2048 x 2500
View size: 605 x 606
WL: -2048 WW: 4096
00000000 (53 y , 53 y)
-- AP
D
Zoom: 30% Angle: 0
Im: 3/4
JPEGLossless:Non-hierarchical-1stOrderPrediction
Position: AP
28/02/15 09:27:47
Made In OsiriX
Image size: 2500 x 2048
View size: 739 x 605
WL: -2048 WW: 4096
00000000 (53 y , 53 y)
-- AP
D
Zoom: 30% Angle: 0
Im: 1/4
JPEGLossless:Non-hierarchical-1stOrderPrediction
Position: AP
28/02/15 09:27:36
Made In OsiriX
Image size: 2048 x 2500
View size: 605 x 606
WL: -2048 WW: 4096
00000000 (53 y , 53 y)
-- AP
D
Zoom: 30% Angle: 0
Im: 4/4
JPEGLossless:Non-hierarchical-1stOrderPrediction
Position: AP
28/02/15 09:33:10
Made In OsiriX

FOLLOW UP

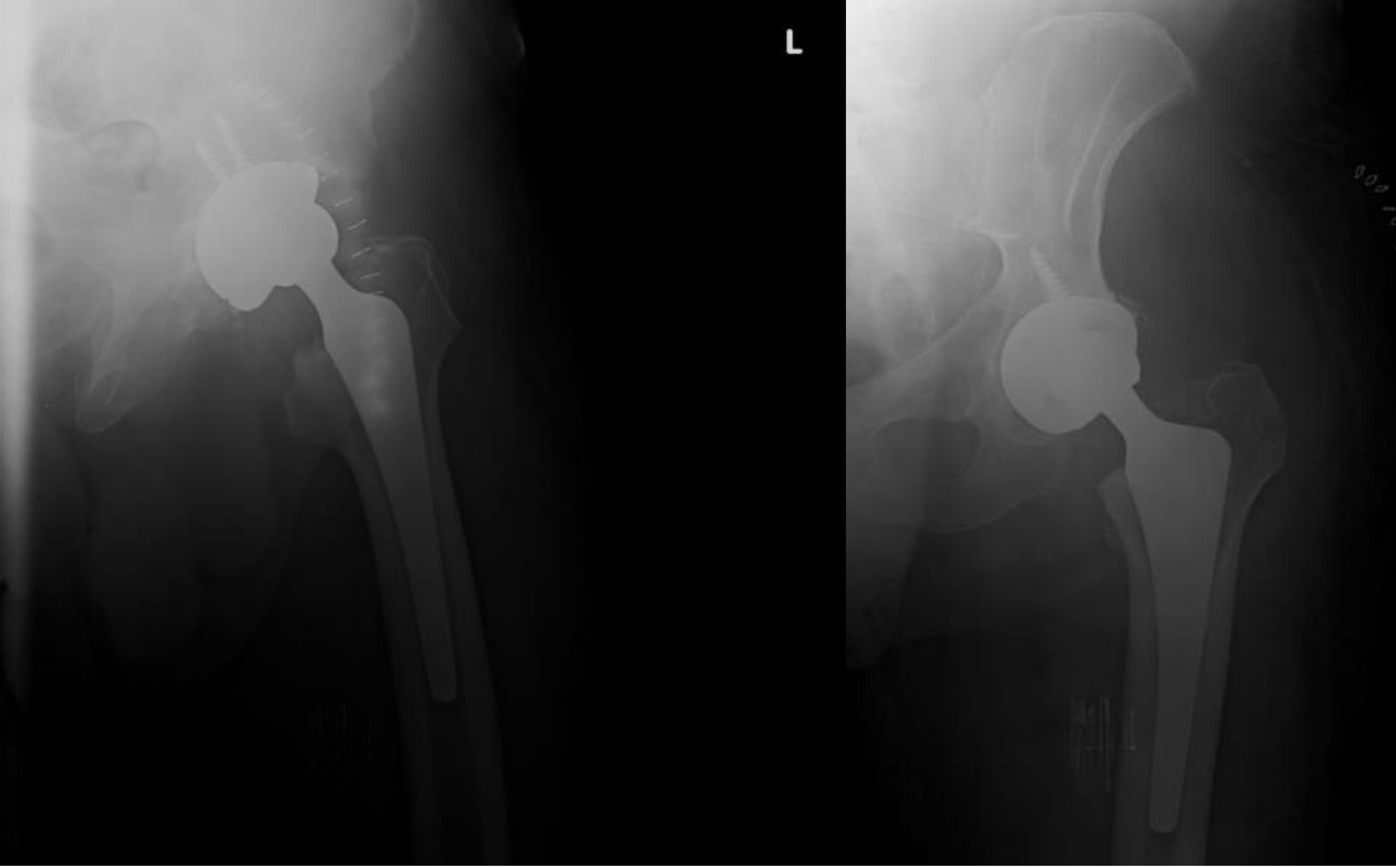
April 8, 2015

FOLLOW UP

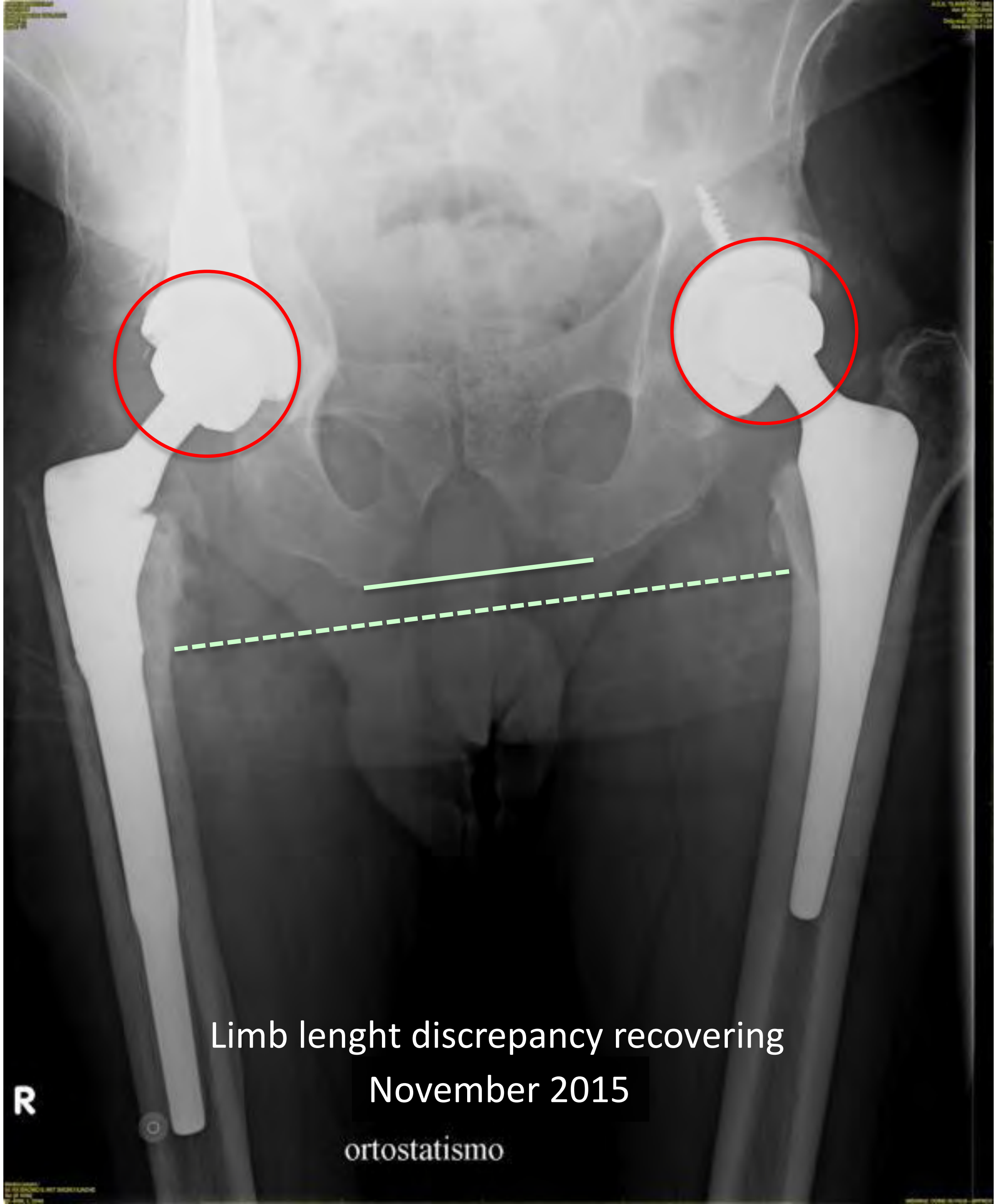
Complained Left hip pain



April 8, 2015



April, 2015



Limb lenght discrepancy recovering
November 2015

November 2015

CONCLUSIONS

Multiple surgeries reduce the quality of the bone

Often we are faced with more than one complication, general and local

Adopt strategies to deal with more problems simultaneously

It requires a greater collaboration between more specialized figures for a multidisciplinary treatment

THANK YOU

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Department of Orthopaedics - University of Verona

A minimum of 10-years "follow up" of the Burch –Schneider cage and bulk allografts for the revision of acetabular bone loss.

A. Iudica - G. Trivellin - I. Bonetti – A. Sandri – D. Regis – B. Magnan

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

- Revision of the acetabular component of a total hip arthroplasty with associated bone loss is a complex challenge due to the difficulty to obtain a primary stability and to reconstitute periprosthetic bone stock.

- The aim of the study was to evaluate the minimum 10-year clinical and radiographic outcome of massive allografts combined with the Burch-Schneider APC for the management of severe combined deficiencies in failed total hip arthroplasty.

January 1992 – December 2000

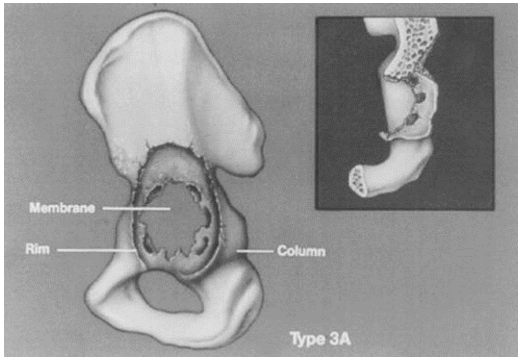
97 hips in 94 patients

29 died

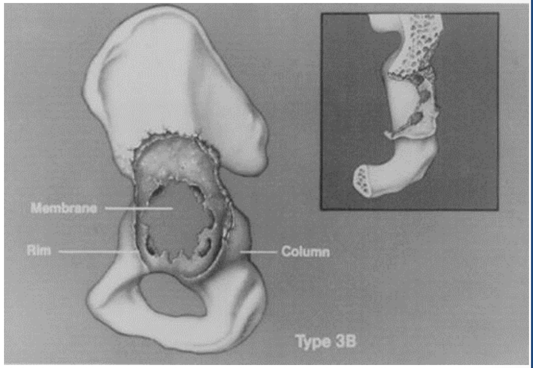
3 bilateral

BONE DEFECT

(Paprosky et al 1990–91–94-95)



65 hips



3 A = 27

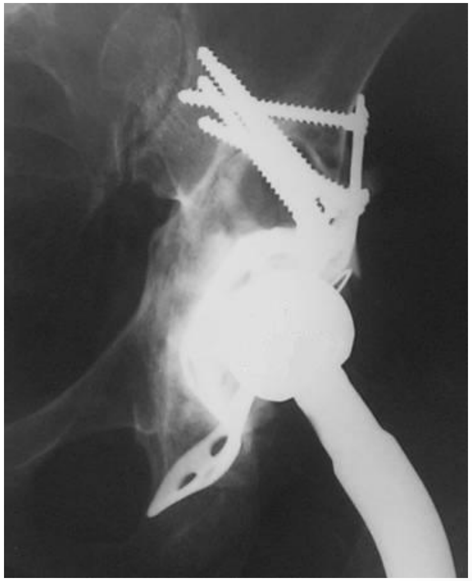
3 B = 38

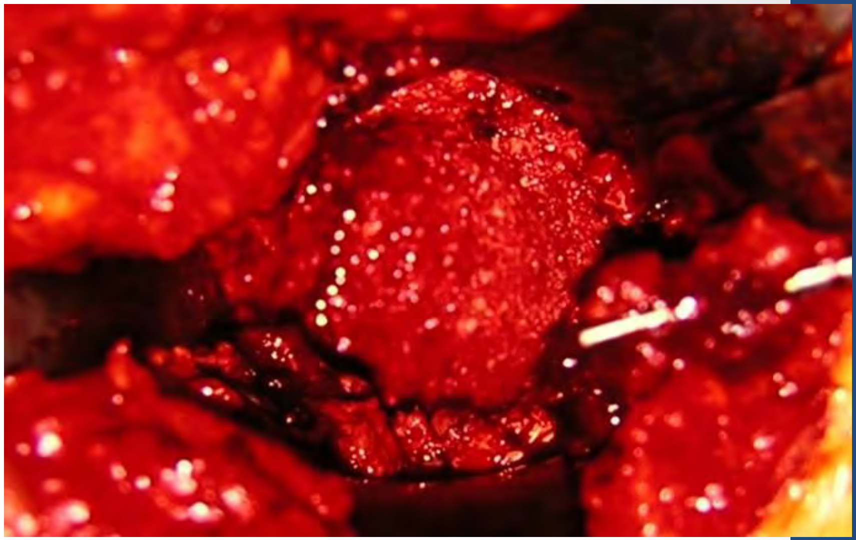
- *16 males – 49 females*
- *age 60 yrs (29 – 83)*

MASSIVE

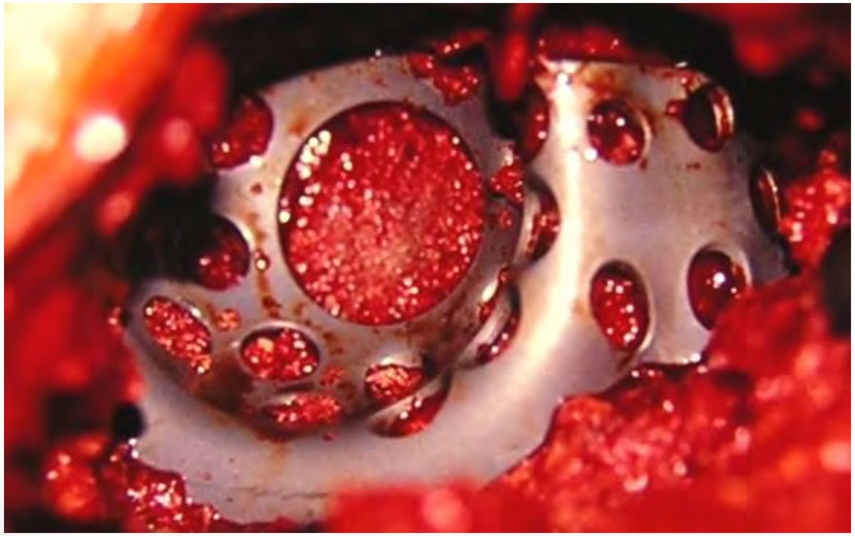
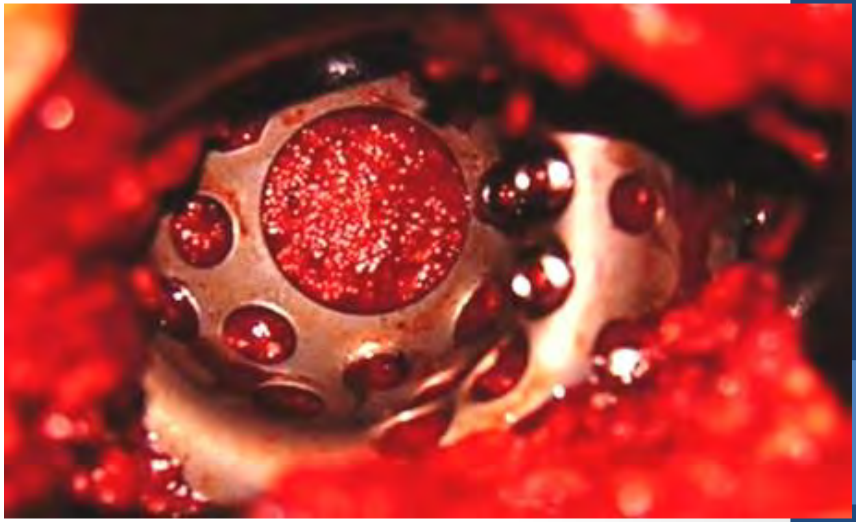
ALLOGRAFT

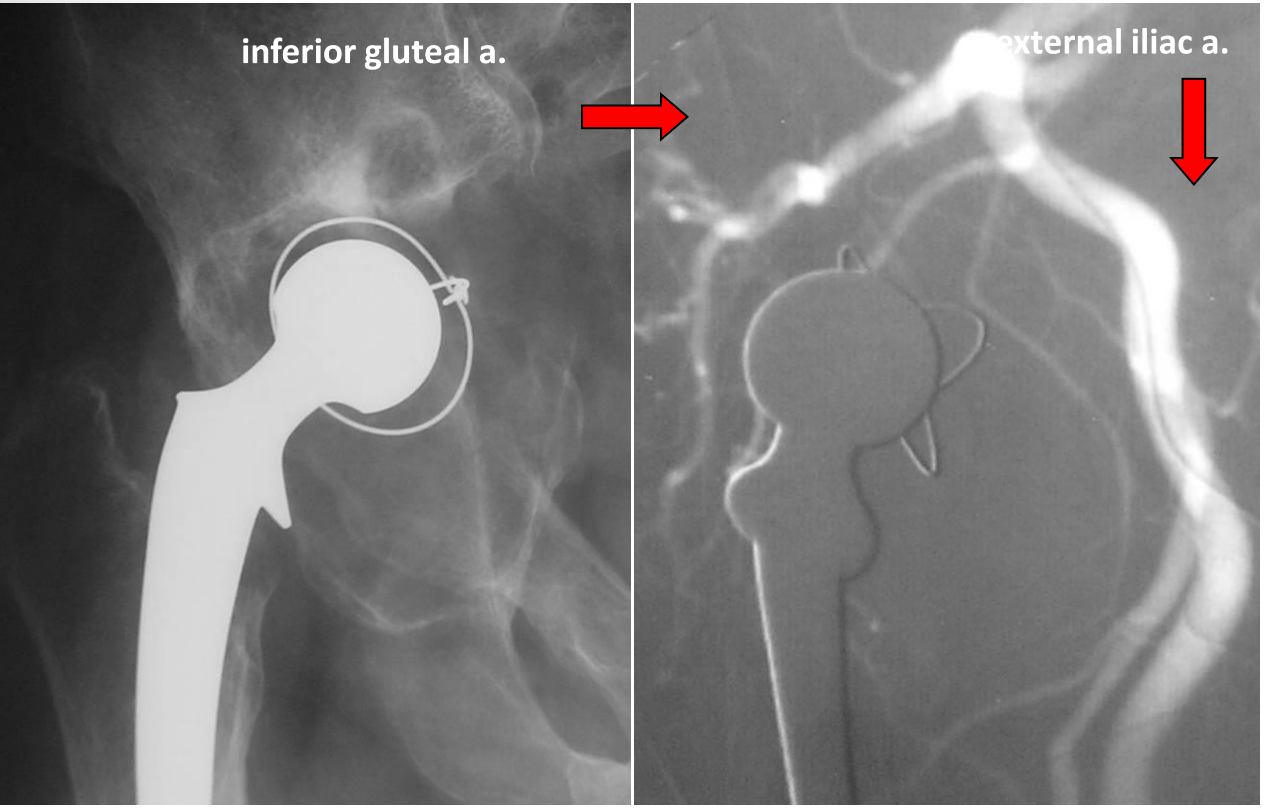
BURCH-SCHNEIDER ANTI-PROTRUSIO CAGE

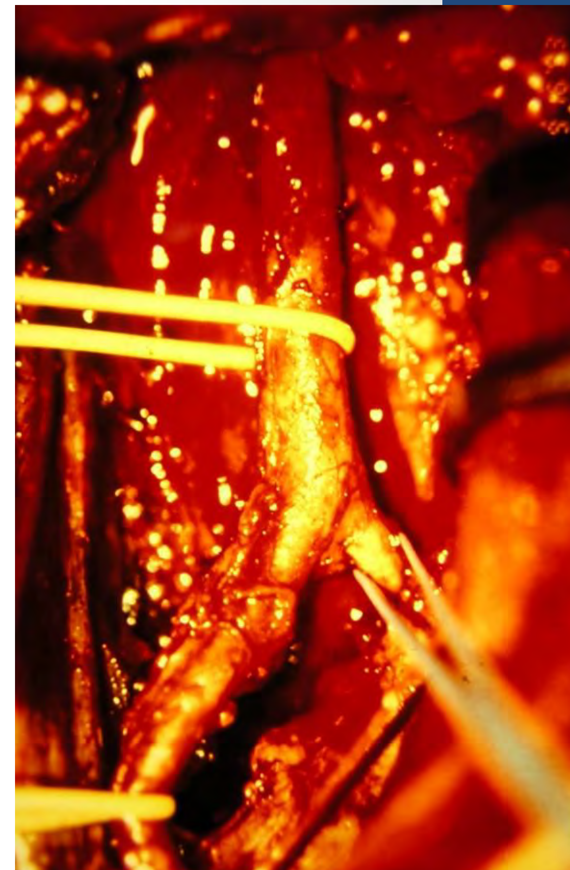


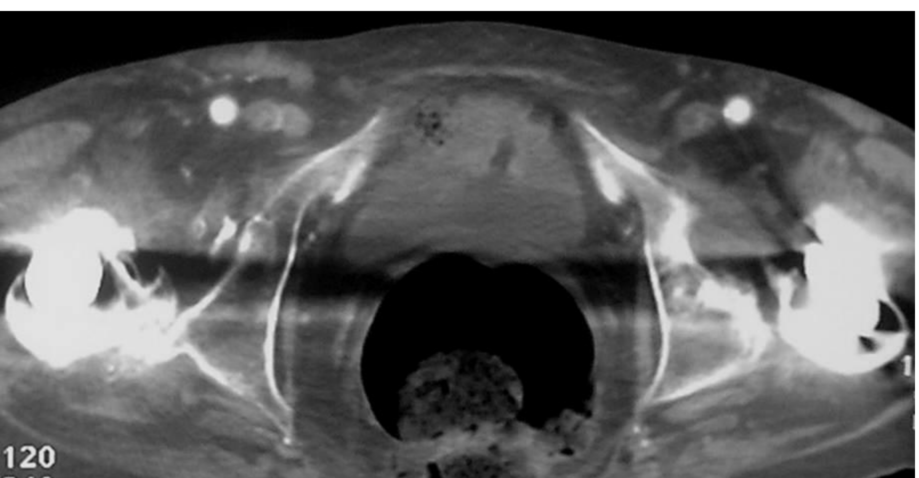



SURGICAL TECHNIQUE

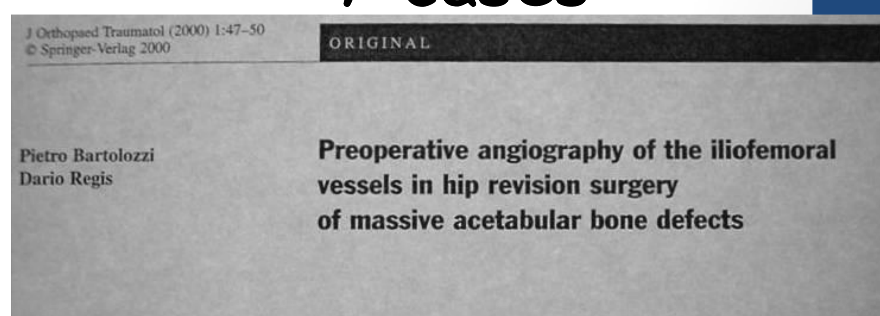









7 cases

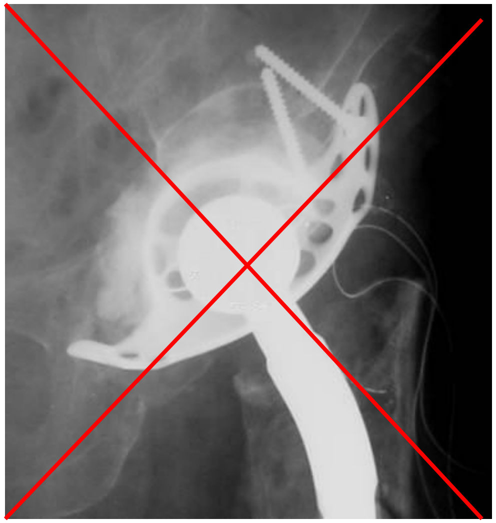

J Orthopaed Traumatol (2000) 1:47–50
© Springer-Verlag 2000

ORIGINAL

Pietro Bartolozzi
Dario Regis

Preoperative angiography of the iliofemoral vessels in hip revision surgery of massive acetabular bone defects

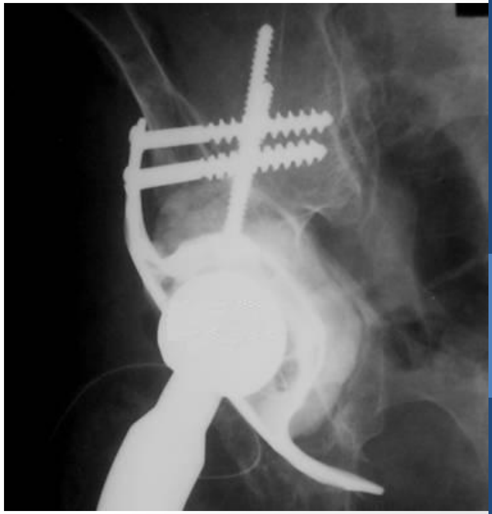
PRIMARY STABILITY



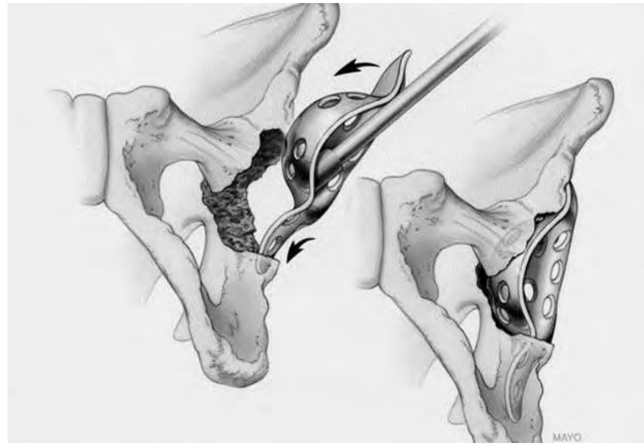
screw fixation to iliac bone

Placement: dome

Number: 4 - 5



PRIMARY STABILITY



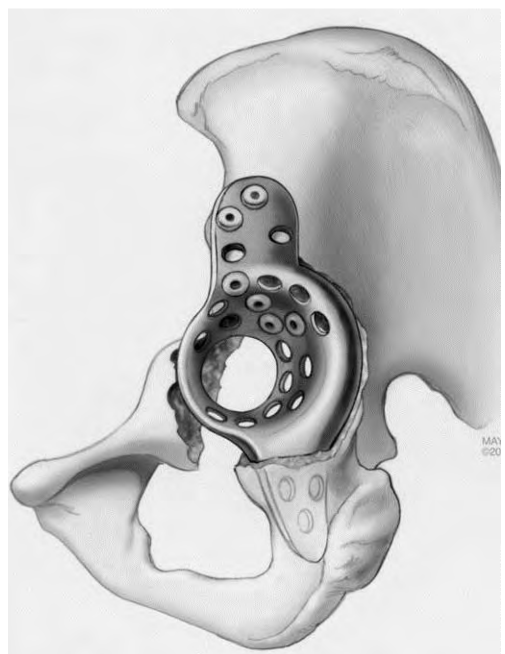
SLOTTED

 # 56 (86%)

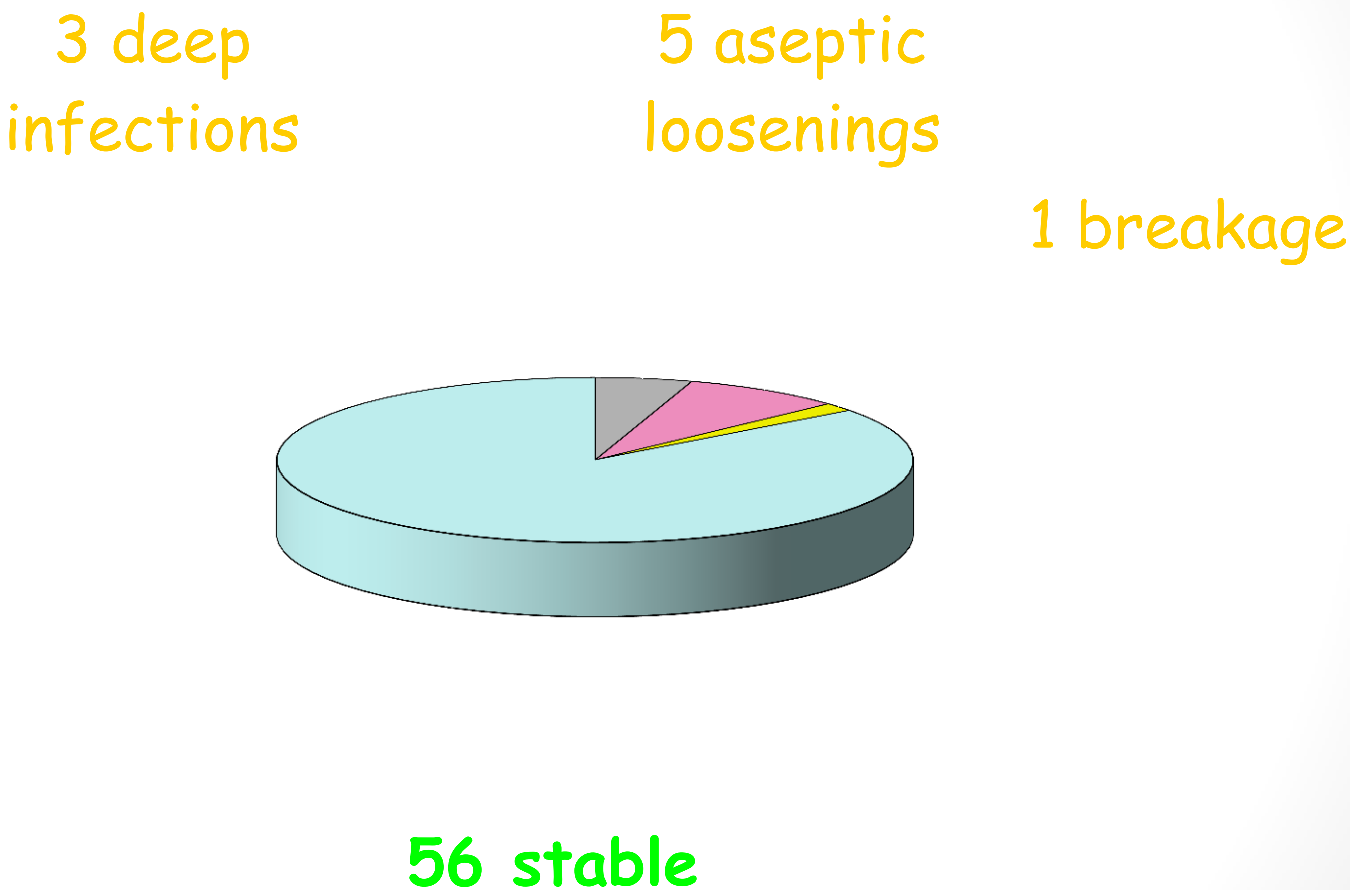
inferior flange (ischium)

BUTTRESSED

 # 9 (14%)



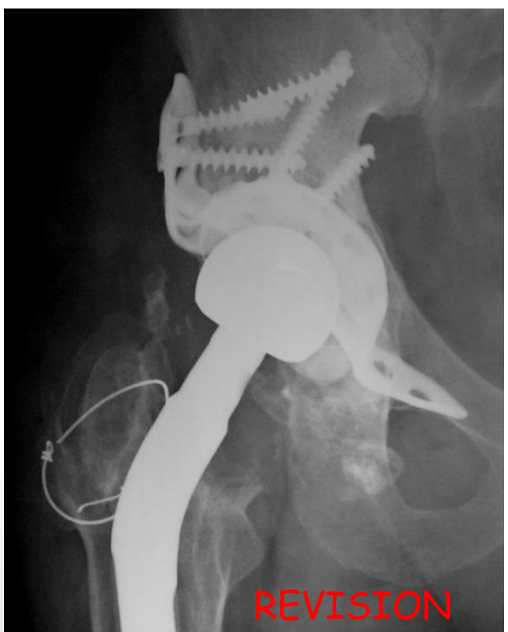
RESULTS - 65 hips



Paprosky 3B – GIR IV

Aseptic loosening

Breakage



BMJ Case Reports

Current TOC | Instructions for authors

BMJ Case Rep. 2009; 2009: bcr08.2008.0604. PMCID: PMC3028164

Published online 2009 March 26. doi: 10.1136/bcr.08.2008.0604

Unusual presentation of more common disease/injury

Late fracture of a Burch–Schneider acetabular cage: rare occurrence following polyethylene cup wear

Dario Regis, Andrea Sandri, Alessandra Rizzo, and Pietro Bartolozzi

Male 33 yrs

CLINICAL EVALUATION

- **HARRIS HIP SCORE**

RADIOGRAPHIC EVALUATION

- **STABILITY OF THE ACETABULAR COMPONENT**

  Gill 1998

Definitely Loose (Type III)
- Screws used to fix the acetabular reinforcement device are broken
- Evidence of acetabular migration (>5 mm)
- Complete, progressive radiolucent line is present medially and superiorly or around the screws

Probably Loose (Type II)
- Progressive radiolucencies are present medially or superiorly

Possibly Loose (Type I)
- Radiolucencies are nonprogressive and do not involve the screws

- OSSEOINTEGRATION OF THE STRUCTURAL ALLOGRAFT

  Gross 1999

MINOR	**< 1/3 of graft resorbed**
MODERATE	**1/3 – 1/2 of graft resorbed**
SEVERE	**> 1/2 of graft resorbed**

CLINICAL RESULTS

Harris Hip Score

I. Pain (44 possible)

A. None or ignores it	44
B. Slight, occasional, no compromise in activities.	40
C. Mild pain, no effect on average activities, rarely moderate pain with unusual activity, may take aspirin	30
D. Moderate pain, tolerable but makes concessions to pain. Some limitation of ordinary activity or work. May require occasional pain medicine stronger than aspirin.	20
E. Marked pain, serious limitation of activities.	10
F. Totally disabled, crippled, pain in bed, bedridden	0

II. Function (47 possible)

A. Gait (33 possible)

1. Limp

a. None	11
b. Slight	8
c. Moderate	5
d. Severe	0

2. Support

a. None	11
b. Cane for long walks.	7
c. Cane most of the time	5
d. One crutch	3
e. Two canes	2
f. Two crutches	0
g. Not able to walk (specify reason)	0

B. Activities (14 possible)

1. Stairs

a. Normally without using a railing	4
b. Normally using a railing.	2
c. In any manner	1
d. Unable to do stairs	0

2. Shoes and Socks

a. With ease	4
b. With difficulty	2
c. Unable	0

3. Sitting

a. Comfortably in ordinary chair one hour	5
b. On a high chair for one-half hour	3
c. Unable to sit comfortably in any chair	0
4. Enter public transportation	1

III. Absence of deformity points (4) are given if the patient demonstrates:

A. Less than 30° fixed flexion contracture
B. Less than 10° fixed adduction
C. Less than 10° fixed internal rotation in extension
D. Limb-length discrepancy less than 3.2 centimeters

IV. Range of motion (index values are determined by multiplying the degrees of motion possible in each arc by the appropriate index)

A. Flexion 0–45 degrees × 1.0
45–90° × 0.6
90–110° × 0.3
B. Abduction 0–15° × 0.8
15–20° × 0.3
over 20° × 0
C. External rotation in ext. 0–15 × 0.4
over 15° × 0
D. Internal rotation in extension any × 0
E. Adduction 0–15° × 0.2

To determine the over-all rating for range of motion, multiply the sum of the index values × 0.05. Record Trendelenburg test as positive, level, or neutral.

Preoperative	33.1
Follow-up	75.6

X-RAY RESULTS

Bone Graft Incorporation : 52/65 = 80%

Paprosky 3 A

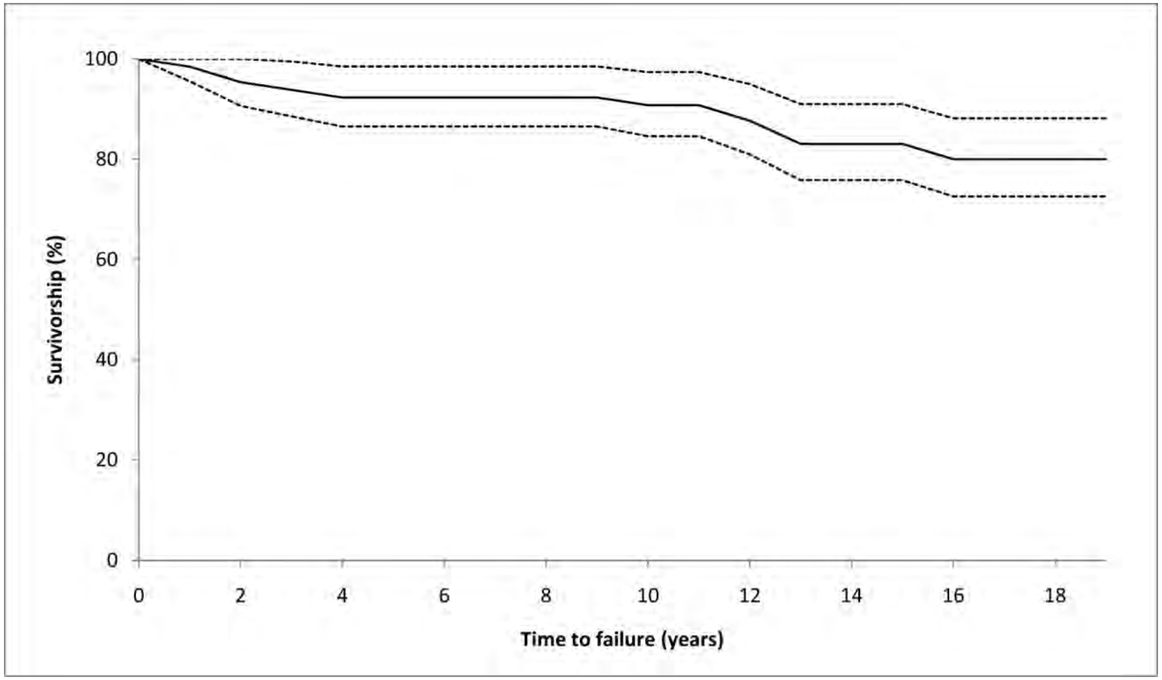
X-RAY RESULTS

Pauci symptomatic loosening : 4/65 (6.1%)

Paprosky 3 A

REVISION (9) + RADIOGRAPHICALLY LOSE (4)

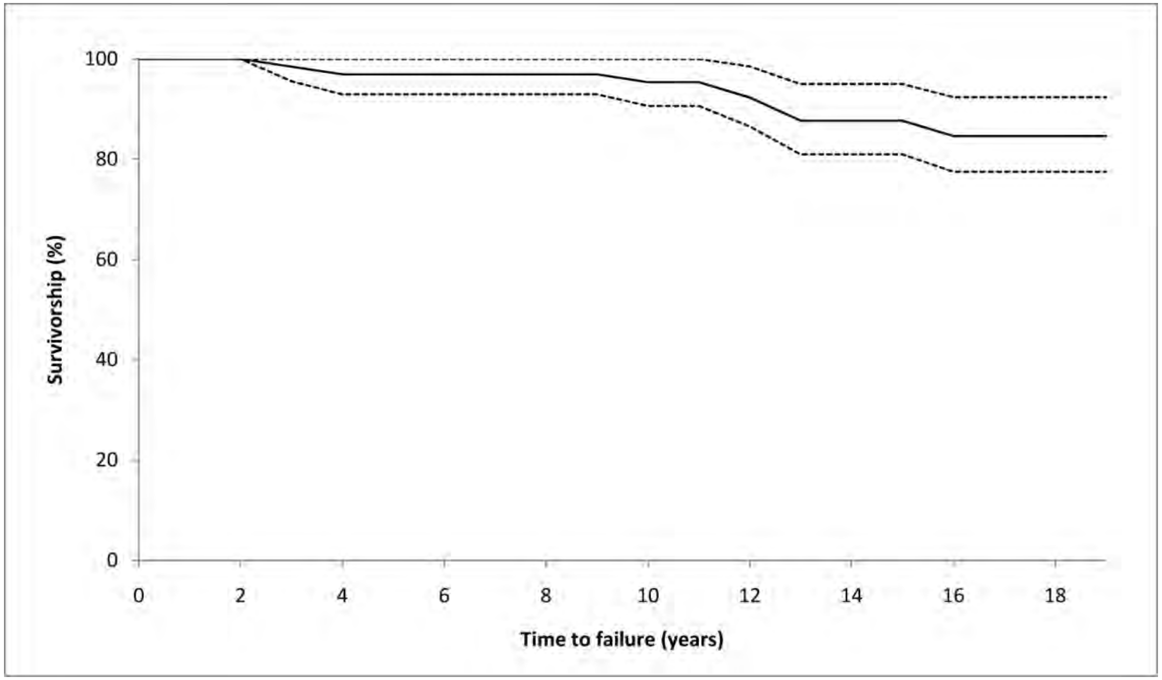
Survivorship 18.9 years



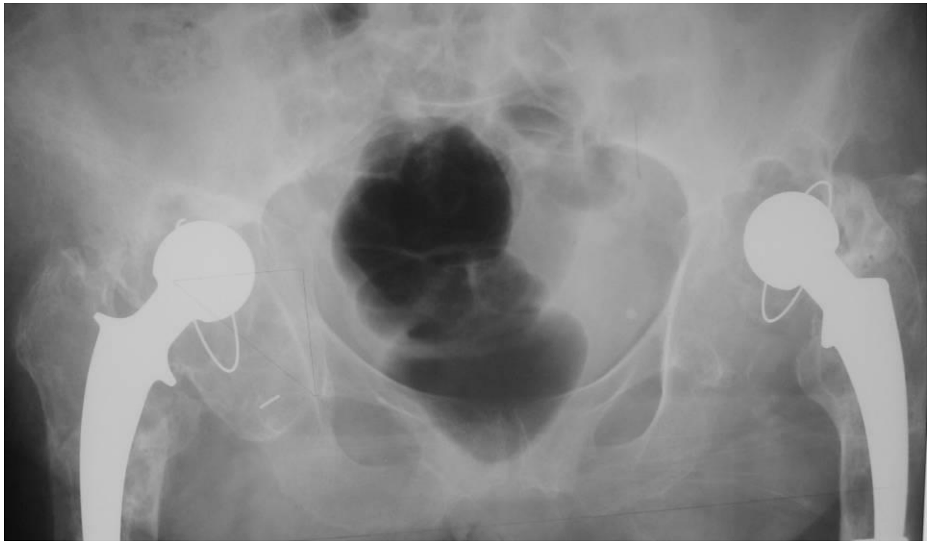
80.0%

ASEPTIC LOOSENING (6) + RADIOGRAPHIC LOOSENING (4)

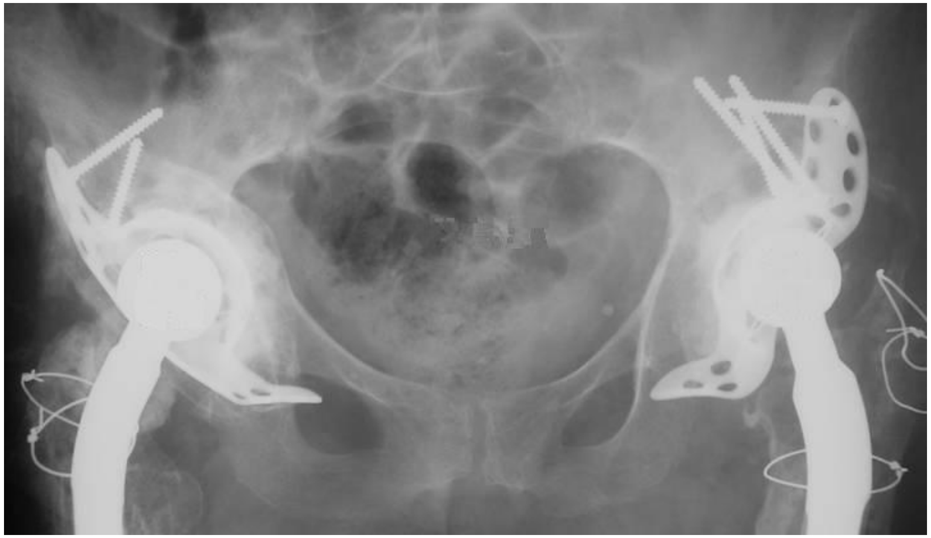
SURVIVORSHIP 18.9 years



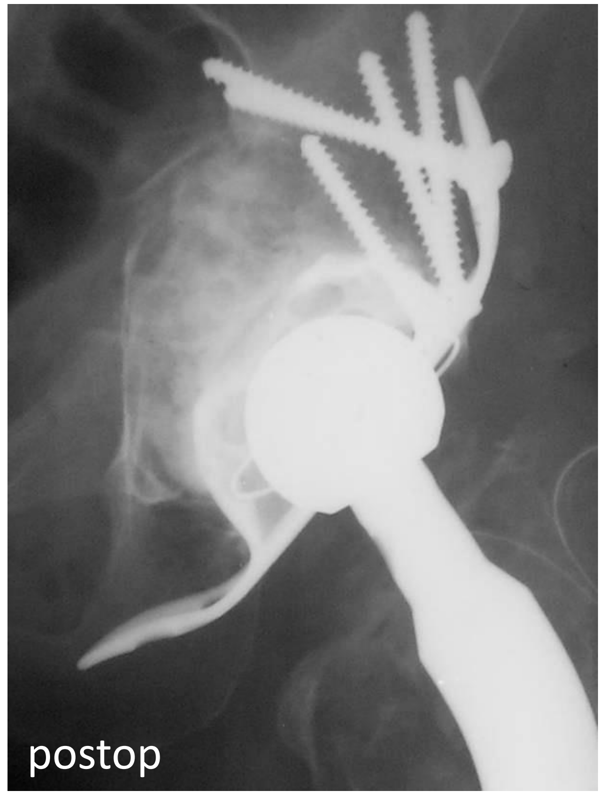
84.6%



RESTORING CENTRE OF ROTATION



BONE GRAFT PROTECTION

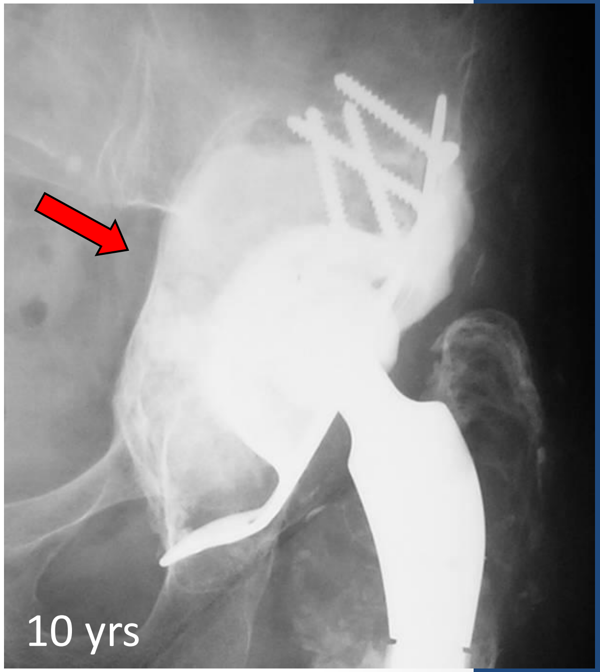


Paprosky 3 A

BONE STOCK RESTORATION

Paprosky 3 B

BONE DEFECT RECOVERY



Paprosky 3B

Paprosky 3 A

CONCLUSIONS

- Currently a limited but valuable role in the revision of the most complex case of acetabular bon loss
- Provide a large surface against the pelvis to span bone defects, distribuite load, protect large bone grafts and prevent early migration
- Is a reliable procedure to manage severe periprosthetic deficencies

THANKS FOR THE ATTENTION

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Trabecular metal for acetabular defects in hip revision surgery. Short term clinical and radiographic evaluation

G. Marongiu[1], A. Campacci[2], M. Mastio[1], A. Capone[1]

[1]Orthopaedic Department - University of Cagliari, Italy

[2]Orthopaedic Department – Ospedale Sacro Cuore, Negrar, Italy

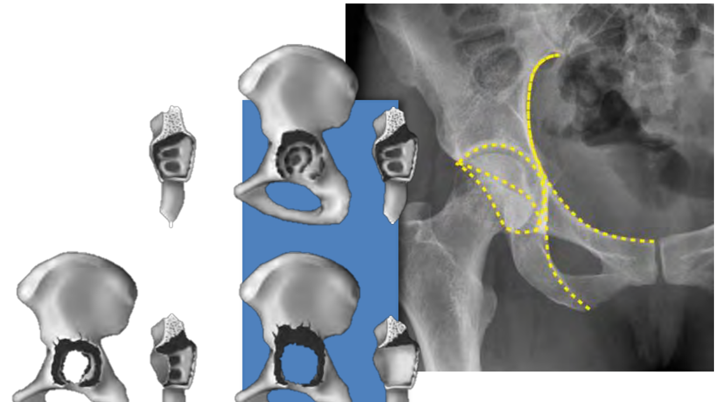
Acetabular revision treatment Algorithm

1) **Defect classification**:
   Migration
   Rotation centre

2) **Bone stock**:
   Contained defect
   Non contained defect
   Bone stock > 50%
   Bone stock < 50%

3) **Implant choice**

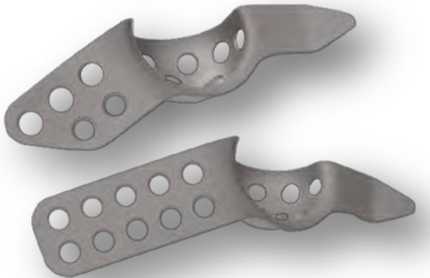
4) **Surgical approach**



PAPROSKY CLASSIFICATION

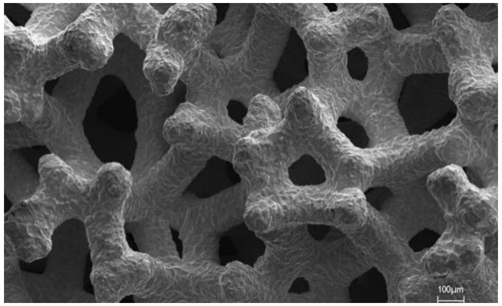
Defect	Rim	Walls/Domes	Columns	Bone bed
Type II	Intact	Intact	Intact and supportive	> 50%; cancellous
Type II	Distorted	Distorted	Intact and supportive	< 50%; cancellous
Type III	Missing	Severely compromised	Non supportive	membranous/sclerotic

ACETABULAR REVISION



WHICH SYSTEM?

Trabecular Metal

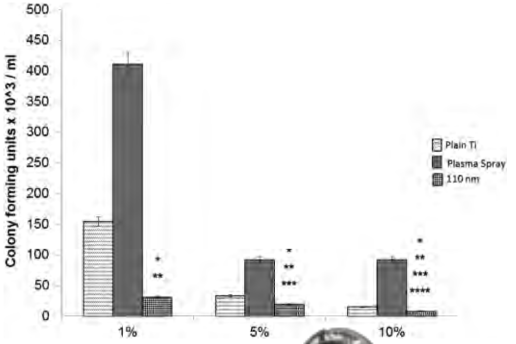


Tantalum

nano-textured structural architecture
80% porosity / 400 – 600 micron pores

High coefficient of friction 0.98
Low modulus of elasticity

Vascularization and biologic ingrowth
Biocompability
Low bacteria adhesion



Trabecular Metal Cups
Trabecular Metal Augment
Wedges, buttress

Bobyn JD, Hacking SA, Chan SP, et al. Characterization of new porous tantalum biomaterial for reconstructive orthopaedics. Scientific Exhibition: 66th Annual Meeting of the American Academy of Orthopaedic Surgeons; 1999; Anaheim, CA.

Elia Marin, L. Fedrizzi, L. Zagra. Porous metallic structures for orthopaedic applications: a short review of materials and technologies. Eur Orthop Traumatol Received: 22 April 2010 / Accepted: 1 August 2010 EFORT 2010

Trabecular Metal acetabular cups and augments

Author	N° of hips	Follow up	Survival	Implant	Defect type	N° of augments
Unger et al 2005	60	4 yrs	97%	55 TM Monoblock 5 TM Monoblock Revision (Zimmer, Warsaw, IN)	1 - type I 16 - type IIA 25 - type IIB 10 - type IIC 7 - type IIIA 1 – type IIIB	0
Fernandez Farein et al 2010	263	4,2 yrs	97,2%	68 TM Monoblock 165 TM Revision (Zimmer, Warsaw, IN)	20 - type I 73 - type IIA 82 - type IIB 39 - type IIC 40 - type IIIA 9 – type IIIB	34
Van Kleunen et al 2013	97	4 yrs	100%	22 TM Modular 75 TM Revision (Zimmer, Warsaw, IN)	24 - type IIA 19 - type IIB 19 - type IIC 19 - type IIIA 16 – type IIIB	23
Grappiolo et al 2014	55	5 yrs	92,8%	5 TM Modular 14 TM Revision (Zimmer, Warsaw, IN)	42 – type IIIA 13 – type IIIB	65
Whitehouse et al 2015	56	10 yrs	92%	75 TM Revision (Zimmer, Warsaw, IN)	6 - type IIA 9 - type IIB 2 - type IIC 28 - type IIIA 11– type IIIB	45

Material and methods

January 2012 – May 2014

Orthopaedic Department - University of Cagliari, Italy

Department Orthopaedics and Traumatology – Ospedale Sacro Cuore, Negrar VR

- 27 patients (14 F 13 M)
- 28 revisions
- Mean age 71 yrs (min 42 – max 86)
- BMI 28,9
- follow up 2,5 yrs (min 12 months – max 47 months)
- Mean time from primary THA to revision:11,8 yrs
- All patients had standard preoperative imaging (16 patients had CT and Angio CT scan)
- All patients had preoperative and postoperative HHS score (1,3, 6 months and 1 year)

Paprosky Classification for acetabular defects	
Type I	6
Type IIA	7
Type IIB	2
Type IIC	6
Type IIIA	2
Type IIIB	3

Material and methods

Cause of revision	N°
Aseptic loosening	21
Infection	6
Fracture	1
Dislocation/instability	1

Type of revision	N°
Acetabular isolated	13 (46%)
Total	15 (54%)

Type of implant	N°
Cementend	11 (39%)
Not cemented	17 (61%)

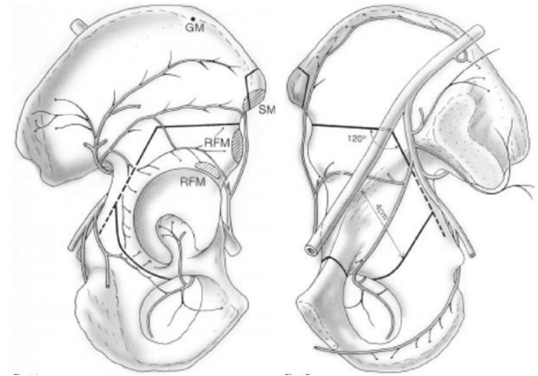
Bearings	N°
Poly on metal	17
Metal on metal	5
Ceramic on ceramic	6

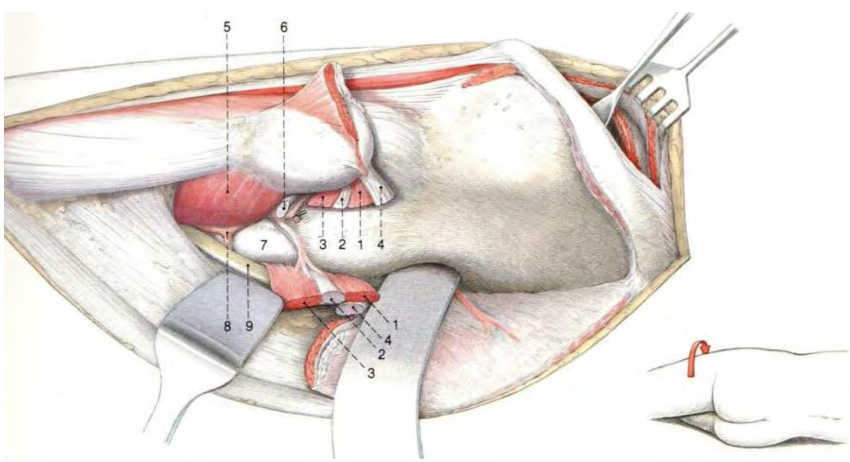
Material and methods

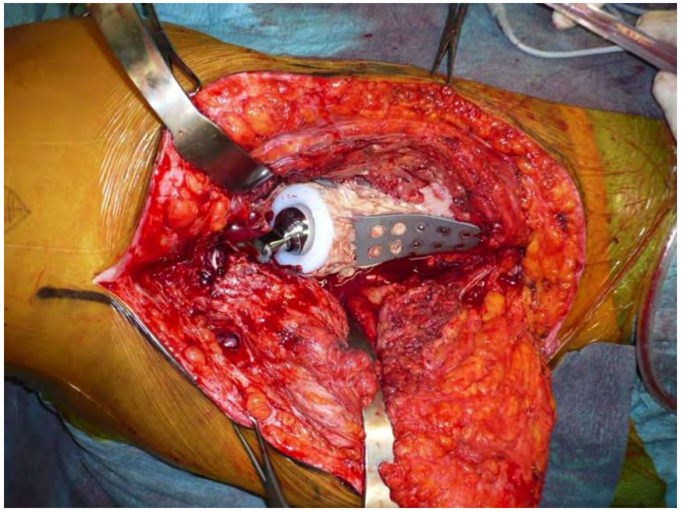
Implant	tot	Type I	Type II	Type III
TM Modular Acetabular Shell ™	19	6	13	
TM Revision Shell ™	1	-	1	-
Continuum ™	1	1	-	-
TM Revision Shell ™ TM Modular Acetabular Shell ™ Continuum ™ + Augment	5	-	2	3
TM Revision Shell ™ + Augment + Cage	1	-	-	1
Screws	1,5 mean 23/27	0,5 3/6	2,5 mean 10/11	2,2 mean 5/5
Impaction bone grafting	21	3/6	10/13	5/5

Surgical approach

Surgical approach	n°
Direct Lateral	25
Postero lateral	2
Ileo femoral	1







Clinical outcome

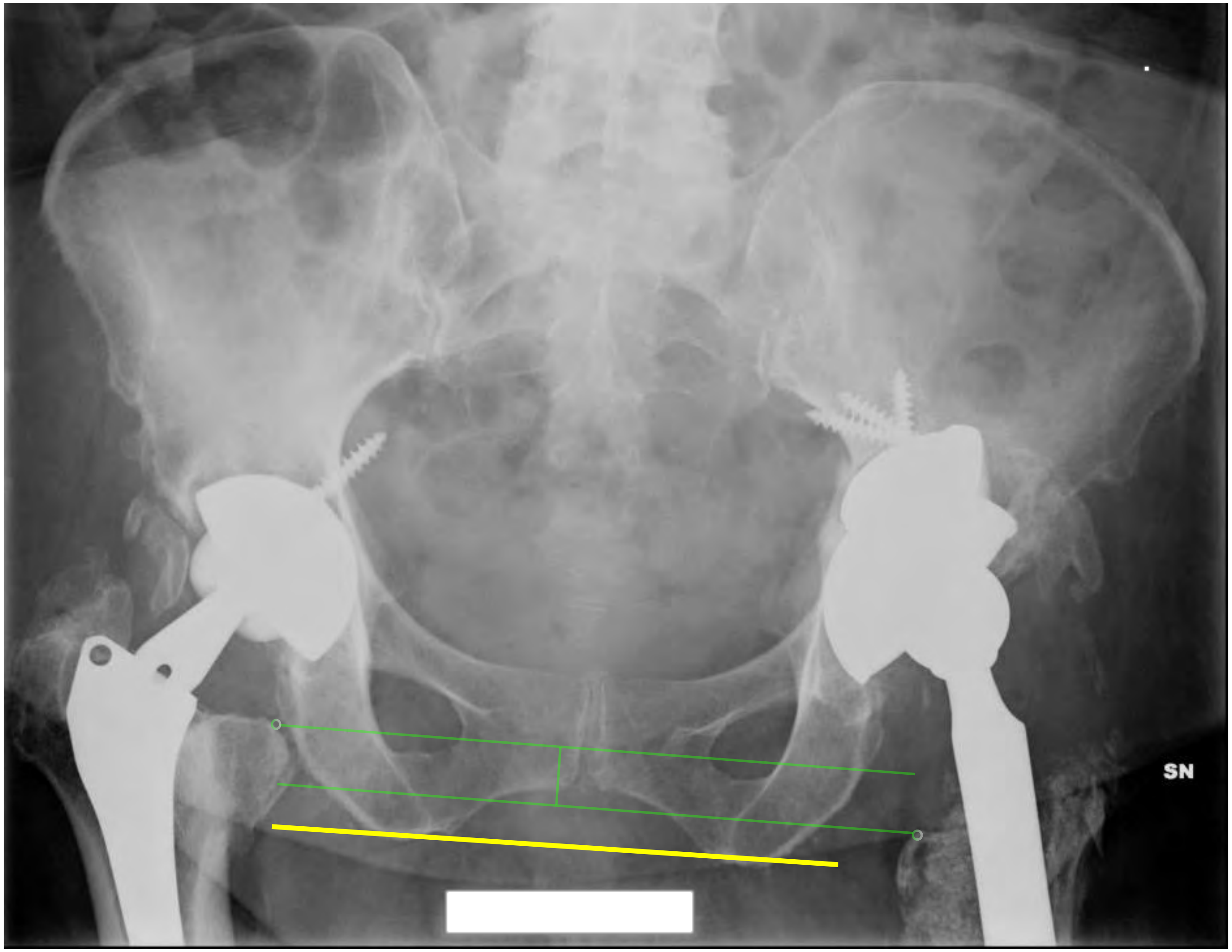
follow up 2,5 yrs (min 12 months – max 47 months)

Post operative complications

- 1 sciatic nerve palsy
(remission in 5 months)

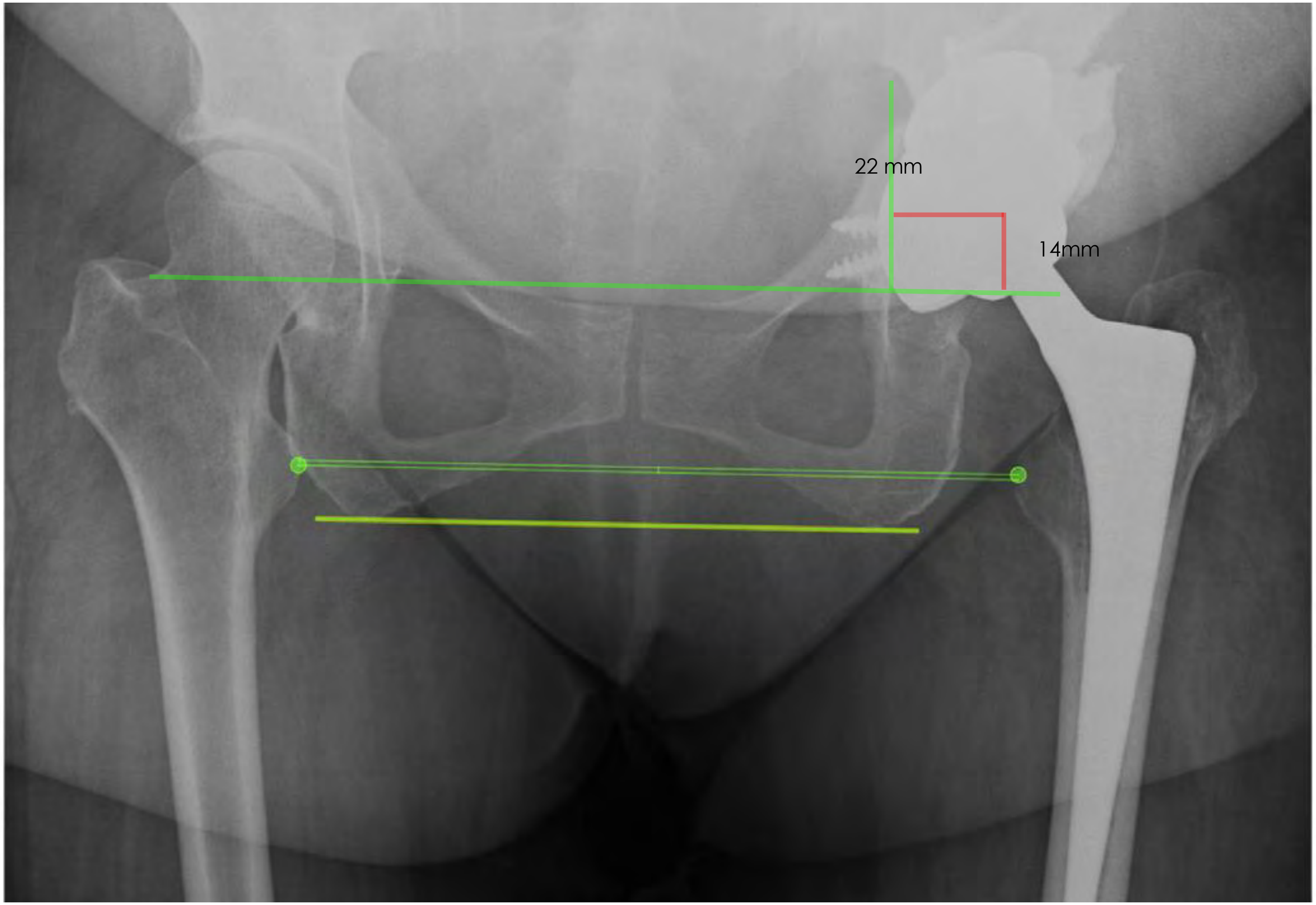
- 1 dislocation
(after 1 month from surgery)

Leg Lenght Discrepancy



Hip Arthroplasty Templating 2.4.3 per OsiriX MD v.6.5.164-bit

Centre of rotation



Hip Arthroplasty Templating 2.4.3 per OsiriX MD v.6.5.164-bit

Statistics : SPSS for Mac
(version 16.0 SPSS Inc, Chicago, Illinois)

Radiological assessment

	PREOP	POST OP	
LEG LENGTH DISCREPANCY	16 mm	2 mm	p <0,005

COR restoration All cases	PREOP	POST OP	
Horizontal distance	15 mm	28 mm	p <0,005
Vertical distance	32 mm	14 mm	p <0,005

COR restoration in Revision with AUGMENT	PREOP	POST OP	
Horizontal distance	9 mm	23 mm	p <0,005
Vertical distance	35 mm	15 mm	p <0,005

Statistics : SPSS for Mac
(version 16.0 SPSS Inc, Chicago, Illinois)

Radiological assessment

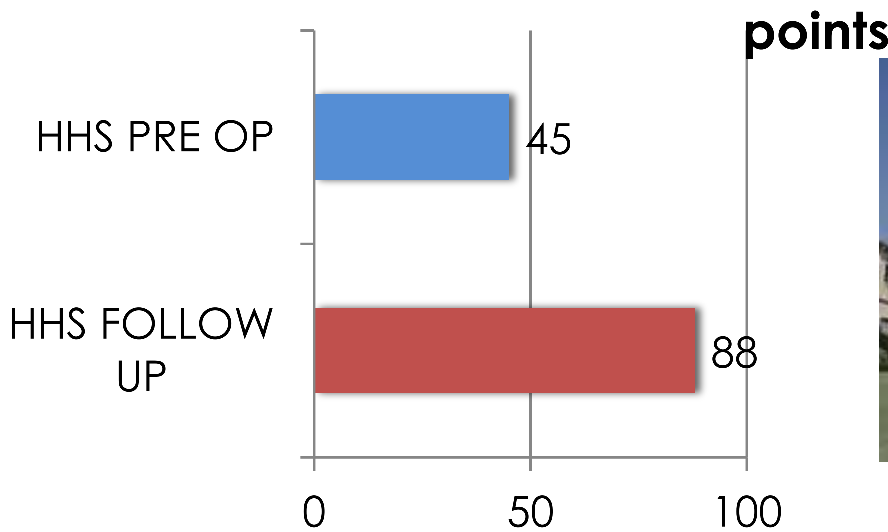
		%
ACETABULAR CUP INCLINATION	47° (min 42 – max 52)	26/28 (92%)
RADIOLUCENCY LINES (DeLee Charnley 1976)	2	2/28 (0,7%)
OSTEOINTEGRATION (Moore 2006)	28/28	100%
HETEROTOPIC OSSIFICATION (Brooker 1994)	4 (3 Grade I, 1 Grade 2)	4/28 1,4%

follow up 2,3 yrs (min 12 months – max 47 months)

Statistics : SPSS for Mac
(version 16.0 SPSS Inc, Chicago, Illinois)

Functional results

follow up 2,5 yrs (min 12 months– max 47 months)

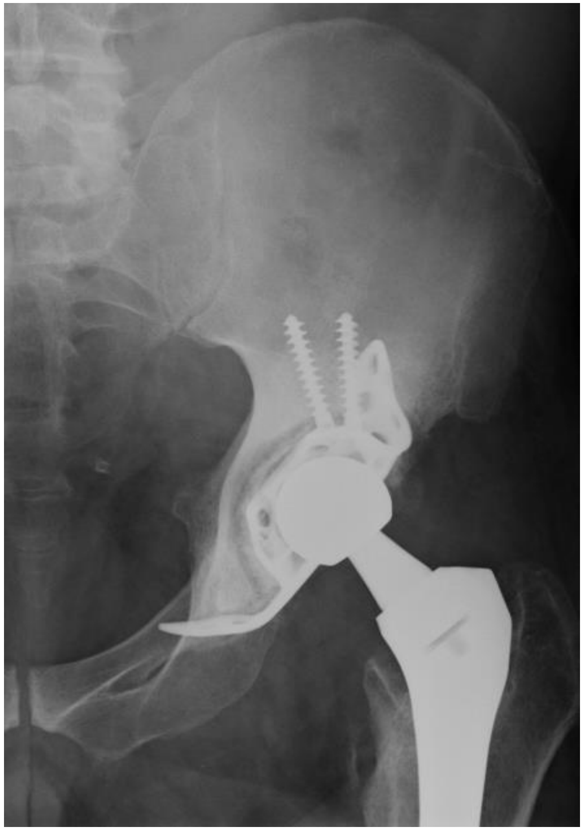


	PREOP	FOLLOW UP
FLEX	83°	117°
EXTRA	21°	35°
INTRA	12°	23°
ABD	27°	35°

Wilcoxon Test $P < 0.0001$

Case I

Male, 71 yrs. Infection of non cemented reinforcement ring. Treated with a antibiotic spacer. Acetabular bone defect Paprosky Type IIB



Case I

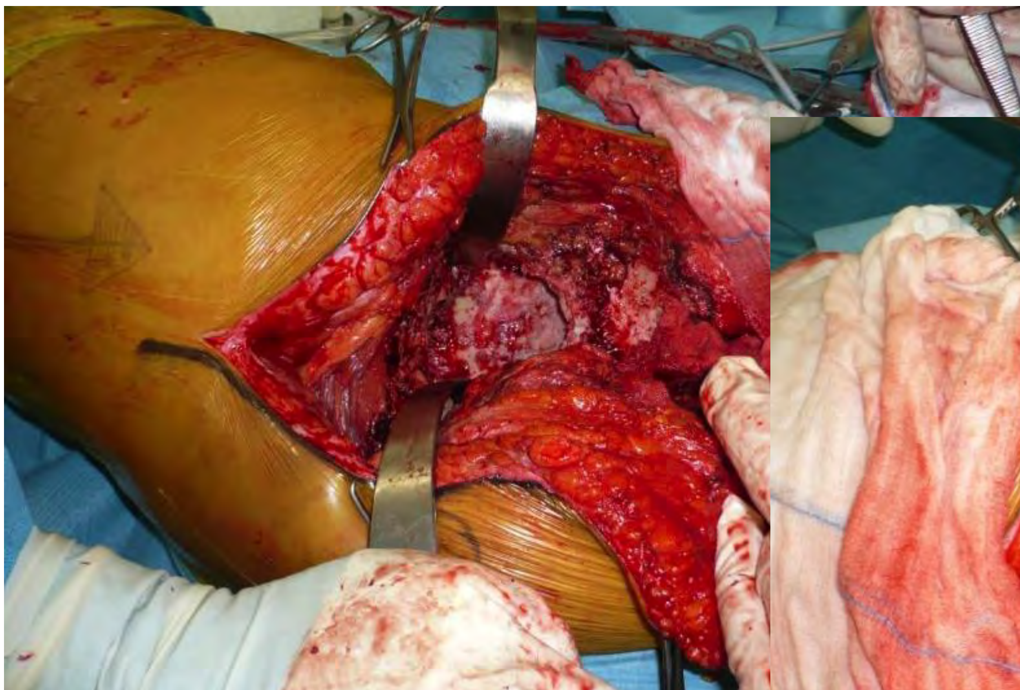
6 months later

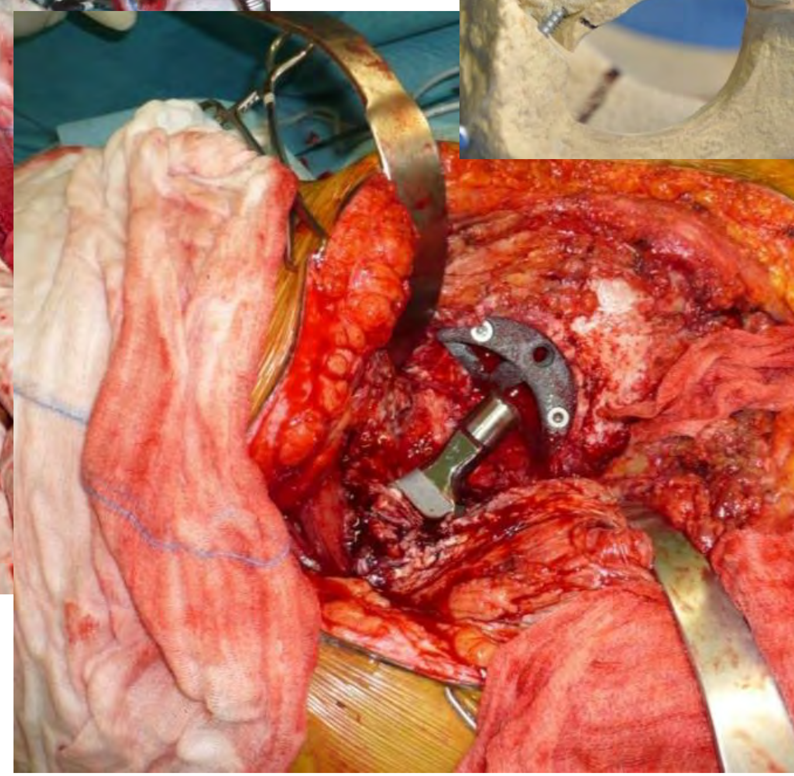
Ileo femoral approach

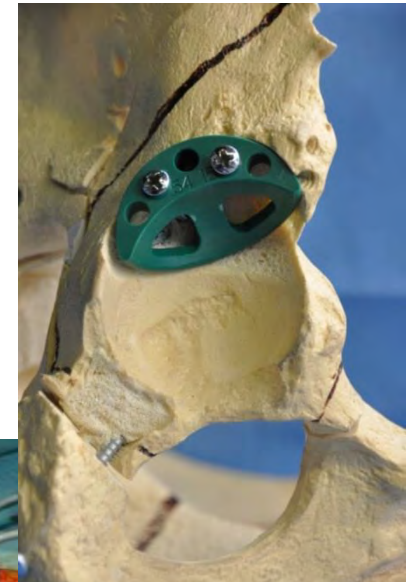
ESR 12 mm/h
PCR 7 mg/L

Case I

Acetabular defect Paprosky Type IIB



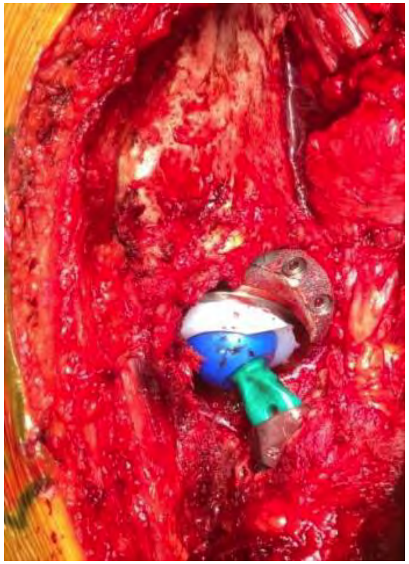


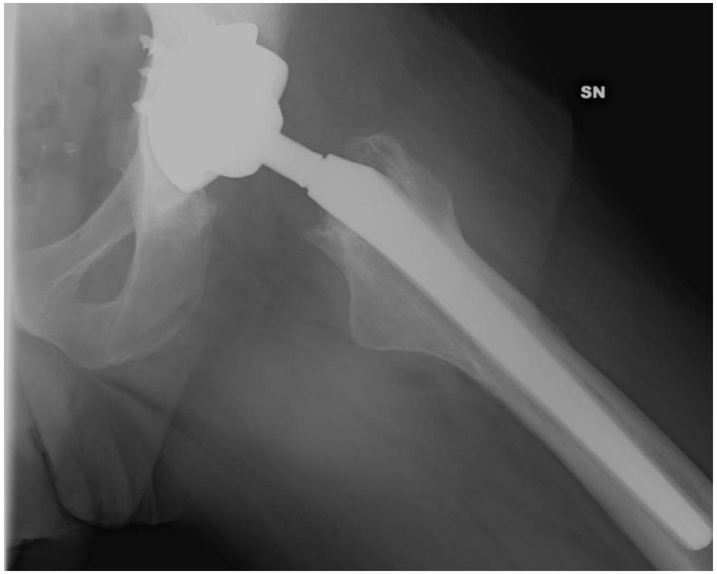


Case I

Revision with Trabecular Metal™ Acetabular Shell 54 mm and augment 54 x10 mm, 5 stabilization screws.

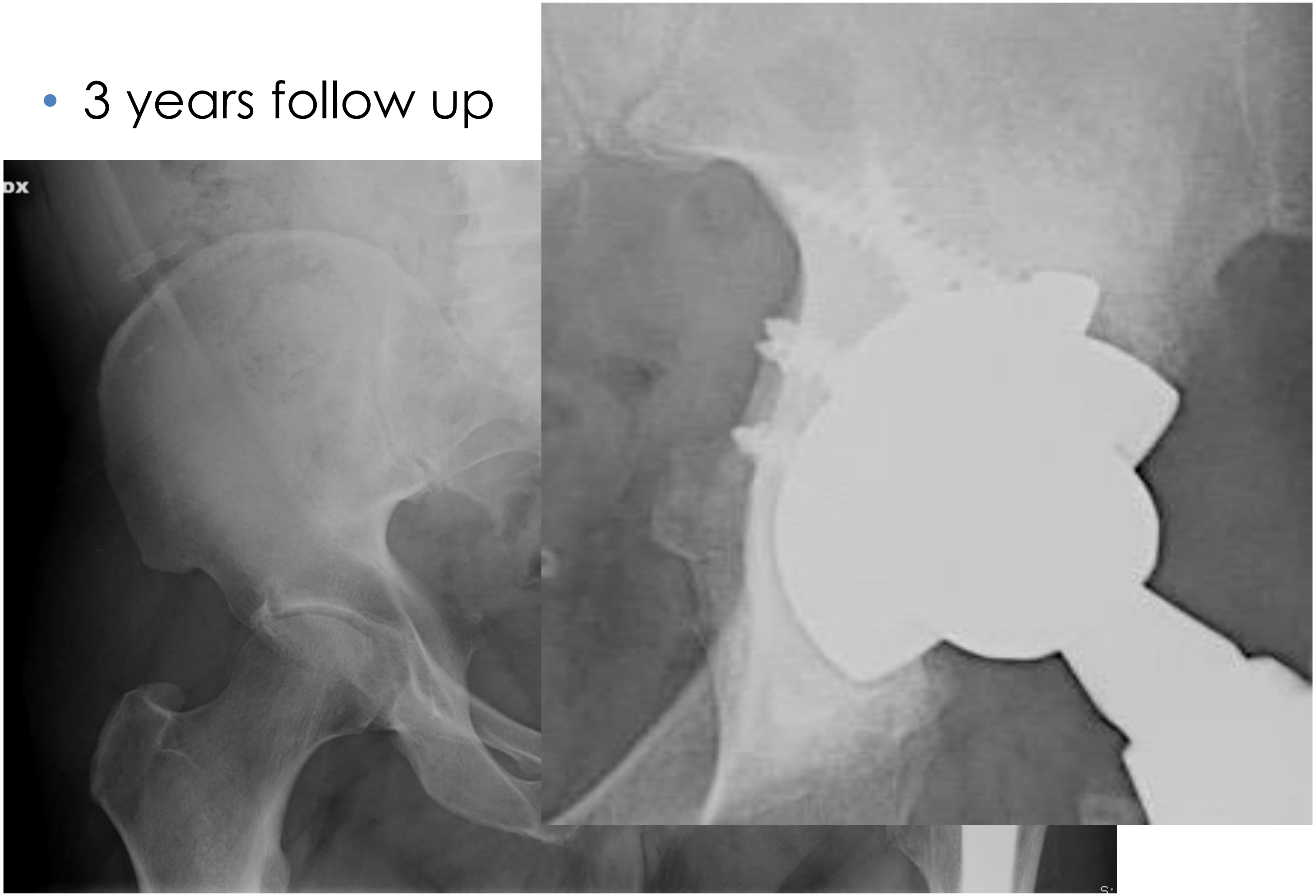
Impaction Bone Grafting, Femoral stem revision with AEQUA stem (Adler Ortho, Italy)





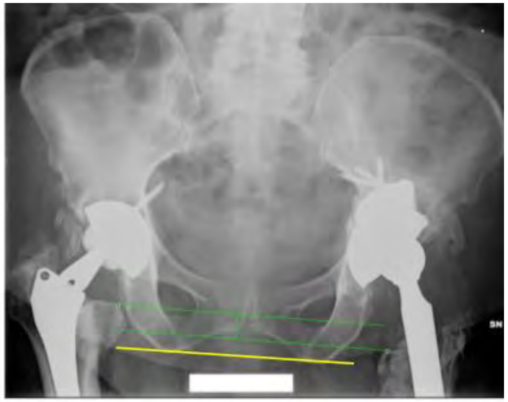
Case I

- 3 years follow up



Conclusions

- Trabecular metal provides early stability and osteointegration, avoiding bone graft complications



- Modular system:
  - Geometric reconstruction of bone defect
  - customized acetabular reconstruction
  - restoration of centre of rotation and leg lenght discrepancy

- Long – term follow up ?

Thank you

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

The John Charnley Trust

wrightington
Lower Limb Unit

Late results of Acetabular Impaction Grafting in Revision Hip Replacement using Whole Femoral Head Allograft retaining the Articular Cartilage

D Shaw

E. Drampalos, A. Fadulelmola, J. Hodgkinson

Centre for Hip Surgery, Wrightington Hospital, U.K.

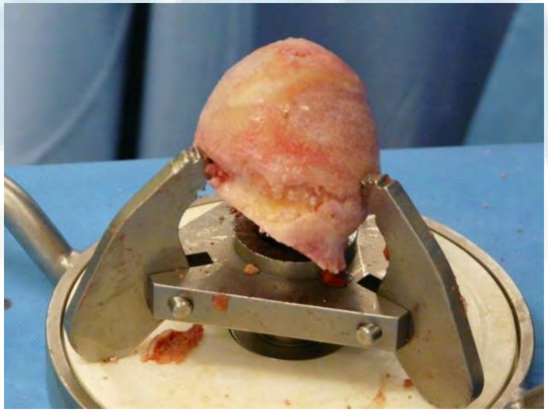
Wrightington, Wigan and Leigh NHS
NHS Foundation Trust

Aims of the Study

- Acetabular impaction bone grafting (IBG) of cancellous bone with a cemented polyethylene cup aims to reconstitute the bone stock in hip revision
- Effective but also resource intensive and time consuming technique
- Most surgeons remove the articular cartilage from the femoral head allograft
- Aim was to reproduce the results of pure cancellous bone grafting whilst retaining the articular cartilage
- Is it mechanically stable?
- Is the graft incorporated?

Methods

- Retrospective series
- 42 acetabular revisions between 2002 and 2005 using whole femoral head as graft material
- Trochanteric osteotomy
- Clinical assessment was made using Oxford hip score
- Radiological assessment using Hodgkinson's criteria[1] for socket loosening
- Allograft incorporation evaluated using Gie classification [2]


[1]*Hodgkinson et al., Clin Orthop 1988; 228:105-109*
[2]*Gie et al., J Bone Joint Surg 1993; 75-B: 14-21*

Wrightington, Wigan and Leigh NHS
NHS Foundation Trust

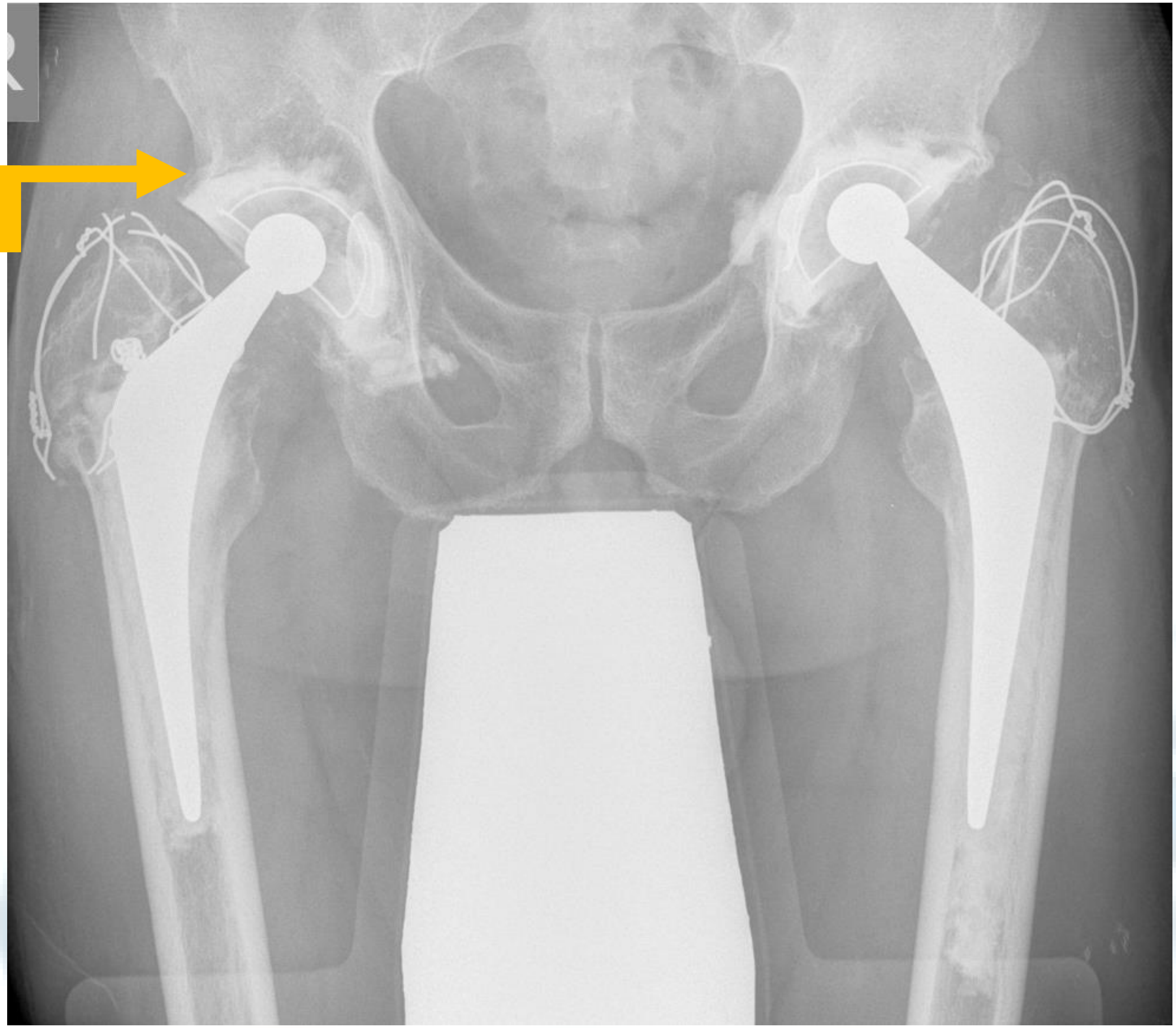
Results

- Mean follow up: 8.3 years (range, 4-14 years)
- Mean change in hip score was 20
- 6 patients lost to follow up

Results

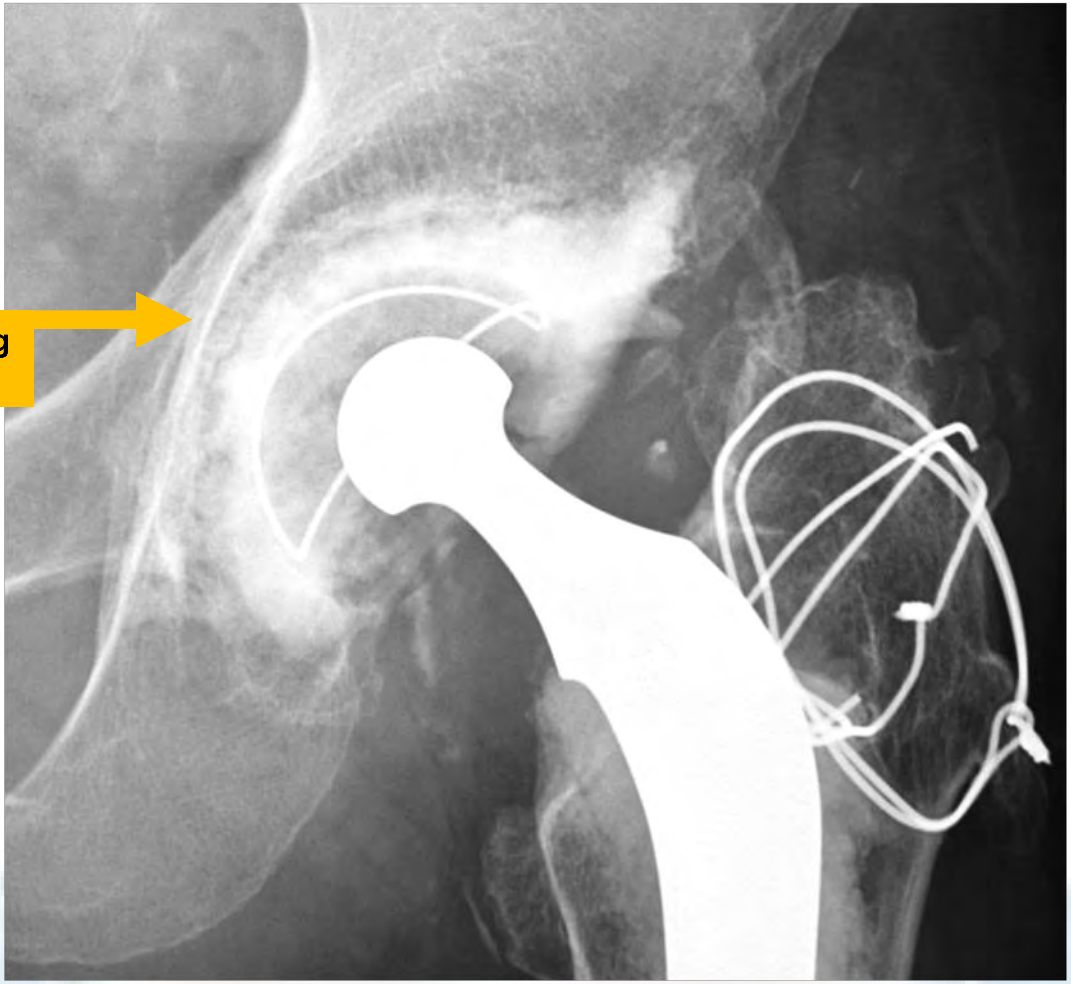
- 27 (75%) sockets were considered radiologically stable
- 6 (16.6%) sockets were radiologically loose
- 3 (8.4%) cases of socket migration
- 30 (83.4%) cases showed good trabecular remodeling
- 6 (16.6 %) cases showed poor trabecular remodeling

Radiolucent line in zone 1

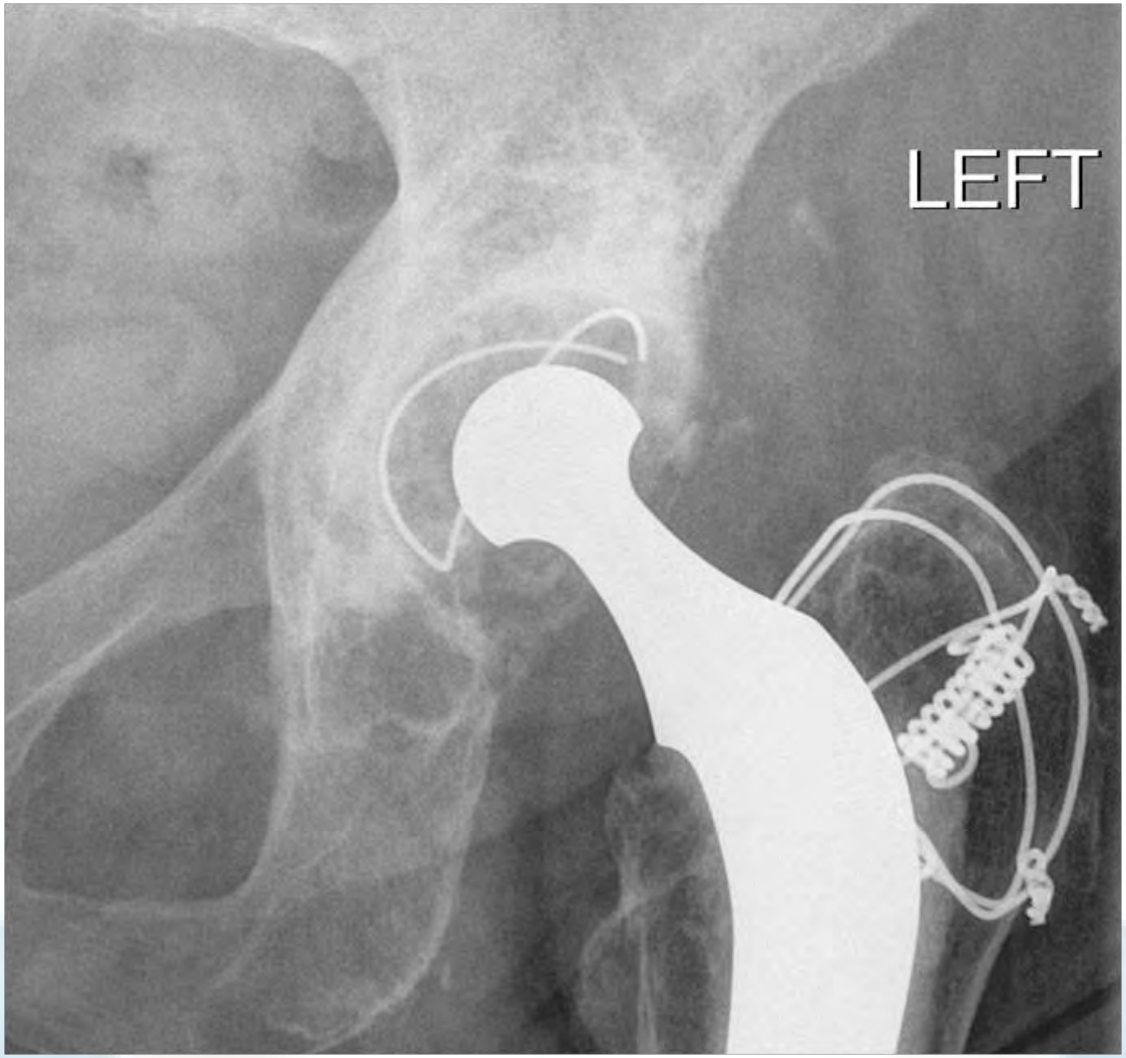


Hodgkinson grade 1, **13yrs** follow-up

Radiolucent line involving all 3 zones



Hodgkinson grade 3, **7yrs** follow-up



Good trabecular remodelling

Results

- 2 revisions: one patient with migration (Hodgkinson 4) and pain
  one patient with recurrent dislocation
- 5 (11.4%) trochanteric non union
- 1 (2.3%) periprosthetic femoral fracture treated with plate and cables
- 4 (4.1%) asymptomatic heterotopic ossification

Discussion

- Technique introduced by Slooff[1] in Nijmegen (1984) : 79% survival at 15 years

- Fresh frozen femoral heads → *cancellous bone*
  cortical bone
  articular cartilage

- Presence of cartilage might decrease compaction and act against incorporation[2]

[1]Slooff et al., Acta Orthop Scan 1984; 55:593-596
[2]Bavadekar et al., Acta Orthop Scan 2001; 72: 470-476

Discussion

- 40% loss of bone graft obtaining pure cancellous graft
- 25% after removing cartilage
- <10% when using whole femoral head[1]
- if no complete integration of the allograft then fibrous ingrowth can provide acceptable stability[2]
- Removing the cartilage is time consuming[3] and expensive (3 or more allografts for every revision)[4]

[1]Bavadekar et al., Acta Orthop Scan 2001; 72: 470-476
[2]Toms et al., JBJS Am 2004; 86: 2050-2060
[3]Bolder et al., Acta Orthop Scan 2003; 74:652-657
[4]Harris et al., J Bone Joint Surg[Am] 1969; 51-A: 737-755

Discussion

- We have previously reported early results similar and comparable to other studies, retaining the articular cartilage (100% survival rate at 3 years)[1]

- Survival at 8.3 years was 94.4%

"Particularly when the supply of allograft and operative time are limited retaining the articular cartilage of the femoral head is a safe and effective alternative to be considered"

[1] *Subramanian et al., Ann R Coll Surg Engl 2010; 92:27-30*

THANK YOU

EYX

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Dual mobility acetabular components for revision of metal on metal total hip arthroplasty

Orthopaedic Clinic - University of Florence

M.Mancini, I. Felici, G. Munz, M. Villano, R. Civinini, M. Innocenti

- Metal on metal total hip arthroplasty was widely implanted in last decades

- It was soon clear that it was associated with high rate o

- Therefore Revision of metal on metal had become more and more common (13%-21%)

- It is extimated a number of duplicated revisions in the n

- Result of revision for metal on metal THA are usually worse than anticipated

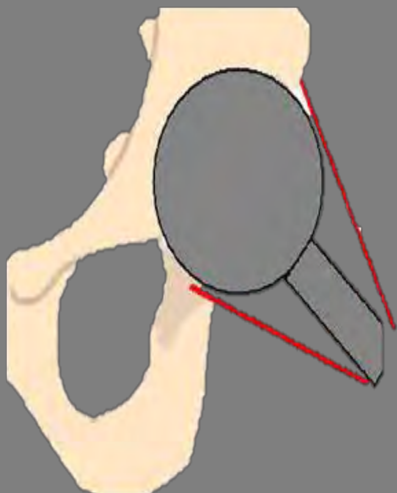
- In MoM the outcomes of revision are generally poor, with up to 50% of patients encountering major complications with dislocation being one of the most frequent .

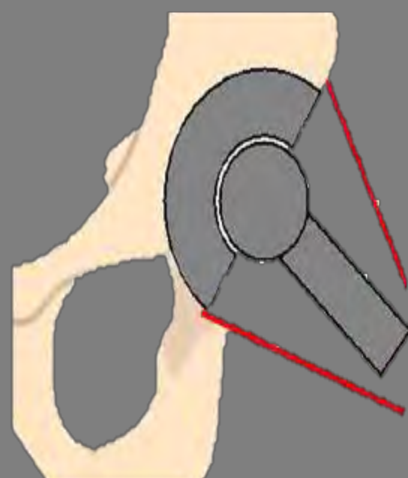
MoM revision dislocation rate

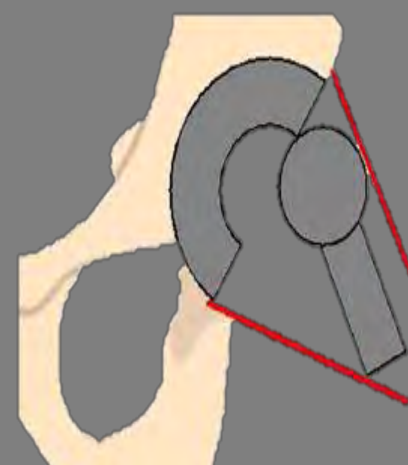
Authors	Cases	Dislocation	Year
Munro et al.	32	28%	2014
G. Grammatopoulos et al.	16	18%	2009
Strykers et al.	107	4%	2015
Matharus et al.	216	7%	2014
Wyles et al.	37	5%	2014

MoM revision is associated with high dislocation rate for :

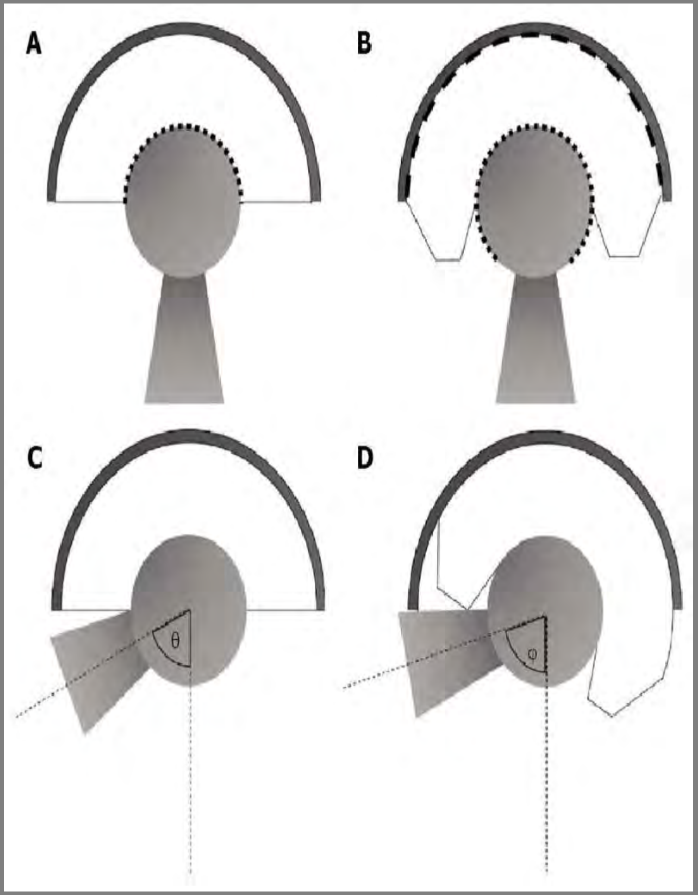
- Large soft tissue debridment
- Decreased femoral head size at revision







Dual mobility THA had a wide range of movement with a low dislocation rate



De Martino - World J Orthop. 2014 Jul 18; 5(3): 180–187

Rationale of use

Isolated acetabular revisions

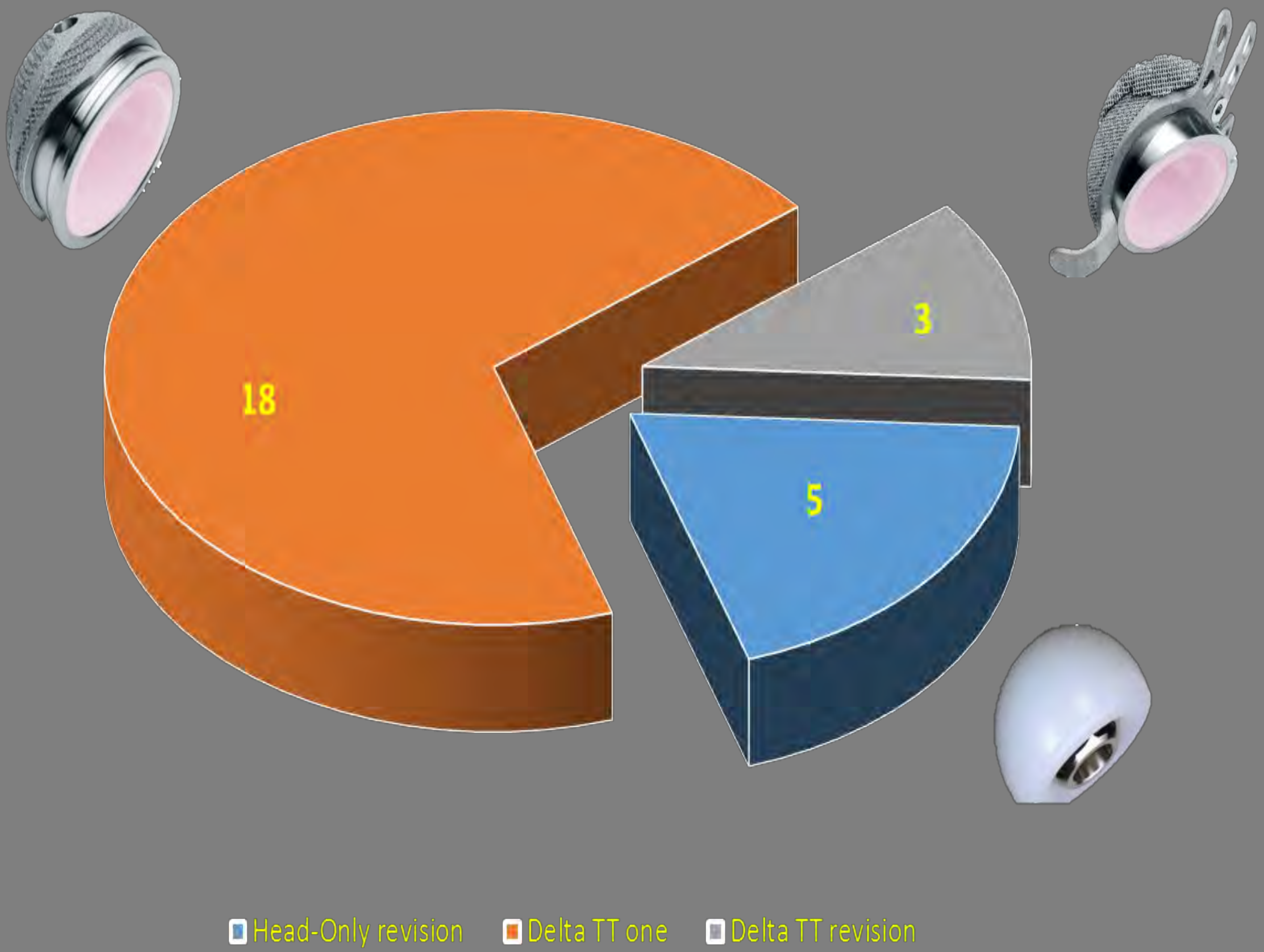
Head-only exchange

Femoral and acetabular component revision

Our experience

23 patients	
Age	73 yrs(56 -83)
Gender	14♀ 9♂
BMI	27,8 (24-31)
Time to Revision	7,4 yrs (2 – 11)
Average Follow Up	3,2 yrs (1-5)

Type of revision



In 16 cases we used morcellized bone

Delta TT One

Delta TT Revision

Trabecular Titanium

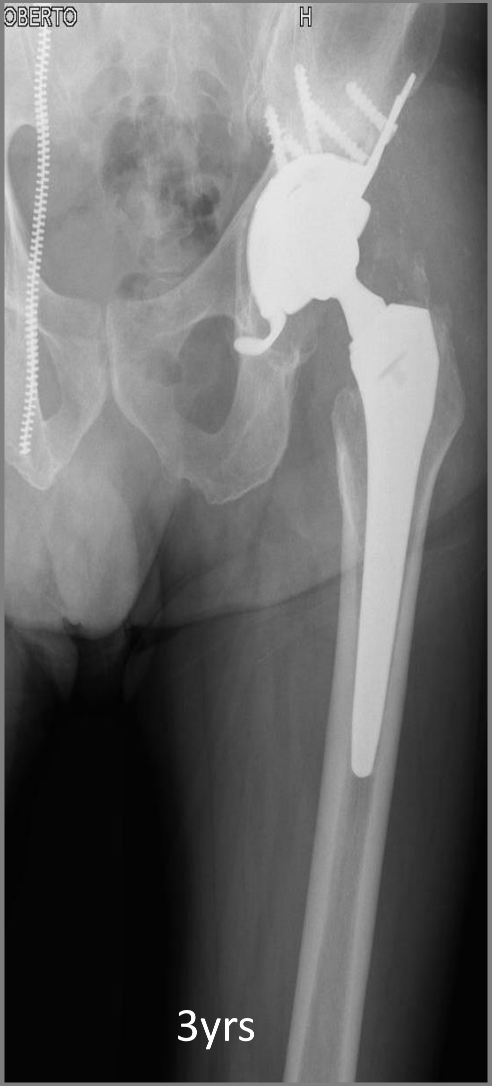
Dual Mobility integrated

Internal spacer system to restore coverage and anteversion

Caudal hook and flanged design

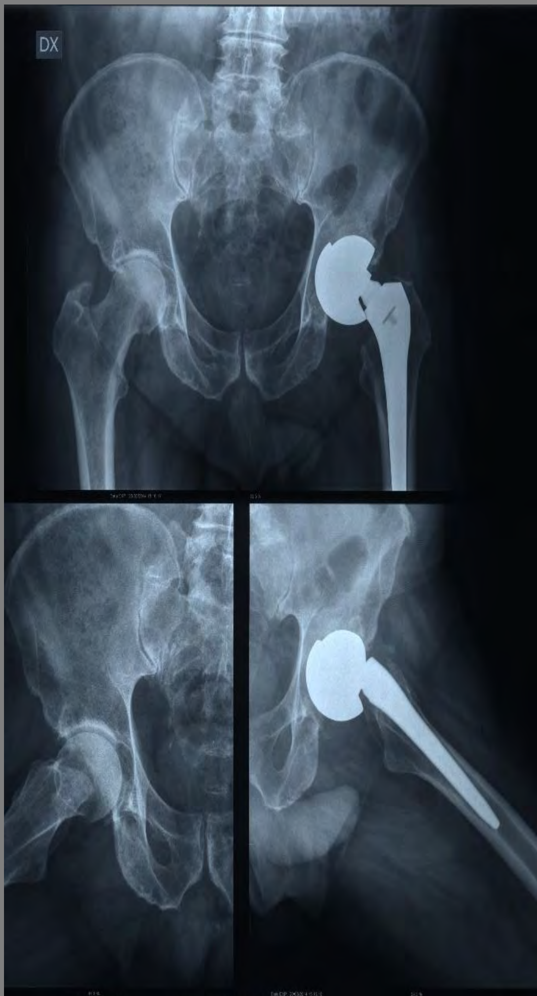
Lima Corporate
Orthopaedic emotion

Delta TT Revision



Male, 73yrs , HHS at 3 yrs 90

Delta TT One



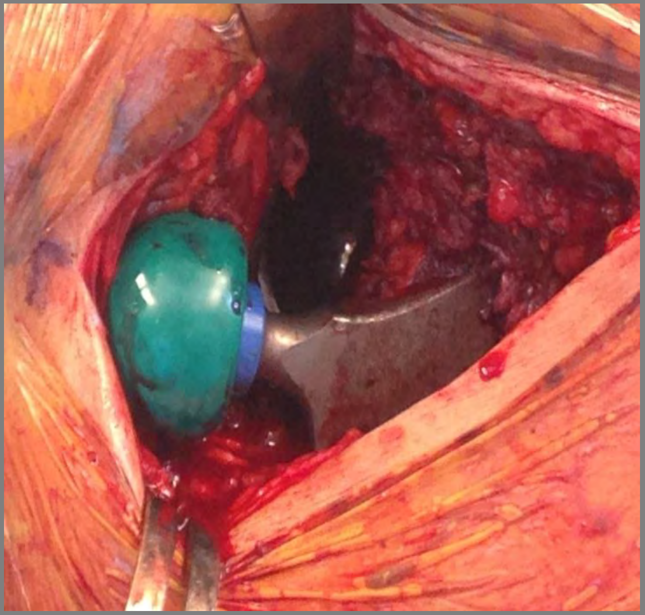
Male, 64yrs , HHS at 4 yrs 92

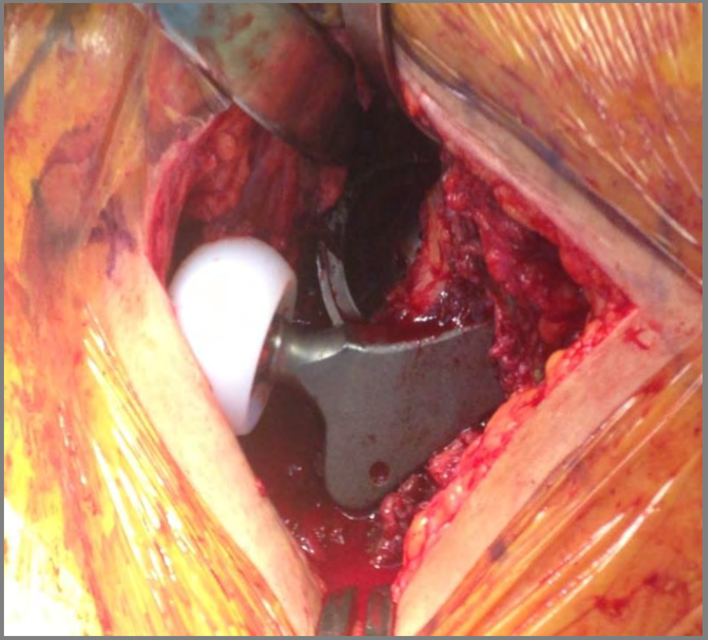
Head- only exchange - Case 1

Female – 65yrs – 7 yrs from primary THA with Biomet M2a Magnum

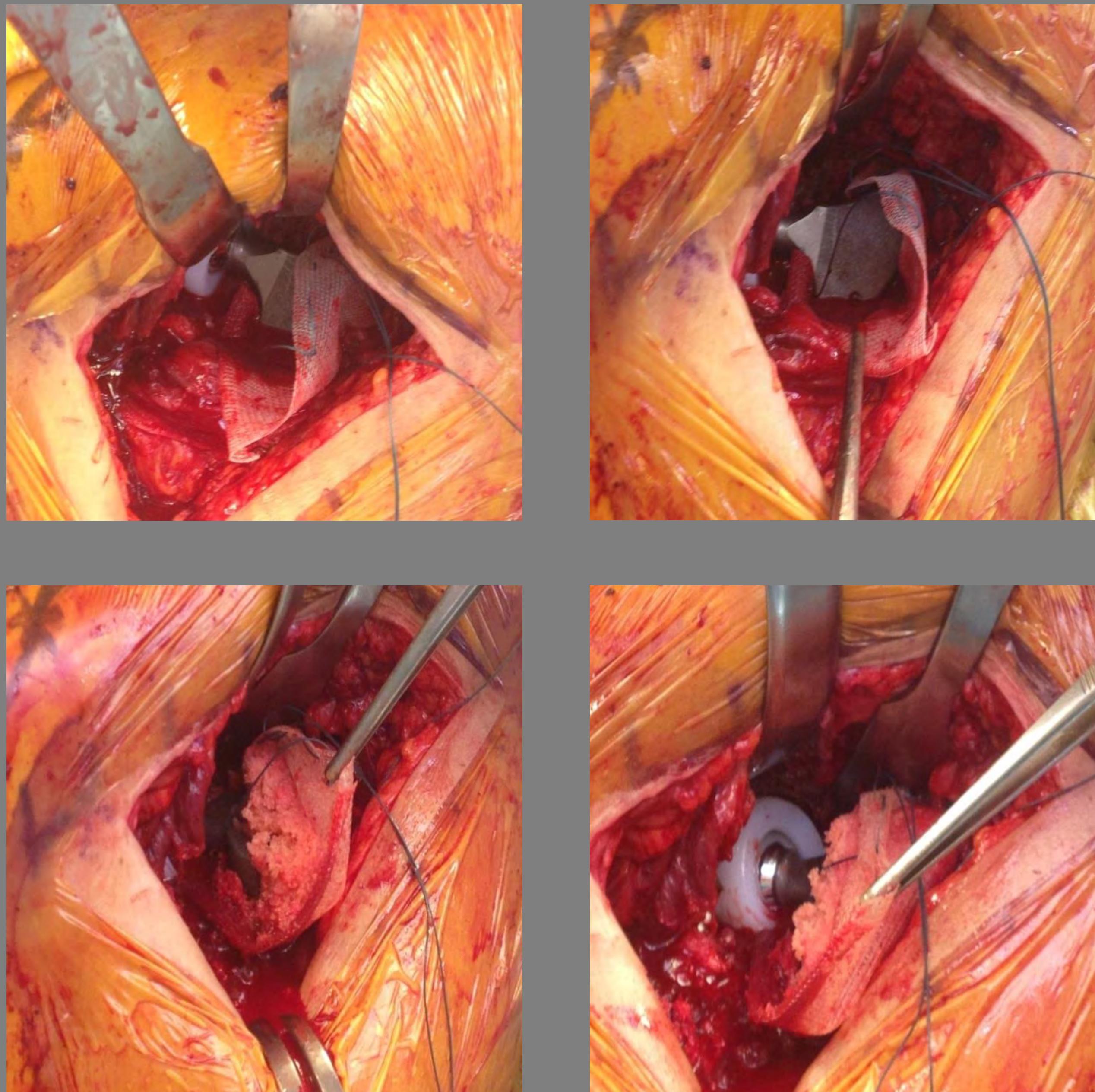
Head- only exchange - Case 2

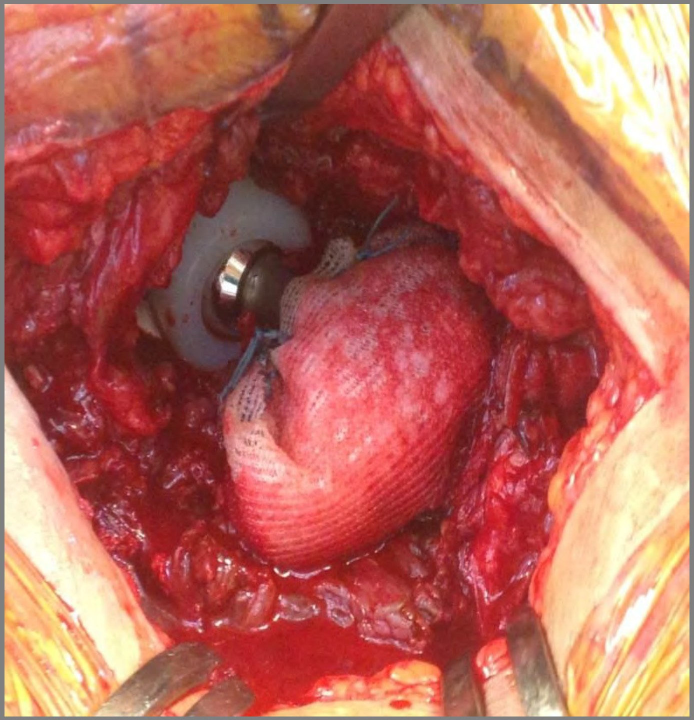
Female – 68yrs – 6 yrs from primary THA with Biomet M2a Magnum




PML3
30cm x 30cm
ECP471
2017-01
PROLENE*
MESH MALLA
TREILLIS RETE
NETZ
Polypropylene Knitted Non-Absorbable Mesh Undyed
Treillis de Polypropylène Tricoté Non Résorbable Incolore
Polypropylen Netz Gewirkt Nicht Resorbierbar Ungefärbt
Rete di Polipropilene Non Assorbibile Non Colorata
Polypropyleen Gevlochten Niet Resorbeerbaar Mesh Ongekleurd
Malla Tejida No Absorbible de Polipropileno Incoloro
ETHICON, LLC.
* Trademark RMC: 385958
US Patent 6287316
•1 Piece •1 Pièce
•1 Stück •1 Pezzo
•1 Stuk •1 Pieza
ETHICON*



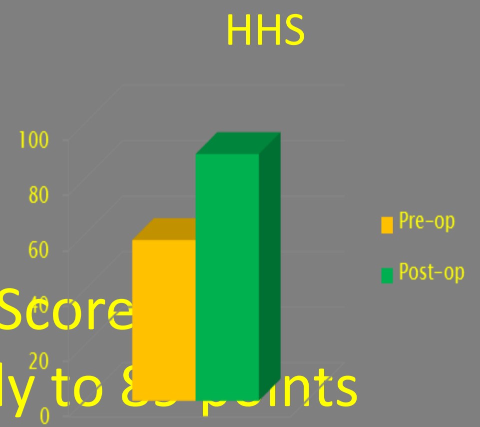



1 2 3 4 5 6 7 8 9 10 11
Devon
OR Products & Safety Solutions
Measurement device is not calibrated. Use for approx.
1 2 3 4

Head-only exchange - Case 2

Results

- None of patients had dislocations



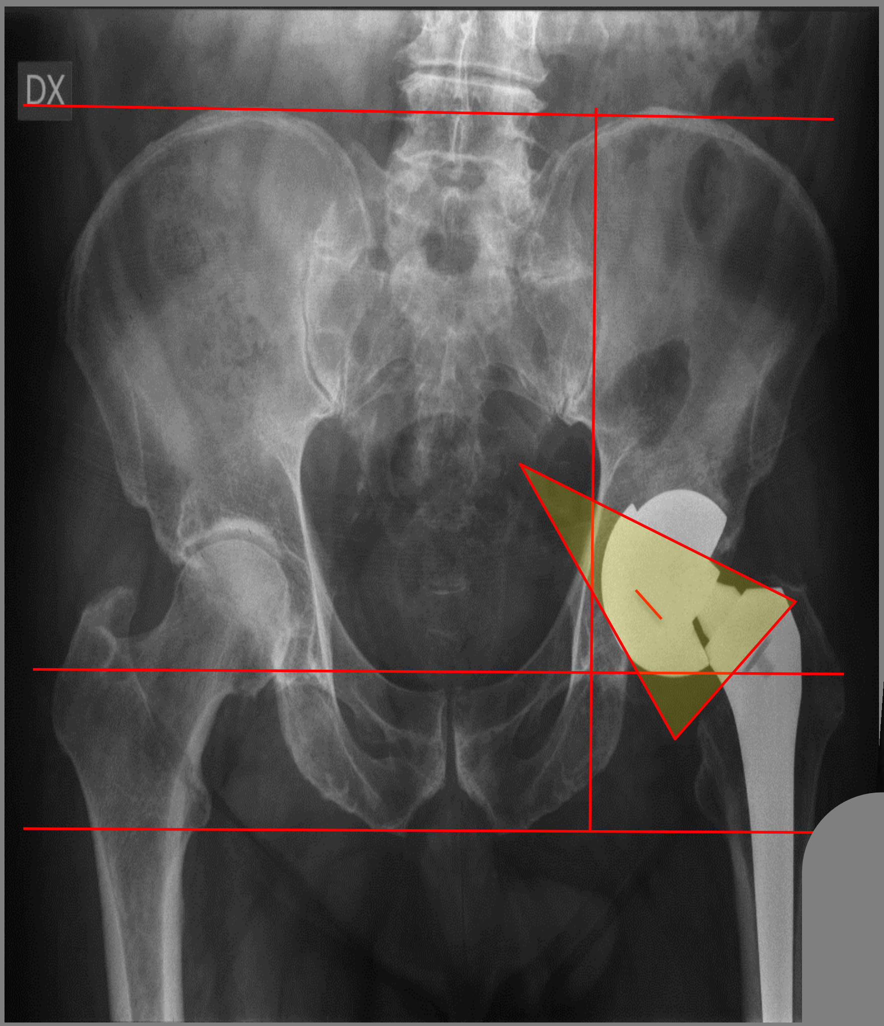
- At final follow-up the mean Harris Hip Score increased from 58 points preoperatively to 8[illegible] points

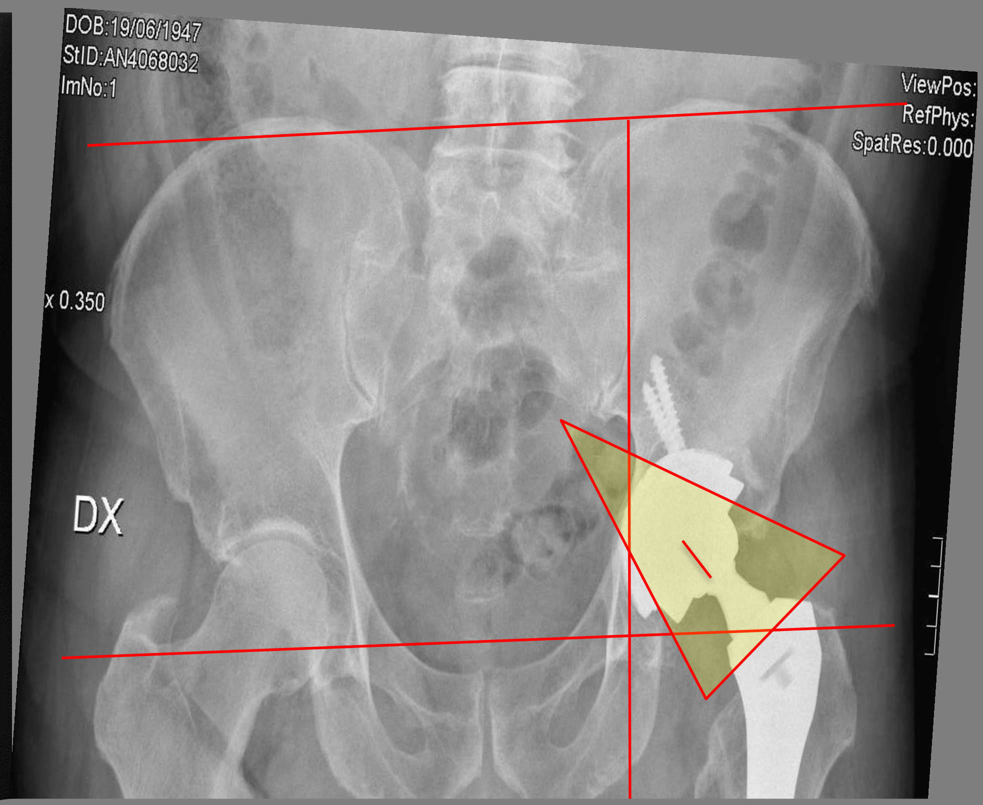
- One hip was treated for infection at 6 months with a successful

- No migration
- No osteolysis
- No loosening

Results

Satisfactory restoration of the rotation center of the hip





Reported complication of the dual mobility system : IPD

Infraprosthetic Dislocation (IPD) is a specific complication of the dual mobility system.

Authors describe an IPD rate from 0,2% to 2%

In our experience : 0% of IPD

Conclusio n

- Frequently in next years we’ll perform a MoM revision

- Complication in MoM revision are common

- Dislocation has an high rate of incidence

- Dual Mobility system has a wide jump distance before dislocate

- In selected cases we can also resolve   the tribologic issue of MoM with a smart , low complication rate, surgery procedure .

Thank
you

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Megaprostheses of the proximal femur: could functional outcome be comparable between oncology and complex revision?

P. Pellegrino, M. Schirò, **A. D'Amelio**, U. Albertini,
M. Boffano, R. Piana,
S.C. Chirurgia Oncologica e Ricostruttiva
CTO - Maria Adelaide. Torino

SALUS SCIENTIA
AZIENDA OSPEDALIERO - UNIVERSITARIA
Città della Salute e della Scienza di Torino

Proximal Femur metastasis

- Frequent and often needing an OPERATIVE TREATMENT
- Metastatic patient: needs to underwent a “DEFINITIVE” surgery
- Target: Implant has to survive more than patient

Treatment in oncology?

right choise

HIP REPLACEMENT

Non-neoplastic conditions

Aseptic loosening from PE debris

Intra/periprosthetic fracture

Megaprostheses

PRO

• Better mechanical stability than conventional THA with a subtrocanteric lysis / loss of bone (GIR 3-4).

• Early mobilization/weight bearing

• Better respect of resection margins with a better control of local desease

CONS

• More local complications

• More risk of infection

• More risk of dislocation

• More expensive in “low demanding” patients

Our cases

From 2006 to 2012 in our department 25 patients were treated with a proximal femur arthroplasty.

20 tumoral desease

5 revision of THA (3 periprosthetic fractures and 2 aseptic loosenings)

Clinical Outcome

Table 2
Summary of PFA Results Showing Complications, Mortality Rates and Hip Scores.

Study	N	Mortality (%)	Re-Operations/ N (%)	Hip Score Before	Hip Score After	Mechanical: Loosening/ N (%)	Mechanical: Dislocation/ N (%)	Mechanical: Component Fracture/N (%)	Mechanical: Periprosthetic #/N (%)	Mechanical: Soft Tissue Problems/N (%)	Non-Mechanical: Infection/ N (%)	Non-Mechanical: Wound Healing/ Hematoma/N (%)
Sim and Chao, 1982 [10]	21	0 (0)	4			1 (5)	3 (14)	1 (5)	1 (5)	0 (0)	1 (5)	0 (0)
Malkani, 1995 [11]	50	3 (6)	16	46^{2}	80^{2}	4 (8)	11 (22)	1 (2)	0 (0)	2 (4)	3 (6)	2 (4)
Haentjens et al, 1996 [18]	19	0 (0)	9		14.9^{5}	1 (5)	7 (37)	0 (0)	0 (0)	0 (0)	2 (11)	0 (0)
Parvizi et al, 2007 [1]	48	3 (15)	10	37.1^{2}	64.9^{2}	0 (0)	8 (17)	0 (0)	0 (0)	0 (0)	1 (2)	0 (0)
Shih et al [20]	12	1 (7)	7	30^{2}	80^{2}	1 (8)	5 (42)	0 (0)	0 (0)	0 (0)	4 (33)	0 (0)
Schoenfeld et al, 2007 [19]	19	2 (11)	3		MDA^{6}	0 (0)	3 (16)	0 (0)	1 (5)	0 (0)	1 (5)	0 (0)
Bertani et al, 2009 [12]	10	1 (13)	4		$16.2/8.6^{1}$	0 (0)	3 (30)	0 (0)	1 (10)	0 (0)	1 (10)	0 (0)
Gebert et al, 2010 [8]	45	8 (38)	8	30^{2}	78^{2}	2 (4)	1 (2)	0 (0)	0 (0)	0 (0)	5 (11)	0 (0)
Sewell et al, 2010 [13]	15	1 (5)	2	18^{2}	69^{2}	0 (0)	2 (13)	0 (0)	0 (0)	1 (7)	2 (13)	1 (7)
				26^{3}	71^{3}							
Al Taki et al, 2011 [4]	63	15 (30)	6	34.9^{7}	54.9^{7}	0 (0)	4 (6)	0 (0)	0 (0)	0 (0)	1 (2)	0 (0)
Mclean et al, 2012 [15]	20	2 (11)	6		68^{3}	0 (0)	3 (15)	0 (0)	1 (5)	0 (0)	2 (10)	0 (0)
					$P53/M61^{4}$							
Dean et al, 2012 [14]	8	0 (0)	0		71.4^{2}	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Colman et al, 2013 [17]	21	2 (40)	8			0 (0)	4 (19)	0 (0)	0 (0)	0 (0)	4 (19)	0 (0)
Lundh et al, 2013 [16]	5	6 (95.2)	2			0 (0)	2 (40)	0 (0)	0 (0)	0 (0)	1 (20)	0 (0)
Total (percentage)	**356**	**44 (12)**	**85 (24)**			**9 (3)**	**56 (16)**	**2 (0.5)**	**4 (1)**	**3 (0.8)**	**27 (8)**	**3 (0.8)**

1 = Musculoskeletal Tumour Society score, 2 = Harris Hip Score, 3 = Toronto Extremity salvage score, 4 = SF-36 physical (P) and mental (M) scores, 5 = Merle Daubigne score, 6 = 11 good, 5 fair, 3 poor, 1 bad, 7 = Oxford hip score.

Korim, Esler, Ashford. **Systematic Review of Proximal Femoral Arthroplasty for Non-Neoplastic Conditions.** *The Journal of Arthroplasty 29 (2014) 2117–2121*

More local complications?

- Wound healing problems or high blood loss resulting in significant hematomas were reported as extremely rare (0,8%)

Korim, Esler, Ashford. **Systematic Review of Proximal Femoral Arthroplasty for Non-Neoplastic Conditions.** *The Journal of Arthroplasty 29 (2014) 2117–2121*

- Wound healing problems rate in neoplastic pts: 3%

R. Capanna et al. **What Was the Survival of Megaprostheses in Lower Limb Reconstructions After Tumor Resections?** *Clin Orthop Relat Res (2015) 473:820–830*

More risk of infection?

- Infection rate for non-neoplastic pts: **8%** (0-33%)

Korim, Esler, Ashford. *The Journal of Arthroplasty 29 (2014) 2117–2121*

- Infection rate for neoplastic pts: **9,4%**

P. Ruggieri et al. *Journal of Surgical Oncology 2013;108:403–408*

- Infection rate for ORIF: 3,8 to **8,3**

Moore et al. *The Journal of Arthroplasty 29 (2014) 872–876*

More risk of dislocation?

- Dislocation rate in non-oncological pts: **16%** (0-42%)

Korim, Esler, Ashford. *The Journal of Arthroplasty 29 (2014) 2117–2121*

- Dislocation rate in neoplastic pts: **5%** to **25%**

A. Streitbürger et al. *Unfallchirurgie 2014 · 117:607–613*

More expensive?

- **Proximal femural replacement** (for metastatic patients) £ **18002**

Ashford et al. **Proximal femoral replacements for metastatic bone disease: financial implications for sarcoma units**. *International Orthopaedics (SICOT) (2010) 34:709–713*

- **ORIF** (for periprosthetic fractures) £ **24834**

Phillips et al. **What is the financial cost of treating periprosthetic hip fractures?** *Injury, Int. J. Care Injured 42 (2011) 146–149*

Prospectives

- Better define indications
- Improve use of Coated Implants
- Improve use of DM sockets or Constrained Liners
- Reduce the re-intervention rate (23%)


Thank You!

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

BHS & SIDA

Milano, 26-27 november 2015

Cages and related solutions

F Fischer M d'Imporzano

ISTITUTO AUXOLOGICO ITALIANO

Istituto di ricovero e cura a carattere scientifico

Presidio Ospedaliero Capitanio, Milano

GREAT ACETABULAR REVISION

- removal of the failed implant

- evaluation of the remaining bone stock and it’s reconstruction

- new implant

normal hip

Be aware of any damage during removal of the failed implant that determines the choice of the type of prosthesis

new grading of bone loss

OPTIONS

BONE RESTORATION

GAP IS FILLED BY *BONE GRAFT*

- ✓ impaction grafting + cement
- ✓ impaction grafting - cement
  (+ cage, stemmed cup, etc)
- ✓ massive structured allograft (?)

OPTIONS

BONE SUBSTITUTION

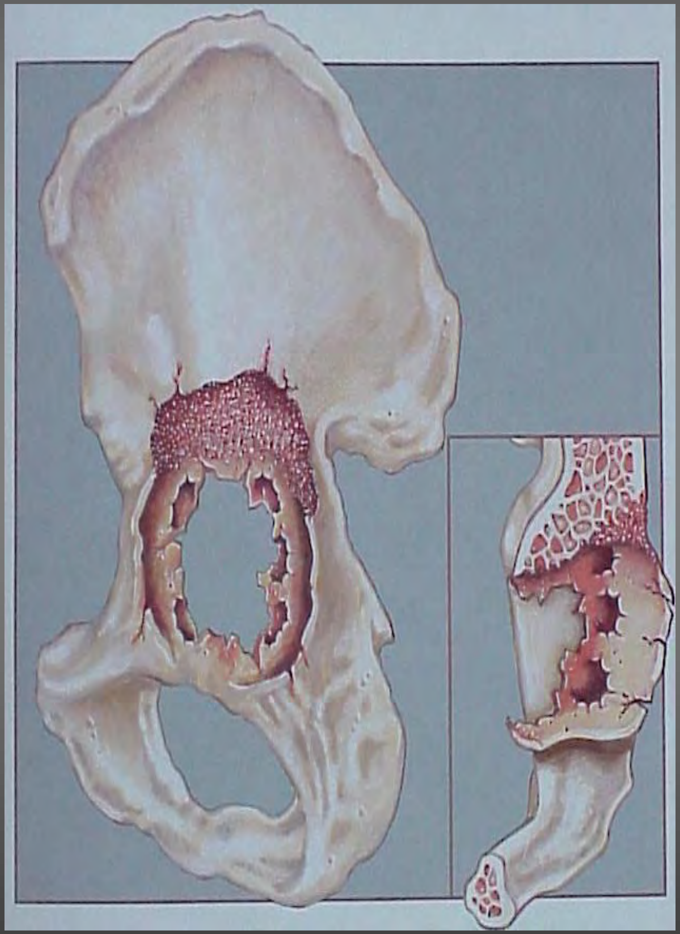
GAP IS FILLED BY *IMPLANT*

- ✓ standard hemispherical cups
- ✓ cement filling (+ cage, poly primary cup...)
- ✓ jumbo – cup (66 – 80mm)
- ✓ oblonged cups
- ✓ augmentation

GREAT ACETABULAR REVISION

In the AIR classification the great acetabular revisions with important bone loss are...

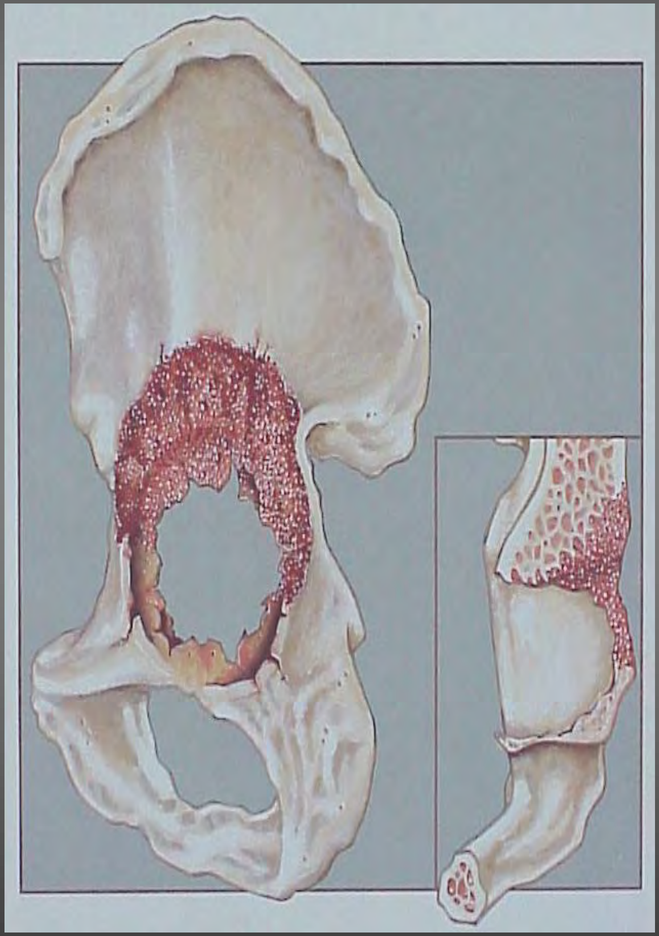
GRADE III



Eccentric enlargement of the acetabular cavity

loss of more than 1 wall

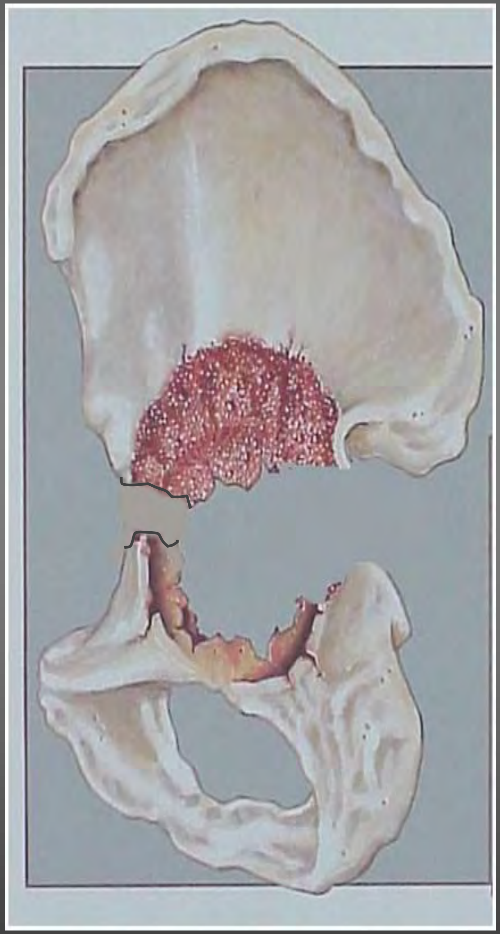
GRADE IV



Massive periacetabular bone defect

often protruded

GRADE V



Massive periacetabular bone defect

instability of residual elements

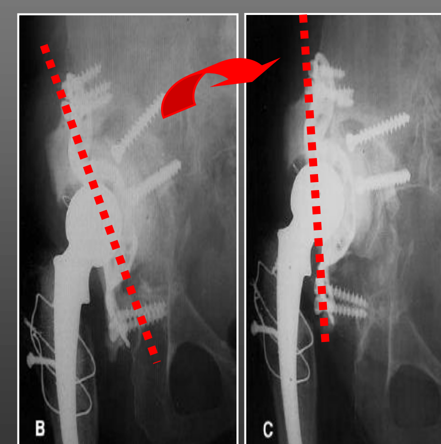
CASE SERIES

IST. ORTOPEDICO G. PINI MILANO
1987 - 1995

71 casi

Revision after	5 yrs	11%	(8 cases)
Revision after	10 yrs	16%	(12 survive

4 DISLOCATION
3 LOOSENING
2 INFECTION
2 BREAKAGE
1 HAEMATOMA

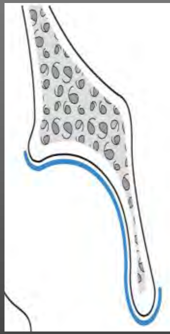
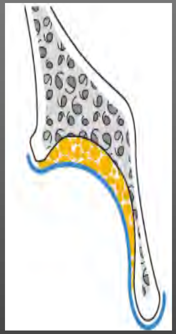


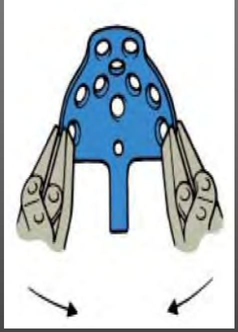
MÜLLER RING

- M. E. MÜLLER 1977
- 12 sizes (36 – 58 mm)
- proximal holes
  fixation with 3 – 5 screws
- for cavitary defects / dome
  - primary THA
    poor bone stock
  - revision
  - DDH

GANZ CAGE

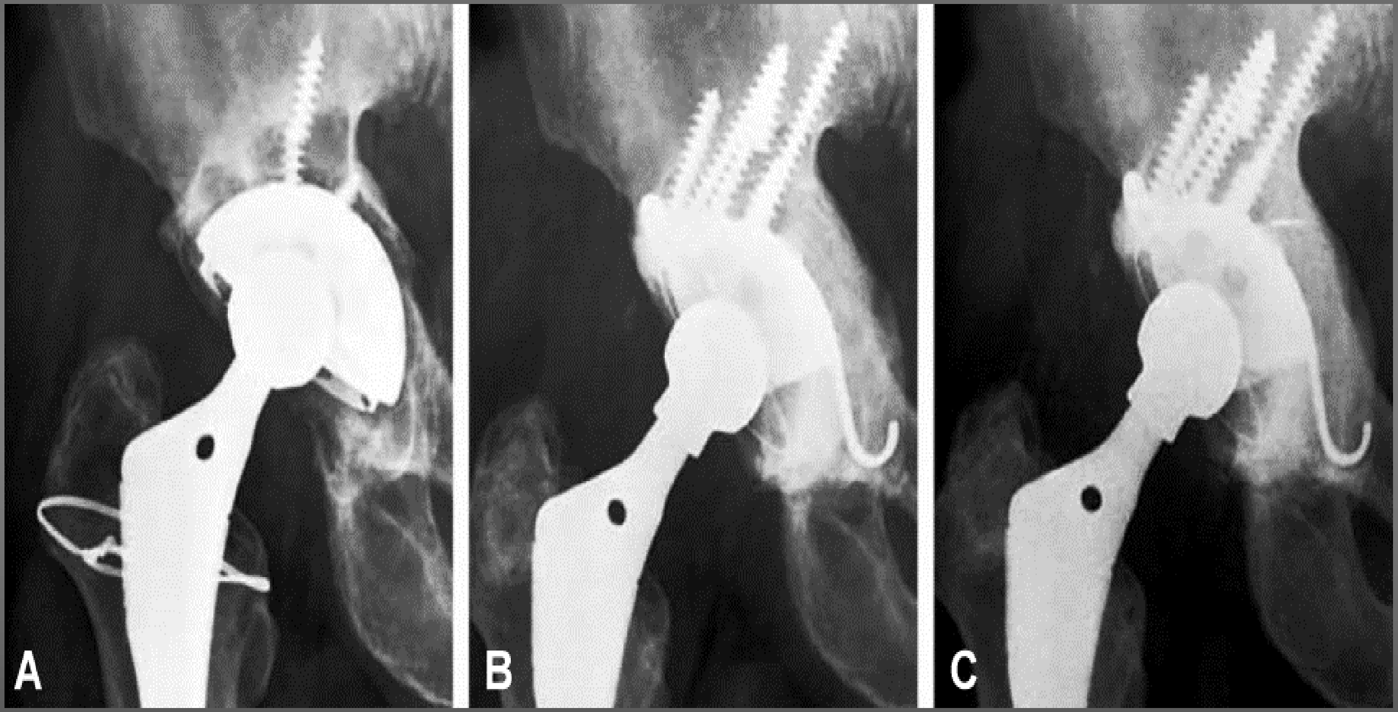




- GANZ 1986
- 15 sizes (36 – 64 mm)
- hook in obturator foramen
  Increases stability, determines an anatomic position and absorbes cranial stress (graft protection)
- for acetabular defects with
  closed obturator foramen

GANZ

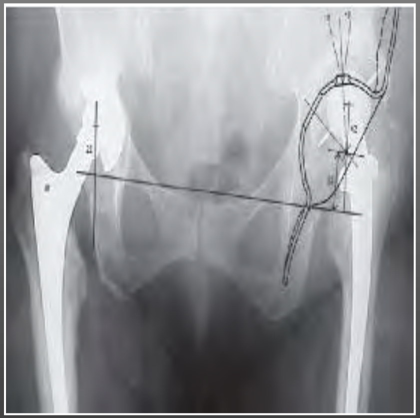


Sang Joon Kwak et al J Korean Hip Soc.

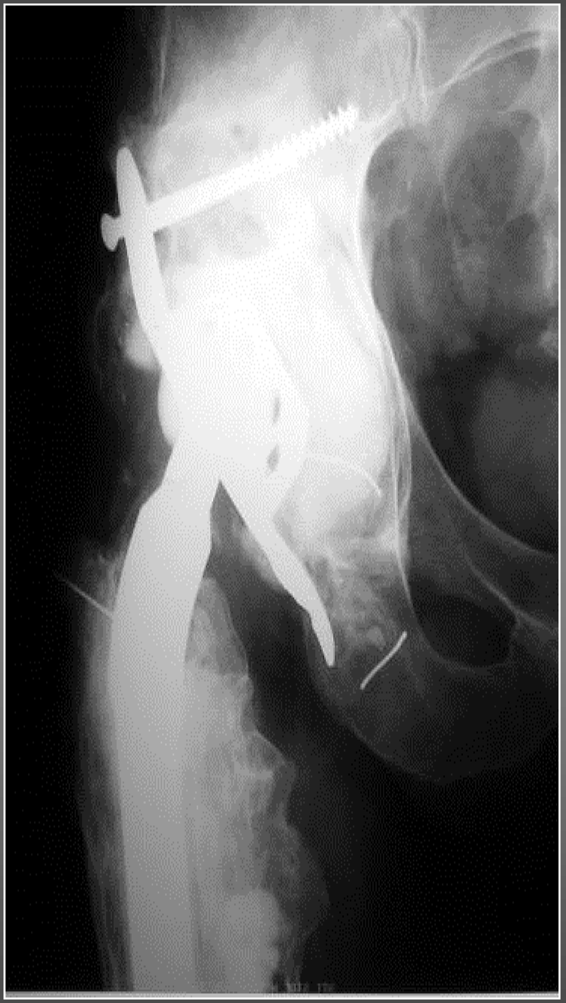
KERBOULL

Kawanabe k, Akiyama H,Onishi E, Nakamura T (2007) JBJS

BURCH - SCHNEIDER



- R. SCHNEIDER 1974
- 4 sizes (44 – 56 mm)
- cranial flange for screws, inferior nose for fixation in/on sciatic bone
- for the major acetabular defects (cavitary, segmental, or combinations)
- major surgical



INDICATIONS

GIR 1 GIR 2 GIR 3 GIR 4

PRO’S

- RESTORE HIP ROTATION CENTER
  (ECCEPT MÜLLER)

- GRAFT PROTECTION DURING INTEGRATION

Gross AE, Wong P, Saleh KJ (2000) Orthopedics 23; 973-974

- LINER VERSION INDEPENDENT OF CAGE POS

- POSSIBLE USE OF AB-LOADED CEMENT

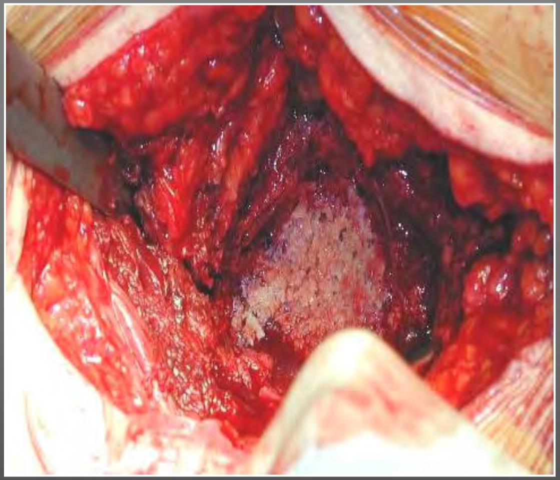
- LOW COST (vs SPECIAL IMPLANTS)

PRO'S

- PENETRATING CEMENT DOES NOT HAVE ANY CONTACT WITH THE HOST BONE, BUT WITH THE GRAFT

  " CEMENTLESS DEVICE "

- AFTER FAILURE POSSIBLE REVISION WITH A NON-CEMENTED IMPLANT DUE TO THE RESTORATION OF BONE STOCK



Goodman S, Saastamoinen H, Shasha N, Gross A (2004) J Arth

CON'S

IN THE PAST:

- SMOOTH METAL SURFACE DOES NOT STIMULATE THE INTEGRATION / ONGROWTH AND INCREASES MOBILISATION *Berry DJ (2004) CORR 420;106-112*

- FATIGUE FRACTURES OF THE DEVICE

- SICURE FIXATION OF THE INSERT?

CON'S

TODAY:

EVOLUTION OF THE IMPLANTS:

- TITANIUM ALLOYS
- POROUS SURFACES

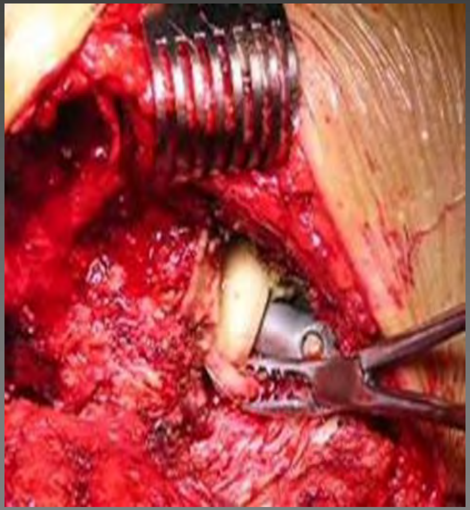
SEEM TO HAVE SOLVED THE PROBLEMS OF THE PAST

♂ 1939

McKee

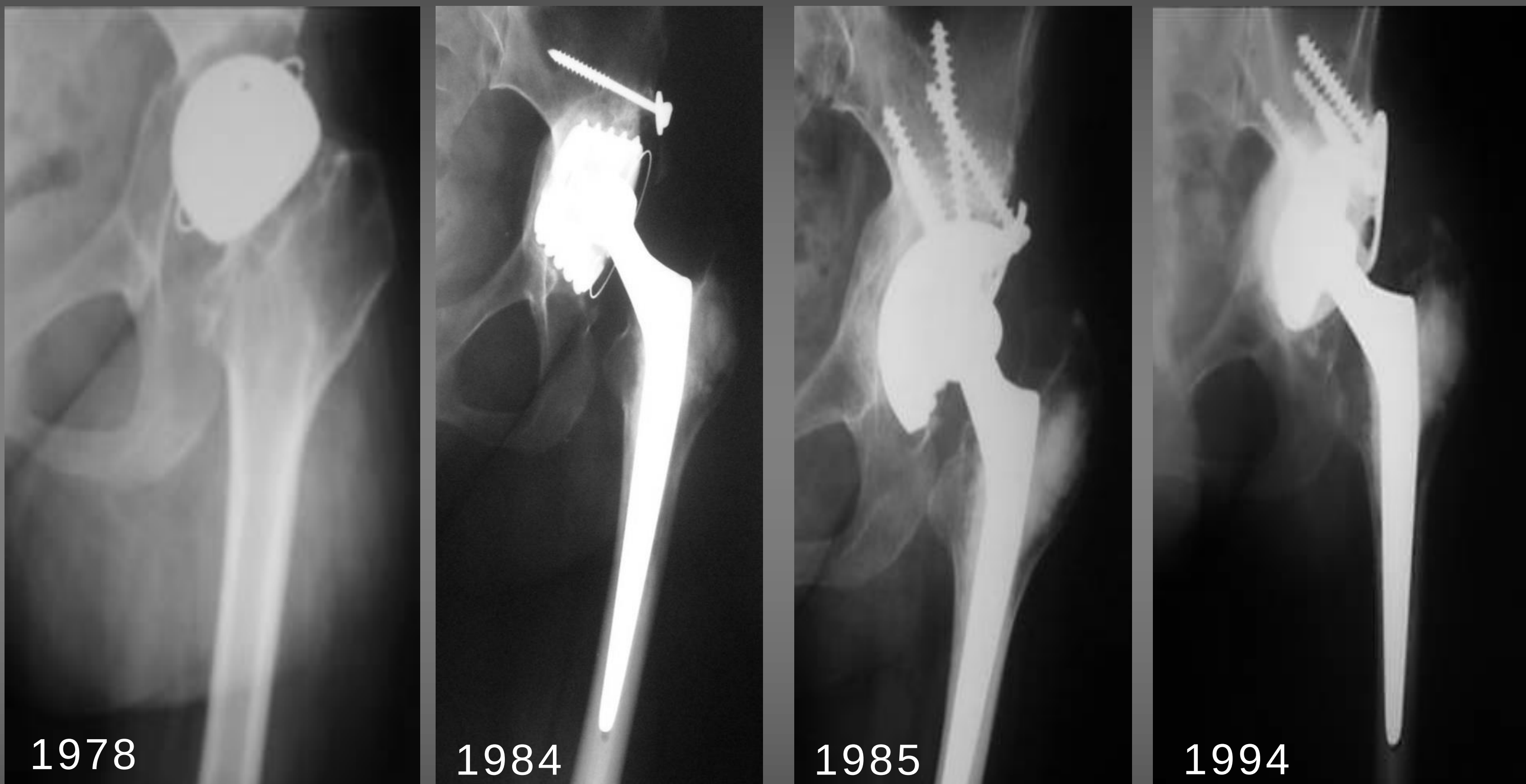
Burch-Schneider
Wagner stem
A 9yrs

a 13 yrs




3 yrs

♀ 1945

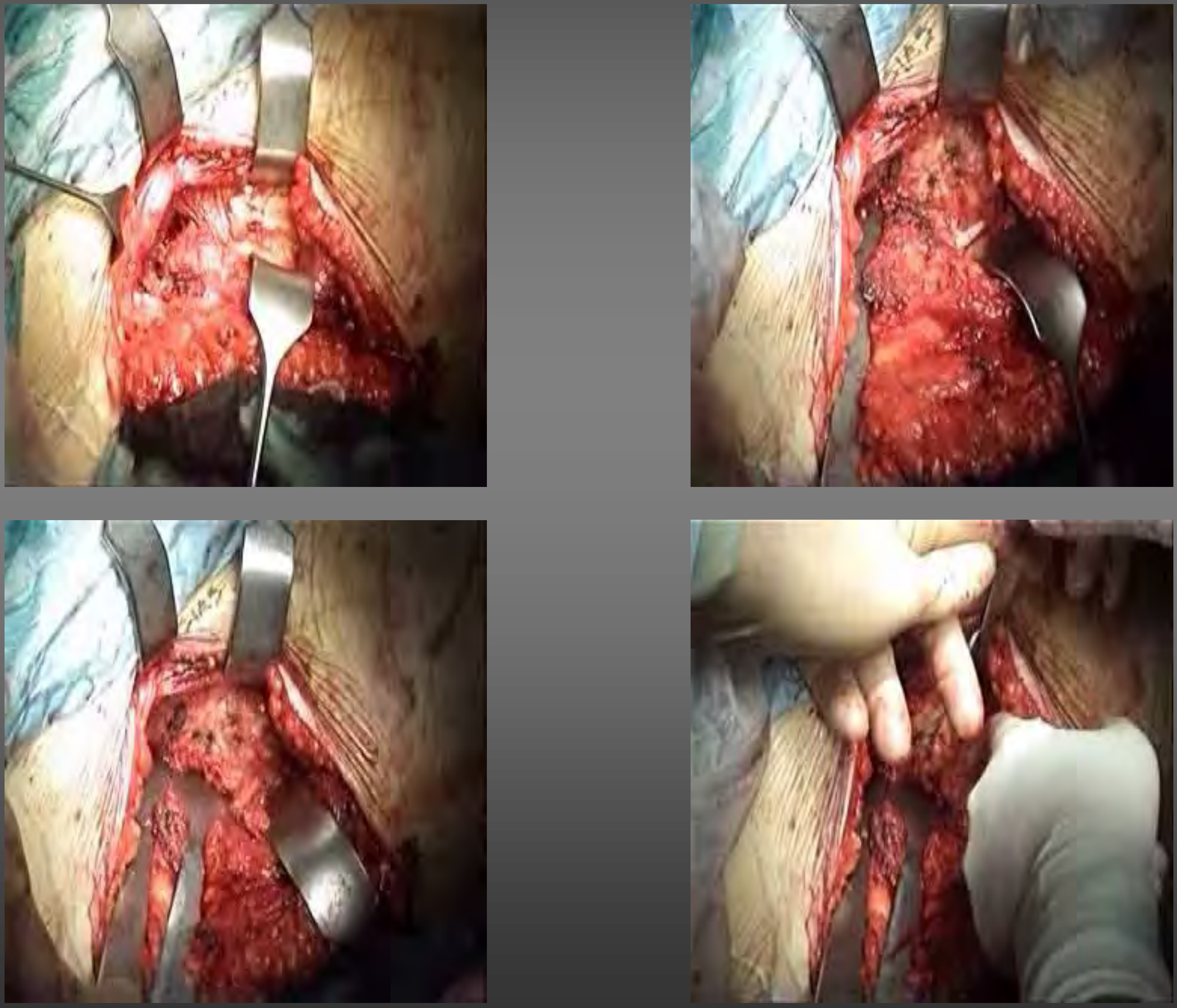


Wagner Mueller Mueller ring

HOWEVER...

today we prefer the reconstruction of the bone loss with morselized or structured bone grafts

SURGICAL ACCESS

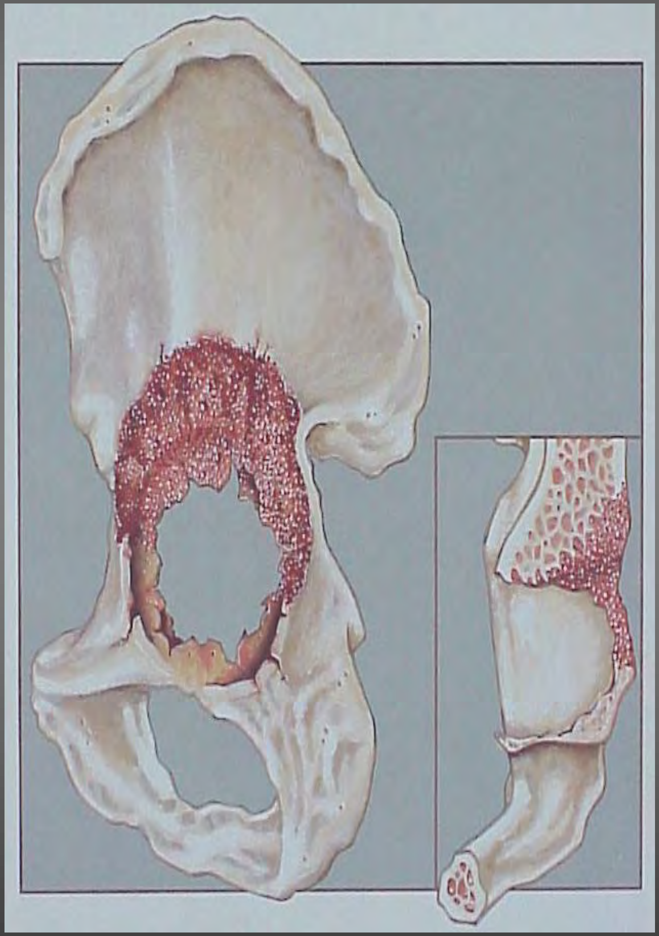


THE GREAT ENDOPELVIC

H
E
A
D

the anterior approach by Smith-Petersen offers a medial window between iliopsoas and the iliac wing – often very useful

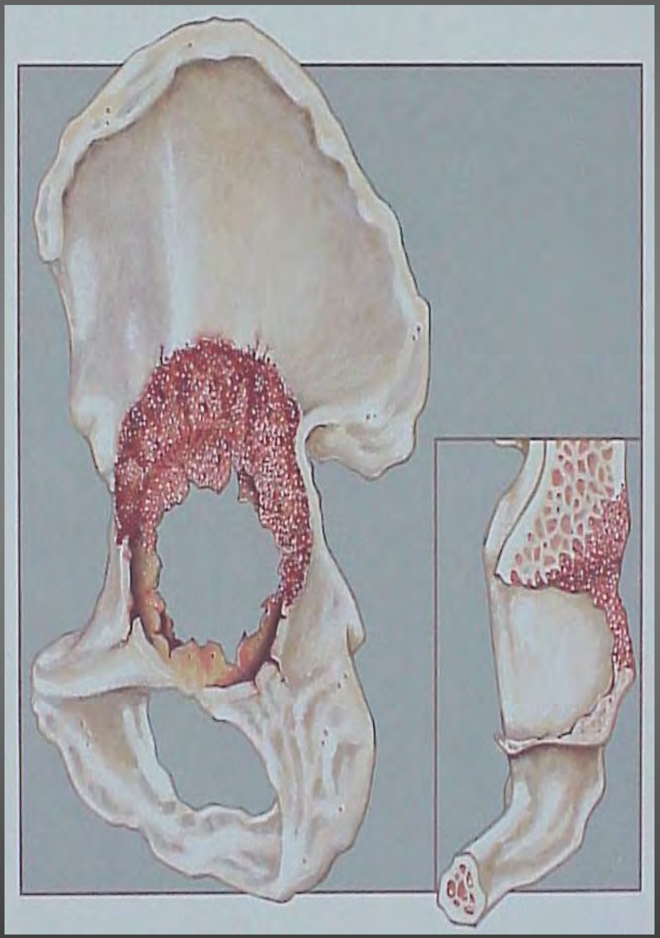
GRADE IV



Massive periacetabular bone defect

often protruded

GRADE IV



INDICATION:

- stemmed cup
- cup or cage with a supra-infra-acetabular fixatio
- trabecular titanium multi-hole

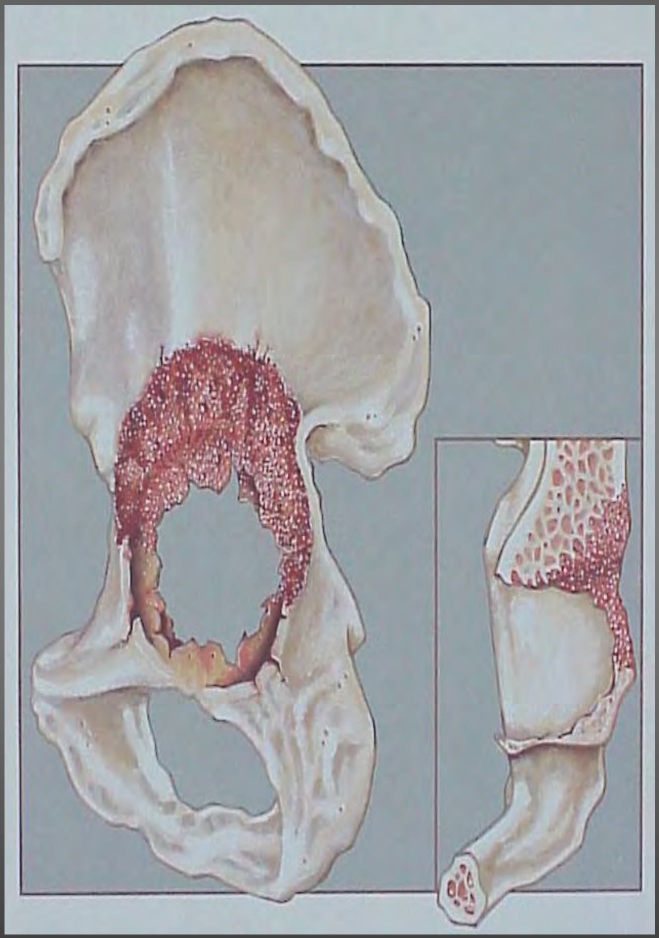
DEDICATED APPROACH + BONE GRAFT (MASSIVE) TO RECREATE THE ACETABULAR WALLS

♂ 1927

Post-op

7 aa

GRADE IV



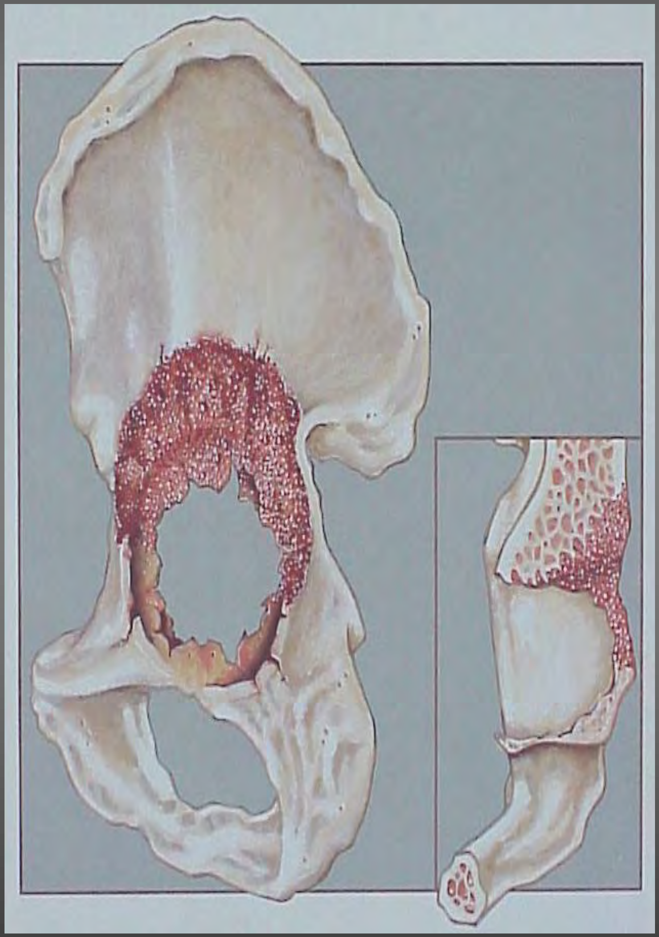
INDICATION:

- stemmed cup
- cup or cage with a supra-
  infra-acetabular fixatio
- trabecular titanium
  multi-hole

DEDICATED APPROACH +
BONE GRAFT (MASSIVE) TO RECREATE THE ACETABULAR WALLS

♀ 1930

GRADE IV



INDICATION:

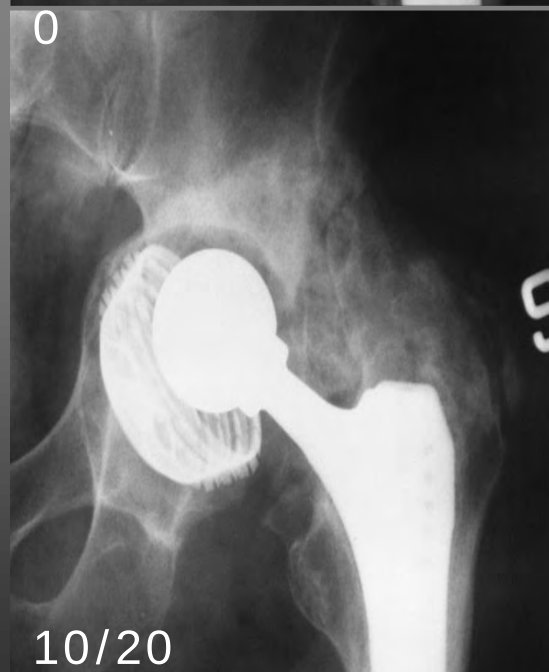
- stemmed cup
- cup or cage with a supra-
  infra-acetabular fixatio
- trabecular titanium
  multi-hole

DEDICATED APPROACH +
BONE GRAFT (MASSIVE) TO RECREATE THE ACETABULAR WALLS

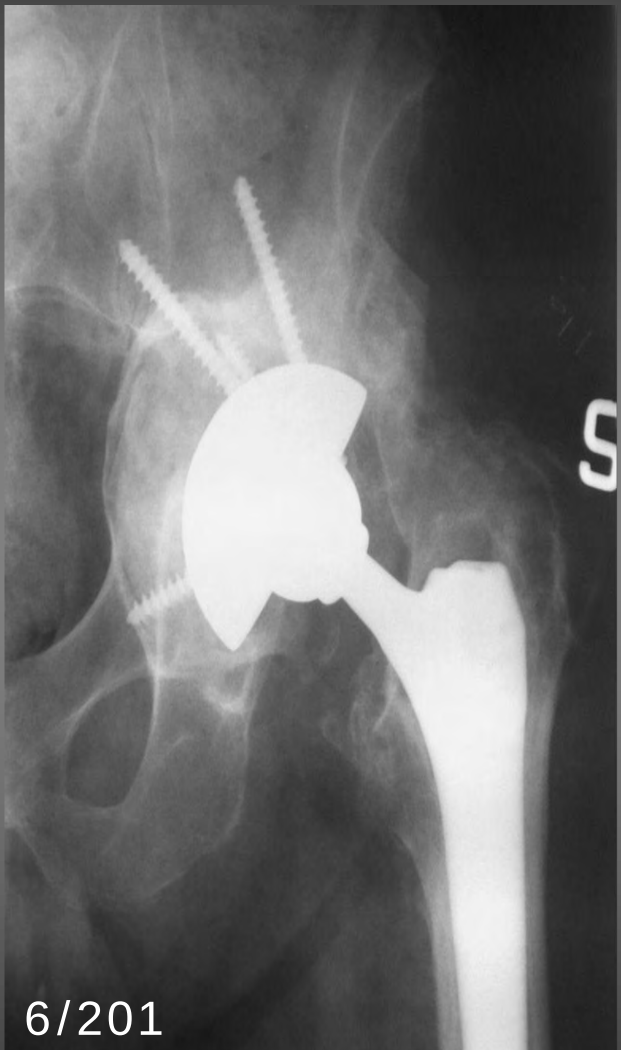
♂ GA 1942

1/2010

7/2010



10/2010



6/2013

SURGICAL TECHNIQUE
STRENGTH OF BONE GRAFT

THE DEFATTED BONE IS MORE STABLE AND HAS MINOR IMMUNOLOGICAL ACTIVITY

DEFATTING

G. Ullmark, Uppsala University, 2001

SURGICAL TECHNIQUE

PRESSURIZATION OF BONE CHIPS

The mechanical stability of the graft bed dipends on the diameter of the morselized fragments

(acetabulum 7-9mm)

...major is the strength of pressurization, minor will be the migration of the cup...

G. Ullmark, Uppsala University, 2001

SURGICAL TECHNIQUE

PRESSURIZATION OF BONE CHIPS

The mechanical stability of the graft bed dipends on the diameter of the morselized fragments

(acetabulum 7-9mm)

...an eccessive compaction reduces the possibility of ingrowth of the morselized graft and it's incorporation

G. Ullmark, Uppsala University, 2001

TO ACHIEVE IN MAJOR BON

- STABILITY OF THE ACETABULAR WA
- STABILITY OF THE GRAFT
- STABILITY OF THE IMPLANT

- RESISTANCE OF THE DOME

- RECREATE ACETABULAR CONTAINMENT (STRUCTURED GRAFT)

- FIX > 50% OF THE SURFACE OF THE CUP TO SOLID HOST BONE

STRUCTURAL ALLOGRAFT

- Stability of <u>massive graft </u>is mandato
  mechanical support

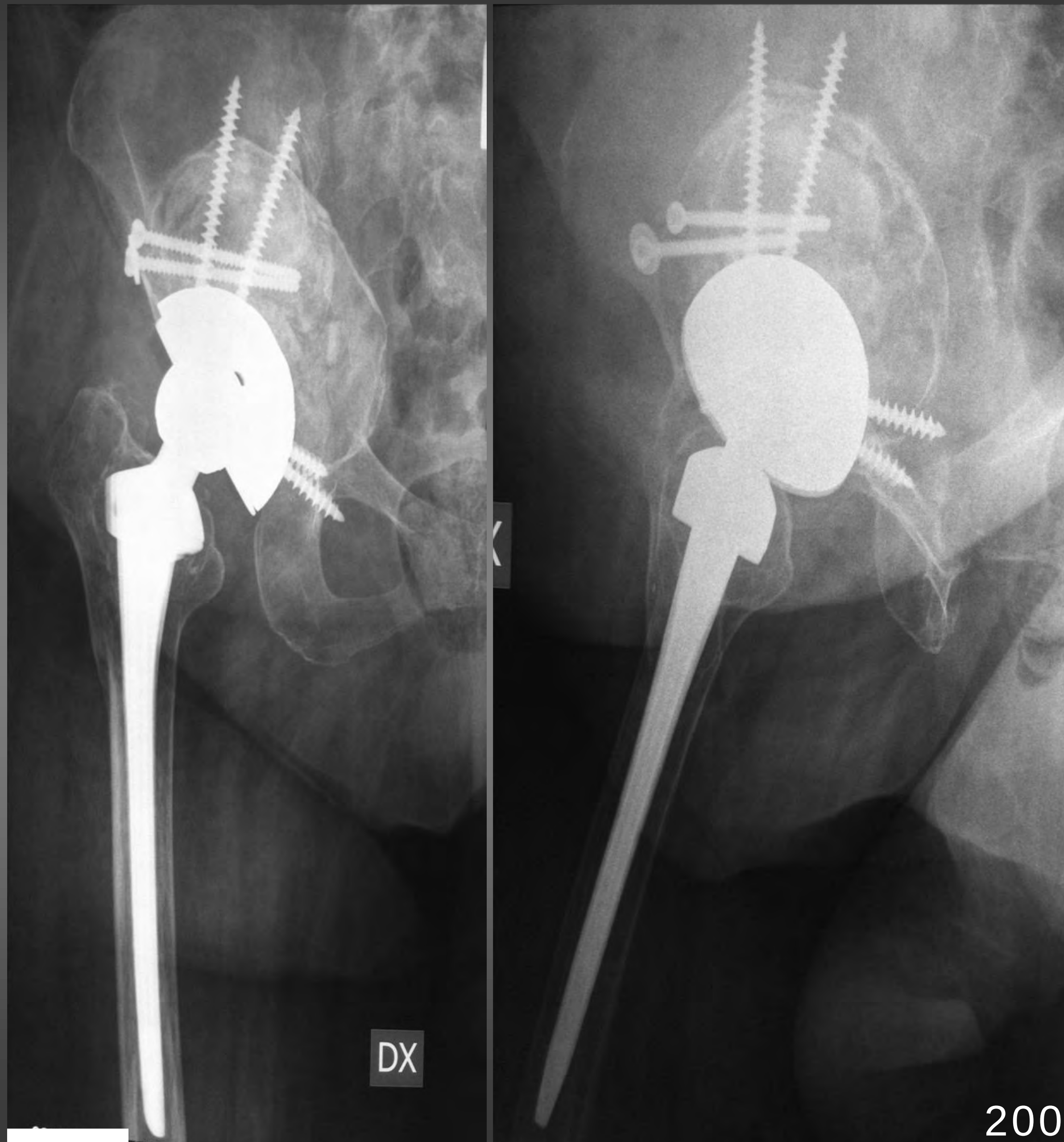
- The graft has to be loaded

- The graft gets sufficiently involved but not completely incoroporated

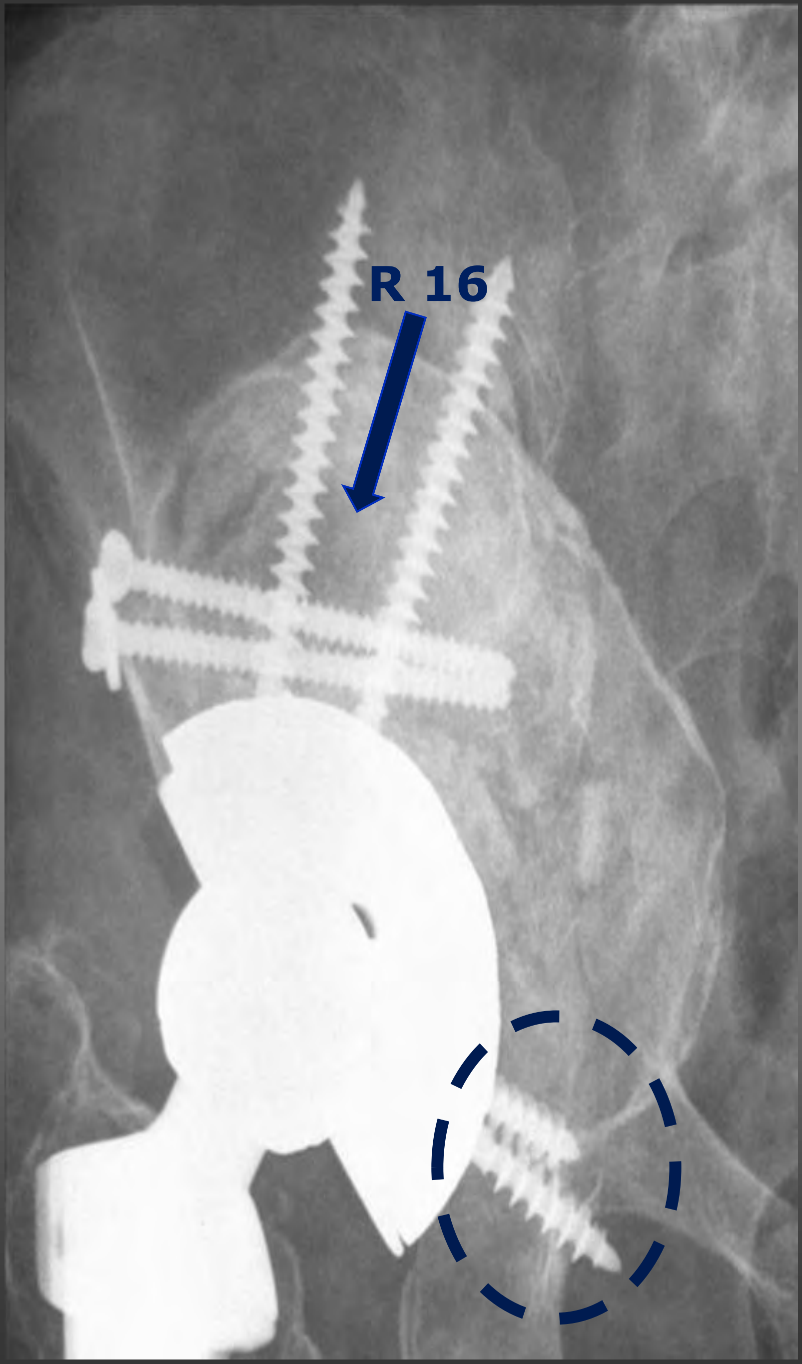
Enneking WF et al (2001) J Bone Joint Surg Am 83-A(7):971–986


8aa


18aa



2007

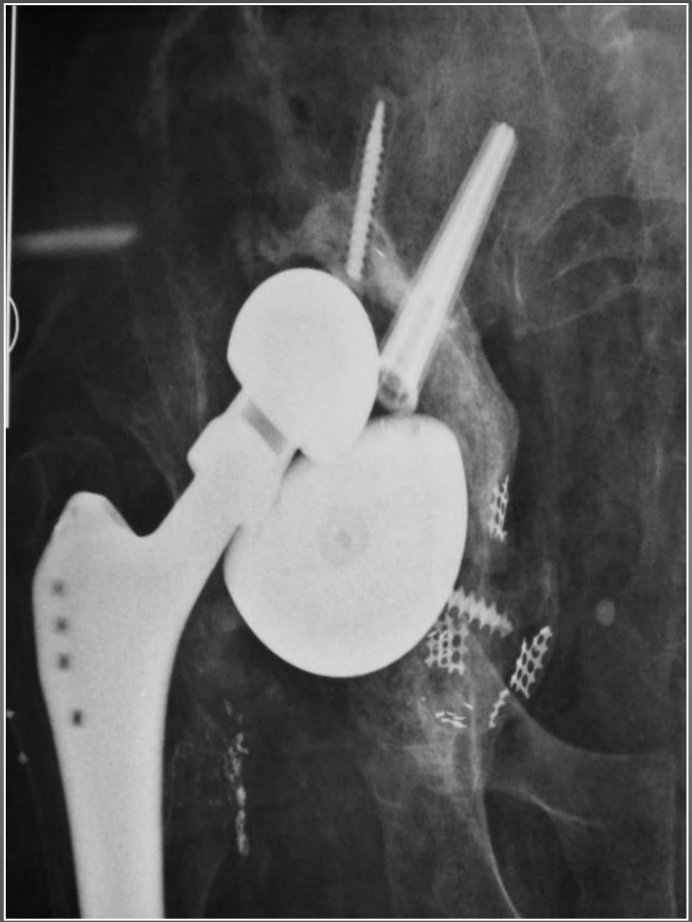


THE GRAFT HAS TO BE LOADED

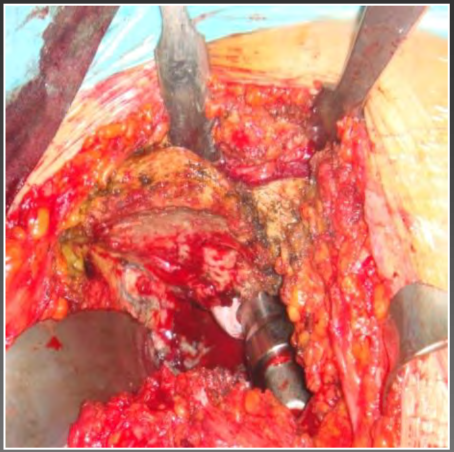
DISTAL FIXATION IS FUNDAMENTA
L

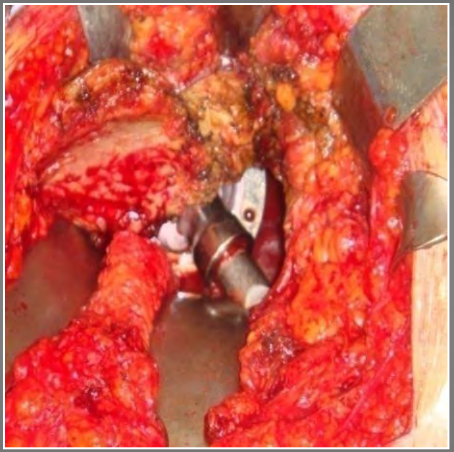
6aa

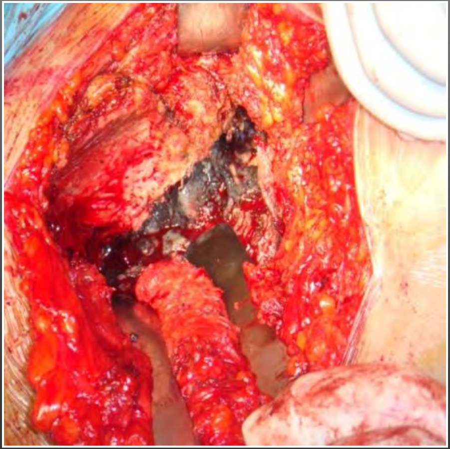
♂ GA 1947



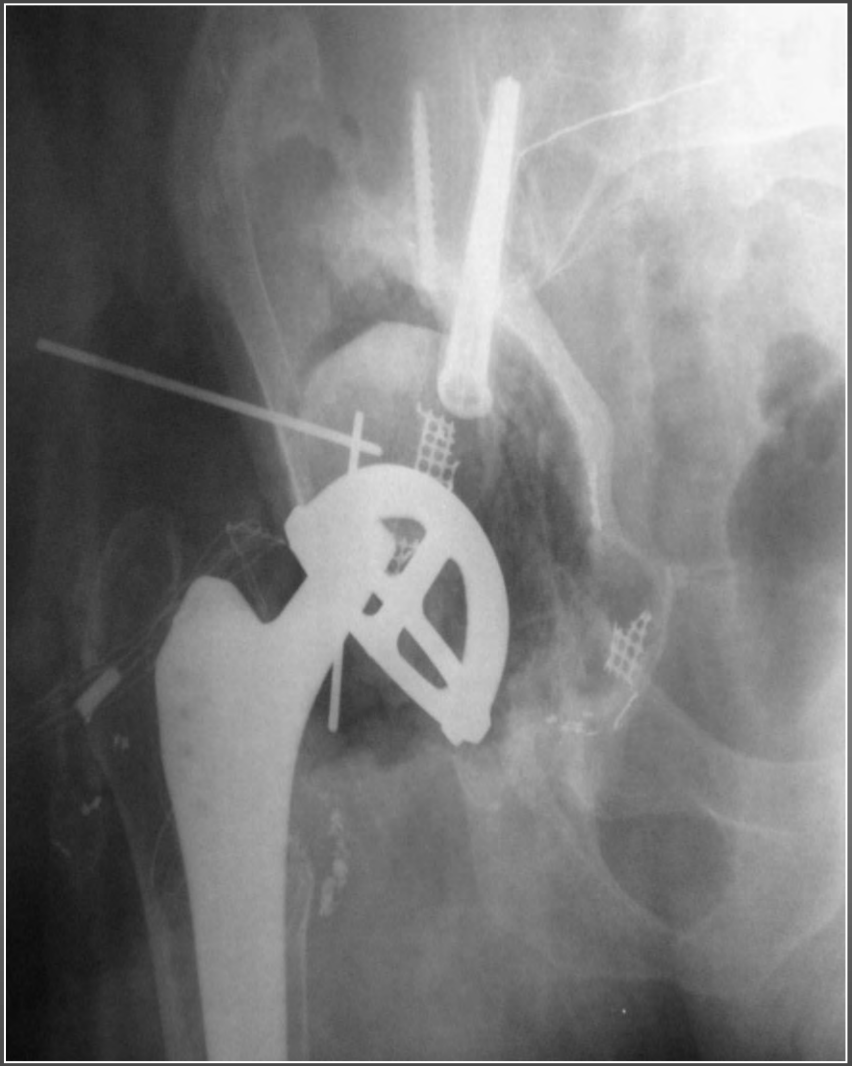
11/2008



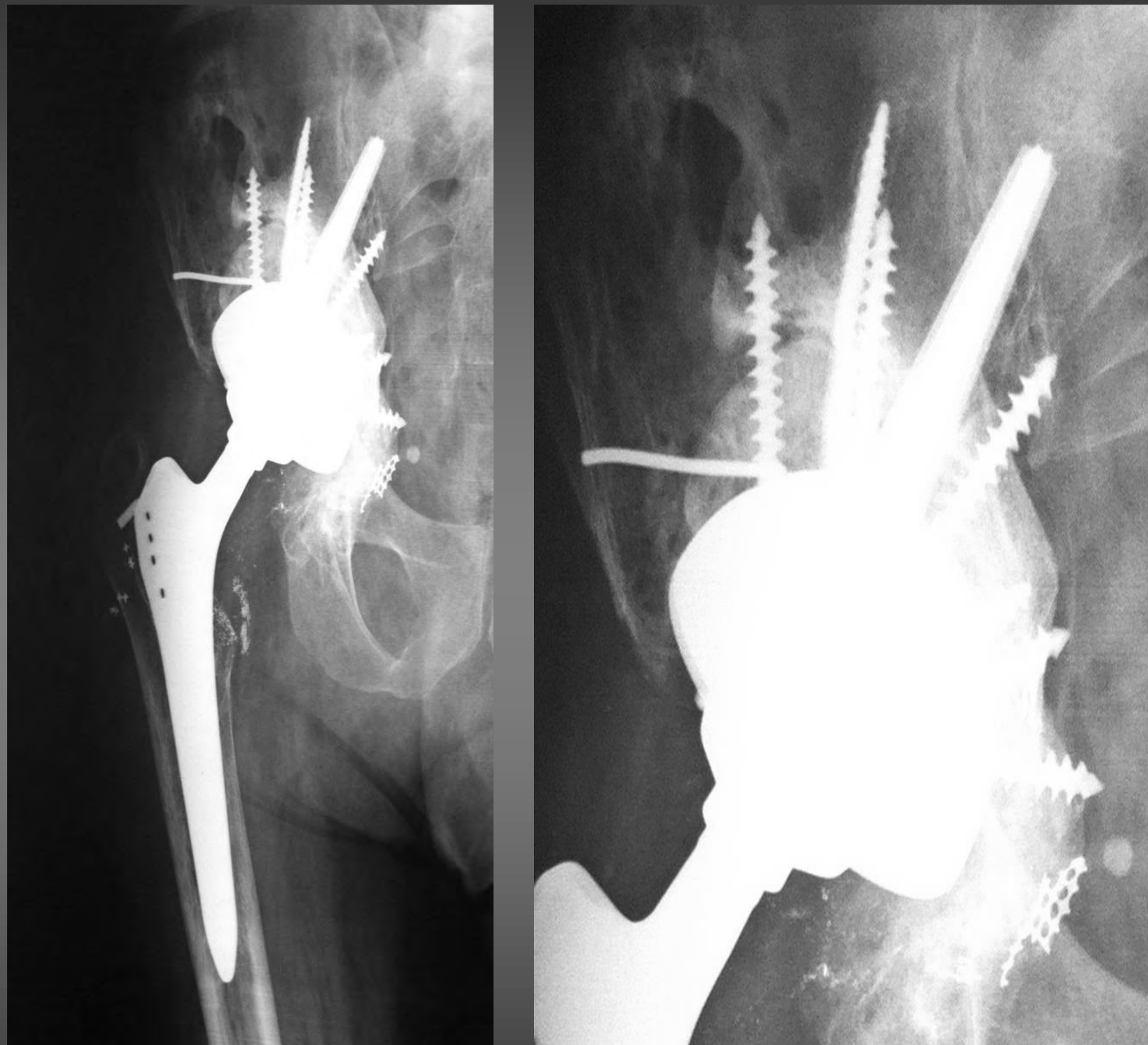




- SELECTIVE REMOVAL OF THE FAILED IMPLANT
- STRUCTURAL GRAFT AS A MECHANICAL SUPPORT
- FILLING BY MORCELLIZED GRAFT



1 aa



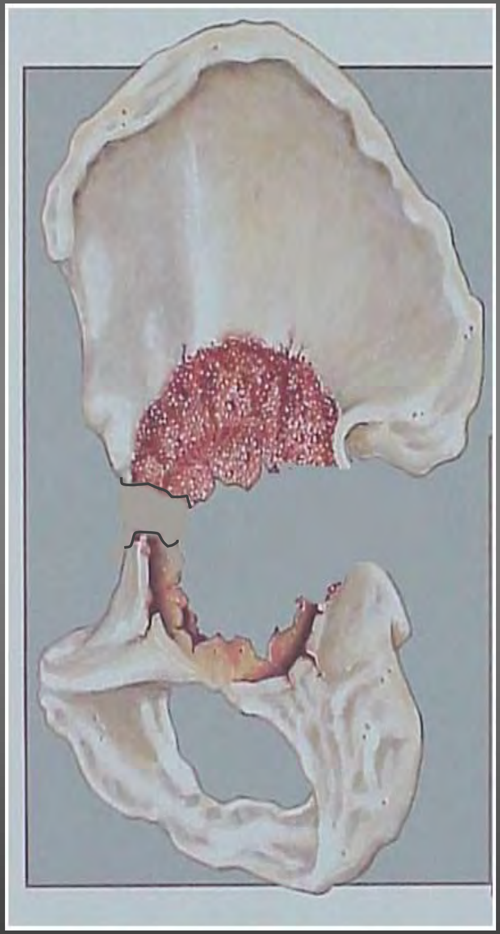
5aa

7aa

BUT … ATTENTION!

INSTABILITY OF THE
ACETABULAR WALLS

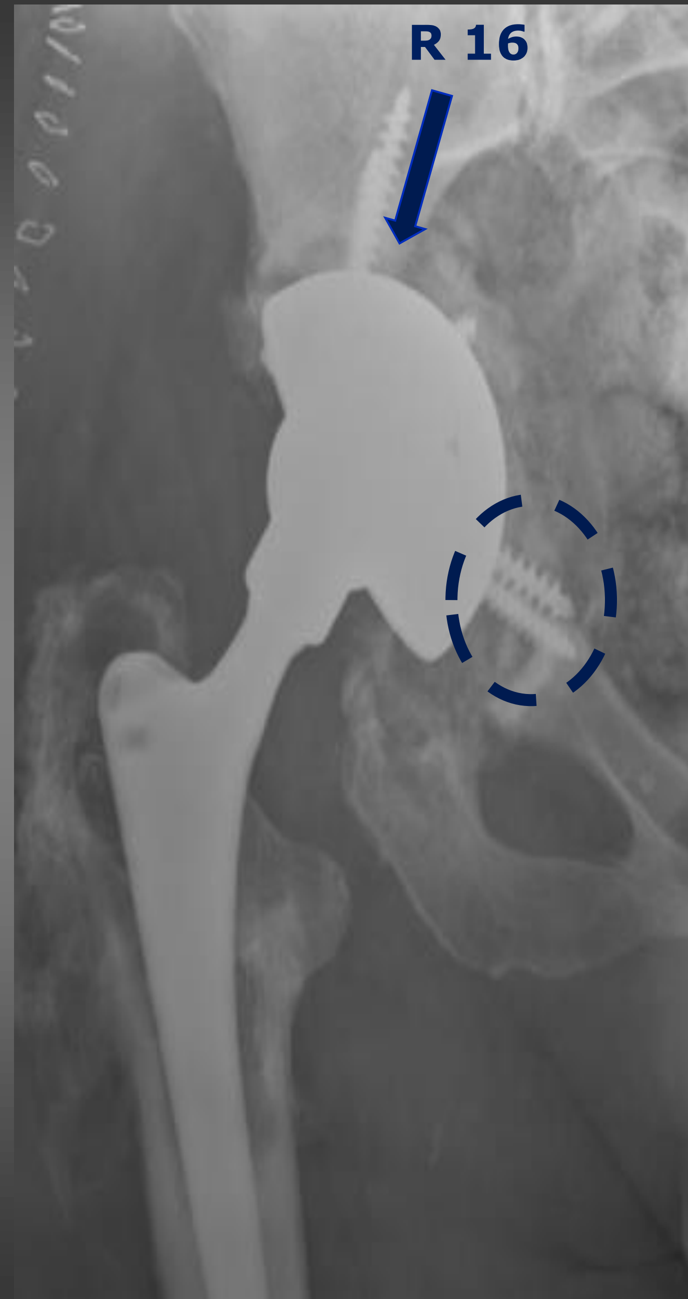
GRADE V



Massive periacetabular bone defect

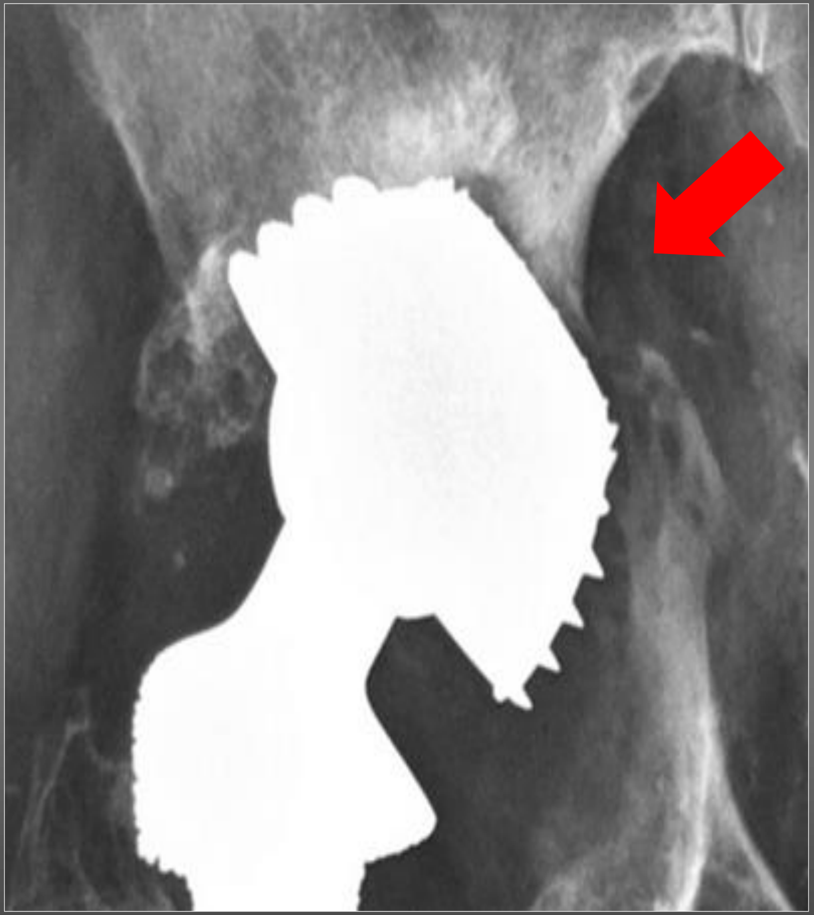
instability of residual elements


DX


R 16

1y
r

♀ RV 1938



2007

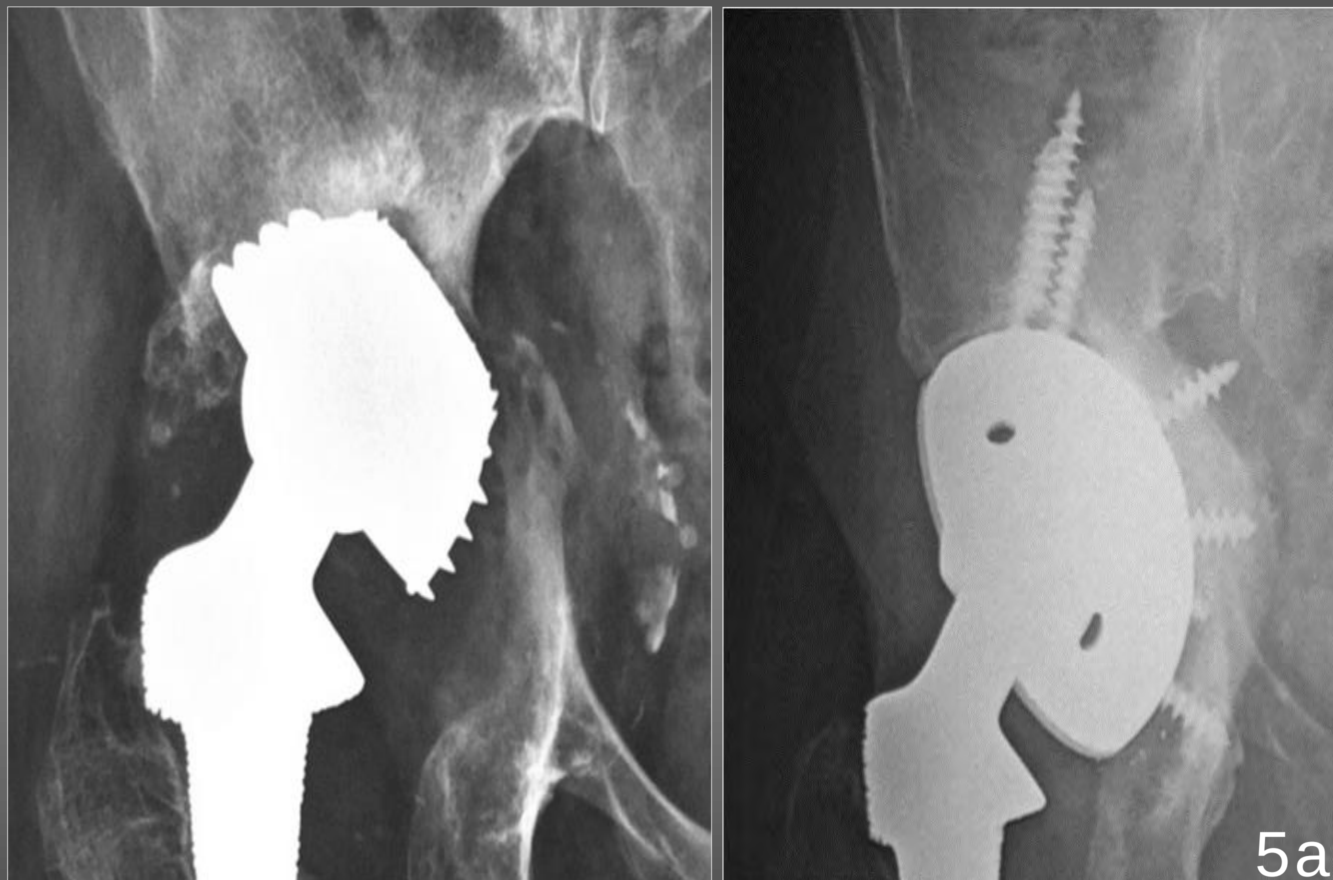
CENTRAL STRUCTURED AND FILLING BY MORSELIZED GRAFT

2/2008

2/2008

10/2008

MORCELISED GRAFT WITH GROWTH FACTORES



5aa

ISTITUTO AUXOLO ITALIANO
Istituto di ricovero e cura a carattere scientifico

Presidio Ospedaliero Capitanio, Milano

ENDOCLINICA MILANO
study group for arthroplasty

www.dimporzano.info

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Is iliac stability still an option ?

G. Pignatti, M.S. Dawod

Chief: “Hip Revision Surgery Dept.”

Istituto Ortopedico Rizzoli

Bologna – Italy

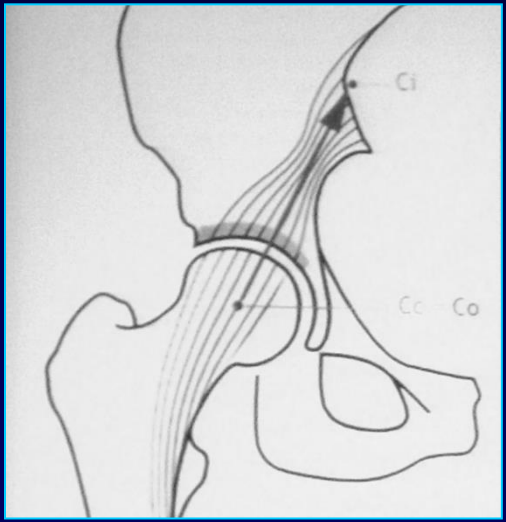
Yes indeed

THE CONCEPT

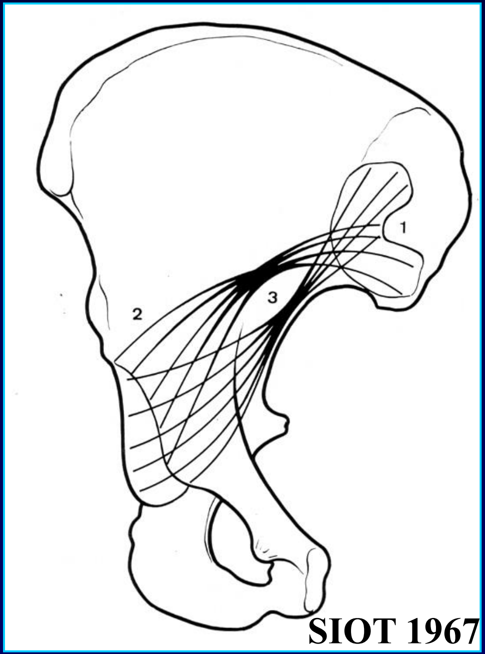
Iliac stability

THE CONCEPT

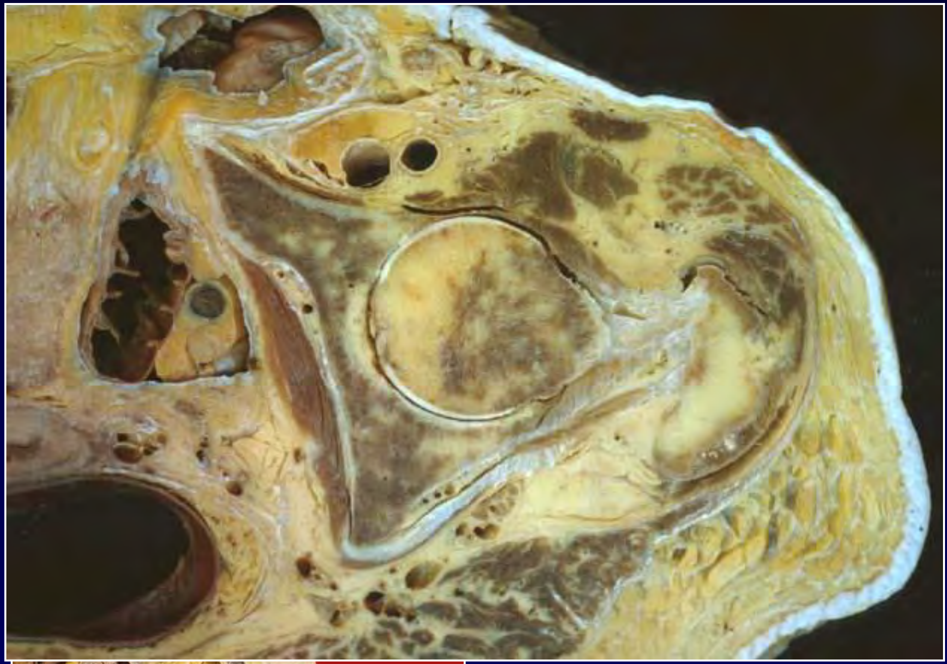
Iliac stability



Anatomical rationale



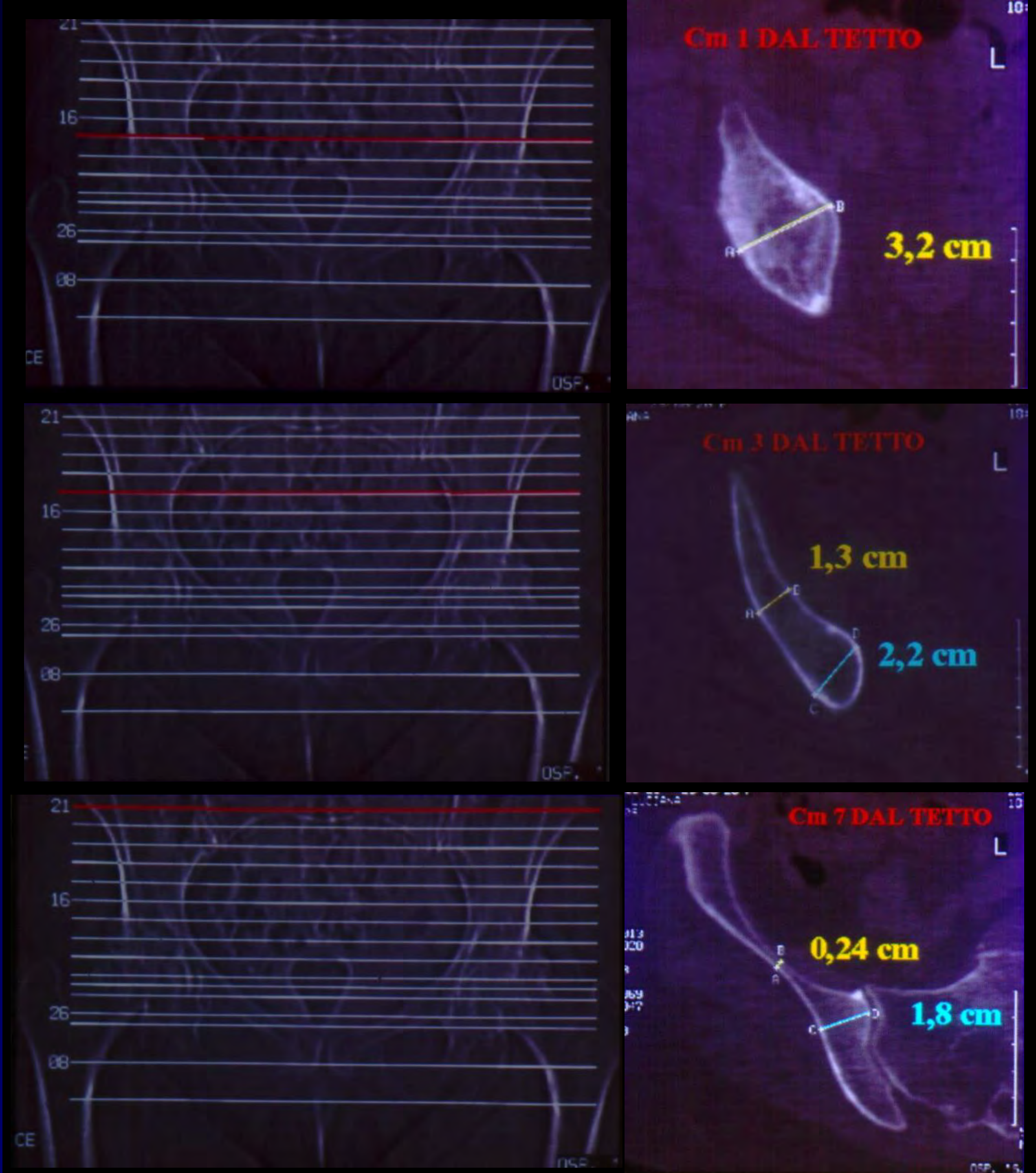
Anatomical rationale



POSTERIOR COLUMN

Usually preserved

CT study to evaluate the iliac bone thickness



Sacro – Iliac joint

False image

Paprosky – acetabular defect

- Type I – minimal bone loss
- Type II – < 3cm superior migratiion

– A – Superomedial (rim intact)

– B – Superolateral (rim involved)

– C – Medial (breaching Kohler's line)

Possible indication

- Type III - > 3cm superior migration

– A – Up and Out

– B – Up and In

– Pelvic disjunction

Primary indication

Paprosky WG1, Perona PG, Lawrence JM. : Acetabular defect classification and surgical reconstruction in revision arthroplasty: A 6-year follow-up evaluation. J. Arthroplasty. 1994 Feb;9(1):33-44.

- PAPROSKY……3A…..3B…..Pelvic Disjunction

Remember: imaging underestimate the defect

The past

COMPLETE REPLACEMENT ARTHROPLASTY OF THE HIP
BY THE RING PROSTHESIS

P. A. RING, REDHILL, ENGLAND

From the Redhill and Netherne Group of Hospitals

The requirements of an arthroplasty of the hip are that it should produce a pain
reely mobile and stable joint. It is apparent that this can be achieved in osteoarthritis
y replacing both the pelvic and femoral components.

The success of the intramedullary femoral prosthesis in the treatment of subca
ractures of the hip lies largely in the way in which the load is transferred through the fem
eck, the stem of the prosthesis serving to locate and maintain this relationship accura
he results of using the Moore prosthesis in osteoarthritis, however, are relatively
Heywood-Waddington 1966) partly because of acetabular erosion. The matching of
rthritic acetabulum to the spherical implant is inaccurate, and can only be improve
ome form of acetabular replacement. Progress in the development of the acetab
omponent has been limited by the difficulties of securing it in the pelvis, and by do
bout the most suitable material for completing the articulation.

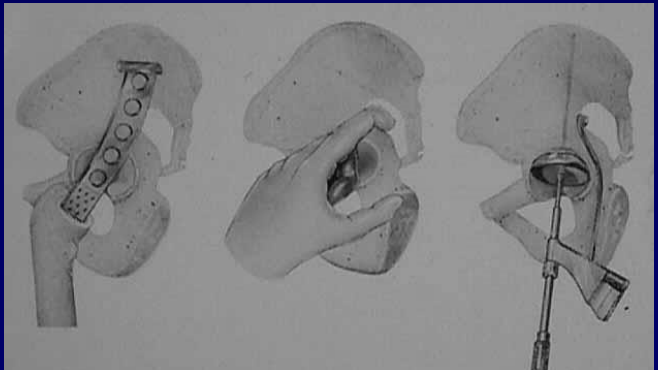
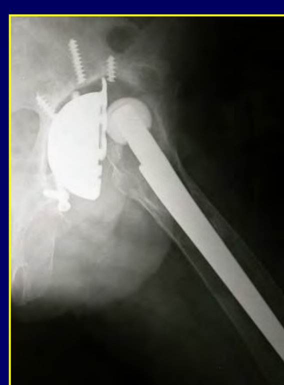


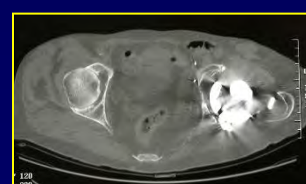
FIG. 4 FIG. 5 FIG. 6

P. Ring JBJS-B 1968

The Past

A Stemmed Acetabular Cup for Complex Hip Arthroplasty
McMinn DJW, Grigoris P, Roberts P
J Bone Joint Surg Br, 75 (1993), p. 123 Suppl.



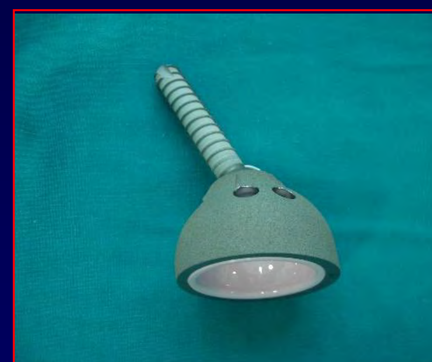


The Present

ansone cup

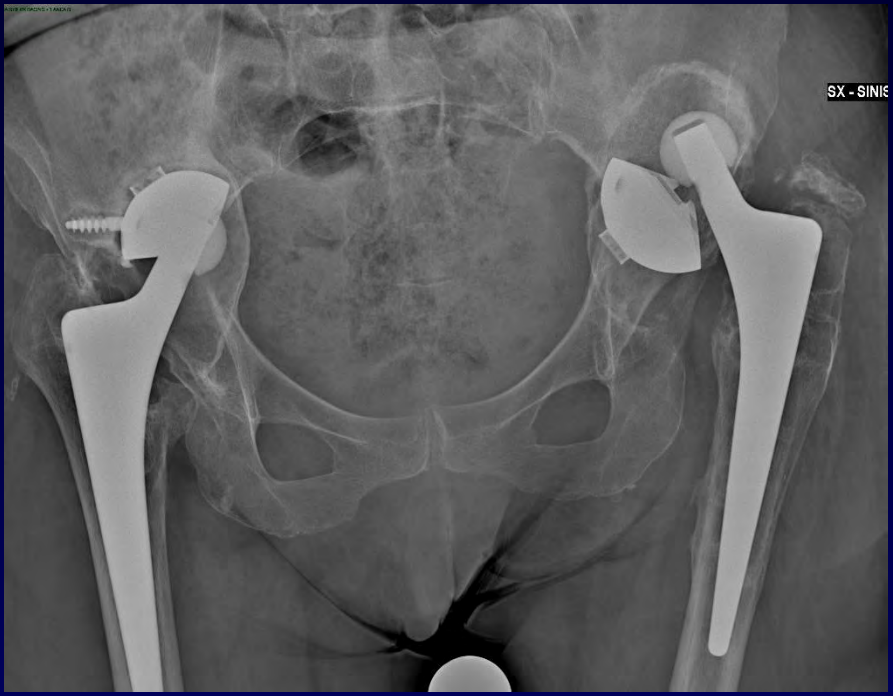
"Nove sed non nova"

- New design
- Old concept



- Polar screw 10 - 12 - 14 mm diameter
- Polar screw 40 - 60 - 80 mm. length
- 50° freedom
- Locking washer
- Additional peripheral screw fixation

Paprosky 3 A

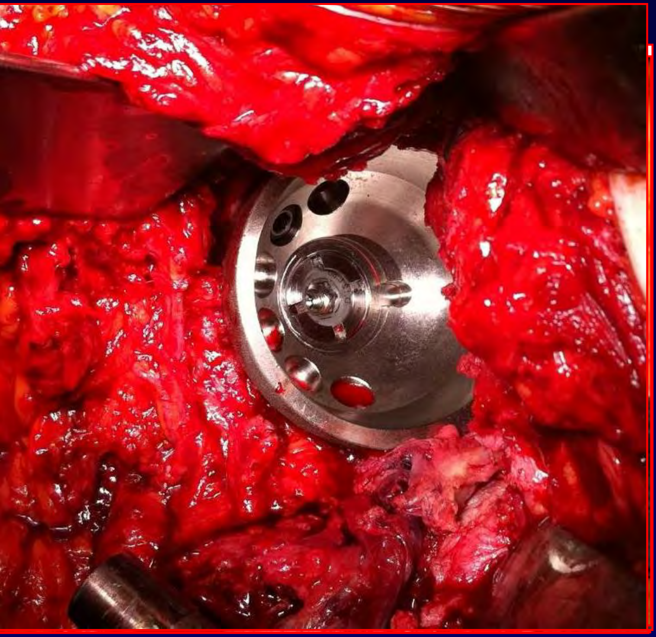


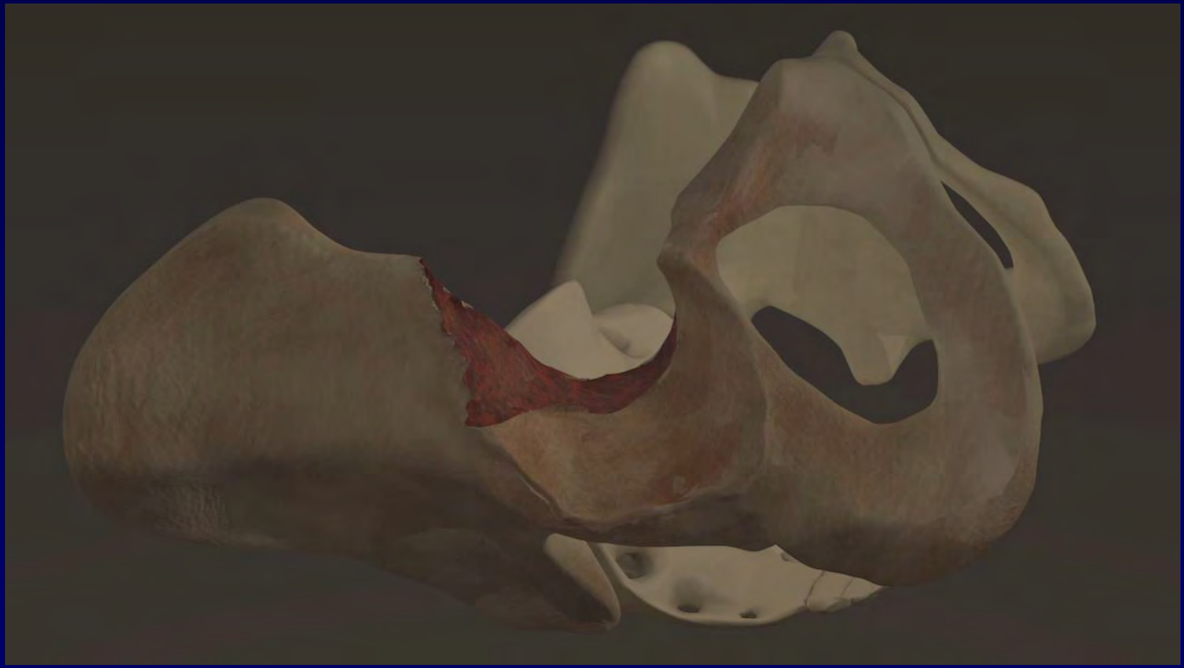
V.A.. f. 69 y.
wheelchair

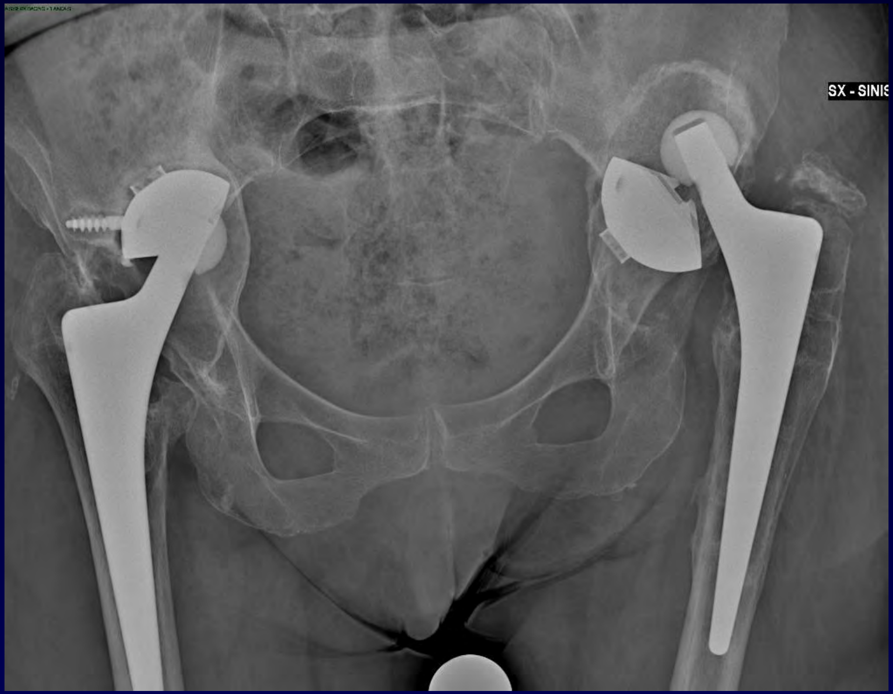
Locking Washer

one

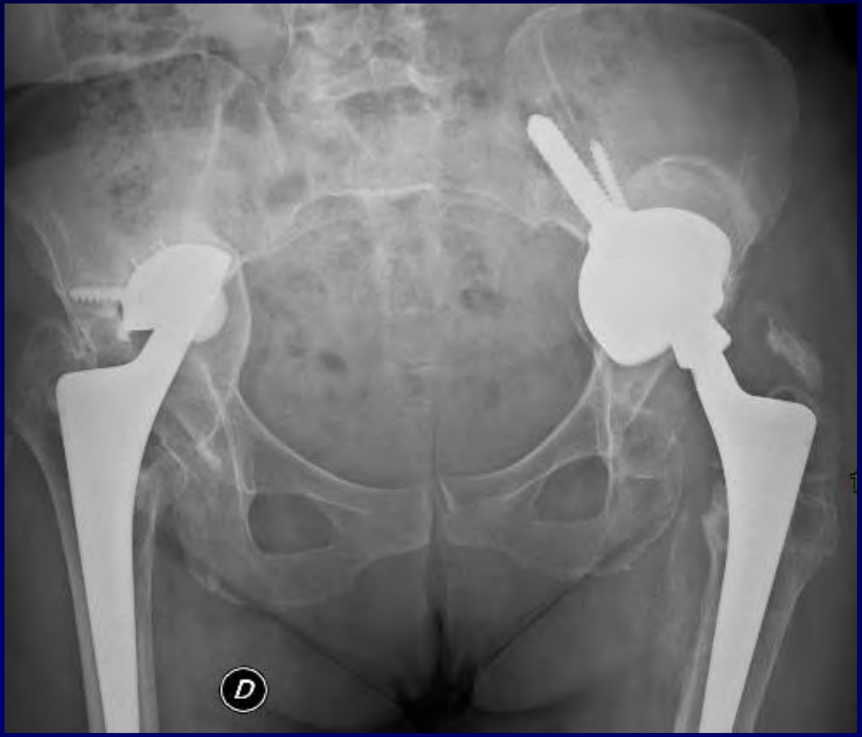
bone







Paprosky 3 A

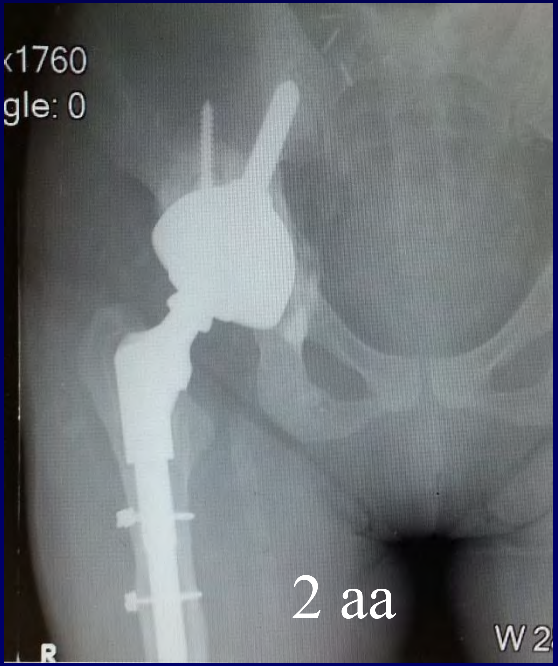


No crutches, 2 a.

Paprosky 3 A

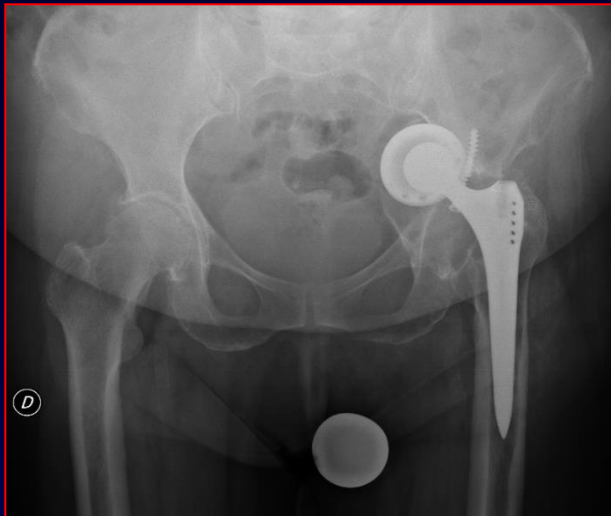
F.M. f. 44 aa
C-C with metal sleeve adaptor

Postop.

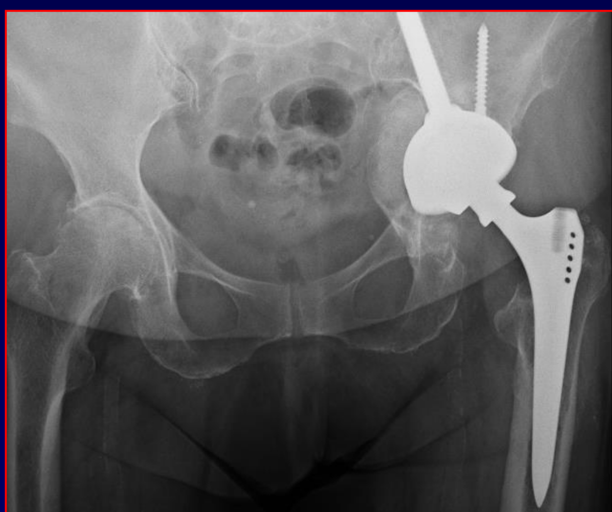


2 aa

Paprosky 3 B



S.A. f. 69y.

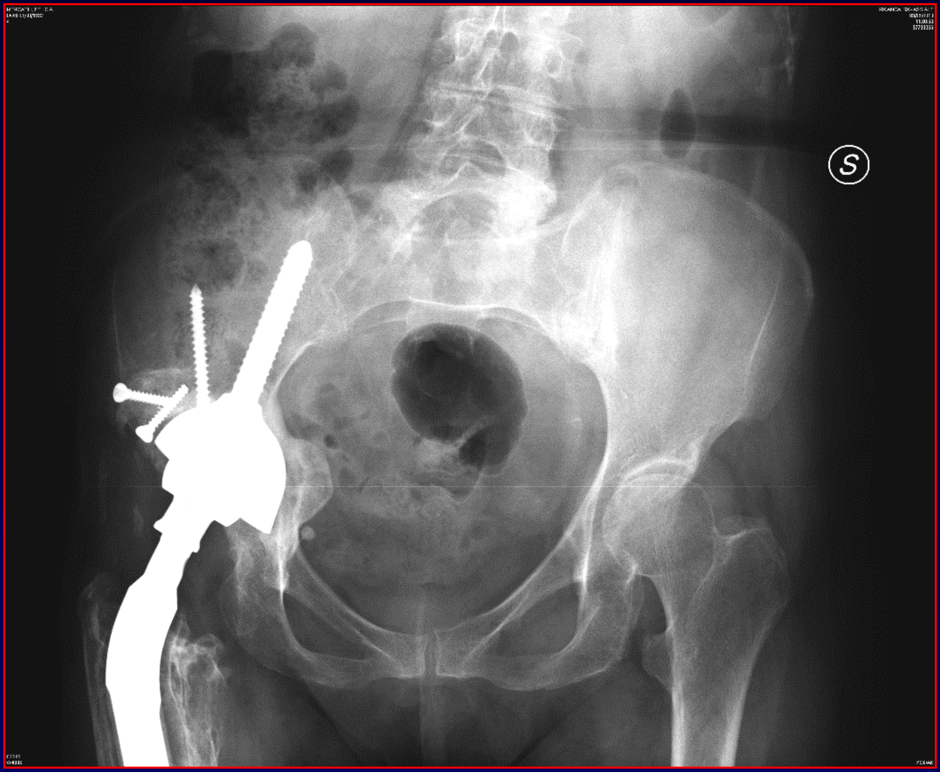


2 m

4 y

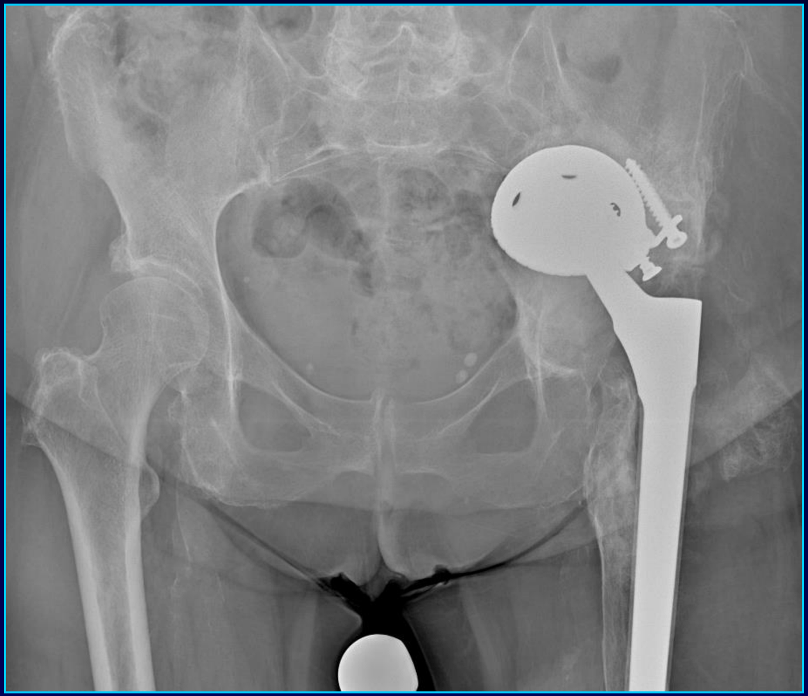
Paprosky 3 A

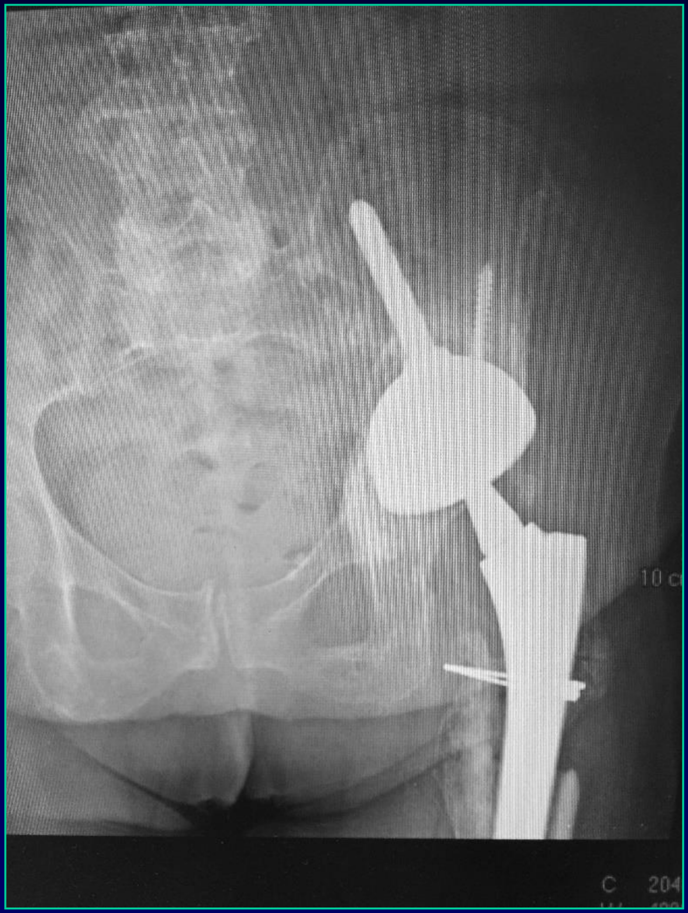
M.F. f. 75 y.



5 y.

Paprosky 3 B

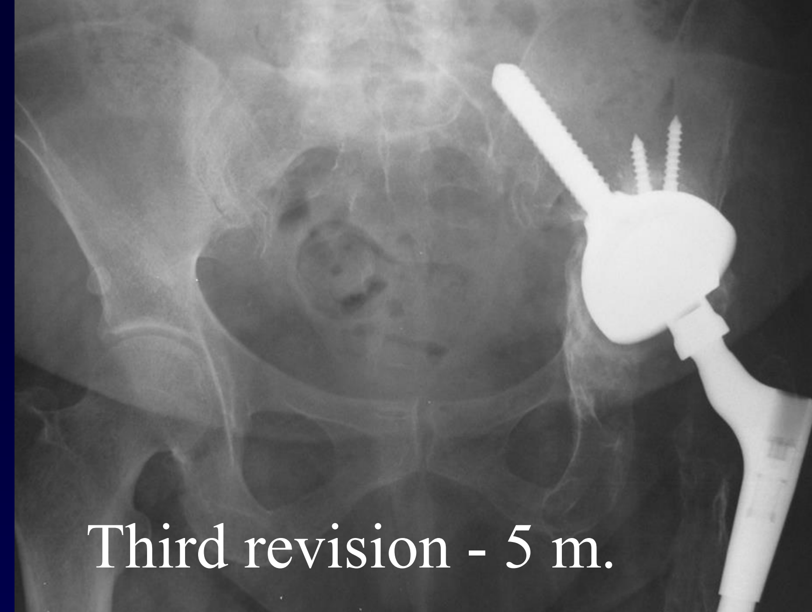




Z.F. f. 65 y.

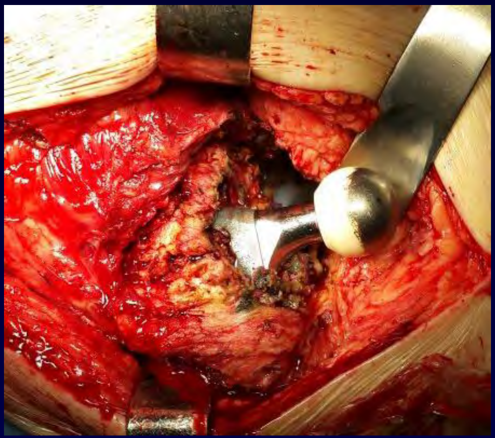
FU 2 y. No pain, no crutches

P.G. f. 68 y.

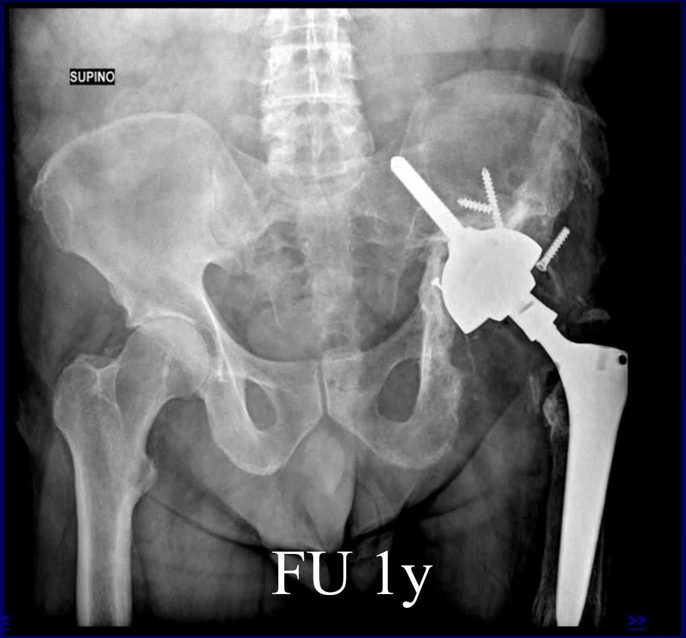


Third revision - 5 m.

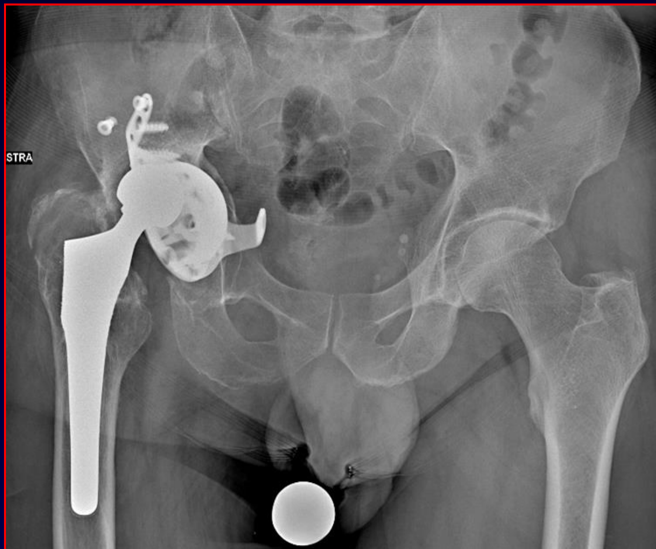
5 y.



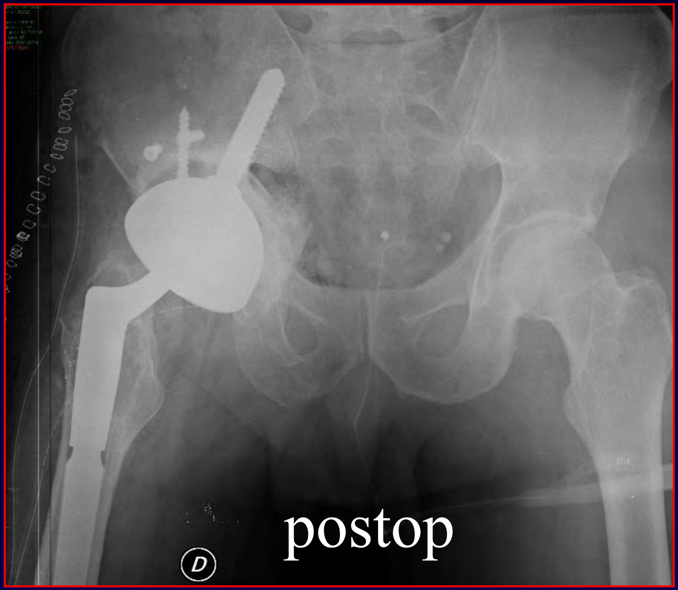
S.G.F. m. 54 y.



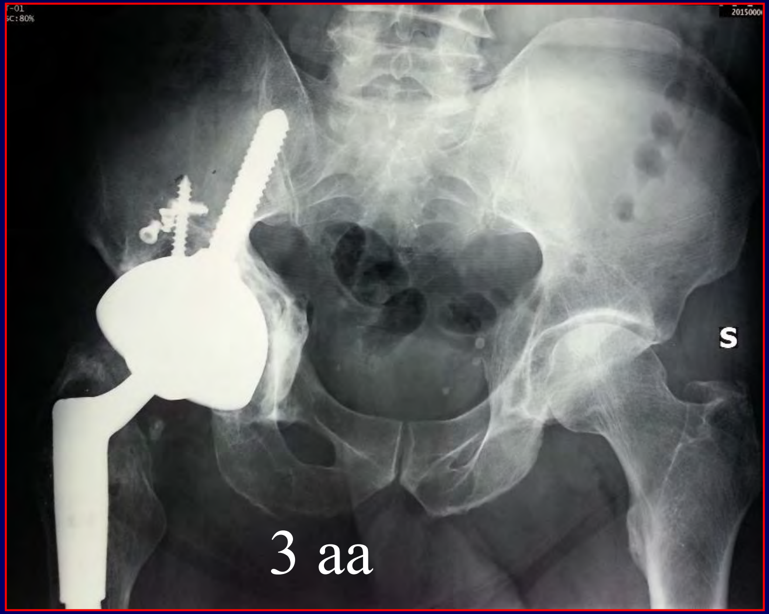
C-C coupling



Paprosky 3A



D.S.R. m. 54 aa



July 2008 – July 2013

127 Sansone cups

124 pts (3 bilateral)

- 95 female – 29 male
- Age mean 67 y (30 – 91 y)
- FU mean 45 m. (1 – 84 m)
- 50 cases: 1 o more revisions
- Paprosky 25: 2B, 20: 2C, 43: 3A, 39: 3B
- HHS……mean 82 (32 – 95)

- 3 dislocations – 2 closed reduction
- 3 explants - 1 recurrent disloc., 2 recurrent/persistent infection

NO mechanical failure

Drawbacks

- HHRC
- Stress shielding…..??
- Difficult technique – learning curve
- X-ray exposure/ image intensifier
- …………………….


6 mos.
Rager, A


S

Sansone Cup reconstruction

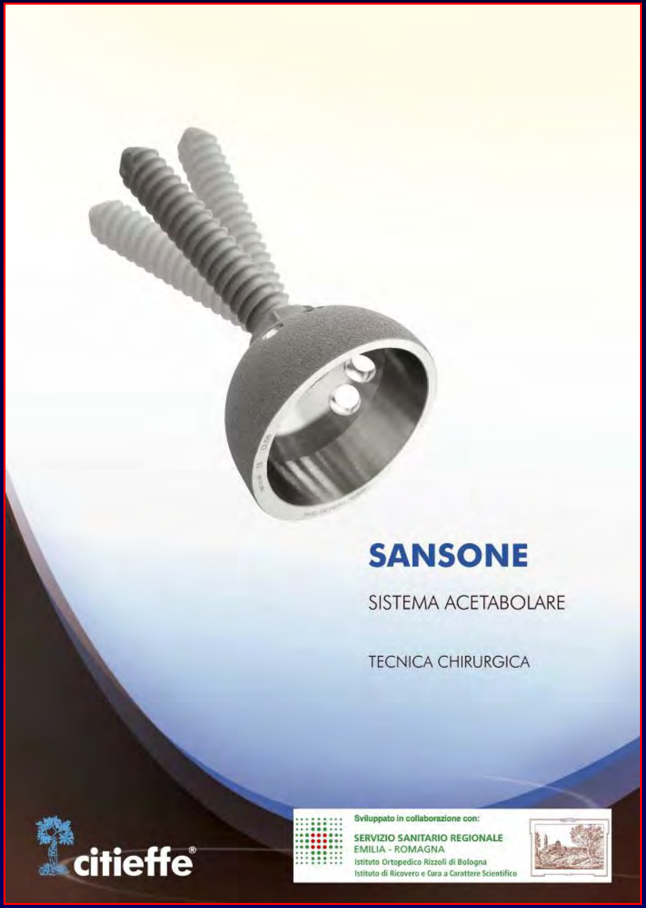
S imple

E ffective

R eliable

R apid

I nexpensive



First choice in periacetabular severe bone defects

Opening cerimony
Istituti Ortopedici Rizzoli
28° june 1896

Thank

You

First operation IOR 1896

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

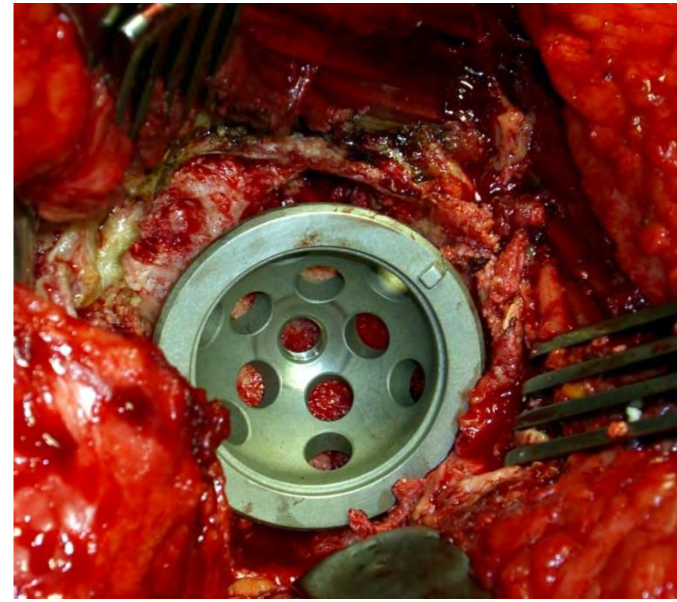
Cementless solutions including augmentation: a critical review

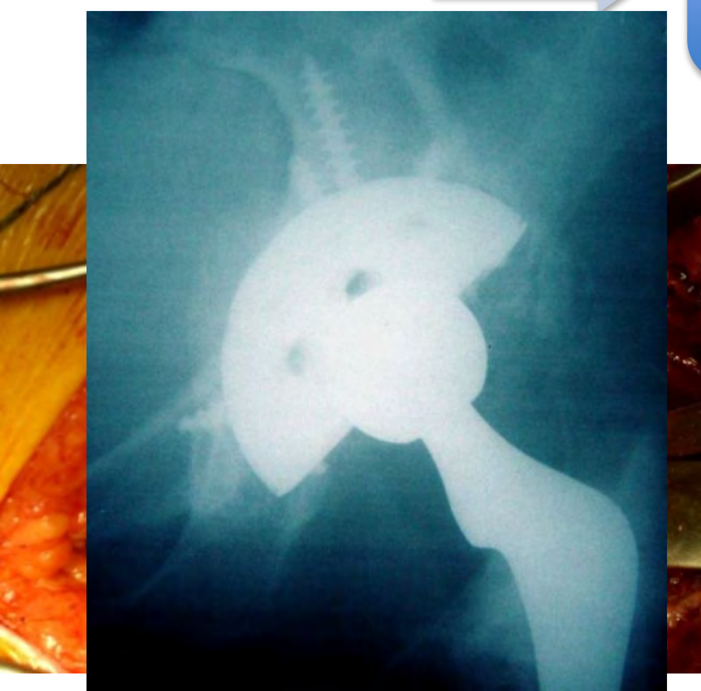
Jonathan Miles
Royal National Orthopaedic Hospital

Andrew Manktelow
Queens Medical Centre
University Hospital
Nottingham

Surgical technique

1. Meticulous debridement
2. Ream to contact bleeding viable host bone
3. Initial implant stability with screw augmentation
4. Historically aiming for 50% host bone contact
5. May be able to reduce contact % with porous metals





Socket options - Versatility

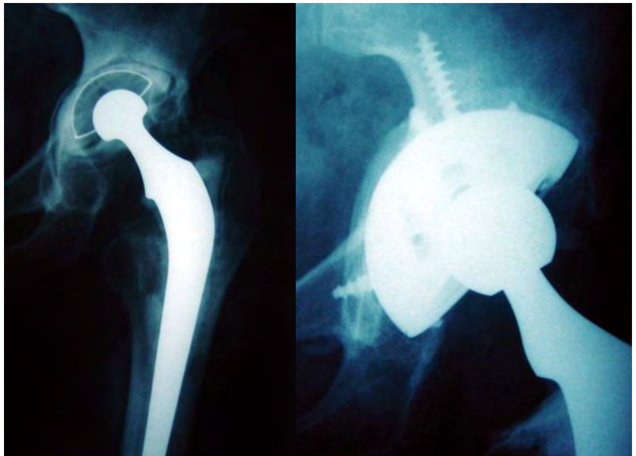
Shells

- size
- geometry
- surface finish, coatings
- additional fixation options

Liners

- internal diameter
- lips & face changing
- eccentric liner & lateralised
- captive cups
- Dual mobility

Results of uncemented revision



138 hips by 4 surgeons in a single centre. Mean age 55

HG1 shell with average size 62mm

JBJS 2005 Della Valle

Failure for aseptic loosening - 15 yr survivorship was 97%

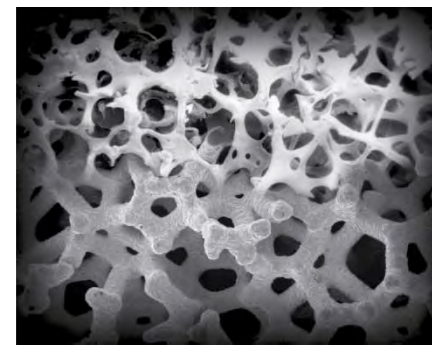
Failure for any reason was 81% - infection, instability, liner wear

With shell revision for loosening 95% survival at 20yrs

Park et al JBJS 2009

Highly porous metal

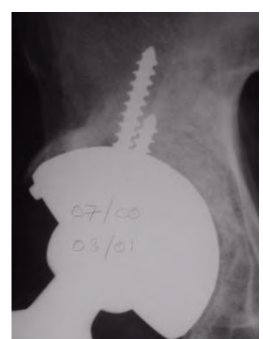
Higher Friction
- Better primary stability
- Less bone contact needed



High porosity
- Ingrowth capacity
- Low stiffness

Enhanced screw options
- Better initial stability
- Combine with other methods

Can combine with bone grafting



Results of highly porous shells

Kim JBJS Br 2008

- 46 revisions in paprosky 2-3 cases with tanatalum
- 40 month follow up – all but 1 osseointegrated
- 2 liner revisions for instability with shell retained
- Loose one was a Paprosky 3B case

Beckmann J Arthroplasty 2013

- Literature review of trabecular shells vs. reinforcement rings
- 1541 rings mean 5.7 years

  1959 trabeular shells mean 3.7 years
- Trabecular metal outperforms rings in all grades of acetabular bone loss
- The Severe defects benefit most form trabecular metal

D Berry review – 3448 revision hips: porous tantalum cups outperform others

Porous shells with low host bone contact

53 of 254 revisions had 50% or less bone contact (average 19%)

Columns/rim intact

No structural augment or graft required

'Dilated weakened' acetabulum

Min 2 year follow up (24-71 months)

2 (4%) failed

2(4%) probable loosening

4 dislocations

1 sciatic nerve injury

Require initial stability re-enforced with screws

Promising results with large cavitary defects

Clin Orthop Relat Res (2009) 467:2318–2324
DOI 10.1007/s11999-009-0772-3

SYMPOSIUM: PAPERS PRESENTED AT THE ANNUAL CLOSED MEETING OF THE INTERNATIONAL HIP SOCIETY

Trabecular Metal™ Cups for Acetabular Defects With 50% or Less Host Bone Contact

Dror Lakstein MD, David Backstein MD, MEd, FRCSC,
Oleg Safir MD, FRCSC, Yona Kosashvili MD, MHA,
Allan E. Gross MD, FRCSC

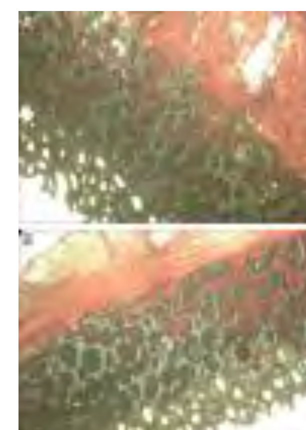
Published online: 10 March 2009

Ingrowth & Gap filling

Ingrowth 90% - 30% on normal cups

Analysis of bone ingrowth on a tantalum cup. D'Angelo. Indian J Orth 2008

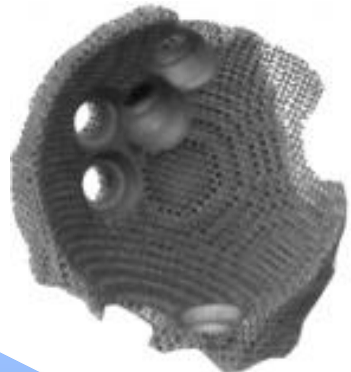
Gaps <5mm fill by 24 weeks in stable cups

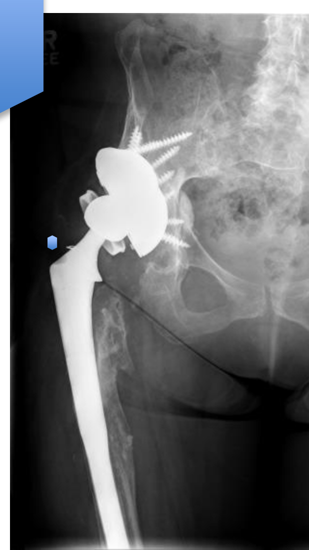


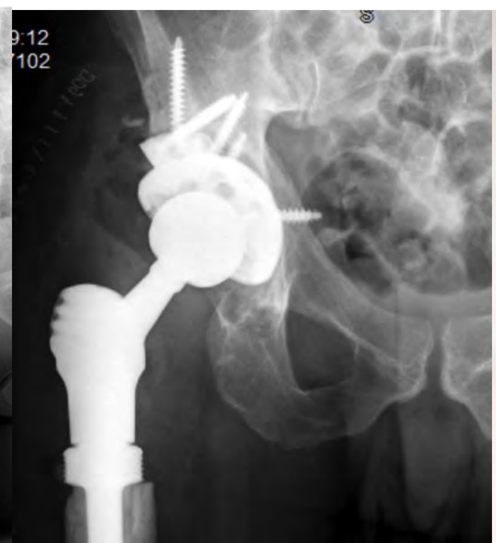
Radiological evaluation of the metal-bone interface of a porous tantalum monoblock acetabular component. *Macheras JBJS Br. 2006 Mar*

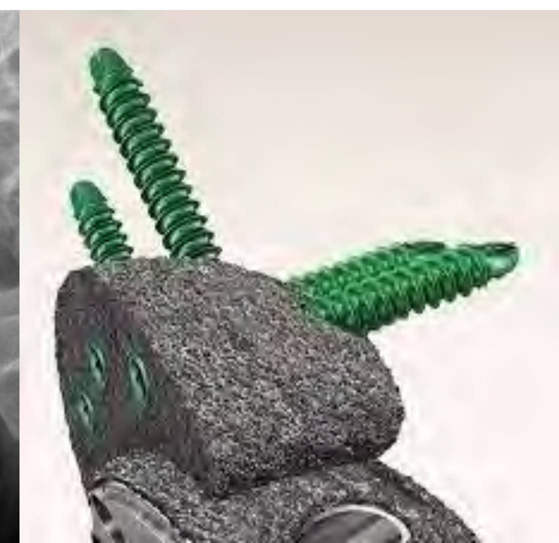
Augments –more versatility

disc
segment
custom
shim
buttress
Cup-cage
Locking









Augment techniques

‘Double Bubble’

Flying buttress

‘Footings’

Augment position

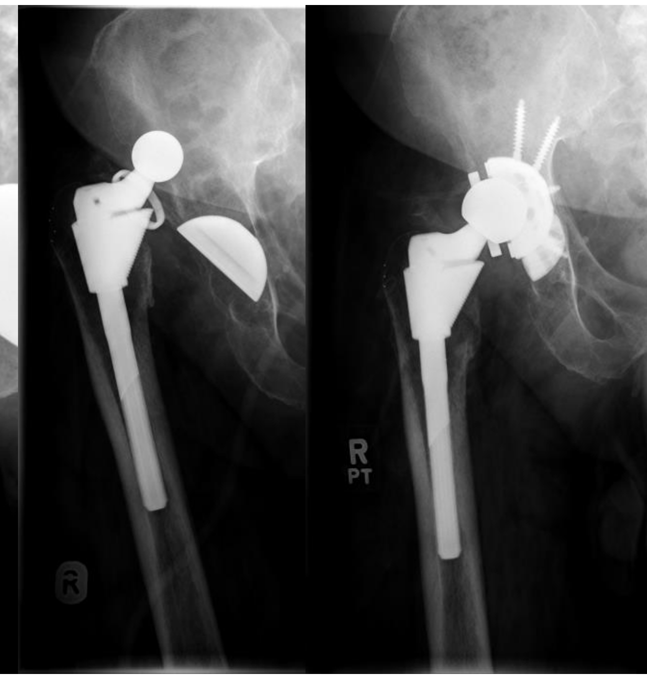
BACKWARDS

Large rim defects

MULTIPLE

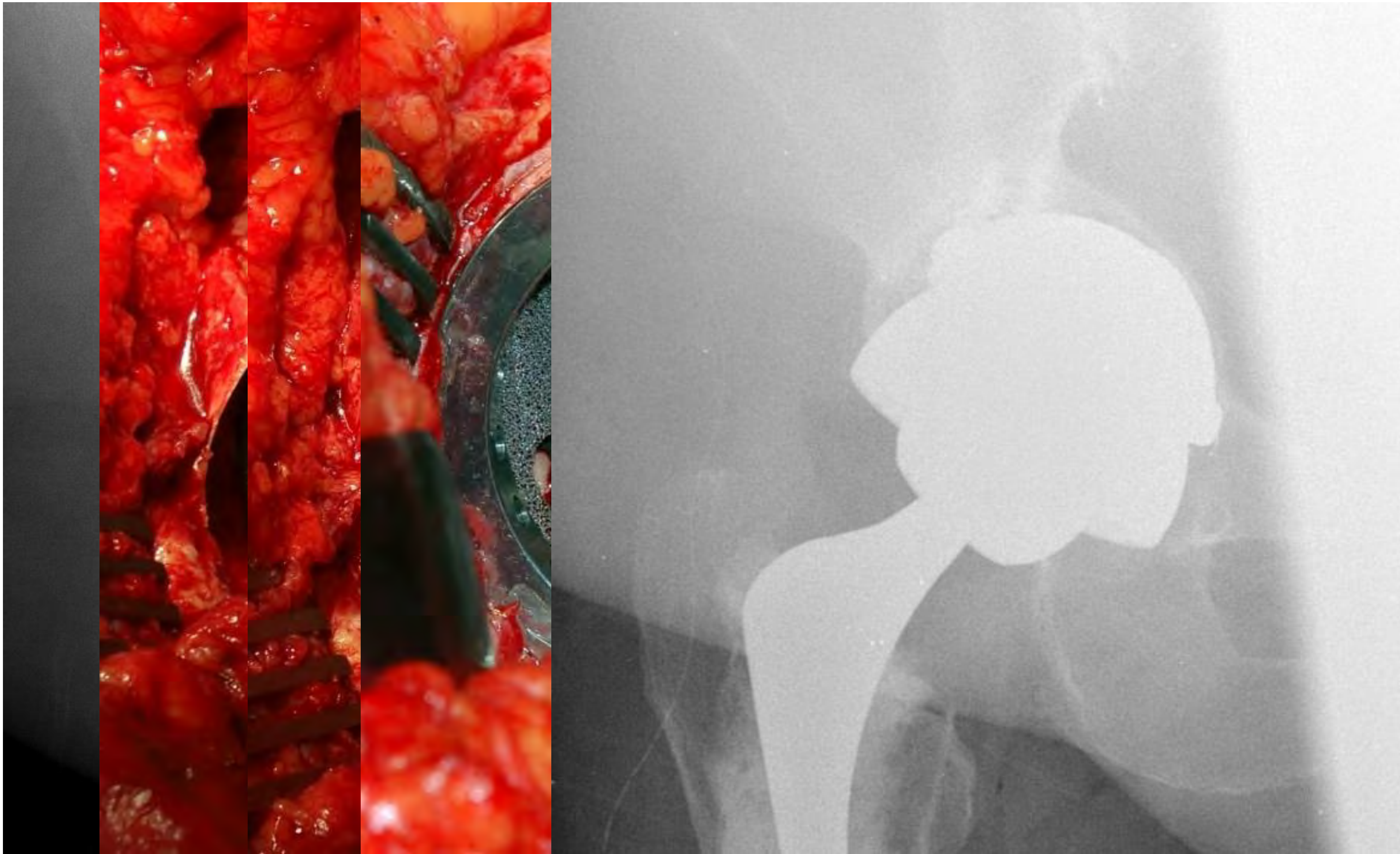
Large cavitatory defects

UNDERNEATH



Leg length/tissue tension issues

Revision case



Results of augmented cementless shells

Whitehouse CORR 2015

- 56 trabecular augments with trabecular shells
- 92% survivorship at 10 years
- 4 revisions
  - 3 loosening
  - 1 infection
- 18% of their trabecular cases used an augment

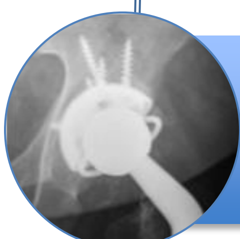
Abolghasemian BJJ 2013

- Combined porous shell and augment failed in 34 of 448 hips
- 18 minor column defect
- 14 major column defect
- 2 discontinuity
- 3 aseptic loosening
- 2 discontinuities
- 1 with 2 augments
- 91.1% 5 year survival

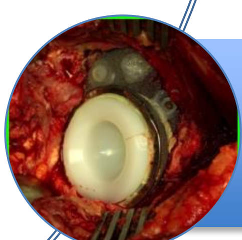
Cementless solutions including augments

Cementless hemispherical sockets remains the workhorse

Allows the surgeon to manage the vast majority of defects

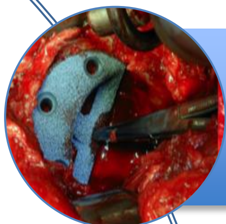


Provides liner exchange options to manage complications



Established longevity albeit with ‘liner’ revisions

Cementless solutions with augments



- Use of augments allows a ‘Stepwise’ technique in reconstruction sequentially ‘down-grading’ the defect

- Optimise contact and fixation with a ‘unitised’ construct

- Reproducible techniques, though not perhaps for ‘part timers’
- Increasingly encouraging mid-term results

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Surgical technique with reinforced cement under pressure

Piero Garosi
Orthopaedics Prosthetic Surgery Unit
Centro Oncologico Fiorentino
Sesto Fiorentino (Italia)

Francesco Strambi
South West London Elective Orthopaedic Centre
London (UK)

INTRODUCTION

BONE STOCK **CENTRE OF ROTATION**

<u>STABLE FIXATION</u>

1986 - 1996

125 patients (pts)

Follow up at 5 years: 115 pts

Excellent and goods results: 97 pts (**85%**)

Follow-up at 10 years: 75 pts

Excellent and goods results: 45 pts (**60%**)

COMPROMISED VASCULAR STATUS

AGE ≥ 75

SCLEROTIC BONE

SYSTEMIC DISEASES

- Anaemia
- Diabetes
- Chronic Nephropathies
- Chronic Hepatopathies
- Rheumatoid Arthritis
- Neoplasms

1996

ACETABULAR RECONSTRUCTION OF ROOF BONE-LOSS WITH BONE CEMENT

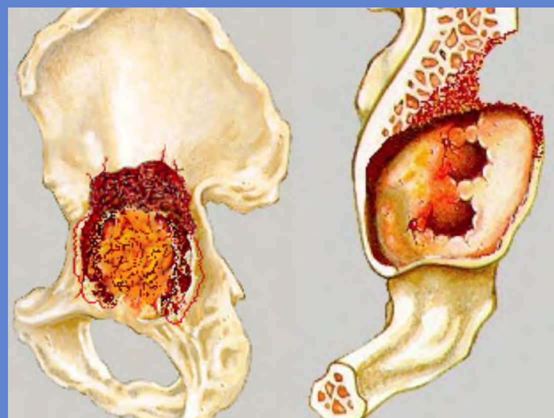
MATERIALS AND METHODS

March 1996 → March 2014

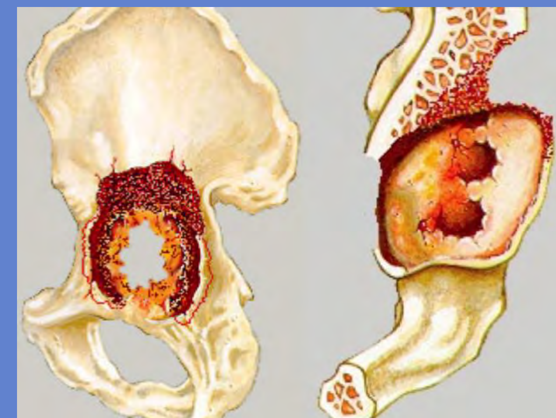
- Patients: **442**
- Follow-up (1 year to 18 years): **328** (74%)

AGE ≥ 75 years

Grade 2A



Grade 2B



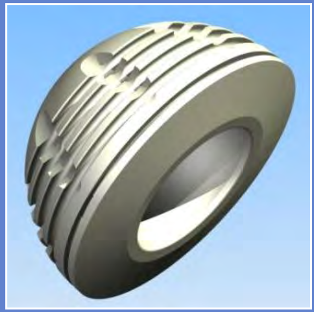
Grade 3A

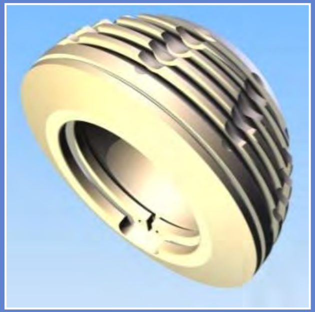
Grade 3B

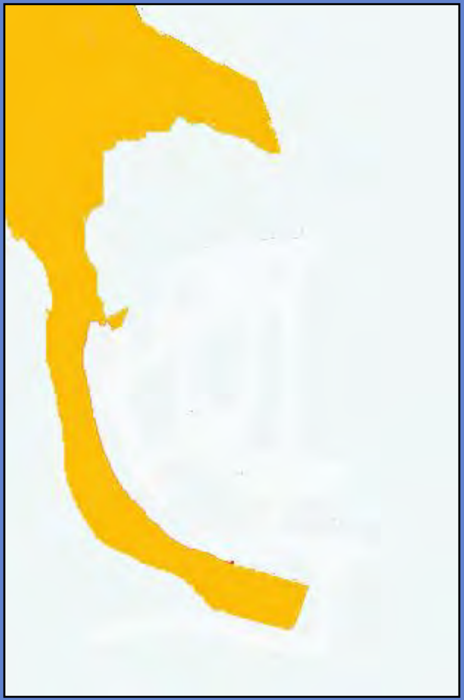
Garosi ,P., Di Giacinto, S., Pipino, F. (2013). La riprotesizzione acetabolare. GIOT, **Dicembre 2013;39:421-428**

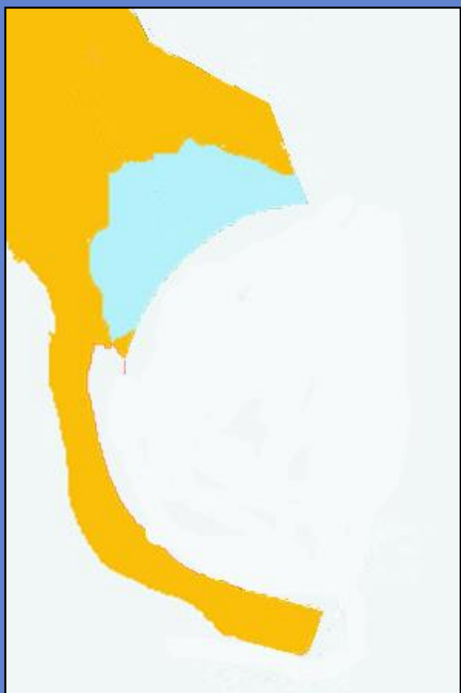
OPERATIVE PROCEDURE

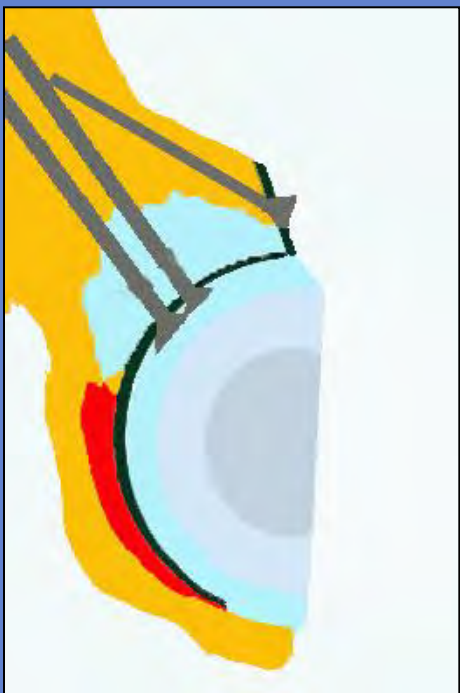

CHECKED CONTENT
Heraeus
COPAL® G+C
High viscosity, radiopaque bone cement containing Gentamicin and Clindamycin
1x40
Gentamicin 1x1.0g
Clindamycin 1x1.0g
+C
STERILE EO
STERILE A







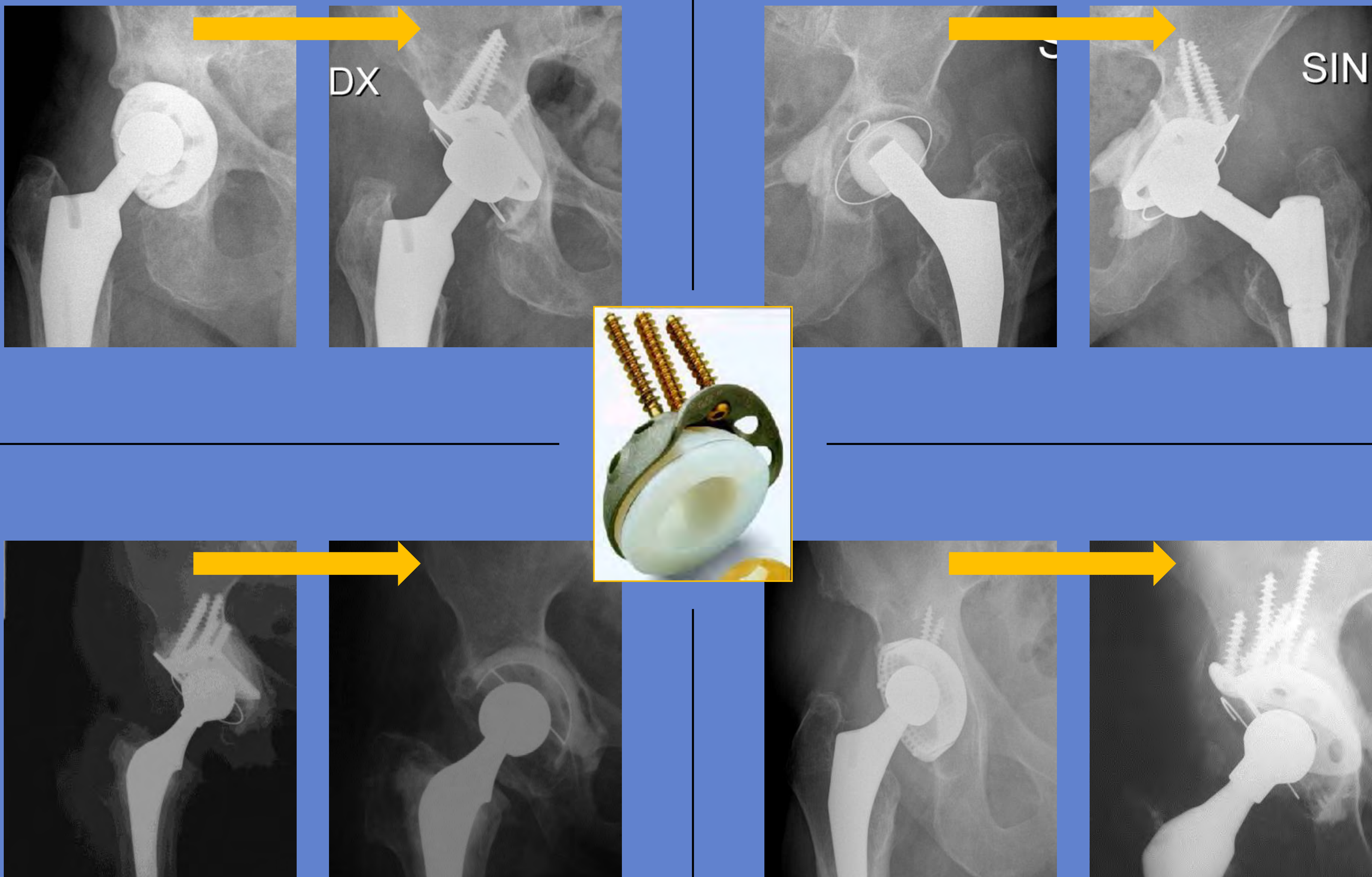



RESULTS

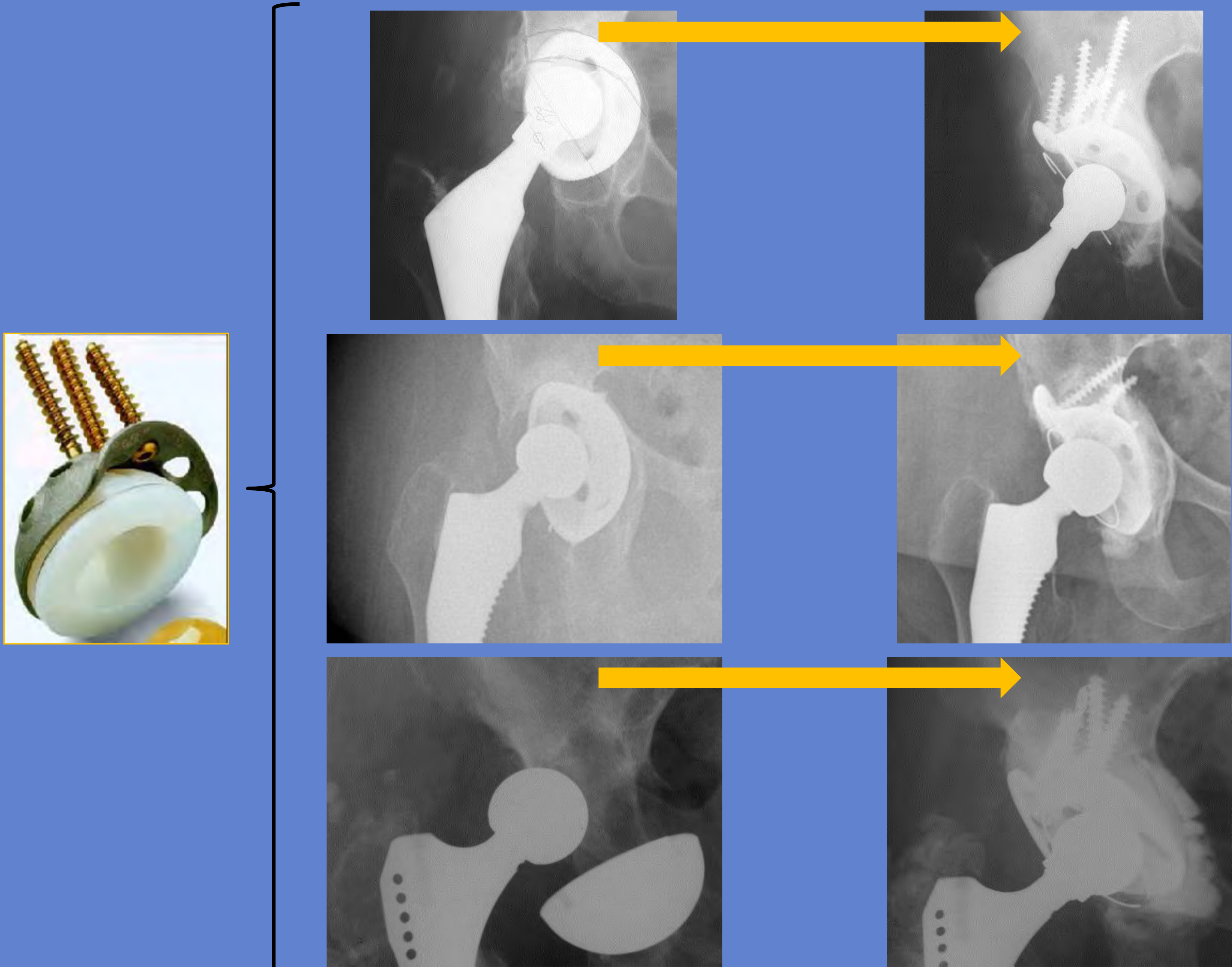
- Excellent and good: 304 (**93%**)
- Bad: 24 (**7%**)

CASES

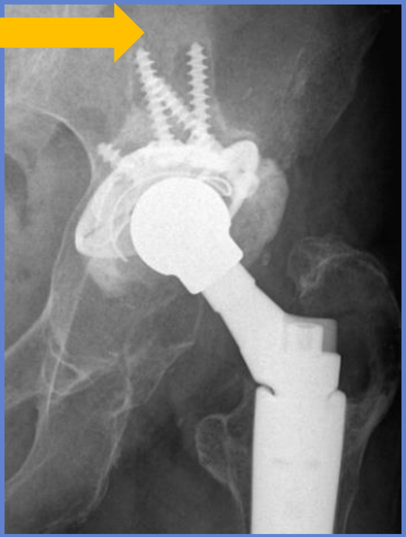
Grade
2A

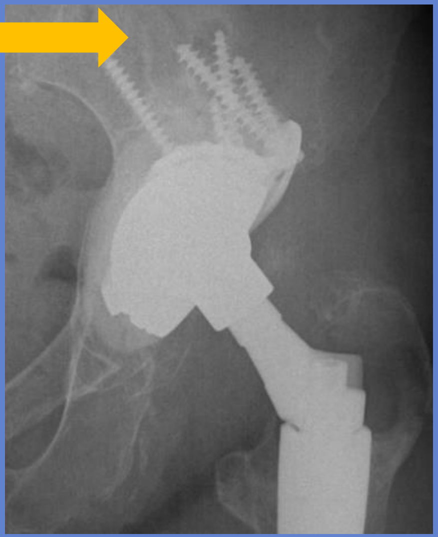

DX
SIN

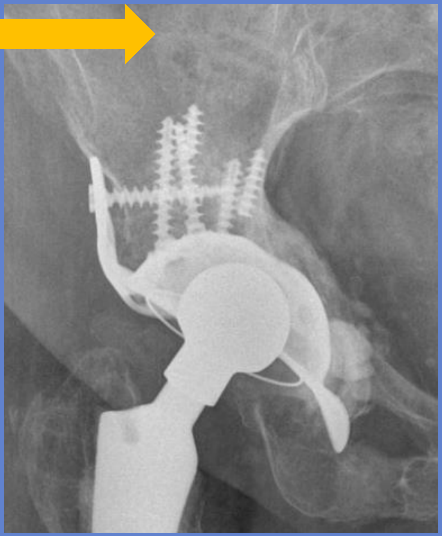
Grade
2B



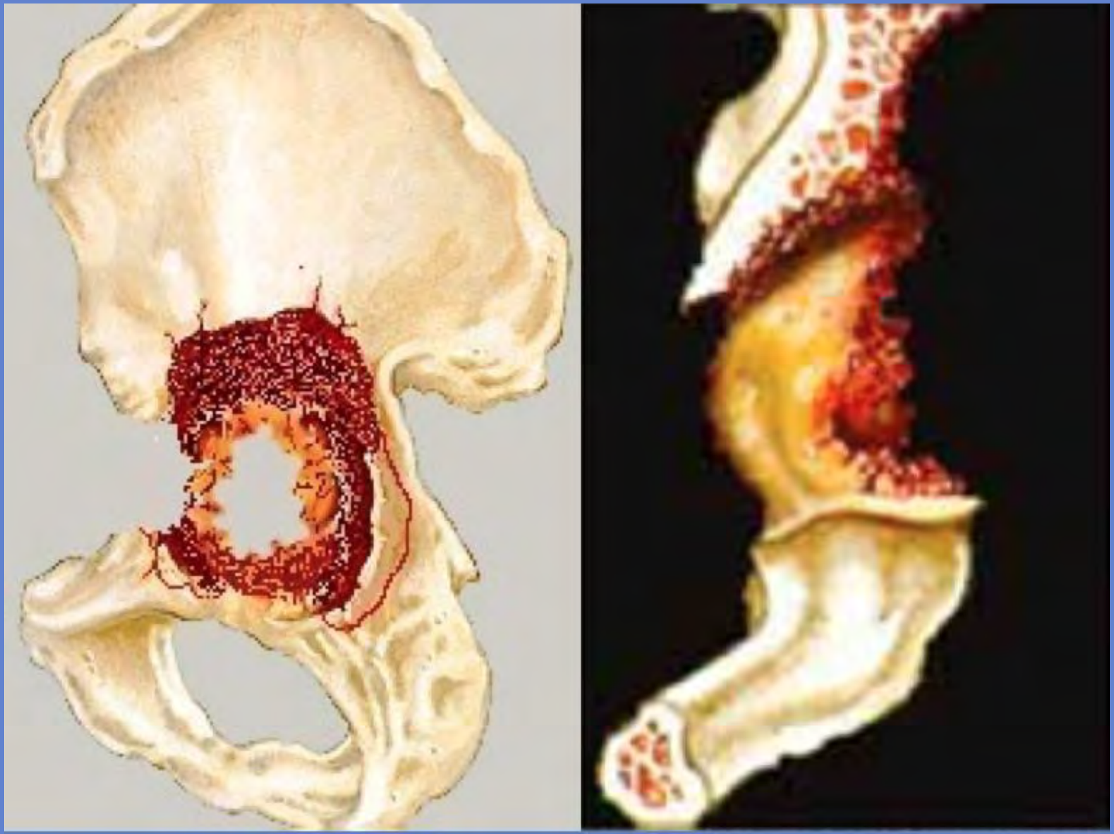
Grade
3A

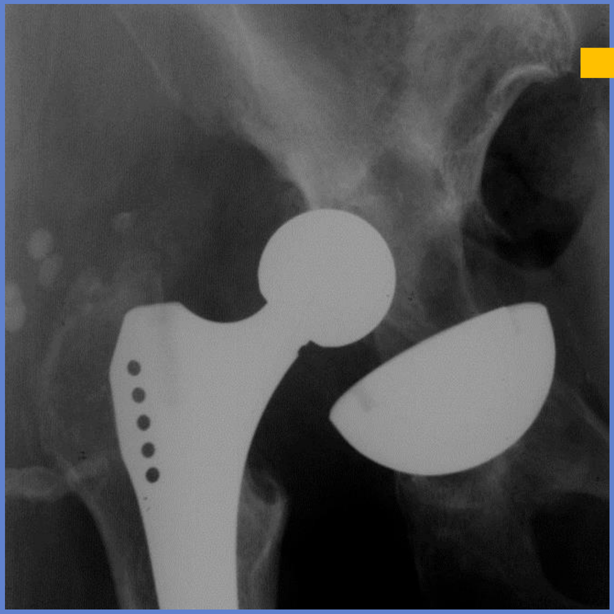


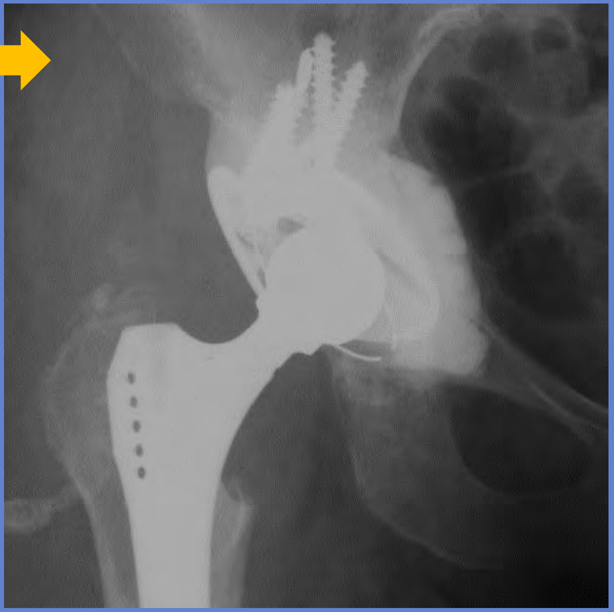


Grade
3B







CONCLUSIONS

- PATIENTS ≥ 75 WITH COMPROMISED VASCULAR STATUS
- IMMEDIATE LOADING
- “SHORT” SURGICAL TIME
- LOW COST

Centro Oncologico Fiorentino - CFO
Città della Salute Firenze

pierogarosi@tiscali.it

Thank you

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

CUSTOMIZATION OF THE ACETABULAR IMPLANT: the near future ?

PROFESSOR IAN STOCKLEY MD FRCS
LOWER LIMB ARTHROPLASTY UNIT
NORTHERN GENERAL HOSPITAL
SHEFFIELD ENGLAND UK

British Hip Society

Società Italiana dell'Anca

Sheffield Hallam University

Sheffield Teaching Hospitals NHS
NHS Foundation Trust

DISCLOSURES

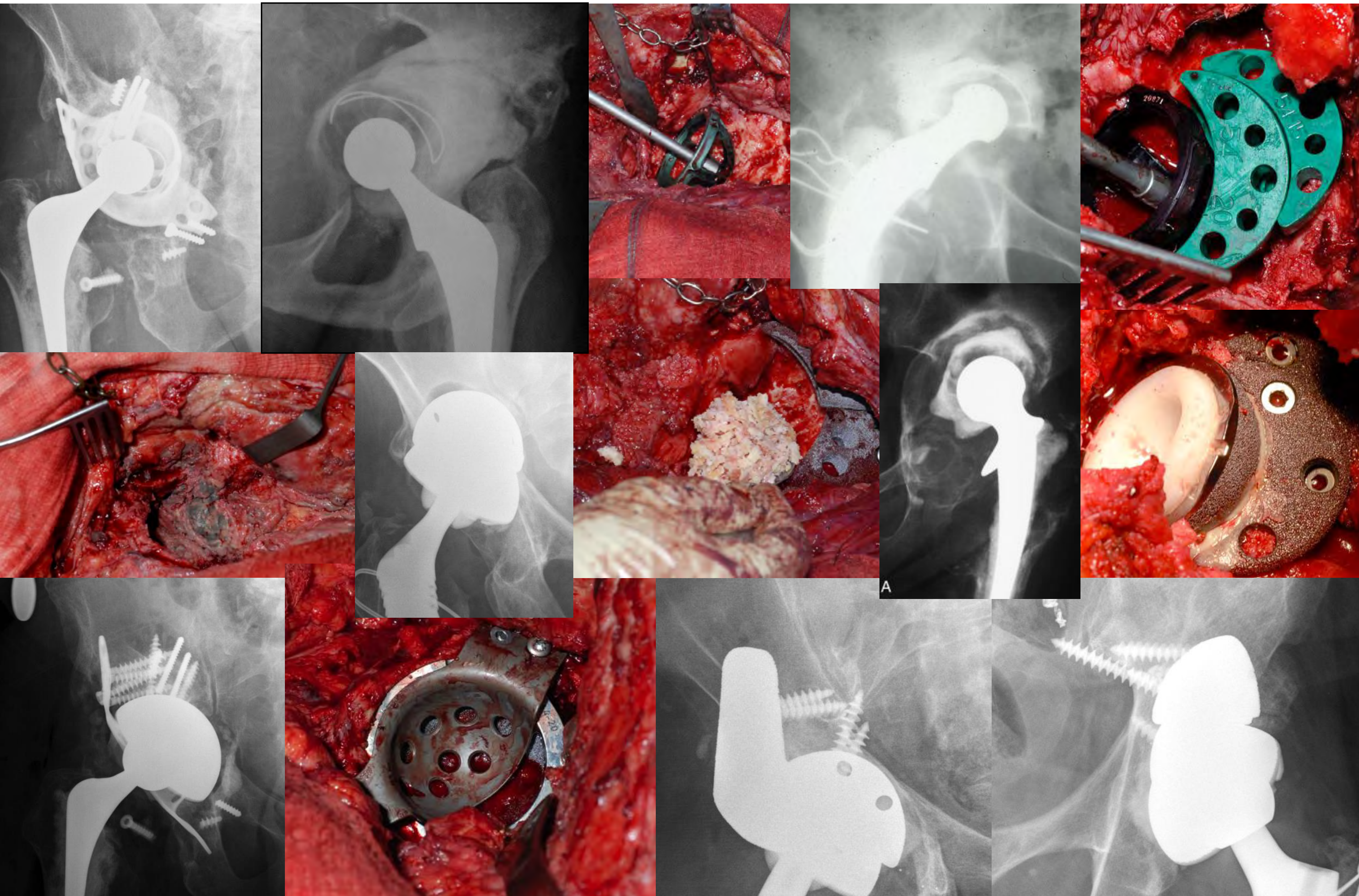
ZIMMER BIOMET

- receive royalties relating to the sales of a femoral revision system
- paid consultant for educational meetings

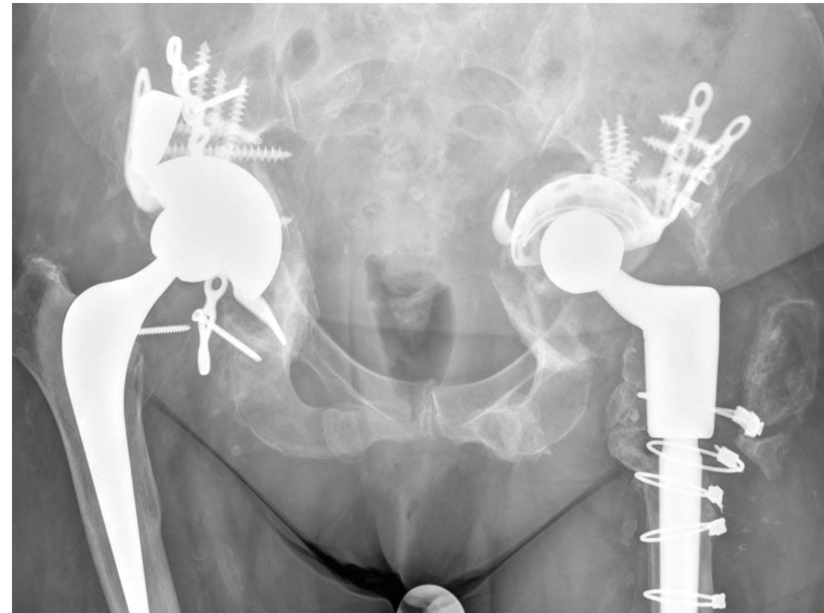
JRI

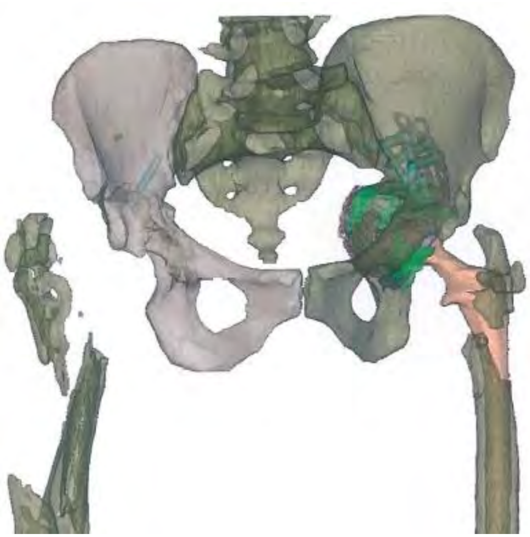
- receive royalties relating to the sales of a primary hip system

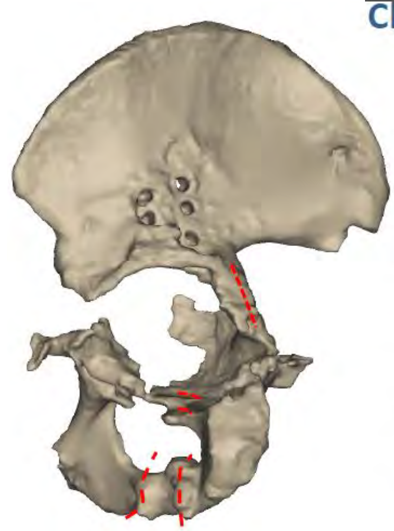
IT CAN'T GET ANY WORSE!

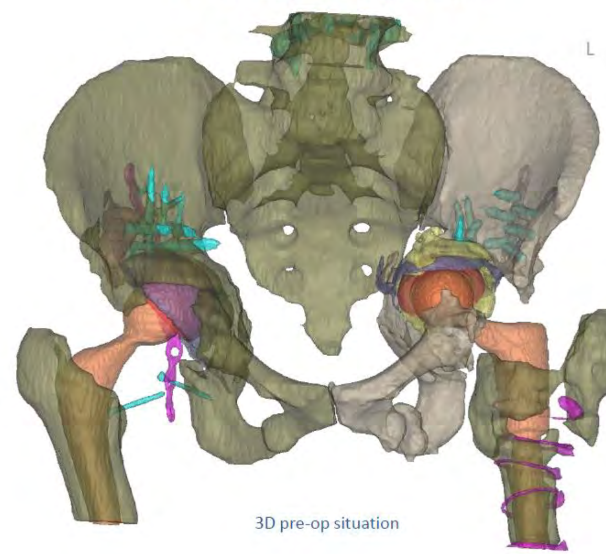


IT DOES!





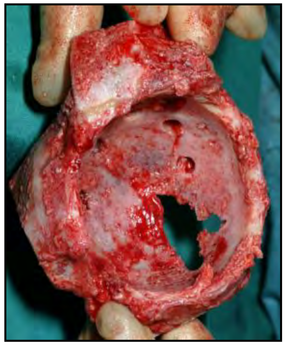




HOW DO WE RECONSTRUCT ?

- SADDLE PROSTHESIS

- ALLOGRAFT – PROSTHETIC COMPOSITES



- CUSTOM ACETABULAR COMPONENTS

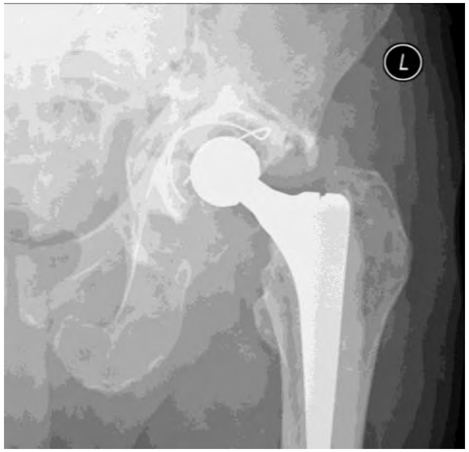
VANDERBILT UNIVERSITY MEDICAL CENTER'S WEEKLY NEWSPAPER

“new implant may eliminate repeat hip replacements”

“the Triflange cup will become the standard for many revision hip replacements and could ultimately be used in initial hip replacement surgeries.”

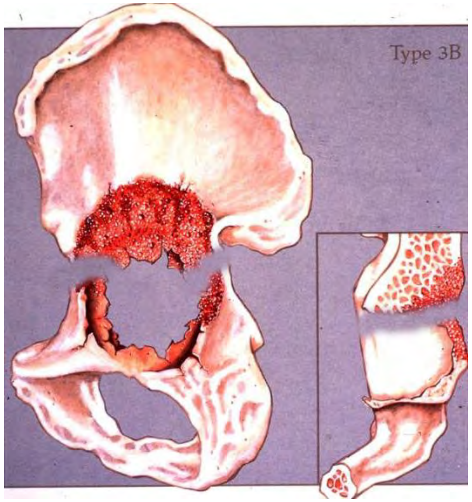
CHRISTIE & De BOER 26/07/1996

INDICATIONS

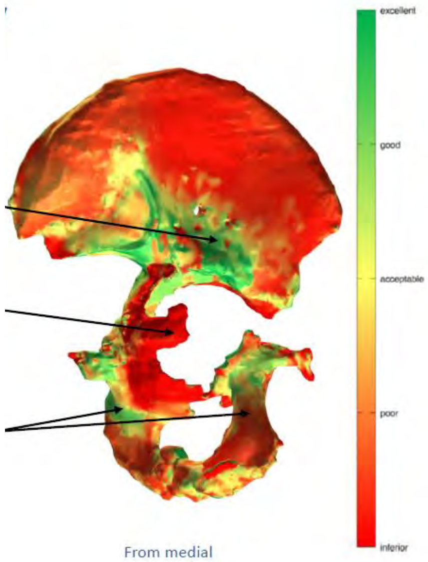


<u>Severe bone loss</u>

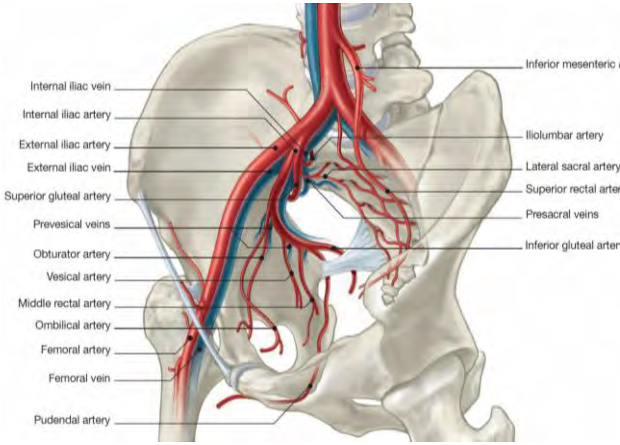
- Paprosky 3B
- Pelvic discontinuity



SCEPTICAL



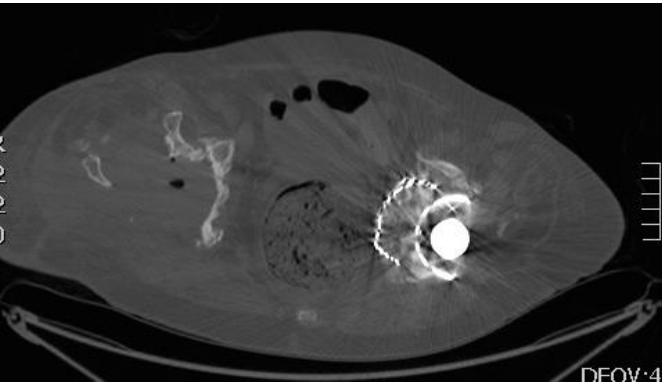
- STANDARD TECHNIQUES HAVE FAILED
- BEST BONE HAS GONE
- HOW CAN YOU FIX THIS IMPLANT TO THE BONE?
- WHERE ARE THE SCREWS GOING?



CUSTOM 3-DIMENSIONAL PRINTED IMPLANT

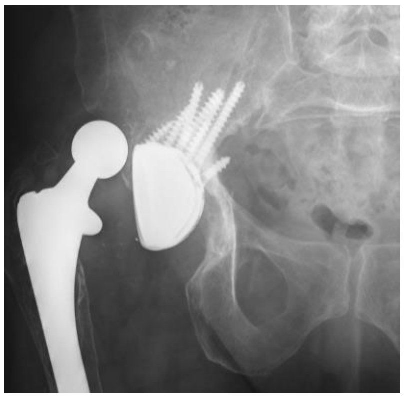
- patient and defect specific implant
- designed from CT images
- Ti alloy powder is fused layer by layer in vacuum
- as layers build, powder is melted selectively to produce meshes
- different surface finishes can be added

eg porous, silver coating, smooth

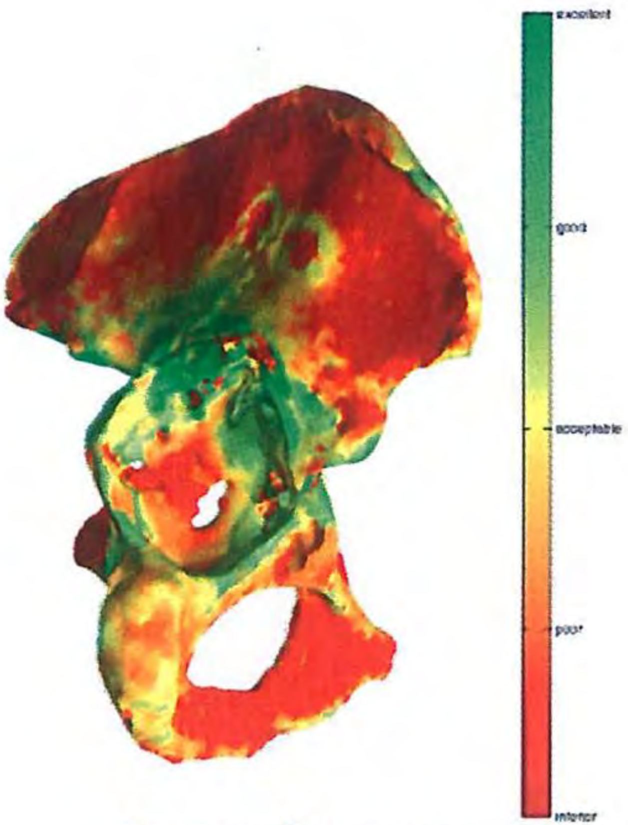


aMace®

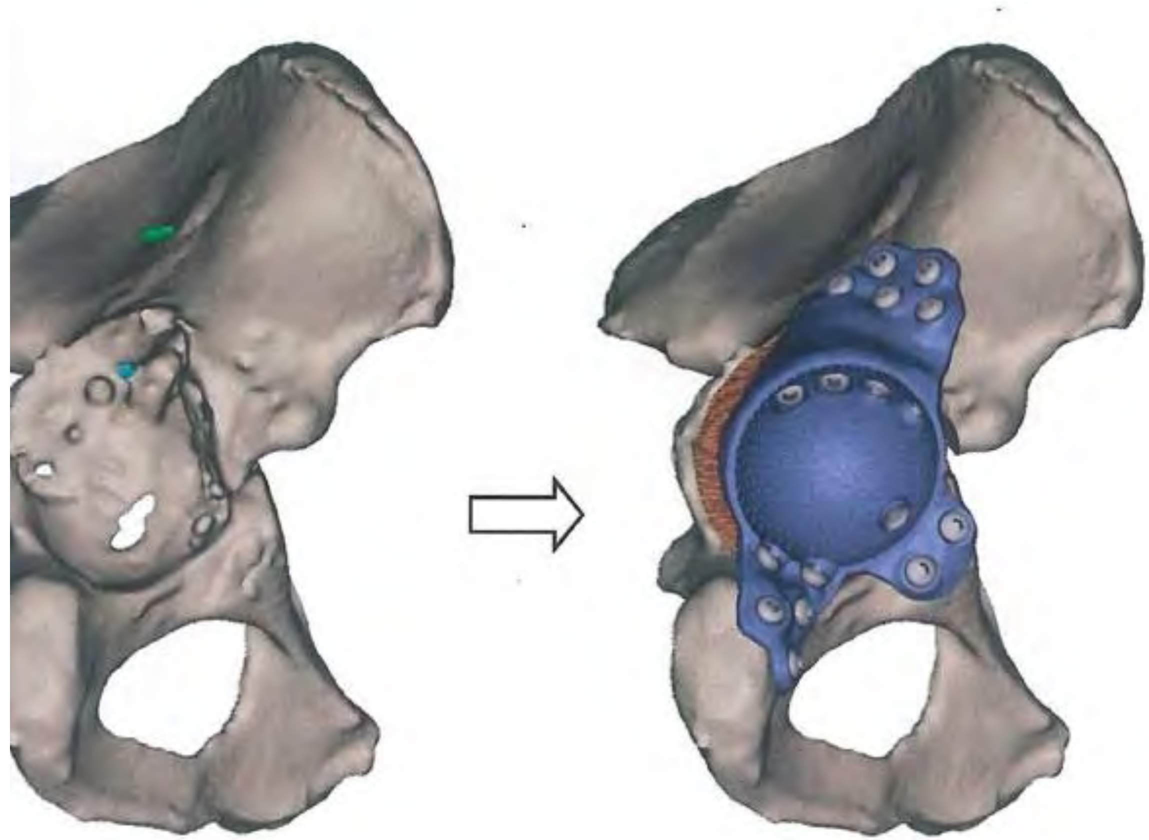
Acetabular Revision System



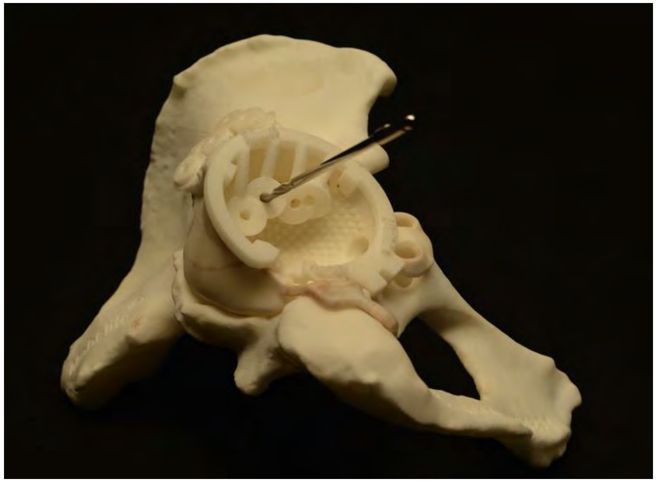
FROM CT SCAN TO DELIVERY
4 – 6 WEEKS



Bone quality map to determine the optimal screw positions and directions

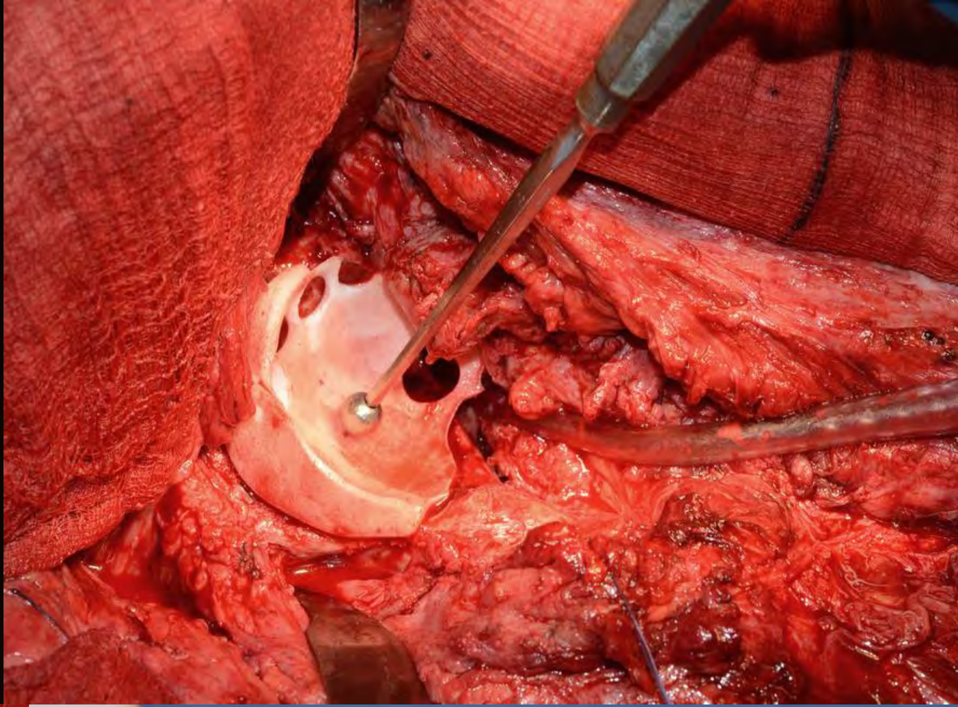
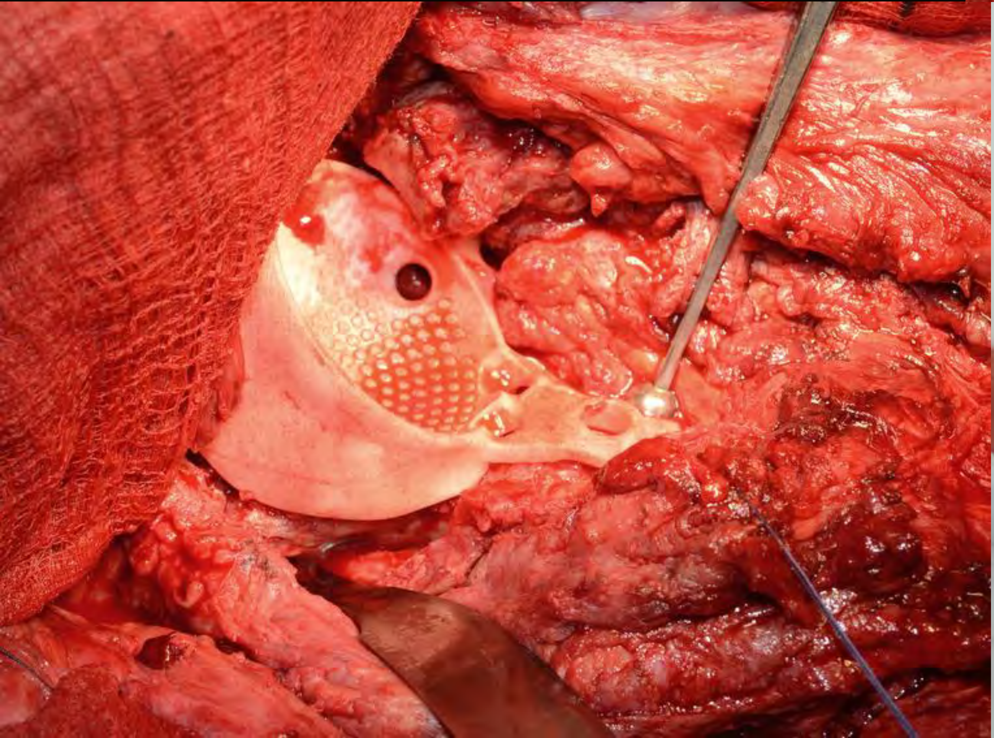


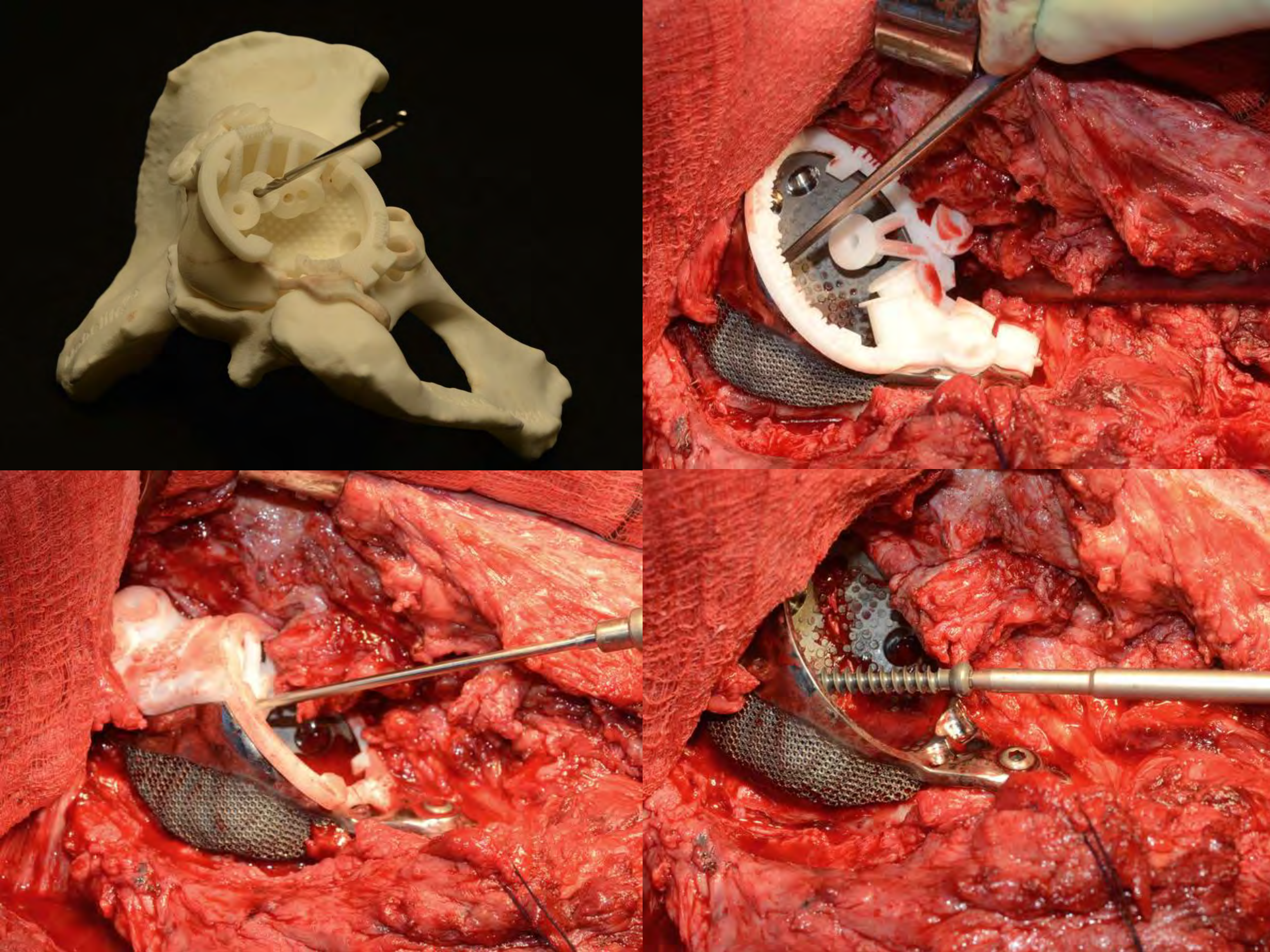
SCREW LENGTH AND PLACEMENT

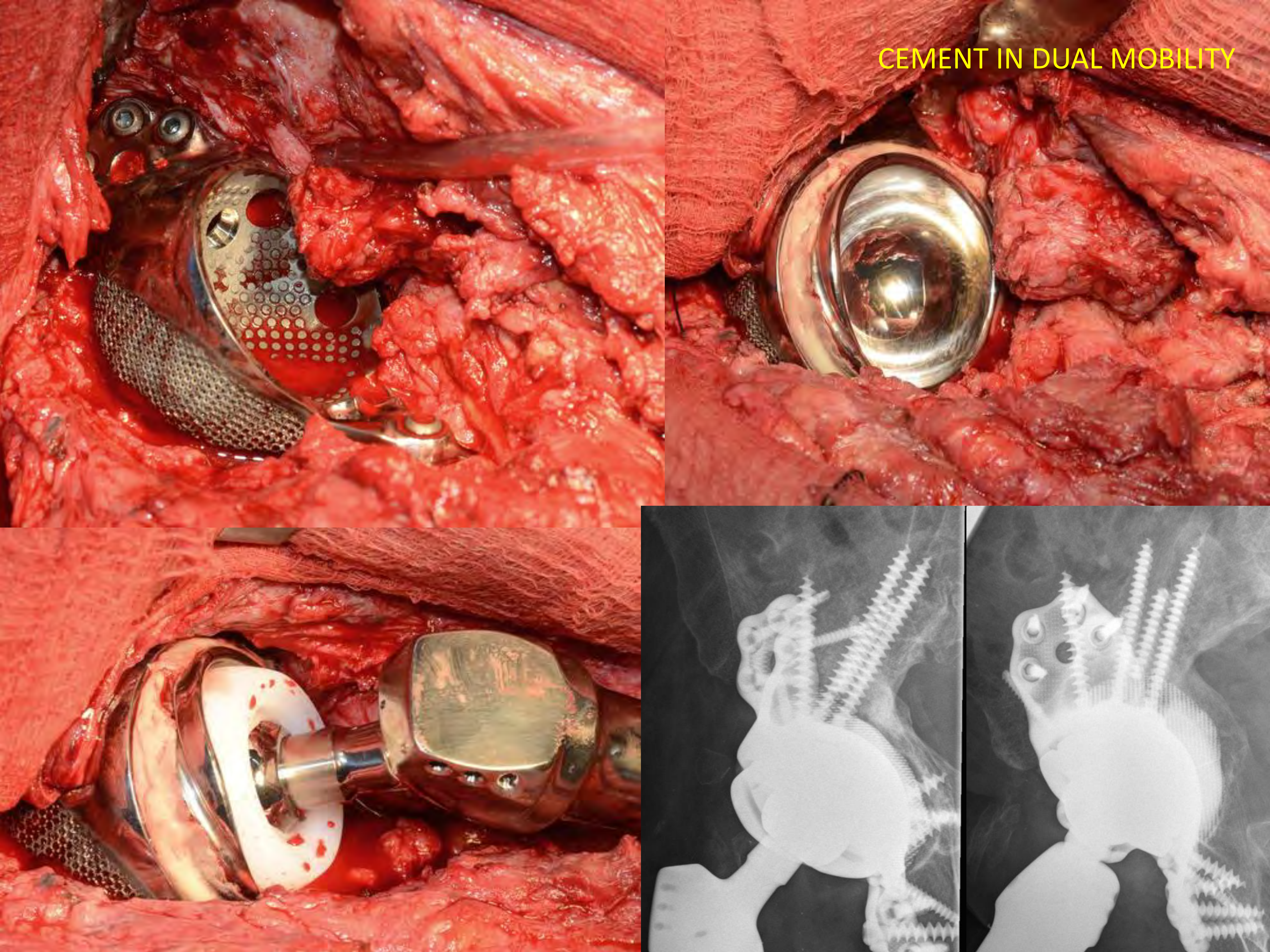


Screw no.	Bone thickness	Max. Screw shaft length	total screw length (AO)
1	15 mm	16 mm	21 mm
2	14 mm	15 mm	20 mm
3	23 mm	26 mm	31 mm
4	21 mm	21 mm	26 mm
5	18 mm	19 mm	24 mm
6	26 mm	31 mm	36 mm
7	18 mm	25 mm	30 mm
8	28 mm	29 mm	34 mm
9	31 mm	32 mm	37 mm
10	26 mm	27 mm	32 mm
11	52 mm *	60 mm	65 mm
12	55 mm *	60 mm	65 mm
13	45 mm *	45 mm	50 mm
14	27 mm *	27 mm	32 mm
15	32 mm *	35 mm	40 mm
16	22 mm *	24 mm	29 mm
17	18 mm *	20 mm	25 mm

Distances measured along screw axis


Mobelife®




CEMENT IN DUAL MOBILITY

RESULTS

- 76 pts (78 hips) custom made triflange implant
- 39 pelvic discontinuity, 39 extensive bone loss
- 65 pts (67 hips) mean FU 4.5yrs

- radiographic evidence of union in 30 (of 32) hips
- 1 BROKEN SCREW, NO MIGRATION
- NO REVISIONS of the triflange (liner exchange for dislocation 8%)
- mean HHS 33 to 82

CHRISTIE et al 2001

RESULTS

- 28 pts (30 hips) custom made triflange implant
- mean FU 10 yrs

- radiographic evidence of union in 18 hips
- 5 patients multiple dislocations
- NO BROKEN SCREWS, NO MIGRATION
- NO REVISIONS of the triflange
- mean HHS 41 to 80

DeBOER et al 2007

RESULTS

- 57 patients
- FU 24-215 months. Av 65 months
- 95% survival rate
- 81% stable with healed discontinuity
- mean HHS 74.8
- Costs: Triflange = Trabecular metal cup cage

TAUNTON et al 2012

RESULTS

- 19 patients
- FU 16-59 months. Av 31 months
- 2 revisions of triflange
- Mean HHS 33 to 68
- <u>both surgeon and patient expectations should be realistic</u>

WIND et al 2013

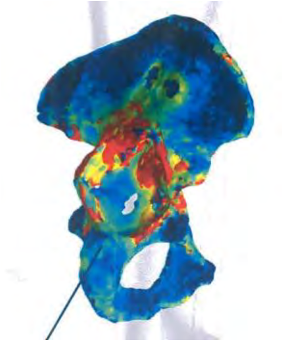
RESULTS

- Mobilife
- 6 patients
- FU 10 -58 months
- Mean HHS 44 to 71
- 100% patient satisfaction

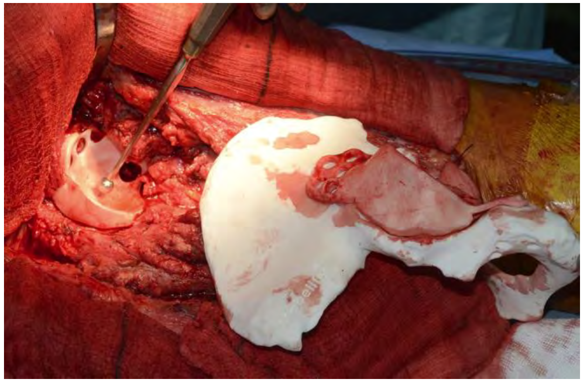
COLEN and MULIER 2013

DISADVANTAGES

- RELYING ON FIXATION PRE DETERMINED BY CT SCAN



- INABILITY TO MODIFY INTRA OPERATIVELY



ADVANTAGES

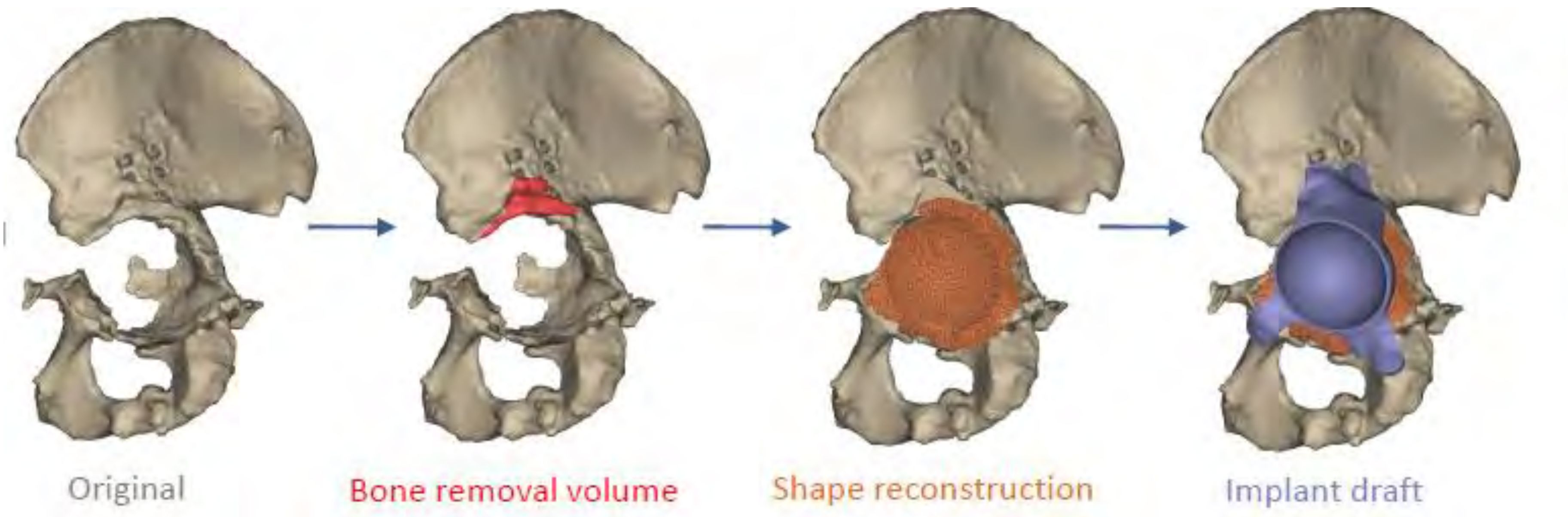
- ‘RELATIVELY, UNCOMPLICATED SURGICAL PROCEDURE’

  no need to shape, fit and fix the structural graft or bend and fix the cage

- THICK, RIGID, INDIVIDUALLY CONTOURED FLANGES ALLOW FOR RIGID FIXATION

  pelvic discontinuity is a <u>fracture non union</u> rather than a large acetabular defect

THERE IS STILL HOPE!



INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY