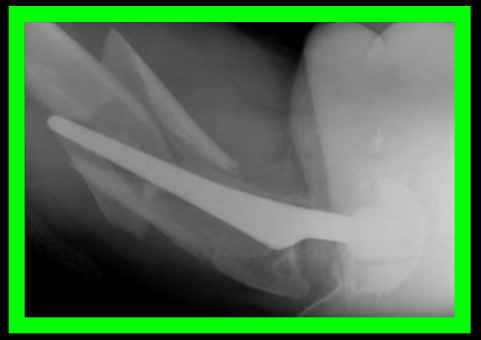
TRAUMA

1. Management of periprosthetic fractures. When and how to revise?
2. Management of priprosthetic fractures. Fixation and management of bone stock
3. Periprosthetic Fractures of the Femur Following Total Hip Replacement
4. Periprosthetic femoral fracture due to sideways fall: a comparative analysis on the effect of stem design
5. Systematic review of the management of periprosthetic fractures of hip resurfacing
6. Late periprosthetic fracture of the femur after total hip replacement
7. Periprosthetic fractures treatment with uncemented modular femoral tapered revision stems: our experience
8. Distally locked Uncemented stem (Cannulok) in B2 and B3 Periprosthetic femoral fracture in elderly population
9. Cable plating and a strut allograft in the treatment of periprosthetic femoral fractures
10. The effect of delay to surgery on outcome and length of stay following periprosthetic fracture around the hip
11. Learning curve in management of acetabular both-column fractures
12. Surgical hip dislocation for the management of irreducible posterior hip dislocation with femoral head fracture
13. Minimal-invasive posterior approach in the treatment fractures of the acetabulum: …. after 10 years
14. Dislocation and complications after THA for acute femoral neck fractures
15. Constrained Total Hip Arthroplasty – "Retentive cup" in patients with Femoral Neck Fracture
16. Dynamic Locking Plate VS. Simple Cannulated Screws For Nondisplaced Intracapsular Hip Fracture: A Comparative Study
17. Intramedullary nails Vs extramedullary implants for extracapsular hip fractures: 1-yr mortality and periop bleeding….
18. Follow-up of 810 consecutive titanium hydroxyapatite coated uncemented hemiarthoplasties
19. Hemiarthroplasty versus total hip arthroplasty for the treatment of femoral neck fractures. A prospective comparative study
20. Outcomes following Total Hip Arthroplasty for Neck of Femur fractures
21. 30 day readmission rate of patients managed for neck of femur fracture; a population based tool for targeted long term management
22. Analysis of A.S.A. Score in geriatric hip fractures as a predictive factor for complications and readmission in hospital
23. Acute Kidney Injury as a risk factor for 30 day mortality in fractured neck of femur patients
24. The influence of acetabular and proximal femoral morphology on the femoral neck and trochanteric fractures
25. Rethinking tip – apex distance for the Proximal Femoral Nail Anti-rotation
26. Update on fixation of intra-capsular femoral fractures
27. Arthroplasty for fractured neck of femur - cement should be used every time
28. Hemiarthroplasty: what about cementless stem?
29. Femoral Neck Fractures: Hemi vs Total Arthroplasty
30. Hip Arthroplasty in Emergency

Management of periprosthetic fractures: When and how to revise?

Andrew Manktelow



Nottingham University Hospitals
Nottingham
UK

BHS SIDA Combined Meeting
Milan

Thursday 26th November 2015

Disclosures

Zimmer Biomet	Design and education contract
Matortho	Design contract

Periprosthetic fractures

Increasing problem

1.7% within 10yrs

Vioreanu et al JBJS Nov 2014

Younger, active pts at index arthroplasty

Increased uncemented stems

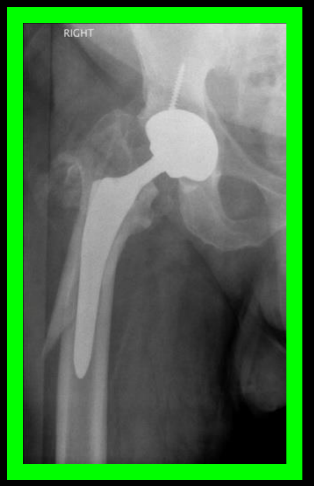
High activity profile post procedure

Patient longevity

Issues of wear, lysis and loosening

Lack of appropriate follow up

Increasing number of revision procedures



Practical concerns

Elderly patients

High co-morbidity

10% mortality in 1 year

Vioreanu et al JBJS Nov 2014

Poor bone stock and biology

‘Scarred’ soft tissues

Landmarks disrupted

Restoration of length

Correct rotation

Joint stability

Surgery has high morbidity with significant clinical resource and financial implications

THE BONE & JOINT JOURNAL

■ SPECIALTY UPDATE

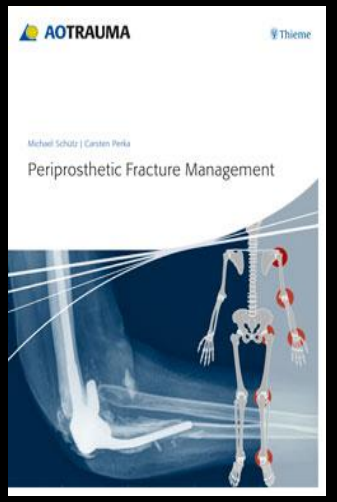
The Unified Classification System (UCS): improving our understanding of periprosthetic fractures

C. P. Duncan,
F. S. Haddad

From Department of Orthopaedics, University of British Columbia, Canada

Periprosthetic fractures are an increasingly common complication following joint replacement. The principles which underpin their evaluation and treatment are common across the musculoskeletal system. The Unified Classification System proposes a rational approach to treatment, regardless of the bone that is broken or the joint involved.

Cite this article: ***Bone Joint J*** **2014;96-B:713–16.**



Type A A pophyseal
Type B B ed of implant
Type C C lear of implant

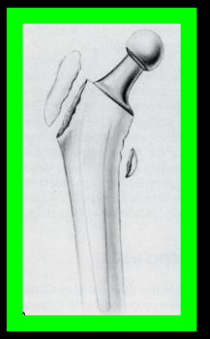
Type D D ividing implants
'Block out analysis'

Type E E ach of two bones
Type F F acing an implant

VOL. 96-B, No. 6, JUNE 2014

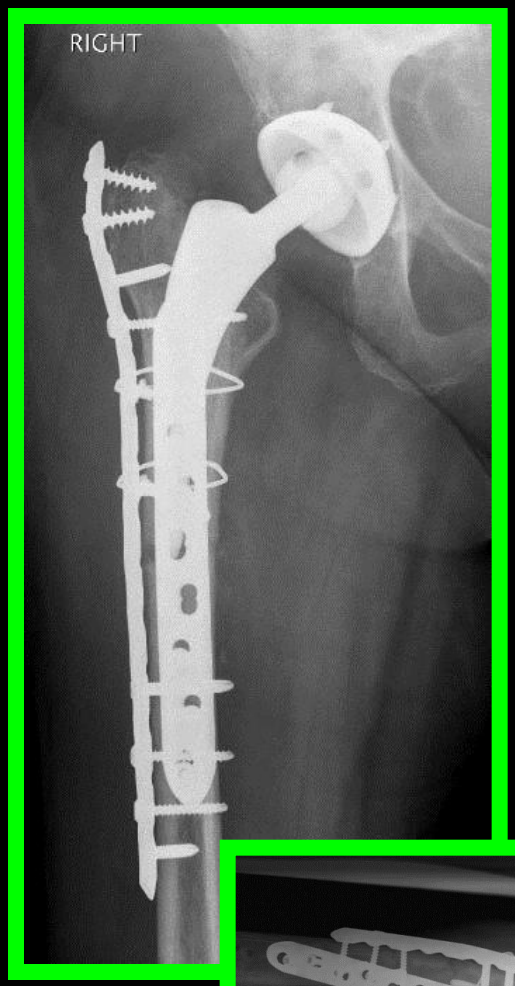
Vancouver Classification

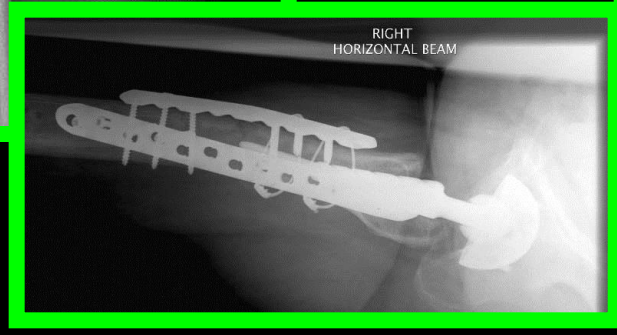
Location	A	‘Above’ stem
	B	Around stem
	C	Below stem
Fixation	B1	Well fixed stem
Bone stock	B2	Loose stem
		Reasonable bone stock
	B3	Loose stem
		Poor bone stock



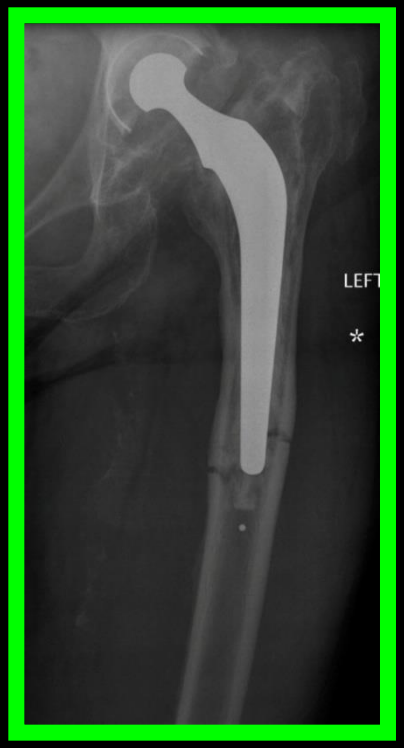
Brady Orth Clin North Am 1999

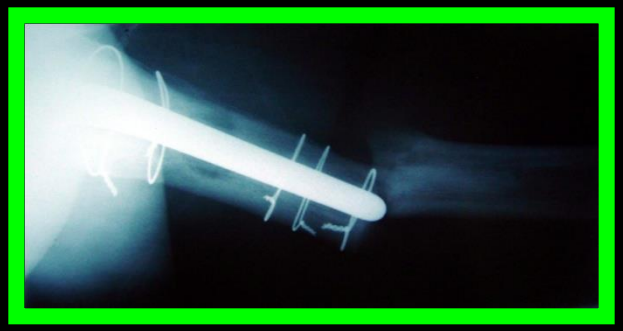
Fixation of B1 fractures



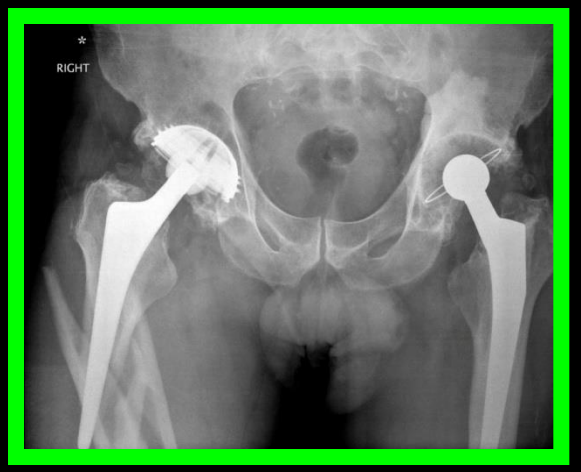


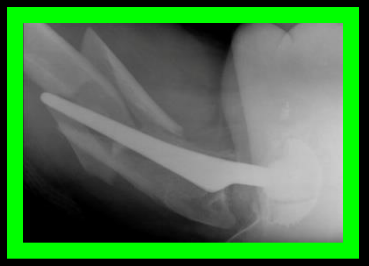
Type B2 Fractures





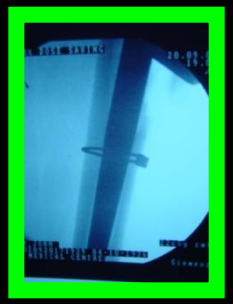
Type B3 Fractures





Principles in management of B2/B3 fractures

Treat fracture and loose prosthesis simultaneously

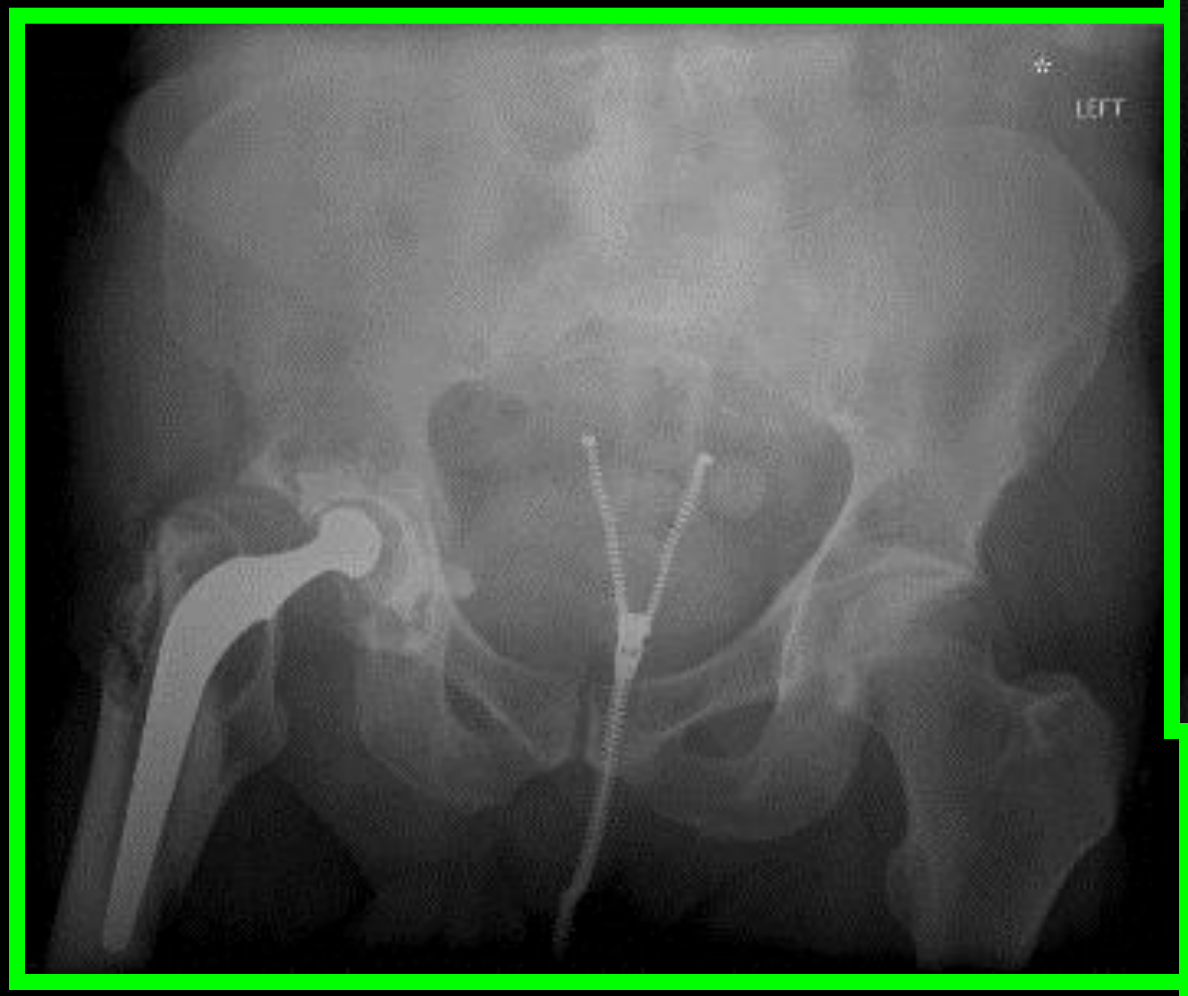


- Bypass fracture
  - Distal fixation
  - Re approximate femur proximally
  - Facilitate fracture union

- Modularity to facilitate biomechanics
- Reconstitute
  - length
  - offset
  - stability

Restore hip joint biomechanics

Allow early and active mobilisation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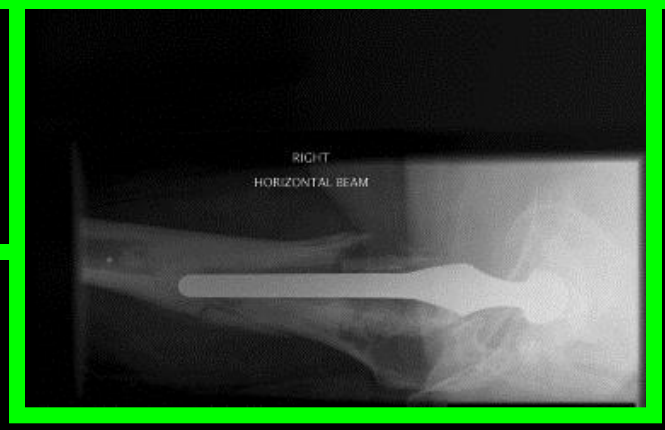
RIGHT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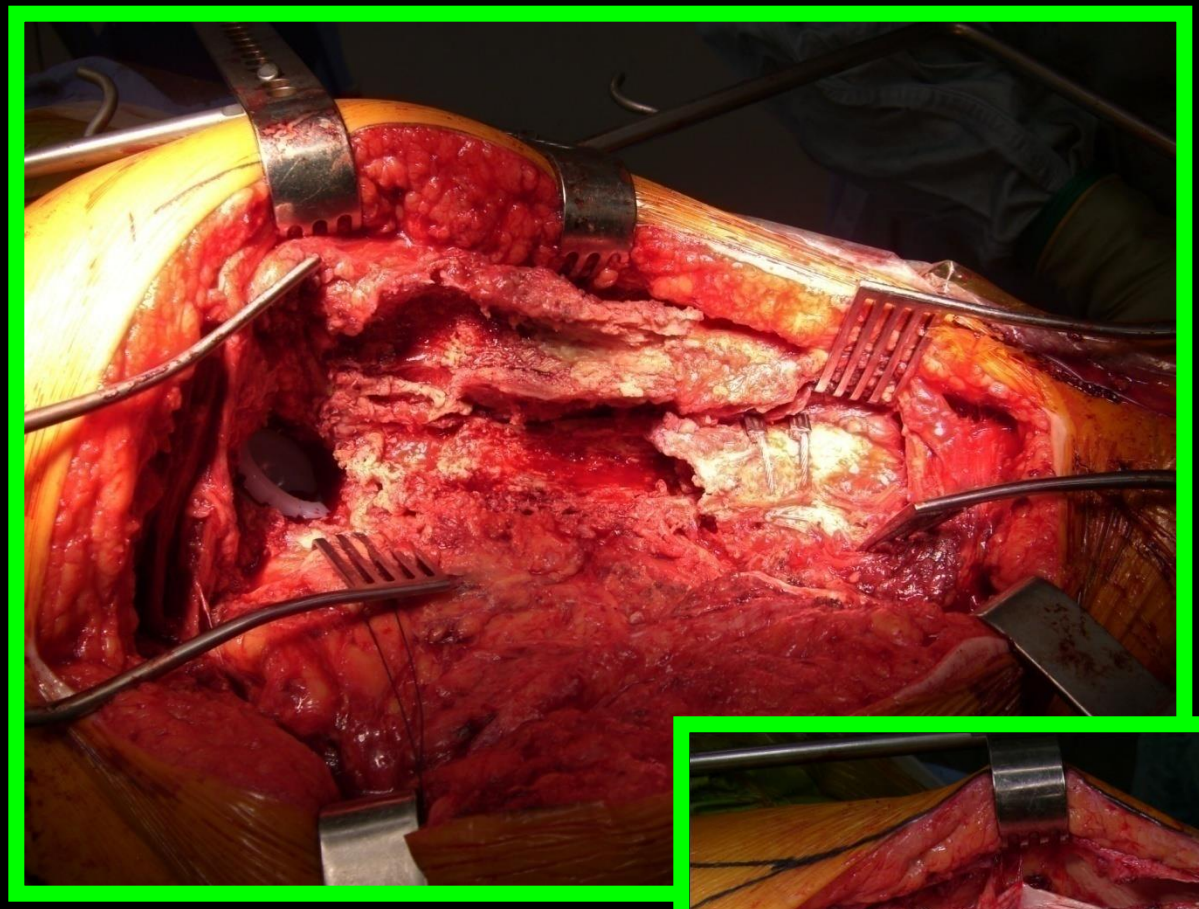
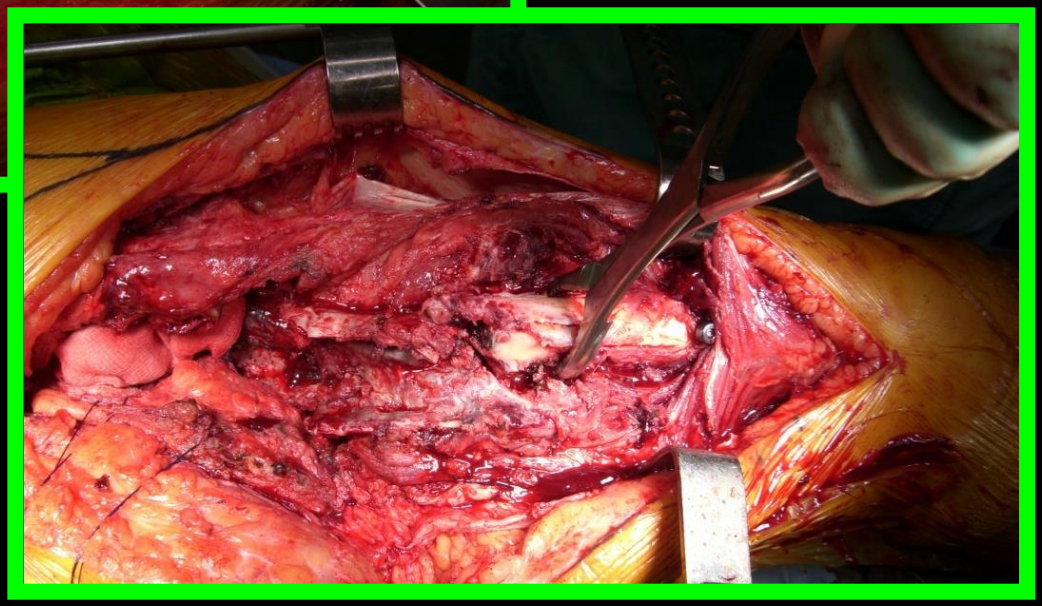
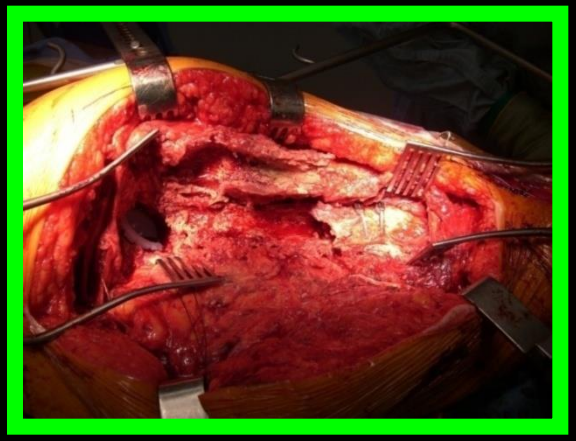
HORIZONTAL BEAM



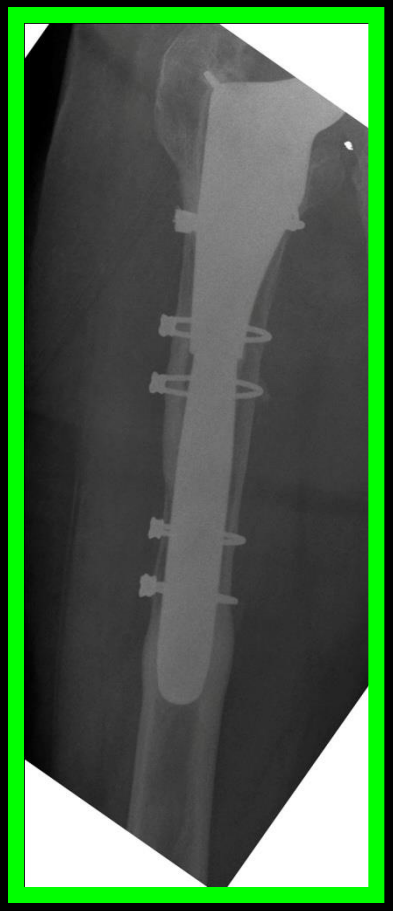


Principles in management of B2/B3 fractures

- Careful exposure, avoid additional stripping
- Identify landmarks from existing implant
- Use fracture as ‘osteotomy’ for exposure and for implant removal
- Identify landmarks from fracture
- Take measurements

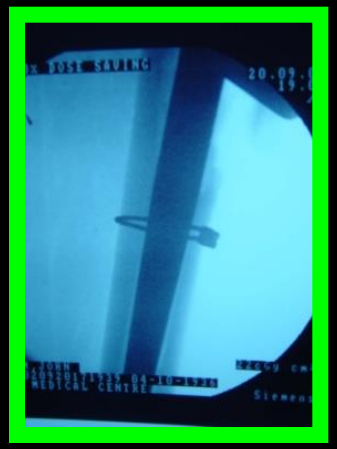


- Check / revise socket
- Distal circlage



- Careful distal preparation
- Sound stem stability

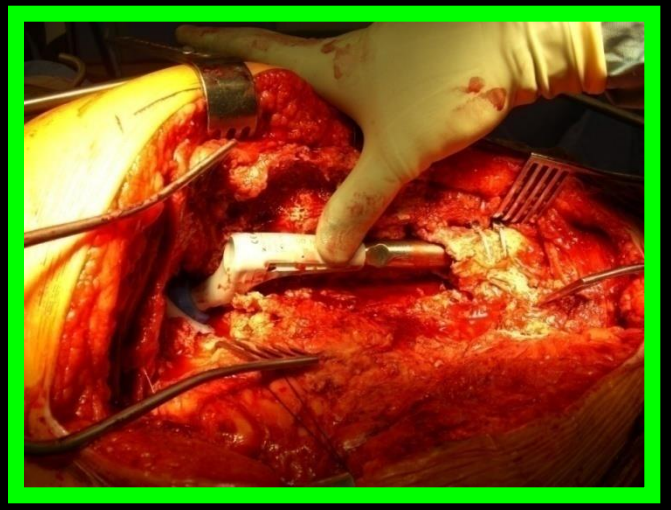
  Adequate bypass

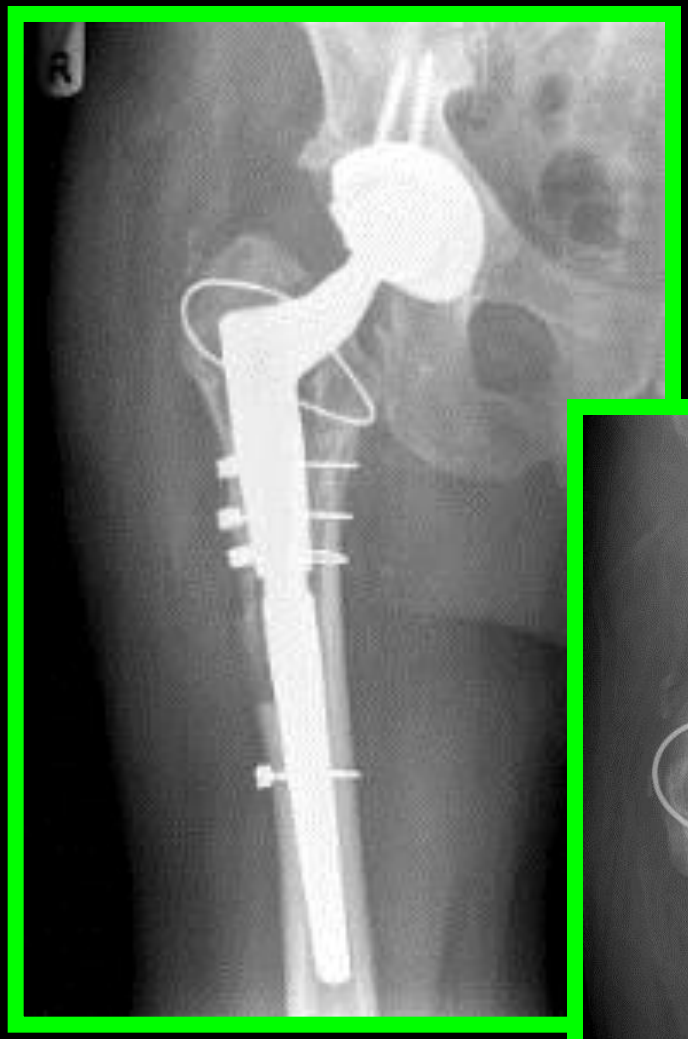


- Proximal preparation

  High speed burr, curette
- Re establish biomechanics

  Leg length, version, offset
- Proximal ‘re approximation’
- Realignment / ‘Implosion’ osteotomy

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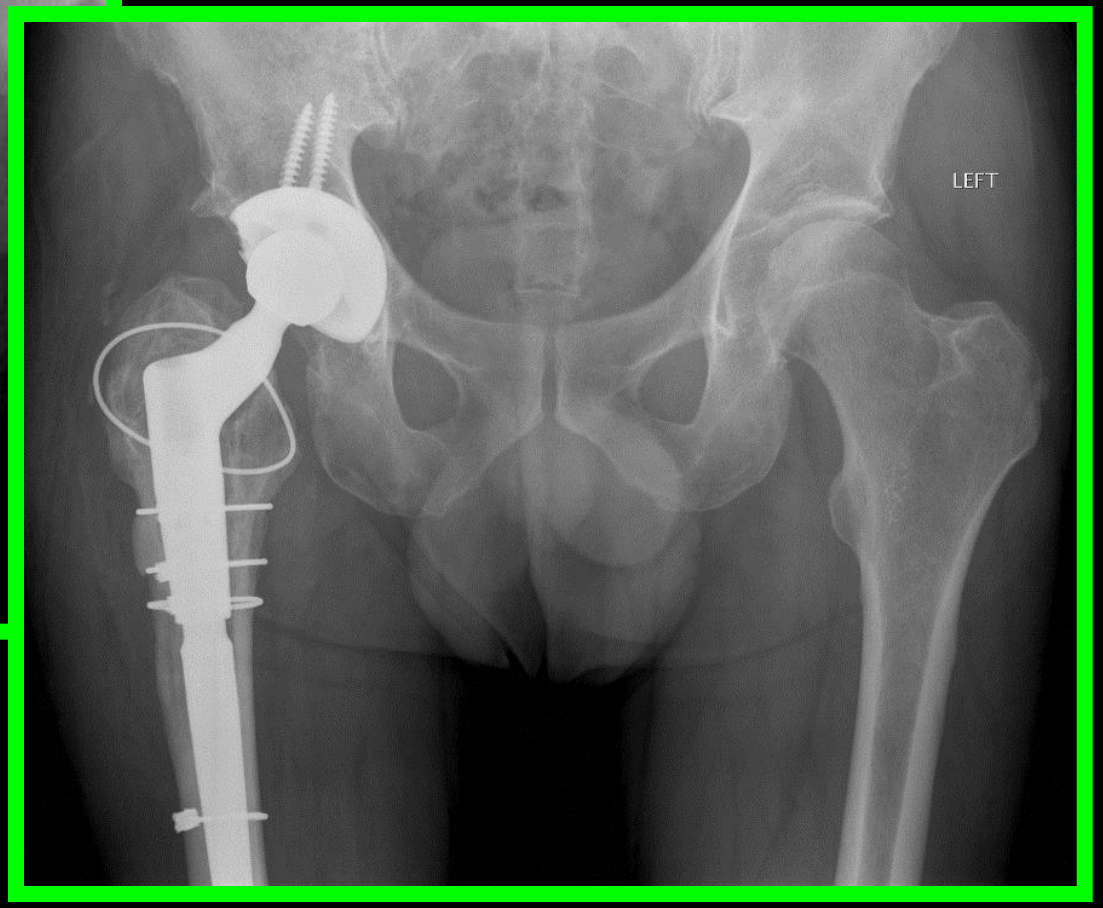
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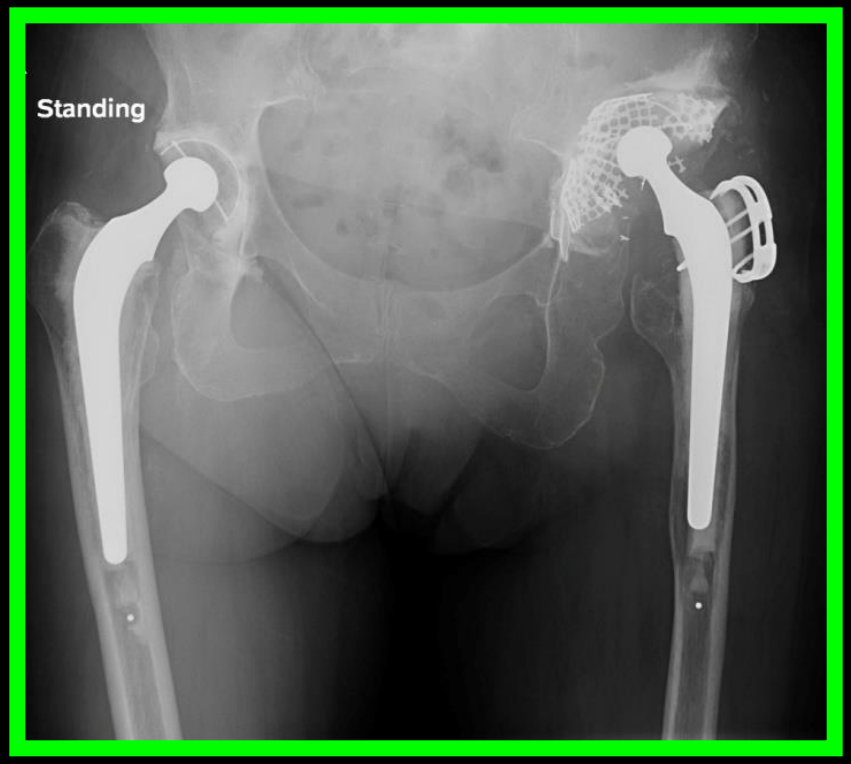
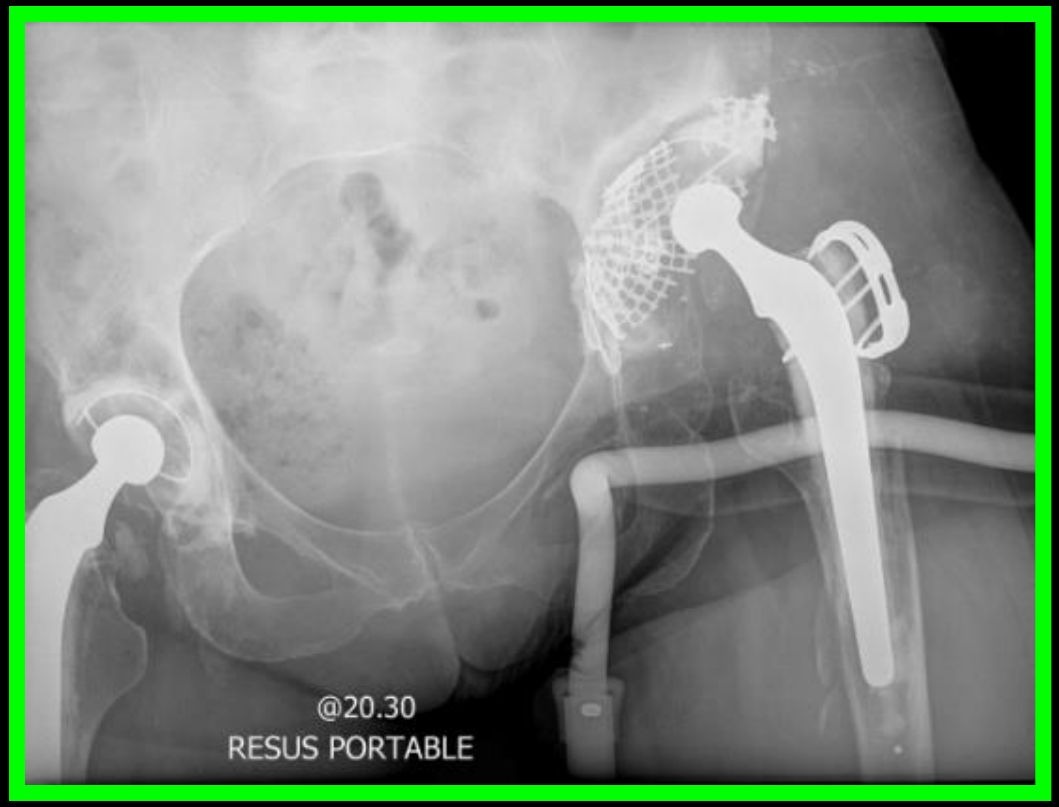
Complex combinations

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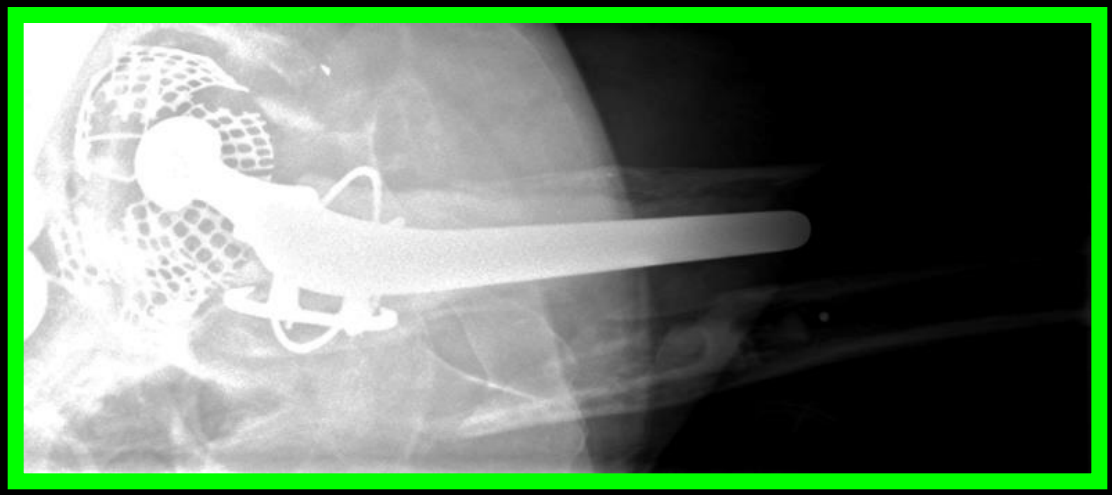

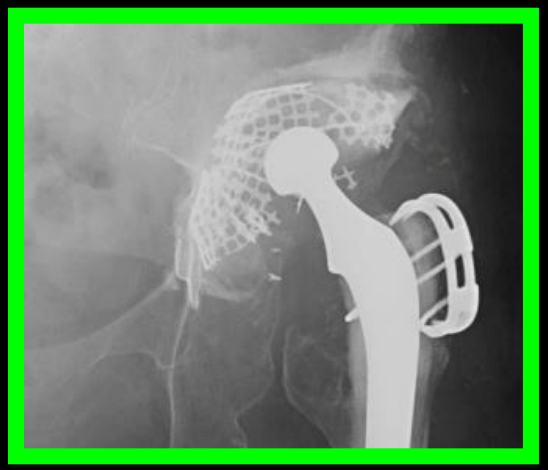

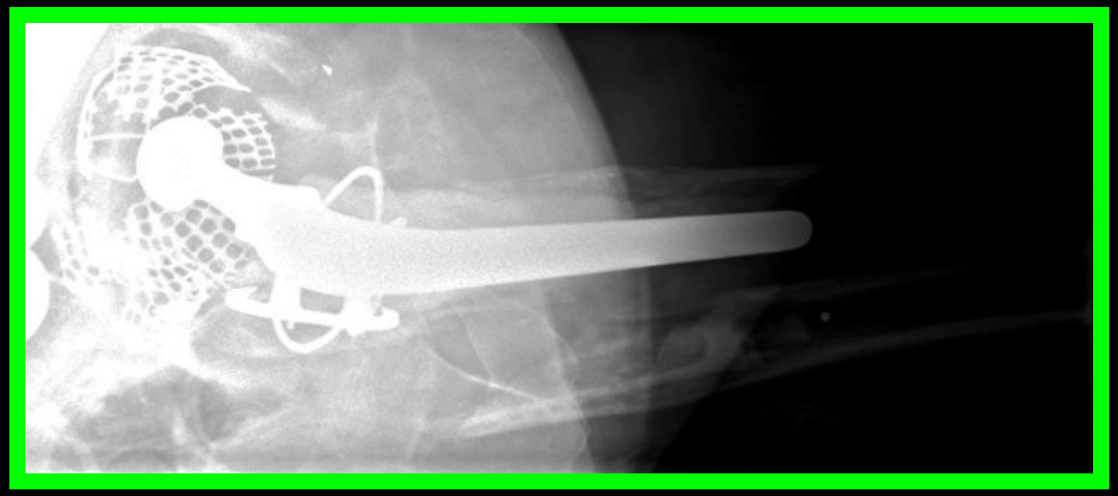

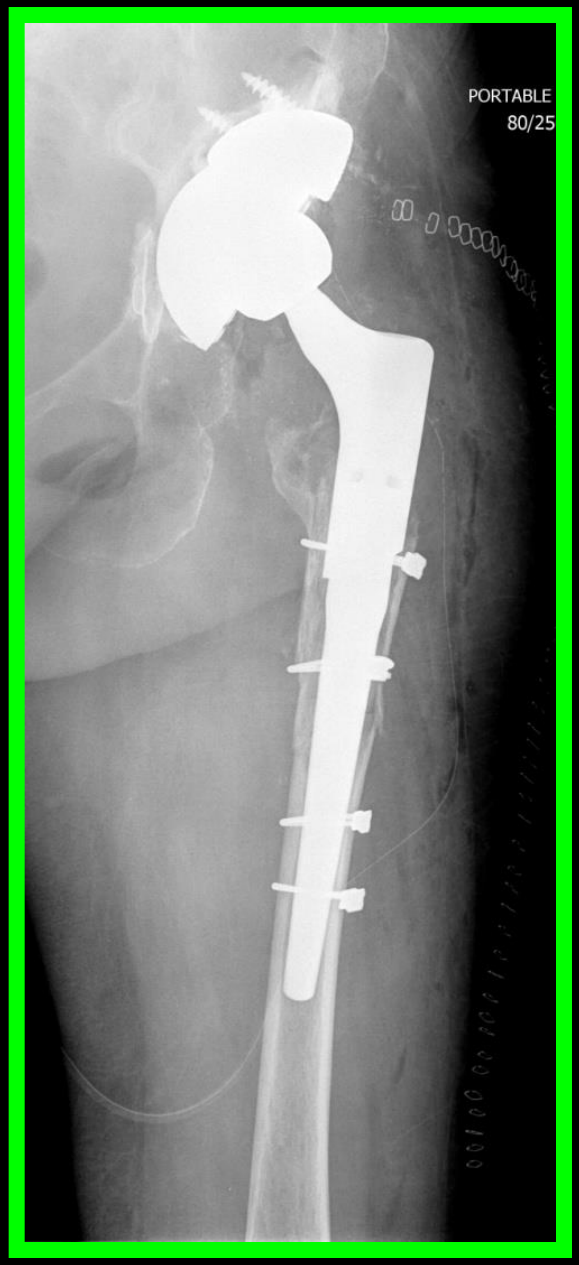
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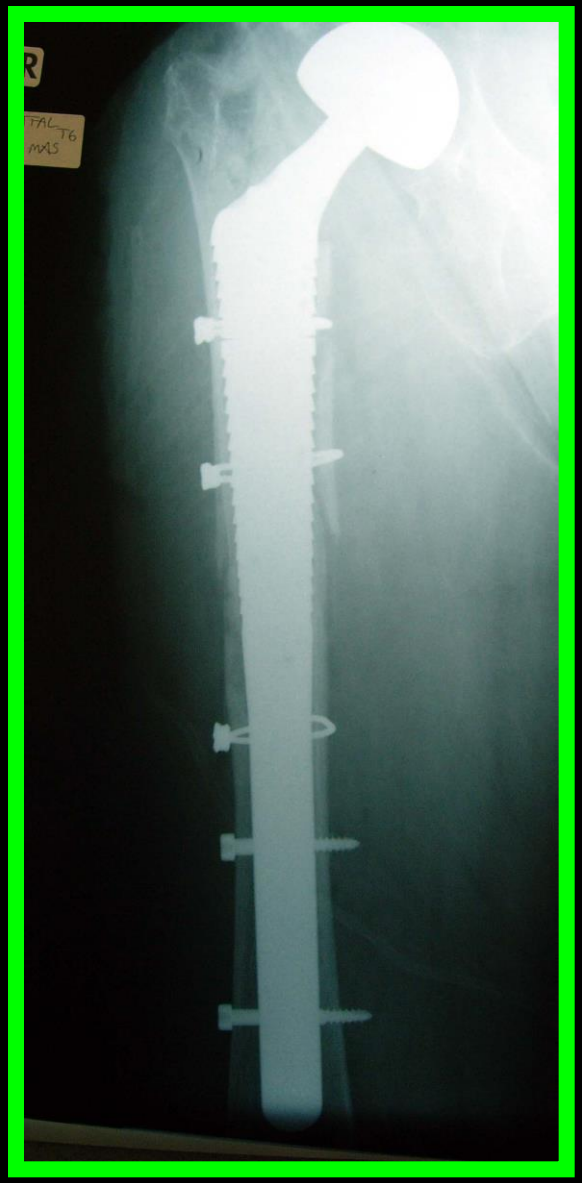
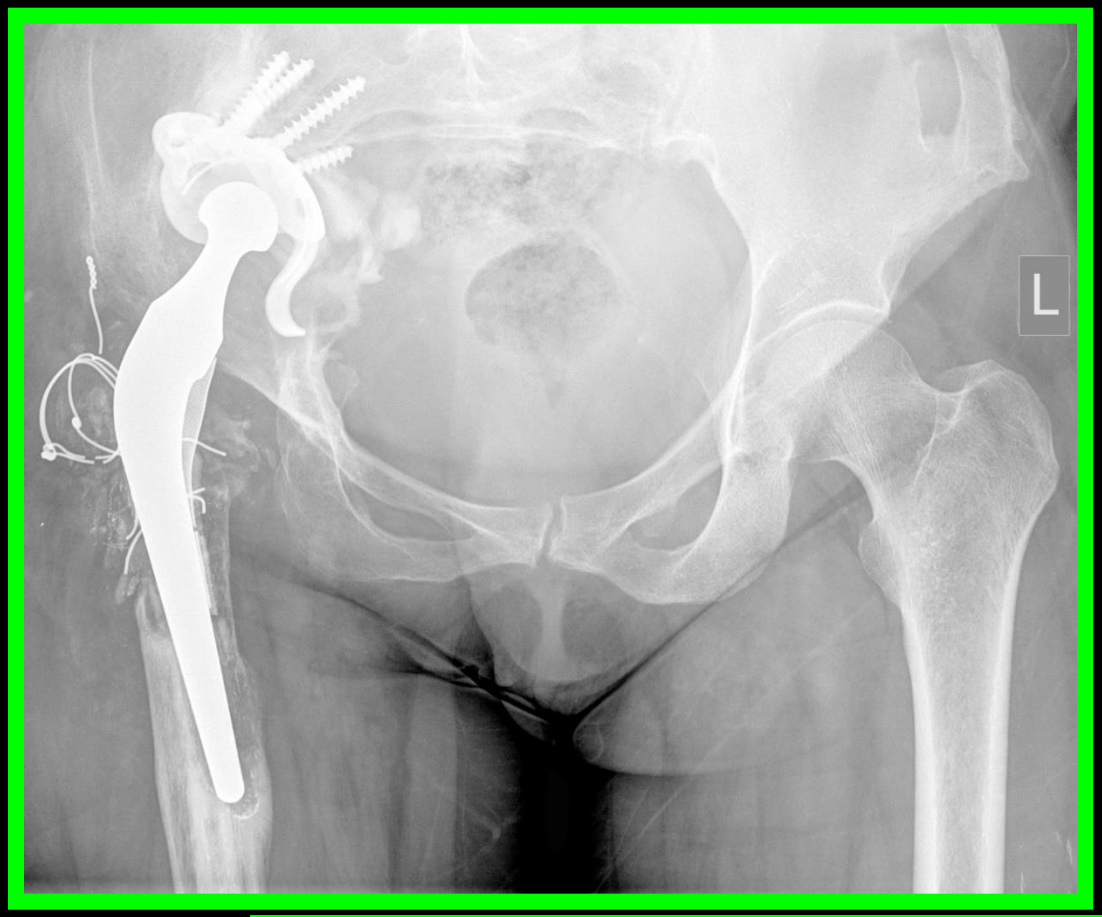
Other options

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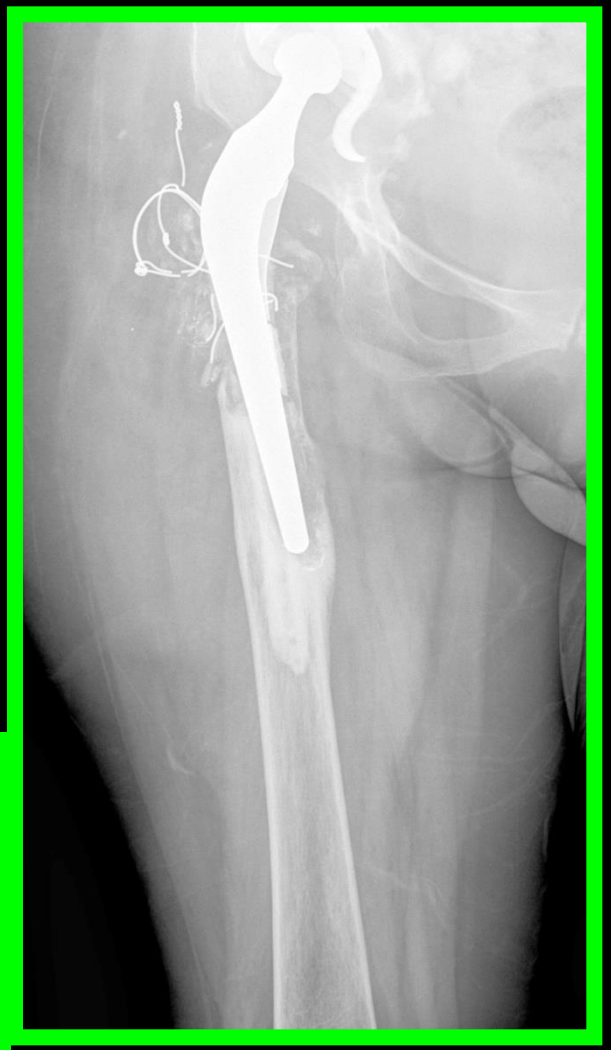

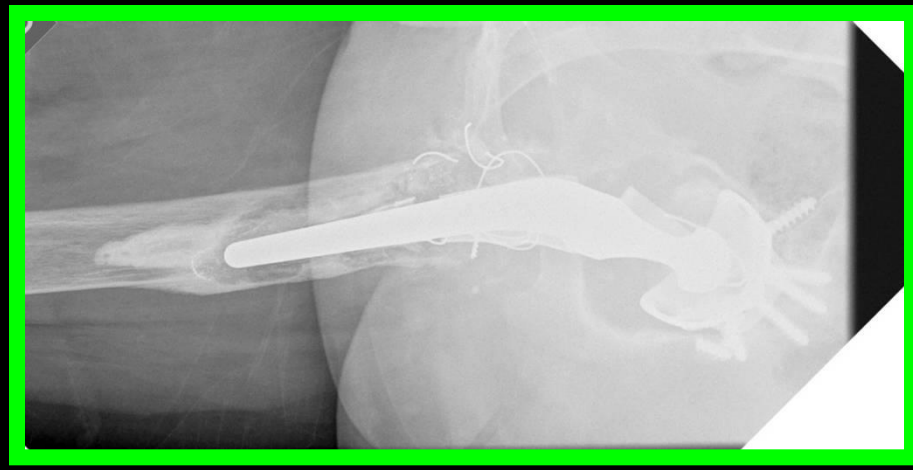

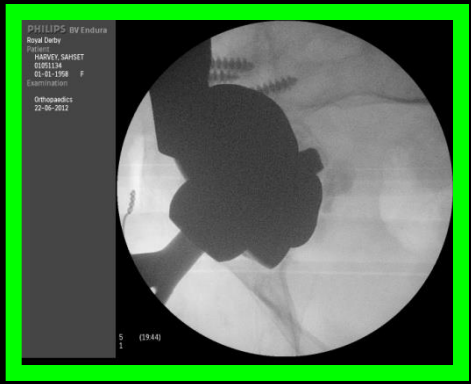
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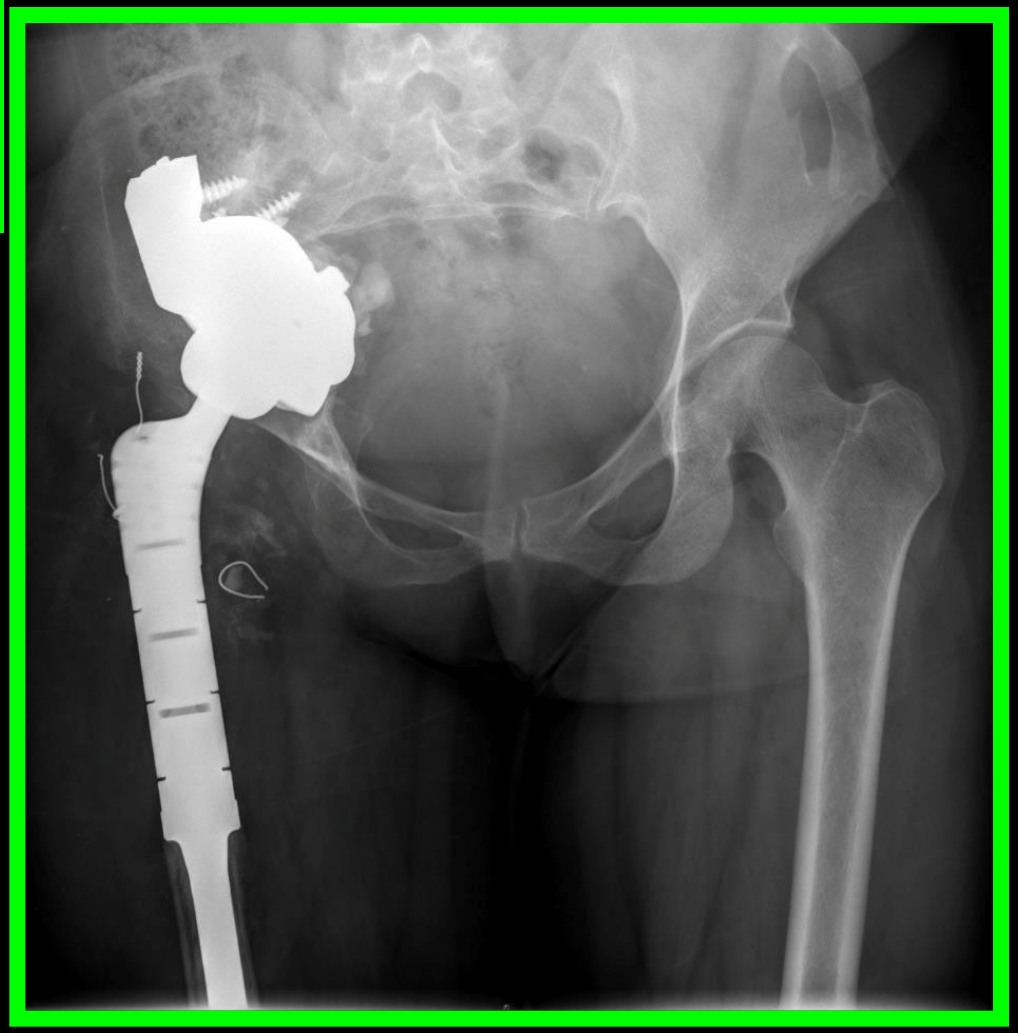


Nottingham experience

All periprosthetic fractures between 1999-2015
Prospective data collection

Initial clinical and radiological evaluation
Fracture classification

Clinical and radiological follow up
234 consecutive patients
Ave age 81 yrs (43-99) 56% Female
Follow up 48mths (3-120mths)
No loss to follow up.
Failure defined as nonunion requiring surgery
or further revision surgery

NUH Experience

114 Vancouver B2 and B3 fractures

36% around hemiarthroplasties

64% around THA

83% primary 17% around revision THA

- 62% discharged from regular ‘follow up’

66% B2

34% B3

6 pts had simultaneous infection

101 pts (88%) underwent complex revision

45% with acetabular revision

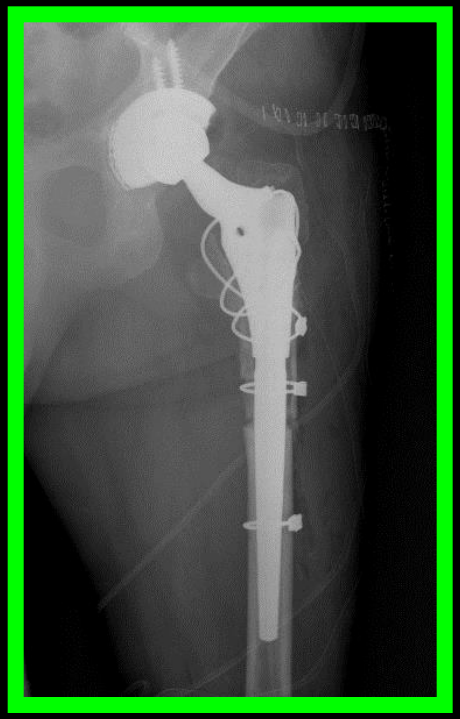
Results

The mortality rate 1yr 22%

5 yrs 47%

60 pts alive at time of report

Others reviewed to time of death



Ave time to union 6mths

16 died prior to union

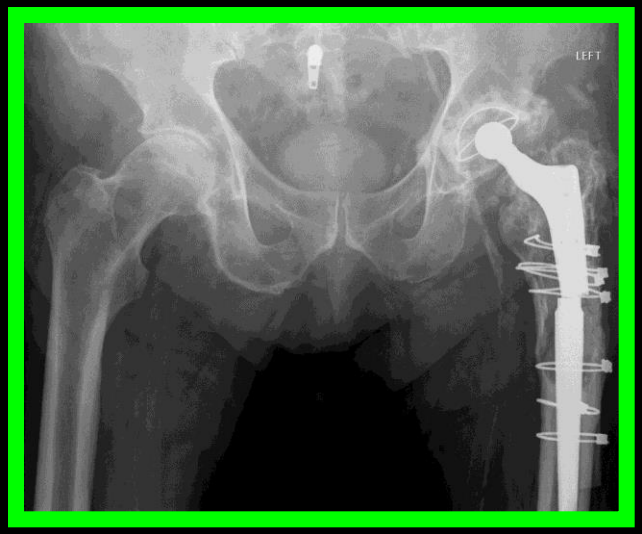
3 Symptomatic non unions

Others ‘functional’ union and functioning revision

Reoperations

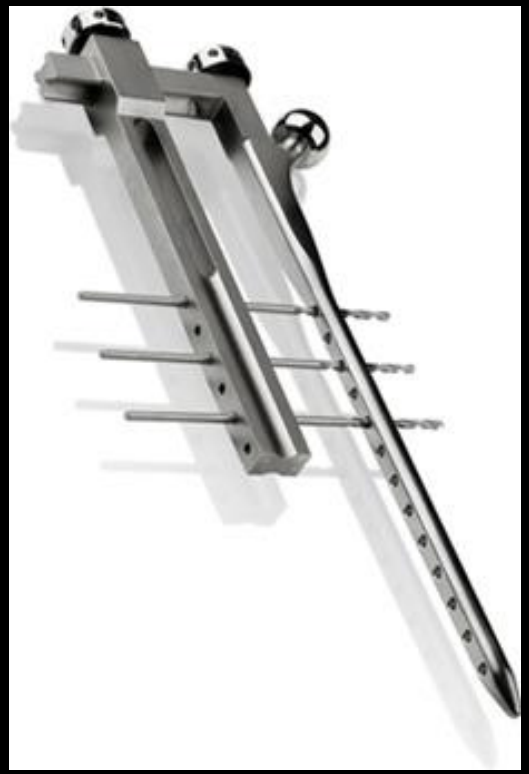
8 cases (8%)

- 2 aseptic stem loosening (cemented stems)
- 2 Revisions for instability
  - 1 liner/head exchange
  - 1 Captive liner
- 1 Stem failure
- 1 B1 periprosthetic fracture
- 2 Revisions for infection
- 1 Failed revision for non union
  - Awaiting Proximal Femoral Replacement

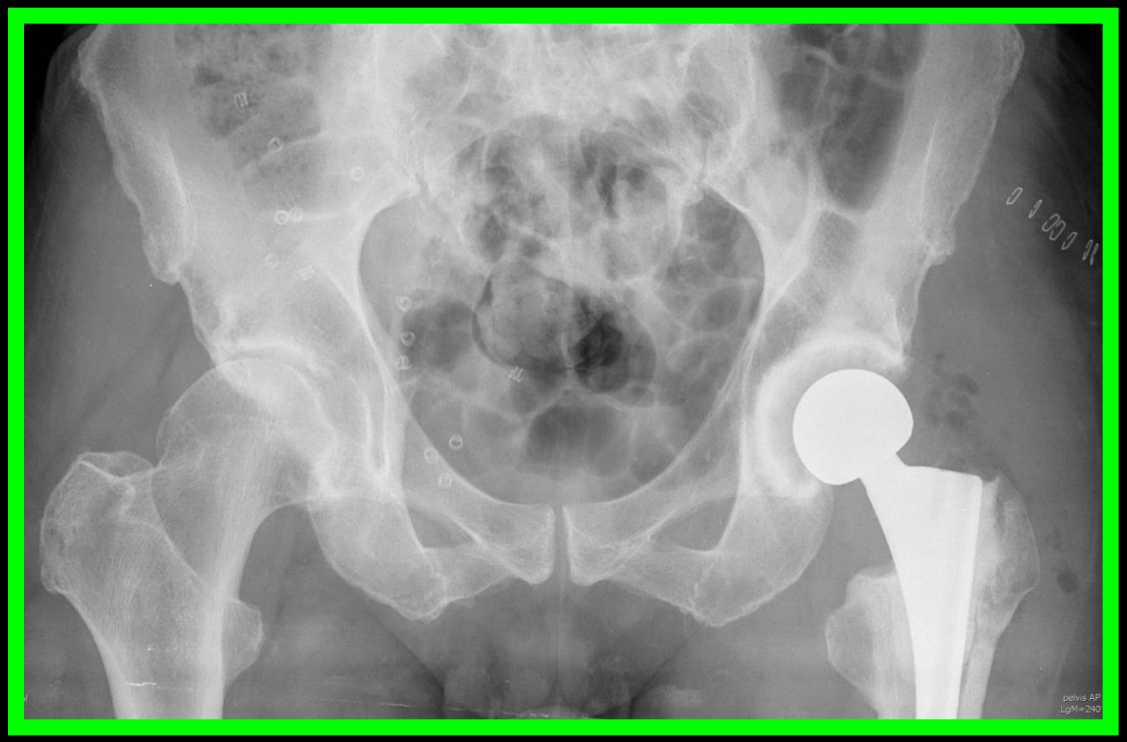


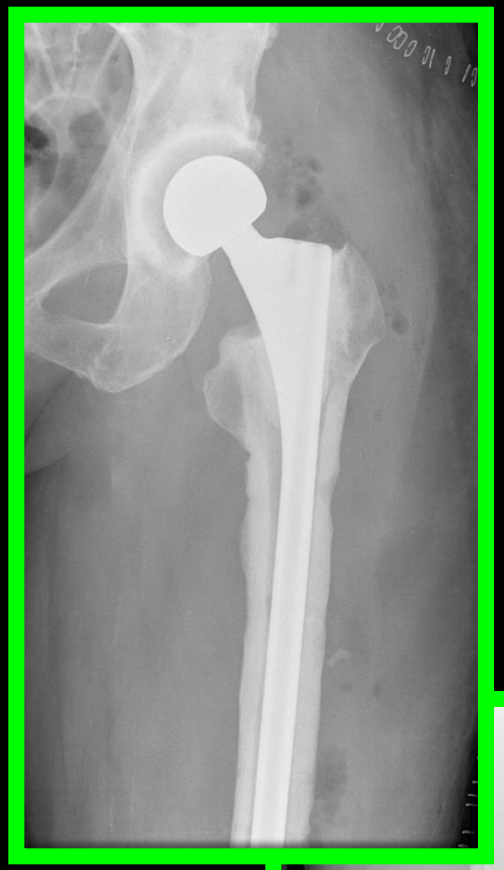
Successful Outcomes in Temporary and Definitive Management of Infected Peri-prosthetic Femoral Fractures Using Interlocking Prostheses

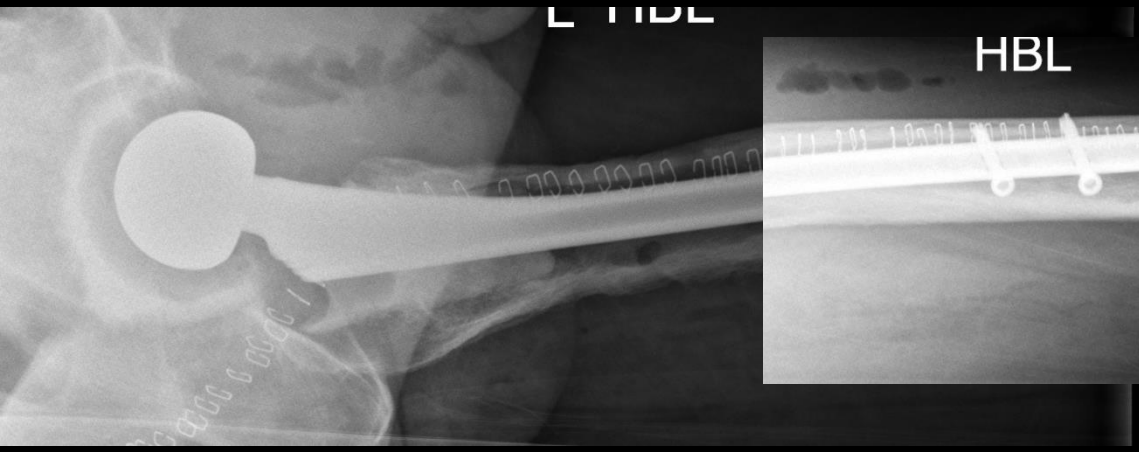
Benjamin-Laing *H, Konan S, Ranyan F, Manketelow A & Haddad F S.*
Bone Joint J 2013 vol. 95-B no. SUPP 15



"The use of interlocking stems offers a relatively appealing solution for a complex problem"



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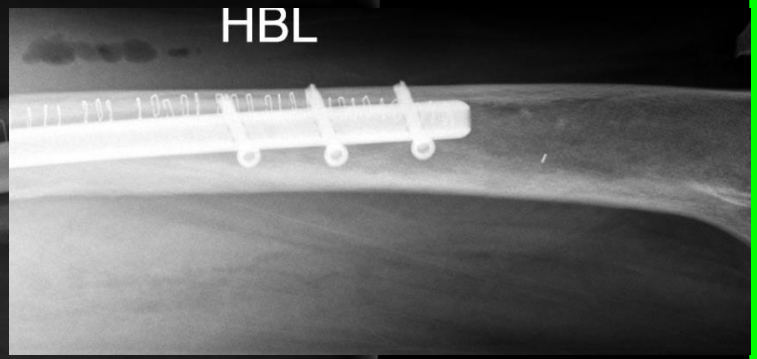

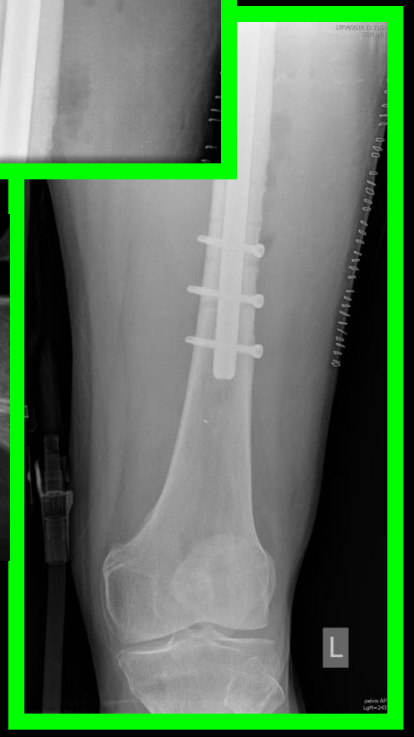
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A particular challenge?


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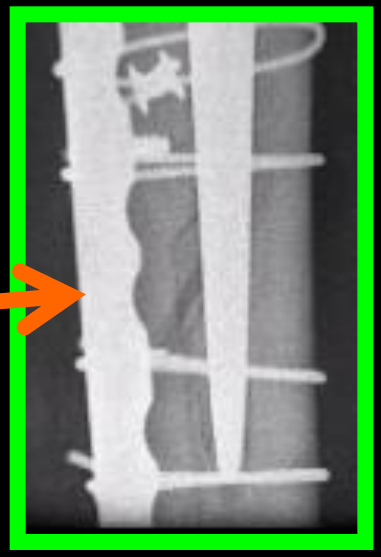
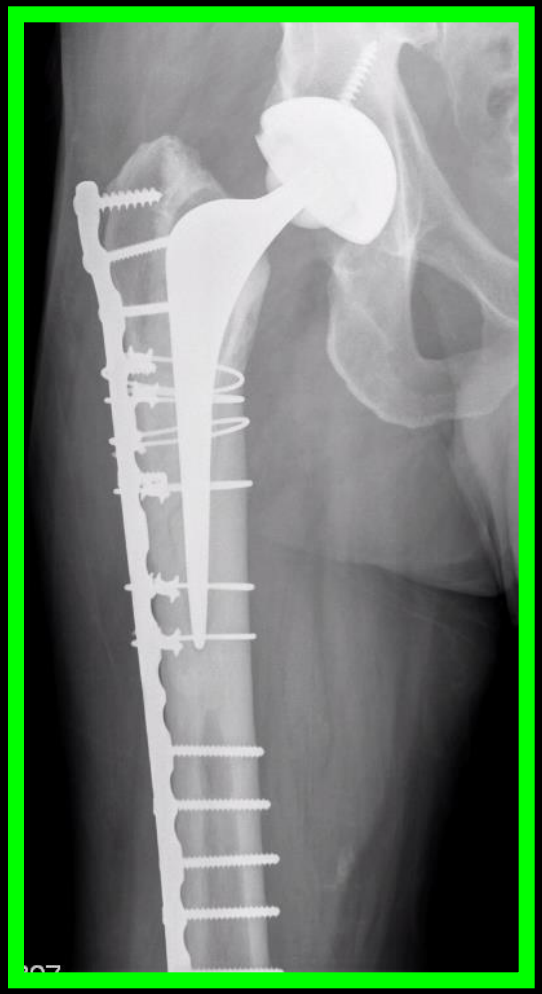
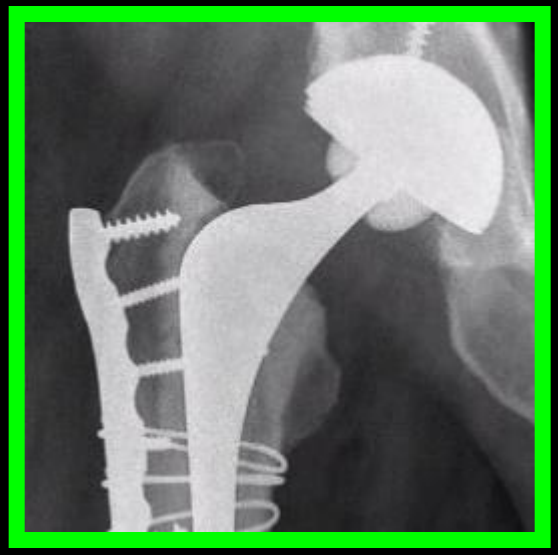
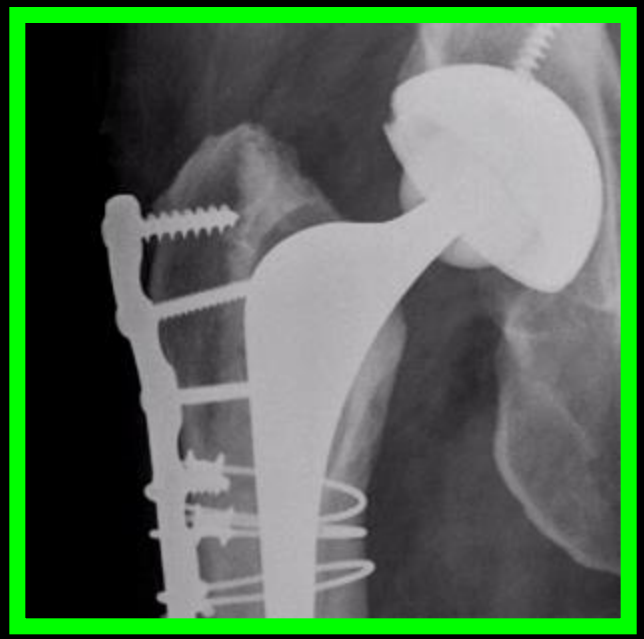
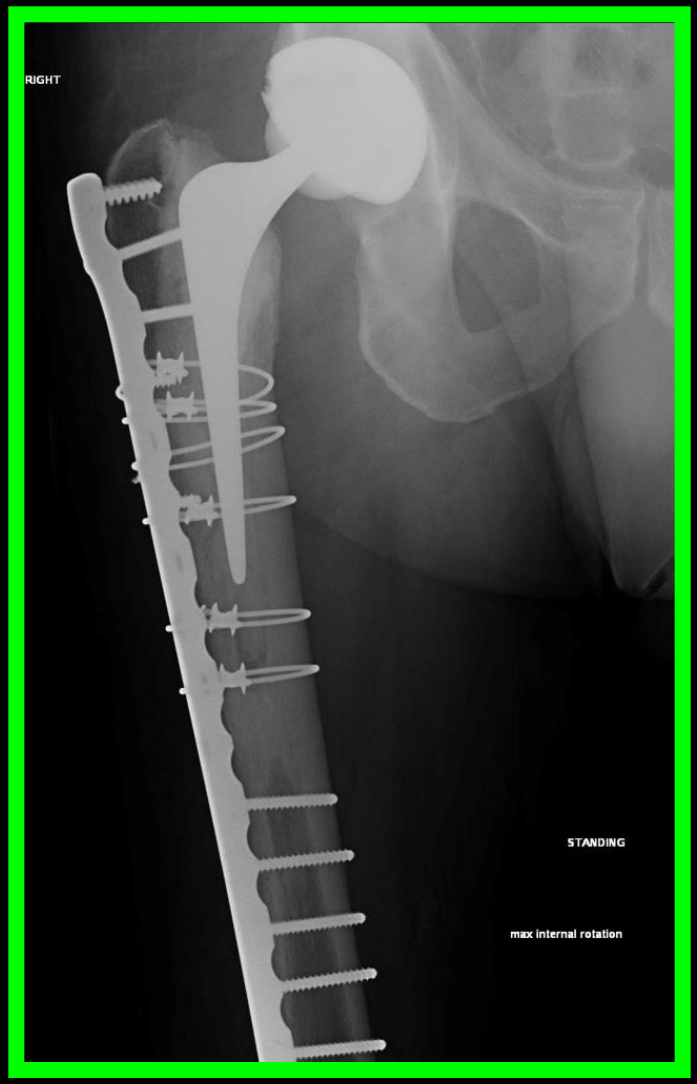




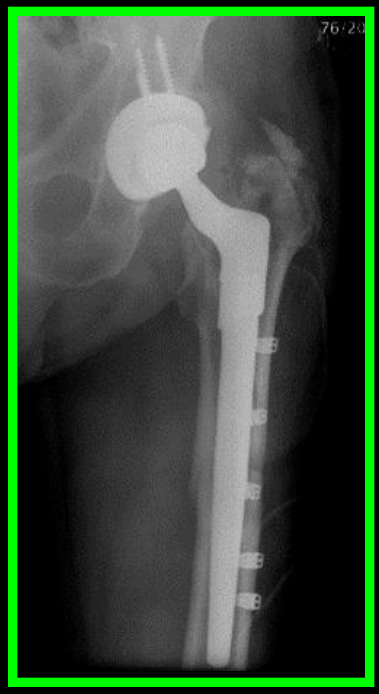





RIGHT
STANDING
max internal rotation


LEFT


L



Periprosthetic fractures
When and how to fix?

Prevention is better than cure

? Role of follow up

- Review and plan from pre op films
- Beware ‘unfavourable’ fractures
  - Short oblique / transverse

- Plan carefully, have a back up plan
- Take care with exposure and implant removal
- Use all available landmarks
- Protect the distal femur

Periprosthetic fractures
When and how to fix?

- Surgeon should be aware of, and be able to use, all potential reconstructive options
- Modular Uncemented Revision
  Versatile, reliable, relatively quick
  'Workhorse' with good clinical results in Nottingham series
- Increasing numbers and complexity

Treat in appropriate centres with required surgical experience and support

Thank you

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Orthopedic Department – Milano-Bicocca University
San Gerardo Hospital
Monza – ITALY
Director: Prof. G.Zatti

Management of priprosthetic fractures

Fixation and management of bone stock

G. ZATTI

Milano 26.11.2015

Periprosthetic Fracture

Periprosthetic Fracture

Intraoperative

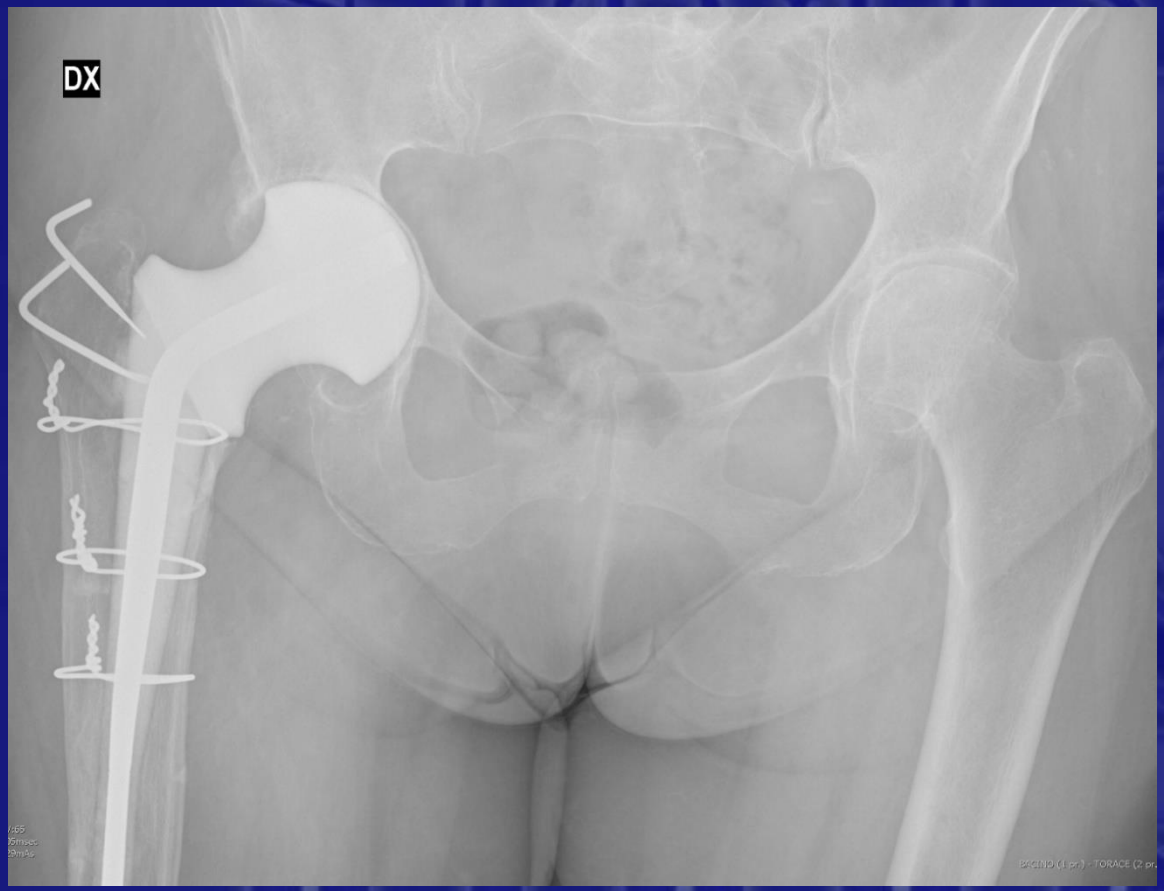
Postoperative

Intraoperative Fracture

Intraoperative Fracture

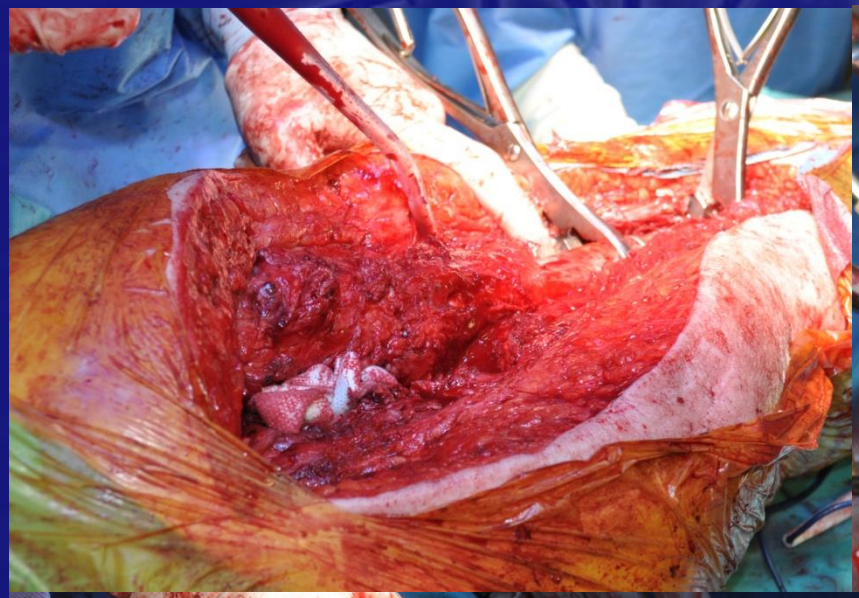
- Acetabular fractures
- Metaphyseal
- Dia-Metaphyseal
- Diaphyseal

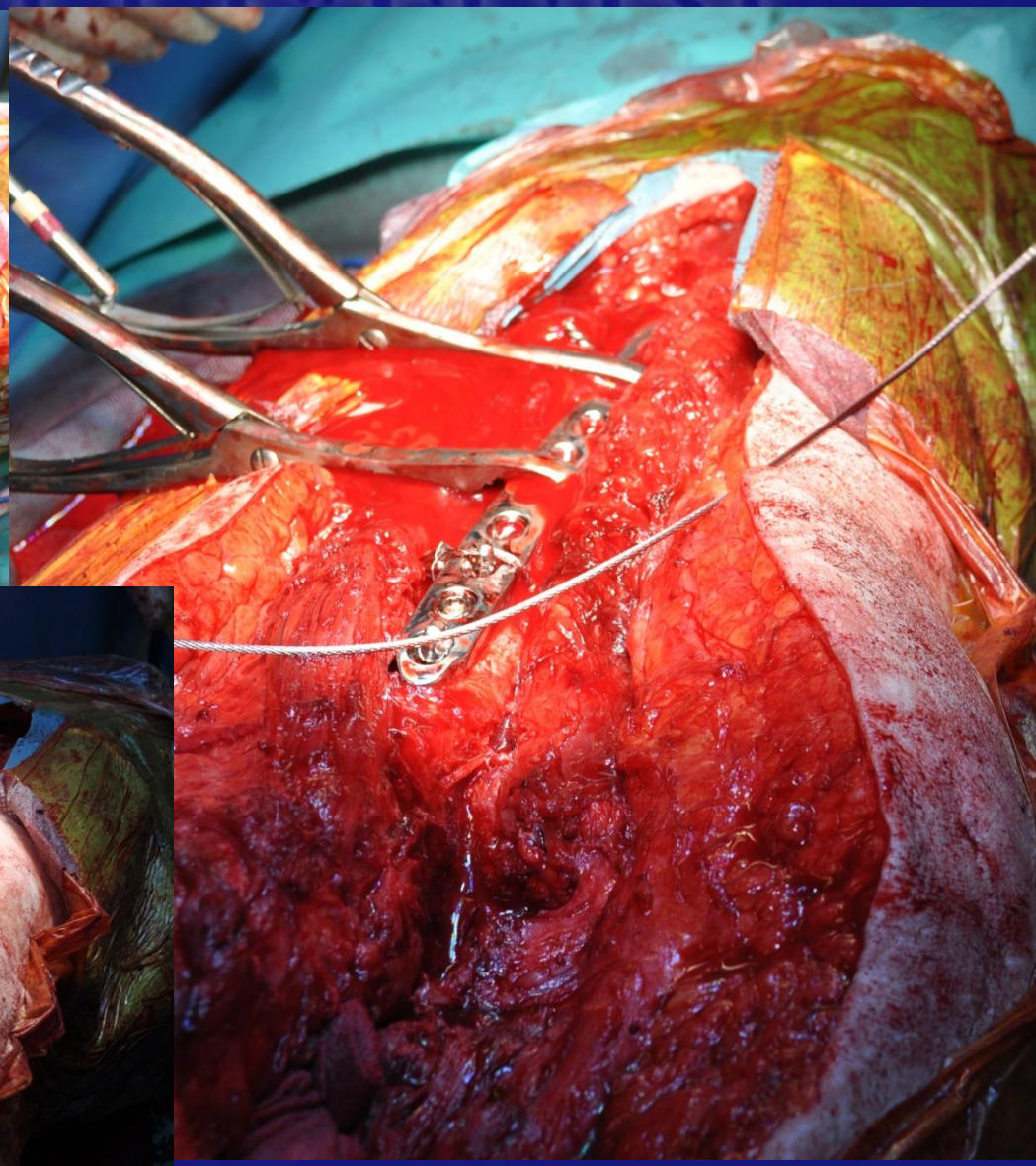
Intraoperative Fracture

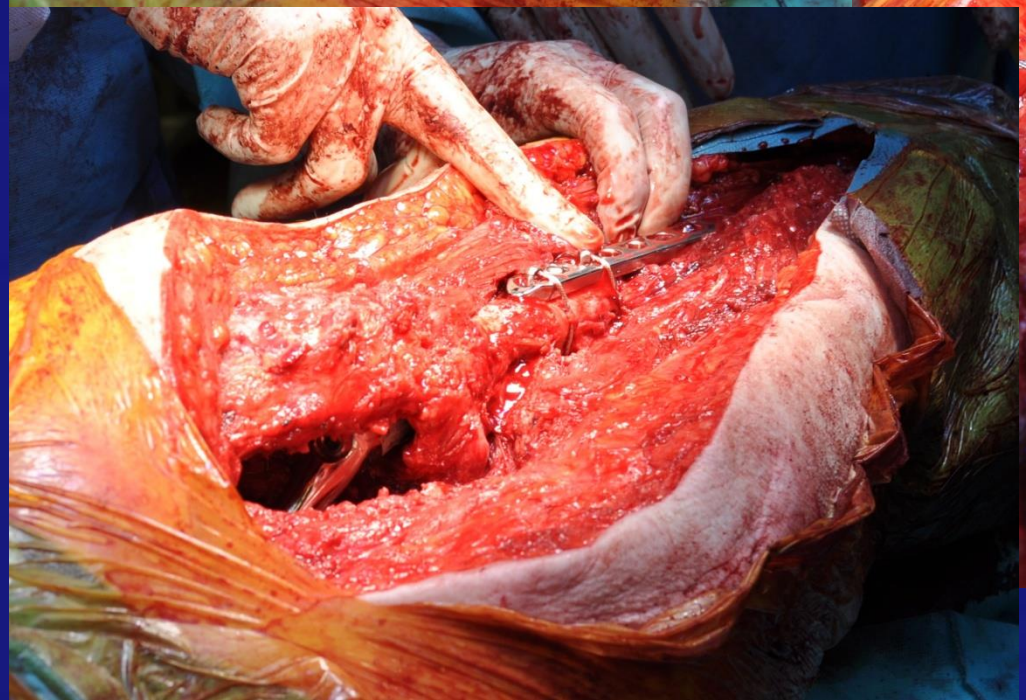


M.F - female 80 yrs
G-Spacer in hip prosthesis infections
Preop rx

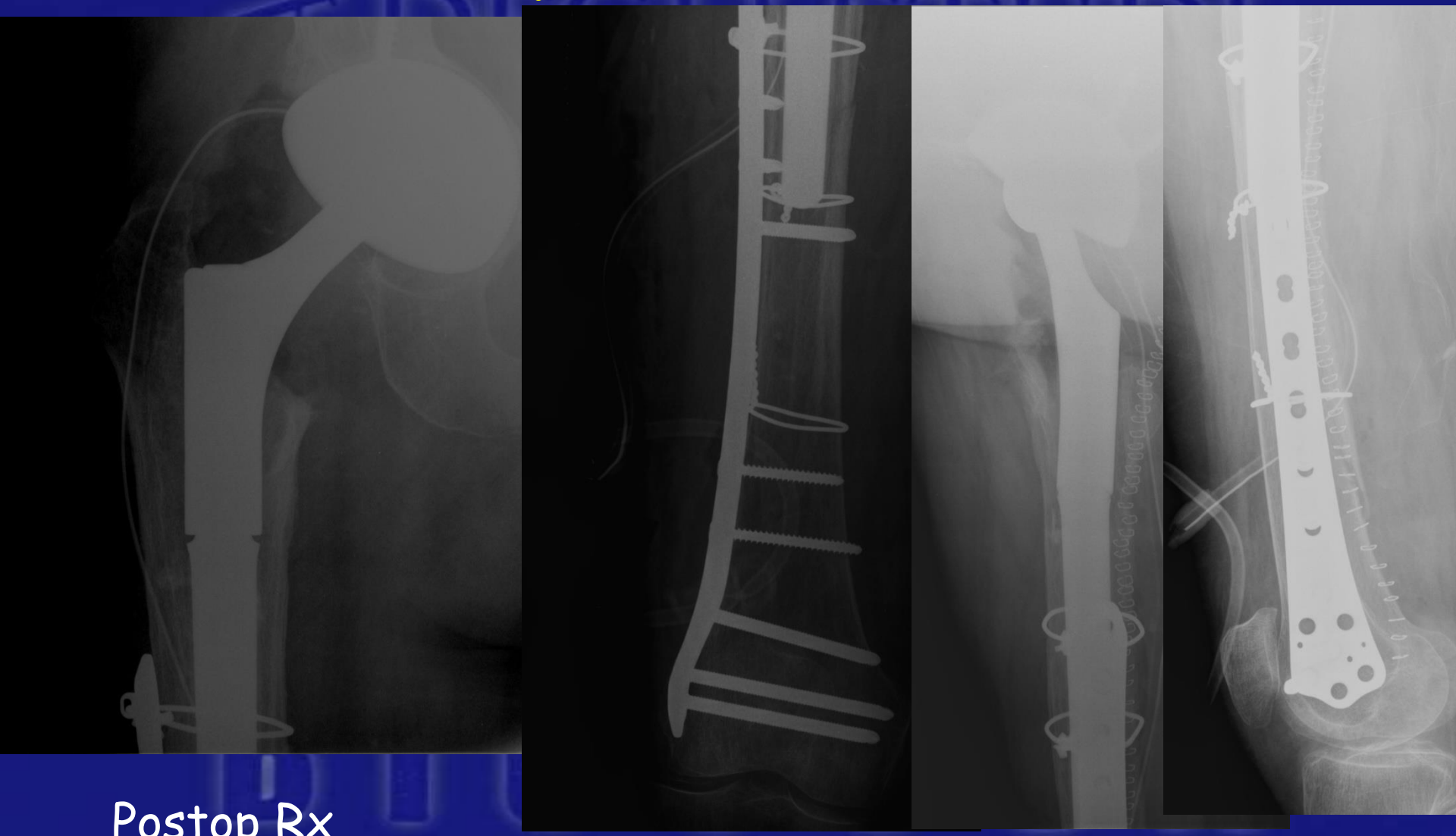
Intraoperative Fracture





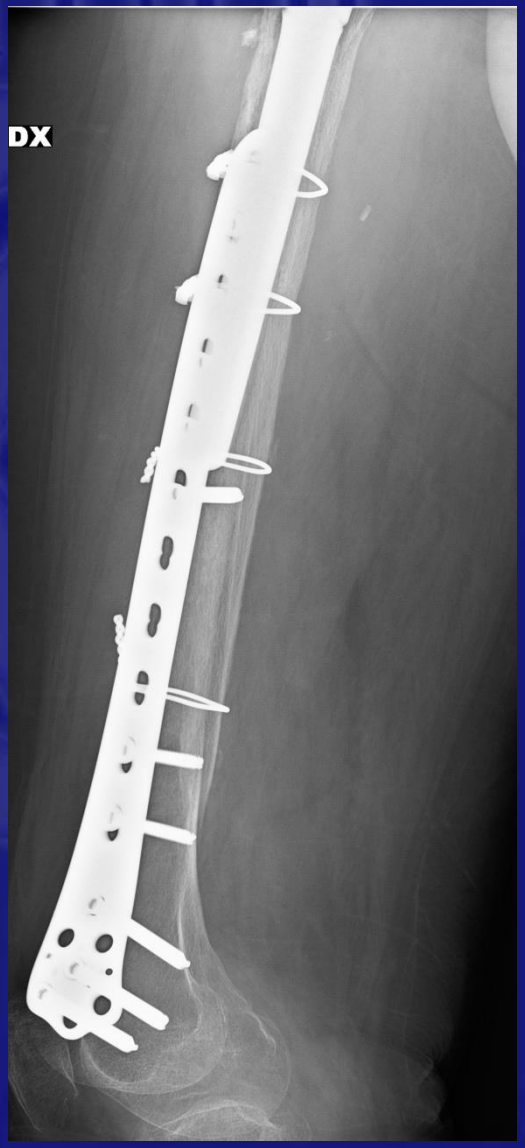


Intraoperative Fracture



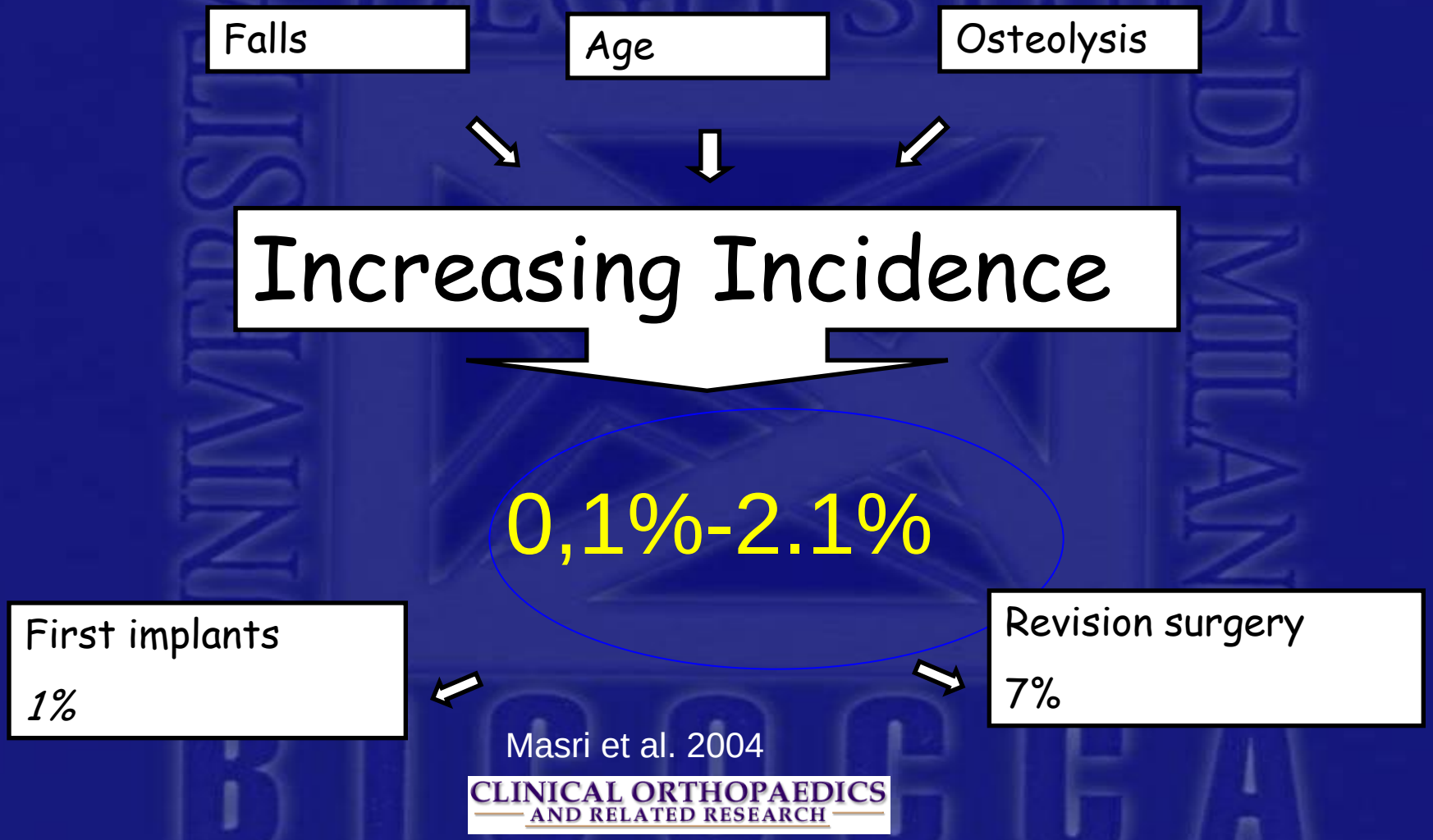
Postop Rx

Intraoperative Fracture



Postop rx 2 months

Postoperative Fracture

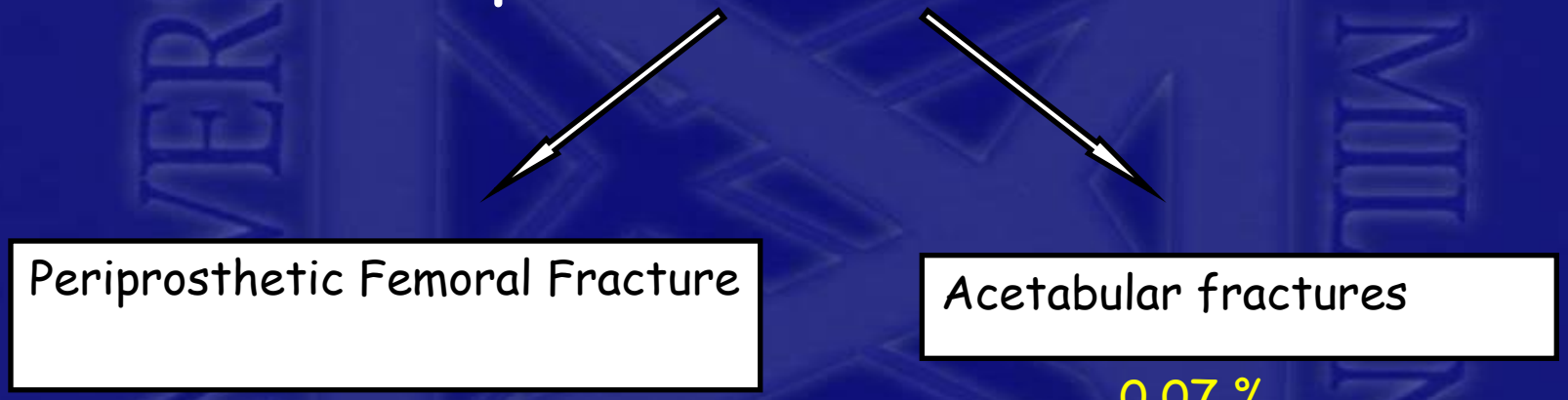


Franklin J, Malchau H Risk factors for periprosthetic femoral fracture; Injury 2007 Jun;38(6):655-60.

Criteria for treatment

- Type and site of fracture
- Level of displacement
- Implant stability
- Bone condition
- Patient condition
- Functional demand

Postoperative Fracture



Peterson C, Lewallen D. Periprosthetic Fracture of the Acetabulum after Total Hip Arthroplasty. JBJS, Vol. 78-A(8), August 1996, pp 1206-1213.

Surgical treatment

Goals

- Restore a good anatomical axis
- Obtain stability of both the prosthetic implant and the fracture
- Achieve early mobilization of the patient
- Try to ensure returning to the quality of life before trauma

° Kelley SS.
Periprosthetic femoral fractures. J Am Acad Orthop Surg 1994;3:164-72.

° Garbuz DS, Masri BA, Duncan CP.
Periprosthetic fractures of the femur: principles of prevention and management.
In:Cannon WD, ed. *Istructional Course lectures*. Rosemont, IL: A.A.O.S. 1998;47:237-42.

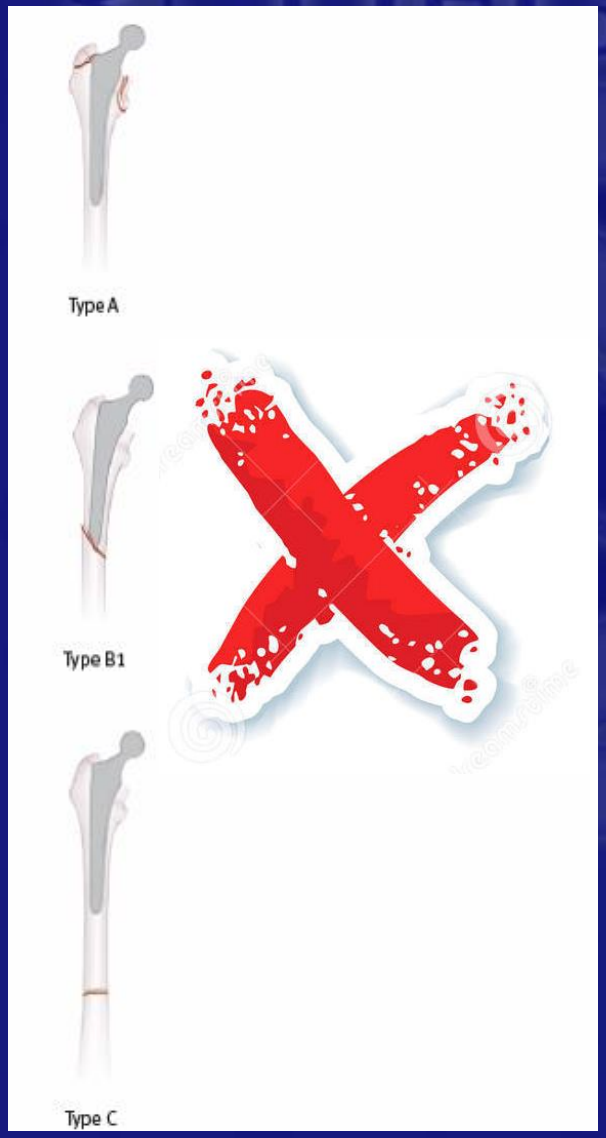
° Duncan CP, Masri BA.
Fractures of the femur after hip replacement. In: Jackson DW, ed.
Istructional Course Lectures. Rosemont, IL: A.A.O.S. 1995:293-304.

Postoperative Fracture

Vancouver Classification of Periprosthetic Femoral Fracture

Type and Subtype	Location and Characteristics
Type A	
A_G	Greater trochanter
A_L	Lesser trochanter
Type B	
B1	Around stem or stem tip; stem well fixed
B2	Around stem or stem tip; stem loose
B3	Around stem; stem loose, poor proximal bone stock
Type C	Distal to stem

Postoperative Fracture



Vancouver Classification of Periprosthetic Femoral Fracture

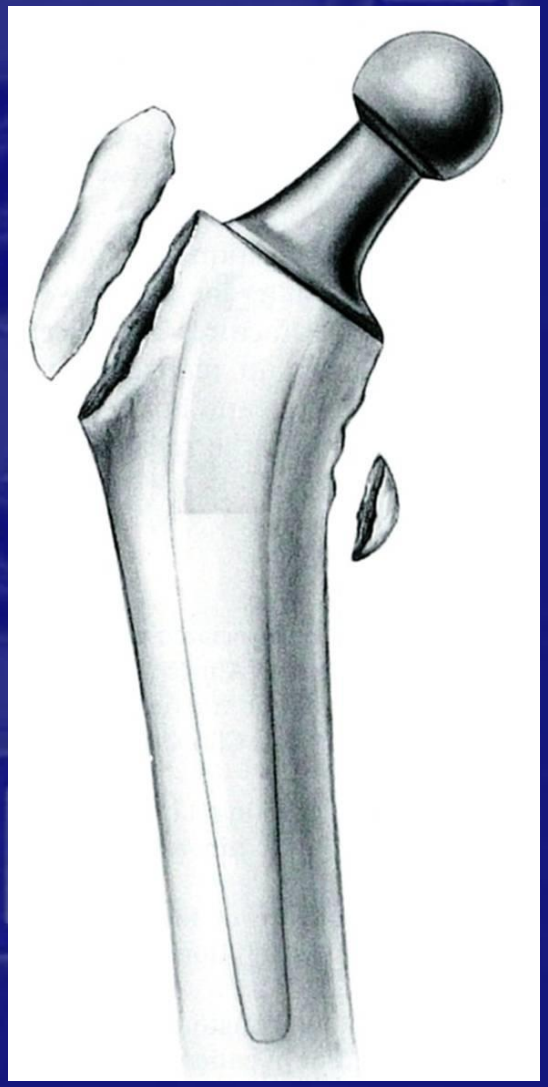
Postoperative Fracture

Type A Fracture

Type A fracture are located in trochanteric area

ORIF of GT if the the fracture is displaced to avoid pain, weakness, limp and instability.

LT Fracture may lead to implant instability if the fragment is large and medial buttress is lost



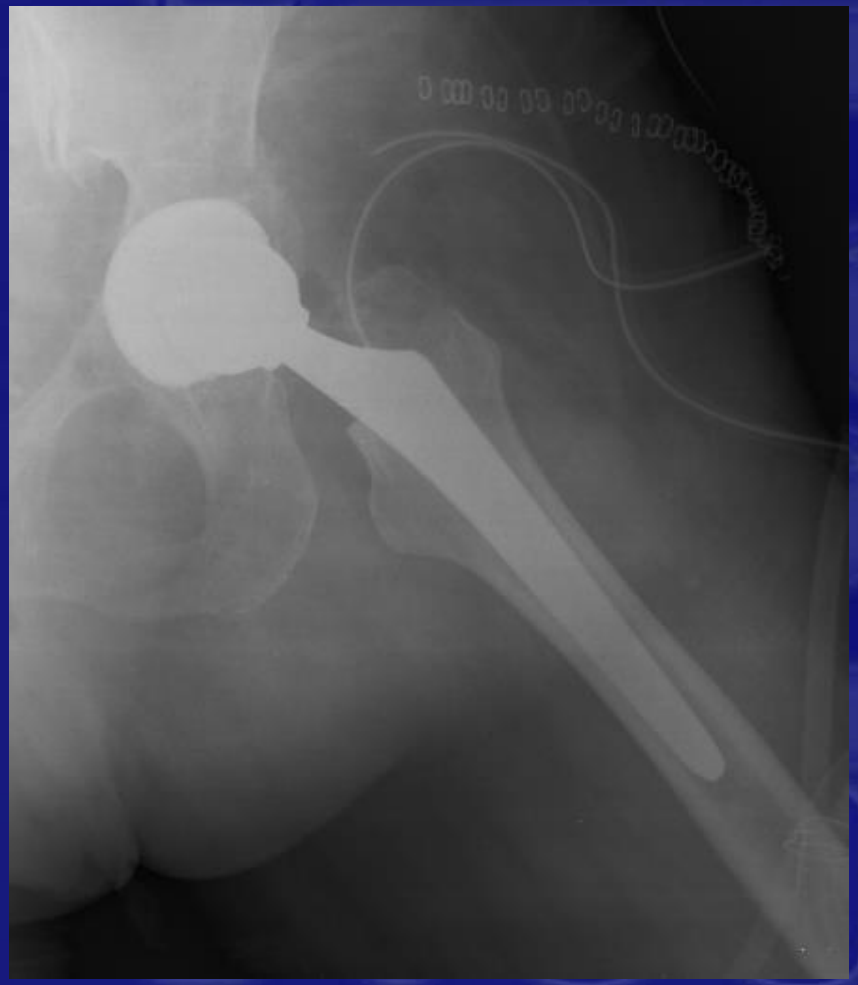
Periprosthetic fractures evaluation and treatment. Clin Orthop Relat Res. Masri BA, Meek RM, Duncan .
2004 Mar;(420):80-95.

Type A Fracture

D. S.T - female 74 yrs
Primary coxarthritis

Preop rx

Type A Fracture



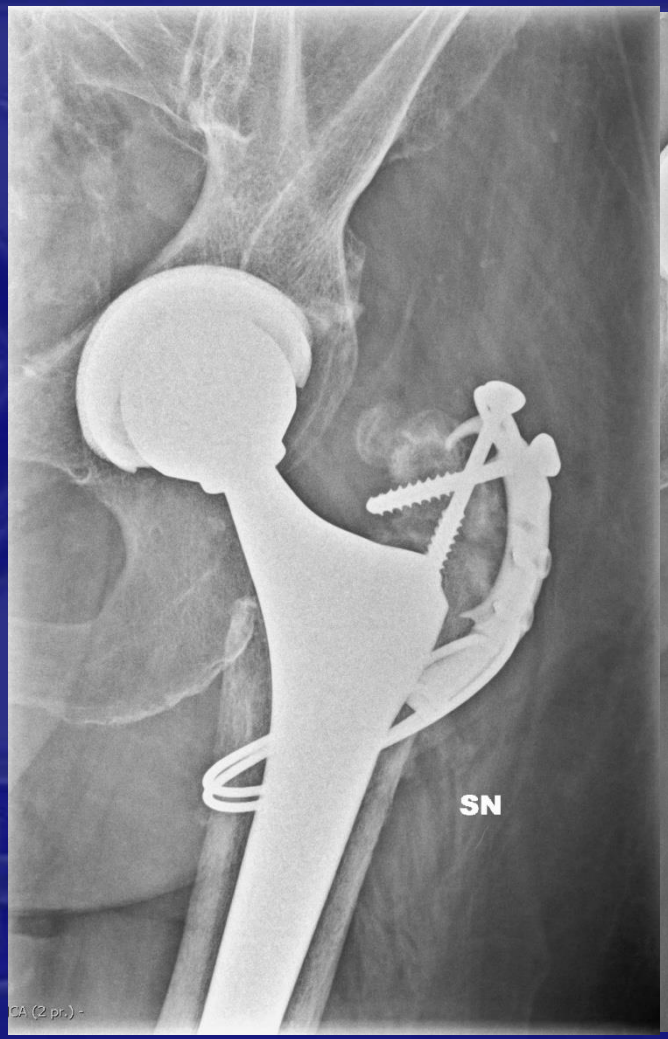
Postop rx
Trocanteric Fracture

Type A Fracture

Postop rx 6 months

Type A Fracture

Postop rx + Orif with
Cable Ready Plate



Postop rx 9 months

Postoperative Fracture

Type B1 Fracture

Allows to fix the plate without screws

Similar to internal splint

Selected cases: non garantee of stability

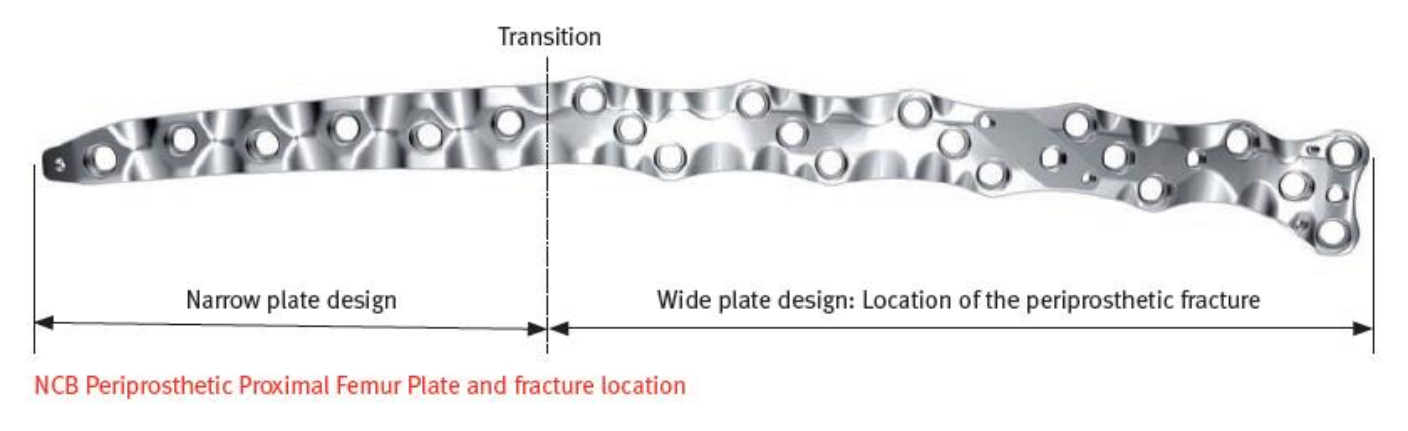
Discrepancy about results

Cavenago et al. 2004

MENNEN PLATE

Postoperative Fractures

Designed plates for periprosthetic fractures

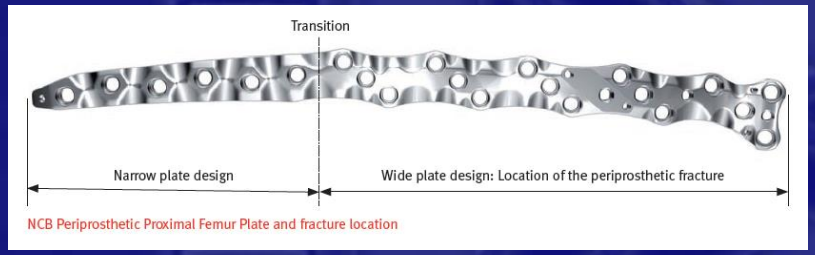


NCB Periprosthetic Proximal Femur Plate and fracture location

The wide part of the plate: fixation with bicortical screws around the prosthesis
The narrow part of the plate: less damage to the soft tissues
+
NCB® polyaxial locking plate technology
=
NCB® Periprosthetic polyaxial locking plate system

Postoperative Fractures

Specific plate design for periprosthetic fractures (wide vs narrow)

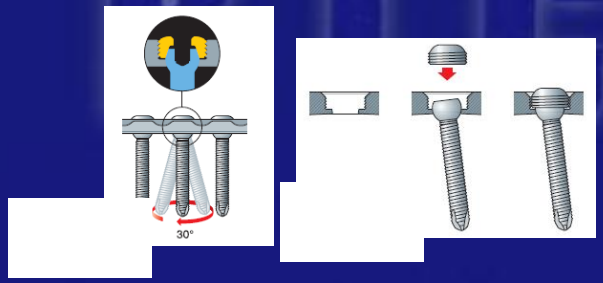


NCB Periprosthetic Proximal Femur Plate and fracture location

+

+

NCB® locking screw system using locking caps



Periprosthetic anchorage with bicortical locking screws and cerclages

Monocortical screws, cerclage buttons and cables

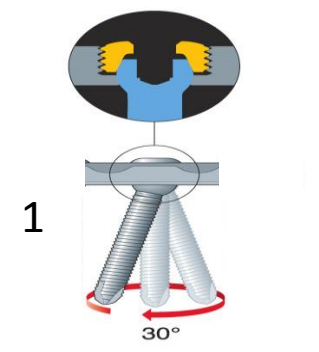
Postoperative Fractures
Need for specific plates

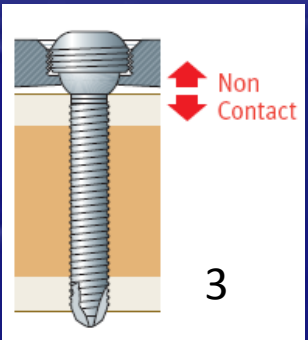
Polyaxial Locking Plate System

1) Allows use of polyaxial screws (30 degrees cone) useful in periprosthetic fractures

2) Conventional screws can be made into locking screws intraoperatively with the use of a locking cap

3) Possibility of cerclages



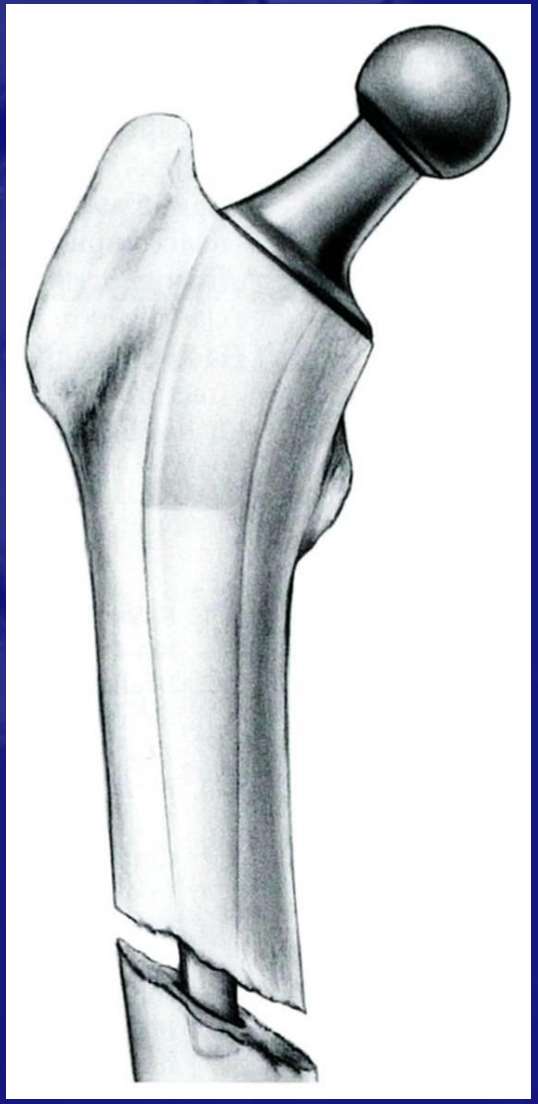


Postoperative Fracture

Type B1 Fracture

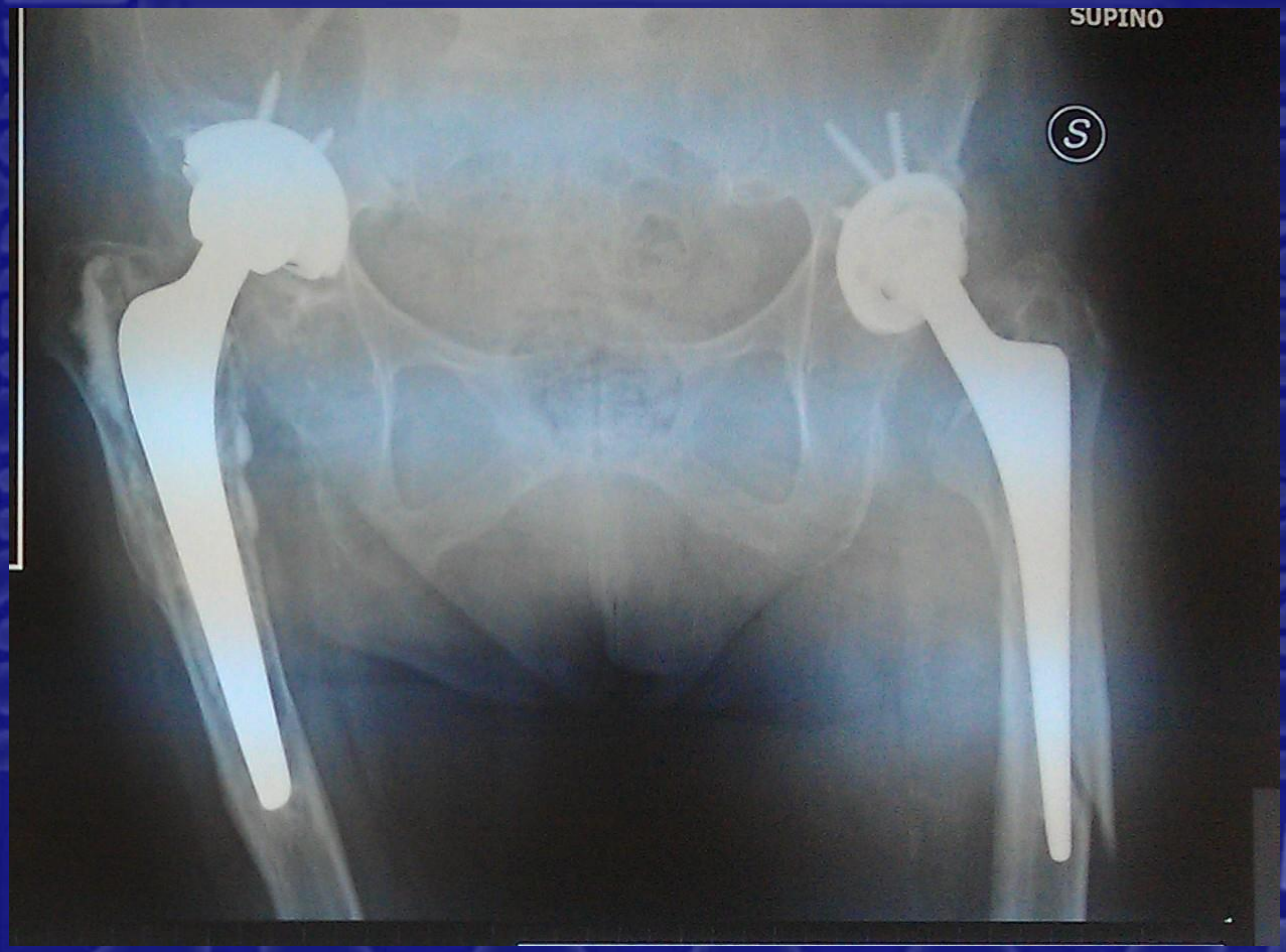
- Around the stem or just below
- Stem well fixed

Open reduction and internal fixation of the fracture with retention of the femoral component



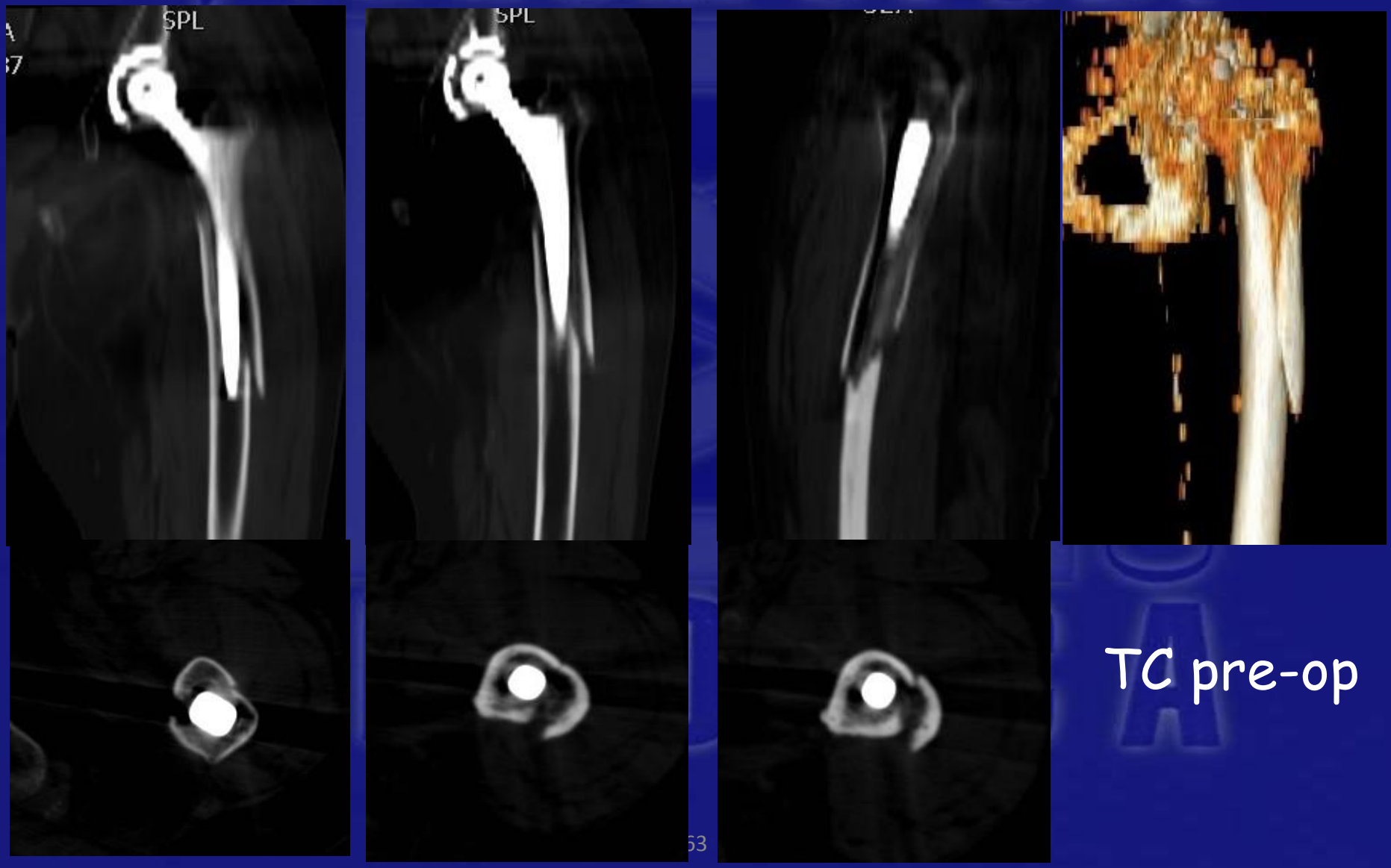
Periprosthetic fractures evaluation and treatment. Cli Orthop Relat Res. Masri BA, Meek RM, Duncan . 2004 Mar;(420):80-95.

Postoperative Fracture B1

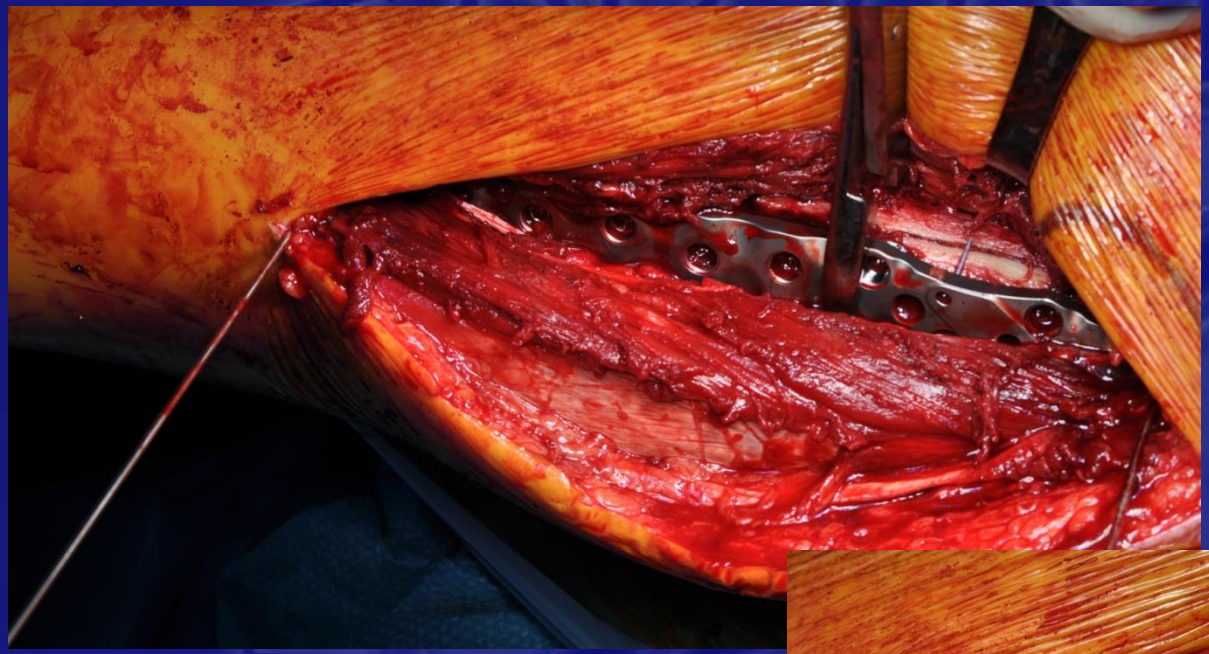


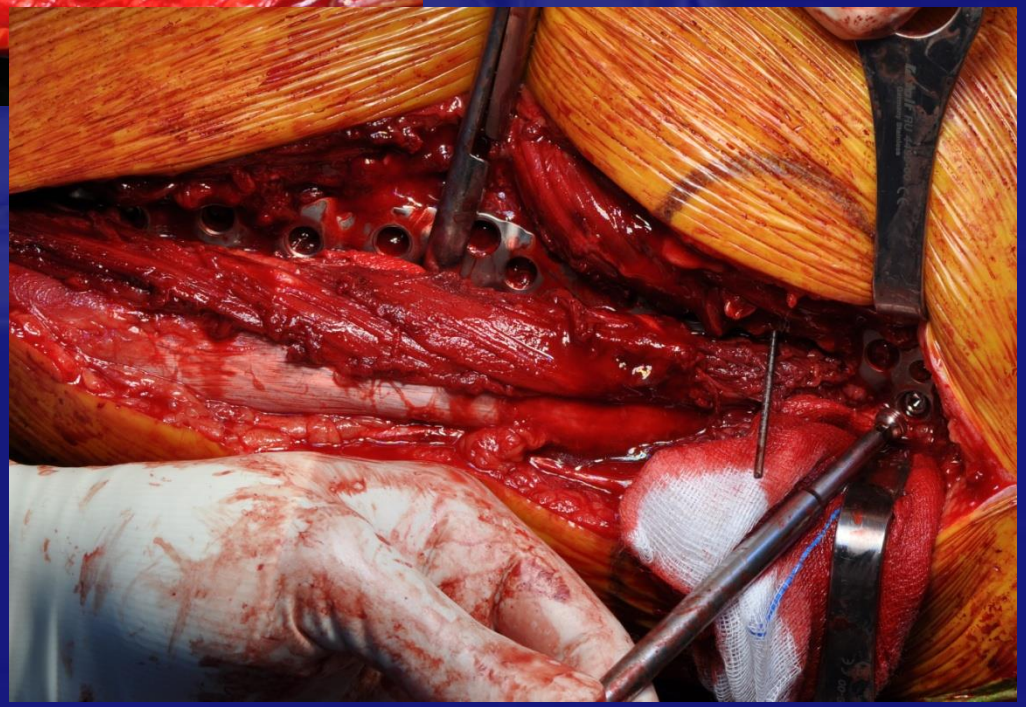
R.E- Male fracture Vancouver B1

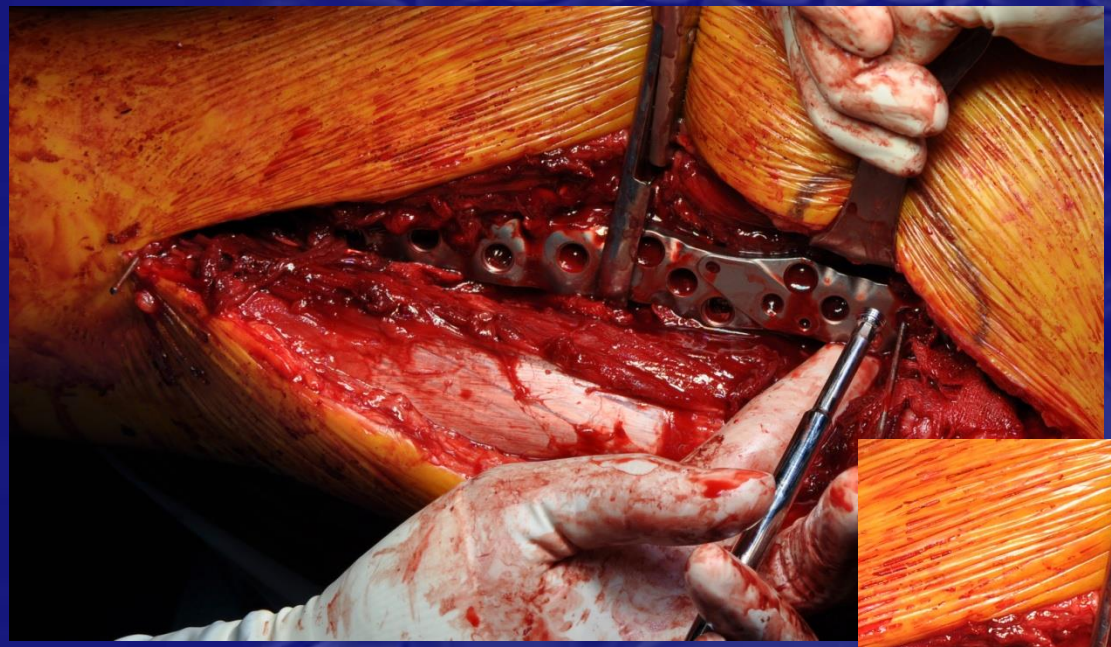
Postoperative Fracture B1

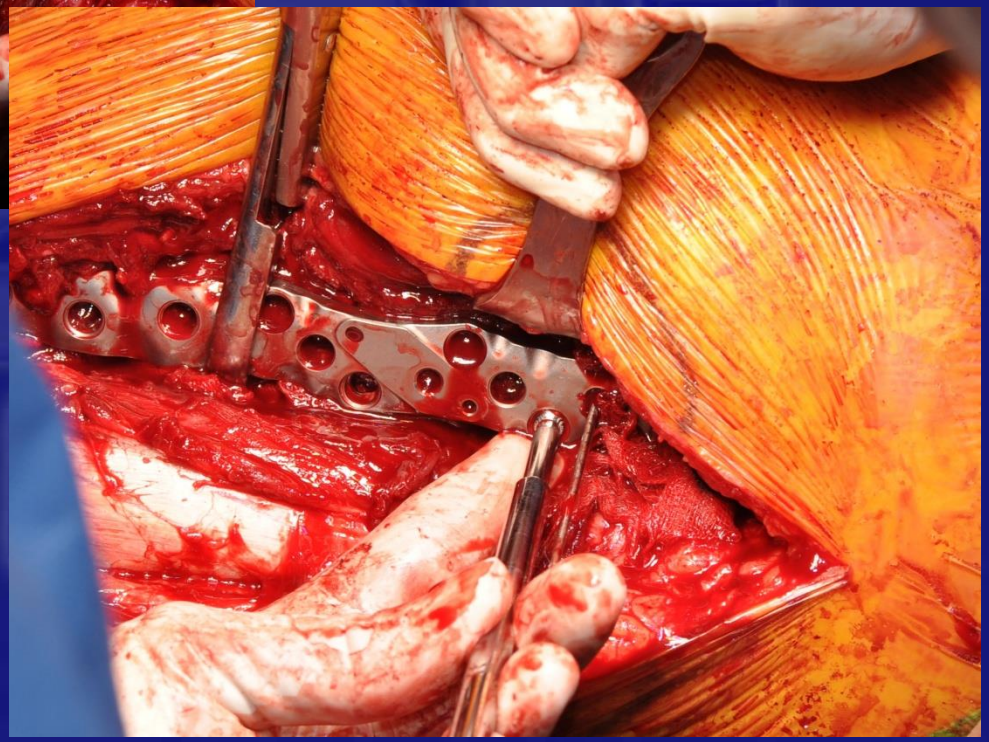


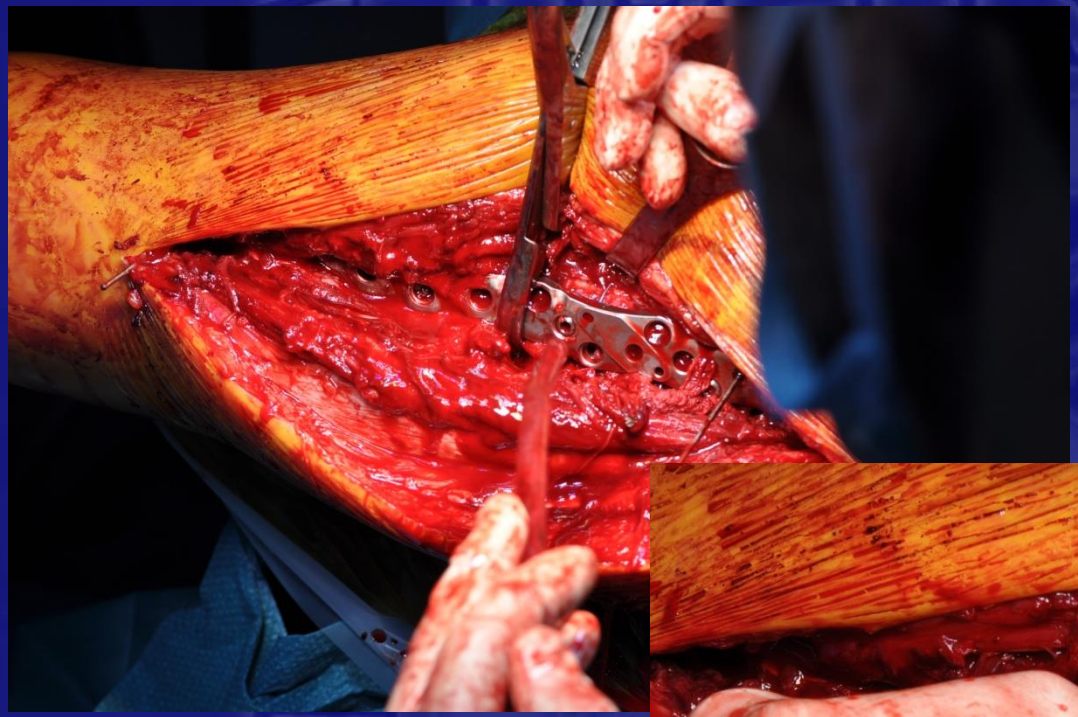
TC pre-op

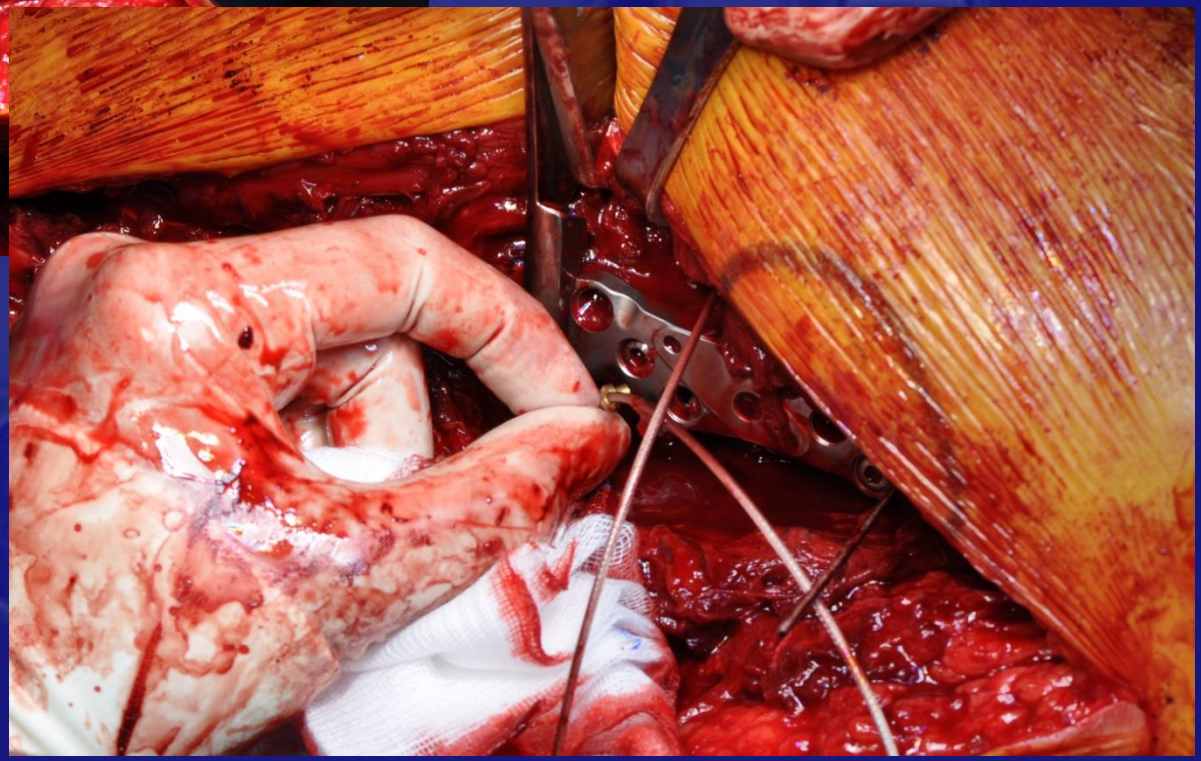


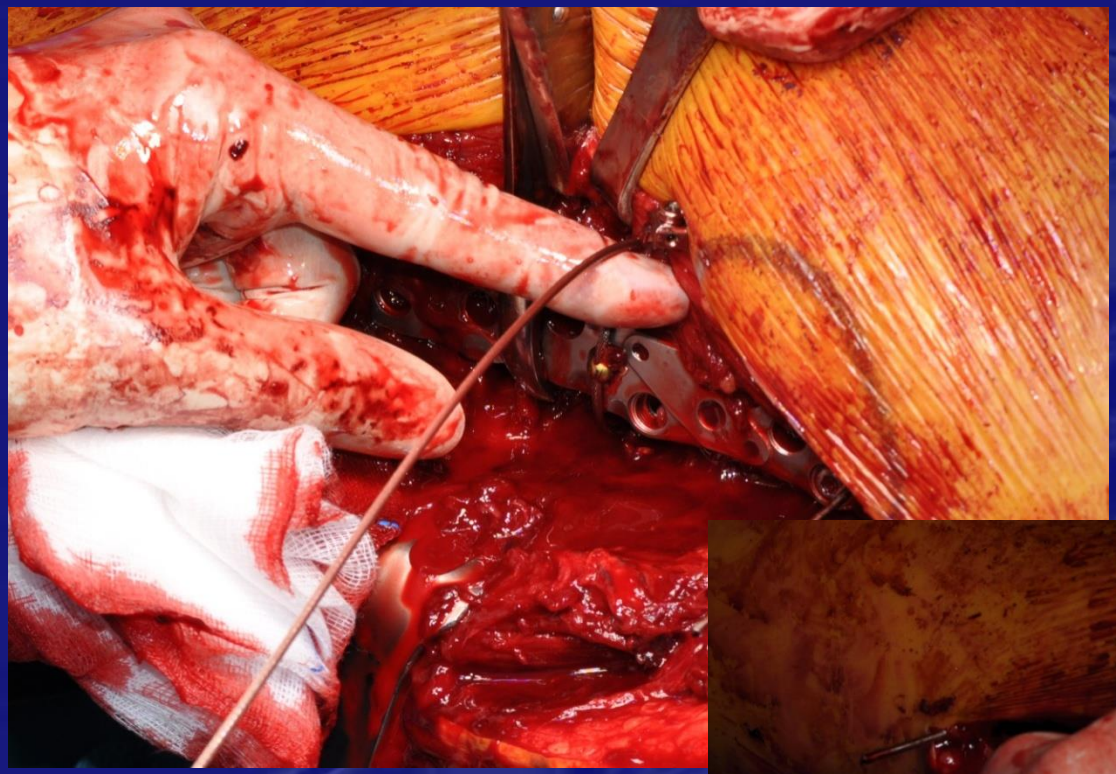


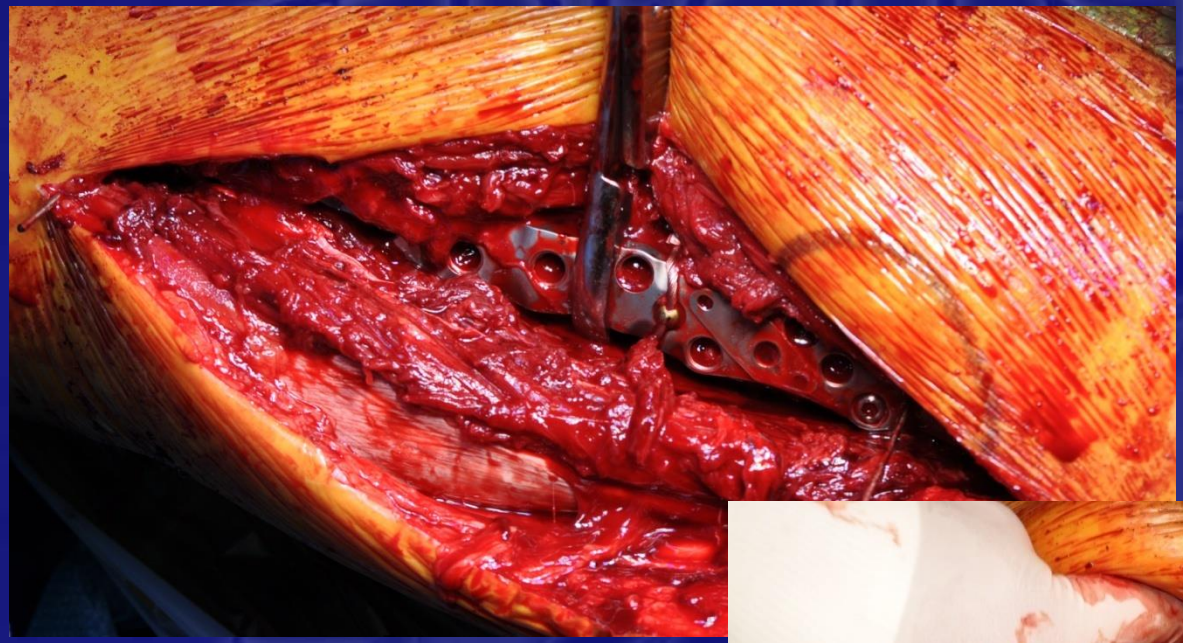












Postoperative Fracture B1

Rx post-op

Postoperative Fracture B1

Postop rx 10 months

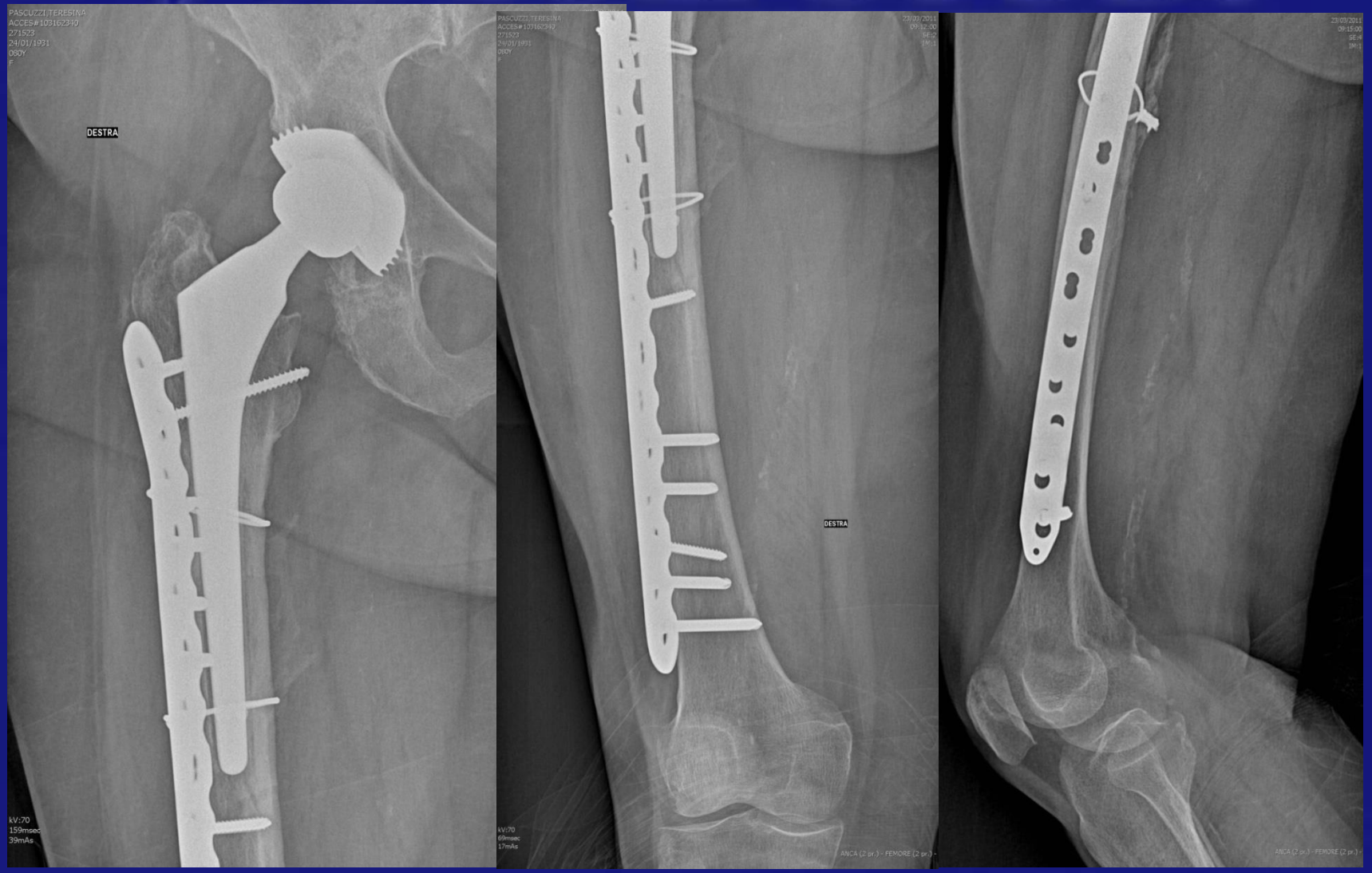
Postoperative Fracture

- P.T- female 80 yrs fracture type B1

ORIF with Plate + Cable

Postop. Rx

Postoperative Fracture



Postop Rx. 9 months

Postoperative Fracture

Type C Fracture

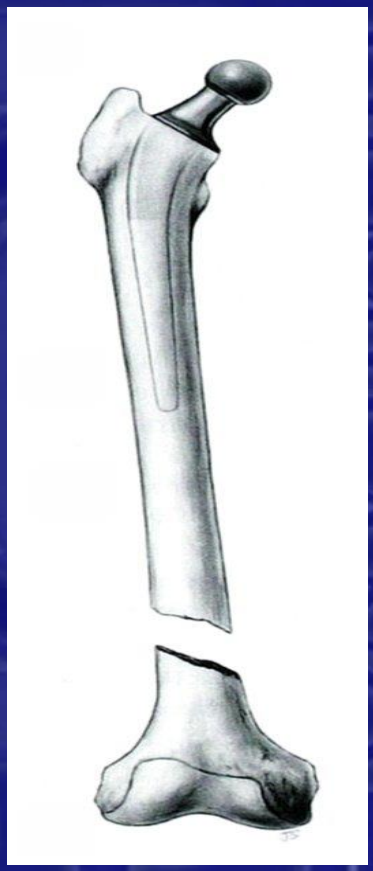
- Below the stem

ORIF of the fracture

(*plating*)

+

Ev. Grafting (ev. strut graft)



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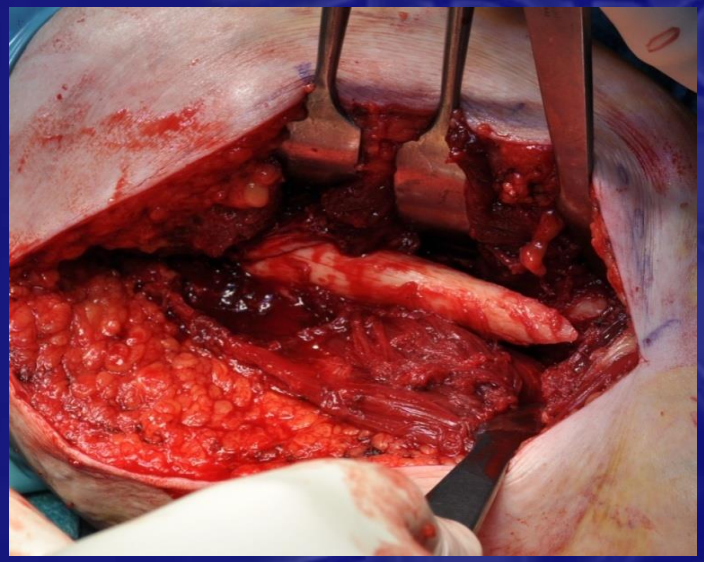
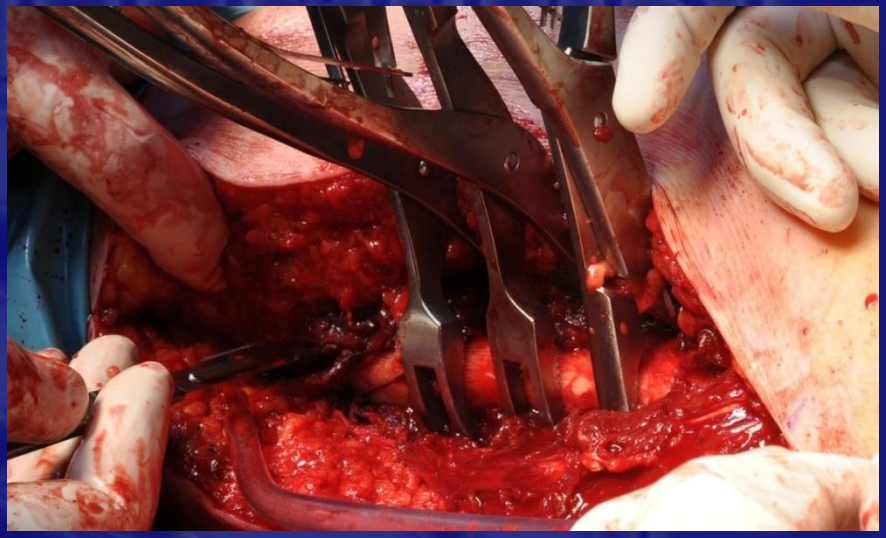
2004 Mar;(420):80-95.

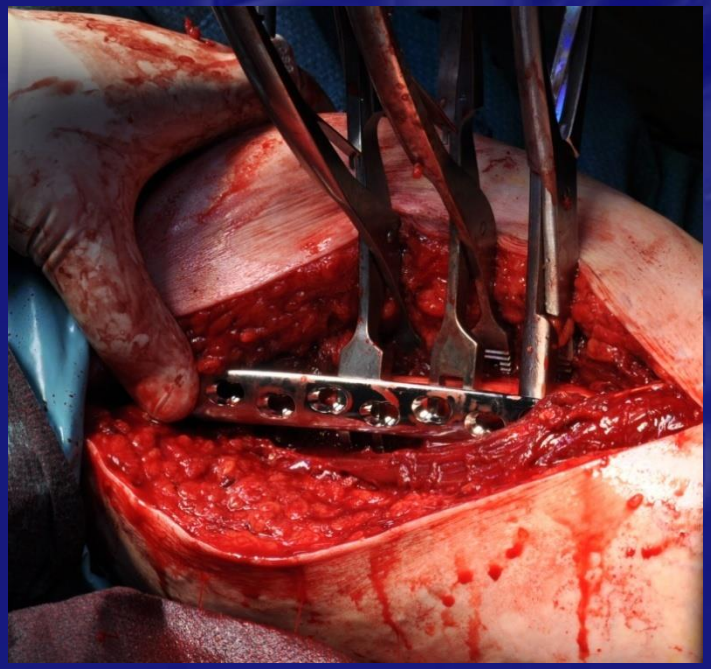
Wong P, Gross AE.
The use of structural allografts for treating periprosthetic fractures of the hip and knee.
Tech Orthop. 1999;14:102-106.

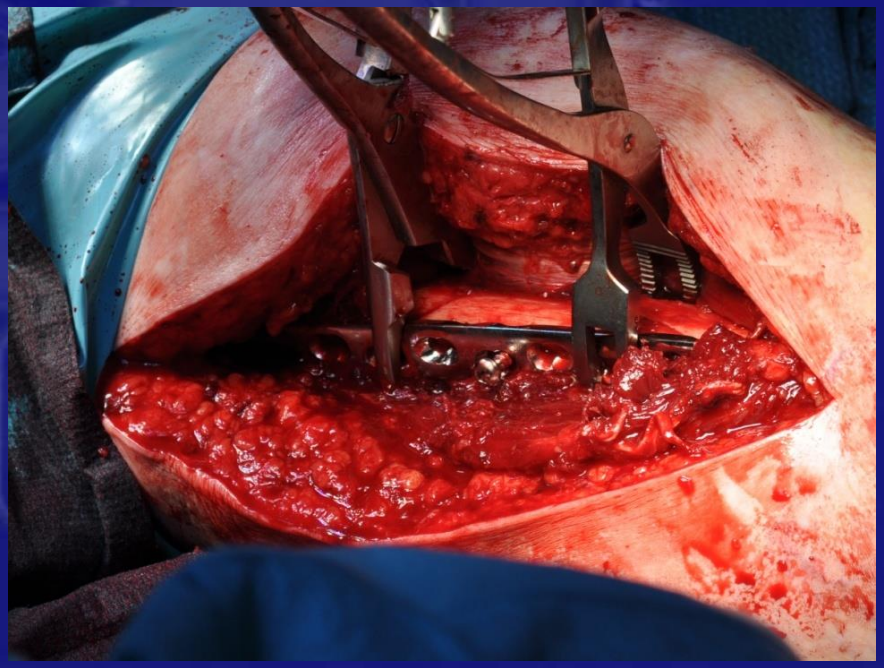
Postoperative Fracture C

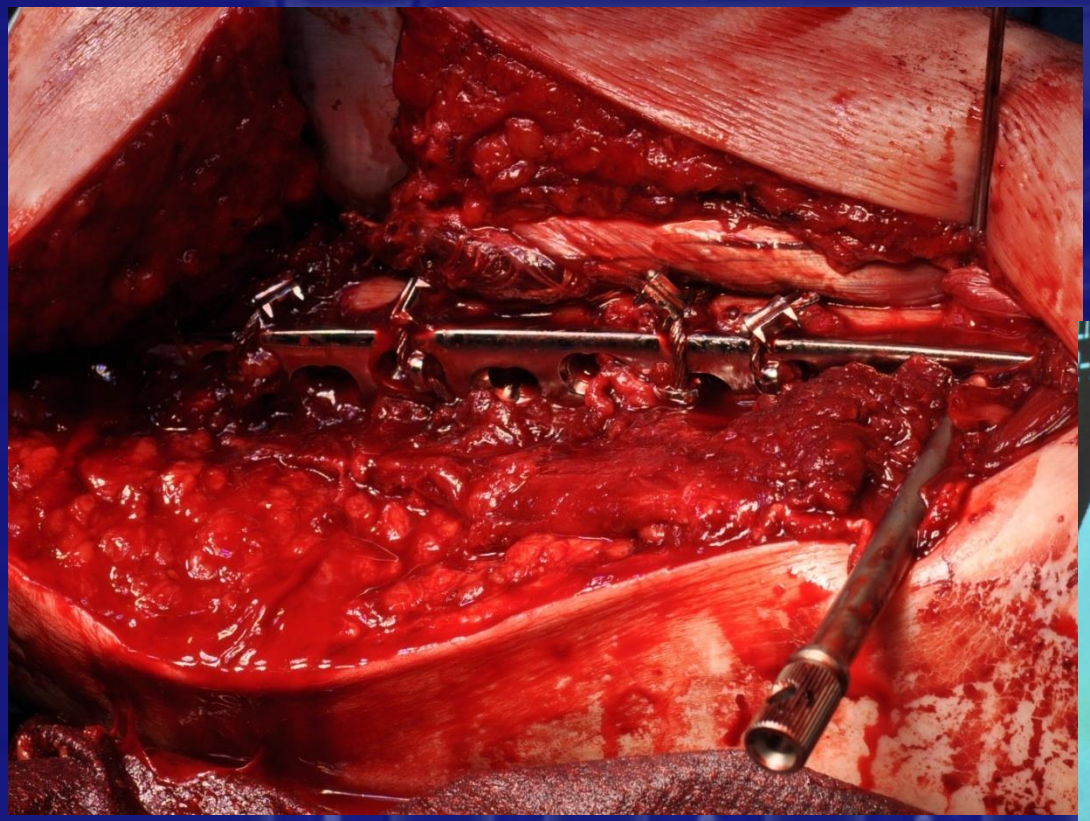
M.O- female 80 yrs type C fracture

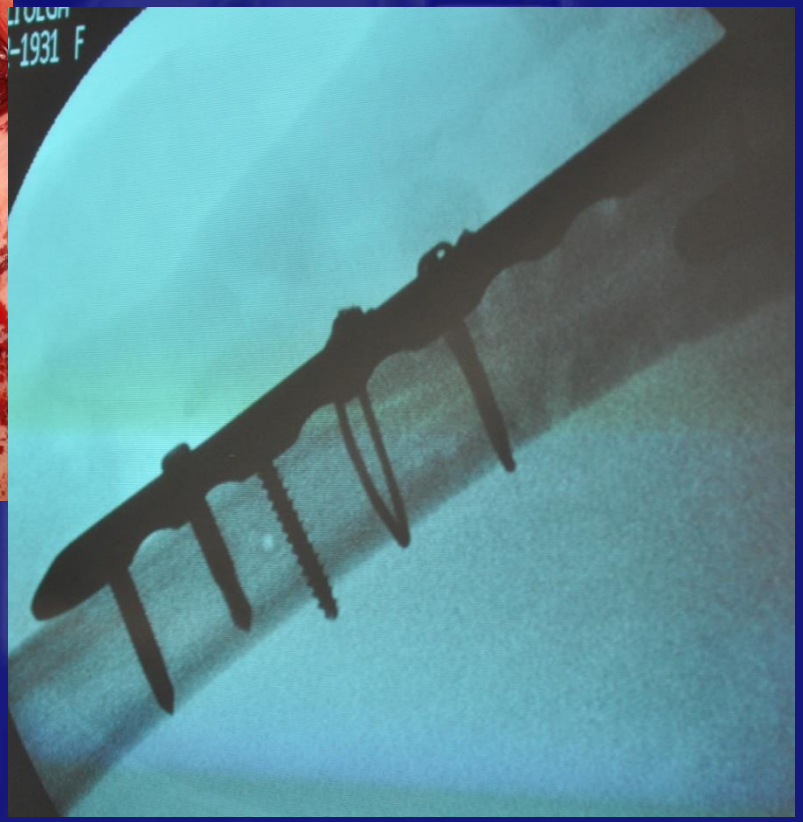




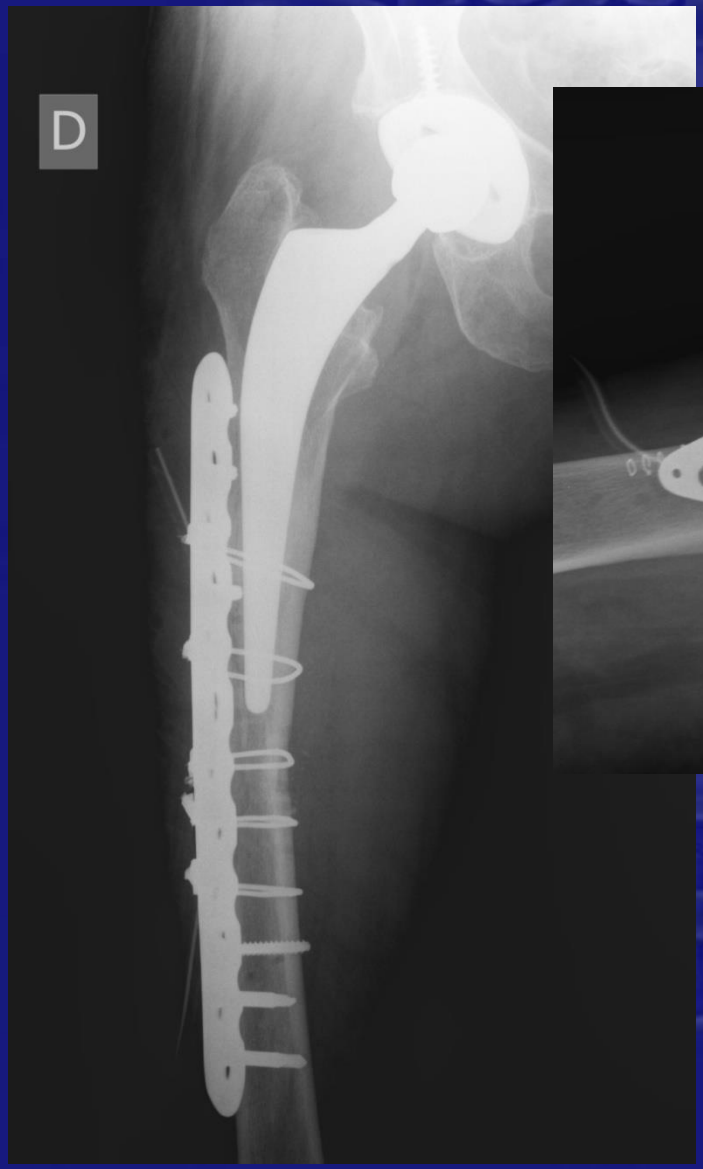


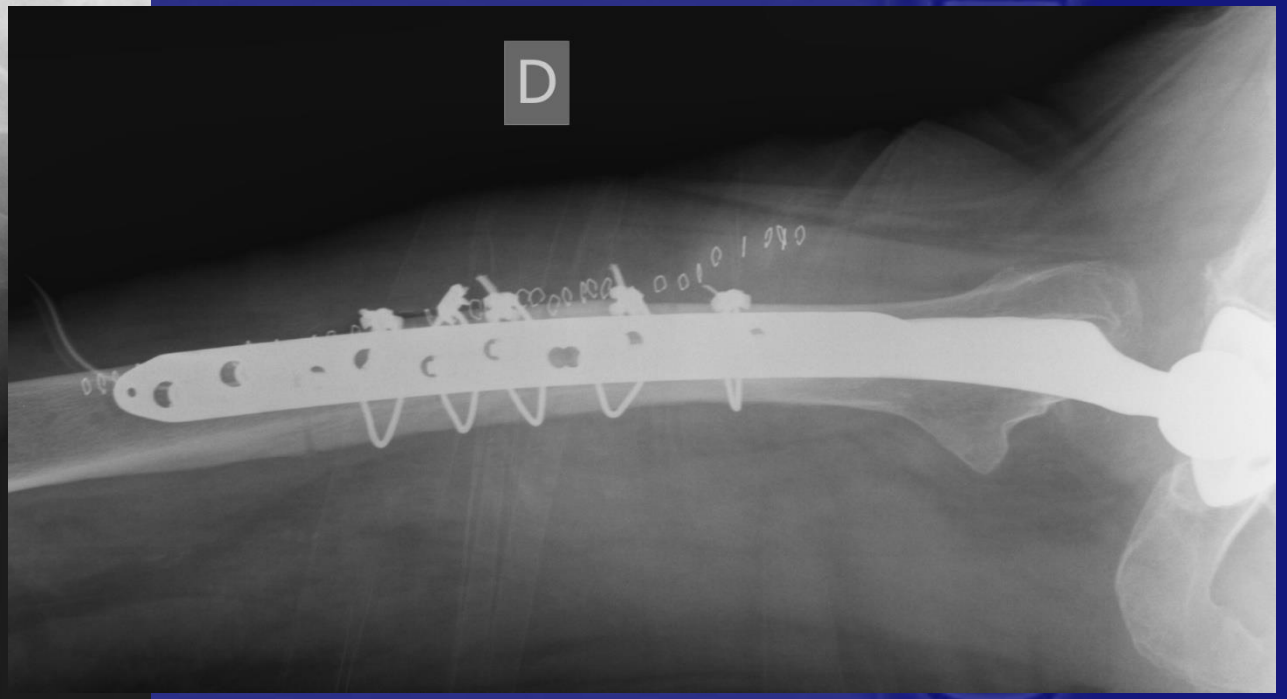





-1931 F

Postoperative Fracture





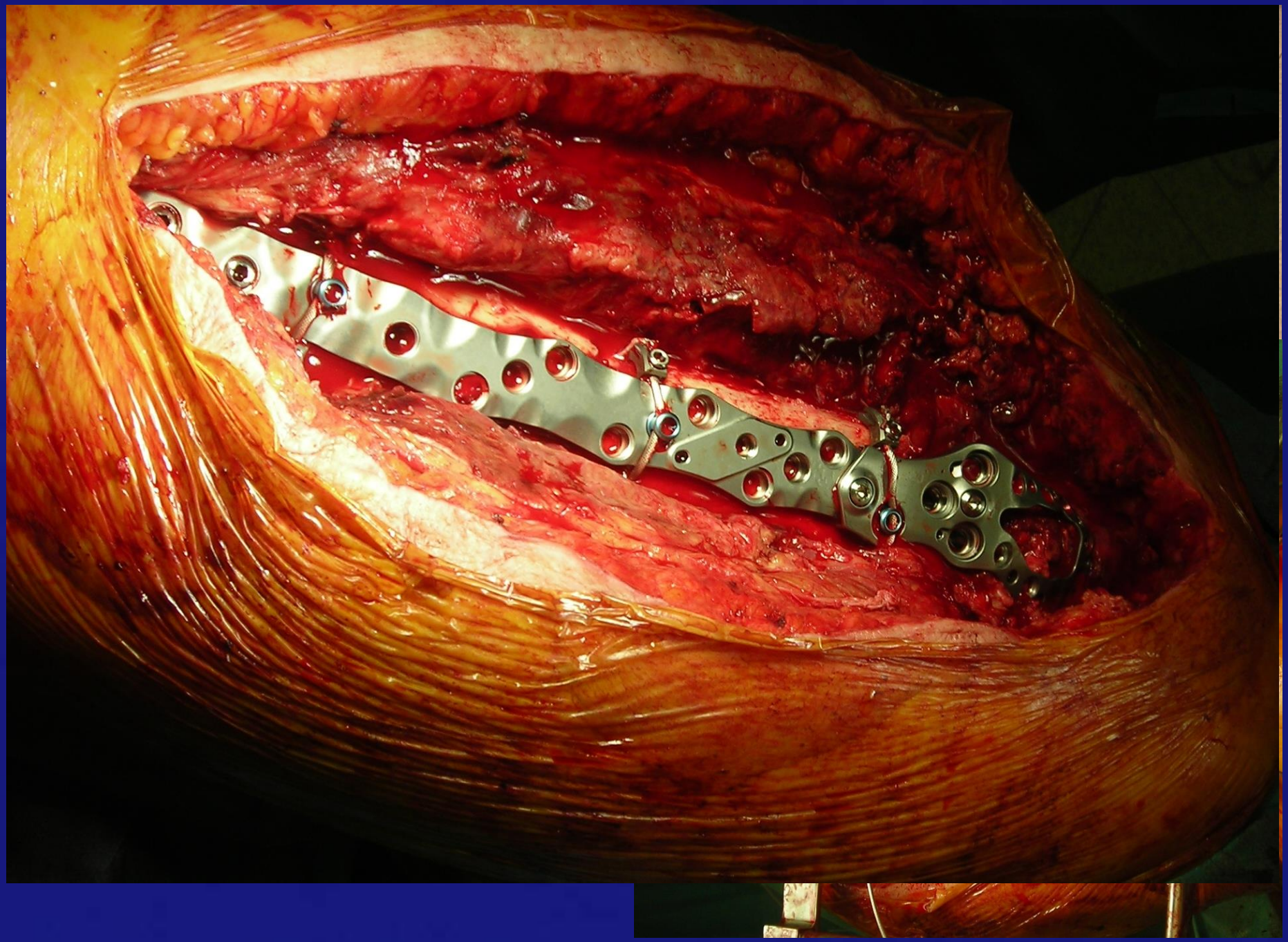
Postop Rx
Plate + Cable ready

Postoperative Fracture

Postop Rx 2 years

Bone stock: Structural allografts

A: R- Female 81 years



Postop

Wong P, Gross AE.
The use of structural allografts for treating periprosthetic fractures of the hip and knee.
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Postoperative Fracture

Postop rx
2 years

Postoperative Fracture

Conclusions

- Treatment depends on the general condition of the patient

- Accurate preoperative planning and classification(CT-scan)

- Surgical techniques and implants to obtain early mobilization

Thank You!

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

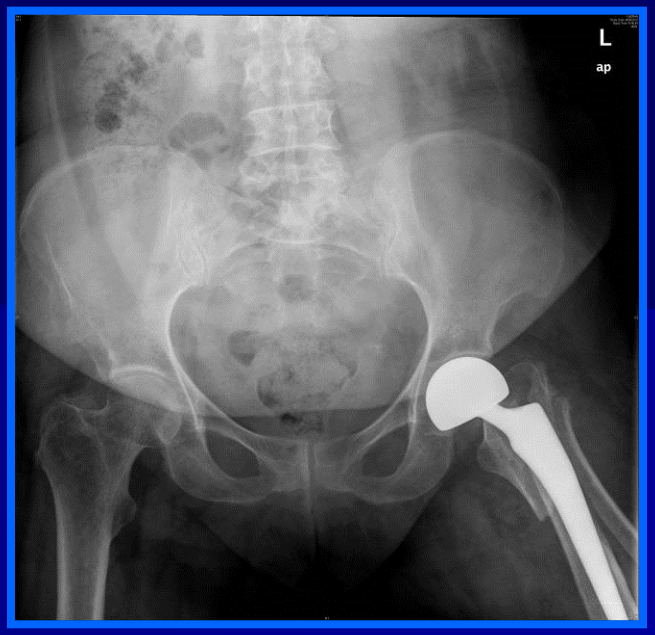
Periprosthetic Fractures of the Femur Following Total Hip Replacement

G. Volpin, R. Sevi, C. Tauber, H. Shtarker , A. Kaushanski

Departments of Orthopaedic Surgery, Nazareth, Nahariya, Hadera, and Rehovot, Israel

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

Periprosthetic Fractures of the Femur Following THR



Periprosthetic fracture is a serious complication following THR or TKR and represents a difficult treatment challenge.

The treatment is based on the site of fracture, implant stability, and quality of bone stock.

Fractures may occur intraoperatively or postoperatively.

Duncan et al 1995, Masri et al Clin Orthop 2004

Periprosthetic Fractures of the Femur Following THR

Risk factors:

Periprosthetic osteolysis, osteoporosis

rheumatoid arthritis, Neurologic problems

female gender , trauma

post revision arthroplaty,

Minimally invasive THR: 1%-4% PPFx

Ricci- Injury 2007, Cook- Clin Orthop 2008,

Periprosthetic Fractures of the Femur Following THR

* *Incidence (most reports):*

  0.3%-2%

* *According to the Mayo Clinic Joint Registry :*

  1.1 % post THR; 4% post Revision THA

  (Berry 1999, 2002)

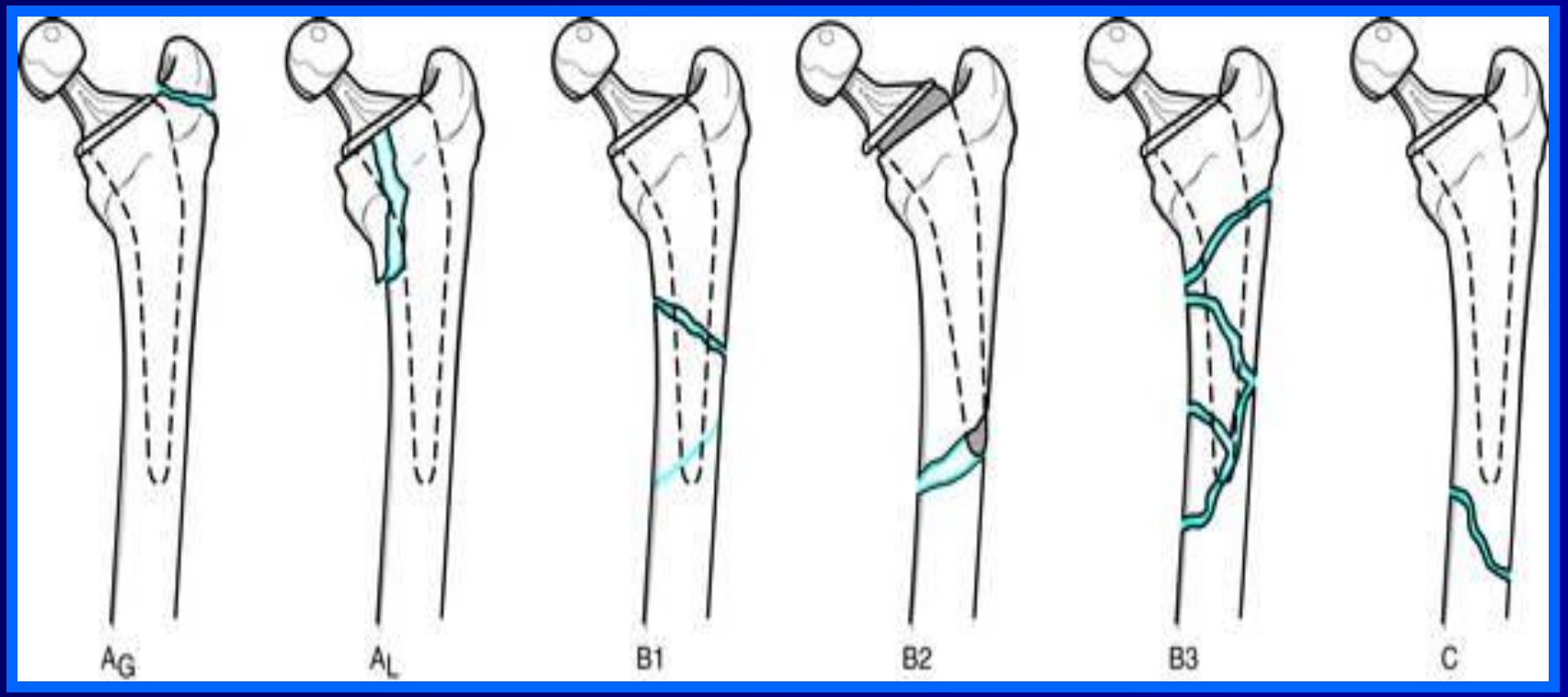
* *Intaoperative or Post Operative*

CLASSIFICATION OF POST OPERATIVE PERIPROSTHETIC FRACTURES OF THE FEMUR FOLLOWING THR

The Vancouver Classification

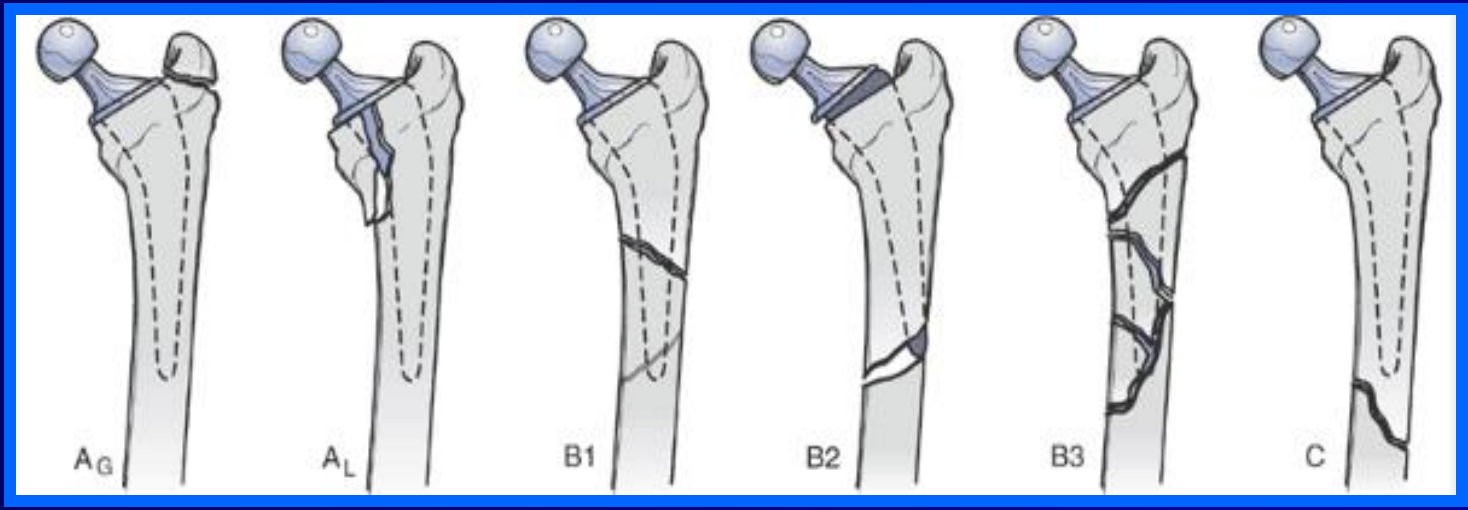
(Duncan, Masri - Instr Course Lecture 1995)

This classification system depends on location, configuration, and stability of the fracture.



Classification of periprosthetic femoral fractures

Duncan and Masri -"Vancouver Classification"

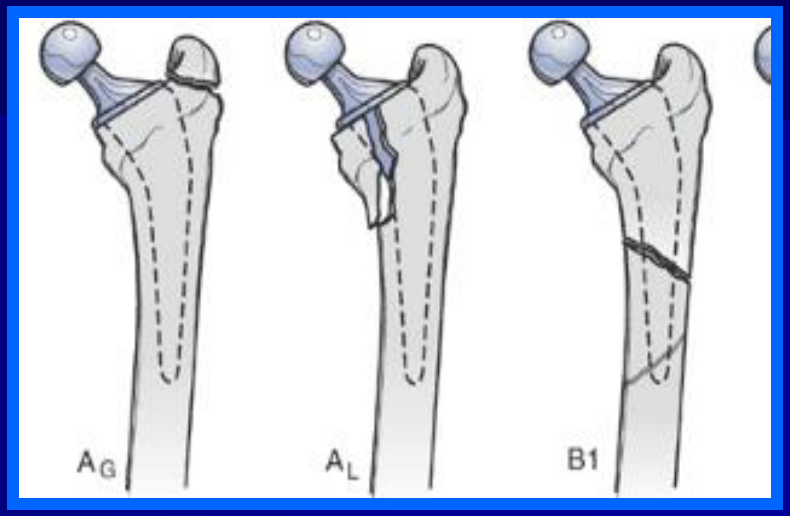


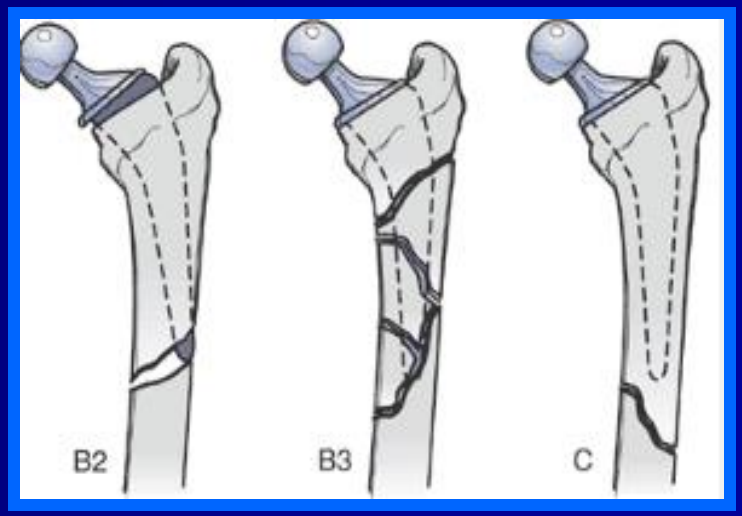
Type	Location	Subtype
A	Trochanteric region	A_G—greater trochanter
		A_L—lesser trochanter
B	Around or just distal to stem	B_1—prosthesis stable
		B_2—prosthesis unstable
		B_3—bone stock inadequate
C	Well below stem	

Periprosthetic femoral fracture

- This series included 89 patients with femoral fractures following THR

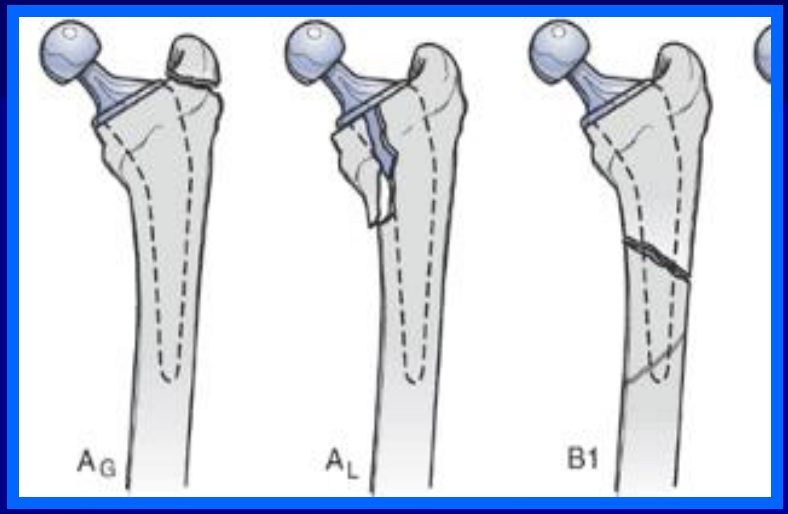
- TYPE 1- 4
- Type B1- 18
- Type B2 – 22
- Type B3 - 21
- Type C. - 24

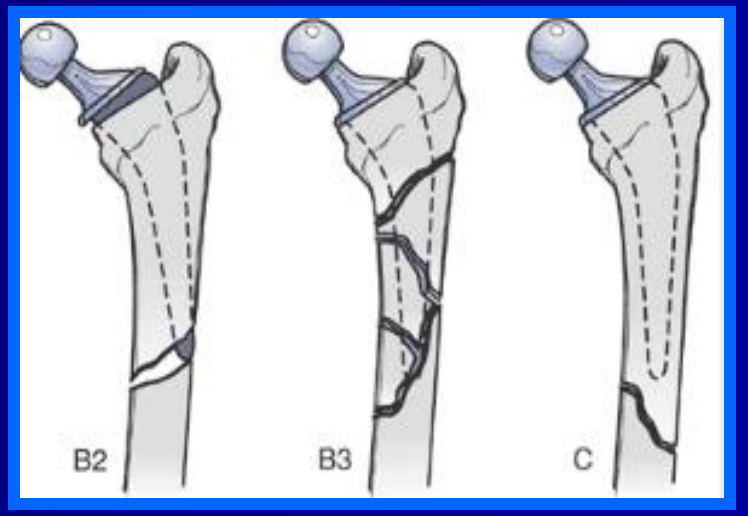




Periprosthetic femoral fracture

- In cases of stable stem (B1, C) we used ORIF with cerclage wires or cables, screws and plates.
- Fractures associated with a unstable prosthesis (B2, B3) were treated by a revision arthroplasty using a non cemented long femoral stem with or without bone-grafting
- In 4 patients with Type B2, B3 with addition of long allograft.





Periprosthetic femoral fracture
Vancouver type A g

(trochanteric fracture)

Fractures proximal to the tip of a fixed prosthesis are stable and usually can be treated nonoperatively or with limited internal fixation.

Periprosthetic femoral fracture
Vancouver type B1 (stable prosthesis)

(treatecd by long plate)

1st Patient

75 y F ; 1994 – THR Rt

2004 ? – after 10 years - PERIPROSTH # ORIF LCP

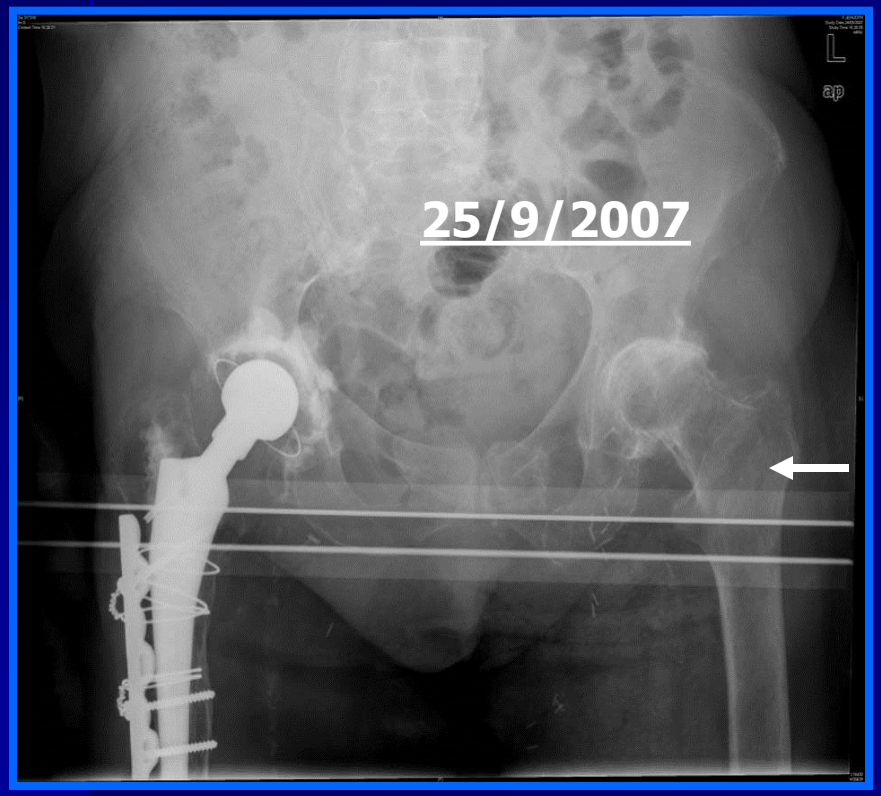
25/9/2007 RICHARD'S LT HIP

1st Patient

75 y F ; 1994 – THR Rt

2004 ? – 10 YEARS POST THR - PERIPROSTH # -ORIF LCP

25/9/2007 RICHARD'S LT HIP



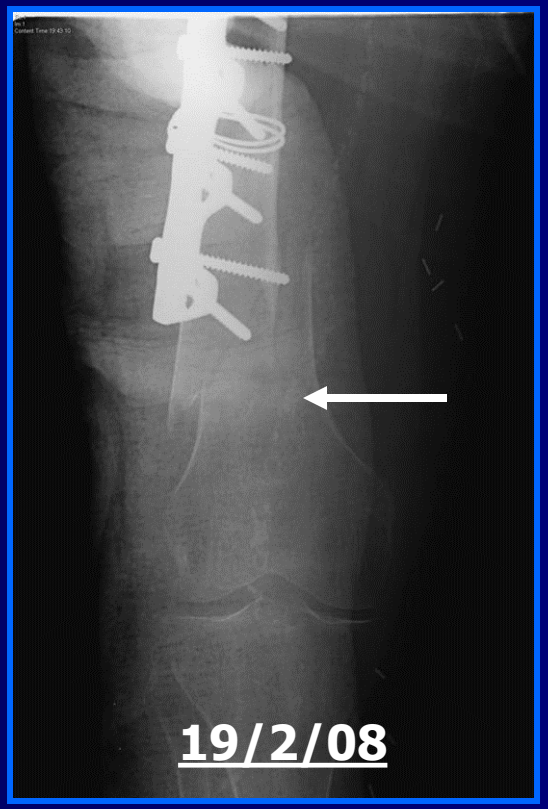
1st Patient

75 y F ; 1994 – THR Rt
2004 ? - PERIPROSTH # ORIF LCP
25/9/2007 RICHARD'S LT HIP

19/2/08- 2nd PERIPROSTHETIC #

1st Patient

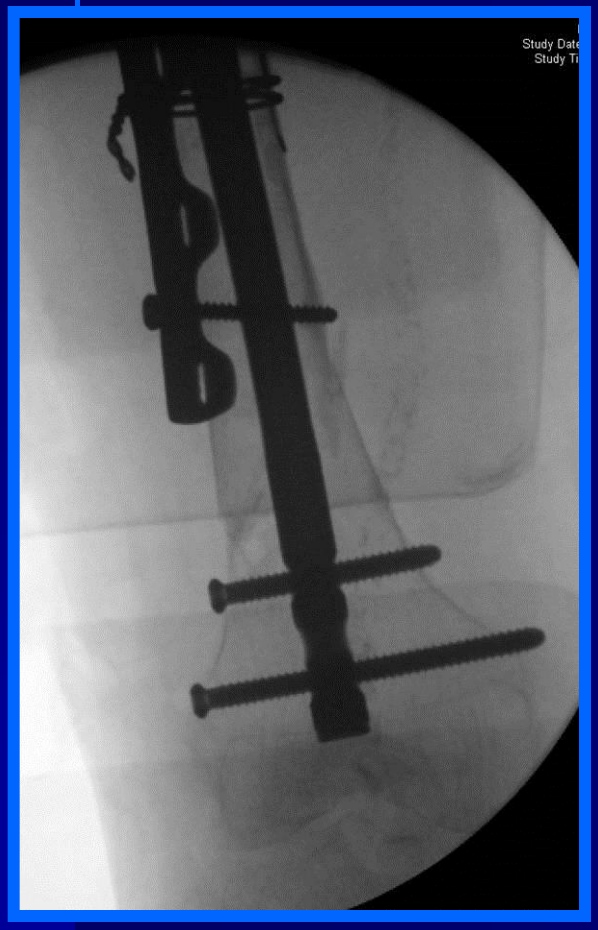
75 y F ; 1994 – THR Rt
2004 ? - PERIPROSTH # ORIF LCP
25/9/2007 RICHARDS LT HIP
19/2/08- 2nd PERIPROSTHETIC #



??????????????

1st Patient

75 y F ; 1994 – THR Rt
2004 ? - PERIPROSTH # ORIF LCP
25/9/2007 RICHARD'S LT HIP
19/2/08- 2nd PERIPROSTHETIC #

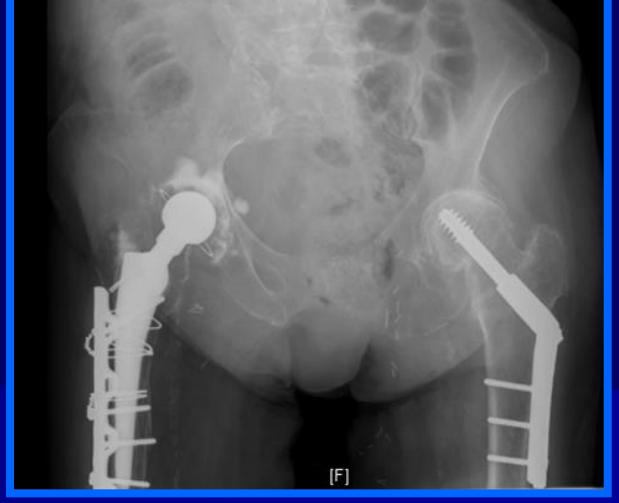


1st Patient

75 y F ; 1994 – THR Rt
2004 ? - PERIPROSTH # ORIF LCP
25/9/2007 RICHARD'S LT HIP
19/2/08- 2nd PERIPROSTHETIC #

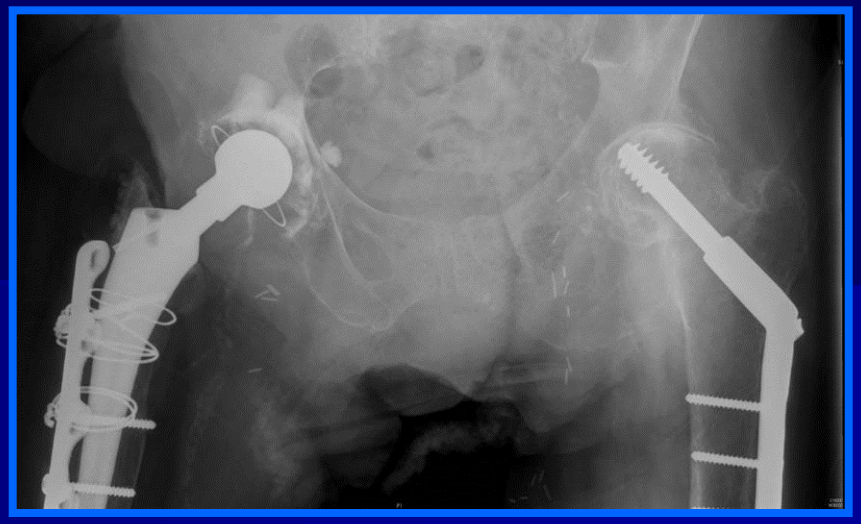
1st Patient

75 y F ; 1994 – THR Rt
2004 ? - PERIPROSTH # ORIF LCP ;
19/2/08- 2nd PERIPROSTHETIC #
20/6/08 4 MTHS POST OP



1st Patient

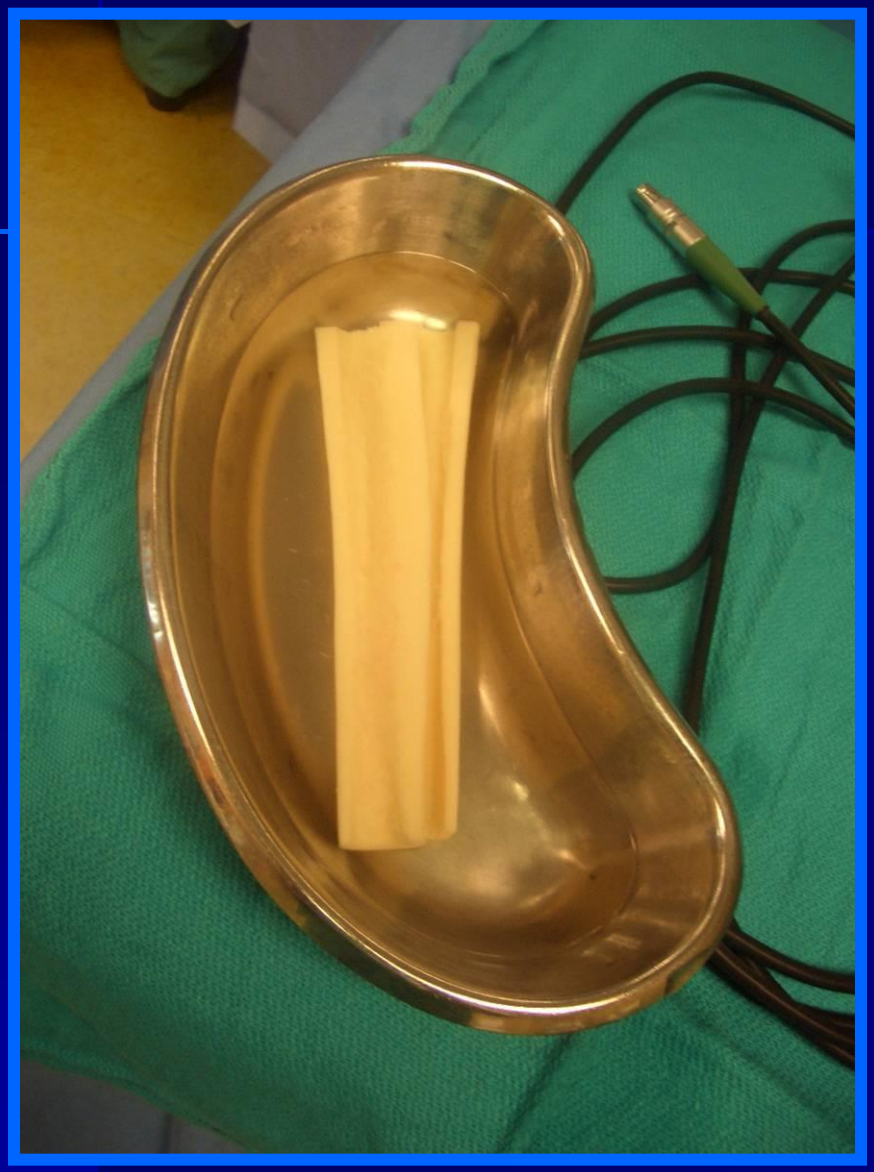
75 y F ; 1994 – THR Rt
2004 ? - PERIPROSTH # ORIF LCP ;
19/2/08- 2nd PERIPROSTHETIC #
4/3/12 4Y POST OP

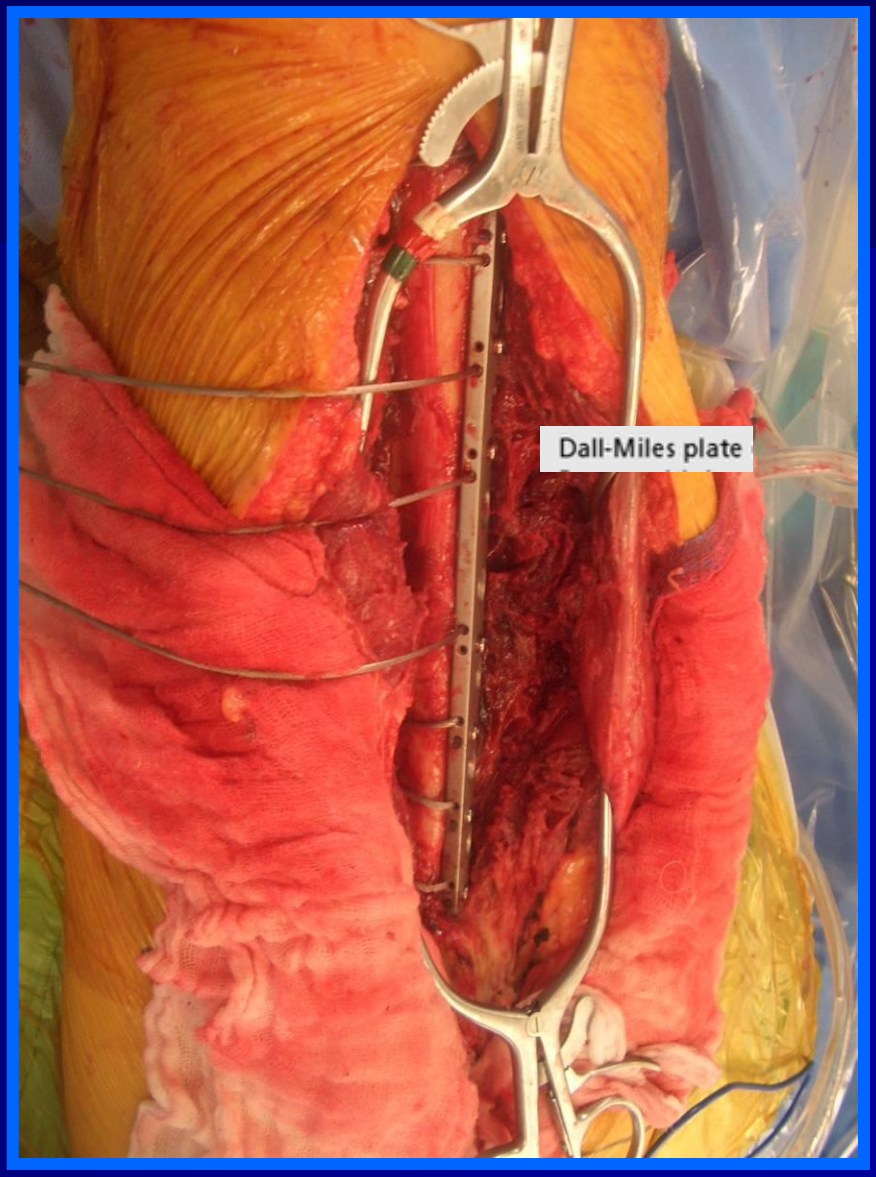


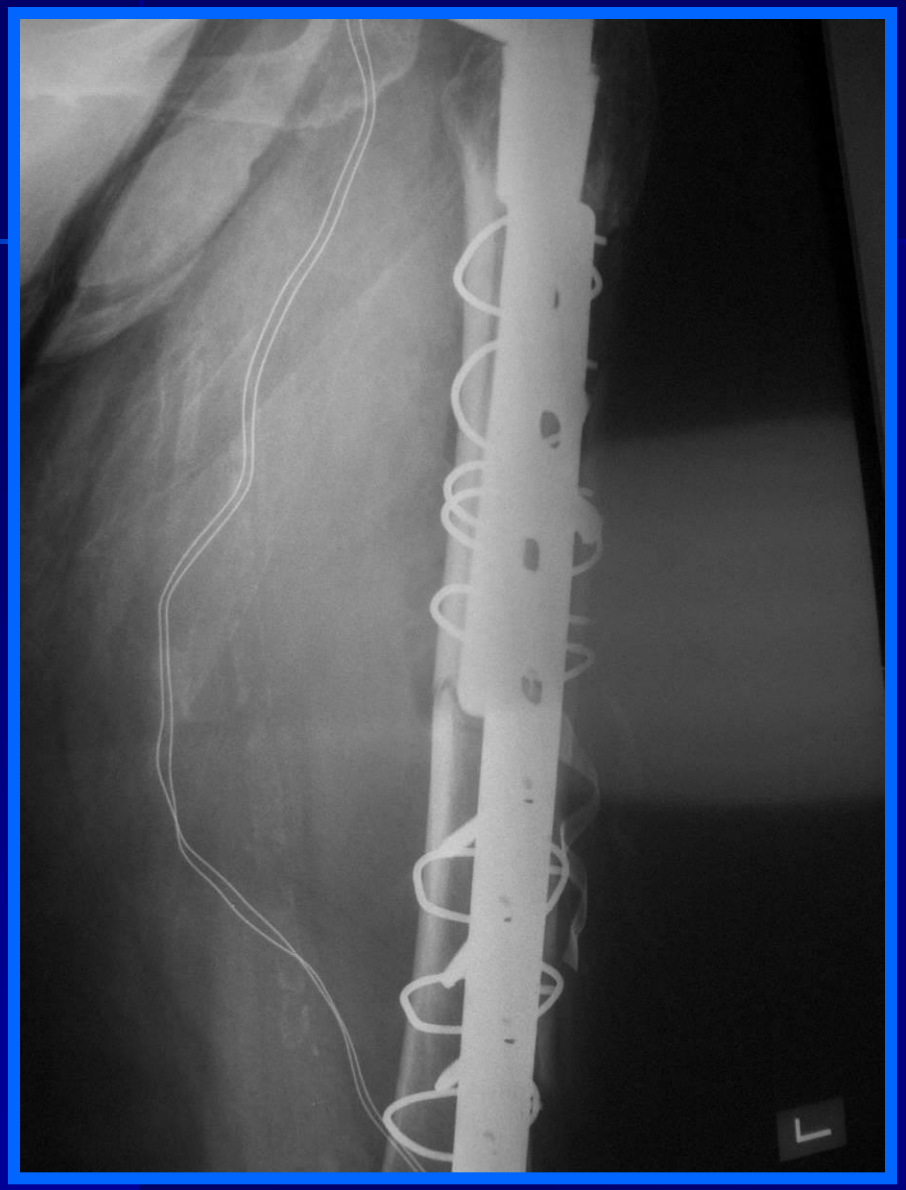
Periprosthetic femoral fracture

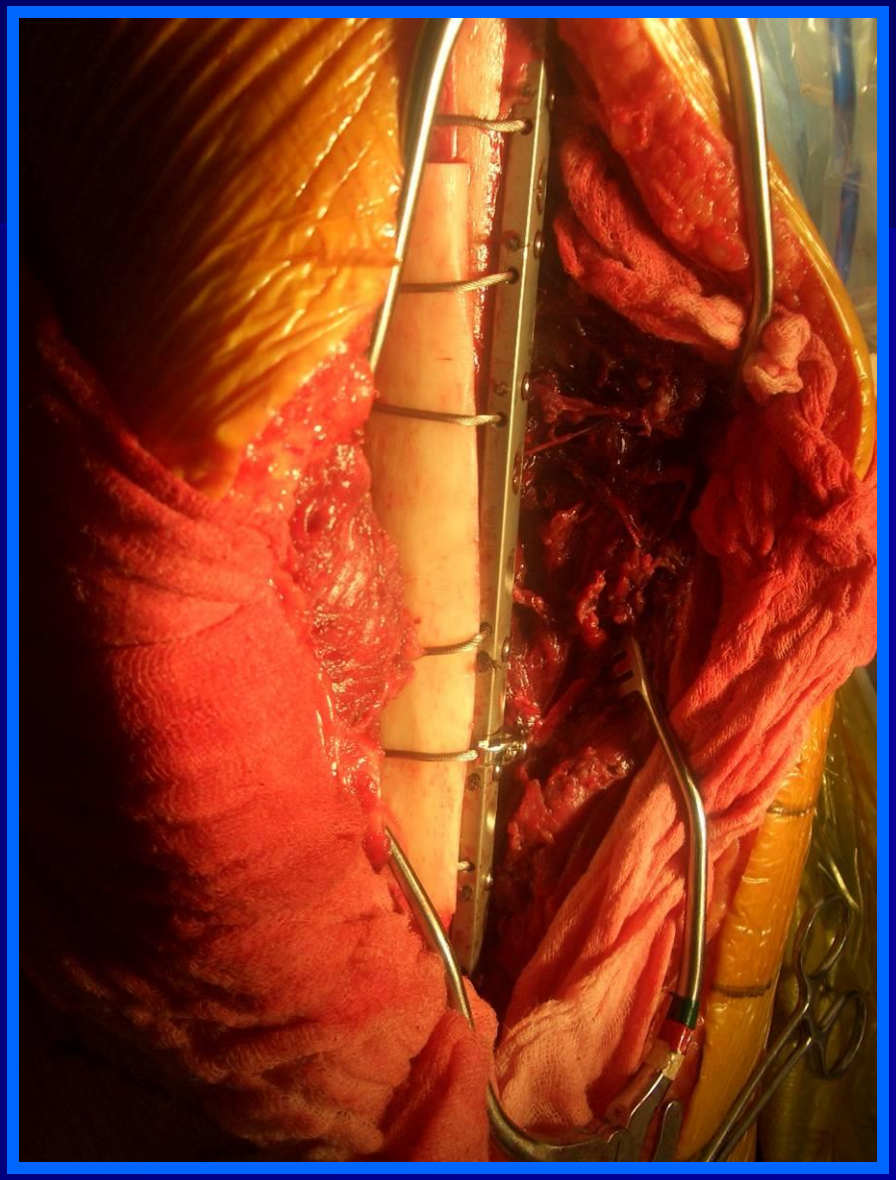
Vancouver type B2 (Unstable prosthesis)

(Treated by allograft and fixation by Dall Miles plate with cables and screws)




Dall-Miles plate

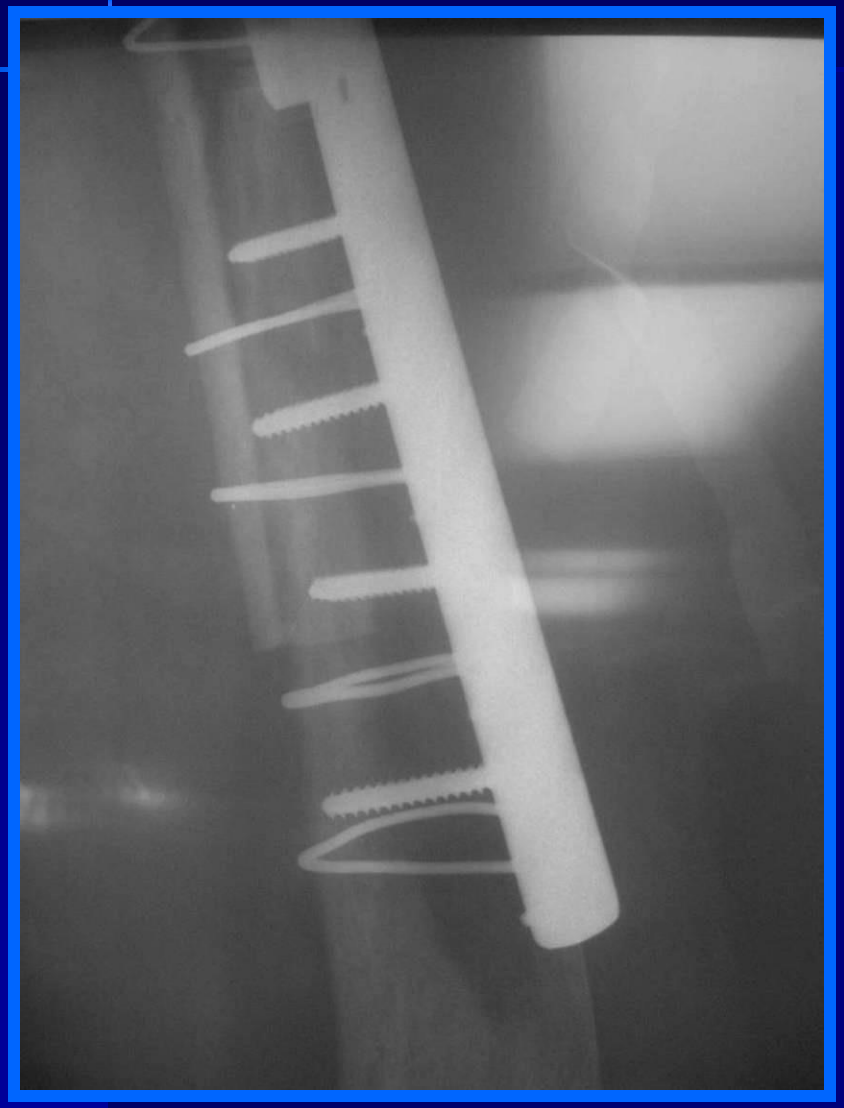




Periprosthetic femoral fracture

Vancouver type B2 (Unstable prosthesis)

(Treated by allograft and fixation by Dall Miles plate with cables and screws)



Operative

some fractures types B2 B3

Impaction bone grafting with allogenic particulate graft

when performing revision together with fracture fixation
in large femoral metaphysis or diaphysis cavitary defects
the **only** technique capable of restoring bone stock

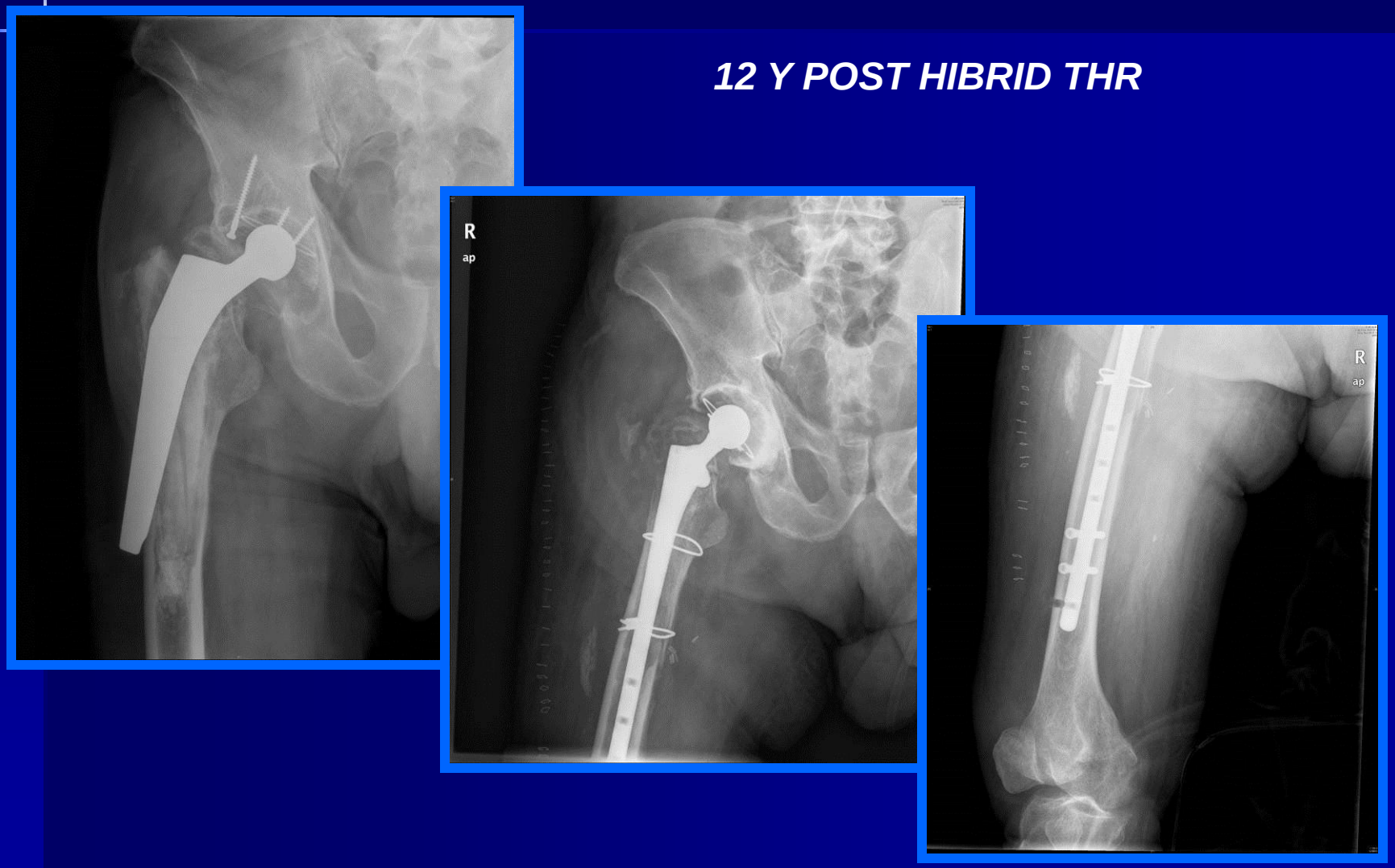
Tsiridis et al: Impaction Femoral Allografting and Cemented Revision for Periprosthetic Femoral Fractures JBJS 2004; 86Br;1124-1132

OAKES et al: Impaction Bone Grafting for Revision Hip Arthroplasty. Biology and Clinical Application J. Am Acad Ortho Surg, 2006:14;620-628

Periprosthetic femoral fracture
Vancouver type B2 (Unstable prosthesis)

(Treated by Fixation by cables and screws and bone graft)

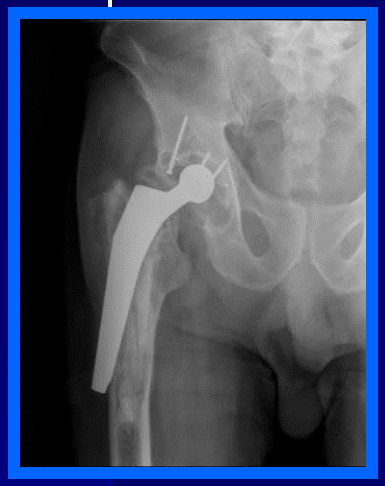
12 Y POST HIBRID THR

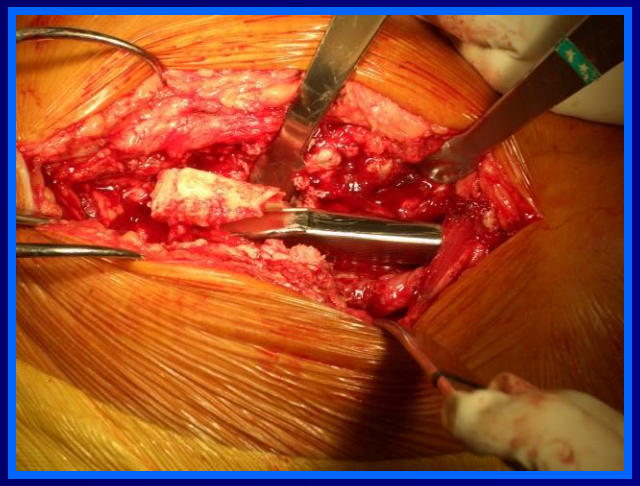


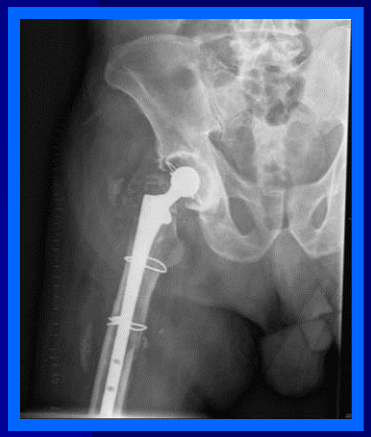
KATZ

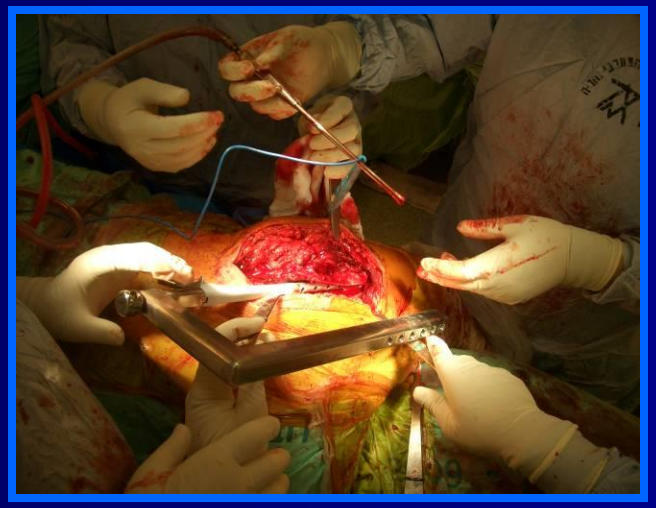
Periprosthetic femoral fracture
Vancouver type B2 (Unstable prosthesis)

(Treated by fixation by cables and screws & bone graft)





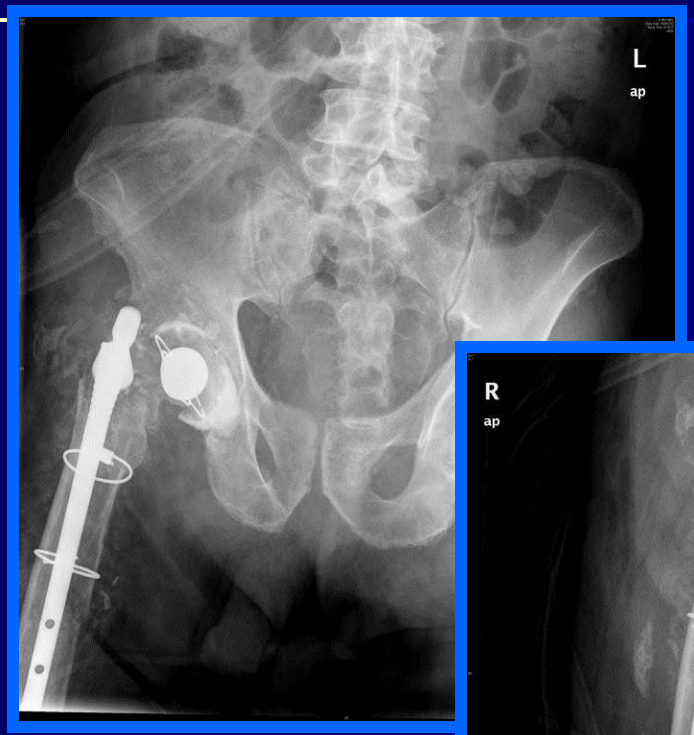




KATZ

2 mths later

KATZ

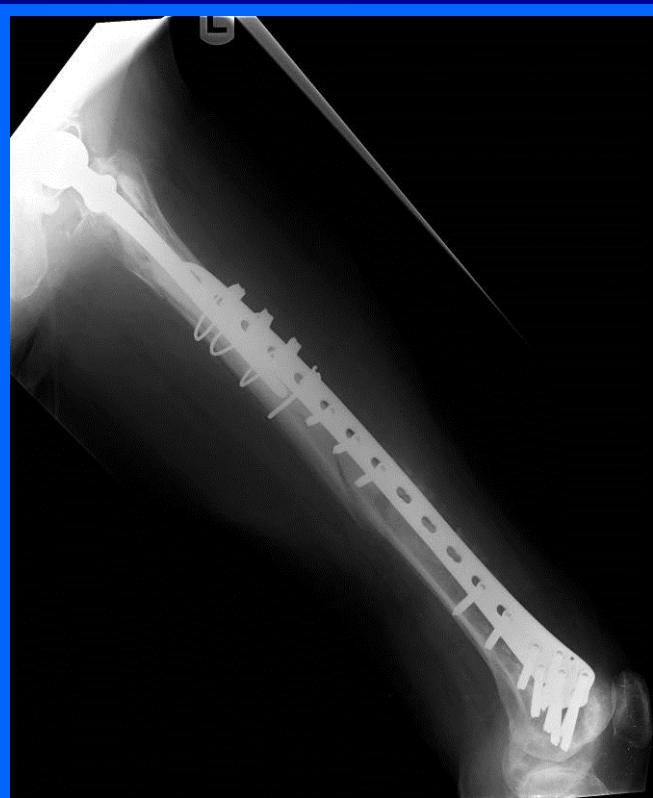


Periprosthetic femoral fracture
Vancouver type C (stable prosthesis)

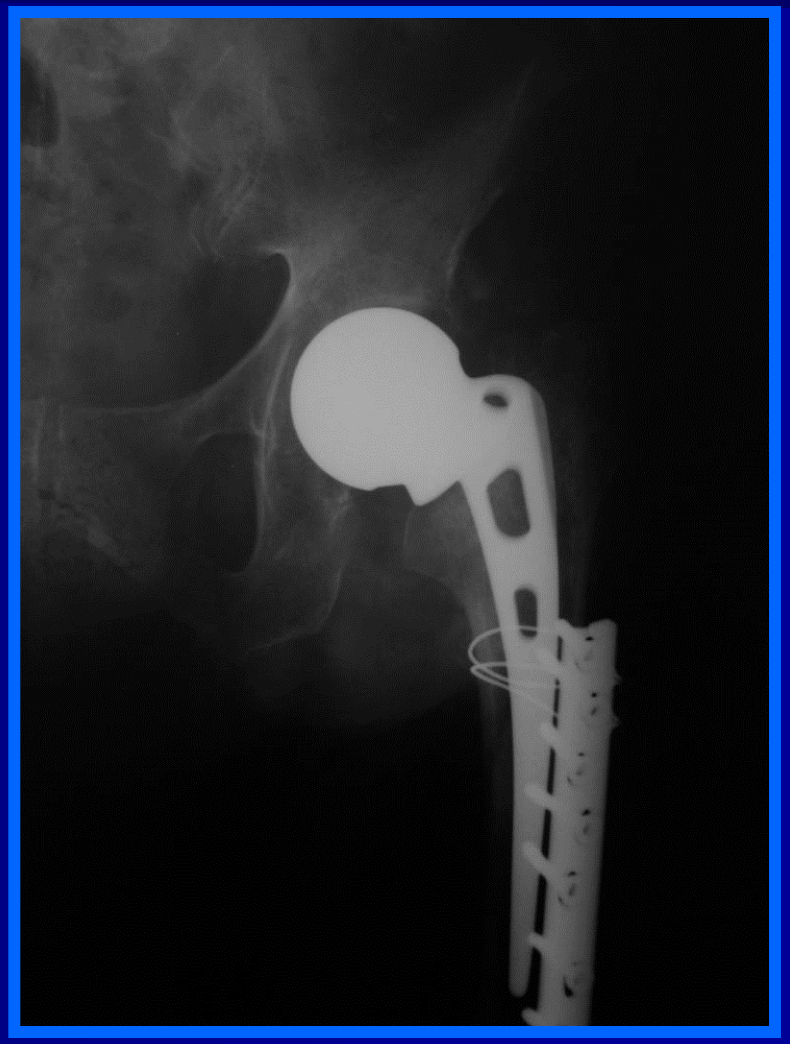
(Treated by fixation by plates, DFN etc)

Periprosthetic femoral fracture
Vancouver type C (stable prosthesis)

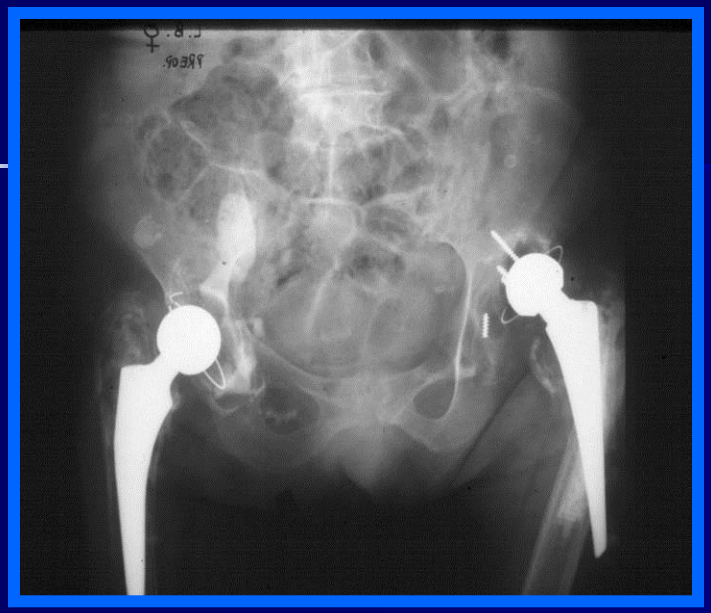
(Treated by fixation by plates, DFN etc)

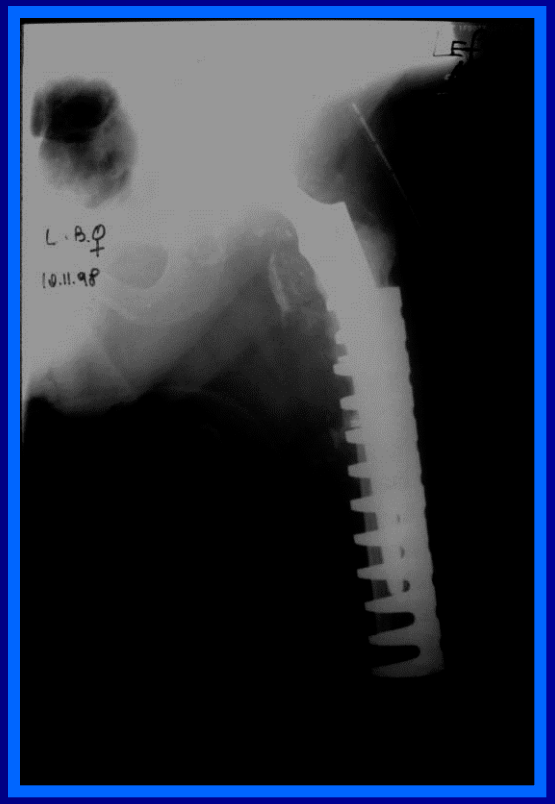


Same principles following hemiarthroplasty



Periprosthetic femoral fracture treatment with **Mennen plate**





10.11.98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FOR YOUR
ATTENTION

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

Periprosthetic femoral fracture due to sideways fall: A comparative analysis on the effect of stem design

Luigi La Barbera[1,2], Alberto Anticonome[1], Claudia Ottardi[1], Tomaso Villa[1,2], Luigi De Napoli[3], Massimo Franceschini[4], Giuseppe Mineo[4]

[1] *LaBS, Dpt. of Chemistry, Materials and Chemical Engineering "G. Natta", Politecnico di Milano, Italy*

[2] *IRCCS Istituto Ortopedico Galeazzi, Italy*

[3] *Dipartimento di Ingegneria Meccanica, Energetica e Gestionale, Università della Calabria, Italy*

[4] *Università degli Studi di Milano, Clinica Ortopedica e Traumatologica - IV Divisione, Istituto Ortopedico "G. Pini", Italy*

POLITECNICO MILANO 1863

26th November 2015, Milan

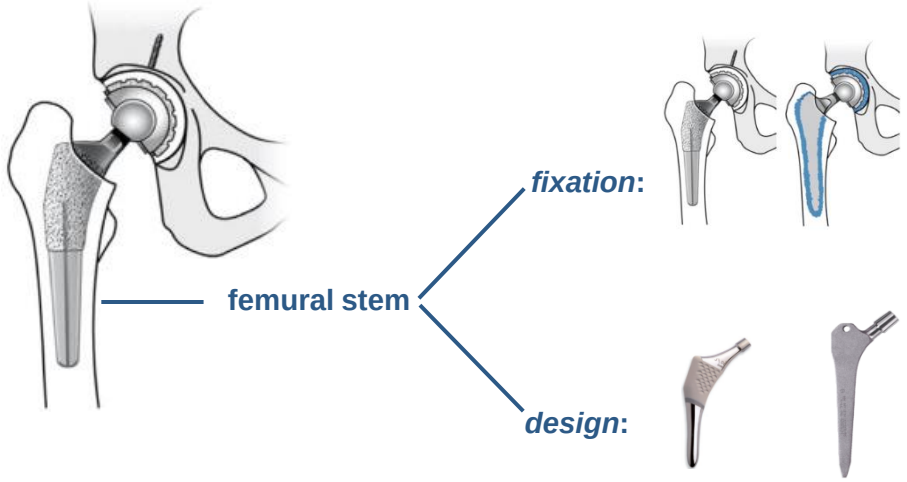
Azienda Ospedaliera Istituto Ortopedico GAETANO PINI

Introduction: Arthroplasty registers' analysis

- 75% of PFF are caused by **low-energy sideways fall with impact on the greater trochanter**
  (The Swedish Total Hip Replacement Registry, 2011)

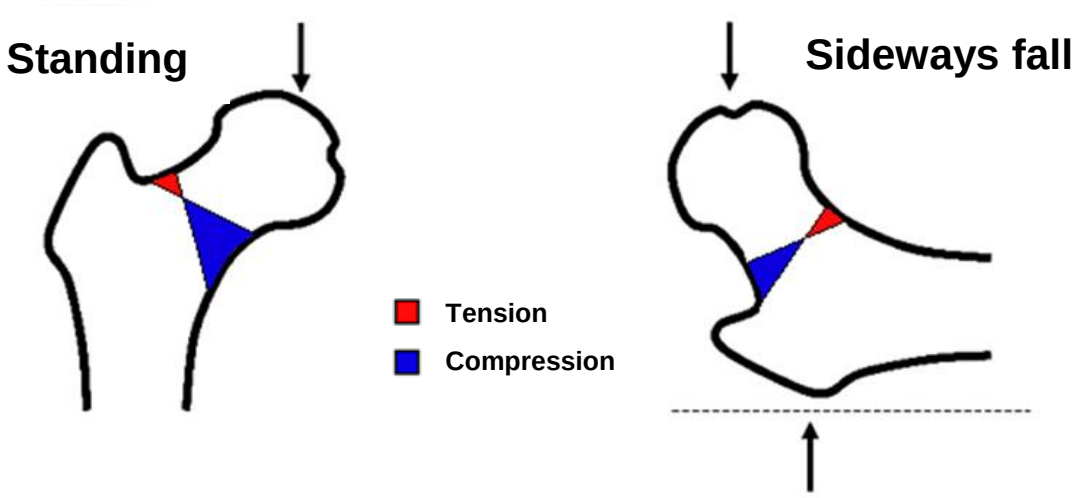
- Higher incidence of PFF with **uncemented stems** (67%)
  (SoFCOT Total Hip Arthroplasty Register, 2011)

- Risks factors: - age,
  - gender,
  - bone quality,
  - surgical technique,
  - **stem design**.
  (Lindahl et al, 2005)

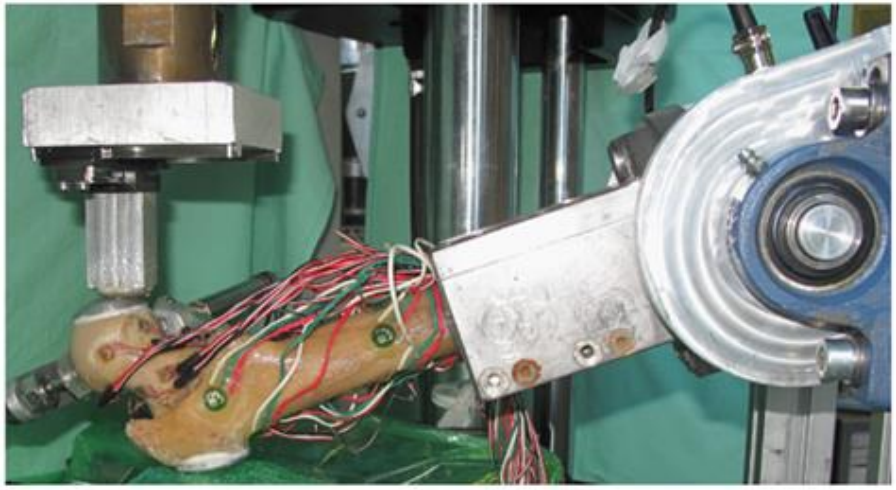


Introduction: Sideways fall biomechanics

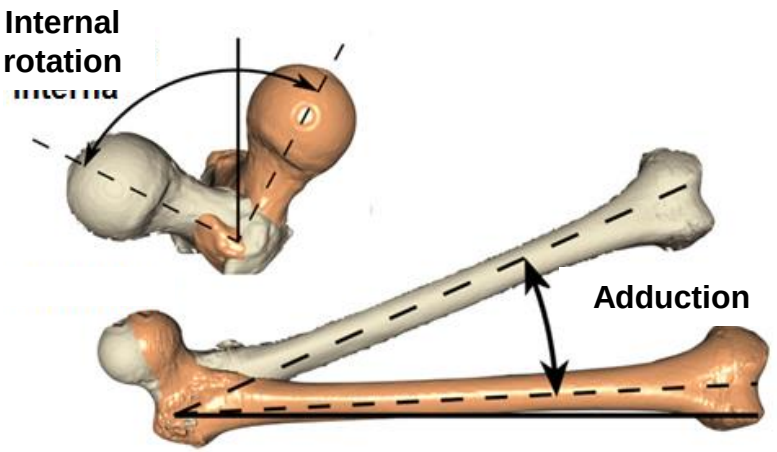
The loading condition on the femural neck during sideways fall is opposite with respect to standing:



Experimental set-up:



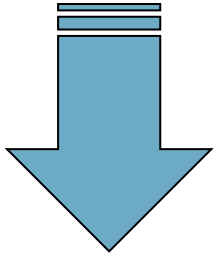
(Grassi et al, 2011)



Aims

ISSUE:

No study investigated the **effect of femoral stem design** on the **risk of periprosthetic femoral fractures** (PFF)



AIMS:

•Study the loading condition arising during **sideways fall** on an **implanted femur** in **osteopenic subjects**,

•Comparative Finite Element Model (FEM) study on the **effect of stem design** (straight vs. anatomical) on the **risk of PFF** and **comparison with clinical data**

Material & Methods: INTACT FEMUR

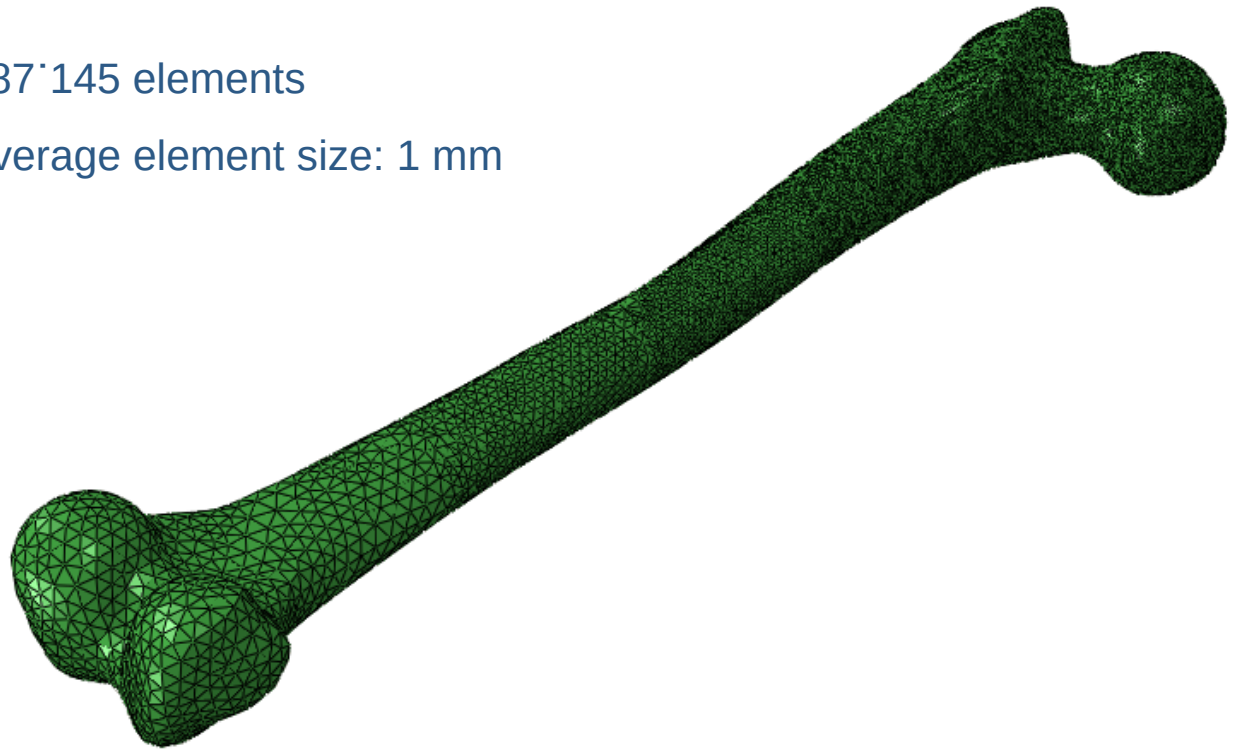
- **Geometry:** - downloaded from VPH NoE database (www.vph-noe.eu)
  - left synthetic composite femur (Sawbones®).

- **Material:** - homogenous
  - linear elastic properties:

	Cortical bone	Trabecular bone
E (Gpa)	16.7	0.155
ν	0.3	0.3

(Ebrahimi et al, 2012)

- **Discretization:** - 187˙145 elements
  - average element size: 1 mm



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luigi.labarbera@polimi.it

Material & Methods: Stem design

STRAIGHT
(PBF, Permedica®)

- long conical shape
- rectangular profile
- tricortical support
- sand-blasted surface

ANATOMICAL
(ABG II, Stryker®)

- short stem
- smoothed profile
- proximal support
- proximal HA surface coating

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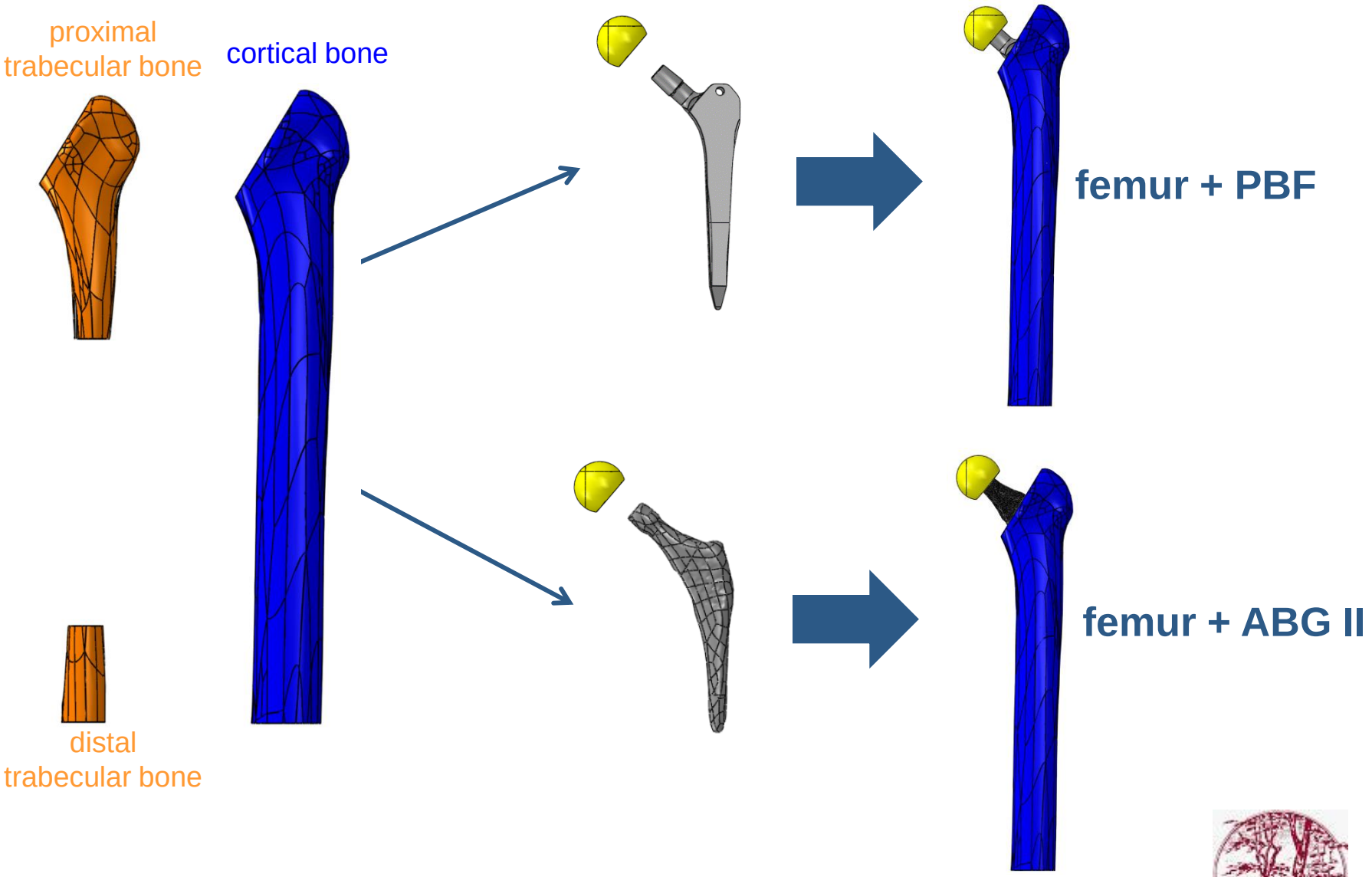
Material & Methods: Implanted femur models

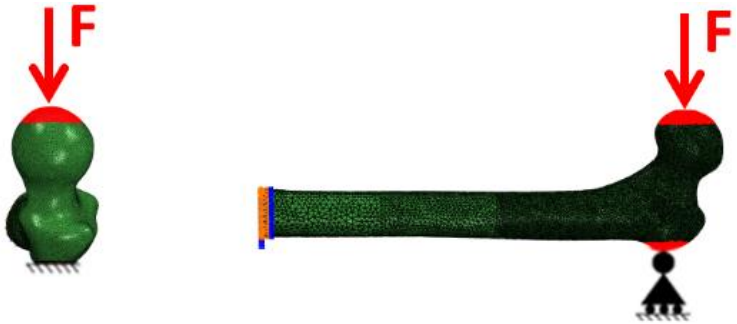
Resected femur



Material & Methods: Loading conditions

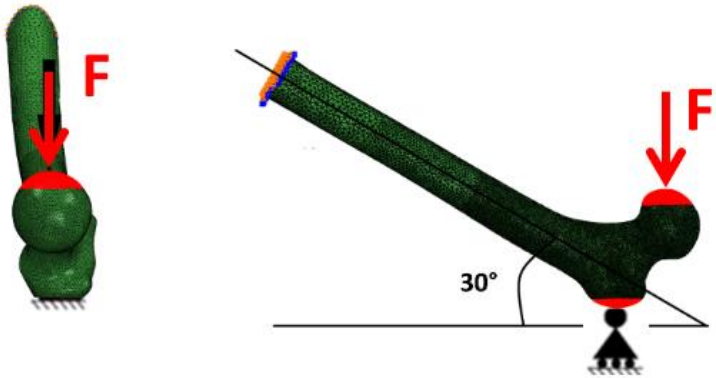
Simple sideways fall (0-0)

(Grassi et al 2011, Zani et al 2012)



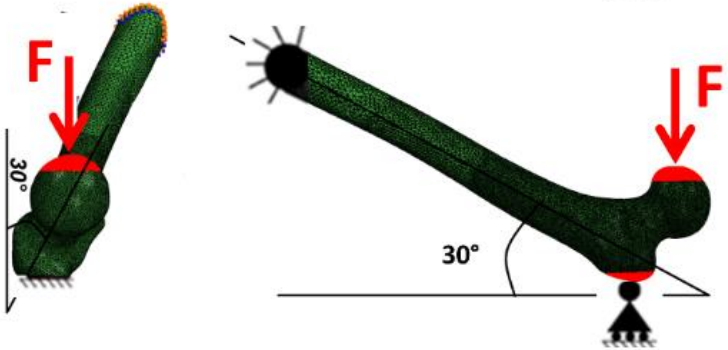
+ 30° adduction (30-0)

(Grassi et al 2011, Zani et al 2012)



+ 30° internal rotation (30-30)

(Grassi et al 2011, Zani et al 2012)

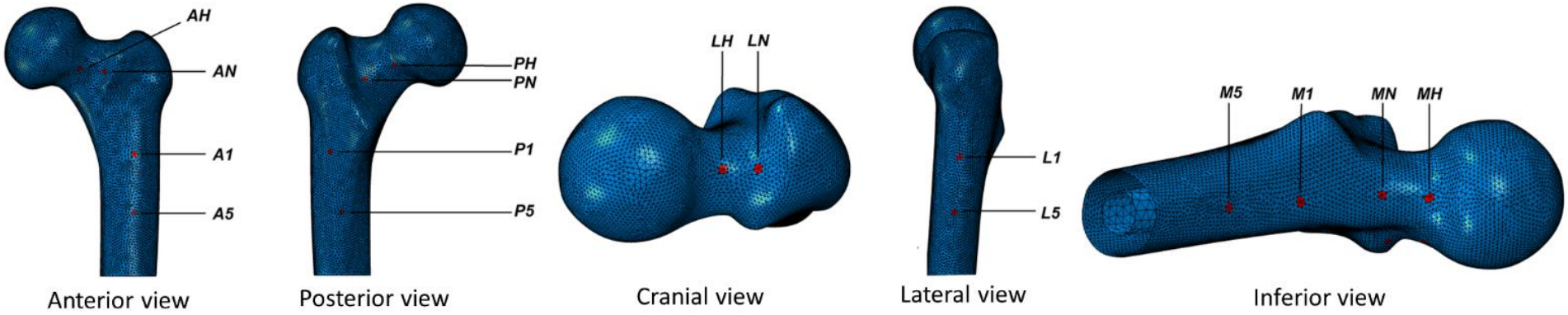


Vertical load (standing)

(Cristofolini et al, 2008)

Material & Methods: Parameters of interest

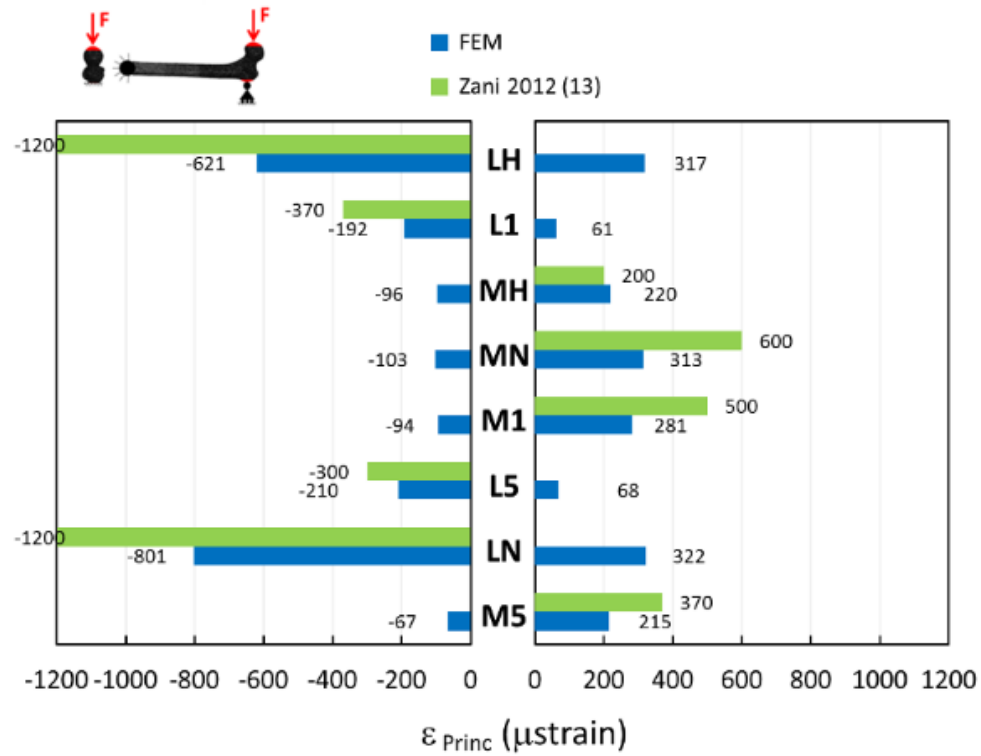
- **INTACT FEMUR:** strain validation by comparison with experimental measurements
  - **sideways fall** *(Grassi et al 2011, Zani et al 2012)*
  - **vertical load** *(Cristofolini et al 2008)*



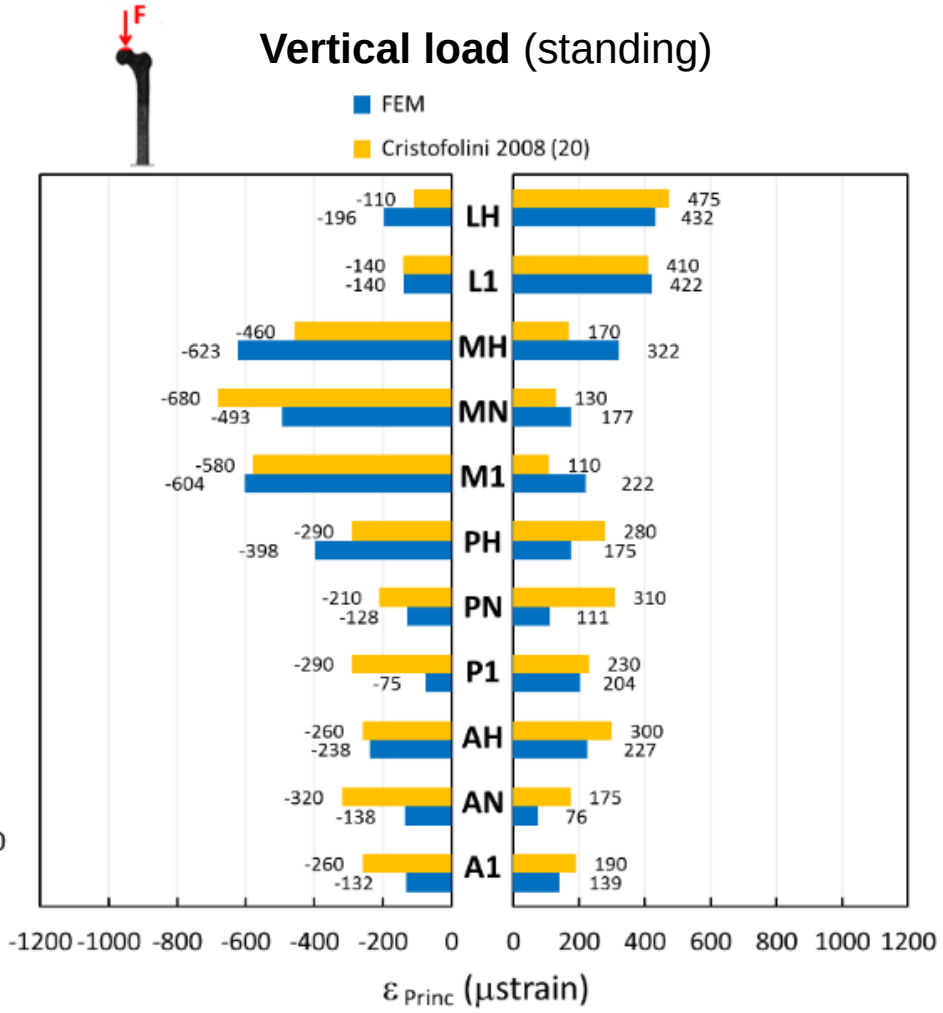
- **IMPLANTED FEMUR:**
  - **sideways fall:** risk of PFF (stress: σ_{VM}, strain: ε_{Princ})
  - **vertical load:** stress shielding (stress: σ_{VM}, strain: ε_{Princ})

Results & Discussion: Validation

Simple sideways fall (0-0)



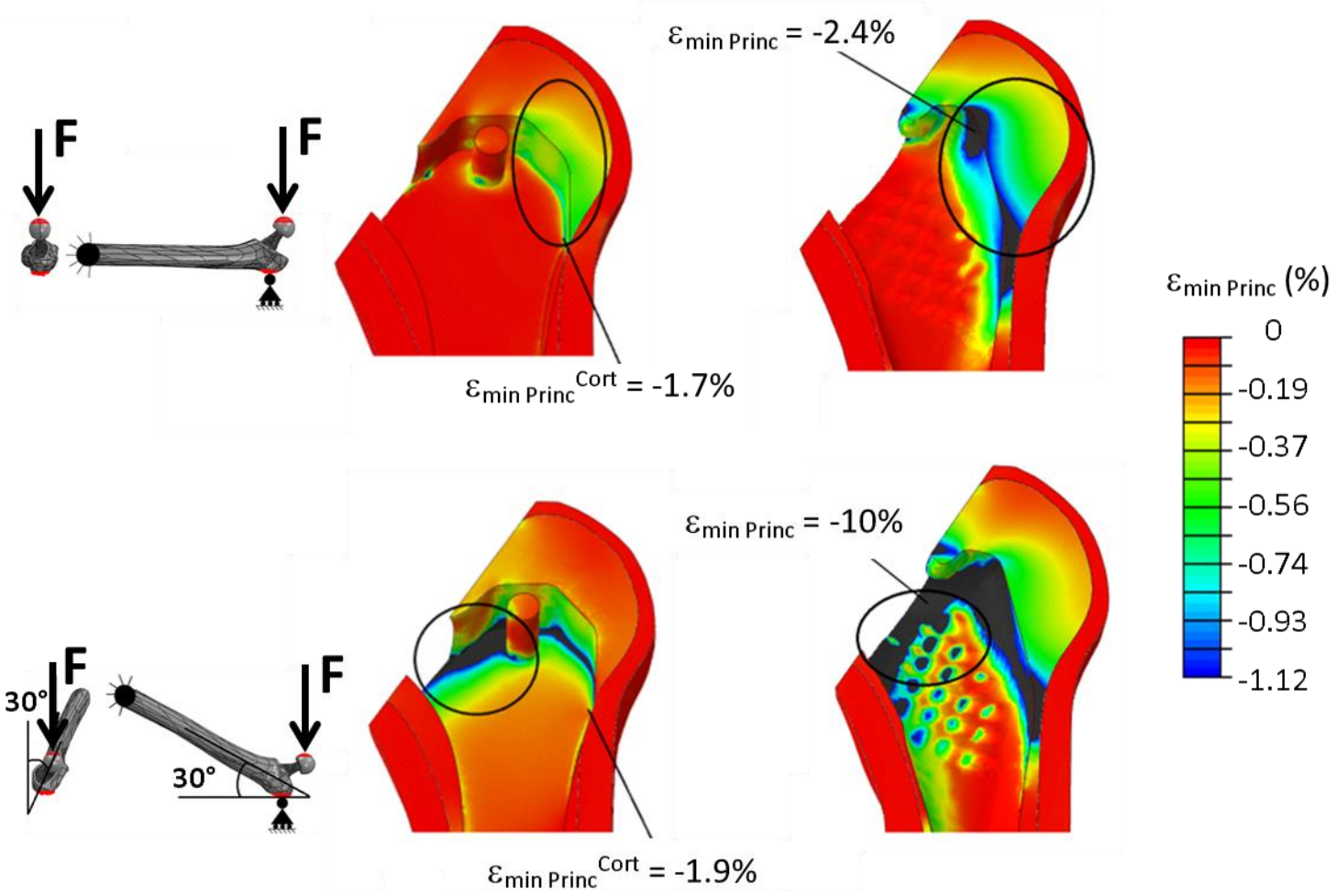
Vertical load (standing)



the predicted strains (FEM) are comparable with the experimental measurements from literature

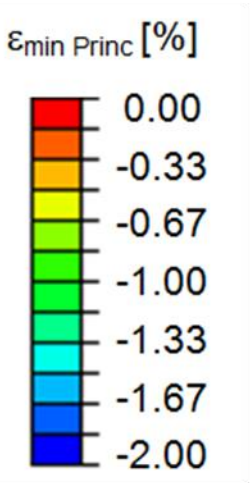
Results & Discussion: Sideways fall

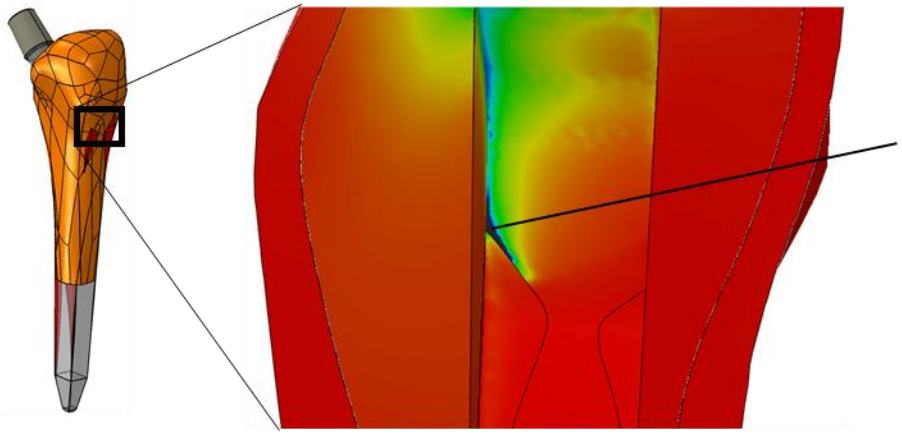
Loading on the proximal femur: PBF ABG II



Results & Discussion: Sideways fall

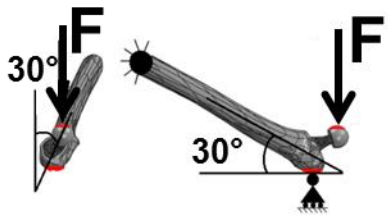
Loading at the interface between the straight PBF stem and the bone

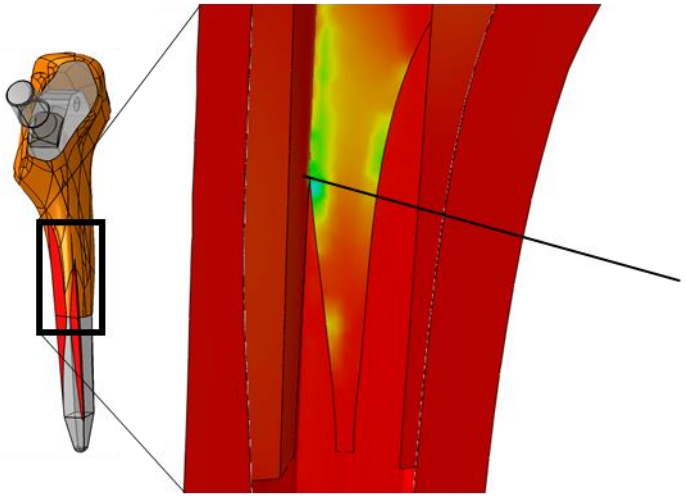




ε cort min princ = - 1.9%

ε trab min princ = - 42.4%





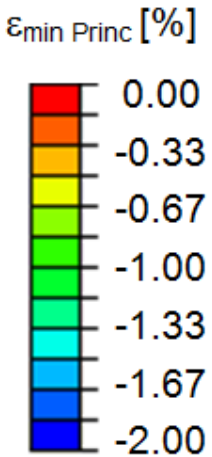
ε cort min princ = - 0.35%

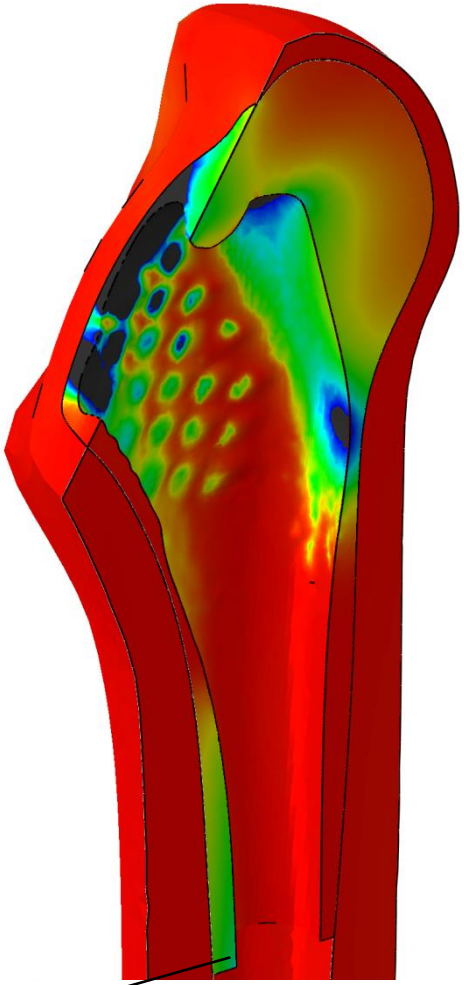
ε trab min princ = - 1.2%

luigi.labarbera@polimi.it

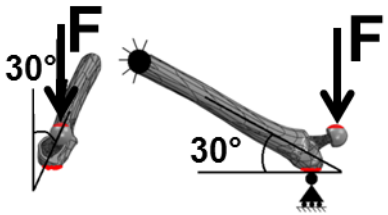
Appendix: Sideways fall

Loading at the interface between the anatomical ABG II stem and the bone





εmin princ = -1.6%



Appendix

PFF Istituto Ortopedico G. Pini 2010-2015

- 75 patients with proximal PFF in our Institution
- Exclusion criteria:
  - Cemented stem
  - Pts unable to attend follow up
- 41 patients, mean age 76 y-o, 26 (63%) straight stem, 15 (37%) anatomic stem

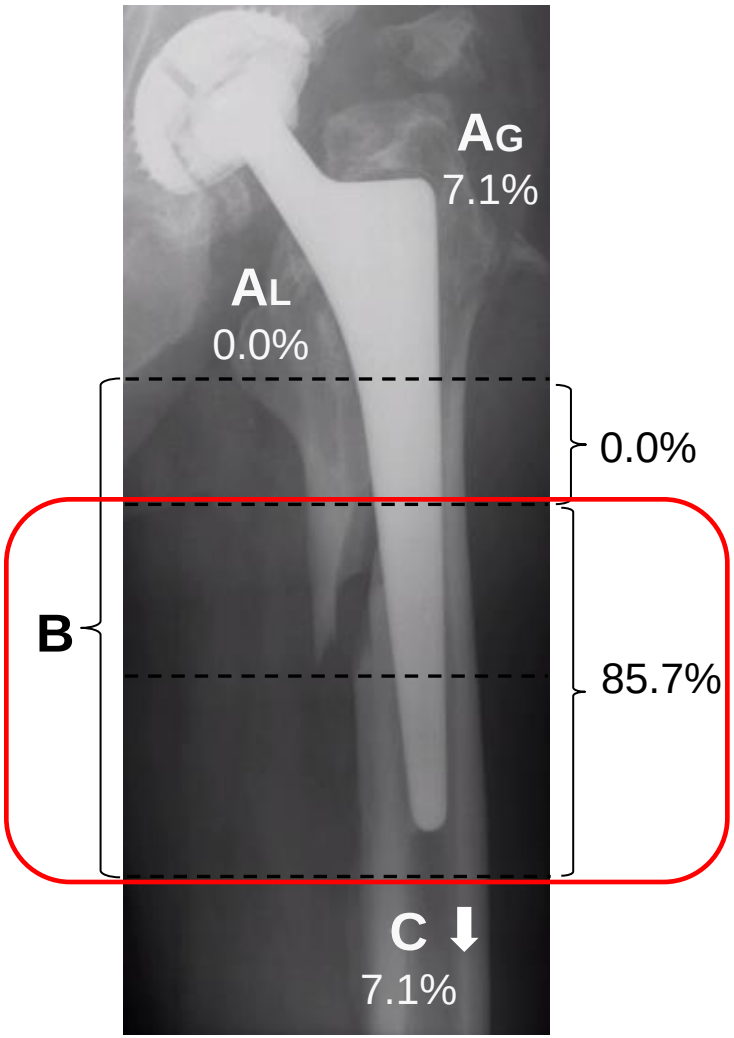
proximal dyaphiseal

dyaphiseal

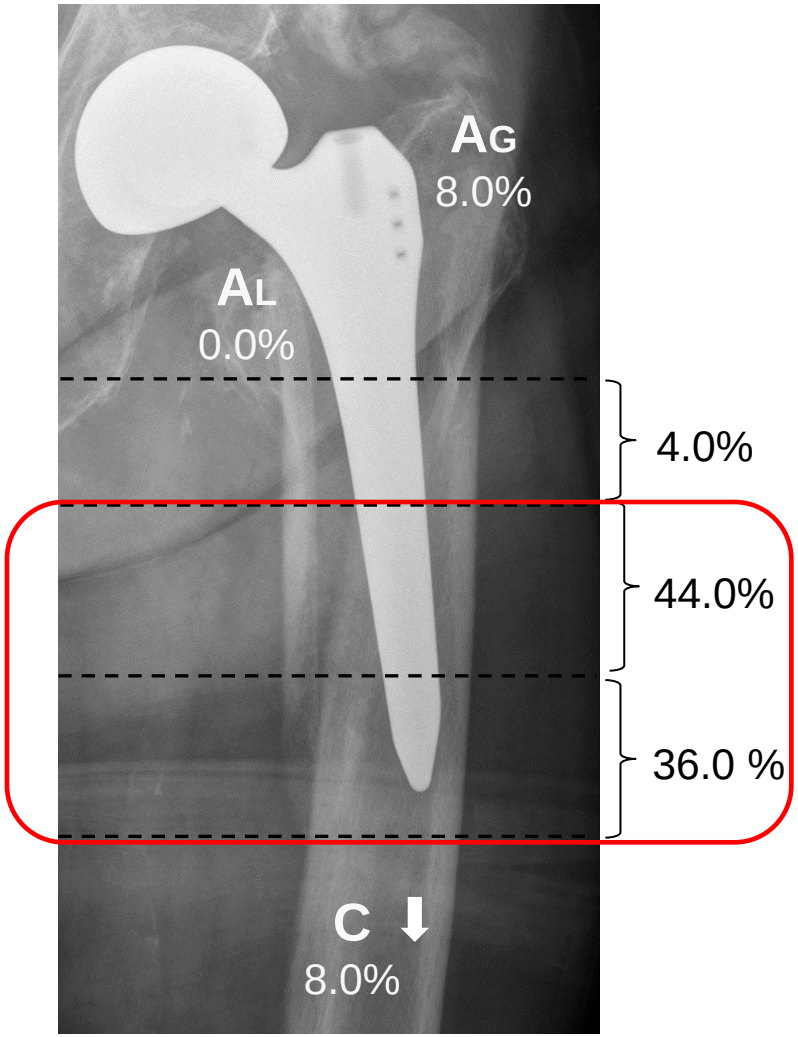
distal dyaphiseal

Results & Discussion: PFF incidence with straight stems

(Streit al, 2011: n=14)



Istituto Ortopedico G. Pini: n=25



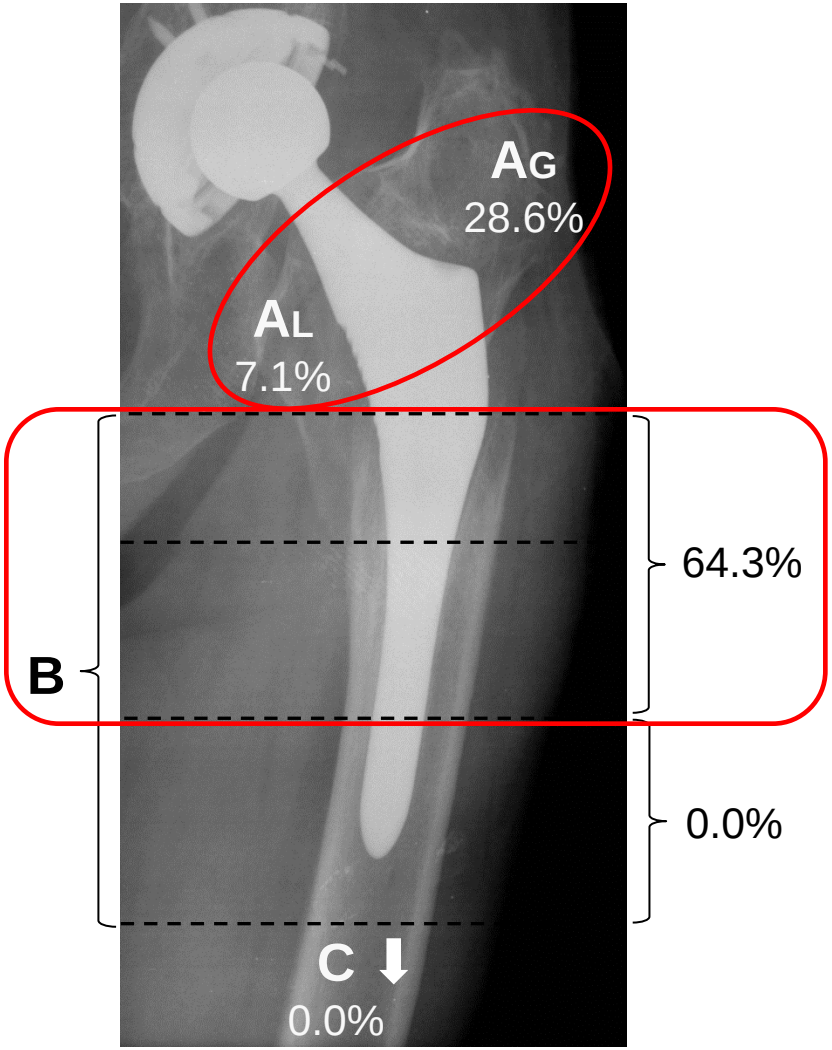
Higher incidence of distal PFF

POLITECNICO MILANO 1863

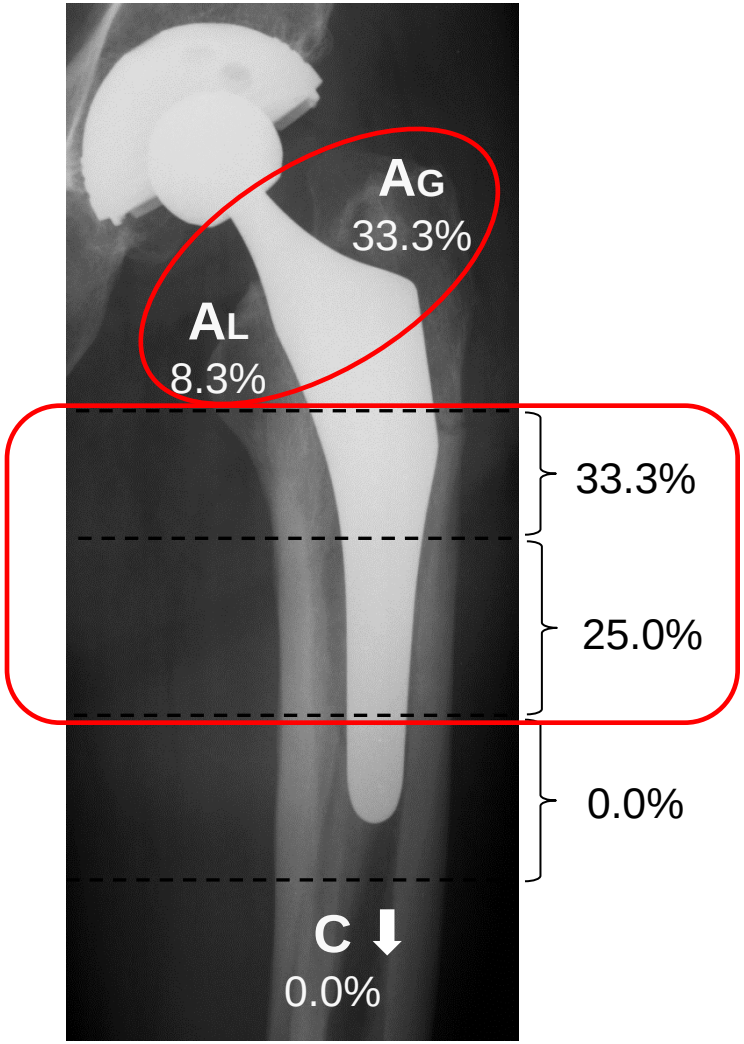
luigi.labarbera@polimi.it

Results & Discussion: clinical data on PFF with anatamical stem

(Van der Wal et al, 2011: n=15)



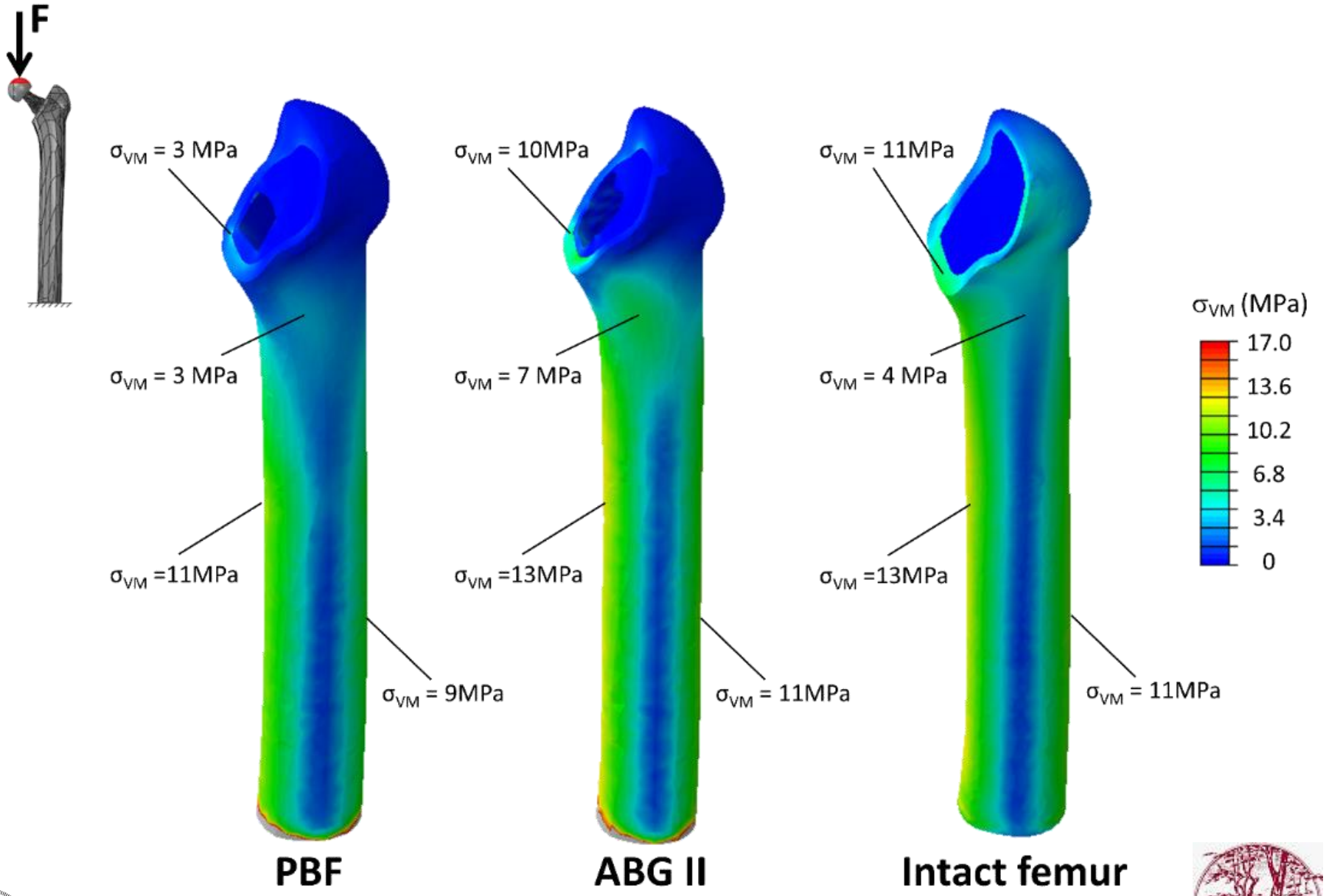
Istituto Ortopedico G. Pini: n=12



Higher incidence of PFF in the greater trochanteric and in the proximal diaphiseal regions

luigi.labarbera@polimi.it

Results & Discussion: Vertical loading and stress shielding

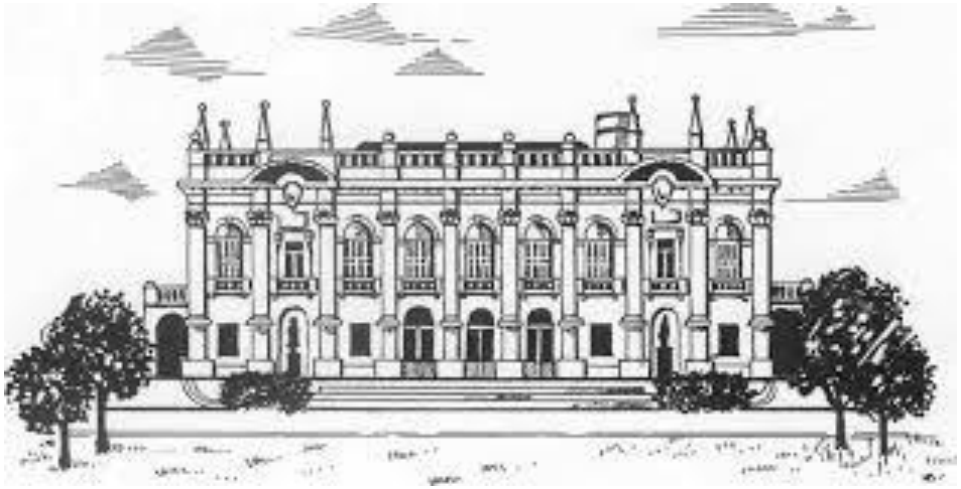


Conclusions

	Straight stem	Anatomical stem
FEM		
Vertical load	- **Greater** stress shielding proximally	- **Lower** stress shielding proximallly
Sideways fall	Stress peak at the interface between the implant and the bone	Stress peak in the trochanteric and proximal regions
	Risk of distal PFF	**Risk of proximal PFF**
Clinical data		
Vertical load	✓ **higher bone resorption proximally**	discontinuity in bone quality ✓ **lower** bone resorption proximally, but bone apposition in the diaphyseal regions: **Gradient in bone density**
Sideways fall	✓ prevalence of **distal** PFF	✓ prevalence of trochanteric and diaphyseal fractures

luigi.labarbera@polimi.it

GRAZIE



luigi.labarbera@polimi.it

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

SYSTEMATIC REVIEW OF THE MANAGEMENT OF PERIPROSTHETIC FRACTURES OF HIP RESURFACING

GRAY C

ROYAL ORTHOPAEDIC HOSPITAL, BIRMINGHAM

INTRODUCTION

- 1% of the 83 125 hip replacement procedures performed in 2014 in the UK were resurfacings (12th NJR)[1]. This has decreased proportionally from a peak of 10.8% of the 47 550 primary hip replacement procedures in 2006.
- The median age at time of primary procedure was 55 years (49-60)

INTRODUCTION

- The incidence of periprosthetic fractures of hip resurfacings have been reported between 0.4 to 4.0% [2-9]. Intertrochanteric fractures are a rarer mode of failure than intracapsular fractures.
- The standard management is revision to a stemmed femoral prosthesis.
- However, the successful management with the retention of prosthesis has been described following a traumatic fracture, in a previously well-fixed prosthesis with well-positioned components.
- This would be advantageous for preservation of bone stock and for reduced surgical morbidities associated with revision surgery.

OBJECTIVES

- To review the current evidence regarding the management of retaining the prosthesis in the presence of a traumatic periprosthetic fracture, in a previously well-fixed hip resurfacing.

METHOD

- A systematic review was performed using the MeSH Terms
- 1. ‘Periprosthetic Fracture’ AND ‘Hip Resurfacing’,
- 2. ‘Intracapsular Fracture’ AND ‘Hip Resurfacing’ and
- 3. ‘Intertrochanteric Fracture’ AND ‘Hip Resurfacing’. The MeSH Terms were linked with the Boolean operator ‘AND’.
- Studies only published in English language were included. Studies were excluded if they did not consider the management of periprosthetic fractures of hip resurfacings.

RESULTS

- Twenty-one studies were identified were relevant.
- 12 considered the management of intertrochanteric fractures [2,4-14].
- 6 reviewed the management of intracapsular fractures [15-20].
- 2 studies considered basicervical fractures [3,21].
- 1 study considered a femoral shaft fracture [22].

Table To Show The Results of The Management of Intertrochanteric Periprosthetic Fractures

Author	Fracture Type	Sex	Age	Implant	Time Since Surgery	Fixation
Aning *et al [2]*	Complex, multifragmentary femoral neck and shaft	M	60	Birmingham Hip Resurfacing (BHR, Smith & Nephew)	2 years	Reconstruction Nail
Baxter *et al [10]*	Intertrochanteric	M	67	Cormet (Corin)	34 days	Distal femoral locking plate in reverse position
Carpentier *et al [4]*	Complex Intertrochanteric	M	72	BHR	6 years	Distal femoral locking plate in reverse position
Haddad *et al [11]*	Intertrochanteric	M	59	BHR	8 years	Three 6.5mm cannulated screws
MacDonald *et al [12]*	Intertrochanteric with subtrochanteric extension	F	56	BHR	5 years	Proximal femoral peri-articular locking compression plate (LCP) (Synthes)
Morgan *et al [13]*	Intertrochanteric	F	78	BHR	11 years	Conservative management
Morgan *et al [13]*	Intertrochanteric	M	69	BHR	2 years 5 months	Conservative management
Orpen *et al [5]*	Intertrochanteric	M	54	Conserve (Wright Medical)	2 years	Distal femoral variable axis NCB (non-contact bridging) locking plate (Zimmer)
Orpen *et al [5]*	Intertrochanteric, reverse oblique	M	54	BHR	3 months	Distal femoral variable axis NCB (non-contact bridging) locking plate (Zimmer)
Peskun *et al [6]*	Intertrochanteric	M	47	Conserve	16 months	Cephalomedullary nail (Gamma Nail 2; Stryker)
Peskun *et al [6]*	Intertrochanteric with subtrochanteric extension	M	41	BHR	30 months	Cephalomedullary nail (Gamma Nail 2; Stryker)
Silk *et al [7]*	Intertrochanteric	F	55	BHR	5 years	Proximal femoral peri-articular locking compression plate (LCP) (Synthes)
Weusten *et al [8]*	Intertrochanteric with metaphyseal fragmentation and subtrochanteric extension	M	40	BHR	3 years	Proximal femoral peri-articular locking compression plate (LCP) (Synthes)
Weinrauch *et al [14]*	Intertrochanteric	M	67	Cormet	19 months	Angled blade plate
Whittingham-Jones *et al [9]*	Comminuted Intertrochanteric	F	32	BHR	4 years	Contoured broad AO DCP (Synthes)

Results of Intertrochanteric Periprosthetic Fractures

- 15 cases described in 12 studies
- 11M: 4F
- Median age 56 years (32 -78)
- Median time of fracture from primary surgery 30 months (34 days -11 years)

Results of Intertrochanteric Periprosthetic Fractures

Methods of fixation included

- 5x distal femoral locking plates in reverse position
- 3x proximal femoral peri-articular locking compression plates
- 3x cephalomedullary nails
- 1x angle blade plate
- 2x conservative management

All fractures achieved union

Complications

- MacDonald *et al* [12] noted that the fracture collapsed slightly into a more varus position, in a patient who was managed with a proximal femoral peri-articular locking compression plate (LCP), for an intertrochanteric fracture with subtrochanteric extension. The patient was managed with light partial weightbearing and there was no further displacement.

Table To Show The Results of The Management of Intracapsular Periprosthetic Fractures

Author	Fracture Type	Sex	Age	Implant	Time Since Surgery	Fixation
Cossey *et al [15]*	Intracapsular (7 cases)	4 M, 3 F	Average 58 (46-64)	BHR	All fractures presented within 4 months of initial surgery	Conservative management
Cumming *et al [16]*	Intracapsular	F	60	BHR	2 weeks	Conservative management (fracture started to unite whilst awaiting revision surgery & therefore continued with conservative management)
Jacobs *et al [17]*	Intracapsular (13 cases)	Data not recorded	Data not recorded	Data not recorded	Data not recorded	Conservative management. (All fractures united, however 4 united in a varus position)
Klutty *et al [18]*	Intracapsular	M	57	BHR	2 months	Two 7.3mm cannulated screws
Sharma *[19]*	Intracapsular	F	55	Cormet	3 months	Conservative management. Failure with malunion (patient declined revision to stemmed total hip replacement).
Zustin *et al [20]*	Intracapsular	M	55	BHR	18 weeks	Three cannulated screws. Conversion to a femoral stemmed total hip replacement for failure.

The Results of Intracapsular Periprosthetic Fractures

- 24 cases described in 6 studies (2 case series and 4 case reports)
- 6M: 5F (Jacobs *et al* did not record data)
- Age range 46- 64 years (Jacobs *et al* did not record data)
- Fracture sustained within 4 months from primary surgery (Jacobs *et al* did not record data)

The Results of Intracapsular Periprosthetic Fractures

Methods of fixation included

- 22x conservative management
- 2x fixation with cannulated screws

2 fractures did not achieve union (8.3%)

(1 patient managed conservatively and 1 patient managed with cannulated screws)

1 required revision to a stemmed femoral prosthesis [20]. The other patient declined further surgery [19].

Complications

- 4 fractures united in a varus position (conservative management)

Table To Show The Results of The Management of Basicervical Periprosthetic Fractures

Author	Fracture Type	Sex	Age	Implant	Time Since Surgery	Fixation
Brennan *et al [3]*	Basicervical	M	69	BHR	1 year	Two 6.5mm Richards cannulated screws
Mereddy *et al [21]*	Basicervical	M	69	BHR	15 months	Three AO cannulated screws

All basicervical and femoral stem fractures achieved union.

DISCUSSION

- The evidence available is limited and considers case reports and series only.
- No longterm data is available
- All intertrochanteric, basicervical and femoral shaft fractures united. Revision surgery for these fractures would be more challenging than for intracapsular fractures.
- The intracapsular fractures occurred much earlier than the intertrochanteric fractures, but the significance of this is unknown.

DISCUSSION

- The majority of intertrochanteric fractures were managed with surgical fixation. The use of femoral locking plates was most common. Earlier studies reported distal femoral plates reversed, however, once proximal femoral plates were available, more recent studies have described their use.
- Consideration has to be made to the available area for fixation in the femoral neck, without compromising the prosthesis. The inner surface of the femoral component of a 50mm BHR is 17.2mm [3]. Two 7.3mm and one 5mm screw are utilised in a proximal femoral LCP, which is small enough not to interfere with the cement mantle or stem of prosthesis.
- The proximal femoral LCP may also be used for fracture compression or as a bridging construct.
- It may also be less likely to cause further comminution, than a cephalomedullary nail.

DISCUSSION

- The majority of intracapsular fractures were managed conservatively.
- Although, there is no further compromise to the femoral neck with non-operative management, it requires a compliant patient. Careful monitoring is required for displacement.

DISCUSSION

- Intracapsular fractures have a higher rate of failure. Zustin *et al [20]* postulated that this maybe secondary to trauma-induced avascular necrosis. They microscopically assessed the retrieved the femoral tissue from the revision surgery. They believed that the femoral bone remnant was viable after implantation of the resurfacing arthroplasty, but changes at the fracture site were suggestive of osteonecrosis.

CONCLUSIONS

- The management of traumatic periprosthetic fractures of previously well-performing, hip resurfacings maybe managed with retention of the prosthesis, although the evidence is limited.
- Most cases have been managed surgically for intertrochanteric fractures and conversely, more intracapsular fractures have been managed conservatively.
- Intracapsular fractures have a higher failure rate.
- Fractures managed non-operatively and intracapsular fractures should be closely observed.
- If there is any concern regarding the stability of the prosthesis or component malpositioning, revision to a stemmed femoral component is advocated.
- Longterm follow up data is awaited.

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- 4. Carpentier *et al*. Internal fixation of an intertrochanteric femoral fracture after BHR. Acta Orthop Belg. 2012 78(2):275-8
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- 7. Silk *et al*. Internal fixation of trochanteric fracture following hip resurfacing. Injury Extra. 2011 (42):183-5
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- 11. Haddad *et al*. Successful fixation of an intertrochanteric fracture after hip resurfacing using cannulated screws. J Arthroplasty. 2013 28(1):197.e13-6
- 12. MacDonald *et al*. Fixation of a periprosthetic intertrochanteric hip fracture below a BHR. Case Rep Orthop. 2014;393984
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- 14. Weinrauch *et al*. Femoral fracture after hip resurfacing managed with blade-plate fixation. JBJS [Am]. 2008 90(6):1345-7
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- 16. Cumming *et al*. Non-operative management of a per-prosthetic fracture after BHR. JBJS [Br]. 2003 85(7):1055-6
- 17. Jacobs *et al*. Postresurfacing periprosthetic femoral neck fractures: nonoperative treatment. Orthopedics. 2012 35(5):e732-6
- 18. Klutty *et al*. Intracapsular fracture of the proximal femur after hip resurfacing treated by cannulated screws. JBJS [Br]. 2009 91(8):1100-2
- 19. Sharma H. The nonoperative management of periprosthetic fractures associated with the BHR. J Arthroplasty. 2006 21(2):301-2
- 20. Zustin *et al*. Failed internal fixation due to osteonecrosis following traumatic periprosthetic fracture after hip resurfacing. Acta Orthop. 2009 80(6):666-9
- 21. Mereddey *et al*. Peri-prosthetic fracture neck of femur following BHR treated by internal fixation. Injury Extra. 2009 (40):65-7
- 22. Bilkhu *et al*. Intramedullary fixation of a femoral shaft fracture with preservation of an existing hip prosthesis. Injury. 2015 46(4):763-6

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

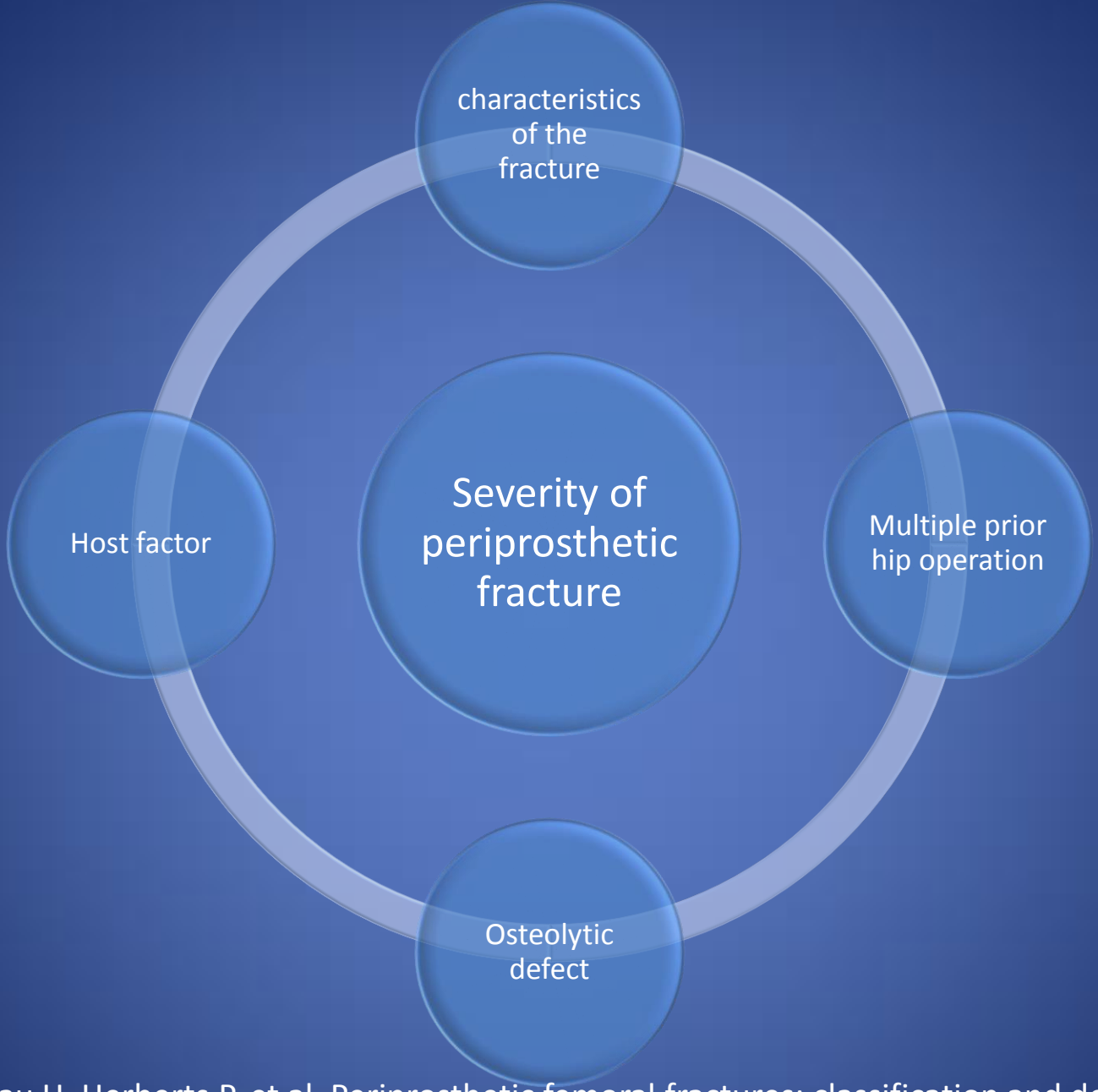
26-27 NOVEMBER 2015

MILAN, ITALY

Azienda Ospedaliero-Universitaria
S.Orsola-Malpighi Bologna
Dipartimento dell' Emergenza – Urgenza
U.O. Ortopedia e Traumatologia
Direttore: Dr. Massimo Laus

Late periprosthetic fracture of the femur after total hip replacement

Rino C. Alfonso
M. Laus



Lindahl H, Malchau H, Herberts P, et al. Periprosthetic femoral fractures: classification and demographics of 1049 periprosthetic femoral fractures from the Swedish National Hip Arthroplasty Register. J Arthroplasty 2005;20:857.

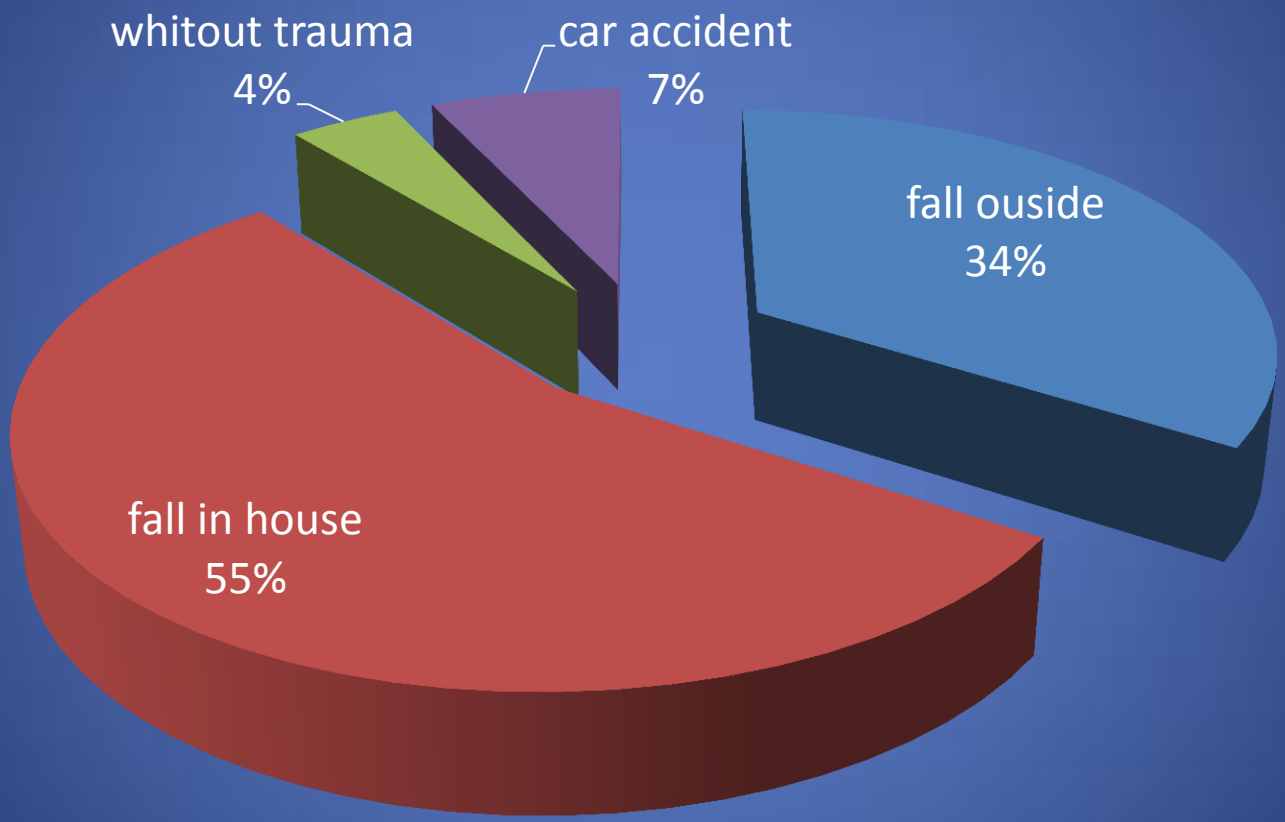
Mortality

- 1.8% WITHIN A WEEK The Swedish National Hip Arthroplasty Register
- 13.1% AFTER A YEAR Griffiths EJ, Cash DJW, Kalra S, et al. Time to surgery and 30-day morbidity and mortality of periprosthetic hip fractures. Injury 2013;44:1949
- 35.1% AT 10 YEAR Lindahl H, Malchau H, Herberts P, et al. Periprosthetic femoral fractures. Classification and demographics of 1049 periprosthetic femoral fractures from the Swedish National hip arthroplasty register. J Arthroplasty 2005;20:857.

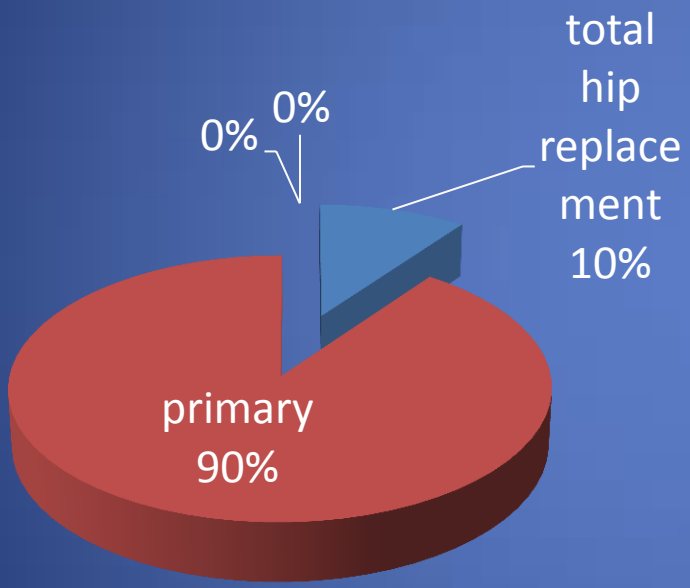
Azienda Ospedaliero-Universitaria Policlinico S.Orsola – Malpighi Bologna
January 2005 - February 2015

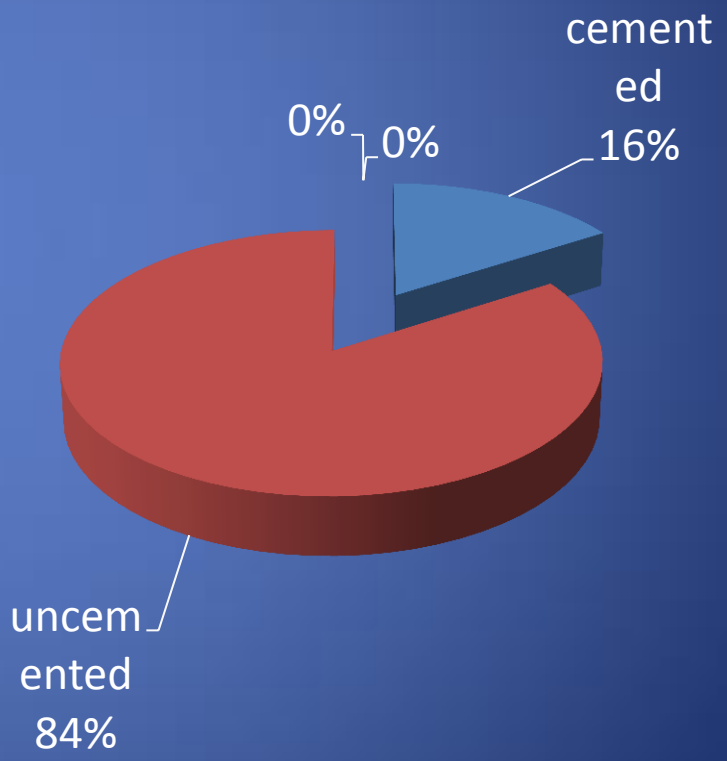
- 58 Periprosthetic fractures (56 patients)
- 39 Female
- 18 Male
- Everage age 76,3 years (min. 46, max 93)

Mechanism of injury



characteristics of the prosthesis



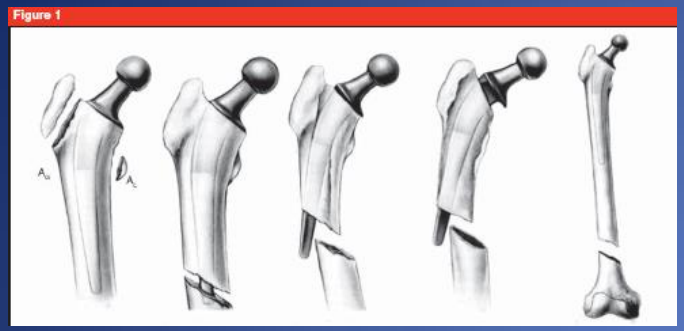


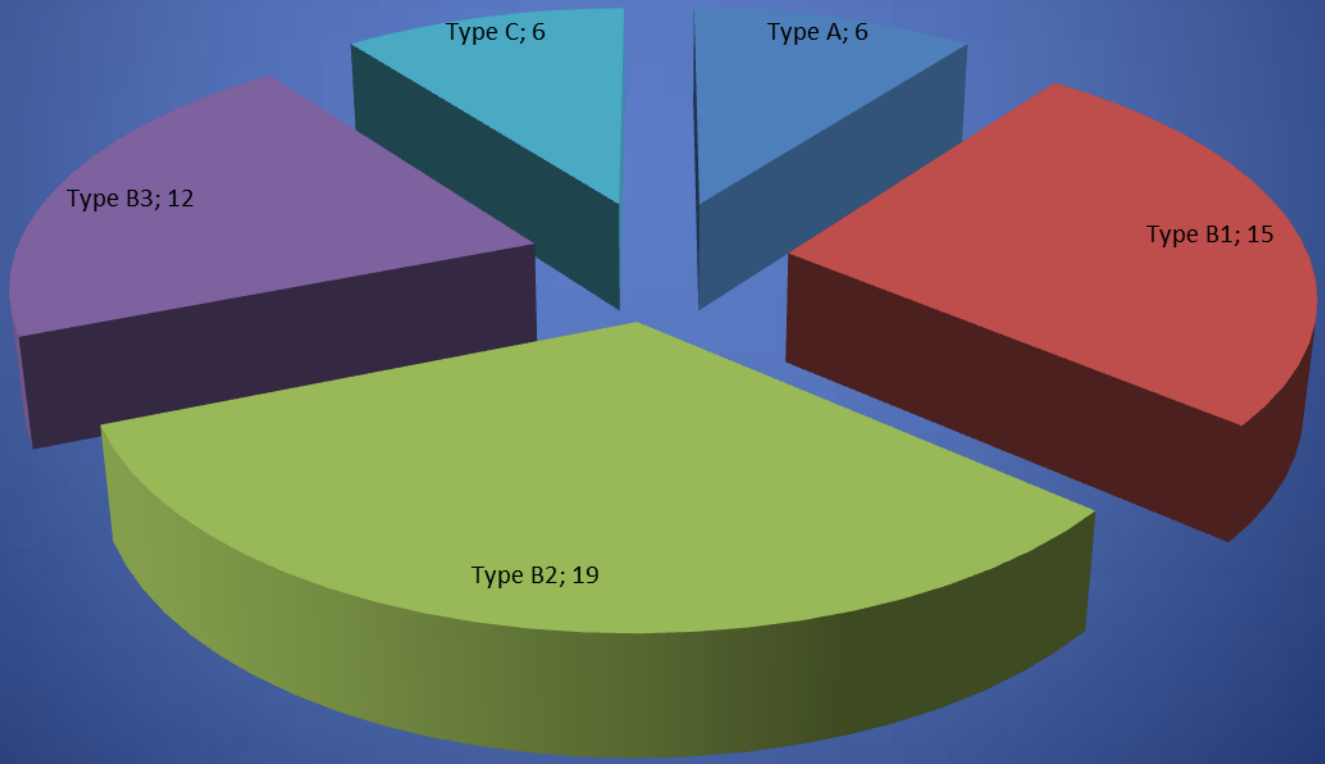
Average time spent by the first THA and the time of the trauma

90,8 months

min 1, max 240

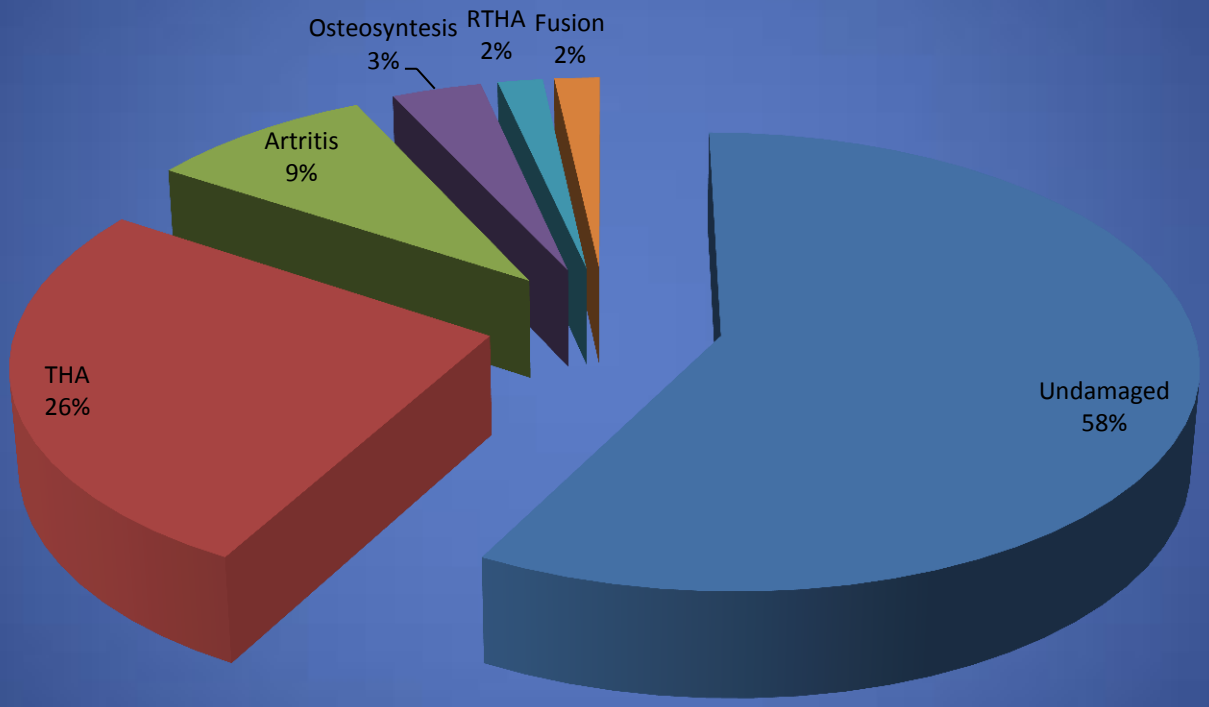
DUNCAN & MASRI – VANCOUVER CLASSIFICATION



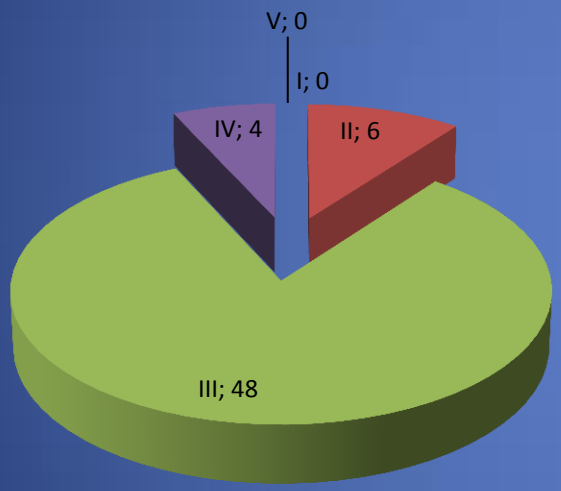


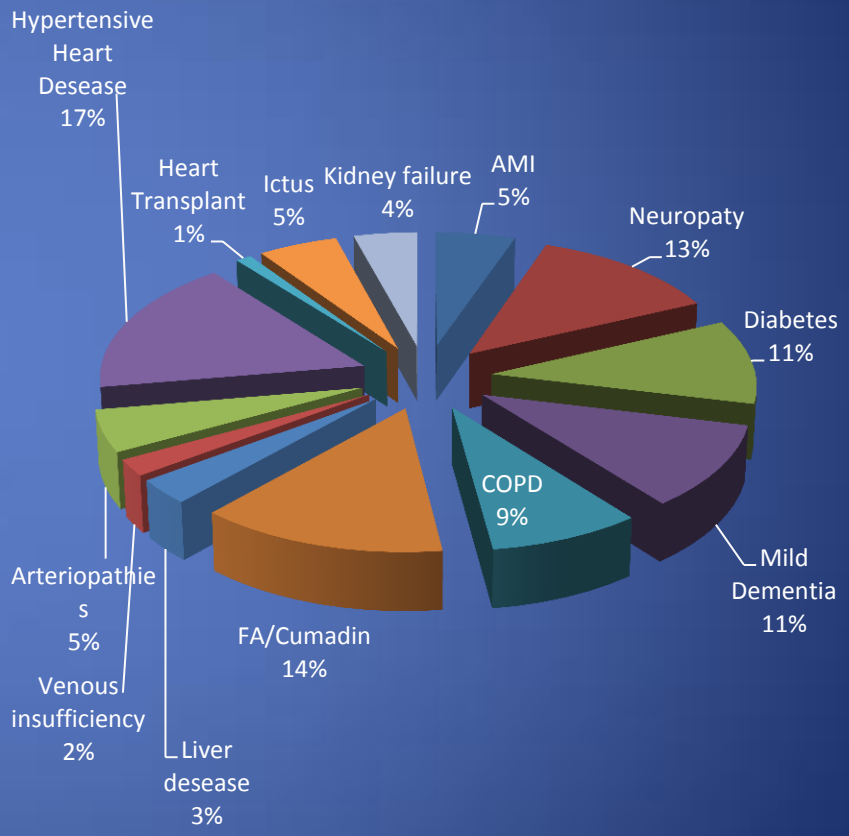
Duncan CP, Masri BA. Fractures of the femur after hip replacement. *Instr Course Lect*. 1995;45:293–304.

Ipsilateral Hip

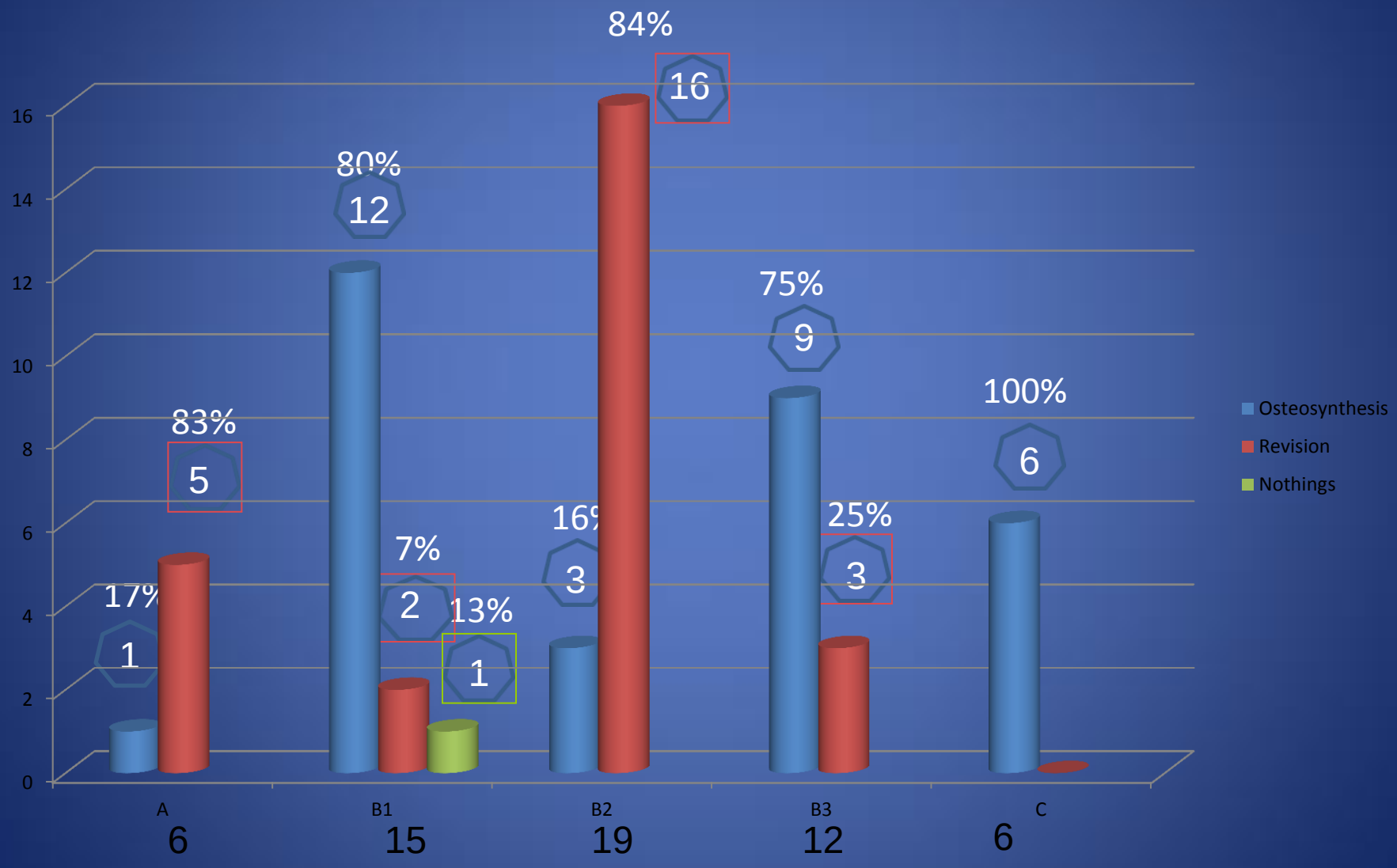


ASA Class


V; 0
I; 0
IV; 4
II; 6
III; 48


Hypertensive Heart Desease 17%
Heart Transplant 1%
Ictus 5%
Kidney failure 4%
AMI 5%
Neuropaty 13%
Diabetes 11%
COPD 9%
Mild Dementia 11%
FA/Cumadin 14%
Arteriopathies 5%
Venous insufficiency 2%
Liver desease 3%

Treatment choice/Vancouver class.



Type A

Woman 75 yo

1 year later

Type A

Woman 75 yo

5 Years later

Type B1

Woman 79 yo

7 months later

Type B1

Woman 77 yo

3,5 years later

Type B2

Woman 88 yo

2 years later

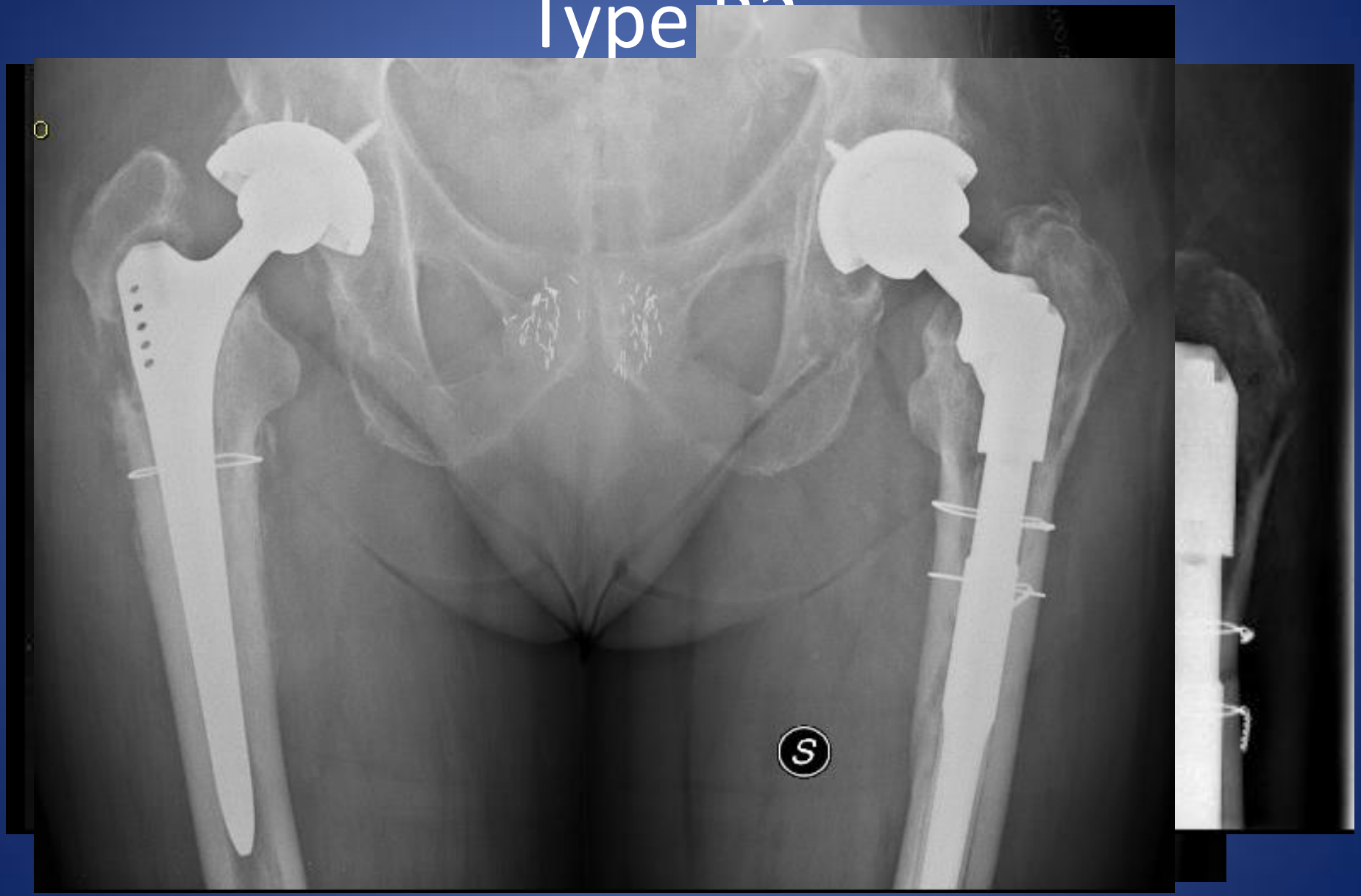
Type B2

Man 74 yo

1 year later

Revision 2 years later

Type B2



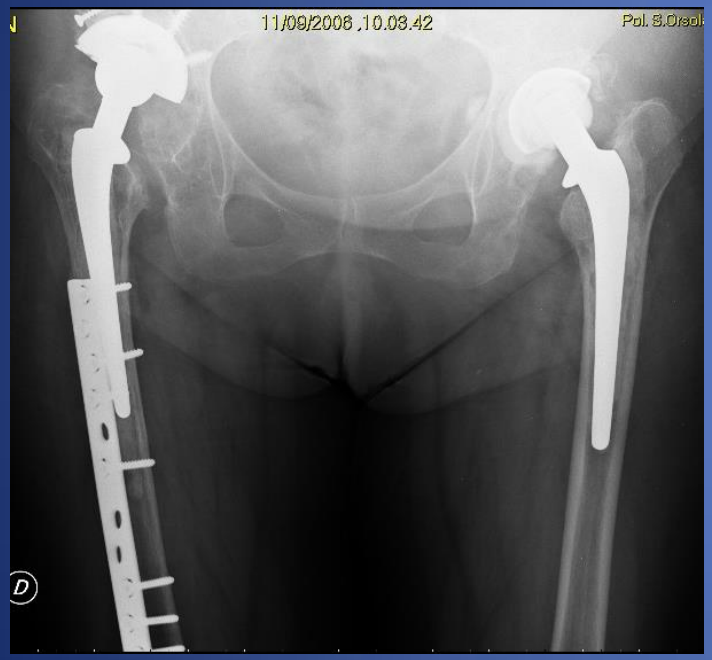
1 year later

Type B2

Man 76 yo

3 years later

Type B3



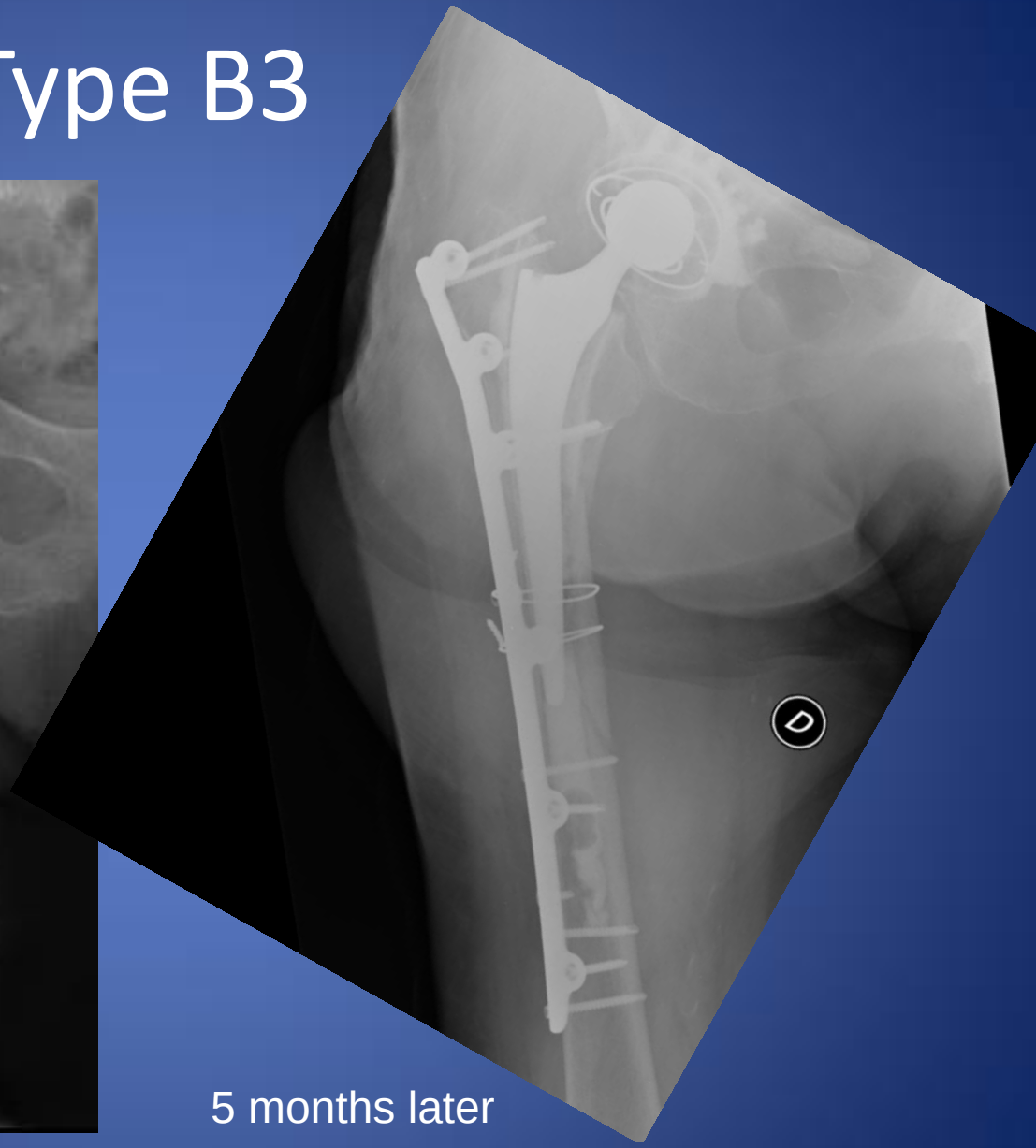
Woman 66yo

3 years later

4 months after osteosynthesis

Type B3

Woman 93 yo



5 months later

Type B3

Woman 88 yo

5 months later

Type C

Man 76 yo

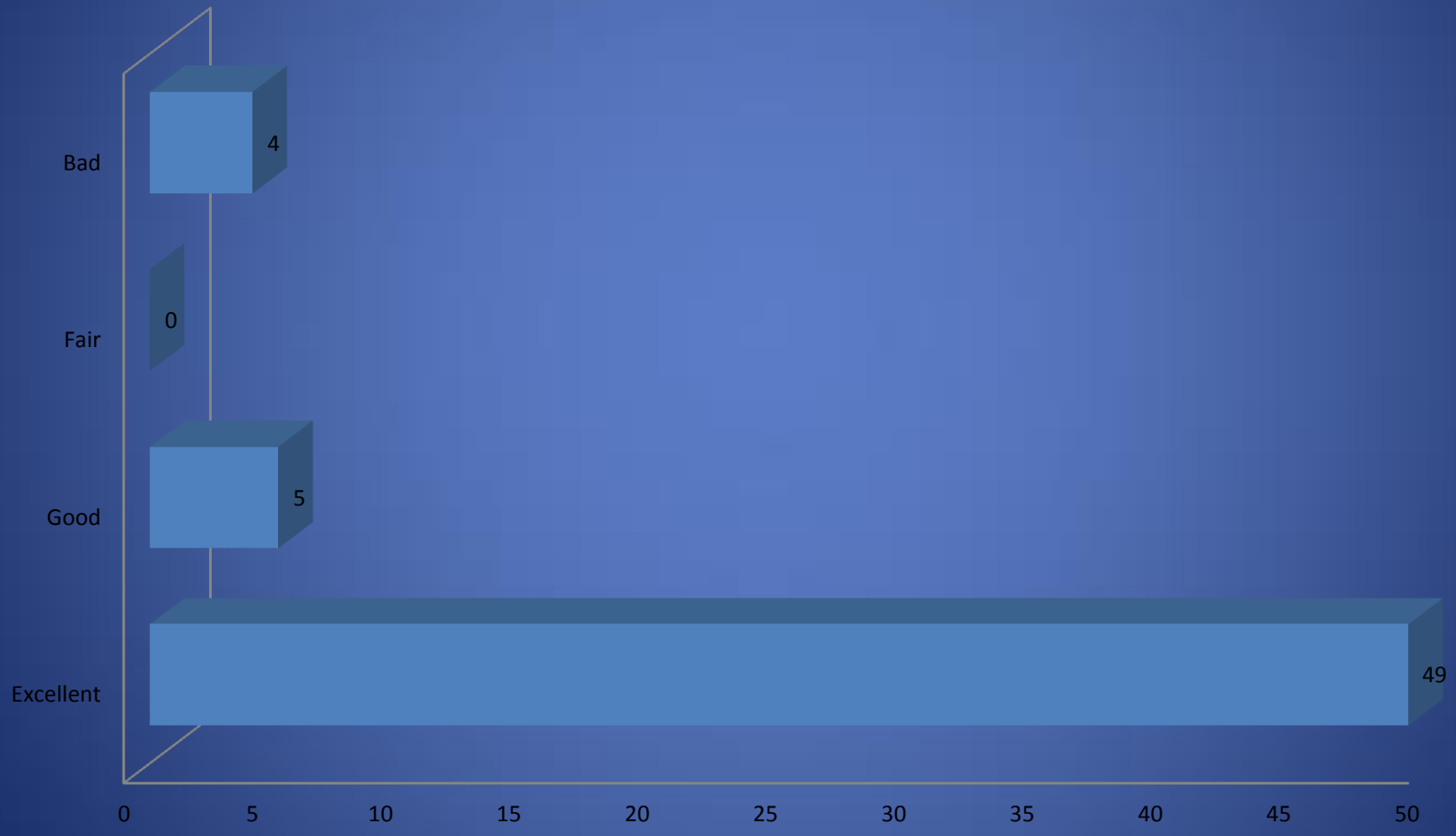
8 months later

Type C

Man 47 yo

8 months later

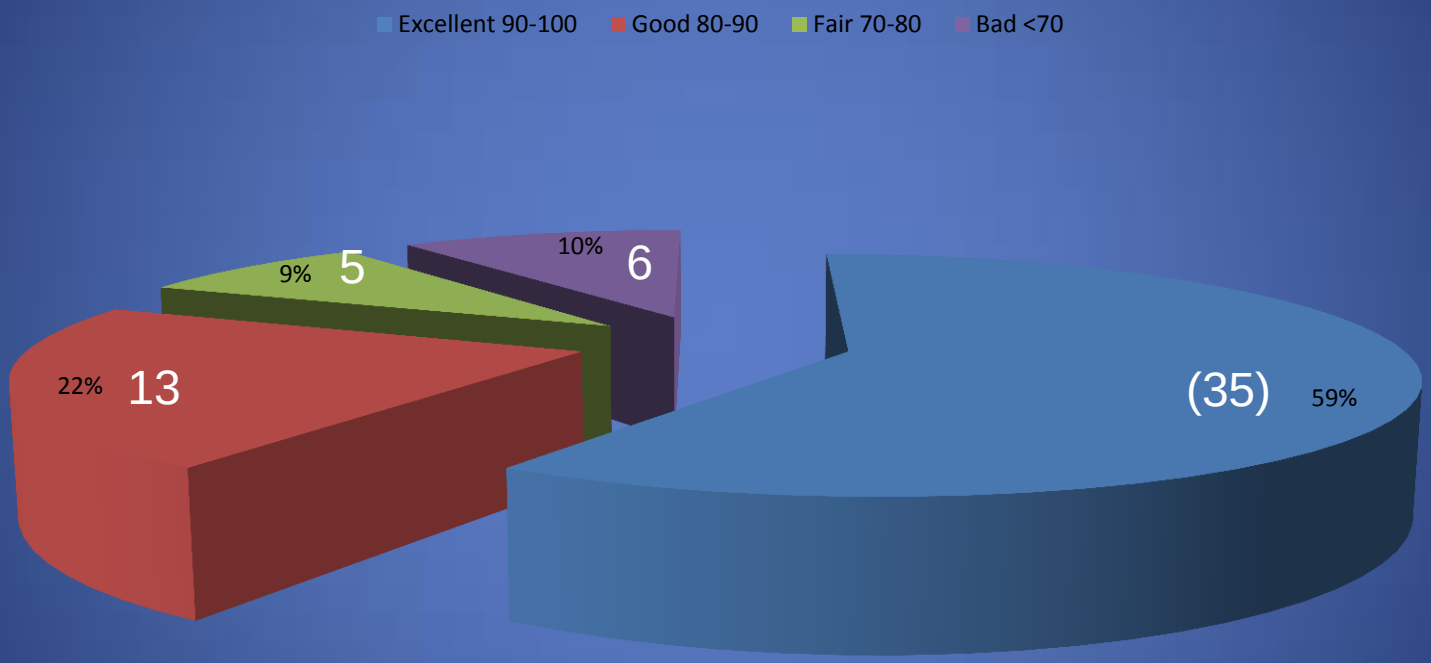
Radiological results using Beals and Towers' criteria



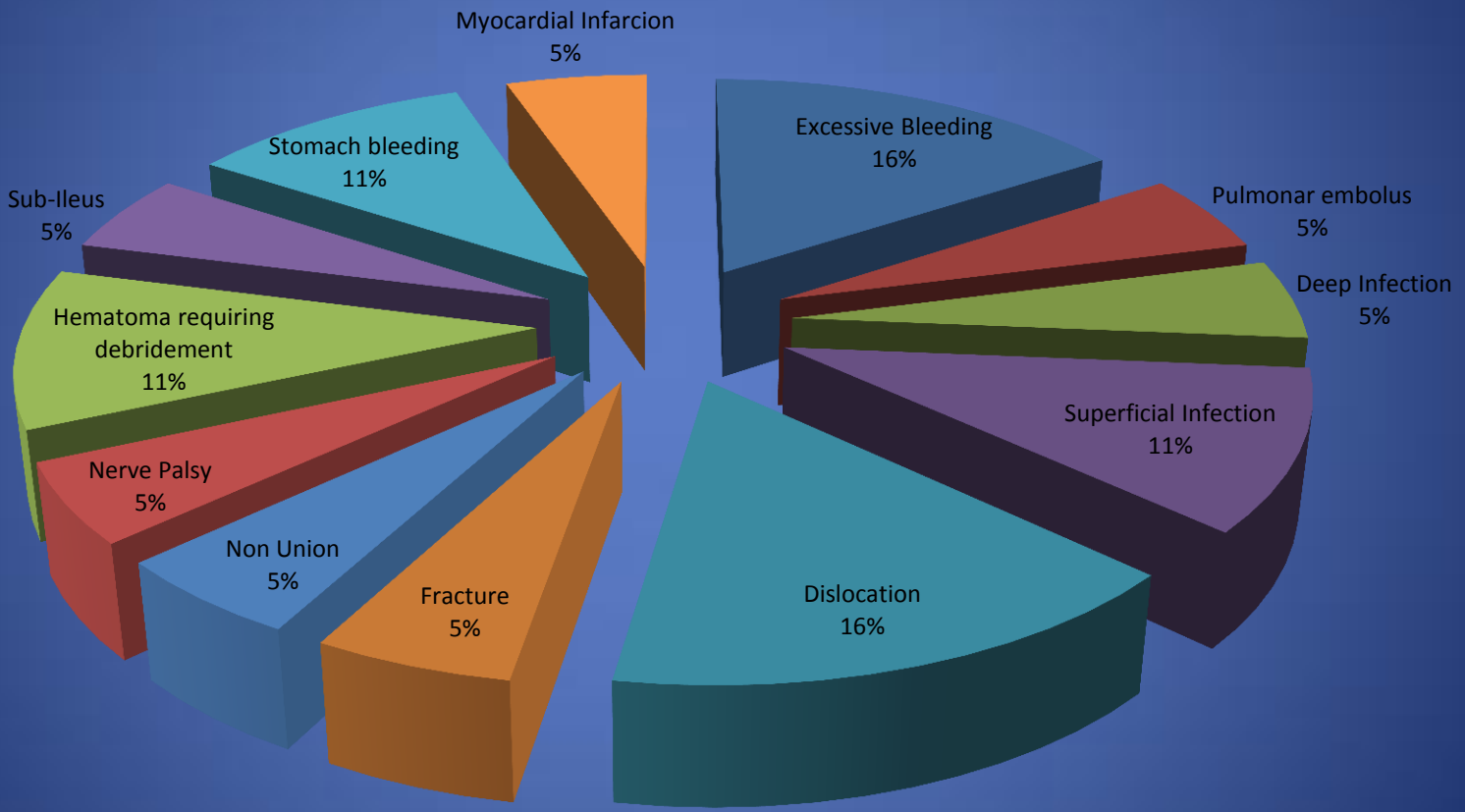
Average Fusion time

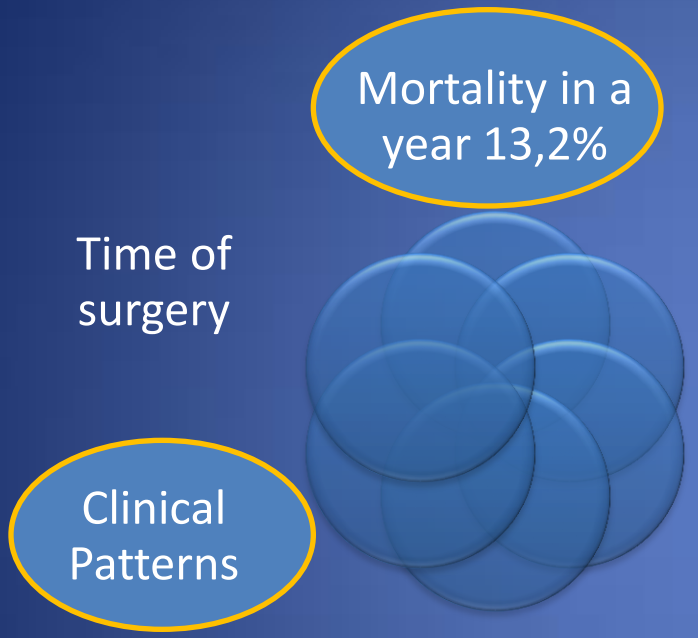
4,7 months

Clinical Results using Harris Hip Score



Complication





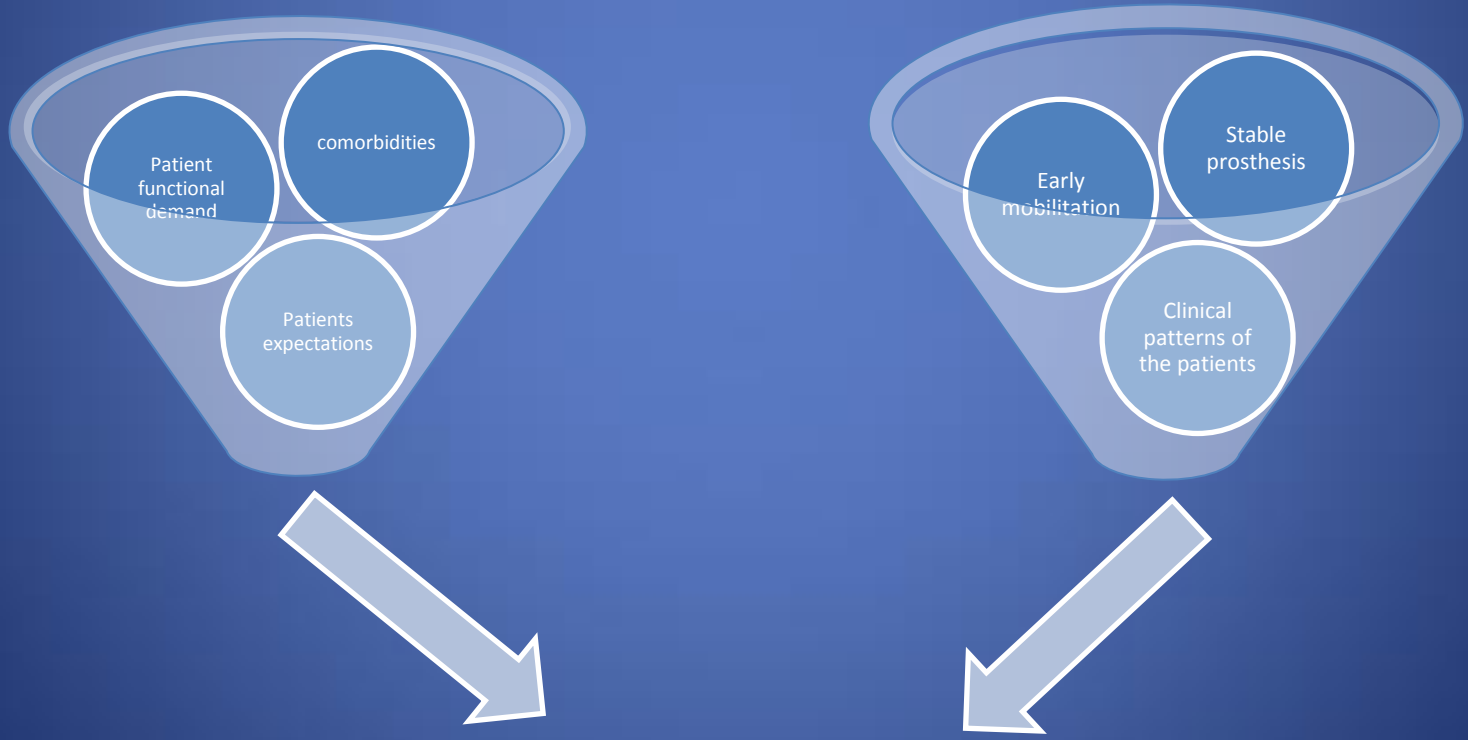
High correlation with clinical condition
No correlation with external elements

Füchtmeier B, Galler M, Müller F Mid-Term Results of 121 Periprosthetic Femoral Fractures: Increased Failure and Mortality Within but not After One Postoperative Year. The Journal of Arthroplasty 30 (2015) 669–674

Conclusions

Host Paradigms

Fracture Paradigms



Individualized surgical strategy

Thank you

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

UNIVERSITA' DEGLI STUDI MILANO BICOCCA
Clinica Ortopedica e Scuola di Specialità in Ortopedia
Azienda Ospedaliera S. Gerardo - Monza
Dir.: Prof. Giovanni Zatti

PERIPROSTHETIC FRACTURES TREATMENT WITH UNCEMENTED MODULAR FEMORAL TAPERED REVISION STEMS: OUR EXPERIENCE

G.Gallinari, R. Sotiri, A. Rossi, D. Munegato, G.Zatti

Milan – November 26th, 2015

Periprosthetic Femoral Fracture (PFF)

- Incidence:
  - 1-3,5% after primary THA
  - 5-9% after all revision surgery
- Second most likely cause for revision from 4 years after surgery
- Mortality after PFF 11% (2,9% after primary THA)

Why uncemeted modular tapered titanium conical stem ?

- Simplified reaming process (reducing risk of iatrogenic fracture)
- Distal fixation of the stem not compromise fracture fixation
- Secure fixation requires 4 to 8 cm of intact diaphysis
- Titanium reduces elastic modulus mismatch reducing thigh pain and stress shielding

Problems

- Subsidence is related to underfilling of the femoral cortex
- The modular junction may be a site of loosening, disengagement or implant fracture
- Unknown fretting at the modular junction

Vancouver Classification

Type of fracture	Characteristics	Management options
Type A	**Fracture located in the trochanteric region**	
A-G Greater trochanter	Fracture involving greater trochanter	Treat conservatively with protected weight bearing. Indications for ORIF: Displaced > 2.5 cm, abductor weakness due to non-union and chronic pain
A-L Lesser trochanter	Fracture involving smaller trochanter	Treat conservatively with protected weight bearing unless a large portion of the medial cortex is involved
Type B	**Fracture around or just distal to femoral stem**	
B1	Around or just distal to femoral stem, stem well fixed. *See Figure 1.*	Open reduction and internal fixation with cerclage wires alone if long oblique or plate osteosynthesis. This can be achieved with different plates (dynamic compression, locking or Dall-Miles plates).Cortical strut grafts and cerclage fixation can be used separately or utilised in combination with a plate
B2	Around or just distal to femoral stem, stem loose, good bone stock in proximal femur. *See Figure 2.*	The fracture need to be bypassed with a longer (revision) stem with cerclage reinforcement, with or without cortical strut
B3	Around or just distal to femoral stem, stem loose, poor bone stock in proximal femur. *See Figure 3.*	A combination of a revision stem and bone grafting (impaction or strut grafting). In severe osteolysis revision stems with distal screw fixation are preferred. Consider proximal femoral replacement (tumour type prosthesis) for low demand or elderly
Type C	**Fracture is located well below the femoral stem**	Ignore implant and manage fracture first in conventional way (Locking plate, blade plate or condylar screw plate)

- Vancouver B2:
  - loose stem
  - good bone stock

- Vancouver B3:
  - loose stem
  - inadequate bone support

Which is the correct definition of good bone stock?

Criteria for choosing treatment

- Displaced fractures should be treated surgically when the patient can undergo surgical procedure
- Mobilized stems have to be replaced with longer stems that go beyond (4-8cm) the fracture

Treatment
Goals

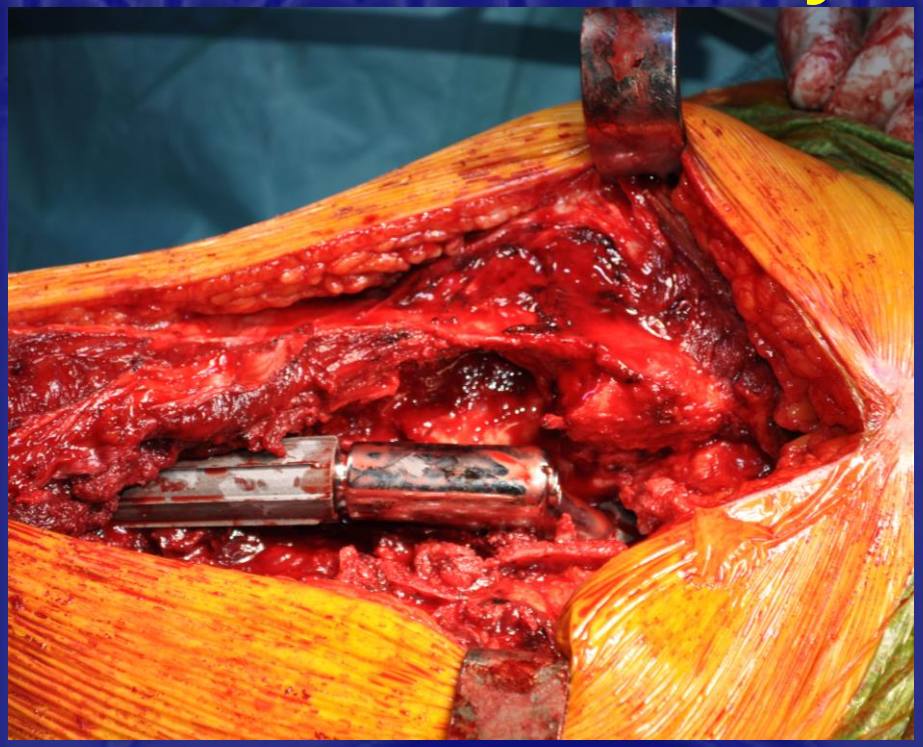
- restore the best anatomical axis
- obtain stability of both implant and fracture
- obtain early mobilization of the patient
- try to achive the level of life quality as before fracture

° Kelley SS.
Periprosthetic femoral fractures. J Am Acad Orthop Surg 1994;3:164-72.

° Garbuz DS, Masri BA, Duncan CP.
Periprosthetic fractures of the femur: principles of prevention and management.
In:Cannon WD, ed. *Istructional Course lectures*. Rosemont, IL: A.A.O.S. 1998;47:237-42.

° Duncan CP, Masri BA.
Fractures of the femur after hip replacement. In: Jackson DW, ed.
Istructional Course Lectures. Rosemont, IL: A.A.O.S. 1995:293-304.

Aim of the study



Evaluate short and mid term follow-up of revision surgery with uncemented diaphyseal stem in Vancouver B2-B3 fractures

Materials & Methods

2007 October – 2015 January

- 18 patients (14 W - 4 M)

- Mean age 71 Years (range 48-87)

- ASA 3: 44,5% - ASA 2: 50 %, - ASA 1:5,5%

- Vancouver B2- 14 pz, B3- 4 pz

- 50% right (9 pz) - 50 % left (9 pz)

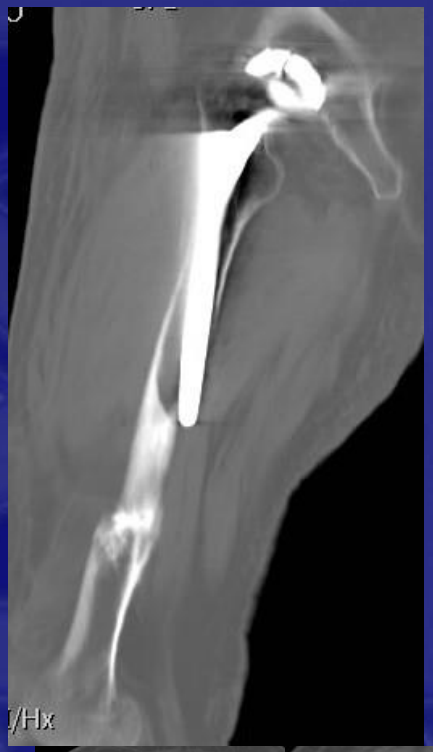
- Mean follow-up 48 months (range 8-84)

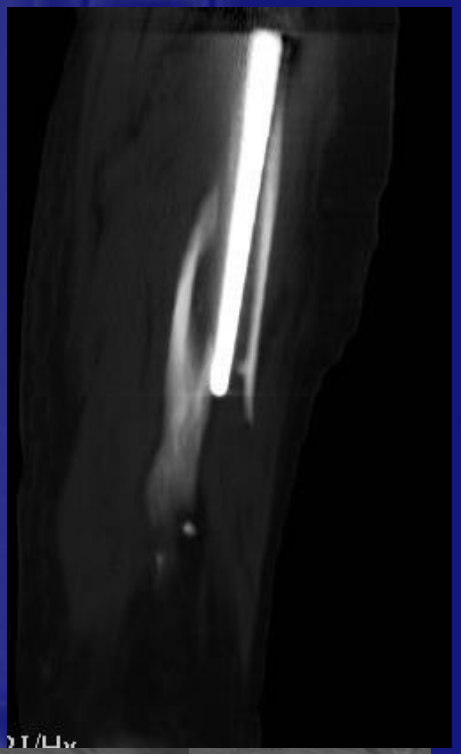
Materials & Methods

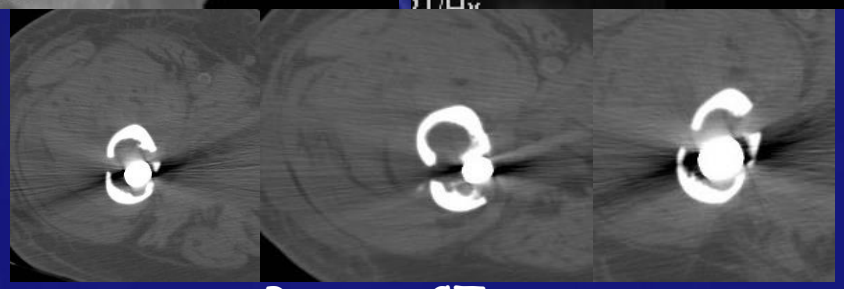
- in 67 % of cases a pre-op CT study has been conducted

G.P.A- 75y M
displaced B2 fx

Pre-op X-ray







Pre-op CT

Results

- In 16 patients: revision with uncemented diaphyseal stem + cerclages

- 1 pz stem+plate+cerclages

- 1 pz only stem

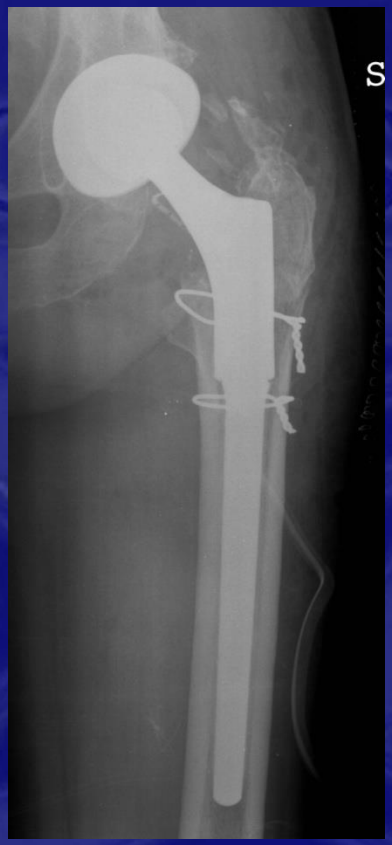
- 1 case of superficial wound infection

- No deep infection

- 1 case of revision for liner dislocation

- P.F: W,
  76 years

Pre-op X-ray



Post-op

Follow-up 6 years

All fractures were fixed

No stem mobilisation

Mean HHS 84 (range 69-95)

- 73% free from pain

- 27% mild pain (*NRS range 1-3*)

- 50% walks without support

- 39% cane or walking stick only for long walks

- 11% regularly

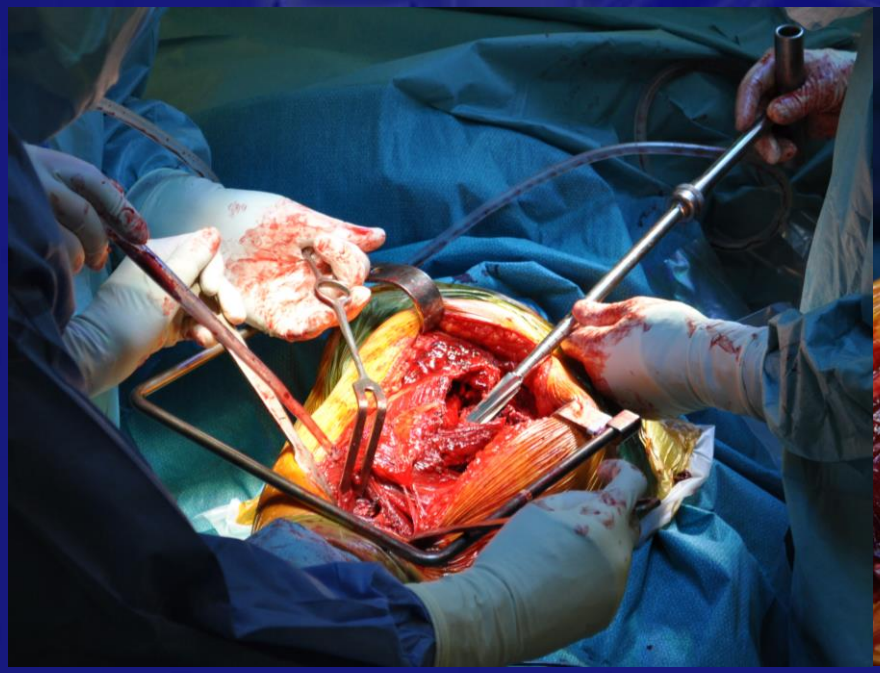
NO PAIN NO CANE

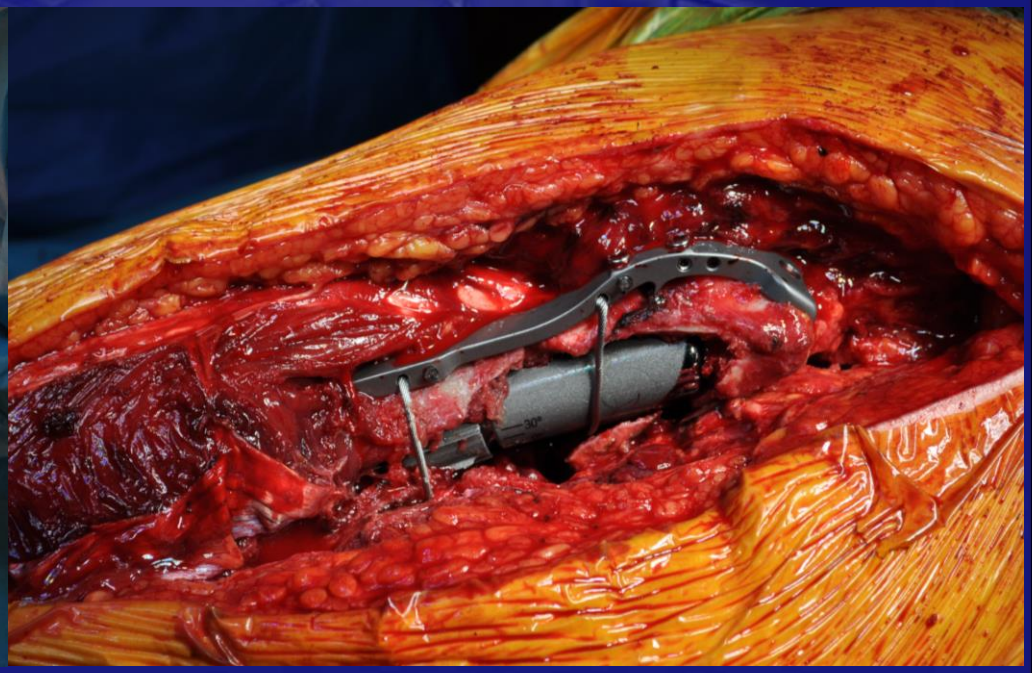
Discussion:

Autore	N° pz	HHS	Follow up
Munro JT 2013	200	53-91	54 months
Canbora K 2013	17	68-82	15-132 m
Marx A 2012	15	83	74 m
Fink B 2012	22	59-91	24 m
Neumann D 2012	53	72	67 m
Rayan F 2010	26	83	60 m

Conclusions:

- Treatment varies on :
  - type of fracture
  - patient's general conditions
- Functional ***good*** results and relief of pain
- Pre-op CT study and planning are ***mandatory***
- Fracture stability and early patient mobilization





Thanks!

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Distally locked Uncemented stem (Cannulok) in Vancouver B2 and B3 Periprosthetic femoral fracture in elderly population

A. El-Bakoury, H. Hosny, M. Williams, J. Keenan, R. Yarlagadda

Presented by:

Ahmed El-Bakoury, MCh (Orth), FRCS (Tr & Orth)

Senior Arthroplasty Fellow, Plymouth- UK

Introduction

- **Periprosthetic femoral fracture is a serious complication following THA / hemiarthroplasty**

- **Difficult fracture /Difficult patient**

Goals of treatment in elderly popu

- Stable (axial and rotational), cost effective prosthesis
- Early mobilization
- Avoid complications of cementation
- Fracture Union

Cannulock Plus,
Orthodynamics, England

Modular cannulated distally locked titanium stem

IA fully coated curved stem

J Arthroplasty. 1993 Apr;8(2):129-32
Biomechanical analysis of a distally interlocked press-fit femoral total hip prosthesis.
Mahomed N[1], Schatzker J, Hearn T.

distal interlocking increase torsional stability by 320%and axial stability by 230%

International Orthopaedics (SICOT) (2011) 35:275–282
DOI 10.1007/s00264-010-1182-6

ORIGINAL PAPER

Distal locking stem for revision femoral loosening and peri-prosthetic fractures

Patrice Mertl · Remy Philippot · Philippe Rosset · Henri Migaud · Jacques Tabutin · Denis Van de Velde

Best results with curved HA coated ir

Contents lists available at ScienceDirect
The Journal of Arthroplasty
journal homepage: www.arthroplastyjournal.org

Long Term Results With the Interlocking Uncemented Long Stem in Revision Hip Arthroplasty: A Mean 15-Year Follow-Up

Tomomi Kamada, MD [a], Hiroshi Imai, PhD [a], Naohiko Mashima, PhD [a], Jun Takeba, PhD [a], Hideo Okumura, PhD [b], Hiromasa Miura, PhD [a]

[a] Department of Bone and Joint Surgery, Ehime University Graduate School of Medicine, Shitsukawa, Toon, Ehime, Japan
[b] Department of Orthopaedic Surgery, Rakuyo Hospital, Sakyo-ku, Kyoto, Japan

Distal locking implants play critical ro in PPF management

Patients demographics

Plymouth Hospit NHS
NHS Trust

- **Retrospective study**
- **Inclusion criteria:**

- Patient with periprosthetic proximal femoral fractures (PFF) classified as B2 or B3 (Vancouver)
- The patient has had a revision of the stem using Cannulok femoral stem
- At least 2 years following revision.
- Patients were 75 y old or above at the time

Our main questions were:

- Clinical outcome of the Cannulok?
  - **Oxford Hip score**
  - **Postoperative complications**
- Rate of the fracture union?
- The survivorship of the Cannulok?
  - **The stem revision rate for any reason at the end of follow up**

Patients demographics

- in the period from Dec 2006 to Jan 2013 ,

91 patients with surgically treated PFF

↓

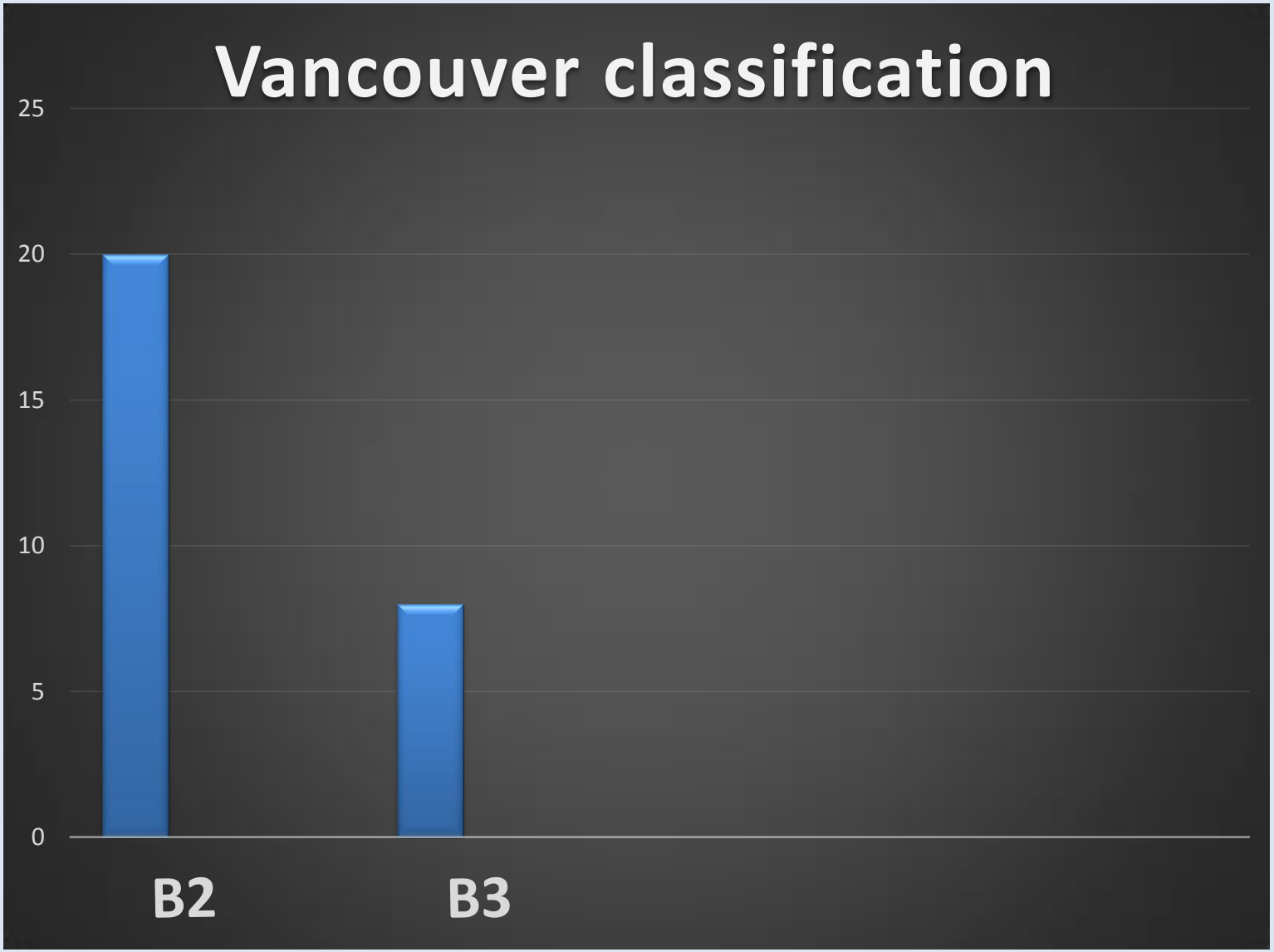
28 patients have met our inclusion criteria

Patients demographics

- Mean age 82.6 ± 5.4 yrs (range 75-92 yrs)
- Mean time to fracture was 7.6 yrs ± 4.7 (range 2 m- 15 yrs)
- The mean follow up was 44.6 months (24-102).

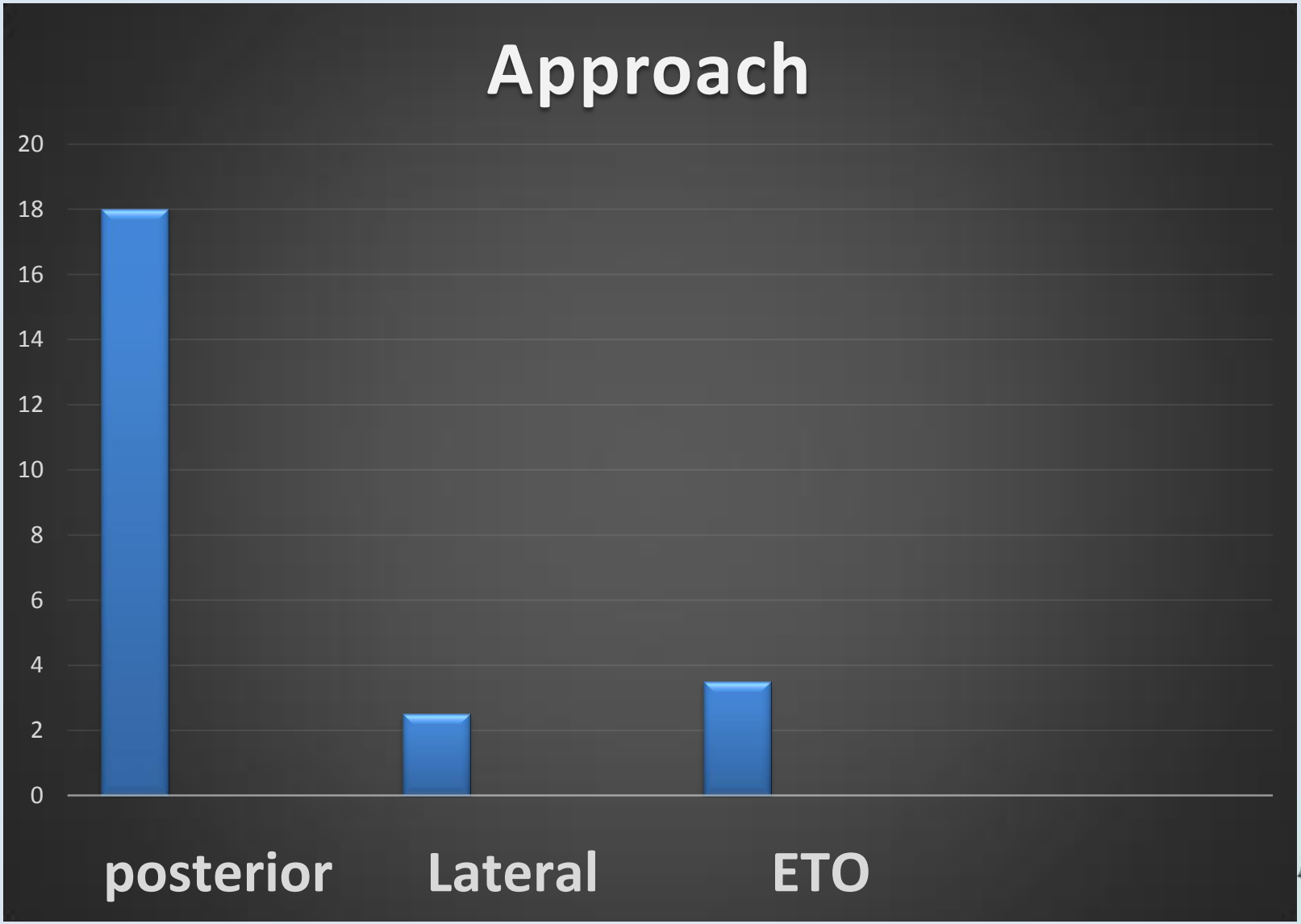
Patients demographics

Plymouth Hospit NHS
NHS Trust



Procedure

Plymouth Hospit NHS
NHS Trust



Postoperatively

- **Implant: Cannulock (300mm) was used in all cases**
  - **>2 femoral cortical diameters**
- **Additional fixation : cables**

1. The Cannulok survivorship

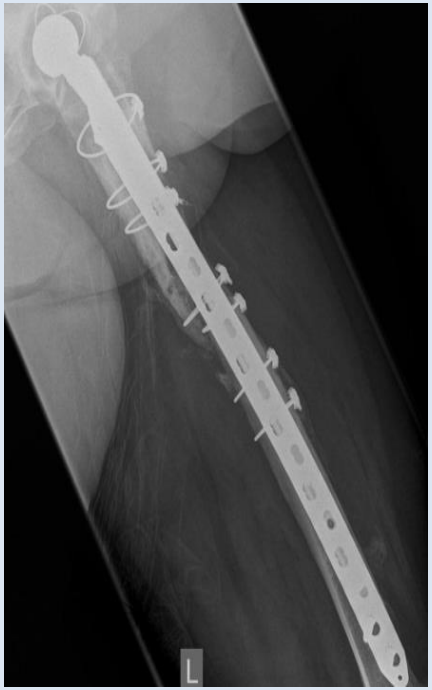
No femoral stem revisions for any reason

2. The Rate of Fracture union

95.8 %

One Fracture has not united

Results



3. The clinical outcome

A. Oxford Hip score (OHS)

The mean postoperative OHS was 30.1

Factors:

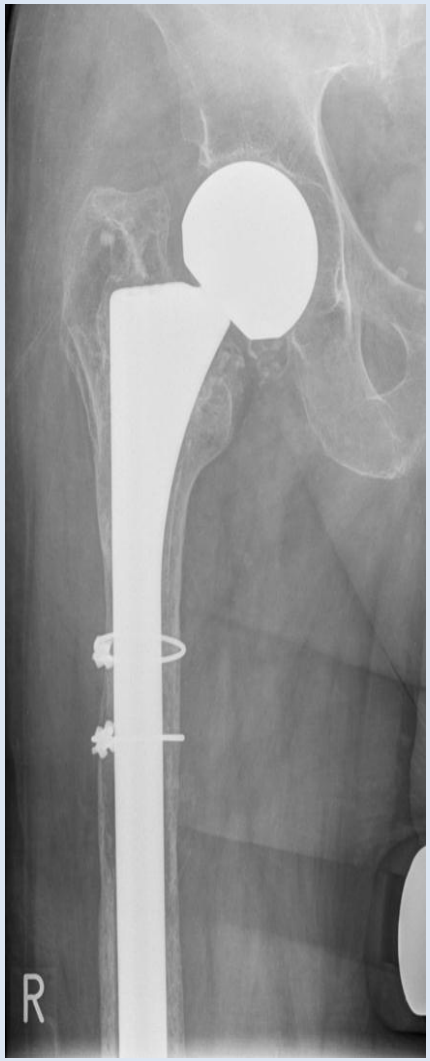
1- Age: -ve

2. Gender: -ve

3. ASA grade:

High ASA ➡ low OHS (independent t test,


R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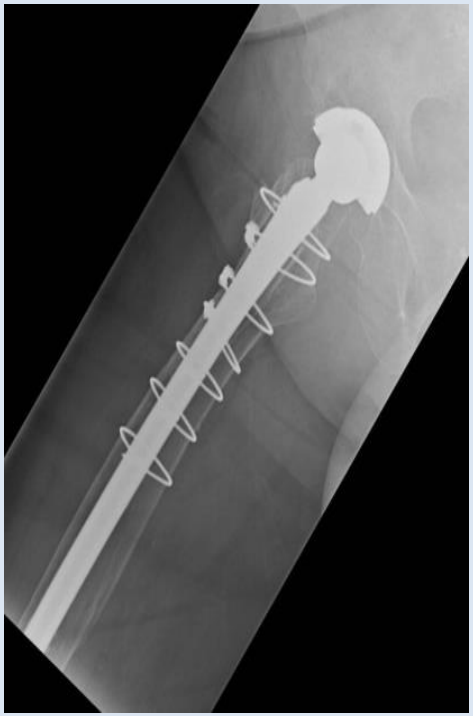

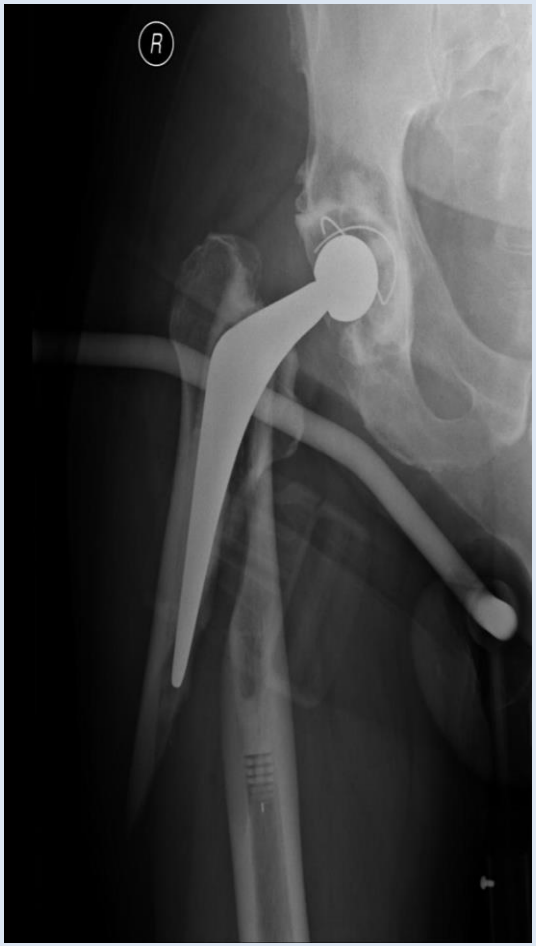
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R

Complications: (28.5%)

	Complication rate	Mortality rate	Reoperation rate
Matharu 2012	35%	15%	12%
Zuurmond 2010	48%	45%	33%
This study	28.5%	14.2%	20%

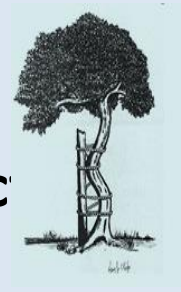
Complications:

Patient	Age	ASA grade	OHS	Complications
1	85	3	N/A	Dislocation, MUA
2	75	4	17	periprosthetic # type C, broken distal locking screw
3	91	3	N/A	periprosthetic # type C, ORIF LISS plate, dislocation PLAD
4	86	3	31	periprosthetic # type C, conservative
5	87	3	21	Dislocation, MUA
6	81	3	36	Dislocation, MUA
7	78	2	36	Non Union, ORIF + BG
8	88	2	46	periprosthetic # type C, ORIF LISS plate

Conclusions

Plymouth Hospitals NHS
NHS Trust

- Management of these PPF in elderly population poses considerable clinical challenge.
- Morbidity and mortality risk is high as expected in this elderly group of patients.
- Distal locking stem achieves strong initial fixation required for bone ingrowth even in cases of severe bone loss
- Distal locking stem is a valid option in treating B2, B3 fractures with low risk of revision in short to mid-term FU.
- Patients with low ASA grade perform better as regard of func (OHS)



Thank you

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Cable plating and a strut allograft in the treatment of periprosthetic femoral fractures

JR Manara, JA Mathews, HS Sandhu

Royal United Hospital, Bath, U.K.

Royal United Hospital Bath NHS
NHS Trust

Periprosthetic fractures

- Incidence is between 1% and 3.5% after a primary THR
- Account for 9% of single-stage revisions
- Annual incidence of around 0.1%
- UCS classification
- Internal Fixation
  - Stable stem
- Revision
  - Unstable Stem

Royal United Hospital Bath NHS
NHS Trust

Our Study

- Single surgeon
- Single centre
- Single plate with strut allograft construct
  - (with added bone graft)

Royal United Hospital Bath NHS
NHS Trust

Our Study

- Series of 28 patients (2006-2015)
- 13 males and 15 females
- Average age of 75.7 years (range 30-95)

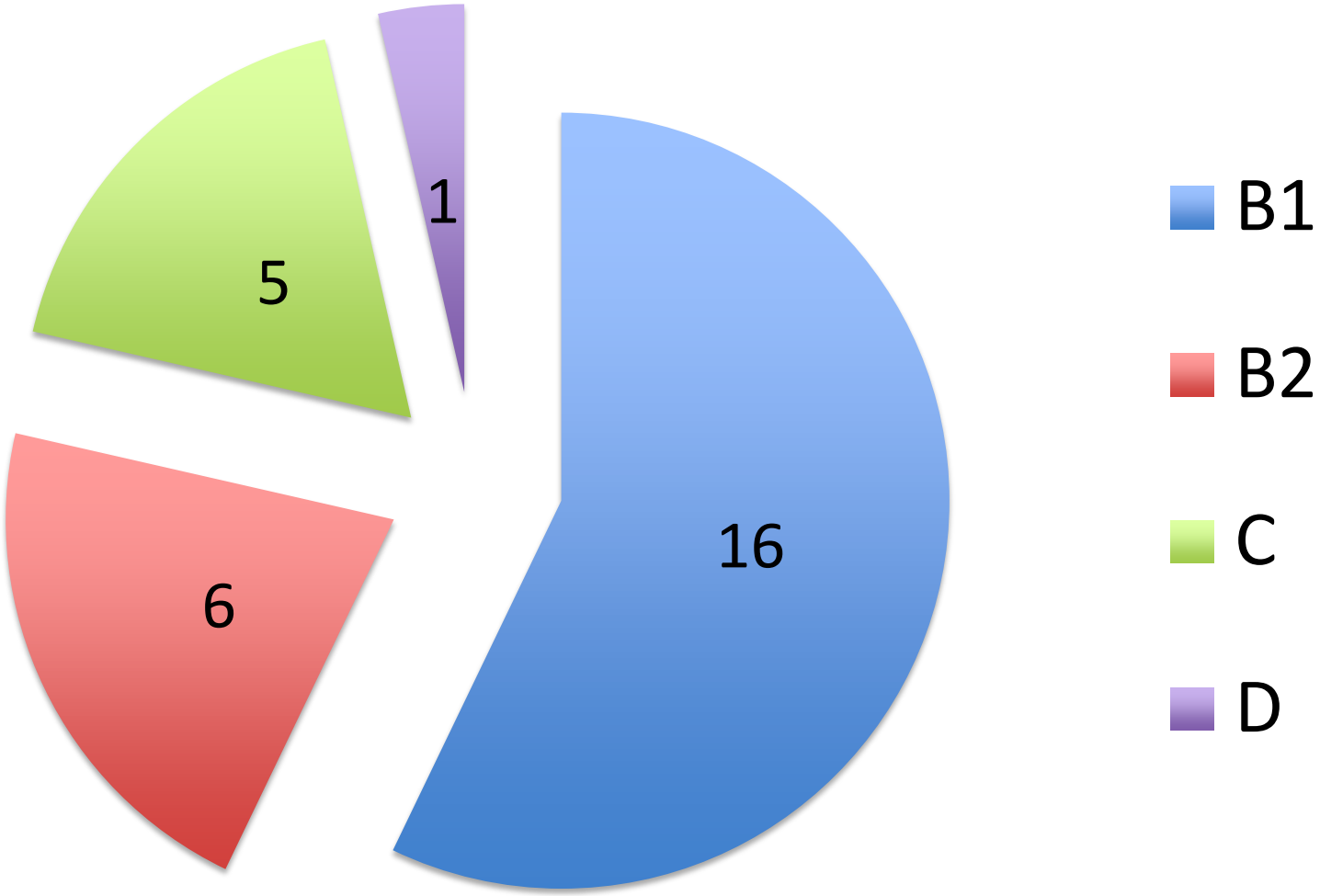
Royal United Hospital Bath NHS
NHS Trust

Cable Ready

NCB Plate

Cortical Strut Allograft

Fracture Type



Example 1


[redacted]
ROYAL UNITED HOSPITAL
XR Hip RT
AP
SUPINE
Red Dot
Z: 0.50
C: 2048
W: 4096
Compressed 27:1
IM:1
Page: 1 of 1
cm


[redacted]
R
ROYAL UNITED HOSPITAL
XR Femur (Thigh) Rt
AP
11/12/2014 10:12:23
SUPINE
Z: 0.50
C: 2048
W: 4096
Compressed 27:1
IM:1
Page: 1 of 1
cm

Example 2


R
RNHRD
XR Hip Both
AP
07/02/2011 09:22:08

SUPINE

Z: 0.41
C: 2048
W: 4096
Page: 1 of 1
cm
IM:1


ROYAL UNITED HOSPITAL
XR Femur (Thigh) Rt
LATERAL
18/10/2012 14:19:50

SUPINE
R

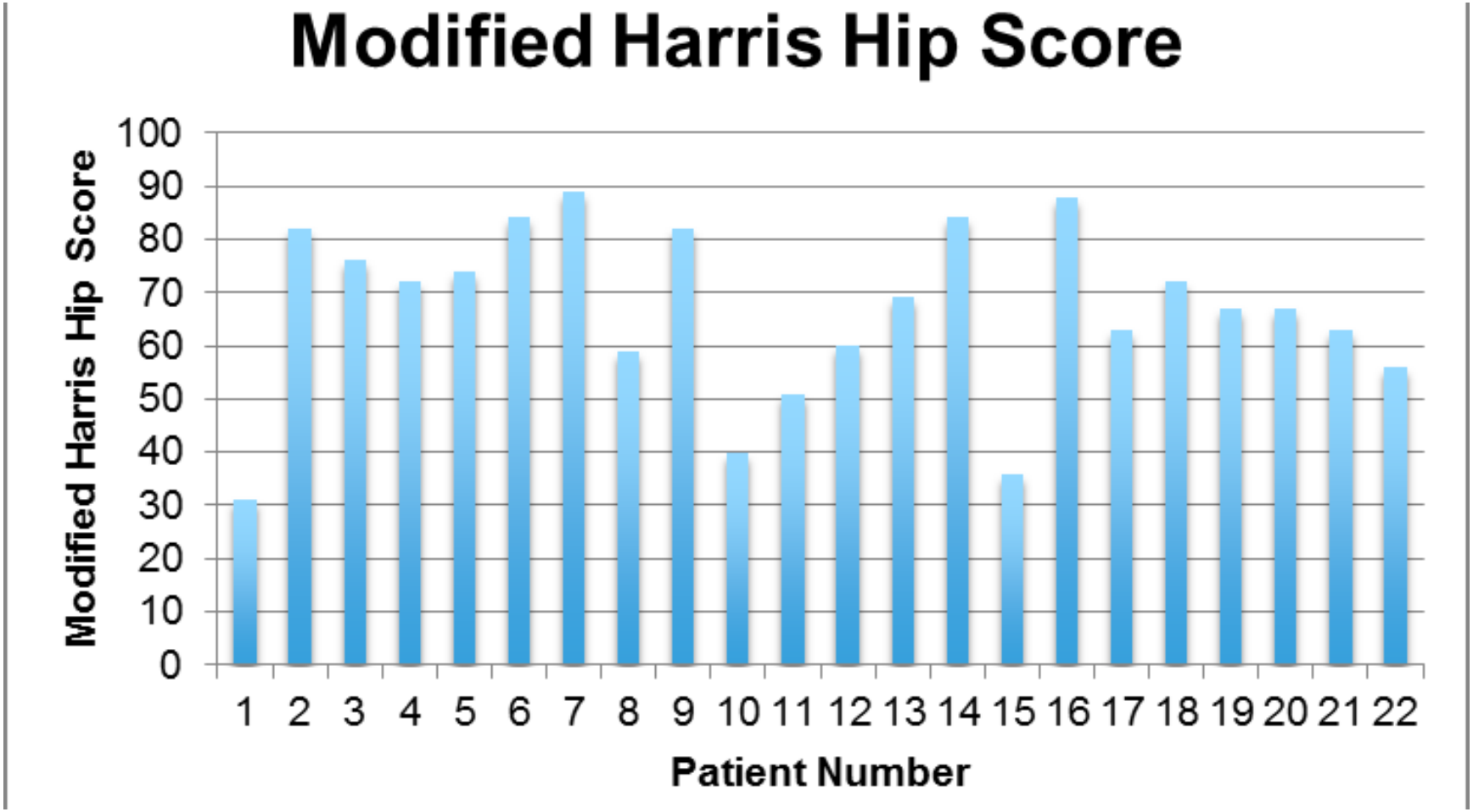
Z: 0.41
C: 2048
W: 4096
Page: 1 of 1
cm
IM:1

Example 3

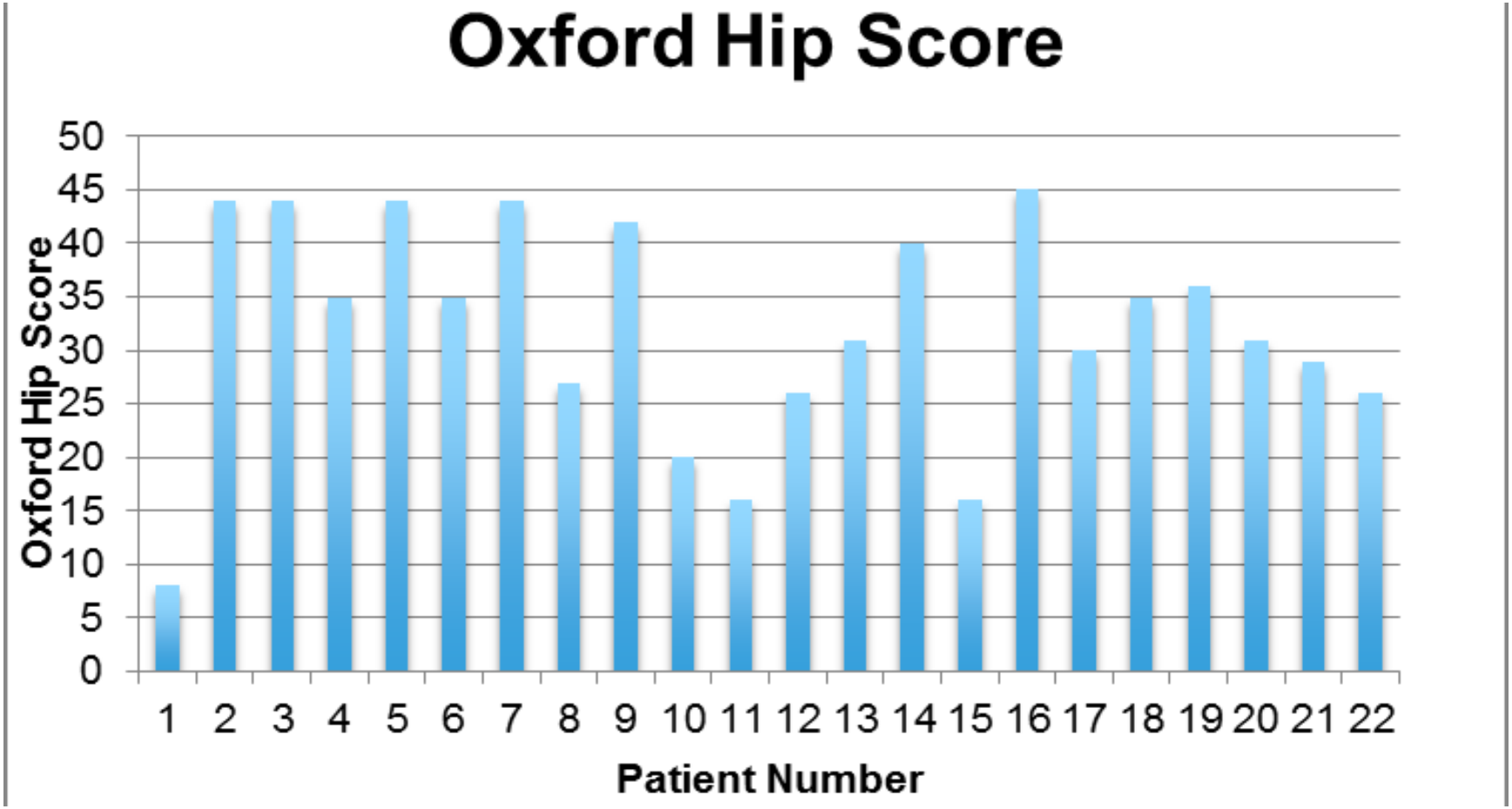

ROYAL UNITED HOSPITAL
XR Hip Lt
AP
30/01/2015 20:33:55
SUPINE
Z: 0.50
C: 2048
W: 4096
Compressed 27:1
IM:1
Page: 1 of 1
cm


ROYAL UNITED HOSPITAL
XR Femur (Thigh) Lt
LATERAL
02/04/2015 10:48:12
Z: 0.50
C: 2048
W: 4096
Compressed 27:1
IM:1
Page: 1 of 1
cm

Post-Operative Results 1



Post-Operative Results 2



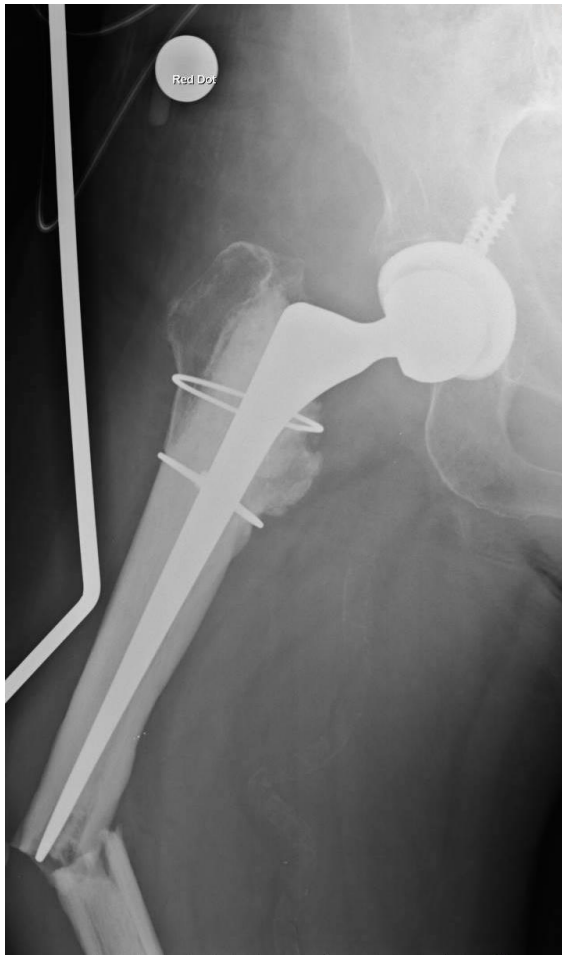
3 x Complications

- Construct failure (B1)- unicortical screws
- Painful underlying metalwork
- Infection requiring debridement with antibiotics and implant retention

Conclusions

- Effective treatment method with good clinical outcomes
- Anatomical reconstruction of the femur
- Can be used in B1 fractures, B2 fractures with cemented, polished tapered stem
- Not in bisphosphonates fractures (Long Stem Revision)

Bisphosphonate Fractures



Thank you

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

The effect of delay to surgery on outcome and length of stay following periprosthetic fracture around the hip

Mrs S Johnson-Lynn
Mr A Ngu
Mr J Holland
Mr I Carluke — Newcastle upon Tyne Hospitals Trust
Mr P Fearon — Northumbria NHS Trust

Introduction

- Increasing population at risk for periprosthetic fractures around the hip
- Surgical challenges with loose implants, compromised soft tissue, bone loss and osteoporosis
- Anaesthetic risks due to frailty and multiple medical comorbidities
- Mortality and morbidity in this population is similar to that seen after fractured neck of femur.

Aims

- To investigate the effect of delay to surgery on morbidity and mortality following treatment of periprosthetic fracture.

Methods

- Retrospective case note review including all patients presenting with periprosthetic fractures around the hip in the last 5 years in the Northumbria and Newcastle upon Tyne Trusts.

Results - demographics

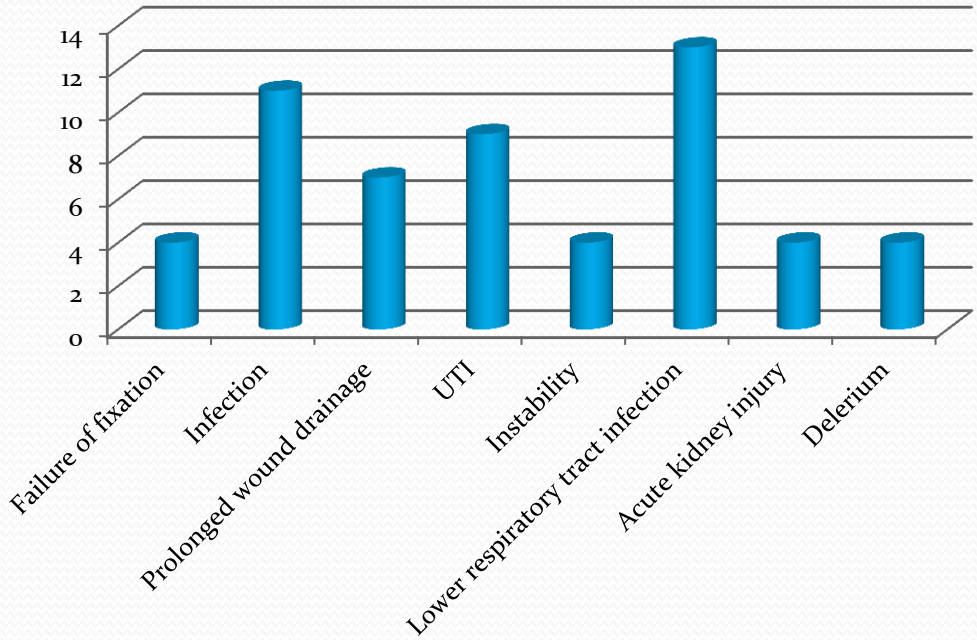
- 82 consecutive fractures in 80 patients
- Mean age 78.3 years (range 46-93)
- 70 primary hips, 12 revision hips
- Mean time from arthroplasty to fracture was 8.8 years
- Vancouver grading 9 A (greater trochanter), 20 B1, 36 B2, 5 B3, 11 C
- Majority of fractures (71) were caused by falls from standing height

Results - surgery

- Mean time to surgery 4.2 days
- Mean length of surgery 3.3 hours (range 1-7)
- Intra-operative blood loss averaged 881mls
- Mean ASA grade 2.8 (range 1-4)
- Mean length of stay 34.9 days
- **Total length of stay was not significantly correlated with delay to surgery**

Results - complications

- 47 patients experienced at least one complication.
- No significant correlation between delay to surgery and number of complications.



Results - mortality

- In hospital mortality 11.0%. Mean delay to surgery 4.1 days in those without mortality, 5.2 days in those with p=0.3075.
- 1 year mortality 17.1%. Mean delay 4.5 days in those with 1 year mortality, 4.16 days in those without p=0.6203.
- **Neither inpatient nor 1 year mortality were significantly positively correlated with delay to surgery**

Conclusions

- Periprosthetic fractures occur in elderly patients with multiple co-morbidities, similar to fractured neck of femur patients.
- However, there is no correlation between delay to surgery and either length of stay or mortality in this population.
- **A delay to order necessary equipment and obtain relevant surgical expertise for the treatment of these complex fractures is safe and not associated with increased mortality or post-operative complications.**

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

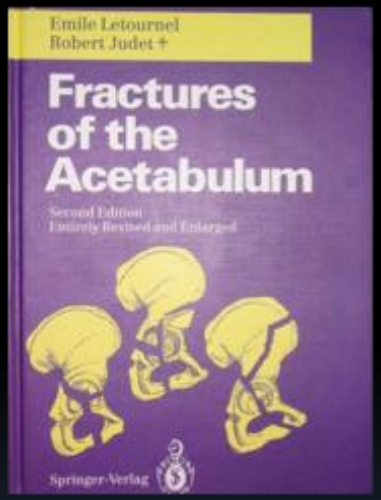
Learning curve in management of acetabular both-column fractures

Does experience in pelvic surgery modify the results?

Dr. Andrea D'AMELIO[1], Dr. Alberto NICODEMO[2], Dr. Alessandro APRATO[2], **Prof. Alessandro MASSE'[1,2]**

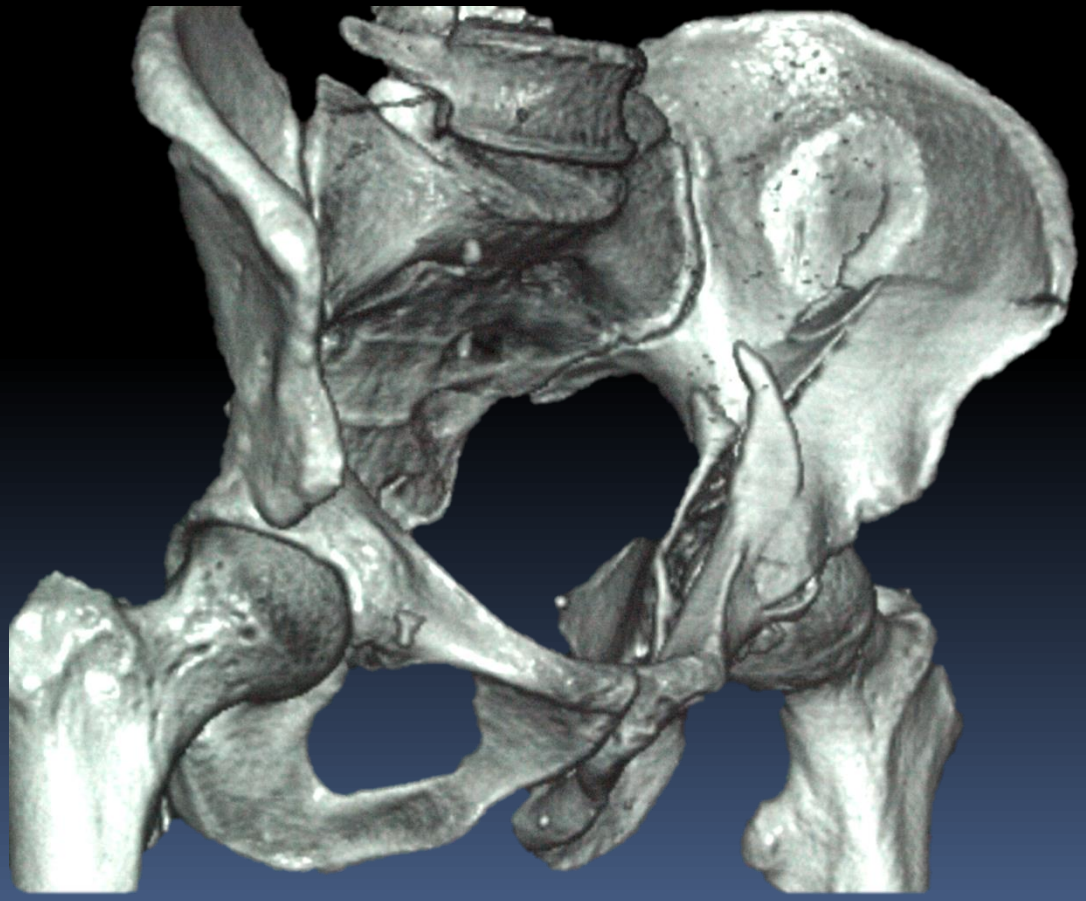
[1] University Department of Orthopaedic and Traumathology in CTO, Turin
[2] University Department of Orthopaedic and Traumathology in Osp. San Luigi Gonzaga, Orbassano (TO)

BOTH-COLUMN

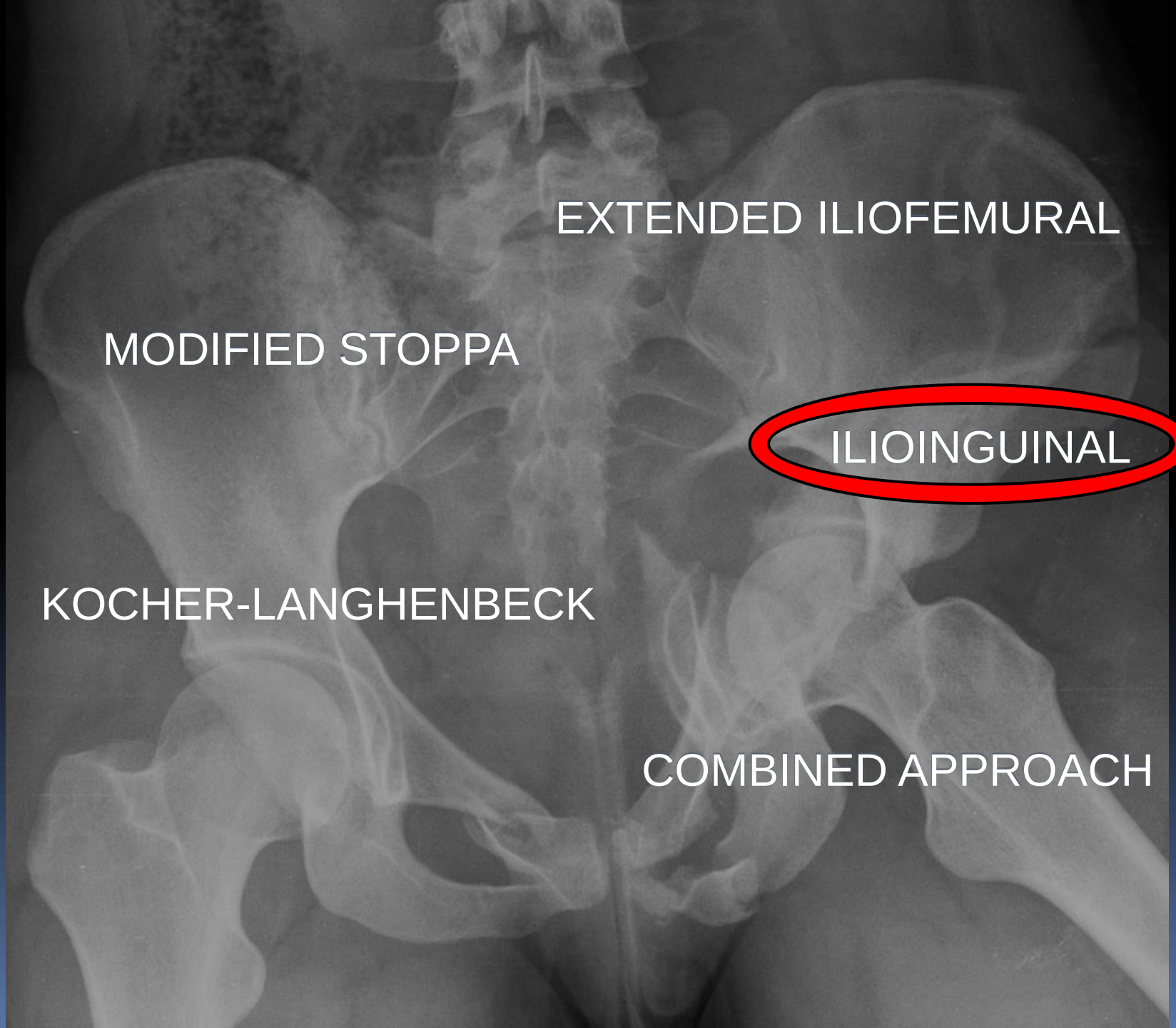


22,6% of all acetabular fractures

Pre-op imaging



3D printer


EXTENDED ILIOFEMURAL
MODIFIED STOPPA
ILIOINGUINAL
KOCHER-LANGHENBECK
COMBINED APPROACH

Our Study


THE CAPITAL OF MONTANA
IS NOT "HANNAH"
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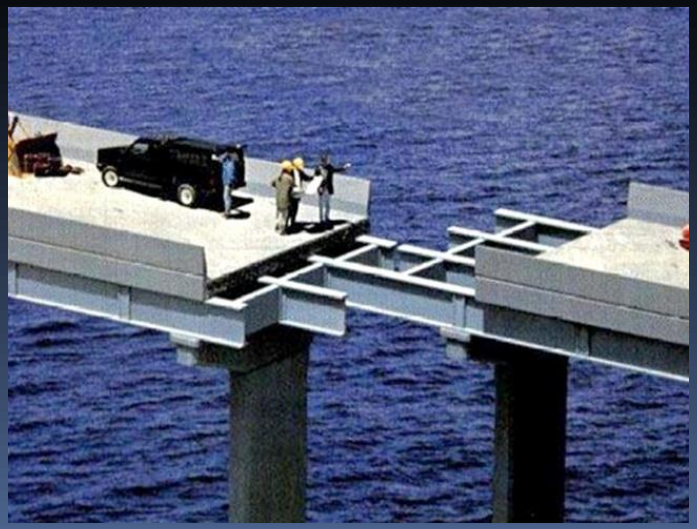


Material and Methods

- 62 both-column acetabular fractures (2002 - 2010)

- mean F.U. 86 months (48 - 308)

- ... s treated be... of pelvic trau...

- ... al approach ... A (named ...

- combined approaches in 7 patients of Group A (ACA)

Results

Population Data

	group AIL	group B
number of patients	25	27
male;female (number)	20;5	20;7
left;right	12;13	19;8
age (years)	39,2	49,2
time from trauma to surgery (days)	10,7	9,6

Surgery Results

***p* = 0,013**

	group A	group B
Surgical Time (minutes)	225 (212)	170
H.O. (number)	1	1
Vascular Iatrogenic Injury (number)	1	0
Sciatic Nerve palsy (number)	1	0
Femoro-Cutaneus Nerve palsy (number)	4 (2)	5

*Quality of Reduction**

$p < 0{,}001$ **$p = 0{,}005$**

	group A	group ACA	group AIL	group B
Anatomical reductions	10	2	8	19
Satisfactory reductions	17	3	14	6
Not satisfactory reductions	5	2	3	0

* **Matta JM.** Fractures of the acetabulum: accuracy of reduction and clinical results in patients managed operatively within three weeks after the injury. *J Bone Joint Surg [Am]* 1996;78-A:1632-45.

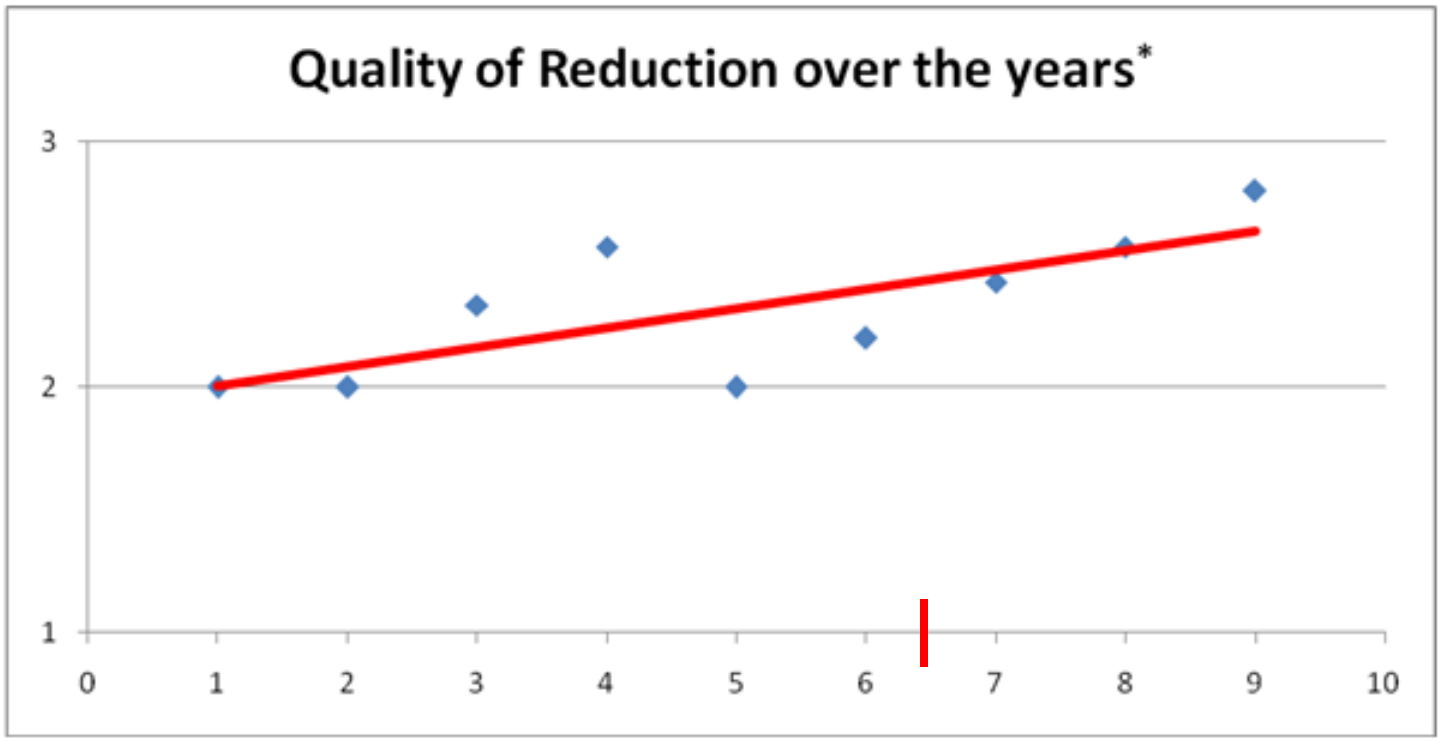
*Merle D'Aubigne score**

Excellent	**28,2%**
Good	**65,2%**
Fair	**4,3%**
Poor	**2,3%**

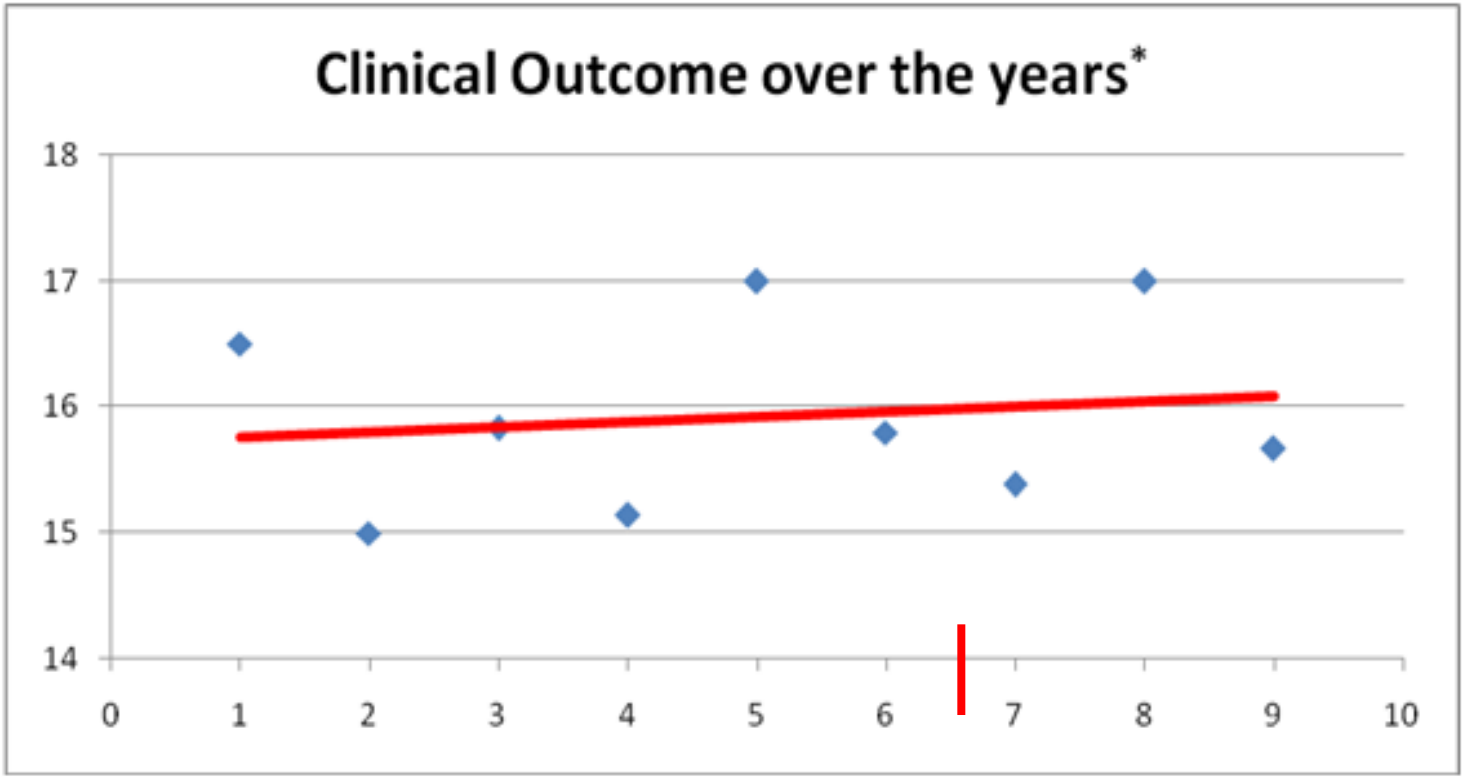
***p* = 0,028** **p = 0,020**

	group A	group ACA	group AIL	group B
Mean Value	15,2	14,7	15,7	16,6

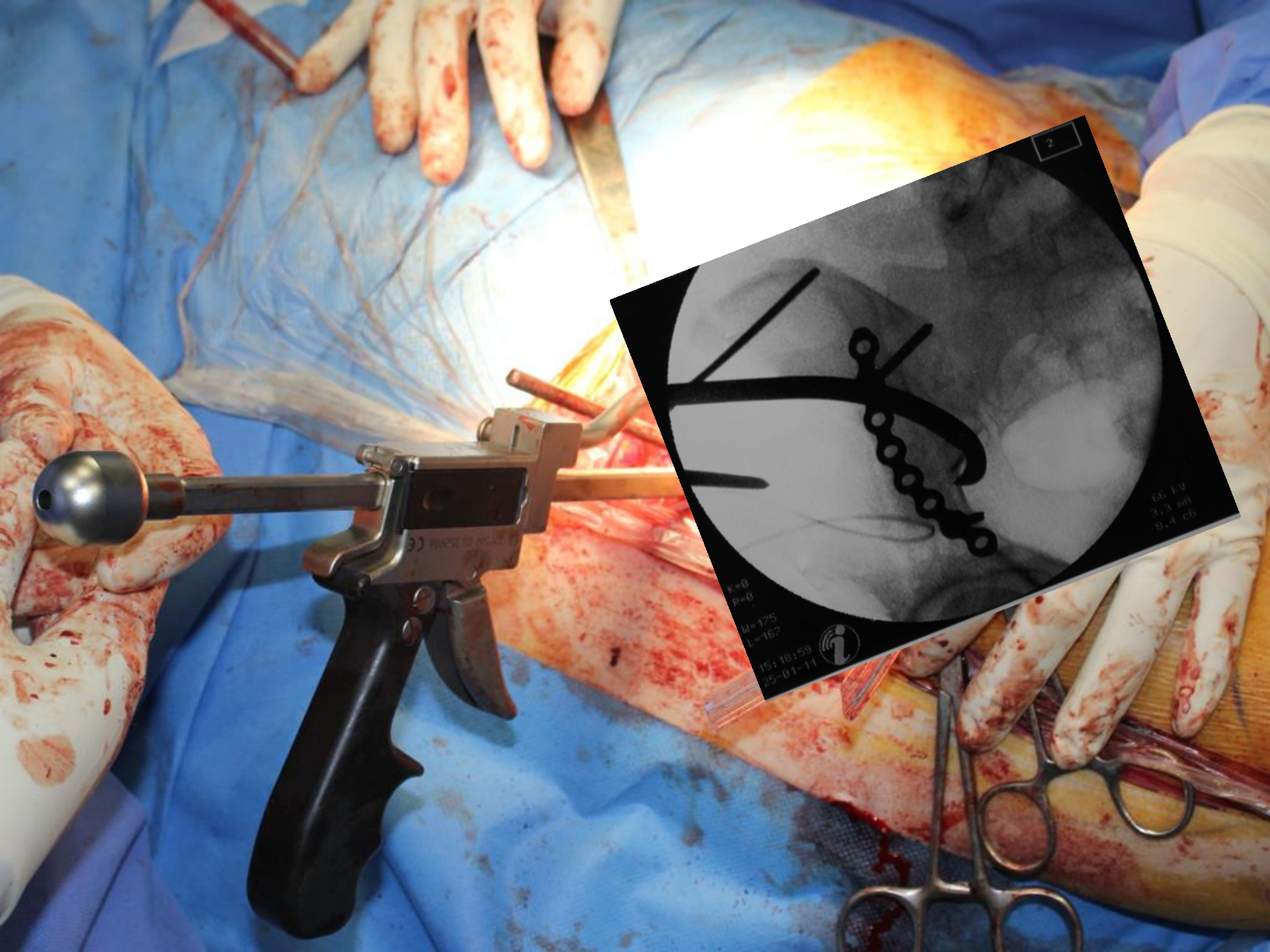
* **Merle d'Aubigné R, Postel M.** Functional results of hip arthroplasty with acrylic prosthesis: 1954. *J Bone Joint Surg [Am]* 1954;36-A:451-75.



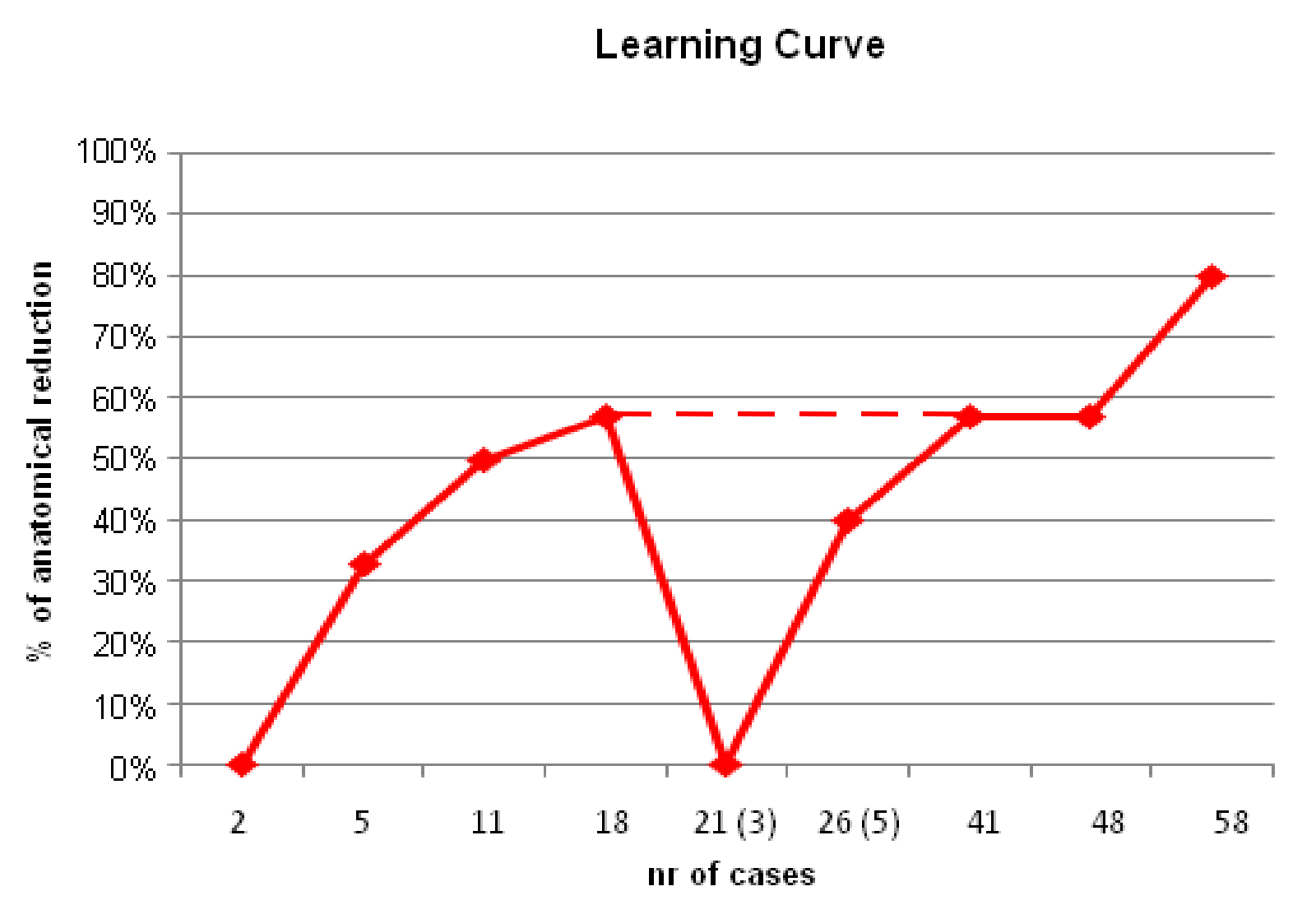
*years of surgeon's experience



*years of surgeon's experience


2
K=0
R=0
W=125
L=167
15:18:59
25-01-11

Conclusion


Learning Curve
% of anatomical reduction
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2
5
11
18
21 (3)
26 (5)
41
48
58
nr of cases


Thank You!

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Surgical hip dislocation for the management of irreducible posterior hip dislocation with femoral head fracture: a case series

first BHS_SIDA meeting
Nov 2015 ,Milan,italy

Dr Kaveh Gharanizadeh ,HIP surgeon
Assistant professor ,IUMS, Tehran, Iran

Dr M.abolghasemian , Assistant professor ,IUMS ,Tehran, Iran

Dr G.A.Macheras ,Chief Orthopaedic Surgeon
KAT Hospital, Athens, Greece

Pipkin fx

- Rare injury
- 5-15% post hip dx : associated head fx
- associated injury is very high

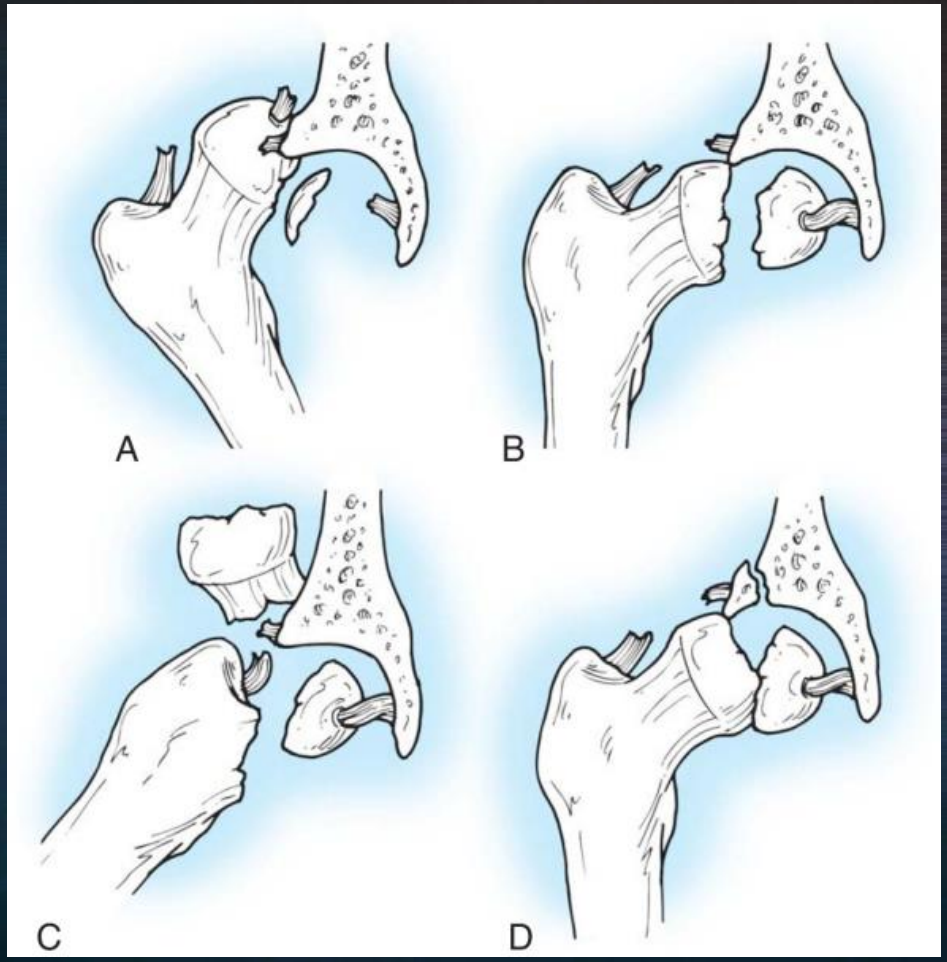
Pipkin Classification

I :Fracture inferior to fovea

II : Fracture superior to fovea

III :Fracture of femoral head & neck

IV: Fracture of femoral head & fracture



Pipkin Management

1. emergent closed reduction
2. head FX : full X-Ray and CT-Scan after CR

- Conservative
- Excision
- ORIF: anterior approach
- Arthroplasty

irreducible FX/DX

- irreducible posterior hip Dx with head FX
  what would be the best approach?
- irreducible posterior hip Dx: posterior approach
- for head Fx: anterior approach
- Literature : poor

ELSEVIER

Clinical Imaging xx (2012) xxx – xxx

CLINICAL IMAGING

A rare but radiographically recognizable cause of an irreducible hip fracture-dislocation☆

David A. Lawrence[a,*], Edward Smitaman[a], Michael Baumgartner[b], Andrew Haims[a]

[a]*Department of Diagnostic Radiology, Yale University School of Medicine, New Haven, CT, USA*
[b]*Department of Orthopaedics and Rehabilitation, Orthopaedic Trauma Service, Yale University School of Medicine, New Haven, CT, USA*

Received 13 May 2012; accepted 21 June 2012

Irreducible Fracture–Dislocations of the Femoral Head Without Posterior Wall Acetabular Fractures

Samir Mehta, MD and M.L. Chip Routt, Jr., MD†*

J Orthop Trauma, 2008

- 72 femoral head fractures treated in 6 years
- 7 (10%) failed closed reduction
- approach : Anterior OR with detaching soft tissue

1. Iatrogenic femoral neck fracture :one
2. AVN : 2 cases , delayed open reduction (14-32hrs).

Recommendation

- early identification based on clinical and radiographic findings
- emergent open reduction through anterior approach (i.e. DO **NOT** attempt at closed reduction)

Retrospective study

- five cases
- all young males: 24-38 y
- Unsucessful closed reduction: 2 times
- surgical hip dislocation with GT sliding osteotomy
- fixation: mini screws,threaded pins
- labral refixation : suture anchor
- follow up :26-41 m(mean 36)
- Merel D'Aubigne and Postel, thompson and Epstein scores in addition to radiological evaluation..

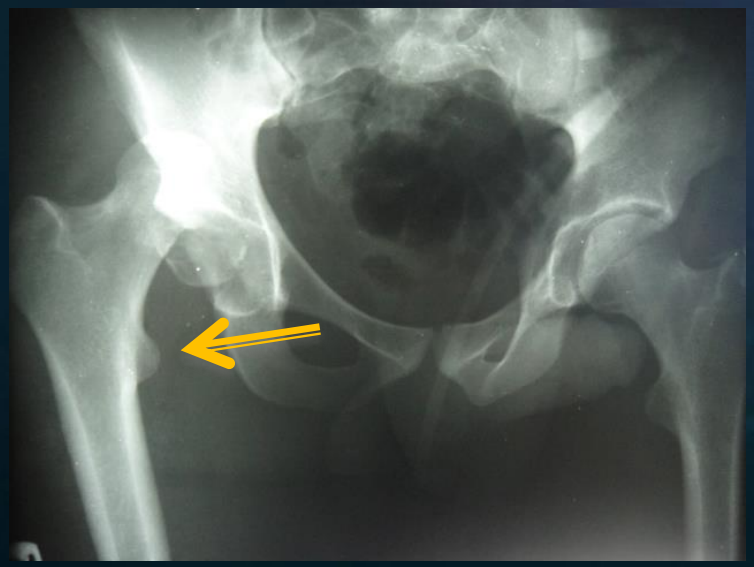
table 1. Patients characteristics and Clinical findings

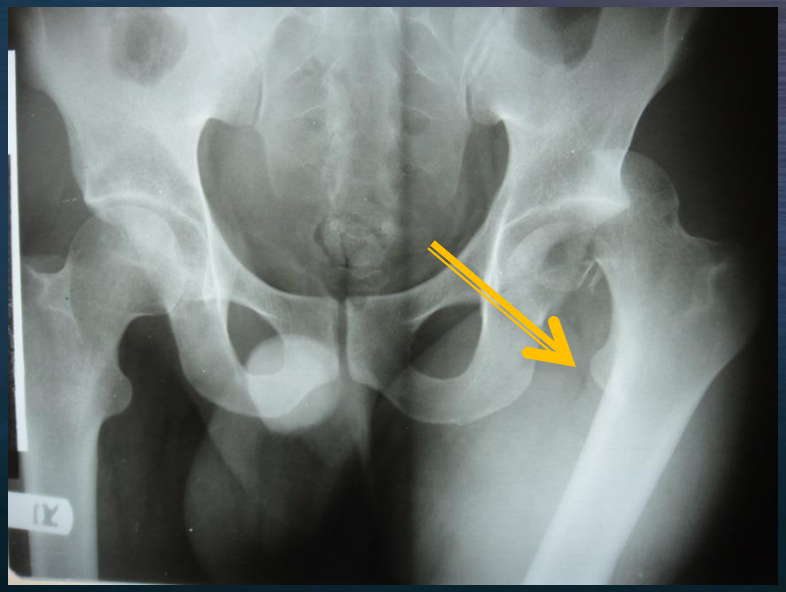
case	age (year)	operation delay (Hour)	fixation device	labral repair with suture anchor	follow up (month)
1	26	14	mini screw	yes	41
2	24	10	mini screw , full threaded pin 2mm	no	36
3	36	36	mini screw	yes	34
4	29	8	mini screw	yes	31
5	38	11	mini screw	no	25

Results

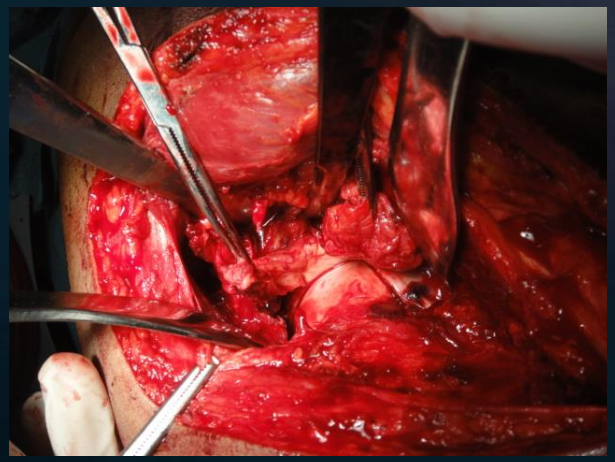
- unique clinical ,radiographic and intra operative findings
- clinical : slight, but fixed hip flexion with
- knee flexion and leg length discrepancy, no IR
- locked hip

1. posterosuperior disclocations
2. sagittal plane femoral head fractures
3. intact posterior wall of acetabulum
4. close apposition of proximal femur to the supra-acetabular ilium.





- common pathological feature: Femoral head was buttonholed and locked through a large capsule-labral flap detached from 12 o’clock posteriorly to the end of the posterior rim of the acetabulum.



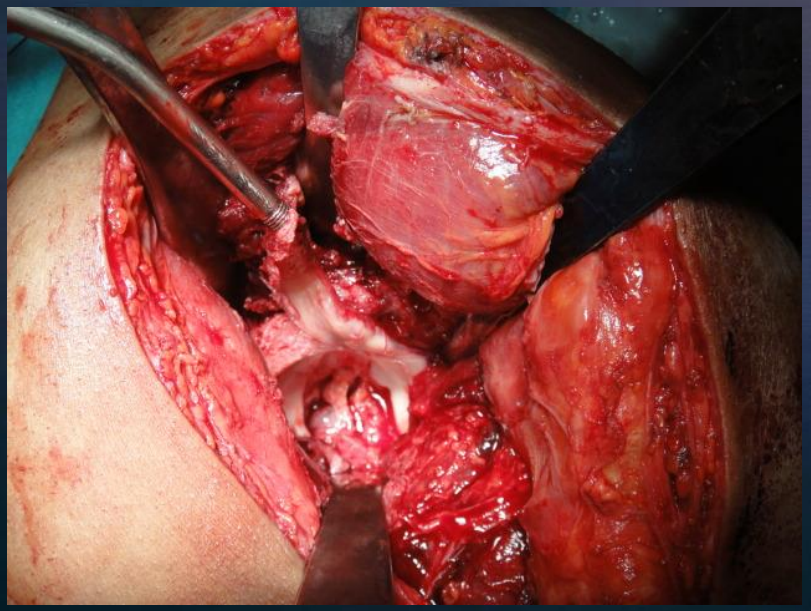


table 2. final clinical and radiographic results

case	Merel D'Aubigne and Postel	thompson and Epstein score	AVN	heterotopic ossification	osteoarthritis (Tonnis grade)	revision surgery
1	excellent	excellent	no	grade 1	no	no
2	good	good	no	grade 1	grade 1-2	no
3 #	poor	poor	yes	no	-	Hip replacement
4	excellent	excellent	no	grade 1	no	no
5	excellent	excellent	no	no	no	no

at 4 months hip replacement was done with Good functional result after joint arthroplasty

Discussion

Injury, Int. J. Care Injured (2007) 38, 478–488

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INJURY
INTERNATIONAL JOURNAL OF THE CARE OF THE INJURED

www.elsevier.com/locate/injury

Femoral head injuries: Which treatment strategy can be recommended?

Philipp Henle [a], Peter Kloen [b], Klaus A. Siebenrock [a,*]

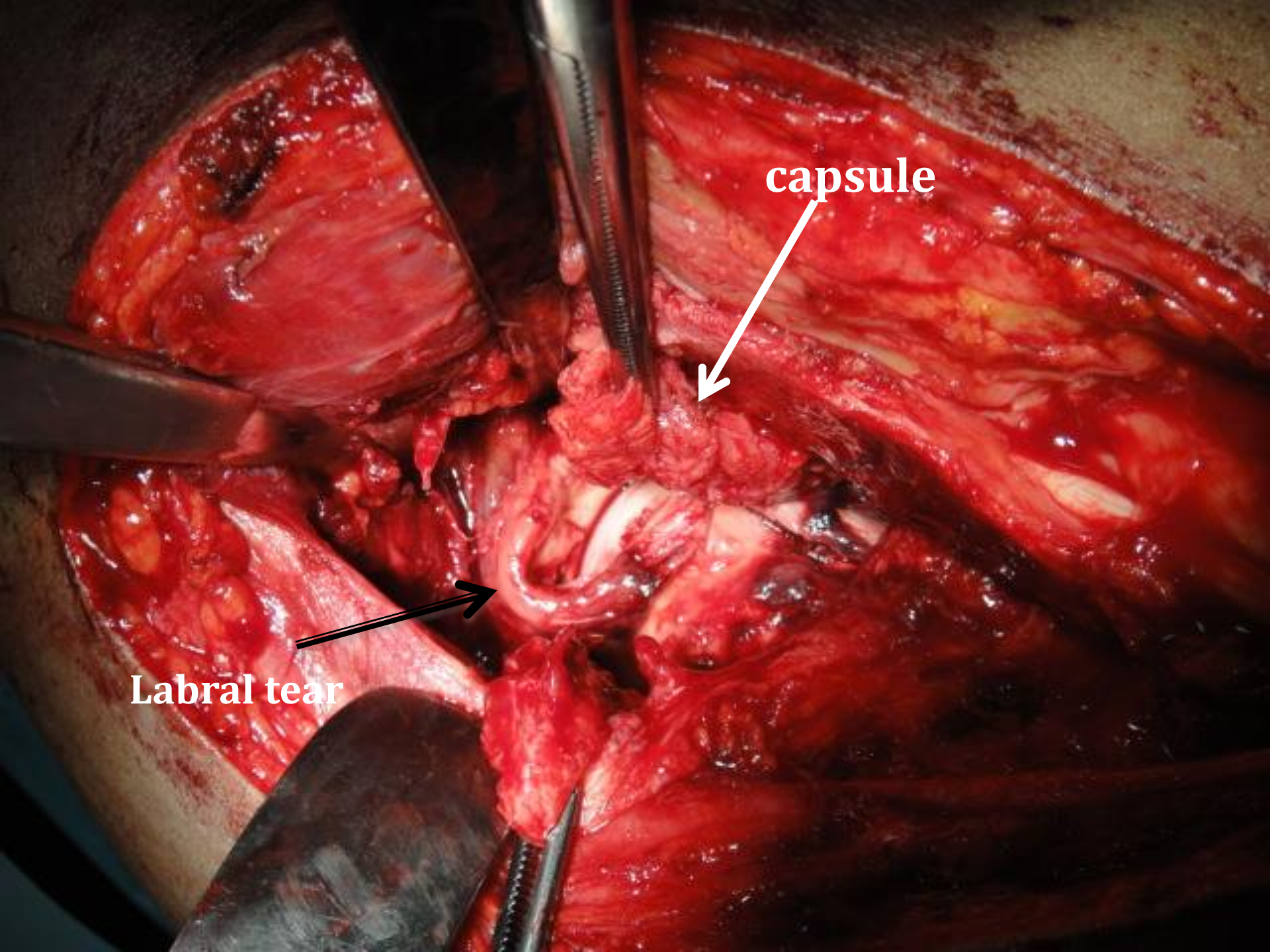
[a] *Department of Orthopaedic Surgery, Inselspital, University of Berne, CH-3010 Berne, Switzerland*
[b] *Department of Orthopaedic Surgery, Academic Medical Center, Amsterdam, The Netherlands*

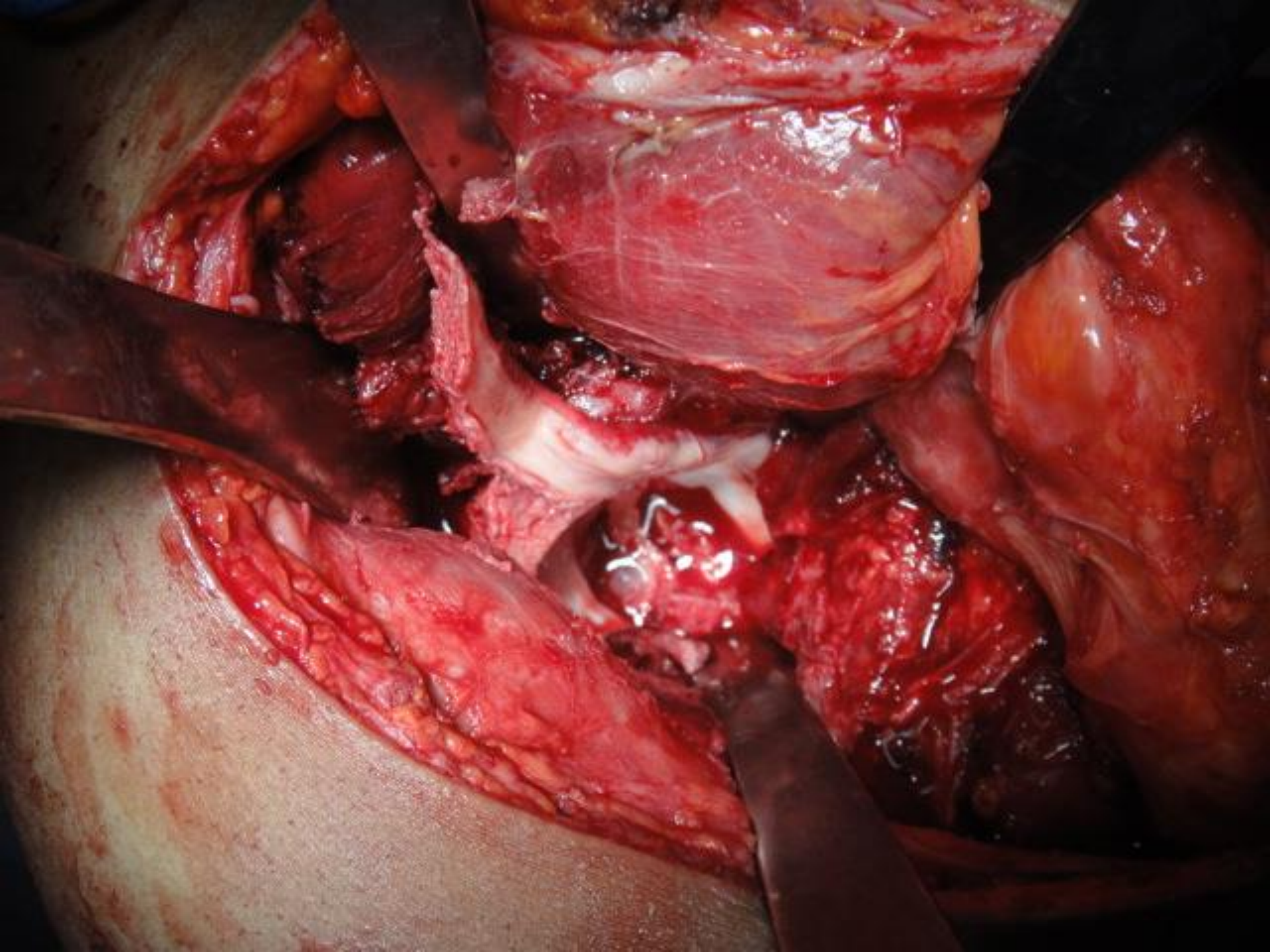
Accepted 16 January 2007

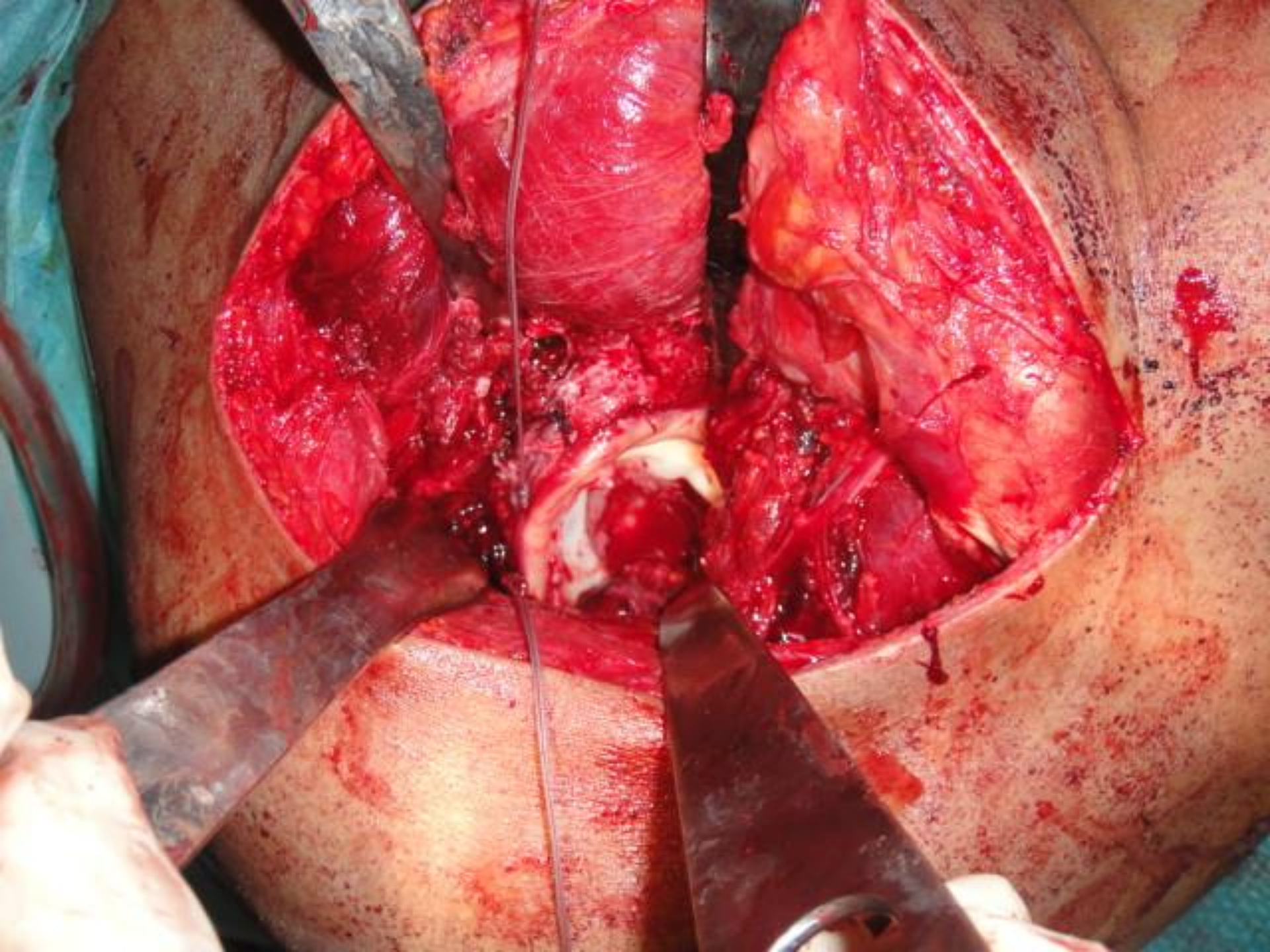
Table 1 Patient demographics and results

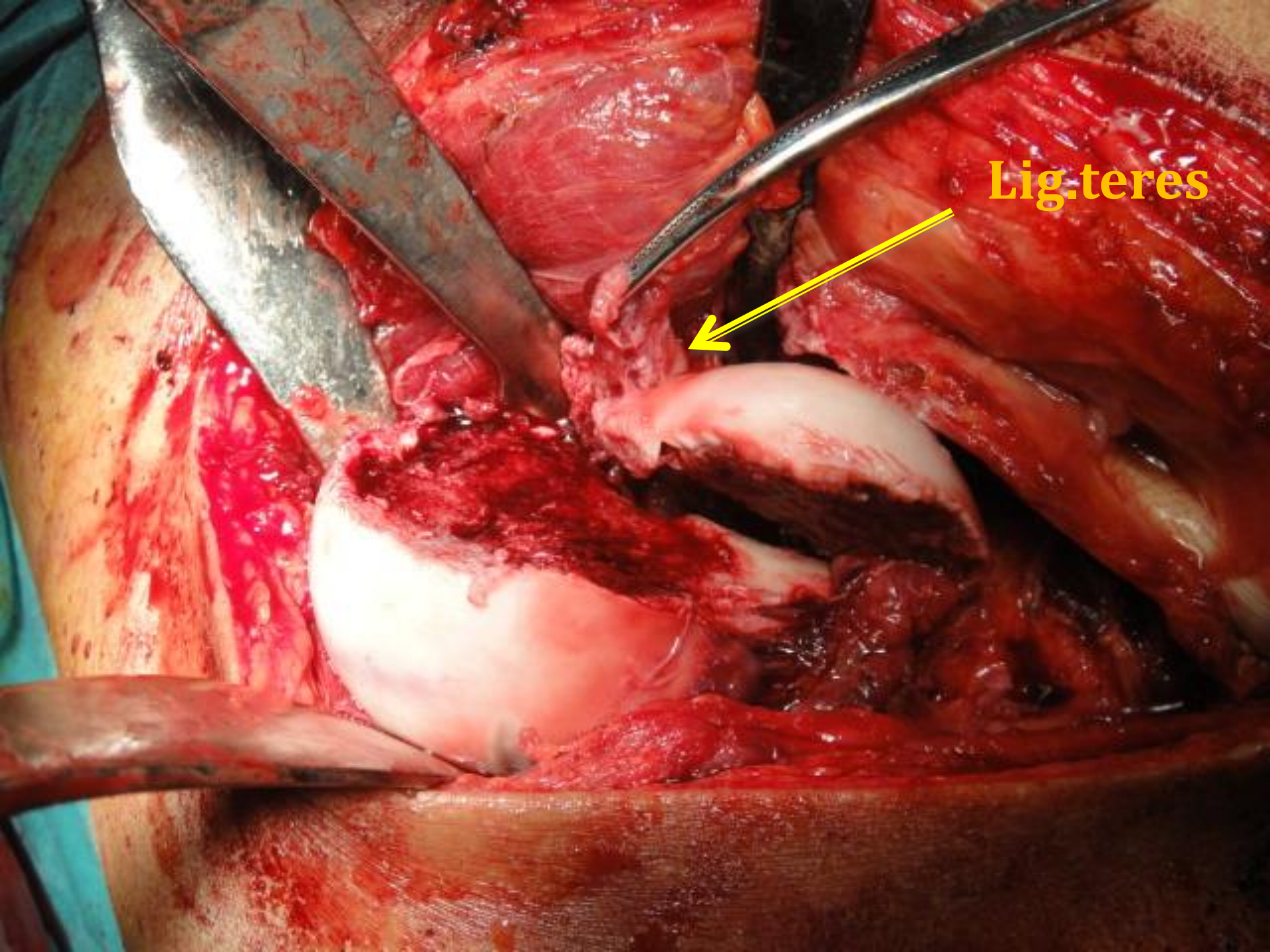
Case	Age	Sex	Fracture type (Pipkin)	Type of accident	Complications	Additional surgery	Follow-up (months)	Heterotopic ossification (Brooker)	Outcome (Merle d' Aubigne and Postel)	Outcome (Thompson and Epstein)	Remarks
1	33	w	IV	Sports accident (paragliding)	—	@ 7 mo: cosmetic scar correction and hardware removal of trochanter screws	15	0*	Excellent	Excellent	
2	32	m	IV	MVA	—	—	14	0*	Excellent	Excellent	Including labrum fixation with suture anchors
3	34	m	II	MVA	HO	Excision of heterotopic ossification	30	III*	Good	Good	Multiple trauma including brain injury
4	40	m	IV	Fall	HO, AVN	@ 20 mo: HO excision; @ 25 mo: total hip arthroplasty; @ 90 mo: revision due to trochanter non-union; @ 92 mo: removal of prostheses due to infection; @ 96 mo: revision arthroplasty	96	IV	Poor	Poor	Multiple trauma including brain injury
5	26	m	I	MVA	—	—	6	0	Excellent	Excellent	
6	71	m	II	Falling tree	HO	—	24	III	Excellent	Good	Patient died of unrelated cause 24 months after trauma
7	39	m	IV	MCA	—	@ 7 mo: hardware removal of trochanter screws	83	0*	Good	Good	
8	28	m	IV	MCA	—	—	9	0	Excellent	Excellent	
9	51	m	IV	MCA	—	—	7	I	Excellent	Excellent	
10	47	w	II	MVA	—	—	36	0	Good	Good	
11	39	m	IV	Sports accident (soccer)	AVN	@ 23 mo: total hip arthroplasty	32	0*	Poor	Poor	Good functional result after joint arthroplasty
12	38	m	IV	MCA	HO		33	II*	Good	Good	

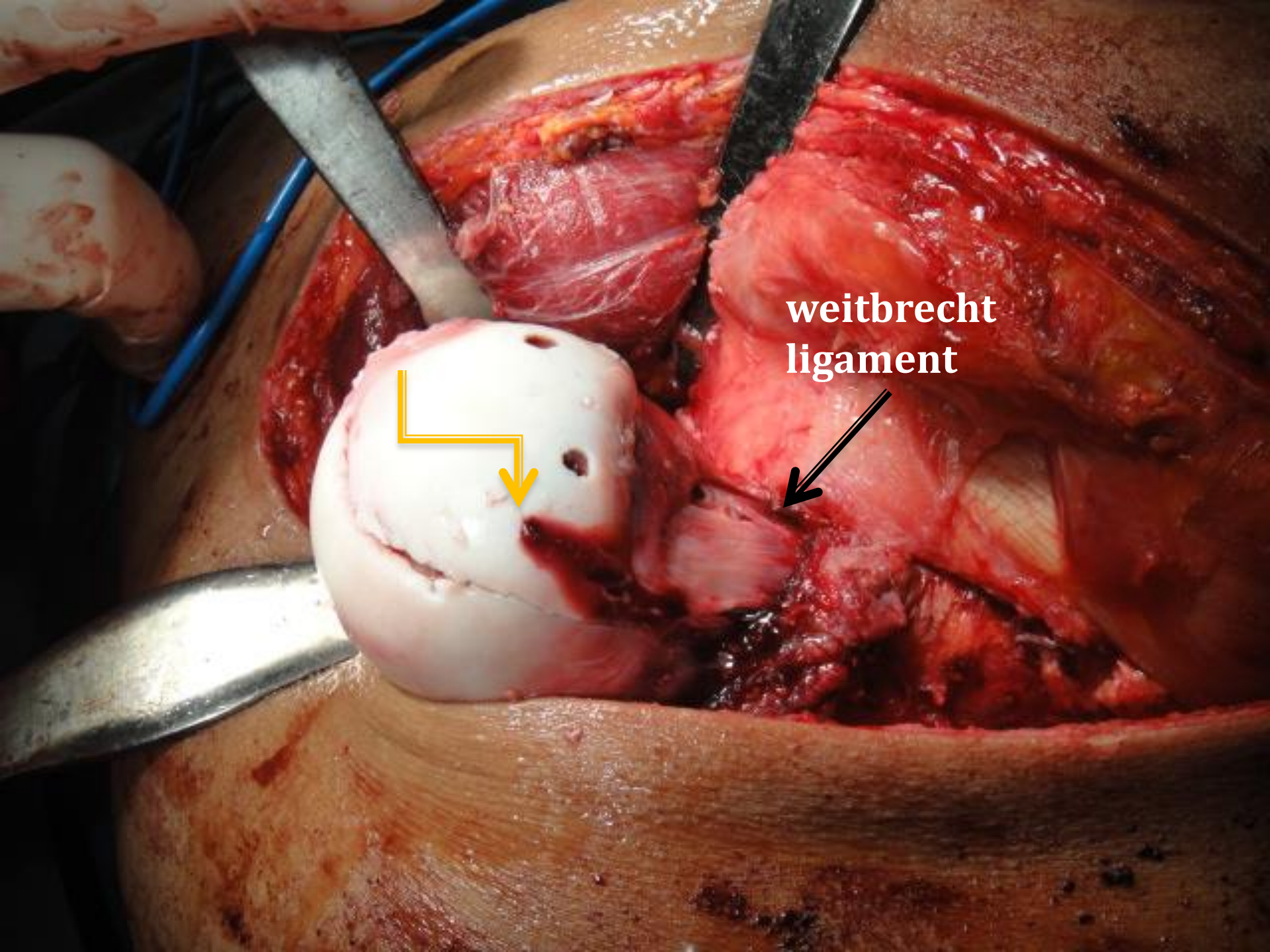
Abbreviations—MVA: motor vehicle accident; MCA: motor cycle accident; HO: heterotopic ossification; AVN: vascular necrosis of the femoral head; @ *x* mo: *x* month postoperatively; *: received indomethacin for prophylaxis of heterotopic ossifications.

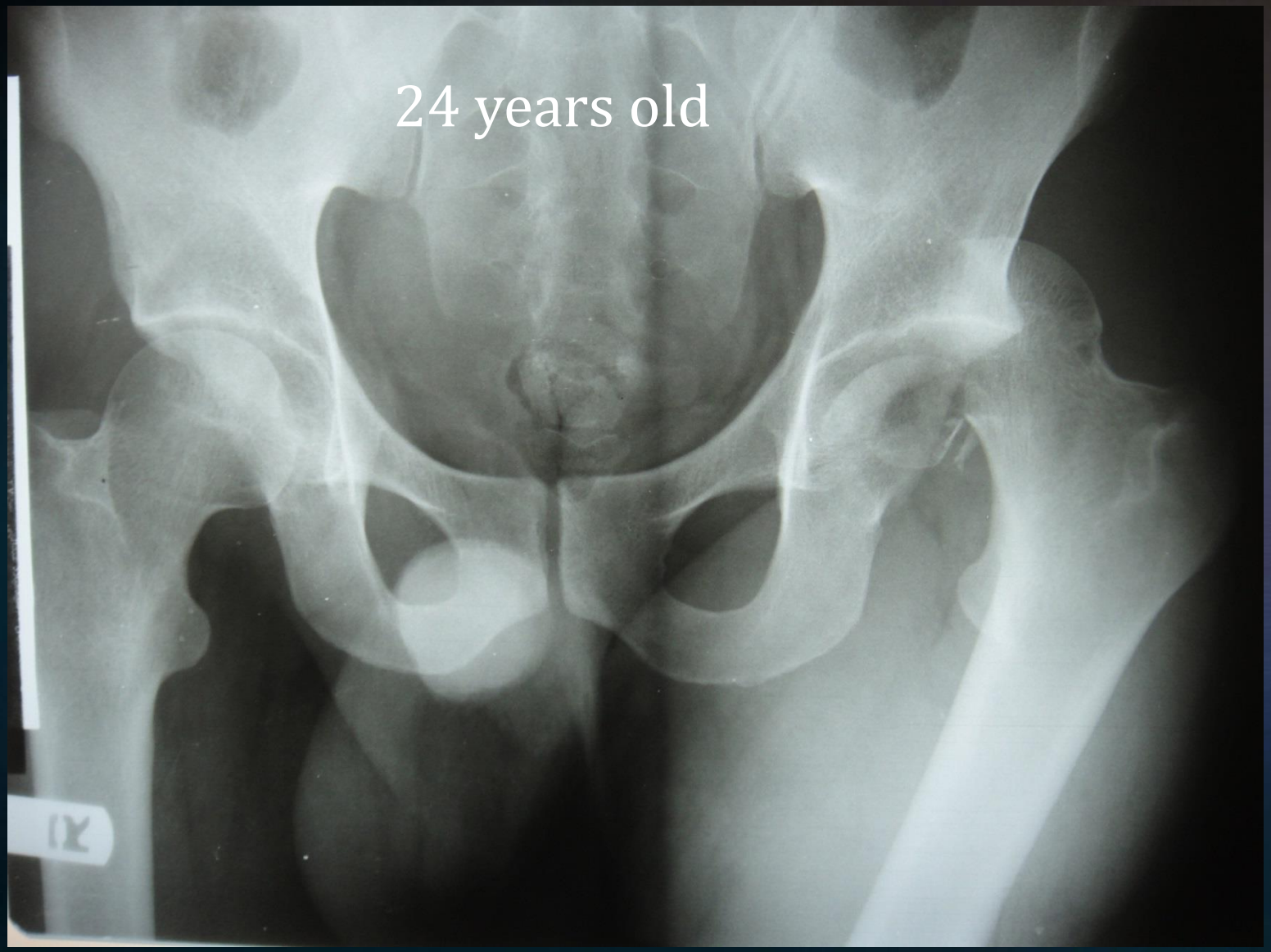

capsule
Labral tear



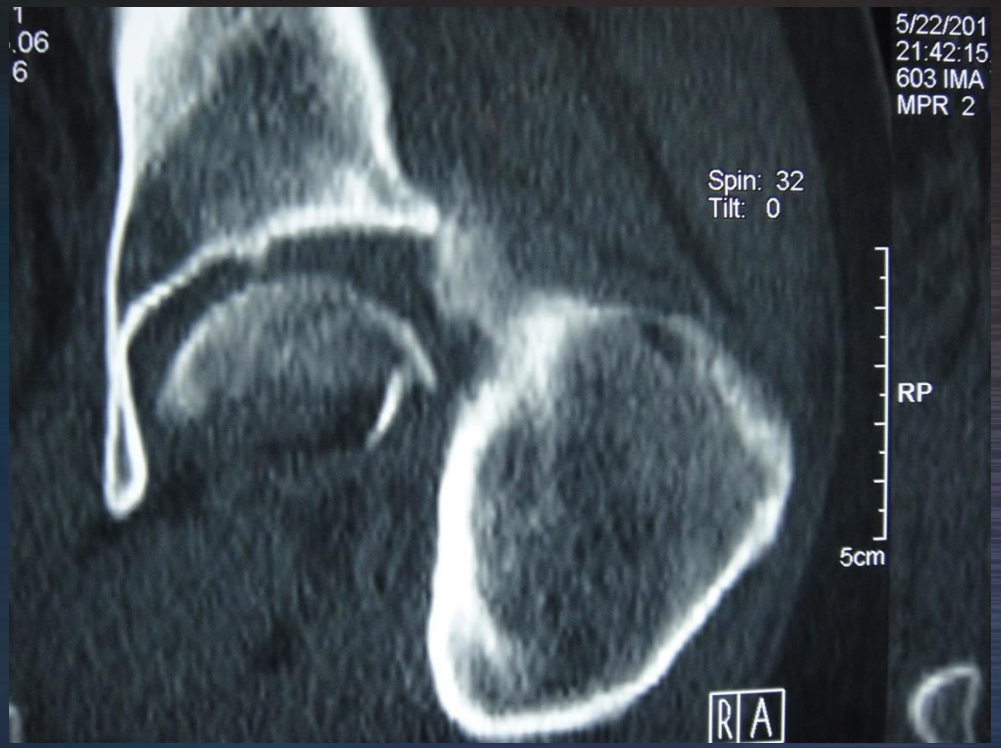



Lig.teres


weitbrecht
ligament

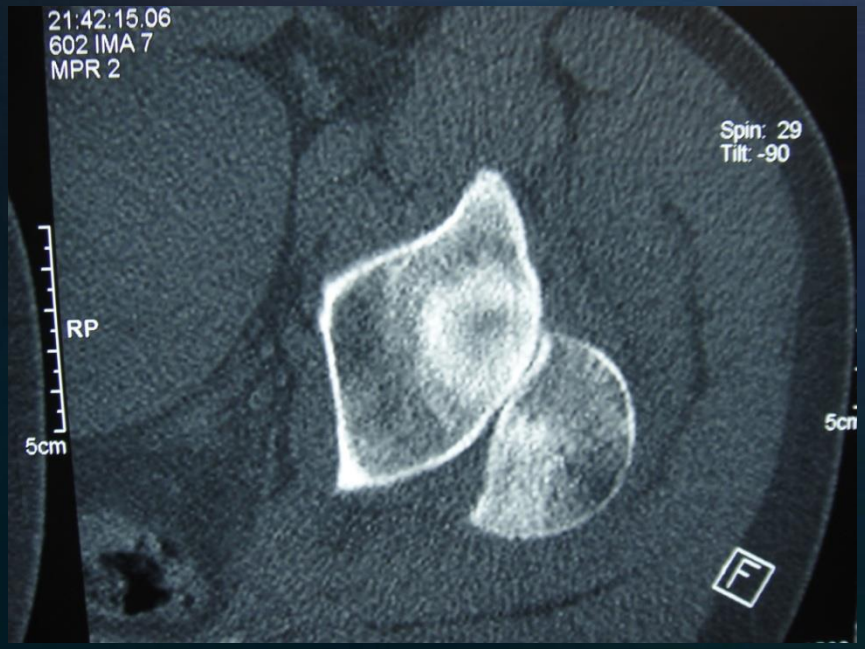

24 years old

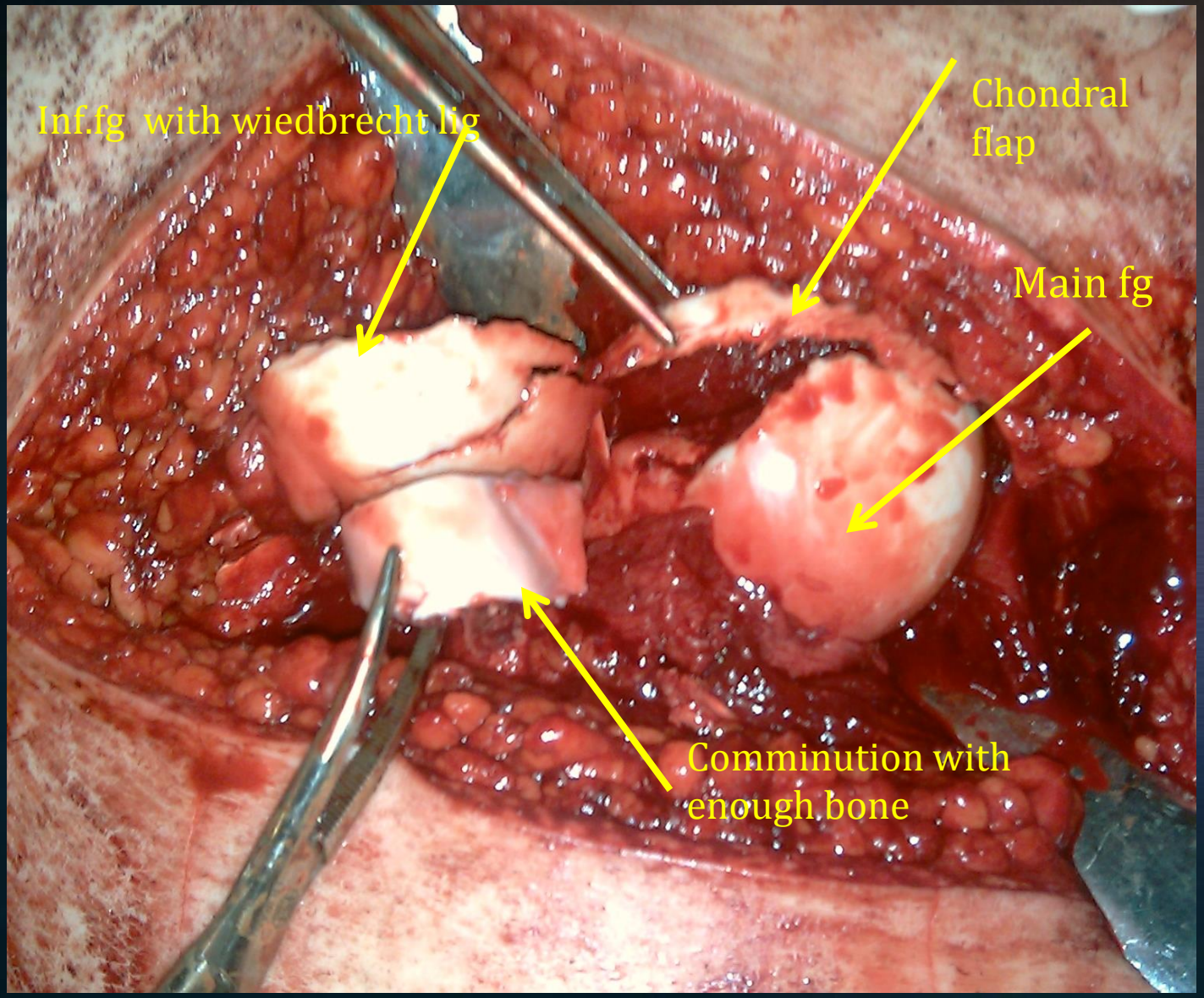

5/22/1984. M. 27Y
5/22/2011
21:42:15.06
604 IMA 7
MPR 2
Spin: -57
Tilt: 0
AR

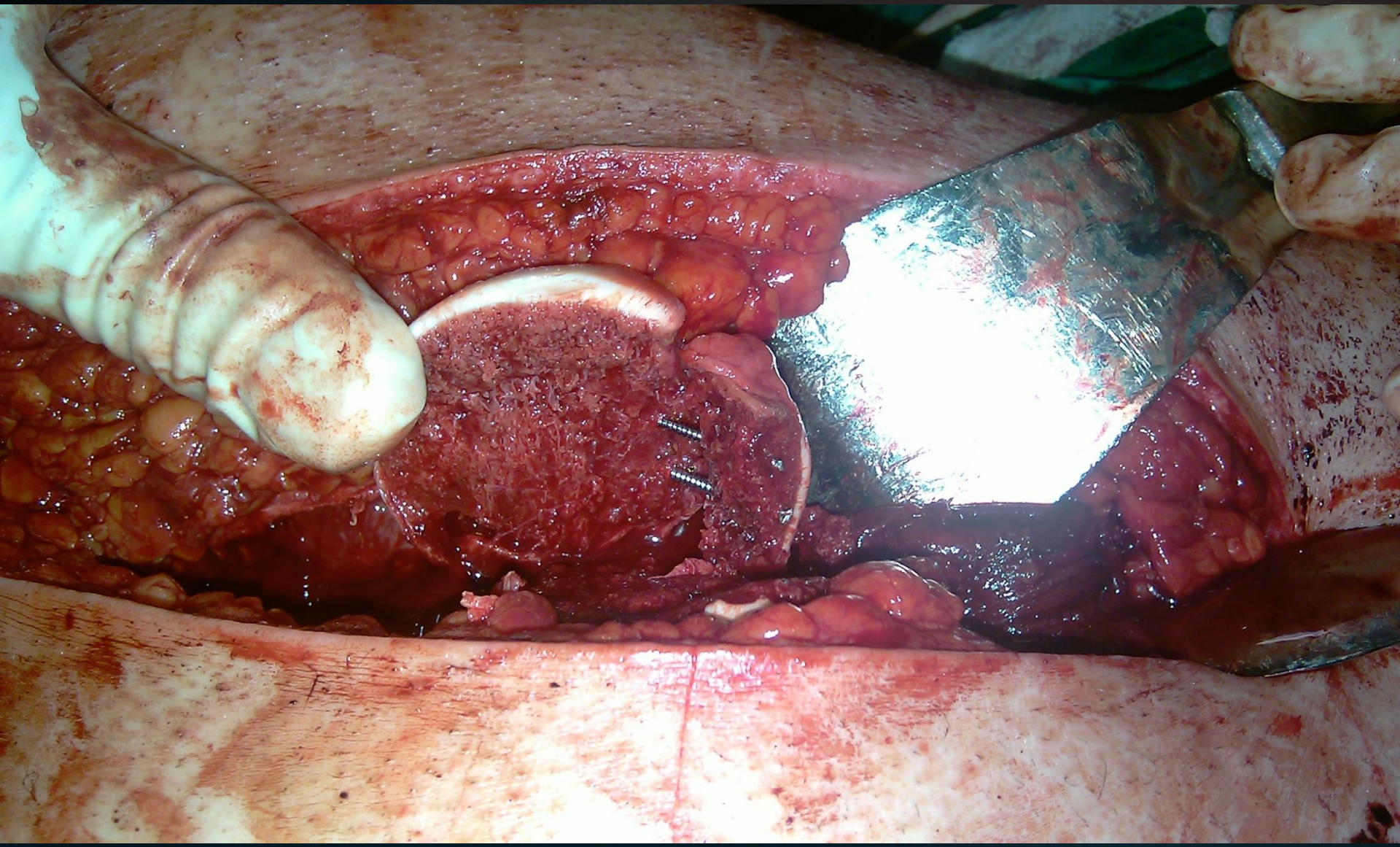

5/22/201
21:42:15
603 IMA
MPR 2
Spin: 32
Tilt: 0
RP
5cm
R A

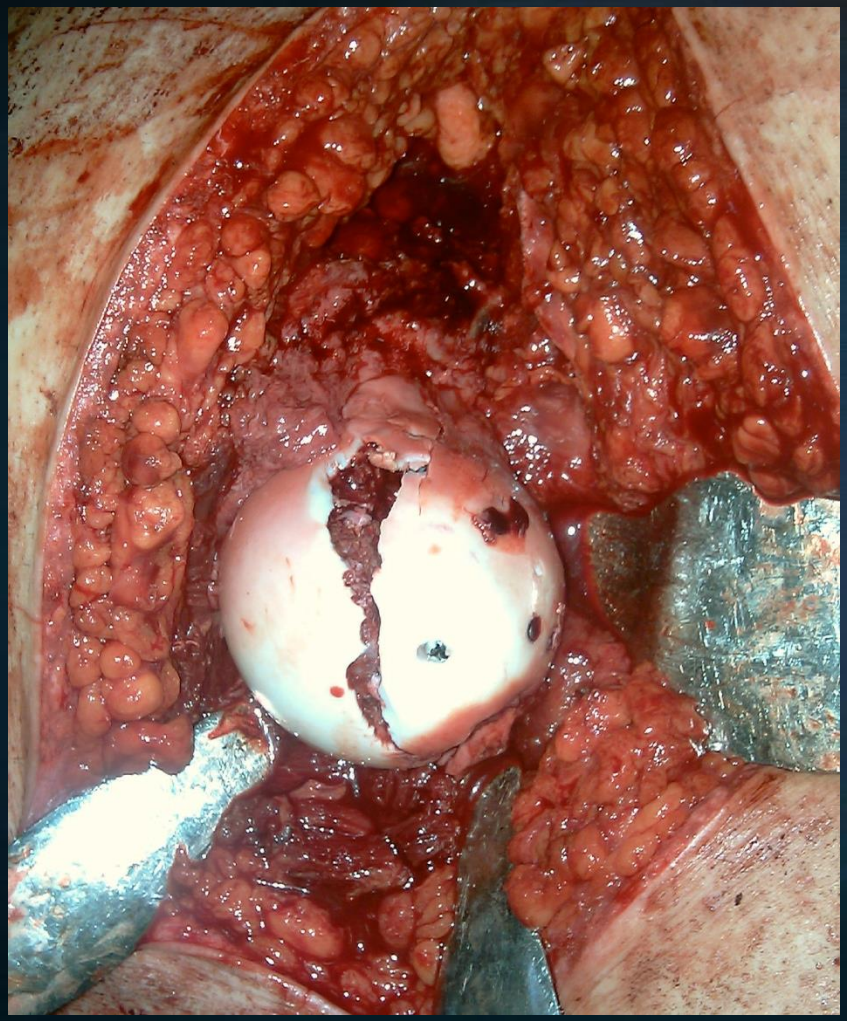

Spin: 29
Tilt: -90
F

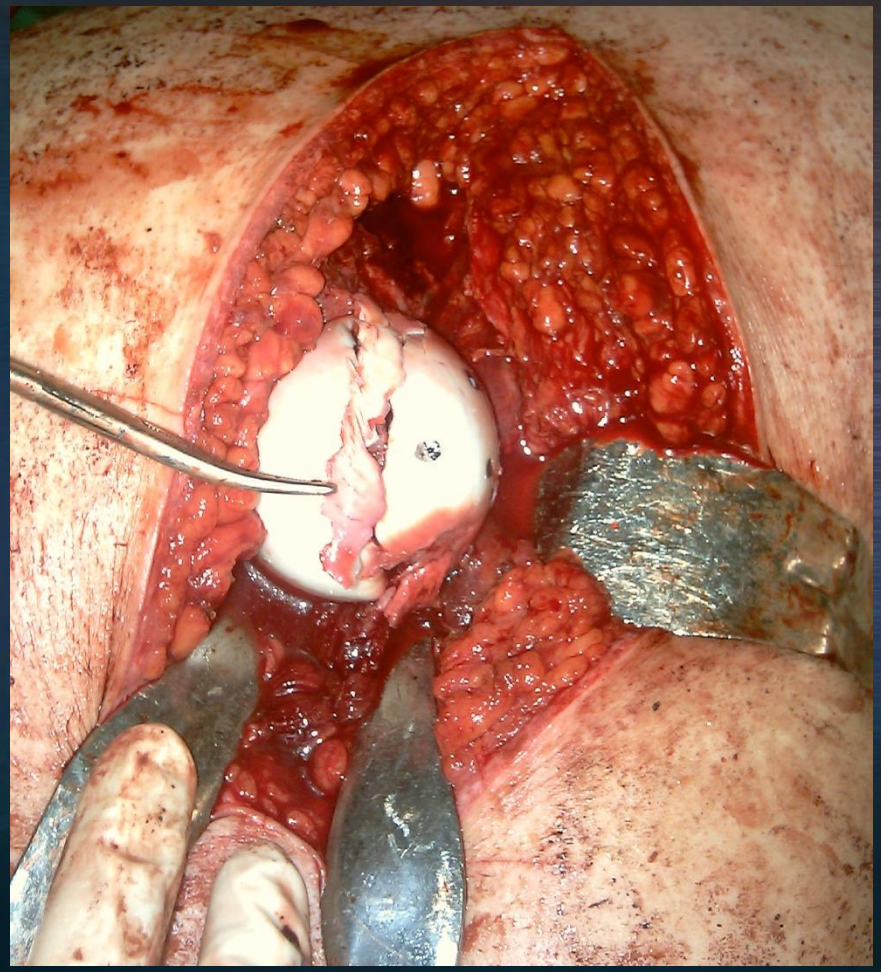

Spin: 29
Tilt: -90
F

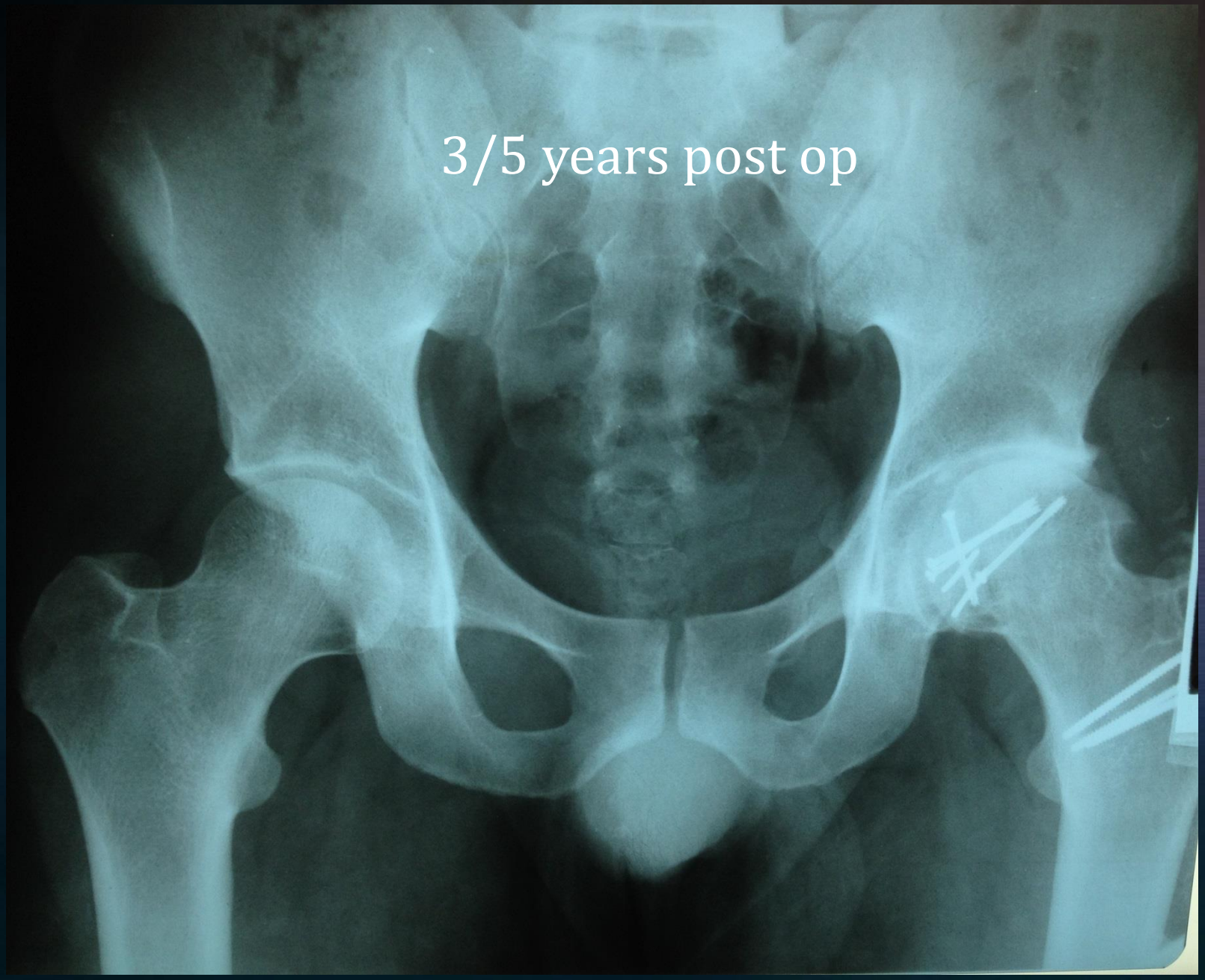

21:42:15.06
602 IMA 7
MPR 2
Spin: 29
Tilt: -90
RP
5cm
F


Inf.fg with wiedbrecht lig
Chondral flap
Main fg
Comminution with enough bone








3/5 years post op

conclusion

- Be aware of irreducible hip DX/Fx : unique clinical and radiographic picture
- don’t attempt Closed reduction
- Ganz technique of surgical hip dislocation is

1. safe : regarding AVN
2. full access to FX
3. full acess for labral repair

Thank you

INTERNATIONAL COMBINED MEETING

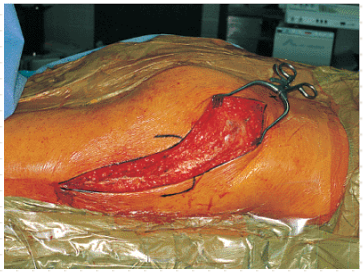
BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

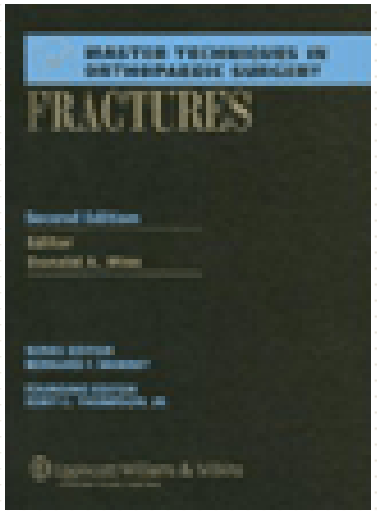
26-27 NOVEMBER 2015

MILAN, ITALY

Minimal-invasive posterior approach in the treatment fractures of the acetabulum: the Italian experience,considerations and indication after 10 years

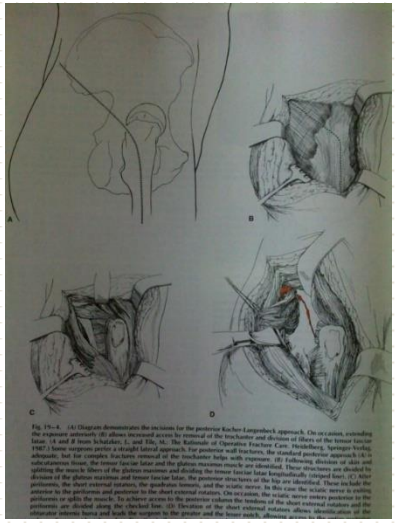
R. Spagnolo, F. Caroli, P. Capitani, G.A. La Maida, F. Sala, F. Bove, F. Luceri (Italy)





Master Techniques in Orthopaedic Surgery: Fractures
2nd Edition

Berton R. Moed



damage the superior gluteal artery and nerve

reduced motility of the hip

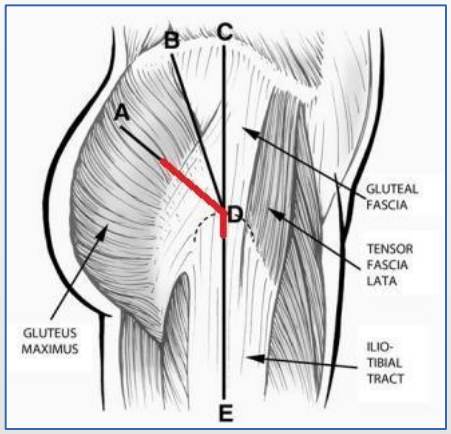
eeterotopic ossifications

Judet R, Judet J, Letournel E. Fractures of the acetabulum: classification and surgical approaches for open reduction. J Bone Joint Surg Am 1964;46:1615– 75.

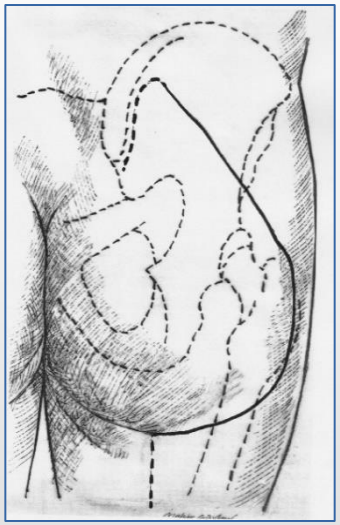
Dickson WH, et al, "*Muscle strenghteing testing for lowing surgery foracetabular fractures*". J Orthop Trauma Am 2006; 20(8): 573-5

Matta JM,Olson SA.Factors related to hip muscle weakness for lowing fixation of acetaboular fractures.Orthopaedics.2000;23:231-235

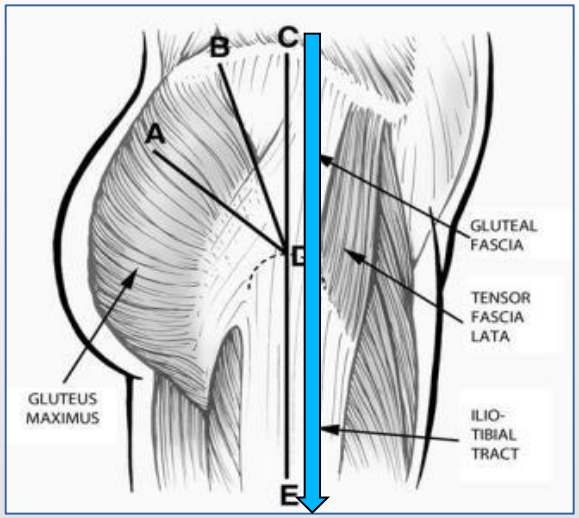
Surgical approaches and literature review



James B.Carr
2006
R.Spagnolo
2009

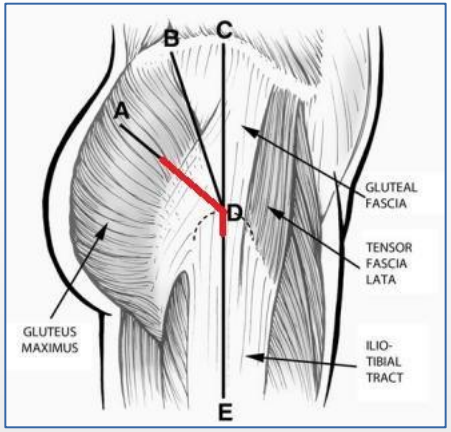


N. K. Magu
2011



B.R. Moed
2010-2014

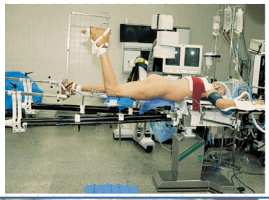
Gluteus Maximus–Splitting Approach

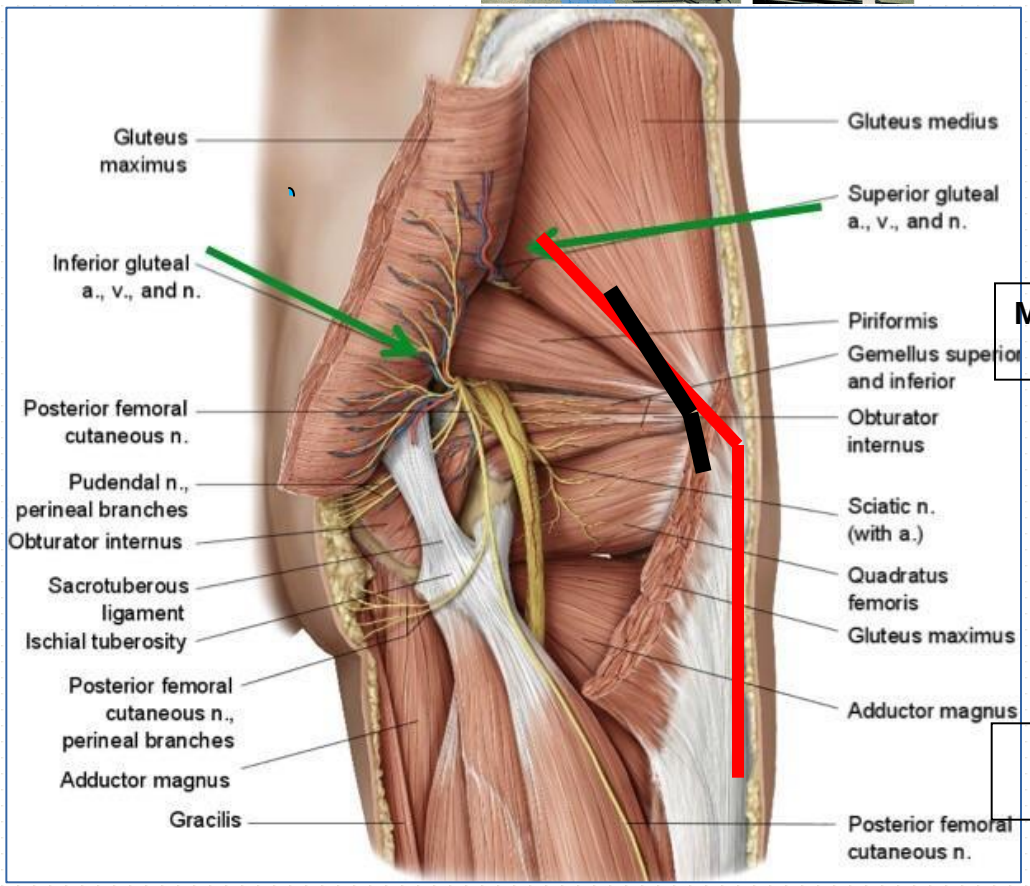


James B.Carr et al. Small-Incision Surgical Exposure for select Fractures of the Acetabulum:The Gluteus Maximus-Splitting.*J Orthop Trauma-Volume 20 , Number 8 , September 2006* ***LATERAL POSITION***

R.Spagnolo et al Minimal-invasive posterior approach in the treatment of the posterior wall fractures the acetabulum.Chir.Org.Mov May 2009 93(1),9-13
Injury extra 2007

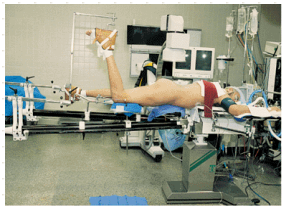
Surgical Tecnique Splitting Approach



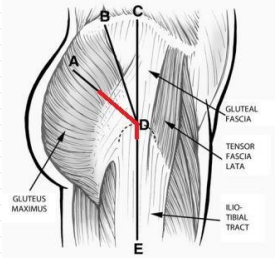


Minimal-invasive posterior approach

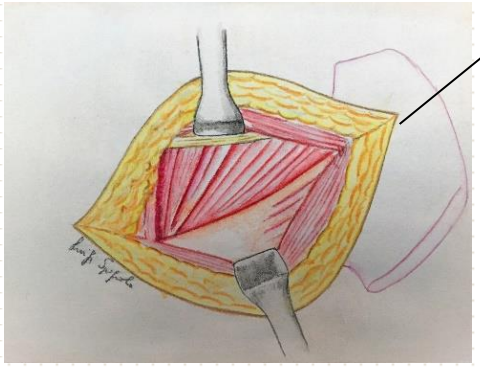
KL Approach



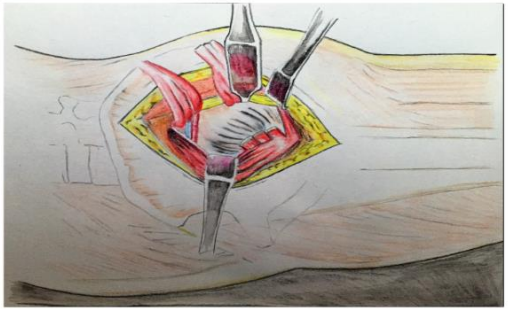
Surgical Tecnique



Incision 12-18 cm



Skin incision about 4-6 to SPI and continue till the great trochanter. Divide the fascia lata in line with the skin incision and bluntly split the gluteus maximus. The splitting approach is minimal to protect the branch of the superior gluteal nerve to the antero-superior portion of the gluteus maximus to avoid DENERVATION



Incise the short external rotators muscles at their tendinous insertions on the greater trochanter and reflect them medially to further protect the sciatic nerve. Next, elevate the gluteus medius and minimus sub-periosteal from the posterior and lateral ilium. The dissection to avoid lesions to superior gluteal artery and nerve. We preserve quadratus femoris muscle to avoid bleeding due to medial circumflex artery lesion and the subsequent AVN of femoral head.

Spare external hip rotatores approach

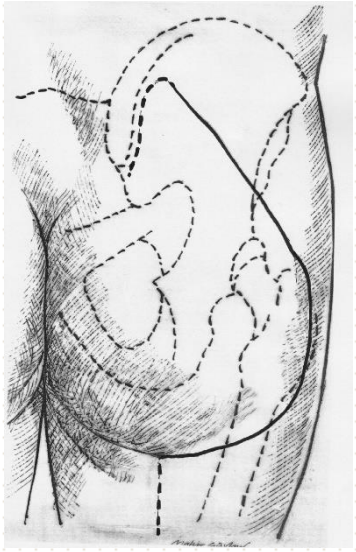
N. K. Magu, R. Rohilla, S. Arora, and H. More, “Modified kocher-langenbeck approach for the stabilization of posterior wall fractures of the acetabulum,” *Journal of Orthopaedic Trauma*, vol. 25, no. 4, pp. 243–249, 2011.

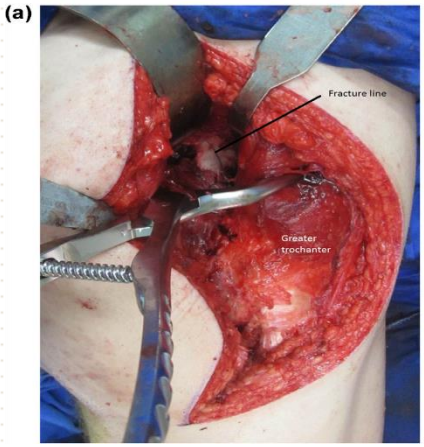
C. Josten and O. Trabold, “Modified “2-portal” kocher Langenbeck approach: a minimally-invasive procedure protecting the short external rotator muscles,” *Journal of Orthopaedic Trauma*, vol. 25, no. 4, pp. 250–257, 2011

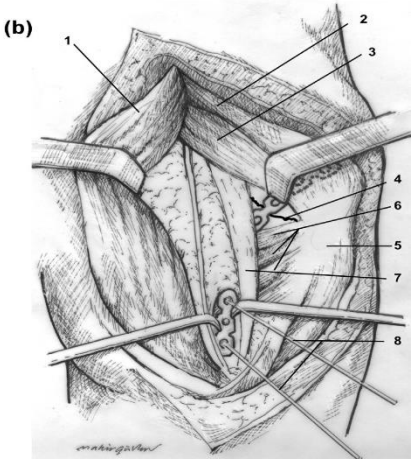
A. Y. Sarlak, O. Selek, M. Inanir, R. Musaoglu, and T. Baran, “Management of acetabular fractures with modified posterior approach to spare external hip rotators,” *Injury*, vol. 45, pp. 732– 737, 2014.

Ceylan H, Selek O, Inanir M, et al. External rotator sparing with posterior acetabular fracture surgery: does it change outcome? [Journal Article] *Adv Orthop 2014.:520196*.

Management spare external hip rotatores





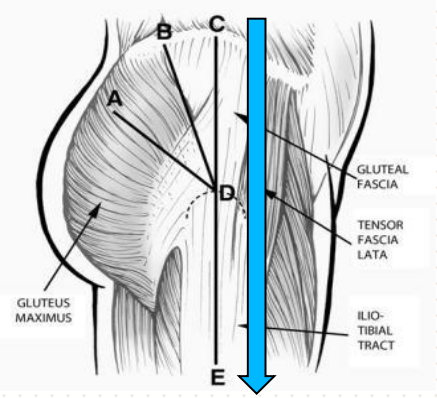


A. Y. Sarlak, O. Selek, M. Inanir, R. Musaoglu, and T. Baran, “Management of acetabular fractures with modified posterior approach to spare external hip rotators,” *Injury*, vol. 45, pp. 732– 737, 2014.

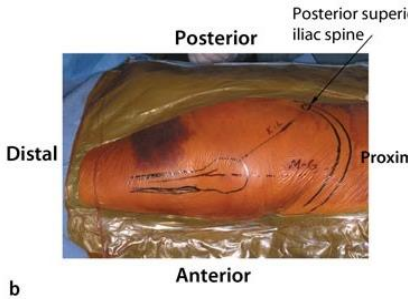
The modified Gibson posterior surgical approach

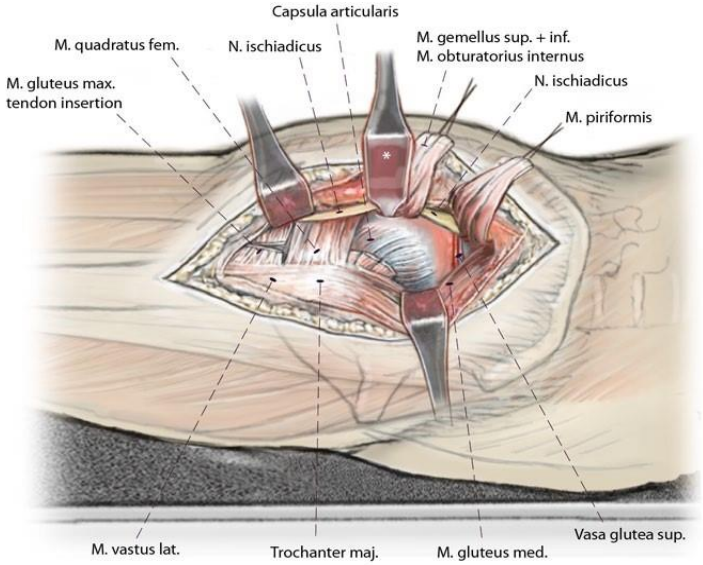
Moed BR The modified Gibson posterior surgical approach to the acetabulum. *J Orthop Trauma* 24:315–322 2010

B.R. Moed The modified Gibson approach to the acetabulum. **Operative Techniken** Operative Orthopädie und Traumatologie , Vol 26, Issue 6, 591-602 ,2014



Indication use this approach was of compromised posterior soft tissues





The modified Gibson skin incision shown as compared with previous skin incisions. The greater trochanter is outlined by *black dashes* (*D*).

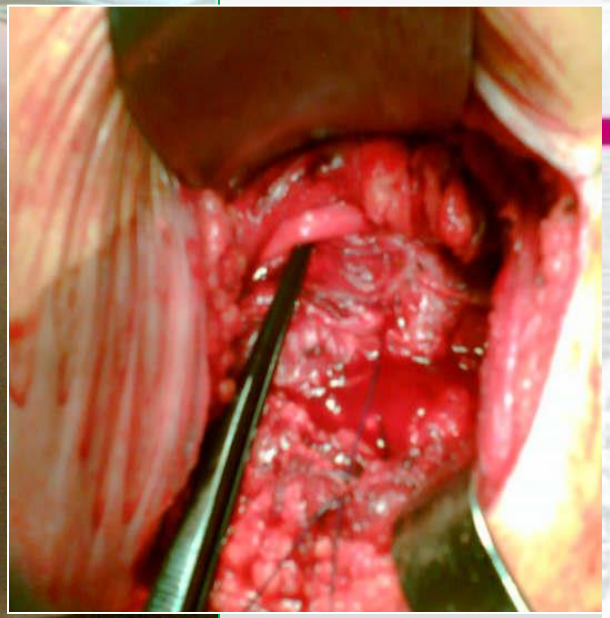
The *straight line* (*C, D, E*) shows the current skin incision for the modified Gibson approach superimposed on the muscles and fascia.

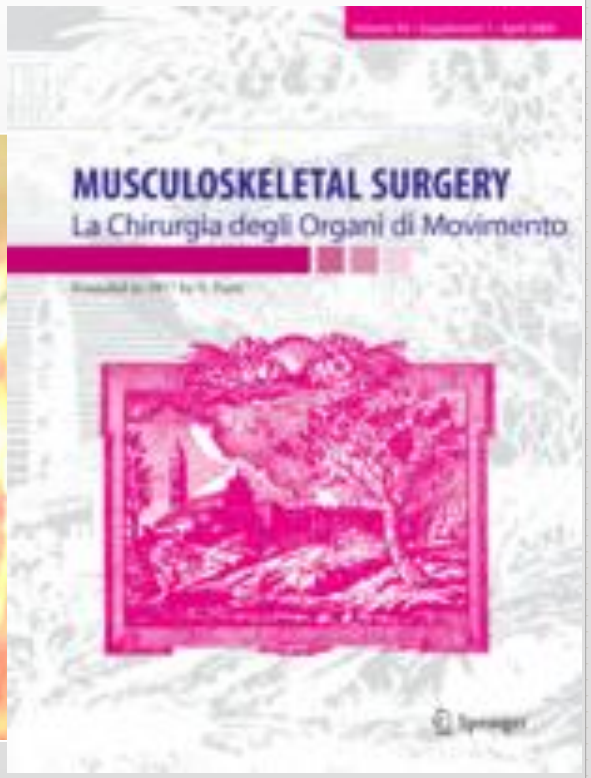
The *angled line* (*B, D, E*) shows the location of Gibson's original skin incision [3].

The *angled line* (*A, D, E*) shows the location of the Kocher–Langenbeck skin incision. (Berton R. Moed)

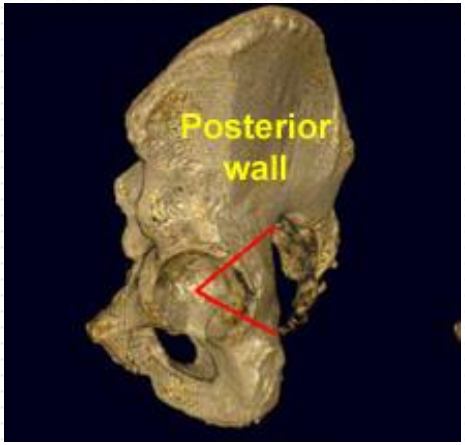
Surgical Tecnique Splitting approach

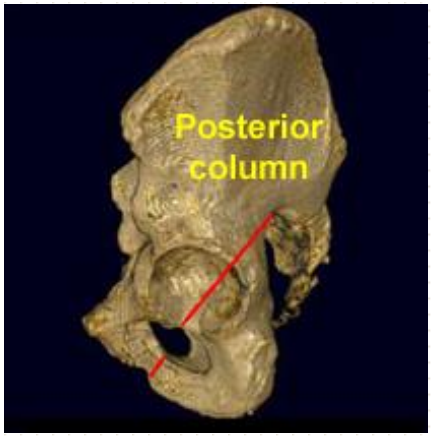
Indications
Cases Report

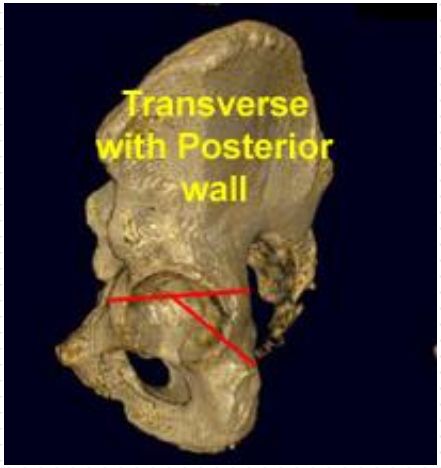


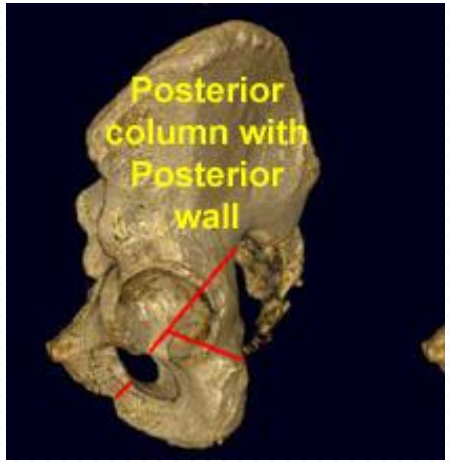


Posterior Approach









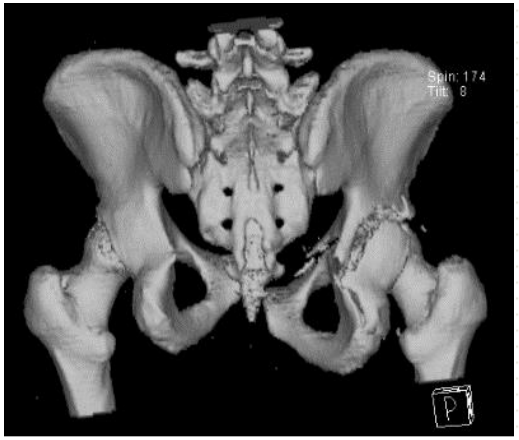
Minimal-invasive posterior approach in the treatment of the posterior wall fractures of the acetabulum ,2009 R.SPAGNOLO ET AL.

Planning

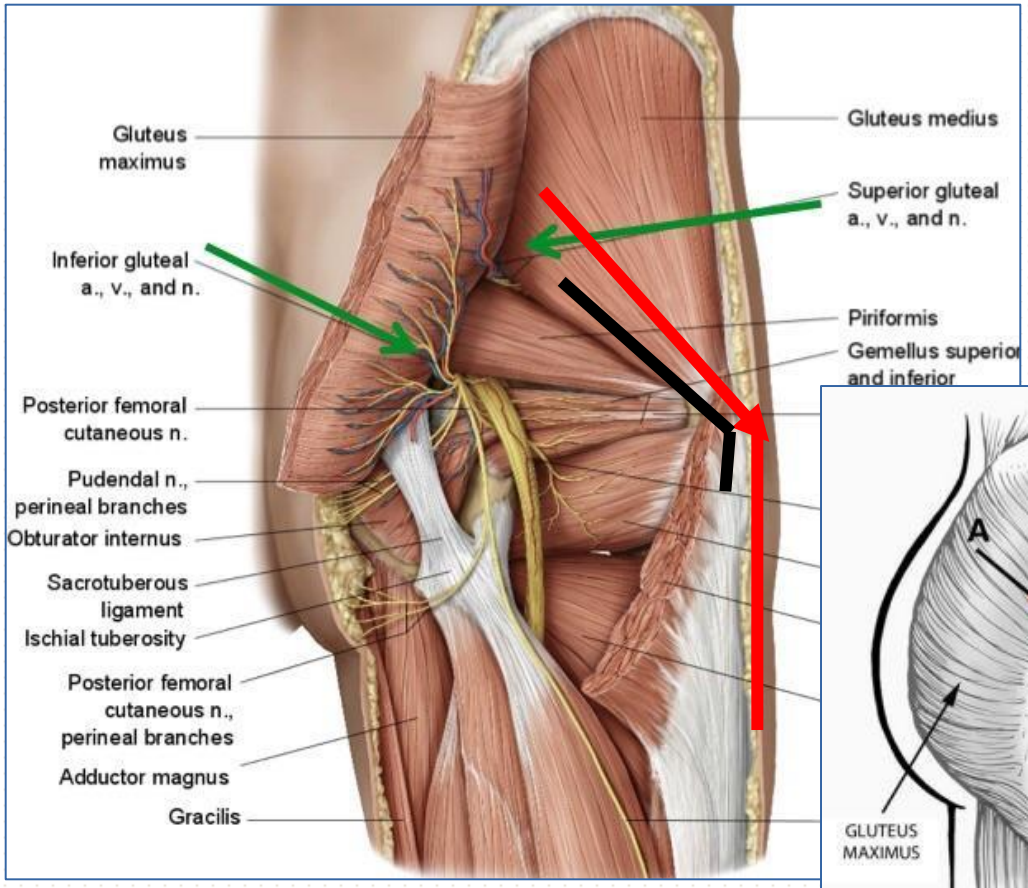


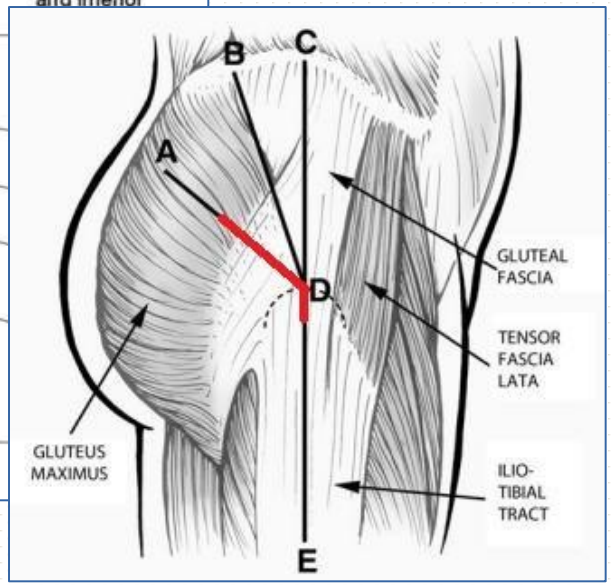




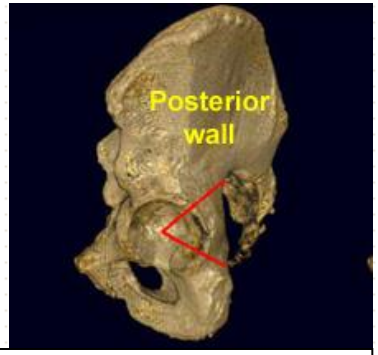


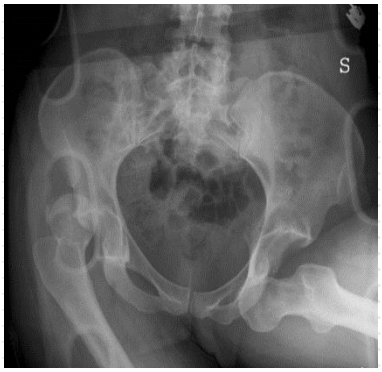
Clinical cases

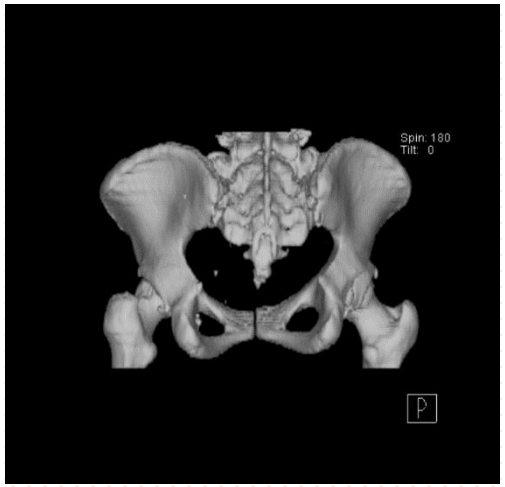




First Case 2004 H.Niguarda Milan







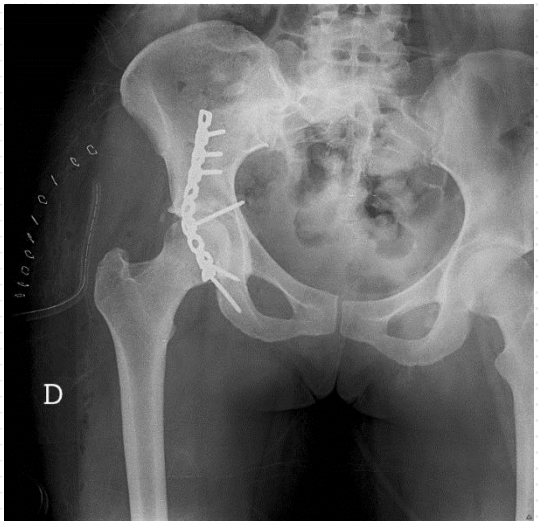
TBI commotio

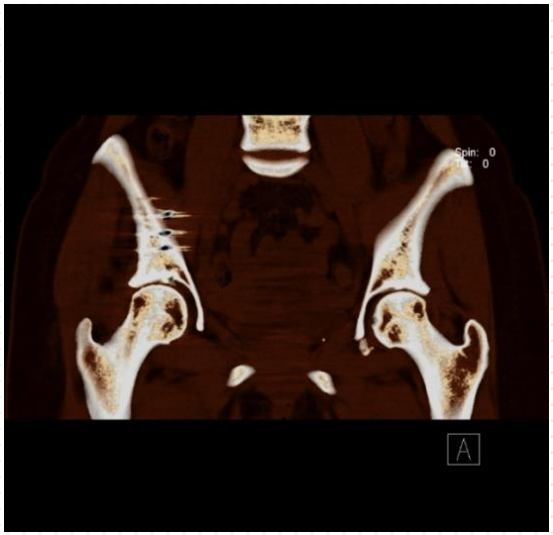
bilateral hip dislocation with fracture of the posterior wall to the right

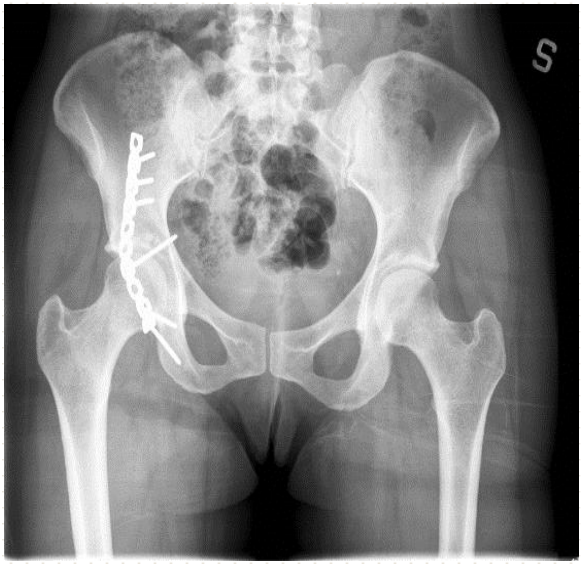
first degree burn right hip

No indomethacin

Follow –up: 7 y







NON SOLUS

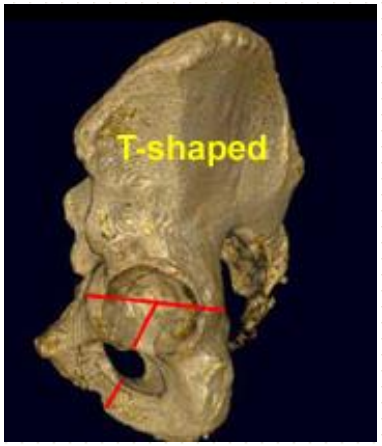
ELSEVIER

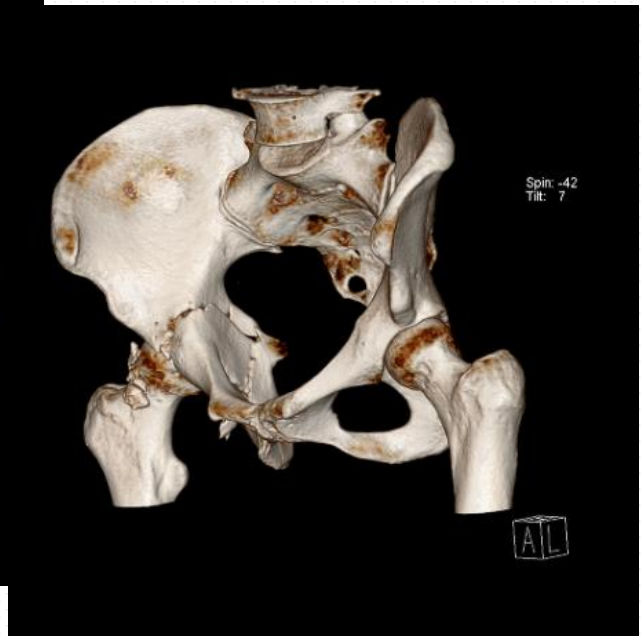
Posterior bilateral hip dislocation with ipsilateral acetabular fracture

R. Spagnolo .

Injury Extra (2008) 39, 65—67

2nd Case 2007 H.Niguarda Milan ,surgery after 6 day

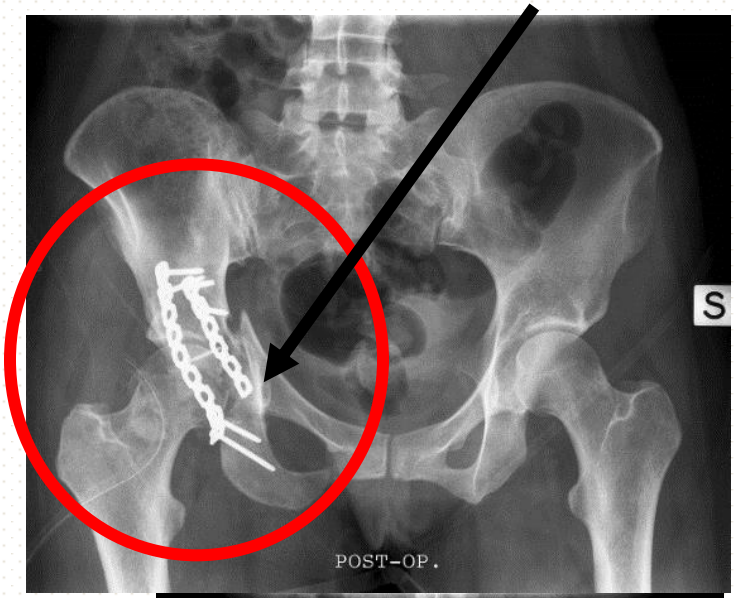


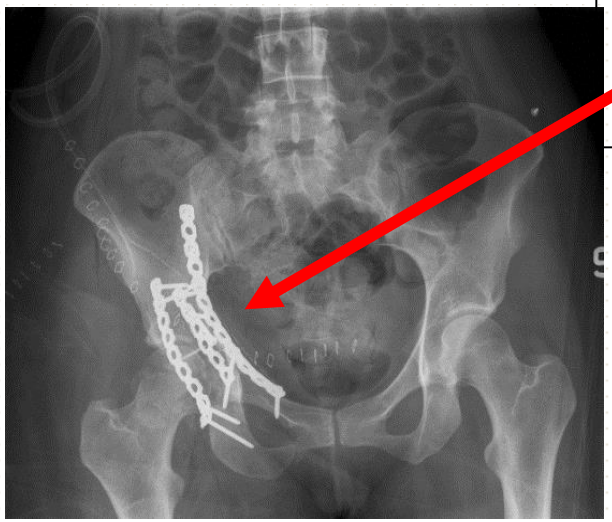


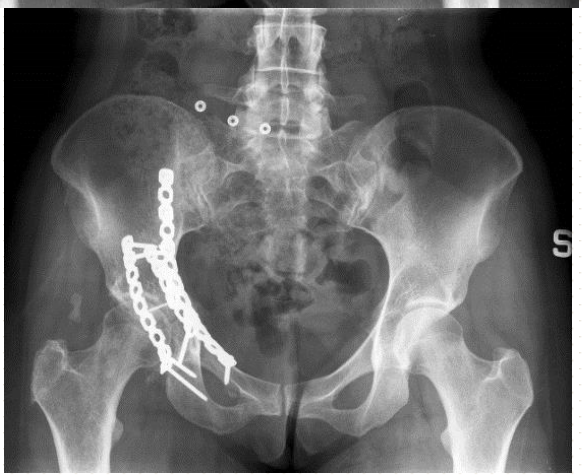
Follow-up: 4 y

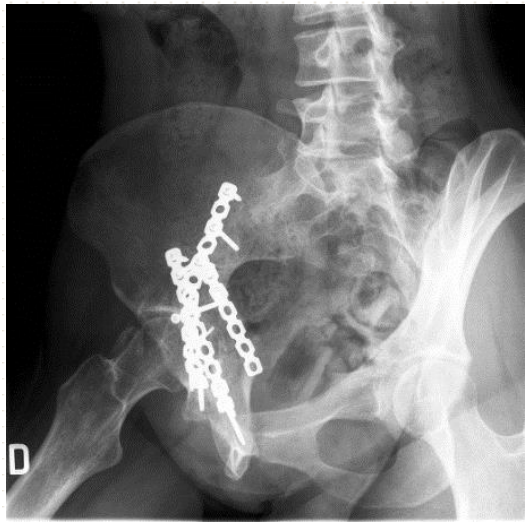
NO SCREW …..to facilitate

… .the reduction anterior plate

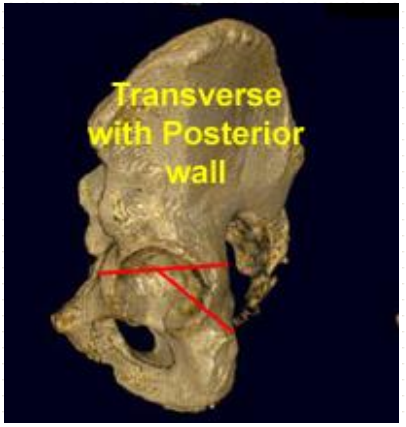


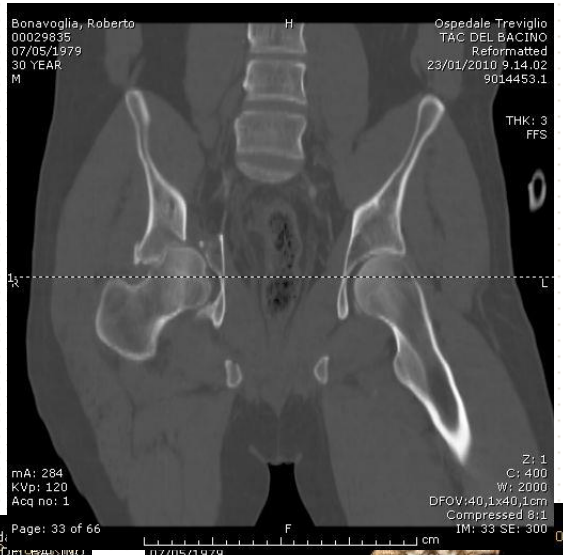


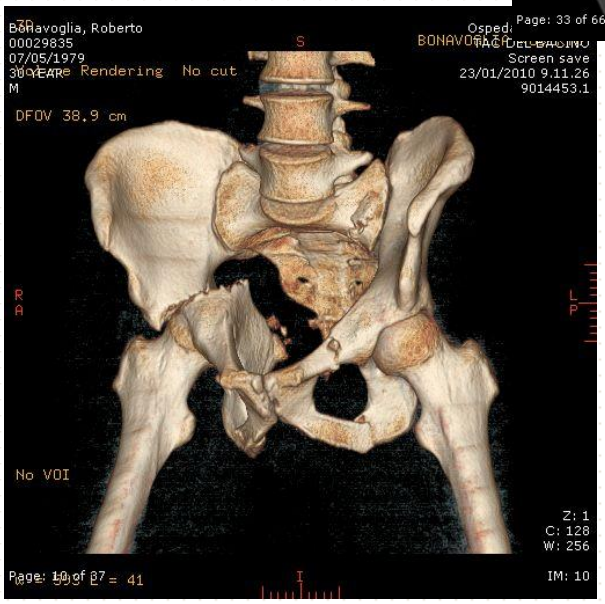


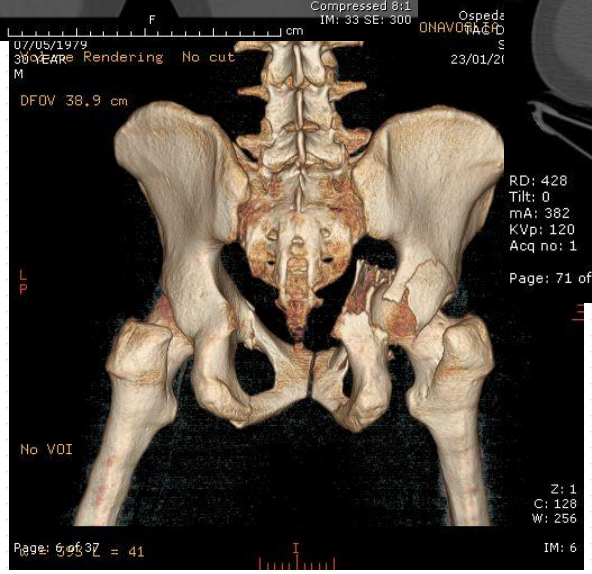


3th case **Hospital Treviglio (BG) 2010**

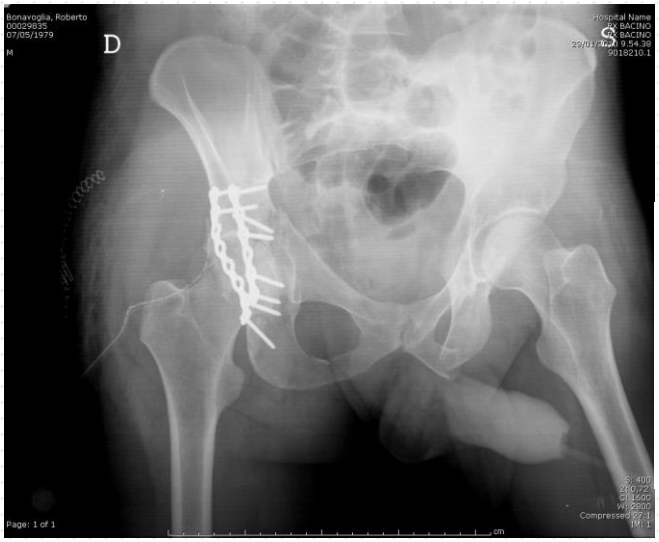


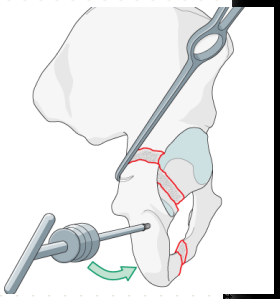


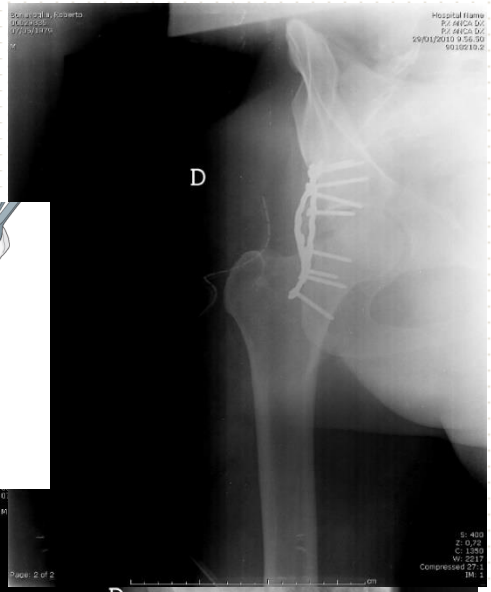


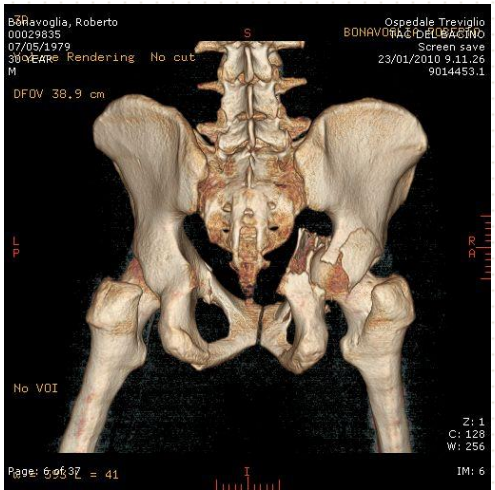


Hospital Treviglio (BG) 2010 Surgery after 4 day

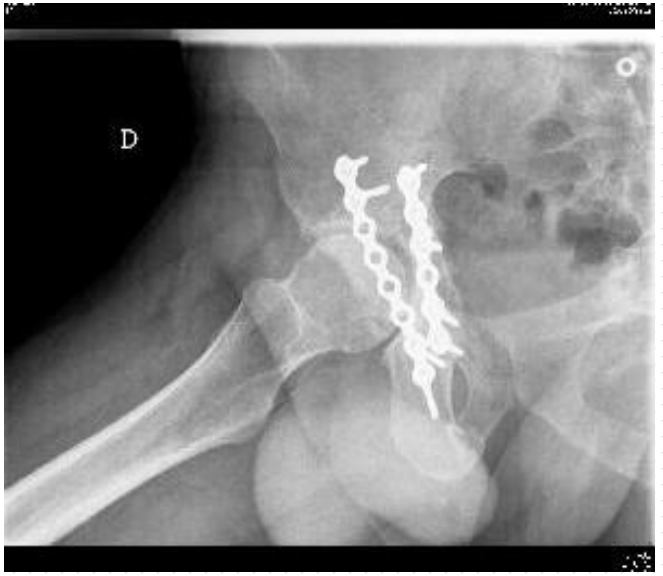








Follow-up: 3 y



Special case 2006

Head commotion
Male
Transverse fracture complex

Burn widespread

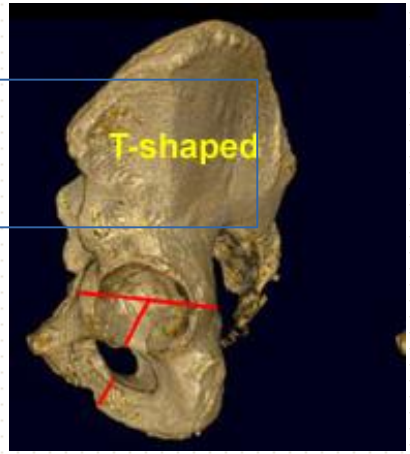
Sciatic injury complete
Thoracic abdominal trauma
Open fracture right hand

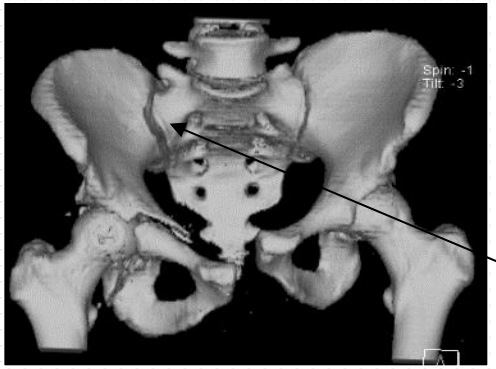
Transferred to H.Niguarda after 27 day of trauma … .

Surgery after 35 days

No indomethacin (stress ulcer)

Special case

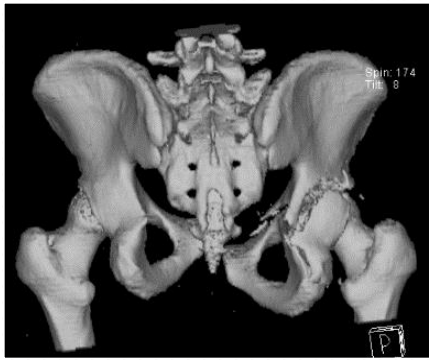




Surgical Approach?….firstly?
Anterior Approach
Posterior Approach

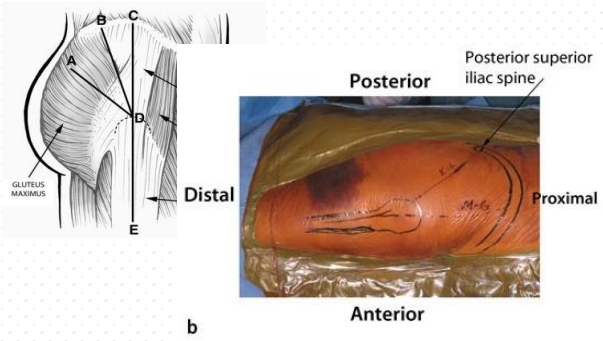
Right Sacro-Iliac joint

Anterior Pelvic Ring Instability

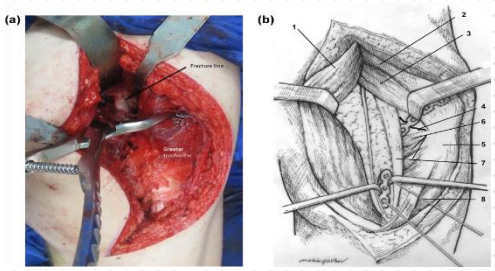


Special case

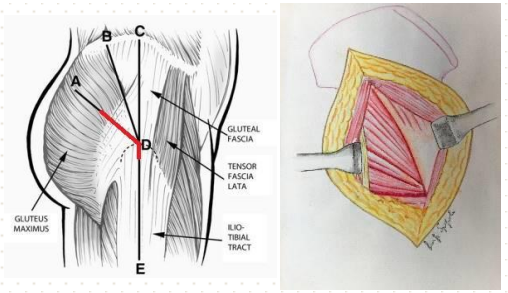
Surgical Approach….?



Modificated Gibson approach-2014 Moed

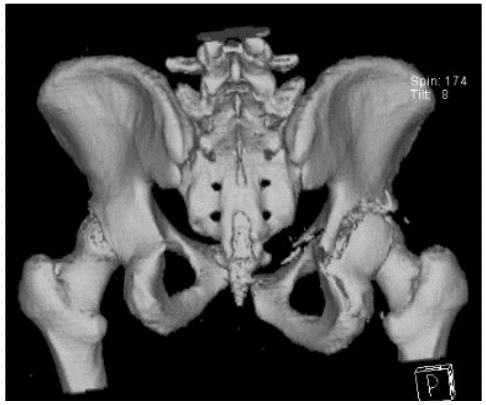


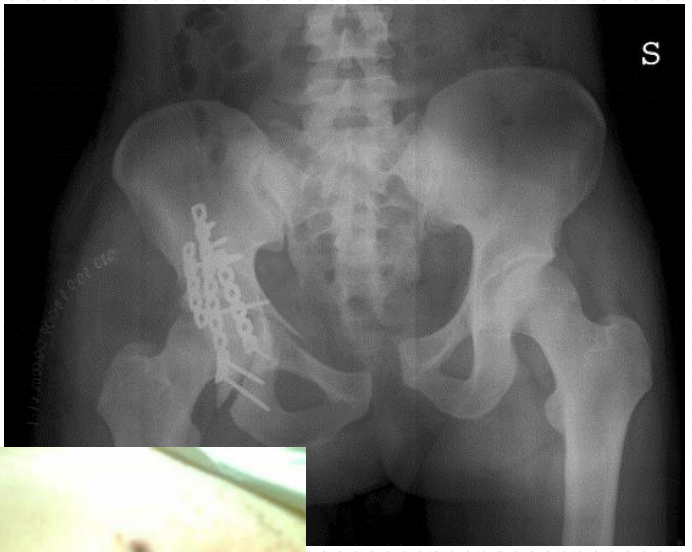
spare external hip rotatores
A. Y. Sarlak 2014,

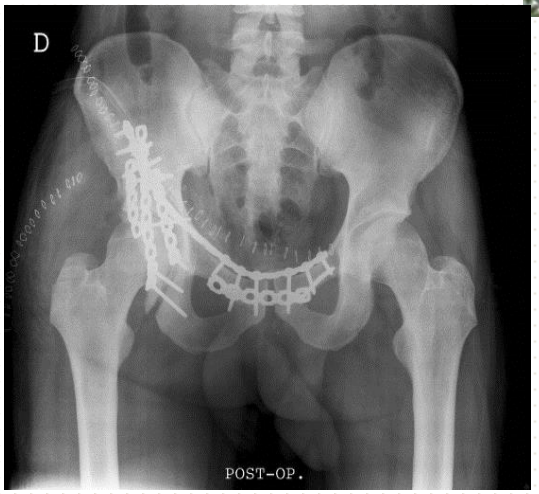


Splitting Gluteus
R.Spagnolo 2008
2009

After Surgery



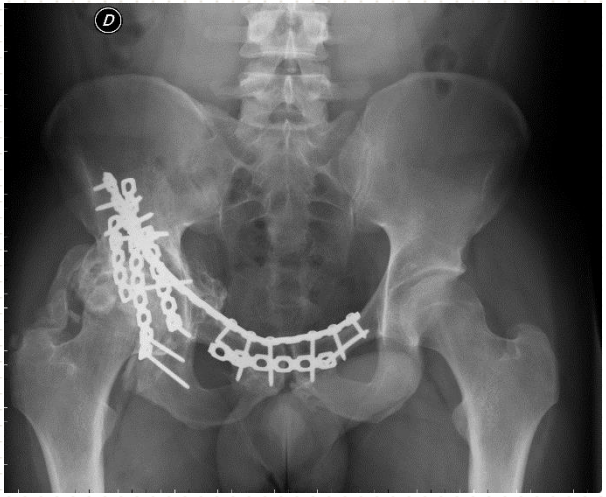


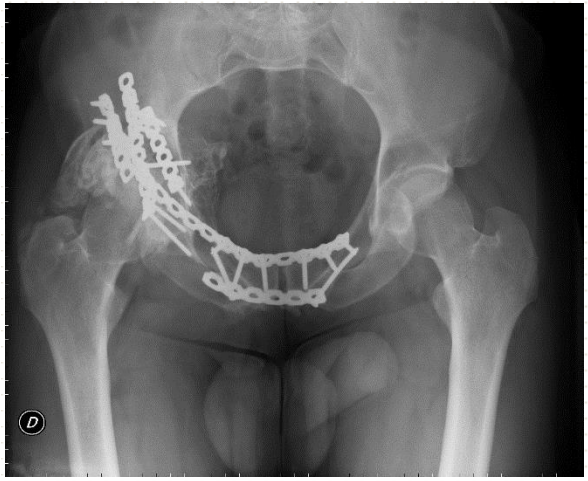


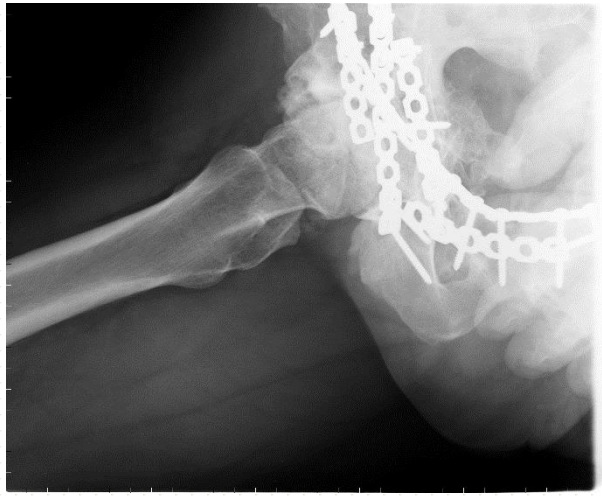
Heterotopic ossification after an acetabular fracture has been shown to be related to the surgical exposure,male sex, associated head injury and the fracture type,skin …**Time of surgery**

TILE M. FRACTURES OF THE ACETABULUM 1995

Follow-up: 50 months







Clinical Follow-up: 60 months

Complication

A proximal deep vein thrombosis	3 cases
Osteonecrosis	1 cases
Osteoartrhoris	1 case
Heterotopic ossification,	Type 1 10
	Type 3 1

Results:54 cases
Survey in 70%

Clinical outcomes, according to Merle d'Aubigne and Postel, we obtained in 54 cases with follow up over 36 months:

excellent (66%)
very good (22%)
good (11%)
Bad (1%)(Prosthesis 2 cases)
The latest follow-up X-rays were were excellent in (68%), good in (30%).

Conclusion

Best tropism muscle in postoperative ROM

Best especially hip abduction

Reduction of postoperative transfusions

James B.Carr et al. Small-Incision Surgical Exposure for select Fractures of the Acetabulum:The Gluteus Maximus-Splitting.*J Orthop Trauma-Volume 20 , Number 8 , September 2006*

R.Spagnolo et al Posterior bilateral hip dislocation with ipsilateral acetabular fracture Injury Extra 39,65-67 2007

R.Spagnolo et al Minimally invasive posterior approach in the treatment of the Posterior wall fractures of the acetabulum . Musculoskelet Surg 93:9-13 2009

Moed BR The modified Gibson posterior surgical approach to the acetabulum. *J Orthop Trauma* 24:315–322 2010

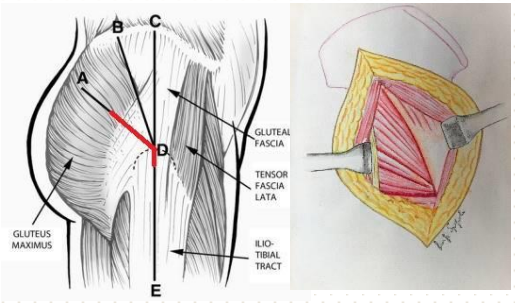
N. K. Magu, R. Rohilla, S. Arora, and H. More, "Modified kocher-langenbeck approach for the stabilization of posterior wall fractures of the acetabulum," *Journal of Orthopaedic Trauma*, vol. 25, no. 4, pp. 243–249, 2011.

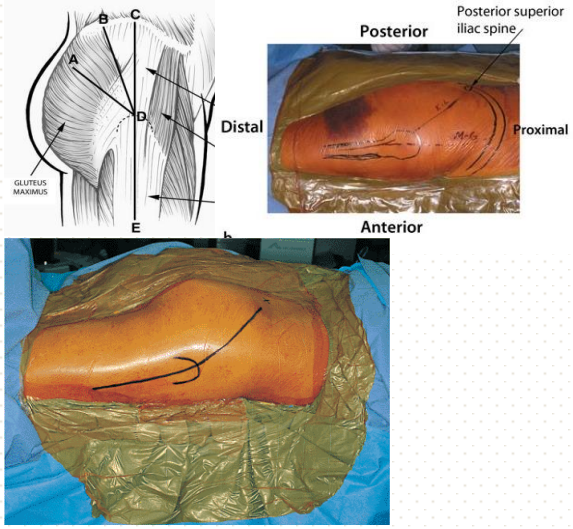
Ceylan H, Selek O, Inanir M, et al. External rotator sparing with posterior acetabular fracture surgery: does it change outcome? [Journal Article] *Adv Orthop 2014.:520196.*

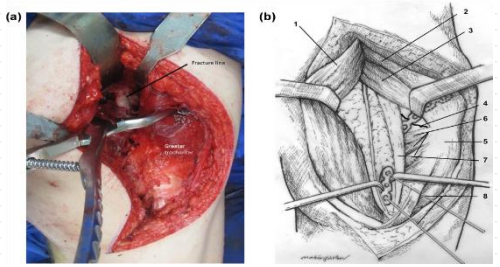
TAKE HOME

Surgery innovations are important, but thinking it is always easy to play them is a mistake .

IN DOUBT WE DO WHAT MASTERS TEACH – US TO DO







In chirurgia le innovazioni sono importanti ,ma pensare che sia facile riprodurle sempre è un errore.

NEL DUBBIO FACCIAMO QUELLO CHE I MAESTRI CI HANNO INSEGNATO

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Wrightington, Wigan and Leigh NHS
NHS Foundation Trust

Dislocation and complications after THA for acute femoral neck fractures

Mr A. Turaev
Mr A. Radhakrishnan
Mr A. Al- Khaled
Mr N Shah

26th November 2015

wrightington
Lower Limb Unit

your hospitals, your health, our priority

NICE Guidance (CG124)

- Offer total hip replacements to patients with a displaced intracapsular fracture who:
- were able to walk independently out of doors with no more than the use of a stick **and**
- are not cognitively impaired **and**
- are medically fit for anaesthesia and the procedure.

Standards (literature)

- Dislocation rate 10-22% (4 times higher than THR for OA)

- 45% of revisions are for dislocations

Aim

- To review dislocation rates and other complications in patients who had THR for neck of femur fracture in a DGH

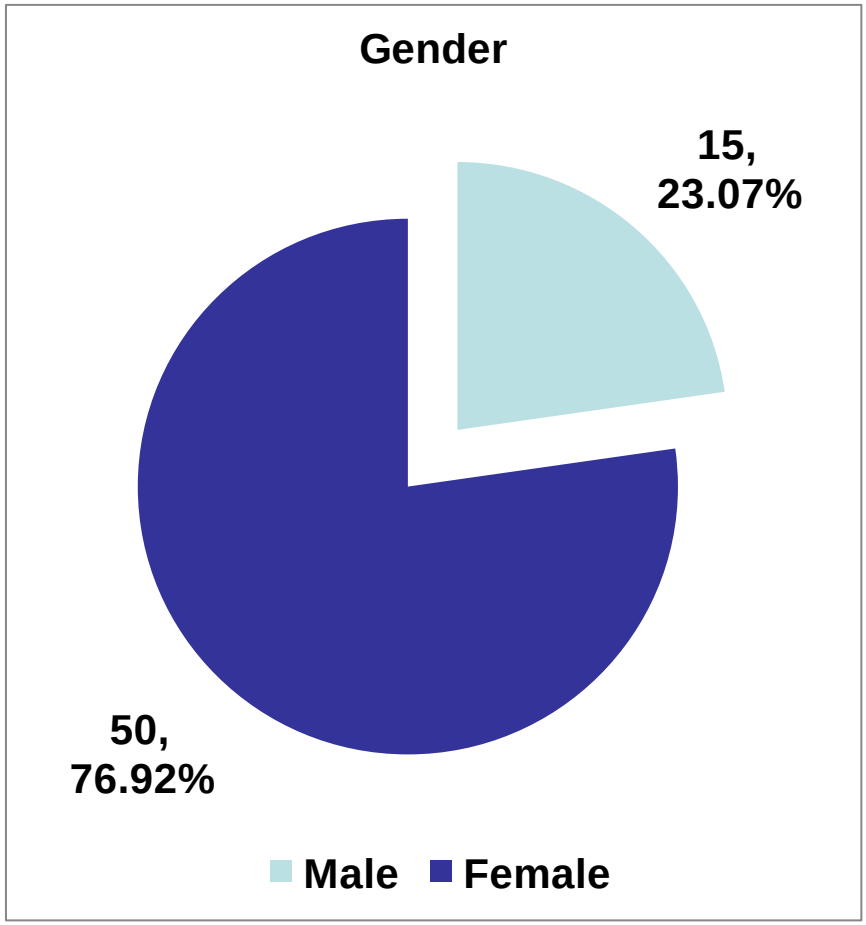
Methodology

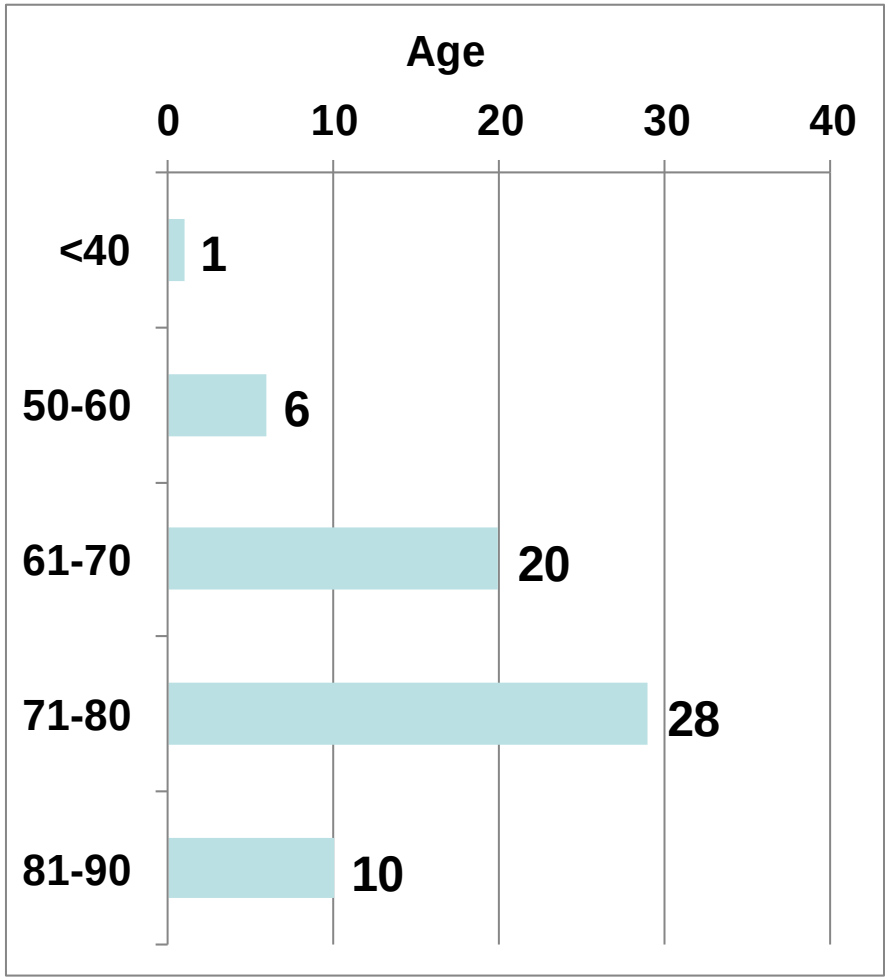
- Retrospective audit – 65 patients
- All THR for Fracture Neck of Femur
- Nov 2009 to Nov 2014
- 65 patients

Demographics

Mean: 71.53
Median: 72

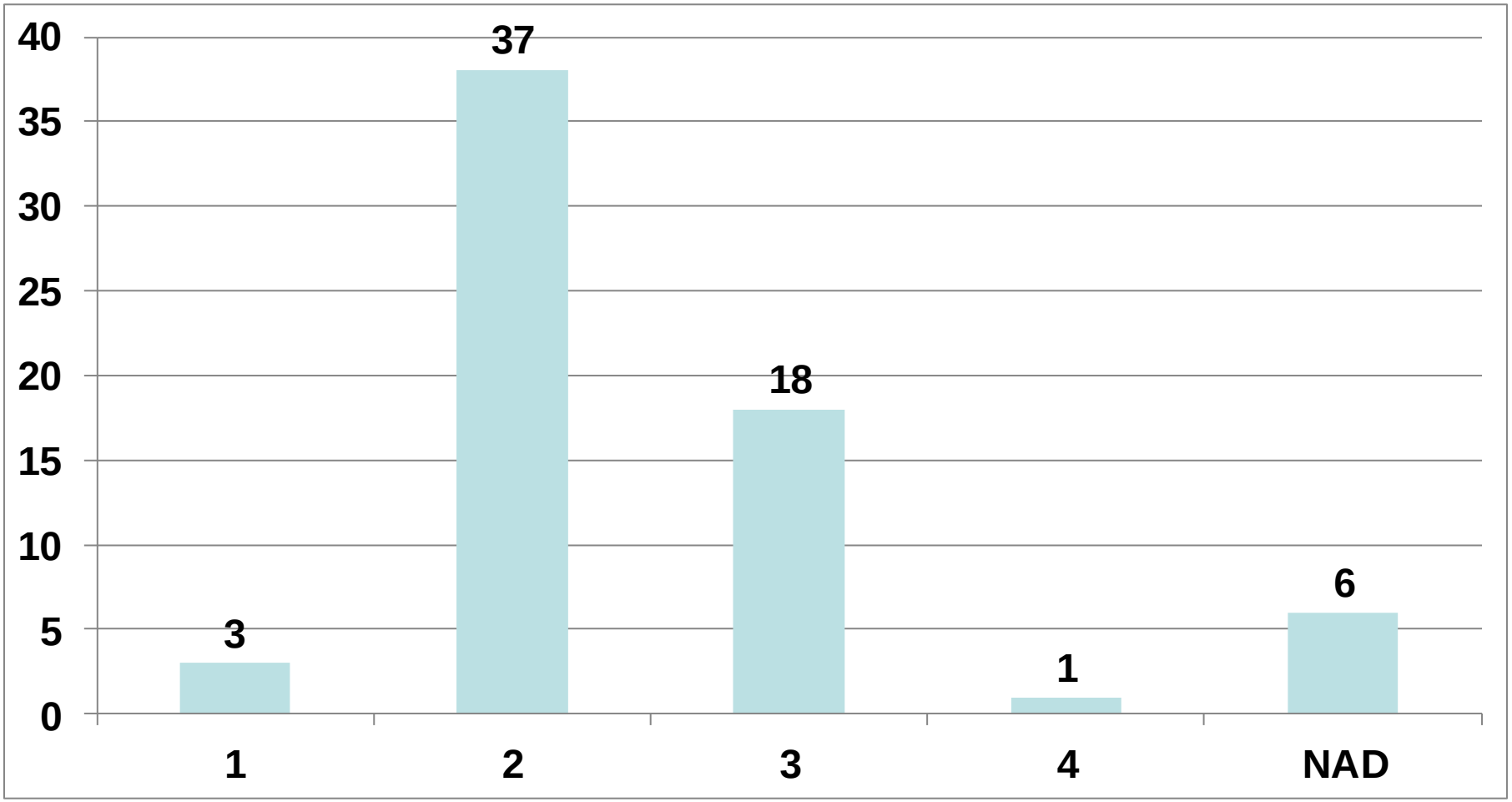
N = 65





ASA Grade

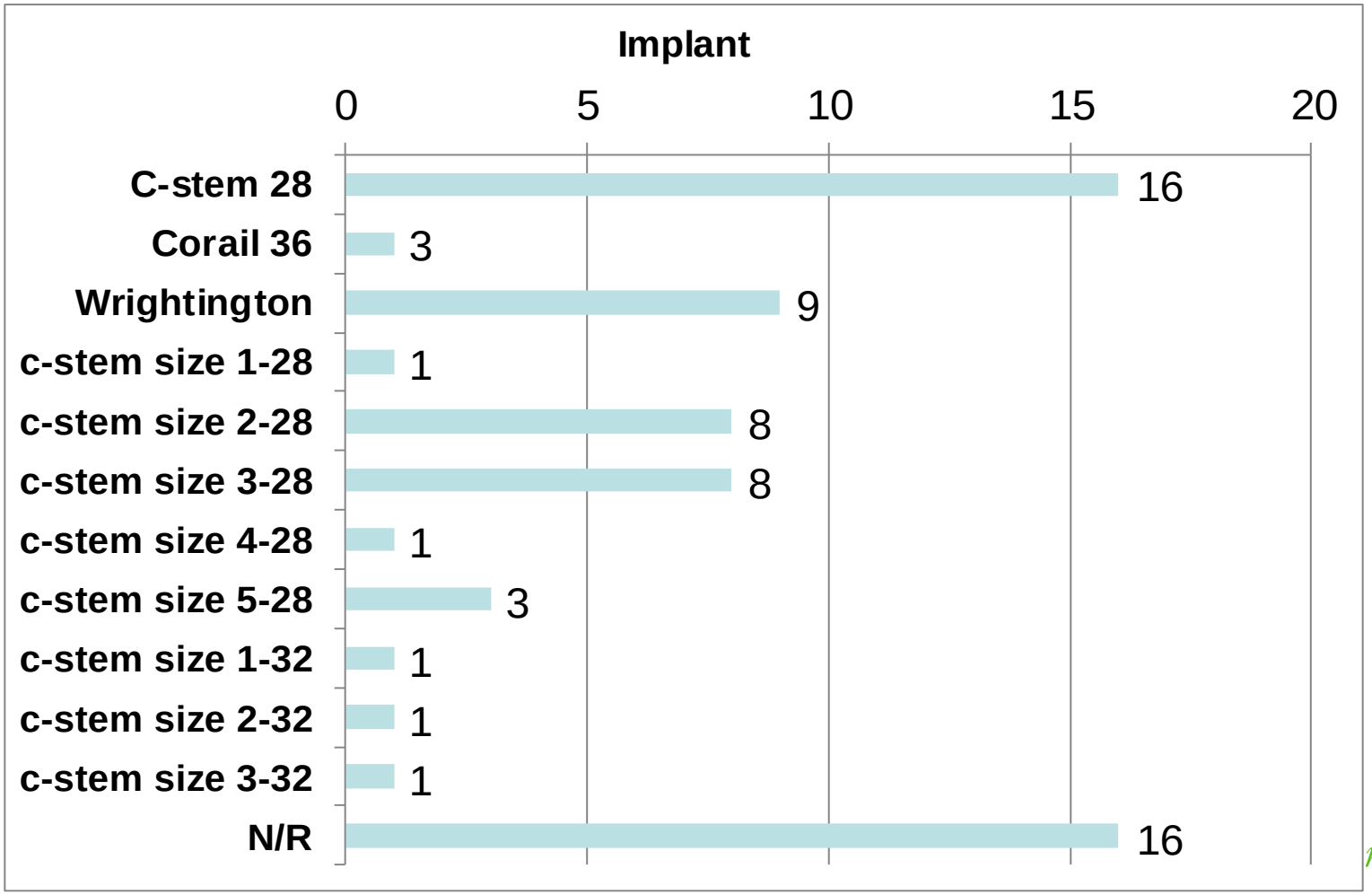
N = 65



Procedure

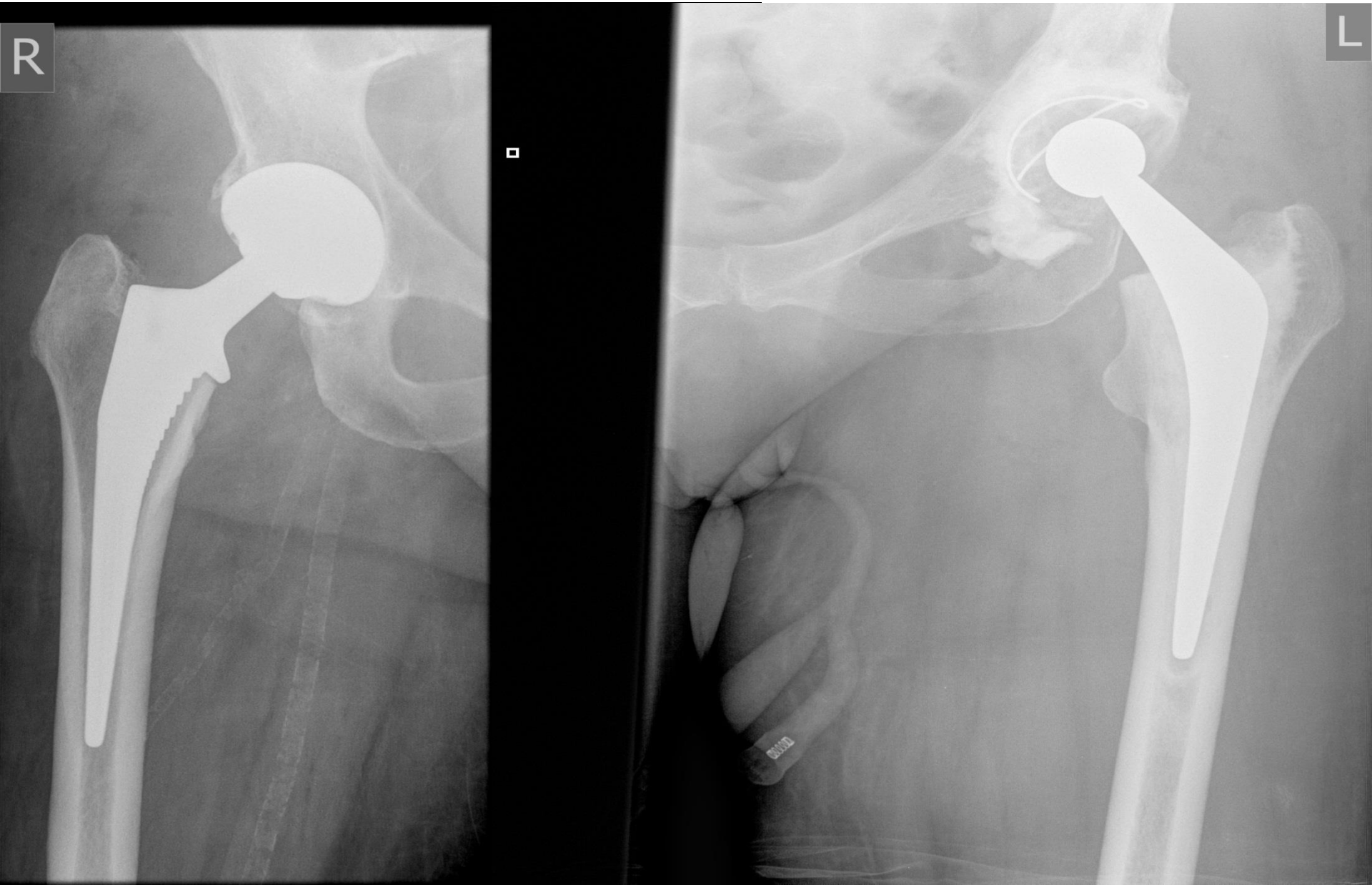
62 patients had Cemented THR
3 patients had uncemented THR

N = 65



riority

Post operative x-rays



Dislocation - 1 patient

- 1 (1.5%) patient x 4 dislocations
  - 77F
  - Progressive Alzheimer's after surgery
  - Non-complaint with instructions from day 1
  - Final outcome- pseudarthrosis
  - Poor patient selection in hinsight

Miscellaneous

- No infections
- Peri-prosthetic # (cemented stem) 1
  (revision THR)
- No fatal PE (VTE diagnosed in 4)

30 day mortality

- None

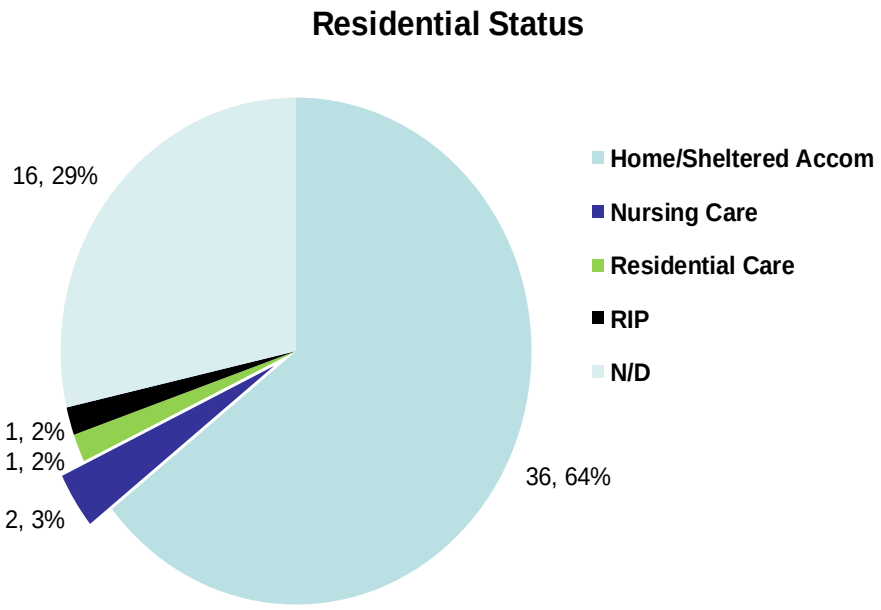
Late Mortality > 12 months

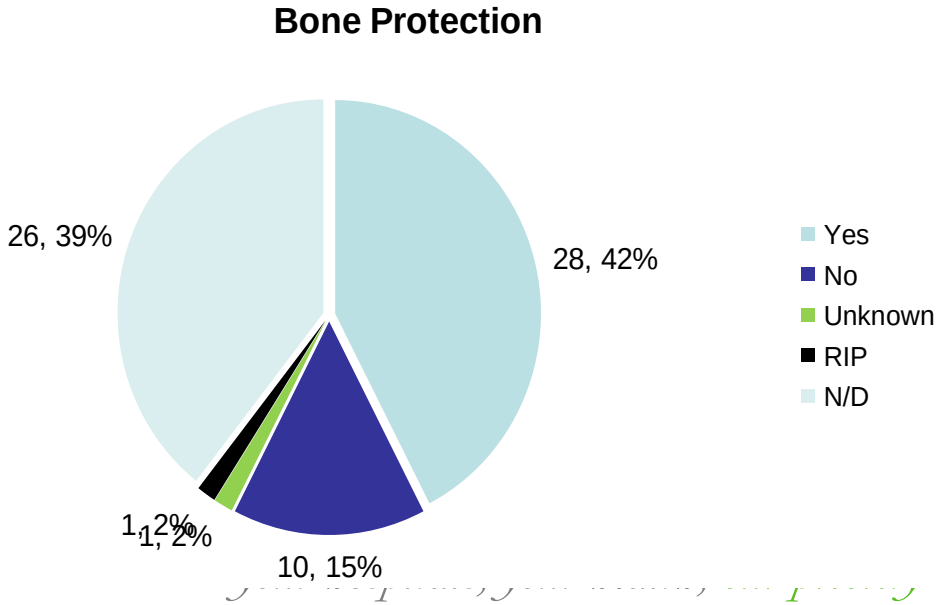
- 9 (14%)
  - 3 patients 2012
  - 4 patients 2013
  - 2 patients 2014

Revision

- 2
- 1 Girdlestone pseudarthrosis
- 1 stem revision for periprosthetic fracture(Vancouver B2) 3 years after primary procedure.

Outcome @ 1 Year





Mobility @ 1year

- 2 (3%) = 2 aids or frame
- 32 (48%) = regularly walk without aids
- 3 (4.5%) = regularly walk with one aid
- 2 (3%) = wheelchair or bed bound
- 1 (1.5) = RIP
- 26 (39%) = N/D

Conclusion

- Majority remained at home or sheltered accommodation
- Most were mobile with minimal external aid
- No wound problems and infection
- Dislocation rate was 1.5%(1)
- DVT/PE 6%(4)
- 1 periprosthetic fracture

Discussion

- Low dislocation rate of THR for NOF patients
- No constrained bearings used
- Our % of THR less than national average
- ?? Influence of patient selection

Thank you

Grazie

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Constrained Total Hip Arthroplasty – "Retentive cup" in patients with Femoral Neck Fracture

A. Garti, M. Yassin, M. Weisbrot, M. Khatib, D. Robinson
Hasharon Hospital – Petah Tiqva, Israel

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY

SOCIETÀ ITALIANA DELL'ANCA

Rabin Medical Center

Optional Treatment for Displaced Femoral Neck Fracture: D.F.N.F.

A. CRIF or ORIF (Young and Active)

B. Hemiarthroplasty (Unipolar or Bipolar)

C. Total Hip Arthroplasty (Leonardson JBJS Br. 2009)

THA in general is accepted to give best functional results (Ravikumar KJ. Injury 2000)

Dislocation Rate after THA in Patients with D.F.N.F:

A. High – in Femoral Neck Fracture Patients (Up to 20% Ravikumar KJ, Inj. 2000, 25% Philippe Hernigou, CORR April 2010)

B. Low – in Osteoarthritic Patients (1%-1.5% - Berry D.J. – JBJS Am 2004)

C. High – in some group of Femoral Neck Fracutre patients treated with Hemiarthroplasty (Meek RMD – CORR 2006)

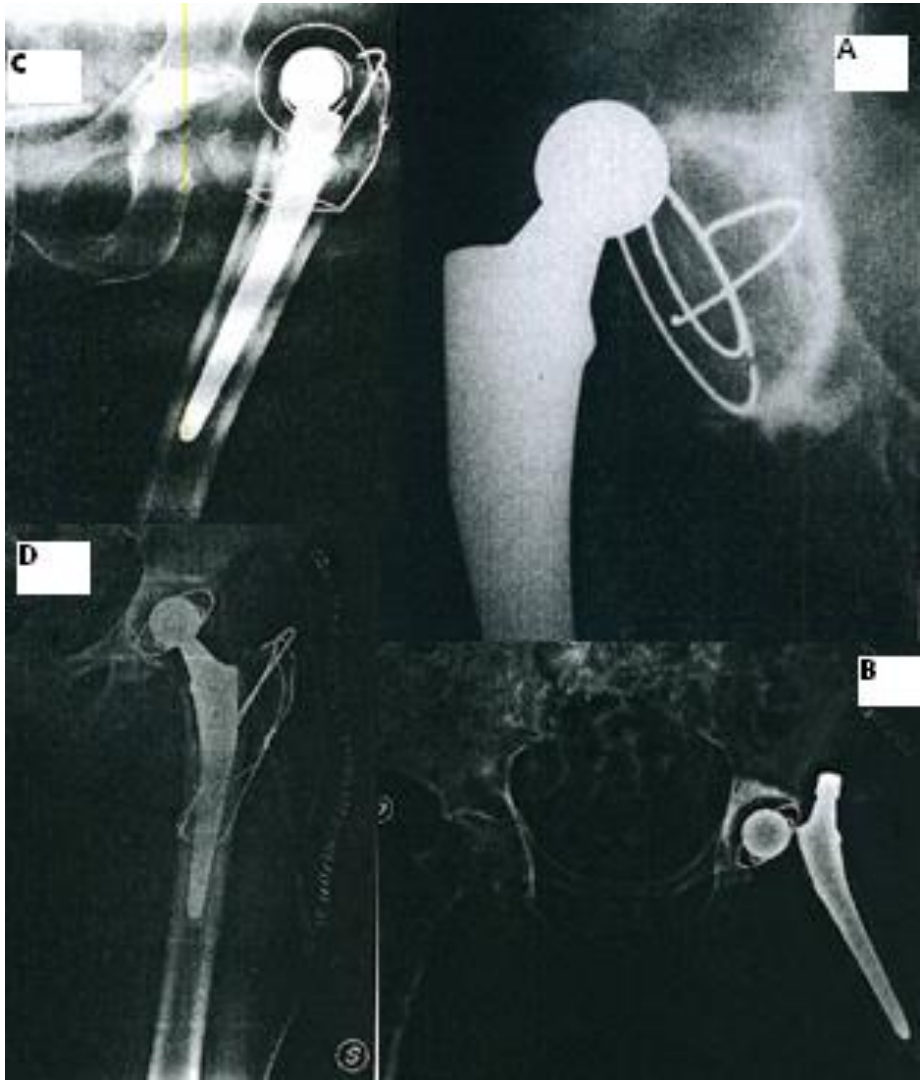
High Rate of Dislocations After Hemiarthroplasty in Femoral Neck Fracture Patients:

MULTIFACTORIAL: Mainly seen in "At Risk" Patients:

1. Low Demand Patients (Alzheimer, OBS, Down Syndrome)
2. Muscle Imbalanced Patients(Poliomyelitis, Marfan)
3. Neurologic Impaired Patients (post CVA, Hemiplegia, Paraparesis)
4. Tremor (Parkinson, Parkinsonism, Delirium)

Possible failures of constrained T.H.A:

A. Simple dislocation of the head from the socket (failure of the locking ring) – Technical: easy insertion of the head with less than 30N, dislocation needs 2153N.
B. Disengagement of the ball-head from the taper (the head remains in the socket)
C. Disruption of the socket from the pelvis with the prosthesis
D. Periprosthetic fracture



Methods:

2008 – 2012: 354 Patients with D.F.N.F. were treated in our Hospital.

"At Risk" Patients were treated with cemented constrained System "Retentive Cup – Cotyle Retentif, Group Lepine "

Results of Constrained THA in Patients with D.F.N.F – "At Risk":

87/354 Patients – Constrained THA

Avg Age 78 Years. 73% Female – 27% Male

18 – Hemiparesis / Hemiplegia

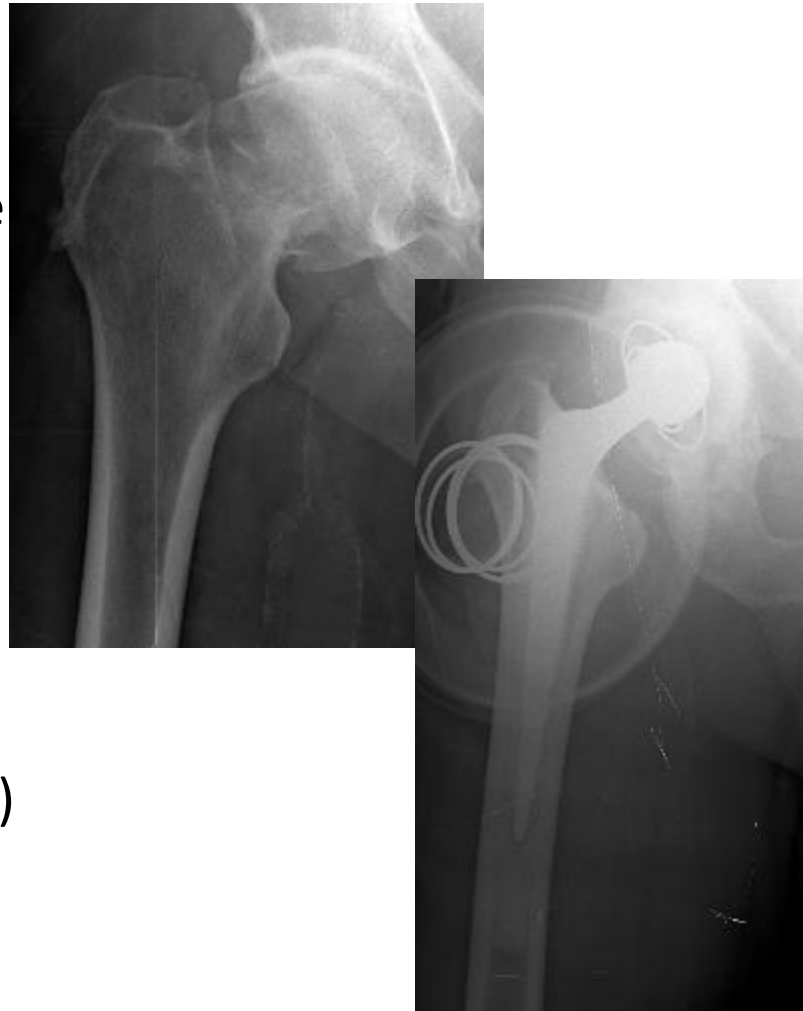
29 – Parkinson Dis. Of Parkinsonism.

39 – Sarcopenia (Alzheimer, OBS)

1 – Poliomyelitis

11 – Lost to Follow up

76 – Follow up 2.1 – 7 Years (Avg 4.5 Years)



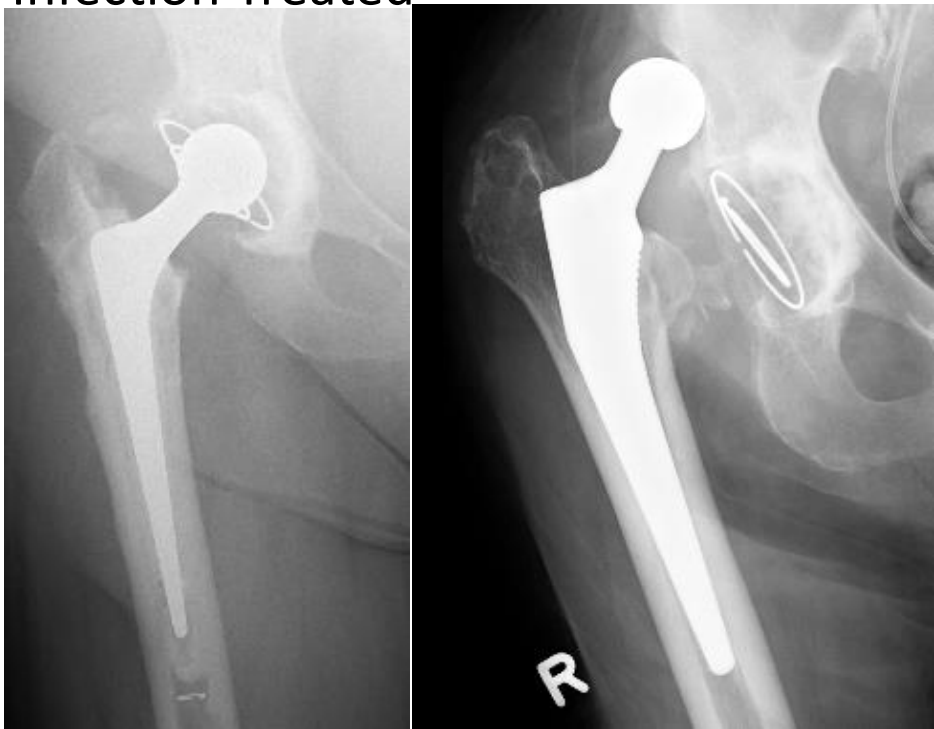
Results – Constrained THA in "At Risk" D.F.N.F Patients:

74/76 – Uneventful Recovery HOOS After 2 years 76+7.

2/76 – Dislocation of THA, - Due to Infection Treated with resection Arthroplasty

(Girdlestone)

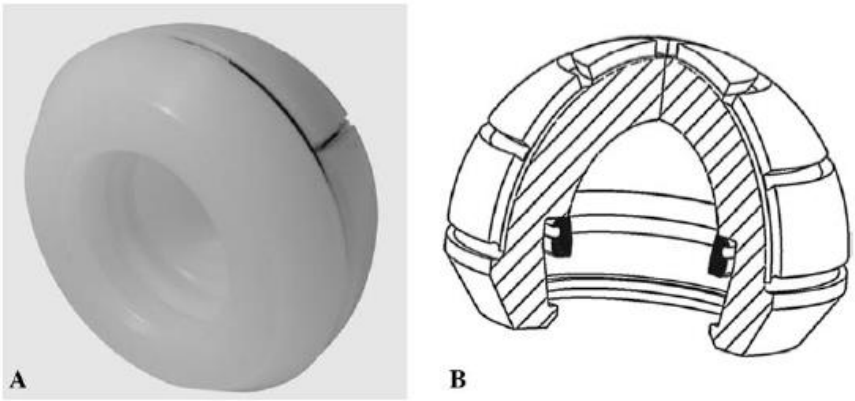
0/76 – No Mechanical Failure.

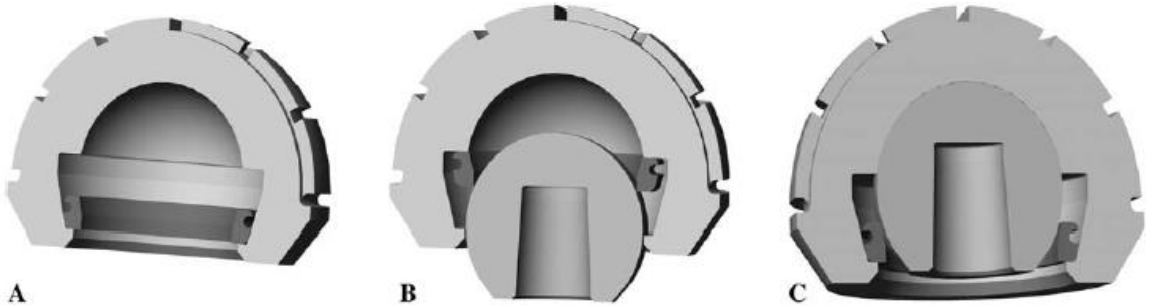


Technical Properties of the Retentive Cup (groupe lepine – France):

Design incorporating a Mobile Ring in a more enveloping P.E. Cup than the Hemispheric – Regular Model

A split locking P.E. Ring –permits– retentiveness. But in most situations the cup does not act as a locking Liner. Its acting like one only in extreme conditions.





Summery: T.H.A in D.F.N.F Patients

1. T.H.A is the Treatment of Choice in D.F.N.F patients (Kaplan-Mayer)
2. High Dislocation rate is mainly seen in "At Risk" patients
3. Dislocations can be reduced by using a Constrained Liner Cup.
4. Good functional results are achieved with "Retentive Cup" system.

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY

SOCIETÀ ITALIANA DELL'ANCA

Thank You!

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

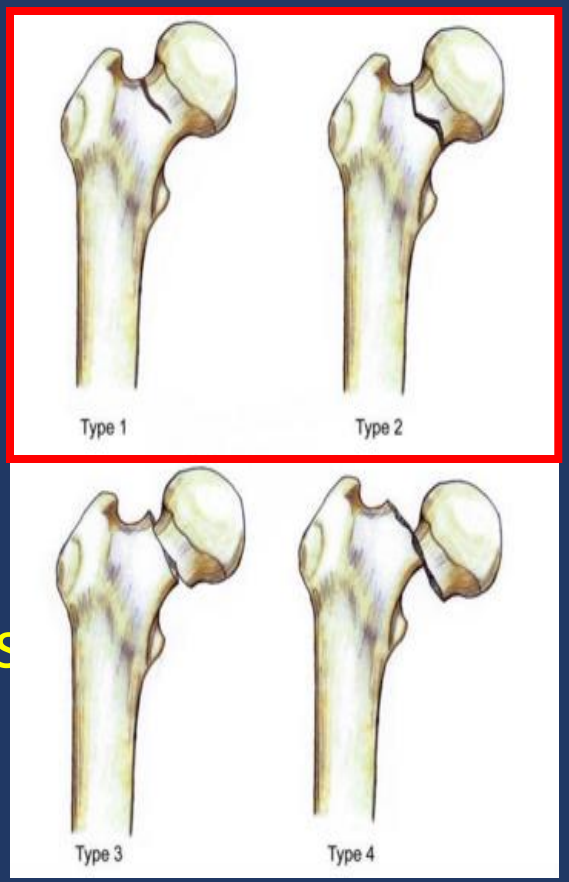
MILAN, ITALY

Dynamic Locking Plate VS. Simple Cannulated Screws For Nondisplaced Intracapsular Hip Fracture: A Comparative Study

Yaniv Warschawski , MD; Zachary T Sharfman, MS; Omri Berger , MD; Eyal Amar, MD ; Ely Steinberg , MD; Nimrod Snir, MD

Nondisplaced Intracapsular hip fractures

- Elderly -low energy falls
- 32 - 38 % of all ICHF
- Garden classification
- Garden I – valgus impacted
- Garden II – non-displaced fractures



Treatment

- cannulated screws -7.3mm accepted proc
- Complications- up to 5%
- re-operation rates - up to 19%

- Fixed angle locking plate - Targon FN- Aescu
- reduce the risk of femoral-head rotation pre fracture displacement into secondary varus subluxation

Aim

To Compare Targon FN device to standard cannulated screws for non displaced ICHF

Study design

Retrospective

115 patients

Garden 1/2 - nondisplaced or undisplaced fractures

July 2009 to December 2012

Surgery within 48 hours

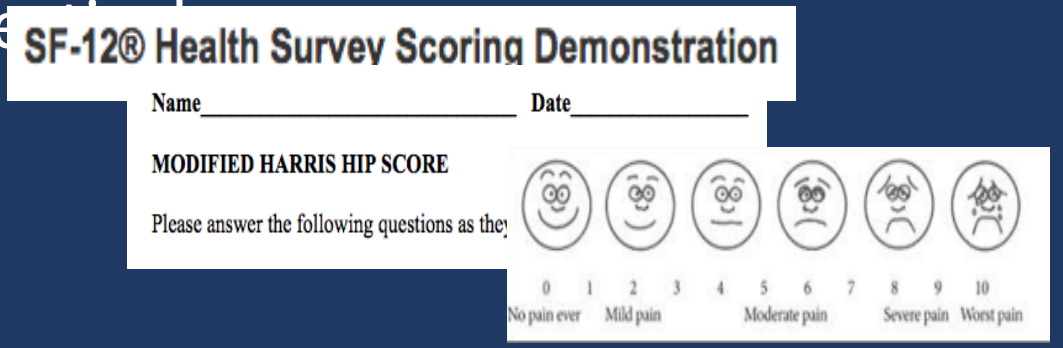
Same Postoperative care- PWB

	Cannulated screws	fixed angle locking plate	P-value
Total number	81	34	
Gender			0.015
Male	20 (24.7%)	17 (50%)	
Female	61 (75.3%)	17 (50%)	
Side			0.541
Right	39	19	
Left	42	15	
Mean age [SE] years	77.7 [2.48]	66.8 [1.48]	<0.001
Garden stage (%)			0.09
1	66 (81.48%)	22 (64.7%)	
2	15 (18.52%)	12 (35.3%)	
Pauwels stage(%)			0.605
1	13 (16%)	4 (11.76%)	
2	53 (65.43%)	26 (76.4%)	
3	15 (18.56%)	4 (11.76%)	
Mortality	12	2	0.226
Follow up[st	19+-1.9 (14.45-50.7)	28+-1.3 (14.43-42.2)	0.006

Demographic Parameters :

sex, age, injury mechanism

Questionnaires (SF-12 , modified Harrison's hip score , VAS) filled prospe


SF-12® Health Survey Scoring Demonstration

Name_____ Date_____

MODIFIED HARRIS HIP SCORE

Please answer the following questions as they

0 1 2 3 4 5 6 7 8 9 10

No pain ever Mild pain Moderate pain Severe pain Worst pain

Complications :

Orthopedic

non-union, mal-union, AVN, cut out, periprosthetic fractures

Non orthopedic complications

Complications	Cannulated screws	Targon FN	P-value
Orthopedic complications	7	2	0.724
Nonunion	1	0	1
Malunion	2	1	0.298
Avascular necrosis	3	1	1
Cutout	1	0	0.553
Periprosthetic fractures	0	0	n/a
Total revisions	5	2	1
Revision surgery to total hip replacement	2	0	
Revision fixation	1	0	
Removal of implant	2	2	
Superficial wound infection	0	0	
Deep wound infection	0	0	
Non-orthopedic complications	11	2	0.339
Cardiovascular	3	1	
Gastrointestinal	1	0	
Pulmonary	2	0	
Urinary	5	1	

	Cannulated screws	fixed angle locking plate	P-value
Vas score mean	3.086	4.5	0.009
MHHS	49	56	0.373
SF-12 physical	40.3	39	0.67
SF-12 mental	53.6	51.3	0.321

Discussion

no significantly **difference**:

peri-operative complications

re-operation rates

Cannulated screws – less pain

not sufficient advantages for Targon FN over CCS in nondisplaced ICHF

Conclusion

similar clinical outcomes

Targon FN- increased financial burden

we suggest the use of simple cannulated screws for treatment of nondisplaced ICH

Thank you

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

UNIVERSITÀ DEGLI STUDI DI MILANO-BICOCCA
Facoltà di Medicina e Chirurgia
Corso di Laurea Specialistica in Ortopedia e Traumatologia

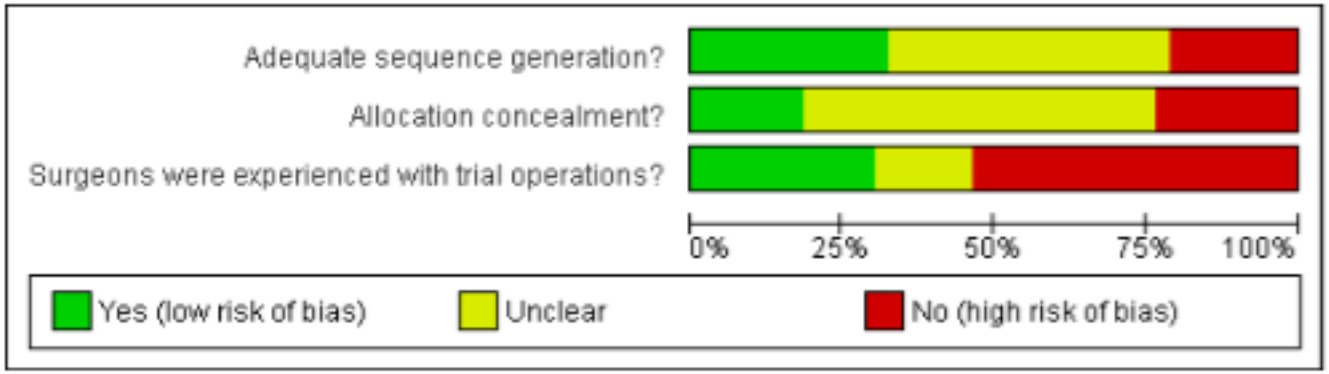
Intramedullary nails versus extramedullary implants for extracapsular hip fractures: 1-year mortality and perioperative bleeding in a retrospective comparative study of 615 patients

Dr. M. Begnini, Dr. A. Angeloni, Dr. D. Gaddi, Prof. G. Zatti

MANAGEMENT OF HIP FRACTURES...

Gamma and other cephalocondylic intramedullary nails versus extramedullary implants for extracapsular hip fractures in adults (Review)

Figure 2. Risk of bias graph: judgements about each risk of bias item presented as percentages across all included studies.



COLLABORATION®

...WHAT DOES EBM SAY?

SIGN
Scottish Intercollegiate Guidelines Network
Part of NHS Quality Improvement Scotland

British Orthopaedic Association
PATRON: H.R.H. THE PRINCE OF WALES

NICE National Institute for Health and Care Excellence

The sliding hip screw is the standard against which other devices should be judged

A **Sliding hip screws are recommended for the fixation of extracapsular hip fractures, except in certain circumstances** *(eg reverse oblique, transverse or subtrochanteric fractures)* **where an intramedullary device may be considered.**

AAOS
American Academy of Orthopaedic Surgeons

MANAGEMENT OF HIP FRACTURES IN THE ELDERLY

EVIDENCE- BASED CLINICAL PRACTICE GUIDELINE

AO Publishing

T. P. Rüedi
W. M. Murphy

AO Principles of Fracture Management

C. L. Colton, A. Fernandez Dell'Oca
U. Holz, J. F. Kellam, P. E. Ochsner

STABLE INTERTROCHANTERIC FRACTURES
Moderate evidence supports the use of either a sliding hip screw or a cephalomedullary device in patients with stable intertrochanteric fractures.
Strength of Recommendation: Moderate ★★★☆

UNSTABLE INTERTROCHANTERIC FRACTURES
Moderate evidence supports using a cephalomedullary device for the treatment of patients with unstable intertrochanteric fractures.
Strength of Recommendation: Moderate ★★★☆

OBJECTIVES

PRIMARY

- Evaluate intraoperative bleeding and 1-year mortality in the treatment of stable and unstable extracapsular hip fractures with both extramedullary and intramedullary fixation

SECONDARY

- Assess 1-year mortality risk factors

METHODS

Retrospective comparative study of 615 patients with extracapsular hip fracture

Population data

- age
- gender
- ASA Score
- Charlson Comorbidity Index (CCI)

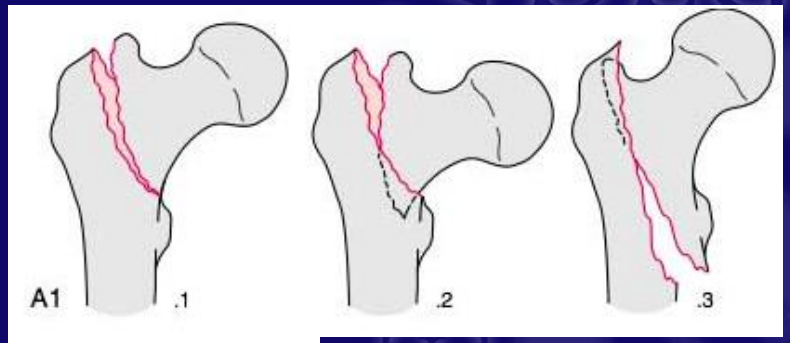
Preop analysis

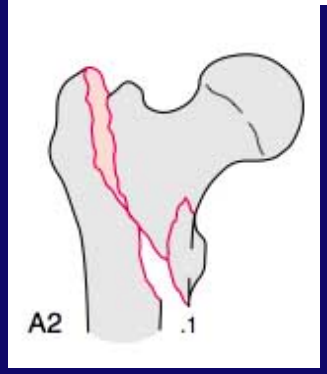
- time to surgery
- admission haemoglobin
- transfusion rate

Postop analysis

- blood loss
- transfusion rate
- lenght of stay
- survivability

AO/OTA fracture classification

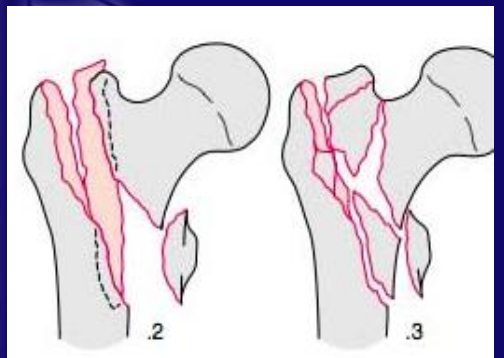


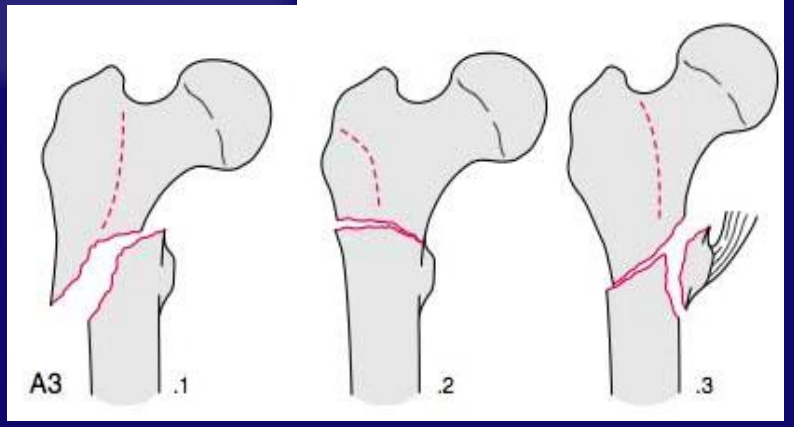


STABLE

31 A

UNSTABLE





Paul O. et al, J Orthop Trauma. 2012 Mar;26(3):148-54

POPULATION ANALYSIS

615 PATIENTS

341 STABLE FRACTURES

- AGE: 83,8 ± 7,3 yr
- F / M: 75,1 / 24,9 %
- ADMISSION HB: 12,03 ± 1,52 g/dL
- TIME TO SURGERY: 65,7 ± 37,3 h
- ASA 1/2/3/4: 0/40,2/53,4/6,5 %
- C.C.I. : 5 + 6 = 49,3%

274 UNSTABLE FRACTURES

- AGE: 83,77 ± 6,56 yr
- F / M: 82,8 / 17,2 %
- ADMISSION HB: 11,74 ± 1,66 g/dL
- TIME TO SURGERY: 72,33 ± 38,31 h
- ASA 1/2/3/4: 0/33,6/60,6/5,8 %
- C.C.I. : 5 + 6 = 47,4%

No difference within the groups regarding age, gender, admission HB, time to surgery, ASA Score and CCI distribution

RESULTS (1)

STABLE FRACTURES

LENGTH OF SURGERY	P = 0,65
BLOOD LOSS (HB DROP)	P =0,70
TRANSFUSION RATE	**P = 0,015**
LENGHT OF STAY	P = 0,57
1-YEAR MORTALITY	P = 0,17

FAVOURS PLATE

RESULTS (2)

UNSTABLE FRACTURES

	FAVOURS PLATE
LENGTH OF SURGE	**P = 0,04**
BLOOD LOSS (HB DROP)	P = 0,07
TRANSFUSION RATE	P = 0,24
LENGHT OF STAY	P = 0,83
1-YEAR MORTALITY	P = 0,15

RESULTS (3)

OVERALL 1-YEAR MORTALITY

19,5 %

NO DIFFERENCE FOR TIME-TO-SURGERY LESS THAN 48 HOURS

MALE SEX
OR 1.8

AGE > 80
OR 1.2

HIGHER ASA SCORE-CCI
P < 0,001

ADMISSION HB < 12 g/dl
OR 1.4

CONCLUSION

Both implants seem to provide good results and can be useful to fix stable and unstable fractures.

Risk factors for 1-year mortality are mainly related to patients comorbidities and general pre-fracturative conditions

???

THANK YOU

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

St. Peter's Hospitals NHS
NHS Foundation Trust

FOLLOW-UP OF 810 CONSECUTIVE TITANIUM HYDROXYAPATITE COATED UNCEMENTED HEMIARTHOPLASTIES

Presenter: SZ Nawaz

Senior Author: A Khaleel

International Combined BHS-SIDA Meeting 2016 Milan

Why?

Cemented

Cost
Complications
Skill Set
Evidence ??

Uncemented

Cement Deaths
Operative Time
Blood Loss

Nice Guidelines

Chertsey Experience

Jan 2008 – June 2014

Consecutive Review of all Uncemented Hemiarthroplasties

TaperLoc Stem – ODEP 10A

Radiograph Analysis

Patient Access Systems

NHFD

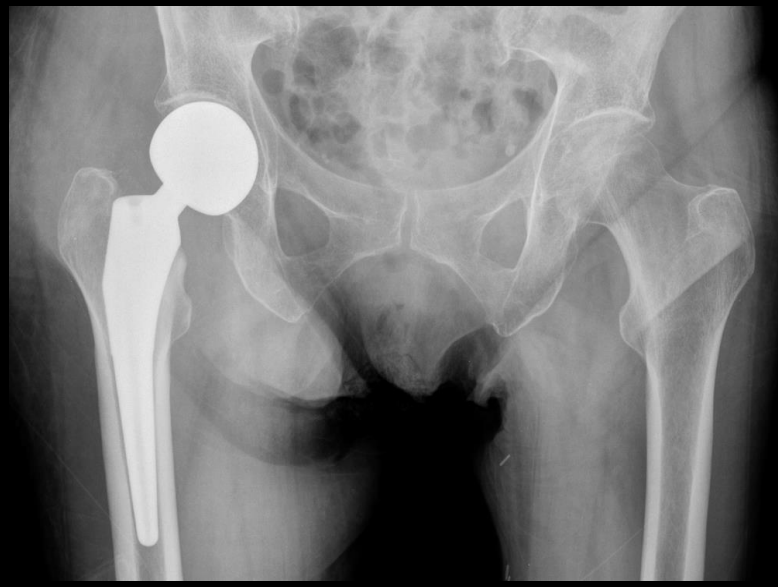
Results

810 Hemi arthroplasties in 763 patients

Mean follow-up 34 months (12-90)

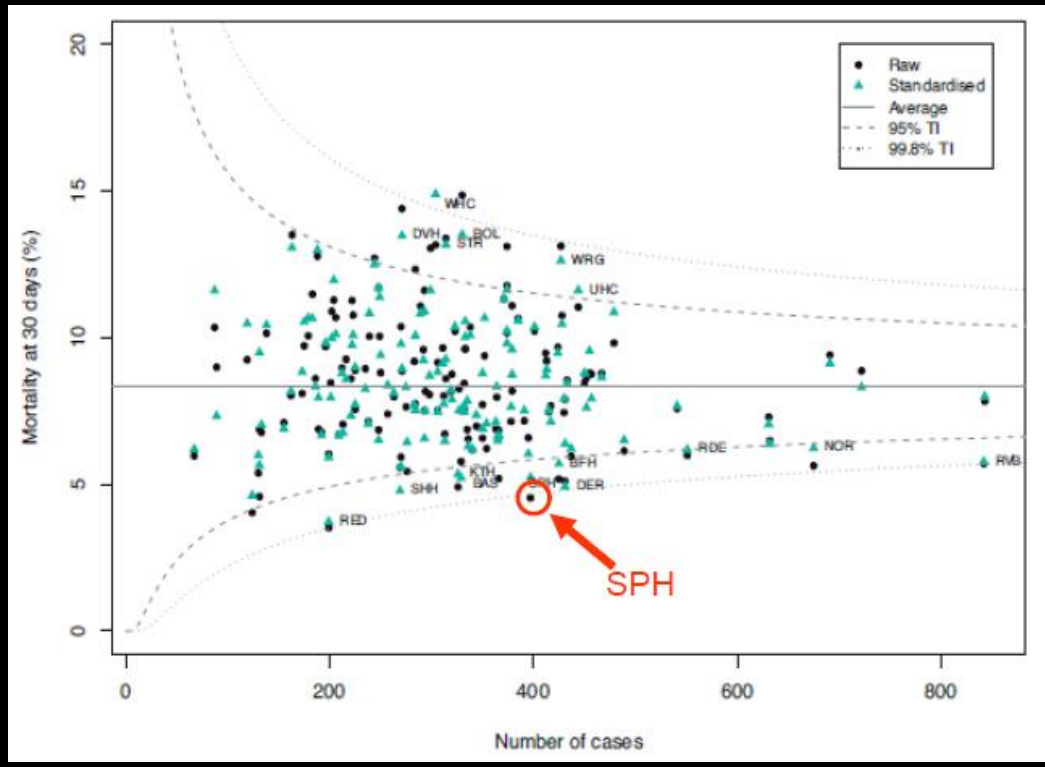
Mean Age 83 yrs (59-103)

71% female



Mortality

- < 24hr 0.0% (0)
- 30 day 4.4% (33)
- 1 year 11.2% (89)



National Average Mortality @ 30 days = 8.2%

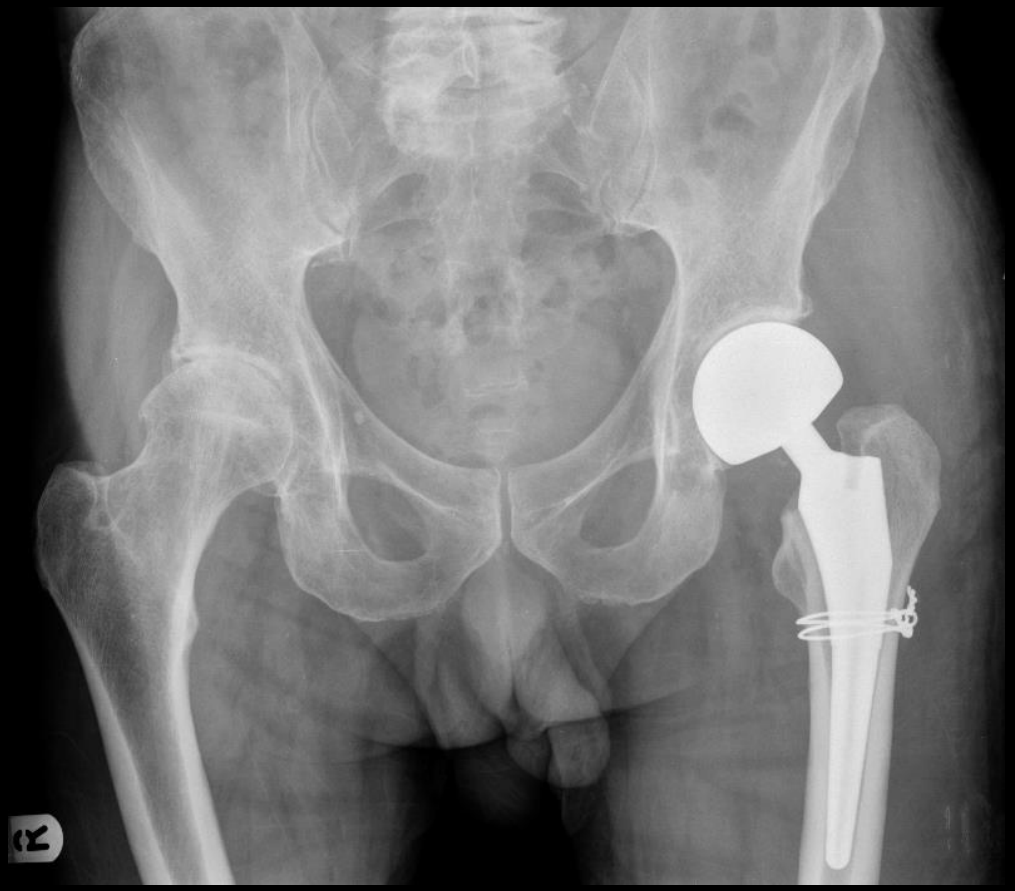
Complications (1)

<u>Calcar Crack</u>

1.0% (8)

All cabled

No Subsidence @
3 and 12 month f/u



Further Surgery (n=810)

Total	Revision Surgery	3.7%	(30)
5	Conversion to THR		
15	Girdlestone		
10	Washouts		
Dislocations		0.9%	(7)
Subsidence		0.6%	(5)
Infection		2.2%	(18)
ReAdmission Peri-prosthetic #		2.5%	(20)

16 ORIF vs Revision 4

Discussion

- No deaths within 1st 24hrs post surgery
- Cases done by all levels (Trainees & Cons)
- Less Anaesthetic time/Blood Loss - ?ASA 3 or 4 pts
- Calcar crack rate low – no consequences at 1-7 year follow-up
- Clinical relevant Subsidence rate - low
- Representing Periprosthetic #s: Fix vs Revise
- Cost of Stem??

Summary

Comparable to cemented hemiarthroplasty

Comparable to NICE guidelines

Cost

Safe to use uncemented hemiarthroplasty

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

A.O.U "Federico II" Napoli
Dipartimento Universitario di Sanità Pubblica
Sezione di Ortopedia e Traumatologia

Azienda Ospedaliera di rilievo nazionale
"A. CARDARELLI" Napoli
I ortopedia - Chirurgia dell'anca

Hemiarthroplasty versus total hip arthroplasty for the treatment of femoral neck fractures

A prospective comparative study

G. Orabona, S. Cerbasi, G.G. Costa, P. Recano, M. Misasi, M. Mariconda

EPIDEMIOLOGY

Incidence rate (2000)

- ✓ **Europe: 500.000 new cases/year**

  4,8 bln Euro for hospitalization

  2030: 750.000/year

  2050: 1 mln/year

- ✓ **Italy: 80.000 new cases/year**

  555,8 mln Euro for hospitalization

  Females/Males 3:1

Italy is the country with the oldest population all over the Europe: 130 over 65 y every 100 young people

According to statistic projections, 6.260.000 femoral fractures are expected in 2050 all over the world .

BACKGROUND

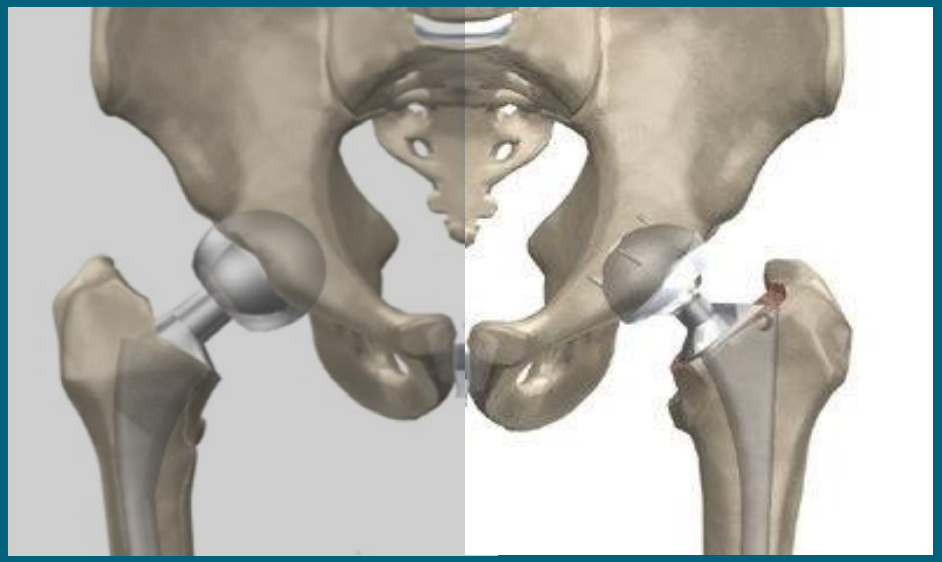
Total hip arthroplasty (THA) vs hemiarthroplasty (HA) for displaced fractures of the femoral neck

Preoperative status may influence the functional outcome and mortality after surgery. Indeed, HA is commonly performed in older and low activity patients.

There are few prospective comparative studies matching THA and HA patients with identical preoperative status.

AIM OF THE STUDY

To compare the 4-month and 1-year mortality and functional outcome in two groups of patients with similar baseline characteristics who underwent THA or HA for displaced fracture of the femoral neck using prospectively collected data.



MATERIALS AND METHODS

Two-hundred forty-one patients underwent surgery at our institutions for a femoral neck fracture between January 2011 and April 2012

Two homogeneous groups of patients who underwent THA and HA

MATERIALS AND METHODS

CHARACTERISTICS OF PATIENTS

GROUPS	THA N = 40	HA N = 40	*P*
AGE (years)	71.4 ± 6.5	74.0 ± 5.5	*NS*
FEMALES (%)	77	80	*NS*
BMI (kg/m^2)	24.7 ± 3.9	25.2 ± 4.8	*NS*
SURGICAL DELAY (days)	5.5 ± 7.1	5.8 ± 6.4	*NS*
ASA class	2.6 ± 0.5	2.7 ± 0.4	*NS*
COMORBIDITY (CIRS - Linn et al, 1968)	6.0 ± 2.8	6.3 ± 2.7	*NS*
COGNITIVE STATUS (MMSE – Folstein et al, 1975)	26.6 ± 5.2	25.1 ± 6.9	*NS*
EDUCATIONAL STATUS (5-step scale)	3.1 ± 1.2	2.9 ± 1.1	*NS*
PRE-FRACTURE AMBULATORY ABILITY (5-step scale)	4.7 ± 0.7	4.7 ± 0.9	*NS*
PRE-FRACTURE ADL index	5.7 ± 0.6	5.4 ± 1.4	*NS*

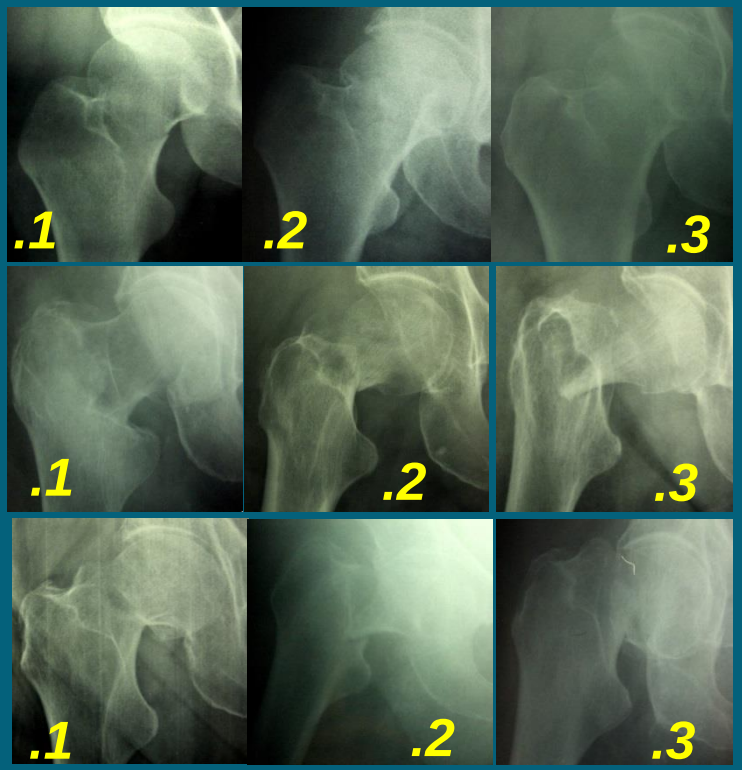
***** Values are expressed as mean ± standard deviation or frequency %

MATERIALS AND METHODS

FRACTURE CLASSIFICATION

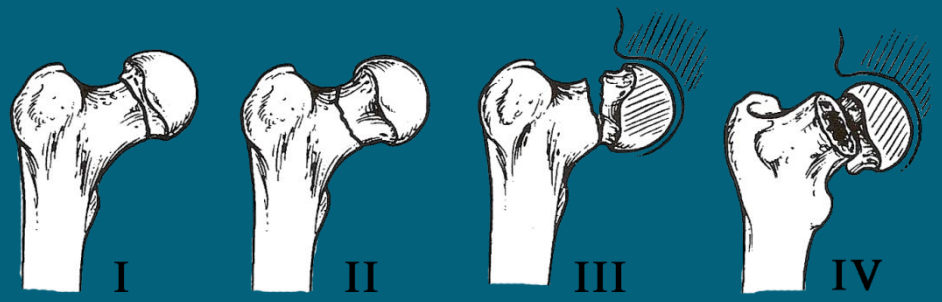
AO/ASIF31-B

	THA	HA	*P*
B1	4	3	*NS*
B2	15	19	
B3	21	18	



Garden

	THA	HA	*P*
1	1	1	*NS*
2	3	2	
3	23	19	
4	13	18	



OUTCOMES

4-MONTH AND 1-YEAR PHONE INTERVIEWS

- MORTALITY
- AMBULATORY ABILITY (5-STEP SCALE, Hoffer et al, 1973)
- ADL INDEX (6-STEP SCALE, Katz et al, 1963)
- GENERAL COMPLICATIONS
- LOCAL COMPLICATIONS
- REVISION SURGERY

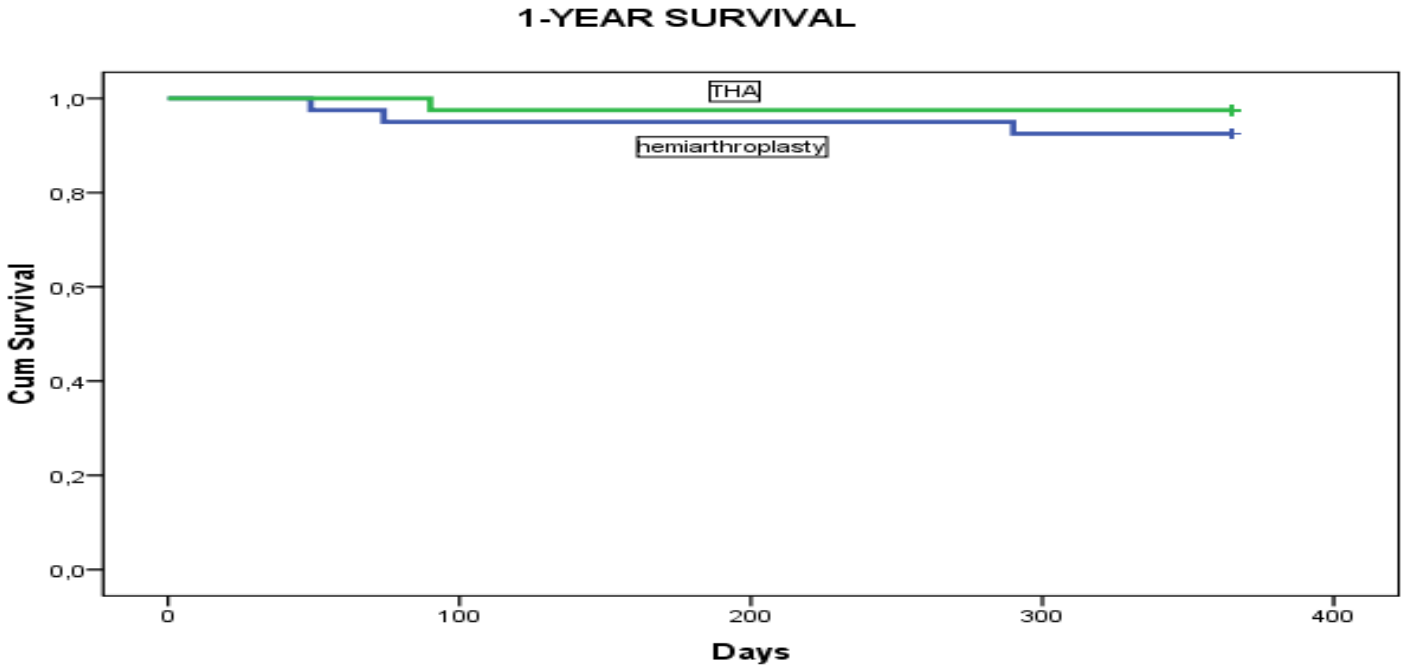
STATISTICAL ANALYSIS

- t-Test for paired and unpaired data
- Chi-square test for categorical variables
- Kaplan-Meyer survivorship analysis

SPSS SOFTWARE FOR DATABASE AND STATISTICS

RESULTS

No difference in the survival rate



	Total	N events	N survivors	Survival %
HA	40	3	37	92.5%
THA	40	1	39	97.5%
Overall	80	4	76	95.0%

$P = 0.31$

RESULTS

FUNCTIONAL OUTCOME

Significant decrease of ADLs in HA group at 4M and 1Y of FU

ADL			
	PROCEDURE	MEAN ± S.D.	P
PREFRACTURE	HA	5.4 ± 1.4	NS
	THA	5.7 ± 0.6	
4 MONTH	HA	4.6 ± 1.9 †	0.007
	THA	5.5 ± 0.9	
1 YEAR	HA	4.6 ± 2.0 †	0.009
	THA	5.5 ± 1.0	

† *p<0.001 vs. prefracture ADL*

RESULTS

FUNCTIONAL OUTCOME

No difference between groups in ambulatory ability

AMBULATORY ABILITY			
	PROCEDURE	MEAN ± S.D.	P
PREFRACTURE	HA	4.7 ± 0.9	NS
	THA	4.7 ± 0.7	
4 MONTH FU	HA	3.9 ± 1.4***	NS
	THA	4.3 ± 1.0**	
1 YEAR FU	HA	4.0 ± 1.4***	NS
	THA	4.5 ± 0.9*	

** p<0.05 vs. prefracture ambulatory ability*

*** p<0.01 vs. prefracture ambulatory ability*

**** p≤0.001 vs. prefracture ambulatory ability*

RESULTS

FUNCTIONAL OUTCOME

No difference in general complications until 4 months

GENERAL COMPLICATIONS			
	THA	**HA**	**P**
IN-HOSPITAL (ONLY MAJOR COMPLICATIONS)	4	5	0.72
4 MONTH FU	3	7	0.16
1 YEAR FU	0	4	0.03

RESULTS

FUNCTIONAL OUTCOME

Higher rate of local complications in THA

LOCAL COMPLICATIONS			
	THA	**HA**	**P**
IN-HOSPITAL	4 *(2 DISLOCATIONS, 1 DISLOCATION + PERIPROSTHETIC FRACTURE, 1 SPE NERVE INJURY)*	0	0.04
4 MONTH FU	3 (1 DISLOCATION, 1 PERIPROSTHETIC FRACTURE, 1 HETEROTOPIC OSSIFICATION)	0	0.09
1 YEAR FU	0	0	1.00

RESULTS

No difference in re-surgery rate

REOPERATIONS (1-YEAR FU)			
	THA	HA	P
IN-HOSPITAL	2	0	0.17

1 REVISION ARTHROPLASTY + WIRING, 1 WIRING

DISCUSSION

AUTHOR, YEAR	STUDY DESIGN	N. OF PATIENTS	F.U.	CONCLUSIONS
Wang et al, 2015	Meta analysis	1014 patients	1 year	Dislocation rate, general complications, 1 year mortality **THA=HA** Quality of Life **THA>HA**
Hedbeck et al, 2011	RCT	120 patients	4 years	Quality of life and functional outcomes **THA > HA**
Baker et al, 2006	RCT	81 patients	3 years	Functional outcomes and fewer complications **THA > HA**
Van den Bekerom et al, 2010	RCT	252 patients	1 year	Functional outocomes, mortality, complications, revision rate **THA=HA**

CONCLUSION
THA vs HA

Despite more dislocations, **THA** can benefit patients with displaced femoral neck fractures with **higher functional scores for ADLs and a lower rate of general complications** at the one year FU compared to HA

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Outcomes following Total Hip Arthroplasty for Neck of Femur fractures

A. ALI, S.Z. NAWAZ, A. KHALEEL, J. THOMAS

NICE guidance

- Offer total hip replacements to patients with a displaced intracapsular fracture who:
  - Were able to walk independently outdoors with no more than use of a stick
  - Are not cognitively impaired and
  - Are medically fit for anaesthesia and the procedure

Hip fracture: Management (2001) NICE guidelines [CG124]

Methods

- Consecutive patients from 2011 – 2014
- Demographics
- Perioperative details
- Morbidity
- Mortality
- Function at 12 months (OHS)

Results

- 1683 patients
- 100 patients underwent THA
- 9 lost to follow up
  - 2 mortalities within one year
  - 2 diagnosed with dementia
  - 5 died after one year

Patient details

- 22 male : 78 female
- ASA 1.7 (1-3)
- 55 had 2 or more comorbdities

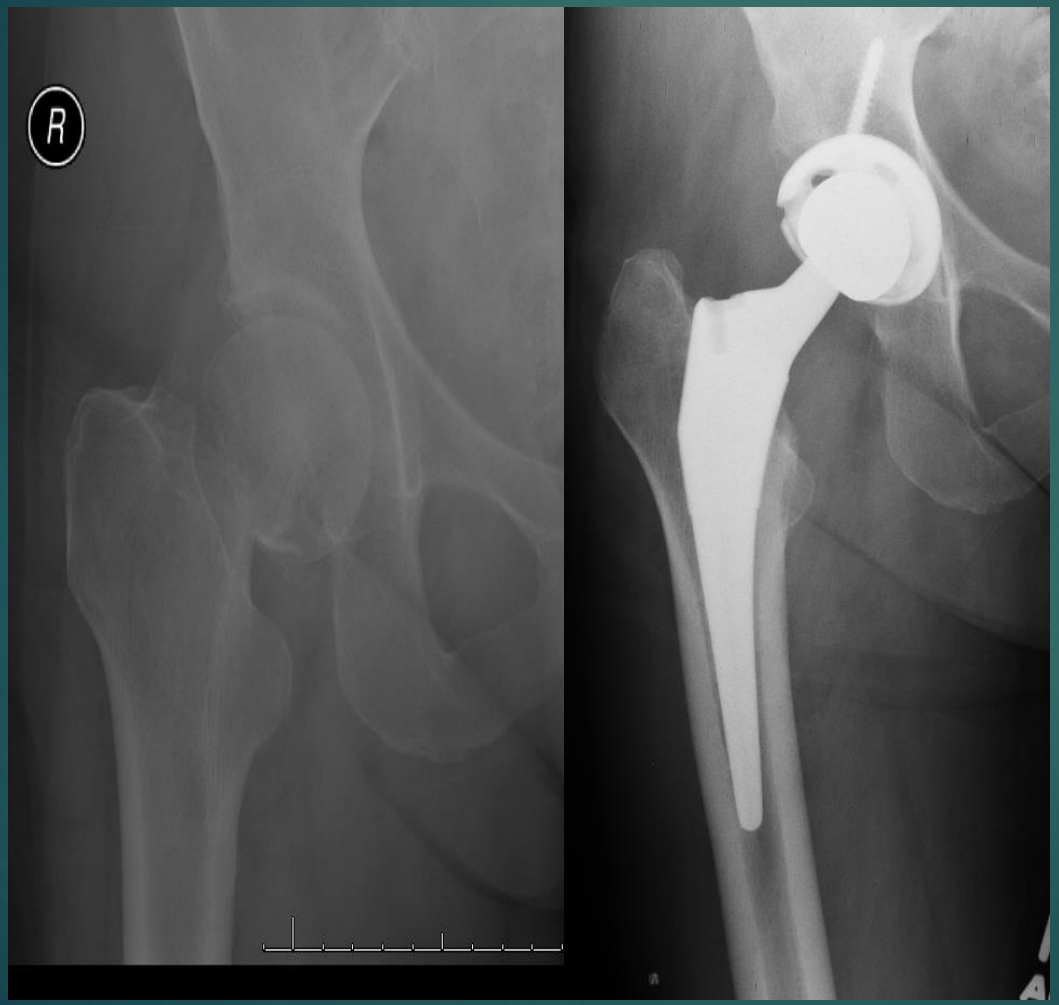
Operative details

- 10 consultants
- 34 posterior : 66 anterolateral
- 40 cemented
- 27 uncemented
- 33 hybrid

Cemented

Biomet

Uncemented



Smith & Nephew

Hybrid

Stryker

Outcomes

- Average OHS 40.36 (4 – 48)
- 40 – 48 “satisfactory joint function”
- 9 complications
- Fisher test

Gender

- Female 40. 67 (4 – 48)
- Male 39. 11 (23 – 48)

ASA grade

ASA	No. of Patients	Av OHS (Responses)	Range
1	43	43.57 (42)	21-48
2	46	38.55 (40)	4-48
3	11	33.44 (9)	23-47

P value 0. 009

Comorbidities

Co-Morbidities	No. of Patients	Av OHS (Responses)	Range
0	20	41.37 (19)	21-48
1	35	41.84 (33)	23-48
2	30	39.64 (28)	4-48
3	12	38.25 (8)	23-48
4	3	30 (3)	24-40

P-value 0. 191

Anterolateral approach

- Average OHS 39. 63 (4 – 48)
- 7 complications
  - 1 Periprosthetic fracture
  - 1 dislocation
  - 1 aseptic loosening
  - 4 persistent pain

Posterior approach

- Average OHS 41. 77 (22 – 48)
- 2 complications
  - 1 periprosthetic fracture
  - 1 dislocation
- 2 mortalities

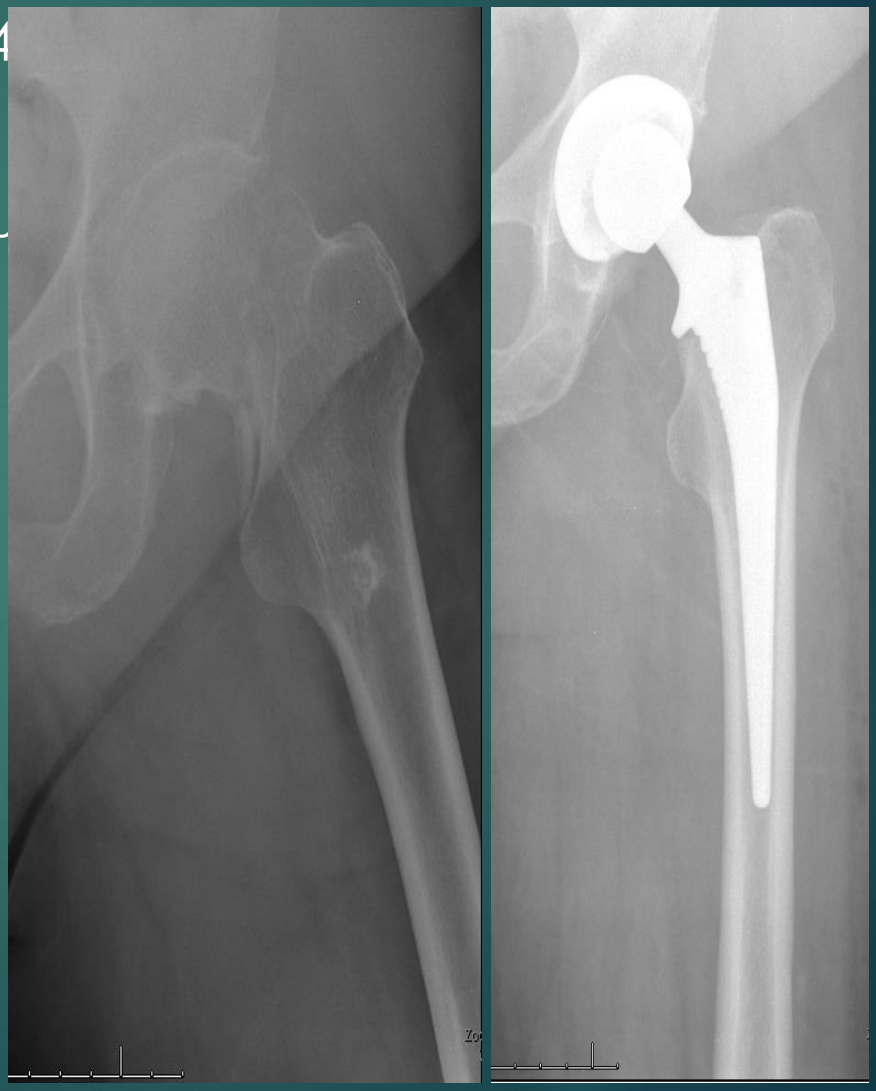
P-value 0. 630

Cemented

- Average OHS 42. 38 (21 – 48)
- 1 aseptic loosening

Uncemented

- Average OHS 37. 17 (4
- 5 complications
  - 1 periprosthetic fractu
  - 1 dislocation
  - 3 persistent pain



Hybrid

- Average OHS 40. 43 (12 – 48)
- 3 complications
  - 1 periprosthetic fracture
  - 1 dislocation
  - 1 persistent pain

P-value 0. 478

Summary

- 5.9% underwent THA
- Average OHS 40. 36
- ASA grade and fewer comorbidities
- 9% complication rate

“Thank you

”

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

The Whittington Hospital NHS
NHS Trust

30 DAY READMISSION RATE OF PATIENTS MANAGED FOR NECK OF FEMUR FRACTURE; A POPULATION BASED TOOL FOR TARGETED LONG TERM MANAGEMENT

AUTHORS:
IBIDUMO IGAH, ADRIAN O'GORMAN, RHYALL HUGHES, RHORI EDWARDS, SIOBHAN MELLETT,

NONE OF THE AUTHORS HAVE ANY DISCLOSURES

Introduction

- Significant amount of patients (3% – 11%) return to hospital with 30days
- The hospital is penalised for readmission within 30 days of discharge because it postulated that complications usually arise from:
  - Consequence of the health at the time of admission
  - Direct complication from the surgery
  - Infection acquired during hospitalisation
  - Poor progress in rehabilitation

Other postulation about readmissions is:

- Some readmissions may be paradoxical, reflecting unusually good care (keeping patients alive who may have died in other hospitals, resulting in a sicker patient population at discharge)
- Better access to hospitals (permitting such patients to be rehospitalized rather than dying outside hospital).

Advances in Surgery 48 (2014) 185–199

ADVANCES IN SURGERY

Readmission After Surgery

Donald J. Lucas, MD, MPH[a],
Timothy M. Pawlik, MD, MPH, PhD[b,*]

[a]Department of General Surgery, Walter Reed National Military Medical Center, 8901 Wisconsin Avenue, Building 9, 1st Deck, Bethesda, MD 20889, USA; [b]Division of Surgical Oncology, Department of Surgery, Johns Hopkins Hospital, 600 North Wolfe Street, Blalock 688, Baltimore, MD 21287, USA

JOURNAL OF SURGICAL RESEARCH 194 (2015) 430–440

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.JournalofSurgicalResearch.com

All things not being equal: readmission associated with procedure type

Kevin R. Kasten, MD,[a] *Peter W. Marcello, MD,*[b] *Patricia L. Roberts, MD,*[b] *Thomas E. Read, MD,*[b] *David J. Schoetz, MD,*[b] *Jason F. Hall, MD, MPH,*[b] *Todd D. Francone, MD,*[b] *and Rocco Ricciardi, MD, MPH*[b,*]

[a] *Section of Colon and Rectal Surgery, Brody School of Medicine at ECU, Greenville, North Carolina*

[b] *Department of Colon and Rectal Surgery, Lahey Hospital & Medical Center, Burlington, Massachusetts*

OBJECTIVES

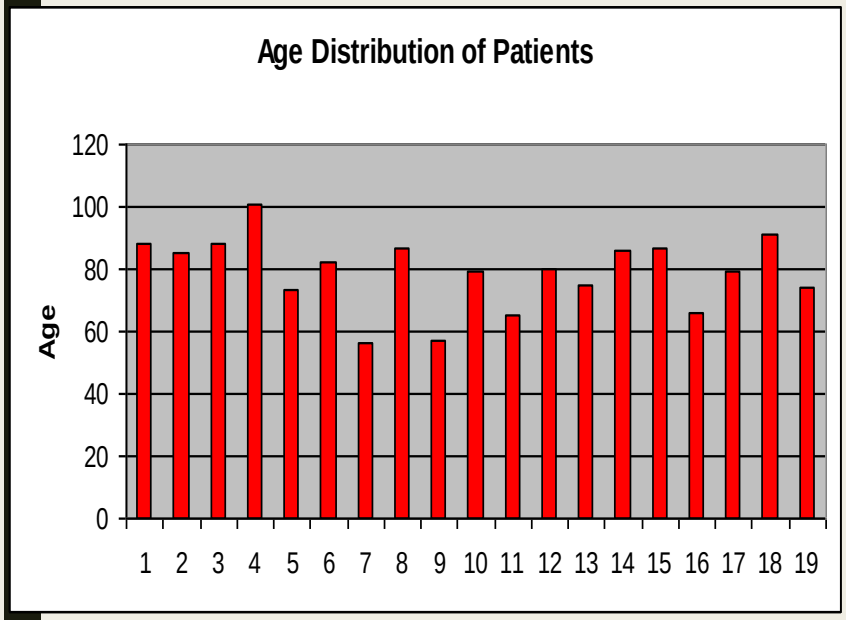
Improve local measures:

- reduce length of stay
- improve patient experience
- improve discharge planning
- reduce readmission

METHODOLOGY

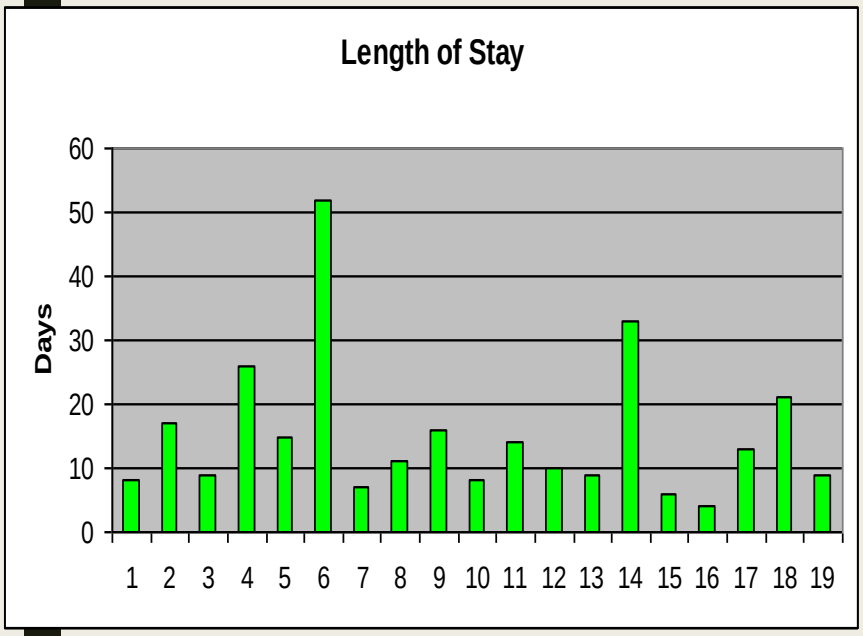
- Retrospective audit involving 167 patient admitted and managed for neck of femur fracture between in 2013 in our general hospital.
- Data was obtained from the national hip fracture database (NHFD) and other hospital clinical software (such as ICE and Medway) and available clinical notes.

RESULTS



- 19 patients (11.3%) were readmitted within 30 days of discharge
- 10 FEMALE, 9 MALE PATIENTS
- MEAN AGE 78.8 YEARS (56-101)

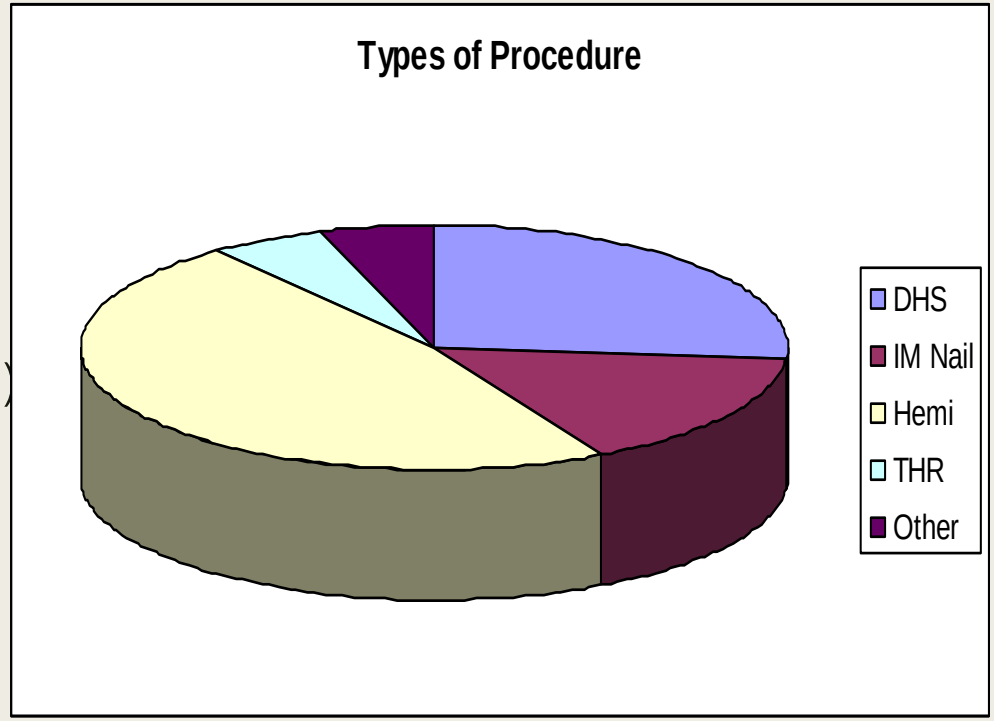
RESULTS



- MEAN LENGTH OF STAY 15 DAYS (4-52 days)

RESULTS

- Types of procedure
  - DHS – 26% (5)
  - IM nail – 15% (3)
  - Hemiarthroplasty – 47% (9)
  - THR – 5.5% (1)
  - Cannulated screws – 5.5% (1)

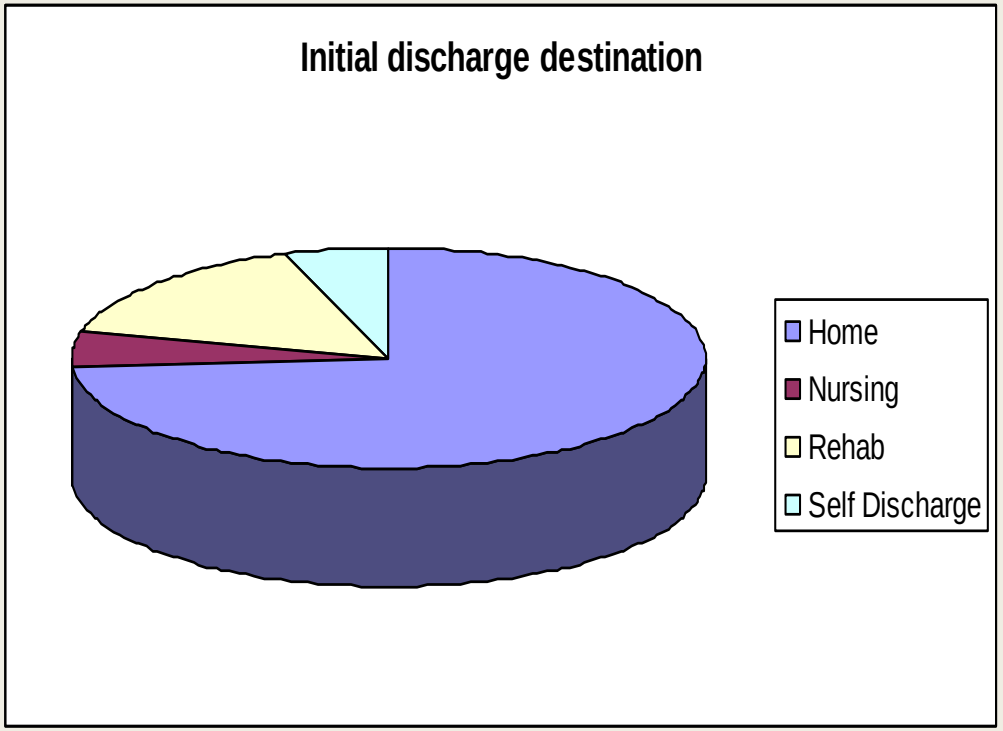


RESULTS

Immediate post operative complications	Number of patients
Anaemia (<100g/l)	8 (42%)
Anaemia requiring transfusion	6 (32%)
Community Acquired Pneumonia	3 (16%)
Acute confusion / Delerium	3 (16%)
Clostridium Difficile infection	1 (5%)
Wound infection	1 (5%)

RESULTS

- Initial discharge destinations
  - Rehab
  - 17% (3/19)
  - Nursing Home
  - 5% (1/19)
  - Own Home
  - 73% (14/19)
  - Self-discharged
  - 5% (1/19)



RESULTS

- Re-admission teams:
  - Medical 15 (79%)
  - Orthopaedics 4 (21%)

- Re-admission was related to previous admission – 13 (78%)

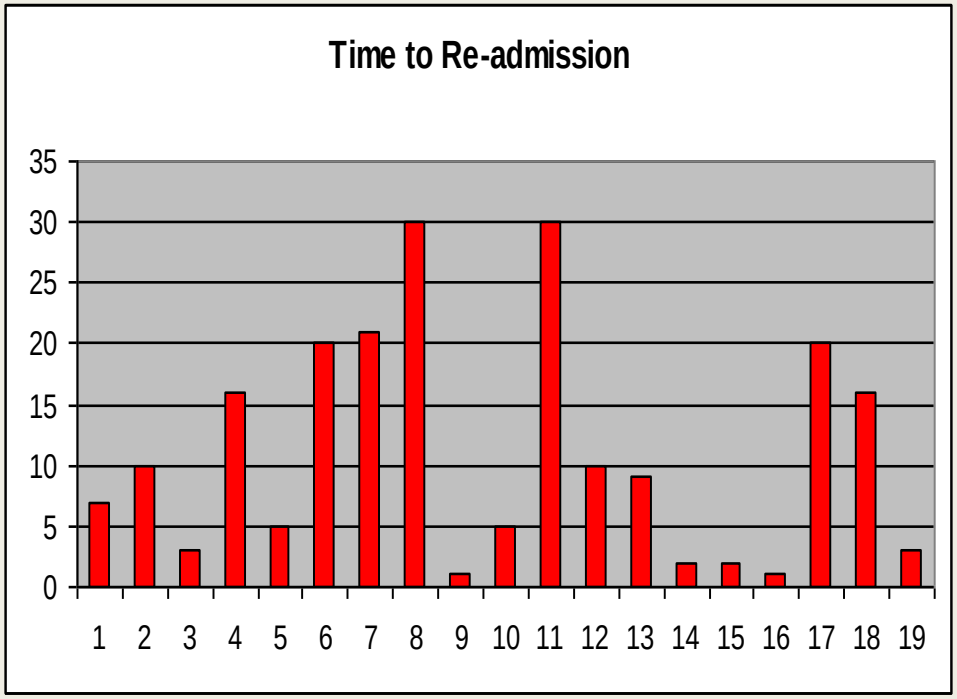
- Not related to previous admission (Acopia, UTI, dehydration, confusion, stroke) – 6 (32%)

Related to previous admission

Complications	No. patients/ %
Community acquired Pneumonia (CAP)	3
Hospital Acquired Pneumonia	2
Fall + CAP	1
Fall	4
Related Surgical procedure	3

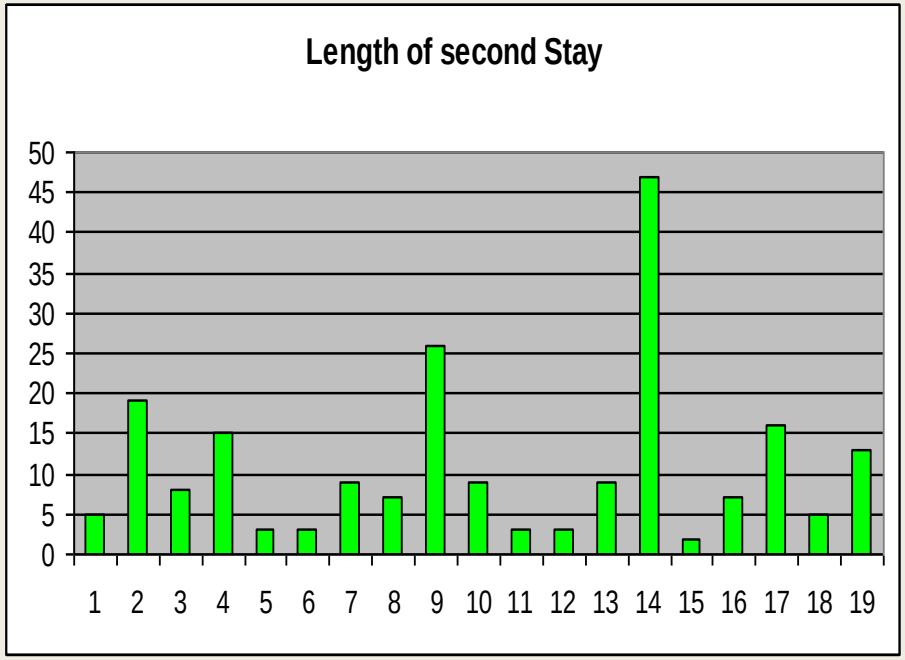
RESULTS

- Mean time to Re-admission is 11.1 days (1-30 days)



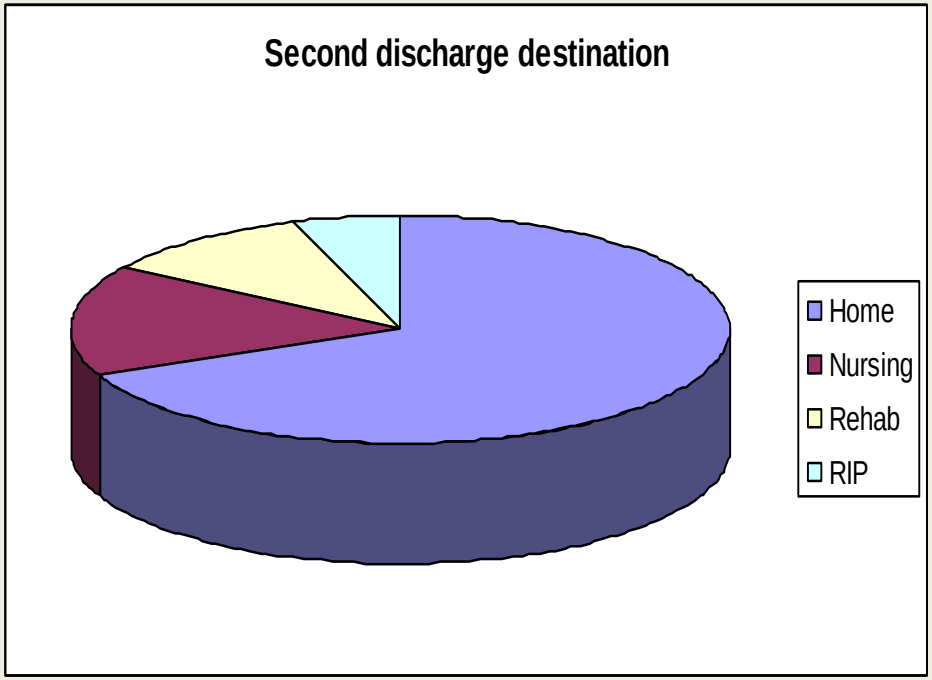
RESULTS

- Average length of stay for re-admission 11 days (2-47 days)



RESULTS

- Second discharge destination:
  - Home – 68% (13/19)
  - Nursing Home – 16% (3/19)
  - Rehab Unit – 11% (2/19)
  - RIP – 5% (1/19)



RECOMMENDATION FOR LOCAL MEASURES

- Education and training of medical staff
- Re-evaluate measures to prevent falls following discharge
- Key patients to be flagged to community based multiple disciplinary team on discharge
- Community matron referral of all patients discharged home for 48 hour review

CONCLUSION

- 30 day Re-admission rate following surgery for neck of femur fracture is an out-come measure which reflects local factors affecting outcome measure and can be used to design local measures to improve patient care following surgery.

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THANK YOU
?? ANY QUESTIONS

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Analysis of A.S.A. Score in geriatric hip fractures as a predictive factor for complications and readmission in hospital.

Kastanis Grigorios,[1]
Alpantaki K.,[2]
Ziogas K., [2]
Sperelakis J., [2]
Kapsetakis P., [2]
Katsoulis P., [1]
Balalis K. [2]

Department of Orthopaedics - General Hospital Lasithiou[1]
Department of Orthopaedics and Trauma University Hospital of Heraklion[2]

GERIATRIC

Hip Fractures

- Is a common and serious injury in the elderly patients,
- Is the 2nd leading cause of hospitalization,
- Mortality rate 1 year after fracture range 18%-33%,
- Are associated with significant cost to patients and health care system.

Surgery is the definitive treatment for almost all geriatric hip fractures but return to optimal functional level after surgery is not determinated by the type of operation but by preoperative comorbidities and postoperative complications.

Donegan J.D. et all(2010)

A.

- initial developed to determine the risk of operative morbidity based on patients comorbidities,

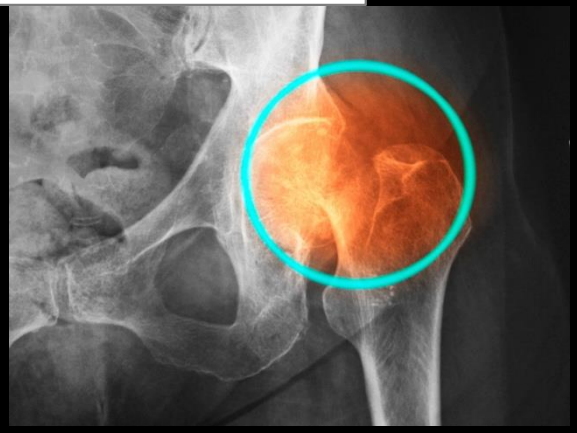
S.

- Recent studies shown that A.S.A . can correlate and with other factors: → Surgical complications
  - → Operative time
  - → Type of surgery
  - → Hospital length of stay
  - → Delay to surgery
  - → Morbidity
  - → Mortality

A.

Daabiss M.(2015)
Yeoh C.J.C. et all(2013)
Sathiyakumar V. et all(2013)
Garcia A.E. et all(2011)

Purpose



Is to analyze if the American Society of Anesthesiologist Score is a predictive factor for complications (peri- postoperative) and hospital readmission in geriatric hip fractures.

Material & Methods

- Between 2007-2014
- 198 patients hip fracture

CHARACTERISTICS:

PREOPERATIVE:
- ✓Age
- ✓Sex
- ✓Cause of injury
- ✓Type of fracture
- ✓Comorbidities
- ✓Functional status
- ✓ASA Score
- ✓Days from hospital admission to surgery

OPERATIVE:
- Type of Anesthesia
- Type of Surgical Procedure

POSTOPERATIVE:
- ✓Postop. Complications
- ✓Transfer other Clinic
- ✓Hospital Discharge
- ✓Readmission(30 days)

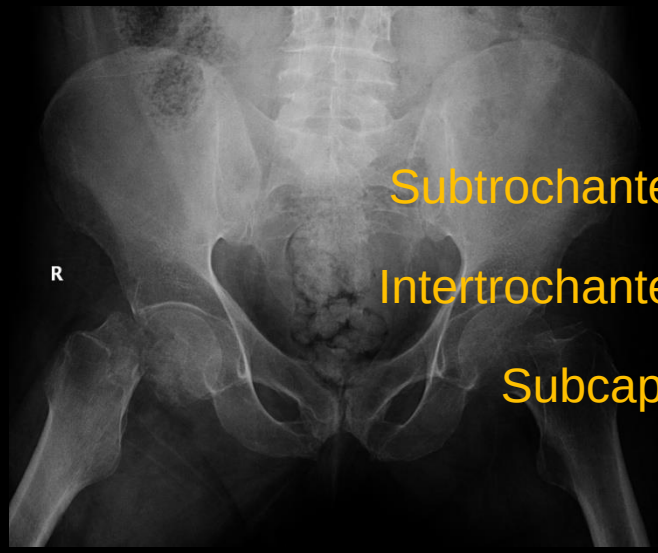
I. Preoperative Characteristics

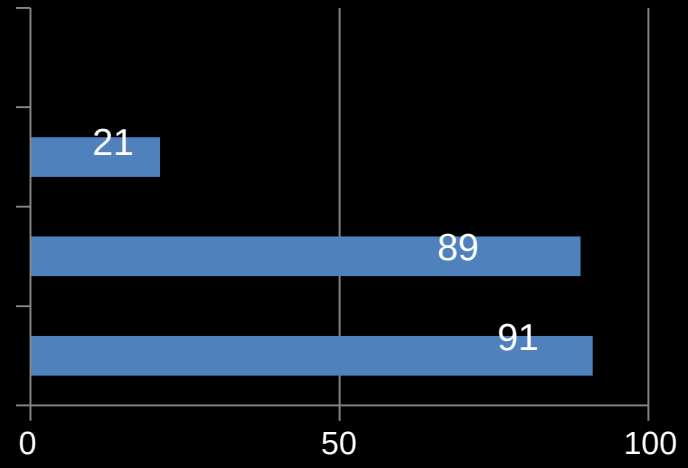
- 198 patients: → 55 male(27,8%)
  → 143 female(72,2%)

- average age 85,4 y.o(range 67-103 y.o.)

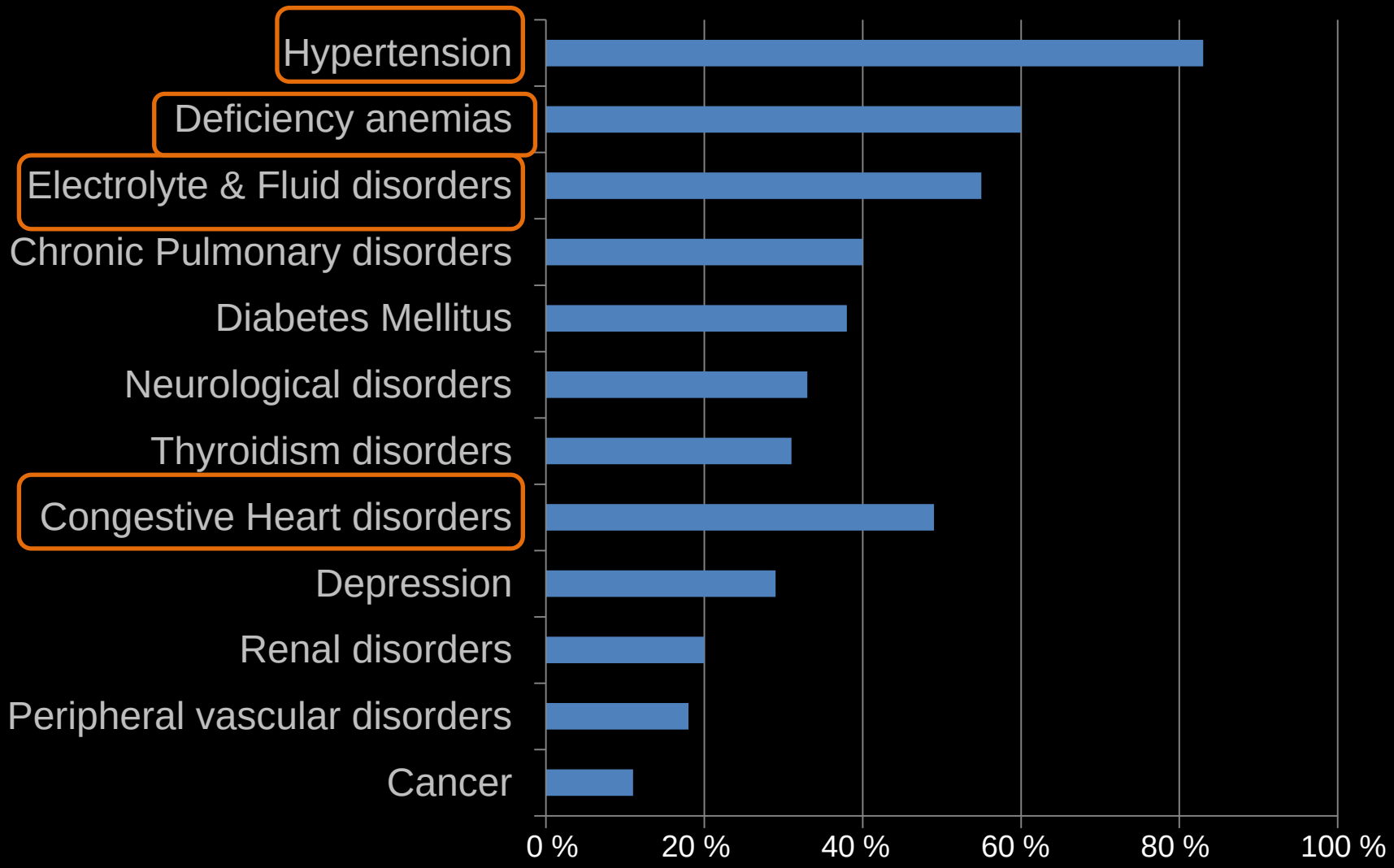
- Cause: → fall from standing height: 106 cases(53,5%)
  → fall downstairs, or
  off a step ladder 81 cases(40,9%)
  → vehicle accident: 11 cases(5,6%)

Type





Comorbidities



Functional Status

Independent	102(51,5%) pats.
Partial dependent	64(32,2) >>
Totally dependent	32(16,2%) >>

Days from admission to surgery

DAYS	PATIENTS
0	4,6% (9 cases)
1	29,3% (58 cases)
2	38,4% (76 cases)
3 or more	27,7% (55 cases)

II. Operative Characteristics

Type Anesthesia:

General	23(11,6%)
Epidural	97(49,1%)
Spinal	78 (39,3%)

Type of Operation

❖Subcapital fractures : → Cann. Screws
→hemiarthroplasty

❖Intertrochanteric fractures: I.F.:
→ stable # → D.H.S.
→ unstable # → Intramedullary Devise

❖Subtrochanteric fractures:
Intramedullary device

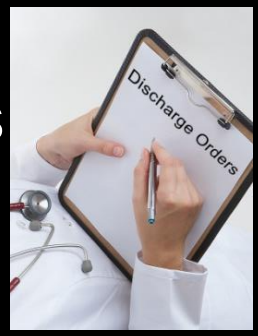
III. Postoperative Characteristics

Complications:
- Cardiac
- Pulmonary
- Gastrointestinal
- Neurologic
- Renal
- Surgical

Transfer Clinic: 36(18,2%) pat.:

→Cardiology	32,5%
→Intens. Care Unit	16,3%
→Pathological	41,9%
→Neurological	9,3%

Hospital Discharge: 195 (98,5%) cases



Readmission(30 days): 19 (9,6%) cases

Results

Majority of patients were encouraged to stand with support and partial weight bearing as tolerated from the 1st post - operative day.

A.S.A. Score:

II 76 patients(38,4%%):→12 men
→ 64 female

Median time to operate: 1 day(range 0 – 2 days)

Postop. Complications: Minor:
- urinary infection: 7 cases
- Hematoma: 4 cases
- Wound Infection: 5 cases

Median time to hospitalizations: 6,4 days(range 4- 8 days)

Discharge to other clinic: 0

Readmission: 0

A.S.A. Score:

III 91 patients(45,9%): → 27 men
→ 62 female

Median time to operate: 5,2 days(range 4 – 9 days)

Postop. Complications: (30,8%)

- Cutaneous Ulcer: 7 cases
- Wound Infection: 4 cases
- Pneumonia: 4 cases
- Pulmonary embolism: 2 cases
- Congestive Heart Failure: 5 cases
- Cerebrovascular accident: 3 cases
- Acute Renal failure: 2 cases
- Ileus: 1 case

Median time to hospitalizations: 10,4 days(range 8- 15 days)

Death: 2 case

Discharge to other clinic: 17 cases: (19,1%)

- Cardiology
- Intens. Care Unit
- Pathological
- Neurological

Readmission: 11 cases(12,3%)

A.S.A. Score:

IV 31 patients(15,7%): → 16 men
→ 17 female

Median time to operate: 8,4 days(range 6 – 14 days)

Postop. Complications: (67,7%)

Infection:	2 cases
Pneumonia:	4 cases
Aspiration Pneumonitis:	2 cases
Pulmonary embolism:	3 cases
Myocardial Infarction:	1 case
Congestive Heart Failure:	4 cases
Cerebrovascular accident:	2 cases
Acute Renal failure:	2 case
Ileus:	1 cases

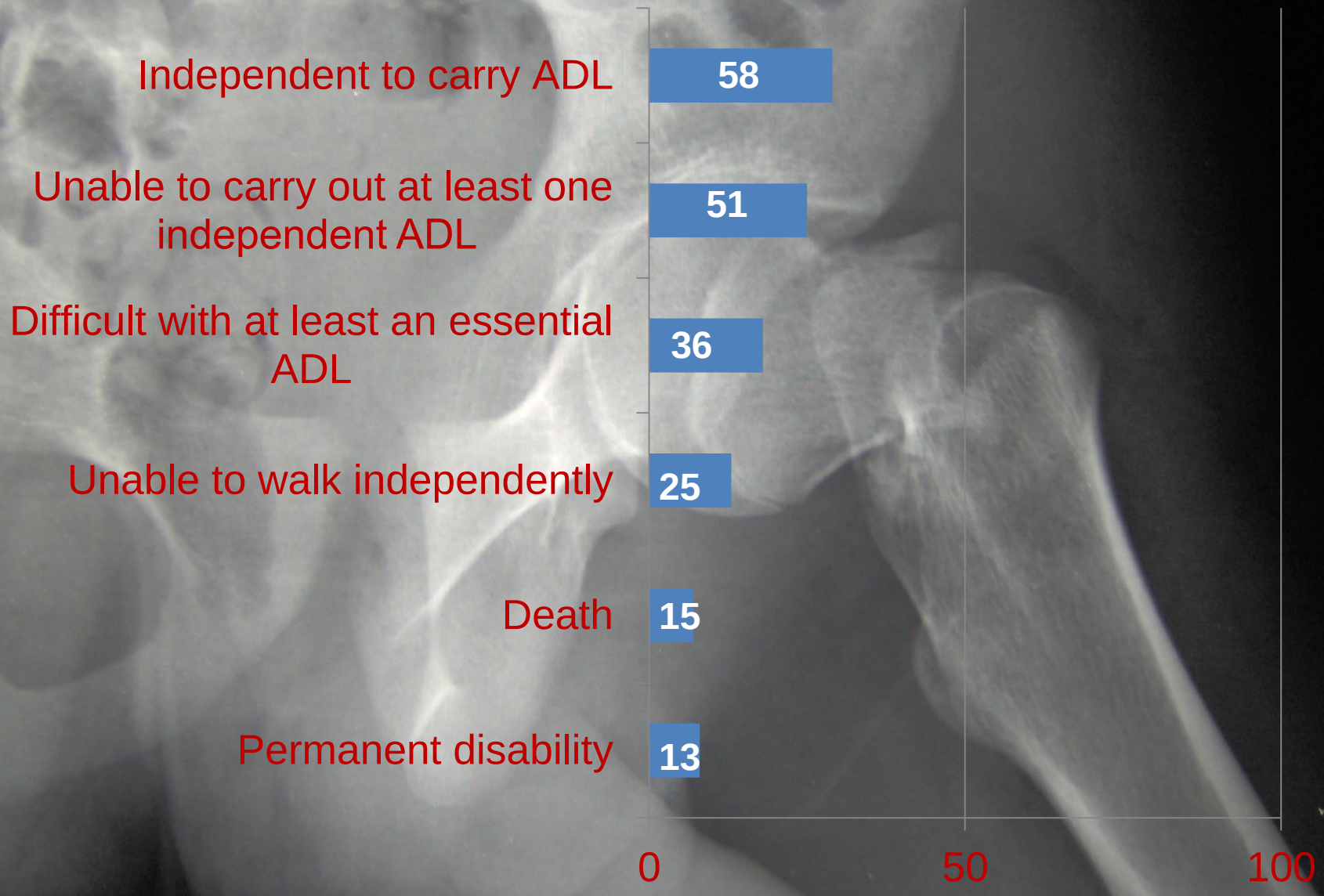
Median time to hospitalizations: 13,5 days(range 10- 24 days)

Death: 1 cases

Discharge to other clinic: 19 cases: (61,2%)
- Cardiology
- Intens. Care Unit
- Pathological
- Neurological

Readmission: 8 cases(26.7%)

FUNCTIONAL OUTCOMES AT 1 YEAR



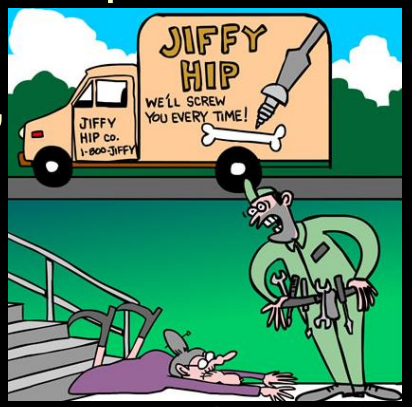
DISCUSSION

Hip Fractures

❖Are a sentinel event signaling a systemic decrease in the patients health,

❖Each year >1,6 million geriatric hip # occur worldwide,

❖Reduce life expectance by 25% compared with age & sex matched at general population,



<<Because of high mortality rates the overall rate of recovery of pre-injury function or ambulatory status is < 70%.>>

Vidan M. et all(2005)

➢ Is early mobilization, in effort to prevent complications associated with prolonged recumbency,

➢ Return to functional activity.

introduced A.S.A. Score to provide a basis for comparison of statistical data in anesthesia to allow:

→ anesthesiologist to record the overall health status prior surgery

→ patients outcomes to be stratified by a general assessment of disease severity

Saklad M(1941)

Revised in 5 classes

I. Patient is a completely health

Dripps RD(1963)

II. Patient with mild systemic disease

III. Patient with a serious, non – incapacitating systemic disease

IV. Patient with a life – threatening, incapacitating systemic disease

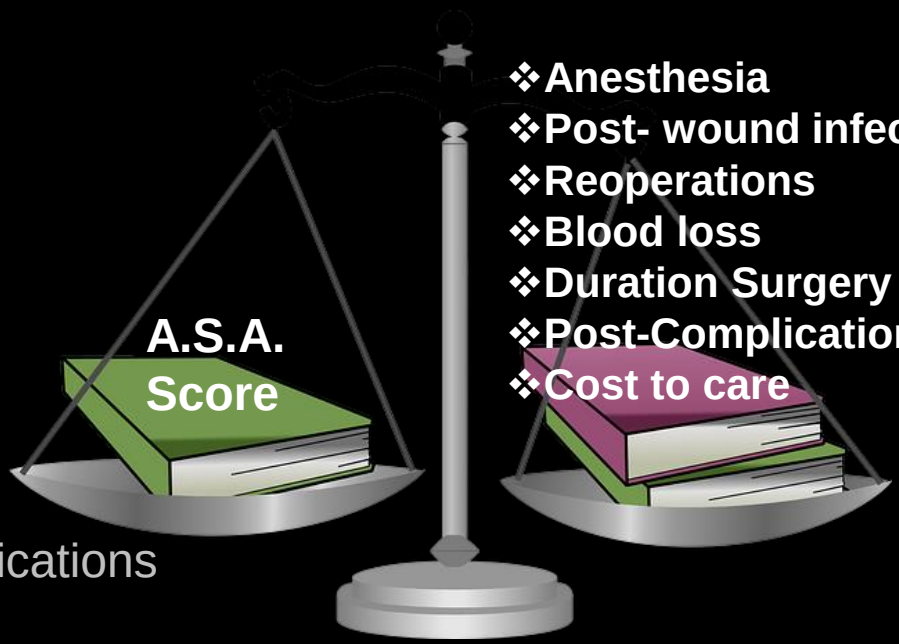
V. Moribund patient, with death expected in less than 24 hours

Wolters U. et all(1996)

6301 patients

A.S.A. Classification

Post –Complication



- ❖Anesthesia
- ❖Post- wound infection
- ❖Reoperations
- ❖Blood loss
- ❖Duration Surgery
- ❖Post-Complications
- ❖Cost to care

Estimated that the risk of systemic complications is higher in patients → A.S.A. III → 2,2%
→ A.S.A. IV → 4,2%

<<A.S.A. classification is strong predictor of postoperative outcomes >>

Lefaivre K.A. et all(2009): 607 pat, age > 65 y.o. → hip # found comorbidities associated with Length of Hospital Stay with average 23,48 days especially in pat > 3 diseases.

Kay H.F. et all(2014): 273 pat, age > 65 y.o. with hip #,

A.S.A.	(complications)	L.O.S.(days)
II		4,08 – 5,55
III		4,81 – 6,10
IV		7,00 – 9,75

Radcliff T.A. et all(2008): 5683 male pat, age > 65 y.o. → hip fractures

A.S.A. III,IV is associated with worse outcomes (systemic organic dysfunction)) in 30 days post operative with an average 75%

Donegan J.D. et all(2010): 197 pat, aver. age 79,5 y.o. hip #

Post- Complication	A.S.A. II,(52)	A.S.A.III(127)	A.S.A.IV(17)
Cardiac,	4 (%)	15 (%)	29 (%)
Pulmonary,	6 (%)	12 (%)	29 (%)
Gastrointestinal,	4 (%)	5 (%)	12 (%)
Renal	0 (%)	15 (%)	29 (%)
Neurologic,	13 (%)	21 (%)	29 (%)
Surgical	15 (%)	18 (%)	18 (%)
Transfer Unit	4 (%)	26 (%)	29 (%)

<< patients with higher ASA(III,IV) had an increased percentage of postoperative complications after surgery that require interventions by a medical specialist >>

Kastanis G et all(2015): 198 male pat, age > 65 y.o. → hip fractures

A.S.A.	Complications	Transfer Unit
II	12%	0%
III	30,8%	19.1%
IV	67,7%	61,2%

Mortality

1109 pat. aver age .65 y.o. with hip fractures

Paksima N. et all(2008)

A.S.A.	Mortality 1 year
II	4%
III	13%
IV	22%

<<Patients with ASA III,IV had a threefold risk to mortality during the 1st year after hip fracture and returned to the risk of the standard population 3 years postoperatively>>

Holt G. et all(2009): 18817 pat, age > 65 y.o.

A.S.A.	Mortality 30 days	120 days
II	3%	9%
III	8%	21%
IV	25%	55%

<< Patients with A.S.A. III,IV have the most significant effect on post-operative mortality and unfortunately, associated diseases cannot be treated by pre-operative medical interventions>>

Yeoh CJ. Et all(2009)

The early identification of high-risk patients and daily individualized patient care have been shown to reduce the incidence of medical complications associated with the treatment of elderly patients with a hip fracture.

Conclusions

❖Geriatric hip fracture is a common and serious injury in the elderly patients,

❖ Mortality rate 1 year after fractures range 18%-33%,

❖ The overall rate of recovery of pre-injury function or ambulatory status is less than 70%,

❖ A.S.A. Classification system shown to be correlated with multiple factors →Post-complications
- → Length to Hospital Stay
- → Delay to surgery
- → Mortality

} Hip geriatric fractures,

❖ When A.S.A. Score in patients is III or IV, the percentage of post operative complications and mortality are threefold or fourfold higher than other patients,

❖Treatment of hip geriatric fractures must to be a multidisciplinary approach with object to decrease postoperative morbidity ,mortality, and patient to return in a optimal functional level.

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Acute Kidney Injury as a risk factor for 30 day mortality in fractured neck of femur patients.

Gwithyen Silk, Niraj Vetharajan and Mr Mark Price

Weston General Hospital, UK

2015

Introduction

- *"Acute kidney injury (AKI) is both a prevalent and serious problem amongst hospitalised patients" NCEPOD 2009*

- Only one previous small study published on AKI and NOF

  (Bennet et al 2010 Injury)

- AKI defined using the RIFLE criteria (a fall in eGFR of 25% or more) *(Acute Dialysis Quality Initiative)*

- Aim was to see if AKI is associated with 30-day mortality

Methods

- A retrospective analysis
  - All hip fracture patients admitted to our Trust
  - 2 year period
  - Excluded if no operation or no result available
- We reviewed eGFR at pre op and day 1 post op
- 30 day mortality data from NHF database

Results

- 616 patients
- Male 26%:Female 74%, age range 63-106, median age 86
- With a 30-day mortality of 13 % (80 patients)
- Six patients were excluded because they died pre-operatively

eGFR analysis pre-op to day 1 post op

- 71 patients eGFR fell by 25% or more
- 17 patients died – 23%

- 539 pts eGFR did not fall by more than 25%
- 57 patients died – 10%

- Overall incidence of AKI – 11.6%

Chi-square test for independence

- indicated a significant association between AKI and mortality at 30 days

χ^2 (1, *n* = 610) = 10.52, *p = 0.001*

	Dead	**Alive**	***Marginal Row Totals***
AKI	17 [2.8%]	54 [9.0%]	71 [11.8%]
No AKI	57 [9.2%]	482 [79%]	539 [88.2%]
Marginal Column Totals	74 [12.0%]	536 [88%]	610 [100%]

Conclusions

- AKI is associated with a significantly higher 30 day mortality in patients with a neck of femur fracture

- We recommend that review of eGFR should be routine for NOF patients

Thank you

Any questions?

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

The influence of acetabular and proximal femoral morphology on the femoral neck and trochanteric fractures

DR.ERHAN OKAY

Marmara University Education and Training Hospital
ISTANBUL-TURKEY

INTRODUCTION

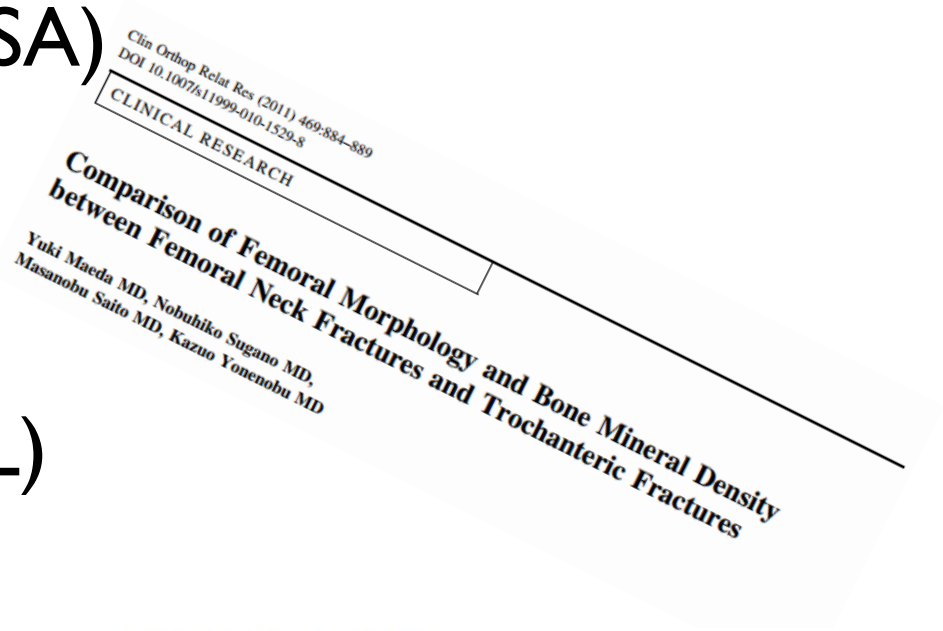
- İmportant health-care problem for elderly age group
- İncreased risk for morbidity and mortality
- Classification based on fracture location:
  - ✓ Femoral neck fracture
  - ✓ Femoral trochanteric fracture

ETİOLOGY

- Age
- Bone mineral density
- Proximal femoral morphology

Proximal femoral morphology

- ✓Neck/shaft angle(NSA)
- ✓Cortical index(CI)
- ✓Hip axis length(HAL)



Clin Orthop Relat Res (2011) 469:884–889
DOI 10.1007/s11999-010-1529-8

CLINICAL RESEARCH

Comparison of Femoral Morphology and Bone Mineral Density between Femoral Neck Fractures and Trochanteric Fractures

Yuki Maeda MD, Nobuhiko Sugano MD, Masanobu Saito MD, Kazuo Yonenobu MD

Osteoporos Int (2011) 22:803–807
DOI 10.1007/s00198-010-1301-7

ORIGINAL ARTICLE

Proximal hip geometry and hip fracture risk assessment in a Korean population

G. I. Im · M. J. Lim

JOURNAL OF BONE AND MINERAL RESEARCH
Volume 12, Number 11, 1997
Blackwell Science, Inc.

Different Morphometric and Densitometric Parameters Predict Cervical and Trochanteric Hip Fracture: The EPIDOS Study

F. DUBOEUF,[1] D. HANS,[1] A.M. SCHOTT,[1] P.O. KOTZKI,[2] F. FAVIER,[3] C. MARCELLI,[4] P.J. MEUNIER,[1] and P.D. DELMAS[1]

Hyphothesis

Acetabular morphology

Acetabular index (AI)

Acetabular depth (AD)

ANY CORRELATİON? ? ? ?

Patient group

Inclusion

- Between 2012 -2014
- One center
- Retrospective design
- Primary trauma
- 60 cases (41 Females-19 Males)
- Mean age: 77,56 (58 – 95 yr)

Exclusion

- ✓ High energy trauma
- ✓ Contralateral hip fracture
- ✓ Pathologic fracture
- ✓ Paralysis
- ✓ Presence of previous deformity
- ✓ Metabolic bone disease
- ✓ Operation history in healthy contralateral hip

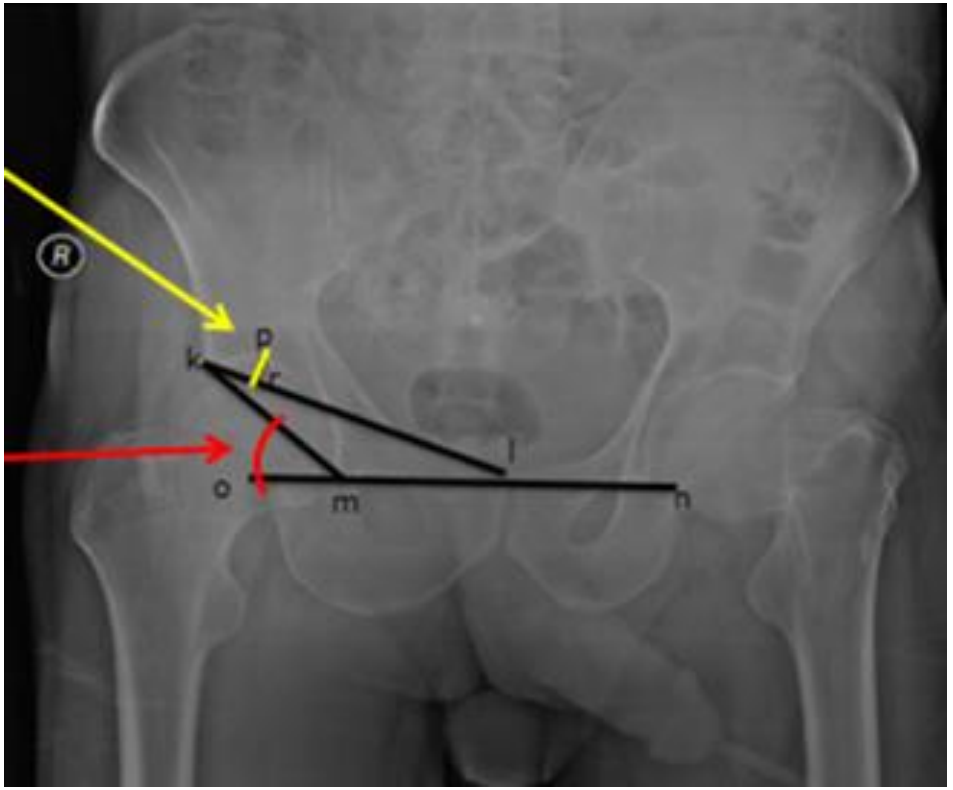
Demographics

	TROCHANTERİK	**FEMORAL NECK**	**P value**
Female/Male	32/5	9/14	**0,001**
Age	79,22±9,09	74,77±8,29	**0,036**

MEASUREMENTS

Acetabular depth

Acetabular index



MEASUREMENTS

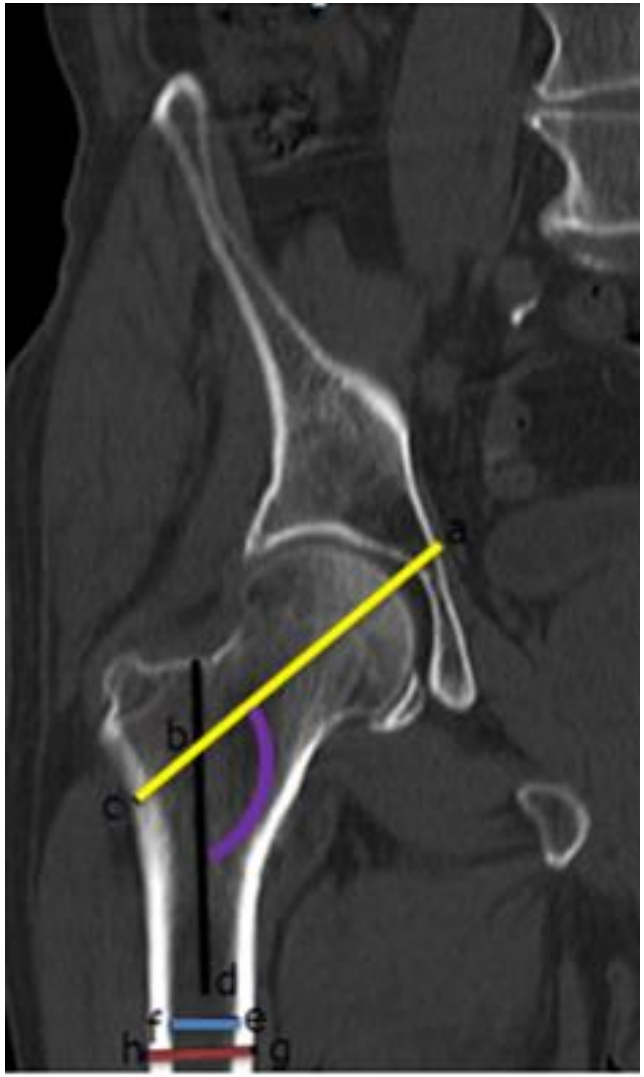
AC: Hip axis length

FE:Intramedullar diameter

HG: Femur diaphysis diameter

ABD: Neck shaft angle

CI: FE/HG = Cortical index



COMPARİSIONS

	TROCHANTERİC	FEMUR NECK	P değeri
NSA	132,24±16,71	128,74±3,39	0,271
AD	11,38±1,77	11,43±1,95	0,975
AI	37,95±2,35	32,57±4,02	**0,001**
HAL	97,00±6,5	104,52±6,69	**0,001**
CI	0,43±0,06	0,44±0,06	0,222

RESULTS

TROCHANTERİC FRACTURE

~

FEMORAL NECK FRACTURE

- Neck Shaft Angle(NSA)
- Acetabular Depth (AD)
- Cortikal index (CI)

TROCHANTERİC FRACTURE RİSK ⬆

- Increased age ⬆
- Acetabular index ⬆
- Hip-Axis length ⬇

CONCLUSION

- Acetabular morphology can play a role in femoral neck and trochanteric fracture in addition to proximal femoral morphology.

Hip-Axis length (HAL) ↑ Femoral neck fracture ↑

Acetabular index (AI) ↑ Trochanteric fracture ↑

LİMİTATİON

- Small sample size
- Retrospective design
- Heterogenity between 2 groups

FUTURE INSIGHTS

- Population-based studies on acetabular anatomy
- Clarification of hip fracture mechanism
- **Biomechanical studies assessing acetabular morphology**

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INTERNATIONAL COMBINED MEETING

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26-27 NOVEMBER 2015

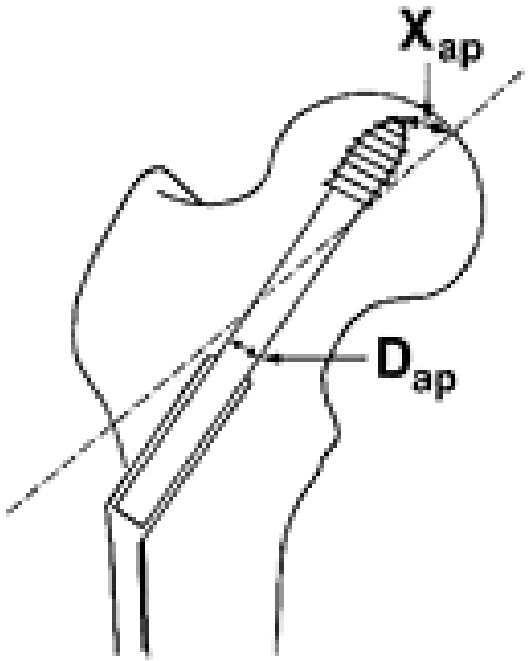
MILAN, ITALY

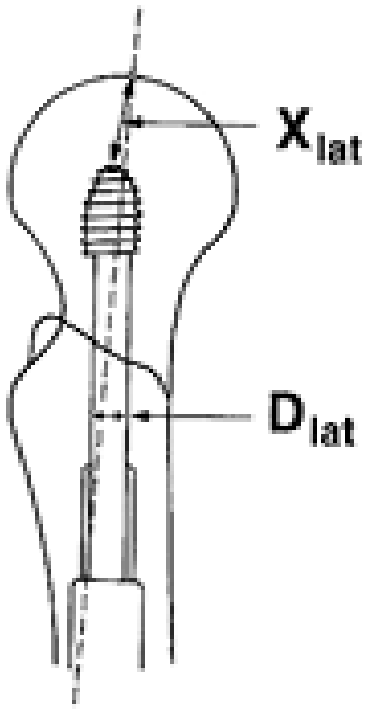
Rethinking tip – apex distance for the Proximal Femoral Nail Anti-rotation

Will Manning, Kiran Singisetti, Adam Farrier, Nick Cooke,
North Tees Hospital, Teesside

Introduction

- Proximal femoral nail anti-rotation (PFNA) is used for unstable proximal femoral/femoral neck fractures
- PFNA blade design compacts the cancellous bone in femoral head.
- This has been suggested to provide **biomechanical advantage** by reducing rotation and varus collapse.
- Common practice is to insert lag screw with a tip-apex of <25mm measured in two planes (AP/Lat) [1]





$$TAD = \left(X_{ap} \times \frac{D_{true}}{D_{ap}}\right) + \left(X_{lat} \times \frac{D_{true}}{D_{lat}}\right)$$

2A

- The PFNA blade is a spiral construct with no terminal screw portion. The mode of engagement involves impaction of bone as the blade is struck, not torqued, into the bone. The blade creates a large surface area and the fins of the blade are analogous to the keel on a boat

The PFNA blade

- Previous studies defining suitable tip-apex distance performed in Dynamic Hip Screw
  - Baumgartner et al. 1995
- Not clear if tip-apex distance applies to PFNA
  - Nikoloski et al. 2013

Aim

→ To determine the extent to which the tip-apex distance is critical to the cut-out survivorship in the PFNA where the tip-apex distance is greater than 25mm

Patients

- Data collected between 2006 and 2014
- 228 consecutive patients with unstable proximal femoral fractures who underwent PFNA fixation
- Single institution – North Tees Hospital, Teesside

Method

- Retrospective review of data
- Radiographs were reviewed by two independent practitioners (AF and SK)
- Pre-operative radiographs:
  - fracture configuration → AO/ASIF classification system
- Immediate post-operative radiographs:
  - the Tip-apex distance
- Disagreements encountered in fracture classification were resolved with the help of a third author

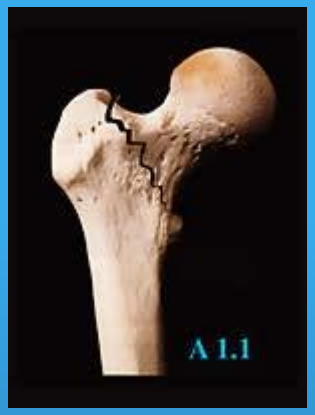

A 1.1
A 1.2
A 1.3
A 2.1
A 2.2
A 2.3
A 3.1
A 3.2
A 3.3

Statistical method

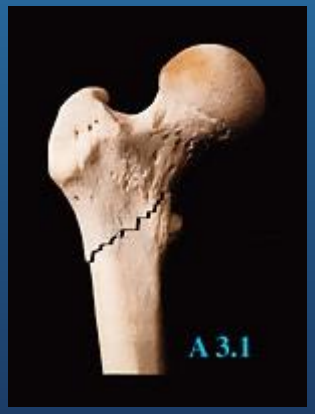
- Kaplan-Meier survival analysis
  - to assess the survivorship of the PFNA prosthesis
- Categorical data was analysed with Fisher's exact test

Results

- There were 228 cases in total of which 60 were male and 168 were female
- The majority of the fractures belonged to AO/ASIF classification types 31A3.3 (n=77) and 31A2.3 (n=43)
- The mean tip-apex distance (TAD) was 22 mm (range 4–34 mm)
- Post-operatively, 15 patients died within 30 days
- Patients were followed up for a median time of 18.9 months
- The PFNA blade cut out rate was 3.07% (n=7)
- The overall implant failure rate requiring revision surgery was 5.7% (n=13)



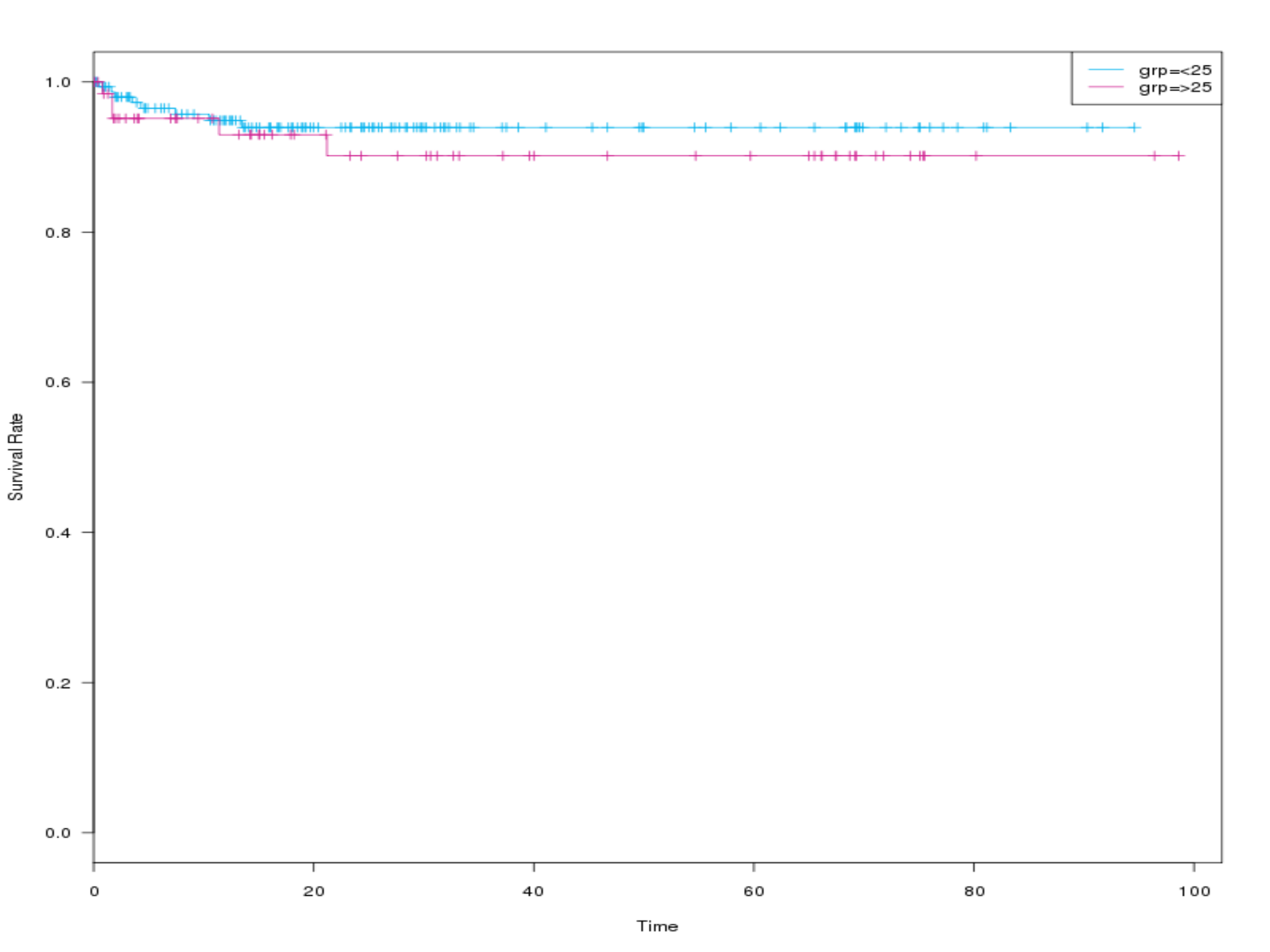
19%



34%

Results

- 3 of the 7 (43%) cases which failed due to ‘cut-out’ involved a PFNA with a TAD >25mm.
- mean TAD in failures due to cut-out was 27.9mm (range 14-48mm)
- Median time to implant failure was 1.7 months (range 0.8-10.5 months)
- The Kaplain-Meir **100 month survival** for the PFNA implant with TAD >25mm was 95% (CI 89 -100%) and 97% (CI:94 to 100%) for TAD <25mm


grp=<25
grp=>25
1.0
0.8
0.6
0.4
0.2
0.0
Survival Rate
0
20
40
60
80
100
Time

Discussion

- In our cohort ‘cut-out’ was still the most frequent reason for implant failure
- The Kaplan-Meier survivorship for PFNA with TAD >25mm and <25mm was high with no statistically significant difference between the two *(p=0.4 – fishers exact test)*
- The PFNA appears to tolerate a TAD >25mm without failure due to ‘cut out’

Conclusion

- **Unstable proximal femoral/femoral neck fractures were treated successfully with the PFNA**
- Cut out tends to happen early
- Our series showed no statistically significant difference in PFNA blade cut out rate with TAD <25mm and >25mm
- This suggests that the PFNA blade may be tolerant of TAD greater than 25mm with a comparable implant survivorship in this cohort

Limitations

- Small study size
- High population morbidity and mortality
- Short follow up
- Retrospective review

References

- 1 - MR Baumgaertner, SL Curtin, DM Lindskog Intramedullary versus extramedullary fixation for the treatment of intertrochanteric hip fractures. Clin Orthop Relat Res 1998, 348:87–94.
- 2 - AN Nikoloski, AL Osbrough and PJ Yates Should the tip-apex distance (TAD) rule be modified for the proximal femoral nail antirotation (PFNA)? A retrospective study

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Update on fixation of intra-capsular femoral fractures

University of Torino School of Medicine
Centro Traumatologico Ortopedico
Clinica Ortopedica I
www.chirurgia-bacino-anca.unito.it

Troch-anter

31-A1
pertrochanteric simple

select

31-A2
pertrochanteric multifragmentary

select

31-A3
intertrochanteric

select

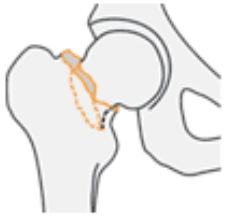
Neck

31-B1
subcapital, with slight displacement

Click for more info

select

31-B2
transcervical



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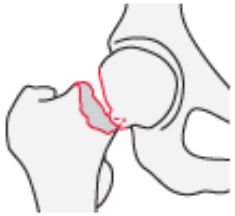
31-B3
subcapital, displaced, non impacted



select

Head

31-C1
split (Pipkin)

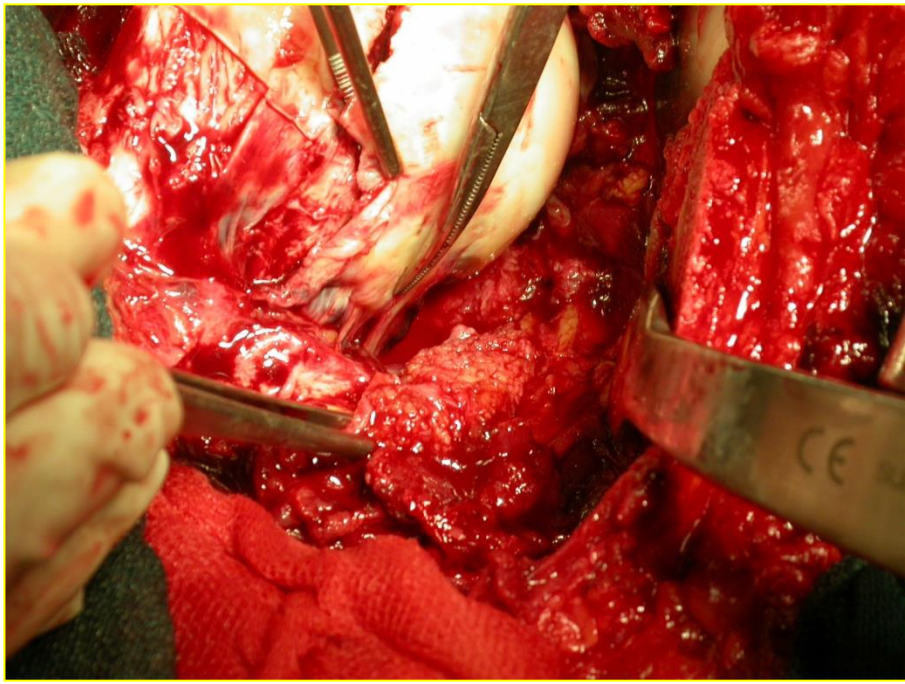
select

31-C2
with depression

select

31-C3
with neck fracture

select



Troch-anter

31-A1
pertrochanteric simple

☑ select

31-A2
pertrochanteric multifragmentary

☑ select

31-A3
intertrochanteric

☑ select

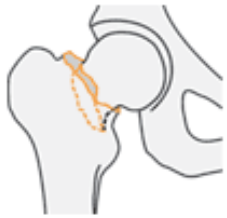
Neck

31-B1
subcapital, with slight displacement

Click for more info

☑ select

31-B2
transcervical



☑ select

31-B3
subcapital, displaced, non impacted

☑ select

Head

31-C1
split (Pipkin)

☑ select

31-C2
with depression

☑ select

31-C3
with neck fracture

☑ select

Contents lists available at ScienceDirect

Injury

journal homepage: www.elsevier.com/locate/injury

Complications following young femoral neck fractures

G.P. Slobogean [a,b,*], S.A. Sprague [b,c], T. Scott [c], M. Bhandari [b,c]

[a] Department of Orthopaedic Surgery, University of British Columbia, Canada
[b] Division of Orthopaedic Surgery, Department of Surgery, McMaster University, Canada
[c] Department of Clinical Epidemiology and Biostatics, McMaster University, Canada

- reoperation incidence 18.0%
- avascular necrosis (AVN) 14.3%
  (up to 50% in displaced)
- nonunion 9.3%
- malunion 7.1%
- implant failure 9.7%

Fixation / Technique

- **Urgent reduction and fixation**
- Anatomical reduction
  - Closed manipulation, internal rotation, pressing from anterior
  - Open reduction (Smith-Peterson or Watson-Jones approaches)
- Three screws or DHS
  - No solid evidence for choice of implant

AVN

-Early reduction of femoral neck fractures and decompression of capsular hematomas may be of benefit

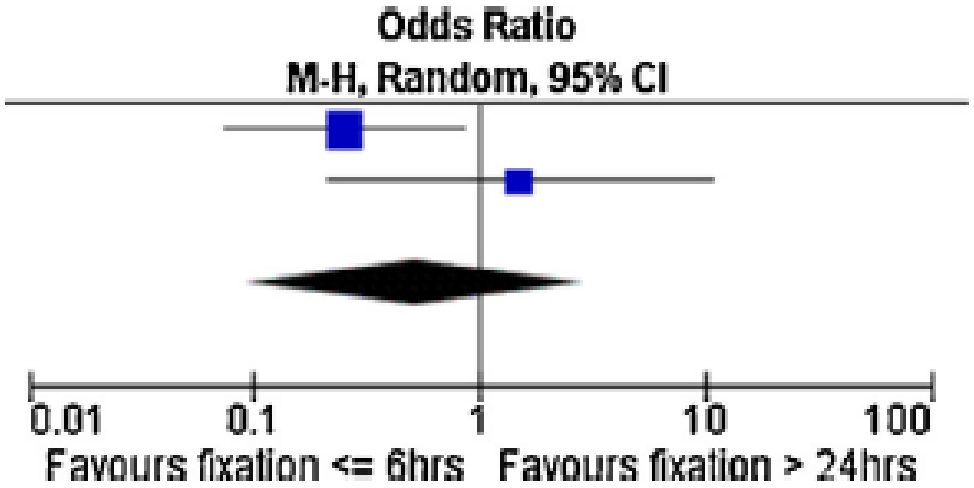
-lack of agreement with respect to the allowable timing for reduction

-recommendations range from less than six hours to within 24 hours

Timing of internal fixation of femoral neck fractures. A systematic review and meta-analysis of the final outcome

Costas Papakostidis [a,b,c,d], Andreas Panagiotopoulos [a,b,c,d], Andrea Piccioli [a,b,c,d], Peter V. Giannoudis [a,b,c,d,*]

[a] "G Hatzikostas" General Hospital, Department of Trauma and Orthopaedics, Makriyianni Av., 45 001 Ioannina, Greece
[b] Academic Department of Trauma & Orthopaedic Surgery, University of Leeds, Clarendon Wing, Floor A, Great George Street, Leeds General Infirmary LS1 3EX Leeds, UK
[c] Cancer Center, "Palazzo Baleani", Teaching Hospital Policlinico Umberto I, Corso Vittorio Emanuele II 244, 00186 Rome, Italy
[d] NIHR Leeds Biomedical Research Unit, Chapel Allerton Hospital, LS7 4SA Leeds, West Yorkshire, UK

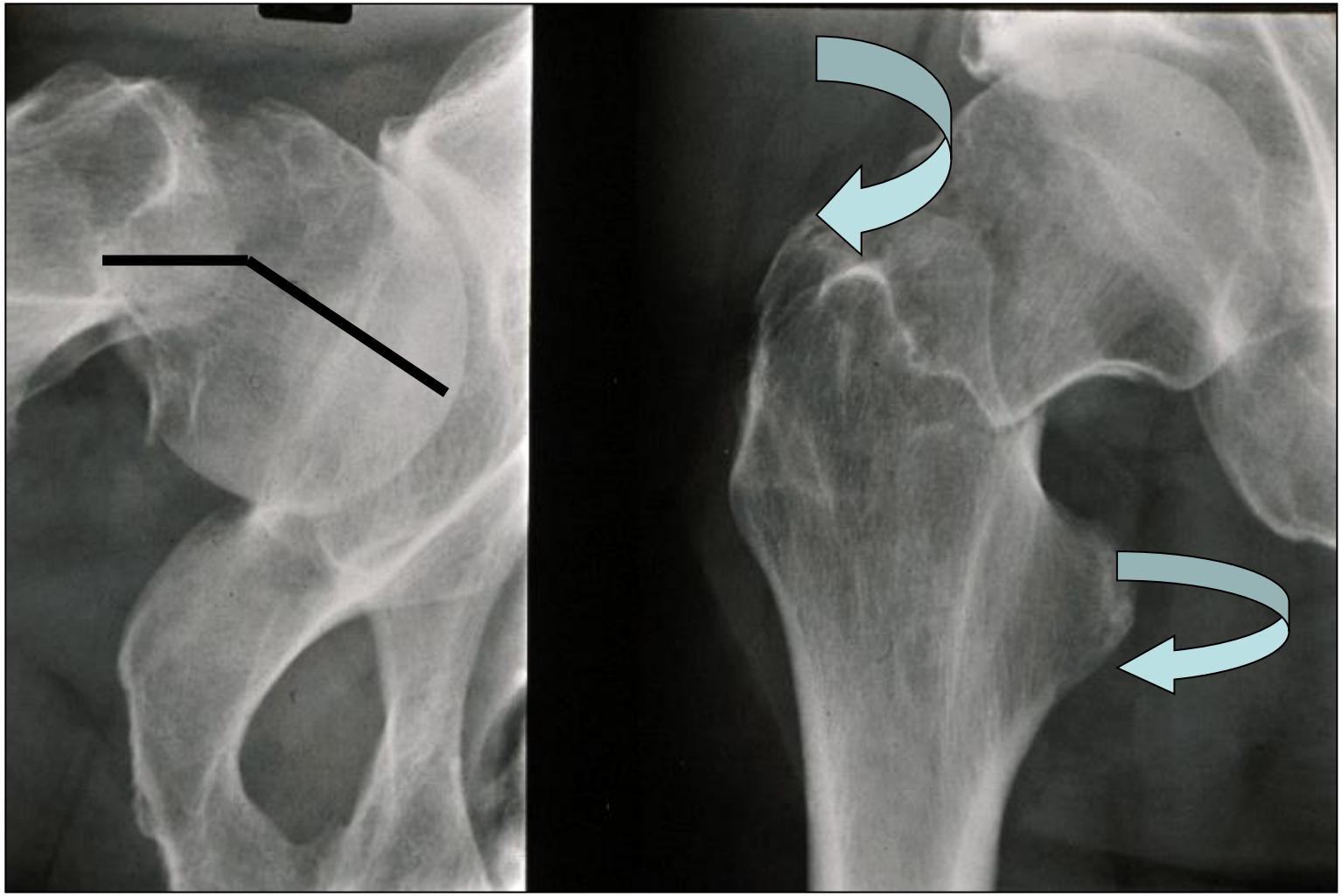


Our study failed to prove any essential association between timing of fracture internal fixation and incidence of AVN

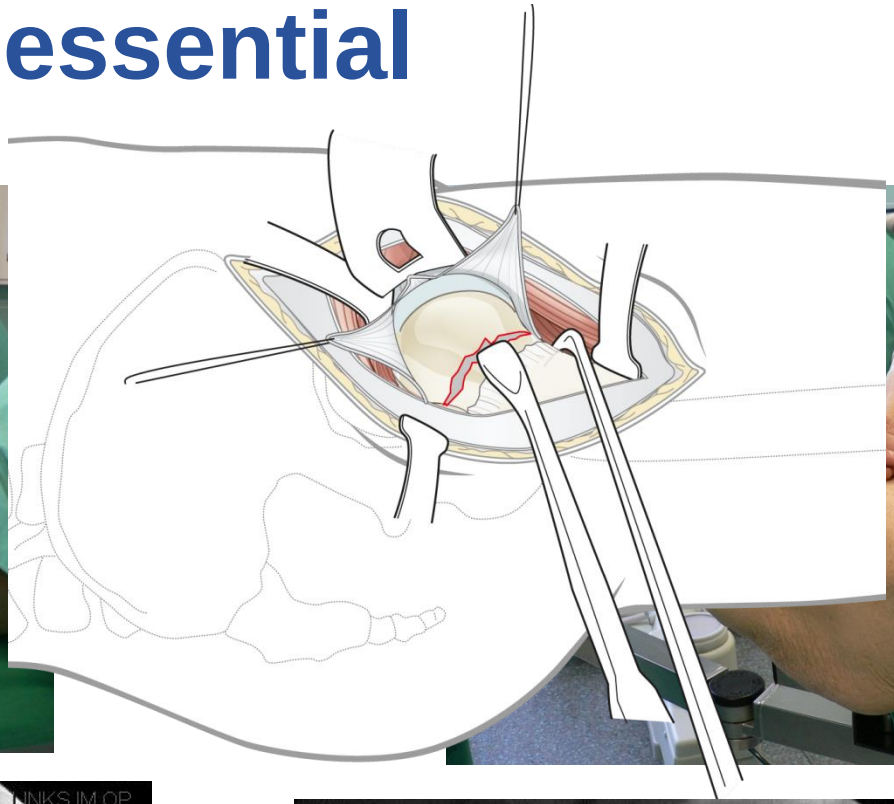
Fixation / Technique

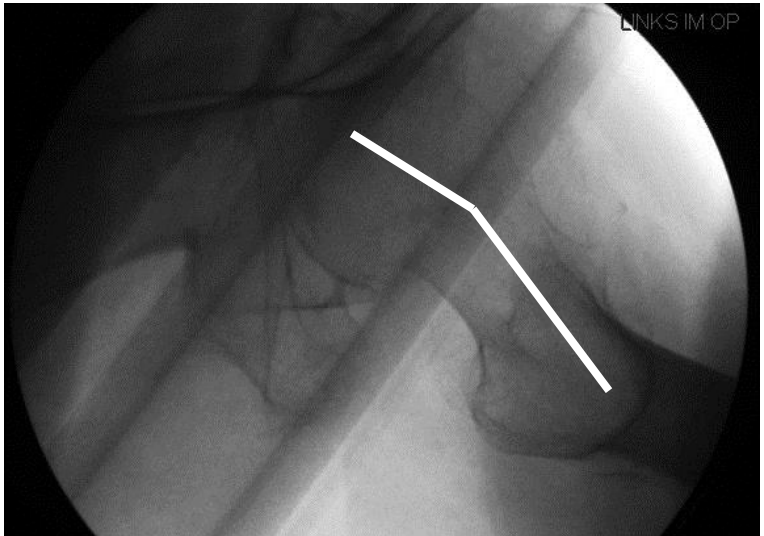
- Urgent reduction and fixation
- **Anatomical reduction**
  - **Closed manipulation, internal rotation, pressing from anterior**
  - **Open reduction (Smith-Peterson or Watson-Jones approaches)**
- Three screws or DHS
  - No solid evidence for choice of implant

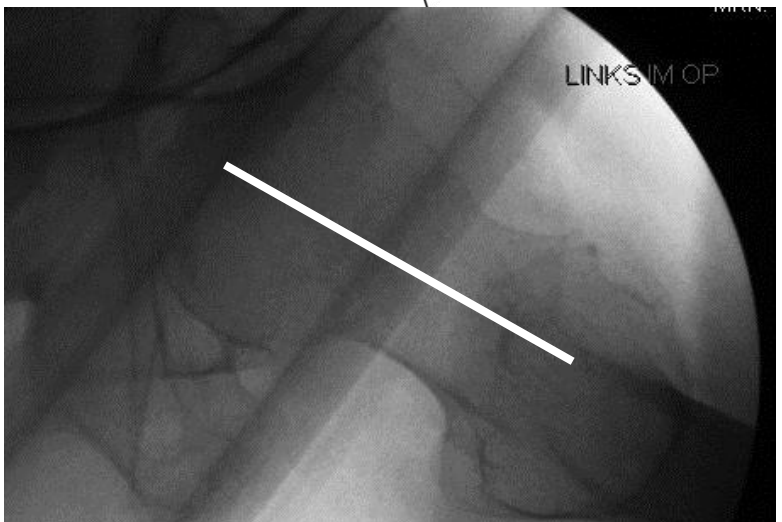
Displaced Garden III varus/retrotorsion



Reduction is essential

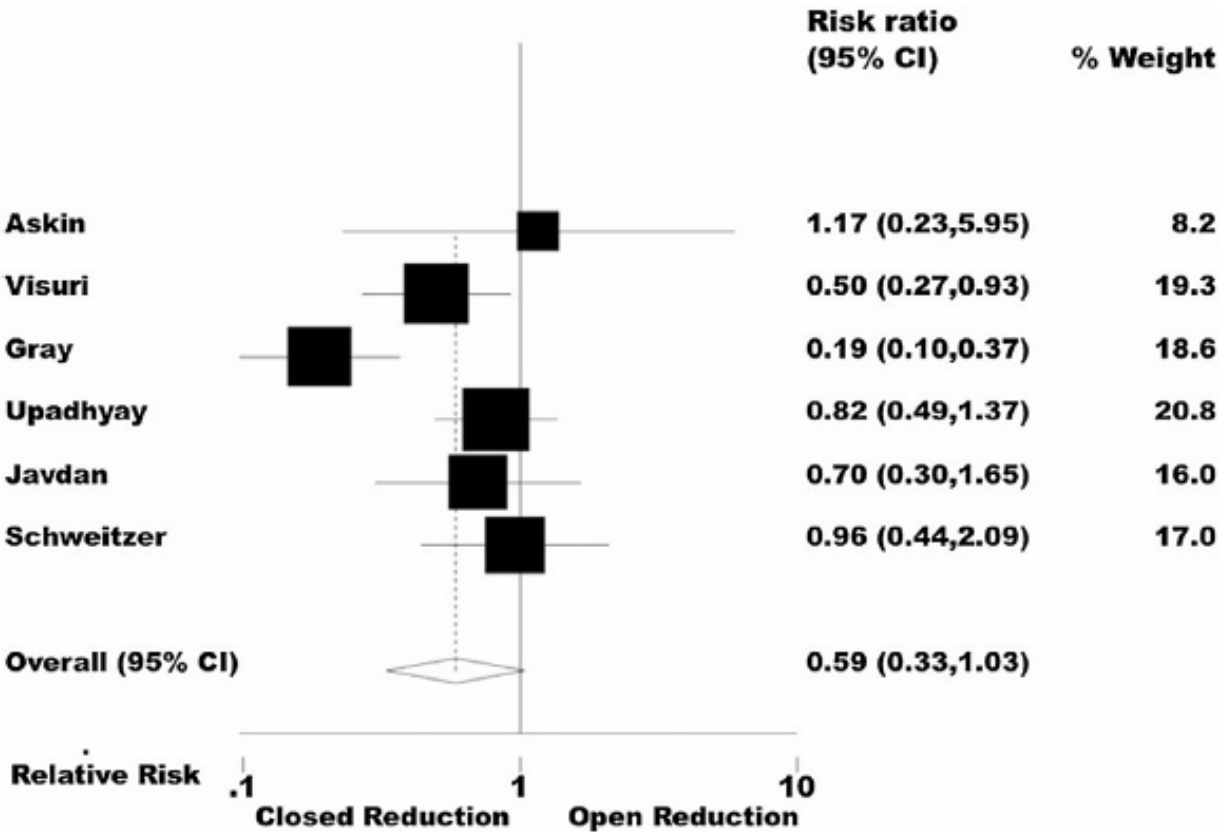






Pouriya Ghayoumi [a,1], Utku Kandemir [b,2], Saam Morshed [b,*]

[a] University of California, San Francisco School of Medicine, United States
[b] University of California, San Francisco, Orthopaedic Trauma Institute at San Francisco General Hospital, United States



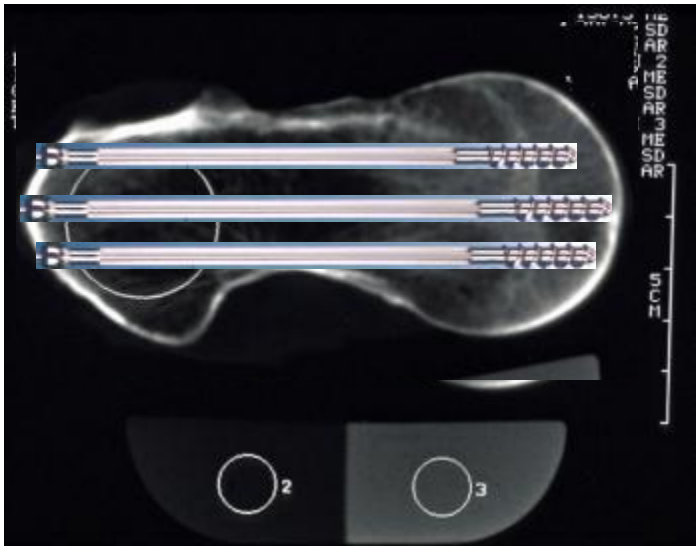
We did not find any significant difference in the incidence of nonunion, avascular necrosis or all complications combined between the open reduced and closed reduced groups

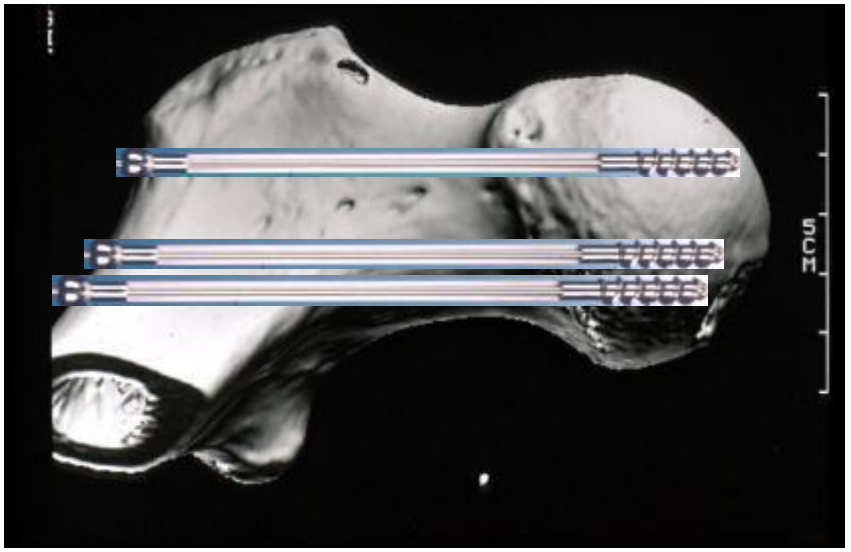
Fixation / **Technique**

- Urgent reduction and fixation
- Anatomical reduction
  - Closed manipulation, internal rotation, pressing from anterior
  - Open reduction (Smith-Peterson or Watson-Jones approaches)
- **Three screws or DHS**
  - **No solid evidence for choice of implant**

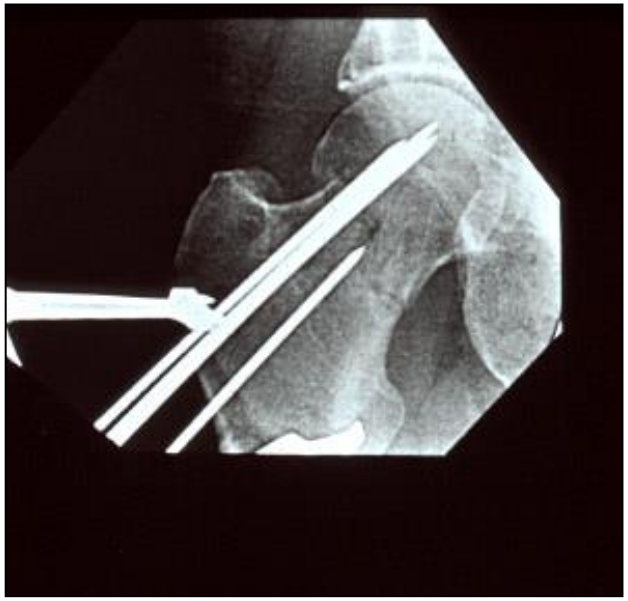
Ideal position of three screws ?

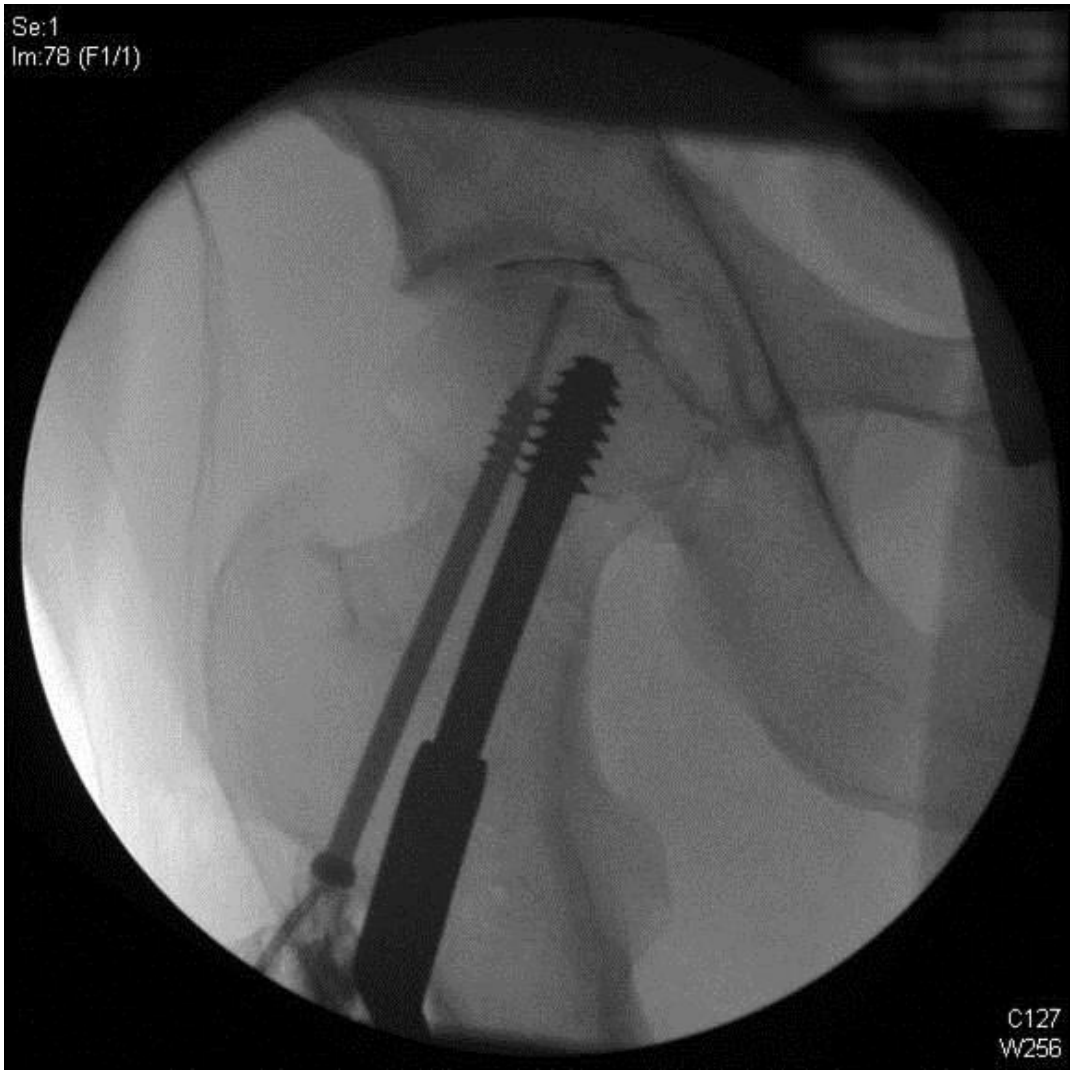
- Subchondral
- Parallel
- One screw inferior, and one posterior neck





Sliding hip screw and antirotation screw





Poor reduction leads to displacement

AOTRAUMA

New implants- limited evidence

DHS blade

Targon FN

PCCP

Original Article Clinics in Orthopedic Surgery 2015;7:22-28 • http://dx.doi.org/10.4055/cios.2015.7.1.22

The Targon FN System for the Management of Intracapsular Neck of Femur Fractures: Minimum 2-Year Experience and Outcome in an Independent Hospital

Donald Osarumwense, FRCS, Elizabeth Tissingh, MRCS, Kakra Wartenberg, MRCS, Saurabh Aggarwal, FRCS, Fikry Ismail, MBBS, Sam Orakwe, FRCS, Farid Khan, FRCS

Department of Trauma and Orthopaedics, Queen Elizabeth Hospital, London, UK

Conclusions: Our study shows similar results with those of the design centre and which are superior to those currently found in the literature for the more traditional fixation methods. It also shows that the promising results with this new implant as seen from the design institutions can be reproduced by all cadres of surgeons in non-specialist practice.

Troch-anter

31-A1
pertrochanteric simple

select

31-A2
pertrochanteric multifragmentary

select

31-A3
intertrochanteric

select

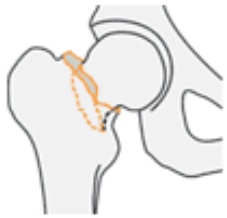
Neck

31-B1
subcapital, with slight displacement

Click for more info

select

31-B2
transcervical



select

31-B3
subcapital, displaced, non impacted

select

Head

31-C1
split (Pipkin)

select

31-C2
with depression

select

31-C3
with neck fracture

select

BACKGROUND

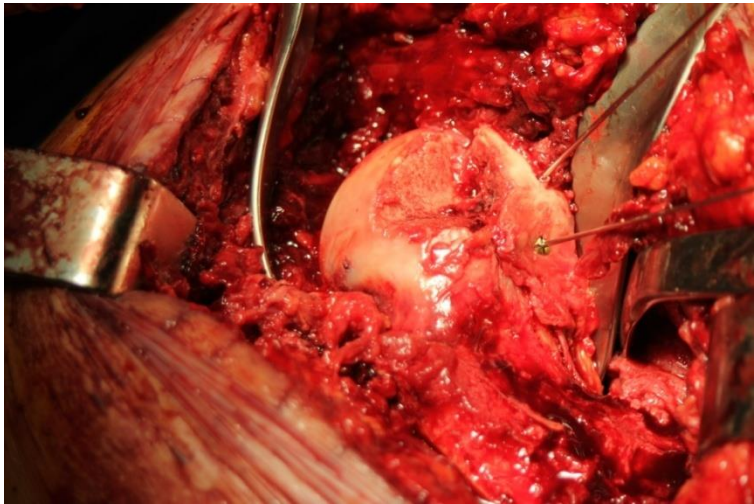
Acta Orthop Scand. 2001 Aug;72(4):348-53.

Clinical and radiographic outcome of femoral head fractures: 30 patients followed for 3-10 years.

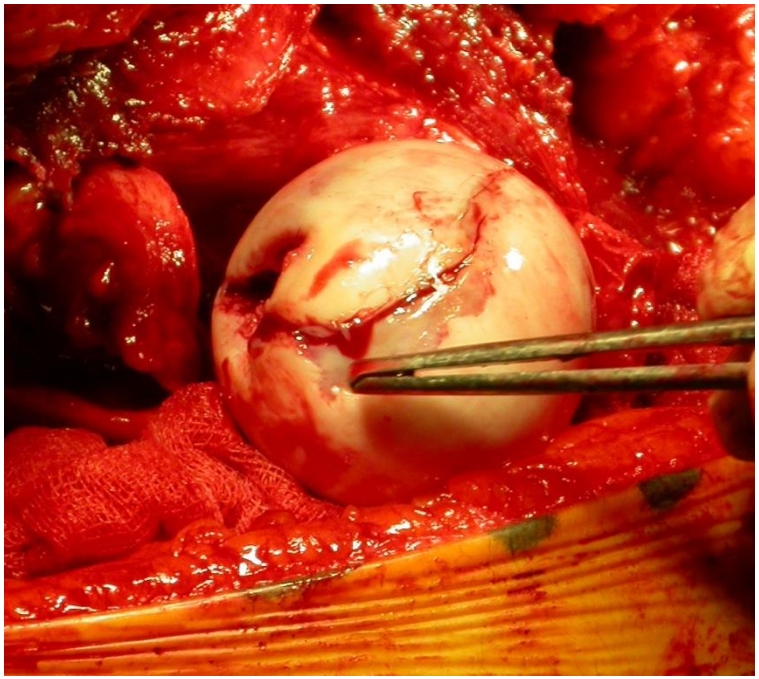
Yoon TR, Rowe SM, Chung JY, Song EK, Jung ST, Anwar IB.

Department of Orthopedic Surgery, Chonnam University Hospital, Kwangju, Korea. tryoon@chonnam.ac.kr

- Rare injury: (2cases x 1 million people x year)
- poor literature, mainly small cohort descriptions
- = no EBM indications

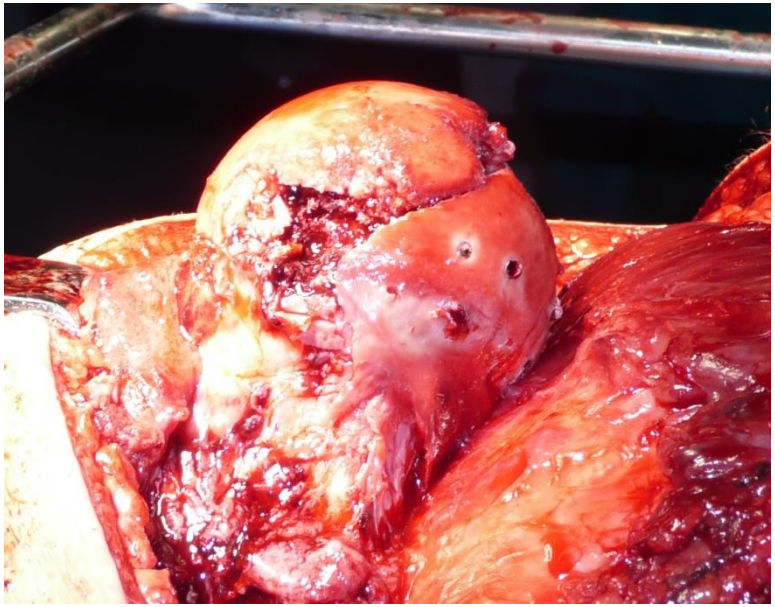


Clinical Outcome



- Cartilage loss
- Joint incongruency

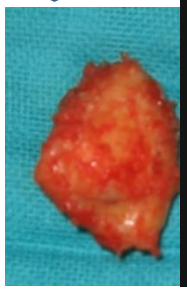
Post traumatic arthritis: >30%



- damage to retinacurar vessels

AVN: 5-20%

TREATMENT OPTIONS

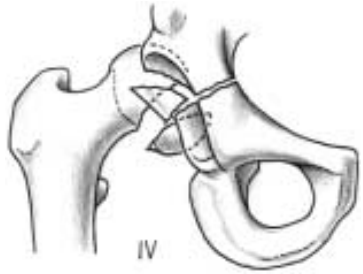


Injury, Int. J. Care Injured 40 (2009) 1245–1251

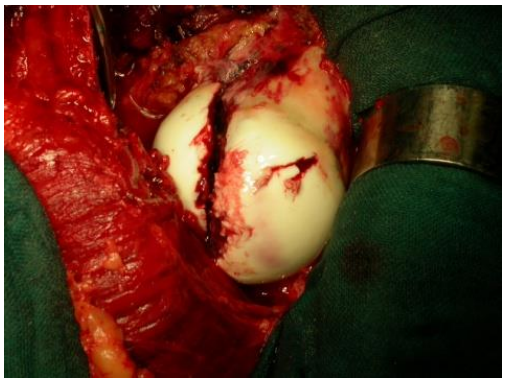
Review

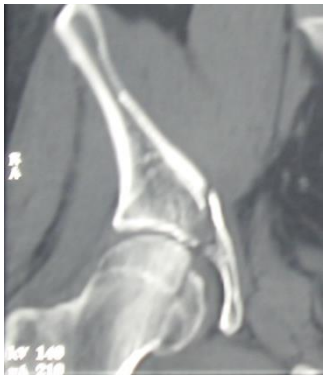
Management, complications and clinical results of femoral head fractures

P.V. Giannoudis [a,*], G. Kontakis [a,b], Z. Christoforakis [b], M. Akula [a], T. Tosounidis [b], C. Koutras [b]



Treatment	Pipkin 2 ($n=78$)	Pipkin 4 ($n=80$)
Nonoperative	15 (19.2%)	8 (10%)
Fragment excision	10 (12.8%)	18 (22.5%)
ORIF	48 (61.5%)	50 (62.5%)
Replacement	4 (5.1%)	4 (5%)
Other	1 (1.3%)	0 (0%)





WHICH SURGICAL APPROACH ?

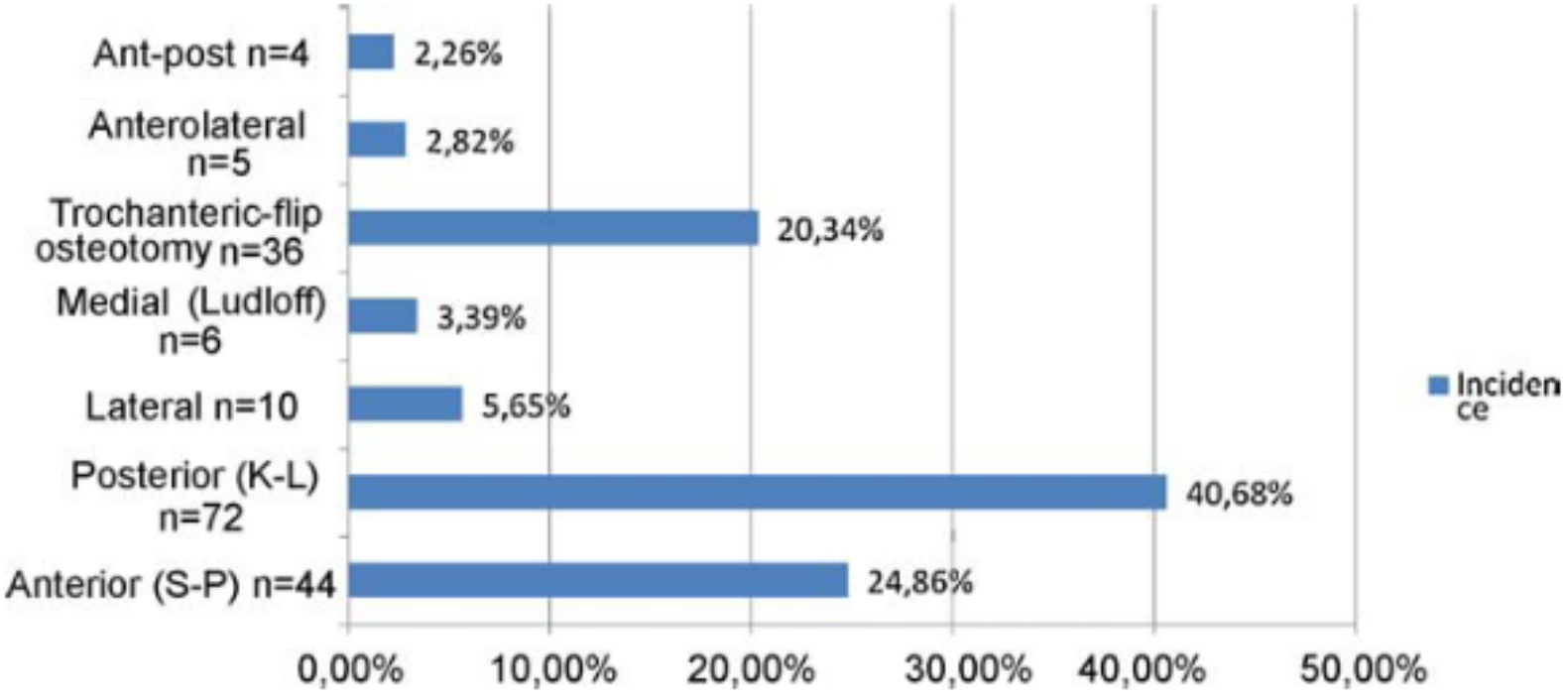
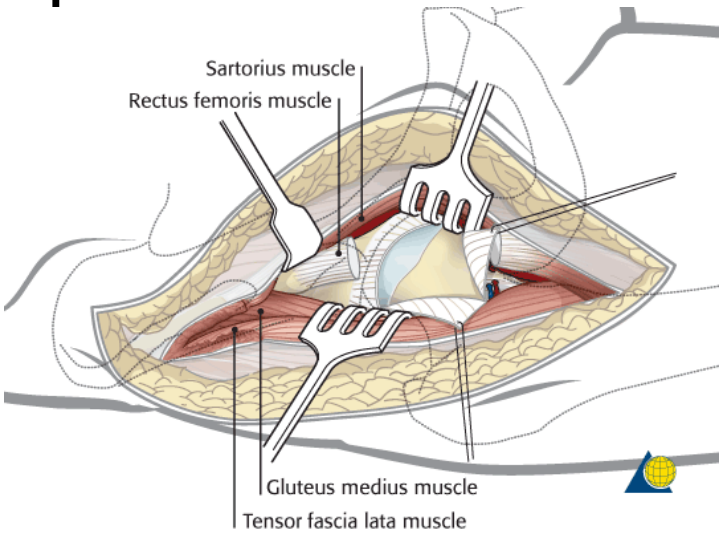
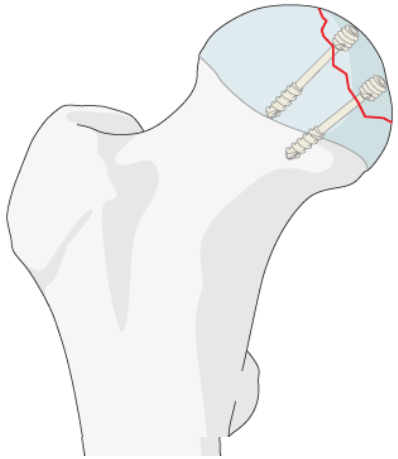


Fig. 1. Favouring approach among 177 surgical cases (14 articles).

ANTERIOR (S-P)

- Good visualization of the anterior femoral head
- Allows removal or reduction and internal fixation
- It does not allow internal fixation of the posterior acetabulum: +K-L?
- Pipkin 1-2





Clin Orthop Relat Res (2009) 467:929–933
DOI 10.1007/s11999-008-0505-z

ORIGINAL ARTICLE

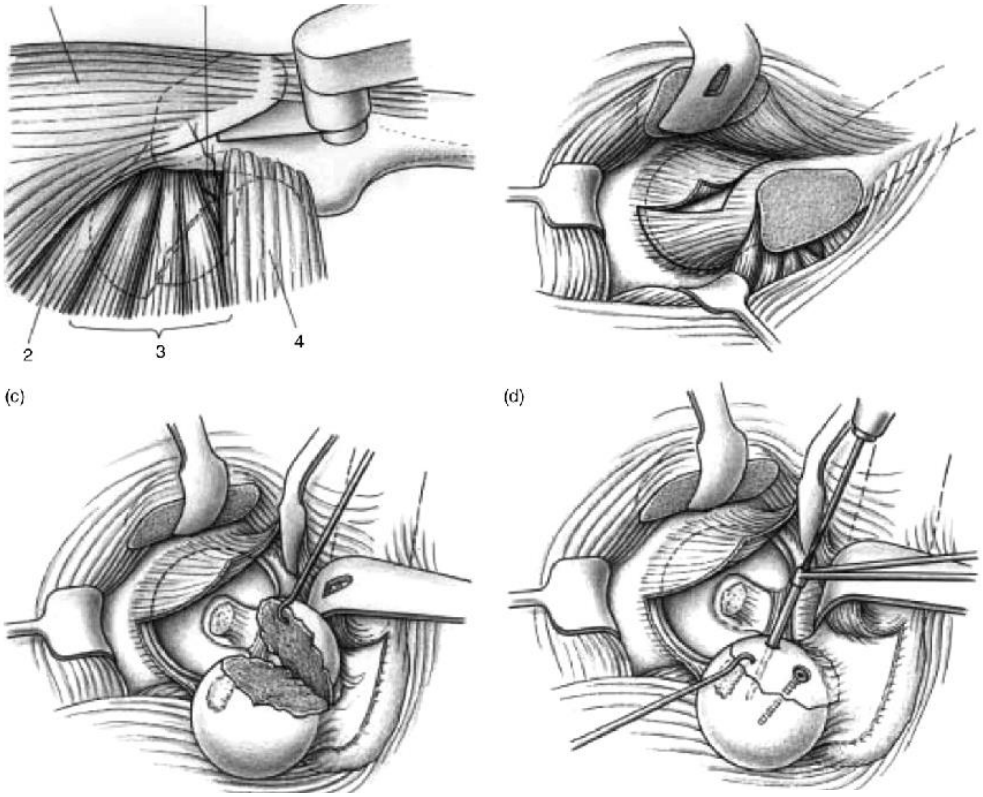
Use of a Trochanteric Flip Osteotomy Improves Outcomes in Pipkin IV Fractures

Brian D. Solberg MD, Charles N. Moon MD, Dennis P. Franco MD

Femoral head injuries: Which treatment strategy can be recommended?

Philipp Henle[a], Peter Kloen[b], Klaus A. Siebenrock[a,*]

[a] *Department of Orthopaedic Surgery, Inselspital, University of Berne, CH-3010 Berne, Switzerland*
[b] *Department of Orthopaedic Surgery, Academic Medical Center, Amsterdam, The Netherlands*



Surgical Dislocation of the Hip for Fractures of the Femoral Head

Michael J. Gardner, MD, Michael Suk, MD, JD, MPH, Andrew Pearle, MD, Robert L. Buly, MD, David L. Helfet, MD, and Dean G. Lorich, MD

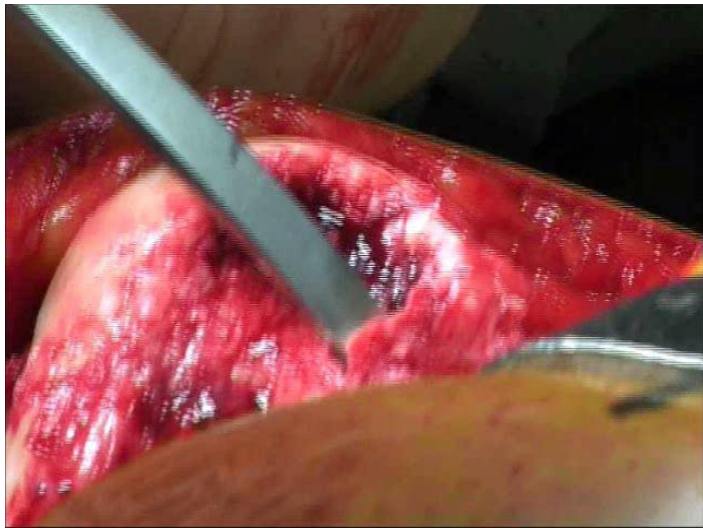
J Orthop Trauma • Volume 19, Number 5, May/June 2005

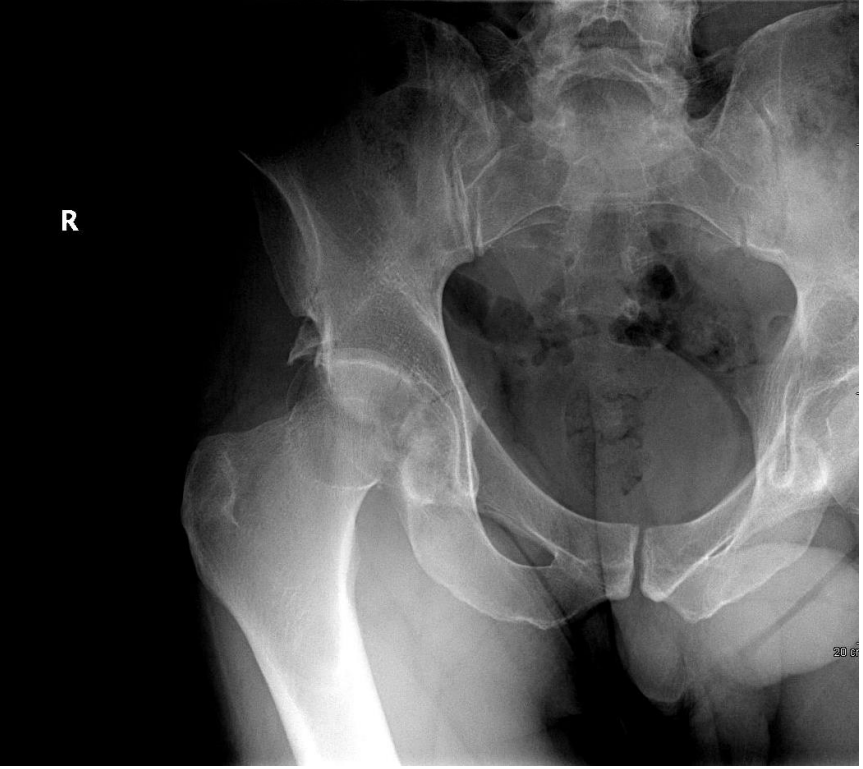
Femoral Head Fractures Revisited

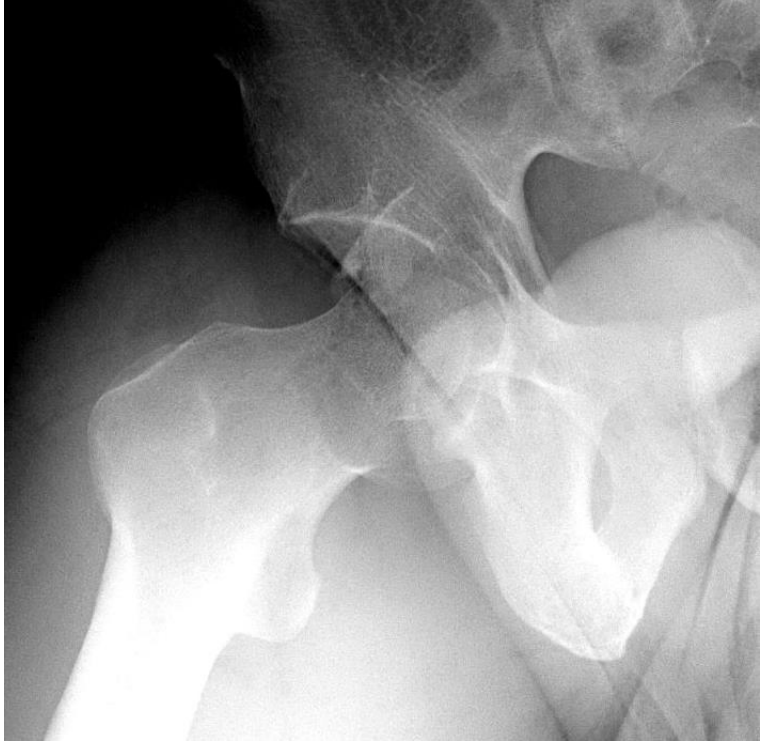
Peter Kloen[1], Klaus A. Siebenrock[2], Ernst L.F.B. Raaymakers[1], Rene K. Marti[1], Reinhold Ganz[2]

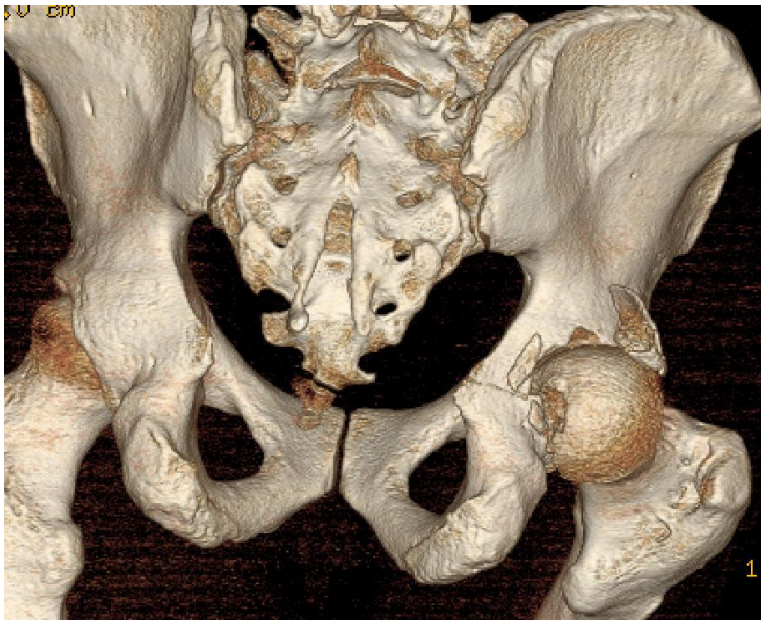
FLIP TROC. OSTEOTOMY AND SURGICAL DISLOCATION

- Complete visualization of the femoral head
- Circumferential visualization of the acetabulum
- Easy reduction and fixation of femoral head and some acetabular fracture
- Not increase the risk of AVN
- Risk of trochanteric nonunion

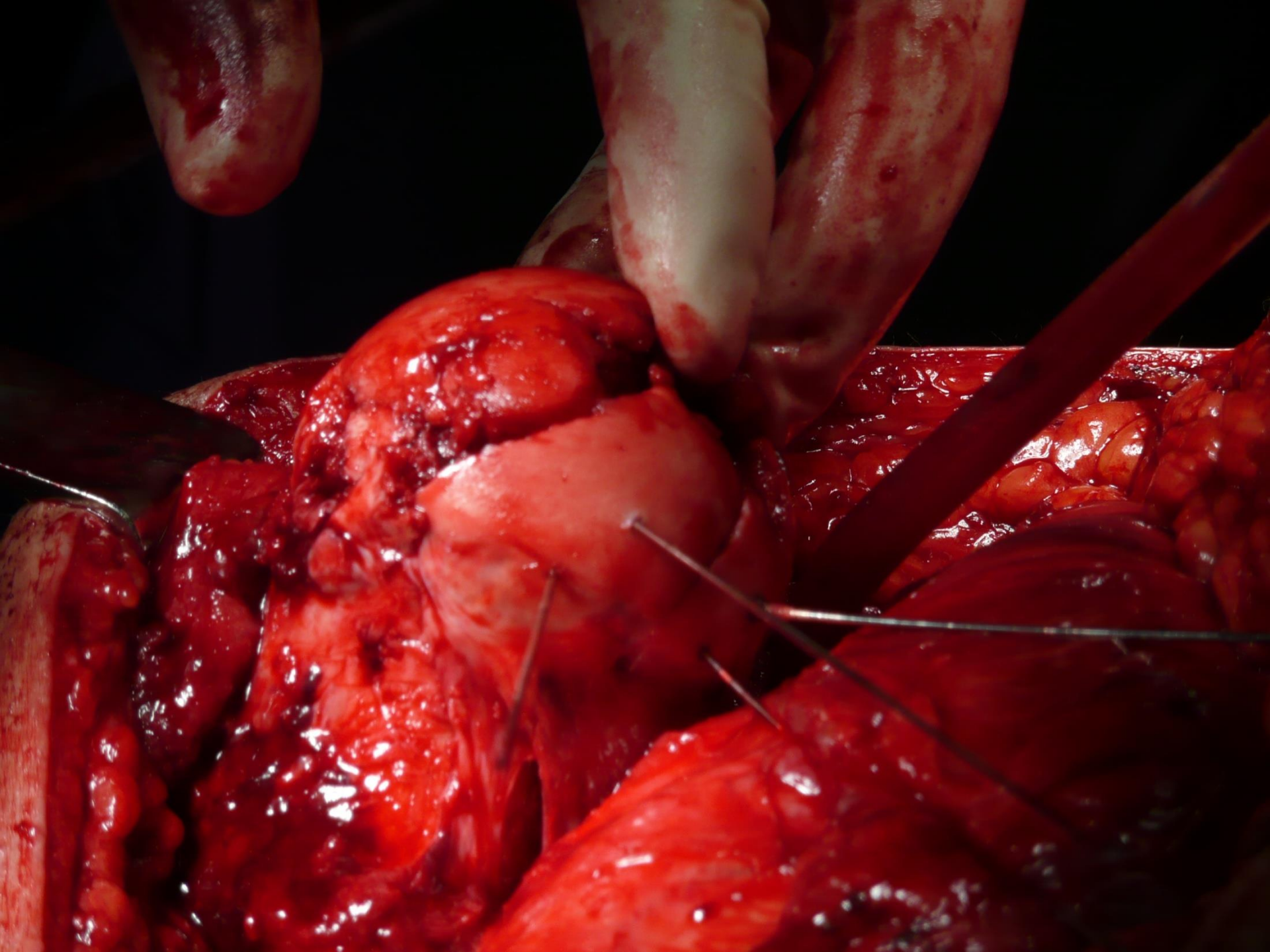


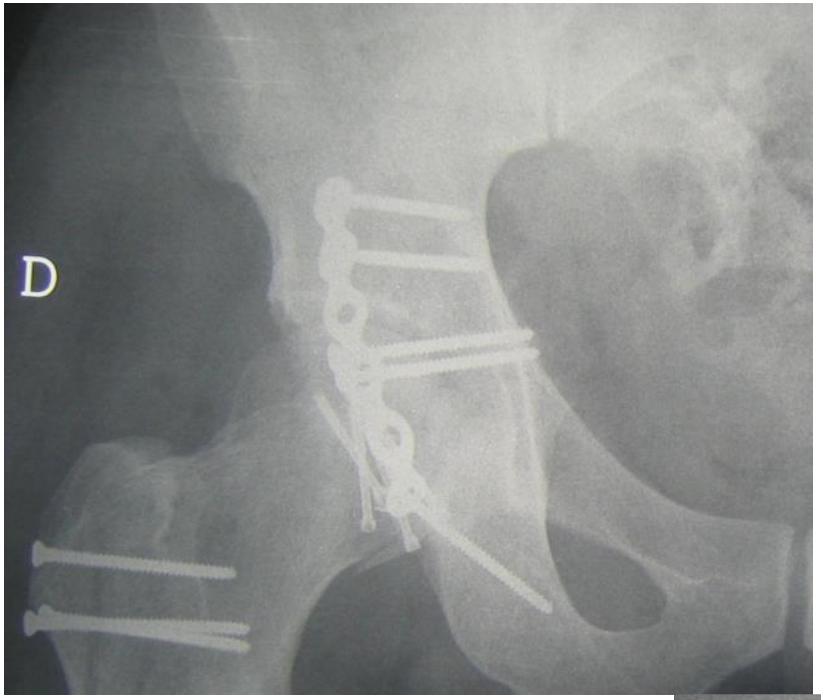






J.Z. 27 yo; Pipkin 4

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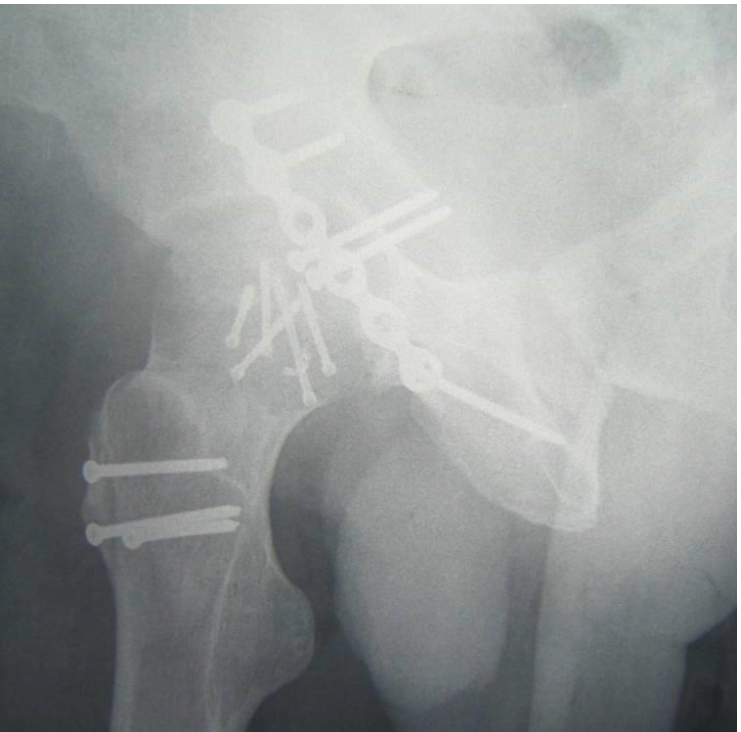


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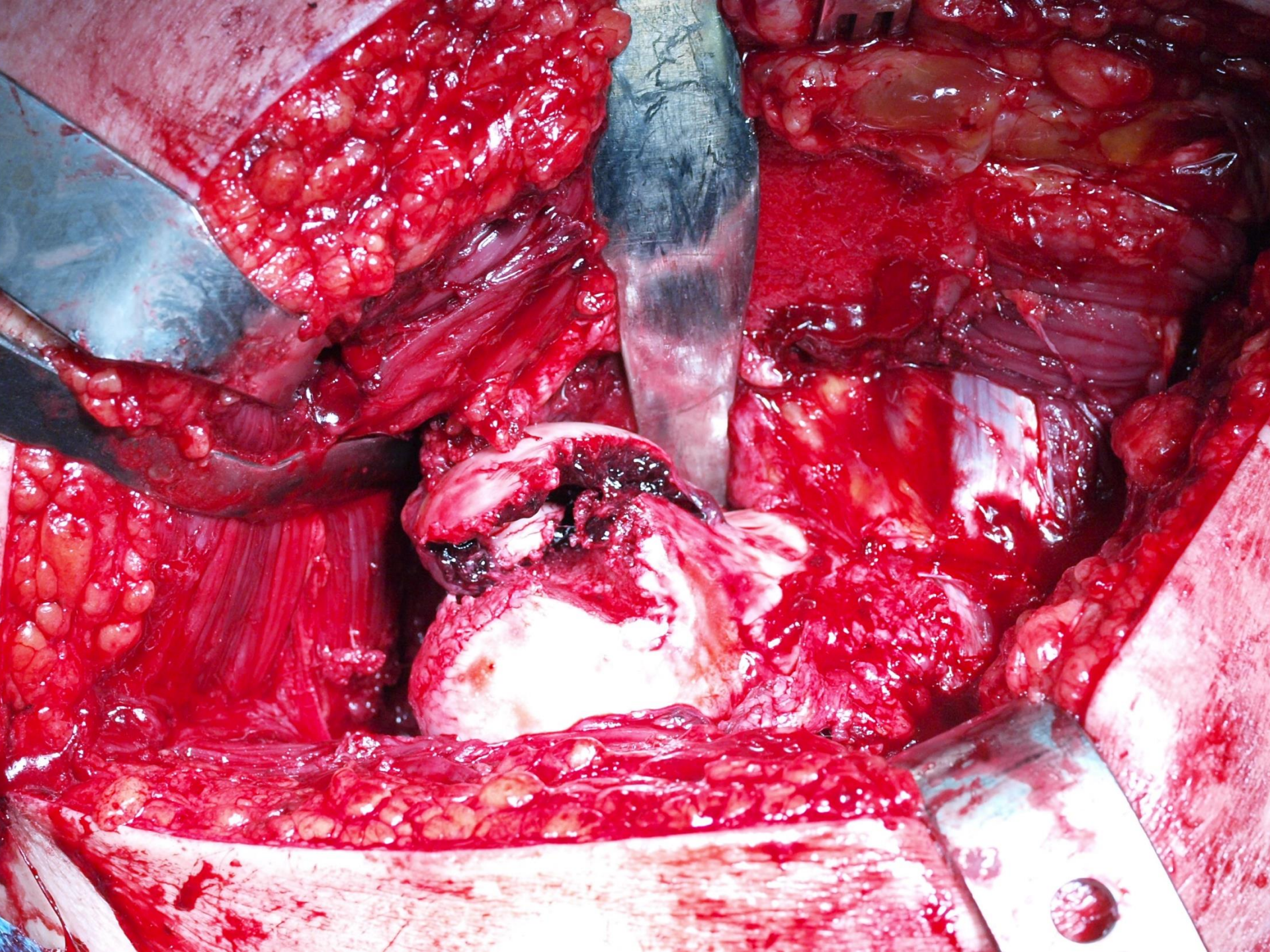

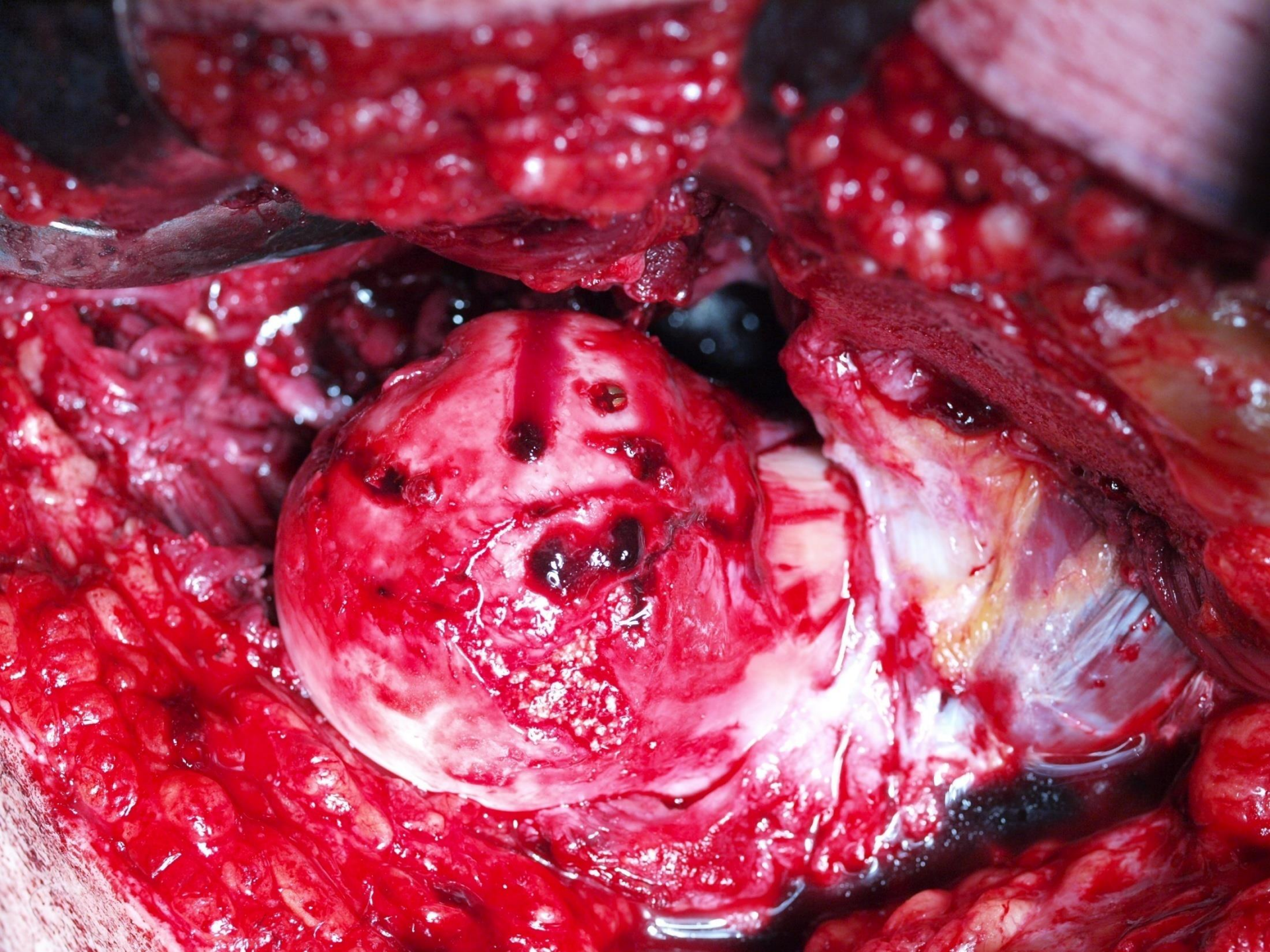

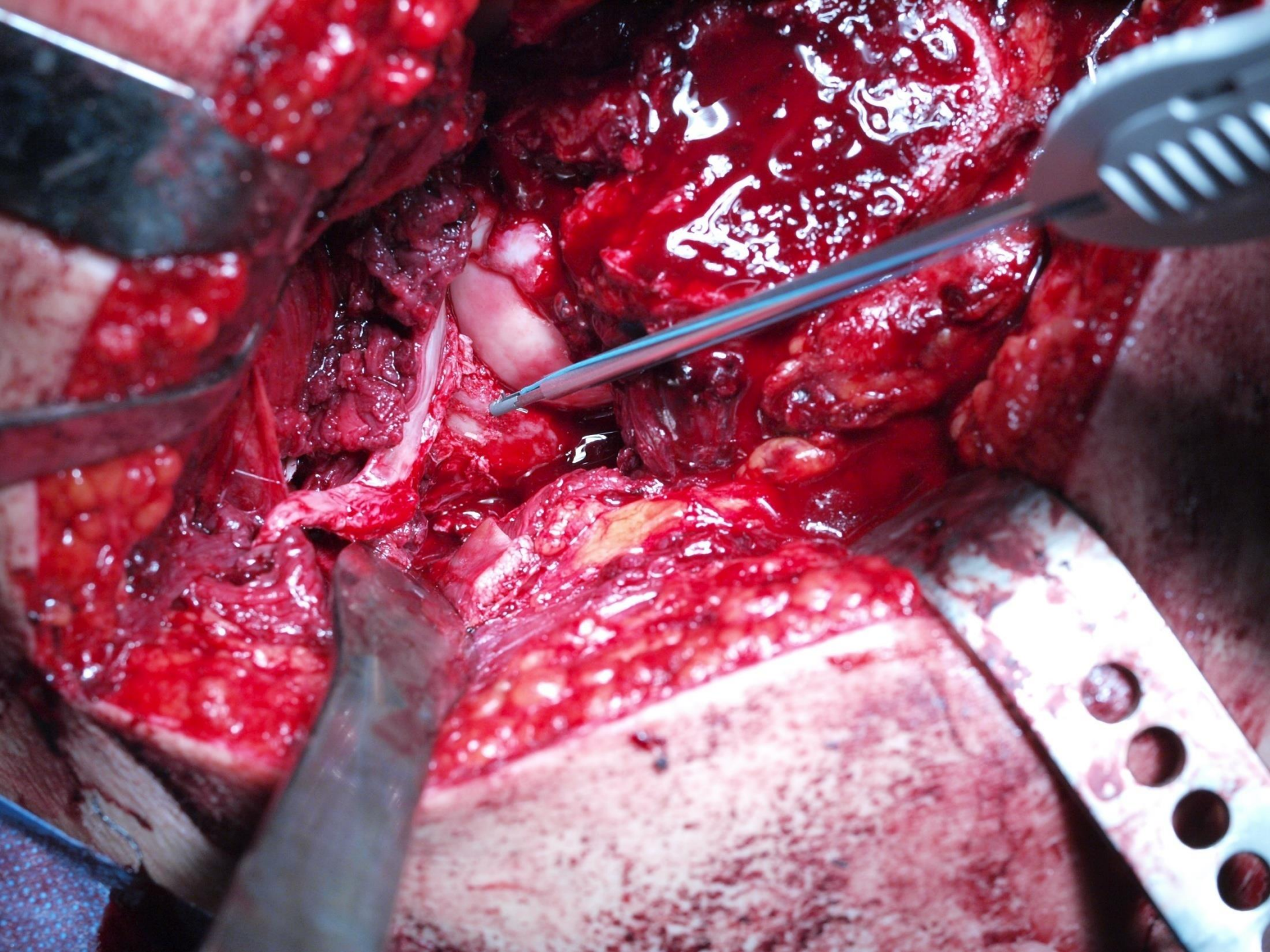

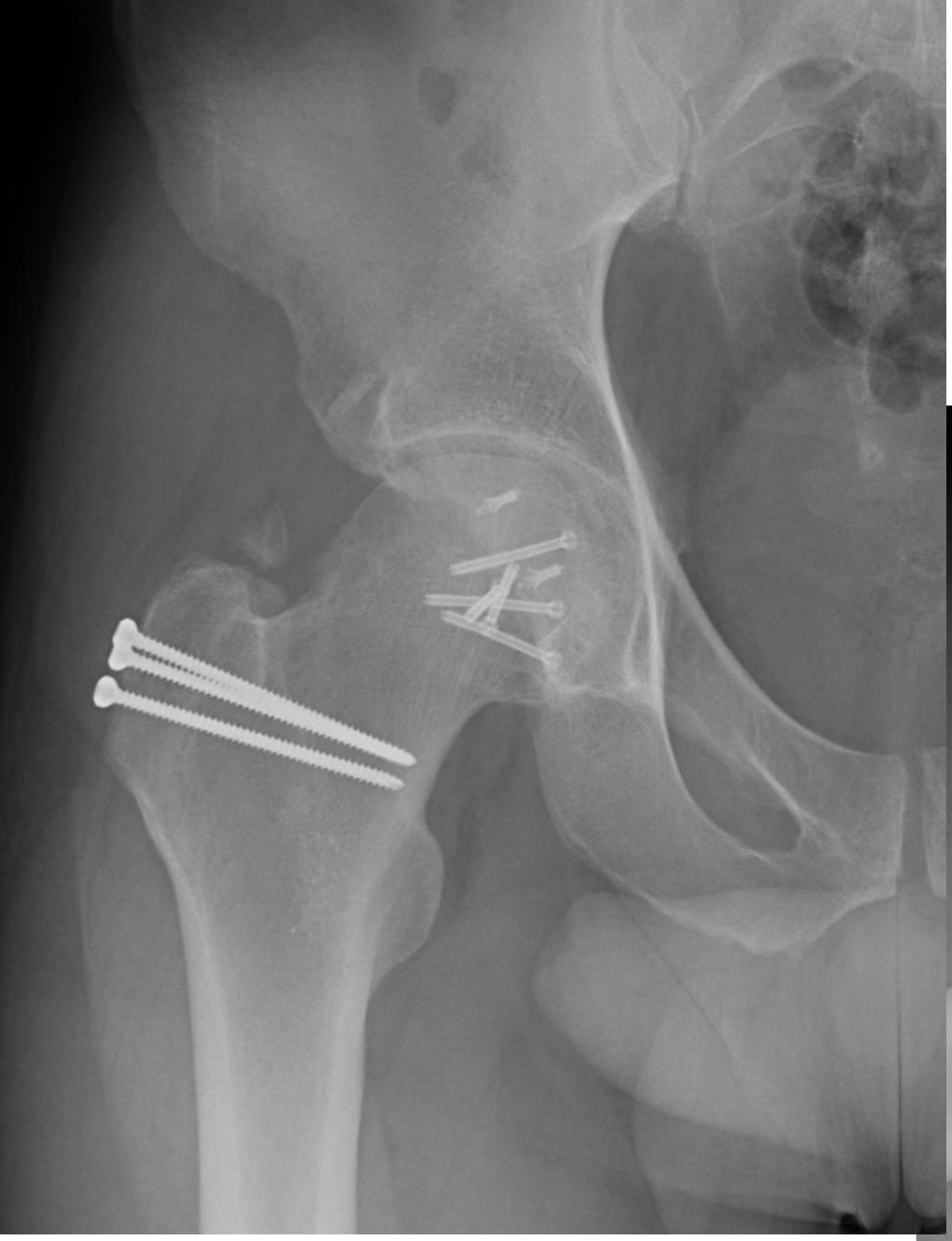

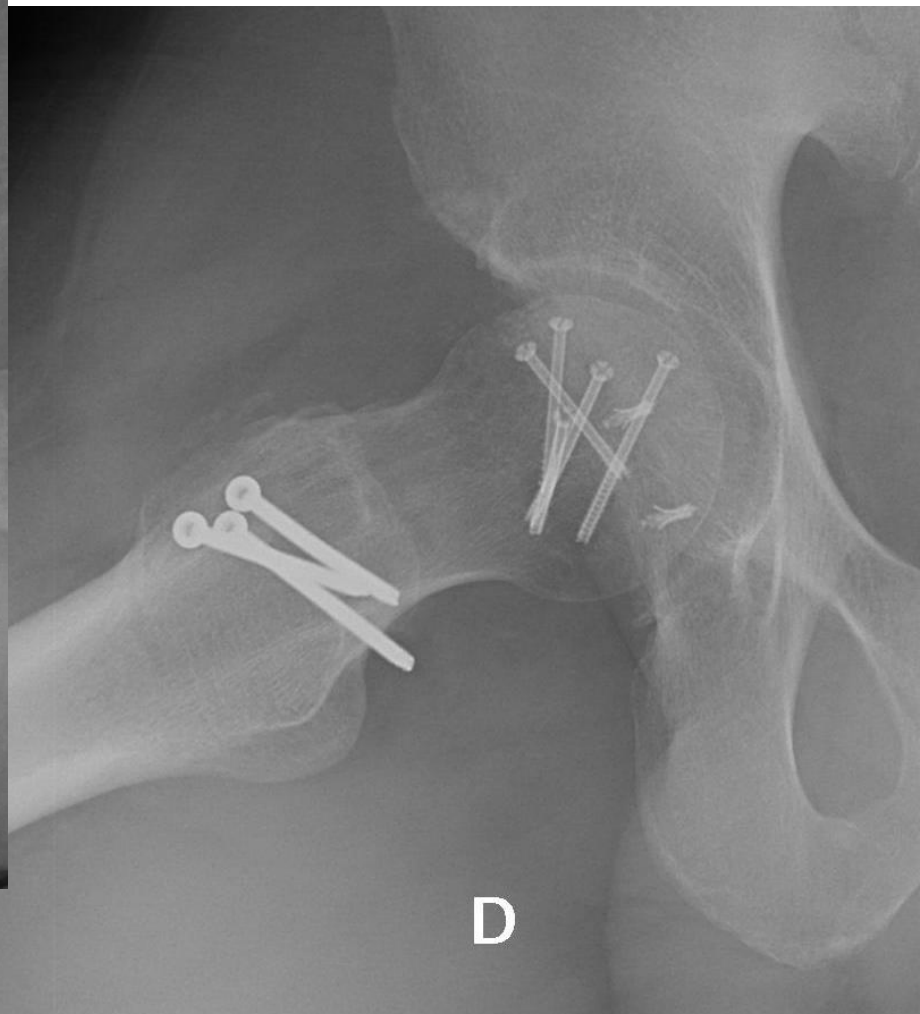
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TAKE HOME MESSAGES

- 31 B-C = High risk of complications
- AVN rate more affected by amount of dislocation rather than time before surgery
- Nonunion and hardware failure more frequent in suboptimal reduction
- For femoral head fx consider surgical dislocation

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Arthroplasty for fractured neck of femur - cement should be used every time

John Timperley

MB ChB, FRCS, D.Phil(Oxon)

Princess Elizabeth Orthopaedic Centre

Exeter

Conflicts of interest

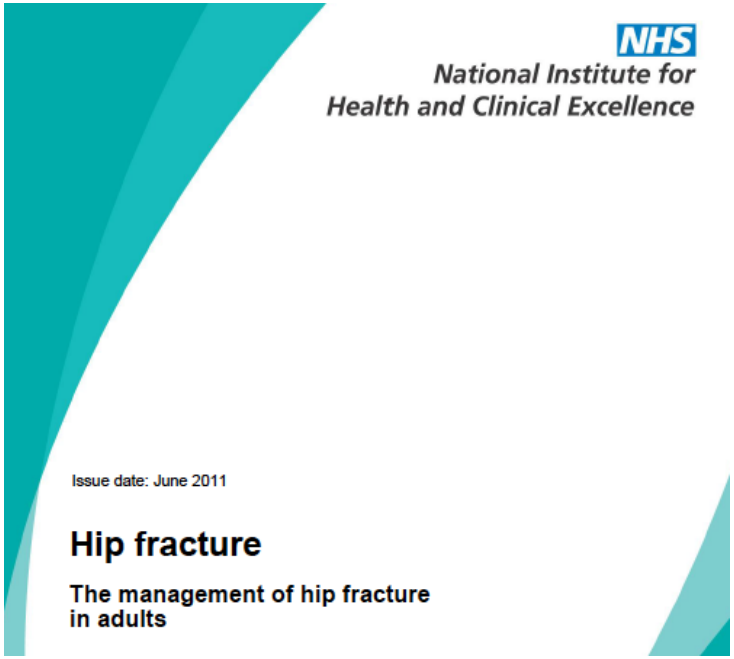
Personal pecuniary interest
Description (if you have no interests in this category, state 'None')
IP in hip instruments and implants - AJT
Personal family interest (if you have no interests in this category, state 'None')
Description
None
Non-personal pecuniary interest (if you have no interests in this category, state 'None')
Description
Royal Devon and Exeter NHS Foundation Trust holds an Institutional Contract with Stryker
Personal non-pecuniary interest (if you have no interests in this category, state 'None')
Description
None

Arthroplasty for fractured neck of femur - the evidence

- NICE Guidelines
- Update on new evidence from around the world
- Mortality after arthroplasty for fractured neck of femur

What is a NICE clinical guideline?

- NICE clinical guidelines are recommendations for care based on the best available research evidence
- NICE uses predetermined and systematic methods to identify and evaluate the evidence relating to specific review questions.



Evidence considered:

- **Clinical literature search**

  MEDLINE, Embase and The Cochrane Library.

  Additional subject specific databases

  Further search on the websites listed below and on organisations relevant to the topic:

  • Guidelines International Network database (www.g-i-n.net)

  • National Guideline Clearing House (www.guideline.gov/)

  • National Institute for Health and Clinical Excellence (NICE) (www.nice.org.uk)

  • National Institutes of Health Consensus Development Program (consensus.nih.gov/)

  • NHS Evidence (www.evidence.nhs.uk/)

- **All references sent by stakeholders are considered.**
- **Health economic literature search**
- **Evidence of effectiveness**
- **Evidence of cost-effectiveness**

Hip Fracture Questions

1. If we replace do we use

   Hemiarthroplasty

   Total Hip Replacement

2. For either type of replacement should we use

   Cemented

   Uncemented

2. Hemiarthroplasty vs. THR

- Absolute indications for THR
  - Pre-existing osteoarthritis
  - Rheumatoid arthritis and hip involved
  - Acetabular dysplasia
  - Paget's disease both sides of joint
  - Metastatic disease both sides

2. Hemiarthroplasty vs. THR

- Summary of evidence: THR gives:
  - Statistically significant improvement in **functional and quality of life** scores
  - **Less pain**
  - Better self-reported **walking distance**
  - THR cost effective compared to hemiarthroplasty

3. Cemented vs. Uncemented Arthroplasty

- Summary of evidence:
  - Cemented implants have **less pain and better function**
  - Even modern uncemented designs have increased risk of **fracture**
  - **No difference in mortality**

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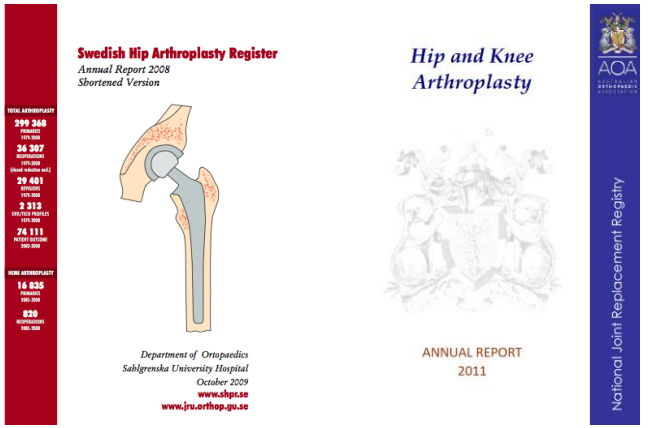
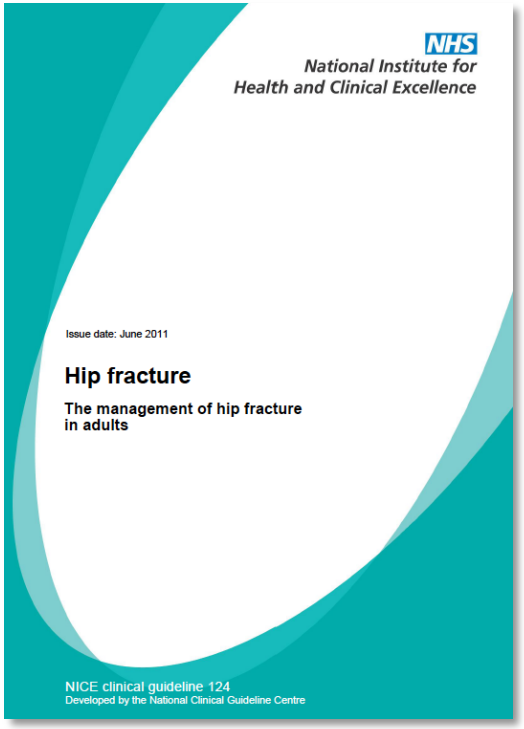


Current UK NICE Guidelines

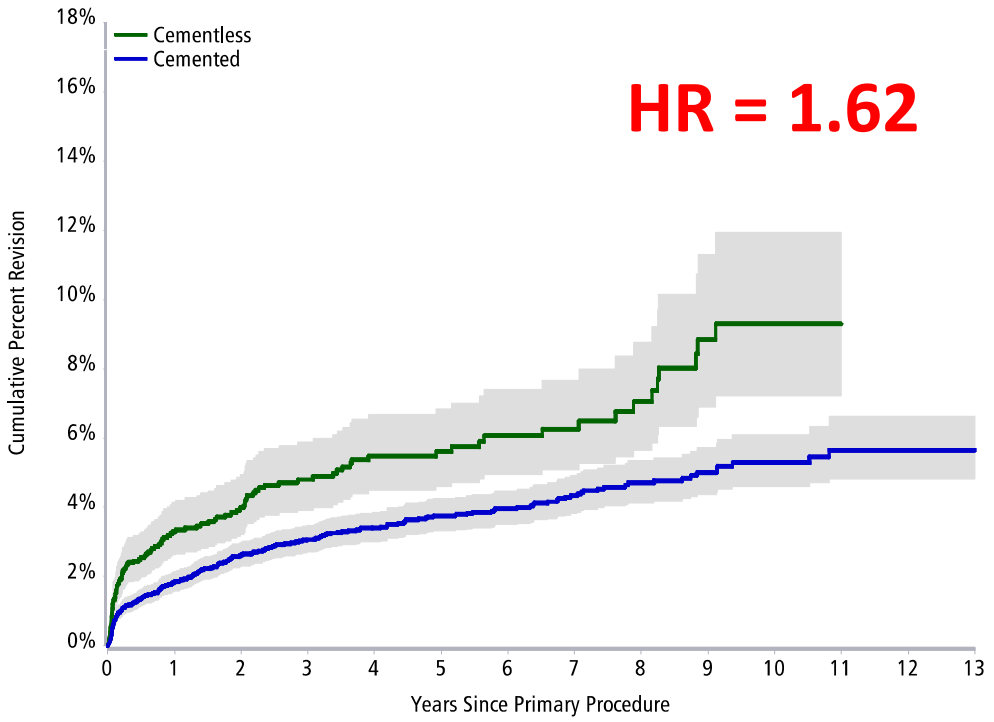
- Hemi or THR for displaced fractures
- Offer THR for
  - ✓ Able to walk independently outdoors with no more than a stick AND
  - ✓ Cognitively intact AND
  - ✓ Fit for procedure
- **Use cemented implants**
- Use a proven stem design



2015 Update

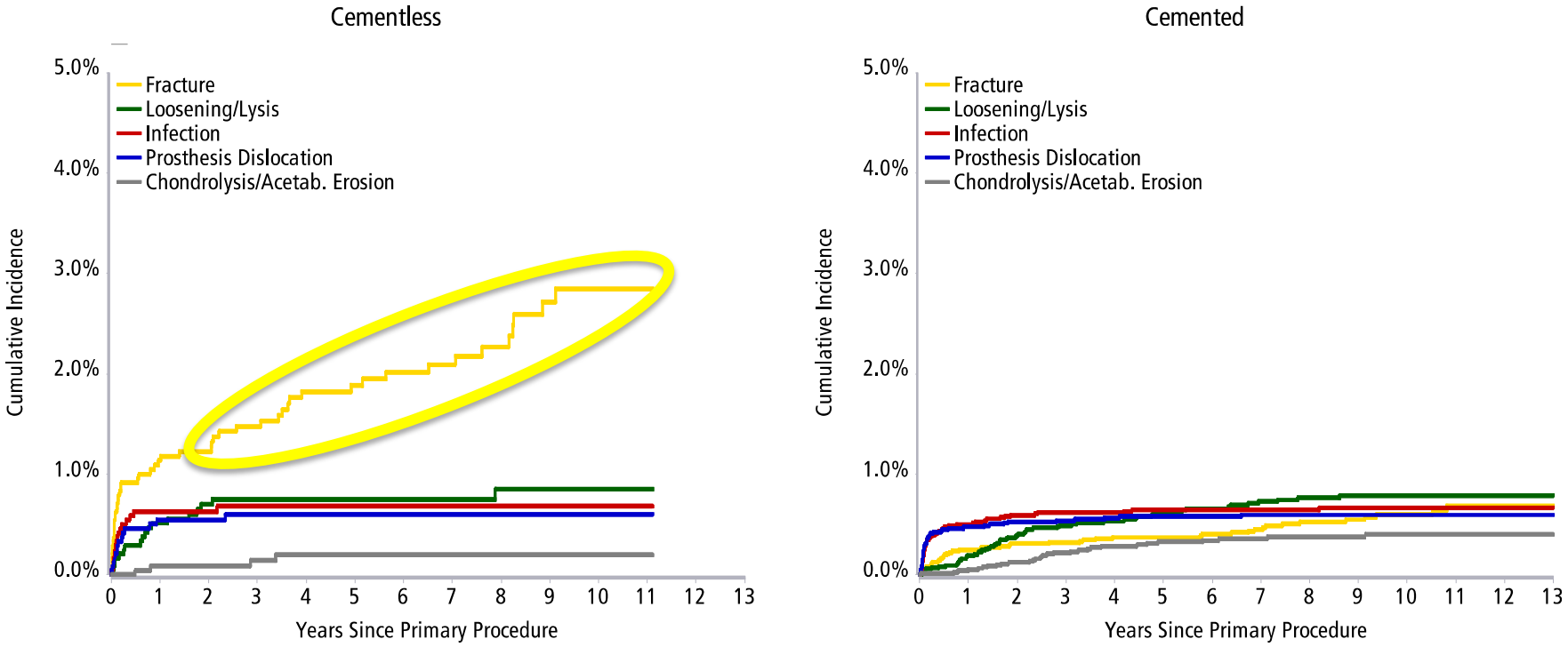
AUSTRALIA:

Figure HP22: Cumulative Percent Revision of Primary Bipolar Hip Replacement by Femoral Fixation (Primary Diagnosis Fractured NOF)



Number at Risk	0 Yr	1 Yrs	3 Yrs	5 Yrs	7 Yrs	10 Yrs	13 Yrs
Cementless	2416	1749	1114	706	413	110	5
Cemented	9916	7206	4832	3263	2062	720	44

Figure HP23: Cumulative Incidence Revision Diagnosis of Primary Bipolar Hip Replacement by Femoral Fixation (Primary Diagnosis Fractured NOF)



The problem is primarily peri-prosthetic fracture

2014 Summary: Australian Registry

"The use of cement fixation reduces the risk of revision by approximately half regardless of the class of partial hip replacement".

SWEDEN:

Higher risk of reoperation for bipolar and uncemented hemi-arthroplasty

23,509 procedures after femoral neck fractures from the Swedish Hip Arthroplasty Register, 2005–2010

Olof Leonardsson[1, 2], Johan Kärrholm[2], Kristina Åkesson[1], Göran Garellick[2], and Cecilia Rogmark[1, 2]

- Risk of reoperation (Cox regression) was higher for uncemented stems (**hazard ratio (HR) = 1.5**), mainly because of periprosthetic femoral fractures
- "**We recommend cemented hemiarthroplasties** and the anterolateral transgluteal approach.
- We also suggest that unipolar implants should be used, at least for the oldest and frailest patients".

NORWAY AND SWEDEN:

Posterior approach and uncemented stems increases the risk of reoperation after hemiarthroplasties in elderly hip fracture patients

An analysis of 33,205 procedures in the Norwegian and Swedish national registries

Cecilia Rogmark[1,2], Anne M Fenstad[3], Olof Leonardsson[1,2], Lars B Engesæter[3,4], Johan Kärrholm[2,5], Ove Furnes[3,4], Göran Garellick[2,5], and Jan-Erik Gjertsen[3]

- A common dataset created based on the Norwegian Hip Fracture Register and the Swedish Hip Arthroplasty Register.
- Between 2005-2010 - 33,205 hip fractures in individuals > 60 years of age treated

Results:

In patients ***over 85 years***, an **increased risk of reoperation** was found for:

- **uncemented stems** (**HR = 2.2**, 95% CI: 1.7–2.8),
- **bipolar heads** (**HR = 1.4**, CI:1.2–1.8),
- **posterior approach** (**HR = 1.4**, CI: 1.2–1.8)
- **male sex** (**HR = 1.3**, CI: 1.0–1.6).

For patients ***aged 75–85*** years, an increased risk of reoperation was found for:

- **uncemented stems** (**HR = 1.6**, 95% CI: 1.2–2.0)
- **men** (**HR = 1.3**, CI:1.1–1.6)

For patients ***aged < 75 years***, an increased risk of reoperation was found due to:

- **uncemented stems**
- **infection** (**HR =1.5**, CI: 1.1–2.0).

18 *Acta Orthopaedica* 2014; 85 (1): 18–25

Posterior approach and uncemented stems increases the risk of reoperation after hemiarthroplasties in elderly hip fracture patients

An analysis of 33,205 procedures in the Norwegian and Swedish national registries

Cecilia Rogmark[1,2], Anne M Fenstad[3], Olof Leonardsson[1,2], Lars B Engesæter[3,4], Johan Kärrholm[2,5], Ove Furnes[3,4], Göran Garellick[2,5], and Jan-Erik Gjertsen[3]

Conclusion

- Cemented stems and a direct lateral transgluteal approach reduced the risk of reoperation after hip fractures treated with hemiarthroplasty in patients over 75 years.
- Men and younger patients had a higher risk of reoperation.

Posterior approach and uncemented stems increases the risk of reoperation after hemiarthroplasties in elderly hip fracture patients

An analysis of 33,205 procedures in the Norwegian and Swedish national registries

Cecilia Rogmark[1,2], Anne M Fenstad[3], Olof Leonardsson[1,2], Lars B Engesæter[3,4], Johan Kärrholm[2,5], Ove Furnes[3,4], Göran Garellick[2,5], and Jan-Erik Gjertsen[3]

NORWAY:

THE JOURNAL OF BONE & JOINT SURGERY

■ TRAUMA

More re-operations after uncemented than cemented hemiarthroplasty used in the treatment of displaced fractures of the femoral neck

AN OBSERVATIONAL STUDY OF 11 116 HEMIARTHROPLASTIES FROM A NATIONAL REGISTER

J-E. Gjertsen,
S. A. Lie,
T. Vinje,
L. B. Engesæter,
G. Hallan,
K. Matre,
O. Furnes

From Norwegian Arthroplasty Register, Norway

Using data from the Norwegian Hip Fracture Register, 8639 cemented and 2477 uncemented primary hemiarthroplasties for displaced fractures of the femoral neck in patients aged > 70 years were included in a prospective observational study. A total of 218 re-operations were performed after cemented and 128 after uncemented procedures. Survival of the hemiarthroplasties was calculated using the Kaplan-Meier method and hazard rate ratios (HRR) for revision were calculated using Cox regression analyses. At five years the implant survival was 97% (95% confidence interval (CI) 97 to 97) for cemented and 91% (95% CI 87 to 94) for uncemented hemiarthroplasties. Uncemented hemiarthroplasties had a 2.1 times increased risk of revision compared with cemented prostheses (95% confidence interval 1.7 to 2.6, p < 0.001). The increased risk was mainly caused by revisions for peri-prosthetic fracture (HRR = 17), aseptic loosening (HRR = 17), haematoma formation (HRR = 5.3), superficial infection (HRR = 4.6) and dislocation (HRR = 1.8). More intra-operative complications, including intra-operative death, were reported for the cemented hemiarthroplasties. However, in a time-dependent analysis, the HRR for re-operation in both groups increased as follow-up increased.

This study showed that the risk for revision was higher for uncemented than for cemented hemiarthroplasties.

Survival: Re-operation for any cause:

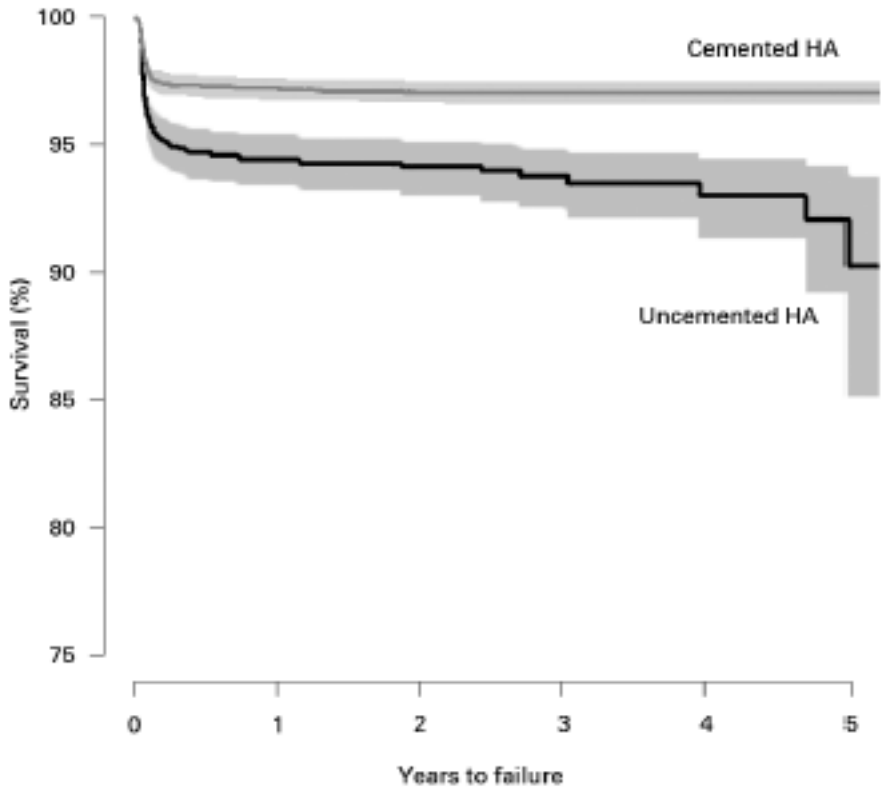


Fig. 1

Adjusted survival with 95% confidence intervals for patients with cemented and uncemented hemiarthroplasty (HA) with all re-operations as the endpoint.

■ TRAUMA

More re-operations after uncemented than cemented hemiarthroplasty used in the treatment of displaced fractures of the femoral neck

J-E. Gjertsen,
S. A. Lie,
T. Vinje,
L. B. Engesæter,

AN OBSERVATIONAL STUDY OF 11 116 HEMIARTHROPLASTIES FROM A NATIONAL REGISTER

- Uncemented hemiarthroplasties had a 2.1 times increased risk of revision compared with cemented prostheses (95% confidence interval 1.7 to 2.6, $p < 0.001$).
- Higher in-patient Mortality in cemented group
- The one-year mortality was 25.6% and 26.5% for patients with cemented and uncemented hemiarthroplasties respectively (adjusted Cox: HRR 0.98, $p = 0.51$).

MORTALITY AND ARTHROPLSTY FOR FRACTURED NOF :

International Orthopaedics (SICOT)
DOI 10.1007/s00264-013-1851-3

ORIGINAL PAPER

Perioperative mortality in hip fracture patients treated with cemented and uncemented hemiprosthesis: a register study of 11,210 patients

Ove Talsnes · Tarjei Vinje · Jan Erik Gjertsen · Ola E. Dahl · Lars B. Engesæter · Valborg Baste · Are Hugo Pripp · Olav Reikerås

Received: 10 January 2013 / Accepted: 21 February 2013

- Norwegian Hip Fracture Register
- 8,674 cemented and 2,536 uncemented hemiarthroplasties
- Increased mortality within the first day of surgery was found in the cemented group (relative risk 2.9, 95 % confidence interval 1.6-5.1, p=0.001)
- Long term follow-up to 6 years showed no difference in mortality related to fixation
- Morbidity, functional outcome, pain, quality of life and reoperations were not investigated

Australian Figures:

25,000 hemiarthroplasty cases from the AOA NJR:

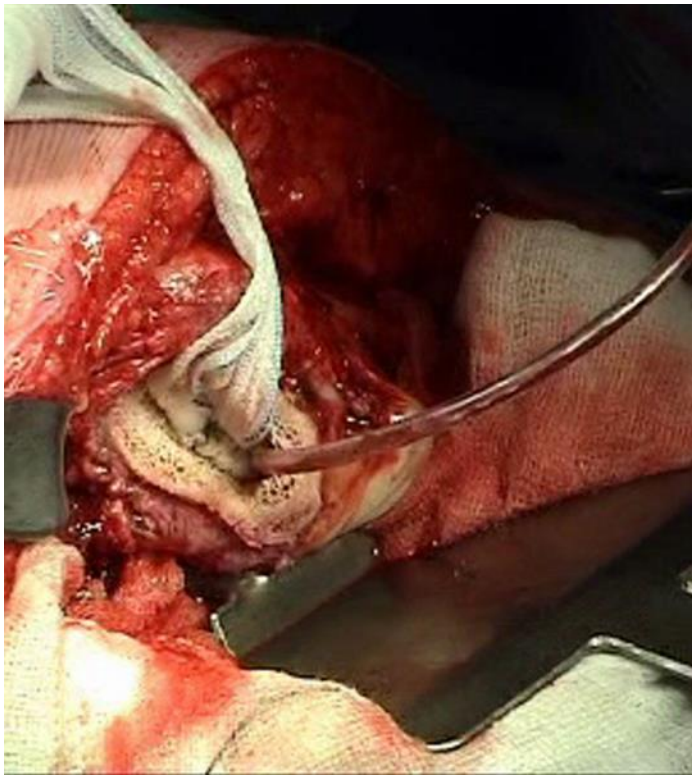
- an increased mortality rate was found day one post-operatively with cement ($p = 0.0005$).
- By 1 week, this trend reversed ($p = 0.02$).
- This trend reversal persisted at
  - 1 month ($p = 0.028$) and
  - 1 year ($p < 0.0001$) post-operatively

Anaesthetic techniques to reduce risk in fracture patients

- Recognition of the at risk patient
- Constant monitoring of the patient
- Assessment of cardiac filling.
- Adequate fluid loading to increase the response to low cardiac output
- Use of vasoconstrictors/inotropes if hypotension does occur

Surgical techniques to reduce risk in fracture patients

- Pressurised lavage
- Suction catheter
- Retrograde cement insertion using gun
- No excessive pressurisation
- Collaboration with anaesthetist

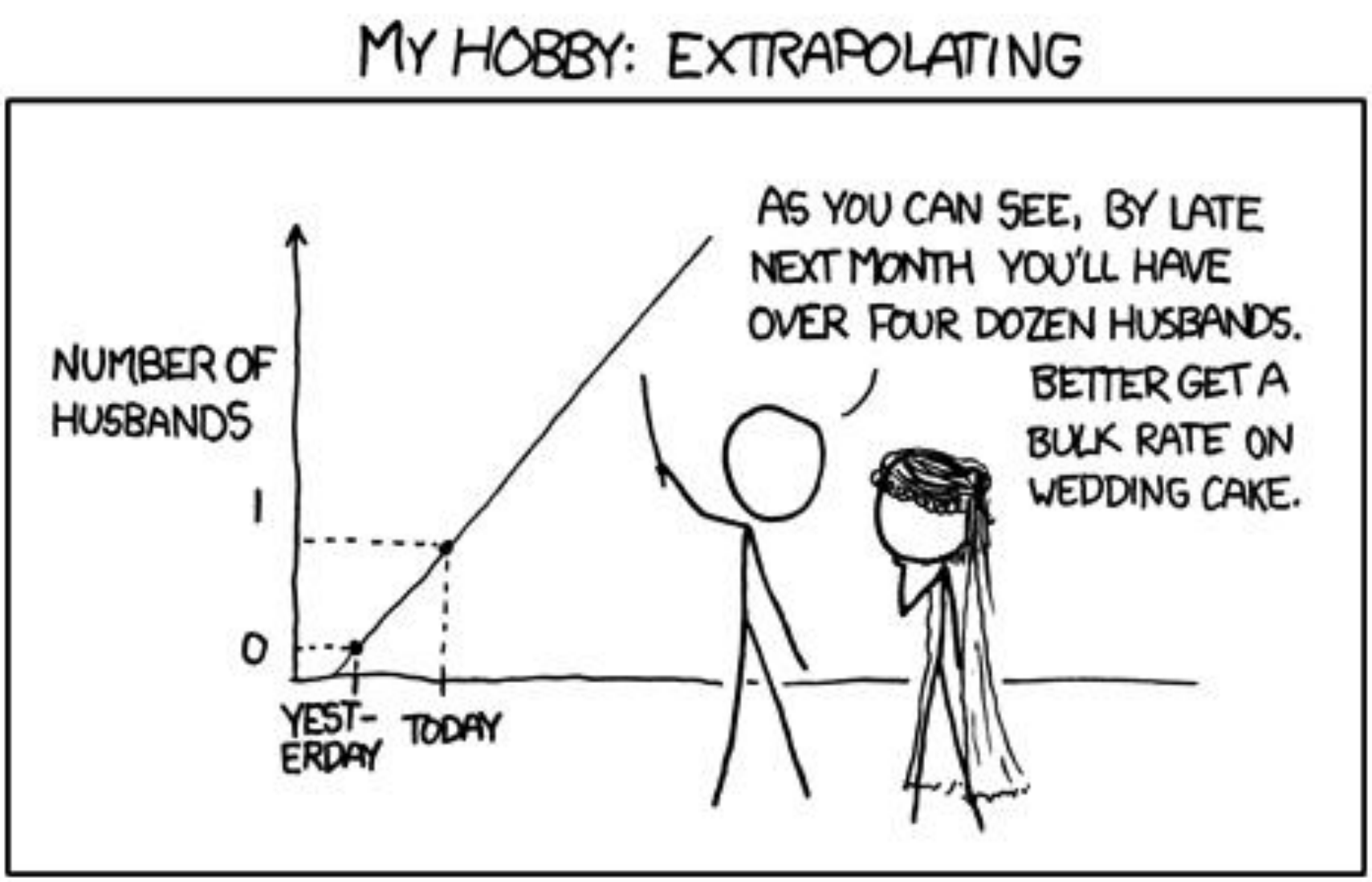


Summary

- NICE Guidelines due to be re-visited this year
- New data would appear to strengthen the existing advice
- Surgeons and anaesthetists can collaborate to reduce the risk of surgery for patients:
  - Working party guidelines

    Anaesthesia 2015; 70: 623-6

    BJJ



Thank you for your attention

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

Istituto Ortopedico Rizzoli
Clinica Ortopedica I
Università degli Studi di Bologna

HEMIARTHROPLASTY: WHAT ABOUT CEMENTLESS STEM?

Giannini S, Cadossi M

HIP FRACTURES IN ELDERLY PATIENTS

- 9 out of 10 hip fracture patients ≥ 65 years old
- Ratio Women/Men 3:1
- Annual cost of treating patients with hip fractures is between 10-15 billion USD
- Cost increase 3 to 8 times higher by the year 2040

A. Morris et al, JBJS (Am), 2002

PROSTHESIS CHOICE IN ELDERLY PATIENTS

- Controversial

- Unipolar ⟷ Bipolar ⟷ Total hip

UNIPOLAR HEMIARTHROPLASTY

- Elderly patients
- Low activity level

H. Miettinen et al. Ann. Chir. Gyn., 1999

- Costs less than bipolar hemiarthroplasty
- No differences in functional results

Ong et al. J Orthop Trauma, 2002

BIPOLAR HEMIARTHROPLASTY *vs* TOTAL HIP ARTHROPLASTY

- No difference in mortality
- Lower risk of dislocation with bipolar
- Better long term results with THR

Macaulay et al. Journal of arthroplasty 2008

TYPE OF FIXATION IN ELDERLY PATIENTS

- Controversial

- Cemented ⟷ Uncemented

CEMENTED IMPLANTS IN ELDERLY PATIENTS

- Good fixation
- Early rehabilitation
- Lower treatment cost
- Uncemented fixation considered inadequate

CEMENTED IMPLANTS IN ELDERLY PATIENTS

DRAWBACKS

- Longer surgical time (average 7.24min)
- Lack of cancellous bone?
- Intraoperative complications caused by bone cement?

Arthroplasties (with and without bone cement) for proximal femoral fractures in adults (Review)

Parker MJ, Gurusamy KS, Azegami S

THE COCHRANE COLLABORATION®

- 23 trials involving 2861 patients
- 6 studies involving 899 patients: cemented vs. press-fit
- 7 trials involving 857 patients: bipolar vs. unipolar
- 7 trials involving 734 patients: hemiarthroplasty vs. THA

Parker et al. 2010

CEMENTED *vs* UNCEMENTED IMPLANTS IN ELDERLY PATIENTS

- No difference in mortality
- Reduced risk of operative fracture of the femur for the cemented prosthesis
- Lower reduction of a mobility score (signifying less loss of mobility) for those treated with a cemented prosthesis
- Fewer patients with residual pain

Sonne Holm et al. Acta Orthopaedica Scand 1982
Emery et al. J Bone Joint Surg Br 1991
Harper et al. Dissertation 1994
Branfoot et al. Injury 2000
Santini et al. J Orthopaedic Traumatology 2005
Parker et al. National Research Register 2009

CEMENTED *vs* UNCEMENTED IMPLANTS IN ELDERLY PATIENTS

Uncemented hemy-arthroplasties

- Increased operative blood loss
- Higher medical complications
- Longer hospital stay
- Greater proportion of patients who failed to regain their prefracture mobility

Sonne Holm et al. Acta Orthopaedica Scand 1982
Emery et al. J Bone Joint Surg Br 1991
Harper et al. Dissertation 1994
Branfoot et al. Injury 2000
Santini et al. J Orthopaedic Traumatology 2005
Parker et al. National Research Register 2009

Arthroplasties (with and without bone cement) for proximal femoral fractures in adults (Review)

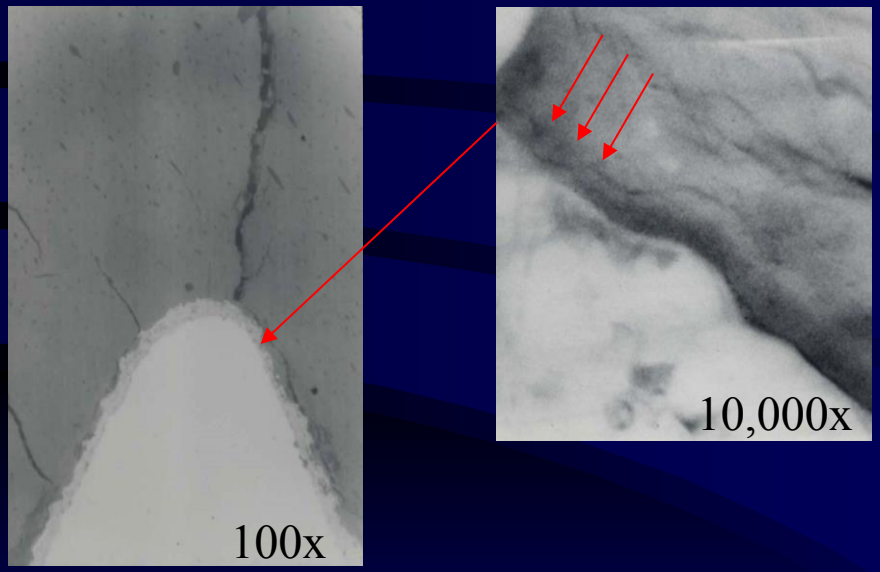
Parker MJ, Gurusamy KS, Azegami S

- Good evidence that cemented arthroplasties have less pain and better mobility
- No notable difference between bipolar and unipolar hemiarthroplasties
- There is limited evidence that THA leads to better clinical outcome than hemiarthroplasty

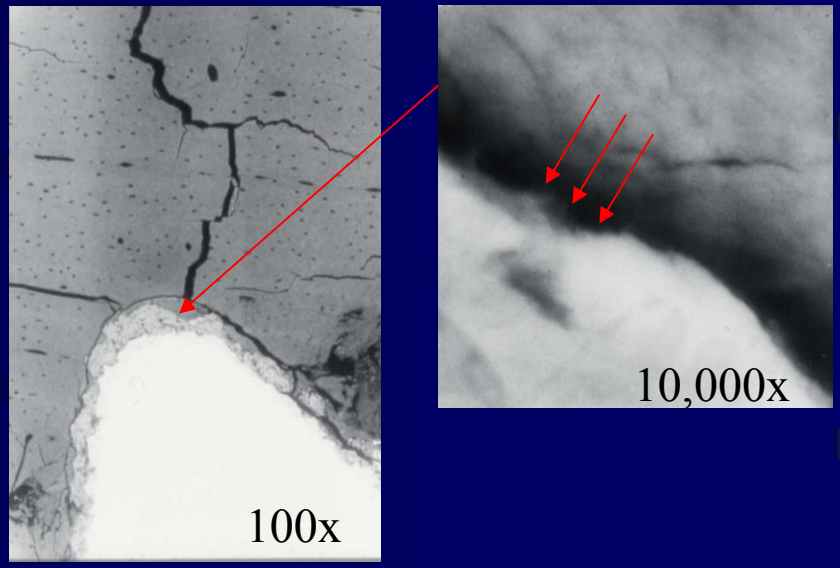
Parker et al. 2010

OSTEOINTEGRATION

Hydroxyapatite



Titanium



Moroni, Giannini et al. J Bone Joint Surg 1998

STEM FIXATION

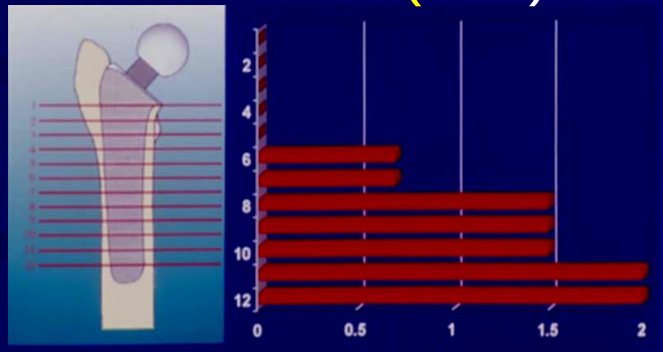
- Conical design
- Contact with proximal metaphyseal compressed cancellous bone
- Osteoconductive coating

“ In 1983, taking inspiration from the glass stopper of a decanter, I designed a coned prosthesis. I believe that because such a stopper does not descend, rotate nor lean due to its conical shape, neither would a hip prosthesis if a cone were built into its design ”.

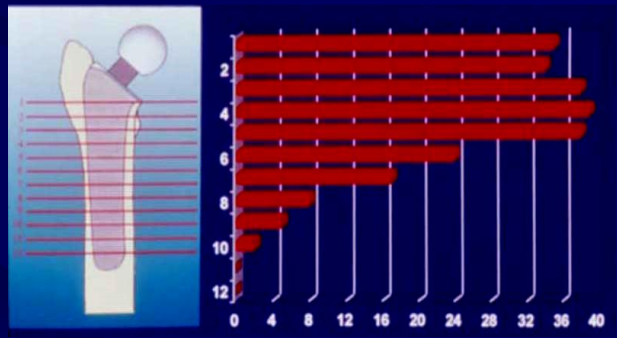
Furlong. In: Hydroxylapatite coatings in orthopaedic surgery, 1993

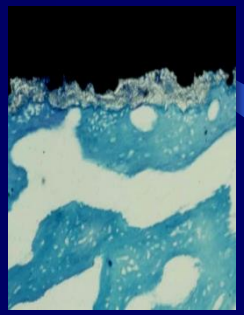
CORRELATION INITIAL CONTACT OSTEOINTEGRATION

INITIAL GAP (mm)



CONTACT AT 1 YEAR (%)





Moroni, Giannini et al. Ann Chir Gyn, 1999

PURPOSE

- A randomized controlled study comparing short-term outcomes of cemented *vs* HA-coated hemiarthroplasty in elderly osteoporotic patients with AO B2 and B3 hip fractures

MATERIALS AND METHODS

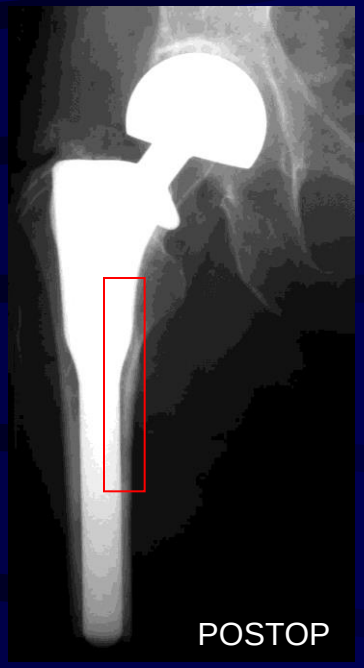
- 40 hip fractures
- Group A: AHS cemented implants
- Group B: Furlong uncemented implants
- Average follow-up 22 months

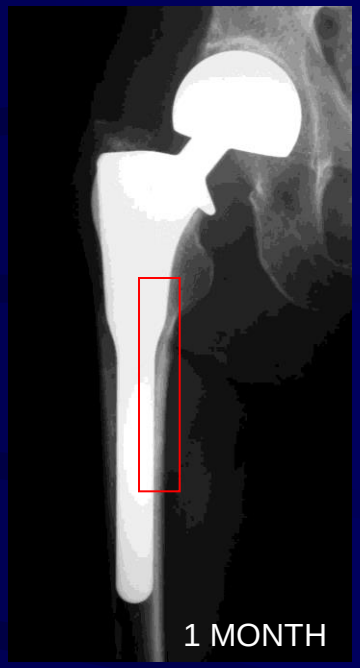
INCLUSION CRITERIA

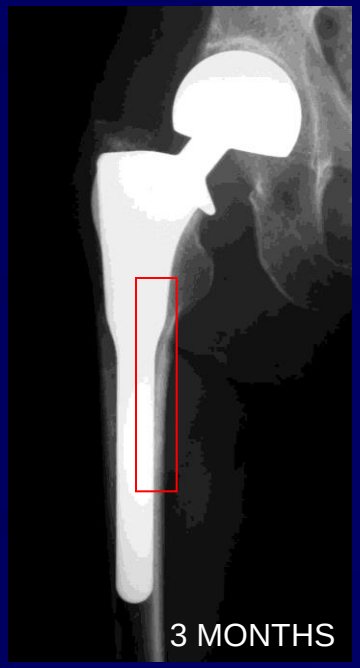
- AO B2 and B3 type hip fractures
- Female aged ≥75
- Fracture resulting from minor trauma
- Able to communicate
- Bone mineral density (BMD) at the contralateral hip less than -2.5 t-score

RESULTS

	GROUP A (AHS)	GROUP B (FURLONG)
• AGE	75±5 y	74±5 y
• ASA	3-4	3-4
• SURGICAL TIME	77±12 min	72±13 min
• BLOOD TRANSF	2.6 U	2.3 U







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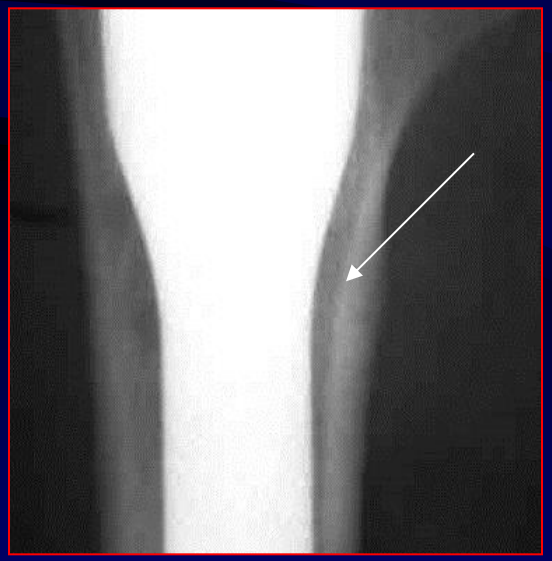
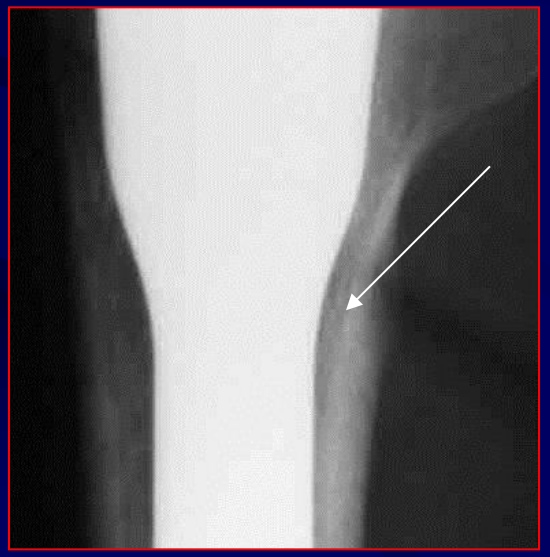
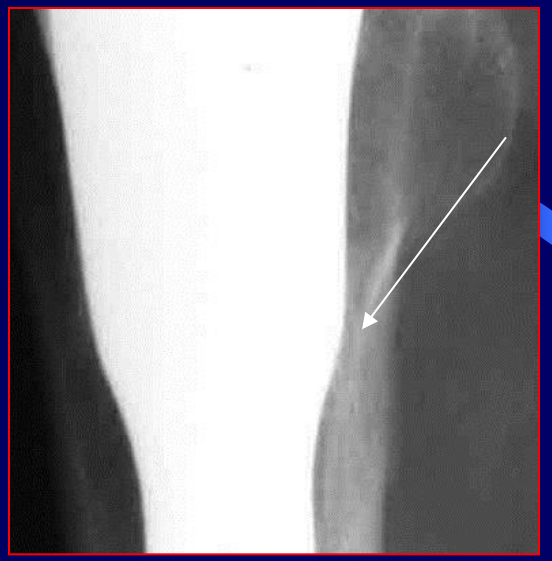
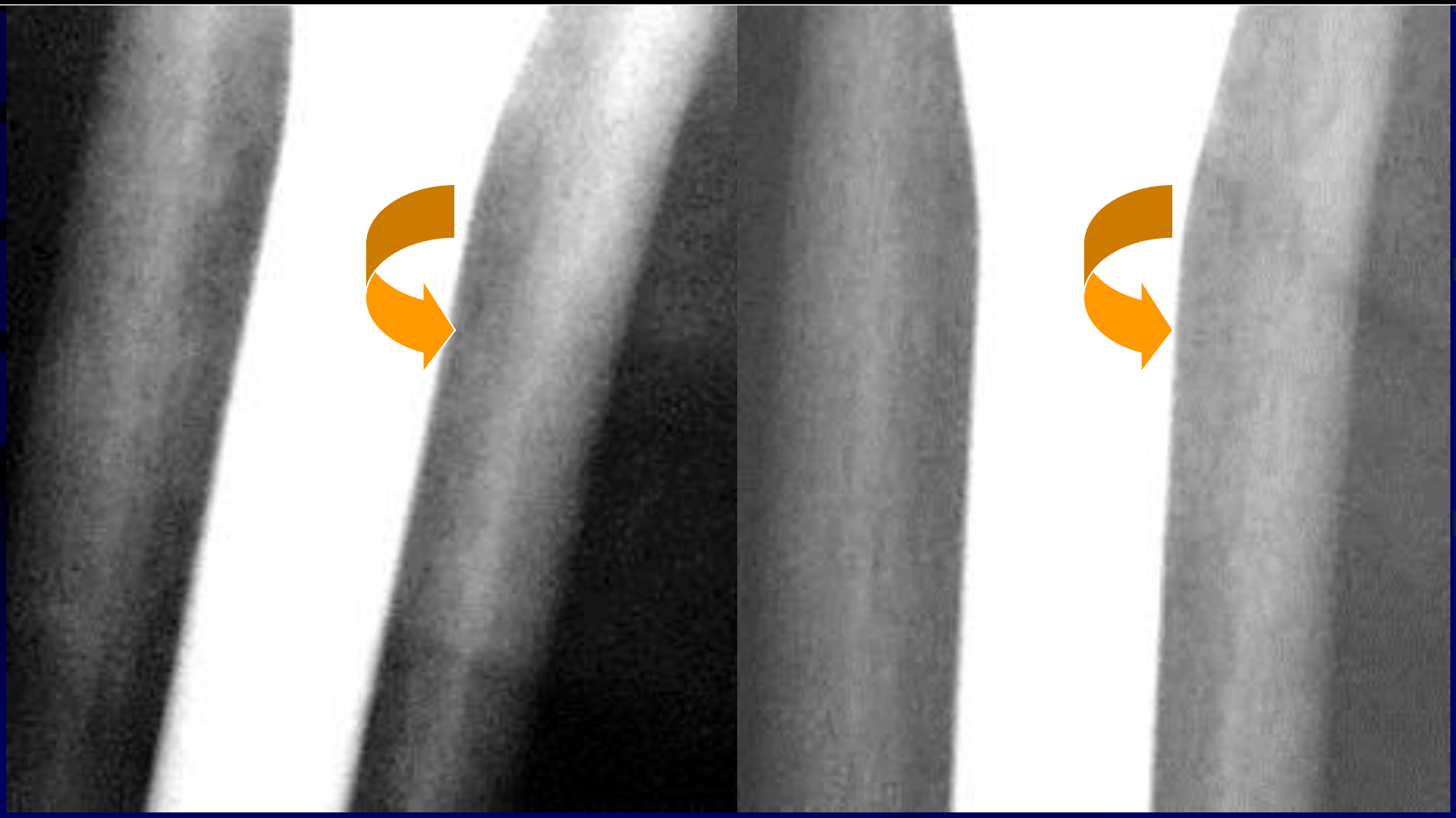


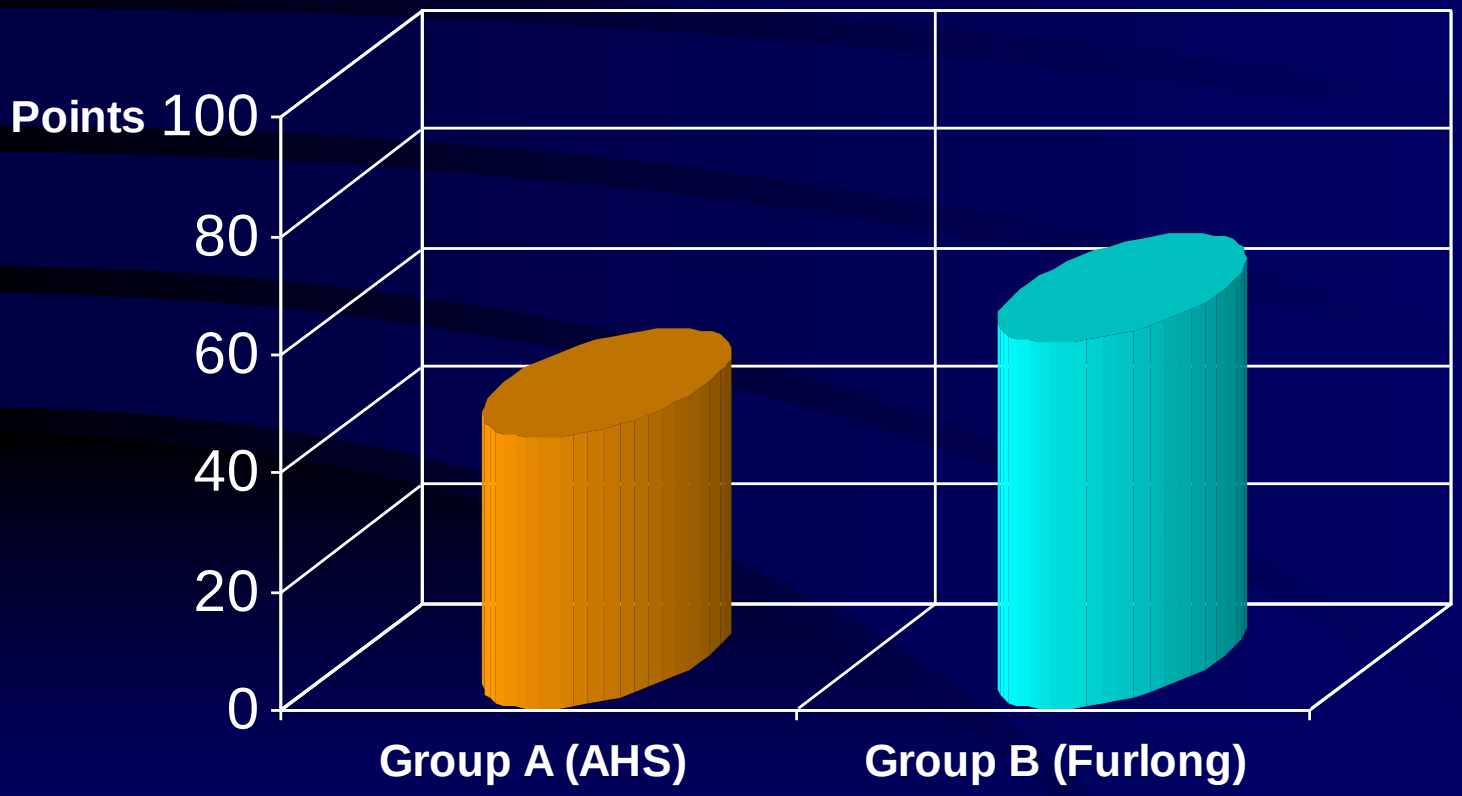




BONE/FURLONG INTERFACE

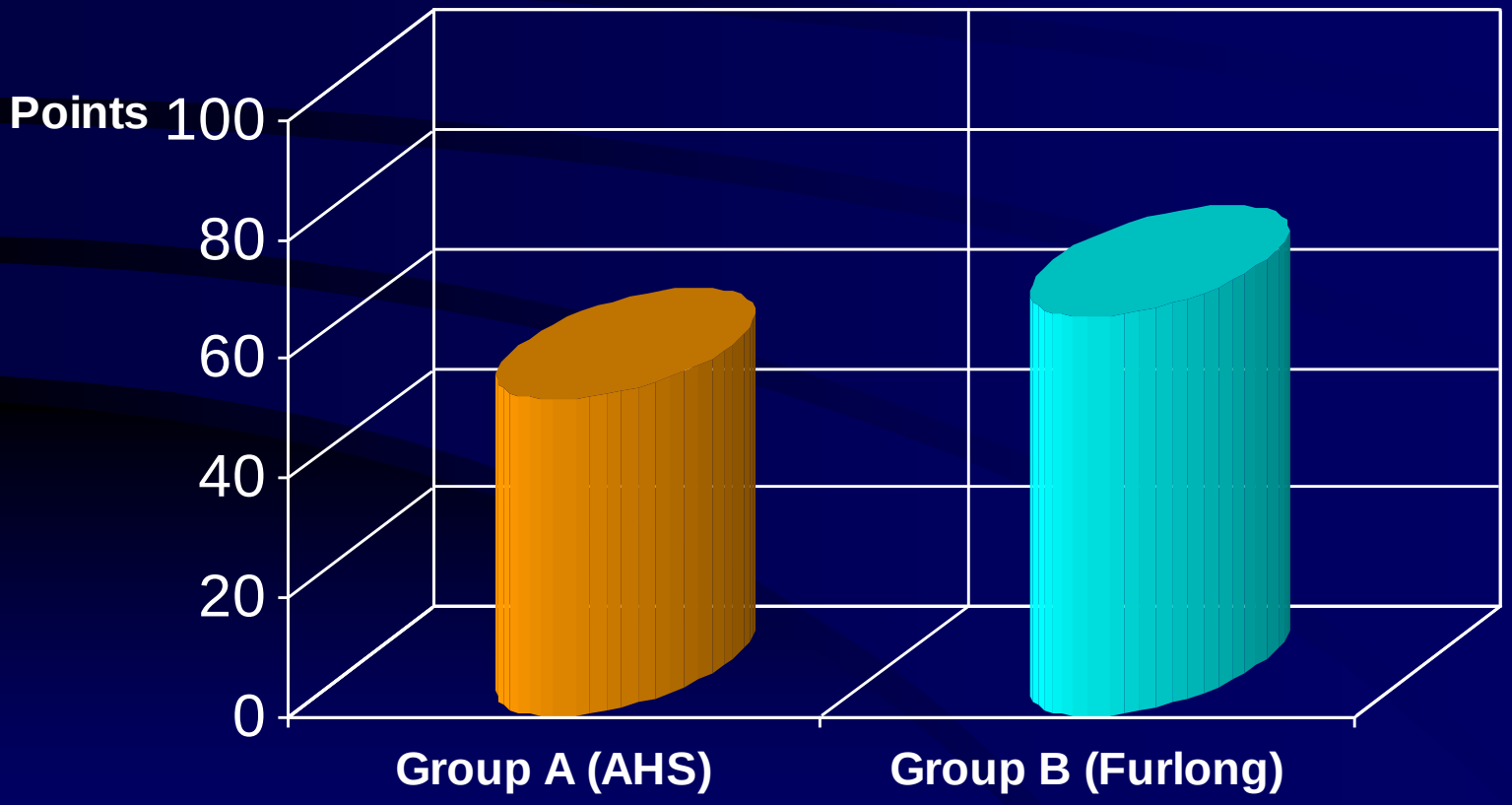


HARRIS HIP SCORE



p<0.05

SF-36



n.s.

DISCUSSION
FURLONG PROSTHESIS

- Stable fixation in osteoporotic bone
- Radiographic features indicative of implant osteointegration
- Biological cement
- Bone prosthesis distance
- Good functional outcomes

CONCLUSIONS

- Bipolar Furlong prosthesis recommended for elderly osteoporotic hip fracture patients
- Effective treatment option
- Positive short-term results

CEMENTED *vs* UNCEMENTED HA FOR DISPLACED FEMORAL NECK FRACTURES RCT: LEVEL OF EVIDENCE I

- Equally good regarding functional outcome and health-related quality of life
- No difference in rare complications such as periprosthetic fractures and cement-related complications
- The seeming advantages of shorter duration of surgery and potentially less blood loss with the uncemented implant are of little importance
- Both implants may be used with good results after displaced femoral neck fractures

Figved et al. Clin Orthop Relat Res 2009

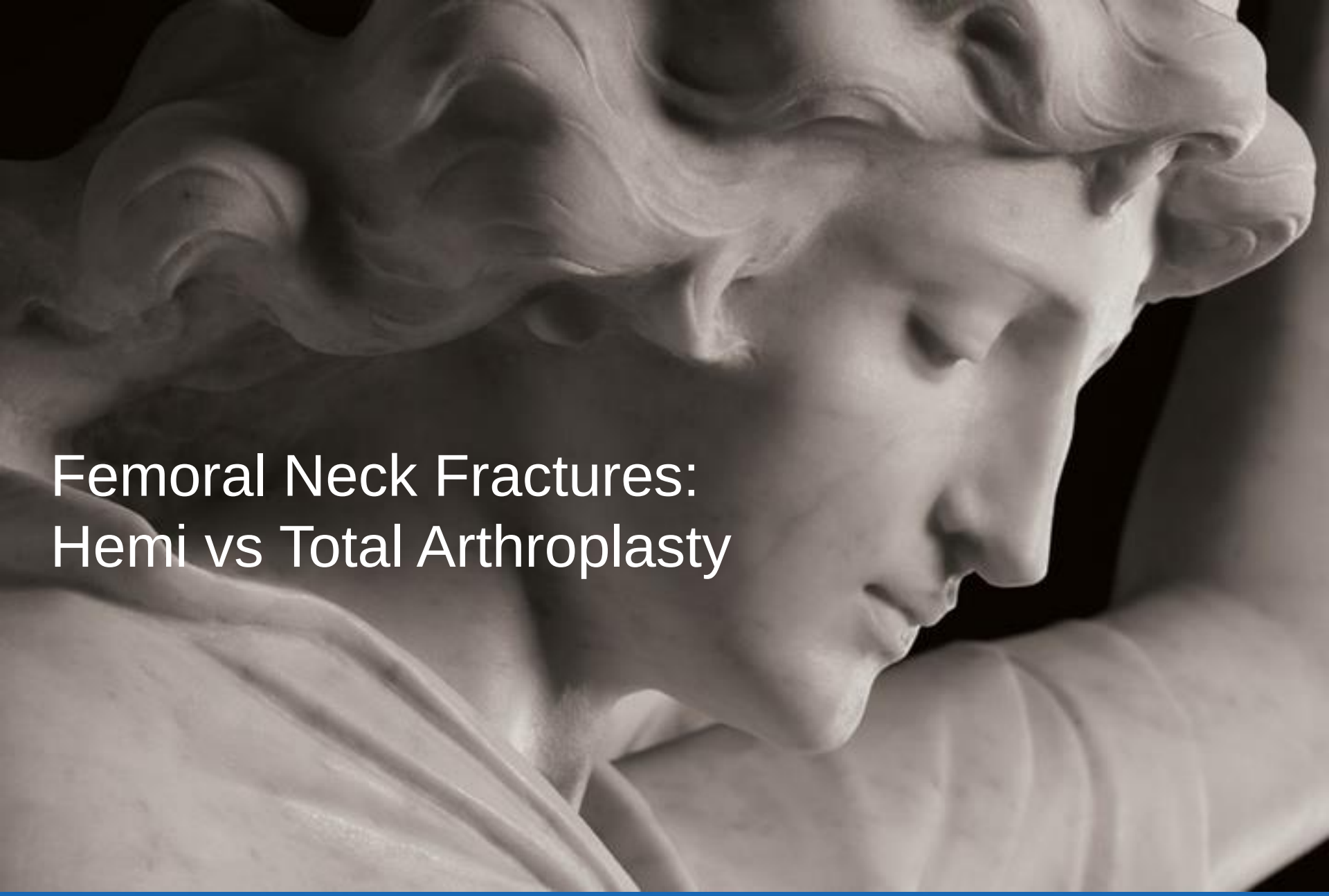

Inauguration of the
Rizzoli Orthopaedic Institute
June 28, 1896
THANK YOU !

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY



Femoral Neck Fractures: Hemi vs Total Arthroplasty

Patients with good health and good bone quality should have ORIF

- high velocity injury
- < 60 years of age (?)
- very active lifestyle

Increasing enthusiasm for arthroplasty in these patients

Increasing enthusiasm for total hip replacement in these patients

Fragility Fracture Meeting (September 2015)

National Hip Fracture Database (UK)

- NICE guidelines (2011)
- April 2010 → March 2013 (174,516 patients)
- 46% (80,000 patients) eligible for total hip replacement under guidelines
  - 2010/2011 – 10.7% total hip replacement
  - 2011/2012 - 15.6% total hip replacement
  - 2012/2013 – 20.7% total hip replacement
- Patients over 80 years of age < 10% total hip replacement
- Patient under 70 years of age > 40% total hip replacement

Should these patients:

- Undergo primary reduction & secondary arthroplasty if reduction / fixation fails?

- Undergo primary arthroplasty without acetabular replacement?
  - Monopolar
  - Modular monopolar
  - Bipolar

  } with or without cement

- Undergo primary total hip replacement?

Su, EP et al: BJJ 90B(Supplement A):43-7 2014 Nov

Primary reduction with subsequent revision arthroplasty

- Complication rate higher than primary arthroplasty
- Functional results may not be as good

Leonardsson O., et al. Journal of Bone & Joint Surgery-British Volume 2009 May;91(5):595-600
Archibeck, MJ et al: J Arthroplasty 28(1) 2013 Jan

Primary arthroplasty without acetabular replacement

Monopolar with or without cement

- Moore
- Thompson

- Inferior results compared to modern designs
- ↑ loosening without cement with ↑ thigh pain (Moore)
- ↑ acetabular wear with cement with ↑ groin pain (Thompson)
- Should be reserved for very inactive patients

Melamed E, et al. Injury 2007 Feb;38(2):256
Singh GK, et al. Injury 2006 Feb;37(2):169-74
Kassam, AA et al: J Arthroplasty 29(9) 2014 Sept

Modular monopolar / bipolar

- Modern stem design to better replicate normal offset + leg length

Klein GR, et al. Journal of Arthroplasty 2006 Dec;21(8):1134-40
Smrke D, et al. Archives of Orthopaedic & Trauma Surgery 2000;120(5-6):259-61

- Modern stem design may allow better bone ingrowth for cementless stems
- Modularity allows easier conversion to THR if acetabular wear is significant

Miller D, et al. Hip International 2008 Oct;18(4):301-6

BUT

- Conversion of modular monopolar / bipolar to THR has a higher complication rate than primary THR for femoral neck fracture

Kanto, K et al: Archives of Orthopaedic & Trauma Surgery 134(9) 2014 Sept
Stoffel, KK et al: ANZ Journal of Surgery 83(4) 2013 April

Cement vs No Cement

- Cement may increase early mortality rate and undoubtedly has an effect on cardiac function (clinical significance unknown)

Lim YW, et al. Journal of Arthroplasty 2009 Dec;24(8):1277-80
Clark DI, et al. Journal of Bone and Joint Surgery – Series B 2001;83(3):414-8

- Cementless stems have:
  - Higher revision rate

Goosen JH, et al. Archives of Orthopaedic & Trauma Surgery 2009 Jun;129(6):801-5

  - ↑ pain scores
  - ↑ higher intra-operative femoral fracture rate

Vochteloo AJ, et al. BMC Musculoskeletal Disorders 2009;10:56
Barlas KJ, et al. Journal of Orthopaedic Surgery 2008 Apr;16(1):30-4
Berend ME, et al. Journal of Arthroplasty 2006 Sep;21(6:Suppl 2):Supl-9
Parker MJ, et al. Cochrane Database of Systematic Reviews (3):CD001706, 2001 2001;(3):CD001706
Mohamed, AM et al: Acta Orthopaedica Belgica 79(6) 2013 Dec

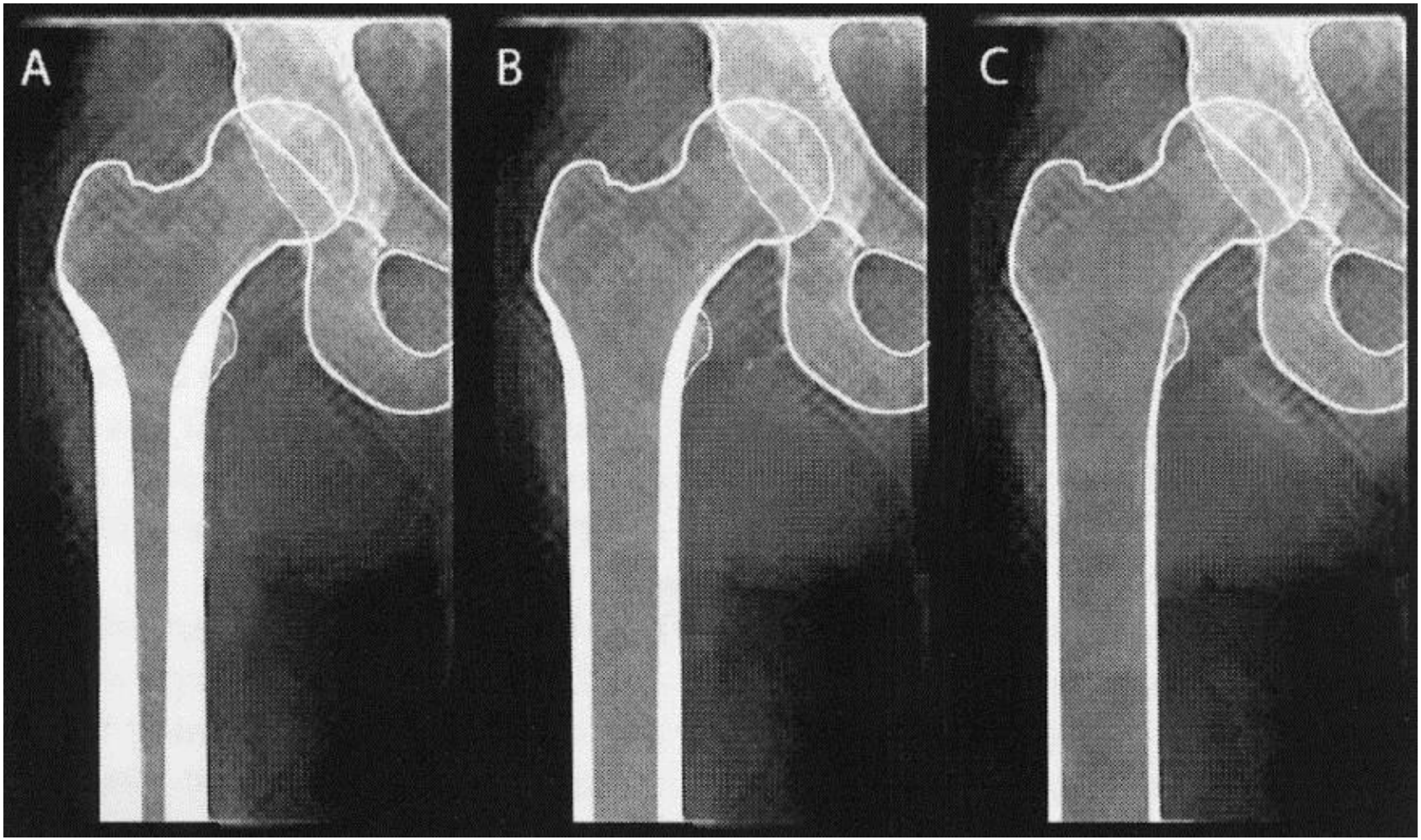
Cemented / Cementless

Complications / Re-Operations

- ⇧ cardiopulmonary issues with cemented stems
- ⇧ re-operation rate with cementless stems
- ⇧ femoral fractures at insertion with cementless stems
- ⇧ femoral fractures long term with cementless stems
- ⇩ hip scores with cementless stems
- 16% revision rate to total hip replacement for both stem types

Late periprosthetic fractures may be higher in the cementless group.

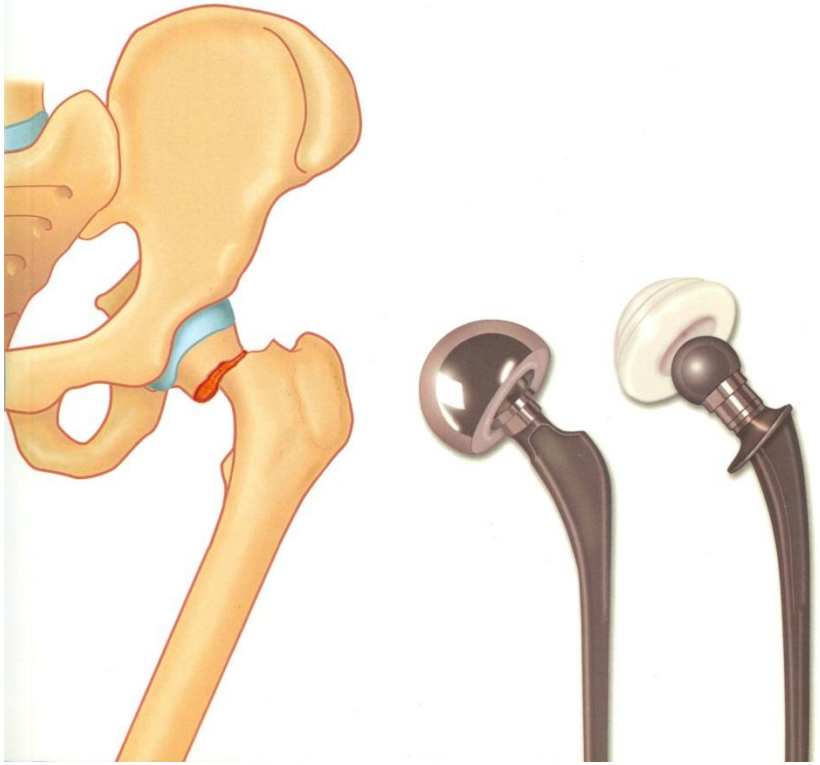
Langslet, E et al: CORR 472(4) 2014 April


A
B
C

Arthroplasty for Femoral Neck Fracture

Results of a nationwide implementation

OLOF LEONARDSSON
LUND UNIVERSITY



Primary THR

- Good functional results
  - Decreased pain
  - Increased walking distance

As compared to femoral head replacement alone

- However,
  - Increased blood loss
  - Increased dislocation rate

As compared to femoral head replacement alone

Schmidt AH, et al. Journal of Orthopaedic Trauma 2009 Jul;23(6):428-33
Watson D, et al. Orthopaedics 2008;31(10):2008
Gjertsen JE, et al. Acta Orthopaedica 2007 Aug;78(4):491-7
Zhao, Y et al: PLoS ONE 9(5)(e); 98071, 2014
Sassoon, A et al: J Arthroplasty 28(9) 2013 Oct

- Displaced fractures in patients > 60 years

- Minimal activity pre-fracture

    - Moore or Thompson (Cost / benefit)

- Moderate activity (supported living)
- Cemented modular monopolar / bipolar

- Normal activity (independent living)
- Cemented THR with large head though stable (anterolateral or modified posterior) approach
- Consider dual mobility concept if instability is a concern

Bensen, AS et al: International Orthopaedics 38(6) 2014 June
Johansson, T: JBJS(A) 96(6) 2014
Leonardsson, O et al: JBJS (A) 95(18) 2013 September

Fragility Fracture Meeting (September 2015)

Portsmouth, UK

- 48 patients with fractured neck of femur receiving total hip replacement
- 38 patients had no mobility aids pre-fracture
- at 1 year one-third of patients back to baseline; two-thirds using 1 or 2 canes

Optimal Hip Fracture Practice

Access and Patient Flow Across the Health Care Continuum

- Timely Surgery
- Transition between Services
- Discharge Planning

Optimal Clinical Practice

- ❖ **Surgery to Maximize Function**
- Clinical Pathways
- Optimal Medical Care
- Early Mobilization
- Delirium, Dementia and Depression Care
- Functional Activity
- Rehabilitation Scheduling
- Community Care

Secondary Prevention

- Osteoporosis management
- Falls prevention

Summary

- bipolar arthroplasty for older less active patients
- total arthroplasty for active patients living independently
- cemented stems
- large head metal/poly articulation vs dual mobility
- active rehabilitation

THANK YOU

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY

UNIVERSITY OF PISA

U.O. ORTOPEDIA E TRAUMATOLOGIA I

CHIEF: PROF. MICHELE LISANTI

Hip Arthroplasty in Emergency

Lisanti

M

SUMMARY

- PATIENT
- TIMING
- INTRAOPERATIVE RISKS
- SURGICAL APPROACH
- IMPLANT SELECTION
- OBJECTIVES

PATIENT

Injury, Int. J. Care Injured (2006) 37, 691–697

ELSEVIER

INJURY
INTERNATIONAL JOURNAL OF THE CARE OF THE INJURED

www.elsevier.com/locate/injury

Young PATIENT

REVIEW

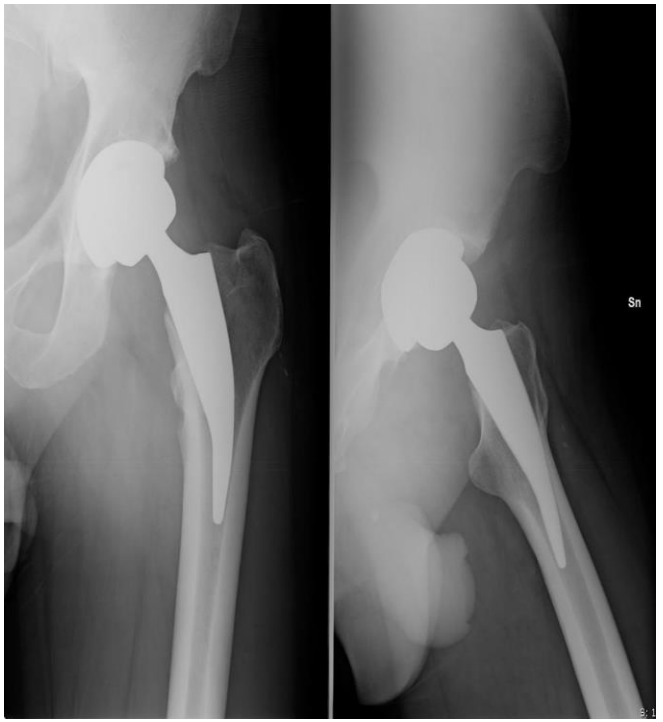
Epidemiology of adult fractures: A review

Charles M. Court-Brown*, Ben Caesar

Orthopaedic Trauma Unit, Royal Infirmary of Edinburgh, UK

Accepted 20 April 2006

RARE IN YOUNGS



MALE 50 Y.O POLITRAUMA PIPKIN FRA

Tipe III
associated neck and head

Injury, Int. J. Care Injured (2006) 37, 691–697

ELSEVIER

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www.elsevier.com/locate/injury

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RARE IN YOUNGS

FEMALE 40 Y.O. MEDIAL FRACTURE IN A

Old PATIENT

Injury, Int. J. Care Injured (2006) 37, 691–697

ELSEVIER

INJURY
INTERNATIONAL JOURNAL OF THE CARE OF THE INJURED

www.elsevier.com/locate/injury

REVIEW

Epidemiology of adult fractures: A review

Charles M. Court-Brown*, Ben Caesar

Orthopaedic Trauma Unit, Royal Infirmary of Edinburgh, UK

Accepted 20 April 2006

Table 1 Comorbidity and postoperative complications in 2448 elderly people with hip fracture

	No (%)
Comorbidity	
Cardiovascular disease	597 (24)
Stroke	322 (13)
Respiratory disease	343 (14)
Renal disease	66 (3)
Diabetes mellitus	232 (9)
Rheumatoid disease	84 (3)
Parkinson's disease	97 (4)
Malignancy	186 (8)
Paget's disease	13 (1)
Current smokers	240 (10)
Enteral steroids	52 (2)
No of comorbidities:	
1	861 (35)
2	414 (17)
≥3	162 (7)
Postoperative complication	
Chest infection	215 (9)
Cardiac failure	119 (5)
DVT/PE	42 (2)
Deep infection	27 (1)
Urinary tract infection	98 (4)
Gastrointestinal haemorrhage	20 (1)
Myocardial infarction	25 (1)
Stroke	35 (1)
No of complications:	
1	331 (14)
2	133 (5)
≥3	34 (1)

DVT/PE=deep vein thrombosis/pulmonary embolus.

What is already known on this topic?

Mortality is high after surgery for hip fracture in elderly patients

Postoperative complications are associated with a poor outcome

What this study adds

Patients with multiple comorbidities, especially respiratory disease and malignancy, before surgery for hip fracture are at higher risk of mortality

Postoperative complications, such as chest infection and heart failure, are also associated with increased mortality

Effect of comorbidities and postoperative complications on mortality after hip fracture in elderly people: prospective observational cohort study

J J W Roche, R T Wenn, O Sahota, C G Moran

Orthogeriatric Care Models and Outcomes in Hip Fracture Patients: A Systematic Review and Meta-Analysis

Konstantin V. Grigoryan, MS, Houman Javedan, MD,† and James L. Rudolph, MD, SM†‡*

Orthogeriatric Models

Three categories (models) of orthogeriatric interventions were identified to address a lack of consistency between the interventions. This categorization was also used to explain heterogeneity and bias in the meta-analyses.

Model 1: Routine Geriatric Consultation—Care that takes place within an orthopaedic ward with consistent geriatrician consultation on older patients. In this model, the geriatrician is a consultant and the article does not describe integration and shared responsibility.

Model 2: Geriatric Ward—Care within a geriatric ward with the orthopaedic surgeon acting as a consultant and responsibility for the care is with the geriatrician.

Model 3: Shared Care—An integrated care model where the patient is within an orthopaedic ward, but both the orthopaedic surgeon and the geriatrician share responsibility for the care of the patient. Articles selected with this model describe the geriatrician as an integral part of the orthopaedic team.

- Aspirin
- Warfarin
- Clopidogr
- Dabigatra
- Rivaroxab

USUALLY PATIENTS WITH COAGULATION PROBLEMS

Drugs
- Aspirin
- Warfarin
- Clopidogrel
- Dabigatran
- Rivaroxaban

Coagulation Disorder
- Haemophilia
- Von Willebrand Disease
- Coagulation factors disorders

Acquired Coagulopathy
- Vitamin K deficieny
- Severe Liver Disease

Not only in elective surgery

More important in emergency

we recommend that you follow the guidelines concerning patient blood management

Drugs

- Aspirin
- Warfarin
- Clopidogrel
- Dabigatran
- Rivaroxaban

Coagulation Disorder

- Haemophilia
- Von Willebrand Disease
- Coagulation factors disorders

Acquired Coagulopathy

- Vitamin K deficieny
- Severe Liver Disease

We recommend use of ultrasound to follow hematoma, especially in obese patient

RCS
ADVANCING SURGICAL STANDARDS

ORTHOPAEDIC SURGERY

Ann R Coll Surg Engl 2015; **97**: 283–286
doi 10.1308/003588415X14181254788845

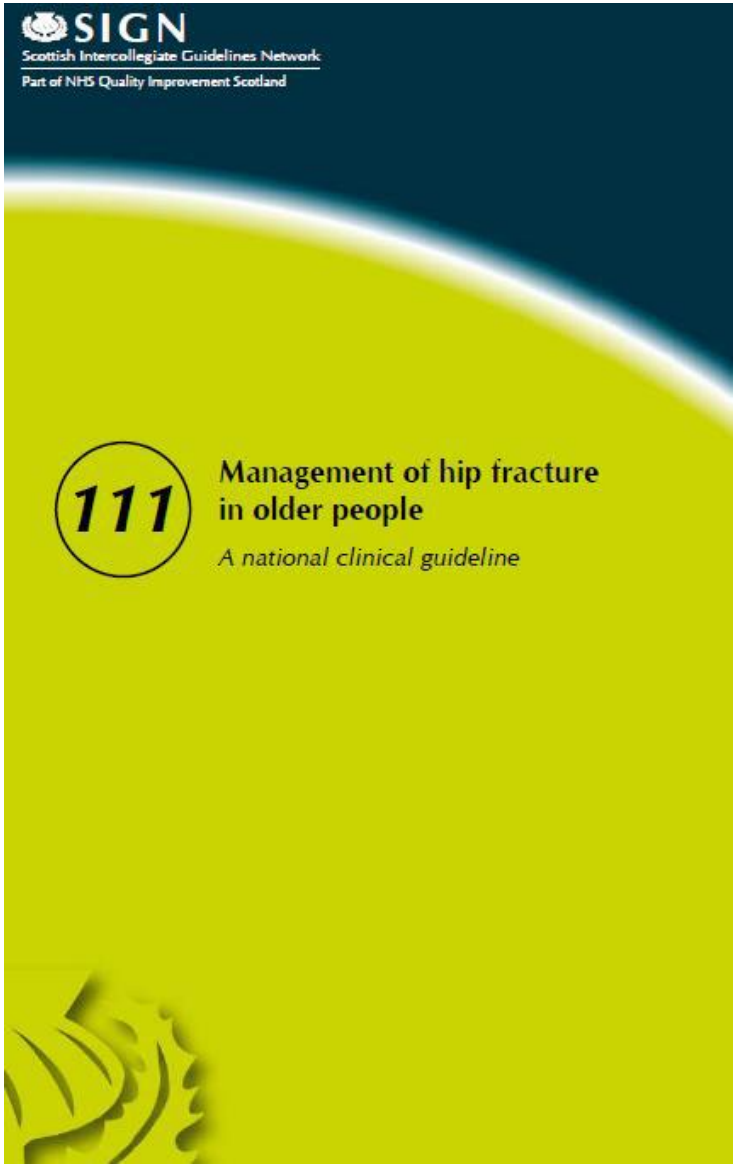
Cost of infection after surgery for intracapsular fracture of the femoral neck

MD Wijeratna, J McRoberts, MJ Porteous

West Suffolk Hospital NHS Trust, UK

TIMING

Bibliography



Recommended immediate reparative surgery, within 24–48 hours from hospital admission
Is it always mandatory?

There is no a complete agreement

Timing Matters in Hip Fracture Surgery. www.plosone.org October 2012 | Volume 7 | Issue 10 | e46175

JBJS The Journal of Bone & Joint Surgery

Early Mortality After Hip Fracture: Is Delay Before Surgery Important?

Christopher G. Moran, MD, FRCS(Ed); Russell T. Wenn, BA; Manoj Sikand, MS, FRCS; Andrew M. Taylor, DM, FRCS

J Bone Joint Surg Am, 2005 Mar; 87 (3): 483 -489 . http://dx.doi.org/10.2106/JBJS.D.01796

Cut off 4 days ??

PROSPECTIVE STUDY 2660 pz > 65 aa

Patients who had been admitted with an acute medical comorbidity that required treatment prior to the surgery had a thirty-day mortality of 17%, which was nearly 2.5 times greater than that for patients who had been initially considered fit for surgery.

a delay of more than four days significantly incre

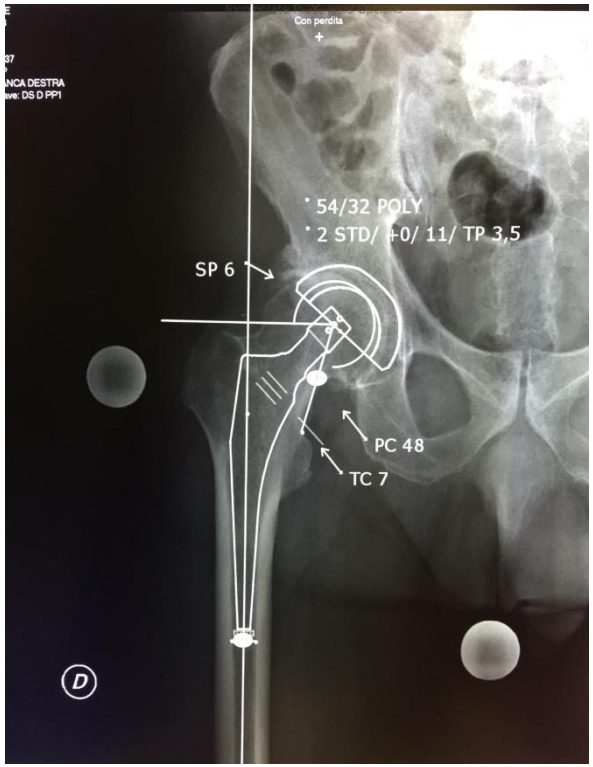
NO STATISTICAL SIGNIFICANT DIFFERENCE BETWEEN TWO OR THREE DAYS but

increased mortality is related to the delay or to comorbidities that cause delay we still do not know exactly

INTRAOPERATIVE RISKS

PLANNING?

THA in Election



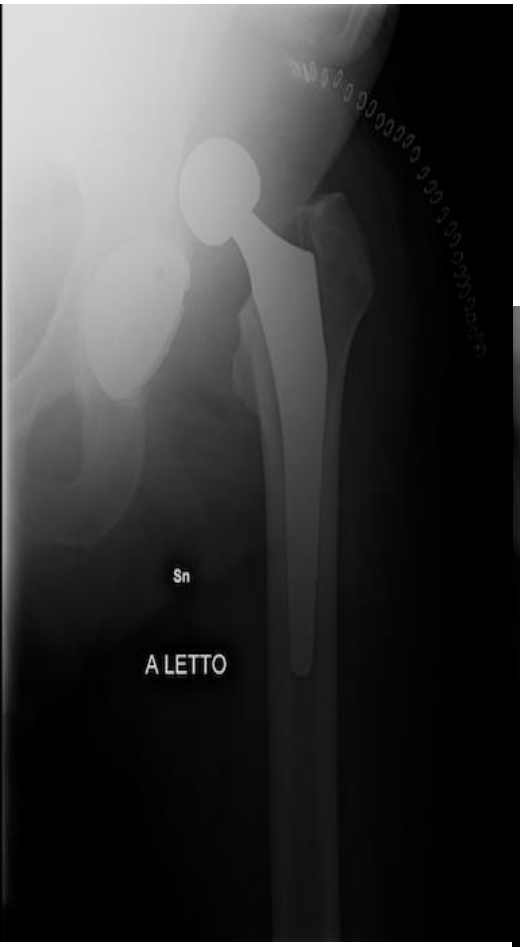
- Accurate preoperative planning
- X-rays perfect
- Helpfull controlateral X-ray

THA in Emergency

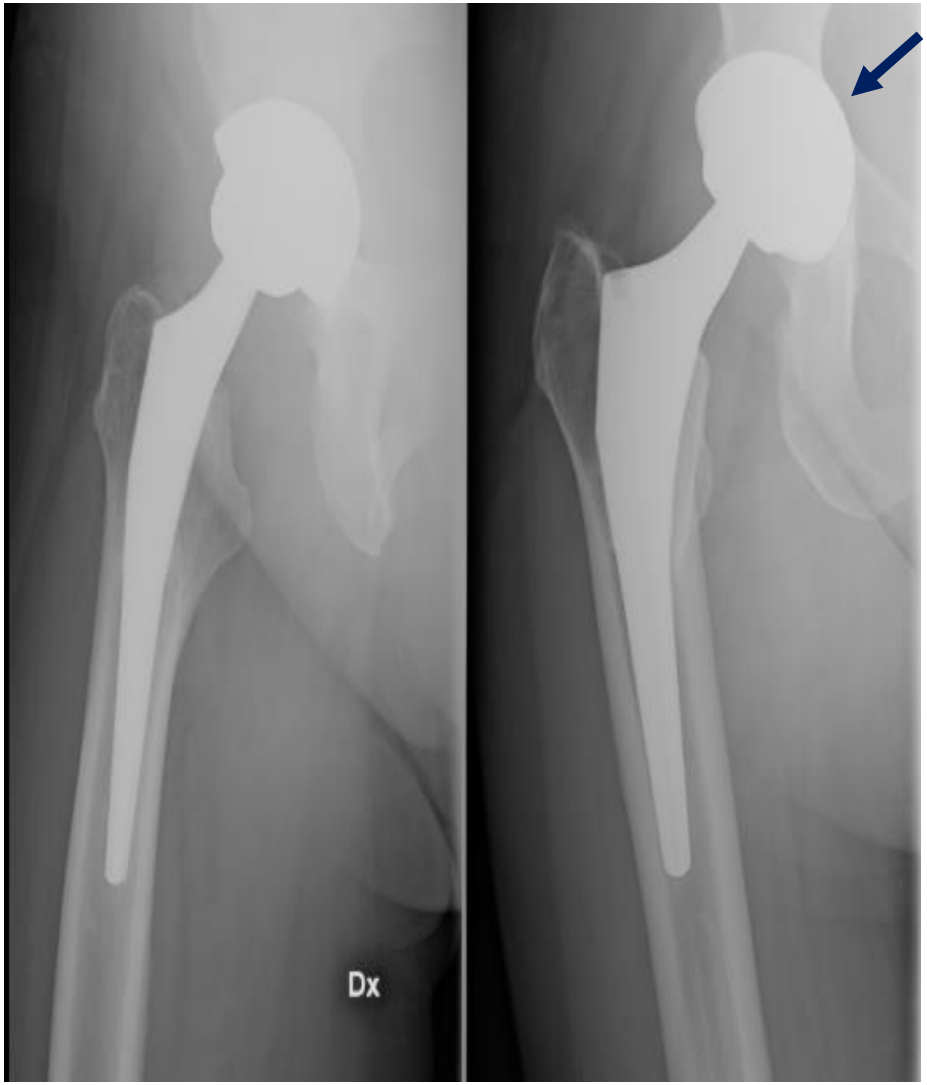
- Preoperative planning difficult or impossible
- X-rays …. as possible with pain
- Helpfull controlateral X-ray ….. not always

It is no easy to manage

- ***Hip stability***
- ***Leg lengt***

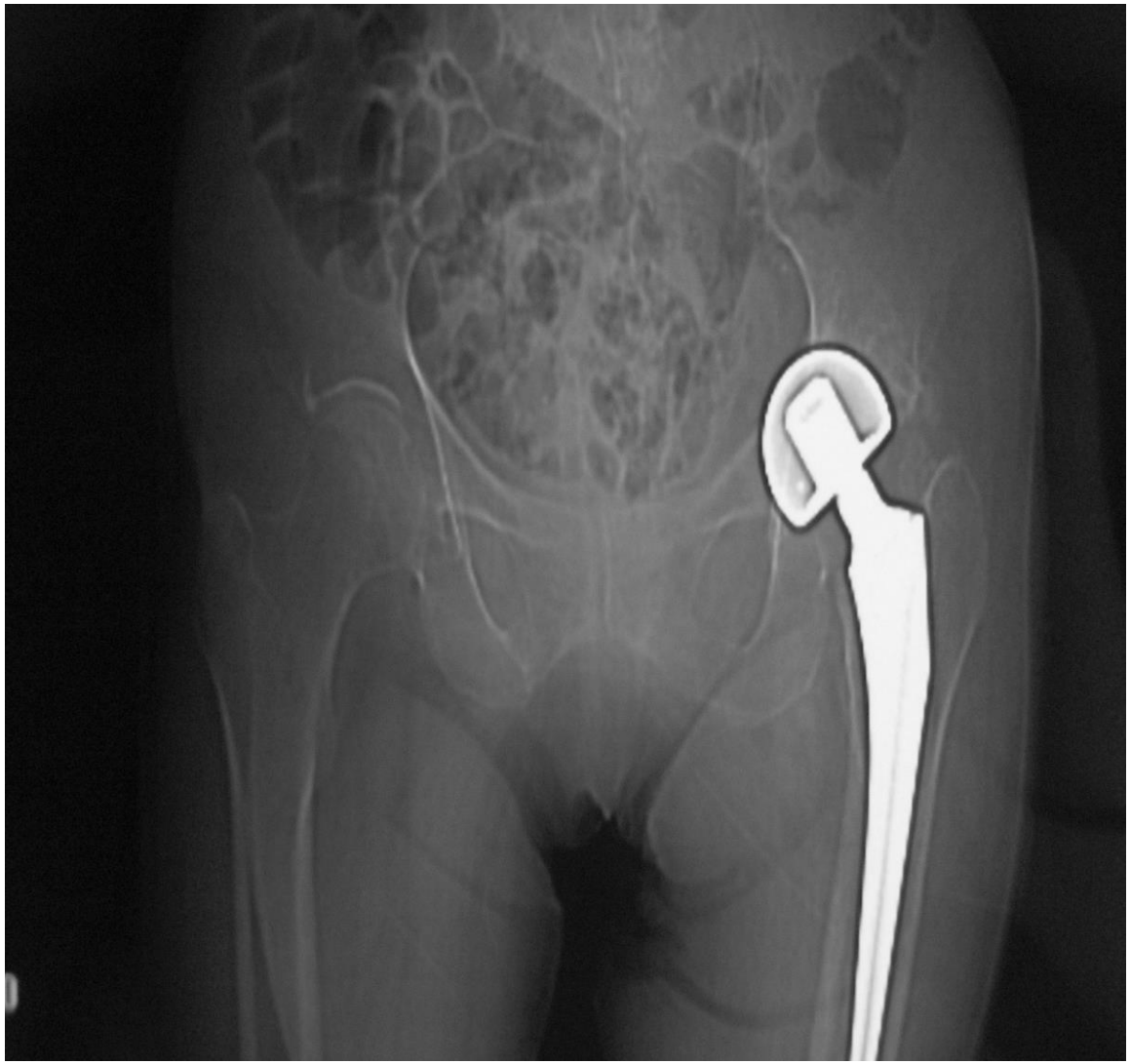


Another common PROBLEM :
Over reaming and lamina interruption



The lamina quadrilatera is very thin in fracture
Instead of arthrosis where osteophites provide more bone-

protrusio

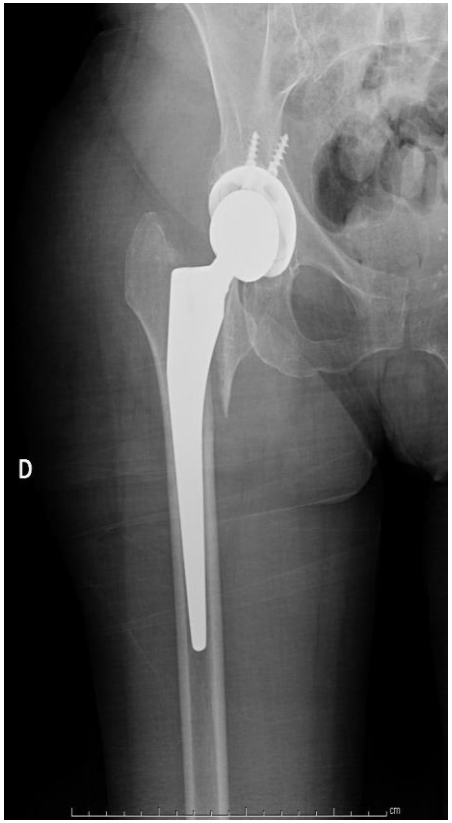


a large central lamina defect after excessive reaming may be due to reach a cup fit

Temporary big head

1 - young surgeon?

2 – senior surgeon



Medial fracure

Post operative x ray

After one week new and more complex surge

One shot = risk

risk

Second shot = much greather

"LANDING ZONE" = COMBINED VERSION OF CUP AND STEM

Is smaller than we tought

Clinical Orthopaedics and Related Research

SYMPOSIUM: 2014 HIP SOCIETY PROCEEDINGS

The 2014 Frank Stinchfield Award

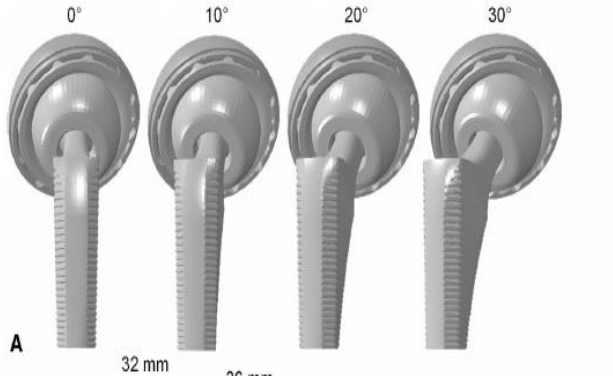
The 'Landing Zone' for Wear and Stability in Total Hip Arthroplasty Is Smaller Than We Thought: A Computational Analysis

Jacob M. Elkins MD, PhD, John J. Callaghan MD,
Thomas D. Brown PhD

Table 2. Previously defined safe zones for acetabular cup orientation

Study	Ideal inclination*	Ideal anteversion*	Other orientations	Type
Lewinnek et al. [31]	40° ± 10°	15° ± 10°		Clinical
Dorr et al. [17]	35° ± 15°	15° ± 15°		Clinical
McCollum and Gray [33]	40° ± 10°	30° ± 10°		Clinical
Biedermann et al. [7]	45° ± 10°	15° ± 10°		Clinical
Barrack et al. [5]	45° ± 10°	20° ± 10°		Biomechanical
Widmer and Zurfluh [42]	40°–45°	20°–28°	$\beta + 0.7*\delta = 37°$	Biomechanical
Yoshimine [44]			$\alpha + \beta + 0.77*\delta = 84.3°$	Biomechanical
Jolles el al [25]			$40° < \beta + \delta < 60°$	Clinical

* Values are mean ± range; α = cup inclination; β = cup anteversion; δ = femoral stem anteversion.

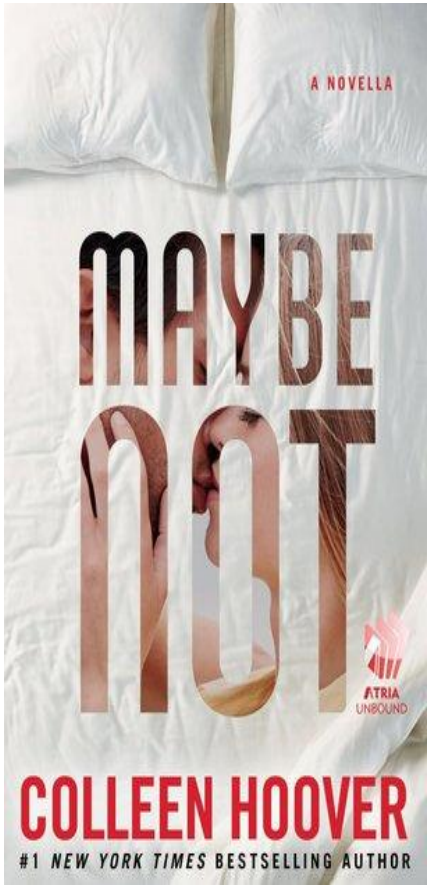


THA in fracture has higher risk of dislocation

Landing zone is small

Find correct combined version in fractures
Is more difficult

IS IT A SURGERY FOR EVERY SURGEONS?



78 MALE

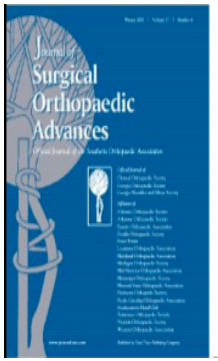
ACETABULAR FRACTURE AND DELAYED POSTERIOR HIP DISLOCATION with post wall insuffic.
Reconstruction or rapid recovery ?

SENIOR SURGEON IS REQUIRED

Bone graft and revision cup

immediate recovery of the load and gait

SURGICAL APPROACH



Surgical Approaches to Total Hip Arthroplasty

Daniel Kelmanovich,[1] Michael L. Parks, MD,[2] Raj Sinha, MD, PhD,[3] and William Macaulay, MD[4]

My word of advice to patients remains this: Stay focused on the important issue – the long term results. Pick your surgeon based on reputation, experience, and your feelings of trust and personal connection. Though it is important to discuss new procedures and technology, in the end let the surgeon in whom you place your trust pick what is best for you. All that is new is not necessarily better, and this is especially true of ideas that have that may have had a past history of problems or failures.

Richard Sweet M.D.

In selected patients, anterior or lateral approach with the patient in supine position could be better

Pay attention especially in DAA with poor bone quality (great trocanter or other fract)

MAJOR RISK OF DISLOCATION IF WE PERFORM POSTERIOR APPROACH?

International Journal of Orthopaedic and Trauma Nursing (2013) 17, 120–130

ELSEVIER

International Journal of Orthopaedic and Trauma Nursing

www.elsevier.com/locate/ijotn

REVIEW ARTICLE

Acute confusion states, pain, health, functional status and quality of care among patients with hip fracture during hospital stay

Inger Johansson PhD, RNT (Associate professor, Professor) [a,b,*], Carina Bååth PhD, RN (Senior lecturer, Research supervisor) [a,c], Bodil Wilde-Larsson PhD, RNT (Professor) [a,d], Marie Louise Hall-Lord PhD, RNT (Professor) [a,b]

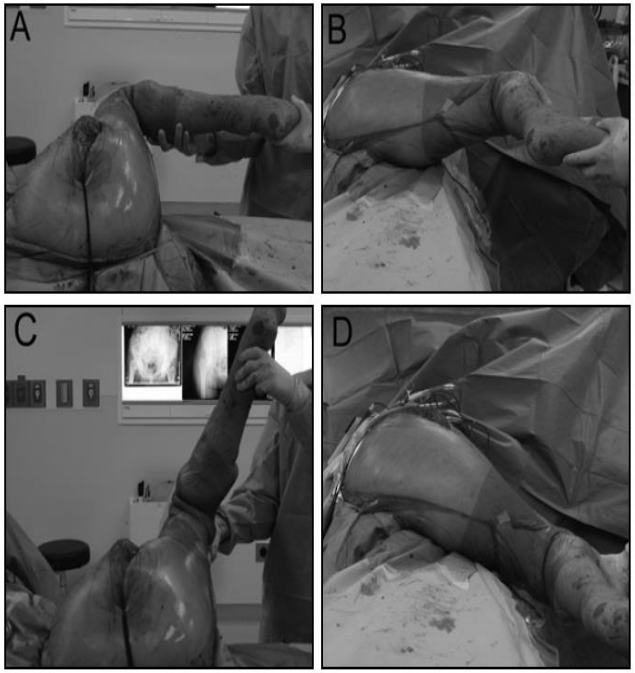
POST OPERATIVE DELIRIUM COULD BE RESPONSIBLE OF DISLOCATION DESPITE THE KIND OF APPROACH WAS USED

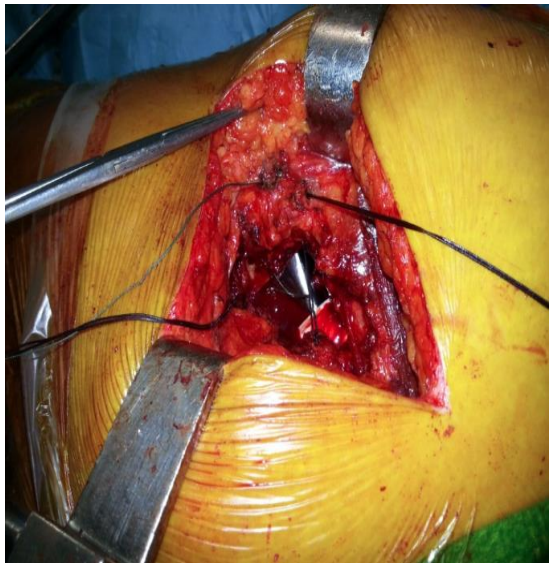
Hip Int 2011; 21 (03): 344 - 350 DOI: 10.5301/HIP.2011.8401

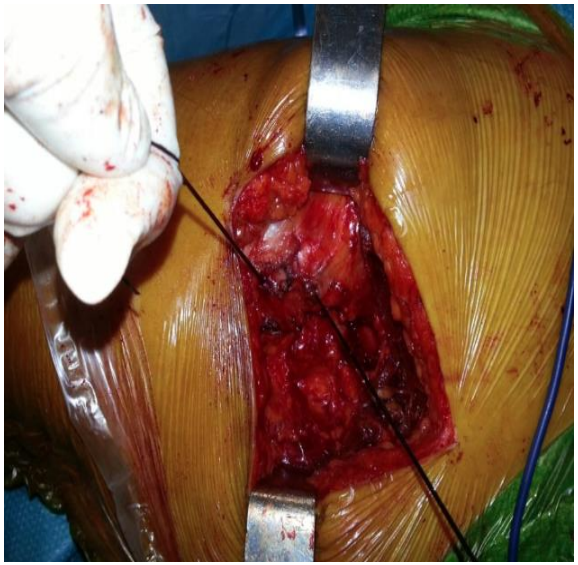
ORIGINAL ARTICLE

Total hip arthroplasty for acute displaced femoral neck fractures via the posterior approach: a protocol to minimise hip dislocation risk

William M. Ricci [1], Jakub S. Langer [1], Stéphane Leduc [2], Philipp N. Streubel [1], Joseph Borrelli Jr [3]







Personal opinion

Posterior approach

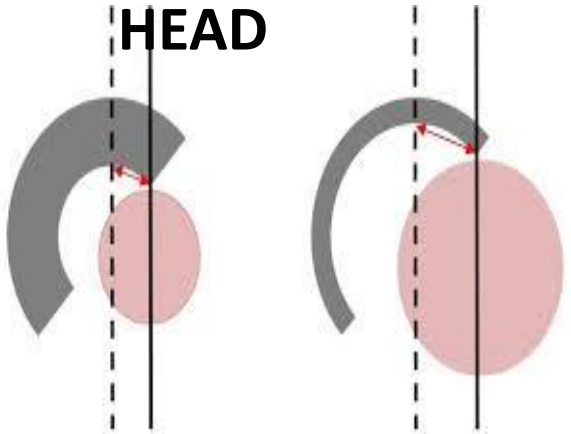
USING SURGICAL TECHNIQUE FOCUSED ON INTROPERATIVE STABILITY, POSTERIOR WALL RECONSTRUCTION, THE RISK OK DISLOCATION IS VERY LOW AND SIMILAR TO OTHER

IMPLANT SELECTION

Reduction in Early Dislocation Rate With Large-Diameter Femoral Heads in Primary Total Hip Arthroplasty

The Journal of Arthroplasty Vol. 22 No. 6 Suppl. 2 2007

CUP AND HEAD



RCS ADVANCING SURGICAL STANDARDS

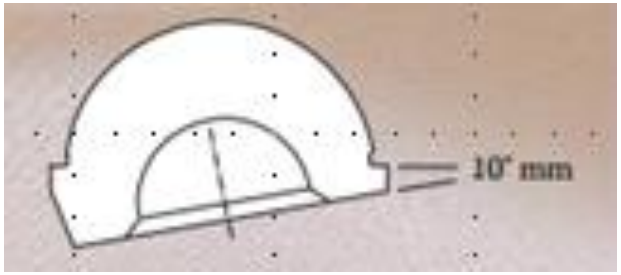
ORTHOPAEDIC SURGERY

Ann R Coll Surg Engl 2014; **96:** 597–601
doi 10.1308/003588414X14055925058391

A double mobility acetabular implant for primary hip arthroplasty in patients at high risk of dislocation

NL Vasukutty[1], RG Middleton[2], P Young[3], C Uzoigwe[4], B Barkham[5], S Yusoff[6], THA Minhas[1]

[1]Pilgrim Hospital, Boston, Lincolnshire NHS Trust, UK
[2]Royal Cornwall Hospitals NHS Trust, UK
[3]NHS Greater Glasgow and Clyde, UK
[4]University Hospitals of Leicester NHS Trust, UK
[5]University of Nottingham, UK
[6]University of Leicester, UK



JBJS The Journal of Bone & Joint Surgery

Relationship to Postoperative Dislocation*

T. K. COBB, M.D.†; B. F. MORREY, M.D.†; D. M. ILSTRUP, M.S.†, ROCHESTER, MINNESOTA

J Bone Joint Surg Am, 1996 Jan; 78 (1): 80 -6 . http://dx.doi.org/

In trauma we reccomand use of
BIG HEAD, ELEVATED RIM LINER, AND DOUBLE MOBILITY IMPLANT REDUCE THIS RISK OF DISLOCATION

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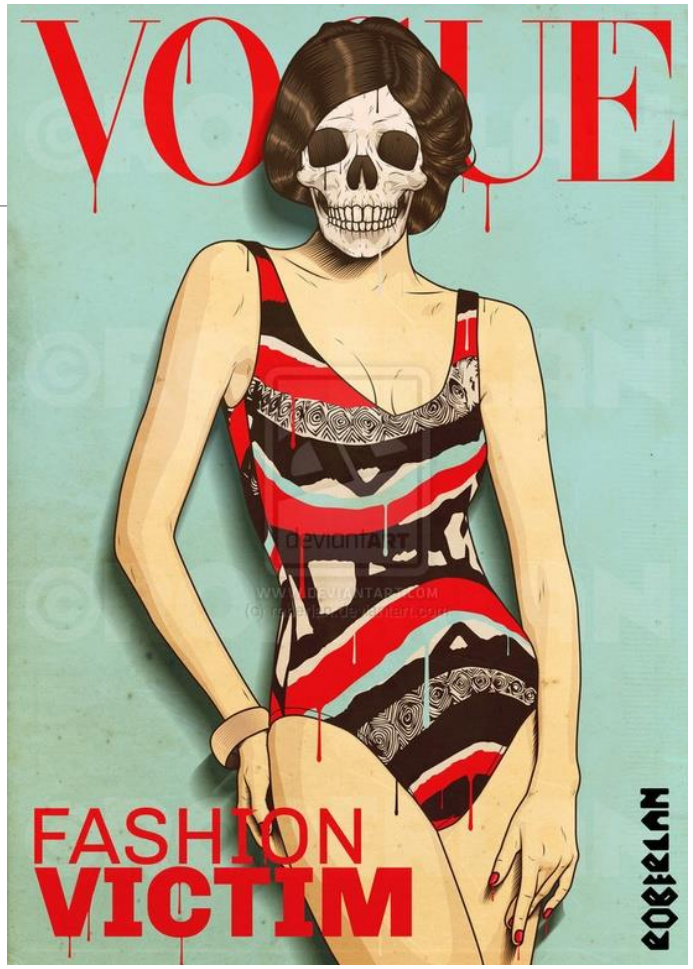
IN THE JOURNALS

Short-stem THA usage in elderly patients yields positive outcomes

Oh KJ. *Orthopedics.* 2014. doi:10.3928/01477447-20140626-57.

September 5, 2014



Uncemented under 75

Uncemented stems are gaining greater acceptance as viable “first-choice” arthroplasty implants for the treatment of femoral neck fractures with many studies reporting equivalent or better functional
results when compared with cemented stems and shorter operative time, lower blood loss, and no difference in complication or reoperation rates.

- Luo X, He S, Li Z, et al. Systematic review of cemented versus uncemented hemiarthroplasty for displaced femoral neck fractures in older patients. Arch Orthop Trauma Surg. 2012;132:455–463.
- Figved W, Opland V, Frihagen F, et al. Cemented versus uncemented hemiarthroplasty for displaced femoral neck fractures. Clin Orthop Relat Res. 2009;467:2426–2435.
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- Bell KR, Clement ND, Jenkins PJ, et al. A comparison of the use of uncemented hydroxyapatite-coated bipolar and cemented femoral stems in the treatment of femoral neck fractures: a case-control study. Bone Joint J. 2014;96-B(3):299–305.
- Ahn J, Man LX, Park S, et al. Systematic review of

“to use or not to use”

Cemented over 80

There is evidence, however, that uncemented stems are at an elevated risk for intraoperative and postoperative periprosthetic fracture; furthermore,
some studies report increased pain and poorer functional outcomes with the use of uncemented stems compared with cemented stems for the treatment of femoral neck fractures in the elderly.

- Yli-Kyyny T, Sund R, Heinänen M, et al. Cemented or unceme
hemiarthroplasty for the treatment of femoral neck fractures? A
Orthop.
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Int
Orthop. 2002;26:229–232.
- Parker MJ, Gurusamy KS, Azegami S. Arthroplasties (with and without
bone cement) for proximal femoral fractures in adults. Cochrane
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Syst Rev. 2010;(6):CD001706.
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without cement: a randomized clinical trial. J Bone Joint Surg Am
2012;94:577–583.
- Viberg B, Overgaard S, Lauritsen J, et al. Lower reoperation r
for

Uncemented under 75 ?

Cemented over 80 ?

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- Figved W, Opland V,
  uncemented
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  Orthop
  Relat Res. 2009;467:242
- Ning GZ, Li YL, Wu Q,
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  Eur J Orthop Surg Traum
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- Viberg B, Overgaard S, Lauritsen J, et al. Lower reoperation r for

We need a system, with the ability to choose during surgery, without changing instrumentation

EXACTA STEM

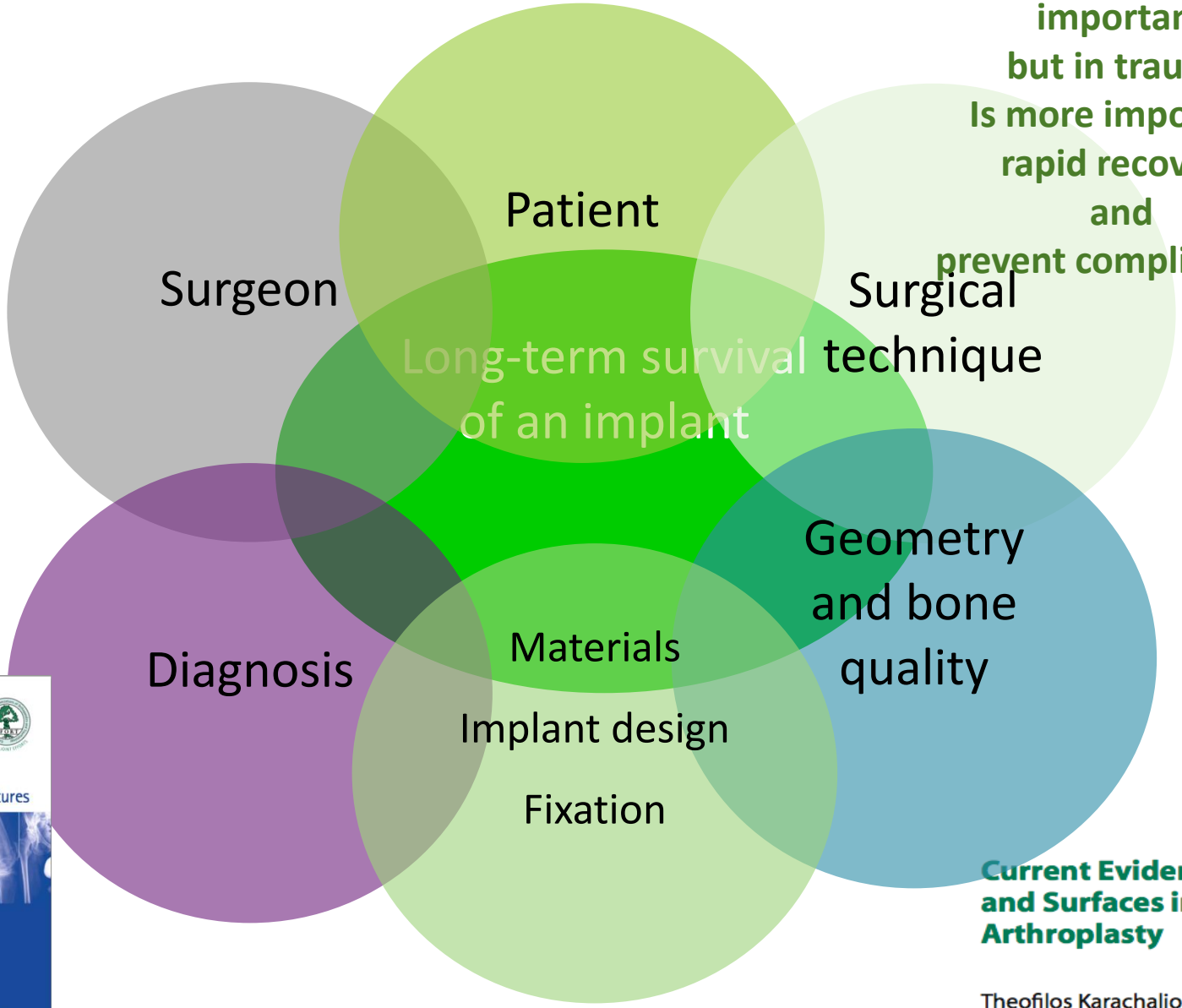
Uncemented Cemented

OBJECTIVES

THE SAME OF ELECTIVE TOTAL HIP SURGERY!

THE SAME OF ELECTIVE TOTAL HIP SURGERY!

Long term implant survival is important but in trauma Is more important rapid recovery and prevent complications



Result Depend on Many different factors

Current Evidence on Designs and Surfaces in Total Hip Arthroplasty

Theofilos Karachalios

CONCLUSION -1

PATIENT → ORTHOGERIATRIC APPROACH

TIMING → IF POSSIBLE NO DELAY (but not mandatory) (80-85% in 48 H)

INTRAOPERATIVE RISKS → IT IS DIFFICULT SUCH OR MORE AS ELECTIVE THA!

SURGICAL APPROACH → THE MORE FAMILIAR ONE

CONCLUSION - 2

IMPLANT SELECTION → BIG HEAD, ELEVATED RIM, BIPOLAR CUPS FOR THE STEM, A SYSTEM

OBJECTIVES → THE SAME OF ELECTIVE THA
But rapid recovery and avoid complications

UNIVERSITY OF PISA

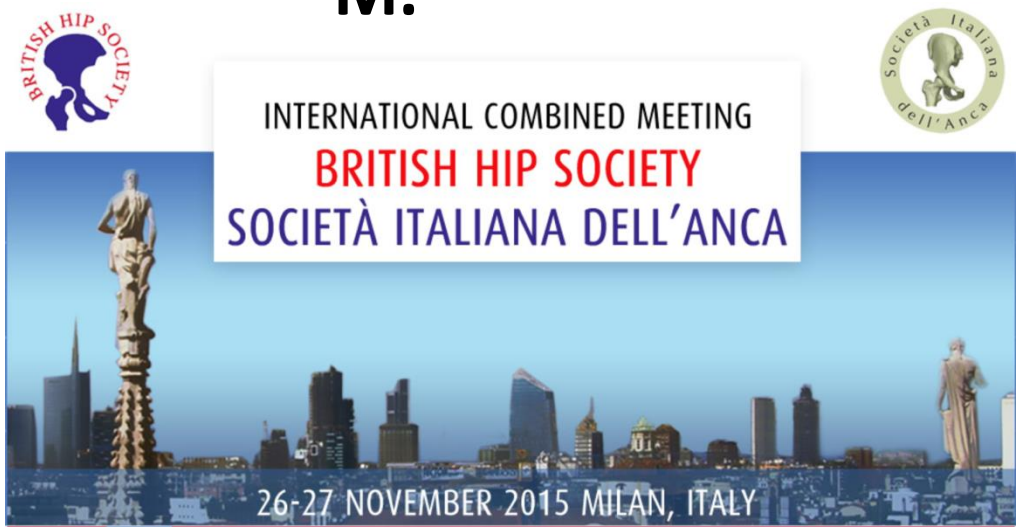
U.O. ORTOPEDIA E TRAUMATOLOGIA I

CHIEF: PROF. MICHELE LISANTI

Hip Arthroplasty in Emergency

Lisanti

M.



THANK YOU FOR ATTENTION!

lisanti@med.unipi.it

INTERNATIONAL COMBINED MEETING

BRITISH HIP SOCIETY
SOCIETÀ ITALIANA DELL'ANCA

26-27 NOVEMBER 2015

MILAN, ITALY