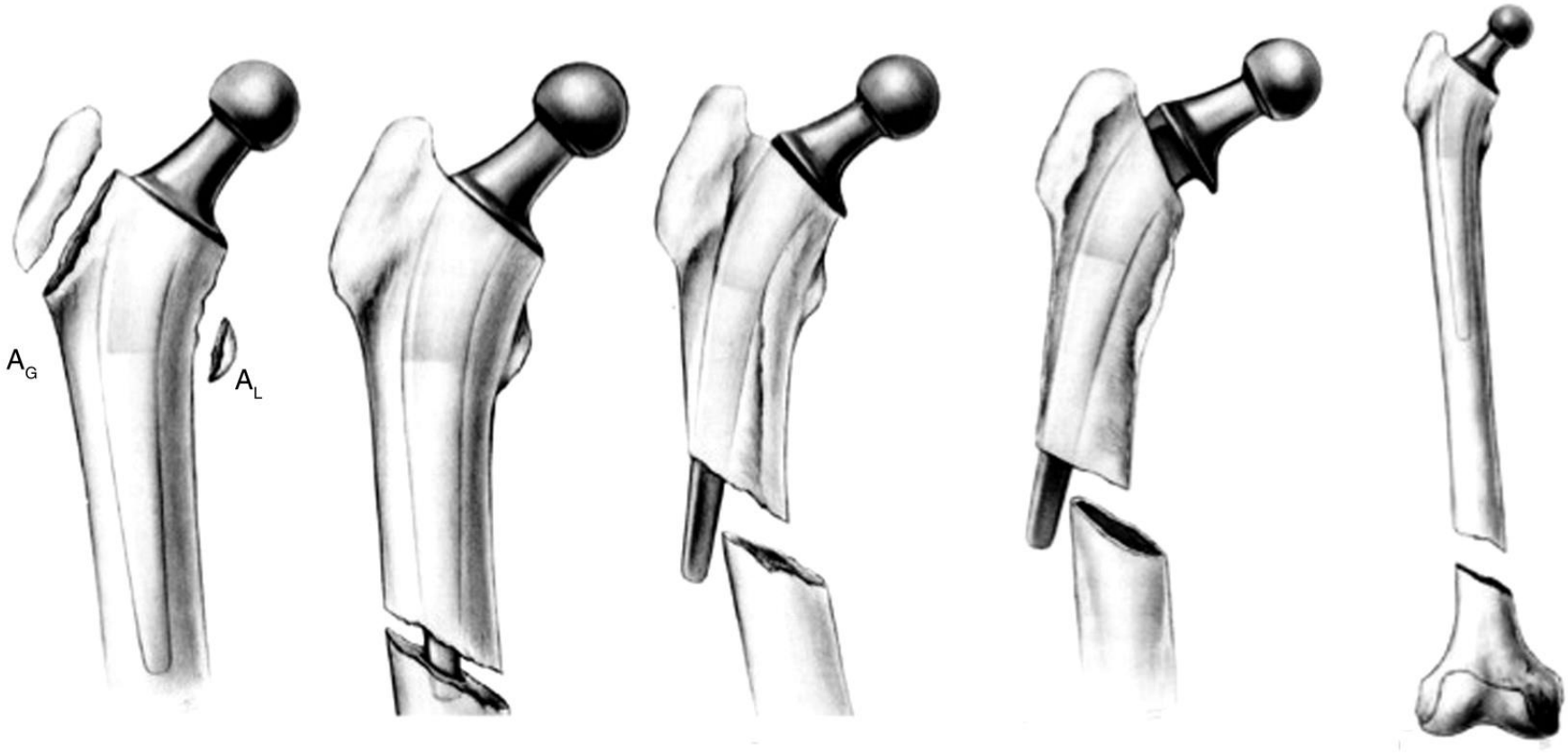
Periprosthetic fractures

Hip and knee

Morten Schultz Larsen, Odense University Hospital

Vancouver classification



A **B1** **B2** **B3** **C**

Vancouver B1 – near well fixed implant

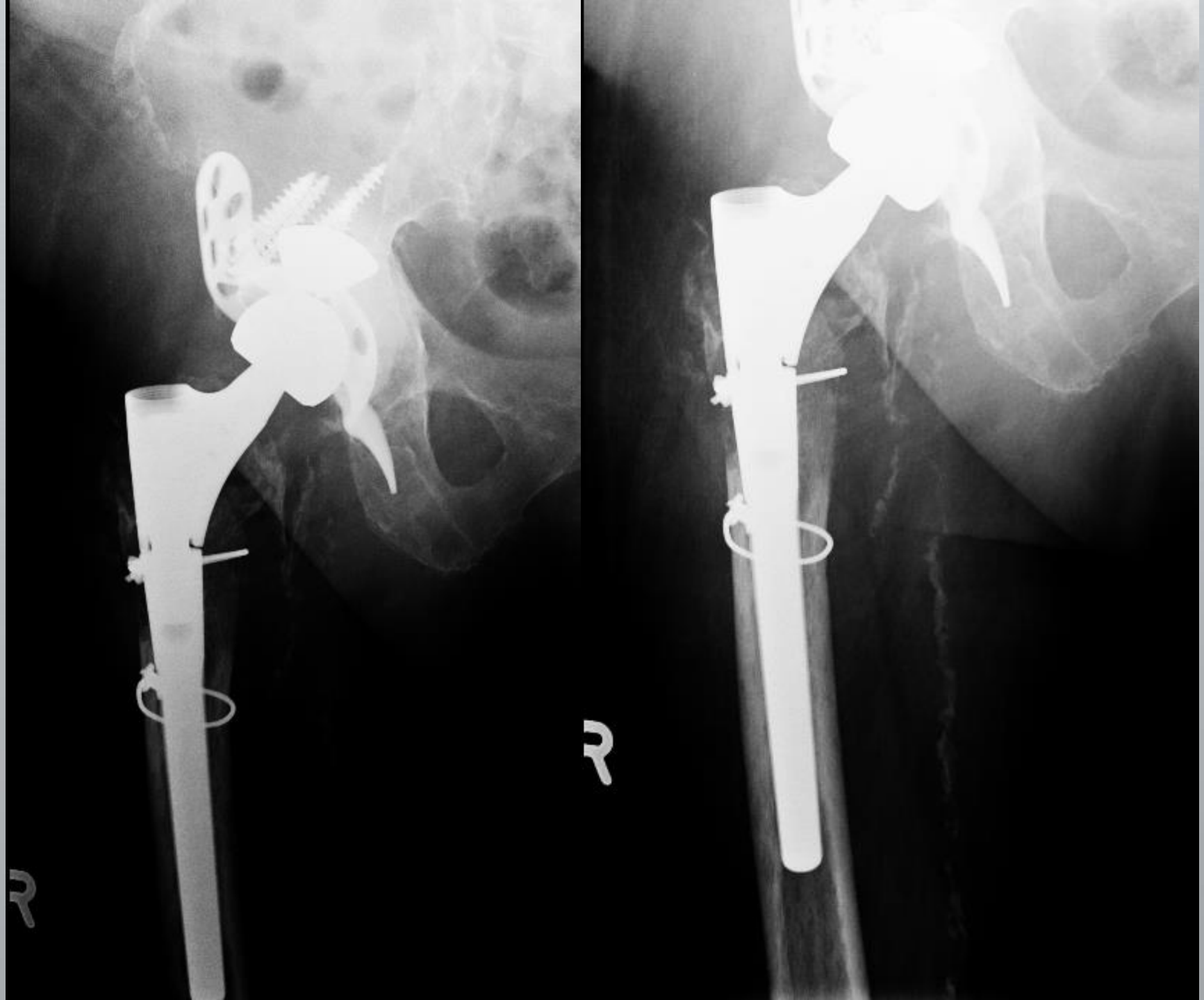
- Corten et al found 9/45 (20 %) radiological stable stems to be loose intra operatively

  (J.BoneJointSurg(Br) 2009;91-B:1424-30)

- All B1 are not the same
  - Osteoporosis
  - Fracture type
  - Healing potential

Discuss with arthroplasty surgeons


Vancouver B2/B3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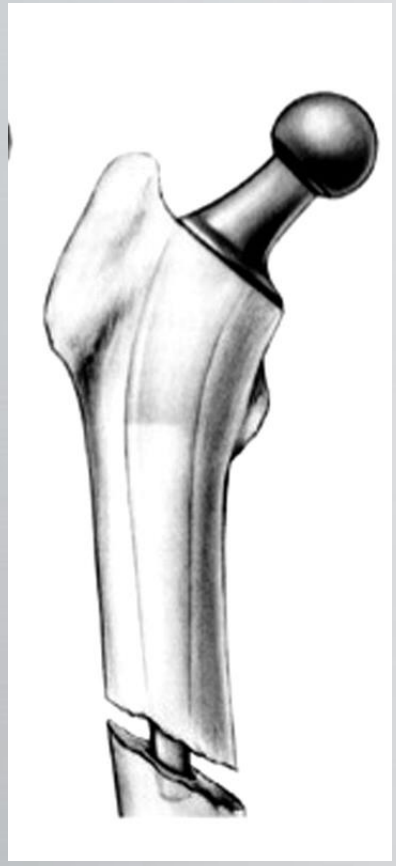
Vancouver classification



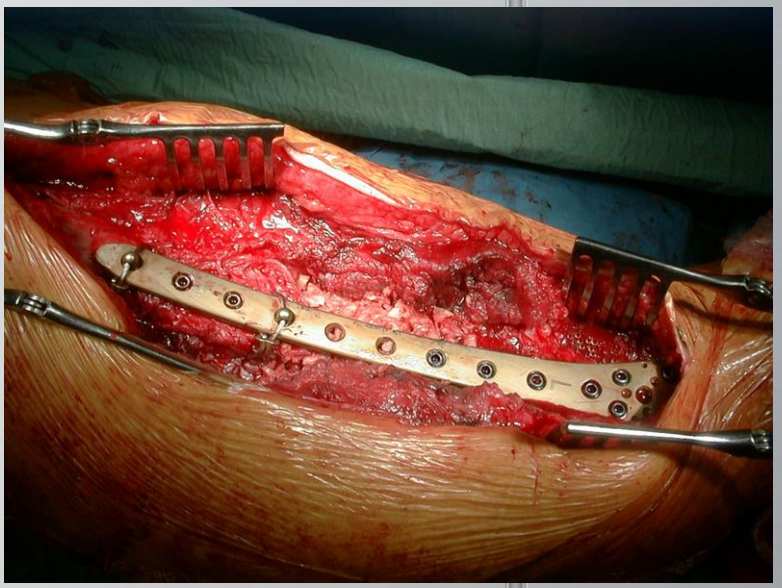
A **B1** **B2** **B3** **C**

Summary – Vancouver B1-C

- Anatomical reduction – defines approach
  - Remove cement if necessary
- Inter fragmentary compression
  - Screw, cable, plate
- Remember the principles
  - Absolute/relative stability
- Overlap the stem
- Secure fixation around stem
  - Uni cortical, cable, LAP
- Avoid stress riser – long plates
- Pitfall: Medial cortex, loose stem

MIPO or ORIF

- Documentation from traditional fracture treatment
- Best suited for bridge plate
- Must be able to reduce anatomically in short fractures
  - Open reduction of fracture
  - MIPO technique for plate
- In open technique
  - Preserve periostium
  - Preserve soft tissue



More is not better

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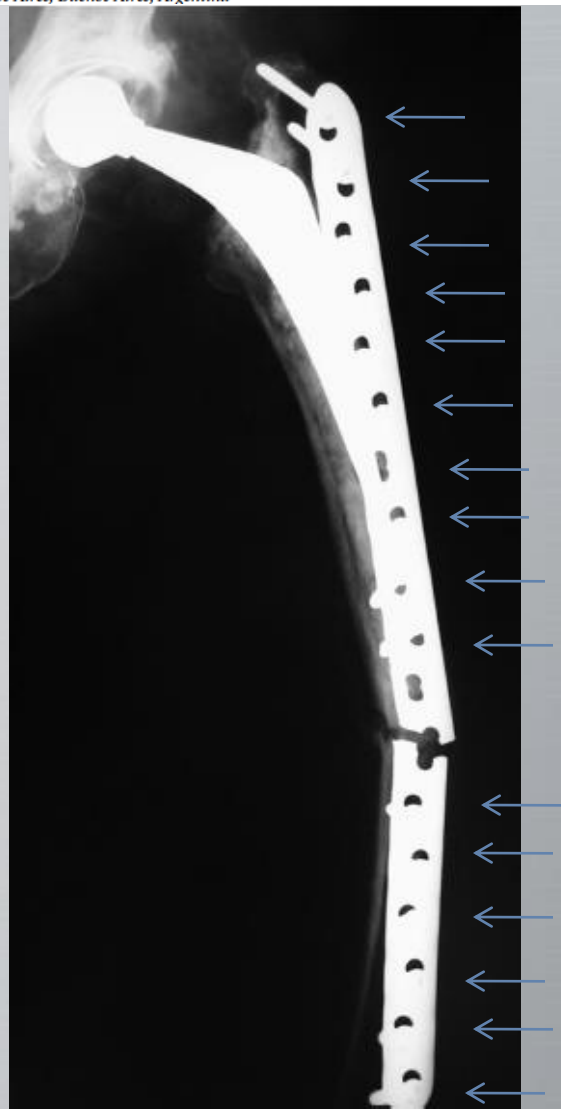
Locking Compression Plate Fixation of Vancouver Type-B1 Periprosthetic Femoral Fractures

By M.A. Buttaro, MD, G. Farfalli, MD, M. Paredes Núñez, MD, F. Comba, MD, and F. Piccaluga, MD

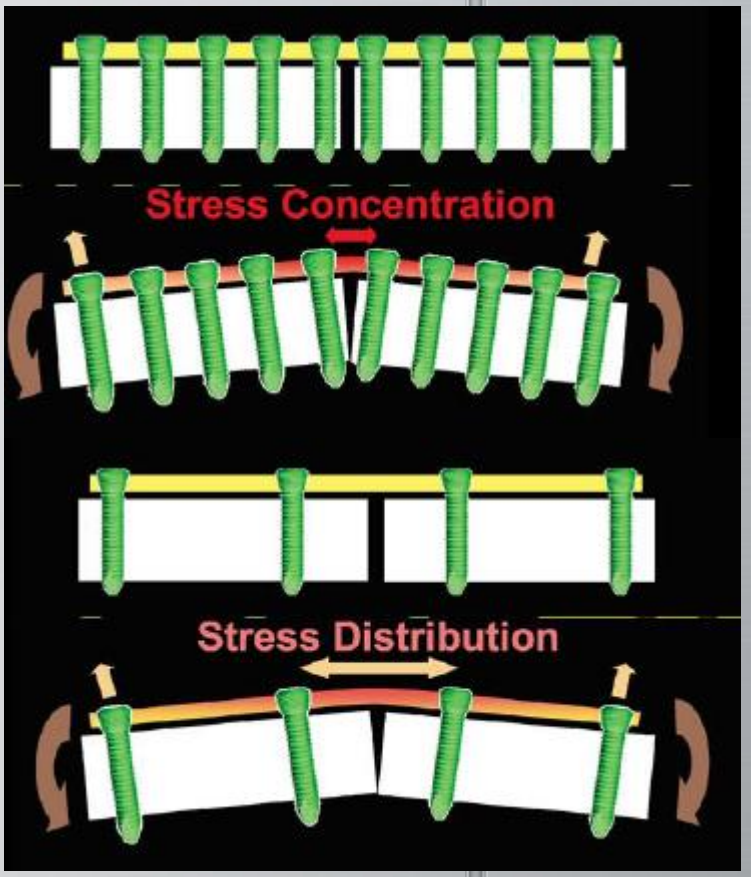
Investigation performed at the Hip Surgery Unit, Institute of Orthopedics "Carlos E. Ottolenghi," Italian Hospital of Buenos Aires, Buenos Aires, Argentina

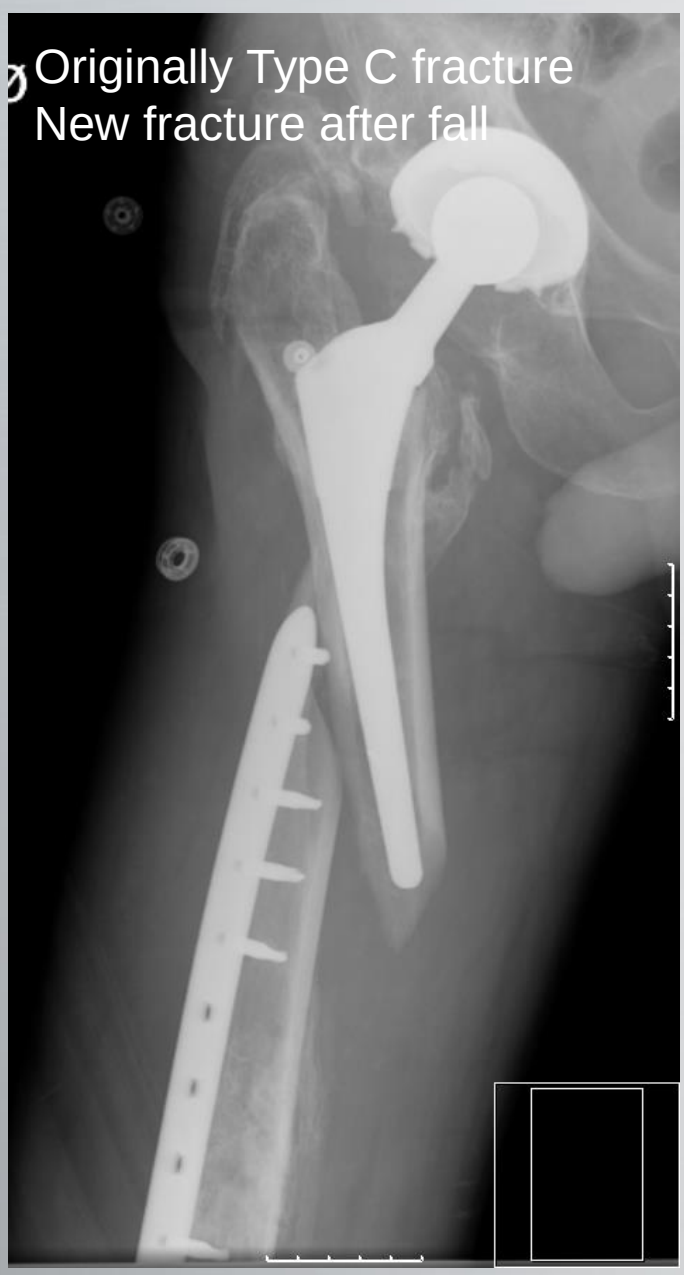
- 14 patients – LCP with locking screws
- 3 non-union => fracture of the plate
  - Many screws
  - Absolute or relative stability ?
- 3 pull-outs proximal
  - Only unicortical screws
  - Some cases only two screws
  - Include fracture through screw hole
- All revised with strut graft and new plate



Basic relation between stability and healing (Perren, J Bone Joint Surg [Br] 2002;84-B:1093-110.)

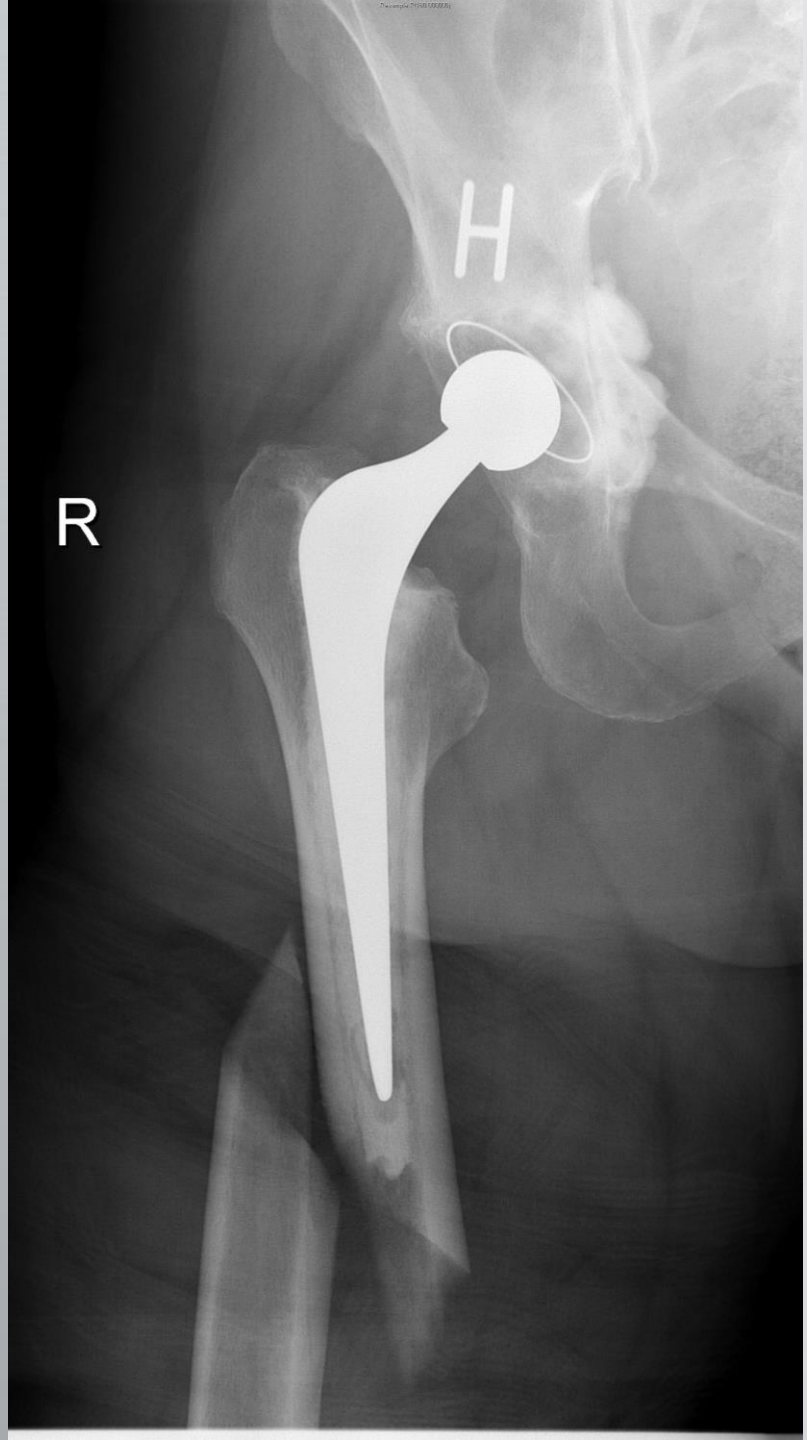
- To many screws stress the plate over the fracture
- To many screws will make fixation to stiff for callus formation, and does not allow for primary healing
- Primary healing requires inter-fragmentary compression of the fracture (absolute stability)
- Secondary healing (callus) requires some movement between fragments




Originally Type C fracture
New fracture after fall


To week proximal fixation
Small plate overlap
HØ


HØ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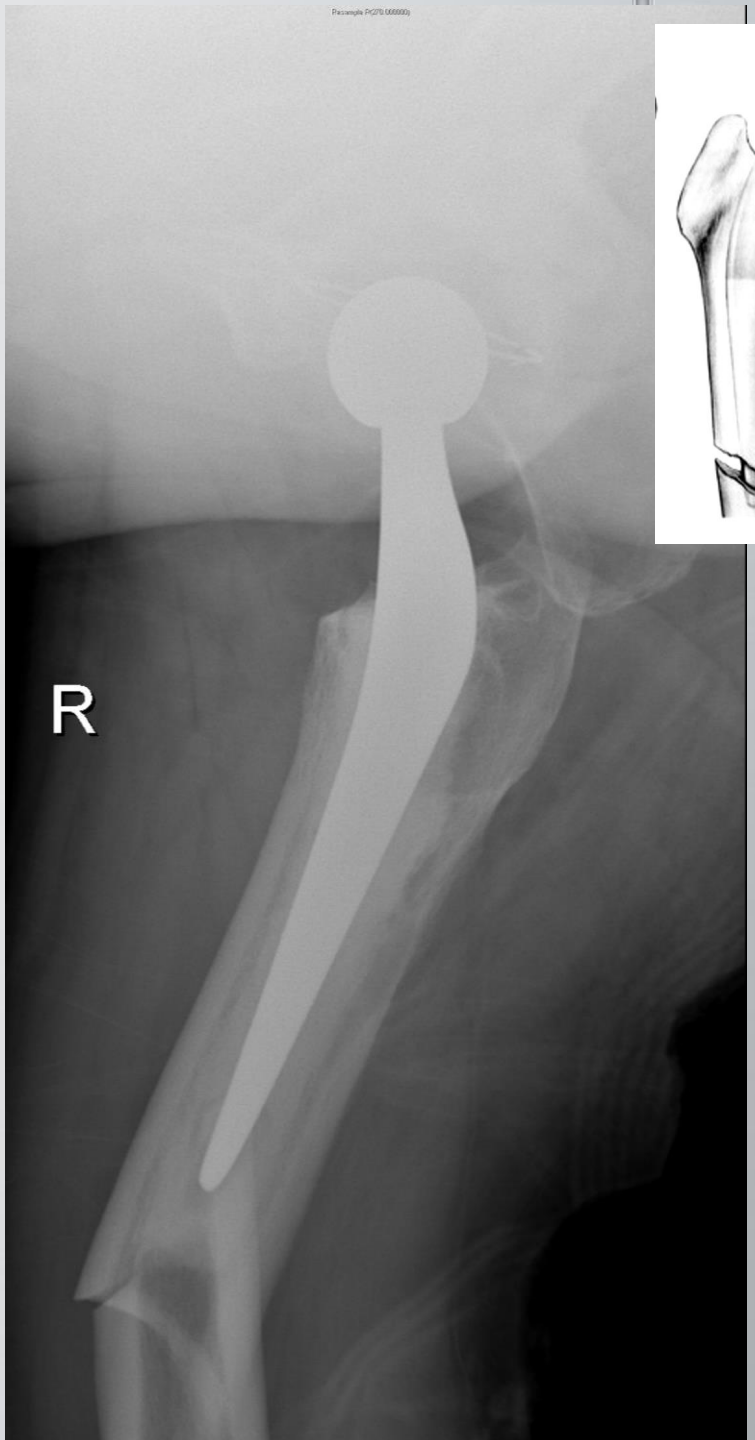
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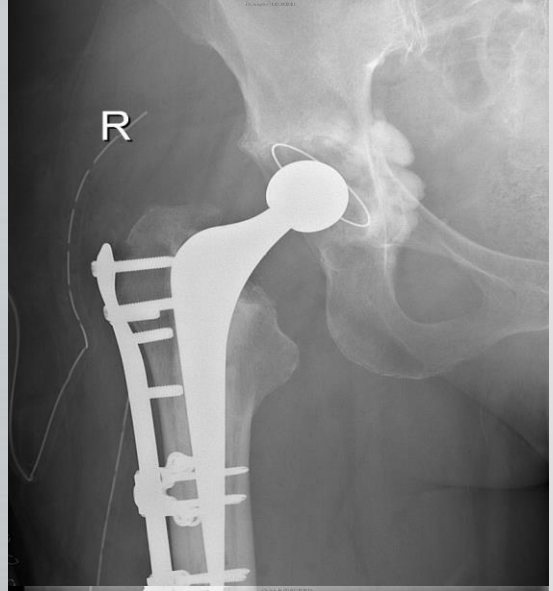
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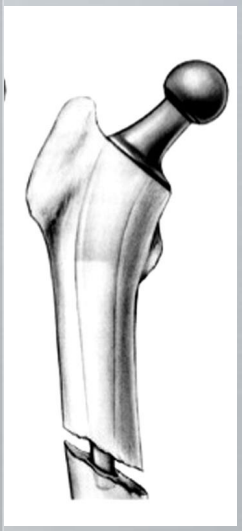

Locking attachment plate

- Multiple 3,5 mm screws instead of one 5,5 mm uni - cortical locking screw
- Alternative to cable
- Can be used limited open (no stripping of bone)
- No studies so far
- Weaken the bone by multiple drilling ?

Summary – Vancouver B1-C

- Anatomical reduction
  - Remove cement if necessary
- Inter fragmentary compression
  - Screw, cable, plate
- Overlap the stem and fix secure
  - Uni cortical, cable, LAP
- Use long plates maybe from hip to knee
- Open technique at fracture and minimally invasive distal
- Pitfall: Medial cortex, loose stem

Periprosthetic fracture around knee

Above knee
Femur

Below knee
Tibia

Patella

Classification - femur

- **Rorabeck and Taylor**
  - Type I: undisplaced fracture and prosthesis is well fixed
  - Usually conservative or minimally invasive

Classifica ur

- **Rorabeck an**
  - Type II: displa
    prosthesis is

Mal-union

- Often because of bad reduction
  - To short => valgus

Mal-union

- Often because of bad reduction
  - To short => valgus
  - Hyper extension => instability, serious walking impairment

Classification - femur

- **Rorabeck and Taylor**
  - Type III: prosthesis is loose, fracture may be displaced or undisplaced

Revision arthroplasty

- If possible
- Bring in the your arthroplasty surgeon colleague
  - Evaluation
  - Indication
  - Surgery

Distal femur replacement

Injury, Int. J. Care Injured 45 (2014) 550–553

Contents lists available at ScienceDirect

Injury

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

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Distal femoral replacement in periprosthetic fracture arou
knee arthroplasty

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Eur J Orthop Surg Traumatol
DOI 10.1007/s00590-017-2009-6

ORIGINAL ARTICLE • KNEE - ARTHROPLASTY

Revision knee arthroplasty using a distal femoral replacement prosthesis for periprosthetic fractures in elderly patients

Ehab Girgis[1] · Christoph McAllen[1] · Jonathan Keenan[1]

- Reasonable results – small series
- Complications
  - Infection
  - Aseptic loosening
  - Wound healing
  - Patellar tracking

Summary

- If fixed – use locking plate …… but
  - Some cases do better with revision
- If loose, then revision……but
  - Some cases can be fixed with locking plates
  - Be prepared for resection/allograft
    - Osteoporosis or bone loss
    - Low demanding elderly