Use of minifragment plates with IM nails

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Disclosures

- Smith and Nephew – speaker
- Stryker – consultant

Long bone fixation w/IMN

- Length
- Alignment
- Rotation

Articular segments

- Anatomic Reduction
- Joint compression

Treatment of Tibial Fractures
by Reaming and Intramedullary Nailing*

BY LAWRENCE B. BONE, M.D.†, AND KENNETH D. JOHNSON, M.D.†, DALLAS, TEXAS

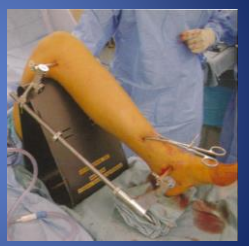
From the University of Texas Health Science Center at Dallas, Dallas

The Evolution of Indirect Reduction Techniques for the Treatment of Fractures

Michael Leunig, MD; Ralph Hertel, MD*; Klaus A. Siebenrock, MD*; Franz T. Ballmer, MD*; Jeffrey W. Mast, MD**; and Reinhold Ganz, MD**

Reduction

- Interposed tissue or bone
- Deforming forces
- Limitations of other means
  - Bumps
  - Percutaneous clamps
  - Ex-fix, distractor
  - Poller/blocking/cortical replacement screws
- Available hands



Minifragment Plates and Nails

1. Reduce and hold extra-articular reduction

2. Fixation of articular fracture prior to nail insertion

Plates and Nails

- "Never open a closed fracture"
  - Preserve biology
  - No evidence of increased infection
- "Confusing the fracture"
  - Preserve biology
  - Improves or holds reduction
  - Does not change relative stability of IM nail

Plates and Nails

- Minifragment plates
  - 2.0mm, 2.4mm and 2.7mm implants
  - Reconstruction and standard style
  - Non-locking
  - Variety of manufacturers
- Intramedullary Nails
  - Any
  - Know proximal/distal interlocking options

Technique

- Minimize soft tissue trauma
  - Utilize open wound
  - Judicious in closed injuries
- Sharp drill bits, bulb irrigation
- Unicortical or bicortical
- Stay or go?
  - Open fx → remove
  - Closed fx → surgeon discretion

Tibia Fractures

- Proximal Tibia
  - Valgus
  - Procurvatum
- Distal Tibia
  - Valgus
  - Simple/Focal articular injury
- Open Fractures
- Segmental Fractures
- Some articular fractures

Predictors of Reoperation Following Operative Management of Fractures of the Tibial Shaft

*†Mohit Bhandari, ‡Paul Tornetta, III, *Sheila Sprague, ‡Soheil Najibi, †Brad Petrisor, *Lauren Griffith, and *Gordon H. Guyatt

J Orthop Trauma, Vol. 17, No. 5, 2003

Predictors for Re-operation

- Cortical contact
- Transverse fracture
- Open Fracture

Provisional Plating of Type III Open Tibia Fractures Prior to Intramedullary Nailing

Robert P. Dunbar, MD, Sean E. Nork, MD,* David P. Barei, MD,* and William J. Mills, MD**

J Orthop Trauma • Volume 19, Number 6, July 2005

- 32 Type III open tibia fx
- 3.5mm DCP or LC-DCP
- Application through open wound
- Biologically friendly
- All plates removed
- Alignment anatomic (< 3°) in all cases
- 9 complications (nonunion, infection, etc.)

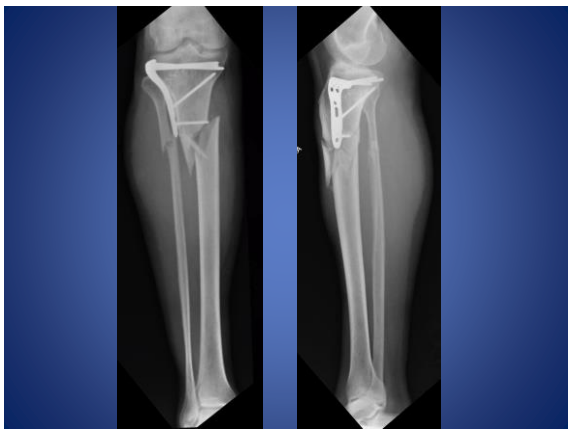
Open Reduction and Intramedullary Nail Fixation of Closed Tibial Fractures

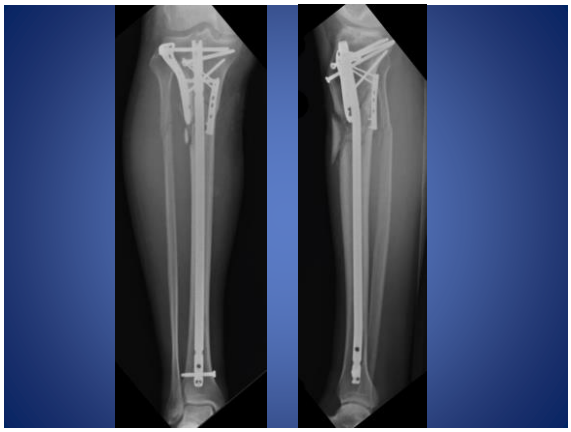
JULIUS A. BISHOP, MD; GREGORY D. DIKOS, MD; DAYNE MICKELSON, MD; DAVID P. BAREI, MD

ORTHOPEDICSNOVEMBER 2012 | Volume 35 • Number 11

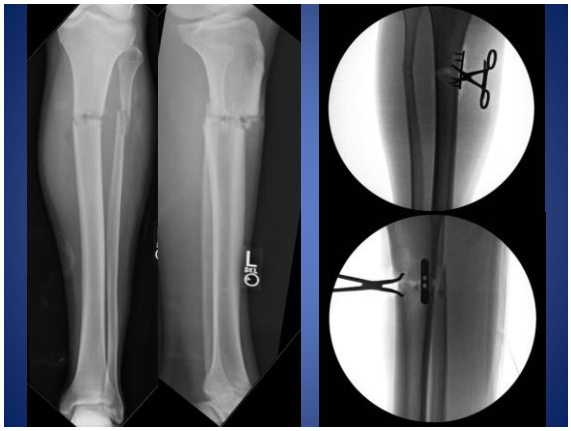
- 32 patients with closed displaced tibia fx.
  - 11 formal open reduction + IMN
  - 21 closed reduction + IMN
- No infections in open reduction group
- No malunions (> 5°)
- No nonunions

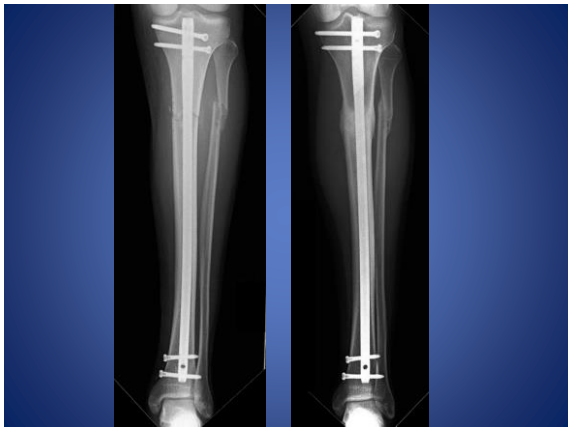
Interposed Tissue



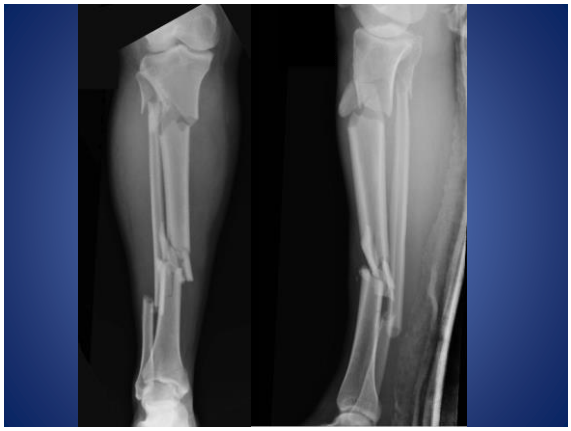


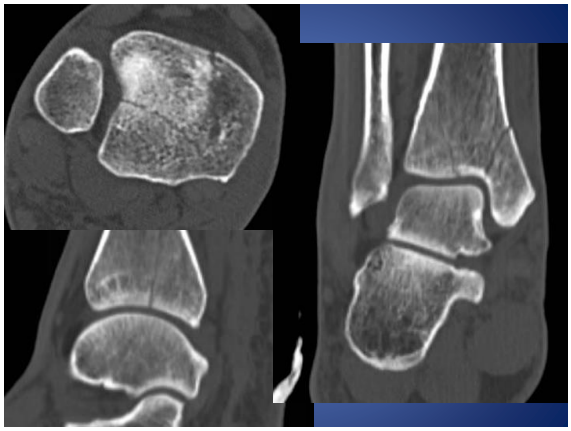
Open fracture/Helping Hands

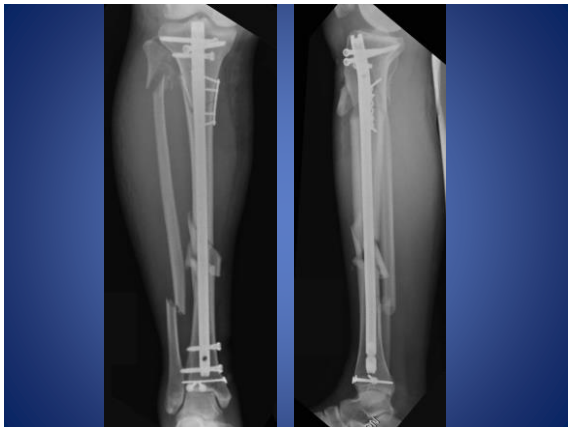




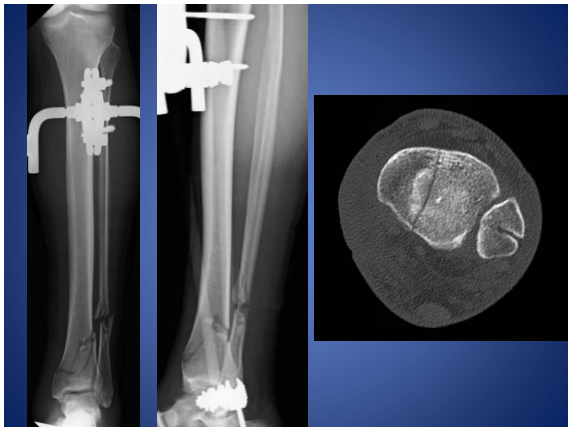
Segmental Injuries

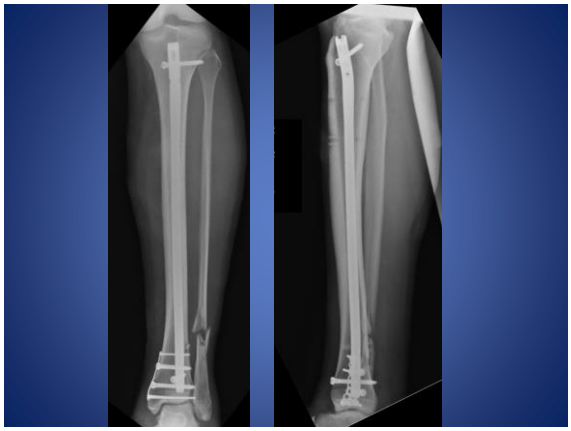


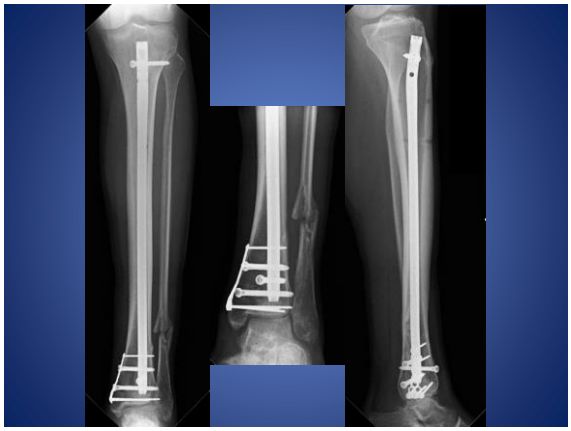


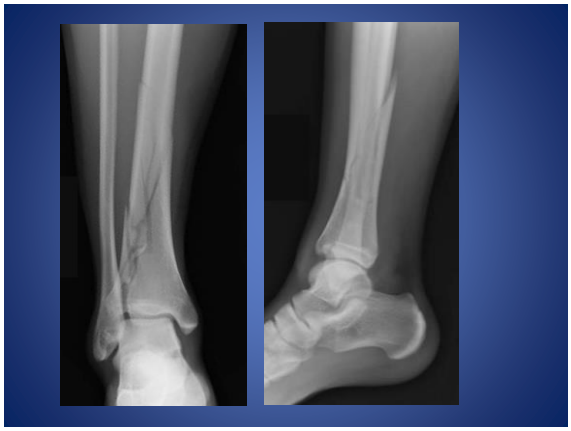


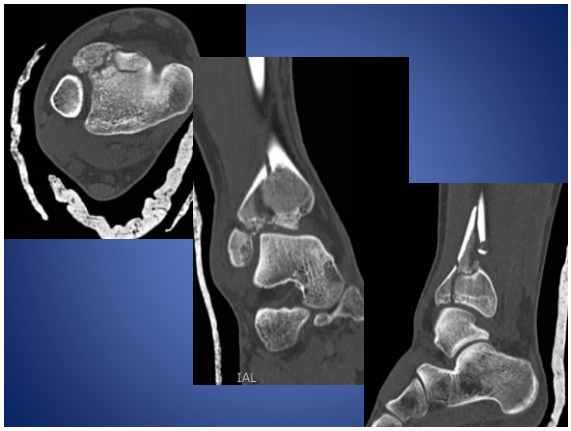
Articular Injuries







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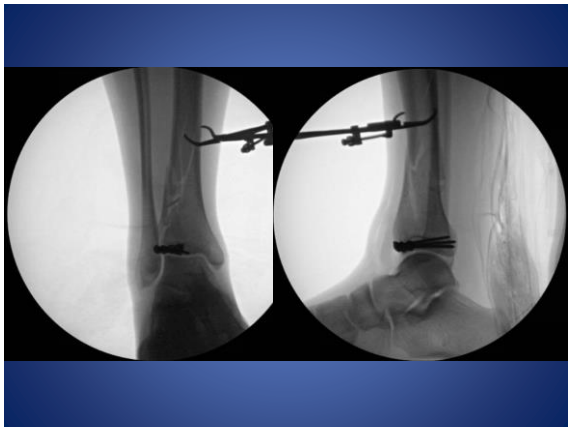

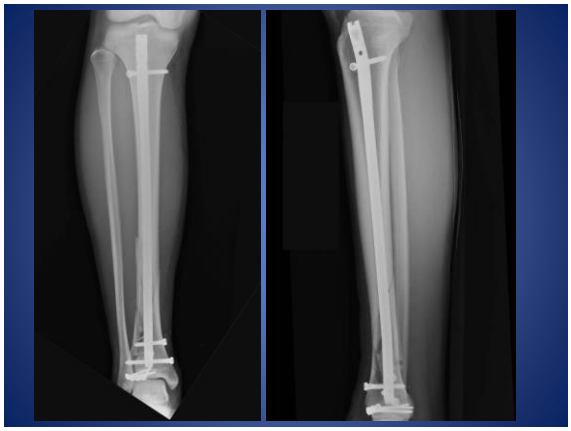

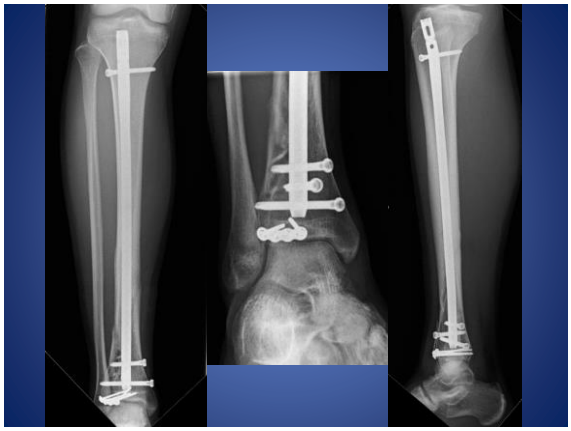

Femur Fractures

- Subtrochanteric Fractures
- Segmental Fractures
- Unacceptable alignment

Open reduction – femur fractures

Clamp-Assisted Reduction of High Subtrochanteric Fractures of the Femur

Alan Afsari, Frank Liporace, Eric Lindvall, Anthony Infante, Jr., Henry C. Sagi and George J. Haidukewych

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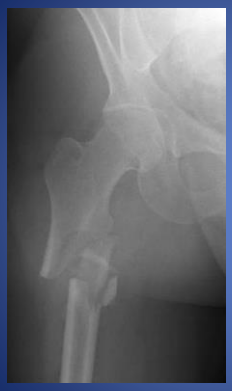
VOLUME 91-A · NUMBER 8 · AUGUST 2009

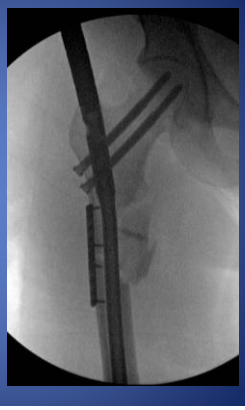
Open reduction and intramedullary stabilisation of subtrochanteric femur fractures: A retrospective study of 56 cases

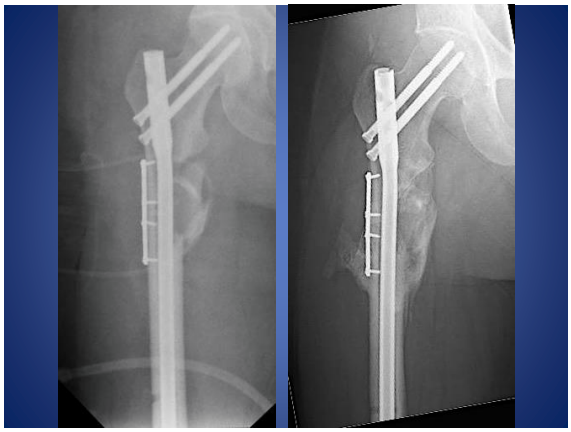
Daphne M. Beingessner [a,*], John A. Scolaro [a], Robert J. Orec [b], Sean E. Nork [a], David P. Barei [a]

Injury, Int. J. Care Injured 44 (2013) 1910–1915

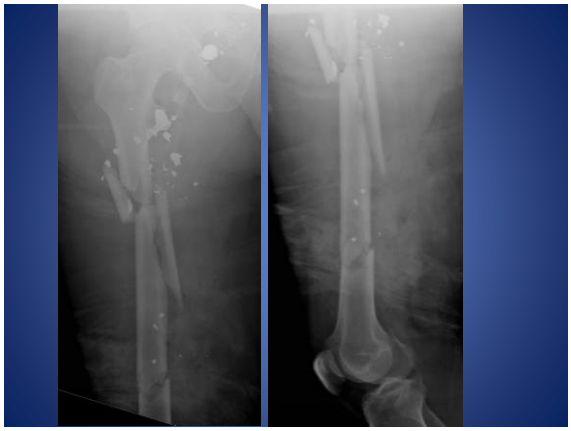
Subtrochanteric Fracture

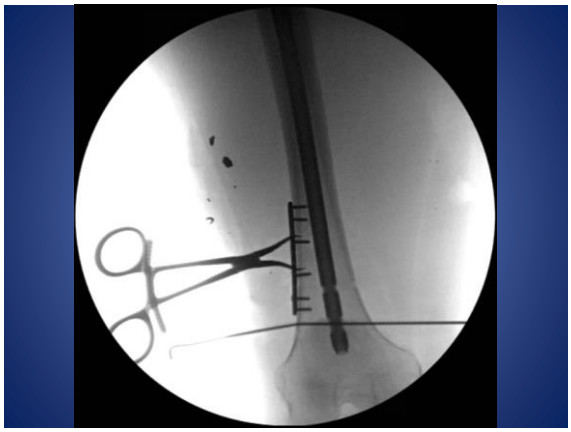


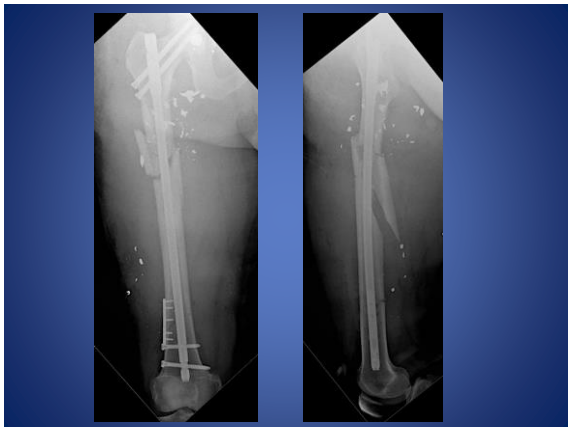




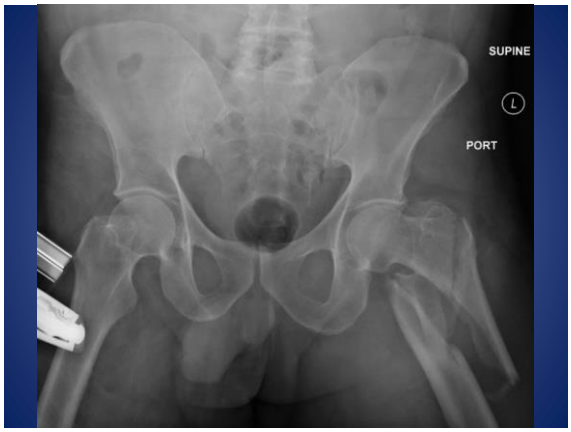
Segmental Injuries







Unacceptable
Alignment/Reduction Aid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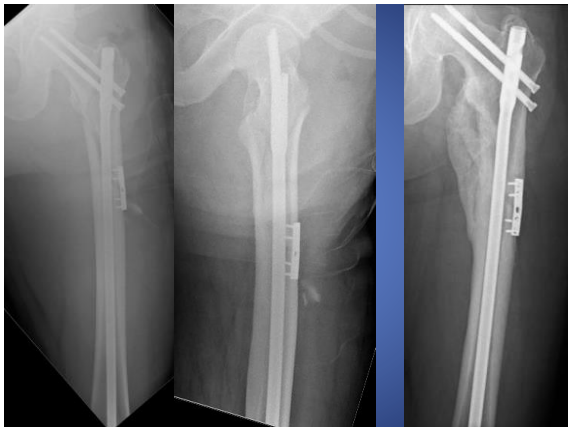

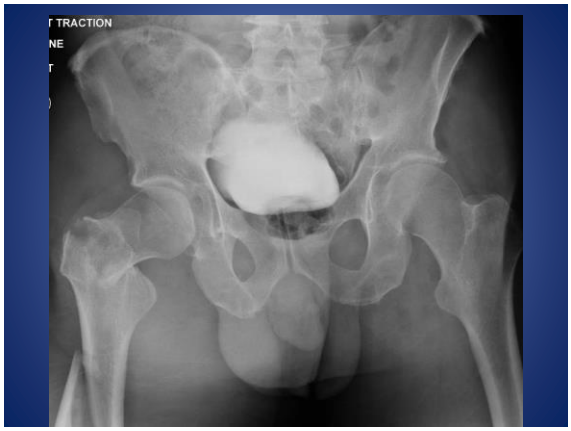
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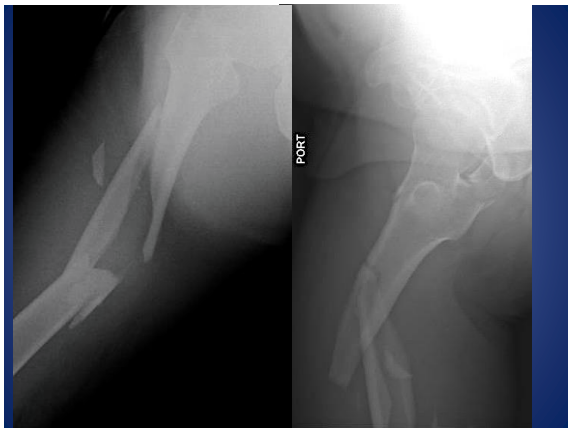
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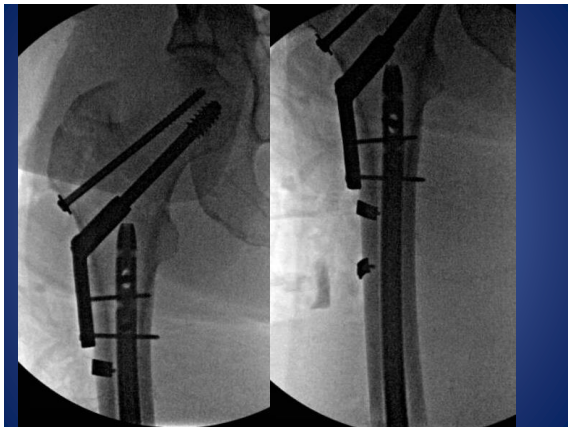

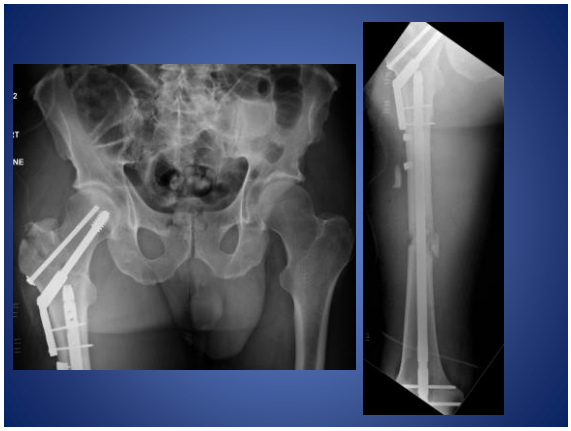

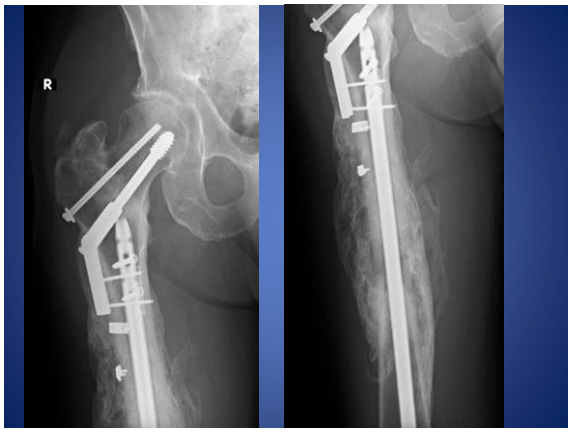

Conclusion

- Minifragment plates can be used with IMN when
  - reduction techniques ineffective
  - Articular fixation w/IMN
- Respect osseous and soft tissue biology
- Plate kept or removed based on function and injury

Thank you