



University of California
San Francisco



Complex Humeral Shaft Fractures: Is Nailing Out of Favor?

SF Trauma Course 2023

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Disclosures

I have no financial disclosures or conflicts of interest

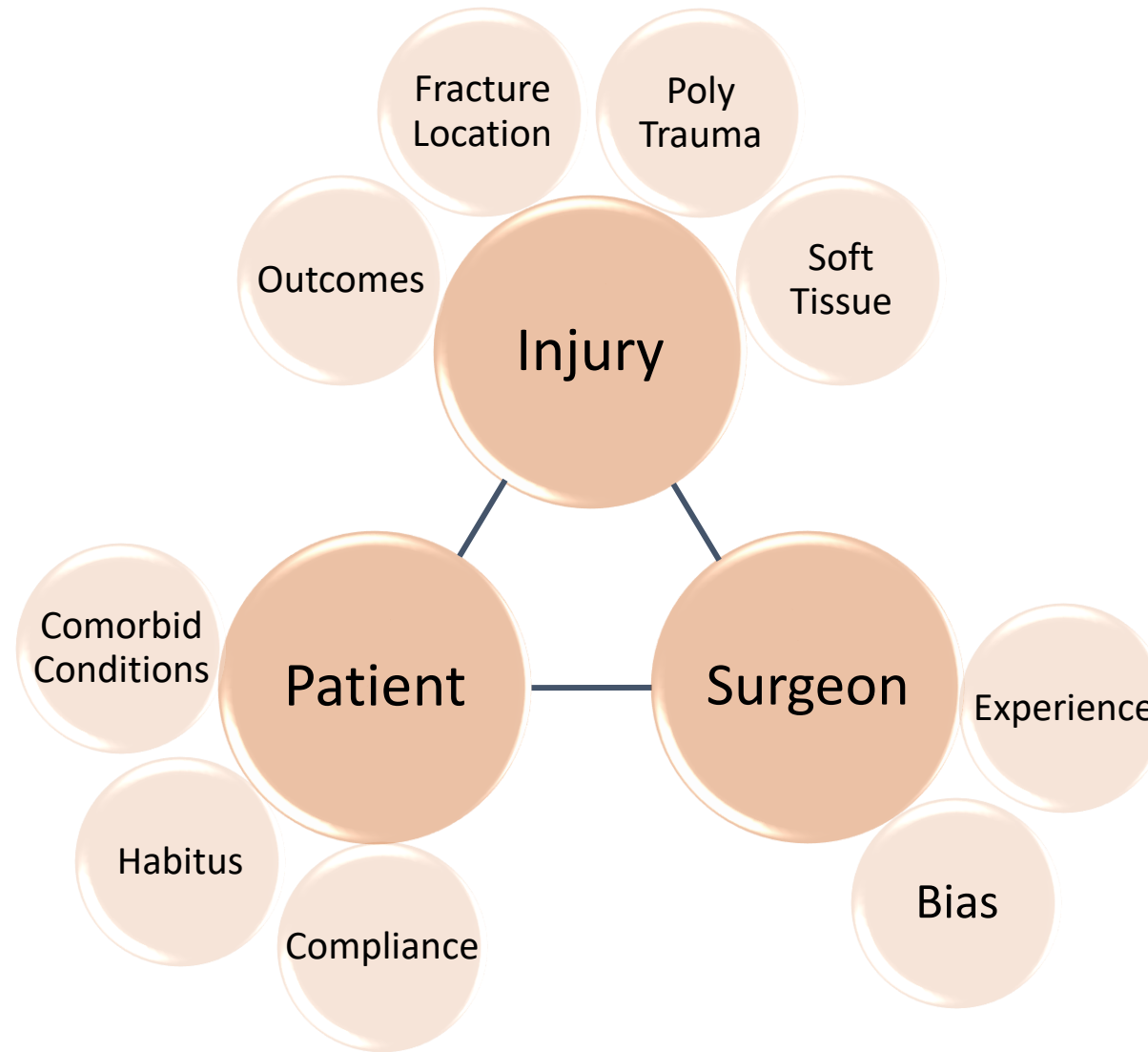
Which Treatment Type?



It Depends...

- Injury
- Patient
- Surgeon

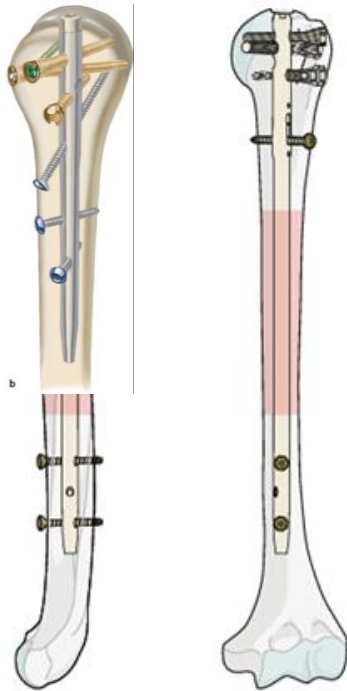
It Depends...



Injury: Location Location Location

IMN

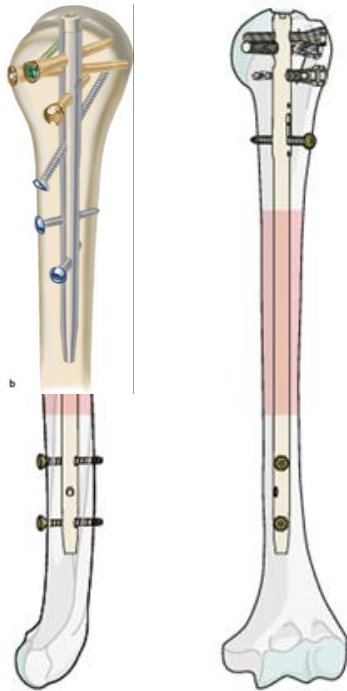
Limited to proximal
2/3rds of humerus



Injury: Location Location Location

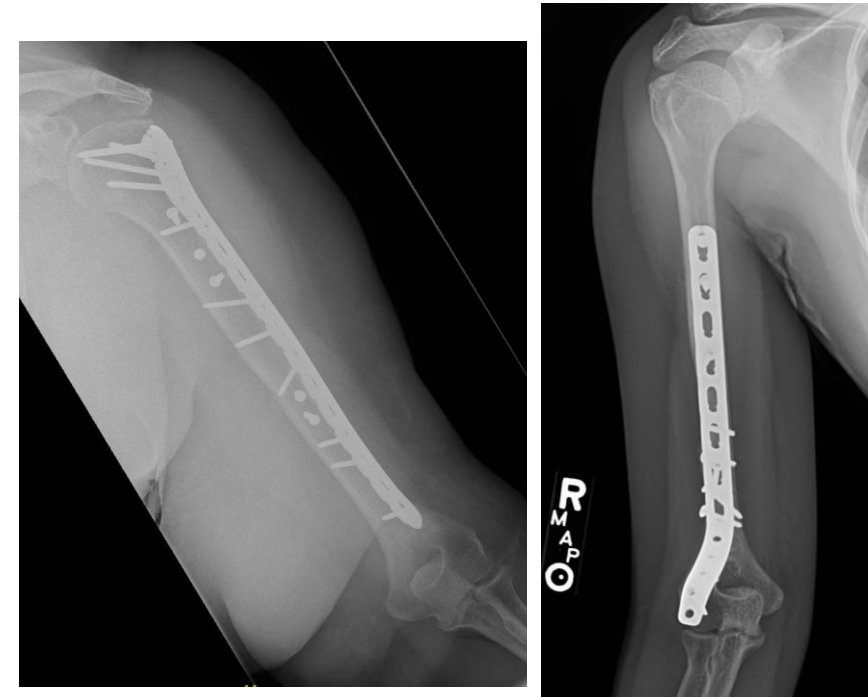
IMN

Limited to proximal
2/3rds of humerus



ORIF

Access all parts of
humerus



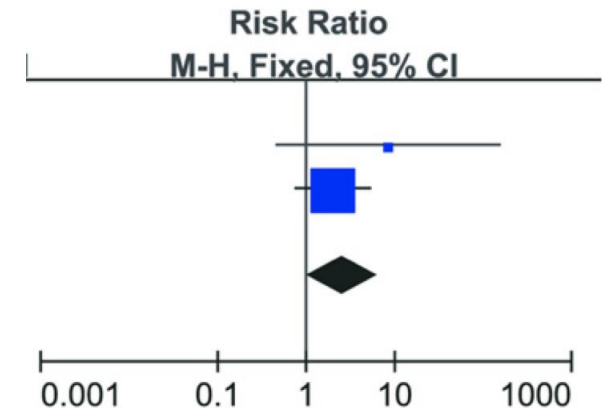
IMN vs ORIF

Plate versus intramedullary nail fixation in the treatment of humeral shaft fractures: an updated meta-analysis

Hanbin Ouyang, MD, Jun Xiong, MD, Peng Xiang, MD, Zhuang Cui, PhD, Liguang Chen, MD, Bin Yu, PhD*

Department of Orthopaedics and Traumatology, Nanfang Hospital, Southern Medical University, Guangzhou, China

Delayed Union



IMN

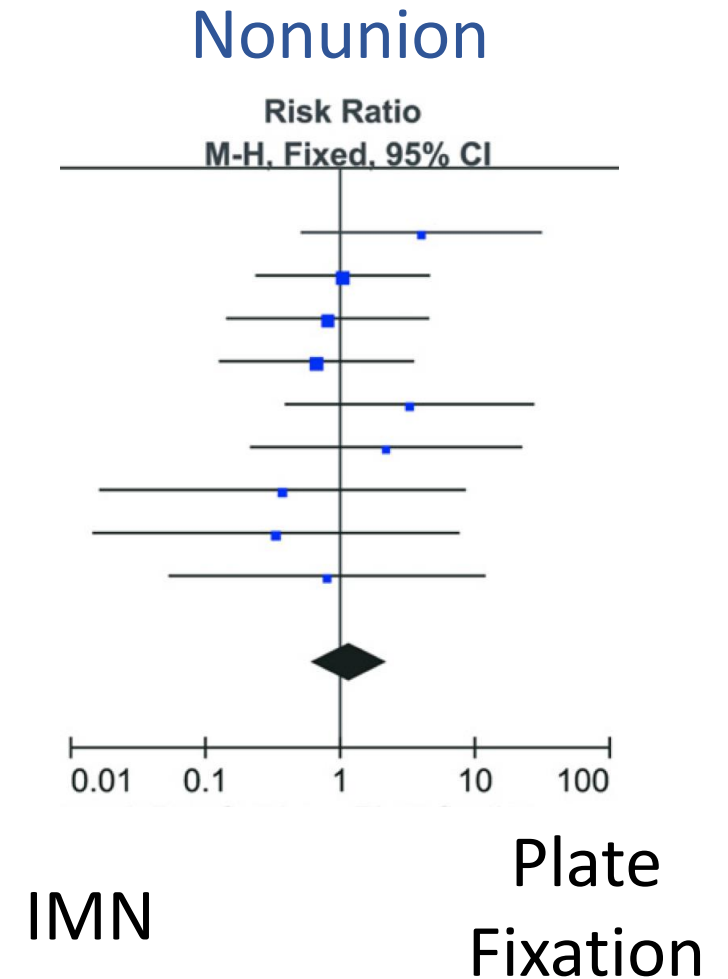
Plate
Fixation

IMN vs ORIF

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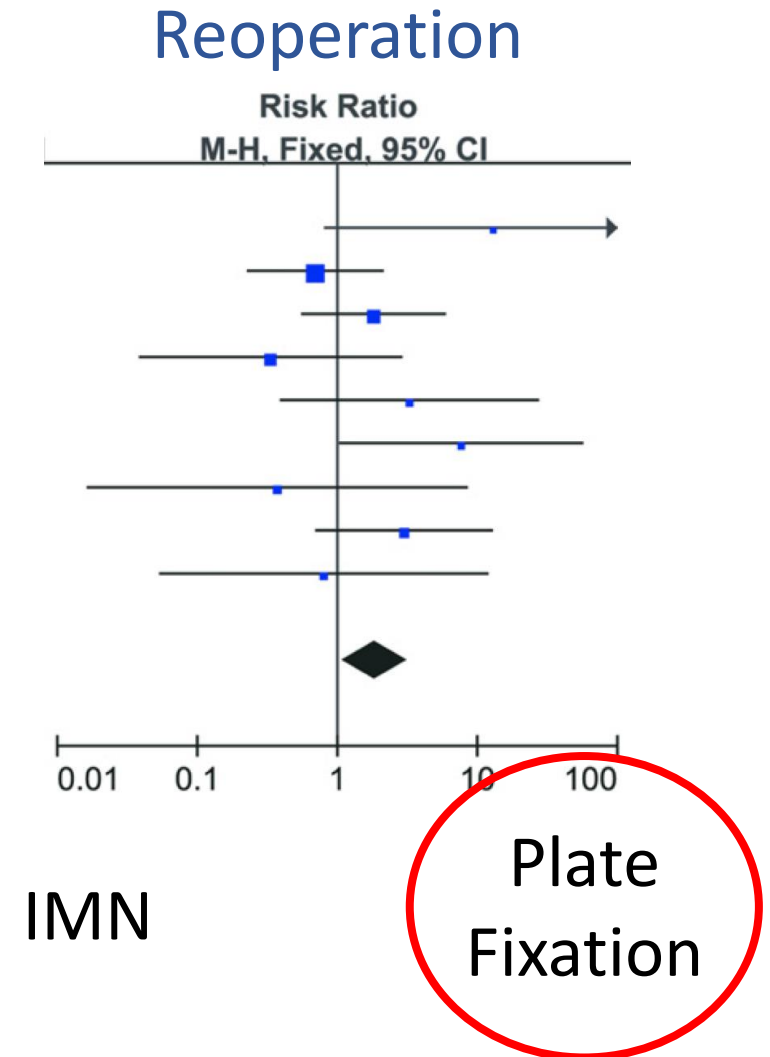


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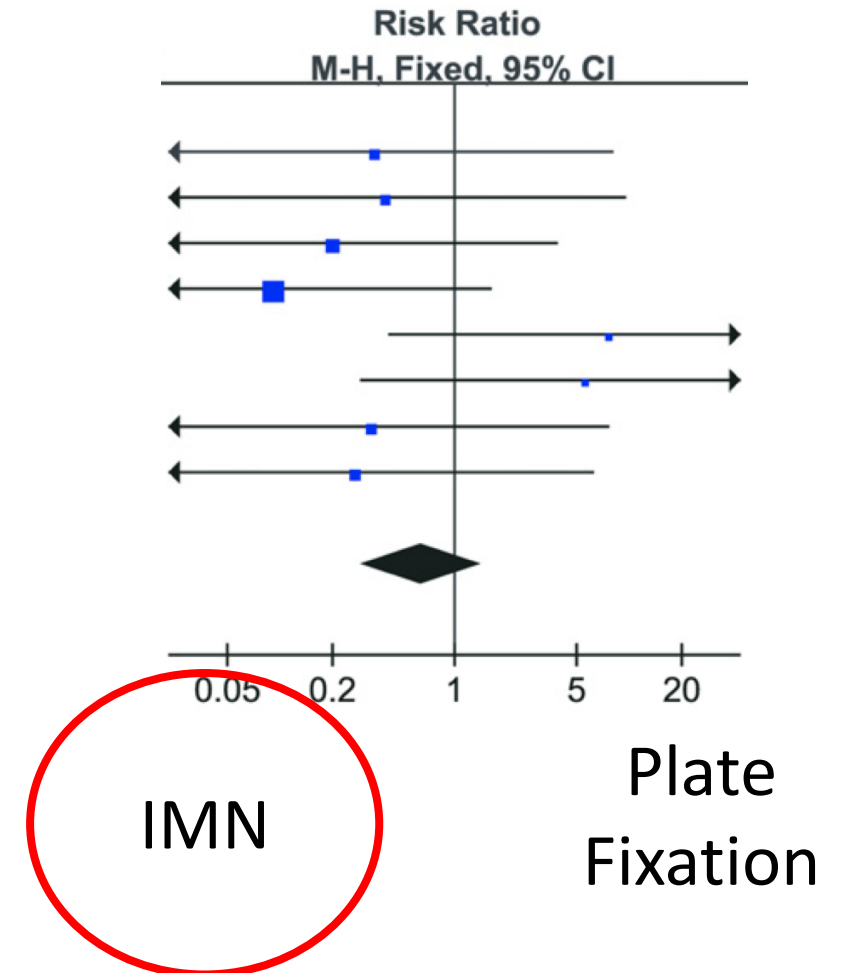
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Key Findings:

- IMN has increased risk of delayed union, reoperation
- Plate fixation has higher risk of infection, radial nerve palsy

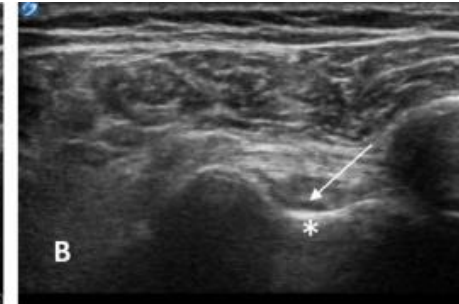
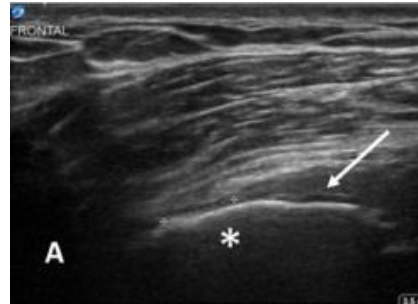
Radial Nerve Palsy



IMN Complications

Shoulder Pain

- Rotator Cuff Injury, LHB
- Impingement
- Protrusion
- Adhesive Capsulitis



Nonunion

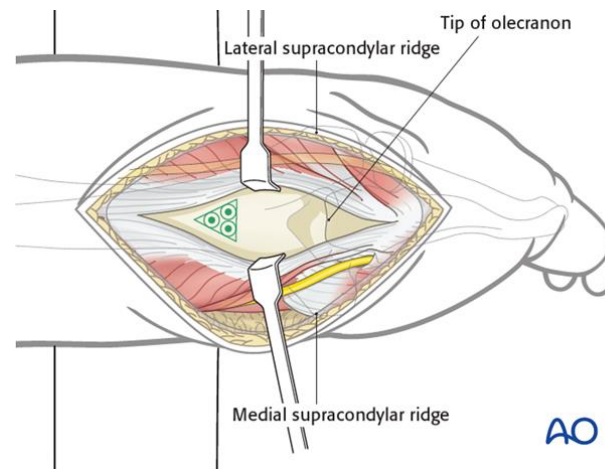
IMN Complications

Supracondylar Fracture



Elbow Pain

- Triceps Weakness
- Elbow Pain, Limited ROM
- Adhesions



IMN Complications

INVITED REVIEW PAPER

Complications of Intramedullary Nailing for Fractures of the Humeral Shaft: A Review

Farragos, Anthony F.^{*}; Schemitsch, Emil H.^{*†}; McKee, Michael D.^{*†}

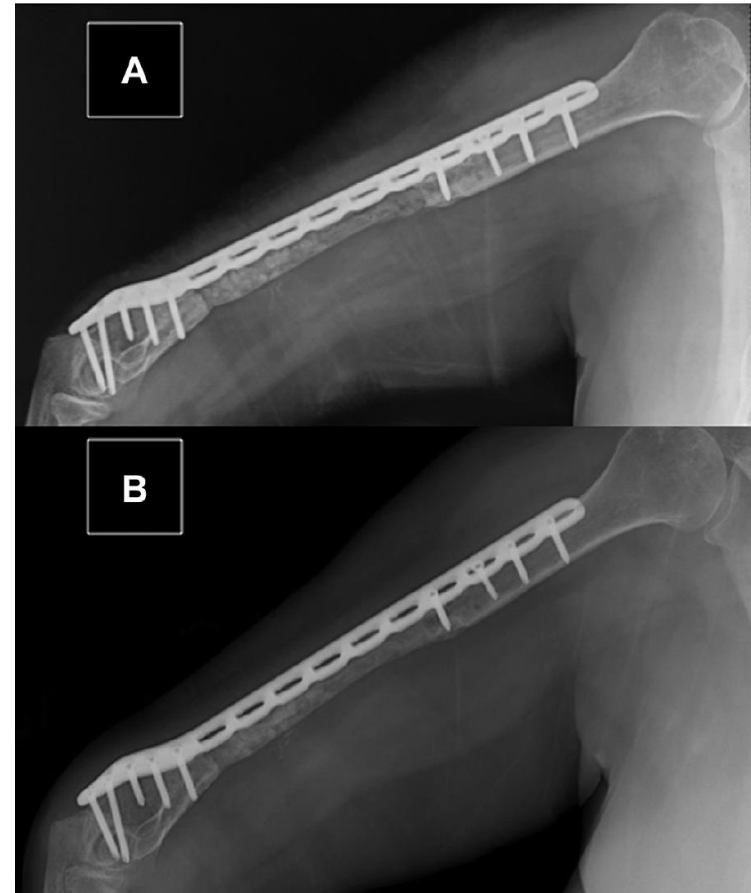
[Author Information](#) 

Journal of Orthopaedic Trauma 13(4):p 258-267, May 1999.

“It is unclear at present whether the trend toward retrograde insertion will restore the interlocking nail to its previous popular status or confirm it as a device that is simply not suited for the humerus”

Fracture Sequelae

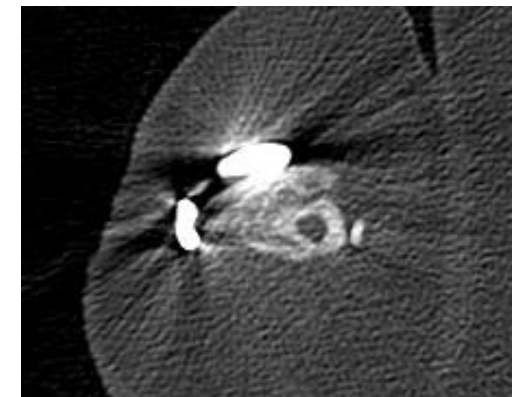
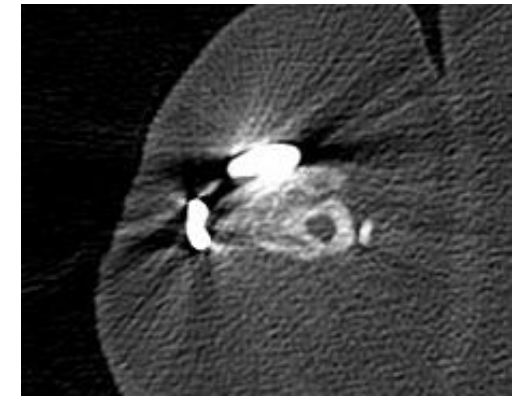
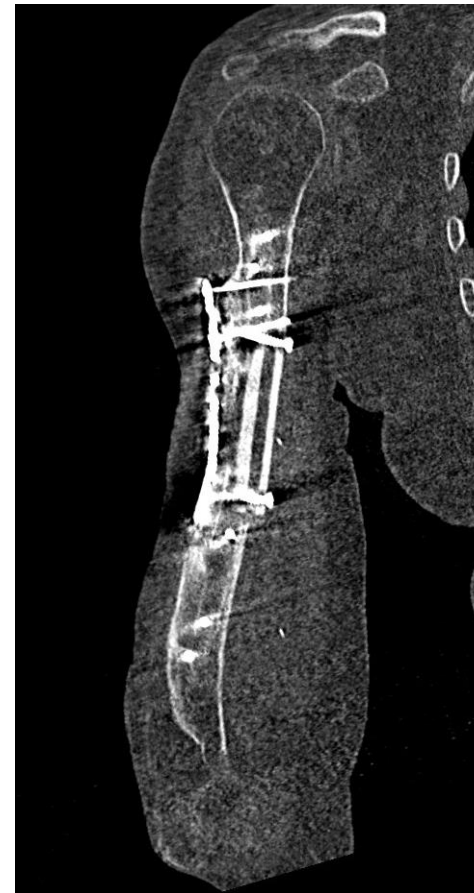
Bone Loss: Masquelet technique over IMN or ORIF



Fracture Sequelae

Bone Loss: Vascularized Fibula with ORIF

2 mos post-op



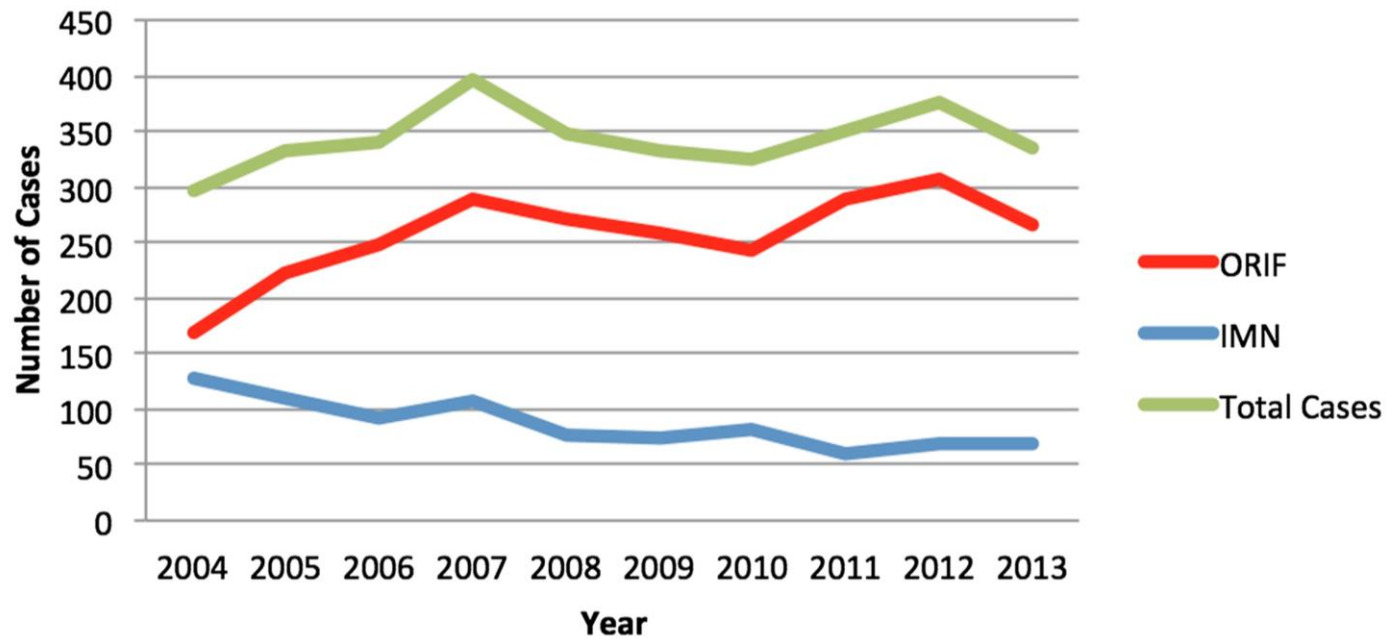
Surgeon Bias

Humeral Shaft Fracture Fixation

Incidence Rates and Complications as Reported by American Board of Orthopaedic Surgery Part II Candidates

Michael B. Gottschalk, MD, William Carpenter, MD, Elise Hiza, MD, William Reisman, MD, and James Roberson, MD

Investigation performed at the Department of Orthopaedics, Emory School of Medicine, Atlanta, Georgia



Key Findings

- Shift away from IMN in favor of ORIF

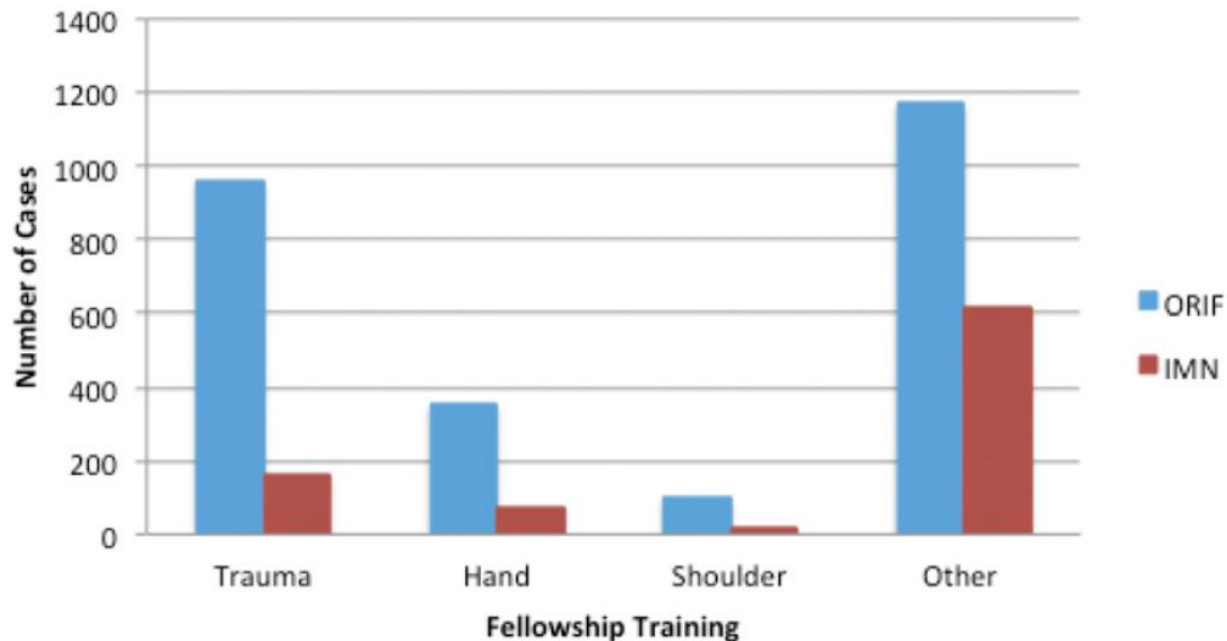
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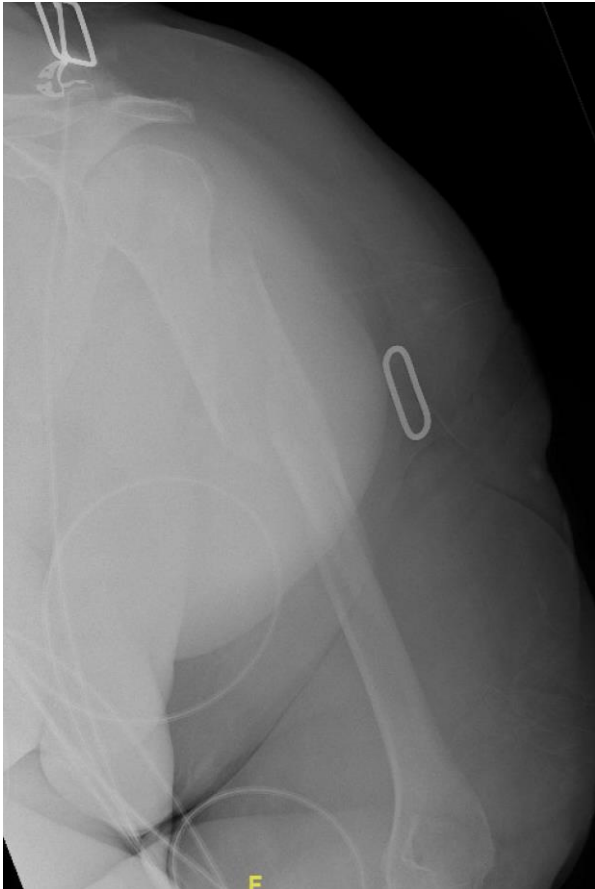


Key Findings

- Shift away from IMN in favor of ORIF
- Treatment Type influenced by fellowship training

Surgeon Bias

66 yo RHD obese F sustained GLF onto L arm. Radial nerve intact.



Summary

General shift away from IMN, in favor of ORIF

- Complications, persistent pain and limitations associated with IMN
- Training bias

There may still be a role for nailing in complex humeral shaft fracture

- Proximal and middle thirds
- Masquelet for bone loss or infection
- Must balance the risks of IMN

Thank You

