Trauma 101: Nailing Proximal Humerus Fractures

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Disclosures

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Proximal Humerus Fractures: Treatment Options
Proximal Humerus Fractures: Treatment Options

Or non-op....

Proximal Humerus Fractures: Epidemiology

- Bimodal distribution
  - 20% young patients, higher energy
  - 80% elderly, low energy falls

- High incidence in osteoporosis

- Many elderly treated non-operatively

Imaging

- X-rays
  - AP Shoulder
  - Lateral ("Y") view
  - Axillary view (care taken to forward flex!)
Imaging

- **CT scan**
  - Comminution, articular extension
  - Glenoid fractures
  - Hill-Sachs lesions

- **MRI**
  - Rotator cuff
  - Capsule
  - Labrum

Associated Injuries

- **Rotator Cuff Tears**
  - Not common
  - Usually premorbid

- **Nerve Injuries**
  - 30-50% axillary nerve injury
    - Primarily in displaced fractures
  - 5-7% brachial plexus injury, primarily with 4-part frxs

- **Vascular Injuries**
  - Rare, but need to watch out for!!

Treatment Options

- **Conservative Management**
  - 50-80% of proximal humeral fractures are non-displaced
  - Closed “reduction”? 
  - Sling, cuff/collar, hanging arm cast
Treatment Options

• Percutaneous Pinning
  – Pin infection, migration ...
• ORIF Plating
  – AVN, malunion, hardware failure, etc.
• IM Nailing
  – Standard locked nail
  – Proximal humeral nail
• Arthroplasty
  – Usually reserved for displaced 4-part fractures

Proximal Humeral Nailing

• Advantages of intramedullary devices
  – Less invasive compared to ORIF
  • Indirect reduction
  • Less soft-tissue stripping
  • Less blood loss?

• Advantages of intramedullary devices
  – Biomechanical advantage over plating with decreased moment arm
  – Similar to proximal femur
Proximal Humeral Nailing

- Complications with traditional IM devices
  - Loss of fixation
  - Failure of fixation
  - Lack of adequate locking options to accommodate different fracture patterns
  - No locking technology to compete with locking plates

Newer Designs

- Concept
  - Stable internal fixation
  - Early PROM in rehab
  - Minimal fracture exposure and indirect reduction
  - Proximal crosslocks thread into the nail
  - Orientation of proximal crosslocks → multi-plane fixation

Locking Proximal Humeral Nails
Nailing Technique

- Fluoroscopy position vital
- Incision based on anterolateral corner of acromion
- "Open RCR"

Patient Positioning

X-ray Set-up
Nailing Technique

- Use joysticks/spikes indirectly reduce fracture

- Consider articular starting point
  - Moves nail entry away from rotator cuff insertion
  - Side-to-side simple repair
Locking Proximal Humeral Nail

Reduction Maneuvers

Initial AP

Initial Scap Y

Reduction Maneuvers

Traction

Schanz Pin

Ball Spike
Case: 20F fell snowboarding

• Isolated injury
• Closed
• NVI
• Treatment?

X-rays

CT Scan
Treatment options

- Non-op
- K-wires
- Plate
- Nail

Control Proximal Segment
3 Months

62F s/p fall

62F s/p fall

- Options:
  - Non-op
  - ORIF plate
  - Nail
  - Arthroplasty
Data: Proximal Humeral Nailing

  - Prospective, randomized study, 51 pts
  - No difference in healing
  - Complications: Plate 31% > Nail 4%
  - Supraspinatus strength
    - 1 yr Plate > Nail
    - 3 yrs Plate = Nail
Outcomes of intramedullary nailing for acute proximal humerus fractures: a systematic review.

- Results satisfactory overall
- High complications

Looking intramedullary nails compared with locking plates for two- and three-part proximal humeral surgical neck fractures: a randomized controlled trial.

- Similar clinical and radiographic results
- Higher complications in nail group

Maybe nail shape?

Proximal humerus nailing: a randomized clinical trial between curvilinear and straight nails:

- Newer straight nails: fewer complications c/w curvilinear design

Take Home Points

- Most proximal humerus = non-op
- Nailing is good alternative to plating
- Less invasive, possibly more stable
Summary

• Avoid a nihilistic attitude
• Your treatment can make a difference in your patient’s outcome and their life

Thank You!