Proximal Humerus Fractures: Patient Management Protocol

Proximal humerus fractures are a common injury, particularly among adults over 65, accounting for approximately 5% of all fractures. Our primary goal is to restore optimal shoulder function and minimize patient pain.

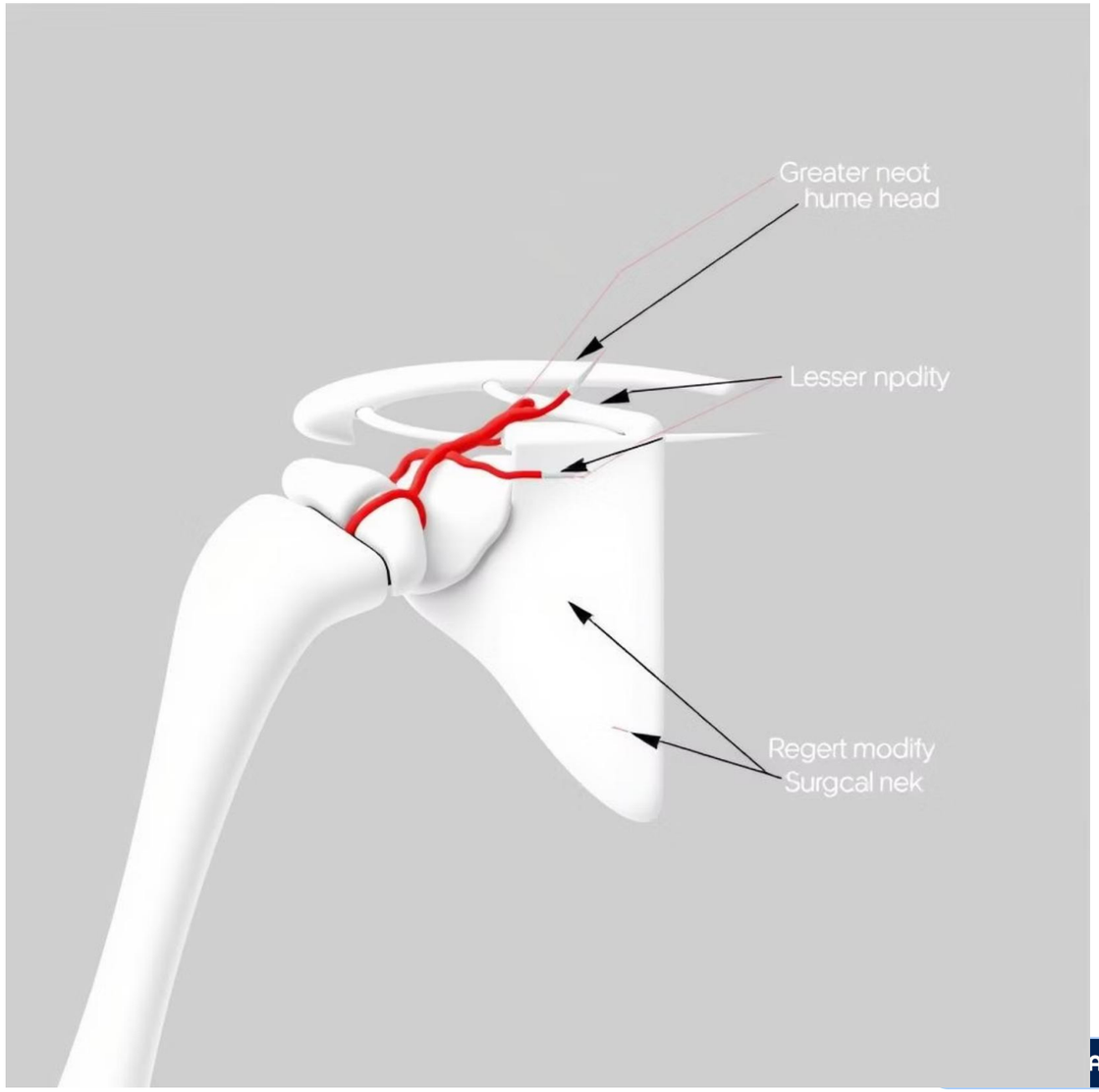
Epidemiology and Relevant Anatomy

Incidence & Mechanism

- 75% occur in patients >60 years old, with a 2:1 female predominance.
- Low-energy falls cause fractures in osteoporotic elderly.
- High-energy trauma leads to fractures in young adults.

Anatomy & Vascularity

- Four main segments: head, greater tuberosity, lesser tuberosity, surgical neck.
- Compromised blood supply from circumflex humeral arteries can lead to avascular necrosis (AVN).



Classification Systems

The **Neer Classification** is the most widely used system, categorizing fractures based on the number of displaced "parts" (displacement >1cm or angulation >45°). Fracture patterns dictate treatment decisions and prognosis.

1

2-Part Fractures

- Surgical neck (most common)
- Greater tuberosity
- Lesser tuberosity

2

3-Part Fractures

Surgical neck + one tuberosity

3

4-Part Fractures

Surgical neck + both tuberosities + articular head displacement

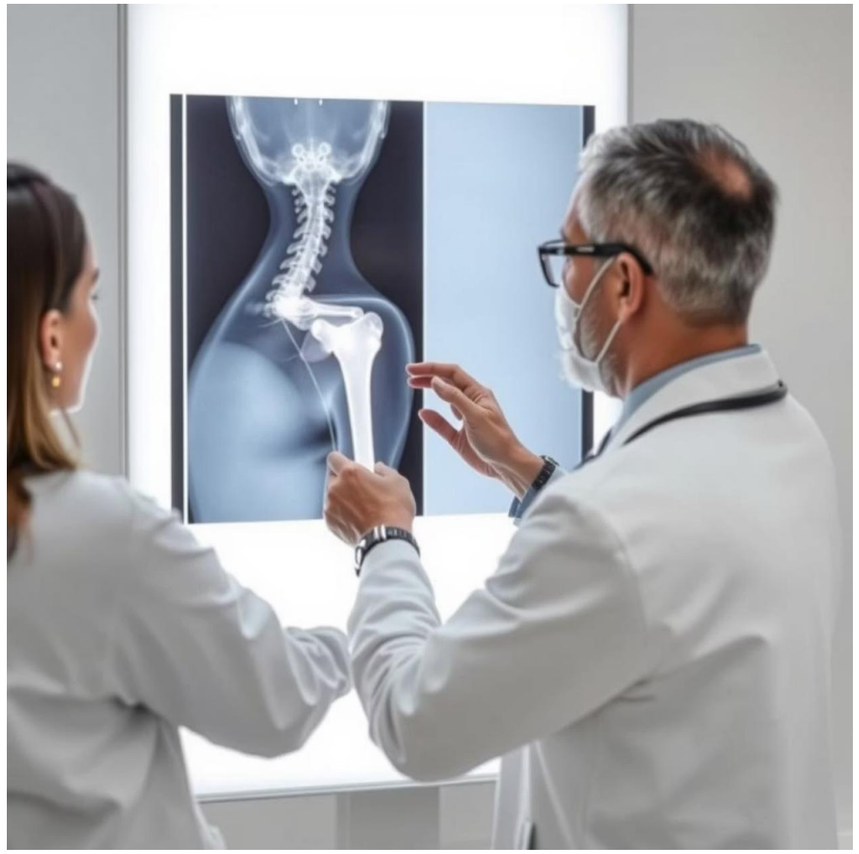
Diagnosis and Initial Management

Clinical Presentation: Pain, swelling, ecchymosis, decreased range of motion.

Imaging: AP, true scapular Y, and axillary lateral X-rays are essential for diagnosis.

CT Scan: Recommended for complex, displaced, or intra-articular fractures to aid surgical planning.

Initial Steps: Sling immobilization, effective pain management, and thorough neurovascular assessment (axillary nerve injury occurs in ~10% of cases).



Non-Operative Management Protocol

Indications

Minimally displaced (<1cm) or minimally angulated (<45°) fractures, which account for 80-85% of cases.

Protocol: Arm sling for 3-6 weeks, followed by early gentle range of motion (pendulum exercises).

Focus: Pain control and gradual return to function, often superior to surgery for stable fractures.

Outcomes: Acceptable functional results in 70-90% of appropriately selected cases.

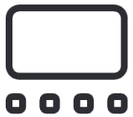
Operative Management Indications and Techniques

Indications

Displaced 2, 3, or 4-part fractures, younger active patients, or concomitant neurovascular injury.

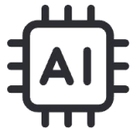
ORIF

Open Reduction Internal Fixation: Locking plate and screw systems are common for reconstructable fractures.



IM Nailing

Intramedullary Nailing: An alternative for some surgical neck fractures.



Arthroplasty

Hemiarthroplasty/Reverse Total Shoulder Arthroplasty: For highly comminuted 4-part fractures, AVN, or in elderly with poor bone quality.

Post-Treatment Rehabilitation Protocol

Full recovery from a proximal humerus fracture can take 6-12 months, with a strong focus on restoring mobility and strength through a structured rehabilitation protocol.

Phase 1 (0-6 weeks)

Immobilization (sling), pain/edema control, and gentle pendulum exercises.

Phase 2 (6-12 weeks)

Gradual increase in passive and active-assisted range of motion (PROM/AAROM).

Phase 3 (12-24 weeks)

Progressive active range of motion (AROM) and light strengthening exercises.

Phase 4 (24+ weeks)

Advanced strengthening, functional activities, and return to sport/work.

Conclusion and Key Takeaways

- Management of proximal humerus fractures is highly individualized.
- Decision-making balances fracture pattern, patient age, bone quality, and functional demands.
- Non-operative treatment remains the gold standard for most minimally displaced fractures.
- Rehabilitation is critical for optimal functional outcomes, regardless of treatment type.