SCAPULAR FRACTURES

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Aims

- Anatomy
- Incidence/Importance
- Mechanism
- Classification
- Principles of treatment
- Specific variations
- Conclusion

Anatomy



Anatomy that protects.....

- Thickened edges
- Its great mobility with recoil
- Its position between layers of muscle

Incidence and etiology

- Scapula fractures
 - -0.4% 1% of all fractures,
 - -3 5% of all shoulder girdle injuries.
- Due to high energy trauma.
- Causes:
 - R.T.A. 60%
 - Fall from height 20%
 - Others 20% eg. avulsion



Associated Injuries: 35-98 %

- Clavicle fractures 15 40%
- Rib fractures 25 50%
- Pulmonary injuries 15 55%
- Humeral fractures 12%
- Brachial Plexus 5-10%
- Skull fractures 25%
- Lower Limb fractures 11%
- Major Vascular injury 11%
- Splenic lacerations 8%

Associated Injuries

- The presence of fracture or soft-tissue injury about the thorax should lead one to search for a scapular fracture.
- Harris and Harris
 - study of chest radiographs from 100 patients with scapula fracture
 - in only 57% was a fracture appreciated on the initial chest film.
 - in only 2 of 100 radiographs was a scapula fracture the only skeletal injury seen in the thorax.

Classification

Anatomical OR

- Extra articular
- Intra articular

Extra articular fractures

- Most can be managed non-operatively.
- Indications for surgery:
- 1. Depressed acromion fractures that encroach on the subacromial space and interfere with rotator cuff function
- Scapular neck # with severe angulations > 40° or displaced greater than 1 cm
- 3. Extra-articular # of scapular neck plus coracoid, acromion or clavicle #.

Depressed acromion fracture impingement



Goss concept - SSSC (Superior shoulder suspensory complex)



Scapular neck fractures

• Hardegger et al. (1984) - the amount of displacement and stability depends on the presence of an associated fracture of the clavicle or a coracoclavicular ligament tear. The altered glenohumeral-acromial relationship results in "functional imbalance" of the Superior Suspensory Complex of the shoulder (SSCS). They recommended open reduction and scapular fixation of this fracture.

Neck + Clavicle fracture



Scapular neck fractures

- Ada and Miller (Clin Orth, 1991)
 - 16 patients with displaced and glenoid neck fractures treated closed, 40% had weakness of abduction, 50% had subacromial and night pain, and 20% had decreased range of motion.
 - Eight patients treated surgically with open reduction through a posterior approach had no complications and no rest or night pain and what they described as greater than 85% of glenohumeral motion.
 - They recommended open reduction of the fracture if the glenoid neck fracture is angulated at 40° or displaced greater than 1 cm.

Glenoid fractures

Incidence

- 10% of scapula fractures
- 10% of Glenoid fractures are displaced
- Displaced Glenoid fractures = 1 in 10 000 of all fractures

Ideberg classification - five types based on 300 cases

- : Type I fractures of the glenoid rim
 - Type Ia—anterior
 - Type Ib—posterior
- Type II transverse fracture through the glenoid fossa, with an inferior triangular fragment displaced with the humeral head
- Type III oblique fracture through the glenoid exiting at the midsuperior border of the scapula, often associated with acromioclavicular fracture or acromioclavicular dislocation

Ideberg classification - five types based on 300 cases

- Type IV—horizontal, exiting through the medial border of the blade
- Type V—which combines type IV with a fracture separating the inferior half of the glenoid.





Type VI fracture (Goss) – severe articular comminution





Radiological assessment:

- True Anteroposterior
- True Axillary
- CT Scan

Management

- Non-Operative
- Operative
- 1. Displacement > 10mm, esp. if size > $\frac{1}{4}$ of glenoid
- 2. Step-off > 5mm
- 3. Subluxed humeral head
- 4. Disruption of the Superior Suspensory Complex

Ideberg type I with subluxation



Type II fracture





Ideberg III – poorest functional recovery







$\overline{\text{Ideberg V}} \quad (\overline{\text{II}} + \overline{\text{IV}} = \overline{\text{V}})$



Scapular body fracture



Base of coracoid fracture

Cephalic tilt view – 35 degrees



Avulsion fractures

Coracoid



- Superior scapular border (L. scapulae)
- Deltoid avulsion of acromion
- Lateral border of scapula (T.Major)
- Infraglenoid tubercle (triceps)

Surgical Approaches

- Anterior Type Ia
- Posterior Types Ib, II, Va
- Posterosuperior Types III, IV, Vb, Vc

Posterior approaches





















Post - Operative Care

- Splintage for 6 weeks
- Sling
- Abduction splint at 45 degrees
- Gentle active-assisted range-of-motion exercises after 6 weeks











Complications

- Osteoarthritis
- Instability
- Impingement
- Other Injuries

Key Points

- 1. Not an isolated injury
- 90% of glenoid fractures can be treated non-operatively
- 3. Displaced glenoid fractures should be fixed
- 4. The Posterior approach provides access to most glenoid fractures