

## SCAPULAR FRACTURES

### Introduction

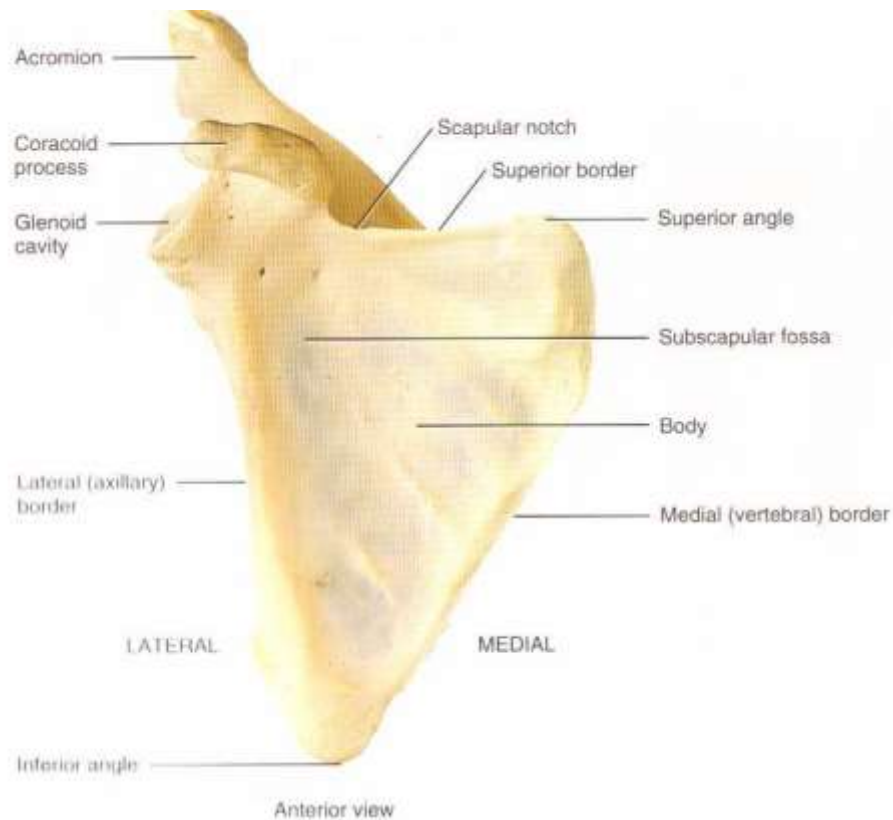
Scapula fractures are relatively uncommon.

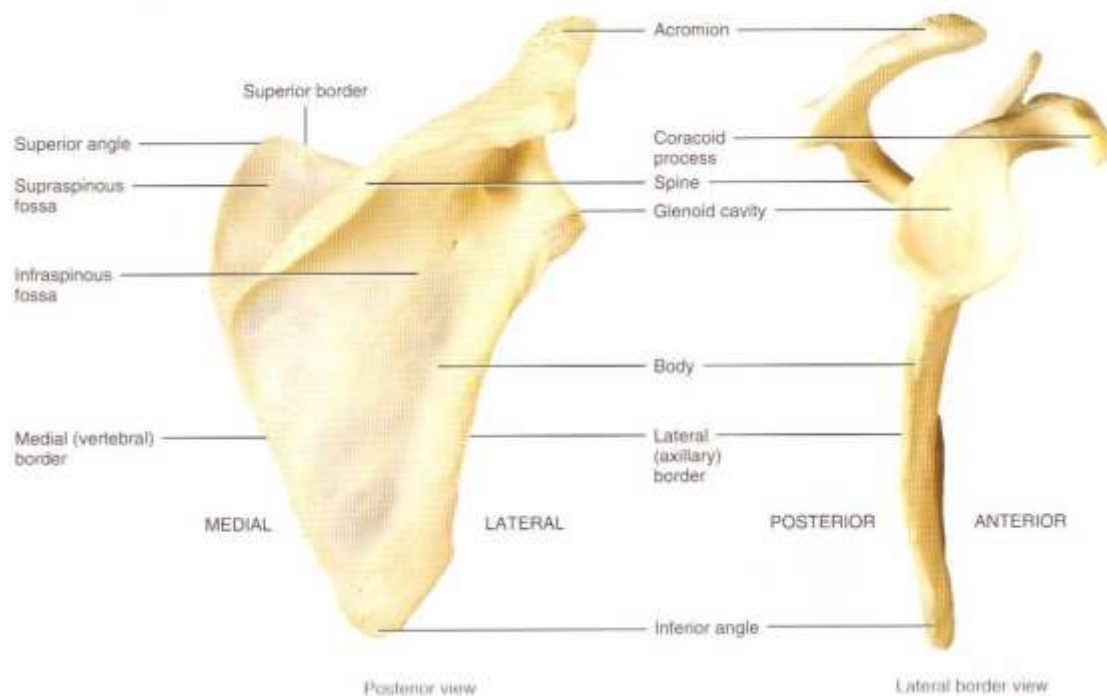
Most are able to be treated conservatively with restoration of full function.

ORIF may occasionally be required for more severe injuries that are significantly displaced or angulated.

**There is a high incidence of associated injuries.**

### Anatomy





### Mechanism

Scapula fractures are most commonly the result of direct and forceful blunt trauma.

### Classification

Scapula fractures may involve (in decreasing order of frequency):

- Body
- Neck
- Glenoid
- Acromion
- Coracoid

Scapula **neck fractures** may be classified as:

Type 1: Non-angulated/ non-displaced

Type IIa: Shortened/ displaced > 1cm.

Type IIb: Angulated > 40 degrees

Scapula **glenoid fractures** may be classified into 5 types according to the Ideberg classification <sup>2</sup>:

Type I: An avulsion fracture of the glenoid rim.

Ia Anterior glenoid rim.

Ib: Posterior glenoid rim.

Type II: A transverse fracture through the inferior glenoid fossa with separation.

Type III: A transverse fracture through the superior glenoid fossa with separation.

Type IV: A horizontal (or transverse) fracture through the glenoid, which extends through into the body to the medial side of the blade of the scapula.

Type V: A type IV fracture in association with a fracture that completely separates the inferior half of the glenoid and blade.

**(See Appendix 1 below)**

#### **Eyres and Brookes Classification for Coracoid fractures**

Type I: The coracoid tip or epiphyseal fracture

Type II; Fracture through the mid-process.

Type III: Fracture through the base of the process.

Type IV: Involvement of the superior body of the scapula.

Type V: Extension into the glenoid fossa.

**(See Appendix 1 below)**

#### **Complications**

Because of the high force required to fracture the scapula, there is a relatively high association with other injuries, which may include:

#### **Associated Injuries:**

1. Adjacent bony injury:

- Ribs, shoulder or clavicle.
  - Shoulder subluxation or dislocation, (in particular with glenoid lip fractures)
2. Lung injury:
- Pneumothorax
  - Lung contusion

*Less commonly, but more seriously:*

3. Neurological injury:
- Brachial plexus injuries
4. Vascular injury:
- Axillary artery injuries.

*Long term complications:*

*Possible longer terms complications include:*

1. Bursitis
2. Post-traumatic secondary osteoarthritis.
3. Shoulder joint instability.

*Floating shoulder:*

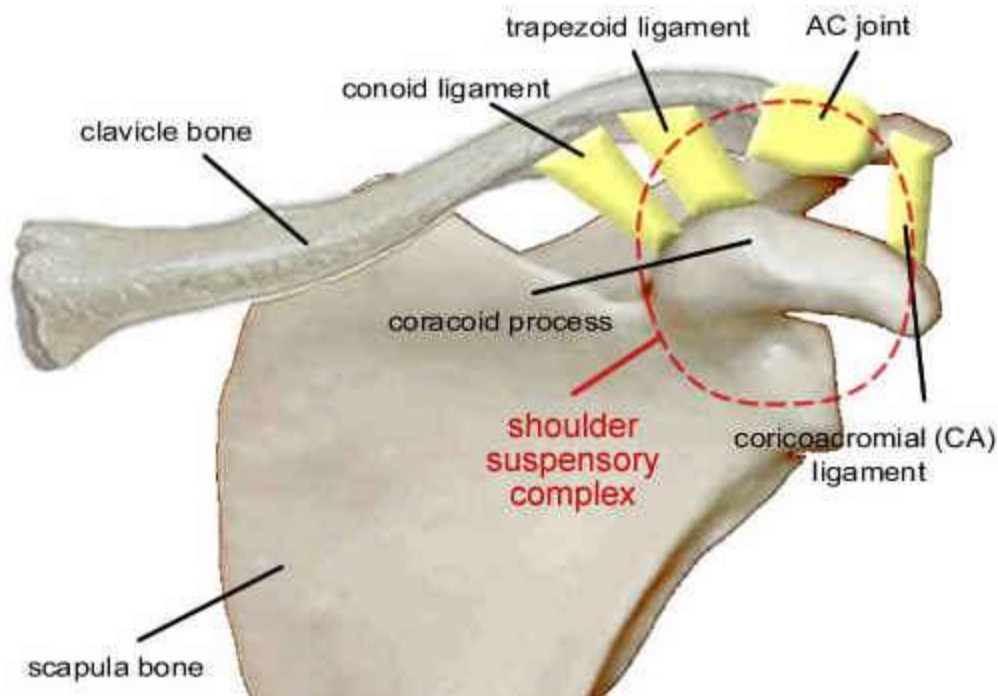
The term *floating shoulder* refers to injuries where a clavicle fracture or AC separation is coupled with a fracture of the scapula.

The injury as originally described by Goss<sup>4</sup> is a disruption of the **superior shoulder suspensory complex, (SSSC)**.

This complex consists of a bone and soft-tissue ring consisting of the:

- Glenoid
- Coracoid process

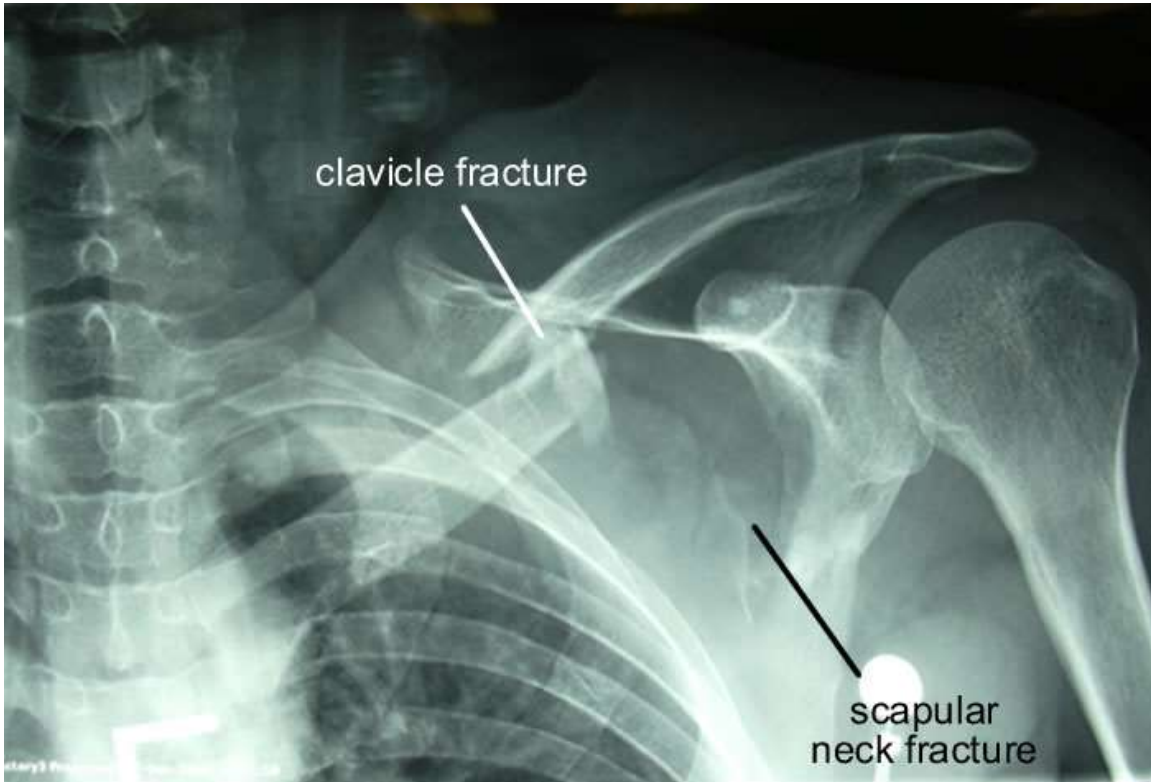
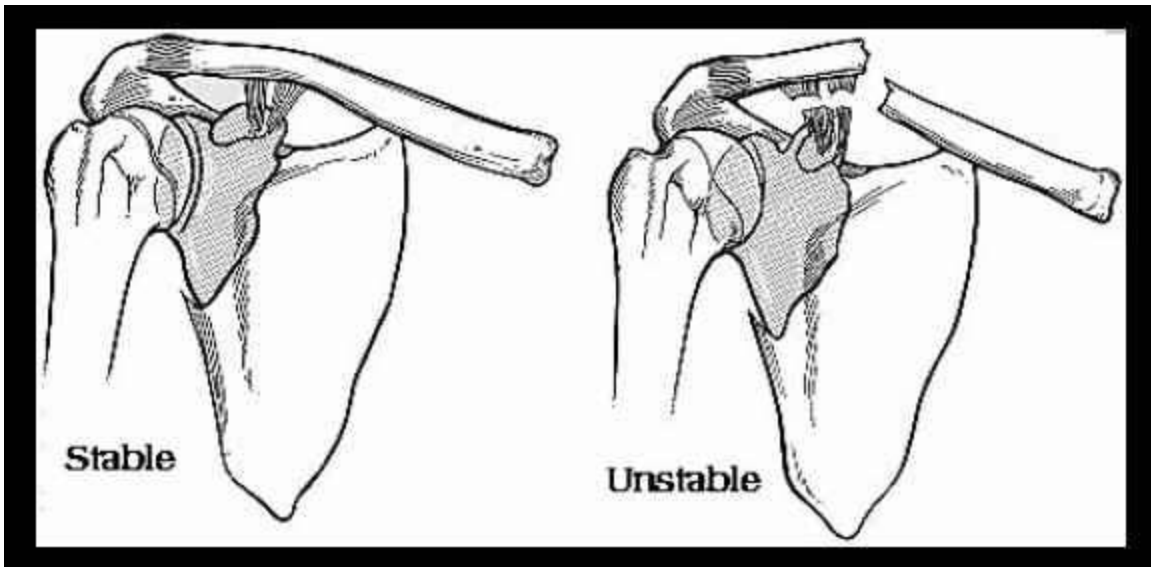
- Coracoclavicular ligaments (conoid and trapezoid)
- Distal part of the clavicle
- Acromioclavicular joint
- Acromion process.
- Some authors feel that the CA ligament should also be included as part of the complex.



The superior shoulder suspensory complex consists of a bone and soft-tissue ring as described above. Injuries to the shoulder may often be treated conservatively if only one structure of the shoulder suspensory complex is disrupted.

However, disruption of **two or more elements** usually leads to an **unstable shoulder, (the so called floating shoulder)**

Because conservative treatment in these cases may result in displacement (medialization) of the shoulder girdle, a floating shoulder is usually considered to be an unstable injury pattern and hence **requiring operative intervention.**



*A floating shoulder variant. In this case, the ligaments appear to be intact, but there is a fracture of the clavicle and the scapular neck. This patient's shoulder displaced after one week of conservative treatment in a sling, thus requiring surgical treatment, (from [Shoulder surgeon.com](http://Shoulder surgeon.com)).*

## Clinical Assessment

There will usually be a history of significant blunt trauma, and because of this there should be a high index of suspicion for associated injuries.

Neurovascular status should be assessed in all cases.

Local signs will usually demonstrate significant swelling and/ or bruising.

The exact point of tenderness, if able to be localized will suggest the type of injury that has been sustained

## Investigations

### Plain radiography:

A-P and lateral scapula views will demonstrate most scapula fractures.

Tangential or oblique views may aid in the evaluation of more subtle fractures, especially of the body of the scapula.

### CT scan:

This will be required

- In cases where plain radiography is equivocal, but clinical suspicion remains high.
- In complex cases to further delineate the extent of injury, and to assist in planning in cases where ORIF is required.

## Management

### Conservative management

In most cases conservative management is sufficient for body, neck, glenoid, acromion and coracoid injuries providing there is not significant displacement or angulation of the fracture fragments.

Early mobilization and physiotherapy will provide good outcomes without long-term disability.

1. Initial treatment:

- Analgesia as required
- Immobilization in board arm sling for comfort, (1-2 weeks)

2. Early mobilization:

- Early mobilization, as soon as pain sufficiently subsides, is important in order to regain full function.

Surgical intervention:

ORIF may be required for significantly **displaced, angulated or complex comminuted** injuries.

It may also be required in cases where there is neurological or vascular compromise.

For scapula neck fractures ORIF will be required for:

- Greater than **1 cm** medial displacement
- Greater than **40 degree** angulation
- Non-displaced fractures of the neck of the scapula usually respond well to conservative management, without any residual functional disability.

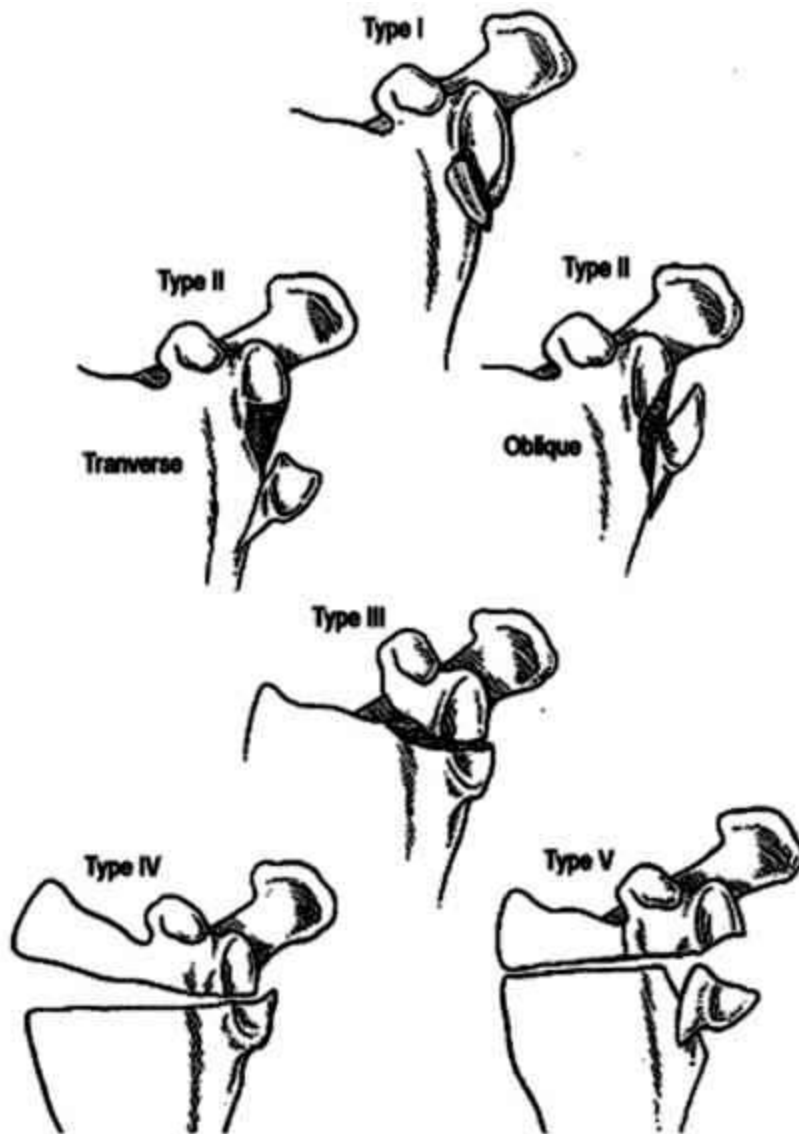
Further indications for ORIF of scapular fractures include:

- Injuries resulting in subluxations of the humeral head.
- Disruption of the superior suspensory complex.

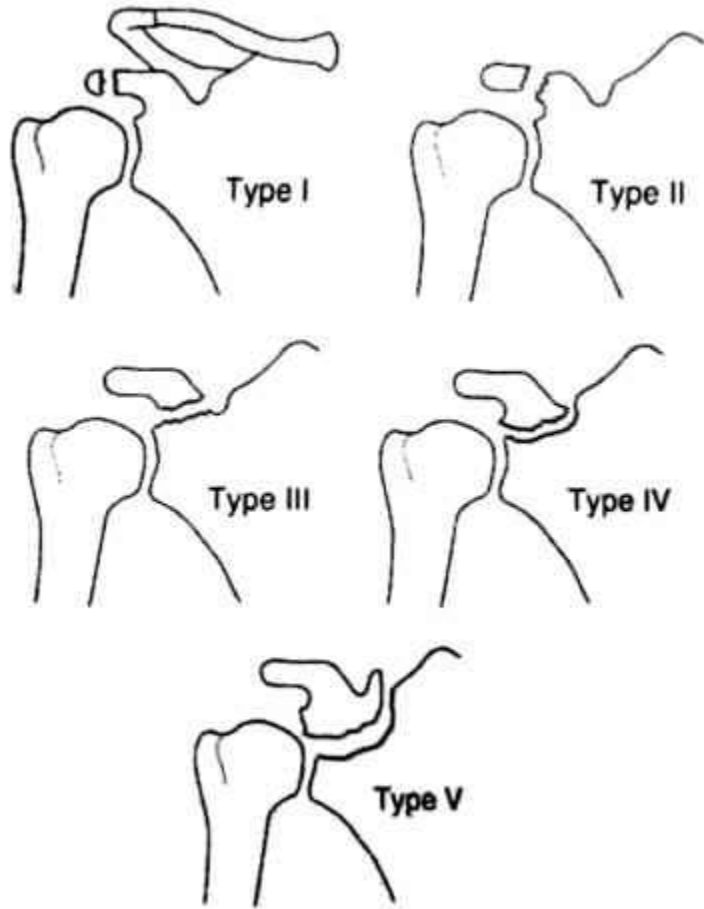


Appendix 1

Ideberg classification of glenoid fractures:



Eyes and Brookes Classification for Coracoid fractures



References

1. Tortora G.J, A Brief Atlas of the Skeleton, Surface Anatomy and Selected Medical Images, 2006
2. Wheelless' Textbook of Orthopaedics on line, ([www.wheelessonline.com](http://www.wheelessonline.com)).
3. Seyed Behrooz Mostofi: Fracture Classifications in Clinical PracticeSpringer; 1<sup>st</sup> edition 2005.
4. Goss TP. Scapular Fractures and Dislocations: Diagnosis and Treatment. *J Am Acad Orthop Surg*. Jan 1995; 3(1):22-33.

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