Hideous deformity of the AC Joint

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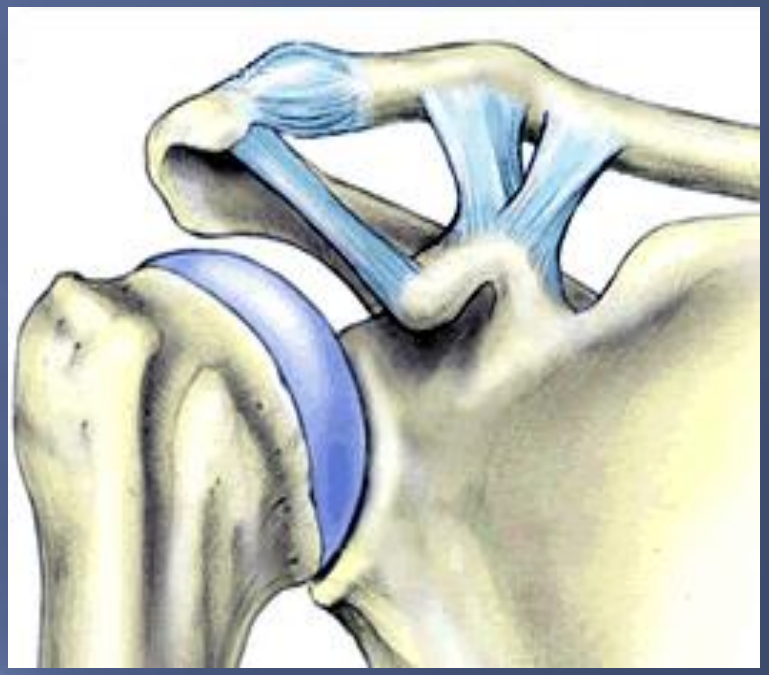
RVI

Aims

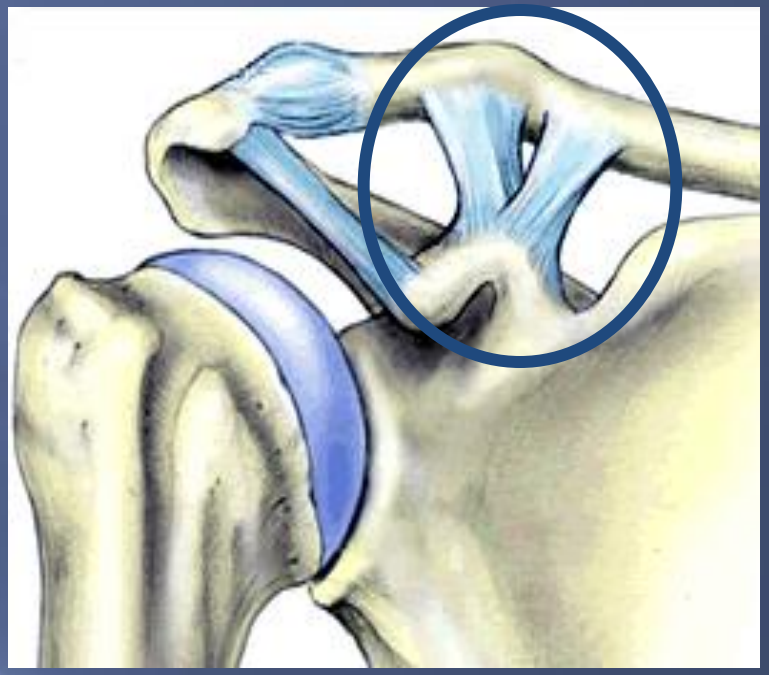
- Describe the anatomy of the AC Joint
- Describe clinical findings in ACJ dislocation
- Decide on conservative vs operative treatment

What is the AC Joint?



- Synovial joint between medial facet of acromion and the distal clavicle.
- Contains intra-articular disk of variable size.
- Thin capsule stabilized by ligaments on all sides:
  - AC ligaments control horizontal (anteroposterior) displacement
  - Superior AC ligament most important

What is the AC Joint?



- Coracoclavicular ligaments
  - Two components:
    - Trapezoid and Conoid

  - "Suspensory ligaments of the upper extremity"
  - Provide vertical stability to AC joint

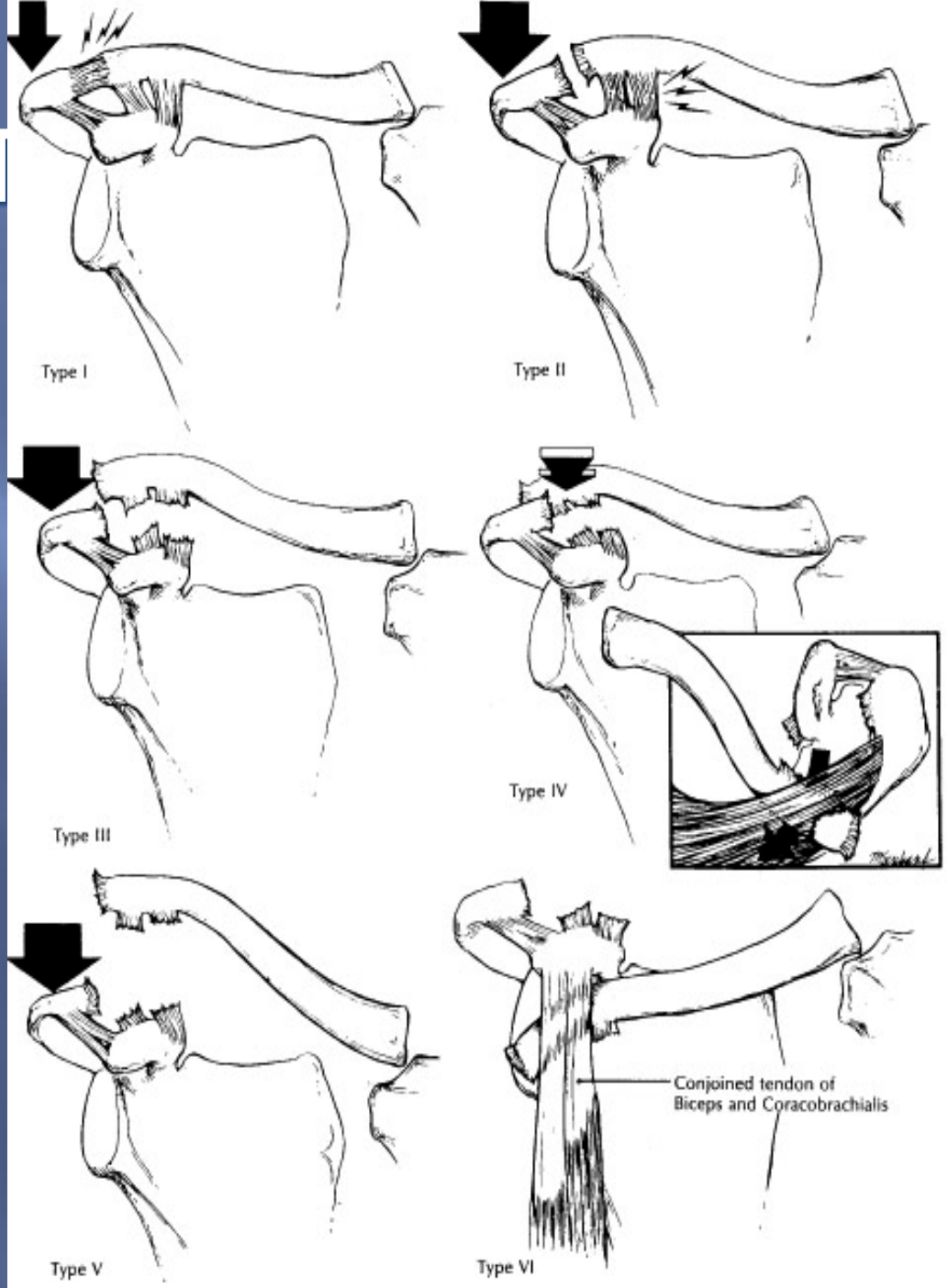
AC Joint Injury

- Moderate or high-energy traumatic impacts to the shoulder
  - Fall from height
  - Motor vehicle accident
  - Sports injury
  - Blow to the point of the shoulder
  - Rarely a direct injury to the clavicle

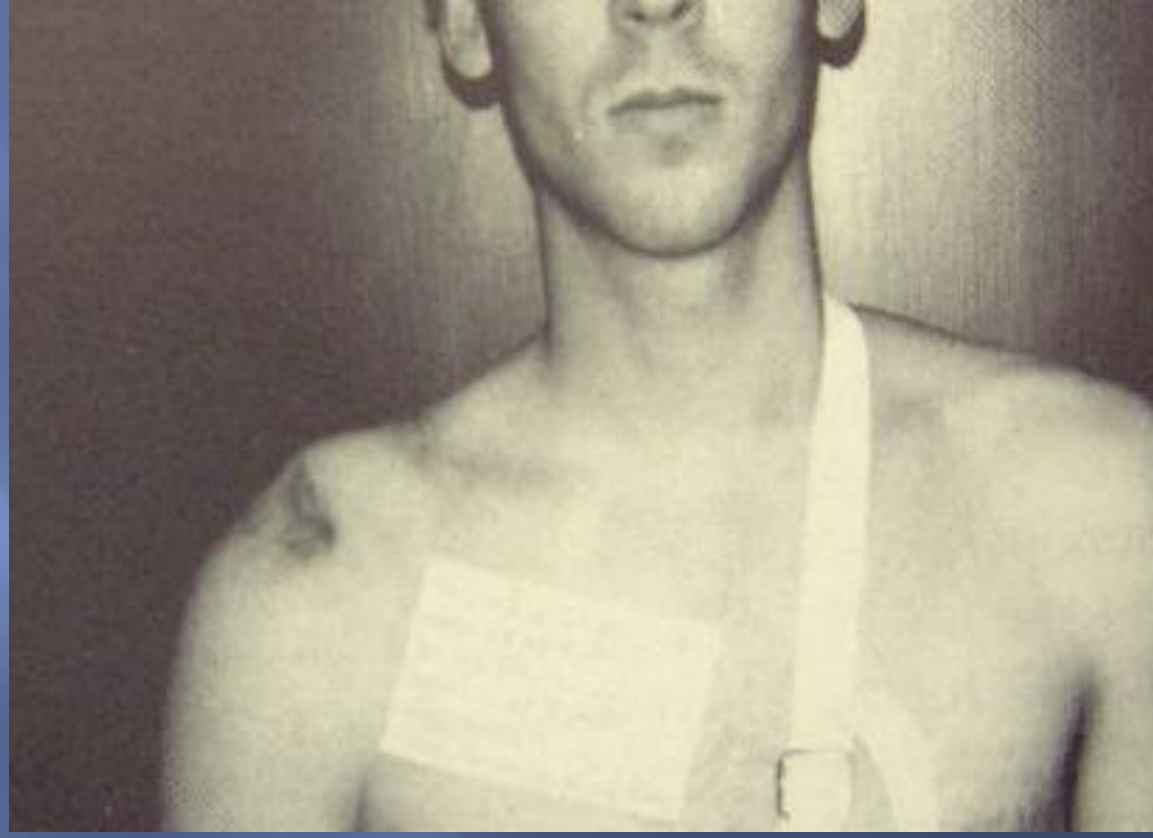
T

Type I – III + V
Common

Type IV +VI
Very
Uncommon

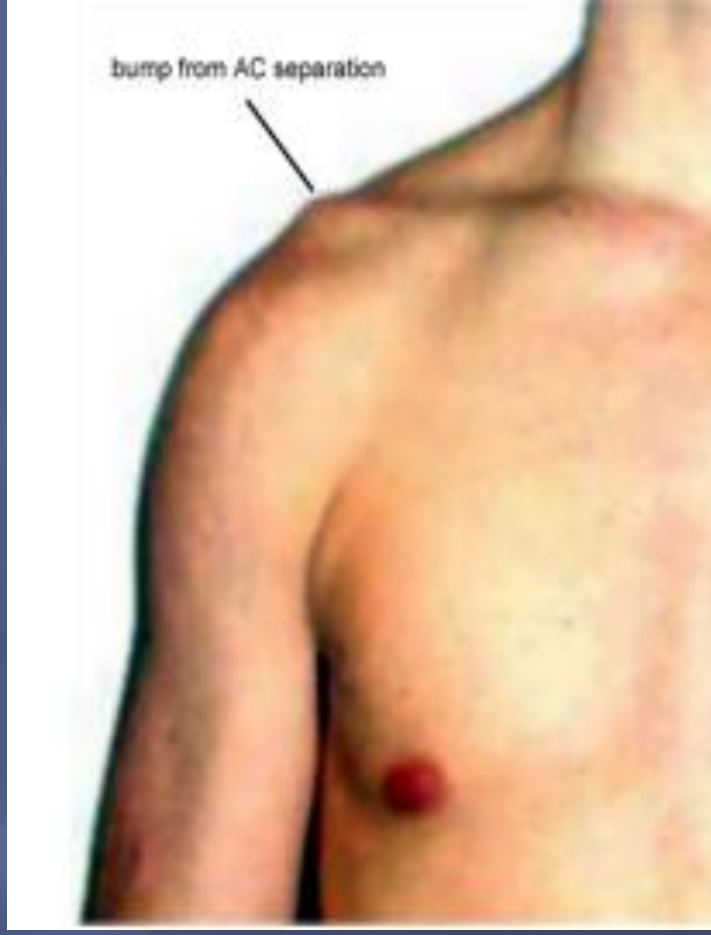


Physical Examination



- Inspection
  - Evaluate deformity and/or displacement
  - Beware of rare inferior or posterior displacement of distal or medial ends of clavicle
  - Compare to opposite side.

Physical Examination



- Palpation
  - Evaluate pain
  - Look for instability with stress
- Neurovascular examination
- Evaluate upper extremity motor and sensation
- Measure shoulder range-of-motion

Differential diagnosis

- Clavicle fracture
- Corocoid fracture

Investig

- Plain Radiographs
  - All information needed
  - Excludes clavicle fracture

Management

- Conservative
  - Majority of patients
  - Immobilisation in sling for 3-4 weeks
  - Avoidance of aggravating activities
    - Heavy lifting, upper limb gym exercises
  - 80% type IIIs asymptomatic

Management

- Surgical Indications
  - Rare
  - Grade III:
    - Cyclists, gymnasts, paddlers
    - Heavy manual work
    - Cosmetic (eg Body builders)

Grade IV-VI require surgery

Surgery

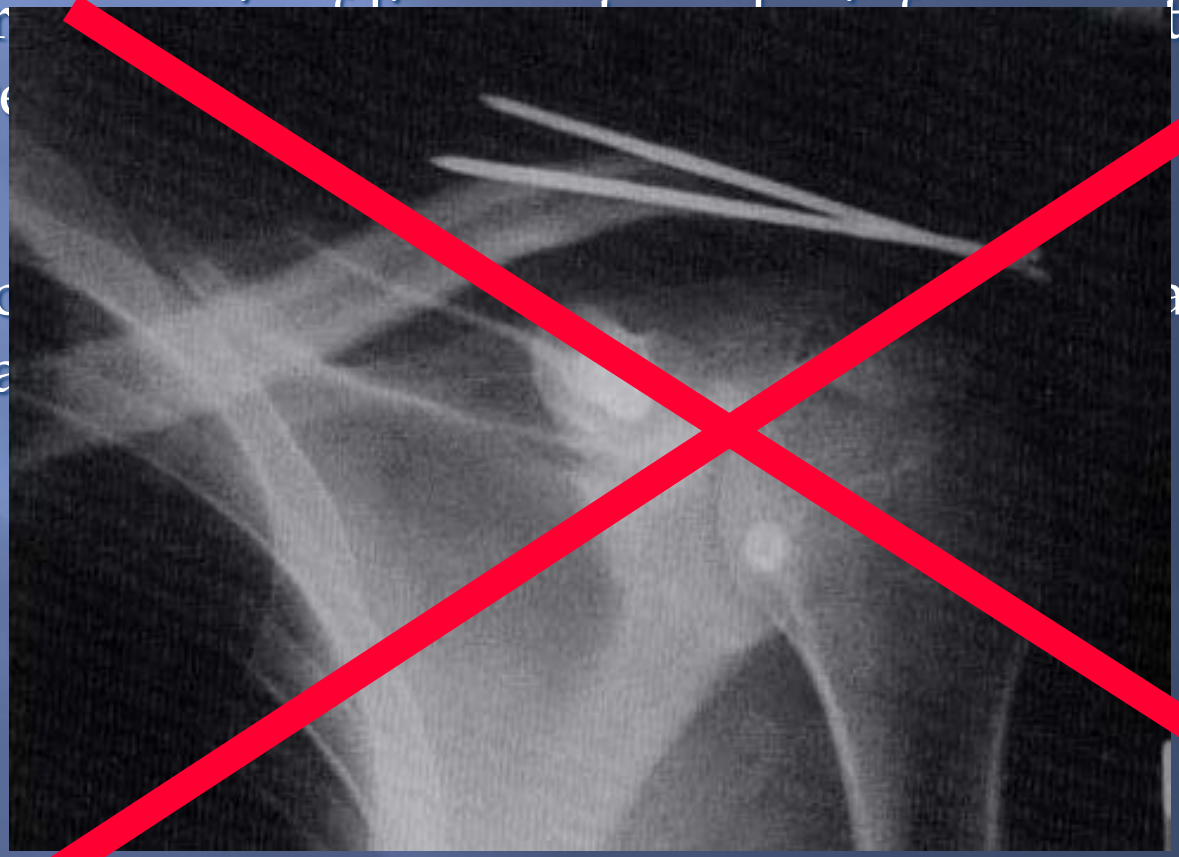
- Acute
  - Direct repair of ligaments and reinforcement with screw/suture/endobutton/hook plate/synthetic
- Late
  - Reconstruct ligaments using Coraco-acromial ligament (Weaver-Dunn)
  - Reinforce with screw/suture/endobutton/hook plate/synthetic

Surgery

- Acute
  - Direct re nt with screw/su
- Late
  - Reconstr ial ligament

Surgery

- Acute
  - Dir t with scre
- Late
  - Rec al liga

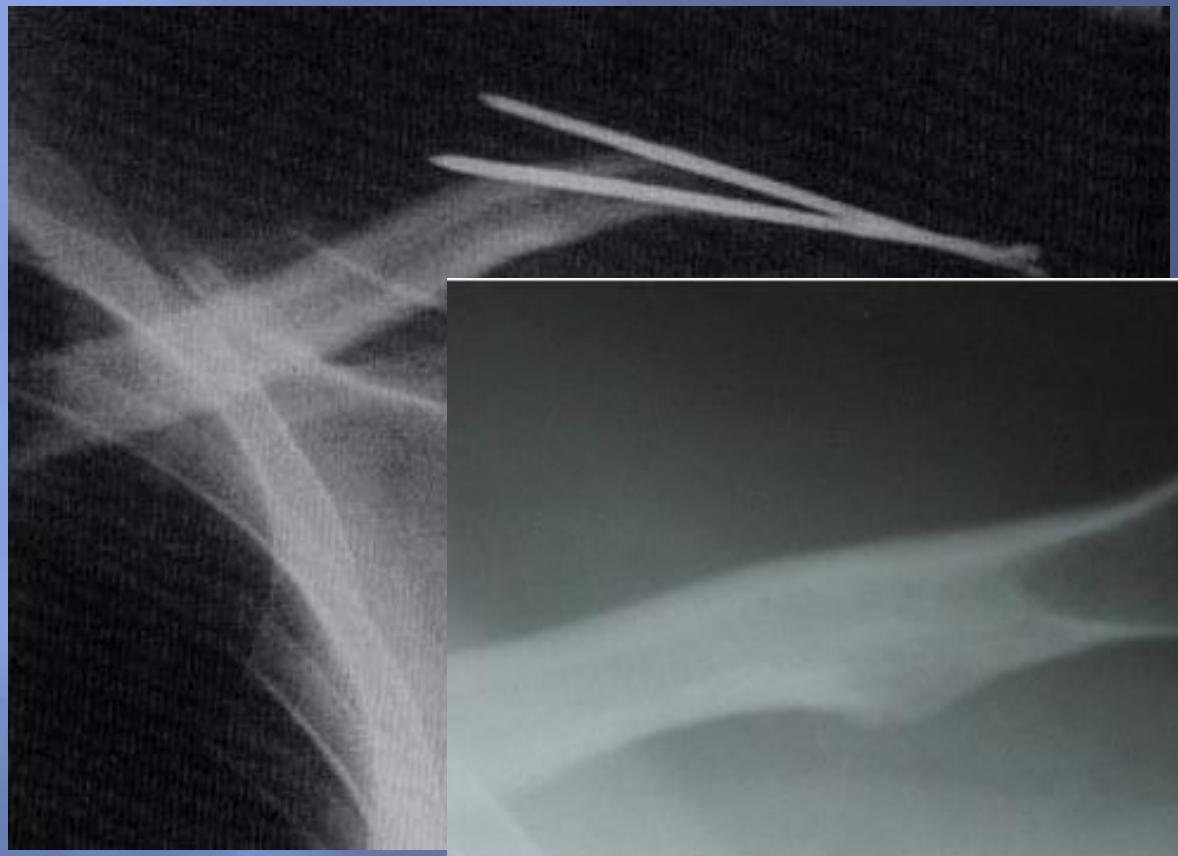



QuickTime™ and a
decompressor
are needed to see this picture.

Summary

- Common injury
- Displacement well tolerated
- Operative treatment for:
  - Incarcerated clavicle
  - Clavicle stripped of muscle attachment
  - Some Type 3s

Questions?




R


bump from AC separation

Scapular Fractures

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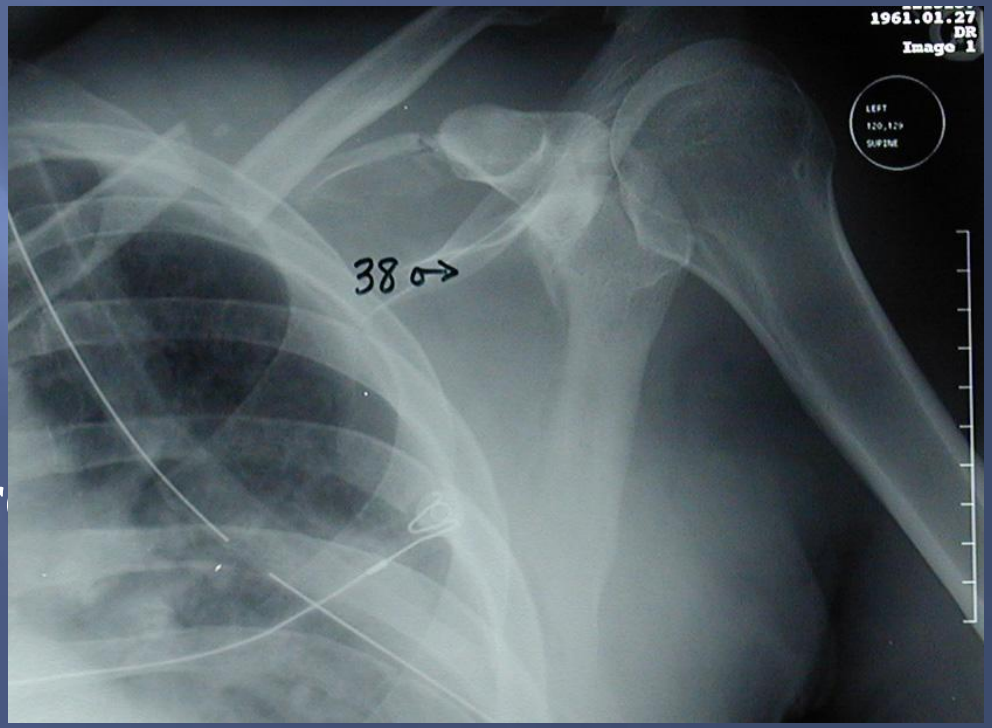
Aims

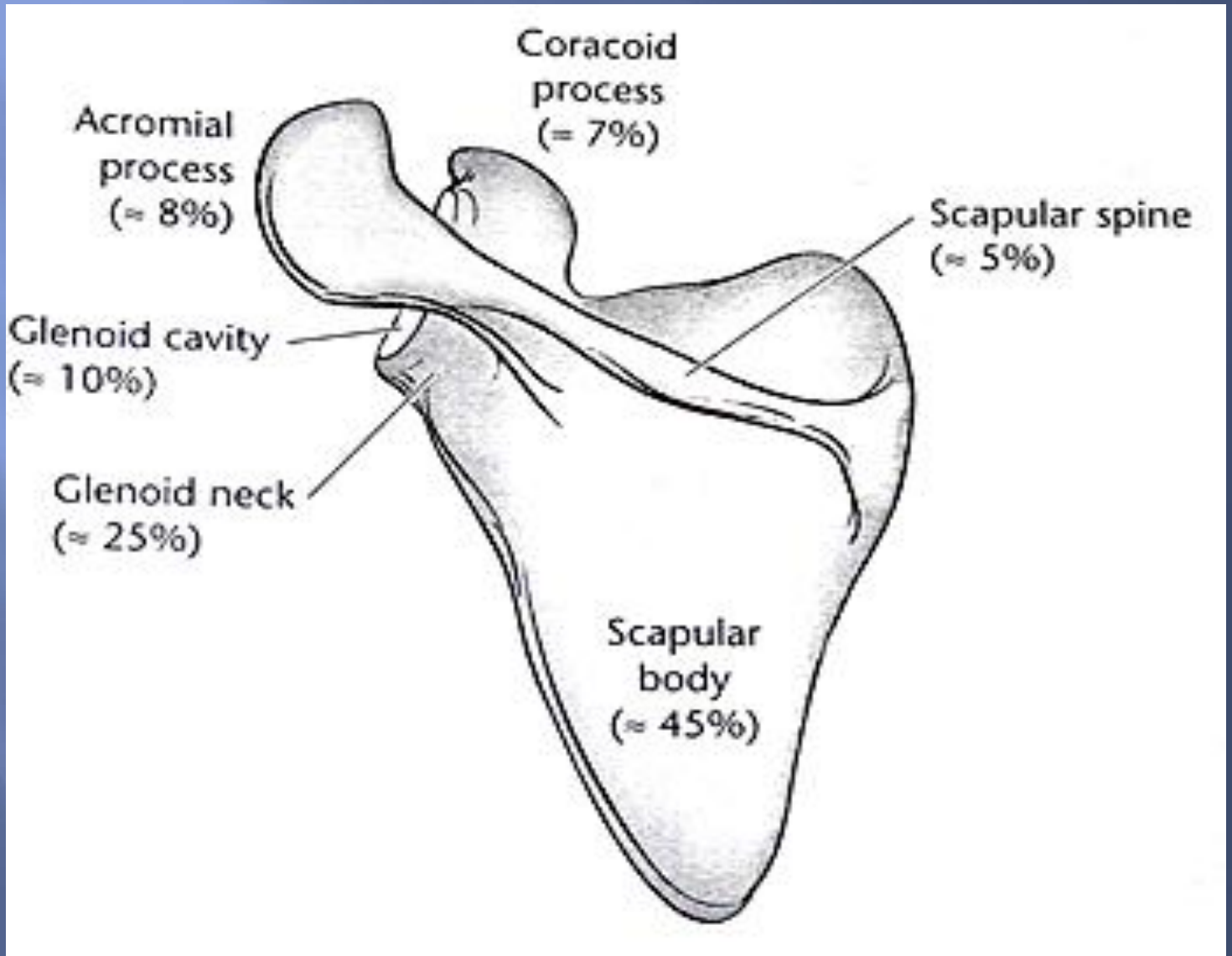
- 1. Understand Incidence and Mechanisms
- 2. Manage scapular fractures
- 3. Identify fractures which may need surgery

Incidence of Scapula Fractures

- 1% of all fractures
- 3% of injuries to shoulder girdle
- 5% of shoulder fractur



Location of Scapula Fractures



Diagnosis

- History typically high energy injury (80-95% incidence other injury)
- Mechanism often direct but can be indirect
- Diagnosis ultimately radiographic
  (Plain film/Pan CT)

Radiographs

- "Scapula trauma series": AP and Lat of scapula, true glenohumeral axillary view
- CT scanning for complex injuries with 3D reconstructions
- Stress AP projection if injury to the clavicular-scapular linkage suspected

Nonoperative Treatment

- >90% scapular fractures minimally displaced
- Treatment in sling and swathe with gradual increase of functional use for first 6 weeks
- x-rays at 2 week intervals until 6 weeks

Nonoperative Tx Continued

- At 6 weeks osseous union usually present and sling/swathe discontinued

- Full recovery may take 6 months to 1 year

Operative Indications

1. Significantly displaced (5-10mm) fractures of glenoid cavity (rim and fossa)

2. Significantly displaced (10mm or 40 degrees rotation) fractures of the glenoid neck

3. Double Disruptions of the superior suspensory shoulder complex with displacement of one or more elements

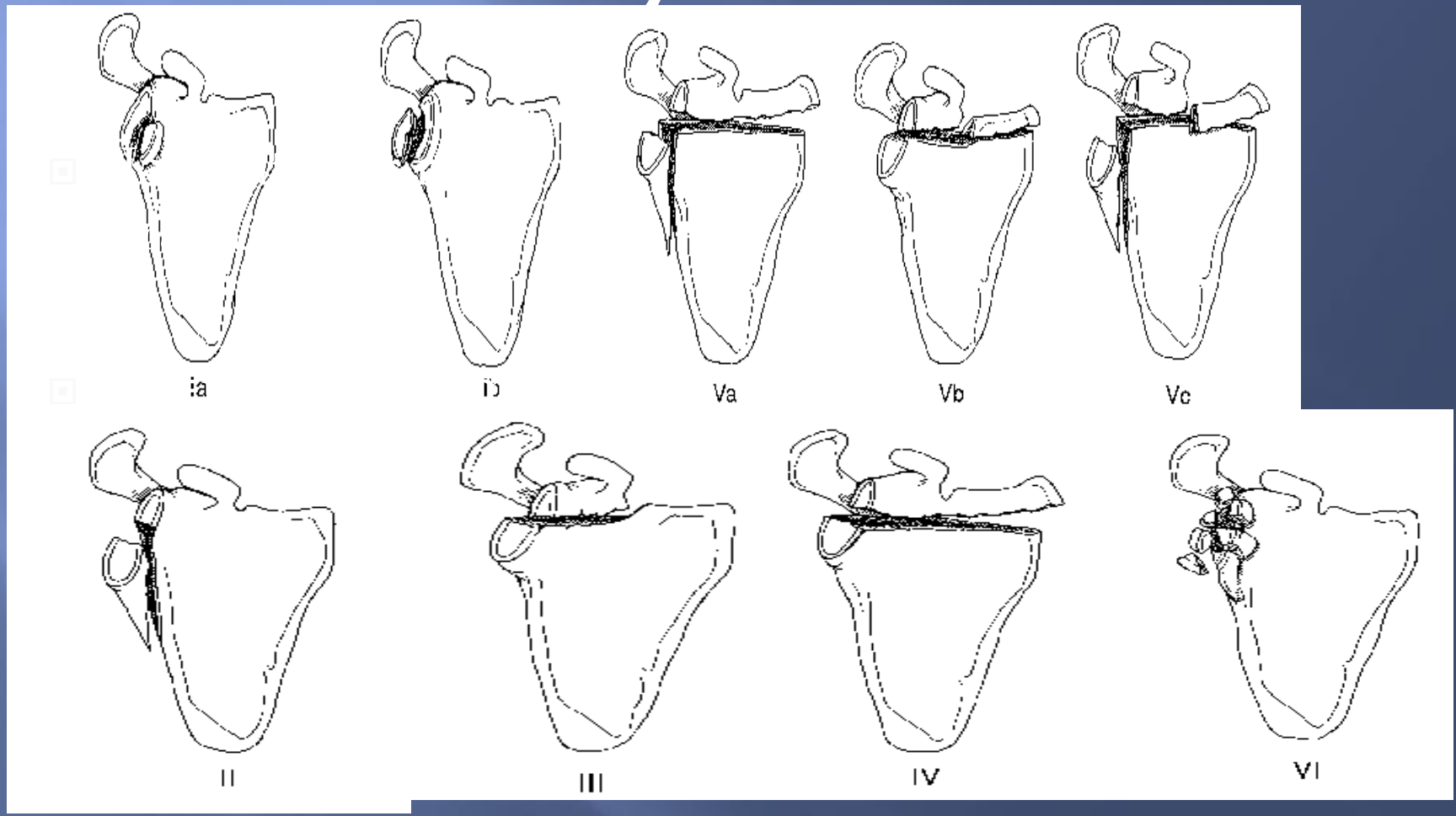
Glenoid Process

- Glenoid process includes glenoid cavity (rim and fossa) and glenoid neck

Fractures of the Glenoid Cavity (Rim and Fossa)

- 10% of scapula fractures of which no more than 10% are significantly displaced

Classification Glenoid Cavity Fractures



Glenoid Rim Fractures

- Instability anticipated if fracture displaced 10mm and involves one fourth anterior aspect or one third posterior aspect glenoid cavity

- Fractures of anterior rim approached anteriorly and posterior rim posteriorly

Fractures of the Glenoid Fossa

- Surgery if articular step-off 5-10mm or displacement causes subluxation humeral head out of glenoid cavity

- All glenoid fossa fractures approached posteriorly

Glenoid Neck Fractures

- 25% of scapula fractures of which 10% or less are significantly displaced
- Mechanism can be direct blow, fall on outstretched arm, or fall on superior aspect shoulder

Glenoid Neck Fractures Continued

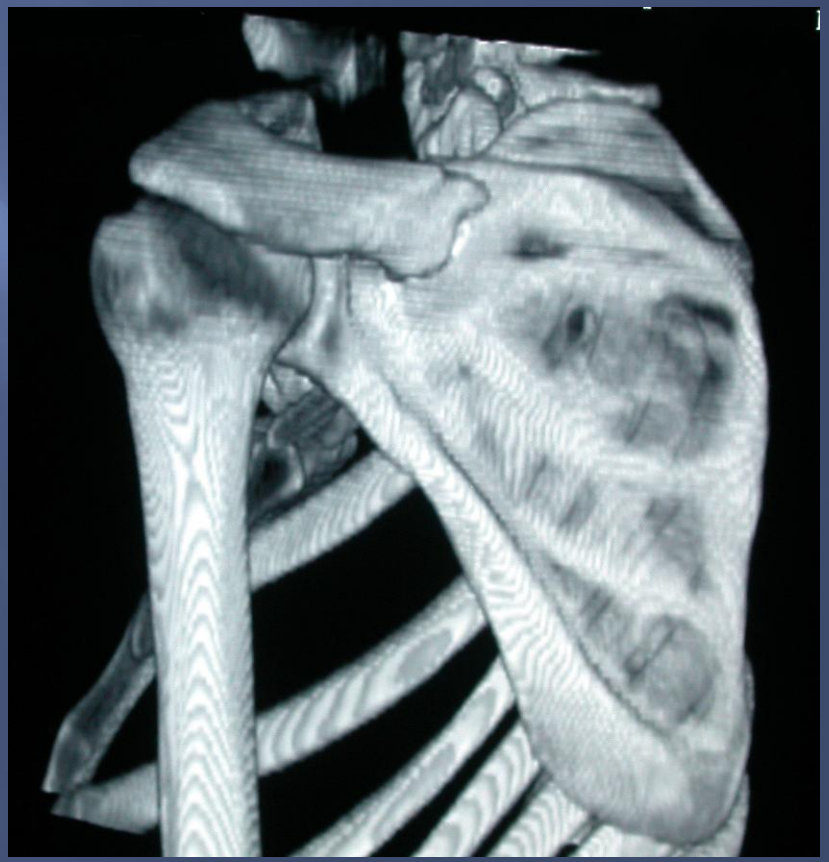
- Surgery for type II fractures (10mm or 40 degrees rotation)
- Posterior approach between infraspinatus and teres minor
- Fixation with 3.5mm recon plate, and possibly k-wires or interfragmentary screws

Isolated Fractures of the Coracoid Process

- Fracture can be at base of coracoid, between CA and CC ligaments, or at tip (avulsion)
- Diagnosis often on plain films but CT scan may be needed to better define fracture
- Fractures at tip of coracoid typically treated non-operatively (athletes and manual laborers may be exceptions)

Isolated Fractures of the Acromial Process

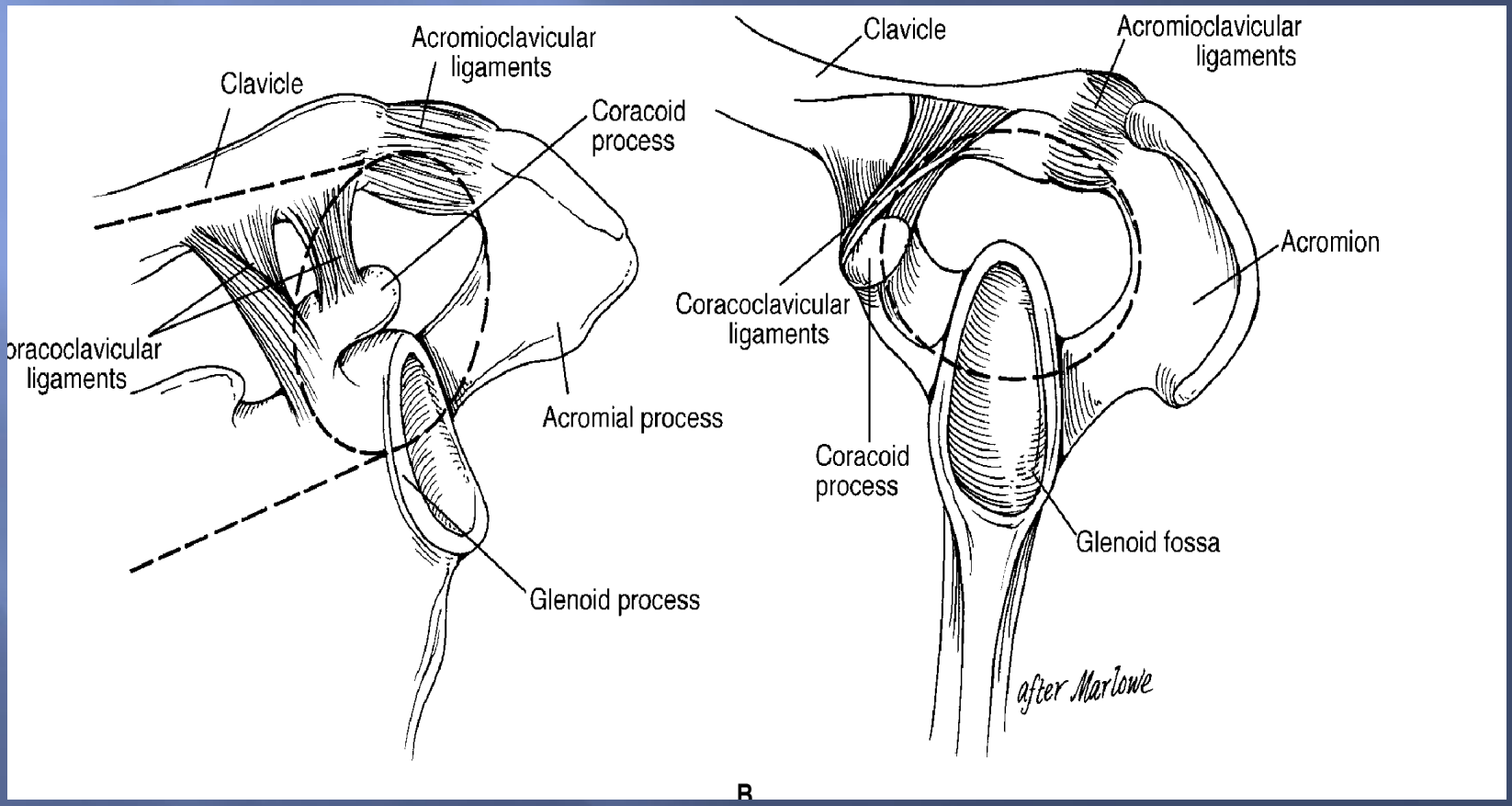
- Scapula series detects most acromial fractures
- Os acromionale may complicate evaluation
- Most are nondisplaced or minimally displaced and treated symptomatically



Double Disruptions of the Superior Suspensory Shoulder Complex (SSSC)

- SSSC is a bone-soft tissue ring at the end of a superior and inferior bone strut
- Ring includes glenoid process, coracoid process, CC ligaments, distal clavicle, AC joint, acromial process
- Superior strut is middle third clavicle
- Inferior strut is lateral scapular body and spine

Superior Shoulder Suspensory Complex



Double Disruption of SSSC

- Traumatic disruption 2 or more components SSSC usually secondary to high energy injury and frequently require surgical management
- Frequently described as “Floating Shoulder”
- Potential long term consequences non-operative treatment include: nonunion, malunion, impingement, altered shoulder mechanics, DJD, neurovascular compromise

Floating Shoulder

- Operative management recommended because of potential instability, displacement of glenoid
- Recent series of floating shoulders treated nonoperatively shows good results with conservative care.

Nonoperative Management of Ipsilateral Fractures of the Scapula and Clavicle

- Retrospective review of 20 cases
  - 11 of 20 clavicle fx's displaced > 10 mm
  - 5 of 20 scapular fx's displaced > 5 mm
- Treated with sling or immobilizer
- Evaluated by 3 different shoulder scores, strength compared to uninjured shoulder.

Edwards SG, et al. JBJS 82B: 774-80, 2000

Results

- 1 clavicle nonunion (segmental bone loss at injury)
- Strength = to opposite arm in all
- Constant score 96, Rowe score 95
- 17-18 patients excellent results depending on evaluation system

Edwards SG, et al. JBJS 82B: 774-80, 2000

Summary – Floating Shoulder

- Nonoperative treatment sufficient for many of these injuries.
- Each component of the injury should be separately evaluated for indications for surgery, but the combination itself does not mandate operative intervention

Questions

Summary

- Relatively uncommon injury.
- Often high energy
- Frequently conservative treatment

- Operative treatment:
  - Glenoid rim and fossa
  - Significantly displaced glenoid neck
  - ? Floating shoulder

- Refer to shoulder surgeon