Common Orthopaedic Conditions of the Shoulder in the Young Athlete

Christopher V. Bensen, M.D.

A PA's Guide to the Musculoskeletal Galaxy
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Denver, CO

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Disclosures

- Partner, Keys Medical Group
- Medical Staff, Lower Keys Medical Center
  - Key West, Florida
- No corporate affiliation, interests, or royalties
- bensencv@gmail.com
- 828-773-9227

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Objectives

- Know how to properly evaluate an athlete with shoulder injury or other symptoms
- Formulate an appropriate differential diagnosis based on history and PE findings
- Recommend initial treatment plans for patients with AC seprations, shoulder instability, and labral injuries

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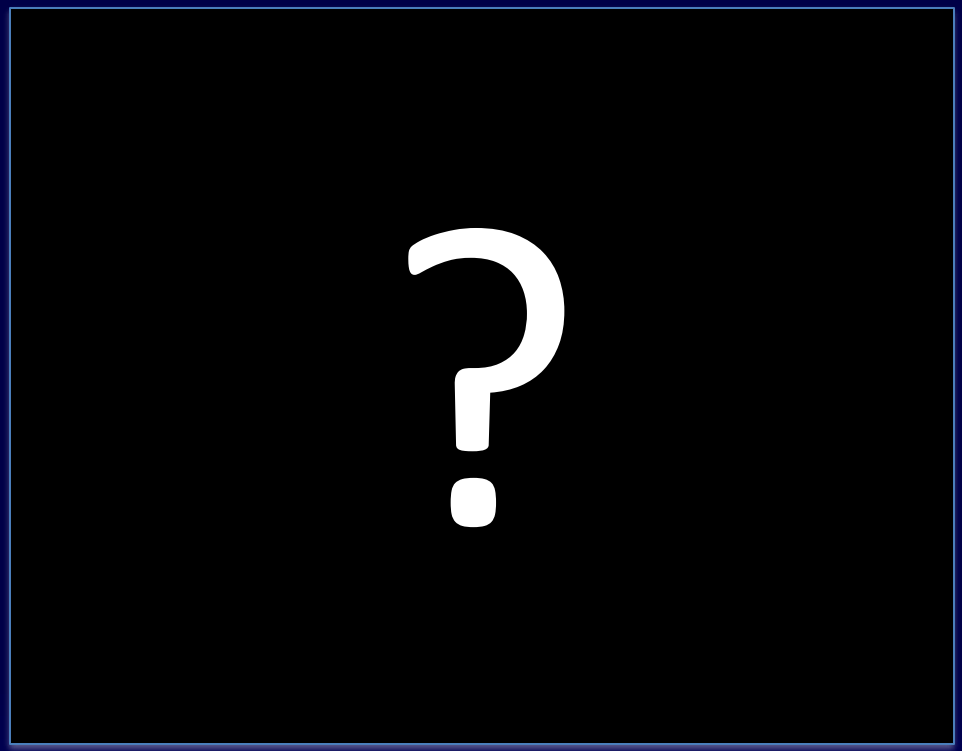
The Shoulder - An Intern's View



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Introduction

- Shoulder anatomy
- SLAP Lesions
- Shoulder dislocations
- Shoulder instability
- Labral injuries
- AC joint separations

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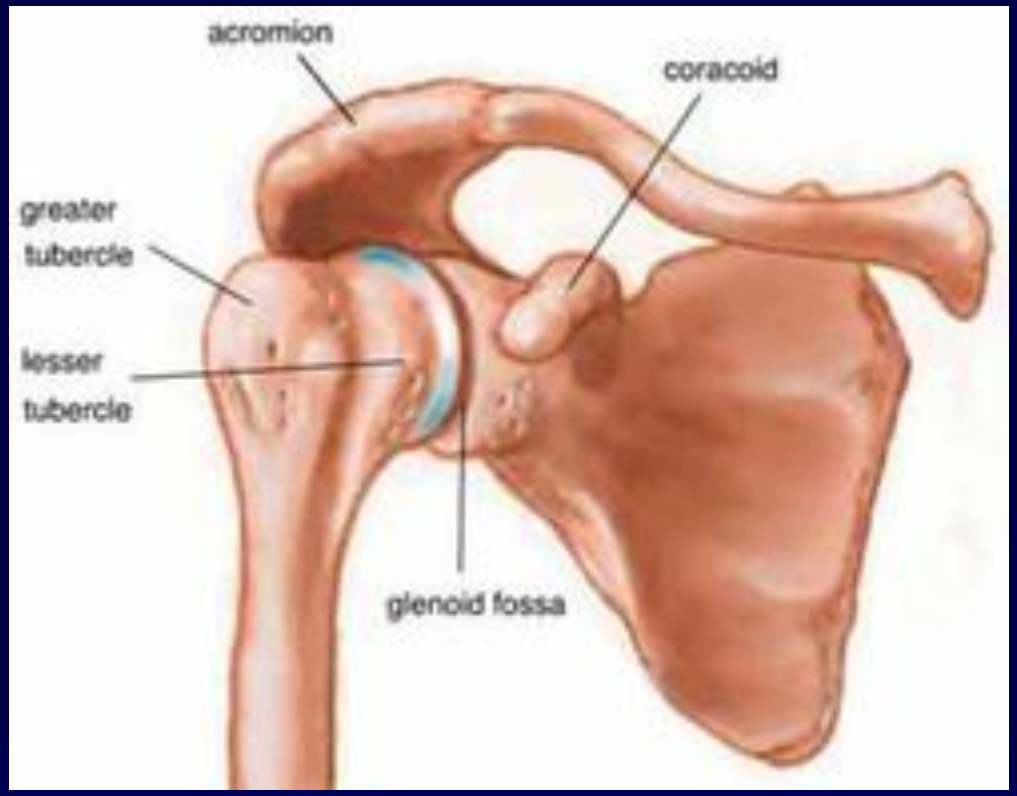
Shoulder anatomy

- Three bones
  - Scapula
  - Humerus
  - Clavicle
- Joints
  - Glenohumeral
  - Acromioclavicular
  - Sternoclavicular
  - Scapulothoracic



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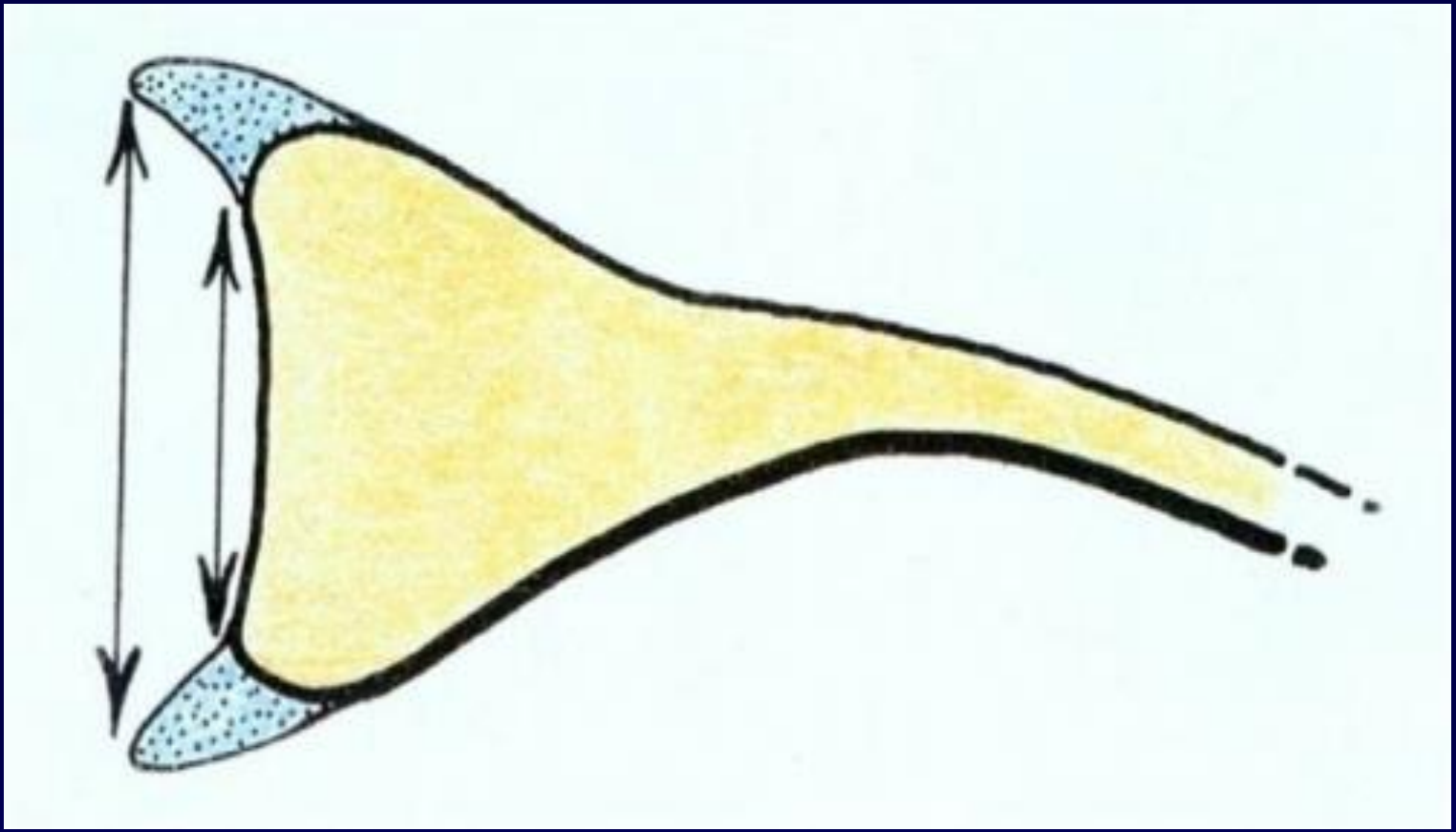
Labral anatomy

- Soft tissue sleeve surrounding glenoid
- Contiguous with joint capsule
- Clock face nomenclature
- LH Biceps attaches on the supraglenoid tubercle at 12 o’clock

Labral anatomy



Case #1

- 24yo RHD collegiate baseball pitcher presents with 3 month h/o intermittent right shoulder pain
- Exacerbated by throwing, lost velocity
- Localized deep and radiates down the front of his upper arm
- Aggravated by overhead reaching
- Relieved by NSAIDs

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Case #1

- Exam reveals good ROM except slightly limited internal rotation
- Positive O’Brien’s test
- Positive biceps load test
- No significant weakness
- Plain x-rays normal
- Any other studies?

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Case #2

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Case #1

- Diagnosis?

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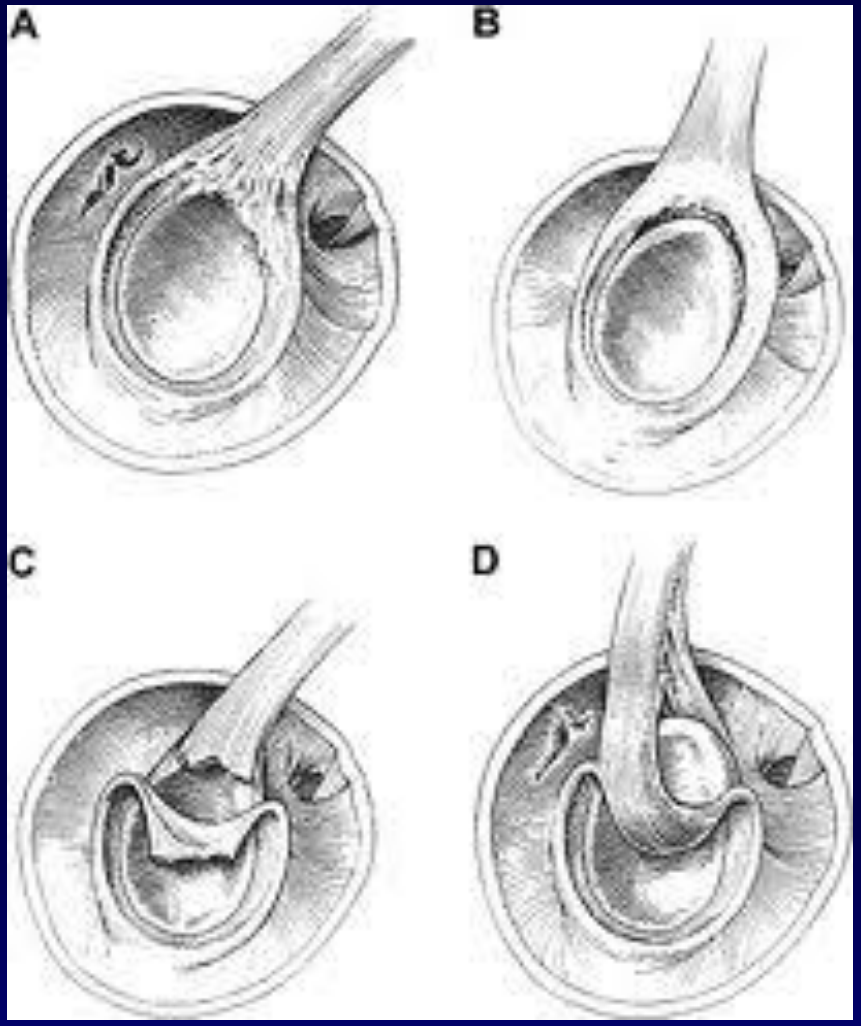
SLAP Lesions

- Superior Labral Anterior Posterior
- Common in overhead athletes
- Degenerative, attritional injury
- Labral tear of variable size at biceps anchor
- May involve a portion of the biceps

Snyder et al. Arthroscopy, 1990.

SLAP Lesions



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SLAP Lesions

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SLAP Lesions

- Conservative treatment includes rest, PT with ROM and terminal stretching exercises
- Associated GIRD
- NSAIDs for pain
- Acitivty modification – difficult for pitchers!
- Most often result in arthroscopic repair in young patients

SLAP Repair

Case #2

- 28 yo male skier attempting a “jump” crashes and lands awkwardly
- Notices pain and deformity at top of his right shoulder
- Presents to the ED

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Case #2

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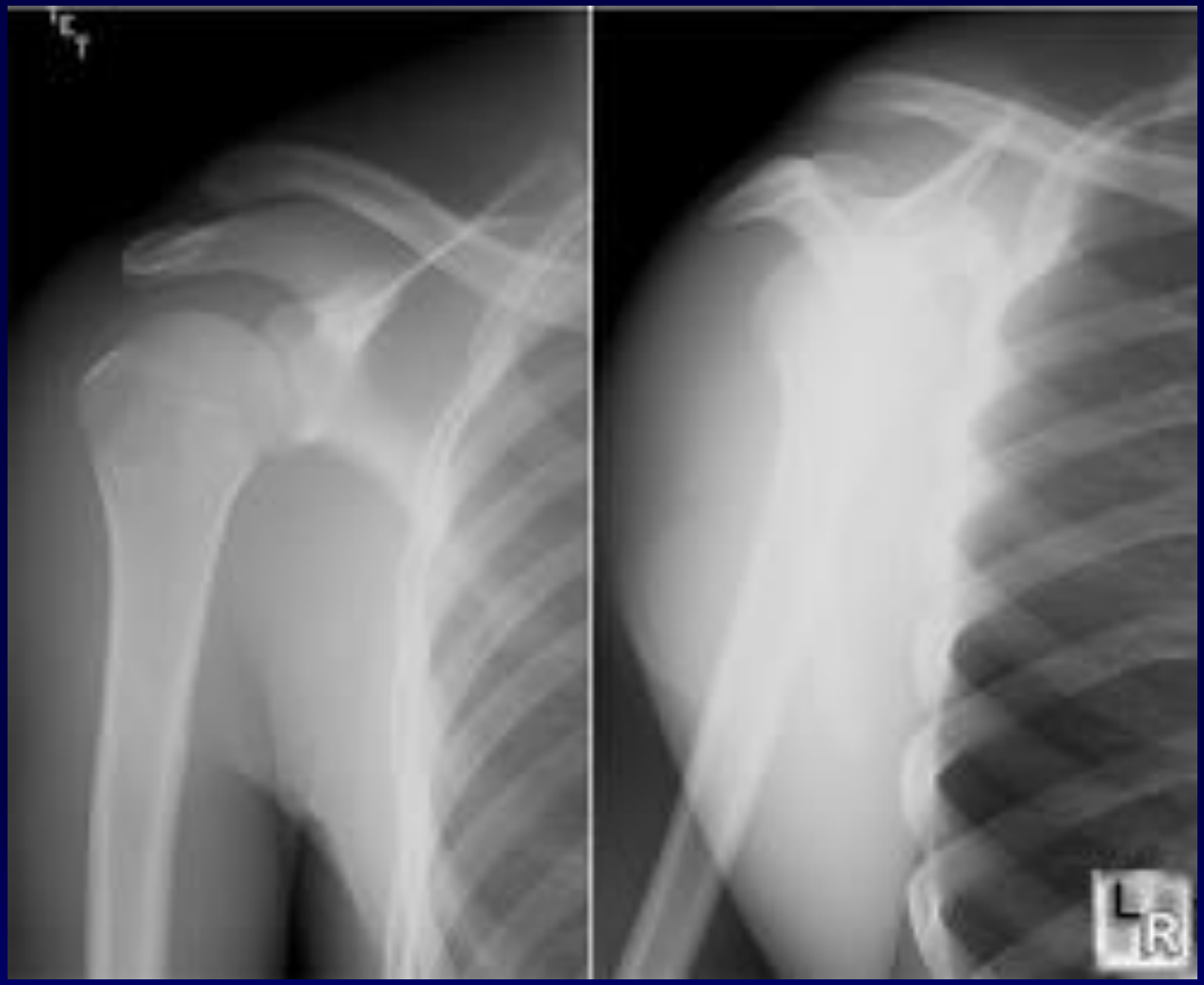
Case #2



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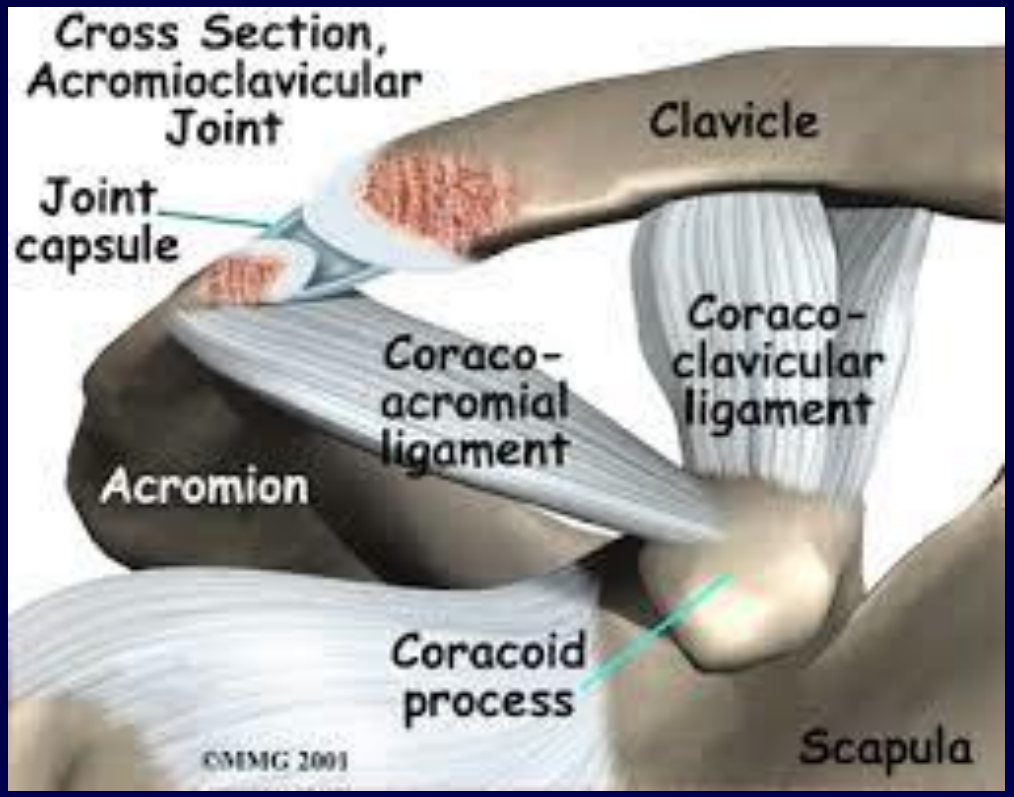
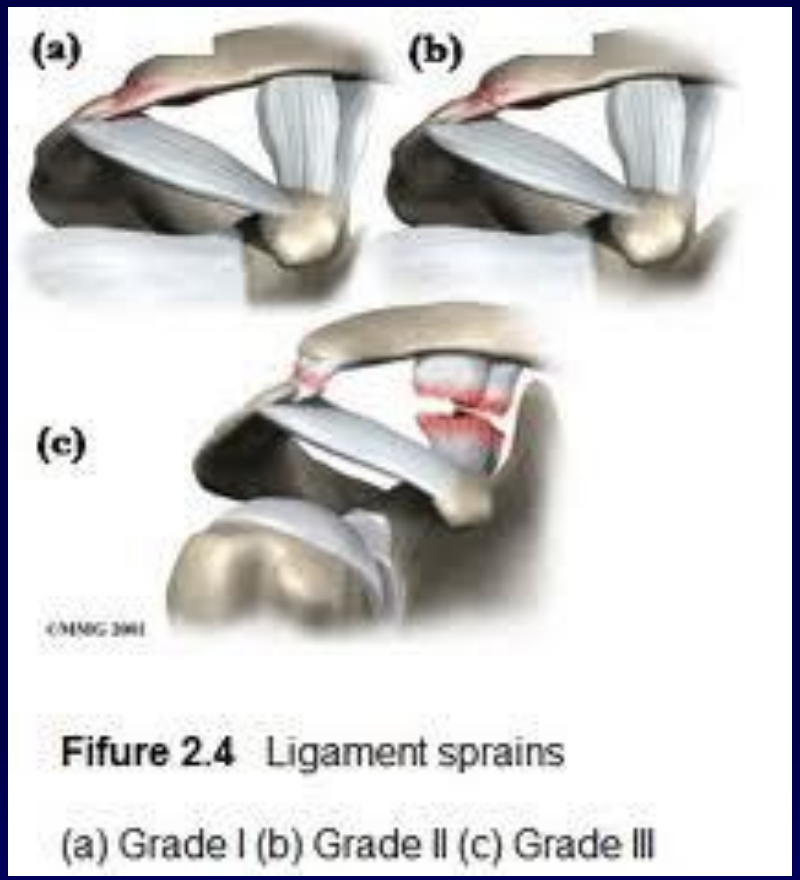
Acromioclavicular separations

- Relatively common injury resulting from a direct blow to top of shoulder
  - Bicycling
  - Snowboarding
  - Skateboarding
  - Football

Acromioclavicular Separations





Fifure 2.4 Ligament sprains

(a) Grade I (b) Grade II (c) Grade III

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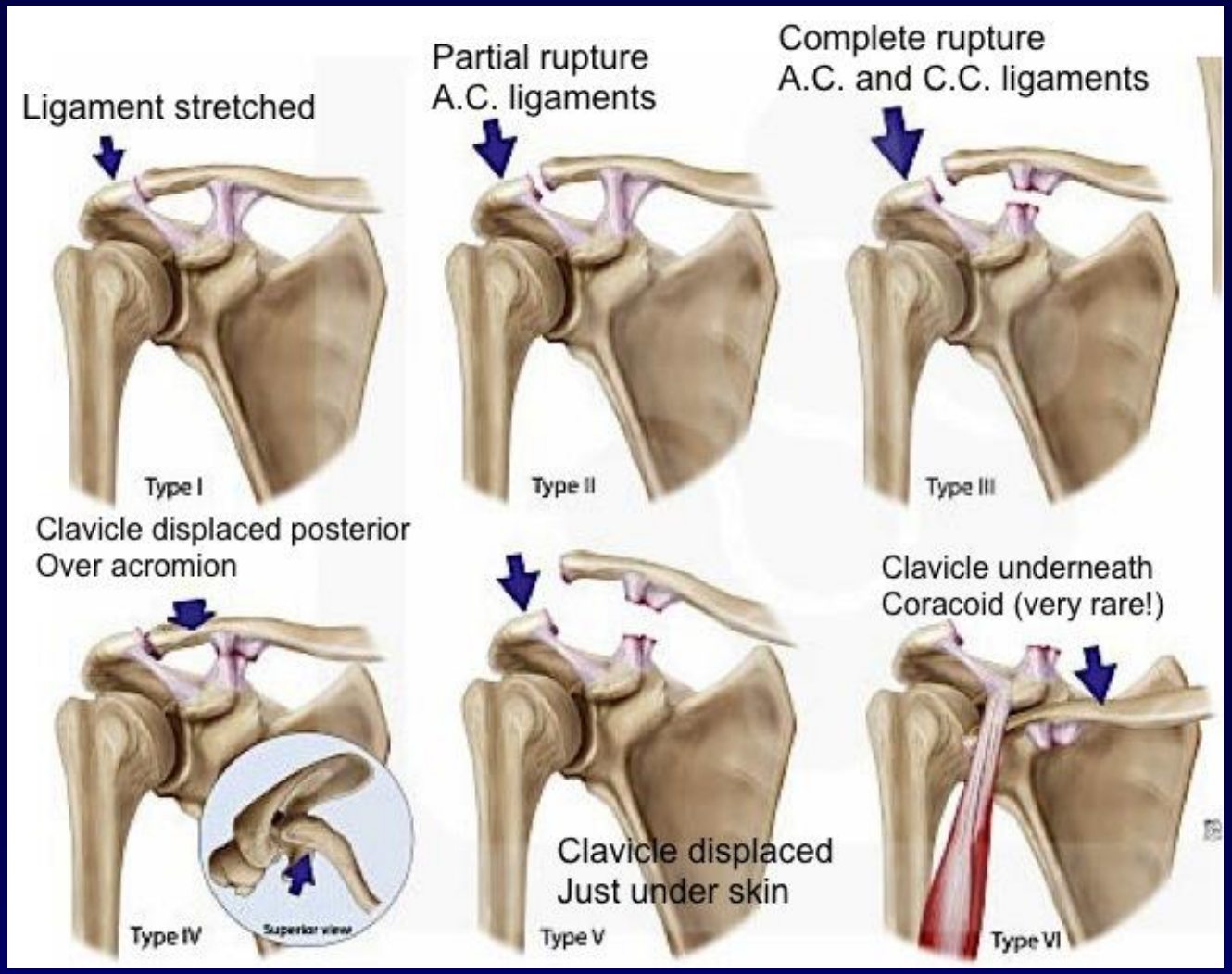
Acromioclavicular separations



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Acromioclavicular separations

- Grade of injury directs management
  - 1-2: Conservative
  - 3: Controversial
  - 4+: Operative
- Numerous procedures described
- Acute injuries can be repaired/stabilized
- Anatomic reconstruction of coracoclavicular ligaments is probably best in chronic cases

Acromioclavicular separations

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Acromioclavicular separations

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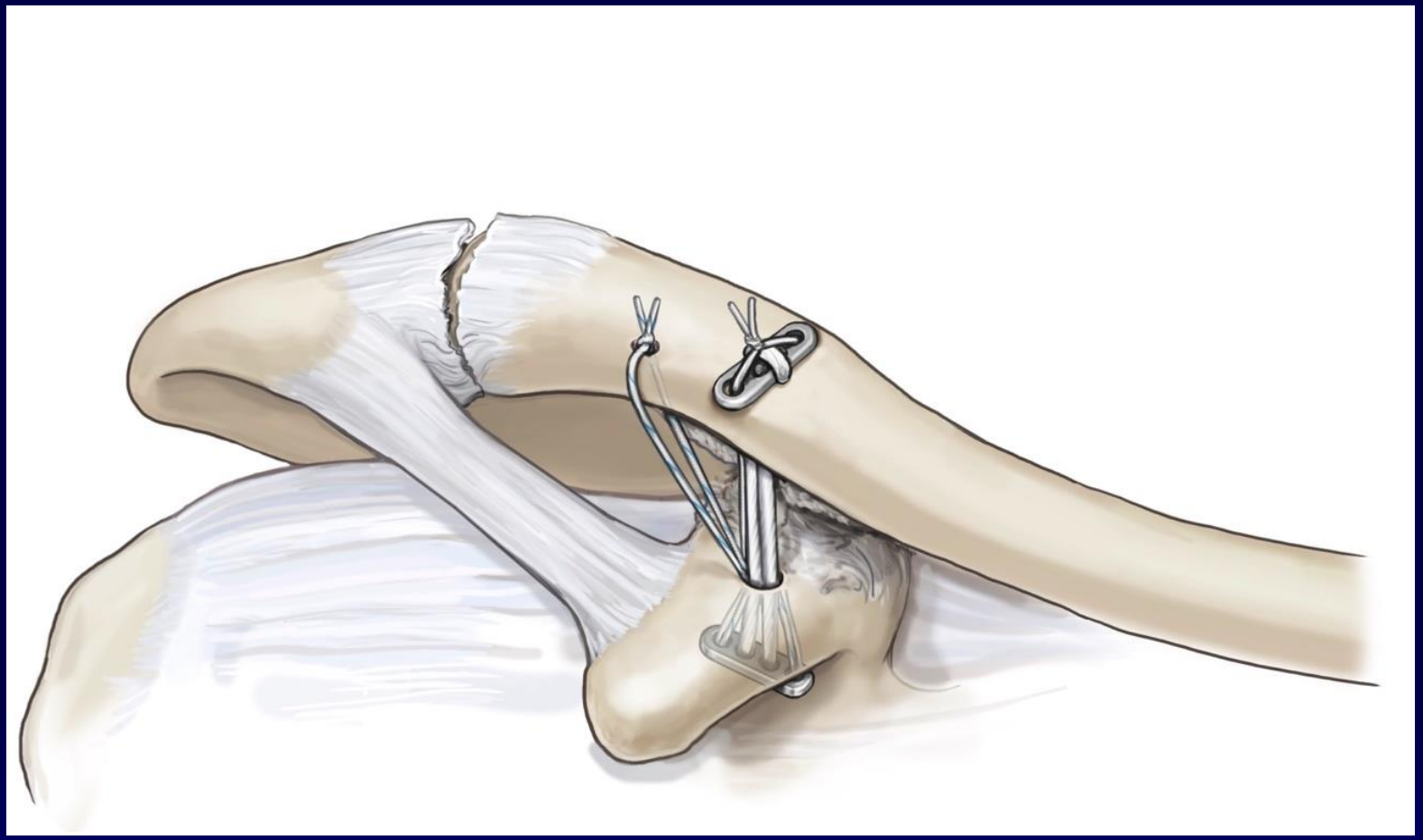
Acromioclavicular separations



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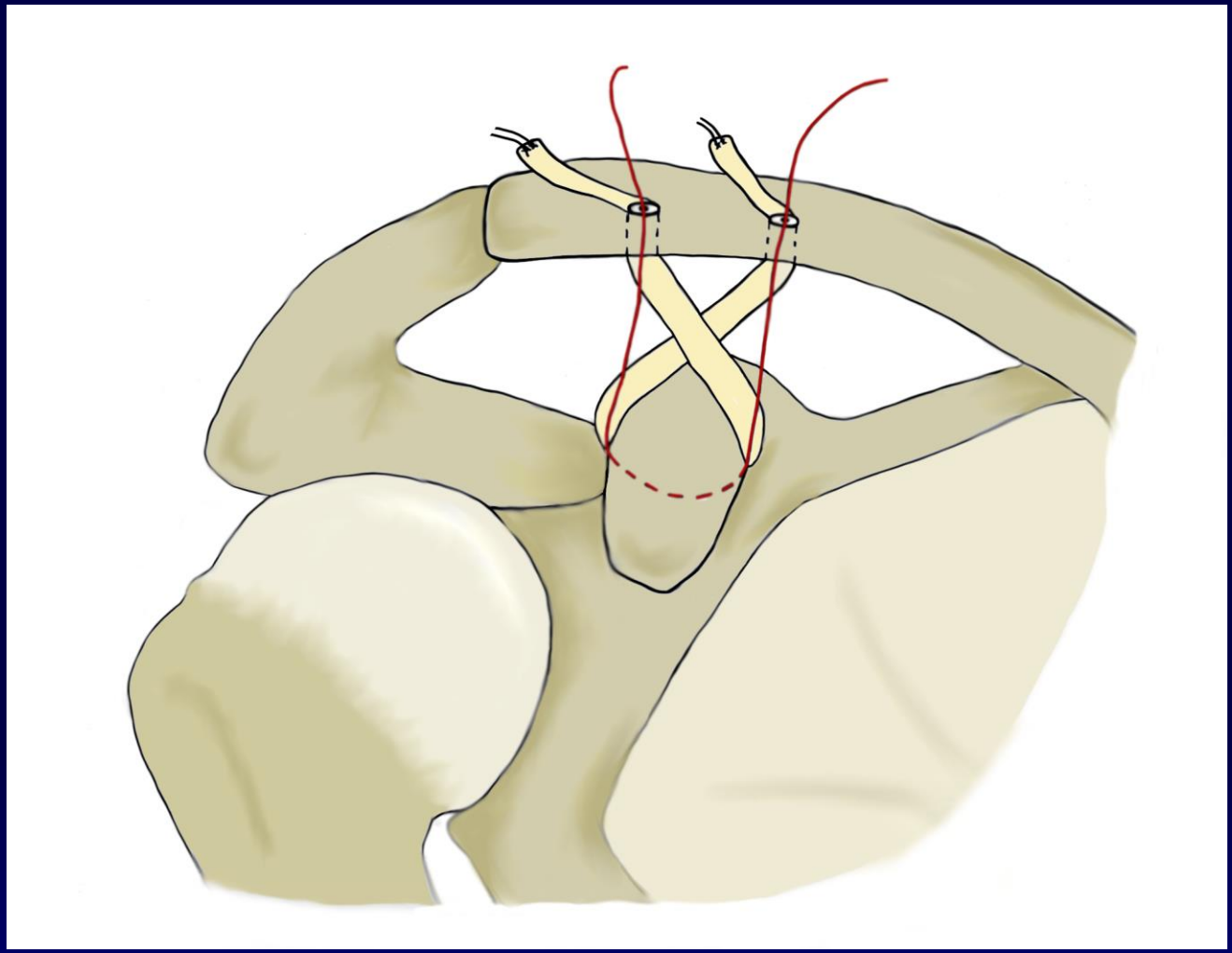
Acromioclavicular separations



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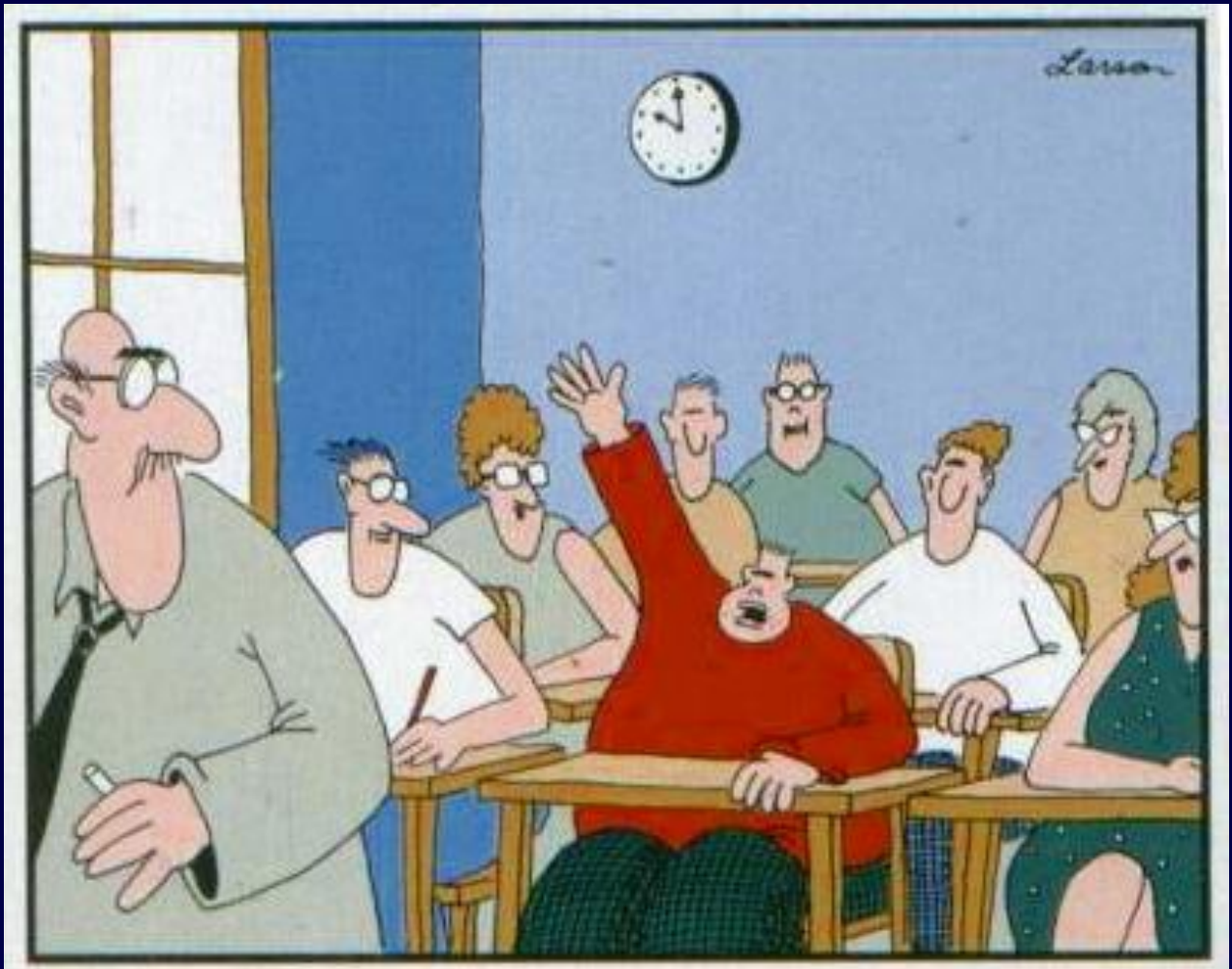

"Mr. Osborne, may I be excused?
My brain is full."

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Case #3

- 18yo high school football player is tackled, landing on his right extended arm
- Immediate deep pain
- Unable to move shoulder
- Taken to training room for evaluation

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Case #3

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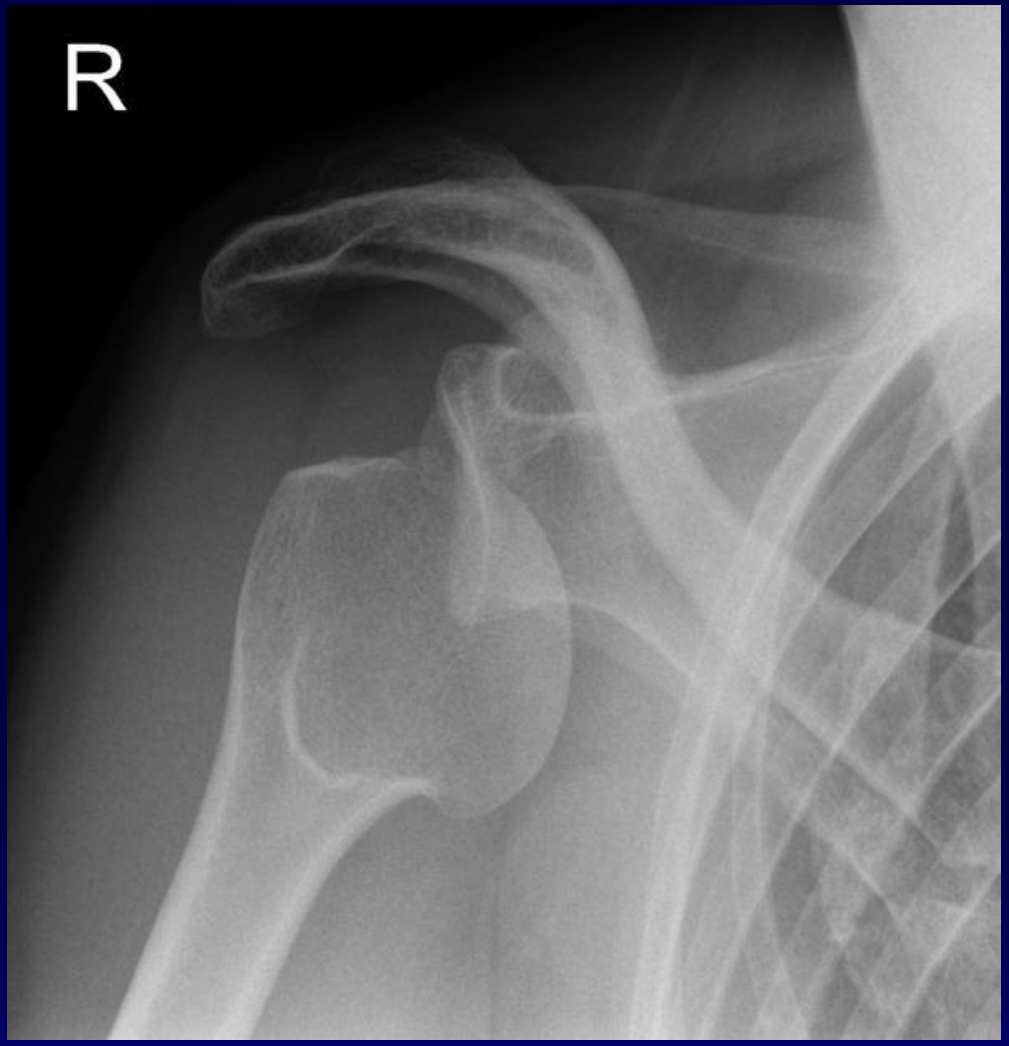
Case #3



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Case #3

- Diagnosis?

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Glenohumeral Dislocations

- Very common injury in younger age groups
- Males (9:1)
- FOOSH
- ABER position
- Majority of traumatic dislocations are anterior/anteroinferior
- Posterior associated with epileptic seizures and electrocution

Glenohumeral Instability

- Loosely divided between traumatic and atraumatic etiology.
- Traumatic usually unidirectional
- Atraumatic usually multidirectional
- TUBS
- AMBRI

Glenohumeral Instability

- TUBS
  - Traumatic
  - Unilateral
  - Bankart lesion
  - Surgical management

Glenohumeral Instability

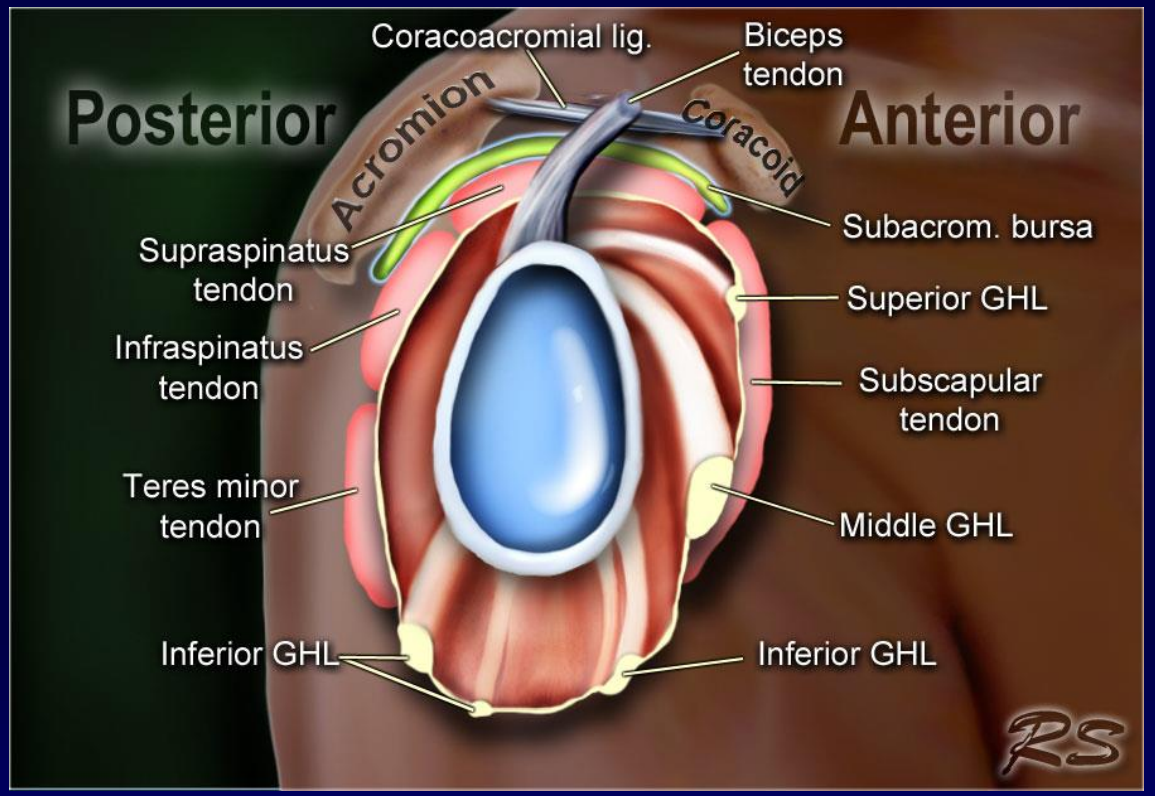
- AMBRI
  - Atraumatic
  - Multidirectional
  - Bilateral
  - Rehabilitation
  - Inferior capsular shift

Multidirectional Instability

- Usually atraumatic
- Multiple subluxation episodes
- Often never required reduction
- “Loose-jointed”
- Positive sulcus/apprehension signs
- Management is PT, then PT, and more PT
- Inferior capsular shift or arthroscopic plication

Glenohumeral Dislocations

- Anatomy review
  - Glenoid
  - Labrum
  - Capsule



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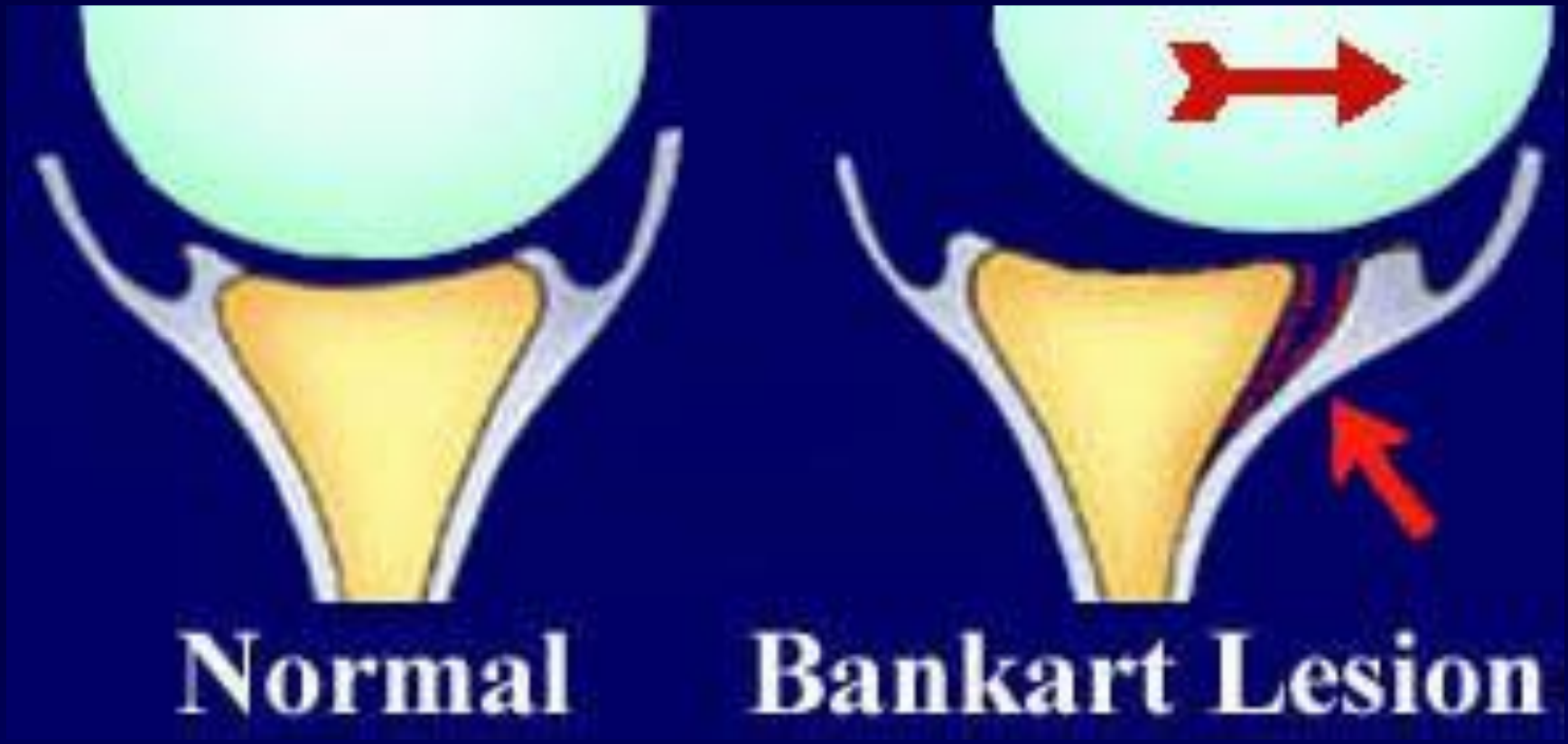
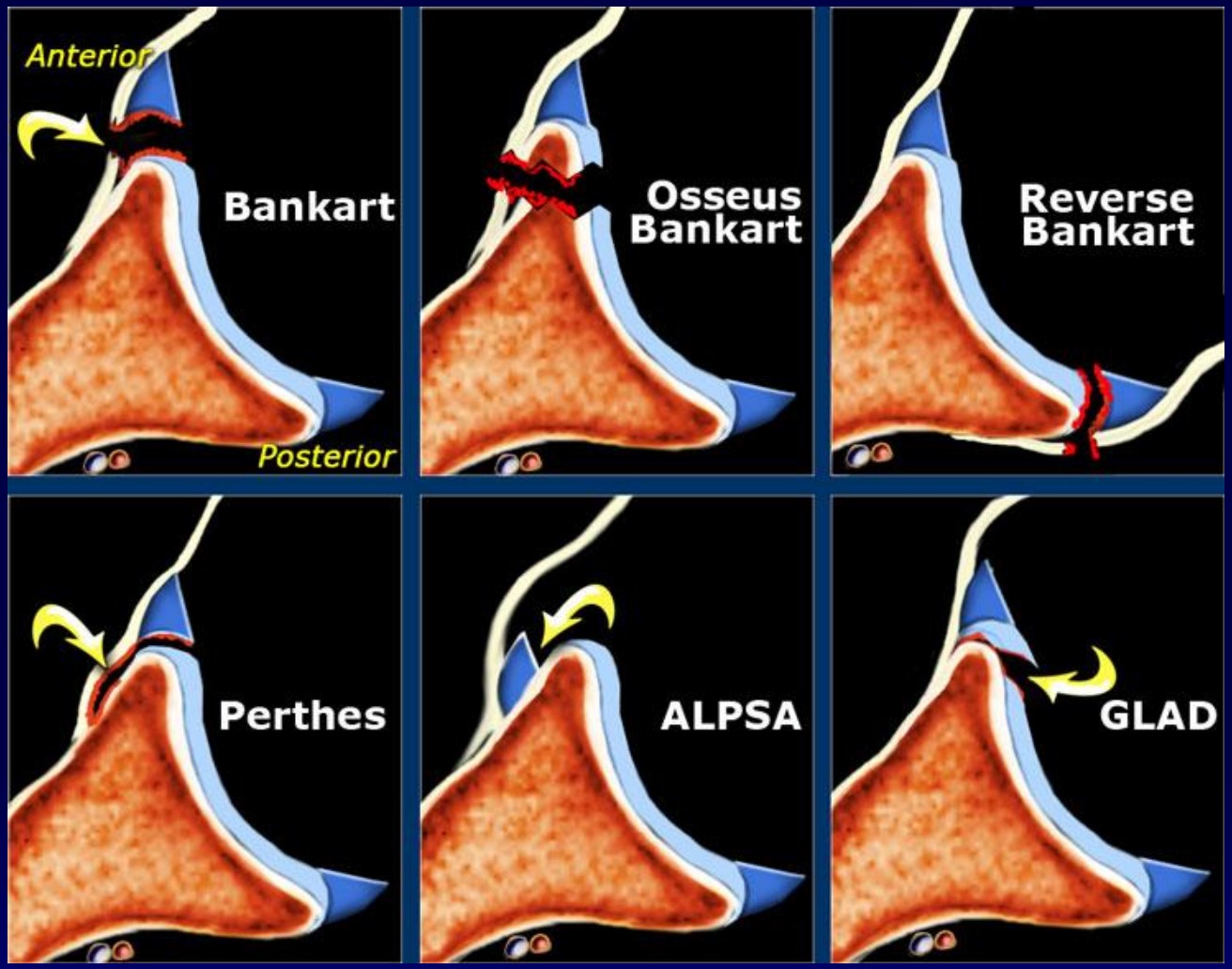
Glenohumeral Dislocations

- Bankart lesion is nearly an “essential” injury in traumatic glenohumeral dislocation
  - Capsulolabral injury
  - Bony Bankart
- Hill-Sachs lesion is a frequent concomitant injury to posterior humeral head

Glenohumeral Dislocations



Bankart and Friends



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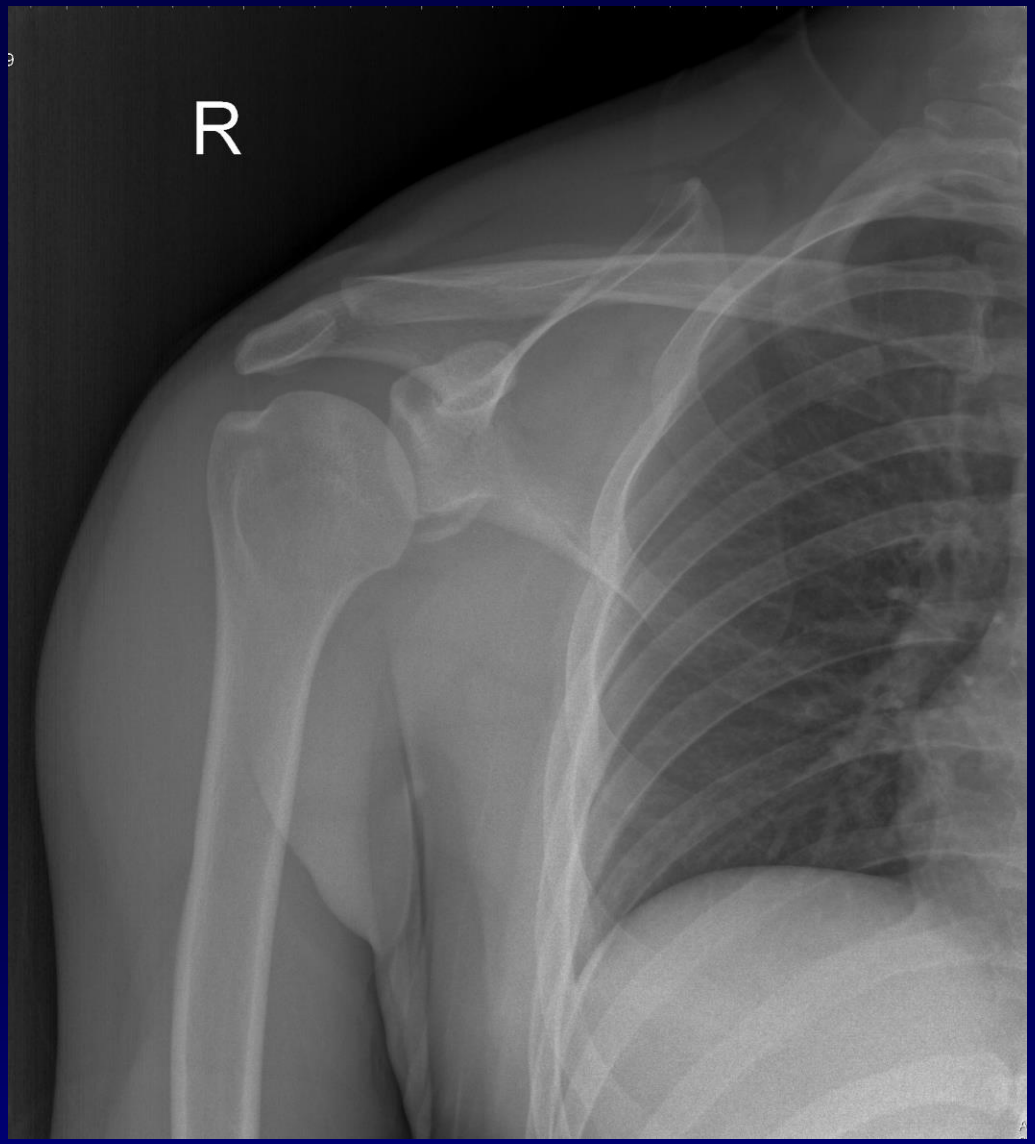
Bony Bankart – X-Rays



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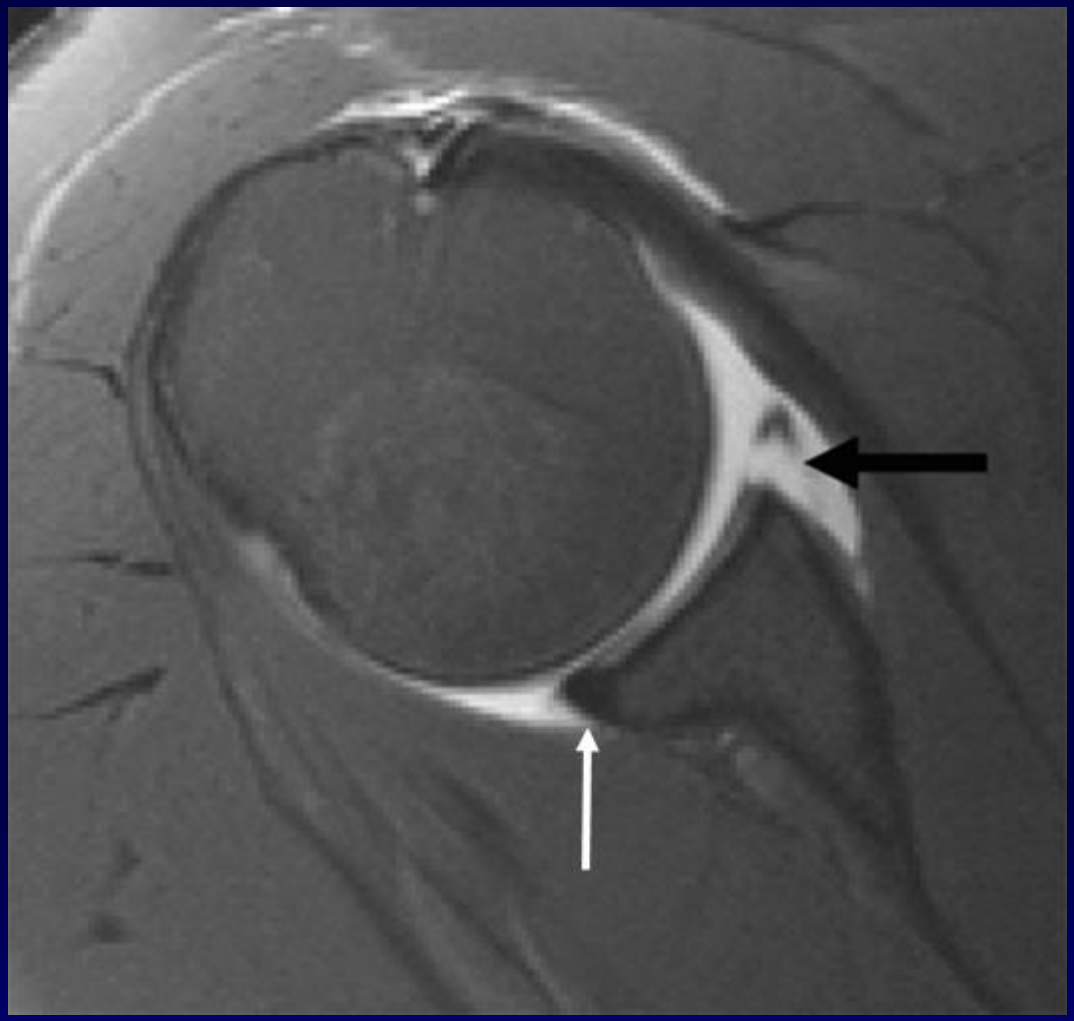
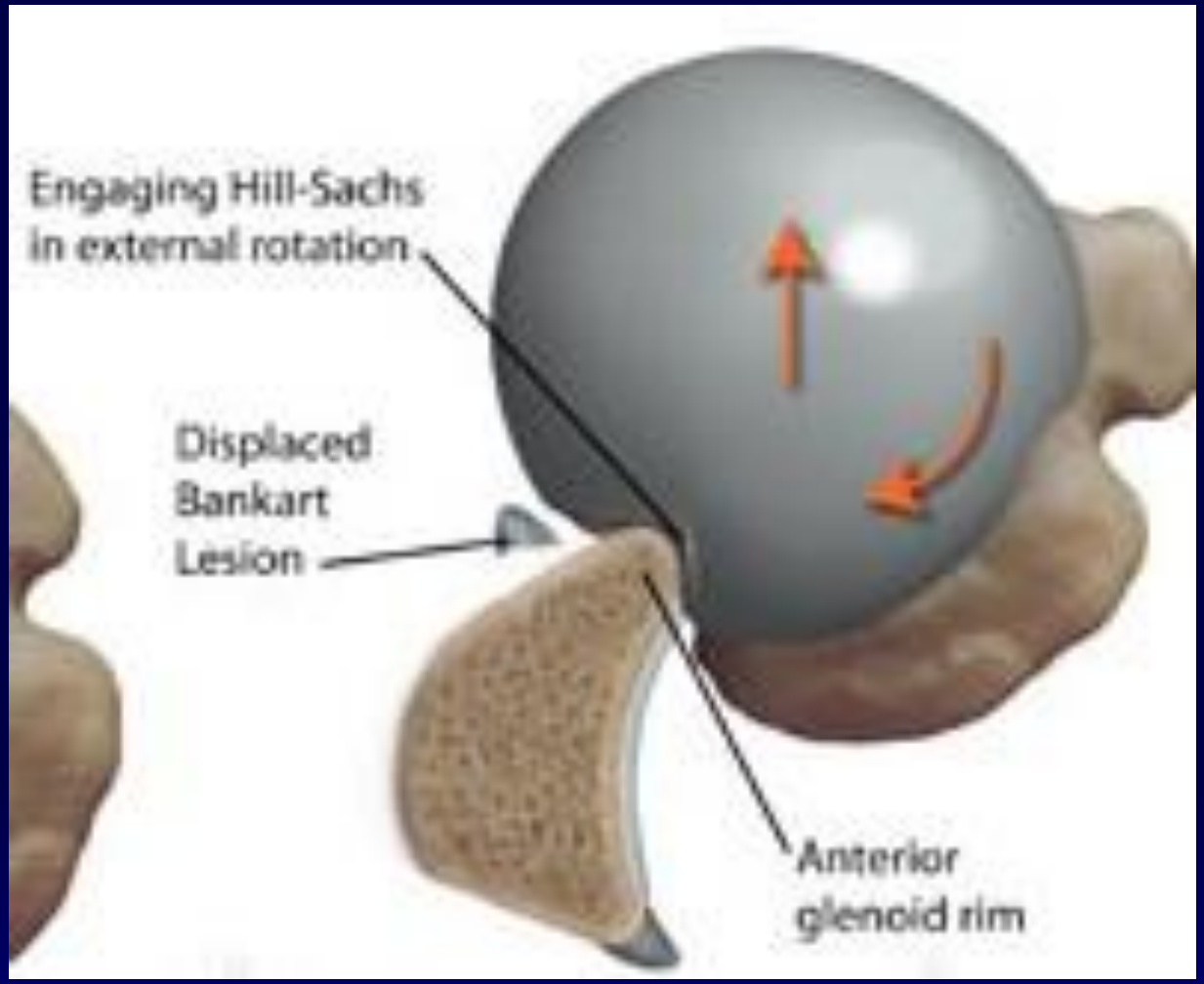
Bankart - MRI



Hill-Sachs Lesion



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Hill-Sachs Lesion

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Glenohumeral Dislocations

- Examination
  - Sulcus sign
  - Prominent acromion
  - Held in IR with limited AROM/PROM
- Imaging
  - Plain X-rays diagnostic (axillary view!)
  - MRI arthrogram shows Bankart
  - CT best for determining glenoid bone loss

Glenohumeral Dislocations

- Management
  - Closed reduction under anesthesia
  - Sling immobilization
  - Pain management
  - PT/Rehabilitation
  - Surgery?
  - Recurrent instability

Glenohumeral Dislocations

- Recurrent instability
  - Rates of re-dislocation higher in young Pts
  - 67% of first time dislocators will have a second
  - 90% of two-time dislocators will have a third

    Simonet and Cofield. Am J Sports Med, 1984.
- Some surgeons have recommended operative management of first time dislocators, especially young athletes

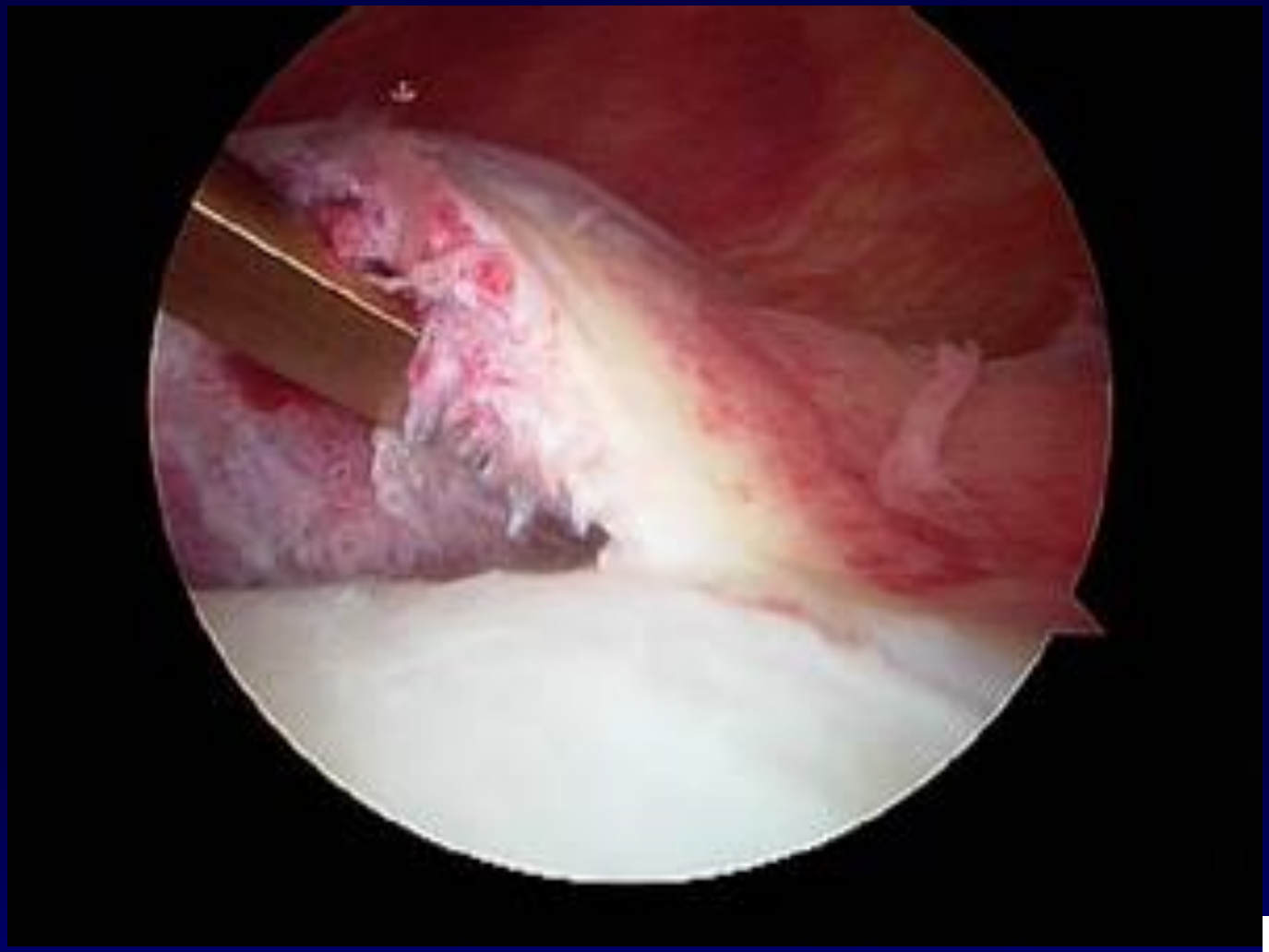
Recurrent Instability

- Age at first dislocation is most important factor in predicting recurrence
  - 0-20% in Pts older than 40 years
  - 40-60% in Pts 20-30 years old
  - 66-95% in Pts younger than 20 years old
  - Almost 100% in Pts with open growth plates

Simonet and Cofield. Am J Sports Med, 1984.

Nevaiser et al. J Shoulder Elbow Surg, 1995.

Bankart Lesion



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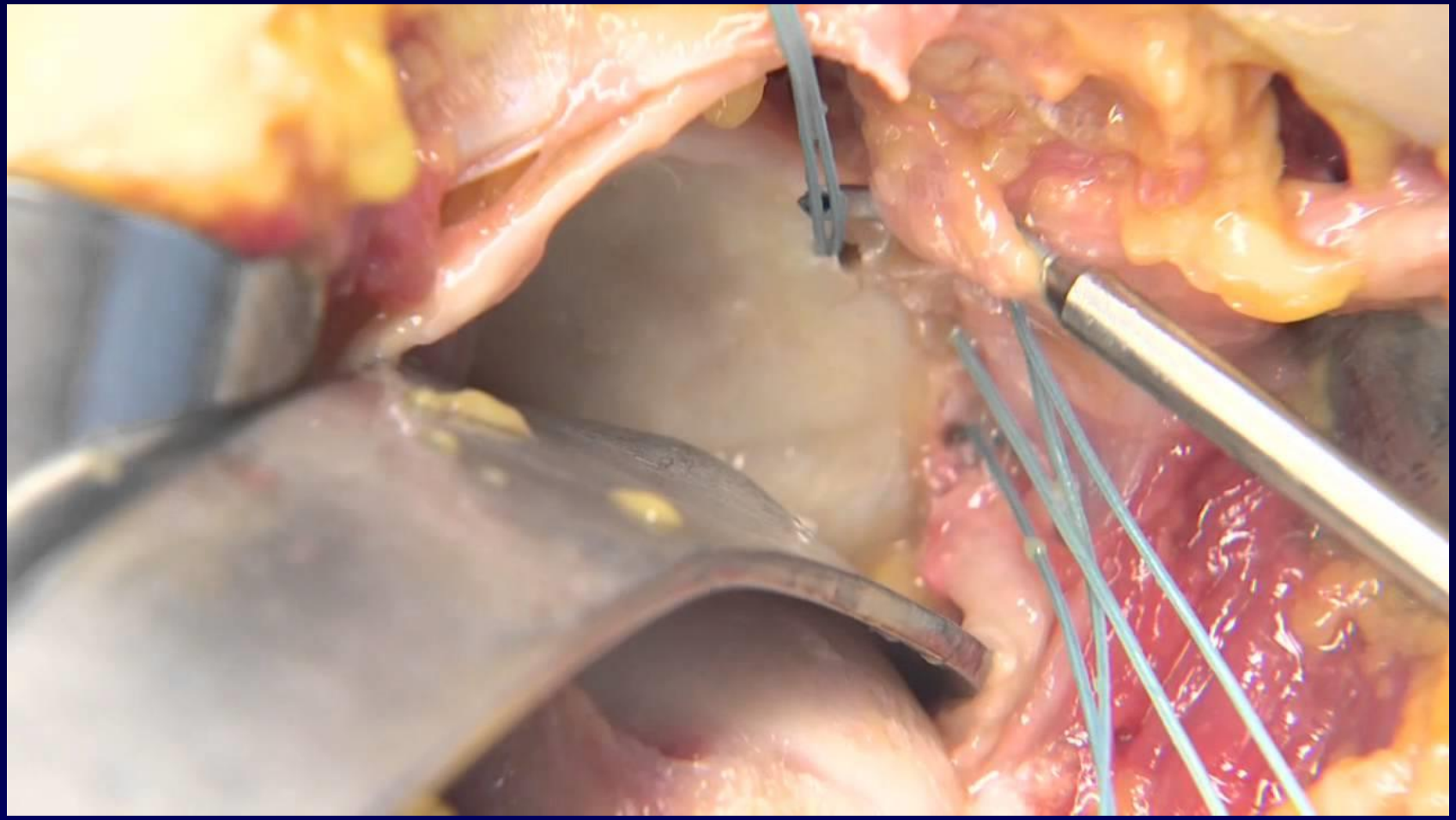
Treatment Options

- Conservative
- Surgical
  - Open Bankart repair/capsular shift
  - Arthroscopic Bankart repair

Open Bankart Repair

- Limited deltopectoral incision
- Labrum reattached to articular edge
  - Bone tunnels
  - Suture anchors
- Knots on outside of capsule
- Independent lateral capsular shift
- Overlapped capsular flaps

Open Bankart Repair



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Open Bankart Repair

- 161 Pts
- Bone defects
  - Glenoid 77%
  - Hill-Sachs 78%
- Only 5 recurrences
- 97% satisfied

Rowe. J Bone Joint Surg 1978

Open Bankart Repair

- 103 Pts
- 85% collision athletes
- Bone defects
  - Glenoid bone loss 14%
  - Hill-Sachs 84%
- 2 recurrences!

Pagnani. Am J Sports Med 2008

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Arthroscopic Bankart Repair

- Less invasive, smaller incisions
- Shorter operative time
- Faster recovery
- Lower incidence of neurovascular injury
- More elegant
- Better in every way?!?

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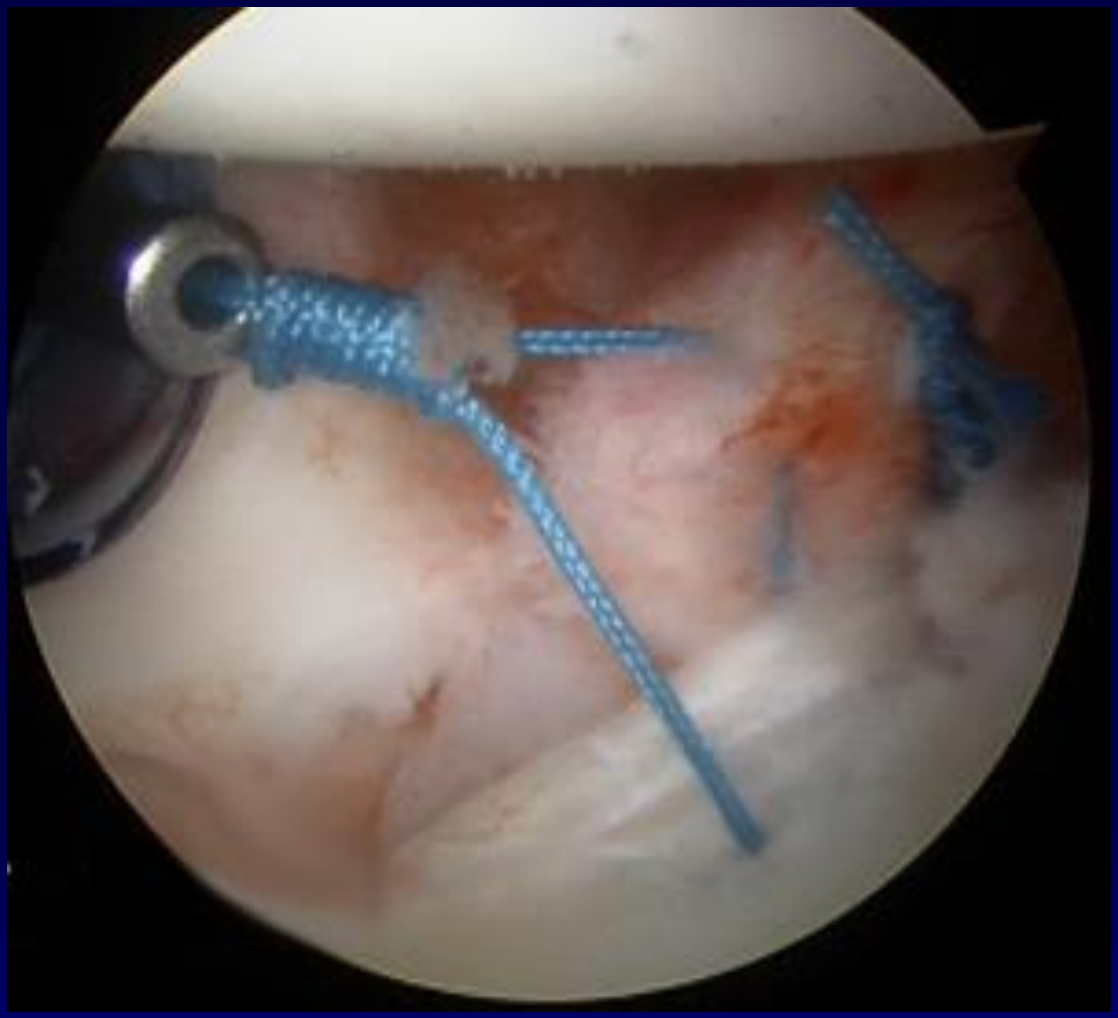
Arthroscopic Bankart Repair



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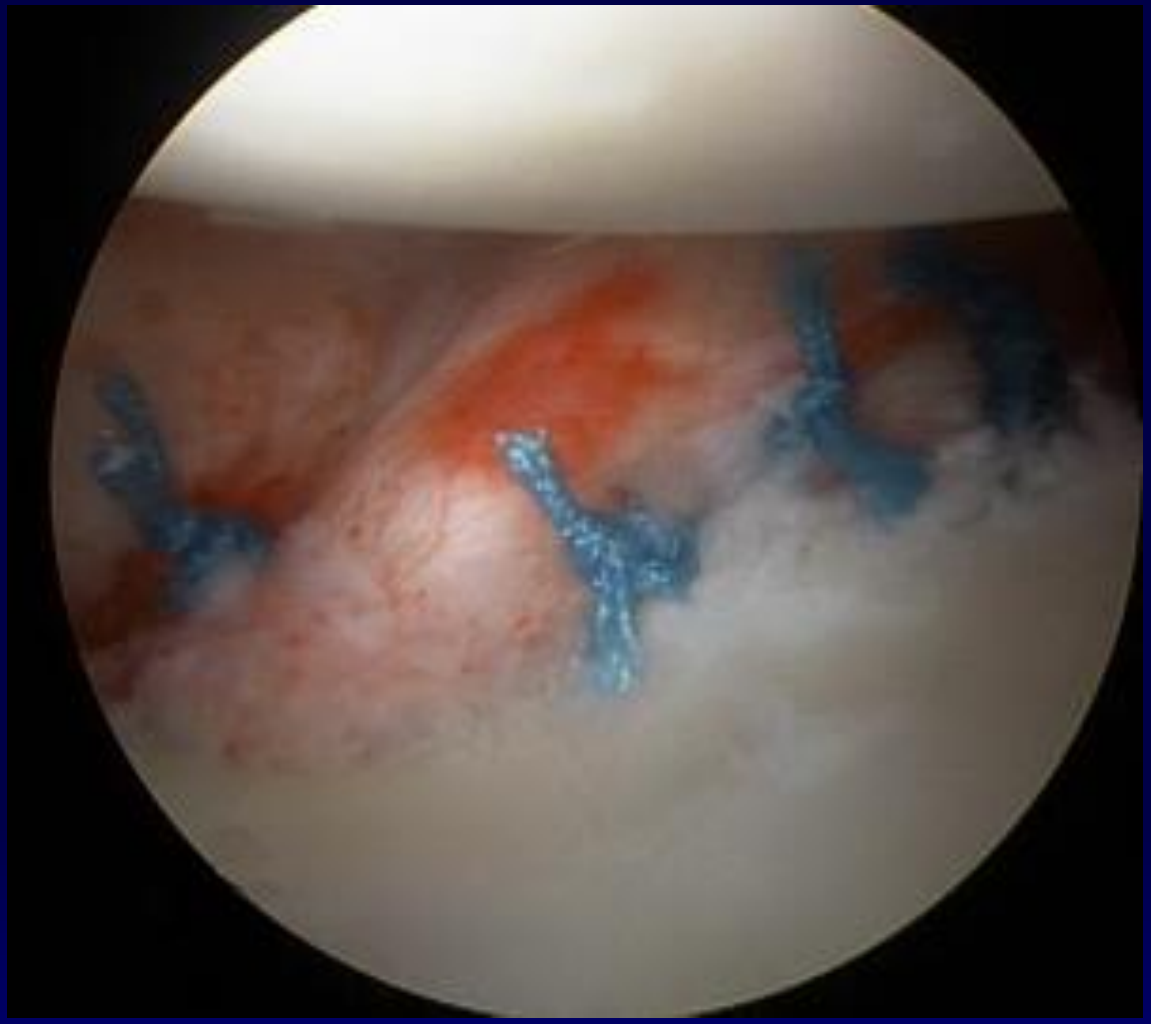
Arthroscopic Bankart Repair



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“Those who do not remember the past are condemned to repeat it”

--George Santayana

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Recurrent Instability

- 79 open repairs, 83 arthroscopic
- WOSI scores: No difference
- Recurrence rates:
  - Open 11%
  - Arthroscopic 23%

Mohtadi et al. J Bone Joint Surg, 2014

Recurrent Instability

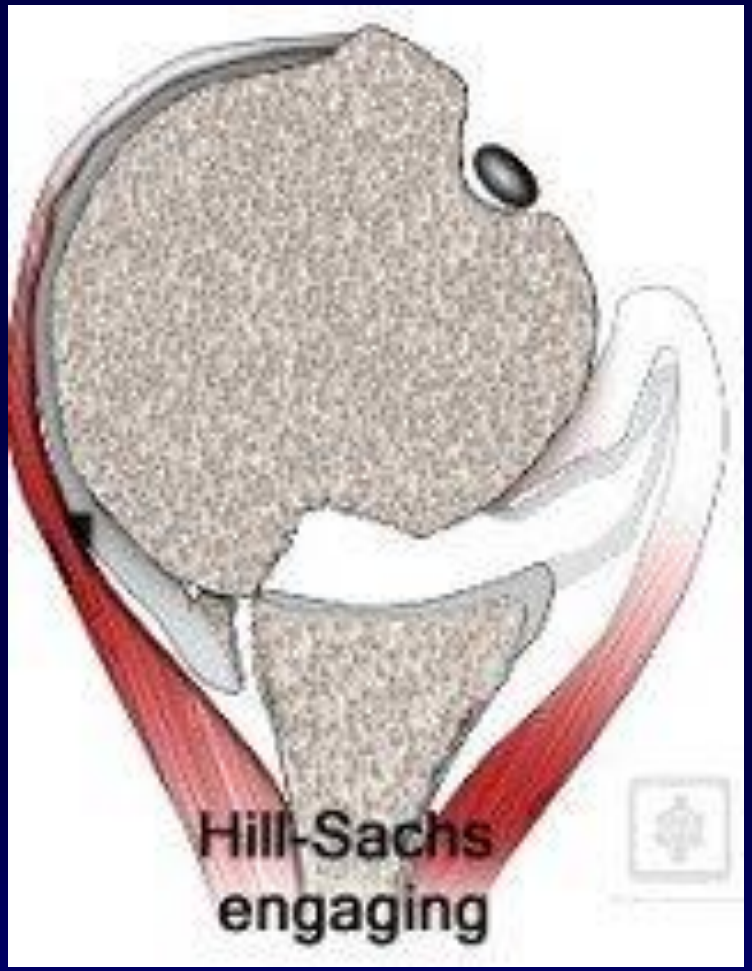
- Consider mechanism
- Beware of glenoid bone loss, especially in multiple time dislocators
- CT scan with 3D recons
- Most will require surgical management
- Bone augmentation
  - Latarjet
  - Bone graft

Bone Loss

- Humeral side
- Glenoid side
- Both (“Bipolar”)

- “On track” vs. “Off track” lesions

Itoi 2017



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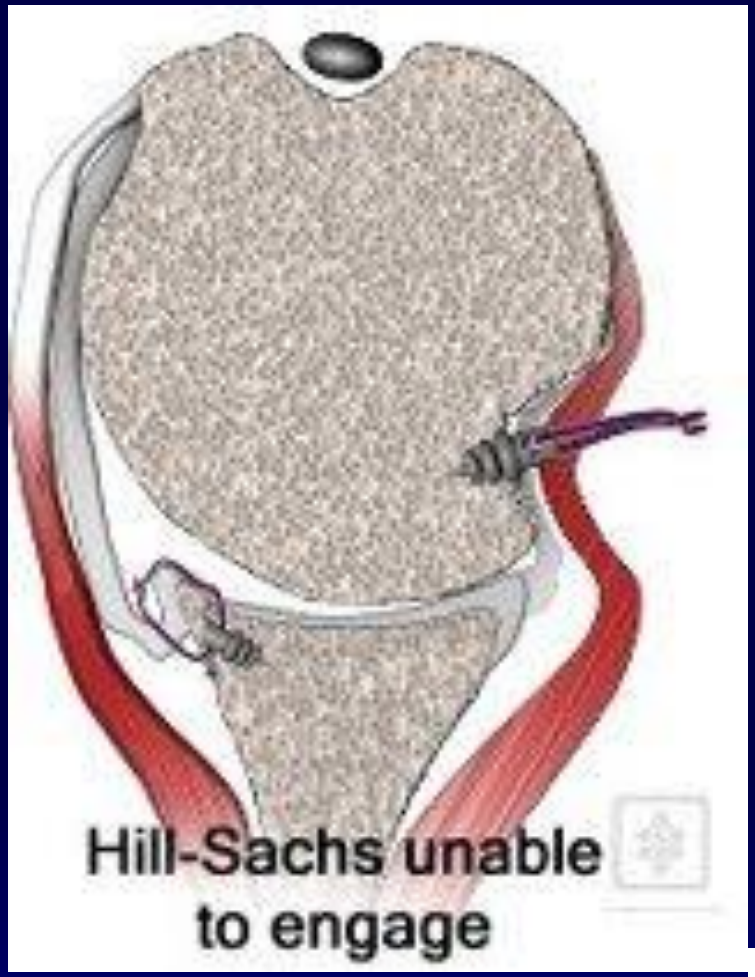
Remplissage

- Insertion of infraspinatus tendon into Hill-Sachs lesion

  Wolf et al. J Shoulder Elbow Surg, 2014.



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Remplissage

- Can be done arthroscopically!
- Learning curve
- Adds +/- 10 min. to Bankart repair

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Remplissage

- 50 patients (Average 29 yo)
- “Off track” Hill-Sachs lesions
- 60 months average follow-up
- Redislocation rate 11%
- 95.5% return to sport
- Loss of ER 5.3 degrees

Garcia et al. Am J Sports Med, 2016.

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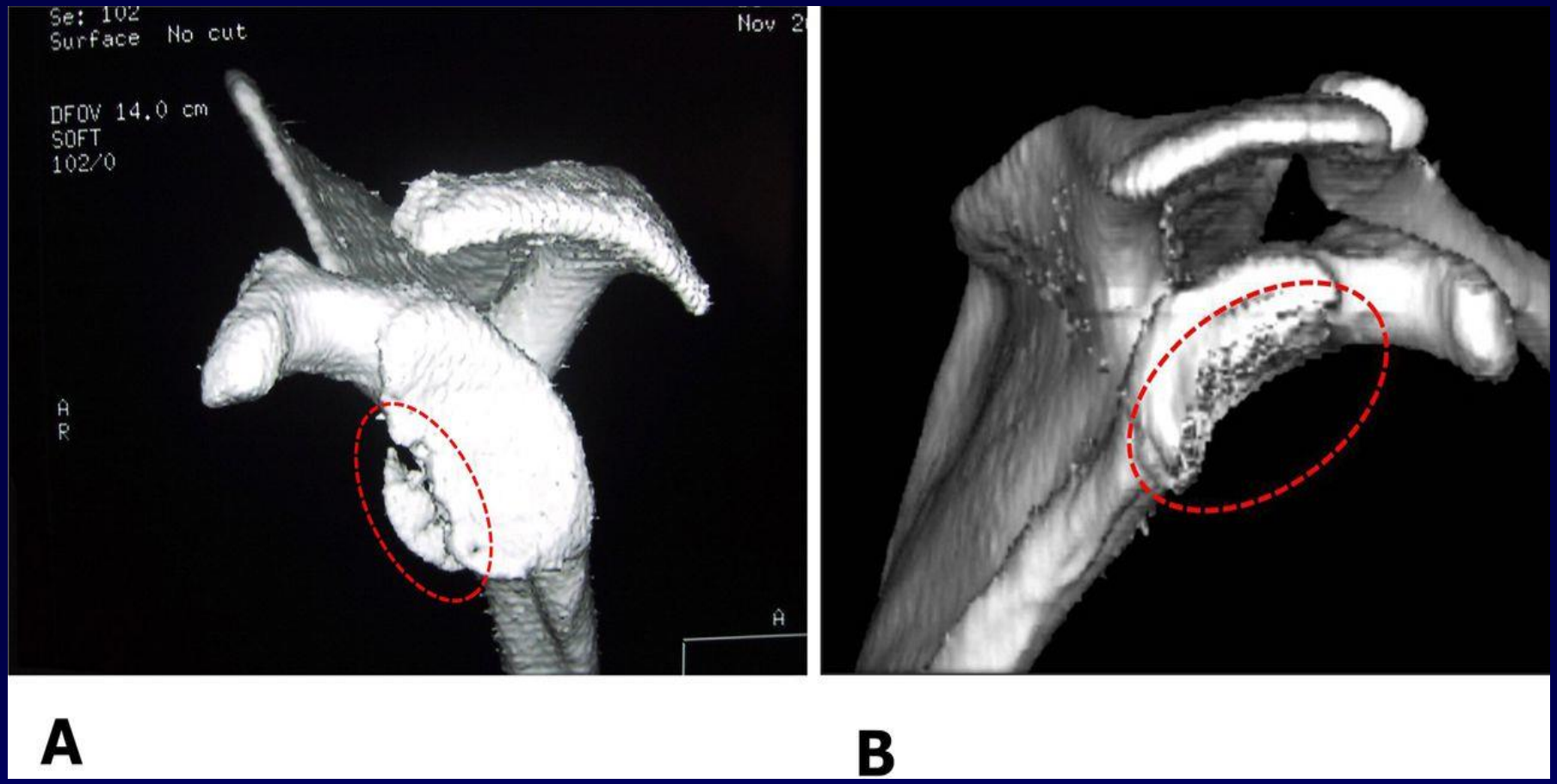
Glenoid Bone Loss



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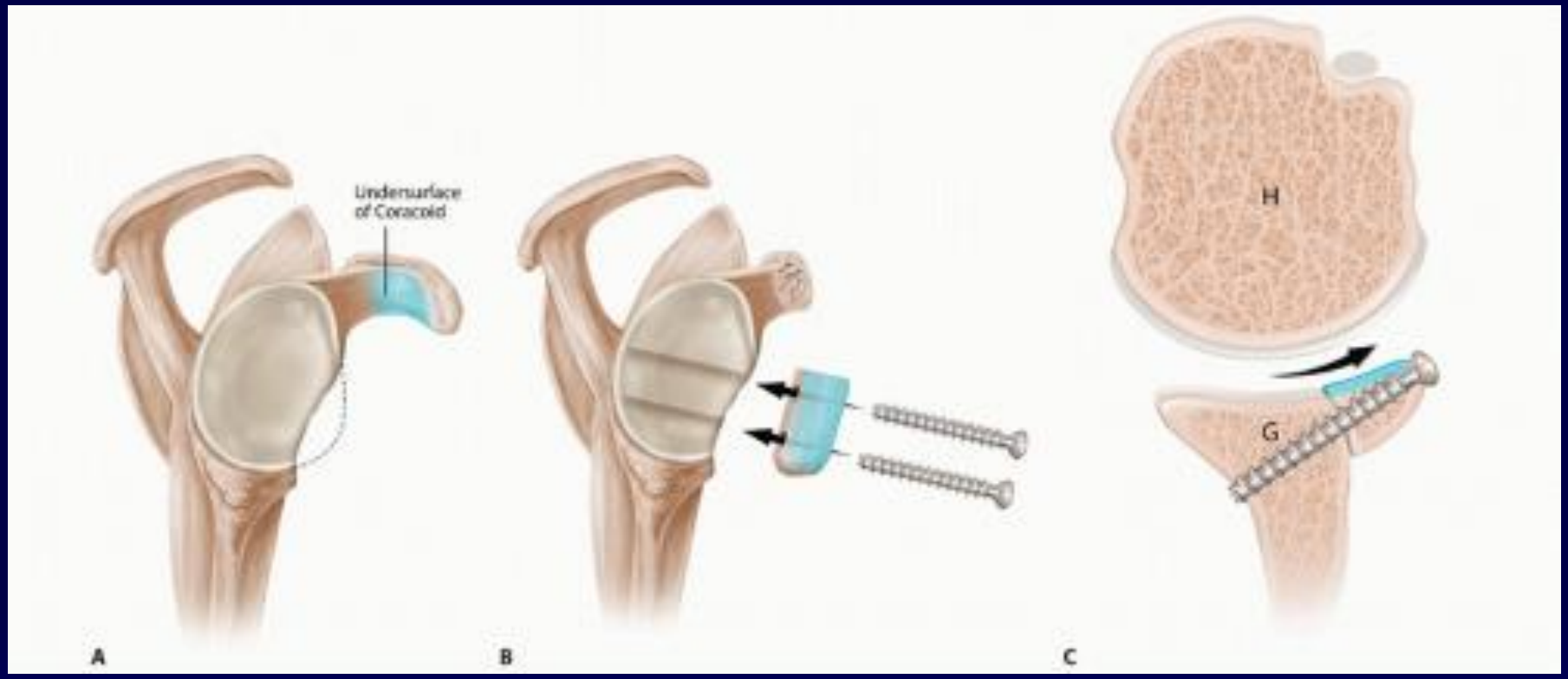
Latarjet Procedure

- Described in 1954
- Modified to be performed through subscapularis split
- “Triple blocking effect”
  - Increased bony arc
  - Sling effect of subscapularis
  - Capsular tightening
- Some surgeons performing arthroscopic

Latarjet Procedure



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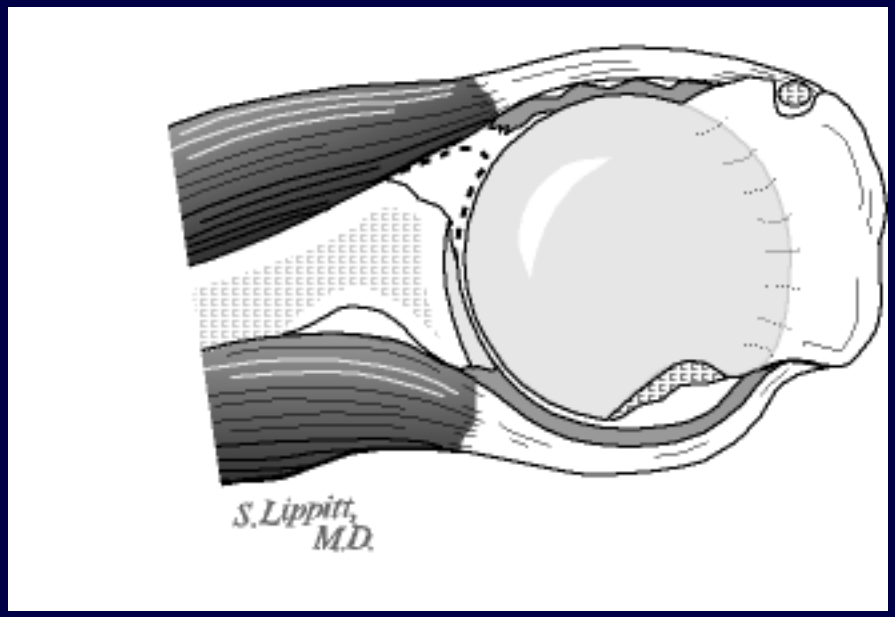
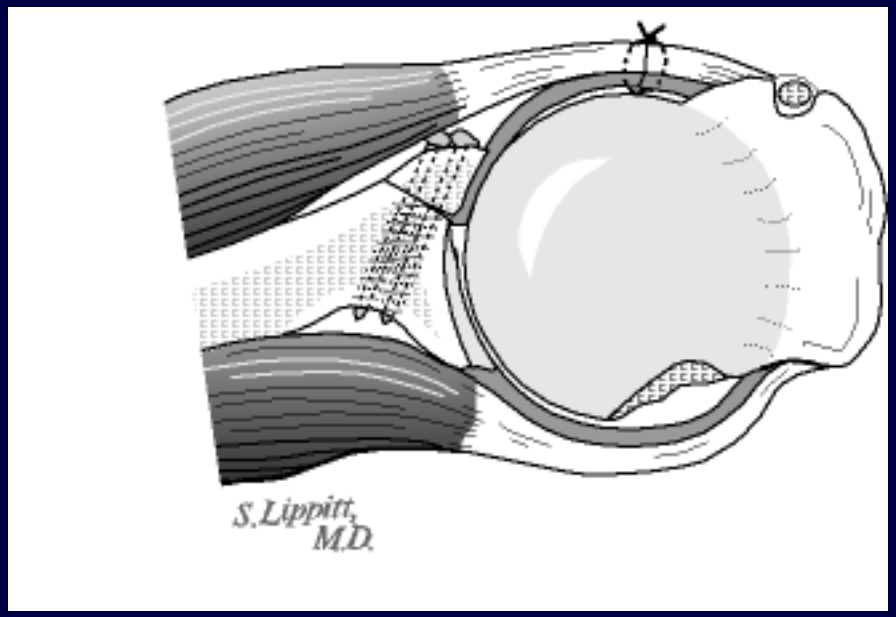
Bone Grafting Anterior Glenoid





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Distal Tibial Allograft

- Easy to prepare
- No morbidity from coracoid harvest
- Less pain/easier recovery
- Comparable results to Latarjet
- Fewer complications?

Provencher et al. Arthroscopy 2009

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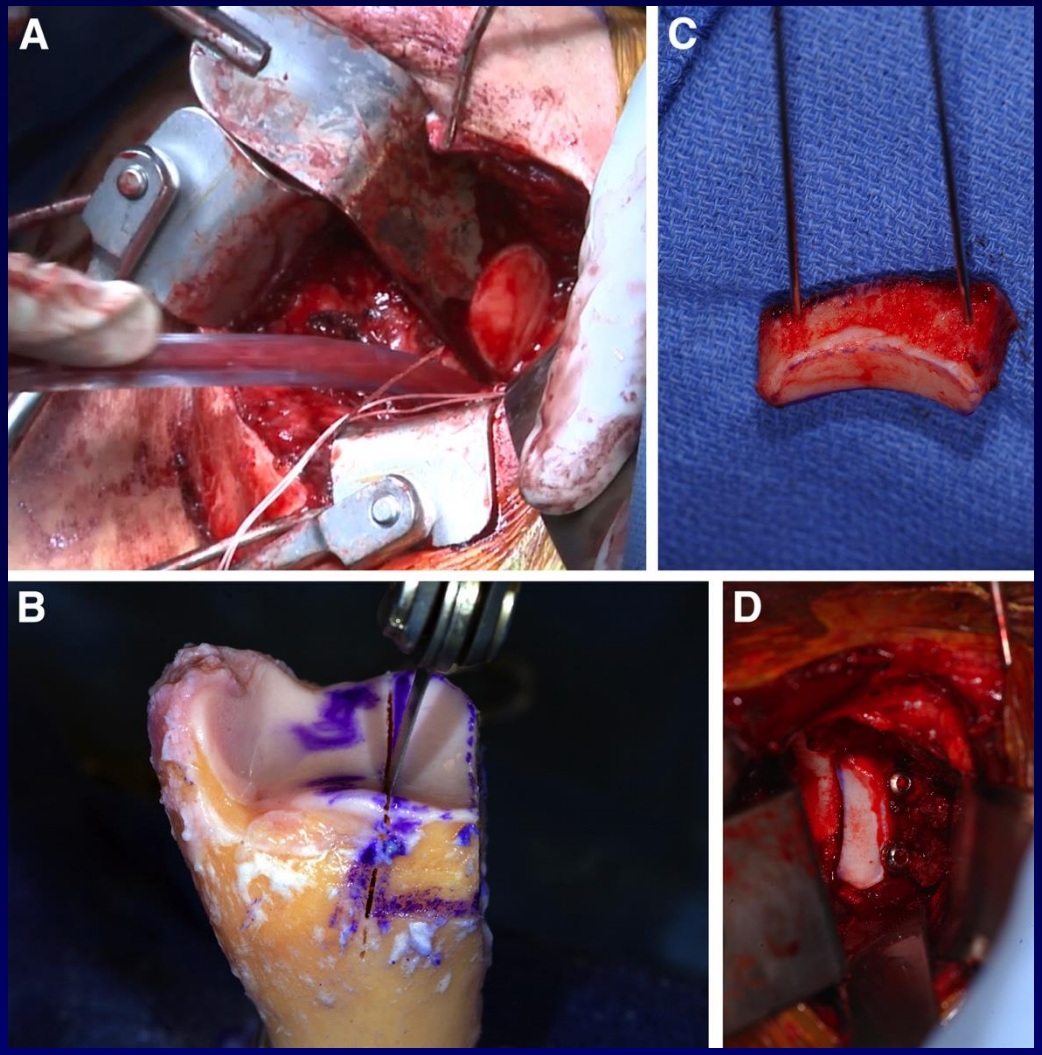
Distal Tibia Allograft



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Take Home Points

- Recognize common shoulder injuries in the young athlete
- Formulate differential diagnoses
- Recommend initial treatment plans:
  - Immobilization
  - Pain Management
  - Imaging
  - Definitive treatment
  - Rehabilitation

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