

The diagnosis and management of common shoulder disorders

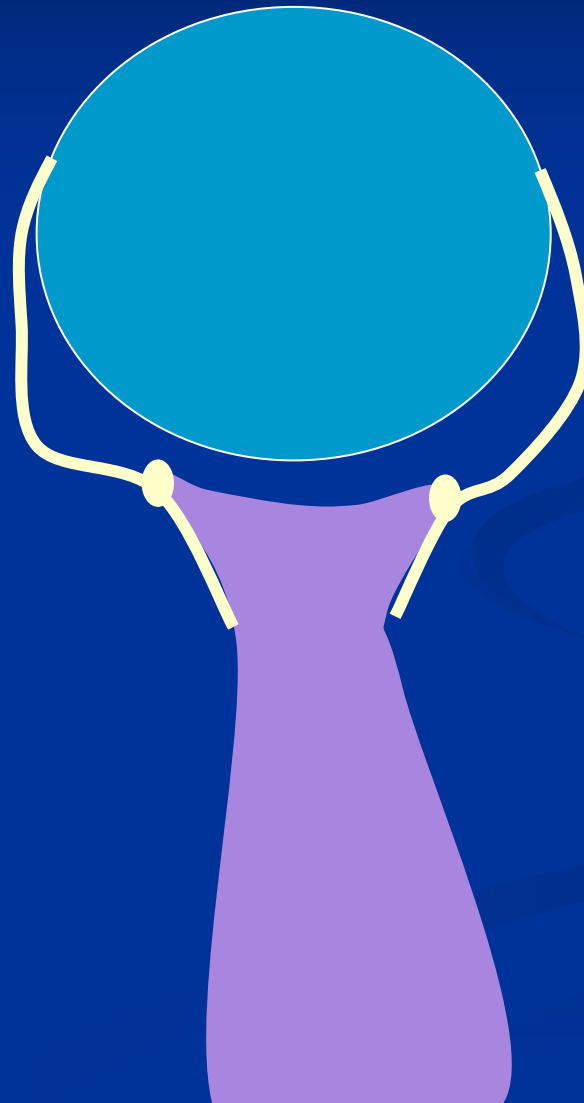
Jaime Candal-Couto

Consultant Orthopaedic Surgeon

Bones & Joints



Glenohumeral joint

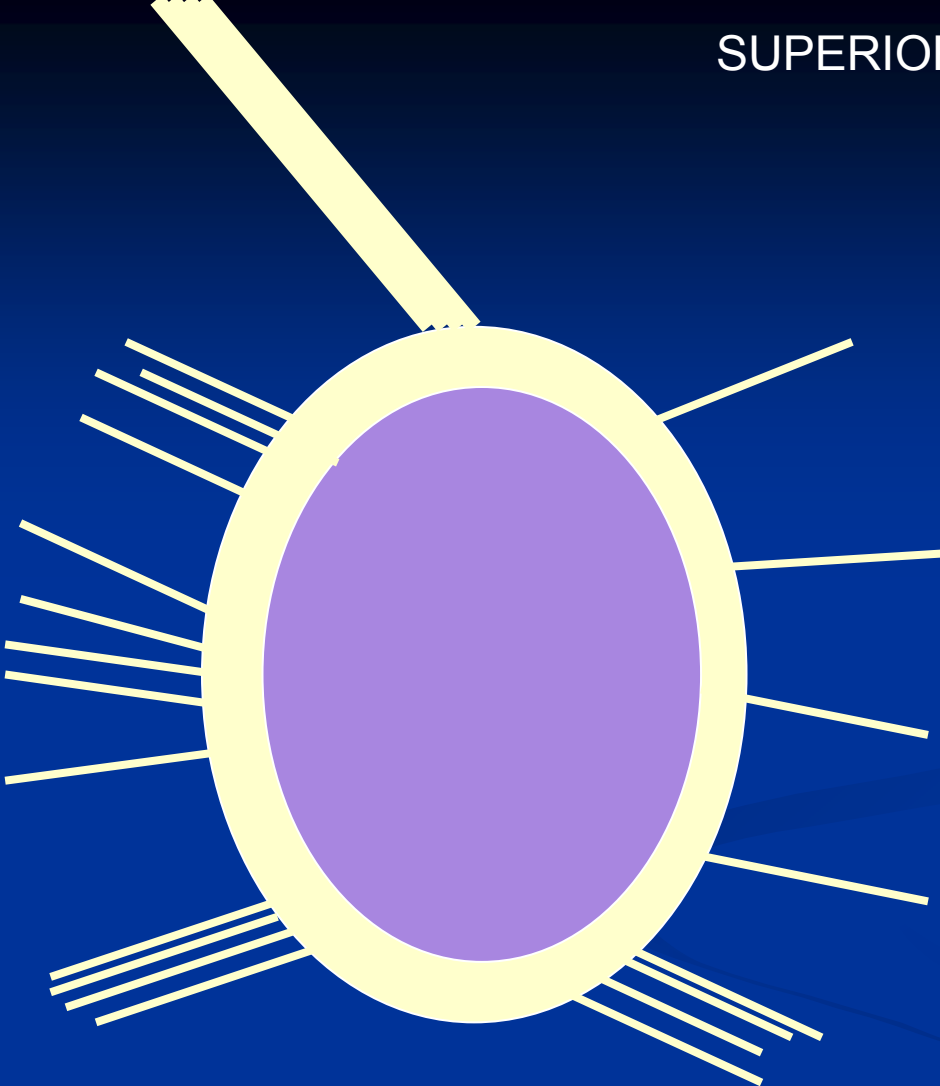


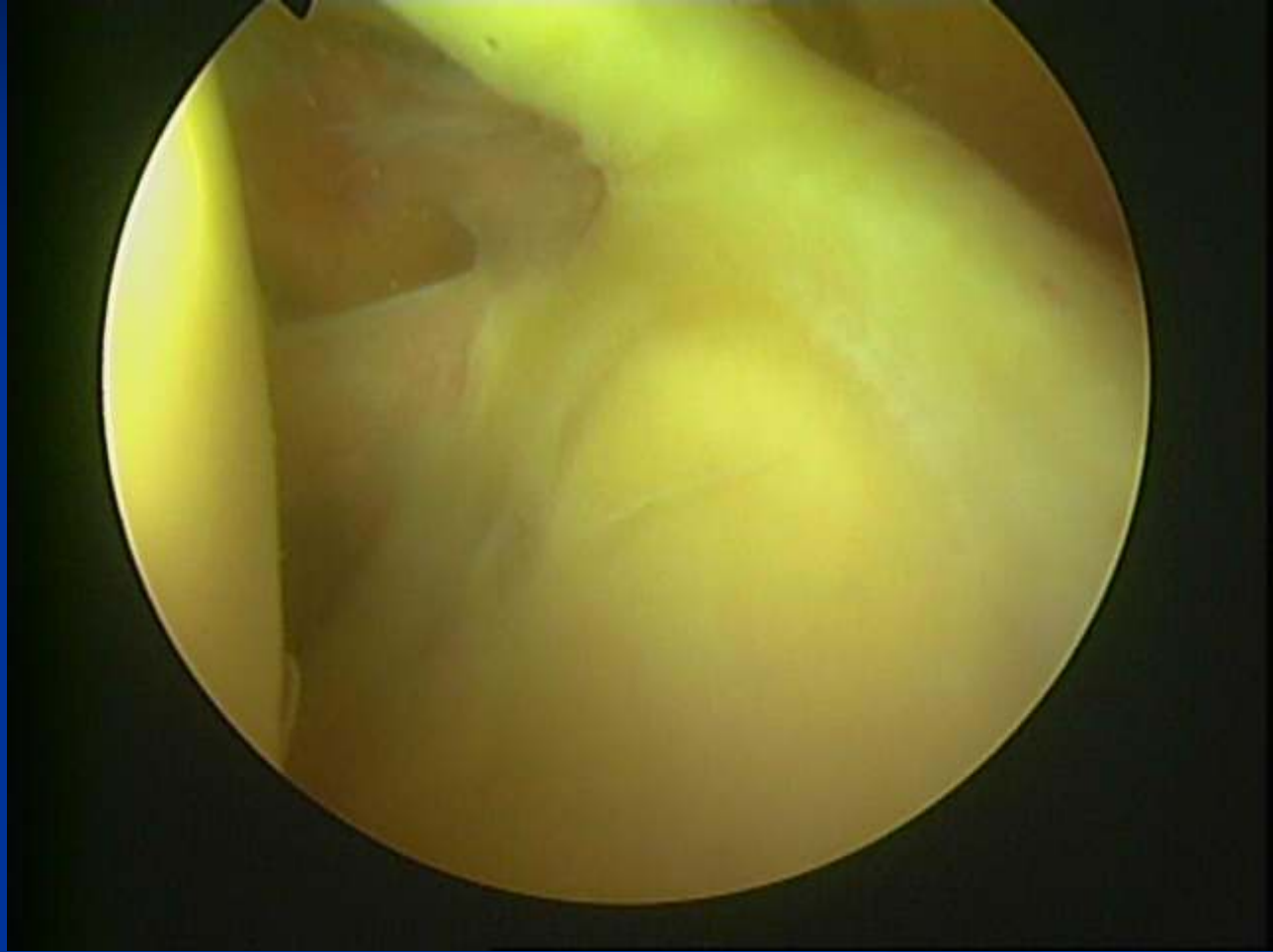
SUPERIOR

ANTERIOR

POSTERIOR

INFERIOR

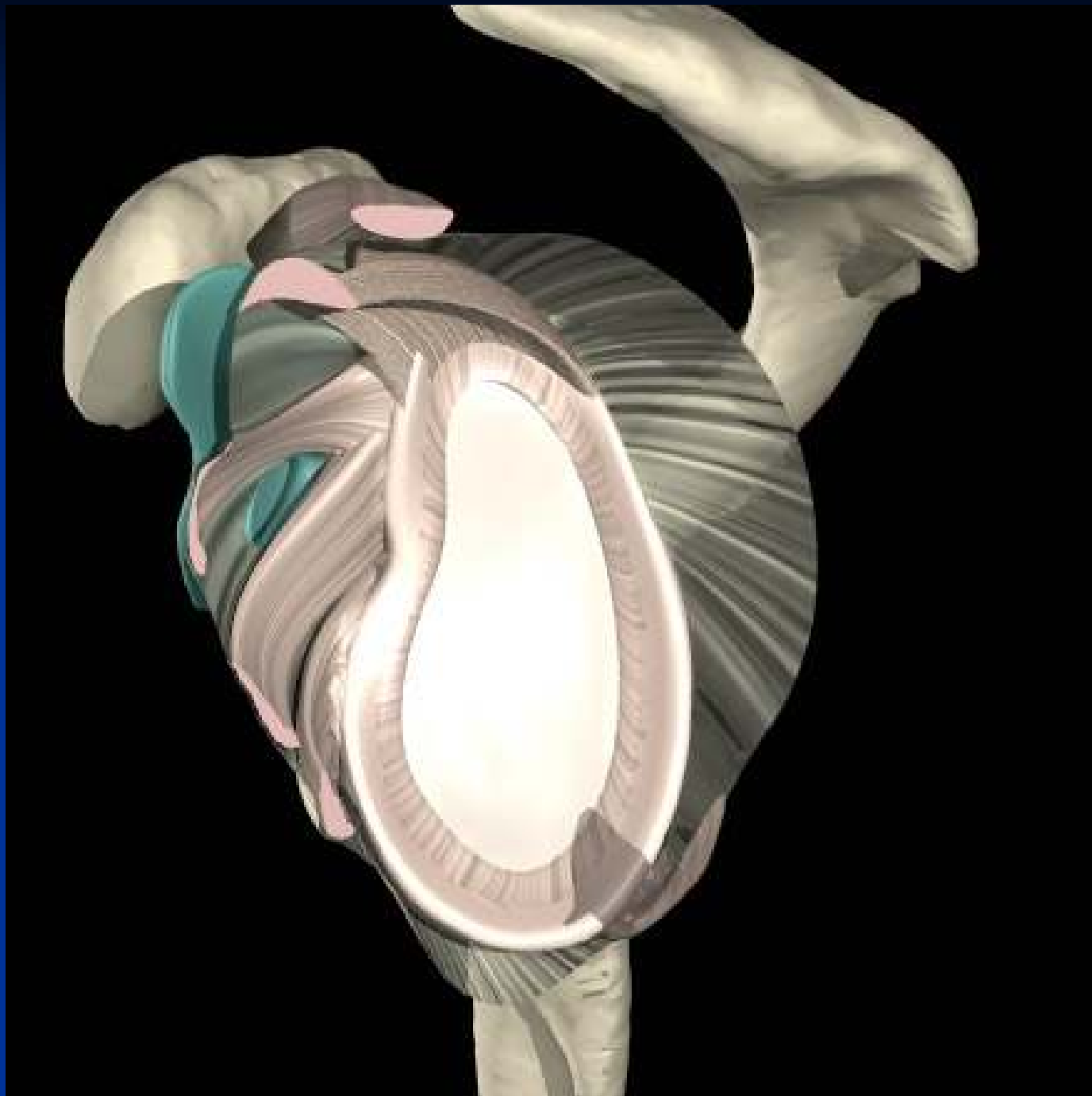


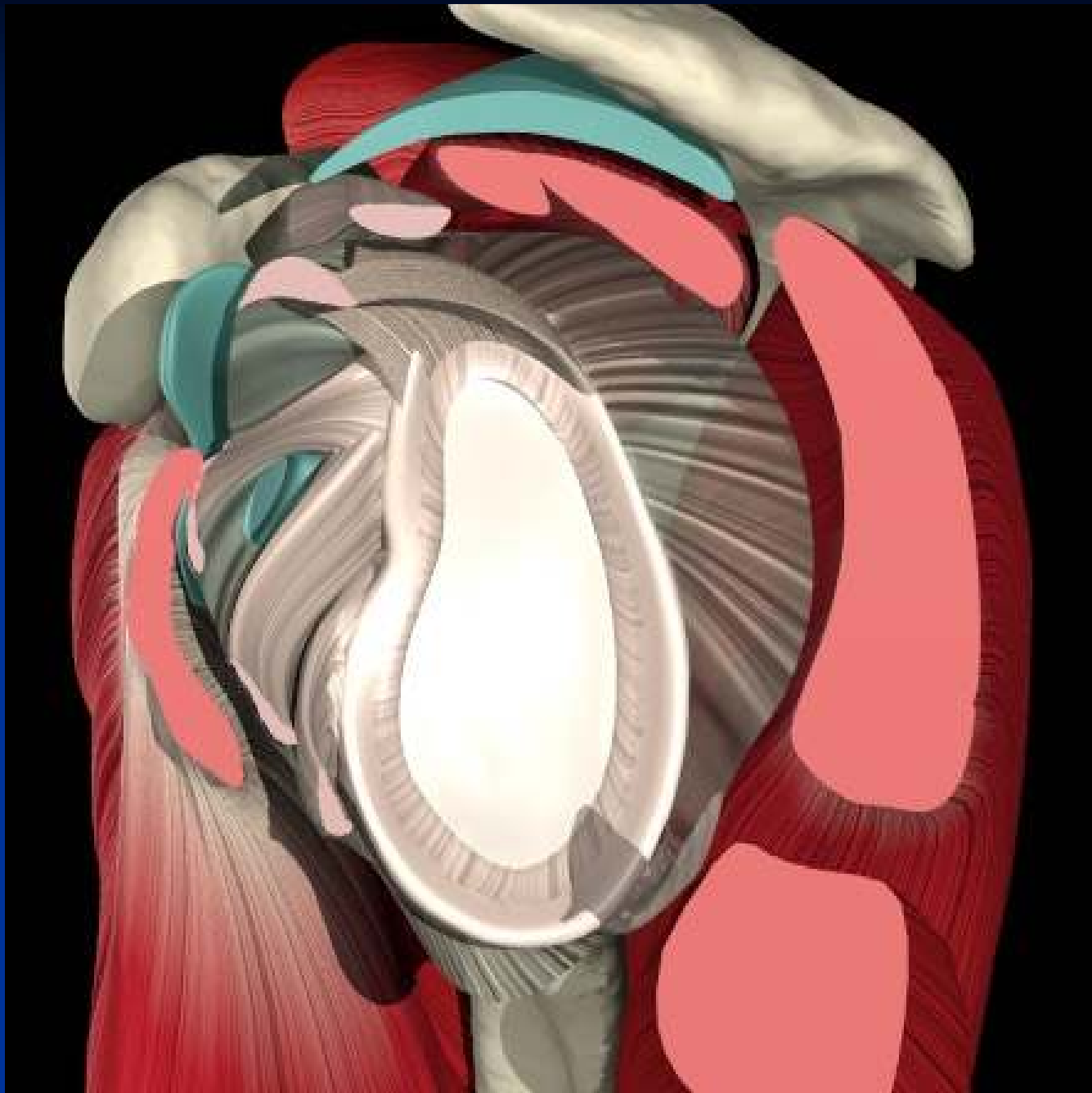




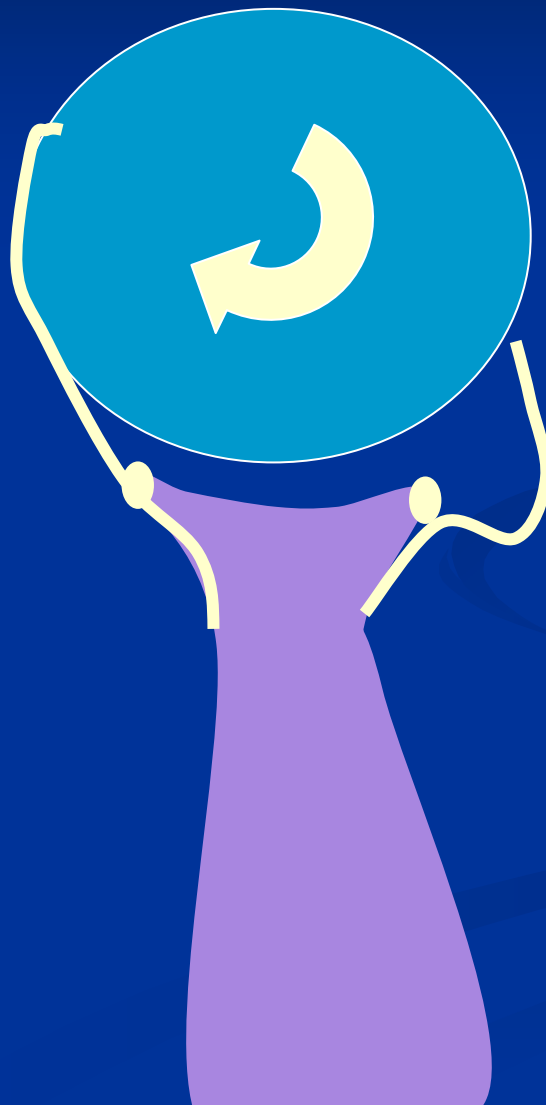


Package

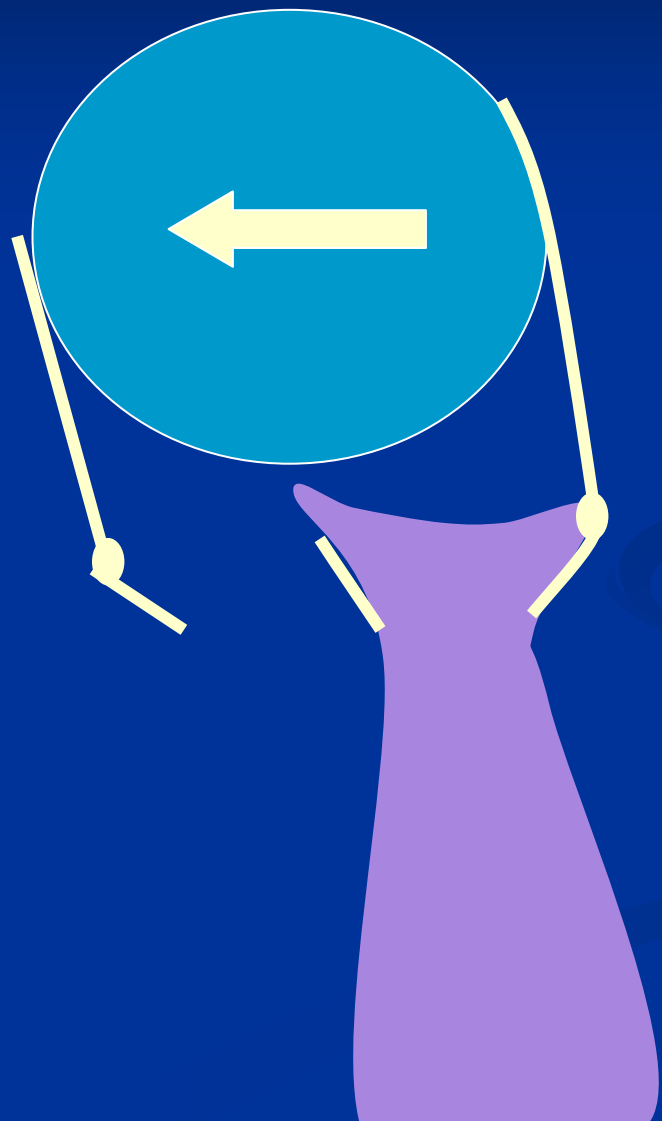




ANTERIOR



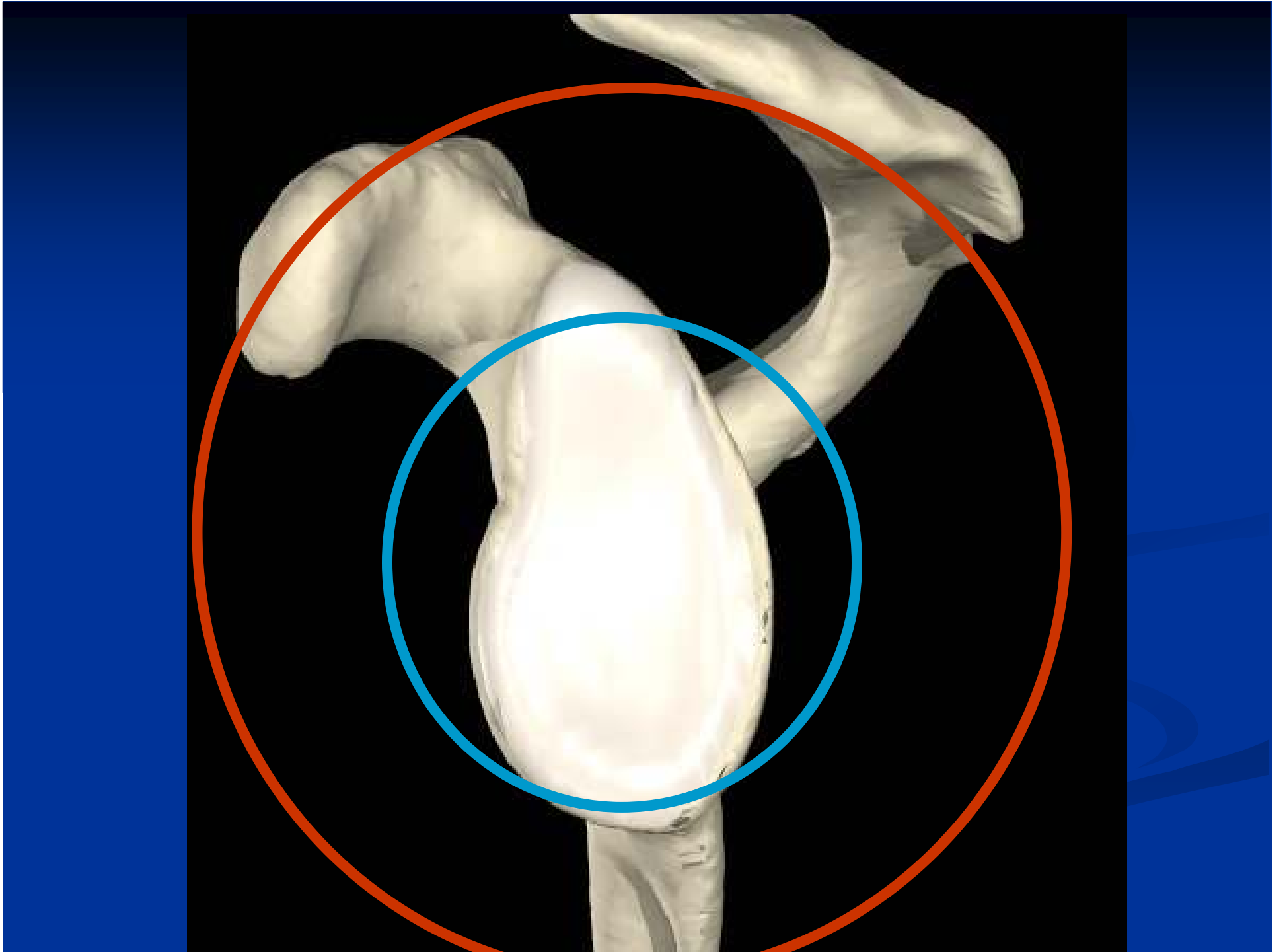
POSTERIOR



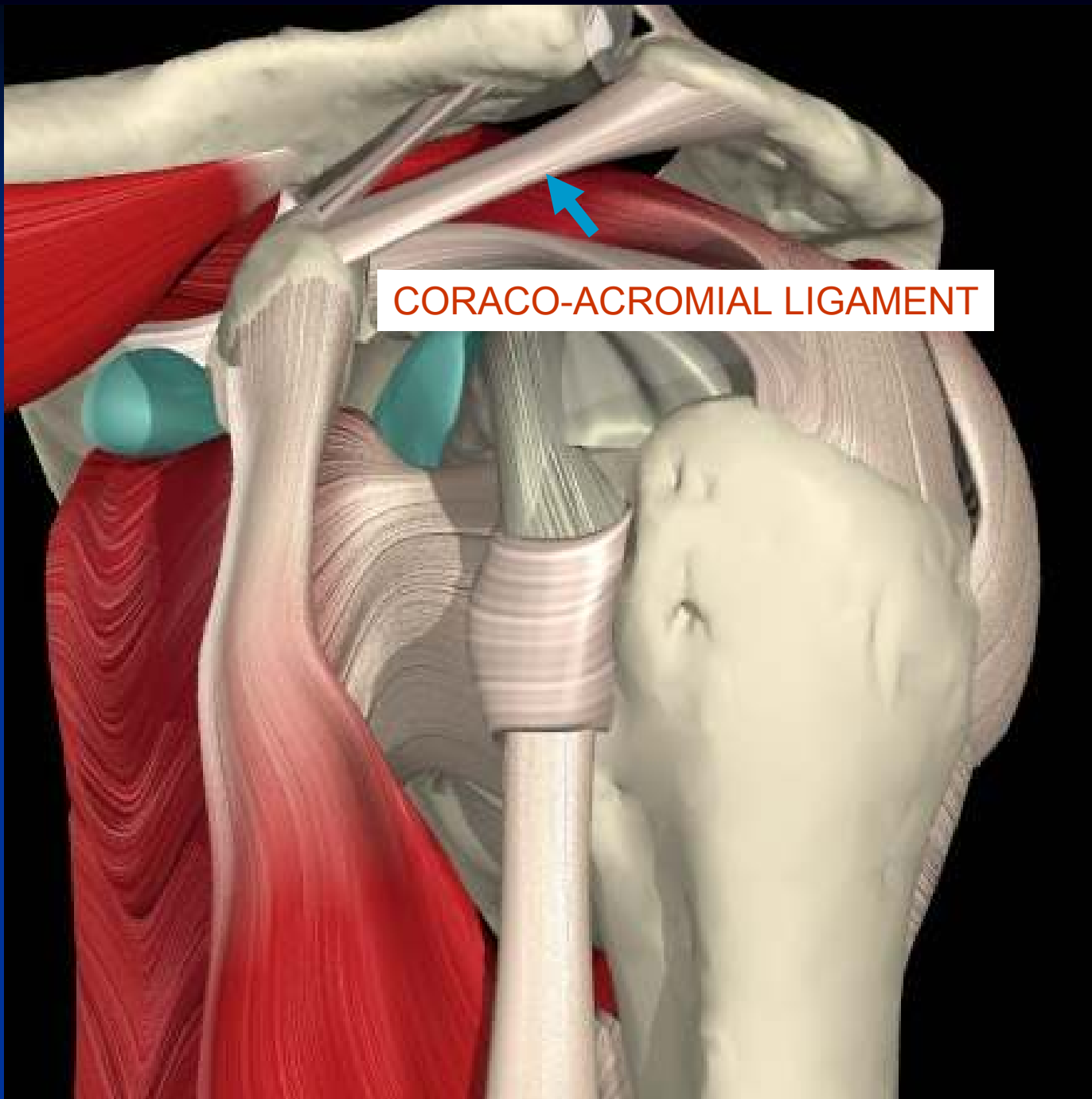
The Subacromial Space

Bones & Joints

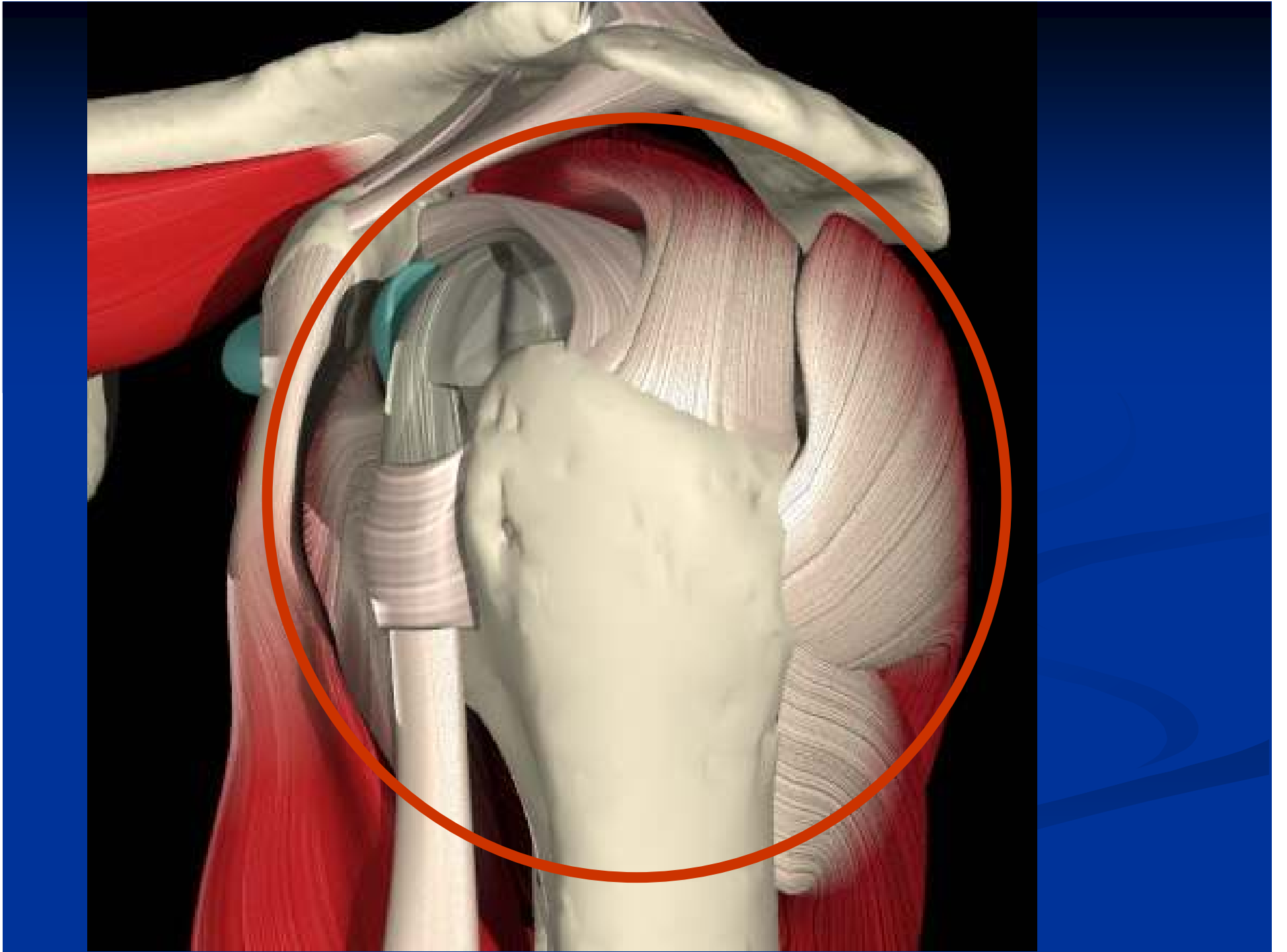
- ELEVATION involves all 5 JOINTS
- EXTERNAL ROTATION only involves GLENOHUMERAL JOINT

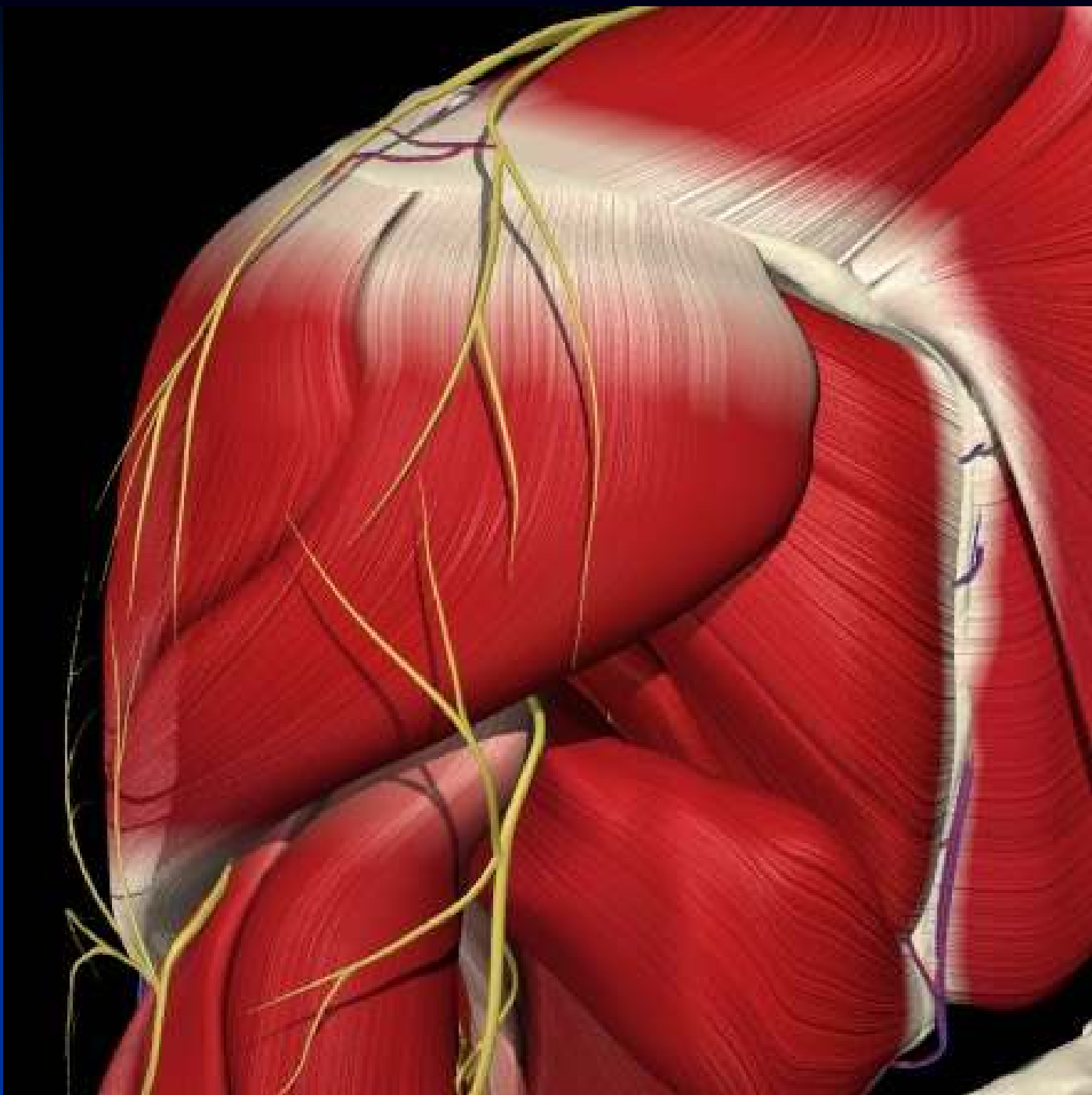


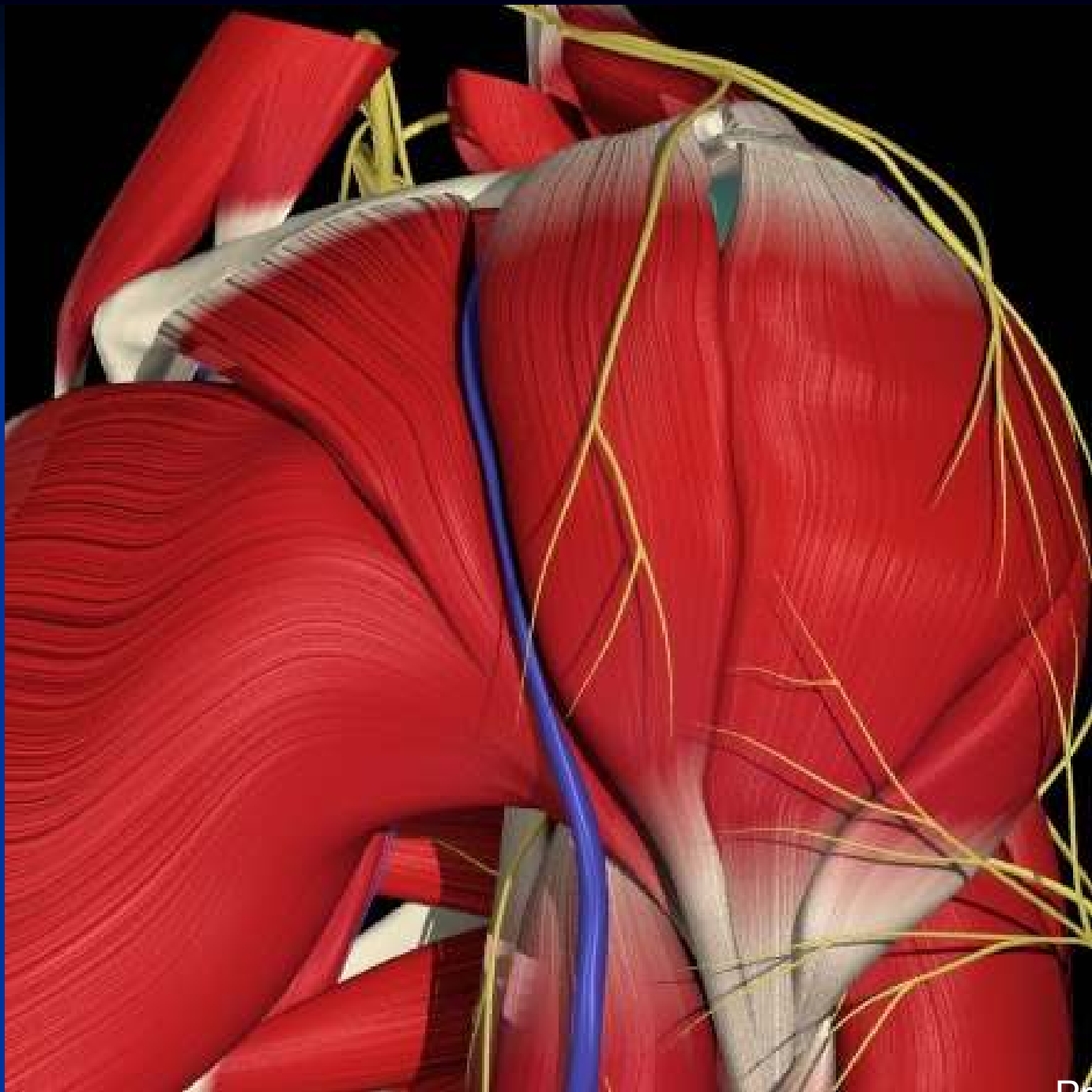


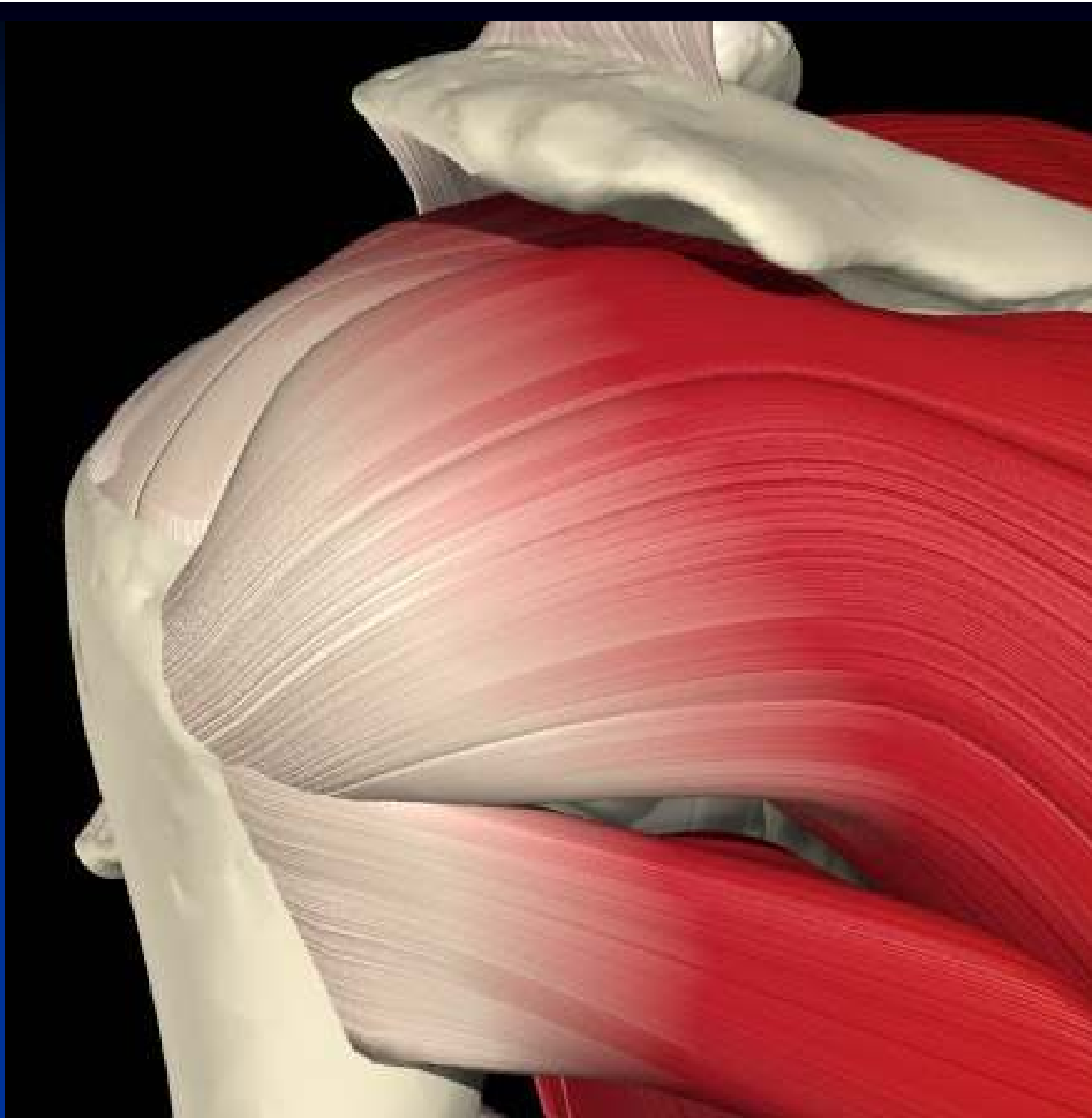


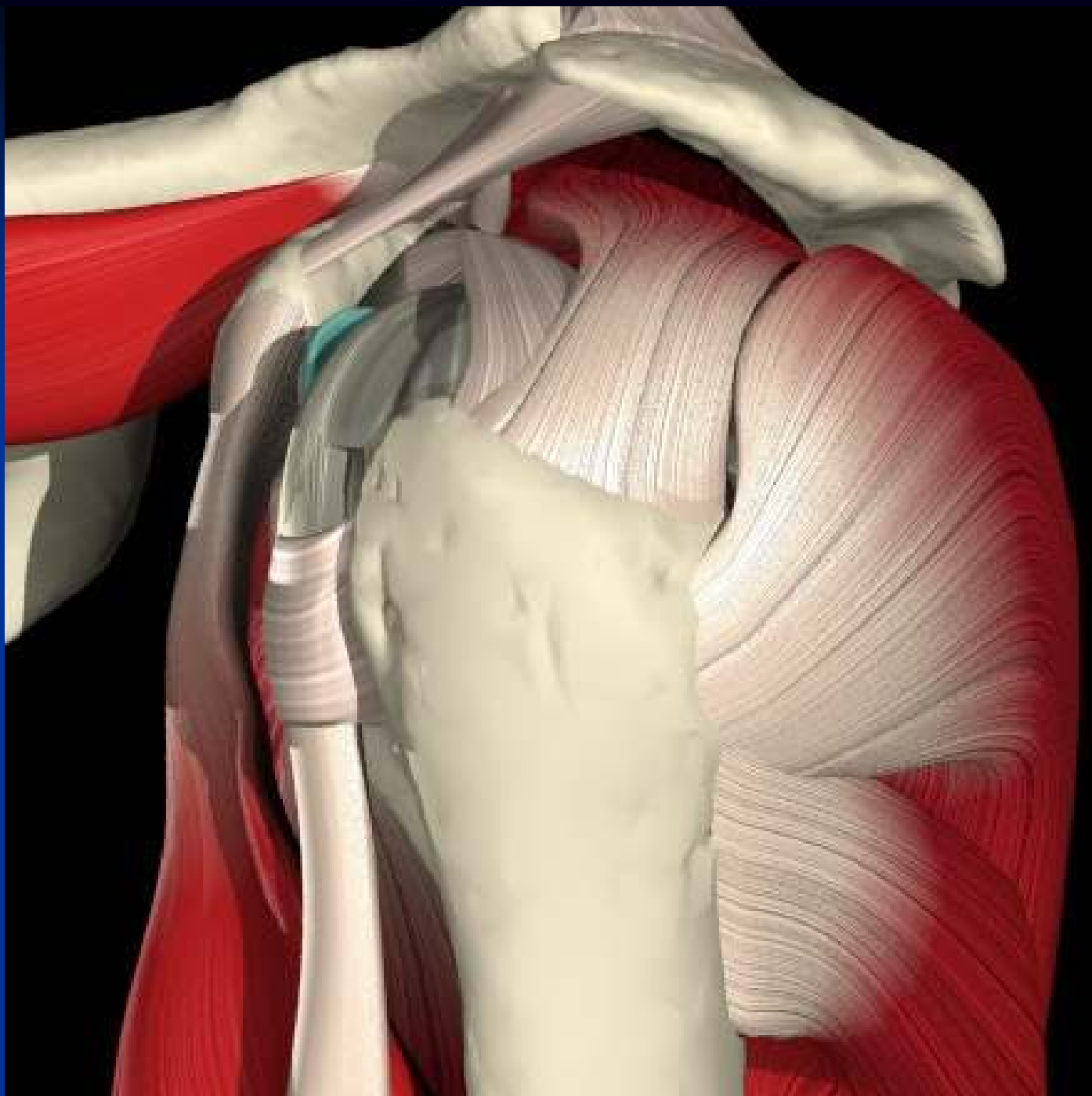
CORACO-ACROMIAL LIGAMENT

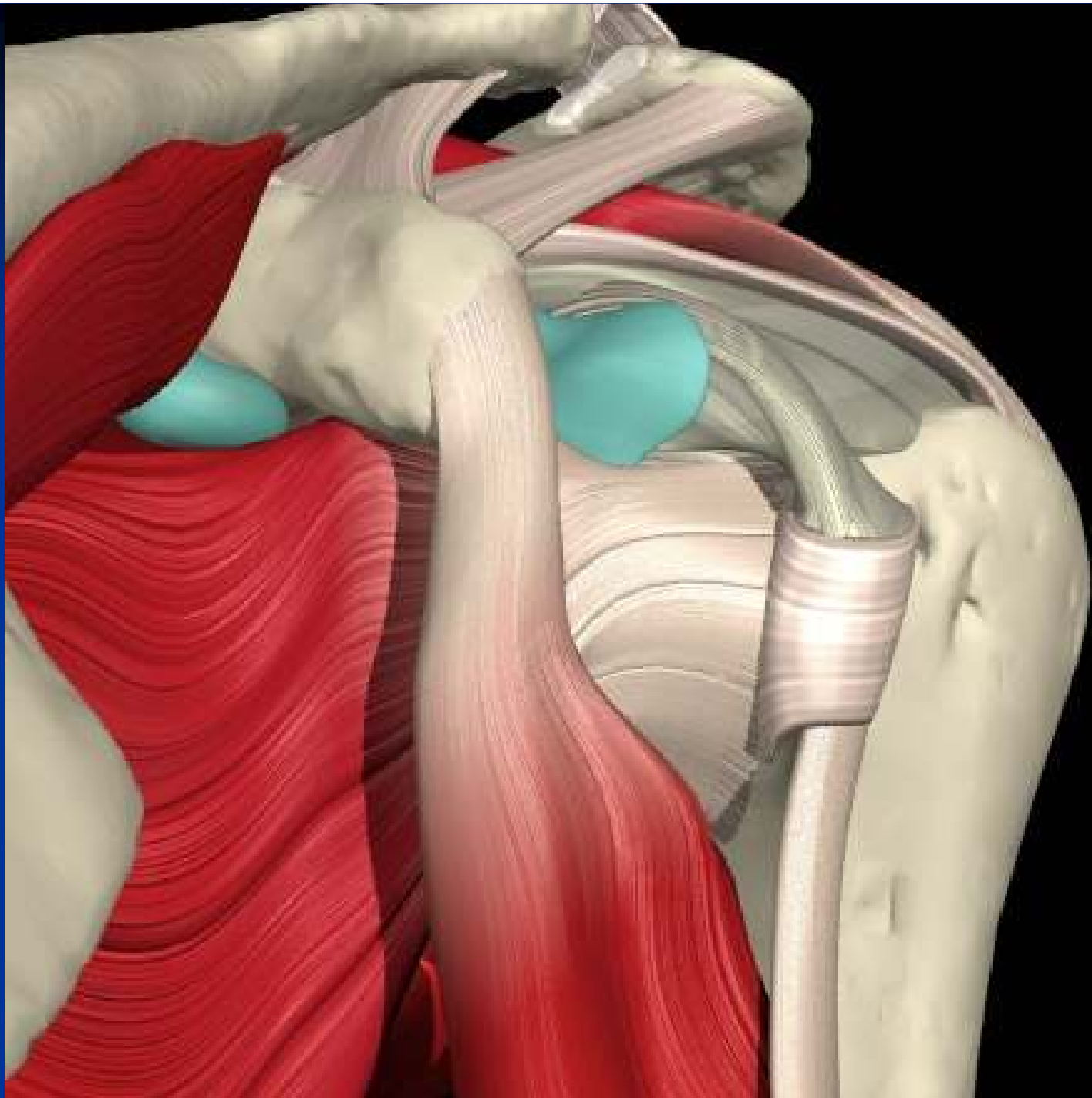






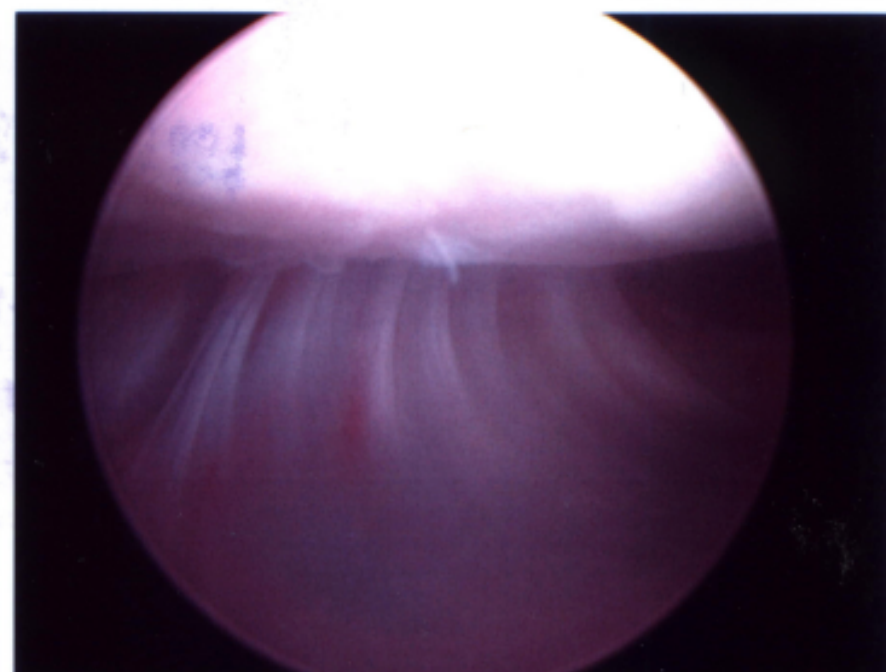
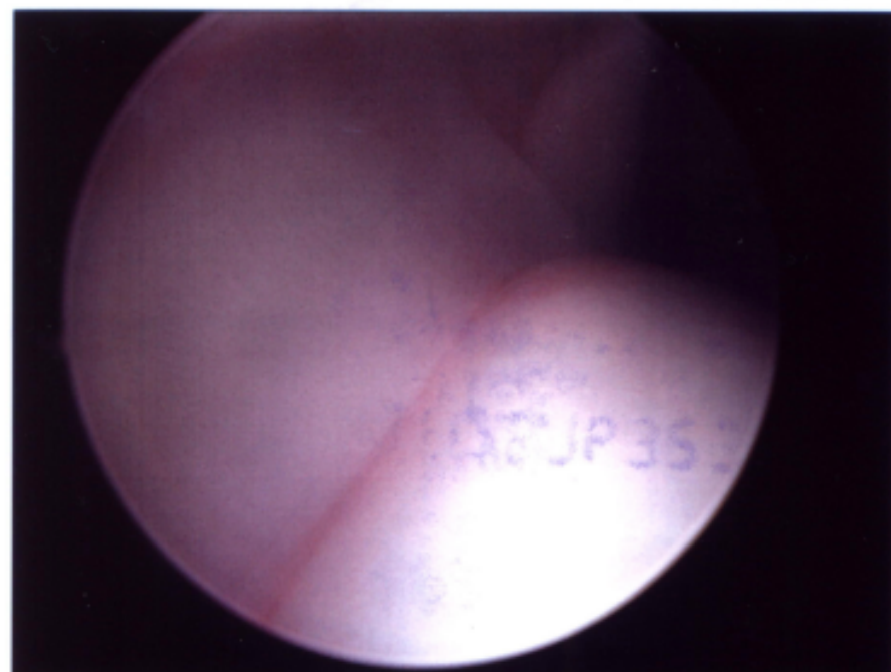
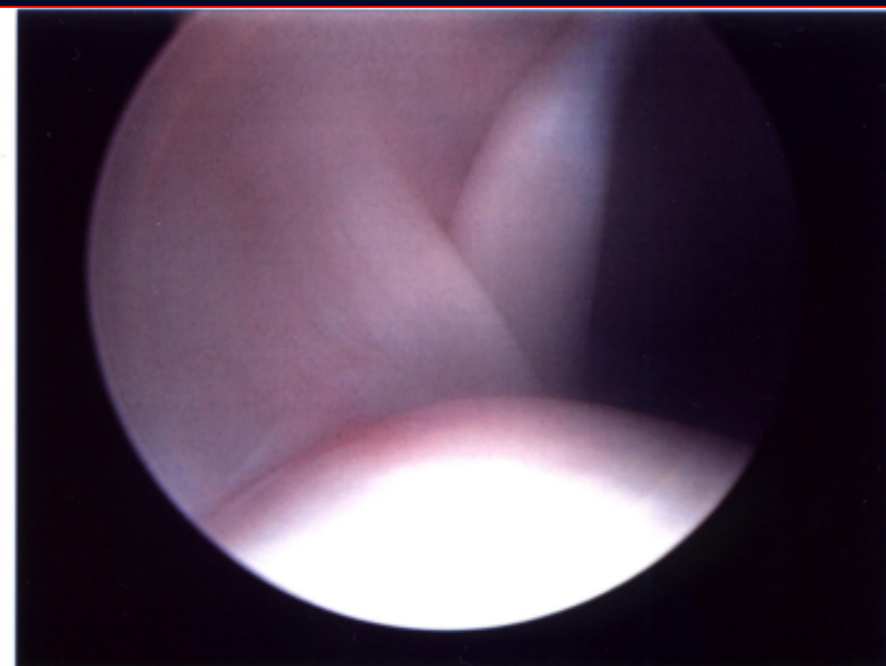
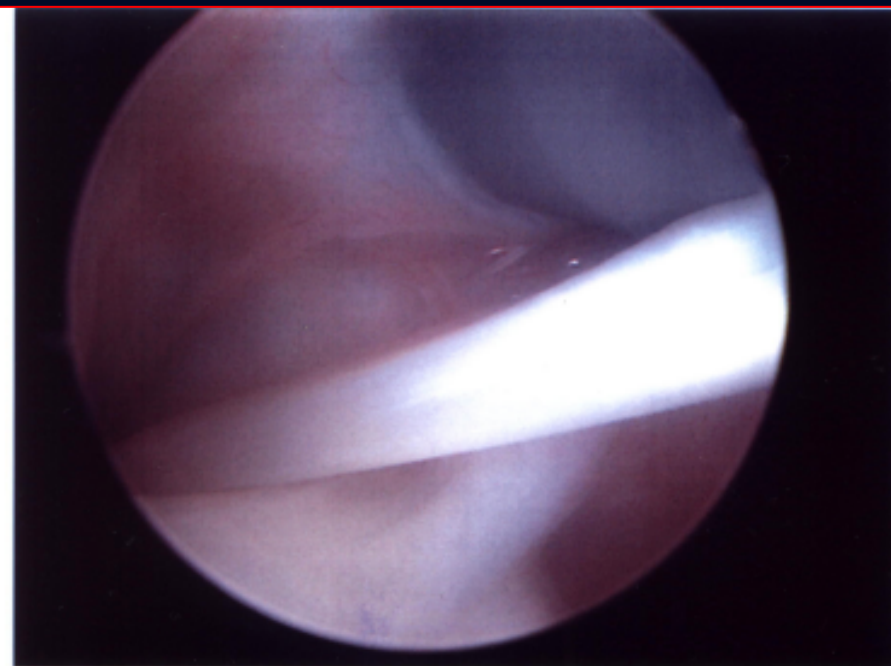


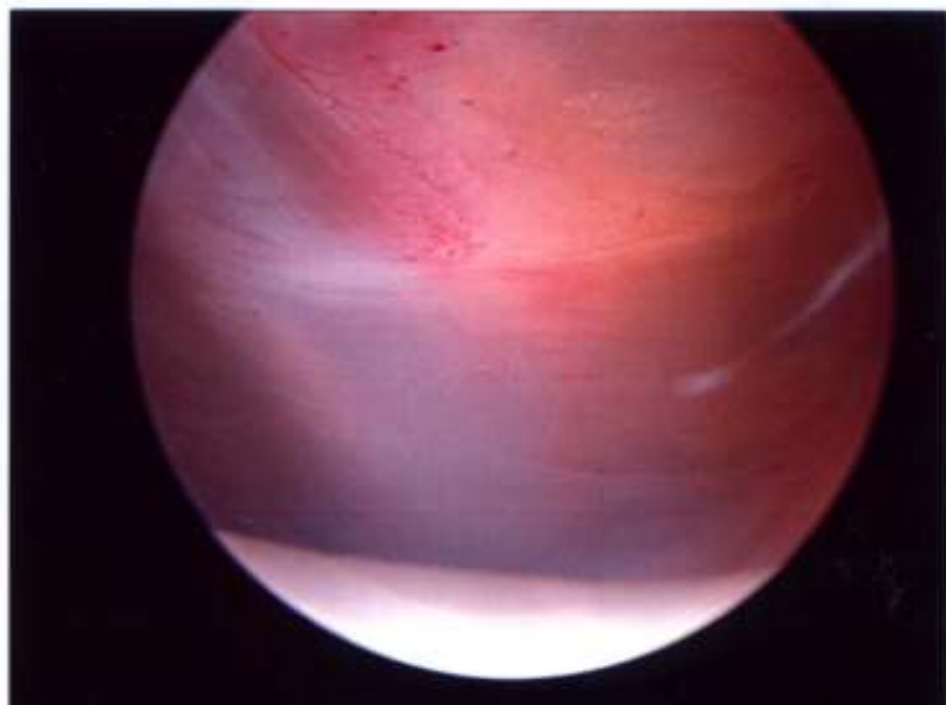
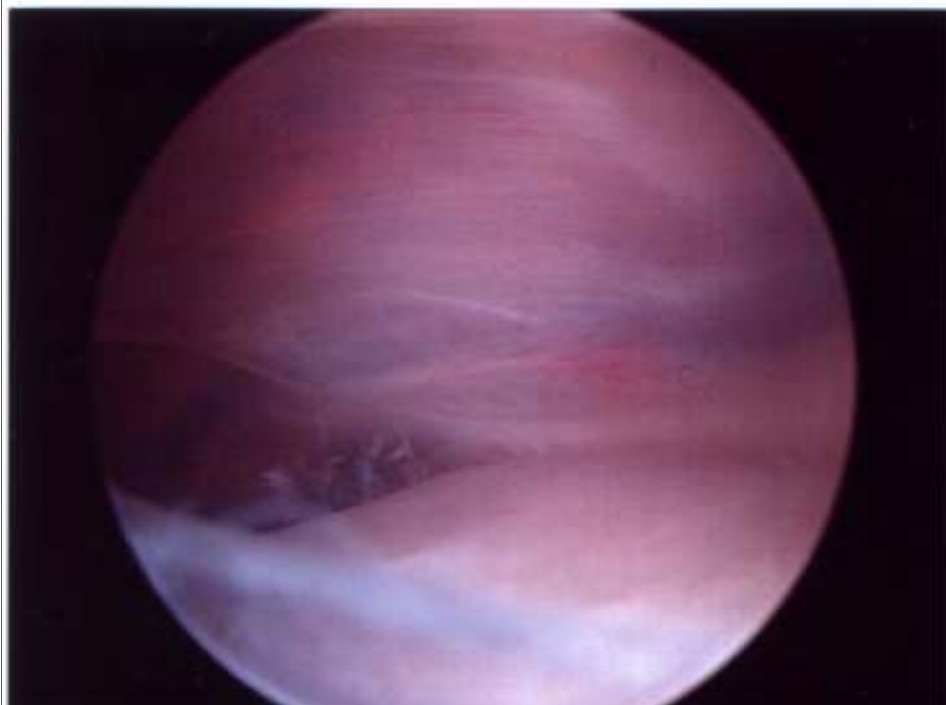
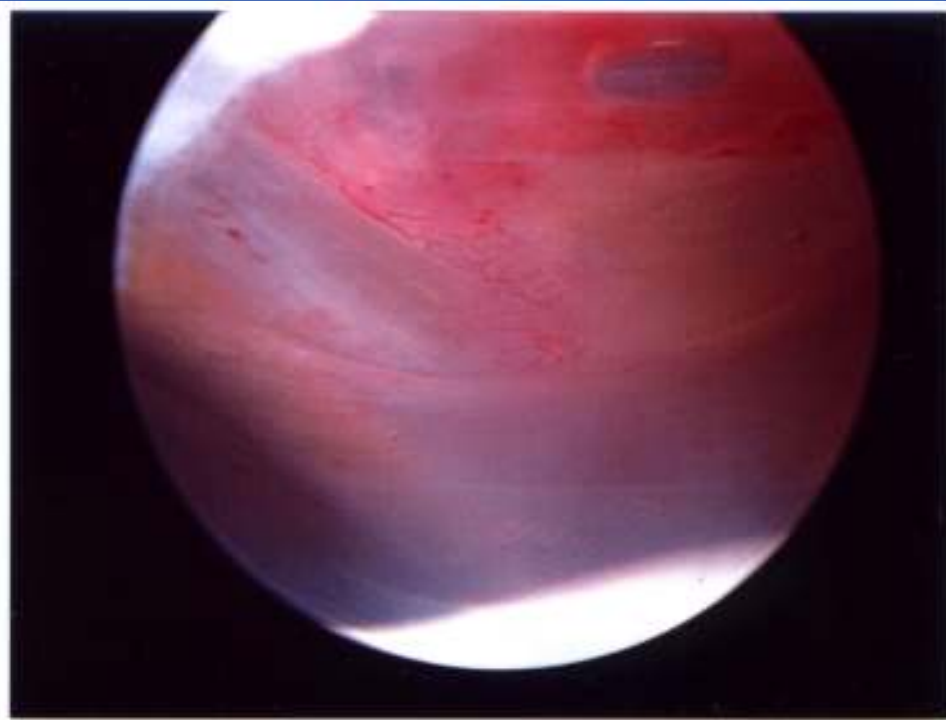
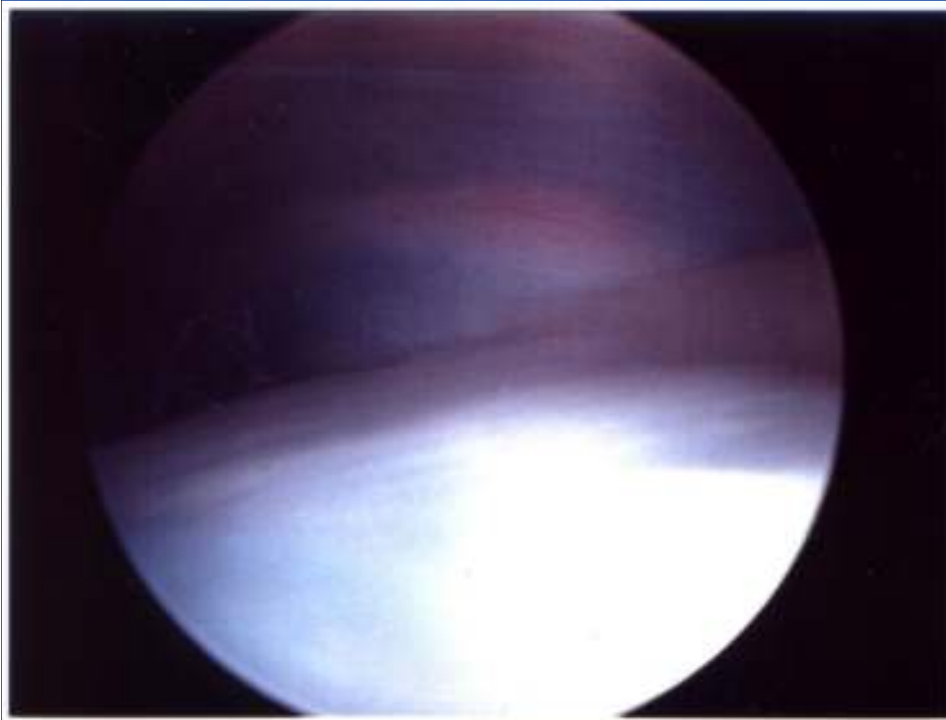




The Rotator Cuff

- Subscapularis
 - Supraspinatus
 - Infraspinatus
 - Teres minor
-
- Rotator cuff Interval
 - Long-head of biceps





The Rotator Cuff

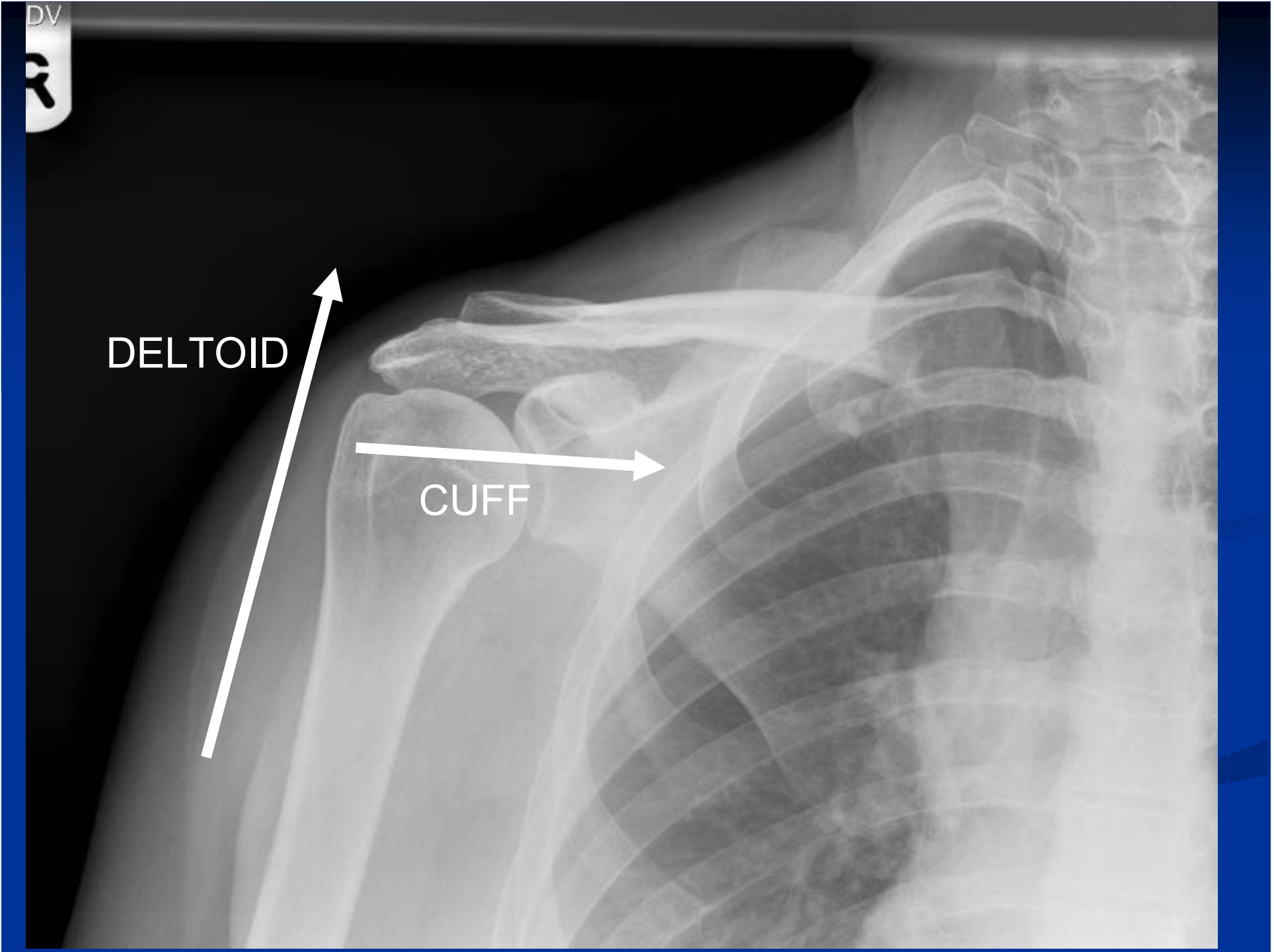
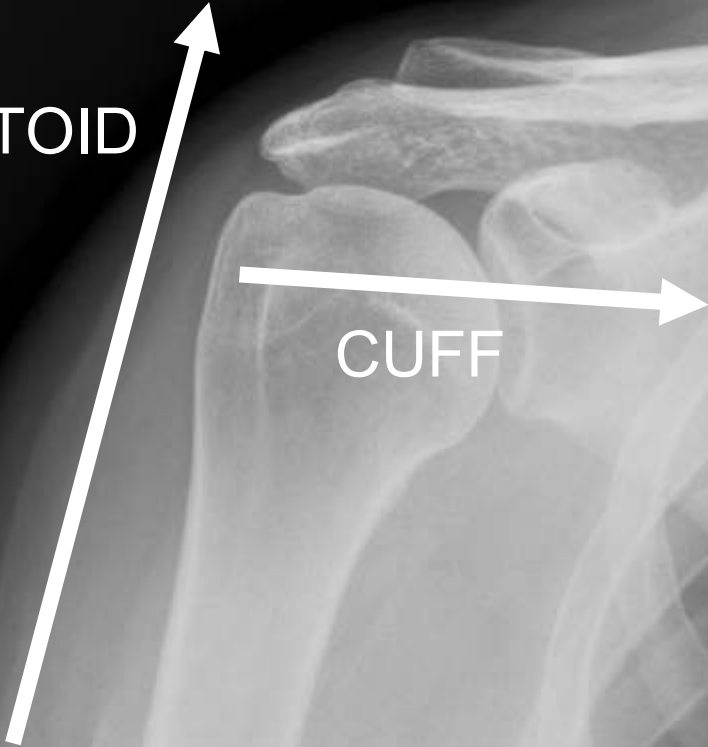
- Rotate the humerus with respect to the scapula
- Compress the humeral head into the glenoid fossa, a critical stabilizing mechanism
- Provide fine muscular balance of humeral motion

DV

R

DELTOID

CUFF







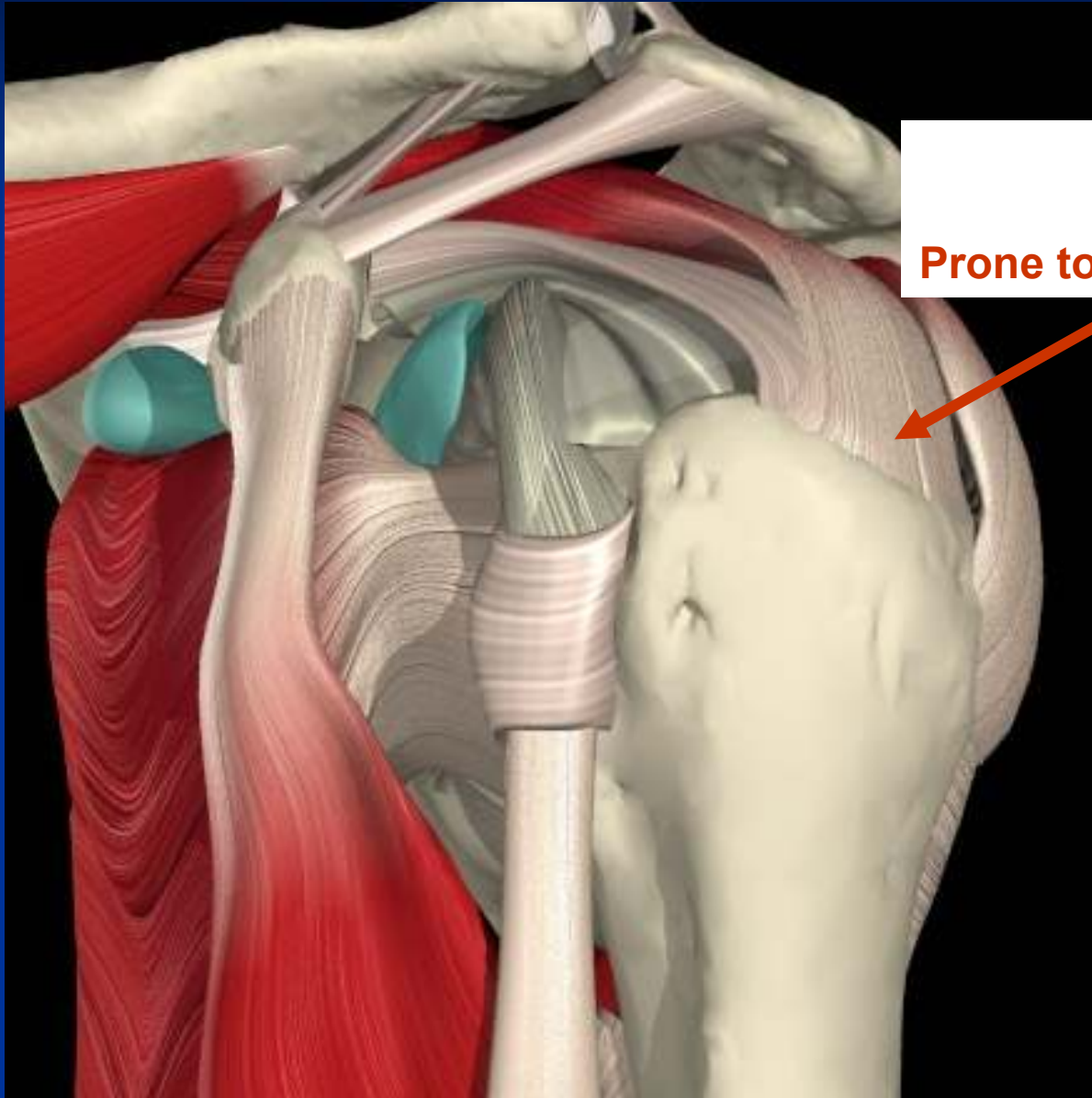


The image is a 3D anatomical model of the shoulder joint, viewed from a superior-posterior perspective. The humeral head is visible on the left, and the acromion of the scapula is on the right. A large, light blue, oval-shaped structure, representing the subacromial bursa, is positioned between the humeral head and the acromion. The bursa is surrounded by various muscles and ligaments, which are shown in red and white. A white rectangular box with the text "SUBACROMIAL BURSA" is overlaid on the blue structure.

SUBACROMIAL BURSA



supraspinatus



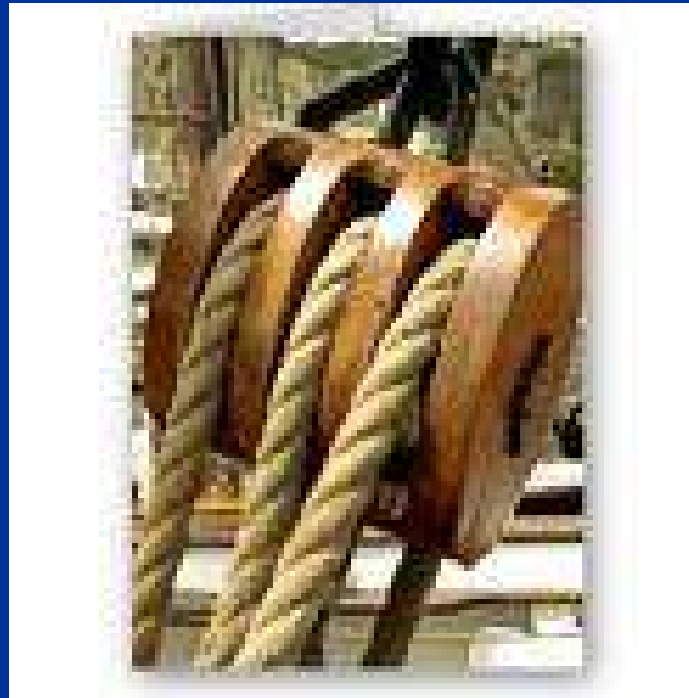
**Critical zone,
Hypovascular?
Prone to calcific deposits and tears**



Nerves

- Cervical Spine : C5/6
- Brachial plexus:
 - Branches to scapular muscles
 - Axillary nerve
 - Suprascapular nerve

Common Shoulder Disorders



SHOULDER PROBLEMS:

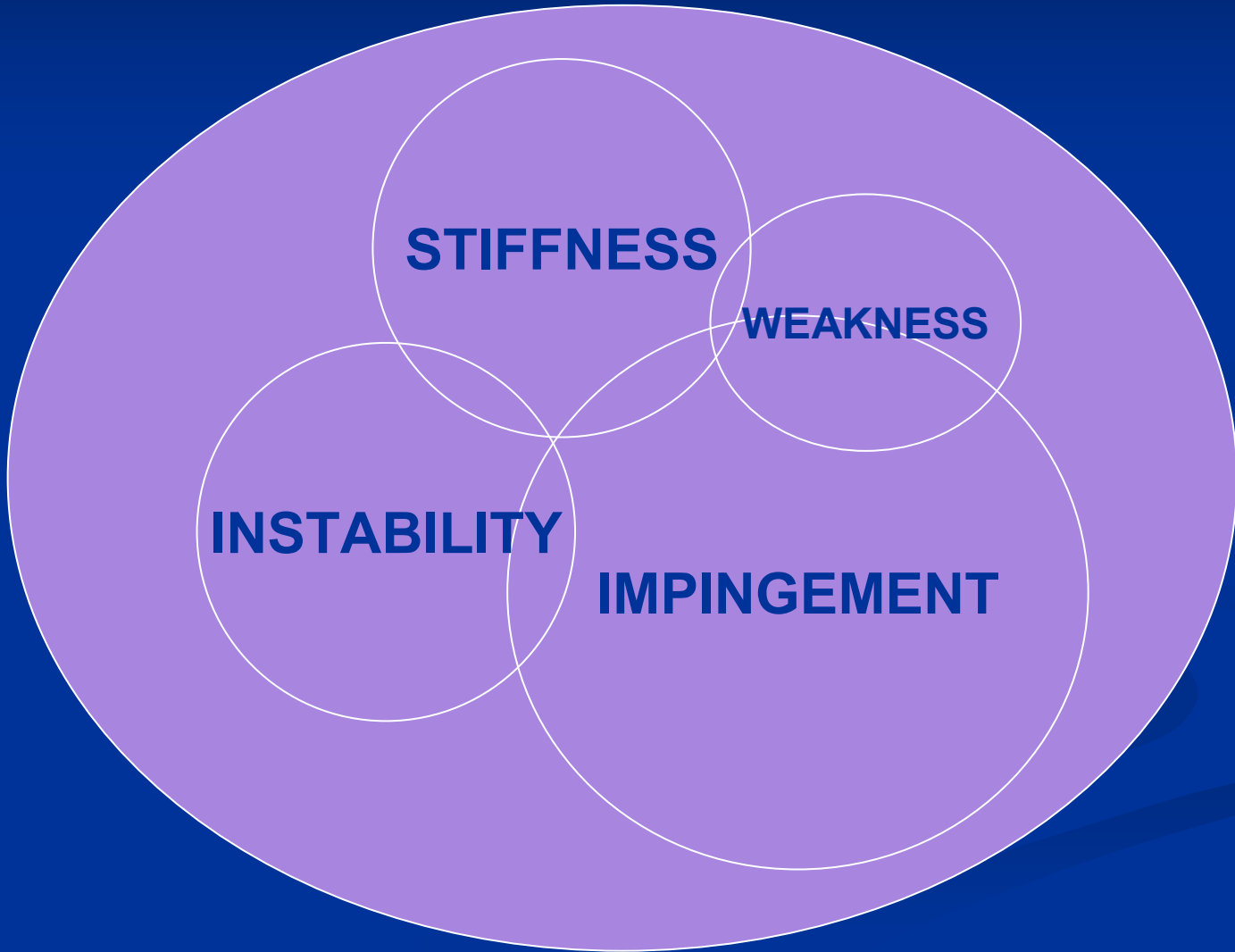
Pain and....

STIFFNESS

WEAKNESS

INSTABILITY

“IMPINGEMENT”



STIFFNESS

WEAKNESS

INSTABILITY

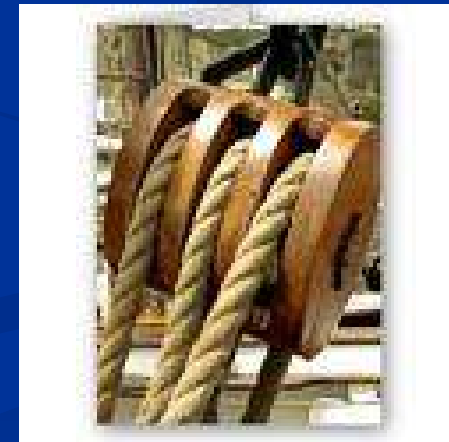
IMPINGEMENT

Making a diagnosis... Pain and:

<u>STIFF</u>	<u>UNSTABLE</u>	<u>“PAIN & WEAKNESS ON ELEVATION”</u>
Lack of External Rotation	Shoulder dislocates	Pain on elevation, IR, Night pain
MUST HAVE X-Ray	?recurrent	EXTREMELY COMMON
Arthritis, AVN, tumour	MRI arthrogram	Rotator Cuff tears, Biceps tendon, Subacromial impingement, AC arthritis...
FROZEN SHOULDER		

1: THE STIFF SHOULDER

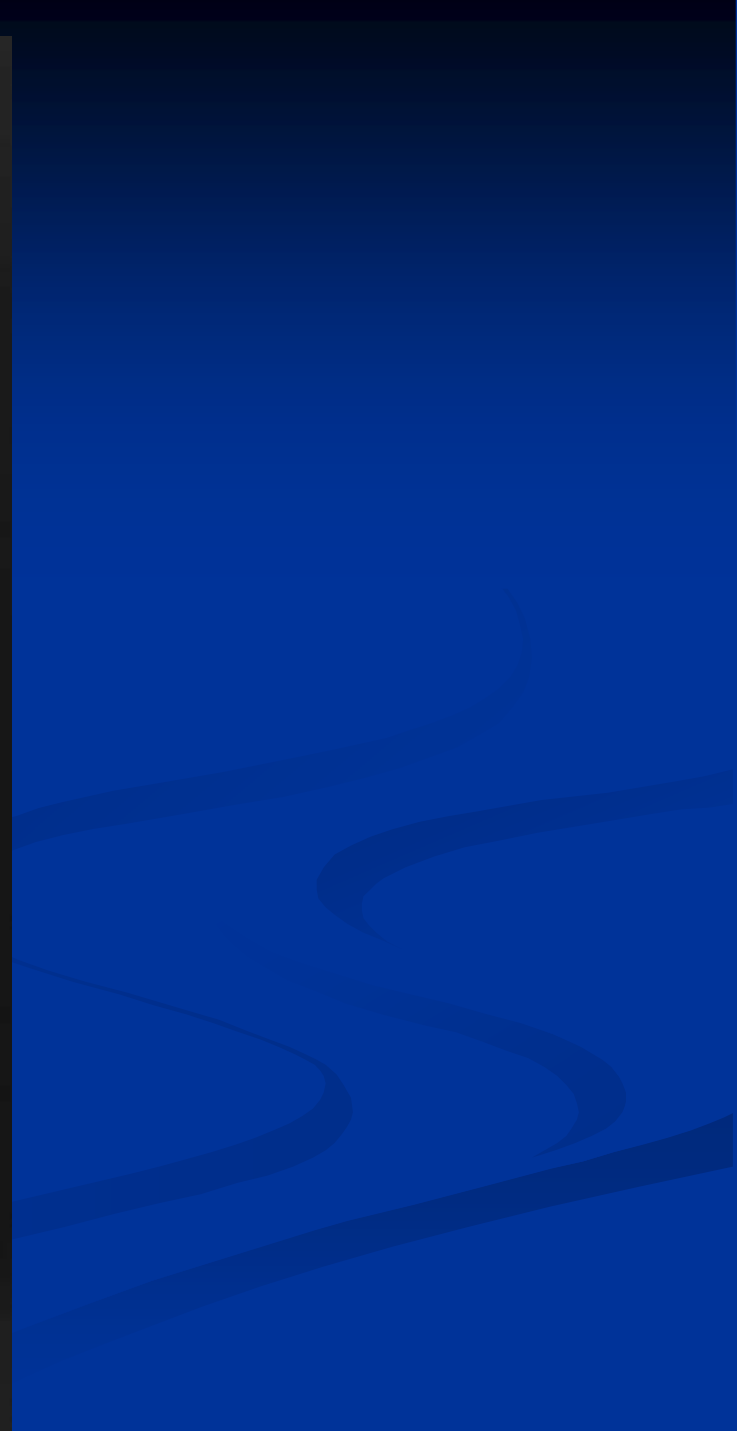
- LACK OF EXTERNAL ROTATION
- X-RAY
 - NORMAL:
 - ADHESIVE CAPSULITIS/FROZEN SHOULDER
 - ABNORMAL:
 - ARTHRITIS
 - TUMOUR
 - AVASCULAR NECROSIS
 - SEPSIS







ES
L



R
AW



Adhesive Capsulitis

- Pathophysiology uncertain but numerous theories proposed
- Rotator interval primarily involved
- What occurs is a very significant synovitis followed by capsular and ligamentous fibrosis
- NORMAL X-RAY

Adhesive capsulitis

- Middle aged
- Bilateral but not usually simultaneous
- F>M
- Common in diabetics

**Never make the diagnosis
of frozen shoulder in the
young or the elderly!!**



ADHESIVE CAPSULITIS

■ MY PRACTICE

- PATIENTS WANT TO GET BETTER TOMORROW RATHER THAN IN 2 YEARS TIME.
- IF EARLY: GLENOHUMERAL INJECTION
- IF ALREADY STIFF: MUA + INJECTION
- IF STIFF AND LATE: ARTHROSCOPIC CAPSULAR RELEASE

ADHESIVE CAPSULITIS

- MANAGEMENT VARIES WIDELY
- NATURAL HISTORY?
 - PAIN-STIFFNESS-RESOLUTION
 - DOES IT ALWAYS GET BETTER AFTER 2 YEARS?

ADHESIVE CAPSULITIS

- Very good results in primary condition
- Post-traumatic and diabetics less predictable.
- URGENT REFERRAL

THE ARTHRITIC SHOULDER

- OA
- RhA
- AVN
- CUFF ARTHROPATHY

THE ARTHRITIC SHOULDER

- INDICATION FOR SURGERY:
INTRACTABLE PAIN
- SURGERY: JOINT REPLACEMENT
- ARTHROSCOPIC AND SOFT TISSUE
SURGERY UNLIKELY TO HELP

JOINT REPLACEMENT

- STATE OF ROTATOR CUFF IS THE SINGLE MOST IMPORTANT FACTOR IN PREDICTING OUTCOME:
- OA & AVN= GOOD PAIN RELIEF AND FUNCTION
- RhA & CUFF ARTHROPATHY: PAIN RELIEF ONLY.

ARTHROPLASTY OPTIONS

- HUMERAL HEMIARTHROPLASTY VS TOTAL SHOULDER REPLACEMENT
- HUMERAL RESURFACING VS STEMMED PROSTHESIS
- REVERSE POLARITY PROSTHESIS.









Cuff Arthropathy

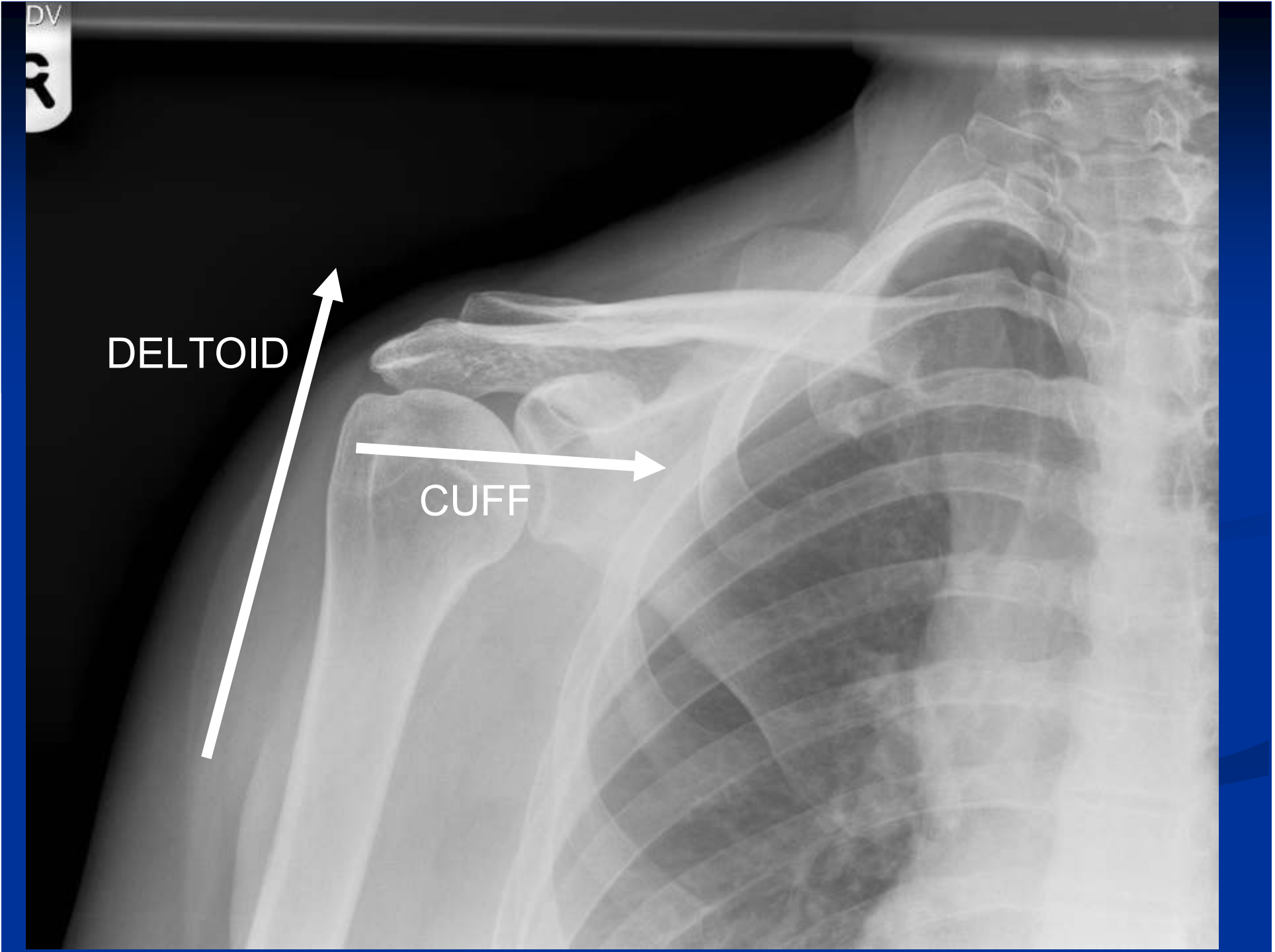
- Elderly
- Pseudoparalysis
- Weakness > stiffness

DV

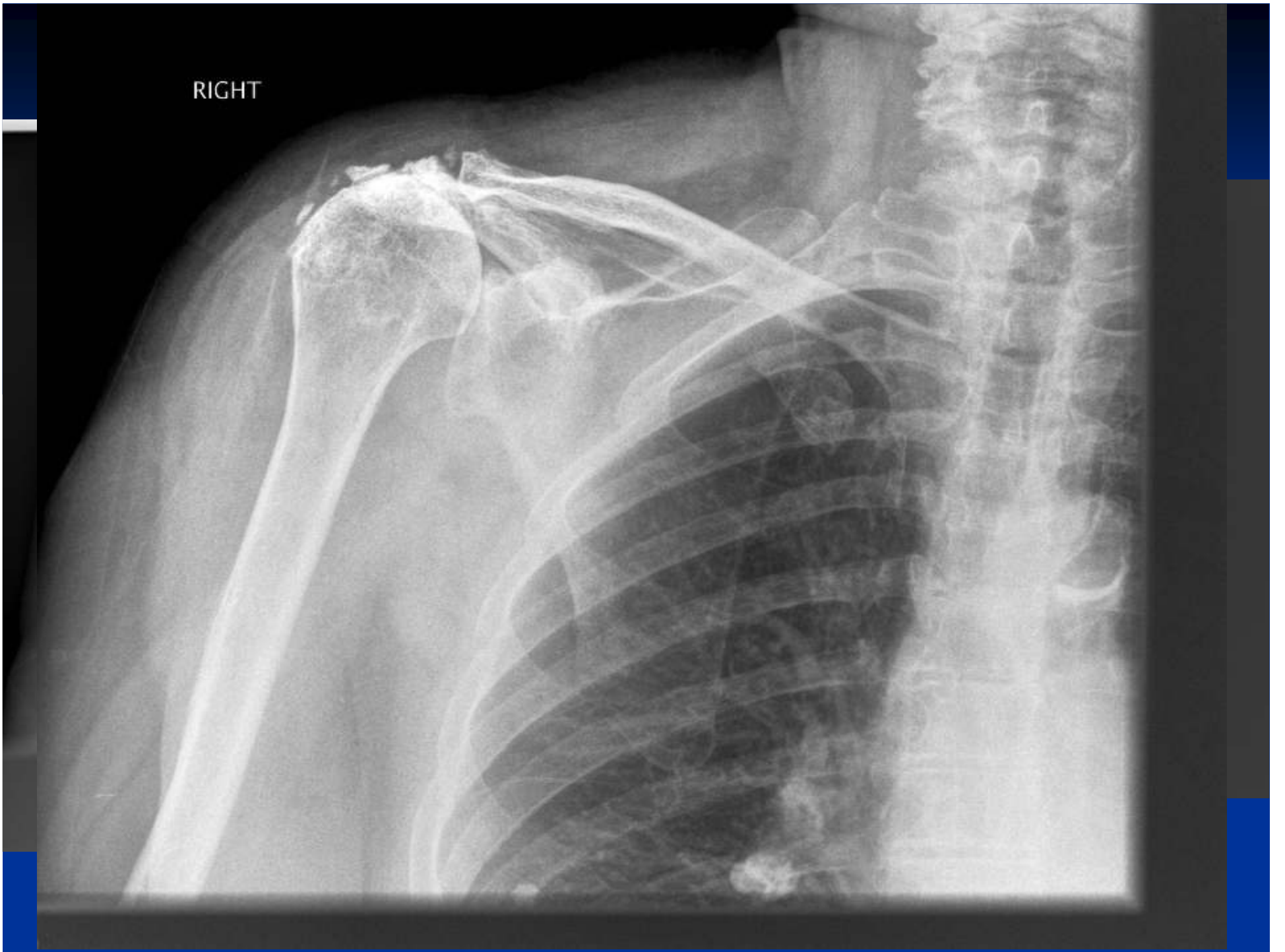
R

DELTOID

CUFF



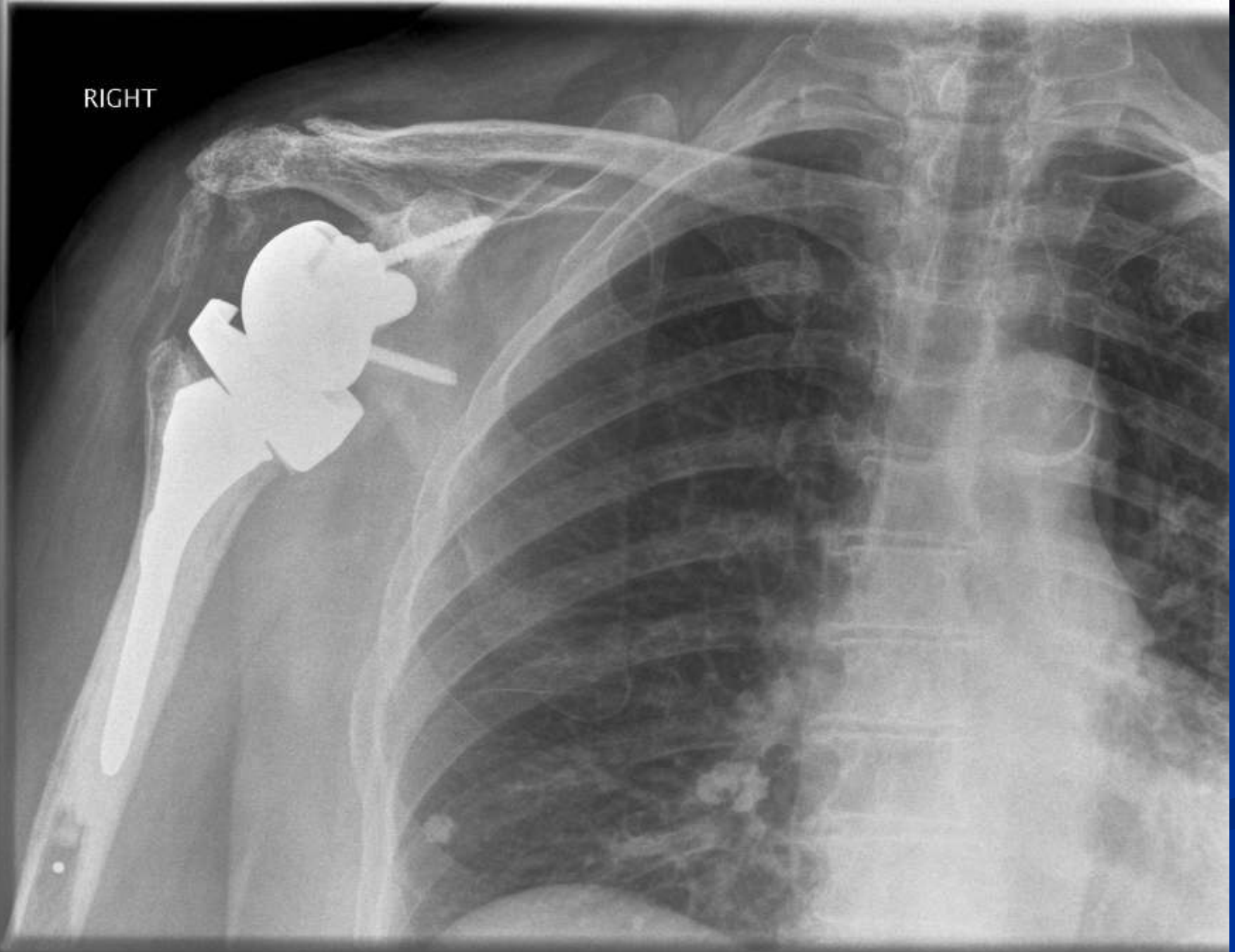
RIGHT





**Delta CTA™ Reverse
Shoulder**

RIGHT

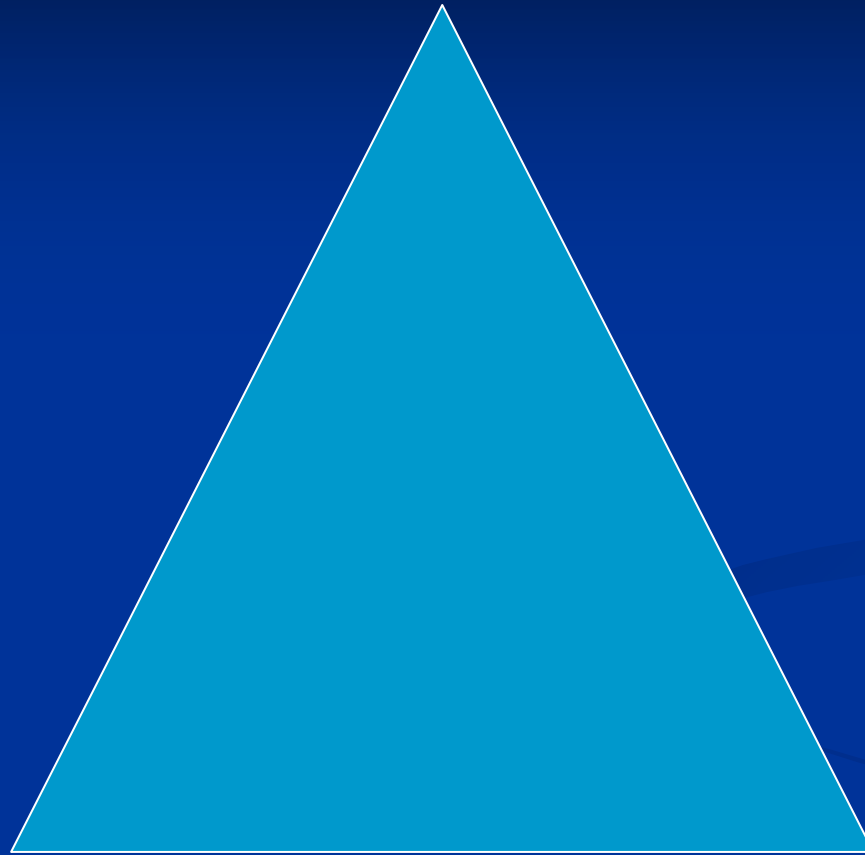




2: Recurrent Instability

- Traumatic
 - TUBS
 - “Tight Tom”
 - “Torn Loose”
- Atraumatic
 - AMBRI
 - “Slack Alice”
 - “Born Loose”

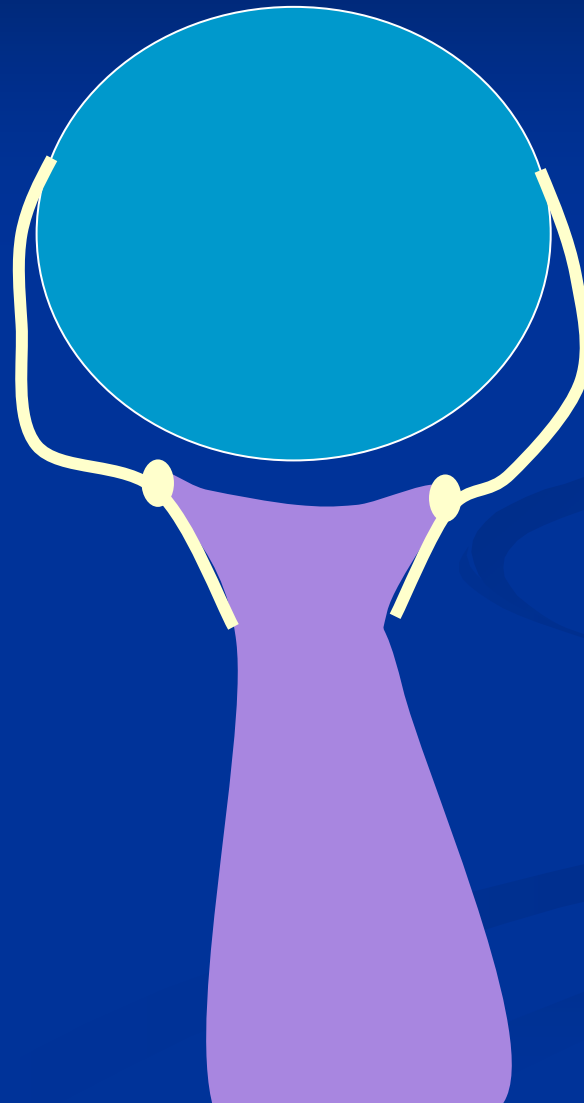
Traumatic Structural Instability



Muscle Pattern Instability

Atraumatic Structural Instability

Static Stabilizers (structural)

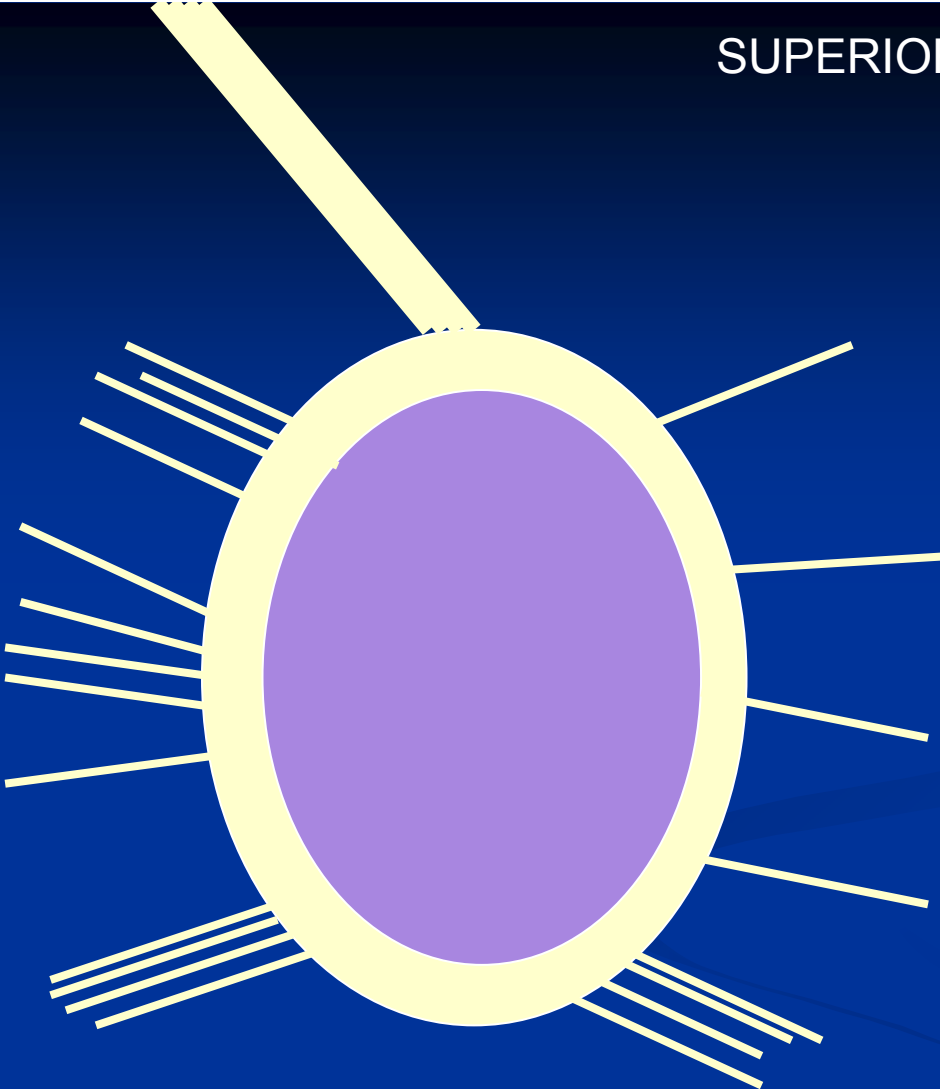


SUPERIOR

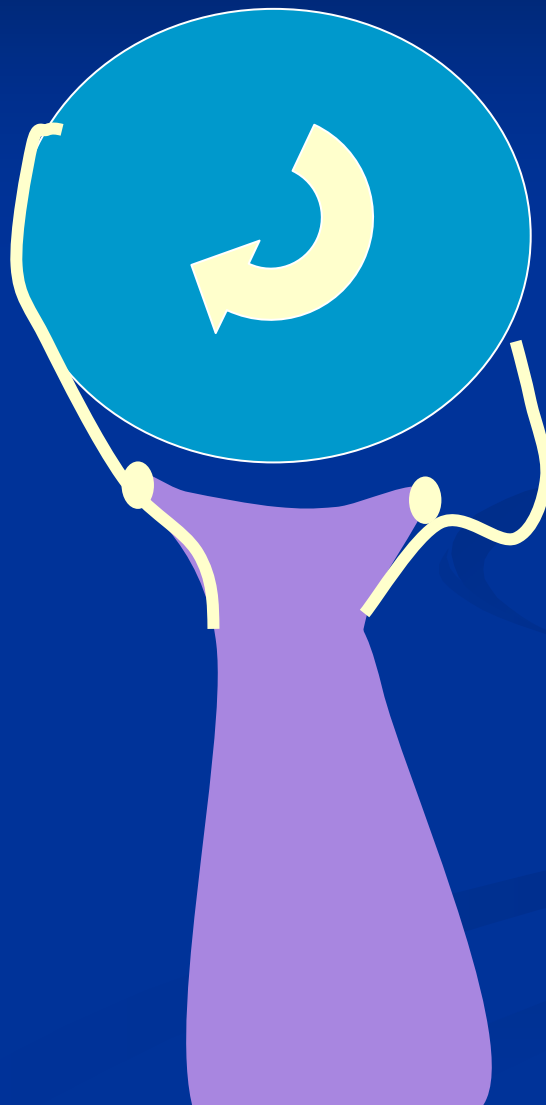
ANTERIOR

POSTERIOR

INFERIOR

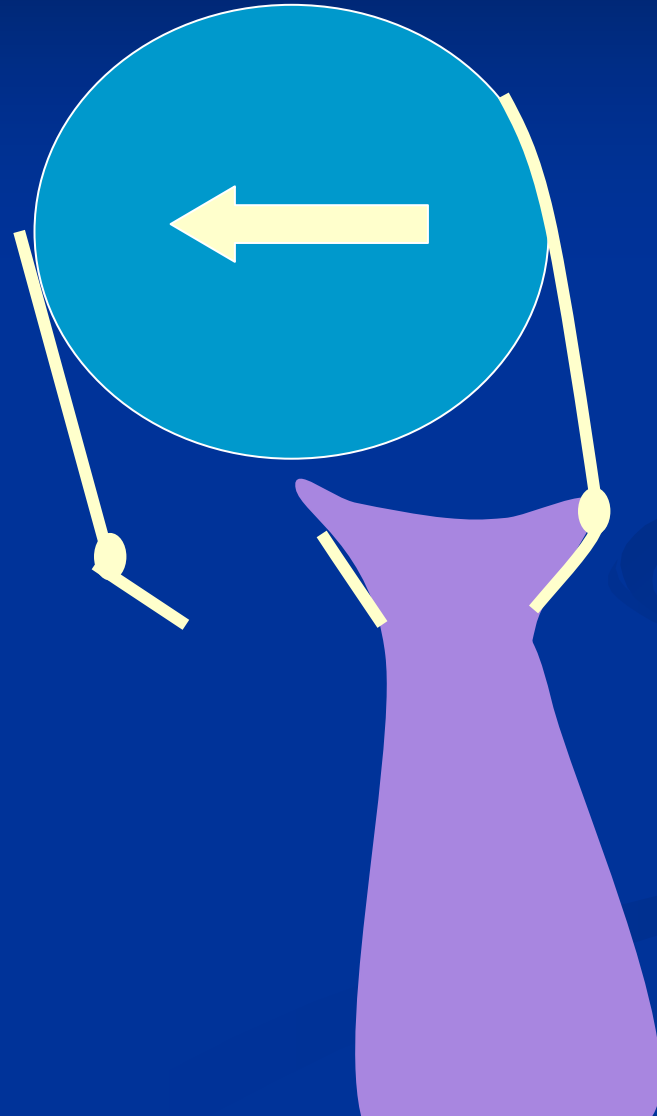


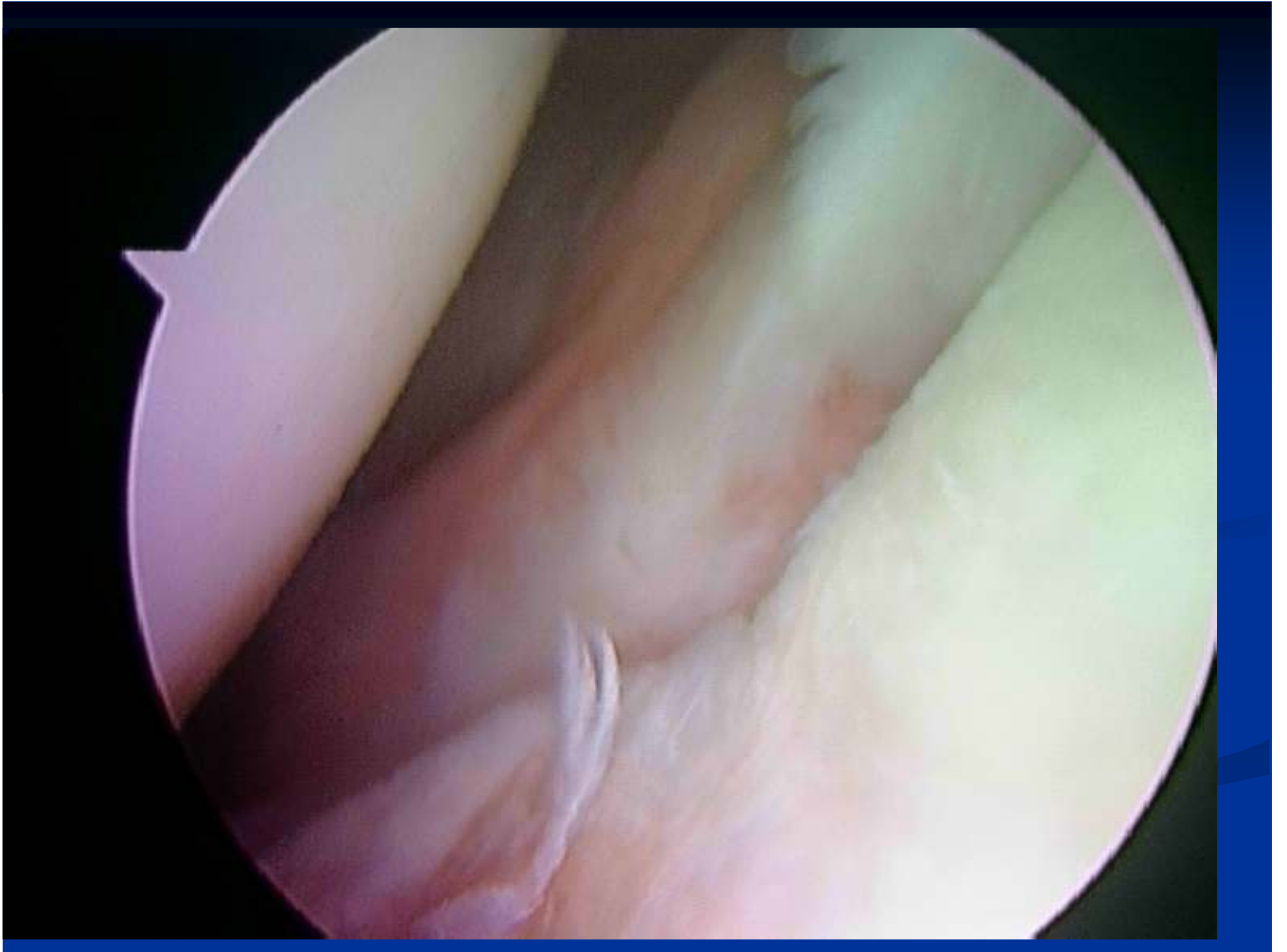
ANTERIOR



POSTERIOR

TRAUMATIC INSTABILITY

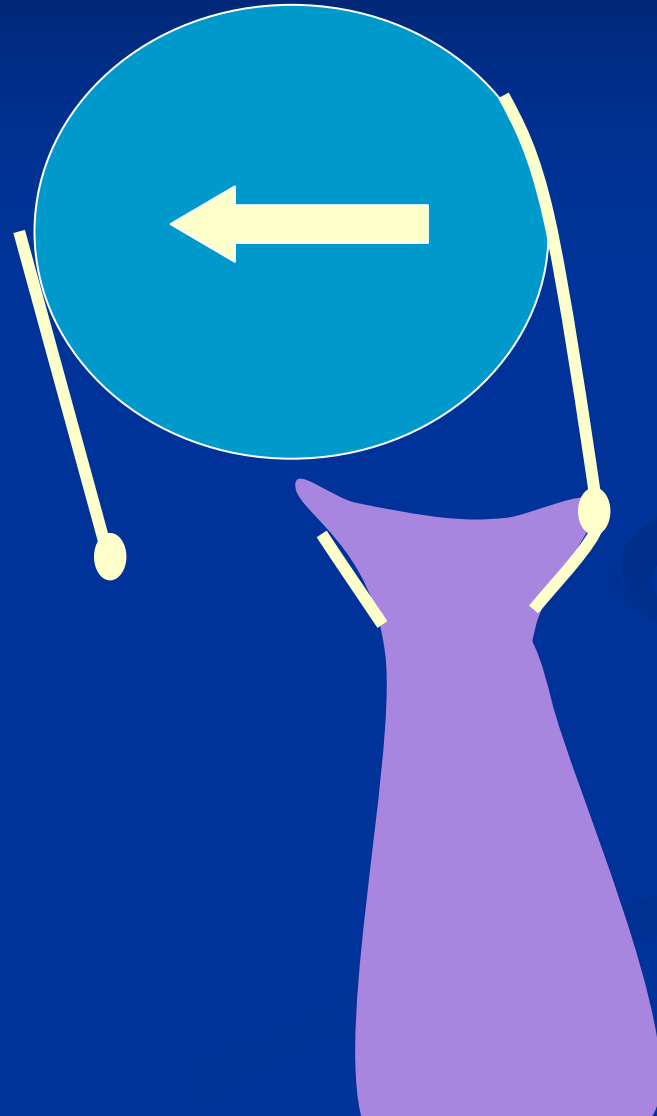




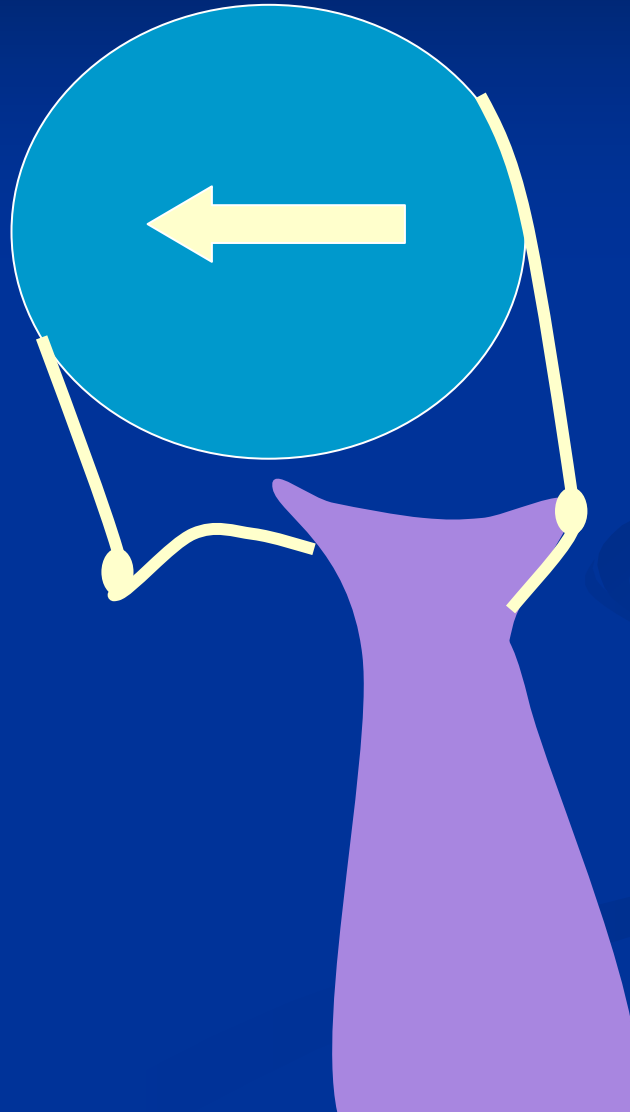
Traumatic recurrent anterior instability

- Spectrum:
 - dislocation-----subluxation
- Young dislocators >90% capsulolabral injury

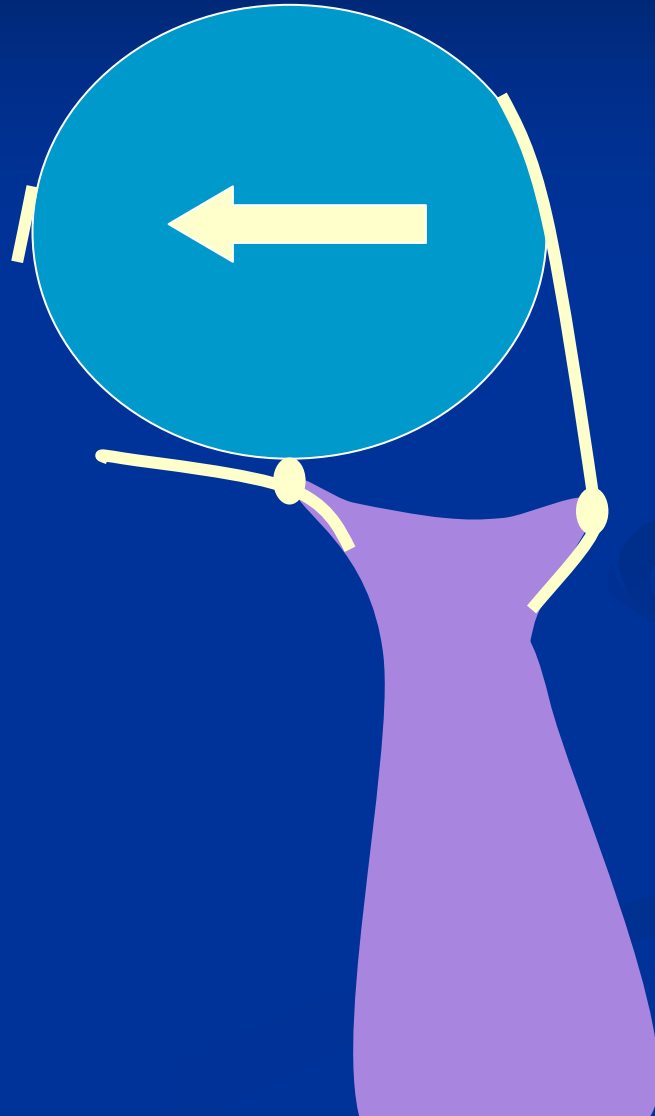
Bankart



ALPSA

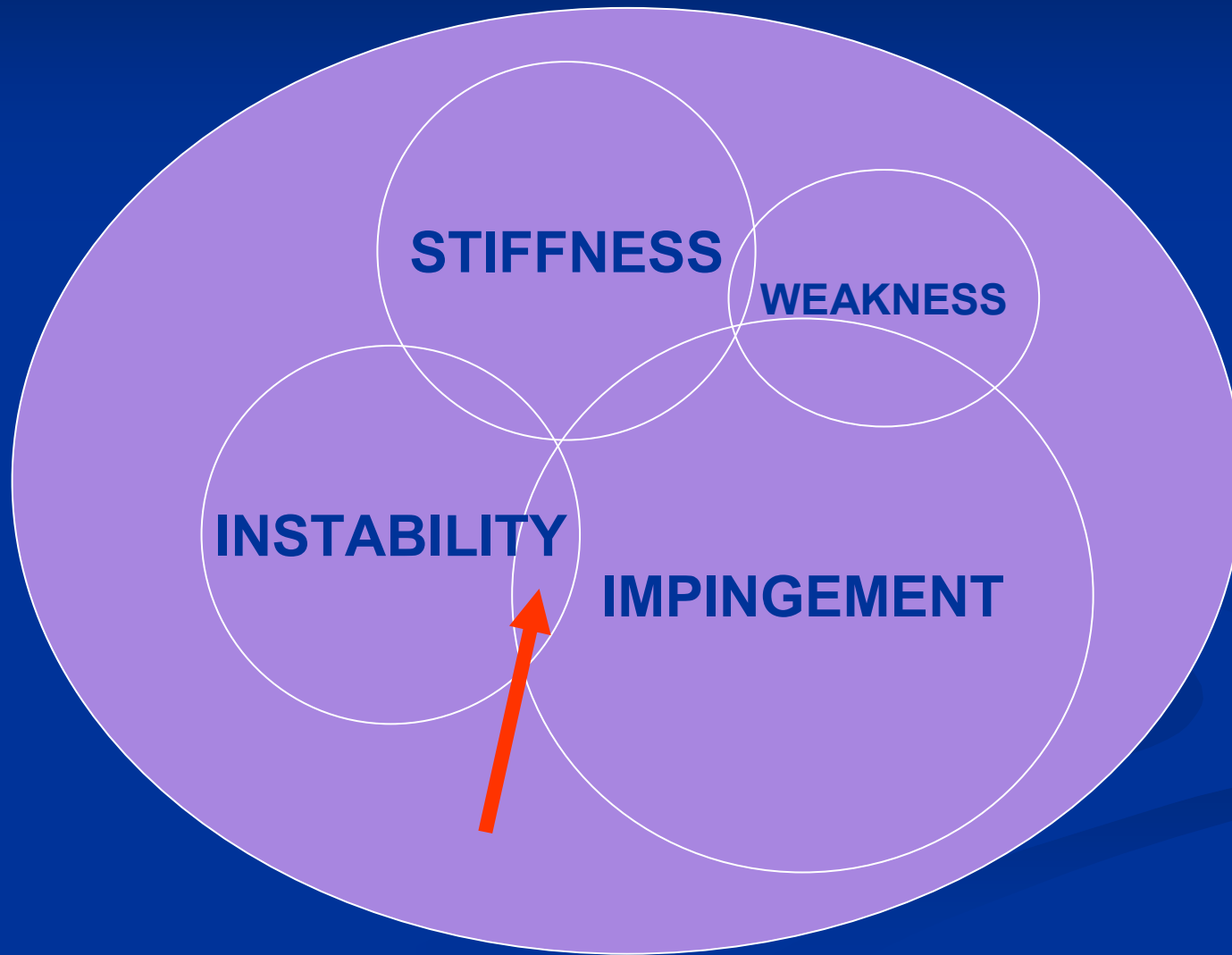


HAGL



Traumatic recurrent anterior subluxation

- Making the diagnosis is the challenge
 - MRI
 - MRI arthrogram
 - EUA and arthroscopy
- If pathology confirmed, treat as recurrent dislocators
- Impingement in the young: instability till proven otherwise



STIFFNESS

WEAKNESS

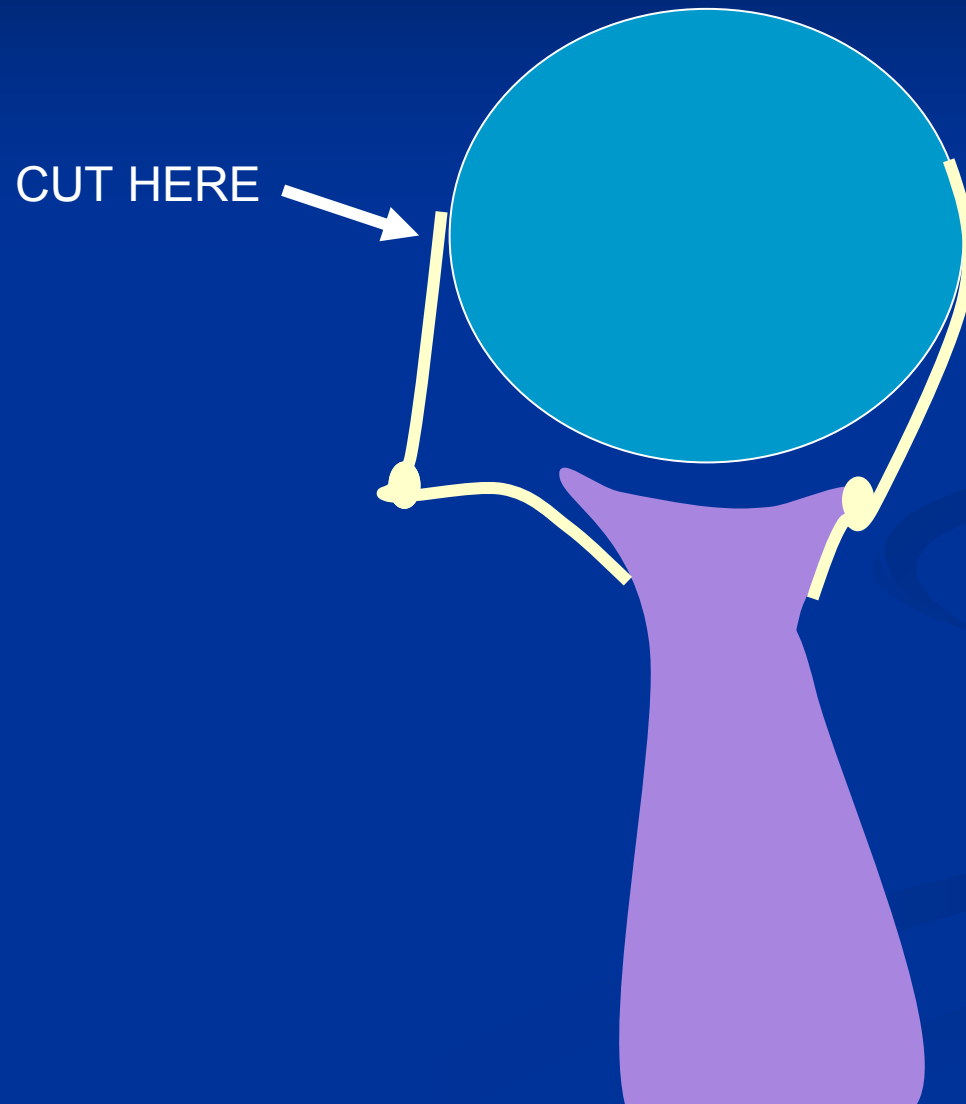
INSTABILITY

IMPINGEMENT

Traumatic recurrent anterior instability

- Physio may help rehabilitation but does not prevent further dislocations.
- Operative treatment clearly superior at reducing recurrence
- Surgery reduces risk of post traumatic arthritis.

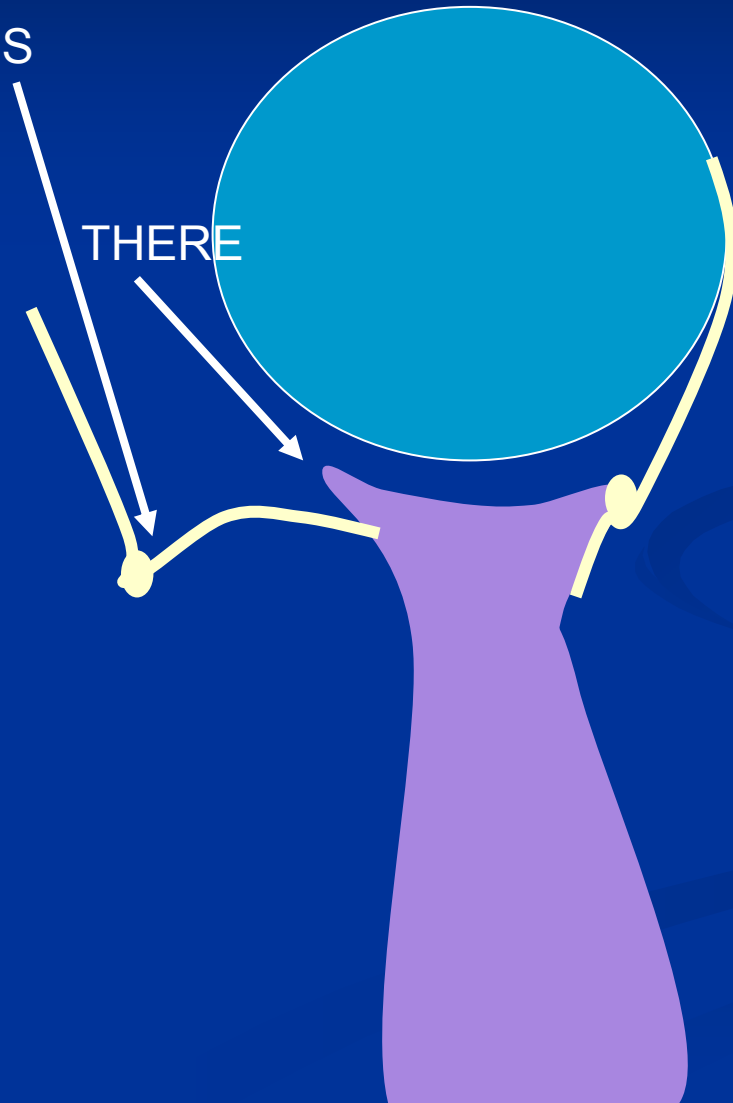
OPEN SURGERY:



OPEN SURGERY:

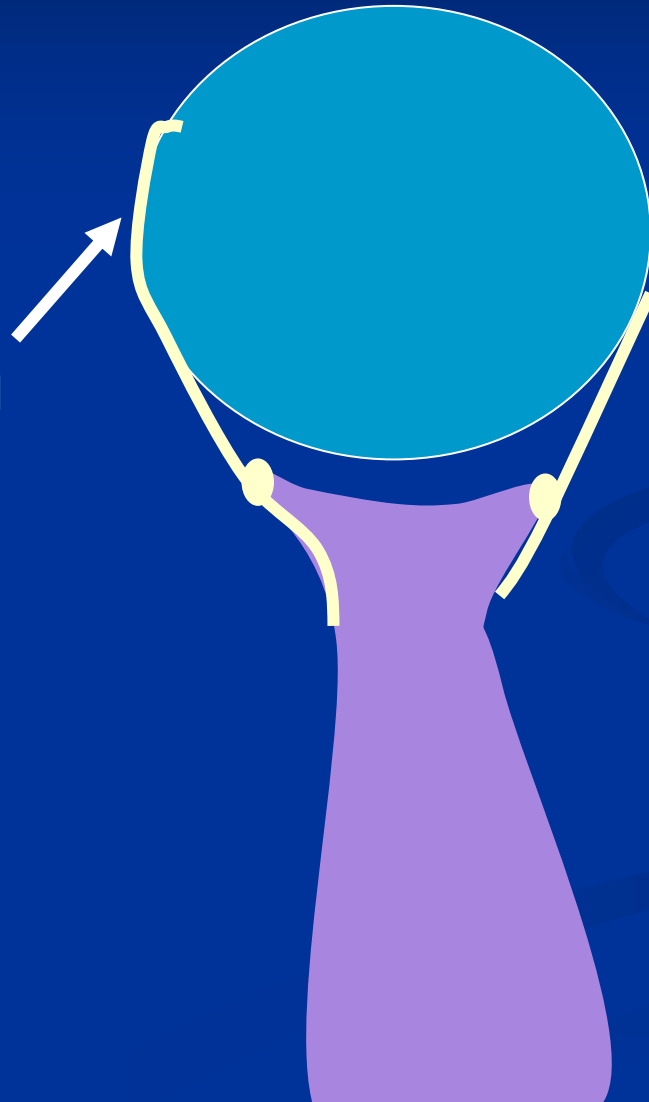
ATTACH THIS

THERE



OPEN SURGERY:

REPAIR & TIGHTEN
THE CAPSULE



ARTHROSCOPIC SURGERY:

NO NEED TO CUT HERE

GRAB THE LABRUM
AND ATTACH IT TO
GLENOID



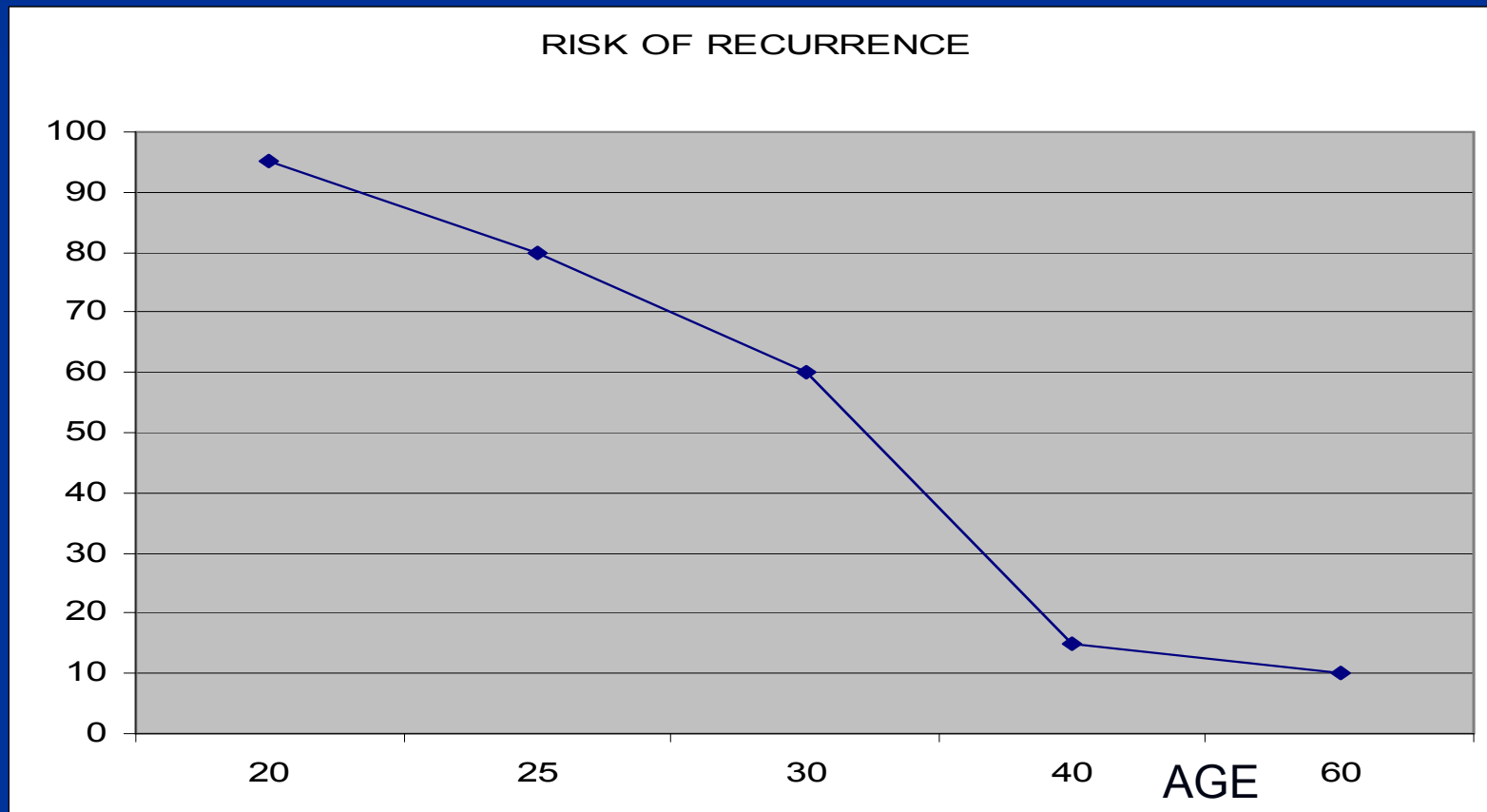


STABILIZATION SURGERY:

- 15-20% RECURRENCE
- NOT WITHOUT RISKS!

RISK OF RECURRENCE

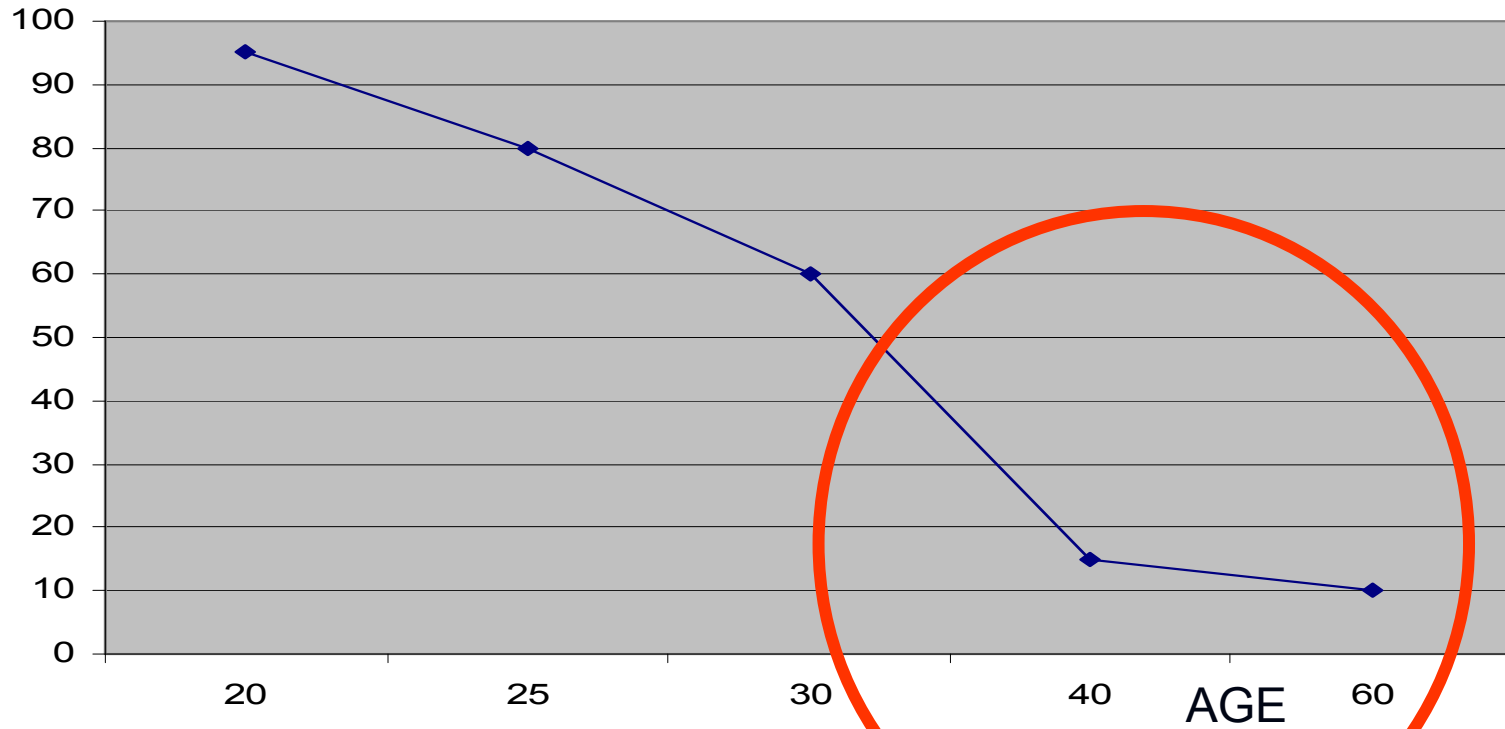
- STUDIES VARY WIDELY BUT ROUGHLY...



Traumatic anterior instability

- Recurrent: Surgery
- First-time:
 - Splint in External rotation
 - Surgery if recurrent

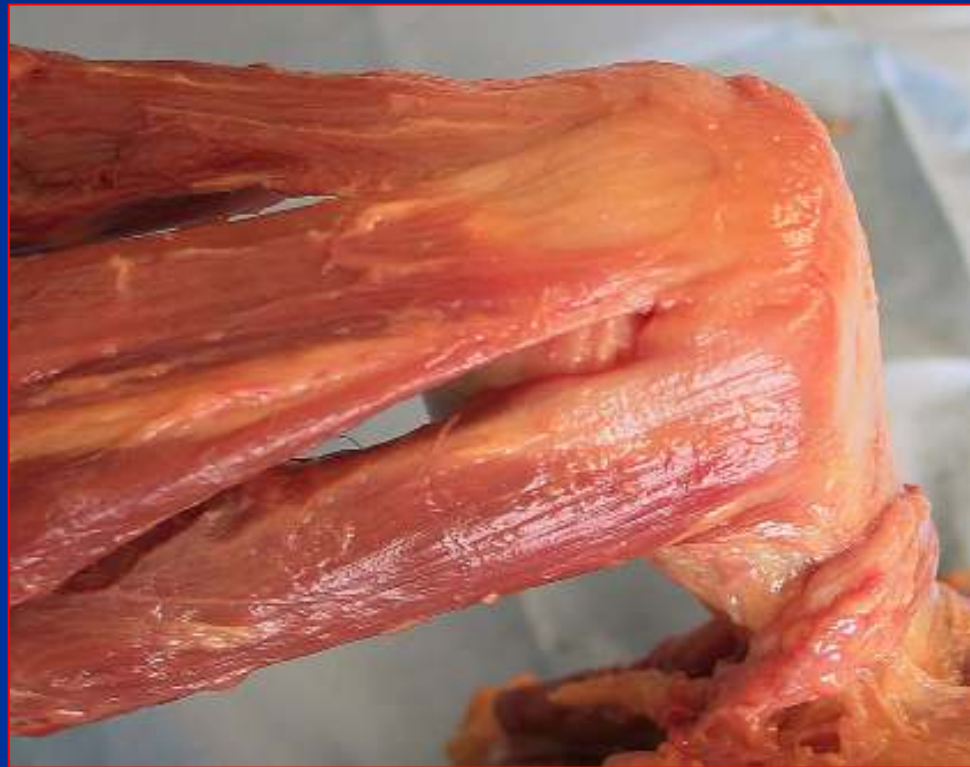
RISK OF RECURRENCE



Age >40

- High incidence of unhappy patients
- ON-GOING:
 - PAIN
 - WEAKNES
 - STIFFNESS

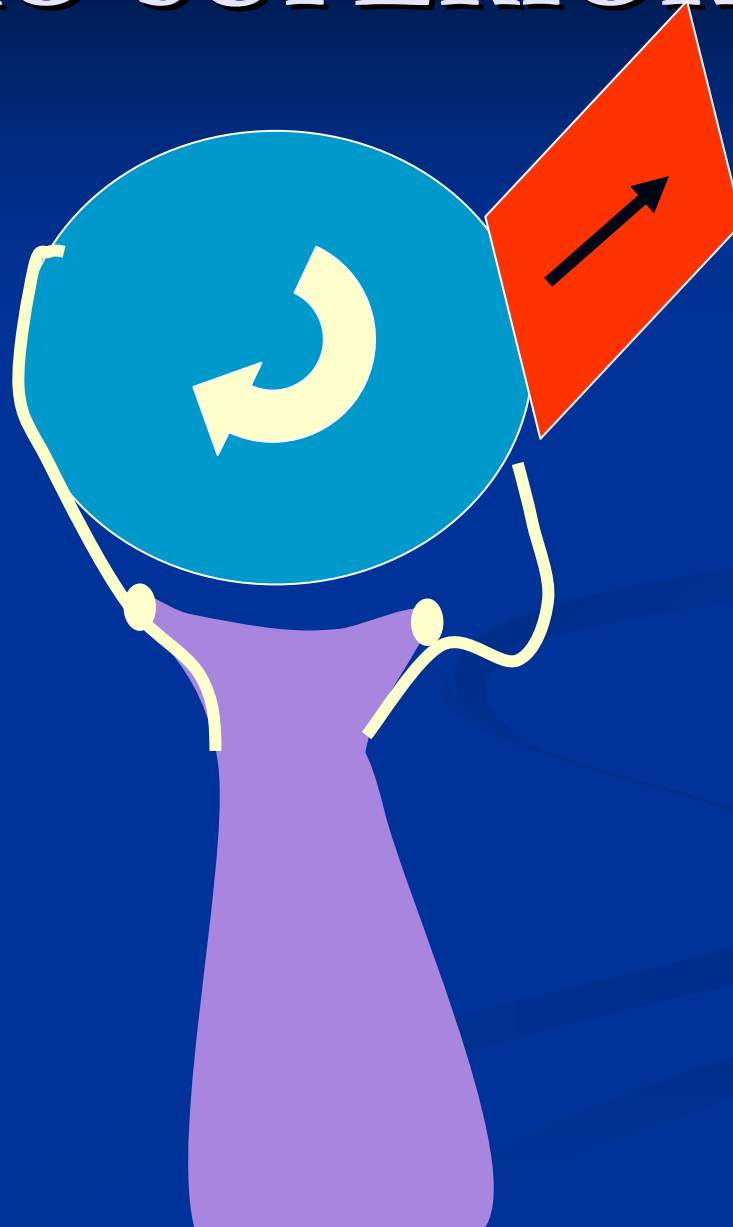
The rotator cuff is the weak link



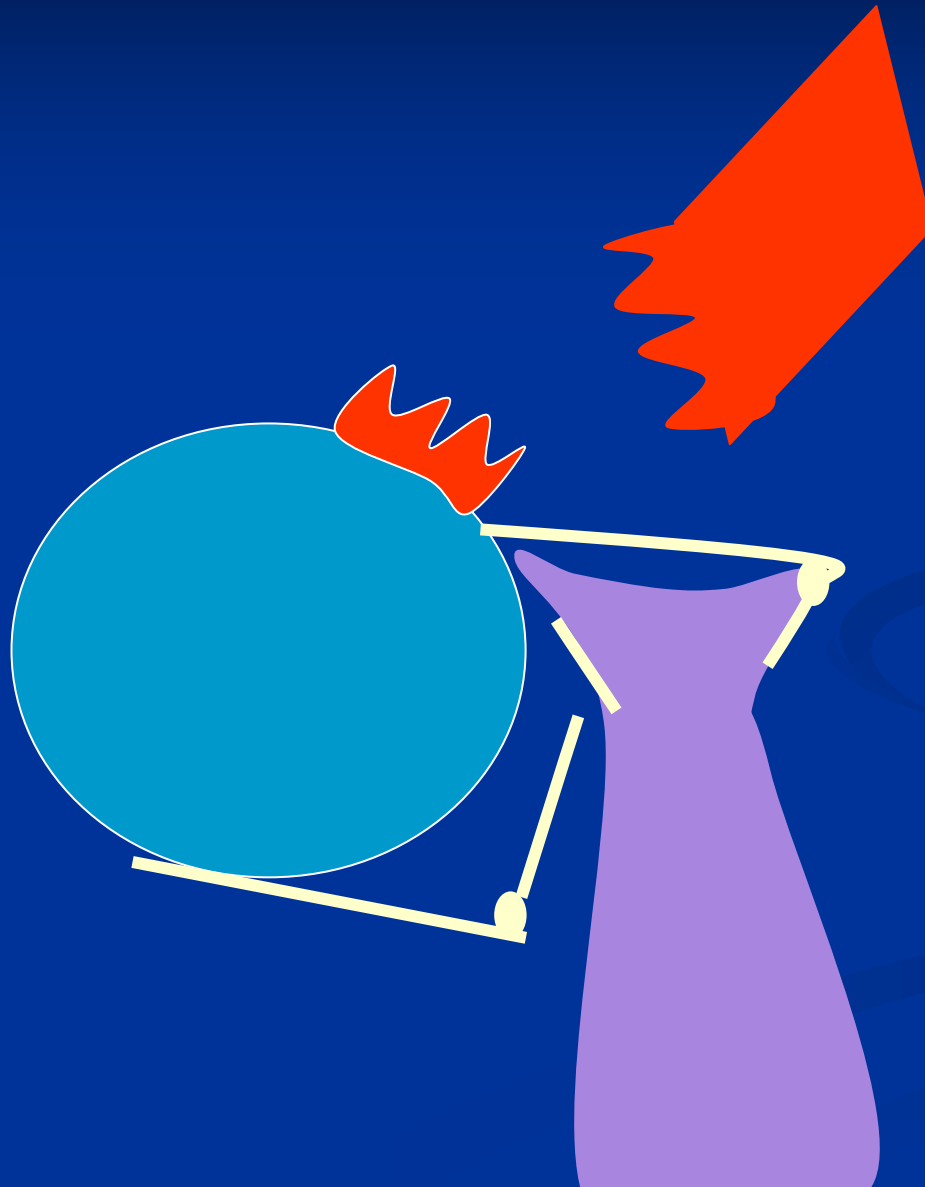
POSTERO-SUPERIOR CUFF

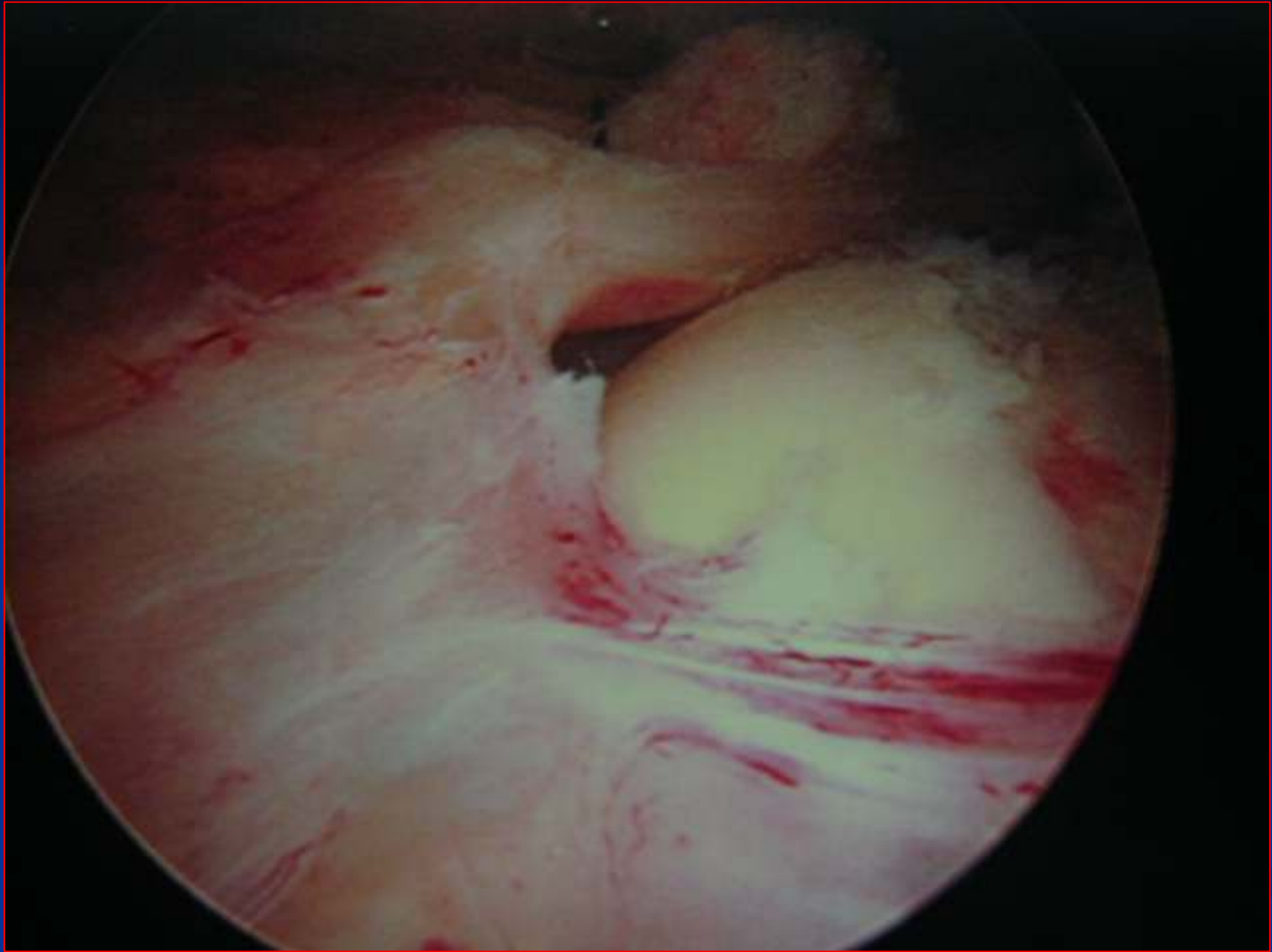
ANTERIOR

POSTERIOR



CUFF TEAR





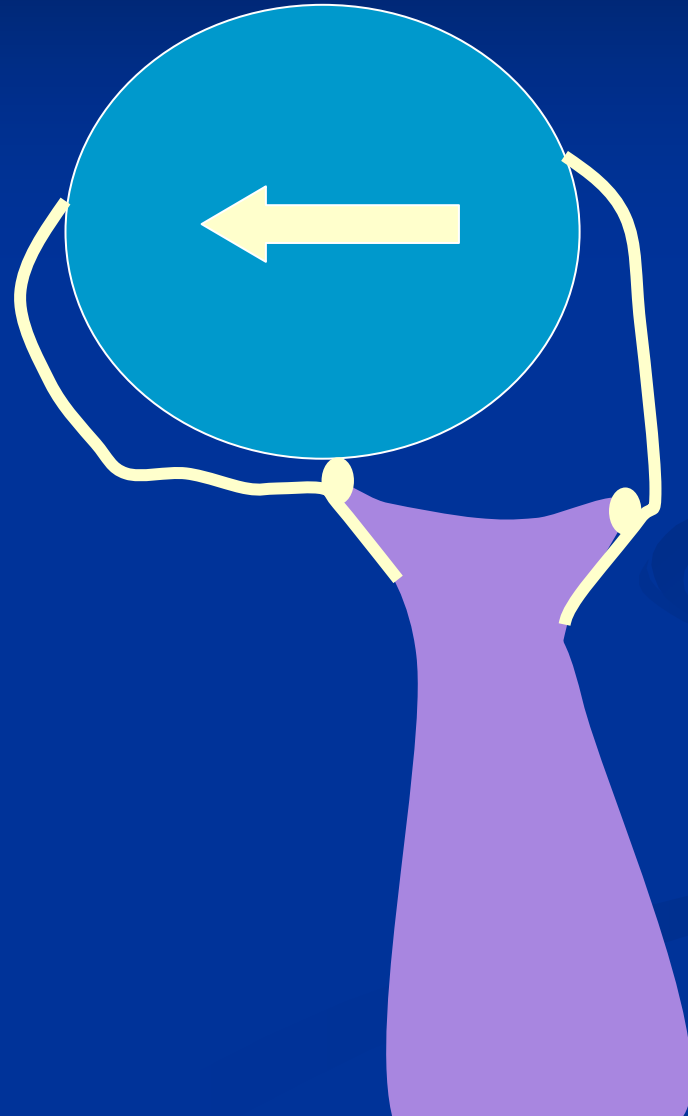
DO NOT MISS A LARGE TRAUMATIC
CUFF TEAR IN A MIDDLE AGE
WORKING PERSON AFTER A
SHOULDER DISLOCATION

IF YOU REPAIR IT EARLY YOU WILL
IMPROVE THE PROGNOSIS
DRAMATICALLY

Atraumatic Structural Instability

- SURGERY HISTORICALLY HAS PRODUCED MANY DISASTERS
 - THERMAL CAPSULORRHAPHY
- Capsular Shift May help

LAXITY



Muscle pattern instability

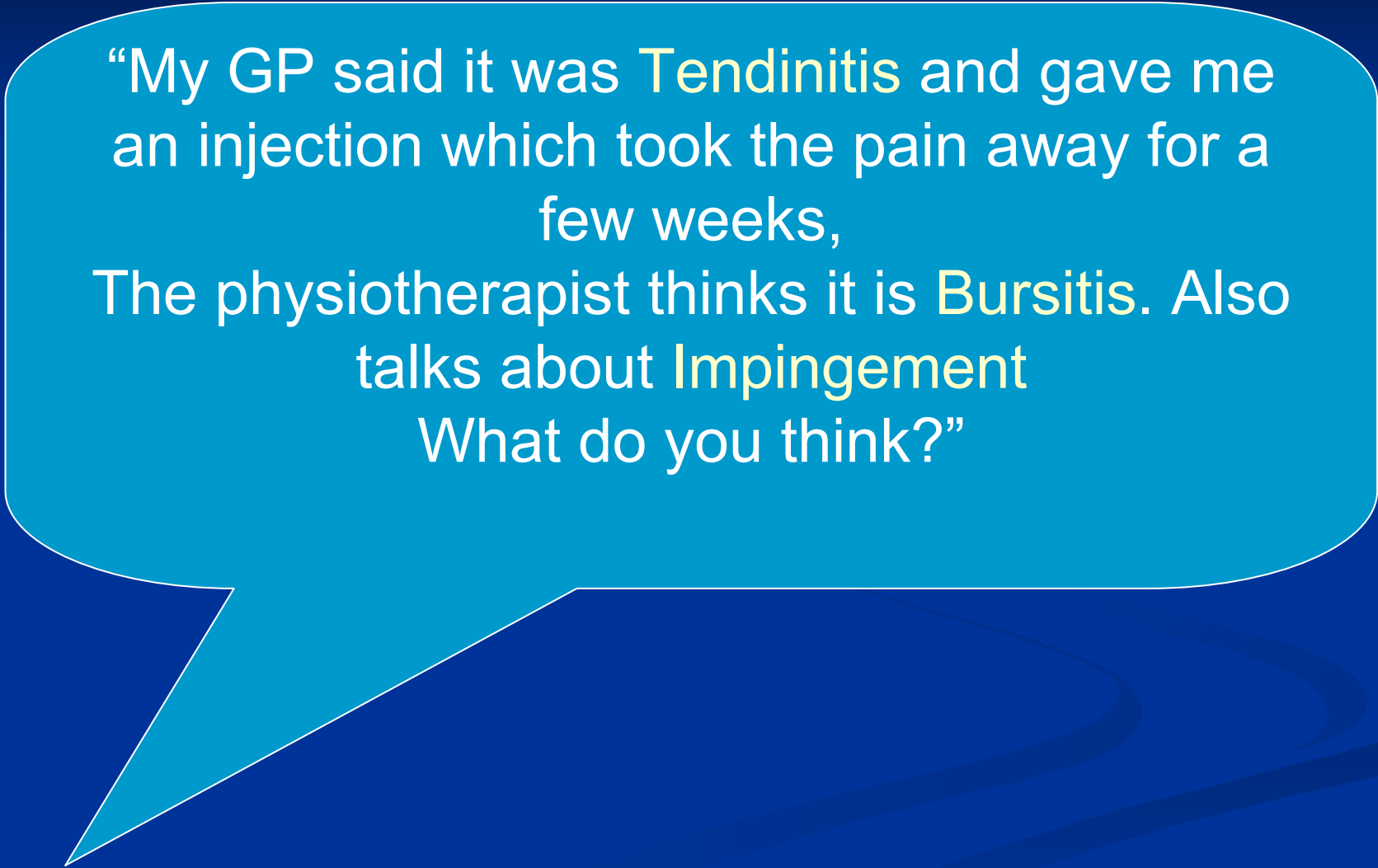
- NEED SPECIALIST PHYSIO
- Diagnostic challenge
- Bizarre scapulo-humeral rhythm and abnormal patterns of muscle contractions

3: “Pain on Elevation”

“It hurts when I raise my arm and
when I reach out for things.

It is really sore at night, can not find a
comfortable position

I find it difficult to reach my back”



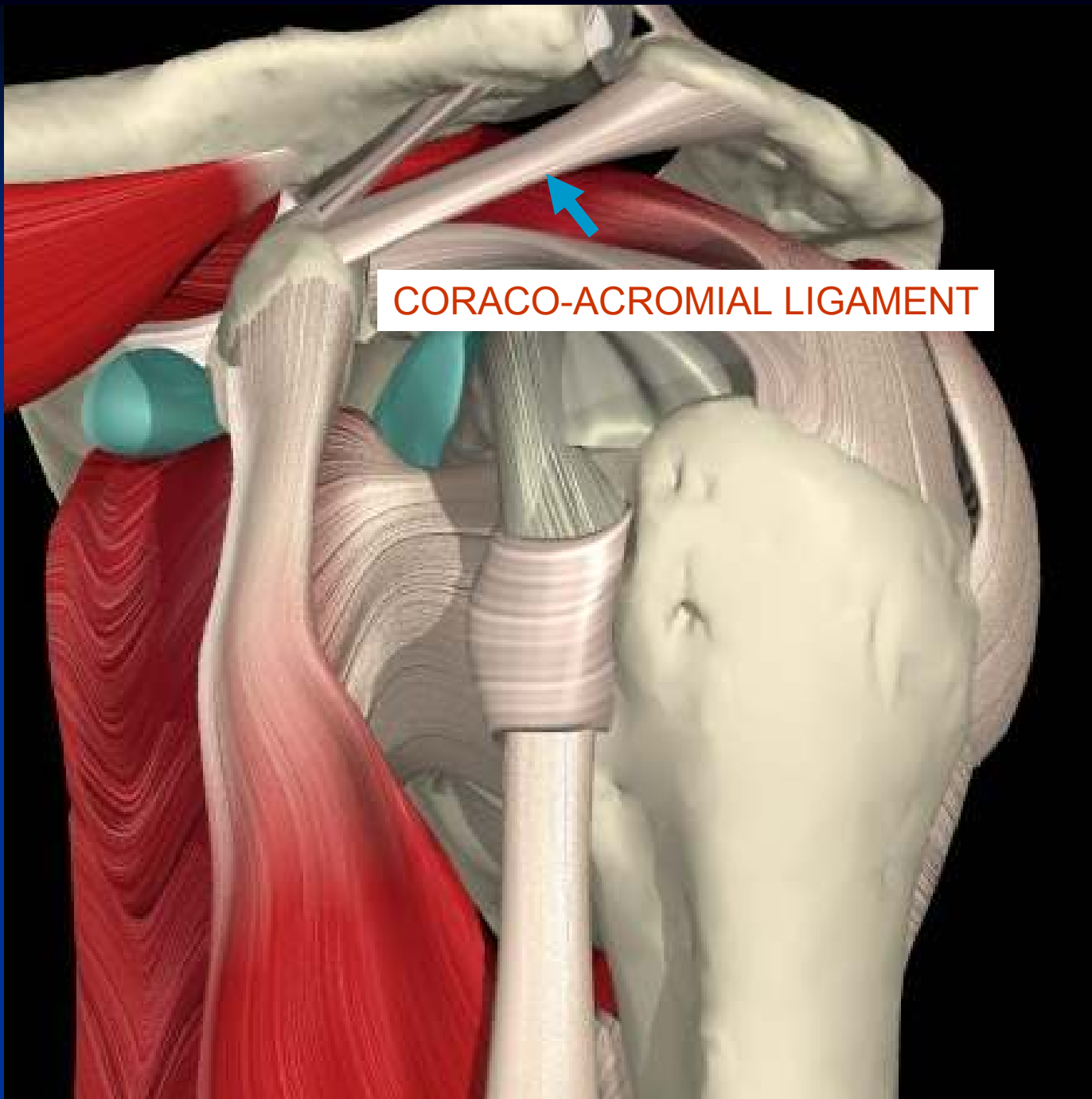
“My GP said it was Tendinitis and gave me an injection which took the pain away for a few weeks,
The physiotherapist thinks it is Bursitis. Also talks about Impingement
What do you think?”

A blue gradient background with a light blue speech bubble containing text. The speech bubble is positioned in the upper middle section of the frame. The text inside the bubble is white and reads "I think you may have a Cuff Tear".

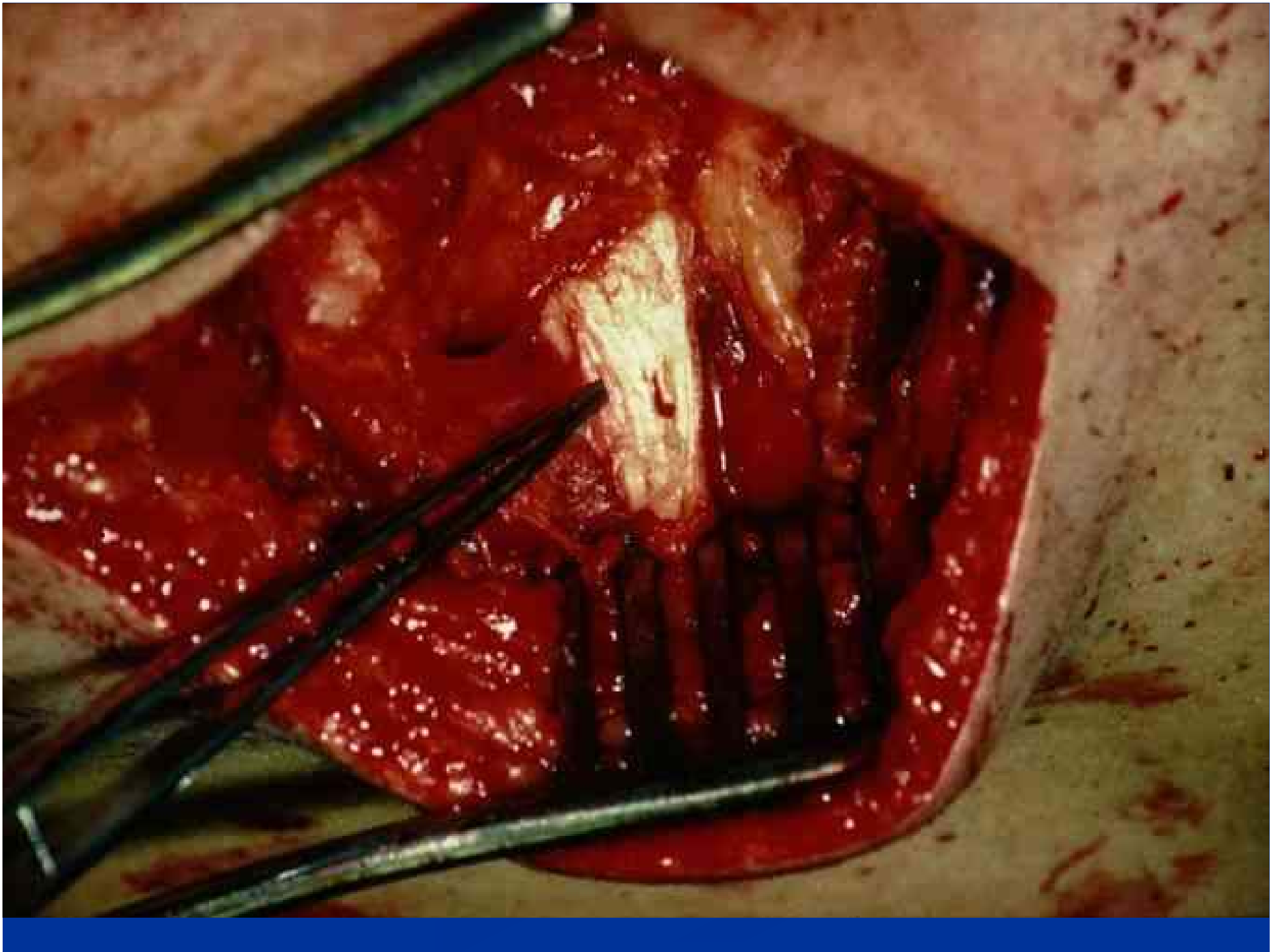
“I think you may have a Cuff Tear”

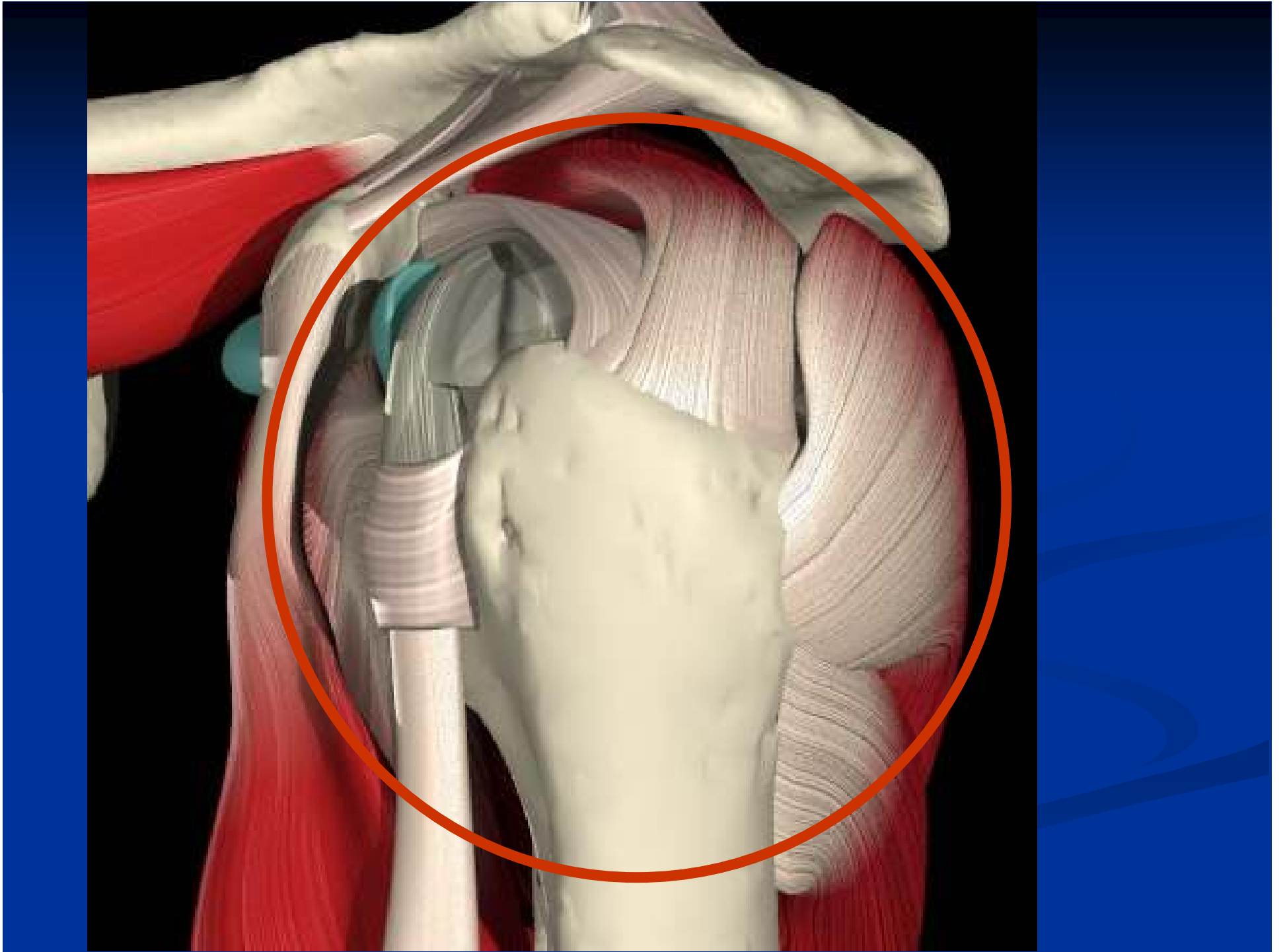
It is all very confusing





CORACO-ACROMIAL LIGAMENT





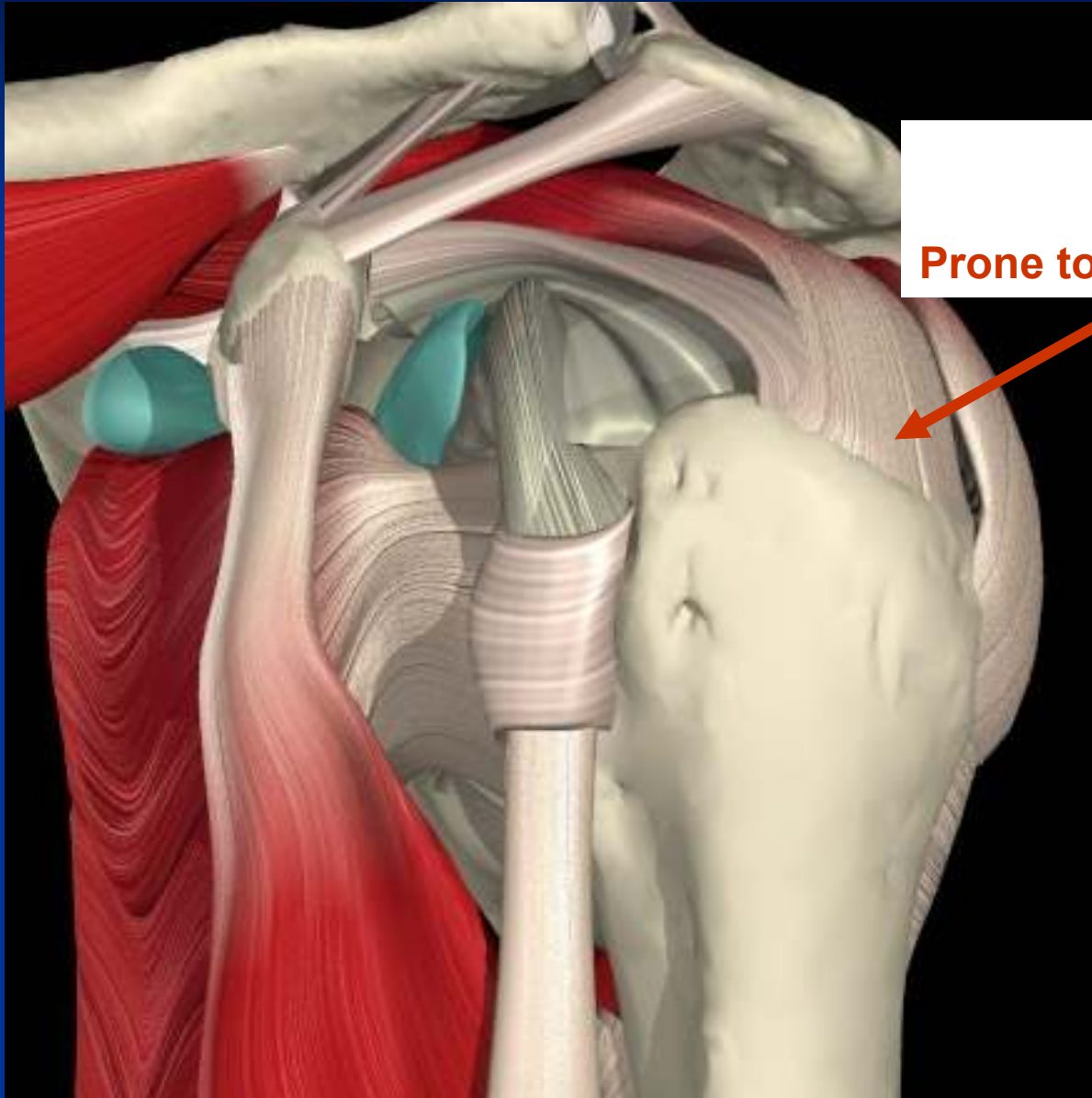
An anatomical illustration of the shoulder joint, viewed from the front. The subacromial bursa is highlighted in a light blue color. It is located between the acromion of the scapula and the greater tuberosity of the humerus. The bursa is shown as a large, oval-shaped structure. The surrounding structures, including the humeral head, acromion, and various muscles and ligaments, are rendered in realistic colors and textures. A white rectangular box with the text "SUBACROMIAL BURSA" is overlaid on the bursa.

SUBACROMIAL BURSA





supraspinatus



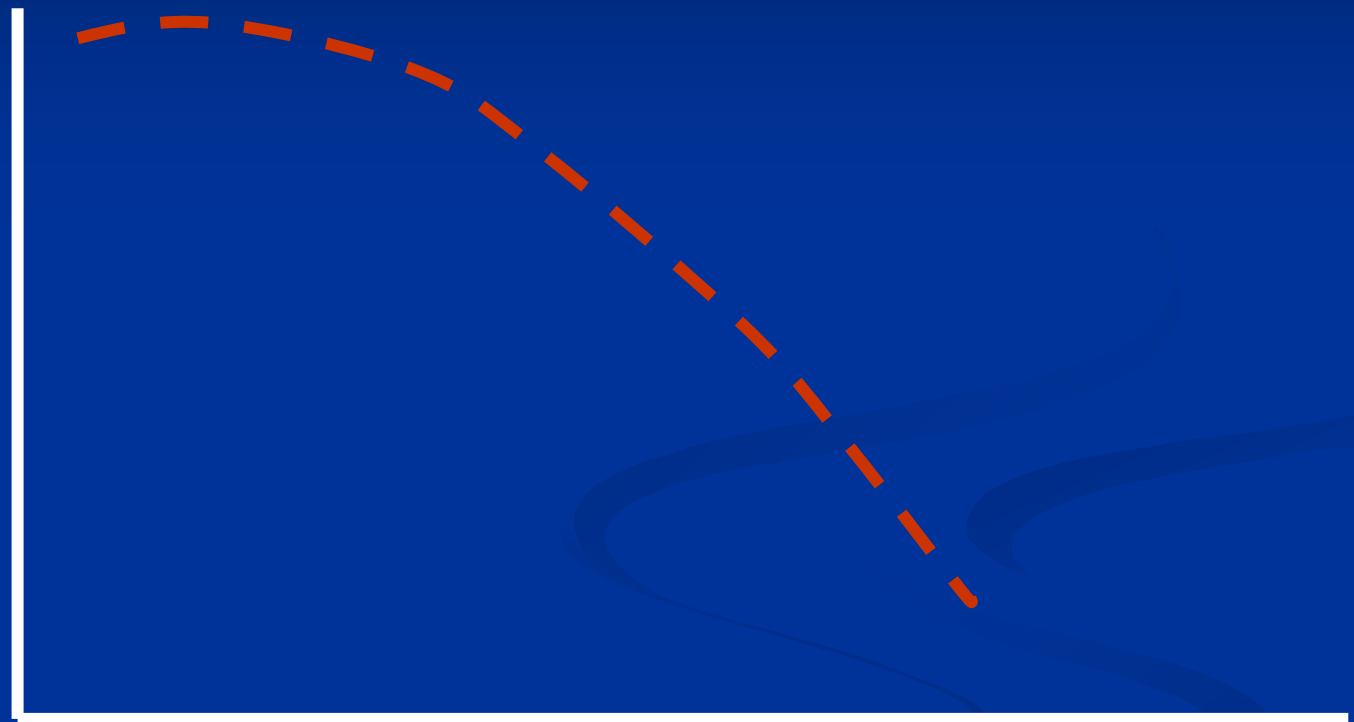
**Critical zone,
Hypovascular?
Prone to calcific deposits and tears**



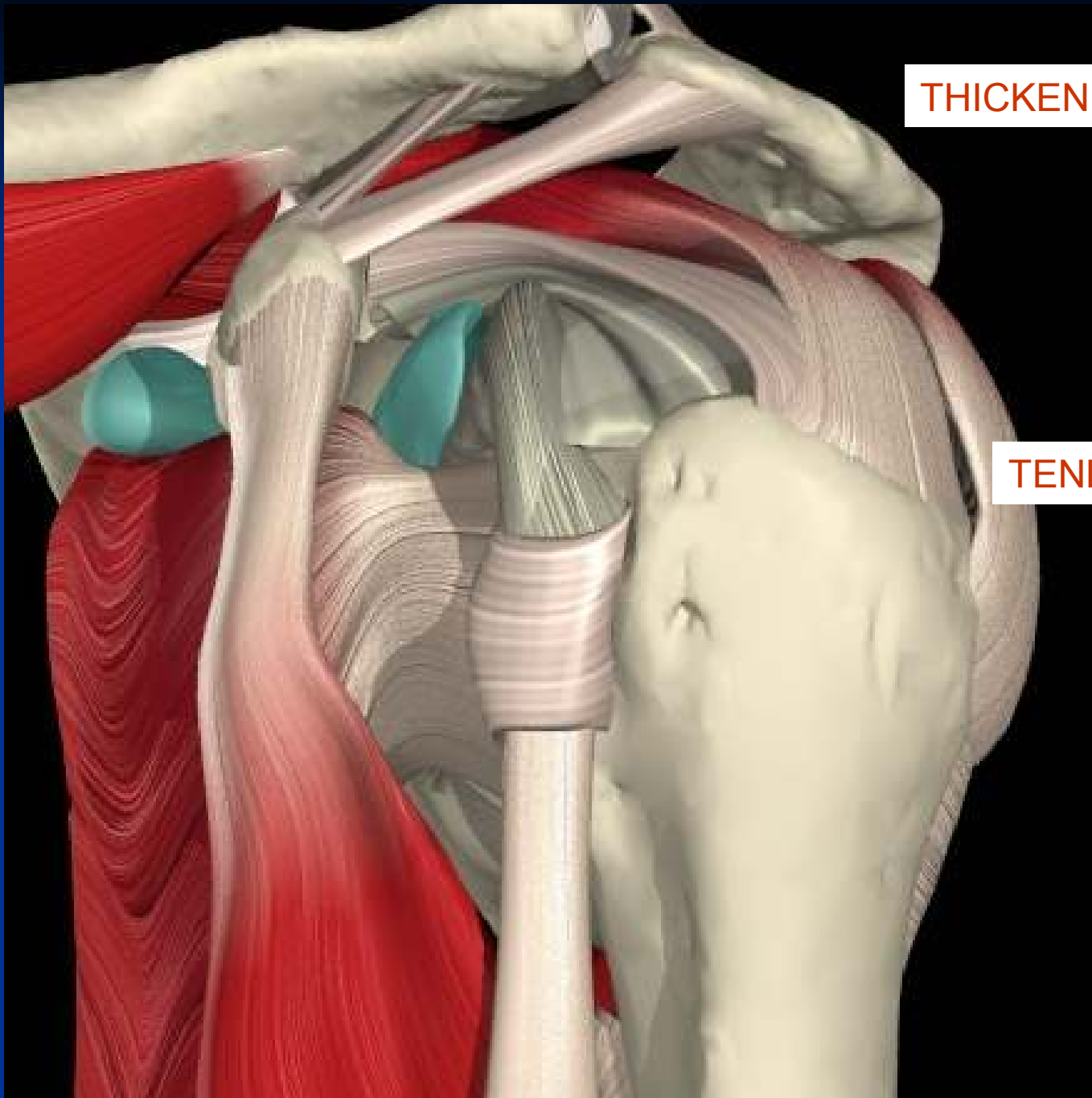
**Failure of rotator cuff is
commonly linked to
shoulder symptoms**

**AGE IS THE SINGLE
MOST IMPORTANT
FACTOR
CONTRIBUTING TO
CUFF FAILURE**

FORCE REQUIRED TO DISRUPT CUFF TENDON FIBRES



INCEASING AGE →



THICKENED C-A LIGAMENT

TENDON DEGENERATION



The image is a 3D anatomical illustration of the shoulder joint. The humeral head is on the left, and the scapula is on the right. A large, light blue, oval-shaped structure is highlighted in the center, representing the subacromial bursa. A white rectangular box with the text "BURSITIS" is overlaid on this structure. The surrounding muscles are shown in red, and the bones are in a light grey/white color. The background is black, with blue vertical bars on the left and right sides.

“BURSITIS”

R



ADDITIONAL FACTORS

- Compressive loads against coraco-acromial arch
- Critical zone more susceptible
- Changes in the coraco-acromial arch
- Role of trauma?

“PROGRESSIVE CUFF FAILURE”

WHEN A FIBRE OF TENDON FAILS...

- Increases the load on the neighbouring, unruptured fibres, giving rise to the “zipper phenomenon”
- Detaches muscle fibres from bone, diminishing the force that the cuff can deliver
- Distorts local anatomy & blood supply, leading to progressive ischaemia
- Exposes more tendon to lytic enzymes of joint fluid

WHEN A FIBRE OF TENDON FAILS

- Inflammatory response
- Ischaemia
- Mechanical compromise
- All possible causes of pain



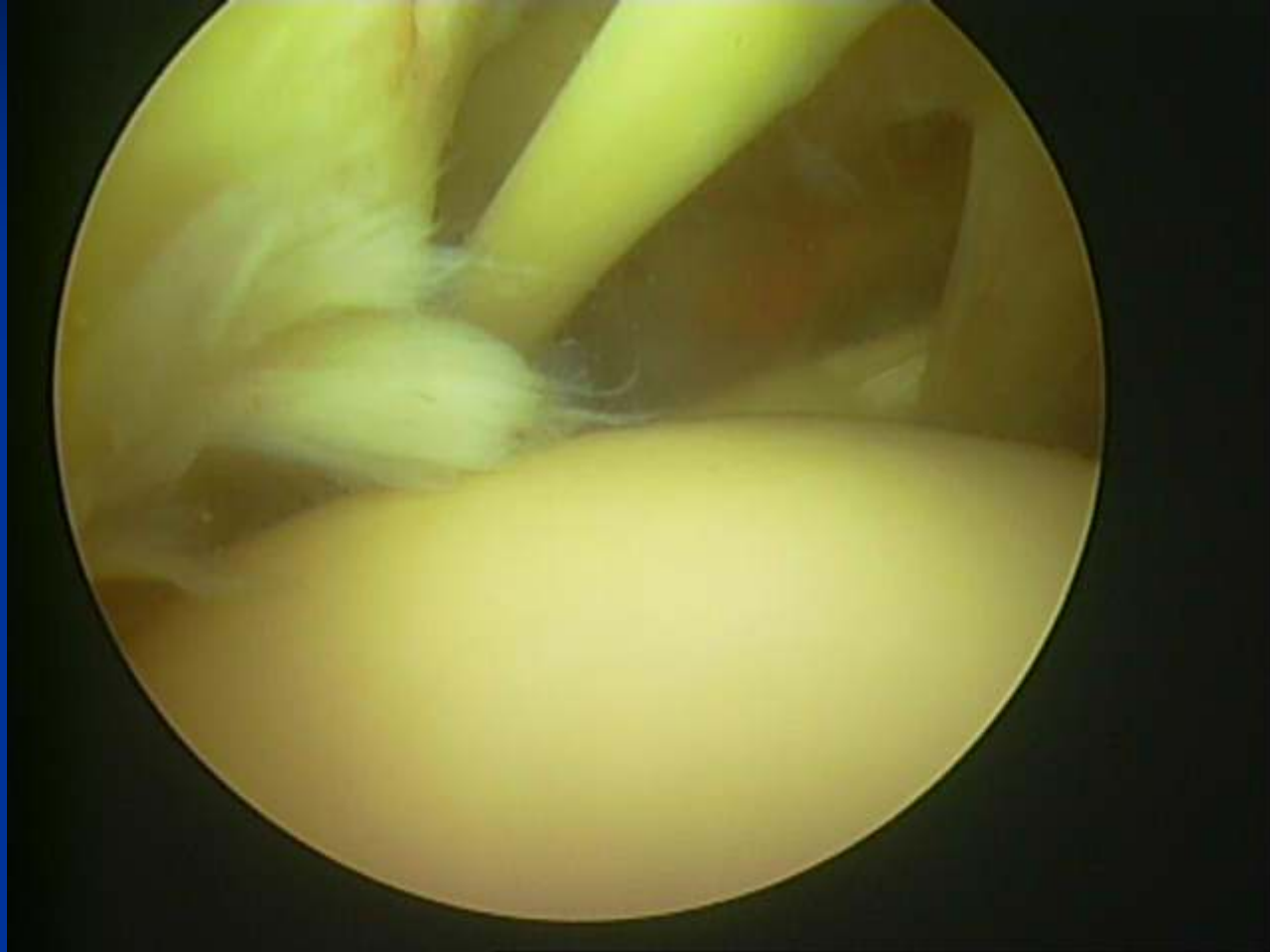
What do we see

- Inflamed tendon
- Partial thickness tears
- Full thickness tears
- Massive tears

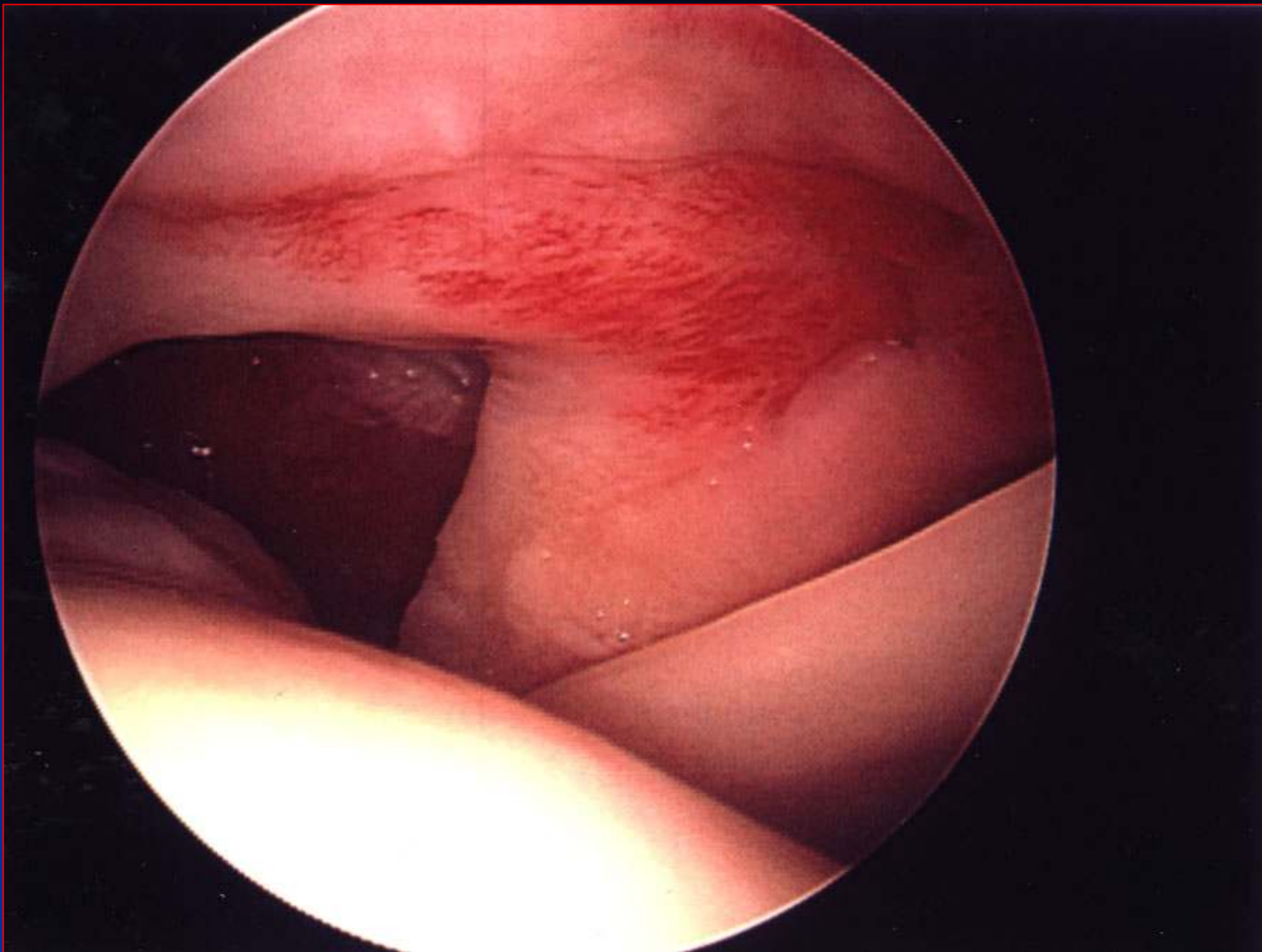
AGE

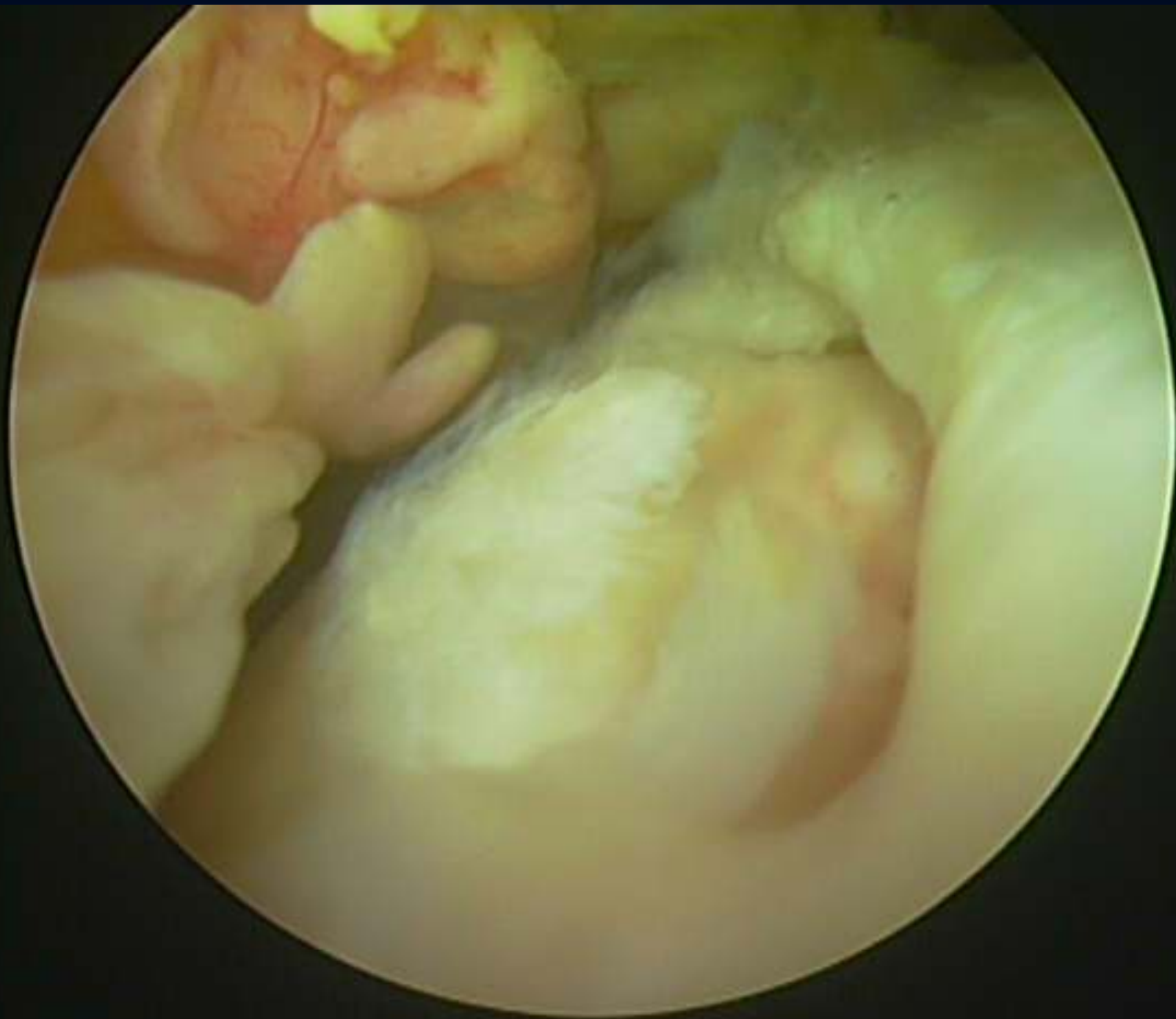




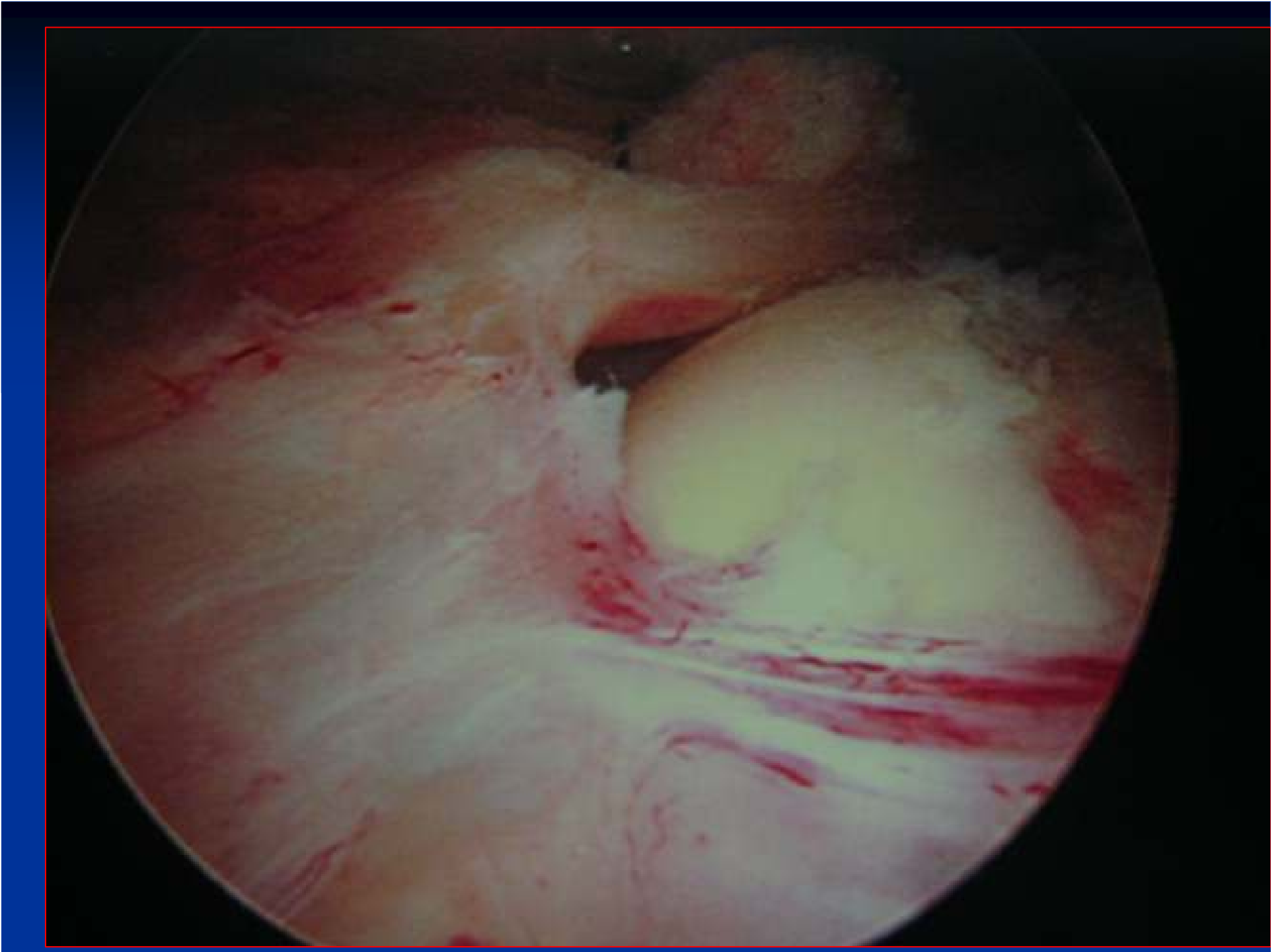












DO TEARS HEAL??



NATURAL HISTORY

- 80% of partial thickness tears will progress
- ...but symptoms may improve
 - Yamanaka et al 1983

Traumatic Cuff Tears

- Healthy tendon is extremely strong and bony avulsion more likely to occur.
- Acute traumatic tears occur in degenerative cuff.

Incidence

- Cadaveric studies: 5-30%
 - More common in older groups
 - Partial thickness tears twice as common

Incidence

- MRI & Arthrogram studies in ASYMPTOMATIC INDIVIDUALS:
 - 50% over 70 years of age
 - 80% over 80 years of age
 - Partial thickness tears commoner in younger groups (24% age 40-60, 4% age less than 40)

**Bilateral tears are
extremely common!**

Clearly, we do not
understand why some
patients are symptomatic

Clinical Scenarios:

- Asymptomatic Cuff Failure
- Stiffness
 - Posterior Capsule tightness
- Weakness
- Pain on muscle contraction
- “Cuff pain”
- Crepitus
- Cuff Arthropathy

Clinical examination

Differential Diagnosis

- ACJ arthritis
- LHB pathology
- Suprascapular nerve pathology
- C5-6 cervical spondylosis

Treatment

Since we do not understand the correlation of pathophysiology and symptoms very well ...

...it is even more difficult to know how to best treat the patient!

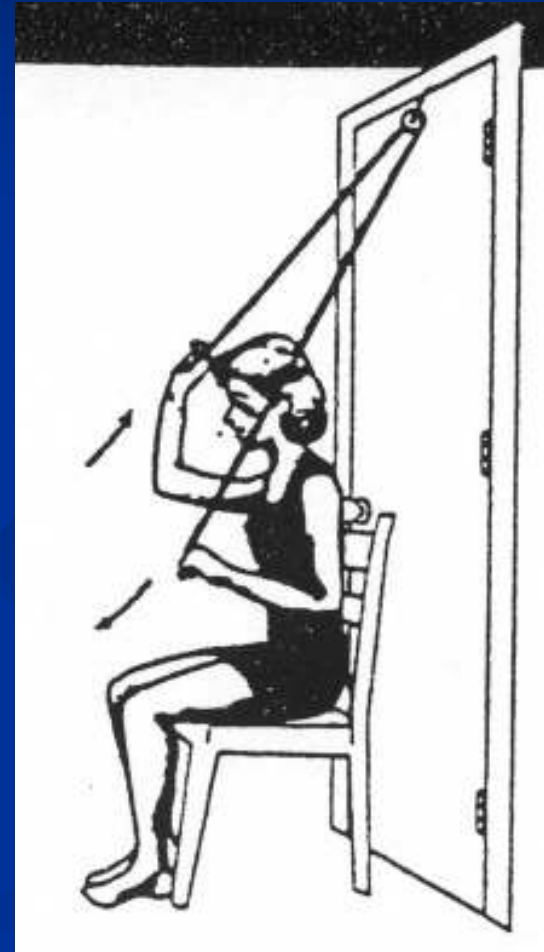
Non-operative management should be the first line of action

But consider surgery in acute traumatic
full-thickness tears (eg after
dislocation)

Many patients may
improve their symptoms
despite progression of
cuff failure

Non-operative management

- Reassurance
- Physiotherapy
- Subacromial Injections



Surgery

- Open or Arthroscopic
- Subacromial decompression
 - CA ligament release
 - Acromioplasty
 - Debridement of bursa
- Cuff repair

Surgery

- If non-operative management fails
- Severe symptoms
- Longstanding symptoms

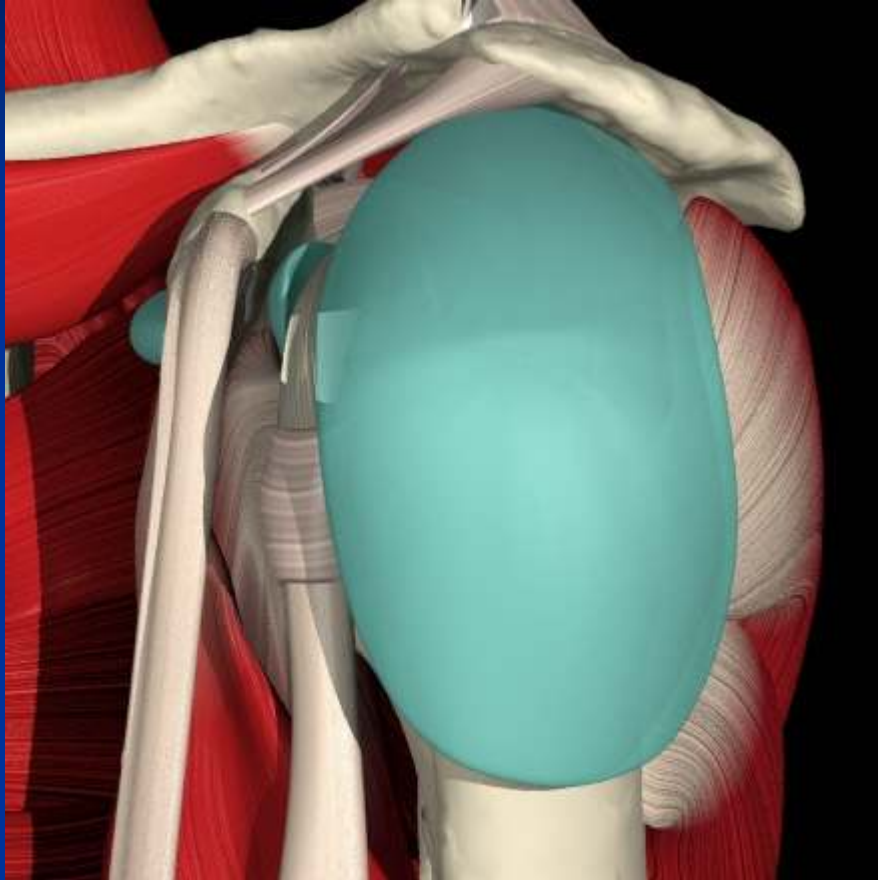
- Can be extremely successful
- Can be a waste of time

- Rapidly evolving field!

Outcomes of surgery...

- Confusing, because indications for surgery are not strict
- Typically “70-80% good-excellent results at 5 years”
- Lack of comparative studies!!!

C-A Ligament release



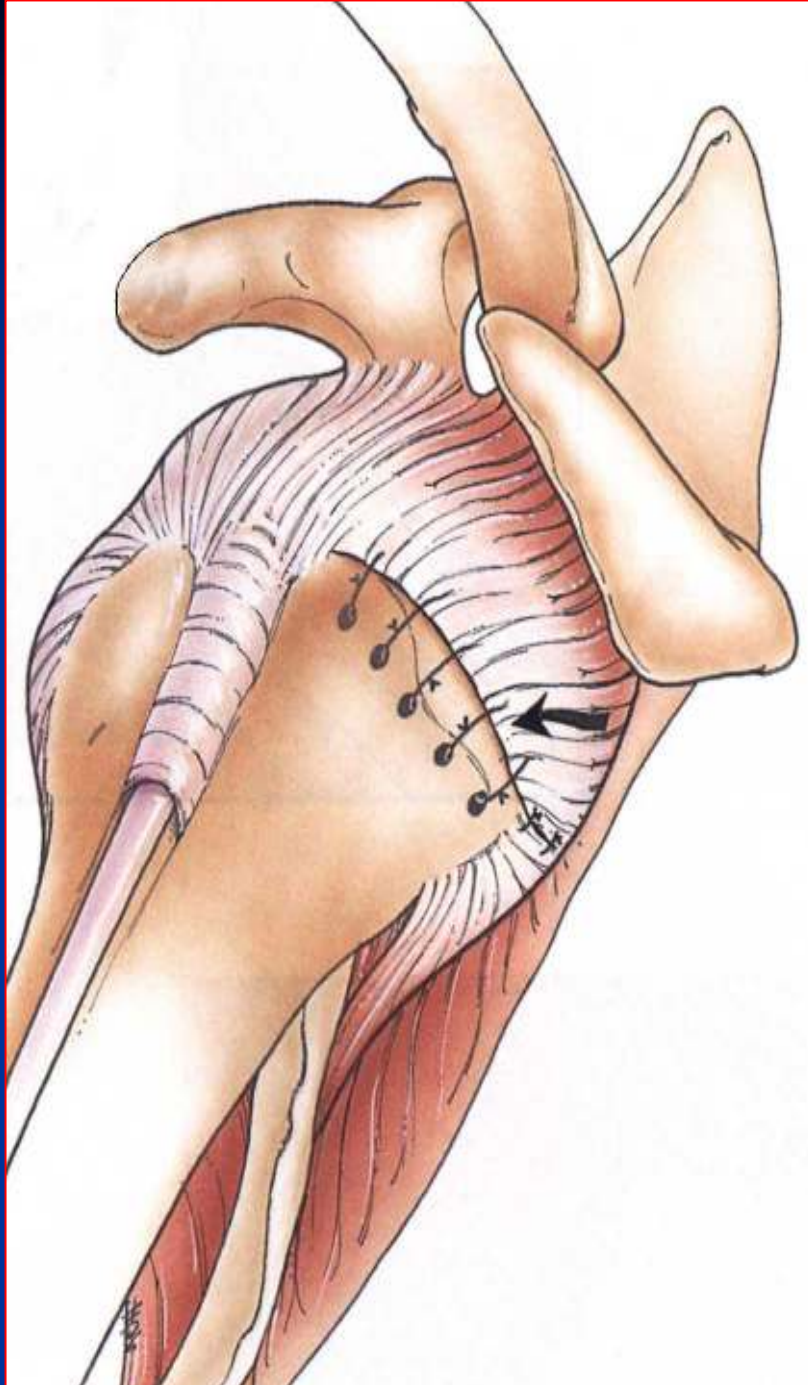
Analogy with Trigger finger etc??

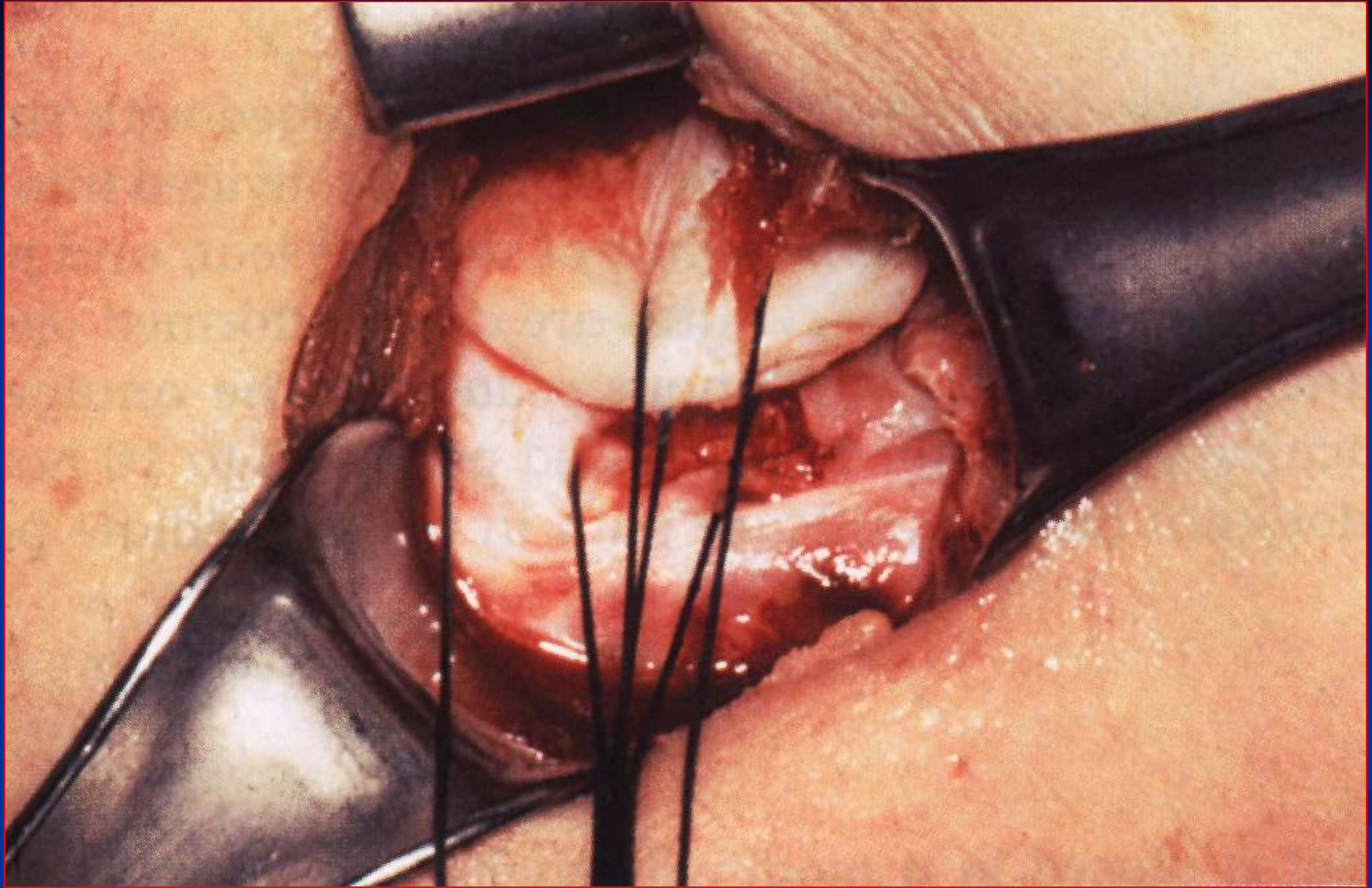


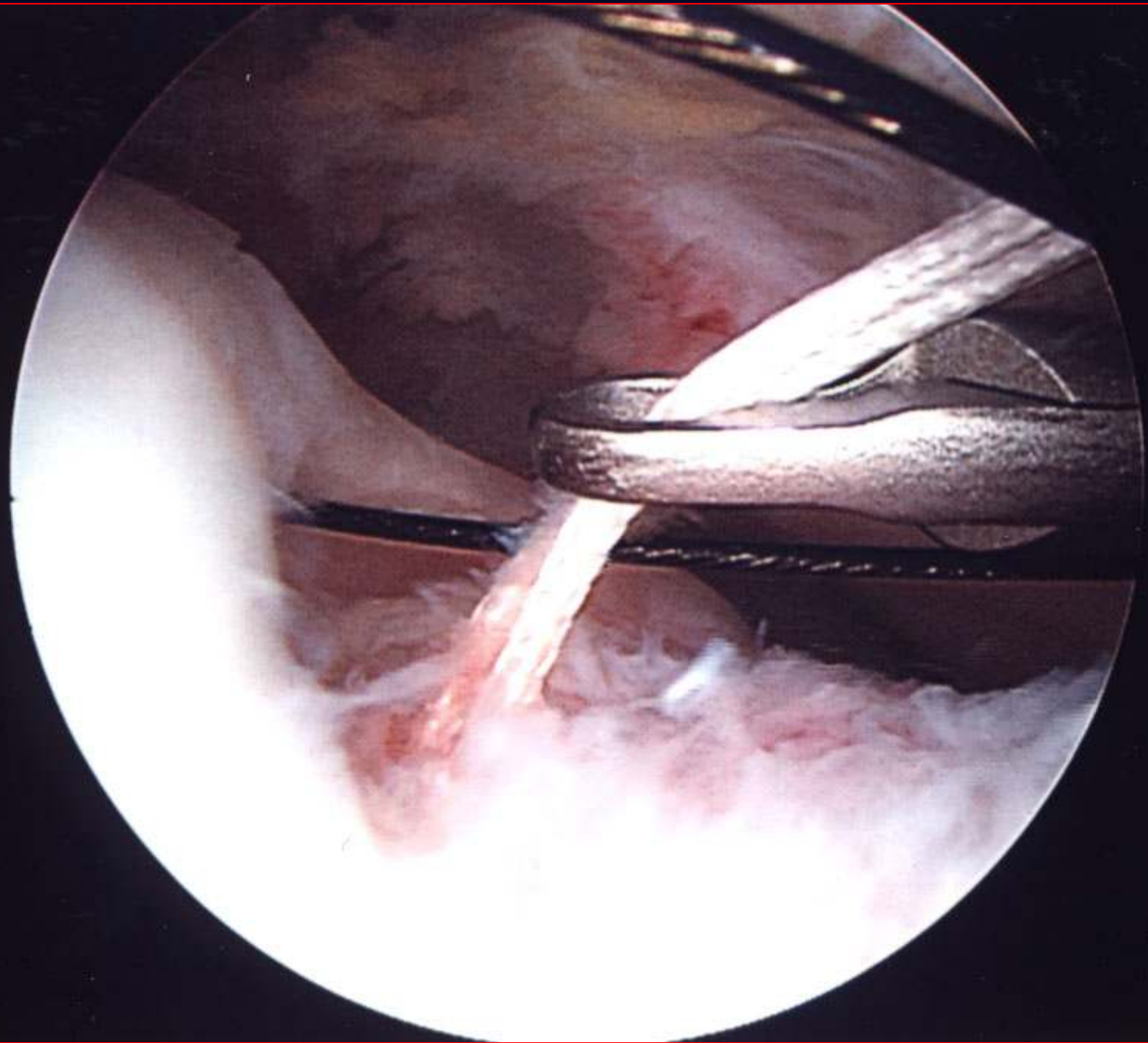
02.mpg



03.mpg







Other causes of pain on elevation

- ACJ pathology
- Long Head of biceps pathology

ACJ PAIN



ACJ PAIN

- ARTHRITIS
- AVN IN WEIGHT LIFTERS
- Intra-articular disc related pain ?

ACJ PAIN

- Localised pain to ACJ?
- Other pains in shoulder also?

ACJ injection

- Very good diagnostic value
- May provide long term relief

ACJ RESECTION

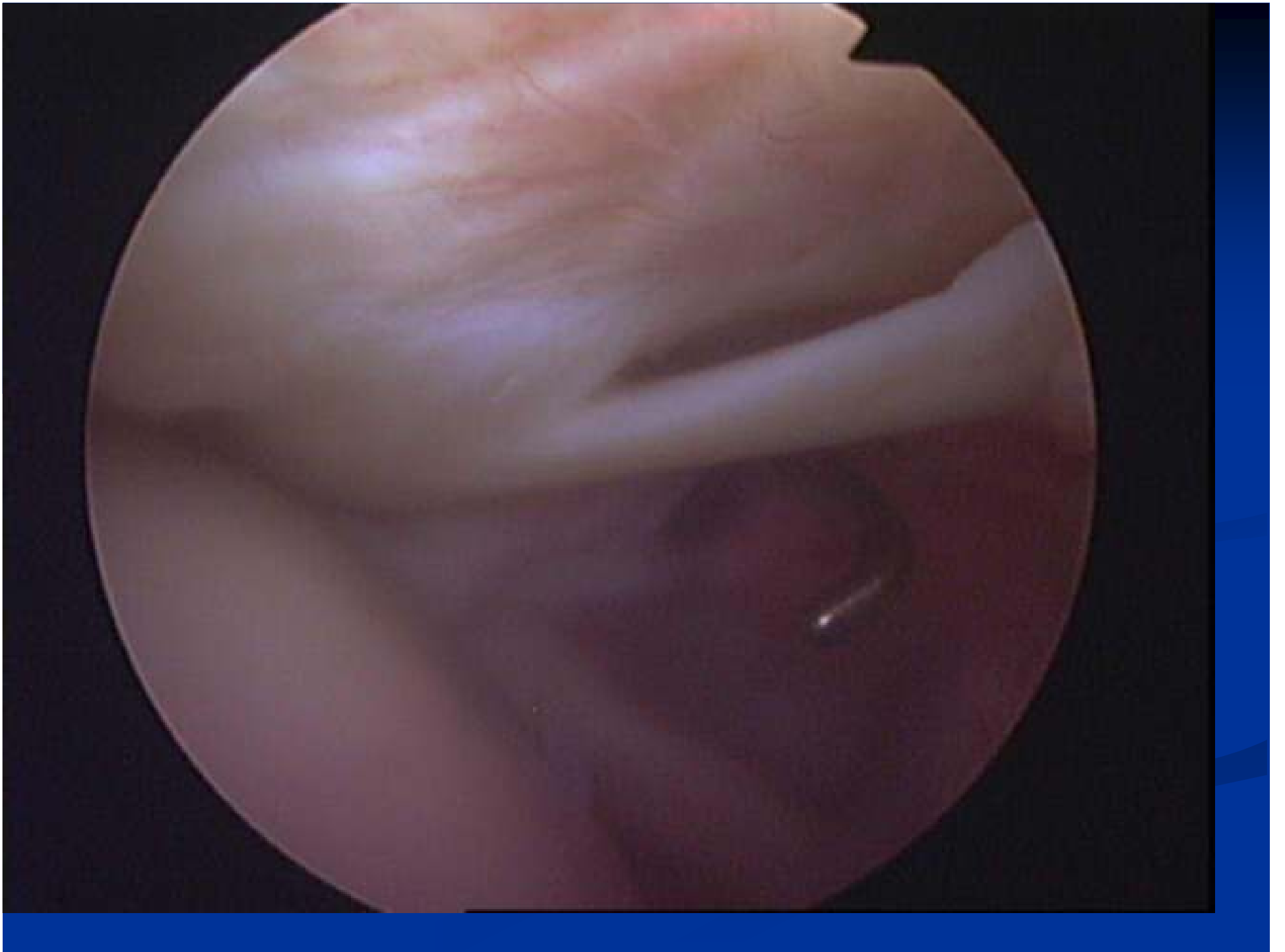
- REMOVAL OF LATERAL 50-10MM OF CLAVICLE.
- OPEN SURGERY
- ARTHROSCOPIC SURGERY
- USUALLY SUCCESSFUL

LHB

- POORLY UNDERSTOOD
- “HOURGLASS BICEPS”
- “TRIGGER BICEPS”



01.mpg





LHB

- BICEPS TENOTOMY
- BICEPS TENODESIS

Summary

Management Summary

- Stiff shoulder: X-ray, consider early referral
- Instability: MRI arthrogram
 - Traumatic recurrent: Surgery
 - Other: Specialist Physio
- Pain on elevation: USS +/- Xray
 - Differentiate traumatic cuff tear from degenerative cuff defect
 - Be aware of possible diagnosis
 - Conservative treatment first

■ Thanks