Edinburgh
Orthopaedic Specialists

# Arthroscopic Capsular Release

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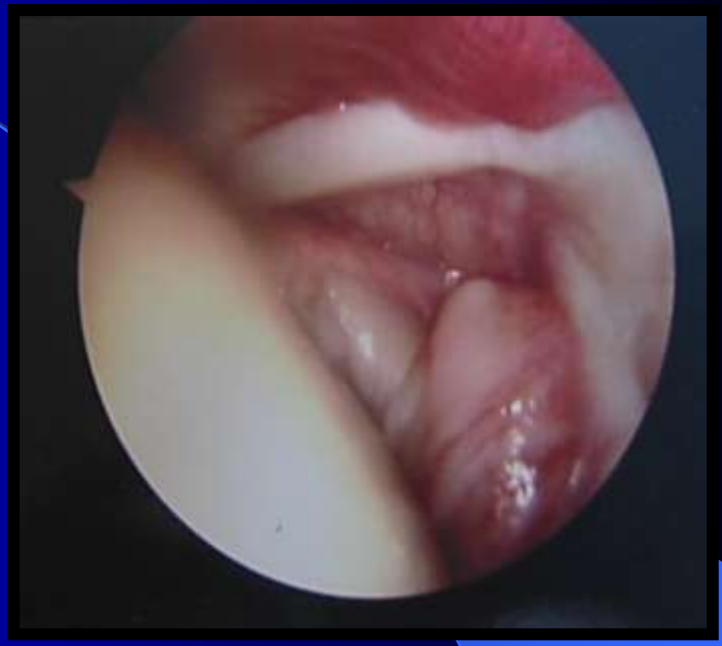
# ‘Frozen Shoulder’

- **Duplay, 1875** ***(Peri-arthrite scapula-humarale)***
- **Codman, 1934** ***(Frozen shoulder)***
- ***‘Capsulite retractile, Periarthritis, Adhesive capsulitis, Contracted shoulder, Checkrein shoulder’***
- **Defn:** **Slow onset shoulder pain**
  **Discomfort near deltoid insertion**
  **Unable to sleep on that side**
  **Restricted elevation and ER**
  **Normal radiographs**

***Codman EA. ‘Tendonitis of the short rotators’. Boston: Thomas Todd; 1934.***

# 1° Adhesive Capsulitis

- 2 – 5% Incidence
- 30% in IDDM
- Association with Dupuytren's
- Pathogenesis unclear
- Inflammation, reactive angiogenesis and scarring
- Jt volume 3-4ml (from 10-15ml)
- Histology: Type I & II collagen, fibroblasts and myofibroblasts
- ? Abnormal cytokine production



*Noel et al, Joint Bone Spine, 2000, 67:393-400*
*Pearsall et al, Med Sci Sports Exerc, 1998, 30:533-39*

# 2° Adhesive Capsulitis

- Trauma
- Cardiovascular disease
- Hemiparesis
- Diabetes
- Rotator cuff tears
- Post surgical

# Treatment of Adhesive Capsulitis

- NO Consensus!!
- Conservative Treatment
  (60 – 80% (1°) will resolve) :
  Observation
  Physiotherapy
  Intra articular steroid

Hannafin et al, Clin Orthop Rel Res 2000; 372:95-109
Shaffer et al, JBJS(A) 1992; 74:738-46
Griggs et al, JBJS(A) 2000; 82:1398-1407
Warner JJ. J Am Acad Orthop Surg 1997; 5:130-140
Arsian et al, Rheumatol Int. 2001; 21:20-23
Alvado et al, Ann Readapt Med Phys 2001; 44:59-71

# Treatment of Adhesive Capsulitis

- **Distension arthrogram and intra articular steroid**
  **(Ekelund et al, Clin Orthop Rel Res, 1992; 282:105-109)**
- **Open release** **(De Palma, Surgery of the Shoulder 1983; 3rd ed. Philadelphia: JB Lippincott, 193-204)**
- **Oral steroids**
- **MUA**
- **Arthroscopic release**

# MUA

- Established method of treatment
  (Kivimaki, Arch Phys Rehab,2001,82:1188; Anderson, JSES 1998,7,218; Dodehoff, JSES 2000,9:23)
- Associated risks
- Iatrogenic fractures/dislocations
- Rotator cuff injury
- LHBT injury
- ?Restricted rotation after MUA
  (Hill, Orthopaedics, 1988,11:1255)
- Bone weakest in torsion ?fear of fracture may reduce rotation gains

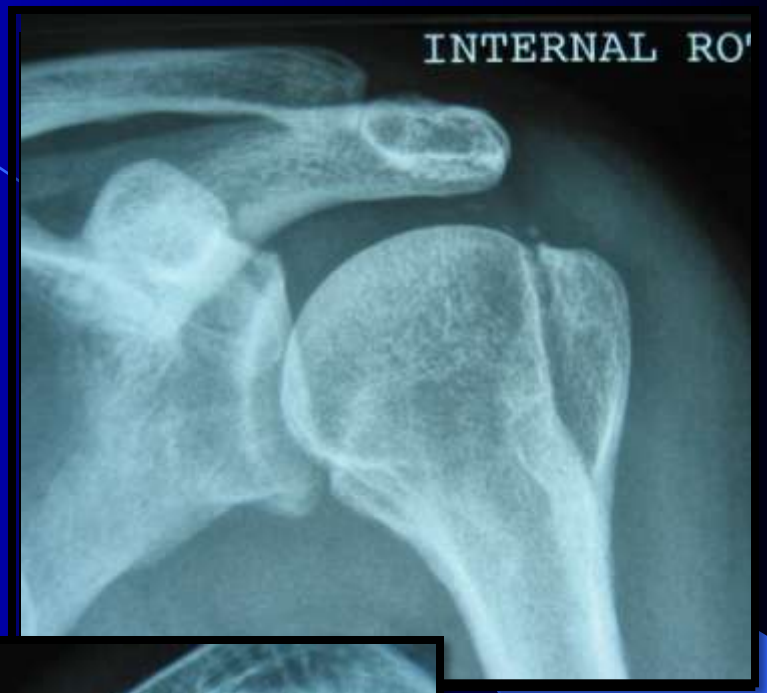
# Arthroscopic Capsular Release

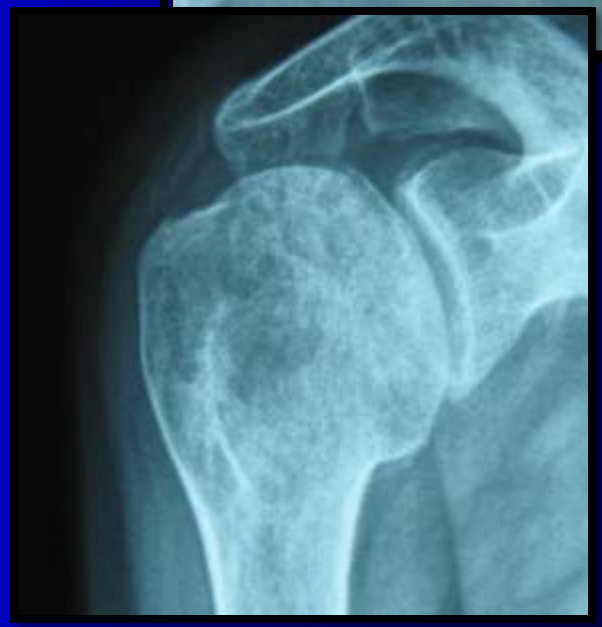
- **Good results** (Harryman, Arthroscopy 1997,13:133; Holloway, JBJS(A) 2001, 83:1682; Ogilvie-Harris, Arthroscopy 1997,13:1-8; Warner et al, JBJS(A) 1996; 78:1808-1816)
- **Minimally invasive**
- **Fewer risks**
- **Precise and accurate release**
- **Haemarthrosis controlled**
- **Treatment of other assoc. pathology**

# Arthroscopic Capsular Release

## Indications :-

- 1° Adhesive capsulitis : Failure of conservative treatment
- 2° Capsulitis:
- ‘Stiff’ rotator cuff tears
- Early osteoarthritis with preservation of jt space
- Capsulitis post trauma (GT fractures!!)
- Post surgical capsulitis



# My Approach to 1° Adhesive Capsulitis

- ‘Painful/Pain predominant’ phase: (2 to 9 months) Distension arthrogram + physiotherapy
- ‘Freezing/Stiffening’ phase: (4-12 months) ‘Thawing/Resolution’ phase (12-42 months)
- **Arthroscopic capsular release : If ER not > 0 deg by 1 year**

# WHAT To Release?

- **NO Consensus!!**
- **1° Source of pathology is the Rotator Interval (Bunker,JBJS(B)1995, 77:671)**
- **Rotator Interval and Anterior capsular release : *should* ↑ ER & Abd**
- **?Inferior ?Posterior capsule**
  **Snow et al,Arthroscopy 2009, 25,1:19-23**
  **Chen, Arthroscopy 2010, 26,4:529 NO Difference!!**
- **Nicolson, Arthroscopy 2003,19:40-9**
  **Ide, JSES 2004,13:174-9 ?Increased IR**

# WHAT To Release?

- ? Subscapularis upper border
- 25% of the length of s/scap only
  (Pearsall, Arthroscopy 2000,16,236-42)
- ↑ Rotation with s/scap release
  (Nicholson, Orthop Trans 1997,21:136)
- 360° release + biceps tenotomy (bursal entry)
  (Lafosse, Arthroscopy, published online, March 2012)
- NO difference with 360° vs 270° release
  (Jerosch, Knee Surg Sports Traumatol Arthrosc 2001,9:178)

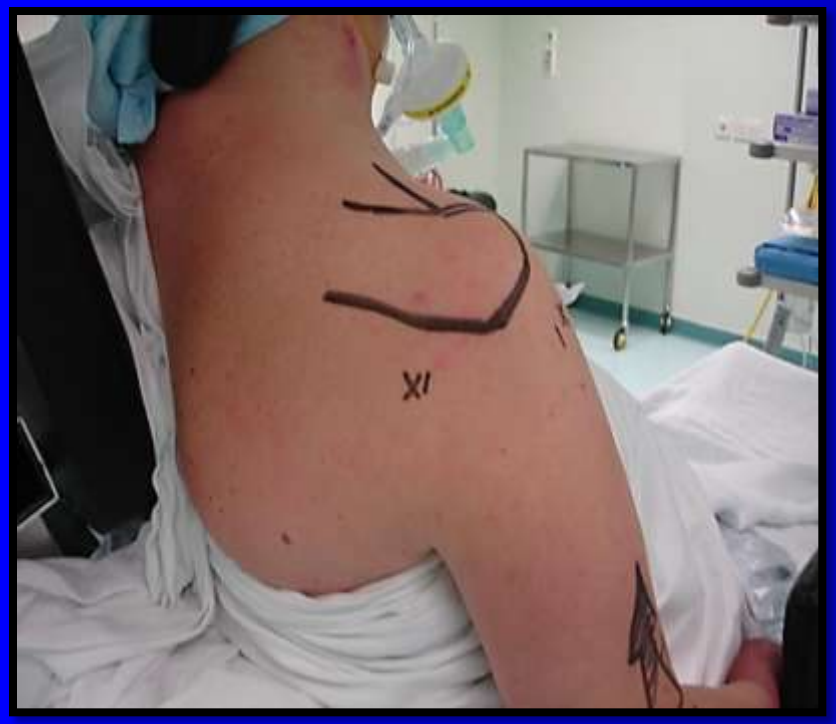
*NO CONSENSUS!!!*

# My Approach:
# Capsular Release :- Set-Up


- Awake Interscalene Block:
  Indwelling catheter
- GA
- Beach Chair Position

# Capsular Release :- Set-Up

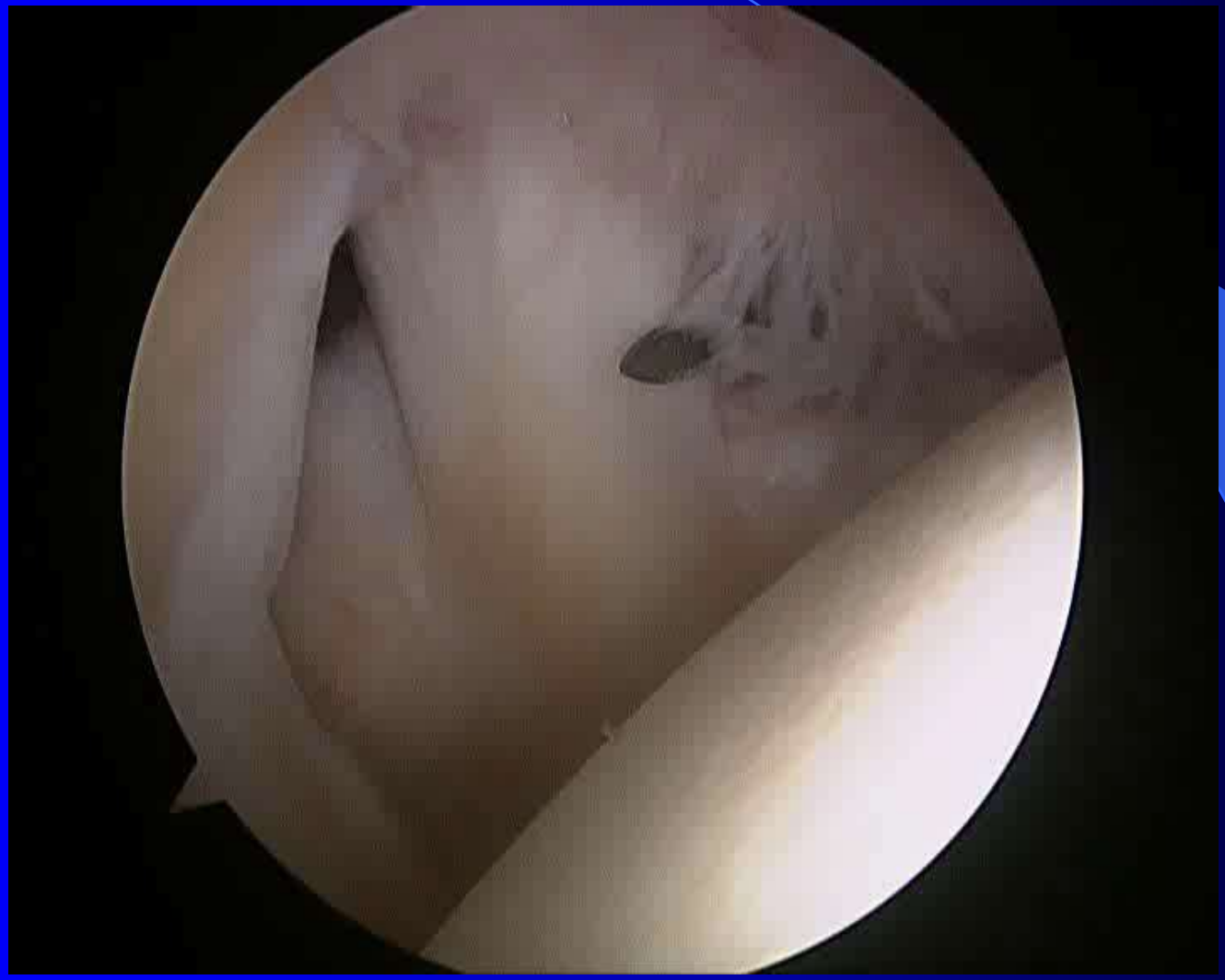
# Capsular Release :- Technique



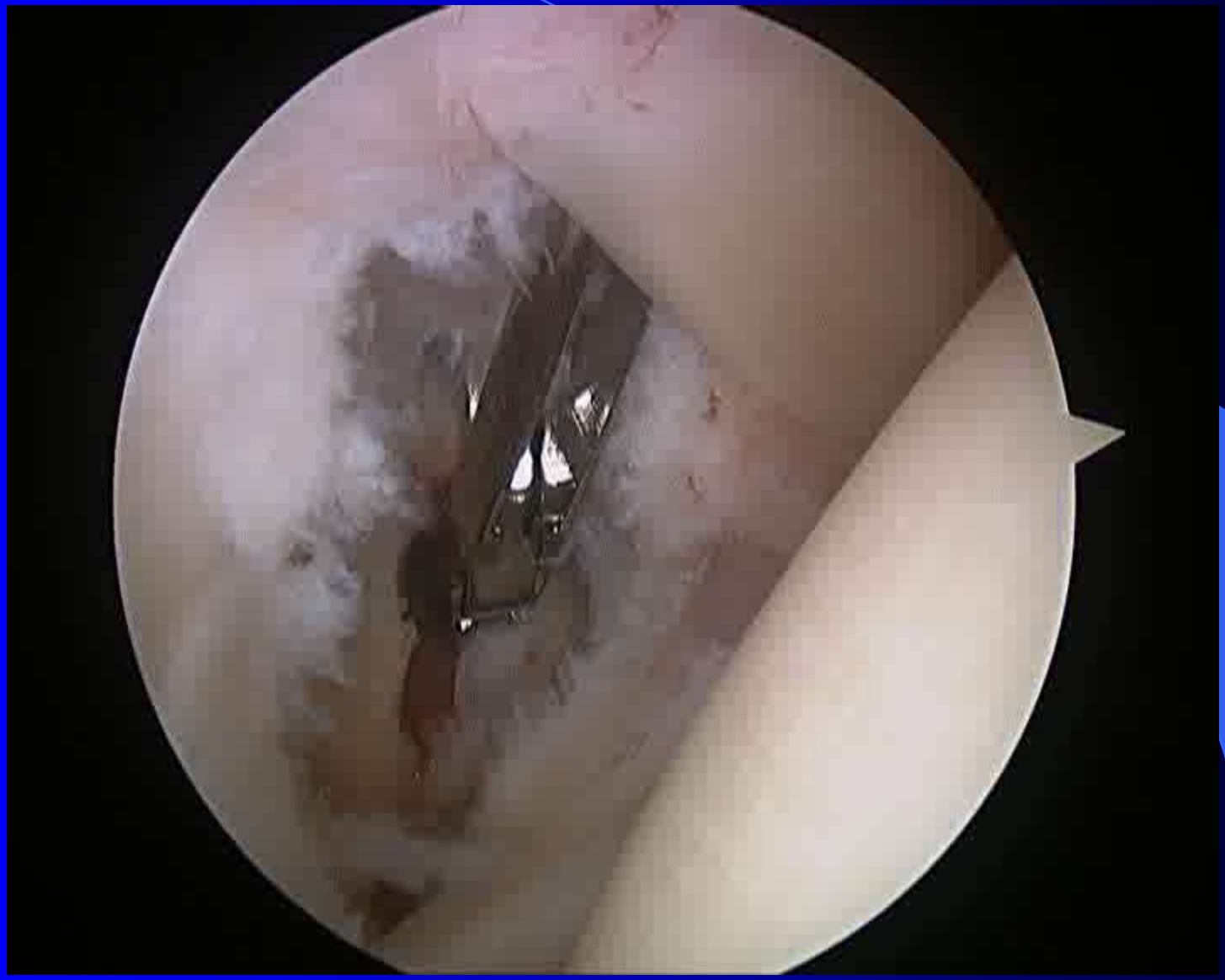
- Fluid management
- Arm free and mobile
- EUA
- ROM normal shoulder
- Posterior portal :
- Joint entry can be difficult!!
  Distend with fluid first.
  ?Joint distraction.
  ?Enter SA space first
  (Lafosse,2012)

# Capsular Release :- Technique

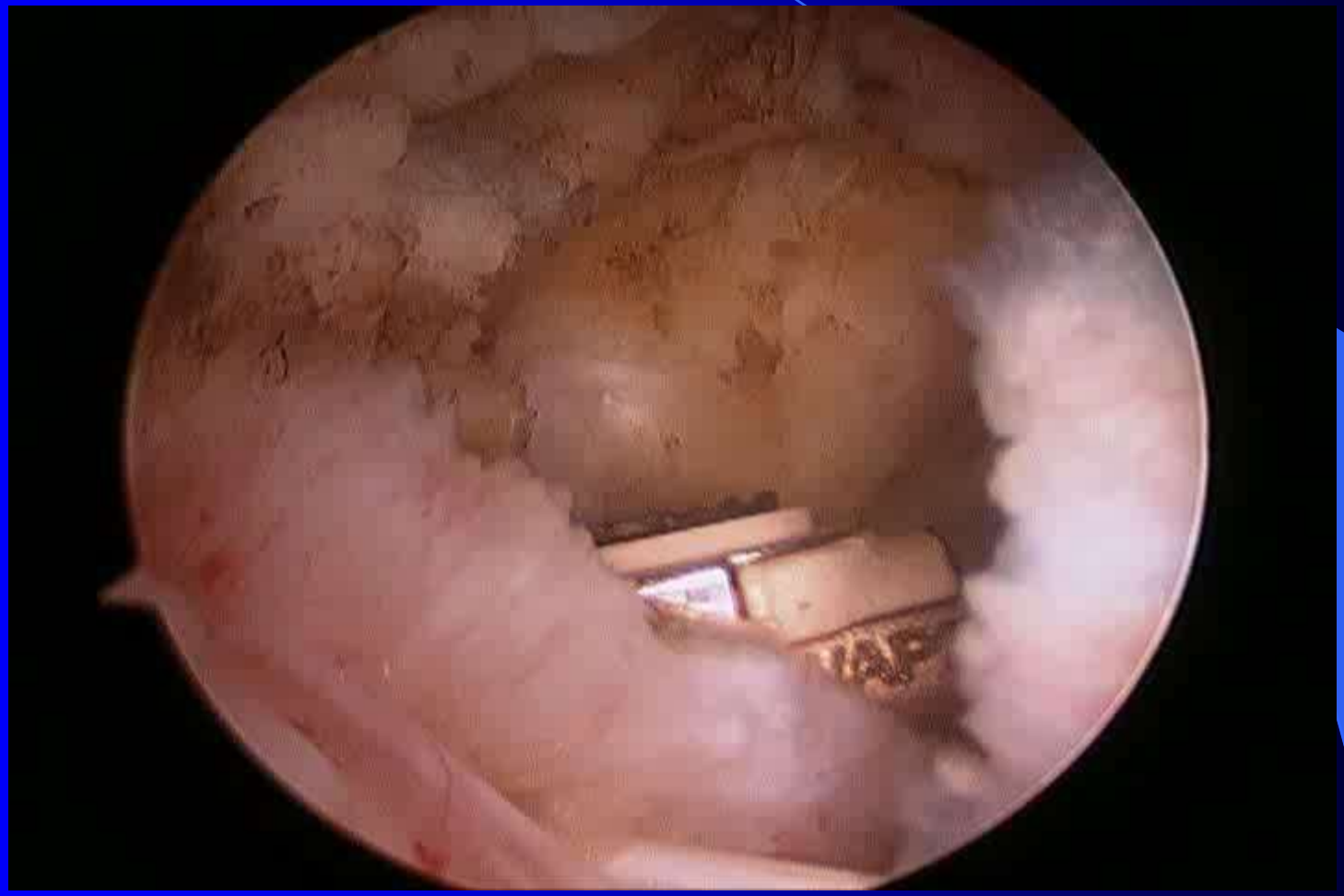
## ‘Circumferential Release’



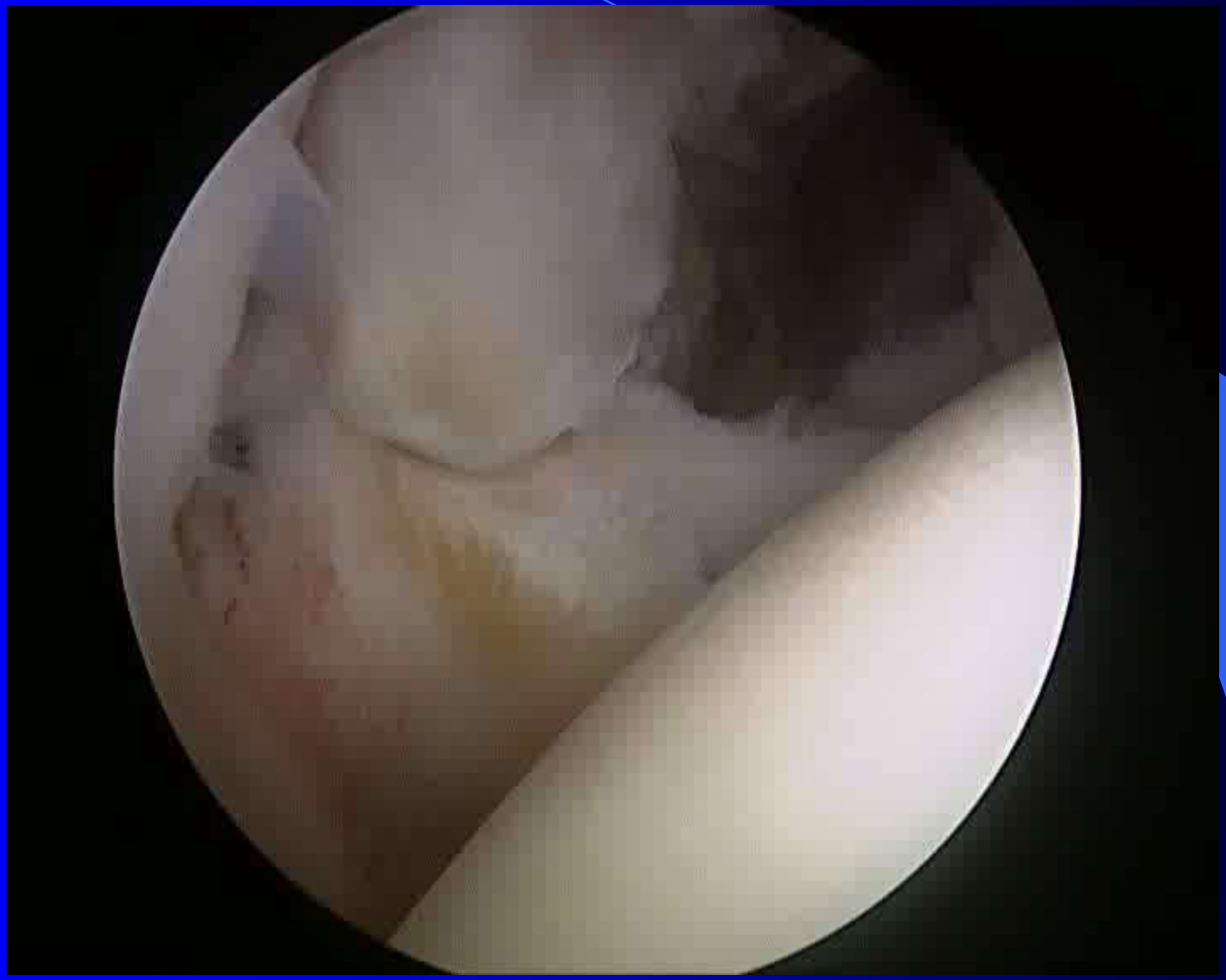
# Open Rotator Interval



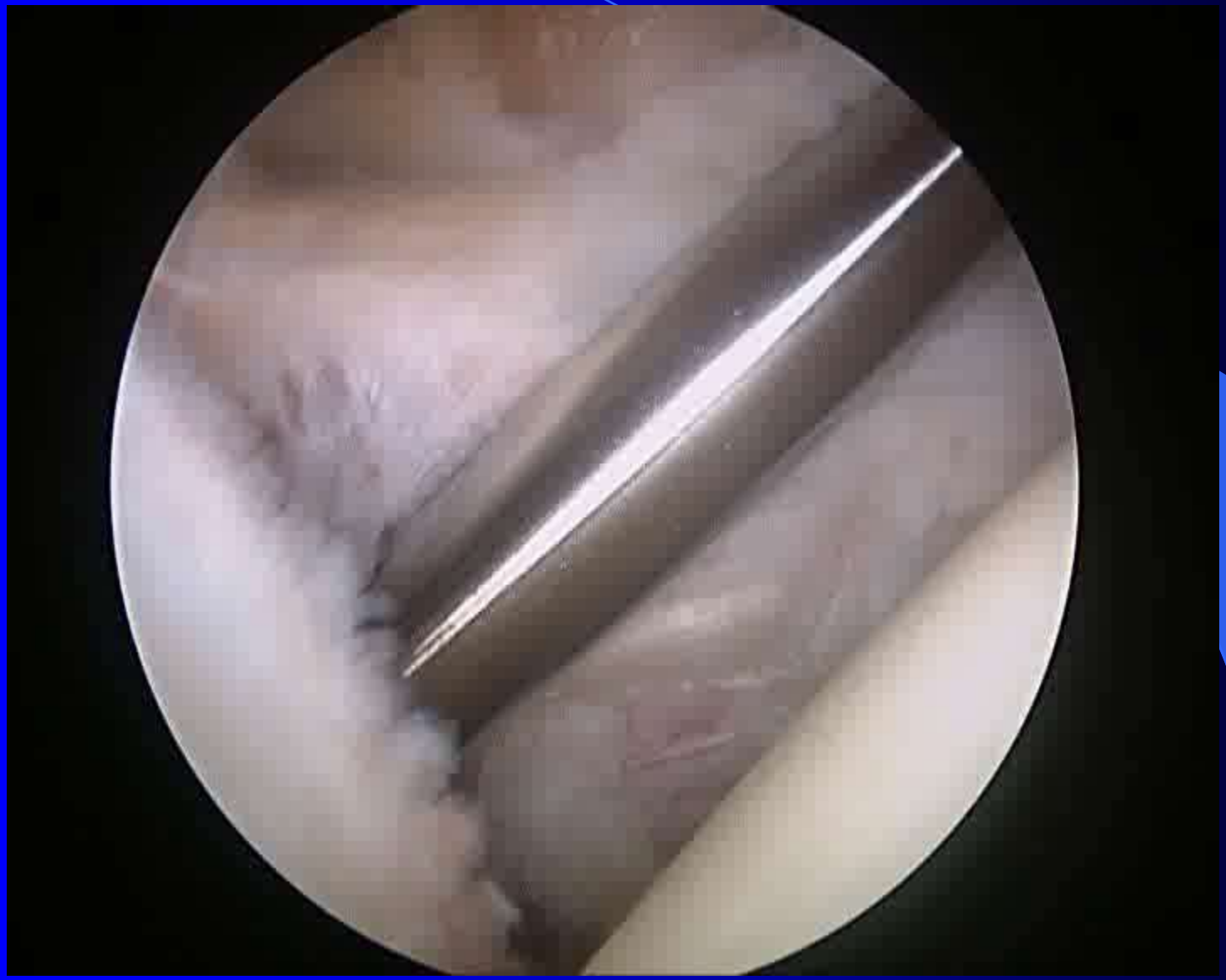
# Open Interval and Expose Coracoid



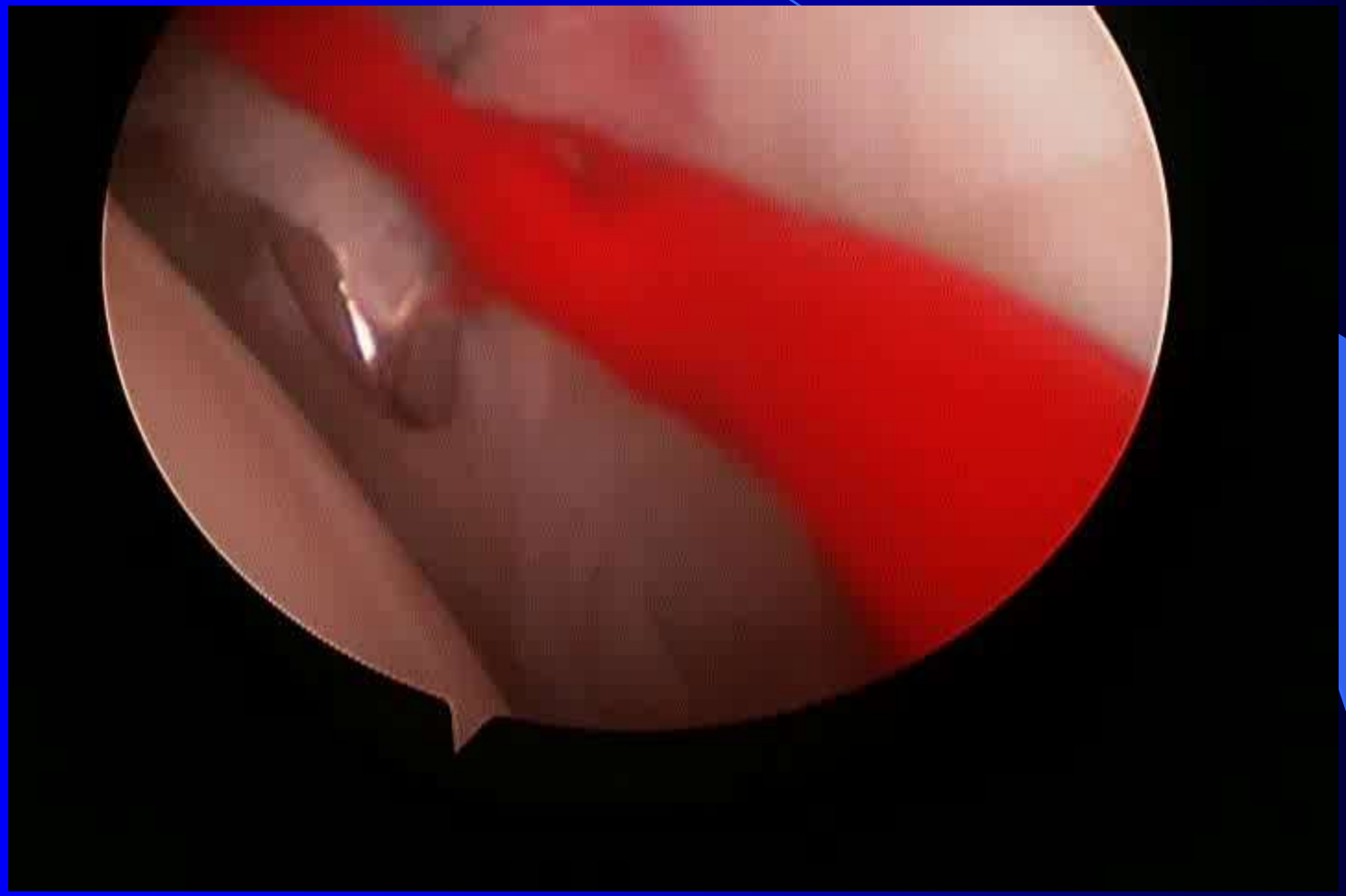
# Excise MGHL



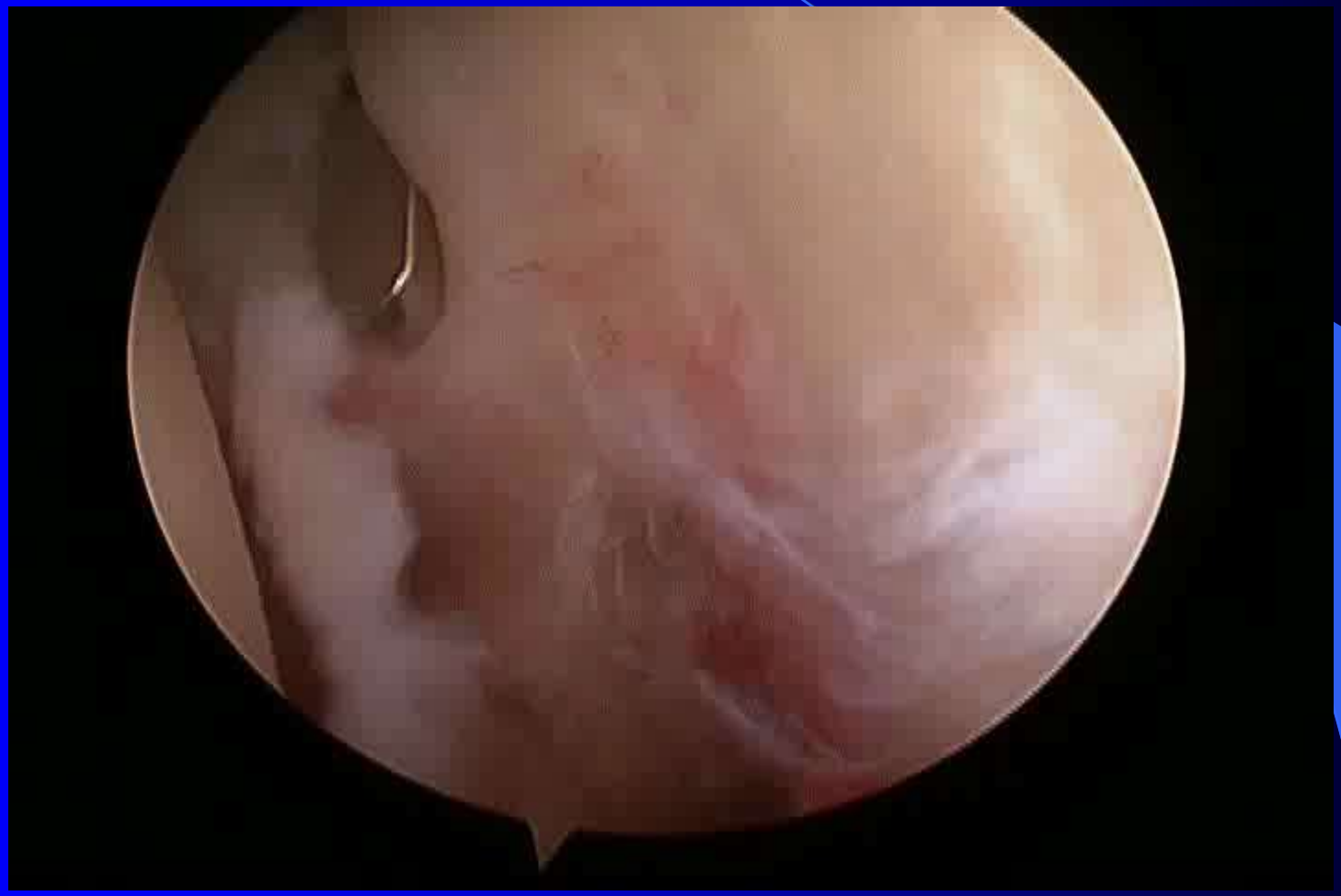
# Release Anteroinferior Capsule



# Release Posterior Capsule



# Complete Posterior Capsule Release



# Capsular Release

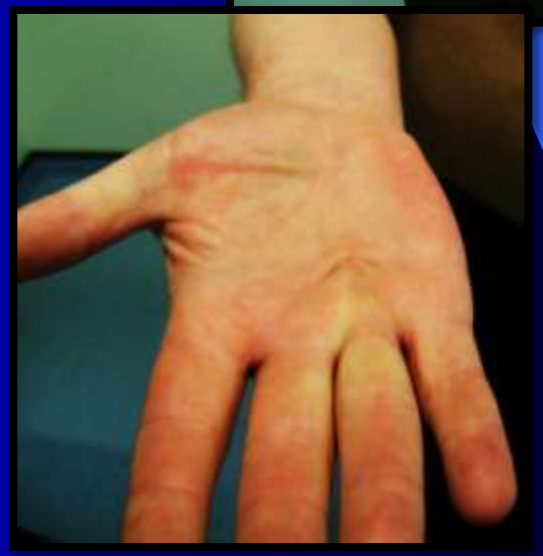
- EUA shoulder after release
- Gentle manipulation if inferior capsule not completely released
- Check subacromial space
- NO decompression unless pathology
- Proceed with rot cuff repair if reqd

# Capsular Release: Rehabilitation

- Interscalene catheter helps
- If NOT a cuff repair:
- NO Sling!!
- Hourly stretches by physio/nursing staff
- Patient must SEE postop ROM
- 23 hour stay
- Regular effective analgesics for 6 weeks
- Daily physiotherapy on discharge
- Early clinic review to check progress

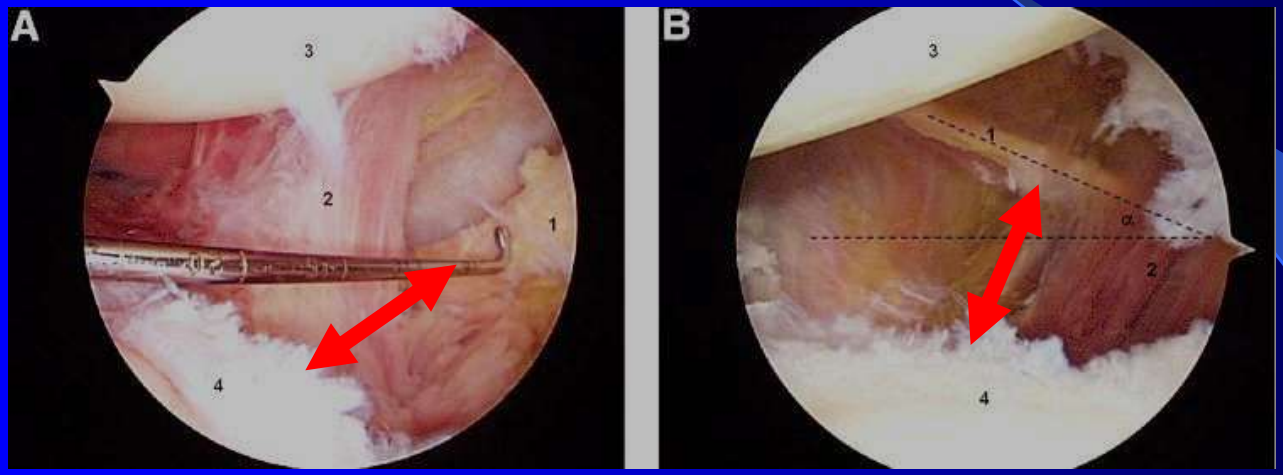
# RISKS/COMPLICATIONS

- Bleeding
- Iatrogenic fracture/dislocation
- Ongoing stiffness/pain:- High risk patients: Males, diabetes, Dupuytrens, Bilateral pathology
- Neurovascular injury:- Risk increased after GH dislocation or fracture



# Neurological Risk of Arthroscopic Capsular Release

- **Anatomy of Axillary Nerve**




**Right shoulder. Posterior portal. Lateral decubitus.**

Axillary nerve enters at 4'o'clock at inferior edge of subscap.

20 to 25mm from glenoid edge, disappears at 7'o'clock btwn glenoid and H/H, inclination 23°.

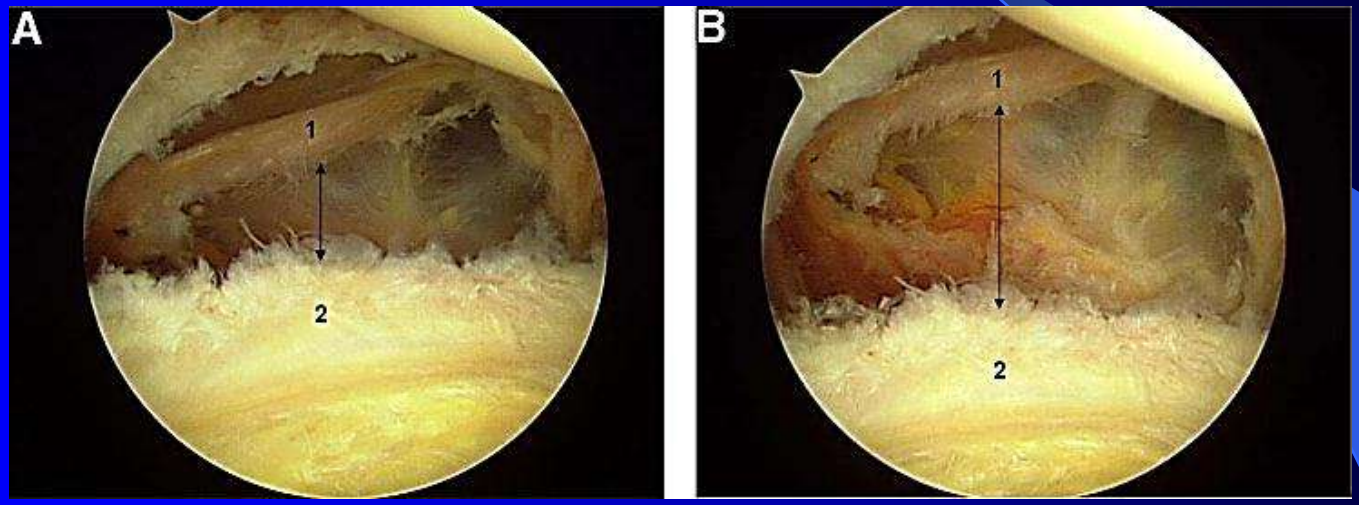
Closest point to glenoid: Between 5.30 and 6'o'clock position.

Mean distance from capsule to axillary nerve is 3.2mm.

Nerve runs adjacent to inferior capsule for several mm's.

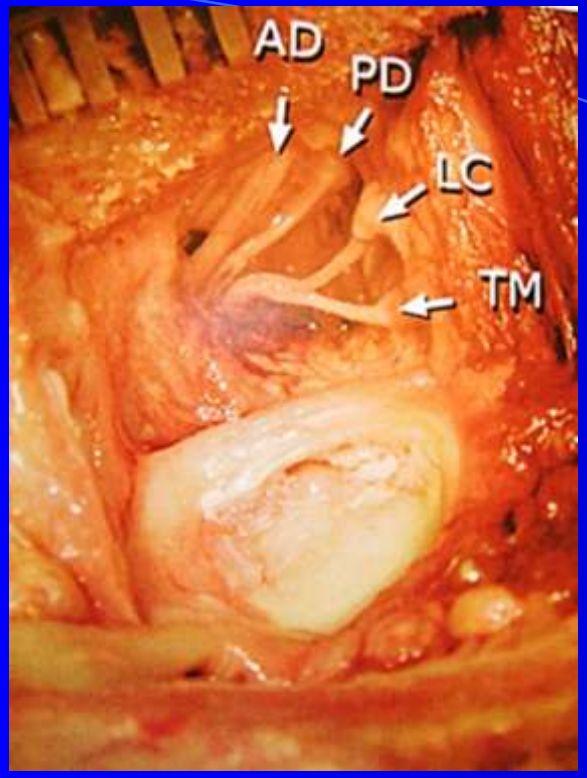
# Neurological Risk of Arthroscopic Capsular Release

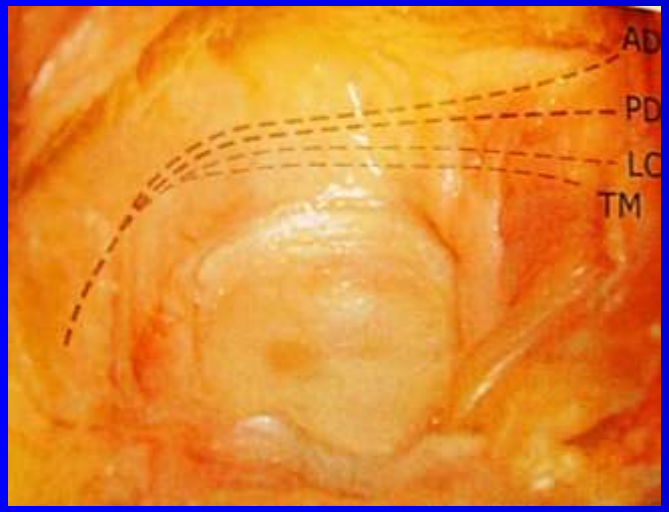
- Axillary nerve




Right shoulder. Viewing anterior portal.
A= neutral position
B= abduction/neutral position (nerve further from glenoid edge)
*Yoo et al, Arthroscopy 2007, 23(12), 1271*

# Axillary Nerve




(Price et al, JBJS(A) 2004; 86,10,2135)

- AD – branch to anterior deltoid
- PD – branch to posterior deltoid
- LC – branch supplying lat cutaneous nerve
- TM – branch to Teres Minor
- (LC and TM branch most vulnerable)
- 182/196 pts with postop axillary neuropraxia:- had only sensory deficit (Wong et al, JBJS(A) 2001; 83 Suppl 2 Pt 2:151)

# Conclusions

- **Arthroscopy ‘ideally suited’ for capsular release**
- **Ideal for rotator cuff tears with secondary capsulitis**
- **Simple procedure BUT not ‘risk-free’: *Bleeding, axillary nerve injury***
- **Optimal visualisation/fluid management essential**

# Conclusions

- **Important to have a good understanding of the normal capsular anatomy**
- **Postoperative rehabilitation is as important as the surgery**
- **Personal View……**
- ***Circumferential release confirms adequate release and...***
- ***Avoids need for potentially dangerous manipulation***

# Thank You