

# Orthopaedics in Boxing/MMA

Rick Weinstein, MD

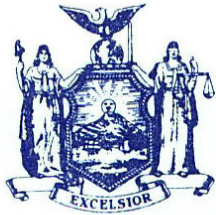
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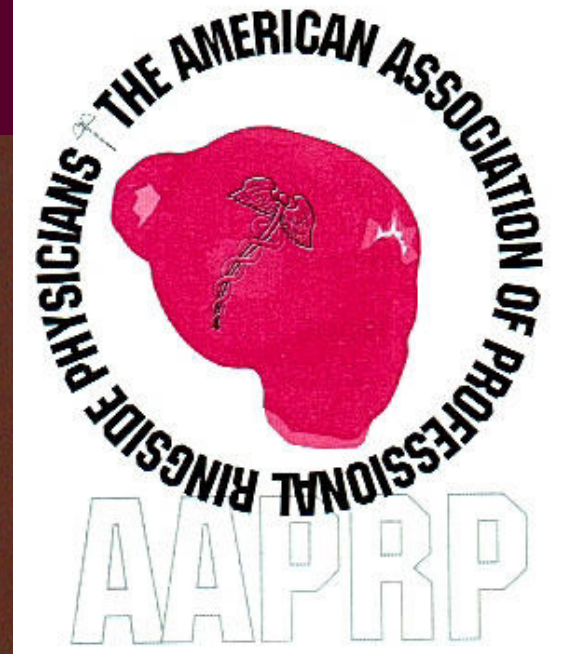


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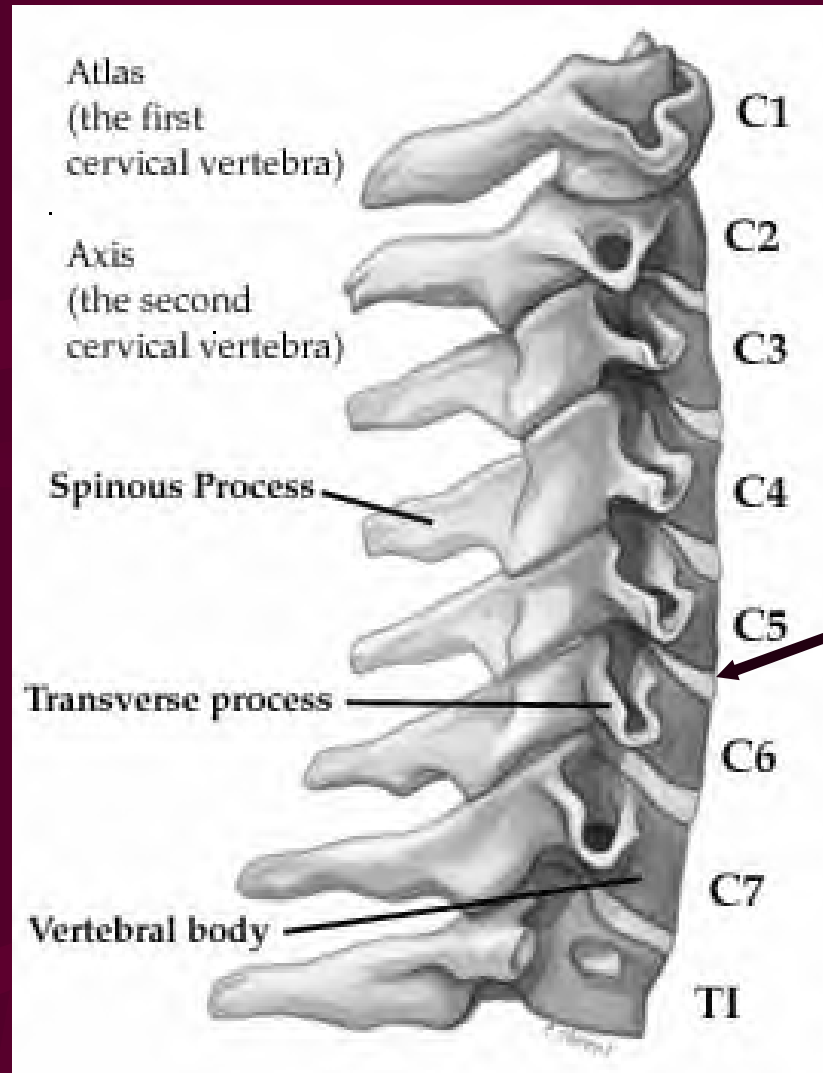


Rick  
Weinstein

Sports  
med



# Cervical Spine

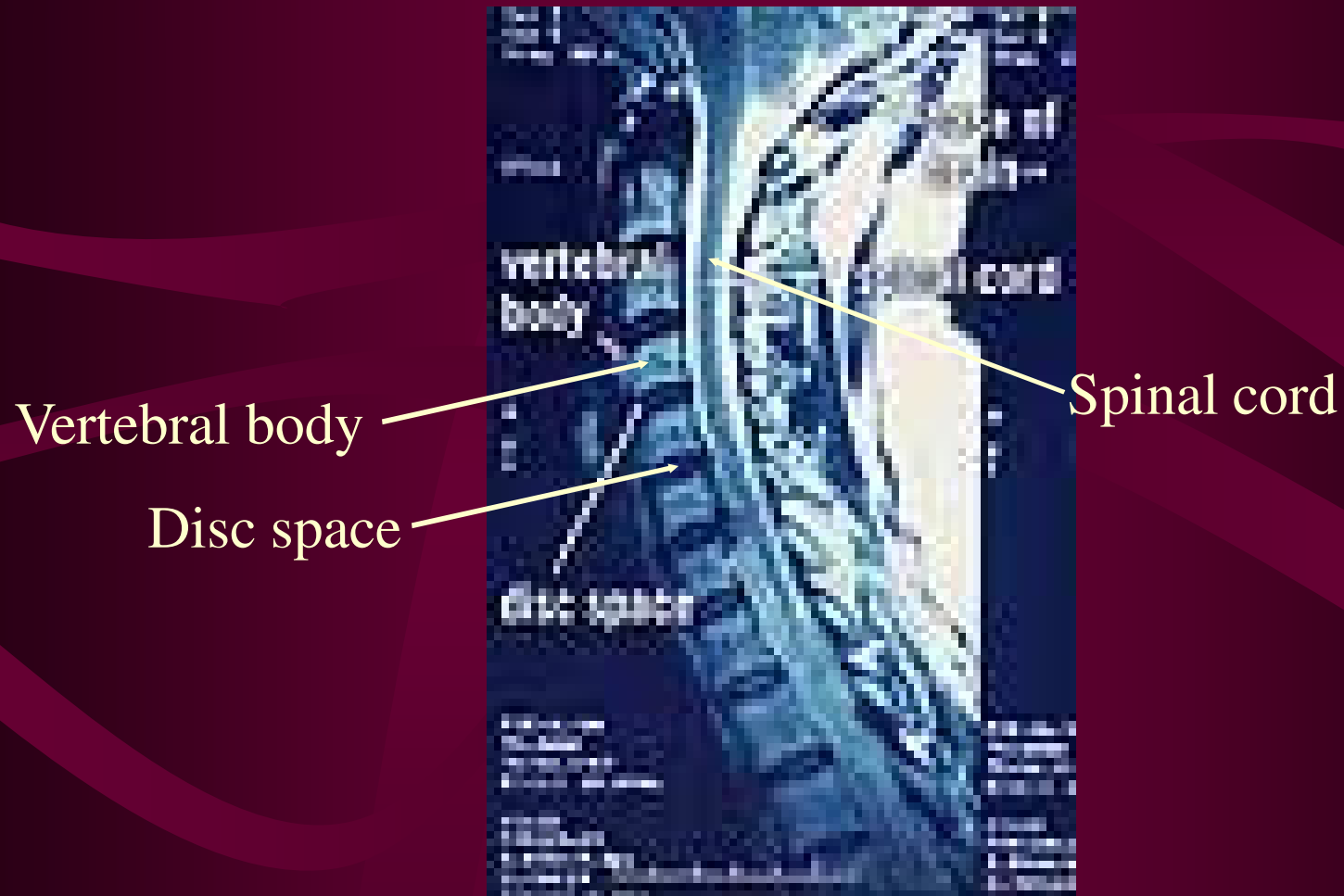


disc

# Cervical Spine

- Any boxer with head trauma, doctor *must* first protect the spine.
  - Do not move boxer and *never* move boxer's head
  - Do not let trainer/corner/referee move injured boxer
    - *You must protect the boxer*
  - ABCs

# MRI C-Spine (normal)



# Herniated Disc



# Cervical Herniated Disc

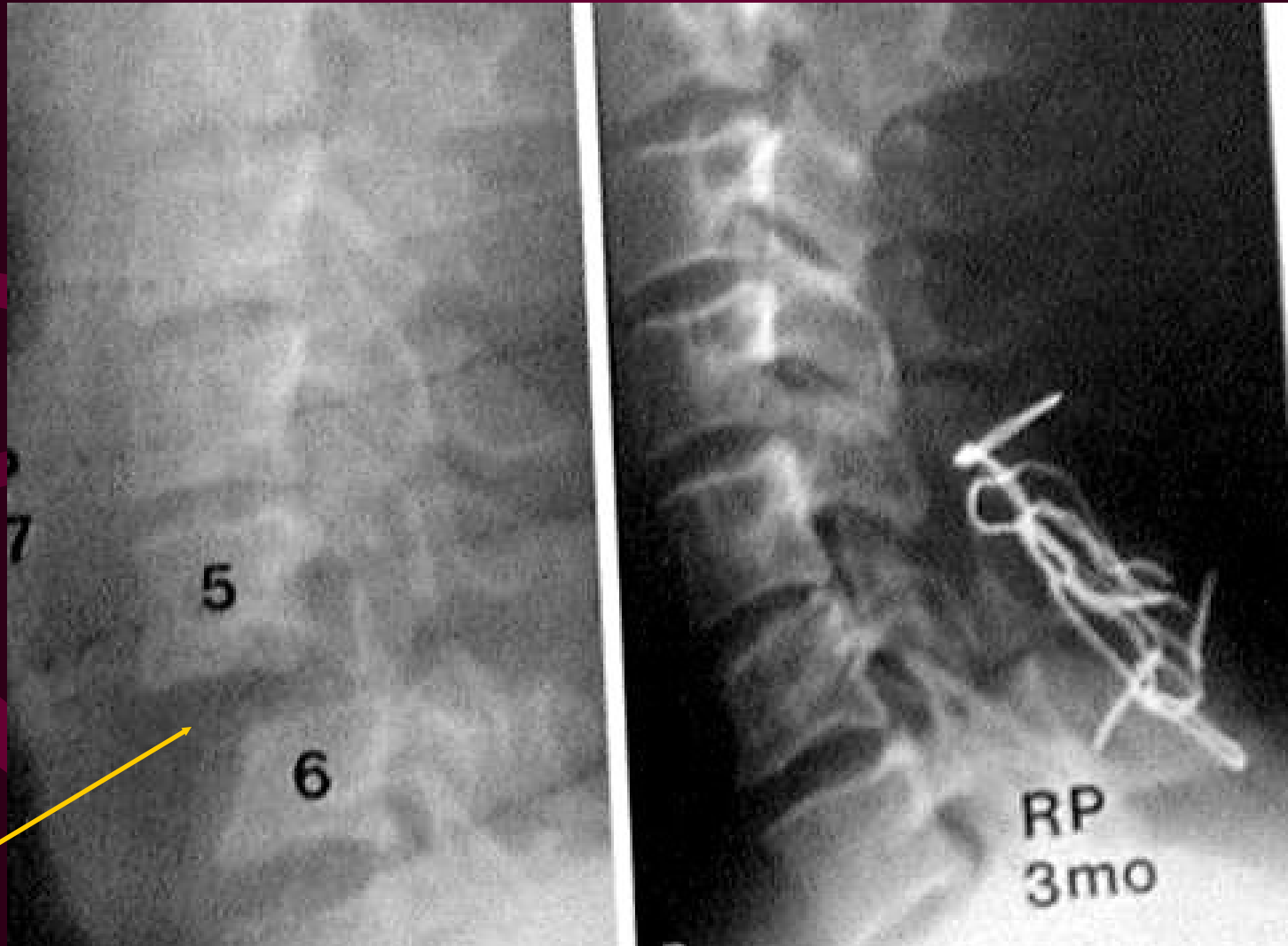


# Cervical Herniated Disc

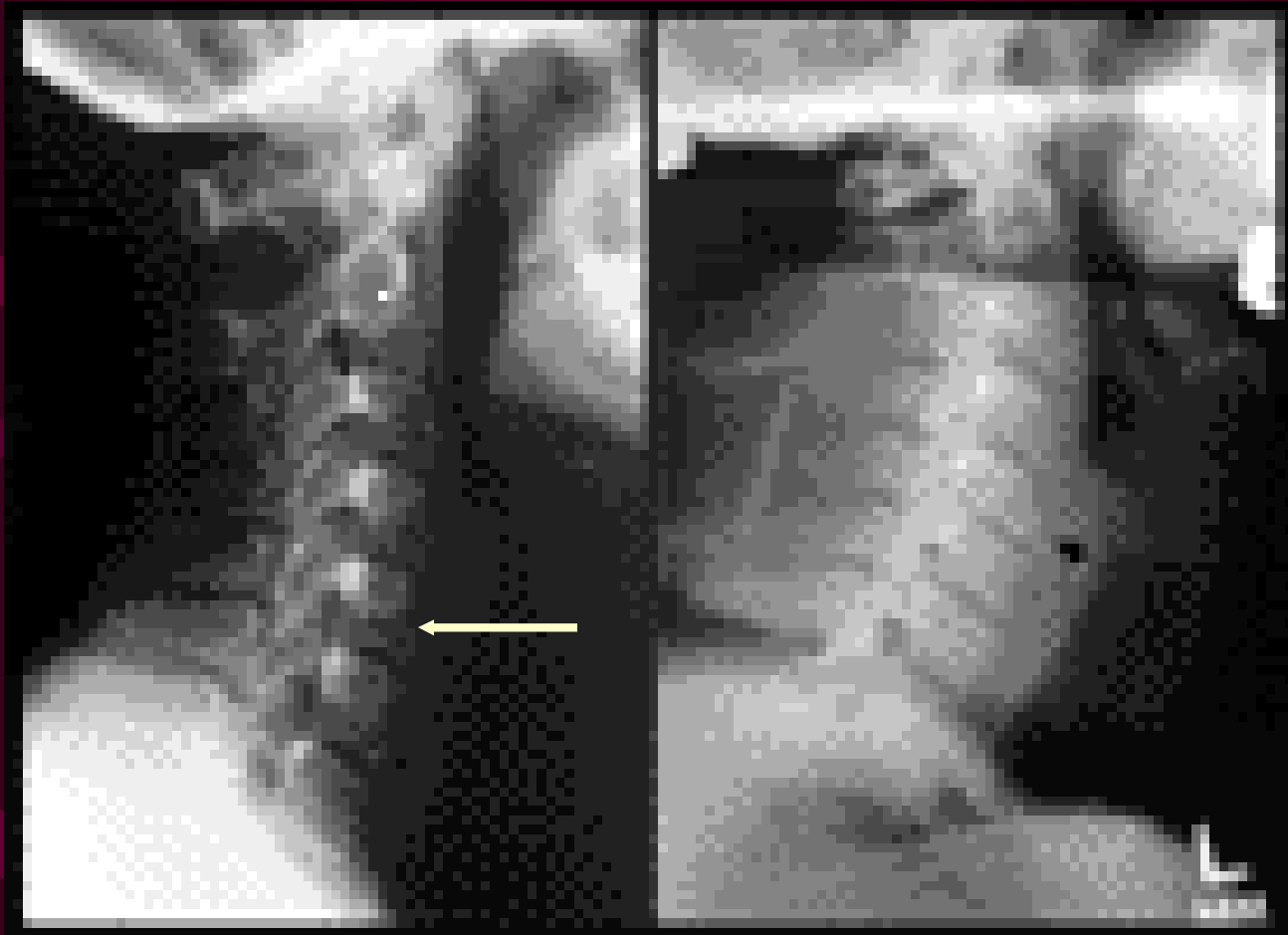




# Cervical Subluxation



# C-5 Fracture



# Evander Holyfield



# Shoulder

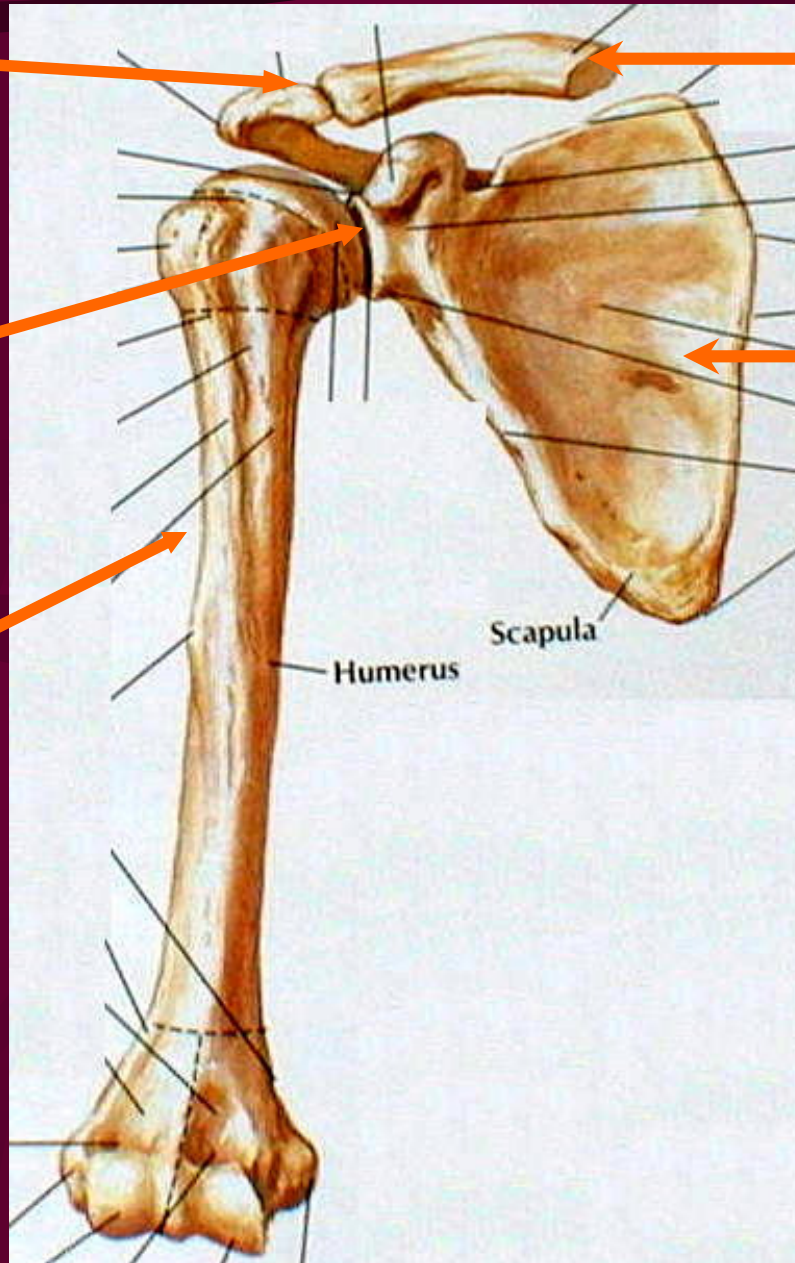
Acromio-  
clavicular  
(A-C) joint

clavicle

Shoulder joint

scapula

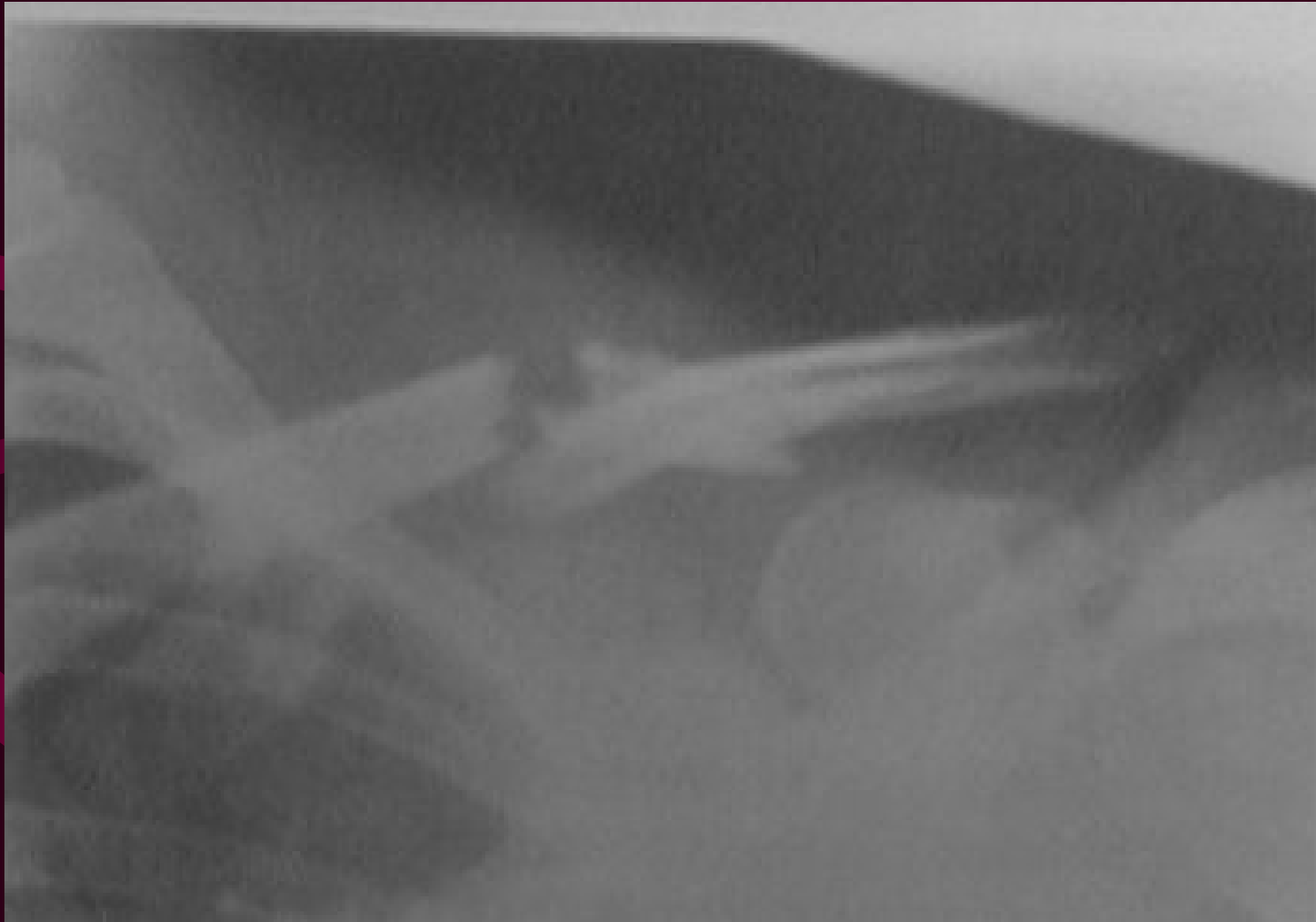
humerus



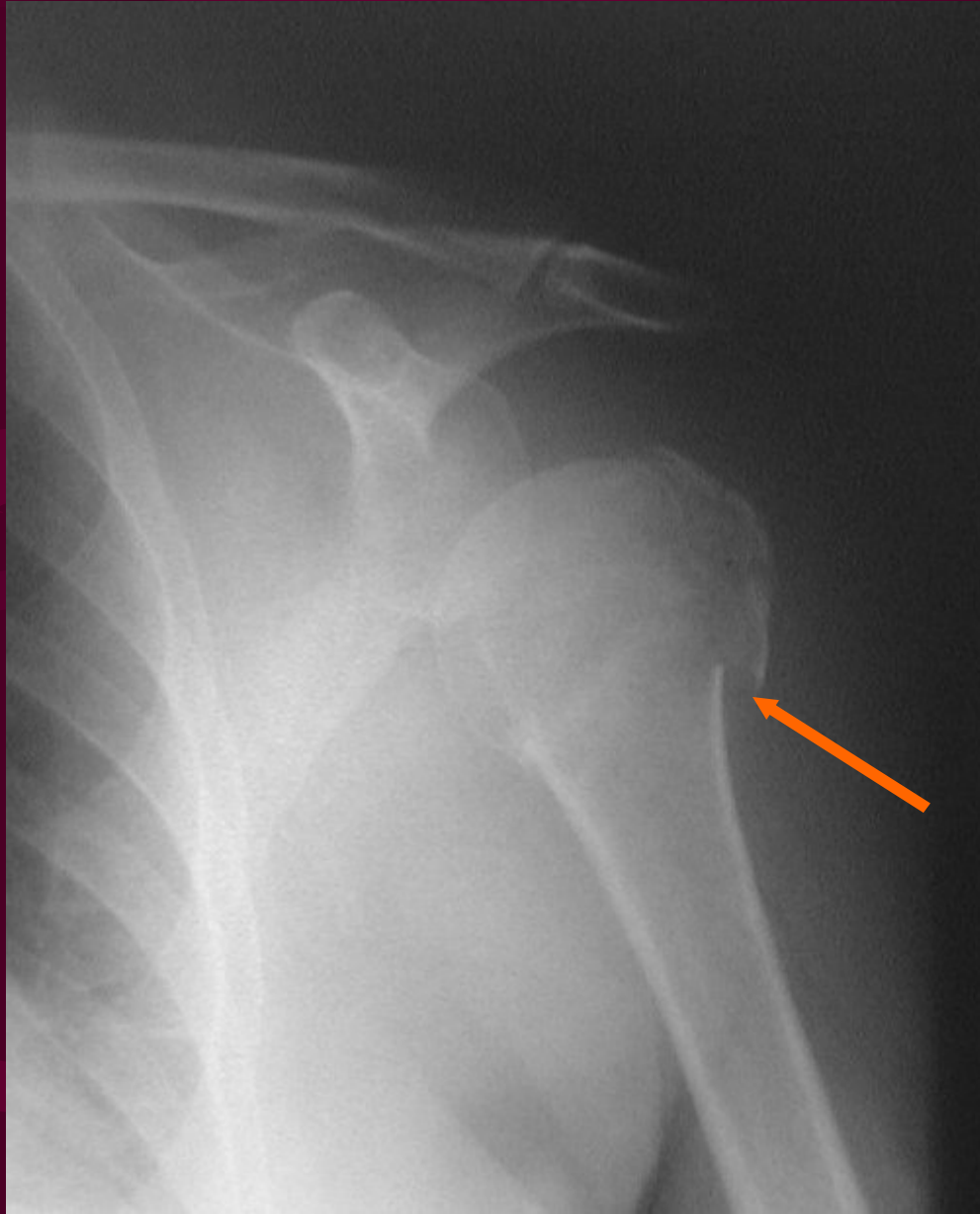
# A-C Separation



# Clavicle Fracture



# Proximal Humerus Fracture



# Shoulder Dislocation

- 95% dislocations are anterior
- Inability to lift arm
- Inability to bring arm across chest (touch other shoulder)
- May tear cuff!
  - Especially in boxers older than 40





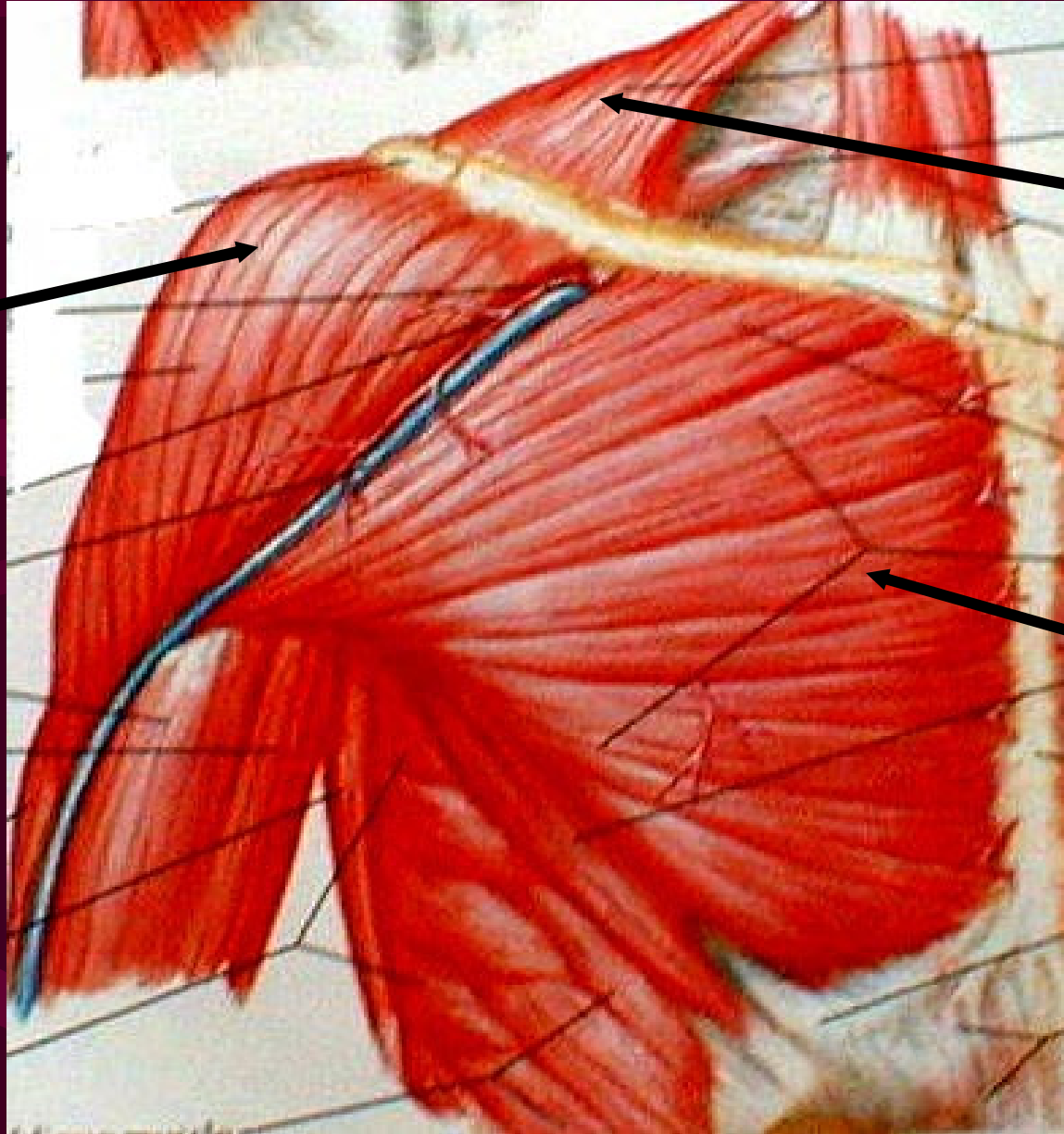
# Shoulder Dislocation

# George “Skinless” Jones



# Shoulder Anatomy - Muscles

deltoid



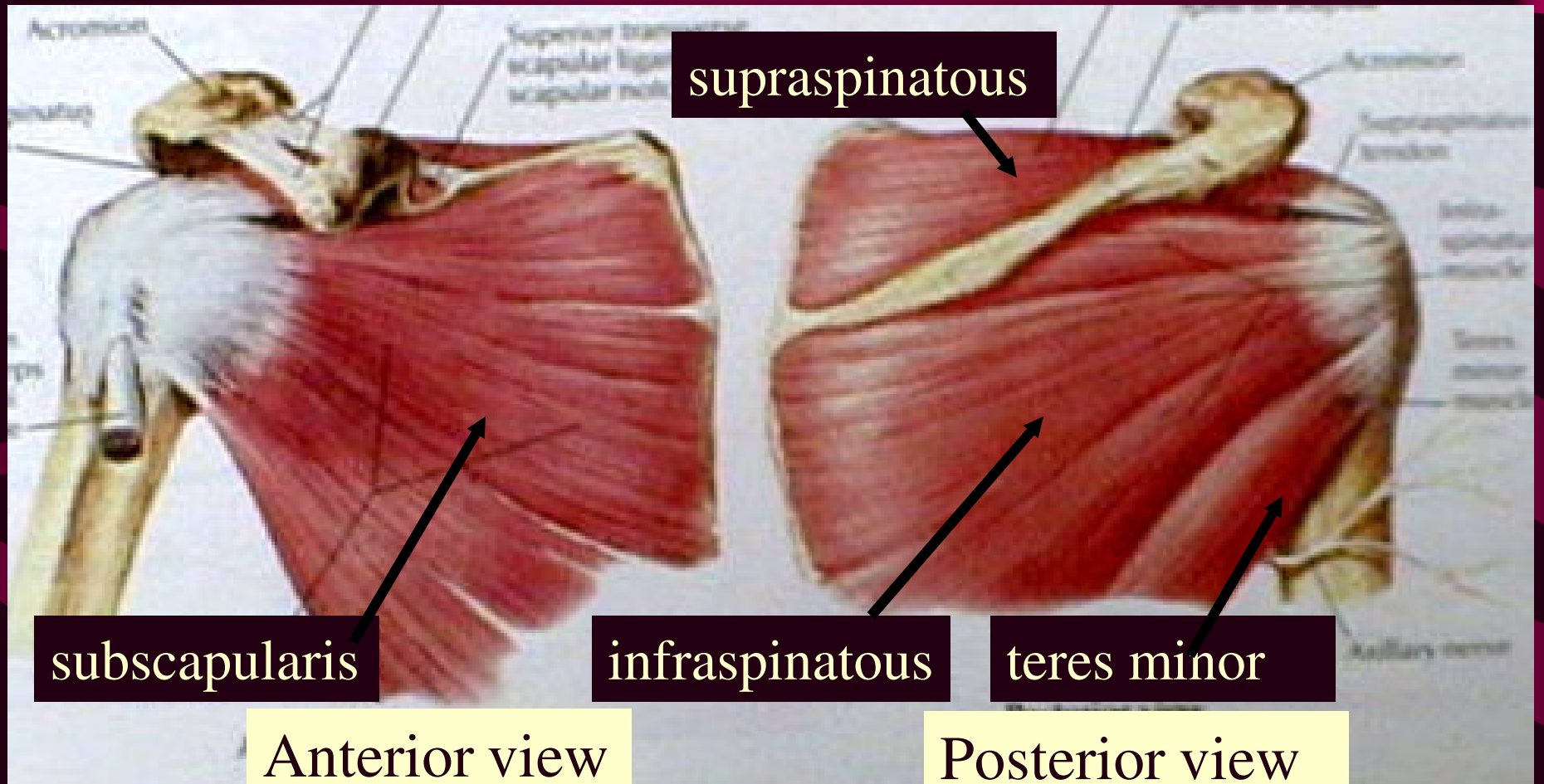
trapezius

pectoralis  
major

# Rotator Cuff

- 4 muscles - SITS
  - Supraspinatous
  - Infraspinatous
  - Teres Minor
  - Subscapularis
- Depress shoulder and stabilize joint

# Rotator Cuff Muscles



# Rotator Cuff Tendonitis/Impingement

- Definition
  - Crushing of rotator cuff muscles between acromion and humeral head (within subacromial space)
  - More likely in boxers older than 35-40 years old

# Impingement sign



# Rotator Cuff Injury - Exam

- ROM - forward flexion, abduction, external rotation, internal rotation (vs. contralateral)
- Impingement sign/test
- Test all muscles - especially rotator cuff
- Rule-out other pathology
  - c-spine



Surgical scar

Bronx "organization"  
scar



# Supraspinatous test



- 90° abduction
- 30° forward flexion
- Full internal rotation

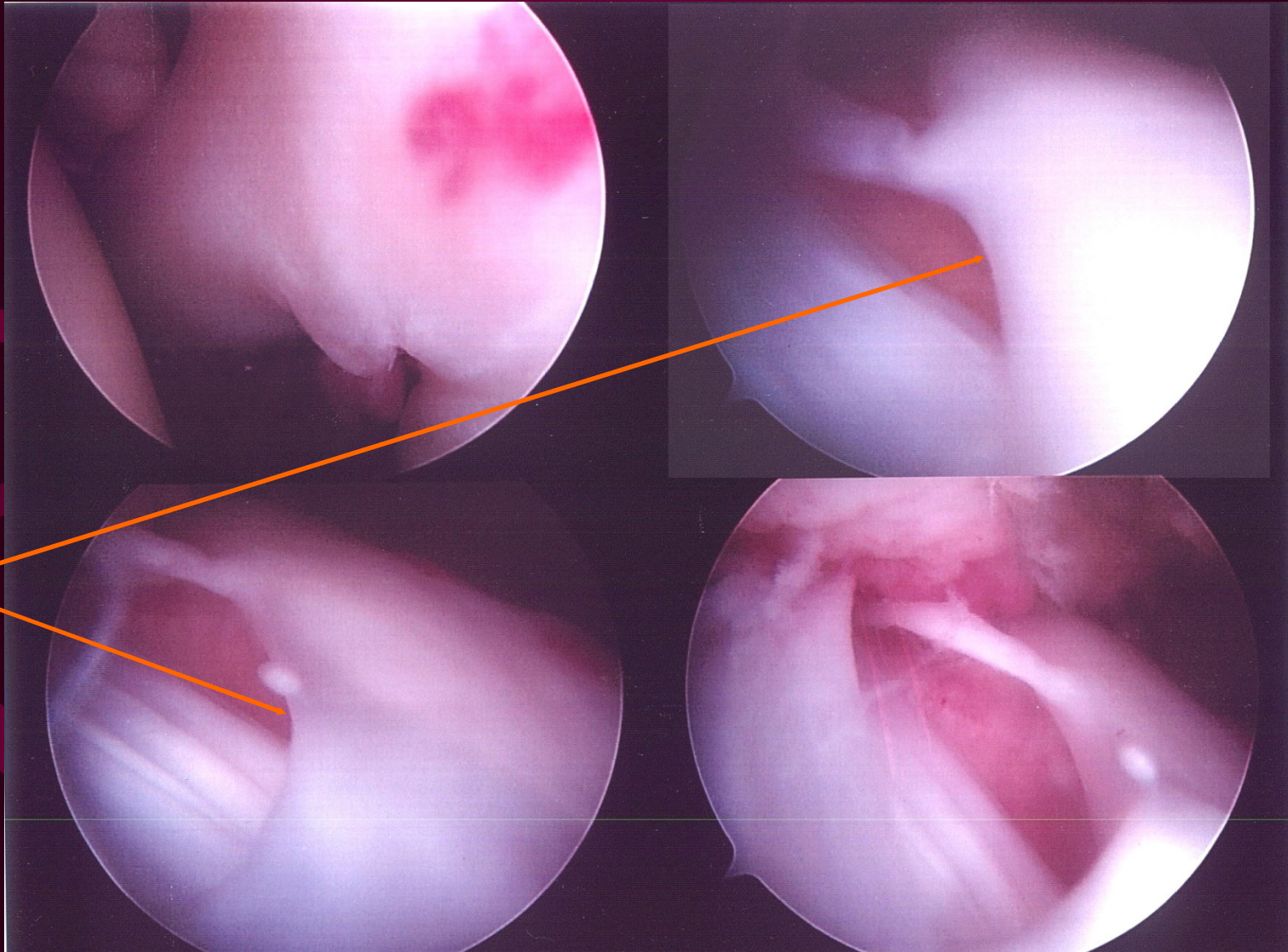
# ER strength

- Elbow 90° against side
- 45° internal rotation



# Rotator Cuff Tear

tear



# Emanuel Steward



# “Boxer’s Fracture”

- Fracture of 4<sup>th</sup> or 5<sup>th</sup> metacarpal
- **Not** common in professional boxers

# “Boxer’s Fracture”



# 4<sup>th</sup> Metacarpal Fracture





# Professional Boxer's Fracture

- Fracture of 2<sup>nd</sup> or 3<sup>rd</sup> metacarpal
- More typically in professional boxers
- Usually dominant hand

# Professional Boxer's Fracture



# Bennett's Fracture (Base Thumb)



# Ruling-Out Fractures

- Acute
  - Tender to palpation
  - Obvious deformity (rotation/bend)
  - Crepitus/pain with motion
- Sub-acute
  - Ecchymosis/swelling
  - tenderness

# Ruling-Out Fractures

Only way to rule-out fracture 100%  
is with appropriate x-rays!

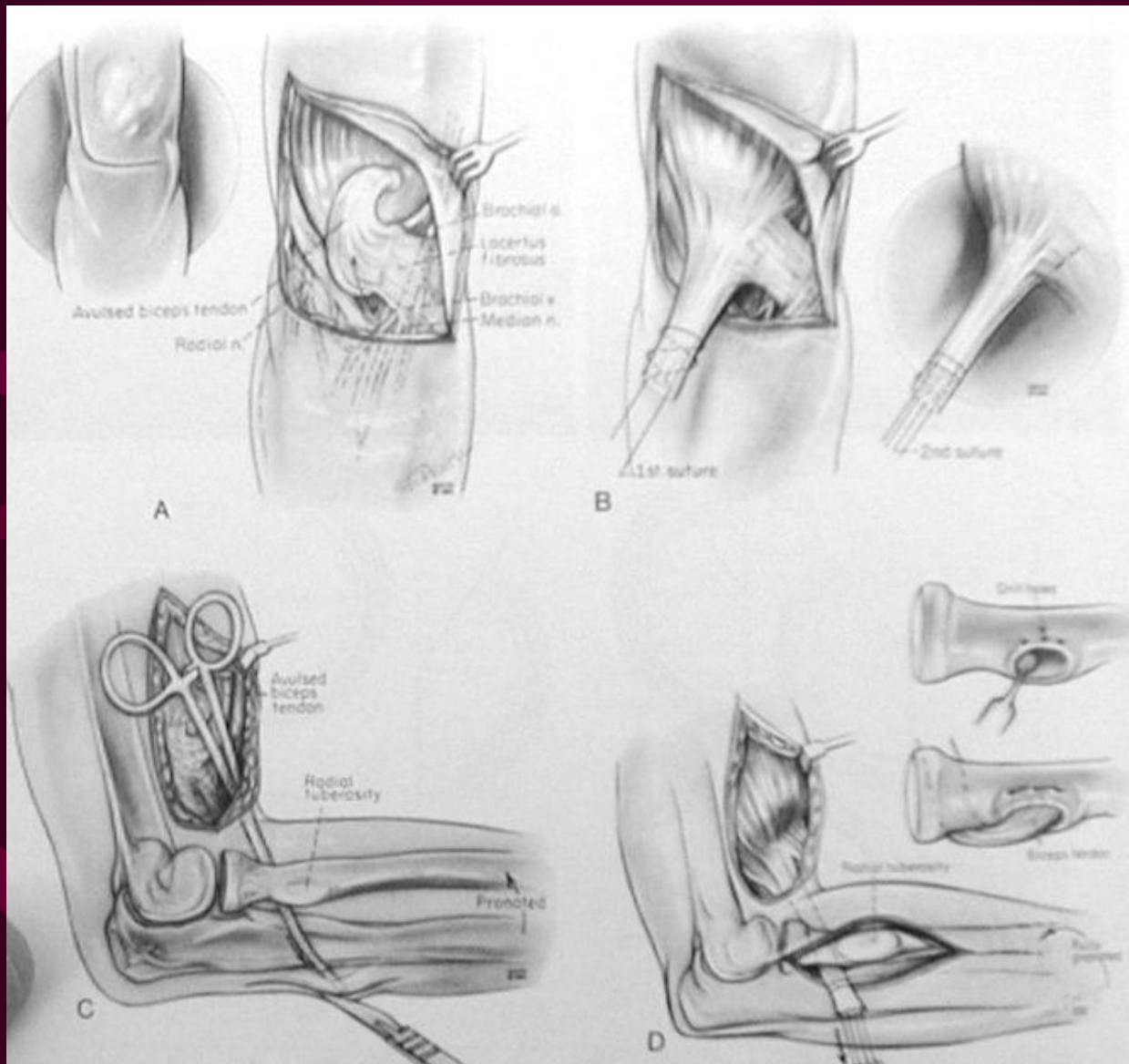
# Distal Bicep Tendon Rupture

- Pain/tenderness in anterior elbow
- Defect and retracted bicep muscle (popeye sign)
- Weak elbow supination/flexion

# Distal Bicep Rupture



# Bicep Tendon Repair





# Bernard Hopkins



# Knee Anatomy

- 4 important ligaments
  - ACL - resists ant translation and hyperextension
  - PCL - resists post translation
  - MCL - resists valgus
  - LCL - resists varus

Right knee in flexion: anterior view

**ACL**

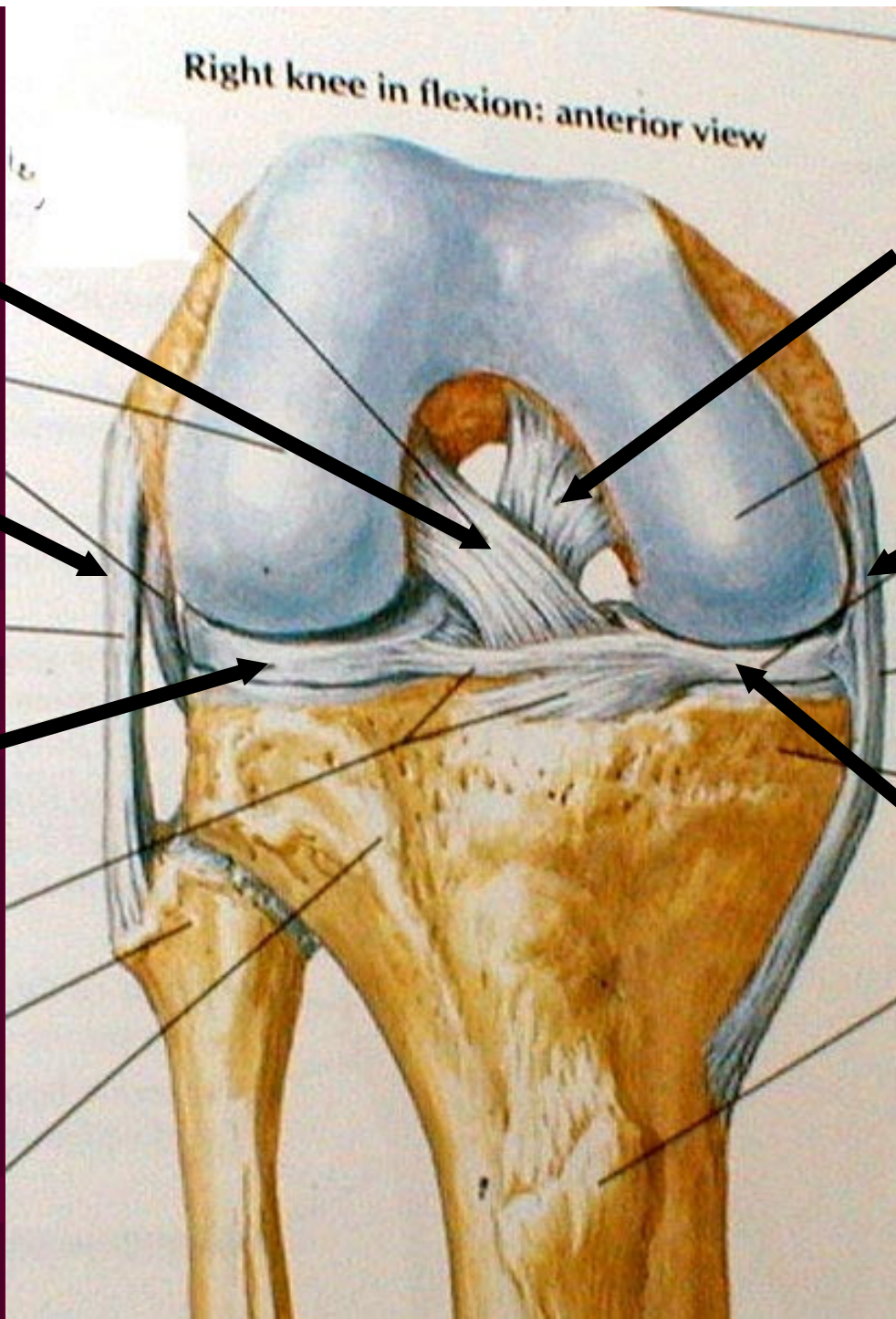
**PCL**

**LCL**

**MCL**

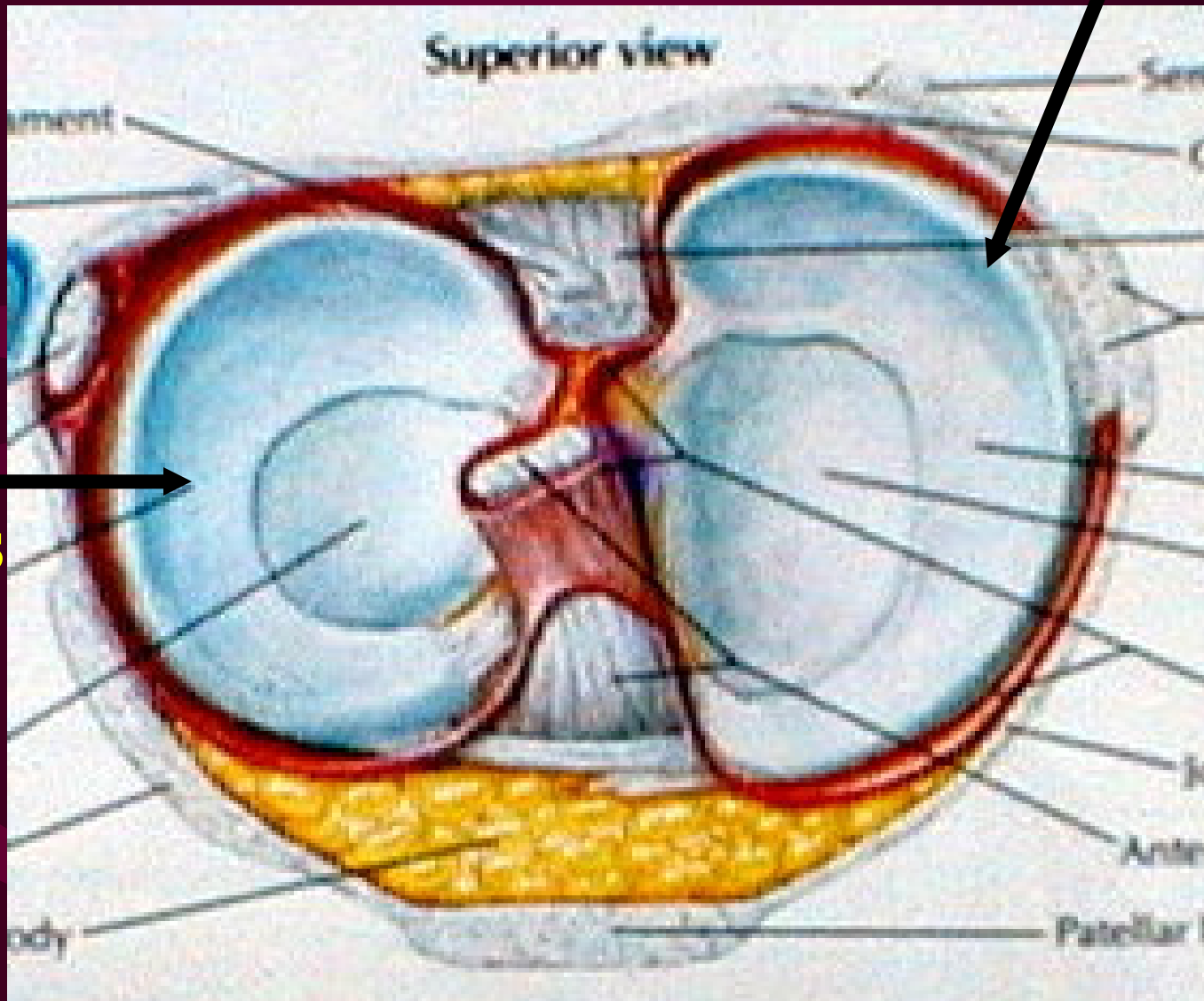
**lateral  
meniscus**

**medial  
meniscus**



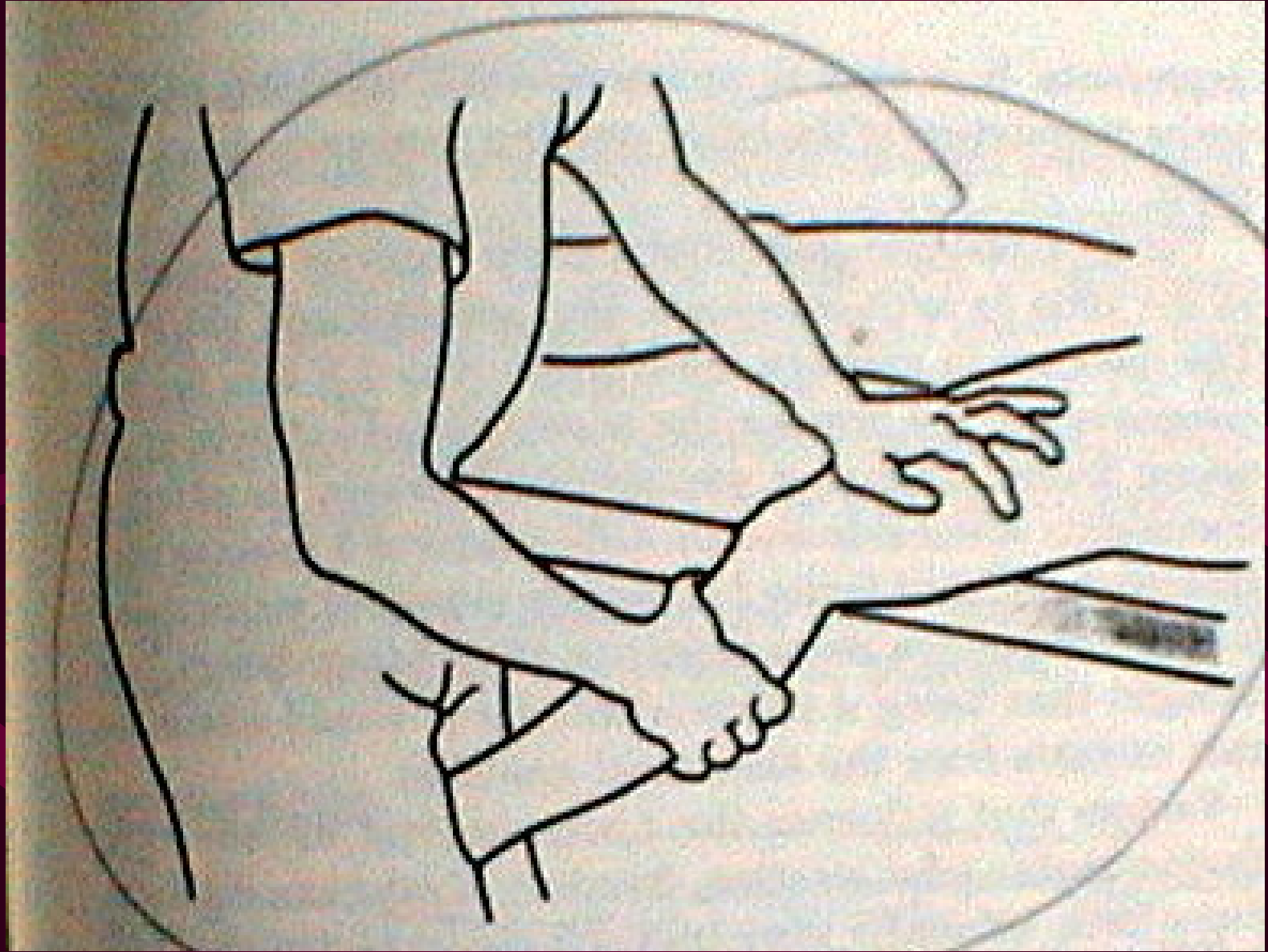
# Menisci of the Knee

**medial  
meniscus**



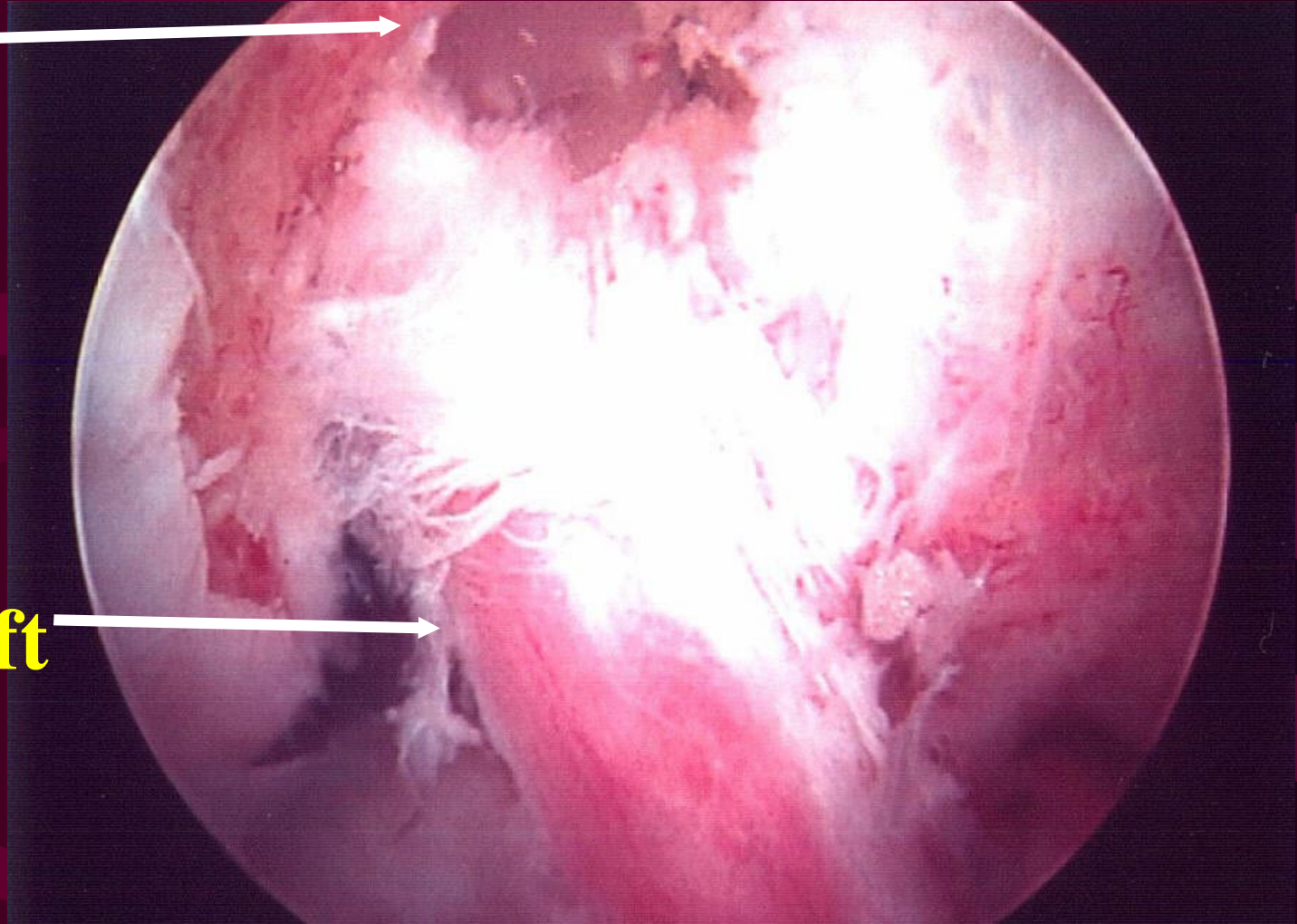
**lateral  
meniscus**

# Lachman Test for ACL



# ACL Reconstruction

**screw**



**ACL graft**

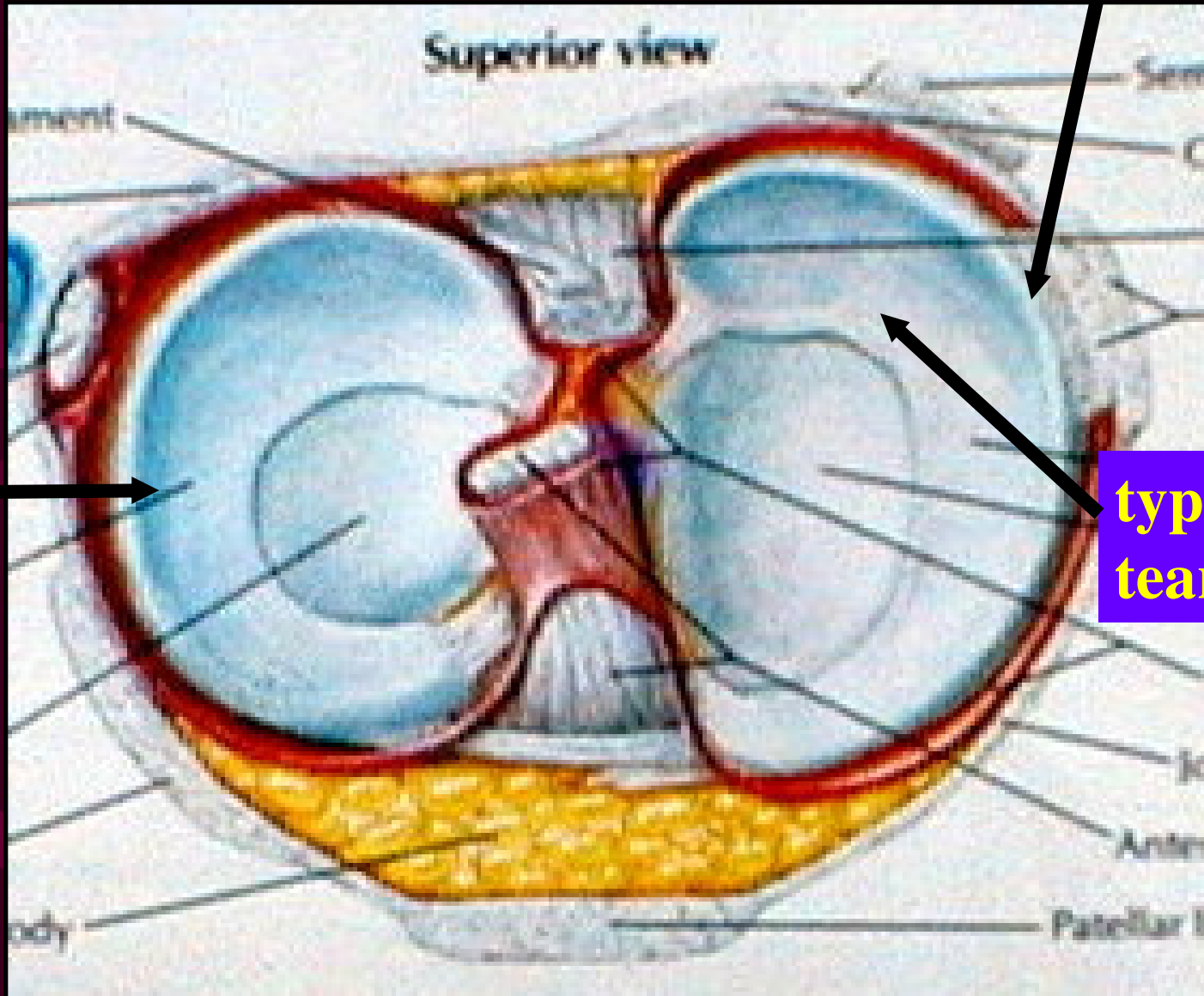
# Menisci of the Knee

**medial  
meniscus**

Superior view

**lateral  
meniscus**

**typical  
tear site**

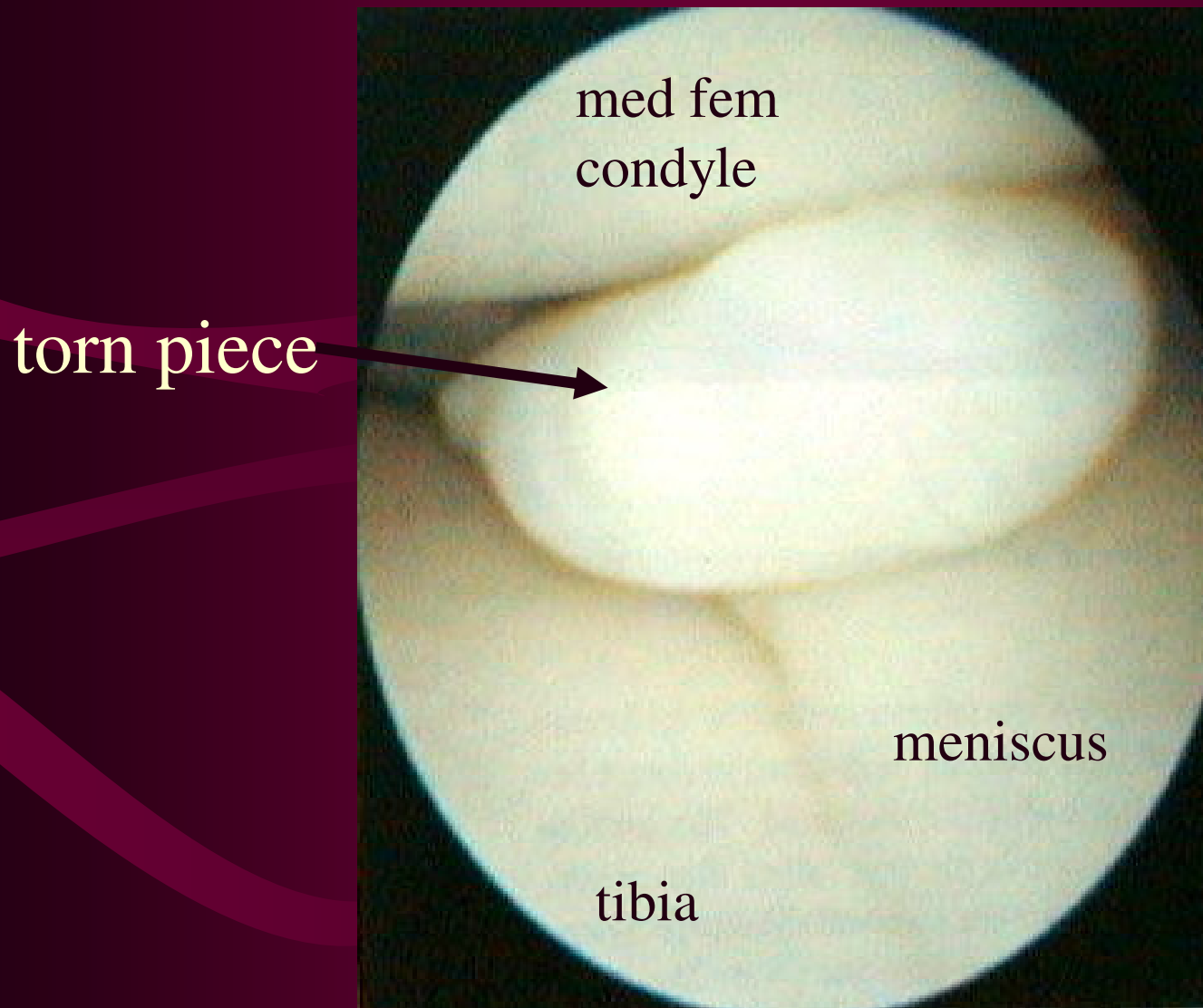


# Physical Exam - Meniscus

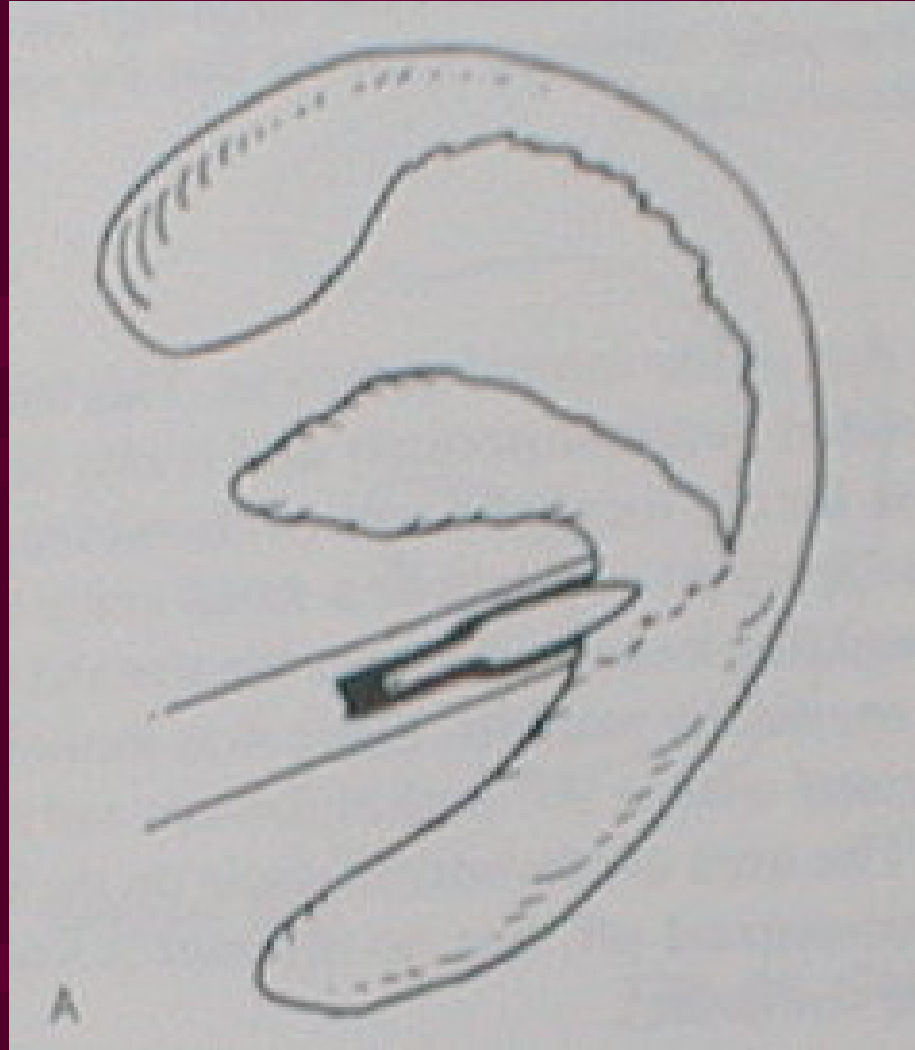
- Joint line tenderness
- McMurray flexion rotation test
- Flexion pinch test
- **Pain with squatting**

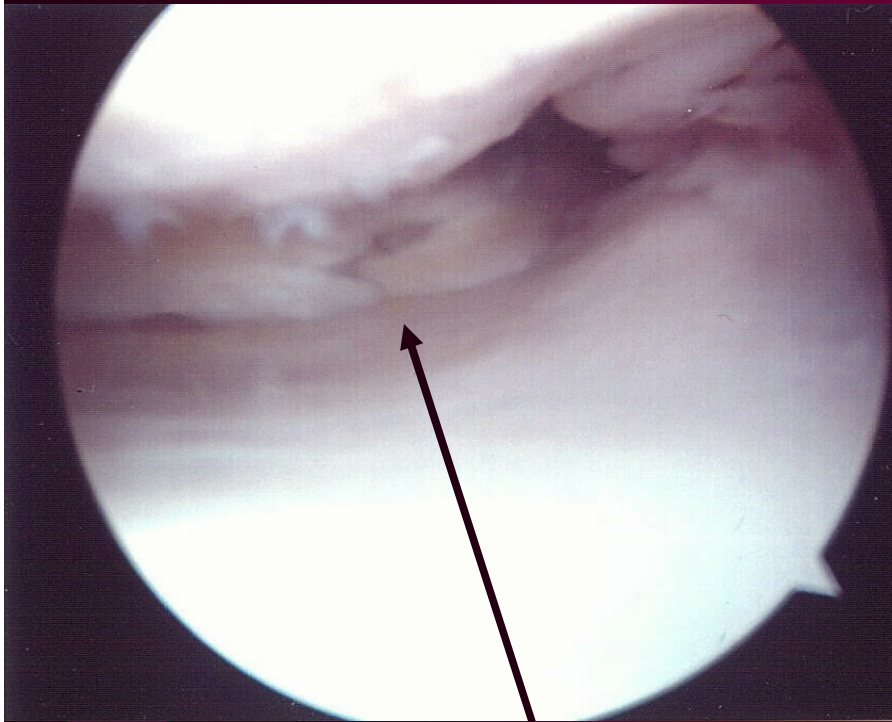


# Meniscus Tear

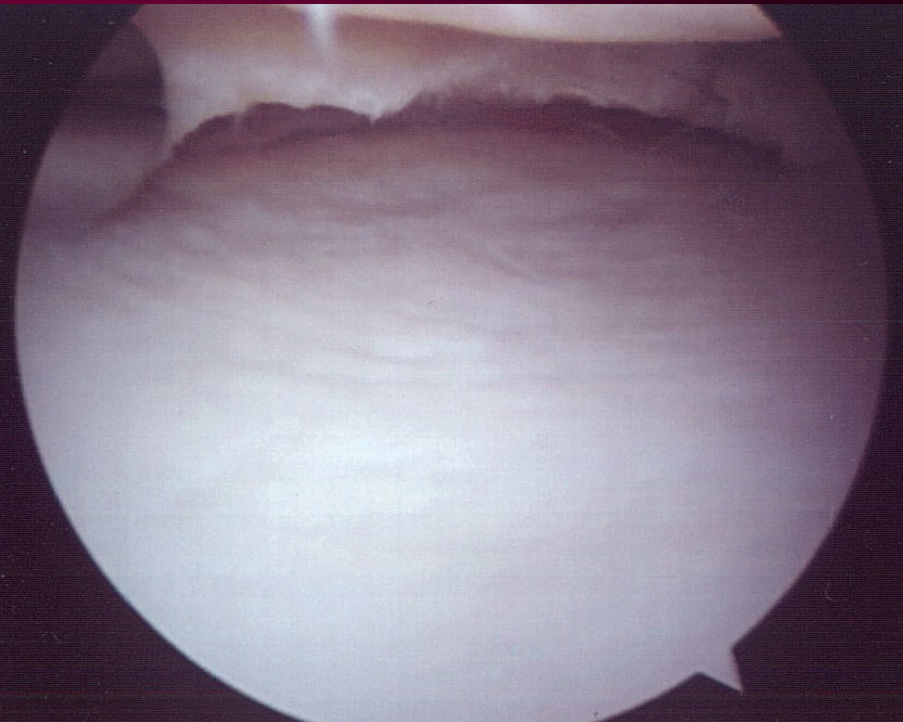


# Partial Meniscectomy





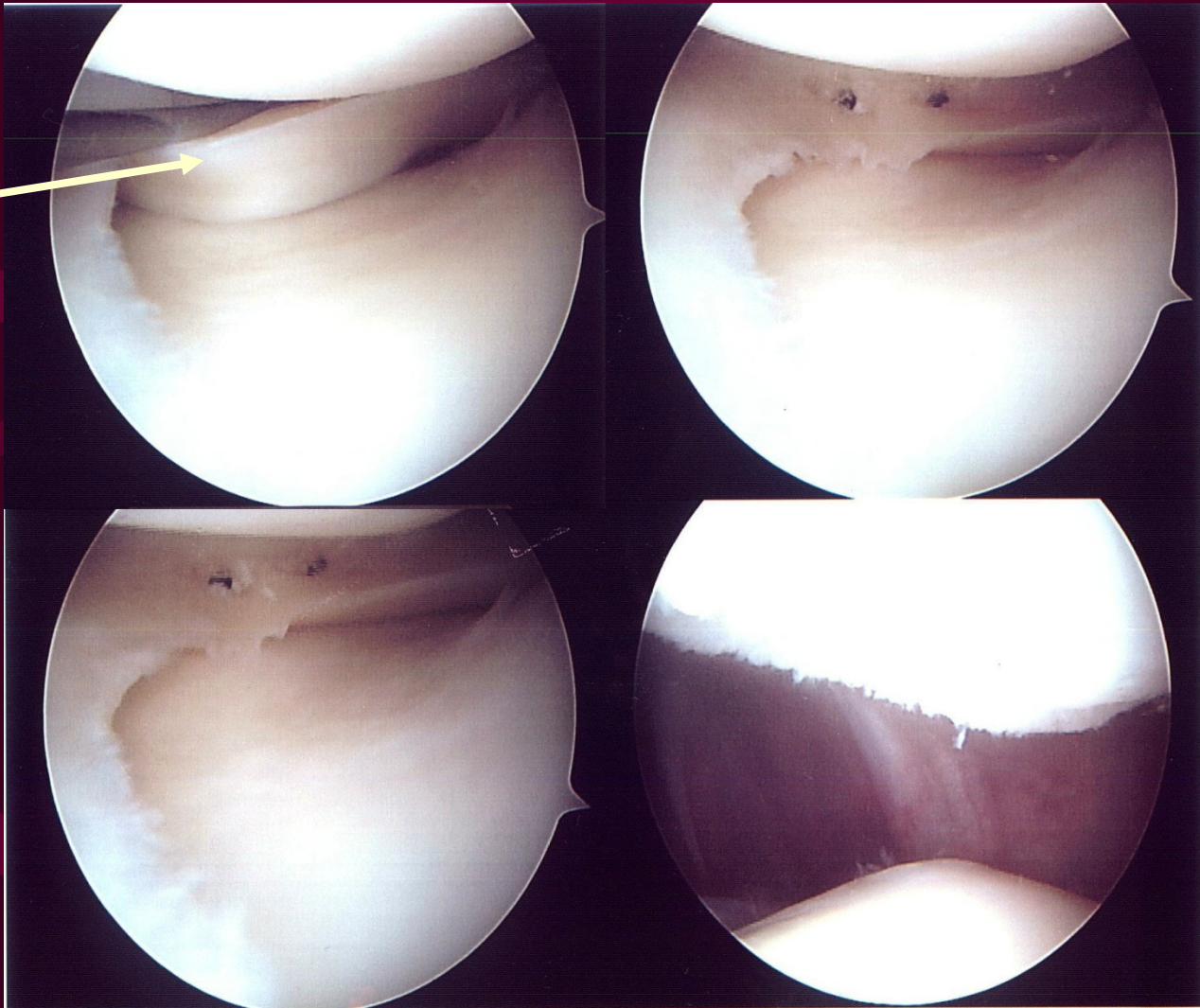
medial meniscus tear



s/p partial meniscectomy

# Meniscus Tear and Repair

medial  
meniscus  
tear



# Arthroscopy Portal Scars



# Gerry Cooney



# Ankle Injuries

- Typically inversion injury
- Lateral ankle sprain is most common

# Ottawa Rules for Ankle Fractures

- Able to bear-weight on affected foot
- Able to take 3 steps unassisted
- No bony tenderness at posterior lateral malleolus

*n.b.-must be fully conscious to apply rules*





# Ankle Dislocation

# Bimalleolar Ankle Fracture



# Orthopaedic Pearls

- Immobilize/Protect suspected c-spine injuries
- *Firmly* palpate any suspected injured areas
  - Check ROM and strength
  - Pre-fight exam always push on MPs and check finger extension
- Compare to contralateral extremity
- Deep squat to test knee

# Senator John McCain



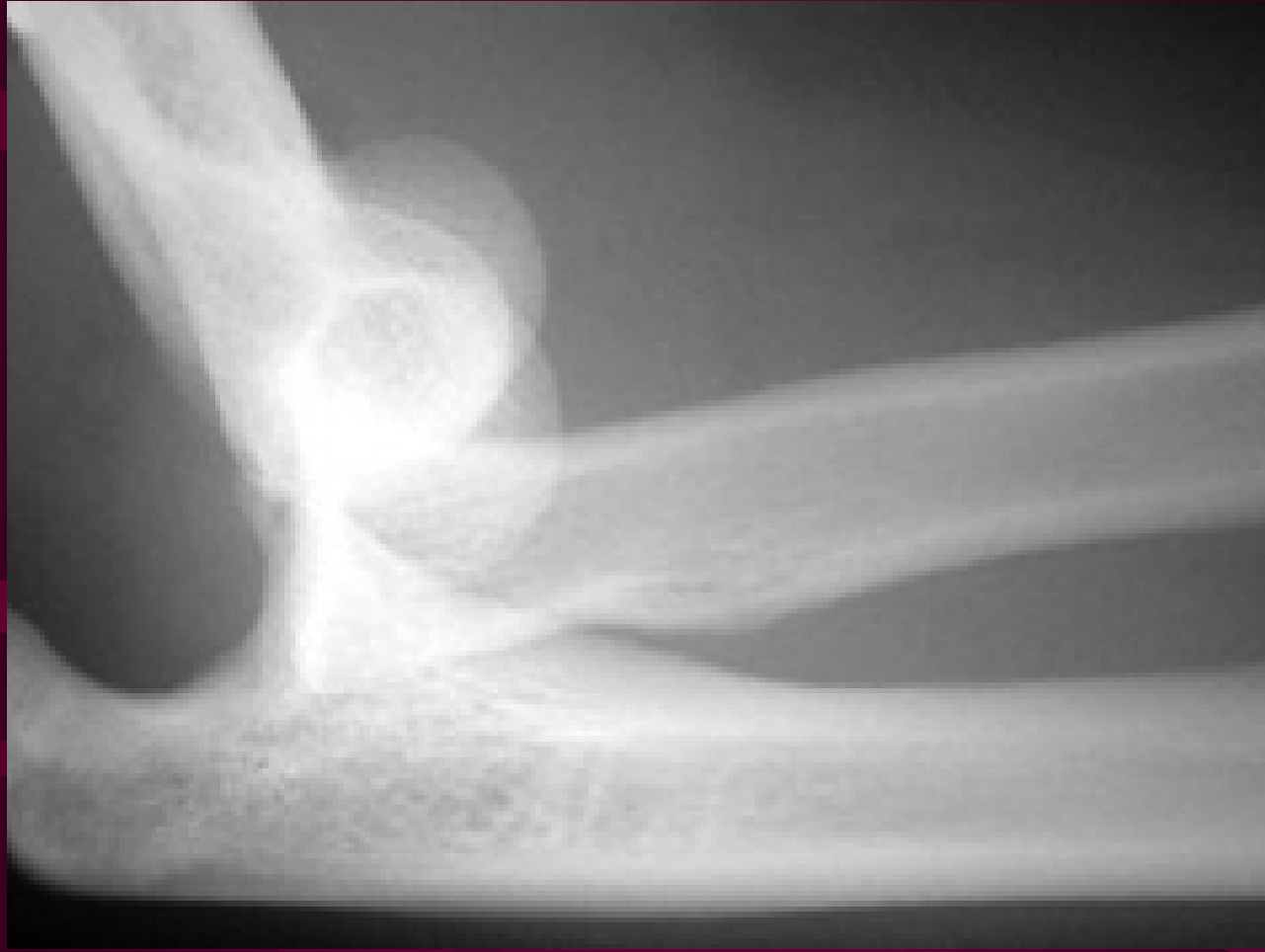
- <http://www.youtube.com/watch?v=HbejYeHwBVc>

# Mixed Martial Arts Injuries

- Joints are a weak point of the human body
- One of the basic tactics of MMA is to stress a joint to point of submission or dislocation



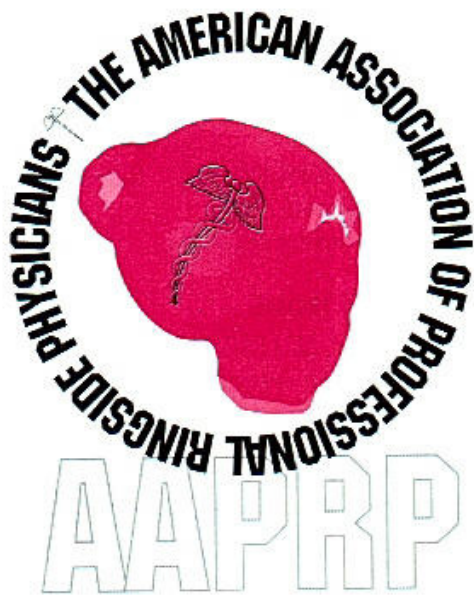
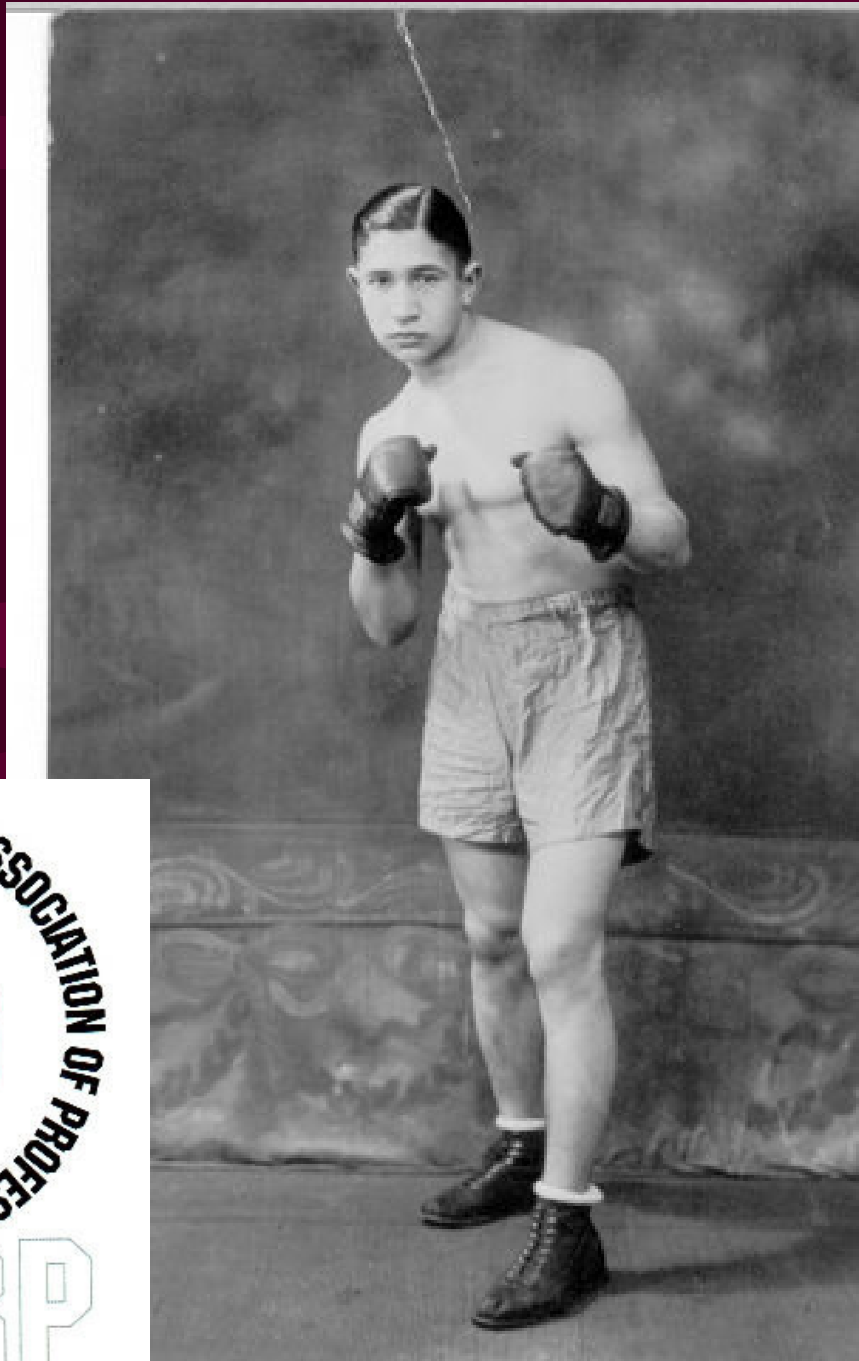
# Finger Dislocation



# Elbow Dislocation



# Thank You!



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