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# **Elbow Ultrasound Tendons and Ligaments**

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No disclosure



# Ultrasound Technique

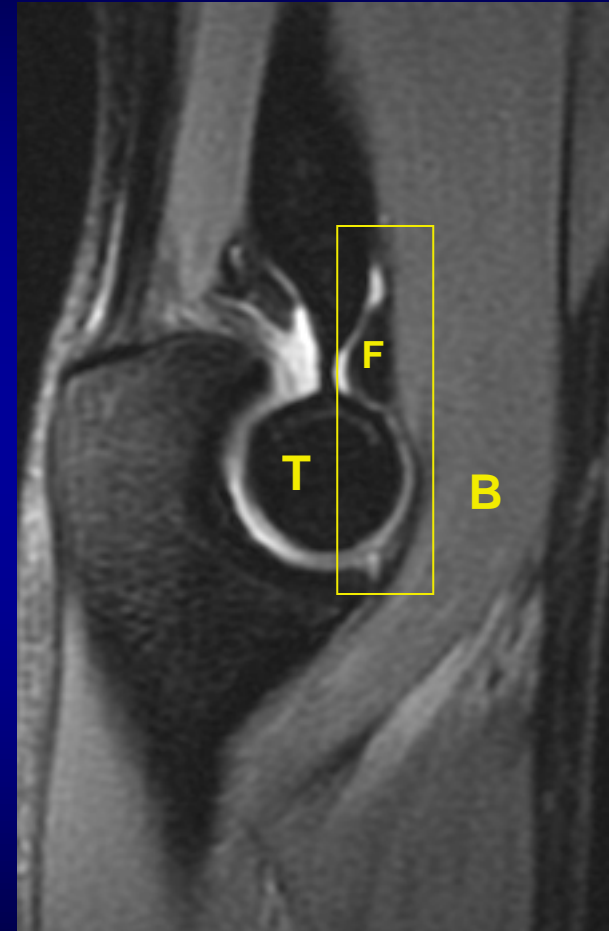
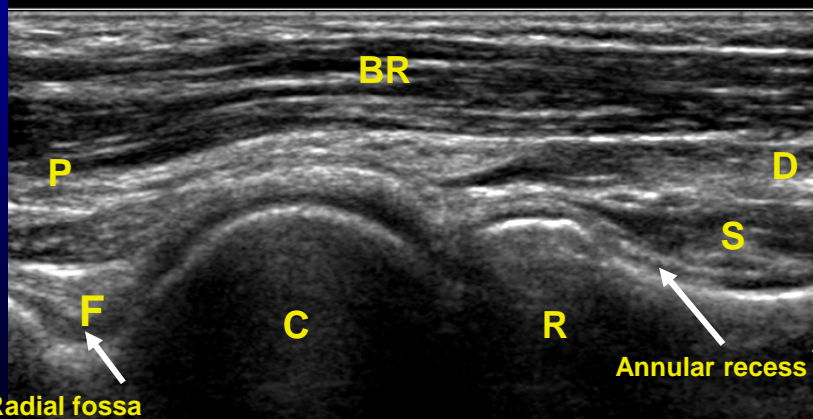
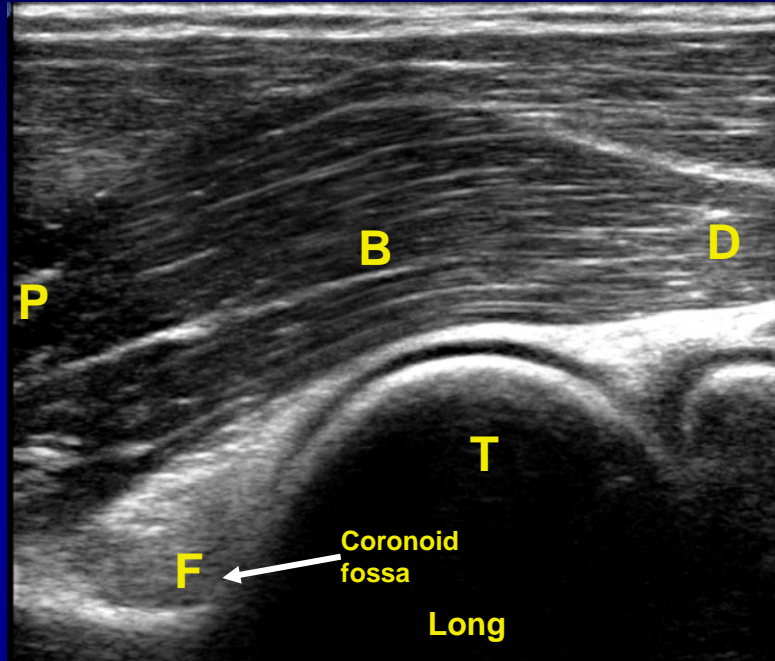
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- Routine protocol
  - Complete examination
  - Focal examination: over area of symptoms
- Patient sitting or laying down
- Transducer: High frequency Linear 10 – 15 MHz

# Anterior joint recess



Elbow -  
extended  
Transducer -  
Sagittal plane



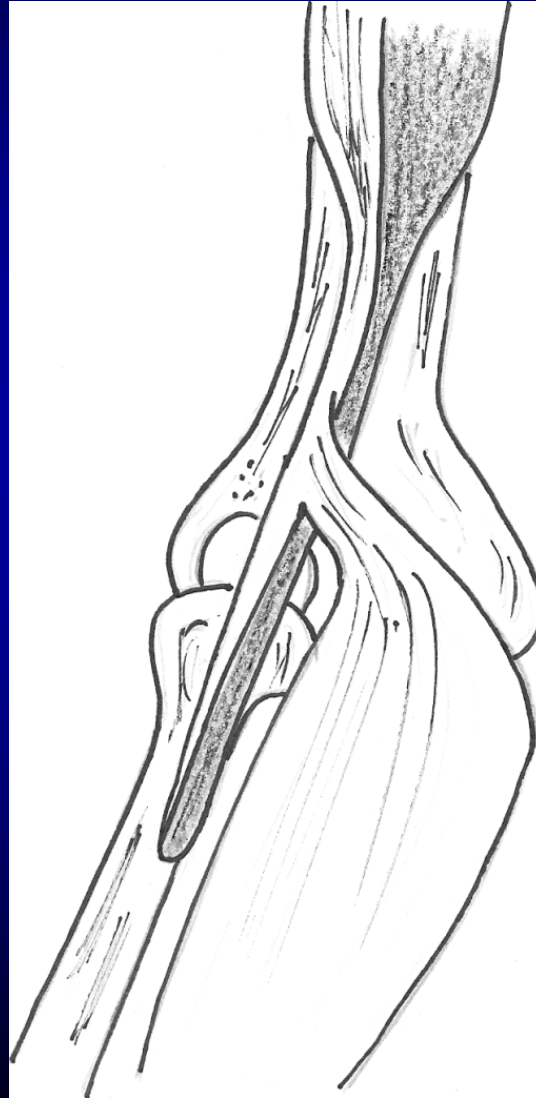
Fat pad – hyperechoic

Normal muscle - hypoechoic

# Anterior Elbow – Biceps tendon

Two separate tendons:

- ✓ Short head: more distal and anterior
- ✓ Long head: more proximal



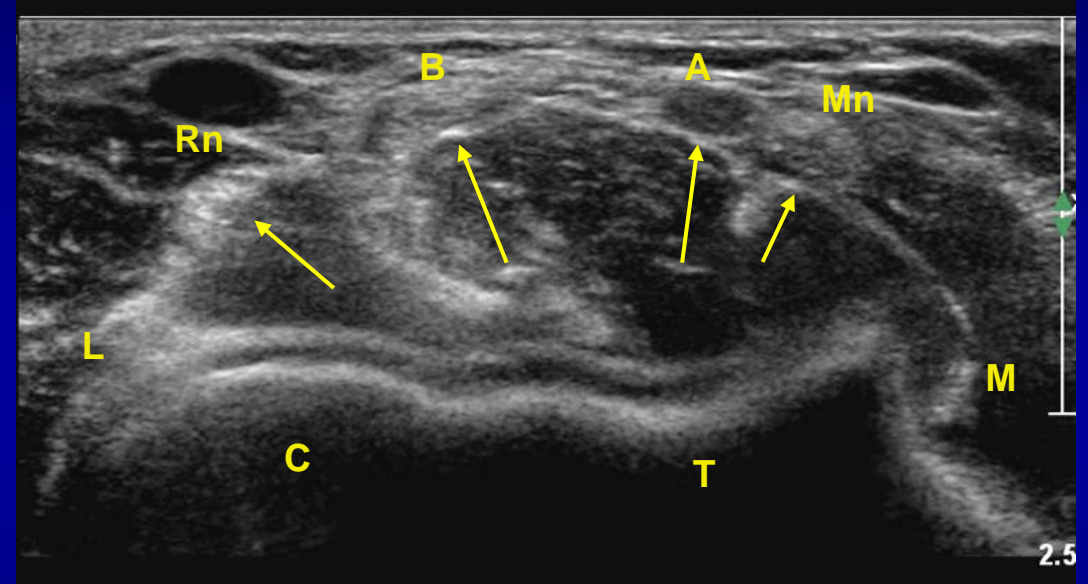
Courtesy by Dr. De Maeseneer



# Anterior Elbow – Biceps tendon

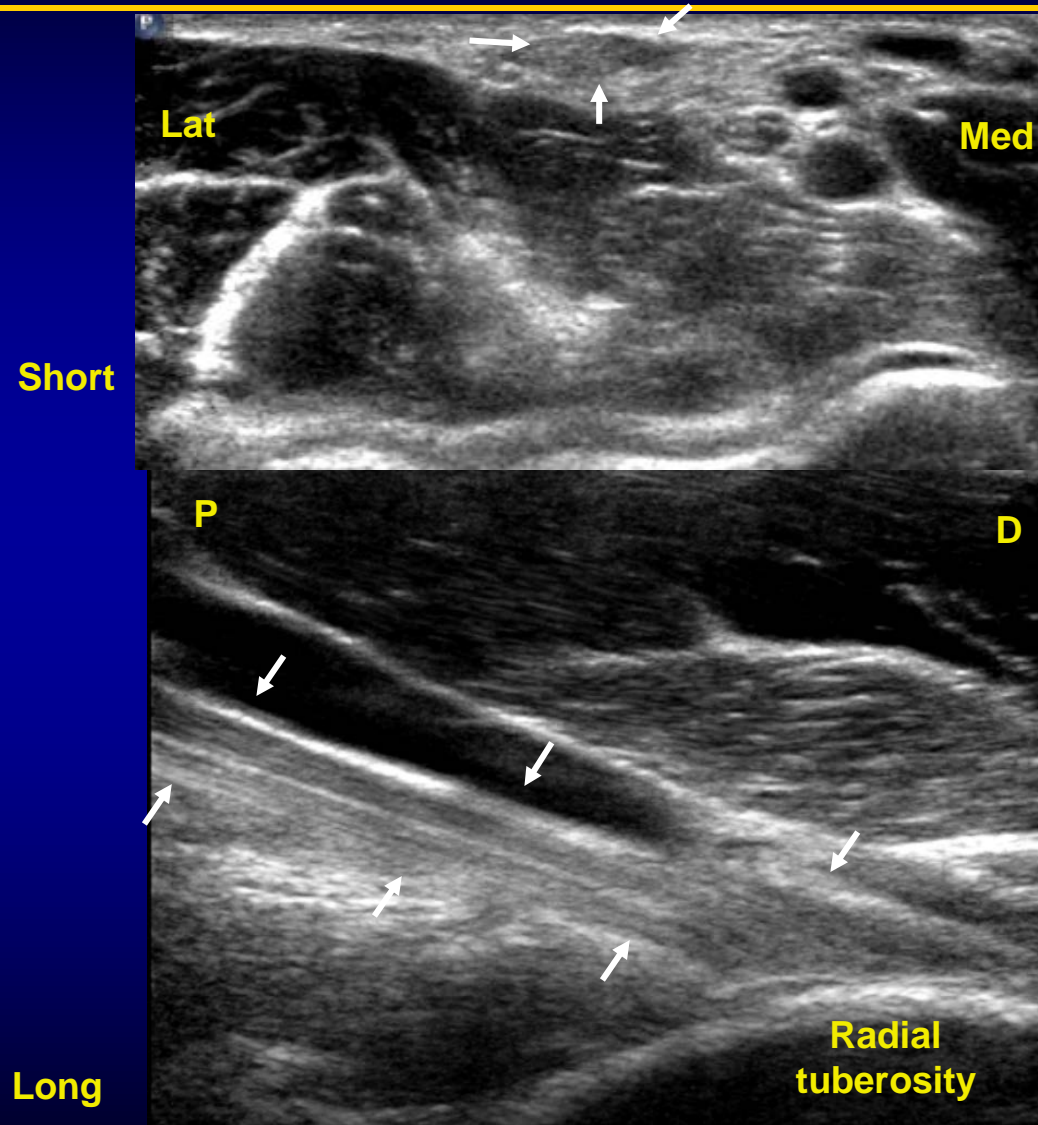


Courtesy by Dr. Jacobson

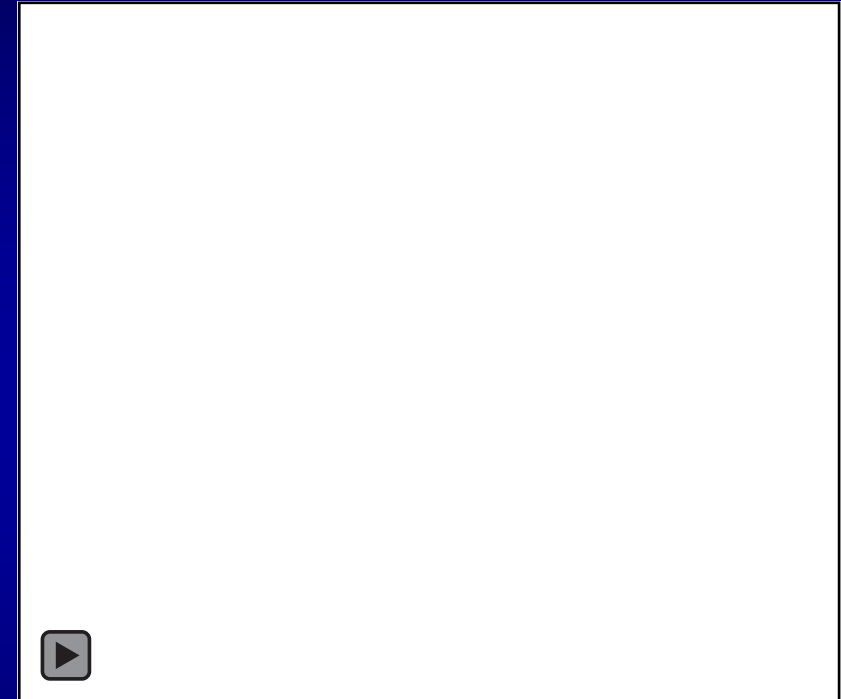


- Brachial Artery
  - Medial: median nerve
  - Lateral: Biceps tendon

# Biceps Tendon



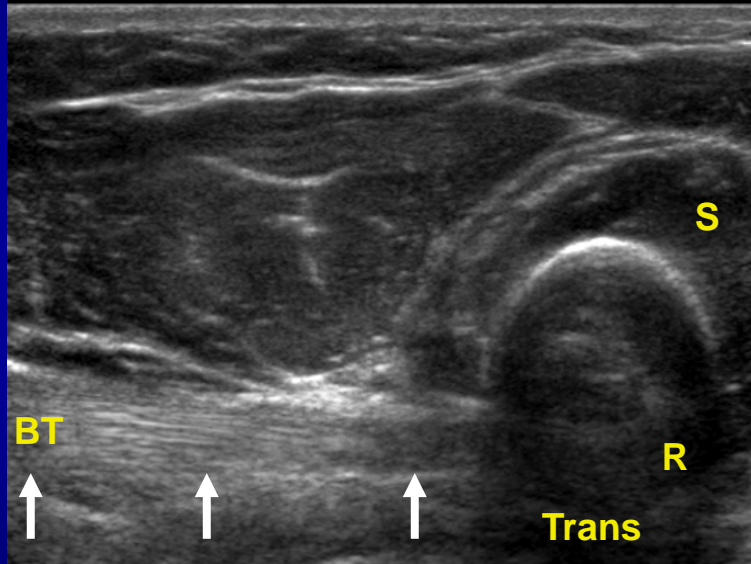
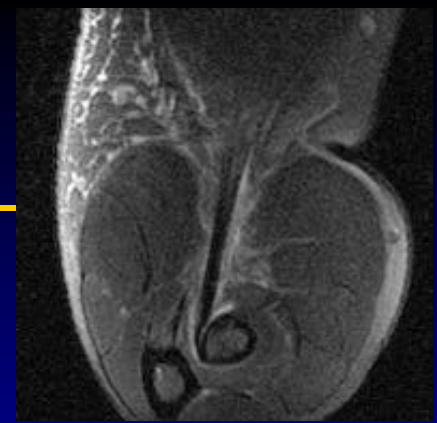
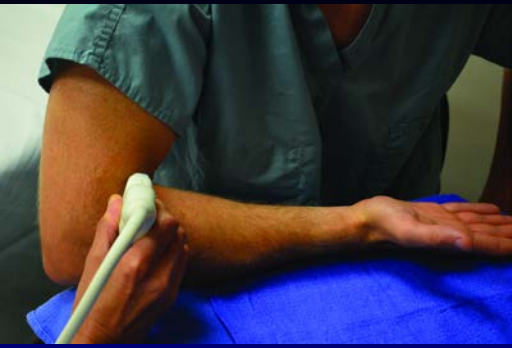
Normal tendon: Hyperechoic & fibrillar



Dynamic



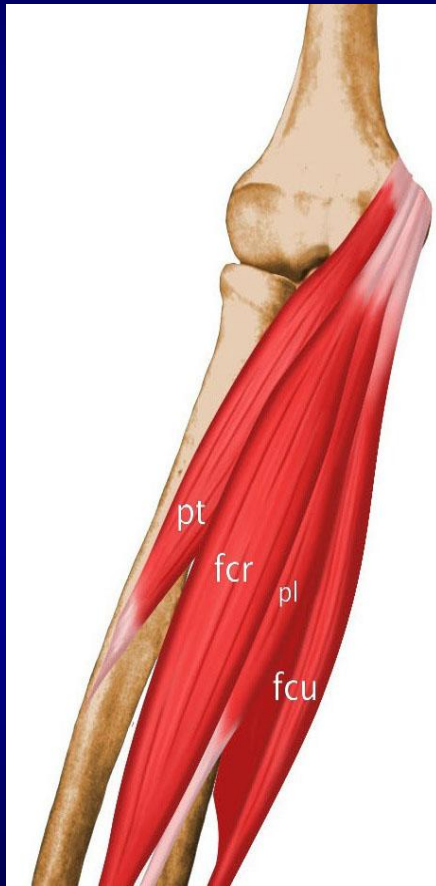
# Biceps Tendon Lateral Approach



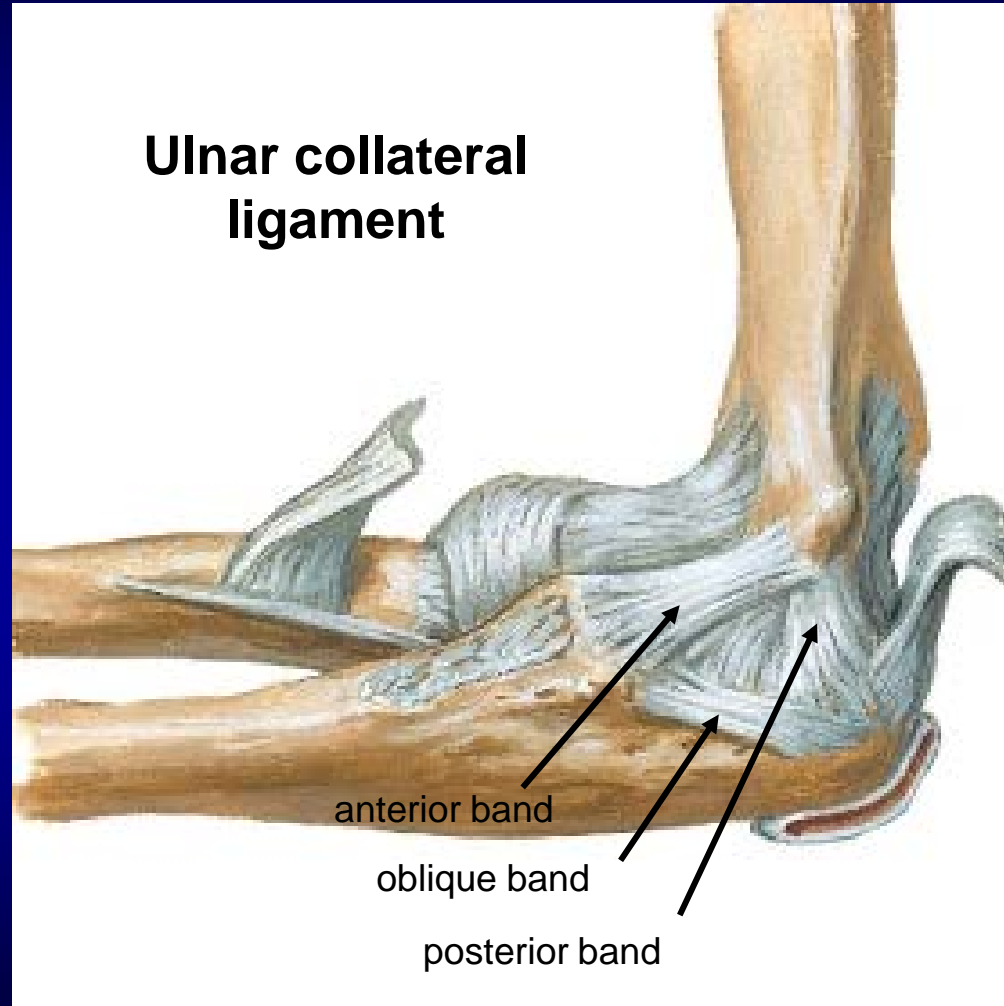
Dynamic evaluation with pronation and supination

→ helps to evaluate complete versus partial tendon tear

# Medial Elbow

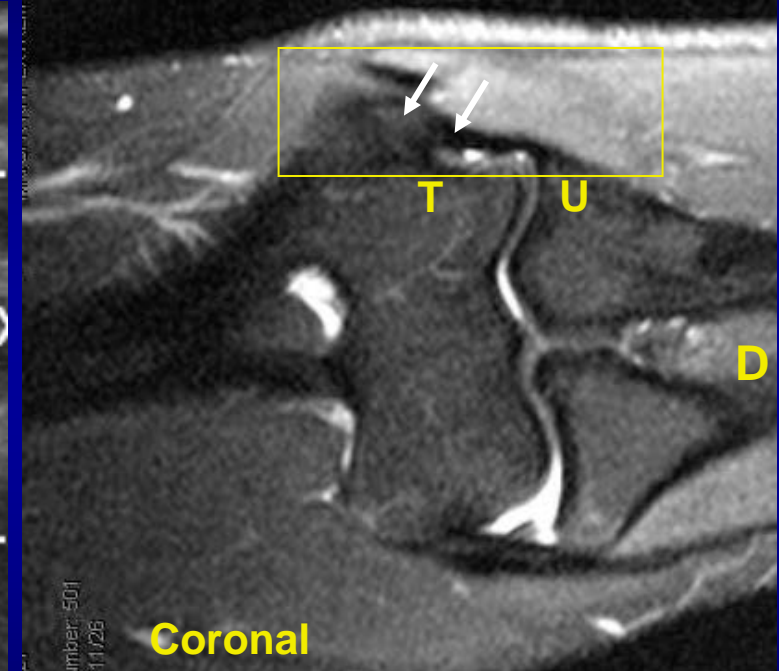
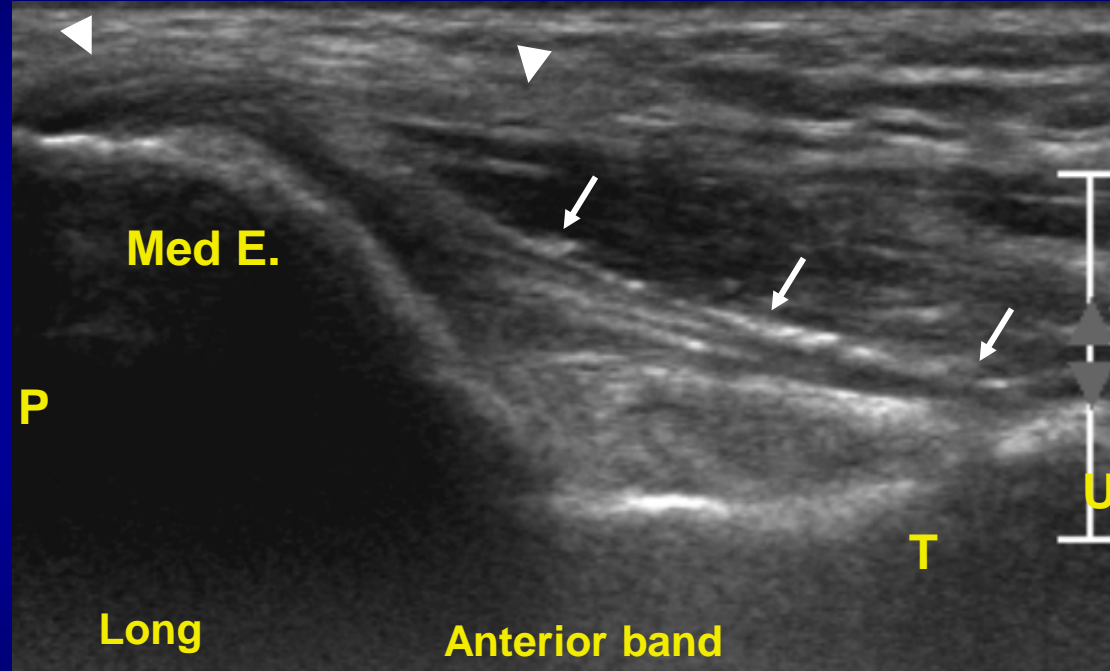


Flexor carpi radialis & pronator teres



From: Netter's Atlas of Human Anatomy

# Ulnar Collateral Ligament and Common Flexor Tendon



- Elbow – minimally flexed
- Transducer - Coronal plane
- Landmark: medial Epicondyle

Normal ligament: Hyperechoic & fibrillar

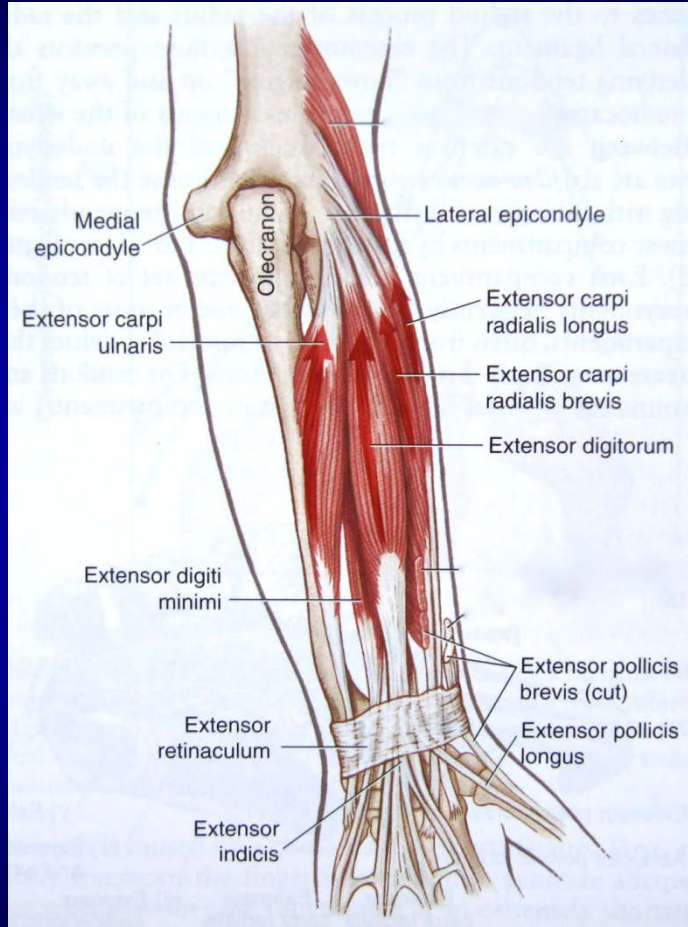
Anterior band: Most important medial joint stabilizer on valgus stress

Longitudinal : most important plane

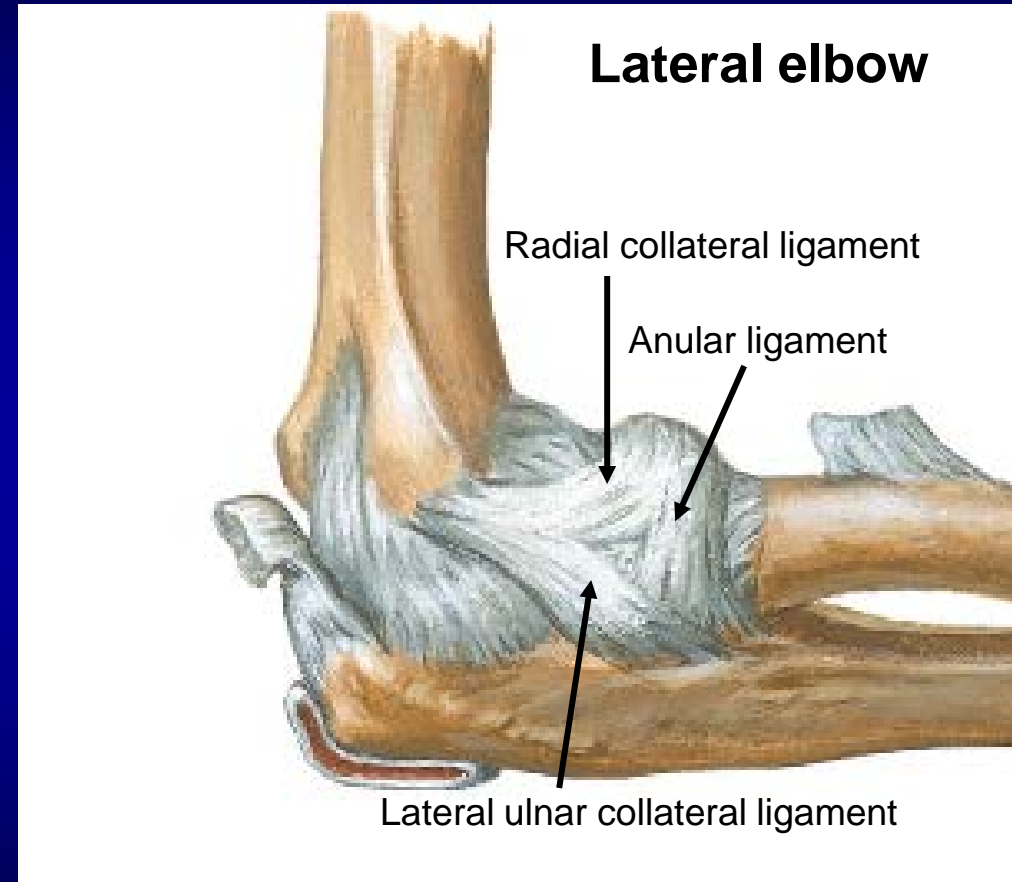
Dynamic evaluation - valgus stress: ligament injury



# Lateral Elbow



Extensor carpi radialis brevis

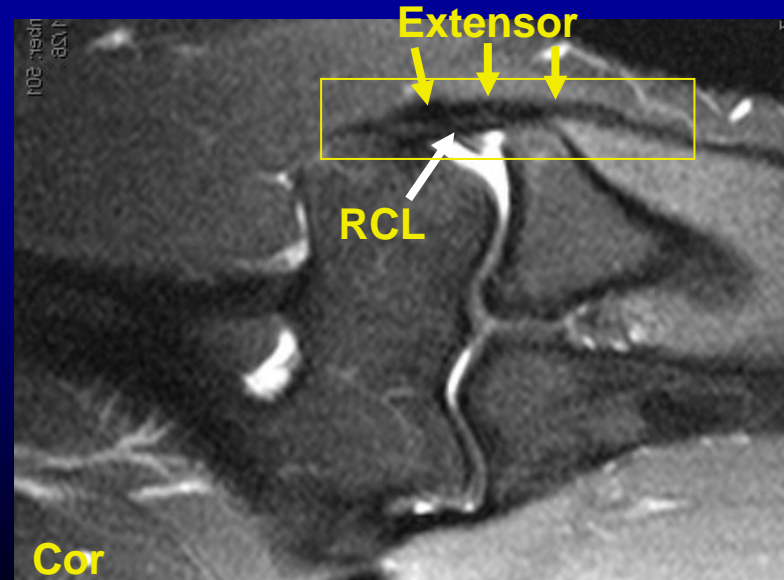
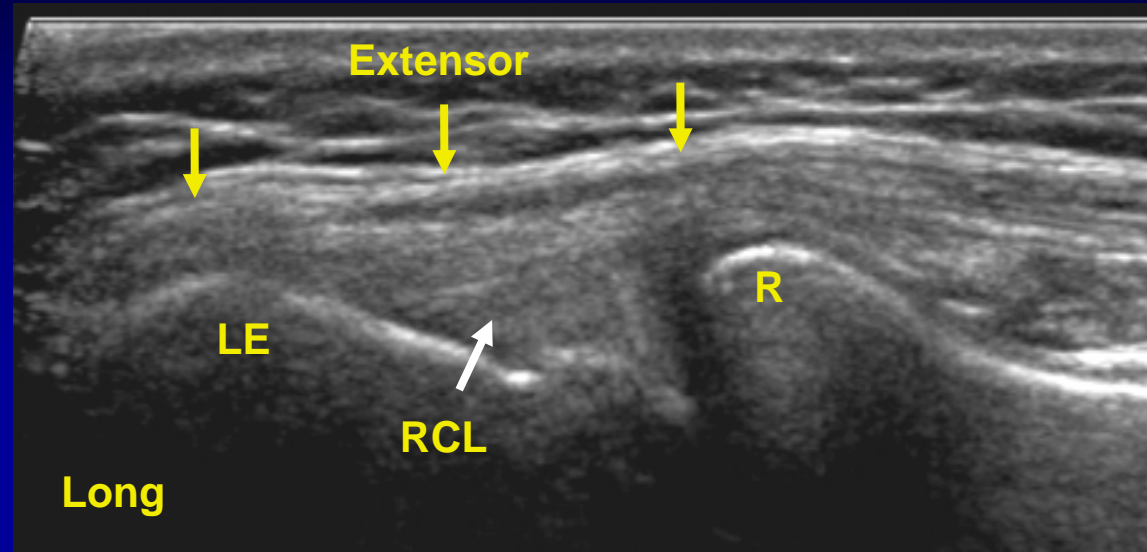


From: Netter's Atlas of Human Anatomy

# Lateral Collateral Ligament and Common Extensor Tendon



Courtesy by Dr. Jacobson



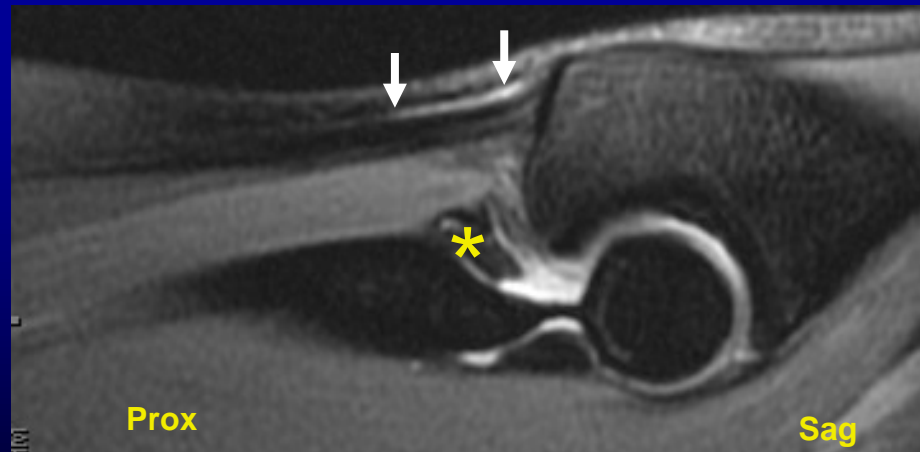
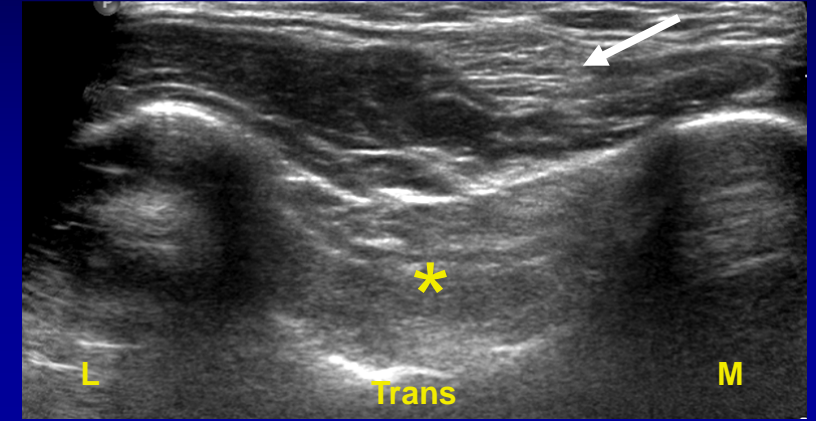
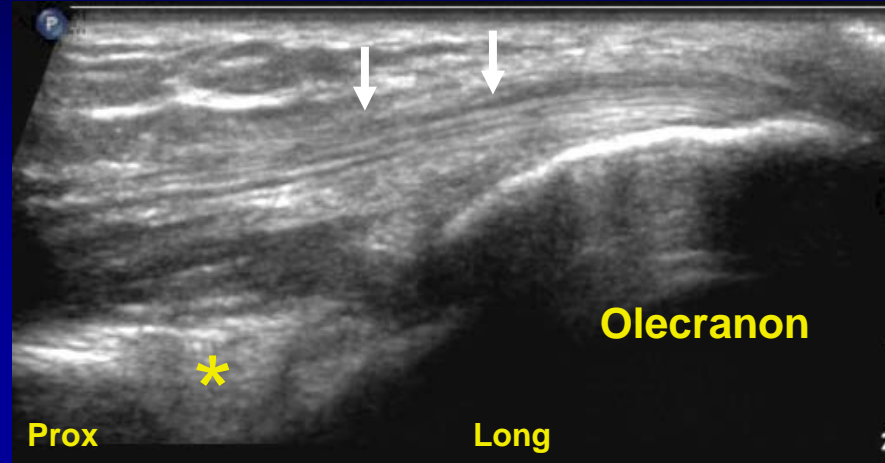
- Rotated inward and slightly flexed
- Transducer - Coronal plane
- Landmark: bone shadowing

- Normal ligament: Hyperechoic & fibrillar
- Longitudinal : most important plane
- Dynamic evaluation - varus stress: ligament injury

# Triceps Tendon and Posterior Joint Recess



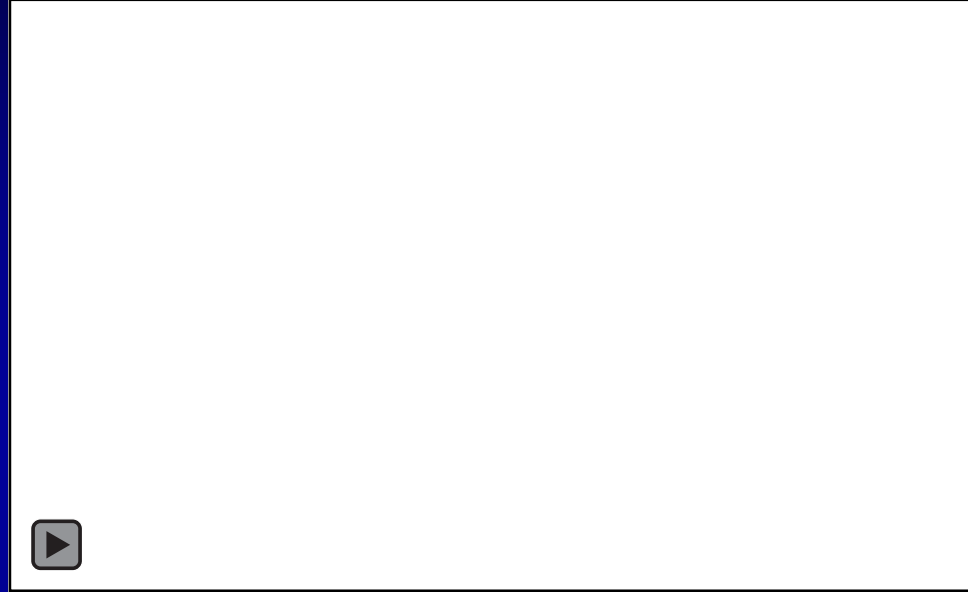
Courtesy by Dr. Jacobson



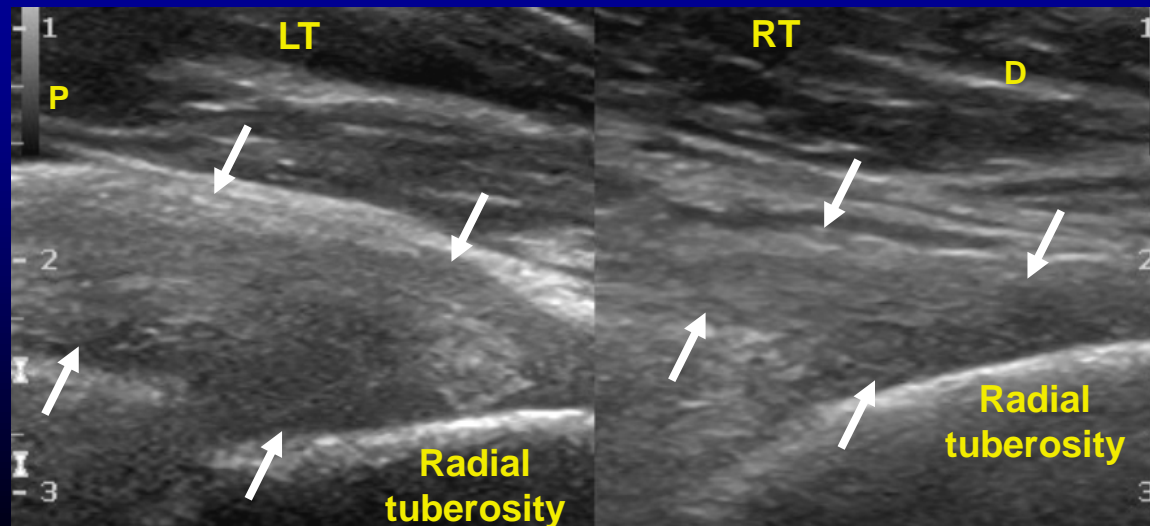
- Triceps insertion
- Olecranon fossa: Posterior joint recess – hyperechoic fat pad
  - Look for effusion and loose bodies
- Olecranon bursa

# Case # 1 & 2 : Distal Biceps Tendon Partial Tear & Tendinosis

- Partial thickness tear:
  - Focal loss of fibrillar appearance
  - Thickening & hypoechogenicity



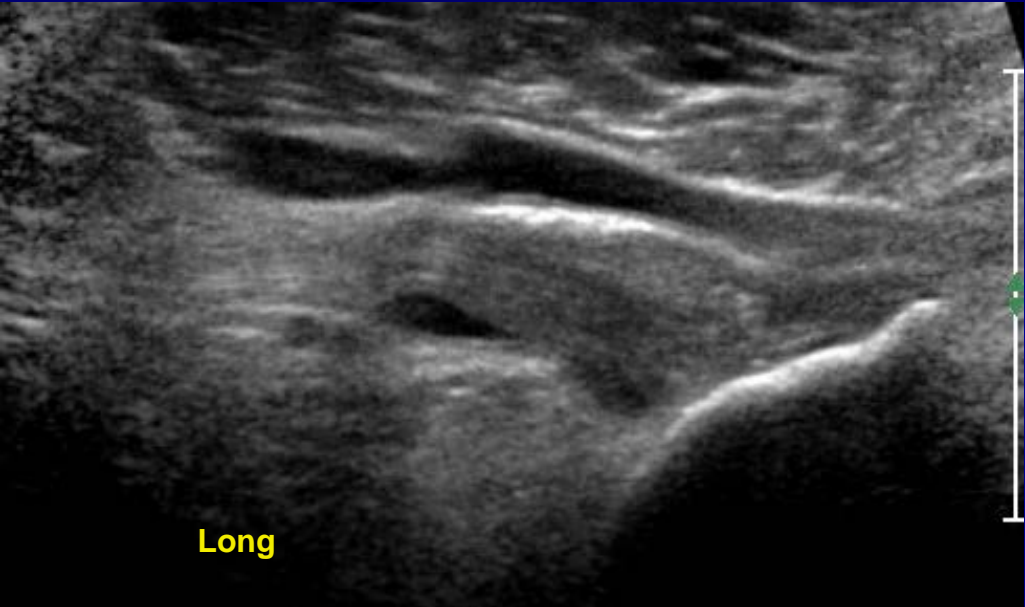
- Tendinosis:
  - Thickening & hypoechogenicity
  - No tendon disruption



Video

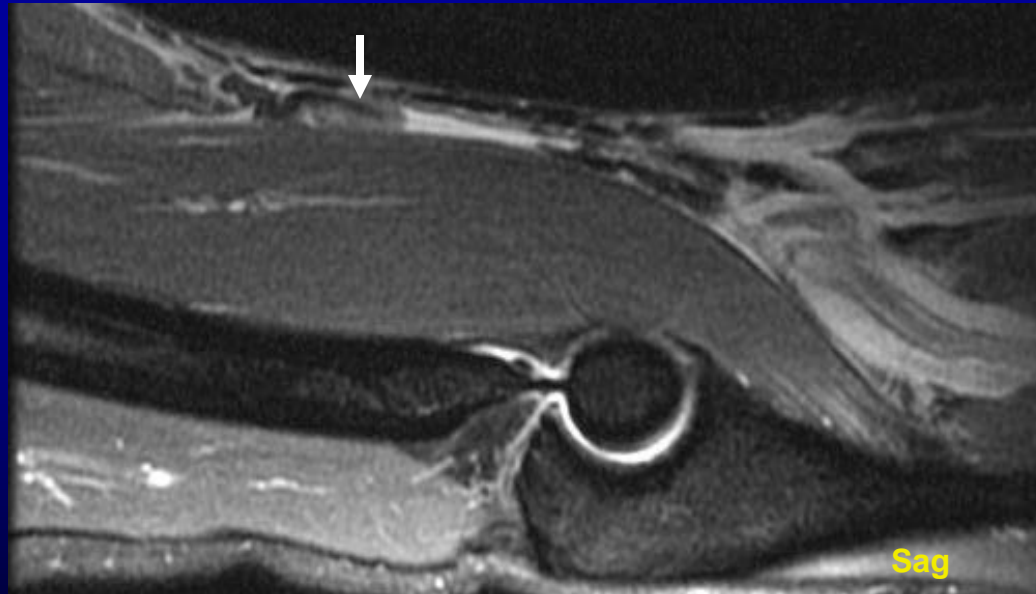
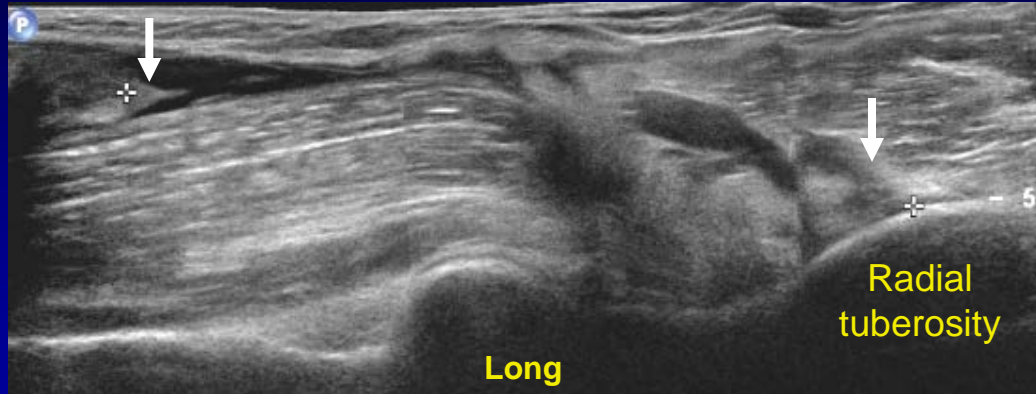
# Case # 3: Partial Distal Biceps Tendon Tear

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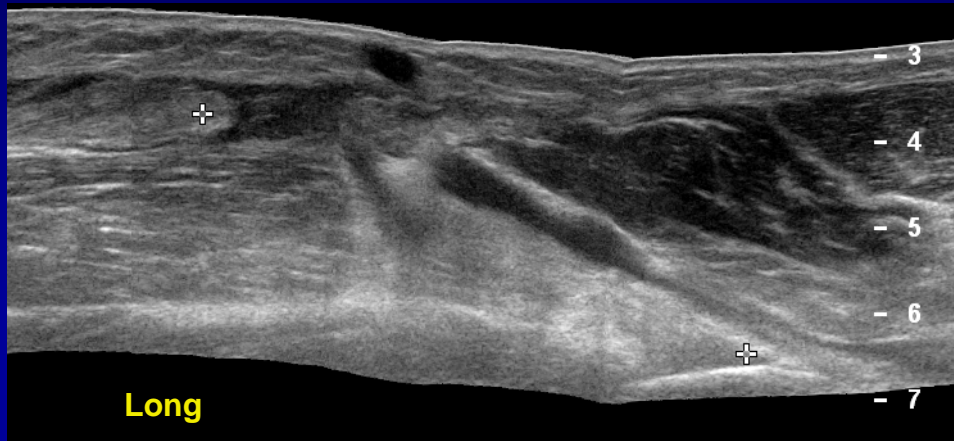
# Case # 4: Complete Distal Biceps Tendon Tear



- Complete tear
  - Disruption of tendon fibers
  - gap filled with fluid +/- retraction of tendon stump

# Case # 5: Complete Distal Biceps Tendon Tear

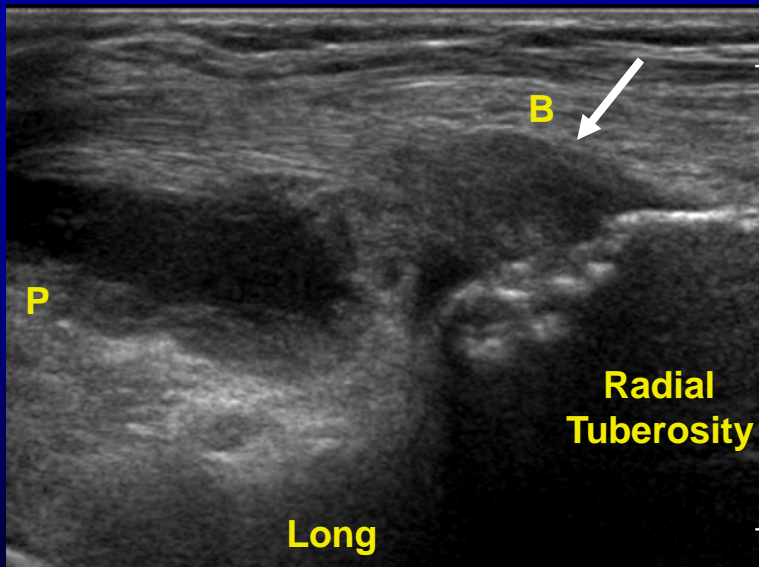
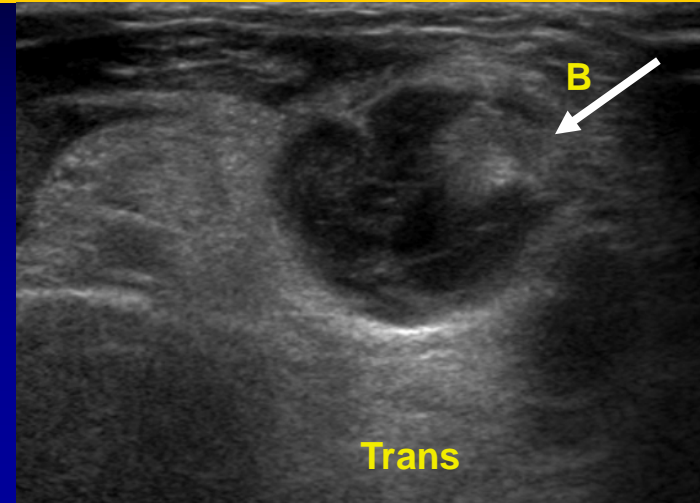
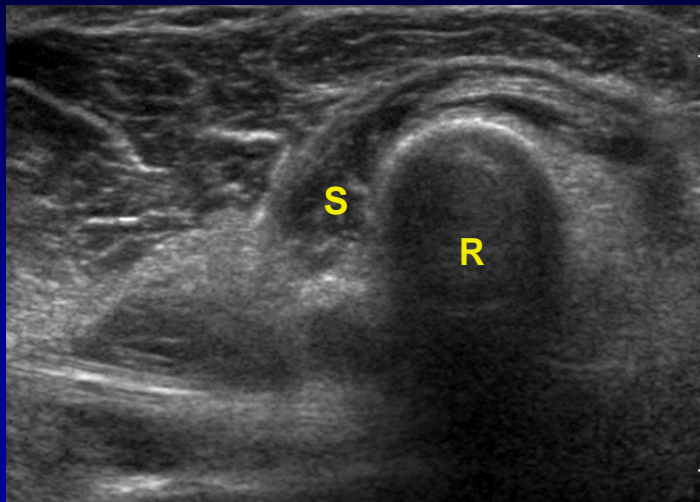
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- Complete tear
  - Disruption of tendon fibers
  - Retraction of tendon stump
  - Dynamic: No motion



# Case # 6: Bicipitoradial Bursitis, Tendinosis and Partial Tear



## Location

- Surrounds the distal biceps

Antecubital mass: Key is the location

**NOT TENOSYNOVITIS:** tendon sheath is not present

## Causes

- Chronic overuse (+ common)
- Inflammatory / Infectious

## May coexist with

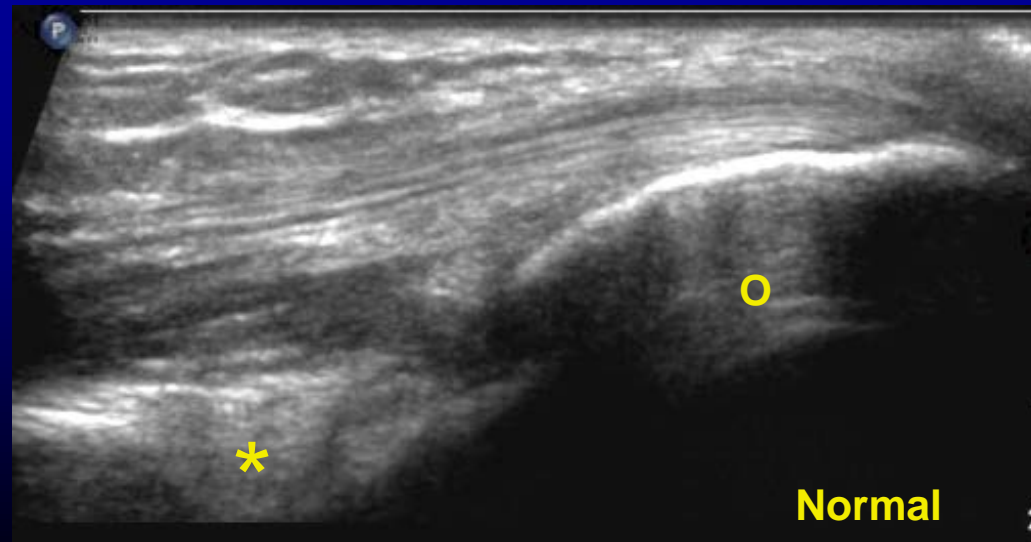
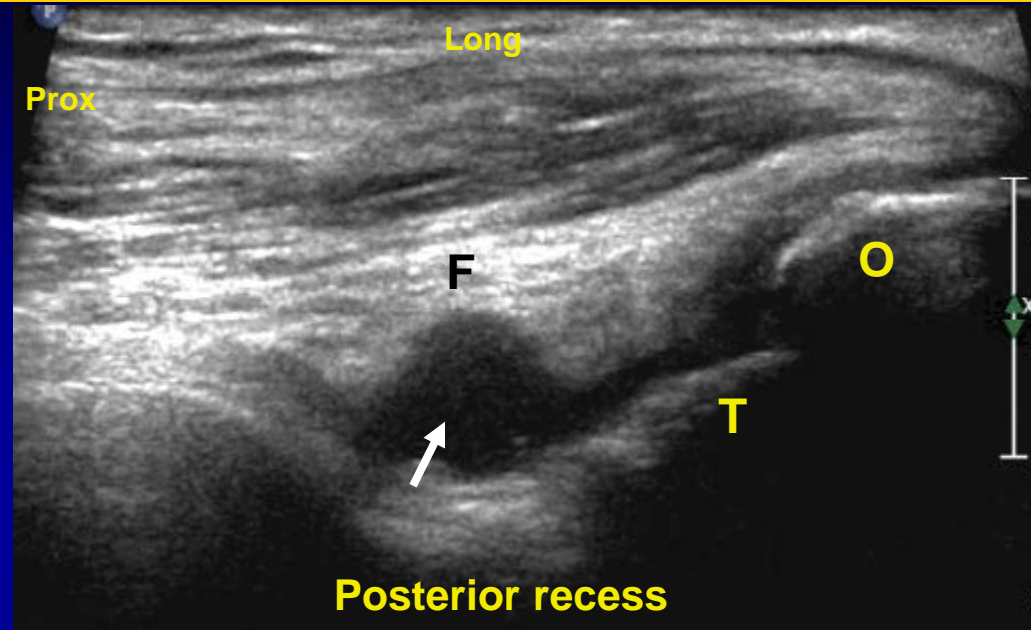
- Biceps Tendinosis, Partial Tear

US: Fluid around distal biceps  
Variable: Hypo → hyperechoic, Osseous irregularities



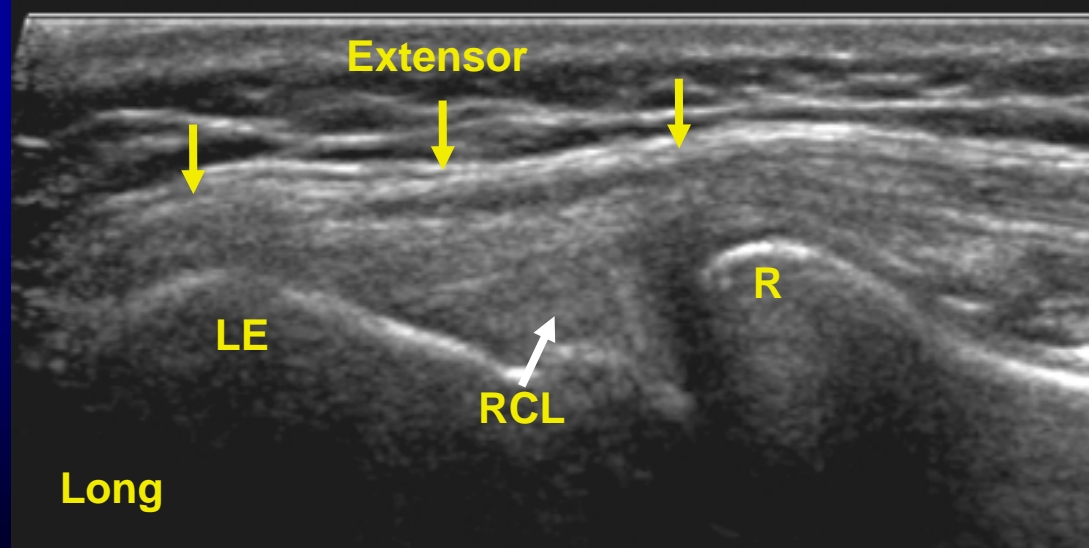
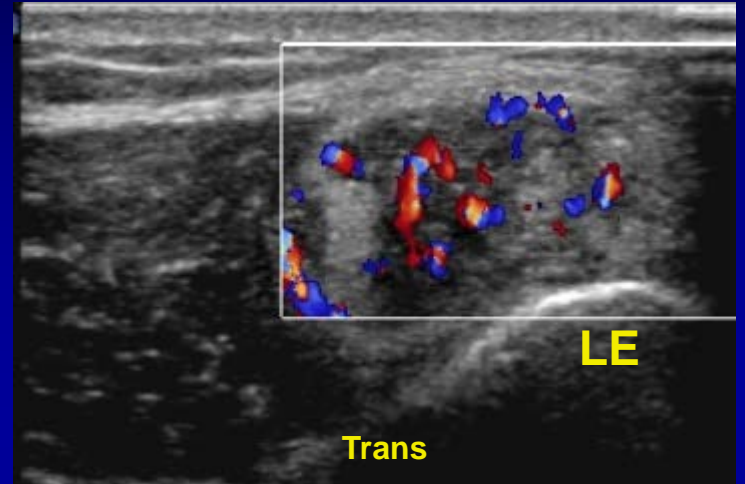
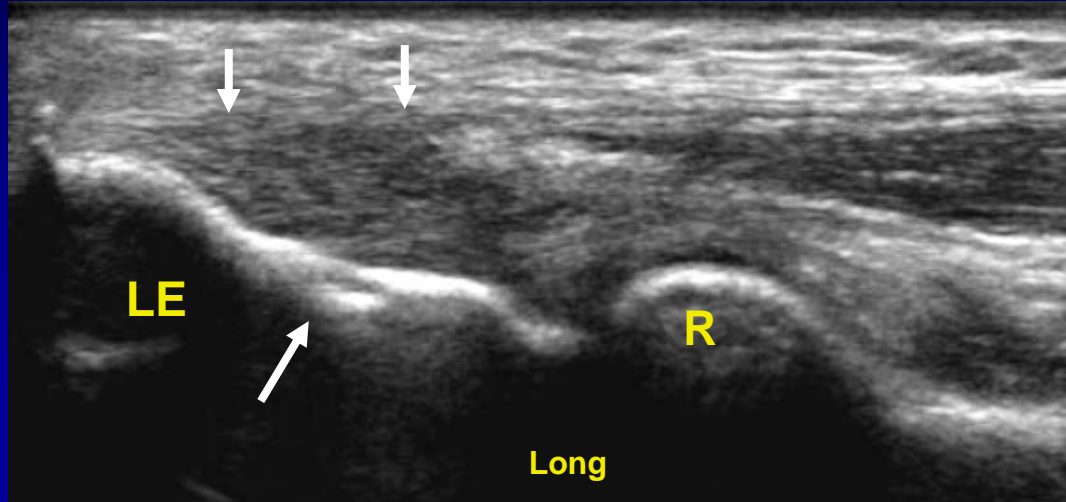
# Case # 7: Effusion

- Nonspecific by US:  
trauma,  
inflammatory/  
infectious, others
- US appearance:
  - Displacement of fat  
pad
  - Simple fluid: Anechoic



# Case # 8: Lateral Epicondylitis (Tennis Elbow)

- Epicondylitis = Tendinosis
- Cause: chronic overuse
  - Lateral (Tennis elbow) is more common than medial (Golfer's elbow)
- Lateral epicondylitis
  - Extensor carpi radialis brevis
- Medial epicondylitis
  - Flexor carpi radialis & pronator teres

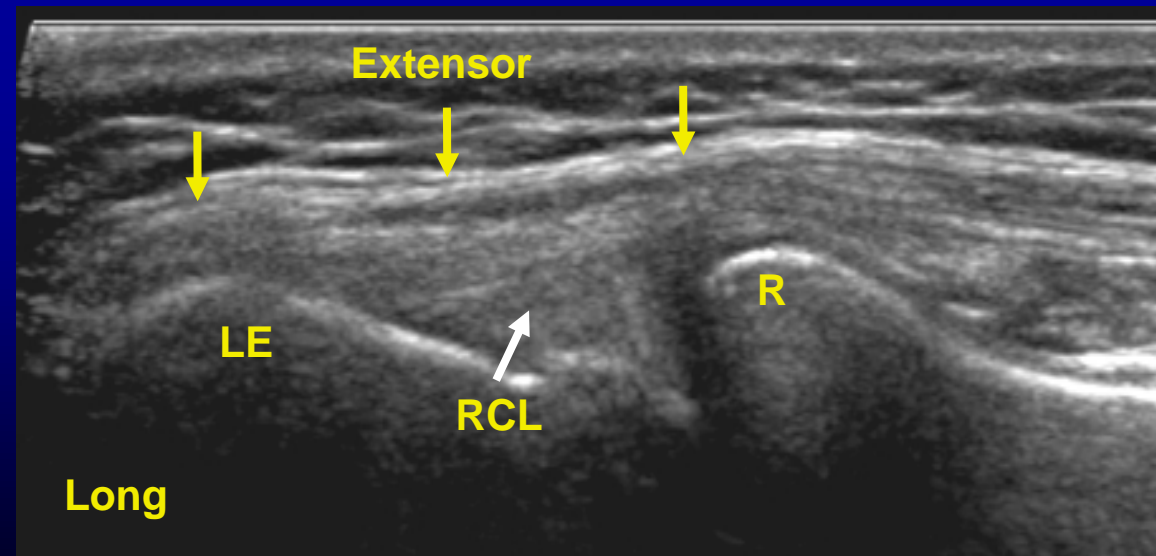
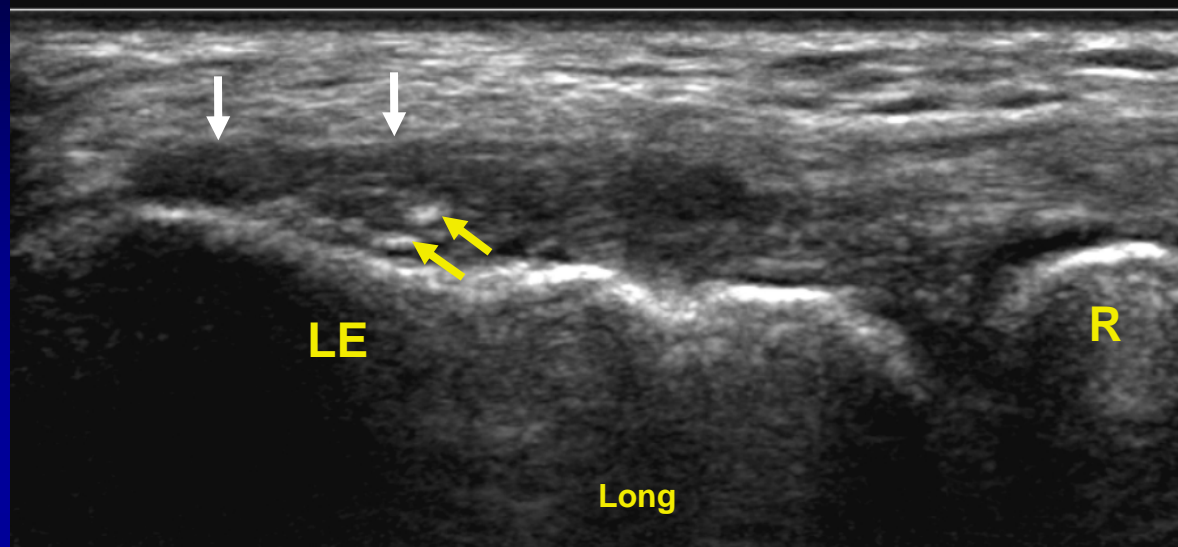


Normal

- Hypoechoogenicity
- Thickening
- Hyperemia

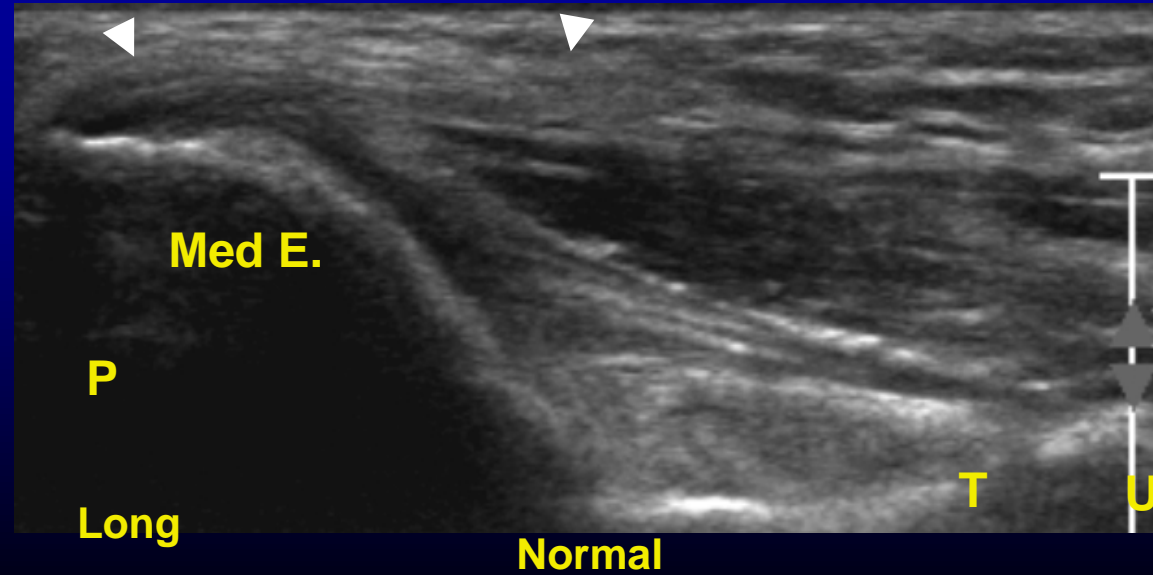
# Case # 9: Lateral Epicondylitis

- Hypoechogenicity
- Thickening
- Calcification
- Tear



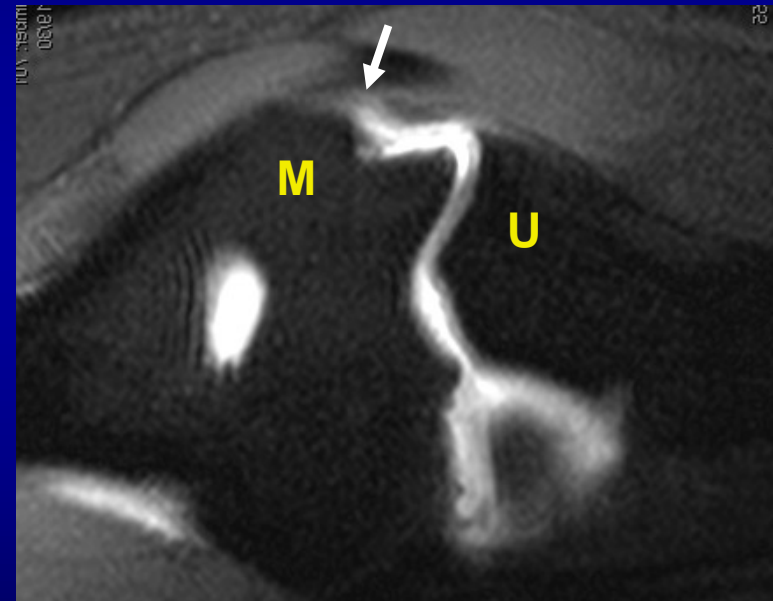
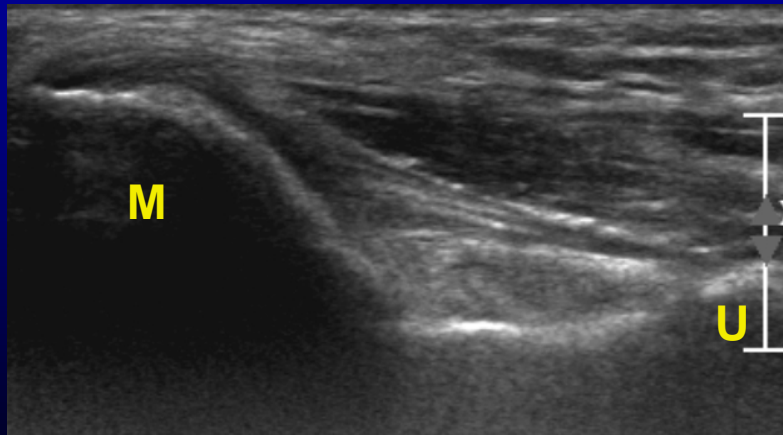
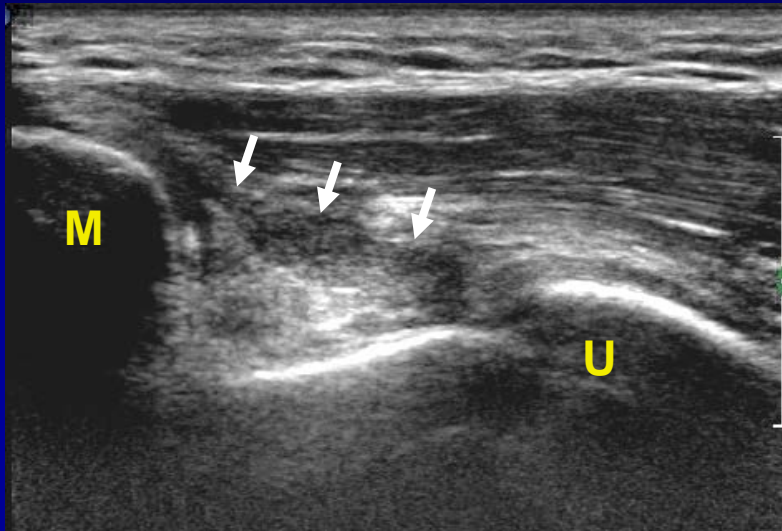
Normal

# Case # 10: Medial Epicondylitis





# Case # 11: Ulnar collateral ligament tear



# Case # 13: Ulnar collateral ligament tear

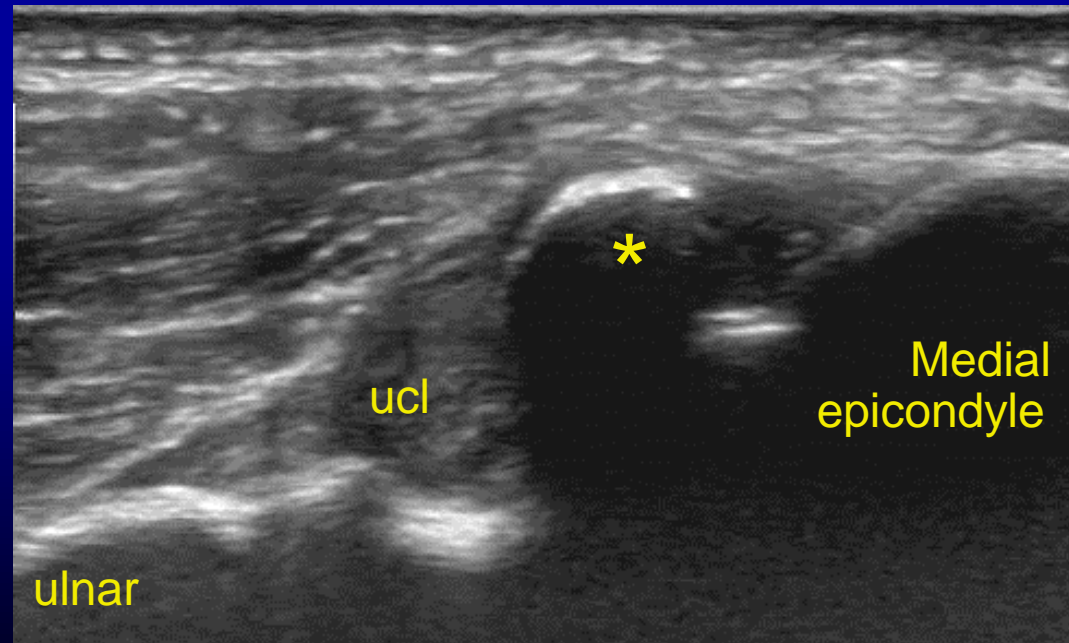


# Case # 12: Chronic Ulnar collateral ligament tear

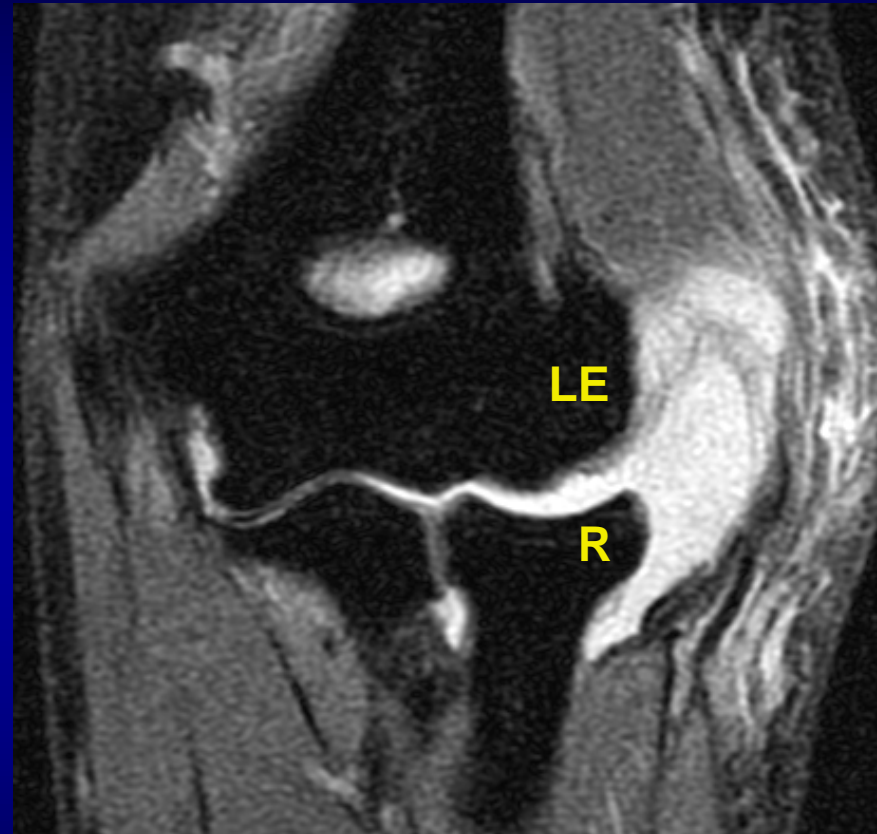
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High school pitcher

Old avulsion of the medial epicondyle, now acting like an ulnar collateral ligament (ucl)



# RCL and Common Extensor Tendon Tear



**Complete common extensor tendon tear and radial collateral ligament tear**





# Conclusion

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Ultrasound is a great imaging modality in the evaluation of a wide spectrum of elbow pathology, particularly tendon and ligament injury

- Understand anatomy and bone landmarks
- Utilize dynamic imaging: partial versus complete
- Compare with asymptomatic side

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THANK YOU