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# **Shoulder Ultrasound Rotator Cuff Tendon**

Monica Kalume Brigido, MD  
Michigan Medicine, Ann Arbor - MI

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**No disclosure**

# Outline

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- Rotator cuff Tendon: Supraspinatus Tendon
- Ultrasound technique and normal ultrasound appearance
- Cases
- Live Demonstration: Complete shoulder ultrasound examination

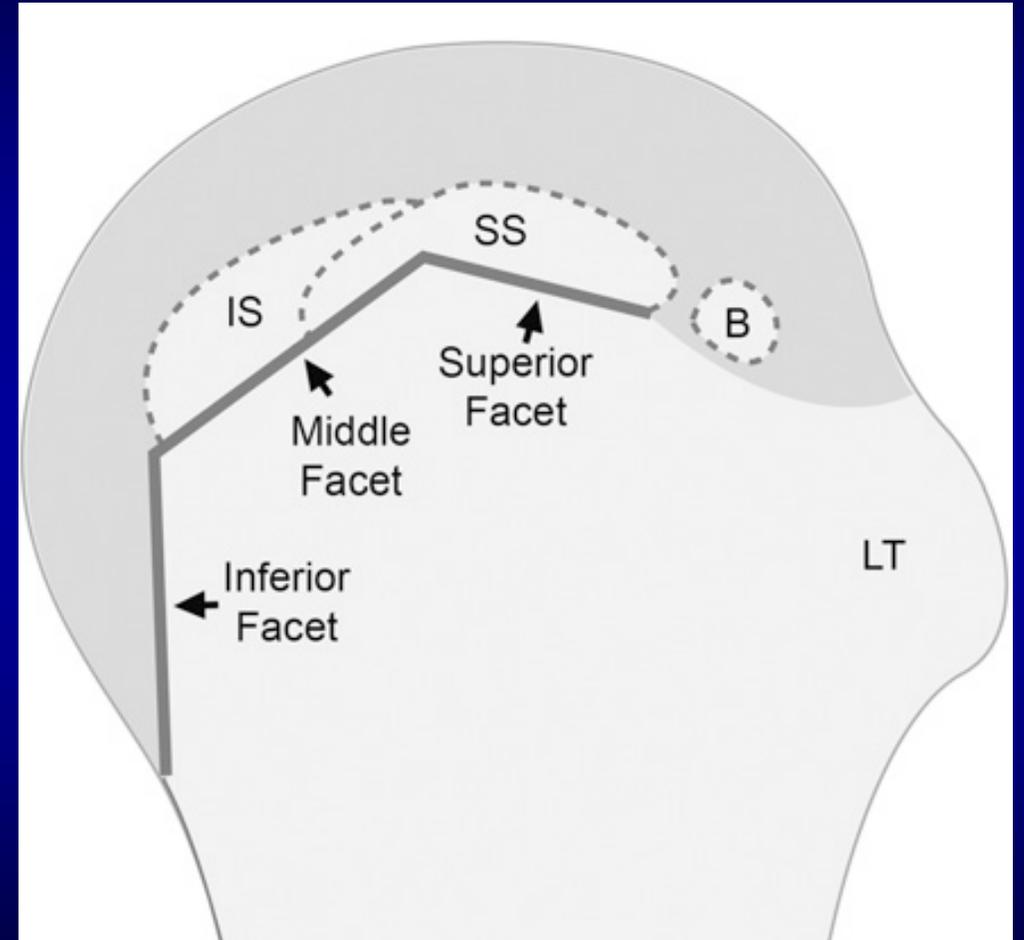
# Shoulder Ultrasound

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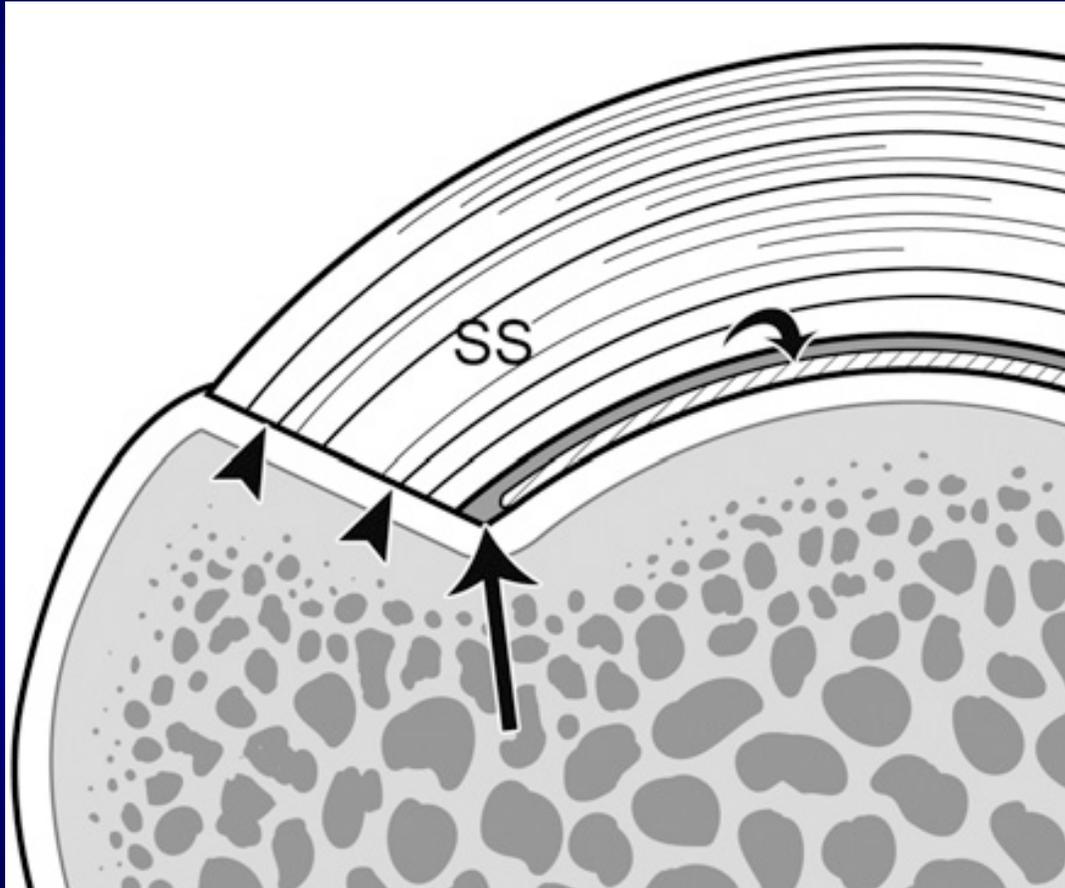
- Rotator cuff pathology
  - Accuracy can reach 100% for full thickness tears (Teefey et al) and 91% for partial thickness tear (Vlychou et al)
  - Sensitivity and specificity equal those of MRI in assessment of the rotator cuff
- Routine shoulder protocol
  - Full examination: check list
    - 12–15 MHz linear-array high-frequency transducer

# Greater Tuberosity Anatomy

- Familiarity with facet anatomy
- and bone landmarks
- 3 facets from A > P:
  - Superior facet
  - Middle facet
  - Inferior facet

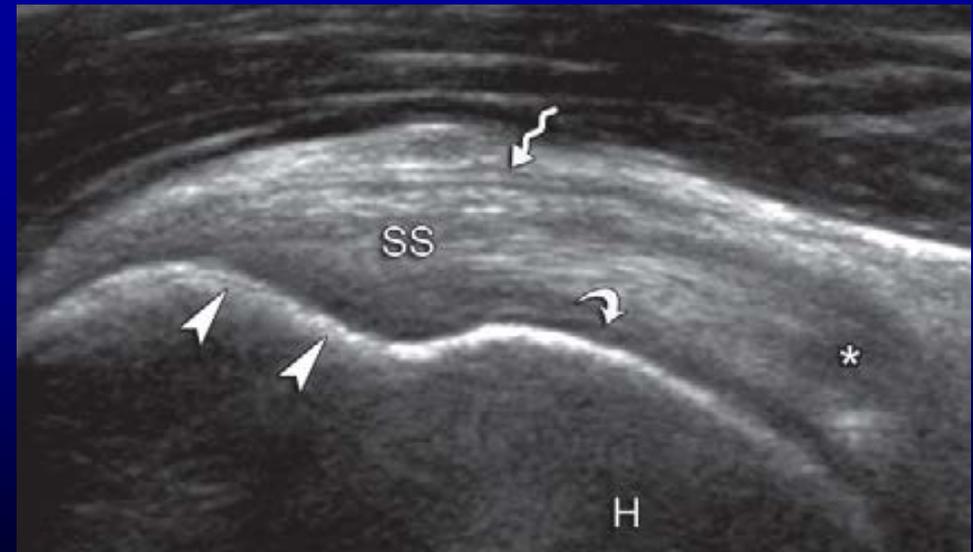


# Supraspinatus Tendon Footprint



- Long axis: Footprint attachment at GT

- Many rotator cuff tears involve this area
- Hyaline articular cartilage covers the humeral head



# Supraspinatus Tendon – Arm positioning

## Long Axis



Crass position: dorsal aspect of the ipsilateral hand is placed behind the back

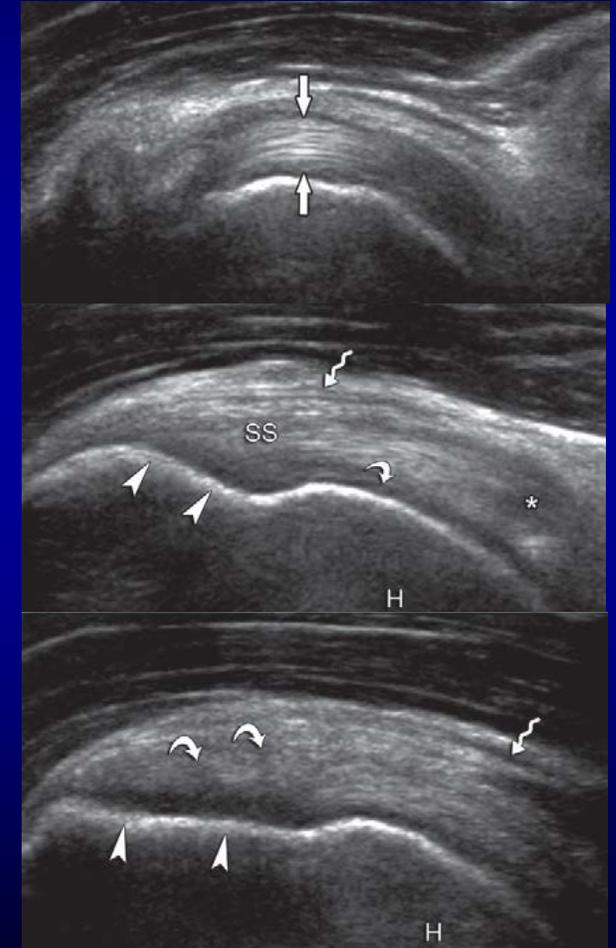
- ✓ Easy GT
- ✓ Not comfortable
- ✓ Not good for RI



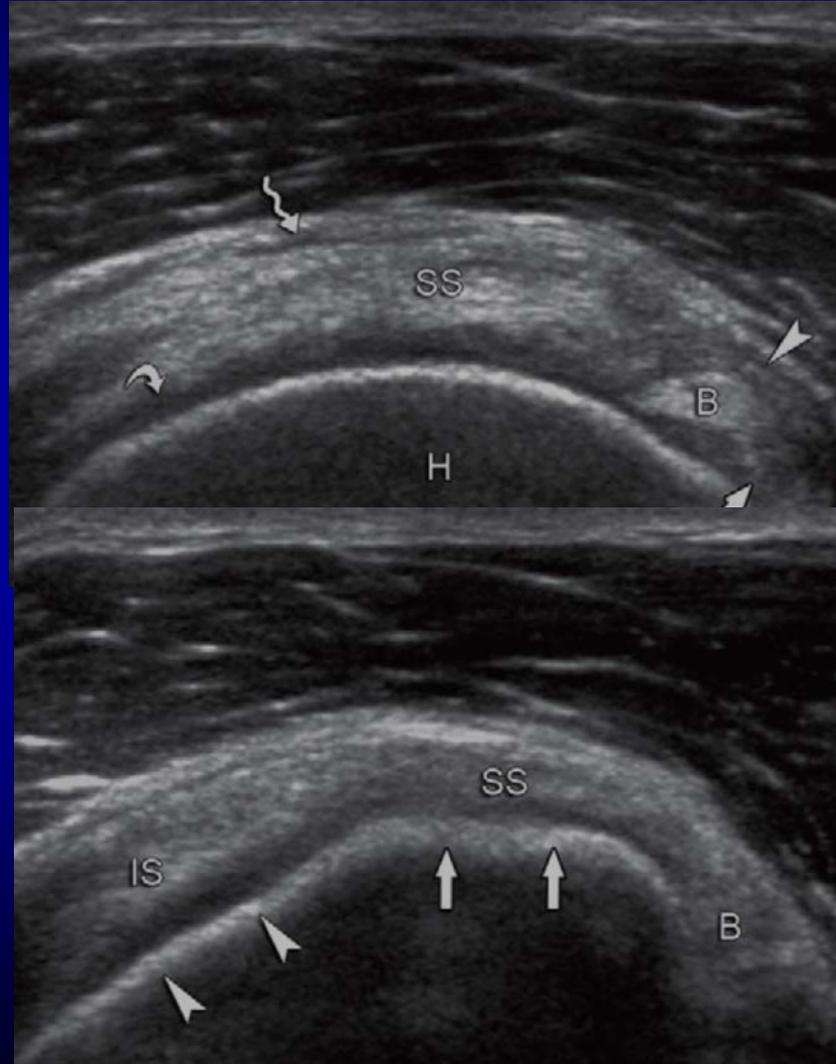
Modified Crass position: hand placed in the buttock region

- ✓ Good for RI; more comfortable

## Fibrillar and hyperechoic



# Supraspinatus Tendon – Short Axis



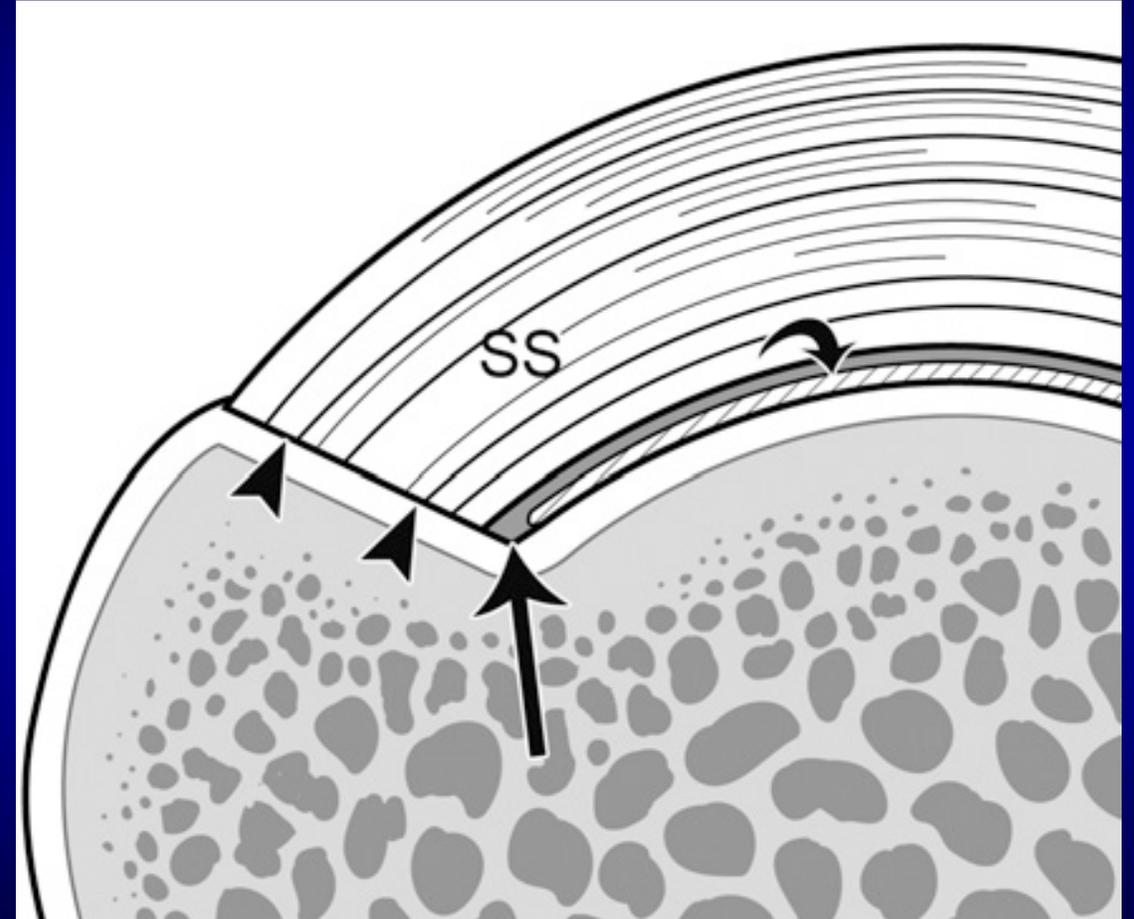
# Problems & Pitfalls

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- Misdiagnosis of RC pathology:
  - Incomplete evaluation of the entire greater tuberosity ~ 2.5 cm in width (anterior to posterior) and the anterior fibers (rotator interval)
  - Anisotropy:
    - normal hyperechoic tendon appears artifactually hypoechoic - tendon is not perpendicular to the sound beam
      - SST footprint
      - SST/IST overlap fibers & subscapularis tendon, LHBT

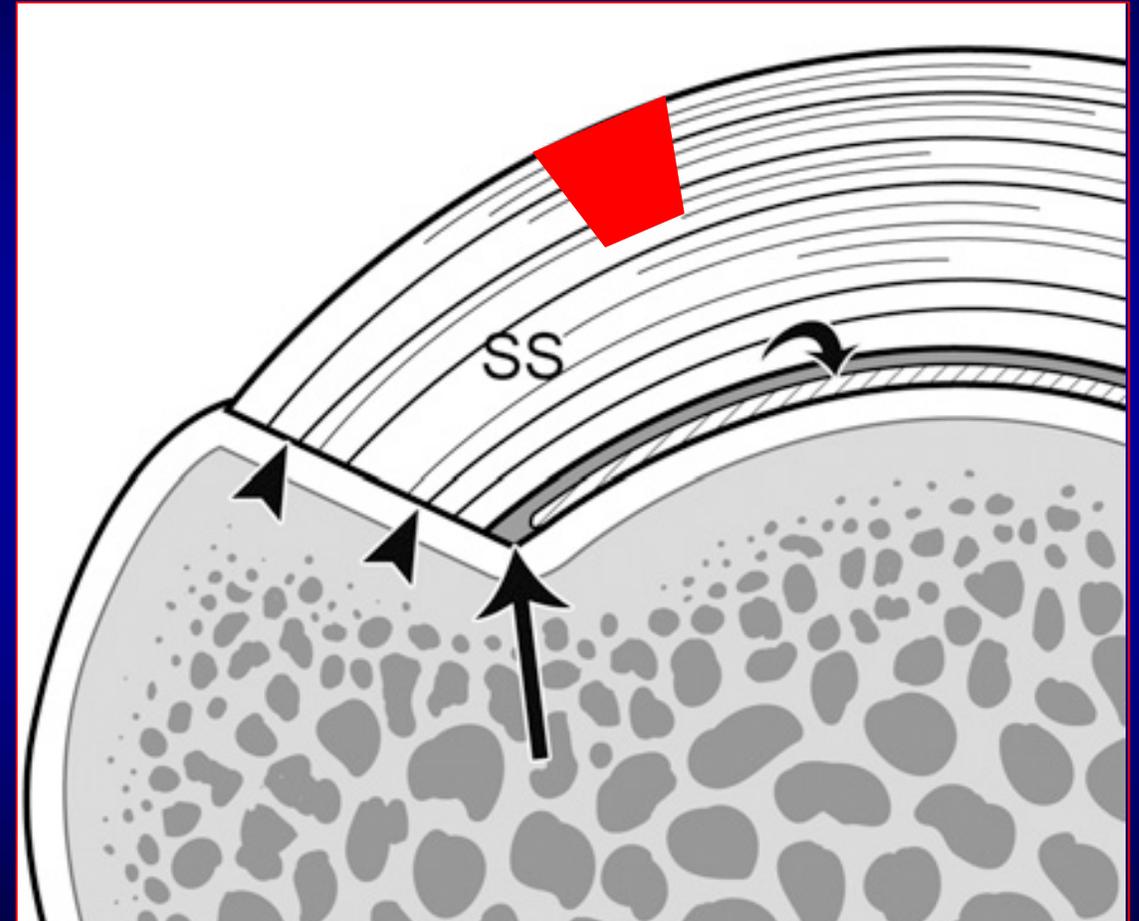
# RC Tendon Pathology: US findings

- Tendinosis: Hypoechoogenicity and thickening without fibers discontinuity
  - ✓ Can coexist with tears
- Partial thickness tear:
  - ✓ Bursal surface, articular surface or intrasubstance
  - ✓ No communication between the bursal and articular surface tears
- Full thickness tear
- Complete tear: Full-thickness, full-width
- Massive tear: Complete with retraction



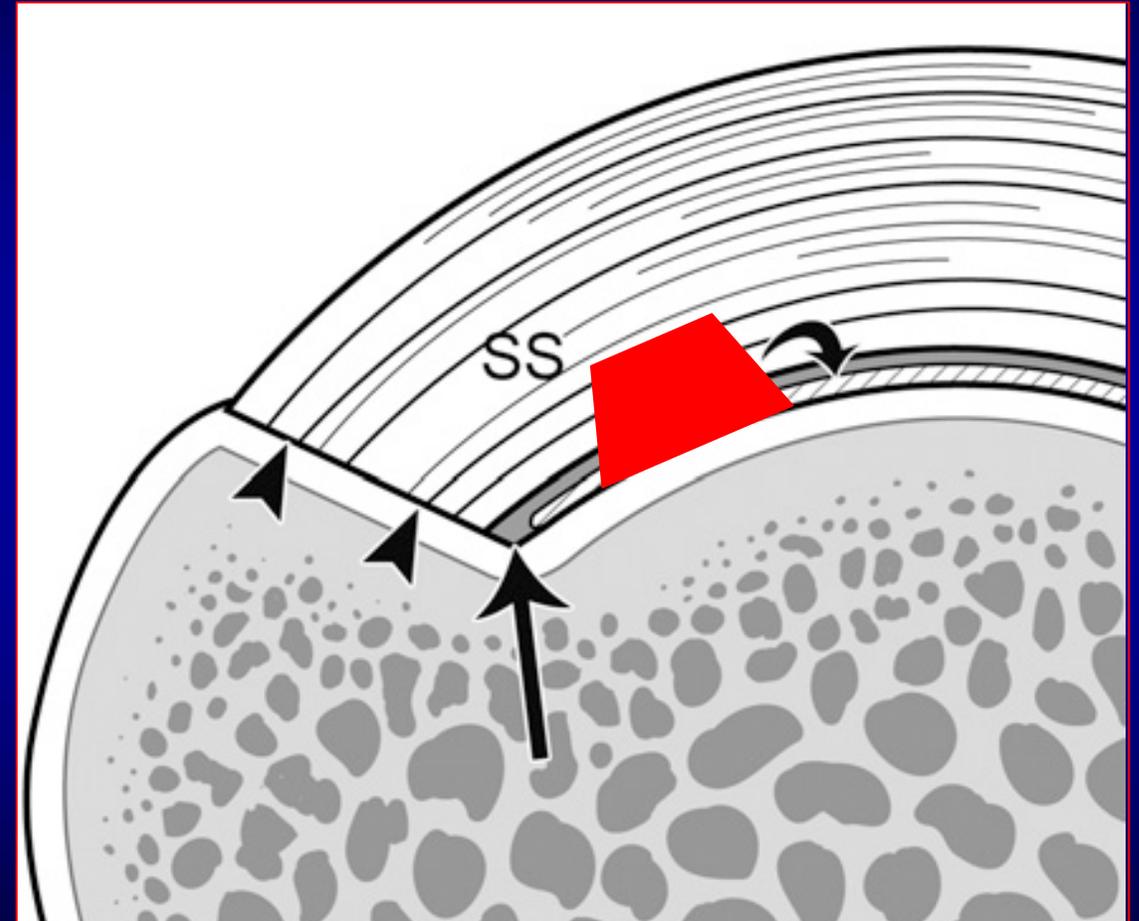
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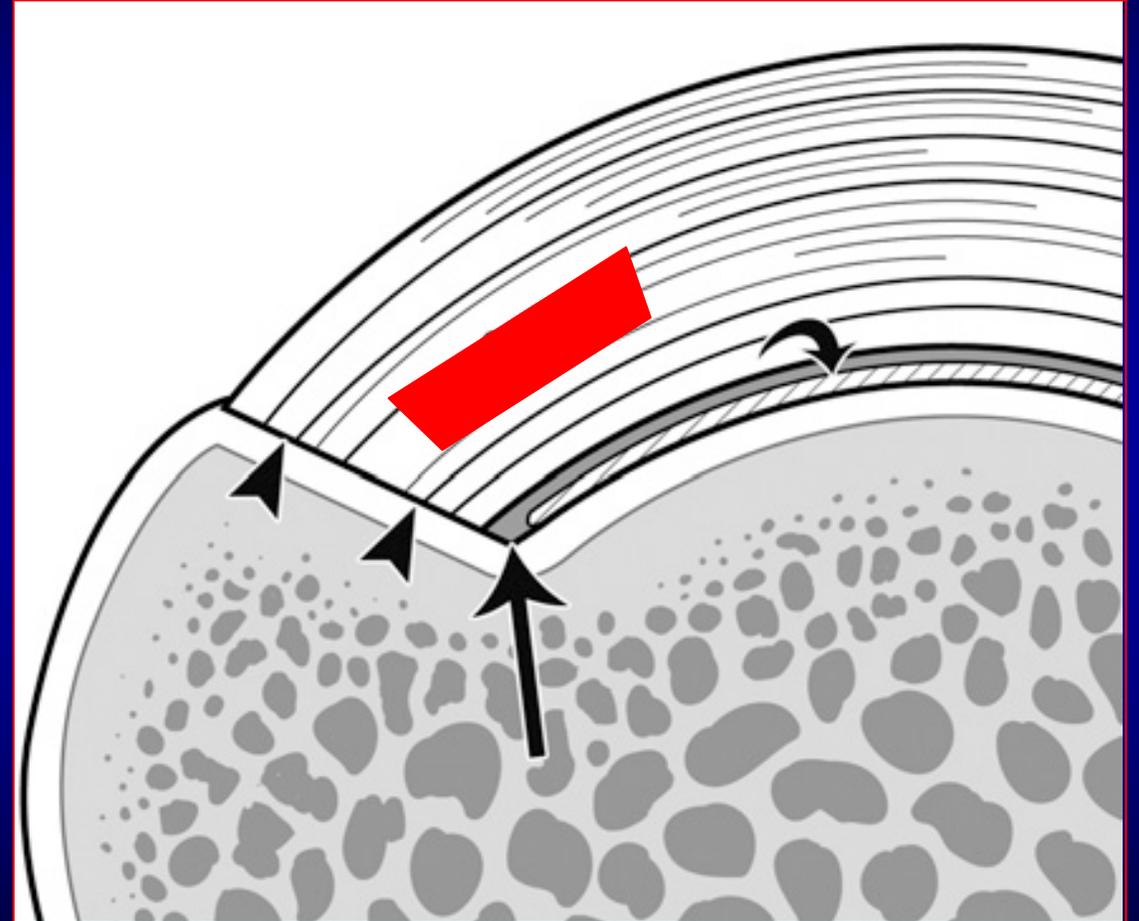
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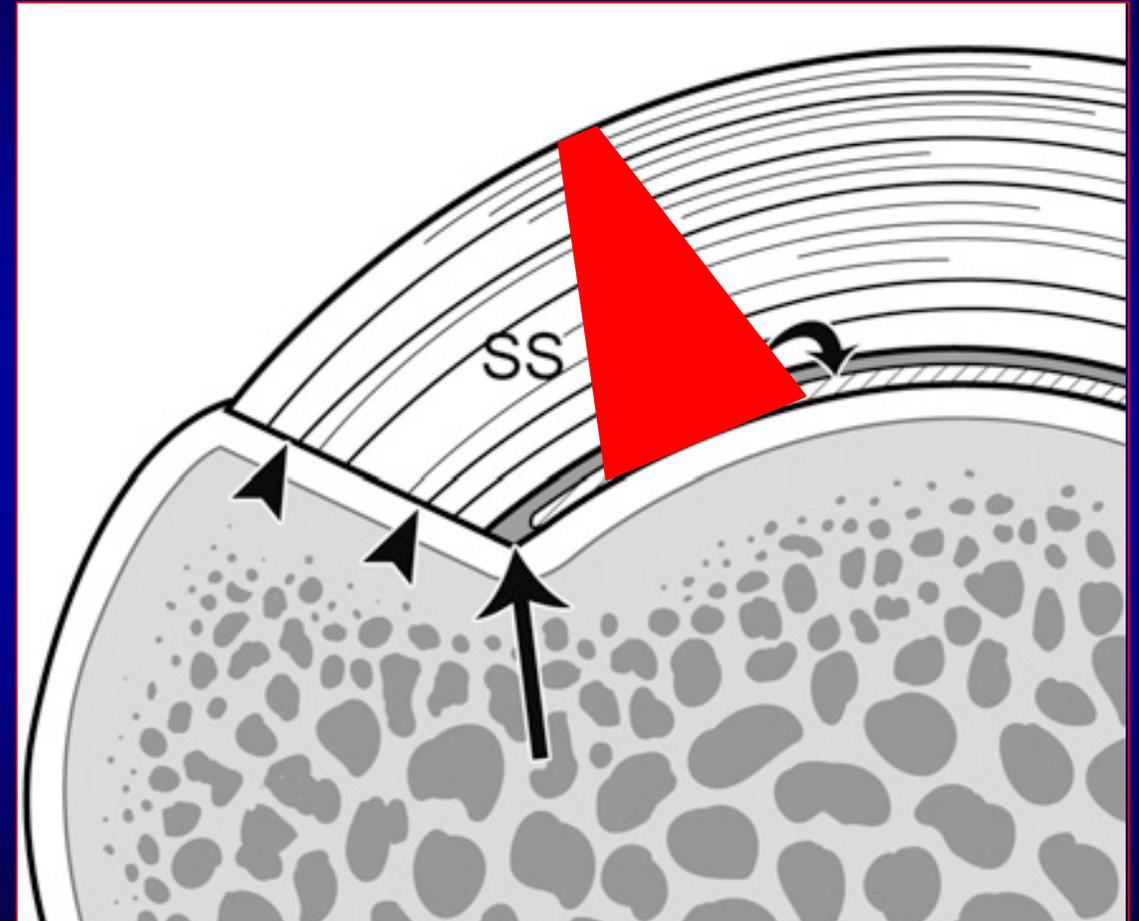
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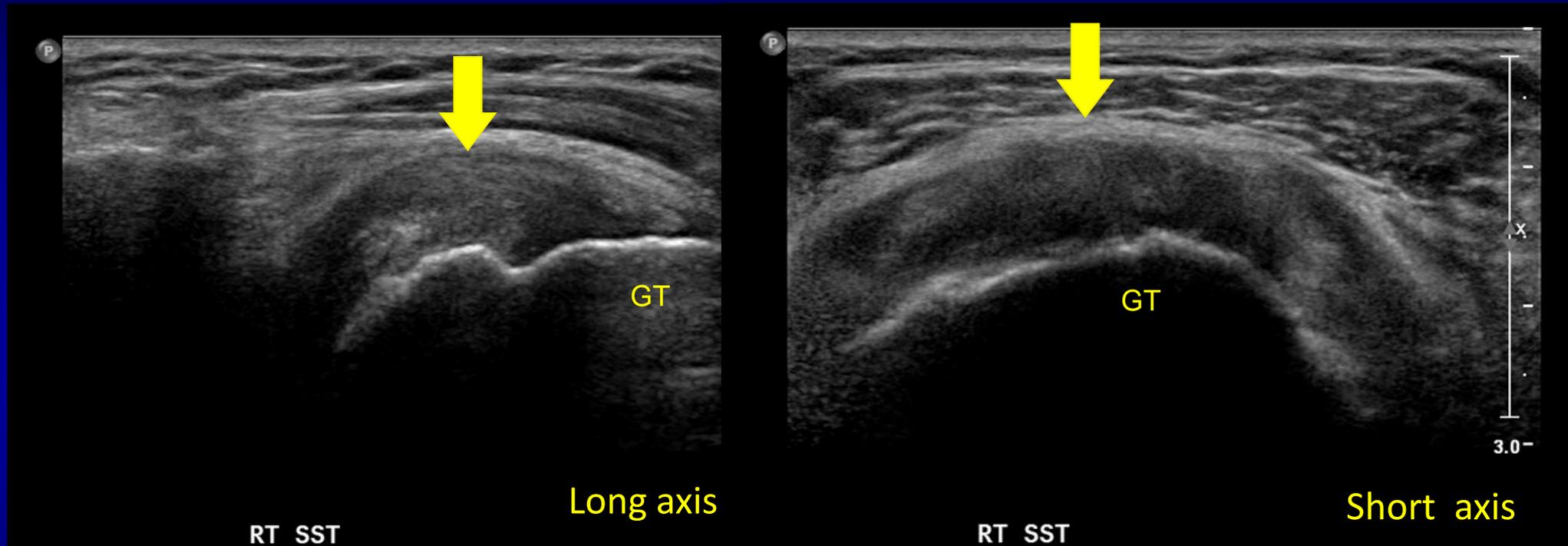
# Tendon Tear

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- Indirect ultrasound signs:
  - Greater tuberosity cortical irregularity
  - Sagging of SA/SD bursa
  - Cartilage interface sign: bright aspect of the humeral cartilage
  - Fluid in the joint and in the bursa

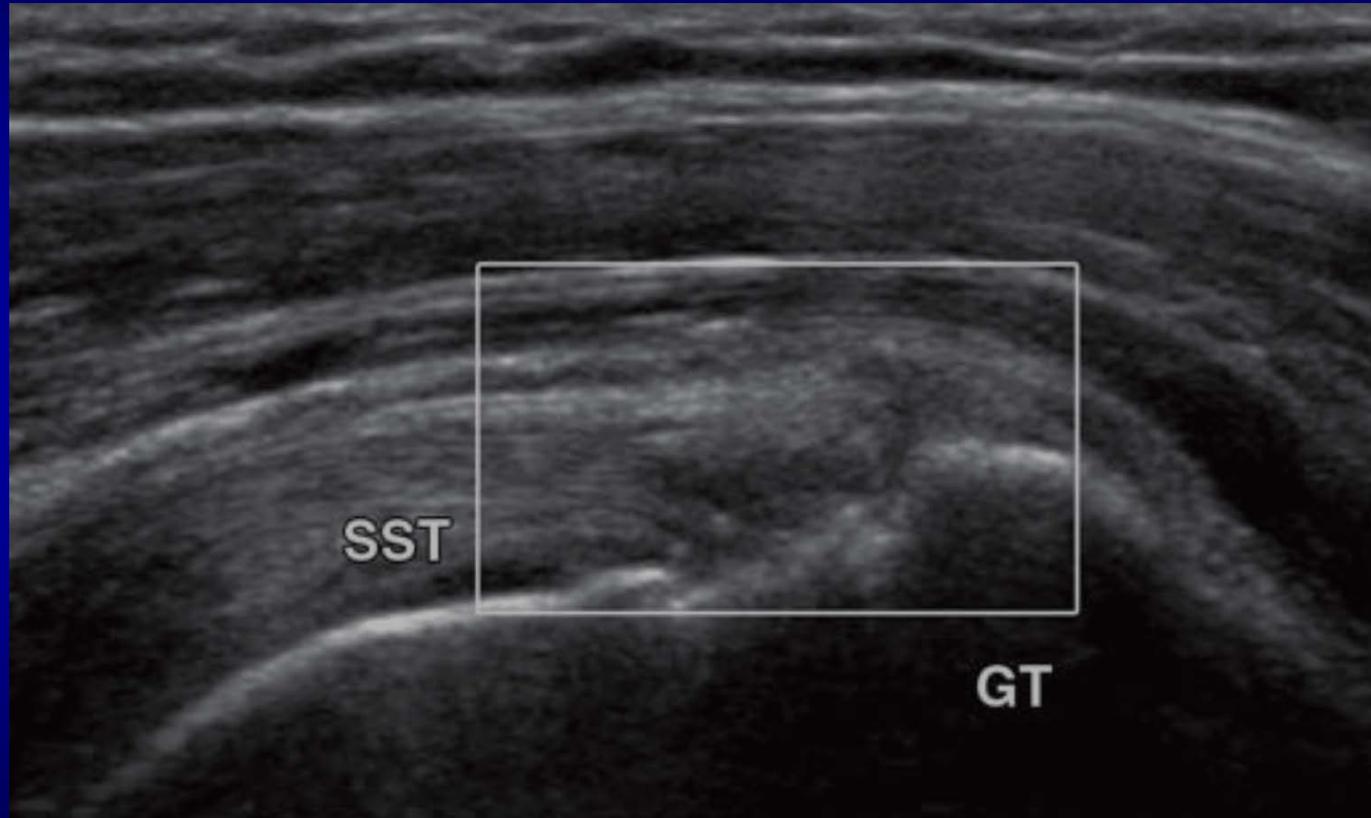


# Supraspinatus Tendinosis



# Partial Bursal Side Supraspinatus Tendon tear

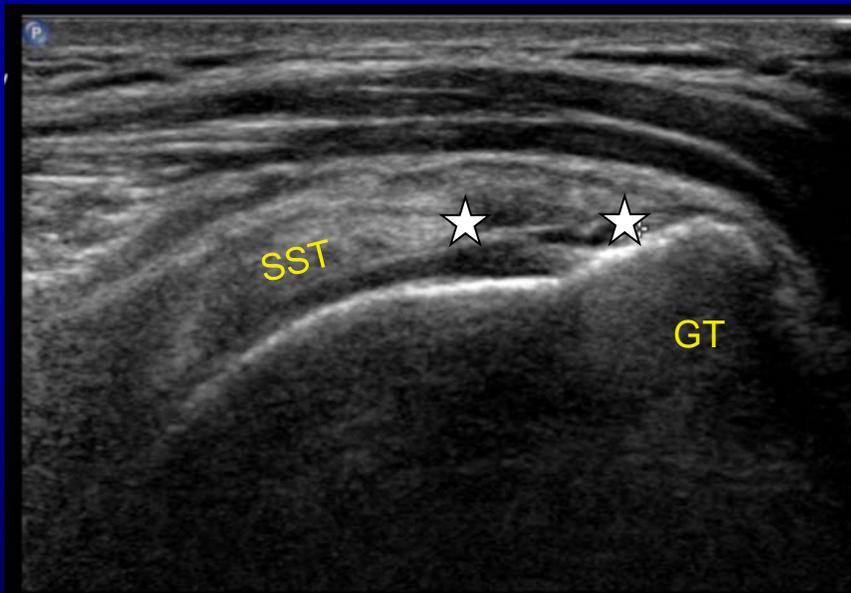
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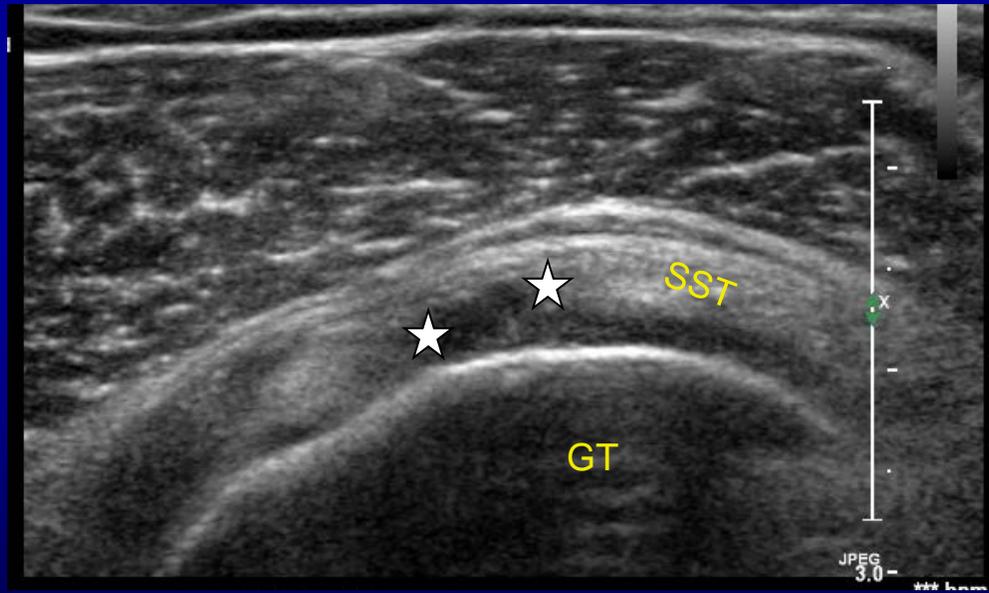
GT Cortical irregularity

# Partial Thickness Articular Tear

- Hypoechoic or anechoic defect not transversing the entire tendon thickness
- Cartilage interface sign



Longitudinal View

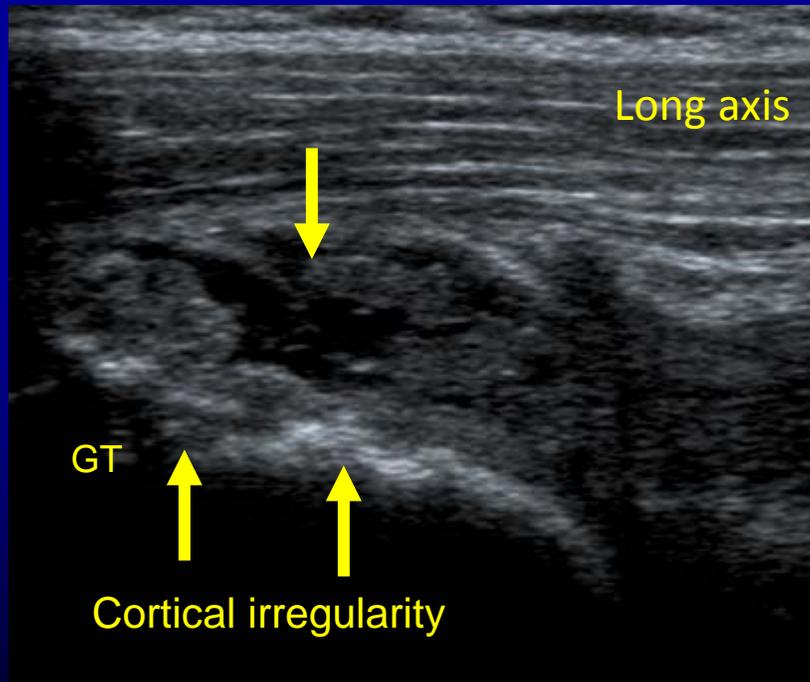


Transverse View

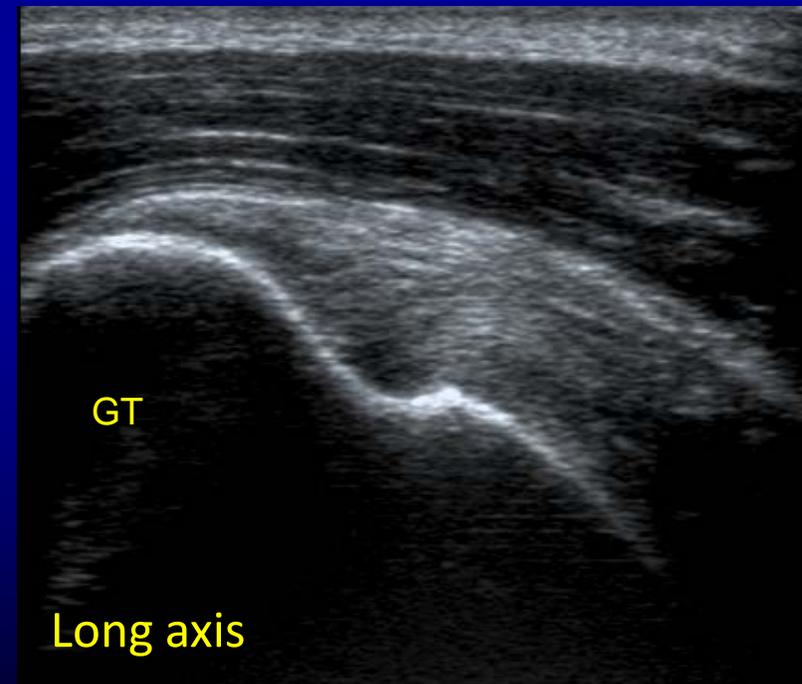
# Supraspinatus Tendon Tear



Torn anterior fibers of  
Supraspinatus

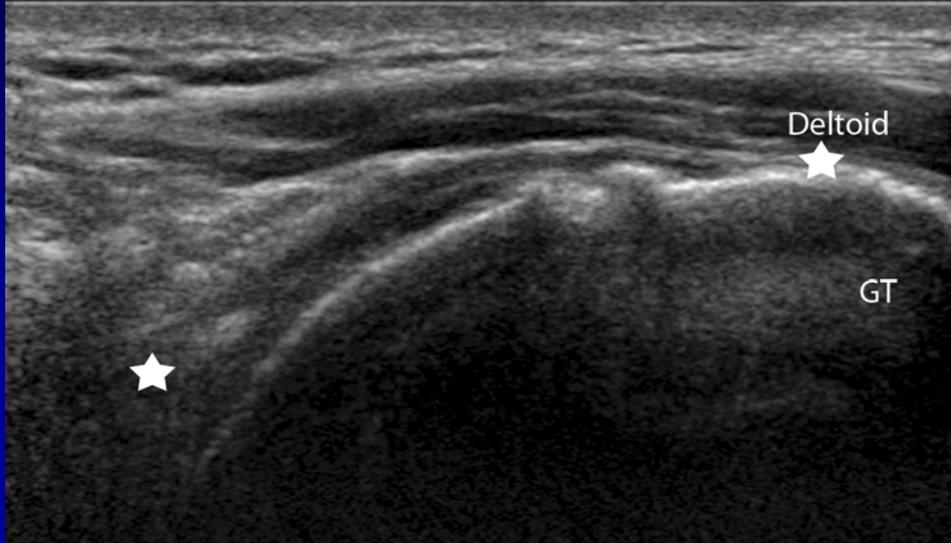


Normal anterior fibers of  
Supraspinatus

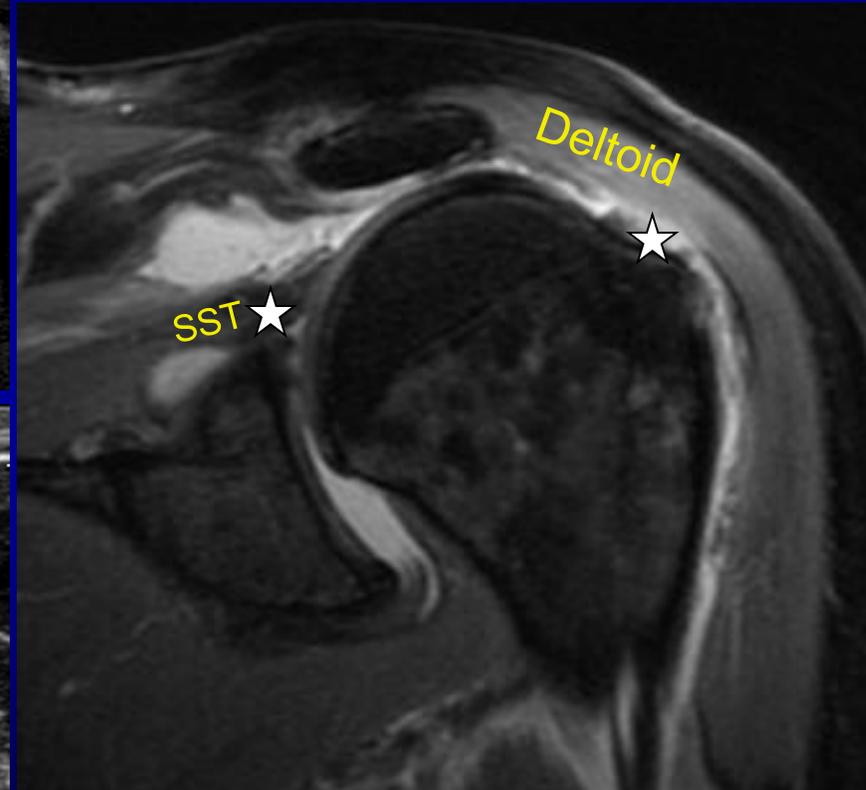




# Massive SST Tear



Deltoid overlying Greater Tuberosity [GT]

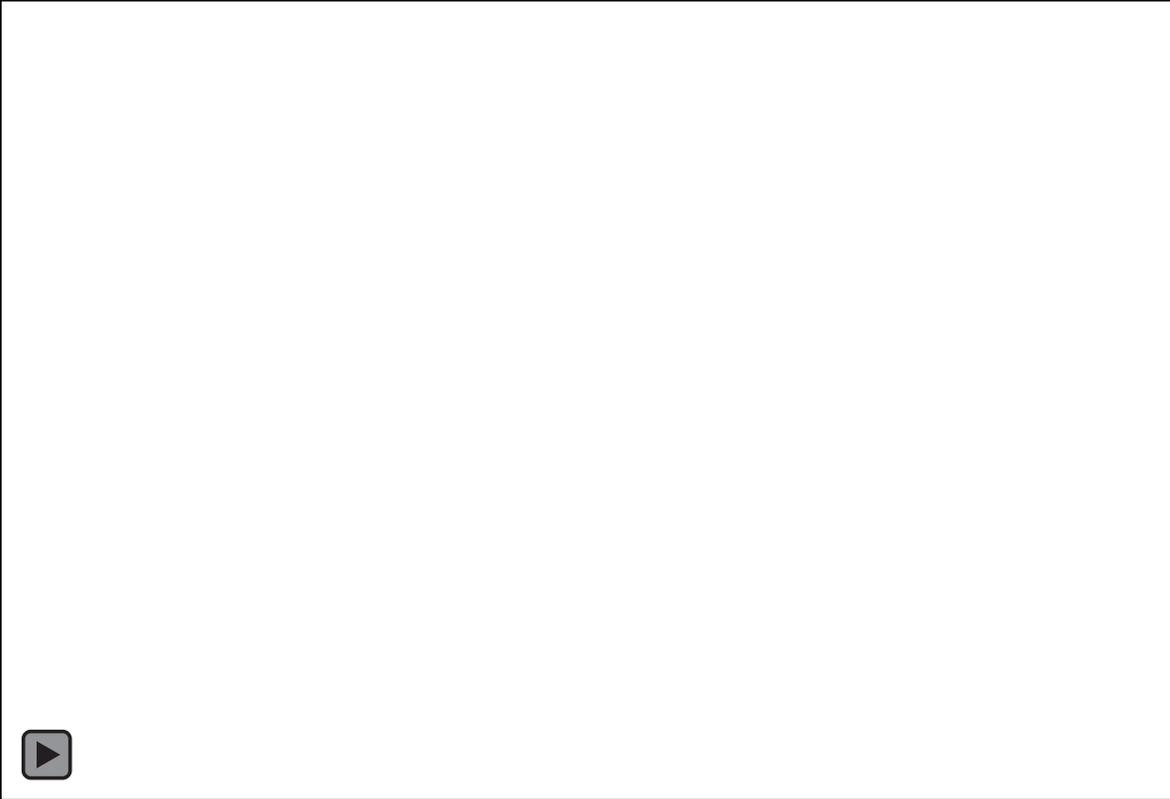


GT- Greater Tuberosity  
SST -- Supraspinatus

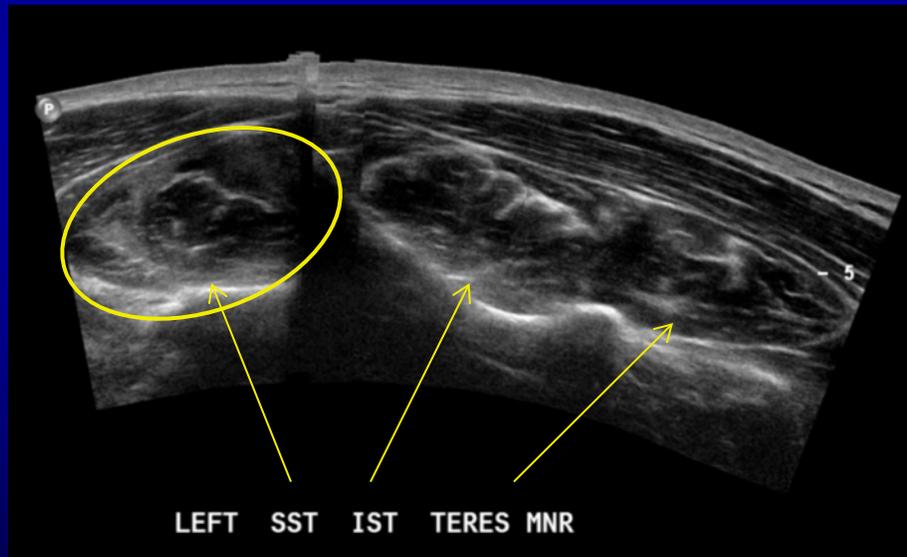


# Full Thickness SST Tear

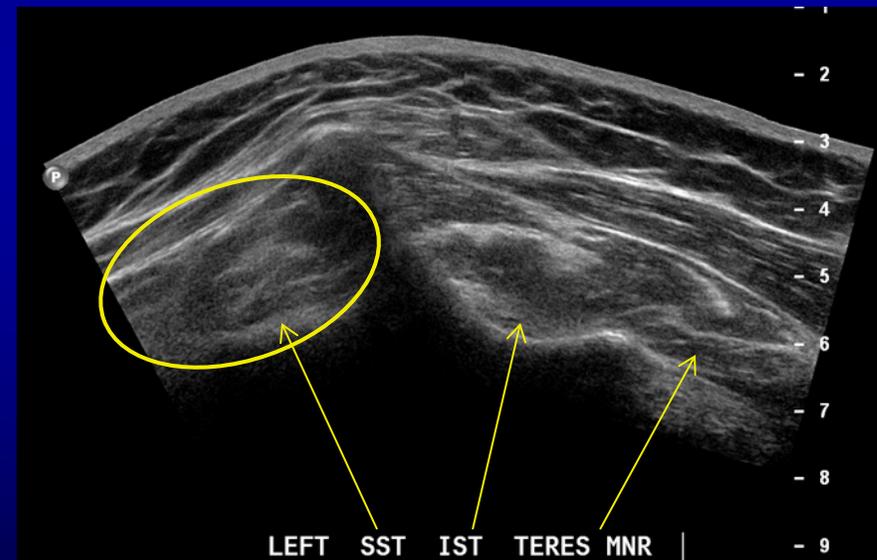
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# Supraspinatus Muscle Atrophy



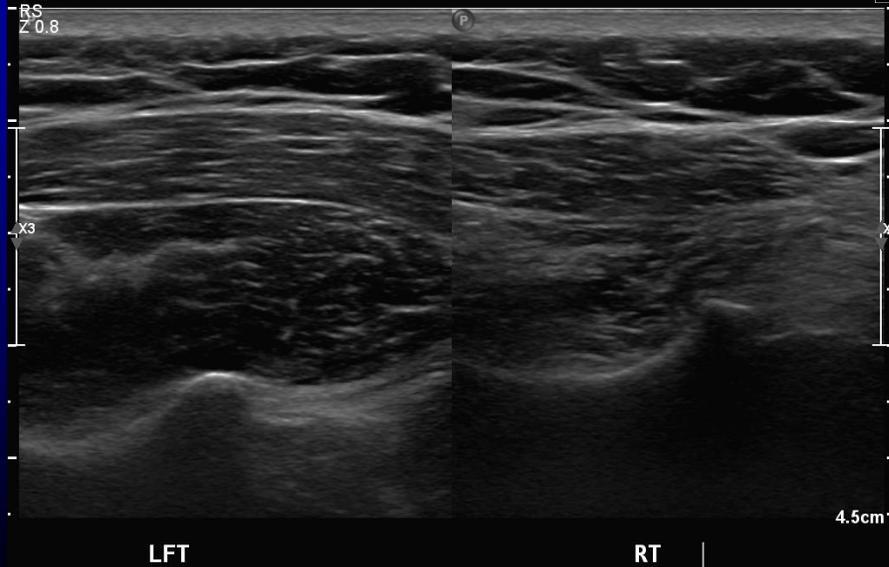
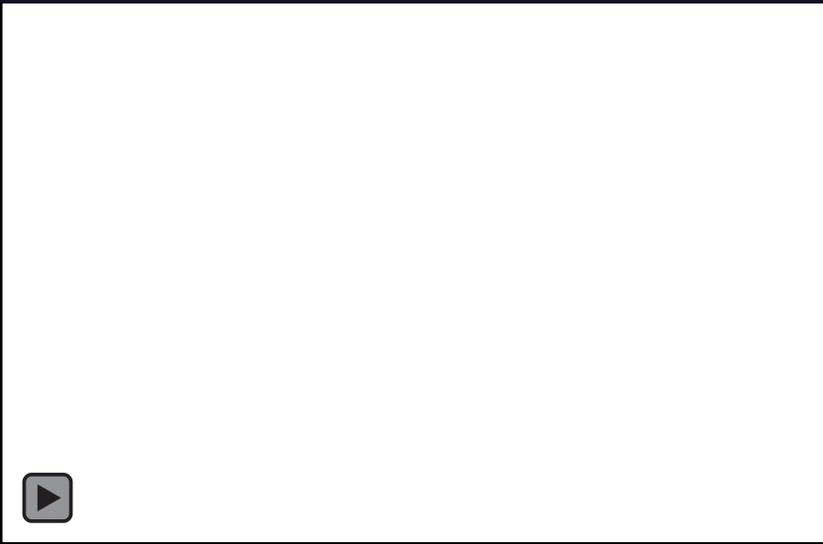
Normal



SST muscle Atrophy

# SST/IST Full Thickness tear

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# Shoulder Ultrasound

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- Excellent imaging tool to evaluate rotator cuff pathology
- High accuracy:
  - Experience of ultrasound performer
  - Familiarity with normal anatomy and bony landmarks
  - Knowledge of pitfalls

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Thank you