ORGANIZATION: **Los Angeles Radiological Society**
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TITLE: **Musculoskeletal Imaging Ultrasound**

Presenters:

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ANSWER KEY

PRESENTATION 1: **Musculoskeletal Ultrasound Overview**

QUESTION 1	DISCUSSION RE: ANSWER OPTIONS
Regarding gout, which is true? a. Ultrasound is not able to show erosions b. A tophus characteristically is hyperechoic with a hypoechoic rim c. Hyperemia is uniformly absent d. Intra-articular monosodium urate crystal deposition creates the "triple contour" sign	Answer: B Explanation: Ultrasound is an ideal method to evaluate for gout of the extremities, as it is able to show bone erosions and tophi, with the latter appearing hyperechoic with a hypoechoic rim. While variable, hyperemia is typically present in symptomatic gout. Intra-articular crystal deposition produces what has been termed the "double contour" sign where echogenic crystals parallel the echogenic bone cortex.

REFERENCE FOR QUESTIONS 1

Advanced imaging in gout. AJR 2013; 201:515-525.

QUESTION 2	DISCUSSION RE: ANSWER OPTIONS
Regarding ultrasound of soft tissue foreign bodies, which is true? a. All foreign bodies are initially hyperechoic b. A foreign body with a smooth, flat surface will shadow c. A hyperechoic halo often forms around the foreign body d. Glass must be tinted or leaded to be seen on radiography	Answer: A All soft tissue foreign bodies are initially hyperechoic at ultrasound, although organic material may become more hypoechoic over time. A foreign body that is smooth will have reverberation while a foreign body with an irregular surface will shadow. A hypoechoic halo representing inflammation will often form. All glass is radio-opaque at radiography, regardless of color or tint.

REFERENCE FOR QUESTIONS 2

US of soft tissue foreign bodies and associated complications with surgical correlation. Radiographics 2001; 21:1251-1256.; The radiographic detection of glass in soft tissue. Radiology 1969; 92:1529-1531.

PRESENTATION 2: **Dynamic Musculoskeletal Ultrasound**

QUESTION 3	DISCUSSION RE: ANSWER OPTIONS
Regarding dynamic imaging of tendons, which is true? a. The biceps brachii long head typically dislocates lateral to the bicipital groove b. Elbow flexion is required to diagnose snapping triceps syndrome c. Contact between the iliopsoas tendon and iliopectineal eminence is required to produce abnormal snapping d. When there is concern for tendon tear, dynamic imaging should be avoided	Answer: **B** Ultrasound is routinely used to dynamically assess tendon abnormalities, such as biceps brachii tendon dislocation medial from the bicipital groove during external shoulder rotation. Elbow flexion is required to show abnormal movement of the medial head of the triceps over the medial epicondyle in snapping triceps syndrome. Snapping hip syndrome from the iliopsoas is due to temporary entrapment of the medial iliacus muscle beneath the psoas major tendon, which is often lateral to the iliopectineal eminence. Dynamic imaging is very helpful in showing tendon retraction to increase accuracy in the diagnosis of full-thickness tears.

REFERENCE FOR QUESTION 3

Presenters:

Jon A. Jacobson, MD *– Professor of Radiology; Director Musculoskeletal Radiology, University of Michigan Health Systems*

ANSWER KEY

Sonographic anatomy and dynamic study of the normal musculotendinous junction. Eur Radiol 2009; 19:995-1001.

QUESTION 4	DISCUSSION RE: ANSWER OPTIONS
Regarding the first MCP joint ulnar collateral ligament, which is true? a. Dynamic assessment should be avoided b. The adductor aponeurosis cannot be visualized with ultrasound c. Displaced tears are always located superficial to the adductor aponeurosis d. Ultrasound is very accurate in the diagnosis of a Stener lesion	Answer: **D** Ultrasound is very accurate in the diagnosis of Stener lesions, quoted at 100%. Dynamic assessment is essential as first interphalangeal joint flexion improves visualization of the adductor aponeurosis. Displaced ulnar collateral ligament tears are typically located at the proximal or leading edge of the aponeurosis but less commonly superficial.

REFERENCE FOR QUESTION 4

Ultrasound of displaced ulnar collateral ligaments of the thumb: the Stener lesion revisited. Skeletal Radiol 2013 42:667-673.

PRESENTATION 3: **MRI of the Rotator Cuff with Ultrasound Correlation**

QUESTION 5	DISCUSSION RE: ANSWER OPTIONS
Regarding rotator cuff tears, which is true? a. Ultrasound and MRI are of similar sensitivity b. The rotator cable cannot be visualized at MRI or ultrasound c. Cortical irregularity is not an indirect sign of supraspinatus tendon tear d. Fatty atrophy of the teres minor indicates poor prognosis after cuff repair	Answer: A Both ultrasound and MRI are of equal sensitivity in the diagnosis of rotator cuff tears. The rotator cable can be seen with both imaging methods; a tear involving the anterior aspect of the cable is more prone to symptomatic retraction. Cortical irregularity is an important indirect sign of supraspinatus tendon tears in patients over the age of 40 years. Fatty atrophy of the infraspinatus, and to a lesser extent the supraspinatus, is a poor prognosis when a tear is surgically repaired.

REFERENCE FOR QUESTION 5

Accuracy of MRI, MR arthrography, and ultrasound in the diagnosis of rotator cuff tears: a meta-analysis; AJR 2009;192:1701-1705.

QUESTION 6	DISCUSSION RE: ANSWER OPTIONS
Regarding rotator cuff anatomy, which is true? a. There are 8 layers of the rotator cuff b. The rotator cable represents the central layer c. There are two tendons within the supraspinatus d. The biceps brachii is one of the rotator cuff tendons	Answer: C There are 5 layers of the rotator cuff with the rotator cable (when present) representing a thickened portion of the deepest layer with the joint capsule. Two tendons are seen at the musculotendinous junction of the supraspinatus; a tear of the anterior tendon is prone to symptomatic retraction. The biceps brachii is not one of the 4 rotator cuff tendons.

REFERENCE FOR QUESTIONS 6

High resolution imaging of the musculoskeletal system. Radiology 1997; 205:593-618.