Course: MRI of Sports Related Injuries

Title of talk: Sports Medicine Injuries of the Elbow and Wrist

Speaker name: Christine B. Chung, MD (cbchung@ucsd.edu)

Highlights: Sports related injuries of the elbow and wrist can generally be subdivided into injuries resulting from and acute post-traumatic insult or chronic repetitive microtrauma.

In the elbow, lesions are basically categorized by ligament, tendon, and osseous abnormality. Commonly encountered injuries include ulnar collateral ligament, common flexor and extensor tendon, biceps tendon, and osteochondral lesions at the radiocapitellar articulation. In the setting of overuse injury, the entity of valgus extension overload will be addressed, including its manifestations in the skeletally immature to maturing patient.

In the wrist, lesions are basically categorized by ligament, triangular fibrocartilage and osseous abnormality. Commonly encountered injuries include the intrinsic ligaments of the wrist (scapholunate and lunotriquetral), the triangular fibrocartilage. In the setting of overuse injury, the entities of the gymnast wrist, and ulnar impaction will be addressed.

Abstract:
When valgus forces are generated at the elbow, damage to the ulnar collateral ligament complex can occur. This can result from a single post-traumatic episode or chronic repetitive microtrauma, both occuring in the overhead thrower. The MR imaging diagnosis is based upon identification and characterization of the ulnar collateral ligament complex, the anterior band representing the most important stabilizer against valgus forces. In the setting of overuse, posteromedial impingement and valgus extension overload can be encountered. These entities, in some cases, are implied to be a spectrum of disease severity, impingement leading to overload. They encompass not only ligament abnormality, but lesions of dynamic stabilizers, with secondary findings of osseous and nerve abnormalities.

Localized lesions of the common flexor, common extensor, and biceps tendons can also be encountered and have been implicated with specific sports related mechanisms of injury. Specifically, the common flexor tendon is injured in the golfer and overhead thrower, the common extensor tendon in tennis, the biceps tendon in weight-lifters, and rock climbers.

In almost any sport, acute post-traumatic injuries of the intrinsic ligaments of the wrist and triangular fibrocartilage can be incurred. As in the elbow, MR imaging diagnosis is based upon identification and characterization of these structures. In the triangular fibrocartilage, the Palmer classification can be used to characterize acute injuries based primarily upon point of failure. Scaphoid fractures are commonly encountered in the setting of acute trauma, particular attention to potential complications such as avascular necrosis is required due to the blood supply of this osseous structure. In the setting of overuse in the skeletally immature patient, physeal injury has been well established in athletes such as gymnasts. In this patient population, the wrists exposed to contact forces similar to weight bearing. In the skeletally mature patient, with ulnar deviation such as that seen in a golfer, ulnar impaction could result from ulnar positive variation or a long ulnar styloid process.

Target Audience: Radiologists interpreting elbow and wrist MRI
Technologists acquiring elbow and wrist MR studies

Orthopedic surgeons, Physiatrists treating patients with elbow and wrist injuries

Objectives: This lecture will: 1) discuss acute post-traumatic and chronic repetitive traumatic mechanisms of injury about the elbow and wrist, 2) establish MR imaging appearance of pertinent normal anatomy of the elbow and wrist, 3) identify MR imaging diagnostic criteria and classification systems for sports related injuries about the elbow and wrist.

References:

Beltran LS, et al., Semin Musculoskelet Radiol. 2013 Nov; 17(5):455-65. Epub 2013 Dec 10.

Lomasney LM, et al., Radiol Clin North Am. 2013 Mar; 51(2): 215-26. Epub 2012 Dec 25.

Taylor SA and Hannafin JA. Sports Health. 2012 Sep; 4(5): 384-93.

Maak TG, et al., J Bone Joint Surg Am. 2012 Aug 15; 94(16): e1211-10. Review.

McDonald LS, et al., J Bone Joint Surg Am. 2013 Jul3; 95(13): 1235-45.

Read J. Br. J Sports Med. 2013 Nov; 47(17) 1061-2.

Campbell D, et al., Br J Sports Med. 2013 Nov; 47(17): 1105-11.

Hawkes R, et al., Br. J Sports Med. 2013 Nov; 47(17): 1075-79.

Bancroft LW. Radiol Clin Norm Am. 2013 Mar; 51(2): 299-311.