Specialty area:

Musculoskeletal MRI: Clinical Interpretation & Advanced Imaging

Speaker:

Tetyana Gorbachova, MD

Title:

MRI of the Elbow.

Target audience:

Radiologists interpreting clinical MRI of the musculoskeletal system

Objectives:

This presentation will focus on specific areas of MRI imaging of the elbow that may evoke interpretational difficulties. The content is organized into a “four quadrant” approach with respect to elbow anatomy.

Discussion:

MRI imaging of the elbow presents unique challenges to the interpreting radiologist. The spectrum of conditions includes anatomic variants, imaging pitfalls, a range of normal appearances and pathologic conditions involving the elbow.

Injuries to the medial stabilizers, including the ulnar collateral ligament complex and common flexor tendon will be reviewed in a clinical context of throwing or overhead activities. The ulnar collateral ligament (UCL) is the most important stabilizer of the elbow against valgus forces. The MR appearance of UCL injury and pitfalls will be discussed.

Throwing activities may lead to impaction or sheering forces applied to the lateral aspect of the joint resulting in injury to the cartilage and subchondral bone. Osteochondral lesions of the elbow in young athletes include Panner’s disease, osteochondritis dissecans of the capitellum (both conditions commonly involve the anterolateral capitellum) or, less commonly, the trochlea. An osseous defect of the posterolateral corner of the capitellum termed “Osborne-Cotterill lesion” can be seen in chronic posterolateral rotatory instability and should prompt careful search for other ligamentous abnormalities. Also posteriorly located is a pseudodefect of the

capitellum, a normal, nearly universal finding on elbow MRI at the junction on capitellum and non-articular portion of lateral condyle; it can be differentiated by its classic location and lack of associated marrow edema or subchondral fractures or cysts.

Lateral sided pathologies of the elbow include abnormalities of the lateral collateral ligament complex and common extensor tendon. The lateral ulnar collateral ligament (LUCL) provides posterolateral stability for the radiocapitellar joint. Posterolateral rotary instability (PLRI) is the most common type of elbow instability and consists of three stages corresponding to the order of ligamentous and capsular failure. Tendon abnormalities in the elbow are commonly caused by chronic repetitive microtrauma. One of the most common clinical conditions is a so called lateral epicondylitis which represents a spectrum of tendinopathy and tears of the common extensor tendons and, in extreme cases, associated injury to the underlying lateral collateral ligament.

When evaluating for cartilage and intraarticular abnormalities, several normal variants should be considered. In particular, synovial plicae are commonly seen in asymptomatic elbows and include the posterolateral plica, and less commonly the anterior and posterior plicae. These plicae, or synovial folds, may be associated with mechanical symptoms, such as snapping, popping or locking. MRI findings raising a concern for a symptomatic plica include an enlarged plica measuring greater than 3 mm in thickness or covering more than one-third of the articular surface of the radial head, as well as associated scarring.

Anteriorly, common pathologies of the elbow include injuries to the distal biceps tendon. Local anatomy including the short and long heads of the biceps brachii, lacertus fibrosus and bicipitoradial bursa will be reviewed along with various injury patterns.

A checklist for ulnar nerve evaluation typically includes the nerve's position, size, signal intensity and surrounding anatomic structures, in particular, the presence of the anconeus epitrochlearis muscle; keeping in mind a range of normal appearance. The presence of abnormal findings may not be associated with clinical symptoms and should be interpreted with caution.

Finally, posteriorly located abnormalities include olecranon bursitis and injuries to the triceps.

References/Suggested reading

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