

Course: MRI of Sports Related Injuries

Title of talk: Shoulder - Rotator Cuff and Impingement

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Highlights:

Many distinct types of impingement are recognized about the painful shoulder with different clinical features, biomechanical alterations, and associated imaging findings.

External impingement is the most common type and can involve extra- or intra-articular structures.

Posterosuperior internal impingement typically affects young and middle aged adults engaged in repetitive overhead motions, manifesting with cystic changes adjacent to the posterior aspect of the greater tuberosity, articular sided tears of the cuff at the infraspinatus/supraspinatus junction, and tears of the posterosuperior/superior labrum.

Anterosuperior internal impingement is caused by damage of the biceps pulley leading to a progressive pathologic cascade of tearing of the anterosuperior labrum and adjacent portions of the rotator cuff, particularly the subscapularis tendon.

Abstract:

Shoulder impingement is a common cause of shoulder pain. The diagnosis of impingement requires all available information, including history, physical examination, and imaging. There is no uniformly accepted classification of the various impingement syndromes. However, a practical and commonly used classification scheme is to divide the impingement syndromes into “external” or “internal” subtypes. External impingement has been described as affecting adults of all ages while internal impingement, and in particular posterosuperior internal impingement, is more common in young and middle-aged individuals specifically involved in repetitive overhead motions. Patients can have more than one type of impingement.

Since the entity of external subacromial impingement was popularized by Neer in 1972, there has been debate in the literature regarding which is the primary (initial) abnormality: “extrinsic” compression by extra-articular structures versus abnormalities initiating within “intrinsic” structures of the articulation such as the rotator cuff. When patients with impingement present for imaging, however, typically abnormalities of both extrinsic and intrinsic structures can be seen and surgical treatment is often targeted at both.

Extrinsic compression can be osseous (subacromial or subcoracoid) or non-osseous. Subacromial impingement syndrome has been described in the literature to be related to acromial morphology and slope, presence of an accessory ossicle (os acromiale), or acromioclavicular osteophyte formation. Subcoracoid impingement is a less common form of extrinsic compression, but is notably often underdiagnosed. Impingement has also been associated with coracoacromial ligament morphology.

In 1992, the concept of posterosuperior internal impingement was described in young athletes presenting with shoulder pain upon throwing. Initially, this was postulated to be related to the contact of the posterosuperior rotator cuff with the posterosuperior labrum in the ABER position; however, the precise

mechanism of this entity as it relates to the disabled shoulder is heavily contended. In particular, various authors now suggest that contact between the rotator cuff and labrum is physiologic in many positions of the shoulder. Through expert consensus, it is currently accepted that posterolateral internal impingement, partial undersurface rotator cuff tears, superior labral tears, and range-of-motion alterations are inter-related in etiology and clinical presentation. In 2000, the concept of anterosuperior impingement was described in patients presenting with pain during horizontal adduction of the arm, internal rotation, and various degrees of anterior elevation. Damage to the biceps pulley as an initiating lesion causes anterosuperior translation of the humeral head and results in a progressive cascade leading to abnormalities of the anterosuperior labrum and adjacent portions of the rotator cuff, particularly the subscapularis tendon where articular-sided tears can be seen.

Target Audience: Radiologists interpreting shoulder MRI

Objectives: This lecture will increase awareness and understanding of the various impingement syndromes about the shoulder, focused on imaging findings.

References:

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