

KARNATAKA RADIOLOGY EDUCATION PROGRAM

SHOULDER JOINT – ANATOMY AND APPLIED RADIOLOGY -2

The shoulder, or shoulder joint, is the connection between the upper arm and the thorax. Comprising numerous ligamentous and muscular structures, the only actual bony articulations are the glenohumeral joint and the acromioclavicular joint (ACJ). The shoulder allows for an extensive range of motion due to the spheroid shape of the glenohumeral joint, but this (i.e. a large ball in a small socket) renders it prone to dislocation and other injuries.

The glenohumeral joint has a greater range of motion than any other joint in the body.

The small size of the glenoid fossa and the relative laxity of the joint capsule renders the joint relatively unstable and prone to subluxation and dislocation.

MR is the best imaging modality to examine patients with shoulder pain and instability.

The CT shoulder protocol serves as an examination for the assessment of the shoulder joint. It is often performed as a non-contrast study. It can be combined with a CT arthrogram for the evaluation of labral injuries or the rotator cuff if MRI is contraindicated or in a postoperative setting where metallic implants are present.

Purpose

The main purpose of a shoulder CT is the depiction of the three-dimensional bony morphology of the proximal humeral head and the glenoid bone.

Technique

- patient position
 - supine position
 - ipsilateral arm next to the body shoulder externally rotated (thumb points outward)
 - o contralateral arm raised above the head
- tube voltage
 - o **≤140 kVp**
- tube current
 - o as suggested by the automated current adjustment mode
- scout
 - \circ proximal half of the humerus to the skin above the acromioclavicular joint
- scan extent
 - o should include the acromioclavicular joint and the inferior angle of the scapula
 - o might vary in the setting of implants
- scan direction
 - o craniocaudal
- scan geometry
 - field of view (FOV): 120-250 mm (should be adjusted to increase in-plane resolution)
 - o slice thickness: ≤1.25 mm, interval: ≤0.625 mm
 - reconstruction algorithm: bone, soft tissue
- multiplanar reconstructions
 - axial images: perpendicular to the humeral shaft axis
 - \circ coronal images: parallel to the scapular body axis
 - sagittal images: perpendicular to the scapular body axis
 - slice thickness: ≤2 mm, overlap 50%
 - o additional coronal and sagittal centered on the humeral stem might be obtained
- 3D reconstruction







CT Shoulder is mainly done to look for bony abnormalities like fracture, destruction , erosion etc.

Axial anatomy and checklist

Look for an os acromiale.

Notice that the supraspinatus tendon is parallel to the axis of the muscle. This is not always the case.

Notice that the biceps tendon is attached at the 12 o'clock position. The insertion has a variable range.

Notice superior labrum and attachment of the superior glenohumeral ligament.

At this level look for SLAP-lesions and variants like sublabral foramen.

At this level also look for Hill-Sachs lesion on the posterolateral margin of the humeral head. The fibers of the subscapularis tendon hold the biceps tendon within its groove. Study the cartilage.

At this level study the middle GHL and the anterior labrum. Look for variants like the Buford complex. Study the cartiage.

The concavity at the posterolateral margin of the humeral head should not be mistaken for a Hill Sachs, because this is the normal contour at this level. Hill Sachs lesions are only seen at the level of the coracoid.

Anteriorly we are now at the 3-6 o'clock position. This is where the Bankart lesion and variants are seen.

Notice the fibers of the inferior GHL. At this level also look for Bankart lesions.





Coronal anatomy and checklist

Notice coracoclavicular ligament and short head of the biceps.

Notice coracoacromial ligament.

Notice suprascapular nerve and vessels.

Look for supraspinatus-impingement by AC-joint spurs or a thickened coracoacromial ligament

Study the superior biceps-labrum complex and look for sublabral recess or SLAP-tear. Look for excessive fluid in the subacromial bursa and for tears of the supraspinatus tendon. Look for rim-rent tears of the supraspinatus tendon at the insertion of the anterior fibers. Study the attachment of the IGHL at the humerus. Study the inferior labral-ligamentary complex. Look for HAGL-lesion (humeral avulsion of the glenohumeral ligament). Look for tears of the infraspinatus.







Sagittal anatomy and checklist

Notice rotator cuff muscles and look for atrophy Notice MGHL, which has an oblique course through the joint and study the relation to the subscapularis tendon. Sometimes at this level labral tears at the 3-6 o'clock position can be visualized.

Study the biceps anchor.

Notice shape of the acromion

Look for impingement by the AC-joint. Notice the rotator cuff interval with coracohumeral ligament.

Look for supraspinatus tears.









BURSAE OF SHOULDER



1.Subacromial-subdeltoid bursa 2.Subscapular recess 3. Subcoracoid bursa 4. Coracoclavicular bursa 5. supraacromial bursa. 6 medial extension of subacromial-subdeltoid bursa



1.Subacromial-subdeltoid bursa



2.Subscapular recess



- 3. Subcoracoid bursa
- 4. Coracoclavicular bursa



5. supraacromial bursa

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