

Arthrography – A Realtime Evaluation of the Rotator Cuff

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Patient history

A 65-year-old male with sharp pain in his right shoulder after falling on his right elbow and hand. He was not able to lift his right arm above the shoulder. Radiography showed no traumatic bone lesions. Three months later, the patient still was not able to fully raise his arm.

Imaging

Ultrasound: First, ultrasound was used to evaluate post-traumatic shoulder pain as it provides information about the soft tissues around the shoulder. The performed ultrasound examination suggested an interruption of the normal tendon structure of the supraspinatus, requiring further examination to define the extent of the rupture.

Radiography: Standard radiography of the shoulder showed a normal bone pattern, slight degenerative changes of the acromioclavicular joint and a preserved space between the acromion and the humeral head. No calcifications could be seen in the soft tissues of the shoulder.

Fluoroscopy: Using fluoroscopic guidance, iodinated contrast agent was injected into the glenohumeral joint. The joint cavity of the shoulder was opacified and the delineation of synovium and capsular infoldings were demonstrated. Furthermore, the injected contrast also opacified the subacromiosubdeltoid bursa suggesting a pathologic communication between the glenohumeral joint space and the subacromiosubdeltoid bursa.

Diagnosis

Full thickness rupture of the rotator cuff, explaining the inability to lift the abducted humerus. The rotator cuff is formed by four muscles and their tendons surrounding the head of the humerus, thus separating the glenohumeral joint from the subacromiosubdeltoid bursa. Contrast extravasation into this bursa is explained by passage of contrast through a full thickness opening in the rotator cuff.

Comments

Radiography following arthrography provides the advantage of an easy realtime observation during contrast injection to diagnose rotator cuff ruptures and supplies indispensable information to the orthopedic surgeon in the pre-operative setting. This examination proves in a direct way the presence of a full thickness rupture of the rotator cuff by visualization of contrast extending from the glenohumeral joint throughout the rotator cuff into the subacromiosubdeltoid bursa.

Other modalities such as MRI rather indirectly suggest the presence of rotator cuff ruptures by change of signal intensity. Most surgeons prefer to rely on the results of arthrography to decide whether surgery is needed.

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- 1 A.p. radiography of the right shoulder.
- 2 Contrast extravasation into the bursa subacromialis-subdeltoida reveals a complete rotator cuff tear.

