Ultrasonography as a Diagnostic Modality in Acromioclavicular Joint Pathologies

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Key words: acromioclavicular joint, anterior shoulder pain, irregularities, dislocation, joint swelling

Abstract

Background: Ultrasound is useful in detecting acromioclavicular pathologies in cases of trauma, inflammations and degenerative changes.

Objectives: To describe the sonographic findings of acromioclavicular joint pathology in patients with anterior shoulder pain.

Methods: Sonographic examination of the ACJ was used to examine 30 adults with anterior shoulder pain. As a control group we studied 30 asymptomatic patients and compared the findings to plain radiographs of the symptomatic group.

Results: The pathologic findings consisted of swelling of the joints, bone irregularities, widening and/or narrowing of the ACJ, soft tissue cyst formation, excessive fluid collection, and calcification. All these signs represent degenerative changes compatible with early osteoarthritis. We encountered one case of septic arthritis that required joint aspiration and antibiotic treatment.

Conclusions: It is our belief that ultrasonography should be used routinely in cases of anterior shoulder pain since it demonstrates various pathologies undetected by plain radiographs.

IMAJ 2005;7:28–30

Localized swelling of the acromioclavicular joint is usually due to osteoarthritis. In general, ultrasound can readily depict osteophytes, capsular thickening and joint effusion. In the ACJ, an effusion is highly suggestive of communication with the subacromial bursa [1,2]. In cases of septic arthritis there is a widening with capsular thickening and bulging. While infection in the ACJ is uncommon, it is seen frequently in immune compromised patients and intravenous drug users [3–10].

Aspiration of the ACJ is easily performed under ultrasonographic guidance. Fluid in the joint is rapidly detectable by ultrasound as a hypoechoic area bounded by the joint capsule. A simple effusion is almost always anechoic. A diffuse increase in echogenicity suggests infection or hemarthrosis, whereas associated synovial thickening, loose bodies and irregular echoes may be seen in a variety of conditions [11].

After acute trauma the ACJ becomes unstable [11–13]. Traditionally, this is assessed clinically and with weight-bearing radiographic views. However, the use of ultrasound enables direct imaging of the ACJ capsule (stressed and unstressed) and measurement of the coraco-acromial distance. Ultrasonography has been proven to be as accurate as radiographic assessment and can be used to follow the reduction maneuver in cases of ACJ dislocation.

ACJ = acromioclavicular joint

Patients and Methods

During 2003 we assessed 30 consecutive patients for anterior shoulder pain unrelated to trauma. The age range of the 18 male and 12 female patients with anterior shoulder pain ranged between 17 and 66 years. A group of 30 symptomless patients were chosen as a control group. The findings were compared to those of plain radiography of the symptomatic patients. Post-surgical cases were excluded. History-taking and physical examination were followed by conventional radiography of the affected shoulder and by ultrasound examination of both shoulders. Sonograms were obtained with Siemens G-50 and Toshiba 8000 Power-Vision with 5-13 MHz linear transducers. The opposite asymptomatic side was used as a control. The acromioclavicular joints were evaluated with ultrasound in coronal and sagittal plans.

Results

The normal ACJ in the asymptomatic group was visualized with ultrasound. The normal sonographic appearance [Figure 1] demonstrated the bony contour of the acromion and the clavicle. There was no capsular distension or accumulation of fluid. No irregularity of bone, cyst formation or calcification was seen.

In the symptomatic group, five patients had clinical limitation of abduction. Five patients had bicipital tendonitis and five had partial tear of the rotator cuff (supraspinatus). Twenty patients had clinically marked tenderness over the ACJ; their ultrasound of the glenohumeral joint on the symptomatic side was normal. Fifteen of these patients demonstrated capsular distension of the ACJ [Figure 2]. Ten patients demonstrated bony irregularity with narrowing of the acromioclavicular space [Figure 3]. Other pathologies included calcification in the ACJ (three patients), cyst formation (three patients) [Figure 4] and acromioclavicular subluxation (two patients).

In the asymptomatic group that had additional X-rays of the shoulder, bony irregularities were noted in four patients and acromioclavicular subluxation in one. However, ultrasound examination demonstrated, in addition to the above, calcifications in the joint in one patient and capsular distension in three patients.

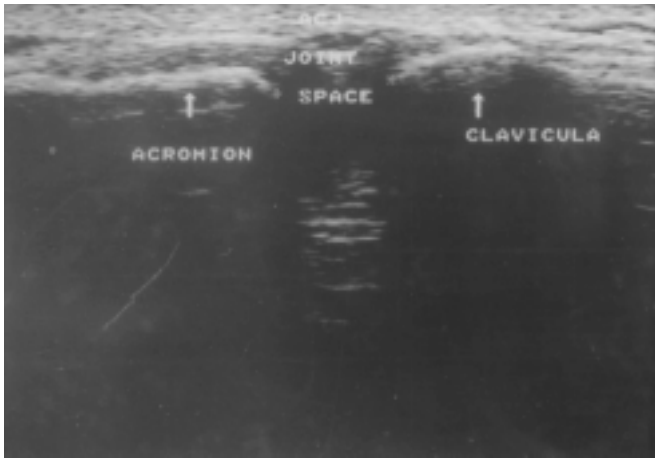

Figure 1. Normal appearance of the ACJ in a young male. Note the normal joint space and the regular bony contour of the acromion and clavicle. There is no distension of the capsule. No asymmetry of the joint space is seen.

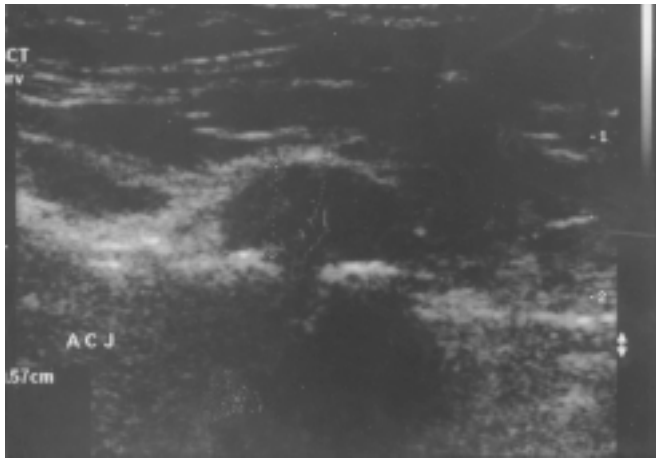

Figure 2. The ACJ capsule is focally distended by fluid.

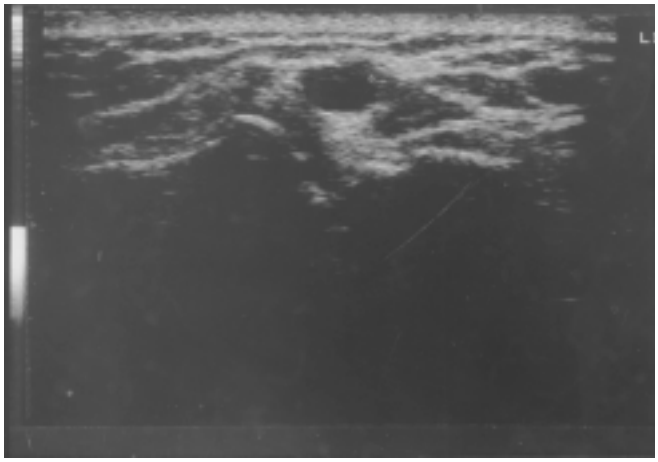

Figure 3. ACJ with ganglion cyst.

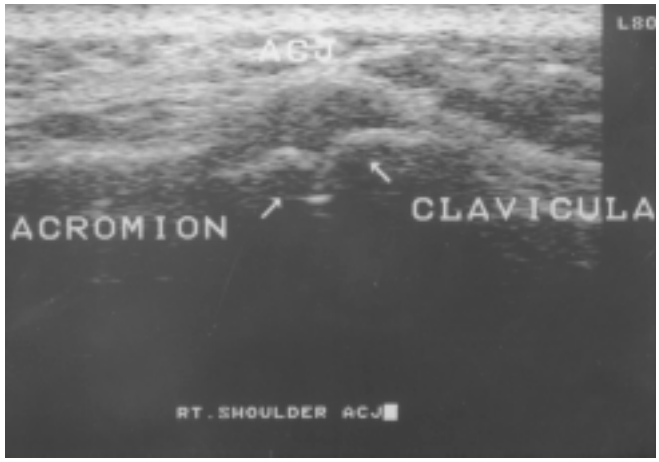

Figure 4. ACJ with arthritic changes. Note the narrowing of the joint space with irregularities of the bone.

In the symptomatic group, X-ray demonstrated bony irregularities in four patients. Other pathologies included acromioclavicular subluxation (one patient) and calcification in the ACJ (one patient)

Discussion

The clinical features of arthritis of the acromioclavicular joint may mimic those observed in arthritis of the shoulder [14–16]. It differs however from arthritis of the shoulder by localized swelling and tenderness appearing over the anterior aspect of the ACJ.

Whereas in the past we used X-rays to demonstrate widening, erosions and destruction of the ACJ, in the current study we used ultrasound to assess the ACJ. The examination is simple, rapid and comfortable. It is dynamic, can be performed in real time and can be applied without delay to the opposite side for comparison. The advantages of ultrasonography include the absence of ionizing radiation, its short examination time, low cost and non-invasive character. Ultrasound of the ACJ can easily demonstrate a distended joint capsule [17], bone irregularities, joint space distances [18], and dislocation of the ACJ. Ultrasound is useful in detecting ACJ subluxation and other trauma. It also enables following the treatment and repeating the examinations, avoiding ionizing radiation. Moreover, it provides information on arthritic changes [1,2], and is also a useful imaging modality for assessing septic arthritis of joints [3–10,19]. The ACJ can be aspirated [15] under ultrasound guidance. Ultrasound of the ACJ can be used to differentiate between the various types of arthropathies.

In conclusion, our findings support the use of ultrasonography for assessing acromioclavicular joint pathologies. It is non-invasive and should be used routinely in every examination of anterior shoulder pain.

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It is easier to fight for one's principles than to live up to them

Alfred Adler (1970-1937), Austrian psychiatrist, whose theories on the psychology of the individual introduced the concept of the inferiority complex. Initially an associate of Freud, Adler's views diverged from Freud's and by 1911 he had founded his own school of thought. Adler viewed each individual as a unique entity striving to compensate for feelings of inferiority resulting form physical or social disabilities.

We would often be sorry if our wishes were gratified

Aesop (6th century BC), supposed author of Greek fables – anecdotal stories whose animal characters are used to illustrate a moral point.

Capsule

Enhanced identification of postoperative infections among inpatients

Yokoe et al. evaluated antimicrobial exposure, discharge diagnoses, or both, to identify surgical site infections (SSI). This retrospective cohort study in 13 hospitals involved weighted random samples of records from 8,739 coronary artery bypass graft (CABG) procedures, 7,399 cesarean deliveries, and 6,175 breast procedures. They compared routine surveillance to detection through inpatient antimicrobial exposure (>9 days for CABG, >2 days for cesareans, and >6 days for breast procedures), discharge diagnoses, or both. Together, all methods identified SSI after 7.4% of CABG, 5.0% of cesareans, and 2.0% of breast procedures. Antimicrobial exposure had the highest sensitivity, 88–91%, compared with routine surveillance, 38–64%. Diagnosis codes improved sensitivity of detection of antimicrobial exposure after cesareans. Record review confirmed SSI after 31–38% of procedures that met antimicrobial surveillance criteria. Sufficient antimicrobial exposure days, together with diagnosis codes for cesareans, identified more postoperative SSI than routine surveillance methods. This screening method was efficient, readily standardized, and suitable for most hospitals.

Emerg Infect Dis 2004;10:1924

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