Case report

Acromio-clavicular joint cyst associated with a complete rotator cuff tear – A case report

Karen M. McCreesh a, *, Sara J. Riley b, James M. Crotty c

a Dept of Clinical Therapies, University of Limerick, Limerick, Ireland
b Academic Unit of Diagnostic Imaging, School of Healthcare, University of Leeds, Leeds, UK
c Dept of Radiology, University Hospital Limerick, Limerick, Ireland

ABSTRACT

This case report describes a patient with an acromio-clavicular joint (ACJ) cyst, associated with a complete tear of the supraspinatus tendon, and the related arthropathy. Ultrasound was a suitable imaging modality to make the diagnosis, and rule out other pathologies. Full assessment of the rotator cuff must be carried out in the presence of ACJ cysts due to their common co-existence with large cuff tears. Cyst aspiration is not a suitable treatment, due to the high likelihood of recurrence. Optimal treatment requires management of the underlying rotator cuff tear.

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1. Introduction

Peri-articular cysts can be found related to numerous joints, the most common being at the wrist (Bianchi et al., 1994). This case report describes the finding of a ganglion cyst of the acromioclavicular joint (ACJ). Although relatively rare, ACJ cysts are commonly associated with a complete tear of the rotator cuff in the affected shoulder (Hiller et al., 2010), as demonstrated in this case. Rotator cuff tears are associated with advancing age (Tempelhof et al., 1999), and may or may not be symptomatic. This case additionally demonstrates remarkable preservation of shoulder function despite a large cuff tear and significant joint arthropathy.

2. Clinical presentation

A 74 year old woman presented to a shoulder clinic with a painless, soft swelling over her right shoulder, which had been present for at least 3 months. She reported that she suffered a right shoulder dislocation four years previously, during a fall. The shoulder was not fractured, and she recovered well following conservative management and rehabilitation. She reported a mild ache and some stiffness in her right shoulder. However, she was more concerned about the lump, due to a previous history of left sided breast carcinoma, treated with radical mastectomy 6 years previously. On palpation, there was a symmetric, soft, non-tender mass over the right ACJ (Fig. 1). She demonstrated 160 degrees of pain-free active shoulder abduction, and a similar range of flexion, with mild pain at the end of the range of movement. Mild pain was provoked with cross-body adduction. Weakness of right shoulder external rotation and abduction was evident during manual muscle testing in comparison to the opposite side. Shoulder function was assessed with the Shoulder Pain and Disability Index (Williams et al., 1995), on which she scored 16% on the pain subscale, 22.5% on the disability subscale, and 20% overall (where a score closer to 100% indicates higher disability or pain).

2.1. Investigations

Ultrasound examination was undertaken with a GE Logiq e ultrasound scanner with a 7–12 MHz linear array transducer (GE Medical, Wauwatosa, WI, USA). Initial examination of the mass was undertaken with the patient positioned in sitting, the shoulder in neutral alignment, and the supinated forearm resting on the ipsilateral thigh. The ACJ was examined both in neutral and in the adducted position, as described by Ferri et al. (2005). A well-defined, hypoechogenic mass, which was multi-loculated, was visualised overlying the ACJ (Fig. 2). There was evidence of posterior acoustic enhancement behind the mass, consistent with the presence of fluid (Fig. 2), with some of the fluid close to the joint appearing thick or mucinous. The mass was deemed to be a ganglion cyst, as it was seen to be clearly associated with the ACJ
Doppler imaging demonstrated no flow in the mass, further confirming its benign nature. The ACJ showed joint space narrowing and bony irregularity consistent with degenerative arthropathy. A full ultrasound examination was undertaken of the shoulder joint according to a published protocol (European Society of Musculoskeletal Radiology, 2010). There was complete non-visualisation of the supraspinatus tendon in either longitudinal or transverse planes, a finding which indicated complete rupture, with tendon retraction (Fig. 3). The long head of biceps, infraspinatus and subscapularis tendons were intact.

2.2. Treatment and outcome

The patient was given a full explanation of the cause of the cyst and reassured that it was not of a malignant nature. Aspiration of the cyst was offered as a treatment by the radiologist, with the stipulation that the cyst may recur, due to the underlying mechanism of rotator cuff tear. Due to the low level of symptoms and her general satisfaction with her shoulder function, the patient decided that a ‘watchful waiting’ approach was most appropriate for her, and so she declined any further intervention.

3. Discussion

While an ACJ cyst is a relatively rare complication of degenerative changes in the glenohumeral joint (GHJ) and/or ACJ, a number of cases have been described in the literature to date, with the first being published in 1986 (Craig, 1986), and with the majority of these occurring in the presence of a rotator cuff tear. Hiller et al. (2010) describe two types of ACJ cysts — Type I; which is an isolated cyst, related to degenerative change in the ACJ, in the absence of a rotator cuff tear; while the Type II cyst is secondary to a rotator cuff tear and the resultant cuff tear arthropathy. Loss of supraspinatus function leads to superior migration of the humeral head due to unopposed deltoid muscle action. Over the longer term it is proposed that the high-riding humeral head causes damage to the inferior capsule of the ACJ, eventually allowing synovial fluid to flow from the GHJ into the ACJ (Hiller et al., 2010). On shoulder arthrogram this is seen as a phenomenon called the “Geyser sign”, where dye leaks from the GHJ, through the rotator cuff, into and beyond the ACJ (Craig, 1984). With increased cyst pressure, or thickening of the fluid (as seen in this case), the return flow of fluid is impeded and the cyst remains.

3.1. Review of published cases

The largest series of cases of ACJ cysts was presented by Tshering Vogel et al. (2005) where 9 patients, who each presented with a mass over the shoulder for tumour imaging, were investigated with Magnetic Resonance Imaging (MRI) and plain radiographs. On the radiographs, all of the patients had degenerative changes in the ACJ including acromial and clavicular osteophytes, along with narrowing of the sub-acromial space. Magnetic Resonance images showed tearing of the inferior ACJ capsule in all cases, along with varying degrees of rotator cuff tears and fatty infiltration of the rotator cuff muscles, and direct flow of fluid between the glenohumeral and ACJ, into the cyst. Seven of these patients were treated with surgery, while two had conservative management. The authors advocated the use of MRI for the investigation of these cysts.

A smaller number of authors have described the use of ultrasound to investigate ACJ cysts. Moratalla and Gabarda (2007) used ultrasound to diagnose an ACJ ganglion cyst along with a full thickness rotator cuff tear in a 66 year old woman who declined MRI examination. No treatment was detailed in this case.

Fig. 1. External appearance of the cyst.

Fig. 2. Ultrasound appearance of the ACJ cyst.

Fig. 3. Ultrasound image showing complete, retracted tear of the supraspinatus tendon.
et al. (1997) reported a case of an ACJ cyst where the rotator cuff, while tendinopathic, appeared to be intact on ultrasound, a fact which was later confirmed by shoulder arthroscopy. In a more unusual presentation, Montet et al. (2004) reported the use of ultrasound to image a large ACJ ganglion, along with a massive cuff tear, which was positioned in the trapezius muscle and not overlying the joint. Ultrasound was capable of diagnosing the cystic nature of this lesion, the lack of flow on Doppler imaging, and the presence of the rotator cuff tear, findings which were later corroborated by MRI examination. Regarding the use of ultrasound for treatment, Chiu et al. (1999) outlined 15 cases where ultrasound was successfully used for guided aspiration of various ganglion cysts around the shoulder; however none of these were related to the ACJ or associated with large cuff tears.

Ultrasound was a very suitable imaging modality for the investigation of this cyst, as it clearly demonstrated the presence of fluid in the mass, visualised its structure and clear association with the ACJ, its lack of vascularity, and also the status of the rotator cuff tendons. There was, therefore, no need for any further imaging. Ultrasound could have also provided the means to undertake guided aspiration of the cyst, if it was deemed appropriate. MRI may be useful where the rotator cuff cannot be clearly visualised or where there is any uncertainty about the benign nature of the mass. The literature clearly shows that a thorough radiological investigation of the status of the rotator cuff is important when an ACJ cyst is discovered, due to its close association with large rotator cuff tears. Brown et al. (2000) take this suggestion further, by advocating that all patients undergoing surgery for ACJ pain should have an arthroscopic examination of their rotator cuff at the time, in order to identify any pathology that has not been seen on imaging.

3.2. Rotator cuff tears and preservation of function

A remarkable aspect of this case is the degree of preservation of shoulder function in the presence of an ultrasound-confirmed complete rupture of the supraspinatus tendon. However, a small number of similarly symptom-free cases with an ACJ cyst and large rotator cuff tears have been reported (Postacchini et al., 1993; Tshering Vogel et al., 2005). The main pre-disposing factor for a rotator cuff tear is increasing age — in fact Tempelhof et al. (1999) documented full thickness rotator cuff tears in 31% of 87 asymptomatic individuals aged between 70 and 79, who underwent ultrasound assessment of their shoulders, suggesting that rotator cuff tears are part of normal ageing. A number of authors have investigated which parameters are associated with rotator cuff tears that do not become symptomatic. Keener et al. (2009) reported that shoulders with symptomatic tears were found to have significantly greater superior humeral migration than those with asymptomatic tears. In an assessment of muscle firing patterns using fine-wire electromyography (EMG) in a small group of people with rotator cuff tears, Kelly et al. (2005) found that asymptomatic shoulders retained better subscapularis function, while those with painful shoulders substituted with increased peri-scapular muscle activity. In this case, the previous shoulder dislocation is likely to have been a factor in the development of the rotator cuff tear, and the post injury rehabilitation will have contributed to the subsequent very good restoration of her shoulder function.

The fact that only the supraspinatus tendon was damaged is another important factor in this case. Schibany et al. (2004) examined a group of 9 asymptomatic individuals with complete supraspinatus ruptures but the rest of the cuff intact, using both US and MRI, with tear sizes ranging from 0.8 to 5.2 cm. When compared to a matched group with no cuff pathology on imaging, the individuals with isolated supraspinatus tears had very similar shoulder function scores, apart from significantly reduced shoulder strength. Other studies of cohorts with asymptomatic cuff tears also report that most of the tears are isolated to the supraspinatus tendon (Tempelhof et al., 1999; Moosmayer et al., 2009). While this lady had minimal symptoms at presentation, this may not always be the case, as Yamaguchi et al. (2001) showed that over half of previously asymptomatic subjects with a rotator cuff tear went on to develop symptoms on average 2.8 years into a 5-year follow-up period, with development of symptoms associated with a progression in tear size.

3.3. Recommendations

As stated by Tshering Vogel et al. (2005), any management options for such a cyst must be planned with regard to the underlying rotator cuff pathology, as simple aspiration often fails due to cyst recurrence. Murena et al. (2009) describe the case of a patient who developed a fistulised cyst following repeated unsuccessful aspirations, and who was successfully treated with excision of the cyst and resection of the distal clavicle. As demonstrated by two case reports by Nowak et al. (2009) and Skedros and Knight (2012), it is possible for ACJ cysts to become quite large — (4 × 8 cm and 6 × 8 cm respectively), which led, in both cases, to the need for plastic surgery input during eventual surgical excision of the cysts. Based on this information, it is clear that the advice to the patient should be to monitor the cyst, and to seek medical advice if it began to grow noticeably in size.

Acromioplasty, cyst and distal clavicle excision, and rotator cuff repair, are the treatments described for four ACJ cyst cases documented by Marino et al. (1998). However, even if the patients’ shoulder in this case had been painful or restricted in function, such a chronic, retracted supraspinatus tear would be unlikely to be suitable for primary repair. Grob et al. (1993) described a case series of 4 patients with ACJ cysts and underlying cuff tear arthropathy, who were successfully treated with shoulder hemi-arthroplasty. While some of these authors reported successful outcomes at one-year follow-up, longer-term studies or randomised controlled trials are needed to determine the best treatment option for ACJ cysts. However, based on current evidence, it is likely that hemiarthroplasty would be the best surgical option for this patient, if she did develop pain or further restricted shoulder function.

4. Conclusion

This case illustrates the association between ACJ cysts, and large rotator cuff tears. The visual identification of such a cyst should make the therapist suspicious of the possibility of an underlying large rotator cuff tear. Ultrasound examination is recommended to confirm the benign nature of the cyst, as well as to explore the integrity of the rotator cuff tendons. This case also demonstrates that very good shoulder function is possible even when a large cuff tear is present, with significant ACJ arthropathy, therefore patient-reported symptoms and functional level should always be considered before any intervention is recommended.

References


