



## Case Series

## Synovial cyst of the acromioclavicular joint with and without rotator cuff tear: A case series of two patients

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## ABSTRACT

**INTRODUCTION:** Acromioclavicular joint cyst (AJC) is a very uncommon condition of the shoulder observed in elderly patients, caused by a degenerative acromioclavicular (AC) joint, frequently associated to a rotator cuff tendon tear. There are two possible cause for the cyst formation. We report two different cases of a AC synovial cyst, with and without rotator cuff tear.

**PRESENTATION OF CASES:** We report two cases, in patients aged respectively 80 and 77 years, with a very large AJC. In one case, the cyst was associated to a rotator cuff tear, while in the other case, the rotator cuff did not present any evident lesion. Both cysts were successfully surgically excised and a distal clavicle resection was performed.

**DISCUSSION:** AJC is a rare complication observed in degenerative AC joint and in the majority of cases is associated to a rotator cuff tear. The diagnosis may be made by ultrasound and conventional radiographic examination, although MRI of the shoulder is generally preferred as it allows to better identify the condition of the rotator cuff. Generally, local aspiration of the cyst and corticosteroid injection fails with recurrence of the cyst and surgically treatment is indicated, especially in painful cases.

**CONCLUSION:** Painful AJC should be surgically treated by excision of the cyst associated to a lateral clavicle resection; when a symptomatic massive rotator cuff is present, a reverse total shoulder arthroplasty may be considered. However, in elderly patients, who have no discomfort, watchful waiting may be the treatment of choice.

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## 1. Introduction

Acromioclavicular joint cyst (AJC) is a rare pathology of the shoulder, generally observed in elderly patient, often due to a communication between the acromioclavicular and the glenohumeral joints. However in some cases, in which the rotator cuff is not injured, it may be a sequela of a degenerated AC joint.

This lesion may be considered a pseudotumor formation, composed by mucoid content and surrounded by a fibrous wall [1,2]. There are two different types: a type 1 cyst, that occurs with an intact rotator cuff and it is caused by a degenerative process of the AC joint, and type 2 cyst secondary to a degenerated AC joint with an associated massive rotator cuff tear [3–5]. Both types are characterized by an abnormal increase of synovial fluid production.

The diagnosis is clinical, however sonography, radiographic examination and MRI are usually performed, especially to orient the orthopaedic surgeon to the correct treatment, in order to avoid recurrence. MRI is the best exam to identify size, fluid composition, anatomical relationship between the cyst, the AC and the glenohumeral joints and rotator cuff status [6]. Moreover, type 2 cysts are characterized by the “geyser sign”, when synovial fluid erupts superiorly from the glenohumeral through to the AC joint [1,7].

Differential diagnosis should exclude rheumatic diseases, tumors, infections and other bone and soft tissue pathologies [8].

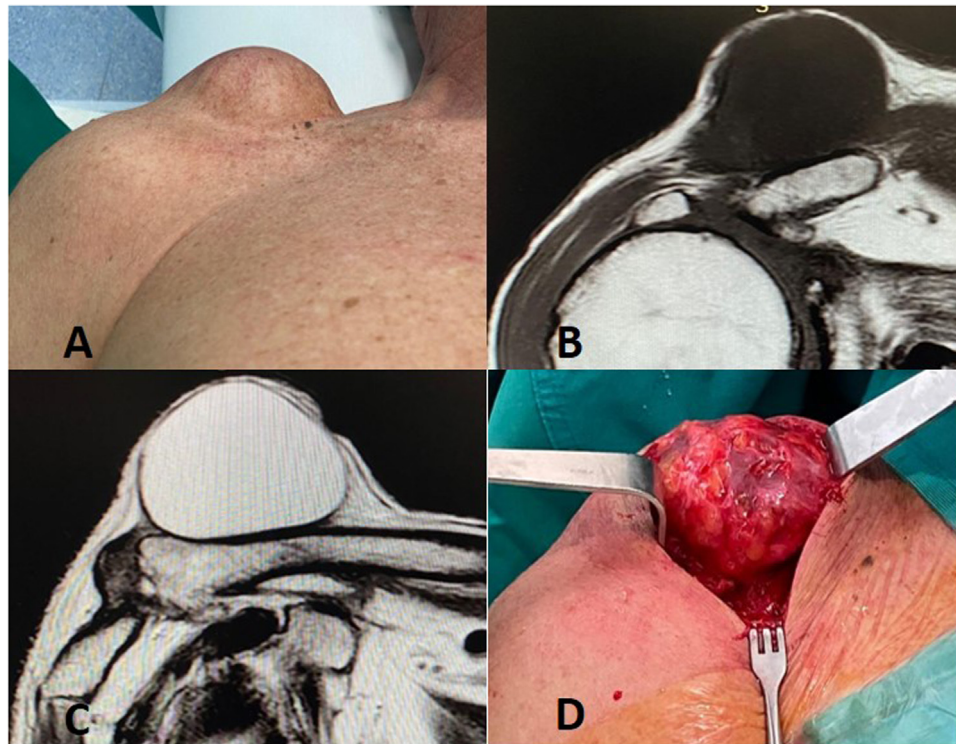
Surgical management is generally the treatment of choice, since the aspiration of the cyst and corticosteroid injection are followed by a high rate of recurrence [9,10].

We report two cases of large AJC in elderly patients treated surgically.

## 2. Presentation of cases

The research work has been reported in line with the PROCESS criteria [11].

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**Fig. 1.** Type 2 AJC of the right shoulder in a 80-year old patient. Clinical aspect (A); MRI shows a fluid filled cyst connected to the AC and glenohumeral joints. The humeral head appeared upward migrated (B, C); Intraoperative finding of the mass during the surgical dissection (D).

### 2.1. Case 1

A 80-year old male was admitted to the outpatient orthopedic clinic of our hospital, complaining of a large mass localized above the right AC joint, which appeared two years earlier, without any trauma (Fig. 1A). The patient referred psychological discomfort due to the cosmetic appearance of the large mass. He underwent, during the previous two years, several aspirations of the cyst followed by local injections of corticosteroids with recurrences shortly after. The clinical examination showed a large mass, that was apparently firm and not pulsating on palpation with a normal overlying skin. The range of motion of the shoulder was almost normal, slightly painful to the extreme degrees of elevation and abduction. MRI showed mass formation, fluid filled, starting from the AC joint and measuring 5,2 cm × 7,2 cm (Fig. 1B,C). Moreover, a complete lesion of the rotator cuff with consequent upward migration of the humeral head was present that caused a direct communication between the acromioclavicular and glenohumeral joints (Fig. 1). The mass was surgically excised with a lateral clavicle resection, because the patient refused a reverse total shoulder replacement, that we initially proposed (Fig. 1D).

### 2.2. Case 2

The second case was a 77-year old male, complaining of a large mass localized above the right AC joint, appeared one year earlier, without any trauma, that bothered him especially while dressing. He also underwent many aspirations of the cyst and local injections of steroids without resolution. The physical examination showed, also in this case, a firm large mass of elastic consistence, not pulsating, with a normal overlying skin. The shoulder range of motion was complete and slightly painful. MRI showed a mass formation with the same characteristic of the other, measuring 5,6 cm × 6,5 cm located on the AC joint (Fig. 2A,B). A fibro-adipose degeneration

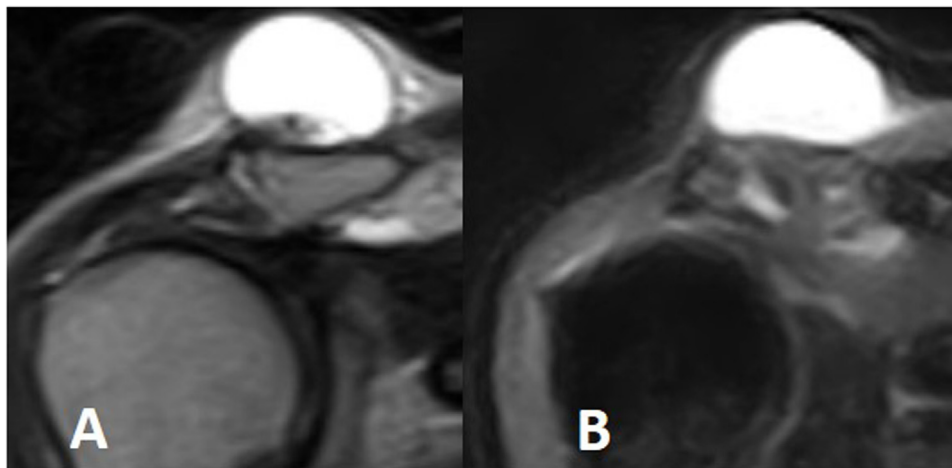
of the supraspinatus was also detected, without any evident sign of rotator cuff tear (Fig. 2A,B). The mass was surgically excised with a lateral clavicle resection.

### 2.3. Surgical technique of both cases

The patients were operated on by the two senior authors (FDM, PF). Both patients were placed in a beach-chair position, commonly used for shoulder surgery, under general anesthesia. In both cases, we performed a direct approach to the mass in line with the coracoid process and the sulcus between deltoid and pectoralis major. The margins of the mass were identified with a meticulous dissection and the cysts were excised (Fig. 1D). In the first case, an extension of the cyst to the lateral portion of the trapezius muscle was present. A lateral clavicle resection was performed in both cases. A final diagnosis of a synovial cyst was performed after histological examination in both cases. The patients wore an arm sling for two weeks until the stitches were removed. No physiotherapy was prescribed and no recurrence of cyst was observed at the latest follow-up, six months after surgery.

### 3. Discussion

Acromioclavicular joint cyst (AJC) is an uncommon complication of a degenerative AC joint disease, first described in the 80 s [1,2]. Ten years later, Postacchini et al. [9] reported 3 cases of type 2 AJC; 2 of them were surgically treated by excision of the cyst and acromioplasty, while the remaining case was treated conservatively. Regarding the 2 surgically treated patients, in one case they also sutured the rotator cuff, with recurrence of the cyst one year later. In the other case, they performed a resection of the lateral part of the clavicle, without recurrence. They concluded that excision of the lateral end of the clavicle appears to be necessary to avoid recurrence of the cyst, despite a persistent massive cuff defect. Gordon



**Fig. 2.** Type 1 AJC of the right shoulder in a 77-year old patient. MRI shows a fluid filled cyst connected to the AC joint without rotator cuff tear (A, B).

et al. in the same year [10], reported 4 cases of type 2 AJC, surgically treated by large-humeral head hemiarthroplasty with no operative treatment directed at the cyst or the AC joint. At follow-up, more than 2 years after surgery, no recurrence was observed. They concluded that hemiarthroplasty is an effective method for treating not only the cyst but the underlying degenerative disease of the joints and the rotator cuff.

Hiller et al. [3] first proposed to classify the AJC in 2 different types; type 1, generally uncommon, in which the cyst appeared superficial and limited to the AC joint, without an evident lesion of the rotator cuff [12], and type 2, more frequent, as a consequence of a massive rotator cuff tear.

The majority of literature on AJC reported individual case report. The largest cohort of patients with an AJC was reported by Tshering Vogel et al. [13], that described 9 cases, all with an extensive rotator cuff tear with a column of fluid extending from the glenohumeral joint through the rotator cuff tear into the AC joint and the acromioclavicular cyst. In 3 cases they found chondrocalcinosis in the AC or glenohumeral joint.

Montet et al. [14] described the first case of AJC associated to a massive rupture of the rotator cuff, with an intramuscular extension of the cyst inside the trapezius, treated conservatively. More recently other authors [15] reported a similar case of AJC that extended intramuscularly into the trapezius that was surgically excised with resection of the lateral part of the clavicle. In our first case, we observed the same extension of the cyst into the trapezius muscle, which represents an extremely rare condition; a large rotator cuff tear was also present. The cyst was surgically excised with an associated resection of the lateral clavicle, since the patient refused a shoulder arthroplasty.

We reported one case classified as type 1, and the other type 2, both treated with a conventional surgery. However, some authors prefer to approach this pathology arthroscopically, performing a conservative subacromial decompression with preservation of the coracoacromial ligament and an accurate debridement of the cyst. Even in the cases treated arthroscopically, the authors performed AC joint resection [16,17].

In both our cases, we performed a surgical excision with a resection of the lateral part of the clavicle, which we consider, in accordance with other authors, the treatment of choice in type 1 (our case 2). In our case 1 (type 2), we proposed to the patient a reverse total shoulder arthroplasty, but, since the shoulder was only slightly painful, the patient refused our proposal. Therefore, we decided to remove only the mass in order to resolve his discomfort, warning him of a possible recurrence.

#### 4. Conclusion

In conclusion, the most common AJC (type 2) is associated to a massive rotator cuff tear and the treatment of choice, especially in symptomatic cases, is a reverse shoulder arthroplasty. More rare is the type 1 AJC, in which the correct treatment is the surgical excision, which can also be performed by an arthroscopic approach, associate to a resection of the lateral clavicle. However, in elderly patients, who have no symptoms and no discomfort, a conservative treatment may be recommended.

#### Declaration of Competing Interest

The authors report no declarations of interest.

#### Funding

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#### Ethical approval

The study was notified to the ethical committee of our hospital (Policlinico di Tor Vergata, Rome, Italy); it does not need a specific ethical approval because only two cases are included in the study.

#### Consent

Written informed consent was obtained from the patients for publication of this case report and accompanying images.

#### Author's contribution

Fernando De Maio: writing.  
Arianna Di Marcantonio: data collection and analysis.  
Vincenzo De Luna: writing.  
Alessandro Caterini: data collection and analysis.  
Ilaria Tresoldi: data collection.  
Pasquale Farsetti: study concept and supervision.

#### Registration of research studies

1. Name of the registry: research registry.
2. Unique identifying number or registration ID: researchregistry5883.

3. Hyperlink to your specific registration (must be publicly accessible and will be checked): <https://www.researchregistry.com/browse-the-registry>.

#### Guarantor

Dr. Fernando De Maio.  
Prof. Pasquale Farsetti.

#### Provenance and peer review

Not commissioned, externally peer-reviewed.

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