



## Acromioclavicular joint cyst in ASA 3-4 patients. Whether and how quickly it recurs after aspiration and steroid injection

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We observed the clinical course, in the short-medium term, of patients with voluminous type II acromioclavicular (AC) joint cyst who underwent aspiration and steroid injection regarded as the only possible treatment to avoid possible skin complications.

Four patients (7.4% of cases described in literature) (3F-1M ; mean age 83 years, range : 78-87 years) with a voluminous (> 7 cm) oval, no mobile, no fluctuant cyst overlying the AC joint, were retrospectively observed. The patients, judged by the anesthesiologist as ASA 3-4 patients, were merely submitted to cyst aspiration and steroid injection. The content of the cyst was microscopically analysed. All patients were clinically evaluated on the day of aspiration and after 14-30 days and after 1 year. Shoulder function and pain intensity were analysed with Constant score and VAS. We were able to aspirate 80-150 ml of amorphous joint fluid. At the first follow-up, all patients had a recurrence of the cyst, a lower grade of tension of the skin overlying the cyst and also a very little decreasing of pain intensity. After a month from aspiration, the cysts of the 4 patients had the same size as that present before aspiration. The range of motion, the average value of VAS and Constant were similar to those recorded before aspiration. In no case signs of infection or draining sinus occurred.

Aspiration is a useless practice. However it is still a motive for discussion if the reduced suffering of the skin overlying the cyst after the aspiration has avoided, or simply postponed, an imminent complication.

**Keywords :** acromioclavicular joint cyst ; massive rotator cuff tear ; shoulder pain ; acromioclavicular joint cyst aspiration.

### INTRODUCTION

The acromioclavicular joint cyst is as a well defined oval mass overlying the superior aspect of a hypertrophied and degenerative AC joint. It was firstly described by Craig (3) in 1984 who magisterially observed the coexistence between a massive, and not recent, rotator cuff tear and degenerative changes of the AC joint. In 1986, the same Author (2) postulated two possible hypotheses able to generate these cysts : a) AC spurs firstly determine an impingement syndrome that progressively causes a rotator cuff tear ; consequently, the abundant glenohumeral fluid, product by the hypertrophic synovia, would pass throughout the cuff and inferior AC capsule tears, extending the superior AC capsule and forming the cyst ; b) the upperward migration of the humeral head, consequent to rotator cuff tear, injures the inferior AC capsule, creating a direct connection between the glenohumeral and AC

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joints. Even in this case, the gleno-humeral fluid would cause a distension of the superior AC capsule. Currently, the latter hypothesis enjoys greater credit.

In 2010, these pseudo-cysts were classified by Hiller *et al* (5) as type II cysts, to distinguish them from type I cysts dependent on degenerative changes of the AC joint due to trauma, infection, metabolic disease or repetitive overuse. Overtime, degenerative changes could be responsible for synovium irritation leading to an overproduction of fluid resulting in cyst formation superficial to the AC joint. Generally, in these cases, rotator cuff is intact.

Clinically, patients with acromioclavicular joint cysts have also an atrophy of the external rotator muscles, a decrease in external rotation strength and, frequently, the range of motion of the involved shoulder is compromised. The MRI shows the geyser effect (3).

This unusual presentation of full thickness rotator cuff tear, associated with AC degenerative changes, has been treated by : watchful waiting, excision with or without rotator cuff repair, lateral clavicle resection with or without the use of allograft patch, hemiarthroplasty, reverse shoulder prosthesis (1-2,4-12). Aspiration with steroid injection has been also a widely used treatment (1,2,4-12).

In the literature, patients with voluminous and teleangiectatic cysts who were submitted to aspiration, despite the possibility of recurrence, infection, draining sinus, are frequent in literature (2,4-7,11,12). In almost all cases, the cyst has recurred. However, we do not know exactly after how much time the cyst recurred and therefore we do not know if aspiration, followed by steroid injection, may be considered a momentarily useful procedure in patients with high possibilities that fistula or ischemia of the overlying skin would develop.

We believed that if the cyst recurred after a long time after aspiration and its dimensions were smaller than before treatment, this practice would be considered an effective temporary solution in inoperable patients. For this reason, we retrospectively observed, in the short and medium term, the clinical course of four ASA 3-4 patients with voluminous type II cyst who underwent aspiration and steroid

injection regarded as the only possible treatment to avoid possible skin complications.

## MATERIAL AND METHODS

Four patients with acromioclavicular joint cyst (3F-1M ; mean age 83 years, range : 78-87 years), considered by the anesthesiologist as ASA 3-4 patients (because they had one or more of these diseases : coronary artery disease ; chronic atrial fibrillation ; valvular disease ; ejection fraction 30%-40% ; diabetes ; ventricular dysfunction ; liver cancer ; severe respiratory insufficiency), were retrospectively observed. All patients had a voluminous oval, no mobile, no fluctuant cyst (max dimensions : 6 cm x 7 cm) overlying the AC joint. All patients referred that the cyst had appeared and rapidly increased in volume (within two months). The cysts had a firm consistency, were covered by telangiectatic vessels, and were scarcely painful (Fig. 1). All patients underwent MRI examination to avoid the suspicion of neoplasia ; in all cases, the MRI showed the geyser effect. None of our patients had a lymphadenopathy.

All patients had an atrophy of external rotator muscles, visible in both physical examination and confirmed by MRI and a compromised active range of motion of the involved shoulder (mean forward flexion : 110° ; mean abduction : 80° ; mean external rotation -side- 5° ; mean internal rotation L5).

Patients were merely submitted to cyst aspiration (utilizing only one posterior via, to not increase the risk of infection and draining sinus) and steroid injection (methylprednisolone 40 mg) (Fig. 2). The content of the cyst (Fig. 3) was microscopically analysed. After aspiration, in all cases a compression bandage was performed.

All patients were clinically evaluated on the day of aspiration, after 14 and 30 days and after 1 year. In each control, the Constant score and pain intensity through the VAS were registered.

## RESULTS

We were able to aspirate 80-150 ml of joint fluid ; at the microscopic analysis the fluids were amorphous, without crystals or typical cells.

At the first follow-up, all patients had a recurrence of the cyst (average size : width 2 cm and height 3 cm). All patients referred that they experienced a lower grade of tension of the skin overlying the cyst and also a very little decreasing of pain intensity. After a month from aspiration, the cysts of



*Fig. 1.* — A 85 year-old- right-handed woman, with a voluminous acromioclavicular type II cyst on her left shoulder.



*Fig. 2.* — AC joint cyst at the end of the aspiration

the 4 patients had the same size as that present before aspiration (Fig. 4). The consistency of the cysts returned to be the same as that appreciated before treatment.

The range of motion, the average value of the pain intensity and the mean Constant score were similar to those recorded before aspiration (Tables I and II). In no case signs of infection or draining



*Fig. 3.* — Aspirated material from the AC joint cyst

sinus occurred. No patient had a rise in body temperature. No patient had a lymphadenopathy.

All patients were deeply disappointed with the clinical result and no one was willing to repeat the same treatment. Only one of the patients underwent surgery (excision of the cyst and removal of the lateral third of the clavicle) three months after the aspiration, accepting the operative risks associated with his health status. At one year after surgery, this patient had no recurrence of the cyst, but not even an increase in the Constant score. The other three patients continue to have, after a year, a voluminous cyst with telangiectatic vessels. No complications (fistula or ischemia of the overlying skin) occurred in these patients.

## DISCUSSION

Acromioclavicular type II cyst is an unusual presentation of full thickness rotator cuff tear in



Fig. 4. — Cyst recurrence after 30 days

patients with degenerative changes of the acromioclavicular joint.

From 1984 to present, 54 cases of acromioclavicular joint cyst have been reported in English literature (1,5,6,10,11). Data suggest that the choice treatment is the cyst excision associated with the lateral clavicle resection and the rotator cuff repair, if it is possible. In cases of cuff tear arthropathy, reverse shoulder prosthesis is indicated in addition to cyst excision (10).

In 1986, Craig (2) described the experience of an 86-year-old man whose cyst had been submitted to several aspirations, followed by re-accumulation within a few weeks. Out of the three cases presented by Postacchini *et al* (9) in 1993, one patient (a 75-year old man) had been undergone repeated aspira-

tions before being operated of cyst excision and lateral clavicle resection. A chronic cyst overlying the acromioclavicular joint was managed with hemiarthroplasty in four patients, by Groh *et al* (4) (2003). All patients had had previous unsuccessful aspiration of the cyst with recurrence. In the Tshering Vogel's *et al* (12) (2005) series, constituted by 9 patients (7M-2F ; mean age of 67 years), aspiration of the cyst was performed in two patients ; subsequently, both underwent surgery due to recurrence. In 2009, Nowak *et al* (4) described a case of a 77-year-old, right hand-dominant woman who underwent cuff tear repair after two aspiration attempts with a rapid re-accumulation of the fluid. In the same year, Murena *et al* (7) submitted a 81-year-old male to lateral clavicle resection after four ultrasound-guided aspirations of the cyst and steroid injections. Of the four cases presented by Hiller *et al* (5) in 2010, two underwent cyst aspiration ; one of them had a recurrence. In 2012, an 84-year-old man was treated with cyst excision and allograft patch of acromioclavicular region by Skedros and Knight (11) after 1 year of observation and 3 aspirations.

All these data indicate that the cysts treated with aspiration and steroid injection recur. Because patients with acromioclavicular type II cysts usually have a no severe shoulder pain, if their general health status contraindicates any type of complex surgery (ASA 3 or 4 patients), watchful waiting may be justified. However, in rare cases, the oval cyst mass can grow to significant sizes to endanger the integrity of the overlying skin, with the possibility to undergo serious complications. In these selected cases, aspiration seems to be the only possible treatment. However it remains unclear how

Table I. — Constant scores registered at each follow up

Case	Sex	Age	Constant Score			
			T0	T1	T2	T3
#1	F	78	35	36	36	35
#2	M	82	37	37	36	34
#3	F	85	33	34	33	35
#4	F	87	38	40	38	35

T0 : aspiration ; T1 : 14 days after aspiration ; T2 : 30 days after aspiration ; T3 : 1 year after aspiration.

Table II. — Pain intensity registered at each follow up.

Case	Sex	Age	VAS			
			T0	T1	T2	T3
#1	F	78	7	6	6	7.5
#2	M	82	6	6	5	6.5
#3	F	85	7	5	7	7
#4	F	87	5	3	5	6

T0 : aspiration ; T1 : 14 days after aspiration ; T2 : 30 days after aspiration ; T3 : 1 year after aspiration.

long the recurrence occurs and if the size of the re-accumulation is similar to that before aspiration.

The present study has some limitations that need to be considered. At first, the medium term follow up does not allow us to affirm certainty whether the aspiration has definitively avoided the possibility of skin complications. Secondly, the small number of patients enrolled, although our series represents 7.4% of type II AC cysts described in literature from 1984 until today.

### CONCLUSION

Our data indicate that the aspirated voluminous cysts recur into two-three weeks and rapidly reach the same size they had before aspiration. Our patients have had only a temporary decrease in skin tension and a transitory pain reduction. Therefore, we believe that aspiration is a useless practice. However it is still a motive for discussion if the reduction of skin tension overlying the cyst has avoided, or simply postponed, an imminent complication.

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