

Acromioclavicular Joint Cyst Treated with Excision and Anterolateral Thigh Flap Reconstruction

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Summary: Acromioclavicular joint (ACJ) cysts are a rare clinical entity that can impair patients' cosmetic appearance as well as activities of daily living. Both nonsurgical and surgical treatments are available, but nonsurgical treatments are often associated with a high recurrence rate. Surgical excision can provide resolution of patients' symptoms, but excision of the cyst as monotherapy is also associated with recurrence. Therefore, various surgical techniques to prevent recurrence have been described, but there is no general consensus regarding the appropriate surgical methods. We describe the case of an 81-year-old man with a recurrent ACJ cyst. The cyst had been excised twice, but it recurred shortly after the excisions. We performed surgical resection and anterolateral thigh (ALT) flap reconstruction. The deteriorated ACJ capsule was repaired with durable fascia lata and the defect after tumor excision was obliterated with an ALT flap harvested from the same donor site as fascia lata. On the 12-month follow-up, the patient had no recurrence of the ACJ cyst. Our case suggests that excision of ACJ cysts as monotherapy is likely to fail, and fascia lata patch for durable ACJ capsule reconstruction can be a viable alternative preventing cyst recurrence. (*Plast Reconstr Surg Glob Open* 2021;9:e3412; doi: [10.1097/GOX.0000000000003412](https://doi.org/10.1097/GOX.0000000000003412); Published online 15 February 2021.)

Acromioclavicular joint (ACJ) cysts are a rare clinical entity, which can impair patients' cosmetic appearance as well as activities of daily living. Both nonoperative and surgical treatments are available, but nonsurgical treatments such as aspiration are typically associated with a high recurrence rate.¹ Surgical excision can resolve patients' symptoms, but cyst excision as monotherapy is also associated with recurrence.² Therefore, various surgical techniques to prevent recurrence have been explored, but a general consensus regarding surgical methods is lacking, as they have shown varied recurrence rates in the literature.³⁻⁶ The present report describes a case of recurrent ACJ cyst successfully treated with surgical resection and anterolateral thigh (ALT) flap reconstruction.

CASE REPORT

An 81-year-old man with no significant medical history presented to our hospital with a recurrent left ACJ cyst. He

had noticed a subcutaneous mass on his left shoulder. Based on a diagnosis of an ACJ cyst, it was excised 5 years previously but it recurred in 5 months. He underwent tumor excision again, and a rotation flap was utilized to obliterate the defect after tumor resection. However, the tumor recurred in 6 months, and he declined its treatment.

He first visited our department after 4 years as the lesion showed rapid enlargement and caused intermittent pain (Fig. 1). The range of motion of his left shoulder was not restricted (flexion, 120 degrees; abduction, 155 degrees; extension, 40 degrees; and external rotation, 50 degrees), but the cyst was disrupting his work as an active master carpenter. Magnetic resonance imaging showed a homogeneous multilocular mass (78 mm × 40 mm × 38 mm) on the ACJ, and degeneration of the ACJ and glenohumeral joint (GHJ) (Fig. 2). A rotator cuff tear was also found with complete tear of the supraspinatus tendon and partial tear of the subscapularis and infraspinatus. The "geyser sign," in which synovial fluid escapes from the GHJ through the ACJ and communicates with the subcutaneous mass, was unclear.

We performed tumor ablation and ALT flap reconstruction under general anesthesia. The extremely thinned skin overlying the cyst was excised, and dissection was performed along the cyst wall (see figure, Supplemental

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Fig. 1. Preoperative photograph of the left shoulder. The ACJ cyst showed rapid enlargement and caused intermittent pain.

Digital Content 1, which demonstrates gross specimen of the excised cyst, <http://links.lww.com/PRSGO/B577>). Ablation of the cyst resulted in wide exposure of the ACJ. Then, an ALT flap was elevated from the left thigh, and the fascia lata was incorporated within the flap to reconstruct the joint capsule. The flap was inserted onto the defect, and the pectoral branch of the thoracoacromial artery and cephalic vein were anastomosed to the arterial and venous pedicle of the flap, respectively. Subsequently, to seal over the potential sources of cyst fluid, the fascia lata of the transferred ALT flap was sutured to the remaining ACJ ligaments and to the margins of bone surfaces of the ACJ through drill holes (Fig. 3) (see figure, **Supplemental Digital Content 2**, which demonstrates the ACJ capsule repair using fascia lata, <http://links.lww.com/PRSGO/B578>). Furthermore, the suture line was reinforced with fibrin glue, to facilitate watertight closure. Postoperatively, his shoulder was immobilized in the resting position for 5 days to avoid disruption of the wound and vascular anastomosis.

The postoperative course was uneventful, and the flap survived entirely. A microscopic examination of the excised cyst revealed a synovial cyst composed of synovium-lined structures containing articular fluid, with no evidence of malignancy. He was discharged 12 days after surgery



Fig. 2. T2 weighted magnetic resonance imaging showing a homogeneous multilocular mass on the ACJ cyst.

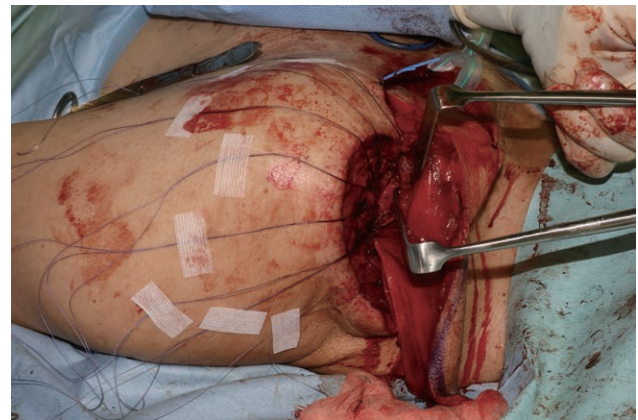


Fig. 3. Ablation of the cyst resulted in wide exposure of the ACJ. Fascia lata of the transferred anterolateral thigh flap was sutured to the remaining ACJ ligaments and through drilled holes to the margins of bone surfaces of the ACJ.

and resumed work without discomfort. At the 12-month follow-up, the ACJ cyst had not recurred (Fig. 4) and the active range of motion was as follows: flexion, 120 degrees; abduction, 150 degrees; extension, 40 degrees; and external rotation, 45 degrees.

DISCUSSION

ACJ cysts are a rare manifestation, typically benign, and either ganglionic or synovial.³ They are classified as type-1 and type-2 cysts according to their etiology.⁷ Type-1 cysts are seen in advanced ACJ arthritis, and are



Fig. 4. Photograph taken 12 months after the operation. The intermittent superficial pain was relieved immediately after the surgery, and the patient continues to have full, pain-free range of motion, with no signs of cyst recurrence.

not associated with rotator cuff tear. Over time, degenerative changes of the ACJ cause irritation of the synovium, leading to an overproduction of the fluid and resulting in cyst formation superficial to the joint. Type-2 cysts are associated with chronic rotator cuff tear. A complete tear of the rotator cuff predisposes to superior migration of the humeral head, leading to irritation and deterioration of the ACJ capsule. Increased synovial fluid production causes the GHJ fluid to leak into the communicating ACJ to produce cysts.

Treatment options for ACJ cysts include observation, aspiration, and surgical interventions.^{3,8,9} Aspiration is often performed, but is associated with a high recurrence rate and risk of fistula formation.¹⁰ Various operative techniques have been described in the literature, either as single or combined modalities; cyst excision, distal clavicle excision, ACJ resection, arthroplasty, acromioplasty, arthroscopic intervention, and rotator cuff repair are among them.³ Surgical methods are selected for patients depending on the type of the cyst, individual findings, symptoms, and systemic conditions of the patients.⁴

To our knowledge, the application of a fascia lata patch for the treatment of an ACJ cyst has not been reported. In our case, a recurrent ACJ cyst with rotator cuff injury (type 2) was successfully treated with cyst excision and ALT flap reconstruction for durable repair of the ACJ capsule. In the first surgery, only excision of the cyst was performed, but it recurred in 5 months. In the second surgery, the cyst was excised again, along with use of a rotation flap to facilitate tension-free closure of the wound; however, it recurred in 6 months. Therefore, we decided to replace the deteriorated ACJ capsule with durable fascia lata,⁴ and obliterate the defect after tumor excision with an ALT flap harvested from the same donor site as the fascia lata.

For the treatment of type-2 ACJ cysts, several operative maneuvers have been advocated that help to terminate the communication between the ACJ and GHJ, such as arthroplasty and even direct closure of the channel with purse-string sutures.^{1,2} In our case, the “geyser sign” was not confirmed on the preoperative magnetic resonance imaging, and fluid leakage into the ACJ was not identified intraoperatively. Thus, we only performed a tight and firm closure of the ACJ capsule. Although some authors also recommend rotator cuff repair to block entry of the synovial fluid into the ACJ capsule,^{5,6} we did not address the suspected full-thickness rotator cuff tear, because the shoulder had unrestricted range of motion and enough strength, without pain on provocative maneuvers.^{1,4} The intermittent superficial pain relieved immediately after the surgery, and the patient continued to have a full, pain-free range of motion with no recurrence at the 12-month follow-up.

Our case suggests that excision of ACJ cysts as monotherapy is likely to fail, and that a fascia lata patch for durable ACJ capsule reconstruction can be a feasible alternative, preventing cyst recurrence.

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