

## Treatment of Cysts of the Acromioclavicular Joint with Shoulder Hemiarthroplasty\*

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**ABSTRACT:** A chronic cyst overlying the acromioclavicular joint was managed in four patients, between July 1988 and September 1991. All patients had had previous unsuccessful aspiration and excision of the cyst with recurrence. Each cyst was associated with a chronic, massive defect of the rotator cuff; superior migration of the humeral head; and degenerative osteoarthritis of the glenohumeral joint. All patients had complained of pain and limitation of motion (mean forward elevation, 95 degrees; mean external rotation, 20 degrees; and mean internal rotation, to the spinous process of the second lumbar vertebra). All procedures consisted of a large-humeral-head hemiarthroplasty, with no operative treatment directed at the cyst or the acromioclavicular joint.

At an average of twenty-seven months (range, fifteen to thirty-six months) after the operation, the patients were all pain-free and had not had a recurrence of the cyst. The average postoperative range of motion was 130 degrees of forward elevation, 30 degrees of external rotation, and internal rotation to the spinous process of the first lumbar vertebra.

A subcutaneous cyst over the acromioclavicular joint is rare. To our knowledge, only five such lesions have been described<sup>2,4,9</sup>. We report on four additional patients who were managed by the senior one of us (C. A. R., Jr.). All four patients had a large defect of the rotator cuff, proximal migration of the humeral head, and degenerative osteoarthritis of the glenohumeral joint.

### Materials and Methods

Four patients were referred to the Shoulder Service, University of Texas Health Science Center at San Antonio, between July 1988 and September 1991 for the

treatment of a subcutaneous cyst over the acromioclavicular joint (Table I). There were three men and one woman, and the average age was sixty-six years (range,

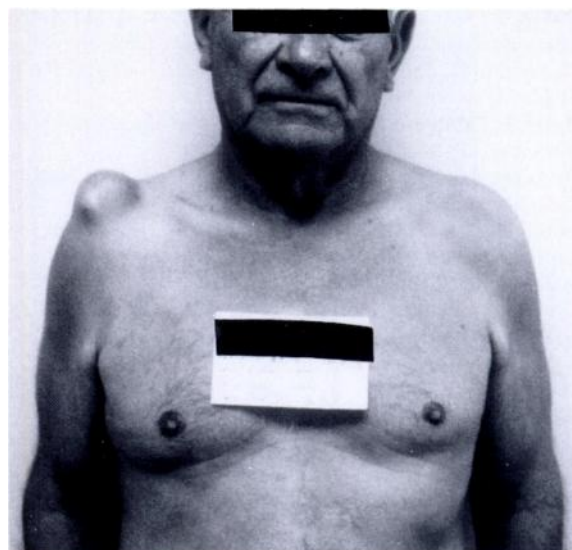


FIG. 1-A

Figs. 1-A through 1-G: Case 2.

Fig. 1-A: Preoperative clinical photograph showing a large subcutaneous cyst overlying the acromioclavicular joint of the right shoulder.

sixty to seventy-one years). The right shoulder was involved in three patients and the left, in one; three lesions involved the dominant limb.

All four patients complained of pain that limited their usual daily activities. All four had had an attempted excision of the cyst and aspiration. One patient had had a subacromial decompression and an attempted repair of the rotator cuff, and another had had an arthroscopic decompression and an attempted repair of the rotator cuff with subsequent arthroscopic removal of the staple. No patient had relief of the symptoms as the result of any of these procedures. The average duration of the symptomatic cysts was twenty-two months (range, eighteen to thirty-two months).

At the initial examination, motion of the shoulder was limited in each patient. Active forward elevation averaged 95 degrees (range, 20 to 155 degrees) and pas-

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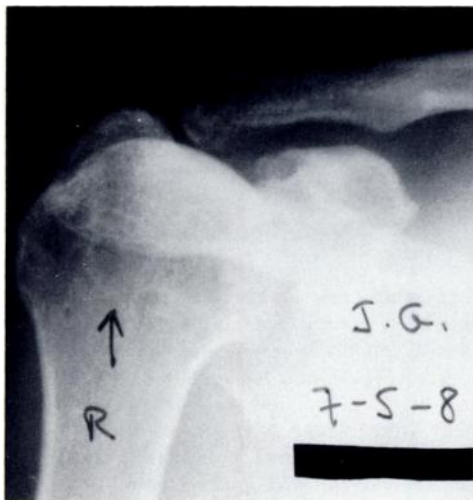


FIG. 1-B

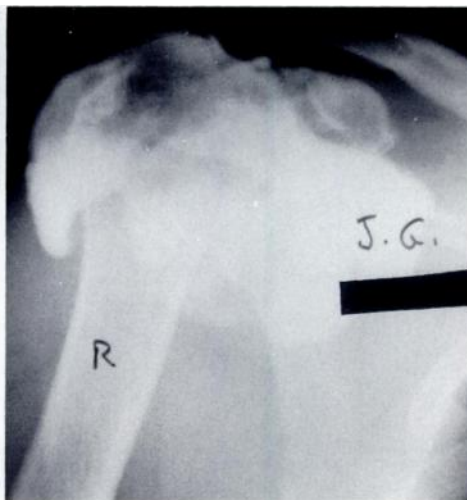


FIG. 1-C

Fig. 1-B: Anteroposterior radiograph showing superior migration of the humeral head and degenerative changes of the glenohumeral joint. Fig. 1-C: Anteroposterior arthrogram, made with the shoulder in neutral rotation, showing a large defect in the rotator cuff.

sive external rotation averaged 20 degrees (range, 10 to 60 degrees). The mean active internal rotation was to the spinous process of the second lumbar vertebra (range, fifth sacral to tenth thoracic vertebra). All four patients had wasting of the supraspinatus and infraspinatus fossae, and external rotation against resistance was weak (either 3 of 5 or 4 of 5, according to the grading system of the Medical Research Council).

Radiographs revealed degenerative changes of the glenohumeral joint and superior migration of the humeral head in all patients. An arthrogram that had been made previously for one patient (Case 2) demonstrated a tear of the rotator cuff, with contrast material communicating into the acromioclavicular joint (Fig. 1-C).

Each patient was managed with a hemiarthroplasty, performed through a long deltopectoral approach. Intraoperatively, all patients were found to have a massive defect of the rotator cuff involving multiple tendons. Severe degenerative changes of the humeral head, with formation of osteophytes, and degenerative changes of the glenoid, which were most pronounced superiorly, were also noted in each patient. All patients had débridement of the irreparable tendons of the cuff in addition to the hemiarthroplasty.

A large-head humeral component was selected and was allowed to articulate with the proximal corner of the glenoid fossa, the inferior surface of the acromion, and the distal portion of the clavicle. Three patients (Cases 1, 2, and 3) were managed with a fixed large-head component (Kirschner, Timonium, Maryland), and the remaining patient (Case 4) received a modular large-head component (Depuy, Warsaw, Indiana). The humeral component was inserted in a press-fit fashion in three patients, and in the remaining patient it was cemented due to insufficient bone stock secondary to rheumatoid arthritis. No operative treatment was directed at either the acromioclavicular cyst or the acro-

mioclavicular joint. The coraco-acromial ligament was preserved in all patients.

Postoperatively, all patients were managed with a standard shoulder-arthroplasty protocol. On the first postoperative day, passive range-of-motion exercises, with use of a pulley and supine elevation with the patient holding a three-foot (ninety-one-centimeter) stick, were initiated. These devices allowed the patient to begin a program of self-assisted passive motion, which was continued as a home-exercise program. The patients were encouraged to use the shoulder in activities of

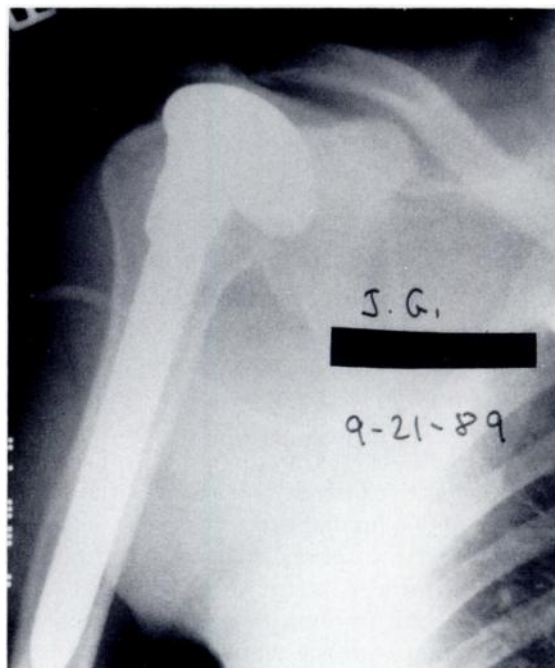


FIG. 1-D

Anteroposterior radiograph showing the humeral prosthesis in place. The large head articulates with the undersurface of the acromion and the superior surface of the glenoid.

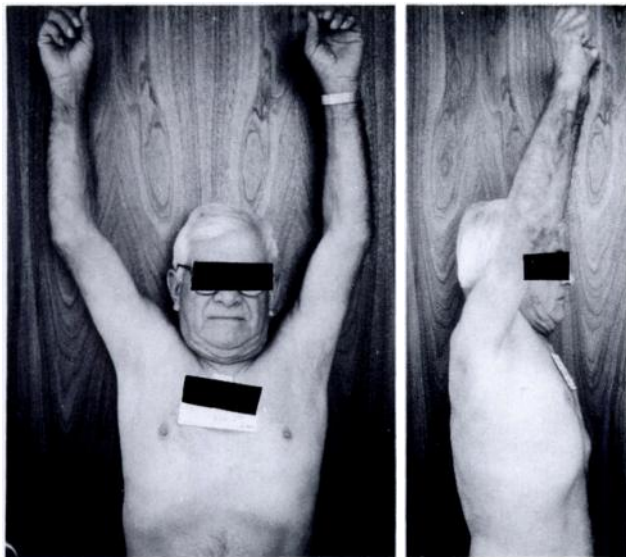


FIG. 1-E

FIG. 1-F

Frontal and side views, demonstrating maximum active forward elevation of the shoulders.

daily living, such as brushing of the teeth and hair, dressing, and bathing. Two weeks after the operation, the running nylon subcuticular suture was removed. Passive range of motion was stressed the first six weeks postoperatively, after which time the patients began a rehabilitation program to strengthen the deltoid, scapular stabilizers, and remaining rotator cuff. Range-of-motion exercises were continued during this active strengthening program, and the stretching exercises were further emphasized<sup>1</sup>.

The average duration of follow-up was twenty-seven months (range, fifteen to thirty-six months). At the follow-up visit, the patients were questioned and examined by the senior one of us (C. A. R., Jr.). In addition, routine anteroposterior and axillary lateral radiographs were made and evaluated.

### Results

The average range of motion of the shoulder improved in all patients, from 95 degrees (range, 20 to 155 degrees) of forward elevation preoperatively to 130 degrees (range, 70 to 165 degrees) postoperatively. Passive external rotation averaged 30 degrees (range, 20 to 60 degrees) postoperatively, compared with 20 degrees (range, 10 to 60 degrees) preoperatively. The average postoperative active internal rotation was to the spinous process of the first lumbar vertebra (range, fifth lumbar to twelfth thoracic vertebra); preoperatively, it had been to the spinous process of the second lumbar vertebra (range, fifth sacral to tenth thoracic vertebra). Active external rotation with the elbow at the patient's side ranged from 3 of 5 to 4 of 5<sup>2</sup>, which was the same as preoperatively.

No patient had a recurrence of the acromioclavicular cyst. Follow-up radiographs revealed no evidence of

loosening of the humeral component. No patient complained of pain in the shoulder. All patients were able to use the involved shoulder in activities of daily living, including dressing, eating, perineal care, and hair-combing. No patient was able to perform strenuous overhead activity with the involved shoulder.

### Illustrative Case Report

**CASE 2.** A sixty-seven-year-old man was referred for treatment of a recurrent cyst over the acromioclavicular joint (Fig. 1-A). He had had three previous operative excisions and multiple aspirations. He had discomfort in the shoulder and a limited range of motion (155 degrees of flexion, 60 degrees of passive external rotation, and internal rotation to the spinous process of the first lumbar vertebra). There was marked weakness of external rotation (3 of 5), and atrophy was visible within the supraspinatus and infraspinatus fossae. Radiographs showed superior migration of the humeral head and degenerative changes of the glenohumeral joint (Fig. 1-B). An arthrogram demonstrated a massive defect in the rotator cuff and contrast material traversing through the acromioclavicular joint and into the subcutaneous cyst (Fig. 1-C).

At the time of the operation, a massive tear of all four tendons of the rotator cuff and the long head of the biceps was observed. A large-head humeral component was press-fit into place, and the non-viable edges of the tendons were debrided (Fig. 1-D).

Thirty months after the operation, the patient had forward elevation of 165 degrees, was pain-free, and had had no recurrence of the cyst (Figs. 1-E and 1-F). Follow-up radiographs revealed the humeral component to be in a good position, without loosening (Fig. 1-G).

### Discussion

Previous reports of acromioclavicular cysts have described several alternative treatments, including ex-

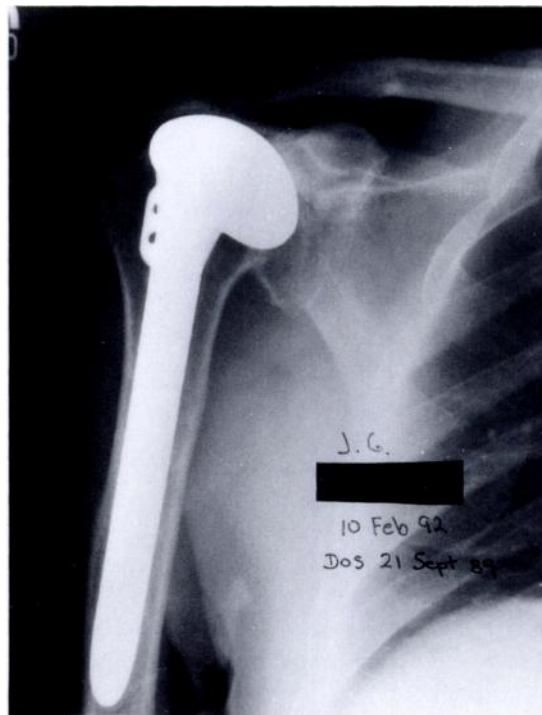


FIG. 1-G

Radiograph, made thirty months postoperatively, showing the unchanged position of the humeral prosthesis without evidence of loosening.

TABLE I  
DATA ON THE PATIENTS

Case	Sex, Age (Yrs.)	Symptoms	Associated Diagnosis	Previous Treatment	Procedure	Duration of Follow-up (Mos.)	Forward Elevation	
							Preop.	Postop.
1	F, 65	Pain, mass	Rheum. arthrit.	Excis., mult. aspirations	Rotator-cuff débrid., large- head hemiarth.	36	20	70
2	M, 67	Mass	Degen. joint disease	Excis. × 3, mult. aspirations	Rotator-cuff débrid., large- head hemiarth.	30	155	165
3	M, 71	Pain, mass	Degen. joint disease	Rotator-cuff repair, staple removal, excis., aspiration	Rotator-cuff débrid., large- head hemiarth.	15	145	155
4	M, 60	Pain, mass	Degen. joint disease	Rotator-cuff repair and subacromial decomp., excis., aspiration	Rotator-cuff débrid., large- head hemiarth.	28	60	130

cision of the cyst alone<sup>3</sup>, excision combined with repair of the rotator cuff<sup>3</sup>, and débridement<sup>9</sup>. However, the duration of follow-up in these reports was limited, and little attention was given to the patient's over-all function.

The etiology and pathogenesis of synovial cysts in general remains unclear. A number of theories have been advanced, including trauma, connective-tissue degeneration, and synovial extension from an adjacent joint<sup>7,13</sup>. Craig proposed that the acromioclavicular cyst is formed by leakage of fluid from the glenohumeral joint through a defect in the rotator cuff and into a degenerated acromioclavicular joint<sup>3</sup>. This communication may be demonstrated on an arthrogram or a computerized tomographic arthrogram<sup>5,12</sup> (Fig. 1-C). In some patients, the contrast material has outlined the acromioclavicular joint, which has been characterized as having an appearance similar to a geyser. Craig suggested an association between these arthrographic signs and the presence of severe disease of the rotator cuff<sup>4</sup>.

An alternative theory, proposed by Nardini, suggested that the cyst is the direct result of a mechanical irritation of the acromioclavicular joint from direct contact of the humeral head in the presence of a torn rotator cuff. Common to both of these theories is the association of a torn rotator cuff with resultant superior migration of the humeral head, allowing articulation of the head with the undersurface of the

acromioclavicular joint. In patients who have advanced disease, degeneration of the glenohumeral joint is also seen<sup>6,10,11</sup>.

Although no operative treatment was directed toward the acromioclavicular cyst or the acromioclavicular joint in the current series, the cysts resolved with treatment directed at the underlying lesion of the rotator cuff and the glenohumeral osteoarthritis. A hemiarthroplasty was selected as the treatment for our patients for two reasons. First, previous treatment directed solely at the acromioclavicular cyst had proved unsuccessful. Second, the cyst was associated with both glenohumeral osteoarthritis and dysfunction of the rotator cuff, and this procedure relieves pain and enhances the function of the shoulder<sup>14</sup>. At the latest follow-up examination, no patient had symptoms related to the acromioclavicular joint. It appears that successful treatment of the underlying disease process with a hemiarthroplasty results in resolution of the cyst and the associated symptoms.

Treatment of a subcutaneous cyst overlying the acromioclavicular joint can prove unpredictable when not directed toward the underlying pathological process. Our results suggest that hemiarthroplasty is an effective method for treating not only the cyst but, more importantly, the underlying degenerative disease in the acromioclavicular and glenohumeral joints and the incompetent rotator cuff.

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