Surgical Excision of a Symptomatic Congenital Coracoclavicular Joint

STEPHEN GIBBS, MD; JARRAD A. MERRIMAN, MD, MPH; ERIC SORENSON, BA; GEORGE F. RICK HATCH III, MD

abstract

The coracoclavicular joint is a rare anatomic variant that consists of an articulation between the conoid tubercle of the clavicle and the superior surface of the coracoid process of the scapula. The coracoclavicular joint is most often asymptomatic and is found incidentally. A symptomatic coracoclavicular joint is exceedingly rare, with only 17 cases reported from 1915 to 2009. Symptoms may include limited range of motion, paresthesia, and brachialgia with radiation to the ipsilateral extremity. In the case of symptomatic coracoclavicular joints for which treatment data are reported, the response to conservative management with rest, analgesics, and physical therapy has been poor. Operative management resulted in complete resolution of symptoms in most patients and symptomatic improvement in the rest. This article reports the case of a 63-year-old man who presented with chronic left anterior shoulder pain exacerbated by forward flexion and overhead activities. Radiographs and computed tomography scan of the affected shoulder showed a bony articulation between the clavicle and the coracoid process of the scapula. The patient did not achieve long-term relief through conservative measures and corticosteroid injections, so the joint was surgically excised by an open procedure. Intraoperative findings were significant for a fully formed synovial joint with a capsule articulating between the clavicle and the coracoid process. After resection, the patient had minimal residual pain, improved range of motion, and symptomatic improvement with activity. The current case provides further data that the coracoclavicular joint can be the cause of significant shoulder pain and can be treated successfully with total resection of the joint if symptoms do not improve with conservative non-operative measures.

The authors are from the Department of Orthopaedic Surgery and Athletic Medicine (SG, ES, GFRH), University of Southern California, Keck School of Medicine, Keck Hospital of USC, Los Angeles; and the San Francisco Orthopedic Residency Program (JAM), St. Mary’s Medical Center, San Francisco, California.

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Correspondence should be addressed to: Stephen Gibbs, MD, Department of Orthopaedic Surgery and Athletic Medicine, University of Southern California, Keck School of Medicine, Keck Hospital of USC, 1500 San Pablo St, Los Angeles, CA 90033 (Stephen.Gibbs@med.usc.edu).

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The coracoclavicular joint is a rare anatomic variant that consists of an articulation between the conoid tubercle of the clavicle and the superior surface of the coracoid process of the scapula. Morphologically, the coracoclavicular joint has been observed to range from a primitive bony articulation to a fully formed diarthrodial joint with cartilaginous articular surfaces and a joint capsule.\(^1\)

Estimates of the prevalence of the coracoclavicular joint by numerous cadaveric, osteologic, and radiographic studies range from 0.04% to 10%, although 1 study estimated that its prevalence may be as high as 30%.\(^2\) When identified, a coracoclavicular joint is frequently bilateral and asymptomatic and is found incidentally.\(^1,2\)

A symptomatic coracoclavicular joint is very rare. A review by Singh et al\(^3\) identified a total of 17 cases described in the literature from 1915 to 2009. The most common symptom is shoulder pain. Associated symptoms may include limited range of motion, paresthesia, and brachialgia with radiation to the ipsilateral extremity. The current article describes a patient with chronic shoulder pain that was relieved by surgical excision of a congenital coracoclavicular joint. The patient was informed that a report of the case would be submitted for publication, and he provided consent.

**Case Report**

A 63-year-old man presented with left anterior shoulder pain of more than 5 years’ duration. Pain was exacerbated by overhead activities and by forward flexion, which was limited to 140°. The shoulder was tender to palpation over the coracoid process. No weakness of the rotator cuff was noted. The patient had no pain in the right shoulder. Radiographs of the affected shoulder showed a bony articulation between the coracoid process and the clavicle (Figure 1). Computed tomography scan further showed a formed joint between the undersurface of the clavicle and the base of the coracoid.

Corticosteroid injections in the region of the anomalous bony articulation provided relief from pain for 2 to 3 weeks. However, long-lasting relief was not achieved. Because conservative management was unsuccessful, the patient underwent open resection of the coracoclavicular joint. Under general anesthesia, an anterior longitudinal saber-type incision was made in the skin directly over the palpable coracoclavicular joint. The pectoralis major was elevated off the clavicle. A diarthrodial joint with a capsule was visualized between the undersurface of the clavicle and the base of the coracoid (Figure 2). The joint was approximately 2×2 cm. The capsule was incised, with removal of the joint capsule and joint tissue. The coracoid articulation and then the clavicular articulation were resected with an oscillating saw, and an osteotome was used to protect surrounding neurovascular structures (Figure 3). A taut band of tissue between the undersurface of the clavicle and the base of the coracoid, consistent with a rudimentary conoid ligament, was visualized and left intact. There was no evidence of a discrete trapezoid ligament after joint resection.

The acromioclavicular joint was found intact, and intraoperative stress testing of the joint was performed. No instability to rotational stress was observed, despite a space of greater than 2 cm between the clavicle and the base of the coracoid. The pectoralis major was closed back onto the clavicle and the trapezial fascia of the clavicle with heavy, inverted absorbable sutures. The subcutaneous tissues and skin were closed in a routine manner.

Postoperatively, the patient remained in a sling for 1 week before gradual return to activity with physical therapy. Postoperative radiographs showed resection of the coracoclavicular joint (Figure 4). Eight weeks later, the patient had minimal residual pain with continued improvement. Range of motion on forward flexion was 160°. Overhead activities were less

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**Figure 1:** Anteroposterior radiograph of the left shoulder showing a well-formed coracoclavicular joint.

**Figure 2:** Intraoperative photograph of the left shoulder before excision of the coracoclavicular joint.

**Figure 3:** Intraoperative photograph of the left shoulder after excision of the coracoclavicular joint.
painful and more manageable. Follow-up radiograph of the affected shoulder at 12 weeks showed mild superior migration of the distal clavicle at the acromioclavicular joint. However, the patient had no pain at the acromioclavicular joint and no tenderness was elicited during physical examination.

**DISCUSSION**

The clavicle and the coracoid process are normally connected by the coracoclavicular ligament complex, which is formed by the conoid and trapezoid ligaments. A rare, anomalous joint between the clavicle and the coracoid has been described in studies dating to the mid-19th century. Formation of the joint is believed to occur by cartilaginous metaplasia of the trapezoid ligament.

The factors that contribute to the formation of a coracoclavicular joint have not been identified. The development of a coracoclavicular joint may be related to aging; some studies have found it to be more prevalent among individuals older than 40 years. The prevalence of a coracoclavicular joint does not appear to differ between the sexes. Although 1 study found that individuals with a coracoclavicular joint possessed significantly larger scapulae, longer first ribs, and longer clavicles than those without this joint, another study found no such association and a third showed no difference in clavicle length or sinuosity of the clavicle among those with and without a coracoclavicular joint.

Symptomatic coracoclavicular joints are markedly rare. A comprehensive literature search published in 2011 by Singh et al yielded 17 cases reported from 1915 to 2009. The dominant presenting symptom was shoulder pain in 12 of 17 cases (70.6%), followed by limited range of motion of the shoulder, with or without a painful arc of movement in 5 (29.4%). Associated symptoms included upper-extremity paresthesia in 4 cases (23.5%) and brachialgia and radiation of pain to the ipsilateral side in 3 (17.6%). In addition, swelling and tenderness at the site of the coracoclavicular joint, bilateral fractures of the surgical neck of the humerus, and hand weakness occurred in 1 patient each (5.9%). The average age at presentation, when it was recorded, was 39.1 years (range, 19-71 years). To the best of the authors’ knowledge, the current case is the only other report of a symptomatic coracoclavicular joint to date.

Shoulder pain in the setting of a coracoclavicular joint has been proposed to result from compression of the brachial plexus, supracoracoid impingement, or degenerative changes in the anomalous joint. Treatment data exist for 11 previously reported cases of a symptomatic coracoclavicular joint. Conservative management, with rest, analgesics, and physical therapy, was attempted in all 11 patients, with 1 patient (9.1%) having complete resolution of symptoms. Corticosteroid injection at the site of the coracoclavicular joint resulted in complete resolution of symptoms in 1 patient (9.1%). Operative management, with resection of the coracoclavicular joint, was performed in 9 patients, resulting in complete resolution of symptoms in 7 patients (77.8%) and improved symptoms in 2 (22.2%).

Thus, the response to non-operative management has generally been poor, with complete resolution of symptoms in only 1 of 11 (8.3%) previously reported patients for whom treatment data are available. The response to surgical resection of the coracoclavicular joint has been excellent, with most patients reporting complete resolution of symptoms and the rest reporting improvement.

Postoperatively, the current patient had asymptomatic superior subluxation of the distal clavicle. Although he did not have symptoms secondary to this subluxation, there is a theoretical risk of symptomatic instability of the acromioclavicular joint after coracoclavicular joint resection.

The current patient provides further evidence that the coracoclavicular joint can cause significant shoulder pain and can be treated successfully by total resection if symptoms do not improve with conservative measures.

**REFERENCES**