J Shoulder Elbow Surg (2019) 28, e187–e189

ELSEVIER

Journal of Shoulder and Elbow Surgery

www.elsevier.com/locate/ymse

Unusual cause of medial clavicle pain: osteoarthritis in an abnormal costoclavicular articulation

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Keywords: Medial clavicle; sternoclavicular joint; costoclavicular joint; costoclavicular ligament; SAPHO; sternoclavicular hyperostosis

The medial articulation of the clavicle forms a synovial saddle joint with the manubrium at the sternoclavicular joint. A cartilaginous disk divides the sternoclavicular joint into 2 discrete compartments. The clavicle is stabilized medially by the anterior and posterior sternoclavicular ligaments and inferiorly by the costoclavicular ligament, which attaches to the first rib. This articulation to the first rib is usually ligamentous with no osseous component. Primary osseous costoclavicular articulations, in the absence of trauma or an inflammatory syndrome, are rare. We report on an unusual presentation of degenerative noninflammatory arthritis in a unilateral costoclavicular joint.

Case

A 39-year-old woman presented with an 8-year history of nontraumatic medial clavicle pain. The pain was of gradual onset and initially associated with swelling and mild radiation to the base of the neck. Oral analgesia and activity modification had failed to control her symptoms. During her initial examination, she was noted to have full shoulder movement and normal strength.

The patient's initial radiographs were unremarkable, but because of the persisting discomfort, she proceeded to undergo a computed tomography (CT) scan; this revealed a degenerative articulation between the clavicle and the first rib. There was congruence and associated focal sclerosis at the abnormal articulation, but the rest of the medial clavicle, first rib, and sternum showed normal structures (Fig. 1). A bone scan was performed and demonstrated increased signal at the abnormal articulation (Fig. 2). Two ultrasound-guided steroid injections were administered to the costoclavicular joint on separate occasions, and both times, the patient enjoyed satisfactory but temporary pain relief.

In view of the patient's persistent symptoms, a magnetic resonance imaging (MRI) scan was obtained to assess the surrounding soft tissues and bone. The MRI scan showed a normal sternoclavicular joint with no osseous or soft-tissue changes. Synovial cysts were observed around the costoclavicular articulation.

Given the patient's recurrent symptoms and the isolated nature of the pathology, involving the anterior half of the costoclavicular articulation, we opted to proceed with a surgical excision. She was carefully counseled on the risks of surgery, and as part of the planning, we ensured that a vascular surgeon was readily available.

Surgical technique

The procedure was performed with the patient under a general anesthetic. She was positioned supine with a sandbag placed between the scapulae posteriorly to

This case report was discussed with the institutional review board equivalent and did not require ethics approval.

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https://doi.org/10.1016/j.jse.2019.02.003

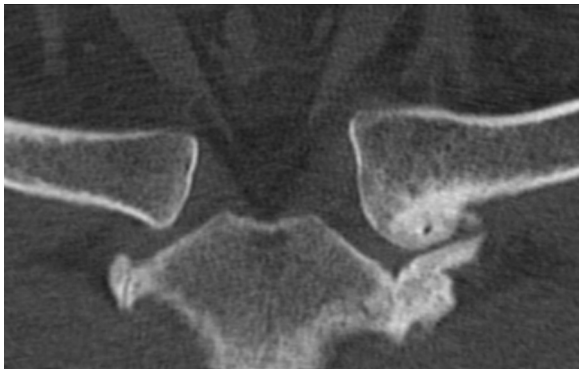

Figure 1 Computed tomography scan demonstrating arthritic costoclavicular joint.

improve exposure. The clavicle and sternum were marked prior to the skin incision. A horizontal skin incision approximately 8 cm long was made inferior to the clavicle, crossing the costoclavicular joint to the sternum (Fig. 3). The dissection was continued down to the epimysium of the pectoralis major muscle, exposing its superomedial attachment. An L-shaped incision was made through the pectoralis major origin at the inferior clavicle and lateral sternal edge, allowing the muscle to be peeled inferiorly as a flap and leaving adequate tissue to perform closure. The abnormal costoclavicular joint was readily identified owing to the bone spurs following subperiosteal dissection. The spurs were removed with a bone rongeur, after which the anterior degenerative articulation was carefully excised by use of fine osteotomes. We confirmed adequate resection by ballottement of the medial clavicle, making sure there was no restricting contact between the clavicle and first rib. The sternoclavicular joint remained stable. We then applied bone wax to the raw bone surfaces to control bleeding before wound closure using absorbable sutures. The patient was placed in an arm sling for comfort for a period of 2 weeks.

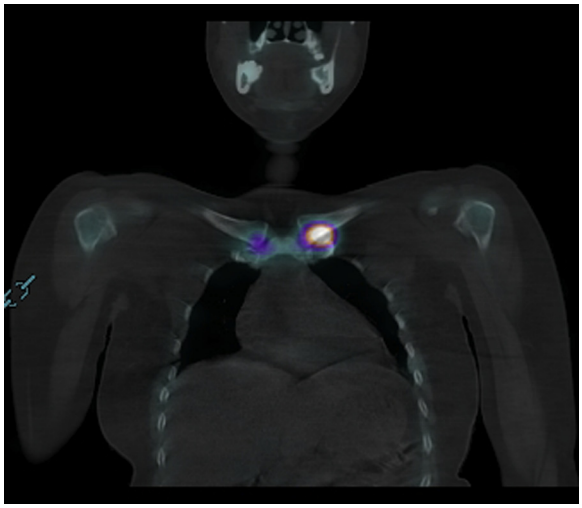

Figure 2 Bone scan showing increased focal activity at costoclavicular joint.

Figure 3 Preoperative incision planning.

Results

The wound healed uneventfully, and the patient commenced range-of-motion exercises after 2 weeks. She had some residual aching at the 3-month review; a CT scan was obtained and confirmed a satisfactory bone excision between the first rib and clavicle (Fig. 4). At the subsequent 6- and 9-month reviews, she was symptom free with a full range of motion and had returned to all her normal activities.

Discussion

This case report highlights an unusual cause of medial clavicle pain. The costoclavicular joint is a rare anatomic variant that has seldom been described in the literature.

Redlund-Johnell[1] identified the presence of a costoclavicular joint in 2 cases during incidental investigation of 450 radiographs and a further review of 500 cases. Of the 2 cases discovered, both were asymptomatic on review, with no symptoms during subsequent follow-up. Degenerative changes did not develop in the aforementioned articulation in either of the patients reviewed.

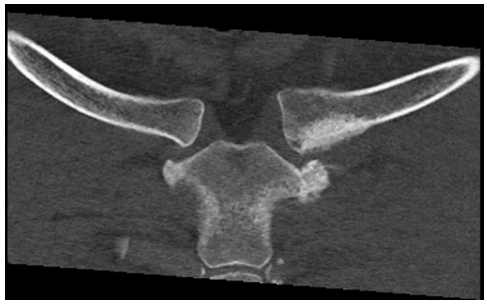

Figure 4 Postoperative computed tomography scan showing increased costoclavicular interval with excision of ledge of bone superior to first rib.

We recommend thoroughly investigating this type of presentation to rule out inflammatory or neoplastic conditions affecting the medial clavicle and degenerative changes at the sternoclavicular joint. CT imaging, bone scanning, and MRI scanning are useful adjuncts in this differentiation. Sternoclavicular joint arthritis is readily distinguished with CT scanning.

An important disorder in the differential diagnosis is sternocostoclavicular hyperostosis, which is a chronic inflammatory disorder presenting with swelling around the medial clavicle.[2] Radiologically, these patients are often found to have hyperostosis and sclerosis of the sternum, distal clavicle, and first rib and may have an articulation between the clavicle and first rib. The ''bullhead'' appearance[3] on bone scanning is highly sensitive. The acronym ''SAPHO'' has been applied to this condition, comprising synovitis, acne, pustulosis, hyperostosis, and osteitis. Surgery has not been shown to be effective in this anatomically diffuse condition, hence the importance of arriving at the correct diagnosis of this rare condition.[2]

Conclusion

We advise a course of targeted steroid injections to confirm that the pain is from the joint prior to proceeding with surgery. The operation is not complex but, in our case, we ensured a vascular surgeon was informed and in an adjacent theater given the proximity to the major vessels, particularly the subclavian vein. In patients who receive a correct diagnosis and in whom conservative treatment has failed, surgical excision is an option in managing this anatomic variation.

Disclaimer

The authors, their immediate families, and any research foundations with which they are affiliated have not received any financial payments or other benefits from any commercial entity related to the subject of this article.

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