Imaging-Guided Treatment of Scapulothoracic Bursitis

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Introduction

Scapulothoracic region pain can be a diagnostic dilemma, occasionally being confused with other causes of shoulder pain or even a thoracic or cervical radiculopathy. True scapulothoracic bursitis can be caused by abnormal biomechanics between the scapula and the rib cage as an isolated entity, due to a structural lesion such as a tumor, posttraumatic, idiopathic, or secondary to a postsurgical deformity of the chest wall [1, 2]. Treatment of scapulothoracic bursitis can include conservative and surgical options, such as arthroscopic release of fibrous adhesions or bursectomies, or image-guided steroid/anesthetic injections of the bursa [2, 3, 4].

We present a case of a patient with scapulothoracic bursitis related to prior chest wall trauma and subsequent thoracoplasty, diagnosed with real-time fluoroscopy and treated with ultrasound-guided injection.

Case report

This is a 47-year-old female who sustained a severe traumatic injury to the posterior right chest wall and right lung in 1994. Multiple surgical procedures were performed over the subsequent 10 years, including resection of the involved posterior right fourth through seventh ribs, resection of heterotopic ossification arising in this region, T4–T7 ganglionectomies, and placement of a Gore-Tex (WL Gore and Associates, Flagstaff, AZ, USA) patch at the posterior chest wall operative site. This patch later failed and was replaced with a methylmethacrylate patch encased in Marlex (Chevron Phillips Chemical, The Woodlands, TX, USA) mesh in April of 2005.

Despite the extensive surgical procedures and revisions, the patient complained of debilitating pain and a sensation of “bone on bone” apposition at the level of the lowest native rib, exacerbated by lowering the upper extremity and largely relieved by upper extremity elevation. After 2 years of aggressive physical therapy and several pain management and surgical consultations, the pain persisted without improvement, and the patient was presented to this institution for dedicated imaging and further surgical consultation.

Multiple fluoroscopic images of the operative area were obtained, as well as cine video loops of the right scapulothoracic articulation during various arm and shoulder positions, some of which were performed to reproduce the patient’s pain. With the arm extended over the head and supported by the left arm, the patient experienced no pain. When the right arm was brought to the side and the shoulder was lowered, however, the patient encountered significant pain and had a palpable sensation of osseous clicking at the scapulothoracic articulation (see Fig. 1).

Imaging during fluoroscopy demonstrated extensive postoperative change of the posterior right chest wall with a large linear area of apparent methylmethacrylate placement for reconstruction of the posterior chest wall. When the patient lowered the right arm and shoulder, the tip of the scapula contacted the apparent last native posterior rib and palpably ridged over the rib, external to the rib and elicited significant pain. The scapula did not pass internal to the lowest remaining rib (see Fig. 1). A diagnosis of scapulothoracic bursitis and adhesions limiting motion and causing pain was made and the patient was sent to ultrasound for further treatment.

Preliminary ultrasound evaluation of the inferior scapular region demonstrated an ill-defined, hypoechoic bursa containing small internal echoes, thought to represent dystrophic calcifications, consistent with scapulothoracic bursitis (see Fig. 2). This was localized to the inferior margin of the scapula at the area of clinical concern and appeared to arise at the area of the articulation of the adjacent rib and scapula. Under direct ultrasound visualization, a 22-gauge spinal needle was inserted into the scapulothoracic bursa and a mixture of anesthetic and

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Fig. 1. Selected fluoroscopic images (left posterior oblique, **a**, **b**, and **c**) taken during examination of the scapulothoracic region and chest wall demonstrates the relation of the scapular with the chest wall (*arrows*). Motion of the scapular against the rib cage with active arm elevation and rotation elicited the patient's pain

steroid was injected. This demonstrated filling of a prominent bursa (see Fig. 2). The patient noted symptomatic relief immediately following the injection and was able to raise and lower the upper extremity without discomfort.

Discussion

Scapulothoracic bursitis can be a cause of significant pain and limited mobility of the shoulder girdle region. The diagnosis of scapulothoracic bursitis is often a diagnosis of exclusion, often being made only after a significant time period, where patient symptoms can persist or progress.

Scapulothoracic bursitis can be suspected clinically in patients who have pain in the scapulothoracic region with motion, occasionally accompanied by a grinding or snapping noise (crepitus) [3]. Scapulothoracic bursitis can exist as an isolated entity, due to abnormal mechanics between the scapula or rib cage, secondary to the presence of a focal osseous lesion such as an elastofibroma or osteochondroma resulting in impingement, or from altered chest wall morphology from prior trauma or surgery [1].

Similar to the case described by Fujikawa et al., we describe a case of a patient with posterior shoulder girdle region pain on scapulothoracic motion who has had extensive surgery including thoracoplasty 3 years before and subsequent revision procedures. Images during fluoroscopy demonstrated significant deformity of the chest wall and rib cage (see Fig. 1). Fluoroscopy was utilized to evaluate and document abnormal motion and biomechanics between the chest wall and the scapula. During active scapulothoracic motion, abnormal catching of the scapula with the rib cage was identified, suggesting the presence of fibrous adhesions and scarring.

The information provided by the real-time imaging examination was then used to direct treatment. Traditionally, fluoroscopy has been used to guide scapulothoracic bursal injections and can be used reliably [4]. Fluoroscopy, however, is limited in that the soft-tissue anatomy – fibrous adhesions, scarring, bursal fluid collections – cannot be identified. More recently, MRI and ultrasound have been

Fig. 2. Longitudinal ultrasound images during ultrasound-guided scapulothoracic bursal injection demonstrates echogenic (bright) material, consistent with dystrophic calcification (*arrow*, **a**) outlining the bursa before injection with subsequent fluid distention of the bursa (*arrow*, **b**) during injection

used to evaluate scapulothoracic pain and can reliably document bursal fluid collections [5, 6].

An advantage of ultrasound over MRI in evaluating patients with scapulothoracic bursitis is its dynamic capabilities and ability to perform ultrasound-guided treatment at the same sitting. In the case reported here, ultrasound was used to evaluate the periscapular region and guide for ultrasound-guided steroid injection into an area of bursal thickening at the scapula–rib contact point noted on the real-time fluoroscopic examination. The patient remains asymptomatic.

In conclusion, scapulothoracic bursitis can be a diagnostic dilemma, often being confused with other causes of shoulder and posterior chest wall pain. Fluoroscopy provides a real-time method of evaluating and documenting abnormal osseous mechanics of the scapulothoracic bursal region. Magnetic resonance imaging and ultrasound can both document potential soft-tissue lesions causing scapulothoracic region pain, such as bursal fluid collections and fibrous adhesions and scarring, and ultrasound's dynamic capabilities allow for a therapeutic injection at the same sitting.

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References

1. Fujikawa A, Oshika Y, Tamura T, Naoi Y (2004) Chronic scapulothoracic bursitis associated with thoracoplasty. *AJR Am J Roentgenol* 183(5):1487–1488
2. Lehtinen JT, Tetreault P, Warner JJ (2003) Arthroscopic management of painful and stiff scapulothoracic articulation. *Arthroscopy* 19(4):E28
3. Kuhn JE, Plancher KD, Hawkins RJ (1998) Symptomatic scapulothoracic crepitus and bursitis. *J Am Acad Orthop Surg* 6(5):267–273
4. Hodler J, Gilula LA, Ditsios KT, Yamaguchi K (2003) Fluoroscopically guided scapulothoracic injections. *AJR Am J Roentgenol* 181 (5):1232–1234
5. Ken O, Hatori M, Kokubun S (2004) The MRI features and treatment of scapulothoracic bursitis: report of four cases. *Ups J Med Sci* 109(1):57–64
6. Huang CC, Ko SF, Ng SH, Lin CC, Huang HY, Yu PC, Lee TY (2005) Scapulothoracic bursitis of the chest wall: sonographic features with pathologic correlation. *J Ultrasound Med* 24(10): 1437–1440