



Arthroscopic treatment of bilateral snapping scapula syndrome: a case report and review of the literature

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Snapping scapula syndrome represents a rare entity in shoulder surgery. Clinically, it presents as shoulder pain and loud crepitus during shoulder movement. Moreover, glenohumeral bursitis can cause additional pain. Snapping scapula syndrome is caused by an increased angulation of the superomedial part of the scapula combined with bursitis. Other common causes such as subscapular osteochondroma or rib fracture non-unions were excluded. We report a 24-year-old female patient with persisting shoulder pain and disturbing crepitus during movement of the left shoulder. Radiographic examination revealed increased angulation of the superomedial scapula on both sides and MRI, bursitis of the left shoulder. The patient was successfully treated with minimally invasive arthroscopic trimming of the prominent osseous formation at the left scapula combined with bursectomy. Additionally, specific pain-adapted physiotherapeutic exercises of both shoulders were performed. The patient had a pain-free shoulder movement without crepitus on both sides at the 6th month follow-up.

Key words: Cracking; shoulder; snapping scapula syndrome; superomedial scapula.

Snapping scapula syndrome represents a rare entity in shoulder surgery. The first case was described by Boinet in 1867.^[1] Complaints include diffuse shoulder pain and disturbing creaking or cracking sounds during shoulder movement of the scapula on the chest wall. Several problems such as bursitis, muscle abnormality or bony and soft tissue abnormalities have been associated with scapular snapping (Table 1).^[2-4] A bursitis can result due to the incongruence of the scapulothoracic articulation as a result of a scoliosis or a thoracic kyphosis^[5] or scapulothoracic impingement due to the absence of the overlying subscapularis muscle in the costal superomedial bare area.^[6] Scapular exostoses, an abnormal angulation

or a prominence of the Luschnka's tubercle are possible causes of bony abnormalities.^[7-9] Snapping scapula syndrome^[10-12] is defined by an increased angulation of the superomedial part of the scapula.^[13-15] Moreover, causes such as tumors^[3,16-29] or pathology of the chest wall have also been reported.^[2] Similar symptoms have been reported in patients following resection of the first rib for the treatment of the thoracic outlet syndrome (TOS).^[30] In addition, causes such as muscle atrophy, lack of muscle innervation or posttraumatic muscle fibrosis have been reported.^[31]

Radiographs are necessary to evaluate the osseous structure.^[32] In cases with bony abnormalities, three-

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Table 1. Etiology of snapping scapula regarding reported cases in the literature.

Etiology of snapping scapula	
Bursitis	<ul style="list-style-type: none"> • inflammation of the scapulothoracic bursa • incongruence of the scapulothoracic articulation (scoliosis, thoracic kyphosis, forward head, rounded shoulders) • scapulothoracic impingement (absence of overlying subscapularis muscle on superomedial bare area of the costal surface)
Muscle abnormality	<ul style="list-style-type: none"> • imbalance of periscapular muscles • partial avulsion of muscle insertion (repetitive muscle trauma resulting in periosteal microtears, subperiosteal hemorrhage and ossification)
Soft-tissue, bony abnormality	<ul style="list-style-type: none"> • osteochondroma • elastofibroma dorsi (repetitive microtrauma causes reactive hyperproliferation of the fibroelastic tissue) • abnormal angulation of the scapula • exostoses after malunion of rib or scapula fractures • exostoses after resection of the first rib after the treatment of thoracic outlet syndrome (TOS)

dimensional CT should be used for supplementary examination^[14,33-35] and MRI of the shoulder joint to assess the glenohumeral participation and exclude tumor entities.^[33,34]

Initially, conservative treatment options such as local infiltration using a local anesthetic,^[11] specific physiotherapy (muscle strengthening and traction) and anti-inflammatory drugs^[3,31] should be attempted. Surgical options should be considered after conservative treatment methods have been exhausted. Surgical options include open^[31,36-38] and arthroscopic procedures.^[37,39,40] Various risks of surgery have been reported. Yamamoto et al. reported one case with subscapular bursal cyst after open

partial scapulectomy.^[41] Arthroscopic surgery carries the risk of vascular and nerve injury.^[15,40] Moreover, it can be difficult to reach all bursa (especially the trapezoid bursa) or the superior angle of the scapula using the standard portals.^[31] Significant advantages of arthroscopic surgery include a decrease in morbidity, better cosmetic results and the ability to initiate early rehabilitation.^[40]

We report a 24-year-old female patient with persisting shoulder pain and disturbing crepitus during movement of the left shoulder.

Case report

A 24-year-old female patient presented to our clinic

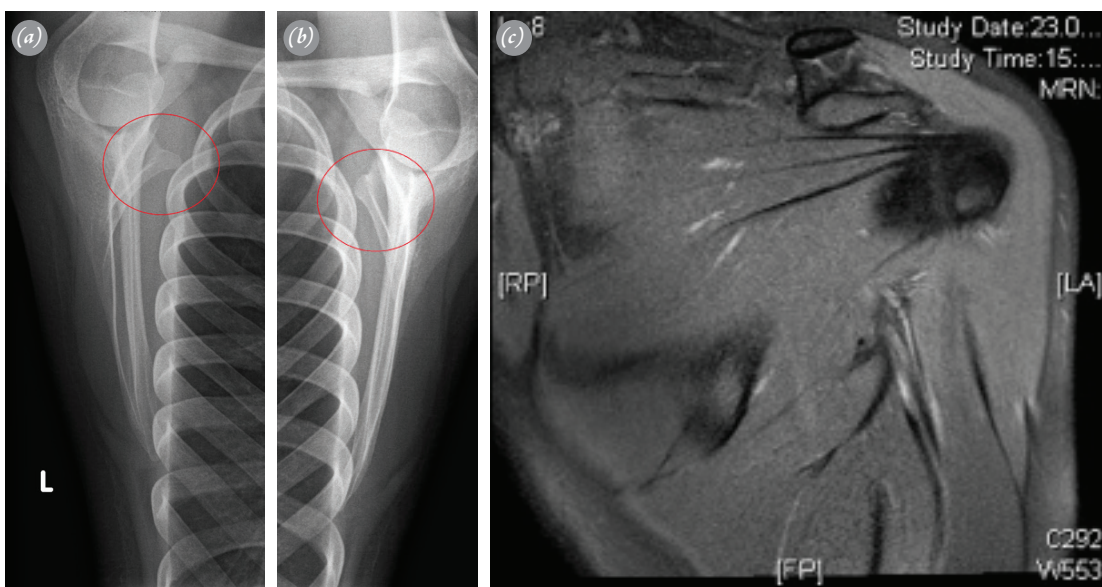


Fig. 1. (a, b) Initial scapular target radiographs of both sides. Significant prominence of the superomedial scapula (red circle). (c) MRI of the left shoulder (coronal view): evidence of bursitis and fluid accumulation in the glenohumeral tissue at the superomedial border of the scapula.

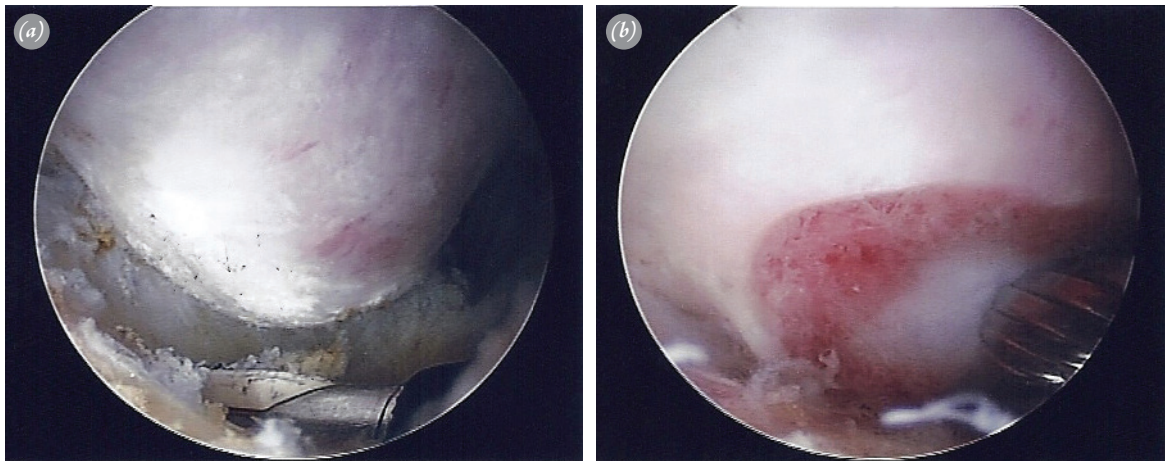


Fig. 2. (a) Arthroscopic view of the superomedial scapula border: distinctive prominence of the superomedial part. (b) Arthroscopic view of the superomedial border: surgical site after arthroscopic trimming with the 5.5-mm Acromionizer. [Color figures can be viewed in the online issue, which is available at www.aott.org.tr]

with complaints of a motion-dependent cracking and creaking during movement of the left shoulder of a progressive duration of more than 3 years. The patient also complained of the psychological impact of the constant and disturbing noise during the shoulder movement.

Clinical examination showed an audible clicking sound during forced elevation and abduction of the left arm. Tender trigger points in the region of the left trapezius muscle were found. The patient had normal CRP levels and leucocyte count and the initial attempt of conservative treatment with analgesics and physical therapy was unsuccessful. Skin condition of both shoulders was normal. Clinical examination showed a painful shoulder movement at the left side during forced elevation and abduction as well as audible creaking. Visual analog scale (VAS) pain score was 3 out of 10. Scapula target radiographs showed increased angulation with prominence of the superomedial scapula in both scapulae and more pronounced in the left side (Fig. 1a, b). A fluid accumulation in the glenohumeral tissue demonstrating a bursitis was seen on the MRI of the left shoulder (Fig. 1c). Tumor or other pathologies of the chest were excluded.

Arthroscopic trimming of the superomedial prominence of the left scapula was performed in combination with bursectomy due to the patient's pronounced clinical symptoms and significantly limited quality of life (Fig. 2a). The procedure was performed using the 'chicken wing-position' of the left arm. Two portals at a distance of 3 cm from the medial scapular border, the superior portal at the level of the crest of the scapula were created to protect the suprascapular nerve. An additional distal portal was created 3 cm away from the superior portal. An instillation of 20 ml of sodium chloride was per-

formed prior to the arthroscopy. Additional space was created with windshield-like movements using a trocar and the upper portal was created under supervision. Bony parts were trimmed using a 5.5-mm Acromionizer (Smith and Nephew plc, London, United Kingdom) (Fig. 2b). Postoperatively, circulation, motor activity and sensory of the left upper extremity were intact.

Passive and active pain-adapted physiotherapeutic exercises and mobilization of both shoulder joints without limitation were initiated on the 1st postoperative day. Postoperative scapula target radiographs showed the complete removal of the prominent osseous scapula parts on the left side. Radiographs did not reveal any fracture (Fig. 3).

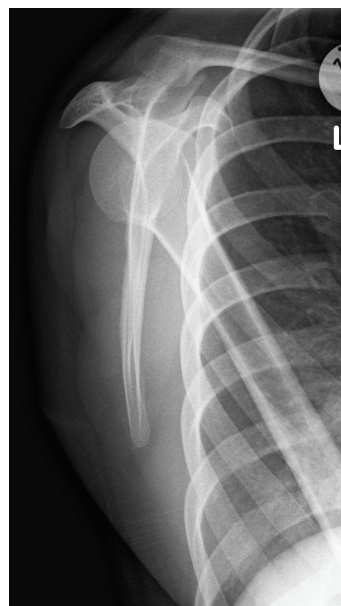


Fig. 3. Left scapula target radiograph after arthroscopic trimming: completely removed prominence of the superomedial scapula part.

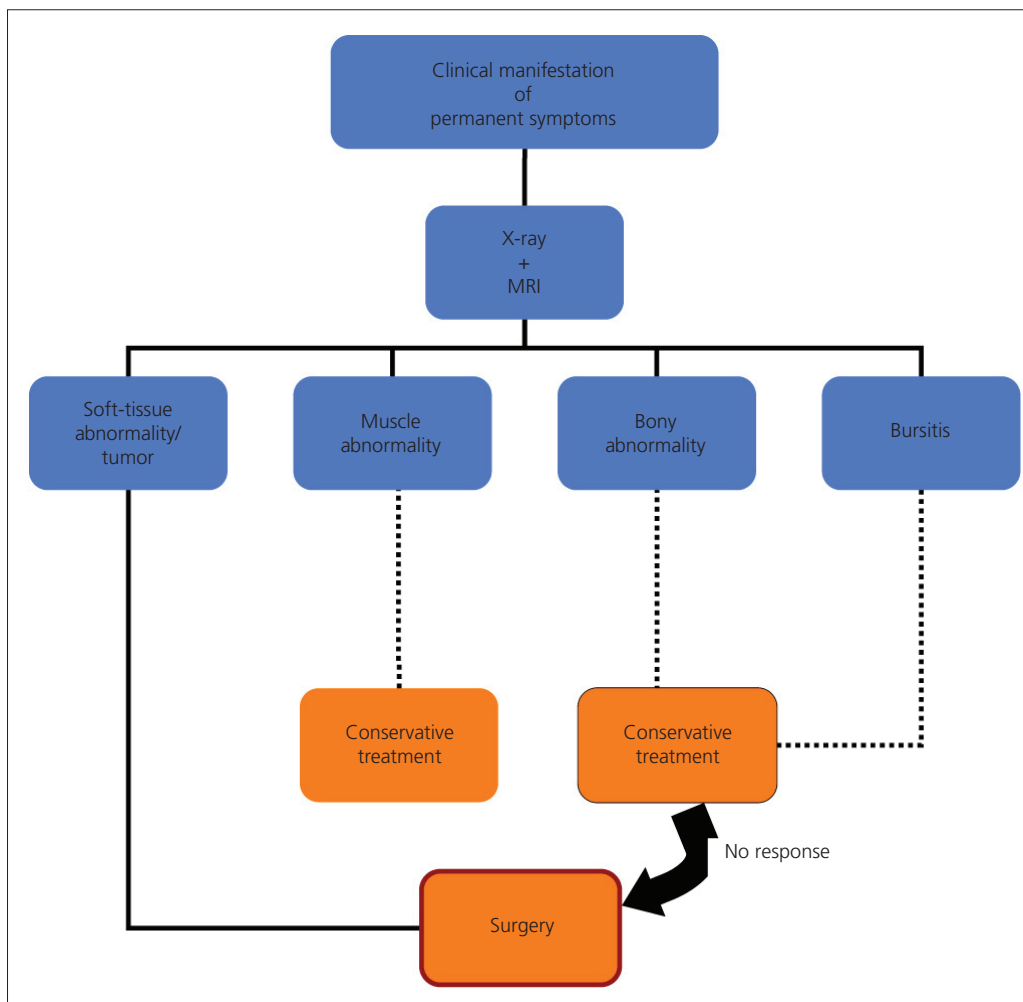


Fig. 4. Treatment algorithm regarding cases and studies in the literature. [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]

Clinical examination showed normal wound conditions of the two arthroscopic portals and a painless mobility of both shoulders without any limitation at the 6th week follow-up. Postoperative VAS pain score was 0. There was no creaking or cracking with any movement.

Discussion

Snapping scapula syndrome is a known but rare entity in shoulder surgery. The literature consists mainly of case reports with a variety of causes.

This syndrome is associated with persistent shoulder pain and a disturbing audible creaking or cracking during shoulder movement. Diagnosis is possible after excluding other such as osseous deviation of the superomedial scapula (Fig. 4). For this reason, plain radiographs of the scapula and MRI of the shoulder joint are necessary in the evaluation of the osseous structures and glenohumeral sliding surface.

Both conservative and operative treatment options exist. Higuchi et al.'s clinical imaging study showed regressed bursitis masses after few weeks without surgical treatment and recommended surgery in patients with permanent scapular snapping.^[42] According to the literature, in the absence of bony abnormality, most symptoms are relieved by physiotherapy.^[43] Conservative treatment options include physiotherapeutic exercises (muscle strengthening and stretching), local injections, NSAIDs, thermal modalities and proprioceptive neuromuscular facilitation (PNF).^[31]

Tumors that are detected should be removed and histopathologically examined.^[3,16-29] Radiologically verified bony abnormalities and unsuccessful conservative treatment indicate surgical intervention. Surgical procedures include open, mini-open and arthroscopic treatment options.^[31,36-40] A review of the literature shows a trend towards arthroscopic surgery. Advantages of arthroscopic

procedures are lower morbidity, better cosmetic results and a shorter rehabilitation period than open surgery.^[40,44]

According to the recommendations in the literature, we performed arthroscopic trimming of the prominent osseous parts of the superomedial scapula at the left shoulder and bursectomy. Subsequently, intensive physiotherapeutic exercises were performed for 4 weeks in both shoulders.^[31]

In conclusion, arthroscopic surgical intervention appears to be a promising treatment option for snapping scapula syndrome in the presence of bony abnormalities combined with permanent pain, disturbing noises and non-response to conservative therapy.

Conflicts of Interest: No conflicts declared.

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