



## Scapulothoracic Bursitis or the Snapping Scapula Syndrome May Mimic with Shoulder Pain

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### Abstract

**Background:** The scapulothoracic joint plays an important role in overall shoulder function by providing a stable base for glenohumeral rotation. Snapping scapula syndrome, a likely under diagnosed condition, can produce significant shoulder dysfunction in many patients. Because the precise origin is difficult to understand, sometimes mimic with shoulder pain. Dysfunctioning of any of muscles, ligament, bursa may cause abnormal scapular motion and predispose to scapulothoracic joint disorders. Accurate recognition of the syndrome may lead to prompt and long-term relief of symptoms by conservative or noninvasive intervention treatment. **Results:** The causes of scapulothoracic bursitis and crepitus include direct or indirect trauma, overuse syndromes, glenohumeral joint dysfunction, boney abnormalities, muscle microtrauma or atrophy or fibrosis, and idiopathic causes. Scapulothoracic bursitis and crepitus remain primarily clinical diagnoses. However, imaging studies or local injections may also be helpful. The initial treatment of scapulothoracic bursitis and scapulothoracic crepitus should be conservative. Intervention procedure is best for treating modalities for scapulothoracic dysfunction, most reports have demonstrated well to excellent outcomes in a significantly high percentage of patients. **Conclusions:** Clearly, the best initial approach to these conditions is a conservative treatment like nonsteroidal antiinflammatory drugs plan that combines scapular strengthening, postural reeducation, and core strength endurance. If an appropriate trial of nonoperative management proves unsuccessful, local non invasive intervention can produce good results.

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### INTRODUCTION

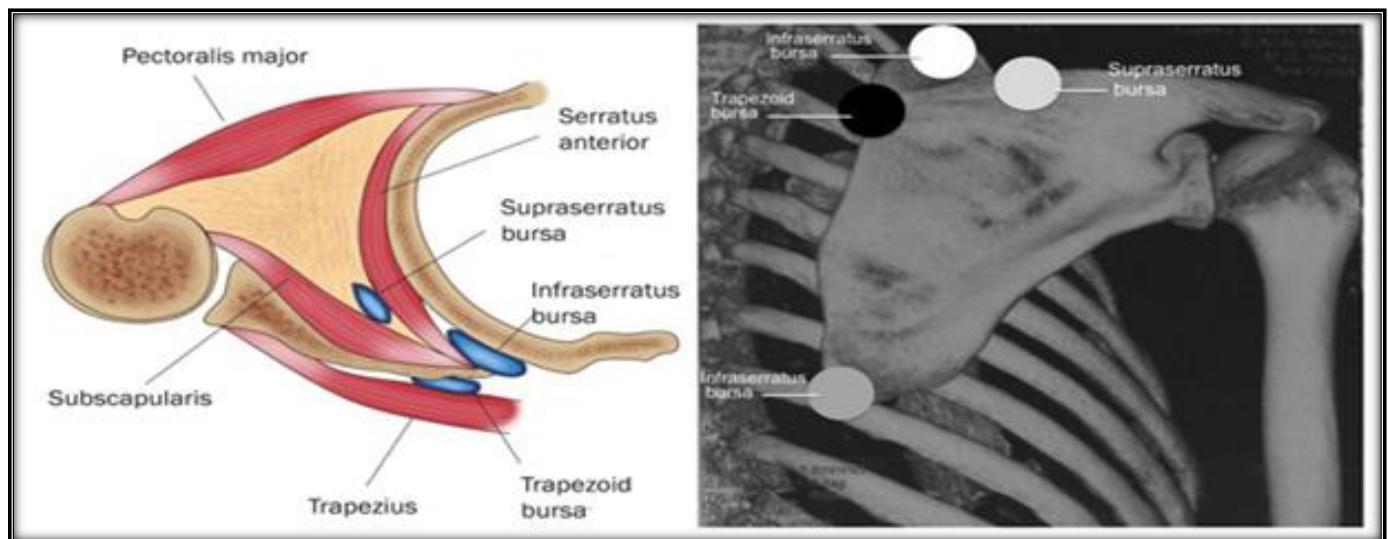
Shoulder pain is a common musculoskeletal condition that is reported annual incidence of shoulder pain in primary care is 14.7 per 1,000 patients per year. Shoulder pain has multiple pain generators in and around the joint which can be damaged due to high range of movement, repetitive trauma and direct

injury. In some cases, shoulder area carries pain from others generator as a referred pain. In shoulder joint movement depends on glenoid cavity, head of the humerus, clavicle, scapula and scapulothoracic articulation.

The scapula (shoulder blade) is an amazing anatomical structure. The scapula is a flat, triangular bone that lies between the second

and seventh ribs. It is suspended over the ribs between the spine and the arm by only two ligaments. There isn't a real joint between the scapula and the trunk. Three layers of muscle and bursae (plural for bursa) support this structure. Scapulathoracic bursitis and the snapping scapula are complex disorders of scapulothoracic articulation. The scapulothoracic articulation is a complex anatomical structure that are often poorly understood and it plays a substantial role in overall shoulder function. The articular bones, ligaments, bursa and muscular periscapular relationships are intricate. While

scapulothoracic pathology is uncommon, a complete understanding of the anatomy, including the various muscular relationships and bursal planes, is critical to the evaluation of patients presenting with scapulothoracic disorders.<sup>[1]</sup> Snapping scapula syndrome is caused by inflammation of the bursae secondary to trauma or overuse owing to sports activities or work. It is crucial, clinically, to have a clear understanding of the anatomy and biomechanics of the scapulothoracic articulation when treating scapulothoracic bursitis and snapping scapula.<sup>[2,3]</sup>



**Figure 1:** Supraserratus, infraserratus and trapezoid bursas around the thoracoscapular articulation.

The scapula is a flat bone lies on the posterolateral aspect of the thoracic cavity overlying 2<sup>nd</sup> to 7<sup>th</sup> ribs.<sup>[1,3]</sup> The scapula is stabilized by the surrounding musculature. It is triangular in shape with three distinct borders such as superior, axillary, and vertebral and three angles superomedial, inferomedial, and lateral or glenoid.<sup>[4]</sup> The

medial or vertebral border of the scapula (vertebral border) is approximately 5-6 cm from the vertebral column, but this distance depending on scapular protraction and retraction. The scapula attached with several important bones including the acromion, coracoid process, spine, and glenoid fossa. At rest, the scapula is slightly rotated anteriorly

approximately 30° relative to the trunk and is tilted forward about 20° in the sagittal plane when viewed from the side.<sup>[5]</sup> This static position is commonly referred to as the "plane of the scapula".<sup>[6]</sup> The scapulothoracic bursae are frequently neglected.<sup>[7]</sup> These bursae allow for smooth, gliding scapulothoracic motion. Two major bursa Supraserratus and infraserratus (or anatomic) bursae and four minor (or adventitial) bursae have been described in the scapulothoracic articulation [Figure 1].<sup>[8]</sup>

The first major bursa is infraserratus bursa that is located between the serratus anterior muscle and the chest wall. The second major bursa is supraserratus bursa that is found between the subscapularis and serratus anterior muscles.<sup>[6]</sup> The anatomic reproducibility of these bursae is well documented.<sup>[9]</sup>

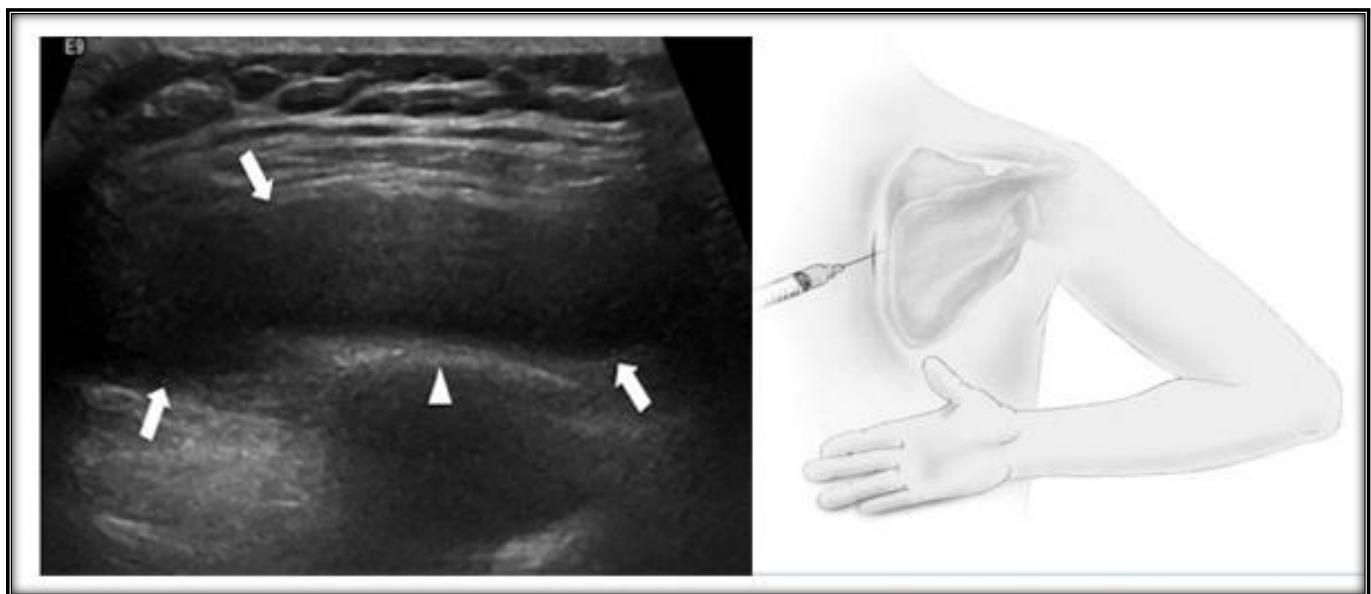
### CASE DESCRIPTION

A 34-year-old man with a 12-month history of left shoulder, neck pain in the scapular area, and "clunking" with abduction of the arm presented to our pain OPD at Islami Hospital Faridpur with a verbal response scale (VRS) of 7 presented with complaints of left shoulder, neck pain in the scapular area, and "clunking" with abduction of the arm. After taking informed consent form, his history was taken. He worked at a lead factory that required repetitive arm abduction and heavy lifting. He did not recall any specific date of onset, trauma or any injuries to the shoulder or neck. It was associated with mild tingling and aching pain in the left shoulder, neck and scapular area. The pain was aggravated with daily activity and mildly improved with rest. He had no history of diabetes, thyroid disease,

neuropathy, gout, or arthritis. He had taken one shot of particulated staroid in the intra-articular left shoulder but no improve with this injection. After that he came to our OPD with this complain. On physical examination revealed that posterior part of left shoulder with over the scapular area tender and crepitus on active and passive elevation of the scapula that causes shoulder pain also reffered to the neck. Crepitus was accentuated with left shoulder abduction and protraction of the left scapula with pressure over the inferior angle of the left scapula and upper thoracic paraspinal musculature along the left trapezius muscle. Left shoulder examination reveals quit normal. There was no scapular winging. Reflexes of upper extremity is normal and shoulder girdle muscle strength were normal. The patient had tender point on palpation at the inferior angle of the left scapula. He had taken one shot of particulated staroid in the intra-articular left shoulder but no improve with this injection. We had prescribed nonsteroidal anti-inflammatory and muscle relaxants. Then we had started SNRI (Serotonin and norepinephrine reuptake inhibitor) & low dose Nortriptyline that gave short-term pain relief initially, although eventually higher doses had not relieved his symptoms. He had taken physiotherapy consisting of ultrasound, heat, and massage but not improved much more. These revealed no evidence for cervical radiculopathy, brachial plexopathy, ulnar neuropathy, or focal neuropathy. We did PHQ-9 and WPI & SSS to exclude the depression and fibromyalgia. The radiographs of the left shoulder, including the anterior posterior view, the Axillary, and the scapular Y (Fig-2) were unremarkable.



**Figure 2:** Radiographies including anterior-posterior view, axillary view, scapular "Y" of left shoulder.



**Figure 3:** Accumulation of bursal fluid at the bursal plan. Scapulothorasic injection at the medial boarder of the scapula. The limb is placed in the "chicken wing" position.

We were planning for diagnostic block with local anesthetic (Inj. Lignocain 1%) injection to the anterior surface of the inferior angle and medial border of the left scapula with successfully improved around 80-90%. He had

taken left sided subscapular depu-steroid injections under ultrasonogram with limb was placed by "chicken wing" position with excellent relief of the impingement symptoms

and verbal response scale (VRS) = 1/10 [Figure 3].

Four weeks after injection patient had complete pain-free range of motion of the left shoulder, and he returned to work without restrictions. At 6 weeks, 9 weeks and 12 weeks follow-up there was no recurrence of the scapular snapping, although mild (verbal response scale (VRS) = 3/10 ) aching of the involved left paraspinal muscle and inferior angle of the left scapula region was reported.

## DISCUSSION

The snapping scapula syndrome was first described by Boinet in 1867. The Scapulothoracic joint is not a true anatomic joint because it has not usual joint characteristics (union by fibrous, cartilaginous or synovial tissues) But the functional Scapulothoracic joint is part of a true closed chain with the Acromioclavicular & Sternoclacvicular joints and the thorax. Articulation of the scapula with the thorax depends on the integrity of the anatomic Acromioclavicular & Sternoclacvicular joints. Any movement of the scapula on the thorax must result in the movement at either the Acromioclavicular & Sternoclacvicular joints or both.<sup>[10]</sup> The infraserratus bursa helps the serratus anterior muscle glide across the chest wall, and the supraserratus bursae separates the serratus anterior and subscapularis muscles.<sup>[11]</sup> Scapulathorasic bursitis and the snapping scapula syndrome is a rare condition caused by the disruption of the gliding articulation between the anterior scapula and the posterior chest wall. It can happen simultaneously or on its own.<sup>[12]</sup>

The etiology of snapping scapula syndrome is multifactorial, and contributing factors include scapular dyskinesis, inflammation of the bursae secondary to trauma or overuse owing to sports and periscapular lesions. During the early stages of rehabilitation, activity modification and nonsteroidal anti-inflammatory medications are used to reduce inflammation.<sup>[13]</sup> Muscle relaxants are also used. Periscapular muscle strengthening and postural training activities should be the emphasis of physical therapy.<sup>[14]</sup> Low-intensity, high-repetition workouts focusing on the subscapularis and serratus anterior muscles should be included in periscapular musculature retraining.<sup>[15]</sup> Very few cases need surgical management. This report describes a 34-year-old male working in a lead factory with weight lifter suffering for 1-year history of increasing pain and fullness over his left shoulder and upper and mid paramedian thorasic region. He had been related to a repetitive motion work disability. The patient had an unsuccessful conservative therapies even intra-articular steroid injection. He was treated by muscle relaxants, nonsteroidal anti-inflammatory medications but not improved. Then he had started SNRI & low dose Nortriptyline that gave short-term pain relief initially but not improve even with higher doses of SNRI & Nortriptyline. Then planning for diagnostic block that provided a significatens relief of symptoms for the patient.

We exclude depression and fibromyalgia, cervical radiculopathy, brachial plexopathy, ulnar neuropathy, or focal neuropathy. Radiographs of the left shoulder, including oblique views, were unremarkable. We were planning for diagnostic block with local



anesthetic injection to the anterior surface of the inferior angle and medial border of the left scapula with successfully improved.

## CONCLUSIONS

To conclude, the scapulothoracic articulation is a complex anatomical structure that plays a substantial role in the overall shoulder function. The osseous, ligamentous, muscular underlying bursa and neurovascular anatomy are variable and intricate. Snapping scapula syndrome is a disorder caused by abnormal scapulothoracic motion that causes superior scapular and retroscapular pain. The syndrome, as reported, is always accompanied by audible and/or palpable retroscapular

creaking of the scapula with scapulothoracic motion. Conservative therapy wasn't successful in this case report. Minimum invasive intervention of the medial border of the scapula provided long-term symptomatic relief in this case in which conservative therapy was unsuccessful. Snapping scapula syndrome is caused by either osseous lesions or scapulothoracic bursitis, and many others causes. Appropriate recognition and treatment of these disorders are dependent on a solid foundation in periscapular anatomy. Intervention treatment of snapping scapula presents good results in the functional scores and it is effective, safe, and allows early rehabilitation.

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