Snapping Scapula Syndrome Resulting from a Subscapular Osteochondroma: Case Report and Literature Review

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ABSTRACT
Snapping scapula syndrome is a rare pathology first described by Boinet in 1867. Its pathogenesis is caused by an incongruency in the thoracic scapular joint, associated with multiple causes including bursitis, exostosis, bone mass, fibrotic tissue or muscular abnormalities, defective consolidation of fractures or anatomical rib or scapular fractures. The purpose of this article is to present a clinical case of an adolescent with incapacitating clinical pain in the right scapular region, as well as a deformity at this level that had evolved for more than 4 years, and which, when diagnostic tests were performed, revealed a subscapular bone mass suggestive of a single large osteochondroma measuring more than 2.5 cm x 4 cm x 4 cm.. A review and update of the literature on the diagnosis and current treatment of this pathology is made.
Keywords: Exostosis; osteochondroma; snapping scapula syndrome; scapulothoracic pathology.
Level of Evidence: III

Síndrome de fricción escapulotorácica por un osteocondroma subescapular: presentación de un caso y revisión bibliográfica

RESUMEN
El síndrome de fricción escapulotorácica, resalto o chasquido escapular es un cuadro poco frecuente, descrito, por primera vez, por Boinet, en 1867. Se produce por una incongruencia en la articulación escapulotorácica, asociada a múltiples causas, como bursitis, exostosis, masas óseas, tejidos fibrótico o muscular anómalos, consolidación defectuosa de fracturas o variaciones de la anatomía costal o escapular. El propósito de este artículo es comunicar un caso clínico de una adolescente con dolor incapacitante y deformidad en la región escapular derecha, de más de cuatro años de evolución. Los estudios diagnósticos revelaron una masa ósea única subescapular sugestiva de un osteocondroma de gran tamaño, más de 2,5 cm x 4 cm x 4 cm. También, se presenta una revisión y actualización de la bibliografía sobre el diagnóstico y el tratamiento actual de esta enfermedad.
Palabras clave: Exostosis; osteocondroma; síndrome de fricción escapulotorácica; enfermedada escapulotorácica.
Nivel de Evidencia: III

INTRODUCTION

The scapulothoracic joint is a complex anatomical structure that plays an important role in overall shoulder function. It is given by the coordination of muscles located in different planes, in addition to bursae located between the subscapularis muscle, the serratus anterior muscle, and the chest wall that allow a smooth and sliding movement.[1-4] Any disruption in this sliding process might create bursae inflammation, causing any direct movement or pressure on it to cause pain.

The purpose of this article is to report the case of an adolescent girl with disabling pain and deformity in the right scapular region, of more than four years of evolution. Diagnostic studies revealed a unique subscapular bone mass suggestive of a large osteochondroma (2.5 cm x 4 cm x 4 cm). The patient underwent resection through an open approach.

In addition, a literature review is presented.

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PATHOGENICS

Snapping scapula syndrome is a rare condition first described by Boinet in 1867.[5] Any disruption in the sliding process might create bursae inflammation, causing any direct movement or pressure on it to cause pain. It is caused by excessive joint wear, infectious diseases, or trauma.[6] In most cases, bursitis or pain is considered to occur from repetitive movement of the scapula over the chest wall,[6-8] or abnormal fibrotic or muscle tissue,[8-10]fracture malunion,[5,11,12] or variations in scapular bone anatomy or exostosis (solitary and multiple osteochondroma). Osteochondroma is the most common benign bone mass,[8,10] it has a slow growth and symptoms are insidious.[5] In this case, its location in the scapula is unusual, its frequency is less than 5%,[1,8-10,13] and it gives the appearance of a winged scapula.[4,6,14,15]

Cadaver studies suggest that approximately 6% of scapulae may show some degree of superomedial snagging and 8.6% of scapular specimens have a superomedial angulation of ≥35°.[16] Sometimes, a similar bone abnormality is identified along the underside of the scapular angle that appears to be the second most common site of symptoms.[16] An osteochondroma or Luschka's tubercle (a bone protrusion at the superomedial edge of the scapula) may also cause persistent symptoms.[6-8,17]

CLINICAL APPROACH

As a common denominator, patients report pain that increases with the use of the glenohumeral joint associated with audible or palpable crepitation,[5] which may be accompanied by muscle dysfunction, protective posture against muscle pain and weakness, pain not attributable to a history of trauma or recent interventions,[4] as well as clinical symptoms of scapular deformity.

When the patient reaches a degree of chronic bursitis, symptoms rarely go away on their own without rest or physical therapy.

Another aspect to consider is the practice of sports activities with overuse of the joint, such as swimming or throwing, gymnastics or weightlifting.

With all these data, an adequate approach is made differentiating soft tissue lesions, such as muscular atrophy, muscle fibrosis, abnormal muscle insertions, subscapular elastofibroma, cervical spondylosis and radiculopathy, sprained periscapular muscles, glenohumeral pictures, [18] and winged scapula, [14] an entity with nerve involvement, identified by various maneuvers to differentiate the true winging from a compensating pseudowinging secondary to a painful scapulothoracic joint.

DIAGNOSTIC AND IMAGING STUDIES

Scapula disorders should initially be evaluated with radiographs to identify bone abnormalities in both the scapula and rib cage. They can be supplemented with a CT scan with 3D reconstruction to improve the definition of bone abnormalities. Additionally, MRI can be usedto identify the location of inflammation and the size of the bursae. Each study is useful to identify the different causes of snapping scapula syndrome (bone involvement in both the scapula and the rib cage, as well as inflammation of the different subscapular bursae). Nerve conduction studies and electromyography help distinguish it from a winged scapula or neurological lesions.[2,4,8,18]

TREATMENT

Initial management includes conservative methods of decreasing sports activity, muscle strengthening and analgesia, physical therapy, and even corticosteroid infiltration, although these bursae can be difficult to inject accurately.[4,18-21] Surgery is indicated if conservative management has not achieved clinical improvement in six months or more,[4,17] although there is no consensus as to time; or before six months for patients undergoing compression by bone protrusions.[2,13] Surgical treatment depends on the causes and may consist of an open or arthroscopic bursectomy, resection of the superomedial or inferomedial edge of the scapula, or osteotomy of the osteochondroma.[5,9,14,17,18,22-28]

CLINICAL CASE

The patient is an adolescent with disabling pain and deformity in the right scapular region of more than four years of evolution. Elevation of the right scapula was found during the clinical examination, with no limitation of the arcs of motion, but with constant moderate pain both at rest and during mobilization (Figure 1).

Figure 1. Clinical image showing pseudowinging and right scapula deformity.

The patient underwent radiographic and tomographic studies with 3D reconstruction in which a single subscapular bone mass suggestive of an osteochondroma of more than 3 cm was observed (Figure 2). The patient underwent surgery with an open technique under direct vision. Histopathological examination of the sample confirmed an osteochondroma.

During surgery, bursitis secondary to chronic friction was detected, without rib deformity, even though the condition had begun in childhood. Analgesic control was administered and the use of a sling was indicated for two weeks, with subsequent rehabilitation. The recovery of the range of motion was complete, with a QuickDASH score of 4.5.

Surgical technique

General anesthesia is administered and the patient is placed in the prone position, in the chicken-wing position (Figure 3) with a homolateral snap on the chest, to increase the subscapular space. The structures are marked (scapula, scapular spine, rhomboid major and minor, trapezoids) and a 4 cm long incision is made in the middle third of the scapula, less than 1 cm from the medial edge, respecting the neurovascular structures (when creating the portals, both arthroscopic and open incisions, special care must be taken with the branches of the nerve and the dorsal scapular artery that descend by the medial edge of the scapula 1 cm from it). Precautions should also be taken not to head over the scapular spine because of the risk of injury to the accessory spinal nerve.[29]

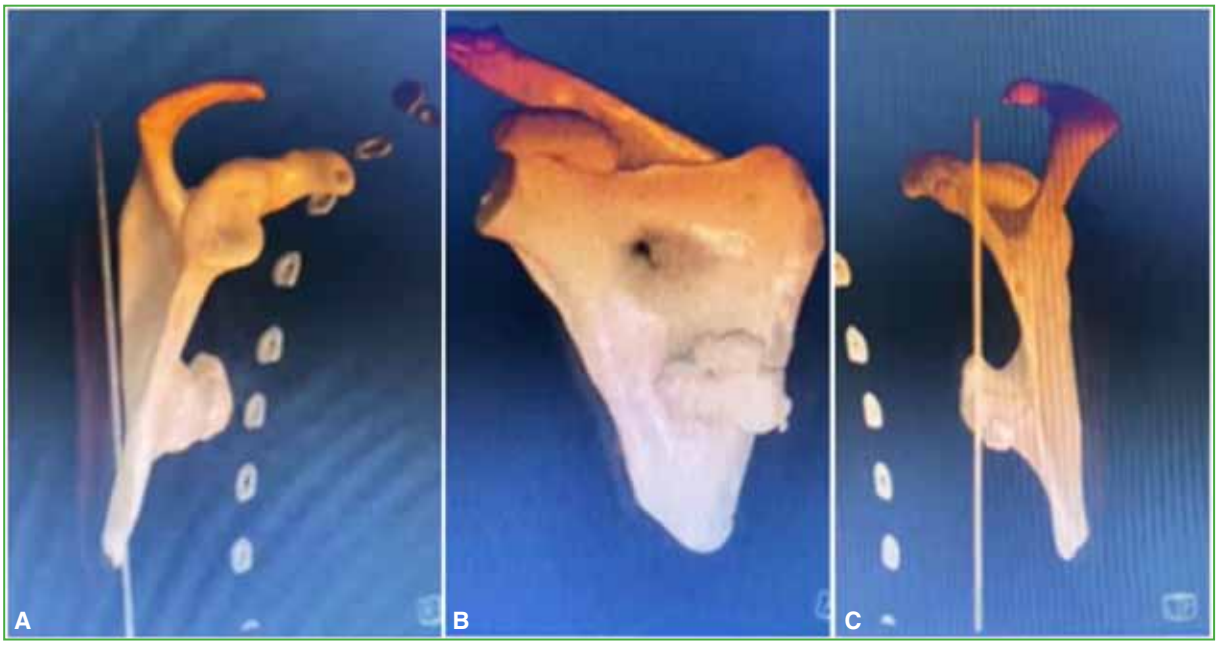

Figure 2. CT scan with 3D reconstruction of the right scapula showing exostosis. **A.** Lateral view. **B.** Anterior view. **C.** Medial view.

Figure 3. Patient in the operating room in the prone, "chicken-wing" position.

The muscle structures are identified, and the trapezius muscle is rebutted upwardly and medially, while the larger rhomboid muscle is partially disinserted from the medial edge of the scapula. The serratus anterior is then partially disinserted 4 cm from the medial edge of the scapula and the subscapularis muscle until the bone tumor mass is identified. The tumor is then excised with an oscillating saw, hemostasis is carried out, muscles are reinserted through transosseous tunnels with fixation by super sutures, and proper scapular stability is verified. The wound is closed. The procedure was carried out without complications (Figure 4).

Figure 4. Exostosis measuring 4 cm length x 2.5 cm height x 2.5 cm width.

DISCUSSION

Poor scapulothoracic congruence triggers a cycle of inflammation and scarring of the bursae that leads to impingement and thus perpetuation of inflammation and pain. The result is fibrosis of the bursa with secondary scarring, pain and snaps. The various causes of shoulder pain, particularly in the scapula, should suggest a possible snapping scapula syndrome, guiding clinical evaluation, selecting complementing research, and indicating behaviors that favor rehabilitation.[3,5,17]

There are different causes that try to explain the etiology. They can be classified into three main groups that correlate: scapulothoracic bursitis, muscle abnormalities and bone abnormalities.[5] Consequently, different treatments are indicated, such as conservative management (physical therapy), open or arthroscopic surgery by resection of the superomedial angle and scapula plus bursectomy,[4,17,22-28] and, in some cases, bursectomy only.

The revised literature, which includes mostly case series, generally reports an improvement in the symptoms of arthroscopically treated patients, with satisfaction rates of 85-90%.[2,17,26,28,29]

Pearse et al.[25] published a retrospective study of 13 patients and lower success rates after arthroscopic treatment (66% satisfaction); however, only three of these 13 patients underwent angle scapulectomy. We did not find any surgical description on osteochondroma resection with arthroscopic technique; the large mass size made us decide to opt for the conventional open approach.

CONCLUSIONS

Although snapping scapula syndrome is an uncommon condition, our understanding about it allows us to suspect it in patients who have pain that is not related to glenohumeral joint or rotator cuff injuries, allowing us to make an accurate diagnosis and recommend appropriate conservative and surgical treatment.

Conflict of interest: The authors declare no conflicts of interest.

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