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Snapping scapula syndrome caused by subscapular osteochondroma

Subskapular osteokondromun neden olduğu snapping skapula sendromu

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Objectives: This study aims to evaluate the results of surgical excisions of subscapular exostoses which caused snapping scapula syndrome.

Patients and methods: Between September 1980 and January 2010 30 patients with scapular osteochondromas which caused snapping, were treated surgically in our clinic. Fifteen patients (9 males, 6 females; mean age 15.6 years; range 6 to 29 years) in whom we were able to contact following treatment were clinically evaluated. The mean follow-up was 13.7 years (range 1 to 31 years). The initial examination included radiographs and computed tomography. The clinical results were evaluated with a simple shoulder test at their last follow-up.

Results: The preoperatively most common complaint was winging of the scapula in all patients (100%), followed by pain in 12 patients (80%), and crepitus with scapulothoracic motion in 10 patients (66.6%). None of the patients had any clue in favor of snapping after surgical treatment. According to the responses to the simple shoulder test, none of the patients had any restriction of motion on their operated shoulders. They didn't give us a history about recurrence of the lesion.

Conclusion: Excision is an appropriate treatment for osteochondromas. In this retrospective analysis, complete relief following excision of the exostosis was achieved in all patients. No patient had any complaint or recurrence.

Key words: Osteochondroma; scapula; snapping; winging.

Amaç: Bu çalışmada, snapping skapula sendromuna neden olan subskapular ekzostozun cerrahi eksizyon ile tedavi sonuçları değerlendirildi.

Hastalar ve yöntemler: Eylül 1980- Ocak 2010 tarihleri arasında, kliniğimizde snapping nedeniyle skapular osteokondromlu 30 hasta cerrahi olarak tedavi edildi. Tedavi sonrası kayıtlardaki iletişim bilgilerine ulaşılabilen 15 hastanın (9 erkek, 6 kadın; ort. yaş 15.6 yıl; dağılım 6-29 yıl) klinik sonuçları değerlendirildi. Takip süresi ortalama 13.7 yıl (dağılım 1-31 yıl) idi. İlk muayene radyografi ve bilgisayarlı tomografiyi içermekteydi. Klinik sonuçlar son kontrollerde basit omuz testi ile değerlendirildi.

Bulgular: Ameliyat öncesi en sık görülen yakınma tüm hastalarda skapular kanatlanma (%100), 12 hastada (%80) ağrı ve 10 hastada (%66.6) skapulotorasik hareket ile oluşan krepitus idi. Hastaların hiçbirinde cerrahi tedavi sonrası snapping lehine herhangi bir ipucu yoktu. Basit omuz testi için verilen yanıtlara göre hastaların hiçbirinde ameliyat edilen omuz hareketlerinde kısıtlılık yoktu. Hastalar lezyonun nüksü hakkında herhangi bir öykü bildirmedi.

Sonuç: Eksizyon osteokondromlar için uygun bir tedavi yöntemidir. Bu retrospektif analizde, eksizyon ile tüm hastalarda tedavi sağlandı. Hiçbir hastada herhangi bir yakınma veya nüks olmadı.

Anahtar sözcükler: Osteokondrom; skapula; snapping; kanatlanma.

The snapping scapula syndrome is an infrequently described source of shoulder discomfort characterized by painful, audible, and palpable abnormal scapulothoracic motion. Scapular movements are uncomfortable, and the noise can often be localized by the examiner to a specific part of the scapulothoracic joint.[1] The syndrome may be caused by skeletal or soft-tissue abnormalities that

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interfere with articulation between the scapula and rib cage.[2]

Scapular osteochondromas are usually painless, but symptoms may result from complications such as a mass effect that produces mechanical problems: impingement syndromes, bursa formation, malignant transformation of the cartilage cap, or snapping and pseudo-winging of the scapula.[3]

This study evaluated the results of the surgical treatment of subscapular osteochondromas that caused snapping scapula syndrome.

PATIENTS AND METHODS

Thirty patients with subcapular osteochondromas that caused snapping scapula syndrome between September 1980 and January 2010 were treated surgically. Since the patients' addresses and phone numbers had changed, we were only able to reach and examine 15 of the patients by mail or phone in the last two years. The preoperative clinical, functional, and radiologic data for these 15 patients (9 males, 6 females; mean age 15.6 years; range 6 to 29 years) were obtained from their hospital files. Institutional review board approval was not applicable.

Winging and crepitus of the scapula was noted and all of the examinations disclosed pain and weakness of the shoulder girdle. Thirteen patients had a solitary osteochondroma, while two patients had hereditary multiple osteochondromatosis.

The most common complaint was winging of the scapula (100%), followed by pain in 12 patients (80%), and crepitus with motion in 10 patients (66.6%).

The initial examination included preoperative anteroposterior, lateral, and oblique radiographs. Computed tomography (CT) was used to demonstrate the osteochondroma in 14 patients. We used magnetic resonance imaging (MRI) for one patient who had dorsal and ventral scapular osteochondromas.

Surgical technique

For each patient in the prone position, with internal rotation of the shoulder, the medial border of the scapula lifted away from the thoracic cavity. A vertical incision was made along the medial scapular edge, and the rhomboids and levator scapula muscles were detached from the medial edge of the scapula to expose the anteromedial border of the scapula. Care was taken when the rhomboids were detached to avoid injuring the dorsal scapular nerve, which is approximately 2 cm medial to the medial scapular edge. Ventral side scapular exostoses were exposed and excised from their pedicles. We removed each entire tumor, including the cartilage cap, to prevent recurrence. After controlling bleeding, the rhomboids and levator scapula muscle were attached to the scapula and the skin incision was closed. The day after the operation, full range of shoulder motion was started to prevent fibrosis (Figure 1a, b and Figure 2a, b).

One patient had anterior and posterior scapular exostoses near the inferior and lateral margins of the ipsilateral scapula. At surgery, the incision was made over the lateral edge to expose both exostoses. We saw the masses inferior to the infraspinatus and teres minor muscles. We removed the entire tumor, including the cartilage cap. After controlling bleeding, the skin incision was closed (Figure 3).

In all patients, the clinical results were evaluated with a simple shoulder test at their last follow-up.[4]

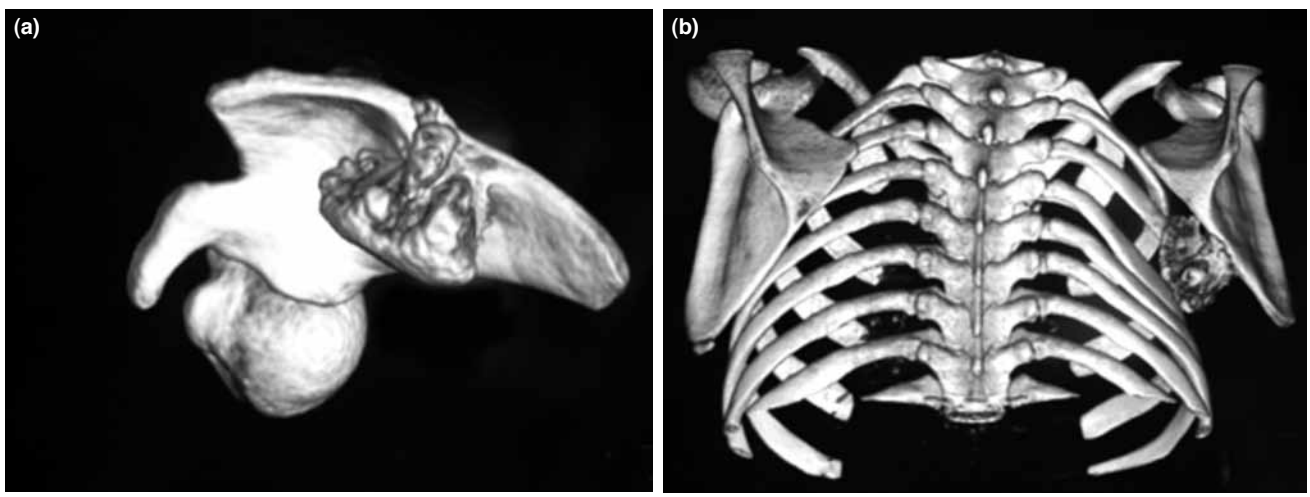

Figure 1. Three dimension (3D) computed tomography images of the osteochondroma. **(a)** Osteochondroma at the medial margin of the scapula. **(b)** Fourth and fifth ribs deformed because of snapping caused by subscapular osteochondroma.

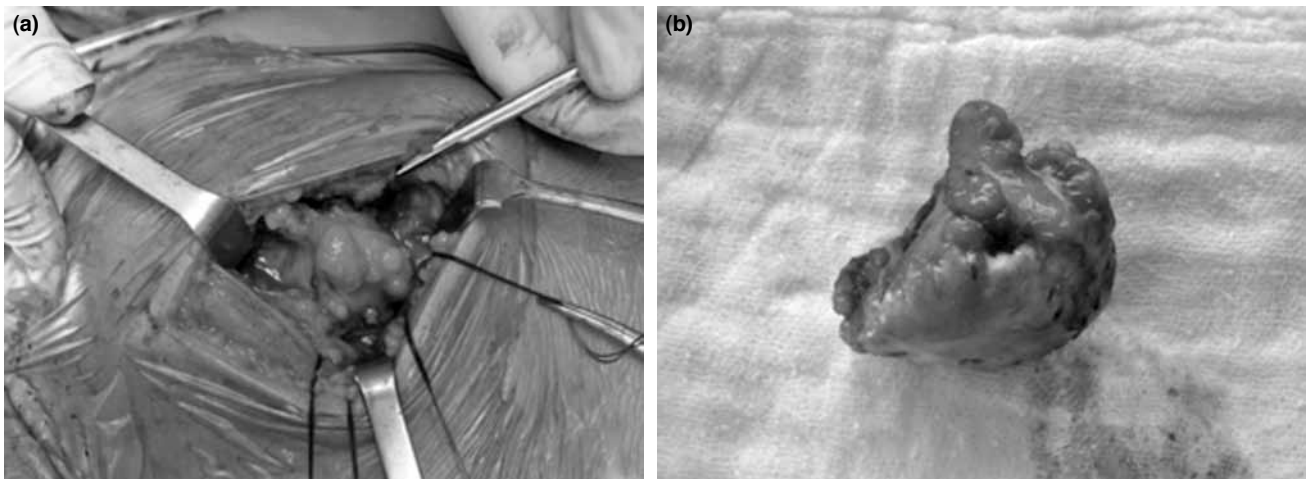

Figure 2. (a) Rhomboids and levator scapula muscles were detached from the medial edge of the scapula to expose the anteromedial border of the scapula. Subscapular osteochondroma were exposed and excised from its pedicle. **(b)** We removed the entire tumor, including the cartilage cap, to prevent recurrence.

RESULTS

In all patients, preoperative anteroposterior and oblique scapular X-rays and CT (for 14 patients) and MRI (for 1 patient) images were checked. The scapular exostoses were located on the anterior surface near the medial margin in all but one patient, who had both anterior and posterior scapular osteochondromas near the inferolateral edge.

The most common complaint was winging of the scapula (100%), followed by pain in 12 patients (80%), and crepitus with motion in 10 patients (66.6%).

Surgical excision of the exostoses was performed in all cases. No infection was detected after surgery. There was no dorsal scapular nerve injury. In the early postoperative period snapping, grinding or popping sensations were lost.

At their last examination, we did not detect any crepitus or winging of the scapula. All patients' shoulder movements were normal. Patients answered a questionnaire (the simple shoulder test) and reported no restriction of motion involving their operated shoulders. They were able to use their shoulder to lift the same weight and toss a softball overhand as the unaffected extremity. According to their answer to the simple shoulder test this surgery did not affect their social or working life. The patients did not need any other surgical treatment for the scapular exostoses, and they reported no symptoms of recurrence, like pain or shoulder discomfort.

DISCUSSION

Snapping scapula syndrome typically involves painful, audible, or palpable abnormal scapulothoracic motion. The syndrome may be caused by skeletal or soft-tissue issues that interfere with smooth articulation between the scapula and rib cage. Crepitus, or the thickening of synovial fluid, can create roughness and crunching in this area.[5]

Also called osteocartilaginous exostoses, an osteochondroma is an overgrowth of cartilage and bone at the end of the bone near the growth plate. Such overgrowth can occur in any bone where cartilage eventually forms bone.[6] In a large retrospective study at the Mayo Clinic (Rochester, MN), osteochondromas comprised 35.8% of benign bone tumors and 8.5% of all bone tumors.[7] Their location is usually metaphyseal, and 90% occur in the distal femur, tibia, or humerus. Occasionally, the pelvis, scapula, or ribs are involved. The most common primary bone tumor of the scapula

Figure 3. Demonstration of the volar and dorsal scapular osteochondromas, oblique radiograph.

is osteochondroma, with an incidence of 4.6%.[7] Osteochondromas of the scapula usually occur on the anterior surface and cause pain and a grating sound with movement of the scapula as part of the scapulothoracic articulation.[2] Pseudo-winging of the scapula and a decreased range of shoulder motion are also common.[8-11]

Osteochondromas are most commonly diagnosed incidentally, based on a radiograph obtained for some other reason. The second most common presenting symptom is a mass, which may or may not be associated with pain. Most of these lesions do not need to be treated, and asymptomatic lesions can be ignored safely. When painful, however, they need to be evaluated properly. The pain is usually the result of mechanical symptoms in which the osteochondroma has a direct mass effect on the overlying soft tissue. This can result in an associated sac or bursitis over the exostosis. Irritation of the surrounding tendons, muscles, or nerves can result in pain.

In an extensive review of the literature, Carlson et al.[2] identified 89 cases of snapping scapula syndrome reported between 1867 and 1996. Osteochondroma of the scapula was the cause in 16% (n=14). Our series contained 15 cases, which is the largest series reported to our knowledge. As we have noted, we operated on 30 patients for this condition, but could not reach half of these patients to evaluate their final complaints and recurrence as only 15 patients were examined in the last follow-up.

As benign lesions, they have no propensity for metastasis. In fewer than 1% of solitary osteochondromas, malignant degeneration of the cartilage cap into secondary chondrosarcoma has been described and is usually heralded by new growth of the lesion, new onset of pain, or rapid growth of the lesion.[5] In our study, no patient gave any history of recurrent pain, and we did not detect any new winging of the scapula or crepitus with shoulder motion.

Surgical treatment can be done with open or arthroscopic techniques. Arthroscopic surgery for snapping scapula syndrome offers several theoretical advantages over open operative treatment. These include minimizing dissection and preserving muscle attachments, thereby eliminating the need for postoperative immobilization and potentially shortening the rehabilitation period. Other advantages include an improved cosmetic appearance and potentially decreased hospital stays. If there is osseous impingement, bone can be resected with use of a high-speed bur.[7] We had no experience with scapulothoracic joint arthroscopy, so open surgery was selected.

In summary, the most common primary bone tumor of the scapula is the osteochondroma. Most are on the volar side. Some of them are symptomatic and cause snapping. Excision is the appropriate treatment for these osteochondromas. In this retrospective analysis, complete relief following excision of the exostosis was achieved in all patients. No patient had any complaint or recurrence.

Declaration of conflicting interests

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