



Case Report

Bilateral scapular osteochondroma in Multiple Hereditary Exostosis patient presented with bilateral shoulder pain treated with arthroscopic and open excision: Case report

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ABSTRACT

Introduction and importance: Multiple etiologies for snapping shoulder syndrome have been described in the existing literature. Scapular osteochondroma is considered as a rare etiology and bilateral scapular osteochondroma have rarely been reported to date. Patient can present with discomfort, pain and crepitation. Multiple surgical methods were described and the patient underwent two different surgical methods with preferable outcome for arthroscopic side.

Case presentation: 24 year-old male who is known case of Multiple Hereditary Exostosis (MHE) since childhood presented with bilateral shoulder pain and snapping scapula. Computed tomography demonstrated bilateral ventral scapular osteochondromas. One side treated with open excision and other side with arthroscopic excision.

Clinical discussion: Patient exhibited resolution of symptoms, restoration of function on both sides, but he reported cosmetic preference over arthroscopic side and faster recovery from surgery as well in terms of pain resolution and rehabilitation.

Conclusion: Osteochondroma should be one of differential diagnoses for snapping shoulder syndrome. Despite arthroscopic excision is technically demanding, it carries better outcome compared to open excision.

1. Introduction

Osteochondroma is a benign tumor characterized by enchondral bone overgrowth [1]. It is the most common benign bone tumor (30–50%) and it represents 10–15% among all bone tumors [2]. It can present as solitary mass or multiple involvement (Multiple Hereditary Exostosis “MHE”) [3]. Most affected sites are distal femur, proximal tibia and proximal humerus [1]. Scapular involvement is reported around 3–4.6% [4]. Scapular osteochondroma is the most common benign bone tumor [5]. Scapular osteochondroma might be asymptomatic, but due to growth nature of the tumor until skeletal maturity symptoms could develop with time [6]. Symptoms are directly correlated with the size of osteochondroma and it is related to mass effect which includes pain explained by fracture, bursa formation or impingement of tendons or nerves [7]. Classically open excision is the treatment option for symptomatic osteochondroma, but recently multiple papers described the arthroscopic excision of scapular exostosis [3,8–10] To best of our knowledge two papers in literature described bilateral scapular

osteochondroma treated with excision [11,12]. We describe in this paper 24 year-old male who is known case of Multiple Hereditary Exostosis (MHE) since childhood presented with bilateral shoulder pain and snapping scapula, one side treated with open excision and other side with arthroscopic excision.

2. Case presentation

A 24 year-old male known case of Multiple Hereditary Exostosis presented with bilateral shoulder painful crepitation for three years from presentation to the clinic. Pain interfering with his daily activities including sleeping in supine position. No reported history of trauma. No reported constitutional symptoms. Upon examination no obvious deformity or winging noticed. No localized scapular tenderness. Painful range motion with audible and palpable crepitation. No neurological deficit in affected limb. Patient denied any past surgical history. No known allergies. No reported family history of similar complaint. Patient denied use of alcohol, cigarettes or recreational drugs.

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X ray Anteroposterior demonstrated no findings on both sides (Fig. 1) but no available scapular Y-view. Computed Tomography (CT) with 3D reconstruction revealed multiple exostosis including two sessile scapular ventral osteochondromas over right side (Fig. 2) and one large solitary osteochondroma over left side (Fig. 3). Non-surgical management including analgesia and physical therapy didn't improve patient's pain. Surgical decision was made for staged procedure (left side first) and patient agreed.

3. Surgical technique

3.1. Arthroscopic excision (right side)

Patient was in prone position with arm in internal rotation (Chicken wing position) to widen scapulothoracic area and to facilitate the exposure in arthroscopy. Adrenaline was injected to minimize the bleeding and to help in visualization during arthroscopy. First portal was inserted 2 cm medial to medial scapular border and inferior to scapular spine level. Second portal was inserted 4 cm inferior to first portal under direct vision. Third portal was inserted 2 cm medial to superomedial angle of scapular for superomedial osteochondroma. Portal sites demonstrated in (Fig. 4). Diagnostic arthroscopy demonstrated two osteochondromas (Fig. 5). Using electrocautery soft tissue was stripped of the bone to expose the tumor. Arthroscopic burr was used for shaving the tumor until it flushed with the scapular body. Sling was applied to minimize post-operative pain. No neurological deficit was noticed after surgery.

3.2. Open excision (left side)

Under general anesthesia patient was in prone position. Medial approach of scapula was taken. Trapezium muscle was incised in line with its fibers, rhomboid muscle was spitted with its fiber, medial exostosis was exposed, identified and osteotomized. Bone wax was applied. Posterior exostosis was identified and osteotomized. Closure done layer by layer. Sling was applied to minimize post-operative pain. No neurological deficit was noticed after surgery. Both procedures were performed by Professor. Abdulaziz Alahaideb (professor of Orthopedic and sport surgery).

During follow up, patient exhibited full painless range of motion with no crepitation and will start strengthening exercises under supervision of physical therapist. Post excision CT 3D of right side demonstrated in

(Fig. 6). To date of writing the case, no reported complication during the treatment course of the patient.

This case report has been reported in line with the SCARE Criteria [13].

4. Discussion

Snapping shoulder syndrome is a rare disease of scapulothoracic joint characterized by painful or painless crepitation either due to bony or soft tissue abnormalities [14]. Normally scapulothoracic joint consisted of posterior ribs and ventral aspect of scapula, painless smooth range of motion explains the congruence in the joint and any alteration in both surfaces produces pain and crepitation [15]. Snapping shoulder syndrome due to osteochondroma is rare [16]. Most commonly present at 1st or 2nd decade of life [5]. Osteochondromas cease growing after skeletal maturity, but in minority it keeps growing after skeletal maturity [6]. In our case patient started to be symptomatic after skeletal maturity.

Patients can present with painless cosmetic deformity, painless crepitation or pain due to multiple complications related to the tumor including fracture of the tumor, bursa formation mechanical irritation of soft tissue, and nerve compression [6]. In our case patient presented with painful crepitation which affected his daily activity.

Diagnosis is made using clinical picture, plain radiographs and advanced imaging in form of Computed Tomography (CT) and confirmed using histopathology [17]. Our patient known to have MHE with diffuse involvement. Plain radiographs were not useful in our case by advanced imaging revealed two sessile osteochondroma.

Surgical excision is indicated in the presence of pain [3]. Multiple techniques described in literature including open and arthroscopic excision [5]. Arthroscopic carries better outcome compared to open excision in term of quicker recovery and lower complication rate [7]. On the other hand, arthroscopic excision considered technically difficult due to limited anatomical landmarks and it carries risk for accessory and dorsal scapular nerve injury [7]. Arthroscopic excision reserved for patients where all investigations are suggestive for osteochondroma and contraindicated for cases where tumor highly suggestive for malignancy to avoid spreading the tumor to the whole joint [18]. In our case patient is known to have MHE and imaging findings are not suggestive for malignancy.

Ruland et al. stated the safe position for portal which should be four fingerbreadths from medial border of scapula and inferior to scapular

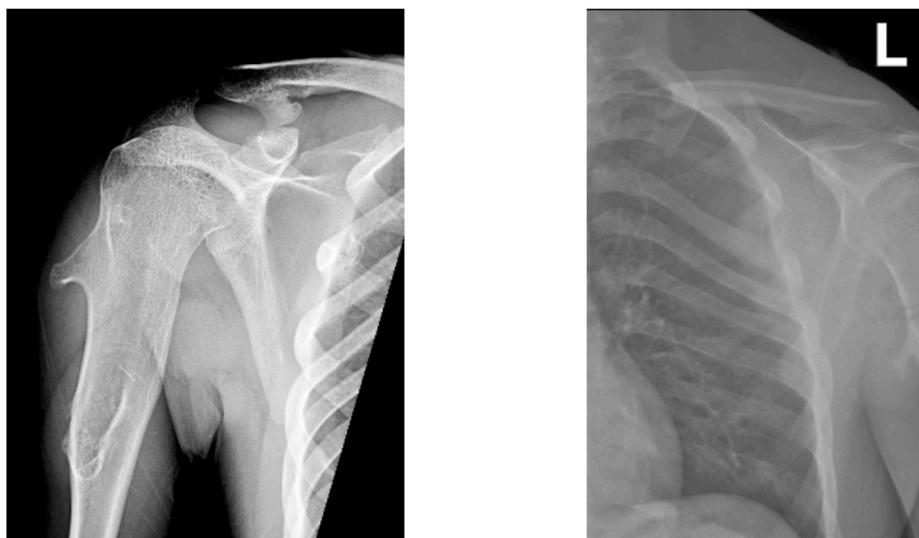


Fig. 1. (a) Plain AP radiograph of right shoulder showing proximal humerus and subclavicular osteochondroma, but no visible scapular osteochondroma. (b) Plain AP radiograph of left shoulder showing proximal humerus osteochondroma, but no visible scapular osteochondroma.

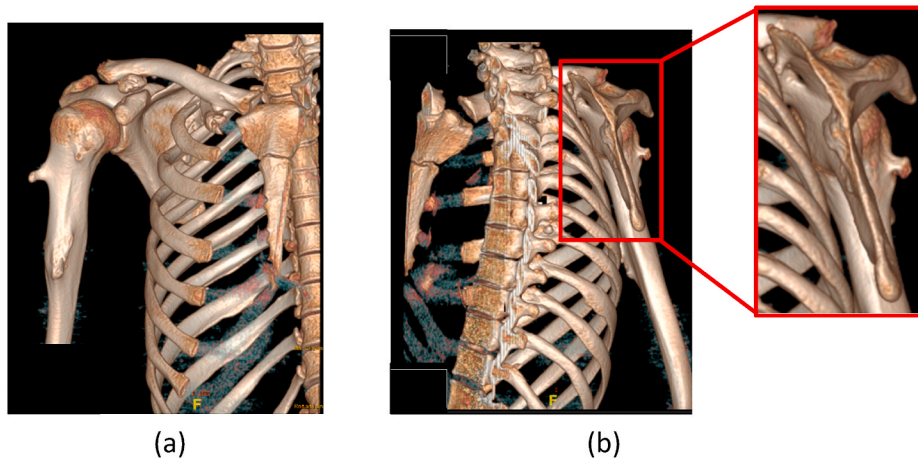


Fig. 2. (a) CT 3D demonstrating detailed anatomy of right proximal humerus and subclavicular osteochondromas. (b) CT 3D Sagittal view of right scapula demonstrating two osteochondromas one at superomedial aspect of scapula and one over medial middle border of scapular.



Fig. 3. CT 3D demonstrating detailed anatomy of left scapula showing large sessile osteochondroma over ventral aspect of scapula.

spine [19]. Inferior portal should be at the level of inferior angle of scapula [19]. Superomedial portal (Ejnisman’s portal) was described to access superomedial angle of scapula [18]. In our case three portals were used, two inferior to scapular spine portals as described by Ruland to access middle osteochondroma and superomedial portal to access

superomedial scapular angle osteochondroma.

Patient exhibited resolution of symptoms, restoration of function on both sides, but he reported cosmetic preference over arthroscopic side (right).

5. Conclusion

We described in this paper 24 years old male presented with bilateral snapping shoulder syndrome secondary to ventral osteochondroma which was treated with open and arthroscopic excision. Follow up showed resolution of symptoms. Osteochondroma should be one of differential diagnoses for snapping shoulder syndrome. Despite arthroscopic excision is technically demanding, it carries better outcome compared to open excision.

Ethical approval

Not applicable.

Sources of funding

Not applicable.

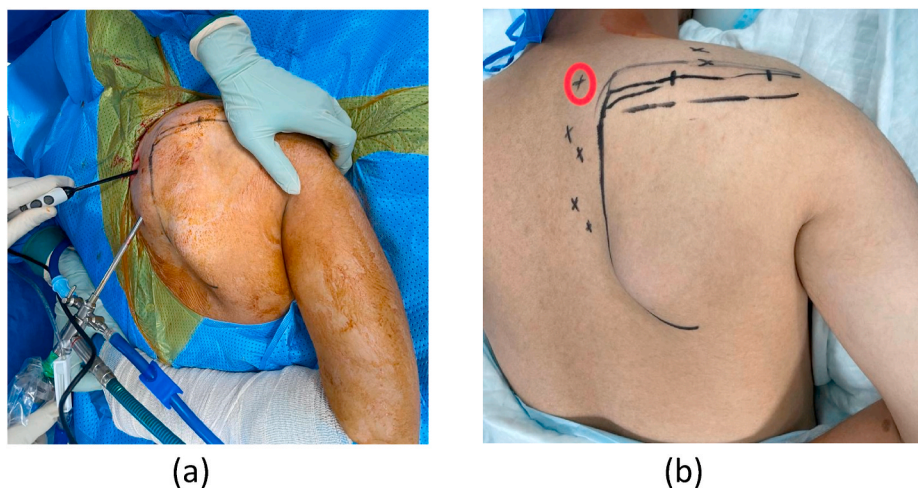


Fig. 4. (a) Intra-operative picture demonstrating starting with two portals inferior to scapular spine. (b) Pre-operative portal site marking and encircled is the superomedial portal used.

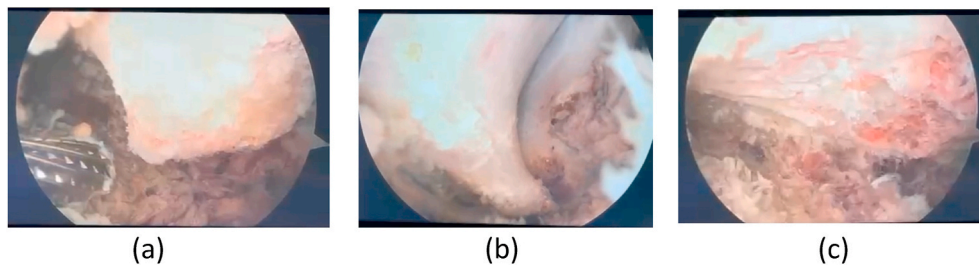


Fig. 5. Arthroscopic views showing: (a) Inferior osteochondroma after stripping soft tissue. (b) Superomedial osteochondroma after stripping soft tissue. (c) Inferior osteochondroma post excision.



Fig. 6. CT 3D reconstruction showing post excision picture of right scapula.

Authors contribution

The following is the list of authors and their contribution in the case report:

Fahad A ALSHAYHAN: Writing introduction and case presentation.

Adel Alahaidib: Writing investigations and preparation of materials.

Mouad Alsowaigh: Writing discussion.

Abdulaziz Alahaideb: Writing surgical technique and review of the paper.

Research registration number

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Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Declaration of competing interest

No conflict of interest between authors.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.amsu.2021.102481>.

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