

Management of Scapular Osteochondroma: An Uncommon Report of Two Cases

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Learning Point of the Article:

Scapular osteochondroma is a rare cause of shoulder dysfunction and posterior shoulder swelling. Early diagnosis with advanced imaging and complete excision at the tumor base provide excellent functional outcomes and prevent recurrence.

Abstract

Introduction: Osteochondroma is the most common benign bone tumor, accounting for approximately 35–40% of all benign skeletal neoplasms. Although commonly seen in the metaphysis of long bones, involvement of the scapula is uncommon. Scapular osteochondromas may present with pain, cosmetic deformity, mechanical restriction of shoulder movement, snapping scapula syndrome, or scapular winging. Symptomatic lesions often require surgical excision.

Case Report: We report two cases of symptomatic dorsal scapular osteochondroma in young adult males. The first patient, a 27-year-old male with a family history of multiple hereditary exostosis, presented with a giant swelling arising from the right scapula associated with pain and restricted shoulder movements. The second patient, a 25-year-old male, presented with a progressively enlarging swelling over the left scapula causing mechanical restriction of shoulder abduction. Radiographs, computed tomography, and magnetic resonance imaging confirmed the diagnosis in both cases. Complete surgical excision was performed through a posterior approach. Histopathological examination confirmed benign osteochondroma in both patients. At 6-month follow-up, both patients demonstrated complete symptom resolution, full range of motion, and no evidence of recurrence.

Conclusion: Scapular osteochondroma should be considered in the differential diagnosis of posterior shoulder swellings and unexplained mechanical shoulder symptoms in young adults. Cross-sectional imaging is essential for diagnosis and surgical planning. Complete excision of symptomatic lesions results in excellent functional outcomes and minimal recurrence risk.

Keywords: Scapular osteochondroma, dorsal scapula, exostosis, benign bone tumor, shoulder swelling, surgical excision.

Introduction

Osteochondromas, also referred to as osteocartilaginous exostoses, represent the most frequently encountered benign bone tumors, accounting for approximately 35–40% of all benign bone neoplasms. They are characterized by a cartilage-capped bony projection arising from the surface of a bone, with cortical and medullary continuity between the lesion and the host bone

being pathognomonic. While the majority originate in the metaphyseal regions of long bones most commonly the distal femur, proximal tibia, and proximal humerus, scapular involvement, though uncommon, is well described in the literature and carries distinct clinical implications owing to the unique anatomy of the scapulothoracic articulation [1].

Scapular osteochondromas may arise from either the dorsal or

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Author's Photo Gallery



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Figure 1: Clinical image of the swelling. The swelling is massive in size. It causes significant mechanical compression of the neurovascular structures.

ventral surface of the bone. Ventral (subscapular) lesions are particularly troublesome, as they occupy the scapulothoracic space and can cause mechanical impingement against the posterior chest wall. This leads to the classic presentation of “snapping scapula” syndrome, pain, and, in advanced cases, scapular winging due to serratus anterior dysfunction [2]. Dorsal lesions, by contrast, may present as palpable posterior chest wall swellings that progressively enlarge and interfere with shoulder mechanics. This report presents two cases of symptomatic scapular osteochondroma, describes their clinical course, surgical management, and outcomes, and provides a focused discussion of the relevant literature.

Case Report

Case 1

A 27-year-old right-hand-dominant male, presented to the orthopaedic outpatient department with a 6-month history of swelling on right side of chest in the back with progressive right shoulder pain and mild restriction of movements of right shoulder. There was no history of trauma. Family history of multiple hereditary exostosis (MHE) was present. On physical examination, a massive, firm, non-tender bony swelling was palpable posterior to the right scapula as seen in Fig. 1. Shoulder

range of motion had restriction of abduction and forward flexion beyond 90°. Neurological examination of the upper limb was normal. Scapular winging was absent.

Plain radiographs of the right shoulder and chest demonstrated a bony excrescence on the dorsal surface of the scapula. magnetic resonance imaging (MRI) scan confirmed a sessile multiloculated lesion measuring $16 \times 14.9 \times 17.1$ cm arising from the lateral border of the right scapula, with a chondroid matrix. A hyaline cartilage cap of approximately 4 mm thickness with abutment to dorsal scapular and suprascapular neurovascular bundle without any feature suggestive of malignant transformation. A diagnosis of dorsal scapular osteochondroma was established. Fig. 2 shows a 3D computed tomography (CT) Scan of the lesion to evaluate the extent of the tumor and helps in the preoperative planning.

The patient was counselled regarding the diagnosis and surgical options. Under general anesthesia in the lateral decubitus position, a standard posterior approach was utilized. The trapezius and rhomboid muscles were reflected medially to expose the dorsal scapular surface. The serratus anterior was carefully detached from the medial border to access the subscapular space. The osteochondroma, along with its overlying reactive bursa, was identified and excised en-bloc at its base using an osteotome, ensuring no residual stalk tissue remained. The wound was closed in layers over a suction drain. The excised specimen measured $4.0 \times 3.0 \times 2.5$ cm.

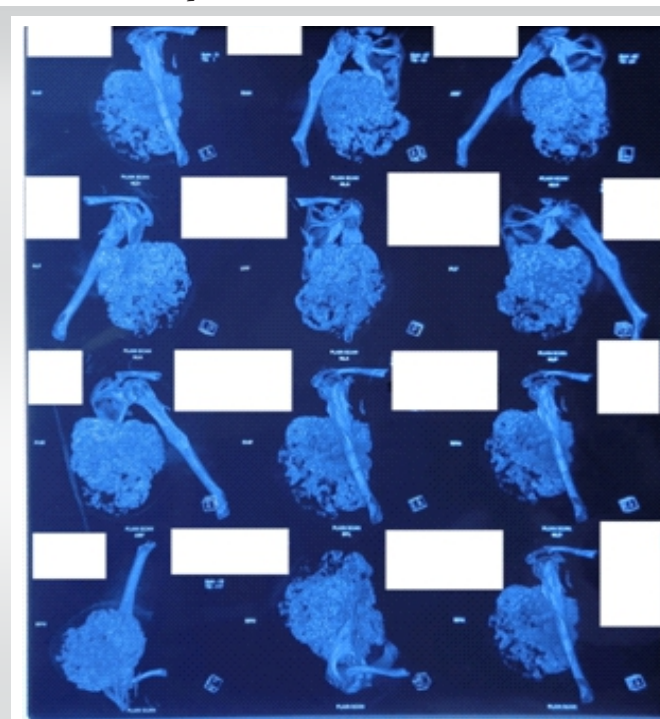


Figure 2: 3D CT scan of the scapula. The 3D CT scan provides an appropriate pre operative planning picture of the swelling. The location, extent and size of the tumor can be clearly delineated. CT: Computed tomography.

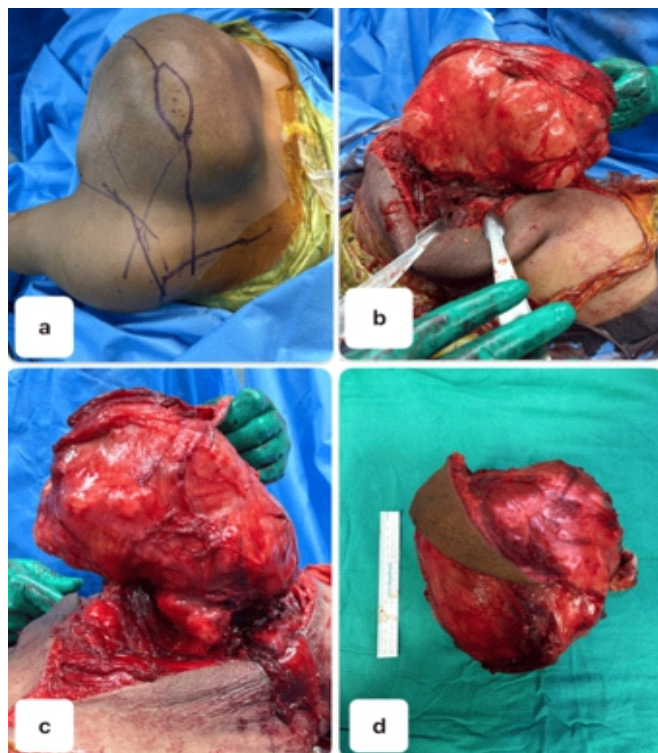


Figure 3: Surgical excision of the tumor. (a) The patient is positioned prone on the operating table and skin marking done. (b) It is very important to properly expose the tumor and reach its base and ablate it to prevent recurrence. (c) The base of the tumor exposed. (d) The tumor after removal and measured with the surgical scale. The redundant skin should be removed to prevent the formation of dead space and hematoma after surgery.

Histopathological examination confirmed osteochondroma with a thin hyaline cartilage cap, orderly endochondral ossification, and no cytological atypia. Fig. 3 demonstrates the surgical excision of the tumor as detailed with the image. Fig. 3a shows the preoperative surgical marking. Fig. 3b and c show the exposure and Fig. 3d shows the excised tumor.

Postoperative recovery was uneventful. The drain was removed on day 2. Physiotherapy was commenced at 2 weeks, and the patient achieved full pain-free range of motion by 6 weeks. At 6-month follow-up, the patient was asymptomatic with no radiological evidence of recurrence. Shoulder function was excellent, and he had returned to his activities.

Case 2

A 25-year-old male student presented with an 8-month history of a progressively enlarging bony swelling over the posterior aspect of the left shoulder, associated with dull aching pain. There was no history of constitutional symptoms, trauma, or family history of similar lesions. On examination, a firm, immobile, non-tender bony prominence was palpable over the body of the left



Figure 4: Swelling on the dorsum of left Scapula. The detailed physical examination reveals the swelling is originating from the scapula. Given the location of swelling it can be misleading to assume its origin and should be confirmed with imaging. (a) The swelling when viewed from side, (b) from front (c) from back.

scapula. Shoulder abduction was restricted to 130° due to mechanical impingement. Distal neurovascular examination was normal. Fig. 4 shows the clinical photograph of the patient. Fig. (4a) from side, (4b) from front, (4c) from back.

Plain radiographs revealed a sessile bony excrescence arising from the dorsal surface of the left scapular body. CT scan demonstrated a 6.7 × 6.5 × 5.5 cm lobulated osseous mass,

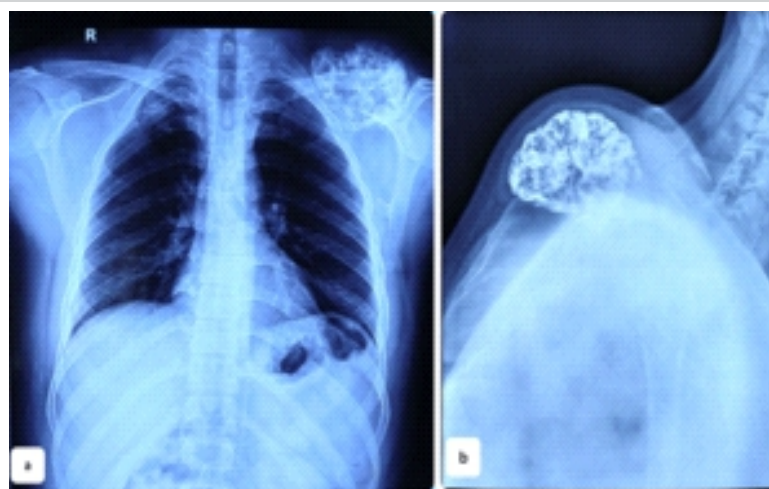


Figure 5: X-ray chest and scapula. Radiographs in different angles guides us to the origin of the swelling and gives a primary idea of the type of the swelling. (b) Antero-posterior view and (b) Lateral view.

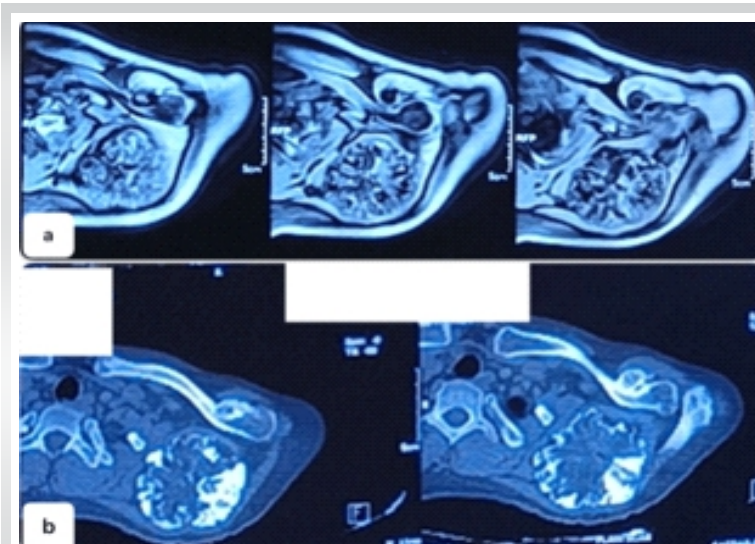


Figure 6: (a) CT scan and (b) MRI of the shoulder and scapula. (a) CT scan and figure (b) MRI confirms the diagnosis and helps to evaluate the extent of the tumor and aids in preoperative planning. CT: Computed tomography, MRI: Magnetic resonance imaging.

chondroid matrix with cortical and medullary continuity with the scapula. MRI confirmed a cartilage cap of approximately 5 mm, abutting supraspinatus muscle with no signs of malignant transformation. The diagnosis of dorsal scapular osteochondroma was established. Fig. 5a shows the Antero-posterior view and Fig. 5b shows lateral view radiographs of the patient. Fig. 6a shows sections of MRI and Fig. 6b shows sections of CT scan of the site of swelling.

Surgical excision was performed under general anesthesia with the patient in the right lateral position. A curvilinear incision was made over the posterior aspect of the left scapula, centred over the mass. The deltoid was retracted superiorly and infraspinatus inferiorly with its fibers to expose the mass. The osteochondroma was dissected free from surrounding soft tissues, and the mass was removed from its base with an osteotome under direct visualization, ensuring complete excision. Histopathological examination confirmed the diagnosis of osteochondroma with no evidence of malignancy. Fig. 7a-c shows the preoperative surgical marking and surgical excision of the tumor. Fig. 7d shows the post-operative surgical site.

The postoperative course was unremarkable. Active-assisted shoulder physiotherapy was initiated at 2 weeks. By 8 weeks, the patient had regained full range of motion and was pain-free. At 6-month follow-up, clinical and radiological examination showed no recurrence, and the patient had returned to full activities of daily living without restriction.

Discussion

Scapular osteochondromas, account for only a small proportion

of all osteochondromas. Both solitary and multiple (in the context of MHE) forms are reported.

The clinical presentations in our two cases are consistent with patterns described in the literature. In case 1, due to massive swelling, the symptoms were primarily due to mechanical impingement of mass on soft tissues. In Case 2, the dorsal lesion presented primarily as a visible and palpable posterior shoulder swelling with secondary mechanical restriction, a more typical presentation but one that can be easily misattributed to soft tissue tumors or lymphadenopathy if imaging is not obtained early. Both the tumors did not involve shoulder joint, but there was restriction of movements due to abutment of tumor to muscles responsible for shoulder movements.

MRI remains the gold standard for preoperative assessment of scapular osteochondromas, as it accurately delineates cartilage cap thickness, which is the most important imaging parameter for risk-stratifying malignant transformation. A cap thickness exceeding 1.5–2 cm in adults (up to 3 cm in skeletally immature patients) raises concern for secondary chondrosarcoma and mandates careful histopathological evaluation. In both our



Figure 7: Surgical excision of the tumor. Gentle dissection to the base of the tumor. The excised tumor is sent for histopathological examination. (a) Preoperative surgical marking. (b) The excised tumor. (c) The tumor. (d) Post-operative surgical site. The redundant skin is removed and closure done to decrease the chances of dead space formation.

cases, cartilage cap thickness was well within benign limits [1, 3, 4].

Surgical excision is indicated for symptomatic lesions and is the definitive treatment. The key surgical principle is complete excision at the base of the stalk, as incomplete resection leaving residual periosteum or cartilage increases the risk of local recurrence. Dorsal lesions are more accessible via a posterior approach with modified Judet approach [1, 2, 5].

Both cases in the present report achieved excellent functional outcomes with no recurrence at 6 months. These findings reinforce the principle that timely and complete surgical excision is curative for scapular osteochondromas [2, 6, 7]. Delayed diagnosis, as documented in several series, may compound symptoms including progressive scapular winging, bursitis formation, and subscapular fibrosis, making dissection more complex and potentially jeopardizing functional recovery [5, 8, 9]. Orthopedic surgeons should maintain a high index of suspicion for scapular osteochondromas in younger patients presenting with mechanical shoulder symptoms, palpable posterior chest wall masses, or unexplained snapping scapula syndrome, and should not hesitate to obtain cross-sectional imaging when plain radiographs are inconclusive [9, 10].

Conclusions

Scapular osteochondroma, though uncommon, should be considered in young patients with posterior shoulder masses and mechanical symptoms. Although rare but it should be considered one of the differential diagnosis in cases of diagnostic dilemma. MRI assessment of cartilage cap thickness is central to malignancy risk stratification and thus detailed imaging is vital for reaching the diagnosis as well as decision making for further course of treatment. Complete excision at the base is curative for symptomatic lesions and yields excellent functional outcomes with low recurrence. Early recognition and treatment can avert secondary scapulothoracic pathology.

Clinical Message

Scapular osteochondroma should be suspected in patients presenting with persistent posterior shoulder swelling and mechanical shoulder symptoms. Advanced imaging is critical for diagnosis and assessment of malignant potential. Complete excision at the tumor base remains the definitive treatment and yields excellent outcomes.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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