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Osteochondroma of Dorsal Scapula: A Case Report and Review of Literature

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Learning Point of the Article:

Osteochondroma arising from the dorsal scapula is a rare entity and should be kept in the differential diagnosis of any patient presenting with scapular swelling. Surgery should be done only when properly indicated for and Patient-Reported Outcome Measures should be used for the outcome of surgical excision of benign tumors of bone, especially in rare cases and for the benefit of clinical research.

Abstract

Introduction: Osteochondroma of the scapula constitutes only 3–5% of all osteochondromas; osteochondroma on dorsal aspect of scapula is a rare entity. Diagnosis is almost always clinicoradiologically. Additional computed tomography scan and magnetic resonance imaging may be required for osteochondroma of flat bones such as scapula. Indications for surgery include pain, deformity, dysfunction, neural or vascular compromise, failure of conservative management, or in clinical settings with the high suspicion of malignant transformation and occasionally cosmesis. Outcome of a surgery should be assessed by Patient-Reported Outcome Measures (PROMs) which appraises what "matters to the patient."

Case Report: A 10-year-old boy presented to us with painless swelling over the right upper back since 3 years of age and discomfort over the area while sleeping on his back for 6 months. Diagnosis confirmed it to be a pedunculated osteochondroma arising from the dorsal scapula. Here, we report the diagnosis, treatment, and successful Patient-Reported Outcome using QuickDASH© score for an osteochondroma of dorsal scapula using CARE© case reporting guidelines.

Conclusion: We report a rare site of osteochondroma, review the relevant literature, and also stress upon the necessity of analyzing PROMs after surgical treatment of benign tumors of bone which would enable us to evaluate the result of surgery on symptoms, functioning, and health-related quality of life from the patient's perspective.

Keywords: Osteochondroma, osteocartilaginous exostosis, scapula, Patient Reported Outcome Measure, Patient-Reported Outcome.

Introduction

Osteochondromas of the scapula are rare, constituting around 3–5% of all osteochondromas and usually occur on the ventral surface [1, 2]. Symptomatic solitary osteochondroma on dorsal aspect of scapula is even more sparsely documented [3]. We conducted a literature search of SCOPUS and PUBMED for osteochondroma or exostosis of dorsal scapula which yielded 11 published articles with a total of 13 reported cases till 2022. However, merely one article by Frost et al. [4] analyzed Patient-Reported Outcome Measures (PROMs) after surgical excision of the osteochondroma of dorsal scapula. PROMs assessment is prerequisite for improving patient health care and for clinicians, regulators, health-care management teams, commissioners, and policymakers [5]. Here, we report a case of diagnosis, treatment,

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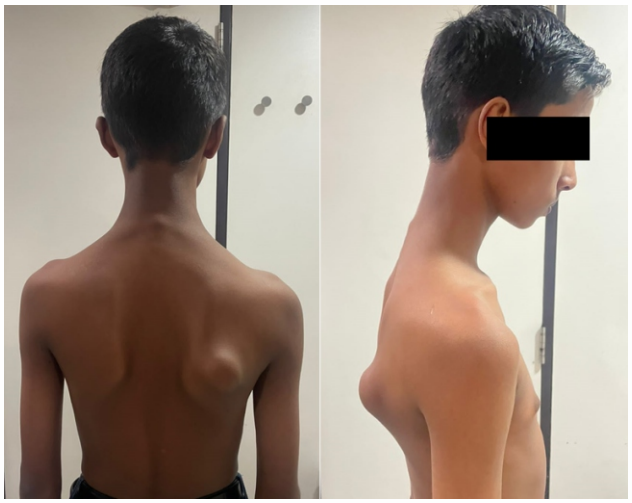

Figure 1: Clinical pictures of the patient shows the swelling on the dorsal aspect of right lower scapula.

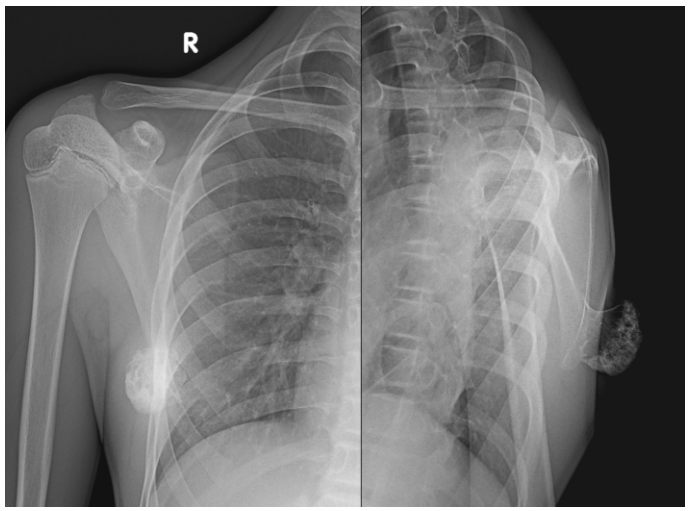

Figure 2: X-ray of right shoulder AP and scapular Y-view shows osteochondroma arising from the dorsal surface of lower end of right scapula measuring 4.9 cm × 3.3 cm.

and successful Patient-Reported Outcome of osteochondroma of dorsal scapula in a 10-year-old boy as per the CARE© [6, 7] case reporting guidelines. Rarity of the site of the tumor and the urge to stress upon the necessity of analyzing PROMs after surgical treatment of benign tumors of bone instigated us to write the report.

Case Report

A 10-year-old boy presented to us with a history of painless swelling over the right upper back since 3 years of age and discomfort over the area while sleeping on his back for 6 months. The swelling was insidious in onset and very slowly increasing in size but was not associated with any impairment of function. The patient denied any history of similar complaints in past, trauma, fever, weight loss, cough, breathing difficulty, constitutional signs and symptoms, or any other known disease or any other swelling in the body. There was no other significant history.

Examination revealed a single smooth, ovoid swelling of size 5.5 cm × 4.5 cm on the dorsal aspect over right lower scapula (Fig.

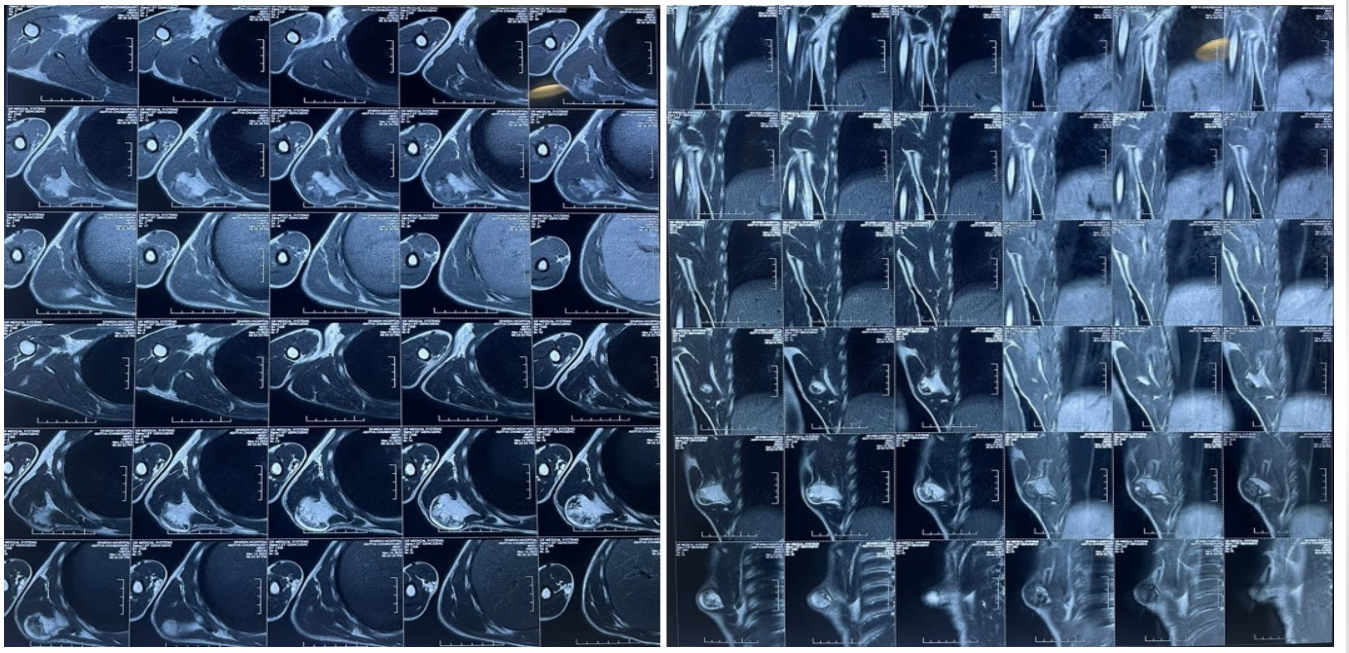

Figure 3: Magnetic resonance imaging shows a bony outgrowth arising from the infraspinatus fossa of the lower end of right scapula measuring 4.8 cm × 4.1 cm × 3.4 cm (mediolateral × anteroposterior × cephalocaudal) with overlying cartilage cap measuring up to 4.6 mm in thickness with no edema within the tumor and no development of bursa around the growth. The overlying muscles appear compressed.

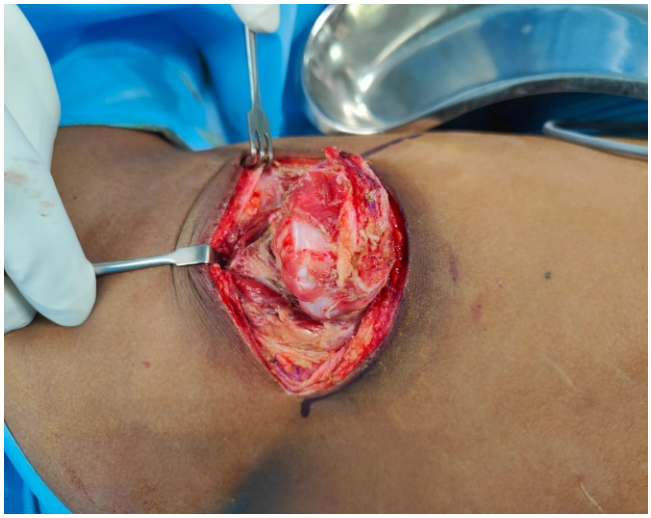

Figure 4: Intraoperative image of the tumor exposed during surgical dissection.

1). It was bony hard, non-tender with smooth edges, and was fixed to the underlying bone but free from overlying skin. There was pain free and full range of right scapulothoracic and shoulder joint motion with no neurovascular deficit in the right upper limb. There was no regional lymph node enlargement. No other similar or palpable swelling was found anywhere else in the body. QuickDASH© questionnaire [8] (copyright property of the Institute for Work &Health) [9] was used to analyze the Patient-Reported Outcome. It is a shortened version of DASH© [9] Outcome measure and consists a subset of 11 items from the 30-item DASH© [9] and is a self-reported questionnaire where the response options are graded as 5-point Likert scales. The scores range from 0 (no disability) to 100 (most severe disability). This score measures physical function and symptoms in people with any or multiple musculoskeletal disorders of the upper limb. Pre-operative QuickDASH© [9] score was 6.818.

Diagnosis of pedunculated osteochondroma of lower end of dorsal right scapula was confirmed with X-ray (Fig. 2) and subsequently magnetic resonance imaging (MRI) (Fig. 3). As patient was symptomatic, surgical excision of tumor was decided upon.

Under general anesthesia and in prone position, an incision of 10 cm was made centered over the tumor along Langer's line. Subcutaneous tissue dissection was done to reach the infraspinatus muscle. The muscle was split along the line of its fibers to expose the tumor and epiperiosteal elevation of muscle was carried out (Fig. 4). The tumor was completely exposed and excised en masse along with a rim of normal scapular bone. The scapular bone edges were smoothened with a bone file. The wound was closed back in layers after achieving proper hemostasis. The postoperative neurological status was intact. Histopathological examination of the tumor confirmed it to be osteochondroma (Fig. 5). Surgical scar was completely healed by 2 weeks after surgery (Fig. 6), and upper limb was supported with an arm sling for 3 weeks, after which gradual shoulder mobilization and muscle strengthening exercises were initiated. Follow-up assessment of the patient is shown in Table 1. QuickDASH© [9] score was zero at the end of 12 weeks. The patient is completely fine with no symptoms or signs of recurrence at 1 year of follow-up.

Discussion

In spite of rarity of osteochondromas in scapula, it is the most common benign bone tumor of the scapula constituting 14.4% of all tumors [1, 10]. Dorsal aspect of scapula is a seldom documented site of origin for osteochondroma [11, 12, 13]. Moreover, majority patients with dorsal scapular osteochondroma are reported to be sessile [11].

Scapular osteochondroma

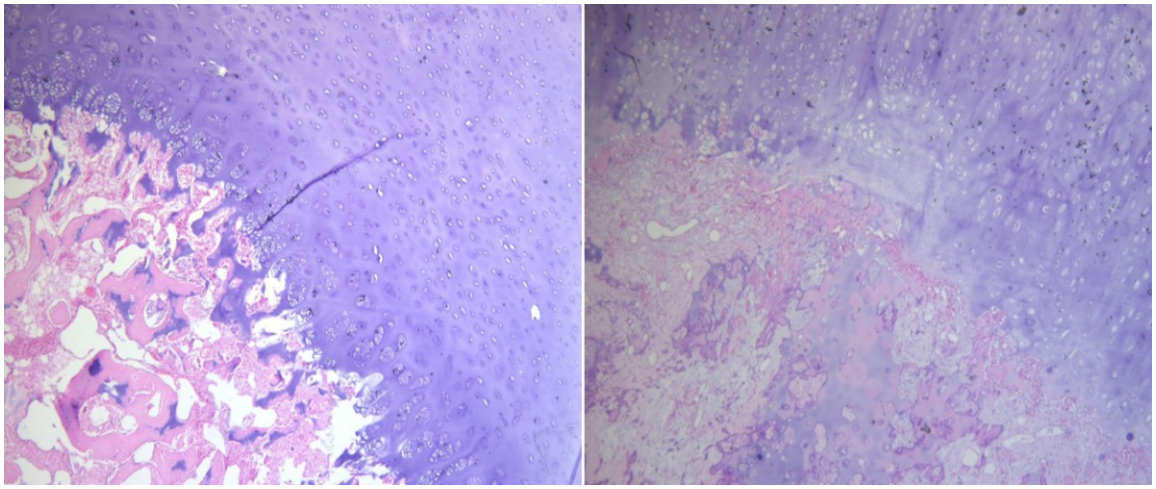

Figure 5: Histopathologic examination after decalcification shows multilobulated neoplasm composed of fibrous capsule formed by benign chondrocytes in columnar arrangements. The base shows endochondral ossification. Maximum thickness of cartilage cap is 5 mm. Fatty cells and hemorrhagic marrow material are seen between the bony trabeculae of the stalk. No spindle cells/nuclear pleomorphism/ abnormal mitosis are seen. Morphological features are consistent with Exostosis/osteochondroma.

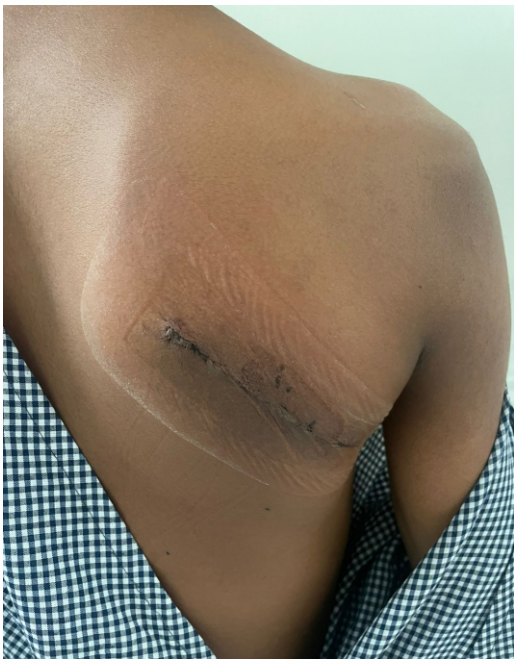

Figure 6: Post-operative picture of a completely healed surgical scar at 2 weeks.

can be an incidental finding or can also have a wide range of symptoms including swelling, cosmetic discomfort, pain, crepitus, and mechanical difficulty/dysfunction, snapping, pseudo-winging, weakness, and pressure effects on circumferential structures including nerves and vessels [12, 13]. The patient can also have difficulty/inability to sleep in supine position in case of dorsal scapular osteochondroma [3, 10] as is in our case too.

Pain can also occur due to irritation and inflammation of overlying soft tissues, bursitis of overlying swelling [14], fracture at stalk of pedunculated osteochondromas, or rarely due to malignant transformation [3]. Signs most concerning for malignant transformation include new onset pain, rapid growth especially after skeletal maturity, anatomical site-scapula or pelvis, and a cartilage cap thickness >2 cm. In skeletally immature bone, during spurts of growth, the cartilage cap may become quite large, and necessarily does not indicate a malignant transformation [15]. It is imperative to distinguish reactive bursa formation from malignant transformation. Computed tomography (CT) scan in these cases can detect the presence of a fluid-filled sac in bursa formation rather than a tumor and also delineate the mineralized portion of the tumor. Fine-needle aspiration is a reliable diagnostic modality for confirmation of a bursa [16]. Sites which predispose to malignant transformation are the locations obscured from general appearance and the bones with complex ossification including multiple ossification centers such as scapula and pelvic bone [15].

Diagnosis of osteochondroma is almost always clinicoradiologically followed by histological confirmation if necessary [17]. Specialized modalities such as CT scan and MRI are essential only when the tumor is not easily visible in X-rays such as in osteochondroma of flat bones [3, 12]. Differential diagnosis includes subungual exostosis, Dysplasia Epiphysealis Hemimelica or Trevor's disease, Turret exostosis, bizzare parosteal osteochondromatous proliferation or Nora lesion, parosteal osteosarcoma, juxtacortical chondroma, and subperiosteal hematoma [18].

Osteochondromas need not be necessarily excised unless properly indicated for [19]. Conservative treatments of scapular osteochondromas include physiotherapy, NSAIDs, and local anesthetic injections. Indications for surgical resection of an osteochondroma include pain, deformity, dysfunction, neural or vascular compromise, failure of conservative management, or high suspicion for malignant transformation [13] or for cosmetic reasons [20]. Surgical treatment is complete excision of tumor and any reactive bursa [4].

There is a predilection of surgery for osteochondromas around shoulder which is even greater for scapula [21]. We must be vigilant for scapular osteochondromas due to potential for malignant change as well as for scapulothoracic motion hindrance and its consequences such as impingement, rotator cuff tear, and biceps tendinopathy [15]. Surgical excision should be done at the earliest for symptomatic cases to reduce the

Postoperative duration	Forward flexion (180°)*	Extension (50°)*	Abduction (180°)*	Internal rotation at 90° (80°)*	External rotation at 90° (90°)*	External rotation at 0° (90°)*	QuickDASH©[9] score
6 weeks	120°	30°	70°	50°	40°	40°	4.545
9 weeks	180°	50°	180°	80°	90°	90°	2.272
12 weeks	180°	50°	180°	80°	90°	90°	0

Table 1: Follow-up assessment of the patient showing the Range of Motion of the operated versus non-operated shoulder and QuickDASH© [9] score of operated upper limb. *The values within parenthesis depict the range of motion of the opposite normal shoulder.

risk of malignant transformation [11].

Recurrence per se does not occur as osteochondromas are benign cartilaginous bone tumor. Any cartilaginous remnant (a not uncommon scenario in large and very sessile lesions) in the skeletally immature bones has the potential to grow and have a "clinical recurrence" [22].

Finally, but most importantly, after surgical treatment, "measuring what matters to patients" is pivotal to improving patient care and service delivery. A method to evaluate it is PROMs, which are questionnaires completed by patients to assess the effects of disease or treatment (or both) on symptoms, functioning, and health-related quality of life from patient's perspective. PROM data can be used to inform health technology assessment, pharmaceutical labeling claims, health policy, and service improvement and can support communication between patients and health-care professionals [5]. CARE© [7] case reporting guidelines also suggest patient perspective to be included in any case report, which can be aptly and successfully done through PROM. This is the first case report of using QuickDASH© [9] score for PROM in a rare case of osteochondroma of dorsal scapula. QuickDASH© [9] score returned to zero at 3 months following surgery which indicates the complete success of the surgical treatment from the patient's perspective.

Conclusion

We report a rare case of osteochondroma of the dorsal scapula in a 10-year-old adolescent boy and successful Patient-Reported Outcome of surgical excision in the same and stress upon the necessity to evaluate the effects of surgical treatment using PROMs, especially in rare cases for the benefit of clinical research.

Clinical Message

Osteochondroma of the dorsal scapula is a rare entity but should be kept in the mind while evaluating any scapular swelling. Surgical indications for osteochondromas should be precisely understood and surgical excision should be done only when properly indicated for. Outcome of surgical excision of any benign bone tumor should be evaluated by PROMs for the improvisation of patient care and service delivery and in assessing what matters to the patient, especially in rare cases and for the benefit of clinical research.

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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