

Osteochondroma of the Scapula: A Case Report and Literature Review

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Review began 09/27/2022

Review ended 10/19/2022

Published 10/21/2022

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Abstract

Osteochondromas are bone lesions composed of medullary and cartilaginous bone covered by a cap of hyaline cartilage. The presence of medullary and cortical bone with the continuity of the tumor is pathognomonic for osteochondroma and aid in establishing the diagnosis.

We report a case of a two-year-old girl who presented to our clinic following her mother noticing a palpable, growing, and painful mass on her left scapula. There was no limitation in the range of motion. A clear-cut mass was seen on the dorsal aspect and palpated measuring around 2.5x3 cm. Surgical excision of the mass followed by histologic examination confirmed osteochondroma. Upon follow-up, the patient had no pain and had a full range of left shoulder motion without discomfort or pain.

In conclusion, scapular exostoses are very rare and more so when they present dorsally. Symptomatic lesions can be managed effectively with surgical excision of exostosis.

Categories: Orthopedics

Keywords: scapula, osteochondroma, exostosis, scapular exostosis, scapular osteochondroma

Introduction

Osteochondromas are bone lesions composed of medullary and cartilaginous bone covered by a cap of hyaline cartilage. The presence of medullary and cortical bone with the continuity of the tumor is pathognomonic for osteochondroma and aid in establishing the diagnosis [1-4]. They are more of developmental lesions, referred to as exostosis, rather than true neoplasms. Osteochondromas emerge due to a separation of a part of the cartilage of the epiphyseal growth plate, which as a result, herniates through the periosteal bone cuff surrounding the growth plate [2,5-8]. There are multiple differential diagnoses that can be considered, such as Nora's lesion, parosteal osteosarcoma, Dupuytren's exostosis, turret exostosis, subperiosteal hematoma, or juxtacortical chondroma; however, none have medullary continuity [1-4,9-13]. Furthermore, osteochondroma is the most common primary bone tumor comprising around 40% of all benign tumors. Some of the common sites for osteochondroma are the proximal humerus, proximal tibia, and distal femur [14,15]. It was also reported to occur following local radiation therapy [16-23] and total body irradiation in children [16,24,25-35]. Osteochondroma rarely occurs in the scapula; but interestingly, it is the most common tumor occurring in the scapula [36-42], accounting for 4.6% of all bone tumors [38,43]. Osteochondromas are usually discovered incidentally due to their asymptomatic nature [3,44,45]. However, symptoms may present with mechanical compression of adjacent structures, fractures, formation of a bursa or osseous deformities, or even malignant transformation [3,4,45,46]. Malignant transformation is rare and commonly associated with hereditary exostosis [45]. Most reported cases in the literature present an anterior scapular location [47-57] and there are very few reports of posterior surface presentation, as we have reported in this paper [14,42,43,58-61], which further explains why our presented case is unique. Very little information is available regarding dorsal scapular osteochondromas. Furthermore, all reported cases have opted for excision, which was sufficient to alleviate the symptoms [14,42,43,47,48,50-60,62]. Surgical management is usually indicated with the presence of pain, need for cosmesis, complications, high risks of malignant transformation, or uncertain diagnosis [44,45,63-66]. We present a case of a two-year-old girl with painful dorsal scapular osteochondroma, which is extremely rare in the literature in her age group.

Case Presentation

We report a case of a two-year-old girl who presented to our clinic following her mother noticing a palpable growing and painful mass on her left scapula for 18 months. No limitation in the shoulder and scapulothoracic joint's range of motion was appreciated. No similar history among other family members was present. A well-defined round mass was seen on the dorsal aspect and palpated measuring 3 x 2.5 cm (Figure 1).

How to cite this article

Altwajiri N A, Fakeeha J, Alshugair I (October 21, 2022) Osteochondroma of the Scapula: A Case Report and Literature Review. Cureus 14(10): e30558. DOI 10.7759/cureus.30558

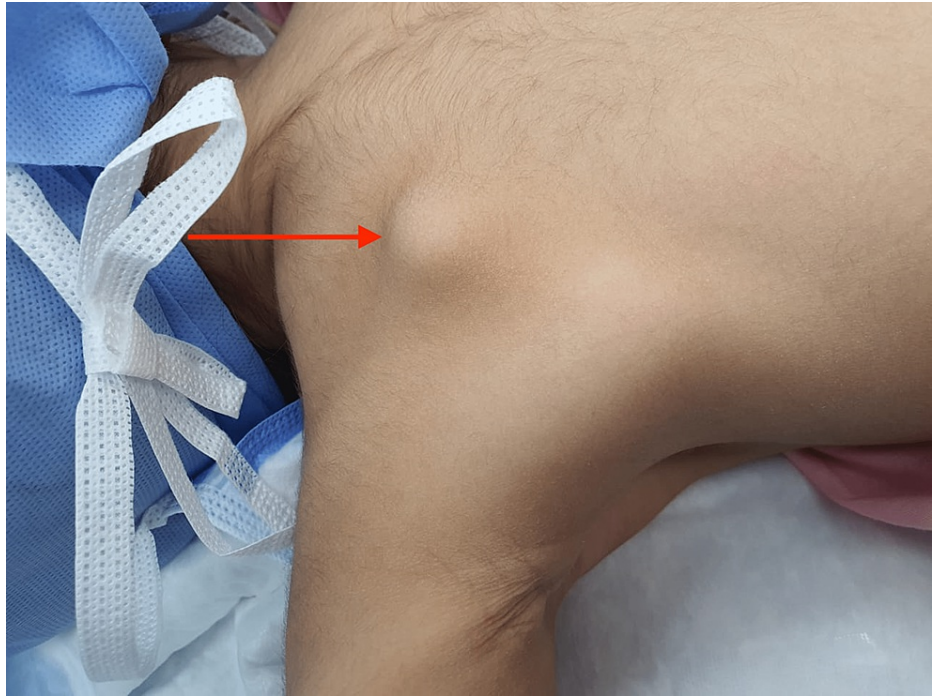


FIGURE 1: Presentation of the patient with scapular exostosis where her parents noted the lump on her back

The mass was severely painful, especially in the supine position. A CT scan confirmed the diagnosis of osteochondroma (Figure 2).

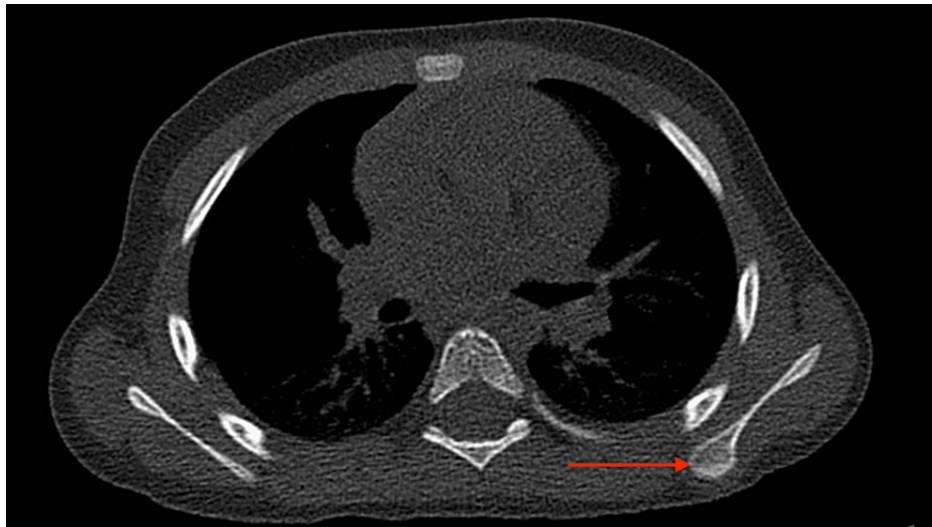


FIGURE 2: CT scan showing exostosis of the left scapula

A nuclear bone scan was done, which concluded the presence of focal uptake in the left scapula corresponding to moderate osteoblastic activity with regular contours and mild sclerotic changes, which were likely related to exostosis, with no other lesions in the body noted on the scan. X-rays showed a bony growth on the dorsal aspect of the scapula (Figure 3).

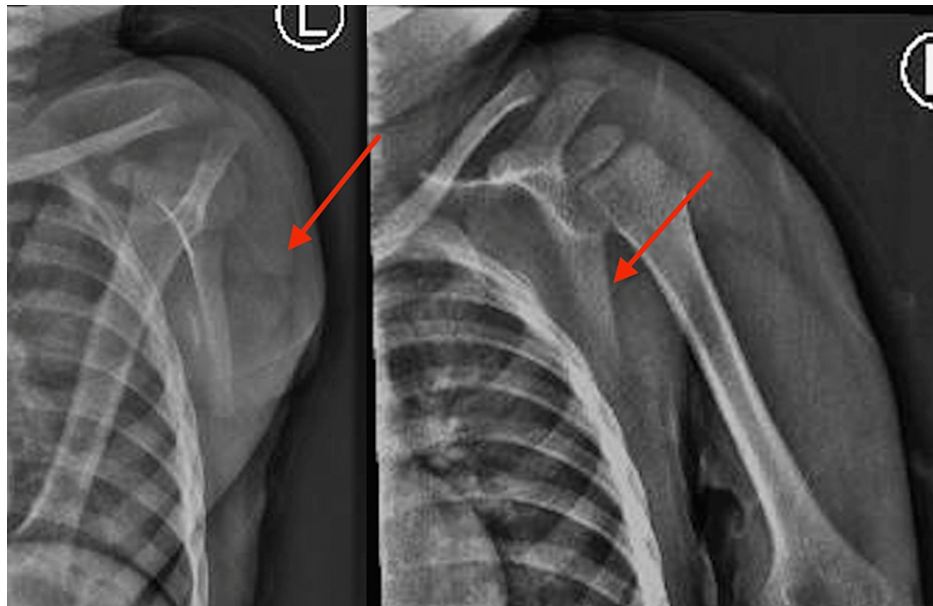


FIGURE 3: Preoperative X-ray taken for the evaluation of the patient

The decision to go for surgical removal with a safety margin was made. The patient was placed in a prone position under general anesthesia. An incision was done right above the mass, separating the muscle directly from the mass, and excising the mass from the base so that no residual part of the mass is left behind. The stalk of the exostosis was excised at the base with an osteotome from the dorsal surface of the scapula (Figure 4). The specimen measured 3× 2.5cm. Histologic examination confirmed that the specimen was an osteochondroma with no signs of malignant transformation.

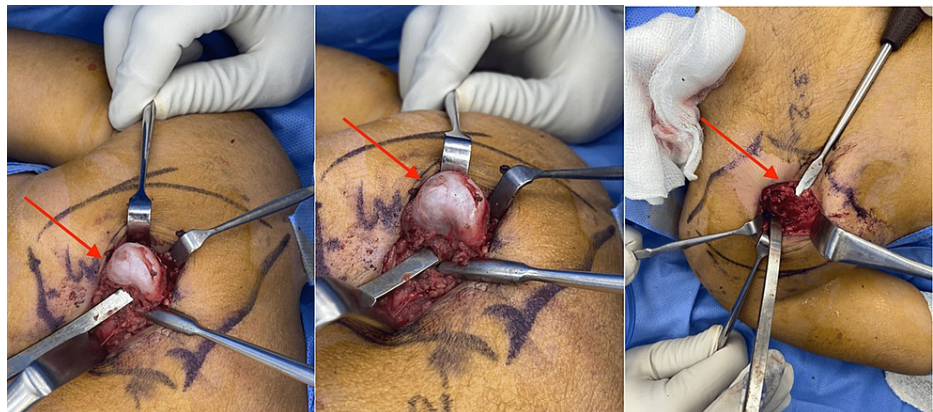


FIGURE 4: Surgical excision of the mass

The patient improved immediately in terms of pain and was followed up in the clinic regularly. Within almost a year, the patient had no pain, and had a full range of left shoulder motion without discomfort or pain. Follow-up X-rays showed no evidence of recurrence (Figure 5). The patient has not developed any recurrence as of now and will be continuously followed up in the clinic to check for any recurrence.

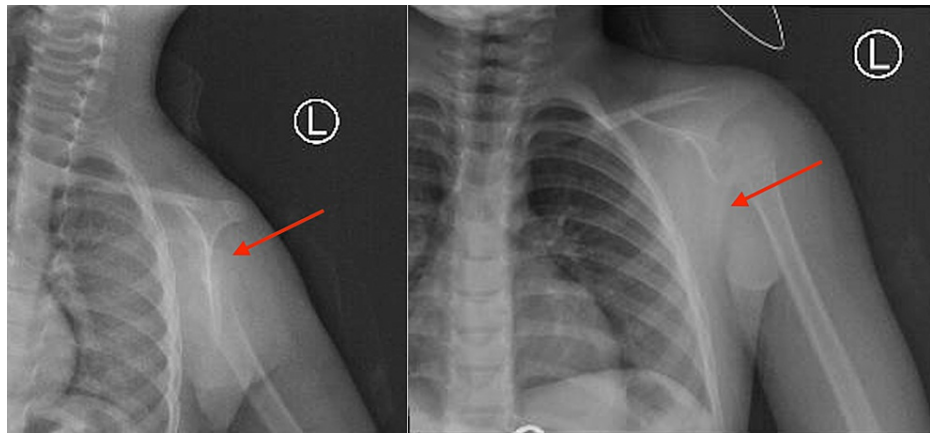


FIGURE 5: X-ray taken upon follow-up post-excision

Discussion

As noted previously, osteochondromas of the scapula account for 4% of all bone tumors occurring in the scapula [38,43]. Mostly, osteochondromas are identified in the first or second decades of life, given that the tumor’s growth usually stops when the physis closes; moreover, they are mostly asymptomatic [67,68]. Our case presents a symptomatic mass in a two-year-old noted by her mother, which in some ways is similar to multiple other papers found in the literature from different age groups, which had a similar presentation (Table 1) [14,42,43,58-61]. The novelty of our case is in the age of presentation, which is extremely rare in the literature.

Author (year)	Age	Gender	Presentation	Imaging	Operative findings	Histology	Size	Follow up
Vaishya et al. (2014) [47]	18	M	Large, painless deformity, scapular winging, limited abduction of the glenohumeral joint	Medial margin	Excised specimen showing the bony tumor with a cartilaginous cap	Well-formed cartilage cap on the surface with a prominent enchondral ossification at the base, which continues into trabeculae of mature lamellar bone	5 x 3 cm	Favorable at 3 months
Ngongang et al. (2019) [48]	17	M	Worsening shoulder pain with right scapula winging	Ventromedial	The stalk of the exostosis was excised	Confirmed osteochondroma of the scapula	9 x 5 cm	Pain alleviation after two weeks, full range of motion, and better self-esteem
Sánchez et al. (2021) [50]	11	M	Painful tumor	Inferior-dorsal	After partially detaching the teres minor muscle, the tumor mass was accessed and resected en bloc	Confirmed osteochondroma of the scapula	4 x 2.8 cm	Favorable at 6 months
Bektas et al. (2019) [42]	15	F	A mass on the left upper back, inability to sleep in a supine position, painful shoulder range of motion, and cosmetic discomfort	Dorsal	Mass was excised using an osteotome	Confirmed osteochondroma of the scapula	NA	Favorable at one year
Fjeldborg et al. (2012) [51]	12	M	Winging of the scapula and minor pain	Ventral	NA	NA	NA	NA
Matthewson							8.4 x	

et al. (2019) [14]	2	M	Painless mass in his right shoulder	Dorsal	Complete resection of osteochondroma	Confirmed osteochondroma of the scapula	7.2 x 10.1 cm	NA
Kumar et al. (2014) [43]	4	M	Progressive swelling and movement restriction	Dorsal	Complete resection of osteochondroma	Confirmed osteochondroma of the scapula	30 x 17 mm	Favorable at 6 months
Yadkikar et al. (2013) [59]	11	F	Gradually progressive pain and inability to sleep in the supine position	Dorsal	Excisional biopsy	Confirmed osteochondroma of the scapula	3 x 2 cm	Favorable at one year
Jadhav et al. (2016) [60]	12	M	Difficulty in sleeping in the supine position	Dorsal	Excised en mass	Confirmed osteochondroma of the scapula	4 x 3 cm	Favorable at one year
Shahid et al. (2021) [58]	23	M	Painless longstanding protrusion over the scapula	Dorsal	No surgery done yet	NA	NA	NA
Nekkanti et al. (2018) [61] (Case 1)	19	M	Progressive swelling and discomfort in the supine position	Dorsal	Complete resection of osteochondroma	Confirmed osteochondroma of the scapula	3 x 3 cm	NA
Nekkanti et al. (2018) [61] (Case 2)	5	M	Progressive swelling	Dorsal	Complete resection of osteochondroma	Confirmed osteochondroma of the scapula	1.5 x 1 cm	NA

TABLE 1: Literature review showing similar cases

NA: not available

Moreover, some cases reported worsening pain (Table 1) [42,48,50,51,59], and others reported difficulty sleeping in the supine position [42,59,60]; furthermore, some cases presented limitations in the range of motion of their joints [43,47]. Most osteochondral lesions of the scapula have been noted to be situated along the scapular equator; however, larger lesions tend to be situated in the inferior aspect of the scapula due to a lack of space restriction [67,69]. Diagnosing osteochondroma is typically clinical and radiologically followed by histological confirmation [44,67,70].

Generally, osteochondromas are managed after skeletal maturity to avoid injuring the growth plate during surgery [46,71], given that with longitudinal growth, the tumor migrates from the metaphysis to the diaphysis and away from the growth plate, which decreases the chances of injuring the growth plate [71]. In the event where cosmesis and pain are the patient's main concern in scapular exostosis, excision can be done at a younger age, such as in our case, if planned carefully and executed by the most senior surgeon of the operating team.

Conclusions

Osteochondromas of the scapula, although benign, are at risk of being left unnoticed until malignant transformation occurs, like other central osteochondromas; therefore, we routinely advocate the removal of scapular osteochondromas at presentation. Excision after diagnosis can be done in a meticulously planned manner to avoid iatrogenic injury to the growth plate and ensure complete excision at the base of the stalk. The patient's family is very grateful for the full recovery of their daughter and is satisfied with the results.

Additional Information

Disclosures

Human subjects: Consent was obtained or waived by all participants in this study. King Saud Medical City IRB issued approval H2RI-08-May 22. We are pleased to inform you that the above-referenced case report has been reviewed and no ethical issue was found. The drafted case report is scientifically sound and approved by the Research & Innovation Centre for submission to the journal for publication. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other

relationships or activities that could appear to have influenced the submitted work.

Acknowledgements

We thank the family of the patient for allowing us to share this case report to further enrich the literature.

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