

## Case Report

# Periosteal chondroma of the scapula penetrating into both the anterior and posterior cortices: a case report

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**Abstract:** Periosteal chondroma of the scapula is an extremely rare disease. Here, we report a case of periosteal chondroma arising in the scapula of an 11-year-old Chinese girl. The girl presented with a mass in her left scapula that was noticed several months ago and gradually enlarged without pain. Plain X-ray showed an irregularly shaped lesion located in the lower pole of the left scapula. Computed tomography revealed a round soft-tissue mass penetrating into both the anterior and posterior cortices of the left scapula. The tumor was successfully excised and pathologic analysis revealed that the tumor was composed of cartilaginous tissue that included active chondroid cells and increased cellularity. Thus, the mass was diagnosed as a periosteal chondroma. The patient recovered well and exhibited no evidence of local recurrence 15 months after the surgery. To the best of our knowledge, this is the third reported case of periosteal chondroma of the scapula.

**Keywords:** Cortex, periosteal chondroma, scapula, tumor

### Introduction

Periosteal chondroma, also known as juxtacortical chondroma, is a rare slow-growing benign cartilaginous tumor that arises adjacent to the cortex beneath the periosteum, with an incidence of about 0.05% [1]. It is usually diagnosed in patients during the second and third decades of life [2], and males are affected more often than females [1]. Although periosteal chondroma is mostly found in long tubular bones, it can affect bones in many other anatomic sites, such as small tubular bones of the hands and feet, the ischium, and the sacrum [1, 2]. Periosteal chondroma often erodes and cause sclerosis of the underlying cortex, without actually breaking into the marrow cavity [3].

Periosteal chondroma arising from the scapula is extremely rare and, to date, there have been only two other reported cases (Table 1) [1, 4]. Here we report a case of periosteal chondroma of the scapula. The penetration of the lesion into both the anterior and posterior cortices of the left scapula is another remarkable feature of our case.

### Case report

An 11-year-old Chinese girl was admitted to our hospital due to an asymptomatic mass on the left shoulder. She noticed the mass about three months ago, which gradually enlarged without pain. Upon admission, she denied any history of trauma or severe diseases. The general physical examination was normal except for a palpable, painless mass in her left scapula.

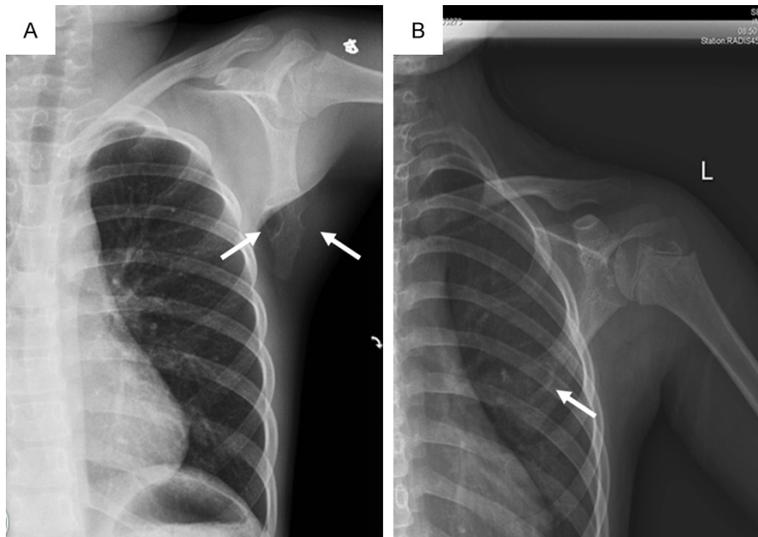
Laboratory tests disclosed no abnormalities. Plain X-ray showed an irregularly shaped lesion located in the lower pole of the left scapula (Figure 1A). A subsequent computed tomography scan revealed a round soft-tissue mass (measuring ~3.0 cm in length) with an obscure boundary (Figure 2). The mass penetrated into both the anterior and posterior cortices of the left scapula. The neighboring osseous tissues had become partially thinner. Her left shoulder joint gap was intact, and there was no obvious increase in the amount of fluid in the articular cavity. Based on these findings, we initially diagnosed her with a juxtacortical chondrosarcoma or periosteal osteosarcoma.

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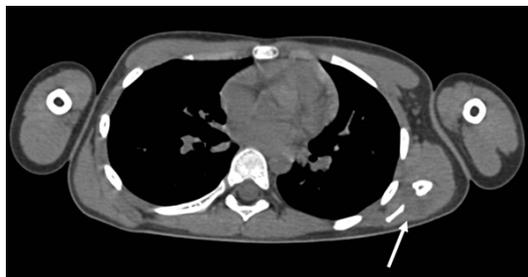
**Table 1.** Summary of reported cases of periosteal chondroma of the scapula

Ref.	Gender	Age (yr)	Location	Size (cm)	Symptoms	Diagnosis	Intervention(s)	Recurrence
[1]	Male	4	Left shoulder	~1	Pain/decreased shoulder movement/ muscle atrophy	Pathology	Curettage of initial lesion + marginal excision and iliac crest bone grafting for recurrent lesion	4 months after surgery
[2]	Male	22	Right shoulder	2.5 × 2.9 × 2.1	Painless mass	Pathology	<i>En bloc</i> resection	No
Present case	Female	11	Left shoulder	3 × 2.5 × 2.5	Painless mass	Pathology	Marginal excision	No

N/A: not available.



**Figure 1.** Plain anteroposterior X-rays of the left shoulder showing an irregularly shaped lesion located in the lower pole of the left scapular (A. The area indicated by the white arrow). Axial computed tomography scan reveals a round soft-tissue mass penetrating into both the anterior and posterior cortices of the left scapula (B. The area indicated by the white arrow).



**Figure 2.** Axial computed tomography scan reveals a round soft-tissue mass penetrating into both the anterior and posterior cortices of the left scapula (the area indicated by the white arrow).

A surgery was subsequently performed and a white-gray tumor, measuring 3 cm × 2.5 cm × 2.5 cm, was found in the left scapula. The penetration of the lesion into both the anterior and posterior cortices of the left scapula was confirmed intraoperatively (**Figure 3**), but the tumor did not extend into the medullary

cavity. Using marginal resection, we completely removed the tumor along with part of the bone cortex. The resected mass was found covered with a thin shell of cortex, which was not visible on computed tomography. After removal of the cortical portion, the tumor was hard and looked much like normal cartilage.

Tumor specimens were subjected to pathological examination (**Figure 4**), which revealed that the tumor was composed of cartilaginous tissue in which active chondroid cells and increased cellularity were observed. Thus, the mass was identified as a periosteal chondroma.

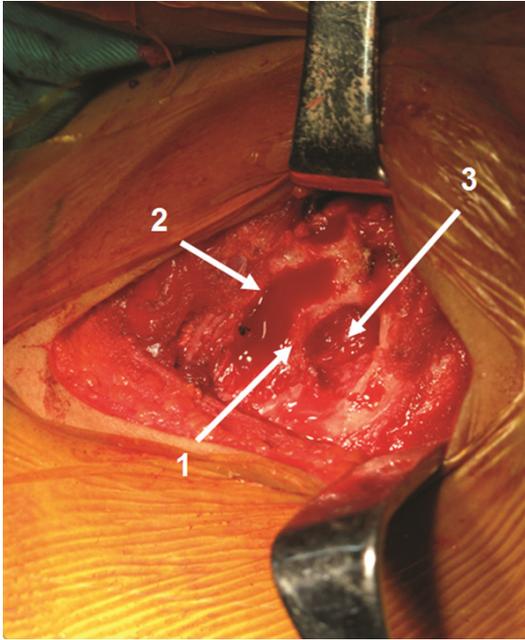
The postoperative course was uneventful. The patient recovered well from surgery and was discharged. At 15 months post-surgery, the patient exhibited no evidence of local recurrence and had no discomfort in her left shoulder (**Figure 1B**).

### Discussion

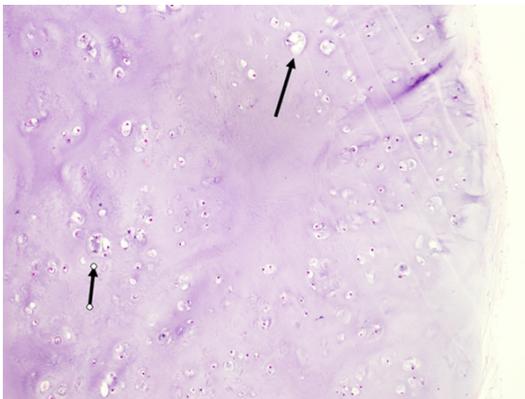
Clinically, periosteal chondromas often present as palpable masses that may be asymptomatic or painful [5]. Since the presenting signs and symptoms of periosteal chondroma of the scapula are characteristic of many other diseases and cannot be used to make a specific diagnosis, radiographic examination of the shoulder is essential for early detection of the disease in most cases.

Radiographically, periosteal chondromas often appear as cortical erosions and sclerosis with periosteal reaction [6]. In most cases, perios-

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**Figure 3.** A round soft-tissue mass penetrating into both the anterior and posterior cortices of the left scapula was observed intraoperatively. Arrow 1 indicated the shoulder blades inside the bone cortex. Arrow 2 indicated the of the shoulder blade lateral cortical bone. Arrow 3 is indicated scapula double cortical bone defect after tumor resection.



**Figure 4.** Histological section showing active chondroid cells and increased cellularity in the tumor, which consisted of cartilaginous tissue (the area indicated by the black arrow) (hematoxylin-eosin staining, magnification 200 $\times$ ).

teal chondromas erode the underlying bone cortex without actually penetrating the medullary cavity [7]. Although the adjacent bone erosion can cause changes in the intraosseous structure, the actual pathological process is confined to the periosteum and the bony changes are only reactive in nature [8]. In our patient,

the tumor penetrated into both the anterior and posterior cortices of the scapula.

Histologically, periosteal chondromas are characterized by lobular formation typical of a cartilaginous neoplasm, increased cellularity, dinucleation/multi-nucleation, greater pleomorphism of chondrocytes, and the presence of hyperchromatic nuclei [6, 8]. The case we present herein met the diagnostic criteria for periosteal chondrosarcoma.

Marginal excision is the treatment of choice for periosteal chondroma [1]. The lesions managed by local treatments that do not include excision of the adjacent bone cortex may have a higher tendency to recur [9]. In our case, the patient underwent marginal excision of the tumor and curettage of the underlying cortical bone, and she showed no evidence of recurrence at 15-month follow-up.

Periosteal chondroma is associated with a good long-term prognosis. Although a few patients will develop local recurrence, malignant change will not occur and excision seems to be curative [10]. In the two previously reported cases of periosteal chondroma of the scapula (Table 1), one developed tumor recurrence 4 months after surgery [1], and the other was similar to our current case and exhibited no evidence of local recurrence after the surgery [4].

In conclusion, we document a rare case of periosteal chondroma arising from the scapula that manifested itself as an asymptomatic mass penetrating into both the anterior and posterior cortices. Because of the extreme rarity of the disease, awareness and knowledge among physicians should be emphasized. Marginal excision of the tumor with curettage of the underlying cortical bone is the preferred strategy for the management of periosteal chondroma of the scapula.

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### Disclosure of conflict of interest

None.

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