

Chondroblastoma of the Rib : Case Report¹

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Chondroblastoma is an uncommon, benign, cartilaginous neoplasm originating in an epiphysis or apophysis of a long tubular bone. The rib is an unusual site for chondroblastoma. The authors describe a case of chondroblastoma of the rib and present a brief review of the literature.

Index words : Ribs

Computed tomography (CT)

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Chondroblastoma is an uncommon bone tumor arising from the epiphyseal region of long bones. A review of the literature reveals that the most common locations for this tumor are the knee and proximal humerus (1 - 4). The most common age group is the second decade of life. Cases of chondroblastoma of the rib in the literature are few and far between (5 - 7); the patients in these reports were older than typical patients with epiphyseal chondroblastoma and had an excellent prognosis following the resection of the tumor. Herein, we report on a case of chondroblastoma of the rib, as well as providing a brief review of the literature.

Case Report

An otherwise healthy 21-year-old man presented with a six-month history of an expanding mass in his right

posterior chest wall causing discomfort during physical activity. During the physical examination, the tumor was palpated and was found to be smooth and non-tender. Plain radiography depicted a well-defined bulging cystic mass in the posterior: or arc of the right sixth rib (Fig. 1A). Presumptive clinical diagnoses during this initial period included chondrogenic tumors such as osteochondroma and enchondroma, aneurysmal bone cyst and fibrous dysplasia. Computed tomography (CT) showed a 3 × 2 cm expansile lesion in the right sixth posterior rib near the costovertebral junction. There was no periosteal reaction or rim of reactive bone or soft-tissue mass around the lesion. There was a small amount of tiny internal calcification (Fig. 1B). The CT differential diagnoses were enchondroma, osteochondroma, chondroblastoma and complicated bone cyst. There were no detectable abnormalities in the complete blood count, blood chemistry or electrolytes. A posterior segmental rib resection was performed. The mass, which was approximately 3 cm in diameter, was successfully excised with a safety margin of 1 cm. Grossly, the cortex was thinned but intact. The mass contained brown and yellowish tissue intermingled with a cartilaginous granular-gray material that was calcific and nodular. (Fig. 1C).

Microscopically, the most cellular portions of the tu-

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mor showed more or less densely packed polygonal chondroblasts. Multinucleated osteoclast-type giant cells were dispersed between the chondroblasts (Fig. 1D). The grossly visible yellow areas of the lesion corresponded to foam cell aggregates. The periphery of the tumor showed reactive new bone formation and cartilage proliferation, as well as focal osteolysis.

Discussion

In 1942, Jaffe and Lichtenstein (1) coined the term "benign chondroblastoma" to describe a variant of giant-cell tumor with cartilage that was previously described by Kolodny, Ewing, and Codman. Benign chondroblas-

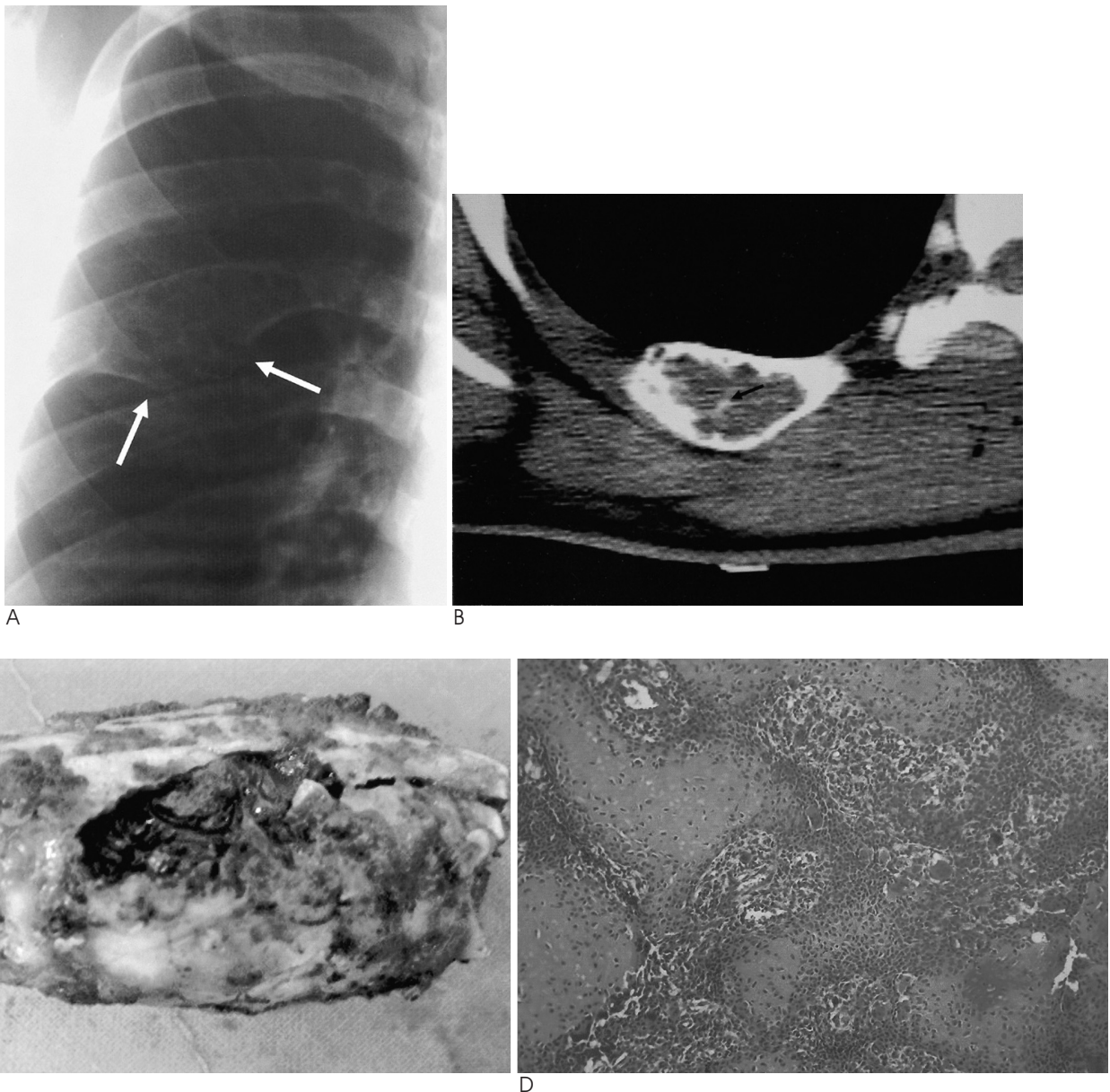


Fig. 1. A 21-year-old man with chondroblastoma of the right sixth rib.

A. Plain radiograph shows an expanded posterior rib lesion (arrows). The cortex is thinned-out. The radiolucent mass is characterized by multiloculated radiolucencies.

B. CT of chest demonstrates expanding lesion of posterior sixth rib with a small amount of internal tiny calcification (arrow) within tumor.

C. The gross specimen shows the scalloped and thin-walled tumor. There is no extension of the tumor outside of the periosteum.

D. Photomicrograph of histologic preparation (hematoxylin-eosin, $\times 100$) shows sheets of chondroblasts with interspersed islands of poorly formed cartilage and scattered osteoclast-type giant cells. There is a highly cellular portion of the tumor with a transition into cartilage.

toma is an uncommon benign tumor, which represents about 1% of all primary bone neoplasms (8). This type of chondroblastoma is usually discovered in the second decade of life and is predominant in males. The most common initial complaint was pain. These tumors are most commonly seen in the proximal tibia and distal femur, followed by the proximal humerus and proximal femur. Radiographically, chondroblastomas are characterized by their epiphyseal location, round contour, sharp margin and cortical scalloping buttressed by a rim of reactive bone (1 - 4). The tumor may extend into the subchondral bone plate or metaphysis. Calcific foci within the lesion are found in approximately 30 to 50 percent of patients. CT may show intralesional stippled calcification of the cartilaginous matrix and is helpful in delineating the anatomic limits of the neoplasm (9).

The rib is an unusual site for chondroblastoma. Nineteen cases have been reported in the literature. The average age of patients with chondroblastoma of the rib is the fourth decade of life, which is higher than that of patients with chondroblastoma of the long bones. However, our patient was only in his twenties. As in larger series, there were more males than females (2:1) in the reported cases of chondroblastoma of the rib (7). Chondroblastoma of the rib may be painful or may present incidentally. There does not appear to be a predilection for a particular rib or a specific portion of a rib (5 - 7, 10). The ossification centers for the rib appear in the second fetal month. There are epiphyseal centers at the head and tubercle of the rib that appear at puberty and ossify in the third decade of life. The epiphyseal plates of the head and tubercle of the rib may be the site of origin of the posterior chondroblastomas; the anterior lesions may arise from the costochondral junction. The relatively late appearance of these epiphyseal plates may explain the difference in age between patients with chondroblastoma of the rib and patients with chondroblastoma at other sites.

Treatment should consist of segmental rib resection without adjuvant therapy. Treatment by resection of the rib yields favorable results. Although the majority of chondroblastomas behave in a benign fashion, local re-

currence and distant metastasis have sometimes been described (10). So, to minimize this risk, it is recommended that follow-up radiographs be taken.

The differential diagnosis for an expanding, slow-growing posterior rib lesion includes enchondroma, low-grade chondrosarcoma, metastatic disease, plasmacytoma and fibrous dysplasia. Also, the following tumors or tumor like lesions should be considered: simple bone cyst, osteoblastoma, giant cell tumor, aneurysmal bone cyst, clear cell chondrosarcoma, eosinophilic granuloma and infection.

While, in the present case, the site and age of the patient are unusual for chondroblastoma, the radiographic features are consistent with the diagnosis. Although chondroblastoma of the rib is rare, this tumor should be included in the differential diagnosis when the tumor represents a cartilaginous mass.

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