Hemangioma of the Rib: a Case Report

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A case of hemangioma of the left seventh rib is presented. In January 1999, a 59-year-old woman presented with an enlarged costal mass which had been followed up for 4 years. Preoperative examination suggested chondrosarcoma because of tumor growth beyond the disrupted bony cortex. She underwent resection of the left seventh rib along with the sixth and seventh intercostal muscles and reconstruction of the chest wall defect. The pathological diagnosis of the lesion was hemangioma. She was discharged after an uneventful postoperative course. There has been no evidence of recurrence after a 14-month follow-up. Tumor growth beyond the disrupted bony cortex was a characteristic feature by both imagery and pathological examination in this case. This case represents a difficulty of a preoperative definite diagnosis of the chest wall tumors by imagery alone.

Key words: hemangioma – rib-resection – primary – tumor

INTRODUCTION

Primary chest wall tumors, including bony and soft tissue tumors, account for ~2% of all primary tumors. Malignant fibrous histiocytoma, chondrosarcoma and rhabdomyosarcoma are common primary malignant tumors. Among primary benign tumors, cartilaginous tumor, desmoid and fibrous dysplasia are common (1). Previous reports on chest wall tumors have demonstrated a high incidence of malignancy, which varies from 30 to 80% (2–6). Since chest wall tumors include various entities, their treatment depends on the condition of the lesion, such as histological type and location. Careful preoperative evaluation is indispensable for planning the treatment.

Hemangioma arising from a rib is a rare benign entity. In previous reports on rib hemangioma (7,8), the radiographic findings were compatible with benign characteristics. We report a case of hemangioma of the rib with radiographic findings which suggested malignant characteristics.

CASE REPORT

A 59-year-old woman was referred to the National Cancer Center Hospital, Tokyo, because enlargement of an asymptomatic costal mass was detected on a chest radiograph in January 1999. Four years before this presentation, the mass had been incidentally found by a chest radiograph in a health survey and had been followed up as a fracture of the left seventh rib until this reference. The past histories of the patient...
and her family were unremarkable. All laboratory studies including serum tumor markers were normal. On physical examination, the lesion could be recognized as a dilatation of the left seventh rib. A chest radiograph taken on admission showed a mass shadow measuring $3.8 \times 2.5$ cm with extrapleural signs in the left middle lung field. A rib radiograph showed a mass shadow expanding beyond the irregular cortex of the left seventh rib. The mass had some calcifications, which presented a so-called honeycomb appearance (Fig. 1). Chest computed tomography (CT) showed localized expansive growth of the tumor projecting toward the thoracic cavity and disrupted bony cortex without any lesions in the bilateral lung fields or mediastinum (Fig. 2). Magnetic resonance imaging of this lesion revealed a low signal on T$_1$-weighted images, a slightly high signal on T$_2$-weighted images and enhancement by contrast media (Fig. 3). A bone scan did not detect any other lesions. Low-grade malignant tumor of the rib, such as chondrosarcoma, was suspected as a preoperative diagnosis because of its growth beyond the bony cortex and relatively long-term clinical course.

She underwent resection of the left seventh rib along with the sixth and seventh intercostal muscles. Reconstruction of the chest wall defect was performed with a Gore-Tex® (polytetrafluoroethylene) patch.

Macroscopically, the tumor measuring $3.5 \times 2.5 \times 1.5$ cm had a firm surface and bulged from the inner part of the seventh rib toward the thoracic cavity. It was covered with smooth pleura. The cut surface of the tumor had a red and multilocular

Figure 2. Chest CT shows localized expansive growth of the tumor (arrow) projecting toward the thoracic cavity.

Figure 3. Magnetic resonance imaging of this lesion shows a low signal on T$_1$-weighted images (a), a slightly high signal on T$_2$-weighted images (b) and enhancement by contrast media (c).
appearance. Disrupted bony cortex was found inside the tumor (Fig. 4). Microscopically, the tumor was composed of a homogeneous conglomerate of thin-walled blood vessels with dilating channels. Most of the channels contained red blood cells in the cavity. A single layer of flat endothelial cells, which did not show significant atypia or mitosis, lined these channels (Fig. 5). There was no necrosis in the tumor. The pathological diagnosis of this lesion was hemangioma of the bone. The bony cortex inside the tumor was disrupted partially with reactive bone formation and was not accompanied by periosteum. On the other hand, there was periosteum between the tumor surface and the pleura, which confirmed expansive growth of the tumor as shown by radiography. No tumor tissue was detected at the surgical margin. She was discharged after an uneventful postoperative course. There has been no evidence of recurrence after a 14-month follow-up.

**DISCUSSION**

Hemangioma of the rib is very rare as both bone hemangioma and primary rib tumor. Hemangioma is defined as a neoplastic entity which arises from blood vessels. Although skin is by far the most common primary site of hemangioma, any organ including the bone can be affected. Hemangioma of the bone accounts for ~1% of all bone tumors in some series in the literature (9). While most of these cases occur in the skull or vertebral bodies, some have been reported to originate from the rib (7,8). On the other hand, primary tumors of the rib are uncommon, accounting for only 6–10% of primary bone tumors and approximately half of them are malignant (2,3,10). Ala-Kulju et al. reported that cartilaginous tumors were the most common of his 34 cases of primary rib tumor (6). According to the Japanese Bone Tumor Registration Database, from 1972 to 1994 there were only eight cases of hemangioma of the rib, accounting for 0.018% of all bone tumors (11).

Radiographically, bony hemangioma usually presents as lucent, well-demarcated defects. It expands and thins the cortex in flat bones, but complete cortical disruption is not present (12). Most cases of bone hemangioma can be diagnosed by characteristic radiographic findings which reflect the formation of reactive spicula produced by the lesion. These findings are generally called ‘sunburst appearance’ for skull hemangioma, ‘corduroy-like appearance’ for vertebra hemangioma and ‘honeycomb appearance’ for rib hemangioma (12). Although the present case presented a ‘honeycomb appearance’ on rib radiography, the tumor showed expansive growth.
beyond the disrupted bony cortex on the rib radiograph and chest CT. These findings suggested malignant characteristics. To our knowledge, there has been no previous report of rib hemangioma with such radiological findings.

A definite histological diagnosis is essential for treating chest wall tumors. There are three types of biopsy methods for chest wall tumors: needle aspiration biopsy, excisional biopsy and incisional biopsy. Ayala and Zornosa demonstrated that the diagnostic rate of needle biopsy for primary bone tumors was 83% in malignant tumors and 64% in benign tumors (13). However, in general, needle biopsy is not recommended unless there is a strong suspicion of myeloma or metastatic disease (14). Excisional biopsy can be generally applied in lesions less than 2 cm in diameter. Open biopsy has some problems that may interfere with a definitive therapy. For example, infection of the biopsy wound may delay initiating the appropriate therapy and the initial resection may interfere with identification of the area which should be removed in a later radical resection (15). Clinically, our preoperative diagnosis of the present case was low-grade primary malignant tumor of the chest wall. We did not perform any type of preoperative biopsy considering the indications and problems mentioned above. Therefore, resection was performed for both a definitive diagnosis and treatment. This case represents a difficulty of a preoperative definite diagnosis of the chest wall tumors by imagery alone.

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**References**