

# Primary Osteosarcoma of Rib Mimicking Lung Mass with Secondary Aneurysmal Bone Cyst Formation

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A 16-year-old boy presented with parasthesia and numbness of right upper limb of 6 months duration and cough, breathlessness, hemoptysis of 3 weeks. On examination, he was tachypneic and in distress. Air entry was diminished on right hemithorax with crepitations.

Radiograph chest showed homogenous opacity right upperzone suggestive of possible lung mass. Magnetic resonance imaging of chest revealed a large heterogenous multicystic mass lesion in right hemithorax with multiple fluid levels within, with secondary aneurysmal bone cyst (ABC) formation and lesion is causing complete erosion and destruction of bone and collapse consolidation of right upper lobe (Fig. 1).

Computer tomography (CT) of chest showed a mixed intensity mass lesion of size 12.3 × 9.5 × 9 cm with multiple hemorrhagic and fluid-fluid areas noted at right chest wall causing lysis of right second rib and lesion extends into right thoracic cavity with compression of right lung upper lobe mimicking a right lung mass (Fig. 2). A tru-cut biopsy was taken. The results of biopsy showed malignant neoplasm composed of atypical spindle cells with pleomorphic nuclei and osteoid. A histopathologic diagnosis of osteosarcoma was made (Fig. 3).

Patient was started on chemotherapy with cisplatin, adriamycin, and ifosfamide. However, patient's general condition deteriorated. He died a week of chemotherapy.

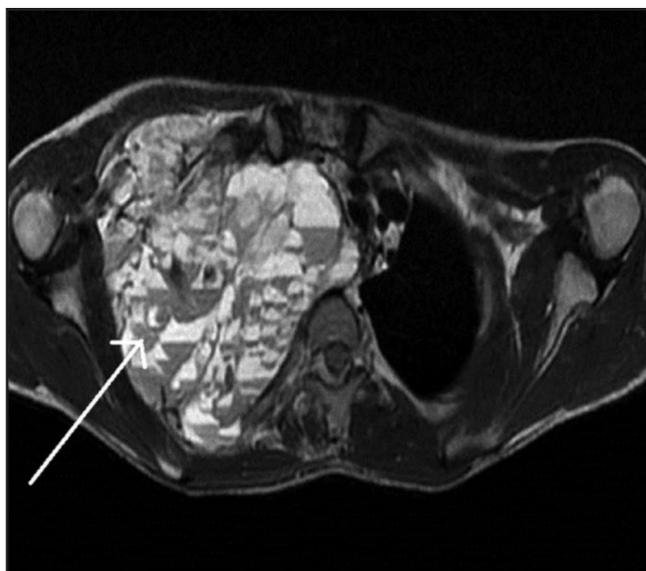
## DISCUSSION

Primary osteosarcoma usually originate in the metaphysis of the long bones. Involvement of flat bones like rib may be seen as a metastatic process or secondary to chemotherapy, but a primary osteosarcoma rib is rare.<sup>1</sup> An aneurysmal bone cyst (ABC) is an expansile osteolytic lesion with a thin wall, containing blood-filled cystic cavities.<sup>2</sup> Aneurysmal bone cyst can occur either as a primary or secondary lesion. Secondary type of ABC constitutes 20 to 30% of cases and develops in an underlying bone lesion such as giant cell tumor, osteosarcoma, and chondrosarcoma where it may occur as a consequence

of alterations in hemodynamics and vascular hemorrhagic degenerative processes.<sup>3</sup>

Telangiectatic osteosarcoma has got almost identical appearance that of aneurysmal bone cyst. It is difficult to differentiate between telangiectatic osteosarcoma and osteosarcoma with secondary ABC formation. The distinction between the two conditions is usually made with magnetic resonance imaging.<sup>4</sup>

An aneurysmal bone cyst has limited thin peripheral septa (usually 2–3 mm thick), which is often best seen as enhancing structure that lack nodularity on gadolinium-enhanced images. Conversely, in telangiectatic osteosarcoma, the periphery and septa around the hemorrhagic spaces are thickened and often nodular and enhance with administration of gadolinium-based



**FIGURE 1.** Magnetic resonance imaging chest shows multicystic mass lesion in right hemithorax with multiple fluid levels within, with secondary aneurysmal bone cyst formation.

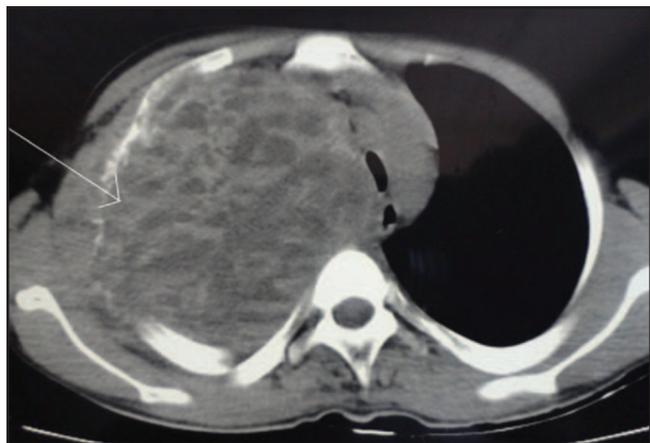
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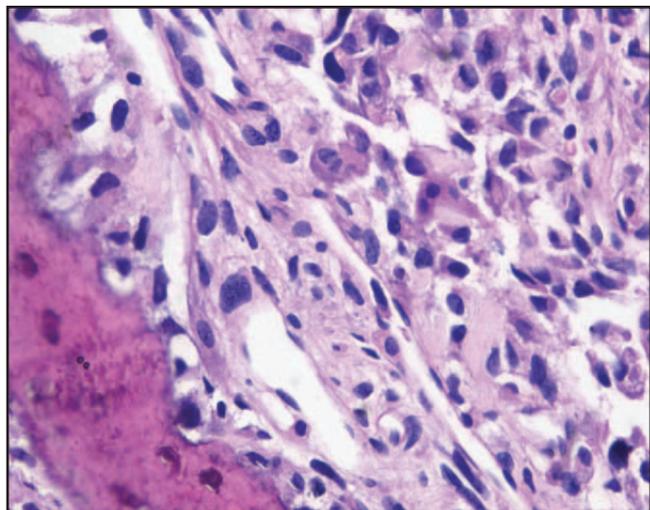
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**FIGURE 2.** Computed tomography chest shows a mixed intensity mass lesion with multiple hemorrhagic and fluid-fluid areas noted at right chest wall causing lysis of right second rib, and lesion extends into right thoracic cavity mimicking a right lung mass.



**FIGURE 3.** Histopathology of osteosarcoma rib showing malignant neoplasm composed of atypical spindle cells with osteoid.

contrast material. At CT, the presence of an osteoid matrix within nodular or septal regions (intraosseous or soft-tissue

component) is a second distinguishing feature from aneurysmal bone cyst.

Finally, telangiectatic osteosarcoma is associated with aggressive growth features, as indicated by cortical destruction and extension into the surrounding soft tissues. In contrast, aneurysmal bone cysts cause marked expansile remodeling of bone and cortical thinning but lack true soft-tissue involvement.

In this case, the initial available radiograph shows sclerotic lesion of the rib, which has progressed to large soft-tissue opacity lesion later. It shows numerous fluid-fluid levels on magnetic resonance imaging suggestive of secondary ABC formation rather than telangiectatic overall survival. CT also shows minimal expansion of the rib with spiculated sclerotic periosteal reaction unlike in telangiectatic overall survival that shows mainly asymmetric expansile lytic lesion and minimal osteoid formation.

Today, using a multimodal approach consisting of preoperative systemic polychemotherapy followed by local surgical therapy and then postoperative chemotherapy, long-term, disease-free survival can be achieved in 60 to 70% patients of conventional osteosarcoma. However, the overall prognosis of osteosarcoma of rib is poor because of the difficulty of complete excision. Surgical resection plays an important role in the treatment for this disease, patients who had a complete resection of the primary tumor has a better survival. A wide local excision with removal of involved ribs and reconstruction and adjuvant multiagent chemotherapy increases the chance of survival. Despite the advances in treatment, the overall survival at 5 years is reported as 27%.<sup>5</sup>

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