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SHORT REPORT

Hemangioma of the Rib

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Hemangioma of the skull and vertebra are very common lesions but hemangioma of the rib is rarerly seen. We report the x-ray, CT and MRI findings of a case of incidentally discovered rib hemangioma.

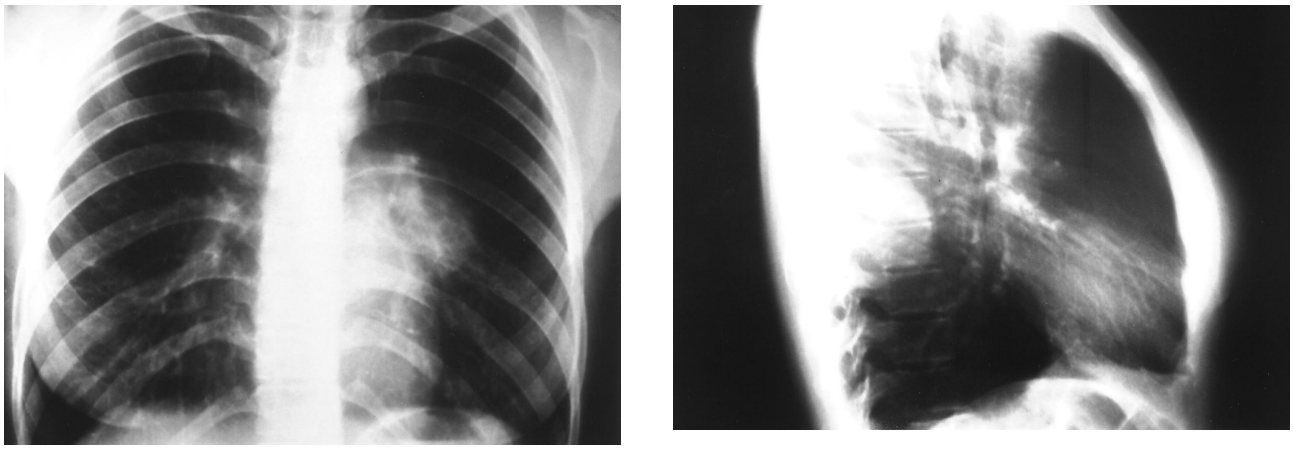
Case report

A 25-year old woman was admitted to the surgery department for the repair of anal fissure. On the routine preoperative PA chest roentgenogram a well defined paracardiac mass lesion about 5x6 cm was detected incidentally. The mass lesion was located posteriorly on the lateral chest roentgenogram (Figure 1a,b). The left cardiac border was not obliterated. The neighboring posterior eight rib was expansile with delicate loculations and coarse trabecular pattern. The asymptomatic patient had no history of trauma, injury or fracture of the chest wall.

The computed tomography of the chest further delineated the characters of the lesion and confirmed the osseous origin (Figure 2). The lesion originated from the medullary bone of the 8th rib and showed osseous expansion with cortical remodelling as well as extrosseous extension. The coarsened trabecular pattern of the posterior eighth rib was better shown on CT. On MRI, the heterogeneous lesion was hyper-isointense relative to muscle on T1 weighted images (Figure 3). The predominantly hyperintene lesion had low signal components in the medullary bone and the periphery. Uniform high signal intensity relative to muscle was detected on T2 weighted images (Figure 4). The mass showed homogeneous enhancement after IV gadolinium administration (Figure 5a-c). The CT and MRI findings were strongly suggestive of hemangioma.

Since surgical resection of the affected rib is the treatment of choice, the patient was referred to the surgery department. The patient was operated under ITGA using a single-luminal endotracheal tube. Posterolateral thoracotomy was applied. During exploration, it was seen that the mass was derived from the 8th rib with 4 x 4 x 7cm dimensions. In palpation, it gave a sensation of a sand-package. The vascular structures that surrounded it were ligated. The mass was excised completely together with the 8th rib from anterior to posterior. The result of frozen examination was benign. The part of the mass close to the vertebral column was curated and then thorachotomy was closed.

On gross pathological examination, the rib was expanded by dark red tumor measuring 5 x 4 x 2.5 cm (Figure 6). The tumor pushed out the periosteum as a dome shaped mass from the inner part of the rib toward the thoracic cavity. On cross sectioning, the tumor had a



A B

Figure 1. Two-view chest roentgenograms.
A: Posteroanterior chest roentgenogram shows a well defined paracardiac mass lesion about 5 x 6 cm.
B: Lateral chest roentgenogram The mass lesion is located in the posterior part of the chest.

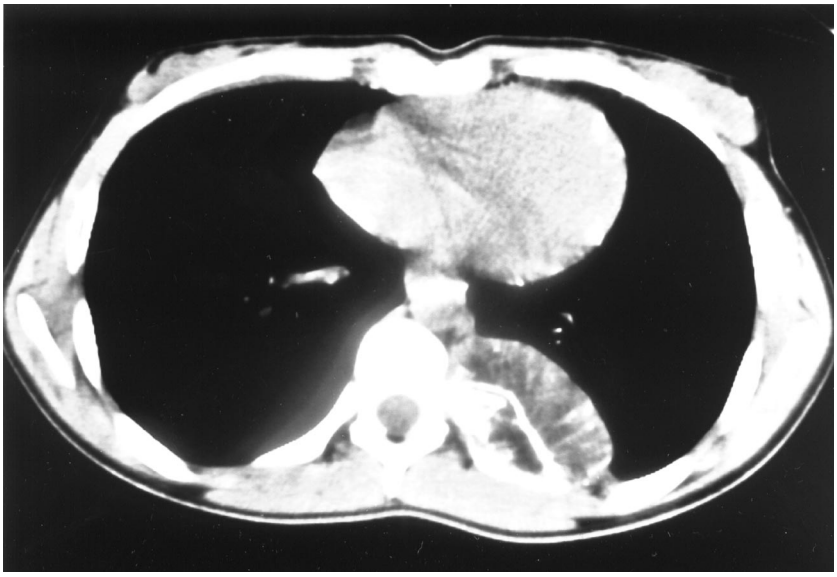


Figure 2. Chest CT shows coarsened trabecular pattern and the soft tissue mass accompanying the lesion.

sponge-like appearance with tightly knit fine bone spicula and surrounded by an intact smooth periosteum, but the bony cortex was disrupted.

On histologic examination, the tumor was characterized by irregular, thin-walled, dilated blood vessels which contained red blood cells (Figure 7). The lining endothelial cells were small, flat, uniform, and inconspicuous without significant atypia. The bone trabeculae were rather thin and sparse.

With all these findings the lesion was diagnosed as cavernous hemangioma of the eigth rib. The patient was discharged 5th day postoperatively.

Bone hemangiomas account for approximately 1% of all bone tumors in some series (1). Most of the cases occur in the vertebral body or skull. Rare costal originated hemangiomas have been reported as case reports in the literature (2,3). Hemangiomas are occasionally found in the soft tissues of the chest wall (4).

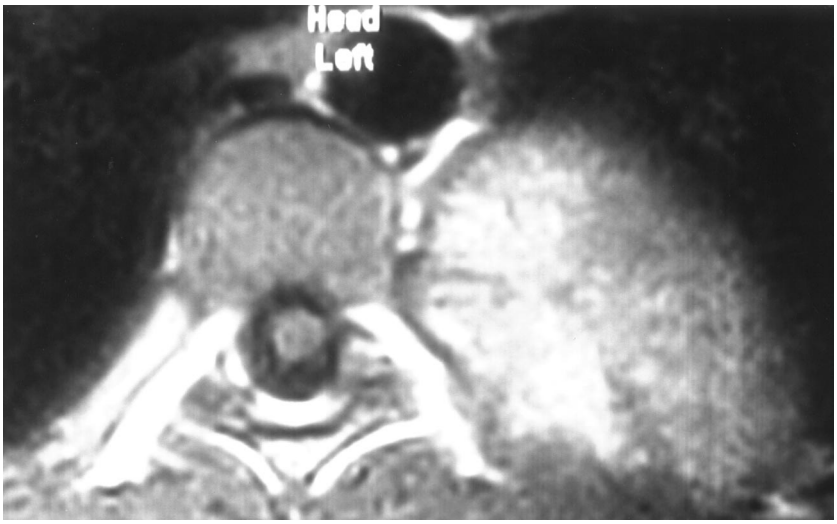


Figure 3. T1-Weighted axial MR image; the lesion is heterogeneous hyper-isointense relative to muscle.

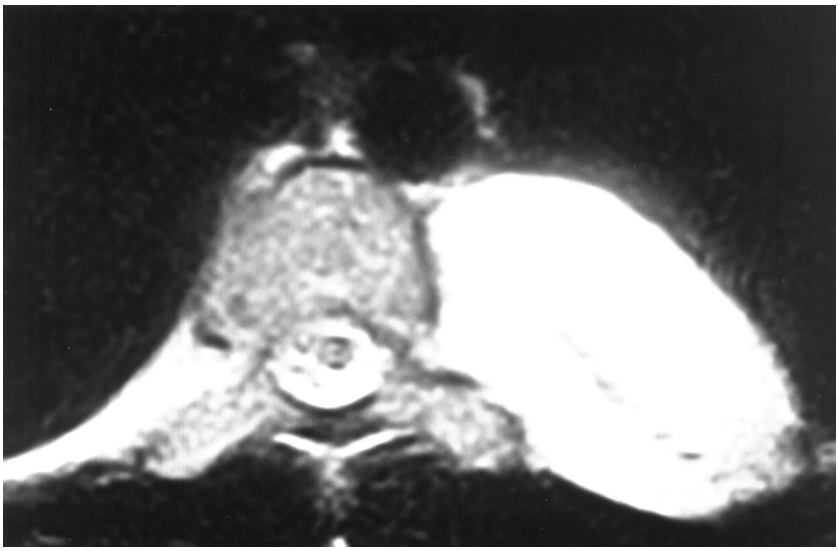
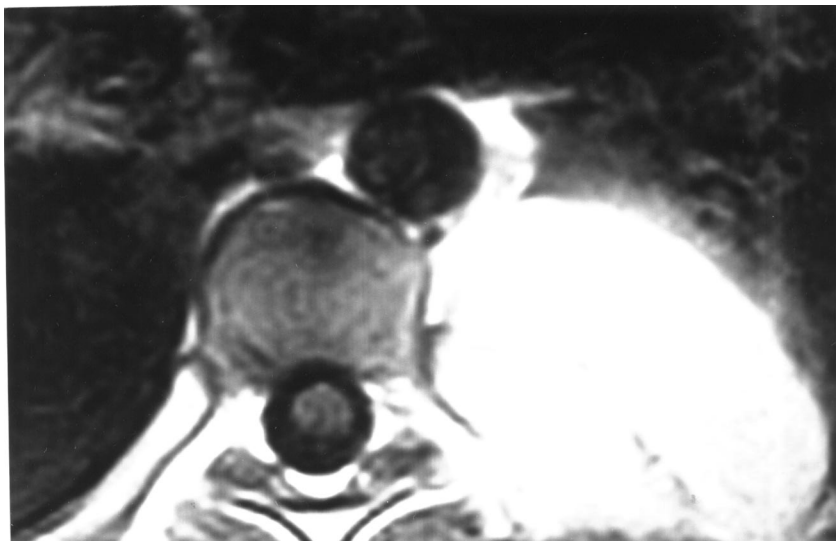


Figure 4. T2-Weighted axial MR image; the lesion shows uniform high signal intensity relative to muscle.

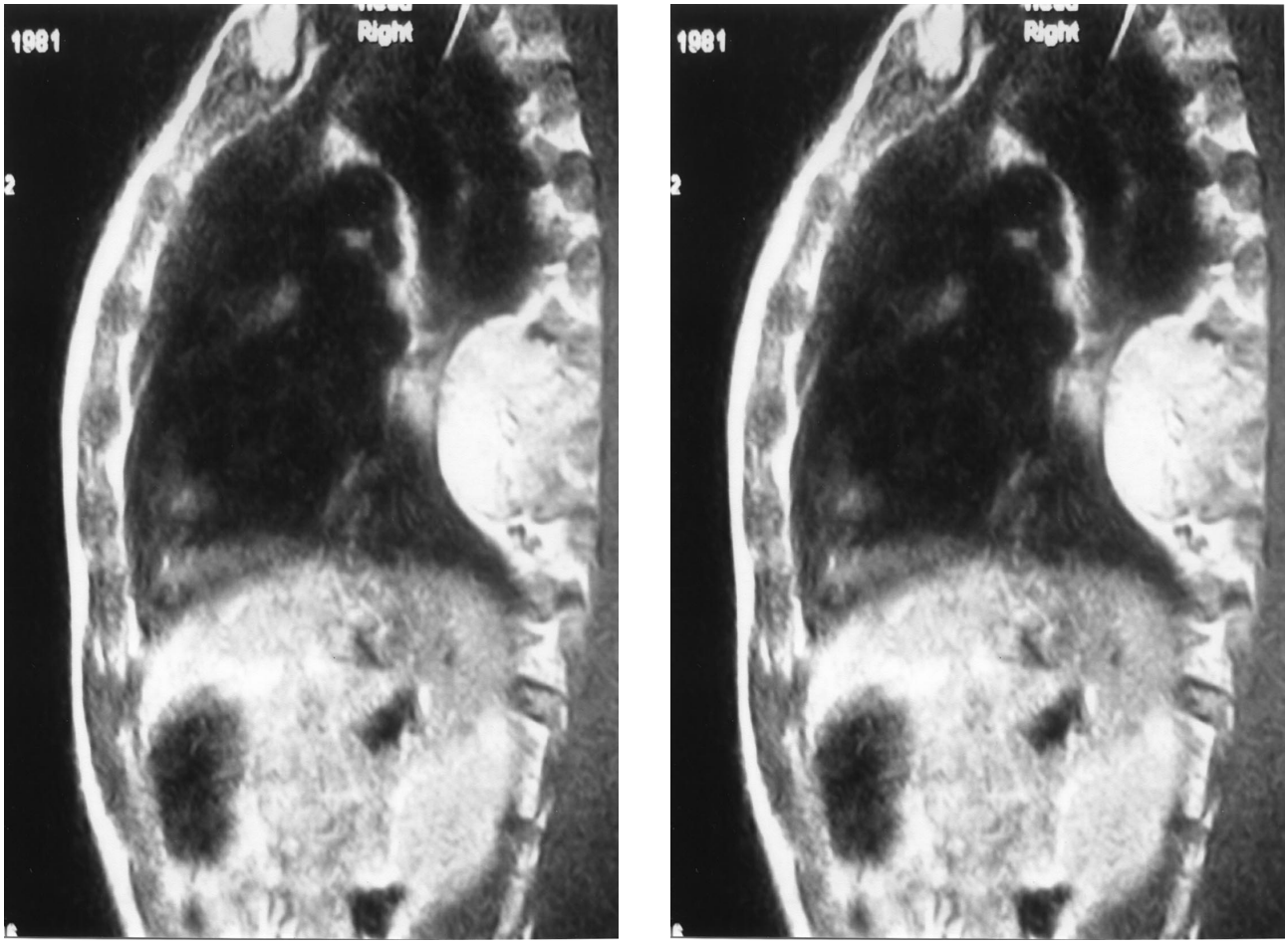
Osseous hemangiomas are usually identified in middle-aged patients more often women. Most of this lesions are discovered as an incidental finding for unrelated reasons, but in the presence of a pathologic fracture there may be soft tissue swelling or pain (5). The lesion in our patient was also discovered incidentally.

There are four histologic variants of hemangioma, classified according to the predominant type of vascular channel: cavernous, capillary, arteriovenous, and venous. Bone hemangiomas are mostly the cavernous and capillary varieties. Cavernous hemangiomas most frequently occur in the skull, whereas capillary hemangiomas predominate in the vertebral column (6).

Radiographically a radiolucent, slightly expansile and well defined intraosseous lesion with a radiating trabecular pattern is highly suggestive of hemangioma for extraspinal sites (5). CT or MRI are useful for assessing changes in bone trabeculae, and the results support the



A



B C

Figure 5. A-C The lesion shows predominant enhancement on postcontrast axial, coronal, sagittal images.

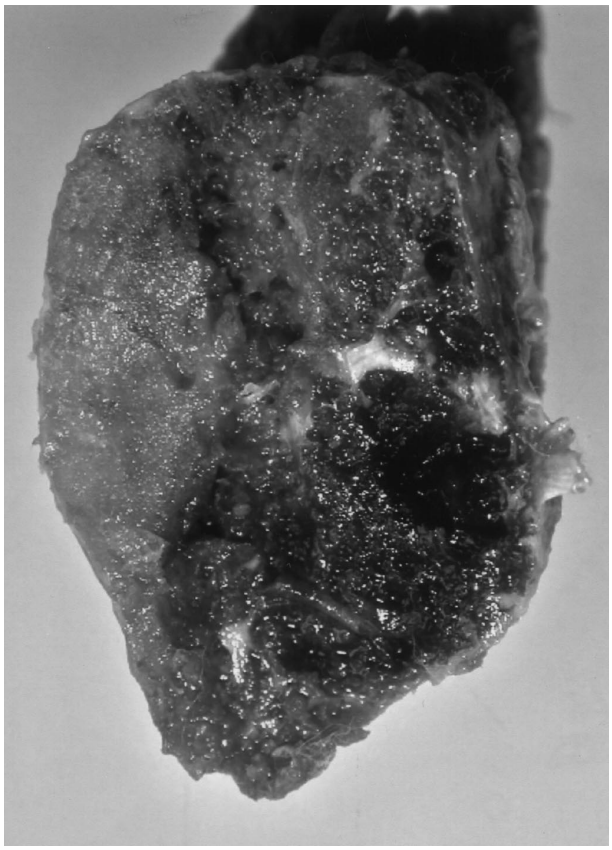


Figure 6. On gross pathological examination, the rib was expanded by a dark red tumor measuring 5 x 4 x 2.5 cm.

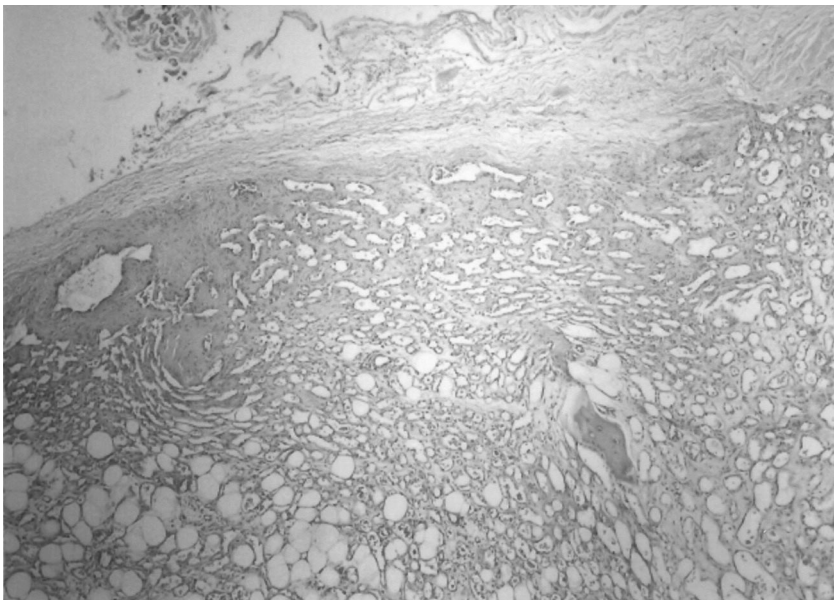


Figure 7. On histologic examination, the tumor was characterized by irregular, thin-walled, dilated blood vessels which contained red blood cells.

plain radiographic findings but provide greater detail.

MRI features of hemangiomas depend on the proportion of fat and vascularity of the lesions. Fat content reveals high signal intensity on T1-weighted MR images, whereas vascular parts show high signal intensity on T2-weighted images. Typically in cavernous hemangiomas, various types of nonvascular tissues may form the matrix within which the angiomatous tissue is interspersed. These include fat, smooth muscle, bone trabeculae, fibrous tissue, and clotted blood products (7). For this reason the signal characteristics may be different according to the ingredient of the matrix. Extraosseous components are of high signal intensity on postcontrast images because of the high vascularity of the content (7,8).

Since rib lesions include various entities, differential diagnoses is an important feature. The most common nonneoplastic tumor of the thoracic skeleton is fibrous dysplasia, although eosinophilic granuloma, giant cell tumor, and aneurysmal bone cyst may also occur (9,10). Fibrous dysplasia is the most common nonneoplastic tumor of the rib, accounting for approximately 30% of benign bone tumors of the chest wall. Fibrous dysplasia manifests as an expanding lytic area with a ground-glass appearance (9,10).

Solitary plasmacytoma is a rare tumor that is associated with latent systemic disease in the majority of affected patients. Plasmacytoma and multiple myeloma are typically seen as well-defined, "punched-out" lytic lesions with associated extrapleural soft-tissue masses, similar in appearance to most metastatic lesions (9,10).

Aneurysmal bone cysts exist as expansile lesions with well-defined inner margins on roentgenograms. CT is useful in delineating the size and location of the intraosseous and extraosseous components of the tumor. MR images typically show a lobulated or septated mass with a thin, well-defined rim of low signal intensity. Fluid-fluid levels are commonly seen in aneurysmal bone cysts (9,10).

Thoracic giant cell tumors often arise in subchondral regions of the flat and tubular bones of the chest wall. Plain radiographs of these tumors show eccentric osteolytic lesions accompanied by cortical thinning and expansion. CT allows evaluation of the extent of the tumor and its relationship to surrounding structures. Tumors typically have a long relaxation time at T1- and T2-weighted MR imaging and appear as areas of low signal intensity on T1-weighted images and high signal intensity on T2-weighted images (9,10).

Surgical resection of the affected rib is the treatment of choice for hemangioma of the rib.

We report the x-ray, CT and MRI findings of a case of incidentally discovered rib hemangioma, which should always be kept in mind during the differential diagnoses of benign lesions of the rib.

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