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Cavernous hemangioma of the rib mimicking malignant bone tumor: A rare case report and literature review

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Abstract

Intraosseous hemangiomas are benign vascular tumors which are more commonly seen in the vertebrae and skull but they rare in the ribs [1]. Rib hemangiomas can mimic malignant rib lesions and definitive clinical and imaging diagnosis might be difficult and pathological confirmation will be required. Here we present a case in a 49 years old female, detected rib tumor in routine examination by chest X-ray, after that done chest CT scan, MRI and bone scintigraphy and underwent a surgical VII rib resection. Histologically, a well-circumscribed tumor was found in the rib. The tumor is formed between the large, thin-walled blood vessels located between the trabeculae of the bone tissue, which are lined with a single row of endotheliocytes. The pathological tissue was diagnosed as a cavernous hemangioma.

Introduction

Hemangiomas are benign vascular tumors that usually involve the skin, liver, eyes and central nervous system, but rare to bones. It's bone hemangiomas have low incidence, accounting for less 1% of all bone tumors [2]. No more than 30 cases of the rib hemangiomas have been reported in the past 30 years worldwide [3]. Hemangiomas of the rib are particularly rare and are often misdiagnosed as malignant tumors, such as metastatic tumors or primary malignant bone tumors [5,6]. If a single solitary tumor of the rib is detected during the examination, rare diseases such as rib hemangioma should be kept in mind. It is not possible to diagnose whether the rib tumor is benign or malignant before surgical resection. The size scope of the operation should be as if a tumor of malignant course is suspected [6]. However, we describe an extremely rare case of a cavernous hemangioma of the rib which was found accidentally in a female patient, the preoperative investigations and the surgical treatment.

Case report

An asymptomatic 49 year old female with no medical history of trauma to the chest wall was admitted due to a bone tumor in the right seventh rib witch was incidentally discovered on routine chest X-ray in July 2024 also no oncological disease, but she had cervical vertebarae C2 hemangioma and her father had some of the bone hemangiomas. Electrocardiography, spirogram was normal and blood laboratory test showed within normal limits including biochemistry, coagulation routine hematology and cancer (tumor biomarkers) markers.

2024- 07-31 Chest CT with contrast demonstrated in the area of the dorsal part of the right VII rib, the structure of the rib is uneven, merging with sclerotic areas, among which there are small osteolytic changes. The bone is unevenly thicker, more than 1 cm locally in the middle section, with a slight protrusion ventrally. In places, the cortical layer at the osteolytic changes is clearly indistinguishable and disrupted. Alongside the changes, there are thicker soft tissues, and the pleural layers have a higher density (Figure 1).

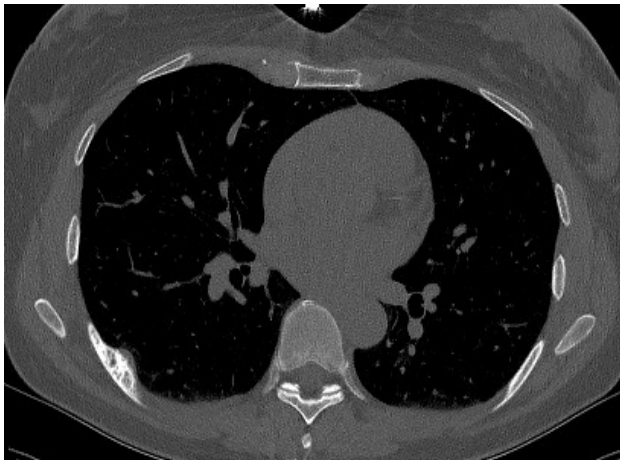

Figure 1: Computed tomography showing heterogeneous, expansile, osteolytic bony outgrowth arising VIIth rib.

2024-08-25 Chest CT showed in the dorsal part of the right VII rib arch, about 2.5 cm in length, the bone structure is altered, deformities present, trabecular structure, and the cortical bone of the ventral-lower edge is disrupted. Their contours are uneven, and there is locally thickened parietal pleura. The changes are similar to those of a malignant tumor, and a primary bone tumor cannot be ruled out.

2024-09-17 Chest MRI in the dorsal part of the right VII rib arc, over approximately 2.5 cm in length, the bone structure is altered, deformed, with a trabecular structure and the cortical bone of the ventral-lower edge is disrupted, with uneven contours. The parietal pleura is locally thickened. Conclusion: A mass on the right VII rib, possibly fibrous dysplasia, but histological verification is required (Figure 2).

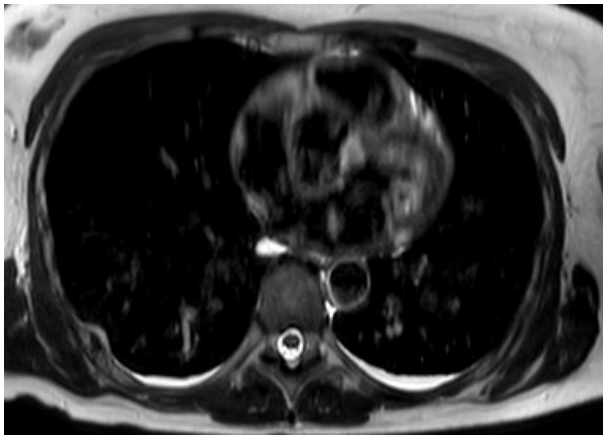

Figure 2: Chest MRI T2 without contrast: the lesion is radiologically nonspecific for hemangioma.

2024-09-20 Bone scintigraphy with CT in the dorsal part of the right VII rib, the radioindicator is focally unevenly more intense. In low-dose CT images, the bone volume is increased, and the structure is irregular— the origin of the lesion is unclear and histological verification is required. The patient was consulted by an interventional radiologist regarding the possibilities of a percutaneous biopsy. However, due to the high risk of fracture and complications and the questionable informativeness of the biopsy material, it was decided that the biopsy is not possible. After all the clinical tests and the inability to perform a minimally invasive biopsy, the patient was consulted by a thoracic surgeon and it was decided to perform a resection of the VII rib.

Histopathology

The surgical specimen was evaluated by the pathologist: an 8 cm bone rib fragment whose center was observed a dark red, fairly smooth lesion in the center measuring up to 2.5 cm. After making incisions the lesion appears blacky white with streaks. A cluster of soft tissue fragments approximately 3 cm in size was obtained. The biopsy material was processed according to bone tissue recommendations and after preparing the specimen, tissue microscopy was performed. During microscopy, a well-defined tumor was observed, forming between the trabeculae of the bone tissue, with large, thin-walled blood vessels lined by a single row of endothelial cells. The microscopic material is evaluated as a cavernous hemangioma. No tumor tissue was detected at the surgical margin. The pathologic diagnosis of this tumor was hemangioma of the rib (Figure 3).

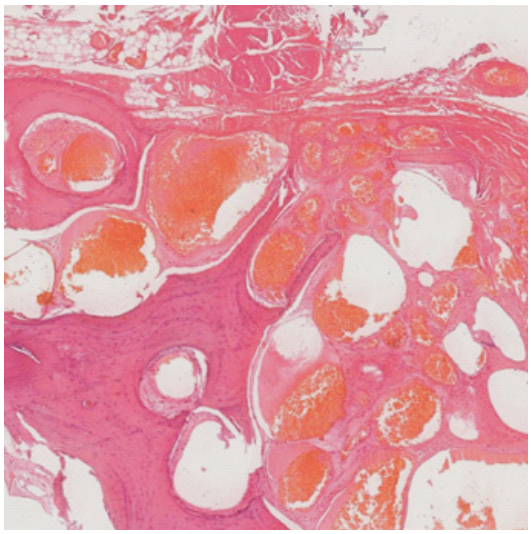

Figure 3: Microscopic findings of the resected mass. Normal bone tissues are interspersed within the mass. The mass consists of thin-walled blood vessels with single layer of endothelial-cell lining containing red blood cells (hematoxylin-eosin).

Discussion

Rib hemangioma is very rare benign vascular tumor, which presents around fifth decade of life and there is slight female predominance, more common over mid thoracic ribs fourth to eighth and over left side [2,7]. Our patient was a 49-year-old female and her hemangioma was on the VII rib. Most cases are asymptomatic and incidentally detected on chest x rays done for other indications, like our patient was detected on routine chest X ray. Different radiological methods in images is mostly difficult to differentiate from malignant rib lesions like chondrosarcoma, multiple myeloma and metastatic tumors [8]. Rib hemangiomas are often misdiagnosed due to rare occurrence in the ribs, 89% of rib tumors are malignant [9]. CT and MR imaging are helpful in further delineating the location and extent of the tumor and in identifying tumor tissues and types ex. characteristic vascular enhancement (cavernous hemangioma) [10]. Radiological diagnosis for rib hemangiomas is never achieved before histological confirmation because of its rarity [11]. Our patient underwent X-ray, CT, MR, bone scintigraphy, but cavernous hemangioma was not identified and, however, CT showed more data for a malignant tumor. This patient imaging diagnosis is challenging because the radiographic characteristics are not pathognomonic.

It was reported in literature that hemangioma of the rib was diagnosed preoperatively by percutaneous needle biopsy which is safe and useful in obtaining a definite diagnosis [12]. However, some reports have stated that preoperative biopsy should be avoided due to risk of bleeding or seeding [5]. Our patient was consulted by an interventional radiologist, but due to the high risk of fracture and questionable limited of the biopsy material, a percutaneous biopsy was not performed. Open surgery when it be excision of rib hemangiomas is a safe procedure with no reported complication after removal or recurrence. Excision of rib hemangioma is a definitive treatment as well as preventive measure to prevent enlargement of tumor and development of symptoms [11]. Despite advances in radiological imaging, histopathological examination remains the gold standard for confirming this clinical condition.

Conflict of interest: The authors declare that they have no competing interests.

References

1. Ching BC, Wong JS, Tan MH, Jara-Lazaro AR. The many faces of intraosseous haemangioma: a diagnostic headache. Singapore Med J. 2009; 50: e195–e198.
2. Kumar J, Magloire J, Quintero L, Vakil D, Bhatt H, Kassira N, et al. Rib hemangiomas: intriguing findings from a systematic review of rare thoracic tumors. J Clin Med. 2024; 13(18): 5586. doi: 10.3390/jcm13185586.
3. Zeng Z, Xia L, Guo Q, Lin F. A hidden cavernous hemangioma of the rib. Asian J Surg. 2022; 45(2): 775–777. doi: 10.1016/j.asjsur.2021.11.056.
4. Itabashi T, Emori M, Terashima Y, Hasegawa T, Shimizu J, Nagoya S, et al. Hemangioma of the rib showing a relatively high 18F-FDG uptake: a case report with a literature review. Acta Radiol Open. 2017; 6: 2058460117728416. doi: 10.1177/2058460117728416.
5. Abrão FC, Tamagno M, Canzian M, Fernandez Â, Bibas J, Fernandes PMP, et al. Hemangioma of the rib. Ann Thorac Surg. 2011; 91: 595–596. doi: 10.1016/j.athoracsur.2010.07.091.
6. Narayan P, Chakrabarthi S, Collins C, Morgan AA. Rib haemangioma: a rarity and diagnostic dilemma. Indian J Thorac Cardiovasc Surg. 2008; 24: 212–214.
7. Huang H, Ning C, Pan Y. Giant cavernous hemangioma of the eleventh rib. J Cardiothorac Surg. 2019; 14: 1–4. doi: 10.1186/s13019-019-0850-x.
8. Resnick D, Kyriakos M, Greenway GD. Tumors and tumor-like lesions of bone. In: Resnick D, editor. Diagnosis of Bone and Joint Disorders. 4th ed. Philadelphia: W.B. Saunders; 2002. p. 3979–3978.
9. Zhu YC, Lin XP, Lu Y, Wang WX, Du KQ, Ye XQ, et al. Hemangioma of the rib: a rare case report and literature review. Open Med (Wars). 2017; 12: 257–260. doi: 10.1515/med-2017-0038.
10. Tateishi U, Gladish GW, Kusumoto M, et al. Chest wall tumors: radiologic findings and pathologic correlation – part 1. Benign tumors. Radiographics. 2003; 23: 1477–1490. doi: 10.1148/rg.236015526.
11. Puri S, Gupta N, Asotra S. Hemangioma of rib masquerading a malignancy. J Cancer Res Ther. 2018; 14(Suppl 3): S809–S811. doi: 10.4103/0973-1482.204847.
12. Roy L, Isler M. Surgical images: musculoskeletal. Costal hemangioma presenting as rib pain after pneumonia. Can J Surg. 2005; 48(2): 152.