Abstract We report a case of focal hematopoietic hyperplasia in the rib of a 24-year-old woman. This is only the fourth case to be reported in the English literature, all of which have involved the rib. Radiologically they all manifested as an expansive and radiolucent lesion and contained ill-defined areas of increased density or calcification. Histologically, all have been characterized by mixed areas of hypercellular marrow and fatty marrow. The lesion is considered a form of pseudotumor. Treatment in our case was by wide marginal excision of the rib.

Keywords Focal hematopoietic hyperplasia · Rib · Pseudotumor · Radiograph · CT


CASE REPORT

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Focal hematopoietic hyperplasia of the rib

Introduction

Focal hematopoietic hyperplasia is a very rare lesion and only three cases have been reported in the English literature [1, 2]. It is characterized by an osteolytic and expansive bony mass with all reported cases involving the rib. Histologically, the lesion consists of hypercellular marrow and merging fatty marrow. No abnormal morphology in the hematopoietic cells and no malignant tumor cells have been seen. Even though this lesion has the clinical and radiologic features of a tumor, it is considered a form of pseudotumor. We report on a case of focal hematopoietic hyperplasia occurring in the posterior rib.

Case report

The patient was a 24-year-old woman who presented with a rib mass incidentally found during evaluation of a thyroid mass. Her thyroid mass had been noted 4 months earlier, and aspiration revealed a degenerative cyst. Thyroid function test was within normal limits. She had no history of hypertension, diabetes mellitus, hematologic malignancy, or any trauma involving ribs. There was no pain or tenderness related to the rib mass. There was no abnormal finding on physical examination.

Hematologic examinations at admission were within normal limits, with hemoglobin of 11.4 g/dl, hematocrit of 33.5%, white blood cell count of 5,100/mm³ with normal morphology. Other laboratory tests showed normal values for glucose, calcium, inorganic phosphate, alkaline phosphatase, creatinine and blood urea nitrogen.

An expanding bony mass in the right third rib was seen on a chest radiograph (Fig. 1A). Computed tomography (CT) revealed that it arose from the head of the posterior rib and involved the transverse process of the third thoracic vertebra without involvement of its body (Fig. 1B). Internal calcification was seen within the lesion. The cortex was ballooned and thin. There was no evidence of cortical destruction, soft tissue mass or periosteal reaction. A bone scan showed increased radiotracer accumulation in the lesion (Fig. 1C). Chondrosarcoma was suggested, but biopsy material showed only thin bony trabeculae with normal marrow cells. We interpreted the biopsy findings as representing a sampling error. Wide marginal excision of the rib was performed.
The resected rib contained an expanding mass, 6.5 × 3.5 cm in size, which had an irregular bony surface. The sections revealed a thin and bulging cortex (Fig. 2). The demarcation between the lesion and adjacent normal marrow was indistinct. Bony trabeculae of the cancellous bone were short, thin and distorted. The marrow space was filled with brown bloody tissue. Microscopic examination demonstrated hypercellular marrow, up to 90%, which merged with fatty marrow (Fig. 3A). Marrow cells were heterogeneous and differentiated into mature cells (Fig. 3B). The myeloid/erythroid ratio was normal. Megakaryocytes were present in appropriate numbers. Atypical cells or solid nest of blasts suggesting leukemia, lymphoma or metastatic carcinoma were not seen. The cortical bone was markedly thinned and focally disrupted by expanding fatty marrow and hematopoietic cells. In some areas, marrow cells were directly attached to the periosteum (Fig. 3C). Narrow bands of fibrous tissue proliferation were present along the endosteal surface, some of which were ossified. Vascular spaces were focally distended, resembling a vascular tumor. The cancellous bone mostly consisted of thin, interrupted and osteoporotic bony trabeculae. Thick and distorted bony trabeculae were present in some areas and appositional new bone growth was also evident there. Osteoclastic activity was nearly absent. Woven bone trabeculae were distributed in the area of osteoporosis (Fig. 3D).

Discussion

Focal hematopoietic hyperplasia is characterized by an osteolytic and expansive bony mass involving the rib. Only three cases have been reported in the English literature with one of them accompanied by radiologic findings and confirmed by fine needle aspiration biopsy. Our study is the fourth such case. All four cases including ours share very similar clinical, radiologic and histologic features [1, 2]. They were all found incidentally on routine chest radiographs performed for unrelated reasons and all cases involved the rib as a solitary lesion, measuring 4–9 cm in size. Radiologically, they manifested as