Giant Cell Tumour of the Anterior rib arc Masquerading as a Primary Breast Lump

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Sir,

A 28-year-old male was referred to our centre for further evaluation of a lump in the right breast. He was being conservatively managed at an outside centre with a presumed clinical diagnosis of gynecomastia. His past, medical and family histories were unremarkable. Clinical examination revealed a well circumscribed, mildly tender, 5×4 cm hard lump in the right breast overlying anterior arc of the right third rib, just lateral to the sternochondral junction. The overlying skin was normal; there was insignificant right axillary adenopathy. All hematological and biochemical investigations were within normal limits. A chest skiagram and a subsequent chest computerized tomography demonstrated a 5×4 cm expansile, lytic lesion involving the anterior arc of the right third rib with cortical thinning and disruption and with adjacent soft tissue invasion. (Figure 1a) A bone scan revealed an isolated increased uptake in the right third rib. (Figure 1b) A fine needle aspiration and a subsequent trucut biopsy were suggestive of a Giant cell tumour (GCT). Following diagnosis, an anterior thoracotomy and a wide resection of the third rib lesion was

performed; the resultant bony defect was bridged with a prolene mesh. (Figure 2a, b) Macroscopic examination revealed an irregular tumour measuring 5.0×3.5×2.5 cm showing large chondroblastic areas along with areas of osteoid production. The tumour cells were round, slightly elongated with vesicular to hyperchromatic nuclei and moderate cytoplasm. Many osteoclastic giant cells were also seen, the final impression was that of a giant cell tumour rib with reactive osteoid formation. (Figure 3a, b) The patient remains well without evidence of recurrence one and a half years following surgery.

Giant cell tumor of bone is a distinct clinical, radiological and pathologic entity accounting for about 4–5 % of all primary bone tumours. It is a benign but locally aggressive neoplasm, classically seen as a purely lytic lesion of the epiphyseal or metaphyseal-epiphyseal region of long tubular bones extending to the articular surface. Around 60 % of the tumours arise around the knee joint, isolated cases have been reported in the scapula, sternum, patella, vertebra, skull, and talus [1].

Fig. 1 **a** CT scan showing a 5×4 cm expansile, lytic lesion involving the anterior arc of the right third rib with cortical thinning and disruption and with adjacent soft tissue invasion. **b** A bone scan showing an isolated increased uptake in the right third rib

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Fig. 2 **a, b** H&EX40- Showing Giant cell tumour rib with reactive osteoid formation. The tumour cells are round to elongated tumour cells with vesicular to hyperchromatic nuclei and moderate cytoplasm, many osteoclastic giant cells are also seen

Fig. 3 **a** Intra operative clinical photograph following removal of the tumour. **b** Clinical photograph of the specimen

A rib is an uncommon site for origin of a GCT with a reported incidence of less than one percent. Even in the cases involving the rib, most were located in the posterior arc [1, 2], anterior arc involvement was noted in our patient.

The majority of patients with GCT will present with a lytic geographic lesion that destroys the involved bone [3], approximately 20 % are associated with a soft tissue component. Histologically, GCT shows a diffuse proliferation of multinucleated, osteoclast-like giant cells in a background of oval- to spindle-shaped mononuclear stromal cells [4]; the differential diagnosis includes brown tumours, telangiectatic osteosarcoma, malignant fibrous histiocytoma, chondroblastoma, and aneurysmal bone cysts.

GCTs are locally aggressive tumors and hence wide excision is usually recommended in all cases [5]. A majority of the patient typically have a benign course, however, a small subset of them (<5 %) show evidence of metastatic involvement, usually to the lung. In conclusion, GCT arising from the chest wall is rare and difficult to diagnose, especially when the

tumour is located in the anterior arc of the ribs; the differential diagnosis easily lends itself to a primary breast lump.

References

1. Shin JS, Lee IS, Kim A, Kim BH (2002) Giant cell tumour originating from the anterior arc of the rib. *J Korean Med Sci* 17:849–851
2. Gupta V, Mittal R (2000) Giant cell tumor of rib-rare location on the anterior aspect. *Arch Orthop Trauma Surg* 120:231–232
3. Briccoli A, Malaguti C, Iannetti C, Rocca M, Bertoni F (2003) Giant cell tumor of the rib. *Skeletal Radiol* 32:107–110
4. Anazawa U, Hanaoka H, Shiraishi T, Morioka H, Morii T, Toyama Y (2006) Similarities between giant cell tumor of bone, giant cell tumor of tendon sheath, and pigmented villonodular synovitis concerning ultrastructural cytochemical features of multinucleated giant cells and mononuclear stromal cells. *Ultrastruct Pathol* 30:151–158
5. Mogi A, Kosaka T, Yamaki E, Hirato J, Kuwano H (2012) Surgical resection and reconstruction for a giant cell tumor of the anterior rib. *Gen Thorac Cardiovasc Surg* 60:233–236