Rare Gigantic Giant Cell Tumor of Anterior Ribs in a Young Lady

Guru Dayal Singh Kalra · Amit Agarwal

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Abstract Any mass arising from the breast region need not to be breast carcinoma! A rapidly growing mass from the chest wall need not to be highly malignant! The present case report defines the thin line between the two extremes and highlights the importance of a good clinical examination followed by a judicious management. The lady in question had a huge Giant cell tumor in the Anterior arc of ribs which is quite rare, making it the second largest tumor been reported so far and the largest in Asia. The patient was referred to us by the Department of Thoracic Surgery in view of the aggressive nature of the lesion and the requirement of a major reconstructive surgery for the chest wall. The reconstructive procedure chosen was time tested and not new yet not so popular in the present time. It could cover such a huge chest wall defect with minimum morbidity and good results.

Keywords Breast · Giant cell tumor · Anterior ribs

Twenty-three year old lady presented with left chest wall mass from past 1 year, rapidly enlarging since 5 months. She had complaints of heaviness in chest associated with pain radiating to left shoulder and arm with no features suggestive of systemic disease. On local examination, solitary chest wall mass was present on left side 14×12 cm extending 1 cm from

clavicle inferiorly in vertical direction and from left border of sternum in horizontal direction displacing the breast tissue inferolaterally. There was no visible pulsations and no impulse on cough. On palpation, it was non tender, uniformly hard in consistency with mild local rise in temperature. The overlying skin was pinchable and dilated veins were present over the mass. The mass was fixed with the chest wall. On pectoral contraction, the mass appeared less prominent. On systemic examination, breath sounds were decreased on left side with cardia displaced to right (Fig. 1).

Diagnosis was made of Chondrosarcoma, Malignant Fibrous Histiocytoma and Pulmonary tumor with Rib metastasis. CT thorax showed 10×8×8.5 cm large mass lesion from chest wall which showed heterogenous enhancement extending into the intrathoracic region with erosion of left second rib. The lesion was compressing the mediastinum with clear fat planes. No significant hilar or mediastinal lymphadenopathy was seen (Fig. 1). FNAC of the mass was suggestive of chondrosarcoma. After investigations, patient was planned for wide local excision with concurrent reconstruction of the chest wall.

Under anaesthesia, left inframammary incision was given which was deepened to sub pectoral space. The whole breast tissue was reflected up with the pectorals to inspect the tumor. It was seen invading the chest wall, so approach was made in infero-lateral direction. Ribs were cut to explore its extent and its involvement with mediastinal structures. There was a clear plane which was further accentuated between the mass and lung. More than 2/3rd of the left pleural cavity was found to be occupied by the tumor. Cardia was pushed to right and left lung was found to be collapsed but uninvolved. Whole mass was removed along with the involved upper four ribs and sternum. Lung expanded with positive pressure. Double folded prolene mesh was sutured to the margins of the chest wall with prolene no.1 suture. Closure was done after draping of the pectoral muscle with the breast tissue over the area

Investigation performed at department of plastic surgery, S.M.S MEDICAL COLLEGE, JAIPUR, INDIA

G. D. S. Kalra
Department Plastic, Burn and Reconstructive Surgery, SMS Medical College, 14 Mahaveer Nagar, Tonk Road, Jaipur, Rajasthan, India 302018
e-mail: drgdkalra@yahoo.com

A. Agarwal (✉)
Plastic, Burn and Reconstructive Surgery, SGPGI, D-43, Rajajipuram, Lucknow, UP, India 226017
e-mail: dr_amit_agarwal78@yahoo.co.in

Fig. 1 a 23 year old female with huge chest mass b CT scan-mass involving the mediastinum with erosion of 2nd rib

(Fig. 2). Patient was extubated uneventfully with no need for ventilator support.

Grossly the tumor weighed approximately 3.4 kg with $16 \times 15 \times 14.5$ cm dimensions making it the largest osteoclastoma on anterior arch of ribs been reported so far in this Asian region. Till now the largest been reported is 25×15 cm [1, 2] making it the second largest been reported so far.

The tumor had yellowish brown capsule with cystic areas and hemorrhage interspread in it. Final biopsy report showed morphology of giant cell tumor composed of round, oval and spindle-shaped stromal mononuclear cells and interspersed multinucleated giant cells, foci of haemorrhage and necrosis. No nuclear atypia and significant mitosis were seen. Infiltration in the surrounding soft tissue was not seen. Patient was evaluated again after 6 months and 1 year. Patient now has normal exercise tolerance with no paradoxical movement of chest wall and her recent CT SCAN proved her to be free of tumor.

Fig. 2 Chest wall defect closed with prolene mesh & pectoral muscle

Discussion

Giant cell tumor (GCT) is an uncommon, aggressive, accounting for 4–5 % of all primary neoplasms. It most commonly arises in the metaphysis/ epiphyses of long bone (60 % around knee). Individual cases have been reported in the scapula, sternum, ribs. Around 5 % affect flat bones, especially those of the pelvis. Most commonly, it presents as lytic lesion that destroys the surrounding bone. Twenty percent have an associated soft tissue mass with cortical breakthrough on radiographic images. Patient typically have a benign course. Less than 5 % of patients will show evidence of metastatic involvement, usually to the lung [3]. Malignant change in giant cell tumour is uncommon. Osteoclastoma rarely presents in ribs <1 %, mostly in posterior arc (head and tubercle) [4]. It has 50 % recurrence rate, which can be decreased with the use of adjuvant therapy [3]. The use of radiation therapy is not recommended in GCT due in part to reported association with malignant transformation of the lesions [5]. Even in cases with pulmonary metastasis, aggressive surgical extirpation is recommended. Due to its rarity, GCT arising from the chest wall is difficult to diagnose, especially when the tumor is located in the anterior arc of the ribs.

The tumour is locally aggressive, but distant metastases are uncommon. When metastases do occur, they rarely prove fatal and hence the term benign metastasis is appropriate. Sometimes it is difficult to separate GCT from giant-cell rich osteosarcoma, malignant fibrous histiocytoma (MFH), chondroblastoma, aneurysmal bone cyst (ABC) and brown tumor. Giant-cell-rich osteosarcoma and MFH are characterized by nuclear anaplasia and abnormal mitotic figures. But in GCT, there is no neoplastic osteoid formation, which is the most pathognomonic finding of giant-cell-rich osteosarcoma. In chondroblastoma, chondroid matrix and plump, spindle shaped mononuclear cell component are

present. Brown tumor has characteristic biochemical findings of hyperparathyroidism.

This case report emphasizes that apart from common tumors like Ewing's sarcoma, chondrosarcoma, fibrous dysplasia and infective osteomyelitic conditions of pyogenic, tubercular origin which are common in our belt in anterior part of ribs, the possibility of a GCT should also be considered in the presence of a soft tissue swelling and a lytic lesion. The patient in question had a short history of 5 months in which the tumor had gained such large dimensions and initially it was thought as breast carcinoma but the clinical examination of the lump below pectorals ruled out that. Aggressive surgical resection with wide margins must be the first choice of treatment for this tumor. This report also emphasises the reconstructive pattern for chest wall where it was done with prolene mesh only.

The patient is now asymptomatic without any dyspnoea and performs all her household works 1 year after surgery. In view of its recurrent potential, regular follow up is mandatory.

She might require a second surgery in view of the deformity of the breast created, but we prefer to wait at least 2–3 years to watch for any recurrence in the chest wall.

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