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Chondrosarcoma of chest wall: Surgical resection and Reconstruction using polypropylene mesh and bone cement

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ABSTRACT:

Primary malignant tumours of the chest wall are very rare, accounting for 8% of all chest wall tumours. Chondrosarcomas present a difficult clinical problem due to its high resistance to conventional chemotherapy and radiotherapy. Hence, complete surgical resection has been the cornerstone for treatment. Management strategies are diverse and depend strongly on the pathological diagnosis and the extent of disease. We present the case of a 35-year-old woman with upper-sternal mass, presenting with chest compression symptoms. Tumour mass was massive and occupied most of sternum, hence after successful reaction on tumour mass in total along with tissue involved; reconstruction with bone cement and propylene mesh was done for chest wall stability.

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INTRODUCTION

Primary malignant tumors of the chest wall are uncommon. Chondrosarcoma is the most common malignancy of the sternum. Chondrosarcomas present a difficult clinical problem due to its high resistance to conventional chemotherapy and radiotherapy. Hence, complete surgical resection has been the cornerstone for treatment. Patients with chondrosarcomas generally have a good prognosis with surgical modality. We present the case of a 35-year-old woman with upper-sternal mass. Thorax computed tomography revealed a well-lineated, hypodense and round mass, which highly suggested the sarcoma of the chest wall. The tumor involved 1/3 proximal part of the corpus sterni and it was largely located on ventral table of sternum and no external chest wall deformity was appreciable. In order to obtain disease-free surgical margins, 1/3 proximal part of the sternum with costochondral junctions was resected and reconstruction of anterior chest wall was performed with prolene mesh and bone cement. The postoperative course was uneventful. The prolene mesh with bone cement provided the essential rigidity and minimal elasticity over the surgical wound.

Case Presentation

A 35-year-old Indian woman, attended a first consultation 1 month after the onset of symptoms: chest pain with chest heaviness, all operating in a context of apyrexia and conservation of general status. A physical examination on admission was normal. A chest radiography showed a rounded and homogeneous opacity.(Figure 1A) A computed tomography (CT) showed, at the anterior mediastinum, a solid formation with well limited contours limited to posterior table of upper half sternum which had extensions to the left sterno-chondral junctions with no sign of subcutaneous invasion radiologically.(Figure 1B) 2D echo showed no valvar lesions, no regional wall motion abnormality, LVEF=50%. Positron emission tomography (PET-CT) scan demonstrated large lobulated predominantly hypodense soft tissue density mass lesion measuring 90 x 77 mm maximal axial extent seen along the left anterior chest wall/anterior mediastinal region. The maximum cranio-caudal extent of the lesion was -71mm and showed minimal low grade FDG uptake(SUV max-1.5) in the periphery which is less than the mediastinal blood pool. Coarse calcifications predominantly in the retrosternal region, superiorly extending upto the level of the midline crossing over brachiocephalic vein and inferiorly abutting left atria.The lesion is seen extending along the 2nd intercostal space involving the chest wall, the pectoris muscles are seen pushed anteriorly by the mass lesion. No obvious erosion of the adjacent ribs seen. The lesion is seen closely abutting the aortic arch, main pulmonary artery and its left branch. At places, the lesion is seen crossing the midline to abut the right side pleura mass in almost entire extent upto the level of the atria with no other sign of distant organ or lymphatic metastasis.(Figure 2A)

The patient underwent an en-bloc resection of the upper half of sternum with approximately 4-5 cm of the 1st to 4th ribs, bilaterally(Figure 2B). A small slit of upper sternal notch, with both sterno-clavicular joints, was preserved for better chest wall stability. In order to reconstruct and recuperate the stability of the thoracic wall, a polypropylene mesh sandwiching antibiotic coated bone cement[Poly-methyl- metha-acrylate]. The postoperative course was uneventful. The prolene mesh with bone cement provided the essential rigidity and minimal elasticity over the surgical wound.(Figure 3). It was then covered with the pectoral muscle and the subcutaneous tissue. The postoperative course was uneventful, and the patient was discharged on the postoperative day 7.

Discussion

Primary malignant tumours of the chest wall are very uncommon, accounting for 8% of all chest wall tumours [1]. The annual incidence of chest wall chondrosarcomas is less than 0.5 per million [2]. Our patient presented the most common manifestation; a palpable mass associated with chest pain, which occurs in approximately 80% and 60% of cases, respectively [3, 4]. Chondrosarcomas constitute a group of neoplasms typical for the production of cartilage matrix by the tumour cells [5]. Conventional chondrosarcoma is the most common type, but several rare subtypes exists, such as Dedifferentiated chondrosarcoma, Mesenchymal chondrosarcoma and clear cell chondrosarcoma [6]. Primary chondrosarcomas arise de novo and secondary chondrosarcomas emerge from pre-existing benign cartilaginous neoplasms [5]. The natural history and prognosis of chondrosarcomas is extremely variable [5]. There have been few long-term studies on the treatment outcomes for chondrosarcomas [5]. Computed tomography and MRI are useful to characterize the tumour and its extension [2]. Different techniques are available to obtain a tissue diagnosis, including minimally invasive incisional or needle biopsies, however, excisional biopsies are preferred [3, 1, 5]. Management strategies are diverse and depend strongly on the pathological diagnosis and the extent of disease. For grade I chondrosarcomas with intact cortex and absence of soft tissue mass, intraregional procedure such as curettage with adjunctive ablation can be considered [5]. However, if there are aggressive imaging features such as cortical breakthrough, soft tissue mass or the tumour is grade II or higher, wide surgical excision is required [5]. Wide, en-bloc surgical excision remains the best available treatment for intermediate to high-grade chondrosarcomas [6]. The 5-year survival rate after resection with adequate surgical margins (4 cm on each side) was 100% compared with 50% in patients with inadequate surgical margins [3]. Inadequate margin of resection is associated with worse overall survival and a higher chance of having local recurrence [3]. It is generally believed that this is due to penetration through the extracellular matrix, low percentage of dividing cells, and poor vascularity, chondrosarcomas are relatively chemo-radiotherapy resistant with the exception of mesenchymal chondrosarcoma with a limited number of cases reporting adequate response [6]. In conclusion, patients with chondrosarcomas generally have a good prognosis when optimally diagnosed and treated [6]. Our case reports interesting and unique findings due to the large size of the chondrosarcoma. Complete resection with wide surgical margin excision remains the best available treatment [3]. It is highly recommended that the patient be referred as soon as possible to a multidisciplinary care centre with an experienced team to improve patient outcomes [2].

References

1. Waisberg D, Conrado F, Fernandez A, Mingarini R, Pêgo-Fernandes P, Biscegli F. Surgically-challenging chondrosarcomas of the chest wall: five-year follow-up at a single institution. Clinics (Sao Paulo) 2011;66:501–3.
2. Widhe B, Bauer HC, Scandinavian Sarcoma Group . Surgical treatment is decisive for outcome in chondrosarcoma of the chest wall: a population-based Scandinavian Sarcoma Group study of 106 patients. J Thorac Cardiovasc Surg 2009;137:610–4.
3. Mukherjee K, Pal M, Saha E, Maity N, Halder S, Ghosh R. Giant chondrosarcoma of chest wall. Indian J Chest Dis Allied Sci 2013;55:229–31.
4. Wang X, Hu S, Guo L, Chen J, Zhu M, Yao F. Primary chondrosarcoma presenting as an intrathoracic mss: a report of three cases. Oncol Lett 2014;8:1151–4.
5. Capps E, Shiller M, Cheek S, Oza U, Konduri K. Chest wall chondrosarcoma. Proc (Bayl Univ Med Cent) 2009;22:362–5.

6. Gelderblom H, Hogendoorn PC, Dijkstra SD, van Rijswijk CS, Krol AD, Taminiau AH, et al. The clinical approach towards chondrosarcoma. Oncologist 2008;13:320–9.