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CASE REPORT

A Rare Case of Sternal Lymphoma

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Abstract

The sternum is a rare site of occurrence of neoplastic lesions. Metastases are commoner than primary neoplastic lesions. We report a case of sternal mass lesion in a 40-year-old male patient who presented with left-sided brachial plexopathy. MRI revealed a normal brachial plexus and a sternal mass lesion which turned out to be sternal lymphoma.

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Introduction

Neoplastic involvement of the sternum is rare, and metastases are much more frequent than primary neoplasms. Malignant lesions are more common than benign lesions among primary lesions.[1]

The radiographic appearance of sternal abnormalities is usually nonspecific. Imaging findings can vary from a localized non-aggressive lesion to an aggressive lesion as seen with infections and malignant neoplasms. CT and MR imaging features help to establish the diagnosis.[2] Here we report a case of a sternal mass lesion in a middle-aged man who presented with brachial plexopathy on left side which turned out to be sternal lymphoma.

Case Report

A 40-year-old male presented to MRI unit of the Department of Radiology of our Institute for an MR Neurography (MRN) evaluation of the left brachial plexus. He complained of limited left shoulder movement and weakness in left arm for the past three months. No prior history of fever or trauma was elicited. He also mentioned a painless midline swelling in the upper part of the chest which he had noticed around the same time and which was slowly increasing in size. Physical examination revealed weakness in adduction and internal rotation of the left arm. Elbow and wrist movements were normal. A non-tender, firm soft tissue swelling was noted in the pre-sternal region, at the level of the manubrium.

MRN study of left brachial plexus revealed no neural lesion. The sternal region was also evaluated. An expansile heterogenous soft tissue mass lesion was seen in the sternal manubrium causing bone destruction. The mass appeared hypointense in T1-weighted images and hyperintense in T2-weighted images (Figs.1a and b).

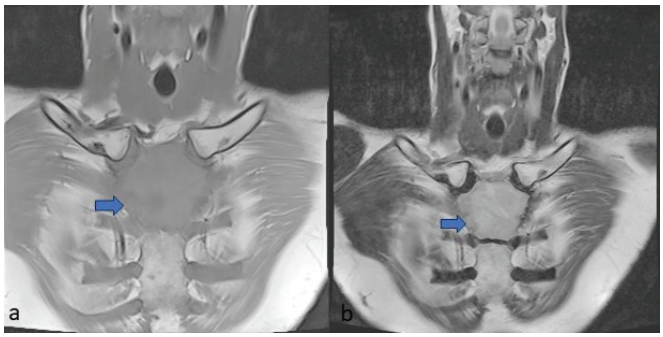

Fig.1a and b: Coronal T1W (a) and T2W (b) MR images showing a T1 hypointense and T2 hyperintense mass lesion in sternal manubrium(blue arrows).

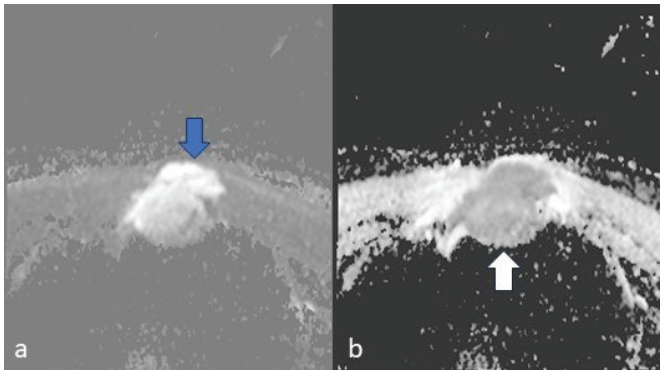

Fig. 2a and b: Axial DW image(a) showing the hyperintense mass lesion (blue arrow) and ADC map (b)showing restricted diffusion (white arrow).

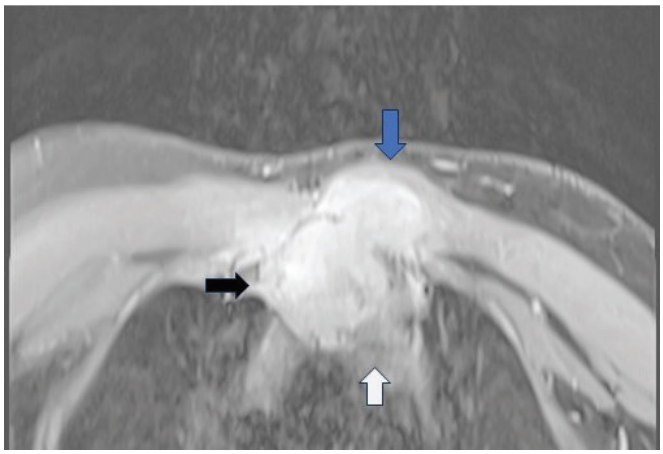

Fig.3: Axial Contrast enhanced T1W image showing heterogeneously enhancing mass lesion(black arrow) in the manubrium with pre-sternal extension and involvement of left pectoralis major muscle(blue arrow) and retrosternal extension (white arrow).

It measured about 5.4 x 4.9 x 5.5cm (CC x AP x TR). It showed restricted diffusion (Figures 2a & b).. There was heterogeneous contrast enhancement with associated pre-sternal and retrosternal soft tissue components (Figure 3). The pre-sternal lesion was

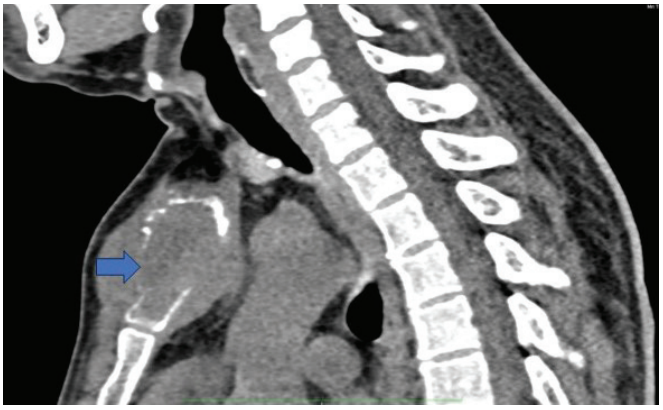

Fig.4: Sagittal reformatted CT image showing expansile mass lesion (blue arrow) in sternal manubrium causing bone destruction with pre-sternal and retrosternal extension.

infiltrating the medial part of the pectoralis major muscle on the left side. The retrosternal lesion was extending into the superior mediastinum but the fat plane between mediastinal structures and the mass was maintained. A non-contrast CT examination revealed an expansile soft tissue density lesion causing bone destruction in the sternal manubrium with associated pre-sternal and retrosternal soft tissue components (Figure 4). No calcification was seen within it. No similar lesions were found in the visualized vertebrae, ribs, scapula, or humerus on both sides. Chest X-Ray and USG abdomen revealed no other primary lesion.

Our differentials included lymphoma, chondrosarcoma, plasmacytoma and metastasis. Subsequently, the lesion was biopsied and histopathological findings were consistent with Diffuse large B-cell lymphoma. The patient was then referred to the Department of Oncology for further management.

Discussion

The appendicular skeleton is the preferred location for bone tumors, and flat bone tumors are rather uncommon. Among the flat bones, tumors of the sternum have an incidence of 0.65% and these account for about 15% of all chest wall tumors. The most frequent sternal neoplasms are metastases. Primary sternal neoplasms, either benign or malignant, are uncommon and out of these, malignant lesions are seen more often.[1]

Primary lymphoma of bone is rare, and usually occurs after 45 years of age with slight male predominance.

Non-Hodgkin's lymphoma is much more common than Hodgkin's lymphoma, among which DL-BCL (Diffuse large B-cell lymphoma) is the most common.[3] Radiographs can show either an osteolytic or osteosclerotic lesion. On CT, the lesion appears heterogeneous with soft tissue components and variable amounts of sclerosis. MRI shows low and high signal intensities on T1- and T2-weighted images, respectively.[4] Contrast-enhanced T1-weighted fat-saturated MR images reveal heterogeneously enhancing mass lesions with extra-osseous soft tissue components.[5] DWI and ADC images are useful in tumor characterization and evaluating treatment response.[6]

Chondrosarcoma usually occurs in males, between the fourth to sixth decade of life. These can either be primary /de novo or secondary. Secondary lesions usually occur due to malignant transformation in a pre-existing exostosis or following therapeutic radiation exposure for other chest and mediastinal malignancies.[1] X-ray shows a well-defined lytic lesion with calcification. On CT, it appears as a well-defined expansile hypodense lesion with ring and arc-like calcification suggesting a chondroid matrix. On MR, it appears as a well-defined heterogeneous lesion that shows intermediate signal intensity in T1-weighted images and appears hyperintense in T2-weighted images. Interspersed calcifications appear hypointense in both T1 and T2-weighted images. There is cortical bony destruction along with the involvement of adjacent soft tissues.[7]

Plasmacytoma usually presents in fifth to seventh decade of life. An osteolytic lesion is seen on radiographs. On CT, it appears as an expansile, enhancing mass lesion causing bone erosion with spiculated periosteal reaction resembling sun rays. No calcification is noted. The lesion may involve adjacent soft tissues. On MRI, it shows homogeneous low signal intensity on T1-weighted images and high signal intensity on T2-weighted images.[8,9]

Metastases are the most common sternal neoplasms. Breast, lung, renal and thyroid malignancies metastasize most commonly to the sternum.[1]. Other malignancies showing sternal metastasis include cholangiocarcinoma, osteosarcoma malignant melanoma, hepatocellular carcinoma, cranial and extracranial meningioma, adenoid cystic carcinoma of the jaw and tongue carcinoma.[10] CT shows solitary or multiple, variable sized lesions with non-circumscribed margins and extending beyond cortex of the sternum. On MRI, these lesions are T1 hypointense and T2 hyperintense with heterogeneous enhancement.[11]

In our case, the lack of matrix mineralization and the absence of other lesions elsewhere in the body decreased the likelihood of chondrosarcoma and metastasis. Hence, our first two differentials included lymphoma and plasmacytoma. Biopsy helped to establish the final diagnosis and the patient was then referred for appropriate management to the Oncology unit of the Institute.

Conclusion

The possibility of lymphoma must be considered in a sternal lesion showing heterogeneous enhancement, bone erosion, and diffusion restriction.

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