

Case Report

Anaplastic large cell lymphoma presenting as sternal swelling

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Received: 14 April 2018

Accepted: 04 May 2018

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ABSTRACT

Lymphomas involving the sternum are very rare. We report a case of lymphoma presenting as lytic sternal lesion. A 14-year-old girl presented with history of painless swelling of central chest (sternum) of 3 months duration. Fine needle aspiration cytology from the site revealed anaplastic large cell lymphoma. It was confirmed by histopathology and immunohistochemistry. She underwent treatment with chemotherapy but succumbed to her illness after six months of treatment.

Keywords: Anaplastic large cell lymphoma (ALCL), Lymphomas

INTRODUCTION

Anaplastic large cell lymphoma is a rare type of peripheral T cell lymphoma. It usually presents at young age and has a special predilection for cutaneous and extranodal organs.¹

Anaplastic large cell lymphoma has a characteristic histology and is differentiated from other lymphomas by CD30 membrane expression. Later it was found that most subsets of this tumour have a balanced translocation t(2;5). This resulted in differentiation of this tumour into two subtypes, ALK (Anaplastic lymphoma kinase) positive and ALK negative. ALK positive subtype occurs in younger patients and has a favourable prognosis.

Involvement of sternum has not been reported in literature and poses a unique diagnostic challenge. Solitary osseous involvement is rare and concomitant non-osseous organ involvement is more common. Tuberculous osteomyelitis and langerhans histiocytosis are the close mimickers.

CASE REPORT

A 14-year-old girl presented to our outpatient department with complaint of swelling in the central part of chest of three months duration.

It was gradually increasing in size, there was no associated pain. There was no history of fever, cough, bleeding tendency, joint pain.

Table 1: Haematological investigations.

Haematological investigations	
Hemoglobin	8.4 g/dl
PCV	44.5%
Total leucocyte count	17400/cmm
Platelet count	5.44 L
MCV	79 fL
ESR	90 mm in first hour
Peripheral smear	Microcytic hypochromic anaemia

On examination she was pale. Lower deep cervical lymph nodes were enlarged on left side of neck, three in number, largest of them measuring 4 × 4 cms, non-tender, firm, discrete. Systemic examination was within normal limits. Haematological investigations showed anaemia, leukocytosis, and elevated ESR as depicted in Table 1. Chest X-ray showed mediastinal widening (Figure 2). Computed tomography of thorax revealed anterior mediastinal mass eroding the sternum with encasement of great vessels (Figure 3). Fine needle aspiration cytology of the swelling reported as anaplastic large cell lymphoma.



Figure 1: Sternal swelling.

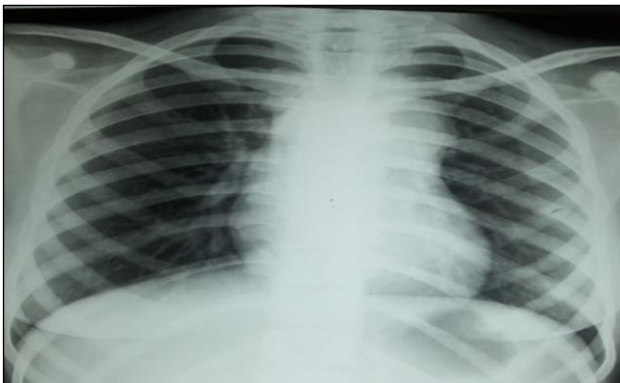


Figure 2: Chest X-ray with mediastinal widening.

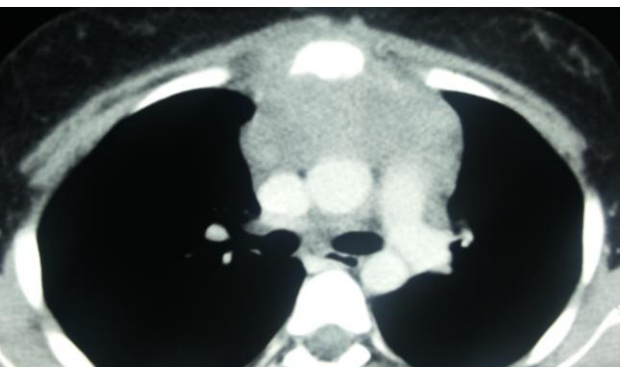


Figure 3: CECT thorax showing anterior mediastinal mass with erosion of sternum.

Biopsy showed eccentric horse-shoe or reniform nuclei (hallmark cells) suggestive of anaplastic large cell lymphoma (Figure 4). Immunohistochemically cells were positive for CD30,EMA and ALK(anaplastic lymphoma kinase),negative for CD20.

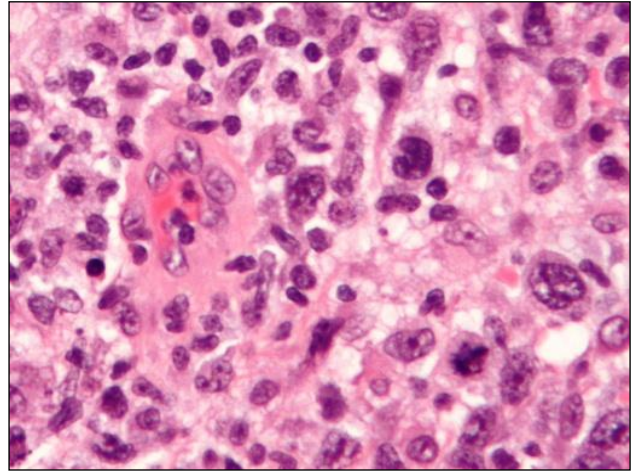


Figure 4: Histopathology showing hallmark cells with reniform nuclei.

She was started on chemotherapy with CHOP regimen (cyclophosphamide, hydroxydaunorubicin, vincristine, prednisolone). She improved initially but unfortunately succumbed to her illness after six months of chemotherapy.

DISCUSSION

Malignant tumors of the sternum are rare, representing less than 1% of primary bone tumors. Their management is complex and depends mainly on their histologic type, local aggressiveness, and the possibility or not of chest wall reconstruction.² The sternum is frequently invaded by lymph nodes of the mediastinum or internal thoracic chain or by local and regional extension of tumors, particularly breast carcinoma. Clinical signs are not specific; chest pain and signs of inflammation are always found. Chest x-rays, CT, and magnetic resonance imaging give precise information about the extension, detect pulmonary metastasis, and aid in the assessment of mediastinal lymph nodes.^{3,4} The diagnosis is usually obtained by surgical biopsy as some authors have reported that needle biopsies may be insufficient because of limited efficacy.⁵ However, even surgical biopsies may be uncertain when the cortex of the sternum is not involved and normal and abnormal tissue cannot be distinguished.⁶ Treatment is by neoadjuvant chemotherapy followed by sternectomy and adjuvant chemotherapy in localised tumours. In the present case, there was extensive mediastinal involvement, chemotherapy was the only option.

Anaplastic large cell lymphoma (ALCL) is a lymphoid neoplasm of T or null cell origin and one of the most

common forms of peripheral T cell lymphoma. Two subtypes of ALCL are recognized by the World Health Organization classification system: ALK-positive ALCL and ALK-negative ALCL. ALK-positive ALCL is associated with translocations involving ALK, the Anaplastic Lymphoma Kinase gene, located on chromosome 2p23. ALCL is a lymphoma most commonly seen in children and young adults, and it has a male predominance. The majority of patients with ALCL present with painless adenopathy and are found to have widespread disease on staging. B symptoms are not uncommon. On lymph node biopsy, the tumor is composed of large cells with horseshoe-shaped nuclei, prominent nucleoli, with or without a paranuclear hof, growing in a cohesive growth pattern. Immunohistochemical analysis demonstrates a strong and homogeneous CD30 expression in a membrane and Golgi pattern.

Approximately 70 to 80 percent of ALCL demonstrate classical morphology, in which the tumor is composed of large cells with round or pleomorphic, often horseshoe-shaped or "embryoid" nuclei with multiple (or single) prominent nucleoli. The cells have abundant cytoplasm, which gives them an epithelial or histiocyte-like appearance. The "hallmark cell," which is classically identified with ALCL, has an eccentric nucleus and a prominent, pale Golgi region. Normal and atypical appearing mitoses are common.⁷ There is also expression of T cell antigens or no lineage-specific antigens as in the case of the null cell type. The presence of an ALK rearrangement can be inferred by immunostaining for ALK (indirectly) or detected directly by molecular genetics or cytogenetics. The differential diagnosis of ALK-positive ALCL includes other lymphoid neoplasms of T or null cell origin and some B cell neoplasms, such as the anaplastic type of diffuse large B cell lymphoma and Hodgkin lymphoma, which may have similar morphologic features.

The main predictors of survival in patients with primary systemic ALCL are the ALK status of the tumor and the International Prognostic Index (IPI). Other predictors of worse outcome include older age (≥ 40 years) and increased beta-2 microglobulin (≥ 3 mg/L).⁸

Patients with newly diagnosed anaplastic large cell lymphoma (ALCL) are usually treated with an anthracycline-based chemotherapy regimen with the goal of achieving a complete remission.

For patients under the age of 60, six cycles of CHEOP regimen and for patients above 60 years, CHOP regimen is administered. Second line regimen includes brentuximab and GDP (Gemcitabine, Dexamethasone, Cisplatin). For ALK positive patients, ALK inhibitors Crizotinib or Ceritinib is an option. For ALK negative patients who do not respond to GDP regimen, third line

regimen drugs include pralatrexate, romidepsin and belinostat.⁹

CONCLUSION

Lymphomas involving the sternum are rare. This unusual presentation should always be a differential diagnosis while dealing with sternal lesions. Anaplastic large cell lymphoma is a peripheral T cell lymphoma with characteristic morphology. Recent technological advancement in immunohistochemistry and cytogenetics has paved the way for better treatment options and prognosis of the tumour.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Narayanan S, Prakash D, Subramaniam G, Mahadevan L. Outcome Anaplastic large cell lymphoma presenting as sternal swelling. *Int J Adv Med* 2018;5:757-9.