Case Report

Langerhans cell sarcoma presenting as a mediastinal mass in a young infant: a case report

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Abstract

Langerhans Cell Sarcoma is an extremely rare disease. Its manifestations vary though skin, lymph-node and bone involvement are most commonly reported. It is an aggressive disease with a poor outcome. We report a six-week-old infant with Langerhans cell sarcoma who presented with a mediastinal mass causing respiratory distress. The diagnosis was made on histopathology and immunohistochemistry of biopsy of the mass. The tumour did not respond to chemotherapy and the baby died within weeks of diagnosis due to respiratory failure. To the best of our knowledge, this is among the youngest patients reported to have a Langerhans cell sarcoma.

Keywords: Infant; Langerhans cell sarcoma; Mediastinal mass

Introduction

Langerhans cell Sarcoma (LCS) is an exceedingly rare malignancy that develops from Langerhans cells. It may occur de novo or may develop from an antecedent Langerhans cell histiocytosis (LCH) [1]. About 70 cases of LCS have been reported worldwide [2-6]. Very little data are available on its manifestations, therapy and prognosis in children. Adult data suggests that it is a fast growing aggressive tumour with a poor prognosis [7]. It is known to occur at any age and congenital presentation has also been reported [8]. We present a 45 day old infant with LCS who presented with a mediastinal mass.

Case Report

A 45-day-old male infant presented with cough, purulent eye discharge and multiple hypo-pigmented skin patches noted about 20 days back, and fast breathing for two days. He was hypoxic and had respiratory distress at presentation. He had generalized hypo-pigmented macular skin lesions, seborrheic dermatitis, hordeolum of right eye lid and a soft liver palpable 2 cm below the costal margin. Due to severe respiratory distress he was emergently intubated and ventilated. He had leucocytosis (20.6 x 10^9/L), thrombocytosis (500 x 10^9/L) and unremarkable renal and liver functions. His chest radiograph showed a mediastinal mass. An ultrasonogram of the chest showed multiple cystic lesions in the thymus.

Computerized tomography (CT) of the thorax showed a mediastinal tumor with heterogeneous cystic areas and calcifications, along with cystic changes in the right lung. A CT guided biopsy was performed. Histopathology showed atypia and increased mitosis of Langerhans cells and immunohistochemistry was positive for LCA, CD1a, S100, CD68 (few cells) and negative for CD3, CD20, CD30 suggestive of Langerhans cell Sarcoma (LCS). A skin biopsy was performed and this showed proliferation of histiocytes with increased eccentric nuclear material and moderate cytoplasm. The skull radiograph was normal.

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The baby was started on chemotherapy with Vinblastine and Prednisolone as per the LCH-III protocol but showed no response despite two weeks of therapy [9]. The mediastinal mass showed no resolution on the chest radiograph and the child continued to be dependent on mechanical ventilation. Two weeks after initiating chemotherapy he succumbed to respiratory complications.

Discussion

LCS is a fast growing, aggressive malignancy, having a poor prognosis and short survival. In a majority of patients, LCS originates de novo from Langerhans cells but rarely, may originate from an antecedent LCH [1]. The literature on LCS is restricted to case series and as far as we know, only about 70 patients including 6 children have been reported in the English literature worldwide [2,8,10-12]. The most recent pediatric report was by Zwerdling et al, of a child presenting with spinal cord compression [10]. A congenital presentation has been described [8].

In the available pediatric literature, clinical presentation has included prolonged fever, abdominal pain, poor appetite, petechiae and hepato-splenomegaly [11,12]. A mediastinal mass has been reported in only one other child [11]. Adults usually present with skin and lymph node involvement [1,7]. Involvement of multiple tissues like bone, lung, brain, skin and mucus membranes, lymph nodes, liver and other soft tissues is known. Mediastinal, thymic or lymph node involvement is rare and occurs in disseminated disease [1]. Anemia, thrombocytopenia and histiocytic infiltration of bone marrow have been reported in children [11]. Diagnosis is based on histopathology of lesional biopsies which show proliferation of typical Bierbeck granule-containing tumour cells with malignant cytological features and immunohistochemistry that is positive for CD1a, S-100 and CD 68. Our patient had similar findings.

There is no established chemotherapy protocol for the treatment of LCS. The E-CHOP regime which includes Etoposide, Vincristine, Cytarabine, Adriamycin and Prednisolone has been tried in a 10 year old boy with a locally invasive pharyngeal LCS. His therapy was discontinued at the parents' request after two cycles since he developed neutropenia. However, he had no evidence of recurrence or metastasis through a two-year follow up [12]. The two children reported by Chung et al were treated with Etoposide and Dexamethasone as per the Hemophagocytic Lymphohistiocytosis (HLH) 2004 protocol [13] after which they had radiological regression of lesions. However, they both had recurrence several months later presenting as bony lesions for which they received another course of chemotherapy and underwent bone marrow transplantation [11]. Adults are usually treated with a combination of radiotherapy and chemotherapy with surgery for localised disease if resectable [1,7]. The MAID regime (Mesna, Adriamycin, Ifosfamide, Dacarbazine) and modified ESHAP regime (etoposide, carboplatin, cytarabine, methylprednisolone) have been reported to result in complete resolution [14,15]. Mutation of the proto-oncogene BRAF known to occur is several neoplasms have now been reported in LCS also (V600E mutation) [16-18]. The BRAF inhibitor dabrafenib has been reported to result in transient improvement in an adult with lymph node disease [5].

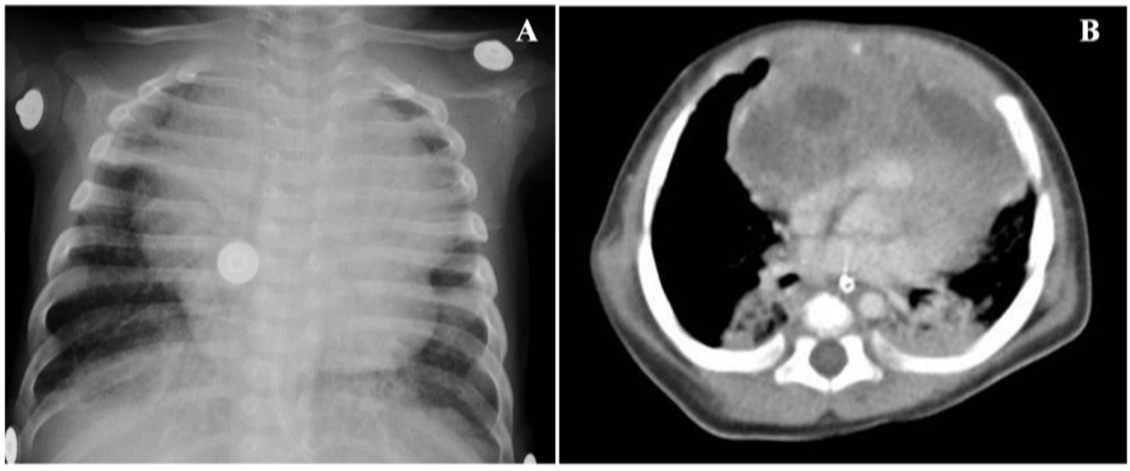

Figure 1: Mediastinal mass on Chest Radiograph (A).
Computerised tomography showing a mediastinal tumour with heterogenous cystic areas and calcification (B).

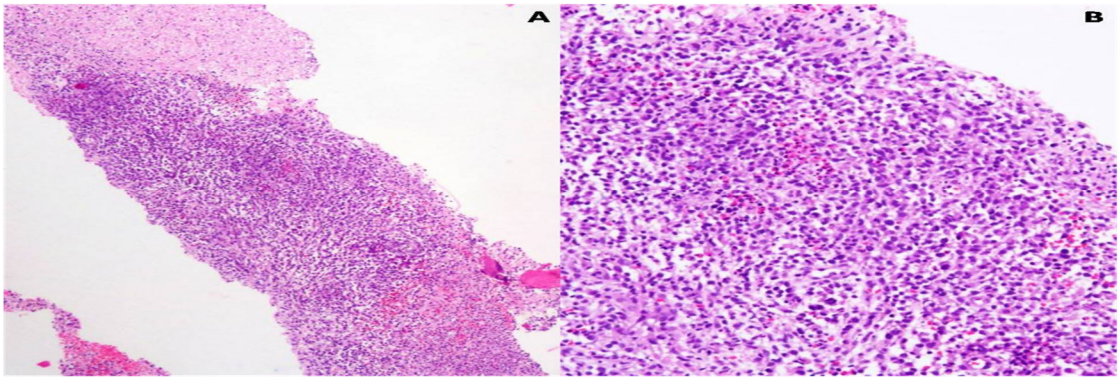

Figure 2: (A): Linear cores displaying highly cellular tumour with areas of necrosis (H&E, X100).
(B): High power displaying sheets of Langhans cells admixed with eosinophils, plasma cells (H&E, X200).

The prognosis of LCS in adults has been poor with the majority of patients dying within two years of diagnosis [7]. The five children reported in the English literature have all survived [10-12]. Localized involvement amenable to surgical excision, and a relatively older age may have favoured their prognosis. Our patient was much younger and had mediastinal involvement at diagnosis. Disease progression and extensive lung involvement contributed to the mortality.

LCS is an unusual cause of mediastinal masses and should be considered when more common etiologies have been ruled out. It may present at any age and bone involvement is not necessarily present. The extent of organ involvement and age may affect the prognosis.

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