Langerhans Cell Histiocytosis Presenting as Isolated Mediastinal Mass in an Infant

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Received: July 26, 2013;
Initial review: October 04, 2013;
Accepted: February 05, 2014.

Background: Isolated mediastinal involvement in Langerhans cell histiocytosis (LCH) has been rarely reported. **Case characteristics**: A 3-month-old boy presented with history of low grade intermittent fever, cough and noisy breathing for 2 weeks. **Observation:** A chest *X*-ray showed massive mediastinal widening. Biopsy of the mass confirmed LCH. **Outcome**: Patient is doing well after one year of treatment with LCH III protocol. **Message**: Langerhans cell histiocytosis should be considered in differential diagnosis of mediastinal mass in infants.

Keywords: *Cancer chemotherapy, Histiocytosis, Mediastinal widening.*

Langerhans cell histiocytosis (LCH) is a rare disease characterized by monoclonal proliferation of dendritic-cell related histiocytes. It frequently involves bones, skin, hypothalamus and "risk organs" (liver, lung, spleen, hematopoietic system) [1]. We report a rare presentation of LCH as an isolated mediastinal mass.

CASE REPORT

A 3-month-old boy (full-term, birth weight 3.0 kg) presented with history of low grade intermittent fever along with cough and noisy breathing for two weeks. On examination, child had respiratory distress with crepitation heard on auscultation over chest. There was no hepato-splenomegaly, rash or ecchymosis. Blood examination and other laboratory studies were normal. He needed supplemental oxygen to maintain normal oxygen saturations and received a trial of nebulized salbutamol with no apparent benefit. A chest *X*-ray showed massive mediastinal widening (***Fig.*1**) and computerized tomography (CT) scan (***Fig*.1**) of the chest showed a large lobulated heterogeneous soft tissue mass (15x15 cm) in the anterior mediastinum with some stromal enhancement and tracheal compression but no osteolysis. Bone marrow aspiration, serum alpha-feto-protein and beta HCG levels were normal.

A CT-guided biopsy of the mass was done; histopathology showed medium sized, coffee bean shaped hyperchromatic cells with abundant pinkish cytoplasm and heavy eosinophilic infiltration. Immunohistochemical stains were positive for S-100 and CD1a. A diagnosis of LCH was made. Skeletal survey, including whole body bone scans (Tc-99m) did not identify any malignant focus.LCH III chemotherapeutic regimen [2] was adopted for treatment. Induction phase consisted of weekly injection of vinblastine (6 mg/m^2) and oral prednisolone (40 mg/m^2) for 6 weeks. After induction chemotherapy, noisy breathing and other chest symptoms improved significantly and CT chest showed reduction of mediastinal mass by 50%. He received another 6 weeks of re-induction chemotherapy. After 12 weeks, a follow-up CT scan of the chest showed significant reduction in the size of the mediastinal mass with minimal residual lesion (***Fig.*1**). He was started on maintenance therapy (vinblastine injection once every 3 weeks, oral 6-mercaptopurine 50 mg/m^2 daily and prednisolone orally 40 mg/m^2 for 5 days once every 3 weeks) for a total duration of 1 year. At present child is off treatment for one year and is doing well without any symptoms or sign of original disease.

DISCUSSION

Our case illustrates that mediastinal compression due to LCH in a young infant can be due to present as an isolated mediastinal mass. Germ cell tumor, thymic hyperplasia, congenital cysts, lymphoma, intrathoracic thyroid tissue and lymphangioma are the common anterior mediastinal mass in this pediatric age group [3]. LCH must be included in the differential diagnosis of such lesions as early diagnosis is key to successful therapy. Though absent in our case, typical seborrheic involvement of the scalp may be mistaken for prolonged "cradle cap" in infants. Infants may also present with skin involvement as brown to purplish papules over any part of their body, and they

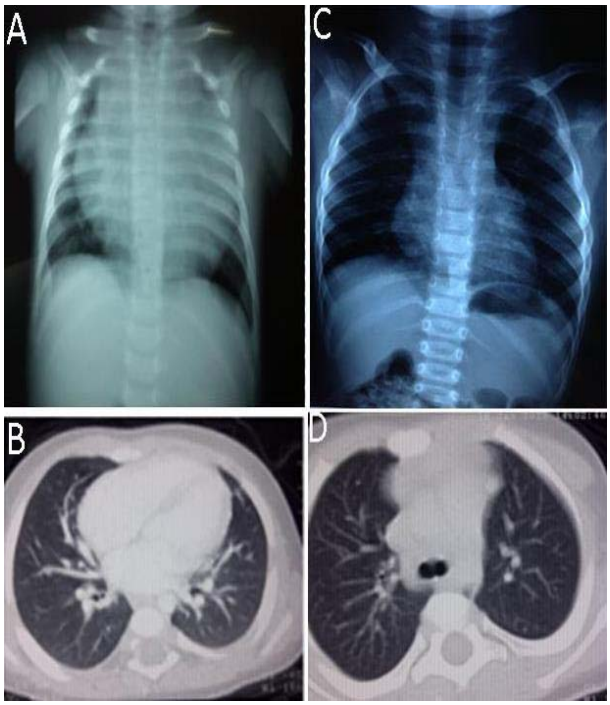

FIG. 1 *Chest X-ray and CT thorax showing large mediastinal mass pre-chemotherapy (A, B) and good response post-chemotherapy (C, D).*

should be followed up regularly [4]. Punctuate or serpentine calcification/cysts are usual radiographic features of lung LCH, but these were absent in our case. Confluence of cysts may lead to bullous formation and spontaneous pneumothorax can be the first sign of LCH in the lung [5]. Though many cases have been reported to present as mediastinal mass along with multisystemic involvement, isolated mediastinal LCH has been reported rarely [7-10]. Recently, a French LCH registry [6] enrolled 1426 patients with LCH in last 20 years; 37 (2.6%) had mediastinal mass, and majority were infants.

Emergent and adequate treatment for sufficient duration is necessary in infant LCH as it may be fatal. Higher rate of reactivation and a higher mortality rate has been reported in mediastinal mass group as compared to non-mediastinal mass group. In LCH III trial, the overall 5-year survival of risk organ positive (RO+) patients was 84% that was higher than in the corresponding (historical) RO+ patients in the predecessor LCH-I (62%) and LCH-II (69%) trials. Underscoring the importance of treatment duration on reactivation frequency, LCH-III RO+ patients (12-month treatment) had a 27% 5-year risk of reactivation, much lower than that of the comparable (RO+) historical controls treated in LCH-I (55%) and LCH-II (44%), who received only 6 months of therapy [2]. This clearly shows the importance of prolongation of treatment in LCH patients.

We conclude that mediastinal LCH should be considered in differential diagnosis of mediastinal mass in infants. Timely diagnosis and treatment can lead to good outcome.

Contributors: Both authors contributed equally to the mauscript. *Funding*: None; *Competing interests*: None.

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