

Case Report

A Rare Case of Thymic Hyperplasia in a 6-month-old HIV-exposed Infant with Signs of Airway Compression

Alemayehu Gezmu

Department Paediatrics and Adolescent Health, Faculty of Medicine, University of Botswana, Gaborone, Botswana

ABSTRACT

This is report of a rare case of thymic hyperplasia in a 6-month-old female child with significant compression effect on the airways and shift of the mediastinum. Timely imaging study and tissue biopsy play an important role in identifying cause of anterior mediastinal mass in this age group.

KEYWORDS: Anterior mediastinum, thymus, thymic hyperplasia

INTRODUCTION

A variety of neoplasms originating in the thymus have previously been lumped together under the single term “Thymoma”. It is apparent, however, that thymoma, thymic carcinoid, various lymphomas, and germ cell tumors that arise in the thymus differ not only pathologically but also in their clinical behavior.^[1]

In the pediatric population, the most common tumor to involve the thymus is lymphoma, followed by germ cell tumors.^[2] Although thymoma are the most common anterior mediastinal primary neoplasm in adults, they are very rare in children, only accounting for approximately 4% of pediatric thymic neoplasms.^[2]

Massive thymic hyperplasia causing respiratory symptoms is extremely rare during infancy. Review of literature revealed only a handful of infants presented with massive thymic hyperplasia and compression of local adjacent structures.

CASE REPORT

A 6-month-old female Motswana child who was born to a 36-year-old mother at term pregnancy. She was diagnosed to have human immunodeficiency virus (HIV) infection before current pregnancy and was started on antiretroviral treatment using once daily Atripla. Venereal disease research laboratory (VDRL) test was negative. Baby has uneventful perinatal history. The child was given single dose nevirapine and daily Zidovudine for 28 days as postexposure prophylaxis. The baby was started on exclusive formula feeding since birth.

Starting age of 2 months, the child started to have shortness of breath, cough, and associated low-grade intermittent fever. The mother complained that the child was not gaining weight and had had loss of appetite. Because of the symptoms, child was given different antibiotics and later started on anti-Tuberculosis (TB) treatment based on symptom complex of tuberculosis and local epidemiology. Despite the fact that the child was on anti-tuberculosis treatment for 1 month prior to presentation to our hospital, child didn't show any sign improvement in her symptoms.

The child was tachypneic and tachycardic. Anthropometric values indicated presence of moderate under nutrition. She had no pallor, no jaundice, and no lymph node enlargement at accessible areas. There was pectus carinatum with intercostal and subcostal recessions and decreased breath sounds at the left lateral and posterior two-third of the lung fields associated with crackles at both sides. Cardiovascular exam was none revealing. On abdominal examination, we identified hepatomegaly but no splenomegaly. Other organ systems were normal.

Laboratory investigations showed WBC 20,300/mm³ with lymphocyte 77.7%, neutrophil 10.8%, and monocyte 5.4%. Hemoglobin level was 13.6 g/dl with MCV of 79.6 f/l, and platelet count was 620,730/mm³. Renal

Address for correspondence: Alemayehu Gezmu, Department of Paediatrics and Adolescent Health, Faculty of Medicine, University of Botswana, PO Box - 00713, Gaborone, Botswana.
E-mail: alemayehu.gezmu@mopipi.ub.bw; alemayehu77@hotmail.com

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function, electrolytes, and liver function tests were within normal limits. Blood culture showed no growth. Deoxyribose nucleic acid (DNA) polymerase chain reaction (PCR) for HIV was negative.

Imaging studies showed the presence of a mediastinal shift to the right with compression of the trachea and main bronchus. There was a homogeneous mass in the anterior mediastinum with no area of necrosis and didn't displace or narrow the vessels. There was no neural foramina compromise. No aeration of the left lung noted with air only seen to the level of proximal main bronchus. There is hyper attenuation in the posteromedial left hemi thorax [Figure 1].

A core-needle biopsy through the left chest confirmed that there was a mediastinal mass with possible thymic tissue and possible lymphomatous malignancy underlying. This led to an open biopsy on the right upper mediastinum which concluded that this was normal thymic tissue. A second biopsy was then performed through a left anterolateral thoracotomy which also confirmed that this was normal tissue. We, therefore, concluded that the diagnosis was in fact nonmalignant but likely thymic hyperplasia. The surgical procedure as well as the risks involved were explained in detail to the mother who consented to the procedure.

A midline incision median sternotomy was performed and a large thymus covering the whole of the anterior mediastinum and both pleural cavities was removed with sharp and blunt dissection. Significant care was taken to avoid both phrenic nerves on both sides. There was a pericardial effusion which was opened and drained as well. Once the pleural effusions were drained, two pleural chest tubes were placed and the thymic tissue was sent for histological assessment.

Histologic assessment of the excised tissue indicated histology of a normal thymus with a diagnosis of thymic hyperplasia.

DISCUSSION

Mediastinal masses in children constitute a heterogeneous group of malignant and benign neoplasms. The majority of malignant tumors with a mediastinal mass were Hodgkin's and non-Hodgkin's lymphoma arising in the anterior and middle mediastinum. Ganglioneuroma arising in the posterior mediastinum made up the bulk of benign tumors. Infants less than 2 years old presented with symptoms of tracheal compression, whereas older children had fewer symptoms but a far greater likelihood of having a malignancy.^[3]

Thymic hyperplasia is defined as an enlarged thymus beyond the normal upper limit for any given patient

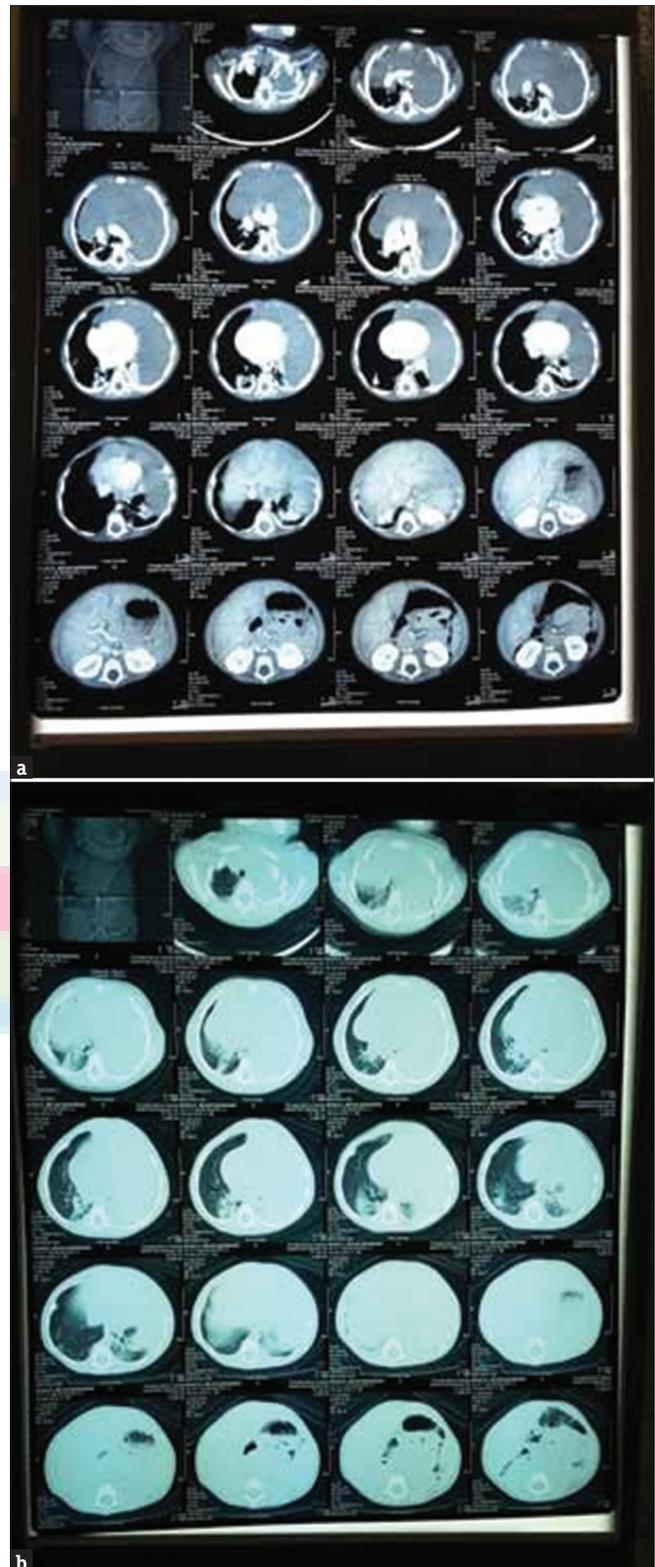


Figure 1: (a and b) Pre and Post contrast Chest CT scan of a 6 month old infant which showed compression and displacement of the mediastinum to the right and a homogeneous mass lesion arising from the anterior mediastinum extending to both the right and left pleural cavity

age. Hence, the imaging appearance is similar to a normal thymus except for its larger size.^[4] Although

thymic disorders are rare in infants and children, thymic hyperplasia is the most common process to involve the thymus gland in this population and may be divided into true thymic hyperplasia and lymphoid hyperplasia.^[2] These two types are associated with different groups of pathologic conditions. Both true thymic hyperplasia and lymphoid hyperplasia manifest as diffuse symmetric enlargement of the thymus.^[5]

Although it is well known that the thymus can undergo hyperplastic changes after suppression from recent stressful conditions such as chemotherapy for neoplasm, Grave's disease, corticosteroid therapy for Cushing's disease, irradiation or thermal burns and some autoimmune diseases (systemic lupus erythematosus, Hashimoto thyroiditis, Addison's disease, and acromegaly), our patient did not have any of these well known systemic stresses or conditions causing thymic hyperplasia.^[4]

Massive thymic hyperplasia is an extremely rare form of true thymic hyperplasia most often described in infants and children. Hyperplasia of this order is not known to occur in any other organ, and its etiology and prognostic significance remain unknown. As there is no accurate way of preoperatively differentiating massive thymic hyperplasia from other tumors of the thymus and anterior mediastinum, the current surgical approach is excision in all cases for histological analysis and relief of mediastinal compression.^[6]

CONCLUSION

Huge mediastinal masses in infants are often difficult to diagnose, and thymic enlargement must be considered in each instance, especially when the mass is located

anteriorly. In the patient reported on here, surgical intervention was required to establish the precise histological diagnosis and relieve compression effect on the mediastinum and surrounding structures.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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