

Posterior mediastinal mass: an unusual presentation of pediatric tuberculosis

Farah Sabouni^{1,2}, Zahra Movahedi³, Mehrzad Mehdizadeh², Alireza Rahimi⁴, Nima Rezaei^{5,6}

¹Pediatric Infectious Diseases Research Center, ²Children's Medical Center, Tehran University of Medical Sciences, Tehran, Departments of ³Pediatric Infectious Diseases, and ⁴Pathology, School of Medicine, Qom University of Medical Sciences and Health Services, Qom, ⁵Research Center for Immunodeficiencies, Children's Medical Center, ⁶Molecular Immunology Research Center, and Department of Immunology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran. E-mail: movahedizahra@yahoo.com

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Mediastinal mass is a rare presentation of tuberculosis in children. The sources of posterior mediastinal mass are usually neurogenic tumors, infections or vascular lesions. Herein, a 12-year-old girl is presented who manifested with a posterior mediastinal mass extending to the right paravertebral space from T3 to T8 with extension to retrocardiac and subcarinal spaces. She suffered from chronic cough, prolonged fever, and weight loss. The results of the tuberculin skin test and biopsy were compatible with tuberculosis. Mediastinal tuberculosis was confirmed histologically and by polymerase chain reaction. The patient was treated with anti-tuberculosis drugs and surgical intervention.

Key words: posterior mediastinal mass, tuberculosis, chronic cough.

Pediatric posterior mediastinal mass is a challenging issue in medicine, as this anatomic space contains several organs, including the esophagus, thoracic duct, as well as nerves, aorta, veins, and lymph nodes¹. Neurogenic tumors, neuroblastic tumors, non-neurogenic tumors, paraspinal abscess, descending aortic aneurysm, esophageal neoplasm, hernias, lymphadenopathy or lymphoma, and extramedullary hematopoiesis could all be considered in the list of differential diagnoses of patients with posterior mediastinal mass².

Herein, a 12-year-old girl with a large posterior mediastinal mass is presented who was diagnosed as tuberculosis and treated successfully with surgery and anti-tuberculosis drugs.

Case Report

A 12-year-old girl was referred to the Children's Medical Center Hospital, Pediatrics Center of Excellence in Tehran, Iran with a history of fever, especially in the evening, malaise, low appetite, dry cough, and abdominal pain, which had been present since at least two months before admission. She also had a weight loss of approximately 9 kg during this period. Because of progressive malaise, she was frequently

absent from school. She had received some empirical antibiotics, such as clarithromycin and amoxicillin, without any improvement in signs or symptoms.

On admission, she was ill in appearance with high fever (oral temperature 40°C). The physical examination revealed clear lungs on auscultation, and cardiovascular, abdominal and nervous system examinations were normal. Early laboratory results were as follows: white blood cells: 3,970/mm³, polymorphonuclears: 51%, lymphocytes: 33%, monocytes: 15%, hemoglobin: 12 g/dl, platelet count: 229,000/mm³, C-reactive protein: 6 mg/L, and erythrocyte sedimentation rate (ESR): 24 mm/h. Results of hepatic and renal function tests were normal. Wright and Widal tests were negative. Peripheral blood smear was normal. Immunological screening tests to exclude underlying immunodeficiencies were performed, which were all normal: immunoglobulin (Ig) G: 670 mg/dl, IgM: 88 mg/dl, IgA: 135 mg/dl, IgE: IU/mL, CD3: 62.7%, CD4: 31.2%, CD8: 24.1%, CD19: 3.5%, CD16-56: 3.0%, and nitroblue tetrazolium (NBT) test: 100%. Human immunodeficiency virus (HIV) antibody was negative.

The first chest X-ray revealed a double shadow at the right heart border (Fig. 1). The lateral view revealed a well-defined oval mass in the posterior mediastinum. There was no active infiltration in the lungs fields. Abdominal sonography was normal. Tuberculin skin test showed 15 mm induration. Culture of gastric aspirate was negative for acid-fast bacillus in staining and polymerase chain reaction (PCR). Bone marrow aspiration was normal.

The chest and abdominopelvic computed tomography (CT) scan showed an irregular soft tissue mass in the right paravertebral space from T3 to T8 with extension to the

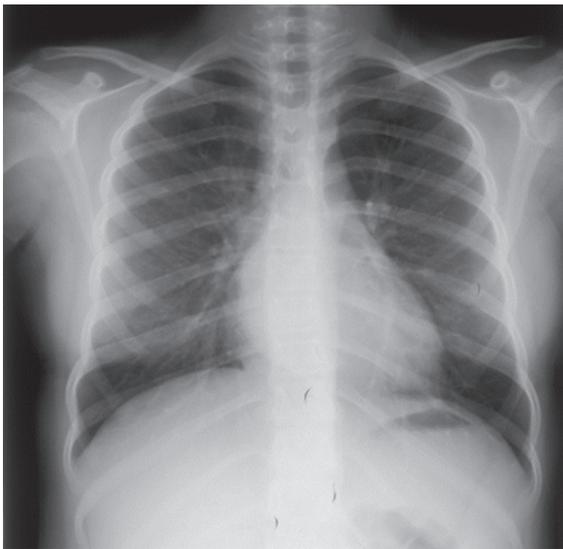


Fig. 1. Chest X-ray showing a shadow at the right heart border.

retrocardiac and subcarinal region anteriorly and intercostal space posteriorly, compatible with round cell tumor or tuberculosis.

Several hypodense small lesions around the pancreas head and porta hepatis were noted (Fig. 2). No significant pelvic lymphadenopathy was detected. Minimal free fluid in the pelvic inlet was noted. Liver, spleen and kidneys were normal. CT-guided biopsy of the mass lesion was done. Results of the biopsy showed fibroconnective tissue infiltrated by mixed inflammatory cells, including lymphocytes, eosinophils and macrophages, as well as a few neutrophils, and some areas with aggregation of epithelioid histiocytes accompanied by extensive necrosis, compatible with chronic necrotizing granulomatous inflammation. No acid-fast bacillus was seen in Ziehl-Neelsen staining. Immunohistochemistry (IHC) staining was not compatible with lymphoma.

Therefore, tuberculosis was diagnosed, and treatment with isoniazid (INH), rifampin (RMP), pyrazinamide (PZA), and ethambutol was initiated. Five days after treatment, the fever resolved. The anti-tuberculosis drugs were continued, but because of no change in mass size in the CT performed two months later, surgical treatment was suggested, and subsequently the posterior mediastinal mass, measuring 4×10 cm, was resected. Histopathologic result showed caseous granuloma (Fig. 3). PCR of *Mycobacterium tuberculosis* was positive in biopsy specimen. The patient was discharged with anti-tuberculosis drugs. At the six-month evaluation,

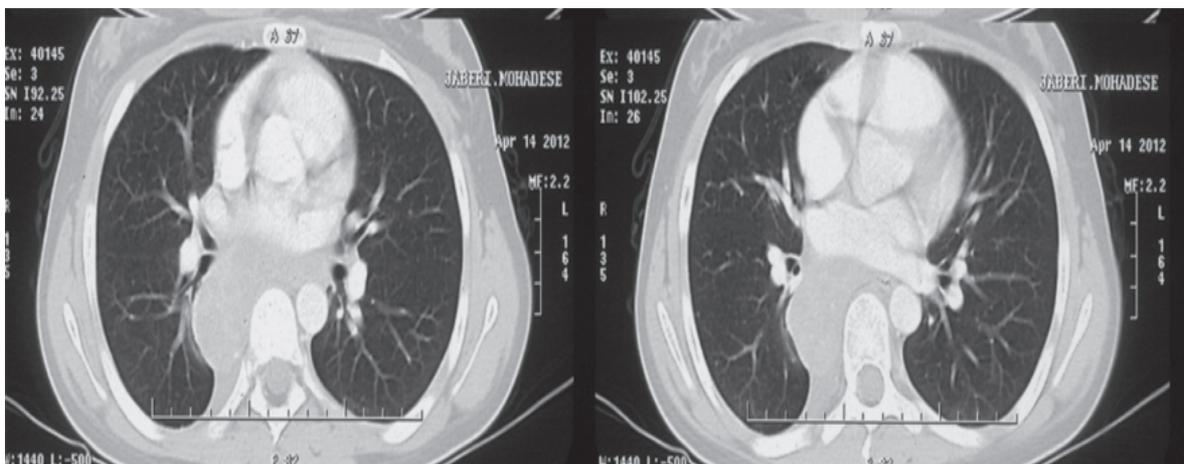


Fig. 2. Chest computed tomography scan demonstrating mediastinal mass lesion.

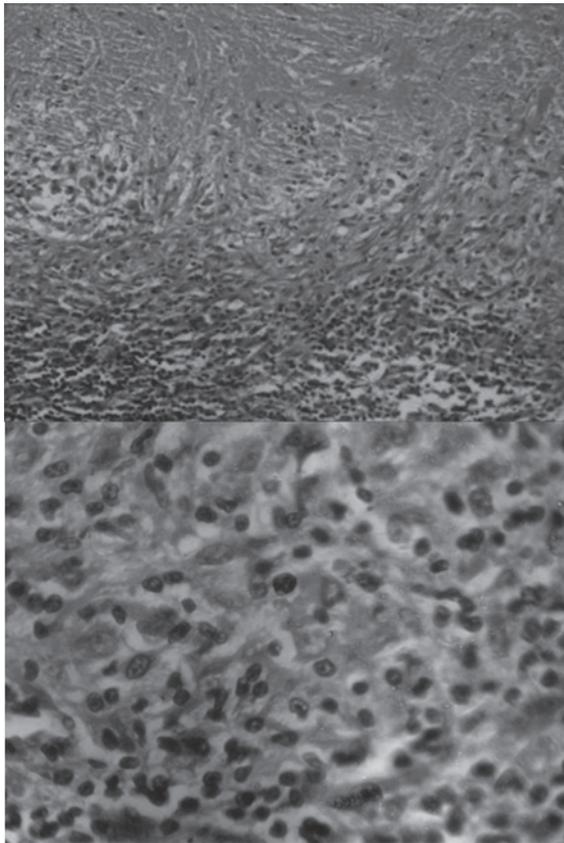


Fig. 3. (a) The pathologic examination showing necrotizing granuloma with central necrosis surrounded by epithelioid histiocytes and lymphocytes and (b) aggregation of epithelioid histiocytes.

the chest CT scan was normal (Fig. 4).

Discussion

Posterior mediastinal masses have neural origin in approximately 95% of cases, and may arise from either sympathetic ganglion cells or nerve sheaths, most commonly neuroblastoma in the first decade of life and ganglioneuroma and neurofibroma in the second decade of life. Mediastinal masses usually have non-specific symptoms and are sometimes found accidentally³, but they can present with acute airway compromise or dysphagia, wheezing or stridor³⁻⁶.

Mediastinal mass is a rare presentation of tuberculosis in children^{1,4}. Tuberculosis was not found as a mediastinal mass in some previous case series^{7,8}. However, there are at least five cases of tuberculosis mediastinal masses in the literature^{1,5,6,9,10}. The first one was reported in a two-year-old girl who presented with respiratory infection in 1989⁹. De Ugarde et al.⁶ described a three-month-old boy with stridor and pulmonary emphysema in 2003. The third and fourth cases were reported in 10- and seven-month-old infants, respectively^{1,10}. Finally, Boussetta et al.⁵ reported a three-month-old boy with a mediastinal tuberculosis mass who presented with wheezing and respiratory distress in 2010. Our case presented with fever, chronic cough and malaise. We detected a mediastinal mass through investigating the cause of fever. The mass mimicked tumors, especially

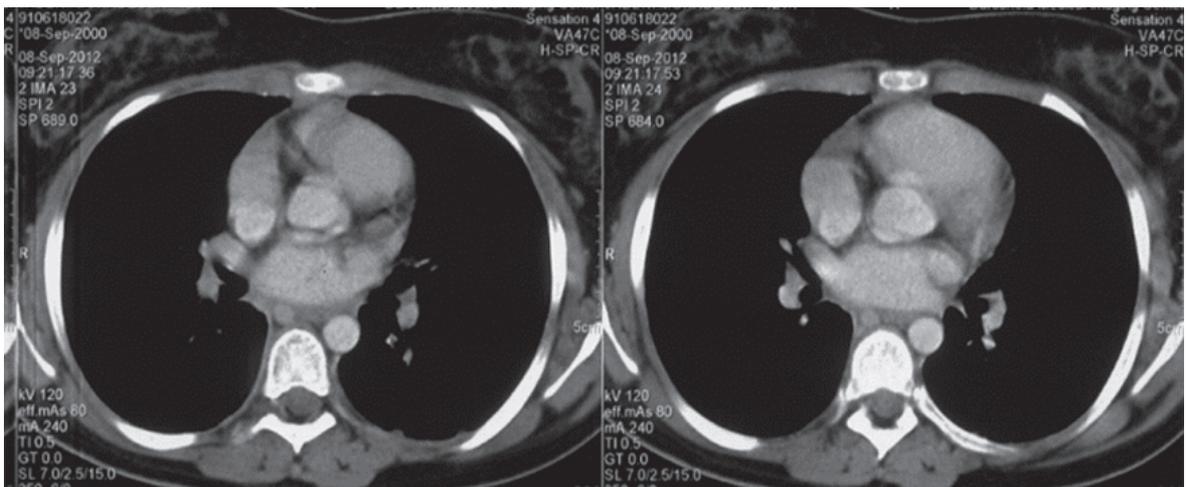


Fig. 4. Chest computed tomography scan after surgery.

lymphoma, in the CT scan. Anti-tuberculosis drugs may reduce the size of a mediastinal mass, but sometimes medication is not enough and surgery may be needed¹¹. It should be noted that while an unusual presentation of tuberculosis as well as *Bacillus Calmette-Guérin* (BCG) complications can be seen in patients with primary immunodeficiencies¹²⁻¹⁴, no underlying immune deficiency was detected in the presented patient.

In conclusion, tuberculosis should be considered in the list of differential diagnoses of mediastinal mass, and the rare complication of tuberculosis should not be missed in countries located in regions with a high incidence of tuberculosis.

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