Extensive unilobar primary pulmonary tuberculosis in an infant: A diagnostic dilemma

Rajiv Chadha, Rakesh Kumar Tripathi, Dharmendra Singh, S. Roy Choudhury

Department of Pediatric Surgery, Lady Hardinge Medical College and associated Kalawati Saran Children’s Hospital, New Delhi - 110001, India
Correspondence: Dr. Rajiv Chadha, E-mail: rajiv_chadha_01@yahoo.com

ABSTRACT

An 11-month old boy presented with frequent episodes of fever and cough over the past 6 months. Investigations revealed a large space-occupying lesion in the upper lobe of the left lung, the remaining lung fields being clear. There was no history of contact with tuberculosis and the tuberculin test was negative. A CT scan of the chest suggested the presence of a pulmonary sequestration in the upper lobe of the left lung. Surgical excision of the affected lobe was performed and histopathological examination of the excised lobe revealed extensive tuberculosis with caseous necrosis. The presentation of progressive primary tuberculosis in infants is discussed along with the diagnostic difficulties in cases with an atypical presentation.

KEY WORDS: Tuberculosis, primary cavitating pulmonary tuberculosis, pulmonary sequestration

INTRODUCTION

Progressive primary pulmonary tuberculosis in infancy and early childhood is now an uncommon disease in the developed world. In India however, pulmonary tuberculosis remains a major cause of childhood morbidity and mortality and although progressive and cavitary pulmonary tuberculosis is relatively uncommon in infants, several cases are still reported from busy pediatric centers. The diagnosis is usually made by a combination of the clinical findings, a positive tuberculin test and radiography. This report describes an 11 month old boy who presented with a large space-occupying tuberculous lesion localized to the upper lobe of the left lung without any other features suggestive of tuberculous infection. Diagnosis was made only after surgical excision of the affected lobe.

CASE REPORT

An 11-month old boy weighing 6.5 kg, a child of poor labourers, was brought with a history of moderate to high-grade fever and cough for the past 15 days. There was a history of several such episodes over the past 6 months for which the child had been treated by a local practitioner. There was no history of tuberculosis in the immediate family. The child had not received BCG vaccination. On examination, the child was malnourished, febrile and tachypneic. There was no significant lymphadenopathy or organomegaly. Examination of the chest revealed decreased air entry in the left hemithorax with diffuse crepitations and areas of bronchial breathing over the left upper zone. The complete blood count showed: hemoglobin 9.21 g/dl, TLC 17,000/ cu.mm with polymorphonuclear leucocytosis. A chest X-ray showed a large opacity in the left upper thorax with the remaining lung fields being clear (Figure 1). A contrast-enhanced computed tomographic (CT) scan of the chest was reported as showing a large intralobular pulmonary sequestration in

Figure 1: Plain X-ray of the chest showing a large opacity in the upper part of the left hemithorax
the upper lobe of the left lung with evidence of secondary infection (Figure 2). The pleura around the affected lobe showed enhancement. The rest of the parenchyma of the left lung as well as the right lung were normal. A Mantoux test (1 Test Unit of PPD RT 23 with Tween 80) was negative.

The child was administered broad-spectrum antibiotics, intravenous fluids and other supportive therapy. After stabilization of the child’s condition, thoracotomy was performed through the left 5th intercostal space, the presumptive diagnosis being an infected pulmonary sequestration in the left upper lobe of the lung. Surgery revealed dense adhesions between the pleura and the lung. The whole of the upper lobe of the left lung was replaced by a mass of cheesy, caseous material which at places was quite firm in consistency. The thickened pleura formed a pseudocapsule around the lobe. No areas of cavitation or gross liquefaction were seen. The lower lobe was normal. The upper lobe was resected with difficulty; at places, piecemeal resection had to be performed. After resection, the lower lobe quickly expanded to fill up the hemithorax. A pleural drain was inserted and closure of the chest cavity performed. Subsequent recovery was uneventful.

Histopathological examination of the resected tissue showed extensive tuberculosis with epitheloid granulomas, Langhan’s giant cells and caseous necrosis. Tubercle bacilli were identified on Ziehl-Nielsen staining. The child was administered standard 3-drug antituberculous drug therapy- isoniazid (5 mg/kg/day), rifampicin (10 mg/kg/day) and pyrazinamide (25 mg/kg/day) for 9 months. At follow up after 10 months, the child is doing well and is asymptomatic.

DISCUSSION

Progressive pulmonary tuberculosis in infants is believed to be a result of poor host defences and favorable conditions for growth of tubercle bacilli so that healing of the primary focus does not occur.\[^5\] In such situations, inflamed areas in the primary focus and regional lymph nodes may merge leading to consolidation. Later, the caseous areas in the lesion may liquefy due to the effects of proteolytic enzymes liberated from dead neutrophils and this material may be discharged into a bronchus leading to a cavity known as primary cavitating tuberculosis (PCT).\[^5,5\] Although PCT is now uncommonly reported in the West,\[^1,2\] the incidence is higher in African\[^6-8\] and Indian children.\[^9,10\] This is probably the result of early tuberculization, malnutrition and measles.\[^1\] In a report of 75 cases of PCT and a review of the literature, Maniar\[^1\] found that PCT is characterized by protean radiological manifestations, the lesions are more often multiple than solitary, the tuberculin test is often negative and malnutrition and measles infection are major predisposing factors. Mortality is high, especially in children less than a year old.\[^1\] Primary pulmonary tuberculosis in infancy has a predilection for the right lung.\[^6-9,11\] In his series, Maniar\[^1\] found associated pulmonary pathology with miliary nodules in 45.3% of cases. Widespread hematogenous infection was common with tuberculous meningitis in 28% cases and a high incidence of hepatosplenomegaly.\[^11\] The accepted diagnostic features of tuberculosis viz. hilar and mediastinal lymphadenopathy, and a positive tuberculin test were often absent while in about a third of cases, history of contact with a person with active tuberculous disease was present.\[^11\]

Our case was unusual in several respects. There was no history of contact with an actively infected person, the tuberculin test was negative and there was no evidence of disseminated tuberculosis in the form of generalized lymphadenopathy, tuberculous meningitis or hepatosplenomegaly. Another remarkable feature was the solitary involvement of the left upper lobe of the lung with no evidence of disease in the lower lobe or right lung. However, the patient had not received BCG vaccination. BCG vaccination is believed to lower the risk of progressive primary tuberculosis.\[^5,10\] The misdiagnosis of pulmonary sequestration on CT scan was also probably because the lesion represented extensive consolidation and caseation without gross liquefaction or the formation of a cavity which would have been detected on chest X-rays or the CT scan. As a presumptive diagnosis of pulmonary sequestration was made, additional diagnostic tests for tuberculosis like immunological tests, culture of gastric aspirate or needle biopsy were not per-
formed. Maniar also emphasized the difficulty in diagnosis of PCT if there is no history of contact and there is absence of extrapulmonary tuberculous lesions. In such cases, it becomes difficult to differentiate these lesions from other causes of cystic and solid lung lesions in children. Fortunately, in our patient, surgical excision of the affected lobe of the lung enabled a firm histological diagnosis to be made and ensured prompt relief of symptoms in combination with a three drug antituberculous drug therapy. However, it is worth considering that Vijayasekaran et al found that inclusion of streptomycin along with 2 or 3 bactericidal drugs in the intensive phase of treatment of PCT produced a better response.

In conclusion, a relatively solid, solitary, space occupying lesion due to progressive primary tuberculosis in an infant may represent a diagnostic dilemma especially if other characteristic features and findings suggestive of tuberculosis are absent. However, considering the high incidence of tuberculosis in the Indian pediatric population, a high element of suspicion is essential to avoid diagnostic errors and optimize the management.

REFERENCES