Infantile endobronchial tuberculosis

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Abstract

Endobronchial tuberculosis (TB) is a specific form or complication of pulmonary tuberculosis. We report four infants with endobronchial TB presenting with secondary complications such as obstructive emphysema and atelectasis and their response to appropriate anti-tuberculous therapy (ATT) with steroid treatment. Early diagnosis and prompt treatment before the development of fibrosis is important to prevent complications such as bronchiectasis.

Keywords: Anti-tuberculous therapy, bronchoscopy, bronchostenosis, endobronchial tuberculosis, infants

Introduction

Endobronchial tuberculosis (TB) is defined as TB of the tracheobronchial tree with microbial and histopathological evidence. More than half the cases present in <35 years of age and has a slight female preponderance. Endobronchial TB has been reported in 18% of adults with pulmonary TB. In children, 30–60% of uncomplicated primary TB have endobronchial involvement when checked with flexible bronchoscope. More than 90% of endobronchial TB cases present with varying degrees of bronchostenosis as a complication. Both being wheezing diseases it is often misdiagnosed with asthma and it also shows a pattern of misdiagnosis with cancer. In children, it can present as unresolved pneumonia or may be mistaken as foreign body aspiration. We present three infants with endobronchial TB, two had emphysematous changes and one had atelectasis.

Case Reports

Case 1

A one-year-old boy presented with evening rise of fever for 20 days and cough for 15 days. There was no loss of weight or contact with TB. He was investigated for the same, and the chest X-ray was suggestive of hyperinflation of right lung and shift of mediastinum to left side. A computed tomography (CT) chest with virtual bronchoscopy showed intraluminal right main bronchus necrotic lymph node with patchy consolidation in right middle and lower lobe. Bronchoalveolar lavage did not grow tuberculous bacillus on culture. Child was started on four drugs ATT consisting of isoniazid (H), rifampicin (R), ethambutol (E), and pyrazinamide (Z) for 2 months and HR for next 7 months. He gained 3 kg weight in the 9-month ATT regime, and X-ray chest on follow-up was absolutely normal.

Case 2

A 6-month-old boy presented in July 2009 with breathlessness for 8 days and cough, fever for 3 days. There was no foreign body aspiration or contact with TB. On examination, weight was 6 kg, height was 62 cm, and there was decreased air entry on the right side with shift of mediastinum to left side. Other systems were normal. Chest X-ray showed obstructive emphysema on right side with shift of mediastinum to opposite side. A CT chest with virtual bronchoscopy showed an endobronchial lesion in the distal right main bronchus causing obstructive emphysema with enlarged necrotic mediastinal lymph nodes suggestive of TB. All family members were screened for TB and maternal uncle was detected to have cavity in right mid zone. The child was started on four drugs ATT consisting of HRZE along with prednisolone (2 mg/kg/day) which were tapered gradually. In
September 2009, his weight was the same and chest X-ray was also the same. CT chest showed persistence of endobronchial lesion and increase in size of mediastinal nodes. He underwent a bronchoscopy and TB culture was negative. In February 2010, his weight increased to 9 kg and in July 2010, his chest X-ray was normal. ATT was stopped in July 2010. He received ATT for 12 months in view of delayed response to ATT.

Case 3
A 2-month-old boy presented with fever for 20 days along with breathlessness. There is no contact with TB. On examination he had decreased air entry on left side with shift of mediastinum to opposite side. Chest X-ray showed right upper zone pneumonia with mediastinal adenopathy and obstructive emphysema on the left side. CT chest showed necrotic mediastinal adenopathy with extrinsic compression of left main bronchus with resultant obstructive emphysema of left lung. Mantoux test was positive. Child was started on four drugs ATT with steroids. At 4 months of age, he weighed 5.25 kg and at 6 months was 6 kg. On follow-up, he was asymptomatic and ATT was stopped after 6 months.

Case 4
A 9-month-old boy presented to our hospital in June 2011 with fever and cough since March 2011. His Mantoux test was positive (11 mm) and chest X-ray showed right upper lobe consolidation but there was no response to antibiotics even after 10 days. A CT chest showed large consolidation right lung with inspissated secretions in right upper lobe bronchus and multiple enlarged necrotic nodes in pretracheal, precarinal, subcarinal, and azygoesophageal region (7–10 mm) in size indenting right lower lobe bronchus. Right bronchial lavage did not grow mycobacteria after 6 weeks. He was started on ATT in April 2011, however, there was no improvement. In June, when he presented, weight was 5 kg (no weight gain in 3 months), length was 65 cm, and air entry decreased in right supramammary region. He was started on prednisolone (1 mg/kg/day) and four drugs ATT was continued. In July 2011, his weight increased to 6 kg and air entry improved on right side with minimal consolidation on chest X-ray. He was shifted to isoniazid and rifampicin and steroids were tapered and stopped. In October 2011, at 13 months of age, his weight had increased only to 6.6 kg. A repeat high-resolution CT chest showed focal atelectasis of right upper lobe and regression of disease process. In February 2012, weight had increased to 7.9 kg and chest was clear. ATT was stopped in March 2012.

Discussion
In children endobronchial TB usually presents with nonspecific symptoms, including fever, cough, wheezing, or diminished breath sounds and these lesions are not evident on chest radiographs. However, endobronchial TB presenting as suspected foreign-body aspiration is more described. Bronchoscopy findings usually have a polypoid spongy mass, white fibrinous exudate, or granulation tissue in the bronchus. The right upper and right main bronchi are involved most frequently. For the evaluation of endobronchial TB, chest CT scan is of more use than a chest X-ray. In children, cause of endobronchial TB is encroachment of enlarged nodes on the bronchi which due to inflammatory changes invade the wall of bronchi till the mucosal lining leading to ulceration and sometimes direct extrusion of caseous material. Healing by granulation tissue results in fibrosis and hence the bronchostenosis which in turn gives rise to obstructive emphysema. Atelectasis due to obstruction is another complication in 90% of patients resulting commonly in right middle or upper lobe. Two of our patients had obstructive emphysema and one presented with right middle lobe syndrome. In both the patients, in whom TB culture was done, there was no growth of the TB bacillus, suggestive of paucibacillary nature of the disease. They were started on ATT and steroids. Addition of steroids to appropriate ATT seems to relieve the features of bronchostenosis to some extent.

After appropriate treatment all the patients recovered. The diagnosis of endobronchial TB is easily mistaken because of nonspecific clinical manifestations and low incidence of acid-fast bacilli staining, particularly in children. A high index of awareness is required by the primary track physicians for the diagnosis of this disease in its early phase. Primary care physicians should watch out for symptoms of refractory cough, sputum, shortness of breath, wheezing, the signs of diminished breath sound, rhonchus and the radiological findings of multiple lobes lesion, or exudative shadow, and should establish a diagnosis by the combination of clinical, radiological, and bronchoscopic findings for early empirical treatments.

Conclusion
We conclude that in patients with endobronchial TB, steroids may have an early role to prevent complications of bronchostenosis.

Declaration form
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Conflicts of interest
There are no conflicts of interest.
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