Consolidation in a Child from Tuberculosis Endemic Area - Thinking Apart from Tuberculosis

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ABSTRACT

Tuberculosis is endemic in South East Asian regions and hence a disease commonly over diagnosed in these parts of the country. Patients presenting with chest x ray shadows and vague symptoms are often started on Anti Tuberculosis Treatment - smear negative. However caution should be administered in prescribing ATT to patients who do not improve symptomatically, even after intensive phase. Congenital abnormalities such as sequestrated lung at times can also be rare causes of abnormal skiagram chest, especially in paediatric patients. A careful systematic approach with non invasive imaging such as CECT chest will often help to clinch the diagnosis in most cases.

Keywords: Congenital anomalies, sequestration lung, tuberculosis

Introduction

Tuberculosis is a common problem in the South East Asian region, presenting with vague symptoms and affecting virtually all organs/organ systems. There are no tests that can diagnose the disease with a high degree of specificity. The usual method of diagnosis - (other than sputum acid fast bacilli [AFB]) Mantoux testing and chest X-ray have high false positivity rates. The lack of specific tests for tuberculosis, it's myriad of symptoms and high prevalence often leads to over diagnosis of tuberculosis. Here, we present a case of pulmonary sequestration, which was managed as smear negative pulmonary tuberculosis.

Case Report

A 10-year-old male child presented to our hospital with complaints of dry cough and streaking of blood for 3 months. For these symptoms, he had already received multiple courses of antibiotics, cough suppressants and was presently on anti-tuberculosis treatment according to weight band under the national program for tuberculosis as a tuberculin test with five tuberculin unit caused an induration of 12 mm.

However, his symptoms persisted and he was referred to our department.

On examination, the child was afebrile, having a body mass index of 17. His system examination was normal, except for occasional crackles in the left infra scapular region. Chest X-ray showed a dense consolidation in the paracardiac region [Figure 1], which had cleared significantly after initiation of anti-tubercular treatment [Figure 2]. However, a lateral view
showed persistence of the shadow and loss of contour of the left diaphragm [Figure 3]. Contrast enhanced computed tomography (CT) thorax revealed a dense area of consolidation in the left paravertebral region, with areas of break down and small cystic spaces [Figure 4]. Based on the clinico-radiological pattern, differential diagnosis of sequestration lung or congenital cystic adenoid malformation Type III was made. The child was referred to the Department of Cardiothoracic Surgery for further management.

Thoracotomy revealed a greyish white sequestrated segment of lung in the posterior aspect of the left side, adjacent to spine. Careful dissection between the chest wall and diaphragm revealed a feeding artery from the thoracic aorta. A pulmonary ligament containing the veins draining into the pulmonary vein was identified, doubly ligated and divided. The cause of hemoptysis was actively searched, but not found. A left lower lobectomy was performed, after searching for aberrant vessels, which were lacking in this case. Post-operative period was uneventful. Histopathology of the specimen revealed no evidence of tuberculosis and hence anti-tubercular treatment was withheld. For the past 2 years, the child is under regular follow-up and remains asymptomatic.

Discussion
Pulmonary sequestration refers to an aberrant, non-functioning mass of lung tissue, having its own systemic vascular supply and lacking communication with the trachea-bronchial tree.[1] First described by Huber in 1777,[2] it was termed sequestration by Pryce in 1946.[3] It is a rare congenital abnormality with incidence of 0.15-1.8%.[4]

Sequestration lung is thought to arise from a developmental anomaly – formation of an accessory lung bud on the ventral aspect of primitive foregut, which derives its own blood supply and develops separately. If occurring early in the course of embryogenesis, the accessory bud develops into intralobar sequestrated (ILS) lung, otherwise it becomes extralobar sequestration (ELS). An acquired theory for sequestration – secondary to obliteration of bronchi after a necrotizing infection or foreign body has also been proposed.[5] The differences between ELS and ILS are summarized in the Table 1.
Pulmonary sequestration has been described in all ages.\textsuperscript{[7,8]} The main presenting complaints are cough, fever, hemoptysis. The chest X-ray findings are usually mistaken for many other conditions, such as bronchogenic cyst, lung cancer, pneumonia, bronchiectasis, pulmonary tuberculosis, A-V fistula etc., on CT scan, they manifest as mass shadows, cystic – solid shadows, cystic shadows, intrapulmonary flake shadows.\textsuperscript{[10]} Recurrent infections, Aspergillus colonization and hemoptysis, are the main complications described. Congestive heart failure due to the high volume left – left shunts in ILS and right to left shunts in ELS has also been described.\textsuperscript{[11]}

### Investigations

Ultrasonography can detect pulmonary sequestrations early in the gestational period itself.\textsuperscript{[10]} The investigation of choice for a definitive diagnosis – digital subtraction angiography and aortogram – is now being replaced by CT angiography and magnetic resonance angiography.\textsuperscript{[11]} A systemic supply to lungs may also be seen in arteriovenous malformations, aplasia of pulmonary artery, long standing pulmonary infections or post-operative lung. These rare conditions should also be kept in mind before making a diagnosis of sequestration, solely based on angiography reports.\textsuperscript{[11]}

### Management

Management is usually surgical.\textsuperscript{[8]} ELS requires only removal of the abnormal tissue, whereas in ILS, a lobectomy must be done. Careful ligation of the feeding vessels must be done, because not often that the sequestrated lung is supplied by multiple systemic branches.

### Conclusion

Even in regions endemic for tuberculosis, differential diagnosis of congenital anomalies mimicking tuberculosis must be thought of before starting anti tubercular therapy in patients whose smear is negative for AFB.

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