Case 5854

Cavitating TB in a Child
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Patient: 12 years, female

Clinical History:

A 12-year-old girl was admitted to hospital following an episode of haemoptysis, associated with coughing. On direct questioning, she admitted symptoms suggestive of a lower respiratory tract infection (having a productive cough), but also complained of night-time sweats. A chest radiograph was performed to evaluate her problems further.

Imaging Findings:

A 12-year-old girl was admitted to hospital for investigation following an episode of haemoptysis, associated with coughing. Questioning revealed recent onset of other respiratory symptoms, with a productive cough and she also complained of night-time sweats. Further history taking elicited information about tuberculosis (TB) infection within family members: the patient’s father had been diagnosed with pulmonary TB and received appropriate treatment 5 years previously, and her grandmother had received treatment 2 years after this. The patient was therefore referred for a chest radiograph to confirm or refute the clinical suspicion of active pulmonary TB. The radiograph showed air space disease and cavitation in both lung apices, findings later confirmed by CT, which did not demonstrate any bronchial, pleural or chest wall spread of disease. The patient was consequently commenced on anti-tuberculous therapy. Direct microscopy of sputum was negative for Mycobacteria. However, the diagnosis was confirmed when sputum culture was subsequently positive, as were gastric washings and stool culture. The organism proved sensitive to standard anti-tuberculous medication. She was treated for 6 months with a quadruple therapy regime, (rifampicin, isoniazid, pyrizinamide and ethambutol). She made a good clinical recovery.

Discussion:

The majority of cases of TB in childhood tend to be primary and many do not result in clinically evident disease. The principle focus of infection is usually the intra-thoracic lymph nodes and sputum production may not be a specific feature: children produce less sputum than adults, frequently swallowing it, making confirmation of a bacteriological diagnosis difficult. The combination of a positive tuberculin skin test, an abnormal chest radiograph and a history of exposure to TB, are the most effective methods for diagnosing TB in children. A chest radiograph remains the most widely used imaging technique for the initial evaluation of pulmonary TB in children. In primary TB, mediastinal and/or hilar lymphadenopathy (either uni- or bilateral) is the most characteristic radiological feature. Primary TB may rarely progress to a caseating lesion known as progressive primary tuberculosis. If caseating lesions erode into pulmonary vessels then the infection can disseminate haematogenously within the lungs and to more distant sites, resulting in miliary TB. Miliary TB in children normally complicates primary disease and affects infants and young children, as they have poorly developed cell mediated immunity. In the United States, cavitating TB has been reported in 14% of all admissions for TB, among children less than 15 years of age. The most common symptoms on presentation are those of fever, cough and wheeze, although other non-specific symptoms (including weight loss) are recognised. The majority of cases of cavitating TB in children under the age of 10 occur during infancy, with a peak age of 7-12 months. These represent cases of primary cavitating TB, which is a rare complication of primary TB. Young children are particularly susceptible. Post-primary cavitating TB is more usual, developing in approximately 50% of patients with post-primary TB. It typically presents in an older age group, such as
adolescents. Pulmonary cavities develop when the involved parenchyma liquefies and is destroyed. Tuberculous cavities often have thickened, irregular walls and are seen within areas of consolidated lung. They are frequently multiple and demonstrating the presence of cavities confirms active disease. The cavities heal through a process of scarring; however, organisms lying dormant within scarred areas can reactivate, causing recurrent cavitatory disease. The apico-posterior segments of the upper lobes are the most frequently involved areas of the lung, with a predilection for the right side. Occasionally the superior segments of the lower lobes are involved. CT is helpful in the investigation of patients with unusual or more complicated presentations of TB. CT has the advantage of defining the extent of the disease, including involvement of the chest wall, pleura and pericardium, and any endobronchial spread. CT findings of active post-primary TB include: centrilobular pulmonary nodules, which can mimic a ‘tree in bud’ appearance, lobular or lobar consolidation and collapse, cavitation, bronchial wall thickening and/or dilatation (bronchiectasis), and bronchial stenosis. MPR and 3D-VR images are particularly useful to examine the major airways. Disseminated post-primary TB is rare in immunocompetent individuals.

**Differential Diagnosis List:** Cavitating Post Primary Tuberculosis

**Final Diagnosis:** Cavitating Post Primary Tuberculosis

**References:**


Description: Chest radiograph showing air space disease in both apices, associated with some volume loss. There are large, thick-walled cavities in both apices too. Origin:
Figure 2

Description: CT image at a level just above the aortic arch. Large cavities are seen in the apico-posterior segments of both upper lobes. The cavities have irregular walls, being thicker more posteriorly, and contain both soft tissue and air. The left-sided cavity abuts an area of thickened pleura.

Origin: