Case Presentation
Primary Tuberculosis Following Exposure

Case History:
A twenty year old woman was evaluated as a contact of a patient who had extensive smear positive pulmonary tuberculosis (drug susceptible isolate). She denied any symptoms of cough, weight loss, fatigue, night sweats or fever. She weighed 86 pounds. A TST was positive with a 20 mm induration. A chest x-ray (CXR) showed opacification of the lower half of the left hemithorax reflective of a moderate size left pleural effusion and/or atelectasis. She had normal laboratory values. She was not able to provide a sputum specimen.

Four months prior to the contact investigation, she delivered a healthy infant. An evaluation during the 20th week of gestation noted her weight at 100 pounds; the patient reported her normal, non-pregnant weight at 98 pounds. Her child had not yet been evaluated as a contact but was reported as “healthy”.

This patient emigrated from the Marshall Islands to the United States in 2001. She denied any exposure to tuberculosis prior to this contact investigation. She had a TST placed during her prenatal care with a reading of 0 mm induration.

Further evaluation included induced sputums which were AFB smear negative but grew *M. tuberculosis* susceptible to all first line drugs. A CT scan revealed hilar adenopathy, volume loss, pleural thickening and a moderate pleural effusion on the left, and patchy infiltrates in the right middle and right upper lobe. A repeat CXR done on the same date as the CT scan was interpreted as a normal chest.

The infant had a normal physical exam and CXR. The TST was 0 mm.

Teaching Points:
• Primary tuberculosis can happen in any part of the lung. It is often in the lower lobes and associated with a pleural effusion and/or hilar adenopathy. In children hilar adenopathy alone is the most frequent abnormality found. The most common radiographic appearance of primary tuberculosis however, is a normal CXR. In immunosuppressed patients, a miliary pattern may be noted, especially by CT scan. Cavitation is rarely seen.

• In patients with a pleural effusion, an associated infiltrate is commonly noted by CT scan although in plain films this is obscured by the fluid. If a thoracentesis is performed and a repeat CXR taken, then the infiltrate may be visible once the fluid is removed. Pleural effusions are almost always unilateral unless the patient has a serious immune deficiency. Bilateral effusions when due to tuberculosis usually represent miliary disease.

• The natural history of pleural effusions is to gradually resolve and disappear. They need to be differentiated from those due to congestive heart failure, carcinoma, and other types of infections. Pleural fluid analysis may help to identify tuberculosis. Typically, the protein is significantly elevated (>4 grams/dL) which identifies the fluid as an exudate and differentiates it from congestive heart failure. Carcinomas may also have elevated protein, but usually have abnormal cytology. A low pleural fluid glucose (<30 mg/dL) is common in tuberculosis but rare in malignancy. An elevated adenosine deaminase (ADA) is frequently found in tuberculous effusions but is rare in carcinoma. The cell count shows increased white blood cells and is usually lymphocytic. Very early in the illness, a neutrophilic predominance can be seen. Smears of the pleural fluid are usually AFB negative but cultures can be positive in half the cases. A pleural biopsy adds considerably to the diagnosis.
• Sputum smears are usually negative in these types of patients but cultures are positive up to 40% of the time. It is important to always order three sputum specimens for smears and cultures and to induce if needed.

• CT scan of the chest can help to define the extent of the disease. A plain film of the chest can be misleading and in the case of this patient the repeat film was reported as normal despite the significant abnormalities noted on the scan. Be cautious of a CXR report that shows rapid resolution of previous abnormal findings. Ask to view the film if at all possible.

• Patients identified with active tuberculosis during contact investigations are asymptomatic up to 50% of the time. This is one of the great benefits of a contact investigation—early identification of TB disease. Early detection of TB disease when smears are negative and the patient is not coughing is an important goal of TB programs. The lack of symptoms should not be used to rule out TB disease. HIV positive patients may have negative smears, a negative TST, a normal CXR and be asymptomatic but still grow M. tuberculosis. That is why sputum collection and culture should be done for any HIV infected individual who is a contact of a TB case.

• The infant was exposed to not only his mother but also the initial active case. He was started on window period prophylaxis pending a repeat TST to be done when he reached six months of age and had a 10 – 12 week break in contact with his mother. The mother was treated with the standard four drug regimen for tuberculosis. In the early postpartum period (usually identified as 3 months) there is an increased risk of hepatotoxicity. Liver enzymes remained normal during treatment.

• The clinical presentation of exposure to a smear positive case, TST skin test conversion, CXR showing a pleural effusion, and weight about 10 pounds less than normal is a classic presentation of active TB in a contact.

References


