

Coexistence of a Ghon Complex, Pott's Disease, and Hip Arthritis in a Child

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Received 2015 May 27; Revised 2015 June 25; Accepted 2015 July 12.

Abstract

Introduction: Tuberculosis remains a major public health problem in developing countries. Diagnosing extrapulmonary tuberculosis can be difficult, as it requires a higher index of suspicion than primary tuberculosis. Extrapulmonary tuberculosis may mimic malignancies and many other diseases, so it should be included in the differential diagnosis. Here, we present a case of extrapulmonary tuberculosis associated with Pott's disease and hip arthritis in a patient who recovered after 12 months of antituberculosis therapy.

Case Presentation: A 16-year-old girl presented to the outpatient otolaryngology clinic with painless swelling of the neck, and to the physical medicine and rehabilitation clinic with complaints of hip and low back pain that mimicked spondyloarthropathy. She was eventually referred to the outpatient pediatric clinic. Her acute-phase reactants were high, and hilar lymphadenopathy was evident on chest x-ray. On computerized tomography, a Pott's abscess involving the T8, T9, and T10 vertebrae was suspected. Magnetic resonance imaging of the dorsal vertebrae and hip was performed, and a Pott's abscess and hip tuberculous arthritis were confirmed. The patient had been exposed to tuberculosis 10 years earlier, and her purified protein derivative (PPD) test was 16 mm. After antituberculosis treatment, our patient recovered and the Pott's disease and hip tuberculous arthritis regressed.

Conclusions: Extrapulmonary tuberculosis may mimic many other diseases, so it should be kept in mind in the differential diagnosis. It is essential to diagnose osteoarticular tuberculosis early, as late diagnosis or inadequate treatment may cause permanent disability.

Keywords: Child, Pott's Disease, Osteoarticular Tuberculosis

1. Introduction

Tuberculosis (TB) is an infectious bacterial disease caused by *Mycobacterium tuberculosis*, which most commonly affects the lungs. Extrapulmonary manifestations include lymphadenopathy and central nervous system, pleural, miliary/disseminated, skeletal, and joint tuberculosis. Bone tuberculosis constitutes 1% - 2% of all cases (1). Tuberculosis is both local and destructive; the most common types of local disease are spondylitis, arthritis, and osteomyelitis. Tuberculous arthritis usually presents as monoarthritis and affects the large joints, usually the hip and knee, in 30% of patients with osteoarticular tuberculosis (2). Spinal tuberculosis constitutes 50% of all bone tuberculosis cases (3). Children represent the highest-risk group for being affected by this disease. Immunosuppressed patients may have multifocal lesions in addition to local lesions caused by a compromised response.

In children, the main source of infection in bone tuberculosis is hematogenous spread from a primary site of infection (1). Skeletal tuberculosis may occur from one

month (tuberculous dactylitis) to years after the primary infection (at which time hip spondylitis develops). Onset of symptoms is approximately 1 - 3 years after infection. If exposure to tuberculosis in the patient's history is unclear and the initiation of clinical symptoms is more than three years after exposure, the diagnosis is delayed (4).

Detecting *M. tuberculosis* in the early phase is crucial for clinical management. Diagnosis becomes difficult in bone tuberculosis, and obtaining material for the diagnosis generally requires invasive procedures and hospital care. Here, we present a case of a 16-year-old female who was initially referred to other clinics because of hip and low back pain, with painless swelling of the neck. After the patient came to our attention, bone tuberculosis was diagnosed.

2. Case Presentation

A 16-year-old girl first presented to the otolaryngology outpatient clinic at Bagcilar Training and Research Hos-

pital, Istanbul, Turkey, with painless swelling of the neck. She also presented to the physical medicine and rehabilitation clinic with complaints of hip and low back pain that mimicked spondyloarthropathy. She had been treated with nonspecific antibiotics for cervical lymph nodes, but the size of the lymph nodes did not change with this treatment. She was followed for hip and low back pain by the physical medicine and rehabilitation clinic for a while, until she was finally referred to our outpatient pediatric clinic for evaluation of systemic disease. She denied cough, night sweats, or weight loss over the prior two months. She was admitted to the pediatric clinic on May 20, 2014. Her family history revealed that her father had been treated for tuberculosis ten years earlier. The patient did not have any underlying disease. She had a crowded family and their socioeconomic level was low.

On physical examination, the patient was pale, with a temperature of 37.8°C, blood pressure of 120/80 mmHg, and a weight of 45 kg (3 – 10 percentile). Heart and lung auscultation were normal, and the patient had no hepatosplenomegaly. She had a 2 × 2 cm solid, painless lymph node in the right cervical region. Tenderness and limited range of motion were evident on hip joint examination, and a gait disorder was apparent. The laboratory findings were as follows: hemoglobin 10 g/dL; white blood cell count 5,800/mm³; platelets 704,000/mm³; C-reactive protein 104 mg/L; erythrocyte sedimentation rate (ESR) 74 mm/h; uric acid 5.2 mg/dL; and lactate dehydrogenase 192 U/L. Other laboratory data were normal. The Brucella agglutination test was negative and the peripheral smear revealed no pathology.

Cervical ultrasonography showed hypoechoic lymphadenopathy. Hilar lymphadenopathy was seen on chest x-ray (Figure 1). We performed thoracic computed tomography (CT), which revealed a Ghon complex in the right lung and was suspicious for a Pott's abscess. Thoracic magnetic resonance imaging (MRI) confirmed a Pott's abscess involving the T8, T9, and T10 vertebrae (Figure 2), and pelvic MRI showed medullary trabecular edema in the right femoral head and neck combined with lobular cystic lesions in the peripheral muscle groups. With these MRI findings, we diagnosed the patient with tuberculous arthritis. Her purified protein derivative (PPD) skin test was 16 mm in diameter. The patient's features are summarized in Table 1. Sputum samples that received three consecutive days of staining for acid-fast bacilli were negative. The contact history and clinical and radiological findings aided in the diagnosis of bone and vertebral tuberculosis. A four-drug antituberculosis regimen was initiated (isoniazid, rifampin, pyrazinamide, and ethambutol). Our patient began to gain weight, and her pain lessened on the seventh day. On the fifteenth day, ESR was 33

mm/h and CRP was 2.3 mg/dL. The patient continued to be followed by the pediatric and orthopedic clinics, and she completed 12 months of tuberculosis treatment. There was no compression or neurologic deficits as complications of the spinal tuberculosis. The 10-month follow-up MRI of the hip showed decreased fluid in the joint space and regression of the abscess formation. At 12 months, her ESR was 2 mm/h and CRP was 0.48 mg/dL. The patient completely recovered after antituberculosis treatment.

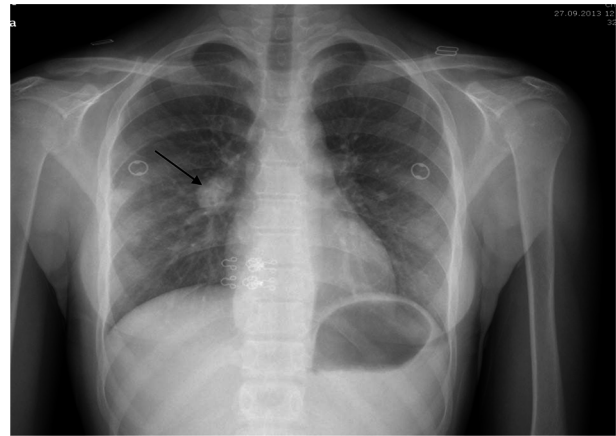


Figure 1. Hilar Lymphadenopathy on Chest x-ray

3. Discussion

In developing countries, 15% of the total burden of TB cases is in children under 15 years of age. There were a total of 16,551 TB cases in Turkey in 2010, 5.5% of them in patients aged 0 – 14 years. There are 1.3 billion childhood TB cases worldwide, and 400,000 children die from the disease every year (5, 6). Low socioeconomic levels, poor nutrition, and overcrowded living conditions are underlying factors for the transmission and spread of this disease.

A Turkish study reported that the bones and joints are the second most frequently involved body parts, following the lungs (7). Mycobacteria can cause osteoarticular infections by three mechanisms: direct inoculation during trauma or surgical procedures, the hematogenous route, and by spreading from a contiguous focus. Skeletal TB is seen in 1% – 3% of all TB patients, and spinal spondylitis is the most common presentation of osteoarticular TB. Osteomyelitis most commonly affects the thoracic or thoracolumbar segments, followed by the lumbar and, rarely, the cervical segments (8, 9). In the present case, thoracolumbar tuberculosis was a component of miliary tuberculosis.

Table 1. Features of the Case

Variable	Value
Age, y	16
Gender	Female
Symptoms at presentation	Neck swelling, hip and low back pain
On physical examination	Pale, weak
Contact history	Father had treatment for tuberculosis 10 years earlier
Chest x-ray	Hilar lymphadenopathy
Thoracic MRI	Pott's abscess at T8-T10
Thoracic CT	Ghon complex in right lung
Hip MRI	Medullary trabecular edema in the right femoral head and neck
PPD, mm	16
Hemoglobin, g/dL	10
White blood cell count, mm ³	5,800
Platelet count, mm ³	704,000
CRP, mg/L	104
Sedimentation rate, mm/h	74

It is thought that spinal tuberculosis is caused by the hematogenous spread of mycobacteria. Initially, destruction of the anterior inferior corpora of the vertebrae is evident; later, the disease spreads to the intervertebral disk spaces and paraspinal tissues, and the spread of subligamentous infection triggers the Pott's disease. Pott's disease in childhood may cause vertebral deformities, spinal cord compression, and progressive neurological deficits. Spinal tuberculosis causes more complications in children than adults (10). In children, neurological symptoms are less frequent than in the adult population, and abscess formation is more common. The clinical symptoms of spinal tuberculosis in children are often insidious and include back pain, fever, paraparesis, sensory disturbances, and bowel and bladder dysfunction (11). In the literature, kyphosis and thoracic spine deformities related to the collapse of the T11 and T12 vertebral bodies were reported due to late diagnosis (12). In the present case, the MRI findings showed the degeneration of the corpus inferior of the T8, T9, and T10 vertebrae; corpus damage of T9 and T10; and a 30 × 12 × 72 mm abscess in the prevertebral space. The patient had severe back pain and a gait disorder, but she did not have neurological symptoms or any deformities. Since the diagnosis of extrapulmonary tuberculosis is difficult, diagnosis can be delayed. In the literature, there is a case of a 3-year-old girl with muscle weakness and motor dysfunction of the lower extremities who was followed for a long time with a diagnosis of muscular dystrophy, but

it was later understood that her diagnosis was spinal tuberculosis. She was followed with muscular dystrophy for some time, then spinal spondylitis was diagnosed. After 18 months of treatment for TB, her neurologic symptoms regressed (13). Spinal tuberculosis has various manifestations, so patients present initially to different types of outpatient clinics. This situation leads to late diagnosis and deformities (14). Our patient initially presented to the physical medicine and rehabilitation clinic for her pain.

Tuberculous arthritis usually presents as a monoarthritis and affects the large joints (principally the hip and knee); such disease is evident in the joints of 30% of patients with osteoarticular tuberculosis (2). Untreated hip tuberculosis may cause progressive hip destruction with pathological dislocation of the joint, as well as pain, limited range of motion, and functional loss (10). In such cases, infections of both the vertebrae and the hip joints trigger postural and gait disorders. Our patient complained of morning stiffness and pain mimicking spondyloarthropathy, and a Ghon complex was evident on thoracic CT. It is relevant that chest radiography reveals pulmonary disease in 50% of all osteoarticular tuberculosis patients.

Superficial (especially cervical) lymphadenitis is evident in 39% - 50% of extrapulmonary tuberculosis patients, and lung pathologies are present in 30% - 40%. The detection of persistent lymphadenopathy measuring over 2 × 2 cm in diameter in the anterior and posterior cervical



Figure 2. MRI Showing Pott's Abscess Involving the T8, T9, and T10 Vertebrae

regions affords 88% sensitivity and 98% specificity in the diagnosis of tuberculosis. In addition, mycobacterial cultures of lymph node material obtained via fine-needle aspiration biopsy are often positive (4). Our patient had cervical lymphadenopathy thought to be related to tuberculosis, but the biopsy material that we obtained was inadequate. We did not repeat the biopsy, which is a weakness in this case report. As an early TB indicator, a positive tuberculin test is strongly indicative of the presence of tuberculosis (12). In our case, the tuberculin test was positive, and this supported the diagnosis. MRI is considered the preferred imaging test, since it detects early changes that are not seen on conventional radiography or CT, and it shows better detail in soft tissues, neural structures, and the paravertebral area (15). The MRI findings indicated TB in our case. In such patients, a four-drug regimen (isoniazid, rifampin, pyrazinamide, and ethambutol) is recommended

for an initial period of two months, followed by continued treatment with only isoniazid and rifampin (16). After this treatment, our patient's clinical symptoms began to improve.

Bone and joint tuberculosis constitutes 10% – 20% of extrapulmonary tuberculosis cases and 2% of tuberculosis overall (4). The symptoms of extrapulmonary tuberculosis can be nonspecific, rendering the diagnosis more difficult than with primary tuberculosis. Prior tuberculosis-exposure history, clinical and radiological findings, microbiological data, and tuberculin skin-test results are informative (1). This case is presented to highlight extrapulmonary tuberculosis, as identification of skeletal tuberculosis is problematic. In endemic areas, all clinicians should be aware of the extrapulmonary manifestations of tuberculosis, as this can mimic other diseases. Morbidity and mortality can be reduced with early diagnosis and the initiation of appropriate treatment.

Acknowledgments

We thank the radiology department at Bagcilar Training and Research Hospital for the technical support.

Footnote

Authors' Contribution: Study concept and design, Statistical analysis: Meltem Erol; acquisition of data: Meltem Erol, Selami Ulas; analysis and interpretation of data: Meltem Erol, Ozlem Bostan Gayret; drafting of the manuscript: Meltem Erol, Isil Ustun; critical revision of the manuscript for important intellectual content: Ozgul Yigit; statistical analysis, administrative, technical, and material support: Ozlem Bostan Gayret, Selami Ulas; study supervision: Ozgul Yigit, Isil Ustun.

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