CASE REPORT

A 5-year-old boy with miliary and osteoarticular tuberculosis

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SUMMARY

Osteoarticular involvement is one manifestation of extrapulmonary tuberculosis (TB). We present a 5-year-old Burmese boy with 10 months of right hip pain and decreased range of motion. The patient also had low-grade fever, cough and decreased appetite. The patient was undocumented and had recently moved from Myanmar. He was thin, in moderate distress with bilateral lung rhonchi, mild subcostal retractions, low back pain, right hip tenderness and painful and limited right range of motion. The patient's chest and pelvis radiographs showed a miliary pattern and right acetabulum osteolytic lesions, respectively. He was started on anti-TB medication and cefotaxime. Ofloxacin was added because of the concern of drug-resistant TB. The patient underwent a right hip debridement. His symptoms improved markedly, with improved mobility. TB is a challenging infection to diagnose, which can cause significant delays in management.

paediatric orthopaedic surgeon. The patient was treated with acetaminophen and ibuprofen.

Twenty days later, the patient developed cough, tachypnoea and persistent fever.

Ten days later, the patient presented to the outpatient paediatric infectious disease clinic at Chiang Mai University Hospital (CMUH) with his father. He was febrile (38.4°C), tachycardic (136 bpm), tachypnoeic (30 breaths/min), with normal blood pressure (116/75 mm Hg), normal room air saturation (98%) and a weight of 12 kg (<5% tile). On examination, the patient was in moderate distress, with bilateral lung rhonchi, mild subcostal retractions, severe low back lordosis, right hip tenderness and limited and painful active and passive range of motion (ROM) of the right hip (figure 1). He was unable to stand without assistance and had a very difficult time walking. No lymphadenopathy, clubbing, hepatosplenomegaly or rash was noted. The rest of the patient's examination was unremarkable. No BCG scar was noted. The patient had no

BACKGROUND

Extrapulmonary tuberculosis (TB) is relatively common ranging from 13% to 54% of all childhood TB cases.^{1–5} Involvement of the bones or joints makes a smaller proportion of these cases. Studies vary widely on the prevalence in children with osteoarticular TB, ranging from 1% to 22% in studies in China, Iran, Taiwan and Thailand.^{1–3 5 6}

The majority of data on TB bone and joint involvement are in adult populations. Common presentations include spondylitis, arthritis (including Poncet's disease, a sterile reactive arthritis) and osteomyelitis. In the 21 paediatric cases of TB osteomyelitis described by Lin *et al*, the most common sites were the tibia (33%) and spine (33%). Tinsa *et al*⁴ studied paediatric extrapulmonary TB and found bone and joint involvement in the hip, knee, elbow, shoulder and thoracic spine. Symptomatic and clinical improvement is routinely seen, although long-term sequelae of pain, disability and deformity occur.

CASE PRESENTATION

A 5-year-old Burmese boy with a history of 10 months of right hip pain and decreased range of motion presented to an outpatient clinic at a provincial hospital in Thailand. The patient was reported to have had an intermittent low-grade fever and decreased appetite over the month prior to presentation. The patient denied cough or dyspnoea. He was diagnosed with an osteolytic lesion on the basis of radiographs and referred to a

Figure 1 A picture of the boy on the day of admission demonstrating severe lordosis and difficulty in standing.

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medical or surgical history. He had no allergies to medications. The patient's vaccination status was unknown. He had no history of TB exposure. The patient was from Myanmar (Burma) and previously lived with his grandfather. He had moved to Thailand without documentation to live with his father approximately 2 months prior to presentation. On further questioning, the patient revealed having received unknown evaluation and treatment in Myanmar. Per reports, the boy did not improve despite treatment. He was subsequently admitted to the hospital.

INVESTIGATIONS

Complete blood was notable for haemoglobin (11.1 g/dL), haematocrit (34.2%), a white cell count 6500 cells/mm³ (neutrophils (67%), lymphocytes (26%), monocytes (6%)) and a platelet count 312 000/μL. The patient had a chemistry panel, liver function tests, erythrocyte sedimentation rate and a urinalysis which were all within normal limits. The patient's HIV test was negative and he had sputum that was negative for acid-fast bacilli (AFB) for 3 days. His chest X-ray (CXR) showed diffuse small nodular patterns throughout the bilateral lungs, predominate in the lower lung fields (miliary pattern), consistent with TB (figure 2). Radiographs of the pelvis showed multiple ill-defined osteolytic lesions involving the right acetabulum and femoral epiphysis with focal osteoporosis and joint space narrowing.

DIFFERENTIAL DIAGNOSIS

The most likely diagnosis was miliary and osteoarticular TB. Other diagnoses considered included community-acquired pneumonia (CAP), reactive osteoarthritis and primary and/or metastatic neoplastic disease.

TREATMENT

The patient was started on isoniazid, rifampin, pyrazinamide, amikacin and cefotaxime, and prednisolone was also started (2 mg/kg/day). The paediatric orthopaedist was consulted and he deferred biopsy. Cefotaxime was stopped after 1 week because of negative blood cultures.

Two weeks after admission, amikacin was stopped and ethambutol was started. The patient's tachypnoea, cough and fever resolved. He was discharged 3 weeks after admission. The patient was continued on IRZE (isoniazid, rifampin, pyrazinamide and ethambutol).

Figure 2 Chest and pelvis radiographs at the time of admission. The chest X-ray showing diffuse small nodular patterns throughout the bilateral lungs, predominate in the lower lung fields (miliary pattern). The pelvis radiograph showing multiple ill-defined osteolytic lesions involving the right acetabulum and femoral epiphysis with focal osteoporosis and joint space narrowing.

Figure 3 Chest and pelvis radiographs 6 weeks after discharge. The chest X-ray showing that the miliary infiltrate has resolved. The pelvis radiograph showing persistent right hip osteolytic lesion.

OUTCOME AND FOLLOW-UP

Six weeks after being discharged from the hospital, the patient was seen by the paediatric orthopaedist and underwent a bone biopsy with debridement of his right hip. The biopsy showed chronic granulomatous inflammation which was AFB positive (1+), but AFB stain was negative. After 8 weeks, the TB culture showed no growth.

Prednisolone was subsequently tapered off (duration of treatment: 8 weeks).

Ten weeks after discharge, repeat radiographs showed an improvement in the pulmonary miliary pattern and no change in the osteolytic lesion of the right hip (figure 3). Ofloxacin was subsequently started due to concerns of drug-resistant TB. The patient was continued on IRZE. The orthopaedist performed a washout of the right hip and planned a right hip fusion.

Four months after discharge, the patient's right hip tenderness had resolved, but he had persistent limited and painful active and passive ROM. The patient's weight had increased by 3.6 kg. Repeat radiographs showed persistent hilar lymphadenopathy, but the miliary pattern had resolved (figure 4). There was no change in the osteolytic lesion of the right hip.

Five months after discharge, the patient's medication regimen was reduced to rifampin, isoniazid and ofloxacin.

Six months after discharge, his right hip pain and tenderness resolved, but he had limited ROM. Ofloxacin was stopped. Repeat radiographs showed persistent hilar lymphadenopathy and decreased number of diffuse small nodular patterns throughout the bilateral lungs indicating regression of the disease (figure 5). The osteolytic lesion of the right hip had resolved.

Seven months after discharge, the patient had persistent limited ROM, but was otherwise asymptomatic. Right hip fusion was recommended by the paediatric orthopaedic surgeon, but family agreement to surgery was still pending.

Figure 4 Chest and pelvis radiographs 4 months after discharge. The chest X-ray showing continued resolution of miliary infiltrate. The pelvis radiograph showing persistent right hip osteolytic lesion.

Figure 5 Chest and pelvis radiographs 6 months after discharge. The chest X-ray showing continued resolution of miliary infiltrate. The pelvis radiograph showing resolution of the right hip osteolytic lesion.

The patient's father has been asymptomatic throughout his son's evaluation and management. He also had a normal CXR. Per Thai national TB guidelines, the father did not receive prophylaxis.⁷

DISCUSSION

We report a case of a 5-year-old boy who presented initially with protracted right hip pain and intermittent low-grade fever. He was subsequently diagnosed with miliary and osteoarticular TB. The patient was initially covered with broad-spectrum antibiotics and steroids to cover miliary TB and CAP. He subsequently had clinical and radiographic improvement. He has been continued on antitubercular therapy and his right hip fusion is planned.

We initially had a broad list of differential diagnoses as joint pain includes degenerative, trauma, reactive, infectious, blood dyscrasia, neoplastic and metastatic disease processes. The patient's history of fever, weight loss, poor appetite and cough pointed towards TB. Although the patient's BCG status and his TB contact history were unknown, he came from an area with a high prevalence of TB. The patient's CXR showed a typical miliary pattern and the positive hip aspirate confirmed our suspicions of TB. This case highlights the difficulty of this diagnosis, with the time from symptom onset to biopsy diagnosis approximately 13 months. This is consistent with other studies that found long delays in diagnosis of osteoarticular TB.^{4 8 9}

Per the norms of American Academy of Pediatrics, pulmonary and extrapulmonary TB (except meningitis) are treated with IRZE and an aminoglycoside. The regimen is simplified when susceptibility is established.¹⁰ Additional corticosteroids are indicated for use if the patient has meningitis, pleural or pericardial effusions; severe miliary disease or abdominal involvement for up to 4 months. When the hip aspiration was found to be AFB positive, we suspected drug-resistant TB as the patient was from Myanmar, so we added a fluoroquinolone. The WHO guidelines allow for physician discretion in initiating second-line therapy.¹¹

Table 1 Tuberculosis (TB) country profiles of Myanmar and Thailand, 2011

	Myanmar	Thailand
TB prevalence #/100 000 population	506	161
TB mortality #/100 000 population	48	14
Percentage of patients with TB and known HIV status	3	74
Percentage of new cases of TB that are multidrug resistant	4.2	1.7
Percentage of 2012 TB budget that was funded	34	94

The patient was an undocumented migrant, who had previously received evaluation and treatment in Myanmar. The healthcare system in Myanmar and its eastern region (where most of the migrants to northern Thailand originate from) is among the world's poorest performing, only outperforming Sierra Leone according to the WHO.¹² In 2003, estimates of Myanmar's under-5 mortality rates (U5MR) were 276 and 107, respectively, for eastern Myanmar and Myanmar.^{13 14} In contrast, Thailand's U5MR was 26/1000 live-births. These trends also reflect the main causes of preventable premature morbidity and mortality of the two countries, particularly TB. Myanmar has higher TB prevalence and mortality, lower HIV infection identification among people infected with TB, more new-drug resistant cases and lower TB budget funding when compared with Thailand (table 1).¹⁵

Learning points

- ▶ The differential diagnosis for joint pain is broad and should be approached systematically.
- ▶ Extrapulmonary tuberculosis (TB) can be a difficult diagnosis to make, but should be considered in patients from a TB endemic region with persistent symptoms to prevent complications.
- ▶ International borders do not stop infectious diseases, and clinicians may need to know disease epidemiology in multiple countries.

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Competing interests None.

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