

Tuberculosis of the Left Calcaneum and Collapsed Right Femoral Head: A Case Report

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Learning Point of the Article:

Tuberculosis of calcaneum is very rare but, in areas where the incidence of skeletal tuberculosis is still seen, high clinical suspicion should be exercised to prevent the complication of delayed diagnosis.

Abstract

Introduction: Tuberculosis (TB), one of the oldest diseases known to affect humans, is caused by the bacteria *Mycobacterium tuberculosis*. The disease usually affects the lungs, although, in up to one-third of cases, other organs are involved. TB of the bone mimics other clinical conditions such as chronic osteomyelitis, Madura mycosis and actinomycosis.

Case Report: A fifth child and last-born girl, in a family of living four children, aged 9 years, consulted Kigali University Teaching Hospital (CHUK) on December 7, 2017, from Kibuye Referral Hospital (Western of Rwanda) for ulcerated, infected left heel with swollen foot 4 months before our consultation. Physical examination revealed a patient with swollen and tender foot discharging serous bloody fluids accompanied by inability to stand with a painful right hip. Small left inguinal lymph nodes were present. Blood work-up, computed tomography scan of the left foot, and an incisional biopsy at the level of the left calcaneus were performed and revealed extrapulmonary TB. The histopathological features for TB were scanty, but the high index suspicion of possible extrapulmonary TB led to the confirmation of the diagnosis using auramine-rhodamine special stain. Anti-TB therapy for 12 months course was initiated and the monthly follow-up for 11 months was done.

Conclusion: Although calcaneal TB is very rare, in countries with high incidence of TB, clinicians must have a high suspicion index and skeletal TB must be included in differential diagnosis of bone masses whenever possible bone mass biopsy and special staining technique in addition to most common diagnosis means should be done to rule out the possibility of bone TB.

Keywords: Calcaneus, tuberculosis, Rwanda.

Introduction

Tuberculosis (TB), one of the oldest diseases known to affect humans, is caused by the bacterium *Mycobacterium tuberculosis*. The disease usually affects the lungs, although, in up to one-third of cases, other organs are involved [1].

TB of the bone mimics other clinical conditions such as chronic osteomyelitis (COM), Madura mycosis, and actinomycosis [2].

Case Report

This was a 9-year-old female patient referred from Kibuye

Hospital in the Western province of Rwanda for further investigations and management of the left calcaneal mass suspected to be an osteosarcoma. The condition had persisted for 4 months before consulting our clinic at Kigali University Teaching Hospital CHUK for the left heel pain and swelling. The examination noted a history of fever, weight loss and swelling of the left foot extending to the whole lower limb without cough. Consulted, as structured health system, Birambo Health Centre, then Kirinda district hospital where she received different treatment (that we are unable to get their records for proper identification), without improvement. After

Author's Photo Gallery



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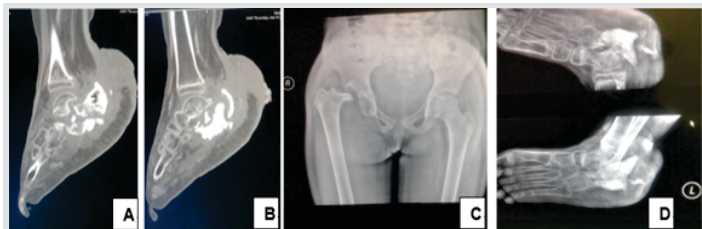


Figure 1: (a and b): Initial computed tomography scan of the left foot, (c) pelvic X-ray, (d) foot X-ray in follow-up showing sequestrum (July 2018).

2 weeks, a pus discharging sinus appeared on the heel mass. Two months later, the patient noted right hip swelling with inability to stand and walk. She consulted Kibuye Referral Hospital, from where she was referred at CHUK on December 1, 2017, for further management of possible osteosarcoma of the left calcaneus. No history of trauma nor TB contact.

On physical examination: Temperature was 37.6°C, respiratory rate of 20 cycles/min, pulse of 97 beats/min; two ulcerated wounds on the lateral aspect of left ankle and heel, swollen and tender ankle joint, two mobile, non-tender, small inguinal lymph nodes on the left side, limited range of motion of right hip joint with tenderness and mild shortening of right lower limb.

Working differential diagnosis

- COM of the left calcaneum with pus discharging sinuses
- Left foot synovial sarcoma/Ewing sarcoma
- TB of the left calcaneum and right hip.

As management, she received analgesics, daily wounds care and different clinical pathology tests were requested (Table 1). Imaging studies including computed tomography (CT) scan of the left foot (Fig. 1a, b and d) and pelvic X-ray (Fig. 1c).

CT scan results (December 8, 2017): Lytic and sclerotic calcaneal tumor consistent with osteogenic sarcoma, the differential diagnosis is COM.

She was admitted on December 14, 2017, on December 18, 2017, curettage and biopsy were performed under general anesthesia and pre-operative chest X-ray was normal. The patient was discharged home on December 20, 2017.

On January 10, 2018, microscopic examination of the calcaneal mass curettings (Fig. 2) revealed rare poorly formed granuloma, rare multinucleated giant cells, and mixed acute and chronic inflammatory cell infiltrates in favor of possible extrapulmonary TB. The special auramine-rhodamine stain was positive for acid-fast bacilli (Fig. 2).

On February 8, 2018, the patient was referred to pediatric outpatient department (OPD) seen in OPD for TB treatment, as follows: Rifampicin, isoniazid, pyrazinamid, and ethambutol (R75 mg H50 mg Z50 mg E100 mg) 8

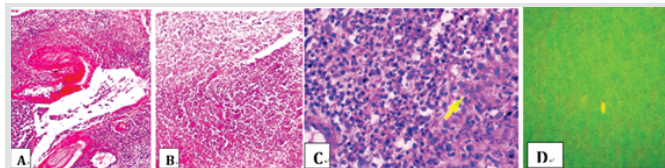


Figure 2: Histologic images from the calcaneal mass. (a) Necrotic, dead bone fragment and mixed acute and chronic inflammatory cell infiltrates (H and E $\times 4$). (b) Extensive necrosis, note poorly formed granuloma (H and E $\times 4$). (c) Note the epithelioid cells; yellow allow (H and E $\times 20$). (d) Auramine-rhodamine immunofluorescence stain, note presence of 1 AFB (yellow color in the center of the image).

tablets per dose for 12 days and then for 48 days. Rifampicin, isoniazid (R75H50) for the remaining period. Pyridoxine 25 mg/day was associated for the two 1st month.

Follow-Up

On July 9, 2018, she was reviewed in OPD with persistent small sinus on the left heel. Walking with axillary crutches. The X-rays showed sequestrum and sclerosis of calcaneum, distal tibia, and fibula (Fig. 1d).

We did a sequestrectomy under general anesthesia at Kibuye Hospital in citizen outreach program. She was discharged and advised to continue anti-TB.

On November 29, 2018, she was reviewed and had significantly improved and gained weight; sinuses healed, mild limping with limb length discrepancy of around 1 cm (right being short) and she could stand and walk with the aid of one axillary crutch. Had a limb length discrepancy of around 1 cm (right being short). The liver function test, renal function test, and hemogram test were normal. Control X-rays and morphology picture of the limb were obtained at the same time (Fig. 3).

Discussion

TB has the propensity to involve virtually any tissue of the body including the bone. Only 2% of all cases of TB are osteoarticular TB (OATB). Skeletal TB in childhood remains a considerable source of skeletal infection in developing countries. It accounts for 10–35% of pediatric extrapulmonary TB. The lesions can develop more than 10 years after the initial infection and occur primary in older children, particularly during the first two decades of life [3,4].

OATB of foot is uncommon and that of calcaneum is very rare [5].

The incidence of TB in the UK is increasing with approximately



Figure 3: (a) Control pelvic X-ray, (b) control left foot X-ray, (c and d) morphology of the left heel after treatment.

Table 1: Clinical hematological test results

Date/Tests	07. 12.2017	16.12.2017	12. 07.2018	14.12.2018
White blood count	9.92×10 ³ /μL	8.58×10 ³ /μL	9.16×10 ³ /μL	
Red blood cells	4.4×10 ⁶ /μL	4.4×10 ⁶ /μL	4.90×10 ⁶ /μL	
Hemoglobin	10.0 g/dL	10.5 g/dL	13.8 g/dL	
Hematocrit	32.10%	34.70%	42.40%	
Platelets	972×10 ³ /μL	846×10 ³ /μL	407×10 ³ /μL	
Neutrophils	26.60%	36.10%	25.70%	
Lymphocytes	63.90%	51.50%	53.30%	
Eosinophils	4.30%	4.90%	15.30%	
Basophiles	0.20%	0.20%	0.40%	
Monocytes	9.00%	7.30%	5.30%	
ESR	98 mm/h			13 mm/h
HIV test	Negative			

9000 new cases reported annually. Isolated TB infection of the bone, however, remains uncommon at 1-3% [6]. The diagnosis and treatment of calcaneal TB are often delayed because of the unawareness of the surgeon and less dramatic signs and symptoms of calcaneal osteomyelitis than osteomyelitis of long bones [7].

The study done by Maqungo et al. found that over 28 cases, the ankle was involved in 13 (46.4%) patients, the midfoot in 9 (32.1%), the subtalar joint in 5 (17.9%), and the calcaneus in 1 (3.6%) [8].

Dhillon et al. found that foot involvement in OATB is uncommon and isolated bony involvement of foot bones with an osteolytic defect is even more rare. They presented 24 osteolytic variety of foot TB (11 calcaneus, 4 cuboid, 2 cuneiforms, 1 talus, 3 metatarsal, and 3 phalanges) out of 92 foot TB cases collected over a period of 20 years among 16 adults and eight children [9].

Hosalkar et al. identified 18 patients with biopsy-proven TB (distal humerus, ulna, scapula, acetabulum, proximal femur, proximal tibia, distal tibia, and calcaneus) among which five cases had multi-focal involvement, all presented with pain, swelling, and stiffness [10].

The systemic symptoms are found in only 33% of children and more common in the immunocompromised host with multiple lesions. Early detection is crucial to prevent bone and joint destruction. Radiologic imaging plays an important role in diagnosis, evaluation of extent, and follow-up [4].

In the absence of trauma, skin, or nail infection (ingrown toenail or verrucae/warts), chronic infections such as TB can present

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with foot and ankle pain and swelling; malignancy, rare but does occur therefore is better to. Look out for red flag symptoms. Benign bone tumors (osteoid osteomas) or malignant tumors (calcaneum is a common site) are among conditions to consider [11].

Rafiqi et al. did a retrospective study, over 30-year period (1980–2010), of 12 unusual OA-TB comprised five boys and seven girls, the mean age was 7 years 4 months (10 months to 14 years). Only one patient had a history of TB [12].

Agarwal et al. reviewed medical records of seven boys and three girls aged 7–12 (mean, 9.8) years, at the Department of Pediatric Orthopaedics, Delhi, India, who presented with calcaneal TB [13].

The study done by Tiwari et al. for a case series of nine patients showed that the presenting symptoms in all patients were pain and swelling around the heel, along with the “heel up” sign. In addition, three patients had discharging sinuses. History of fever, loss of appetite, and weight loss were present in the two female patients only. History of trauma to the heel was given by three patients. Inguinal lymphadenopathy was found in five patients [14].

The treatment of skeletal TB includes administering anti-TB drugs. Many authors suggest that medical treatment alone is enough, while others believe that surgical debridement and drainage is necessary. The most recent recommendations from the Centers for Disease Control and Prevention are to give standard courses of medical treatment for a minimum of 12 months in OA-TB. In some cases, the treatment may be extended for up to 24 months [10].

Conclusion

The location of TB at the calcaneum is extremely rare. Biopsy and culture are the gold standards in diagnosis. The prognosis and outcome depend on an early diagnosis and management. Antitubercular chemotherapy is the mainstay of treatment. Surgical intervention may be needed in select cases.

Clinical Message

TB is a mimicker of many diseases in both childhood and adults and in TB endemic regions, a child with non-traumatic swelling or ulcerative lesion at the level of the heel, a high degree of clinical suspicion of TB of calcaneus should be considered as a key differential diagnosis early and prevent the usual delay in diagnosis.

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