Tubercular Dactylitis in a 5-Year Girl: A Case Report on Uncommon Presentation of Skeletal Tuberculosis

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ABSTRACT

Tuberculosis of the spinal cord, which is known as tubercular spondylitis is the most manifested musculoskeletal TB. Tuberculosis also affects the hip joint, knee joint, wrist, and elbow joint in descending order. Tubercular Dactylitis is a less common form of extra-pulmonary tuberculosis, which involves the small bones of the hand and feet. Tuberculosis causes granuloma formation in short tubular bones resulting in spindle shaped swelling, which is Spina Ventosa.

A 5 years old Bangladeshi girl presented to the orthopaedics department with a history of pain-free gradual expansion of the middle phalanx of the left index finger for 3 consecutive months. Findings of physical and radiographic examination were in line with tubercular dactylitis. Curettage and allogenic bone grafting procedure was performed. Then tubercular dactylitis was ensured by histo-pathological examination. The patient was further treated with Anti-TB drugs for 12 months. Clinical and functional outcomes were satisfactory and there was no recurrence after 2 years of follow-up.

As tubercular dactylitis is an infrequent presentation of skeletal tuberculosis, diagnosis, and management decision was difficult. Our experience in treating the patient with curettage and allogenic bone grafting along with 12 months anti-tubercular medications was excellent. So, this can be recommended as one of the best modalities of treatment of tubercular dactylities in children.

Keywords: Curettage & allogenic bone graft, Extra-pulmonary tuberculosis, Spina Ventosa, Tubercular Dactylitis.

1. INTRODUCTION

The causative organism of tuberculosis is *Mycobacterium tuberculosis*, which results in the formation of caseous necrosis in tissues manifested by tubercles. The most commonly encountered tuberculosis is pulmonary tuberculosis. Osteo-articular tuberculosis comprises 1%–4.3% of all tuberculosis cases and 10%–15% of all extra-pulmonary tuberculosis cases. Tubercular infection of the metacarpal, metatarsal, and phalanges is referred to as tubercular dactylitis.

Rankin first identified tubercular dactylitis in 1886 by histological examination. Feilchenfeld radiologically illustrated tubercular dactylitis in children in 1896.

About 85% of the patients of tubercular dactylitis are below 6 years of age when the epiphyseal centers are formed [1]. Tubercular dactylitis usually affects the bones of the hands than the bones of the feet. Proximal phalanx of the index and middle fingers are the most common sites of tubercular infection. This condition occurs in up to about 7% of children with pulmonary tuberculosis. Tuberculosis spreads to skeletal system through the blood and lymphatic [2].

The diagnosis of tubercular dactylitis is made on the basis of radiological, histological, and bacteriological examination. This condition may be confused with osteomyelitis, gout, sarcoidosis, and tumors.

A good modality of treatment option is anti-tubercular medication therapy and rest of the affected part with early mobilization of the joint. Another option of treatment is curettage and allogenic bone graft with anti-tubercular medications. If the joint is ankylosed in abnormal position, then excisional arthroplasty or corrective osteotomy is indicated. If a finger is grossly scarred, deformed and interferes
2. Case Report

A slum dwelling 5 years old Bangladeshi girl presented with painless progressive swelling of the middle phalanx of the left index finger for 3 months and restriction in the index finger movement for 1 month. There was no history of trauma, pain, or similar swelling elsewhere in the body with no other local & constitutional symptoms of tuberculosis. There was no history of contact with pulmonary tuberculosis. A family history of congenital or acquired swelling is absent.

A fusiform swelling was on the middle-phalanx of the left index finger, more prominent on the dorsal surface, 3.5 cm × 2 cm in size, non-tender, no local rise of temperature, firm, with smooth surface & well defined margin (Fig. 1). Reducibility, compressibility, pulsatility, crackling sensation, ulceration, discharging sinus, scar mark, pigmentation, empty sign & pressure effects were absent. The overlying skin was free. The swelling was immobile & fixed with underlying structure with no neurovascular compromise. DIP joint was mildly flexed with slightly restricted movement of PIP & DIP joints of the left index finger with no wasting of the hand and forearm of the involved side. No other bony swelling was found in the body. Muscle power of all limbs was MRC-5/5.

Laboratory investigation was not significant except for a rise in ESR (48 mm in 1st hr). X-ray of the left hand revealed small cystic lesion within medullary space of the middle phalanx of index finger with expansion of the medullary cavity and thinning of the overlying cortex with no periosteal reaction but mild soft tissue swelling (Fig. 2). Chest X-ray was normal.

The bony cystic lesion in the middle phalanx of left index finger was approached through a 1.5 cm lateral incision. A well circumscribed cavity with thin cortex, eroded at places was found. Straw colored fluid with cheesy materials was found within the cavity. After curetting of material and proper washing, allogenic bone graft was placed within the cavity (Fig. 3).

Histopathology of specimen showed necrotic bone, cartilage and inflamed granulation tissue containing multiple epithelioid granulomas compatible with tubercular osteomyelitis (Fig. 4).

Anti-TB drugs were prescribed for 12 months according to current National guideline of Osteo-articular Tuberculosis treatment in Bangladesh. Excellent clinical and functional results were obtained with no recurrence after 2 years of follow-up.

3. Discussion

85% of children with tubercular dactylitis are younger than 6 years of age. The incidence of tubercular dactylitis
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Fig. 3. X-ray of left hand focusing index finger (A/P & lateral view) showing allogenic bone graft in the middle phalanx with tissue swelling [white arrowed] in 1st post-operative day.

Fig. 4. Histopathological specimen showing tubercular granuloma with epithelioid cells, Langerhans type of giant cells with central Caseation necrosis. [Magnification: 40X].

is 0.65%–6.9% among children who had a prior history of tuberculosis. Due to insufficiency of specific sign and symptoms, the diagnosis is often delayed. Radiographic representations show a varied spectrum of features including soft tissue swelling (90%), osteopenia (72%), joint space narrowing (66%), cysts (66%), erosions (64%), bony sclerosis (20%), periostitis (15%) and calcifications (5%) [4], [5].

Uptake of Technetium 99 diphosphonate is commonly shown in radio-isotope scanning. Bone marrow expansion may be revealed in T2-weighted images in MRI. A large nutrient artery enters in the middle of the short tubular bones of the hands and feet during childhood. Due to this reason, the first inoculum of tubercular infection is settled in the marrow cavity of these short tubular bones and eventually, the interior of these bones is transformed into a tuberculous granuloma. Then there is a spindle shaped swelling of the affected bone, which is called spina ventosa. Thus the nutrient artery of the infected bone is obstructed.

Therefore, internal lamellae of the bone are destroyed and sequestra is formed subsequently [6], [7].

The differential diagnosis of tubercular dactylitis includes: pyogenic osteomyelitis, sickle cell disease, congenital syphilis, fungal infections, histiocytosis X, and bone tumors (enchondromata and fibrous defect). Sickle cell dactylitis is characteristically bilateral and there is irregularly sclerotic new bone formation. In syphilis, there is a significant periosteal reaction. Pyogenic osteomyelitis can be demarcated clinically as it is acutely painful, swollen, and hot and there is high grade fever. Tuberculous osteomyelitis is usually mildly painful with low grade fever, the course of disease progression is benign, and no or sparse radiographically visible periosteal reaction [8].

Most of the tubercular lesions heal with antitubercular chemotherapy. Surgical intervention is required when there is inadequate response to drugs or in case of recurrence [8].

4. Conclusion

A high magnitude of doubt for tubercular dactylitis is critical for children presenting with longterm finger swelling with or without pain, especially in countries like Bangladesh where tuberculosis is endemic.

REFERENCES