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Tubercular dactylitis of left middle finger: A case report

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Abstract
Tuberculous dactylitis is a rare condition. It usually involves bones of hands and feet, predominantly seen in children. The condition is characterized by cystic expansion of the bone due to filing of the medullary cavity with the granulation tissue leading to formation of pus and thinning of cortex. The term spina ventosa is used to describe this condition radiologically. We report a rare case of tuberculous dactylitis of left middle finger in a 15 yrs. old female patient who presented with complaints of swelling at the middle phalanx of the left middle finger. Swelling had an insidious onset and gradually progressed in size over a period of 3 months. Patient gave history of unexplained weight loss since 1 month. Plain x-ray of hand showed lytic lesion of middle phalanx and MRI was done which showed altered marrow intensity changes with erosions in the middle phalanx of 3rd digit with periosseous synovial enhancing thickening and flexor digitorum tenosynovitis-likely infective etiology-suggestive of tuberculosis hence patient was treated with curettage, allograft and stabilization with JESS (Joshi's external stabilizing system).

Keywords: Dactilitis, spina ventosa, middle phalanx

Introduction
Tubercular involvement of short tubular bones of hands and feet known as tubercular dactylitis. Swedish scientist Carl Von Linne was first to mention this condition and named it spina Ventosa [1]. 85 percent of the case are seen in children younger than 6 years of age [2]. Involvement of the upper limb is common than bone of feet and proximal phalanx of index and middle finger is involves more frequently. Osteoarticular tuberculosis (TB) accounts for only 1-3% of all TB infections [3]. It poses a serious diagnostic challenge due to its unusual presentations, inadequate diagnostic skills, limited understanding of the management and many overlapping features with other diseases.

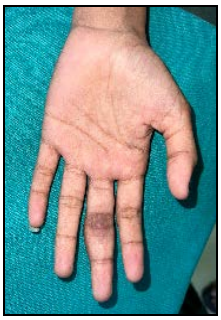
Case Report
A 15 years old child presented with complaints of swelling over the middle phalanx of the left middle finger. Swelling had an insidious onset and gradually progressed in size over a period of 2 months. Patient gave history of unexplained weight loss since 1 months with no history of any trauma. There was no family history of tuberculosis.
On examination, an oval shaped swelling was noted over middle phalanx of left middle finger associated with a discharging sinus. There was local rise of temperature over the swelling and tenderness was present over middle phalanx. The swelling was hard in consistency and was fixed o the underlying bone. Range of movements were normal.
Routine blood instigations were done and C-reactive protein (CRP) was found to be positive with a value of 55 (normal < 5) and erythrocyte sedimentation rate was also high with a value of 80mm/hr. the total counts and other parameters were within normal limits.
X-ray of left hand anteroposterior and oblique view were taken which showed lytic lesions of middle phalanx of middle finger along with cortical thinning and diffuse soft tissue swelling around the middle phalanx. The chest x-ray was normal.
The MRI of left hand was performed and it showed altered marrow intensity changes with erosions in the middle phalanx of 3rd digit with periosseous synovial enhancing thickening, sinus tract and flexor digitorum tenosynovitis-likely infective etiology which was suggestive of tuberculosis.

The surgery was planned and with the consent of the patient the curettage was performed under anesthesia and infective material was curetted out after exposing the full length of middle phalanx using medial approach. Shiny white purulent material was seen within the medullary cavity and was curetted out and sent for biopsy. Cavity was filled with allograft and Wound wash was given and closed in layers and finger stabilized with JESS to prevent pathological fracture.

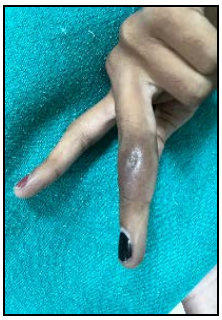
Post operatively regular dressings were done and wound healed uneventfully and suture removal was done. JESS removal was done after 4 weeks and patient is under regular follow up.

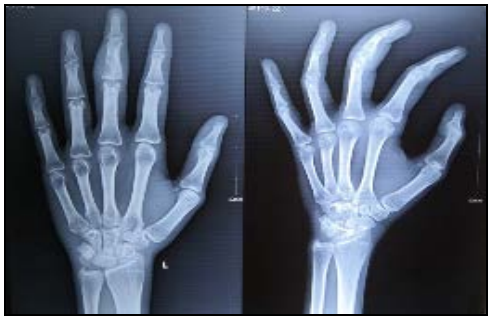
Histopathological examination revealed Viable and necrotic bony bits, Soft tissue bit showing large areas of necrosis surrounded by multiple granulomas showing epithelioid cells, lymphocytes and Langhan's type multinucleated cells. ZN stain for AFB showed occasional acid-fast bacilli and necrotizing granulomatous inflammation suggestive of tuberculosis.

After confirming the diagnosis of tubercular dactylitis, treatment was started with anti-tubercular drugs. JESS fixator was removed at 4 weeks and mobilization was started. There was reduction in the size of swelling in the follow up period and patient responded well to the treatment.

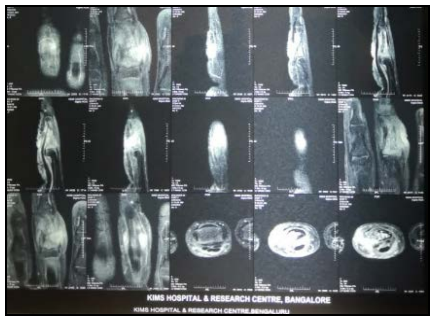


Pre-Operative Clinical Images

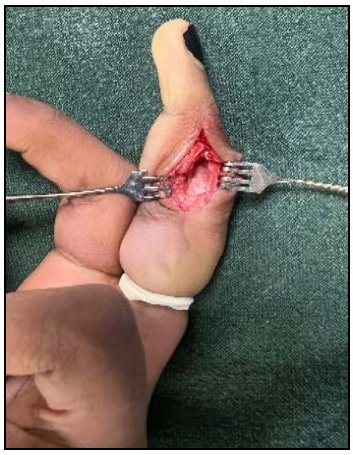




Pre-Operative X-Ray

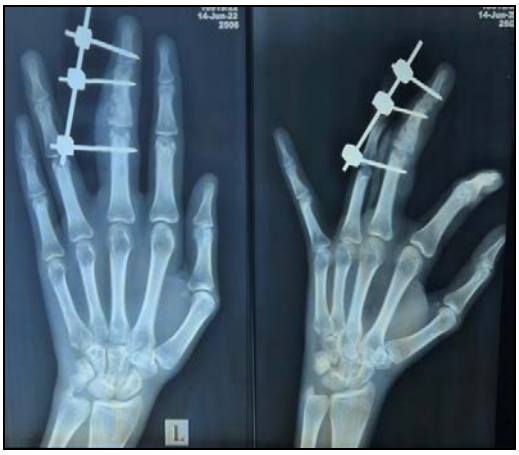


Pre-Operative MRI Showing the Lesion

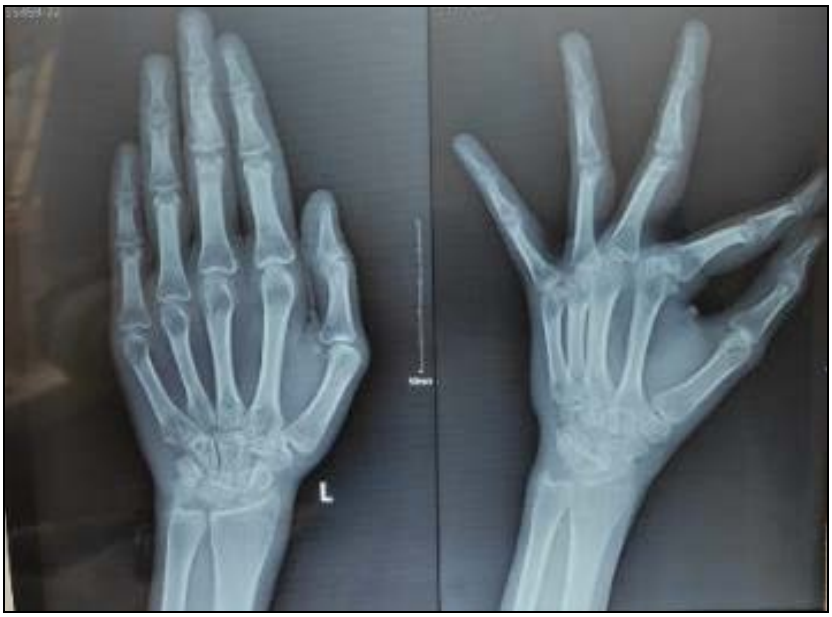


Intra Operative Image Showing Lesion

Stabilization Done with Jess

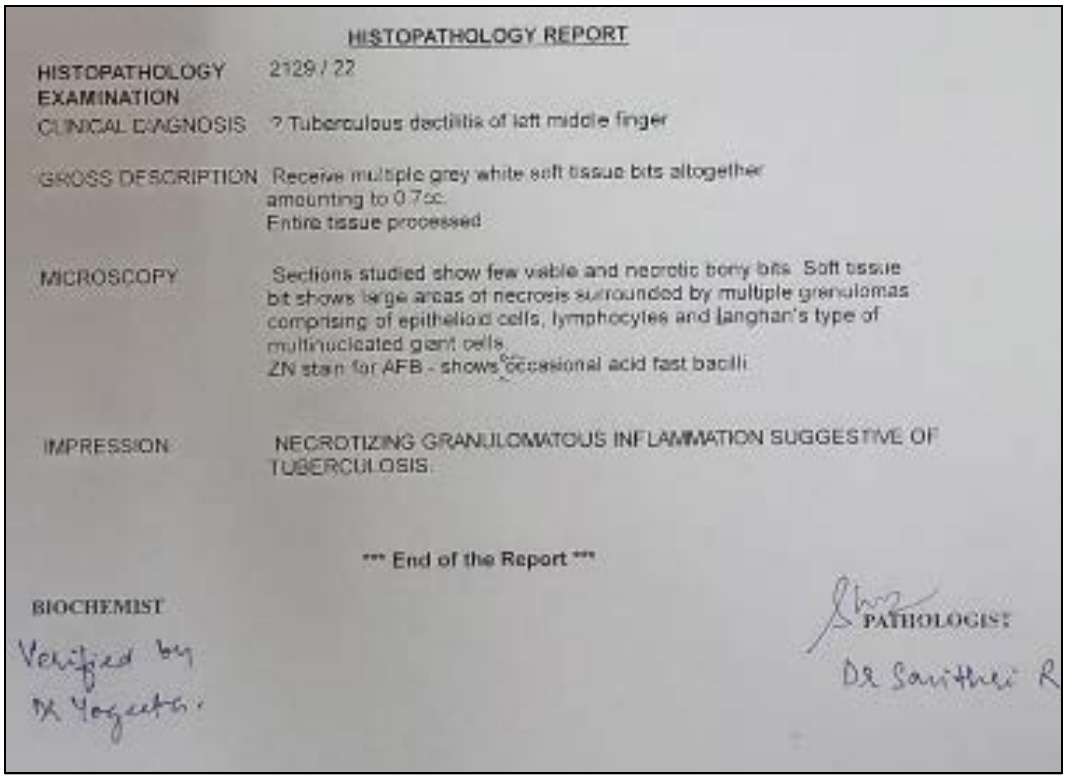


Post-OP X-Ray



Follow up X-Ray at 12 Weeks

Clinical Image at 12 Weeks



HISTOPATHOLOGY REPORT

HISTOPATHOLOGY EXAMINATION 2129 / 22

CLINICAL DIAGNOSIS ? Tuberculous dactilitis of left middle finger

GROSS DESCRIPTION Receive multiple grey white soft tissue bits altogether amounting to 0.7cc
Entire tissue processed

MICROSCOPY Sections studied show few viable and necrotic bony bits. Soft tissue bit shows large areas of necrosis surrounded by multiple granulomas comprising of epithelioid cells, lymphocytes and langhan's type of multinucleated giant cells.
ZN stain for AFB - shows occasional acid fast bacilli

IMPRESSION NECROTIZING GRANULOMATOUS INFLAMMATION SUGGESTIVE OF TUBERCULOSIS.

*** End of the Report ***

BIOCHEMIST

Verified by
Dr Yogeeta.

PATHOLOGIST
Dr Savithri R

Histopathology Report

Discussion

The most common site of osteoarticular tuberculosis is spine. TB spine incidence more than 50% among the patients with extra pulmonary TB [4, 5].

TB of small bones like metacarpals, metatarsals and phalanges are rare. Such cases were the small bones of hand and feet are involved are labelled as tubercular dactylitis or spina ventosa. (Spina=short bones; ventosa=inflated with air) [6]. It spreads via lympho-haematogenous route to the skeletal system during initial infection. 85% of the children with tubercular dactylitis are younger than 6 years of age. The incidence of spina ventosa in children is reported to be 0.65%-6.9%. The most common bones to be affected by this condition in the hand are the middle and index finger proximal phalanx. The unusual presentation in children is because of the rich blood supply of small bones by a large nutrient artery which enters into the middle of these small bones. Whew there is a contact with mycobacterium tuberculae, the inoculums of infection enter these small bones through the nutrient artery and develop into a tubercular granuloma. This causes the enlargement of small tubular bone to accommodate the granuloma. When the nutrient artery of the involved bone gets occluded it leads to formation of the sequestrum and endosteal destruction and new bone formation simultaneously. Radiologically this appears to be cystic expansion of phalanges and spindle shaped bone (spina ventosa). Typically, the disease presents as chronic, painful and progressive swelling of the fingers or toes affecting most commonly the proximal phalanx of the metacarpals. Abscess and sinus formation leads to secondary bacterial infections. X-ray usually shows an osteolytic lesion, mild or no periosteal reaction and areas of bone destruction and sclerosis. Spina ventosa is the radiological characteristic of the tubercular dactylitis. MRI is the modality of choice to see the early marrow and soft tissue involvement. The investigation of choice for the diagnosis of tubercular dactylitis is still the histopathological examination of the biopsy specimen.

Identifying acid fast bacilli on Z-N staining and Gene-Xpert studies for demonstration of mycobacterium TB. However, the gold standard for diagnosis of skeletal tuberculosis is culture of mycobacterium tuberculosis from the bone tissue. Blood investigations such as ESR, CRP and total and differential counts help in ruling out other conditions which mimic the tubercular dactylitis such as non-infectious granulomatous disease, sickle cell dactylitis, benign and malignant tumours, endocrinopathies, metabolic disorders, syphilitic dactylitis, fungal and pyogenic osteomyelitis, brodies abscess, sarcoidosis, psoriasis actinomycosis and brucellosis.

Management of this condition includes the anti-tubercular drugs which consists of two months of initial phase with four drug regimen of isoniazid, rifampicin, ethambutol and pyrqazinamide followed by six to twelve months of regimen of isoniazid and rifampicin [7]. Surgery includes excision of the lytic lesions and curetting the bone cavities followed by stabilization of the bone with k-wires or JESS. This is done to promote early healing.

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