

Tuberculosis of the Foot: A case report

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A case report discusses the presentation, diagnosis and treatment of a 22 year old male who presents with extra-pulmonary tuberculosis of the foot. Extra-pulmonary tuberculosis is extremely rare and accounts for less than 10% of osteoarticular tuberculosis. Radiographic and MRI correlations are introduced.

Skeletal involvement in extra-pulmonary tuberculosis is extremely rare, and foot involvement accounts for less than 10% of osteoarticular tuberculosis. Tuberculosis osteomyelitis of the foot can also mimic a wide range of pathology. Bones and joints are involved in 1% to 3% of all cases. As a result, this condition is often misdiagnosed, or the true nature of the lesion is identified late in the diagnostic process. This article reports a case of tuberculosis in the mid-tarsal joint of the right foot in a 22 year old man.

Case Report

A 22 year old man came to our outpatient department with complaints of pain in his right foot for 4 months duration. Patient had been treated for the same problem by different doctors with various NSAIDs. He came for further management. There was no history of trauma, weight loss, loss of appetite, and evening rise of fever. On further examination, there was no swelling, sinus or discharge was seen in the foot. There was minimal tenderness over cuboid. Range of motion was normal. Random blood sugar was 89mgs. C-reactive protein was negative; Erythrocyte sedimentation rate was 102mm/hr. Other blood parameters were normal. Radiograph of chest was normal.

Radiographs of the right foot showed diffuse osteoporosis, erosions at the peripheral margins of mid-tarsal joints with soft-tissue swelling and minimum periosteal reaction. Infective etiology was kept as a differential diagnosis. (Fig. 1,2)

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FIGURE 1,2 Plain radiographs show diffuse osteoporosis and erosions at the peripheral margins of mid-tarsal joints with soft-tissue swelling and minimum periosteal reaction.

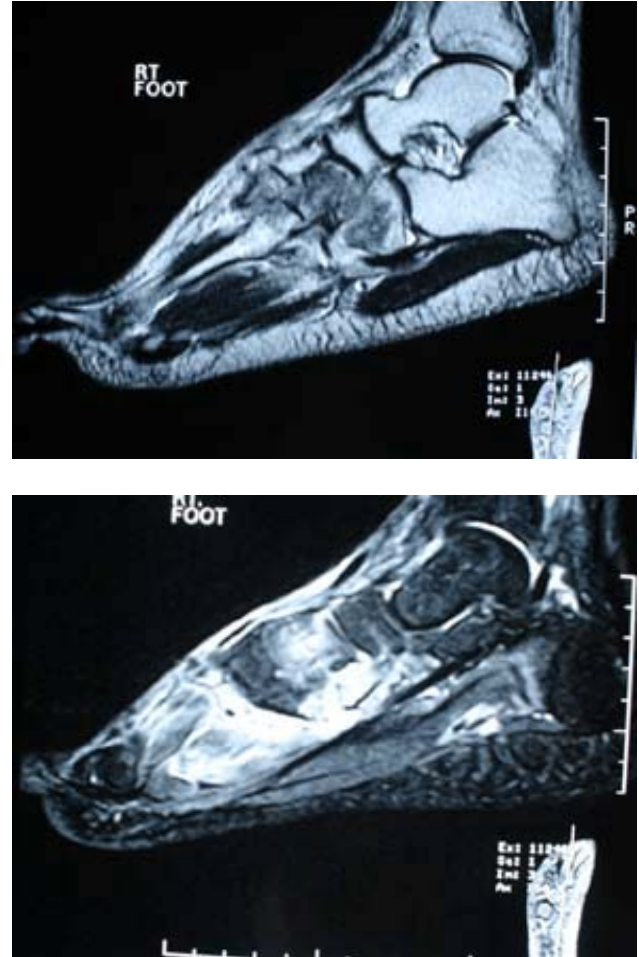


FIGURE 3,4 MRI shows extensive area of altered marrow signal noted in medial and lateral cuneiforms, as well as cuboid which show foci of hypo-intensity (on T1 weight images) along with interosseous edema. Talus, calcaneum, navicular, 1st,5th metatarsals, ankle joint, sinus tarsi are normal.

Altered marrow signal also noted in 2nd and 3rd metatarsals. Extensive musculo-fascial edema noted on the dorsum of the foot and plantar aspect of foot, plantar aspect involving dorsal interossei and adductor hallucis.

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The patient was treated with anti-tubercular drugs according to the WHO regime (2HRZE+4HE). He was immobilized in a below-knee POP cast for 4 weeks. Gradual mobilization with Ankle Foot orthosis was done after 4 weeks. He was followed every month. Radiograph and ESR showed a remarkable recovery. ESR at the end of 6 month was 06mm/hr. Patient is now at 2 year follow up with near normal foot movements and is able to carry out his daily activities.

Discussion

The spine and hip are the most common sites of osteoarticular tuberculosis. It is most easily diagnosed in these areas⁴. By contrast, tuberculosis of the foot and ankle is less common and is detected at a more advanced stage^{1,2,3}. The symptoms are those usually seen in musculoskeletal disorders; pain, stiffness, and swelling⁵ of the foot. The calcaneum is involved most commonly, followed by infection of the talus, Lisfranc joints, and ankle. Joint involvement occurs because of spread from a periarticular bony focus, and in the midfoot, the disease may spread to involve all the interconnected joints, leading to a stiff foot and residual deformities. There is, characteristically, early muscle atrophy⁵. The significance of a history of trauma,⁵ reported by one third of patients, is unknown.

The ESR is almost always elevated in patients with tuberculosis.^{2,4,6} Pulmonary involvement is uncommon.⁷⁻⁹

The most common radiologic finding is that of osteoporosis, which may be intense: cancellous bone involvement may present as a cystic lesion with or without sequestrum. The earliest changes may be erosions at the peripheral margins of a joint.¹¹ Five types of radiological features are described in the literature. They are cystic, subperiosteal, kissing, spina ventosa and rheumatoid. Phemister's triad of periarticular osteoporosis, marginal erosions and narrowing of the joint space is the radiological feature of osteoarticular tuberculosis.¹³ Formation of a sequestrum may occur. If present, sequestra are small and few in number.¹ The radiological appearances of rheumatoid arthritis, particularly when monoarticular, osteoarthritis, gout, neuropathic joints, sarcoidosis and neoplasms may be similar, but can be distinguished from those of osteoarticular tuberculosis.⁶

Computed tomography scans and magnetic resonance imaging are helpful examinations. MRI can demonstrate lesions in and adjacent to bone before they are evident on plain radiography^{12,13,14}. Periarticular osteoporosis occurs because of disuse atrophy and the direct action of toxins. Because the disease is paucibacillary, a positive acid fast bacilli culture is rare and the diagnosis usually is confirmed by obtaining granulomatous tissue on biopsy. In endemic regions, the clinical features, radiological appearance and elevated ESR are sufficient to diagnose tuberculosis¹⁰ and begin treatment. Although biopsy is indicated only in doubtful cases, in regions where tuberculosis is not endemic, histopathological or microbiological confirmation should be mandatory. Imaging studies play a critical part in the diagnosis of tuberculosis of bones and joints^{14,15}

A prolonged course of antituberculous drugs is the basis of treatment. Surgery is an adjunct to the drugs and was not required in our patient. Debridement and curettage may be indicated in non-healing lesions. Resection of a destroyed or sequestered phalanx or metatarsal is rarely necessary¹. The radiological evidence of healing includes a decrease in osteoporosis with repair of scalloped lesions and focal sclerosis. Clinical signs of healing included a decrease in pain and swelling, disappearance of sinuses, improvement in gait and gain in body-weight. They were evident in most patients as early as five weeks. All these clinical and radiological features of 'healing' was seen after four to five months of treatment.

Conclusion

Early diagnosis and antitubercular therapy is essential to prevent joint involvement from periarticular bony lesions; surgical intervention is rarely needed. A high index of suspicion has to be maintained in high risk groups like Asian immigrants. Concomitant extraskkeletal lesions may not always be present.

The uncommon site, lack of awareness, and ability to mimic other disorders clinically and on radiographs, lead to diagnostic and therapeutic delays. In the early stages and when the disease is limited to bone, medical treatment leads to excellent healing and limited residual disabilities. It is hoped that such reports will serve to heighten awareness of the return of this mighty pathogen.

References

1. Tuli SM. *Tuberculosis of the skeletal system (bones, joints, spine and bursal sheaths)*. Second ed. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd, 1991:3-122.
2. Dhillon MS, Sharma S, Gill SS, Nagi ON. Tuberculosis of bones and joints of the foot: an analysis of 22 cases. *Foot Ankle* 1993; 14:505-13.
3. Martini M, Adjrard A. Tuberculosis of the ankle and foot joint. In: Martini M, ed. *Tuberculosis of the bones and joint*. Berlin, etc: Springer Verlag, 1988.
4. Evanchick CC, Davis DE, Harrington TM. Tuberculosis of peripheral joints: an often missed diagnosis. *J Rheumatol* 1986;13:187-9.
5. Messner RP. Arthritis due to mycobacteria, fungi and parasites. In: McCarty DJ, Koopman WJ, eds. *Arthritis and allied conditions :textbook of rheumatology*. Vol 2. Philadelphia, etc: Lea and Febiger.1993:2035-46.
6. Hsu SH, Sun JS, Chen IH, Liu TK. Reappraisal of skeletal tuberculosis: role of radiological imaging. *J Formos Med Assoc* 1993;92:34-41.VOL. 81-B, NO. 6, NOVEMBER 1999
7. Newton P, Sharp J, Barnes KL. Bone and joint tuberculosis in Greater Manchester 1969-1979. *Ann Rheum Dis* 1982;41:1-6.
8. Hunt DD. Problems in diagnosing osteoarticular tuberculosis. *JAMA*1964;190:95-8.
9. Berney S, Goldstein M, Bishko F. Clinical and diagnostic features of tuberculous arthritis. *Am J Med* 1972;53:36-42.
10. Watts HG, Lifeso RM. Current concepts review: tuberculosis of bone and joints. *J Bone Joint Surg [Am]* 1996;78-A:288-98.
11. Versfeld GA, Solomon A. A diagnostic approach to tuberculosis of bones and joints. *J Bone Joint Surg [Br]* 1982;64-B:446-9.
12. Edeiken J, Dalinka M, Karasick D. *Edeiken's roentgen diagnosis of diseases of bone*. Fourth ed. Baltimore: Williams and Wilkins, 1990.
13. Sobel E, Levitz S. Tuberculosis of the foot: a diagnostic challenge. *JAm Podiatr Med Assoc* 1995;85:83-90.
14. Wolfgang CL. Tuberculosis joint infection. *Clin Orthop* 1978;136:257-63.
15. Davidson PT, Horowitz I. Skeletal tuberculosis: a review with presentations and discussion. *Am J Med* 1970;48:77-84.