

Concomitant Madura Foot and Tuberculosis in a Child: A Diagnostic Dilemma!

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ABSTRACT

Madura/Mycetoma foot is an uncommon infection in children seldom described in literature, especially as a coinfection with extrapulmonary tuberculosis. We report a unique case of concomitant madura foot caused by actinomadura madurae and tuberculosis in a child from a known endemic area of Haryana, India which posed a diagnostic and therapeutic challenge.

Keywords: Madura foot, Tuberculosis, Concomitant.

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INTRODUCTION

Madura foot is a neglected tropical disease, usually seen in adults, belonging to low socioeconomic status or rural background who are manual workers like agriculturists and who walk barefoot in dry, dusty environment. It is exogenous in origin, chronic and a progressively destructive inflammatory disease acquired after traumatic inoculation of skin by certain bacteria (actinomycetoma) or fungi (eumycetoma) leading to granulomatous reaction in subcutaneous tissue and deep dermis which may extend to underlying anatomical structures. It is characterized by a triad of tumefaction, draining sinuses and presence of colonial grains in the exudate.¹

A major cause of childhood morbidity and mortality in developing countries like India is tuberculosis. Tubercular lymphadenitis is an extrapulmonary manifestation of tuberculosis in pediatric age group and commonest cause (22-48%) of persistent cervical lymphadenopathy especially in endemic areas.² We present a unique case of concomitant madura foot and tuberculosis in a child which was a diagnostic challenge for the treating physicians.

CASE REPORT

A 13-year-old male from a rural area of Mewat district, southern Haryana (India) presented with a cervical swelling on right side of neck since last 6 months. An on and off discharging sinus on the outer aspect of left heel for a similar duration was also reported (Fig. 1). However, there was no discharge or definite granules from the sinus seen at the time of presentation. On physical examination, mild fever and moderate anemia was observed. The cervical swelling measured 2 × 2 cm in size which was mobile, nontender, firm and the overlying skin was unremarkable. Fine needle aspiration cytology (FNAC) of the cervical swelling revealed features of granulomatous lymphadenitis (Fig. 2). These smears were further subjected to Ziehl-Neelsen (ZN) staining for acid fast bacilli which showed numerous acid fast bacilli (AFB) identified as mycobacterium tuberculosis (Fig. 3). Montoux's test was carried out which was positive, with a wheal of 26 mm. X-ray chest was normal. No other significant lymphadenopathy (axillary or inguinal) was noted. Abnormal laboratory parameters were: microcytic hypochromic anemia with hemoglobin level of 10.5 gm/dl (MCV-72.6 fl), the peripheral blood leukocyte count were 12,000/ml with differential being of 75% neutrophils, a platelet count of 5,10,000/ μ l and the erythrocyte sedimentation rate was 40 cumm/hr. Urine and blood cultures were negative. X-ray foot showed a well defined lytic lesion in the calcaneum (Fig. 4). A deeper tissue biopsy was planned and advised but the patient refused to undergo the same.



Fig. 1: A sinus on the lateral aspect of left heel

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Based on the clinical and laboratory parameters, patient was started on antitubercular treatment (ATT) in the form of Rifampicin, Isoniazid, Ethambutol and Pyrazinamide. Monthly follow-up of the patient showed

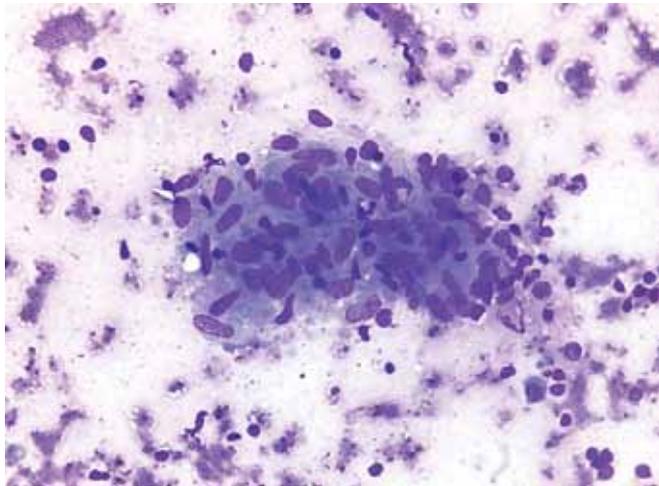


Fig. 2: FNAC smears showing epithelioid cell granuloma with necrosis against a background of lymphoid cells in various stages of maturation

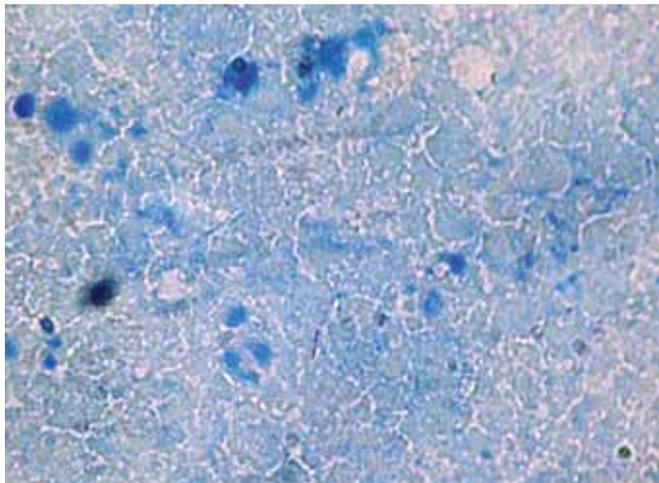


Fig. 3: Ziehl-Neelsen stain showing presence of AFB



Fig. 4: X-ray left foot showing a well-defined radiolucent lesion in calcaneum

signs of improvement, i.e. increase in appetite, no fever and decrease in the size of cervical swelling. However, there was no improvement in the healing of the sinus on foot even after 5 months of treatment. There was yellowish discharge without granules from the sinus this time, although its size remained the same. Sinus curettage was again advised to the patient to which he agreed this time and the curettings were examined histopathologically. Hematoxylin and eosin (H & E) stained sections of the curettings showed thin filamentous aggregates of actinomycetes surrounded by scattered neutrophilic infiltrate (Fig. 5). The discharge was sent for culture which showed colonies of actinomadura madurae.

In view of this histopathological finding and microbiological assay, a diagnosis of madura foot (actinomycetoma) was made. The patient was put on additional medication in form of trimethoprin-sulphamethoxazole in addition to the ATT. Positive response was seen at the end of 6th month follow-up and complete healing of sinus was observed in further 3 months time. ATT was over at the end of 6th month, but the treatment for madura foot was continued for 3 months more till the sinus healed completely and to prevent any recurrences.

DISCUSSION

Madura foot is endemic in the tropics and subtropical Africa, Mexico and India. It is uncommon in children and usually presents between 20 and 50 years of age with male to female ratio 2.2:1. Madura foot is common among barefoot population who live in rural areas in endemic region.³ Minor trauma (gravel abrasion, thorn prick) inoculates pathogen to enter the skin from soil. The rural area to which the child belongs has similar environmental conditions, i.e. dry and dusty with thorny vegetation all around. All these factors might have favored the development of madura foot in this case. We also postulate that the cervical lymphadenopathy due to

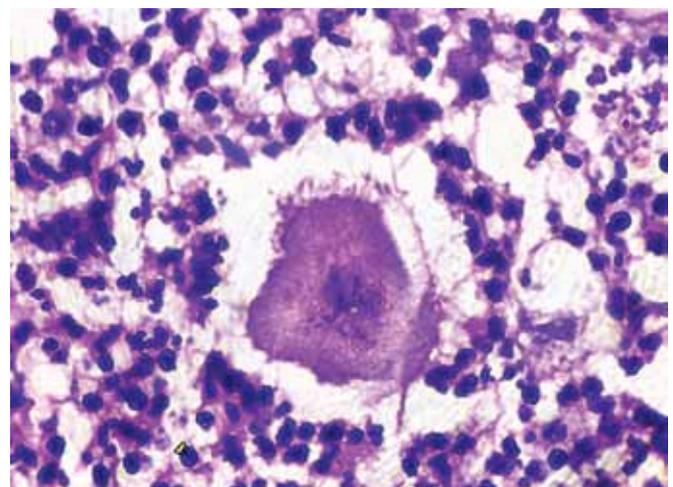


Fig. 5: Actinomycotic colony surrounded by neutrophilic infiltrate (H & E, x10)

mycobacterium tuberculosis was most likely acquired by contact with an infected individual in the community as tuberculosis is highly endemic in Mewat region, owing to the low socioeconomic status of the people, malnutrition, low immunity, which predisposes the population to this overwhelming disease.

Actinomadura madurae is a gram positive, aerobic actinomycete and soil being its primary reservoir. It is a frequent cause of actinomycotic mycetomas, superficial and/or deep suppurating tumefactions of the skin and subcutaneous tissue that result from soil contamination of a penetrating wound and usually involve the lower extremities.⁴ Actinomycetomas present with multiple sinuses with discharging granules, while tuberculosis is usually associated with single nondischarging sinus. Most infections with actinomyces species are polymicrobial. Coinfection of other pathogen with actinomyces species has a suspected pathogenesis, i.e. a synergistic effect: oxygen deprivation through other bacteria leads to growth enhancement of actinomyces species.⁵ In literature, we found no reports of tuberculosis patients coinfecting with actinomadura madurae (actinomycetoma). So the present case highlights that in a known endemic areas, predisposing environmental factors may further aggravate the disease by coexisting together.

Present case posed a diagnostic dilemma as the patient was a 13-year-old boy having cervical lymphadenopathy and a nonhealing sinus on foot which was not responding to ATT alone. Hence, it is suggested that physicians/ surgeons should be alert to any discharging/non-discharging, single/multiple sinus in a child/adult from a known endemic area of tuberculosis/mycetoma foot. The basis of management includes: clinical examination, high index of suspicion, histopathology, isolation and culture of organism.⁶

Actinomycetoma responds to medical treatment with antibiotics and other chemotherapeutic agents in most of the cases. Combined drug therapy is always preferred to a single drug in order to avoid drug resistance and eradicate residual infection.¹ This patient was treated with trimethoprim-sulphamethoxazole in addition to ATT.

Medical management continued until he was clinically cured which was assessed by a reduction in size of the sinus and its complete healing and which was confirmed radiologically also.^{3,7} The bimonthly follow-up period for 1 year was uneventful.

CONCLUSION

Resistance to antimycobacterial drugs is a common cause of therapeutic failure of tuberculosis. In the setting of full susceptibility, other entities, such as coinfection must be suspected, irrespective of age. The mycobacterium tuberculosis and actinomyces species occurring simultaneously in a patient is rare and therefore presents a diagnostic challenge and dilemma in clinical practice especially in underdeveloped areas of tropical developing countries where tuberculosis still has a very strong foothold. Early identification of both these entities prevents not only cost and prolonged diagnostic and therapeutic interventions but also the adverse medical, health and socioeconomic impact on patients, communities and health authorities.

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