Section: Pathology

Case Report

ACTINOMYCOSIS OF THE FOOT DIAGNOSED BY FINE-NEEDLE ASPIRATION CYTOLOGY: A RARE CASE REPORT

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ABSTRACT

Mycetoma remains one of the more quietly devastating diseases of the tropics, a condition that rarely announces itself with pain, yet steadily erodes the tissue and bone beneath a slowly enlarging swelling. We describe a 35-year-old man who had lived with a firm, fixed, painless mass on his right foot for a full year before seeking care, by which time the lesion had progressed to an exophytic, ulcerated and crusted growth. Fine needle aspiration cytology proved decisive: Haematoxylin and Eosin–stained smears revealed tightly packed colonies of slender, filamentous bacteria arranged in a striking "cotton-ball" pattern, set against a grimy, necro-inflammatory background, together with well-formed granulomas composed of epithelioid histiocytes and lymphocytes. This combination of suppurative colonies and granulomatous reaction allowed a confident cytological diagnosis of actinomycotic mycetoma, sparing the patient a more invasive biopsy and allowing prompt initiation of antimicrobial therapy.
Keywords: Mycetoma, actinomycetoma, fine needle aspiration cytology, cotton-ball colonies, granuloma, Madura foot.

INTRODUCTION

Mycetoma is a chronic infection of skin, tissue, and bone, caused by fungi (eumycetoma) or filamentous bacteria (actinomycetoma), and earned the name "Madura foot" in India.[1]

It rarely hurts early on, so patients ignore a growing lump for months while sinus tracts form and bone is damaged. Distinguishing the two forms matters: actinomycetoma needs long-term antibiotics, eumycetoma needs antifungals and often surgery. FNAC is a fast, low-cost test that can make this call early.[2]

We report a labourer whose neglected foot swelling showed both classic actinomycetoma colonies and a granulomatous response on one smear.[3,4]

CASE REPORT

Clinical History

A 35-year-old male presented with a slowly enlarging swelling over the right foot of approximately one year's duration. Over the preceding months the lesion had transformed from a simple nodule into an exophytic, ulcerated mass with surface crusting. Notably, the swelling was firm, fixed to the underlying tissue, and entirely non-tender, a combination that, in hindsight, had allowed the patient to defer medical attention for far longer than the disease warranted. There was no significant antecedent history of penetrating trauma volunteered by the patient, and no comorbid illness of note.

Local Examination

Examination of the right foot revealed a firm, non-mobile, exophytic mass arising over the dorsal aspect of the great toe, with an ulcerated and crusted surface studded with a few discharging points. The overlying and adjacent plantar skin showed patchy hyperpigmentation, and a smaller satellite nodule was noted over the sole, a distribution entirely in keeping with the way mycetoma tends to spread locally through contiguous tissue planes before any regional lymph node involvement occurs.

Figure 1: Gross clinical photograph of the right foot showing an exophytic, ulcerated mass with surface crusting and a few discharging points over the great toe, a smaller satellite nodule on the sole, and diffuse hyperpigmentation of the surrounding skin.

Fine Needle Aspiration Cytology: A blood-mixed aspirate was obtained from the mass and smears were prepared for Haematoxylin and Eosin staining. Microscopy revealed multiple discrete colonies of thin, filamentous bacterial organisms, tightly aggregated in a distinctive radiating pattern widely likened to a "cotton ball", the cytological hallmark of actinomycotic grains. These colonies sat within a dirty, necro-inflammatory background rich in degenerating polymorphs and cellular debris, the visual signature of an infection that the body has been fighting, unsuccessfully, for a long time.

What made this smear particularly instructive was the second finding alongside the bacterial colonies: well-formed granulomas composed of epithelioid histiocytes admixed with lymphocytes. This granulomatous component reflects a more organised, chronic host immune response mounted in parallel with the ongoing suppuration, a reminder that actinomycetoma is not a purely neutrophil-driven disease but one in which the immune system attempts, and partially fails, to wall off the organism over time.

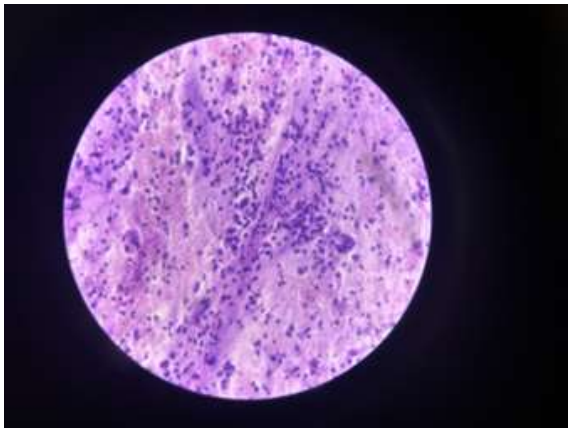

Figure 2: FNAC smear (H&E stain, low power) showing a granulomatous cluster of epithelioid histiocytes and lymphocytes set within a necro-inflammatory background.

On higher magnification, the individual colonies resolved into dense, tangled meshworks of thin, deeply basophilic filamentous organisms, sharply demarcated from the surrounding necro-inflammatory debris and rimmed by degenerating neutrophils. Considered together, filamentous cotton-ball colonies, a necro-inflammatory background, and epithelioid granulomas, the smears supported a confident cytological diagnosis of actinomycotic mycetoma.

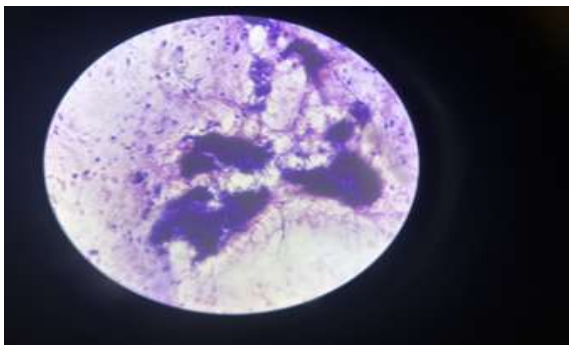

Figure 3: FNAC smear (H&E stain) showing the filamentous bacterial colony with fine, branching, basophilic filaments of Actinomyces arranged in the classic "cotton-ball" pattern, against a dense inflammatory background.

Diagnosis: Actinomycotic mycetoma of the right foot, diagnosed cytologically on fine needle aspiration.

DISCUSSION

Mycetoma is common in the "mycetoma belt," a dry, tropical zone including Sudan, Somalia, India, Yemen and Mexico. In India, actinomycetoma is far more common than the fungal form, mainly in young men doing manual labour, matching our patient. The bare foot is the usual entry site, as barefoot work lets thorns carry the organism under the skin, leading to a nodule, slow growth, sinus tracts, and bone damage as seen here. On cytology, the dense "cotton-ball" colonies of actinomycetoma are usually distinct from the sparser fungal hyphae of eumycetoma, often on H&E stain alone. The granulomas seen here are notable, showing a host response ranging from suppurative to granulomatous. Accurate diagnosis matters: actinomycetoma responds well to antibiotics, eumycetoma often needs antifungals and sometimes surgery. Since mycetoma is painless early on, patients present late, after real damage, which is why an early tool like FNAC is valuable.

CONCLUSION

This case reinforces fine needle aspiration cytology as a fast, minimally invasive and highly informative first step in the work-up of a chronic, painless foot swelling in a patient from a mycetoma-endemic region. The unmistakable cotton-ball morphology of

actinomycotic colonies, when found together with a granulomatous host response, allows a confident cytological diagnosis that can guide early, appropriate antimicrobial therapy, potentially sparing patients the disfigurement and disability that so often accompany delayed recognition of this quietly destructive disease.

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