International Medical Case Reports Journal

Dovepress
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CASE REPORT

Diagnosis and Management of a Long-Standing Eumycetoma of the Wrist in Somalia: A Case Report in a Resource-Limited Setting

Adam Abdulahi Mohamed[1,2], Shafie Abdulkadir Hassan[3], Mhmoud Mohmed Mhmoud Hassan[1]

[1]Center for Mycetoma Research, Mogadishu, Somalia; [2]Faculty of Health Sciences, Central University of Science and Technology, Baladweyn, Hiiran, Somalia; [3]Faculty of Medicine and Health Sciences, Jamhuriya University of Science and Technology, Mogadishu, Somalia

Correspondence: Shafie Abdulkadir Hassan, Email Shafici@just.edu.so

Introduction: Mycetoma is a chronic, progressive, granulomatous inflammatory disease affecting subcutaneous tissues, most commonly caused by traumatic inoculation of certain fungi (eumycetoma) or bacteria (actinomycetoma). Common etiological agents for eumycetoma include Madurella mycetomatis and Trematosphaeria grisea, while actinomycetoma is frequently caused by Nocardia or Streptomyces species. It is endemic in tropical and subtropical regions, including Somalia. The clinical triad of a painless subcutaneous mass, multiple draining sinuses, and the presence of grains in the discharge is characteristic.

Case Presentation: We report the case of a 38-year-old female from Baladweyn, Somalia, who presented with a three-year history of a slowly growing, firm, nodular swelling on the ventral aspect of her right wrist. The lesion was accompanied by mild pain and a discharge containing black grains, which are clinically characteristic of dematiaceous fungi such as Madurella species. Her vital signs and preliminary laboratory investigations, including viral screenings, were unremarkable. The patient underwent complete en bloc surgical excision of the 3x2x1 cm mass. Histopathological examination confirmed the diagnosis of eumycetoma, revealing fungal grains surrounded by a dense neutrophilic and granulomatous inflammatory infiltrate.

Conclusion: This case illustrates the classic clinical and histopathological presentation of eumycetoma. In a resource-limited setting where species-specific identification via culture or PCR and extensive antifungal therapy may be unavailable, complete surgical excision for localized lesions proved to be a successful and curative management strategy. This report underscores the importance of early diagnosis and surgical intervention in preventing the significant morbidity associated with advanced mycetoma.

Keywords: eumycetoma, mycetoma, wrist, surgical excision, Somalia, case report

Introduction

Mycetoma is a debilitating chronic inflammatory disease of the skin and subcutaneous tissues, which can extend to involve muscle and bone.[1,2] It is characterized by a clinical triad of tumefaction, draining sinuses, and the presence of "grains" or granules, which are microcolonies of the causative agent.[3] The disease is caused by either fungi (eumycetoma) or aerobic filamentous bacteria (actinomycetoma).[4] Common fungal pathogens include Madurella mycetomatis and Trematosphaeria grisea, while frequent bacterial causes include species of Nocardia, Streptomyces, and Actinomadura.[1]

The condition is endemic to the "mycetoma belt", a geographical region spanning from Mexico to India, which includes countries such as Sudan, Senegal, and Somalia.[5–7] Epidemiological data from the Horn of Africa indicates that eumycetoma is the predominant form, accounting for approximately 70% of cases in the region.[8] It predominantly affects individuals in rural areas, often agricultural workers, who are susceptible to minor penetrating trauma from thorns or splinters, which inoculate the causative organisms into the subcutaneous tissue.[9] While the foot is the most commonly affected site (giving rise to the term "Madura foot"), extrapedal lesions involving the upper extremities are less frequent but pose significant functional challenges.[10]

https://doi.org/10.2147/IMCRJ.S565197
Received: 4 September 2025
Accepted: 30 December 2025
Published: 8 January 2026

Accurate diagnosis relies on a combination of clinical presentation, imaging, and definitive identification of the agent through microscopy and culture. Histopathology remains crucial for differentiating between eumycetoma and actinomycetoma, as their management differs significantly.[11] While actinomycetoma generally responds well to prolonged antibiotic therapy, eumycetoma is notoriously resistant to medical treatment alone, often necessitating surgical intervention. The objective of this report is to illustrate the clinical presentation, diagnosis, and successful outcome of a 38-year-old female with a rare wrist eumycetoma managed solely with surgical excision.

Case Presentation

A 38-year-old housewife from Baladweyn City, Hiiran, Somalia, presented to the outpatient general surgery department of Hilaal Speciality Hospital with a primary complaint of a swelling on her right hand.

The patient reported that the swelling had been present for three years, with a noticeable but slight increase in size over the few months prior to presentation. It was associated with mild pain and a history of small discharges containing black grains. The patient was otherwise healthy with no other swellings or systemic symptoms.

On physical examination, the patient was vitally stable (Pulse: 84/min, Blood Pressure: 117/72 mmHg, Temperature: 36.7°C). Examination of the right hand revealed a firm, non-tender, nodular lump measuring approximately 1.5×1 cm. It was located on the ventral aspect of the mid-wrist, just anterior to the joint. The overlying skin showed multiple healed sinuses, but the surrounding skin was normal. The mass was slightly fixed to the underlying flexor tendons. There was no regional lymphadenopathy.

Preliminary laboratory investigations, including biochemical, haematological, and serological panels, were conducted to assess the patient's general health status. All key findings were within normal limits, indicating no significant systemic inflammation or organ dysfunction. A summary of the results is presented in Table 1.

A superficial ultrasound of the wrist was performed, revealing multiple thick-walled cavities containing hyperreflective echoes. These findings were consistent with the "dot-in-circle" sign, a characteristic sonographic feature highly suggestive of mycetoma grains. Given the clinical and sonographic findings, a plan was made for a complete excisional biopsy under general anesthesia.

The patient underwent elective surgery where a complete en bloc excision of the lesion was performed using a tourniquet for hemostasis. The wound was closed primarily. The excised specimen was a single tissue fragment measuring 3x2x1 cm, lined by 3×1.5 cm of skin. The cut surface was nodular and revealed multiple sinuses containing black granules. Due to resource limitations, the specimen was placed in formalin for histopathological analysis only, as culture facilities were unavailable.

Table 1 Summary of the Patient's Laboratory Investigations

Laboratory Investigation	Result	Typical Reference Range
Biochemistry		
Random Blood Glucose	94 mg/dl	< 140 mg/dl
SGOT (AST)	26 U/L	5 - 40 U/L
Creatinine	0.7 mg/dl	0.6–1.2 mg/dl
Hematology		
Erythrocyte Sedimentation Rate (ESR)	11 mm/30 min	< 20 mm/hr
Serology		
HBsAg	0.00	Non-reactive
Anti-HBs	0.00 mIU/mL	< 10 mIU/mL (non-immune)
Anti-HCV	0.12	Non-reactive

Histopathology

The pathology report confirmed the diagnosis of eumycetoma. Microscopic examination showed tissue lined by squamous epithelium, with the underlying lesion containing characteristic fungal grains. These grains were surrounded by a dense suppurative and granulomatous inflammation, which included neutrophils, lymphocytes, and multinucleated giant cells. On the Haematoxylin and Eosin (H&E) stain, the internal structure and texture of the grains were distinctively characteristic of Eumycetoma. In contrast to Actinomycetoma grains, which typically display fine, delicate bacterial filaments or a homogenous glazed appearance (eg, S. somaliensis), the grains in this case revealed broad, septate fungal hyphae embedded within a hard cement matrix (Figure 1), leading to the final diagnosis. No signs of malignancy were present.

Post-Operative Course and Outcome

The patient had a smooth post-operative recovery and was discharged on the same day. During follow-up, the wound was clean and healing well. The sutures were removed 10 days after the procedure without complications. The patient recovered well with no signs of early recurrence (Figure 2).

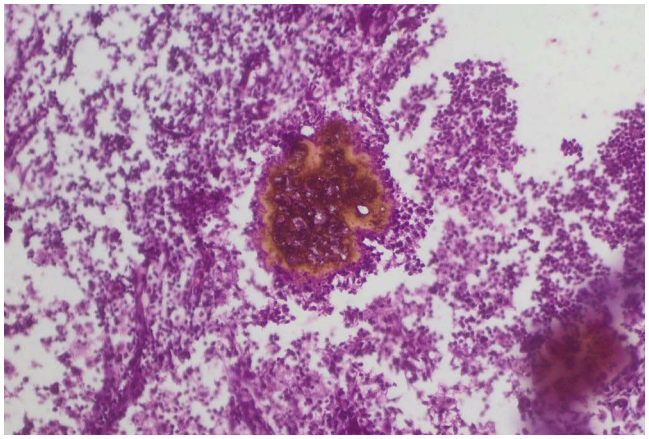

Figure 1 Histopathology of the excised wrist lesion.

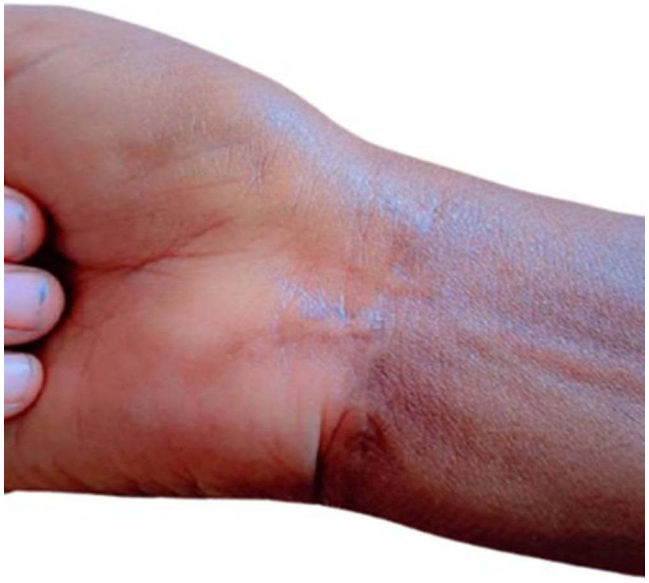

Figure 2 Healed surgical scar on the wrist after the excision of the long-standing eumycetoma.

https://doi.org/10.2147/IMCRJ.S565197

Discussion

This case highlights a classic presentation of eumycetoma. The patient, residing in an endemic region, presented with the characteristic triad of a chronic subcutaneous swelling, draining sinuses, and the discharge of colored grains (black in this case). The three-year duration is typical for this slow-growing disease.[12] The location on the hand is common, as extremities are most prone to the minor trauma that facilitates inoculation.[13]

Somalia is situated firmly within the trans-African "Mycetoma Belt", a geographical zone characterized by an arid climate and specific vegetation that favors the growth of causative organisms.[6,14] Despite being an endemic hotspot, epidemiological data from Somalia remains scarce due to underreporting. In our setting, diagnosis relied on clinical presentation and histopathology. Ideally, definitive identification involves fungal culture and molecular diagnostics, such as PCR and gene sequencing of the ITS regions.[15] Although these tools were unavailable in this case, mentioning them highlights the need for capacity building in local laboratories.

The histopathology was the definitive diagnostic tool, and the microscopic findings revealed organized fungal colonies (grains) surrounded by a significant host inflammatory response, including a neutrophilic abscess and a surrounding granulomatous reaction, are pathognomonic for mycetoma. Although definitive species identification requires culture or molecular analysis, the histopathological features in this case allow for a presumptive identification of the etiological agent. The observation of black grains narrows the differential diagnosis to dematiaceous fungi (Eumycetoma).[16] Furthermore, the microscopic appearance of the grains specifically the presence of broad, septate fungal hyphae embedded within a hard cement matrix is morphologically characteristic of Madurella mycetomatis (Figure 1). This specific architectural pattern distinguishes it from other black-grain causative agents, such as Trematosphaeria grisea (formerly Madurella grisea), which typically lacks this extensive cement formation. Combined with the epidemiological context of Somalia, where M. mycetomatis is the predominant pathogen, the diagnosis is highly consistent with this specific fungal agent.

The management of mycetoma is challenging and depends on the causative agent and extent of the disease.[17] Actinomycetoma generally responds well to long-term antibiotic therapy.[18] Eumycetoma, however, is notoriously difficult to treat with medical therapy alone, often requiring a combination of prolonged antifungal agents (eg, itraconazole, ketoconazole) and surgery.[19] For small, well-encapsulated eumycetoma lesions, complete surgical excision can be curative, as demonstrated in this case.[20] Finally, the patient underwent wide local excision with no signs of recurrence during follow-up. However, considering the high recurrence rates of eumycetoma, we interpret this as a successful clinical management rather than a definitive cure, which would require a disease-free surveillance period of at least three years. The "en bloc" excision, which removes the entire lesion with a margin of healthy tissue, is crucial to prevent recurrence from residual grains.[21]

In the context of a resource-limited setting like rural Somalia, access to fungal culture, speciation, and long-term, expensive antifungal therapy is often restricted. In such scenarios, early detection and aggressive surgical management of localized disease represent the most viable and effective treatment strategy. The successful outcome in our patient, managed with surgery alone, reinforces the value of this approach.

Conclusion

Eumycetoma remains a significant health issue in endemic areas. This case report demonstrates the classic clinical presentation and the pivotal role of histopathology in confirming the diagnosis. It further highlights that for localized eumycetoma, complete surgical excision is a highly effective, and often curative, treatment modality, particularly in settings where comprehensive medical therapies are not readily available.

Ethical Considerations

This case report was conducted with ethical approval obtained from the Ethics Committee of Jamhuriya University of Science and Technology. According to institutional policy, additional ethical approval was not required for the publication of a single case report.

Consent for Publication

Written informed consent was obtained from the patient for the publication of this case report and any accompanying images.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors report no conflicts of interest in this work.

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