Case Report

INTERNATIONAL JOURNAL OF SURGERY CASE REPORTS

OPEN

Knee eumycetoma in Cameroon: diagnostic challenges and therapeutic management of a rare localization – a case report

Elvis Antibé, MD[a,b,*], Loïc Fonkoué, MD, PhD[a,c], Kennedy Olivier Muluem, MD[a,c], Cédric Dongmo, MD[a,b], Thomas Schubert, MD, PhD[b,d], Olivier Cornu, MD, PhD[b,d]

Introduction: Mycetoma is a chronic, destructive infectious disease affecting the skin, subcutaneous tissues, and bone. It is caused by filamentous fungi (eumycetoma) or actinomycetes (actinomycetoma) and is characterized by grain formation. Although endemic in tropical and subtropical regions known as the "mycetoma belt," Cameroon is not included in this area, which may contribute to diagnostic delays in non-endemic settings.

Presentation of case: We report the case of a 50-year-old man from Cameroon presenting with a chronic fistulizing knee swelling associated with black-grain discharge, evolving over more than 1 year. Despite investigations, the diagnosis remained challenging. Clinical and paraclinical findings confirmed eumycetoma. The patient underwent marginal excision followed by split-thickness skin grafting and received adjuvant itraconazole therapy. At 36 months of follow-up, no recurrence was observed, and clinical outcomes were satisfactory.

Discussion: Knee involvement in eumycetoma is rare and may mimic soft tissue tumors, leading to diagnostic delays, especially in non-endemic settings. Although typically associated with rural exposure in tropical regions, mycetoma should not be excluded based solely on atypical epidemiological features. Fistulization with black grains remains a key diagnostic clue, while imaging may be misleading, and histopathological confirmation is essential. Management relies on surgical excision with adequate margins, often requiring reconstructive procedures, combined with prolonged antifungal therapy and long-term follow-up due to recurrence risk.

Conclusion: This case highlights the occurrence of mycetoma in non-endemic regions and underscores the importance of early recognition to reduce diagnostic delay and improve outcomes. Increased awareness among clinicians is essential to ensure timely diagnosis and appropriate management.

Keywords: black grains, Cameroun, rapport de cas, eumycetoma, Infection du genou, Mycétome

Introduction

Mycetoma is a chronic, progressively destructive infectious disease involving the skin, subcutaneous tissues, and occasionally bone, caused by fungi (eumycetoma) or actinomycetes (actinomycetoma) and characterized by the formation of grains[1]. It is endemic in tropical and subtropical regions known as the "mycetoma belt" and was recognized by the World Health Organization as a neglected tropical disease in 2016[2]. Although traditionally associated with rural populations in endemic areas, mycetoma may occur in non-endemic settings and remains frequently underdiagnosed, resulting in delayed management. Knee involvement is uncommon, particularly in eumycetoma, and may mimic soft tissue tumors, representing a diagnostic challenge[2]. We report a rare case of fungal mycetoma of the knee in a Cameroonian patient, highlighting the diagnostic difficulties and therapeutic challenges of managing this condition outside traditionally endemic regions. This case report has been prepared in line with the SCARE checklist[3].

HIGHLIGHTS

- Knee osteoarticular mycetoma is a rare and challenging clinical entity.
- A high index of suspicion is required in non-endemic settings.
- Black grains and MRI findings contributed to an early diagnostic orientation.
- Surgical debridement combined with antifungal therapy provided successful control.
- No recurrence was observed after 36 months of follow-up.

[a]Faculty of Medicine and Biomedical Sciences, University of Yaoundé I, Yaoundé, Cameroon, [b]Institute of Experimental and Clinical Research (IREC), Neuro-MusculoSkeletal Laboratory (NMSK), UCLouvain, Brussels, Belgium, [c]Department of Orthopaedic and Trauma Surgery, Yaoundé General Hospital, Yaoundé, Cameroon and [d]Department of Orthopaedic and Trauma Surgery, Cliniques Universitaires Saint-Luc, UCLouvain, Brussels, Belgium

Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article.

*Corresponding author. Address: Department of Orthopaedic and Trauma Surgery, Neuro-MusculoSkeletal Laboratory (NMSK), Institute of Experimental and Clinical Research (IREC), UCLouvain c/o Banque de tissus, Cliniques universitaires Saint-Luc Avenue Hippocrate 10 1200 Bruxelles, Belgique. Tel.:+32 466 17 88 51. E-mail: elvis.antibe@uclouvain.be (E. Antibé Mbatounga).

Copyright © 2026 The Author(s). Published by Wolters Kluwer Health, LLC. This is an open access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

International Journal of Surgery Case Reports (2026) 00:1–5

Received 30 July 2026; Accepted 13 October 2026

Published online 6 November 2026

http://dx.doi.org/10.1097/RC9.0000000000001241

Table 1

Timeline of events.

Timeline	Clinical event
February 2022	Onset of progressive right knee swelling associated with pain and progressive limitation of flexion
February–December 2022	Traditional treatment without improvement, followed by multiple medical consultations
Early 2023	Referral to an oncology unit due to suspicion of soft tissue tumor
Early 2023	MRI showing a well-defined soft tissue mass without bone involvement and the characteristic "dot-in-circle" sign
Early 2023	Referral for incisional biopsy
Early 2023	Clinical appearance of fistula with seropurulent discharge containing black grains suggestive of eumycetoma
March–April 2023	En bloc surgical excision of the lesion (30 × 10 × 7 cm) with preservation of the popliteal neurovascular bundle
Postoperative day 7	Partial skin necrosis requiring minimal debridement
May–June 2023	Delayed split-thickness skin grafting (≈ 6 weeks after excision)
2023–2024	Histopathological confirmation of eumycetoma and isolation of *Madurella* spp.
12 months post-op (2024)	Completion of itraconazole therapy (200 mg/day)
May 2026	36-month follow-up with no recurrence and preserved knee function

Case presentation (Table 1)

We report the case of a 50-year-old male driver from an urban area in northern Cameroon, referred with an enlarging right knee mass that had been evolving for more than 1 year, associated with progressive limitation of flexion (Fig. 1A). The patient initially received traditional treatment without improvement, followed by multiple medical consultations, including referral to an oncology unit. Medical history revealed no prior trauma and no travel to areas endemic for mycetoma. Clinical examination revealed a firm, homogeneous 30 cm mass involving the right knee, without regional lymphadenopathy. The presence of a fistula discharging seropurulent material with black grains (Fig. 1B,C) was highly suggestive of fungal mycetoma. MRI revealed a well-defined soft-tissue mass without bone involvement, extending to the inferolateral thigh and in close proximity to the popliteal neurovascular bundle (Fig. 1D); MRI may also demonstrate the characteristic "dot-in-circle" sign, which is considered highly suggestive of mycetoma. A staging CT scan showed no evidence of distant disease.

Following standard skin preparation with povidone-iodine (Iso-Betadine®), the patient underwent surgery under spinal anesthesia. The lesion was excised en bloc with macroscopically healthy margins, measuring 30 × 10 × 7 cm (Fig. 2), while preserving the popliteal neurovascular bundle. Partial skin necrosis developed on postoperative day 7 and was managed with limited



Figure 1. Clinical presentation and magnetic resonance imaging findings of knee mycetoma. (A) An anterior knee mass. (B) A sinus tract overlying the lesion, discharging seropurulent material containing black grains. (C) Black grains discharged from the sinus tract. (D) Axial and sagittal magnetic resonance imaging (MRI) demonstrating the characteristic "dot-in-circle" sign (yellow arrows).

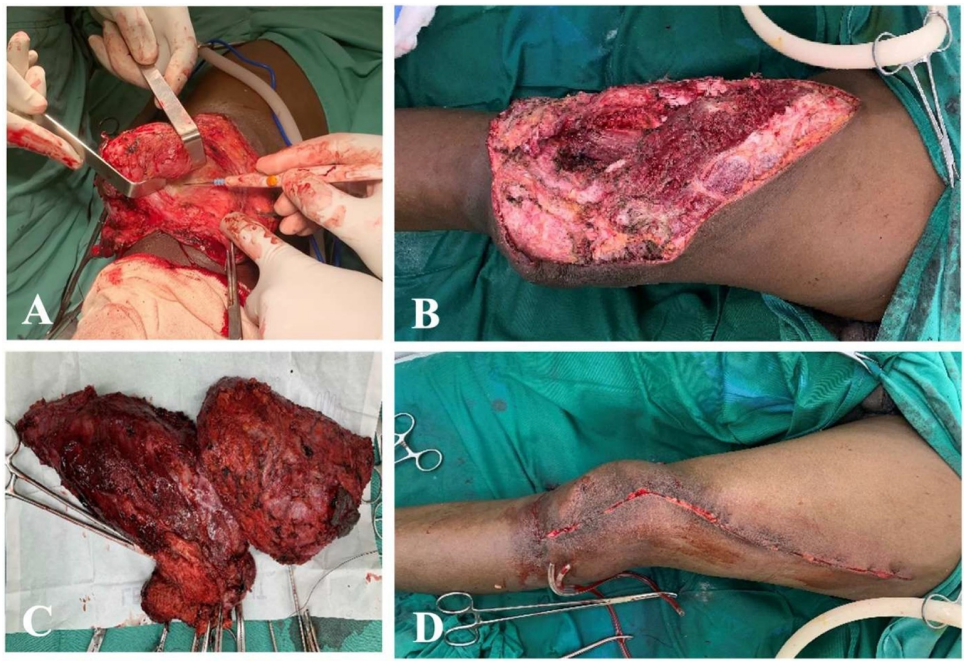


Figure 2. Intraoperative steps of en bloc excision of knee mycetoma. (A) En bloc surgical excision of the lesion. (B) Surgical defect following complete tumor excision. (C) Excised mass measuring 30 × 10 × 7 cm displayed on the operating table. (D) Final wound closure after resection.

surgical debridement. Delayed split-thickness skin grafting was subsequently performed 42 days after the initial surgery (Fig. 3A). Following grafting, the knee was immobilized in full extension using a brace for 4 weeks to minimize tension on the graft. Progressive passive flexion–extension physiotherapy was then initiated three times weekly for 6 weeks to progressively restore the knee's range of motion.

Histopathological examination demonstrated granulomatous inflammation surrounding black fungal grains consistent with eumycetoma, with Periodic acid–Schiff and Grocott methenamine silver staining highlighting septate fungal hyphae; these findings confirmed mycetoma. A fungal culture performed on Sabouraud agar subsequently isolated *Madurella* spp., while species-level molecular identification was not available. The patient received adjuvant itraconazole (200 mg/day) for 12 months.

At the 36-month follow-up, there was no evidence of recurrence or functional impairment, with preserved knee flexion allowing the patient to assume a prayer position (Fig. 3B,C).

Discussion

Mycetoma is a chronic, progressively destructive infectious disease caused by fungi or actinomycetes, typically affecting subcutaneous tissues and sometimes bone. Its distribution is



Figure 3. Postoperative wound healing following excision of the knee mycetoma and split-thickness skin grafting. (A) Wound appearance 7 days after split-thickness skin grafting. (B) Healed surgical site at 1 month postoperatively. (C) Clinical appearance at a 36-month follow-up, demonstrating complete wound healing, full restoration of knee function (prayer position), and no evidence of local recurrence.

Table 2

Summary of published cases of knee mycetoma.

Author	Country	Causative organism	Treatment	Outcome
Mohamed *et al*, 2016[9]	Khartoum, Soudan	*Madurella mycetomatis*	Ketoconazole 800 mg/day, wide surgical excision, skin grafting, voriconazole 800 mg/day, itraconazole 800 mg/day	Massive locoregional recurrence with pulmonary extension
Sarr *et al*, 2019[10]	Dakar, Senegal	Black-grain fungal mycetoma, species not specified	Lower-limb amputation, with hip disarticulation occasionally considered; no details regarding antifungal therapy were provided in the abstract.	Recurrence at the amputation stump
Diongue *et al*, 2021[11]	Louga, Senegal	*M. mycetomatis*	Supracondylar amputation, amoxicillin–clavulanic acid, terbinafine	Death within one month
Singh *et al*, 2022[12]	Jodhpur, India	Eumycetoma, organism not specified	Local excision combined with 6 months of antifungal therapy	Favorable outcome with no recurrence at 13 months
Panday *et al*, 2024[13]	Indore, India	*M. mycetomatis*	Curettage, excision, and antifungal therapy for 6 months before and after surgery	Favorable evolution at 6 months follow-up

classically concentrated in tropical regions known as the "mycetoma belt," with *Madurella mycetomatis* being strongly associated with semi-arid climates such as those of Chad and northern Cameroon[1,4]. Although Cameroon is not traditionally considered endemic for mycetoma, its ecological proximity to endemic zones and the increasing number of reported cases suggest that local transmission is occurring or that the condition is underrecognized. The disease predominantly affects young adult males engaged in rural agropastoral activities, where repetitive minor trauma facilitates inoculation[5]. However, the present case is notable for its urban setting, highlighting that exposure history alone is insufficient to exclude the diagnosis. This suggests that mycetoma should not be excluded solely on the basis of an atypical epidemiological profile[6].

Knee involvement is uncommon (6–8%) and usually associated with actinomycetoma rather than eumycetoma[1,7]. In the published literature from Africa and other parts of the world, fungal knee mycetoma remains rare[8]; nevertheless, the clinical characteristics, causative organisms, treatment modalities, and outcomes of previously reported cases of knee mycetoma are summarized in Table 2[9–13]. Such atypical extrapodal localizations significantly increase the risk of misdiagnosis, particularly when presenting as a slowly growing soft tissue mass, often leading to initial suspicion of neoplastic disease, as illustrated in our patient's diagnostic pathway; in this context, the differential diagnosis included soft tissue sarcoma, chronic bacterial abscess, tuberculous infection, and actinomycetoma, while the slow progression, fistulization, and black grains strongly favored eumycetoma. The presence of fistulization with black grains remains a key diagnostic hallmark and should prompt early suspicion, even in non-endemic settings[5]. Imaging findings may be misleading, as mycetoma can mimic soft tissue tumors with well-defined margins and variable extension[14]. Definitive diagnosis relies on histopathology and culture, which remain essential for species identification and therapeutic guidance[15].

Surgical management remains challenging, as complete en bloc excision with clear margins is crucial to minimize recurrence due to retained grains. Reported recurrence rates remain significant, ranging from 2% to over 10% depending on the extent of resection[8,16]. Extensive soft tissue excision often necessitates complex reconstruction, with potential complications such as wound necrosis, as observed in our case. Adjuvant antifungal therapy with itraconazole has demonstrated efficacy in eumycetoma, although optimal regimens and treatment durations remain non-standardized[17]. Alternative agents and combination therapies have been reported with variable success[18], underscoring the absence of consensus in medical management. Long-term follow-up is essential given the risk of late recurrence; however, loss to follow-up remains a major limitation in endemic and resource-limited settings.

Strengths and limitations

This case highlights the rare occurrence of knee eumycetoma in a non-endemic setting and demonstrates successful long-term outcomes following complete surgical excision and prolonged antifungal therapy. The diagnosis was supported by clinical, imaging, histopathological, and microbiological findings. However, species-level molecular identification and antifungal susceptibility testing were unavailable. As a single case report, the findings cannot be generalized and should be interpreted with caution.

Conclusion

This case underscores that mycetoma should be considered in the differential diagnosis of any chronic, fistulizing soft tissue mass, even in urban and non-endemic settings. A high index of suspicion, combined with early histological confirmation, is critical to avoid diagnostic delay and prevent advanced disease requiring extensive surgery. Increasing clinical awareness is essential to improving early recognition and outcomes of this neglected condition.

Ethical approval

Written informed consent was obtained from the patient for the publication of this case report and the accompanying clinical and imaging data. Patient anonymity and confidentiality were strictly respected in accordance with the ethical principles of the Declaration of Helsinki.

Consent

Written informed consent was obtained from the patient for the publication of this case report and the accompanying clinical and imaging data.

Sources of funding

This work was supported by the Commission de l'Action Internationale (CAI), UCLouvain, Belgium (Dr. Antibé, Dr. Dongmo, and Dr. Fonkoué).

Author contributions

E.A.: Conceptualization, methodology, investigation, data curation, writing-original draft. K.O.M., C.D., and T.S.: Writing-review & editing. L.F. and O.C.: Supervision, conceptualization, writing-review & editing.

Conflicts of interest disclosure

The authors declare that there are no conflicts of interest related to this study. The opinions and findings presented in this article are those of the authors and do not necessarily reflect the views or policies of the institution with which they are affiliated.

Research registration unique identifying number (UIN)

Not applicable, as this is a case report.

Guarantor

Elvis Antibé Mbatounga.

Provenance and peer review

This article was not commissioned and was externally peer-reviewed.

Data availability statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the author(s) used ChatGPT (OpenAI, San Francisco, CA) in order to assist with language refinement. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Acknowledgements

Not applicable.

References

[1] Zijlstra EE, van de Sande WWJ, Welsh O, *et al*. Mycetoma: a unique neglected tropical disease. Lancet Infect Dis 2016;16:100–12.
[2] Salah ME, Fearon Scales ML, Habib K, *et al*. Global sociodemographic, clinical, and epidemiological profiling of patients with mycetoma: a systematic review. PLoS Negl Trop Dis 2025;19:e0013217.
[3] Kerwan A, Al-Jabir A, Mathew G, *et al*. Revised Surgical CAse REport (SCARE) guideline: an update for the age of Artificial Intelligence. Prem J Sci 2025;10:100079.
[4] Emery D, Denning DW. The global distribution of actinomycetoma and eumycetoma. PLoS Negl Trop Dis 2020;14:e0008397.
[5] Fahal AH, Bakhiet SM. Mycetoma and the environment. PLoS Negl Trop Dis 2023;17:e0011736.
[6] Chandler DJ, Escalante L, Maldonado A, *et al*. Mycetoma in Ecuador. Trans R Soc Trop Med Hyg 2024;118:339–42.
[7] van de Sande WWJ. Global burden of human mycetoma: a systematic review and meta-analysis. PLoS Negl Trop Dis 2013;7:e2550.
[8] Escalopier N, Choufani C, Grosset A, *et al*. Traitement des mycétomes au Tchad: experience de l'antenne médico-chirurgicale française déployée à N'Djamena. Médecine Et Santé Tropicales 2019;29:164–69.
[9] Mohamed E. Din N. and Fahal A. Multiple mycetoma lung secondaries from knee eumycetoma: an unusual complication. PLoS Negl Trop Dis 2016;10:e0004767.
[10] Sarr L, Dembélé B, Limam M, *et al*. Recidives of mycetoma after amputation in Dakar (Senegal). Bull Louisiana Soc Pathol Exot 2019;112:195–201.
[11] Diongue K, Diallo M, Sarr L, *et al*. Pulmonary Madurella mycetomatis mycetoma secondary to knee eumycetoma, Senegal. PLoS Negl Trop Dis 2021;15:e0009848.
[12] Singh B, Gehlot R, Saxena M, *et al*. An unusual presentation of mycetoma around knee joint as a subcutaneous mass – a case report. J Orthop Case Rep 2022;12:22–25.
[13] Bagwala JH, Patidar S, Panday A, *et al*. An atypical manifestation of mycetoma around knee joint – a case report. Indian J Orthop Surg 2024;10:386–90.
[14] Sarris I, Berendt AR, Athanasous N, *et al*. MRI of mycetoma of the foot: two cases demonstrating the "dot-in-circle" sign. Radiology 2003;226:803–08.
[15] Ahmed SA, van den Ende BH, Fahal AH, *et al*. Rapid identification of black grain eumycetoma causative agents using rolling circle amplification. PLoS Negl Trop Dis 2014;8:e3368.
[16] Emmanuel P, Dumre SP, John S, *et al*. Mycetoma: a clinical dilemma in resource limited settings. Ann Clin Microbiol Antimicrob 2018;17:35.
[17] Hussein SME, Saeed AA, Fahal AH. Mycetoma management: therapeutic challenges and the role of pharmacovigilance. PLoS Negl Trop Dis 2025;19:e0012827.
[18] Welsh O, Al-Abdely HM, Salinas-Carmona MC, *et al*. Mycetoma medical therapy. PLos Negl Trop Dis 2014;8:e318.