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A Case of Primary Cutaneous Candidiasis of the Foot Mimicking Madura Foot Caused by Candida parapsilosis in a 47-Year-Old Female

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Abstract:

Background:
Mycetoma is a chronic granulomatous infection caused by fungi or filamentous bacteria, typically presenting with tumefaction, draining sinuses, and granule formation. Other deep fungal infections may mimic its clinical presentation. Candida parapsilosis is an opportunistic yeast that usually causes superficial infections, and primary cutaneous candidiasis is rare, particularly in immunocompetent individuals.
Case Presentation:
We report a 47-year-old Filipino female with a four-year history of a verrucous exophytic mass with black grains and reddish globules on the plantar foot initially suspected as eumycetoma. Histopathology revealed pseudoepitheliomatous hyperplasia with granulomatous inflammation, while fungal culture and automated identification confirmed Candida parapsilosis. Antifungal susceptibility testing demonstrated resistance to fluconazole and voriconazole but susceptibility to echinocandins and amphotericin B. Due to limited resources, patient was treated with itraconazole 200 mg daily for 6 months, resulting in symptomatic improvement
Conclusion:
This case highlights the importance of considering Candida parapsilosis infection in chronic verrucous foot lesions resembling mycetoma. Culture and susceptibility testing remain essential to ensure accurate diagnosis and guide appropriate antifungal management.

Keywords:

Candidal Granuloma, Candida parapsilosis, Madura Foot

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Introduction

Mycetoma, also known as Madura foot, is a chronic, subcutaneous granulomatous infection caused by true fungi (eumycetoma) or filamentous bacteria (actinomycetoma) presenting classically as a triad of tumefaction, fistulization of the abscess, and extrusion of colored grains [1]. However, its clinical presentation may be similar to that of other persistent cutaneous diseases or deep fungal infections.

Candida species are opportunistic yeasts, most frequently causing superficial infections such as intertrigo and onychomycosis [2]. Primary cutaneous candidiasis presenting as a verrucous mass resembling mycetoma is exceedingly rare. Among Candida spp., Candida parapsilosis is of particular interest because of its increasing association with cutaneous and invasive disease [3]. Compared to C. albicans, C. parapsilosis usually causes less severe disease, but emerging resistance to echinocandins and azoles can complicate treatment decisions [4].

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Timeline

Timeline of Clinical Course	Clinical Events
4 years before consultation	Verrucous papule on plantar right foot with mild pruritus
2 years before consultation	Papule enlarged into a plaque transforming to an exophytic mass with reddish globules, black deposits, and thick scales
1 year before consultation	Progressive increase in reddish globules and black deposits
Day of consultation	A 6 x 5 x 2 cm verrucous exophytic mass on the plantar foot; firm and hard; reddish globules with black grains KOH negative; Gram stain revealed gram positive branching fungal elements Provisional Diagnosis: Eumycetoma
Initial management	Empirical oral itraconazole 200 mg twice daily started
Biopsy results	Granulomatous Dermatitis suggestive of Chronic Fungal Infection; Orthokeratosis, parakeratosis, pseudoepitheliomatous hyperplasia, hypergranulosis, well-defined caseating granuloma formation composed of lymphocytes, histiocytes, eosinophils and plasma cells
Culture results at 13 days incubation	Saboraud Dextrose Agar: creamy yeast colonies; white powder mold colonies Lactophenol Cotton Blue stain: hyaline branching hyphae; double walled yeast Germ tube test: negative
Organism identification	VITEK® 2 and conventional methods: *Candida parapsilosis*
Antifungal susceptibility	Susceptible: caspofungin, micafungin, amphotericin B Resistant: fluconazole, voriconazole
Management	Surgical excision with broad spectrum antifungal wound dressing + IV amphotericin given for 14 days
Follow-up	Monitor monthly with lesion size, resolution of

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	symptoms, and recurrence

Case Report

A 47-year-old Filipino female presented with a verrucous exophytic mass on the plantar surface of the right foot. The lesion began four years prior as a verrucous papule associated with mild pruritus. Two years before presentation, the papule gradually increased in size, progressing to a plaque and subsequently to an exophytic mass characterized by reddish globules, black deposits, and thick scales. These changes were accompanied by persistent pruritus and discomfort during ambulation. One year prior to consultation, the lesion persisted with an increasing number of reddish globules and black deposits. The patient denied any history of prior trauma, systemic disease, or medication use.

On examination, the mass measured 6 × 5 x 2 cm, was firm and hard, and exhibited reddish globules with black grains on the surface (**Figures 1, 2 & 3**). Potassium hydroxide (KOH) preparation of superficial scales was negative. X-ray findings of the right foot showed lobulated soft tissue mass from mid to distal right foot with no evidence of osteomyelitis (**Figure 4**). Gram staining of the reddish globules, however, revealed gram-positive branching fungal hyphal elements (**Figure 5**). Based on the clinical presentation and preliminary findings, a working diagnosis of eumycetoma (Madura foot) was considered. Empirical antifungal therapy with oral itraconazole 200 mg twice daily was initiated, with baseline laboratory monitoring, while awaiting histopathological and culture results.

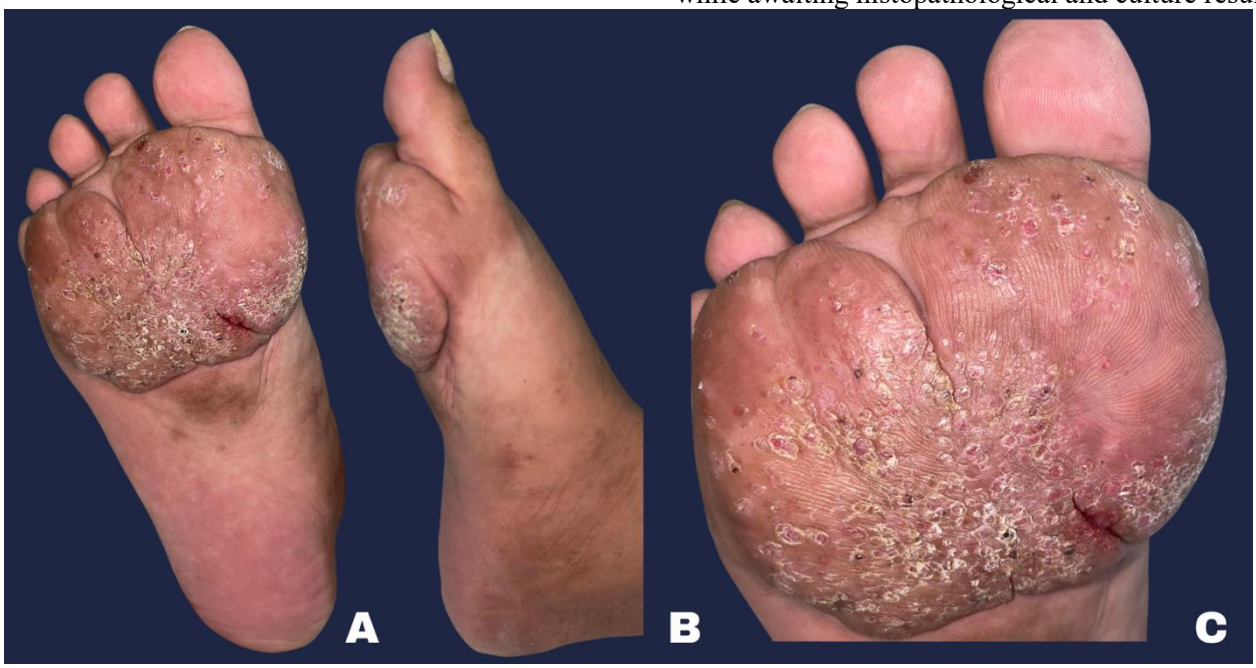

Figure 1. Dermatologic Findings: Plantar and medial view of the verrucous exophytic mass of the right foot **(Figure 1 A & B).** Close-up view of the exophytic mass described as solitary well defined, firm mass with reddish globules and black deposits on the mid to distal right foot **(Figure 1 C).**

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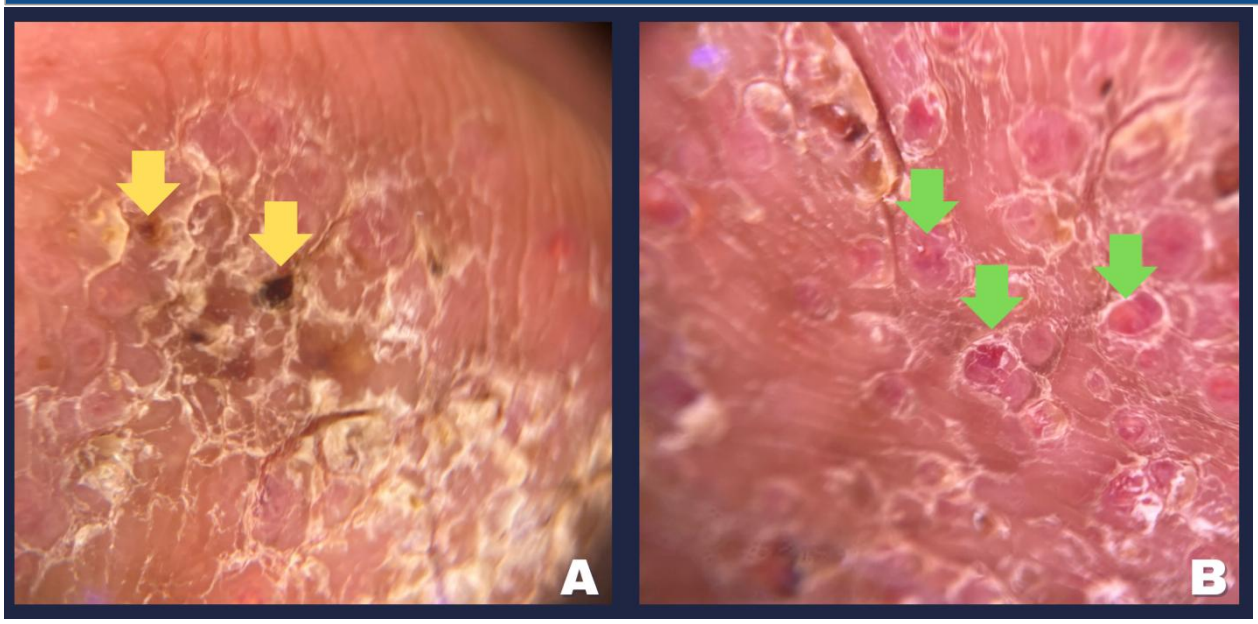

Figure 2. Dermoscopic Findings: Brown-black grains (yellow arrow) (**Figure 2 A**) and reddish globules with peripheral scales (green arrow) **(Figure 2 B).**

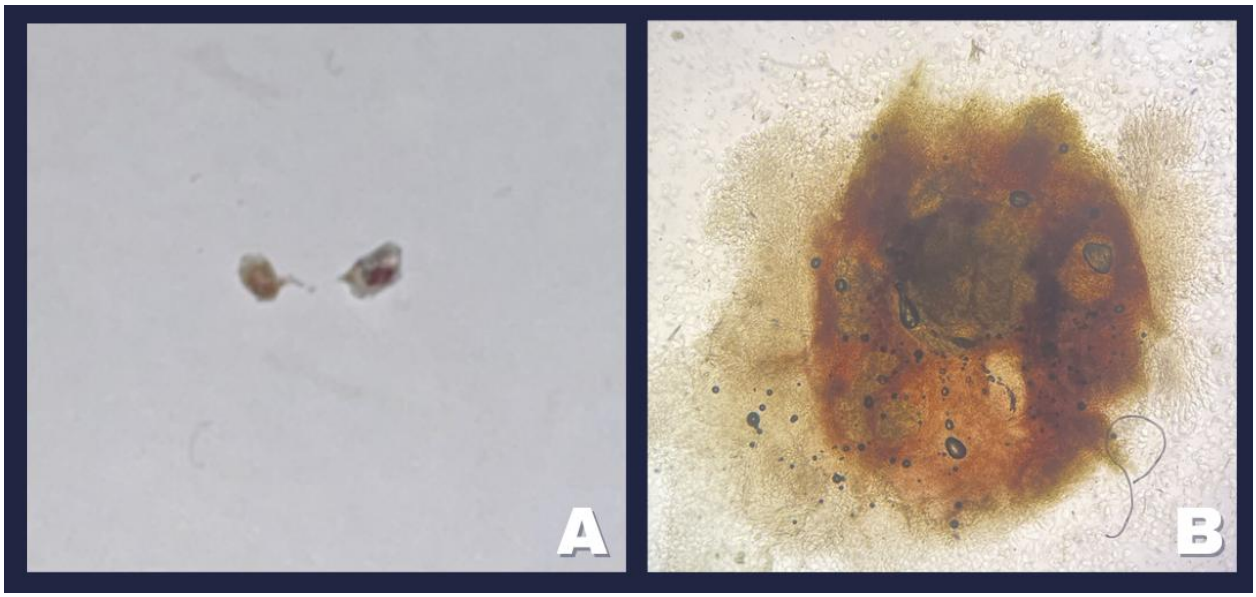

Figure 3. Grain: Brown-black grains extracted from the mas **(Figure 3 A).** 4x magnification of the grain showing compact collections of keratinocytes with yellowish to brown pigment **(Figure 3 B)**.

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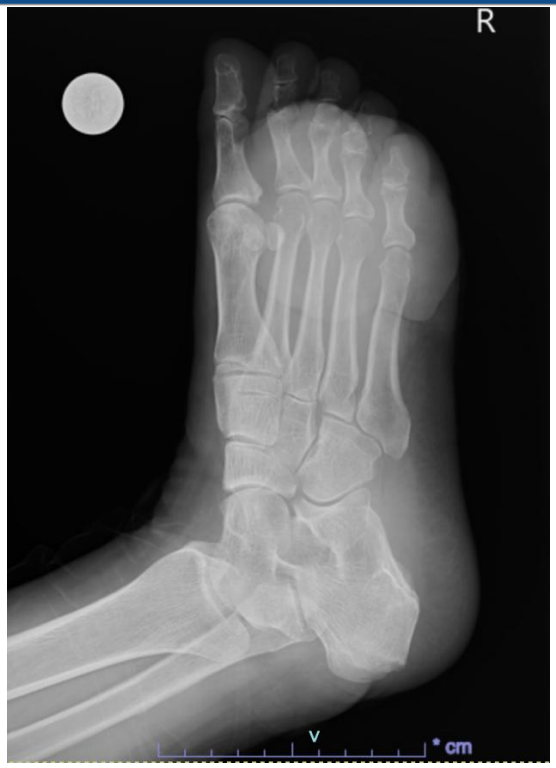

Figure 4. X-ray of the Foot, Right APL view: Lobulated soft tissue mass on the mid to distal right foot. Cortical outline and trabecular pattern of the bones are intact.

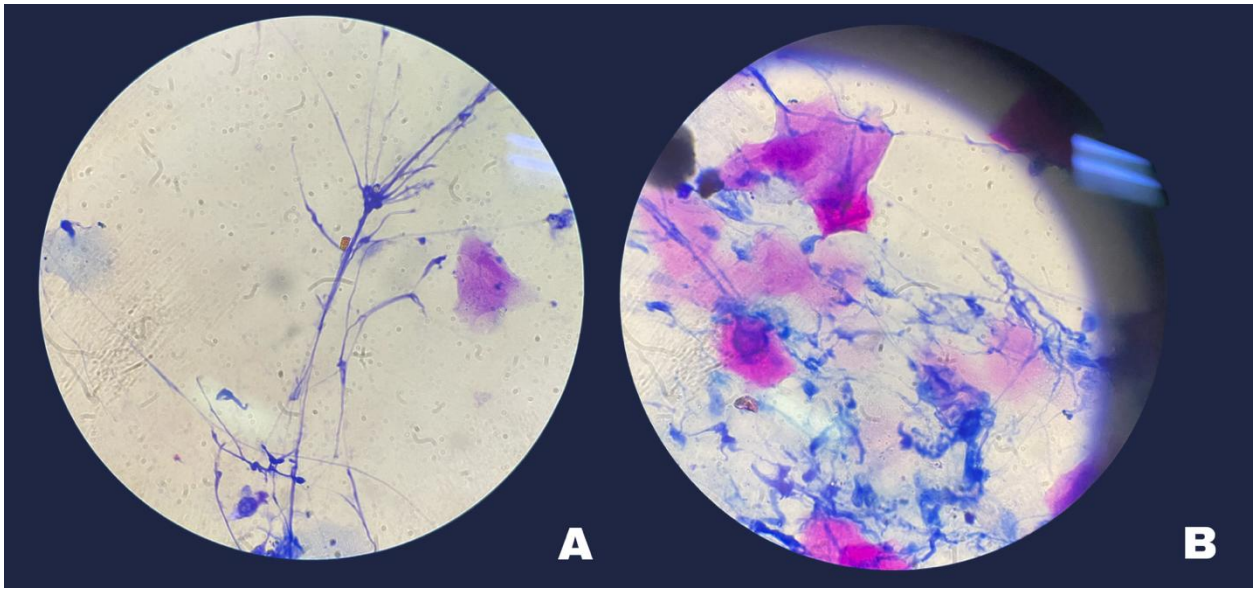

Figure 5. Gram Stain of the tissue: Gram positive branching fungal hyphal elements (**Figure 5 A & B).** Skin punch biopsy revealed sections showing orthokeratosis with parakeratosis overlying an epidermis exhibiting pseudoepitheliomatous hyperplasia and hypergranulosis (**Figure 6 A**). In the dermis, there were a few well-defined caseating granulomas composed of lymphocytes, histiocytes, eosinophils and plasma cells (**Figure 6 B**). Multiple dilated blood vessels and extravasated erythrocytes were likewise seen.

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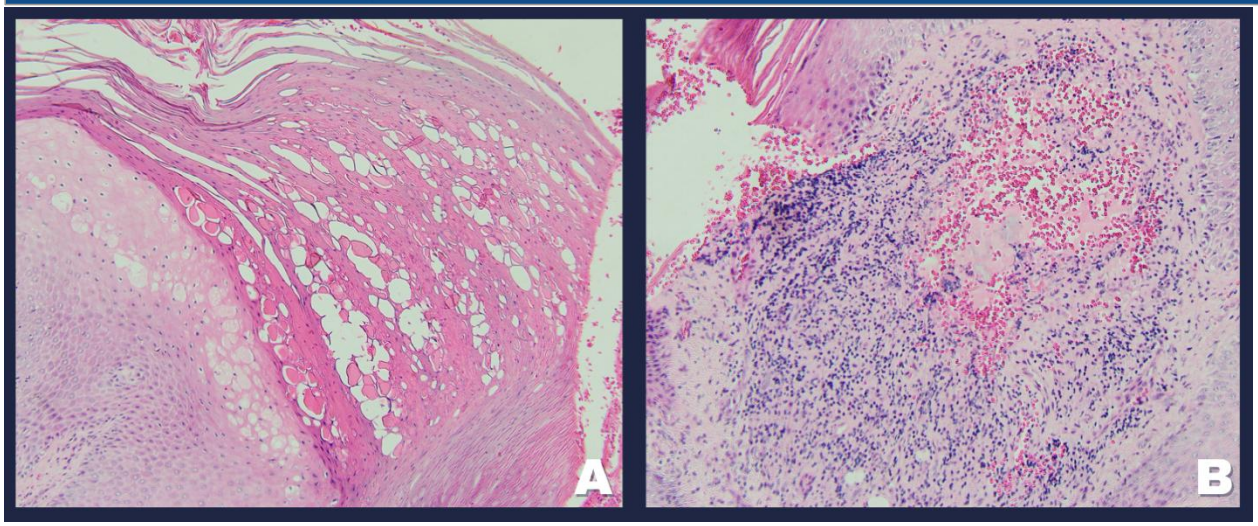

Figure 6. Histopathology: 40x magnification. Epidermis showing pseudoepitheliomatous hyperplasia with orthokeratosis with focal parakeratosis (**Figure 5 A**). Well-defined caseating granuloma formation composed of lymphocytes, histiocytes, eosinophils and plasma cells in the dermis (**Figure 5 B**).

After 13 days of incubation on Sabouraud Dextrose Agar at 20 °C and 35 °C, yeast colonies were described as creamy, soft, and smooth, while mold colonies appeared white and powdery (**Figure 7 A & B**). Microscopic examination with Lactophenol Cotton Blue staining demonstrated multiple hyaline branching hyphae and double-walled yeast forms (**Figure 8 A & B**). A germ tube test was negative. Organism identification was carried out using conventional macroscopic and microscopic morphology for the mold, while the VITEK® 2 automated identification system was used for the yeast. The isolate was identified as *Candida parapsilosis*. Antifungal susceptibility testing showed that the isolate was susceptible to caspofungin (MIC: 0.5 µg/mL), micafungin (MIC: 0.5 µg/mL), and amphotericin B (MIC: 0.5 µg/mL), but resistant to fluconazole (MIC: 32 µg/mL) and voriconazole (MIC: 1 µg/mL).

Patient was treated with oral antifungal through Itraconazole 200 mg daily with monthly monitoring of liver enzymes and complete blood count. Due to limited access and resources to healthcare, she was managed through telemedicine. After 1 month of treatment, she noted improvement and smoothening of the exophytic mass on the plantar area of the right foot (**Figure 9 A**). This was associated with improvement of pain especially on ambulation. With 2 months of consistent treatment with oral itraconazole, she claimed to have softening of the mass and decreasing pain (**Figure 9 B**). However, due to financial constraints and distance from area of healthcare facility, she was unable to follow-up.

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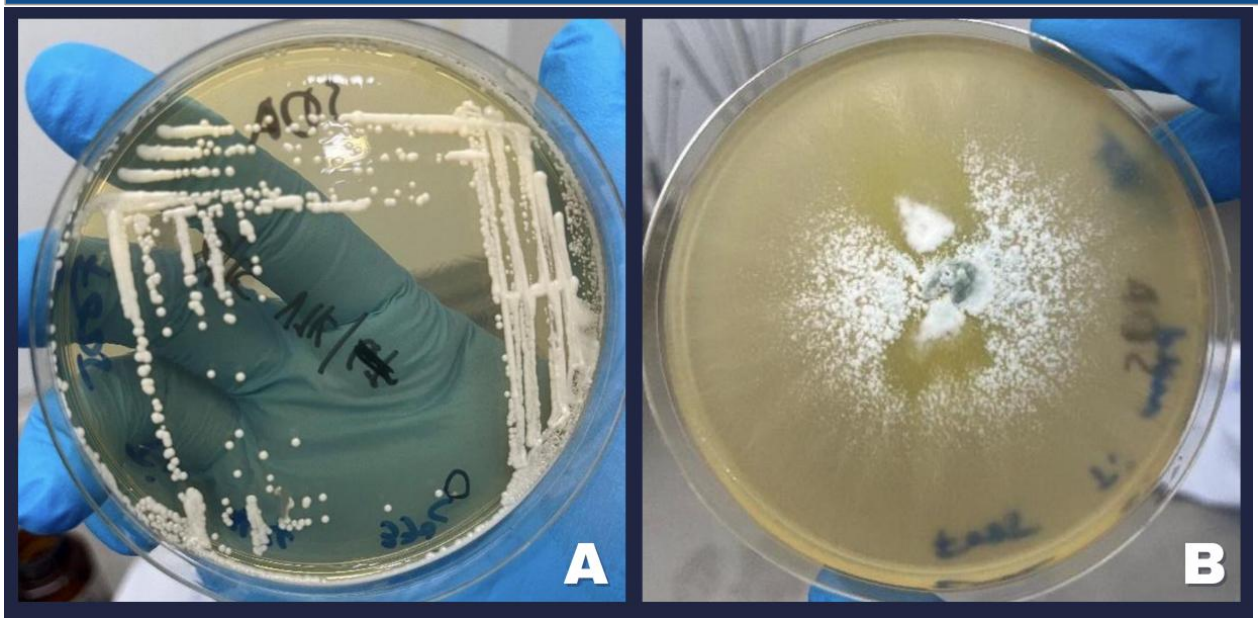

Figure 7. Fungal Culture: Growth of yeast in Saboraud Dextrose Agar incubated at 20 – 22 °C showing white creamy colonies (**Figure 7 A**). Growth of molds in Saboraud Dextrose Agar incubated at 35 - 37 °C showing white powdery colonies (**Figure 7 B**)

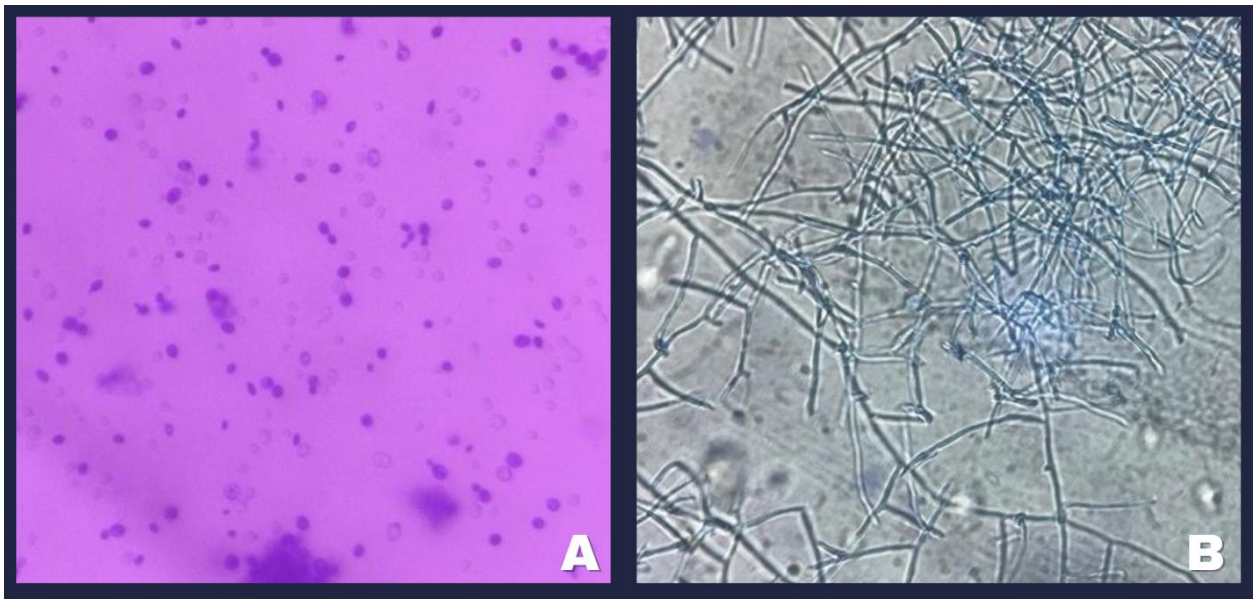

Figure 8. Lactophenol Cotton Blue Stain: 100x magnification. Round to oval yeast with narrow-based budding (**Figure 8 A**). Filamentous, septate hyaline hyphae with dichotomous branching (**Figure 8 B**).

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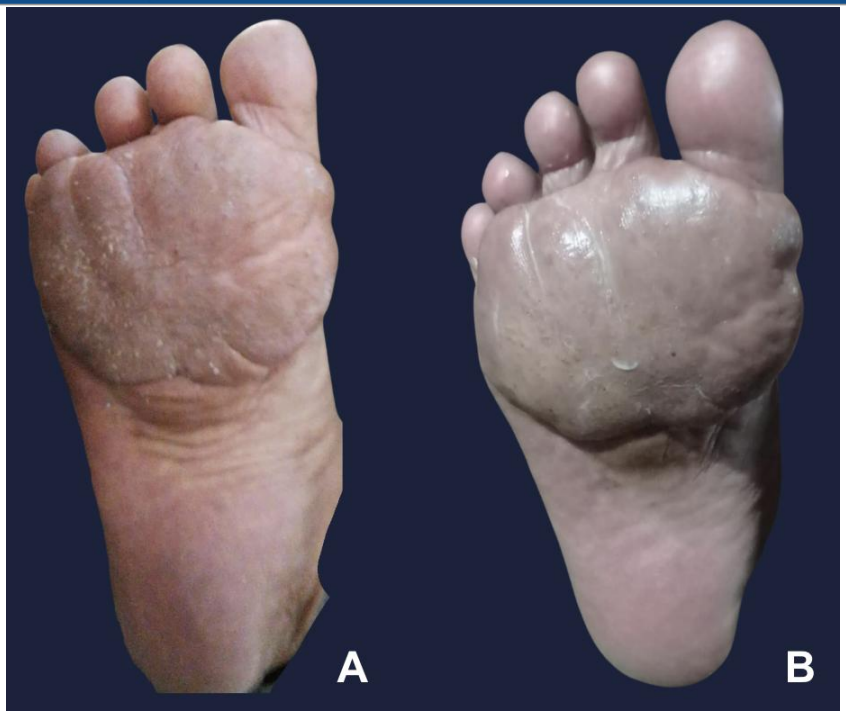

Figure 9. Post-treatment Photos: Plantar view of the right foot. 1 month post-treatment with Itraconazole (**Figure 9 A**). 2 months post-treatment (**Figure 9 B**). Both photos obtained through telemedicine.

Discussion

Candida parapsilosis is an opportunistic yeast that normally colonizes the skin and mucosal surfaces. Establishing a true infection requires identification from microscopy, fungal culture, and histopathology to differentiate it from simple colonization.

This case illustrates an unusual presentation of C. parapsilosis infection mimicking mycetoma (Madura foot) – a chronic granulomatous inflammatory disease caused by a true fungi (eumycetoma) or filamentous bacteria (actinomycetoma). Classically, mycetoma presentis with a triad of painless subcutaneous swelling, draining sinuses, and grains [5]. The case initially presented with a chronic verrucous exophytic mass with black deposits raising a clinical suspicion for mycetoma or Madura foot, a suspicion further supported by the endemicity of the disease in tropical countries [6]. However, the absence of draining sinuses and the confirmatory fungal culture results established the diagnosis of primary cutaneous candidiasis.
Histopathology revealed pseudoepitheliomatous hyperplasia with granulomatous inflammation, findings that reflect the chronic nature of the infection and the host immune response. While eumycetoma also present with granulomatous inflammation, it typically contains grains – aggregates of fungal or bacterial elements - which were absent in the patient's biopsy [5].

Although Candida albicans remains the most frequent pathogenic species, C. parapsilosis has emerged as a clinically significant pathogen in both cutaneous and systemic infections, attributed to its capacity for biofilm formation and its reduced susceptibility to azole antifungals [3,7]. Primary cutaneous candidiasis due to C. parapsilosis is rare as most documented cases occur in immunocompromised hosts. In this immunocompetent patient, infection was confirmed through both morphologic and automated molecular identification methods.

Antifungal agents are still the first line for the treatment of cutaneous candidiasis. In the patient's case management was further guided by antifungal susceptibility testing. The isolate demonstrated resistance to fluconazole and voriconazole but remained susceptible to echinocandins and amphotericin B, consistent with global reports of

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emerging azole resistance in C. parapsilosis [8]. These findings imply the importance of fungal culture and susceptibility testing in ensuring appropriate antifungal therapy and optimize patient outcomes.

With the challenges of limited resources, access to care and location in a far-flung area, oral itraconazole 100 mg was more readily available in the area. This was given at a dose of 200 mg daily for 6 months with monitoring of liver function tests and response through telemedicine.

If we are to regain communication with the patient, pretreatment with an oral itraconazole 200 mg daily will be commenced. Surgical debridement of the exophytic mass, to manage localized deep fungal infections, will then be done. Removal of necrotic tissue facilitates the penetration of immune cells such as macrophages and neutrophils, which, in conjunction with antifungal agents, enhance pathogen clearance [9]. After debridement, patient will be monitored in-hospital as intravenous amphotericin B will be administered at a dose of 30 mg once daily for 14 days. In addition, appropriate broad-spectrum antifungal wound care was applied using silver-containing non-adhesive for dressings. Following completion of the intravenous course, oral itraconazole 200 mg daily will be prescribed for 14 days. The patient will be monitored through weekly follow-ups over a 3-month period to assess treatment response, detect possible recurrence, evaluate medication-related adverse effects, and determine the overall clinical outcome.

Conclusions

We report a rare case of primary cutaneous candidiasis of the foot caused by *Candida parapsilosis* mimicking Madura foot in an immunocompetent hose. This case highlights the importance of considering non-mycetoma etiologies in chronic verrucous foot lesions. Histopathology and culture remain essential for definitive diagnosis. Rising azole resistance in *C. parapsilosis* emphasizes the need for antifungal susceptibility testing to guide therapy.

Patient consent for publication statement

Written informed consent was obtained from the patient described in this report.

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Conflict of Interest

The authors report no conflict of interest.

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