

A red, swollen and painful lesion on the right hand after local steroid injections

A 60-year-old woman with a history of trigger finger presented with a 2-week history of a swollen right middle finger. She had received local steroid injections twice for trigger finger 1 month before the visit. Unfortunately, the injection site became red, swollen and painful [Figure 1a]. No evidence of immunosuppression was proven by tests for human immunodeficiency virus, hepatitis B virus, hepatitis C virus and diabetes. She subsequently underwent local debridement. On incision, there was serosanguinous discharge and necrotic synovitis of the volar side of the right third metacarpal head region [Figure 1b]. Histopathological examination

revealed numerous spore-like microorganisms in the necrotic debris [Figure 2]. Numerous endospores with occasional floret-like arrangement were identified on periodic acid-Schiff and silver stains [Figure 3]. Tissue cultures were set up on blood agar plate and Sabouraud dextrose agar. The wet mount revealed round-to-oval spores of varying sizes (about 10–20 μ) with varying number of endospores inside.

Question

What is the diagnosis?



Figure 1a: The right hand showed local redness and inflammation

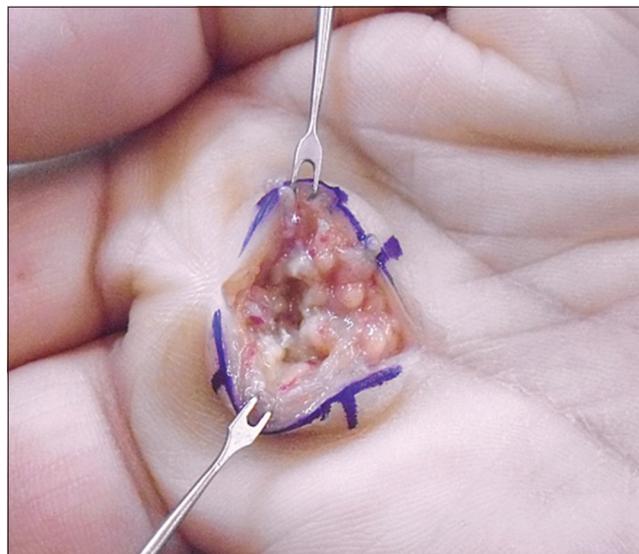


Figure 1b: On surgical exploration necrosis was observed

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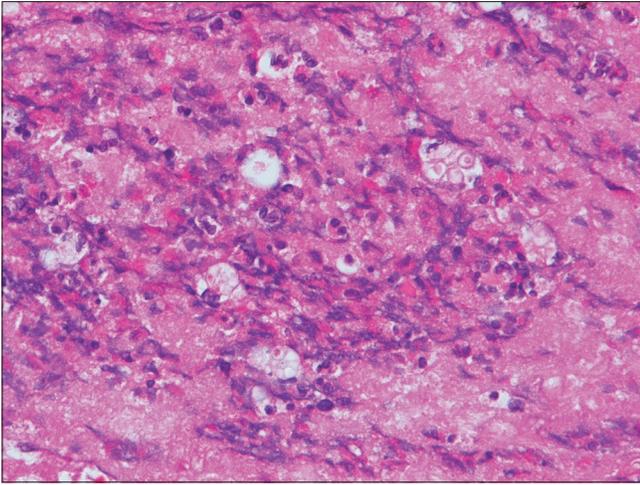


Figure 2: Spore-like microorganisms were found in necrotic debris (H and E, $\times 400$)

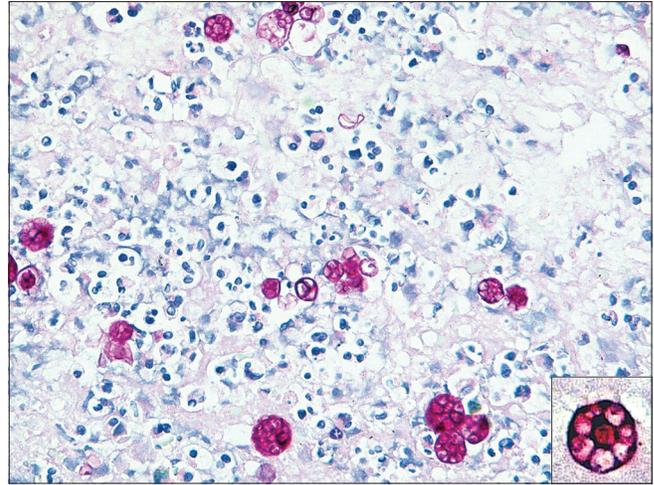


Figure 3: The Periodic acid-Schiff stain revealed numerous spore-like microorganisms ($\times 400$). The endospores with typical floret-like arrangement are identified (inset)

Answer

Human Protothecosis.

Discussion

The wound culture revealed *Prototheca wickerhamii* as the pathogen. Thereafter, oral Itraconazole (200 mg, twice daily) was prescribed and she was discharged with an improving wound. However, 4 months later, a second debridement was performed for recurrent Protothecosis. Her wound underwent much improvement with no residual redness or swelling after another 3 months.

Prototheca is classified as algae that exist ubiquitously in soil and water.¹ Human protothecosis occurs more frequently in people with human immunodeficiency virus infection, diabetes mellitus, underlying malignancy, after chemotherapy, radiotherapy, renal transplantation, as well as in people who receive steroid treatment, locally or systemically.² Protothecosis may be difficult to diagnose because of its morphological similarity to diseases caused by *Blastomyces dermatitidis*, *Coccidioides immitis*, *Cryptococcus neoformans*, *Paracoccidioides brasiliensis* and *Rhinosporidium seeberi*. Culture of the algae serves as the gold standard for diagnosis.³ After reviewing the reported cases, the sensitivity of wound culture was found to be up to 89%.¹ The reported cases were around 170 in number worldwide with an average age of 53 years and no sex predilection.¹ Protothecosis can occur in both immunocompetent and immunosuppressed patients although it may be more severe and disseminated in immunocompromised individuals. Of all the immunosuppressive drugs prescribed, glucocorticoids were the most widely used and the most specifically associated with the onset of *Prototheca* infection.⁴

The most common sites of human protothecosis include the skin, olecranon bursa, wound and fingernails despite disseminated cases being the most reported.¹ Diagnosis is largely made based on the histopathological characteristics or tissue culture. *P. wickerhamii* causes most cases of human protothecosis and the diagnostic histological feature of *P. wickerhamii* is round aggregation of endospores, giving a berry-like or flower-like appearance, which is best appreciated with special stains, such as Periodic acid-Schiff and Gomori methenamine silver stains. The “morula” appearance is characteristic of *P. wickerhamii* but not of other *Prototheca* species.⁴

Treatment of Protothecosis remains controversial and there has been no consistency among various treatment regimens in the clinical responses.⁴ Excision of small, infected, localized tissue may

be acceptable in superficial infections with a cure or improvement rate of 89%, while persistent or deeper infection may require systemic therapy plus excision. For systemic therapy, although Amphotericin-B has the best efficacy both *in vitro* and *in vivo* with a success rate of 80% if given intravenously, the azoles are less toxic and can be given orally.¹ According to the literature, oral Fluconazole has a success rate of 67%, which is similar to the other azoles (55%–75%).¹ The azoles might be a reasonable choice for initial treatment. Despite medical and surgical approaches, treatment failure is not uncommon. Minimal inhibitory concentration testing is not always reproducible, nor do the results always correlate with clinical success.⁴ Although susceptibility testing is not necessary to guide treatment of *Prototheca* infections, it may sometimes be helpful if the ongoing treatment is not successful.

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Conflicts of interest

There are no conflicts of interest.

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