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Case Report

A surprising complication of breast augmentation surgery

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ABSTRACT

Infections caused by opportunistic fungal organisms such as *Scedosporium* spp. have been increasingly recognized over the last few decades. Most affected patients are immunocompromised or critically ill, but *Scedosporium* spp. infections have also been described in immunocompetent patients, such as localized disease from direct inoculation or in near-drowning events. We describe a case of a patient with no known underlying immune impairment who experienced significant infection with *Scedosporium apiospermum* at both sites of breast augmentation. Once identified, the choice of therapeutics can be challenging given the intrinsic resistance and variable activity of different antifungal agents; however, other factors also impact the outcome of this infection such as the host immune status. Thus, both the recognition and treatment of *Scedosporium* infections can be challenging.

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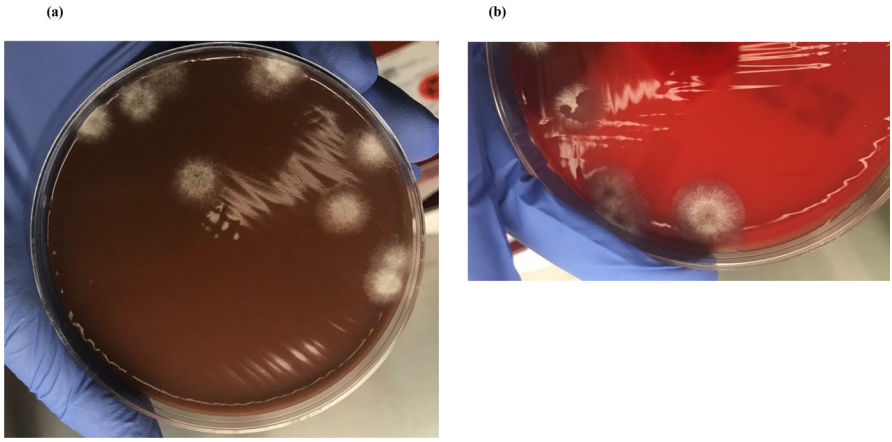

Figure 1. Fungal growth was observed on both (a) chocolate agar plate and (b) blood agar plate.

Case presentation

A 53-year-old woman with a past medical history of pre-diabetes and depression was referred to plastic surgery clinic for elective removal of bilateral breast implants for persistent back and breast pain. Five years prior to presentation, the patient had undergone bilateral (subglandular) silicone breast augmentation in Tijuana, Mexico. The patient reported that shortly after surgery, she developed diffuse joint pain involving the fingers, wrists, shoulders, knees and back. For these symptoms, in Mexico she purchased an over-the-counter combination pill, Ardosons, that contains the corticosteroid betamethasone 0.75 mg, indomethacin 25 mg, and methocarbamol 215 mg. Six months prior to presentation, the patient developed intermittent bilateral pain, warmth, and pruritus involving both breasts. She also reported breast erythema that extended to the bilateral upper extremities. The patient was born and raised in Mexico and moved to the United States 10 years prior to presentation. She did not have any recent travel, animal, or outdoor exposures.

Just prior to removal of the silicone implants, the physical examination of her breasts was normal, including no overlying erythema or palpable fluid collections, and there were no rash or joint abnormalities. Laboratory evaluation prior revealed a normal white blood cell count and normal metabolic panel. The patient underwent bilateral breast implant removal and capsulectomy. Intra-operatively, the patient's right breast was notable for the presence of a thick, yellow exudate and inflamed tissue.

Investigations

Samples of the fluid and capsule were sent for culture and pathology. Mold grew on multiple culture media (Figure 1). Histopathology of the capsule surface showed fungal hyphae admixed with granular debris (Figure 2).

Infectious disease consultation service was contacted after operative fluid cultures grew mold, but definitive mold identification was still pending. Given the patient had no systemic symptoms and no overlying skin changes prior to surgery, the infectious disease consultant was most concerned about a device-associated fungal infection. The plastic surgery consultant suggested a possible diagnosis of breast implant-associated anaplastic large cell lymphoma but the CD30 immunohistochemistry and cytology were negative.

Treatment

Initially, *Aspergillus* spp. was suspected given that this is the fungal pathogen most commonly implicated in surgical site infection. Thus, the patient was empirically prescribed voriconazole 400 mg

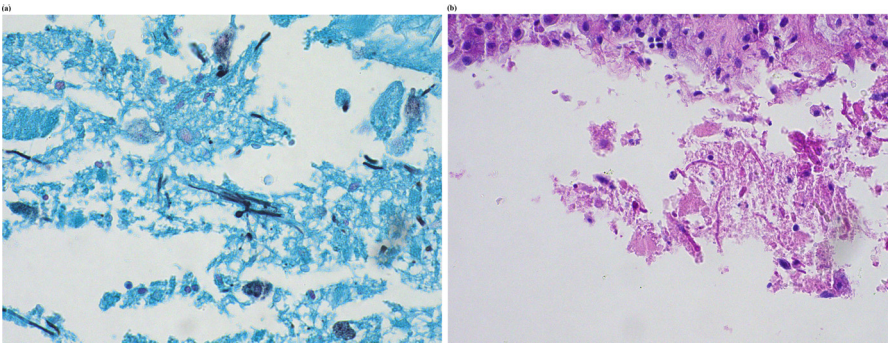

Figure 2. Histopathological images from intraoperative tissue specimens (a) Budding hyphae, Grocott's methenamine silver stain, original magnification x 60, (b) Right-angle branching, Periodic acid–Schiff stain, original magnification x 40.

twice a day for two doses followed by voriconazole 200 mg twice a day until the species was determined. Later, cultures of purulent fluid from the right breast grew *Scedosporium apiospermum*, and fluid from the left breast grew a teleomorph of *S. apiospermum* and *Pseudallescheria boydii.*

Outcome and follow-up

The patient's post-operative course was uneventful. The surgical drains were removed after two weeks. At the 1-month follow-up, the bilateral inframammary surgical incisions were well-healed. She also reported that the diffuse joint and back pain improved. However, she developed fatigue and weakness after 2 months of twice daily voriconazole, so the patient independently reduced the dose to 200 mg / day with resolution of these symptoms. Given the overall symptomatic improvement and definitive source control with bilateral breast implant removal, voriconazole was discontinued after 3 months. One month after the cessation of therapy, the incisions remained healed and there was no evidence of relapsed infection.

Discussion

After breast augmentation surgery, overall infection rates have been reported between 1.1 and 2.5%, with infection rates as high as 35% for procedures performed for reconstruction after mastectomy.[1] As with typical surgical site infections, the most common organisms causing breast implant infections involve bacterial skin commensals such as *Staphylococcus aureus*.[2] Other unusual organisms and mycobacterium have also been reported, sometimes as part of outbreaks owing to gaps in infection control practices or environmental transmission at the time of surgery such as *Mycobacterium jacuzzi*.[3] Breast implant-associated infections are rarely caused by mold, but cases involving a variety of fungal organisms including *Aspergillus* spp., *Candida* spp., and *Trichosporon* have been described.[4] *Scedosporium apiospermum* has been implicated in one case of breast implant capsulitis; that patient had undergone a lung transplant complicated by multiple episodes of rejection and developed hematogenous dissemination of *S. apiospermum* to her lung, breast, and brain.[5] In our immunocompetent patient, *S. apiospermum* was likely introduced at the time of surgery and presented as a late-onset infection 5 years after implantation. In addition, the patient may have been at risk for progression of fungal infection as she was taking a combination pill with low-dose steroids for her joint pain, the equivalent to 5 mg/day of prednisone.

Scedosporium apiospermum is an increasingly recognized opportunistic fungal pathogen.[6] *Scedosporium apiospermum* – and teleomorph *P. boydii* – are filamentous fungi found widely in the environment including in soil and sewage,[6] but can also colonize the airways of patients with underlying respiratory disease such as cystic fibrosis.[7] *Scedosporium* spp. mostly affects immunocompromised patients with underlying malignancy, organ transplant, and/or systemic inflammatory disease.[6] Clini-

cally significant disease in immunocompetent hosts are quite rare, and these patients are usually exposed through surgery or a traumatic event. High mortality rates of up to 80% have been described in patients with severe, invasive disease.[6] Clinical manifestation of this organism ranges widely from cutaneous tissue infection to invasive disease including meningitis, osteomyelitis, endocarditis, and disseminated disease.[6] Surgical site infections caused by *Scedosporium* spp. are rare and to our knowledge, have not been described as a breast implant-associated complication in an immunocompetent patient.

The diagnosis of *Scedosporium* infections remains challenging given how infrequently they occur, but prompt identification is crucial given its associated morbidity and intrinsic resistance to many antifungal agents. As with other mold infections, the gold standard for diagnosis is a positive culture. Distinguishing *Scedosporium* spp. from other molds on culture media plates and tissue histopathological exam can be difficult as there is an overlap of morphology such as hyaline hyphae, regular hyphal septation, and dichotomous branching. Histologic characteristics unique to *Scedosporium* include the combination of lemon-shaped conidia and septate hyphae.[8] To identify the dematiaceous nature of the hyphae the Fontana–Masson stain has been used; however, this stain is laboratory dependent and has been shown to also react with other non-dematiaceous fungi.[9] In our case, there were no specific characteristics evident on histopathology to pinpoint the diagnosis, so *S. apiospermum* was confirmed only with fungal culture obtained from bilateral breast fluid. This underlines the importance – when infection is suspected – of obtaining intraoperative samples for both histopathology as well as culture.

Voriconazole is the preferred therapy for *S. apiospermum*. Other azoles have variable in-vitro activity, and amphotericin B is less consistently active than voriconazole.[10] The optimal duration of therapy is unclear and is tailored to each individual patient with consideration of various factors such as site and severity of infection, host immune status, and whether or not surgical debridement was indicated and achieved.

In conclusion, we report an unusual case of *S. apiospermum* breast implant-associated infection in an immunocompetent patient cured with aggressive surgical management and an extended course of antifungal therapy.

Consent

Informed consent was obtained for the publication of the case report.

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Declaration of Competing Interest

There are no conflicts of interest to disclose from any of the authors.

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