Egypt, J. Plast. Reconstr. Surg., Vol. 49, No. 2, April: 99-101, 2025

Invasive *Zygomycete* Infection of Silicone Augmentation Mammoplasty in an Immunocompetent Patient: Case Report

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Abstract

Background: Invasive *Zygomycete* infection of skin and subcutaneous tissue is rare but can be life threatening. Although seen more commonly in immunosuppressed patients such as those with diabetes or malignancy, it is now increasingly being reported in immunocompetent patients.

Objective: We report a patient who presented with fever five days post aesthetic surgery for bilateral breast implants.

Summary of a Case: Severe pain and erythema was noted at the wound site of implant on the right breast initially spreading later to the left breast. Debridement and surgical removal of breast implants were carried out. *Zygomycete* species was identified in the necrotic tissue. Fungal infection should be suspected in patients not responding to conventional antibiotics. Infection may be iatrogenic and needs a high index of suspicion. Successful treatment is possible only if an early and timely diagnosis is made. Adequate surgical debridement and prolonged course of oral systematic anti-fungal treatment allowed full recovery.

Key Words: *Zygomycete – Mucormycosis infection – complication of breast implant surgery.*

Disclosure: No disclosure.

Introduction

Infection rates post breast surgery are higher than other similar clean procedures such as thyroid surgery. Surgical site and implant associated infections are mostly bacterial in origin **[1]**. Fungal infections are uncommon and occur more in immunocompromised patients. Increasingly such infection in immunocompetent patients are being reported **[2]**.

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Zygomycete are a class of filamentous mold of a single phylum. Members of this order include *Mucoromycete* and *Zoopagomycete*. Mucormycosis is the third most common fungal infection that is invasive in nature, next to candidiasis and aspergillosis **[3]**. Although uncommon, mortality has been reported from 10-30% to more than 80% has been reported with systemic infection of *Mucormycosis* **[4]**. Surgery when combined with timely systemic antifungal therapy may yield a 1.5-fold increase in survival rates **[5,6]**.

We describe an interesting case of invasive *Zygomycetes* infection post esthetic breast implant surgery that was successfully treated.

Clinical Summary

A forty-four-year-old lady presented with a five-day history of fever and rigors. The patient had undergone liposuction, abdominoplasty, and bilateral breast augmentation a week prior to hospitalization. Three hundred and forty (340) cc round silicone cohesive gel implants had been placed in the sub glandular pockets. The patient had no previous medical history. She was completely immunocompetent. She had never needed oral steroids for any medical condition in the past.

On examination, there was evidence of erythema over the surgical wound of right breast suggestive of cellulitis. There was leukocytosis 18.51x103 (4-10.5) and neutrophilia 15.58X10^3 (2-7.1). C-reactive protein (CRP) was elevated 294mg/L. Repeated blood cultures remained negative. The patient was commenced on intravenous Cephalosporin, but CRP continued to rise C-reactive protein (CRP) was elevated 336mg/L, WBC Count 22.71 H X10^3/µL. Antibiotic was stepped up to intravenous Meropenem with no positive response, C-reactive protein (CRP) was repeated and was persistently high - 324.0 Hmg/L.

Ultrasonography showed evidence of very small amount of fluid collection around both breast implants that was inadequate for culture or cytology. Histology was obtained from the necrotic tissue of excised breast. Sections show necrotic fibroadipose tissue with many fungal organisms having broad hyphae showing obtuse angle branching. The fungal hyphae are seen involving the blood vessels. PAS and GMS highlighted the fungal organisms. Morphology confirmed *Mucormycosis*.

Removal of both implants was suggested but the patient initially refused. Cellulitis over the right breast worsened and the discomfort persuaded her to have the right breast implant removed. Post removal the patient continued to be pyrexial. The suture line dehisced and there were features of skin necrosis developing in the inferomedial quadrant. Radical debridement of the right breast was performed. All breast tissue was completely necrotic at this point. The skin over the left breast also developed cellulitis. The left implant was removed too. Computed tomography of thorax showed a sinus with external opening lateral to the sternum on the right side between the 5th and 6th costal cartilages. No intrathoracic infiltration was noted. The patient continued to develop multiple discharging sinuses and required multiple sittings for debridement. Repeated wound cleaning and negative pressure wound therapy was continued until satisfactory granulation tissue was found adequate for skin grafting.

Tissue culture at day 14 reported growth of *Zygomycetes* species. She was initially commenced on Amphotericin B (iAmphB) but failed to tolerate this. Serum creatinine became elevated, and the (IAmphB) was discontinued. She was commenced on oral Posaconazole and there after improved rapidly.

The patient remained hospitalized a total of eight weeks. During this time and for up to a further four weeks post discharge, she continued to require regular wound cleaning, draining of sinuses and manual flushing of sinus cavities. At three month follow-up, the wound on both breasts had healed completely and satisfactorily.

Antifungal therapy with oral Posaconazole was continued for a total of six months. Treatment was stopped when wound healing was thought to be complete and CRP was within normal limits over one month. Breast reconstruction is planned as the next stage in management.

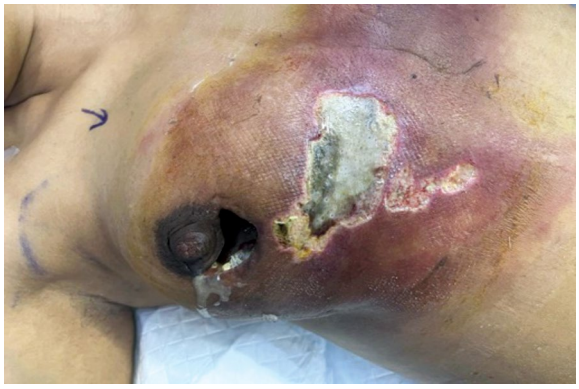

Fig. (1): External appearance of wound initially - right breast.

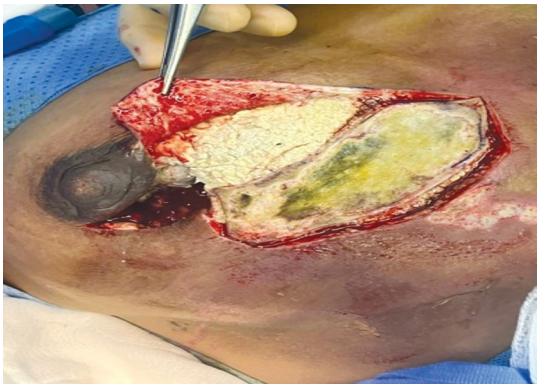

Fig. (2): Initial wound showing the necrotic tissue at commencement of debridement.

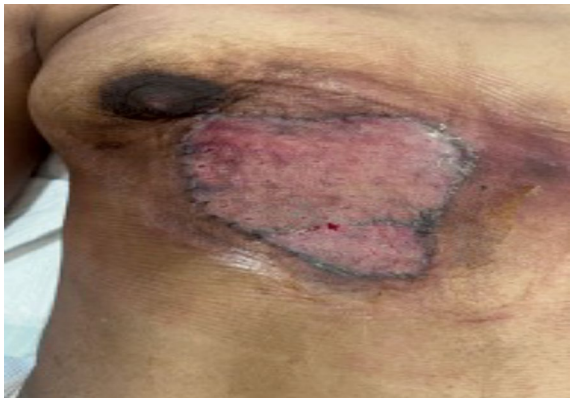

Fig. (3): Healed wound after skin graft of right breast.

Discussion

Mucormycosis of breast tissue has been reported as spontaneous [7] and post esthetic surgery [8]. Our patient had undergone esthetic breast implant bilaterally. We hypothesize that either unclean instrumentation or nidus in burnt tissue after excessive cautery may have caused the infection.

Infection is thought to be acquired variously in developing and developed countries. Inoculation into disrupted skin or wounds is associated with invasive infection [4]. Nosocomial infections and contaminated needles have been also previously reported [2]. We suspect that a contaminated environ-

ment or instruments at the center where the patient underwent surgery may have led to the infection.

In developed countries immunocompetent patients may suffer this serious infection but it is mostly reported in patient with uncontrolled Diabetes Mellitus. Immunosuppressed patients with autoimmune or hematological malignancies may also be predisposed **[4]**. Our patient had no previous significant comorbidity.

Microbiological identification of agents of Mucormycosis is difficult to obtain. Isolates may fail to grow on subculture or sporulate. PCR amplification may also be used. While we isolated *Zygomycete* initially, no further culture was positive. We were unable to subtype it later as systemic antifungal agents were immediately commenced. Even with disseminated disease, blood cultures are usually negative as was the case in our patient. Histology however was confirmatory of the presence of typical fungal hyphae. The fungus invades blood vessels, leading to thrombosis, necrosis, and infarction of tissue **[4]**. Necrosis of complete breast tissue was noted in our patient (Fig. 1).

Mortality with invasive Mucormycosis is high, but rates are much lower (10-30%), among patients with localized cutaneous disease. We were fortunate that our patient responded well to treatment. Delay in initiating treatment can change the outcome significantly **[4]**.

Intravenous iAmphB is suggested as the mainstay of therapy. Our patient failed to tolerate this. Fortunately, newer oral triazoles (Posaconazole and Isavuconazole) are equally effective. Our patient was started on Posaconazole and completed her treatment with it **[9]**. Iron chelation, specifically with deferasirox, has been recommended as adjunct therapy. As it inhibits the growth of fungi by reducing the availability of iron, an essential nutrient for their proliferation. This is especially thought to help patients with diabetic ketoacidosis **[10]**.

Duration of treatment with antifungal therapy remains unknown. Up to two months of treatment has been reported in a patient like our case **[8]**. Response to treatment in our patient was guided by resolving fever, wound healing and resolving CRP. We continued treatment with Posaconazole for a period of six months.

Conclusion:

Invasive fungal infections should be considered as a differential diagnosis in the management of immunocompetent patients with unresolving local infections of the breast. Early and aggressive surgical management along with systemic antifungal treatment improves the survival in these patients **[6]**.

References

1- Corcione S., Lupia T. and De Rosa F.G.: Skin and soft tissue infections after breast surgery. Curr. Opin. Infect Dis., 32 (2): p. 87-94, 2019.

2- Chander J., et al.: Saksenaea erythrospora, an emerging mucoralean fungus causing severe necrotizing skin and soft tissue infections a study from a tertiary care hospital in north India. Infectious Diseases, 49 (3): p. 170-177, 2017.

3- Sanath A.K., et al.: Mucormycosis occurring in an immunocompetent patient: A case report and review of literature. Cesk Patol, 56 (4): p. 223-226, 2020.

4- Reid G., et al.: Mucormycosis. Semin Respir Crit Care Med., 41 (1): p. 99-114, 2020.

5- Riley T.T., et al.: Breaking the Mold: A Review of Mucormycosis and Current Pharmacological Treatment Options. Ann. Pharmacother, 50 (9): p. 747-57, 2016.

6- Panchanatheeswaran K., et al.: Thoracic Mucormycosis in immunocompetent patients. J. Card Surg.,36 (4): p. 1183-1188, 2021.

7- Baezzat S.R., et al.: Primary breast Mucormycosis, a case report. Iran Red Crescent Med. J., 13 (3): p. 208-9, 2011.

8- Rodríguez J.Y., et al.: Saksenaea erythrospora infection after medical tourism for esthetic breast augmentation surgery. Int J Infect Dis, 2016. 49: p. 107-10.

9- Lynch Iii J.P. and Zhanel G.G.: Part 2: Mucormycosis: Focus on therapy. Expert Review of Anti-infective Therapy, 21 (7): p. 737-748, 2023.

10- Ibrahim A.S., et al.: Deferiprone iron chelation as a novel therapy for experimental Mucormycosis. J. Antimicrob Chemother, 58 (5): p. 1070-3, 2006.