Zygomycosis as a Rare Cause of Surgical Site Infection: A Case Report and Review Literature
M Parvathi1, K Janardhana Rao2, G Santa Rao3 and K Srinubabu4

ABSTRACT
Zygomycosis is a rare invasive fungal infection seen most often in patients with haematological malignancies, particularly in the neutropenic phase[1]. Fungal infection causing surgical site infection is uncommon, of which yeast attributes predominant cause, followed by aspergillosis. But zygomycosis manifesting as the surgical site infection is still very rare entity. The treatment of zygomycosis is multimodal, and consists of surgical debridement, use of antifungal drugs and reversal of underlying risk factors, if possible. We report a case of zygomycosis presenting as post-caesarean surgical site infection.

Keywords: Zygomycosis, Surgical site infection, Caesarean, Cotton wool like growth, Multimodal treatment, Serial debridements, Anti fungal drugs

INTRODUCTION
Zygomycosis is an invasive fungal infection, often lethal, mainly affecting immunocompromised patients. Cutaneous zygomycosis is the third most common presentation after sinusitis and pulmonary zygomycosis. Zygomycosis of surgical site is very rare entity and very few cases are reported in the literature. Prompt diagnosis facilitates optimal patient care but a delayed diagnosis is a source of substantial morbidity and can be lethal. Perhaps the greatest threat from infection comes in the form of necrotising fasciitis, an acute and rapidly progressive tissue infection requiring aggressive medical and surgical manage-ment concurrently.

CASE REPORT
A 25-year-old female patient who underwent elective caesarean section presented on fourth post-operative day with pain and swelling at surgical site, seropurulent discharge from the wound associated with low grade fever. There was no history of immunosuppressive condition. At initial examination there was erythema and induration with necrosis at the Pfannenstiel wound site. On subsequent examination, erythema and induration progressed rapidly and most of the area below the umbilicus was involved and the skin and subcutaneous fat was necrotic. There was a rapid development of exuberant cotton wool-like growth at the surgical site and at the edges of the wound, which was easily separable from the tissue (Figure 1).

On investigation, haematological and biochemical tests were within normal limits. She was HIV nonreactive. Brush biopsies from the wound on wet mount revealed broad aseptate, branched and distorted hyphae (Figure 3). Culture showed cotton-like exuberant growth (Figure 4). Histopathology of the edge of the wound revealed broad aseptate and branched hyphae suggestive of zygomycosis (Figure 2).
Figure 1: Pfannenstiel wound site with slough and pus discharge

Figure 2: Histopathology showing broad aseptate, branched and distorted hyphae

Figure 3: Wet mount showing wide, aseptate branched and distorted hyphae

Figure 4: Culture showing cotton-like growth

Figure 5: Showing split skin grafting over the raw area after serial debridements

Patient was managed in an intensive care unit. Sutures were removed and wound laid open. Inspite of daily debridement there was rapid development of mouldy growth on the next day. Serial debridement was done for 2 weeks. Intravenous Amphotericin-B was administered with regular monitoring of renal parameters. Once the wound was stabilised, granulation tissue developed. Split skin grafting was done over the raw area. The patient was discharged in a good general condition 2 weeks after skin grafting.

DISCUSSION

Zygomycosis is a life-threatening fungal infection predominantly affecting immunocompromised
individuals, though it can affect immunocompetent patients as well[2]. Surgical infections result in significant increases in mortality, length of hospital stay, and healthcare costs. Virulence of the microbial agents, host resistance, and wound factors are the determinants of the infection after surgery. Risk factors related to patients for development of surgical site infections are older age, immunosuppression, obesity, diabetes mellitus, chronic inflammatory process, malnutrition, peripheral vascular disease, anaemia, radiation, chronic skin disease, carrier state of organisms and recent operations[3].

The spectrum of zygomycosis includes rhino cerebral, pulmonary, renal, gastrointestinal, central nervous system, and cutaneous infection. The most common manifestation of zygomycosis is rhino-cerebral form[4]. Intact mucosal and endothelial barriers serve as the structural defence mechanism and prevent tissue invasion and angioinvasion by zygomycetes. There are various ways by which the fungal spores can enter the skin, but trauma is the most common[5]. In a review, where in 25 cases of cutaneous mucormycosis some local risk factors were identified, such as surgery (17%), burns (16%), motor vehicle-related trauma (12%), the use of needles (13%), knife wounds (3%), insect or spider bites (3%) and other types of trauma (23%)[6].

Zygomycosis has also been reported to occur as a result of injury in a natural disaster, such as the tsunami that struck Southeast Asia in 2004[7] or the volcano eruption that wiped out the town of Armero, Colombia, in 1985[8].

Primary cutaneous zygomycosis is seen in relation to disruption of skin integrity mainly in immunocompromised patients, patients who have burns or severe soft tissue trauma (road traffic accident), and very premature neonates; it has been reported rarely in patients who have apparently normal skin[5]. Cutaneous zygomycosis typically starts as erythema and induration of the skin at a puncture site and progresses to necrosis. Extension to the subcutaneous tissue or bone is common in patients who have delayed or ineffectively treated cutaneous zygomycosis. Necrotising fasciitis has been reported in cases of cutaneous zygomycosis and carries an extremely poor prognosis.

Diagnosis can be made through visualisation of broad, aseptate, 90° branching, ribbon-like mucor hyphae in skin biopsy histopathological examination and culture in Sabouraud dextrose agar[6]. The disease site and host factors are key determinants of prognosis for zygomycosis. Successful treatment of zygomycosis largely depends on early diagnosis, correction or reversal of the underlying predisposing factors, adequate surgical resection/debridement of infected tissue, and rapid initiation of effective systemic antifungal therapy in form of Amphotericin B[9, 10].

CONCLUSION
Fungal infection presenting as surgical site infection is a rare entity and zygomycetes as a cause for surgical site infection is still rarer. Prompt diagnosis facilitates optimal patient care but a delayed diagnosis is a source of substantial morbidity and can be lethal. The treatment of zygomycosis is multimodal, and consists of surgical debridement, use of antifungal drugs and high-quality supportive care.

REFERENCES
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