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Recommended Citation

Alvi, A. R., Shamsi, G. (2009). Rhizopus necrotizing fasciitis of caesarean wound: A rare life threatening condition. *Journal of the College of Physicians and Surgeons Pakistan*, 19(9), 579-581.

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Rhizopus Necrotizing Fasciitis of Caesarean Wound – A Rare Life Threatening Condition

Abdul Rehman Alvi and Ghina Shamsi

ABSTRACT

Mucormycosis is a rare cause of necrotizing fasciitis in immunocompromised patients. We report a young female, who developed rhizopus necrotizing fasciitis of caesarean wound. The lady died secondary to non-responding sepsis and irreversible multi-organ failure. High index of suspicion can lead to early diagnosis by frozen section of histopathology and fungal culture technique. Aggressive surgical debridement and intravenous anti-fungal medication is the main stay of treatment. A delay in diagnosis and treatment may cause multi-organ failure leading to high mortality.

Key words: *Necrotizing fasciitis. Fungal fasciitis. Postoperative rhizopus fasciitis. Caesarean wound.*

INTRODUCTION

Zygomycosis is a rare infection with a very high mortality rate. Previously referred to as mucormycosis, it is caused most often by organisms from the order Mucorales (class Zygomycetes) and includes a number of species, including species of rhizopus and mucor.¹

The mortality rate for patients with zygomycosis was estimated at close to 100% for those with immunocompromised and disseminated disease.² The incidence of zygomycosis has increased over the last decades particularly in institutions that care for patients with immunocompromised states. We report a case of a previously healthy female acquiring this infection after caesarean section.

CASE REPORT

A previously healthy young female underwent a caesarean section for obstructed labour and subsequent hysterectomy for postpartum haemorrhage in a remote district of Pakistan. She required multiple blood transfusions and developed acute renal failure. She was shifted to Karachi on the 5th postoperative day via ambulance. It took 14 hours to reach this hospital. In the emergency room, she was found to be pale, drowsy and anuric. Her pulse rate was 110 per minute and a blood pressure of 85/50 mmHg was recorded. Abdomen was distended with erythema around the caesarean section wound. The laboratory investigation revealed a

haemoglobin level of 4.1 gm/dl, white cell count of 1009/mm³ with 94% neutrophils. Serum creatinine was 6.4 mg/dl. Serum sodium and potassium levels were normal and arterial blood gases showed moderate metabolic acidosis, with pH of 7.2 and base excess of -8.2. She was resuscitated with four, packed cells transfusion and broad spectrum intravenous antibiotics, including ceftriaxone (one gram), metronidazole (500 mg) and ampicillin (one gram). She had to be shifted to another hospital, because of unavailability of space in the Surgical ICU.

She was brought to the emergency room again after 4 days with septic shock marked by profound dehydration and fever. The wound had a leathery appearance with blackish discoloration of the underlying subcutaneous tissue and growth of moulds could be recognized on gross inspection (Figure 1). She was intubated, rehydrated, started on inotropic support and was given intravenous broad spectrum antibiotics. The laboratory investigation showed WBC of 24000/mm³ with 87% neutrophils, creatinine of 7.1 mg/dl and severe metabolic acidosis along with coagulopathy consistent with Disseminated Intravascular Coagulation (DIC).

She underwent extensive debridement of anterior abdominal wall tissue till bleeding surface was reached (Figure 2). The tissue was sent for cultures and



Figure 1: Wound with blackish discoloration.

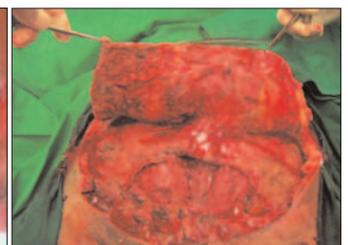


Figure 2: The wound looks clean after debridement.

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Received September 26, 2008; accepted July 07, 2009.

histopathology. She remained on ventilatory and inotropic support requiring hemodialysis on alternate days. The frozen section showed predominately necrotic tissue with numerous broad fungal organisms consistent with mucor organism in deep tissue. The subsequent final histopathology report revealed skin and tissue necrosis with numerous broad ribbons like fungal organism consistent with mucormycosis. She was started on a full dose of amphotericin B despite renal impairment. The final fungus culture revealed heavy growth of rhizopus species.

She underwent repeated wound debridement but all the time the wound looked leathery with gross appearance of mould on the wound surface. Despite aggressive surgical debridement of the wound, appropriate intravenous antibiotic and anti-fungal therapy, her condition deteriorated further. She developed multi-organ failure and acquired multi-resistant *Acinetobacter* pneumonia and *Candida* species in urinary tract. Repeated blood cultures were negative but the wound culture also grew *Staphylococcus* species sensitive to vancomycin. The *Acinetobacter* on tracheal aspirate was only sensitive to polymixin. The patient expired on the 10th day of admission to the ICU, due to severe non-responding sepsis and irreversible multi-organ failure.

DISCUSSION

The fungal pathogens that cause mucormycosis belong to the class zygomycetes and the order mucorales. *Rhizopus* species are the agents most commonly isolated in mucormycosis, followed by *Rhizomucor* species, *Absidia corymbifera*, *Apophysomyces elegans*, *Cunninghamella bertholletiae*, *Mucor* species, and *Saksenaia vasiformis*.¹

Mucormycosis is a rare but serious fungal infection that rapidly attacks and usually kills its untreated victims. It is usually deemed to affect people with compromised immunity like poorly controlled diabetics, organ transplant recipients; hematological malignancies; bone marrow transplant recipients, renal failure and on chelating therapy.¹⁻² Sometimes, individuals with no apparent predisposition develop this infection.

The most common area to be affected in human body are the para nasal sinuses. A few cases have had infection confined to the brain. Other sites include lung, skin, subcutaneous tissue and occasionally, the kidney or the gastrointestinal tract. It may even be disseminated, often only diagnosed postmortem, by many classify skin infections separately, as 'entomophthoromycosis'. 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.³ Necrotizing fasciitis has been reported in

cases of cutaneous zygomycosis and carries an extremely poor prognosis.⁴

In the past 20 years, 3 cases of postoperative mucormycosis infection in immunocompetent patients were reported. The first case was a young lady, who developed mucormycosis infection in a caesarean section wound and was successfully treated with surgical debridement and anti-fungal medicine. The author classified it as a nosocomial infection and suggested a strict sterilization technique to avoid such dreadful morbidity. The others reported a post-sternotomy infection.

Successful treatment of zygomycosis largely depends on timely diagnosis, reversal of the underlying predisposing factors, early surgical debridement and rapid initiation of effective systemic anti-fungal therapy. Early diagnosis is particularly critical to the outcome of zygomycosis.⁵ The mainstay of therapy is aggressive surgical resection of the whole lesion, which may employ disfiguring surgery. Some recommend frozen sections during surgery to ensure clarity of resection margins.⁶

On diagnosis, intravenous amphotericin B should be started at a dose of 1 mg/kg. This should be administered for a long period of time. Most would recommend several months or more. The precautions for amphotericin administration should be observed, including serial monitoring of serum creatinine level and avoiding exposing the solution to light.

Anecdotal evidence suggests that newer, less toxic forms of Amphotericin such as liposomal amphotericin (AmBisome), Amphotec (colloidal dispersion), or possibly even amphotericin B lipid complex (Abelcet) may be beneficial if the patient is developing substantial side effects related to amphotericin administration, or there is central nervous system involvement. Such agents are expensive, but may be effective even with intracerebral extension.⁷

The therapeutic role of hyperbaric oxygen and G-CSF is not clear.⁸ One report suggested that local application of half-strength hydrogen peroxide may be of benefit after resection.⁹ Local dressings with anti-fungal have been described but there is no convincing benefit seen. The disease site and host factors are key determinants of prognosis for zygomycosis. Hence, active haematological malignancy, allogenic bone marrow transplantation, and disseminated infection are associated with poor outcome. Correction of underlying immunodeficiency (rapid tapering of steroids) and early diagnosis coupled with an aggressive, multimodality treatment approach offer the best chance for survival in these patients.

The reported patient underwent caesarean operation in a remote secondary care centre, where she had

massive postoperative haemorrhage leading to an acute renal failure. Nosocomial mucormycosis also puts a question mark on the sterilization technique in place in remote health facilities and raises questions about the referral and transfer system to the tertiary care hospital. The delay must have contributed to the fatal outcome.

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