University Journal of Surgery and Surgical Specialities

ISSN 2455-2860 2020, Vol. 6(8)

CUTANEOUS MUCORMYCOSIS IN ROAD TRAFFIC ACCIDENT WOUND AND PRINCIPLES OF MANAGEMENT

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Abstract : Cutaneous mucormycosis is the most acute, fulminate, and fatal of all fungal infections in humans. It presents most frequently in immunocompromised patients, but can occur in healthy patients in the presence of often-insignificant trauma. Surgical management of primary cutaneous mucormycosis is almost always required. Case reports of surgical treatment for primary cutaneous mucormycosis are reported in the literature however, the extent of debridement required for cure is unclear and no uniform plan of treatment has been suggested. This article reports on a clinical case and submits clinical guidelines designed to assist the clinician in the surgical management of primary cutaneous mucormycosis.

Keyword : Mucormycosis, necrotizing soft tissue infection, Liposomal AMB

INTRODUCTION:

Mucormycosis is an invasive fungal infection of the soft tissue and bone. It belongs to the order Mucorales. It is most commonly found in the environment on decaying vegetation and soil. These organisms have the enzyme ketone reductase which allows it to thrive in acidic, high glucose environment(1). Mechanism of spread is nosocomial. The agent is known to be angioinvasive(2). The risk factors associated with invasive mucormycosis include – Diabetes mellitus/ Long term glucocorticoid usage/ Organ transplantation/ AIDS/ Trauma/ Burns. The clinical presentation is most commonly Rhino-orbito cerebral mucormycosis (44-49%) Cutaneous (10-19%) Pulmonary mucormycosis(10-11%) Disseminated (6-11%) Gastrointestinal(2-11%)(3). Cutaneous mucormycosis results from inoculation of spores into the dermis. Usually associated with trauma or underlying immunocompromised state. The survival rate of invasive mucormycosis is reported as 33% after radical surgery (4).

Case report:

A 22 year old female presented to A&E with complaints of high grade fever with chills associated with severe back pain and pus discharge for 5 days. She had a road traffic accident 6 weeks back. The mode of injury was being hit by a tractor. She sustained left forearm both bone closed fracture and had undergone ORIF of both bones of left forearm and was advised strict bed rest for undisplaced iliopubic ramus fracture. At presentation she had pallor and was febrile. Her pulse rate was 110 per minute and blood pressure was 110/70 mm Hg. There was a patch of necrotizing soft tissue infection over the upper back measuring 20x10cm with induration and blistering. She underwent extensive debridement under general anaesthesia. There was extensive ischemia of the skin, subcutaneous and superficial muscle layer of the back, left flank extending onto the anterior abdominal wall on the left side.

Figure 1: After first debridement

The biopsy of the tissue was reported as invasive mucormycosis. Histopathology revealed the following: The hyphae of mucormycosis are broad, irregularly branched with septations being rare.

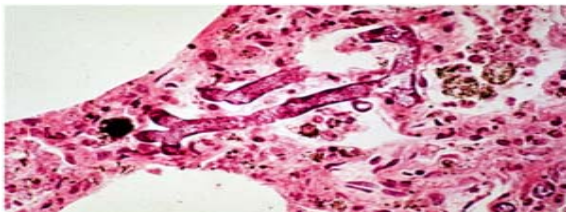

Figure 2: Microscopic features

She was started on Liposomal Amphotericin B 150mg twice daily. She continued to have fever spikes and wound had unhealthy floor and edges. Hence redebridement was done 7 days after the first debridement.

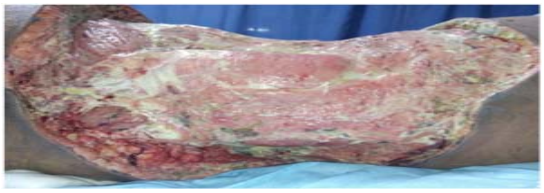

Figure 3: Appearance of wound after redebridement.

Following redebridement the wound appeared healthy. She underwent daily dressings with amphotericin soaked gauze pieces for a duration of 4 weeks. A pus swab and multiple punch biopsies were taken from the raw area after the wound looked healthy and thought to be ready for grafting. The pus swab grew E.coli and Pseudomonas and there was no evidence of invasive fungal elements on the punch biopsies.

Figure 4: Appearance of wound after daily dressings using l-AMB soaked gauze pieces

After adequate antibiotics as per culture result she underwent 2 sittings of split thickness skin Grafts (STSG) with a gap of 2 weeks between the sittings. A course of 4 weeks of Liposomal AMB (total of 3gm) was given. The antifungal and antibacterial therapy was stopped subsequently. She underwent daily dressings using Vaseline gauze pieces.

Figure 5: Wound following STSG

The wound appeared healthy except for an area of persistent pus discharge and tenderness over the posterior superior iliac spine. She underwent a CT scan which revealed osteomyelitic changes over the posterior superior iliac spine on the left side.

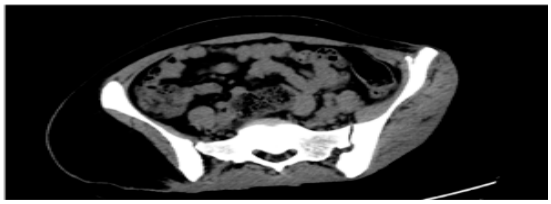

Figure 6: Non contract CT of abdomen

She underwent a bone biopsy using a Jamshidi needle. The biopsy and cultures were negative for fungal elements. The discharge resolved with a course of cloxacillin. There was no further pus discharge from the PSIS and pain decreased. She was discharged after 2 months of hospitalization in a stable state with almost complete healing of the wound at the debrided site, and she was ambulant.

Discussion:

This case presented with necrotizing soft tissue infection secondary to invasive mucormycosis following a road traffic accident. Successful treatment of cutaneous mucormycosis infections depends upon three principles: Early diagnosis, prompt administration of high dose Amphotericin B and serial radical surgical resections with debridement of all necrotic tissue(5). There is high mortality rate if the surgical debridement is not adequate (upto 16%)(6). Early diagnosis is facilitated by having a high level of suspicion. Histopathology gives a confirmation of cutaneous mucormycosis. Amphotericin B is the mainstay of medical therapy, however its side-effects include hypokalemia, renal impairment and infusion related reactions(7). There are no guidelines regarding the duration of antifungal therapy using Liposomal Amphotericin B and is stopped after signs of sepsis are absent and wound appears healthy with no evidence of invasive fungal infection grossly or microscopically by punch biopsies.

The morbidity and mortality associated with fungal infection is very high and cost of treatment is also a major hurdle in adequate treatment of these patients. Radical debridement of the necrotic tissue is the most important component of treatment for these patients. Since the fungus is angioinvasive adequate margins are required for complete clearance of infection.

Conclusion:

In summary, the incidence of cutaneous mucormycosis in wounds following RTA is rare. This report illustrates the need for aggressive management and adequate debridement along with parenteral antifungal therapy for complete resolution. There is high morbidity and mortality associated with invasive fungal infections if the diagnosis is delayed or less than adequate debridement in undertaken and Amphotericin B is withheld in management.

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An Initiative of The Tamil Nadu Dr. M.G.R. Medical University
University Journal of Surgery and Surgical Specialities