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CASE STUDY

MUCORMYCOSIS IN IMMUNOCOMPETENT PATEINT: A CASE REPORT

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ABSTRACT

Mucormycosis is an uncommon opportunistic fungal infection, which is often aggressive and life-threatening. Mucormycosis typically occurs in patients with diabetes or immunosuppression. However, mucormycosis can also occur in immunocompetent individuals. The most effective treatment consists of early diagnosis, reversal of underlying predisposing factors, early surgical debridement of necrotic tissue and administration of antifungal therapy. We present the case of an immunocompetent young female suffering from localized paranasal mucormycosis. Patient was successfully managed with Endoscopic debridement surgery and systemic amphotericin B. The main concern to be highlighted with this case report is to keep mucormycosis as diagnosis even in immunocompetent patients, to diagnose at earliest to avoid complications and mortality.

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INTRODUCTION

Mucormycosis is an opportunistic fulminant fungal infection. Commonly, clinical manifestations of mucormycosis are classified in: 1) rhino-orbito-cerebral, 2) disseminated / miscellaneous, 3) cutaneous/subcutaneous, 4) gastrointestinal, 5) pulmonary, and 6) uncommon presentations. (Kontoyiannis and Lewis, 2006) The increase in the number of cases of invasive mucormycosis is attributable to the recent rise of immunocompromised patients due to rise in cancer incidence, the resistance to the commonly used antifungal agents and immunosuppressive therapies, including organ transplantations. (Torres-Narbona *et al.*, 2007) The delay in management in immunocompetent patients leads to increase in complications. The purpose of this case report is to draw attention to appropriate management of mucormycosis in a immunocompetent patient.

Case Report

A 28 years old female patient came with complain of left eye swelling with decreased vision in same eye since one month. There was history of nasal discharge, fever and vomiting. Anterior rhinoscopy revealed crusts bilateral nasal cavity, with no deviated septum. General examination - swelling over left eye which was diffuse, soft to firm, non-tender, non-erythematous, with proptosis. Oral examination was normal.

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Complete blood count, white blood cell and platelet counts were normal. Patient was negative for HBs Ag, HCV, and HIV. Fasting and post-prandial sugar were within normal limits. Blood urea, serum electrolytes, liver function test, renal function tests were normal. Immediate maxillary debridement surgery along orbital decompression was done and all material including deeper tissue was sent for histopathological study. The Hematoxylin and Eosin staining showed necrotic tissue along with non-septate fungal hyphae with right angled branching that resembled mucormycosis. Patient was started on systemic amphotericin-B 0.7 mg/kg/day in 500 ml dextrose i.v slowly over four to five hours, with serial monitoring of renal functions, patient tolerated it without any major side effects and showed good improvement of symptoms with restoration of vision to 6/12 on snellen chart. Patient was discharged after twenty days, with regular follow up over one year.

DISCUSSION

Mucor is a saprophytic fungus of class Zygomycetes (Zygomycetes), order Mucorales, family Mucoraceae. They have broad non-septate hyphae. Branches arise haphazardly often at right angles to parent hyphae. (Auluck, 2007) These opportunistic pathogens are ubiquitous organisms, existing in the environment, soil, air, food, compost piles, and animal excreta. Although the majority of these pathogenic fungi require oxygen, they are capable of growth in anaerobic and microaerophilic conditions. (Mizutani *et al.*, 1999; Cocanour *et al.*, 1992)

Mucosal and cutaneous epithelium and endothelium acts as a barrier to tissue invasion and angioinvasion. The incubation period is two to five days and it starts by inhalation or inoculation of spores into the damaged skin, followed by dissemination in immunocompromised host. Mucor infection in immunocompetent patients may be due to ability of mucor sporangiospores to attack epithelium previously damaged by infection, direct trauma or due to toxins or proteases secreted by sporangiospores which may directly destroy endothelial cells. The mucor invades the blood vessels, hyphae forms thrombi and causes decrease in blood supply leading to necrosis of hard and soft tissue. (Bharathi and Arya, 2012)

Commonly, mucormycosis has shown an equal sex distribution, although a recent review of all published cases of pulmonary mucormycosis showed a male-to-female ratio of 3:1. (Lee *et al.*, 1999) Clinically, the most common clinical form of mucormycosis is rhino-orbito-cerebral (44–49%), followed by cutaneous (10–16%), pulmonary (10–11%), disseminated (6–11.6%) and gastrointestinal (2–11%) presentations. Mortality rate is higher than 50% with an incidence ranging from 62.5% in rhino-cerebral form to 100% in disseminated form. (Spellberg *et al.*, 2005)

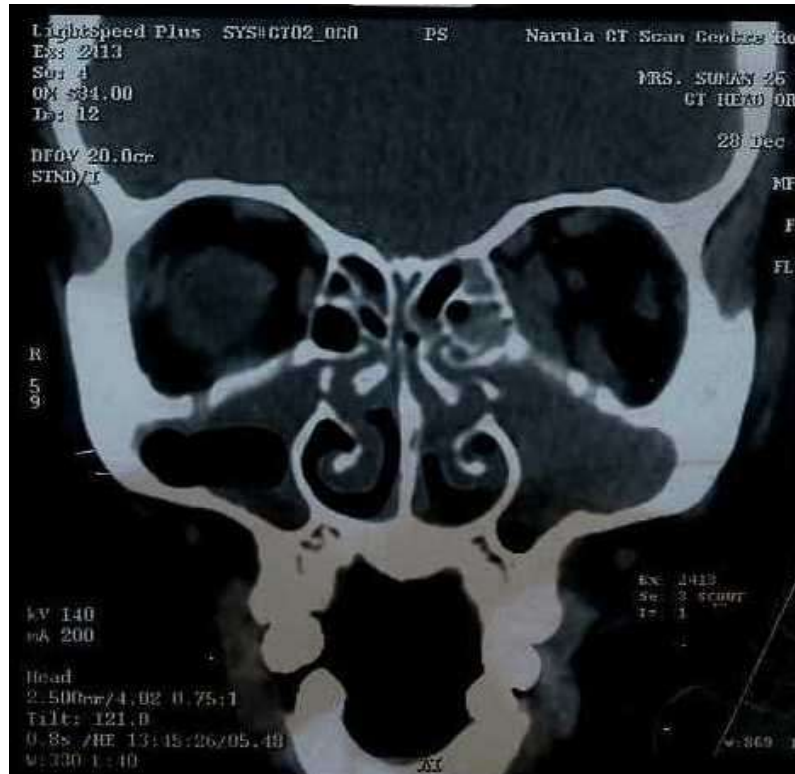


Figure 1. The computed tomography shows soft tissue lesion in the left maxillary sinus causing erosion and destruction of bony wall and extending into orbit



Figure 2. The photomicrograph of hematoxylin and eosin stained sections shows areas of colonies of aseptate fungus, long, broad, slender, right angled branching hyphae characteristic of mucormycosis

In immunocompetent patients, the nose and or maxillary sinuses appear to be the predominant source of infection of the respiratory tract. Once infection has colonized nose and paranasal sinuses, if not promptly diagnosed and treated, this infection may invade the base of the skull through blood vessels, disseminating to the central nervous system, giving the rhino-orbito-cerebral form, or everywhere in the body, giving the disseminated form. (Prabhu *et al.*, 2004)

The review of literature from 35 different countries showed total 212 immunocompetent patients in the world affected by mucormycosis. India was the most affected with 94 patients followed by USA with 42 patients. (Mignogna *et al.*, 2011) India was the most affected country may be due to climatic conditions, socio-economic status, poor hygiene and delay in diagnosis. In India significant proportion of population is below the line of poverty and is therefore malnourished which may predispose them to easily contract an invasive fungal infection. Diabetes Mellitus is a well-known predisposing factor and is more common in India. Many cases of invasive fungal infection in India showed undiagnosed Diabetes Mellitus. The most common form was cutaneous with 90 cases, followed by rhino-orbito-cerebral with 81 cases, 18 genito-urinary cases, 10 disseminated cases, 7 pulmonary cases, 5 gastrointestinal and 1 vascular case.

However, in India it was found that rhino-orbito-cerebral type (44.2%) was the commonest followed by cutaneous (15.5%) and renal (14.0%) involvement in the retrospective analysis for ten years by Chakrabarti *et al.* (Chakrabarti *et al.*, 2003) Mucormycosis with maxillary sinus necrosis in an immunocompetent patient is very rare diagnosis which must be substantiated by biopsy, due to its similar clinical appearance to a number of other conditions like cavernous sinus thrombosis, carcinoma, and midline lethal granulomas. (Yadav *et al.*, 2003; Yadav and Goel, 2003) The clinical Histopathological study confirms the diagnosis and helps in proper management of the patient.

Conclusion

Mucormycosis must be considered in the differential diagnosis of severe acute headache, sinusitis, or orbital cellulitis, not only in immunocompromised patients but also in the absence of any underlying disease. Although prognosis is poor, the survival can be improved with early diagnosis, control of underlying disease and aggressive therapy including aggressive surgical debridement and antifungal therapy with amphotericin B, histopathological evaluation plays an important role in definitive diagnosis.

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