

*Case Report***Paranasal Sinus Mucormycosis in an Immunocompetent Host: A Case Report**Beena Jad¹, Shinu Pottathil², Sanjay Raina³, Varsha A Singh⁴¹Demonstrator, Department of Microbiology, GMC, Jammu, J & K, India²Assistant Professor, Department of Microbiology, MMIMSR, Mullana, Haryana, India³Senior resident, Department of Pediatric Surgery, BHU, Varanasi, India⁴Professor, Department of Microbiology, MMIMSR, Mullana, Haryana, India

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*Received: 18/07/2015**Revised: 17/08/2015**Accepted: 22/08/2015***ABSTRACT**

Mucormycosis is an emerging angioinvasive infection caused by the ubiquitous filamentous fungi of the Mucorales order of the class of Zygomycetes. Mucormycosis is a common fungal infection usually noted in immunocompromised individuals like diabetic and AIDS patients, patients receiving systemic corticosteroid therapy, cancer chemotherapy and organ transplant patients. It is very rare to affect healthy individual. Here we report a case of 30 years old immunocompetent female patient who presented with mucormycosis and the diagnosis was confirmed by surgery and microbiological investigations.

Keywords: Diabetic; Fungi; immunocompromised; Immunocompetent; Mucormycosis; Necrosis; Neoplasm.

INTRODUCTION

Mucormycosis is known to be a fatal, rapidly destructive, and opportunistic infection. Fungi associated with mucormycosis are ubiquitous in nature. Healthy individuals are usually having a strong resistance to these fungal agents. But these fungi may become pathogenic in association with diabetic ketoacidosis or other immunosuppressive disorders [1] and in these patients, the invasive mucormycosis may be misdiagnosed clinico-radiologically as malignancy, which leads to overtreatment or late diagnosis with resultant fatal clinical course [2] This case report explicates mucormycosis in a 30 year old immunocompetent female patient.

CASE REPORT

A 30year-old female admitted in the hospital with complaints of severe headache, blockage of left nasal cavity and hyponasality of voice since two months. On examination no hypertension, no diabetes and no other systemic underlying conditions were found. However, the patient had suffered from same symptoms last year during summer (reaching peak in June).At the time of admission, she was febrile and the general condition was good. Her temperature was 39°C, pulse 72/min, respiratory rate 16/min, BP 118/74mm of Hg. Clinical laboratory findings revealed the following data : [Haemoglobin 10gms, White blood cell count 6500/mm³ (63% neutrophils, 26% lymphocytes, 10%

eosinophil, 1% monocyte), bleeding time 2.00min, clotting time 5.45min, Urea 22.0mg/dl, Creatinine 1.0mg/dl, Glucose 97.8mg/dl]. X-ray chest –normal. A cranial Computed Tomography (CT) report showed soft tissue density filling maxillary sinuses (L>R) extending into bilateral nasal cavity, bilateral ethmoidal air cells, bilateral frontal(R>L) and bilateral sphenoidal sinuses. There was evidence of thinning and expansion of bony walls of sinuses with erosion of ethmoid and floor of the sphenoid sinus. There was an evidence of erosion of medial wall of left orbit with mild intraorbital extension in the medial part of orbit as well. Right orbit normal. There was also mild thinning of cribriform plate. However no intracerebral extension was seen. Intranasal polypectomy was done. Potassium hydroxide (KOH) wet mount examination showed of biopsy specimen showed coenocytic fungal hyphae (Fig 1).

On staining with hematoxylin and eosin (H&E), the hyphae were broad and non septate and irregularly branched (Fig 2)

A presumptive diagnosis of Mucormycosis was made on basis of morphology of fungal hyphae in the direct microscopy and the culture confirmed the diagnosis. (Fig3)



Fig1. KOH wet mount showing coenocytic fungal hyphae

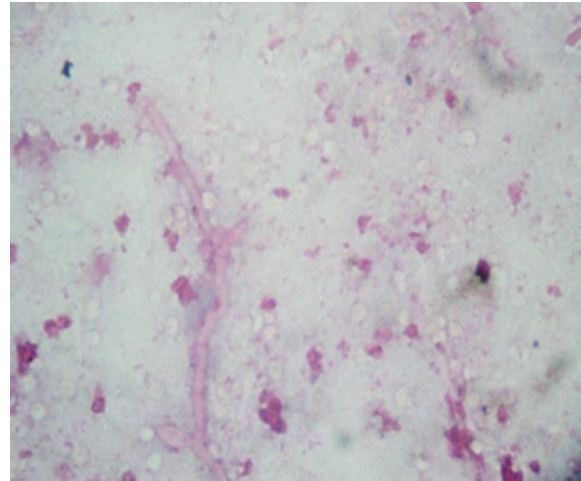


Fig2. H&E staining showing broad, coenocytic hyphae



Fig 3. Growth of Mucor species in culture

The patient was given fluconazole (150 mg) once weekly for three months and advised to come after three months for follow up. After three months, CT scan was repeated and found to be normal.

DISCUSSION

Invasive fungal infections have increased dramatically over the past several years, largely as a result of increasing numbers of immunosuppressed patients. Immunosuppressive states secondary to chemotherapy, hematologic disorders, transplantation and AIDS, place hosts at risk for invasive mycoses. Patients at high risk for acute invasive fungal sinusitis also include poorly controlled diabetics and those

with conditions that predispose to metabolic acidosis such as chronic renal failure or diarrhea. Fungal sinusitis is a well-documented disease in the immunocompromised patient, but in recent years it has been reported increasingly in immunocompetent patients as well. Environmental and local factors may predispose normal hosts and increase a patient's risk for developing fungal paranasal sinus infections, including frequent exposure to air or food contaminated with mycotic spores, domestic pets, root canal fillings, chronic or recurrent bacterial sinusitis, and long-term use of wide-spectrum antibiotics and/or topical steroid use. [3]

In immunocompetent patients, the nose and/or maxillary sinuses appear to be the predominant source of infection. There is substantial increase in cases of mucormycosis with no known risk factors. In recent studies, it is speculated that chronic sinusitis may be a predisposing factor which causes alteration of first-line barrier of upper airway sinonasal mucosa due to impairment of mucociliary clearance, loss of defense and reduction in molecules of epidermal differentiation complex necessary for maintenance of barrier function. This renders sinonasal mucosa vulnerable to fungal colonization of previously damaged epithelium. It is likely that *Mucor* sporangiospores are also capable of secreting several toxins or proteases, which may directly destroy endothelial cells in mucosal membranes with a widespread disease, thus invading the mucosal sinuses spreading along the vascular and neuronal structures or eroding through the walls of the sinus. It has been suggested, if sporangio spores are larger than 10 μ , they remain localized to upper airways and colonize. [4] Well documented cases of invasive paranasal mucormycosis have been reported in the literature in which the patients had no

underlying disorders but were associated with local predisposing factors, such as chronic sinusitis. [4]

In this case that we were not aware when and how the patients came in contact with it. We presume that the fungi might have colonized on the damaged epithelium in order to invade the mucosal sinuses. Infection would have eroded bone through walls of the sinus and remained localized. It was fortunate that an early diagnosis helped to diagnose the *Mucor* infection, otherwise it would have spread into the retro-orbital area, and thereby extending into the brain, resulting in a more extensive form such as rhino-orbital or rhino-orbito-cerebral form. So, we have hypothesized that a chronic local insult, such as a chronic sinusitis, might have acted as a predisposing factor for possible development of *Mucor* infection in immunocompetent individuals.

CONCLUSION

In immunocompetent individuals mucormycosis infection has a worldwide distribution. However, the predisposing factors and the real cause of mucormycosis in such patients still remain unknown.

REFERENCES

1. Suryanarayan Rao S, Panda NK, Pragache G, Chakrabarti A, Saravanan K Sinoorbital mucormycosis due to *Apophysomyces elegans* in immunocompetent individuals - an increasing trend. *Amer J Otolaryngol* 2006; 27:366-369.
2. Bhadani PP, Bhadani UK, Thapliyal N, Sen R A rare presentation of invasive rhino-orbital mucormycosis in an immunocompetent young girl: a case report. *Indian J Pathol Microbiol* 2007; 50:785-786.
3. Mastroianni A. Paranasal sinus mucormycosis in an

immunocompetent host: efficacy and safety of combination therapy with Liposomal Amphotericin B and adjuvant rHuGM-CSF. *Infez Med.* 2004;12(4):278-83.

4. Mignogna MD, Fortuna G, Leuci S, Adamo D, Ruoppo E, Siano M, et al. Mucormycosis in immunocompetent patients: A case – series of patients

with maxillary sinus involvement and a critical review of the literature. *Int J Infect Dis.* 2011; 15:e533-40.

5. Dae Woo Kim, et al Invasive paranasal mucormycosis with peripheral eosinophilia in an immunocompetent patient *Medical Mycology* March 2010, 48, 406–409.

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