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FUNGAL INFECTIONS – A CLINICOMORPHOLOGICAL SPECTRUM

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ABSTRACT

Introduction: Fungal infections at different sites are showing increasing incidence in both healthy and Immunocompromised individuals. Among the fungal infections, Aspergillus and Mucormycosis are the common infections, involving maxillary sinus, oral cavity, lung followed by each case of maduramycosis of foot and mucormycosis of forearm in this study.

Aims: To study the clinical and pathological profile of fungal infections at various sites.

Settings and Design: A Retrospective observational study conducted in Department of Pathology from Jan 2011- Dec 2012, VMKV medical college, Salem.

Material and Methods: Seventeen cases were analyzed in this study with respect to clinical history, physical examination and neuroimaging [computed tomography (CT) or magnetic resonance imaging (MRI)] wherever necessary. Operated specimens were received in 10% formalin for histopathological examination.

Results: Male:female ratio was 11:6. Mean age of 49 years. The common clinical presentations were nasal discharge followed by oral ulcer and foot ulcer. Commonest site of lesion was nasal cavity (59%). Mucormycosis was the commonest fungus.

Conclusions: Early diagnosis and prompt treatment can reduce the mortality and morbidity of this lethal fungal infection.

Key Words: Fungal infections, Mucormycosis, Aspergillus, Oral ulcer

INTRODUCTION

Fungal infections at different sites are now-a-days showing increasing incidence in both normal and Immunocompromised individuals. Mucormycosis, a fulminant fungal infection, invades the arteries, forms thrombi within the blood vessels that reduces blood supply and causes necrosis of hard and soft tissues^(1,2). Once within the arteries, the fungus may spread to orbital and intracranial structures. Aspergillus species are the most common cause of fungal sinusitis.^(3,4)

AIMS

To study the clinical and pathological profile of fungal infections at various sites.

MATERIAL AND METHODS

A Retrospective observational study from Jan 2011- Dec 2012 was conducted in the Department of Pathology, VMKV

medical college, Salem. Seventeen cases were analyzed in this study with regards to clinical history, physical examination, and radiological examination (like X-Ray paranasal sinus view, neuroimaging [computed tomography or magnetic resonance imaging (MRI)] studies). Operated specimens were received in 10% formalin for histopathological examination. Routine Haematoxylin and Eosin stain and, when necessary, special stains like Periodic Acid Schiff stain (PAS) & Silver stains were done.

RESULTS

A total of seventeen cases were studied, with age range of 15 to 80 years. Mean age was 49 years and Male:Female ratio was 11:6. Most common presenting symptom was nasal discharge and clinical diagnosis was nasal polyp/growth. In six cases, the underlying disease was diabetes mellitus. (**Table 1**). X-ray paranasal sinus showed haziness of maxillary

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sinus in all cases. MRI revealed Orbital pseudo tumor in 3 cases and one case showed air filled cavity in the lung.

In this study, Mucormycosis (Fig 1-4) was the commonest fungi (seven cases), followed by five cases of Aspergillosis (Fig 5 & 6), two cases each of candida (Fig 7 & 8) and Rhinosporidiosis (Fig 9 & 10). Only one case of maduramycosis was present in this study (Fig 11&12). Periodic Acid Schiff (PAS) and Silver methenamine special staining technique demonstrated the fungus. Microbiology culture was positive in 7 cases.

DISCUSSION

In this study, histopathological examination with hematoxylin and eosin (H & E) stained sections showed various types of fungal infection with their characteristic feature, like abscess, necrotic material, inflammatory cells or granuloma composed of epithelioid cells, giant cells, surrounding the thin ribbon like fungal hyphae. The most common fungal infection in the present study was Mucor, an aggressive, opportunistic infection in the class of Phycomycetes, first described in 1885 by Paultauf. ⁽⁵⁾ Rhinocerebral mucormycosis is a rare opportunistic infection. It is mostly seen in association with immunosuppression as in this study, underlying conditions were diabetes mellitus and malignancy. ^(5,6,7) Ferry et al in 1983 and Yohai et al ⁽⁸⁾ in 1994, reported sinus involvement in 69% - 79% of mucormycosis respectively. In our study, it was 59%.

Aspergillus species is the most common fungal infection of the paranasal sinuses. ⁽⁶⁾ Allergic Aspergillus sinusitis was first described as a form of fungal sinusitis by Katzenstein et al in 1983. ⁽⁷⁾ The typical presentation is nasal polyp associated with thick mucin & scanty fungal hyphae. However, culture is usually negative in most of the cases. ^(7,8) In our study, out of five cases of aspergillosis, only two cases showed positive culture.

The next common fungal infection was candidiasis. *Candida* species, most often *C. albicans*, are the most frequent cause of human fungal infections. Diabetics patients are particularly susceptible to superficial candidiasis. Candidiasis takes the form of a superficial infection on mucosal surfaces of the oral cavity (thrush), oesophagitis, vaginitis, mucocutaneous and Invasive candidiasis. ⁹

We reported two cases of Rhinosporidiosis. It is characterised by hyperplastic polypoidal lesion of the nasal cavity.

The organism of Rhinosporidiosis are huge, thick walled sporangia containing several thousands of spores. They elicit inflammatory response composed of neutrophils, lymphocytes & plasma cells. ¹⁰

In our study, we had only one case of maduramycosis. 13 species of fungi have been identified as causes of mycetoma. These include *Madurella mycetomi* and *Allescheria boydii*. The condition occurs mainly in Tropical countries like India. The foot is most commonly involved, as in this study. ¹¹

CONCLUSION

The early diagnosis and recognition of invasive fungal infection is very important, to prevent progression of the disease and avoid the high morbidity and mortality with this destructive disease.

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Table 1: Demographic characteristics and diagnosis in all cases

Case No	Age/Sex	Clinical presentation	Site / Clinical diagnosis	Underlying conditions	Diagnosis
1.	39/F	Swelling and pain in right side of cheek	Nose/ Nasal polyp-Mucor	Diabetes	Mucor
2	15/M	Ear discharge	Ear/ Aural polyp	Diabetes	Candida
3	48/F	Haemoptysis	Lung - ?TB	Diabetes	Aspergillus
4	38/M	Nasal discharge	Nose / Nasal growth	Diabetes	Mucor
5	50/M	Left proptosis, headache	Palate/ Oral ulcer	Diabetes	Mucor
6	45/M	Foot Swelling	Foot / ulcer	-	Mucor
7	35/F	Obstruction & Discharge	Nose/ Nasal polyp	-	Rhinosporidosis
8	38/F	Nasal discharge	Nose/ Nasal mass	-	Rhinosporidosis
9	42/F	Nasal obstruction	Nose/ Nasal mass	-	-Mucor
10	80/F	Swelling Rt forearm	Forearm /Neurofibroma	-	-Mucor
11	56/M	Headache,Nasal discharge	Nose/ Sinusitis	-	Aspergillus
12	53/M	Headache,Nasal discharge	Nose/ Sinusitis	-	Aspergillus
13	60/M	Headache,Nasal discharge	Nose / Sinusitis	-	Aspergillus
14	45/M		Nose / Nasal growth	Diabetes	Mucor
15	69/M	Reduced vision of left eye,Headache & proptosis	Palate / Oral ulcer	Diabetes	Mucor
16	45/M	Nasal discharge	Nose / Sinusitis	-	Aspergillus
17	71/M-	Difficulty in swallowing	Oesophagus/ Oesophageal ca	-	Candida

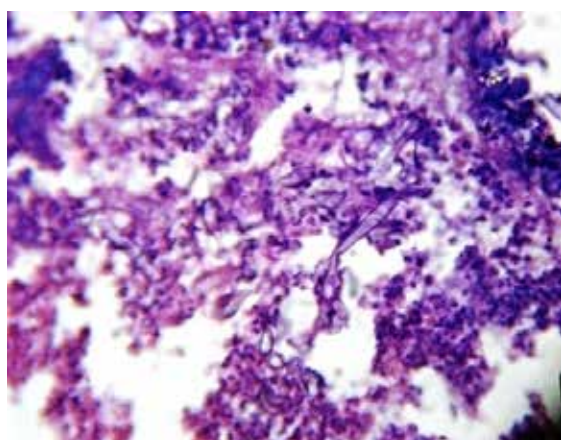


Figure 1: Fungal hyphae - broad, nonseptate- Mucor (H&E,10X)

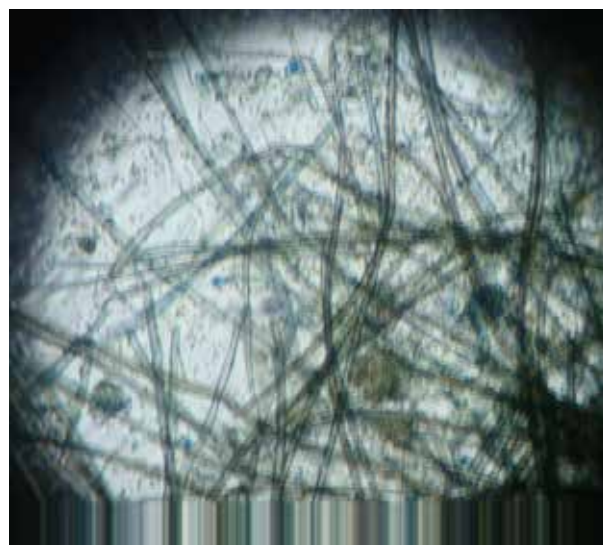


Figure 2: Periodic Acid Schiff (PAS) – fungal hyphae- Mucor (H&E, 10X)

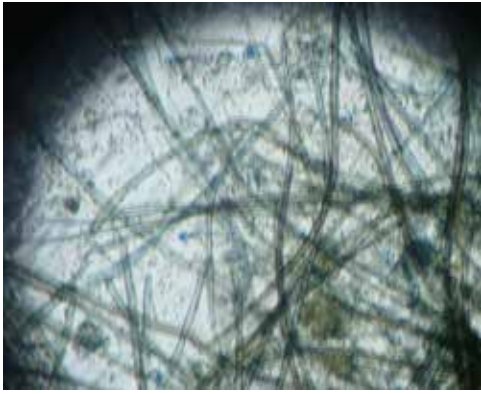


Figure 3: Silver Methenamine stain – Positive for Fungus(Mucor) (H&E, 40X).

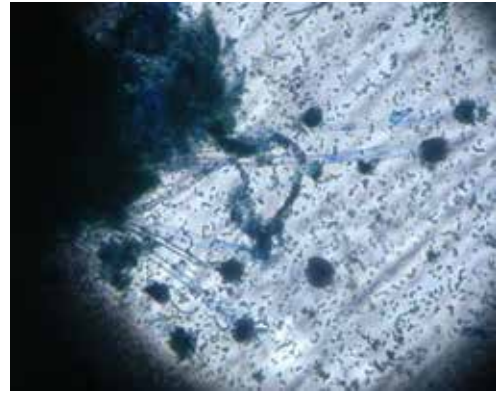


Figure 6: Lactophenol cotton Blue-Aspergillus (10X)

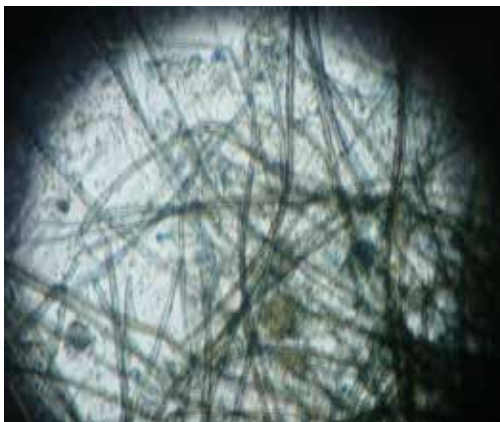


Figure 4: Lactophenol cotton Blue-Mucor (10X)

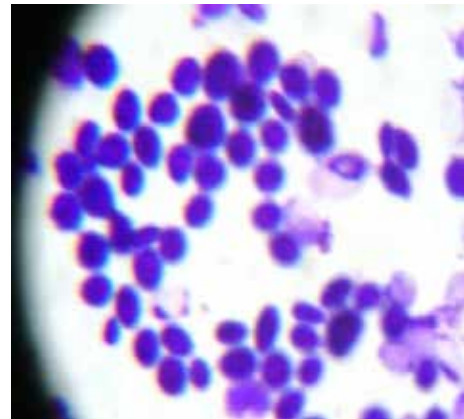


Figure 7: Gram stain(100X) – Budding yeast of candida.

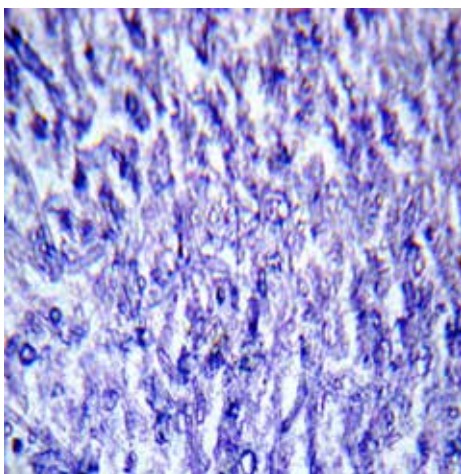


Figure 5: Aspergillus (H&E, 40X).

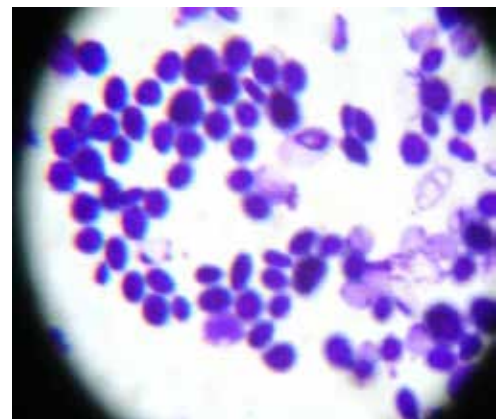


Figure 8: H&E stain(10X)- Budding yeast of candida.

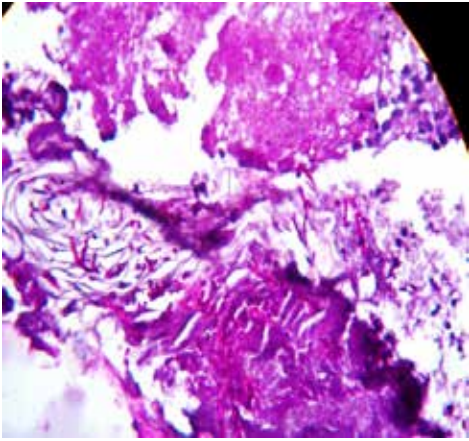


Figure 9: H&E stain(10X)- Sporangia with spores- Rhinosporidiosis

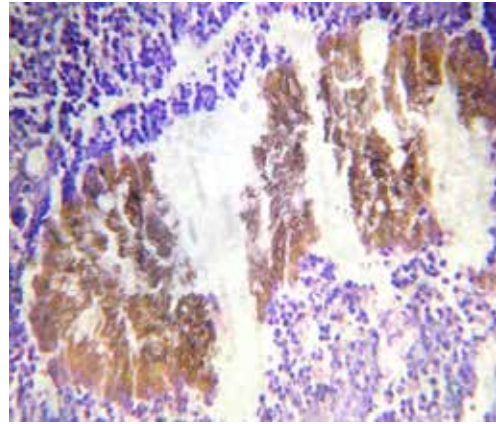


Figure 12: H&E, 10X – Maduramycosis



Figure 10: Silver Methenamine stain – Rhinosporidiosis



Figure 11: Gross-Multiple sinus discharge- Foot