Original Article

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Fungal Rhinosinusitis with Orbital Involvement: A Successful Endoscopic Management

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Abstract

Aim: To know the different orbital manifestations and involvement of surrounding structures and their varied clinical presentations of fungal rhino-orbital sinusitis. *Materials and Methods:* 40 patients with orbital complications secondary to fungal rhino sinusitis from 2007 – 2017 were included in the study of 20 to 70 years of age. Endoscopic Sinus Surgery with orbital clearance / debridement were done as per the need with anti-fungal medications. Mucormycosis with orbital, palatal and intracranial involvement and Aspergillus with Abducens palsy were seen with histopathological evidence. Regular follow up and endoscopic suction clearance were done in all patients. Patients with suspected malignant involvement and traumatic injury. *Results:* Out of the 40 patients, 25 improved completely without any sequelae, 2 under went orbital exenteration, 5 had palatal perforation and 3 succumbed to death. *Conclusion:* Invasive rhino-sino-orbital mycosis is known to have a poor prognosis.Ocular involvement is an ominous sign but orbit can be preserved. The critical factor in treatment is the rapidity of diagnosis and early administration of antifungal therapy because some of these patients may have a stormy course or rapid progression. A high degree of clinical suspicion is required for diagnosis. However real time total surgical excision with an appropriate antifungal therapy will make a difference in the prognosis.

Keywords: Fungal rhino sinusitis; Mucormycosis; Orbital cellulitis; Amphotericin - B.

Introduction

Sinusitis or more accurately rhino sinusitis is a common disorder, affecting approximately 20% of the population at some time of their lives. However, fungal rhino sinusitis once considered a rare disorder, is being recognized and reported with increasing frequency over the last two decades worldwide [1,2].

Because of improved diagnostic methods, which enable us for more frequent recognition and an increase in those factors which predispose to fungal infections, diagnosis of the condition has become less cumbersome.

In this study, patients with orbital involvement, with suspected fungus infection have been evaluated to know the extent of involvement, their appropriate management, morbidity and mortality of the disease.

Aim: To know the different orbital manifestations and involvement of surrounding structures and their varied clinical presentations of fungal rhino-orbital sinusitis.

Study Design: Prospective Study

Materials and Methods

40 patients with orbital complication secondary to fungal rhino sinusitis from 2007–2017 were included in the study of 20 to 70 years of age.

- Endoscopic Sinus Surgery with orbital clearance / debridement were done as per the need with anti-fungal medications.
- Mucormycosis with orbital, palatal and intracranial involvement [Fig. 1] and Aspergillus with Abducens palsy [Fig. 2] were seen with histopathological evidence. [Fig. 3]
- Regular follow up and endoscopic suction clearance were done in all patients.

Results

Table 1:

Structures Involved	Number	Outcome
Isolated sphenoid with VIth nerve palsy	2	Improved – 02
Sino-nasal involvement with only orbital extension	25	Improved – 23 Orbitalexenteration – 02
Orbital + palatal involvement	5	Palatal perforation – 05
Orbital + intracranial Involvement	8	Death – 03

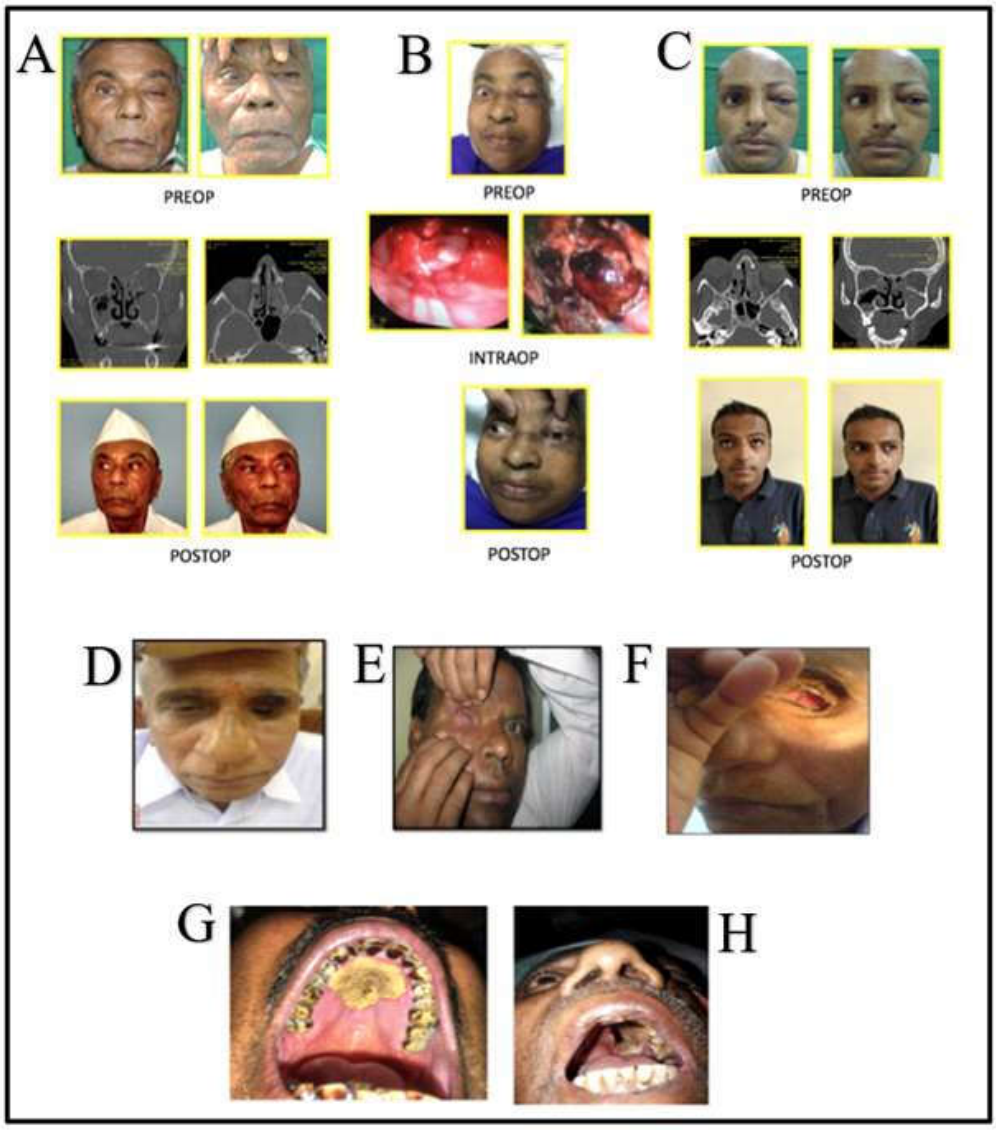

Fig. 1 A,B,C: Fungal rhino sinusitis with left orbital cellulitis
D,E,F: Orbital exenteration
G,H: Palatal involvement with perforation

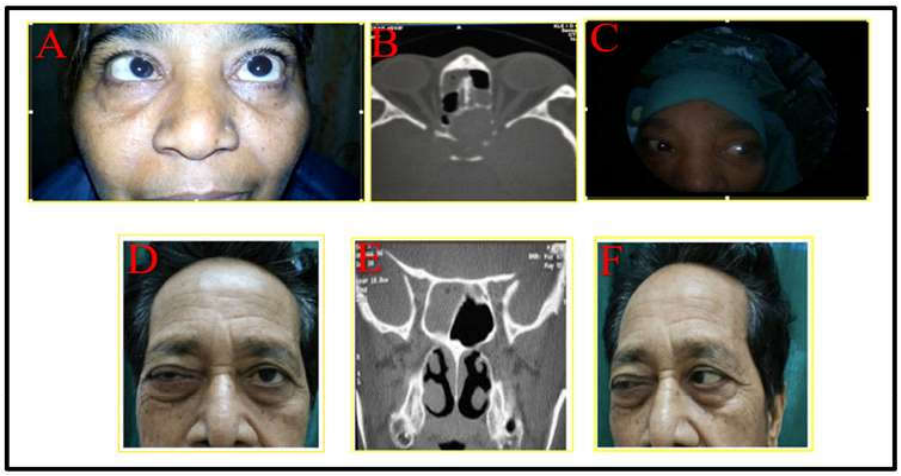

Fig. 2 A,B,C: Isolated left sphenoid sinusitis (Aspergillus) with left VIth nerve palsy and complete improvement post orbital decompression.
D,E,F: Isolated right sphenoid sinusitis with right lateral rectus palsy and complete improvement post orbital decompression.

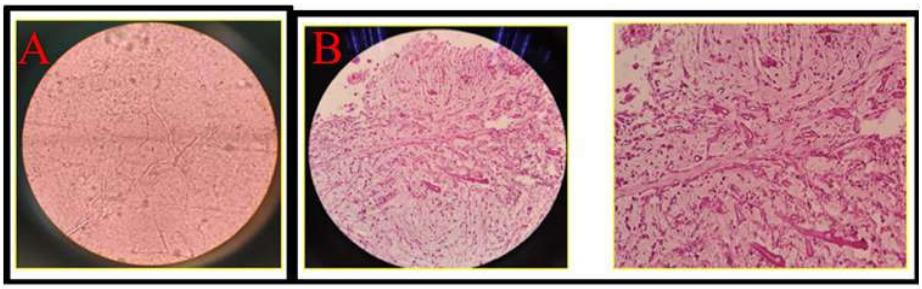

Fig. 3A: KOH positive for fungal filaments
3B: Histopathology of the mucosa showed edema, congestion and diffuse inflammation with necrotic material showing numerous hyphae branching at right angles suggestive of mucormycosis.

Discussion

Due to close proximity of the orbit with sinuses, any sino nasal infection, if not diagnosed early and treated adequately, can lead to the spread of infection. It has been estimated that 5–10% of upper respiratory infections are complicated by sinusitis. Orbital complications include edema, orbital cellulitis, subperiosteal abscess, orbital abscess, cavernous sinus thrombosis and intracranial complications.

Rhino/sino-orbital mycosis is most often caused by the saprophytic moulds - aspergillus and mucorales [3]. These are found worldwide in a variety of habitats like soil, on decaying vegetation, in the air, and also in water supplies. Their thermo-tolerance permits a wide range of suitable host conditions [4,5,6,]. There are about 400,000 known fungal species of which 400 are human pathogens and 50 of which cause systemic or CNS infection.

Clinical presentation, imaging features, and treatment differ based on type of fungal sinusitis.

Fungal rhino sinusitis occurs in two distinct forms –

1. The fulminant invasive disease - immunosuppression
2. Chronic fungal rhino sinusitis - apparently healthy hosts [3].

Nasal cavity and paranasal sinuses being dark, wet and closed spaces form friendly environment for the fungus to grow. Frequently, the disease spreads to adjacent areas [7] including the central nervous system and the mortality in these cases is high [8,9]. Orbital complications are the most common complications and account for 61% of all complications.

It carries a high residual morbidity and mortality due to the angioinvasive property of fungi, causing vascular occlusion and extensive

tissue necrosis. Impaired delivery of the antifungal drugs to the site of infection because of vascular thrombosis and complex anatomy of the rhino orbito cerebral region frequents the need for early diagnosis and aggressive management [10]. Medical treatment is indicated for the first 48 hours with positive KOH results, if patient does not improve then surgical intervention is indicated with antifungal management following histopathological evidence.

Amphotericin B remains the only antifungal agent approved for the treatment of this infection [4]. The lipid formulations of amphotericin B are significantly less nephrotoxic than amphotericin B deoxycholate and can be administered at higher doses for a longer period of time. Several case reports of patients with mucormycosis document successful treatment with up to 15 mg/kg/day of a lipid formulation of amphotericin B [11].

Though azoles have not been found to be effective for treating mucormycosis, combination of suboptimal doses of liposomal amphotericin B and posaconazole/fluconazole given concurrently had a significantly better efficacy in comparison with either monotherapy [12].

Conclusion

Invasive rhino-sino-orbital fungal infection has a poor prognosis.

These patients need surgical procedures that combine otolaryngological expertise.

A multidisciplinary approach by otolaryngologists, opthalmologists, nephrologists and neurosurgeons is required. Ocular involvement is a more ominous sign but orbit can be preserved. As the critical factor in treatment is the rapidity of diagnosis and early administration of antimycotic therapy because of some of these patients may have a stormy course or rapid progression, a high degree of clinical suspicion is required for diagnosis. However real time total surgical excision with an appropriate antimycotic drug will make a difference in the prognosis.

Compliance with Ethical Standards: Ethically approved.

Conflicts of Interest: Nil.

Informed Consent: Written informed consent was taken from participants included in the study.

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