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FUNGAL SINUSITIS - A RISING TREND

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In recent times there has been a growing incidence of fungal sinusitis. This clinical entity has a wide spectrum of presentation as well as prognosis depending mainly on its basic type i.e. whether it is invasive or noninvasive fungal sinusitis.

The objective of this study was firstly to determine whether the rising trend is truly a reflection of increased incidence or of more accurate diagnosis. We also studied the different modes of presentation in our hospital and we discuss four representative case studies.

The final word on management of this disease is still not written. We discuss the management protocols followed in our hospital.

INTRODUCTION

In recent times there has been an increase in fungal infections of the nose and paranasal sinuses, even though it is difficult to ascertain the incidence and prevalence of such disorders. The only information which can be drawn from the literature is that such infections are diagnosed in 6-13% of surgically treated chronic sinusitis. Aspergillosis is the aetiologic agent in approximately 80% cases.

Fungal infections are classified into 2 groups -Non invasive and invasive.

Non invasive includes mycetoma and allergic fungal sinusitis. Invasive includes chronic indolent type which presents with slowly progressive bone erosion and fulminant form.

The maxillary sinus is involved in 80% cases followed in order of frequency by ethmoid and frontal sinus. The sphenoid sinus being extremely rare.

Fungal sinusitis should always be considered in the differential diagnosis of chronic or recurring sinusitis resistant to adequate medical treatment. A high index of suspicion is necessary for diagnosis as clinical examination is rarely conclusive.

MATERIAL AND METHODS

A high index of suspicion is required to make a diagnosis of fungal sinusitis early. All patients of antibiotic resistant sinusitis, florid polyposis and acutely ill patients with sinusitis were screened.

The initial signs and symptoms may be nonspecific like low grade fever, nasal congestion. Initial radiographs may also be unremarkable with only mucosal thickening. The relatively insensate mucosa during examination, tenacious slime like secretions and symptoms suggestive of invasion of surrounding structures give a clue to the diagnosis.

All patients were subjected to nasal endoscopy, biopsies of nasal mucosa were taken and nasal secretions were obtained through sinus washes. Nasal specimens were transported in a sterile petri dish for direct examination and culture in Sabouraud's dextrose agar and in formalin for histopathology. (Figs. 1 and 2). A CT scan of paranasal sinuses both coronal and axial views was done in all patients. MRI was reserved for patients where extensive intracranial extension was suspected. The patient was investigated for predisposing factors like diabetes and HIV infection.

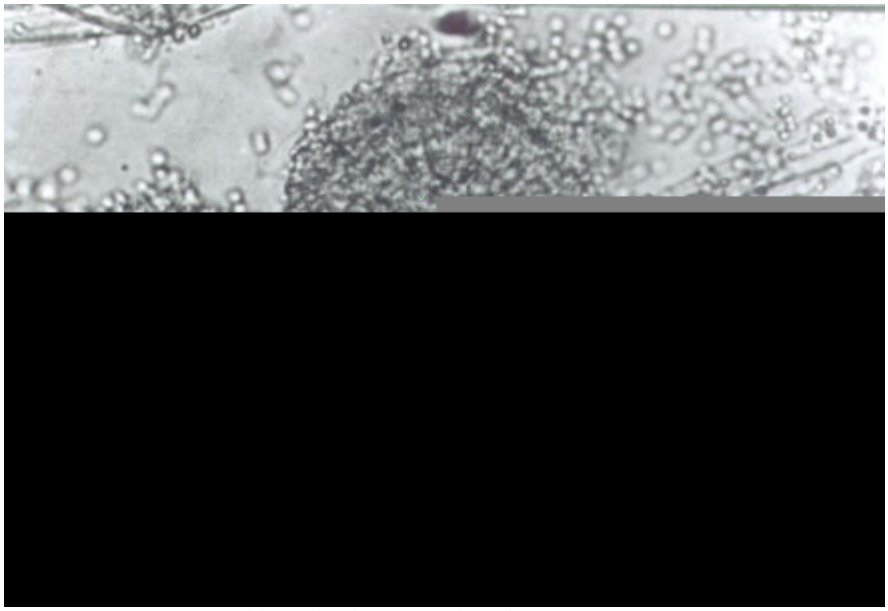

Fig 1. Conidial heads of Aspergillus flavus in wet mount X400.

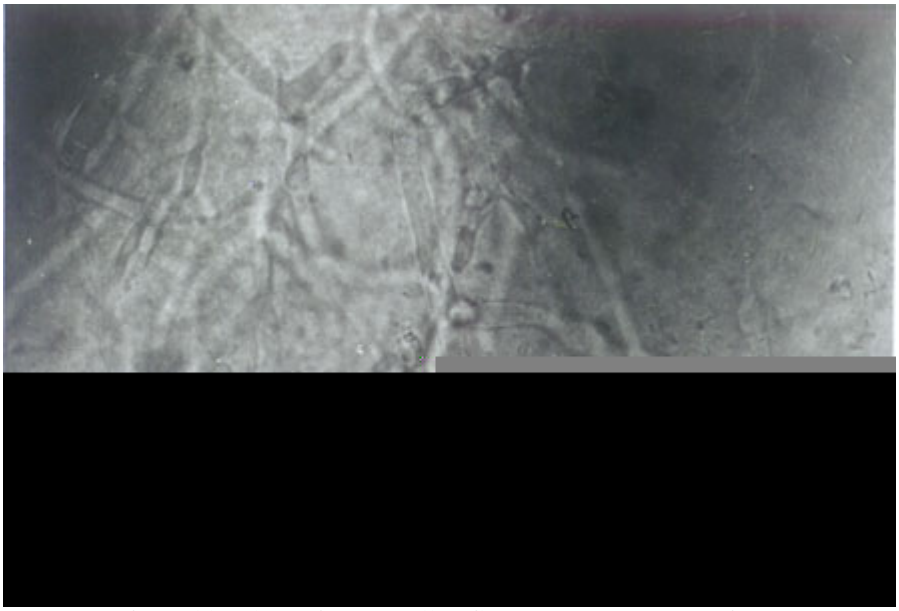

Fig 2. Septate fungal hyphae of Aspergillus flavus in KOH mount from sinus biopsy X400.

In acutely ill patients specific treatment with systemic antifungals was instituted within a few hours of diagnosis on smear report.

In chronic/indolent cases histopathology report was awaited to decide whether the fungus was invasive or noninvasive. This is because the management of these two conditions differs vastly. The mainstays of medical management were the use of systemic antifungals in invasive types and steroids in noninvasive cases.

All patients without exception needed endoscopic surgery along with drug therapy. Surgery consisted of removal of all polyps, wide excision of necrotic tissue and reestablishing aeration of sinuses. Ancillary procedures like removal of the eye ball were necessary in some patients with a view to control the spread of the disease.

OBSERVATION

Patients with fungal sinusitis have a wide spectrum of presentation. In its chronic indolent form the patient may harbour the disease for many years whereas its acutely aggressive form may result in death of the patient within hours. Our observations in 4 representative cases are discussed.

CASE 1

45 year old female with a known history of diabetes presented with proptosis, left orbital pain, headache and loss of vision in left eye and loss of ocular movements.

A CT scan showed soft tissue in left ethmoid sinus with involvement of the medial orbital wall (Fig. 3).

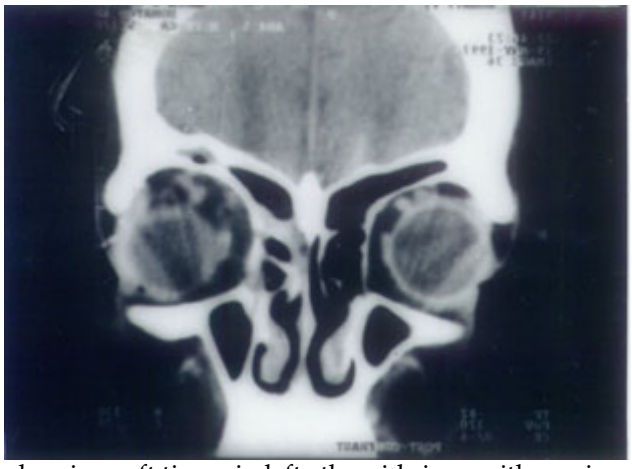

Fig 3. CT scan showing soft tissue in left ethmoid sinus with erosion of the medical qrbital wall

A sinoscopic biopsy was performed which showed plenty of fungal hyphae on KOH mount.

Ketoconazole was started 200 mg od in 24 hours and was given over a period of 21 days.

Left frontoethmoidectomy with orbital exenteration was done. The aim was to remove all necrotic debris and establish good ventilation. Histopathology showed multiple aseptate hyphae suggestive of mucormycosis with diffuse infiltration of optic nerve and extraocular muscles.

The patient has recovered well and has been following regularly for 3 years with no evidence of recurrence.

CASE 2

A 40 year old female with 6 months amenorrhoea with diabetic ketoacidosis admitted in the medical ward, was referred to us for swelling over left maxilla, blocking of nose, headache and loss of vision in left eye since 3 weeks.

A CT scan showed soft tissue in left maxilla and ethmoid sinus with erosion of lamina papyraceae and involving the optic nerve (Fig. 4).

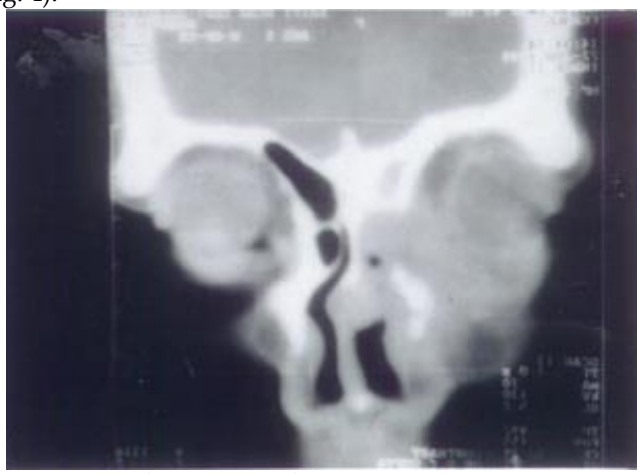

Fig 4. CT scan showing soft tissue in left maxilla and ethmoid sinus with erosion of lamina papyraceae

A nasal scraping was taken which showed fungal hyphae on KOH mount.

Amphotericin B was given intravenously in gradually increasing doses for 6 weeks.

Endoscopic debridement of the fungal mass was done which showed large areas of ischaemic necrosis with widespread destruction. Postoperatively the patient developed palatal necrosis leading to a palatal perforation (Fig. 5).

Fig 5. Clinical photo showing palatal necrosis

Culture report showed growth of Rhizopus arrhizus.

The patient delivered a live premature baby following induction of labour in the 7th month of gestation.

A post-operative CT scan done 2 months later showed control of disease with loss of the cribriform plate and a septal and palatal perforation (Fig. 6).

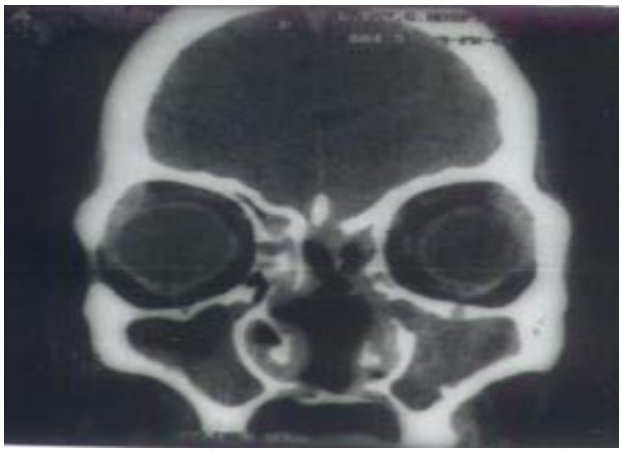

Fig 6. Postoperative CT scan showing loss of cribiform plate and septal perforation with control of disease

CASE 3

A 35 year old female presented with a chronic history of swelling over the left maxilla, blocking of nose, epistaxis.

A CT scan showed a mass in the maxillary antrum and left ethmoid sinusitis.

An antral puncture showed evidence of fungus on KOH mount.

Culture showed growth of aspergillus species. Amphotericin B was started on an urgent basis for 21 days.

Endoscopic debridement of the fungal mass was done. Postoperatively the patient developed oroantral fistula which was closed by simple catgut suture.

Check sinoscopy was done after the drug therapy, which showed no evidence of fungus and a closed oroantral fistula.

There is no evidence of recurrence with a good patient follow up over last 6 months.

CASE 4

A 50 year old male with known history of diabetes and HIV positive status presented with left eye proptosis, loss of vision, headache, nose block since 1 month. Surprisingly the patient was not acutely ill (Fig. 7).

Fig 7. Clinical photograph showing left eye proptosis with conjunctival congestion

MRI showed evidence of left maxillary sinusitis with mass extending into left orbit with erosion of medial wall (Fig. 8).

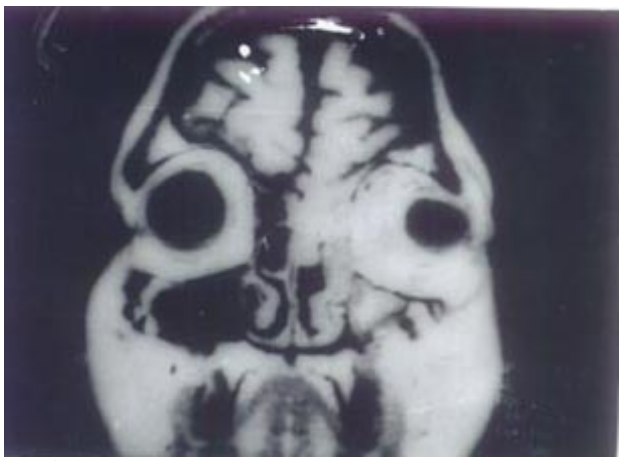

Fig 8. MRI showing left maxillary sinusitis with mas extending into left orbit with erosion of medial wall

Nasal biopsy showed direct visualisation of fungal hyphae on KOH mount.

Culture in Sabouraud's medium showed Aspergillus species.

Histopathology revealed fungus of invasive variety.

Amphotericin B was given to the patient for 15 days.

Debridement of the fungal mass with orbital exenteration was done.

Patient remained locally free of fungus but died 2 months later due to AIDS related complications.

RESULTS

The results are dependent on the chronicity and time of presentation. In our patients with early diagnosis and immediate aggressive medical management and surgical treatment there was good prognosis of our representative invasive cases.

One patient who was HIV positive had died of HIV related complications.

Three patients showed complete cure with no recurrence of disease.

Follow up period was from 6 months to 3 years.

However the morbidity of the disease resulted in sequelae like

-loss of eye due to orbital exenteration

-palatal perforation

-septal perforation

-oroantral fistula

-cribriform plate erosion with no CSF leak.

DISCUSSION

A general awareness of the increased incidence of fungal sinusitis as well as a high index of suspicion in a specific case is necessary for early diagnosis.

Fungal sinusitis presents in 2 forms. The first is a relatively benign non invasive type and the other an aggressively invasive type, which could lead to death in a few days, if appropriate management isnot instituted, which makes early diagnosis and management absolutely imperative.

Invasive fungal sinusitis should be suspected in acutely ill patients who usually but not always have a history of uncontrolled diabetes or immunocompromised status. The common clinical features giving a clue to it are, the presence of florid necrotic polyposis, insensate nasal mucosa, tenacious slime like secretion and evidence of bone invasion on CT scan.

Imaging plays an important role. Non enhanced CT scan is more sensitive than conventional X-ray in detecting the classical focal areas of hyperattenuation and calcification seen in soft tissue mass of fungal sinusitis. MRI findings of hypointense signals on T1 weighted sequences which progress to signal void areas on T2 weighted sequences, are characteristic features of fungal sinusitis. MRI is reserved only where intracranial extension is suspected.

Systemic antifungal therapy should be started within hours as soon as fungal hyphae are demonstrated on KOH mount. Delaying treatment while waiting for a culture report may jeopardize a favourable outcome.

The culture report only serves to reconfirm the diagnosis. There is no consensus on the duration for which antifungal therapy is given but it is titrated according to the clinical and radiological improvement. The usual protocol in our cases was to start Amphotericin B in gradually increasing doses until a well tolerated therapeutic dose was reached.

In one of our earlier cases, Ketoconazole was given and since the patient showed clinical improvement, the therapy was continued without changing the antifungal drug. Another choice of antifungal drug is Itraconazole.

Depending on its toxicity and adverse effects such as cardiac arryhthmias, disruption of renal function, local

phlebitis and anaemia, Amphotericin B may have to be stopped for a few days till parameters like BUN, S. creatinine return to normal after which the drug may be restarted. None of our patients required stoppage of therapy due to side effects.

No compromise should be made in wide surgical exenteration of the disease even though this may entail exenteration of eyeball in certain cases. Therapy should be stopped only if there is evidence of complete control of the disease on repeat CT scan and check sinoscopy. The patient should be followed up regularly for at least 6 months to rule out recurrence.

CONCLUSION

There is an increased incidence in occurrence of fungal sinusitis due to factors like indiscriminate use of antibiotics and more number of HIV patients.

There is also a better rate of diagnosis due to urgent nasal biopsies, KOH mounts, culture in sabourauds agar, histopathology and CT scan which make diagnosis as well as differentiation between noninvasive and invasive easier.

Invasive fungal sinusitis responds to early aggressive treatment with antifungals and wide surgical debridement.

If the above principles of treatment are adhered to, a favourable outcome is possible.

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