



Ophthalmic manifestations of Allergic fungal sinusitis a retrospective study

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Abstract:

Ophthalmological manifestations of allergic fungal sinusitis are rather uncommon. If not identified and managed properly this could lead to disastrous consequences including blindness. This is a retrospective study involving 20 cases of allergic fungal sinusitis presented at Stanley Medical College hospital during 2009-2011.

This study reveals that the commonest ophthalmological manifestation was proptosis. Other ophthalmic manifestations in the descending order of frequency included epiphora, diplopia, ophthalmoplegia and complete loss of vision.

CT imaging from these patients revealed that all patients with orbital manifestations had erosion of lamina papyracea.

Introduction:

Earliest description of allergic fungal sinusitis was by Young et al in 1978³. They described a case with pan sinusitis with bone erosion. They described the contents of maxillary sinuses to be abundant in mucous admixed with eosinophils, necrotic debris and scattered fractured fungal hyphae.

The condition "Allergic fungal sinusitis" as a clinical entity was described in 1980 by Millar et al¹. This non invasive type of fungal sinusitis is commonly seen in atopic individuals who manifest with intractable sinusitis associated with nasal polyposis. The paranasal sinuses of these patients are characteristically filled with eosinophil rich mucin. This mucin is characteristically known as "Allergic mucin". Patients with allergic fungal sinusitis commonly suffer from asthma. Studies reveal that nearly 40% of these patients do so². This condition is caused by IgE driven eosinophilic inflammation within the paranasal sinuses. The cytokines released from this inflammation are known to cause the classic features seen in allergic fungal sinusitis.

Clinical findings in these patients include:

1. Signs of nasal mucosal inflammation

2. Nasal polyposis
3. Facial disfigurement
4. Orbital abnormalities

Diagnostic criteria for allergic fungal sinusitis:

1. Gross production of eosinophilic mucin containing non-invasive fungal hyphae
2. Nasal polyposis
3. Characteristic radiological findings
4. Immuno competence
5. Allergy to fungi

Radiological characteristics of allergic fungal sinusitis⁴:

1. Classically asymmetrical involvement of paranasal sinuses are seen in plain radiographs and CT imaging
2. Bone erosion with extension of the disease to adjacent areas seen⁵
3. Expansion, remodelling and thinning of sinus walls seen. This is due to the expansile nature of accumulated mucin
4. Heterogeneous areas of signal intensities in sinus cavities filled with allergic mucin is seen in CT imaging. This is due to accumulation of heavy metals like iron and manganese.
5. Dessication of sinus contents causes hyperdense areas in CT imaging



Coronal CT paranasal sinuses showing features of allergic fungal rhinosinusitis

Histological features of allergic fungal sinusitis:

Histology of allergic fungal mucin reveals the characteristic branching non invasive fungal hyphae within sheets of eosinophils and Charcot – Layden crystals. Classically H&E stains accentuate the mucin and cellular components of allergic mucin but fail to stain the fungal hyphae. Silver stains are specifically used to stain fungal hyphae. Silver stains color fungi black / dark brown.

Materials and methods:

A retrospective analysis of case sheets of patients with allergic fungal sinusitis treated at Stanley Medical college hospital between 2009 – 2011 was made. 20 cases were identified for the study. Diganosis was made based on Bent – Kuhn criteria ⁶ and analysis of CT scan reports of these patients.

Bent Kuhn criteria for diagnosis of allergic fungal sinusitis:

Bent and Kuhn proposed 5 criteria for the diagnosis of allergic fungal sinusitis.

- (1) type I hypersensitivity (atopy) diagnosed by history, positive skin test, or serology
- (2) nasal polyposis
- (3) characteristic CT scan findings
- (4) positive fungal smear (This feature was not seen in any of the patients in our study) and
- (5) allergic mucin.

Following parameters were taken up for study:

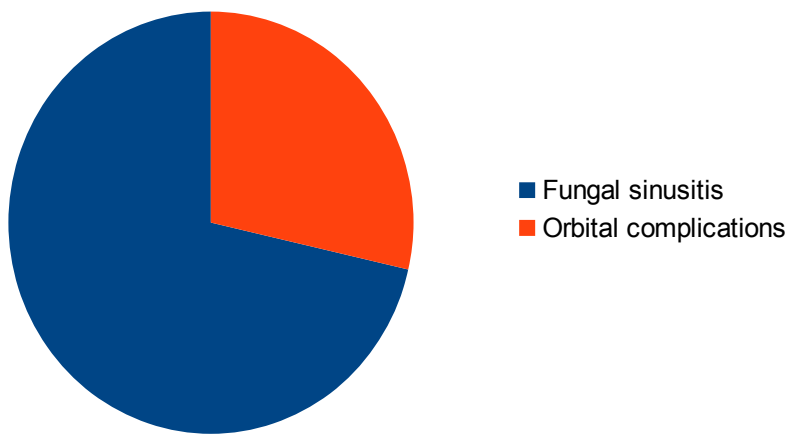
1. Incidence of orbital manifestations
2. Symptomatology
3. Outcome of orbital complications

Results:

Incidence of orbital complications in patients taken up for study:

Number of patients diagnosed with allergic fungal sinusitis = 20

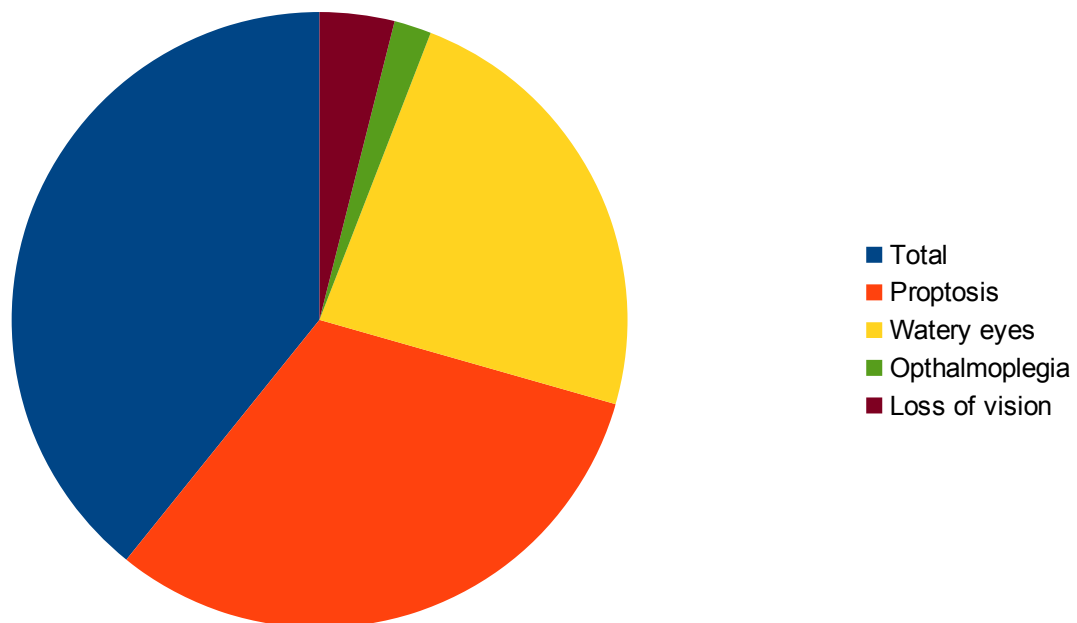
Number of patients presented with orbital manifestations = 8



Pie chart showing the incidence of orbital manifestations in patients with allergic fungal sinusitis

Common ophthalmic manifestations present in these patients included:

1. Proptosis – 16 Patients
2. Watery eyes – 12 patients
3. Ophthalmoplegia – 1 patient
4. Complete loss of vision – 2 patients



Pie chart showing various ophthalmological manifestations seen in these patients

CT scan imaging showed erosion of lamina papyracea in – 16 patients

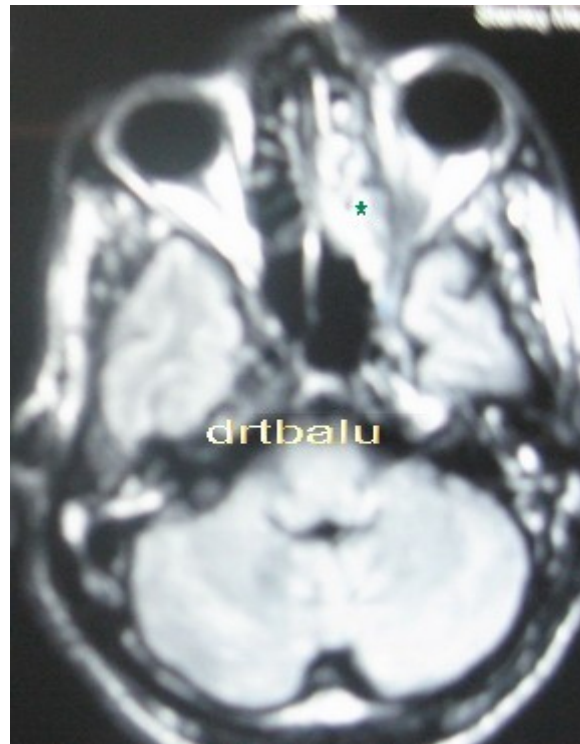
Fungal hyphae was not demonstrated histopathologically in any of these patients. The presence of fungal mucin was prevalent in all these patients.



Image of a patient with proptosis of left eye with ophthalmoplegia due to allergic fungal sinusitis



Axial CT image of nose and sinuses showing erosion of lamina papyracea by the fungal mass



MRI image of nose and sinus showing fungal mass eroding lamina papyracea and extending into the orbital cavity



Endoscopic view of a patient with allergic fungal sinusitis showing nasal polyposis



Endoscopic view of a patient with fungal sinusitis

Discussion:

Patients with allergic fungal sinusitis are immunocompetent individuals ⁷. They are also fairly young when compared to patients with other forms of invasive fungal sinusitis. Ophthalmic manifestations are fairly common in these patients. A high degree of suspicion is necessary for diagnosing this condition. This disease is due to immunological reaction of the nasal mucosa against fungal proteins ⁸. The presence of orbital periosteum is a deterrent to spread of these lesions into the orbit. However pre-existing anatomical channels are available through which these infections can reach the orbit. These pre-existing channels include:

1. Valveless ethmoidal veins
2. Foramina through which ethmoidal arteries pass through
3. Dehiscences in the lamina papyracea
4. Very thin floor of frontal sinus

Since allergic fungal sinusitis can cause disastrous orbital complications ranging from ophthalmoplegia and total blindness it should be considered as an emergency. Endoscopic debridement should be performed in these patients. This is more so when they show early features of orbital involvement. Patients with orbital involvement will always seek the help of ophthalmologist in the first place. Ophthalmologists should be aware of this potential problem.

References:

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