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ORBITAL COMPLICATIONS OF ASPERGILLUS FUNGAL RHINOSINUSITIS AND ITS MANAGEMENT

Otolaryngology

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ABSTRACT

INTRODUCTION: Fungal rhinosinusitis (FRS) can be categorized into invasive and non-invasive, based on the presence or absence of fungus in the tissue. Aspergillosis is the commonest fungal infection. Complications of rhinosinusitis are classified as orbital, intra-cranial, bony or chronic.
AIMS: Aim of the study is to investigate acute ophthalmological manifestations, prompt diagnosis, management and outcomes of aspergillous fungal sinusitis.
MATERIALS AND METHOD: We have retrospectively reviewed 17 patients having aspergillus fungal sinusitis; out of which 8 patients presented with orbital complications at GMERS medical college and hospital, sola from February 2017 to February 2019. In all the patients gender, age, occupation, symptoms and detailed history; followed by nasal endoscopy and contrast enhanced CT PNS was done. Functional endoscopic sinus surgery with supportive treatment of oral antifungal, oral or topical corticosteroids, antihistaminics was given. Strict regular follow up for suction clearance was advised.
RESULTS: Postoperatively, orbital symptoms were completely relieved in most patients. All patients have been on regular follow up, with nasal endoscopic examination and suction clearance to prevent recurrence.
CONCLUSION: Orbital extension of acute sinusitis is a diagnostic and therapeutic emergency. Prompt surgical management (FESS) with complete clearance of disease followed by supportive treatment is must.

KEYWORDS

rhinosinusitis, aspergillosis, chandlers classification, FESS, proptosis, diplopia

INTRODUCTION

Fungal rhinosinusitis (FRS) can be categorized into two broad groups; invasive and non-invasive[1]. This is based on the presence or absence of fungus in the tissue (mucosa, blood vessel or bone) respectively.

A fungal ball is a dense accumulation of extra mucosal fungal hyphae, usually within one sinus, most commonly the maxillary sinus and most common organism in a fungal ball is Aspergillus.

Aspergillosis is the commonest fungal infection of the nose and paranasal sinuses with prevalence of 56-72% of patients with FRS, with mean age of 21-33 year and is 1.5 to 2.6 times more common in men of low socioeconomic group.

It is estimated that 3% of sinusitis cases will progress to orbital cellulitis with 60–85% of orbital cellulitis cases being secondary to sinusitis.

Complications of fungal rhinosinusitis result from progression of infection beyond the paranasal sinuses, potentially causing significant morbidity from either local or distant spread.

Complications of rhinosinusitis are generally classified as orbital, intra-cranial, bony or chronic.[2]

Prior to antibiotic era orbital complications following rhinosinusitis was rather common about 26%. With the advent of excellent antibiotics this figure has come down to less than 5% .

Orbital complications following sinusitis is seen due to:

- Anatomical proximity of paranasal sinuses to the orbit
- The thinness of lamina papyracea which separates nasal cavity from orbit.
- This bony plate contains numerous thin blood vessels which allow active and rapid spread of infection to the orbit.
- Palpebral vessels do not contain valves (valveless diploeic veins of Breschet). These vessels travel parallel with the lamina papyracea.

Periorbita is a strong barrier to spread of infections into orbit. This gives the clinician much needed time to handle the problem of orbital infection.[3]

Based on extent of disease progression and classification of orbital complications treatment modality was determined.

Chandler based his classification on anatomy of orbit, perceived progression of infection, responsiveness to treatment and general prognosis.

Chandlers classification for periorbital cellulitis		
Group 1	Preseptal cellulitis	Inflammatory edema primarily limited to eyelid due to restricted venous drainage.
Group 2	Orbital cellulitis	Progressive inflammatory edema involving globe marked by chemosis
Group 3	Sub-periosteal abscess	Abscess develops in the space between the bone and periosteum displacing orbital contents in an inferolateral direction. Chemosis and proptosis are usually present.
Group 4	Orbital abscess	Involves collection of purulent material within the orbital contents caused due to relentless progression of orbital cellulitis leading to severe proptosis, complete ophthalmoplegia, and loss of vision.
Group 5	Cavernous sinus thrombosis	Development of bilateral ocular signs is the classic feature. These patients classically manifest with fever, headache, photophobia, proptosis, ophthalmoplegia and loss of vision. Cranial nerve palsies involving III, IV, V1, V2 and VI are common.

AIMS AND OBJECTIVES

Aim of the study is

- to investigate acute ophthalmological manifestations
- prompt diagnosis
- management and
- outcomes of

as per gillus fungal sinusitis.

MATERIALS AND METHOD

We have retrospectively reviewed 17 patients having aspergillus fungal sinusitis; out of which 8 patients presented with orbital complications at GMERS medical college and hospital, sola from February 2017 to February 2019.

In all the patients following data was meticulously noted: Gender, age, occupation, symptoms and detailed history.

Clinical endoscopic examination of the nose was performed to help determine the site and extent of disease.

Ophthalmologically, a formal assessment of the degree of chemosis, range of eye movements, degree of proptosis, relative afferent pupillary defect, visual acuity (using a Snellen chart) and inspection of the optic disc was made.

Chandlers classification was used to grade the severity of orbital complications.

Routine blood investigations, CXR-PA, ECG were done for preoperative fitness.

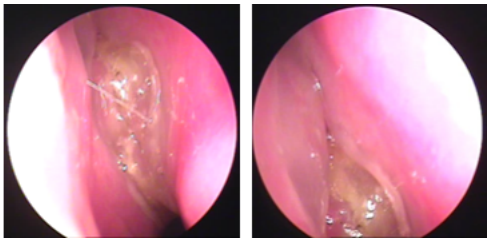
Contrast enhanced CT PNS (paranasal sinus) was done to visualize the extent of disease which further guided to confirm intraoperative findings.

All patients underwent functional endoscopic sinus surgery (FESS) to achieve complete clearance of the disease.

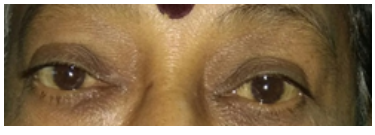
Post operatively, tissue was sent for HPE and fungal culture, and subsequently systemic antibiotics , systemic antifungals based on causative organism, oral steroids, antihistaminics, local decongestant steroidal spray were given.

Regular follow up and suction clearance was emphasized to prevent early recurrence.

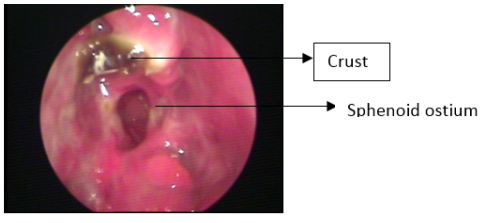
Preoperative picture: right fungal nasal polyposis



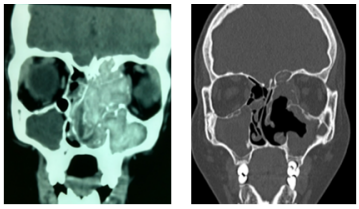
Right eye : downward and outward proptosis



Postoperative healthy nasal cavity; no fungus



Pre and post operative CECT PNS



Infraorbital swelling preoperatively:

Patient had history of infraorbital swelling, hard in consistency since 1 year.

CECT PNS was suggestive of bilateral maxillary thickening with erosion of right maxillary medial, posterior, anterior and superior wall. Biopsy proved aspergillus fungal infection.

Caldwell luc approach was used and maximum possible clearance was achieved followed by intensive course of voriconazole

Post operative – normal:

RESULTS

Out of total 17 cases of aspergillus FRS, 8 (47.05%) presented with acute ophthalmic manifestation.

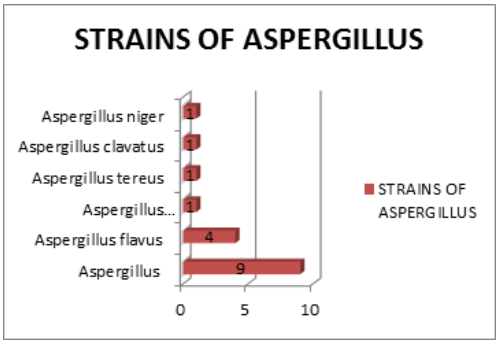
- 4 (50%) patients had proptosis,
- 4 (50%) had ophthamoplegia,
- 3 (37.5%) had diplopia and
- 1 (12.5%) had infraorbital swelling.

Overall, males were predominantly affected by aspergillosis. But rate of orbital complications in female affected by aspergillus was higher by 1.5 times.

Most common strain on fungal culture was aspergillus flavus.

All patients were started on systemic antibiotics and posted for FESS after necessary preoperative investigations.

Postoperatively, orbital symptoms were completely relieved in all except 1 patient, in whom mild proptosis still persisted. All patients have been on regular follow up, with nasal endoscopic examination and suction clearance to prevent recurrence.



DISCUSSION

Chronic sinusitis and diabetes mellitus are common preexisting diseases. EOM (extra-ocular movement) limitation and proptosis predict postseptal involvement, and reduced visual acuity and the presence of RAPD indicate that intracranial extension is likely. Maxillary and ethmoidal sinuses are common sources of infection, and the number of sinuses involved tends to increase with stage.

Predisposing factors of sinusitis include anatomic derangements, impaired sinus drainage, and inhibition of mucociliary transport, which promote bacterial overgrowth.[1]

In addition to the periorbital swelling observed in all patients in this

study, acute ophthalmological findings complicated by sinusitis included EOM limitation, proptosis, IOP elevation, reduced visual acuity, and RAPD. CT scanning was performed in all of our patients, and accurately established the diagnosis of sinusitis and the extent of orbital complications. MRI better delineates the intra cranial extent.

Our finding that the ipsilateral maxillary and ethmoidal sinuses were the most common sources of infection causing orbital/intracranial complications is concordant with previous studies.[1][2][4] Infection in the ethmoidal sinus may spread directly into the orbit via the thin bone of the lamina papyracea, or indirectly to the brain via septic thrombophlebitis.[7]

It is generally believed that preseptal cellulitis and orbital cellulitis respond to drug treatment alone, but subperiosteal/orbital abscess or intracranial complications require surgical drainage.[8]

Several reports indicate that drug treatment alone may be effective for ethmoidal sinusitis-related subperiosteal abscess in some children aged younger than 9 years with intact visual function, provided they meet certain additional criteria . Nevertheless, good clinical judgment should always take precedence and emergency drainage of a subperiosteal abscess may be necessary.

CONCLUSION

Orbital extension of acute sinusitis is a diagnostic and therapeutic emergency.

Prompt surgical management (FESS) with complete clearance of disease followed by systemic antibiotics, oral antifungals, oral steroids, local decongestant steroidal spray and regular follow up ensured a favourable outcome in all patients, especially in patients with non-invasive FRS.

The invasive forms will require intensive systemic antifungal treatment, combined with surgery, particularly mucormycosis.

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