ISOLATED SPHENOID SINUS FUNGAL BALL- A CASE SERIES

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ABSTRACT

INTRODUCTION: Paranasal sinus fungal ball (FB) usually affects middle aged and elderly females, who are not immunocompromised. It is commonly due to aspergillus species. The most frequently involved sinus is the maxillary sinus followed by sphenoid sinus. CT paranasal sinus(PNS) is the imaging of choice and histopathology confirms the diagnosis. Endoscopic sinus surgery is the mainstay of treatment for sphenoid sinus fungal ball (SSFB). **MATERIAL AND METHODS:** A retrospective study was carried out in the department of ENT at Santosh Medical College and Hospital, Ghaziabad. A total of 4 patients with SSFB were studied from April 2022 to September 2022 Diagnostic imaging followed by definitive Endonasal endoscopic sphenoidotomy(EES) was carried out. The aim of the study is to highlight various clinical presentations of SSFB and significance of early management in these cases. RESULTS: All the 4 patients were females with age ranging from 47 to 62 years. There was unilateral SSFB in all cases, as assessed by CT PNS. Endonasal endoscopic sphenoidotomy(EES) ensured complete debridement of FB and optimal sinus ventilation and drainage. **CONCLUSION:** Patients with SSFB may present with non-specific symptoms or be asymptomatic. Therefore high index of suspicion has to be kept to avoid delay in the diagnosis. CT PNS confirms the diagnosis. EES is the standard treatment modality for complete disease extirpation with no morbidities.

KEYWORDS: Fungal ball,Sphenoid sinus, Endonasal endoscopic sphenoidotomy.

INTRODUCTION:

Fungal rhinosinusitis (FRS) can be broadly categorised as non-invasive and invasive infection, based on absence or presence of involvement of tissues. In the former category are Fungal ball (FB) and Allergic fungal rhinosinusitis (AFRS) and in the latter category are Acute fulminant invasive FRS, Granulomatous invasive FRS and Chronic invasive FRS. A fungal ball is a matted collection of extramucosal fungal hyphae,usually within one sinus, most commonly the maxillary sinus.[1] Earlier the term aspergilloma was used as the commonly detected fungus was aspergillus species. [2] Fungal balls are seen more commonly in immunocompetent middle age and elderly females, often with a history of dental interventions. [2] Patients mainly present with nasal blockage, headache and postnasal discharge ; however others may be asymptomatic. [3] Diagnostic Nasal Endoscopy(DNE) findings range from normal mucosa to oedematous polypoidal mucosa .[4] Most sphenoid FB cannot be detected in the early stage due to vague symptoms initially and there is delay in the detection. Paranasal sinus CT scan is a useful tool for diagnosis of FB [5,6].

MATERIALS AND METHODS

A retrospective study was conducted on four patients with SSFB from April 2022 to September 2022 at Santosh Medical College and Hospital,GZB. Detailed history was taken.In our case series, all the patients were immunocompetent. There was no history of Diabetes Mellitus, malignancy, immunosuppressive drugs therapy, HIV etc. Clinical ENT examination, DNE and neurological examinations were recorded. Diagnosis of SSFB was established on CT- PNS with characteristic findings of sinus opacification with areas of calcification.

Surgical procedure: All the patients underwent EES under GA. The sphenoid ostium was identified medial to the superior turbinate and closer to the septum.The Lower 1/3rd of superior turbinate was excised for better access. Anterior sphenoid wall was widely punched/ drilled out to medial orbital wall laterally, to skull base superiorly and inferiorly. This facilitated debridement of cheesy or clay like debris from sphenoid sinus. Debridement was carried out using saline irrigations and angled instruments and the involvement of sinus mucosa and its walls were studied. Finally involved sphenoid sinus was examined with angled endoscopes to ensure complete removal of fungal debris. Microscopy of specimen was carried out to confirm the diagnosis.

Post-operative period: None of the patients were prescribed oral or topical antifungal therapy. They were advised to carry out saline nasal irrigation. All patients were followed up for 3 months for recurrence of symptoms or endoscopic signs of disease. A local debridement through the enlarged sphenoid ostium was performed during the follow up visits. Intra – operative and post operative complications were studied.

RESULTS:

A total of 4 patients were diagnosed with isolated SSFB. The ages ranged from 47 to 62 years and all were female patients. The commonest symptom was headache .Mostly headache had no etiology, intermittent, lasting minutes to hours, unilateral, increased by cough and lowering head. Characteristic CT PNS findings were noted in all the patients(Fig 1,2). The final diagnosis was established intra-operatively(Fig 3,4) and by histopathology(Fig 5).

All the patients were managed by EES with no intra and post-operative complications. On follow up, no patient had recurrence of the disease.The details of the cases are summarised in Table 1.

Fig 1- CT PNS (axial cut),demonstarting opacification left sphenoid sinus with areas of calcification

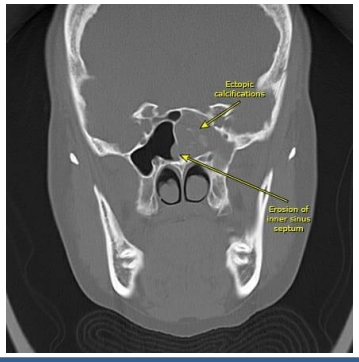

Fig 2- CT PNS coronal cut showing soft tissue mass left sphenoid sinus with hyperattenuation and bowing of intersinus septum

Fig 3 Intra operative sphenoidotomy and isolated SSFB

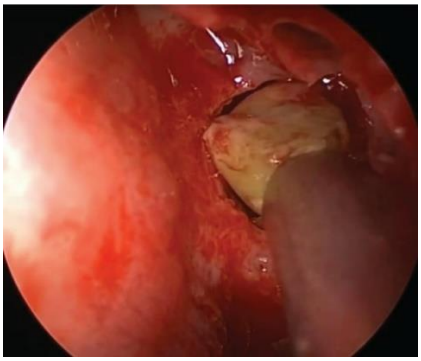

Fig 4 Debridement of the SSFB

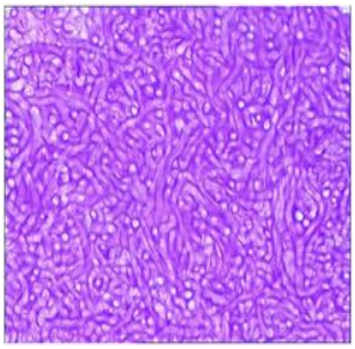

Fig 5 HPE demonstrating fungal hyphae of aspergillus sp.

Table 1: Summary of the studied subjects

SERIAL	GENDER	AGE	CLINICAL FEATURES	CT PNS	SURGERY	HPE
1	F	62	-Headache since 5 months, left temporal and parietal region, intermittent ache -Postnasal discharge -DNE – WNL -Neurological exam-Normal.	Soft tissue opacification of left sphenoid sinus with hyperattenuation Hyperstosis.	EES(lt)	FB of lt sphenoid sinus
2	F	58	-Minimal headache right since 1 year -DNE- WNL -Neurological exam-Normal.	Obliteration of right sphenoid sinus with streaks of calcification.	EES(Rt)	FB of Rt sphenoid sinus
3	F	47	-Left occipital headache intermittent since 10 months -DNE- WNL -Neurological exam-Normal.	Soft tissue mass occupying the left sphenoid sinus with expansion of sinus with areas of hyperattenuation	EES(Lt)	FB of Lt sphenoid sinus
4	F	51	-Headache since 7 months, right retro-orbital extending to occipital region -Cough -DNE- WNL -Neurological exam-Normal.	Right sphenoid sinus opacification with linear calcification and sclerosis of bony walls.	EES(Rt)	FB of Rt sphenoid sinus

DISCUSSION:

FRS is divided into 2 categories: Non invasive FRS, typically affecting immunocompetent patients with no evidence of tissue invasion; Invasive, which usually affects immunocompromised patients with evidence of tissue invasion (mucosa, blood vessels or bone).[7,8] The pathogenesis of FB is not clear. It has been suggested that saprophytic fungal infections i.e. visible fungal colonization of mucus crusts, may be the precursor to FB,if left untreated.[9] Aspergillus is the commonest organism in a FB but cultures are often negative and different fungal species have been observed.[1]

Patients with SSFB may be asymptomatic or have non-specific symptoms.[10] This feature delays the diagnosis or leads to misdiagnosis. Additionally, there are critical structures in sphenoid sinus(SS) in close proximity to the lesion. Therefore, the lesion has to be managed at an early stage to avoid complications viz. optic nerve and intracranial involvement.[11] It is emphasized that patients with non-specific headache, especially in middle aged and elderly females, should be evaluated with high index of suspicion for isolated SSFB. Imaging protocols including CT Brain and PNS are useful to exclude intracranial lesions as well as to assess SS pathology.[12] DeShazo et al. has proposed diagnostic radiological and histopathological features.[13] CT-PNS reveals sinus opacification with areas of calcification, which is due to metabolic deposits of calcium within the fungal concretions.[13] Besides, there can be thickening and sclerosis of SS bony walls without invasion. Histopathological features are: accumulation of matted, dense conglomeration of fungal hyphae without evidence of sinus tissue invasion ; a chronic inflammatory reaction of varying intensity in the mucosa adjacent to fungal hyphae and absence of allergic mucin, granuloma or abundance of eosinophils.[13] In our clinical series also, imaging and histo-pathology revealed similar findings

All the four cases in our study were managed by the direct EES approach. Several studies have highlighted the use of this approach for SSFB.[14] Classically, a wide opening of the affected SS is created, thereby facilitating removal of all fungal debris with the use of curved instruments and saline rinsing. Biopsy is taken from the sinus mucosa to exclude any tissue invasion. Post operative use of saline irrigation ensures optimal healing with restoration of mucociliary function. In our study ,there was no residual or recurrent disease and procedure related complications.

CONCLUSION:

There should be a high index of suspicion of SSFB in any middle aged or elderly female presenting with unilateral headache or non-specific symptoms. The diagnostic features of SSFB are: characteristic CT PNS findings; intra-operative cheesy debris within the sinus; histopathologic examination of extramucosal fungal hyphae. EES is the standard surgical approach for optimal debridement and maintaining sinus ventilation and drainage.

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