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ISOLATED SPHENOID FUNGAL SINUSITIS PRESENTING WITH UNCOMMON COMPLICATIONS: A RARE CASE REPORT

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ABSTRACT A paranasal sinus mucocele is the buildup and retention of mucoid secretion inside the sinus, leading to the weakening, swelling, and erosion of one or more of its bony walls. Less than 1% of people have a sphenoid sinus mucocele. Sphenoid mucoceles can cause headaches, eye problems, and sellar extension because of their expanding nature. A fungus ball (FB) is an extramucosal fungal growth that fills one or more paranasal sinuses. It has been noted that the sphenoid sinus is an uncommon site for this condition. It is rare for fungal sphenoid sinusitis to invade the cavernous sinuses and mimic a mucocele. This report aims to highlight the main clinical and surgical features to distinguish fungal lesions from mucocele in sphenoidal sinus diseases.

KEYWORDS : Paranasal Sinus Mucocele, Headache, Fungus Ball, Cavernous Sinus Invasion, Sellar Extension, Endoscopic Sinus Surgery, Rare Sphenoid Pathology, Mycotic Sinus Infection, Expansile Sinus Lesion.

INTRODUCTION

Paranasal sinus mucocele is characterized by the buildup and retention of mucoid secretion within the sinus, resulting in the thinning, expansion, and erosion of one or more of its bony walls.

The incidence of sphenoid sinus mucocele is less than 1%. Due to their expanding nature, sphenoid mucoceles can cause headaches, ophthalmic issues, and sellar extension.

The fungus ball (FB) is defined as an extramucosal mycotic growth that fills one or more paranasal sinuses. The sphenoid sinus is an uncommon site for this condition, as reported.

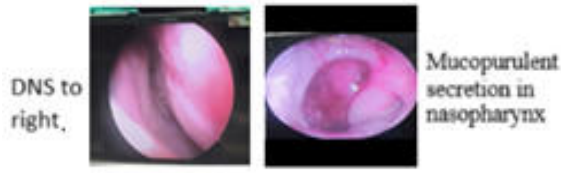
Fungal sphenoid sinusitis that mimics a mucocele and invades the cavernous sinuses is rare. This report aims to highlight the key clinical and surgical features that distinguish fungal lesions from mucoceles in sphenoidal sinus conditions

CASE REPORT

A 56-year-old female patient presented to the ENT department with persistent right-sided headaches and retro-orbital pain, incomplete closure of the right eye, pain at the medial canthus of the right eye, nasal obstruction, postnasal discharge, and blurred vision for 5 months

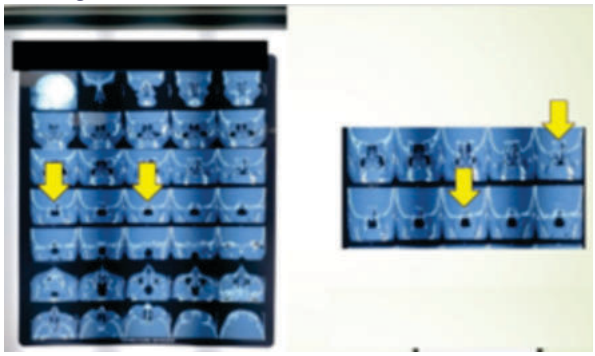
The family history was normal.

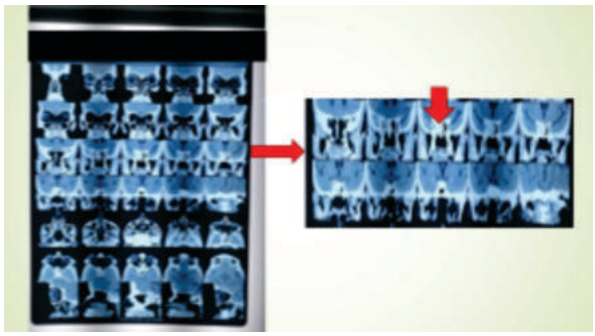
ON EXAMINATION:



- **Anterior rhinoscopy:** Deviated nasal septum to the right with bilateral hypertrophy of the inferior turbinates.
- **Diagnostic nasal endoscopy**: There is mucopurulent discharge present in both nasal cavities and the nasopharynx, along with the findings from anterior rhinoscopy..
- **Hematological and biochemical parameters**, with hepatitis C reactive serology and no active symptoms

Radiological Examination –





- MRI BRAIN WITH PNS (contrast) revealed diffuse cerebral atrophy, with asymmetrical cavernous sinuses noted on the right side, showing T1 isointensity and T2 and STIR hyperintensity within it.
- Mild expansion of the right sphenoid sinus with a lesion measuring 2.2 x 1.9 cm, showing T2 hypo-intensity and T1 hyperintensity cm. - Features S/o Right Sphenoid mucocele
- Post-contrast study reveals: enhancement of the lesion observed. No central enhancement. The lesion is causing indentation on orbital apex structures. The right cavernous sinus shows increased enhancement—likely due to infective or inflammatory causes.

Provisional Diagnosis: SINUS FUNGAL BALL

PLANNED FOR SURGICAL PROCEDURE- TRANSNASAL ENDOSCOPIC SINUS SURGERY USING MICRODEBRIDER AND COBLATOR WAS PERFORMED UNDER GENERAL ANAESTHESIA

Surgical Management –

- Under GA, endotracheal intubationn
- The patient is placed under general anesthesia. Decongestion with nasal packing is performed to reduce bleeding.
- A rigid endoscope (0°) is inserted, and lateralization of the middle turbinate is carried out.
- Identification of the sphenoid ostium.
- A fungal ball is observed occupying the sphenoid sinus.
- Widening the sphenoid ostium, debridement, and removal of the fungal ball using a debrider.
- The sinus cavity is inspected to ensure complete removal of the fungal material.
- Bilateral merocel nasal packing is applied.
- The sample collected from the sphenoid sinus is sent for HPE and KOH mount.

Figure 4 Showing Fungal Ball Is Seen Occupying The Sphenoid Sinus

Figure 5 Showing Widening Of The Sphenoid Ostium

Figure 6 Showing Debridement And Removal Of The Fungal Ball Using Debrider

Histopathological Report:

Sections studied show fragments of respiratory epithelial tissue with extensive lymphoplasmacytic infiltrate in the subepithelial edematous stroma and fungal hyphae aggregates. (closed angle and septate)

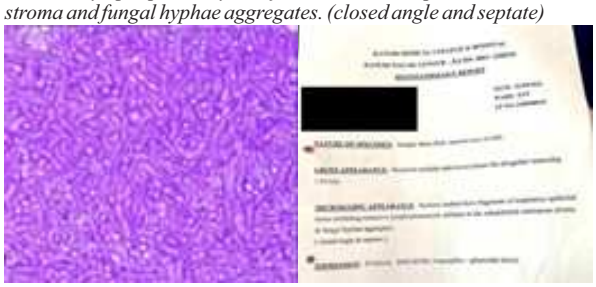


Figure 7- Histopathological Picture Of Fungal Sinusitis.

These histological features are suggestive of a ***"Fungal sinusitis-(ASPERGILLUS-SPHENOIDAL SINUS)."***

- **FINAL DIAGNOSIS**- The patient was diagnosed with **chronic fungal sinusitis involving isolated right sphenoid sinus**.
- **Histopathology** confirmed the presence of fungal elements consistent with a **fungal ball (Aspergillus).**

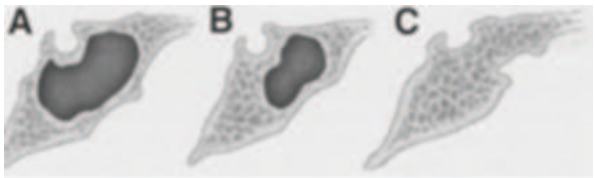
Postoperative Course And Follow Up:

- The patient is monitored for complications such as bleeding, infection, or cerebrospinal fluid (CSF) leak.
- The merocele nasal packs are removed after 2 days.
- Antifungal has been prescribed postoperatively
- Post-operative nasal irrigations are prescribed to help clear debris and promote healing.

DISCUSSION

At the eighth week of intrauterine life, the posterior nasal capsule invaginates towards the sphenoid bone, marking the beginning of the development of the sphenoid sinus (SS).

- The development of the sphenoid sinus (SS) begins with the invagination of the posterior nasal capsule towards the sphenoid bone at the 8th week of intrauterine life.
- **Sphenoid sinus** is the most posterior paranasal sinus.
- SS is generally non-pneumatic at birth and pneumatization begins around 2–3 years of age
- The direction of pneumatization continues in the posterolateral and inferior directions.
- **Types and degree of pneumatization of sphenoid sinus** is categorized into 3 types as Sellar (86%), presellar (11%), and conchal (3%) type.

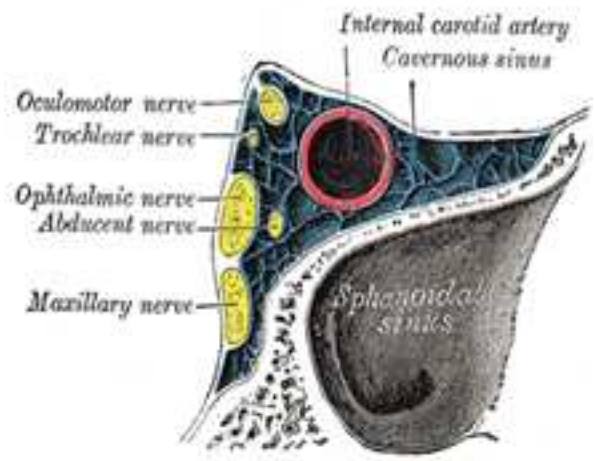


A) Sellar Type 86%
B) Pre Sellar 11%
C) Conchal 3%

- **Location:** the central body of the sphenoid bone anteroinferior to the sella turcica

Relations

- superiorly: cavernous sinus, sella turcica, and its contents
- inferiorly: nasal cavities
- anteriorly: nasal cavities, posterior ethmoid air cells
- posteriorly: contents of the middle cranial fossa
- laterally: cavernous sinus, cranial cavity
- **Mucocele in sphenoid**
- Mucoceles of the sphenoid sinus are a very rare condition and represent only 1% of all paranasal sinus mucoceles.
- It represents 15 to 29 percent of all cases of isolated sphenoid disease.
- They can occur in individuals aged 8 to 83 years, with no sex predominance.



They are characterized clinically by an undetermined silent initial period, followed by a phase in which their expansion causes symptoms. Clinical manifestations depend on the direction of the

expansion toward adjacent structures and include fronto-orbital headache (87%), oculomotor palsies (55%), and nasal symptoms (38%) such as anosmia, nasal obstruction, and nasal discharge.

- Mucoceles, which typically contain sterile material, are called mucopyoceles when infected, with Gram-positive bacteria like Staphylococcus aureus, Staphylococcus epidermidis, and streptococci being the most commonly isolated organisms.
- Surgical treatment is absolutely necessary for mucoceles.
- The goal of surgery is to evacuate the cystic lesion, relieve symptoms, and prevent recurrence.
- An endonasal endoscopic approach with drainage and marsupialization of the sphenoid sinus, using a transnasal corridor, is a safe and effective treatment method.y.

Fungal Sinusitis In Sphenoid

- The FB is defined as a non-invasive dense collection of fungal hyphae arranged in concentric layers, usually located in a single sinus cavity.
- Involvement of a FB in the sphenoid sinus accounts for 4.5% to 26.8% of cases with FB.
- The size and pneumatization of the sphenoid sinus vary, and many important structures are located nearby, such as the cavernous sinus with cranial nerves II, III, IV, V1, V2, and VI, the pituitary gland, and the internal carotid artery.
- These anatomical features make sphenoid sinusitis prone to serious side effects like headaches and vision problems..
- *Aspergillus fumigatus* is the most common agent encountered.

Clinico Pathological Criteria For Diagnosis Of Fungus Ball

1. Radiologic evidence of sinus opacification with or without associated flocculent calcifications.
2. Mucopurulent, cheesy, or clay-like materials within a sinus.
3. A matted, dense conglomeration of hyphae separate from but adjacent to sinus respiratory mucosa.
4. A chronic inflammatory response of variable intensity in the mucosa near the fungal elements. This response includes lymphocytes, plasma cells, mast cells, and eosinophils without eosinophil predominance or granulomatous response. Allergic mucin is absent on haematoxylin–eosin-stained material.
5. No histological evidence of fungal invasion of mucosa, blood vessels, or underlying bone has been seen microscopically using Gomori methenamine silver or other special stains for fungus.

Fungal sinusitis in sphenoid

- **Imaging Studies**
- **CT scan** and **MRI** are commonly used to evaluate the extent of sinus involvement:
- **CT scan**:
- Opacification of the sphenoid sinus, often showing hyperdense areas that may indicate the presence of fungal debris.
- **Nasal or sinus cultures:** Swabs or biopsy samples can be cultured to identify the fungal species.
- Furthermore, early surgical removal should be considered as an option for a sphenoid sinus FB even in patients without visual dysfunction.
- Recurrence is rarely reported in the literature, with reoperation rates for sphenoid sinus fungus balls treated via a trans-ostial or trans-ethmoidal approach ranging from 0 to 8%.

Differential Diagnosis

- Mucocele
- Cystic pituitary adenoma
- Epidermoid cyst
- Cystic optic nerve glioma and
- Arachnoid cyst

COMPLICATIONS

- **Skull base erosion**
- **Cavernous Sinus Thrombosis**
- **Cerebrospinal Fluid Leak**
- **Orbital complications-** Optic Neuritis or Compression: The fungal ball can press against the optic nerve, causing visual issues, reduced visual sharpness, or even permanent vision loss.
- **Orbital Apex Syndrome:** This rare condition can result from fungal invasion near the orbital apex, causing vision loss and ophthalmoplegia (paralysis of eye muscles)..
- **Intracranial complications**- Meningitis
- **Internal carotid artery thrombosis**

CONCLUSION

- This case emphasizes the importance of considering a sphenoid sinus fungal ball as a differential diagnosis when assessing patients with symptoms that suggest a mucocele.
- Despite similar clinical and radiographic features, the treatment options vary significantly.
- Early and precise diagnosis, combined with appropriate surgical intervention, is essential for preventing potential complications and achieving the best possible patient outcomes.
- This case highlights the need for careful evaluation and a high level of suspicion in atypical cases.

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