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Symptomatology and Radiologic Features of Isolated Sphenoid Sinusitis

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ABSTRACT

Background: Isolated sphenoid sinusitis has a potentially dangerous clinical course with nonspecific presentations leading to delayed diagnosis.
Aim: To assess the presenting symptoms and CT findings of isolated sphenoid sinusitis.
Method: From the period of November 2015 to November 2022, 19 patients who were diagnosed with isolated sphenoid sinusitis was identified. The presenting symptoms and radiological studies were retrospectively reviewed and analysed.
Results: The most common presenting symptom was headache, which was present in 17 out of 19 patients. 11 patients complained of nasal symptoms. Blurring of vision was present in 2 patients. CT PNS showed sinus wall sclerosis in 11 and intra-sinus calcification in 10 patients. The most common anatomical variation observed was inferior turbinate hypertrophy in 10 patients.
Conclusion: With headache being the only dependable finding, CT imaging remains a valuable tool for the diagnosis of isolated sphenoid sinusitis.

Keywords: sphenoid sinusitis, paranasal sinus diseases, headache

INTRODUCTION

The sphenoid sinus is called a neglected sinus due to its deep position and difficult surgical access.[1] Sphenoid sinusitis presents with nonspecific symptoms and this leads to delayed diagnoses.[2] The sphenoid sinus's proximity to vital anatomical structures can lead to serious complications such as optic nerve involvement, cavernous sinus thrombosis, meningitis, and abscesses.[3,4] Prompt and aggressive treatment is necessary to reduce the risk of complications, especially in immunocompromised individuals. Sphenoid sinusitis is commonly a sequela of viral upper respiratory infections and can be worsened by obstructive pathologies and external factors.[1] Nasal endoscopy and imaging technologies aid in diagnosis. Bacterial and fungal sinusitis, as well as mucoceles, are common forms of isolated sphenoid sinus disease. CT and MRI are the preferred imaging methods.[5] Endoscopic trans-nasal sphenoidotomy is the standard of treatment.[6,7] Given the disease's occult nature, complications, and lack of research in the Indian population, this study aims to bring clarity to the clinical profile of isolated sphenoid sinusitis.

PATIENTS AND METHODS

We retrospectively reviewed the cases of 19 patients who were diagnosed with isolated sphenoid sinusitis between November 2015 and November 2022 at our otorhinolaryngology department. Their age range was 19–83 years, with a mean age of 53 years. There were 11 men and 8 women. The diagnosis of isolated sphenoid sinusitis was based on clinical features, routine ear, nose, and throat examinations, DNE, radiologic imaging, and histopathological

and microbiological evaluation. The presenting signs and symptoms and CT PNS studies were retrospectively reviewed from the patients' medical records.

RESULTS

Among the patients included in the study, the most common symptom was headache, with 17 out of 19 patients reporting the symptom, out of which 11 had unilateral retro-orbital, 4 had vertical and 2 had non-specific localisation of pain. Nasal symptoms were reported in 11 patients, facial pain in 4 patients, ocular symptoms in 2 patients, while 1 patient had sixth cranial nerve involvement.

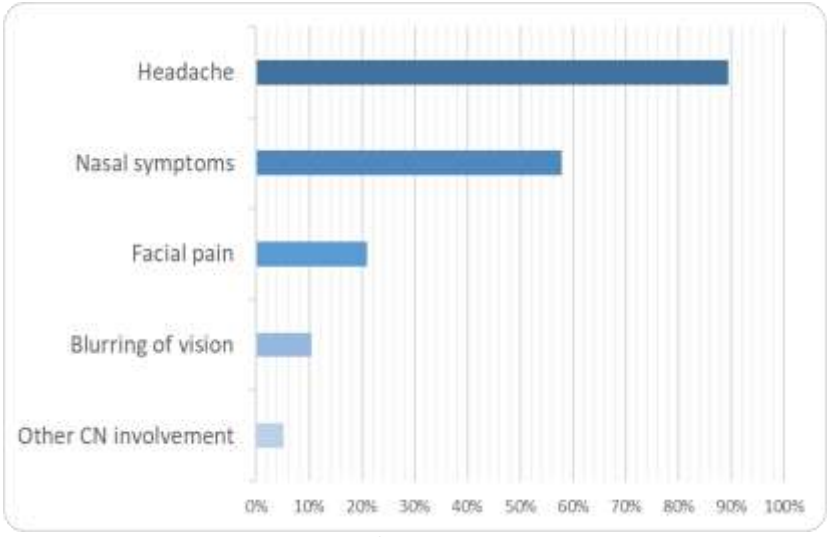

Figure 1: Proportion of patients having each symptom

The most common CT finding was sinus wall sclerosis in 11 patients, followed by intra-sinus calcification 10, air fluid level in 4 and bony erosions in 2 patients.

Finding	Frequency
Air - fluid level	4
Wall sclerosis	11
Intra-sinus calcification	10
Bony erosion	2

Table 1: CT findings in patients of isolated sphenoid sinusitis

It was also found that the most common anatomical variation in the patients studied was inferior turbinate hypertrophy with 53% of patients demonstrating it. DNS and Concha bullosa was found in 26% of patients each. Spur, Onodi cell, paradoxically curved middle turbinate and medialised uncinate process were other variations observed.

DISCUSSION

The sphenoid sinus is most often involved by inflammatory disease in unison with other paranasal sinuses. The evaluation and treatment of the sphenoid sinus is thus undertaken along with the rest of the sinuses. Isolated sphenoid sinus disease is on the other hand, more obscure in its presentation, findings and radiography.[8,9]

In our study the most common symptom was headache (89%), which was predominantly unilateral retro-orbital type followed by vertex and non-specific localisation. This is similar to a study by Sethi where the most common symptom was retro-orbital headache in isolated sphenoid sinus lesions. [10] This is also similar to the findings by Kieff, where headache followed by post nasal drip were the most common complaints.[11] In our study, concerningly, 2 patients had visual disturbances and one patient had involvement of the Abducens nerve, in relation with sinus wall erosion.

Anatomical variations play a crucial role in modulating the drainage of sinuses and thereby the progress of sinusitis. In our study the most common anatomical variation observed was inferior turbinate hypertrophy (53%). Turbinate hypertrophy

is a reliable indicator of allergic rhinitis in both adults and children and is often implicated in the pathogenesis of rhinosinusitis.[12] However, the exact mechanism by which inferior turbinate hypertrophy is linked to isolated sphenoid sinus disease needs to be investigated further. DNS and concha bullosa were the next common anatomical variations.

Sinus wall sclerosis was the most common abnormality in CT scans in our study. Sclerotic and thickened sinus walls are features of chronic rhinosinusitis and are caused by prolonged mucoperiosteal reaction.[13] Intra-sinus calcification was found predominantly in those patients whose histopathology was consistent with non-invasive fungal sinusitis. Allergic fungal rhinosinusitis is a type of eosinophilic chronic rhinosinusitis and is a result of IgE mediated hypersensitivity to inhaled fungal material. It is found in immunocompetent patients and does not show features of bony invasion.[13]

CONCLUSION

As a result of the precarious location of the sphenoid sinus in association with multiple significant and delicate structures, isolated sphenoid sinus disease poses a potential threat if not identified early. However, the vague presentation of the disease, predominantly headache, necessitates radiologic evaluation of paranasal sinuses with CT being a reliable and valuable diagnostic tool.

Declaration by Authors

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