



A Retrospective Study Of Isolated Sphenoid Sinusitis On Computed Tomography

¹Dr. Aromal Raj J, ²Dr. Dayananda Kumar R, ³Dr. Preethi B V, ⁴Dr. Ananya K, ⁵Dr. Yathish B M

¹Radiology Resident, ²Professor and HOD, ³Radiology Resident, ⁴Radiology Resident, ⁵Radiology Resident
¹Radio-diagnosis,

¹M.V.J Medical College and Research Hospital, Bangalore, India

Abstract:

Background:

Isolated sphenoid sinusitis is a rare disease of inflammatory and neoplastic origin. Diagnosis and treatment of isolated sphenoid sinusitis is difficult due to its non-specific symptoms and its late presentation. It is often overlooked due to its remote location.

Materials and Methods:

A retrospective study was conducted from December 2018 to November 2022 in MVJ Medical College by a computer-assisted search of all the reports of CT scans performed with clinical symptoms of sinusitis namely headache and nasal obstruction to detect the presence of isolated sphenoid sinus opacification, mucosal thickening and its complications. A total of 55 cases of isolated sphenoid disease were identified.

Results:

We identified 55 cases of isolated sphenoid disease of which 27 were females and 28 were males. 7 patients were in less than 20 year age group, 26 patients in 21-40 year group, 15 patients in 41-60 year age group and 7 patients in older than 60 years. Isolated acute sphenoid sinusitis with air-fluid level was seen in 25 cases. Isolated chronic sphenoid sinusitis was seen in 30 cases. Incidentally, asymptomatic isolated sphenoid opacification was seen in 8 cases. Neuro-ophthalmic complication was noted in one case.

Conclusion:

Opacification of paranasal sinuses is frequently seen. However isolated opacification of the sphenoid sinus is uncommon with low clinical suspicion. Therefore, imaging studies like Computed Tomography is necessary for the assessment of isolated sphenoid sinusitis for its diagnosis and early detection of complications.

Key words: Sphenoid, Sinusitis, Computed Tomography.

I. INTRODUCTION

Inflammation of the paranasal sinuses is referred to as sinusitis. It can be seen in any age group, however, more commonly seen in the pediatric age group. It rarely leads to serious complications. Sinusitis based on its etiology can be categorized into bacterial sinusitis, fungal sinusitis and allergic sinusitis, of which bacterial sinusitis is most common. Sinusitis based on its duration can be classified as acute and chronic. Predisposing factors for sinusitis include viral upper respiratory infection, known allergens, nasal airway obstruction, ciliary dysfunction, cystic fibrosis and immunodeficiencies.

An isolated disease of the sphenoid sinus is rare, representing 2–3% of all paranasal sinus lesions [1, 2]. Usually, it is inflammatory in origin, very rarely it is due to neoplasms [3, 4]. Diagnosis and treatment of isolated sphenoid sinusitis is difficult due to its non-specific symptoms and its late presentation. It is often overlooked due to its remote location. Nevertheless, prompt diagnosis and early intervention is mandatory as any delay can lead onto catastrophic consequences because of contiguity to vital structures like optic nerve, internal carotid artery, cavernous sinus, cranial nerves. [5]

II. AIMS AND OBJECTIVES

To have an understanding of isolated sphenoid sinusitis with discussion of the clinical symptoms, radiological findings and complications.

III. MATERIALS AND METHODS

A retrospective study was conducted from December 2018 to November 2022 in MVJ Medical College by a computer-assisted search of all the reports of CT scans performed with clinical symptoms of sinusitis namely headache and nasal obstruction to detect the presence of isolated sphenoid sinus opacification, mucosal thickening and its complications. A total of 55 cases of isolated sphenoid sinusitis were identified.

The study of the patients was done using GE Brivo 16 slice CT scanner and after eliminating all artifacts from the scanning area. Firstly, a scout view was obtained perpendicular to the hard palate. Plain CT images were obtained from the level of hard palate to above the end of frontal sinuses. Voltage and current settings of 120 kVp and 200 mA were used respectively. Axial images with section thickness of 5 mm were obtained and reconstructed in multiplanar coronal and sagittal planes using thin sections of 1.2 mm. Images were acquired and analyzed on the GE advantage workstation in bone and soft tissue windows.

The axial and coronal reformatted planes of Computed Tomographic scans of the paranasal sinuses of the patients were examined. No specific age or sex criteria was considered. Patients with complaints of headache and nasal obstruction were included in the study. Patients with pansinusitis, malignancy, motion artifacts, polyps and post-operative statuses were excluded from the study. The presence of mucosal thickening, air fluid level, opacification of the sphenoid sinus was assessed. The left and right sides of sphenoid sinus were assessed separately for the presence of mucosal disease. This disease was evaluated as either being present or absent.

Statistical Analysis: All the data obtained were recorded in a tabulated form and analyzed on MS Excel.

IV. RESULTS

We identified 55 cases of isolated sphenoid disease in 27 female (49%) and 28 male subjects (51%). Age interval ranging from 12 to 72 years of age of which 7 patients were in less than 20 year age group, 26 patients in 21-40 year group, 15 patients in 41-60 year age group and 7 patients in older than 60 years. (Table 1). The most common symptoms were headache in 36.3 % (n = 20) of cases, nasal obstruction in 27.2 % (n = 15) of cases and both of symptoms in 21.8 % (n = 12) of cases. Incidentally, asymptomatic sphenoid opacification was seen in 14.5 % (n = 8) of cases. 1 case experienced headache with complications of diplopia. (Table 2)

Acute sphenoid sinusitis with air-fluid level was seen in 45.5 % (n = 25) of cases. Chronic sphenoid sinusitis with mucosal thickening and sclerosis of the sinus walls were seen in 54.5 % (n = 30) of cases. (Table 3)

Neuro-ophthalmic complication was noted in a single case in a 12-year-old boy who presented with head ache and inability to open right eye since 4 days. He had no fever and no signs of infection, nor any history of trauma. General physical examination was normal. Neurological examination revealed right sided oculomotor nerve palsy. Complete blood count and biochemistry tests were normal, except for lymphocytosis and thrombocytosis. CT of the head revealed right sphenoid sinus opacity, with the rest of the sinuses and brain normal. Patient was started on treatment with I.V. Ceftriaxone plus Metronidazole. He was treated with intravenous antibiotics for 10 days, after which he was switched to oral Cefuroxime Axetil for 10 days. His final outcome was excellent.

Table 1. Distribution of patients based on age.

Age group	No. of Patients
1-20	7
21-40	26
41-60	15
>60	7
Total	55

Table 2. Distribution of patients based on clinical symptoms

Clinical symptom	No. of Patients
Headache	20
Nasal obstruction	15
Both headache and nasal obstruction	12
Asymptomatic	8
Total	55

Table 3. Distribution of patients based on CT findings

CT Findings	No. of patients
Chronic sinusitis with opacification and sclerosis of sinus wall	30
Acute sinusitis with air fluid level	25

Case report



Fig. 1: 12 y/M patient showing right sided ptosis



Fig.2: NCCT scan showing isolated right sphenoid sinus opacification

V. DISCUSSION

Isolated sphenoid sinus sinusitis is rare. Based on its etiology, sphenoid sinusitis can be broadly categorised into inflammatory and non-inflammatory origin. Inflammatory pathologies include bacterial, fungal sphenoid sinusitis, mucocele and sphenochanal polyp. Non-inflammatory pathologies include benign neoplasms like inverted papilloma, fibrous dysplasia and malignant neoplasms such as squamous cell carcinoma of sphenoid sinus. Associated complications include CSF leak, internal carotid artery aneurysms and orbital complications.

The initial symptoms of isolated sphenoid sinus disease are vague, making it difficult to diagnose. [5] Isolated sphenoid sinusitis can lead to a variety of symptoms, with headache being the most common: 62–88% of isolated sphenoid sinusitis cases are associated with headache. [6] Since a patient with headache is usually diagnosed with the more common causes and treated symptomatically, there can be significant delay in

imaging and arriving at a diagnosis of isolated sphenoid sinusitis when present. Moreover a normal conventional X ray of PNS and normal endoscopic findings can be misleading. Endoscopic examination of the sphenoidal recess can be normal in chronic inflammatory lesions of sphenoid making the diagnosis difficult. Hence diagnosis of sphenoid sinus lesions are based mainly on imaging studies. [5]

This is in agreement with the study done by Friedman et al. who reported that 34% of isolated sphenoid sinusitis patients look normal in endoscopy, suggesting that imaging tests are necessary to diagnose sphenoid diseases [7]. CT is effective for detecting bone erosion, and MRI for qualitative evaluation. Sensitivities of CT and MRI in diagnosing inflammatory lesions are 95% and 61%, respectively, whereas, in tumorous disease, the corresponding values are 72% and 100%, respectively. In the osseous disease, sensitivity is 100% for both CT and MRI, whereas, in sphenoid sinus roof defect, the sensitivities are 50% and 100%, respectively [8].

VI. CONCLUSION

An isolated opacification of the sphenoid sinus is uncommon with low clinical suspicion. In recent years, there has been an increase in the number of opportunities for imaging studies, potentially leading to an increase in the number of incidental isolated sphenoid sinusitis findings. Its unspecific presentation may delay the diagnosis and can lead to catastrophic and devastating complications. Therefore, imaging studies like Computed Tomography is necessary for the assessment of isolated sphenoid sinusitis for prompt diagnosis and early detection of complications.

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