

“A Comparative Study on Ct Scan Findings and Intraoperative Findings of Sphenoid Sinus Anatomy and Pathologies in Chronic Rhinosinusitis Patients”

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Abstract Background

Chronic rhinosinusitis is the most prevalent disease characterized by swollen and inflamed nasal cavities. Chronic Rhinosinusitis (CRS) is a notable health problem resulting in severe effect on lower respiratory infection and normal health conditions. In India alone, nearly 15% of the population is afflicted by chronic rhinosinusitis¹; the impact of this ailment is more widespread than diabetes, asthma or coronary heart disease. The disease has a varying effect on society as well as on life quality. CRS exhibits a range of inflammatory and infectious conditions of the nose and sinuses. After the advent of diagnostic nasal endoscopy (DNE) and computed tomography (CT) imaging, substantial importance has been focused on anatomy of the paranasal region. Detailed information of anatomic variations in paranasal sinus region is necessary for surgeons doing endoscopic sinus surgery and for the radiologist as part of preoperative workup.

MaterialsAndMethods

The present cross sectional study “A comparative study of CT scan findings and intraoperative findings of sphenoid sinus anatomy and pathologies in chronic rhinosinusitis patients” in patients attending ENT OPD GGH, Kakinada was conducted in department of Otorhinolaryngology & Head & Neck Surgery, Rangaraya Medical College, KAKINADA between January 2018 to November 2019. The study was approved by the ethics committee of the institution.

Results: In our study of 50 cases of Chronic rhino sinusitis .CT scan anatomical variation in sphenoid sinuses found, no patients with conchal type, 20% (10) of patients with presellar type, 80% (40) of patients with a complete sellar type of pneumatization. Out of the 50 patients 23 were males and 27 were females. CT scan analysis of the patients of the Study, it is seen that only 1 (2%) patient was devoid of septum within the sphenoid sinus. Other respondents 49 (98%) possessed the so-called intersphenoid septum. By analysis of axial CT images of patients was seen that the main septum exists in 40 (81.6%) (from the 49 patients with one or more septa) had not been placed in the median line, at its posterior point, but on the left or right side. Of the 40 analyzed images, the right-set intersphenoid septum had 26 (65%) and left set 14 (35%). From the 49 patients who had verified the existence of intersphenoid septum, 06 of them (12.24%) had one more so-called accessory septa, a total of two in one sphenoid sinus. Of the 06 people who had registered the existence of accessory septum, in 04 cases, accessory septum was present to the right of the so-called main septum, and in 02 cases to the left. Presence of 3 septa (1 main, 2 accessory) in patients was seen in 02 (4.08%) patients. The presence of sphenoid sinuses with 4 septa (1 main and 3 accessory) was found in 1 (2.04%) patients. Based on the interpretation of CT scan of male patients, we conclude existence more than one sphenoid septum in the sinus in 09 cases (18.4%). All the above information related to the sample of 49 patients since in one case it had not been registered existence of a septum.

Conclusion: From our study of 50 cases of chronic rhinosinusitis, we have drawn following Conclusions: Among chronic sinusitis cases age group most commonly affected between 21-40 years group. On CT scan, (80%) patients showed the complete sellar type of pneumatization, (20%) showed presellar type of pneumatization no patients are there with the conchal variety of pneumatization. Regarding septation, most patients (80%) have a single intersphenoid septum, which has not been placed in the midline, with 65% to the right and 35% to the left. Accessory septa are seen in 18% of cases. On the comparison of CT PNS findings and intraoperative findings in the present study revealed that the septation in the sphenoid sinus is more or less similar. The variations in the pneumatization can be studied in detail in CT PNS and there is no effect on the degree of pathology with the variations in both CT and during the surgery. CT PNS in chronic rhinosinusitis patients

serves useful in identifying pneumatization, the extension of pneumatization, septation, the extension of disease in the sphenoid sinus and serves as good guide for surgeon during surgery. Since the present study consists of a small sample size i.e, 50 patients, the outcomes obtained on the comparison of CT scan findings with intraoperative findings of the sphenoid sinus cannot be extrapolated to studies with large sample size and the general population.

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I. Background

¹Chronic rhinosinusitis is considered to occur as a consequence after a constant inflammatory process in the sinonasal mucosa.

II. Aims and Objectives

To analyze the anatomical variations of sphenoid sinus in chronic rhinosinusitis patients. To examine the clinical findings in patients with sphenoid sinus pathologies. To observe the intraoperative findings of sphenoid sinus pathology and correlate with CT scan findings.

III. Materials And Methods Inclusion Criteria

In the study 50 patients attending the ENT Department of Government General Hospital, Rangaraya Medical College, Kakinada between January 2018 and November 2019, with Patients of both sexes between the age group of 22-65 years presenting with chronic rhinosinusitis with the involvement of sphenoid sinus on CT scan. Patients who gave consent for the above study have been included.

Method of Collection of Data

This is a case series carried out in the Dept. of ENT, Government General Hospital, Rangaraya Medical College, Kakinada between January 2018 and November 2019. The study was approved by the ethics committee of the institution. 50 patients fulfilling the above criteria were selected for the study. Complete clinical history, thorough ENT examination along with X-ray of paranasal sinuses, diagnostic nasal endoscopy and computerized tomography of the nose and paranasal sinuses are done.

IV. Results

In the present study, 50 cases of chronic rhinosinusitis were studied during the period from January 2018 to November 2019 at the ENT

Department of Rangaraya Medical College, Government General Hospital, Kakinada. This study shows the following observations:

Table 1: Age Distribution

Age group	No. of patients	Percentage
21-40	29	58%
41-60	18	36%
>60	3	06%
Total	50	100%

Table 2: Sex Distribution.

Sex	No. of patients	Percentage
Male	23	46%
Female	27	54%

Table 3: Variations in sphenoid sinus pneumatization

Type	No. of patients	Percentage
Conchal	00	00%
Presellar	10	20%
Sellar	40	80%

Table 4: Septation of the sphenoid sinus

Number of septa (main + accessory)	Frequency	Percentage
00	01	02%
01	40	80%
02	06	12%

03	02	04%
04	01	02%

Table 5: CT PNS findings of sphenoid in Chronic rhinosinusitis cases:

CT finding	Number	Percentage
Complete opacification	33	66%
Mucosal thickening	12	24%
Heterogenous opacities	05	10%
Bone erosion	03	06%

Table6:Intraoperative endoscopic findings of sphenoid sinus:

Finding	Number	Percentage
Polyps Unilateral	10	20%
Polyps Bilateral	15	30%
Pooled up secretions	03	06%
Mucosal thickening	25	50%
Fungal debris	07	14%
Bone erosion	03	06%
No pathology	05	10%

Table7:Comparison between CT scan findings and Intraoperative endoscopic findings of sphenoid sinus:

CT finding	percentage	Intraoperative finding	percentage	P value
Complete opacification	66%	Polyps& Pooled up secretions	56% (50%+6%)	>0.05
Mucosal thickening	12%	Mucosal thickening	50%	<0.05
Heterogenous opacities	10%	Fungal debris	14%	>0.05
Bone erosion	03%	Bone erosion	03%	>0.05

CT SCAN AND INTRAOPERATIVE ENDOSCOPIC PICTURE

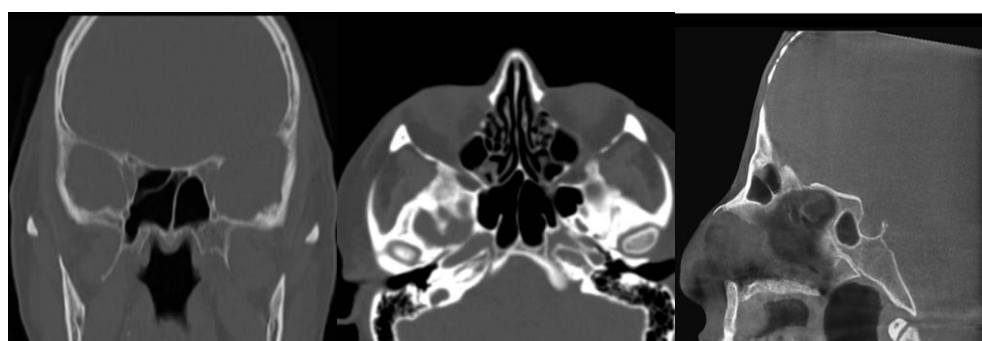


FIG:1

FIG:2

FIG:3



FIG:4

FIG:5

FIG:6

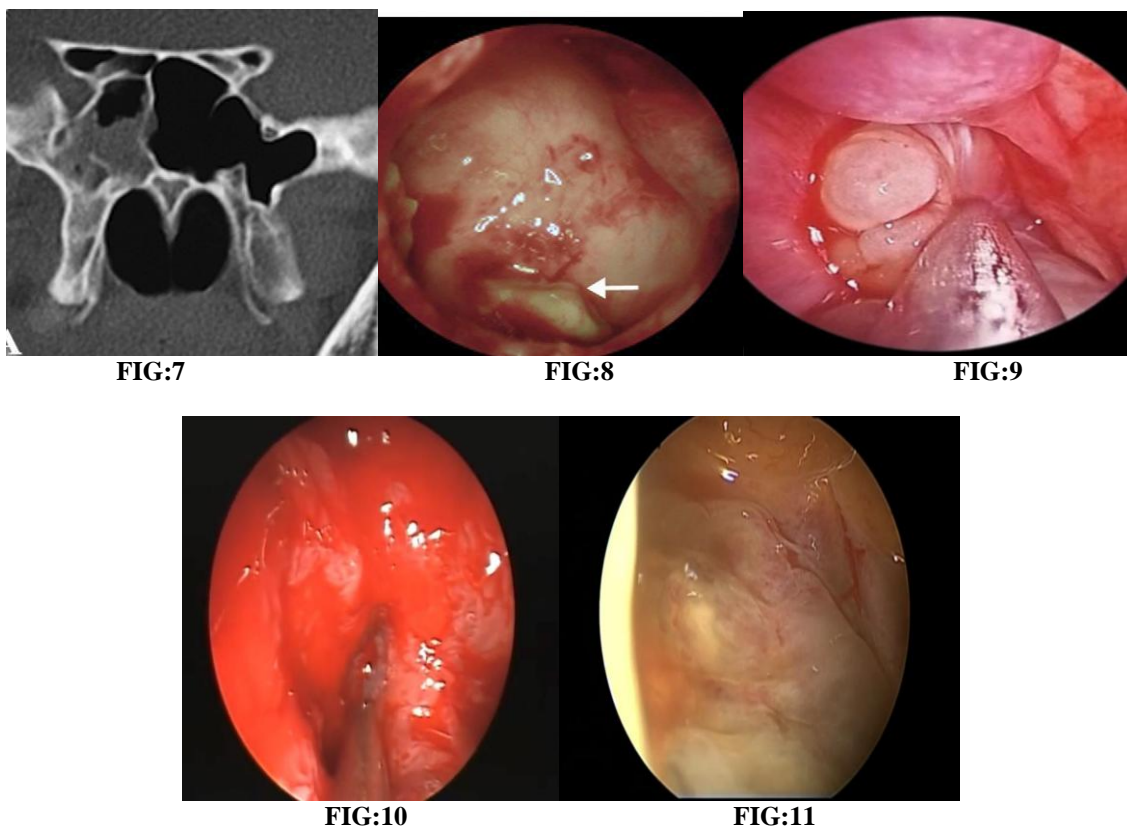


FIG: 1 Coronal CT scan PNS. Visible existence of 2 septa at the coronal scan, one inserts at the carotid canal. **FIG:2** Axial CT scan PNS - Visible existence of multiple septa in the sphenoid sinus. **FIG:3** Sagittal CT section showing a presellar type pneumatization of the sphenoid sinus. **FIG:4** Sagittal CT section showing a sellar type pneumatization of the Sphenoid sinus. **FIG:5** Coronal CT scan showing heterogenous opacity in the right sphenoid sinus. **FIG:6** Coronal CT scan showing complete opacification with bone erosion. **FIG:7** Coronal CT scan showing a mucosal thickening in the right sphenoid sinus. **FIG:8** Intraoperative endoscopy showing fungal debris in the sphenoid sinus. **FIG:9** Intraoperative endoscopy showing polyp in the sphenoid sinus. **FIG:10** Intraoperative endoscopy showing mucosal thickening in the sphenoid sinus. **FIG:11** Intraoperative endoscopy showing pooled up secretions and mucosal thickening in the sphenoid sinus.

V. Discussion

In the present study, the most common age group was 21-40 years (58%), The mean age was 39.38 years. Mean age group presenting with chronic rhinosinusitis could be because of unhealthy living environment and lack of awareness and most importantly delayed presentation. Before referral to a professional or tertiary care centre, these patients had tried home remedies or traditional medical care from quacks and homeopaths. During this period topical nasal drops and various antibiotics were used by these patients. The incidence of chronic rhinosinusitis with male-female ratio 0.85:1. The female predominance might be due to delayed seeking of medical advice and attending government hospital preferably. The most common type of CT variants (80%) of patients with a complete sellar type of pneumatization. The position of the main septum analyzed at axial CT images, in the majority of cases was not in the median line, but was present paramedian, with higher frequency on the right side. The presence of greater than one septum (multiple septa) was registered in 18% cases. It was perceived that multiple accessory septa appear more frequently to the right of the main septum. Most common CT scan abnormality complete opacification due to mucosal thickening, heterogenous opacities, bone erosion. Endoscopic finding intraoperatively shows most commonly mucosal thickening with secretion and polyps followed by fungal debris, normal anatomy, bone erosion and pooled up secretion.

VI. Conclusion

From our study of 50 cases of chronic rhinosinusitis we have drawn following conclusions: Among sinusitis cases age group most commonly affected between 21-40 years age group. Among sinusitis cases sex predominance resulted as females but since it is the small study sample we cannot extrapolate the result of sex

predominance to the general population. Among chronic rhinosinusitis most common type of CT variants complete sellar type of pneumatization. The position of the main septum was present paramedian, with higher frequency on the right side. Most common CT scan abnormality complete opacification due to mucosal thickening. Endoscopic finding intraoperatively shows most commonly mucosal thickening with secretion and polyps.

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