



## COMPARATIVE STUDY OF PREOPERATIVE CT SCAN AND INTRAOPERATIVE ENDOSCOPIC SINUS SURGERY FINDINGS IN PATIENTS WITH SINONASAL POLYPOSIS.

### KEYWORDS

Sinonasal Polyps, Nasal Endoscopy, CT PNS.

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**ABSTRACT** Sinonasal polyposis is commonly encountered in clinical practice. The provisional diagnosis is made with a clinical assessment, diagnostic nasal endoscopy and a computed tomography (CT). This study was carried out to provide a correlation between preoperative CT scan findings and intraoperative endoscopic sinus surgery findings. Statistical analysis of data was recorded from paranasal CTs of 74 patients between the age of 12 and 80 years who subsequently underwent FESS, over a period of 2 years. The most concomitant aetiology among the patients was allergy in 41 cases, based on histopathology examination. Polyps were most commonly situated in the maxillary sinus in our study. No clinical correlation was found between clinical symptoms and gender or duration of disease. CT scans provide a good amount of objectivity and its correlation to endoscopy findings are discussed in this study.

### INTRODUCTION:

Sinonasal polyposis is a commonly found lesion in ENT clinical practice. They are non-neoplastic masses of oedematous nasal or sinus mucosa, the lining of which has prolapsed and has blocked the nose to a variable degree. Aetiology of polyps is attributed to pre-existence of diseases such as Chronic rhinosinusitis, Asthma, Allergic fungal sinusitis and certain inherited disorders. There are two main types-bilateral ethmoidal polyps and antrochoanal polyps, yet they may extend further into the nose and other paranasal sinuses. CT imaging is an important diagnostic tool which shows extent of polyps, osteomeatal complex and bony anatomy<sup>2</sup>. In this study we will discuss these findings in correlation to our intraoperative findings.

### OBJECTIVE:

Correlation of intraoperative nasal endoscopy vs CT PNS (coronal and axial) in the management of Sinonasal polyposis.

### MATERIAL AND METHODS:

This is a prospective study from paranasal CTs and intraoperative endoscopy of 74 patients, over a period of 2 years, between the age of 12 and 80 years. These are patients who have come to the ENT outpatient department. At the time of presentation, a detailed history was taken. This includes documenting nasal symptoms, headache, facial pain, olfactory disturbances, allergy status, medication taken and previous surgical procedures. This was followed by an ENT examination. The patients were prescribed nasal decongestants and steroidal nasal sprays for one week, followed by a diagnostic nasal endoscopy with a 4mm 0° nasal endoscope was done, followed by a plain CT PNS obtaining coronal and axial views with a high resolution and slice thickness of 1 mm (Multi-slice CT scan, Toshiba, Model-Aquilion, 64 slice, MAS=200, Pitch =1, kV=120, slice thickness =3 mm, thickness interval=3mm) and the report is evaluated by an expert radiologist. These patients were then planned for surgery, during which nasal endoscopy findings were further re-confirmed.

The data was tabulated in a Microsoft Excel spreadsheet. Data was then exported to SPSS ver 22 for statistical analysis. Kappa and Chi square analysis was used. A p value of less than 0.05 was considered statistically significant.

### Observations:

- 74 patients with a mean age of 38 years were enrolled in this study.

- 62 percent were male and 38 percent were female.
- Information obtained on taking a detailed history:

Concerned Factors:	Number of Patients	Percentage (%)
1)Symptoms:		
-Nasal Obstruction	74	100
-Sneezing	56	75.6
-Rhinorrhoea	68	91.8
-Altered sense of smell	57	77
-Pain( facial, headache)	52	70.2
-Epistaxis	0	0
-Ocular symptoms	1	1.3
2)Related Conditions:		
-Chronic Rhinosinusitis	73	98.6
-Asthma	2	2.7
-Allergic Fungal Rhinosinusitis	1	1.3
3)Previous Sinus Surgery:		
-Yes	7	9.4
-No	64	86.4

- Nasal obstruction and rhinorrhoea were the most common symptoms.
- 73 percent of these patients had pre-existing chronic rhinosinusitis
- On Diagnostic Nasal Endoscopy, the polyps were graded according to Lund and Kennedy Scoring System<sup>3</sup>. Most commonly occurring score was 3, 1, 1.
- A CT scan of paranasal sinuses (coronal and axial view) was done:

Involvement of Sinus Groups	Bone changes	Osteomeatal Complex
Maxillary -62	Erosion -32	Right OMC block -44
Ethmoid -46	Dehiscence-6	Left OMC block -39
Frontal -1	Scalloping-52	
Sphenoid -7		

- Intraoperative findings were noted and tabulated across the preoperative CT findings:
- Kappa analysis showed a fair agreement, yet Chi square analysis reported a p value <0.05, indicating discrepancies between the 2 modalities.

**Kappa analysis-**

Findings	FESS POSITIVE		FESS NEGATIVE		
	CT scan Positive	CT scan Negative	CT scan Positive	CT scan Negative	
1)Mucosal Abnormalities	29	38	7	0	0.086 = fair agreement.
2)Polyps	74	0	0	0	
3)Septum deviation	15	3	40	16	
4)Right OMC patency	42	6	2	24	
5)Left OMC patency	36	5	3	30	
6)Bone erosion	25	10	7	32	

**Chi square analysis:**

Serial No.	Parameters	CT Scan	Intraoperative Endoscopy	P value
1	Mucosal Abnormalities	36	67	Less than 0.05 =statistically highly Significant, Null hypothesis is void.
2	Nasal Polyp	74	74	
3	DNS	55	18	
4	Right OMC Block	44	48	
5	Left OMC Block	39	41	
6	Bone erosion	32	35	

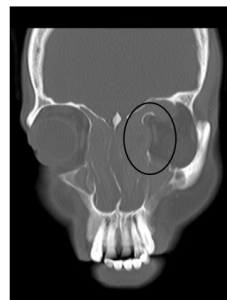
**Discussion:**

CT is the standard diagnostic test in the evaluation of paranasal sinuses. This study aims at determining the agreement between preoperative CT and intraoperative FESS findings in patients with sinonasal polyposis. The results indicate a fair level of agreement between the two modalities, with some discrepancies.

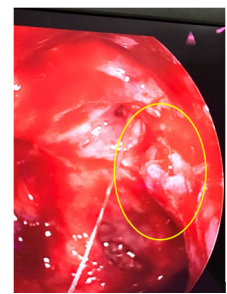
CT is based on electron density and the more dense a structure, for eg bone, the easier it is, to detect as compared to identifying polyps, diseased mucosa and mucopus<sup>4</sup>. Endoscopy allows for better visualisation of the type of soft tissue involved. Minor bony deviations can be seen on a CT scan while in intraoperative endoscopy, septal deviations were documented only if it was moderate to severe. This was noted in this study, as CT scans reported more deviated septums, because even minor deviations less than 5 mm were considered significant. Accessory maxillary ostia is not visualised on CT scans. Nasal polyps produce pressure effects over bone which can be seen in imaging. This causes bone remodelling or thinning of sinuses. Sometimes this thinning may appear as bony erosion on a CT scan (Fig1 and Fig2).

Sinus endoscopy and CT can be considered complementary techniques for effective demonstration of nasal anatomy and paranasal sinuses<sup>5</sup>. CT scans can serve as an anatomic map for the surgeon<sup>6</sup>. When combined with a thorough history, endoscopy can yield valuable information regarding anatomic location and severity of the disease<sup>7</sup>.

Figure 1-33 yr old female patient with Sinonasal Polyposis and Allergic Fungal Sinusitis.

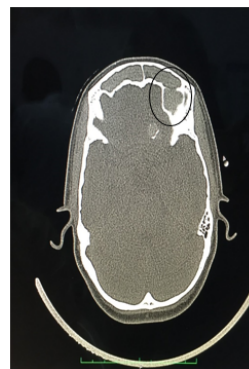


CT reporting erosion of lamina papyracea.



Intraoperative endoscopy showing thinned out Lamina papyracea.

Fig 2: 33 yr –old female with Sinonasal Polyposis



CT reporting erosion of posterior wall of left frontal sinus



Endoscopy showing intact posterior wall of left frontal sinus

**Conclusion:**

CT provides definition of bone and air filled spaces and it is the primary modality for imaging of the sinuses<sup>8</sup>. This study serves to correlate preoperative CT findings and intraoperative endoscopic findings. Although there was a fair level of agreement between the 2 modalities in this study, there were some discrepancies that should be considered in the management of sinonasal polyposis.

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