



“STUDY OF CORRELATION OF DEVIATED NASAL SEPTUM WITH PARANASAL SINUS DISEASE”

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ABSTRACT

Aim: To study the effect of type and site of DNS on osteomeatal complex and sinus diseases.

Materials and Methods: 100 patients including Male and Female above 18years attending ENT OPD, at Index Medical College and having both nasal symptoms and asymptomatic (with ear and throat complains without nasal symptoms) will be evaluated. These patients will undergo ENT examination, and DNS would be seen by anterior rhinoscopy. DNS would be confirmed by Diagnostic nasal endoscopy. Further the patients were advised CT PNS to delineate the extent of sinus disease, define any anatomical variants and relationship of sinuses with the surrounding important structures.

Results: The results of the present study showed that the endoscopy was 73.9% sensitive and 81.5 % specific in identifying the right DNS while was 89.1% sensitive and 72.2% in identifying the left DNS.

Conclusion: Nasal endoscopy and CT yield complementary information regarding diseases of the paranasal sinuses.

INTRODUCTION

Deviated Nasal Septum is a condition in which septum instead of being placed central and thereby dividing the nasal cavity into equal chambers of same size is inclined to one side or other, so as to increase one cavity at the expense of other. A deviation of the nasal septum can cause obstruction to one or both of the nasal airways, producing nasal obstruction. Deviation of nasal septum can lead to improper drainage of sinuses, leading to sinus infections. Infection of these sinuses is one of the commonest cause of patients visit to the otorhinolaryngologist. Around one in five cases seen in outpatient department is concerned with sinus disease. Surgical clearance of these chronically infected sinuses while maintaining their ventilation and drainage is the treatment of choice. Recently combination of diagnostic endoscopy and systematic understanding of the lateral nasal wall with CT in the coronal plane has become the corner stone in the evaluation of PNS disease. In this study we

have compared the findings of diagnostic nasal endoscopy (DNE) and CT PNS of patients with sinus diseases.

AIM: To study the effect of type and site of DNS on osteomeatal complex and sinus diseases.

MATERIALS & METHODS

Study design: Hospital based observational study.

Study area: Index Medical College Hospital and Research Centre, Indore

Sample size: 100 patients were taken for the study.

Study duration: January 2021 to July 2022

INCLUSION CRITERIA:

- Patients with age 18 years and above.
- All patients of either sex with DNS.
- Patients giving consent to be a part of the study.

EXCLUSION CRITERIA:

- Patients with cystic fibrosis
- Patients with immune deficiency
- Patients with metabolic diseases
- Patients with malignant mass
- Patients those who had previously undergone nasal or sinus surgery
- And children < 18 year of age

PROCEDURE:

A detailed history and ENT examination was done according to the proforma. Diagnostic Nasal Endoscopy (DNE) was done for all the patients. Further the patients were advised CT PNS to delineate the extent of sinus disease, define any anatomical variants and relationship of sinuses with the surrounding important structures. Findings of endoscopy and CT scan were correlated with symptoms and scoring was done using Lund Kennedy [1] and Lund Mackay scoring system [1] respectively.

STATISTICAL ANALYSIS:

Data was entered into the excel sheet. Data was analysed using SPSS (Statistical Package for Social Sciences) 21.0 version, IBM, Chicago. Comparison of categorical variables was done using Chi-square test. P value <0.5 was considered statistically significant.

OBSERVATIONS & RESULTS

The study included total of 100 participants having DNS. The mean age of the participants was 33.47 years (range- 18.0-58.0 years).

Table 1: Distribution of Participants based on Age

Age distribution	Number of Participants
18-20	15
21-30	32
31-40	24
41-50	17
51-60	12
Total	100

Table 2: Distribution on the basis of Types of DNS

Type Of DNS	No. Of Patients	Percentage
C-shaped	26	25.24%
S-shaped	8	7.76%
Spur	57	55.33%
Mucosal thickening	4	3.88%
Caudal dislocation	8	7.76%

Table 3: Distribution on the basis of Status of Osteomeatal Complex

Osteomeatal Complex	No. of Patients	Percentage
Patent	66	66%
Obliterated (B/L)	18	18%
Obliterated (U/L)	14	14%
Widened	2	2%

Table 4: Status of Osteomeatal Complex in Relation to Type of DNS

Type Of DNS	Patent	Obliterated
C-shaped	13	13
S-shaped	3	5
Spur	43	14
Mucosal thickening	3	1
Caudal dislocation	7	1

Table 5: Comparative Findings OF DNE and CT scan

Findings		Diagnostic nasal endoscopy	Computed tomography findings
Deviated nasal septum		100	92
Middle meatus	Polyp	14	13
	secretions	20	3
Middle turbinate Hypertrophy		29	27
Inferior turbinate	Hypertrophy	17	35

Table 6: Agreement between the findings of CT and endoscopy in diagnosing Deviated Nasal Septum

			Endoscopy		Total
			Right DNS	Left DNS	
CT	Right DNS	Count	34	12	46
		Percentage within CT	73.9%	26.1%	100.0%
		Percentage within endoscopy	77.3%	21.4%	46.0%
	Left DNS	Count	5	41	46
		Percentage within CT	10.9%	89.1%	100.0%
		Percentage within endoscopy	11.4%	73.2%	46.0%
	Centralised	Count	5	3	8
		Percentage within CT	62.5%	37.5%	100.0%
		Percentage within endoscopy	11.4%	5.4%	8.0%
Total		Count	44	56	100
		Percentage within CT	44.0%	56.0%	100.0%
		Percentage within endoscopy	100.0%	100.0%	100.0%

Table 6, Cohen kappa value of 0.537 and p value <0.5 revealed statistically significant moderate agreement between the findings of endoscopy and Computed Tomography [CT]. Which means both endoscopy and CT PNS have their own importance in diagnosis of DNS

Table 7: Predictive accuracy of endoscopy in identifying Right DNS

Sensitivity	True positive / (True positive + False negative)	34 / 46	73.9%
Specificity	True negative / (True negative + False positive)	44 / 54	81.5%
Positive predictive value	True positive / (True positive + False positive)	34 / 44	77.3%
Negative predictive value	True negative / (True negative + False negative)	44 / 56	78.6%

Table 8: Predictive accuracy of endoscopy in identifying Left DNS

Sensitivity	True positive / (True positive + False negative)	41 / 46	89.1%
Specificity	True negative / (True negative + False positive)	39 / 54	72.2%
Positive predictive value	True positive / (True positive + False positive)	41 / 56	73.2%
Negative predictive value	True negative / (True negative + False negative)	39 / 44	88.6%

DISCUSSION:

The impact of chronic rhinosinusitis (CRS) has been well documented. It is a common condition in medical practice, which affects many people worldwide and its prevalence is rising. When combined with sinonasal endoscopy, computed tomography (CT) provides the majority of objective data used to diagnose CRS. Present study was conducted on 100 patients with deviated nasal septum (DNS) and comparison was drawn between findings of CT PNS and Diagnostic Nasal Endoscopy.

In the present study, DNE was able to detect Deviated Nasal Septum in all 100 patients while CT PNS was able to detect DNS in only 92 patients. Present study has Cohen's kappa- 0.537, p value- .001. Cohen's kappa- 0.537, p value <0.5 revealed statistically significant moderate agreement between the findings of endoscopy and CT, which means both endoscopy and CT PNS have their own importance in diagnosis of DNS. According to Mallikarjun S. Tegnoor et al [2]; Deviated nasal septum is seen in 33 (66%) patients on endoscopy and 36 (72%) patients on CT scan, this difference of 3 cases is accounted for posterior (bony) DNS which can be seen on CT scan. In the study conducted by Fikret Kasapoglu et al [3], the most common findings are deviated nasal septum noted in 18 (41.9%) cases on CT scan. According to Rawand Kamaran Hussein et al [4]; sensitivity of the nasal endoscopy (in

diagnosing deviated nasal septum) compared with the CT findings was 100%, its specificity was 85%, the positive predictive value was 93%, the negative predictive value was 100%, and the total agreement was 95%. No significant difference was detected between the two tests regarding their findings ($P = 0.250$). The Kappa statistics showed high level of agreement ($\kappa = 0.883$, $P < 0.001$). The discrepancy between CT scan findings and DNE findings of DNS in present study can be explained by 1. Proper 2mm cuts in CT PNS are required to rule out DNS. Small DNS might be missed if cuts are taken more than 2mm. 2. For caudal dislocation, DNE is better as compared to CT PNS.

Table 9: Pros & Cons of CT PNS

	PROS	CONS
CT	<ul style="list-style-type: none"> - It shows progressively deeper structures as the surgeon encounters them during operation (e.g.: uncinat process, bulla ethmoidalis, ground lamella, sphenoid sinus, in an A-P direction). - It shows the relationships of the above structures to important areas such as the lamina papyracea and skull bone, reducing the morbidity. - Dehiscence of the lamina papyracea are better visualized. - Comparative study of two sides of the ethmoid labyrinth is possible. 	<ul style="list-style-type: none"> - Radiation dose to the sensitive areas like cornea and lens is particularly high when axial cuts are taken nearly 185 times more than that recorded for plain X-rays. Careful positioning of the patient in the scanner can reduce this. - Inability to differentiate between fibrous tissue (post-op) and inflammatory mucosal disease. Thus, CT scan falsely indicates recurrent disease because of the presence of postoperative fibrosis in the PNS. (i.e., Specificity of CT is lower than the Sensitivity of CT). - Relatively expensive investigation.

Table 10: Pros & Cons of Diagnostic Nasal Endoscopy (DNE)

	PROS	- CONS
DNE	<ul style="list-style-type: none"> - <i>Endoscopy is essential in order to provide serial examinations, differentiate among the various aetiologies of inflammatory sinus disease and examine the condition of mucosa in these patients.</i> 	<ul style="list-style-type: none"> - Gross septal deviation can make endoscopy difficult and unrewarding. - Localized disease within the infundibulum, frontal recess and maxillary sinus ostium is difficult to diagnose. - Optical illusory effect - due to this, a beginner may find difficult to orient the anatomy especially when using different optical views. - Depth perception is not there because of absence of binocular vision. - Gives no information regarding position and status of vital relations of sphenoethmoids. - Extent of disease within the Sphenoethmoid is difficult to be made out. CT imaging of PNS can overcome these limitations.

CONCLUSION

From the present study it is concluded that CT scan has got a better advantage compared to DNE in detecting the anatomical variants as well as to know the condition of sinus cavity and the extent of disease in sinuses. DNE can prove to be a better diagnostic modality compared to CT scan when conditions like middle meatal secretions, condition of mucosa, polyps are looked for. Thereby indicating that in all patients with sino-nasal disease both CT scan and DNE has to be done, to know the exact pathology and to plan for further management. Nasal endoscopy and CT yield complementary information regarding diseases of the paranasal sinuses.

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