



A COMPARATIVE STUDY BETWEEN DIAGNOSTIC NASAL ENDOSCOPY AND COMPUTED TOMOGRAPHY OF NOSE & PNS IN DIAGNOSIS OF SINONASAL DISEASES

Dr. Shantanu Mandal¹ and Dr. Ankur Gupta^{*2}

¹Consultant, Head of Department, Department of Ent, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, India.

²Senior Resident, Department of Ent, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, India.

***Corresponding Author: Dr. Ankur Gupta**

Senior Resident, Department of ENT Safdarjung Hospital & V.M.M.C New Delhi India.

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ABSTRACT

Introduction: Diagnostic nasal endoscopy and computed tomography of nose & para-nasal sinuses play an important role in the diagnosis and treatment of sino-nasal disease. This study explains the importance of both, individually and together. **Aims and Objective:** The objective of this study is to compare the computed tomographic findings to the nasal endoscopy findings in patients with chronic sino-nasal diseases. This study aims to compare CT scan and DNE in sino-nasal diseases. **Methods:** 50 Patients attending ENT OPD with any sino-nasal complaints lasting for more than 4 weeks and not responding to medical line of management. Patients are selected by random sampling method. Patients were evaluated with Computerized Tomography scan and Diagnostic nasal Endoscopy. **Results:** Total 50 patients were studied. Male to female ratio was 3:2. Out of 50 patients maximum number of patients had septal deviation on nasal endoscopy examination (35); followed by nasal discharge (34) and nasal polyp (25) and inferior turbinate hypertrophy (13). Maxillary sinus opacity was seen in 20 cases ethmoid opacity in 18 cases, polyp in 10 cases, deviated nasal septum in 10 cases on computerized tomography. **Conclusions:** Thereby indicating that in all patients with sino nasal diseases both CT scan and DNE has to be done, to know the exact pathology and to plan for further management. Both Computerized Tomography scan and Diagnostic nasal endoscopy are complementary to each other.

KEYWORDS: Sino nasal disease, Computerized tomography, Diagnostic nasal endoscopy, Anatomical variants.

INTRODUCTION

Computerized Tomography (CT) provides essential preoperative information for the assessment of patients undergoing functional endoscopic sinus surgery (FESS). CT scan of nose & paranasal sinuses is aimed at delineating the extent of the disease; define any anatomical variants and relationship of the sinuses with the surrounding important structures. At present, CT scan is the most used imaging technique for assessing chronic sinusitis and defining the anatomical abnormality. Hence, endoscopy and computerized tomography (CT) have revolutionized the understanding and management of sinonasal in recent times. Recently, combination of diagnostic nasal endoscopy and systematic understanding of the lateral nasal wall with CT in the coronal plane has become the corner stone in the evaluation of the paranasal sinus disease. This is the basis for the concept of FESS. In this study, we have compared the diagnostic nasal endoscopic findings and CT findings of the patients with nose & paranasal sinus diseases and elaborated the importance of both. These paranasal diseases usually

presents with various symptoms which are multiple and vague. The direct examination of the sinuses is not possible and the procedure of anterior rhinoscopy gives very little information about middle meatus and about the osteomeatal unit.^[1]

The older sinus radiographic diagnostic techniques used failed to identify and detect minimal to moderate degree of mucosal thickening in the ethmoidal and middle meatus region. In the recent years the newer diagnostic technique has been developed to improve the radiographic evaluation and better visualization of the intranasal findings.

Hence the various investigation modalities like computer tomography and nasal endoscopic procedures are done for the better diagnosis of nose & paranasal disease. This investigation helps in the identifying mucosal abnormalities, anatomical and bony variations of paranasal sinuses and also helps in to localize the pathogenic changes among the patients who are

subjected for sinusitis surgery.^[2] The computerized tomographic (CT) findings have improved the imaging of paranasal sinus anatomy and gives better results than the radiographic findings and improves and gives the better anatomical variations in the paranasal sinus.^[3]

Computerized tomography (CT) provides an essential preoperative information for the assessment of patients undergoing functional endoscopic sinus surgery (FESS) in defining the anatomical variants and its relation to the sinus and surrounding structures.

The primary role of the coronal CT scan is to determine the extent and possibly the underlying cause of sinusitis. As a rule, surgeons individualize their surgical approach according to the amount and location of disease they see on CT scan.^[2-4]

Endoscopic techniques for paranasal sinus surgery gives the surgeon complete and detailed visualization of the inner structures of sinus with minimum discomfort to the patient. The telescopic view of the operative field shows detail of the sinus anatomy and its disease. It has been possible to see areas which are not so clearly defined in CT like cribriform and orbital wall that are at risk to produce cerebrospinal fluid rhinorrhea and orbital complications during the surgery. At the same time, landmarks for avoiding these complications can be defined to guide the surgeon during the surgery as seen through the endoscope.^[5]

OBJECTIVE

To compare the diagnostic nasal endoscopy and computerized tomography findings of paranasal sinus in diagnosing sino-nasal disease.

METHODS

A comparative study was conducted at Vardhman Mahavir Medical College & Safdarjung hospital, new delhi, India for a duration of one year from June 2010 to June 2011. All the patients attending the ENT OPD with Sino nasal disease and who meets the inclusion criteria during the study periods were included in the study.

A total of 50 patients were included in the study and analyzed.

Inclusion Criteria & Exclusion Criteria

All the patients with clinically proven chronic sinusitis not responding to routine medical line of treatment and who are willing to give consent for the purpose of the study were included in the study.

The patients who are not willing to get the CT of PNS or DNE, suffering from acute attack of sinusitis and children with less than 10 years and patients with previous maxilla facial trauma and sinus surgery were excluded from the study.

A routine haemogram (HB, BT, CT, TC, DC) and urine examination (albumin, sugar, microscopy), swab from middle meatus for culture sensitivity along with X-ray paranasal sinuses were done for the patients. All the patients in active stage of the disease were treated with course of suitable antibiotic, systemic antihistamines and local decongestants. They were also treated for medical conditions like diabetes mellitus, hypertension, nasal allergy. No patient received steroid therapy or immunotherapy. Each patient underwent a systematic diagnostic nasal endoscopy and computed tomography of nose and paranasal sinuses.

RESULTS

Total 50 patients were studied. The age ranged from 18 years to 60 years. Maximum patients were in 20-29 years of age group, which contribute 38% of total patients. In study male preponderance was 60% and female was 40%, Male to Female ratio was 3:2.

In this study most common complaint was nasal obstruction seen in 44 patients (88%), followed by nasal discharge in 37 patients (74%), headache in 33 patients (66%), excessive sneezing in 28 patients (56%), pus on anterior rhinoscopy in 19 patients (38%), post nasal drip in 18 patients (36%), anosmia/hyposmia in 11 patients (22%) while least common complaints was facial pain in 4 (8%). Many patients came with multiple complaints at a time for particular pathology, most common symptom with which patients presented considered as a primary complaints. The duration of the symptoms varied from 2 months to 13 years. Mean duration of symptoms was 3.2 years. According to the Sino-Nasal Assessment Questionnaire (SNAQ scoring), 0 patients had score <10, 8 patients had score 10-20(16%), 26 patients had score 21-30(52%), 13 patients had score 31-40(26%), 3 patients had score 41-50(6%), and no patients had score >50, maximum score was 45 and minimum total score was 15. In clinical examination, on anterior rhinoscopic examination, 2 patients (4%) were found to be normal, among the positive findings septal deviation were seen in 34 patients (68%). the other finding were turbinate hypertrophy in 19 patients (38%), discharge in 22 patients (44%), nasal mucosal abnormality in 12 patients (24%). The routine investigation were normal in all patients.

Diagnostic Nasal endoscopy was done in all the patients. In our study group, 8 patients had paradoxical middle turbinate (16%), septal deviation in 35 patients (70%), 25 patients had polyp (50%), 34 patients has nasal discharge (68%), 12 patients has mucosal abnormalities (24%), 13 patients had inferior turbinate hypertrophy (26%), 9 patients had concha bullosa (18%). (TABLE.1)

Diagnostic Nasal Endoscopy (Table.1).

Findings	No of Cases	Percentage
Polyp	25	50%
Paradoxical middle turbinate	8	16%
Septal deviation	35	70%
Nasal discharge	34	68%
Cocncha bullosa	9	18%
Inferior turbinate hypertrophy	13	26%
Mucosal abnormality	12	24%

Diagnostic Nasal Endoscopy findings were scored according to Lanza & Kennedy scoring system. Minimum total score was 2 and maximum total score was 12. (Table.2)

DNE SCORE (TABLE.2)

SCORE	CASE	PERCENTAGE
0-3	19	38%
4-6	25	50%
7-9	6	12%
10-12	0	0

CT scan findings (TABLE.3).

Findings	No. Of cases	Percentage
Maxillary Opacification	20	80
Ethmoid Opacification	18	72
Frontal Opacification	6	24
Sphenoid Opacification	9	36
Omc Blocked	21	84
Mucosal Abnormality	6	24
Polyp	10	40
Concha Bullosa/Turbinate Hypertrophy	11	44
Nasal Discharge/Secretions/Air –Fluid Level	15	60
Bone Destruction	4	16
Dns	10	40

Computer Tomography Score (Table.4).

Score of Patient	No of Patients	Percentage
0-6	7	28
7-12	9	36
13-18	6	24
19-24	3	12

On the basis of computed tomography findings patients were scored in accordance with their sinus score, findings were recorded. Maximum number belonged to score 7-12 (9 patients), followed by 7 patients in score 0-6, 6 patients in score 13-18, and 3 patients in score 19-

24. Maximum score obtained was 24 and minimum being 4, mean Lund–Mackay score was 11. (FIGURE.4)

All the patients underwent surgery was done under endoscopic control or septoplasty or excision was done under GA.

Table 5: Comparson of Dne Score With Lm Score.

Findings	Dne Score (in %)	Lm score (in %)
Septal deviations	68	40
Turbinate hypertrophy	38	44
Polyp	36	40
Discharge/secretions	44	60
Mucosal abnormality/thickening/edema	24	24

DISCUSSION

The development of modern rigid nasal endoscopy represents a major advance in rhinologic diagnostic

capability. The study conducted by Aminnu Bakari et al.^[6] and Levine et al.^[7] had maximum number of patients in between 31 to 40 years with mean age 33.3

and 35.6 respectively. In our study majority of patients was in the age group of 20 to 29 years with total 19 cases. In the present study 30 patients were male while 20 patients were female with male to female ratio was 3:2. In the study conducted by Kirtane et al.^[8] there were 48 (61.5%) males and 30 (38.4%) females and male to female ratio was 1.6:1. Abtin Tabaei^[9] had 39 (63.9%) male and 22 (36%) female with ratio 1.7:1 in his study. Similarly study conducted by Aminnu Bakari et al.^[6] showed 42 (55.2%) male and 34 (44.7%) female and had ratio 1.2:1. In the study conducted by Kirtane et al.^[8] the commonest complaint was nasal discharge seen in 61% patients, followed by nasal obstruction in 59% patients. In the study conducted by Aminnu Bakari et al.^[6] the nasal discharge (97.4%) was the most common presenting complaints followed by nasal obstruction (94.7%). In our study the most common presenting complaints was nasal obstruction seen in 44 patients (88%) followed by nasal discharge in 37 patients (74%). Out of 22 patients of sinusitis, 16 (72.72%) patients had associated anatomical variations on diagnostic nasal endoscopy. This was well in agreement with the study done by Lolyd et al.^[10] who reported a figure of 62%. Similarly study conducted by Levine et al.^[7] showed anatomical variation in 56.6% in his 150 studied patients. Diagnostic nasal endoscopy was of great significant in patients of epistaxis. It helped in accurate diagnosis of cause of epistaxis and proper management of the same. This measure was better tolerated and less uncomfortable as compared to nasal pack or balloon. This conclusion was consistent with those of McGarry et al.^[11]

Diagnostic nasal endoscopy was useful in identifying conductive olfactory loss and associated pathology with it. Clinical examination failed to diagnose pathology in 11 (22%) cases of olfactory loss and endoscopy was necessary to make the proper diagnosis. This figure is close to the figure of 51% given by Allen et al.^[12] Rigid endoscopy helped in careful manipulation and removal of nasal foreign bodies and rhinolith under direct vision which were posteriorly placed and were not visible on clinical examination. Also, posterior extent of rhinolith was carefully evaluated. This conclusion was also supported by studies of Keck et al.^[13] and Hade et al.^[14] Nasal endoscopy helps in exact localization and minimizing trauma to surrounding structure and prevents bleeding during foreign body removal. In this study endoscopic biopsy was taken in 6 patients with sinonasal mass. Nasal endoscopy showed exact site in the region of pathology from where biopsy had to be taken which help in accurate histopathological diagnosis and help to minimize the bias. This conclusion was supported in the study conducted by Abtin Tabaei et al.^[9] who stated that office based nasal endoscopy with biopsy represent a safe and important tool in evaluation of sinonasal neoplasm and this procedure provides diagnostic information that may alter treatment decision. In this study 5 patient of olfactory disturbance had atrophic rhinitis which was best diagnosed and managed by nasal

endoscopy. This conclusion was supported by studies of Sevil Ari et al.^[15] who managed cases of atrophic rhinitis on regular follow up and endoscopic removal of nasal crust. In our study, anterior rhinoscopy did not reveal pathology and diagnosis in 39 cases (39%) which were diagnosed on Nasal endoscopy. This finding is consistent with Levine et al.^[7] study showed a figure of 38.7%. Thus, nasal endoscopy is efficient over clinical examination for diagnosing nasal pathology.

On studying the CT scans we found that 40 % had septal deviation and/or spur, 40 % have polyp, 44 % concha bullosa, We found that 84 % patient had osteomeatal complex blocked, 80 % maxillary sinus haziness, 72% ethmoid sinus haziness, 24% frontal sinus haziness and 36 % sphenoid sinus haziness. On scoring according to Lund Mackay scoring of CT PNS, 28 % subjects had scores between 0 -6, of which 36% had scores less than 7-12, 24 % had scores between 13-18, 12 % had scores between 19-24.

CONCLUSION

Diagnostic nasal endoscopy helps reduce CT utilization, thereby reducing cost and radiation exposure in a large segment of the population being evaluated for CRS. Diagnostic endoscopy, a less expensive, easily accessible tool, offers an advantage in the diagnosis of CRS. In patients with limited or poor endoscopic visualization, due to polyps, or septal deviation or crowding of osteomeatal complex and presence of hidden air spaces like sphenoid sinus, ethmoid bulla and posterior ethmoids, CT scan is useful in discerning the disease. In light of these findings, we propose that if a patient meets guideline symptom criteria and has positive endoscopic findings on examination, it would be reasonable to treat with a clinically presumed diagnosis of CRS before obtaining a paranasal sinus CT scan. Sinus imaging could then be considered for those patients with refractory symptoms despite maximal therapy and in those cases where surgery is being planned. Diagnostic endoscopy and CT scan is a must prior to any functional endoscopic sinus surgery. They help in assessing the extent of sinus disease and to know the variations and vital relations of the paranasal sinuses. CT assists the surgeon as a "road-map" during FESS. CT scan should be used to provide supplementary clinical data to the history and endoscopic examination, and assist in directing surgical treatment to the affected areas. Finally, we can conclude that the CT scan has a good and better advantages when compared to DNE to identify the anomalies in the Sino Nasal Diseases.

CONFLICT OF INTEREST

There is no conflict of interest.

ETHICAL APPROVAL

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research

committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

INFORMED CONSENT

Informed consent was obtained from all individual participants included in the study.

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