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Role of Diagnostic Nasal Endoscopy in Sinonasal Disease

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Abstract

Objective- To study the extent of disease by DNE in case of sinonasal diseases as compared to patients' symptoms and CT finding as well as surgical findings.

Method- Study was conducted at Saraswathi institute of medical sciences, Hapur from may 2017 to October 2018. Study consists of hundred patients who underwent DNE and CT scan. DNE findings were scored using Lanza and Kennedy scoring and patients were also staged using CT. We used the current definition of CRS.

Observation and Results- In our study 16 patients had paradoxical middle turbinate (16%), Septal deviation in 70 patients (70%), 50 had polys (50%), 68 patients had the nasal discharge (68%), 24 patients had mucosal abnormality (24%), 26 with inferior turbinate hypertrophy (26%), 18 patients had concha bullosa (18%).

Conclusion- Nasal endoscopy can diagnose sinonasal diseases accurately regardless of CT scan.

Keywords- *Diagnostic nasal endoscopy, Sinonasal diseases.*

Introduction

Otolaryngologists have traditionally considered chronic sinusitis to be a progressive condition associated with an escalating degree of treatment difficulty related to the extent of sinus involvement. The majority of reports of the results of sinus surgery, until recently, have emphasized techniques, but have generally lacked specificity as to the extent and nature of the disease process and the criteria for a successful outcome. The need for classifying and accurately evaluating the treatment of sinusitis has been driven by the burgeoning interest in surgery of the paranasal sinuses coupled with the recognition that sinusitis is now one of the most common medical diagnosis. It is no longer sufficient for a surgeon to report excellent results in treating sinusitis without describing the degree of disease treated, a treatment protocol, and an assessment of results based on the extent of the disease process.

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Previously there had been no organised format for the documentation of these. In 1994, the Committee on Rhinology and Paranasal Sinus Disease of the American Academy of Otolaryngology, Head and Neck Surgery established an international protocol to evaluate CT staging systems for sinus disease. Later scoring systems for endoscopy by Lanza and Kennedy [(16)] were also developed, the symptoms were evaluated in the clinical practice and research by the 20 item Sinonasal Outcome Test (SNOT 20), [(7)] Rhinosinusitis Disability Index, Quality of Life Questionnaire, Chronic Rhinosinusitis Quality of Life Questionnaire and Chronic Sinusitis.

Among all the recent advances, the development of the nasal endoscopy has been most efficient, and useful advance made in evaluation and treatment of sinonasal disorders. It has afforded the otolaryngologist unparalleled access to paranasal structures and site of disease. It allows for precision of instrumentation and surgery in the region of osteo-meatal complex and beyond, in restoring anatomic continuity, mucociliary clearance, ventilation, and reversing Sinunasal disorders more effectively. It has also encroached into the field of Ophthalmology and Neurosurgery. Use of endoscope reduces the morbidity and the length of hospital stay and surgery is also cosmetically more acceptable.

Messerklinger[19] is credited with being the first to develop and establish a systematic endoscopic diagnostic approach to the lateral wall of the nose and the PNS.

In our study we have made an attempt to correlate symptoms, DNE findings, CT scan finding and operative findings in patients of chronic rhinosinusitis and other Sino-nasal disorders.

Aims

The study aimed to assess extent of disease by DNE in cases of sinonasal disorders & compare them with CT findings and patient symptoms. They were also compared with surgical finding.

Materials and Method

This study was conducted in the Department of Otolaryngology, Saraswathi medical college, hapur, U.P. Hundred patients who presented to the OPD with features suggestive of sinonasal disorders like CRS, DNS, ANGIOFIBROMA etc. After obtaining Informed consent of all the patient suffering from sinonasal disorders, confirmed by their history symptoms and clinical findings, patients were taken for DNE and CT Scan. We used the current definition of CRS which is based upon the persistence for more than twelve weeks of 2 or more major Signs and symptoms or at least one major or 2 minor symptoms with adequate treatment.

Exclusion criteria were patients who had undergone FESS previously or had associated debilitating disease like HlV, DM, HTN.

All patients were treated with the steroid nasal spray and course of antihistamine. If there was evidence of infection or purulent discharge or PND, patients were given course of antibiotic. All patients were followed up in OPD for 6 months. Non-responders were taken up for DNE and CT Scan & SNAQ was filled (based on clinical history proforma).

On DNE presence of any DNS, Spur, Paradoxical middle turbinate polyp and mucosal abnormality was made. DNE findings were scored using Lanza & Kennedy. A maximum of 12 points and a minimum of 0 points is given.

	0	1	2
Secretion	Absent	Watery/clear	Dense/ Purulent
Oedema	Absent	Minor	Massive
Polyp	Absent	In middle meatus	Massive Polyposis

Both Sides would be assessed individually and their sum would represent the endoscopy score.

CT as an essential prerequisite was done in each patient. All patients underwent optimal (3 weeks) medical therapy prior to proceeding for CT examination. 3mm coronal cuts were taken from the frontal to the sphenoid sinus. 3mm axial cuts were taken from roof of the frontal sinus to the floor of nasal cavity. A bone window width of +2000 HU with a level of ~2000 HU was chosen.

Patient were staged in accordance with the following computed tomography staging system. This is a point-based system which stage the disease on basis of number of points scored. It has also taken into account any bony changes along with. Total of maximum 24 points can be score 12 for each side sinus system.

	LEFT	**RIGHT**
Maxillary Sinus		
Anterior Ethmoid Sinus		
Posterior Ethmoid Sinus		
Sphenoid Sinus		
Frontal Sinus		
Osteo-meatal complex		
TOTAL		

Scoring: For all sinus systems except osteomeatal complex, 0= no abnormalities, 1= partial opacification, 2= complete opacification. For osteomeatal complex, 0= not occluded, 2= occluded.

Observations and Results

Our study group comprised of patients in age group of 18-60 years with 60 males and 40 females. Overall median age was 30.58 years.The duration of disease ranged. between 2 months to 13 years, with a mean being 3.24 years. Maximum number of patients presented within 1 year from of the first symptom (34%). The most

prominent symptom in our study was nasal blockage (88%) and nasal congestion, nasal discharge (74%) Other signs and symptoms including headache (66%), excessive sneezing (56%), pus on anterior rhinoscopy (38%), post nasal drip (36%), anosmia / hyposmia (22%), cough (14 %) and facial pain (8%). Most of the patients presented with more than two major symptoms, only two patients presented with one major symptom. Only two patients each with ear fullness, Chronic suppurative Otitis Media and complaint of decreased hearing.According to SNAQ scoring,0 patients had score <10, 8 patients had score 10 -20 (16%) 26 Patients had score 21-30 [52%] 3 patients had score 41-50 [6%] and no patients had score >51 Maximum score was 45 & minimum total score was 15.On anterior rhinoscopic examination, 4 patients {4%} were found to be normal among the positive findings, septal deviation were seen in 68 patients [68%] The other findings were turbinate hypertrophy in 38 patients [38%], polyp in 36 patients [36%], M/P Ds in 44 patients {44%}, nasal mucosal abnormality in 24 patients [24%].

The routine Investigations were normal in all patients. Diagnostic endoscopy was done in all the patients. In our study group,16 patients had paradoxical middle turbinate [16%], septal deviation in 70 patients [70%], 50 patient had polyp [50%],68 patients had nasal discharge [68%],24 patients had mucosal abnormalities [24%],26 patients had inferior turbinate hypertrophy [26%] and 18 patients had concha bullosa [18%].On the basis of computed tomography findings patients were scored in accordance with the sinus Score. findings were recorded. Maximum number belong to score 7-12 (14 patients) followed by 14 patients in Score 0-6, 12 patients in Score 13-18, and 6 patients in Score 19-24. Maximum score obtained was 24 and minimum being 4; mean LM score was 11. In all the patients, who underwent surgery was done under endoscopic control or septoplasty or excision. Operative findings were recorded based on surgical procedure performed in 40 patients, data was recorded mucosal abnormalities seen in 6 patients [15%], polyposis was recorded in 24 (60%) patients, pus was drained from 12 [30%] patients, turbinate changes were found in 8 [20%] patients and septal deviations was seen in 12 [30%].

Our findings were extremely interesting and conclusive in this aspect of our study and we were able to draw a hypothesis based on this finding.

Discussion

In our study we have correlated symptoms, DNE findings, CT scan findings and operative findings in patients of chronic rhinosinusitis and other Sinonasal disorders.

Our study group comprised of patients in age group of 18-60 years with more than 50% of the patient were in age range of 20-40 years. The mean age was 30.6 years. Unlike the finding of Dudvarski[8] in whose study mean age was 45 years. In our study there was a predominance of males (60%) as compared to Dudvarski[7], whose study included 52% males and 48% females,

The duration of disease ranged. between 2 months to 13 years, with a mean being 3.24 years. Maximum number of patients presented within 1 year from of the first symptom (34%).

The most commonly reported signs and symptoms in order of decreasing severity were nasal blockage, nasal congestion, nasal discharge, fatigue, headache, facial pressure, and dysosmia as found by N. Bhattacharya [3,4]. Most of the patients presented with more than two major symptoms, only one patient presented with one major symptom. Only one patient each with ear fullness, Chronic suppurative Otitis Media and complaint of decreased hearing. Many patients also complained of fatigue and nasal bleeding.

All the patients were examined clinically before being taken up for nasal endoscopy and CT scanning. 42 patients (42%) had discharge in nasal cavity, 68 patients (68%) had septal deviations and 34 patients (34%) had polyp on clinical examination. However, on DNE examination 50 patients (50%) were diagnosed having polyp and 70 patients (70%) had septal deviation.

Each patient was treated with maximal medical therapy prior to being considered for DNE. Diagnostic Nasal Endoscopy was done in all patient 100 patients,70 were found to have septal deviation and nasal polyps were found in 50 patients while paradoxical middle turbinate was found in 16 patients. Anatomical variants such as-medially bent uncinate process and paradoxical middle turbinate were visualised on CT scan as well as on endoscopy but were not included in staging of disease, although they are known to affect the disease prognosis. Rationale given was to have a simplified system and to make it more comprehensive and broaden

its application. Patient DNE score was in range of 2 to 12 (mean being 4.03). in Z. Dudvarski's study DNE score was 9.03 in the polyposis group and 2.43 in non-polyposis group (mean of 6.833) [7].

Patients filled Sinoasal Assessment Questionnaire and were accordingly scored. Score was in the range of 15 to 45 (mean being 27.1) as compared to S. Basu[2] study where SNAQ Score assessed was in range of 25 to 60 (mean of 47.2).Our patient group complained of more than one major symptom(except one) yet our scoring was very less in comparison to S.Basu[2]. Probably because our study' group was small and as infections are more common in tropical areas patients observed more relief during the initial 3 weeks treatment thereby having a lesser score of SNAQ.In our study polyps were seen in 20 patients (40%), in comparison to Jerry W Sonkens (1991)[3,5] study of sinus CT cans of 500 patients in which he saw polyposis in 49 patients (10%). Our staging system has been deliberately reduced to its simplest form to minimize individual variation in interpretation of the degree of opacification.

May and Levine's staging system was very time efficient but as it only gave a single score per patient it did not allow comparisons of extent. of disease at different anatomical sites. The division of osteomeatal complex into anatomical subdivisions as in Jorgenson's system, resulted in a reduced level of inter-observer agreement when compared with assessment of the osteomeatal complex as a single entity in Lund and Mackay's scoring. Lund-Mackay (CT scan) Score was in range of 4 to 24 (mean being 11). As compared to Lund-Mackay score in S. Basu's study which was in range of 5.5 to 24 (mean being 14.5). In its comparison N. Bhattacharya's [3,4] study showed a Lund-Mackay score of 3.79 in patients of CRS.

In this study a 68% of the patient had septal deviation in DNE in comparison to 40% on CT

scan & 30% at surgery. Polyps were seen in 36%patients in comparison to 40% on CT scan & 60% at surgery. Such difference can be attributed to a small study group and much smaller number of patients undergoing surgery. Those patients who underwent surgery mostly had more extensive disease.

Statistical analysis confirmed there was correlation between SNAQ & LUND-MACKAY SCORE (CT SCAN) Pearson Correlation Coefficient being 0.66. As compared to S.Basu[2] study where no correlation, was found correlation coefficient being 0.152. Correlation coefficient between SNAQ score and LANZA-KENNEDY SCORE (DNE) was 0.64 showing positive correlation. Correlation Coefficient between LANZA-KENNEDY SCORE (DNE) and LUNDMACKAY SCORE (CT SCAN) was 0.75; in comparison to Z.Liu[22] study where a much stronger correlation was found correlation coefficient being 0.88. Positive predictive value of DNE was 0.762; and negative predictive value was 0.5.

Conclusions

Due to better illumination, magnified view and deflected angles of the endoscopes every nook and corner of the, otherwise inaccessible areas of the nasal cavity can be examined with great accuracy by nasal endoscopy.

Photo documentation is possible in nasal endoscopy.

Nasal endoscopy can diagnose sinonasal diseases accurately regardless of CT scan.

Nasal endoscopy and CT scan are complimentary to each other.

Extensive polyposis with any intra cranial extension should always be confirmed by CT SCAN.

Haller cells, Onodi cells and other anatomical variations need to be confirmed by CT scan.

CT scan is mandatory before a patient is taken up for FESS to confirm the diagnosis and to know the extent of disease.

Follow up endoscopy gives an idea about the response to medical as well as surgical treatment. It also helps to find out recurrence and synechiae formation.

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