

A Comparative Study between nasal endoscopy and CT PNS in evaluation of chronic nasal obstruction

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Abstract

Introduction: Nasal obstruction is defined as sensation of insufficient airflow through the nose. Nasal obstruction may be the cardinal presenting symptom of many common disease processes, such as rhinitis, sinusitis, septal deviation, adenoid hypertrophy, and nasal trauma. **Aims and Objectives:** To study the etiopathogenesis of chronic nasal obstruction by evaluating with help of CT and endoscopic findings. **Materials and Methods:** This study was conducted in the ENT Department, with all patients with chronic nasal obstruction coming to the MGM Hospital, Aurangabad during the year October 2013 and October 2015. Total 50 cases of nasal obstruction are included in this fulfilling following criteria. History of nasal obstruction > 3 months, AGE: 18-60 years of age. Statistical analysis done by Z-test and Chi-square test. **Result:** Amongst 50 cases of chronic nasal obstruction highest incidence were found in 3rd decade of life i.e. 16 cases (32%) followed by 4th (20%) and 5th (18%) decade. Male were preponderance i.e. 29 (58%) males and 21 (42%) were female with male to female ratio 1.38:1. All cases (100%) of AC polyp and DNS were diagnosed by In our study, all cases (100%) of AC polyp and DNS were diagnosed by endoscopy, followed by sinusitis 6 (75%) out of 8 cases, 53 haemangiomas 2 (66.66%) out of 3 cases and ethmoidal polyp 3 (33.34%) out of 9 cases. All the pathologies (100%) causing obstruction can be diagnosed radiologically (C.T. Scan). Only cases of mucosal thickening and generalized causes of nasal obstruction were not diagnosed with the help of endoscopy. So in the present study by comparing the findings of DNE and CT PNS no significant statistically correlation seen between them i.e. $p > 0.05$. Which shows there is close association between the findings of endoscopy and CT scan. **Conclusion:** Nasal endoscopic examination is comparatively equally useful to CT scan examination in diagnosis of cases of chronic nasal obstruction patients.

Key Words: CT PNS, Chronic nasal obstruction, DNS.

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INTRODUCTION

Nasal obstruction is defined as sensation of insufficient airflow through the nose.¹Nasal obstruction may be the cardinal presenting symptom of many common disease processes, such as rhinitis, sinusitis, septal deviation, adenoid hypertrophy, and nasal trauma.²The causes of

nasal obstruction are :The causes of nasal obstruction are: Infective rhinitis: acute rhinitis is often infective in origin, Viral rhinitis, Bacterial rhinitis, Fungal rhinitis, Allergic rhinitis, Non-allergic rhinitis, Foreign bodies in the nose, Nasal septum abnormalities: Nasal septal deviation (congenital or acquired), haematoma (trauma) Perforation, Occlusion of the nasal valve: Turbinate hypertrophy: Adenoid hypertrophy: Nasal polyps. Rhinosinusitis. Neoplasm- Inverted papilloma, sarcoma, lymphoma, juvenilesopharyngeal angiofibroma and squamous cell carcinoma. Choanal atresia. When combined with diagnostic endoscopy and computed tomography (CT), it provides a majority of objective data used to diagnose chronic nasal obstruction. It has high sensitivity and provides objective findings regarding the condition of the nasal mucosa, paranasal sinuses and the presence of fluid or polyps.³Diagnostic nasal endoscopy provides angled, illuminated and magnified view, thus allowing detailed

assessment of intranasal anatomy and pathology that can be missed on clinical examination. It is also a useful tool to create documentation for permanent records with the help of attached camera. Nasal endoscopy allows to approach and clear the disease from nose and paranasal sinuses and to restore the function to normal, by Functional endoscopy sinus surgery (FESS).⁴High resolution Computed Tomography (CT) scanning of Paranasalsinuses (PNS) provides excellent bony details and soft tissue mapping coronal and axial views are obtained with the head in neutral position and hyperextension respectively. CT has become the modality of choice for inflammatory disease of the sinuses and the ostiomeatal complex. It provides various anatomic landmarks at the skull base. CT has replaced conventional radiographs as imaging modality of choice for assessment of PNS diseases. CT plays an important diagnostic role in patients with sinonasal disease and determines the treatment. It is now mandatory and a medico legal requirement to evaluate PNS and nose before FESS, as this provides a “ROAD MAP” to guide the during surgery and serves to direct the surgical approach. CT determines the distribution and extent of disease and detect those anatomic variations like septal deviation, spur formation, concha bullosa, paradoxical curve of middle turbinate etc.⁵A combination of CT and diagnostic endoscopy has become the corner stone in evaluation of the paranasal sinus diseases. with the help of CT scanning and nasal endoscopy it may be possible to have access and visualization of the niches and narrow spaces in this region. The role of endoscopist in association with study of CT scan would be to locate the possible trigger area in sinonasal pathology. endoscopy in association with computed tomography has opened new vistas in peeping into inaccessible areas and niches of lateral nasal wall and anatomical variations undetected clinically.⁶In my present study I am trying to find out causes of chronic nasal obstruction by doing diagnostic nasal endoscopy as well as by doing CT PNS and evaluating their findings .The results of nasal fossa findings obtained by nasal endoscopy were more conclusive in the elucidation and diagnosis than those obtained by the CT scan of the Paranasal sinuses.⁷Vining EM *et al* in 1993 conducted a study on the importance of preoperative nasal endoscopy in patients with sinonasal disease and concluded that in 100 consecutive patients with symptoms of sinus disease and found 9% of patients with abnormal telescopic examination in the context of negative CT findings. In those patients whose CT examinations were positive, telescopic nasal endoscopy was especially useful in delineating the type of soft tissue which obscured the area of the middle meatus. In those patients whose CT

examinations were negative, telescopic examination demonstrated septal deflections, mucosal edema involving the middle meatus, as well as turbinate and adenoid hypertrophy. These findings demonstrate that telescopic nasal examination is an important diagnostic modality which often yields important information when evaluating patients with sinonasal disease.⁸Stankiewicz JA *et al* in 2002 conducted a study on 78 patients meeting the definition of chronic rhinosinusitis were subjected to same-day endoscopy and CT scanning and concluded that positive endoscopic results correlated well with CT, and negative endoscopic results correlated in 71% of patients with negative CT results.⁹

MATERIALS AND METHODS

This study was conducted in the ENT Department, with all patients with chronic nasal obstruction coming to the MGM Hospital, Aurangabad during the year October 2013 and October 2015. Total 50 cases of nasal obstruction are included in this fulfilling following criteria. History of nasal obstruction > 3 months, AGE: 18-60 years of age, Those patients of nasal obstruction which do not resolve in spite of medication included into study while Those with history of nasal and paranasal sinus surgery in the past, Immunocompromised patients and Pregnant women, Cases of Atrophic rhinitis were excluded from the study. Patient evaluated in OPD, Detailed ENT examination, Diagnostic nasal endoscopy with 0° and 30°, followed by CT PNS.

RESULT

Table 1: Age distribution of chronic nasal obstruction cases (n=50)

Age group (Yrs.)	No. of cases	Percentage
18- 20	07	14.0%
21-30	16	32.0%
31-40	10	20.0%
41-50	9	18.0%
51-60	8	16.0%
Total	50	100.0%

Above table shows, amongst 50 cases of chronic nasal obstruction highest incidence were found in 3rd decade of life i.e. 16 cases (32%) followed by 4th (20%) and 5th (18%) decade. Least cases were observed in the age of 51-60 yrs. i.e. only one case (16%).

Table 2: Sex distribution of chronic nasal obstruction cases (n=50)

Sex	No. of cases	Percentage
Male	29	58.0%
Female	21	42.0%
Total	50	100.0%

In the present study, out 50 chronic nasal obstruction cases male were preponderance i.e. 29 (58%) males and 21 (42%) were female with male to female ratio 1.38:1.

Table 3: Different cases of chronic nasal obstruction diagnosed by endoscopy (n=50)

Pathology	Diagnosed by Endoscopy	Not diagnosed by endoscopy	Total (%)
Polyp	22(78.57%)	06(21.43%)	28(100.0%)
AC polyp	19(100%)	Nil	19 (100.0%)
Ethmoidal polyp	03(33.34%)	06(66.67%)	09(100%)
DNS	08(100%)	Nil	08(100.0%)
Sinusitis	06(75%)	02(25%)	08(100.0%)
Haemangiomas	02(66.66%)	01(33.33%)	03(100%)
Mucosal thickening	Nil	02(100%)	02(100%)
Generalized	Nil	01(100%)	01(100%)

In our study, all cases (100%) of AC polyp and DNS were diagnosed by endoscopy, followed by sinusitis 6 (75%) out of 8 cases, 3 haemangiomas 2 (66.66%) out of 3 cases and ethmoidal polyp 3(33.34%) out of 9 cases. Significant statistical co-relation was seen to diagnose polyps by endoscopy ($p < 0.01$). No case of mucosal thickening and Generalized was diagnosed by endoscopy.

Table 4: Comparative study between nasal endoscopy and CT PNS

Pathology	Diagnosed by endoscopy	Total (%)	Diagnosed by CT Scan	Total (%)
Polyp	22	78.57%	28	100.0%
DNS	08	100.0%	08	100.0%
Sinusitis	06	75.0%	08	100.0%
Haemangiomas mass	02	66.66%	03	100.0%
Mucosal thickening	00	Nil	02	100.0%
Generalized	00	Nil	01	100.0%

In the present study, all the pathologies (100%) causing obstruction can be diagnosed radiologically (C.T. Scan). Only cases of mucosal thickening and generalized causes of nasal obstruction were not diagnosed with the help of endoscopy. So in the present study by comparing the findings of DNE and CT PNS no significant statistically correlation seen between them i.e. $p > 0.05$. Which shows there is close association between the findings of endoscopy and CT scan.

DISCUSSION

In our study, all cases (100%) of AC polyp and DNS were diagnosed by endoscopy, followed by sinusitis 6 (75%) out of 8 cases, haemangiomas mass 2 (66.66%) out of 3 cases and ethmoidal polyp 3(33.34%) out of 9 cases. No case of mucosal thickening and Generalized was diagnosed by endoscopy. Out of 9 cases of ethmoidal polyp 3 (33.34%) out of 9 cases got diagnosed with help of endoscopy. Out of 8 cases of sinusitis, 6 (75%) were diagnosed by endoscopy. Out of 3 cases of haemangiomas mass 2 got diagnosed with nasal endoscopy i.e. 66.6%. No case of mucosal thickening and Generalized was diagnosed by endoscopy (Table 9). Significant statistical co-relation was seen to diagnose polyps by endoscopy ($p < 0.01$). In the present study, all the pathologies (100%) causing obstruction can be diagnosed radiologically (C.T. Scan) (Table 10). Only cases of mucosal thickening and generalized causes of nasal obstruction were not diagnosed with the help of endoscopy. So in the present study by comparing the

findings of DNE and CT PNS no significant statistically correlation seen between them i.e. $p > 0.05$. Which shows there is close association between the findings of endoscopy and CT scan. Only the cases of haemangiomas mass i.e. 75% and mucosal thickening of sinuses i.e. 100% and generalized case of nasal obstruction were not diagnosed with the help of endoscopy, but in almost all the cases all the endoscopic findings of chronic nasal obstruction correlates with CT PNS. The association between diagnostic nasal endoscopy and CT scan PNS was calculated using Chi square test. Since $P > 0.05$ indicates there is no association between diagnostic nasal endoscopy and CT scan PNS findings in diagnosing the patients of chronic nasal obstruction. In fact parameters like septal bony spur, hidden anatomical areas like the inaccessible areas and niches of fronto-ethmoidal complex, sphenoidal recess and sphenoid sinuses can be assessed more precisely with the help of DNE. Out of 50 only 1 case was diagnosed as generalized cases of nasal obstruction on CT PNS. In study by Priyanjal Gautam¹⁰ *et al* Abstract among the parameters that were correlated, CT scan PNS was found to be most sensitive investigation for middle meatus 89.28%, frontal recess 88%, middle turbinate 87%, hiatus semilunaris 86.66% and both sphenoidal recess and bulla ethmoidalis 80% respectively. The specificity of CT scan PNS for middle meatus was 90.90%, hiatus semilunaris 90%, sphenoidal recess 89%, both bulla ethmoidalis and middle turbinate 84% and frontal recess 80% respectively. In the study by

by Priyanjal Gautam¹⁰ *et al* the association between diagnostic nasal endoscopy and CT scan PNS was calculated using Chi square test. Since $P=1E-11 < 0.05$ indicates there is a high association between diagnostic nasal endoscopy and CT scan PNS. In the study by Pokharel M *et al*¹¹, It has been recently recommended that either a CT scan or endoscopic evaluation of nose (preferably with photo or video documentation) should be a part of any prospective clinical trial, as it provides the majority of objective data used to diagnose CRS. Stankiewicz¹² *et al* reported that nasal endoscopy had a sensitivity of 46%, specificity 86%, positive predictive value 74%, and negative predictive value of 64% and showed that there was poor correlation between nasal endoscopy and sinus CT. In a study by Rafael José Geminiani *et al*¹³. Eight patients (23%) presented positive results on endoscopic analysis and on CT scan. Four of them (11.4%) presented positive results on endoscopy exam but negative ones on CT. Twelve patients (34.4%) presented positive endoscopic results and 23 (65.6%) presented negative ones. Ten patients (28.5%) presented CT positive results and negative endoscopic ones. Thirteen patients (37.1%), presented negative results for both CT and endoscopy exam. In the study by Nitin V *et al*, Chronic Rhinosinusitis (CRS) according to recommendation of Task Force on rhinosinusitis.^{6,14,15} Nasal endoscopy could diagnose Chronic rhinosinusitis in 70 (57.37%) patients and CT scan diagnosed it in 80 (65.57%) patients. Kappa coefficient is 0.828 indicating good agreement between the two in diagnosing chronic rhinosinusitis with good correlation (82.8%). Menas in our study almost all the cases are getting diagnosed with the help of endoscopy as well by CT PNS and their respective findings got correlated with each other. However, in the present study, we observed statistically significant correlation between radiological score and endoscopy score. This is a finding supported by other studies and also correlates with the above studies.

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