

TO STUDY THE ANATOMICAL VARIATIONS IN PATIENTS OF NASAL OBSTRUCTION ON ANTERIOR RHINOSCOPY AND NASAL ENDOSCOPY

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Abstract

Background: Nasal obstruction is one of the most frequent symptoms encountered in primary care and specialist clinics. Deviated nasal septum is the major cause of nasal obstruction. Other pathologies in the nose and paranasal sinuses responsible for nasal obstruction are HIT, CB, CRS, nasal polyps, mucocele, mucous retention cyst in the paranasal sinus, tumors and adenoid hypertrophy. The routine anterior and posterior rhinoscopy gives very little information regarding causes of nasal obstruction as we can see only the structures which lie directly in the line of sight. Nasal endoscopy allows a thorough evaluation of intranasal anatomy and identification of pathology that is impossible to see using standard techniques of anterior rhinoscopy and headlight with head mirror. **Objectives:** To evaluate the diagnostic efficacy of nasal endoscopy in patients of nasal obstruction. To correlate the findings of anterior rhinoscopy with that of diagnostic nasal endoscopy in patients of nasal obstruction. **Materials and Methods:** A hospital based cross-sectional study was conducted over 105 patient having nasal obstruction and associated sinonasal complaint. Detailed clinical examination was performed including general systemic examination and thorough examination of ENT with special emphasis on examination of nose which included anterior rhinoscopy, posterior rhinoscopy, nasal patency test and then patient was taken up for diagnostic nasal endoscopy. **Results:** The age range of our study was 10-60 years and maximum patients were in the age group of 31-40 years, males were more commonly affected, 79 patients had unilateral nasal obstruction. Most common associated presented complaint was sneezing. The anatomic variation in our study in descending order was Deviated nasal septum (most common), paradoxical middle turbinate, bullous middle turbinate, accessory maxillary ostium followed by medially bent uncinat process. When findings of anterior rhinoscopy and nasal endoscopy were compared it was observed that most of the anatomic variations of nose other than deviated nasal septum such as paradoxical middle turbinate, bullous middle turbinate, accessory maxillary ostium medially bent uncinat process could not be visualized on anterior rhinoscopy. **Conclusion:** Diagnostic nasal endoscopy should be recommended as a routine procedure in patients of nasal obstruction to arrive at an early and definitive diagnosis in the proper care management of patients with nasal obstruction and to keep pace with advancement in medical technology.

INTRODUCTION

Nasal obstruction is one of the most frequent symptoms encountered in primary care and specialist clinics. Deviated nasal septum is the major cause of nasal obstruction. Other pathologies in the nose and paranasal sinuses responsible for nasal obstruction are HIT, CB, CRS, nasal polyps,

mucocele, mucous retention cyst in the paranasal sinus, tumors and adenoid hypertrophy. Although individual tolerance to nasal obstruction varies from person to person, it is thought to be one of the most distressing symptoms. The obstruction may be unilateral or it can be bilateral or is intermittent, progressive, or persistent.^[1] The nasal patency test, anterior rhinoscopy and posterior rhinoscopy are

usual diagnostic clinical methods for nasal obstruction.

The routine anterior and posterior rhinoscopy gives very little information regarding causes of nasal obstruction as we can see only the structures which lie directly in the line of sight and moreover the posterior rhinoscopy may not be possible in all patients.^[2]

Nasal endoscopy allows a thorough evaluation of intranasal anatomy and identification of pathology that is impossible to see using standard techniques of anterior rhinoscopy and headlight with head mirror.

Nasal endoscopy is mentioned as a standard test to precisely assess nasal obstructive disease and it is considered necessary in all patients with nasal obstruction.^[3] Study was conducted to evaluate the diagnostic value of nasal endoscopy and to correlate routine clinical examination with that of diagnostic nasal endoscopy in patients of nasal obstruction.

Aims and Objective

To evaluate the diagnostic efficacy of nasal endoscopy in patients of nasal obstruction

To correlate the findings of anterior rhinoscopy with that of diagnostic nasal Endoscopy in patients of nasal obstruction.

MATERIALS AND METHODS

A hospital based cross-sectional study was conducted over patient complaint of nasal obstruction and associated complaint in the outpatient Department of ENT in Chhatrapati Shivaji Subharti Hospital, Meerut during the study period of 1 year. A total of 105 patients were taken into the study.

Inclusion Criteria

Patients with complaint of nasal obstruction and associated sinonasal complaint between the age range of 10-60 years

Exclusion Criteria

Patients less than age of 10 years and more than 60 years

Patient with acute inflammatory conditions like acute rhinitis, frunculosis and vestibulitis were not included.

All the candidates were subjected to a detailed history taking with special emphasis on onset, duration and course of nasal obstruction. An enquiry was made into any associated symptoms like nasal discharge, epistaxis, post nasal drip and headache. Detailed clinical examination was performed including general systemic examination and thorough examination of ENT with special emphasis on examination of nose which included anterior rhinoscopy, posterior rhinoscopy, nasal patency test and then patient was taken up for diagnostic nasal endoscopy.

RESULTS

The age range in the study was 10-60 year. Out of total 105 patients, majority 39 (37.1%) patients and least 3 (2.8%) patients were from 51-60 age group.

Out of total 105 students, 63 (60.0%) patients were male, and 42 (40.0%) patients were female.

In this study out of total 105 patients, 79 (75.2%) patients had Unilateral Nasal Obstruction, and 26 (24.8%) patients had bilateral Nasal Obstruction.

Out of total 105 patients, majority 61 (58.1%) patients had symptoms over 6- 12 months, 24 (22.8%) patients had duration of symptoms over 3-6 months, 11 (10.5%) patients had symptoms over 1-2 years, 5 (4.8%) patients had symptoms over 2-5 years and 4 (3.8%) patients had symptoms over 0-3 months.

5. The most common associated complaint was sneezing, out of total 105 patients, 31 (63.2%) patients had sneezing, 7 (14.3%) patients had nasal discharge, 5 (10.2%) patients had headache, 4 (8.2%) patients had PND, and 2 (4.1%) patients had epistaxis

6. In this study On Anterior rhinoscopy showed 76 patients had deviated nasal septum in which majority 47 (61.8%) had c-shaped septum, 51 patients had inferior turbinate hypertrophy, majority 21 (41.2%) patients showed bilateral inferior turbinate hypertrophy, 10 patients had Middle Turbinate hypertrophy, majority 5 (50.0%) patients showed Middle Turbinate hypertrophy in left, 1 patient had bilateral nasal polyp, 2 patients had synechia and that too on left side, 1 patient had nasal mass (other than polyp) on left side.

7. On nasal endoscopy out of 105 patients 96 patients had deviated nasal septum in which majority 51 (53.1%) had c-shaped septum, 53 patients had Inferior Turbinate Hypertrophy, majority 22 (41.5%) patients had bilateral Inferior Turbinate Hypertrophy, 23 patients had middle turbinate hypertrophy, majority 11 (47.8%) patients had middle turbinate hypertrophy in left side, 17 patients had Paradoxical middle turbinate hypertrophy, 13 patients had Bullous Middle Turbinate, majority 7 (53.8%) patients had Bullous Middle Turbinate in left side, 3 patients had Mucopus in Middle Meatus, 2 patients had Medially Bent Uncinate Process and both had it in right side, 7 patients had Accessory Maxillary Ostium, 2 patients had polyp, 1 (50.0%) had polyp in right and 1 (50.0%) had bilateral polyp, 9 patients had Adenoids Hypertrophy, 1 patient had Nasal Masses (Other Than Polyps) and that too in right

8. The anatomic variation in our study in descending order was Deviated nasal septum (most common), paradoxical middle turbinate, bullous middle turbinate accessory maxillary ostium followed by medially bent uncinat process

9. In our study when findings of anterior rhinoscopy and nasal endoscopy were compared it was

observed that most of the anatomic variations of nose other than deviated nasal septum such as paradoxical middle turbinate ,bullous middle turbinate,accessory maxillary ostium medially bent

uncinate process could not be visualized on anterior rhinoscopy.

Table 1: Age Wise Distribution

Age (in years)	No. of Patients (n=105)	Percentage (%)
10-20	09	8.6
21-30	32	30.5
31-40	39	37.1
41-50	22	21.0
51-60	03	2.8

Table 2: Duration of Symptoms

Duration	No. of Patients (n=105)	Percentage (%)
0-3 months	04	3.8
3-6 months	24	22.8
6-12 months	61	58.1
1-2 years	11	10.5
2-5 years	05	4.8

Table 3: Findings On Anterior Rhinoscopy

Findings		No. of Patients (n=105)	Percentage (%)
Deviated Nasal Septum	Anterior dislocation	13	17.1
	Posterior dislocation	00	0.0
	c-shaped septum	47	61.8
	s-shaped septum	07	9.2
	Spur	09	11.9
	Total	76	100
Inferior Turbinate Hypertrophy	Right	13	25.5
	Left	17	33.3
	Bilateral	21	41.2
	Total	51	100
Middle Turbinate Hypertrophy	Right	03	30.0
	Left	05	50.0
	Bilateral	02	20.0
	Total	10	100
Polyp	Right	00	0.0
	Left	00	0.0
	Bilateral	01	100
	Total	01	100
Synechia	Right	00	0.0
	Left	02	100
	Bilateral	00	0.0

Table 4: Findings On Nasal Endoscopy

Findings		No. Of Patients (N=105)	Percentage (%)
Deviated Nasal Septum	Anterior Dislocation	13	13.6
	Posterior Dislocation	09	9.3
	C-Shaped Septum	51	53.1
	S-Shaped Septum	11	11.4
	Spur	12	12.6
	Total	96	100
Inferior Turbinate Hypertrophy	Right	14	26.4
	Left	17	32.1
	Bilateral	22	41.5
	Total	53	100
Middle Turbinate Hypertrophy	Right	07	30.4
	Left	11	47.8
	Bilateral	05	21.7
	Total	23	100
Paradoxical Middle Turbinate	Right	08	47.1
	Left	09	52.9
	Bilateral	00	0.0
	Total	17	100
Bullous Middle Turbinate	Right	06	46.2
	Left	07	53.8
	Bilateral	00	0.0
	Total	13	100
Mucopus In Middle Meatus	Right	00	0.0
	Left	02	66.7
	Bilateral	01	33.3

	Total	03	100
Medially Bent Uncinate Process	Right	02	100
	Left	00	0.0
	Bilateral	00	0.0
	Total	02	100
Accessory Maxillary Ostium	Right	07	100.0
	Left	00	0.0
	Bilateral	00	0.0
	Total	07	100
Polyp	Right	01	50
	Left	00	0.0
	Bilateral	01	50
	Total	02	100
Synechia	Right	04	44.4
	Left	05	55.6
	Bilateral	00	0.0
	Total	09	100
Nasal Masses (Other Than Polyps)	Right	01	100
	Left	00	0.0
	Bilateral	00	0.0
	Total	01	100
Adenoid Hypertrophy	Total	09	100

Findings		No. Of Patients (N=105)	Percentage (%)
Deviated Nasal Septum	Anterior Dislocation	13	13.6
	Posterior Dislocation	09	9.3
	C-Shaped Septum	51	53.1
	S-Shaped Septum	11	11.4
	Spur	12	12.6
	Total	96	100
Inferior Turbinate Hypertrophy	Right	14	26.4
	Left	17	32.1
	Bilateral	22	41.5
	Total	53	100
Middle Turbinate Hypertrophy	Right	07	30.4
	Left	11	47.8
	Bilateral	05	21.7
	Total	23	100
Paradoxical Middle Turbinate	Right	08	47.1
	Left	09	52.9
	Bilateral	00	0.0
	Total	17	100
Bullous Middle Turbinate	Right	06	46.2
	Left	07	53.8
	Bilateral	00	0.0
	Total	13	100
Mucopus In Middle Meatus	Right	00	0.0
	Left	02	66.7
	Bilateral	01	33.3

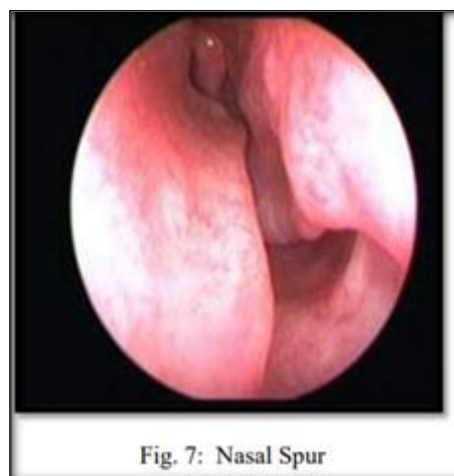
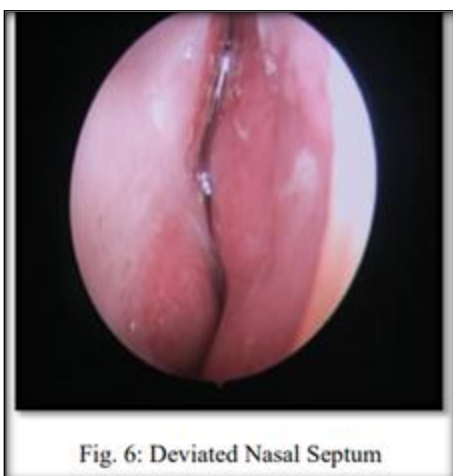




Fig. 8: Paradoxical Middle Turbinate

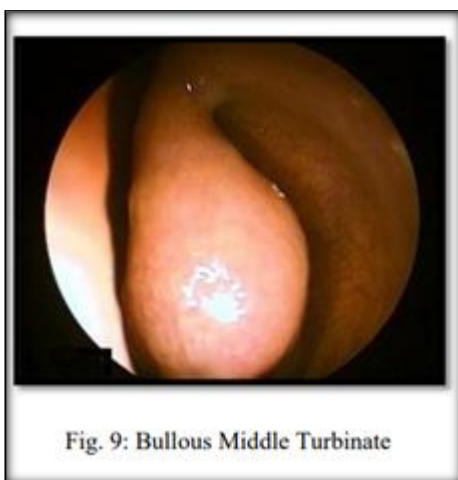


Fig. 9: Bullous Middle Turbinate

DISCUSSION

Nasal endoscopy allows a detailed examination of the nasal and sinus cavities not possible by standard examination such as anterior rhinoscopy using headlight or head mirror⁴³. Nasal Endoscopy is a minimally invasive, diagnostic medical procedure and currently the most preferred initial method of evaluating medical problems affecting nose and sinuses such as nasal stuffiness and obstruction, sinusitis, nasal polyposis, nasal tumors, epistaxis, recurrent bouts of sneezing and rhinorrhea. The present study was conducted to evaluate and correlate the anatomical variations in patients with nasal obstruction on Anterior rhinoscopy and Nasal endoscopy.

In this study, it was observed that out of total 105 patients, majority 39 (37.1%) patients were from 31-40 age group and least 3 (2.8%) patients were from 51-60 age group. Male dominance was observed in this study i.e. 63 (60.0%) patients were male, and 42 (40.0%) patients were female. K Maru Y et al³ in their retrospective and prospective study reported group 21-30 (31%), group 10-20 (26%), with least in group above 50 (8.5%), they observed female dominance.

Classification under nasal obstruction was 79 (75.2%) patients had Unilateral Nasal Obstruction,

and 26 (24.8%) patients had bilateral Nasal Obstruction, majority 61 (58.1%) patients had symptoms over 6-12 months. The present study recorded presence of sneezing 31 (63.2%), 7 (14.3%) patients had nasal discharge, 5 (10.2%) patients had headache, 4 (8.2%) patients had PND, and 2 (4.1%) patients had epistaxis, Kamal et al.^[4] reported presence of nasal discharge in 76 (50.66%) cases, deviated nasal septum in 50 (37.53%) cases, turbinate hypertrophy in 30 (20%) cases, nasal polyp in 28 (18.66%) cases, nasal mass in 2 (01.33%) and crusting in 2 (01.33%) cases.

During rhinoscopic evaluation c-shaped septum was most prominent findings of present study (71%) followed by Anterior dislocation (17.1%) & Spur (11.9%) under deviated nasal septum. Nasal Endoscopy findings showed 96 patients had deviated nasal septum in which majority 51 (53.1%) had c-shaped septum, 53 patients had Inferior Turbinate Hypertrophy, majority 22 (41.5%) patients had bilateral Inferior Turbinate Hypertrophy. 23 patients had middle turbinate hypertrophy, majority 11 (47.8%) patients had middle turbinate hypertrophy in left side, 17 patients had paradoxical middle turbinate, 13 patients had bullous middle turbinate, majority 07 (53.8%) had bullous middle turbinate in left side, 2 patients had medially bent uncinat process and that to in right side, 7 patients had accessory maxillary ostium, 9 patients had adenoid hypertrophy and total 9 patients had synechia, majority in left side (55.6%). Findings of both diagnostic modalities were compared eventually and observed that Anterior Dislocation, Posterior Dislocation C-Shaped Septum, S-shaped septum and spur showed statistically significant correlation. Kaluskar & Paul⁵ reported common abnormal endoscopic findings which were concha bullosa, paradoxical middle turbinate, polyps, discharge, uncinat process, bulla ethmoidalis, agar nasi cells and septal spur. Levine & Cleveland^[6] stated their findings middle meatus polyps in 23 cases, discharge in 12 cases, polyps and discharge in 20 cases and web-like synechia in 3 cases. Eight of the patients in this group had concha bullosa and nineteen patients had accessory ostia.

In this study, comparison between Anterior Rhinoscopy and Nasal Endoscopy Findings of DNS were recorded and it was observed that Anterior Dislocation, Posterior Dislocation C-Shaped Septum, S-shaped septum and spur showed statistically significant correlation. Middle Turbinate Hypertrophy, Paradoxical middle turbinate, Accessory maxillary ostia, bullous middle turbinate and adenoid hypertrophy showed statistically significant correlation. We also observed that POLYP, SYNECHIAE, MUCOPUS In Middle showed and Nasal Mass Other Than Polyp, inferior turbinate hypertrophy and medially bent uncinat process showed statistically non-significant correlation. Duarte AF et al⁶¹ reported turbinate hypertrophy by endoscopy. Lawrason et al.^[7] had identified nasal

pathology in almost 40% Of patients who had normal examination on anterior rhinoscopy. Chakraborty P et al⁶³ studied the anatomic variations of the nose in rhinosinusitis and found that the most common anatomic variation was deviated nasal septum with 92.68%. Varma BRV et al⁶⁴ stated 34.6% of patients with polyps Sinonasal polyposis (27.7%), Antrochoanal polyps (55.5%), Allergic fungal polyposis (15.6%). Tegnoor MS et al.⁶⁸ reported middle meatal purulent secretions are the most obvious finding in DNE evaluation.

CONCLUSION

From this study it was concluded

1. The most common anatomical variation of nose which could be detected on anterior rhinoscopy was deviated nasal septum and most common pathological variation was inferior turbinate hypertrophy
2. The anatomical variations of nose which could be detected by diagnostic nasal endoscopy were deviated nasal septum, bullous middle turbinate, paradoxical middle turbinate, accessory maxillary ostium and medially bent uncinate process
3. The Pathological variations of nose which could be seen by diagnostic nasal endoscopy were inferior and middle turbinate hypertrophy, mucopus in middle meatus, nasal polyps, adenoid hypertrophy and nasal masses other than polyp.
4. In the study when findings of anterior rhinoscopy and diagnostic nasal endoscopy were correlated it was concluded that DNE is better technique to detect various anatomical as well as pathological variation of nose in patients of nasal obstruction which are otherwise inaccessible on anterior rhinoscopy especially in the key area comprising the ostiomeatal complex. Also being easily available and cost effective, patients can be spared from unnecessary cost and radiation exposure by performing diagnostic nasal endoscopy prior to CT scan. Endoscopic images can also be captured and recorded for documentation. Hence Diagnostic nasal endoscopy should be recommended as a routine procedure in patients of nasal obstruction to arrive at an early and definitive diagnosis in the proper care management of patients with nasal obstruction and to keep pace with advancement in medical technology.

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