

# Preoperative Evaluation With Anterior Rhinoscopy And Diagnostic Nasal Endoscopy In Patients With Symptomatic Deviated Nasal Septum In North Indian Population.

## Authors

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## ABSTRACT:

**Background:** Symptomatic deviated nasal septum is one of the most common diagnosis in otolaryngology. Nasal obstruction is most common presentation of the symptomatic DNS. Diagnosis can be made reliably through patient symptoms and examination. The diagnostic accuracy can be increased greatly by anterior rhinoscopy and diagnostic nasal endoscopy (DNE) **Aim:** To evaluate Anterior Rhinoscopy and Diagnostic Nasal Endoscopy findings in patients with symptomatic Deviated Nasal Septum (DNS). **Methods:** A profile of 120 Patients with chief complaints of nasal obstruction and findings of deviated nasal septum with or without inferior turbinate hypertrophy on anterior rhinoscopy attending the department of Otorhinolaryngology and Head and Neck Surgery, Government Medical College Srinagar, over a period of 18 months were included after fulfilling the inclusion criteria in this study. **Results:** In this study, 120 patients were enrolled, majority of the patients (~80%) were young <30 years old. Most common presentation was nasal obstruction in 120(100%) patients. On examination C shaped DNS was seen in 93 (77.5%) patients followed by S shaped DNS in 17 (14.2%) patients and C/S shaped DNS with spur was noted in 10 (8.3%) patients, among 120 patients, 22 (18.3%) had hypertrophied inferior turbinate on anterior rhinoscopy. On DNE Most common type of DNS (Mladina classification) was type 2 in 52 (43.3%) patients, followed by type 3 in 35 (29.2%) patients, type 4 in 18 (15.0%) patients, type 5 in 6 (5.0%) patients, type 1 in 5 (4.2%) patients and type 6 in 4 (3.3%) patients. 10 (8.3%) had bullous middle turbinate. Middle meatus discharge was seen in 10 (8.3%) patients. Sphenoethmoidal recess secretions were seen in 1(0.8%) patient. Paradoxical middle turbinate and accessory ostia were seen in 12 (10%) patients and 2 (1.7%) patients respectively. **Conclusion:** Preoperative evaluation with anterior rhinoscopy and diagnostic nasal endoscopy is adequate in most of the cases of symptomatic DNS. It is particularly important in developing countries where CT scans are not readily available and that x ray exposure can be avoided by a thorough clinical examination.

**Keywords:** Nasal Obstruction, Deviated Nasal Septum, Anterior Rhinoscopy, Diagnostic Nasal Endoscopy

**Introduction:**

Nasal obstruction is a highly prevalent problem that can negatively affect quality of life. One of the common causes of nasal obstruction is a deviated nasal septum<sup>1</sup>.

Anterior rhinoscopy, using a head lamp and nasal speculum, allows assessment of the nasal septum and inferior turbinates. Anterior septal deviations and bony spurs are evident<sup>2</sup>. An anterior rhinoscopy (AR) which is often the first diagnostic procedure in the evaluation of obstructive nasal pathologies is often adequate in the assessment anterior part of nasal cavity. It provides valuable information about the nasal valve area which is most common site of obstruction in symptomatic DNS<sup>3</sup>.

Nasal endoscopy using rigid endoscopes allows thorough examination of even the most posterior portions of the nasal cavity. The septum, inferior turbinate, and eustachian tube orifices in the nasopharynx may be seen in this way<sup>4</sup>. Diagnostic nasal endoscopy is also used for the diagnosis and grading of nasal septal deviation and turbinate hypertrophies<sup>5</sup>. However nasal endoscopy becomes very challenging in the patients with impacted nasal septum. In these patients nasal endoscopy can be done after correction of deviations to look for any additional pathology<sup>6</sup>.

**Methods:**

**Study Design:** Cross-sectional, observational study

**Conflict of interest:** None

**Funding:** None

This study entitled “**Preoperative Evaluation with anterior rhinoscopy and diagnostic nasal endoscopy in Patients with Symptomatic Deviated Nasal Septum**” was conducted in the Postgraduate Department of Otorhinolaryngology and Head and Neck Surgery, Government Medical College Srinagar, over a period of 18 months. All patients attending the department were included after fulfilling the inclusion criteria.

**Inclusion criteria:**

- Patient with chief/predominant complaint of nasal obstruction diagnosed with Deviated Nasal Septum with or without inferior turbinate hypertrophy on anterior rhinoscopy.
- Patient 17 years of age and above.

**Exclusion criteria:**

- All patients with nasal polyps on anterior rhinoscopy or nasal endoscopy.
- Previous nasal surgery.
- Patients with sinonasal tumors.
- Acute rhinosinusitis.

## METHODOLOGY

All patients who meet the inclusion criteria were enrolled for this study. Written informed consent was taken from all the patients. Detailed history was taken included history about the symptoms, their duration, age, gender, history of previous nasal surgery were recorded. A complete nasal examination by inspection and palpation of external nose and assessment of nasal cavity of every patient was done by anterior rhinoscopy. Patients with chief complaints of nasal obstruction and findings of deviated nasal septum with or without inferior turbinate hypertrophy on anterior rhinoscopy were included in the study. These patients underwent nasal endoscopic examination by a 0 degree 4mm/2.7mm rigid endoscope. Patients having nasal polyps or sinonasal tumors on endoscopy were excluded. Rest of the patients was advised septoplasty with or without inferior turbinate surgery based on the clinical examination after taking proper consent.

Different endoscopic findings were noted (as per proforma).

Classification of Deviated Nasal Septum (DNS) was used in this study.

Mladina Classification (1987)<sup>7</sup>

Type 1: Midline septum or Mild deviation.

Type 2: Anterior vertical, C-Shaped.

Type 3: Posterior vertical, C-Shaped.

Type 4: S- shaped deviation.

Type 5: Horizontal spur.

Type 6: Horizontal spur with deep groove on the concave side.

Type 7: Combination.

Inferior Turbinate Classification system was used preoperatively for grading the amount of airway space that the anterior aspect of the inferior turbinate occupies relative to the total available airway space and were categorized as follows<sup>8</sup>:

- Grade 1: 0-25% of total airway space
- Grade 2: 26-50% of total airway space
- Grade 3: 51-75% of total airway space
- Grade 4: 76-100% of total airway space

Turbinate surgery was not done in patients with Grade I turbinate hypertrophy.

## STATISTICAL ANALYSIS

Data was entered in a Microsoft Excel spreadsheet. Categorical variables were summarized as frequency and percentage. Anterior rhinoscopy, diagnostic endoscopic findings and intra-operative findings were compared using McNemar chi-square test for each parameter

of interest. Two-tailed p-values were reported and a p-value < 0.05 was considered statistically significant. Statistical analysis was done using STATA version 15.

**Conflict of interest: Nil**

**Funding: Nil**

### Results:

Maximum number of patients 66 (55%) were seen in age group 20-29 followed by 31 (25.8%) in age group <20, 15 (12.5%) in age group 30-39, 6 (5%) in age group 40-49 and the lowest percentage in those above 50. The mean age in our study was  $24.7 \pm 7.32$  years with a range of 17-52 years [Table 1].

**Table 1: Age distribution of study patients**

Age (years)	No. of patients	Percentage
< 20	31	25.8
20-29	66	55.0
30-39	15	12.5
40-49	6	5.0
≥ 50	2	1.7
<b>Total</b>	<b>120</b>	<b>100</b>
<b>Mean±SD (Range)=24.7±7.32 (17-52)</b>		

Nasal obstruction was the most common presenting symptom recorded in all 120 (100%) patients. The second most common presenting symptom was headache in 93 (77.5%) patients followed by snoring in 39 (32.5%) patients and sneezing in 37 (30.8%) patients. Nasal discharge was complained by 20 (16.6%) patients, nasal bleeding by 19 (15.8%) patients and postnasal drip by 15 (12.5%) patients [Table 2].

**Table 2: Various symptoms at presentation in study patients**

Symptoms	No. of patients	Percentage
<b>Nasal obstruction</b>	<b>120</b>	<b>100.0</b>
<b>Headache</b>	<b>93</b>	<b>77.5</b>
<b>Snoring</b>	<b>39</b>	<b>32.5</b>
<b>Sneezing</b>	<b>37</b>	<b>30.8</b>
<b>Nasal Discharge</b>	<b>20</b>	<b>16.6</b>
<b>Nasal bleeding</b>	<b>19</b>	<b>15.8</b>
<b>Postnasal Drip</b>	<b>15</b>	<b>12.5</b>

On anterior rhinoscopy, C shaped DNS was seen in 93 (77.5%) patients followed by S shaped DNS in 17 (14.2%) patients and C/S shaped DNS with spur was noted in 10 (8.3%) patients. Among 120 patients, 22 (18.3%) had hypertrophied inferior turbinate. It was hypertrophied on right side in 14 (11.7%) patients and on left side in 8 (6.7%) patients [Table 3].

**Table 3: Findings on anterior rhinoscopy in study patients**

Anterior Rhinoscopy Findings		No. of patients	Percentage
DNS	C-Shaped	93	77.5
	S-Shaped	17	14.2

	<b>C/S shaped DNS with Spur</b>	<b>10</b>	<b>8.3</b>
<b>Hypertrophied inferior turbinate</b>	<b>Right</b>	<b>14</b>	<b>11.7</b>
	<b>Left</b>	<b>8</b>	<b>6.7</b>

Diagnostic nasal endoscopy findings shows, most common type of DNS (Mladina classification) was type 2 in 52 (43.3%) patients, followed by type 3 in 35 (29.2%) patients, type 4 in 18 (15.0%) patients, type 5 in 6 (5.0%) patients, type 1 in 5 (4.2%) patients and type 6 in 4 (3.3%) patients [table 4].

Table 4: Diagnostic nasal endoscopy findings in study patients

Type of DNS (Mladina)	Frequency	Percentage
Type 1	5	4.2
Type 2	52	43.3
Type 3	35	29.2
Type 4	18	15
Type 5	6	5.0
Type 6	4	3.3
Type 7	0	0
<b>Total</b>	<b>120</b>	<b>100</b>

DNS = Deviated nasal septum

In this study grading of inferior turbinate hypertrophy was done on DNE. On right side, grade 1 was seen in 103 (85.8%) patients, grade 2 in 12 (10%) patients, grade in 3 (2.5%) and grade 4 in 2 (1.7%) and on left side grade 1 was seen in 110 (91.7%) patients, grade 2 was seen in 7 (5.8%) patients, grade 3 in 1 (0.8%) patient and grade 4 in 2 (1.7%) patients(Fig 1)

Table 5. DNE Findings (other findings)

variables	No. of Patients	Percentage*
Bulbous middle turbinate (n=10)	Right	5
	Left	4
	Bilateral	1
Middle meatus discharge / edematous (n=10)	Right	2
	Left	6
	Bilateral	2
Sphenoethmoidal recess discharge	Right	1
Paradoxical Middle Turbinate	12	10
Accessory ostia	2	1.7

\*%age was calculated out of total of 120 patients

In this study, on DNE, among 120 patients, 10 (8.3%) had bullous middle turbinate. It was bullous middle turbinate in 5 (4.2%) patients on right side, in 4 (3.3%) patients on left side, and

in 1 (0.8%) patient bilateral. Middle meatus discharge was seen in 2 (1.7%) patients on right, 6 (5.0%) patients on left, and 2 (1.7%) patients on bilateral. Sphenoethmoidal recess secretions was seen in 1(0.8%) patient on the right side. Paradoxical middle turbinate and accessory ostia were seen in 12 (10%) patients and 2 (1.7%) patients respectively.

### Discussion:

Deviated Nasal Septum (DNS) is a physical disorder of the nose, involving displacement of the nasal septum. Some displacement is common, affecting 80% of people, most unknowingly. The nasal septum is the bone and cartilage in the nose that separates the nasal cavity into the two nostrils. The normal nasal septum is straight, symmetrical and meets evenly arched palate in midline<sup>9,10</sup>.

In our study majority of patients i.e. 66 (55%) were in the age group of 20-29 years and least number of patients 2 (1.7%) aged >50 years. The mean age in our study was  $24.7 \pm 7.32$  years with a range of 17-52 years (Table 1). In a similar study, **Adeel M et al (2013)**<sup>11</sup> found a mean age of  $31.0 \pm 13.15$ . In another study conducted by **Kanwar SS et al (2017)**<sup>12</sup> majority of patients (33%) in their study were in the age group of 21-30 years. In a study done by **Moorthy PNS et al (2014)**<sup>13</sup> found majority of patients i.e. 45 (45%) were aged between 16-25 years, followed by 29 (29%) patients who belonged to 26-35 years age group.

In our study, nasal obstruction was the most common presenting symptom recorded in all 120 (100%) patients. The second most common presenting symptom was headache in 93 (77.5%) patients followed by snoring in 39 (32.5%) patients and sneezing in 37 (30.8%) patients. Nasal discharge was complained by 20 (16.6%) patients, nasal bleeding by 19 (15.8%) patients and postnasal drip by 15 (12.5%) patients. In a similar study done by **Etigada Y et al (2017)**<sup>14</sup> found nasal obstruction as the main symptom in 100% patients followed by headache in 86% patients, nasal discharge in 70% patients and postnasal drip in 60% patients, other presenting complaints were nasal bleeding in 26%, snoring in 23%, anosmia in 13% and sneezing in 10% patients. In a study done by **Verma J et al (2016)**<sup>15</sup> found nasal obstruction as the most common presenting symptom in 82% of patients, followed by nasal discharge in 66%, headache and allergic symptoms in 52%, epistaxis 10%. In a study done by **Gupta S et al (2016)**<sup>16</sup> found nasal obstruction in 126 (63.30%) of their patients followed by nasal discharge in 70 (35%) patients, headache in 66 (33.30%) patients.

On anterior rhinoscopy, C shaped DNS was seen in 93 (77.5%) patients followed by S shaped DNS in 17 (14.2%) patients and C/S shaped DNS with spur in 10 (8.3%) patients. In a similar study by **Moorthy PNS et al (2014)**<sup>17</sup> C-shaped DNS was observed in 90% of patients and S-shaped DNS was seen in 10% of patients.

In our study, 22 (18.33%) patients had hypertrophied inferior turbinate. In a similar study done by **Kishore K et al (2012)**<sup>18</sup> found hypertrophied inferior turbinate in 20% of patients. In a study conducted by **Venkatchalam VP et al (1999)**<sup>19</sup> inferior turbinate hypertrophy was seen in 10% patients.

On DNE, most common type of DNS (Mladina classification) was type 2 in 52 (43.33%) patients, followed by type 3 in 35 (29.16%) patients, type 4 in 18 (15.0%) patients, type 5 in 6 (5%) patients and type 1 in 5 (4.2%) patients and type 6 in 4 (3.3%) patients. None of the patients had type 7 in our study. In a study done by **Gupta S et al (2016)**<sup>16</sup> type 2 DNS was observed in 45% of patients followed by type 3 DNS in 20.50% of patients. In a similar study done by **Etigada Y et al (2017)**<sup>14</sup> found type 3 DNS in 8 (26.66%) patients, followed by type 2 in 7 (23.33%) patients, type 5 in 6 (20%) patients, type 4 in 4 (13.33%) patients. Type 6 DNS was seen in 3 (12%) patients with type 1 and type 7 in 1 (3.3%) patient each.

In this study grading of inferior turbinate hypertrophy was done on DNE and Grade 1 was seen in 103 (85.8%) patients on the right side and in 110 (91.7%) patients on the left side

(these patients were not candidates for turbinate surgery). Grade 2 inferior turbinate hypertrophy was seen in 12 (10%) patients on the right side and in 7 (5.8%) patients on the left side. Grade 3 was observed in 3 (2.5%) patients on the right side and in 1 (0.8%) patient on the left side. Grade 4 inferior turbinate hypertrophy was seen in 2 (1.7%) patients on both sides. Grade 2 and above hypertrophied inferior turbinate which required surgery for turbinate reduction was seen in 27 (22.5%) patients. In a similar study done by **Eylgor H et al (2018)**<sup>20</sup> found inferior turbinate hypertrophy in 25.1% patients. In a study done by **Chakraborty P et al (2016)**<sup>21</sup> observed inferior turbinate hypertrophy in 57.3% patients.

In our study, on diagnostic nasal endoscopy, 10 (8.3%) patients had bullous middle turbinate (Table 5). Bullous middle turbinate was present in Five (4.2%) patients on right side, in 4 (3.3%) patients on left side, and in 1 (0.8%) patient bilateral. In a similar study done by **Sayani RK (2016)**<sup>22</sup> found bullous middle turbinate in 7.6% of patients on DNE which is comparable to the findings of the present study. In a study conducted by **Kishore K et al (2012)**<sup>18</sup> observed bullous middle turbinate in 5.35% of patients on DNE.

In our study, on diagnostic nasal endoscopy, middle meatus discharge was seen in 10 (8.3%) patients, sphenoethmoidal recess secretions in 1 (0.8%) patient, paradoxical middle turbinate in 10 (8.3%) patients and accessory ostia were seen in 2 (1.7%) patients. In a study done by **Kishore K et al (2012)**<sup>18</sup> found middle meatus discharge and paradoxical middle turbinate in 10.7% of patients. In a study done by **Sood VP (1990)**<sup>23</sup> found middle meatus discharge in 4% of patients. In a similar study done by **Shelkar R et al (2014)**<sup>24</sup> found paradoxical middle turbinate in 7% of patients and accessory ostia in 1% patient.

The findings in our study were in accordance with the above mentioned studies.

## Conclusion:

From this study it is concluded that Preoperative evaluation with anterior rhinoscopy and diagnostic nasal endoscopy is adequate in most of the cases of symptomatic DNS. Addition of diagnostic nasal endoscopy in preoperative evaluation of symptomatic DNS is valuable. It is particularly important in developing countries where CT scans are not readily available and that X-ray exposure and cost involved can be avoided by a thorough clinical examination. NCCT nose and PNS is not usually required in patients if disease within the paranasal sinuses is not in question on history and examination in cases of symptomatic DNS.

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