

**An Observational Study Assessing the Association between Deviated Nasal Septum and External Nasal Deformity****Sonam Kumari<sup>1</sup>, Saurabh Yadav<sup>2</sup>, Kumari Jyoti Mani<sup>3</sup>, Satyendra Sharma<sup>4</sup>**<sup>1</sup>Senior Resident, Department of ENT, Nalanda Medical College and Hospital, Patna, Bihar, India<sup>2</sup>PG Student, Department of ENT, Nalanda Medical College and Hospital, Patna, Bihar, India<sup>3</sup>Senior Resident, Department of ENT, Nalanda Medical College and Hospital, Patna, Bihar, India<sup>4</sup>Professor, Department of ENT, Nalanda Medical College and Hospital, Patna, Bihar, India

Received: 12-09-2023 Revised: 16-10-2023 / Accepted: 25-11-2023

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Conflict of interest: Nil

**Abstract****Aim:** The aim of the present study is to correlate the association of nasal septal deviations with external nasal deformities.**Methods:** A total of 200 patients between age group of 18 to 50 years, attending the OPD of department of ENT for 2 years, were included in our study. Inclusion criteria for the study were patients with deviated nasal septum and external nasal deformity.**Results:** Out of 200, 106 patients had external nasal deformity with deviated nasal septum while 94 patients had deviated nasal septum without external nasal deformity. Mean age of patient was 26 years. Maximum number of patients was in the age group of 21-30 years (40%). Out of 200 patients, 140 were males and 60 were females. Nasal obstruction (75%) was the leading chief complaint followed by nasal discharge (45%), headache (18%), epistaxis (12%) and postnasal drip (5%). According to Mladina classification, most common type in our study was Type 4 nasal septal deviation. According to Yong Ju Jang classification, Type 1 was the most common type of external nasal deformity observed in our study. By sequential correlation of the type of septal deviation associated with each type of external nasal deformity, it was found that Type 1, 2 and 3 were not associated with any external nasal deformity. Type 4 septal deviation was associated more frequently with Type 1 external nasal deformity.**Conclusion:** According to our study, it can be concluded that there is a close correlation between nasal septal deviation and external nasal deformity. Both entities have to be analysed together so as to have a better functional and cosmetic outcome.**Keywords:** Nasal septal deviation, External nasal deformity, Mladina classification, Yong Ju Jang classificationThis is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Nasal obstruction is a common presenting symptom to both primary care physicians and otolaryngologists and may be caused by a wide range of anatomic, physiologic, and pathophysiologic factors. [1] Airflow resistance is essential during breathing for good pulmonary function. The anterior portion of the nasal cavities is the place of highest nasal resistance to airflow. [2] The sympathetic nervous system significantly affects nasal resistance due to its action on the erectile tissue (venous) of the inferior and middle turbinate, causing a difference in the engorgement of the capacitance vessels of the nasal mucosa [3] The internal nasal valve is a structure that regulates air or liquid flow within the human body. [4] The internal nasal valve is considered the narrowest part of nasal airway, and hence, has the greatest resistance flow.

Physiological studies demonstrate that this complex region significantly regulates both nasal airflow and nasal resistance. [5]

Collapse or obstruction of the internal nasal valve is mostly the cause of nasal airway obstruction. [2] This perplexing problem greatly inhibits normal nasal breathing through the narrowing of the external valve area and the nasal valve angle. [6] A caudal end deviation is a common diagnosis made by otolaryngologists but is one that is not usually based on objective measurements. As a result, there can be a significant inter-observer variability in terms of diagnosing the condition, verifying its precise location, quantifying the degree of deviation, and assessing its clinical impact on patients. This subjectivity can lead to unnecessary surgical

treatments, patient complications, and low patient satisfaction rates. [7] Septal deviations with or without external deformities can lead to symptoms ranging from nasal obstruction to nasal bleed. Apart from vital role of deviated nasal septum in perpetuating sino nasal infections, it can also negatively contribute to common maladies like headache and allergy.

While some authors consider the nasal septum as a figure representing the displacement of maxilla during growth and development, this suggestion has not been confirmed. [8] Deviation of the septum may take the form of a "C" or "S" or may look like a large spur. [9] Cottle classified the deviations of the septum into four different groups: subluxation, large spurs, caudal deflection and tension septum. [10] On the other hand, Guyuron's classification proposes 6 different forms: tilt, anteroposterior C, cephalocaudal C, anteroposterior S, cephalocaudal S and wide spurs. [11] Gray reported a prevalence of bilateral nasal septal deviation in 27% and unilateral in 31% from a series of 2380 infants. [12] Van der Veken showed that the prevalence of septal deviation in children increases from 16% to 72% in a linear fashion from 3 to 14 years of age. [13]

The aim of the present study is to correlate the association of nasal septal deviations with external nasal deformities.

### Materials and Methods

A total of 200 patients between age group of 18 to 50 years attending the OPD of department of ENT, Nalanda Medical College and Hospital, Patna, Bihar, India for 2 years, were included in our study. Inclusion criteria for the study were patients with deviated nasal septum and external nasal deformity. Patients with septal abscess, septal hematoma, septal perforation, sinonasal malignancy and granulomatous disease were excluded from our study. All patients with deviated nasal septum with or without external nasal deformity were examined clinically using anterior rhinoscopy and nasal endoscopy. In our study, we classified nasal septal deviations according to Mladina Classification<sup>14</sup> and classified external nasal deformity according to Yong Ju Jang classification.

### Results

**Table 1: Demographic details**

Age in years	N%
10-20 years	6 (3)
21-30 years	80 (40)
31-40 years	70 (35)
41-50 years	44 (22)
Gender	
Male	140 (70)
Female	60 (30)
Nasal deformity	
Deviated nasal septum with external nasal deformity	106 (53)
Deviated nasal septum without external nasal deformity	94 (47)

Out of 200, 106 patients had external nasal deformity with deviated nasal septum while 94 patients had external nasal deformity without deviated nasal septum. Mean age of patient was 26 years. Maximum number of patients was in the age group of 21-30 years (40%). Out of 200 patients, 140 were males and 60 were females.

**Table 2: Chief complaints**

Chief complaints	N%
Nasal obstruction	150 (75)
Nasal discharge	90 (45)
Headache	36 (18)
Epistaxis	24 (12)
Post nasal drip	10 (5)

Nasal obstruction (75%) was the leading chief complaint followed by nasal discharge (45%), headache (18%), epistaxis (12%) and postnasal drip (5%).

**Table 3: Type of nasal septal deviation according to Mladina classification**

Type of nasal septal deviation	N%
Type 1	24 (12)
Type 2	20 (10)
Type 3	10 (5)
Type 4	56 (28)
Type 5	42 (21)
Type 6	38 (19)
Type 7	10 (5)

According to Mladina classification, most common type in our study was Type 4 nasal septal deviation.

**Table 4: Type of external nasal deformity according to Yong Ju Jang classification**

Type of external nasal deformity	N%
No Deformity	94 (47)
Type 1	58 (29)
Type 2	16 (8)
Type 3	10 (5)
Type 4	14 (7)
Type 5	8 (4)

According to Yong Ju Jang classification, Type 1 was the most common type of external nasal deformity observed in our study.

**Table 5: Correlation of external nasal deformity with nasal septal deviation**

External deformity	Deviated nasal septum							Total
	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	
No Deformity	24	20	10	0	28	12	0	94
Type 1	0	0	0	40	7	4	7	58
Type 2	0	0	0	7	0	8	1	16
Type 3	0	0	0	0	0	10	0	10
Type 4	0	0	0	9	3	0	2	14
Type 5	0	0	0	2	4	2	0	8
<b>Total</b>	24	20	10	58	42	36	10	200

By sequential correlation of the type of septal deviation associated with each type of external nasal deformity, it was found that Type 1, 2 and 3 were not associated with any external nasal deformity. Type 4 septal deviation was associated more frequently with Type 1 external nasal deformity.

**Discussion**

Deviated nose deformities and deviated nasal septum has always been a surgical challenge, and it is essential to achieve both functional and aesthetic improvements. These terms encompasses all clinical conditions involving deviation of nasal pyramid from the midline of face. Nasal septal deviations play a critical role in nasal obstruction symptoms, aesthetic appearance of the nose, increased nasal resistance and sometimes snoring. The septal condition mostly controls the direction of deviation. Trauma creates the extrinsic forces that are exerted on septum, resulting in deviated nasal bones, upper lateral cartilages and connections with the vomer, ethmoid and maxillary crest. Intrinsic forces can be the result of imperfect growth of septal cartilage or from trauma altering the tissue ultrastructure, after which the deviated cartilaginous tissue has a tendency to revert to its initial position. Whenever

there is an external deformity of nose, its anatomical basis may be rooted in bony pyramid defect, cartilaginous framework defect, septal deformity or combination of these vectors. Septal deviations with or without external deformities can lead to symptoms ranging from nasal obstruction to nasal bleed. [15] There are various classification systems for deviated nasal septum. Nasal septal deviations can be described as developmental (C shaped or S shaped) or traumatic (irregular, angulated and sometimes dislocated). Nasal septal deviations can also be classified based on relationship of nasal septum to inferior turbinate- Degree 1: deviation did not reach inferior turbinate, Degree 2: deviation reached inferior turbinate and Degree 3: deviation reached lateral wall and compressed inferior turbinate. [16]

Out of 200, 106 patients had external nasal deformity with deviated nasal septum while 94 patients had deviated nasal septum without external nasal deformity. Mean age of patient was 26 years. Maximum number of patients was in the age group of 21-30 years (40%). Out of 200 patients, 140 were males and 60 were females. Nasal obstruction (75%) was the leading chief complaint followed by nasal discharge (45%), headache (18%), epistaxis (12%)

and postnasal drip (5%). According to Mladina classification, most common type in our study was Type 4 nasal septal deviation. According to Yong Ju Jang classification, Type 1 was the most common type of external nasal deformity observed in our study. Deviated or crooked septal cartilage is usually due to two causes; congenital disproportion with the cartilage being too long to its location or due to trauma sustained earlier in life. [17] The nose is the most commonly injured facial structure. [18] This should produce a higher incidence of past history of trauma. However, in many people with DNS there is no obvious history of trauma. [19] It is also difficult for people to remember injuries or small accidents that occurred early in life or in their childhood. 65% patients in our series gave a history of trauma. By sequential correlation of the type of septal deviation associated with each type of external nasal deformity, it was found that Type 1, 2 and 3 were not associated with any external nasal deformity. Type 4 septal deviation was associated more frequently with Type 1 external nasal deformity.

### Conclusion

Deviated nasal septum is a highly prevalent condition, with a mostly congenital etiology, seen commonly in the male population in their twenties. Majority of the patients presented with nasal obstruction and rhinitis. Most of the patients had 'S' shaped septum with an anterior deviation. According to our study, it can be concluded that there is a close correlation between nasal septal deviation and external nasal deformity. Both entities have to be analysed together so as to have a better functional and cosmetic outcomes. Future studies must be performed to arrive at a proper conclusion regarding the prevalence, modalities of investigations, clinical co-relations, and choice of surgery, postoperative evaluation and the development of a standard scoring system.

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