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Nasal Septal Deviation in Relation to External Nasal Deformities: An Observational Study

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Abstract

The nose is structurally complex and this complexity results in nasal shape variations. The study aimed to determine the nasal septal deviations occurrence in relation to external nasal deformities. A cross-sectional study was conducted in Department of Ear, Nose and Throat, in our hospital. All the individuals having septal deviation with external nasal deformity from November 2017 to November 2018. Those patients be evaluated by comprehensive clinical examination of ear, nose and throat. Patient's symptoms are rated with Sino-Nasal Test -22 questionnaire. Septal deformities were classified using Mladina classification modified. External nasal deformities were classified employing Yong Jo Jang's classification. Approximately, 43% were males and 57% were females. About 90% of patients aged from 21 years to 50 years. About 58% of patients were symptomatic while the rest 42% were without symptoms. On correlating the symptoms with the type of deviation it was found significantly association (P=0.05). Majority of individuals are in the middle age group. Type II and IV are the most common types of NSD whereas type I is a common END. Noteworthy finding of our study is patients had no deformity.

Keywords: Nasal Cavity; Nasal Endoscopy; Nasal Sepal Deviation; External Nasal Deformity; Sino-Nasal Symptoms

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Introduction

One of the most fragile organs in our body is the nose. The outer nose serves the cosmetic purpose by improving an individual's personality and attractiveness [1].

The nose is the primary mammalian breathing route and serves important functions, including nasal respiration, defence of the lower respiratory tract by inspired air filtration, air conditioning, mucociliary function, sneeze reflex and humidification, vocal resonance, olfactory resonance and an outlet to lacrimation [2].

The nasal cavity is divided by nasal septum into two air filled spaces. Each side of the cavity is divided by three conchae, or turbinates [3]. Deviation of the cartilage and/or bony structure of the nasal septum from the midline can cause various nasal symptoms, such as nasal obstruction. Deviated nasal septum (DNS) incidence is due to numerous causes, including ethnic factors, septum birth moulding during parturition, trauma and septum developmental deformities [1]. The internal nasal valve (INV) is a major anatomical landmark. It is a cross sectional area defined medially by the dorsal septum, laterally by caudal part of the upper lateral cartilage, and inferiorly by the head of inferior concha [3].

The human nose is complex structure, and the midline deformities are hump nose, saddle nose, tip deformities and lateral nasal deformities are crooked nose, deviated nose, alar depression are common forms of deformity affecting the external nose [2]. External nasal deformities was categorised by YongJo Jang's into five types (Supplementary I), and it was focused on the bony pyramid orientation with the cartilaginous vault [4].

Nasal septal deviation lead to nasal obstruction, which best explained as perceived sense of dropped airflow through nose or a feeling of fullness of face [5].

The study aimed to determine the nasal septal deviations occurrence in relation to external nasal deformities.

Methods

Study design and setting

A cross-sectional study was conducted in Department of Ear, Nose and Throat, in our hospital. All the individuals having septal deviation with external nasal deformity from November 2017 to November 2018.

Inclusion criteria: All patients who have NSD and END aged from 12 to 70 years.

Exclusion criteria:

1. Patients aged below 12 years and above 70 years.
2. Obstructive lesions.
3. Septal haematoma, abscess, and sinonasal mass
4. Malignancy.

Supplementary I: Sino Nasal Test -22 questionnaire.

	No Trouble	Very Mild Trouble	Mild or slight Trouble	Moderate Trouble	Severe Trouble	Trouble as bad as it can be
a) Wanting to blow your nose	0	1	2	3	4	5
b) Blocked nose	0	1	2	3	4	5
c) Sneezing	0	1	2	3	4	5
d) Running nose	0	1	2	3	4	5
e) Cough	0	1	2	3	4	5
f) Post nasal discharge	0	1	2	3	4	5
g) Nasal discharge: Thick	0	1	2	3	4	5
h) Ear fullness	0	1	2	3	4	5
i) Dizziness	0	1	2	3	4	5
j) Ear ache	0	1	2	3	4	5
k) Facial pain or pressure	0	1	2	3	4	5
l) Reduced sense of smell or Taste	0	1	2	3	4	5
m) Difficulty to fall asleep	0	1	2	3	4	5
n) Wakeup at night	0	1	2	3	4	5
o) Reduced sleep at night	0	1	2	3	4	5
p) Tired on waking up	0	1	2	3	4	5
q) Fatigueness	0	1	2	3	4	5
r) Reduction in productivity	0	1	2	3	4	5
s) Difficult to concentrate	0	1	2	3	4	5
t) Frustrated or restlessness or irritability	0	1	2	3	4	5
u) Feeling unhappy	0	1	2	3	4	5
v) Feeling Embarrassed	0	1	2	3	4	5

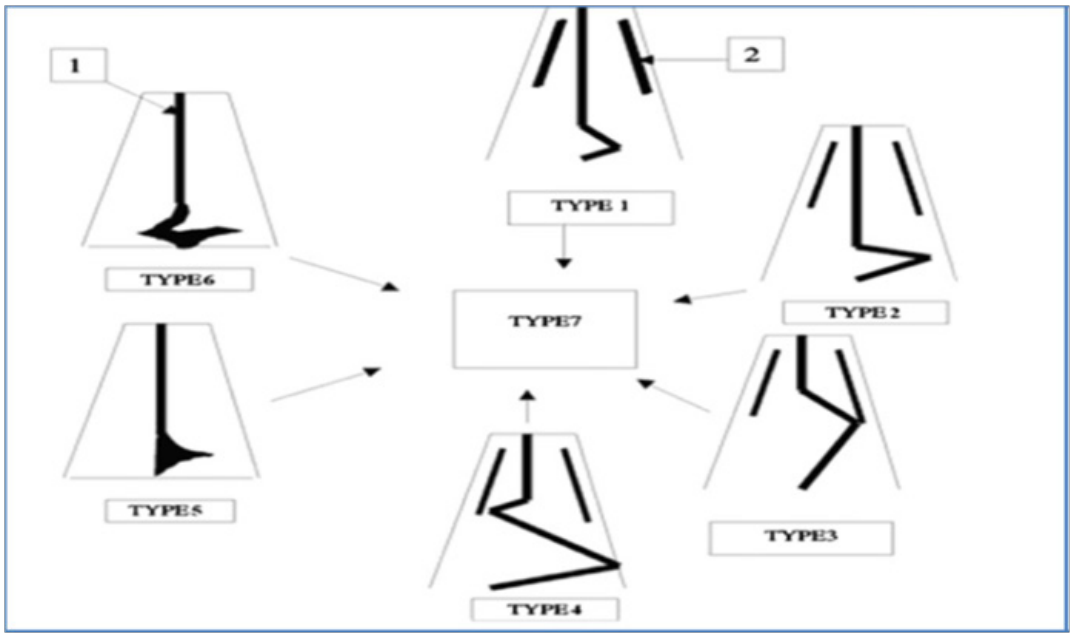

Figure 1: Mladina's classification of nasal septal. Mladina's classification of nasal septal (DNS).

Those patients be evaluated by comprehensive clinical examination of ear, nose and throat. Patient's symptoms are rated with Sino-Nasal Test -22 questionnaire (Supplementary II) [6]. Diagnostic nasal endoscopy applied to measure the angle of internal nasal valve with the nasal septum prior to surgery. X-ray for post nasal space was done. Septal deformities were classified using Mladina classification modified which classifies septal deformities into seven types (Supplementary III) [7]. In this classification Type I-VI are separate entities while Type VII is combination of Type I-VI. External nasal deformities were classified employing Yong Jo Jang's classification.

Type 1: Midline septum / mild deviations in vertical/horizontal plane, which do not extend throughout the vertical length of the septum.

Type 2: Anterior vertical deviation.

Type 3: Posterior vertical deviation.

Type 4: 'S' septum – posterior to one side and anterior to other side.

Type 5: Horizontal spur on one side with or without high deviation to the opposite side.

Type 6: Type 5 with a deep groove on the concave side.

Type 7: Combination of more than one type.

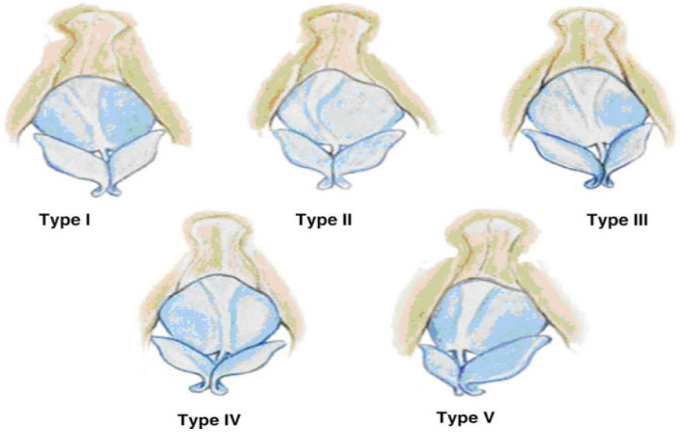

Figure 2: Yong Ju Jang's classification for external nasal deformity.

Type 1: Straight tilted bony pyramid with, tilted cartilaginous vault in the opposite direction.

Type 2: Straight tilted bony pyramid with concavely / convexly bent cartilaginous vault.

Type 3: Straight bony pyramid with tilted cartilaginous vault.

Type 4: Straight bony pyramid with bent cartilaginous vault.

Type 5: Straight tilted bony pyramid & tilted cartilaginous dorsum in the same direction.

Statistical methods

Statistical analysis be done with SPSS v 20 (IBM Inc., Chicago, IL, USA). Descriptive statistics consist of numbers, and percentages were measured. Mean, median, range, min, max, and SD for categorical data calculated. An association between variables assessed by Chi-square test. A two-sided P value of less than 0.05 was considered statistically significant.

Results

A cross-sectional study involving 100 patients with END and NSD who were referred to the ENT department. Approximately, 43% were males and 57% were females. About 90% of patients aged from 21 years to 50 years (Table 1). About 58% of patients were symptomatic while the rest 42% were without symptoms (Table 2). Incidence of type of END and NSD were listed in (Table 3). On correlating the symptoms with the type of deviation it was found significantly association (P=0.05).

Discussion

Physiological studies showed that both nasal airflow and nasal resistance are substantially regulated by this complex issue [8]. Even small deformities in this area may transform into significant increases in inspiratory resistance, thereby compromising the subject's efficiency especially during physical effort, and sometimes causing sleep disturbances [7].

Table 1: Gender and age distribution.

		No. (%)
Gender	Male	43 (43)
	Female	57 (57)
Age groups (Years)	12-20	7 (7)
	21-30	30 (30)
	31-40	32 (32)
	41-50	28 (28)
	51-60	3 (3)

Table 2: Distribution of patients according to symptoms.

Examination	No. (%)
Symptomatic	58 (58)
No symptoms	42 (42)

Table 3: Distribution of patients according to type of NSD and END.

Type of NSD	No. (%)	Type of END	No. (%)	P value
I	3	No	40	0.05
II	25	I	20	
III	10	II	11	
IV	25	III	15	
V	10	IV	5	
VI	12	V	9	
VII	15	-	-	

Previously, many authors have attempted to make and evolve a classification for NSD and associated END. A classification with etiological correlation simply divided nasal septum into anterior cartilaginous deviation and combined (cartilaginous and bony) septal deformity [1].

Approximately, 43% were males and 57% were females. About 90% of patients aged from 21 years to 50 years. In several other studies, mean age of 31.5 years [4], 37 years [9], 33.5 years [10] has been reported. These findings by different authors are in keeping with our findings. In this study male to female ratio of 1.7:1 has been observed Ratio of 1.8:1 [6] and 2.2:1 [7] have been reported. Preponderance in males can be reasoned out by the fact that most common etiology of deviated nasal septum is traumatic which occur more frequently in males [11].

About 58% of patients were symptomatic while the rest 42% were without symptoms. In Guyuron et al study [10] found that nasal obstruction (71%), nasal discharge (41%), headache (20%) sneezing (15% and epistaxis (3%) were the symptoms in cases of NSD in order of their frequency.

The incidence between END and NSD were correlating significantly (P=0.05). Type II and IV were the most common deviations in 25%. In contrast to our findings, Janardhan et al. [7] found Type V (45%), as the most common septal deviation. In the present study, END type I was common (20%), and forty-patients have no deformity. In one of the previous studies [4], Type I deformity accounted for, maximum 24 patients (32%) of their series were noted thus endorsing our observation.

On correlating nasal septal deviation with external nasal deformity, observed that Type I, III and V septal deviation were not associated with any external deformity. It is largely because deviations in this type are localized deviation and are not strong enough to pull the nasal dorsum to create external nasal deformity. Type II septal deviation were seen most commonly with Type III external deformity (Tilt of cartilaginous vault keeping the bony pyramid central). It can be cogently argued that Type II septal deviation is a vertical cartilaginous deviation that can pull the mid dorsum without tilting bony pyramid [1].

Type IV septal deviation is an 'S' shaped anterior cartilaginous and

posterior bony deviation on the opposite side, which is commonly seen with Type I external deformity [1].

Thus, the close association between external nasal deformity and nasal septal deviation points towards the fact that neither the septum nor the external deformity can be evaluated and treated separately if final outcome as regards nasal form and function is to be gratifying [1].

Conclusions

Majority of individuals are in the middle age group. Type II and IV are the most common types of NSD whereas type I is a common END. Noteworthy finding of our study is patients had no deformity.

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