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Original Research Article

A Hospital Based Retrospective Assessment of Deviated Nasal Septum Based on Mladina's Classification and its Association with Symptomatology and Post Septoplasty Complications

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Abstract

Aim: The aim of the present study was to identify the most common radiological classification with relation to clinical presentation and post-operative complications of deviated nasal septum and their relation to the deviation severity.

Methods: A retrospective record-based study were taken targeting all patients with clinically diagnosed with deviated nasal septum and undergone surgical intervention at department of ENT The study included 50 patients with DNS whose ages ranged from 18 to 40-year-old.

Results: In the present study, maximum patients had type II followed by type III and type IV degree of deviated nasal septum. Nasal obstruction was the most frequent for all types of DNS followed by snoring followed by nasal discharge. Regarding type IV, the second most reported complaint was frontal headache which also the same for type VII DNS. As for post-operative complications, nasal obstruction was the most recorded complication followed by external nose deformity, dental anesthesia, smell disturbance and infection. As for complications distribution according to DNS type, nasal obstruction, external nose deformity, and smell disturbance were the most recorded for type I DNS. For type II, nasal obstruction and dental anesthesia were the most frequent post-operative complications.

Conclusion: In conclusion, more than one third of the cases had type II deviation followed by type III and type IV equally. Type II & IV are the most sever types respectively according to clinical presentation and post-operative complications. However, studies with larger samples are required to support the finding in our study.

Keywords: Deviated Nasal Septum; Cerebrospinal Fluid.

Introduction

Nasal septal deviations play a critical role in nasal obstruction symptoms, aesthetic appearance of the nose, increased nasal resistance, and sometimes snoring. [1] Consequently, a comprehensive assessment of the nasal septum serves an essential role in preoperative planning, reestablishing function, and overall cosmetic appeal. Typically, a septoplasty suffices in addressing significant nasal septal deviations, but on occasion such deviations warrant a single-stage septorhinoplasty. [2-4] In 1954, Lindahl described nasal septal deviations as either developmental (usually smooth, "C-shaped" or "S-shaped" nasal septum with occurrence more often in the anterior septum) or traumatic (usually irregular, angulated, and sometimes dislocated) in origin. [5]

Over the years, individual authors and groups studied the assessment and classification of internal nasal septal deviations but none to date conducted a systematic evaluation of these studies with a comprehensive summarization of the individual results. Because of the variation in classification systems, such as grading internal septal deflections in the anterior aspect versus along the entire nasal airway, utilizing physical examination versus computed tomography, a summary of the currently published international literature would help facilitate future research. The importance of a summary is notable when studies report the prevalence of nasal septal deviations, given that studies reporting findings by simply using a handheld otoscope will have a lower prevalence of nasal septal deviations than those that use endoscopy or computed tomography because the

handheld otoscope fails to consider the internal nasal septum's entire length and subsequently under categorized these deviations. This in turn led to underestimations of the true prevalence of nasal septal deviations. [6]

The wide variation of NSD structure, symptoms and associated comorbidities has evolved the development of classification systems. NSD can be classified according to extent of the nasal deviation on the inferior turbinate.[7] This classification has three degrees, degree I comprises a septal deviation without reaching the inferior turbinate, degree II represents a deviation reaching the inferior turbinate, and degree III involves a septal deviation reaching and compressing the inferior turbinate. [7] Another classification relies on the commonly noticed deviation patterns such as S-shaped and C-shaped deviations. [8] Mladina's classification system has been proposed to classify the NSD according to the characteristics of the nasal septum seen horizontally and vertically on rhinoscopy or cone-beam computed tomography (CBCT). [9] Mladina's system classifies nasal septum deviation into seven types; type I involves the vertical ridge without reaching the nasal dorsum; type II involves the vertical ridge reaching the nasal dorsum; type III involves the vertical ridge in a deeper area; type IV involves the anterior and the deeper areas of the vertical ridge; type V manifests as a horizontal deformity on one side of the nose with the other being flat; type VI manifests a bilateral involvement of the septum with dislocation of one side and deviation of the other side; type VII represent as a combination of two or more types. [9,10]

The aim of the present study was to identify the most common radiological classification with relation to clinical presentation and post-operative complications of deviated nasal septum and their relation to the deviation severity.

Materials and Methods

A retrospective record-based study were taken targeting all patients with clinically diagnosed with deviated nasal septum and undergone surgical intervention at department of ENT, Nalanda Medical College and Hospital, Patna, Bihar, India for one year. The study included 50 patients with DNS whose ages ranged from 18 to 40-year-old. We excluded revision surgery, rhinoplasty cases, sinus surgery and those with incomplete records or those who do not have preoperative CT study. We contacted them and obtained a verbal consent to participate in this study. All medical files were reviewed, and clinical data were extracted using pre-structured data extraction sheet to minimize data extraction error. Files with incomplete data were excluded if personal contact with the patient failed. Data extracted included patient's demographic data, clinical signs, and symptoms; clinical grading of DNS based on Mladina's classification. Other data included post-operative recorded complications such as nasal obstruction, nasal deformity, loss of smell sensation, and all others.

Data Analysis

After data were collected it was revised, coded, and fed to statistical software IBM SPSS version 22. The given graphs were constructed using Microsoft excel software. All statistical analysis was done using two tailed tests and alpha error of 0.05. P value less than or equal to 0.05 was statistically significant. Frequency and percent were used to describe the frequency distribution of the different collected variables including DNS grade, signs and symptoms, and post-operative complications. Cross tabulation was used to show the clinical presentation of the different DNS grade and post-operative complications recorded with each grade.

Results

Table 1: Degree of deviated nasal septum among the study patients based on mladina's classification

Degree of deviated nasal septum	N	%
Type I	5	10
Type II	18	36
Type III	10	20
Type IV	10	20
Type VII	7	14

In the present study, maximum patients had type II followed by type III and type IV degree of deviated nasal septum.

Table 2: Signs and symptoms of deviated nasal septum among the study cases

Signs and symptoms	N	%
Nasal obstruction	46	92
Snoring	35	70
Nasal Discharge	32	64
Frontal headache	31	62
Post nasal drip	29	58

Facial pain	21	42
Throat discomfort	20	40
Smell disturbance	18	36
Epistaxis	12	24

Nasal obstruction was the most frequent for all types of DNS followed by snoring followed by nasal discharge.

Table 3: Distribution of pre-operative signs and symptoms of deviated nasal septum according to its severity

Pre-Operative Signs and Symptoms	Mladina's Classification				
	Type I	Type II	Type III	Type IV	Type VII
	No	No	No	No	No
Nasal obstruction	5	10	6	8	4
Nasal discharge	3	8	4	5	2
Frontal headache	4	7	3	6	3
Epistaxis	0	4	0	5	0
Smell disturbance	3	4	2	4	3
Postnasal drip	2	8	4	6	2
Snoring	4	9	3	5	3
Facial pain	2	7	2	4	2
Throat discomfort	0	6	4	4	0

Regarding type IV, the second most reported complaint was frontal headache which also the same for type VII DNS.

Table 4: Distribution of post-operative complications of deviated nasal septum according to its severity

Post-Operative Signs and Symptoms	Mladina's Classification				
	Type I	Type II	Type III	Type IV	Type VII
	No	No	No	No	No
Nasal obstruction	2	4	0	2	1
Nasal bleeding that make patient visit ER or clinic	0	1	0	1	0
Septal perforation	0	1	0	1	0
External nose deformity	2	0	0	3	1
Infection and Septal abscess	0	2	0	1	0
Smell disturbance	2	0	1	0	0
Watery discharge (CSF leak)	0	1	0	0	0
Dental anesthesia	0	4	1	0	0
Septal hematoma	0	0	0	0	0

As for post-operative complications, nasal obstruction was the most recorded complication followed by external nose deformity, dental anesthesia, smell disturbance and infection. As for complications distribution according to DNS type, nasal obstruction, external nose deformity, and smell disturbance were the most recorded for type I DNS. For type II, nasal obstruction and dental anesthesia were the most frequent post-operative complications.

Discussion

Deviated nasal septum (DNS) is a physical disorder of the nose, involving a displacement of the nasal septum. Some displacement is common, affecting 80% of people, mostly without their knowledge. [11] A deviated septum occurs when the thin wall between nasal passages is displaced to one side. Among many people, the nasal septum is off-center or deviated narrowing one nasal passage. [12] Severely deviated nasal septum blocks one side of the nose and reduces airflow, causing difficulty of breathing. [13] The continued exposure of a deviated septum to the dryness due to airflow through the nose may sometimes contribute to crusting or bleeding in some cases. [14] A nasal blockage or congestion can occur from a deviated nasal septum, from swelling of the tissues lining the nose or from both. [15]

In the present study, maximum patients had type II followed by type III and type IV degree of deviated nasal septum. Nasal obstruction was the most frequent for all types of DNS followed by snoring followed by nasal discharge. Regarding type IV, the second most reported complaint was frontal headache which also the same for type VII DNS. As stressed in the literature, identification of the C- and S-shaped deformities at the time of planning remains crucial to identifying potentially complex surgeries compared to less technically challenging operative interventions such as septal tilts. [16,17]

C- and S-shaped deformities are sometimes surgically scored on the convex side to silence the cartilaginous memory and frequently enhanced with grafting material to support and straighten the cartilaginous septum. [17,18] Perforations also present with unique challenges, as the repair of a septal perforation usually necessitates bilateral elevation of the surrounding mucoperichondrium. While a unilateral perforation typically heals with no surgical intervention, bilateral opposing perforations can lead to permanent septal perforation. Accurately identifying septal perforations further allows for appropriate preoperative planning including the need for grafting material versus flap. [18]

As for post-operative complications, nasal obstruction was the most recorded complication followed by external nose deformity, dental anesthesia, smell disturbance and infection. As for complications distribution according to DNS type, nasal obstruction, external nose deformity, and smell disturbance were the most recorded for type I DNS. For type II, nasal obstruction and dental anesthesia were the most frequent post-operative complications. The presence of headache as a presenting symptom for some patients was explained by the contact between the convex side and the mucosa of the peripheral nasal wall of the inferior turbinate or middle turbinate, or the lateral nasal wall of the nasal septum. The end of the sensory nerve is located between them, and it will be affected and cause pain. It is reported that in such rhinogenic headaches, surgical treatment is better than medical treatment. The same study suggested septoplasty as one of the treatment options for unexplained headaches. [19] The presence of nasal sounds is usually found among those who are suffering from obstruction or those having narrow nasal cavities which correlates with the severity of the deviation. This highlights the beneficiary utilization of acoustic rhinometry (AR) in the diagnosis of anterio-caudal deviation. This indeed does not exclude the importance of endoscopic examination prior to septoplasty. [20] Clinical evaluation as opposed to imaging has both been shown to be underestimating some types of NSD, both options should be sought before decision-making in clinical settings. [21]

The most common surgical method used to treat NSD in adults is septoplasty. [22] Septoplasty is a common otolaryngological surgical procedure, which involves the correction of a deviated septum, expanding the nasal passage and allowing adequate airflow. [22,23] Indications for septoplasty include septal deviation with symptomatic obstruction, gaining access for endoscopic sinus surgery and lead point headaches. [23] Septoplasty is usually an open procedure done when dealing with a caudal septal deviation but when there is a posterior septal deviation surgeons prefer to use endoscopic septoplasty due to its advantage of providing the surgeon with a better visualization compared to open septoplasty. However, choosing one of these techniques depends on the capabilities, skills, and preferences of the surgeon. [24]

Conclusion

In conclusion, more than one third of the cases had type II deviation followed by type III and type IV equally. Type II & IV are the most sever types respectively according to clinical presentation and post-operative complications. However, studies with larger samples are required to support the finding in our study.

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