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Comparison of the Outcomes Among Patients Undergoing Septoplasty with or without Inferior Turbinoplasty

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Author`s Contribution

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ABSTRACT

Objective: To compare the outcomes among nasal obstruction cases subjecting to septoplasty with or without inferior turbinoplasty in terms of alleviation of nasal symptoms and pain.

Methodology: A comparative analytical study was conducted at ENT Department, Holy Family Hospital from Apr 2023 to Sep 2023. Two groups of Deviated Nasal Septum (DNS) each comprising of 75 cases who were enrolled by consecutive non-probability sampling. Group A was subjected to septoplasty only while group B cases underwent both septoplasty and inferior trubinoplasty. Apart from demographics, data was gathered pertaining to turbine hypertrophy in addition to severity of pain and alleviation of nasal symptoms by using Visual Analog Scale (VAS) and Nasal Obstruction Symptom Evaluation (NOSE) scale respectively. The patients of both groups were followed up for NOSE and VAS scores after 1st, 2nd and 3rd month of surgery. Data was analyzed by SPSS version 25.0. Difference in mean VAS and NOSE scores on follow up of the cases were determined by independent sample t-test. $P < 0.05$ was considered significant.

Results: The mean age of the cases in group A and group B was 36 ± 2.4 and 34 ± 4.0 years respectively. Of the total 150 study subjects, most (109) were females. About 23 and 36 patients of group A and group B had grade-III inferior turbine hypertrophy. NOSE score among group B cases undergoing septoplasty along with inferior turbinoplasty showed statistically significant reduction on follow-up after 1st, 2nd and 3rd month with P-value of 0.002, 0.004 and 0.001 respectively. Likewise, VAS score among group B cases was suggestive of marked relief of pain in comparison with group A patients with P-value of 0.003 after 3rd month of follow-up.

Conclusion: Septoplasty coupled with inferior turbinoplasty resulted in significant alleviation of nasal symptoms along with periodic pain reduction among DNS cases.

Keywords: Septoplasty, inferior turbinoplasty, Deviated Nasal Septum (DNS), inferior turbine hypertrophy.

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Introduction

Nasal obstruction significantly impacts the quality of life of the cases. Its chronic onset is substantially linked with headache and sleep irregularities.[1] Nasal obstruction negatively impacts the mental competence and ability to concentrate at workplace and school.[2] According to a study by Clark DW, about 11% of inhabitants of United States had mild nasal obstruction while 63% and 24% had severe and moderate nasal obstruction respectively.[3]

Nasal obstruction among one third global population is attributed to septal deviation.[4] A national study by Khan MA et al revealed Deviated Nasal Septum (DNS) as the commonest etiology for nasal obstruction among 35% of adults, followed by combination of DNS and inferior turbine hypertrophy among 22.6% of the cases.[5] Apart

from anatomic reasons of nasal blockage like septal deviations and turbine hypertrophy; some physiological attributes like infections, inflammations as a result of environmental and occupational exposure should also be sorted out before planning for management[1]. Nasal obstruction cases resultant of DNS frequently present to primary care physicians worldwide; that if non-responsive to medical care are then subjected to septoplasty.[6]

As nasal obstruction secondary to DNS has been identified as the predominant cause for periodic visits of the cases to ENT consultants; septoplasty has been recognized as the third commonest surgical procedure[7]. Most of the patients who underwent septoplasty not only got relief of the symptoms that affected their well-being but also illustrated significant improvement in their quality of life[8]**.** It is carried out among cases with DNS concomitant with profound epistaxis or obstructive sleep apnea.[9] Recovery occurs in couple of weeks with slight complications.[10]

There is ample evidence internationally pertaining to comparison between healthcare consequences in terms of complication or recovery rate between the cases undergoing septoplasty with or without turbinoplasty[11]; our national data in this regard is quite scarce. The present study has therefore been aimed to compare and analyze the outcomes among patients subjecting only to septoplasty and those undergoing septoplasties coupled with inferior turbinoplasty. The results of this study would enable our ENT consultants and plastic surgeons to plan the suitable surgical procedure with due consideration of the symptomatic improvement along with overall satisfaction of the patients.

Methodology

A comparative analytical study was carried out among total 150 cases of nasal obstruction who were enrolled in the study through consecutive non-probability sampling.

Ethical approval for this study was sought from institutional ethical review board. Informed consent was taken from all the study participants. The study duration was 6 months i.e. 15th Apr, 2023 to 16th Sep, 2023. Sample size was calculated by WHO sample size calculator; level of significance 95%, anticipated population proportion=56.36% & 34.62%[11], sample size=74 cases in each group. All patients complaining of nasal obstruction due to DNS were enrolled in the study. Group A comprising of 75 cases was subjected to septoplasty without inferior trubinoplasty while 75 patients of group B underwent septoplasty along with inferior turbinoplasty.

Severity of pain was perceived by using Visual Analog scale while symptoms of nasal obstruction were measured by means of Nasal Obstruction Symptom Evaluation (NOSE) scale. Visual Analog Scale is a valid and reliable tool to measure the intensity of pain in clinical practice.[12]

Nasal Obstruction Symptom Evaluation (NOSE) scale[13] is a 20-point scale that is based on 5 variables which include nasal stuffiness, nasal obstruction, troubled breathing through nose, troubled sleeping, inability to get enough air through nose during exercise or exertion. NOSE scale has substantially been used as a validated tool for measuring subjective nasal obstruction[14]. Score attained on NOSE scale is ultimately multiplied with 5; hence minimum score of 0 is indicative of no problem with nasal obstruction while maximum score of 100 is illustrative of worst problem with nasal obstruction. Nasal obstruction severity on this scale was classified as follows[15]

Mild	Moderate	Severe	Extreme
5-25	30-50	55-75	80-100

Septoplasty is a common operative procedure carried out to relieve the nasal obstruction resulting from deviation of nasal septum[16]. Inferior trubinoplasty is a surgical intervention done to relieve the nasal blockage caused by hypertrophy of inferior turbinates in the nose. It involves excision of mucosa along with the soft erectile tissue and turbine bone[17]. Data was collected from patients of both groups through a semi-structured questionnaire pertaining to their demographics, nasal symptoms (nasal sneezing, itching, rhinorrhea) and pain. Grades of inferior turbine hypertrophy were identified on physical examination of the patients. Data was entered and analyzed by means of SPSS version 25.0 software. Descriptive statistics were applied. For age, mean ± SD were calculated. NOSE and VAS baselines scores of the patients from both group A and B were measured before subjecting them to respective procedures. The difference between mean NOSE and VAS scores of both the groups were statistically compared on follow-up after 1st, 2nd and 3rd month by applying independent sample t-test. $P < 0.05$ was taken as significant.

Results

The study analyzed 150 patients divided into two groups (75 in each) according to inclusion criteria. Group A underwent septoplasty alone, while Group B underwent septoplasty with inferior turbinoplasty. Patient demographics, including age and gender distribution, showed no significant differences (36±2.4 vs. 34±4.0

Table I: Demographic & Clinical parameters of study participants.

		Group A [septoplasty without inferior turbinoplasty] n=75	Group B [septoplasty with inferior turbinoplasty] n=75
Age (year)		36±2.4	34±4.0
Gender	Male	17	24
	Female	58	51
Nasal symptoms	Nasal sneezing	38	39
	Nasal itching	44	47
	Rhinorrhoea	35	41
Grade of Inferior turbinate hypertrophy	grade II	52	39
	grade III	23	36
Nasal Obstruction Symptoms Evaluation NOSE	Baseline	64.2	66.3
Pain (VAS)	Baseline	60.1	64.4
Education	≤ matric	56	61
	above matric	19	14

Table II: Pain score on VAS among cases of Group A and Group B.

		Group A [septoplasty without inferior turbinoplasty] n=75	Group B [septoplasty with inferior turbinoplasty] n=75	p-value*
Nasal Obstruction Symptoms Evaluation	Baseline	72 (24.0)	73 (31.8)	
	1st month	38 (22.4)	29 (21.4)	0.002
	2nd month	30 (21.3)	22 (16.9)	0.004
	3rd month	30 (20.2)	17 (11.3)	0.001
Pain (VAS)	Baseline	68 (29.6)	72 (27.6)	
	1st month	51 (25.7)	43 (21.7)	0.002
	2nd month	36 (21.1)	23 (19.4)	0.001
	3rd month	28 (20.3)	17 (14.2)	0.003

years; female-to-male ratio: 58:17 in Group A vs. 51:24 in Group B). (Table I)

Baseline nasal symptoms (sneezing, itching, rhinorrhea) and turbinate hypertrophy grades were assessed, showing a slightly higher prevalence of sneezing, itching, and rhinorrhea in Group B. Grades of turbinate hypertrophy varied, with Group A having more moderate cases (Grade II: 52 cases), whereas Group B showed more severe hypertrophy (Grade III: 36 cases).

Nasal Obstruction Symptom Evaluation (NOSE) scores were higher in Group B at baseline (66.3 vs. 64.2), highlighting more severe initial symptoms. Over time, significant reductions in nasal obstruction symptoms were noted in Group B compared to Group A, particularly at the 1st, 2nd, and 3rd months follow-up (p-values < 0.05), indicating better symptom relief in Group B. (Table II)

Similarly, pain levels assessed via Visual Analog Score (VAS) demonstrated statistically significant improvements in Group B at all follow-up points. These results suggest that adding inferior turbinoplasty may offer superior relief for patients with severe nasal obstruction and turbinate hypertrophy, supporting its consideration in surgical planning for enhanced long-term outcomes.

Discussion

Of the total 150 cases, 75 undergone septoplasties only and rest of the 75 patients were subjected to both septoplasty and inferior turbinoplasty. Most (72.6%) of the operated cases were females. Contrary to this, statistics of Swedish National Septoplasty Registrar are illustrative of more septal deviation problem among males.[18] A study by Arnold MA et al also concluded that there is higher frequency of nasal obstruction secondary to septal fractures among male population due to more exposure to outdoor activities like sports and road traffic accidents.[19] Likewise, another study by Pedersen L et al revealed that comparatively more males (72%) were subjected to septoplasty.[20] Another study among cases of Italy demonstrated more (57%) septal deviation cases among females[21]. This gender-based variation in cases of nasal obstruction due to septal deviation should also be highlighted along with their plausible causes for having more comprehensive results.

The mean age of the patients in group A and group B in the present study was 36 ± 2.4 years and 34 ± 4.0 years respectively (Table 1). Likewise, a study revealed mean age of the cases undergoing septoplasty was found to be around 40[20]. Certain changes in nasal cartilage has been

demonstrated with increasing age.[22] Moreover, there is enlargement of nasal cavities that increases the likelihood of prompt healing after surgery.[23] According to a retrospective study carried out by Raghavan M et al pertaining to pediatric septoplasty, mean age of the children who underwent septoplasty was 14.2 years; however, those children were suffering from comorbidities like cleft lip followed by asthma.[24] Hence, consideration of various attributes for septoplasty apart from age also depends on concomitant comorbidities and congenital anomalies that should preferably be discussed in multi-disciplinary meetings for getting optimistic post-operative outcomes.

The nasal symptoms prevailing excessively among our nasal obstruction cases were nasal itching with more or less nasal sneezing and rhinorrhea. Another study done among DNS cases of a teaching hospital of Lahore revealed that sinusitis was an accompanying symptom among majority of the cases.[25] A cross-sectional study by Alsaggaf ZH et al among cases visiting a teaching hospital of Saudi Arabia concluded that patients of DNS were three times more prone to develop sinusitis (P<0.001)[26]. About 35 patients of group A and 41 cases of group B in current study had rhinorrhea. Similar to our results, a review article by Malpani SN et al illustrated that long term DNS preludes to progression of rhinosinusitis and that all DNS cases do not present with rhinosinusitis.[27] Knowing the duration of DNS in addition to acquiring information about the accompanying symptoms would enable to rationally comprehend the difference in symptoms among cases.

Although baseline NOSE score of both group A and B cases in present study was illustrative of severity; yet this score was substantially reduced to moderate level in group B cases (P=0.002) after 1 month and became mild in group B cases after 2nd and 3rd month with statistically significant difference from NOSE score of group A cases (Table II). This shows that nasal obstruction was considerably alleviated among cases who underwent septoplasty along with inferior turbinoplasty. VAS score among group B cases in current study also demonstrated drastic reduction. Similarly, an interventional study by Ghosh SK et al highlighted the greater benefit achieved by the patients subjecting to both septoplasty and inferior turbinoplasty than those undergoing septoplasty only in terms of improvement in NOSE score on follow-up every month.[28] Another interventional study by Samarei R et al suggested to carry out combination surgery among DNS cases who also had inferior turbine hypertrophy in order to get periodic improvement in nasal symptoms. Likewise, our results, the patients undergoing combination surgery revealed massive improvement in both NOSE and VAS scores even after 2 and 4 years of follow-up.[29] Another prospective study also elucidated the drastic reduction in NOSE and VAS scores among nasal obstruction cases undergoing septoplasty along with inferior turbinoplasty. However, obesity among cases seemed to be associated one way or the other with worsening of the symptoms[30]. However, A prospective study with consideration of all personal attributes apart from demographics of the cases should be planned in Pakistani culture and context to respond to such queries logically.

Conclusion

Study findings highlights the advantages of including inferior turbinoplasty in surgical treatment for patients with nasal obstruction, as evidenced by the significant improvements in both nasal symptoms and pain levels over time.

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