Open Access

Original Article

Improvement of Nasal Obstruction Symptoms after Septoplasty with or without Turbinoplasty

Shafaq Zaman, Saleem Asif Niazi, Shahzad Maqbool, Ayesha Khalid, Yousra Riaz, Muhammad Sulman*

Department of ENT, Pak Emirates Military Hospital/National University of Medical Sciences (NUMS) Rawalpindi Pakistan, *Department of Medicine, Pak Emirates Military Hospital/National University of Medical Sciences (NUMS) Rawalpindi Pakistan

ABSTRACT

Objective: To assess the improvement of nasal obstruction symptoms after septoplasty with or without turbinoplasty.
Study Design: Prospective comparative study.
Place and Duration of Study: Pak Emirates Military Hospital Rawalpindi, Pakistan, from Jan to Dec 2021.
Methodology: Two hundred patients having nasal obstruction due to unilateral deviated nasal septum with contralateral hypertrophied inferior turbinate were included. By convenient sampling, patients were assigned septoplasty with turbinoplasty in Group-A or Group-B. Follow-up was done after 3 and 6 months. NOSE Score was used to evaluate the post-operative effectiveness of the procedures.
Results: At three months follow-up, out of 103(51.5%) patients in Group-A, 14(13.59%) were minimally satisfied, 29(28.16%) were moderately satisfied, and 60(58.25%) were totally satisfied with the surgery outcome. Out of 97(48.5%) patients in Group-B, 37(40.66%) were minimally satisfied, 26(26.80%) were moderately satisfied, and 34(35.05%) were totally satisfied. At six months follow-up, in Group A, 9 (8.74 %) were minimally satisfied, 24(23.3%) were moderately satisfied, and 70(67.96%) were totally satisfied with the results. While in group B, 41(42.26%) were minimally satisfied, 21(21.65%) were moderately satisfied and 35(36.08%) were totally satisfied.
Conclusion: Patients who underwent septoplasty with inferior turbinoplasty had much higher satisfaction levels than those in Septoplasty alone.
Keywords: Nasal obstruction, Septoplasty, Turbinoplasty.

How to Cite This Article: *Zaman S, Niazi SA, Maqbool S, Khalid A, Riaz Y, Sulman M. Improvement of Nasal Obstruction Symptoms after Septoplasty with or without Turbinoplasty. Pak Armed Forces Med J 2023; 73(6): 1804-1807. DOI: https://doi.org/10.51253/pafmj.v73i6.10505*

INTRODUCTION

One of the most common symptoms otorhinolaryngologists encounter in outpatient departments is nasal obstruction.[1] Deviated nasal septum (DNS) is the primary reason for nasal obstruction, and septoplasty is the third most frequently performed operation by ENT surgeons to alleviate the symptom. The surgery costs about 5.8 billion dollars yearly in USA.[2,3]

The main indication for septoplasty is marked nasal obstruction. Many surgical techniques, such as endoscopic approach, trans-nasal, and open methods, are practised for nasal septal correction.[4] Septoplasty can be paired with turbinoplasty to improve nasal obstruction symptoms and postoperative results.[5] Even after successful septal surgery, nasal obstruction might persist due to other coexisting factors such as nasal allergy or turbinate hypertrophy, etc.[3] Inferior turbinate hypertrophy is described as an increase in the size of the turbinate.[6,7]

So far, there has yet to be a consensus to devise a method for objectively assessing subjective improvement in nasal obstructive symptoms before and after nasal septal surgery.[8] However, various studies have implicated the Visual analogue scale score and NOSE score.[9] Some surgeons believe that once the deviated septum is fixed, turbinates regress independently; others believe that DNS-associated inferior turbinate hypertrophy is permanent unless rhinoplasty is undertaken to reduce the size .[10]

As recent surgical techniques focus on a conservative approach, our study aims to find out whether septoplasty alone or with rhinoplasty is more effective in relieving a patient's symptoms of nasal obstruction. This study will also help us offer better treatment options to improve patient outcomes.

METHODOLOGY

The study was conducted at the ENT Department, Pak Emirates Military Hospital (PEMH), Rawalpindi, Pakistan from January to December 2021 after approval of the Institutional Ethics Committee (IEC) (A/28/EC/540/23). The sample size was calculated using the OpenEpi sample size calculator with population proportion of DNS, as 62.5%.[11]

Inclusion Criteria: Patients of either gender, aged 18-50 years with persistent moderate to severe nasal obstruction due to unilateral DNS with contralateral

Correspondence: Dr Shafaq Zaman, Department of ENT, Pak Emirates Military Hospital, Rawalpindi Pakistan
Received: 16 Jun 2023; revision received: 06 Nov 2023; accepted: 10 Nov 2023

hypertrophied inferior turbinate (Grades 2 and 3), were included.

Exclusion Criteria: Patients having craniofacial malformation were excluded. Patients having any cause of bilateral inferior turbinate hypertrophy like sinonasal polyposis, allergic rhinitis, sinusitis, chronic hypertrophic rhinitis, bilateral turbinate hypertrophy, septal perforation, any significant systemic disease who were unfit for general anaesthesia or patients who had previous nose surgery were excluded from the study.

Based on the inclusion and exclusion criteria, data from patients during the defined period was collected on a structured Performa after informed consent. Diagnosis of DNS & turbinate hypertrophy was made on clinical examination by an otorhinolaryngologist.

NOSE SCORE was used to evaluate the post-operative effectiveness of the procedure. This score uses the subjective judgement of the patient regarding the improvement of symptoms and compares it with their preoperative symptoms. It consists of five questions, as shown in the Table.

Table-I: NOSE Score

Symptoms	Not a Problem	Very Mild Problem	Moderate Problem	Fairly Bad Problem	Severe Problem
Nasal stuffiness	0	1	2	3	4
Nasal blockage	0	1	2	3	4
Trouble breathing through nose	0	1	2	3	4
Trouble sleeping	0	1	2	3	4
Unable to get enough air through nose during exercise or exertion	0	1	2	3	4

A score of 0-12 was given to patients with minimal symptoms, and a 13-25 score was given to patients with moderately severe and more than 25 with severe symptoms.

By convenient sampling, patients were assigned to septoplasty with or without inferior turbinoplasty. Group-A included septoplasty and inferior turbinoplasty, whereas Group-B patients underwent septoplasty alone. All patients underwent classical Killian septoplasty under general anaesthesia. 1% Lignocaine with adrenaline 1:100,000 was injected into the nasal septum. A slightly curvilinear incision was made 2-3mm above the caudal end of septal cartilage on the concave side, followed by the elevation of perichondrial and periosteal flaps on the same side. Septal cartilage was separated from the vomer and ethmoid portion of the nasal septum. The deviated portion of the septum was removed along with a thin septal sliver from the maxillary crest. A deviated portion of the bony septum was also removed, and scoring was done on the leftover portion of the nasal septum. Mucosal flaps were repositioned, and nasal splints were placed for ten days. The nasal cavity was packed with ventilatory PVA nasal packs for 24 hours. Group-A underwent septoplasty, along with endoscopic turbinoplasty. Turbinoplasty was carried out by creating a tunnel between the mucosa of the turbinate and the bone; mucosal flaps were raised after that, one-third of the mucosa was removed, and flaps were repositioned. Hemostasis was secured endoscopically, after which the nasal cavity was packed with ventilator PVA nasal packs for 48 hours. Follow-ups were done at three months and six months.

Statistical Package for Social Sciences (SPSS) version 25.0 was used for the data analysis. Quantitative variables were expressed as Mean±SD and qualitative variables were expressed as frequency and percen-tages. Chi-square test was applied to explore the inferential statistics. The *p*-value of ≤0.05 was set as the cut-off value for significance.

RESULTS

Two hundred patients having nasal obstruction due to unilateral deviated nasal septum with contralateral hypertrophied inferior turbinate were included. We divided the patients into two groups: Group-A, [103, 51.5%], including patients who underwent septoplasty and rhinoplasty. Meanwhile, patients in Group-B, [97, 48.5%], underwent septoplasty alone. Patients were scheduled for follow-up twice in six months. The first follow-up for assessment of nose score was at three months, and the second was at six months. The mean age of patients was 33.80±9.265 years.

At three months follow-up, 14(13.59%) patients in Group-A were minimally satisfied, 29(28.16%) were moderately satisfied, and 60(58.25%) were totally satisfied with the surgery outcome. In Group-B, 37(40.66%) were minimally satisfied, n-26 (26.80%) were moderately satisfied, and 34(35.05%) were totally satisfied, as shown in Figure-I. At six months follow-

up, in Group-A, 9(8.74 %) were minimally satisfied, 24(23.3%) were moderately satisfied, and 70(67.96%) were totally satisfied with the results. In Group-B, 41(42.26%) were minimally satisfied, 21(21.65%) were moderately satisfied, and 35(36.08%) were totally satisfied with the results of the surgery, as shown in Figure-II. The p-value was statistically significant (p<0.05) between the groups after 3 and 6 months follow-up.

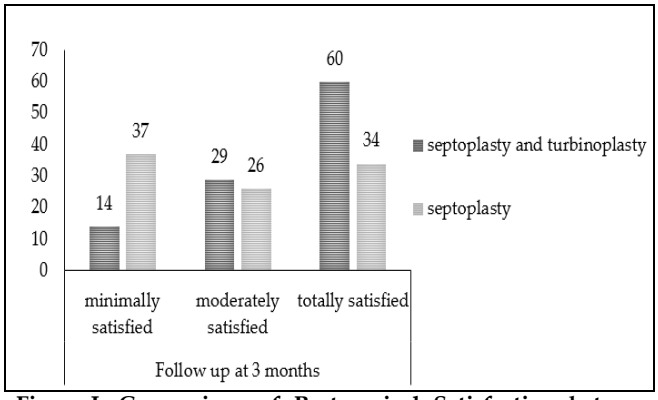

Figure-I: Comparison of Postsurgical Satisfaction between Study Groups after 3 Months (n=200)

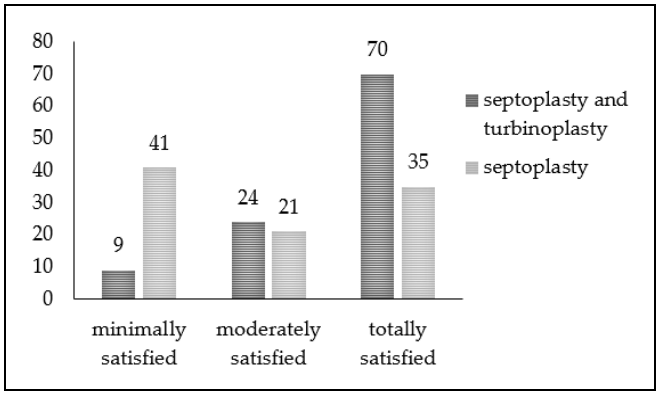

Figure-II: Comparison of Postsurgical Satisfaction between the Study Groups after 6 Months (n=200)

DISCUSSION

Septoplasty remains a classical surgical technique to relieve symptoms of nasal obstruction due to a deviated nasal septum (DNS).[11] In selected cases, it can be combined with rhinoplasty to achieve better outcomes symptomatically. As DNS is not the only contributing factor towards nasal obstruction, inferior turbinate hypertrophy also plays a role.[12,13]

In a recent study conducted in Turkey by Seden *et al.* in 2022, subjective and objective assessment in improving nasal obstruction postoperatively was made using acoustic rhinometry, peak nasal inspiratory flow, NOSE score and Sino-nasal outcome test-22 scores.[5] Improvement in nasal obstruction, postoperatively, was assessed between two groups (septoplasty alone and septoplasty with inferior turbinate reduction) and no notable difference was noted between the two groups. This study results contradict our result. The difference may lie in the smaller sample size (200 vs 74) and shorter follow-up period (6 vs 3 months).

In September 2020, Samarei *et al.* conducted a study to subjectively assess improvement in nasal symptoms postoperatively in patients undergoing septoplasty with or without inferior turbinoplasty. The distinctive features of this study were that only subjective assessment was made using the NOSE score and VAS; moreover, the follow-up period spanned over two years. The researcher observed initial improvement in the group undergoing septoplasty alone, but this improvement gradually became less marked throughout the two-year follow-up. Meanwhile, the group undergoing septoplasty and turbinoplasty had steady improvement starting at six months and lasting throughout the follow-up period.[14] The results concur with our study results, where marked subjective improvement was noted on six months of follow-up in patients undergoing septoplasty with inferior turbinoplasty (p-value<0.05).

A study was conducted in 2018 by Shamanna *et al.* for three years, including 60 patients, and showed results similar to our study results. According to this study, the NOSE score was lower in the group that underwent septoplasty along with rhinoplasty compared to the group that had septoplasty alone. Lower Nose score meant a better quality of life and better long-term symptomatic improvement in septoplasty accompanied by rhinoplasty patients.[15]

Nevertheless, another study conducted by Ahmad *et al.* in Pakistan from January 2012 to December 2014 supports the results of our study. 86% of patients undergoing septoplasty with turbinoplasty had successful improvement in nasal obstruction, while patients undergoing septoplasty alone had a success rate of only 16.6 percent.[16] One conducted a study over two years with a follow-up duration of 12 months to establish improvement in nasal soft tissue obstruction after septoplasty 'without' turbinectomy. They concluded that hypertrophied turbinate regresses independently after septoplasty alone due to normal air entry on both sides postoperatively. CT scans were obtained before and after the surgery to assess any improvement in nasal obstruction.[19] This study result

contradicts our hypothesis. The only limitation of this study was a small sample size of 30. Meanwhile, the follow-up period spanned over 12 months.[17]

In 2015, Han *et al.* constituted a panel of ENT experts and developed clinical consensus statements using a modified Delphi method. The panel agreed that in the presence of inferior turbinate hypertrophy along with DNS, inferior turbinoplasty is an effective adjunctive procedure to septoplasty.[18]

CONCLUSION

Although many centres undertake septoplasty without addressing the inferior turbinates, in our study, septoplasty with turbinoplasty had far better results. It is concluded that DNS with grade 2 and 3 turbinate hypertrophy should undergo turbinoplasty and septoplasty.

Conflict of Interest: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

SZ & SAN: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

SM & AK: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

YR & MS: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

REFERENCES

1. Gamerra M, Cantone E, Sorrentino G, De Luca R, Russo MB, De Corso E, Bossa F, et al. Ie. Mathematical model for preoperative identification of obstructed nasal subsites. Acta Otorhinolaryngol Ital 2017; 37(5): 410-415. https://doi.org/10.14639/0392-100X-1385.
2. Watters C, Brar S, Yapa S. Septoplasty. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2022.
3. Cantone E, Ricciardiello F, Oliva F, De Corso E, Iengo M. Septoplasty: is it possible to identify potential "predictors" of surgical success?. Acta Otorhinolaryngol Ital 2018; 38(6): 528-535. https://doi.org/10.14639/0392-100X-2072.
4. Sharma A, Jain S, Sen K, Gupta A. Clinical outcome following septoplasty with or without inferior turbinate reduction. Int J Otorhinolaryngol Head Neck Surg 2020; 6(9): 1651. https://doi.org/10.18203/issn.2454-5929.ijohns20203567.
5. Seden N, Araz Server E, Yigit O. Does turbinate reduction combined with septoplasty have better outcomes than septoplasty alone? A randomised, controlled study. J Laryngol Otol 2022; 136(1): 55-59. https://doi.org/10.1017/S0022215121003340.
6. Bin Lajdam G, Alaryani K, Ghaddaf AA, Aljabri A, Halawani A, Alshareef M, et al. Septoplasty versus septoplasty with turbinate reduction for nasal obstruction due to deviated nasal septum: a systematic review and meta-analysis. Rhinology 2022; 60(6): 411-420. https://doi.org/10.4193/Rhin22.157.
7. Bergmark RW, Gray ST. Surgical Management of Turbinate Hypertrophy. Otolaryngol Clin North Am 2018; 51(5): 919-928. https://doi.org/10.1016/j.otc.2018.05.008.
8. Chhabra N, Houser SM. Surgery for allergic rhinitis. Int Forum Allergy Rhinol 2014; 4 Suppl 2: S79-83. https://doi.org/10.1002/alr.21387.
9. Abdullah B, Singh S. Surgical Interventions for Inferior Turbinate Hypertrophy: A Comprehensive Review of Current Techniques and Technologies. Int J Environ Res Public Health 2021; 18(7): 3441. https://doi.org/10.3390/ijerph18073441.
10. Alghamdi FS, Albogami D, Alsurayhi AS, Alshibely AY, Alkaabi TH, Alqurashi LM, et al. Nasal Septal Deviation: A Comprehensive Narrative Review. Cureus. 2022; 14(11): e31317. https://doi.org/10.7759/cureus.31317.
11. Karamatzanis I, Kosmidou P, Ntarladima V, Catalli B, Kosmidou A, Filippou D, et al. Inferior Turbinate Hypertrophy: A Comparison of Surgical Techniques. Cureus. 2022; 14(12): e32579. https://doi.org/10.7759/cureus.32579.
12. Ye T, Zhou B. Update on surgical management of adult inferior turbinate hypertrophy. Curr Opin Otolaryngol Head Neck Surg 2015; 23(1): 29-33. https://doi.org/10.1097/MOO.0000000000000130.
13. Kim DH, Kim SW, Hwang SH. Efficacy and safety of endoscopic septoplasty for treating nasal septal deviations compared with conventional septoplasty: A systematic review and meta-analysis. Clin Otolaryngol 2023; 48(2): 108-121. https://doi.org/10.1111/coa.14021.
14. Samarei R, Mabarian S. A randomised trial comparing the subjective outcomes following septoplasty with or without inferior turbinoplasty. Eur Ann Otorhinolaryngol Head Neck Dis 2020; 137(4): 277-283. https://doi.org/10.1016/j.anorl.2020.01.024.
15. Shamanna K, Godse A. Comparative study on outcome of septoplasty with or without turbinoplasty based on NOSE score. Res Otolaryngol 2018; 7(3): 55-59.
16. Ahmad N, ud Din I, Gul I. Why Nasal Septal Surgery Alone is not Sufficient to Relieve Nasal Obstruction in Case of Deviated Nasal Septum?. J Med Sci 2017; 25(1 Suppleme): 115-118.
17. Assanasen P, Choochurn P, Banhiran W, Bunnag C. Radiofrequency inferior turbinate reduction improves smell ability of patients with chronic rhinitis and inferior turbinate hypertrophy. Allergy Rhinol (Providence) 2014; 5(1): 12-16. https://doi.org/10.2500/ar.2014.5.0077.
18. Han JK, Stringer SP, Rosenfeld RM, Archer SM, Baker DP. Clinical Consensus Statement: Septoplasty with or without Inferior Turbinate Reduction. Otolaryngol Head Neck Surg 2015; 153(5): 708-720. https://doi.org/10.1177/0194599815606435.