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ORIGINAL ARTICLE

Comparison of outcomes of conventional septoplasty vs conservative endoscopic septoplasty

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ABSTRACT

Background: Nasal obstruction is a prevalent issue in rhinologic practice, with a deviated nasal septum being a primary cause. The assessment of septal deviation, which contributes to nasal obstruction, largely relies on physical examinations and imaging techniques. This study was conducted to compare the outcome of conventional septoplasty and conservative endoscopic septoplasty for symptomatic deviated nasal septum.

Methods: The ENT Department at Sheikh Zayed Hospital in Lahore carried out this randomized controlled study (ClinicalTrials.gov Identifier: NCT07434765). Total 210 adults between the ages of 16 and 50 who have been diagnosed with DNS were included. Individuals with allergic rhinitis, vasomotor rhinitis, acute infection, and other systemic illnesses and have undergone other nasal procedure such as turbinectomy were excluded. A sample of 210 cases were randomized into two groups based on the lottery method: 105 were undergone conventional septoplasty (Group A), and 105 were undergone conservative endoscopic septoplasty (Group B). Postoperative follow-up was done to evaluate Symptom relief (nasal obstruction, headache, nasal discharge), Endoscopic findings (residual deviation, septal perforation, synechiae formation, delayed healing), and Operative outcomes (intraoperative blood loss and operative duration).

Results: In this study, group A's mean operative time and intra-operative blood loss were 44.87 ± 11.14 minutes and 72.90 ± 10.78 ml respectively, while group B's was 32.20 ± 7.89 minutes and 51.07 ± 6.77 ml. Post-operative nasal obstruction, headache and nasal discharge at three weeks were 6.67%, 9.52%) and 5.71% in group A and 0.95%, 1.90% and 0.95% in group B. Conventional septoplasty had a substantially higher residual deviation, septal perforation and Synechiae Formation than endoscopic septoplasty (7.62% vs. 1.90%, 6.67% vs 0.95% and 11.43% vs 2.86%).

Conclusion: In contrast to traditional septoplasty, endoscopic septoplasty showed better postoperative symptom alleviation and fewer complications in this study.

Keywords: Deviated Nasal Septum, Septoplasty, Nasal Obstruction.

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Introduction

Nasal obstruction is a prevalent issue in rhinologic practice, with a deviated nasal septum being a primary cause. The assessment of septal deviation, which contributes to nasal obstruction, largely relies

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on physical examinations and imaging techniques (1).

Beyond nasal obstruction, a significantly deviated septum has been associated with conditions like epistaxis, sinusitis, obstructive sleep apnea, and headaches, often due to contact points with lateral nasal wall structures (2). For the surgical correction of the nasal septum to be considered ideal, it should meet several criteria: (a) effectively alleviate nasal obstruction; (b) adopt a conservative approach; (c) avoid causing any unintended deformities and (d) allow for revision surgery if needed (3). Previously, submucous resection was performed as a radical approach but came with various complications. Several surgical techniques have been developed for correcting a deviated nasal septum, with numerous modifications introduced since the procedure's inception. Initially, submucous resection of the septum was the standard approach; however, this was a more invasive surgery that often led to multiple complications (4).

Traditional surgeries like conventional septoplasty, while improving nasal airflow, often fail to meet all these criteria due to limitations such as inadequate visualization, restricted access, poor illumination, and difficulties in accurately evaluating the pathology. These challenges can lead to unnecessary tissue manipulation and resection, overexposure of the septal structure, the need for nasal packing, and reduced potential for future revision surgeries (5). The use of a nasal endoscope has enhanced the precision in identifying septal pathologies and related lateral nasal wall abnormalities, facilitating better planning for conservative endoscopic septal surgeries. A targeted conservative endoscopic septoplasty approach is particularly beneficial for treating isolated septal spurs without extensive septal deviations. This approach minimizes dissection and promotes faster postoperative recovery (6).

Trimartani and Damara (2023) found that conservative endoscopic septoplasty presents a reduced risk of complications, with long-term benefits for nasal obstruction likely comparable between the two techniques. (7)A study found that mean blood loss was greater in conventional septoplasty (88.67mL) compared to endoscopic septoplasty group (54.6mL) (5). Postoperatively, headache improved in 83% of patients in the conventional septoplasty group and 100% in the endoscopic group, while nasal obstruction improved in 88% and 97%, respectively, showing better symptom relief with endoscopic septoplasty (8). Another study noted that endoscopic septoplasty also showed significantly less blood loss and shorter operative time. Nasal deviation was right-sided in 51.6% and left-sided in 48.4% of cases (9).

The purpose of this study is to compare the outcomes of conventional septoplasty and conservative endoscopic septoplasty in patients with nasal septum deviation. By evaluating these two approaches, the study aims to determine which technique provides more effective relief of nasal obstruction while minimizing complications and preserving nasal structure for potential future surgeries. This comparison seeks to inform best practices in septal surgery, enhancing patient care and guiding surgeons in selecting the most beneficial approach for nasal septum correction.

Methods

The ENT Department at Sheikh Zayed Hospital in Lahore carried out this randomized controlled trial (ClinicalTrials.gov Identifier: NCT07434765) from 20th November 2025 to 19th February

2026 with institutional ethical review committee permission (Refno.02TERC/NHRC-SZH/INT-SC/896).

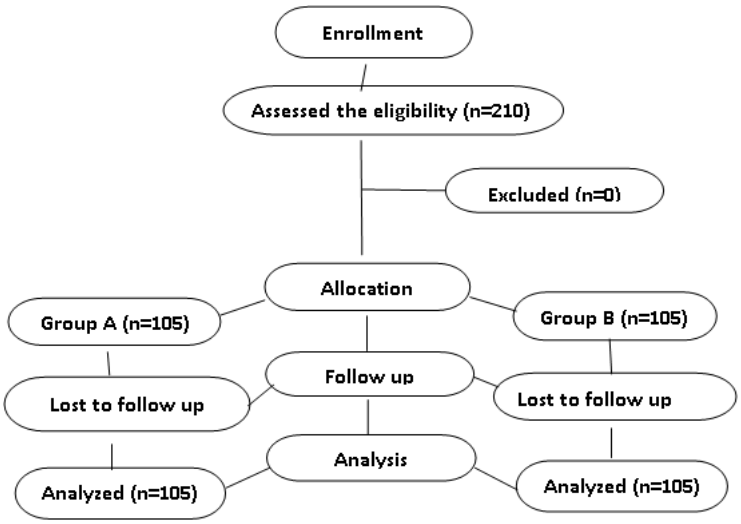
The sample size of 210 (105 per group) was estimated using 80% power, 95% confidence level, and 88% vs 97% improvement in nasal obstruction (8). Adults between the ages of 16 and 50 who have been diagnosed with symptomatic deviated nasal septum were included. Individuals with allergic rhinitis, vasomotor rhinitis, acute infection, and other systemic illnesses and have undergone other nasal procedure such as turbinectomy were excluded.

A sample of 210 cases were selected using a non-probability consecutive sampling technique, with patients randomized into two groups based on the lottery method: 105 were undergone conventional septoplasty (Group A), and 105 were undergone conservative endoscopic septoplasty (Group B). Detailed patient history and clinical examination were recorded, and each case was evaluated subjectively and objectively preoperatively. Nasal septal deviation was classified based on the side (right, left, or S-shaped) and anatomical involvement (anterior, posterior, or both), with posterior rhinoscopy and diagnostic nasal endoscopy were performed as needed to rule out other pathologies. For patients in the conventional septoplasty group, the traditional surgical technique for septoplasty was applied in which bilateral flap elevation was done. In the conservative endoscopic septoplasty group, an incision was made 2 mm posterior to the caudal end of the septum (hemitransfixation) on the concave side to access the bony-cartilaginous junction abnormality. The initial mucoperichondrial flap was elevated. Proper plane elevation was performed to minimize bleeding, and exposure was limited to the targeted area. For cases involving subluxated cartilage from the crest, excess cartilage was carefully trimmed with a No.15 blade Bard-Parker knife without disrupting the vomerochondral junction. Cartilage near the anterior nasal spine was repositioned over the crest to prevent supra-tip deformity. Any laterally projecting vomerine spur or overlapping cartilage was resected. In instances of posterior deviation or ethmochondral junction deviation, the bony septum was fractured for midline alignment or minimally resected at the ethmoidal plate's caudal end. A 'C' shaped deviation was corrected through precise wedge resections to target strategic locations.

For caudal dislocation or anterior buckling of the cartilage, correction was performed after the remainder of the septum is aligned. In cases with a spur but no other septal deformities, a resection was conducted with an anterior incision. Incisions made at the mucocutaneous junction was closed with 3-0 chromic catgut sutures. A gross anterior deviation was first addressed with a traditional approach, while any posterior deformities were corrected endoscopically. Postoperative care included a course of antibiotics for at least one week, along with analgesics and decongestants. Nasal packs were removed 24 hours after surgery, and saline nasal douching was recommended for a week. Patients were discharged on the third postoperative day. Postoperative follow-up was done to evaluate Symptom relief (nasal obstruction, headache, nasal discharge), Endoscopic findings (residual deviation, septal perforation, synechiae formation, delayed healing), and Operative outcomes (intraoperative blood loss and operative duration). All data was recorded on a structured proforma.

Data was analyzed in the SPSS V.25. Frequency and percentages were used to display the qualitative data (such as gender,

presence/absence of nasal obstruction, headache, nasal discharge, and septal perforation). The means and standard deviations were used to display quantitative data (age, operative time, intraoperative blood loss). The independent t-test was used for quantitative data and the chi-square test for qualitative data for comparing the two groups. A P-value less than 0.05 was deemed significant.



Results

The average age was 36.90 ± 7.86 years. The average age of the patients in groups A and B was 36.07 ± 7.92 and 36.73 ± 8.61 years, respectively. Of the 210 patients, 128 (60.95%) were men and 82 (39.05%) were women, resulting in a male to female ratio of 1.5:1. Distribution of different variables is shown in Table I.

Table-I: Distribution of different variables (n=210).

Variables	Group A (n=105) Number (%)	Group B (n=105) Number (%)		P-value
Age (years)	16-30	55 (52.38%)	58 (55.24%)	0.678
	31-50	50 (47.62%)	47 (44.76%)	
Gender	Male	66 (62.86%)	62 (59.05%)	0.571
	Female	39 (37.14%)	43 (40.95%)	
Pre-Operative Symptoms	Nasal obstruction	58 (55.24	54 (51.43%)	0.841
	Headache	24 (22.86%)	25 (23.81%)	
	Nasal discharge	23 (21.90%)	26 (24.76%)	
Gertner Grading for Nasal Airflow	1	21 (20.0%)	18 (17.14%)	0.866
	2	34 (32.38%)	35 (33.33%)	
	3	42 (40.0%)	41 (39.05%)	
	4	08 (7.62%)	11 (10.48%)	
Rhinoscopic Findings	Right sided DNS	48 (45.71%)	47 (44.76%)	0.916
	Left sided DNS	45 (42.86%)	44 (41.90%)	
	Bony spur	12 (11.43%)	14 (13.33%)	

In this study, group A's mean operative time and intra-operative blood loss were 44.87 ± 11.14 minutes and 72.90 ± 10.78 ml respectively, while group B's was 32.20 ± 7.89 minutes and 51.07 ± 6.77 ml (Table 2).

Table-2: Comparison of outcome.

Variables	Group A (n=105)	Group B (n=105)	p-value
	Mean ± SD	Mean ± SD	
Operative time (min)	44.87 ± 11.14	32.20 ± 7.89	0.0001
Intra-operative Blood Loss (mL)	72.90 ± 10.78	51.07 ± 6.77	0.0001

Post-operative nasal obstruction, headache and nasal discharge at three weeks were 6.67%, 9.52%) and 5.71% in group A and 0.95%, 1.90% and 0.95% in group B (Table 3).

Table 3: Post-Operative Symptom Assessment at 3 weeks.

Variables		Group A (n=105)	Group B (n=105)	P-value
Nasal obstruction	Yes	07 (6.67%)	01 (0.95%)	0.031
	No	98 (93.33%)	104 (99.05%)	
Headache	Yes	10 (9.52%)	02 (1.90%)	0.017
	No	95 (90.48%)	103 (98.10%)	
Nasal discharge	Yes	06 (5.71%)	01 (0.95%)	0.055
	No	99 (94.29%)	104 (99.05%)	

Conventional septoplasty had a substantially higher residual deviation, septal perforation and Synechiae Formation than endoscopic septoplasty (7.62% vs. 1.90%, 6.67% vs 0.95% and 11.43% vs 2.86%) (Table 4).

Table 4: Comparison of Post-Operative Complications.

Parameters		Group A (n=105)	Group B (n=105)	P-value
Residual Deviation	Yes	08 (7.62%)	02 (1.90%)	0.052
	No	97 (92.38%)	103 (98.10%)	
Septal perforation	Yes	07 (6.67%)	01 (0.95%)	0.031
	No	98 (93.33%)	104 (99.05%)	
Synechiae Formation	Yes	12 (11.43%)	03 (2.86%)	0.016
	No	93 (88.57%)	102 (97.14%)	

Discussion

There were 210 instances in the current study. All 210 patients were clinically evaluated after being split into two groups, of which 105 had endoscopic septoplasty and 105 had conventional septoplasties. It was 36.90 ± 7.86 years old on average. Patients in groups A and B had respective average ages of 36.07 ± 7.92 and 36.73 ± 8.61 years. According to Singh R et al. (10), the majority of patients (64%) in the traditional septoplasty group and 72% in the endoscopic group were between the ages of 18 and 40.10. Just 26.6% of patients in a different study by Dhaka R et al. were older than 30. The patients were in the 10–30 age range (11). The male-to-female ratio for septal deviation in our study was 1.5:1, and people in their second to fourth decades of life were the most often impacted age group. These results are consistent with those of Alsehli A et al (12). and Kulkarni MR et al. (13), who found that the average age of 28.8 years was associated with a peak incidence in the 26–35 age group and a greater prevalence in males. Similarly, Besharah BO et al discovered that most patients were between the ages of 15 and 30. The mean ages of their two study groups were 25.35 and 25.55 years, and that the prevalence

was higher in males (70% in the conventional group and 55% in the endoscopic group) (6).

In both groups in this study, nasal obstruction was the most prevalent symptom. 23.81% of patients in the endoscopic group and 22.86% of patients in the traditional group experienced a headache. A study by Darji BL et al (14). found that 78.3% of patients complained of nasal blockage, 76.66% of patients experienced headaches, 45.0% of patients had rhinorrhea, and 58.33% of patients had post-nasal discharge. This finding is similar to that study. In a different study by Dawood MR et al. (15), 74% of patients had nasal blockage as their main symptom. Similar findings were made by Besharah BO et al (6), who discovered that nasal blockage occurred in 100% of cases, although headache (42.5%) and postnasal drip (20%) were less frequent. According to Khan MN et al, the most common symptom was nasal obstruction (58.26%), which was followed by headache (30.04%) and nasal discharge (30.04%) (16).

The average time for endoscopic surgery was 32 minutes, while the average time for conventional surgery was 44 minutes. The statistically significant p value demonstrated that endoscopic procedures were quicker and resulted in time savings. This result is consistent with the findings of Jino ME et al., Nassrullah S et al., and Doomra S et al., who found that endoscopic surgery took 15–27 minutes, but conventional surgery took 23–34 minutes (17-19). Endoscopic procedures take longer than traditional ones, according to Khan et al. The mean intra-operative time for endoscopic septoplasty was slightly longer at 38.7 minutes with a standard deviation of ±4.77 minutes, compared to 36.35 minutes with a standard deviation of ±5.33 minutes for traditional septoplasty (16).

The endoscopic group lost 51 milliliters of blood on average, while the conventional group lost 72 milliliters. The p-value indicated that, in terms of intraoperative blood loss, endoscopic method outperformed traditional surgery. According to one study, the group that underwent traditional septoplasty lost more blood on average (88.67 mL) than the group that underwent endoscopic septoplasty (54.6 mL) (5).

In both groups, headache and nasal obstruction were the most prevalent symptoms. It is easy to conclude that the majority of patients in the endoscopic group did not exhibit any complications after the third week of post-operative follow-up. Both groups continued to have headaches and nasal blockages. The majority of patients in both groups did not exhibit any complications at the final follow-up. However, compared to the conventional group, the endoscopic group's number was significantly lower. According to a study by Singh R et al. (10), both the conventional and endoscopic groups saw clinical improvement mostly in nasal blockage. A comparison of the two groups' symptom reduction at the conclusion of eight weeks revealed a statistically significant difference, according to another study by Bhardwaj H et al (6).

Synechiae formation was the most frequent complication in the current study, and it was more likely in individuals who had conventional septoplasty. Similar findings were made by Kour B. et al (20) Suraneni VR. et al (21), Singh A. et al (22), and Rambabu P. et al (23), who discovered that they were more common with traditional septoplasty than with endoscopic septoplasty.

In endoscopic septoplasty, the rate of synechiae may be reduced by less mucosal damage and precise placement of the Silastic ® sheet, as well as by improved visualization

during flap dissection and separation (24.25). Endoscopy results in fewer postoperative complications. According to the findings of the study by Mandal S. et al (26), the endoscopic approach demonstrated a more inclusive clinical profile with fewer complications, finer enlightenment, improved approachability to remote locations, less blood loss, and a shorter operating time than the conventional method.

Additionally, Bhandary R and Shetty R (27) came to the conclusion that, in comparison to the conventional procedure, endoscopic septoplasty allows for a flawless and conservative reconstruction of the obstructive deviated nasal septum with fewer problems and superior functional results. According to a study by Haque et al (28), appropriate patient counseling and pre-operative evaluation are essential for the best post-operative outcome and conformity because the reparatory ability of endoscopic septoplasty varies depending on the type of deviated nasal septum, as determined both subjectively and objectively. However, research by Na'ara S. et al (29) found that endoscopic and conventional trans nasal trans-speculum septoplasty both produce comparable outcomes when treating a deviated nasal septum.

Endoscopic septoplasty demonstrated greater postoperative clinical improvement for headache (100% vs. 80%) and nasal obstruction (93% vs. 86%), according to Dhaka R et al (11). With fewer instances of synechiae and chronic pathology, the endoscopic group experienced fewer complications. Improved visibility and accessibility to isolated spurs and posterior deviations were made possible by endoscopic septoplasty. On the other hand, exterior abnormalities and anterior deviations were better treated with traditional septoplasty. Compared to the conventional group (80%), the endoscopic group had a shorter postoperative stay (88% released within 48 hours). In some complex circumstances, the combination of methods proved advantageous (11).

All things considered, endoscopic septoplasty has a number of benefits, such as improved visualization, less invasiveness, quicker recovery, and educational value. These advantages, as well as its application in complicated situations, demonstrate its superiority over traditional approaches in certain situations.

Conclusion

In contrast to traditional septoplasty, endoscopic septoplasty showed better postoperative symptom alleviation and fewer complications in this study. Better illumination, magnification, accurate correction, and use in treating solitary spurs, posterior and high septal abnormalities, and as a prelude to other nasal procedures are some of its benefits. It is also a useful tool for documentation and instruction. For the correction of external nasal abnormalities, anterior deviations, and cartilage-level damage, conventional septoplasty is still the best option. Both methods are complementary to one another and can sometimes be used in tandem to produce the best results. Despite its drawbacks and learning curve, endoscopic septoplasty has many therapeutic advantages.

Limitations:

Because this was a single-center study with a small sample size, the findings might not be widely relevant. Due to the relatively short follow-up time, our study did not assess long-term effects beyond the follow-up period.

Recommendations

Achieving the greatest outcomes still requires careful preoperative evaluation and suitable

patient selection. Future research should concentrate on bigger sample size, multicenter trials with longer follow-up periods. To strenghthen clinical evidence, standardized objective measurements and quality-of-life assessments should be included.

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All the authors agree to take responsibility for every facet of the work, making sure that any concerns about its integrity or veracity are thoroughly examined and addressed.