ORIGINAL RESEARCH

To compare the post-operative outcomes and effectiveness of endoscopic septoplasty and Conventional septoplasty in the treatment of deviated nasal septum at a tertiary care centre:A comparative study

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ABSTRACT

Background: To compare the effectiveness of endoscopic septoplasty and conventional septoplasty in the treatment of deviated nasal septa.**Materials and methods:** The research comprised 80 patients, of either gender, between the ages of 20 and 60, who had symptomatic deviated nasal septum (DNS). Patients experiencing symptoms from a deviated nasal septum do not respond to non-invasive medical therapy. This research covered five symptoms for consideration: nasal obstruction, postnasal discharge, headache, epistaxis, and hyposmia. The research excluded individuals with allergic or vasomotor rhinitis, nasal masses, nasal polyps, and revision patients. Group A consisted of 50 patients who received endoscopic septoplasty (ES), whereas Group B consisted of another 50 instances that underwent conventional septoplasty (CS) under local anaesthesia.**Results:**The current investigation revealed that the most common symptom before surgery was nasal blockage, affecting 91% of the participants. This was followed by headache (55%), postnasal drip (50%), hyposmia (48%), and epistaxis (31%). During the 90-day follow-up visit, residual deviation was seen in 42.5% of patients in the conventional group, compared to just 7.5% of patients in the endoscopic group (P = 0.001). In the conventional group, 15 out of 40 patients (37.5%) acquired synechiae, whereas in the endoscopic group, only 4 out of 40 patients (10%) got synechiae. The difference in the incidence of synechiae between the two groups was statistically significant (P = 0.01).**Conclusion:** Both conventional and endoscopic septoplasty were found to be highly effective in alleviating symptoms. However, endoscopic septoplasty demonstrated significantly superior results due to its precise identification of pathology, improved illumination, enhanced accessibility to remote areas, and magnification. ES is linked to a significant decrease in post-operative morbidity because it limits the occurrence of flap dehiscence.

Keywords: Nasal septum, Endoscopic, Conventional, Septoplasty

INTRODUCTION

The nasal septum is the bony and cartilaginous structure inside the nose that divides the nasal cavity into two distinct nostrils. Typically, the septum is positioned in the centre, resulting in symmetrical nasal passageways. A deviated septum is a pathological disease characterized by the lateral deviation of the cartilaginous ridge, resulting in the blockage of the corresponding nasal canal. An undiagnosed deviated septum may remain uncorrected for an extended period of time. This problem may lead to inadequate sinus drainage and consequent sinusitis, breathing difficulties, headaches, nosebleeds, and sleep abnormalities such as snoring or sleep apnea.[1,2] In 1991, Lanza et al.[3] and Stammberger[4] were the first to report the use of endoscopic methods for correcting septal deformities. Lanzaet al.[3] provided a comprehensive endoscopic method for treating isolated septal spurs.

In rhinologic practice, nasal obstruction is the most common complaint, and its most common cause is a deviated nasal septum. Epistaxis, sinusitis, obstructive sleep apnea, and headaches related to contact points with lateral nasal wall structures have all been

attributed to a significantly deviated nasal septum.[5] Compared to patients undergoing endoscopic septoplasty, those undergoing traditional septoplasty need to stay longer because of bleeding or lip oedema. By precisely guiding the shaving of septal cartilage, the endoscope also helped with limited resection and thus better conservation.[6] Giles et al. assessed the function of endoscopic septoplasty as a supplementary procedure to functional endoscopic sinus surgery. With the increasing popularity of endoscopic procedures, endoscopic septoplasty is a rapidly developing concept that is becoming more and more popular.[7]The use of endoscopic procedures during septoplasty significantly improves visualisation. It is possible to focus on specific septal pathologies like contact points, spurs, perforations, and isolated deflections.[8]

AIMS AND OBJECTIVES

- To compare the effectiveness of endoscopic septoplasty and traditional septoplasty in the treatment of deviated nasal septum
- To evaluate the advantages, disadvantages, and complications of both endoscopic and traditional septoplasty.

MATERIALS AND METHODS

The present research was an interventional randomised control trial that included a sample of 80 patients, of either gender, between the ages of 18 and 65, who had symptomatic deviated nasal septum (DNS) admitted to the ENT emergency/OPD, Department of Otorhinolaryngology (ENT),Shree Narayan Medical Institute and Hospital, Saharsa, Bihar, India. Written consent from parents was obtained in order to take part in the study. The study was conducted from February 10, 2022 to September 25, 2022. Keeping power (1-beta error) at 80% and confidence interval (1-alpha error) at 95%, the minimum sample size required was 60 patients; therefore, we included 80 (more than the minimum required number of cases) patients in the present study.The Institutional Ethics Committee gave the study its approval. Data such as name, age, etc. was recorded.

INCLUSION CRITERIA

- Age between 20 and 69 years;
- Patient with symptomatic deviated nasal septum, nasal obstruction, chronic rhino sinusitis,
- Patient suffering from complications like epistaxis and snoring.

EXCLUSION CRITERIA

- Age less than 20 years and more than 60 years;
- External deviation with a deviated nasal septum.

Patients experiencing symptoms from a deviated nasal septum do not respond to non-invasive medical therapy. This research covered five symptoms for consideration: nasal obstruction, postnasal discharge, headache, epistaxis, and hyposmia. The research excluded individuals with allergic or vasomotor rhinitis, nasal masses, nasal polyps, and revision patients. The study received approval from the Institutional Review Board. All individual subjects participating in the research provided informed, signed consents. Each patient had a comprehensive clinical assessment, which included an inquiry into their symptoms (namely, nasal blockage, headache, postnasal drip, hyposmia, and epistaxis) as well as thorough ear, nose, and throat (ENT) tests. The individuals had radiographic examinations, namely an X-ray of the para-nasal sinus (PNS) and a non-contract computerised tomogram of the nose and PNS, in order to exclude any nasal abnormalities. A thorough examination of the nasal passages was performed using rigid 0 and 30 degree 4 mm Hopkins rod endoscopes, while the patient was under local anaesthesia with 4% xylocaine without the use of vasoconstrictors. Observations were made about the presence of DNS (deviated nasal septum), nasal polyps, turbinate hypertrophy, and chronic sinusitis. The information was meticulously documented in a tailored proforma. The patients were allocated into two groups using a simple randomization process with single blinding, depending on the surgical treatment they underwent. Group A consisted of 40 patients who received endoscopic septoplasty (ES), whereas Group B consisted of another 40 instances that underwent conventional septoplasty (CS) under local anaesthesia.

METHODOLOGY

Endoscopic septoplasty: The operation used rigid endoscopes with a diameter of 4 mm, available in both 0° and 30° angles. An infiltration of Xylocaine 2% with adrenaline was administered bilaterally immediately anterior to the deviation. A cut was made below the deviation on the outer side, running approximately parallel but towards the head of the traditionally described incision used for hemi-transfixation. The surgeon elevated muco-perichondrial and muco-periosteal flaps to expose any deviation, whether it was caused by bone, cartilage, or a mix of both. The cartilage was cut in a parallel manner, positioned below the flap incision, and located towards the tail end of the deviation. If the deviation was osseous, the incision was performed at the intersection between the bone and cartilage. A mucoperichondrial elevator was introduced through the incision in the cartilage, and a flap of muco-perichondrial/mucoperiosteal tissue was elevated on the other side. The deviance was removed. Efforts were made to ensure that enough dorsal cartilage was preserved in order to maintain the form of the nasal dorsum. The flaps were repositioned in their anatomical places. To address septal spurs, a surgical cut was made on the same side as the spur, running parallel to the nasal floor, at the highest point of the spur. The flaps were raised in a superior and inferior direction using an elevator in order to reveal the

underlying bony or cartilaginous spur. A surgical instrument called an osteotome was placed against the bottom of the bony growth and used to eliminate it. The remaining fragments of the spur were removed using endoscopic forceps by making precise cuts. Then the flaps were returned to their original places. The nasal cavity was packed with merocele.

Conventional septoplasty: Following the administration of a 2% solution of xylocaine with adrenaline into the columella and septum under a spotlight, an incision was made at the caudal boundary using a hemi transfixion technique. The flaps of the mucoperichondrium and mucoperiosteum were raised until they reached the perpendicular plate of the ethmoid bone. The Osseo cartilaginous junction was displaced. A section measuring 0.5 cm from the front edge of the perpendicular plate of the ethmoid bone was extracted using Luc's forceps. If needed, a substandard cartilaginous strip of 0.5 cm was excised. The surgical cut was sealed with chromic catgut (3-0), and the nasal cavity was filled with packing material. Intra-operatively, the following parameters were noted:

- Surgical duration,
- Intraoperative blood loss.

Patients received oral antibiotics, analgesics, and antihistamines. They were discharged from the hospital after the removal of the pack 48 hours later.

After the operation, all patients were monitored as outpatients at 7, 14, 28, and 90 days. During these follow-up visits, their pre-operative symptoms, including nasal blockage, headache, postnasal drip, hyposmia, and epistaxis, were evaluated for any subjective improvement. Following that, a nasal endoscopic examination was conducted to provide an objective evaluation within the same session. The following observations were made during the endoscopy:

- Continuation of the deviation,
- Presence of a spur,
- Development of synechiae,
- Occurrence of septal perforation.

STATISTICAL ANALYSIS

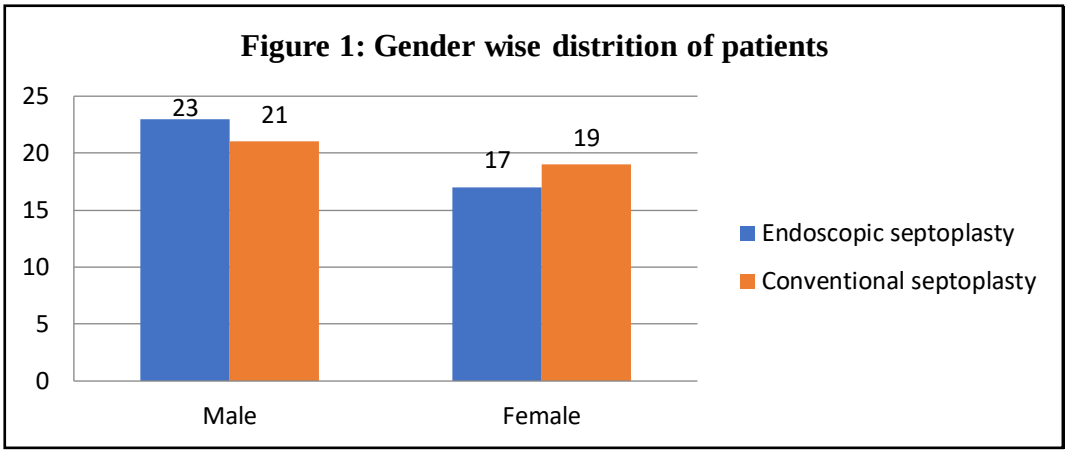
The collected data was analysed using Microsoft Excel 16 and SPSS version 21. The study's statistical analysis used the Chi square test, with a p-value of 0.05 being deemed statistically significant.

RESULTS

The present study included a total of 80 patients. Out of 80 patients, 36 were females and 44 were males respectively. Out of a total of 36 females, 17 patients opted for endoscopic septoplasty, whereas 19 patients chose traditional septoplasty.

Table1: Demographic characteristicsof the Patients

Characteristics	Endoscopic septoplasty		Conventional septoplasty		P value
	Number (n=40)	Percentage	Number (n=40)	Percentage	
Gender					
Male	23	57.5%	21	52.5%	<0.05
Female	17	42.5%	19	47.5%	
Age in years					
Below 30	11	27.5%	9	22.5%	<0.05
30-45 years	22	55%	17	42.5%	
Above 45	7	17.5%	14	35%	



Out of a total of 44 men, 23 patients opted for endoscopic septoplasty, whereas 21 patients chose traditional septoplasty. The findings revealed a predominance of male patients over their female counterparts. The patients' ages varied between 20 and 60 years with a mean age of 36.78±4.26 years. The bulk of our patients were between the ages of 20 and 40 years old (Table 1, Figure 1). The difference between the two groups was statistically significant (P<0.05).

Table 2: Pre-operative symptoms among two groups

Symptoms	Endoscopic Septoplasty (n=40)		Conventional Septoplasty (n=40)		Total (n=80)	
	Number	Percentage	Number	Percentage	Number	Percentage
Nasal obstruction	31	77.5%	37	92.5%	68	85%
Headache	22	55%	23	57.5%	45	56.25%
Postnasal drip	19	47.5%	21	52.5%	40	50%
Hyposmia	20	50%	17	42.5%	37	46.25%
Epistaxis	9	22.5%	15	37.5%	24	30%

The current study show that the most common symptom before surgery was nasal blockage, affecting 85% of the participants. This was followed by headache (56.25%), postnasal drip (50%), hyposmia (46.25%), and epistaxis (30%), as shown in Table 2.

Table 3: Duration and volume of blood loss during surgery

Parameter	Endoscopic septoplasty	Conventional septoplasty	P value
	Mean ±SD	Mean ±SD	
Duration of surgery(minute)	24.85± 5.40	32.65± 6.53	0.40
Volume of blood loss (ml)	53.95± 5.82	86.52± 8.72	0.01

We observed that the mean duration for Conventional septoplasty was 32.65 minutes, with a Endoscopic septoplasty standard deviation of 6.53. However, it is worth noting that endoscopic septoplasty took an average of 24.8 minutes, with a standard deviation of 5.40 minutes, as shown in Table 3. The difference between the two groups was not statistically significant. Hemorrhage occurring during a surgical procedure: The mean blood loss in milliliters (ml) for the conventional septoplasty (CS) group was 86.52 ml, while the endoscopic septoplasty (ES) group had a mean blood loss of 53.95ml (Table 3). The amount of blood loss was greater in the CS group. The difference between the two groups was not statistically significant (P<0.05).

Table 4: Comparison of relief in symptoms in both groups at the end of 90th day

Symptoms	Endoscopic group (n=40)			Conventional group (n=40)		
	Total number	Number of patients after relief	Percentage (%)	Total number	Number of patients after relief	Percentage (%)
Nasal obstruction	31	29	95.56%	37	23	62.16%
Headache	22	19	86.36%	23	13	56.52%
Postnasal drip	29	22	75.86%	21	7	33.33%
Hyposmia	20	17	85%	17	11	64.70%
Epistaxis	9	7	77.78%	15	0	66.67%

The post-operative outcome was evaluated by categorising it into subjective and objective assessments at the end of 90th day. Both groups of patients had a significant increase in their subjective well-being. We observed that in Endoscopic group,95.56% reduction in nasal blockage, an 86.36% improvement in nasal headache, and a 75.86% improvement in postnasal drip. The occurrence of hyposmia was seen in 85% of patients and Epistaxis was reported in 77.78% of patients in endoscopic septoplasty group. In contrast, the Conventionalseptoplasty group showed improvements in nasal obstruction (62.16%), headache (56.52%), post-nasal drip (33.33%), hyposmia (64.70%), and epistaxis (66.67%), as seen in Table 4. The disparity in the alleviation of symptoms was shown to be quite substantial.

Table 5: Objective assessment in both groups at the end of 90th day

Parameter	Endoscopic group		Conventional group		P value
	Number of patients (n=40)	Percentage	Number of patients (n=40)	Percentage	
Persistence of deviation	3	7.5%	17	42.5%	0.001
Persistence of spur	2	5%	9	22.5%	0.30
Formation of synechiae	4	10%	15	37.5%	0.01
Septal perforation	1	2.5%	6	15%	0.62

During the 90-day follow-up visit, residual deviation was seen in 42.5% of patients in the conventional group, compared to just 7.5% of patients in the endoscopic group (P = 0.001). In the conventional group, 15 out of 40 patients (37.5%) acquired synechiae, whereas in the endoscopic group, only 4 out of 40 patients (10%) got synechiae. The difference in the incidence of synechiae between the two groups was statistically significant (P = 0.01). The results were statistically significant, as shown in Table 5.

DISCUSSION

The present study aimed to compare the outcomes of conventional septoplasty with endoscopic septoplasty in patients with nasal septal abnormalities. A total of 80 patients were included in the study and were followed up for at least 3 months after the surgery. The outcomes were evaluated based on subjective symptomatic improvement, objective endoscopic findings, and the occurrence of post-operative complications. In this research, we aimed to assess the benefits and drawbacks of both endoscopic and traditional septoplasty.

The current study shows that predominant manifestation seen in patients with septal deviation in this research was nasal obstruction, reported by 85% of the participants. Headache was the second most prevalent symptom, reported by 56.25% of the patients, followed by post-nasal drip in 50% of the cases. Hyposmia was reported by 46.25% of the patients, and epistaxis by 30%.

The current results were comparable to the findings of Nayak DR et al.[9], in which 78.3% of patients reported nasal blockage as a complaint. Headache was reported by 76.66% of the participants, rhinorrhoea by 45%, post-nasal drip by 58.33%, and hyposmia by 8.33%. In separate research done by Gulatiet al.[10], 92% of patients reported nasal blockage, 58% reported headache, 50% reported catarrh, and 30% reported post-nasal discharge.

We observed that the mean duration for Conventional septoplasty was 32.65 minutes, with aEndoscopic septoplasty standard deviation of 6.53. However, it is worth noting that endoscopic septoplasty took an average of 24.8 minutes, with a standard deviation of 5.40 minute. The difference between the two groups was not statistically significant. Hemorrhage occurring during a surgical procedure: The mean blood loss in milliliters (ml) for the conventional septoplasty (CS) group was 86.52 ml, while the endoscopic septoplasty (ES) group had a mean blood loss of 53.95ml. The amount of blood loss was greater in the CS group. The difference between the two groups was not statistically significant (P<0.05).

Aiyeret al.[11] found a similar result, stating that the majority of patients (82%) who had endoscopic septoplasty experienced low blood loss (<50 ml), compared to just 45% in the traditional septoplasty group.

After the 90-day follow-up, there was a substantial disparity in symptom alleviation between the endoscopic septoplasty (ES) and conventional septoplasty (CS) groups. We observed that in Endoscopic group**,**95.56% reduction in nasal blockage, an 86.36% improvement in nasal headache, and a 75.86% improvement in postnasal drip. The occurrence of hyposmia was seen in 85% of patients and Epistaxis was reported in 77.78% of patients in endoscopic septoplasty group. In contrast, the Conventionalseptoplasty group showed improvements in nasal obstruction (62.16%), headache (56.52%), post-nasal drip (33.33%), hyposmia (64.70%), and epistaxis (66.67%). The disparity in the alleviation of symptoms was shown to be quite substantial. The findings from our observations aligned with the results of previous comparable investigations. Harley et al.[12]conducted a study where patients with nasal blockage and headaches were chosen. The researchers found that there was a substantial improvement in the group that had endoscopic procedures compared to the group that underwent traditional septoplasty. In comparison research conducted by Gulatiet al.[10], including 50 patients, it was shown that 90.5% of the cases reported improvement in their blockage using the endoscopic procedure, whereas 80% of the cases using the traditional way had alleviation. This further supports our results. Research conducted by Sindhwaniet al.[13] found that 54% of patients who reported nasal blockage and face discomfort were healed, 38% exhibited improvement, and 8% did not experience any benefits.

Harley et al.[12] conducted a study in which individuals with nasal blockage and headaches were chosen. The researchers found that the endoscopic group showed a substantial improvement compared to the conventional group. These discoveries bear a striking resemblance to our own. Park et al.[7] did research on

44 patients to evaluate the use of endoscopic-assisted repair of deviated noses with standard septorhinoplasty. Out of the total of 44 patients, 16 had endoscopic-assisted septoplasty, whereas the other patients got traditional septorhinoplasty. The endoscopic method resulted in a patient satisfaction rate of 87.5% and a complication rate of 0%. In contrast, the conventional approach had a patient satisfaction rate of 71.4% and a problem rate of 14.3%.

The current investigation found that the ES group of patients showed a statistically significant improvement in correcting septal deviation and spur compared to the CS group.

During the 90-day follow-up visit in current study, residual deviation was seen in 42.5% of patients in the conventional group, compared to just 7.5% of patients in the endoscopic group (P = 0.001). In the conventional group, 15 out of 40 patients (37.5%) acquired synechiae, whereas in the endoscopic group, only 4 out of 40 patients (10%) got synechiae. The difference in the incidence of synechiae between the two groups was statistically significant (P = 0.01).

This result is comparable to the findings of Nayaket al.[9]The study showed that only 10% of patients with anterior deviation had a chronic septal deformity. However, most instances of posterior deviations or spurs were adequately treated in the group that underwent endoscopic septoplasty. Additionally, they noted that endoscopic septoplasty has shown greater efficacy in alleviating symptoms such as nasal blockage and headaches, which aligns with the current findings. In the research conducted by Gileset al.[7], it was shown that the formation of synechiae occurred much less often in the ES group compared to the CS group. This aligns with the present research.

The findings of Prakashet al.[14] showed a statistically significant increased occurrence of complications in the conventional group (35%) compared to the endoscopic group (15%), which is comparable to our results. This finding exhibited some resemblance to the research conducted by Gupta et al.[15], Jain et al.[16], and Talluri et al.[17]. Both conventional and endoscopic techniques were shown to be helpful in reducing symptoms. However, endoscopic septoplasty was superior to the traditional procedure due to the use of an endoscope, which provides greater lighting, magnification, and improved access to areas with a high deviated nasal septum (DNS). This technique permits a restricted cut and lifting of tissue, resulting in minimal removal and achieving repair with the least amount of tissue resection. This approach minimises stress on the septum, resulting in a decrease in post-operative complications. By enabling intraoperative examination, it efficiently alleviates the headache caused by touch in the region of contact. In research done by Sousa et al.[18], it was shown that endoscopic nasal septal surgery offers a straightforward, efficient, and expedient alternative to traditional septoplasty.

Nevertheless, the endoscope has inherent limitations, such as the absence of binocular vision and the need for periodic cleaning of the endoscope tip, particularly in cases of excessive bleeding.[10]

Limitation of study: The small sample size and short duration of the study.

CONCLUSION

Both conventional and endoscopic septoplasty were found to be highly effective in alleviating symptoms. However, endoscopic septoplasty demonstrated significantly superior results due to its precise identification of pathology, improved illumination, enhanced accessibility to remote areas, and magnification. ES is linked to a significant decrease in post-operative morbidity because it limits the occurrence of flap dehiscence. Nevertheless, endoscopy is not without its limitations, such as the absence of binocular vision, the need for repeated cleaning of the tip in the presence of excessive bleeding, and the inability to rectify complicated deformities. Additional surgical expertise and more extensive comparable research will aid in resolving the challenge.

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