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CONVENTIONAL SEPTOPLASTY VERSUS ENDOSCOPIC SEPTOPLASTY: A COMPARATIVE STUDY

Otolaryngology

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ABSTRACT

Introduction: Septoplasty is surgery done to correct Deviated Nasal Septum. Endoscopic approach to septoplasty lessens the chances of injuring the vital structures and hence lessens the complications. This study was undertaken to study and compare the results and complications of conventional septoplasty with that of endoscopic septoplasty.

SETTING : Department of Otorhinolaryngology Govt.Medical College Amritsar.

Aims and Objectives

1. To compare between conventional septoplasty and endoscopic septoplasty in terms of efficacy in the relief of the symptoms.
2. To compare post operative pain, complication rate and hospital stay in endoscopic septoplasty when compared to conventional septoplasty.
3. To assess any specific septal deviations / defects where endoscopic septoplasty may have definite advantage over conventional septoplasty.

Material and Methods: 50 patients undergoing septal surgery for Nasal Obstruction were randomized to 2 groups of 25 each. 25 patients underwent endoscopic septoplasty approach and 25 underwent conventional septoplasty. Post operative data regarding relief of symptoms, any complications, and hospital stay was recorded in the follow up period for 3 months. Collected data was statistically analyzed between 2 groups and conclusions were drawn.

Results: It was found that endoscopic septoplasty is more effective in treating symptoms such as nasal obstruction and headache. Conventional septoplasty group patients had comparatively longer hospital stay (> 48 hours). Complications were lesser with endoscopic septoplasty.

Conclusion: Endoscopic septoplasty do have advantages over conventional septoplasty, but it has its own limitations. Thus, combined approach is best - endoscopic approach for inaccessible posterior deviation and the conservative traditional technique for accessible anterior deviation of the nasal septum.

KEYWORDS

INTRODUCTION

The nasal septum is an important physiological and supportive structure of nose.[1] Deviated nasal septum has been implicated in various rhinological complaints, which includes nasal obstruction, epistaxis, sinusitis and obstructive sleep apnea.[2]

Nasal obstruction is one of the most common complaint that otorhinolaryngologist faces in the day to day practice and deviated nasal septum is one of the most common cause for the nasal obstruction. It not only causes breathing difficulties but also results in improper aeration of paranasal sinuses predisposing to sinusitis and also results in drying of mucosa leading to crusting and epistaxis.[3]

Septoplasty is a commonly performed surgical procedure aimed at relieving nasal airway obstruction often in conjunction with other nasal and sinus procedures, such as cosmetic rhinoplasty and functional endoscopic sinus surgery (FESS).[29]

Septoplasty is a surgical procedure that corrects a deformity of the nasal septum. The usual purpose is to improve the nasal breathing.[4]

The different methods of septal surgery include Submucosal resection, Septoplasty with repositioning of nasal septum, Cottle's technique, Septoplasty under video endoscopic control, Septoplasty by external approach. In some cases septoplasty can be combined with Rhinoplasty, known as Septorhinoplasty, which improves the external appearance as well.[5-20]

The systematic submucous resection of the nasal septum was started with two now very well known surgeons, Otto Tiger Freer (1857-1932) from Chicago and Gustav Killian (1857-1932) from Freiburg.[20,21] Long-term follow-up studies of patients who had undergone submucous resection frequently showed loss of the support structure of the nose as evidenced by complications like septal perforations, flaccid septum, supratip depression etc.[22-26] The era of modern septal surgery began in the 1940s with Cottle, Goldman, and Smith who favored a more conservative approach to septoplasty.[27]

Each surgical procedure has its limitations and cannot deal with all the variants of the deformities of the nasal septum. An ideal surgical correction of the nasal septum should satisfy the following criteria:-

1) Should relieve the nasal obstruction
2) Should be conservative
3) Should not produce iatrogenic deformity
4) Should not compromise the osteomeatal complex
5) Must have the scope for a revision surgery, if required later.

The ideal objective in septal surgery is permanent correction of deviation with avoidance of any complication. Four basic principles are consistent with objective: good exposure, safe elevation of flaps, resection of only a limited and necessary amount of septum and elimination of aetiological dynamic forces. All these principles are best achieved by an endoscopic approach to the septum.[31]

The traditional surgeries of the nasal septum improve the nasal airway but do not fulfill the above mentioned criteria in most instances. The reasons being, poor visualization, relative inaccessibility, poor illumination, difficulty in evaluation of the exact pathology, need for nasal packing, unnecessary manipulation, resection and overexposure of the septal framework reducing the scope for a revision surgery, if required later.[32]

The uses of nasal endoscopes in rhinological practice have revolutionized the refinements in the diagnosis and treatment of nasal obstruction. The nasal endoscope allows precise preoperative identification of the septal pathology and associated lateral wall abnormalities and helps in better planning of endoscope-aided septal surgery.[25]

In 1991, Lanzaet al[30] and Stammberger[34] described the application of endoscopy for the correction of septal deformity. Endoscopic septoplasty has emerged as an attractive alternative to traditional 'headlight' approaches to septoplasty. Endoscopic septoplasty is a minimal invasive technique that can limit the dissection and minimize trauma to nasal septal flap under excellent visualization. This is especially valuable for patients who have had previous septal surgery.[11,33]

The limitation of the use of the nasal endoscope include loss of binocular vision, need for frequent cleaning of the tip of the endoscope especially when there is more bleeding, and that combined traditional and endoscopic methods may be required if pathology also involves the caudal most part of the septum, i.e. anterior buckling and trimming of the excess caudal end of septum.

Therefore, the present study was conducted for comparison between septoplasty done by the conventional technique and the endoscopic septoplasty in terms of relief of the symptoms of patients including

nasal obstruction, efficacy in the relief of headache, hyposmia and post-nasal drip and synchiae formation following either surgery.

MATERIAL AND METHODS

50 patients undergoing septal surgery for Nasal Obstruction in the Department of ENT, Ram Lal EYE and ENT Hospital attached to Government Medical College, Amritsar were selected based on a predetermined inclusion and exclusion criterion and randomized into 2 groups of 25 each. 25 patients underwent endoscopic septoplasty and 25 underwent conventional septoplasty.

The study criteria of patients was described as follows:
Inclusion criteria:
Patients having following symptoms:-

1) Persistent nasal obstruction refractory to medical treatment
2) Nasal discharge attributable to deviated nasal septum
3) Increased post-nasal discharge attributable to deviated nasal septum
4) Hyposmia and Headache attributable to deviated nasal septum.

Exclusion criteria:

1) Nasal obstruction secondary to allergic rhinitis, sinusitis other than deviated nasal septum was excluded.
2) Patient with systemic disorders like hypertension and diabetes mellitus.
3) Patient with any contraindication to surgery.

Each case after being screened from Outpatient Department and taken informed consent was clinically evaluated by taking detailed history regarding symptoms and other relevant personal History.

Then, complete local ENT examination was done. Subjective evaluation of nasal patency was done by using the Visual Analogue Scale (VAS) and Nasal Obstruction Symptom Evaluation (NOSE) Scale[24] before and after surgery. Objective evaluation of the nasal patency was done using Gertner's Plate method before and after surgery. Diagnostic Nasal endoscopy was done in all patients before surgery.

Requisite investigations and Pre-Anaesthesia Checkup (PAC) & clearance for surgery was taken before surgery. Approval of Institutional Ethical Committee was also taken.

Technique for Conventional Septoplasty:

The procedure was performed under local or general anaesthesia. Both nasal cavities were packed with 4% xylocaine packs for 15 minutes. After infiltration with 2% xylocaine with adrenaline into columella and septum, incision (hemitransfixion incision) was given at caudal border. The mucoperichondrial and periosteal flaps were elevated upto perpendicular plate of ethmoid. The osseocartilaginous junction was dislocated and mucoperiosteal flap on other side was elevated. A 0.5 cm of the anterior margin of perpendicular plate of ethmoid was removed with Luc's forceps. An inferior cartilaginous strip of 0.5 cm was removed along vomerochondral junction, if necessary. Mucoperiosteal flaps were elevated along the vomerine crest on either side and part of bony protrusion was removed, if needed. The incision was closed using chromic catgut (3-0). Bilateral nasal packing was done. Nasal packs were removed after 48 hours (Fig 1).

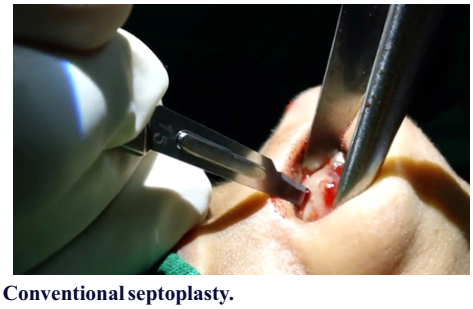

Fig. 1: Conventional septoplasty.

Technique for Endoscopic Septoplasty:

The procedure was performed under local or general anaesthesia. The septum was injected with 1% xylocaine in 1: 20,000 epinephrine on the convex side of the most deviated part of the septum using 0° rigid 4 mm endoscope. Hemitransfixation incision was made. Incision was extended superiorly and inferiorly just as needed to expose the most deviated part. A submucoperichondrial flap was raised using a suction elevator under direct visualization with an endoscope, underlying bone was exposed and the most deviated part was removed .The flap was repositioned back after suction clearance and edges of the incision were just made to lie closely without the need to suture. The nasal cavity was then packed with merocel (Fig 2-5).

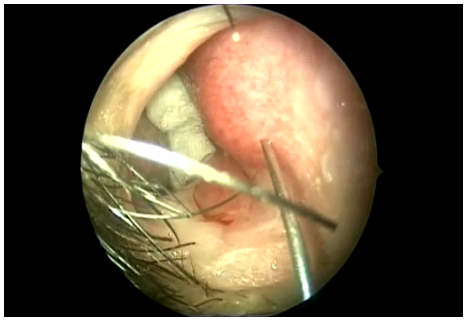

Fig. 2: Endoscopic septoplasty – infiltration.

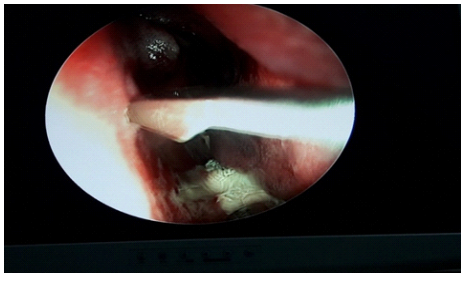

Fig. 3: Endoscopic septoplasty: incision over the deviated portion of the septum.

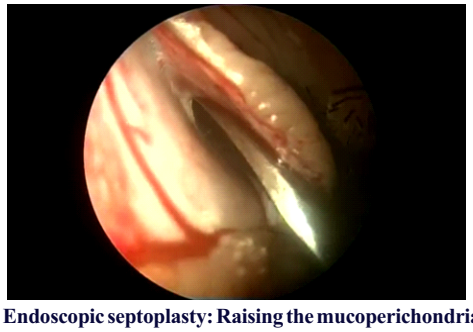

Fig. 4: Endoscopic septoplasty: Raising the mucoperichondrial Flap

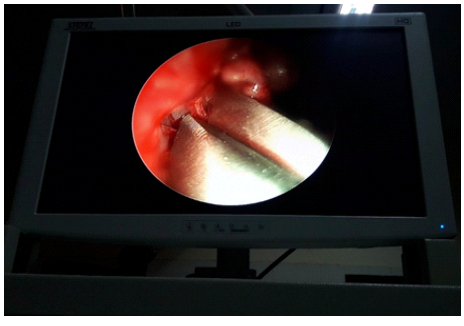

Fig. 5: Endoscopic septoplasty: Incising the septal cartilage.

Post operative period:

Post operative data regarding relief of symptoms, any complications, pain, duration of surgery and hospital stay was recorded. Follow up of the patients was based on nasal obstruction visual analogue score (VAS), Nasal Obstruction Symptom Evaluation (NOSE) Scale and Nasal patency by Gertner's plate method post operatively at 1 week, 2 weeks, 1 month and 3 months. Collected data was statistically analyzed and conclusions were drawn.

OBSERVATIONS AND RESULTS

In present study Males were found to be affected more than females in our study, approximately 3:1. Majority of cases (48%) were in the age group of 21-30 years.

TABLE 1
SHOWING AGE INCIDENCE

Age group (years)	Number of cases	Percentage (%)
10-20	13	26
21-30	24	48
31-40	12	24
>40	1	2
Total	50	100.0

Majority of the patients taken up for this study had chief complaint of nasal obstruction (90%). Nasal obstruction was bilateral in 68% of all patients. Nasal discharge was present in 74% cases. Associated symptom of post nasal discharge was recorded in 64% cases. Excessive sneezing was recorded in 54% cases. History of mouth breathing and headache was seen in 54% and 42% cases respectively. 8% cases had history of nasal trauma. History of previous nasal surgery was reported in 8% cases.

TABLE 2
SHOWING INCIDENCE OF PRE-OPERATIVE SYMPTOMS

Pre-operative Symptoms	Number of cases	Percentage (%)
Nasal obstruction • Unilateral • Bilateral	45 11 34	90 22 68
Nasal Discharge	37	74
Excessive Sneezing	27	54
Mouth breathing	27	54
Post Nasal Discharge (PND)	32	64
Epistaxis	2	4
Hyposomia	1	2
Headache	21	42
Fever	3	6
h/o previous nasal surgery	4	8
h/o previous nasal trauma	4	8

*not mutually exclusive

All the patients had a deviated nasal septum. 58% cases also had inferior turbinate hypertrophy. Anterior caudal dislocation and septal spur was found in 84% and 68% cases respectively at the time of examination.

TABLE 3
SHOWING INCIDENCE OF PRE-OPERATIVE ANTERIOR RHINOSCOPY/NASAL ENDOSCOPY FINDINGS

Signs	Number of cases	Percentage (%)
Inferior turbinate hypertrophy	29	58
Middle turbinate hypertrophy	6	12
Septum deviation	50	100
Septal spur	34	68
Anterior caudal dislocation	42	84
Nasal mucosa		
• Congested	34	68
• Normal	12	24
• Pale	4	8

*not mutually exclusive

In our study, after 3 months follow–up, patients with nasal obstruction showed more improvement in group B (90.4%) as compared to group A (83.3%). Patients with headache also showed more improvement in group B (90.9%) as compared to group A (80%). Similarly, nasal discharge (94.4%) and Post nasal Drip (92.8%) were also more relieved in group B as compared to group A.

TABLE 4
POSTOPERATIVE SYMPTOMS RELIEVED (SUBJECTIVE ASSESSMENT)

Symptom	Group A Conventional Septoplasty	Group B Endoscopic Septoplasty
Nasal Obstruction	20/24 (83.3%)	19/21 (90.4%)
Headache	8/10 (80%)	10/11 (90.9%)
Nasal Discharge	16/19 (84%)	17/18 (94.4%)
PND	15/18 (83.3%)	13/14 (92.8%)

Majority of patients (76%) who underwent conventional septoplasty (Group A) had a longer hospital stay (> 48 hours). While only 4% of patients who underwent endoscopic septoplasty had hospital stay of more than 48 hours.

Intra operative haemorrhage was more commonly encountered in conventional septoplasty group (24%) while it was encountered in only 4% cases of endoscopic septoplasty. More patients of conventional septoplasty group (16%) complained of severe post operative nasal pain as compared to endoscopic septoplasty group where it was reported in only 4% cases. Synechiae were formed in 8 % cases of group A while none of the group B patients developed synechiae. None of the patient in either group developed anypost operative external deformity or septal perforation. More number of patients (32%) in group A had residual posterior deviation as compared to only 4% of group B patients, as seen on Diagnostic Nasal Endoscopy at 3rd month follow up visit.

TABLE 5
SHOWING INCIDENCE OF COMPLICATIONS

COMPLICATIONS	Group A Conventional Septoplasty		Group B Endoscopic Septoplasty	
	No.	%	No.	%
Haemorrhage	6	24	1	4
Mucosal tear	2	8	1	4
Severe nasal pain	4	16	1	4
Infraorbital oedema	3	12	1	4
Crusting	4	16	2	8
Delayed healing at incision site	1	4	0	0
Synechiae	2	8	0	0
External deformity	0	0	0	0
Septal perforation	0	0	0	0
Residual posterior deviation	8	32	1	4

*not mutually exclusive

DISCUSSION

With the introduction of endoscopes in other branches of surgery, there have been attempts at its utilization in septal surgery. Endoscopic septoplasty is an attractive alternative to traditional headlight approach for septoplasty.

In our study, it was found that endoscopic septoplasty is more effective in treating symptoms such as nasal obstruction and headache. Patients with nasal obstruction showed more improvement in group B (90.4%) as compared to group A (83.3%). Patients with headache also showed more improvement in group B (90.9%) as compared to group A (80%). Study of Magdy A Salama (2014)showed nasal obstruction was relieved in 30% of cases of conventional septoplasty group and in 90% of endoscopic septoplasty group. Headache was relieved in 40% of cases of conventional septoplasty and 60% of cases of endoscopic septoplasty.

The study of Gupta, Motwani (2005) and Nayak et al (1998); both study showed that traditional group patients required longer stay due to bleeding or lip edema which is in agreement with the present study.[4,5]

In our study, incidence of complications was less in Endoscopic septoplasty group. The results are in agreement with study of DC Sathyaki (2014) in which intra operative haemorrhage was seen in 24% cases of conventional septoplasty group and 8% cases of endoscopic septoplasty group. Synechiae developed in 16% patients of conventional septoplastygroup while none of patients of endoscopic septoplasty group developed post op synechiae.

In study of SP Gulati (2009), residual deformity was seen in 20 % in conventional group and in 8 % in endoscopic group ($p<0.05$). Synechiae developed in 36% patients of conventional group and in 8% patients of endoscopic group ($p<0.01$). It was statistically significant difference.[34]

CONCLUSION

It is concluded that Endoscopy septoplasty is more effective than conventional method in terms of relief of the symptoms. It is associated with significant reduction in patient's morbidity in postoperative period due to limited extent of flap dissection, limited manipulation and resection of septal framework. Posterior septal deviation, high

deviation and isolated spurs are definitely best corrected by endoscopic septoplasty. It is also an effective teaching tool as it provides an excellent opportunity for recording and studying anatomy, pathology and surgical techniques. However, the endoscope has its own limitations like frequent cleaning of the tip and that gross septal deformities cannot be dealt with endoscope.

Thus, we advocate Endoscopic approach for inaccessible posterior deviation and Conventional approach for accessible anterior deviation of the nasal septum and external crookedness of nasal dorsum. Both these approaches should be taken as adjuvants to one another as some cases may require combined conventional and endoscopic approach. Every endoscopic septoplasty surgeon must have a good experience of conventional septoplasty.

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