

Conventional Septoplasty *verses* Endoscopic Septoplasty: A Comparative Study

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Abstract:

The study was carried out to compare the postoperative morbidity among patients of conventional and endoscopic septoplasty and to assess the efficacy and use of endoscopic septoplasty with other endoscopic surgeries. The present prospective study was conducted among 100 patients of deviated nasal septum, admitted in the department of Otorhinolaryngology, of Sawai Man Singh Medical College and hospital, Jaipur, Rajasthan. Patients were selected by simple random sampling procedure and were divided into group A and B, with 50 cases in each group. Group A underwent conventional septoplasty and group B underwent endoscopic septoplasty. Deviated nasal septum was commonly associated with inferior turbinate hypertrophy (75%) and concha bullosa (26%). Postoperatively, a significant relief from the symptoms of nasal obstruction (96%), nasal discharge (88%), headache (100%) and post nasal drip (67%) was observed in endoscopic septoplasty. Posterior deviations were best corrected by endoscopic septoplasty. Complication rate was higher in conventional septoplasty. The endoscopic approach to septoplasty facilitates accurate identification of the pathology. It facilitates realignment by limited and precise resection of the pathological areas.

Key Words: Endoscopic septoplasty, Conventional, Deviated nasal septum, Endoscopic sinus surgery (ESS)

Introduction:

Nasal obstruction is the most common complaint in rhinologic practice and a deviated nasal septum is the most common cause of nasal obstruction. The evaluation of septal deviation causing nasal obstruction depends heavily on physical examination and imaging (Dinis & Haider, 2002). Apart from nasal obstruction, a significantly deviated nasal septum has been implicated in epistaxis, sinusitis, obstructive sleep apnea and headaches attributable to contact points with structures of the lateral nasal wall (Pannu et al, 2009).

Numerous medical descriptions are available regarding the pathology and the treatment of the deviated nasal septum. However, none of these descriptions have highlighted a complete surgical management of this condition to improve the nasal airway. 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 : (a) should relieve the nasal obstruction; (b) should be conservative; (c) should not produce iatrogenic deformity; (d) should not compromise the osteomeatal complex and (e) must have the scope for a revision surgery, if required later.

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.

The nasal endoscope allows precise preoperative identification of the septal pathology and associated lateral nasal wall abnormalities and helps in better planning of endoscope-aided septal surgery (Nayak et al, 1998). A directed endoscopic septoplasty approach is useful for treatment of isolated septal spurs in the absence of larger septal deviations. A directed approach results in limited dissection and faster postoperative healing. Septoplasty was first described by Cottle in 1947 as a treatment to correct nasal airway obstruction (Maran & Lund, 1990). Lanza et al (1991) described endoscopic techniques to correct septal deformities. Since that time surgeons have performed concomitant endoscopic septoplasties under varying situations not only to treat symptomatic nasal obstruction but also for improving surgical access to the middle meatus as an adjunct to ESS (Lanza et al, 1993; Giles et al, 1994; Cantrell, 1997; Yanagisawa & Joe, 1997; Toffel, 1998; Hwang et al, 1999).

Early reports of endoscopic septoplasty describe several advantages associated with the technique. e.g. it makes easier for surgeons to see the tissue planes and it offers a better way to treat isolated

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septal spurs. Additionally, the endoscopic approach makes it possible for many people to simultaneously observe the procedure on a monitor, making the approach useful in a teaching hospital. Nasal endoscopy is a valuable tool for initial assessment of the relationship of the septum to the middle turbinates, which allows the surgeon to judge whether or not the position of the septum will limit access during ESS. Even in the absence of subjective nasal obstruction or gross septal deviation, septoplasty may be necessary to maximize access to the middle meatus during ESS, such as in the setting of a narrow nasal cavity with a prominent septal body. Nasal endoscopy is an excellent tool for outpatient surveillance following septoplasty during the initial postoperative healing period and beyond (Sautter & Smith, 2009).

Therefore, the present study was conducted to compare the postoperative morbidity among conventional and endoscopic septoplasty patients; to assess endoscopic septoplasty as the better surgical procedure in correcting high deviations and to assess the efficacy and use of endoscopic septoplasty with other endoscopic surgeries for sinonasal pathology like chronic dacryocystitis, concha bullosa and sinusitis.

Material and Methods:

One hundred patients of deviated nasal septum were selected by simple random sampling method, who were admitted in the department of Otorhinolaryngology, of Sawai Man Singh Medical College and Hospital, Jaipur, from July 2008 to September 2009. They were divided in to group A and B, with 50 cases in each group.

Group A underwent conventional septoplasty and group B underwent endoscopic septoplasty. Out of 50 endoscopic septoplasty, 20(40%) underwent this

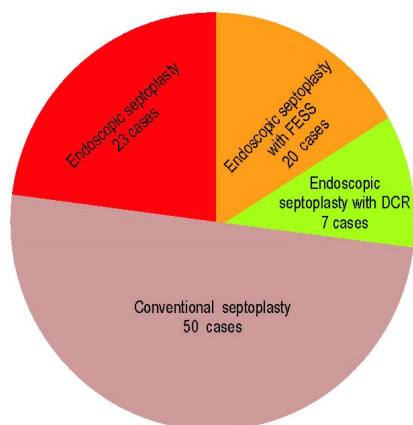


Fig. I: Type of surgery done among study subjects.

in conjunction with functional endoscopic sinus surgery and 7(14%) with endoscopic DCR (Fig.I).

Inclusion criteria: Patients with nasal obstruction, nasal discharge, hyposmia, post nasal drip, facial pain and headache were included in the present study.

Exclusion criteria: Patients with allergic rhinitis and upper respiratory tract infection were excluded.

Ethical clearance was obtained from ethical committee of Sawai Man Singh medical college and hospital, Jaipur and informed consent was taken from each subject. A self prepared proforma was used to collect the patient’s information which included patient’s name , age , sex, occupation, present history, past history, complete examination of nose, anterior rhinoscopy, nasal endoscopy and radiological examination.

Statistical analysis was done using Statistical Package of Social Science (SPSS Version 15.0) and Z-test was applied.

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 was made. Incision was not extended from dorsum to the floor as in classical incision but was extended both 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 a 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 packed with merocel (Nasal pack), which is sponge like & expands on getting wet and provides uniform pressure over all surfaces in contact. It also avoids mucosal abrasions while doing packing and removal of it.

The conventional approach involves headlight illumination and visualization with nasal speculum.

Results:

In the present study the male to female ratio for deviated nasal septum was 7:3. The most commonly affected subjects belonged to the 2nd and 3rd decade of life in both sexes (Table I).

Most prevalent complaint in the patients of deviated nasal septum among study subjects was nasal obstruction (74%) followed by anterior nasal discharge (41%), headache (20%), sneezing (15%), post nasal drip (8%), epiphora (7%), hyposmia (3%), bleeding (3%) and snoring (3%).

Table I: Sample distribution of subjects according to age and gender.

Gender	10-20 Year	21-30 Year	31-40 Year	41-50 Year	Total
Male	25	27	10	08	70
Female	12	09	06	03	30
Total	37	36	11	11	100

Among the prevalence of lateral nasal wall pathology associated with deviated nasal septum, the commonest was Inferior turbinate hypertrophy (75%) followed by concha bullosa (26%), paradoxical middle turbinate (25%), Uncinate process abnormality (21%) and others (Table II).

Table III: Prevalance of lateral nasal wall pathology in association with deviated nasal septum among study subjects.

Lateral nasal wall pathology	No. of cases	Percentage
Concha bullosa	26	26%
Paradoxical middle turbinate	25	25%
Polypoidal middle turbinate	19	19%
Inferior turbinate hypertrophy	75	75%
Over pneumatized bulla	13	13%
Uncinate process abnormality	21	21%
Mucosal disease	21	21%

Postoperative follow up of the patients showed that 38% cases of group A and 96% of group B were relieved of nasal obstruction while headache was relieved in 54% of Group B and 50% of group A. There was no relief from hyposmia in group A while it

Table III: Frequency of symptoms relieved Postoperatively among group A and group B subjects.

Symptoms relieved	Conventional -Septoplasty (Group A) N=50	Endoscopic-Septoplasty (Group B) N=50	Z-value	p-value
Nasal obstruction	19(38%)	48(96%)	5.95	0.0001(HS)
Headache	25(50%)	27(54%)	0.20	0.84(NS)
Nasal discharge	18(36%)	15(30%)	0.42	0.67(NS)
Hyposmia	0(0%)	5(10%)	1.82	0.06(NS)
Post nasal drip	9(18%)	20(40%)	2.20	0.02(S)

was relieved in 10% of patients of group B. There was significant relief from nasal obstruction ($p < 0.01$) and post nasal drip ($p < 0.05$) in group B patients (Table III). Objective assessment at last follow up among study subjects revealed that 13% of group A and 10% of

Table IV: Objective assessment at last follow up among study subjects.

Objective assessment at 3 months	Conventional-Septoplasty (Group A) N=50	Endoscopic-Septoplasty (Group B) N=50	Z-value	p-value
Anterior deviation	7(13%)	5(10%)	0.30	0.75(NS)
Posterior deviation	12(23%)	2(3%)	2.59	0.009(S)
Spur	7(13%)	0(0%)	2.35	0.01(S)
Synechia	10(20%)	0(0%)	3.0	0.002(S)
Persistent pathology of turbinates	19(37%)	10(20%)	1.76	0.07(NS)
Discharge in middle meatus	22(43%)	14(27%)	1.45	0.14(NS)

group B cases had persistent anterior deviation; 23% of group A and 3% of Group B had persistent posterior deviation and 13% of group A had persistent spur. Persistent pathology of turbinates was found in 37% of group A and 20% of group B. There was significantly less persistence of posterior deviation, spur and synechia ($p < 0.05$) in group B patients (Table IV).

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.

Olphen (2008) described that Cottle in 1963 gave the concept of conventional septoplasty which is done in 6 phases: (a) gaining access to the septum; (b) correction of pathology; (c) removing pathology; (d) shaping removed cartilage and bone; (e) reconstruction of the septum; (f) stabilizing the septum.

In the present study we found male to female ratio of septal deviation was 7:3 and the most common affected group were of younger age from 2nd & 3rd decades. This was in concordance with the study of Rao et al (2005).

Most common complaints of patients with septal deflections were nasal obstruction(74%), anterior nasal discharge(41%), headache(20%), sneezing (15%) and postnasal drip(8%).The frequency of complaints of nasal obstruction(75%) and nasal discharge(55%) were similar to the study of Gupta and Motwani (2005) but the headache was second major complaint in their study.

Nayak et al (2002) reported that several lateral nasal wall pathologies are associated with deviated septum, commonest and consistent being the inferior turbinate hypertrophy (75%) followed by concha bullosa, paradoxical middle turbinate, mucosal disease , overpneumatised bulla, polypoidal middle turbinate and uncinate process abnormality. In the present study we found almost similar incidence, commonest being, inferior turbinate hypertrophy (75%) followed by concha bullosa (26%), paradoxical middle turbinate (25%) and uncinate process abnormality (21%).

Endoscopic septoplasty is not primarily meant for relieving nasal obstruction but mostly it is performed to gain access to surgical site as in cases of FESS but has distinct advantages- in paediatric cases, in revision surgeries and cases with previous septal perforation and also in cases with isolated septal spurs.Complex deformities need correction by conventional approach so also the caudal deflections. Out of the 50 cases selected for endoscopic correction in the present study, endoscopic septoplasty alone was performed in 23 cases, 20 cases in conjunction with FESS and 7 cases in conjunction with DCR. Cantrell (1997)and Hwang et al. (1999) have reported similar incidence.

Significantly higher rate of persistence of symptoms were found with conventional septoplasty as compared to endoscopic septoplasty in the present study and that of Nayak et al (2002).

In a study by Sindwani & Wright (2003) 54% patients with complaints of nasal obstruction and facial pain were cured and 38% showed improvement and 8% were not benefited. Harley et al. (2003) observed significant improvement in patients with nasal obstruction and headache in endoscopic group as compared to conventional group. In the present study more number of patients were relieved from these symptoms in endoscopic septoplasty as compared to conventional group (Table III). This is in agreement with the observations of Gulati et al. (2009).

Park et al. (1998) observed that the synechia were formed in significantly less number in patients of endoscopic septoplasty group as compared to

conventional group; similar results were found in the present study. Complication rate in endoscopic septoplasty group was 3%, in the present study while complication rate was found to be 2.08% and 5% by Gupta et al. (2005) and Hwang et al. (1999) respectively.

In the study by Yoysem et al (1991), 88% patients needed septoplasty and 21.8% patients of Gaskin (1992) undergoing FESS underwent septal reconstruction, whereas in the present study endoscopic septoplasty was performed in conjunction with FESS in 20% cases.

The traditional approach to septoplasty involves headlight illumination, visualization through a nasal speculum, and surgical instruments that are typically disparate from that used during standard endoscopic procedures. These circumstances can be suboptimal when treating a narrow nose, approaching posterior deviation, or required frequent exchanges between headlight and endoscope. In addition impaired visualization may predispose to nasal mucosal trauma, which can compromise endoscopic visualization during sinus surgery.

Lastly, endoscopic septoplasty can also be considered an effective teaching tool. In fact, when viewed over a monitor, the procedure provides an excellent opportunity for recording and studying anatomy, pathology and surgical techniques in the training of Assisting Surgeons, graduate Specialists and Medical students.

Conclusion:

The endoscopic approach to septoplasty facilitates accurate identification of the pathology due to better illumination, improved accessibility to remote areas and magnification. It facilitates realignment by limited and precise resection of the pathological areas, by precise repair and strategically placed wedge resections. It effectively relieves contact areas and thus contact headache by allowing intraoperative assessment.

Endoscopic septoplasty is associated with significant reduction in patient's morbidity in both preoperative and postoperative period due to limited extent of flap dissection, not using Killian nasal speculum which by pressure can cause preoperative discomfort, limited manipulation and resection of septal framework. However, the endoscope has its own limitations which include loss of binocular vision, need for frequent

cleaning of the tip of endoscope especially when there is more bleeding and lastly by endoscopic approach to septoplasty complex deformities with caudal deflections could not be corrected.

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