Endoscopic Aided Septoplasty Versus Conventional Septoplasty

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Abstract: Septoplasty is a commonly performed surgical procedure aimed at relieving nasal airway obstruction. The advent of the nasal endoscopes facilitates accurate identification of the pathology. Further limited elevation of the flap, minimal resection and realignment are possible. 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. This study was conducted at the department of ENT, Riyadh National Hospital, Saudi Arabia from January 2011 to March 2013. Eighty patients with deviated nasal septum were recruited into study where the patients were divided into two groups, 40 cases in each group. Group I underwent conventional septoplasty while group II underwent endoscopic seoptoplasty. All of the patients had nasal septal deformities associated with other sinus or nasal pathology. Most prevalent complaint in the patients was nasal obstruction (90%), headache (40%), nasal discharge (20%) and sneezing (18%). The most prevalent pathology is hypertrophy of inferior turbinate (81%) followed by cocha-bullosa and mucosal disease (20% for each), polypoid middle turbinate (18%), paradoxical middle turbinate (17%) and uncinate process abnormality (15%). They were 70% males and 30% females. The median of age was 32.3 years. The post-operative follow-up of frequency of symptoms after surgery showed relive of nasal obstruction in 30% of cases of group I and in 90% of group II. However, headache was relieved in 40% of cases of conventional septoplasty and 60% of cases of endoscopic septoplasty. Post-nasal drip was relieved among 50% of patients underwent endoscopic septoplasty while it was relieved in 10% only in who had conventional septoplasty. Objective assessment at last follow-up visit among study subjects revealed that 5 cases of conventional septoplasty group and 3 of endoscopic septoplasty cases had persistent anterior deviation. While, 14 cases of group I and 3 cases of group II had persistent posterior deviation. Spur and synchiae were persisting in 8 and 6 cases that underwent conventional septoplasty, respectively. One case from each group still had Spur and synchiae after endoscopic septoplasty. There was significantly less persistence of posterior deviation, spur and synchiae in group II patients than group I. No major complications in the immediate post-operative period were observed. Minor complications such as haemorrhage occurred in one patient and septal haematoma in one patient. Endoscopic septoplasty was found effective in relieving almost all symptoms, especially headache, nasal obstruction and post-nasal drip. Endoscopic septoplasty is associated with significant reduction in patient’s morbidity.

Key words: Endoscopic Septoplasty - Conventional Septoplasty - Septal Deviation and Nasal Obstruction

INTRODUCTION

Various techniques have been described for the correction of different types of septal deviations in the past. The concept of submucosal resection was popularized and refined by Killian [1] and Freer [2] separately in the early twentieth century. However an increasing incidence of complications of septal surgery led to the more conservative septoplasty. Metzenbaum [3] described the swinging door technique for caudal dislocation and subluxation. Galloway [4] removed the entire nasal cartilage and replaced it as a single autograft.
More recently refinements in septal surgery have been popularized by Cottle [5]. It is essential to know the biomechanical behavior of the cartilaginous septum as described by Murakami [6]. An ultra conservative approach is advocated in the management of septal disorders [7].

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) [8].

Other indications include rhinologic headache, which is due to irritation caused by the contact of the septum with the lateral nasal wall and chronic sinusitis secondary to septal deviation. The rationale for developing an endoscopic technique from a traditional head light approach comes from the fact that during common nasal procedures, the surgeons view is obstructed due to the narrowing that is caused by septal spurs or septal deviations [9].

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; should relieve the nasal obstruction, should be conservative, should not produce iatrogenic deformity, should not compromise the osteomeatal complex and, must have the scope for a revision surgery, if required after. 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 the flap, minimal resection and realignment are possible [11].

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 [12].

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 [13].

The nasal endoscope allows precise preoperative identification of the septal pathology and its associated lateral nasal wall abnormalities and helps in better planning of endoscope aided septal surgery [14].

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 functional endoscopic sinus surgery (FESS) but has distinct advantages in pediatric 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 [15].

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. Also, to assess the efficacy and use of endoscopic septoplasty with other endoscopic septoplasty with other endoscopic surgeries for other associated sino-nasal pathologies as chronic sinusitis and concha-bullosa.

**MATERIALS AND METHODS**

This is a comparative study between conventional septoplasty and endoscopic septoplasty conducted at the department of ENT, Riyadh National Hospital, Saudi Arabia from January 2011 to March 2013. Eighty patients with deviated nasal septum were recruited into our study where the patients were divided into two groups, 40 cases in each group. Group I underwent conventional septoplasty while group II underwent endoscopic septoplasty. A detailed history was obtained from every patient.

Each patient was examined thoroughly pre-operatively with anterior rhinoscopy in the outpatient clinic then followed by nasal endoscopy after application of nasal decongestant for better identification of pathology of turbinates.

Radiological examination of each patient with plain X-ray occipito-mental view was done followed by CT scanning of every patient. Allergy tests sometimes performed in indicated cases.

**Inclusion Criteria:** Patients complaining of nasal obstruction, nasal discharge, increased (Copious) mucopurulent post-nasal discharge, hyposmia and/or
headache were recruited for our study after obtaining consent. Patients with allergic rhinitis and upper respiratory tract infections were excluded from our study. All cases were performed under general anesthesia.

The technique for endoscopic septoplasty included position of the patient, preparation and draping for septoplasty. Under endoscopic visualization with a 0 degree 4 mm endoscope, the following steps were performed; local oxymetazoline was applied for decongestion; 1% lidocaine with 1: 100,000 epinephrine was injected subperichondrially along the septum. Hemitranfixation was made. Incision was not extended from dorsum to the floor as in classical incision but was extended both superiority and inferiorly just as needed to expose the most deviated part.

Mucoperichondrial flap elevation was performed with a cottle elevator under direct endoscopic visualization with a 0 degree endoscope, underlying bone was exposed and the most deviated part was removed with the small Luc's forceps. Adequacy of the surgical correction was assessed by returning the mucosal flaps to the midline and inspecting the nasal airway bilaterally while palpating areas of residual deviation. Once satisfactory correction had been achieved, the flap was repositioned back after suction of blood and edges of the incision were made to lie closely without the need of suture. Then packing of the nasal cavity with Merocel pack was performed. Patients were instructed not to blow their nose and to use saline spray to keep the nasal mucosa moisturized. Pain control was achieved with paracetamol and the patients were discharged to home following pack removal 24 hours post surgery. Endoscopic septoplasty was done in 15 cases associated with other procedures as functional endoscopic sinus surgery.

Conventional septoplasty was performed in 40 cases. The conventional approach involved headlight illumination and using the nasal speculum for visualization.

**RESULTS**

The study group consisted of 80 patients who underwent seoptoplasty either conventional or endoscopic over a period of two years. They were 56 males (70%) and 24 females (30%). The age of the patients ranged between 20 and 42 years (Median 32.3). The duration of presenting symptoms varied from 6 months to 12 years. They were divided into 2 groups; Group I who underwent conventional seoptoplasty and including 40 patients and Group II who underwent endoscopic seoptoplasty and including the remaining 40 patients.

All of these patients had nasal septal deformities associated with other sinus or nasal pathology. They were treated medically before surgery with topical steroid sprays, mucolytics and anti-allergy medications.

Most prevalent complaint in the patients of deviated septum among the study subjects was; nasal obstruction among 70 cases (90%), headache (40%), nasal discharge (20%), sneezing (18%), bleeding (7%), hyposmia (5%) and snoring (5%).

Table 1 shows the incidence of lateral nasal wall pathology associated with nasal septal deviation among the 80 studied patients. The most prevalent pathology is hypertrophy of inferior turbinate (81%) followed by cocha-bullosa and mucosal disease (20% for each). Polypoid middle turbinate is represented by 18% while paradoxical middle turbinate is represented by 17%. Uncinate process abnormality is the least pathology observed at the lateral nasal wall among our patients (15%).

Table 2 and Figure 1 show the post-operative follow-up of frequency of symptoms relieved after surgery among our patients. Nasal obstruction was relieved in 30% of cases of group I and in 90% of group II. However, headache was relieved in 40% of cases of conventional seoptoplasty and 60% of cases of endoscopic seoptoplasty. Post-nasal drip was relieved among 50% of patients.
underwent endoscopic septoplasty while it was relieved in 10% only in who had conventional septoplasty. There was a significant relief in nasal obstruction and post-nasal drip in cases treated by endoscopic septoplasty.

Table 3 shows the objective assessment at last follow-up visit among study patients. The follow-up period ranged from 3 months to 8 months. The efficacy was assessed both subjectively and objectively. Subjective evaluation carried out using visual analogue scale by comparison of pre and post operative symptomatology while objective evaluation was carried out using endoscopes. Objective assessment at last follow-up visit among study subjects revealed that 5 cases of conventional septoplasty group (Group I) and 3 of endoscopic septoplasty cases (Group II) had persistent anterior deviation. It is to be noted that 14 cases of group I and 3 cases of group II had persistent posterior deviation. Spur and synchia were persist in 8 and 6 cases who underwent conventional septoplasty, respectively. One case from each group still had Spur and synchia after endoscopic septoplasty. There was significantly less persistence of posterior deviation, spur and synchia in group II patients than group I. No septal perforation or saddle nose deformity was noticed in either group. Our study found no major complications in the immediate post-operative period. Minor complications such as haemorrhage occurred in one patient and septal haematoma in one patient.

**DISCUSSION**

In our present study we noticed that nasal septal deviation more common in males than females and the most common affected groups were of 2nd and 3rd decades of life and this was in concordance with Rao and his colleague study [15].

Most common complaints of our patients with septal deflections were nasal obstruction (90%), anterior nasal discharge (60%), headache (40%), sneezing (18%), post nasal drip (8%), bleeding (7%), hyposmia (5%) and snoring (5%). The frequency of complaints of nasal obstruction and nasal discharge were similar to the study of Gupta and Motwani [16] but the headache was second major complaint in their study.

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. study [17]. Nayak et al. [17] 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 (81%) followed by concha bullosa and mucosal disease (20% for each), Polypoid middle turbinate (18%), paradoxical middle turbinate (17%) and uncinate process abnormality (15%).

An ultra conservative approach is advocated in the management of septal disorders. The advent of the nasal endoscope facilitates accurate identification of the pathology. Further limited flap elevation, minimal resection and realignment are possible. Giles et al [18] in their series of 38 patients describe the use of nasal endoscopes in limited septal resection to facilitate endoscopic sinus surgery. The authors in this series classify various septal deviations and discuss their endoscopic surgical management.

In the study by Sindwani and Wright [19], 54% patients with complaints of nasal obstruction and facial pain were cured and 38% showed improvement and 8% were not benefited. In the present study more number of patients was relieved from these symptoms in endoscopic septoplasty as compared to conventional group. This is in agreement with the observations of Gulati et al. study [20].

Rao and Chitradur [21] observed that the synechiae were formed in significantly less number in patients of endoscopic septoplasty group as compared to conventional group. Complication rate in endoscopic septoplasty was 3% in the present study while complication rate was found to be 2.08% and 5% by Gupta [22] and Hwang et al. [11], respectively. In our study we reported only haemorrhage which occurred in one patient and septal haematoma in one patient.

In the study by Yoysem et al. [23], 88% patients needed septoplasty and 28% patients of Gaskin [24] undergoing FESS underwent septal reconstruction, whereas in the present study endoscopic septoplasty was performed in conjunction with FESS in 15 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.

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 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.

REFERENCES