

ENDOSCOPIC VERSUS TRADITIONAL SEPTOPLASTY

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ABSTRACT

Objective: The aim of this study was to evaluate efficacy of endoscopic septoplasty compared with traditional one. **Methods:** This study was carried on patients complaining mainly of persistence nasal obstruction and presented to the ENT outpatient clinic in Benha university hospital. Out of these patients 40 cases were diagnosed to have nasal septal deviations during the period from July 2010 to April 2011. 20 patients underwent endoscopic septoplasty and the other 20 patients underwent traditional septoplasty. Pre and postoperative evaluations were done in the form of history taking, clinical examination and nasal endoscopy. Endoscopic septoplasty was done for different types of septal deformities to show the technique and to compare efficacy with traditional septoplasty. **Results:** It was found that endoscopic septoplasty is more effective than traditional septoplasty in treating nasal obstruction, correction of posterior deviations and septal spurs and prevention of contact between septum and lateral nasal wall. **Conclusion:** We conclude from our study that symptomatized deviated septum can be corrected by different techniques. Endoscopic septoplasty provides an excellent alternative to traditional head light one with many advantages as easy, safe, rapid, limited dissection of the flaps, good access to posterior and high deviations, good illumination and visualization, less complications(odema, tear, perforation, hematoma, crustation), easy for revision and good teaching tool if used with monitors. Also this technique can avoids splints, packing and stitches so it can decrease the post-operative period and pain.

Key Words: Endoscopy, Endoscopic septoplasty, Nasal septum .

INTRODUCTION

Surgery on a deviated nasal septum has seen several modifications since its inception, starting from radical septal resection to mucosal preservation and subsequent preservations of the possible septal framework (1,2,3,4,5).

Recently, the emphasis has been on conservation of the septal framework rather than resection, as the former gives rise to lesser complications, allows concomitant rhinoplasty or a revision surgery later and moreover conservative surgery can be safely performed in children, without fear of a possible poor development of the midface.(6).

The application of endoscopic techniques to the correction of septal deformities was initially described in 1991 by both Lanza et al.(7) and by Stammberger(8). In 1993, Lanza et al.(9) described a detailed endoscopic approach to the treatment of isolated septal spurs.

Conventional septoplasty is performed under standard headlight vision and involves septal correction after elevating the mucoperichondrial and mucoperiosteal flap(10). Septoplasty is an operation that should be done under direct vision(11).The endoscope provides good illumination, magnification, and direct vision(12). In performing endoscopic sinus surgery, the septal deviation needs to be corrected if it obscures adequate access for (13).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(14). The traditional surgeries of the nasal septum improve the nasal airway but do not fulfill the above mentioned criteria in most instances (14).

The aim of this study is to evaluate efficacy of endoscopic septoplasty compared with traditional one.

PATIENTS AND METHODS

The present study has been conducted on 40 patients with nasal septal deformities. They were 24 males and 16 females. Their ages ranged from 18 to 39 years old. They attended otorhinolaryngology department, Benha University Hospitals during the period from November 2010 to December 2011. The study was approved by the local ethical committee of Benha Faculty of Medicine. These patients were divided into 2 groups A and B. Each group included 20 patients. Patients of group A underwent endoscopic septoplasty while patients of group B underwent traditional septoplasty. All patients were complaining one or more of these nasal symptoms; persistent nasal obstruction either unilateral or bilateral, chronic headache, facial pain and, or recurrent epistaxis.

Excluded from this study patient with allergic or non allergic chronic rhinitis, patients with sinonasal polypi and patients with gross external nasal deformities who requiring septorhinoplasty. Clinical assessment was done for all patients preoperatively and every patient in this study submitted for :

Subjective assessment

A total symptoms score was obtained for each patient by using the visual analogue scale (VAS) of 0-10, where 0 means no symptom present and 10 means the most severe symptom. The evaluated symptoms were persistent nasal obstruction either unilateral or bilateral, chronic headache, facial pain , recurrent epistaxis, snoring ,postnasal discharge and hyposmia.

Objective assessment

1. General preoperative routine examination.
2. Full ENT examination.
3. Anterior rhinoscopic examination.
4. Diagnostic Nasal Endoscopy was performed using both 0 and 30 degree adult nasal endoscope.

Evaluation was performed to assess the septal deformity either anterior, posterior or septal spur. Also to detect if there is contact point between the nasal septum and the lateral nasal wall as well as endoscopy was done to exclude any other sinonasal pathology. CT Scan paranasal sinus coronal view was done for

every patient pre operatively to confirm findings of clinical examinations and also to exclude any hidden sinonasal pathology. (Fig.1)

Operative technique

The patients of Group A underwent endoscopic septoplasty while those of Group B underwent traditional headlight septoplasty. Random selection of patients was done based on patients age, those patients their age are odd numbers belong to Group A while those with Even number belong to Group B.



Fig. (1): CT scan on paranasal sinuses of a case of left posterior septal deviation.

Steps of endoscopic septoplasty:

Nasal decongestant drops e.g. oxymetazoline Hcl were used one hour before operation. Both techniques were performed under general anesthesia. Cottonoid packs soaked with (1: 200,000) adrenaline in saline solution were used at the beginning of the operation.

Infiltration :

Subperchondrial infiltration of the nasal septum was done bilaterally using 1: 200,000 adrenaline in saline solution. In cases of septal spur, infiltration was done under endoscopic visual control at the spur itself (Fig. 2).



**Fig. (2): Infiltration of the nasal septum using
1: 100,000 adrenaline in saline solution.**

Incision:

Standard Killian incision from down upward on the left side of the septum was used except in cases of isolated septal spur, incision was done on the spur itself using a sickle knife or using No. 15 knife blade (**Fig. 3**).



**Fig. (3): A Killian incision is made by a number
15 knife blade.**

Flap elevation and dissection:

After mucosal incision, muco- perichondrial flap elevation was performed with a cottle elevator. Once there is enough space a self retaining nasal speculum is put to allow free handling of instruments and endoscope. A suction elevator was used as a useful alternative dissecting instrument to simultaneously clear any blood from the field of view during flap elevation. Further elevation was done

using 0° nasal endoscope (4 mm), held in left hand, keeping the tip of the endoscope between mucoperichondrial flap and the septal cartilage. The right hand was used for instrumentation. Exposure was limited to the target area (Fig.4).



Fig. (4): Suction elevator is used for flap elevation on the left side.

The septal cartilage was then incised just posterior to the mucosal incision. The contralateral mucoperichondrial flap elevation was then performed under endoscopic visual control. Flap elevation was continued bilaterally until complete extent of septal deformity had been dissected (Fig.5).

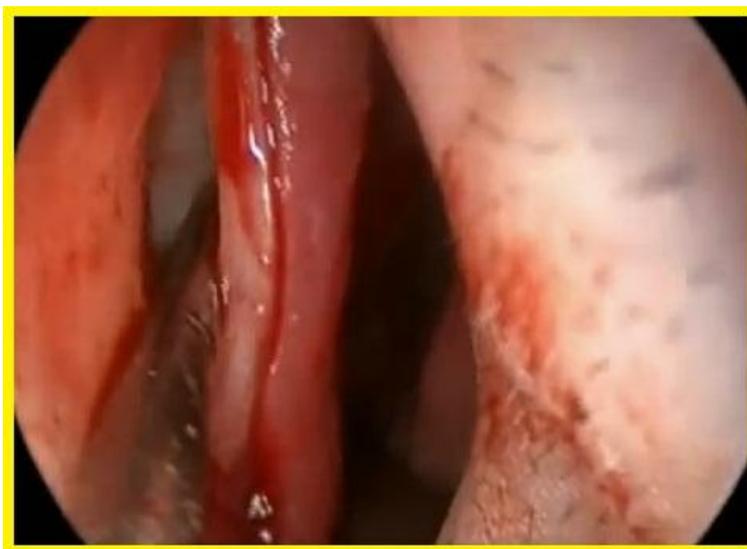


Fig. (5): Suction elevator is used for flap elevation on the contralateral side of the

At this time, an angled scissors was introduced and used to cut through septal cartilage on a direction, which is parallel to, and at least 1cm posterior to

the nasal dorsum. We removed only the obstructing cartilage, leaving at least caudal and dorsal struts to maintain support of nasal dorsum and columella.

The cartilage was removed with Luc's forceps or a Ballenger's swivel knife under endoscopic visual control (**Fig.6**).

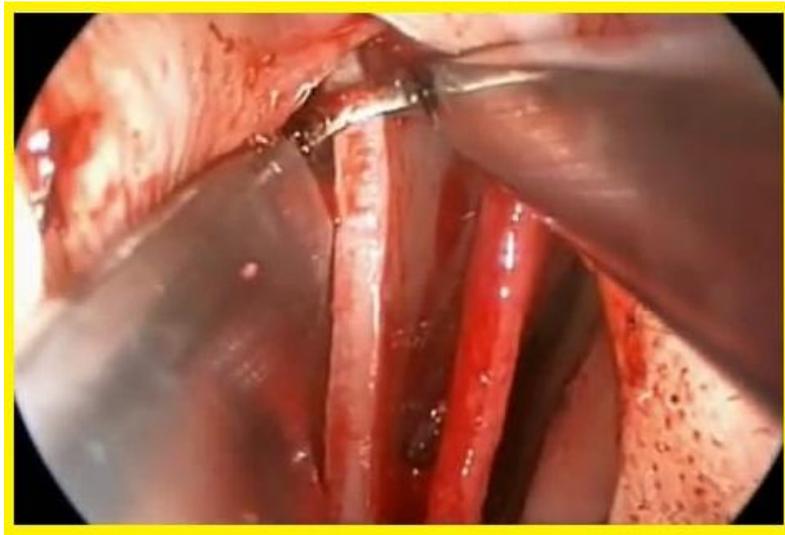


Fig. (6): Deviated cartilage is removed with Ballenger's swivel knife under

Punches or forceps could also be used. Any deviated bone only in the perpendicular plate of ethmoid was then removed under endoscopic visual control with punches or forceps. Large pieces of excised cartilage and bone were saved in saline solution in order to re-insert one of them between the two flaps, if needed at the end of the surgery.

If the maxillary crest is deviated, elevation of the flaps of the maxillary crest and vomer was done under endoscopic visual control. Then deviated crest was removed with gouge held in surgeon right hand and hammer used by the assistant.

In cases of subluxated cartilage from the crest, the excess cartilage inferiorly was shaved using No. 15 knife blade. Then it was repositioned over the crest to prevent a supratip deformity. If there was associated vomerine spur or crest, it was resected.

In cases of septal spur only, incision was done directly over the spur under endoscopic visual control especially for posterior spurs. Exposure was done by

elevating the flaps with the sharp end of Cottle elevator superiorly and inferiorly. It was removed either by straight biting forceps or osteotome.

At the end of the operation, suturing of the two flaps with 4/0 catgut suture was done. Splinting of half of the patients was done using readymade Reuter nasal splints (**Fig.7**).

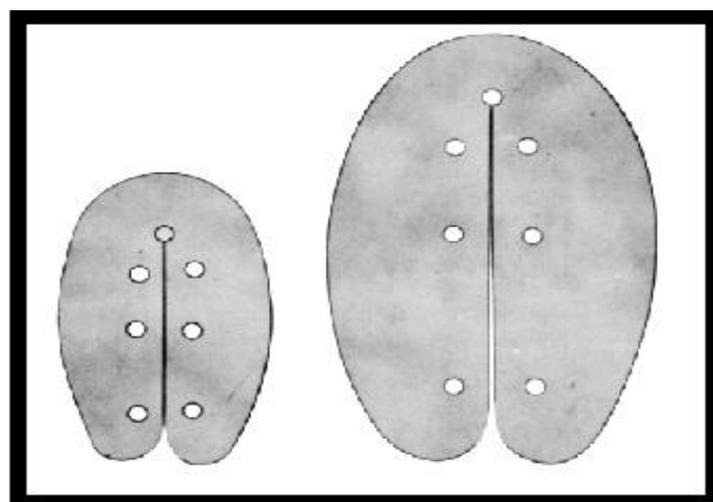


Fig. (7): Reuter nasal splints

In traditional group, cottle technique or mobilization of quadrilateral cartilage and re-position it into the columella were used without use of endoscope. Splinting of half of the patients of both groups was done using readymade Reuter nasal splints.

Both nasal cavities were packed with merocell packs on both groups.

Postoperatively, all patients were viewed in the outpatient clinic. Once weekly for the 1st month then every 2 weeks for 3 months and monthly till the end of follow up period after 6 months.

Statistical analysis of the collected data was done using Statistical package for social science (SPSS version 15).

RESULTS

The age in the traditional group varied from 18 to 38 years with a mean of 26.8 years. The age of the endoscopic group varied from 18 to 36 years with a mean of 25.13 years. In this study the male to female ratio was 3:2. We didn't find any significant difference in pre-operative results between both groups as regards age, sex, side of nasal obstruction, and types of septal deformities (Septal spur, anterior septal deformity or posterior septal deformity). So, the pre-operative circumstances were similar between both groups; consequently any expected difference in the post-operative results would depend mainly on the surgical technique used in each group.

As regard the duration of each procedure in our study, endoscopic septoplasty consumed 15 minutes in isolated septal spur up to 27 minutes in broadly based deflections or more than one septal deformity. But in traditional septoplasty, it is ranged from 22 to 34 minutes which means that the duration of operation is shorter by endoscopy.

As regards of data obtained from subjective assessment of all patients in both groups pre & post operatively and statistical analysis of the mean VAS of all patients in each group we found the followings:

*In both group A and B, there was significant decrease S of the mean of VAS of patients postoperatively compared with that preoperatively. These findings are summarized in table (1). However comparison between the mean of VAS of group A patients with that of group B patients postoperatively, there was significant difference S regarding headache, facial pain and epistaxis but no significant difference NS regarding nasal obstruction, postnasal discharge, hyposmia and snoring . These findings are summarized in table (2).

Table (1): Comparison of the subjective results of both groups preoperatively and postoperatively

VAS	Group A endoscopic septoplasty				P value	Group B traditional septoplasty				P value
	Mean		SD			Mean		SD		
	Pre	Post	Pre	Post		Pre	Post	Pre	Post	
Nasal obstruction	8.6	1.8	0.98	3.4	0.0001	8.6	2.1	0.92	3.3	0.0001
Chronic headache	8.3	3.5	2.6	2.9	0.0001	7.9	5.7	2.7	3.7	0.038
Facial pain	8.2	2.3	0.7	2.8	0.0001	8.3	4.5	0.5	3.9	0.0001
Recurrent epistaxis	8.7	1.8	0.9	4.4	0.0001	8.6	4.5	0.8	3.8	0.0001
Postnasal discharge	8.8	2.9	0.9	3.2	0.0001	8.2	4.6	0.8	3.7	0.0001
Hyposmia	8.3	3.6	0.5	4.1	0.0001	8.4	4.1	0.5	2	0.0001
Snoring	8.3	3.4	0.9	3.5	0.0001	8.1	5.1	0.7	3.7	0.001

Table (2): Comparison of the subjective results of both groups postoperatively

VAS	Group A post.		Group B post.		P value	Sig.
	Mean	SD	Mean	SD		
Nasal obstruction	1.8	3.4	2.1	3.3	0.77	NS
Chronic headache	3.5	2.9	5.7	3.7	0.043	S
Facial pain	2.3	2.8	4.5	3.9	0.047	S
Recurrent epistaxis	1.8	4.4	4.5	3.8	0.045	S
Postnasal discharge	2.9	3.2	4.6	3.7	0.128	NS
Hyposmia	3.6	4.1	4.1	2	0.63	NS
Snoring	3.4	3.5	5.1	3.7	0.14	NS

Regarding nasal endoscopic finding postoperatively, table (3) collected these finding.

Table (3): Nasal endoscopic findings postoperatively.

Nasal endoscopic findings post operative	Endoscopic		Traditional		P	Significance
	No.	Percentage	No.	Percentage		
Persistent deformity						
a) Anterior deviations	0	0%	0	0%	--	--
b) Posterior deviations	1	5%	7	35%	0.008	H.S
c) Spurs	0	0%	5	25%	0.008	H.S
Nasal bleeding	2	10%	3	15%	0.31	N.S
Persistent contact with turbinate	0	0%	7	35%	0.001	H.S
Nasal crustations	2	10%	3	15%	0.543	N.S
Nasal synechiae	1	5%	3	15%	0.32	N.S
Septal perforation	0	0%	2	10%	0.073	N.S

Regarding the nasal deformities; anterior deformities were corrected in all patients of both groups. While there was residual persistent posterior septal deformity detected on endoscopic examination and it was found in group A only in one patient (5%). While in traditional septoplasty group B we found in 7 cases (35%). So there was significant difference between both groups regarding posterior deformity.

As regards septal spure we didn't find any residual septal spure in cases of group A septoplasty while in group B patients we found 5 cases (25%) had residual septal spure and it was of significant difference between both groups .

Nasal bleeding postoperatively was found in 2 cases (10%) of group A and in 3 cases (15%) of group B. These 5 cases had mild nasal bleeding upon removal of the packs and were controlled by ephedrine packs for few minutes. There was no significant difference NS between both groups .

As regards contact point of the nasal septum with middle turbinate postoperatively it was not found in any case of group A patients. While it was found in 7 cases (35%) of group B who still had contact point between the septum and the middle turbinate. So, there was highly significant difference between both groups **(Fig.8,9)**.

Nasal crusts were found in 2 cases (10%) of group A patients, while in Group B 3 cases (15%) showed crusts postoperatively. The difference was insignificant .

Nasal synchia were observed in one case (5%) of group A and in 3 cases (15%) of group B. However no significant difference between both groups.

Septal perforation was observed in 2 cases (10%) of group B while in group A there was no cases of septal perforation (0%). But there is no significant difference between both groups .

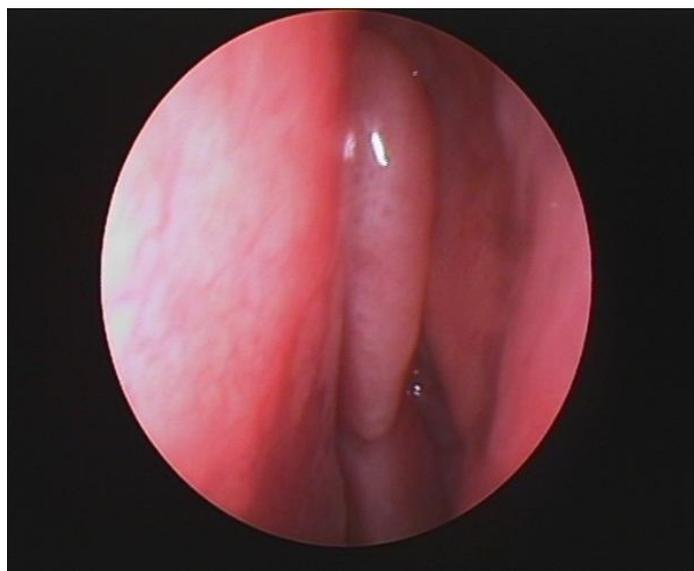


Fig. (8): contact point of the nasal septum



Fig. (9): contact point of the nasal septum

DISCUSSION

Surgery on a deviated nasal septum has progressed from radical removal of cartilage, and mucosa and radical removal of cartilage only by submucous resection to the modern technique septoplasty.(15,4) Endoscopic septoplasty as a minimally invasive technique can limit the dissection and minimize trauma to the nasal septal flap under excellent visualization. This is especially valuable for the patients had previous nasal septal surgery.(16,17)

The most common complaints of patients pre-operatively were nasal obstruction(80%),headache(65%),post nasal discharge(35%) and facial pain (35%). And this in agreement with Gupta (2005)(18) and Leena Jain et al,(2011) (14).

This study did not show significant differences except for headache, facial pain and epistaxis in the postoperative results (after 6 months) between both groups subjectively. And this disagree with Nayak et al,1998.(6)and Leena Jain et al,2011 (14)as they found significantly higher rate of persistence of symptoms with conventional septoplasty as compared to endoscopic one.

Concerning the duration of surgery, the endoscopic technique vary from 15 to 27 min. while traditional one from 23 to 34 min. with relative shorter time in endoscopic technique. And this in agreement with the majority of authors as Giles et al.1994(19) and Horry et al 1997 (20).

in our study we reported only two cases (10%) had mild nasal bleeding upon removal of the packs, two patients(10%) with smell of bad odour and crustations, one case (5%) with septal hematoma as the septal flaps not sutured together also one case (5%) with synechiae but no cases with septal perforation, septal spurs and persistent contact with the turbinates. This in agreement with the observation of Hwang et al,(1999)(16) in their retrospective study of 111 patients undergoing endoscopic septoplasty.

As regards the effect of splinting postoperatively we did not find any importance in use of septal splints at the end of the operation as they not only offer no additional help in stabilizing the septum post-operatively but also cause discomfort after pack removal in patient of both groups. This in agreement with the study of James et al(1991) (21)as they recorded the position of the septum, patency of the airways ,presence of adhesions and degree of discomfort in 100 patients and concluded that the statistical analysis of the results obtained indicated splints added significantly to post-operative discomfort with no clear advantages in inserting intranasal splints according other factors.

We found that endoscopic septoplasty is superior to traditional septoplasty because of the following:

- It is effective in management of nasal obstruction.
- It is more effective in preventing contact between septum and lateral nasal wall.
- It provides accurate identification of the septal anatomy and pathology.
- Better visualization and accessibility to the posterior deviations and isolated septal spurs.

- Good for revision septal operations .
- It is effective teaching tool.
- Instruments used in endoscopic septoplasty are similar to those used for FESS.
- Incision and elevation of the flap over the deviated part under direct endoscopic vision minimizes intra-operative and post-operative complications.
- It helps in documentation of cases.
- Less time consuming during surgery and less morbidity.
- Less expensive ,less post-operative discomfort and patient can return work early.

But the disadvantages of endoscopic septoplasty include:

- Loss of binocular vision.
- Loss of bimanual work during operation.

CONCLUSION

We conclude from our study that symptomatized deviated septum can be corrected by different techniques. Endoscopic septoplasty provides an excellent alternative to traditional head light one with many advantages as easy, safe, rapid, limited dissection of the flaps, good access to posterior and high deviations, good illumination and visualization, less complications(odema, tear, perforation, hematoma, crustation), easy for revision and good teaching tool if used with monitors. Also this technique can avoids splints, packing and stitches so it can decrease the post-operative period and pain.

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