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A COMPARATIVE STUDY OF ENDOSCOPIC SEPTOPLASTY AND CONVENTIONAL HEAD LIGHT SEPTOPLASTY IN CASES OF DEVIATED NASAL SEPTUM: A CLINICAL STUDY

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Conflicts of Interest: Nil

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Abstract:

Objective: To assess advantages and disadvantages of endoscopic septoplasty over the traditional or conventional head light septoplasty.

Design: Prospective study; interventional type; randomised design; comparative analysis.

Method: Study was done in Department of Otorhynolaryngology, Govt. Medical College & Dr. Susheela Tiwari Hospital, Haldwani, Uttrakhand. We included 50 patients in the study presenting with nasal septal deviation with or without spur. All patients were divided into two groups. First one undergoing conventional septoplasty under head light and second one underwent endoscopic septoplasty. Post-operative assessment was carried out at the end of 1st, 3rd, 5th and 7th week and the two techniques were subjected to comparision.

Result: Endoscopic septoplasty was found to be more effective in treating symptoms such as nasal obstruction and headache as compared to the septoplasty under headlight. The technique found more useful for posterior septal deviation and bony spur. Complications in endoscopic septoplasty were minimal as compared to traditional surgery.

Introduction

Surgery on deviated nasal septum has changed a lot, starting from radical septal resection to preservation of the possible septal framework, as the later gives rise to lesser complications. Moreover conservative surgery can be safely performed in children. In traditional head light septoplasty there is often overexposure, unnecessary manipulation of septal anatomy and excessive resection. Relatively poor illumination, inaccessibility and less magnification call for more exposure by a large incision and by elevation of flaps on both sides of the septum. Endoscopic septoplasty is a fast developing concept and gaining popularity. It provides a direct approach to the septal anatomic deformity, allowing minimally invasive procedure with limited septal mucosal flap dissection and removal of a small cartilaginous and/ or bony septal deformity. More than one incision can be given to correct the deformities on either side of the nasal septal mucosa. There is superior visualization and magnification, provided by the endoscope which helps to increase the precision of the surgical procedure. Endoscope aids limited but sufficient exposure of septal pathology. Endoscopic septoplasty is a minimally invasive surgery and there is no need for disarticulation of ethmoidochondral and vomerochondral junctions.

The development of cold light source and Hopkins optics have improved the capability of this method and made it possible to take excellent photographs for future use. Diagnostic Nasal Endoscopy done during endoscopic septoplasty gives information which is often superior to that obtained during clinical and radiological examination.It is also an effective teaching tool.

The application of endoscopic technique for the correction of septal deformities was first described in 1991 by *Stamberger*[1,2,3]. *Giles et al*[4]. evaluated the role of endoscopic septoplasty as an adjunct to functional endoscopic sinus surgery. *Park et al*.[5] concluded that they could visualize the nasal septum under magnification on a video monitor and operate with precision, as well as demonstrate the technique. *Hwang et al*.[6] stated that endoscopic septoplasty is helpful in revision cases and correction of posterior septal deformities. *Lanza et al.*[7] described a detailed endoscopic approach to the treatment of isolated septal spurs.

Material and Methods

This was a prospective study done to assess advantages and disadvantages of endoscopic septoplasty over the traditional or conventional head light septoplasty. It was conducted in the department of ENT at Dr. Susheela Tiwari Hospital and Govt. Medical College Haldwani in the state of Uttrakhand. Study was conducted for a period of one year from July 2012 to June 2013. 50 cases were selected from outpatient department of ENT.

Following was the selection criteria for the study:

1. Patients with symptoms of nasal obstruction for more than 12 weeks.

2. Patients having nasal septal deviation with or without sepal spur.

3. Symptomatic septal spur was also included in the study.

4. No symptomatic relief with all possible medical therapy..

Patients with allergic rhinitis and other forms of rhinitis causing nasal obstruction were excluded from the study.

Diagnostic Nasal Endoscopy (DNE) was done in each case to confirm the diagnosis as well as to visualize the posterior part of nasal cavity. Every case was subjected to NCCT for greater anatomical details of nose and paranasal sinuses.

Cases were randomly divided in two groups. Group A underwent conventional septoplasty under headlight. Group B patients were subjected to endoscopic septoplasty. After routine blood investigations surgery was performed under local anaesthesia in both groups..

Surgical Technique:

All patients undergone septoplasty were given premedication. One ampule of Injection Fortwin (Pentazocine, 30 mg) and one ampule of Injection Phenargan (Promethazine,25 mg) were mixed and half of this mixture was given through intramuscular route 30 minutes before surgery and remaining half was given intravenously just before surgery.

Endoscopic septoplasty

The patient was positioned, draped and prepared as for standard endoscopic sinus surgery. The nasal cavity was packed for 15 minutes with ribbon gauze soaked in solution of 30 ml of topical xylocaine 4% with 3 ampules of Injection adrenaline.

The nasal cavity was then examined endoscopically and the site, severity of the deviation or septal spur was noted. Local infiltration of septum was done with injection lignocaine 2% and inj. Adrenaline (1:100000) as per the standard dose. The incision was given vertically just anterior to the point of maximal deviation on the convex side of septum (Killians incision). The mucopericondrial and mucoperiosteal flap were raised under direct visualization using a 0^0 endoscope to expose the deviated portion of septum. In cases of both cartilaginous and bony deviation, raised flaps were divided along the horizontal axis of maximal deviation and the flaps were opened like a book (hence the open book technique). This exposed the entire deviated segment of septum with excellent visualization. The deviated segment was excised with endoscopic scissors or Luc's forcep. The flaps were reposited back to their original position and often they were well opposed so no suturing was required. In some cases quilting sutures were used across the septal flaps. In cases where there was only spur, spurectomy was done by giving horizontal incision over most prominent part and flaps were elevated superiorly and inferiorly. In some cases two separate incisions were given for correcting deviated segment and spur removal. Merocel was used to pack the nasal cavity.

Conventional Septoplasty/ Head Light septoplasty:

Local infiltration of columella and septum was done with inj. 2% xylocaine and adrenaline (1:100000). Under headlight, incision was made at caudal border of septal cartilage. The mucoperichondrial and mucoperiosteal flaps were elevated on both sides. The cartilage was freed from perpendicular plate of ethmoid posteriorly and maxillary crest inferiorly. Deviated parts were removed. The incision was closed using 3'0 chromic catgut suture. Bilateral nasal cavities were packed with merocel.

OBSERVATIONS

Following observations were made at the end of 1 year. Out of 50 patients 34 (68%) were male and 16 (32%) were female. The maximum number of patients was seen in 21- 30 yrs of age group. The duration of symptom ranged from 1 year to 5 years with maximum number of cases in 1 year group.

The complaints of the patients in the study were categorized as shown in Table I.

Anatomical Variations:

Diagnostic Nasal Endoscopy (DNE) and NCCT nose and paranasal sinuses were done in every patient and anatomical variations were observed as shown in Table II.

Post Operative Assessment of nasal symptoms:

Most of the patients were discharged after removing anterior nasal packing on third day. 6 patients of head light septoplasty and 2 patients of endoscopic septoplasty group required longer stay after pack removal due to bleeding. Postoperative assessment was compared at the end of 7^{th} week as shown in Table III and IV.

Diagnostic Nasal Endoscopy (DNE) at 7^{th} week

Objective assessment among study subjects revealed that 14.1% of group A and 12.5% of group B cases had persistent anterior deviation; 40% of group A and 9% of Group B had persistent posterior deviation and 54.4% of group A had persistent spur, while no spur seen in group B. Synechiae formation was seen in 6 cases (24%) of group A while no such case was seen in group B.

Table I:

S.No	Presenting symptoms	Group A	GroupB
1.	Nasal obstruction	19 (76%)	21 (76%)
2.	Anterior Nasal discharge	12 (48%)	10 (40%)
3.	Headache	12 (48%)	13 (52%)
4.	Sneezing	3 (12%)	3 (12%)
5.	Post nasal drip	2 (8%)	3 (12%)
6.	Hyposmia	1 (4%)	1 (4%)
7.	Bleeding	3 (12%)	4 (16%)
8.	Snoring	1 (4%)	1 (4%)

Table II: ANATOMICAL VARIATIONS ON DNE AND NCCT NOSE AND PARANASAL SINUSES

S.No.	Anatomical variations	No. of cases n=50	Percent (%)
1.	Inferior turbinate hypertrophy	30	60
2.	Concha bullosa	12	24
3.	Paradoxical middle turbinate	12	24
4.	Uncinate process abnormality	10	20
5.	Agar nasi cells	07	14
6.	Haller cells	05	10

Table III: SYMPTOMS RELEIVED POSTOPERATIVELY AMONG GROUP A (25 CASES)

S.No.	Symptom	Pre- op	Post-op (7wks)	Percent %
1.	Nasal obstruction	19	08	42.1
2.	Headache	12	07	58.3
3.	Ant.nasal discharge	12	04	33.3
4.	Sneezing	3	02	66.6
5.	Postnasal drip	2	01	50.0
6.	Hyposmia	1	00	00.0
7.	Bleeding	3	01	33.3
8.	Snoring	1	00	00.0

Table IV: SYMPTOMS RELEIVED POSTOPERATIVELY AMONG GROUP B (25 CASES)

S.No	Symptom	Pre- op	Post-op (7wks)	Percent %
1.	Nasal obstruction	21	19	90.4
2.	Headache	13	11	84.6
3.	Ant.nasal discharge	10	04	40.0
4.	Sneezing	03	03	100.0
5.	Post nasal drip	03	02	66.6
6.	Hyposmia	01	01	100.0
7.	Bleeding	04	03	75.0
8.	Snoring	1	00	00.0

Discussion:

Nasal obstruction is the most common complaint in rhinological practice and a deviated nasal septum is the most common cause of nasal obstruction. The evaluation of septal deviation causing nasal obstruction depends on clinical examination and imaging studies *(Dinis & Haider, 2002*)[8]. Apart from nasal obstruction, a significantly deviated nasal septum has been implicated in epistaxis, sinusitis, obstructive sleep apnea and headache [attributable to contact points with structures of the lateral nasal wall] *(Pannu et al, 2009*)[9]. 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 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.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, unnecessary manipulation, resection and overexposure of the septal framework reducing the scope for a revision surgery. 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)*[10,11]. An 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. (*Maran & Lund, (1990*)[12]; *Lanza et al (1991)*[13] described endoscopic techniques to correct septal deformities. Since that time surgeons have performed concomitent 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 Endoscopic Sinus Surgery (ESS) (*Lanza et al,1993*[13]*; Giles et al, 1994*[4]*; Cantrell, 1997*[14]*; Yanagisawa & Joe, 1997*[15]*; Hwang et al, 1999*[6]*)*. 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 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. Diagnostic nasal endoscopy is a valuable tool for initial assessment of the relationship of the septum to the middle turbinates, it allows the surgeon to judge whether or not the position of the septum will limit the 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. Nasal endoscopy is an excellent tool for outpatient surveillance following septoplasty to assess healing and any other complication. *(Sautter & Smith, 2009*)[16].

Conclusion

Endoscopic septoplasty is increasingly being used in surgical treatment of deviated nasal septum. It 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 deviated area. It effectively relieves headache caused by contact areas in nasal cavity especially in cases of septal spur. Endoscopic septoplasty is associated with significant reduction in patient's morbidity in postoperative period due to limited extent of flap dissection, avoiding use of Killian nasal speculum which by pressure can cause discomfort, limited manipulation and resection of septal framework.

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