



Case Report

A study of single sided mucoperichondrial resection versus conventional technique in submucosal resection

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ABSTRACT

Introduction: Nasal septal deviation is a condition which is frequently encountered in the general population. Surgical correction of this problem has been the mainstay of treatment for over a century.

This study is to compare SMR with Single sided mucoperichondrial resection. This new technique in Septal Surgery is found without complication whereas complications were noted in SMR.

Materials and Methods: The study to compare the Single sided mucoperichondrial resection versus conventional SMR was carried out in the Department of Otorhinolaryngology at AJ Institute of Medical Sciences and Research Centre, Mangalore, Karnataka during the period from 1st October 2018 to 31st September 2019.

A total of 20 cases with symptomatic DNS were included in the study, after randomization 10 cases underwent conventional SMR and 10 cases Single sided mucoperichondrial resection.

Results: Among 10 patients who underwent conventional SMR, Septal hematoma and septal perforation were the most common complications. None of the patients who underwent Single sided mucoperichondrial resection had any complications.

Conclusion: In conventional SMR, retention of both mucoperichondrial flaps results in many recognized post op complications. In Single sided mucoperichondrial resection, no complications were seen in comparison.

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1. Introduction

Nasal septal deviation is a condition which is frequently encountered in the general population. The chief symptom is nasal obstruction causing difficulty in breathing. Surgical correction of this problem has been the mainstay of treatment for over a century.

Freer and Killian, credited with the concept of submucous resection (SMR) form the basis of most techniques. They proposed that to correct the abnormality, the cartilage and the bone should be carefully identified between the layers of the mucous membrane and removed, with retention of both dorsal and caudal struts of cartilage. The procedure is completed by replacing the mucoperichondrial flap.

In Single sided mucoperichondrial resection, in contrast to SMR, the mucoperichondrial flap is resected.

2. Aims and Objectives

To determine and compare the postoperative outcome following Single sided mucoperichondrial resection and SMR.

3. Materials and Methods

The study to compare the single sided mucoperichondrial resection versus conventional SMR was carried out in the department of otorhinolaryngology at A J Institute Of Medical Sciences and Research Centre, Mangalore during the period from 1st October 2018 to 31st September 2019.

Based on the inclusion criteria cases were selected from the patients who attended the out-patient clinic.

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Data was collected by selecting the patients with deviated nasal septum willing for surgery. They were divided into 2 groups by random selection; 1st group underwent conventional SMR and the 2nd group- Single sided mucoperichondrial resection. Patients were assessed preoperatively and followed up postoperatively.

A total of 20 cases with symptomatic DNS were included in the study; out of which 10 cases were planned for conventional SMR and 10 cases were for Single sided mucoperichondrial resection.

A study was conducted for 1 year. Simple Prospective randomization study was conducted. Patient with symptomatic deviated nasal septum and age above 18 years were included in the study. Patient with external nasal deformity, systemic disease, past history of nasal trauma or surgery and age below 18 years were excluded in the study.

Cases selected for the study were subjected to detailed history and clinical examination and the patients were assessed subjectively and objectively before the surgery. Cold spatula test was done followed by anterior rhinoscopy.

Deviations were classified as right or left depending on the side of deviation. Depending on the involvement of cartilaginous or bony parts of septum they were classified into anterior or posterior or both. Caudal dislocation, spurs, buckling of septum were identified. Posterior rhinoscopy was done in all patients to rule out other pathologies.

Following investigations were done prior to surgery.

1. Blood investigations.
2. X ray of PNS- Water's view and Caldwell. CT scan of paranasal sinuses were done in selected cases.
3. Diagnostic nasal endoscopy to rule out other pathologies.

3.1. Procedure

3.1.1. Conventional SMR

Killian incision is most commonly used for this procedure. It is an oblique incision about 5mm above the caudal border of the septal cartilage. Mucoperichondrial flap was elevated and an incision was made through the cartilage; the opposite perichondrium should be kept intact. With the help of an angled scissor, cut is made in the septal cartilage leaving the dorsal and caudal struts intact; to maintain the support of the nasal dorsum and columella.

The cartilage is removed with the help of a luc's forceps. Any deviated portion of the bone in the region of the vertical plate of ethmoid is then removed. The next step is to elevate flaps off the maxillary crest and the vomer. Crest is finally removed with a hammer and gouge. Mucoperichondrial flap is replaced and nasal packing is done.

3.1.2. Single Sided Mucoperichondrial Resection

Killian incision is most commonly used for this procedure. It is an oblique incision about 5mm above the caudal border

of the septal cartilage. Mucoperichondrial flap was elevated and an incision was made through the cartilage; the opposite perichondrium should be kept intact. With the help of an angled scissor, cut is made in the septal cartilage leaving the dorsal and caudal struts intact; to maintain the support of the nasal dorsum and columella.

The cartilage is removed with the help of a luc's forceps. Any deviated portion of the bone in the region of the vertical plate of ethmoid is then removed. The next step is to elevate flaps off the maxillary crest and the vomer. Crest is finally removed with a hammer and gouge. The elevated mucoperichondrial flap is 'removed'. There is no need of nasal packing in this procedure.

4. Results

The results of 10 cases of conventional SMR and 10 cases of single sided mucoperichondrial resection were assessed under following headings.

1. Patient parameters
2. Surgical results.
3. Functional results.

4.1. Age Distribution

In our study of 20 cases, the age of the patients varied between 19 and 51 years.

4.2. Sex Distribution

The present study shows male preponderance i.e, 60% male and 40% female patients.

4.3. Symptomatology

In the conventional SMR group, commonest symptom is nasal block which is seen in 100% of patients followed by headache which is seen in 35% patients. No patients had complaints of epistaxis.

In the Single side mucoperichondrial resection group, 90% patient had nasal block, 30% patient had headache and 10% had history of epistaxis.

4.4. Signs

In this study, conventional group had 60% of patients with DNS to left and 40% of patients with DNS to right. In this group 10% had spur.

Single sided mucoperichondrial resection group had 70% of patients with DNS to left and 30% of patients with DNS to right, 20% had spur.

Postop Symptomatology: Patient who underwent both conventional and Single sided mucoperichondrial resection had 100% relief from symptoms like nasal block headache postoperatively.

Table 1: AgeDistridution

Age	Conventional	Single sided mucoperichondrial resection		Fisher exact test p value
	Count	Column N %	Count	
<20 yrs	1	10%	3	30%
21-30	6	60%	4	40%
31-40	2	20%	1	10%
>40	1	10%	2	20%
Total	10	100%	10	100%

Table 2: Signs in the study

		Conventional		Single sided MPR		p value	
		Count	Column N %	Count	Column N %		
DNS	DNS to L	6	60%	7	70%	0.736	NS
	DNS to R	4	40%	3	30%		
	Total	10	100%	10	100%		
SPUR	Absent	9	90%	8	80%	0.292	
	Present	1	10%	2	20%		
	Total	10	100%	10	100%		
PNS Tenderness	Absent	10	100%	10	100%		
Total	Total	10	100%	10	100%		

Table 3: Different complications postoperatively

		Conventional		Single sided MPR		p value	
		Count	Column N %	Count	Column N %		
Septal perforation	Absent	9	90%	10	100%	0.147	NS
	Present	1	10%	0	0		
	Total	10	100%	10	100%		
Septal abscess	Absent	0	0	0	0	0.035	Sig
	Total	10	100%	10	100%		
Septal hematoma	Absent	8	80%	10	100%		
	Present	2	20%	0	0		
	Total	10	100%	10	100%		
Other		0	0	0	0		
Total		10	100%	10	100%		

Postop Complication: In the conventional group study 20% patient had septal hematoma and 10% patients had septal perforations. No patient had septal abscess. In the Single sided mucoperichondrial resection group study 20% patient had septal hematoma, septal perforations or septal abscess.

5. Discussion

The main function of the nose (olfaction, heating, humidification and defense) require good interaction between the inspired air and the mucous membranes or the sensory cells of the olfactory system. This is achieved by complicated aerodynamics that depends on the geometry of the internal nose. The septum helps to preserve this geometry. The septum also supports the dorsum, columella and tip of the nose and as such it contributes to cosmesis. The success of functional nasal surgery, as well as cosmetic nasal surgery, depends heavily on the correction of the

septum. This explains why nasal surgery almost always involves both function and aesthetics as pointed out by Maurice Cottle in 1960s.¹

The nasal septum is composed of a small anterior membranous portion, cartilage and several bones: the perpendicular plate of the ethmoid, the vomer and two bony crests of the maxilla and palatine. The cartilaginous portion is composed of a quadrilateral cartilage with a contribution from the lower and upper lateral alar cartilages forming the anterior nasal septum. The quadrilateral cartilage is 3-4 mm thick in its center but increases to 4-8 mm antero- inferiorly, an area which has been termed the footplate. The upper margin of the cartilage also expands where it is connected to the upper lateral cartilages, forming the anterior septal angle, just cranial to the domes of the lower lateral cartilages. The perpendicular plate forms the superior and anterior bony septum, is continuous above with cribriform plate and crista galli and abuts a variable amount of the nasal

bones. The vomer forms the posterior and inferior nasal septum and articulates by its two alae with the rostrum of the sphenoid, thereby creating the vomerovaginal canals which transmit the pharyngeal branches of the maxillary artery.²

Only few deviated nasal septum's affect the nasal function and therefore require treatment. The symptoms caused by septal deviations are entirely the result of their effects on nasal function. The dominant symptom being nasal obstruction, epistaxis, post nasal discharge, hyposmia.³

Until the 1960s, submucous septal resection as promoted by Freer⁴ and Killian⁵ was standard practice in Western Europe. With this technique a more or less straight septum was obtained in the areas where the septal skeleton was resected. Septal perforation were common complication, in part due to drying of the opposing mucoperichondrium adjacent to the incision. Another drawback of this technique was that correction of pathology in the dorsal, caudal, inferior and posterior parts of the septum was not possible.

A study was conducted in the Department of ENT, L.N.Medical College & Research Centre, Bhopal, Madhya Pradesh, India to compare between SMR and Septoplasty to manage deviated nasal septum. The study claimed that both SMR and Septoplasty have their own advantages and disadvantages but neither SMR nor Septoplasty seems to be the best treatment modality. The study showed that complications are more for SMR than that of Septoplasty. But the functional outcomes were same in both surgeries. Septal perforation was present in 8.33% of the cases and septal hematoma was present in 2.5% of the cases.⁶

Muhammed IA, Nabir-ur Rahman conducted a study at the department of Otorhinolaryngology, Head and Neck Surgery, Civil Hospital, Karachi, from 1997-1999. A total 200 cases were taken. All of them were subjected to nasal septal surgery as per situation. Classical SMR was performed in most of the cases. The overall incidence of complications was septal perforation in 10 cases (5%), adhesions in 14 cases (7%), recurrence of symptoms or deformity in 12 cases (6%), saddle nose deformity in 2 cases (1%) and columellar retraction with loss of tip projection was found in 2 cases (1%). The incidence of complications was 21% and it was higher in classical submucosal resection.⁷

Kamar Iqbal, Muhammad Ismail, Amir Amanullah conducted a study to find out the functional outcome and frequency of complications with SMR and Septoplasty. The study group consists of 220 patients with symptomatic deviated nasal septum. Classical SMR was performed in 120 (54.55%) while Septoplasty in 100 (45.45%) patients. The functional results and complications of two procedures were assessed. Nasal obstruction was relieved in 89/120 (74%) patients after SMR and 72/100 (72%) after Septoplasty. The overall complication rate was 37/120 (31%) in SMR and 24/100 (24%) in Septoplasty. The study revealed no significant difference between the functional outcome and

complication rates for the two procedures.⁸

A.Tzadik, S.E. Gilbert, and J. Sade conducted a retrospective study with 263 patients who had previously undergone submucous resection of their nasal septa. Unsatisfactory septal corrections, perforations, and dorsal saddling were looked for and could be correlated with the skills of the ten surgeons who performed the procedures. From the total number of the patients 17 (6.4%) were noted to have persistent septal perforations, 10 (3.8%) had residual deviations of their nasal septa, and 1 (0.4%) had a saddle nose deformity. The findings show that a well-executed submucous resection of the nasal septum carries a high incidence of complications in unskilled hands.⁹

Surgical intervention is the mainstay of treatment in the correction of DNS, the techniques being septoplasty and SMR. Fjermedal O, Saunte C, Pedersen J (1988) did a study of 478 patients to compare between septoplasty and SMR of septum. It was found that septoplasty was associated with lesser complications and more satisfactory results compared to SMR of septum.¹⁰

In our study a new technique (Single sided mucoperichondrial resection) was introduced to address the complications caused by SMR. All 20 patients underwent surgery of which 10 were conventional SMR and 10 were Single sided mucoperichondrial resection. All surgeries were done under general anaesthesia and done by the same surgeon.

In the present study the patients were examined on 3rd and 15th day post operatively and then monthly for 3-6 months. During each visit, the patients were assessed subjectively and objectively. The following were the results noted; Postoperative subjective assessment was done by asking the patients about the following symptoms- nasal obstruction and headache was absent in all patients (100%) in conventional SMR and in Single sided mucoperichondrial resection group.

The objective assessment was done by noting the condition of septum using nasal endoscope. Complications were- 2 patients had septal hematoma (20%) that underwent conventional SMR, 1 patient had septal perforation (10%) that underwent conventional SMR. None of the patients who underwent Single sided mucoperichondrial resection had any complications. External deformities and other complications were not seen in both the groups.

6. Conclusion

Single sided mucoperichondrial resection is a major innovation and good evolutionary step in the history of septal surgery.

In the conventional SMR, retention of both mucoperichondrial flaps results in many recognized complications that include septal haematoma, abscess and perforation. In Single sided mucoperichondrial resection, no complications were seen in comparison.

7. Source of Funding

None.

8. Conflict of Interest

None.

References

1. Barelli PA, Loch EE, Kern, Steiner A. Rhinology: the collected writings of Maurice H. American Rhinologic Society; 1987.
2. Lang J. Clinical anatomy of the nose, nasal cavity and paranasal sinuses, Stuttgart: Georg Thieme Verlag. Stuttgart; 1989. p. 37.
3. Scott-Brown's. Otolaryngology: Butterworth & Heinemann Sixth edition. vol. 4;. p. 11–12.
4. Freer OT. The correction of delections of the nasal septum with minimum traumatism. *JAMA: J Am Med Assoc.* 1902;XXXVIII(10):636.
5. Killian G. The submucous window resection of the nasal septum. *Ann Otol.* 1905;14:363–7.
6. Patel T. Comparative study between submucous resection and Septoplasty to manage deviated nasal septum. *Int J Recent Trends Sci Technol.* 2014;9(3).
7. Muhammad IA, Rahman NU. Complications of the surgery for deviated nasal septum. *Jcoll Physicians Surg Pak.* 2003;13(10):565–8.

8. Iqbal K. Submucous resection versus Septoplasty: complications and functional outcome in adult patients. *Gomal J Med Sci.* 2011;9(1).
9. Tzadik A. Complications of submucous resections of the nasal septum. *Arch Otorhinolaryngol.* 1998;245:74–6.
10. Sauntec F, Pedersen J. Septoplasty and or SMR Nasal septal operation. *J Laryngol Otol.* 1988;p. 790–8.

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