Complications of Submucous Resection versus Septoplasty in Deviated Nasal Septum

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Abstract

Introduction: A deviated or deflected septum is a condition in which the nasal septum consisting of bone and cartilage and that divide the nasal cavity into two halves is significantly off-center, or twisted, making breathing difficult. Two conventional methods that are septoplasty and submucous resection were used for the correction of the deviated nasal septum with varying degrees of complications.

Objective: The objective of this study was to compare the complications of submucous resection and septoplasty in patients with the deviated nasal septum.

Materials and Methods: A Quasi-experimental study was conducted at the Department of Otolaryngology at Bolan Medical Complex, Quetta for a period of one year i.e. from 15-03-2015 to 20-09-2015. 100 patients were selected and divided into two groups. A total of 50 patients were selected for septoplasty and 50 for sub-mucous resection. Patients with nasal bone fracture and external nasal deformity were excluded from the study.

Results: Postoperative complications like adhesions were found in 4 cases of each group. Septal perforation found in 3 patients of sub-mucous resection and one patient of septoplasty. Septal hematoma formed in 2 patients of sub-mucous resection only, supra-tip nasal deformity in 2 patients in both groups. Persistence of symptoms in 8 patients of septoplasty and one patient of sub-mucous resection while columellar restriction occurred in only one patient who underwent submucous resection.

Conclusion: Sub-mucous resection procedure is technically relatively easy to perform with fewer complications than septoplasty so it deserves it prime role as a surgical procedure for nasal septum corrective surgery.

Keywords: Deviated nasal septum, nasal septum corrective surgery, sub-mucous resection, septoplasty.
Introduction

The symptomatic deviated nasal septum can be corrected by two conventional surgical methods, the sub-mucous resection operation, and septoplasty to improve the quality of life and decrease the use of medication. The classical sub-mucous resection (SMR) involves extensive removal of obstructing portion of septal cartilage and bone while preserving at least 1 cm of the caudal and dorsal strut. In theory, these struts preserve the cartilaginous dorsum and protect the supporting framework of the nose. Conversely, septoplasty is a tissue-sparing procedure involves tissue freeing the periphery of quadrangular cartilage margins with either minimal or subtotal excision, refashioning or reinsertion. Preservation of central support is the chief advantage of septoplasty. The procedure allows access to, and manipulation of the entire nasal septum including the caudal septum, dorsal margins of quadrilateral cartilage, upper lateral cartilage, nasal spines and maxillary crest areas.

Available techniques can be combined with the best benefit of the patient. The anatomy and pathology of the septum vary from patient to patient and so should be surgeon’s technique. The common postoperative complications after both procedures are septal perforations, supra-tip nasal deformity, septal hematoma formation, adhesions formation, recurrence of symptoms or deformity, columellar retraction and palatal perforation. Complications are related to the type of procedure performed. More complications are seen with classical sub-mucous resection. This study has been selected because nasal septal corrective surgery is a very common procedure in our setup and before this in our best knowledge no work upon complications arising after septal corrective surgery done in Pakistan. This study will also help in highlighting the complications that can arise after nasal septal corrective surgery, identify the available methods like plastic splint placement, proper nasal packing and early resection of adhesions to counter postoperative problems and evaluate their effectiveness in minimizing these complications.

Materials and Methods

100 patients who underwent nasal septum corrective surgery in the ENT department at Bolan Medical Complex, Civil Hospital Quetta between 15-3-2015 till 20-9-2015 were selected. Patients were equally divided into two groups i.e. 50 patients in the submucous resection group and 50 in the septoplasty group. All the patients belonged to Quetta to make the follow up easy.

Patients were studied prospectively. Qualitative response variables like gender, history of patients include nasal obstruction, headache, rhinorrhea, and postnasal drip, examination findings include anterior and posterior deviations and post-operative complications include septal perforation, supra-tip nasal deformity, septal hematoma formation, the persistence of symptoms and columellar retraction were compared.

Inclusion criteria were patients of all ages and both genders with a complication of persistent nasal obstruction, headache, chronic and uncontrolled nasal bleeding. On anterior rhinoscopy, there was nasal septal deviation either in a vertical or horizontal plane. On the x-ray PNS view, there was septal deviation or haziness of sinuses associated with deviation off septum either on an x-ray or on anterior rhinoscopy. Exclusion criteria were patients having nasal bone fracture and deformity, submucous resection as a preliminary step in hypophysectomy (trans-septal trans-sphenoidal approach) or vidian neurectomy (trans-septal approach) and patients who were unfit for GA.

Data was collected by taking history and examining the patients of all ages and both genders who admitted through OPD in the department of ENT BMCH, Quetta with complaints of symptomatic deviated nasal septum, meeting the inclusion criteria. Routine investigations like blood CBC, HbsAg, Anti HCV, Urine R/E, x-ray chest and specific investigation like x-ray PNS (water’s view) were done. The purpose and procedure of the study were explained to the patient. The procedure was explained to all the patients and informed consent was taken. The deviated nasal septum was corrected either by septoplasty or submucous resection procedure. A preformed proforma was used to record the information about the patients and the complications of the procedure performed. Early complications that arose in the first 72 hours like during the surgery septal perforation, supra-tip nasal deformity, and hematoma formation were noted and if found were corrected by primary repair or graft repair of septal perforation, graft repair of supra-tip nasal deformity and evacuation of a septal hematoma.
All the patients were sent home on the third postoperative day. The first follow up was after 10 days of operation in which intranasal splint was removed. All the patients were also taken in confidence for a second follow up visit to the outpatient department of ENT until after 1 month of surgery. The nose was examined for any complaints. Overall patient satisfaction was judged at each follow-up visit.

Data analysis was performed using SPSS version 16. The patient’s age was presented by mean ± SD and a student’s t-test (unpaired) was applied to compare the mean age between groups of a patient who underwent sub-mucous resection and septoplasty. Frequencies and percentages were compared to present the qualitative variables like gender, history of patient’s complaint includes nasal obstruction, headache, rhinorrhea, and postnasal drip. Examination findings included anterior deviation, posterior deviation, c-shaped and s-shaped deviations, and postoperative complications included septal perforation, supra-tip nasal deformity, septal hematoma formation, the persistence of symptoms and columnar retraction. Chi-square test applied to compare the proportions of the aforementioned qualitative variables between groups of patients who underwent sub-mucous resection and septoplasty. Fisher’s exact test in place of chi-square test was applied if any cell count in cross-table was less than 5 where it was appropriate. Statistical significance was considered if p-value ≤ 0.05.

**Results**

A total of 100 patients was analyzed from whom 50 underwent Sub-mucous resection and 50 underwent Septoplasty. Out of the total 50 who underwent SMR, 40(80%) were males and 10(20%) females while among 50 patients who underwent Septoplasty, 37(74%) were males and 13(26%) were females. Insignificant difference of gender distribution between patients who underwent SMR and Septoplasty (χ²= 0.51, p= 0.476). The overall mean age of 100 patients was 26.68 ±8.47 (ranging from 14 to 50) years. The difference of mean age was significant between SMR and Septoplasty groups (27.94±9.36 vs 25.34±7.33, p= 0.114).

All (100%) the patients of both groups presented with the complaint of nasal obstruction. Headache in the short history of the complaint was reported by 38(76%) patients of the SMR group and 26(52%) patients of the Septoplasty group. Data reveals a significantly high proportion (χ²= 6.25, p=0.012) of headache in the group of patients who underwent SMR. A significantly high proportion of rhinorrhea in the group of patients who underwent Septoplasty (50% vs. 20%, p= 0.002). A short history of postnasal drip was reported by 15 (30%) patients who underwent SMR and 13(26%) who underwent Septoplasty, however, this difference of proportions between groups was statistically insignificant (χ²= 0.198, p= 0.656).

On examination, the anterior deviation was found in 11(22%) patients and 13(26%) patients of SMR and Septoplasty group. Statistically insignificant (χ²= 0.219, p=0.640) difference of proportion of anterior deviation between the two groups was found.

A significantly high proportion of posterior deviation in the group of patients who underwent septoplasty then SMR (56% vs. 15%, p= 0.009) was found. As early complications become more obvious after taking off the splint so they are analyzed along with the complications of the first visit. On the first visit, adhesion formation was the commonest postoperative complication that was reported by 4(8%) of the SMR group and 4(8%) patients of the septoplasty group as shown in Table 1.

**Table 1: Comparison of complications of adhesions formation between patients who underwent submucous resection and septoplasty.**

|                      | SMR   | Septoplasty |
|----------------------|-------|-------------|
| **Total number of patients** | 50    | 50          |
| **Adhesion formation**   | 4(8%) | 4(8%)       |

An insignificant difference in the proportion of adhesions formation between patients who underwent SMR and Septoplasty (Fisher’s exact test, p=0.999). n=100

Septal perforation was found in 3(6%) patients of the SMR group and 1(2%) patient of the Septoplasty group. An insignificant difference in the proportion of septal perforation (fisher’s exact test, p=0.617) between the two groups was found.

Supra-tip nasal deformity was found in one patient, equally in both groups as shown in Table 2.
Table 2: Comparison of complication of Supra-tip nasal deformity between patients who underwent submucous resection and septoplasty.

|                        | SMR     | Septoplasty |
|------------------------|---------|-------------|
| **Total number of patients** | 50      | 50          |
| **Supra-tip nasal deformity** | 1(2%)   | 1(2%)       |

An insignificant difference in the proportion of SND between patients who underwent SMR and Septoplasty (Fisher’s exact test, p=0.999). n=100

Septal hematoma formation occurred in two patients of the SMR group only. On the second visit, a higher proportion of persistence of symptoms was seen in the group of patients who underwent a septoplasty group than SMR ((16% vs. 4%). However, this difference of proportion was statistically insignificant (P=0.092) as shown in Table 3. Columella retraction occurred in one patient who underwent sub-mucous resection.

Table 3: Comparison of complication of Persistence of symptoms between patients who underwent the submucous resection and septoplasty

|                        | SMR     | Septoplasty |
|------------------------|---------|-------------|
| **Total number of patients** | 50      | 50          |
| **Persistence of symptoms** | 1(2%)   | 8(16%)      |

n=100

Discussion

Surgery of the nasal septum for symptomatic deviated nasal septum is amongst the most frequently performed procedure in otorhinolaryngology. Besides nasal obstruction, a deviated septum can be associated with other symptoms like headache, rhinorrhea, snoring, hyposmia or epistaxis. Submucous resection and septoplasty are the two main procedures, practiced worldwide to relieve these symptoms and to bring the deflected septum in the midline.

This study was planned to know the complications arising after submucous resection and septoplasty operation and the available methods to overcome them. The study had shown that nasal septum corrective surgery was effective in relieving the main complaints. Post-operative complications were observed in both groups of patients. The overall complications in the submucous resection group were observed in 12(24%) patients while 14(28%) in the septoplasty group.

Adhesions were seen in 8% of each group. Iqbal in his study demonstrated adhesions in 5% of SMR patients and 2% in septoplasty patients. Other studies showed adhesions of 10-23%,11,12 in submucous resection patients and 4-26%13,14 in septoplasty patients. Possible causes of synechiae or adhesions formation identified were blood clots, infection, and trauma to both the lateral as well as medial nasal wall and postoperative slough and crust formation. Small adhesions were broken in the outpatient department under local anesthesia when the patients were coming for review visits. Adhesions formation is best avoided by control of infection by giving postoperative antibiotics, minimal trauma at the time of surgery and proper placement of intranasal splints for at least 1-2 weeks.

Septal perforation occurred in 3(6%) patients of the submucous resection group and 1(2%) patients of the septoplasty group. Iqbal noted septal perforation in 4% of patients after submucous resection operation and in 1% patients after septoplasty. Other studies revealed septal perforations in patients after classical submucous resection ranging from 3-14% and 2-5% in patients after septoplasty procedure.15,16,17 Iqbal K, Khan MI noted septal perforation in 2% of their cases after nasal septum corrective surgery.18 While in other studies the frequency of perforation ranges from 3-25%.19 The exact frequency is very difficult to determine as long term studies and clear differentiation of the severity or classification of septum perforations are lacking.

The septal hematoma was found in 2(4%) patients of submucous resection group while in septoplasty patients no complications observed. Low and Fjermedal reported septal hematoma formation in their series of submucous resection operations 1.3%6 and 6.9%20 respectively. No case of septal hematoma found in the septoplasty group in this study. Hematoma formation after septoplasty in various studies ranging from 2-7%.14 Proper cleavage formation after incision in mucoperichondrium and gentle elevation of mucoperichondrial-periosteal flap minimizes the risk of hematoma formation. The use of intranasal BIPP-bismuth iodoform paraffin paste also prevents hematoma formation.
Aesthetic complications were noted in 2 (4%) patients of the submucous resection group. 1 patient developed supra tip nasal (saddle) deformity and 1 developed columellar retraction noted in this group. Reports of external nasal deformity following submucous resection operation varied from 0.4% to 19%.21 Supra tip nasal deformity also occurred in 1 (2%) patient after septoplasty in this study but no columellar retraction noted in this group. Other studies revealed aesthetic nasal problems ranging from 2.9% after septoplasty.13

In this study, there were also found persistence of symptoms in both groups, 1 (2%) patient of submucous resection group and 8 (16%) patients of septoplasty were still presenting with the persistence of symptoms. Iqbal reported recurrence of symptoms in 2% cases after submucous resection operation and 4% cases after septoplasty.10

The results of this study showed that submucous resection was associated with few post-operative complaints as compared to that of septoplasty. The main reason for post-operative dissatisfaction was recurrence or persistence of deviation. Otherwise, septoplasty has superior results than submucous resection as it is a tissue conserving procedure with fewer complications and procedure of choice in revised surgery cases. Submucous resection operation is technically easy to perform, even the resident can do it with no major difficulty, while septoplasty is technically a more demanding procedure. To obtain better results septoplasty needs to be taught in the form of workshops to produce this procedure safe and effective.

Submucous resection operation, being relatively easy to perform and having similar complications and patient satisfaction rate as septoplasty, deserves its place as an operation for the correction of the deviated nasal septum in ENT surgical practice.

**Conclusion**

Besides its ability as a tissue-sparing procedure, in septopasty surgeons faced more complications than submucous resection especially the persistence of deviation. Another disadvantage is that septoplasty is more time consuming and require expert hands to perform. Long term follow-up is required to assess the effectiveness and complications of septal corrective surgery. However, the following conclusions can be drawn:

1. Complications after submucous resection operation were fewer than septoplasty, so this procedure should be retained in the surgical armamentarium for deviated nasal septum.
2. Submucous resection operation is relatively easy to perform.
3. Training workshops for septoplasty are recommended.

**Acknowledgements**

Foremost, I am beholden of the help extended by my parents who continuously prayed for me in this strenuous yet overwhelming voyage of learning. My august appreciation for my supervisor Prof. Zainullah Kakar, who not only convinced me to take the road less travelled but continuously supported through his timely guidance. His treatises enabled me to explore this interesting yet challenging study. In the same vein, I would like to thank my colleagues’ Dr Sadia Chaudhry for manuscript writing, Dr Muhammad Afzal Khaliq for statistics and Dr Maaz for proof reading and who also acted as a great support throughout this study.

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