

A Comparative Study of Intra Nasal Splints And Repeated Nasal Toilet for the Prevention of Nasal Adhesions In Nasal Surgery

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Background: Nasal adhesions are a challenging complication following nasal surgery. Intranasal toilet was done in the past to prevent adhesion formation. Now a day, silicone splints are in common use as an alternative which are made according to the patient's morphology of nasal cavity. It provides an extra side support and keeps the operated septum in its position & thus prevents the occurrence of intra-nasal adhesions and epistaxis. We describe the comparison of two techniques in preventing the intranasal synechiae.

Objective: This study compares the effect of using intra nasal splints and repeated nasal toilet for the prevention of intra nasal adhesions in nasal surgery.

Methods: A randomized clinical trial was carried out at ENT department FJMC/Sir Ganga Ram Hospital, Lahore for six months from 04-08-2008 to 03-02-2009. Two hundred patients undergoing nasal surgery were allocated in two groups, one with intranasal splints (INS, n=100) and other with intranasal toilets (INT, n=100). The outcome of interest was frequency of adhesion formation. Data was collected on a specially designed Proforma. Demographic details and details of adhesions were noted. For comparison between two procedures (intra nasal splints and nasal toilet) for the prevention of intranasal adhesions, Chi-square test was used with a P value ≤ 0.05 significant.

Results: There was a significant difference of nasal adhesion formation between the groups, with intranasal splints (INS, n=100) revealing nine patients (9%), compared to group treated with nasal toilet (INT, n=100) having 16 patients (16%) in this study.

Conclusions: Although not very significant statistically, but patient with intranasal splints develop less adhesion as compared to those with intranasal toilet.

Keywords: Intranasal splint; intranasal adhesions; nasal toilet.

INTRODUCTION

A variety of nasal operations have been described since mid 1800s to treat the nasal problems. The commonest risks of nasal surgery include bleeding, infection, septal hematoma, septal perforation, saddle-nose deformity and intranasal adhesions. Among these, intranasal adhesion formation has been a very important complication in the postoperative phase in septal corrective surgery¹. Intranasal adhesions are often formed between septum and turbinates. They may also develop because of trauma and other conditions such as syphilis, tuberculosis, lupus or sarcoidosis². Many studies have analyzed the advantages of post-operative nasal splints and repeated intranasal toilet aiming at the reduction of undesirable septal defects and mainly at avoiding nasal adhesions³. Use of nasal splints started about 35 years back in an attempt to keep the corrected septal position

in place after the surgery. Initially, they were improvised with several plastic forms, and now they are industrially made in several forms and sizes, although a Greek study has indicated the use of wax envelope containing Fucidin⁴.

Presently, commonly available splints in use are of silicone. It is highly appropriate because it is made according to the patient's shape and size of nasal cavity. Its use has been increasing in the last years due to its capacity of keeping the operated septum in its position, of preventing the occurrence of epistaxis and of synechiae⁵. Despite increased frequency of their usage, an increase in morbidity has also been debated such as anxiety of device removal, pain, discomfort and some cases involving the toxic shock syndrome.^{6,7}

The aim of this study is to compare the effect of using intra nasal splints and repeated nasal toilet for the prevention of intra nasal adhesions in

nasal surgery. Establishing the effective method has wider implications for reduced frequency of postoperative intranasal adhesions.

MATERIAL AND METHODS

STUDY DESIGN: Randomized clinical trial.

SETTING: Study was carried out in ENT department FJMC/Sir Ganga Ram Hospital Lahore which is a Tertiary Care Hospital.

SAMPLE SIZE: The calculated sample size with 10% margin of error, 80 % power of study with magnitude of prevention of adhesion which is 94.8 % in non splinted (nasal toilet) and 96.1 % in splinted group was 100 cases in each group.

DURATION: Six months, extending from 04-08-2008 to 03-02-2009.

SAMPLING TECHNIQUE: It will be non-probability purposive sample

INCLUSION CRITERIA: All the patients of both genders, more than 15 years of age undergoing nasal surgery as nasal septoplasty, Septorhinoplasty, intranasal polypectomy, partial inferior nasal turbinectomy, and sinus surgery were included.

EXCLUSION CRITERIA: All the patients with previous intra nasal surgery, suffering from acute upper respiratory infection or diabetes mellitus were excluded.

DATA COLLECTION PROCEDURE: Patients were admitted for study from outpatient ENT Department of Sir Ganga Ram Hospital Lahore. The diagnostic criteria was based on clinical examination (Anterior / posterior rhinoscopy and nasal endoscopy) and radiology. Their informed consent was taken. The subjects were asked about their socio-demographic information like age, sex etc. The patients were divided randomly into two groups A and B using random number table, each consisting of 100 patients. Intra nasal splints (made of silicon sheet) were placed in (INS,

n=100) while in (INT, n=100) nasal toilet (with 0.9% saline) was performed. Nasal splints were placed for 10 days and nasal toilet was done daily for the same number of days. Formation of intra nasal adhesions was assessed by anterior rhinoscopy and nasal endoscopy. Adhesion formations were assessed on 2nd, 3rd and 4th weeks. All this information was collected on specially designed Proforma.

DATA ANALYSIS PROCEDURE: The data was entered in the SPSS version 10 and analyzed. Qualitative variables such as gender, adhesion formation, site of adhesion formation were presented as frequencies and percentages (%age). Quantitative variables such as age were presented as mean and standard deviation (SD). For comparison between two procedures (intra nasal splints and nasal toilet) for the prevention of intranasal adhesions, Chi-square test was used. P value ≤ 0.05 was considered significant.

RESULTS

Two hundred patients undergoing nasal surgeries were allocated in two groups. (INS, n=100) with splints and (INT, n=100) with intranasal toilets. The mean age of the patients in (INS, n=100) was 22.14 ± 6.03 years [range 12-40]. There were 49 (49%) patients of age range of <20 years, 41 (41%) patients of age range of 21-30 years, 0 (0%) patient of age range of 31-40 years, 0 (0%) patient of age range of 41-50 years of age and 3 (3%) patients of age range of > 60 . In (INT, n=100) group, the mean age of the patients was 26.11 ± 9.39 years [range 12-60]. There were 40 (40%) patients of age range of <20 years, 34 (34 %) patients of age range of 21-30 years, 20 (20%) patient of age range of 31-40 years, 5 (5%) patient of age range of 41-50 years of age and 1 (1%) patients of age range of > 60. (Table 1).

Table 1: Distribution of patients by age (n=200)

Age	(INS, n=100)		(INT, n=100)	
	No. of patients	Percentage	No. of patients	Percentage
<20	49	49	40	40
21-30	41	41	34	34
31-40	10	10	20	20
41-50	0	0	5	5
>50	0	0	1	1
Mean + SD	22.14+6.03		26.11+9.39	
Range	12-40		12-60	

Table 2: Frequency of Adhesion Formation (n=200)

Adhesions	(INS, n=100)		(INT, n=100)	
	Number	Percentage	Number	Percentage
Yes	9	9	16	16
No	91	91	84	84
Total	100	100	100	100

Figure 1: Distribution of patients by sex (n=200)

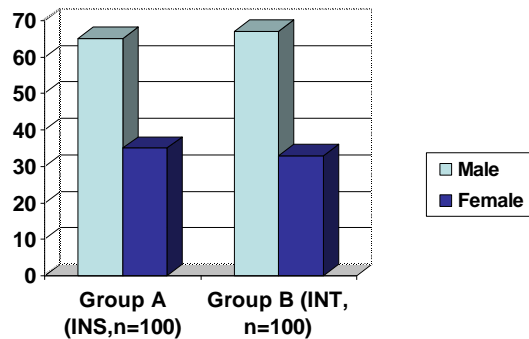
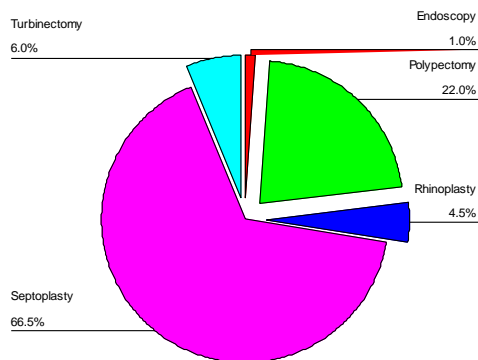


Figure 2: Frequency of procedures in the study (n=200)



There were 35 (35%) female patients in (INS, n=100) and 33 (33%) in (INT, n=100). Similarly, there were 65 (65%) male patients in (INS, n=100) and 67 (67 %) patient in (INT, n=100). The male to female ratio for (INS, n=100) was 1: 1.86 and for (INT, n=100) was 1: 2.03 (Figure 1).

Of the total 200 procedures including both groups, septoplasty was in 133 (66.5%), polypectomy in 44 (22%), Turbinectomy in 12 (6%), rhinoplasty in 9 (4.5%) and endoscopy in 2 (1%) patients (Figure 2).

Nine (9%) adhesions were formed in (INS, n=100) where as 16 (16%) adhesions in (INT, n=100). Ninety one (91%) patients in (INS, n=100) and 84 (84%) patients in (INT, n=100) did not develop adhesions. (p value > 0.05) (Table 2)

All the adhesions were formed between middle turbinate and nasal septum regardless of the type of procedure and time of follow up.

DISCUSSION

This study evaluated the effectiveness of intranasal splints in nasal surgery in preventing intranasal adhesions by comparing it with nasal toilet (one of the common procedures carried out for prevention of adhesions). This is a large study in Pakistan (including 200 patients) covering most of common nasal surgical procedure. In Recent past, Sharif et al compared the efficacy and morbidity of nasal splints and nasal packing after nasal septal surgery & concluded that the morbidity associated with splints and packing does not justify their use in routine nasal septal surgery ⁸.

In a study reported by Al-Raggad DK, et al.,the frequency of adhesions after septoplasty was 5.9 % which is quite lower (9%) to the frequency noted in our study ⁹. Xiao J et al., in their study showed that incidence of synechiae formation after endoscopic surgery was 9.16%. The sites of synechiae were: occlusion synechia between middle turbinate and lateral nasal wall, middle turbinate synechiae with nasal septum, inferior turbinate synechiae with nasal septum¹⁰. This is also consistent with our study results. The most frequent site of synechiae formation in our study was between middle turbinate and nasal septum (almost in every patient, which is consistent with 100% patients who presented with adhesion formation). In a study by Muhammad IA and Rahman N, the incidence of postoperative adhesion formation was noted 7 % which is lower as compare to our study (10%) with the use of intranasal splint in septoplasty procedure ¹¹.

The above discussion suggests that the actual range of adhesion formation after nasal surgery lies between 6% to 9% depending mainly on the type of surgical procedure. Although the rate of 9% with use of intranasal splints and those with nasal toilet (16%), which we found in our study, is higher as compared with results from other studies. By comparison, our results are not discouraging; keeping in mind the substandard operation theatre conditions in hospitals in Pakistan. The results of our study are very near to other studies in Pakistan¹².

Adhesions developed in 9 % patients in (INS, n=100) with a success rate of 91 % as compared to those in (INT, n=100) patients (16% with a success rate of 84 %). Although, a little better result was observed with the use of intranasal splints, but these were not significant ($p > 0.05$). Like most of the studies, our data shows that septoplasty was the most common procedure performed. Similarly, most of the adhesions were formed in this procedure and comparison of the two groups (10 % and 14%) indicates that the use of intranasal splints is better as compared to nasal toilet. The incidence of the adhesions may be higher because in most of the circumstances we can not look into actual proportion of patients coming for follow up, as patients follow up could be a problem in Pakistan. Patients do not usually come back unless they develop serious problems.

The key to our method is using a silicon splint of the proper size. If a bigger size of the splint is used, it may induce irritation and mucosal injury to the root and dome of the middle turbinate during packing or postoperative dressing. Moreover, it may induce mucosal injury or bleeding at the horizontal portion of the middle turbinate or entrance of the ethmoid sinus. Conversely, a splint that is too small may be displaced or extruded from the middle meatus during removal of packing postoperatively^{13,14}. Therefore, the size of the splint is the most important factor in our technique. Crust and synechae formation between injured mucosa usually occurs in the first 10 to 14 days after surgery. An intranasal splint can effectively prevent these events by serving as a barrier between the middle turbinate and lateral nasal wall.

The Silicon splint can also prevent synechae formation between the septum and inferior turbinate. If septal mucosal injury occurs during septoplasty, it can accelerate the healing process by moistening and humidifying the injured site and

by avoiding possible trauma during postoperative care¹⁵. Some patients complained of nasal obstruction due to crust formation and nasal discharge; however, this could be relieved with saline irrigation and meticulous postoperative care¹⁶. Crusting at the suture site can also be prevented by applying an ointment or emolient¹⁷.

This study has some limitations. This was not a double blind study. Antibiotic prophylaxis and treatment were considered together during analysis which may have altered the results. We could not be able to compare the results of endoscopic surgery due to small number of patients.

CONCLUSION

Septoplasty is most commonly performed procedure as compared to others. Although not significant statistically, but intranasal splints after nasal surgery has been found to be better as compared to intranasal toilet in preventing nasal adhesions. Still, the use of intranasal splints is not in common use. More multicentre clinical trials are presently required to document its efficacy.

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