ORIGINAL ARTICLE

Whether Use of Intranasal Splints after Combined Septoplasty and Partial Inferior Turbinectomy Prevents Adhesion Formation? - a randomized clinical trial

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ABSTRACT

Aim: To find out the efficacy of intranasal splints in preventing nasal adhesions after combined septoplasty and partial inferior turbinectomy procedure.

Methods: This was a randomized clinical trial carried out on 80 patients at Department of ENT, Nawaz Sharif social security teaching Hospital Lahore over ten month period between December 2017 and September 2018. The patients were randomly placed in one of the two groups, those with and those without splints. Splints were removed and nasal toilet performed on 7th post-operative day. The presence or absence of nasal adhesions was noted at one week and at six weeks post-operatively. The data was analyzed using SPSS software version 21.

Results: A total of 71 patients completed the study because 9 patients did not complete the follow up. The study results revealed that splints were effective in preventing nasal adhesion formation in the short term (p =0.000 DF = 1) as well as in the long term (p =0.002 DF = 1) without causing more pain as compared to those with no splints.

Conclusion: Splints are effective in preventing formation of adhesions after septal surgery without causing much discomfort and must be used routinely after combined septoplasty and turbinectomy procedure.

Keywords: Intranasal splints, septoplasty, inferior turbinectomy, nasal adhesions.

INTRODUCTION

Septoplasty is one of the most frequent ENT surgical operations[1]. Although rare, different complications like septal hematoma or abscess, bleeding, adhesions and septal perforation can result in postoperative period. Amid these complications, nasal adhesion formation occurs very frequently and can lead to nasal obstruction after septal surgery[2]. The risk of developing adhesions is augmented when multiple procedures are performed (25% to 36.2%) or when combined surgery to nasal septum and lateral wall is performed (18%)as compared to isolated surgery limited to nasal septum or lateral wall (09%) or when single procedure is performed (03% to 6.8%)[3, 4].

Intranasal splints are extensively used after nasal septal surgery for prevention of intranasal adhesions.[5,6] The first record of use of intranasal splint after septoplasty can be found as early as in 1955by Salinger and Cohen[7]who used two pieces of hand cut x-ray film. Many different types of splints have been used since then including use of polyethylene coffee cup lids by Wright (1969)[8], Polytetrafluoroethylene (Teflon) by Johnson (1964), magnetic splints by Goode[9] in 1982, dental utility wax in 1995 by Nayak et al[10] and absorbable splints using collagen prepared into Gelfilm[11]. There were few drawbacks associated with the use of few of them so their use was abandoned. Today, splints made from silicon rubber, plastic and Teflon material are commonly used with silicone rubber splints found most popular in a consultant survey[12].

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There is still controversy in literature regarding the use of intranasal splints for the prevention of adhesions. The use of intranasal splints has been recommended to prevent nasal adhesions especially if combined procedure on nasal septum and lateral nasal wall e.g., turbinectomy have been performed[13,14]. Later on other studies[15,16,17] concluded that intranasal splints were not effective in preventing nasal adhesions and they also caused substantial pain in postoperative period. Recently another study[2] found that if properly fashioned silastic nasal splints were used, they were effective in prevention of adhesions without causing significant postoperative discomfort. We carried out this study to find out whether routine use of intranasal splints after septal surgery is warranted or not in our context. This study will help us resolve this controversy that prevails about the use of intranasal splints after nasal surgery.

MATERIAL AND METHODS

This was a randomized clinical trial that included 80 patients requiring septoplasty with partial inferior turbinectomy and presenting in the Outpatient Department of Nawaz Sharif social security hospital over ten month period between December 2017 and September 2018. Patients were put randomly into one of the two groups, either to the group with splints or to those without splints.Randomization was done on the basis of hospital numbers and weplaced 40 patients with odd hospital numbers into a group that received intranasal splints after surgery and 40 patients with even hospital numbers into a group that did not receive intranasal splints. All the patients, both male and female,above 17 years of age who presented during period of study and required septoplasty with partial inferior turbinectomy were included in the study. Patients below 17 years of age, those with diabetes mellitus, undergoing other intranasal procedures, those undergoing revision surgery those requiring septoplasty

only and those who did not complete the follow up were excluded from the study.

Splints that we used were made of plastic, custom-made and tailored according to the size of nasal cavity and fixed in place with chromic catgut 2/0. Nasal packs of Vaseline gauze were inserted in both nasal cavities after the procedure for hemostasis in both groups and these were removed after 48 hours.Splints were removed on 7th post-operative day. Both groups also had nasal toilet on7th post-operative day. Routine follow up of these patients was arranged at 6 weeks. The patients were assessed for pain using visual analogue scale (VAS) at the time of pack removal and again at the time of splint removal/ nasal toilet, with 0 meaning no pain, 10 meaning most severe pain that one can imagine. The presence or absence of nasal adhesions was noted at one week and six weeks post-operatively.

The data was analyzed using SPSS software version 21. Independent samples Mann Whitney U test was used to assess the difference in scores of pain and Chi-square test to assess the difference of adhesion formation between the two groups. A value of $p<0.05$ was considered statistically significant.

RESULTS

A total of 71 patients completed the study because 9 patients did not complete the follow up, out of the 80 patients who were initially enrolled for the study and therefore these 9 patients were excluded from the study. There were 36 patients with splints and 35 patients without splints that completed the study and were finally included in study. There were 50 (70%) male and 21(30%) female patients. The mean age of patients was 24.75 years with the standard deviation of 6.729.

The study results revealed that splints were effective in preventing nasal adhesion formation in the short term as well as in the long term. (Table 1)There were 46% (16/35) patients without splints who developed adhesions at 1 week as compared to 3% (1/36) patients with splints who developed adhesions. The difference was statistically highly significant (p =0.000 DF = 1) using Pearson chi square test. At 6 week the score for adhesion were 34% (12/35) in patients without splint and 6% (2/36) in patients with splint. This was again statistically highly significant (p =0.002 DF = 1) using Pearson chi square test.

It was found that splints did cause slightly more pain as compared to those patients in which splints were not used after septoplasty and partial inferior tubinectomy but the difference in pain scores was not statistically significant.(Table 2)The mean pain scores were 5.33 in patients with splints and 5.09 in patients without splint on pack removal and this difference was found to be statistically insignificant (p =0.364) whereas the scores on splint removal/nasal toilet were 3.39 and 3.09 in patients with splints and those without splints and the difference was again statistically insignificant (p =0.334).

Table 1: Adhesions in two groups

		Adhesions at 1 week		Total	Chi square test		
		Present	Absent		Value	*p* value	df
Patient group	With splints	1	35	36	17.966	0.000	1
	Without splints	16	19	35			
Total		17	54	71			
		Adhesions at 6 week		Total			
		Present	Absent				
Patient group	With splints	2	34	36	9.253	0.002	1
	Without splints	12	23	35			
Total		14	57	71			

Table 2: Pain score analysis in two groups

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Pain score on pack removal is the same across categories of Patient group.	Independent-Samples Mann-Whitney U Test	.364	Retain the null hypothesis.
2	The distribution of Pain score on splint removal/nasal toilet is the same across categories of Patient group.	Independent-Samples Mann-Whitney U Test	.334	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

DISCUSSION

The development of adhesions after nasal surgery is a common complication especially when combined surgery to nasal septum and lateral wall is performed [3,4,13,14] and this finding prompted us to conduct study on patients undergoing combined septoplasty and turbinectomy. We wanted to know the role of intranasal splints in prevention of nasal adhesions that were expected to occur after such kind of procedure.

This study has confirmed that splints are effective in preventing nasal adhesion formation in the short term (1 week) as well as in the long term (6 week) and although patients with splints didexperience more pain as compared to those in which splints were not used but this difference was not statistically significant both at the time of pack removal (p =0.364) and at the time of splint removal / nasal toilet (p =0.334). Our results are in agreement with the findings ofCampbell et. al[13] who recommended the use of intranasal splints when performing combined procedure on medial and lateral wall of nose.

Subsequently few studies were done that had findings in contradiction to those of our study. Cook et al.[15]in his RCT of 89 patients, found low incidence of post-operative nasal adhesions and there was no difference in adhesions between the splint and no-splint patients at 6 weeks and they found statistically significant higher pain score in the splints group over the first week. Malki et al[16] in his study (RCT) found that 1/55 of the patients with splints developed adhesions as compared to 4/52 of the patients without splints developing adhesions at six weeks but this difference in scores was not found statistically significant. The patients with splints were suffering from more pain than those with no splints (pain scores 2.2 as compared to0.5) at 1 week and this difference was found to be statistically significant (p<0.0001). Von Schoenberg et al.[17]in a study that was a RCT found that most adhesions were seen in patients who had combined surgery to septum and lateral wall and in patients with no splints (31.6%) as compared to 3.6% in those with splints at one week but adhesions were seen only in one patient in each group at 3 months and this gross reduction in adhesion rate was attributed to aggressive nasal toilet by them. They also found statistically significant (p<0.001) more pain in patients with splints as compared to those with no splints at the time of pack and splints removal. The more pain in splint cases in these studies may be due to the large size of the splints used that were not tailored to the size of the nasal cavity. The less pain experienced during nasal toilet and less adhesions seen in the long term in these studies might be due to reason that the authors employed division of adhesions under local anaesthesia during nasal toilet. We found more adhesions in patients without splint as compared to patients with splints and almost equal pain scores in both groups during splint removal/ nasal toilet because we did not employ division of adhesions under local anaesthesia when performing nasal toilet.

Recently Jung et al.[2] in a double blind RCT found that if nasal splints were prepared carefully, they were effective in prevention of nasal adhesions without causing more pain than when they were not used. Their findings are consistent with our study. We used custom made splints that were cut to fit the size of nasal cavity for each individual case so that they did not touch the roof or the floor of nasal cavity, the same technique that was used by Jung et al.[2] when preparing and placing intranasal splints. This may be the reason for less discomfort or pain in our study.

CONCLUSION

Properly prepared and placed Splints when used, are effective in preventing formation of adhesions after septal surgery without causing much discomfort and therefore must be used routinely when concurrent septoplasty and turbinectomy procedure is performed.

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