ORIGINAL ARTICLE

Role of Nasal Splints in Prevention of Nasal Adhesions following Septal Surgery at CMH Lahore: A Comparative Cross-Sectional Study

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ABSTRACT

Objective: To compare the incidence of nasal adhesion formation following nasal surgery in patients of DNS (Deviated Nasal Septum) with and without postsurgical application of nasal splints with long-term follow-up.

Study Design: Comparative cross-sectional study.

Place and Duration of Study: This study was carried out at the Department of ENT, Combined Military Hospital (CMH) Lahore, Pakistan from July 2020 to July 2021.

Methods: Sixty patients between the ages of 18 and 60 with deviated nasal septum who got corrective Septal Surgery were incorporated in this study. They were divided into two equal groups for analysis: Group I – where splints were placed in both nostrils of patients, and Group II – In which no splints were placed. The removal of nasal splints typically occurs on the 10th day after surgery. Both nasal cavities of patients of both groups were examined two weeks postoperatively and then after 02 months, the absence or presence of adhesions was noted.

Results: In Group I patients who were given intra-nasal splints, 1 (3.330%) out of 30 developed nasal adhesions whereas 29 (96.7%) did not develop nasal adhesions. However, in Group II patients who were not given nasal splints, 6 out of 30 (20.0%) patients developed nasal adhesions while 24 (80%) were observed to have no formation of nasal synechiae with a *P*-value of 0.044.

Conclusion: The study concluded that the use of nasal splints in patients undergoing septal surgery significantly reduces the incidence of adhesion formation in post-operative septal surgery patients, compared to those without nasal splints.

Keywords: *Intranasal Surgery, Nasal Mucosa, Nasal Septum, Nasal Blockage.*

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Introduction

Nasal obstruction is a prevalent complaint among patients, often attributed to septal deviation.[1] Deviated nasal septum refers to the displacement of the nasal septum, which is a common condition affecting approximately 80% of individuals without their knowledge.[2,3] While mild cases may go unnoticed, more severe deviations can lead to symptoms such as difficulty breathing and require medical intervention.[4] These symptoms include sleep apnea/obstructive sleep apnea (OSA), sinus infections, frequent sneezing, facial pain, nose bleeds/epistaxis, breathing difficulty, and impaired sense of smell.[5-8]

Nasal obstruction due to allergic rhinitis, acute rhino-

sinusitis, and deviated nasal septum is a common complaint in the ENT department.[9] Nasal septum deviation has a prevalence rate of 19-65% as per different criteria for deviated nasal septum definition.[10] Septoplasty is the most common surgery in ENT.[3,11] Intra-nasal adhesion formation is a common occurrence after septoplasty, as the surgical trauma and rough packing create raw surfaces on both the lateral nasal wall and nasal septum.[11-13] This has been a significant complication in post-operative cases of nasal surgery, with an incidence reaching up to 36%.[14] However, utilizing intra-nasal splints can aid in stabilizing the septum.[15] Septoplasty, turbinectomy, intra-nasal polypectomy, and endoscopic sinus surgery are among the most frequently performed intra-nasal procedures. Different types of intra-nasal splints are used, like soft silicon, x-ray film, and soft plastic material of intravenous drip bottles.

This study aims to investigate the effectiveness of the application of intra-nasal splints in preventing postoperative nasal adhesion formations after septoplasty.[13] Previous studies have explored the use of intra-nasal splints in various nasal surgeries, but they had limitations such as a lack of long-term follow-up and the inclusion of additional procedures like turbinate surgery.[16,17] Therefore, we conducted this study to provide valuable insights into the effectiveness and potential drawbacks of using nasal splints specifically for preventing adhesion formations. Nasal adhesions can cause both psychological distress and financial burden for patients. By evaluating the use of intra-nasal splints, we sought to improve surgical outcomes by minimizing these complications.[18] Additionally, our study also examined any associated complaints or discomfort related to wearing intra-nasal splints during the early postoperative period. By addressing these critical aspects, our research aims not only to contribute new knowledge but also to help clinicians make informed decisions regarding optimal practices in septoplasty procedures.

Methods

The comparative cross-sectional study was carried out at the Department of ENT, Combined Military Hospital (CMH) Lahore, Pakistan from July 2020 to July 2021. The sample size for each group was calculated based on a significance level of 5%, power of 80%, and anticipated population proportions of 3.6% and 31.6 respectively, resulting in a total sample size of 60 patients. Non-probability consecutive sampling technique was employed for patient selection in this study. Approval of this study was taken from the Ethical Review Board of the hospital on dated: 20th August 2020 vide IRB letter number: 392/2020.

Inclusion Criteria: Patients of both genders aged 18-60 years having a diagnosis of Deviated nasal septum (DNS) requiring septal surgery.

Exclusion Criteria: Patients excluded from the study were those with bleeding diathesis (acute and chronic leukemia), diabetes mellitus, hypertension/HTN (systolic blood pressure >139 and diastolic blood pressure >90), syphilis, tuberculosis, craniofacial abnormalities such as cleft lip /cleft palate deformities, malignant diseases in the head and neck region with or without radiotherapy, nasal obstruction due to turbinate hypertrophy, polyps or secretions caused by chronic sinusitis and nasal masses (benign and malignant). Additionally, patients who had undergone other types of nasal surgery such as turbinectomy, polypectomy, functional endoscopic sinus surgery or revision of nasal surgery were also excluded from the study. Informed consent was obtained from all patients who met the inclusion criteria and were undergoing septoplasty after receiving approval from the Hospital Ethical Review Committee. Before their participation, these patients were fully informed about the study and its details. Non-probability consecutive sampling was done, and patients were allocated into two equal groups through a randomization process. Group I patients had splints in both nostrils and Group II in which no splints were placed. Medical History and Physical examination were conducted for all patients before they underwent surgery. All surgeries were performed by a consultant ENT specialist. Nasal splints were placed after the surgery in Group I patients while in Group II the nasal packing was done without the nasal splints. All post-operative cases were packed with Vaseline gauze on both sides, which were removed from both nostrils after 24 hours of surgery. A nasal splint was removed after ten days in Group I patients. Both

nasal cavities were examined in all patients after two weeks postoperatively and then after 2 months. Adhesions were categorized as absent or present.

The Statistical Package for the Social Sciences software, version 23.00 was utilized to conduct the data analysis. The standard deviation and mean were determined for qualitative variables, whereas frequency and percentage were calculated for discrete variables. We conducted a chi-square test to examine associations between variables. A significance level of $p < 0.05$ was used to determine statistical significance.[19,20]

Results

The age range of participants in the study was 18 to 60 years, with a mean age of 25.75 ± 6.79 years. In Group I, the average age was 23.97±3.311 years and in Group II it was 23.97±4.537 years. Group I consisted of 16 (54%) female patients and 14 (46%) male, whereas Group II had and 11 (37%) female patients and 19 (63%) males. (Table-1).

Table-1: Demographic data of the participants

Parameter		Group I (with splints) n= 30	Group II (Without splints) n=30
		MEAN±SD	MEAN±SD
Age (Years)		23.27±3.311	23.97±4.537
		Frequency (%)	Frequency (%)
Gender	Male	14 (46.7)	16 (53.3)
	Female	19 (63.3)	11 (36.7)

SD: Standard Deviation

Group I patients who were given intra-nasal splints, 1 (3.330%) out of 30 developed nasal adhesions whereas 29 (96.7%) did not develop nasal adhesions. However, in Group II patients who were not given nasal splints, 6 out of 30 (20.0%) patients developed nasal adhesions while 24 (80%) were observed to have no formation of nasal synechiae with a statistically significant *p*-value of 0.044. (Table-2).

Table-2: Comparison of the incidence of nasal adhesion formation in both groups

		Group I (With splints) n=30 Frequency (%)	Group II (without splints) n=30 Frequency (%)	*P*-Value
Nasal Adhesions	Yes	1 (3.3)	29 (96.7)	<0.044
	No	6 (20)	24 (80)	

Discussion

In nasal surgery, the utilization of intra-nasal splints is prevalent, particularly after septal and turbinate procedures.[18] Intra-nasal splints were first introduced by Salinger and Cohen in 1955 to maintain the septum position after septal surgery.[21] One common reason cited by Pringle MB in the UK for using nasal splints was the prevention of nasal adhesion formation.[22] Additionally, intra-nasal splints have a wide range of applications including securing anterior nasal packs in treating epistaxis and holding septal grafts in place.

Campbell JB et al. in their study have shown that the incidence of adhesions following nasal surgery was reduced from 26% to 0% if sialistic splints were used after the operation for one week.[23] The researcher's conclusion suggests that the use of splints may be justified for bilateral wall procedures, but their increased morbidity does not support their use in single-wall procedures. However, Eliopoulos PN et al. argued that the use of wax paper enveloping fucidin® gauze to pack the nose postoperatively resulted in the prevention of the formation of nasal adhesions even without the application of nasal splints.[24] In this study, the post-operative application of nasal packing was done for both groups, thereby concluding that nasal packing without the splints did not account for the prevention of all nasal adhesion formation.

In contrast, previous studies have shown varying results regarding the effectiveness of intra-nasal splints in preventing nasal adhesions after septoplasty. For example, Cook et al. found that there was no clear advantage of using intra-nasal

splints as it did not significantly reduce the incidence of adhesion formation compared to non-splinted groups.[25] They suggested utilizing nasal toilet techniques instead after septal surgery. Additionally, a survey conducted by Pringle MB reported that 33% of consultants rarely or never used intra-nasal splints and observed no statistically significant difference in adhesion rates between patients who were splinted versus those who were not (5.2% vs 3.9%, respectively).[22] Similarly, Malki D et al. and Almoflehi MS et al. reached similar conclusions about the lack of a significant difference in the occurrence of adhesions between individuals with or without intra-nasal splints.[19,26]

Additionally, in a study conducted by Tang et al., it was discovered that the use of nasal splints after intra-nasal procedures resulted in increased postoperative pain without sufficient evidence of reducing the incidence of intra-nasal adhesions.[27] Campbell et al. on the other hand, found that during bilateral wall procedures, there was a significantly lower rate of adhesion formation in splinted cases as compared to non-splinted cases.[23] However, they concluded that the increased morbidity associated with splints did not justify their use in single-wall procedures.[23] Roberto et al.'s research showed promising results with nasal splints effectively preventing adhesion formation in patients undergoing septoplasty with turbinectomy compared to those who did not receive them (0% versus 10.6% incidence rates).[21]

Maka et al. discovered that the efficacy of nasal splints in preventing nasal adhesions after septoplasty was notably superior to the use of nasal packing.[16] Additionally, a study conducted by Amer et al. demonstrated notable differences statistically (P<0.05) between the two groups in terms of intranasal adhesions. Group A displayed a significantly reduced incidence of adhesions (P=0.021).[28] Patients in group A expressed higher satisfaction with the surgical outcome six weeks after the operation compared to those in other groups (P<0.001). Similarly, a local study supported the role of nasal splints in the prevention of nasal adhesions and advocated its use only in difficult cases.[29] Similarly, our results were supported by a local study, where 8.2% of patients developed intranasal adhesions after septoplasty without the use of intranasal splints.[30] Similarly, Zada B et al. had a prevalence of 7.2% intranasal adhesions after the use of intranasal splints.[30] Although our study was supported by previous research, it is important to note that these studies did not have long-term follow-up to assess the durability of the effect or determine if the benefits of nasal splints persisted over time.[30] Our study addressed this limitation and provided evidence for the long-term efficacy of intranasal splints in preventing adhesion formation after septal surgery.

Conclusion

We concluded that the incidence of postoperative adhesion formation in septal surgery with splints is significantly less than without splints. So, we suggest that the utilization of intranasal splints in patients undergoing septal surgery may be beneficial in reducing post-operative adhesion formation. This can potentially contribute to improved patient outcomes and minimize associated complications.

Limitations of Study

The study was carried out in a single center and the sample size was relatively small.

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Conflict of Interest: The authors declare no conflict of interest

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Authors Contribution

AA: Idea conception, study designing, data collection, data analysis, results and interpretation, manuscript writing and proofreading

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UR: Study designing, data analysis, results and interpretation

KA: Study designing, data collection, data analysis, results and interpretation

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