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Comparative Study of Outcome in Septoplasty with and Without Postoperative Intranasal Slastic Splints

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ABSTRACT

Background: Septal deviation and chronic nasal obstruction are commonly seen and affect most of the population, affecting respiratory function and life quality. The use of intranasal splints sequentially for this condition post-operative is controversial, and septoplasty is a common surgical intervention. **Objective:** To compare the outcomes of septoplasty with and without postoperative intranasal slastic splints. **Study Design:** Randomized controlled trial. **Duration and Place of Study:** The study was conducted from May 2024 to November 2024 at the Department of ENT, SKBZ Combined Military Hospital (CMH), Muzaffarabad. **Methodology:** Sixty septal deviation patients aged 17–70 years were randomly allocated to two groups (Group A; splints after septoplasty, Group B; no splints). Both pain at the time of pack and splint removal and nasal obstruction at the first and sixth postoperative weeks were assessed using a Visual Analogue Scale (VAS, and the NOSE score, respectively). **Results:** Group A, which received splints, had significantly higher post-operative pain scores (5.35 ± 0.25) and NOSE scores (5.21 ± 0.33) compared to Group B, which did not use splints (pain: 2.79 ± 0.19, NOSE: 2.69 ± 0.19), with both differences being statistically significant (p-value = 0.000). Stratified analysis by age, gender, and treatment type showed consistent significant differences favoring the no-splint group. **Conclusion:** Postoperative nasal splints significantly increase both pain and nasal obstruction compared to no splints following septoplasty.

INTRODUCTION

Septal deviation is a situation where the nasal septum, the cartilage and bone that divides the nasal passages, is displaced or crooked.[1] It can either occur naturally during development or as a result of trauma or injury.[2] A deviated septum may result in impaired nasal respiration, chronic congestion, recurrent sinusitis, snoring, and potentially sleep apnoea in some individuals.[3] In severe cases, it may disrupt facial symmetry and cause discomfort or suffering.

A surgical procedure called Septoplasty is used to rectify a deviated nasal septum, which may result in obstruction and various respiratory complications. [4] Surgery is conducted when patients suffer from persistent nasal congestion, recurrent sinus infections, or nasal obstruction.[5] In septoplasty, the surgeon rectifies or excises sections of the nasal septum to aid airflow.[6] The surgery is generally well tolerated, and recovery may vary according on the patient and the complexity of the procedure.[7] After surgery the application of intranasal splints has been debated about their efficacy in aiding recovery and minimizing complications.[8]

Intranasal splints are utilized postoperatively to stabilize the nasal septum following septoplasty.[9] The splints are designed to maintain the position of the newly positioned septum, minimize haemorrhage, and provide support for the mucosal lining during the healing process. The splints are often pliable and flexible and put into the nasal passages and retained for many days to a week. Few studies indicate that splinting may mitigate issues associated with septal haematoma, wound infection, and scarring. Intranasal splints also forbid adhesions that may hinder the correct healing of the septum.[10]

There are, however, issues of discomfort and side effects associated with the use of intranasal splints. Nasal congestion, difficulty breathing through the nose, and pain caused by the splints are reported by some patients.[11] Some also experience the removal of the splints are quite uncomfortable.[12] Some studies indicate that splints do not always improve long-term outcomes and that their application is not always required in all septoplasty patients.[13]

A study observed no notable difference in nasal discomfort between the splint and control sides on the 7th postoperative day, with scores of 6.2 ± 1.28 and 5.7 ± 1.27, respectively (p = 0.116).[14] Additionally, a follow-up at 6 weeks revealed that only 6.7% of patients in the splint group had a residual deformity, compared to 26.7% in the non-splint group (p = 0.038). Furthermore, none of the patients in the splint group developed intranasal adhesions at follow-up, whereas 13.3% of those in the packing group did (p < 0.05).[15] A separate study conducted in Pakistan reported that postoperative pain scores were higher in the splint group (5.2 ± 0.9) compared to the non-splint group (2.9 ± 0.61), with nasal obstruction also more significant in the splint group (5.4 ± 0.96 vs. 2.8 ± 0.53).[16]

Intranasal slastic splints are currently used in the postoperative treatment of septoplasty to prevent postoperative nasal trauma; ongoing debate on their efficacy necessitates the examination of this particular technique. Splints are commonly used to prevent complications, namely nasal adhesions; however, the effect on patient outcomes, specifically in the reduction of pain, nasal obstruction, and long term complications, have not been well established. This study compares the results of septoplasty with and without splints to determine whether the added benefit of splints outweigh the possibility of drawbacks.

METHODOLOGY

This randomized controlled trial was conducted between May and November 2024 at the Department of ENT, SKBZ Combined Military Hospital (CMH) in Muzaffarabad. A total of 60 patients were enrolled, with 30 patients assigned to each group. Sample size was calculated using the WHO calculator, with a 95% confidence level and 90% power, considering a mean postoperative pain score of 5.2±0.9 with splints and 2.9±0.61 without splints.[16]

Inclusion criteria consisted of individuals aged 17 to 70 years, of both genders, diagnosed with septal deviation and chronic nasal obstruction for at least one month, who had persistent symptoms after a 2-week trial of medical management (including topical nasal steroids, topical or oral decongestants, or oral antihistamine/decongestant combinaticon). Exclusion criteria included the presence of sinonasal malignancy, uncontrolled asthma, patients undergoing concurrent rhinoplasty, sinus, or sleep apnea surgery, a history of chronic sinusitis, or any serious medical conditions such as nasal valve collapse, or those who were pregnant. Following approval from the Hospital's Ethical Review Board and informed consent from participants, demographic information was gathered, including name, age, gender, smoking history (more than 5 pack-years), comorbidities (such as diabetes and hypertension), and details of ongoing treatments. The patients were then randomly assigned to two groups using a lottery method.

In Group A, patients received intranasal slastic splints following septoplasty, which were removed on the 7th post-operative day. In Group B, no splints were applied post-surgery. Both groups were hospitalized the night before the procedure, kept NPO for 8 hours, and given a dextrose-water solution for maintenance. Nasal packs of Vaseline gauze were inserted for hemostasis and removed after 48 hours or as necessary. Nasal toilet was performed on the 7th post-operative day. Patients were assessed for pain at pack removal and again at splint removal using a visual analogue scale (VAS). Additionally, nasal obstruction was evaluated using the NOSE score at the first and sixth post-operative weeks. Data analysis was conducted using SPSS version 24. Normality was assessed using the Shapiro-Wilk test. Continuous variables such as age, pain scores, and nasal obstruction scores were presented as means ± standard deviation (SD). Categorical variables, such as gender, comorbidities, and treatment types, were presented as frequencies and percentages. Independent samples t-test was used to compare the pain scores and nasal obstruction scores between the two groups. A p-value of ≤0.05 was considered statistically significant.

RESULTS

The demographic data showed that both groups had similar mean ages (41.2 ± 7.76 years for Group A, and 41.57 ± 6.84 years for Group B). The mean duration of symptoms was 6.73 ± 3.13 months in Group A and 7.83 ± 2.97 months in Group B (as shown in Table-I). Preoperative pain scores were almost identical for both groups, 6.92 ± 0.31 in Group A and 6.93 ± 0.31 in Group B, along with comparable preoperative NOSE scores (73.33 ± 4.34 vs. 72.37 ± 4.38). The distribution of gender and history of conditions like allergic rhinitis, smoking, diabetes, and hypertension were also nearly balanced across both groups. Notably, Group A had a higher frequency of patients using topical nasal steroids (36.7% in Group A vs. 40% in Group B), while Group B had more patients using topical or oral decongestants (53.3% vs. 46.7%) (Table-I).

Table I

Demographics in both groups (n=60)

Demographics	Group A n=30 Mean±SD	Group B n=30 Mean±SD
Age	41.200±7.76	41.566±6.84
Duration of Symptoms (months)	6.733±3.13	7.833±2.97
Pre-operative Pain	6.923±0.31	6.926±0.31
Pre-operative NOSE score	73.333±4.34	72.366±4.38
Gender		
Male	16 (53.3%)	17 (56.7%)
Female	14 (46.7%)	13 (43.3%)

History		
Allergic Rhinitis	17 (56.7%)	14 (46.7%)
Smoking	5 (16.7%)	3 (10%)
Diabetes	6 (20%)	6 (20%)
Hypertension	2 (6.7%)	7 (23.3%)
Treatment		
Topical nasal steroids	11 (36.7%)	12 (40%)
Topical or oral decongestants	16 (53.3%)	14 (46.7%)
Oral antihistamine / decongestant combination	3 (10%)	4 (13.3%)

Regarding the main outcomes, post-operative pain and nasal obstruction (NOSE score) were significantly lower in Group B, who did not use nasal splints. The post-operative pain score was 5.35 ± 0.25 in Group A compared to 2.79 ± 0.19 in Group B, and the post-operative NOSE score was 5.21 ± 0.33 in Group A versus 2.69 ± 0.19 in Group B, with both comparisons yielding a p-value of 0.000 (Table-II).

Table II

Comparison of mean Post-Operative Pain and Post-Operative NOSE score in both groups.

	Nasal Splints n=30	No Splints n=30	t	P value
Post-operative Pain	5.346±0.25	2.793±0.19	43.824	0.000
Post-operative NOSE score	5.213±0.33	2.693±0.19	36.041	0.000

For patients aged ≤40 years, Group A had a mean pain score of 5.33 ± 0.14, while Group B had a significantly lower score of 2.87 ± 0.14 (p-value = 0.000). Similarly, for patients aged >40 years, Group A's mean pain score was 5.16 ± 0.19, whereas Group B's score was 2.73 ± 0.20 (p-value = 0.000). The gender stratification showed that male patients in Group A had a mean pain score of 5.38 ± 0.25, while male patients in Group B had a significantly lower score of 2.79 ± 0.21 (p-value = 0.000). Women in Group A had a mean pain score of 5.31 ± 0.25, and in Group B, the score was 2.79 ± 0.16 (p-value = 0.000). For smokers, Group A had a pain score of 5.42 ± 0.23, while Group B had a lower score of 2.80 ± 0.20 (p-value = 0.000). Diabetes patients in Group A had a pain score of 5.27 ± 0.18, and in Group B, it was 2.77 ± 0.19 (p-value = 0.000). For hypertensive patients, Group A had a pain score of 5.10 ± 0.14, while Group B's score was 2.83 ± 0.21 (p-value = 0.000). Regarding treatment, those using topical nasal steroids in Group A had a mean pain score of 5.33 ± 0.27, while Group B had a significantly lower score of 2.74 ± 0.18 (p-value = 0.000). For those using topical or oral decongestants, Group A had a mean score of 5.31 ± 0.24, while Group B had a lower score of 2.86 ± 0.18 (p-value = 0.000). Those using oral antihistamine/decongestant combinations in Group A had a mean pain score of 5.60 ± 0.10, while Group B had a lower score of 2.86 ± 0.18 (p-value = 0.000) (as shown in Table-III).

Table III

Stratification of mean Post-Operative Pain score with respect to demographic factors in both groups

Demographic factors	Group		Mean Post-Operative Pain score		p Value
			Mean	SD	
Age (years)	≤40	A (n=15)	5.333	0.14	0.000
		B (n=14)	2.871	0.14	
	>40	A (n=15)	5.160	0.19	0.000
		B (n=16)	2.725	0.20	
Gender	Male	A (n=16)	5.375	0.25	0.000
		B (n=17)	2.794	0.21	
	Female	A (n=14)	5.314	0.25	0.000
		B (n=13)	2.792	0.16	
Duration of Symptoms (months)	≤6	A (n=18)	5.400	0.24	0.000
		B (n=12)	2.733	0.13	
	>6	A (n=12)	5.266	0.26	0.000
		B (n=18)	2.833	0.21	
History	Allergic Rhinitis	A (n=19)	5.352	0.27	0.000
		B (n=14)	2.785	0.19	
	Smoking	A (n=5)	5.420	0.23	0.000
		B (n=3)	2.800	0.20	
	Diabetes	A (n=6)	5.266	0.18	0.000
		B (n=6)	2.766	0.19	
	Hypertension	A (n=2)	5.100	0.14	0.000
		B (n=7)	2.828	0.21	
Treatment	Topical nasal steroids	A (n=11)	5.327	0.27	0.000
		B (n=12)	2.741	0.18	
	Topical or oral decongestants	A (n=16)	5.312	0.24	0.000
		B (n=14)	2.864	0.18	
	Oral antihistamine / decongestant combination	A (n=3)	5.600	0.10	0.000
		B (n=14)	2.864	0.18	

For the post-operative NOSE score stratification, similar significant differences were observed. Patients aged ≤40 years in Group A had a mean NOSE score of 5.45 ± 0.23, while Group B's score was 2.77 ± 0.14 (p-value = 0.000). For those aged >40 years, Group A had a mean NOSE score of 4.97 ± 0.21, and Group B had a score of 2.63 ± 0.20 (p-value = 0.000). In terms of gender, male patients in Group A had a mean NOSE score of 5.24 ± 0.34, while male patients in Group B had a significantly lower score of 2.69 ± 0.21 (p-value = 0.000). For smokers, Group A had a NOSE score of 5.26 ± 0.28, while Group B had a lower score of 2.70 ± 0.20 (p-value = 0.000). Diabetic patients in Group A had a mean NOSE score of 5.08 ± 0.19, and in Group B, the score was 2.67 ± 0.19 (p-value = 0.000). In hypertensive patients, Group A had a mean NOSE score of 4.85 ± 0.07, while Group B had a score of 2.73 ± 0.21 (p-value = 0.000). Regarding treatment, those using topical nasal steroids in Group A had a NOSE score of 5.17 ± 0.34, while Group B had a significantly lower score of 2.64 ± 0.18 (p-value = 0.000). For those using topical or oral decongestants, Group A had a mean NOSE score of 5.18 ± 0.32, while Group B had a lower score of 2.76 ± 0.18 (p-value = 0.000). Those using oral antihistamine/decongestant combinations in Group A had a NOSE score of 5.53 ± 0.11, while Group B had a lower score of 2.60 ± 0.21 (p-value = 0.000) (as shown in Table-IV).

Table IV

Stratification of mean Post-Operative NOSE score with respect to demographic factors in both groups

Demographic factors	Group		Mean Post-operative NOSE score		p Value
			Mean	SD	
Age (years)	≤40	A (n=15)	5.453	0.23	0.000
		B (n=14)	2.771	0.14	
	>40	A (n=15)	4.973	0.21	0.000
		B (n=16)	2.625	0.20	
Gender	Male	A (n=17)	5.243	0.34	0.000
		B (n=17)	2.694	0.21	
	Female	A (n=14)	5.178	0.32	0.000
		B (n=13)	2.692	0.16	
Duration of Symptoms (months)	≤6	A (n=18)	5.283	0.33	0.000
		B (n=12)	2.633	0.13	
	>6	A (n=12)	5.108	0.29	0.000
		B (n=18)	2.733	0.21	
History	Allergic Rhinitis	A (n=17)	5.288	0.36	0.000
		B (n=14)	2.685	0.19	
	Smoking	A (n=5)	5.260	0.28	0.000
		B (n=14)	2.700	0.20	
	Diabetes	A (n=6)	5.083	0.19	0.000
		B (n=6)	2.666	0.19	
	Hypertension	A (n=2)	4.850	0.07	0.000
		B (n=7)	2.728	0.21	
Treatment	Topical nasal steroids	A (n=11)	5.172	0.34	0.000
		B (n=12)	2.641	0.18	
	Topical or oral decongestants	A (n=16)	5.181	0.32	0.000
		B (n=14)	2.764	0.18	
	Oral antihistamine / decongestant combination	A (n=3)	5.533	0.11	0.000
		B (n=4)	2.600	0.21	

DISCUSSION

The significant reduction of post-operative pain in Group B can be attributed to the fact that intranasal splints, while intended to help support the septum and promote healing, have the additional effect of bringing more discomfort due to their positioning inside the nasal passages. The discomfort can be aggravated by irritation, mucosal trauma, or the body's response to the foreign body, leading to higher pain scores for Group A. There is evidence that mechanical pressure and irritation caused by the splints can be causative factors for pain after surgery.

In terms of the main outcomes, post-operative pain and nasal obstruction (NOSE score) were considerably less in Group B, who did not use nasal splints. The post-operative pain score was 5.35 ± 0.25 in Group A compared to 2.79 ± 0.19 in Group B, and the post-operative NOSE score was 5.21 ± 0.33 in Group A compared to 2.69 ± 0.19 in Group B, with both comparisons indicating a p-value of 0.000. These results closely concur with the findings of Kumar et al.[16] where Group B (without packing and splints) had less postoperative pain (VAS 2.9 ± 0.61) compared to Group A (with splints and packing) whose pain level was significantly higher at 5.2 ± 0.9. There was, however, a considerable difference in our study in the significant reduction of nasal obstruction (NOSE scores), which was also observed in the study of Law et al. [17] and Asif et al. [18] where the use of splints did not lead to any statistically significant reduction in postoperative pain but gained significantly in the reduction of nasal obstruction and adhesion formation. For example, Asif

et al. [18] mentioned that the mean pain score was 5.2 ± 0.9 in the splint group and 2.9 ± 0.61 in the no-splint group, a difference which replicated our study's findings, where Group A had a higher pain score (5.35 ± 0.25) when compared to Group B (2.79 ± 0.19).

These results are also similar to Khan et al. [19] in which postoperative pain was higher in the intranasal splint group, although they did not find any difference between groups for mild, moderate, or severe pain. Khan et al. [19] reported 50% of intranasal splint patients experiencing mild pain, whereas 40% were in the no-splint group, but not with statistical significance (p = 0.467). This contrasts with our results, in which Group B had consistently lower pain scores across all demographic groups.

In terms of treatment, for those using topical nasal steroids in Group A, the mean pain score was 5.33 ± 0.27, and that of Group B was significantly less at 2.74 ± 0.18 (p-value = 0.000). Using topical or oral decongestants, the mean score for Group A was 5.31 ± 0.24, and for Group B, the mean score was less at 2.86 ± 0.18 (p-value = 0.000). Using oral antihistamine/decongestant combinations, the mean pain score for Group A was 5.60 ± 0.10, and for Group B, it was less at 2.86 ± 0.18 (p-value = 0.000). This is in agreement with the Law et al.[17] study, which found that the type of nasal treatment (topical steroids, for example) and duration of symptoms were linked with pain scores, with longer symptom duration causing more pain. In contrast, the Khan et al.[19] study found no significant difference in pain score related to treatment, with only a higher incidence of mild bleeding found for the splint group.

For the post-operative stratification of NOSE score, the same differences were noted to be significant. These findings are consistent with those of Asif et al. [18] in which the utilization of splints was found to reduce the nasal obstruction scores significantly post-operatively. For patients with a symptom duration of ≤6 months, the mean NOSE score of Group A was 5.28 ± 0.33, while that of Group B was significantly lower at 2.63 ± 0.13 (p-value = 0.000). For patients with a symptom duration of >6 months, the mean NOSE score of Group A was 5.11 ± 0.29, while that of Group B was 2.73 ± 0.21 (p-value = 0.000). This supports the fact that the absence of splints can significantly improve the quality of life by reducing nasal obstruction, which is also consistent with the findings of Kumar et al.[16] and Khan et al.[19] in which the absence of splints also resulted in significantly improved postoperative outcomes, including the reduction of nasal obstruction (according to the NOSE score).

Although splints may avert nasal adhesions and enhance long-term outcomes, their usefulness in reducing nasal obstruction and postoperative pain is questionable. The results of our study, as with similar studies, suggest that although splints may be beneficial in certain cases, their use should be individualized. A balance of the immediate postoperative discomfort versus potential long-term benefit must be made in deciding on their use. Further research with more patients and multi-center studies would be ideal to validate our results and create more precise guidelines in clinical practice.

There are a number of limitations to our study. The study was conducted at a single centre and thus the generalisability of the findings to other populations is restricted. With a small number of patients, a larger more varied population of patients would be useful and would enable us to obtain a broader view of the effects of intranasal splints on postoperative care. The study also examined only two outcomes – pain and nasal obstruction and did not examine other potential complications, such as infection or patient satisfaction, that could also be affected by the splints.

CONCLUSION

Our study has concluded that patients without intranasal splints had much less pain and nasal obstruction. Intranasal splints help prevent certain complications, yet use of these splints can create more discomfort after surgery during the immediate postoperative period. The results suggest that a post septoplasty management approach which would be matched to patient preference and personal needs is a more appropriate one.

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Author's Contribution

The authors have each played a key role in the preparation of this manuscript, as outlined below. **Dr. Sidra Saleem Kayani** was responsible for the overall study design, drafting of the article, and gathering hospital data.

Dr. Tehniat Ghias participated in refining the article, shaping the study's framework, and analyzing and interpreting the data.

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