**Original Article**

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# Comparison of Outcome of Septoplasty with and without Intranasal Splintage in Patients Admitted to a Tertiary Care Hospital, Peshawar

**Noor Hayat Khan[1], Haider Zaman[2], Mubasher Ullah Jan[3], Syed Muddasir Shah[4], Sumbal Rastbaz[5], Majid Ali[6], Maimoona Ismail[7]**

[1,6]Registrar ENT Department, MMC, Mardan, [2,3,4]Assistant Professor, ENT Department, MMC, Mardan
[5]Medical Officer ENT Department, MMC, Mardan
[7]Faculty of Rehabilitation and Allied Health Sciences, Riphah International University, Islamabad.

Author`s Contribution

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***Address of Correspondent***
*Dr Noor Hayat Khan*
*Registrar ENT Department, MMC, Mardan*
*drnoorhayat6@gmail.com*

**ABSTRACT**

**Objective:** To compare outcome of septoplasty with and without intranasal splints in patients admitted in Khyber Teaching Hospital, Peshawar

**Methodology:** A Randomized controlled trial was done at department of ENT, Khyber Teaching Hospital, Peshawar from 21-01-2020 to 21-07-2020. Patients with diagnosis of symptomatic DNS, aged between 15 to 30 years, both genders and undergoing septoplasty for symptomatic Deviated Nasal Septum for primary surgery were included. Patients were randomly allocated into two groups using a coin toss method. Patients in group A were subjected to intranasal splintage packing while patients of group B were not be subjected to intranasal splintage. Patients in both groups was assessed on the first postoperative day, for degree of pain. Follow-up visits were scheduled after first and third weeks following the surgery. All the data was entered and analyzed in SPSS Version 23.0.

**Results:** The mean age of the whole sample was 22.7 ± 4.9 years. Average age in the group A was 22.3 ± 4.9 years compared to 23.3 ± 5.0 years (p = 0.271). 60% in group A were males compared to 61.7% in group B (p = 0.852). On follow-up, out of an overall sample of 120, mild, moderate, and severe pain and bleeding were recorded in 35%, 45%, and 20% (pain) and 35%, 30%, and 35% (bleeding), respectively. In group A, 30% had mild pain compared to 40% in B group (p = 0.467), 50% in A group had mild bleeding compared to 20% in B group (p = 0.002), 30% in A group developed crusting compared to 20% in the B group (p = 0.206), and 20% in the A group had synechiae compared to 10% in the B group (p = 0.125).

**Conclusion:** The outcome of septoplasty with splints not observed significantly differ from septoplasty without splints, except in the case of postoperative bleeding.

**Key Words:** Septoplasty, splints, pain, bleeding, crusting, synechiae, visual analogue scale.

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## Introduction

Nasal septal deviation can either be congenital due to an anatomical abnormality or can result from nasal trauma and the septoplasty is considered to be of the most popular conventional remedial surgical procedures widely used in reconstructive rhinology. Packing of the nose may the final phase in septoplasty and is typically used for preventing complications following the procedure.[1]

Anterior packing of the nose by the endonasal splint is commonly used to stabilize the nose after septoplasty and reduce the deviation recurrences risk. Anterior septoplasty does not require nasal packing and the patients without

nasal packing typically have shorter hospital stays. One of the complications of nasal packing is postoperative pain.[2]

Nasal packing is widely employed to prevent postoperative complications, including endonasal bleeding, formation of adhesion, mucosal flap apposition, and subsequent issues like septal hematoma and the septal perforation of the cartilage.[3] Deflected nasal septum (DNS) is a common defect of nasal septum that is caused by traumatic injury or inborn errors of development. A deviated nasal septum (DNS) causing symptoms such as nasal obstruction, lower the level of oxygen, sinusitis, cosmetic concerns, headaches, or nosebleeds typically necessitates septoplasty.[4] Conventional nasal packing, often using materials like Vaseline or the medicated gauze, synthetic material, paraffin mesh, or the glove finger, may cause significant nasal blockage and potentially lead to additional complications such as damage to mucosa, formation of the adhesions and the rhino-sinusitis.

Occasionally nasal packing can result in fatal complications such as nocturnal hypoxemia, aspiration leading to collapse the lungs, obstructive sleep apnea (OSA), pulmonary edema and the toxic shock syndrome.[5,6] After nasal packing, patients often experience mouth breathing, which can lead to delayed recovery from general anesthesia, mouth dryness, ears blockage, disturbance in the sleep, and the increased stress level. Complications associated with nasal obstruction can be prevented by ventilating packs of the nose that facilitate nasal breathing for the patient. Ventilation tubes can also be utilized for the suctioning of blood or secretions from the area behind the nose.[4] In patients of post septoplasty the most common complaint associated with nasal packing is postoperative pain. Regarding nasal packing, limited studies suggest that its use should be reconsidered due to the significant pain and discomfort caused during its removal from the nose. However, the nasal septal suturing is a widely utilized alternative to nasal packing following septoplasty.[7] The advantage of stitching the septum following septoplasty leads the minimal complications, to avoid patient discomforting and duration of the hospitalization in case of suturing technique is less as compared to the nasal packing. To minimize complications following septal procedures, various suturing techniques have been developed to secure mucosal flaps. Suturing the septum under the guidance of the endoscopy enhances the precision and lowers the risk of the trauma by needle to the turbinates.[8] Intranasal splints are defined as pressure equalization tubes and in otorhinolaryngology it is the most commonly used prosthesis postoperatively. Frequently, the splint accumulates dried mucus or blood, potentially obstructing proper breathing for the patient. The splints can also induce additional discomfort beyond typical surgical discomfort. The presence of splints may cause the nose to appear wider. These are transient changes that typically resolve after the stitches are taken out.[9] To reduce complications after nasal surgeries, the use of INS is commonly employed as an effective intervention. However, despite its widespread use, recent studies have cast significant doubt on its effectiveness and reliability.[10-11]

Packing of the nose and the suturing across the septum seem to show similar outcomes in terms of bleeding following the procedure, formation of the hematoma, septal perforations, development of the infection, and remaining septal deviation. The trans-septal suturing technique not only leads to reduced patient pain, fewer headaches, and a lower incidence of adhesions following septoplasty, but it also correlates with enhanced the quality of life of the patients and their satisfaction.[12] This study aims to evaluate the necessity of septoplasty with nasal packing and without splints in patients treated at our department, and to compare the occurrence of postoperative complications between patients who underwent septoplasty with nasal packing and those without splints. As Peshawar is the capital of KPK and Khyber teaching hospital is the main tertiary care hospital in Peshawar so, an overview of septoplasty with nasal packing for four hours only and without splints in patients attending KTH will give us better idea of understanding the septoplasty incidence and significance in KPK.

# Methodology

**A** Randomized Control Trial was done at department of ENT Khyber Teaching Hospital, Peshawar and was carried out during six months from 21-01-2020 to 21-07-2020. Determinations of a sample size of 120 cases (60 in each group) based on an estimated 24%[11] proportion of postoperative crusting in the intranasal splints group and 6% in the without intranasal splints group, via CL of 95%, 80% power of the test, and a 5% margin of error, using the WHO formula for sample size calculation. The sampling technique, non-probability consecutive was employed. All the patients with definitive diagnosis of symptomatic DNS, aged between 15 to 30 years, both genders and undergoing septoplasty for symptomatic Deviated Nasal Septum for primary surgery were included. All the patients with DNS complications and undergone previous septal

surgeries and DNS causing maxillary sinusitis were excluded. Patients was divided into two groups through toss method. Patients in group A was subjected to intranasal splintage packing while patients will not be subjected to intranasal splintage. Intranasal antibiotic-infused gauze was placed in both nasal cavities. For patients not receiving nasal packing, silicone septal splints were inserted into both nasal cavities and secured with figure-of-eight-shaped trans-septal sutures using 3–0 Ethilon sutures. Care was taken to ensure both flaps were correctly approximated with adequate pressure to maintain the corrected septum in the midline. Neosporin ointment was administered on both sides of the septum covered by splints, and there was no application of antibiotic gauze packs. Cases of the both groups were evaluated on the first day after surgery to assess pain intensity using a VAS (visual analogue scale ranging from 1 to 10). In the group that received nasal packing, antibiotic gauze packs were removed 48 hours post-surgery, whereas in the group that did not receive packing, splints were removed one week after surgery. Following removal of the antibiotic packs or splints, all patients were instructed to use saline nasal sprays for 15 days. Follow-up of the patients was scheduled after first and third weeks following the surgery.

Patients lost to follow up will excluded from the study. All the information including age, gender and outcomes was recorded on a separate proforma annexed with this proforma. All the study data were inputted and analyzed using SPSS 23 Version. Descriptive statistics, including means and standard deviations (SDs), were used to present numerical variables such as age and postoperative pain, while categorical variables like gender and efficacy were presented as frequencies and percentages. Comparison of outcomes between both groups was conducted using the chi-square test at significant P- value $\leq 0.05$. Stratification by age and gender was performed to identify any effect modifiers.

# Results

The study was conducted on 120 patients prepared for septoplasty. Patients were randomly allocated in two group. In group A, patients were subjected to intranasal splints and in group B to no splints. The mean age of the whole sample was 22.7 + 4.9 years. The mean age in group A was 22.3 + 4.9 years compared to 23.3 + 5.0 years (p 0.271). Gender distribution was almost similar, with 60.0% males in the group A and 61.7% in the group B (p = 0.852). The female distribution was 40.0% in the group A and 38.3% in the group B. For postoperative pain, 30.0% of the splint group and 40.0% of the no-splint group experienced mild pain (p=0.467). Moderate pain was 50.0% in the splint group and 40.0% in the no-splint group, while severe pain was equal in both groups at 20.0%.

Postoperative bleeding showed significant differences: 50.0% of the splint group had mild bleeding compared to 20.0% of the no-splint group (p=0.002). Moderate bleeding was higher in no-splint group (40.0% vs. 20.0%), and severe bleeding was more common in the no-splint group (40.0% vs. 30.0%). Crusting was present in 30.0% of the splint group and 20.0% of the no-splint group (p=0.206), while absence of crusting was reported by 70.0% and 80.0%, respectively. Synechiae were observed in 20.0% of the splint group and 10.0% of the no-splint group (p=0.125), with 80.0% and 90.0% reporting no synechiae in the respective groups. Table I

**Table I: Comparison of postoperative pain, bleeding, crusting and Synechiae in both groups (n=120)**

| Variables | | Treatment groups | | P value |
|---|---|---|---|---|
| | | Intranasal Splint | No Splints | |
| Postoperative pain | Mild | 18 | 24 | 0.467 |
| | | 30.0% | 40.0% | |
| | Moderate | 30 | 24 | |
| | | 50.0% | 40.0% | |
| | Severe | 12 | 12 | |
| | | 20.0% | 20.0% | |
| Postoperative bleeding | Mild | 30 | 12 | 0.002 |
| | | 50.0% | 20.0% | |
| | Moderate | 12 | 24 | |
| | | 20.0% | 40.0% | |
| | Severe | 18 | 24 | |
| | | 30.0% | 40.0% | |
| Crusting | Yes | 18 | 12 | 0.206 |
| | | 30.0% | 20.0% | |
| | No | 42 | 48 | |
| | | 70.0% | 80.0% | |
| Synechiae | Yes | 12 | 6 | 0.125 |
| | | 20.0% | 10.0% | |
| | No | 48 | 54 | |
| | | 80.0% | 90.0% | |

Mild and severe pain were equally distributed in the 15-20 age group, with moderate pain higher in the splint group. The 20-25 age group showed similar pain levels, but mild bleeding was more common in the splint group, while moderate bleeding was higher in the no-splint group. The 25-30 age group had more mild pain in the no-splint group and moderate pain in the splint group, with significantly more mild bleeding in the splint group. Males in the no-splint group reported more mild pain and moderate bleeding, while severe pain and mild bleeding were higher in the splint group. Females had more mild pain and bleeding in the splint group, while moderate and severe

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**Table II. Comparison of postoperative pain, bleeding, crusting and Synechiae in both groups (n=120)**

| Variables | | Postoperative pain | Treatment groups | | P value | Postoperative bleeding | Treatment groups | | P value |
|---|---|---|---|---|---|---|---|---|---|
| | | | Intranasal Splint | No Splints | | | Intranasal Splint | No Splints | |
| Age groups | 15-20 years | Mild | 7 | 7 | 0.832 | Mild | 11 | 5 | 0.359 |
| | | | 50.0% | 50.0% | | | 68.8% | 31.2% | |
| | | Moderate | 13 | 9 | | Moderate | 6 | 7 | |
| | | | 59.1% | 40.9% | | | 46.2% | 53.8% | |
| | | Severe | 4 | 4 | | Severe | 7 | 8 | |
| | | | 50.0% | 50.0% | | | 46.7% | 53.3% | |
| | > 20-25 years | Mild | 8 | 8 | 0.910 | Mild | 10 | 4 | 0.108 |
| | | | 50.0% | 50.0% | | | 71.4% | 28.6% | |
| | | Moderate | 6 | 7 | | Moderate | 3 | 7 | |
| | | | 46.2% | 53.8% | | | 30.0% | 70.0% | |
| | | Severe | 5 | 4 | | Severe | 6 | 8 | |
| | | | 55.6% | 44.4% | | | 42.9% | 57.1% | |
| | > 25-30 years | Mild | 3 | 9 | 0.199 | Mild | 9 | 3 | 0.028 |
| | | | 25.0% | 75.0% | | | 75.0% | 25.0% | |
| | | Moderate | 11 | 8 | | Moderate | 3 | 10 | |
| | | | 57.9% | 42.1% | | | 23.1% | 76.9% | |
| | | Severe | 3 | 4 | | Severe | 5 | 8 | |
| | | | 42.9% | 57.1% | | | 38.5% | 61.5% | |
| Gender | Male | Mild | 10 | 17 | 0.251 | Mild | 22 | 9 | 0.002 |
| | | | 37.0% | 63.0% | | | 71.0% | 29.0% | |
| | | Moderate | 18 | 15 | | Moderate | 4 | 15 | |
| | | | 54.5% | 45.5% | | | 21.1% | 78.9% | |
| | | Severe | 8 | 5 | | Severe | 10 | 13 | |
| | | | 61.5% | 38.5% | | | 43.5% | 56.5% | |
| | Female | Mild | 8 | 7 | 0.524 | Mild | 8 | 3 | 0.248 |
| | | | 53.3% | 46.7% | | | 72.7% | 27.3% | |
| | | Moderate | 12 | 9 | | Moderate | 8 | 9 | |
| | | | 57.1% | 42.9% | | | 47.1% | 52.9% | |
| | | Severe | 4 | 7 | | Severe | 8 | 11 | |
| | | | 36.4% | 63.6% | | | 42.1% | 57.9% | |

pain and severe bleeding were higher in the no-splint group. Table II

Crusting and synechiae rates were similar across age groups, with no significant differences (p->0.05). Gender-wise, males with splints had higher rates of both crusting and synechiae, while females showed no significant differences between the two groups. Overall, age and gender had minimal influence on postoperative crusting and synechiae. Table III

# Discussion

Septoplasty is a surgical procedure aimed at correcting a deviated nasal septum, which may lead to difficulty in the breathing, recurrent sinus infections, and other complications. The use of intranasal splints during septoplasty has been a topic of discussion among otolaryngologists, with varying opinions on its benefits and drawbacks. This study explores the outcomes of septoplasty with and without intranasal splints in patients, highlighting the effects on postoperative pain and complications, on 120 patients with overall mean age of 22.7 $\pm$ 4.9 years and with 60.0% males in the group A and 61.7% in the group B (p = 0.852). These demographic findings were similar to those reported by Mujahid AM et al[13] as among 165 patients, there were 109 males (66.1%) and 56 females (33.9%) with average age as 37.3 ± 12.3 years. In comparison, Alam M et al[14] also reported that the mean age of their patients was 30 years, with 62% being male and 38% female, and the mean duration of symptoms was 2 years.

In this study outcome of septoplasty using splints is not significantly different compared to no splints, except for postoperative bleeding, particularly as for postoperative pain, 30.0% of the splint group and 40.0% of the no-splint group experienced mild pain (p=0.467). Moderate pain was 50.0% in the splint group and 40.0% in the no-splint group, while severe pain was equal in both groups at 20.0%. Postoperative bleeding showed significant differences: 50.0% of the splint group had mild bleeding compared to 20.0% of the no-splint group (p=0.002).

Moderate bleeding was higher in no-splint group (40.0% vs. 20.0%), and severe bleeding was more common in the

**Table III: Comparison of postoperative pain, bleeding, crusting and Synechiae in both groups. (n=120)**

| Variables | | Postoperative Crusting | Treatment groups | | P value | Postoperative Synechiae | Treatment groups | | P value |
|---|---|---|---|---|---|---|---|---|---|
| | | | Intranasal Splint | No Splints | | | Intranasal Splint | No Splints | |
| Age groups | 15-20 years | Yes | 7 | 5 | 0.757 | Yes | 11 | 5 | 0.880 |
| | | | 58.3% | 41.7% | | | 68.8% | 31.2% | |
| | | No | 17 | 15 | | No | 6 | 7 | |
| | | | 53.1% | 46.9% | | | 46.2% | 53.8% | |
| | > 20-25 years | Yes | 7 | 4 | 0.283 | Yes | 10 | 4 | 0.290 |
| | | | 63.6% | 36.4% | | | 71.4% | 28.6% | |
| | | No | 12 | 15 | | No | 3 | 7 | |
| | | | 44.4% | 55.6% | | | 30.0% | 70.0% | |
| | > 25-30 years | Yes | 4 | 3 | 0.465 | Yes | 9 | 3 | 0.116 |
| | | | 57.1% | 42.9% | | | 75.0% | 25.0% | |
| | | No | 13 | 18 | | No | 3 | 10 | |
| | | | 41.9% | 58.1% | | | 23.1% | 76.9% | |
| Gender | Male | Yes | 14 | 9 | 0.180 | Yes | 22 | 9 | 0.037 |
| | | | 60.9% | 39.1% | | | 71.0% | 29.0% | |
| | | No | 22 | 28 | | No | 4 | 15 | |
| | | | 44.0% | 56.0% | | | 21.1% | 78.9% | |
| | Female | Yes | 4 | 3 | 0.727 | Yes | 8 | 3 | 0.947 |
| | | | 57.1% | 42.9% | | | 72.7% | 27.3% | |
| | | No | 20 | 20 | | No | 8 | 9 | |
| | | | 50.0% | 50.0% | | | 47.1% | 52.9% | |

no-splint group (40.0% vs. 30.0%). Crusting was present in 30.0% of the splint group and 20.0% of the no-splint group (p=0.206), while absence of crusting was reported by 70.0% and 80.0%, respectively. Synechiae were observed in 20.0% of the splint group and 10.0% of the no-splint group (p=0.125), with 80.0% and 90.0% reporting no synechiae in the respective groups. In the few comparable randomized controlled trials involving 100 patients undergoing surgery either for septoplasty alone or combined septal and inferior turbinate surgery,[15,16] participants were randomly assigned to receive either nasal splints post-surgery or no splints. All patients had their nasal packing removed on the first day following the operation, and splints were taken out after one week. Cook et al[15] utilized shortened silicone Medasil splints and observed comparable improvements in septal position and airway openness six weeks post-surgery across both groups, with no significant difference in intranasal adhesion rates. However, patients in the splint group reported higher pain scores during the initial week after surgery. Malki et al[16] employed trimmed Silastic splints and reported that all patients had comparable pain levels within the first 48 hours post-surgery, but by one week, the mean pain score was significantly higher in the splint group (P<.0001). By six weeks, intranasal adhesions were observed in 1.8% of the splint group compared to 7.7% in the no splint group, although this disparity was statistically insignificant. Von Schoenberg et al[17] utilized standard-sized Exmoor Silastic splints and found that the splint group experienced significantly higher pain levels (P<.001). Patients who underwent the procedure experienced concurrent surgery the highest incidence of intranasal adhesions on both the septum and lateral nasal wall, with 31.6% of patients in the group without splints developed adhesions, compared to 3.6% in the group with splints. By three months, both groups had only one patient each with adhesions, attributed to nasal care completed during the one-week follow-up visit. Importantly, the authors noted routine postoperative nasal toilet, including adhesion division under topical anesthesia.

Ardehali et al[18] randomized 114 septoplasty patients to receive either septal splints with antibiotic meshes or transseptal horizontal mattress sutures. Removed the antibiotic meshes at 48 hours post-operation, while splints were removed after one week. The study did not find statistically significant differences in the rates of mucosal adhesions between the two groups. Postoperative pain, measured on a 10-point visual analog scale (VAS), was reported to be greater in the group that received nasal packing. In a study by Yilmaz et al[19] 51 patients undergoing septoplasty were randomized into two groups: one received Merocel nasal packing, while the other received silicone splints with built-in airway components, with the aim to compare postoperative eustachian tube

function. Both nasal packing and splints were removed after 48 hours. Results indicated that tympanometric middle ear pressures were pathologically reduced in 74% of the packing group, in contrast to 21% of the splint group at this time point. Although the Bingöl F et al[20] and Kim SJ[21] also found comparable findings. In a study by Malki et al, 110 patients were enrolled, with half randomly assigned to receive nasal splints following septoplasty alone. Various types of splints were employed, and some patients also received gauze packing. Pain levels did not significantly differ within the first 48 hours postoperatively. However, by one week after surgery, the group that received splints reported significantly higher levels of pain compared to those who did not receive splints.[16]

# Conclusion

The outcome of septoplasty using splints is not significantly different compared to no splints, except for postoperative bleeding. However, the study possesses much smaller sample size and did not account for other effect modifiers. Therefor more randomized controlled trials (RCTs) are recommended with larger sample sizes and consideration of other effect modifiers to reach conclusive evidence on the use or non-use of splints after septoplasty.

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