

Original Article

Outcomes of Septal Surgery with Nasal Packing Versus Quilting Sutures

Muhammad Umair Adeel¹, Muhammad Atif Imran Zaheer Shah², Imran Yaseen¹, Farhad Mustafa³, Hassan Rasheed⁴, Laiba Gul⁵,
Muhammad Ishfaq Ahmad⁶, Muhammad Farrukh Habib^{7*}

¹Resident ENT, Combined Military Hospital, Lahore, Pakistan.

²Consultant ENT, Combined Military Hospital, Lahore, Pakistan.

³Resident ENT, Combined Military Hospital Kharian, Pakistan.

⁴House Officer, Combined Military Hospital, Lahore, Pakistan.

⁵Resident Ophthalmology, Combined Military Hospital, Lahore, Pakistan.

⁶Resident Medicine, Combined Military Hospital Quetta, Pakistan.

⁷Department of Management Sciences, Shifa Tameer E Millat University Islamabad, Pakistan.

*Corresponding Author: Muhammad Farrukh Habib; Email: muhammadfarrukhhabib@gmail.com

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ABSTRACT

Background: Septoplasty is a common surgical procedure used to correct a deviated nasal septum, which can cause nasal obstruction and impact respiratory function. Postoperative management traditionally includes nasal packing to prevent complications such as bleeding and hematoma, although it can be associated with discomfort and other complications. Quilting sutures have been proposed as an alternative technique to reduce these issues.

Objective: To compare the postoperative outcomes of nasal packing versus quilting sutures in patients undergoing septoplasty.

Methods: This prospective comparative cross-sectional study was conducted at the ENT unit of Combined Military Hospital Rawalpindi, Pakistan, after obtaining ethical approval. The sample size comprised 384 patients, with 192 in the nasal packing group and 192 in the quilting sutures group. Inclusion criteria included patients aged 18 to 70 years undergoing elective nasal septoplasty. Exclusion criteria were patients with nasal polyps, allergic rhinitis, diabetes, coagulation disorders, septal flap tears, those unfit for surgery, and those undergoing combined septoplasty and turbinate intervention. Patients were randomly assigned to either nasal packing or quilting sutures groups. Baseline characteristics, including age, gender, and BMI, were documented. Postoperative assessments were conducted at 48 hours, 1 week, and 3 months, evaluating pain using a visual analogue scale (VAS), bleeding, epiphora, dyspnea, hematoma, and adhesions. Data analysis was performed using SPSS version 26.0, with quantitative data represented as mean \pm standard deviation and qualitative data as percentages and frequencies. Statistical significance was determined using chi-square and unpaired two-tailed Student's t-tests, with $p < 0.05$ considered significant.

Results: The mean age of participants was 34.37 ± 6.95 years. Gender distribution included 256 males (66.7%) and 128 females (33.3%). At 48 hours postoperatively, the nasal packing group had a higher mean pain score (5.96 ± 1.39) compared to the quilting sutures group (2.03 ± 1.05) ($p < 0.001$). Bleeding was more significant in the quilting sutures group (1.82 ± 0.60) than in the nasal packing group (1.27 ± 0.45) ($p < 0.001$). Epiphora and dyspnea were more common in the nasal packing group, with 48 patients (25%) and 81 patients (42.2%), respectively, compared to 8 patients (4.2%) and 6 patients (3.1%) in the quilting sutures group ($p < 0.001$). Hematoma occurrence was low and not significantly different between the groups. After 1 week, pain scores remained higher in the nasal packing group (1.45 ± 1.12) compared to the quilting sutures group (0.58 ± 0.79) ($p < 0.001$). At 3 months, pain scores were still higher in the nasal packing group (1.45 ± 1.12) compared to the quilting sutures group (0.58 ± 0.80) ($p < 0.001$), with no significant difference in adhesion formation.

Conclusion: Quilting sutures resulted in lower postoperative pain and fewer complications compared to nasal packing in patients undergoing septoplasty, despite a slightly higher risk of bleeding. These findings suggest that quilting sutures may be a preferable alternative to nasal packing for postoperative management in septoplasty.

Keywords: Septoplasty, Nasal Packing, Quilting Sutures, Postoperative Complications, Nasal Obstruction, Visual Analogue Scale, Hematoma, Epiphora, Dyspnea, ENT Surgery, Randomized Controlled Trial.

INTRODUCTION

The nasal cavity in humans, with its vital physiological functions, has evolved over millennia to warm, filter, and humidify ventilated air while simultaneously providing immune protection and facilitating olfaction (1). Structural abnormalities within the nasal cavity can disrupt airflow dynamics and increase nasal resistance, leading to what is known as structural nasal obstruction. This condition adversely impacts the nasal cavity's ventilation, temperature regulation, and humidification functions (2, 3).

Septoplasty, a widely utilized surgical intervention for symptomatic deviated nasal septum, has been shown to have favorable outcomes in multiple studies (4, 5). Notably, a randomized controlled trial by van Egmond et al. demonstrated that septoplasty is more effective than nonsurgical management in alleviating nasal obstruction in adults with septal deviation (6). One common post-operative approach involves nasal packing, which aims to prevent septal hematoma formation and postoperative hemorrhage. It stabilizes the remaining septum and prevents further deviation (7). However, anterior nasal packing has several disadvantages, including compromised nasal breathing, dryness of the mouth, nasal pain, infections (8), nasal valve narrowing, vestibulitis, crusting, synechiae, headache, eye watering, ear blocking, throat irritation, difficulty swallowing, hypoxia, hypoxemia, and secondary infection (9).

An alternative method involves the use of quilting sutures post-septal surgery to prevent complications such as septal hematoma and bleeding (9). These sutures can also stabilize the middle turbinates during the healing process, reducing the risk of complications. The efficacy of quilting sutures compared to nasal packing in preventing these postoperative complications has not been extensively detailed in previous methods (10-12). This study aims to address this gap by comparing the outcomes of nasal packing and quilting sutures in the postoperative period, providing a comprehensive analysis of their respective benefits and drawbacks.

MATERIAL AND METHODS

The study was a prospective comparative cross-sectional investigation conducted at the ENT unit of Combined Military Hospital Rawalpindi, Pakistan, following approval from the hospital's ethical review board. The sample size, calculated using a specified formula (12), comprised 384 patients, with 192 in the nasal packing group and 192 in the septal quilting sutures group.

Participants were selected based on strict inclusion criteria, encompassing individuals aged 18 to 70 years, of either gender, who underwent elective nasal septoplasty with either nasal packing or septal quilting sutures. Exclusion criteria included patients with nasal polyps, allergic rhinitis, diabetes, coagulation disorders, septal flap tears during surgery, those deemed unfit for surgery, and those who underwent a combination of septoplasty and turbinate intervention. No septal splints were used during the study. The study population was selected using a non-probability consecutive sampling method from patients presenting to the outpatient department of surgery at the institution. Written informed consent was obtained from all participants.

$$n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\epsilon^2}$$

Once the study pool of 384 patients was identified, they were randomly assigned to two equal groups based on their medical registration numbers. Group A included patients who underwent septoplasty with nasal packing, while group B consisted of patients who underwent septoplasty with quilting sutures. Baseline characteristics such as age, gender, and body mass index (BMI) were documented for all participants.

Postoperatively, patients in group A received nasal packing with paraffin gauze, while those in group B underwent septal quilting with non-absorbable 3/0 or 4/0 sutures. Immediate postoperative complications were assessed 48 hours after surgery, focusing on bleeding, pain, difficulty breathing, and sleep disturbances. Pain was evaluated using a 10-point visual analogue scale (VAS), while bleeding was quantified using a scale from 1 to 5 (see Table I). Subsequently, patients were followed up after 7 days to check for hematoma formation, bleeding, nasal adhesions, and to record pain scores. A final follow-up after 3 months was conducted to assess adhesion formation and pain using the VAS.

Data collection and analysis were performed using Statistical Package for Social Sciences (SPSS) version 26.0. Quantitative data such as age, pain, and bleeding were represented as means with standard deviations, while qualitative data such as gender, hematoma, and adhesions were represented as percentages and frequencies. Statistical analysis was conducted using the chi-square test for qualitative variables and the unpaired two-tailed Student's t-test for quantitative variables. A p-value of less than 0.05 was considered statistically significant. The study adhered to the ethical principles outlined in the Declaration of Helsinki.

RESULTS

The study evaluated the outcomes of nasal packing versus quilting sutures in patients undergoing septoplasty, with baseline characteristics and postoperative variables meticulously analyzed. The mean age of participants was 34.37 ± 6.95 years (Table 1). Gender distribution revealed that 256 (66.7%) participants were male, and 128 (33.3%) were female (Table 1). When comparing the two groups, the nasal packing group had a mean age of 34.44 ± 6.97 years, while the quilting sutures group had a mean age of 34.30 ± 6.96 years, with no statistically significant difference ($p = 0.838$). Gender distribution between the groups also showed no significant difference, with males comprising 67.2% and 66.1% and females 32.8% and 33.9% in the nasal packing and quilting sutures groups, respectively ($p = 0.829$) (Table 2).

Table 1: Baseline Characteristics

Sr. No.	Characteristics	Value
1	Mean age	34.37 ± 6.95 years
2	Gender	
	- Male	256 (66.7%)
	- Female	128 (33.3%)

Table 2: Comparison of Baseline Characteristics between Groups

Characteristic	Nasal Packing Group (n = 192)	Quilting Sutures Group (n = 192)	p-value
Age	34.44 ± 6.97 years	34.30 ± 6.96 years	0.838
Gender			0.829
- Male	129 (67.2%)	127 (66.1%)	
- Female	63 (32.8%)	65 (33.9%)	

Table 3: Comparison of Variables after 48 hours of Surgery

After 48 hours (mean \pm SD)	Nasal Packing Group (n = 192)	Quilting Sutures Group (n = 192)	p-value
Pain score on VAS	5.96 ± 1.39	2.03 ± 1.05	< 0.001
Bleeding	1.27 ± 0.45	1.82 ± 0.60	< 0.001
Epiphora	48 (25%)	8 (4.2%)	< 0.001
Shortness of breath	81 (42.2%)	6 (3.1%)	< 0.001
Haematoma	2 (1.0%)	1 (0.5%)	0.562

Table 4: Comparison of Variables after 1 Week of Surgery

After 1 Week (mean \pm SD)	Nasal Packing Group (n = 192)	Quilting Sutures Group (n = 192)	p-value
Pain score on VAS	1.45 ± 1.12	0.58 ± 0.79	< 0.001
Bleeding	1.27 ± 0.49	1.82 ± 0.60	< 0.001
Adhesions	0	0	N/A
Haematoma	0	0	N/A

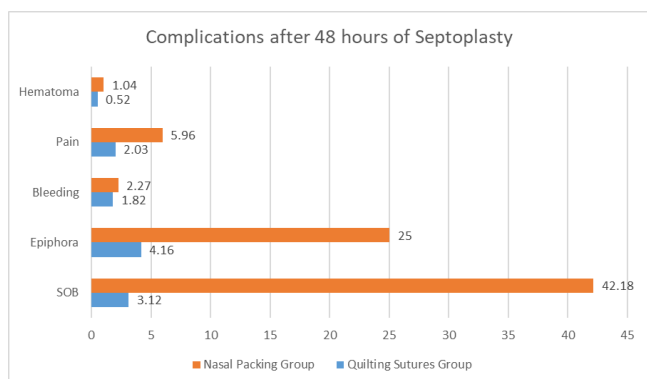


Figure 1 Complications after 48 Hours of Septoplasty

Table 5: Comparison of Variables after 3 Months of Surgery

After 3 Months (mean \pm SD)	Nasal Packing Group (n = 192)	Quilting Sutures Group (n = 192)	p-value
Pain score on VAS	1.45 \pm 1.12	0.58 \pm 0.80	< 0.001
Adhesions	2 (1.0%)	4 (2.1%)	0.411

Postoperative assessments at 48 hours revealed significant differences between the groups. The mean pain score on the visual analogue scale (VAS) was notably higher in the nasal packing group (5.96 \pm 1.39) compared to the quilting sutures group (2.03 \pm 1.05), with this difference being statistically significant ($p < 0.001$). Bleeding, quantified using a specific scale, showed a mean score of 1.27 \pm 0.45 in the nasal packing group versus 1.82 \pm 0.60 in the quilting sutures group, again showing a significant difference ($p < 0.001$). Additional postoperative complications such as epiphora were observed in 48 patients (25%) in the nasal packing group compared to only 8 patients (4.2%) in the quilting sutures group ($p < 0.001$). Similarly, shortness of breath was significantly more common in the nasal packing group, affecting 81 patients (42.2%), whereas only 6 patients (3.1%) in the quilting sutures group reported this complication ($p < 0.001$). The occurrence of hematoma was low and not significantly different between the groups, with 2 cases (1.0%) in the nasal packing group and 1 case (0.5%) in the quilting sutures group ($p = 0.562$) (Table 3).

After one week, the pain scores continued to favor the quilting sutures group, with a mean VAS score of 0.58 \pm 0.79 compared to 1.45 \pm 1.12 in the nasal packing group ($p < 0.001$). Bleeding remained significantly lower in the quilting sutures group (1.82 \pm 0.60) compared to the nasal packing group (1.27 \pm 0.49) ($p < 0.001$). Notably, there were no cases of adhesions or hematoma in either group at this stage, rendering statistical comparison for these variables unnecessary (Table 4).

At the three-month follow-up, pain scores were still significantly lower in the quilting sutures group, with a mean VAS score of 0.58 \pm 0.80, while the nasal packing group had a mean score of 1.45 \pm 1.12 ($p < 0.001$). Adhesion formation was slightly higher in the quilting sutures group, with 4 cases (2.1%) compared to 2 cases (1.0%) in the nasal packing group; however, this difference was not statistically significant ($p = 0.411$) (Table 5).

Overall, the study demonstrated that quilting sutures are associated with significantly lower postoperative pain and bleeding compared to nasal packing, both in the immediate and longer-term postoperative periods. While minor complications such as epiphora and shortness of breath were also less common with quilting sutures, the incidence of hematoma and adhesions did not differ significantly between the two techniques.

DISCUSSION

Septoplasty remains the predominant corrective procedure for deviated nasal septum (13). Nasal packing post-septoplasty has traditionally been employed to prevent bleeding, septal hematoma, and synechiae formation between the septum and lateral nasal wall (14). In the present study, patients who underwent septoplasty were assigned to either nasal packing or trans-septal sutures. It was observed that postoperative complications, with the exception of bleeding, were more prevalent in the nasal packing group, including pain, epiphora, and dyspnea. There was no statistically significant difference between the groups concerning hematoma and adhesion formation or re-deviation of the nasal septum.

These findings align with earlier studies that reported a higher complication rate with nasal packing compared to septal quilting sutures. For instance, Walikar et al. conducted a randomized control trial demonstrating a higher frequency of complications in the nasal packing group (15). Similarly, Dadgarnia et al. found a lower complication rate with the septal suturing technique and less bleeding in patients treated with nasal packing (16). Naik K. also reported fewer postoperative complications, such as hemorrhage, crusting, and reduced hospital stays in the trans-septal suturing group compared to the nasal packing group (17). Although our study did not observe postoperative infections, previous research by Lee et al. documented cases of pyogenic granuloma and toxic shock associated with nasal packing (18, 19).

Contrarily, some studies have indicated no significant difference between the two groups in terms of bleeding and postoperative hematoma formation (6). Interestingly, our study found a higher incidence of dyspnea in the nasal packing group, which contrasts with Melih et al.'s findings that reported a 3.6 times higher rate of respiratory distress in the trans-septal suturing group (20).

The study's strengths included a rigorous follow-up period of three months and the comprehensive assessment of multiple complications at various postoperative intervals. However, the study had limitations such as the relatively short postoperative follow-up, the procedures being performed by different specialists with varying skill levels, and a higher male gender representation in our sample due to institutional policies.

In conclusion, the rate of postoperative complications was higher in patients who underwent nasal packing after septoplasty, particularly regarding pain and shortness of breath, compared to those who received trans-septal quilting sutures. However, the latter group exhibited a slightly higher risk of bleeding. This study underscores the importance of evaluating the potential benefits of quilting sutures over nasal packing to minimize patient discomfort and complications. There was no conflict of interest declared

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