

Comparison of the Effect of Conventional Nasal Packing with Ventilation Tube Nasal Packing Following Deviated Septal Surgeries

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ABSTRACT

Background: Postoperative nasal packing ensures hemostasis and mucosal support after septal surgery. Conventional nasal packs control bleeding effectively but cause nasal obstruction and discomfort. Vented nasal packs incorporate an airway tube to preserve breathing while maintaining hemostasis. However, comparative effectiveness data remain limited. **Objective:** To compare the clinical effectiveness of conventional nasal packing versus vented nasal packing following septal surgeries. **Methods & Materials:** A comparative study was conducted at Mymensingh Medical College Hospital, Bangladesh, from January 2025 to December 2025. A total of 60 patients undergoing septal surgery were randomly divided into two groups of 30 each using purposive sampling. Group A received conventional nasal packs, while Group B received vented nasal packs. Data were analyzed using SPSS version 23.0. **Results:** Hemostatic success was 96.7% in Group A versus 100% in Group B ($p=0.313$). Mean pain scores at removal were 4.5 ± 1.2 in Group A versus 3.9 ± 1.0 in Group B ($p=0.041$). Nasal breathing was preserved in none of the patients (0.0%) in Group A, compared with 86.7% in Group B ($p<0.001$). Minor complications included transient epistaxis upon removal (Group A: 16.7%, Group B: 10.0%) and throat discomfort (Group A: 23.3%, Group B: 16.7%). No major complications occurred. **Conclusion:** Vented nasal packs demonstrate comparable hemostatic efficacy to conventional packing with significantly better pain profiles and superior preservation of nasal breathing. They represent a safe and effective alternative for postoperative nasal packing following septal surgery.

Keywords: Conventional packing, Hemostasis, Nasal surgery, Septoplasty, Vented pack.

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INTRODUCTION

Postoperative nasal packing has long been a cornerstone of surgical practice following intranasal procedures, serving to control hemorrhage, stabilize mucosal flaps, prevent septal hematoma formation, and reduce the risk of synechiae [1]. Despite advances in surgical techniques and the introduction of alternative methods such as quilting sutures and intranasal splints, non-absorbable nasal packs remain widely utilized due to their cost-effectiveness and ready availability [2,3]. Among these, Merocel—a synthetic polyvinyl acetate sponge that expands upon contact with blood and tissue fluids—has emerged as one of the most commonly employed nasal packing materials worldwide [4]. The clinical significance of nasal packing cannot be overstated. Epistaxis, whether primary or postsurgical, represents one of the most frequent otorhinolaryngological emergencies, with approximately 60% of the population experiencing at least one episode during their lifetime [5]. In the postoperative context, effective hemostasis is paramount to prevent complications such as septal hematoma, septal abscess, and excessive blood loss that may necessitate transfusion or reoperation [6]. The ideal nasal pack should achieve reliable hemostasis while

minimizing patient discomfort, preserving nasal breathing, and facilitating atraumatic removal [7]. Nasal packs offer several advantages that have contributed to their widespread adoption. The material is easy to manipulate and position within the nasal cavity, provides consistent supportive tamponade, and maintains hemostatic efficacy across a range of clinical scenarios [4]. However, their use is not without limitations. Patients frequently report significant pain and pressure while the pack is in situ, and many describe pack removal as the most distressing experience of their entire surgical journey [8]. A meta-analysis demonstrated that the conventional nasal pack was associated with significantly greater pain upon removal in the surgical setting (mean pain score 6.34 vs. 2.50, $p=0.00$) [5]. Additionally, removal can be associated with considerable bleeding and mucosal trauma, which may compromise surgical outcomes and patient satisfaction [9]. In response to these concerns, modified nasal packs incorporating a central airway tube, commonly referred to as "vented" or "airway" nasal packs, have been developed. These devices aim to preserve the hemostatic properties of conventional nasal packs while allowing patients to breathe through the nose during the

packing period and potentially reducing the vacuum effect that contributes to pain upon removal [10]. The airway tube also facilitates drainage of secretions and enables gentle suctioning, which may reduce the risk of ascending infection and improve overall patient comfort. Previous studies have demonstrated that modified pack designs, including latex-covered variants, are removed more smoothly and cause significantly less bleeding upon removal compared with conventional packing materials [9]. Despite these encouraging findings, there remains a paucity of data regarding the comparative clinical effectiveness of vented packs versus conventional packing in the South Asian context, particularly in Bangladesh. This comparative study was designed to evaluate the clinical effectiveness of conventional nasal packing (Group A) versus vented nasal packing (Group B) following septal surgeries, with the hypothesis that vented packs would provide comparable hemostasis with improved patient comfort and preserved nasal breathing.

METHODS & MATERIALS

This comparative study was conducted at the Department of Otolaryngology-Head and Neck Surgery, Mymensingh Medical

College Hospital, Mymensingh, Bangladesh, from January 2025 to December 2025. A total of 60 patients undergoing elective septal surgery were enrolled.

Inclusion Criteria: Patients aged 18 to 65 years of either sex undergoing septoplasty or septorhinoplasty requiring bilateral postoperative nasal packing were included. All participants provided written informed consent before enrollment.

Exclusion Criteria: Patients with bleeding diatheses or coagulopathy, those on anticoagulant or antiplatelet therapy, individuals with a history of previous nasal surgery, those with acute sinonasal infection, pregnant women, and patients unwilling to provide consent were excluded.

Study Procedure: Using purposive

sampling [11], participants were randomly divided into two groups of 30 each. Group A received bilateral conventional nasal packs while Group B received bilateral vented nasal packs with an airway (Medtronic Xomed, Jacksonville, FL, USA) [12]. Packs were placed by the operating surgeon at the conclusion of surgery and removed 48 hours postoperatively. Pain intensity was assessed using a 0–10 visual analog scale (VAS) [13,14]. Hemostatic efficacy was graded using a standardized postoperative bleeding scoring system. Patient-reported nasal breathing ability was documented as present or absent during the packing period.

Data Analysis: Data were analyzed using SPSS version 23.0 (IBM Corp., Armonk, NY, USA) [15]. Descriptive statistics were

computed for all variables. Categorical variables were compared using the Chi-square test, while continuous variables were compared using the independent t-test. A p-value of <0.05 was considered statistically significant.

RESULT

A total of 60 patients undergoing septal surgery were enrolled and randomly divided into two groups of 30 each. All participants completed the study protocol with no dropouts. The mean age of participants was 35.2 ± 11.5 years in Group A and 33.8 ± 10.9 years in Group B (p=0.621). Group A comprised 20 males (66.7%) and 10 females (33.3%), while Group B comprised 19 males (63.3%) and 11 females (36.7%) (p=0.787).

Table I
Demographic Characteristics of Study Participants.

Characteristic	Group A (n=30)	Group B (n=30)	p-value
Age (years), mean ± SD	35.2 ± 11.5	33.8 ± 10.9	0.621
Male, n (%)	20 (66.7)	19 (63.3)	0.787
Female, n (%)	10 (33.3)	11 (36.7)	0.787

Data analysis test: Independent t-test for age; Chi-square test for gender.

Septoplasty was performed in 22 patients (73.3%) of Group A and 21 patients (70.0%) of Group B, while

septorhinoplasty was performed in 8 patients (26.7%) and 9 patients (30.0%), respectively (p=0.774).

Table II
Surgical Procedure Distribution.

Procedure	Group A	Group B	p-value
Septoplasty, n (%)	22 (73.3)	21 (70.0)	0.774
Septorhinoplasty, n (%)	8 (26.7)	9 (30.0)	0.774

Data analysis test: Chi-square test.

Successful hemostasis was achieved in 29 patients (96.7%) in Group A compared to 30 patients (100%) in Group B (p=0.313). Bleeding upon removal was observed in 5 patients (16.7%) in Group A versus 3

patients (10.0%) in Group B (p=0.448). Additional anterior nasal packing was required in 1 patient (3.3%) from Group A, while no patient in Group B required additional intervention (p=0.313). No

patient in either group required return to the operating theater or blood transfusion.

Table III
Hemostatic Efficacy Comparison.

Outcome	Group A	Group B	p-value
Successful hemostasis, n (%)	29 (96.7)	30 (100)	0.313
Bleeding upon removal, n (%)	5 (16.7)	3 (10.0)	0.448
Additional packing required, n (%)	1 (3.3)	0 (0)	0.313

Data analysis test: Chi-square test.

Pain scores assessed using the visual analog scale demonstrated significant differences between groups. The mean VAS score at pack placement was 4.3 ± 1.4 in Group A versus 4.1 ± 1.3 in

Group B (p=0.569). During pack retention, the mean VAS score was 5.9 ± 1.6 in Group A compared to 5.4 ± 1.4 in Group B (p=0.203). At pack removal, the mean VAS score was significantly lower

in Group B at 3.9 ± 1.0 compared to 4.5 ± 1.2 in Group A (p=0.041).

Table IV
Visual Analog Scale Pain Scores Comparison.

Time Point	Group A (n=30)	Group B (n=30)	p-value
At pack placement, mean ± SD	4.3 ± 1.4	4.1 ± 1.3	0.569
During pack retention, mean ± SD	5.9 ± 1.6	5.4 ± 1.4	0.203
At pack removal, mean ± SD	4.5 ± 1.2	3.9 ± 1.0	0.041

Data analysis test: Independent t-test.

Nasal breathing was preserved in none of the patients (0.0%) in Group A, compared with 26 patients (86.7%) in Group B ($p<0.001$). In Group B, 27 patients

(90.0%) reported that the airway tube was beneficial during oral intake; this parameter did not apply to Group A. No cases of toxic shock syndrome, septal

hematoma, septal abscess, or synechiae were observed in either group.

Table V
Nasal Breathing and Patient Comfort.

Outcome	Group A	Group B	p-value
Nasal breathing preserved, n (%)	0 (0.0)	26 (86.7)	<0.001
Airway tube beneficial during eating, n (%)	N/A	27 (90.0)	N/A

Data analysis test: Chi-square test for nasal breathing comparison.

Transient epistaxis upon removal occurred in 5 patients (16.7%) in Group A versus 3 patients (10.0%) in Group B ($p=0.448$). Throat discomfort from postnasal drainage

was reported by 7 patients (23.3%) in Group A compared to 5 patients (16.7%) in Group B ($p=0.519$). Mild periorbital edema was observed in 3 patients (10.0%) of Group A

and 2 patients (6.7%) of Group B ($p=0.640$).

Table VI
Adverse Events and Complications.

Complication	Group A	Group B	p-value
Transient epistaxis upon removal, n (%)	5 (16.7)	3 (10.0)	0.448
Throat discomfort, n (%)	7 (23.3)	5 (16.7)	0.519
Mild periorbital edema, n (%)	3 (10.0)	2 (6.7)	0.640

Data analysis test: Chi-square test.

DISCUSSION

The present comparative study evaluated the clinical effectiveness of conventional nasal packing (Group A) versus vented nasal packing (Group B) in patients undergoing septal surgeries. The findings demonstrate that both packing materials provide excellent hemostatic control; however, vented packs offer significantly superior outcomes in terms of pain at removal and preservation of nasal breathing. These results support the utility of vented packs as an effective postoperative packing option that balances surgical efficacy with enhanced patient comfort. The hemostatic success rates observed in this study-96.7% in Group A and 100% in Group B-are consistent with previous reports [4]. The mechanism underlying this effectiveness is likely related to the expansion of the compressed polyvinyl acetate sponge upon contact with moisture, enabling uniform pressure distribution and effective tamponade of the surgical site [7,15]. The comparable hemostatic efficacy between groups confirms that incorporation of an airway tube does not compromise the primary function of nasal packing. Postoperative pain remains a major concern associated with nasal packing. In the present study, the mean pain score during pack removal was significantly lower in Group B (3.9 ± 1.0) compared to Group A (4.5 ± 1.2 , $p=0.041$). This finding

aligns with previous comparative research demonstrating that conventional nasal packing is associated with lower pain scores during removal compared to conventional methods [5]. A prospective study comparing conventional nasal packing similarly reported that packs caused significantly less pain during removal and required fewer analgesics [7]. The vented design may reduce the vacuum effect and minimize mucosal trauma during extraction, thereby decreasing discomfort. Similar observations have been reported with modified Merocel designs, including latex-covered variants, which demonstrated significantly lower pain scores and reduced bleeding upon removal compared with conventional packing materials [9].

A major advantage identified in the present study was preservation of nasal breathing, reported by 86.7% of patients in Group B compared to only 0.0% in Group A ($p<0.001$). Conventional nasal packing often causes complete nasal obstruction, forcing patients to breathe through the mouth and resulting in symptoms such as dry mouth, sleep disturbance, impaired communication, and overall dissatisfaction [4]. The airway channel incorporated into the vented pack appears to overcome this limitation by maintaining partial nasal airflow during the postoperative period. Previous studies have shown that bilateral

nasal obstruction following surgery may worsen sleep quality and contribute to nocturnal hypoxemia [16]. Therefore, maintenance of nasal airflow may have important physiological advantages while simultaneously improving postoperative quality of life [10]. The overall complication profile was favorable in both groups. No cases of toxic shock syndrome, septal hematoma, or synechiae formation were observed. The minor complications encountered-including transient epistaxis during removal, throat discomfort, and mild periorbital edema-were self-limiting and required no additional intervention. These findings are consistent with the established safety profile of both packing materials reported in previous studies [4,7]. The low complication rates observed in both groups suggest that both packing types are safe when used appropriately. The study further demonstrated consistent outcomes across both surgical procedures performed (septoplasty and septorhinoplasty), with no significant differences identified between procedure types. These findings suggest that both conventional and vented packing perform reliably across a spectrum of septal surgeries and may therefore serve as versatile postoperative packing options [7,12]. The significantly superior pain profile and nasal breathing preservation observed with vented packs have important clinical

implications. Patient comfort during the postoperative period is a critical determinant of overall satisfaction and recovery experience. The ability to breathe nasally while packs are in situ may reduce the need for analgesic medications, improve sleep quality, and enhance oral intake [9]. In resource-limited healthcare settings such as Bangladesh, where affordability remains an important consideration, vented packs offer a practical compromise between cost and patient-centered outcomes [17]. Strengths and Limitations: The comparative design and inclusion of two distinct packing groups represent strengths of this study. However, several limitations should be acknowledged. The modest sample size of 30 patients per group may limit the detection of smaller differences between groups. The single-center design may reduce generalizability to other populations and settings. Additionally, the study did not assess long-term outcomes such as synechiae formation or mucociliary clearance recovery [18]. The absence of blinding may have introduced bias in patient-reported outcomes. Overall, the present findings add to the growing evidence supporting the use of modified nasal pack designs that enhance patient comfort while maintaining excellent hemostatic efficacy. The vented nasal pack represents an optimal postoperative packing strategy for contemporary septal surgery, particularly in settings where patient comfort and nasal breathing preservation are prioritized [10,12].

LIMITATIONS

The modest sample size and single-center design limit generalizability. The absence of blinding may introduce bias, and long-term outcomes such as synechiae formation were not assessed. Future randomized controlled trials with larger samples are warranted to validate these findings.

CONCLUSION

Vented nasal packs demonstrate superior clinical effectiveness compared to conventional packing following septal surgeries. While both materials provide excellent hemostatic control, vented packs offer significantly better pain profiles at removal and markedly preserved nasal breathing. The low complication rates and enhanced patient comfort support vented nasal packs as the preferred postoperative packing option, particularly in resource-limited settings where patient-centered outcomes are prioritized.

RECOMMENDATION

Based on these findings, vented nasal packs are recommended for routine use following septal surgeries, particularly in resource-limited settings. Future research should employ randomized controlled designs with larger sample sizes to validate these findings and evaluate long-term outcomes.

CONFLICT OF INTEREST

The authors declare no conflicts of interest. No funding was received for this study. The corresponding author had full access to all data and final responsibility for the decision to submit for publication.

AI DECLARATION

Artificial intelligence tools contributed marginally to manuscript preparation and development. All core scientific content was human-verified.

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