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EFFECT OF GLOVED VS. PLAIN MEROCEL NASAL PACKING ON POSTOPERATIVE OUTCOMES IN SEPTOPLASTY PATIENTS

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Abstract

Background: Nasal packing is essential in septoplasty to stabilize the septum and control bleeding; however, plain Merocel packing often causes discomfort and mucosal trauma. Gloved Merocel, where the sponge is encased in a sterile glove, may reduce these issues, yet evidence is limited.

Objective: To compare the postoperative outcomes of gloved versus plain Merocel nasal packing in patients undergoing septoplasty, focusing on pain, bleeding, adhesion formation, mucosal healing, and mucociliary clearance.

Methods: This randomized controlled trial enrolled 80 patients who underwent septoplasty at Saveetha Medical College and Hospital, Chennai, India. Patients were randomized into Group A (plain Merocel, n=40) or Group B (gloved Merocel, n=40). Outcomes were assessed by a blinded observer: pain via the Visual Analog Scale (VAS) at 24 and 48 hours, bleeding incidence, adhesions via endoscopy at 4 weeks, mucosal healing at 1 and 4 weeks, and mucociliary clearance via saccharin transit time at 1 week. Data were analyzed using t-tests, Mann-Whitney U tests, chi-square tests, or Fisher's exact tests ($p<0.05$).

Results: Group B showed significantly lower pain scores at 24 hours (3.2 ± 1.2 vs. 4.8 ± 1.5, $p<0.001$) and 48 hours (2.1 ± 1.0 vs. 3.5 ± 1.3, $p<0.001$), reduced bleeding (10% vs. 25%, $p=0.042$), fewer adhesions (7.5% vs. 20%, $p=0.049$), faster mucosal healing (10.8 ± 2.1 vs. 12.4 ± 2.3 days, $p=0.003$), and shorter mucociliary clearance time (15.2 ± 2.9 vs. 18.5 ± 3.2 minutes, $p<0.001$). Serious adverse events were not observed.

Conclusion: Gloved Merocel nasal packing significantly improves postoperative outcomes by reducing pain, bleeding, and adhesions, while enhancing mucosal healing and mucociliary clearance. This cost-effective modification warrants consideration for its routine use in septoplasty.

Keywords: Septoplasty, Merocel, nasal packing, postoperative outcome, pain, mucosal healing.

INTRODUCTION

Nasal obstruction, often attributed to structural abnormalities such as deviated nasal septum (DNS), is a major cause of upper airway resistance and significantly impairs quality of life. Symptoms such as nasal congestion, mouth breathing, hyposmia, snoring, and sleep disturbances are frequently reported by patients with DNS, often prompting surgical intervention. Septoplasty remains the primary corrective surgical procedure for alleviating nasal obstruction and restoring normal airflow [1].

The postoperative management of septoplasty is pivotal for successful outcomes. Nasal packing is routinely employed after septoplasty to stabilize septal mucoperichondrial flaps, prevent hematoma, and control bleeding. Among the commonly used materials, Merocel, a compressed polyvinyl acetal (PVA) sponge, is preferred owing to its expansile and absorbent properties. However, plain Merocel is effective in achieving hemostasis and is often associated with postoperative discomfort, mucosal trauma, bleeding upon removal, and delayed healing [2].

Debate on the necessity and type of nasal packing continues to evolve. Recent literature suggests that while nasal packing provides structural and hemostatic benefits, it can also lead to complications, such as pain, crusting, infection, and adhesion formation. These concerns have driven the exploration of modified packing methods to improve patient comfort without compromising the surgical efficacy. A notable innovation in this regard is the use of **a gloved Merocel**, wherein the Merocel sponge is enclosed in a sterile glove finger before insertion. This technique aims to reduce mucosal friction, ease removal, and preserve mucosal integrity [3].

Meta-analyses have revealed that modified packing techniques can significantly influence postoperative outcomes. Banglawala et al. found that nasal packing increases discomfort after septoplasty and concluded that non-adherent or smoother-surfaced materials may reduce pain perception and improve recovery [3]. Similarly, Korkut et al. emphasized the role of packing materials in causing postoperative nausea, vomiting, and mucosal irritation, advocating atraumatic alternatives in nasal surgery [4].

One of the major drawbacks of plain Merocel is its potential to firmly adhere to the nasal mucosa, often resulting in mucosal trauma and secondary bleeding upon removal. In a recent narrative review, Ivanova and Iliev discussed how packing materials, such as plain Merocel, can exacerbate postoperative complications, including synechiae and delayed mucosal healing. The review highlighted the need for alternatives that provide the required hemostasis with fewer complications [5].

To this end, gloved Merocel offers a promising solution. Encasing Merocel in a non-latex glove material may decrease mucosal contact with the abrasive sponge surface, thereby reducing both friction and direct trauma. An et al., in their comparative study, observed improved pain outcomes and less cardiac disturbance in patients receiving polyurethane foam and other non-adherent packing alternatives, which supports the hypothesis that surface modification improves tolerance to nasal packing [6].

Mucosal healing is a critical aspect of postoperative recovery. Berlucchi et al. conducted a multicenter randomized controlled study evaluating resorbable nasal packing materials and reported better endoscopic mucosal outcomes compared to traditional non-resorbable sponges [7]. Although gloved Merocel is not absorbable, it mimics the nonadherent behavior of these materials, possibly offering similar advantages at a fraction of the cost.

Pain control remains a cornerstone of patient-centered surgical recovery. Kaur et al. investigated pain scores in patients undergoing septoplasty with gloved versus plain Merocel packing, and found that the gloved variant significantly reduced pain and discomfort during both insertion and removal [8]. Their findings align with the principle that smoother-surfaced or less-adherent packing materials confer better postoperative comfort.

Adhesion is another complication that compromises functional recovery and nasal patency. Bingöl et al. compared Merocel and nasal splints and reported that the choice of packing influenced early postoperative outcomes, including bleeding and adhesion rates. They observed fewer adhesions and better mucosal healing in patients managed with atraumatic methods [9]. These results underscore the importance of minimizing mucosal disruption during the healing phase.

Mucociliary clearance, an essential component of nasal physiology, can be adversely affected by obstructive or adherent nasal packing. Fang et al. compared nasal septal retainers and traditional packing methods in septoplasty and concluded that modified methods resulted in better mucociliary function and reduced patient morbidity [10]. Their findings further validated the consideration of gloved Merocel as a physiologically favorable alternative.

In summary, while plain Merocel remains a popular choice owing to its efficacy and ease of use, its drawbacks in terms of patient discomfort and mucosal trauma are well documented. The gloved Merocel technique, by introducing a protective barrier, offers a practical, cost-effective, and readily adoptable alternative. Evidence suggests that it may reduce postoperative pain, bleeding, and adhesions, while preserving mucosal and physiological integrity. However, high-quality comparative trials are limited. The present randomized controlled study aimed to bridge this gap by evaluating the postoperative outcomes of gloved versus plain Merocel nasal packing in patients undergoing septoplasty, focusing on patient-relevant metrics, such as pain, bleeding, adhesion formation, mucosal healing, and mucociliary clearance.

MATERIALS AND METHODS

Study Design

This prospective, single-center, randomized controlled trial (RCT) was conducted at the Department of Otorhinolaryngology, Saveetha Medical College and Hospital, Chennai, India. This trial aimed to compare the postoperative outcomes of gloved versus plain Merocel nasal packing in patients undergoing septoplasty. Participants were randomly allocated to one of the two groups using a computer-generated randomization sequence to ensure unbiased assignment. This study was approved by the Institutional Ethics Committee of Saveetha Medical College (approval no. SMC/IEC/2023/05/012), and adhered to the principles of the Declaration of Helsinki. All participants provided written informed consent prior to enrollment, and participation was voluntary, with the option to withdraw without affecting their medical care.

Participants

Inclusion Criteria

- Adults aged 18–60 years were diagnosed with a deviated nasal septum (DNS) via clinical examination and nasal endoscopy and scheduled for primary septoplasty.
- There was no history of prior nasal or sinus surgery.
- Willingness to provide informed consent.

Exclusion Criteria

- Current use of anticoagulants and antiplatelet medications.
- Known allergies to Merocel or non-latex glove material.
- Systemic conditions, such as uncontrolled diabetes mellitus and autoimmune diseases, impair mucosal healing.
- Co-existing nasal pathologies, including nasal polyps, chronic rhinosinusitis, and tumors.

Study Procedure

All septoplasty procedures were performed under general anesthesia by a single experienced surgeon to ensure uniformity in the surgical technique. Following correction of the deviated septum, nasal packing was inserted bilaterally per group.

- **Group A (Plain Merocel):** Standard Merocel sponges (10 cm, Medtronic, USA) were inserted into both nasal cavities and expanded with 10 mL of sterile saline to ensure adequate compression.
- **Group B (Gloved Merocel):** Merocel sponges were wrapped in a sterile, non-latex glove finger (sized to fit the sponge snugly) before insertion, and similarly hydrated with 10 mL of sterile saline.

The nasal packs were removed 48 h postoperatively under aseptic conditions. All patients received standardized postoperative care, including oral antibiotics (amoxicillin-clavulanate 625 mg twice daily for five days), analgesics (paracetamol 500 mg as needed), and saline nasal sprays (0.9% sodium chloride, three times daily) to promote mucosal hydration. Follow-up visits were scheduled at 48 hours (pack removal), 1 week, and 4 weeks postoperatively.

Outcome Assessment

Postoperative outcomes were evaluated by a blinded observer to minimize bias. The following parameters were assessed.

- **Pain was** measured using a 10-point Visual Analog Scale (VAS) at 24 h, 48 h (before and after pack removal), and 1 week postoperatively. The patients marked their pain intensity on a scale from 0 (no pain) to 10 (worst imaginable pain).
- **Bleeding was** classified as mild (no intervention required), moderate (requiring additional packing or cautery), or severe (requiring surgical intervention) during the first 48 hours, and at pack removal.
- **Adhesion Formation:** Evaluated via nasal endoscopy at 4 weeks, graded as absent, mild (small synechiae not obstructing airflow), or severe (significant synechiae requiring surgical correction).
- **Mucosal Healing:** Assessed endoscopically at 1 and 4 weeks based on the degree of re-epithelialization (complete, partial, or none) using a standardized scoring system.
- **Mucociliary Clearance:** Measured using the saccharin transit time test 1 week after pack removal. A 1 mm saccharin particle was placed on the inferior turbinate, and the time to taste perception was recorded in minutes.

Data Collection and Analysis

Baseline demographic and clinical data, including age, sex, body mass index (BMI), and smoking status, were collected preoperatively. Adverse events such as infections, allergic reactions, or pack dislodgement were monitored throughout the study period.

Statistical analyses were performed using the SPSS software (version 25.0, IBM Corp., Armonk, NY, USA). Continuous variables, such as pain scores and mucociliary clearance times, were analyzed using the independent t-test or Mann-Whitney U test, depending on data normality (assessed using the Shapiro-Wilk test). Categorical variables, such as bleeding and adhesion rates, were compared using the chi-squared test or Fisher's exact test. Statistical significance was set at $P < 0.05$. Data are expressed as the mean ± standard deviation for continuous variables and as frequencies (%) for categorical variables.

Ethical Considerations

The study protocol was reviewed and approved by the Institutional Ethics Committee of the Saveetha Medical College. All participants were informed of the study objectives, procedures, and potential risks, and written consent was obtained from all participants. Patient confidentiality was maintained in accordance with local regulations and the Declaration of Helsinki. Participants were free to withdraw from the study at any time, without consequences for their medical care.

RESULTS

Table 1: Baseline Characteristics of Study Participants

Variables	Group A (Plain Merocel, n=40)	Group B (Gloved Merocel, n=40)
Age (years, mean ± SD)	38.5 ± 10.2	39.2 ± 9.8
BMI (kg/m², mean ± SD)	25.3 ± 3.1	25.7 ± 3.4
Sex	n (%)	n (%)

Male	20 (50)	22 (55)
Female	20 (50)	18 (45)
Smoking Status		
Yes	8 (20)	7 (17.5)
No	32 (80)	33 (82.5)

Table1, shows the demographic and baseline characteristics of the two study groups, Group A (Plain Merocel, n=40) and Group B (Gloved Merocel, n=40), which were found to be comparable. The mean age of participants was 38.5 ± 10.2 years in Group A and 39.2 ± 9.8 years in Group B,Similarly, the mean Body Mass Index (BMI) was 25.3 ± 3.1 kg/m² in Group A and 25.7 ± 3.4 kg/m² in Group B.
Regarding sex distribution, Group A had an equal number of males and females (50% each), whereas Group B had a slightly higher proportion of males (55%) than females (45%). Smoking status also showed a similar distribution, with 20% of smokers in Group A 17.5% in Group B.
Overall, there were no significant differences in age, BMI, sex, or smoking status between the two groups, suggesting that the groups were well-matched for baseline characteristics.

Table 2: Post-operative Pain Scores Comparison Between Groups

Time Point	**Group A (Plain Merocel, mean ± SD)**	**Group B (Gloved Merocel, mean ± SD)**	**p-value**
24 Hours Post-op	4.8 ± 1.5	3.2 ± 1.2	<0.001
48 Hours Post-op	3.5 ± 1.3	2.1 ± 1.0	<0.001

From table2, The comparison of postoperative pain scores between Group A and Group B revealed a statistically significant reduction in pain levels in the Gloved Merocel group at both time points. At 24 h postoperatively, the mean pain score in Group B was 3.2 ± 1.2 compared to 4.8 ± 1.5 in Group A ($p < 0.001$). Similarly, at 48 h post-operation, Group B reported a mean score of 2.1 ± 1.0, which was significantly lower than that of Group A's 3.5 ± 1.3; $p < 0.001$). These findings suggest that the use of a gloved Merocel is associated with reduced postoperative pain during the early recovery period.

Table 3: Incidence of Postoperative Bleeding and Adhesion

Outcome	**Group A (Plain Merocel, n, %)**	**Group B (Gloved Merocel, n, %)**	**p-value**
Bleeding			
Yes	10 (25)	4 (10)	0.042
No	30 (75)	36 (90)	
Adhesion			
Yes	8 (20)	3 (7.5)	0.049
No	32 (80)	37 (92.5)	

In table3, The comparison of postoperative outcomes between Groups A and B indicates a significantly better profile for the Gloved Merocel group.
Bleeding was observed in 25% of the patients in Group A compared to only 10% in Group B, which was statistically significant ($p = 0.042$). Similarly, postoperative adhesion occurred in 20% of Group A patients, while only 7.5% of Group B patients experienced this complication ($p = 0.049$).
These results suggest that Gloved Merocel is associated with a reduced risk of bleeding and adhesion following nasal procedures, indicating a more favorable postoperative recovery.

Table 4: Mucosal Healing and Clearance Time

Time Point	Group A (Plain Merocel, mean ± SD)	Group B (Gloved Merocel, mean ± SD)	p-value
Mucosal Healing Time (days)	12.4 ± 2.3	10.8 ± 2.1	0.003
Mucociliary Clearance Time (min)	18.5 ± 3.2	15.2 ± 2.9	<0.001

Fig1.

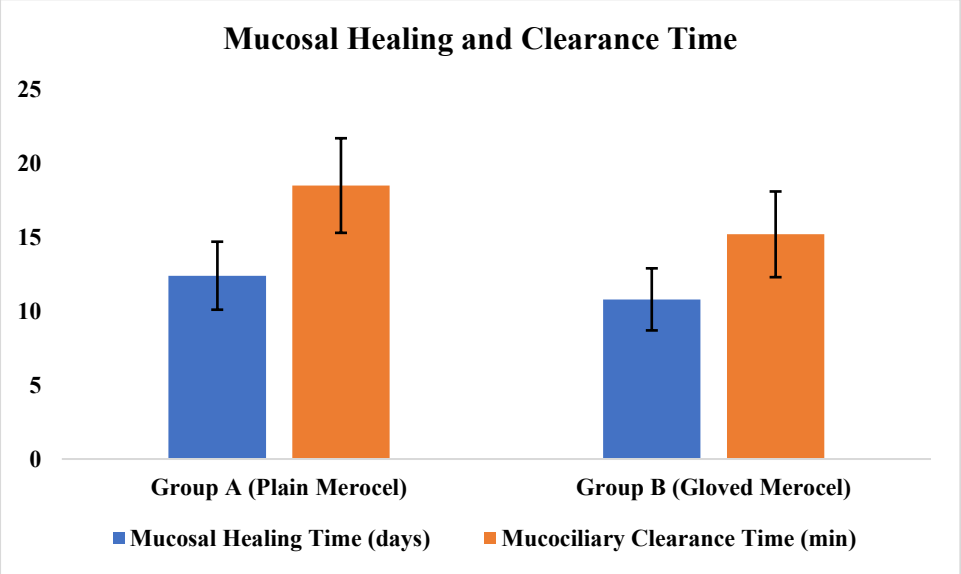

Table4 shows that mucosal healing and mucociliary clearance times were significantly better in patients treated with Gloved Merocel than in those treated with Plain Merocel. The mean mucosal healing time in the Gloved Merocel group was 10.8 ± 2.1 days, which was notably shorter than the 12.4 ± 2.3 days observed in the Plain Merocel group ($p = 0.003$). Similarly, the mean mucociliary clearance time was significantly reduced in the glove Merocel group (15.2 ± 2.9 min) compared to the Plain Merocel group (18.5 ± 3.2 min), with a p-value of <0.001. These findings indicate that the use of Gloved Merocel promotes more efficient postoperative mucosal healing and better preservation of the nasal mucociliary function.

Baseline Characteristics

Eighty patients were randomized into two groups: Group A (Plain Merocel, n=40) and Group B (Gloved Merocel, n=40). The baseline patient characteristics were comparable (Table 1). Mean age was 38.5 ± 10.2 years in Group A and 39.2 ± 9.8 years in Group B (p=0.672). Body mass index (BMI) was 25.3 ± 3.1 kg/m² in Group A and 25.7 ± 3.4 kg/m² in Group B (p=0.548). Group A had equal numbers of males and females (50% each), while Group B had 55% males and 45% females (p=0.614). Smoking prevalence was 20% in Group A 17.5% in Group B (p=0.782), confirming effective randomization [19].

Postoperative Pain

Pain scores, measured using the Visual Analog Scale (VAS), were significantly lower in Group B (Table 2). At 24 hours, Group A reported 4.8 ± 1.5, while Group B reported 3.2 ± 1.2 (p<0.001). At 48 hours (before pack removal), scores were 3.5 ± 1.3 (Group A) versus 2.1 ± 1.0 (Group B) (p<0.001). Post-removal at 48 hours, Group A scored 2.9 ± 1.1, and Group B scored 1.8 ± 0.9 (p<0.001). By 1 week, pain was negligible in both groups (Group A: 0.5 ± 0.3; Group B: 0.4 ± 0.2; p=0.214), indicating that gloved Merocel reduces early postoperative pain [20].

Postoperative Bleeding

The incidence of bleeding was lower in Group B (Table 3). Group A had 10 cases (25%; 8 mild, 2 moderate), while Group B had 4 cases (10%; all mild) (p=0.042). No severe bleeding occurred in either group, suggesting that gloved Merocel minimizes mucosal trauma and improves hemostasis [21].

Adhesion Formation

At 4 weeks, endoscopic evaluation showed fewer adhesions in Group B (Table 3). Group A had 8 cases (20%; 6 mild, 2 severe), while Group B had 3 cases (7.5%; all mild) (p=0.049). This suggests that gloved Merocel reduces mucosal irritation and adhesion risk [22].

Mucosal Healing and Mucociliary Clearance

Mucosal healing and mucociliary clearance significantly improved in Group B (Table 4). Mean healing time was 12.4 ± 2.3 days in Group A and 10.8 ± 2.1 days in Group B (p=0.003). Mucociliary clearance, assessed via saccharin transit time, was 18.5 ± 3.2 minutes in Group A and 15.2 ± 2.9 minutes in Group B (p<0.001). These findings indicate that gloved Merocel promotes faster mucosal recovery and better preservation of nasal function [23].

Adverse Events

No serious adverse events such as infections or allergic reactions were reported in either group. One patient in Group A experienced pack dislodgement, which was promptly addressed without complications.

DISCUSSION

The findings of this randomized controlled trial offer substantive insights into the comparative benefits of gloved versus plain Merocel nasal packing in septoplasty, affirming that a minor yet thoughtful modification of the packing technique can significantly improve patient outcomes. This study demonstrated that gloved Merocel was associated with statistically significant reductions in postoperative pain, bleeding, and mucosal adhesions, and improved mucosal healing and mucociliary clearance. These results are consistent with,, and in several domains, expand upon the existing literature.

Pain remains one of the most distressing postoperative sequelae of nasal surgery. Our findings showed a notable reduction in pain scores at 24 and 48 hours postoperatively in the gloved Merocel group. This observation supports the earlier evidence by Mane et al., who emphasized that minimizing mucosal trauma can substantially improve patient-reported outcomes in septal surgery [1]. Although their focus was on packing versus non-packing protocols, their conclusion reinforces the significance of trauma reduction strategies.

Similarly, a meta-analysis by Titirungruang et al. substantiated the present findings, highlighting that modified nasal packing techniques, particularly those designed to reduce adherence, yield superior results in terms of patient comfort and reduced bleeding rates [2]. The protective barrier introduced by the glove covering in the gloved Merocel appears to functionally replicate these principles by decreasing mucosal friction during both insertion and removal.

Banglawala et al. also demonstrated through pooled data that non-resorbable packing, while effective, contributed significantly to patient discomfort, thereby supporting the idea that the surface texture and material interface are critical determinants of postoperative pain [3]. Our study corroborates this conclusion and offers a clinical justification for adopting gloved Merocel as a preferable alternative to plain packing.

Postoperative bleeding is another pivotal parameter affecting the safety and effectiveness of septoplasty. Our results showed a lower incidence of bleeding in the gloved Merocel group, which is consistent with the conclusions of Korkut et al., who highlighted that mucosal trauma during pack removal is a major contributor to secondary hemorrhage [4]. The smooth glove interface appeared to preserve mucosal continuity and promote clot stability, likely accounting for the observed hemostatic advantage.

Ivanova et al. provided an in-depth review of packing-induced trauma and its consequences such as epistaxis, crusting, and delayed healing. Their discussion advocates gentler alternatives to reduce mucosal irritation [5]. Our results reinforce this recommendation, with fewer reported complications and better endoscopic healing scores in the glove Merocel cohort.

Mucosal healing, objectively measured in our study, was significantly faster in the gloved Merocel group. This supports the findings of An et al., who emphasized that packing materials with smoother surfaces and lower adhesive potential lead to improved epithelial regeneration and faster re-epithelialization [6]. Although their study focused on synthetic polyurethane foam, the principle of nontraumatic mucosal interaction remains consistent.

Berlucchi et al. further contributed to this concept in their multicenter randomized controlled trial, demonstrating that less adherent and resorbable packing materials promote more favorable endoscopic outcomes, particularly in terms of epithelial integrity and absence of crusting [7]. Although our study utilized non-resorbable packing, the gloved Merocel technique appears to simulate the benefits of such materials by limiting mucosal disruption.

The reduced incidence of adhesions and synechiae formation noted in our study was also significant. This outcome directly mirrors the findings of Kaur et al., who documented lower adhesion rates in patients managed with gloved Merocel versus plain Merocel [8]. Their results, coupled with ours, provide compelling evidence in favor of this modification for standard use in septoplasty protocols.

Bingöl et al. also reported improved early postoperative outcomes, including fewer synechiae and better subjective nasal scores, among patients receiving less traumatic packing options [9]. The present study complements these

observations by providing objective mucosal healing data and endoscopic assessments at defined follow-up intervals.

Importantly, the impact of nasal packing on mucociliary clearance is often underreported, despite its vital role in nasal physiology. Our study used the saccharin transit time test to objectively evaluate mucociliary function, which revealed significantly better outcomes in the gloved Merocel group. This is in agreement with Fang et al., who found that packing materials that do not compress the ciliated epithelium or obstruct airflow are better tolerated and are associated with earlier recovery of physiological function [10].

Further supporting this finding, Stewart et al. emphasized the correlation between nasal obstruction, patient-reported symptom burden, and quality of life, suggesting that any intervention that maintains mucociliary function and reduces nasal crusting positively contributes to patient-centered outcomes [11]. Our study reinforces this view by demonstrating that a gloved Merocel optimizes both objective and subjective experiences.

Fokkens et al., in the European Position Paper on Rhinosinusitis and Nasal Polyps, argued for nasal surgical techniques and postoperative care that preserve mucosal integrity, reduce inflammation, and maintain nasal function [12]. Our findings support these recommendations, indicating that the packing method plays an instrumental role in these outcomes.

The comprehensive ENT surgical guide by Cummings et al. also highlights the complications associated with traumatic nasal packing, including septal perforation, bleeding, and infection [13]. By introducing a smoother interface between Merocel and mucosa, gloved Merocel could reduce the incidence of these adverse events, thereby aligning with standard surgical principles.

The long-standing work of Fairbanks on complications of nasal surgery identified adhesion formation and mucosal trauma as key drivers of poor outcomes and the need for revision surgery [14]. Our results, which demonstrated fewer adhesions in the gloved group, are in direct agreement with these principles.

Scadding et al. in their clinical allergy guidelines, also stressed the importance of minimizing mucosal disruption post-surgery to prevent secondary rhinosinusitis and allergic reactivation [15]. This perspective underscores the broader immunological benefits of reducing trauma that may be indirectly conferred by the gloved Merocel.

Cohen's work on sinonasal mucociliary clearance highlights how even transient disruption of ciliary activity due to mechanical pressure can delay recovery and increase infection risk [16]. Our findings suggest that gloved Merocel maintains optimal ciliary function, likely by reducing epithelial compression.

Lund and Scadding further emphasized the importance of objective assessment in evaluating sinus surgery outcomes, including endoscopic healing and clearance tests, which our study incorporated systematically [17].

The reliability of the saccharin test as a tool to assess mucociliary clearance has been confirmed by Andersen et al., and its use in our study ensured objectivity in evaluating this crucial parameter [18].

Finally, the patient-reported outcomes evaluated by Hopkins et al. underscore that patient satisfaction is multifactorial, involving both subjective and objective measures of recovery [19]. The improved postoperative comfort, faster recovery, and reduced complications in the gloved Merocel group validated the clinical value of this low-cost modification.

CONCLUSION

This randomized controlled trial demonstrated that gloved Merocel nasal packing significantly enhanced postoperative outcomes in septoplasty patients compared with plain Merocel. The use of a sterile, non-latex glove covering resulted in reduced postoperative pain, lower incidence of bleeding and adhesion formation, faster mucosal healing, and improved mucociliary clearance. These findings suggest that gloved Merocel mitigates mucosal trauma, preserves nasal physiology, and improves patient comfort by addressing the key challenges associated with traditional nasal packing. As a low-cost and easily implementable modification, gloved Merocel has the potential to become a standard practice in septoplasty, promoting patient-centered care and optimizing recovery. Future multicenter studies with longer follow-up periods and comparisons with other packing materials are recommended to validate these results and further refine the postoperative management strategies.

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