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Effect of Triamcinolone-Infused Nasal Packing on Postoperative Results in Nasal Surgeries

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Abstract

Purpose: The common goal of all rhinology surgeons is to achieve excellent hemostasis and good postoperative healing while avoiding adhesion formation and preventing infection. A well-healed sinus cavity is a known determinant of a successful outcome after sinus surgery. This study aims to evaluate the efficacy of triamcinolone acetate-impregnated nasal packing in preventing or reducing postoperative complications in various nasal surgeries.

Methods: This is a prospective, randomized, double-blinded study conducted on 90 patients who fulfilled the inclusion and exclusion criteria. Triamcinolone-impregnated Merocel packing was placed in one nasal cavity and saline-soaked packing in the other cavity after nasal surgery. Postoperative outcomes were measured using the 22-item Sinonasal Outcome Test (SNOT-22) score, Nasal Obstruction Symptom Evaluation (NOSE) score, perioperative sinus endoscopy (POSE) score, and Lund-Kennedy score (LKS) at one, four, eight, and 12 weeks postoperatively. P values were calculated using paired t-tests.

Results: The male-to-female ratio was 1:0.6. We found statistically significant improvements in the SNOT-22 and NOSE scores postoperatively ($p < 0.001$), which suggested an improved quality of life in our study subjects. A gradual improvement ($p < 0.001$) was noted in both POSE and LKS scores on the triamcinolone-treated side at all follow-up visits in patients who underwent sinus surgery.

Conclusion: Improved postoperative SNOT-22 and NOSE scores underscore the positive impact of triamcinolone on postoperative quality of life after nasal surgery. Objective endoscopic assessment revealed sustained and significant reductions in both POSE and LKS scores, which suggest that triamcinolone-impregnated nasal packing may serve as an effective adjunct in postoperative nasal care after sinus surgery, with the potential to improve both short-term recovery and quality of life in terms of postoperative pain perception.

Categories: Otolaryngology
Keywords: crusting, functional endoscopic sinus surgery, lund kennedy, pose score, snot-22, synechiae, triamcinolone acetate

Introduction

Various endoscopic nasal surgeries such as septoplasty, rhinoplasty, and functional endoscopic sinus surgery (FESS), especially when combined with turbinectomy and/or submucous resection of the septum, may result in postoperative bleeding and/or postoperative hematoma requiring hemostatic measures [1]. The common goal of all rhinology surgeons is to achieve excellent hemostasis and good postoperative healing while avoiding adhesion formation and preventing infection [2]. Optimal surgical outcomes are obtained by preserving good patency of the middle meatus and using good surgical technique [3]. The most common complications of FESS are postoperative synechiae and crust formation, and their incidence ranges from 1% to 36% [4-6].

The effectiveness of functional endoscopic sinus surgery in patients with chronic rhinosinusitis with nasal polyps is dependent on the reduction of postoperative complications such as scarring, edema, and crusting, which hinder natural ciliary function and sinus drainage [7]. Various postoperative supportive measures are available, including saline nasal irrigation, thorough cleaning of the nasal cavity, and the use of topical steroid sprays.

Although several studies have evaluated steroid-impregnated nasal packing following FESS, evidence regarding its effect across different nasal surgical procedures and its influence on postoperative endoscopic healing remains limited. Therefore, the present split-nose randomized study was undertaken to evaluate the efficacy of triamcinolone acetate-impregnated nasal packing in reducing postoperative complications in various nasal surgeries such as endoscopic sinus surgery, septoplasty, and turbinoplasty.

Materials And Methods

This is a prospective, randomized, double-blind, split-nose interventional study conducted in the Department of Otorhinolaryngology at MVJ Medical College and Research Hospital from July 2025 to August 2026. Institutional Ethics Committee approval was obtained prior to commencing the study (IEC No. MVJMC&RH/IEC-150/2025). We included a heterogeneous study population of 90 patients who met the inclusion and exclusion criteria. This study was conducted after obtaining informed consent from the patients. All the patients' details and endoscopic images included in the manuscript were uploaded after obtaining their consent.

Aim and objectives

The aim of this study was to evaluate the effectiveness of triamcinolone acetate-impregnated anterior nasal packing on short- and mid-term postoperative outcomes in patients undergoing nasal surgeries such as functional endoscopic sinus surgery (FESS) and septoplasty.

The primary objectives were to assess the impact of triamcinolone-infused nasal packing in endoscopic sinus surgeries with regard to postoperative complications such as nasal crusting, nasal discharge, polypoidal changes, and synechiae formation using the Perioperative Sinus Endoscopy (POSE) score and Lund-Kennedy score (LKS) and to assess quality of life using the Nasal Obstruction Symptom Evaluation (NOSE) questionnaire in patients undergoing septoplasty with or without turbinoplasty.

The secondary objectives were to assess quality of life in the immediate postoperative period using the Sino-Nasal Outcome Test (SNOT-22) questionnaire for patients undergoing FESS, the NOSE score for patients undergoing septoplasty, and the visual analog scale (VAS) for all patients involved in the study and to compare the study results with findings reported in previously published studies.

Inclusion criteria

The inclusion criteria were as follows: (1) patients undergoing functional endoscopic sinus surgery for chronic rhinosinusitis with or without sinonasal polyposis refractory to medical treatment; (2) patients undergoing other nasal surgeries such as septoplasty, inferior turbinoplasty, concha bullectomy, septorhinoplasty, or excision of nasal tumors; and (3) patients willing to participate in this study.

Exclusion criteria

The exclusion criteria were as follows: (1) patients with immunocompromised states due to conditions such as diabetes mellitus, invasive fungal sinusitis, autoimmune disorders, tuberculosis, or HIV; (2) patients undergoing revision surgery; (3) patients who had undergone nasal packing secondary to epistaxis; and (4) patients unwilling to participate in the study.

The initial basic details of all patients who fulfilled the inclusion and exclusion criteria were collected during history taking, and a detailed examination was performed. All patients underwent baseline preoperative investigations and diagnostic nasal endoscopy, and preanesthetic clearance was obtained. Preoperative quality-of-life questionnaire SNOT-22 scores were obtained for patients undergoing FESS. Preoperative NOSE scores were obtained for patients undergoing septoplasty. SNOT-22 and NOSE scores provide patient-reported outcomes of the surgery rather than the effect of triamcinolone itself [8]. The NOSE (Nasal Obstruction Symptom Evaluation) scale was introduced by Stewart et al. in 2004 [9]. All nasal surgeries were performed under general anesthesia after obtaining written informed consent. Patients who were diagnosed with chronic rhinosinusitis with or without sinonasal polyps underwent functional endoscopic sinus surgery. Mini-FESS (middle meatal antrostomy, anterior ethmoidectomy) and full-house FESS (middle meatal antrostomy, anterior ethmoidectomy, posterior ethmoidectomy, sphenoidotomy, frontal sinusotomy) were performed according to the sinuses involved. Patients also underwent septoplasty, inferior turbinoplasty, concha bullectomy, or septorhinoplasty as clinically indicated. All surgeries were performed using a standardized technique. All surgeries were performed by a single senior surgeon in order to avoid any performance bias.

After completion of surgery, a thorough saline nasal wash was given to remove any mucosal tags that could increase the chance of synechiae formation. At the conclusion of surgery, each patient received polyvinyl acetate (Merocel) nasal packing impregnated with 2 mL of triamcinolone acetate solution (2 mL of distilled water was added to a vial containing 40 mg/mL triamcinolone acetate) in one of the randomly selected nasal cavities (a computer-generated randomization sequence was used to allocate the triamcinolone pack to either the left or right nasal cavity to prevent surgeon preference bias), while the contralateral nasal cavity was packed with a Merocel nasal pack impregnated with 2 mL of isotonic saline (154 mmol sodium + 154 mmol chloride). Hence, the dose of triamcinolone acetate used was 40 mg per nasal cavity. The assistant performed all anterior nasal packing after the procedure to ensure that the primary surgeon remained blinded. The nasal pack was removed after 24 hours, and the VAS score for pain was collected one hour after removal for all patients, and the scores were compared between both nasal cavities. The patients were unaware of which side the triamcinolone-infused pack was present, and hence, the patients were blinded in this study.

VAS score

The VAS score ranges from 0 to 10, where 0 indicates no pain; 1-3, mild pain; 4-6, moderate pain; 7-10, severe to intolerable pain; and 10, the worst pain.

All patients were given appropriate antibiotics and antihistamines during their hospital stay as per the hospital protocol. Alkaline nasal douching and nasal decongestant drops were started on the second postoperative day. At the time of discharge, patients were instructed to perform alkaline nasal douching four times a day for one month. Steroid nasal sprays (fluticasone furoate) were prescribed two weeks postoperatively for patients undergoing FESS and turbinoplasty.

Patients were reviewed at the first, second, and fourth weeks and at the second and third postoperative months. SNOT-22 questionnaire scoring and NOSE scoring were performed at 1, 4, 8, and 12 postoperative weeks for all patients undergoing FESS and septoplasty, respectively. For all postoperative FESS patients, we used the Perioperative Sinus Endoscopy (POSE) scoring system and Lund-Kennedy scoring to determine the effect of steroids on mucosal healing. The assessment of postoperative wound healing and surgical outcomes was performed using a zero-degree, 4-mm rigid endoscope by a single person who was blinded to which side the triamcinolone nasal pack was used. In the postoperative period, we used the POSE scoring system to determine the effect of steroids on mucosal healing in patients who underwent FESS [10]. We additionally used Lund-Kennedy scoring, which was described by Lund and Kennedy in 1995, based on the degree of scarring, crusting, edema, polyps, and discharge [11]. The assessment was performed at the end of 1, 4, 8, and 12 weeks postoperatively. Data were analyzed and compared accordingly.

Sample size calculation

Sample size for paired means (paired t-test) was calculated as follows:

$$n = \frac{(Z_{\alpha/2} + Z_{\beta})^2 \times \sigma_d^2}{d^2}$$

where n is the number of patients, $Z_{\alpha/2}$ is the Z value for a significance level of 0.05 (1.96), Z_{β} is the Z value for 80% power (0.84), σ_d is the standard deviation of the differences between paired observations, and d is the expected mean difference (effect size). The calculated sample size was 90 patients.

Statistical analysis

Data were collected using a structured proforma. Data were entered into an MS Excel sheet (Microsoft Corporation, Redmond, Washington) and analyzed using IBM SPSS Statistics for Windows, Version 22 (Released 2013; IBM Corp., Armonk, New York). Qualitative data were expressed in terms of frequencies and percentages. Means and standard deviations (SDs) were calculated for continuous variables. Statistical analysis was performed using the paired t-test. A p-value of less than 0.05 was considered statistically significant, whereas a p-value of less than 0.001 was considered highly significant.

Results

We conducted this study on 90 patients, among whom 57 (64%) were male and 33 (37%) were female. The male-to-female ratio was 1:0.6. We found that male patients were predominantly in the 31-40-year age group, and female patients were predominantly in the 21-30-year age group. The age group and gender distribution is shown in Figure *1*.

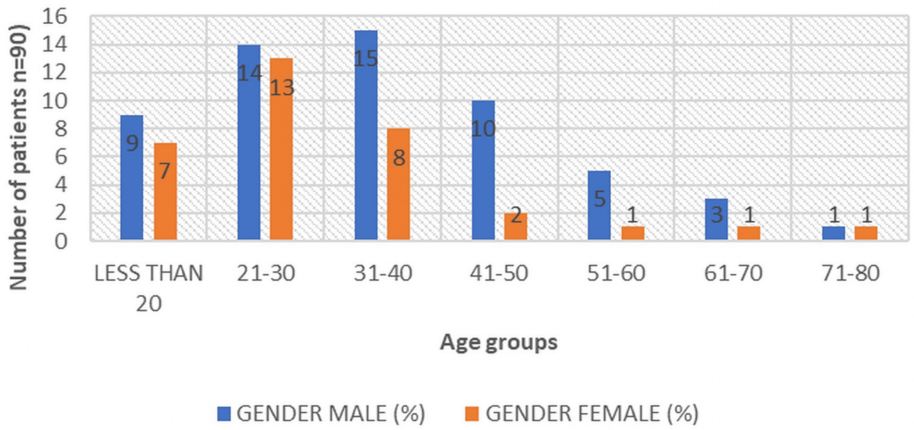


FIGURE 1: Age and gender distribution

In our study, 20 (22%) patients underwent FESS with septoplasty, 12 (13.3%) patients underwent septoplasty alone, 16 (17.7%) patients underwent FESS (mini-FESS + full-house FESS), 10 (11%) patients underwent septoplasty with inferior turbinoplasty, 13 (14%) patients underwent FESS with septoplasty and inferior turbinoplasty, 10 (11%) patients underwent FESS with septoplasty and conchoplasty, four (4.4%) patients underwent septoplasty with inferior turbinoplasty and conchoplasty, two (2.2%) patients underwent septorhinoplasty, one (1.1%) patient underwent FESS with septorhinoplasty, one (1.1%) patient underwent FESS with rhinolith removal, and one (1.1%) patient underwent septoplasty with growth (rhinosporidiosis) excision (Figure *2*).

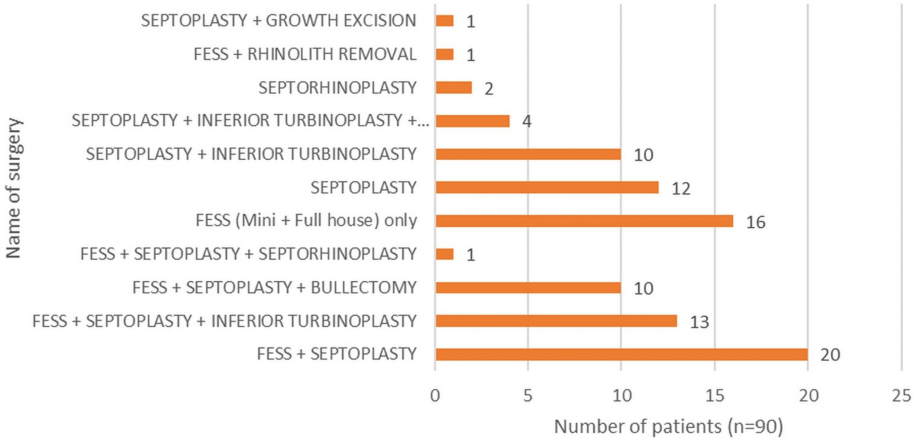


FIGURE 2: Patient distribution according to different types of surgery

FESS: functional endoscopic sinus surgery.

We assessed the difference in pain perception between the two nasal cavities using the visual analog scale (VAS; 0 to 10) one hour after nasal pack removal. The mean VAS pain score one hour after nasal pack removal was significantly lower on the triamcinolone side (mean ± SD, 2.3 ± 1.1) compared to the saline side (mean ± SD, 4.1 ± 1.4), with a statistically significant difference ($p = 0.0002$) (Figure *3*). This was attributed to the anti-inflammatory property of triamcinolone, which reduced mucosal edema, which in turn reduced pain and improved patient comfort after nasal pack removal, thus improving the patient's quality of life.

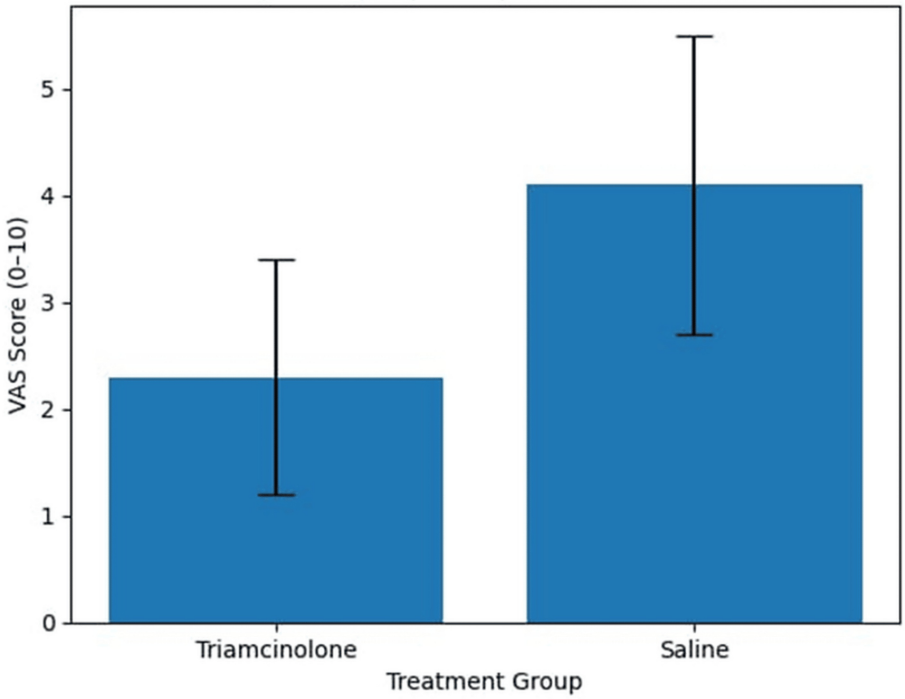


FIGURE 3: Postoperative pain perception by visual analogue score on the triamcinolone side and saline side respectively for all patients

VAS: visual analog scale.

We assessed the quality of life of patients with chronic rhinosinusitis using the SNOT-22 questionnaire and that of patients who underwent septoplasty using the NOSE score. Means and standard deviations were calculated, which showed a preoperative SNOT-22 score of 52.4 ± 8.6 (mean ± SD) and a preoperative NOSE score of 68.5 ± 10.2 (Table *1*). We found gradual improvement in both SNOT-22 and NOSE scores during the three-month postoperative follow-up period.

Variables	SNOT-22 scores, mean ± SD	P-value	NOSE scores, mean ± SD	P-value
Pre-op	52.4 ± 8.6		68.5 ± 10.2	
Post-op: 1 week	25.6 ± 6.2		18.4 ± 5.3	
Post-op: 4 weeks	14.3 ± 2.5	<0.001	15.4 ± 3.5	<0.001
Post-op: 8 weeks	10.2 ± 1.2		10.5 ± 2.5	
Post-op: 12 weeks	7.3 ± 1.1		7.3 ± 1.2	

TABLE 1: SNOT-22 scoring in post fess patients and NOSE scoring in post septoplasty patients

SNOT-22: 22-item Sinonasal Outcome Test; SD: standard deviation; NOSE: Nasal Obstruction Symptom Evaluation; pre-op: preoperative; post-op: postoperative.

In our study, POSE scoring was performed only for patients who underwent FESS. We found that postoperatively, the triamcinolone-impregnated nasal packing side demonstrated significantly lower POSE scores compared to the saline side at one week (10.8 ± 2.2 vs. 12.0 ± 2.4), four weeks (7.2 ± 1.9 vs. 9.1 ± 2.1), eight weeks (4.5 ± 1.5 vs. 6.8 ± 1.8), and 12 weeks (2.3 ± 1.1 vs. 4.6 ± 1.4), with all comparisons showing statistically significant differences ($p < 0.001$). A sharp drop in both groups was seen at one week, which is an expected post-FESS improvement, and a gradual improvement trend across the weeks was seen, with consistently lower scores on the triamcinolone side. Variability (SD) decreased over time, suggesting stabilization of healing (Table *2*).

POSE score	Triamcinolone side (mean ± SD)	Saline side (mean ± SD)	Mean difference	95% Confidence interval	t-value	P-value
Postoperative - 1 week	10.8 ± 2.2	12.0 ± 2.4	-1.2	-1.87 to -0.53	-3.54	<0.001
Postoperative - 4 weeks	7.2 ± 1.9	9.1 ± 2.1	-1.9	-2.49 to -1.31	-6.44	
Postoperative - 8 weeks	4.5 ± 1.5	6.8 ± 1.8	-2.3	-2.78 to -1.82	-9.5	
Postoperative - 12 weeks	2.3 ± 1.1	4.6 ± 1.4	-2.3	-2.66 to -1.94	-12.56	

TABLE 2: Intergroup comparison of POSE scores in the postoperative follow-up

POSE: perioperative sinus endoscopy.

Scoring based on the Lund-Kennedy endoscopic criteria (0-2 for each parameter) was performed, and progressive improvement was seen over time in both groups, but a greater reduction was seen in the steroid group. Highly significant differences ($p < 0.001$) at all time points confirmed better mucosal healing with triamcinolone nasal packing (Tables *3*, *4*). We found a gradual improvement in the endoscopic scores in terms of crusting, edema, and nasal discharge on the triamcinolone side over the three-month follow-up period. Crust formation was seen more commonly on the saline side (Figure *4* A, B). There was decreased synechiae formation on the triamcinolone side, which was statistically significant. We found synechiae formation between the septum and the inferior turbinoplasty site on the side with saline nasal packing; however, good mucosal healing was seen on the triamcinolone side (Figure *4* C, D). Panels A and B of Figure *4* depict one patient, while panels C and D depict another patient. All photographs were taken and included in the manuscript after obtaining consent from the concerned patients.

Lund-Kennedy endoscopic score	Triamcinolone side (mean ± SD)	Saline side (mean ± SD)	Mean difference	95% Confidence interval	T-value	P-value
Postoperative - 1 week	5.8 ± 1.2	6.6 ± 1.3	-0.8	-1.17 to -0.43	-4.29	<0.001
Postoperative - 4 weeks	3.9 ± 1.1	5.0 ± 1.2	-1.1	-1.44 to -0.76	-6.41	
Postoperative - 8 weeks	2.3 ± 0.9	3.6 ± 1.0	-1.3	-1.58 to -1.02	-9.17	
Postoperative - 12 weeks	1.2 ± 0.7	2.4 ± 0.8	-1.2	-1.42 to -0.98	-10.71	

TABLE 3: Intergroup comparison of the Lund-Kennedy score

Postoperative period	Triamcinolone side (mean ± SD)	Saline side (mean ± SD)	Mean difference	95% Confidence interval	t-value	P-value
Mucosal edema						
1 week	1.6 ± 0.4	1.8 ± 0.3	-0.2	-0.31 to -0.09	-3.79	<0.01
4 weeks	1.0 ± 0.3	1.4 ± 0.4	-0.4	-0.51 to -0.29	-7.59	
8 weeks	0.6 ± 0.2	1.0 ± 0.3	-0.4	-0.48 to -0.32	-10.52	<0.001
12 weeks	0.3 ± 0.1	0.6 ± 0.2	-0.3	-0.35 to -0.25	-12.73	
Nasal discharge						
1 week	1.4 ± 0.4	1.6 ± 0.5	-0.2	-0.33 to -0.07	-2.96	<0.05
4 weeks	0.9 ± 0.3	1.2 ± 0.3	-0.3	-0.39 to -0.21	-6.71	
8 weeks	0.5 ± 0.2	0.8 ± 0.3	-0.3	-0.38 to -0.22	-7.89	<0.001
12 weeks	0.2 ± 0.1	0.4 ± 0.2	-0.2	-0.25 to -0.15	-8.49	
Crusting						
1 week	1.5 ± 0.5	1.7 ± 0.4	-0.2	-0.33 to -0.07	-2.96	<0.05
4 weeks	1.0 ± 0.3	1.3 ± 0.4	-0.3	-0.41 to -0.19	-5.69	
8 weeks	0.5 ± 0.2	0.9 ± 0.3	-0.4	-0.48 to -0.32	-10.52	<0.001
12 weeks	0.2 ± 0.1	0.5 ± 0.2	-0.3	-0.35 to -0.25	-12.73	
Synechae						
1 week	1.3 ± 0.4	1.5 ± 0.4	-0.2	-0.32 to -0.08	-3.35	<0.05
4 weeks	0.8 ± 0.3	1.1 ± 0.3	-0.3	-0.39 to -0.21	-6.71	
8 weeks	0.4 ± 0.2	0.7 ± 0.3	-0.3	-0.38 to -0.22	-7.89	<0.001
12 weeks	0.2 ± 0.1	0.5 ± 0.2	-0.3	-0.35 to -0.25	-12.73	

TABLE 4: Intergroup comparison (triamcinolone vs saline) of individual parameters assessed in the Lund-Kennedy postoperative endoscopic scoring system

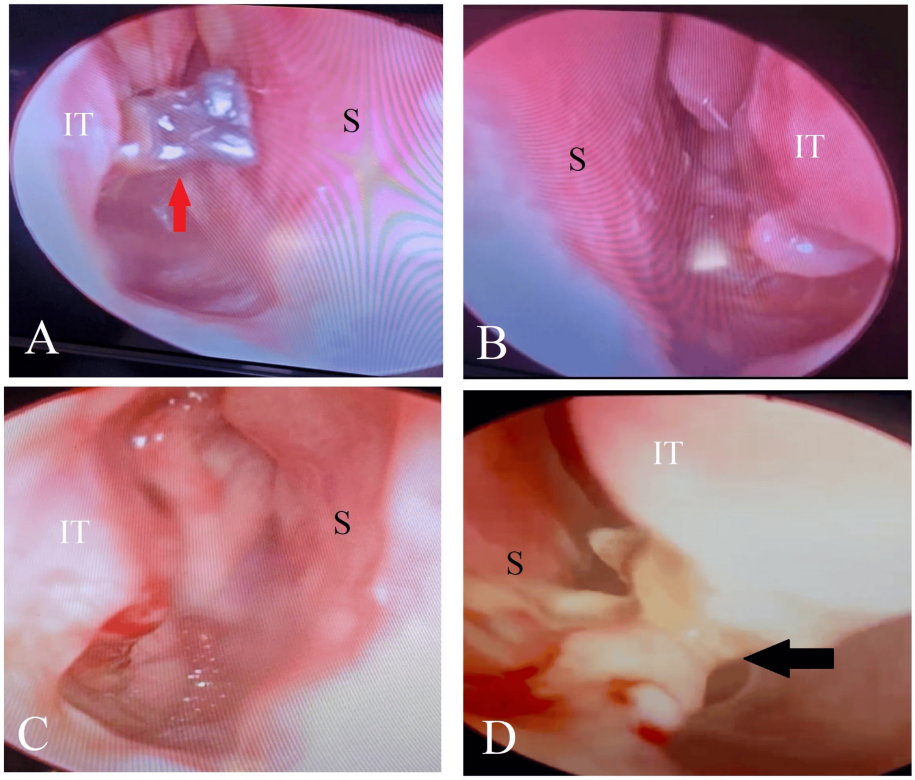


FIGURE 4: Postoperative nasal endoscopic picture showing crusting (red arrow) in the right nasal cavity where saline was used (A) with well healing mucosa in the left nasal cavity where triamcinolone was used (B). Similarly, a well healing mucosa seen in right nasal cavity (triamcinolone) (C) and synechiae (black arrow) seen between septum and inferior turbinate in left nasal cavity (saline) (D)

S: septum; IT: inferior turbinate.

Discussion

Any manipulation of the nasal cavity and the lateral nasal wall (including nasal packing and surgical management) causes fluctuations in the cell-cytokine balance. Fibroblasts and myofibroblasts (activated via TGF-β, transforming growth factor β) directly contribute to the development of intranasal adhesions through the production of collagen [12]. The incidence of intranasal adhesions or synechiae formation in rhinosurgical procedures ranges from 6.8% to 36.2% and is due to improper nasal mucosal healing [13,14]. Adhesions can also be caused by excessive lateralization (movement toward the lateral wall of the nasal cavity) of the middle turbinate during FESS [15].

About 20% of patients experience impaired wound healing following ESS, leading to recurrence and further complications [16]. A well-healed sinus cavity is a known determinant of a successful outcome following endoscopic sinus surgery (ESS). Common causes of suboptimal results following endoscopic sinus surgery include recurrent inflammation, polyposis, adhesion/synechiae formation, postoperative crusting, middle turbinate lateralization, stenosis of the surgically enlarged sinus ostia, and scarring of the frontal recess area. These can be reduced with adequate postoperative care and frequent nasal douching [17].

Administration of short-term systemic steroids during the perioperative period can result in healthier nasal cavities postoperatively, but they come with side effects such as gastrointestinal disturbances, including peptic ulceration, and hyperglycemia. Therefore, steroid-impregnated nasal packing was proposed as an alternative to systemic steroids. According to More et al., triamcinolone-impregnated absorbable nasal dressing is comparable to oral steroids in the management of early nasal polyposis after sinus surgery [18].

Intranasal corticosteroids decrease membrane permeability and inhibit both early- and late-phase reactions to allergens. They minimize the nasal secretory response and reduce the sensitivity of local nasal irritant receptors. Topical application causes a flushing action on the nasal mucosa, which reduces secretions and

allergens [19, 20]. The anti-inflammatory action of triamcinolone reduces mucosal edema and helps in the early return of mucociliary function of the sinonasal mucosa. This further reduces crusting, thereby improving wound healing. Triamcinolone also decreases the infiltration of inflammatory cells and reduces the hyperreactivity and vascular permeability of the nasal mucosa [21].

In the literature, we found studies that explained the effects of various types of steroid-infused nasal packing on postoperative outcomes in patients who underwent FESS. However, in our study, we investigated the effects on all endoscopic nasal surgeries, as steroids reduce synechiae and crust formation and thus improve postoperative healing. In our study, we found a statistically significant improvement in the preoperative and postoperative SNOT-22 scores, confirming a better patient-perceived outcome. Gajendra et al. also concluded that there was a significant benefit in the quality-of-life index (SNOT-22 score). We found that pain perception was much lower on the triamcinolone side, as depicted by the VAS scores, which we attribute to the anti-inflammatory property of triamcinolone, which reduces edema and thus reduces pain. Gajendran et al. suggested that triamcinolone reduces immediate postoperative complications such as headache by reducing mucosal edema [22].

We found a gradual decrease in the POSE and Lund-Kennedy scores in all postoperative FESS patients, which was statistically significant, thus suggesting that triamcinolone helps improve various postoperative outcomes such as discharge, crusting, and synechiae formation and thus helps improve healing. A study conducted by Sabarinath et al. showed that triamcinolone-impregnated nasal packing reduced mucosal edema and crusting, with no significant reduction in early recurrence or nasal discharge [23].

Various studies support other methods of intranasal triamcinolone administration, such as intraoperative irrigation of the sinus cavity with triamcinolone, which has been shown to reduce edema and polypoidal changes as it allows longer contact time in the frontal and sphenoid sinuses, facilitating better mucosal absorption and thus improving postoperative outcomes [21]. No adverse events attributable to topical triamcinolone were observed during the 12-week follow-up. One study suggested that triamcinolone-impregnated nasal dressings suppressed serum cortisol levels during the early postoperative period, which gradually recovered and normalized 10 days after surgery [19].

After septoplasty, synechiae formation occurs due to damage to the mucoperichondrial layer, and the risk is higher when septoplasty is performed along with conchoplasty. The use of intraoperative mitomycin C-infused nasal packs for five minutes significantly reduced adhesions compared with the control group [24]. Ramalingam et al. compared the effects of triamcinolone and mitomycin C nasal packing in FESS patients and concluded that mitomycin C caused a significant reduction in crusting in the immediate postoperative period, whereas triamcinolone caused a significant long-term reduction in synechiae formation and crusting [25]. Triamcinolone had a long-term effect on reducing crusting due to the prolonged anti-inflammatory action of topical steroids on the nasal mucosa, while mitomycin facilitated the rapid return of normal respiratory epithelium, which aided in minimizing crust formation with immediate effect [26].

In our study, we used Merocel nasal packing; however, absorbable materials such as NasoPore can be used, but they may cause a slight delay in the recovery of normal ciliary function and the healing process [27]. This is probably due to the bridges formed by the incomplete resorption of nasal packs, which cause increased osteogenesis and synechiae formation [28]. There are also next-generation PROPEL-like devices, which are drug-eluting bioabsorbable stents that incorporate mometasone furoate or ciprofloxacin in multilayer matrices, achieving sustained release over 30-90 days while degrading into noninflammatory byproducts and significantly reducing polyp recurrence by 40-60% in patients with chronic rhinosinusitis [29].

There are various other methods to reduce adhesions in patients after septoplasty and septorhinoplasty, such as transseptal stitching and insertion of silicone splints instead of intranasal packing. However, the literature offers no established consensus regarding intranasal packing and splinting following nasal surgeries [30]. In our study, the triamcinolone side showed better healing across all parameters, such as edema, crusting, discharge, and synechiae formation, while the POSE score improved more rapidly, indicating superior mucosal recovery. One limitation of our study is that we did not follow up with patients beyond three months to study the effects of triamcinolone with respect to the recurrence of chronic rhinosinusitis. The NOSE and SNOT-22 scores are patient-reported outcomes reflecting the surgery itself rather than side-specific results, which is also a limitation of our study. Since we used a heterogeneous population, the results cannot be generalized.

Conclusions

The present study demonstrates that triamcinolone-impregnated nasal packing confers a statistically significant advantage over conventional saline nasal packing in postoperative management after nasal surgeries. Its potent anti-inflammatory effect results in a marked reduction in mucosal edema, which translates into lower postoperative pain scores as measured by the visual analog scale. Improved SNOT-22 and NOSE scores indicate a better quality of life. Triamcinolone use contributes to decreased secretion stasis, crust formation, and synechiae, thereby optimizing the healing milieu and potentially reducing postoperative complications.

Importantly, objective endoscopic assessment revealed a sustained and significant reduction in both POSE and Lund-Kennedy scores in patients who underwent FESS over a follow-up period of three months. These results suggest that triamcinolone-impregnated nasal packing may serve as an effective adjunct in postoperative nasal care, with the potential to improve both short-term recovery and quality of life in terms of postoperative pain perception.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: PR Reshma, M Swetha Lakshmi, MS Madhu, Shambavi Ganesh

Acquisition, analysis, or interpretation of data: PR Reshma, M Swetha Lakshmi, MS Madhu, Shambavi Ganesh

Drafting of the manuscript: PR Reshma, M Swetha Lakshmi, MS Madhu, Shambavi Ganesh

Critical review of the manuscript for important intellectual content: PR Reshma, M Swetha Lakshmi, MS Madhu, Shambavi Ganesh

Supervision: PR Reshma, M Swetha Lakshmi, MS Madhu, Shambavi Ganesh

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. MVJ Medical college and Research Hospital issued approval MVJMC&RH/IEC-150/2025. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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