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Original Research Article

THE EFFICACY OF NASAL CORTICOSTEROIDS IN PREVENTING RECURRENCE AFTER NASAL POLYP SURGERY

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ABSTRACT

Background: Nasal polyposis is a chronic inflammatory disorder of the nasal and paranasal sinus mucosa with a high tendency for recurrence despite surgical management. Functional endoscopic sinus surgery effectively removes polypoidal disease and improves sinonasal ventilation; however, persistent inflammation often leads to postoperative recurrence. Topical nasal corticosteroids are commonly prescribed after surgery to suppress inflammation and reduce recurrence, yet their long-term efficacy warrants evaluation.
Objectives: To assess the effectiveness of postoperative nasal corticosteroid therapy in preventing recurrence of nasal polyps following surgical intervention.
Materials and Methods: Design: This prospective observational study was conducted in the Department of Otorhinolaryngology over a period of 18 months. A total of 60 patients diagnosed with nasal polyposis and undergoing nasal polyp surgery were included. Postoperatively, all patients received intranasal corticosteroid therapy and were followed at regular intervals. Clinical outcomes were assessed using symptom evaluation and diagnostic nasal endoscopy to identify recurrence of nasal polyps during the follow-up period.
Results: Patients receiving postoperative nasal corticosteroids showed significant improvement in nasal obstruction, discharge, and olfactory symptoms. Endoscopic examination during follow-up demonstrated a reduced rate of polyp recurrence compared to expected postoperative recurrence patterns. Better disease control and delayed recurrence were observed among patients compliant with regular corticosteroid use.
Conclusions: Postoperative intranasal corticosteroid therapy is effective in reducing the recurrence of nasal polyps following surgery. Regular and sustained use contributes to improved symptom control and prolonged disease-free intervals. Nasal corticosteroids should be considered an essential component of postoperative management after nasal polyp surgery.
Keywords: Nasal polyps; Nasal corticosteroids; Endoscopic sinus surgery; Polyp recurrence; Chronic rhinosinusitis; Postoperative therapy.

INTRODUCTION

Nasal polyposis is a chronic inflammatory condition of the nasal cavity and paranasal sinuses, characterized by benign, edematous protrusions of the mucosa that commonly arise from the ethmoidal sinuses.[1] It represents a frequent manifestation of chronic rhinosinusitis and is often associated with persistent nasal obstruction, rhinorrhea, hyposmia or anosmia, facial pressure, and impaired quality of life. The condition shows a strong tendency toward recurrence, making long-term management challenging for both patients and clinicians.[2]

The pathophysiology of nasal polyposis is complex and multifactorial, involving chronic mucosal inflammation, epithelial barrier dysfunction, and immune dysregulation. Eosinophilic inflammation, local IgE production, and cytokine-mediated pathways play a central role in polyp formation and persistence. Despite medical therapy, a significant

proportion of patients eventually require surgical intervention due to refractory symptoms or complications.[3]

Functional endoscopic sinus surgery has become the standard surgical approach for nasal polyposis. The primary objectives of surgery are removal of polypoidal tissue, restoration of sinus ventilation and drainage, and facilitation of postoperative topical drug delivery.[4] While surgery provides effective symptomatic relief in the short term, it does not address the underlying inflammatory process. As a result, recurrence of nasal polyps following surgery remains a well-recognized problem, with recurrence rates reported to increase with longer follow-up periods.[5]

Postoperative medical therapy is therefore crucial in maintaining surgical outcomes and preventing disease recurrence. Among available options, topical nasal corticosteroids are considered the cornerstone of postoperative management.[6] These agents exert potent anti-inflammatory effects by reducing mucosal edema, suppressing eosinophilic infiltration, and inhibiting pro-inflammatory cytokine release. In addition, regular use of nasal corticosteroids enhances mucociliary clearance and helps maintain patency of the surgically opened sinus ostia.[7]

Several clinical studies have suggested that postoperative use of intranasal corticosteroids reduces the rate of polyp recurrence and improves symptom control. However, variations in study design, sample size, duration of follow-up, and corticosteroid regimens have resulted in inconsistent conclusions. Moreover, patient compliance and long-term effectiveness remain areas of ongoing debate.[8]

Given the chronic nature of nasal polyposis and its tendency to recur after surgery, there is a need for continued evaluation of postoperative therapeutic strategies. The present study was undertaken to assess the efficacy of nasal corticosteroids in preventing recurrence after nasal polyp surgery, with a focus on postoperative symptom control and endoscopic evidence of recurrence during follow-up. Therefore, it is of interest to evaluate the efficacy of nasal corticosteroids in preventing recurrence after nasal polyp surgery and to assess their role in improving postoperative clinical outcomes.

MATERIALS AND METHODS

Study Design and Setting

This was a prospective observational study conducted in the Department of Otorhinolaryngology over a period of **18 months**. The study included patients diagnosed with nasal polyposis who underwent surgical management and were subsequently followed to assess postoperative outcomes.

Study Population

Patients diagnosed with nasal polyposis and planned for surgical intervention were evaluated for inclusion. All patients underwent nasal polyp surgery using standard surgical techniques. Postoperatively, patients were managed with intranasal corticosteroid therapy and followed at regular intervals.

Sample Size Calculation

The sample size was calculated using the standard formula for estimating a proportion in a population:

$n = Z^2 \times p \times q / d^2$

Where:

n = required sample size

Z = standard normal variate corresponding to the desired confidence level

p = estimated proportion of postoperative recurrence of nasal polyps

q = 1 − p

d = allowable margin of error

Based on this calculation and feasibility of patient recruitment during the study period, a total of **60 patients** were included in the study.

Inclusion Criteria

Patients aged 18 years and above

Diagnosed cases of nasal polyposis

Patients undergoing nasal polyp surgery

Willingness to comply with postoperative intranasal corticosteroid therapy and follow-up protocol

Exclusion Criteria

Patients with previous nasal polyp surgery

Presence of fungal sinusitis, sinonasal malignancy, or granulomatous disease

Patients with contraindications to corticosteroid therapy

Inadequate follow-up or non-compliance with postoperative treatment

Postoperative Management and Follow-up

All patients received intranasal corticosteroids following surgery, initiated after the immediate postoperative period. Patients were advised regular usage as per standard dosing protocols. Follow-up visits were scheduled at periodic intervals during which clinical symptoms were assessed and diagnostic nasal endoscopy was performed to evaluate mucosal status and detect any evidence of polyp recurrence.

Outcome Measures

The primary outcome measure was recurrence of nasal polyps as assessed by diagnostic nasal endoscopy during follow-up. Secondary outcome measures included improvement in nasal symptoms such as obstruction, discharge, and olfactory disturbances.

Ethical Considerations

The study was conducted in accordance with institutional ethical guidelines. Informed consent was obtained from all participants prior to inclusion in the study, and patient confidentiality was maintained throughout.

Statistical Analysis

Collected data were compiled and analyzed using descriptive statistical methods. Results were expressed as frequencies and percentages. Findings were interpreted in relation to the study objectives.

RESULTS

A total of 60 patients who underwent nasal polyp surgery and received postoperative intranasal corticosteroid therapy were included in the study and followed over an 18-month period. The study population comprised adults with a confirmed diagnosis of nasal polyposis, all of whom completed the planned follow-up schedule. The majority of patients belonged to the middle-aged adult group, with a predominance of males observed in the cohort. Nasal obstruction was the most common presenting symptom and was reported by all patients prior to surgery, followed by nasal discharge and olfactory disturbances.

Preoperative diagnostic nasal endoscopy revealed that most patients had moderate to severe nasal polyposis, with a higher proportion presenting with Grade II and Grade III polyps. Bilateral nasal involvement was more frequently observed than unilateral disease. Following surgery and initiation of intranasal corticosteroid therapy, the majority of patients demonstrated significant symptomatic improvement during follow-up. Improvement in nasal obstruction was the most pronounced, while olfactory symptoms showed comparatively gradual recovery.

Assessment of treatment adherence revealed that most patients maintained good compliance with postoperative nasal corticosteroid therapy throughout the follow-up period. Endoscopic evaluation during follow-up showed healthy nasal mucosa in a large proportion of patients, while a smaller subset exhibited mild mucosal edema or early polypoidal changes. Recurrence of nasal polyps was observed in a minority of cases during the study period. Recurrence was more frequently noted among patients with irregular compliance to nasal corticosteroid therapy. Only a small proportion of patients required revision surgical intervention, indicating favorable overall postoperative disease control with adjunctive intranasal corticosteroid use.

Table 1: Age distribution of the study population (N = 60)

Age group (years)	Number of patients	Percentage (%)
18–30	14	23.3
31–40	18	30.0
41–50	16	26.7
>50	12	20.0
Total	**60**	**100**

Table 2: Gender distribution of patients

Gender	Number of patients	Percentage (%)
Male	38	63.3
Female	22	36.7
Total	**60**	**100**

Table 2 depicts the gender distribution among the study participants.

Table 3: Presenting symptoms before surgery

Symptom	Number of patients	Percentage (%)
Nasal obstruction	60	100
Nasal discharge	47	78.3
Hyposmia/anosmia	41	68.3
Facial pressure/headache	29	48.3
Sneezing	21	35.0

Table 3 shows the distribution of presenting symptoms among patients.

Table 4: Endoscopic grading of nasal polyps preoperatively

Polyp grade	Number of patients	Percentage (%)
Grade I	12	20.0
Grade II	27	45.0
Grade III	21	35.0
Total	**60**	**100**

Table 4 summarizes the severity of nasal polyposis before surgery.

Table 5: Laterality of nasal polyps

Laterality	Number of patients	Percentage (%)
Bilateral	44	73.3
Unilateral	16	26.7
Total	**60**	**100**

Table 5 depicts the laterality of disease.

Table 6: Postoperative symptom improvement at follow-up

Symptom improved	Number of patients	Percentage (%)
Nasal obstruction	52	86.7
Nasal discharge	45	75.0
Olfactory symptoms	39	65.0
Facial pressure	25	41.7

Table 6 shows improvement in major symptoms following surgery and corticosteroid therapy.

Table 7: Compliance with postoperative nasal corticosteroid therapy

Compliance status	Number of patients	Percentage (%)
Good compliance	46	76.7
Irregular compliance	14	23.3
Total	**60**	**100**

Table 7 presents compliance data.

Table 8: Endoscopic findings during follow-up

Endoscopic finding	Number of patients	Percentage (%)
Healthy mucosa	42	70.0
Mild edema	11	18.3
Polypoidal changes	7	11.7

Table 8 shows postoperative endoscopic findings.

Table 9: Recurrence of nasal polyps during follow-up

Recurrence status	Number of patients	Percentage (%)
No recurrence	49	81.7
Recurrence present	11	18.3
Total	**60**	**100**

Table 9 presents recurrence rates observed during the study period.

Table 10: Association between compliance and recurrence

Compliance	Recurrence n (%)	No recurrence n (%)
Good compliance	4 (6.7)	42 (70.0)
Irregular compliance	7 (11.7)	7 (11.7)

Table 10 shows the relationship between corticosteroid compliance and polyp recurrence.

Table 11: Need for revision surgery

Revision surgery	Number of patients	Percentage (%)
Required	**6**	**10.0**
Not required	54	90.0

Table 11 shows the proportion of patients requiring further surgical intervention.

Table 12: Overall postoperative outcome

Outcome	Number of patients	Percentage (%)
Good control (no recurrence, symptom relief)	47	78.3
Partial control	7	11.7
Poor control (recurrence requiring intervention)	6	10.0

Table 12 summarizes overall outcomes at the end of follow-up.

Table 1 demonstrates that nasal polyposis requiring surgical intervention was most frequently observed in patients aged 31–40 years (30.0%), followed by those aged 41–50 years (26.7%). This distribution indicates that recurrence prevention strategies are particularly relevant in the middle-aged adult population. **Table 2** shows a clear male predominance, with males accounting for 63.3% of cases. This suggests that male patients constituted the majority of individuals undergoing surgery and receiving postoperative intranasal corticosteroid therapy in the present cohort. **Table 3** indicates that nasal obstruction was universally present in all patients (100%), highlighting it as the dominant presenting symptom. Nasal discharge (78.3%) and olfactory disturbances (68.3%) were also common, reflecting the typical symptom burden of nasal polyposis prior to surgical management. **Table 4** reveals that a substantial proportion of patients presented with advanced disease, as 80.0% had Grade II or Grade III nasal

polyps on preoperative endoscopic evaluation. This finding underscores the severity of disease among patients selected for surgical intervention. **Table 5** shows that bilateral nasal polyposis was more common than unilateral involvement, occurring in 73.3% of patients. This suggests a diffuse inflammatory process rather than localized disease in most cases. **Table 6** demonstrates marked postoperative symptomatic improvement, particularly in nasal obstruction, which improved in 86.7% of patients. Improvement in nasal discharge (75.0%) and olfactory symptoms (65.0%) further indicates effective postoperative disease control with adjunctive intranasal corticosteroid therapy. **Table 7** indicates that 76.7% of patients showed good compliance with postoperative nasal corticosteroid use. This high level of adherence is relevant when interpreting postoperative outcomes and recurrence rates. **Table 8** shows that endoscopic examination during follow-up revealed healthy nasal mucosa in 70.0% of patients, while only a small proportion exhibited polypoidal changes. This finding reflects effective mucosal healing and inflammation control in the majority of cases. **Table 9** demonstrates that nasal polyp recurrence occurred in 18.3% of patients during the follow-up period, indicating a relatively low recurrence rate in patients receiving postoperative intranasal corticosteroids. **Table 10** highlights a clear association between treatment compliance and recurrence, with higher recurrence observed among patients with irregular corticosteroid use compared to those with good compliance. This suggests that adherence to postoperative therapy plays an important role in reducing recurrence. **Table 11** shows that only 10.0% of patients required revision surgery, indicating that most recurrences were either mild or adequately controlled with medical management. **Table 12** confirms favorable overall postoperative outcomes, with good disease control achieved in 78.3% of patients by the end of the follow-up period, reinforcing the beneficial role of intranasal corticosteroids in postoperative care.

DISCUSSION

Nasal polyposis is a chronic inflammatory disease with a well-recognized tendency for recurrence even after adequate surgical clearance. Although functional endoscopic sinus surgery plays a pivotal role in restoring nasal ventilation and sinus drainage, surgery alone does not address the underlying inflammatory pathology. The present study was undertaken to evaluate the role of postoperative intranasal corticosteroids in preventing recurrence of nasal polyps and improving long-term clinical outcomes.[9]

In the current study, nasal polyposis was most commonly observed in middle-aged adults, with a clear male predominance. This demographic pattern is consistent with commonly reported clinical trends, where adult males more frequently present with advanced disease requiring surgical intervention. The predominance of nasal obstruction as the presenting symptom highlights the significant functional impairment caused by nasal polyps and explains the need for operative management in these patients.[10]

Preoperative endoscopic findings revealed that the majority of patients had moderate to severe disease, with Grade II and Grade III polyps and predominantly bilateral involvement. This reflects the diffuse inflammatory nature of nasal polyposis and underscores the importance of effective postoperative medical therapy to prevent disease persistence or early recurrence. Bilateral disease, in particular, is often associated with higher recurrence rates, making postoperative management crucial in such cases.[11]

Postoperative administration of intranasal corticosteroids was associated with marked improvement in nasal symptoms, especially nasal obstruction and discharge. Improvement in olfactory function, although present, was comparatively slower, which may be attributed to prolonged mucosal inflammation and epithelial damage in long-standing disease. These findings emphasize the role of corticosteroids in controlling mucosal inflammation and maintaining postoperative symptom relief.[12]

Endoscopic assessment during follow-up demonstrated healthy nasal mucosa in the majority of patients, indicating effective suppression of postoperative inflammation. Only a small proportion of patients developed early polypoidal changes or mild mucosal edema. The overall recurrence rate observed in this study was relatively low, supporting the effectiveness of intranasal corticosteroids in reducing postoperative recurrence when used regularly.[13]

An important observation was the association between treatment compliance and recurrence. Patients with irregular use of intranasal corticosteroids showed a higher incidence of recurrence compared to those with good compliance. This finding reinforces the importance of patient education, long-term adherence, and regular follow-up in achieving optimal postoperative outcomes. Poor compliance may negate the benefits of surgery and predispose patients to early recurrence.[14]

The need for revision surgery was limited to a small subset of patients, suggesting that most recurrences were either mild or adequately controlled with continued medical therapy. This highlights the role of intranasal corticosteroids not only in preventing recurrence but also in delaying or reducing the severity of recurrent disease.[15]

Despite its strengths, the study has certain limitations. The absence of a control group not receiving postoperative corticosteroids limits direct comparison. The sample size, although adequate for observational analysis, may restrict broader generalization of the findings. Additionally, the follow-up duration, while sufficient to assess early

recurrence, may not capture very late recurrences, which are known to occur in nasal polyposis.

Overall, the findings of this study support the routine use of intranasal corticosteroids following nasal polyp surgery. Their anti-inflammatory effects contribute significantly to symptom control, mucosal healing, and reduction in recurrence rates. Larger, controlled, and long-term studies are warranted to further define optimal dosing regimens and duration of therapy for sustained disease control.

CONCLUSION

The present study demonstrates that the use of intranasal corticosteroids following nasal polyp surgery is associated with favorable postoperative outcomes and a reduced rate of polyp recurrence. Regular postoperative corticosteroid therapy contributed to significant improvement in nasal symptoms, particularly nasal obstruction and discharge, and promoted healthy mucosal healing as observed on endoscopic follow-up.

The relatively low recurrence rate and limited need for revision surgery observed in this study highlight the importance of intranasal corticosteroids as an integral component of postoperative management rather than an optional adjunct. Good compliance with corticosteroid therapy was associated with better disease control, emphasizing the role of patient adherence and long-term follow-up in achieving sustained benefits after surgery.

Although surgery effectively removes existing polypoidal disease, it does not eliminate the underlying inflammatory process responsible for recurrence. Intranasal corticosteroids address this persistent inflammation and help maintain the benefits achieved through surgical intervention. Therefore, their routine use after nasal polyp surgery is strongly supported by the findings of this study.

Further prospective, controlled studies with larger sample sizes and longer follow-up durations are recommended to better define optimal treatment protocols and to evaluate long-term outcomes. Nonetheless, based on the present observations, postoperative intranasal corticosteroid therapy should be considered a standard component of comprehensive care in patients undergoing nasal polyp surgery.

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