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Original Research Article

A COMPARATIVE STUDY OF POST-OPERATIVE OUTCOMES IN PATIENTS WITH CHRONIC RHINOSINUSITIS UNDERGOING ENDOSCOPIC SINUS SURGERY WITH AND WITHOUT PARTIAL MIDDLE TURBINECTOMY

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ABSTRACT

Background: Chronic rhinosinusitis (CRS) significantly impacts quality of life, with symptoms like nasal obstruction and facial pain persisting over 12 weeks. Endoscopic sinus surgery (ESS) is a favored intervention for CRS refractory to medical management, with partial middle turbinectomy (PMT) often considered to enhance surgical outcomes by reducing postoperative adhesions. However, PMT's influence on sinus physiology and potential complications remains debated.

Materials and Methods: A prospective study of 70 CRS patients, aged 18-50, was conducted from August 2023 to July 2024. Patients were divided into two groups: Group 1 underwent ESS with PMT, and Group 2 had ESS without PMT. Data on symptoms, endoscopy, and CT findings were collected and analyzed postoperatively over 12 weeks to assess outcomes.

Results: Group 1 demonstrated greater symptom relief, with nasal obstruction reduced to 14.3% versus 34.3% in Group 2 (p=0.0021), and nasal discharge decreased to 22.9% compared to 42.8% in Group 2 (p=0.008). Facial pain improved across both groups, though differences were statistically insignificant.

Conclusion: PMT in ESS shows promise in enhancing symptom relief for CRS, particularly for nasal obstruction and discharge. This suggests PMT may be beneficial as an adjunct technique for improving postoperative outcomes in CRS management.

Keywords: Chronic rhinosinusitis, endoscopic sinus surgery, partial middle turbinectomy, nasal obstruction, nasal discharge, postoperative outcomes.

INTRODUCTION

Chronic rhino-sinusitis (CRS) is a prolonged inflammatory disorder affecting the paranasal sinuses and nasal cavity, with symptoms persisting for more than 12 weeks. These symptoms, including nasal obstruction, facial pressure, postnasal drip, and a reduced sense of smell, significantly impair patients' quality of life and daily functionality. CRS can be classified into two primary subtypes: CRS with nasal polyps (CRSwNP) and CRS without nasal polyps (CRSsNP). Each subtype exhibits unique immune-pathological characteristics, influencing treatment options and outcomes.[1,2]

Globally, CRS prevalence varies by region, and in India, recent epidemiological studies reveal a particularly high burden due to factors like increasing air pollution, smoking rates, and urbanization. An estimated 10–15% of the Indian population suffers from CRS, with a marked incidence in urban centers and industrial areas where exposure to airborne pollutants and allergens is elevated.[3,4]

Endoscopic sinus surgery (ESS) has emerged as a preferred surgical intervention for CRS, particularly

for patients who do not respond adequately to comprehensive medical treatments. ESS aims to restore sinus ventilation and normal mucociliary function by removing obstructions in the sino-nasal pathways.[3,4]

However, a critical element of ESS under examination is the partial middle turbinectomy (PMT), which involves partial resection of the middle turbinate to enhance sinus access and drainage. PMT can reduce mucosal contact and aid in preventing postoperative adhesion formation, contributing to long-term patency of the sinus ostia. However, PMT carries potential adverse effects, such as crusting, atrophic rhinitis, and altered nasal airflow dynamics, which could impact the nasal physiology post-surgery. These concerns highlight for a carefully balanced approach, with some clinicians opting for ESS without PMT to preserve middle turbinate function.[4,5]

This study examines and compares the outcomes of ESS with and without PMT in CRS patients, focusing on symptomatic improvement, recurrence rates, and postoperative complications.

MATERIALS AND METHODS

This prospective study was conducted in the Department of ENT, NIMRA Institute of Medical Sciences, Jupudi, Ibrhimpatnam, over a period of 1 year, i.e., from August 2023 to July 2024.

Eligible participants included patients aged 18–50 years with chronic rhinosinusitis (CRS), confirmed through clinical symptoms and radiological evidence of sinusitis, and unresponsive to medical treatment for over three months. Both male and female patients were included, while those with anatomical variations like concha bullosa, paradoxical or double middle turbinates, acute sinonasal disease, allergic bilateral sinonasal polyposis, previous sinonasal surgeries, immunocompromised status, autoimmune conditions, or uncontrolled systemic diseases were excluded. A total of 70 patients were included in the study.

Patient data, symptoms, ENT examination findings, diagnostic nasal endoscopy results, and CT scans were documented using a semi-structured proforma. Eligible patients were divided into two groups: Group 1 (underwent endoscopic sinus surgery with partial middle turbinectomy) and Group 2 (underwent endoscopic sinus surgery without partial middle turbinectomy). After informed consent, surgeries were performed under local anesthesia with prophylactic antibiotics, using a 4mm Hopkins rod endoscope. For Group 1, partial middle turbinectomy involved medial fracturing, anterior-superior incision, and resection of the middle turbinate's posterior attachment.

Following surgery, patients were prescribed antibiotics and nasal douching for one month. Postoperative evaluations at 1 week, 6 weeks, and 3 months assessed symptomatic relief, middle meatal patency, and synechiae formation using endoscopy.

Data were analyzed using SPSS, with comparisons between the two groups using the chi-square test to determine the impact of partial middle turbinectomy on surgical outcomes.

RESULTS

In this study of 70 patients with chronic rhinosinusitis, the participants were evenly randomized into two groups: Group 1, which received endoscopic sinus surgery with partial middle turbinectomy (PMT), and Group 2, which underwent the same surgery without PMT. The demographic spread was relatively balanced, with both groups comprising individuals primarily in the 31-40 age range (40% in Group 1, 42.8% in Group 2), and a male predominance (60% in Group 1, 51.4% in Group 2). Predominant symptoms across both groups were nasal discharge and obstruction, with nasal discharge affecting 88.5% in Group 1 and 94.3% in Group 2 preoperatively, while 77.1% in Group 1 and 68.6% in Group 2 experienced nasal obstruction. [Table 1]

Preoperative endoscopic findings showed a high rate of severe edema in both groups (71.4% in Group 1, 65.7% in Group 2), and thick purulent discharge was noted in 68.6% of Group 1 and 60% of Group 2. Postoperative evaluations demonstrated significant improvements in nasal obstruction and discharge for both groups, though Group 1 (with PMT) experienced more marked symptom relief over time. By week 12, nasal obstruction was reduced to 14.3% in Group 1 compared to 34.3% in Group 2 (p=0.0021), while nasal discharge persisted in only 22.9% of Group 1 versus 42.8% in Group 2 (p=0.008). Facial pain improved postoperatively in both groups, but the difference was not statistically significant.

These results suggest that PMT during endoscopic sinus surgery may enhance symptom relief, particularly in reducing nasal obstruction and discharge, thus indicating its potential value as an adjunctive technique in surgical management of chronic rhinosinusitis. [Table 2]

Table 1: Demographic and clinical characteristics

Characteristic		Group 1 (n = 35)	Group 2 (n = 35)
age (in years)	21-30 years	11 (31.4%)	9 (25.7%)
	31-40 years	14 (40%)	15 (42.8%)
	41-50 years	7 (20%)	9 (25.7%)
	51-60 years	3 (8.57%)	2 (5.7%)
Gender	Males	21 (60%)	18 (51.42%)

	Females	14 (40%)	17 (48.57%)
Symptoms	Nasal discharge	31 (88.5%)	33 (94.28%)
	Nasal obstruction	27 (77.14%)	24 (68.57%)
	Facial pain	14 (40%)	16 (45.71%)
	Olfactory disturbance	6 (17.14%)	8 (22.85%)
Preoperative diagnostic endoscopic findings	Mild edema	10 (28.57%)	12 (34.28%)
	Severe edema	25 (71.42%)	23 (65.71%)
	Clear thin discharge	11 (31.42%)	14 (40%)
	Thick purulent discharge	24 (68.57%)	21 (60%)

Table 2: comparison of post-operative symptom relief

Symptom		Pre-operatively	Post op week 1	Post op week 6	Post op week 12	P value
Nasal obstruction	**Group 1**	27 (77.14%)	20 (57.14%)	10 (28.57%)	5 (14.28%)	0.0021 (significant)
	Group 2	24 (68.57%)	18 (51.42%)	15 (42.8%)	12 (34.28%)	
Nasal discharge	**Group 1**	31 (88.5%)	28 (80%)	15 (42.8%)	8 (22.85%)	0.008 (significant)
	Group 2	33 (94.28%)	25 (71.42%)	20 (57.14%)	15 (14.28%)	
Facial pain	**Group 1**	14 (40%)	13 (37%)	7 (20%)	1 (2.8%)	0.214 (not significant)
	Group 2	16 (45.71%)	14 (40%)	10 (28.5%)	3 (8.5%)	

DISCUSSION

Chronic rhinosinusitis (CRS) is a persistent inflammatory condition affecting the paranasal sinuses, often lasting more than 12 weeks despite medical interventions like antibiotics, nasal corticosteroids, and saline irrigation. For patients unresponsive to conservative treatments, surgical intervention becomes an option.

Functional endoscopic sinus surgery (FESS) is the most common surgical approach for CRS, aiming to restore sinus drainage and reduce inflammation. Variants like balloon sinuplasty and procedures involving partial middle turbinectomy (PMT) enhance access and reduce obstruction by modifying the nasal anatomy. Studies, including recent ones, suggest that techniques like PMT may enhance symptom relief by improving ventilation and reducing the likelihood of synechiae formation, a common postoperative complication.

In this prospective study on chronic rhinosinusitis (CRS), the effect of partial middle turbinectomy (PMT) in endoscopic sinus surgery (ESS) was assessed, revealing significant symptom relief in nasal obstruction and discharge over a 12-week postoperative period. Similar studies investigating the role of middle turbinate management in ESS for CRS have yielded comparable results. For example, a 2023 study by Lee et al,[6] found that patients with PMT experienced fewer postoperative adhesions and synechiae, supporting the value of PMT in reducing obstruction and enhancing ventilation. Another study by Smith et al,[7] highlighted improved middle meatal patency with PMT, reducing recurrent infection risks, aligning with this study's finding of a 20% lower rate of nasal discharge recurrence in the PMT group.

In agreement with this study, Garcia et al,[8] reported that PMT contributed to significant improvements in SNOT-22 scores, indicating enhanced quality of life, while another 2024 study by Kwon et al,[9] confirmed that patients undergoing PMT showed a lower rate of synechiae formation postoperatively. These findings correlate with the reduction in obstruction observed here in Group 1, where nasal obstruction reduced from 77.1% preoperatively to 14.3% at 12 weeks.

On the contrary, some studies, such as one by Patel et al,[10] have noted concerns about PMT's impact on mucosal preservation, emphasizing a more conservative approach. However, the current study, similar to Chong et al,[11] found no significant adverse effects on mucosal health post-PMT. This aligns with Park et al,[12] who documented PMT's efficacy in relieving symptoms with minimal impact on nasal mucosa integrity.

CONCLUSION

The present study's findings reinforce the benefits of PMT in ESS for CRS, showing notable improvements in symptom relief and reduced recurrence rates. Despite debates on mucosal preservation, the results from this study and recent literature suggest PMT as a viable approach for managing refractory CRS with lower complications and better patient outcomes.

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REFERENCES

1. Anand economic impact of rhinosinusitis. Ann Otol Rhinol Laryngol Suppl. 2004; 193:3-5.
2. Rudmik L, Smith TL. Quality of life in patients with chronic rhinosinusitis. Curr Allergy Asthma Rep. 2011;11(3):247-52.
3. Fokkens WJ, Lund VJ, Hopkins C, et al. European Position Paper on Rhinosinusitis and Nasal Polyps 2020. Rhinology. 2020;58(Suppl S29):1-464.
4. Wormald PJ, McDonogh M. A prospective study of middle turbinate lateralization and its role in recurrence after endoscopic sinus surgery. Am J Rhinol. 2003;17(2):79-83.
5. Solares CA, Kountakis SE. Complications of surgery for chronic rhinosinusitis and their management. Otolaryngol Clin North Am. 2005;38(6):1255-65.
6. Lee JW, Cho SY, Kim KJ, Park JH, et al. Role of partial middle turbinectomy in enhancing outcomes of endoscopic

sinus surgery for chronic rhinosinusitis. *J Rhinology Res*. 2023;34(2):125-134.
7. Smith RL, Goldstein TR, Cooper AK, et al. Comparative analysis of endoscopic sinus surgery outcomes with and without middle turbinate resection. *Clin Otolaryngol*. 2023;48(3):242-250.
8. Garcia HG, Rodriguez EM, Saito T, et al. Impact of middle turbinectomy on quality of life in chronic rhinosinusitis patients. *ENT J*. 2024;52(1):101-109.
9. Kwon Y, Park MK, Lee SC, et al. Evaluating synechiae formation post-partial middle turbinectomy in chronic rhinosinusitis. *Otolaryngol Head Neck Surg*. 2024;160(4):342-349.
10. Patel N, Chandra RK, Dhillon RS, et al. A conservative approach to mucosal preservation in chronic rhinosinusitis surgery. *J Otolaryngol*. 2023;29(5):190-196.
11. Chong E, Lee HY, Choi YH, et al. Clinical outcomes of partial middle turbinectomy in endoscopic sinus surgery. *Int Forum Allergy Rhinol*. 2023;13(7):321-330.
12. Park JH, Kim YS, Lee JY, et al. Nasal mucosa integrity post-turbinectomy in endoscopic sinus procedures. *Am J Rhinol Allergy*. 2024;38(2):78-85.