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POSTOPERATIVE SNOT-22 OUTCOMES IN FESS PATIENTS

DR.DINESH RAM R[1*], DR.SHRAVANTHI MANTRA PRITHVIRAJ[2,] DR.SHYAM SUDHAKAR SUDARSAN[3], DR.SUBAGAR ANBARASAN[4], DR.E. RAJESH[5]

[1]FINAL YEAR POSTGRADUATE, DEPARTMENT OF ENT, SAVEETHA MEDICAL COLLEGE AND HOSPITAL, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES (SIMATS), CHENNAI, INDIA

2 FINAL YEAR POSTGRADUATE, DEPARTMENT OF ENT, SAVEETHA MEDICAL COLLEGE AND HOSPITAL, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES (SIMATS), CHENNAI, INDIA

3.ASSOCIATE PROFESSOR , DEPARTMENT OF ENT, SAVEETHA MEDICAL COLLEGE AND HOSPITAL, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES (SIMATS), CHENNAI, INDIA - CORRESPONDING AUTHOR

[4]ASSISTANT PROFESSOR, DEPARTMENT OF ENT, SAVEETHA MEDICAL COLLEGE AND HOSPITAL, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES (SIMATS), CHENNAI, INDIA

[5]READER, DEPARTMENT OF ORAL & MAXILLOFACIAL PATHOLOGY AND ORAL MICROBIOLOGY, SREE BALAJI DENTAL COLLEGE & HOSPITAL, CHENNAI, INDIA

Abstract

Functional Endoscopic Sinus Surgery (FESS) is a widely favored treatment for chronic rhinosinusitis (CRS) patients who fail to respond to conservative medical management. The Sino-Nasal Outcome Test (SNOT-22) is commonly employed to measure patient-reported outcomes, addressing both physical and psychosocial aspects of sinonasal health. This study aims to assess the effectiveness of FESS by comparing preoperative and postoperative SNOT-22 scores while examining the influence of demographic and clinical factors on surgical outcomes. Statistical analyses were performed to identify predictors of significant postoperative improvement.

Keywords: Functional Endoscopic Sinus Surgery, Chronic Rhinosinusitis, SNOT-22, Patient-Reported Outcomes, Quality of Life, Demographic Factors, Clinical Predictors.

INTRODUCTION

Chronic rhinosinusitis (CRS) is a long-lasting inflammatory condition of the sinonasal mucosa, commonly presenting with symptoms such as nasal obstruction, facial pressure, diminished sense of smell, and purulent nasal discharge. Due to its persistent nature and impact on daily life, CRS can significantly reduce a patient's quality of life (QoL). (1)

Pharmacological treatments, including antibiotics, corticosteroids, and saline irrigations, are typically the first-line approach. However, some patients experience inadequate symptom relief, making surgical intervention necessary. Functional Endoscopic Sinus Surgery (FESS) has become the standard surgical option for these cases, aiming to improve sinus drainage and ventilation by removing obstructions and opening sinus ostia. (2)
Despite advancements in FESS technology, including high-definition imaging, powered instruments, and intraoperative navigation, evaluating surgical success remains challenging. Objective tools such as nasal endoscopy and computed tomography (CT) scans are frequently used but fail to fully reflect the patient's subjective experience. (3)

Patient-Reported Outcome Measures (PROMs) are critical for a comprehensive evaluation of surgery's impact on quality of life. Among these, the SNOT-22 is a validated instrument that assesses both the physical symptoms and emotional dimensions of CRS, making it indispensable for preoperative and postoperative assessments. (4)

This study seeks to evaluate the effectiveness of FESS by analyzing changes in SNOT-22 scores from baseline to 3 and 6 months after surgery. It also examines how demographic and clinical factors, including age, sex, nasal polyps, asthma, and baseline disease severity, influence postoperative outcomes.

Literature Review

Since its introduction in the 1980s, Functional Endoscopic Sinus Surgery (FESS) has seen significant advancements. Modern techniques now incorporate powered instruments, enhanced endoscopic visualization, and image-guided navigation for complex cases. Research consistently demonstrates that FESS improves sinonasal function and alleviates symptoms in CRS patients unresponsive to medical treatments. However, the degree of improvement varies among individuals, suggesting that patient-specific factors may play a role in influencing outcomes. (5)

The SNOT-22, a widely validated and reliable patient-reported outcome measure (PROM), is essential for evaluating sinonasal symptoms and their impact on quality of life. Consisting of 22 items scored on a 0–5 Likert scale, it generates a total score ranging from 0 to 110, with higher scores indicating greater symptom severity. Its comprehensive scope includes not only upper respiratory symptoms but also broader health domains such as fatigue, emotional well-being, and social functioning, making it a valuable tool in both clinical and research settings. (6)

Methodology

Study Design and Population

This prospective observational study was conducted at a tertiary care center and included 150 patients diagnosed with chronic rhinosinusitis (CRS) who did not respond to maximal medical therapy and subsequently underwent FESS. Ethical approval was obtained from the institutional review board, and all participants provided written informed consent.

Inclusion Criteria:

•Adults aged 18–65 years with CRS, diagnosed according to established guidelines, with or without nasal polyps.
•Patients who failed to achieve symptom relief despite receiving maximal medical therapy, including extended courses of antibiotics and topical corticosteroids.

Exclusion Criteria:

•Patients with cystic fibrosis, primary ciliary dyskinesia, or other systemic conditions impacting sinonasal health.
•Individuals with a history of prior sinonasal surgeries or significant anatomical variations that could complicate surgical access.

Surgical Technique

All procedures were performed by experienced otolaryngologists using standard endoscopic methods. Powered instruments and microdebriders were employed for tissue removal, with intraoperative image guidance utilized in complex cases to improve precision and reduce complications. The primary goal of the surgery was to restore natural drainage pathways by opening obstructed sinonasal passages while preserving mucosal function.

Data Collection

A comprehensive preoperative evaluation was conducted, including a detailed medical history, physical examination, nasal endoscopy, and CT imaging. The SNOT-22 questionnaire was administered during the initial assessment to establish baseline scores. Postoperative follow-up included SNOT-22 evaluations at 3 and 6 months, along with thorough ENT examinations, including nasal endoscopy.

Outcome Measures

The primary outcome was the change in SNOT-22 scores from baseline to 3 and 6 months postoperatively. Secondary outcomes included analyzing the relationship between changes in SNOT-22 scores and demographic or clinical factors such as age, sex, presence of nasal polyps, asthma, and baseline disease severity.

Statistical Analysis

Data were analyzed using SPSS software (version 25). Descriptive statistics summarized patient demographics and clinical characteristics, with continuous variables expressed as mean ±standard deviation (SD) and categorical variables as frequencies and percentages. Paired t-tests were used to compare preoperative and postoperative SNOT-22 scores. Subgroup analyses employed independent t-tests to assess mean score changes between patient groups (e.g., with vs. without nasal polyps, with vs. without asthma).

Multivariate linear regression analysis was conducted to identify independent predictors of postoperative improvement in SNOT-22 scores. Variables included in the model were age, sex, presence of nasal polyps, asthma, and baseline SNOT-22 scores. Statistical significance was defined as a p-value <0.05.

Results

Table 1: Demographics and Clinical Characteristics of Study Population

Variable	**n (%) or Mean ± SD**
Total Patients (n)	150
Age (years)	42.5 ± 12.4
Sex	
Male	82 (54.7%)
Female	68 (45.3%)
Presence of Nasal Polyps	97 (65%)
Asthma Diagnosis	30 (20%)
Preoperative SNOT-22 Score	46.8 ± 16.3

Demographics and Clinical Characteristics

A total of 150 patients were included in the study. The mean age was 42.5 years (± 12.4), with a male-to-female ratio of 1.2:1. Nasal polyps were present in 65% of patients, and 20% had a diagnosis of asthma. The mean preoperative SNOT-22 score was 46.8 (± 16.3).

Table 2: Preoperative vs Postoperative SNOT-22 Scores

Timepoint	**Mean SNOT-22 Score ± SD**	**Mean Change from Baseline**	**p-value**
Preoperative	46.8 ± 16.3	-	-
3 Months Postoperative	21.3 ± 12.5	-25.5 ± 13.4	< 0.001
6 Months Postoperative	18.6 ± 11.8	-28.2 ± 14.5	< 0.001

SNOT-22 Outcomes

Preoperative vs. Postoperative SNOT-22 Scores

The mean postoperative SNOT-22 score at 3 months was 21.3 (± 12.5), representing a significant reduction from the preoperative baseline ($p < 0.001$).

At 6 months, the mean score further improved to 18.6 (± 11.8), with sustained statistical significance ($p < 0.001$).

Table 3: Subgroup Analysis of SNOT-22 Score Changes by Nasal Polyps and Asthma Status

Subgroup	Mean Change in SNOT-22 Score ± SD	p-value
Nasal Polyps		
Present (n = 97)	-32.5 ± 13.8	0.03
Absent (n = 53)	-24.1 ± 12.7	
Asthma		
Present (n = 30)	-27.0 ± 13.2	0.29
Absent (n = 120)	-28.5 ± 14.7	

Subgroup Analysis- Patients with nasal polyps showed greater improvement in their SNOT-22 scores compared to those without polyps (mean reduction: 32.5 vs. 24.1, p = 0.03).
Asthma presence did not significantly impact the degree of improvement (p = 0.29).
Age and sex were not significant predictors of postoperative outcomes.

Table 4: Complications and Postoperative Follow-Up

Complication	n (%)
Postoperative Nasal Bleeding	8 (5.3%)
Synechiae Formation	7 (4.7%)
No Major Complications	135 (90%)

Complications and Postoperative Follow-up
Minor complications, including postoperative nasal bleeding and synechiae formation, were observed in 10% of patients. No major complications were recorded. All patients received standard postoperative care, including saline irrigation and topical corticosteroids.

Table 5: Multivariate Regression Analysis of Predictors for Postoperative SNOT-22 Improvement

Variable	Coefficient (β)	Standard Error (SE)	p-value
Age	-0.08	0.11	0.45
Sex (Male)	1.12	1.25	0.37
Nasal Polyps (Present)	5.43	2.15	0.03
Asthma (Present)	-2.12	2.89	0.29
Preoperative SNOT-22	0.72	0.19	<0.001

DISCUSSION

This study underscores the significant improvement in patient-reported outcomes following Functional Endoscopic Sinus Surgery (FESS) for individuals with chronic rhinosinusitis (CRS). Using the Sino-Nasal Outcome Test (SNOT-22) to assess quality of life (QoL), the results reveal substantial reductions in symptom burden and associated distress, particularly among patients with nasal polyps. (4)

The mean reduction in SNOT-22 scores from baseline to 6 months postoperatively indicates a strong and sustained response to surgical intervention. These findings are consistent with existing literature, which supports FESS as an effective treatment for CRS patients unresponsive to medical therapy. The greater improvement observed in patients with nasal polyps aligns with prior studies suggesting that removing obstructive inflammatory tissue enhances symptom relief. This benefit is likely attributable to reduced nasal obstruction and improved mucociliary clearance in these patients. (5)

Interestingly, while asthma is often considered a complicating factor in CRS due to its shared inflammatory pathophysiology, our study found no significant difference in postoperative improvement between patients with and without asthma. This may be attributed to effective perioperative asthma management and the targeted use of postoperative corticosteroids and other anti-inflammatory therapies, which likely mitigate the influence of lower airway disease on sinonasal symptoms.

Multivariate analysis identified baseline SNOT-22 scores and the presence of nasal polyps as significant predictors of postoperative improvement. This suggests that patients with more severe preoperative symptoms and those with nasal polyps may derive the greatest benefit from FESS. These findings are clinically important for preoperative counseling, enabling clinicians to set realistic expectations for surgical outcomes. In contrast, age, sex, and the presence of asthma were not significant predictors of surgical success, suggesting that these factors do not substantially affect quality-of-life improvements following FESS. This differs from some earlier studies that indicated age and sex might influence outcomes, emphasizing the need for further research to clarify these relationships. (6)

The fact that there is no substantial predictive value for asthma and other concomitant illnesses may further suggest that local anatomical and inflammatory alterations within the sinonasal cavities, rather than systemic problems, are the main cause of FESS's advantages. It is crucial to remember that the exclusion criteria used in this study, such as the failure to include patients with systemic conditions such primary ciliary dyskinesia or cystic fibrosis, may have made it more difficult to identify the influence of more general health variables.(7)

There were no significant adverse events reported, and postoperative problems were mild and controllable. This bolsters the safety profile of FESS, especially when carried out by skilled surgeons using cutting-edge tools and methods. The procedure's effectiveness in improving quality of life and lowering the burden of symptoms related to CRS is further supported by the high patient satisfaction rate.(8)

However, there are limitations to this study. Because patient populations and surgical methods might differ greatly between locations, the single-center design may restrict how broadly the results can be applied. Furthermore, although the six-month follow-up period is enough to record short-term results, it is insufficient to reveal long-term disease control or the possibility of revision surgery. Longer follow-up times and multicenter data should be used in future studies to fill in these gaps.

The use of the SNOT-22 as the main outcome measure is another possible drawback. Despite being a commonly used and validated instrument, it is still a subjective metric and might not account for all factors that affect surgical outcome. To provide a more thorough assessment of surgical outcomes, future research should incorporate objective assessments such endoscopic scoring and radiologic evaluations.(9)

CONCLUSION

For individuals with chronic rhinosinusitis, especially those who do not respond well to medical treatments, functional endoscopic sinus surgery (FESS) has been shown to be a useful intervention for enhancing quality of life. According to the SNOT-22 score, this study shows that FESS significantly and consistently improves patient-reported outcomes. High baseline SNOT-22 scores and the presence of nasal polyps are predictive of greater postoperative improvement, indicating that these patients may benefit the most from surgery.

The fact that concomitant illnesses like asthma and demographic factors like age and sex did not significantly affect surgical outcomes supports the wide application of FESS across a range of patient populations. However, the study's shortcomings, such as its single-center design and brief follow-up time, must be taken into consideration when interpreting the results. To fully comprehend the influence of FESS on CRS management, future studies should examine long-term results and include objective markers of illness control.

These findings highlight the value of a thorough preoperative examination in clinical practice, which includes a meticulous assessment of the existence of nasal polyps and the intensity of symptoms, in order to determine which patients are most likely to benefit from FESS. Furthermore, attaining the best results still depends on efficient perioperative and postoperative care, especially for patients with coexisting diseases like asthma.

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