

ORIGINAL ARTICLE

Functional Endoscopic Sinus Surgery Outcome in Adults with Chronic Rhinosinusitis by Sino-nasal Outcome Test 20

¹Muniraju Bharath, ²Sanjeev Saxena

ABSTRACT

Objective: This study is designed to compare the symptomatic profile of chronic rhinosinusitis (CRS) before and after functional endoscopic sinus surgery (FESS) by 20-item Sino-Nasal Outcome Test (SNOT-20) questionnaire.

Study design: Open prospective observational study.

Materials and methods: A group of 40 patients with symptoms of CRS were included in the study. They underwent FESS at the Department of ENT, Command Hospital, Air Force, Bengaluru, from July 2014 to December 2015. Patients were assessed for CRS symptoms preoperatively and postoperatively by SNOT-20 questionnaire. Follow-up of patients was done at 1 week, 2 weeks, 1 month, 3 months, and 6 months respectively, by SNOT-20 score.

Results: There was a significant difference noted in overall SNOT-20 score as well as improvement in symptoms at the end of 6 months.

Conclusion: A good objective outcome in terms of symptoms improvement can be obtained with FESS in patients with CRS by SNOT-20.

Keywords: Chronic rhinosinusitis, Functional endoscopic sinus surgery, Outcome, Sino-nasal outcome test 20.

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INTRODUCTION

Chronic rhinosinusitis is one of the most frequent otolaryngologic diseases encountered in routine ENT practice. Chronic rhinosinusitis significantly impacts the quality of life by interfering with the general health, vitality, and social functioning, and cause decrease in productivity in

the workforce, which is comparable with that observed in patients with coronary heart disease and chronic lung disease. Most cases of CRS respond to medical treatment, but if no improvement in symptoms is achieved, FESS advocates systematic approach to the surgical treatment of the disease of the nose and sinuses.^{1,2}

Although much has been written about the surgical techniques of FESS, not much has appeared about its results. An analysis was done of 100 consecutive patients undergoing FESS over 23 months' duration with average follow-up time of 5 months with patients' average age of 39 years (6–83 years), including 50 males and 50 females. Fifty-nine patients had recurrent sinusitis, 4 had polyps only, and 37 had both. Forty-nine patients had previous sinus surgery. After FESS, 14 patients had minor complications, the most common complication being synechiae, between middle turbinate and septum in 6 patients. Eighty-three patients had significant improvement after FESS, while 10 had one episode of sinusitis postoperatively. The results of this series suggest that FESS is an efficacious advancement in the treatment of sinusitis.³

Iro et al⁴ assessed, in a retrospective study, the medium-term clinical outcome of FESS in 208 patients with CRS with a mean follow-up of 3.1 years. A questionnaire focusing on nasal obstruction, rhinorrhea, nasal dryness/crusting, sneezing, headache, smell, numbness in cheeks and lips, ear fullness, epiphora, and sore throat was used. It was concluded in the study that there was improvement for nasal symptoms and coexisting complaints after FESS. The value of FESS is underlined for the treatment of patients with CRS. The present study attempts to evaluate the outcome of FESS in patients with symptomatic CRS by using SNOT-20 questionnaires.

MATERIALS AND METHODS

Source of Data

The study included patients (n = 40) diagnosed as CRS fulfilling the Rhinosinusitis Task Force of the American Academy of Otolaryngology guidelines.⁵

Inclusion Criteria

- Age 18 to 60 years

¹Senior Resident, ²Professor

^{1,2}Department of ENT and Head and Neck Surgery, Command Hospital (Air Force), Bengaluru, Karnataka, India

Corresponding Author: Muniraju Bharath, Senior Resident Department of ENT and Head and Neck Surgery, Command Hospital (Air Force), Bengaluru, Karnataka, India, Phone: +919902417971, e-mail: drbharath2607@gmail.com



Table 1: Sino-nasal outcome test 20 questionnaire

Considering how severe the problem is when you experience it and how frequently it happens, please rate each item below on how "bad" it is by circling the number that corresponds with how you feel using this scale: →

	No problem	Very mild problem	Mild or slight problem	Moderate Problem	Severe Problem	Problem as bad as it can be	5 most important items
Need to blow nose	0	1	2	3	4	5	○
Sneezing	0	1	2	3	4	5	○
Running nose	0	1	2	3	4	5	○
Cough	0	1	2	3	4	5	○
Postnasal discharge	0	1	2	3	4	5	○
Thick nasal discharge	0	1	2	3	4	5	○
Ear fullness	0	1	2	3	4	5	○
Dizziness	0	1	2	3	4	5	○
Ear pain	0	1	2	3	4	5	○
Facial pain/pressure	0	1	2	3	4	5	○
Difficulty falling asleep	0	1	2	3	4	5	○
Wake up at night	0	1	2	3	4	5	○
Lack of a good night's sleep	0	1	2	3	4	5	○
Wake up tired	0	1	2	3	4	5	○
Fatigue	0	1	2	3	4	5	○
Reduced productivity	0	1	2	3	4	5	○
Reduced concentration	0	1	2	3	4	5	○
Frustrated/restless, irritable	0	1	2	3	4	5	○
Sad	0	1	2	3	4	5	○
Embarrassed	0	1	2	3	4	5	○

- Established diagnostic criteria of CRS as per Task Force of the American Academy of Otolaryngology guidelines
- Refractory to medical treatment
- Associated with or without nasal polyposis

Exclusion Criteria

- Patients with diseases like cystic fibrosis, primary ciliary dyskinesia, and immune deficiencies
- Patients who have undergone previous nasal surgeries
- Pregnancy
- Patients with bleeding disorders
- Asthma cases, acute sinusitis, fungal sinusitis, and orbital complication cases

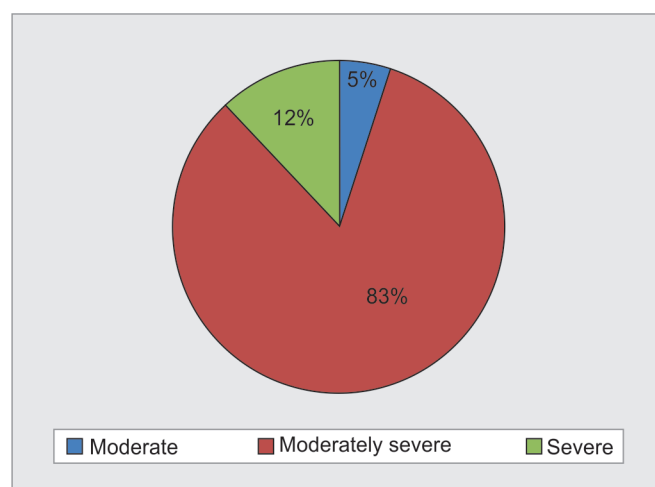
Evaluation and Assessment

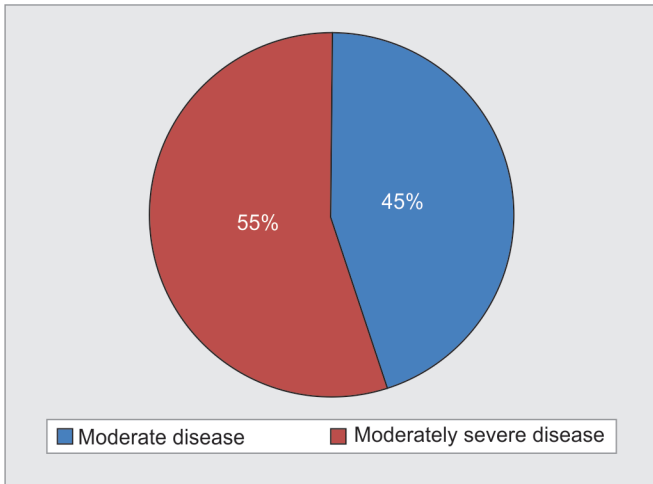
After fulfilling inclusion and exclusion criteria, patients were recruited to study protocol. Patients were evaluated for signs and symptoms by diagnostic nasal endoscopy and computed tomography scan of paranasal sinuses preoperatively. Patients' symptoms were assessed by SNOT-20 questionnaire (Table 1) preoperatively. All the patients underwent FESS by Messerklinger technique.⁶ Symptom scoring of all patients was done with SNOT-20 questionnaire postoperatively at 1-week, 2-week, 1-month, 3-month, and 6-month follow-up.

RESULTS

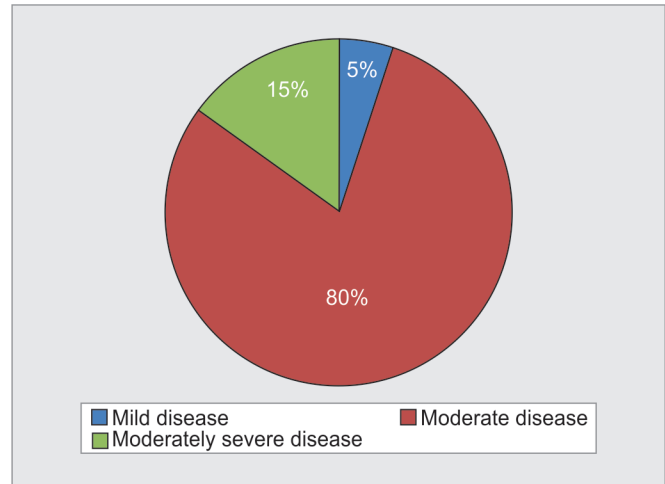
The total study population included 40 patients. Males were 29 (73%), females 11 (27%). The SNOT-20 questionnaire classified patients into no disease with scores 0 to 10, mild disease with scores 11 to 20, moderate disease with scores 21 to 40, moderate severe disease with scores 41 to 70, and severe with scores 70 to 100.

Baseline SNOT-20 questionnaire grouped 33 patients (83%) as moderately severe, 5 patients (12%) as severe, 2 patients (5%) as moderate (Graph 1). At postoperative

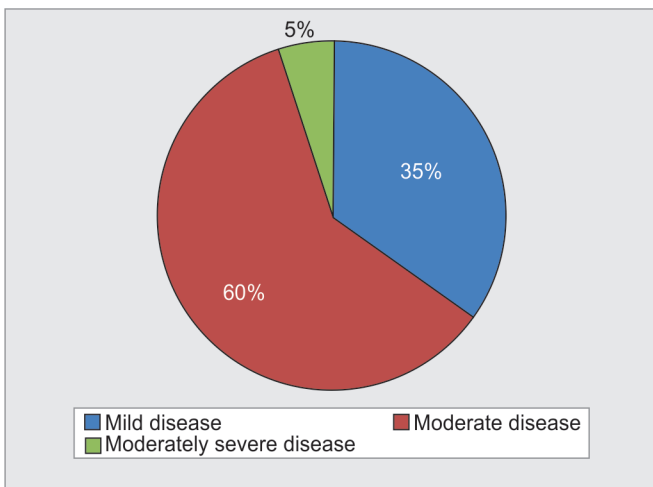
**Graph 1:** Baseline grading of patients on SNOT-20



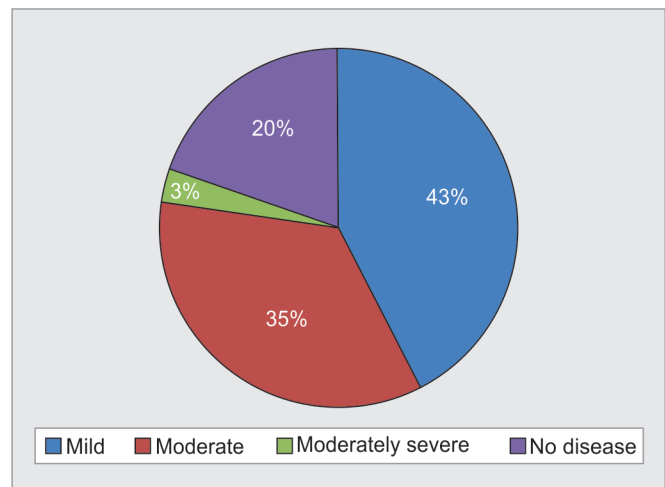
Graph 2: Postoperative 1 week grading of patients on SNOT-20



Graph 3: Postoperative 2 week grading of patients on SNOT-20



Graph 4: Postoperative 1 month grading of patients on SNOT-20



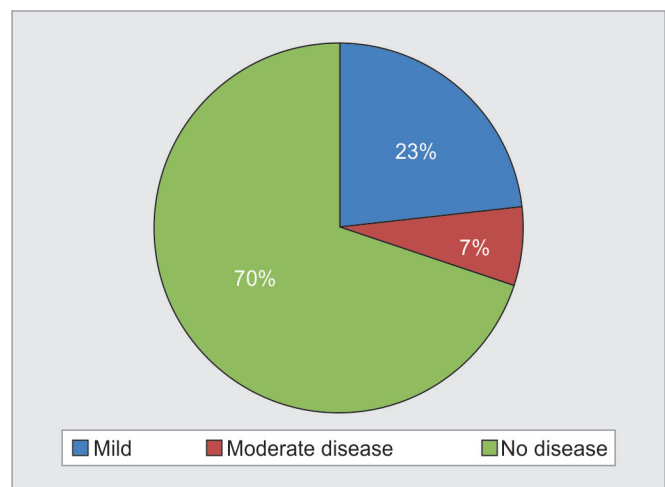
Graph 5: Postoperative 3 months grading of patients on SNOT-20

1 week, 18 patients (45%) had moderate disease, and 22 patients (55%) were moderately severe (Graph 2). At 2nd week postoperative, 32 patients (80%) had moderate disease, 6 patients (15%) had moderately severe, and 2 patients (5%) had mild disease (Graph 3). At the end of 1 month, 14 patients (35%) had mild disease, 24 patients (60%) had moderate disease and 2 patients (5%) had moderately severe disease (Graph 4). At 3 months postoperative, 17 patients (43%) were mild, 32 patients (35%) were moderate, 1 patient (3%) was moderately severe and 8 patients (20%) had no disease (Graph 5). Finally, at 6 months postoperative, 9 patients (23%) were mild, 3 patients (7%) were moderate, and 28 patients (70%) were no disease (Graph 6).

The mean SNOT-20 scores from baseline to postoperative 6-month follow-up shows statistical significance (Table 2 and Graph 7).

Statistical Analysis

The statistical analysis was performed by STATA 11.2 (College Station, Texas, USA). Shapiro–Wilk test was

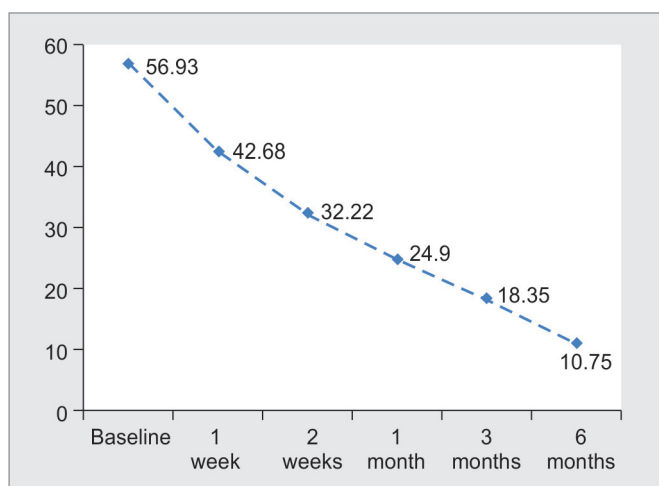


Graph 6: Postoperative 6 months grading of patients on SNOT 20

used to find the normality of SNOT-20 of pre- and postoperative scores. Student’s paired t-test was used to find the significant difference between the pre- and postcomparisons of SNOT-20 scores, and it is expressed

Table 2: Mean SNOT-20 scores from baseline to post-op 6 months

	Mean	Standard deviation	p-value
Baseline	56.93	9.61	
1 week	42.68	8.45	<0.001
2 weeks	32.22	8.12	<0.001
1 month	24.90	7.96	<0.001
3 months	18.35	8.94	<0.001
6 months	10.75	8.21	<0.001

**Graph 7:** Mean SNOT-20 scores from baseline to 6 months follow-up

as mean and standard deviation. Chi-square test was used to measure the association between the degree of disease pre- and postoperatively, and it is expressed as frequency and percentage.

DISCUSSION

The literature regarding the evaluation of outcome of FESS in CRS patients with SNOT-20 score is very sparse. Our study was designed primarily to assess the same. In this prospective study, we found that 93% patients with symptomatic CRS refractory to medical management had significant improvement (no disease, mild disease) in the overall symptom score after FESS attempt of 6-month follow-up. So, FESS does have a beneficial role in patients with moderate-to-severe disease as per SNOT-20 questionnaire.

Review of literature shows very few similar studies. A survey of symptoms and quality of life was conducted using SNOT-20 questionnaire with 76 patients before and after endoscopic sinus surgery by Zhong et al.⁷ The

overall effect of endoscopic sinus surgery on CRS was subjectively self-evaluated by patients.

RESULTS

After 6-month follow-up, the total SNOT-20 score of patients was significantly decreased from the baseline ($p < 0.001$). The most important five items were found to be "thick nasal discharge," "need to blow nose," "dizziness," "frontal pain," and "lack of a good sleep." Other items, related to sleep and emotion, were also significantly improved: the proportions of responses of "much improved," "improved," and "not improved" were 56.3, 33.3, and 10.4% respectively.⁷ The symptomatic improvement after FESS in our study was nearly similar to the one conducted by Zhong et al.⁷ Our observations suggest that a good subjective outcome in terms of symptom improvement can be obtained with FESS in patients with CRS.

We advocate that patient symptomology and clinical assessment should be given due importance for decision-making before subjecting a patient to FESS. Thus, SNOT-20 questionnaire provides an ideal way to understand and grade the disease severity in patients and thus prioritize them for surgery. However, a large patient pool and longer follow-up will be required to make this statement more substantial.

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