

PERCENTAGE OF POSITIVE OUTCOME OF SYMPTOMS IN PATIENTS UNDERGOING FUNCTIONAL ENDOSCOPIC SINUS SURGERY

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Abstract

Background: The commonest disease that disturbs the day-to-day activity of thousands of individuals was recognised as chronic rhinosinusitis. The purpose of the research was to analyse the degree of improvement of symptom profile in patients suffering from chronic sinusitis undergoing endoscopic sinus surgery and to explain the success or limitation of the procedure depending upon the extent to which the patient experiences improvement in individual symptoms. **Materials and Methods:** This prospective study was conducted on 60 individuals with symptoms of chronic sinusitis undergoing FESS at Govt. Theni Medical College & Hospital, Theni and Kanyakumari Government Medical College. Patients were assessed for the CRS-related and unrelated symptoms preoperatively using the SNOT-22 system, and scores were as no symptom (0), very mild (1), mild (2), moderate (3), severe (4), problem as bad as it can be (5). Three times scoring, one before surgery and two after surgery. **Result:** The symptoms that showed marked improvement in the majority of the subjects were nasal obstruction (88.3%), nasal discharge (78.3%), postnasal dripping (68.3%), ear discharge (70%), decreased sensation of smell (68.3%) and which showed no or mild improvement were headache, cough, rhinorrhea, sneezing, facial pain, those symptoms associated with allergic rhinitis. **Conclusion:** The study found that most patients with chronic rhinosinusitis showed marked improvement in symptoms like nasal obstruction, nasal discharge and postnasal drip, and symptoms like sneezing and headache showed mild or no improvement.

INTRODUCTION

Many disease processes, including Chronic Rhino Sinusitis (CRS) clinical diagnostic measures, cannot identify the full burden of the disease. The discordance between radiological / pre-endoscopic findings and patient symptoms highlights this dilemma.^[1] The degree of sinonasal inflammation as measured by CT/DNE (diagnostic nasal endoscopy) fails to correlate with the extent of symptoms experienced by the patient.^[2] At present, CRS remains a symptom-based diagnosis corroborated by objective signs. The minimally clinically important difference (MCID) is crucial in assessing the minimal change in symptoms after an intervention, as objective and patient-centre assessments lack agreement.^[3]

The extent of symptoms experienced by the patient remains the overriding factor in seeking medical or surgical treatment. The study of patient-centered disease impact is critical in understanding quality of life outcomes after FESS.^[4] Many studies such as the Rhinosinusitis Disability Index (RSDI), Chronic Sinusitis Survey (CSS), Rhinitis QOL questionnaire, and Sino Nasal Outcome Test (SNOT-22) provide validated means to objectively quantify patients' perception of disease burden in terms of symptoms before and after instrumentation.^[5,6]

Prioritising the symptoms of chronic rhino sinusitis patients undergoing FESS and assessing the outcome, considering comorbid factors, is crucial to determine the success or limitations of the procedure and its impact on quality-of-life outcomes.^[6] Mosher deemed intranasal ethmoidectomy dangerous and

blind in the early 20th century. However, endoscopes revolutionised this view, allowing for a more detailed examination of the inside of various body cavities.^[7] Hirschmann's modified cystoscope in 1907 examined the middle meatus and sinus ostia. The 1950s saw significant advancements with Hopkins' solid rod lens and cold light source, making sinonasal endoscopy an essential diagnostic tool.^[8]

The pioneering work of Prof Walter Messerklinger of Graz, Austria, on sinus mucosa and mucociliary transport has brought light to the understanding of the pathophysiology of sinus diseases.^[9] Most PNS infections spread from nose to sinus, and recurrent sinusitis is secondary to insufficient outflow or ostial obstruction. Sites of obstruction or partial stenosis are the ethmoid infundibulum at the maxillary and frontal sinus entrances. FESS has gained popularity and continues to do so among ENT surgeons in recent years with a better understanding of the lateral wall of the nose.

Chronic rhinosinusitis is a common otolaryngologic disease that significantly impacts the workforce's quality of life, health, and productivity. It is often prescribed with antibiotics and responds to medical treatment. If symptoms don't improve, FESS recommends a systematic surgical approach for the nose and sinuses, similar to those seen in patients with coronary heart disease and chronic lung disease. The study aimed to assess the various symptoms of CRS before and after FESS, compare the various symptoms of CRS before and after FESS, and assess the success or limitation of FESS depending on the degree of improvement of individual symptoms the patient experienced before and after the procedure.

MATERIALS AND METHODS

This prospective study was conducted on 60 patients attending the ENT Out Patient Department at Govt Theni Medical College and Hospital, Theni and Kanyakumari Government Medical College, Asaripallam, Tamilnadu, with clinical features and investigations suggestive of CRS were randomly selected after applying the following inclusion and exclusion criteria. The study received the ethical committee's approval and informed consent before the initiation.

Inclusion Criteria

All cases of CRS, with infective aetiology, with symptoms for at least 12 weeks, patients refractory to medical treatment for a minimum of 6 weeks and patients above 20 years and below 60 years old were included.

Exclusion Criteria

Patients below 20 years and above 60 years old, gross DNS, previous nasal surgeries, Complications of Chronic sinusitis and Growth in the nasal cavity, benign or malignant and sinonasal polyposis were excluded.

Patients with rhinosinusitis were evaluated based on Sino-Nasal Outcome Test (SNOT-22) scoring, which

ranged from 0 to 60. Ten specific symptoms and two non-specific ones were considered, each scoring ranging from no problem to severe problem. Preoperative questionnaire scoring was done, and any history of co-existing conditions like bronchial asthma, aspirin sensitivity, diabetes, or hypertension was considered. A family history of similar complaints was also recorded. Personal habits regarding smoking and alcohol intake were also considered. Vital parameters were recorded, and systemic examination of the central nervous, cardiovascular, and respiratory systems and per abdominal examination were carried out.

The ENT examination of the nose includes external examination for nasal deformities, para-nasal sinus tenderness, septum deviation, airway tests, and nasal mucosa examination. Oral cavity and oropharynx examination include buccal mucosa, tongue and dentition, anterior pillars and tonsil examination, and indirect laryngoscopic examination for pathology. Ear examination includes post auricular area and pinna examination for operative scar or mastoid tenderness, external auditory canal examination for wax, debris, or discharge, and tympanic membrane examination for motility, colour, lustre, perforation, and discharge.

Routine haematological and biochemical examinations were carried out (Hb%, TLC, DLC, BT, CT, Urine-routine and microscopy. Blood sugar: fasting and postprandial, BUN, Serum creatinine, when patients above 40 years or with a history of DM or HTN). X-ray PNS-Water view was used to assess the condition of the septum, inferior turbinates, air-fluid levels, and haziness or opacification of the sinuses. Non-contrast CT PNS was done to assess the extent of disease, condition of OMU, degree of opacification of sinuses, bony erosion and roof of the ethmoids, among others, assessing the level of the anterior skull base, degree of pneumatization of ethmoids and its encroachment to the surrounding bones like Haller cells, Onodi cells, Concha bullosa. This was considered the surgical roadmap before sinus surgery.

Two senior surgeons performed surgical procedures in Operation Theater under strict aseptic precautions, following guidelines formulated by Messerklinger and Stammberger.^[10] The procedures included uncinctomy, middle turbinate reduction, Middle Meatal Antrostomy, anterior and posterior ethmoidectomy, sphenoidotomy, and frontal sinusotomy. The surgery depended on the laterality and extent of the disease. After surgery, haemostasis was achieved, and the nose was packed with a Merocel nasal pack. Patients were started on antibiotics, NSAIDs, oral decongestants, and antacids postoperatively. Nasal packs were removed 24 to 48 hours after surgery, and local decongestants and alkaline nasal douching were started. Patients were sent home on the second or third postoperative day with medications for an additional five days and asked to return for review at the end of one week.

During the postoperative follow-up, the patient was asked to come once a week for the first month and once a month for the next two months. During each time endoscopy was done, crusts were removed, and suction clearance of the secretions was done. A postoperative questionnaire regarding improvement of symptom profile was done three weeks post-op and three months post-op, and improvement in scoring for each symptom as mild or moderate or marked improvement or no improvement depending on the degree of down scoring for each symptom were considered. Alkaline nasal douching was continued for the initial two to four weeks, depending upon the amount of crusting seen during the follow-up nasal endoscopic examination [Figure 1]. All the above results were tabulated, and the symptoms before and after FESS were compared statistically using the Chi-Square test.

RESULTS

Table 1 indicates the predominance of male patients, with a significant number presenting with symptoms for six months to 1 year. Mucopus is a common finding in both anterior rhinoscopy and preoperative diagnostic nasal endoscopy.

Opacification is more common in the ethmoid sinuses and left maxillary sinus. The right frontal sinus is less commonly opacified than the left frontal sinus. The right sphenoid sinus was more commonly opacified than the left [Table 2].

Nasal obstruction showed that a majority of patients experienced severe or very severe nasal obstruction, with 82.4% and 50% reporting these severities on the right and left sides, respectively. Nasal discharge showed a significant number of patients had moderate to very severe nasal discharge, with 75% experiencing very severe discharge on the left side. Postnasal dripping was next common symptom which was severe and reported by 38.9% of patients on the right side. Ear discharge showed that most patients reported moderate to very severe ear discharge, with 56.3% experiencing very severe discharge on the left side [Table 3].

Most patients reported severe to very severe rhinorrhea, with 58.3% experiencing severe symptoms. With Sneezing, 53.8% of the patients experiencing severe symptoms. In Headaches, 57.1% of the patients were experiencing severe symptoms. With Cough, 33.3% of patients experiencing moderate symptoms. Most patients experienced a moderate to severe decrease in smell sensation, with 84.2% experiencing severe symptoms. Fatigue was found with 21.9% of patients experiencing severe symptoms. Bodily pain, with 40% experiencing mild-to-moderate symptoms [Table 4].

The study found that 66.7% of patients reported significant improvement in nasal obstruction, 61.7% reported good nasal discharge, and 16.7% reported the best improvement postoperatively. However,

61.7% of patients reported no improvement in rhinorrhea, 48.3% reported no improvement in sneezing, 53.3% reported improvement in nasal drip, 26.7% reported no improvement in headaches, and 61.7% reported no improvement in cough. Facial pain was also unresolved, with 18.3% reporting no improvement and 28.3% reporting only mild improvement. Lastly, 61.7% of patients reported improvement with ear discharge. And most reported no postoperative improvement in fatigue and bodily pain. The study suggested about all significant postoperative outcomes with nasal obstruction, nasal discharge, rhinorrhea, sneezing, cough, decreased smell, facial pain, ear discharge, fatigue, and bodily pain [Table 5].

Most patients reported moderate to marked improvements in nasal obstruction, discharge, postnasal dripping, decreased smell sensation, and ear discharge. However, a significant number of patients reported no or mild postoperative improvement in rhinorrhea, sneezing, headache, cough, facial pain, fatigue, and bodily pain [Table 6].

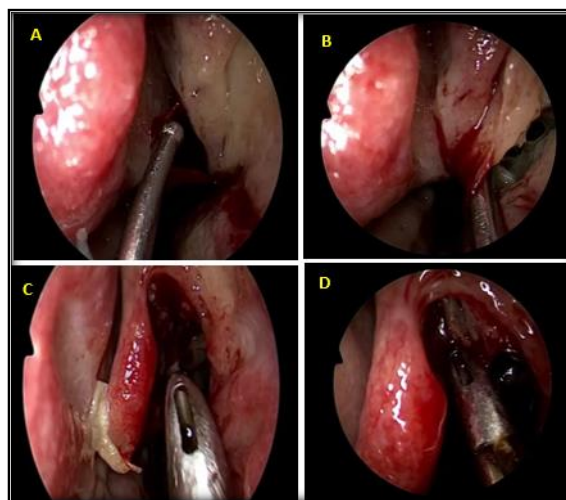


Figure 1: FESS is in progress and Endoscopic picture A). Using ball probe uncinete process delineation, B) Uncinectomy, C) Middle meatal antrostomy, D) Anterior Ethmoidectomy.

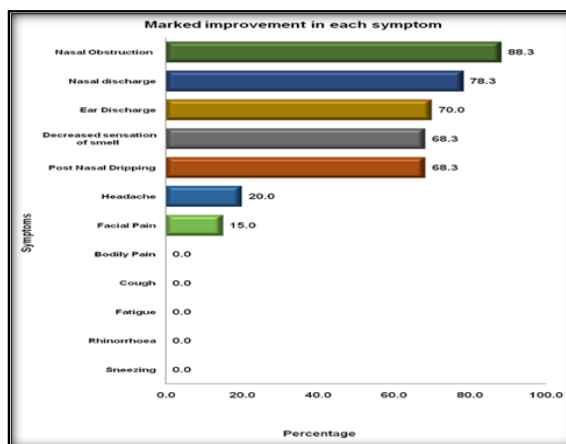


Figure 2: Percentage of patients facing marked improvement in individual symptoms

Table 1: Demographic data of the study

		Number	Percentage
Age range	20-30	25	41.67
	30-40	20	33.33
	40-50	13	21.67
	50-60	2	3.34
Sex	Male	38	63.34
	Female	22	36.66
Duration of Symptoms	3 to 6 months	20	33.3
	6 months to 1 year	28	46.7
	1 year to 2 years	10	16.7
	> 2 years	2	3.3
Anterior Rhinoscopy Findings	DNS	10	16.7
	Inferior turbinate hypertrophy	10	16.7
	Pale boggy mucosa	2	3.3
	Congested mucosa	4	6.7
	Polyps	2	3.3
	Mucopus	56	93.3
Preoperative Diagnostic Nasal Endoscopic Findings	DNS	10	16.7
	Polyps	2	3.3
	Mucopus	58	96.7
	Paradoxical middle turbinate	8	13.3
	Bulbous Middle turbinate	14	23.3
	Accessory ostia	2	3.3
Type of Procedure	Uncinectomy	60	100
	Middle Meatal Antrostomy	60	100
	Anterior Ethmoidectomy	60	100
	Posterior Ethmoidectomy	60	100
	Sphenoidotomy	20	33.3
	Frontal Recess Drainage	32	53.3
	Septal Correction	10	16.7
	Reduction of the middle turbinate (Conchoplasty)	14	23.3
	Out Fracturing of Middle Turbinate	8	13.3
	Polypectomy	2	3.3

Table 2: CT Plain of the PNS

Sinuses	Right		Left	
	Normal	Opacified	Normal	Opacified
Anterior Ethmoids	4 (6.7%)	56 (93.3%)	3 (5%)	57 (95%)
Posterior Ethmoids	4 (6.7%)	56 (93.3%)	3 (5%)	57 (95%)
Maxillary Sinus	2 (3.3%)	58 (96.7%)	4 (6.7%)	56 (93.3%)
Frontal Sinus	34 (56.7%)	26 (43.3%)	40 (66.7%)	20 (33.3%)
Sphenoid Sinus	46 (76.7%)	14 (23.3%)	50 (83.3%)	10 (16.7%)

Table 3: Nasal Obstruction/ Discharge / Post Nasal Dripping / Ear Discharge Pre-Op

Three Month Duration	Nasal Obstruction/ Discharge / Post Nasal Dripping / Ear Discharge Pre-Op			
	Mild	Moderate	Severe	Very Severe
Nasal Obstruction	-	-	28 (82.4%)	13 (50%)
	-	-	6 (17.6%)	12 (46.2%)
	-	-	0	1 (3.8%)
Nasal Discharge	0	5 (71.4%)	36 (75%)	2 (50%)
	1 (100%)	2 (28.6%)	9 (18.8%)	1 (25%)
	0	0	3 (6.3%)	0
	0	0	0	1 (25%)
Post Nasal Dripping	2 (100%)	4 (100%)	14 (38.9%)	1 (5.6%)
	0	0	16 (44.4%)	9 (50%)
	0	0	1 (2.8%)	4 (22.2%)
	0	0	5 (13.9%)	4 (22.2%)
Ear Discharge	2 (100%)	5 (71.4%)	14 (40%)	4 (25%)
	0	1 (14.3%)	16 (45.7%)	9 (56.3%)
	0	1 (14.3%)	5 (14.3%)	2 (12.5%)
	0	0	0	1 (6.3%)

Table 4: Rhinorrhoea/ Sneezing/ Headache/ Cough/ Decreased sensation of smell/ Facial Pain/ Fatigue/ Bodily Pain: Pre-Op

Three Month Duration	Rhinorrhoea/ Sneezing/ Headache/ Cough/ Decreased sensation of smell/ Facial Pain/ Fatigue/ Bodily Pain: Pre-Op					
	No Problem	Very Mild	Mild	Moderate	Severe	Very Severe
Rhinorrhoea	7 (100%)	7 (77.8%)	7 (58.3%)	1 (12.5%)	1 (4.3%)	0

	0	2 (22.2%)	4 (33.3%)	1 (12.5%)	1 (4.3%)	0
	0	0	1 (8.3%)	2 (25%)	9 (39.1%)	0
	0	0	0	4 (50%)	12 (17.4%)	0
	0	0	0	0	0	1 (100%)
Sneezing	9 (100%)	7 (53.8%)	0	1 (7.7%)	0	0
	0	6 (46.2%)	2 (18.2%)	2 (15.4%)	0	0
	0	0	9 (81.8%)	6 (46.2%)	1 (9.1%)	0
	0	0	0	4 (30.8%)	9 (81.8%)	1 (33.3%)
	0	0	0	0	1 (9.1%)	2 (66.7%)
Headache	2 (100%)	0	2 (100%)	4 (57.1%)	12 (31.6%)	3 (30%)
	0	1 (100%)	0	1 (14.3%)	10 (26.3%)	5 (50%)
	0	0	0	1 (14.3%)	5 (13.1%)	1 (10%)
	0	0	0	1 (14.3%)	11 (28.9%)	1 (10%)
Cough	14 (100%)	3 (33.3%)	2 (16.7%)	2 (10%)	0	-
	0	6 (66.7%)	25	2 (10%)	0	-
	0	0	7 (58.3%)	7 (35%)	0	-
	0	0	0	9 (45%)	4 (80%)	-
	0	0	0	0	1 (20%)	-
Decreased sensation of smell	2 (100%)	3 (100%)	8 (100%)	16 (84.2%)	17 (68%)	1 (33.3%)
	0	0	0	1 (5.3%)	6 (24%)	2 (66.7%)
	0	0	0	2 (10.5%)	2 (8%)	0
Facial Pain	32 (100%)	4 (100%)	3 (100%)	0	0	0
	0	0	0	1 (16.7%)	1 (8.3%)	0
	0	0	0	5 (83.3%)	7 (58.3%)	0
	0	0	0	0	4 (33.3%)	3 (100%)
Fatigue	14 (100%)	-	0	1 (8.3%)	1 (3.1%)	0
	0	-	0	0	1 (3.1%)	0
	0	-	1 (100%)	10 (83.3%)	13 (40.6%)	0
	0	-	0	1 (8.3%)	10 (31.3%)	0
	0	-	0	0	7 (21.9%)	1 (100%)
Bodily Pain	49 (100%)	4 (100%)	-	0	0	-
	0	0	-	1 (20%)	0	-
	0	0	-	2 (40%)	2 (100%)	-
	0	0	-	2 (40%)	0	-

Table 5: Improvement scores of individual symptoms from baseline at the end of follow-up

Overall improvement from OP to 3-month	No (0)	Mild (+1)	Moderate (+2)	Good (+3)	Better (+4)	Best (+5)
Nasal Obstruction	0	0	0	7 (11.7%)	40 (66.7%)	13 (21.7%)
Nasal discharge	0	0	6 (10%)	7 (11.7%)	37 (61.7%)	10 (16.7%)
Rhinorrhoea	37 (61.7%)	4 (6.7%)	17 (28.3%)	2 (3.3%)	0	0
Sneezing	29 (48.3%)	14 (23.3%)	16 (26.7%)	1 (1.7%)	0	0
Post Nasal Dripping	0	2 (3.3%)	7 (11.7%)	12 (20%)	32 (53.3%)	7 (11.7%)
Headache	16 (26.7%)	14 (23.3%)	5 (8.3%)	13 (21.7%)	12 (20%)	0
Cough	37 (61.7%)	10 (16.7%)	11 (18.3%)	2 (3.3%)	0	0
Decreased sensation of smell	0	4 (6.7%)	7 (11.7%)	6 (10%)	30 (50%)	13 (21.7%)
Facial Pain	11 (18.3%)	17 (28.3%)	9 (15%)	14 (23.3%)	9 (15%)	0
Ear Discharge	0	1 (1.7%)	6 (10%)	11 (18.3%)	37 (61.7%)	5 (8.3%)
Fatigue	32 (53.3%)	14 (23.3%)	9 (15%)	5 (8.3%)	0	0
Bodily Pain	50 (83.3%)	5 (8.3%)	2 (3.3%)	3 (5%)	0	0

Table 6: Percentage of patients having mild/moderate/marked improvement for individual symptoms

Overall improvement from OP to 3-month	No/Mild Improvement	Moderate Improvement	Marked Improvement
Nasal Obstruction	0	7 (11.7%)	53 (88.3%)
Nasal discharge	0	13 (21.7%)	47 (78.3%)
Rhinorrhoea	41 (68.3%)	19 (31.7%)	0
Sneezing	43 (71.7%)	17 (28.3%)	0
Post Nasal Dripping	0	19 (31.7%)	41 (68.3%)
Headache	30 (50%)	18 (30%)	12 (20%)
Cough	47 (78.3%)	13 (21.7%)	0
Decreased sensation of smell	6 (10%)	13 (21.7%)	41 (68.3%)
Facial Pain	28 (46.7%)	23 (38.3%)	9 (15%)
Ear Discharge	1 (1.7%)	17 (28.3%)	42 (70%)
Fatigue	46 (76.7%)	14 (23.3%)	0
Bodily Pain	55 (91.7%)	5 (8.3%)	0

DISCUSSION

The symptoms that showed the marked improvement in the majority of the subjects were nasal obstruction

(88.3%), nasal discharge (78.3%), post nasal dripping (68.3%), ear discharge (70%), decreased sensation of smell (68.3%) and which showed no or mild improvement were, headache, cough, rhinorrhea,

sneezing, facial pain, those symptoms associated with allergic rhinitis. The non-specific symptoms, such as fatigue and bodily pain, largely depend on the symptoms, which showed little improvement. So, they also showed poor improvement compared to poorly improved symptoms. In a few proportions of the subjects in whom these symptoms showed a moderate improvement, the patients said they experienced marked improvement of these non-specific symptoms like fatigue and bodily pain.

CONCLUSION

In conclusion, patients who visit the ENT outpatient department diagnosed with chronic rhinosinusitis generally present with various symptoms. It's critical to analyse which symptoms they give priority to. Suppose their priority is directed to the symptoms, which showed a marked improvement at the end of this study. In that case, a patient can be assured of a good quality of life after undergoing endoscopic sinus surgery to improve the ailment for which they sought a surgical intervention. Similarly, for those patients presenting with predominant symptoms of allergy with chronic rhinosinusitis, such as sneezing, rhinorrhoea, dry cough, headache or facial pain, it's better not to subject them to surgery, taking into consideration the results of this study about these symptoms. Thus, anti-allergic treatment measures should be the first management line before planning any surgical intervention for such patients.

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