

Original Research Article

A Hospital Based Prospective Study of Impact of Endoscopic Sinus Surgery on Symptoms Manifestations of Chronic Rhino Sinusitis**Hari Singh Khedar^{1*}, Punit Kumar Lamoria², Anand³**¹*Associate Professor, Department of Otorhinolaryngology, Government S. K. Medical College, Sikar, Rajasthan, India*²*Senior Demonstrator, Department of Preventive & Social Medicine, Government S. K. Medical College, Sikar, Rajasthan, India*³*Junior Resident, Department of Otorhinolaryngology, NIMS Medical College, Jaipur, Rajasthan, India***Received: 10-06-2021 / Revised: 16-10-2021 / Accepted: 14-12-2021****Abstract**

Background: FESS has gained popularity and continues to do so among the ENT surgeons in the recent years with the better understanding of the lateral wall of the nose. Most cases of chronic rhinosinusitis 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. The aim of this study to assess the impact of endoscopic sinus surgery on symptoms manifestations of chronic rhino sinusitis. **Materials & Methods:** A hospital based prospective study done on 50 patients attending ENT Outpatient Department at government medical college Sikar, Rajasthan, with clinical features and investigations suggestive of CRS were randomly selected. Patients with at least two major, or one major and two minor criteria/sinus symptoms were considered. All their symptoms were graded preoperatively as mild (1) moderate (2) or severe (3) (grade 0 allotted for no symptoms). Endoscopic examination was performed preoperatively and at each postoperative visit. **Results:** The average age of the patients in the study was 39 years, 32 patients were males (64%) and 18 patients were females (36%). The average duration of the patients was 5 years and 3 months. Bilateral disease was observed in 46 patients and 4 patients had unilateral disease two in the right and other two in the left. The most common symptom was nasal obstruction (N=43, 86%) from the major criteria followed by headache (N=40, 80%) from the minor criteria. Post operatively the patient satisfaction over-all based on the symptom profile was high. 86% of the patients in the study felt Much Better (p value <0.001) after the treatment with FESS. **Conclusion:** We concluded that FESS is the best available treatment modality for Chronic Rhinosinusitis. Symptomatic relief was successfully established in 86% of patients who fail to respond to medical treatment.

Keywords: FESS, CRS, Nasal Endoscopy, Symptoms.

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Introduction

Sinusitis is a common problem that leads to a significant amount of health care expenditure due to direct costs of physician visits and antibiotics as well as indirect costs related to reduced productivity and a decrease in quality of life[1,2]. The cornerstone of accurate diagnosis and treatment of chronic rhinosinusitis (CRS) is a thorough history, complete physical examination including nasal endoscopy and computed tomographic (CT) analysis[3].

In 1907, Hirschmann used a modified cystoscope to examine the middle meatus and study sinus ostia[4]. The most significant development in nasal endoscopy was noticed during 1950's when Hopkins developed solid rod lens with proximal cold light source. In the latter part of twentieth century sinonasal endoscopy has been established as an important component in our diagnostic and therapeutic armamentarium[5].

Modern endoscopic sinus surgery is arbitrarily divided into Messerklinger[5] and Wigand[6] approaches.

The ideal approach for disease involving the anterior ethmoids, may or may not involving the maxillary and frontal sinus is Messerklinger approach (1985)[5] which is from anterior to posterior. If the sphenoid sinus, posterior ethmoids and frontal are involved, procedure can be extended. The Wigand approach (1978)[6] in contrast to above, is ideal for patients with pansinusitis who may not respond to limited surgery. It involves routinely clearance of disease in all sinuses in a posterior to anterior approach.

FESS has gained popularity and continues to do so among the ENT surgeons in the recent years with the better understanding of the lateral wall of the nose. Chronic rhinosinusitis is one of the most frequent otolaryngologic diseases encountered in routine ENT practice. The diagnosis of chronic rhinosinusitis is made by a variety of physicians including primary care physicians, general physicians, pediatricians, pulmonologists and otolaryngologists[7].

Chronic rhinosinusitis is one of the commonest conditions for which antibiotics are prescribed. Most cases of chronic rhinosinusitis 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[7]. The aim of this study to assess the impact of endoscopic sinus surgery on symptoms manifestations of chronic rhino sinusitis.

Materials & methods

A hospital based prospective study done on 50 patients attending ENT Out Patient Department at government medical college Sikar, Rajasthan, with clinical features and investigations suggestive of CRS

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were randomly selected after applying the following inclusion and exclusion criteria:

Inclusion Criteria

- 1) All cases of CRS, including allergic and infective, with symptoms for at least 6 weeks.
- 2) Patients' refractory to medical treatment for a minimum of 6 weeks.
- 3) Patients more than 12 yrs of age.

Exclusion Criteria

- 1) Gross DNS.
- 2) Previous nasal surgeries.
- 3) Complications of Chronic sinusitis.
- 4) Growth in the nasal cavity, benign or malignant, except nasal polyps.

Methods

The patients were clinically evaluated and followed up with endoscopic nasal examination and preoperative CT scans. Before surgery each patient completed a questionnaire, which catalogued symptoms of CRS. The patients graded the severity of the major symptoms (nasal obstruction, nasal discharge, loss of smell, nasal bleeding, headache, facial pain and posterior nasal drip) before and after surgery.

Patients with at least two major, or one major and two minor criteria/sinus symptoms were considered. All their symptoms were graded preoperatively as mild (1) moderate (2) or severe (3) (grade 0 allotted for no symptoms).

Mild grade - symptoms not disturbing sleep or day-to-day activities;

Moderate - symptoms disturbing day- to- day activities, with occasional absence from work or disturbed sleep;

Severe - symptoms disturbing day- to- day activities, with absence from work and disturbed sleep.

Endoscopic examination was performed preoperatively and at each postoperative visit. We used endoscopic staging proposed by Lund-Kennedy to assess the following parameters: nasal mucosal edema (0: absent, 1 : minimal, 2: gross), presence of secretion (0 : absent, 1 : thin, 2 : purulent) and presence of polyps (0 : absent, 1 : present in meatus, 2 : present in nasal cavity but not obstructing airway, 3 : nasal cavity with obstruction of airway).⁸

This assessment was performed with the total points corresponding to the sum of values obtained in both sides and ranged from 0-14. CT scans were evaluated preoperatively as per Lund- Mackay score (0: no opacity, 1: partial opacity, 2: total opacity).⁸

Surgical Procedure

The surgical procedures were performed along the guidelines described by Messerklinger[5] and Stammberger[6]. The various procedures performed were uncinectomy, middle turbinate reduction, MMA, anterior ethmoidectomy, posterior ethmoidectomy, sphenoidotomy and frontal recess clearance. The various surgical procedures performed depended upon the laterality and the extent of the disease. At the end of the surgery, haemostasis was achieved and the nose packed with Merocel nasal pack only when the surgery was limited to the ground lamella. When the surgery extended beyond the ground lamella the nose was packed with medicated ribbon gauze (BIPP or Soframycin with betadine) in addition to the Merocel nasal pack. Post-operatively patients were started on appropriate antibiotics (e.g. Ampicillin), NSAIDs, oral decongestants and antacids. Nasal packs were removed 24 to 48 hours after the surgery depending on the extent of surgery. Local decongestants and alkaline nasal douching (common salt-50 gm, sodium bicarbonate-25 gm and sodium bitorate-25 gm in 250 ml of sterile water) was started. The patients on the second post operative day or third post operative day were discharged with above medications for an additional 5 days and asked to come back for review at the end of one week.

During the postoperative follow-up, the symptoms were assessed using the following grades: much better (+2), better (+1), no change (0), worse (-1) and much worse (-2). Nasoendoscopic suction toilet was also performed during which the healing of the cavities and patency of the ostia were monitored. Recurrence of the disease, and presence of crusts, synechiae and mucopus were also observed. Grading of symptoms, and nasoendoscopic suction toilet was done at the end of second week, third week, fourth week, second month and third month. From second week onwards, local intra nasal steroid sprays were started (Fluticasone/mometasone/ beclomethasone), especially in patients with extensive polyposis or with allergic etiology, and continued for three months. Alkaline nasal douching was continued for the initial two to four weeks depending upon the amount of crusting seen during the follow-up naso-endoscopic examination. Oral steroids (prednisolone) were started preoperatively only for extensive polyposis, to reduce their bulk, and postoperatively for recurrences of the disease. All the above results were tabulated and the symptoms before and after FESS compared statistically using Chi-Square test.

Results

The average age of the patients in the study was 39 years and the range was between 15 to 60 years. 32 patients were males (64%) and 18 patients were females (36%) in our study. The duration of symptoms was ranging from 3 months to 20 years and the average duration of the patients was 5 years and 3 months. Bilateral disease was observed in 46 patients and 4 patients had unilateral disease two in the right and other two in the left (table 1).

Table 1: Demographic profile of patients

Demographic profile	No. of patients	Percentage
Gender		
Male	32	64%
Female	18	36%
Age group (yrs)		
15-30 yrs	15	30%
31-45 yrs	20	40%
46-60 yrs	15	30%
Duration of symptoms		
3 months-1 year	8	16%
1-5 yrs	25	50%
6-10 yrs	15	30%
11-15 yrs	1	2%
16-20 yrs	1	2%
Avg. duration of symptoms	5 yrs 3 months	

All the patients in the study were given extensive medical treatment before subjecting them to surgery. It included antibiotics, local and systemic decongestants and steroids (topical and intra-nasal). The most common symptom was nasal obstruction (N=43, 86%) from the major criteria followed by headache (N=40, 80%) from the minor criteria (table 2 & 3).

Table 2: Pre Operative Symptom Profile – Major Criteria

Major Criteria	No Symptom (0)	Mild (1)	Moderate (2)	Severe (3)	Percentage
Nasal Obstruction	7	2	6	35	43 (86%)
Facial Pain/Pressure	13	3	3	31	37 (74%)
Post-Nasal Drip	15	4	10	21	35 (70%)
Anosmia	12	5	18	15	38 (76%)
Nasal Discharge	27	4	4	15	23 (46%)
Fever (Acute) (Acute)	50	0	0	0	0%

Table 3: Pre Operative Symptom Profile – Minor Criteria

Minor Criteria	No Symptom (0)	Mild (1)	Moderate (2)	Severe (3)	Percentage
Headache	10	3	6	31	40 (80%)
Halitosis	37	6	4	3	13 (26%)
Dental Pain	45	3	0	2	5 (10%)
Cough	45	3	0	2	5 (10%)
Ear Ache	47	2	0	1	3 (6%)
Ear Fullness	35	10	3	2	15 (30%)
Fever	50	0	0	0	0

Clinical examination of the patients was done and the anterior rhinoscopy findings are listed. Posterior rhinoscopy was also done which revealed polyps extending to the choanae in 8 patients with polyps (table 4).

Table 4: Anterior Rhinoscopy Findings

Structures	No Of Patients	Percentage
Mild DNS	7	14%
Inferior Turbinate Hypertrophy	10	20%
Pale Boggy Mucosa	20	40%
Congested Mucosa	1	2%
Polyps	28	56%
Mucopus	17	34%

X-ray PNS was done in all patients which showed mild DNS in 7 patients and septum in the center in 43 patients (table 5).

Table 5: X Ray Findings of PNS

Sinuses	Right			Left		
	Normal	Haziness	Opacified	Normal	Haziness	Opacified
Maxillary Sinus	15	22	13	10	23	17
Frontal Sinus	25	17	8	23	16	11

Post operatively the patient satisfaction over-all based on the symptom profile was high. 86% of the patients in the study felt Much Better (p value <0.001) after the treatment with FESS. One patient (2%) had no change and three patients (6%) felt worse after surgery. The scoring category of no change, worse and much worse were considered to be failures in the post operative period. Thus, the observations and results showed that FESS was the best and effective treatment modality for chronic rhinosinusitis alleviating most of the symptoms improving physical quality of life (graph 1).

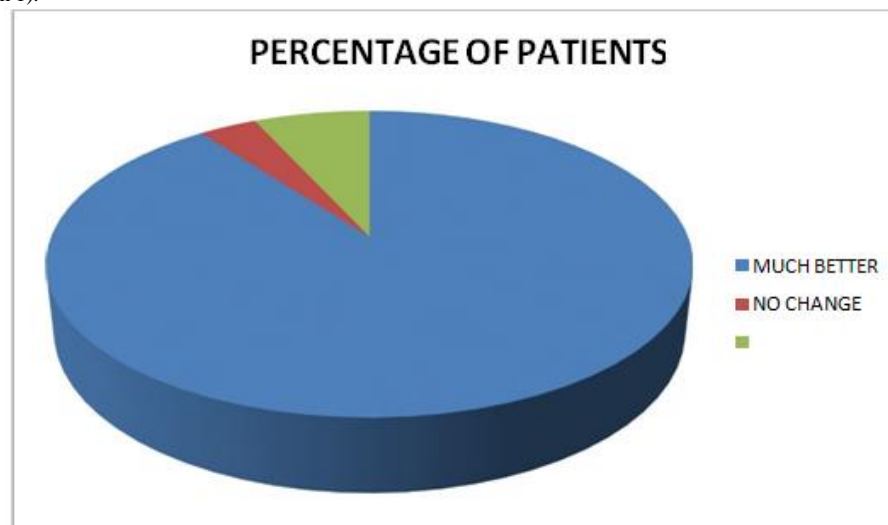


Figure 1: Overall Patient Satisfaction Post Operatively After Six Months Follow Up

Discussion

Chronic Rhinosinusitis is one of the most common diseases in many parts of the world including India. The prevalence of CRS is on the rise posing a serious health care problem in the society and hence a proper evaluation of the disease and its treatment modality by testing its effectiveness is very much needed.

The most important part of evaluation remains history. This includes nasal obstruction (N=43, 86%), which was the commonest symptom in our patients, followed by anosmia (N=38, 76%), facial pressure/pain (N=37, 74%), post-nasal drip (N=35, 70%), & purulent nasal discharge (N= 23, 46%). Fever was not one of the presenting complaints in any of the patients. Symptoms of minor criteria were headache (N=40, 80%), ear fullness (N=15, 30%), halitosis (N=13, 26%), dental pain (N=5, 10%), cough (N=5, 10 %) and earache (N=3, 6%).

Post operatively, 88% of patients with nasal obstruction as a symptom showed marked improvement. 86 % of patients with headache, 86 % of pts with anosmia, 86 % pts with facial pain / pressure, 84% pts with post-nasal drip and 76% pts with nasal discharge as a major symptom showed marked improvement post- FESS after 3 months follow up. 100 % improvement was observed after FESS with all the minor symptoms. The symptom that responded the least among the major symptoms was purulent nasal discharge and the best one was nasal obstruction. The findings of our study were consistent with many other similar series of study. The percentage of patients in the study who showed marked improvement after FESS and good symptom relief and satisfaction is 86% and they required no medical treatment after 6 month follow up.

Brain L Mathew et al (1991)[9] documented nasal obstruction as the commonest symptom (n=146, 96%) followed by postnasal drip (n=143, 92%), & facial pain/headache (n=139-90%). Overall, 140 patients (91%) believed that surgery was beneficial. Patients with facial pain preoperatively showed greatest improvement.

Jakobsen J and Svendstrup F (2000)[10] conducted a prospective study on 237 consecutive patients suffering from chronic sinusitis and /or nasal polyposis. Nasal obstruction was the most frequent symptom (61%) followed by purulent nasal discharge, anosmia, frontal pain, headache and maxillary pain. Duration of symptoms averaged 9.3 years. At the end of 1 year follow up, 45% were totally satisfied with the results and were symptom-free, and 44% more definitely feeling better.

FESS is an effective and safe procedure when performed by surgeons experienced in the technique. In inexperienced hands, the major complications that may occur after FESS are CSF leak, intracerebral hemorrhage, diplopia, blindness, meningitis, severe nasal hemorrhage and intracranial penetration. In our study, there were no major complications recorded. The most common minor complication was post-operative bleeding (N=6), which was managed successfully with nasal packing. Synechiae (N=5) were the next common complication, which were released during the postoperative follow-up. The breach of lamina papyracea was the only minor complication that occurred in one patient and this patient subsequently developed periorbital emphysema, after he blew his nose inadvertently on the second post-operative day. The patient was treated conservatively, and he subsequently improved without any sequelae. Our complication rates are the same as reported by other authors. Average postoperative healing time was 3 to 8 weeks. A few (N=8, 16%) of them required 12 weeks, during which time regular nasal toilet was done to remove crusts/debris.

Schaffer SD et al [11], in his study noticed minor complications in 14 patients, the most common complication being synechiae between middle turbinate and septum in 6 patients, resulting in revision surgery in four patients. In the series conducted by Howard L. Levine (1990)[12] 8.3% developed minor complications and 0.7% developed major complications.

Hemorrhage occurred postoperatively in 2 patients (1.5%) in the

study done by Brain L Mathew et al (1991)[9]. Nasser A Fageeh et al [14] recorded minor complications like mild to moderate nasal bleeding, synechiae & facial swelling. One major complication in the form of internal carotid artery rupture was noted. Jakobsen J and Svendstrup F (2000)[10] came across no serious complications 16, while Roth Y et al (1995)[14] observed 17% complications (all minor). Another study done by Terris MH and Davidson TM (1999)[15] in their series recorded major complications in 1.6% of the patients.

Conclusion

We concluded that FESS is the best available treatment modality for Chronic Rhinosinusitis. Symptomatic relief was successfully established in 86% of patients who fail to respond to medical treatment.

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