

Original Research Article

Effect of functional endoscopic sinus surgery on the symptom profile in chronic rhinosinusitis cases

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ABSTRACT

Background: Chronic rhinosinusitis (CRS) is a common chronic disease, that have considerable impact on quality of life, functional and emotional impairments of affected beings. Post-surgical improvement of quality of life indicates the surgical success. Functional endoscopic sinus surgery (FESS) is the dominating surgical procedure for CRS. This study was designed to assess the symptom profile of patient before and after surgery and the complications after FESS in the post-operative period.

Methods: A total of 50 cases attending ENT outpatient department with clinical features and investigations suggestive of chronic sinusitis with infective pathology were randomly considered for this study. Cases were assessed for CRS symptoms pre and post operatively using grading symptoms.

Results: Common major symptom was nasal obstruction (93.3%, N=28) followed by post nasal drip (83.33%, N=25), purulent nasal discharge (76.66%, N=23), facial pain/pressure (66.66%, N=20) and hyposmia (60%, N=18). None of the patients reported fever and facial congestion or fullness. Post operatively, cases with nasal obstruction (92.8%), purulent nasal discharge (86.9%), facial pain or pressure (85%), headache (81.8%), post nasal drip (84%), ear pain or fullness or pressure (92.8%) and hyposmia (61.1%) showed improvement after FESS at the end of three follow-up.

Conclusions: The most common symptom pre operatively was nasal obstruction which also responded best to FESS, along with all the other minor symptoms including headache. The results of this study confirm that FESS is an excellent method of treatment in patients with CRS refractory to medical treatment.

Keywords: Functional endoscopic sinus surgery, Chronic rhino sinusitis, Symptom profile, Pre and post-operative

INTRODUCTION

Chronic rhinosinusitis (CRS) is termed as inflammation of the nose and paranasal air sinuses persists for longer than 12 weeks which disturbs the quality of life of patients. CRS is rapidly growing than hypertension and arthritis, even like chronic problems, vascular complication and diabetes mellitus.^{1,2} CRS is common chronic diseases, has considerable impact on quality of life, functional and emotional impairments of suffered cases and is associated with a high socioeconomic

burden.^{3,4} The prevalence ranged from 2 to 16% and 10% in the UK.⁵ Functional endoscopic sinus surgery (FESS) has become established surgical strategy for CRS refractory to the medical management.⁶ Current transnasal approaches aim to remove bony sinus partitions and debulk polypoid mucosa, thereby allow in restoration of mucociliary clearance through the natural drainage pathways. This approach significantly reduces morbidity and provides satisfactory results when combines with appropriate medical therapy. The present study is an attempt to assess the symptom profile of

patients with chronic rhinosinusitis undergoing FESS and evaluate the post-operative complications after the surgery.

METHODS

The present study was conducted in the Department of ENT, Gandhi hospital, Secunderabad during April 2014 to June 2015. A total of 50 Cases attending ENT outpatient department with clinical features and investigations suggestive of chronic sinusitis with infective pathology was randomly considered for this study. Cases of chronic rhino sinusitis with infective pathology with symptoms for at least 12 weeks, cases under medication for minimum 6 weeks and above 18 years of age were included. Cases with a history of nasal surgeries, benign or malignant growth in the nasal cavity, CRS with allergic pathology and less than 18 years of age were excluded from the study.

Informed consent was obtained from all the cases and study protocol was approved by the institutional ethics committee. All the subjects were undergone to general and systemic examination to know cardiovascular complications, nervous system complications, respiratory complications and per abdominal examination. Local examination of nose and PNS (external nasal profile, DNS, airway patency, appearance of nasal mucosa and inferior turbinate), routine hematological, biochemical examinations and radiological examination (X-ray PNS, X-ray chest PA view, ECG and diagnostic nasal endoscopy) was conducted.

Pre operatively, based on symptoms cases were graded into grade 0- no symptoms, grade 1- mild, grade 2- moderate and grade 3- severe. The diagnosis and extent of the disease is established and the patient is taken up for surgery after a pre- anaesthetic evaluation. The surgical procedures done were uncinectomy, conchoplasty, middle meatal antrostomy, anterior ethmoidectomy, sphenoidotomy and frontal recess clearance. Depended upon the laterality and the extent of disease surgical procedure was performed. During the post-operative follow up, the symptoms were assessed by using the following grades: score -2 (much worse), score -1 (worse), score 0 (no change), score +1 (better), score +2 (much better). The data was collected into Microsoft Office Excel 2010. The processes of exporting the coded data from excel to SPSS was employed.

RESULTS

A total 30 patients were evaluated in the study using the above methodology. The average age was 39 years, the range being 20 to 70 years (Figure 1). 63.33% (N=19) of the patients in this study were males, and 36.66% (N=11) were females (Figure 2). Among the total cases, 29 had bilateral symptoms and 1 had unilateral on left side.

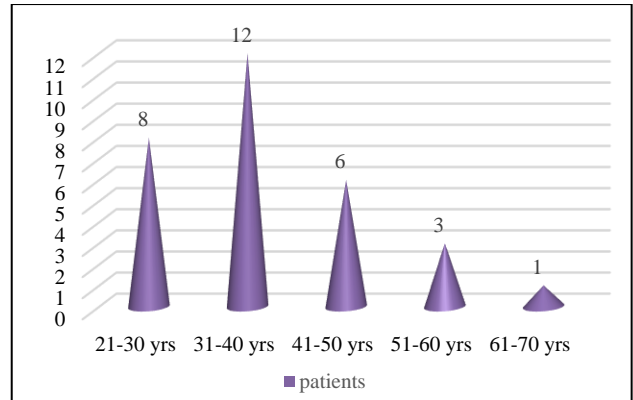


Figure 1: Age wise distribution of study cases.

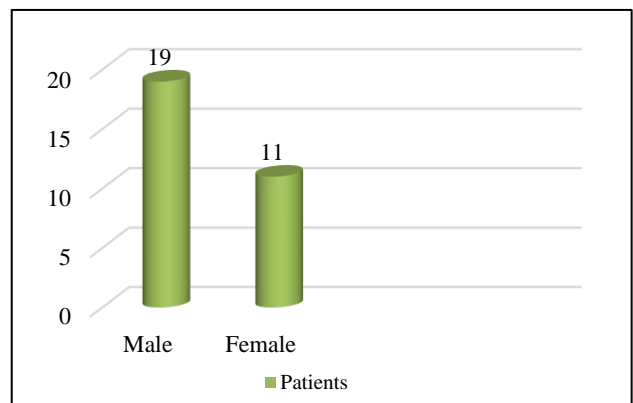


Figure 2: Gender wise distribution of study cases.

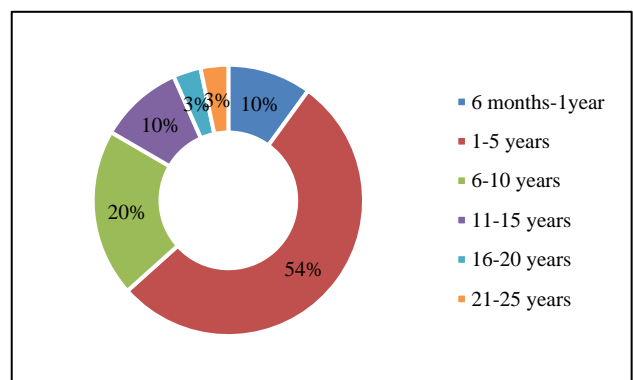


Figure 3: Duration of symptoms in the study participants.

The average duration of symptoms was 3 years and 2 months with a range of 6 months to 25 years (Figure 3). The commonest symptom was nasal obstruction (93.33%, N=28) followed by post nasal drip (83.33%, N=25). Other symptoms noted are purulent nasal discharge (76.66%, N=23), headache (73.33%, N=22), facial pain/pressure (66.66%, N=20), hyposmia (60%, N=18), ear fullness or pain or pressure (46.66%, N=18), cough (26.66%, N=8) and halitosis (23.33%, N=7) (Table 1).

Table 1: Pre-operative symptom profile in study cases.

Major criteria	Grade 0	Grade 1	Grade 2	Grade 3	Percentage (%)
Major criteria or symptoms					
Facial pressure/pain	10	2	7	11	66.66
Nasal obstruction	2	2	6	20	93.3
Post nasal drip	5	7	8	10	83.33
Nasal purulent discharge	7	5	10	8	76.66
Hyposmia	12	5	9	4	60
Fever (acute)	30	0	0	0	0
Minor criteria or symptoms					
Headache	8	5	7	10	73.33
Non-acute fever	30	0	0	0	0
Halitosis	23	5	2	0	23.33
Dental pain	30	0	0	0	0
Cough	22	5	2	1	26.66
Ear pain/pressure/fullness	16	6	7	1	46.66

Table 2: NCCT of the PNS.

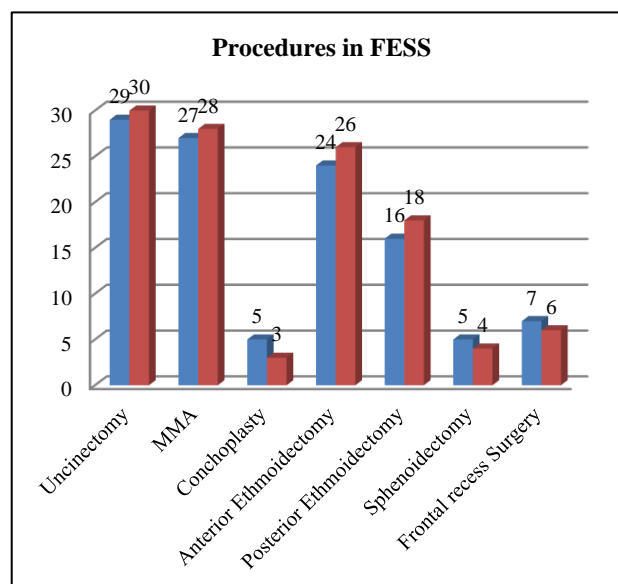
Sinuses	Right			Left		
	Normal	Mucosal thickening	Opacification	Normal	Mucosal thickening	Opacification
Maxillary sinus	6	8	16	4	8	18
Anterior ethmoids	5	8	17	6	6	18
Posterior ethmoids	14	7	9	12	9	9
Frontal sinus	17	6	7	18	6	6
Sphenoid sinus	21	4	5	20	4	6

Clinical examination by anterior rhinoscopy showed, 16.6% cases had mild DNS, 16.6% cases had inferior turbinate hypertrophy, 6.6% case had congested mucosa and 46.6% cases had mucopurulent discharge. X-ray of PNS (Waters view) showed mild DNS in 5 patients and septum in midline in 25 patients. Inferior turbinate hypertrophy was seen in 5 patients. Findings of diagnostic nasal endoscopy showed mild DNS in 23.35 cases, mucopus in 53.3% cases, concha bullosa in 16.6% cases and accessory ostia in 6.6% cases. The osteomeatal unit was found to be blocked in 27 patients of the study.

NCCT of PNS, axial and coronal cuts, was done prior to surgery in all the patients. All the CT scans were evaluated by both the Radiologist and the operating ENT surgeon and the findings were recorded. The osteomeatal unit was found to be blocked in 27 patients of the study (Table 2).

Majority of the patients underwent uncinectomy (96.66%, N=29 on right; 100%, N=30 on left), followed by middle meatal antrostomy (90%, N=27 on right; 93.33%, N=28 on left). The other procedures done were anterior ethmoidectomy (80%, N=24 on right; 86.66%, N=26 on left), posterior ethmoidectomy (53.33%, N=16 on right; 60%, N=18 on left), frontal recess surgery (23.33%, N=7 on right; 20%, N=6 on left), sphenoidotomy (16.66%,

N=5 on right; 13.33%, N=4 on left) and conchoplasty (16.66%, N=5 on right; 10%, N=3 on left) (Figure 5).

**Figure 4: Various procedures performed in FESS.**

The post-operative nasal endoscopic findings during the follow-up period of 3 months (Table 3).

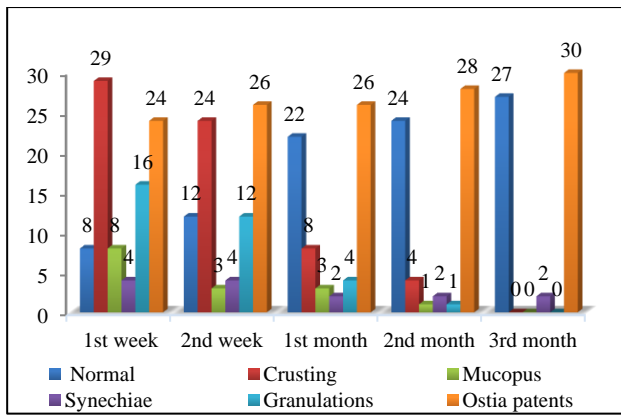


Figure 5: Post-operative nasal endoscopic findings during follow up.

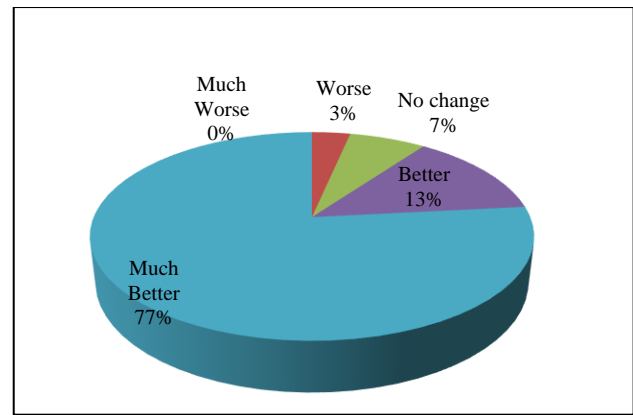


Figure 6: Overall patient improvement at the end of three-month follow-up period.

Table 3: Post-operative symptom profile at the end of third month follow-up period.

Symptoms	Score (-2)	Score (-1)	Score (0)	Score (1)	Score (2)	Success (%)
Facial pain	0	0	3	3	14	85
Nasal obstruction	0	1	1	2	24	92.8
Post nasal drip	0	0	4	4	17	84
Purulent nasal discharge	0	0	3	4	16	86.9
Hyposmia	0	0	7	11	0	61.1
Headache	0	0	4	6	12	81.8
Halitosis	0	0	0	1	6	100
Cough	0	0	0	1	7	100
Ear pain/fullness/pressure	0	0	1	1	2	92.8

Patients reported a high satisfaction post operatively with 90% (N=27) patients feeling much better. Two patients reported no change in symptoms post operatively with worsening of symptoms reported by one patient (Figure 6).

DISCUSSION

CRS is not a life-threatening disease, but have considerable impact on quality of life of the patients. The prevalence of disease enormously increased globally and affecting 10% of adults in the UK.^{5,7} CRS was termed by the presence of nasal obstruction or nasal discharge, facial pain and pressure or anosmia for at least 12 weeks. This study was designed to assess the symptom profile of patient before and after surgery and the complications after FESS in the post-operative period.

In this study the most common major symptom was nasal obstruction (93.3%, N=28) followed by post nasal drip (83.33%, N=25), purulent nasal discharge (76.66%, N=23), facial pain/pressure (66.66%, N=20) and hyposmia (60%, N=18). Of the major criteria, none of the patients reported fever and facial congestion or fullness. The minor symptoms were headache (73.33%, N=22), ear pain/pressure/fullness (46.66%, N=14), cough (26.66%, N=8), halitosis (23.33%, N=7). None of the patients reported dental pain, fatigue or non-acute fever. Study by

Karanam et al found nasal obstruction in 90% (n=27), and postnasal discharge in 90%(n=27), followed by headache in 76.7% (n=23).⁸ Study by Wardas et al stated nasal blockade was most troublesome symptom followed by nasal discharge, loss of smell, PND and pain in the identical or very similar order.⁹ The commonest clinical symptom was nasal obstruction (96%, N=146) followed by post nasal drip (92%) and facial pain/headache (90%, N=139).⁶ Study by Damm et al stated that nasal obstruction (92%) and post nasal drip (87%) were commonest symptoms.¹

Post operatively, 92.8% patients with nasal obstruction showed improvement. 86.9% cases with purulent nasal discharge, 85% cases with facial pain or pressure, 81.8% cases with headache, 84% cases with post nasal drip, 92.8% patients with ear pain or fullness or pressure and 61.1% cases with hyposmia showed improvement after FESS at the end of three follow-up. Patients with minor symptoms of cough and halitosis showed 100% improvement after FESS. Among the major symptoms, most improvement was seen in nasal obstruction and the least improvement was noted in post nasal drip. In this study No major complications were recorded. Common minor complications were synechiae (13.33%, N=4) and bleeding (10%, N=3). Nasal obstruction was the major symptom that responded best to FESS (92.8%) followed by post nasal discharge (86.9%). The least response to

FESS was noted for hyposmia (61.1%). In a study by Damm et al after a mean post-operative follow-up of 31.7 months, an improvement in quality of life was achieved in 85%, no change in 12%, and deterioration in 3%. Mainly responsible for this improvement was the post-operative decrease of nasal obstruction (84%), headache (82%) and post nasal drip (74%) with all symptoms $p < 0.01$. Hence, it was concluded that symptoms improved excellently by FESS in majority of the patients, achieving better quality of life in the long term.¹

The major complications associated with FESS include orbital haematoma, CSF leak, diplopia, blindness, intracranial penetration, meningitis and severe nasal haemorrhage (7). This study had no major complications, but had two minor complications such as synechia formation (N=4) which were released during the post-operative follow-up and bleeding after pack removal (N=3). It was treated by repacking the nose and was successfully managed conservatively. The average post-operative healing time was 4 to 8 weeks. 3 patients (10%) required 12 weeks, during which time regular nasal toilet was done to remove the nasal crusts/debris. Schaefer et al in his study noted minor complications in 14 patients, the most common complication being synechia between middle turbinate and septum in 6 patients, resulting in revision surgery in four patients.¹⁰ In a study by Mathew et al, haemorrhage occurred post operatively in 2 patients (1.5%).¹¹ Study Bhattacharyya found statistically significant decreases in major and minor symptoms ($p < 0.001$). Decreases in facial pressure, congestion, nasal obstruction, rhinorrhoea, and headache was observed post-operatively.¹²

CONCLUSION

FESS is an excellent method of treatment of CRS refractory to medical treatment. In the present study, 90% of the patients had a very good relief. Nasal obstruction, post nasal drip, headache, purulent nasal discharge and facial pain/pressure were the most common presenting symptoms. Pre-operative assessment often showed OMC block with disease in ethmoid and infundibulum, consistent with a rhinogenic origin of the disease. Maxillary sinus disease and posterior ethmoid disease were the next common entities. Uncinectomy, MMA and anterior ethmoidectomy were performed as a bilateral procedure in majority of the cases. Nasal obstruction and all other minor symptoms, including headache were the symptoms with the most improvement after FESS. The complications of FESS are minimal when performed by an experienced surgeon. The best functional outcome is determined not just by surgical technique, but by medical measures in the immediate pre and postoperative periods. Postoperative management aims to prevent postoperative infection, synechia formation and aid mucosal healing to return to normal function.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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