www.jmscr.igmpublication.org
Impact Factor (SJIF): 6.379
Index Copernicus Value: 79.54
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossrefDOI: https://dx.doi.org/10.18535/jmscr/v6i10.116

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

A Clinical Study of Cases Undergoing Functional Endoscopic Sinus Surgery and Its Outcome

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Abstract
Introduction: *Rhinosinusitis is a group of disorders characterised by the inflammation of the mucosa of the nose and paranasal sinuses. Chronic rhinosinusitis is defined by signs and symptoms rather than physical findings.Many host and environmental factors plays role in its etiology.*
Objective: *To assess various symptoms of chronic rhinosinusitis and to evaluate FESS for treatment of CRS refractory to medical treatment and its efficacy in management of this challenging disease*
Materials and Methods: *The Study was conducted from August 2013 to July 2014 in the ENT department of Gandhi Hospital, Secunderabad. A total of 50 patients with Chronic Rhinosinusitis were trated with Functional Endoscopic Sinus Surgery and followed up for 3 months*
Results: *Nasal obstruction (93.3%) was the most common symptom followed by post nasal drip (83.33%). In most of the cases, uncinectomy and anterior ethmoidectomy were done. 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%). There was 90% overall satisfaction after FESS at the end of three months of follow-up.*
Keywords: *Chronic Rhinosinusitis, Functional Endoscopic Sinus Surgery, Nasal Obstruction, Uncinectomy*.

Introduction

Chronic rhinosinusitis (CRS) is one of the most common chronic diseases and is associated with a high socioeconomic burden from direct and indirect costs[1]. Rhinosinusitis is a group of disorders characterised by the inflammation of the mucosa of the nose and paranasal sinuses[2]. When symptoms persist for > 12 weeks it will become chronic . Its estimated prevalence ranges widely, from 2 to 16%.[1] The diagnosis of Chronic rhinosinusitis requires the presence of the following two major or one major and two minor symptoms/signs. Major symptoms are Facial pain/pressure, Facial congestion/fullness, Nasal obstruction/ blockage,

Nasal discharge/ purulence/, Post nasal discharge , Hyposmia/ anosmia, Purulence on nasal examination, Fever (acute RS only). Minor symptoms include Headache, Fever (non acute),Halitosis, Fatigue, Dental pain, Cough, Ear pain/pressure/ fullness.[3] Current consensus differentiates CRS with nasal polyps (CRSwNP) from CRS without nasal polyps (CRS sine NP, CRSsNP) as subgroups of CRS[4] The nasal symptom questionnaire is a convenient, reliable and valid method for assessing nasal symptom severity. [5]Its principal use is to act as an outcome measure in rhinosinusitis, by comparing scores before and after treatment.CRS significantly impacts the quality of life by interfering with the general health, vitality and social functioning and causes decreased productivity in the workforce.[6] Most cases of CRS respond to medical treatment. Surgical intervention is typically performed when patients remain refractory to medical therapy. Functional endoscopic sinus surgery (FESS) has revolutionized the surgical treatment of CRS since its introduction in 1985. The area of endoscopy developed very slowly in the twentieth century as illuminating and examining the narrow interiors of the nose and paranasal cavities was technically challenging.[7] Endoscopy was first performed by Hirschmann in 1903 using a modified cystoscope[8]. In 1925, Maltz commissioned Wolf to make a dedicated endoscope and introduced the term 'Sinoscopy'[9]. During 1950s, fundamental improvements in optics, i.e., rod lenses for image transmission that are now part of modern day endoscopes were made by Harold H. Hopkins. In 1963, Karl Storz combined rod lenses for image transmission with fibre bundles for illumination. The ability to treat paranasal sinus disease has been revolutionized by fibreoptic endoscopes and computed tomographic (CT) scanning. Functional endoscopic sinus surgery (FESS) is a minimally invasive technique in which sinus air cells and sinus ostia are opened under direct visualization to restore sinus ventilation and normal function.[10]

The present study is an attempt to assess the symptom profile of patients with chronic rhinosinusitis undergoing FESS and evaluate the efficacy of Functional endoscopic sinus surgery.

Aims & Objectives

1. To assess the various symptoms of chronic rhinosinusitis before FESS.
2. To compare the various symptoms of CRS before and after FESS.

Materials and Methods

Study Design: A Clinical study (Uncontrolled Before after Study) to evaluate various symptoms of Chronic Rhinosinusitis and to evaluate outcomes of Functional Endoscopic Sinus surgery

Study Area: Department of Otorhinolaryngology (E.N.T.), Gandhi Hospital, Secunderabad, Telangana

Study Duration: 1year (August 2013 – July 2014). A post- operative follow up period of 3 months was given to each case.

Sample Size: A total of 50 patients with Chronic Rhinosinusitis were included in the study.

Study Population: 50 patients with Chronic Rhinosinusitis requiring Functional Endoscopic Sinus Surgery during the study period were included in the study after applying inclusion and exclusion criteria after taking informed consent.

Inclusion criteria

1. Cases of CRS with infective pathology with symptoms for at least 12 weeks.
2. Patients refractory to a minimum of 6 weeks of medical treatment.
3. Patients above 18 years of age.

Exclusion criteria

1. Cases of CRS with allergic pathology.
2. Patients with septal deformities requiring corrections.
3. Patients with previous nasal surgeries.
4. Complications of CRS.
5. Growths in the nasal cavity, benign or malignant, including nasal polyps.
6. Patients below 18 years of age.
7. Patients who did not give informed consent. Subsequently all the selected patients were worked up in the following pattern.

Sampling technique: All the patients requiring FESS were considered under this study. The Efficacy of Functional endoscopic sinus surgery is

evaluated by comparing symptom score before and after surgery among same group of patients.

Examination of study subjects: In all the study subjects detailed history was elicited and clinical examination of ear, nose and throat was done with special reference to the nose. Anterior Rhinoscopy was done in detail about septum, turbinates, nasal mucosa and to know the pathology. All findings were confirmed with endoscopic examination .X-ray paranasal sinues were taken. Broad spectrum antibiotics were given to all cases.

All their symptoms were graded pre operatively as

0 – No symptoms

1 – Mild grade – symptoms not disturbing sleep or day to day activities

2 – Moderate grade – symptoms disturbing day to day activities, with occasional absence from work or disturbed sleep.

3 – Severe grade – symptoms disturbing day to day activities with absence from work and disturbed sleep.

The surgical procedures done were uncinectomy, conchoplasty, middle meatal antrostomy, anterior ethmoidectomy , sphenoidotomy and frontal recess clearance. The various surgical procedures performed depended upon the laterality and the extent of disease.

Post operatively patients were started on appropriate antibiotics (e.g., Cefotaxim), NSAIDs, oral decongestants, antacids and Vitamin B complex supplements. Nasal packs were removed 24 hours after the surgery. Alkaline nasal douching (isotonic normal saline) and local decongestants were started three times a day. The patients were discharged on the 2nd or 3rd post operative day with the above mentioned medications for additional 5 days and were asked to come back for review at the end of one week.

During the post operative follow up, the symptoms were assessed by using the following grades:

-2 – Much worse

-1 – Worse

0 – No change

+1 – Better

+2 – Much better

Results

50 patients were evaluated in the study using the above methodology. The average age was 39 yrs, the range being 20 to 70 yrs. 63.33% of the patients in this study were males, and 36.66% were females. The average duration of symptoms was 3 years and 2 months with a range of 6 months to 25 years shown in table 1.The commonest symptom was nasal obstruction (86%) followed by post nasal drip (80%). Other symptoms noted are purulent nasal discharge (76%), headache (74%), facial pain/ pressure (70%), hyposmia (66%), ear fullness /pain/pressure (58%), Cough (46%) and halitosis (44%) shown in table 2&3.Most common finding in Anterior Rhinoscopy was Mucopurulent discharge , followed by Deviated Nasal septum and Inferior turbinate hypertrophy . Congested nasal mucosda is seen in 14% of cases shown in table 4.In the present study maximum number of cases with chronic rhinosinusitis, xray findings shown haziness shown in table 5. Patients reported a high satisfaction post operatively with 90% patients feeling much better. There is improvement in Nasal obstruction in 83% of cases , decreased purulent nasal discharge in 79% , halitosis and cough relieved completely and least improvement is seen in hyposmia (57%) shown in table 6.

Table 1: Duration of Symptoms

DURATION	NUMBER OF PATIENTS	PERCENTAGE
6 months – 1 year	6	12%
1 year – 5 years	21	42%
6 years – 10 years	9	18%
11 years – 15 years	6	12%
16 years – 20 years	4	8%
21- years – 25 years	4	8%

Table 2: Pre Operative Symptom Profile - Major Criteria/Symptoms

Major Criteria	No symptom (0)	Mild (1)	Moderate (2)	Severe (3)	Percentage
Facial pressure/ pain	15	7	12	16	70%
Nasal obstruction	7	7	11	25	86%
Post nasal drip	10	12	13	15	80%
Nasal purulent discharge	12	10	15	13	76%
Hyposmia	17	10	14	9	66%
Fever (acute)	50	0	0	0	0%

Table 3: Pre Operative Symptom Profile – Minor Criteria/ Symptoms

Minor criteria	No symptom (0)	Mild (1)	Moderate (2)	Severe (3)	Percentage
Headache	13	10	12	15	74%
Non-acute fever	50	0	0	0	0%
Halitosis	28	13	9	0	44%
Dental pain	50	0	0	0	0%
Cough	27	10	7	6	46%
Ear pain / pressure/fullness	21	11	12	6	58%

Table 4: Anterior Rhinoscopy Findings

Structures	**Number of patients**	**Percentage**
Mild DNS	12	24%
Inferior turbinate hypertrophy	12	24%
Congested mucosa	7	14%
Muco purulent discharge	19	38%

Table 5: X-Ray Findings of PNS

	Right		**Left**	
Sinuses	Normal	Haziness	Normal	Haziness
Maxillary sinus	18	32	16	34
Ethmoid sinus	27	23	28	22
Frontal sinus	29	21	31	19

Table 6: Post Operative Symptom Profile at the end of 3 Month Follow-Up Period

Symptoms	**Much worse (-2)**	**Worse (-1)**	**No change (0)**	**Better (1)**	**Much better (2)**	**Success percentage**
Facial pain	0	0	8	8	19	77.14%
Nasal obstruction	0	1	6	7	29	83.72%
Post Nasal Drip	0	0	9	9	22	77.5%
Purulent Nasal Discharge	0	0	8	9	21	78.94%
Hyposmia	0	0	14	19	0	57.57%
Headache	0	0	9	11	17	75.67%
Halitosis	0	0	0	8	14	100%
Cough	0	0	0	8	15	100%
Ear pain/ fullness/ pressure	0	0	6	15	8	79.31%

Discussion

50 patients were evaluated in the study using the above methodology. The average age was 39 yrs, the range being 20 to 70 yrs. 63.33% of the patients in this study were males, and 36.66% were females. The average duration of symptoms was 3 years and 2 months with a range of 6 months to 25 years. Nayak et al [11](1991) studied a group of 78 patients (30 unilateral disease & 48 bilateral disease) between 12 to 57 yrs with chronic sinusitis over a period of 16 months with various nasal symptoms, the commonest complaint being nasal discharge (27 unilateral, 34 bilateral), followed by headache (26 unilateral. 33 bilateral) and nasal obstruction (21 unilateral, 38 bilateral), with a range of duration of symptoms being 3 months to 30 yrs.[11] The commonest symptom was nasal obstruction (86%) followed by post nasal drip (80%). Other symptoms

noted are purulent nasal discharge (76%), headache (74%), facial pain/pressure (70%), hyposmia (66%), ear fullness/pain/pressure (58%), Cough (46%) and halitosis (44%) .This is according to the study by Brian L Mathew et al (1991) documented nasal obstruction as the commonest symptom (96%) followed by post nasal drip (92%), & facial pain/headache (90%)[12]. Most of the patients had 3 major criteria/ symptoms and 2 minor criteria / symptoms on an average. Most common finding in Anterior Rhinoscopy was Mucopurulent discharge, followed by Deviated Nasal septum and Inferior turbinate hypertrophy. Congested nasal mucosda is seen in 14% of cases. This is similar to the study conducted by V.P. Venkatachalam [14] and Arun Bhat , where in their study also Mucopurulent discharge was the main finding in Anterior Rhinoscopy . In the present study maximum number of cases with chronic rhinosinusitis, xray findings shown haziness, this is similar to the study conducted by V.P.Venkatachalam[14] and Arun bhat, where xray findings of their study also shown haziness in maximum number of patients.

Patients reported a high satisfaction post operatively with 90% patients feeling much better. There is improvement in Nasal obstruction in 83% of cases, decreased purulent nasal discharge in 79%, halitosis and cough relieved completely and least improvement is seen in hyposmia (57%). This is according to the study conducted by Nasser A Fageeh et al (1996) in a retrospective study of 129 patients observed that the most significant improvement was noticed in patients with nasal obstruction (60%). The least improvement occurred in patients with anosmia (40%)[13].

Conclusion

Nasal obstruction, post nasal drip, headache, purulent nasal discharge and facial pain/pressure were the most common presenting symptoms. 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 and all other minor symptoms including headache were the symptoms with the most improvement after FESS. Good 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, synechiae formation and aid mucosal healing to return to normal function. The results of this study confirm that FESS is an excellent method of treatment in patients with CRS refractory to medical treatment.

Acknowledgement

I would like to thank Principal of Gandhi medical college and Superintendent of Gandhi Hospital for giving permission and making it possible to conduct our study smoothly. I would like to thank all my colleagues who participated in this study,last but not the least i would like to thank each and every patient who gave their their consent and willingness to participate in this study.

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