Retrospective Analysis of the Effectiveness of Functional Endoscopic Sinus Surgery in the Treatment of Adult Chronic Rhinosinusitis Refractory to Medical Treatment

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Abstract Chronic rhinosinusitis (CRS) is a common disease that restricts the quality of life of millions of involved patients. The aim of the study was to evaluate how functional endoscopic sinus surgery (FESS) modifies patients symptom profile and to also confirm that FESS is the modality of treatment in patients with refractory CRS. The study was retrospective analysis. 105 patients with symptoms of CRS were included in the study (between August 2006 to July 2009). Patients were assessed for CRS symptoms preoperatively and postoperatively using grading symptoms. Statistical analysis using Chi square test. Leading symptom of CRS was nasal obstruction followed by headache. Furthermore patients reported of anosmia, facial pressure, postnasal drip, purulent nasal discharge, halitosis, dental pain, cough, earache. None of the patients had fever as their complaint. After a postoperative followup of 6 months there was improvement in the symptoms. All minor symptoms had 100% improvement. Nasal obstruction responded best, next followed by (all symptoms P value <0.001). An overall improvement of 86.66% was recorded. The restriction of quality of life in patients with CRS is mainly caused by these symptoms, which can be improved in excellent fashion by FESS in majority of the patients.

Keywords Adult chronic rhinosinusitis · Functional endoscopic sinus surgery · Treatment outcome

Introduction

Adult chronic rhinosinusitis (CRS) [1] is one of the most common health care problems for which an individual seeks medical care, resulting in high direct medical costs. Estimates suggests that CRS is more wide spread than arthritis and hypertension, with impacts on the quality of life, even in comparison to chronic debilitating diseases such as diabetes mellitus and congestive heart failure [2]. Furthermore, CRS not only causes significant physical symptoms but also results in substantial functional and emotional impairment. In the present day scenario functional endoscopic sinus surgery (FESS) is considered to be the surgical option in patients with chronic rhinosinusitis not responding to medical management [3]. In our present study we have retrospectively analysed the effectiveness of FESS by assessing the symptoms before and after the surgery, hence emphasizing the above fact again.

Patients and Methods

Our study comprises of 105 cases with chronic rhinosinusitis (with and without polyposis), refractory to medical treatment (in the form of broad spectrum antibiotics, anti-histamines, leukotriene inhibitors, topical steroid sprays) for at least 12 weeks duration, who underwent FESS between August 2006 and July 2009. Of these cases 44 were CRS without polyposis and 61 were CRS with polyposis. Revision and recurrent cases were excluded from the study. Diagnosis of both the groups were based on clinical and radiological methods [4]. All FESS were done by the authors in the Medical College Hospital. 52 cases were done under LA and 53 under GA (with endotracheal tube and throat pack—removed before extubation). The

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surgical techniques followed were that put forth by Messerklinger and Stammberger [5]. Postoperatively medicated ribbon gauze were used for anterior nasal packing, which were removed 24 h later. The patients were discharged on the 2nd or 3rd postoperative day. Postoperatively all the patients were instructed to use alkaline nasal douching till the nasal crusting reduced (2–3 weeks), and were reviewed at 10th day, 1 month, 3 month and 6th month. At each visit the patients symptoms were assessed and (endoscopic) examination and toileting were done.

Results

105 patients were enrolled in the study, of which 64 were men and 41 were women. Patients belonged to a wide range of age group between 18 and 60 years (average 37 years). Duration of symptoms were anywhere between 6 months to 15 years. All cases had bilateral disease who had undergone extensive medical management before being considered for surgery. 7 patients had history of aspirin sensitivity and associated bronchial asthma for which they received appropriate treatment. The most commonest symptom was, nasal block ($N = 91, 86.66\%$), followed by anosmia ($N = 81, 77.14\%$), facial pressure ($N = 77, 73.33\%$), postnasal drip ($N = 74, 70.47\%$), headache ($N = 66, 62.85\%$), nasal discharge ($N = 61, 58.09\%$), fatigue ($N = 32, 30.47\%$), halitosis ($N = 28, 26.66\%$), dry cough ($N = 12, 11.42\%$), dental pain ($N = 11, 10.4\%$), earache/fullness ($N = 7, 6.66\%$), none of the patients had fever as their symptoms (Table 1). Most of the patients on an average had three major criterias and two minor criterias. All patients had at least one of the first four most

Table 1 Preoperative symptom profile

Symptoms	No symptom	Mild	Moderate	Severe	%
Facial pain/pressure	28	4	18	55	73.33
Nasal block	14	16	15	60	86.66
PND	31	14	25	35	70.47
Anosmia	24	14	42	25	77.14
Nasal discharge	44	11	11	39	58.09
Fever (ac)	0	0	0	0	0
Headache	39	7	14	45	62.85
Halitosis	77	14	7	7	26.66
Dental pain	94	6	1	4	10.4
Cough (dry)	93	7	2	3	11.42
Earache/pressure/fullness	98	4	1	2	6.66
Fatigue	73	18	7	7	30.47
Fever (non-ac)	0	0	0	0	0

Fig. 1 Preoperative DNE findings

commonest symptoms. 63 of them had three of the four most commonest symptoms and 38 had all four of the common symptoms. On examination, on anterior rhinoscopy 54 patients had deviated nasal septum (DNS), polyps were visualized in 47 patients on anterior rhinoscopy itself, mucopus in 20 patients. Posterior rhinoscopy revealed posterior extent of the polyp in 17 patients. All the patients were subjected to diagnostic nasal endoscopy (DNE) (Fig. 1), next followed by non-contrast computerized tomography (NCCT) nose and paranasal sinuses (Table 2). All patients in the study were subjected to FESS. 52 under Local anesthesia and 53 under general anesthesia. Majority of them underwent uncinctomy ($N = 102, 97.14\%$) followed by anterior ethmoidectomy ($N = 95, 90.47\%$), middle meatal antrostomy ($N = 88, 83.80\%$), posterior ethmoidectomy ($N = 77, 73.33\%$), frontal recess surgery ($N = 38, 36.19\%$) and sphenoidotomy ($N = 35, 33.33\%$) 0.18 patients (17.14%) also had reduction of the anterior part of the middle turbinate, another 18 patients underwent septoplasty and 11 conchotomy in addition to the above procedures to gain access to the middle meatus. The duration of hospital stay was on an average 3 days (2–5 days). There were no major complications encountered, though minor complication in the form of breach of

Table 2 Preoperative NCCT nose and PNS findings

Sinus	Right			Left		
	Normal	Partial	Complete	Normal	Partial	Complete
Anterior ethmoid	14	49	42	18	35	52
Posterior ethmoid	18	45	42	21	42	42
Maxillary	34	39	32	27	39	39
Frontal	49	35	21	45	32	25
Sphenoid	66	14	25	66	14	25

Table 3 Post operative symptom profile

Symptom	−2	−1	0	1	2	% success
Facial pressure/pain	0	2	8	0	67	87.01
Nasal block	0	7	3	0	81	89.01
PND	0	7	3	4	60	86.48
Anosmia	0	4	7	0	70	86.41
Nasal discharge	0	4	5	17	35	85.24
Headache	0	4	4	4	54	87.87
Dental pain	0	0	0	0	11	100
Cough(dry)	0	0	0	4	12	100
Earche/fullness/pressure	0	0	0	0	7	100
Fatigue	0	0	0	7	25	100
Halitosis	0	0	0	0	28	100
Fever	0	0	0	0	0	100

lamina papyracea was seen in four patients, one of whom developed a subcutaneous emphysema of the eyelids on the side of the breach due to tight anterior nasal packing which was immediately released. The surgical emphysema resolved subsequently in next few days. The other minor complication was synechia ($N = 14, 13.33\%$) which were released during the post operative follow up (6 months). However there were no permanent sequelae encountered. The overall patient satisfaction postoperatively at the end of 6 months was high (Table 3) (86.66%, $P < 0.001$). 0.7 patients had no change, 4 felt worse and three patients were lost in followup. The above group of patients were considered as failures of surgical treatment ($N = 14, 13.33\%$).

Discussion

Chronic Rhinosinusitis has become one of the most common diseases in many parts of the world including India. Most of these patients can be managed successfully with medical therapy. Those who fail to respond to medical treatment can be managed with FESS [5]. 86.66% of our patients in this study were symptom free with very good relief at the end of 6 month followup ($P < 0.001$), requiring no medical treatment after the initial postoperative period. All these patients had failed intensive medical treatment. Our results are consistent with those of other studies which have shown 75–92% post operative improvement after FESS [6]. Nasal obstruction was the most commonest symptom encountered by the patients, next followed by anosmia, facial pressure, postnasal drip, headache, purulent nasal discharge. None of the patients had fever as their complaint. All the symptoms, showed improvement/recovery after FESS ($P < 0.001$). Post operatively 87.01% of the nasal obstruction showed improvement. 87.87% of them with headache had

improvement. 86.41% with anosmia, 87.01% with facial pressure/pain, 86.48% with post nasal drip and 85.24% with purulent nasal discharge, showed improvement after surgery at the end of 6 month followup (Table 3). Purulent nasal discharge responded the least after FESS. Headache and Nasal obstruction responded the best among the symptoms. These findings are consistent with those of the other series [7–16].

91 patients in the present study had bilateral OMU blocked, thus reemphasizing the role of OMU in the pathophysiology of CRS, as mentioned by Messerklinger [3]. Its inferred from the observation that CRS is a bilateral disease affecting the PNS on both sides. Most patients had bilateral symptoms. Post operative healing time was on an average 4–8 weeks, few of them required 12 weeks, during which time patient required regular office visits to remove crusts/debris or to look out for recurrences. This time of healing is consistent with other authors. In inexperienced hands, the major complications associated with FESS can include intracerebral haemorrhage, CSF leak, diplopia, blindness, intracranial penetration, meningitis and severe haemorrhage. Our complication rates are the same as reported by other authors [7–16]. FESS is a very effective and safe procedure when performed by surgeons experienced in the technique. Nearly 50% of our cases were performed under local anaesthesia and the other 50%, under general anaesthesia. The choice of anaesthesia being determined by the extent of disease, general condition of the patient, patients desire, and surgeons preference. In general there were no difference in hospitalization duration between the patients with general or local anaesthesia. However it was felt that general anaesthesia increased patients comfort.

Conclusion

FESS is an excellent method of treatment for CRS. 86.66% of our patients had very good relief ($P < 0.001$). A history of nasal obstruction, headache, anosmia, facial pressure/pain, post nasal drip, were the most common presenting symptoms. The pre operative NCCT of the nose and PNS often showed anterior ethmoid and infundibular disease, consistent with a rhinogenic origin of PNS infection. Posterior ethmoid disease and maxillary sinus disease were the next common entities. In most instances we perform, uncinctomy, anterior ethmoidectomy, MMA and posterior ethmoidectomy as a bilateral procedure. The complications of FESS are minimal when performed by experienced surgeon. Nasal obstruction and headache were the symptom that responded best to FESS. Most patients required no medical treatment after 6 months of followup duration.

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