

A Study on the Cavity Problems in Patients Who Have Undergone Functional Endoscopic Sinus Surgery

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Abstract

Background and Objectives: Studies on the postoperative problems of endoscopic sinus surgery are rare in literature. The objective is to study the postoperative symptoms of patients and findings on nasal endoscopy after functional endoscopic sinus surgery (FESS). Adequate postoperative care necessary after FESS and ways to reduce the cavity problems to be studied. **Methods:** 113 patients who underwent FESS for various pathologies were followed up at regular intervals with nasal endoscopy. Postoperative symptoms of patients were documented, nasal endoscopy done and findings noted. Necessary interventions performed according to the problems visualized. Results were analysed at 1 month and 3 months post surgery and as required thereafter. **Results:** Postoperative review at 1 month showed symptoms of smell disturbances (24 cases), nasal obstruction (16 cases), headache (4) and nasal discharge (2). Nasal endoscopy revealed synechiae in 16 patients, significant crusting and fungal debris in 11 patients each. AFRS (17 out of 25 cases) and ethmoidal polyps (19 out of 52 cases) had maximum problem rate. Procedure wise, revision FESS and cases with septal correction showed maximum problems. Necessary intervention performed. Review at 3 months showed persistent smell disturbances in 6 ethmoidal polyp cases and persistent fungal debris in 5 of the AFRS cases. Rest of the cases improved. Outside this review, 1 case of antrochoanal polyp and 9 cases of ethmoidal polyps showed recurrence later on which was treated endoscopically. **Interpretation and Conclusion:** AFRS and ethmoidal polyps require rigorous postoperative care with nasal endoscopy and appropriate intervention as they are prone for recurrence and postoperative problems. Revision FESS need extensive preoperative assessment to reduce problem rate. Duration of follow up necessary for each case need more extensive long term studies.

Keywords: Functional Endoscopic Sinus Surgery, Post operative, Cavity Problems.

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Introduction

The publication of the concept of Messerklinger technique of endoscopic sinus surgery in 1978 changed the entire concept of treatment of sinonasal pathologies. Radical external approaches to the paranasal sinuses were replaced by the technique of functional endoscopic sinus surgery.

Newer indications are being added to endoscopic sinus surgery almost everyday and there are no absolute contraindications for the approach anymore. FESS was initially described for the treatment of sinonasal pathologies; chronic rhinosinusitis, sinonasal polyposis, mucocoeles etc. In the treatment of these disorders, a trial of medical management is initially given and those who are not responding to it are taken for sinus surgery. A thorough evaluation of the patient and exact identification of the pathology of the lateral wall of the nose is necessary before embarking on FESS. Anterior and posterior rhinoscopic examination is insufficient to get a clear picture of the condition of the sinuses. With the emergence of CT scan, excellent visualization of the anatomy of the nose and paranasal sinuses is possible more so with different views, better

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resolution and thinner slices. But CT is prone for overdiagnosis of sinusitis and inability to differentiate inflammatory tissue from mass lesions. The advent of nasal endoscopy as an office procedure has greatly complemented computerized tomography in the accurate diagnosis of sinonasal pathologies. The present standard of investigation for sinonasal pathology is hence nasal endoscopy along with CT scanning. Terminology of various nasal pathologies also has undergone a lot of changes with the improved grasp of the anatomy and pathology of nose and paranasal sinuses. The term sinusitis was modified to rhinosinusitis with the observation that any pathology of the sinuses involves the nasal cavity as well. Newer textbooks and literature have done away with the terms of ethmoidal polyp and antrochoanal polyp and replaced them with a more general term sinonasal polyposis. Traditional conservative opinion still values the discrimination of polyps into ethmoidal and antrochoanal because the behavior of these two entities and their response to treatment are poles apart to be included in one heading. Fungal rhinosinusitis are of 4 types – fungal ball, allergic fungal rhinosinusitis (AFRS), chronic or indolent invasive fungal rhinosinusitis and fulminant invasive fungal rhinosinusitis. There are more controversial terminologies like non allergic eosinophilic fungal rhinosinusitis and saprophytic fungal sinusitis which are better avoided. Chronic rhinosinusitis is reserved for cases of bacterial sinonasal infections without the presence of fungus. But the distinction is hardly absolute as different authors have their own concepts regarding the usage of such terms. In a nutshell, the more advanced we have become in evaluating and treating the various pathologies, the more complex and confused the diagnosis has turned out to be. In the management of these various sinonasal pathologies, the concept of osteomeatal unit is of paramount importance. For any of the pathologies mentioned above, maintenance of a functioning osteomeatal unit (OMU) is the concept of FESS (Functional Endoscopic Sinus Surgery). The patency of the natural ostia of the sinuses is shown to pave way for the resolution of sinonasal pathologies. This small space bounded medially by the uncinate process, laterally by is the site of primary defect in almost all sinonasal pathologies. So it is not enough to preserve the functionality of this area during surgery but frequent visualizations and intervention is necessary to prevent the development of further problems. A simple rhinoscopic examination and blind suctioning of the nasal cavity is in no way sufficient in the postoperative care of endoscopic sinus surgery due to the above said reasons. So the primary

modality of postoperative care is nasal endoscopy and necessary intervention.

A lot of literature is available describing the various complications of endoscopic sinus surgery. But as one of the doyens of ESS, Kennedy, rightly pointed out, there is a definite dearth in the study of postoperative problems of endoscopic sinus surgery.

Hence the main idea of this study is to assess the postoperative problems of endoscopic sinus surgery – FESS Cavity Problems, and not the intraoperative complications of FESS which are widely available nor the effectiveness of FESS which is already well established. In this study, a more traditional way of diagnostic terminologies are used – ethmoidal polyp; antrochoanal polyp; allergic fungal rhinosinusitis (AFRS) for rhinosinusitis cases with either CT findings of fungal presence and/or a positive fungal culture and/or positive fungal histopathology even in the presence of sinonasal polyps; chronic rhinosinusitis for bacterial rhinosinusitis without polyps and positive fungal signs. This distinction turned out to be very significant in the end when the analysis was carried out.

Objectives

To study the various cavity problems encountered by patients who have undergone Functional Endoscopic Sinus Surgery (FESS) in the department of ENT, Medical College Kottayam.

The postoperative complaints of patients and findings on nasal endoscopy to be documented.

To formulate a consensus on the postoperative care after FESS

Rationale of Study

Functional Endoscopic Sinus Surgery (FESS) is generally considered to be a safe and effective procedure for various sinonasal pathologies. Hence studies on the long term problems of FESS are relatively few, and studies conducted in India are still less. Though the major complications associated with FESS are rare, the minor complications like adhesions or crusting or anosmia can be very troublesome for the patient. Coupled with the fact that FESS is one of the most common surgeries in ENT practice, there is a definite need for such a study in the local setup. The study is also envisaged to help in the preoperative and postoperative care to be taken and in treating the complications encountered. Diagnostic nasal endoscopy (DNE) is a routine component of clinical evaluation of patients with sinonasal pathology. Postoperative FESS patients are evaluated best by DNE on postoperative review.

Materials and Methods

Study Design: Descriptive study

Study Setting: Department of ENT, MCH Kottayam

Study Subjects

Case Definition

Patients who have undergone functional endoscopic sinus surgery in the Department of ENT, MCH Kottayam during a period of 18 months from March 2011.

Inclusion Criteria

All patients who have undergone FESS in the Department of ENT, MCH Kottayam starting from March 2011 for 18 months are included in the study.

Exclusion Criteria

* Patients who are not available for followup after surgery.

* Patients in whom endoscopic surgeries were performed other than for FESS.

* Patients in whom sinonasal cavities occurred by surgeries other than by FESS like external ethmoidectomy.

Sampling

No sampling is done. All cases who have undergone FESS are taken for the study satisfying the abovesaid criteria.

Study Method

Permission for the study is obtained from the Head of Department of ENT and the ethical committee. Patients who come to ENT OPD for review after FESS are carefully assessed. Consent from the patients for the study is taken. Indications for FESS and preoperative CT findings are recorded. Post operative complaints of the patients, if any, are documented. Findings of anterior rhinoscopy examination are noted. All postoperative FESS patients are routinely assessed by diagnostic nasal endoscopy examination for thorough visualization of the FESS cavity. The proforma is filled in the first visit itself and complaints arising during the subsequent visits are entered accordingly. Findings of nasal endoscopy are documented and the corrective measures undertaken according to the pathology visualized. The time interval between the procedure and the appearance of complications are carefully entered. Patients are reviewed at 15 days, 1 and 3 months after procedure when complaints and findings are noted. Interventions performed as needed in between reviews.

Analysis is done at the end of the study

Analysis

By chi square test and other appropriate statistical methods.

Results

Between the time period of March 2011 to August 2012 (18 months) 113 patients who underwent Functional Endoscopic Sinus Surgery for various sinonasal pathologies were included in the study.

Age Distribution

Table 1: Patients were divided into 5 age groups

| Age | Age group | No. of patients |
|-------|-----------|-----------------|
| <15 | 1 | 3 |
| 16-30 | 2 | 20 |
| 31-45 | 3 | 47 |
| 46-60 | 4 | 32 |
| >60 | 5 | 11 |

Sex distribution

Out of total 113 patients, 66(58.4%) were male and 47(41.6%) were female[Fig 1]

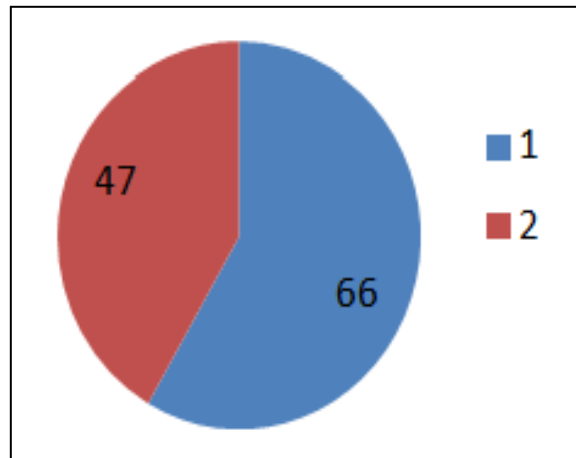


Fig 1:Sex distribution

Presenting Complaints

The various complaints of the study population group who underwent FESS were

Nasal Obstruction – 96 patients (85%)

Disturbance in smell including hyposmia, anosmia and cacosmia – 56 patients(49.5%)

Headache – 24 patients (21.2%)

Nasal Discharge – 31 patients (27.4%)

Epistaxis – 7 patients (6.1%)

Facial pain – 7 patients (6.1%)[Fig 2]

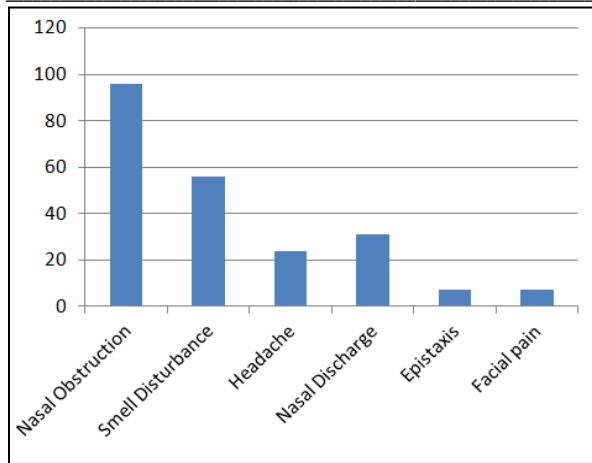


Fig 2: various complaints of the study population group who underwent FESS

Associated co morbidities

Diabetes mellitus, hypertension and Bronchial asthma were the main co morbidities found in the patients, out of the 3, diabetes was the most common, 9 patients (7.9%)[Fig 3]

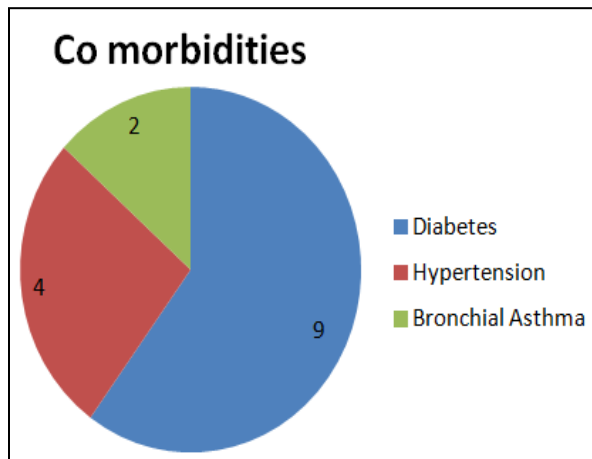


Fig 3:Co morbidities

Distribution according to diagnosis

Ethmoidal polyps, antrochoanal polyps, chronic rhinosinusitis, and allergic fungal rhinosinusitis were the 4 sinonasal pathologies for which the patients underwent FESS. The commonest pathology was Ethmoidal Polyps amounting to 52 cases (46%). There were 28 cases of chronicrhinosinusitis (24.7%), 25 cases of AFRS (22.1%) and 8 cases of antrochoanal polyp (7%)[Fig 4]

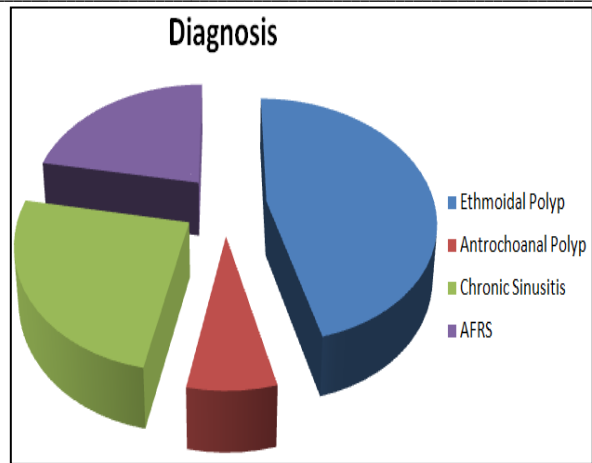


Fig 4:Distribution according to diagnosis

Distribution according to the procedure underwent

Out of the 113 patients, primary FESS alone was performed in 77 cases (68.1%). 28 patients underwent septal correction along with primary FESS (24.7%) and 8 were revision FESS cases (7%)[Fig 5].

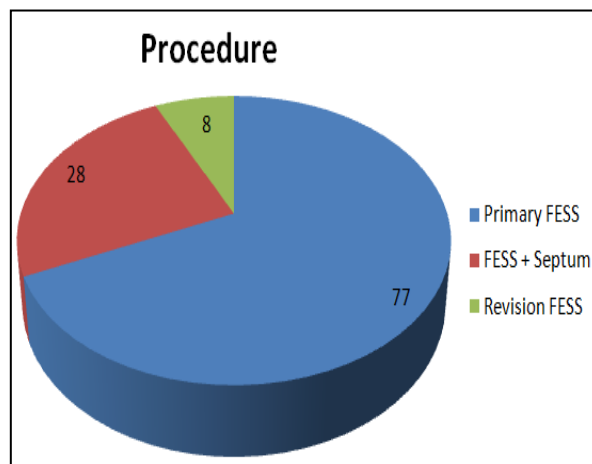


Fig 5:Disrtribution according to the procedure underwent

Postoperative problems

Symptoms of patients

Postoperative assessment of symptoms after 1 month showed nasal obstruction in 16 cases (14.1%). 24 patients had postoperative symptoms of smell disturbance comprising hyposmia, anosmia and cacosmia (21.2%). Headache was present in 4 cases and 2 patients had persistence of nasal discharge even after surgery. There were no complaints of epistaxis or facial pain which was present in the preoperative period[Fig 6]

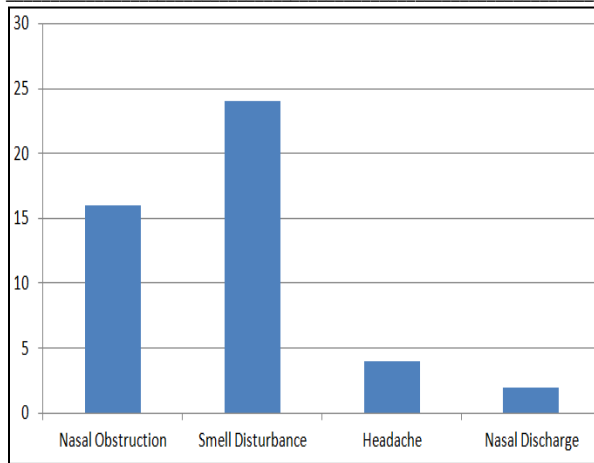


Fig 6: Postoperative problems

Pre operative and postoperative symptom profile

Preoperative and postoperative comparison of symptoms showed a marked reduction in nasal obstruction from 85% to 14%. Smell disturbance was persistent in close to 45% of the cases who had similar preoperative symptom. Headache and nasal discharge showed marked improvement. There were no complaints of epistaxis or facial pain in the postoperative period[Fig 7]

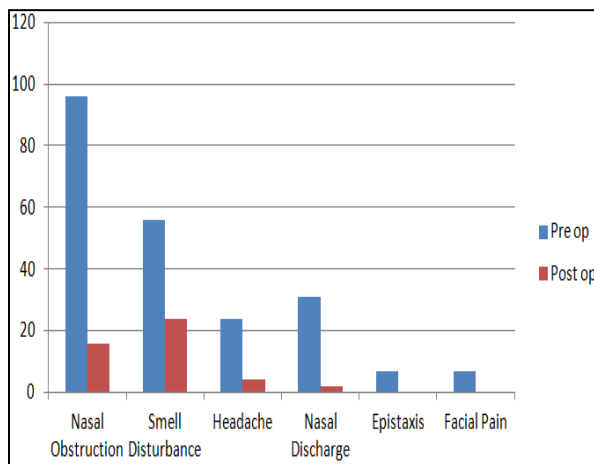


Fig 7: Pre operative and postoperative symptom profile

Findings in nasal endoscopy

All 113 patients underwent postoperative nasal endoscopy at regular intervals(1 and 3 months) after their surgery to assess the status of their FESS cavity. Synechia was present in 16 patients (14.1%), significant crusting and fungal debris was visualized in 11 patients each (9.7%) at 1 month. 9 cases who had normalized FESS cavities during initial postoperative

reviews had recurrence of polyps on later assessment. Allergic mucosa was visualized in 14 patients (12.3%) [Fig 8]

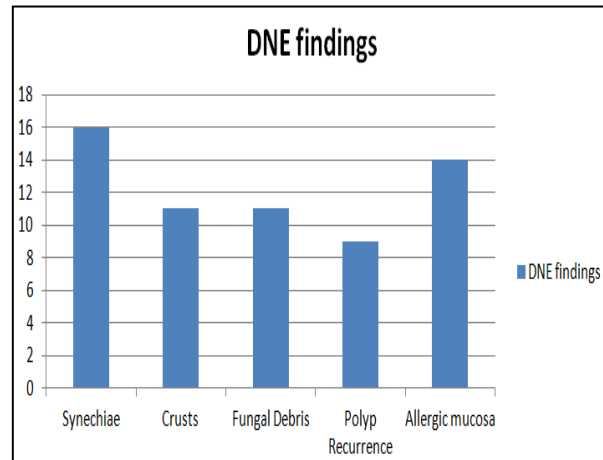


Fig 8: findings in nasal endoscopy

Relief in problem cases

A total of 43 patients were found to have one or the other problems, either symptomatic or abnormal finding in DNE. They underwent corrective measures depending on the pathology identified. After 3 months of regular follow up they were again reassessed for their problems. Out of 43 problematic cases 32 improved, (74.4%). The rest had persistent problems[Fig 9]

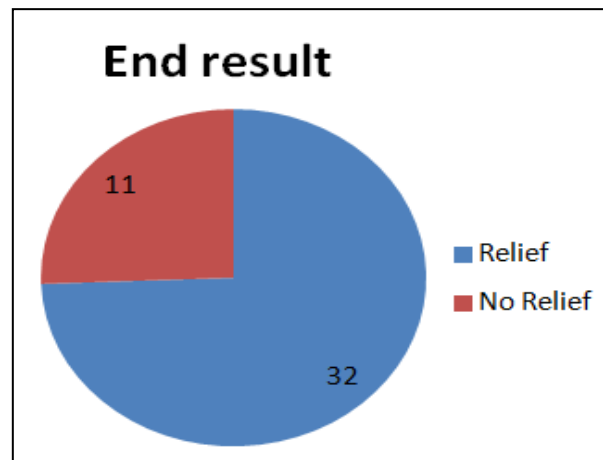


Fig 9: Results obtained

Association between diagnosis and incidence of post op problems

On the analysis of post operative problem with reference to the diagnosis, we found a significant association. AFRS had a problem rate of 68%, 17 out of the total 25 cases of AFRS had one or the other

problem at 1 month of follow up. Ethmoidal polyp came in second with 36.5% cases having postoperative problems 19 out of the total 52. One case of antrochoanal polyp had recurrence later on. 6 out of 28 cases of chronic rhinosinusitis had postoperative problems (21.4%). A p value of 0.002 was obtained for the association (significant)[Fig 10]

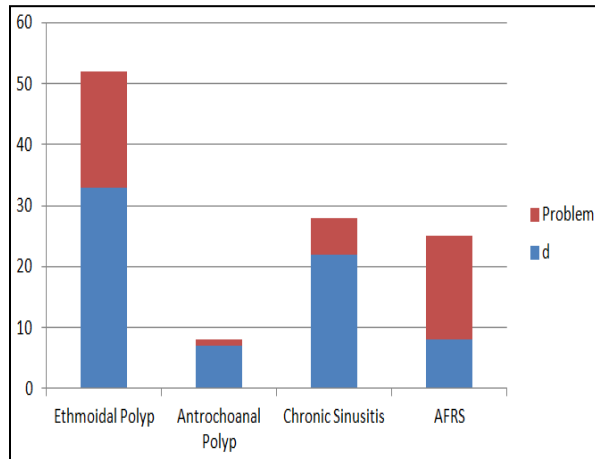


Fig 10: Association between diagnosis and incidence of post op problems

Out of the 43 problematic cases, ethmoidal polyps contributed 19 cases and AFRS,17.

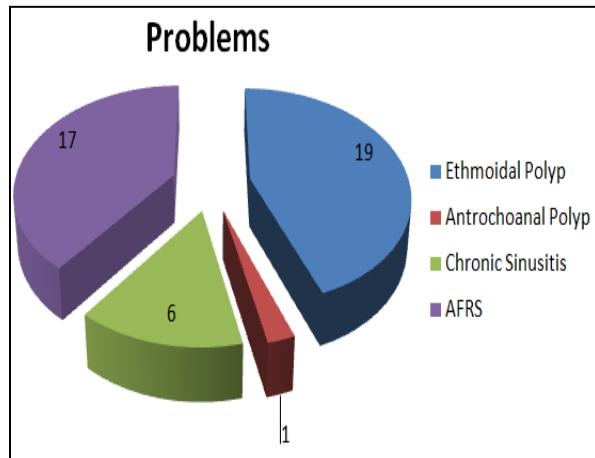


Fig 11:Problems associated

Association between procedure and incidence of post op problems

Analysis of the association between the procedure underwent 1 – Primary FESS, 2- Septal Correction with FESS , 3 – Revision FESS and postoperative incidence of problems found a significant association.15 cases who underwent septal correction along with FESS had postoperative synechia which

was subsequently released on follow up. Revision cases of FESS did poorly with 7 out of the only 8 cases having postoperative problems. The statistical evaluation showed a p value of 0.001 for the association (significant)[Fig 12,13].

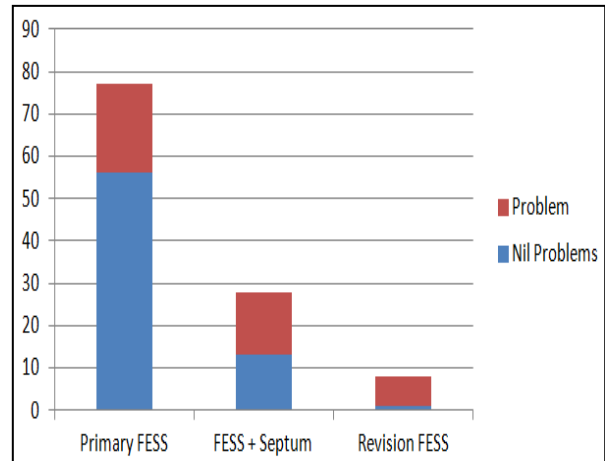


Fig 12:Comparison of problems and nil problems

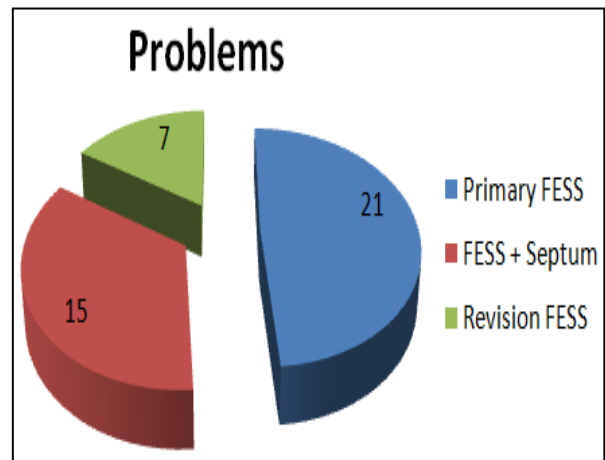


Fig 13: Association between diagnosis and incidence of post op problems

Statistical evaluation found no significance to the association between age group and problem. p value 0.536(insignificant).

Association of sex with post op problems found no significant association.

Association of diabetes with post op problems also found no significant association. A p value of 0.681 was obtained for diabetes. The number of Hypertension and bronchial asthma cases were too small to be analysed for a probable association.

Analysis of cases relieved with intervention

Out of the total 43 patients who underwent further intervention, 32 were relieved of symptoms and signs. This included all the cases of chronic sinusitis and the single case of antrochoanal polyp who underwent endoscopic revision. 7 out of the 13 ethmoidal polyp cases and 7 out of the 12 AFRS cases also showed relief[Fig 14]

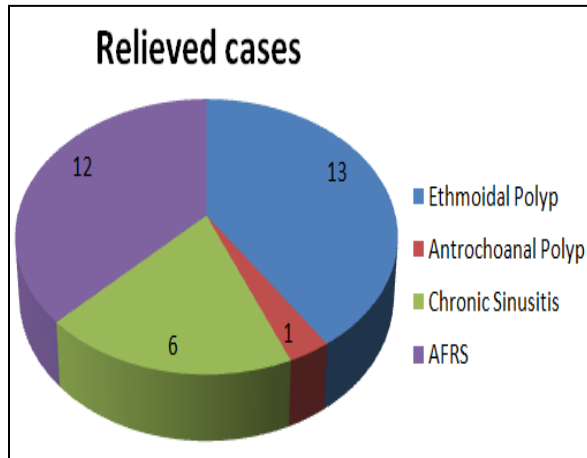


Fig 14: Analysis of cases relieved with intervention
Cases not relieved with intervention

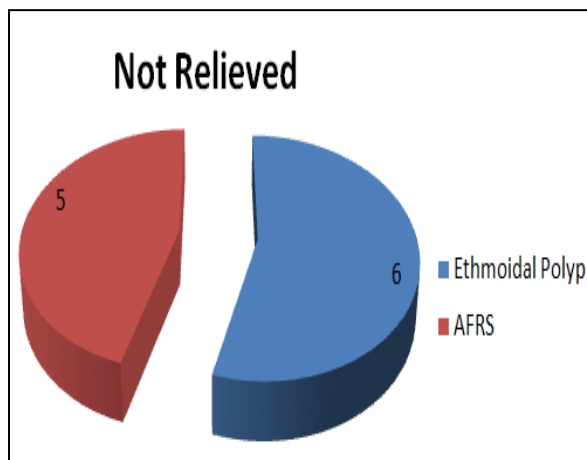


Fig 15: Cases not relieved with intervention

At the end, 5 AFRS cases and 6 ethmoidal polyp had persistent cavity problems. AFRS cases had persistent fungal debris on DNE and associated nasal obstruction and disturbance in smell. Ethmoidal polyps had persistent hyposmia/anosmia[Fig 15].

Discussion

Sinonasal disease though commonly considered more of a nuisance rather than a life threatening catastrophe, in reality is a condition severely affecting the quality of

life of the patient. Damm et al in their study in 2002 found that 94% of the patients affected with chronic rhinosinusitis (comprising the spectra of polyps, fungus and bacterial infections) had restricted quality of life and out of it 74% described the symptoms as intolerable and severe[1]. So the impact of functional endoscopic sinus surgery in improving the quality of life of patients is very huge. Today, the treatment of choice in the management of sinonasal diseases is endoscopic sinus surgery and the radical external approaches are almost done away with. ESS can achieve all that was possible and even more than that with the traditional external approaches. In the study described above of 279 patients FESS was able to improve the quality of life of 85% of the patients from severe to mild symptoms. But the question is whether the improvement obtained with the procedure is sustainable for prolonged periods. One of the doyens of the procedure, DW Kennedy opined rightly that a lot of studies are done on the perioperative and short term successes of FESS, but long term studies on the subject are very sparse[2]. In the study published in 1998 on 120 patients, Kennedy and his group described that the improvement obtained from FESS can be sustained with long term follow up of the patients. And the long term follow up of patients can be sufficiently achieved not with simple anterior and posterior rhinoscopy and blind suctioning of the cavity but with nasal endoscopic examination. He also talked about the need for more studies in this regard. Another important point in his study was that cavities that has returned normalcy are unlikely to require further surgery and manipulation. This point of cavities returning to normalcy cropped up another question on its own, how long should be the postoperative follow up of the patients. In their study appropriately titled "Quality of life outcomes after endoscopic sinus surgery – how long is long enough" Zachary and Timothy analysed 127 patients in a multi institutional review and came to the conclusion that quality of life does not appear to change between the time frame of 6 to 20 months, and a time period of 6 months can be considered as a primary endpoint in the postoperative management of ESS[3]. In our study, we did regular follow up for 3 months after the procedure and those found to have a normalized FESS cavity were asked to review in case of any difficulty. But we had 9 cases of recurrence of ethmoidal polyps and 1 case of antrochoanal polyp in those patients with normal FESS cavity. This indicates that either our follow up protocol was not "long enough" or there are chances of recurrences later on in predisposed patients. Only more studies specifically directed at the long term behavior of sinonasal polyps

can provide an answer to the problem. In our study population of 113, antrochoanal polyps were found in 8 patients (7%). With primary endoscopic sinus surgery all the cases were successfully treated of their pathology, though 1 patient presented with recurrence of polyp 9 months after surgery, which was subsequently removed with wide middle meatal antrostomy. A 87.5% success rate was achieved. These are on par with the studies conducted on the same subject elsewhere. Kaushalet al in 2004 reported a success rate of 91.5% with ESS.[4]. Loury et al compared ESS with Caldwell Luc surgery and came to the conclusion that the results of cure of antrochoanal polyp with ESS are better than the traditional Caldwell Luc approach[5]. Eladi and Elmorsy came to a similar conclusion in their experience and they preferred the use of powered instruments, angled endoscopes and instruments for the complete excision of the polyps[6]. In a very significant study reported by Tsukidate et al from Japan as recently in 2012, long term evaluation of nasal polyps in children were done[7]. They found that postoperative CT findings at 1 year post op in antrochoanal polyps were normal in 91% of the cases, but the cases in whom bilateral polyps were present prior to surgery, half of the cases had persistent CT changes even after surgery. Hence they advocate a follow up period of at least 4 years for bilateral polyps and a routine follow up (possibly 6 months) for antrochoanal polyps. This study also validates our preference in comparing ethmoidal polyp differently from antrochoanal polyp and not combining them into the heading of sinonasal polyps nor including them in chronic rhinosinusitis heading. There were 52 cases of ethmoidal polyps in our study and 9 cases had recurrence after the 3 month normal post operative period, a recurrence rate of 17%. They were further subjected to revision FESS to achieve control. Studies on the incidence of recurrence of ethmoidal polyps are almost univocal in proclaiming that there will be recurrences no matter how well the surgery is done, but the recurrences can be reduced to an “acceptable” rate with precautions and meticulous opening up of all the involved cells. Hoseiniet al in august 2012 explained this acceptable rate to be about 8% with their study and the recurrences was more associated with asthma and eosinophilia[8]. Nair et al in 2011 compared the results of FESS in chronic rhinosinusitis and nasal polyposis and found that though the technique of the procedure is similar in both, and the postoperative cavity is similar on immediate follow up, the subjective and objective scores in the 1 year follow up period showed a decline in the scores in the nasal polyp group. Hence the pathology of both conditions are significantly different

and there is no 100% cure in polyp, but rather an “acceptable” recurrence can be obtained with meticulous surgery and regular follow up[9].

All the cases of fungal rhinosinusitis in our study were non invasive allergic fungal rhinosinusitis. They turned out to be the most difficult to treat condition. An astonishing 68% of the cases (17 out of 25) had one or other symptoms or signs of cavity problem at 1 month of follow up. With meticulous suction clearance, usage of topical steroid and saline nasal sprays, a lot of the cases were controlled. At 3 months postoperative period, 5 of them continued to have problems and it was found difficult to control them. Singh and Bhalodiya¹⁰ in 2005 reported a recurrence rate of 6% though the follow up time period was not specified, but they opined that fungal rhinosinusitis is readily recurrent. Reports from China by Wang et al 2009 reported a very low recurrence rate 3% at 2 years[11]. But other studies are not so optimistic. Supportive care with nasal and systemic steroids is another area of huge debate in allergic fungal rhinosinusitis. Khalil et al in 2009 reported a very high recurrence rate of 75% with no antifungals and a recurrence rate of 10% with topical antifungals and antifungal irrigation[12]. This recurrence rate seems more realistic than the Chinese studies. Ikramet al in 2009 reported the experience with steroids after FESS for allergic fungal rhinosinusitis[13]. They reported a recurrence rate of 50% without steroids and 15% with steroids. They suggest further studies to decide the optimal dosage and duration of therapy. Singh and Bhalodiya in their study recommended both steroids and antifungals in the postoperative care[10]. But Reichelman in the German study published in 2011 found no benefit with antifungal treatment[14]. Similar result had been reported by Liu in 2007[15]. As there is no general consensus in the treatment of allergic fungal rhinosinusitis, the pathological behavior and response to treatment being an enigma, we prefer topical steroid sprays in the postoperative care of AFRS along with regular frequent suction clearance and care of the FESS cavity. Chronic rhinosinusitis in most of the studies include both polyps and fungus. Isolated reports of bacterial rhinosinusitis report a good outcome with FESS alone. Nair et al reported good subjective and objective reports with FESS alone[9]. Out of our 28 cases, 6 cases had complaints of nasal obstruction and hyposmia and were found to have small synechiae and crusts on nasal endoscopy. These symptoms promptly improved with adequate care of the cavity with suction clearance and saline nasal sprays. There were no persistent complaints at 3 months and all had good FESS cavities. Among the procedures performed, a

high rate of problems was noted with revision FESS. It is almost like a vicious cycle. On analysis we found that 4 out of the 7 revision cases who had persistent problems 4 were complaints of hyposmia and anosmia for which no reason could be found on nasal endoscopy and all were cases of recurrent ethmoidal polyposis. So the pathology may actually be due to the disease itself and not the surgery. So a thorough evaluation of the revision cases has to be done to identify the pathology and avoid the mistakes of the previous procedure. Moses et al reviewed 90 cases of revision FESS cases and achieved a 67% success rate. The reasons for the failure in the cases were attributed to massive polyposis, allergy and large extent of the disease[16]. Equivocal results were obtained with primary FESS. Septal correction with FESS was associated with greater number of synechiae, (total of 16 cases, 14%) but it is important to note that 12 of them were asymptomatic and minor. These were readily amenable to release without any residual sequelae. Ramadan in 2004 reported a very high synechiae rate of 52% in his failed cases of FESS.[17]. Synechiae and stenosis were the predominant problems in his study. But the symptomatology of such patients could not be found in the study. Fageehet al reported a synechiae rate of 25% in his study, and he opined they can be treated with meticulous suction clearance and release under endoscopic guidance[18]. Analysis of the patients who had persistent problems with FESS showed that three fourth of them were having complaints of hyposmia/anosmia, and half of them had no relevant finding in nasal endoscopy and such patients with negative endoscopic finding were all cases of ethmoidal polyps for whom revision FESS had been carried out. In fact decreased sense of smell is one of the most common complaints of patients with chronic rhinosinusitis which significantly reduces the quality of life of the individual. But very little studies are there on the effect of FESS on the sense of smell. Delank and Stoll concluded in their study in 1998 that FESS improved the olfaction in 80% of the patients[19]. But only 5% of the patients with anosmia improved after FESS. The majority of improvement was in the hyposmia group in whom the disease was mild. Litvacket al 2009 published an article criticizing the neglect of the studies on the sense of smell of patients post FESS[20]. Their study found that anosmia improved significantly after FESS but most of them did not return to normal status. Contrary to the other study, hyposmia failed to show significant improvement after FESS. One important point in the study was the significant association between anosmia and nasal polyposis. Successful treatment of polyposis improved

the olfaction of the patients. But more studies are needed for a clearer picture on the subject.

It comes as no wonder that the most comprehensive review of post operative cavity problems of FESS was done by the great exponent of FESS, Prof Stammberger. In his article published in 1990, he analysed a 10 year data of 500 patients. Overall 246 of the 500 patients suffered from massive nasal polyposis[21]. Sixty-four of these patients had a clinical picture of diffuse polyposis, with up to 18% having recurrences and some having multiple recurrences. They came across patients who were completely free of symptoms following surgery, some for many years, but with abnormal mucosa seen endoscopically. They encountered slight inflammatory changes, some polypoid thickenings and crusting or prominent secretions. Some patients whose mucosa endoscopically looked completely normal and whose sinus ostia all were free still complained of some remaining problems, for which no objective cause could be identified. In about 8% of all patients followed, varying degrees of synechiae were found mainly between the anterior portion of the middle turbinate and the lateral nasal wall. Only 15% of the patients in whom synechiae were identified suffered from recurring or persisting problems. 23% of the 500 patients seen in follow-up reported some (varying) degrees of anosmia preoperatively. In the majority of these cases the symptoms improved subjectively after surgery. The results of our study in a nutshell, almost corresponds to the findings of his study as is evident from the summary that follows. Long term postoperative follow up with regular thorough endoscopic evaluation of the nose and paranasal sinuses forms the mainstay of management of cavity problems of FESS. Corrective measures have to be taken according to the pathology and appropriate supportive management with topical steroids and saline irrigations is helpful. More studies are needed to form a definite valid protocol for the postoperative management of FESS.

Conclusion

Functional endoscopic sinus surgery is the present treatment of choice for various sinonasal pathologies and beyond. The effectiveness of FESS is well established and the intraoperative complications are also well studied. There is a need for more studies on the long term problems of FESS cavity as the number of cases being performed is increasing in an exponential manner. Postoperative care is as much important as the surgery itself for the ultimate outcome in the management of various sinonasal pathologies. Nasal endoscopy is the method to be used in

postoperative assessment and not anterior rhinoscopy and blind suctioning. Regular frequent monthly follow up is necessary post procedure for atleast 6 months, thereafter the reviews can be prolonged depending on the status of the FESS cavity. Of the various sinonasal pathologies, ethmoidal polyps and allergic fungal rhinosinusitis requires extra special care because they are highly prone for recurrences and persistence of symptoms. Suction clearance of the FESS cavity and maintenance of the patency of the natural ostia are the most important factors in the postoperative care. Usage of topical steroid nasal sprays and saline sprays are helpful in the supportive management. Revision cases are never easy and they should undergo extensive preoperative assessment to determine the reason of failure in the primary surgery so as not to make the same mistakes again and to avoid more complications. Fungal rhinosinusitis and ethmoidal polyps needs more study to evaluate their behavior and response to steroids and other medical management.

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