

A STUDY ON THE ENDOSCOPIC SINUS SURGERY OVER THE PERIOD OF 9 YEARS

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ABSTRACT

Objective: To share experience of 1000 patients who underwent functional endoscopic sinus surgery (FESS) in 4 different hospitals for various diseases over span of 9 years.

Study Design: Prospective observational study.

Place and Duration of Study: Sheikh Khalifa Hospital Muzaffarabad, Combined Military Hospital Sialkot, Pak Emirates Military Hospital Rawalpindi and Combined Military Hospital Quetta, from Jun 2009 to Jun 2018.

Methodology: We included 1000 patients who underwent Functional endoscopic sinus surgery (FESS) in four different military hospitals, suffering with various diseases discussed later. Patients were operated after failure to get response to medical therapy. All the patients had preoperative endoscopic examination and CT-scan paranasal sinuses (PNS) done for disease assessment. Patients were examined post operatively at 1, 15 days and 2 months. All patients were documented for the level of satisfaction at end of 2 months post-operative period.

Results: Most patients were suffering from rhino sinusitis 364 (36.4%). Bilateral ethmoidal polyps constituted the second largest group at 289 (28.9%) patients. About 837 (83.7%) of patients were completely free of symptom, 104 (10.4%) with partial improvement whereas, 59 (5.9%) patients did not report any improvement in symptoms. 899 (89.9%) of patients were discharged on their first post operation day meaning less hospital stay and quick recovery.

Conclusion: Functional endoscopic sinus surgery (FESS) can be employed to treatment variety of common nasal diseases (chronic rhino-sinusitis, nasal polyps) and non-nasal diseases like cerebrospinal fluid (CSF) rhinorrhea and as approach to skull base. This method of treatment was quite effective in alleviating symptoms of patients.

Keywords: Chronic rhino sinusitis, Functional endoscopic sinus surgery, Mucociliary clearance, Nasal polyp, Osteo-meatal complex.

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INTRODUCTION

Paranasal sinus surgery has progressed as new and innovative techniques in exposure and visualization have developed. By 1868, the use of anterior rhinoscopy was routinely practiced, and external approaches to the paranasal sinuses were subsequently developed and refined. The canine fossa approach to the maxillary sinus was described by George Caldwell in 1893. The first endoscopic examination of the nose was performed by Hirshman in 1901 using a modified cystoscope, just as the Caldwell-Luc procedure was gaining popularity for the treatment of chronic sinusitis¹.

With the development of endoscopes,

Messerklinger was able to carefully study both the anatomy and the pathophysiology of the paranasal sinuses. His collection of images and experience was eventually published in 1978 and is now widely considered the major reference work for endoscopic diagnosis². Improvements in both endoscopes and sinus instrumentation developed as interest grew in the United States. Stammberger, Messerklinger's former resident, and Kennedy, who had observed Messerklinger's technique, eventually began teaching endoscopic sinus techniques outside of Germany and Austria³.

FESS has revolutionized the ability to diagnose and treat paranasal sinus disease with the help of endoscopes and computed tomographic (CT) scanning⁴. These procedures can be performed under general anesthesia. Office procedure

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can be done under local anesthesia. The specific structures that must be identified and assessed for disease during the examination are the middle turbinate and the middle meatus (osteomeatal complex)⁵.

The concept of FESS has recently been widely accepted with reasoning all over the world and supported by rhinologist (The term "functional" was introduced to distinguish this type of endoscopic surgery from non-endoscopic, "conventional" procedures)⁶. So main aim of FESS is to preserve the mucociliary function by preserving the protective mucosal layer of nose and paranasal sinuses, to make paranasal sinuses healthy, restore their function by maintaining their ventilation through the individual Ostia⁷. Functional endoscopic sinus surgery may be used as a term which represents range of procedures in the sinuses depending upon extension of the disease⁸.

With the advent of FESS it has become very easy to assess the problem by the endoscopic examination, remove the disease, restore the ventilation and preserve the mucociliary clearance by preserving the mucosa. In FESS all the sinuses are taken care of simultaneously & Polypectomies done. For maxillary problem, middle meatal antrostomy that is widening of the natural maxillary ostium in the middle meatus is done and the maxillary sinus mucosa is left intact⁹. For ethmoid disease, ethmoidectomy that is opening and removal of the bulla ethmoidalis (anterior ethmoids). Frontal recess clearance is done by cleaning of the frontal recess at the frontal ostium off the polyps. The frontal sinus mucosa is left intact & frontal ostium not touched. Sphenoid disease is dealt by widening of the natural sphenoid ostium and cleaning the sphenoid sinus off secretions and polyps. The sphenoid sinus mucosa is left intact. Combination of different procedures depends upon the extent of disease¹⁰.

The aim of this study was to share our experience of endoscopic surgery of various diseases of head (nose) in Sheikh Khalifa Hospital, Muzaffarabad, CMH Sialkot, Pak Emirates Military hospital Rawalpindi and CMH Quetta.

METHODOLOGY

This 9 years prospective observational study was carried at four different hospitals (Sheikh Khalifa Hospital Muzaffarabad, CMH Sialkot, Pak Emirates Military Hospital Rawalpindi and CMH Quetta) from June 2009 to June 2018, after getting approval from hospital ethics committees. 1000 Cases which underwent FESS, from both gender between 15 to 65 years of age were included using consecutive sampling technique.

Through history and nasal examination of all the patients, using 0° and 30° rigid nasal endoscopes was done in all cases. CT scans PNS plain in both coronal and axial planes using 5mm cuts were obtained as standard in all cases. Patients were prepared for FESS where applicable. They were treated with anti-allergic, systemic steroids and nasal decongestants before surgery. After informed consent, all these cases were operated. All the patients were advised to have regular follow up for at least 2 months. Patients having previous history of surgery were also included in this study. Patients with previous history of trauma or known cases of DNS were also included in this study. Patients which were excluded were unilateral nasal growths with suspicion of malignancy on histopathology, and head & neck tumors with regional metastasis. These results were analyzed by using Statistical Package of Social Sciences (SPSS) version 17. Frequencies and percentages were calculated for categorical data. Mean and standard deviation were calculated for quantitative data. Microsoft office 2010 was used for generating charts.

RESULTS

In this 9 year period 1000 cases of FESS were done in 4 hospitals around Pakistan. The patients belonged to both genders and age ranged between 15 to 65 years. The mean age of patients was 34.3 ± 7.2 years. Total patients operated were 1000 out of which 148 (14.8%) cases were treated at Sheikh Khalifa Hospital, Muzaffarabad and 74 (7.4%) cases were treated at CMH Sialkot. About 580 (58%) cases were treated at Pak

Emirates Military Hospital Rawalpindi and 198 (19.8%) cases at CMH Quetta.

Types of Cases in this study are shown in table-I. Out of 1000 cases 364 (36.4%) were of rhino sinusitis, 289 (28.9%) cases were of bilateral

Table-I: Disease wise distribution of cases.

Diseases	n (%)	Valid Percentage
Chronic rhinosinusitis	364 (36.4)	36.4
Ethmoidal polyps	289 (28.9)	28.9
Enlarged turbinate	45 (4.5)	4.5
Inverted papilloma	32 (3.2)	3.2
Antrochoanal polyp	32 (3.2)	3.2
Fungal sinusitis	103 (10.3)	10.32
Orbital cellulitis	32 (3.2)	3.2
Endoscopic DCR	39 (3.9)	3.9
Skull Base Surgeries	10 (1.0)	1.0
Miscellaneous	54 (5.4)	5.4
Total	1000 (100)	100.0

Table-II: Distribution of cases for miscellaneous cases.

Diseases	n (%)	Valid Percentage
Epistaxis	15 (1.5)	1.5
Revision Surgery	25 (2.5)	2.5
Foreign body	7 (0.7)	0.7
CSF Leak	2 (0.2)	0.2
Adenocarcinoma	1 (0.1)	0.1
Esthesioblastoma	2 (0.2)	0.2
Total	54 (5.4)	5.4

ethmoidal polyps, 45 (4.5%) cases were of nasal obstruction due to enlarged turbinates' for which endoscopic turbinoplasty was done. Thirty two (3.2%) out of 1000 cases were of *antrochoanal polyp*. Fungal sinusitis was diagnosed and treated in 102 patients (10.2%). Inverted papilloma cases were 32 (3.2%). Out of 1000 cases, patients of Orbital cellulitis were 32 (3.2%), operated for skull base surgeries were 10 (1%), operated for endoscopic DCR were 39 (3.9%) and Miscellaneous were 54 (5.4%). Out of 54 miscellaneous cases further break up is shown in table-II (revision surgery 25, epistaxis 15, foreign body 7, CSF leak 2, adenocarcinoma 1, esthesioblastoma 2, choanal atresia 2).

Mostly 899 (89.9%) the patients were discharged on their first post operation day and the other 101 (10.1%) on 2nd or 3rd post operation

day depending upon their respective complications. 837 (83.7%) of patients were completely free of symptom, 104 (10.4%) with partial improvement whereas, 59 (5.9%) patients did not report any improvement in symptoms. Response of patient symptoms at 2 months post operatively is shown in figure.

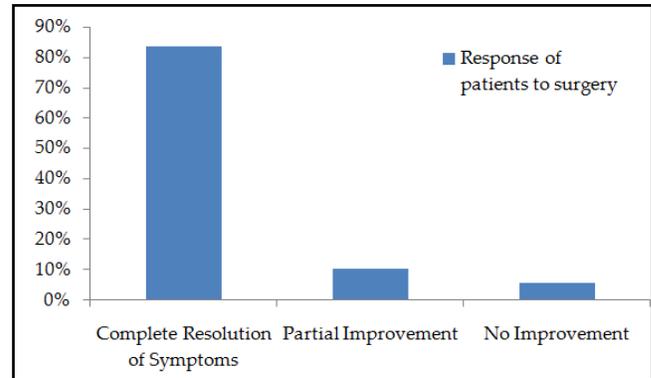


Figure: Response of patients to FESS at completion of 2 months.

DISCUSSION

Endoscopic sinus surgery is already a gold standard in developed countries for treatment of most of nasal and paranasal sinuses diseases because of superior visualization and ability to reach areas which were inaccessible previously^{11,12}. FESS is relatively new to third world countries like Pakistan because of high cost of procurement and lack of technical expertise in this region. However, despite being late in starting in endoscopic sinus surgery various centers are catching up rapidly to this revolution in ENT. In this study, we have tried to share our experience of FESS over span of 9 years in 4 hospitals around Pakistan.

In our study, we employed FESS to tackle variety of problems being encountered. Chronic rhino sinusitis was the commonest problem for which FESS was utilized at our institutions and constituted 36.4% of all operated cases. In a study done by Chopra *et al*¹³, 38% of patients operated through FESS had chronic rhinosinusitis which is comparable with our study implying that chronic rhinosinusitis is commonest entity for which FESS is used. In another study, done by Razzak *et*

al, the number of patients with chronic sinusitis constituted about 31.67% of all cases operated with FESS¹⁴. All these studies show that in centers where FESS is used to tackle variety of nasal diseases patients of chronic rhino sinusitis constitutes the bulk.

Ethmoidal polyposis is another common problem being faced by Rhinologist throughout world. In our study 28.9% of cases operated through FESS were of ethmoidal polyps. In another study done by Siam *et al*, 40% of patients undergoing Fess had problem of nasal polyposis¹⁵. In another study patients of nasal polyps constituted 36.67% of patients who underwent FESS¹⁴.

FESS has an advantage of superior visualization of advanced rigid endoscopes and therefore can be used to address variety of nasal and allied problems. In our study in addition to routine nasal diseases FESS was employed to encounter other relatively uncommon but difficult situations. In our study 3.9% of patients were of endoscopic DCR, 0.2% of patients were of CSF leak repair and 1.5% patients were of epistaxis. Therefore showing range of situations in which FESS can be beneficial. In a study done by Qureshi *et al*, Fess was employed to tackle variety of conditions and their 14% cases were of endoscopic DCR, CSF repair constituted 5% of their study subjects and 2.3% of their patients treated were of epistaxis¹⁶. In another study done by Raza *et al*, FESS was used to do advanced surgeries involving skull base and orbits, showing true spectrum of diseases being treated¹⁷. Results of this study also validates that FESS has started to replace conventional nasal surgery in our centers and has use in treating variety of disease entities.

FESS is very effective in alleviating symptoms of nasal diseases. In our study 83.7% of patients were completely free of symptoms at 2 months post operatively furthermore 10.4% showed partial improvement establishing the efficacy of FESS in treating various diseases. In a study carried out by Razzak *et al*¹⁴, complete relief of symptoms was noted in 81.67% of treated cases which is in line with our study. In another study

82% of patients were symptom free after 3 months of surgery cementing role FESS in treatment¹⁸. Overall FESS was found to be very effective mode of treatment in various studies^{9,10}.

FESS can be employed to treatment variety of common nasal diseases (chronic rhino-sinusitis, nasal polyps) and non-nasal diseases like CSF rhinorrhea and as approach to skull base. This method of treatment was quite effective in alleviating symptoms of patients.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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