

## EFFICACY OF FUNCTIONAL ENDOSCOPIC SINUS SURGERY IN RECURRENT NASAL POLYPOSIS

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### ABSTRACT

**Objective:** To analyze the efficacy of FESS in patients with recurrent nasal polyposis in terms of relief of nasal obstruction, improvement in sense of smell and to assess recurrence of disease.

**Study Design:** Descriptive case series.

**Materials and Method:** All patients who underwent FESS (Functional endoscopic sinus surgery) for recurrent nasal polyposis from June 2008 to June 2010 with an average follow up of 06 month were included. Clinical symptoms including nasal obstruction and olfactory disturbance were evaluated using VAS system pre and postoperatively. Preoperatively computed tomography scan was done in all cases to assess extent of disease and surgical anatomy.

**Results:** Following FESS 96% of total patients demonstrated statistically significant improvement in relieving nasal obstruction after 6 months follow up, however improvement in sense of smell was seen in 44% of patients. Recurrence was seen in only 3 (6%) cases at 3<sup>rd</sup> and 6<sup>th</sup> month follow up.

**Conclusion:** Functional endoscopy sinus surgery of recurrent nasal polyposis is an effective method of surgery with significant improvement of symptom of nasal obstruction and olfaction with minimal recurrence at 6 month in our centre. Our results were compatible with results attained internationally.

**Keywords:** Functional Endoscopic Sinus Surgery, Nasal Obstruction, Recurrent Nasal Polyposis.

### INTRODUCTION

Nasal sinus disease is prevalent through out the world. Patients with sinus disease particularly nasal polyposis and chronic sinusitis often experience a significant impact on their general quality of life. An intermittent course of oral steroids associated with long term administration of topical steroid is highly effective in relieving symptoms, however in refractory and uncontrolled cases of nasal polyposis surgery is required to improve quality of life in patient. Simple nasal polypectomy is still done in Pakistan for nasal polyposis with significant recurrence of disease. After simple nasal polypectomy most of patients don't have satisfactory improvement in symptoms along with significant recurrence of disease mainly because of incomplete removal of disease or persistence of underlying cause, most commonly fungal infection. After simple nasal polypectomy

post-operative symptom scores did not differ significantly and revision surgery is required more frequently after few months of surgery<sup>1</sup>. FESS has emerged as treatment of choice for nasal polyposis, both for primary modality as well as recurrent nasal polyposis.

Most otolaryngologists now consider FESS to be the standard of care for treating nasal polyposis and CRS that is not responsive to medical treatment, replacing other older procedures, such as Caldwell Luc's and external ethmoidectomy. Our study analyzed the outcome of patients who under went FESS with recurrent nasal polyposis following intranasal polypectomy, including effectiveness of procedure and complications.

### PATIENTS AND MEHTODS

A descriptive, study was conducted at CMH Kharian over a period of two years from June 2008 to June 2010. Fifty patients with recurrent nasal polyposis who were already operated by simple nasal polypectomy once undergoing FESS were evaluated. Patients were selected using purposive sampling technique.

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The decision of surgery was based on following inclusion criteria, patients between 18 and 60 years of age of either sex, patients with prior simple intranasal polypectomy once, patients with positive nasal endoscopy and CT scan findings, patients with DM, HTN, TB, neoplasm, immunosuppression, patients lost to follow up were excluded from study.

All patients were assessed for specific clinical symptoms of nasal polyposis including nasal obstruction and olfactory disturbance using VAS system.

The severity of symptom was graded into five categories using VAS scale.

0-2 no / mild, 3-4 moderate, 5-6 moderately severe, 7-8 severe, 9-10 worst

After informed consent, surgeons of almost equal surgical competence performed surgery (functional endoscopic sinus surgery) under GA in each case with standard anterior to posterior approach. The surgical steps were applied depending upon extent of disease in each case.

Vaseline gauze was used as post operative nasal packs which were removed on 2<sup>nd</sup> post operative day. All the patients were advised post operative antibiotics, intra-nasal and oral steroids along with careful nasal debridement /toilet. Augmentin (co-amoxiclav 50 mg/kg TDS), prednisolone 1 mg/kg/24 hrs were prescribed for 5 days and topical nasal steroids thrice daily were advised for 01 month. Post operative follow-up was carried out at 1<sup>st</sup> week, 2<sup>nd</sup> week, 1<sup>st</sup> month 3<sup>rd</sup> and 6<sup>th</sup> month.

**Table-1: Radiological data for involvement of different sinuses.**

	Right	Left
Maxillary sinus	30	38
Ant.ethmoidal sinus	43	47
Post ethmoidal sinus	32	38
Sphenoid sinus	16	20
Frontal sinus	26	30

At each follow-up nasal obstruction, olfactory disturbance and recurrence of disease

was recorded through VAS (0-10 scale). Nasal endoscopy was also performed at 3<sup>rd</sup> and 6<sup>th</sup> month follow up to see state of mucous membrane of nasal cavity and the recurrence of disease. The recurrence of nasal polyposis was considered when nasal polypi appeared in nasal cavity within 3 month of follow-up.

**RESULTS**

Fifty patients with recurrent nasal polyposis who underwent FESS were included, forty one (82%) were males and 9 (18%) were females with an average age range of 18-58 years. Mean age of males was 37.9 years and mean age of females was 36.7 years.

Almost all patients had nasal obstruction while disturbed sense of smell was observed in 26 (52%) patients. Most cases were placed in severe and worst category i.e nasal obstruction was moderately severe in 11 (22%) of patients, severe in 34 (68%) while 5 (10%) of patients were placed in worst category. Disturbed sense of smell was moderately severe in 10 (20%) cases, severe in 9 (18%) and worst in 7 (14%) of cases.

Nasal endoscopy in each case was done and nasal polyposis was staged in 3 categories: polyps limited to middle meatus; polyps reaching inferior meatus; polyps reaching floor of nasal fossa. According to nasal polyposis grading system, 36 (72%) patients were placed in stage 2 and 14 (28%) patients were placed in stage 3.

Radiological grading in each patient was done and results are shown in table-1.

Post operative information was achieved as a result of several intermittent clinical standardized examinations (including endoscopy) of each patient. In addition written information given on questionnaire forms were included in over all evaluation.

Out of 50 patients 48 (96%) of individuals showed relief of nasal obstruction after follow up of 06 months. Thirteen patients had associated septal deviation which was addressed surgically during the procedure. At 2<sup>nd</sup> week of follow-up 15 (30%) patients were placed in moderate

category and 35 (70%) were placed in mild category. At 3<sup>rd</sup> and 6<sup>th</sup> month follow up 48 (96%) patients were placed in mild category, while 2 (4%) were placed in moderate category.

Similarly as far as sense of smell was concerned, 18 (36%) patients were placed in mild category, 6 (12%) in moderate and 2 (4%) in moderately severe category. Twenty two (44%) cases showed improvement in the sense of smell after 6 months and were placed in mild category, while 3 (6%) were placed in moderate and 1 (2%)

post-operative synechia between turbinate and septum. All cases were managed by excision of synechia.

The patient’s data of nasal obstruction and sense of smell assessed pre-operatively was compared to the data at 6 months post operatively using Chi square test. The severity of nasal obstruction was lesser in patients at 6 months post operatively and the difference was found to be statistically significant (*p*-value 0.000). The severity of loss of sense of smell was

**Table-2: Cross tabulation; data of pre- and post-operative severity of nasal obstruction.**

	Mild	Moderate	Moderately severe	Severe	Worst	Total	<i>p</i> -value
Pre-op	0	0	11	34	5	50	0.00
Post-op at 6 <sup>th</sup> month	48	2	0	0	0	50	
Total	48	2	11	34	5	100	

was placed in moderately severe category.

Nasal endoscopy under local anaesthesia was performed in all cases at 3<sup>rd</sup> and 6<sup>th</sup> month follow up visit. Almost normal mucosa was seen in 47 (94%) patients. In 3 cases mild polypoidal mucosa was seen in posterior ethmoidal sinus while three patients showed adhesions at site of middle meatal antrostomy which were cleared under LA along with sinus wash.

No major post operative complications were seen in this study.

Peri-operatively unilateral arterial bleed from sphenopalatine branches were seen in 6 cases and all were successfully managed by local adrenaline nasal packs/coagulation using long thin bipolar forceps.

No intra orbital bleeding with formation of hematoma occurred, neither did any kind of visual disturbances appeared in post-operative period.

CSF fluid leak was seen in 1 patient unilaterally, which responded to conservative treatment.

Lamina papyracea was damaged in 4 patients. In these cases exposure of orbital fat occurred peri-operatively, however no major orbital complication occurred. Eleven patients had

also significantly reduced at 6 months post operatively compared to pre-operative values (*p*-0.000).

**DISCUSSION**

Polypos present as bundle of grapes in nose, having multi-site origin, mostly near osteomeatal complex. Nasal polyposis is considered as part of spectrum of chronic rhino sinusitis<sup>2</sup>.

The use of endoscopes for sinus surgery allowed Messerklinger to introduce mucosal sparing technique that focused on removing key areas of obstruction to allow the restoration of normal muco-ciliary function<sup>3</sup>.

The term functional endoscopic sinus surgery was used by Kenedy et al to describe these techniques, since then many studies have been published reporting the results of endoscopic sinus surgery for treatment of nasal and sinus diseases<sup>4</sup>. The justification and motivation for performing functional endoscopic sinus surgery has been described by Stamberger and is under pinned by findings that almost all infections of frontal and maxillary sinus originate in nose and anterior ethmoids<sup>5</sup>.

Therefore FESS is targeted at osteomeatal complex area, clearing diseased air cells, stenotic

clefts and mucosal contact areas. Similarly ventilation and drainage of maxillary and frontal sinuses are re-established via their natural routes.

Mild to moderate cases of nasal polyp usually responds well to topical or systemic steroids. Severe, non responding cases to medical therapy require surgery and are usually treated by post-operative topical nasal steroids to reduce recurrence<sup>6</sup>.

Choice of surgery ranges from simple polypectomy or conservative surgery to a more extensive or radical approach. Simple nasal polypectomy is still done mostly in many centres with significant recurrence of disease. In National Health Service research and development health technology assessment programme evaluation, polyp recurrence was 28% following endoscopic sinus surgery compared with 35% following intra-nasal polypectomy<sup>7</sup>.

Nowadays FESS has replaced all other older surgical procedures, considering it a better surgical option for treatment of nasal polyposis with less recurrence. One of goals of endoscopic sinus surgery in polyposis is to reduce the surface area from which polyp can arise for appropriate distribution of nasal drops to diseased mucosa. Steward et al showed that patients with more severe disease on pre-operative CT scan were more likely to have larger improvement in symptoms scores after treatment<sup>8</sup>.

In this study all patients were followed up for 06 months by surgeon himself. This provides opportunity to follow step by step the development of disease or normalization of nasal and sinus mucosa in each patient.

In all patients middle turbinate was preserved with aim not to disturb the main landmark of nose and this can be one of the contributing factors of less improvement in olfaction.

Few complications also occurred during surgery in our study even though this procedure necessitates meticulous dissection of dangerous

areas. However all the complications were successfully managed.

Post-operative topical steroids were given along with antibiotics with an idea to facilitate healing and avoidance of recurrence and infection. Although no guidelines are available to support such an attitude, some studies have shown some advantages in following medical management, especially in refractory cases<sup>9</sup>.

Endoscopic sinus surgery has proven to be correlated with low complication rate and low morbidity in the hands of experienced and well trained surgeon. Nevertheless it bears the potential of all risks and hazards of all ethmoidal surgery in general<sup>10</sup>.

The long term follow up has shown that FESS should be operative method of choice for most patients with nasal polyposis giving good post operative results. Endoscopic sinus surgery has also shown to be a safe procedure.

Complication rates are reported as less than 1%. Some of the major complications include blindness, intra cranial injury; orbital hematoma and CSF leak<sup>11</sup>.

FESS is also an effective surgical procedure in chronic sinusitis as it improves muciliary transport by improvement in ciliary population, decrease in inflammation, edema and polyp formation<sup>12</sup>. Nowadays image guidance system is used for FESS which helps to provide the surgeon with improved three dimensional conceptualization of surgical anatomy and give surgeon the ability to correlate patients anatomy point to point with their individual.

Fine cut axial CT scan are reformatted into a sagittal and coronal plane, allowing the surgeon to operate and localize anatomy in three dimensions. Although not yet the standard of care, image guidance is commonly used in patients and disease states with altered anatomy and / or the potential for major complications e.g. frontal and sphenoid sinus revision surgery and skull base tumors<sup>13</sup>.

Pituitary tumors are now commonly being removed transnasally using endoscopic techniques, with reduced complication and hospital stay<sup>14</sup>. Additionally balloon catheter technology has been used to dilate maxillary, frontal and sphenoid sinus ostia without bone or soft tissue removal. Early reports show persistent patient's symptom improvement and sinus ostia patency. Further studies and long term outcomes with this technology will determine its role in endoscopic sinus surgery<sup>15</sup>.

The future of endoscopic sinus surgery may depend on robotic surgery which is currently being used for cardiothoracic surgery. Similarly advances in computer aided surgery will allow for safer and more thorough dissections.

### CONCLUSION

Functional endoscopic sinus surgery has proven to be a safe and successful treatment for recurrent nasal polyposis. Advances in the field have allowed less morbidity, improved patient comfort and surgery in places that would otherwise have required more invasive approaches.

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