

Endoscopic Sinus Surgery versus Conventional Method in Management of Naso-Ethmoidal polyps and Their Associated Intranasal Abnormalities

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Abstract

Background: This is a prospective and comparative clinical study, implemented in department of Otolaryngology –Sulaimani Teaching Hospital, from Aug. 1st 2006 to Nov. 1st 2007.

Objectives: This study was carried out to compare the influences and outcomes of endoscopic sinus surgery versus conventional intranasal method in management of patients with nasal polyps, which is the most common intranasal swelling.

Methods: The sample of the study includes 50 patients' aged 12-75 years old that are managed for nasal polyp, thirty patients managed by conventional method and twenty patients were managed by endoscopic sinus surgery. Patients are observed postoperatively by symptomatic score and endoscopically

Results: Endoscopic sinus surgery resulted in better improvement in symptoms, better treatment of other associated sinonasal pathologies, less complication rate, and less recurrence rate than conventional polyoectomy. On the other hand endoscopic sinus surgery is more technically demanding and needs more operative time than the conventional way.

Conclusion: We concluded from the study that Endoscopic Sinus surgery is better than conventional intranasal polypectomy, as endoscopy provides approximate field of vision and illumination, good access, hidden pathology are revealed and managed, and complication, recurrent rate are less.

Keywords: nasal polyp, conventional polypectomy, endoscopic sinus surgery.

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Introduction

The introduction of endoscopes in sinus surgery has brought about a revolution in the approach to surgery of paranasal sinuses. This technical achievement has been critical in the evolution of a functional philosophy of sinus surgery which was introduced by Messerklinger (1978) and Wigand (1981) and further refined by Stammberger (1986) ⁽¹⁾.

Endoscopic sinus surgery is a minimally invasive technique in which sinus air cells and sinus ostia are opened under direct visualization ⁽²⁾.

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Most rhinologists agree that Endoscopic Sinus Surgery should be a "disease-directed" and mucosal-sparing operation, recognizing the principle of the

potential for re-establishing drainage and mucosal recovery of the dependent sinuses ⁽³⁾.

The ability to treat paranasal sinus disease and the nasal cavity has been revolutionized by endoscopes and computed tomographic scanning (CT). Endoscopes have made it possible to examine the nose thoroughly from the anterior nares to the postnasal space ⁽²⁾.

Endoscopy also used for therapeutic purposes for patients who are correctly documented disease have failed to respond to appropriate medical therapy like chronic rhinosinusitis and nasal polyp with preservation of mucosal and bony framework in critical areas of the nasal cavity ⁽⁴⁾.

CT scanning identifies the anatomic relationships of the key structures (orbital contents, optic nerve and carotid artery) to the diseased areas. A process that is vital for surgical planning. CT also defines the extent of disease in any individual sinus, as well as any underlying anatomic abnormalities that may predispose a patient to sinusitis and nasal polyp ⁽²⁾.

The reasons and concepts supporting the use of FESS have recently become widely accepted. The term "functional" was introduced to distinguish this type of endoscopic surgery from nonendoscopic, "conventional" procedures; the goal of FESS is to return the mucociliary drainage of the sinuses to normal function. The paranasal sinuses are maintained in a healthy state by ventilation through the individual ostia and by a mucociliary transport mechanism that keeps a continuous protective layer of mucus flowing out of the sinuses ^(1, 2, and 5).

Nasal Polyps are parts of an inflammatory reaction involving the mucosa of the nose and paranasal sinuses. Nasal polyps are evaginations of the nasal mucosa attached by a pedicle arising from the ethmoidal sinuses, middle turbinate, maxillary sinuses and some times from the septum ⁽⁶⁾.

Types:

- Simple.
- Neoplastic.
 - o Benign.
 - o Malignant.

There are 5 main theories of pathogenesis:

1. Bernoulli phenomenon.
2. Polysaccharide changes.
3. Vasomotor imbalance.
4. Infection.
5. Allergy ⁽⁸⁾.

No single predisposing disease can be implicated in the formation of polyps, though they may be associated with several other diseases, notably non-allergic (intrinsic) asthma and aspirin intolerance or sensitivity ⁽⁹⁾.

The association of asthma and nasal polyps has been noted by numerous authors. What is also recognized, but much less often cited, is that this association is strongest in women ⁽¹⁰⁾.

In advanced cases the external nose may be broadened, the condition is known as "frog-face"

On examining the interior of the nose, attention should first be directed to the region of the middle turbinate, though in obvious cases a view of this part will be obscured by the multiple grey polypoidal masses. They are insensitive to probing, mobile on their pedicles, and may totally fill the nose bilaterally.

Posterior rhinoscopy should also be done; the nose can be looked perfectly normal anteriorly in the presence of a large choanal polyp, the narrow pedicle of which cannot be seen in the middle meatus ⁽¹²⁾.

- There is no specific hematological, biochemical or immunological investigations that are required apart from those involved in the general work up of cases prior to surgery.
- Radiology

Plain radiographs of the paranasal sinuses demonstrated by the conventional three views will show the extent of the disease in the nose and paranasal sinuses to some extent. A CT_ scan will give more information, particularly the anatomical detail ⁽⁸⁾.

Management:

The treatment of nasal polyposis is a debatable subject. Surgical or medical treatment or both have been recommended as the treatment of choice.

A.Medical treatment:

According to the "Position statement on nasal polyps," medical treatment should be used for at least 1 month before surgery is contemplated in patients with typical nasal polyposis because some studies have indicated that in those patients who respond to medical treatment , no additional treatment is necessary ⁽¹³⁾.

Steroids are the cornerstone for treating NP. This can range from topical steroid sprays or drops in mild to moderate polyposis, to a short course of systemic steroids in severely affected patients ⁽¹⁴⁾.

Both oral corticosteroids and topical nasal corticosteroids are effective in shrinking polyps and controlling their

recurrence. Topical corticosteroids are first-line therapy that should be employed prior to considering surgical intervention. Unless there is a contraindication, a trial of a tapering course of oral corticosteroids is also frequently used prior to surgical resection. Should surgery eventually become necessary, topical corticosteroids and occasionally oral corticosteroids may be needed for long-term maintenance ⁽¹⁵⁾.

B.Surgical treatment:

Anaesthesia

Surgical treatment is performed under either local or general anesthesia. If the operation is performed under local anesthesia, the polyps themselves often shrink, which makes removal difficult. However, recurrence is common as there are large parts of the polyps which shrink into the ethmoidal cells.

General anesthesia on the other hand allows the surgeon an excellent access to the ethmoidal polyps ⁽¹⁶⁾.

Conventional polypectomy

A snare is passed around each polyp in turn and gradually tightened as high up around the pedicle as possible .It is important that the pedicle should be avulsed and not cut or torn through, otherwise early recurrence is inevitable ⁽¹²⁾.Or forceps are used to remove the polyps.

Endoscopic sinus surgery

Polyps are removed using endoscopy;and associated pathologies in the nose and paranasal sinuses are corrected through endoscopic sinus surgery.

Visualization without magnification that can be transmitted by optical camera to a monitor.

The whole nasal cavity can be visualized in approximate view by three passes of endoscope along the floor of nasal cavity, between middle and inferior turbinate and between the middle turbinate and septum of the nose. Each area of nasal cavity is examined in a systematic fashion [4, 5]. . The specific features that must be identified and assessed during the

Patients and the method:

The present prospective comparative study was conducted in the department of otolaryngology, endoscopy unit, Sulaimani Teaching Hospital from August 2006 to November 2007.

The sample of the study consists of 50 patients aged above 12 years old who underwent nasal polypectomy either conventionally (30 patients) or endoscopically(20 patients). All were otherwise healthy, and all provided informed consent.

Patients having antrochoanal polyp, marked deviation of nasal septum and nasal or antral tumour were excluded from the study.

A. Initial patient work-up: included detailed history taking, the symptoms and their duration. Thereafter, detailed examination including anterior rhinoscopy, posterior rhinoscopy, and endoscopical examination, and throat, ear examination was done. These procedures are done through rigid nasal endoscope; Hopkins rod which had diagnostic and therapeutic applications; the great and single advancement brought about by endoscopy is its ability to assist in the accurate diagnosis of sinonasal diseases for this 4mm zero or 30° Hopkins rod are used after anesthetizing the area by 4% xylocaine spray. Also using nasal endoscopy provides excellent illumination through endoscope, good access and better view

examination are the middle turbinate and the middle meatus (osteomeatal complex), anatomic obstruction like septal deviation near ostiomeatal complex and the presence of mucopus and nasal polyps ⁽⁴⁾.

All patients were given medical treatment for two weeks in the form of broad-spectrum antibiotics, antihistaminics and local or systemic steroids and decongestants. The patients were then subjected to compute tomography scan of

paranasal sinuses- both axial and coronal views.

B.Definite treatment:The patients are divided into two groups:.

1.Twenty patients underwent endoscopic sinus surgery for nasal polyps.

The extent of surgery was decided based on the findings in pre-operative endoscopy and CT scan of paranasal sinuses. Uncinectomy, removal of lateral wall of concha bullosa, anterior ethmoidectomy, posterior ethmoidectomy, middle meatus antrostomy and/or clearance of frontal recess were performed in the second group of patients. Sphenoid sinus ostium was widened only if CT scan showed evidence of its involvement. Along with this any significant anatomical abnormality was also noted and taken in consideration during surgery.

2.Thirty patients underwent conventional intranasal polypectomy.A snare is passed around each polyp in turn and gradually tightened as high up around the pedicle and avulsed;or forceps are used to remove polyps.

C. Post operative follow up: At the time of discharge from the hospital, the patients

were given systemic antibiotic for 10 days along with decongestant drops. Steroid nasal spray was advised in all cases. Alkaline nasal douching was also advised. Patients were advised follow-up one week later, six weeks and three months. Subjective assessment for symptomatic improvement was done and objective results were assessed by check endoscopy. The results were then compiled.

Statistical analysis

The data are analysed by using StatCalc, version 5.3.4, by chi square analysis, P value less than 0.05 regarded as significant.

Results

The first operative group is composed of 13 males and 7 females and the second operative group consists of 20 males and 10 females.

The mean age of first operative group is 34.3 years while the mean age of second operative group is 37.9 years. There is no significant difference between the two groups regarding the age and sex, p value 0.38 (see table 1).

Table 1: patient's characteristics Distribution of number, age and sex between the two groups.

characteristics	group I	group II
Number of patients	20	30
Mean age (years) $\pm$ SD*	34.3 $\pm$ 13.09	37.9 $\pm$ 14.78
Sex (M: F) ratio	1.85:1	2:1
Residence (urban /Rural)ratio	1.5:1	1.5:1

Group I: endoscopic sinus surgery group.

Group II: conventional intranasal polypectomy group.

SD = Standard deviation

* = p value = 0.38

The occupations of the patients are shown in the (Figure 1).

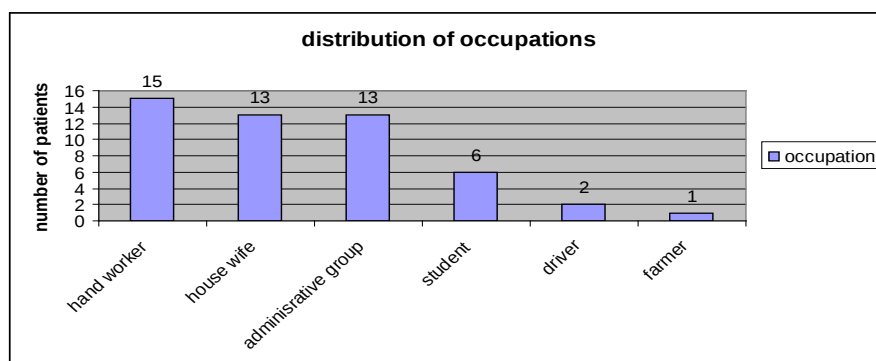


Figure 1: shows the occupation distribution in the study group

Regarding the preoperative symptoms, both groups had nearly similar complaints, all they had nasal polyps with exclusion of

antrochoanal polyp, nasal and antral tumor.

Table 2: preoperative symptoms.

Symptoms	group I n=20	group II n=30
1-nasal obstruction	20 (100%)	22 (73.3%)
2-running and sneezing	18 (90%)	29 (96.6%)
3- hyposmea	20 (100)	22(73.3%)
4-pain	18 (90%)	29(96.6%)
5-postnasal drip	5 (25%)	8 (26.6%)
6-hyponasal speech	20 (100%)	26 (86.6%)
7-mouth breathing	16 (80%)	18 (60%)

n= number

Regarding the preoperative examination by anterior/posterior rhinoscopy and nasal endoscope as a diagnostic tool for the two groups, gross finding such as deviated nasal septum, and hypertrophied turbinate are noted by either

techniques while a hidden pathologies such as tiny middle meatal polypi and deformities of the middle turbinate are clearly visible by nasal endoscope (Figure2).

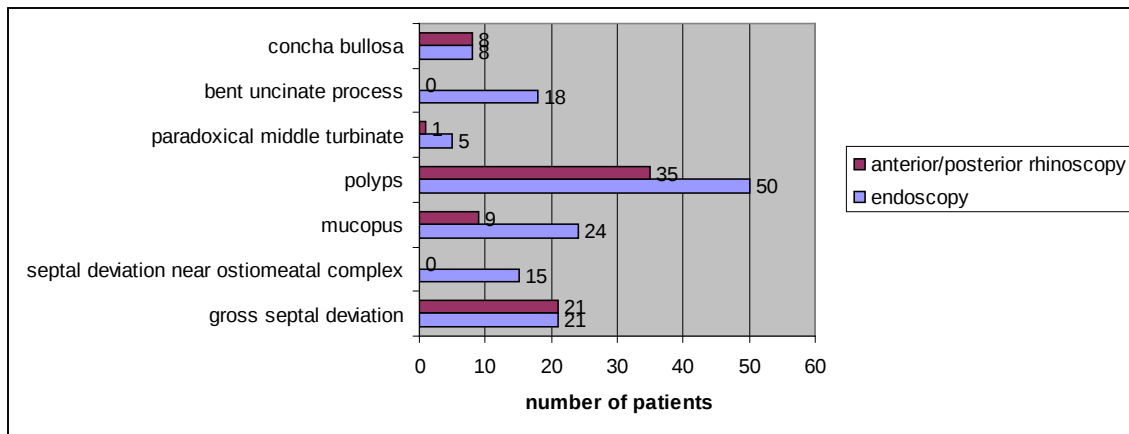


Figure 2: comparison of nasal pathology on clinical examination.

Regarding the operative procedures, Group I underwent Endoscopic sinus surgery for management of nasal polyps and associated finding preoperatively and

intraoperatively while all group II patients underwent conventional intranasal polypectomy (table 3).

Table 3: management of associated intranasal abnormality by Endoscopic Sinus Surgery.

Surgical Procedures	number n=20	%
Septoplasty	10	50%
Uncinectomy	18	90%
Anterior /posterior ethmoidectomy	18	90%
Removal of lateral wall of choncha bullosa	8	40%
Agger nasi exenteration	6	30%
Enlargement of maxillary sinus ostium	14	70%
Frontal recess clearance	1	50%

n=normal.

The duration of operation lasted longer in group I, the operation for 16 patients lasted 1.5-2 hours whereas 4 patients' lasted 1-1.5 hours. While the duration for operation in group II lasteed

shorter, the operation for 25 patients' lasted 0.5-1 hours, 4 patients lasted less than 0.5 hour and only one patient last 1-1.5 hours (figure 3), p value (0.000).

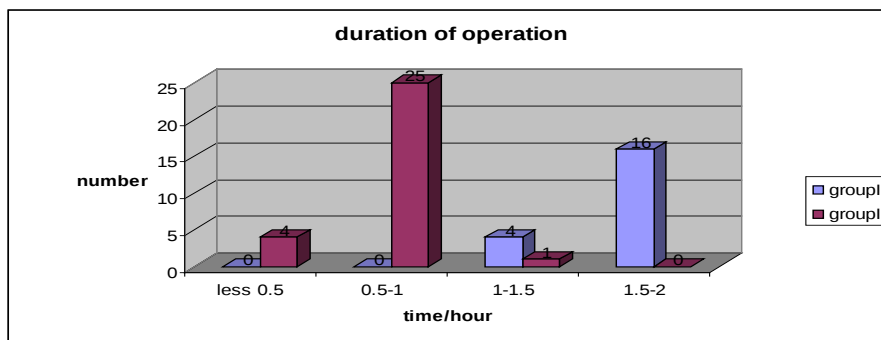


Figure 3: Duration of operation.

During follow up to six months postoperatively, patients in group I show great improvement symptomatically in

comparison with symptomatic improvement in group 2, see table (4).

Table 4: postoperative finding

Symptom	Group I n=20	Group II n=30	p value
nasal obstruction	2 (10%)	13 (43.3%)	0.001
running and sneezing	4 (20%)	15 (50%)	0.03
hyposmea	2 (10%)	13 (43.3%)	0.001
pain	2 (10%)	10 (33.3%)	0.07
postnasal	4(20%)	12 (40%)	0.13
hyponasal speech	10 (0.0%)	2 (10%)	0.23
mouth breathing	10 (0.0%)	2 (10%)	0.23

n=number

From 20 patients, only 2 patients remain with nasal obstruction postoperatively in group I which represent 10% of patients (see figure

4). While from 30 patients, 8 patients remain with nasal obstruction which represents 26.6% of patients (see figure 5).

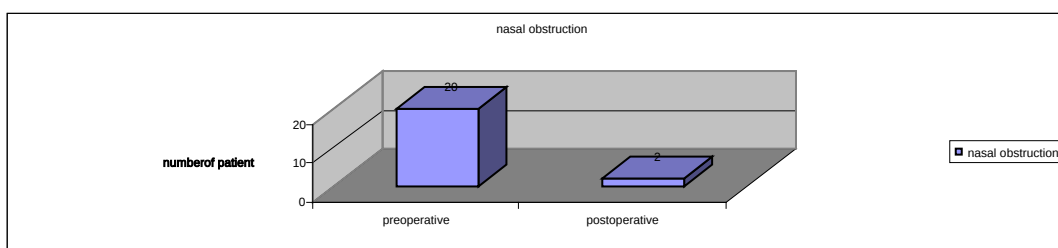


Figure 4: Summary of preoperative and post operative nasal obstruction in group I.

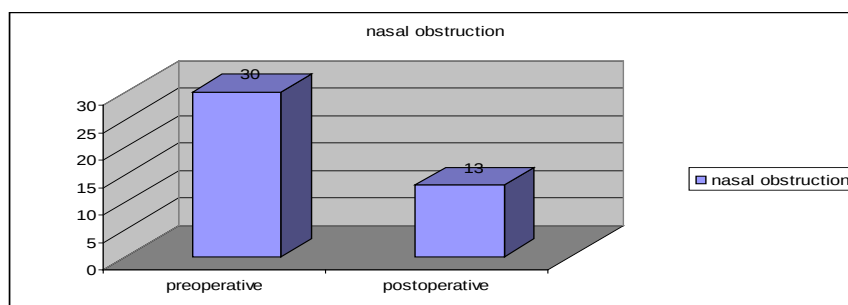


Figure 5: summary of preoperative and postoperative nasal obstruction in group II.

From 20 patients, only 2 patients remain with hyposmea postoperatively in group I which represent 10% of patients ;(Figure6). While from 22

patients, 13 patients remain with hyposmea postoperatively in group II which represent 59% of patients; (Figure 7).

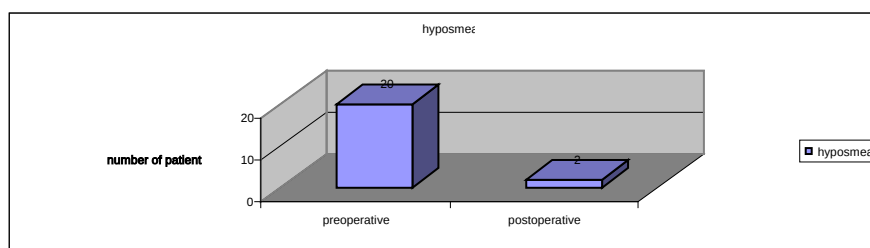


Figure 6: summary of preoperative and postoperative hyposmea in group I.

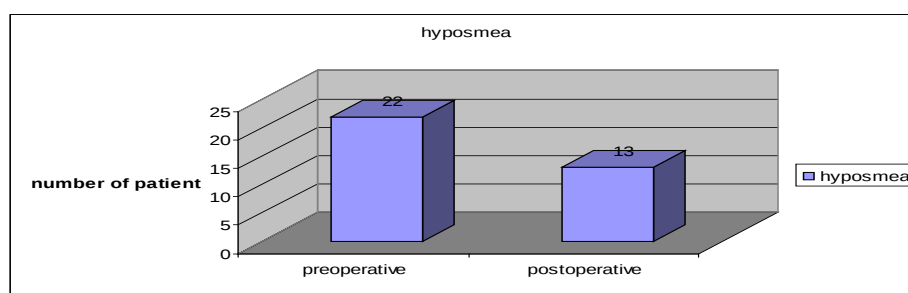


Figure 7: summary of preoperative and postoperative hyposmea in group II.

Regarding complications, minor complications like crusting present in 60% of patients in group I while 26.6% complain of crusting postoperatively.

Because of associated pathology that had been corrected in group I; one patient developed septal haematoma (Table5).

Table 5: complications of operations

Complications	Group I	Group II	P value
Intranasal Crusting	12(60%)	8(26.6%)	0.018
Epistaxis	3(15%)	7(23.3%)	0.47
Septal hematoma	1(5%)	0	0.21
Periorbital chymosis	1(5%)	1(3.3%)	0.76
Rhinitis/sinusitis	1(5%)	5(16.6%)	0.21
Surgical emphysema	0	0	
Orbital cellulitis	0	0	
Orbital hematoma	0	0	
Meningitis	0	0	

During follow up postoperatively, recurrence of polyps in group I found in only 1 patient which represent (5%) of the patients, while the recurrence group II found in 9 patients which represents (30%) of the patients.

In group I, syncline found in only two patients (10%), while in group II, it is found in 5 patients (16.6%) during follow up examination. (Table6)

Table 6: Endoscopic finding on follow up.

Finding	Group I n=20	Group II n=30	P value
Recurrence of polyps	1 (5%)	9(30%)	0.03
Synechia	2(10%)	5 (16.6%)	0.33

Discussion

The results of 50 patients with ethmoidal polyps undergoing Endoscopic Sinus Surgery (ESS) or conventional intranasal polypectomy are analyzed.

Thirty patients are undergoing conventional intranasal polypectomy and twenty patients undergoing endoscopic sinus surgery.

There are no significant differences between the two groups regarding the age and sex. The urban/rural ratios are the same between the two groups P value (0.38), (see table1).

Regarding the preoperative symptoms, both groups have nearly

similar complaints. They have nasal polyps with exclusion of antrochoanal polyp, nasal and antral tumor.

Concerning the preoperative examination by anterior/posterior rhinoscopy and nasal endoscope as a diagnostic tool for the two groups, gross finding such as deviated nasal septum, and hypertrophied turbinate are noted by either techniques while a hidden pathologies such as tiny middle meatal polypi and deformities of the ostiomeatal complex are clearly visible by nasal endoscope (Figure2). This concludes that nasal endoscopies is much more superior to

anterior/posterior rhinoscopy to examine and diagnose intranasal pathologies. This coincides with the study of MATTOX, D.E.⁽¹⁷⁾ and LEVINE, H.L.⁽¹⁸⁾ who stressed on the importance of endoscopy in the diagnosis of sinonasal diseases.

The diagnosis of recurrent ethmoiditis due to a small polyp obstructing the ostiomeatal complex can be difficult and often unrecognized during anterior rhinoscope examination and can be diagnosed by nasal endoscopy⁽¹⁹⁾.

Regarding the operative procedures, all patients in group II underwent just conventional intranasal polypectomy while apart from polypectomy other pathologies were treated in group I like septoplasty (50%), uncinectomy (90%), anterior/posterior ethmoidectomy (90%), removal of lateral wall of concha bullosa (40%), Agger nasi exenteration (30%), Enlargement of maxillary sinus ostium (70%) and Frontal recess clearance (5%), (Table 3). This may explain that with endoscopic surgeries we can treat other pathologies which can not be treated by conventional way.

This validates the result of Ms Kim Dalziel, Research Fellow (LEAD), who states that ESS aims not only to remove the polyp but also to improve sinus drainage and ventilation, which may decrease recurrence rates. Advantages are claimed over conventional surgery: permitting a better view of the surgical field, fewer complications and lower recurrence rates. ENT specialists, aside from removal of polyps, use endoscopes for a variety of procedures⁽²⁰⁾.

The duration of operation lasts longer in group I, the operation for 16 patients lasts 1.5-2 hours whereas 4 patients' last 1-1.5 hours. While the duration for operation in group II lasts shorter, the operation for 25 patients'

lasts 0.5-1 hour, 4 patients last less than 0.5 hour and only one patient lasts 1-1.5 hours (Figure 3), p value (0.000).

The final follow up was done after six months of surgery. There is satisfactory relief of symptoms postoperatively in all the subjects of the study with significant difference regarding nasal obstruction, running and sneezing and hyposmia (p value 0.001, 0.03, 0.001 respectively). These could be attributed to the removal of polyps and partly to the practice of doing anterior/posterior ethmoidectomy and other associated procedures of the middle turbinate, which bears the brunt of inspiratory airflow (See table 4). Stammberger (1991) reports that 85% very good overall improvement and facial pain and headache were assessed as better as 93.4%⁽²¹⁾.

The most common complication encountered involving intranasal crustation in 12 patients (60%), epistaxis in 3 patients (15%) and intranasal adhesions in 2 patients (10%).

Close outpatient postoperative care with meticulous cleaning of the nasal cavity under endoscopic guidance can easily prevent most of these adhesions.

The patients are advised to use nasal saline irrigation two to three times daily and nasal ointment to prevent dryness and crusting for at least two months postoperatively. The use of gel film has been reported to be effective in preventing synechiae formation between the middle turbinate and the lateral nasal wall.

The recurrence rate after six month period of follow up shows significant differences in recurrence rate, in group II, 9 patients (30%) while in group I shows only 1 patient (5%), p value 0.03.

We strongly recommend using endoscopic examination even in those departments which do not routinely

perform endoscopic sinus surgery, as it often reveals hidden pathologies.

Endoscopic sinus surgery is better than conventional intranasal polypectomy because of other pathologies can be treated like high septal deviation, tiny polyp obstructing the ostiomeatal complex and better ventilation and drainage of nose and paranasal sinuses.

The recurrence rate and complication are less if compared with conventional intranasal polypectomy.

It's a minimally invasive surgery, has approximate field of vision and illumination and good access if compared with conventional intranasal polypectomy, but it needs well trained and expert surgeon.

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