Original Article

Comparison of Synechiae Formation in Patients with Nasal Polyps Undergoing Endoscopic Sinus Surgery with and Without Microdebrider

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Objective: To compare the frequency of synechiae formation in patients with nasal polyps undergoing endoscopic sinus surgery with and without using microdebrider.

Material & Methods: This study was conducted at ENT department of Fatima Memorial College of Medicine & Dentistry, Lahore and Central Park Medical College, Lahore/Kasur between June 2008 and June 2009. One hundred patients with nasal polyps were included who, after thorough examination and investigations, underwent endoscopic sinus surgery with and without microdebrider.

Results: The mean age of patients in group A (Microdebrider endoscopic sinus surgery) was 32.6±10.43 years. Male to female ratio was 1:1.08 in group A and 1.17:1 in group B. Synechiae formation after 4 weeks was 8% in group A and 10% in group B (p=0.5).

Conclusion: There is no difference between both groups after 2nd and 4th postoperative week of synechiae formation.

Key Words: Nasal polyps, Endoscopic sinus surgery, Synechiae formation, Microdebrider.

Introduction

Nasal polyps are part of an inflammatory process and originate in the upper part of the nose around the openings of the ethmoidal sinuses. The polyps protrude into the nasal cavity from the middle and superior meatus, resulting in nasal blockage and abolishing airflow to the olfactory region.[1] The incidence of nasal polyps varies between 0.6% and 4% of the population.[2] Nasal polyps are mainly caused by allergy and inflammation.[3,4,5] Apart from these factors, anatomical variations and mucociliary abnormalities are other contributing factors. Patients with nasal polyps mainly present with nasal obstruction, nasal discharge, postnasal drip, reduced or abolished sense of smell and/or taste and lastly facial pain and/or headache.[6]

Treatment of nasal polyps can either be medical and/or surgical. Nowadays endoscopic sinus surgery (ESS) is the standard surgical treatment.[7-10] Functional endoscopic sinus surgery (FESS) is a minimally invasive surgical procedure that opens up sinus air cells and sinus ostia with an endoscope, exercising a functional approach that is attempting to reverse pathophysiological processes by conservative surgery in areas dictated by disease. With standard endoscopic sinus surgery there is more risk of complications like trauma, bleeding, cerebrospinal fluid leak, synechiae formation and recurrence in patients with sinonasal polyps. These complications can be overcome by using microdebrider by an experienced ENT surgeon.[11,12]

With the advent of microdebrider, which is a powered rotatory shaving device with continuous suction that cuts and sucks polyps, the surgical management of polyps has become safer with fewer complications.

In our country endoscopic techniques are still growing in the field of ENT. Synechiae formation causes occlusion of sinus ostia resulting in nasal obstruction.[13] There are contrasting results in literature regarding both the techniques. Some studies support the use of endoscopic sinus surgery with microdebrider showing 0% incidence of post-operative synechiae formation, in contrast to conventional endoscopic sinus surgery that has 13% incidence of developing synechiae, whereas other studies conclude that there is no significant difference of incidence regarding this complication in both techniques.[12] We conducted this study to compare the incidence of synechiae formation postoperatively in our setting, with other studies, already done.

Material & Methods

One hundred patients who presented in ENT outpatient department (OPD) with nasal polyps were included in the study and were advised surgery. All patients were explained about the procedure, risks and benefits of surgery. Informed consent was taken from all patients for surgery. Patients were given short course of oral corticosteroids 30 mg/day for up to one week prior to surgery. Experienced ENT surgeons performed operations. Patients with

bilateral nasal polyps were divided randomly into group A and B using random number tables. In group A, patients undergoing endoscopic sinus surgery using microdebrider were included while patients undergoing conventional endoscopic sinus surgery were included in group B. In conventional endoscopic sinus surgery, standard instruments like sickle knife, back biting forceps and non-cutting Blakesly forceps were used. Antibiotics, nasal decongestants, maintenance dose of nasal steroid spray and antihistamines were given postoperatively for up to 4 weeks.

All the patients were followed up in outpatient department at one, two and four weeks post operatively. Presence of synechiae formation was assessed during 4 weeks using anterior rhinoscopy under local anesthetic.

Results

The mean age of patients in group A (Microdebrider endoscopic sinus surgery) was 32.6±10.43 years while in group B (Conventional endoscopic sinus surgery) the mean age was 31.96±9.25 years. The difference was statistically not significant (p=0.4036).

In this study 24 (48%) patients were male in group A and 27 (54%) in group B. Similarly 26 (52%) patients were female in group A an 23 (46%) patients were female in group B. Male to female ratio was 1:1.08 in group A and 1.17:1 in group B.

There was no patient with postoperative synechiae formation in both groups after 1st postoperative week. After two weeks, three (6%) patients in group A and 4 (8%) patients in group B were seen with synechiae formation. After fourth postoperative week, 4 (8%) patients in group A while in group B 5 (10%) patients showed similar problem. The difference was not statistically significant (p=0.5).

Discussion

With the advent of Endoscopic Sinus Surgery, it has become the procedure of choice for the treatment of many nasal problems like chronic rhinosinusitis (CRS) and nasal polyposis. Surgical treatment for sinus has become safer and the outcome has improved. Traditional intranasal polypectomy alone is no more better than nasal polypectomy with endoscopic sinus surgery and is worse for patients with Samter's triad. With appropriate preoperative evaluation and planning, endoscopic sinus surgery is usually carried out in an ambulatory setting with minimal discomfort to patients.[14]

Table-1: Age distribution of patients in both groups (n=100).

Age in Years	Group A (n=50)		Group B (n=50)	
	Frequency	% age	Frequency	% age
15-25	29	58.0	25	50.0
26-35	13	26.0	15	30.0
36-45	08	16.0	10	20.0
Mean±SD	**32.6±10.43**		**31.96±09.25**	

Table-2: Sex distribution of patients.

Sex	Group A (n=50)		Group B (n=50)	
	Frequency	% age	Frequency	% age
Male	24	48.0	27	54.0
Female	26	52.0	23	46.0
Male: Female Ratio	**1 : 1.08**		**1.17 : 1**	

Table-3: Comparison of postoperative synechiae formation in both groups of patients.

Postoperative Synechiae formation	Group A (n=50)		Group B (n=50)		P Value
	Frequency	% age	Frequency	% age	
Week 1	0	0.0	0	0.0	0.0
Week 2	3	6.0	4	8.0	0.70
Week 4	4	6.0	5	10.0	0.50

age of the patients in group A was 48.2 years and in group B 49.8 years.[15] In a study done by Luciano the age range was 24 to 78 years with a mean age of patients 49 years.[16] Our study showed a mean age of 32.6±10.43 years in group A and 31.96±9.25 years in group B which is slightly low as compared with some other studies.

In a study reported by Munoz et al, out of total 121 patients, there were 63.7% males and 36.3% females.[15] Another study carried by Luciano, out of 192 patients, 66.14% were males & 33.85% females.[16] The present study showed that 24 (48%) patients were males and 26 (52%) were females in group A and 27 (54%) patients were males and 23 (46%) were females which is comparable with other studies.

Nasal polyposis occurs in 6-48% of children with cystic fibrosis. Surgery is performed when children become symptomatic. Recurrence of polyps in cystic fibrosis is almost universal, requiring repeated surgeries every few years. In fact, recurrence is typical for many diseases that cause nasal polyps; patients should receive preoperative counseling about this possibility.[17]

One study was carried out by Kingdom et al, only to stress the importance of close follow-up, repeated nasal toilets and care of nose and sinuses. Resuming medical treatment and control of allergic rhinitis is important to prevent polyp recurrence. It is not uncommon that patients may have good immediate post surgery results, in getting relief of nasal obstruction. However without follow-up and lack of medical treatment postoperatively, incidence goes higher for the recurrence of polyps. Patient's education regarding the long term treatment plan should be stressed. The need for long term follow-up and treatment to prevent the recurrence of polyposis should be conveyed to all patients.[18]

In a review by Cochrane that included 3 randomized controlled studies, 4 comparative non-randomized studies and 35 case series with more than 50 patients, the total percentage of complications oscillates between 0.3% and 22.4%. Minor complications ranged from 1.1% to 20.8% with the most common being synechiae formation followed by re-stenosis of the middle meatus. The number of major complications ranged between 0% and 1.5%.[19]

Various studies regarding training programs for residents, describe complications that vary from 6% to 22%; major complications range from 0% to 1.4% with synechiae formation being the most frequent.[20,21] Careful, systematic surgery is the key to a good result. This requires an opening of the affected sinuses to restore natural drainage and to remove the pathological mucous membrane.[22]

The training of residents should be based on anatomical, clinical and radiological sessions, during which endoscopic sinus surgery images and videos are shown. It has been proven that residents trained with multimedia learning programs, with the use of simulators and virtual reality before carrying out their first endoscopic surgery, have a lower risk of complications including orbital or meningeal complications.[25-27] All of this is done under the supervision of senior surgeon who intervenes as and when required, depending upon the learning curve of the resident.[28]

Mucosal oedema, formation of crusts and retention of blood secretion are present in almost all cases during the first 4 weeks. Consequently, weekly or bimonthly postoperative examinations are recommended during the first month.[23,24]

Success in outcome of endoscopic sinus surgery in patients with chronic rhinosinusitis and nasal polyposis is heavily dependent on reducing postoperative scarring, edema and crusting that can inhibit natural ciliary function and sinus drainage. Many rhinologists advocate aggressive use of saline irrigation and nasal steroid sprays postoperatively along with meticulous debridement of nasal cavities and secondary sinus outflow tracts. With this practice, incidence of synechiae formation in the nasal cavity is reduced. Synechiae were rare in both the treatment and control groups; there was a trend to less synechiae formation in the cavities assigned to the treatment group, but the data lacked statistical significance ($p>0.05$).[29]

In various studies so many methods have been proposed to prevent synechiae formation and to handle the unstable middle turbinate. Friedman recommended middle turbinate medialization by inducing a controlled synechiae between caudal end of the middle turbinate and septum using microdebrider-assisted mucosal abrasion.[30] However, this method may compromise airflow to the olfactory neuroepithelium and can affect the sense of smell. In addition controlled synechiae might not be created, leading to lateralization of the middle turbinate. Thornton introduced suture stabilization technique of the middle turbinate.[31] Although this method may effectively prevent synechiae, the suture technique is difficult to perform in a narrow posterior nasal cavity, and it is also difficult to pass a needle through the solid bone of the middle turbinate and ethmoid plate,

performed.[32]

In different studies reported by various authors, in spite of well-performed endoscopic sinus surgery, a small percentage of patients may have persistent or recurrent disease. The revision rates ranging from 3-14% have been documented.[33] A revision rate of 8.7% was seen in patients with initial extensive polyposis and asthma. Various studies have shown significant improvement of symptoms of chronic rhinosinusitis (CRS) after endoscopic sinus surgery but the success rates of individual symptoms vary.[34]

The symptom manifestation of chronic rhinosinusitis (CRS) is varied and hence the subjective parameters used in the various studies as well as the definition of success rates vary. In our study the subjective parameters of symptom improvement and objective evaluation of endoscopic scores have been considered for evaluating success.[35]

Conclusion

We conclude that there is not much difference between group A and group B as far as synechiae formation is concerned post operatively after 4 weeks and results are statistically not significant because of good and timely follow up.

Endoscopic Sinus Surgery is excellent treatment option for patients, refractory to medical treatment. It results in significant improvement in the symptoms of chronic rhinosinusitis (CRS) and nasal polyposis along with a definitive decreased requirement of antibiotics and antihistamines.

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Picture Quiz

A 66 years old man with known CAD, had a stent placed 4 years ago. Comes in with recurrent light headedness for the past 3-4 weeks. Postural changes in BP present. Clinical and lab work did not reveal any infective focus. Patient never took digoxin but was on short acting beta blocker which he had stopped 2-3 days ago. ECG tracing is given below.

What is the diagnosis?

1. Sinus rhythm with complete heart block with junctional escape
2. Sinus rhythm with complete heart block with ventricular escape
3. Ventricular standstill with ectopic beats
4. Low voltage qrs with occasional ventricular ectopy