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NASAL POLYPS;

SYNECHIAE FORMATION AFTER FUNCTIONAL ENDOSCOPIC SINUS SURGERY (FESS) AMONG PATIENTS WITH NASAL POLYPS; A DESCRIPTIVE CASE SERIES

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ABSTRACT… Introduction: Functional Endoscopic Sinus Surgery (FESS) is now undoubtedly the procedure of choice for surgical treatment of chronic sinusitis and nasal polyposis after failure of medical treatment. In order to present the formation of synechie nasal packing is performed. Moreover, it also helps in supporting the process of wound healing and prevention of postoperative bleeding. **Objectives:** To determine the frequency of synechiae formation after functional endoscopic sinus surgery (FESS) in patients presenting with nasal polyps. **Study Design:** Descriptive case series. **Setting:** Department of Otorhinolaryngology at Services Hospital Lahore. **Period:** Six months from 03-10-2013 to 02-04-2014. **Methodology:** A total of 150 cases were included in this study. Patients were treated by functional endoscopic sinus surgery (FESS) and were followed at the end of 1st, 2nd, 3rd and 4th week postoperatively for the development of synechiae (as per operational definition). **Results:** The age of majority of patients was from 20 to 40 years and minimum patients were < 20 years old. Mean age of the patients was 35.30±10.54 years. Male patients were 80 (53.3%) while female patients were 70 (46.7%). Synechiae formation was observed in 28 patients (18.7%). **Conclusion:** Synechiae formation was developed in 18.4% of the patients after functional endoscopic sinus surgery.

Key words: FESS, Nasal Polyps, Synechiae Formation.

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INTRODUCTION

Nasal polyps are benign polypoid lesions which arise from the mucosa of paranasal sinuses and extend into the nasal cavity. They usually have cystic and solid parts[1], 4-6% of the general population has nasal polyps.[2] Etiology of nasal polyps is still unknown, chronic inflammation and allergy is implicated in its pathogenesis.[2] Mainstay of medical treatment is topical steroids and treatment of allergy.[1,2] Patients not responding to medical therapy are treated surgically. Surgical options used in routine practice are intranasal polypectomy, intranasal ethmoidectomy and external ethmoidectomy. These modalities are accompanied by various side effects. Intranasal polypectomy is followed by a high recurrence rate of nasal polyps and postoperative synechiae formation. Intranasal ethmoidectomy is a blind procedure. External ethmoidectomy is complicated by external scarring.[3] The condition of nasal polyposis, though extensively researched, is still not fully understood.

The prevalence varies from one study to another, however it is usually reported in between 0.2% to 4.3% of general population.[4-6] In a study conducted in Denmark over a 6-year period by Larsen and Tos, they diagnosed 252 new nasal polyposis patients (174 males and 78 females) to study its incidence in background population of 223449 inhabitants. They reported 0.627 / 1000 every year as incidence in Denmark.[7] Klossek et al reported an overall prevalence of 2.11% in France.[8] In their study, 10033 subjects were screened for presence of nasal polyps by use of a validated questionnaire/algorithm. It has also been reported that the incidence is directly proportional to the age of patients with male predominance.[7,8] Fascinatingly, a high prevalence of cases of nasal polyps is usually reported when examining specimens of autopsy.[9,10] It is likely that smaller polyps may not present themselves

clinically during life. Polyps generally remain asymptomatic, until they progress to such a size as to obstruct the ostia of the paranasal sinuses, resulting in symptoms of nasal obstruction and sinusitis. However, it has not been proven that development of nasal polyps is part of the physiological process of aging. Nasal polyps are also frequently associated with asthma[11-13] and aspirin tolerant asthmatic population.[14,15]

Polyps may be solitary and unilateral, or multiple and bilateral. Their appearance depends largely on the makeup of the stroma. Generally, they are pear-shaped or rounded and translucent.[16] In consistency, they are usually soft and gelatinous and look like a mass of viscid mucus or the pulp of a skinned white grape.[16] They are movable, do not bleed readily, and are insensitive to manipulation. The polypoidal hypertrophy of the turbinates, however, is firmer, more sensitive to manipulation, bleeds more freely, and is sessile. The surface of the polyps may be modified by hypertrophy of the epithelium or by ulceration. Their translucency is influenced by the extent of interstitial oedema, vascularity, the presence of haemorrhage, number of glands, presence of cysts, and the amount of fibrosis.[16]

Functional endoscopic sinus surgery (FESS) is an intranasal surgical technique, performed under direct vision which is minimally invasive and more effective. Synechiae are formed due to medialization and scarring which causes obstruction of meatus and recurrent sinusitis, necessitating further surgery.[3] Factors contributing to synechiae formation include history of previous nasal surgery, poor surgical technique.[3]

Although FESS is an advancement in nasal surgery but intranasal synechiae formation is its important complication which causes recurrence of disease and necessitates for revision of surgery. In literature variable results of synechiae formation after FESS are reported. Shamoon et al concluded 16.6% synechiae formation after FESS in a study conducted on 60 patients.[4] Baradaranfar et al concluded 32.4% synechiae formation after FESS in a study concluded on 37 patients.[5] So previous studies showed different rates of synechiae formation.

Synechiae formation is an important and most devastating complication of FESS. As this surgical technique is recently introduced in our country no such study has ever been conducted in our set up. Therefore the current study was conducted to determine the frequency of synechiae formation after functional endoscopic sinus surgery (FESS) among patients presenting with nasal polyps to come up with evidence-based results that could help in deciding whether this procedure should be continued in future with same technique or some modification in surgical technique is required.

METHODOLOGY

A descriptive case series design was incorporated in our study that was conducted at the Department of Otorhinolaryngology of Services hospital Lahore Pakistan after obtaining the ethical approval. The calculated sample size was 150 cases with 6% margin of error, 94% confidence level taking expected percentage of synechiae i.e. 16.6%. Non-probability consecutive sampling was used.

The inclusion criteria included patients above 16 years and upto 60 years of age diagnosed with nasal polyp (as per operational definition) by consultant working at Otorhinolaryngology department. The exclusion criteria included those patients who were having recurrent nasal polyps and patients with polyps extending into cranium or orbit. Also those patients who had previous surgery for any nasal pathologies and patients with nasal or paranasal sinus malignancy were not included in our study.

An informed consent was taken from the patients to collect the data and to use it for research purpose. A proforma was designed to record the data. Demographic data including age (in years) and gender was taken. All the patients were treated by FESS and was followed at the end of 1st, 2nd, 3rd, and 4th week postoperatively for the development of synechiae (as per operational definition). The patients were labeled as yes or no for synechiae formation.

The data was analyzed SPSS version 16 and analyzed. The data which was qualitative in nature such as gender and presence of synechiae formation (yes or no) was expressed as frequency distribution. Quantitative data such as age (in years) was expressed as mean and standard deviation. Confidentiality and Anonymity of study participants was ensured. The study was carried out over a period of six months from 03-10-2013 to 02-04-2014.

RESULTS

A total of 150 cases were included in this study during the study period of six months from 03-10-2013 to 02-04-2014. The age of majority of patients was from 20 to 40 years and minimum patients were < 20 years old. Mean age of the patients was 35.30±10.54 years (Table-I).

Age (Year)	Number	Percentage
≤ 20	12	08.0
21-40	93	62.0
41-60	45	30.0
Total	150	100.0
Mean±SD	35.30±10.54	

Table-I. Age-wise distribution of cases

Synechiae formation was observed in 28 patients (18.7%) while in 122 patients (81.3%) no synechie formation was observed as shown in Table-II.

Synechiae Formation	Number	Percentage
Yes	28	18.7
No	122	81.3
Total	150	100.0

Table-II. Distribution of cases by synechiae formation

Stratification with regard to age and sex was carried out as expressed in Table-III and Table-IV. Out of total 28 patients in which synechie formation was observed, 4 were < 20 years, 15 were 21-40 years and 9 were belonging to 41-60 years of age groups, respectively.

Age (Year)	Synechiae Formation		Total
	Yes	No	
≤ 20	04	08	12
21-40	15	78	93
41-60	09	36	45
Total	28	122	150

Table-III. Stratification of age with regard to synechiae formation

Table-IV depicts gender-wise distribution of synechie formation. It was revealed that out of 28 cases of synechie formation 13 were males while 15 were females while out of the 122 cases in which synechie formation was not observed the male patients were 67 while 55 were female patients.

Gender	Synechiae Formation		Total
	Yes	No	
Male	13	67	80
Female	15	55	70
Total	28	122	150

Table-IV. Stratification of gender with regard to synechiae formation

DISCUSSION

Nasal polyps are still challenge to treat by otorhinolaryngologists. Relationship between nasal polyps and chronic rhinosinusitis is much debated but nasal polyps should be regarded as one form of chronic inflammation in nose and paranasal sinuses.[17]

Regarding treatment, surgery on its own cannot achieve or maintain healthy nasal mucosa. In surgery, diseased mucosa is removed that has not recovered during preoperative medical treatment. Surgery may be able to overcome mucosa-mucosa contact resuming mucociliary clearance, remove diseased tissue, improving sinus drainage and allowing assess to topical nasal treatment, but surgery it self cannot cure nasal disease. Patients need to be counseled for continuing medical treatment postoperatively in order to achieve best possible results and may need prolong medical treatment after surgery with regular follow up.

FESS is now the standard for management of nasal polyps and refractory chronic rhinosinusistis, however the most commonly occurring complication as a result of FESS is postoperative synechie formation with incidence ranges from 1% to 36%.[18] Mucosal damage, scar formation, retained secretions, presence of blood clot, crusting aids in synechiae formation. Many techniques such as placing biodegradable packing materials, have been used to prevent

postoperative synechiae formation.[19] Certain packing materials that are biodegradable such as MeroGel/Meropak, Nasopore (Polyganics, The Netherlands); and carboxymethylcellulose.[20] Use of mitomycin c during surgery has shown to decrease scar tissue and Synechiae formation after FESS.[21]

In our study, most of the cases were belonging to the age category of 21-40 years (n=93, 62%), which is consistent with results of other similar studies. In our study, synechiae formation after FESS was observed in 18.7% of the patients. Our findings are comparable with the study carried out by Shumon et al.[4] Baradaranfar et al disagree with our findings, they demonstrated 32.4% synechiae formation after FESS.[5]

CONCLUSION

Synechiae formation was developed in only 18.4% of the patients after Functional endoscopic sinus surgery while in rest of the 81.3% of cases no synechie formation was observed which illustrates that FESS has been an efficient and safe modality for treating nasal polyps. In our study, a slight female predominance was observed in synechie formation, however a multi-center study with large sample size is required to be conducted to generalize the results.

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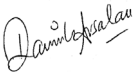
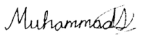
AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Farhan Salam	Conceived the idea, Planned the study, and drafted the manuscript.	
2	Damish Arslan	Got the ethical approval and collected the data.	
3	M. Salman Haider Qureshi	Critically revised the manuscript and performed literature review.	
4	Ejaz Ahmad	Did statistical analysis.