

# Comparison of Efficacy of FESS (Functional Endoscopic Sinus Surgery) Versus Conventional Intranasal Polypectomy in Patients with Nasal Polyposis

Syed Jawad Hussain Shah<sup>1</sup>, Maisam Ali<sup>2</sup>, Syed Ali Naqi<sup>3</sup>

1. Department of ENT, DHQ Hospital Bagh AJK; 2. Department of ENT, Ayub Medical Complex. Abbotabad;
2. 3. Department of ENT, Islamabad Medical and Dental College, Islamabad

## Abstract

**Background :** To Compare the efficacy of Functional Endoscopic Sinus Surgery (FESS) with Conventional Intranasal Polypectomy in patients with nasal polyposis

**Methods:** In this comparative study patients with sino-polyposis were divided into two groups Group-A was allotted to FESS and Group-B to the patients with conventional endoscopic endonasal-polypectomy. All patients, after surgery, were followed till 4 months for efficacy. Frequencies and percentages were calculated for qualitative variable i.e. gender and efficacy. Chi square test was applied to compare the significant difference regarding efficacy of both groups. p-value of  $\leq 0.05$  was considered statistically significant. Stratification was done for age and gender of the patients and duration of the disease to control the effect modifiers. Post stratification chi-square test was applied.

**Results:** In group A, the efficacy was found in 82.67% whereas in group B the efficacy was observed in 61.33%. By using chi-square test, significant association was found between study group and efficacy having p-value = 0.004.

**Conclusion:** Efficacy was significantly higher in FESS group as compared to conventional intranasal polypectomy in patients with sinonasal polyposis.

**Key Words:** Sinonasal Polyposis, Functional Endoscopic Sinus Surgery FESS, Conventional Intranasal Polypectomy.

## Introduction

Intranasal polyposis is one of the chronic upper airway diseases affecting nose and paranasal sinuses causing rhinosinusitis which affects the quality of life differently depending upon the severity of the condition along with psychological impact.<sup>1-6</sup> Polyps are benign, soft, pedunculated, painless grape like masses over the mucosal lining of nose and para-nasal sinuses affecting mostly the region of middle meatus

and osteomeatal complex and can be seen in approximately 4% of general population.<sup>7,8</sup> The exact etiology and pathophysiology of the disease is not known and multiple factors are considered to be responsible for the development of nasal polyposis. The possible initiating triggers may be allergy, viral, bacterial or fungal infections which may speed up the inflammation of the sinus mucosa and ultimately develop polyps.<sup>9,10</sup> Higher numbers of inflammatory cells, especially eosinophils, neutrophils and lymphocytes have been shown on histology of nasal polyp lamina propria as compared to healthy nasal mucosa.<sup>11,12</sup> The complex nature of the disease makes the disease management more complex with high recurrence tendency.<sup>13</sup>

The symptoms of polyposis may include running nose, loss of smell, sneezing and post nasal drip but about 10-23% East Asia patients of intra nasal polyposis do have associated asthma and these patients represent more severe form of nasal polyposis which have earned a new term for the disease called united airway disease.<sup>6,8,11</sup> The diagnosis of nasal polyposis is based on history, clinical examination, nasal endoscopy and CT Scan.<sup>7,9,14</sup> CT is needed and adds to the management of polyposis. For the one sided nasal polyposis, more diagnostic procedures may be required.<sup>15</sup>

The first line of treatment is medical.<sup>16</sup> Different medications have been used for reducing the symptoms of nasal polyposis. The reason of medical therapy is to maintain the normal anatomy and to halt the development of polyp. Topical and oral steroids, antihistamines and macrolide antibiotics are among the few strategies applied.<sup>17</sup> Long term topical nasal steroid, short term oral steroid along with oral antihistamine are most effective in relieving the symptoms.<sup>8,12</sup>

In case of failed medical therapy various surgical approaches might be useful to get rid of the polyps but with the possibility of recurrence after the surgery.<sup>1,16</sup> After the introduction of Functional

endoscopic sinus surgery (FESS) it has been in use for the restoration of normal ventilation and drainage of the sinuses.<sup>7,9,18</sup> Endoscopic sinus surgery is used to treat chronic sinusitis, nasal polyps, pituitary tumours, and other nasosinus diseases.<sup>19,20</sup> This is challenging surgery because of its location and proximity to the brain and other vital structures with restricted view within its narrow space. The anatomic landmarks should be kept in mind to avoid complications which could be life threatening.<sup>4,18,19,21</sup>

Endoscopic sinus surgery may involve restoration of drainage of osteomeatal complex, polypectomy, uncinectomy, maxillary antrostomy, radical resection of sphenoid and ethmoid with no standardization of the extent of surgery but with improvement from polyposis symptoms.<sup>14,22,23,24</sup>

Functional endoscopic sinus surgery (FESS) is one of the most common procedures performed nowadays for chronic sinus diseases.<sup>7</sup> In US about 200,000 patients annually are treated by this method with a success rate of as high as 98%.<sup>25</sup>

In one study efficacy of conventional and endoscopic endonasal polypectomy in terms of recurrence of nasal polyposis was compared and recorded 36% recurrence in conventional polypectomy and 12% in FESS.<sup>26</sup> Another study recorded these findings as 30% in conventional and 5% in FESS.<sup>27</sup> Because of high recurrence conventional polypectomy is losing its charm.<sup>8</sup>

### Patients and Methods

This comparative study was performed in Department of ENT, Services Hospital, Lahore from September 2015 to July 2016. A total of 150 patients were selected through non-probability consecutive sampling. Only diagnosed cases of sinonasal polyposis aged between 18-50 years were included in the study. All recurrent cases of nasal polyposis, nasal tumours or patients with marked deviation of nasal septum were excluded to control confounding. Informed written consent was taken from the participants of the study. Two groups were formed, following random number table method, Group-A was allotted to FESS (according to departmental protocols), and Group-B to the patients with conventional endoscopic endonasal-polypectomy. All patients, after surgery, were followed till 4 months for efficacy (no recurrence of sinonasal polyposis). Chi square test was applied to compare the significant difference regarding efficacy of both groups. P-value of  $\leq 0.05$  was considered statistically significant. Stratification was done for age and gender of the patients and duration of the disease to control the

effect modifiers. Post stratification chi-square test was applied.

### Results

From one hundred and fifty patients, the minimum overall age was found as 18 years and maximum age was 50 years with mean  $\pm$  standard deviation as  $34.63 \pm 9.15$  years. The minimum overall duration of disease was found as 6 months and maximum duration of disease was 18 months with Mean  $\pm$  SD as  $10.18 \pm 3.59$  months. In group A mean age was found out to be 35.96 years with a SD of 9.33 years. The mean + standard deviation of duration of disease was found as  $10.80 \pm 3.64$  months. In group B, the mean  $\pm$  standard deviation of age was found as  $33.31 \pm 8.84$  years. The mean + standard deviation of duration of disease was found as  $9.56 \pm 3.47$  months. There were 52 % male patients and 48% patients were female in group A and 45.33 % male patients and 54.67% patients were female in group B. In group A, recurrence was found in 17.33% whereas in group B the recurrence was observed in 38.67%. In group A, the efficacy was found in 82.67% whereas in group B the efficacy was observed in 61.33%. By using chi-square test, significant association was found between study group and efficacy having p- value = 0.004 (Table 1). Study group was not significantly associated with efficacy having p-value 0.228 in less than 30 years of age group whereas in more than 30 years of age group, significant association was found between study group and efficacy with p-value = 0.024 (Table 2).

**Table.1 Group wise distribution of recurrence and efficacy comparison (n = 150)**

Group	Efficacy		Total
	Yes (%)	No (%)	
Group A	62 (82.67%)	13(17.33%)	75
Group B	46 (61.33%)	29 (38.67%)	75
Total	108	42	150
p-value	0.004*		

\*statistically significant at  $p \leq 0.05$

Significant association was not found between study group and efficacy having p- value = 0.228 in males whereas in females, study group was significantly associated with efficacy having p-value = 0.025. Study group was significantly associated with efficacy having p-value 0.014 in less than 1 year of duration of disease group whereas in more than 1 year of duration of disease group, significant association was found

between study group and efficacy with p-value = 0.188 (Table 3).

**Table.2 Stratification of efficacy in both groups with respect to age (n = 150)**

Age	Study group	Efficacy		Total	p- value
		Yes	No		
< 30 years	Group A	16	2	18	0.228*
	Group B	12	6	18	
≥ 30 years	Group A	46	11	57	0.024*
	Group B	34	23	57	
Total		108	42	150	

\*statistically significant at p ≤ 0.05

**Table 3: Stratification of efficacy in both groups with respect to duration of disease (n = 150)**

Duration of Disease	Study group	Efficacy		Total	p- value
		Yes	No		
< 1 year	Group A	41	7	48	0.014*
	Group B	36	21	57	
≥ 1 year	Group A	21	6	27	0.188*
	Group B	10	8	18	
Total		108	42	150	

\*statistically significant at p ≤ 0.05

## Discussion

Kennedy used the term functional endoscopic sinus surgery for the first time in 1985. It is a technique using an endoscope to restore the normal nasociliary clearance drainage and aeration of the sinuses. The development of rigid endoscope proved greatest advancement in rhinology which gives improved visualisation of the sinonasal anatomy. The ciliary regeneration is quick in FESS compare to more extensive removal of tissue thus provides earlier drainage.<sup>28</sup>FESS is an effective treatment option for all the cases of chronic rhinosinusitis with polyposis not responding to medical treatment but polyps have high rate of recurrence probably due to scarring and stenosis of the drainage pathways of the osteomeatal complex.<sup>16,29</sup>

In our study the mean age of presentation of the disease was approximately 34.63 ± 9.15 years with range of 18 to 50 years with 48.66% male patients and 51.34% were female. The age of presentation is comparable to 49.3 ± 12.7 SD, but with male patients included 66.1%.<sup>5</sup>

Sandhauset et al and Adnane et al had equal ratio of both the genders in their studies and average age of presentation of 35.5 years and 39.22 years respectively which are comparable to our study.<sup>7,20</sup> Another study<sup>8</sup> showed mean age of 37.9 years with male of 64.7%. patients age range was 18-60 years while this was 18-50 years in our study while the range of age of the patients was 27-46 years by Sandhauset et al and 16-71 years by Barac et al.<sup>10,20</sup>

In our study the recurrence was found 17.33% with FESS whereas recurrence with conventional polypectomy was observed in 38.67% cases. Similarly the efficacy was found as 82.67% with FESS while this was 61.33% with conventional polypectomy while Huang et al reported a success rates as high as 98%.<sup>25</sup> Recurrence after FESS was 12% by Goharet al<sup>8</sup>, 8% by Dalziel et al and 16.85% by Chaaban et al which are comparable to our studies while recurrence were high by Van der Veen et al (35.6%), Barac et al (56%), Singh et al (25%) and Wynn et al (60%).<sup>5,8,10,16,28,30,31</sup> Recurrence of the nasal polyposis was observed in 35% cases after polypectomy by Dalziel et al which is comparable to our study while this was as high as 55% by Singh et al.<sup>28,30</sup>

FESS improves the signs and symptoms of not only polyposis but can be used as treatment of other sinonasal pathologies, with less complications and comparatively less recurrence rate than conventional polypectomy. High rate of recurrence of the disease is due to the disease burden as it has been observed that polyps reappear more often in cases of more severe form of disease.<sup>31</sup>FESS is more technical procedure requires more surgery time compared to conventional polypectomy. FESS is better option than conventional intranasal polypectomy as it provides good visualization of the field with powered instruments.<sup>28</sup>

## Conclusion

Efficacy of FESS is significantly higher as compared to conventional intranasal polypectomy in patients with sinonasal polyposis. Effect modifiers (age more than 30 years, female and less than 1 years of duration of disease) have significant effect on efficacy.

## References

1. Esmatinia F, Bakhshaei M. Recurrent sinonasal polyposis after the endoscopic sinus surgery. Rev Clin Med 2014;1:86-92.
2. Basilio FMA, Arantes MC, Ballin AC. Efficacy of Endoscopic Sinus Surgery in the Treatment of Chronic Rhinosinusitis Infl Arch Otorhinolaryngol São Paulo(Brasil) 2010;14:433-37.
3. Farrukh MS, Rafique M. Recurrent Nasal Polyps: An Experience at Liaquat University Hospital Hyderabad and Civil Hospital Karachi. JLUMHS 2013;12:195-97.

4. Fetta M, Tsilis NS, Segas JV, Nikolopoulos TP, Vlastarakos PV. Functional endoscopic sinus surgery improves the quality of life in children suffering from chronic rhinosinusitis with nasal polyp. *Int J Pediatr Otorhinolaryngol* 2017;100:145-48.
5. Van der Veen J, Seys SF, Timmermans M, Levie P, Jorissen M, Fokkens WJ. Real life study showing uncontrolled rhinosinusitis after surgery in a tertiary referral centre. *Allergy* 2017;72:282-90.
6. Chen FH, Deng J, Hong HY, Xu R, Guo JB. Extensive versus functional endoscopic sinus surgery for chronic rhinosinusitis with nasal polyps and asthma: A 1-year study. *Am J Rhinol Allergy*. 2016;30:143-48.
7. Adnane C, Adouly T, Zouak A, Mahtar M. Quality of life outcome after functional endoscopic sinus surgery for nasal polyposis. *Am J Otolaryngol* 2015;36:47-51.
8. Gohar MS, Niazi SA, Niazi SB. Functional endoscopic sinus surgery as a primary modality of treatment for primary and recurrent nasal polyposis. *Pak J Med Sci* 2017;33:380-82.
9. DeConde AS, Suh JD, Mace JC, Alt JA, Smith TL. Outcomes of complete vs targeted approaches to endoscopic sinus surgery. *Int Forum Allergy Rhinol* 2015;5:691-700.
10. Barac A, Pekmezovic M, Spiric VT, Trivic A, Marinkovic J. Chronic rhinosinusitis: association of recalcitrant nasal polyposis and fungal finding in polyp's single cell suspension. *Eur Arch Otorhinolaryngol* 2015;272:3727-34.
11. Eskeland Q, Danielsen KA, Dahl F, FridrichK, Orszagh VC, Bachmann-Harildstad G et al. causes of higher symptomatic airway load in patients with chronic rhinosinusitis. *BMC Ear Nose Throat Disord* 2017;29:15-17.
12. Peric A, Baletic N, Milojevic M, Sotirovic J, Zivic L. Effects of preoperative clarithromycin administration in patients with nasal polyposis. *West Indian Med J* 2014;63:721-27.
13. Huvenne W, van Bruaene N, Zhang Nele T, Patou J. Chronic rhinosinusitis with and without nasal polyps: what is the difference? *Curr Allergy Asthma Rep*. 2009;9:213-20.
14. Armani A, Karadi RN, Kumar S. A study of anatomical variations of osteomeatal complex in chronic rhinosinusitis patients-CT findings. *J Clin Diagn Res* 2014;8:1-4.
15. Dai LB, Zhou SH, Ruan LX, Zheng ZJ. Correlation of computed tomography with pathological features in angiomatous nasal polyps. *PloS one* 2012;7:e53306.
16. Chaaban MR, Rana N, Baillargeon J, Baillargeon G. Outcomes and complications of balloon and conventional functional endoscopic sinus surgery. *Am J Rhinol Allergy*. 2018;32:388-96.
17. Benson M. Pathophysiological effects of glucocorticoids on nasal polyps: an update. *Curr Opin Allergy Clin Immunol*. 2010;5:31-35.
18. DeMaria S, Govindaraj S, Huang A, Hyman J. the influence of positive end-expiratory pressure on surgical field conditions during functional endoscopic sinus surgery. *Anesth Analg*. 2015;120:305-10.
19. Sandhaus H, Chen PG. Intraoperative functional endoscopic sinus surgery training: Efficient teaching techniques- A new method. *Clin Med Insights Ear Nose Throat*. 2018;11:1179550618758647
20. Karabayiri S, Ugur KS, Demirciglu RI, Muslu B. Surgical conditions during FESS; comparison of demedetomidine and remifentanyl. *Eur Arch Otorhinolaryngol*. 2017;274:239-45.
21. Eichhorn KW, Westphal R, Rilk M, Last C, Bootz F. Robot-assisted endoscope guidance versus manual endoscope guidance in functional endonasal sinus surgery. *Acta Otolaryngol*, 2017;137:1090-95.
22. Gupta D, Gulati A, Singh I, Tekur U. impact of endoscopic sinus surgery on olfaction use of alternative components in odor threshold measurement. *Am J Rhinol Allergy*. 2015;29:117-20.
23. Rix I, Hakansson K, Larsen CG, Frendo M, Von Buchwald C. Management of chronic rhinosinusitis with nasal polyps and coexisting asthma: A systemic review. *Am J Rhinol Allergy*. 2015;29:193-201.
24. Suzuki S, Yasunaga H, Matsui H, Fushimi K, Kondo K, Yamasoba T. Complication rate after functional endoscopic sinus surgery: analysis of 50,734 Japanese patients. *Laryngoscope*. 2015;125:1785-91.
25. Huang BY, Lloyd KM, DelGaudio JM, Jablonowski E, Hudgins PA. Failed Endoscopic Sinus Surgery: Spectrum of CT Findings in the Frontal Recess. *RadioGraphics* 2009;29:177-95.
26. Nagalikar S, Rathod CV, Pillai RM, Manjunath S. A prospective study of role of FESS in management of recurrent nasal polyposis. *Ind J Pub Health Res & Dev* 2013;4:257-61.
27. Rawandzi HA. Endoscopic Sinus Surgery versus Conventional Method in Management of Naso-Ethmoidal polyps and Their Associated Intranasal Abnormalities. *Iraqi J Med Sci* 2009;7:93-103.
28. Singh R, Hazarika P, Nayak DR, Balakrishnan R. A comparison of microdebrider assisted endoscopic sinus surgery and conventional endoscopic sinus surgery for nasal polypi. *Indian J Otolaryngol Head Neck Surg*. 2013;65:193-96.
29. Yoo F, Ference EH, Kuan EC, Lee JT, Wang MB, Suh JD. Evaluation of patient nasal saline irrigation practices following endoscopic sinus surgery. *Int Forum Allergy Rhinol*. 2018;8:32-40.
30. Dalziel K, Stein K, Round A, Garside R, Royle P. Systemic review of endoscopic sinus surgery of nasal polyps. *Health Technol Assess*. 2003;7:1-159.
31. Wynn R, Har-El G. Recurrence rates after endoscopic sinus surgery for massive sinus polyposis. *Laryngoscope*. 2004;114:811-13.