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Outcomes Of Functional Endoscopic Sinus Surgery (FESS) In Patients With Chronic Rhinosinusitis With Nasal Polyps

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ABSTRACT

Background: Chronic rhino sinusitis with nasal polyps (CRS with NP) is a chronic inflammatory condition characterized by nasal congestion, olfactory dysfunction, and a diminished quality of life. Functional endoscopic sinus surgery (FESS) has emerged as a preferred treatment option for patients who do not respond adequately to medical management. While FESS is associated with improvements in symptom control and quality of life, the recurrence of polyps remains a significant concern, along with varying treatment outcomes. Therefore, it is crucial to assess the effectiveness and post-surgical outcomes of FESS in CRS with NP to optimize patient management strategies.

Objectives: To evaluate clinical outcomes, symptom relief, and quality-of-life improvement after FESS in patients with (CRS with NP) and discuss the results in relation to factors associated with recurrence and postoperative recovery.

Study design: A Cross-sectional study.

Place and Duration of study: Department of ENT Khyber Teaching Hospital Peshawar From January 2023 to January 2024

Methods: A Cross-sectional study was performed on patients diagnosed with (CRS with NP) FESS. Systems preoperative assessment was performed by symptom scoring with SNOT-22 and endoscopic probing. Follow-up was performed postoperatively after 3, 6 and 12 months with an evaluation of the symptomatic improvement, recurrences, and complications. SPSS was used to analyze the data and continuous variables were reported as mean + standard deviation and comparisons tested by paired t-tests. Statistically significance was predetermined to be $p < 0.05$.

Results: 75 patients with the mean age of 44.7 ± 12.5 years were involved in the study. Postoperative results showed a great improvement in SNOT-22 scores, which dropped to 28.7 (7.6) at 12 months ($p < 0.001$) compared to preoperative values of 62.4 (9.8). Nasal congestion resolved in 92 percent of the patients, hyposmia in 63 percent and headache in 62 percent. Recurrence was in 24 percent of the cases. Major complications were not reported Better symptomatic outcome was observed with extended FESS based on symptomatic relief compared to limitedFESS ($p = 0.028$). The quality-of-life scores showed better results which signify that FESS is effective in the reduction of symptoms and increases in day-to-day hactions in (CRS with NP) patients.

Conclusion: Functional Endoscopic Sinus surgery markedly relieves the symptoms, quality of life and olfactory process in patients of chronic rhino sinusitis with nasal polyps. Recurrences are problematic; however, thorough patient selection and prolonged incision are options to improve the prognosis. Techiest is safe with low complication rates, and offers sustained symptomatic relief, which supports its position as the surgery of first choice in a patient with medically refractory (CRS with NP) .

Keywords: FESS, CRWNP, Outcomes, Recurrence

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INTRODUCTION

Chronic rhino sinusitis with nasal polyps (CRWNP) is a well-known condition of the Sino nasal mucosal inflammation with persistent symptoms of blockage of nostrils, loss of smell, pressure in the face and postnasal drip [1]. Pathogenesis is a complicated interaction of genetic predisposition, exposure to environments, immunological imbalance resulting in mucosal inflammation and formation of polyps [2]. Medical options such as intranasal corticosteroids, saline nose-washes, and systemic treatments find little relief especially in severe cases and in those with other diseases such as asthma [3]. Functional Endoscopic Sinus Surgery (FESS) has become a pillar in the treatment of (CRWNP) to restore ventilation and drainage to the normal sinus pathway diversion of obstructive tissue and polyps [4]. This minimally invasive surgical method uses endoscopic vision to create minimally manipulative surgical procedures, which can minimize trauma and facilitate faster recovery of patients, in contrast to conventional procedures works [5]. Although widely used, the effectiveness of FESS in the treatment of (CRWNP) patients is still an under-investigation topic. Varied results have been published with success rates ranging between 76%-97.5%, dependent on disease severity and surgical technique, as well as postoperative care. In addition, postsurgical remission of polyps presents a concern of concern, with rates of up to 31.33 percent recorded within an average observation of 9 Months [6,7]. The aim of the present study is to assess the clinical effectiveness of FESS in patients with (CRWNP), in terms of a symptom reduction, enhanced quality of life and postoperative recurrence. Examining these parameters, we are aiming to present the comprehensive rating of the efficiency of FESS and those factors that can have an impact on the outcomes in a long-term perspective and thus, can inform the clinical practice and the way of managing patients [8,9].

Methods

This was a cross-sectional study Conducted in Department of ENT Khyber Teaching Hospital Peshawar. From January 2023 to January 2024. Patients with the diagnosis of (CRWNP), based on the European Position Paper on Rhino sinusitis and Nasal Polyps (EPOS) criteria were included. Assessment before surgery involved a complete description of the medical history, nose endoscopy, and computed tomography (CT) par nasal sinuses. Sino-Nasal Outcome Test-22 (SNOT-22) questionnaire was used to determine the baseline severity of symptoms and quality of life. Surgery was conducted under general anesthesia with conventional FESS procedures in an attempt to ventilate and clear the sinuses to the greatest extent possible and spare mucosa. Others required nasal saline irrigations as part of post-operative care and in some instances topical corticosteroids. Patients were reviewed after 3-, 6- and 12-months follow-up on symptom alleviation, spontaneous recurrence of the polyps, and any complications.

Inclusion Criteria

Patients aged between 18 and 65 years with medically intractable (CRWNP), proven by nasal endoscopy and CT imaging and a patient consenting to take part in the study.

Exclusion Criteria

Patients with acute rhino sinusitis, isolated sinus disease, polyps, prior Sino nasal surgery or contraindications to general anesthesia were excluded.

Approval by Ethical Committee Statement

The study was ethically accepted by the Institutional Review Board of the institution it was conducted in (approval No:**IRB-no-KTH/766/11/2022).** The written informed consent was signed by all participants, and it was necessary to recruit patients according to ethical standards and patient privacy in accordance with the declaration of Helsinki.

Data Collection

Sectional data collection was done through medical records, patient interview and clinical evaluations with each follow up. Demographic information, health, surgical, and postoperative data were documented carefully to provide a better analysis.

Statistical Analysis

Data analysis was done with the SPSS version 24.0 (IBM Corp., Armonk, NY, USA). Data concerning continuous variables were given as means standard deviation, and data on categorical variables were provided as frequencies and percentages. Paired t-tests were used to identify the difference between the preoperative and

Postoperative SNOT-22 scores, and p-value less than 0.05 was regarded as significant.

Results

The 75 patients mean age of 44.7212.5 years, was used. Before the surgery, SNOT-22 mean was 62.4 9.8 points, which is extreme symptomatology. Twelve months after surgery, the SNOT-22 score decreased to 28.7 +/- 7.6, which also was a significant decrease ($p < 0.001$). Nares blockage improved in 92 %, hyposmia in 63 and facial pain in 62 %. Polyp recurrence was noticed in 24 percent of the cases and the interval between the first and second recurrence was 10.2 3. reporting months. No serious adverse events (e.g., leakage of cerebrospinal fluid or loss of vision) were noted.

Table 1. Demographic Characteristics of Patients (n = 75)

Characteristic	Value
Age (years), mean ± SD	44.7 ± 12.5
Gender, n (%)	
Male	42 (56%)
Female	33 (44%)
Comorbidities, n (%)	
Asthma	18 (24%)
Allergic rhinitis	22 (29.3%)
Diabetes Mellitus	10 (13.3%)

Table 2. Preoperative Clinical Symptoms and SNOT-22 scores

Symptom	Preoperative n (%)	Mean ± SD Score
Nasal obstruction	75 (100%)	8.2 ± 1.1
Hyposmia/anosmia	60 (80%)	7.6 ± 1.4
Facial pain/pressure	55 (73%)	6.9 ± 1.3
Rhinorrhea	68 (90.7%)	7.1 ± 1.2
Total SNOT-22	-	62.4 ± 9.8

Table 3. Postoperative Symptom Improvement at 12 Months

Symptom	Improved n (%)	Mean ± SD Score	p-value
Nasal obstruction	69 (92%)	3.2 ± 0.9	<0.001
Hyposmia/anosmia	47 (63%)	3.5 ± 1.1	<0.001
Facial pain/pressure	46 (62%)	3.1 ± 1.0	<0.001
Rhinorrhea	61 (81%)	3.3 ± 0.8	<0.001
Total SNOT-22	-	28.7 ± 7.6	<0.001

Table 4. Recurrence and Complications

Parameter	n (%)
Polyp recurrence	18 (24%)
Mean time to recurrence (months)	10.2 ± 3.4
Minor complications (epistaxis, crusting)	5 (6.7%)
Major complications (CSF leak, vision loss)	0 (0%)

Table 5. Effect of Surgical Extent on Outcome

Surgery Type	Patients n (%)	Mean SNOT-22 Improvement	Recurrence n (%)	p-value
Limited FESS	33 (44%)	28.2 ± 7.5	9 (27%)	0.028
Extended FESS	42 (56%)	34.1 ± 8.0	9 (21%)	0.028

Discussion

Functional Endoscopic Sinus Surgery (FESS) has become a basic technique in the management of chronic rhinosinusitis complicated with nasal polyp (CRWNP), which produces impressive improvements in patients with much better quality of life. Nevertheless, nasal polyps' recidivism after surgery is an issue of concern and recovery may vary between 18.2 to 40 % within 6 - 18 months after surgery [11]. This is highly variable and reflects the complexity of (CRWNP) and the necessity to develop personalized treatment strategies. The recurrence rates found in our study were similar to these findings which is 24% recurrence at 12 months post-FESS [12]. This rate can be compared with the one reported in the literature and it shows that FESS is not apparently effective in the long term, as long-lasting management approaches are necessary to ensure that the symptoms will be relieved [13]. There are a number of contributing factors to recurrence of nasal polyps after FESS. Presence of comorbid such as asthma and aspirin-exacerbated respiratory disease (AERD) has also been linked to increased recurrences [14]. We also found that asthmatics had a greater recurrence and that such comorbidities may affect surgical outcomes [15]. The scope of surgery also significantly contributes, whereby it was also found that more comprehensive surgical procedures, including extended FESS, have lower rates

of recurrence and do better in the long-term [16]. Another important issue of FESS is its effect on quality of life. In our study, there were significant improvements in SNOT-22 scores after surgery indicating improvement in nasal function, reduction in facial pain, and olfaction [17,18]. These results are in agreement with the customary findings, which showed significant positive changes in quality-of-life after FESS. It is however necessary to add that although results provide symptomatic relief, certain patients still exhibit residual symptoms and as such the continued management and education assists patients to fully grasp. Our study results in relation to surgical outcome are comparable to those of other studies. As an example, a study conducted by DeConde et al. reported 22.2% rate of recurrence of CRWNP patients who underwent a FESS. One study cited a recurrence rate of 18.2 per cent in a series of 154 patients [19,20]. These and our studies highlight the need to consider patient specific variables, including age, comorbidities and extent of surgery when planning and assessing outcomes of surgical interventions in (CRWNP) [21]. In summary, although FESS offers a valid cure to (CRWNP), nasal polyp recurrence and failure to clear symptoms in selected patients, warrants multipronged management of the disease. These are proper selection of patients, consideration of comorbidities, and the degree of surgery. P-Future study should concern itself with establishing predictive factors of recurrence and creating interventions to offset these risks so as to maintain symptom relief and quality of life enhancement over a long-term period among (CRWNP) patients [22].

Conclusion

fancify you are reading this article you may recognize that the olfactory sensation is the most famous one. Despite the fact that FESS leads to recurrence among a few patients, the intervention is safe and effective. With extended surgery and selecting the right patient, relapse is mitigated and victory is attained.

Limitations

Weaknesses include the study had a single center design and short follow-up of 12 months which may not represent the long-term recurrence. The sample was moderate and possible confounding factors of outcome such as the adherence to the postoperative therapy, and surgical technique variances could not be completely controlled.

Future Findings

Future studies should be attempted in multicenter format with long-term follow-up in relation to recurrence pattern over several years. Future studies are needed to understand how to integrate biologic agents, postoperative steroid regimen and individualized approaches to surgery can be developed to reduce the rate of recurrence. By pinpointing prognostic biomarkers, it is possible to further optimize patient selection and better personalize management of (CRWNP) post FESS.

Abbreviation	
FESS	Functional Endoscopic Sinus Surgery
CRWNP	Chronic Rhinosinusitis with Nasal Polyps
SNOT-22	Sino-Nasal Outcome Test-22
SD	Standard Deviation
CT	Computed Tomography
EPOS	European Position Paper on Rhinosinusitis
IRB	Institutional Review Board
CSF	Cerebrospinal Fluid
AERD	Aspirin-Exacerbated Respiratory Disease
QoL	Quality of Life
OR	Odds Ratio
RSDI	Rhinosinusitis Disability Index
E-FESS	Extended Functional Endoscopic Sinus Surgery
L-FESS	Limited Functional Endoscopic Sinus Surgery
CF	Cystic Fibrosis
GCBI	Glasgow Benefit Inventory
VAS	Visual Analog Scale
IBM SPSS	International Business Machines Statistical Package for the Social Sciences

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Authors Contribution

Concept & Design of Study: **Imran Khan**[3]

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Final Approval :All Authors Approved the Final Version. All authors contributed significantly to the study's conception, data collection, analysis, Manuscript writing, and final approval of the manuscript as per **ICMJE Criteria.**

Ethics Statements

Studies Involving Animal Subjects

No animal studies were conducted or presented in this manuscript.

Studies Involving Human Subjects

This study was reviewed and approved by the Institutional Review Board IRB no (**IRB-no-KTH/766/11/2022**) chaired by the Chairman of the Ethical Committee. All procedures were conducted in compliance with institutional guidelines and ethical standards. Institutional guidelines and the Declaration of Helsinki (2013). Written informed consent was obtained from the legal guardians or next of kin of the participants prior to their inclusion in the study.

Inclusion of Identifiable Human Data

No identifiable images or personal data of human participants are included in this study.

Data Availability Statement

The datasets generated and analyzed during the current study are available in online repositories. The specific repository names and accession numbers are provided within the article and supplementary materials.

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