

EVALUATION OF EFFECTIVENESS OF SINUS SURGERY IN CHRONIC RHINOSINUSITIS PATIENTS USING SINONASAL OUTCOME INDEX-22, MODIFIED LUND MACKAY SCORE AND RHINOSINUSITIS DISABILITY INDEX

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ABSTRACT

Functional endoscopic sinus surgery (FESS) is done in patients with chronic rhinosinusitis (CRS) not responding to medical therapy. This study aims to evaluate the subjective, objective and overall quality of life improvement in CRS patients following FESS surgery. Sinonasal outcome index-22, modified Lund-Mackay score and Rhinosinusitis Disability Index were used to evaluate subjective, objective and overall quality of life in patients with CRS. The questionnaires were asked before the surgery and three months after surgery. A total of 110 patients were enrolled in the study. All three types of evaluation showed improvement following FESS surgery. FESS in CRS patients refractory to medical management caused significant improvement in symptom intensity, endoscopic score and overall quality of life.

KEYWORDS

Sinonasal outcome index-22, modified Lund-Mackay score, rhinosinusitis disability index

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INTRODUCTION

Chronic rhino-sinusitis (CRS) is a common chronic disease condition involving nose and paranasal sinuses. It is the second most common chronic condition in United States affecting about 31 million people every year.^{1,2} The treatment of CRS starts with a course of antibiotics, nasal irrigation and steroids. If medical management fails, surgery is advised. The name of surgery is functional endoscopic sinus surgery (FESS).³

Rapid development in visualization, instrumentation, and technology within endoscopic sinus surgery have facilitated safe and effective operation by reducing operative time, blood loss, and postoperative scarring.⁴⁻⁶ In this study we are aiming to find subjective and objective clinical improvement in CRS patients not responding to medical therapy after intervention with FESS.

MATERIALS AND METHODS

This was a prospective quantitative observational study carried out in the department of ENT and Head and Neck surgery from March 15, 2022 to March 15, 2023. Convenience sampling technique was used to include the chronic sinusitis cases. All cases of chronic rhinosinusitis diagnosed clinicoradiologically and planned for functional endoscopic sinus surgery were included as cases. The revision cases of surgery and patients who didn't come for follow up were not included in the study. After surgery the patients were again evaluated after 3 months during follow-up.

For subjective evaluation of symptoms, sinonasal outcome index-22 (SNOT-22) was utilized before surgery and after 3 months follow-up. It consisted of 22 questions and the patients were asked to grade the severity

of symptoms starting from 0 which meant no symptoms and 5 which meant problems as bad as they could be.⁷

The objective evaluation of the nose and paranasal sinuses was done using modified Lund Mackay Score. The nasal endoscopic appearances of all ten sinuses (left and right maxillary, ethmoid, sphenoid, frontal sinuses and olfactory fossa) were quantified for mucosal inflammation (0-6; 0 = normal mucosa, 1 = mild edematous mucosa with patent cavity, 2 = severe oedematous mucosa with compromised cavity, 3 = mild polypoid mucosa with patent cavity, 4 = severe polypoid mucosa with compromised cavity, 5 = polyp confined within cavity, 6 = polyp extending beyond cavity), mucus (0-2; 0 = none, 1 = clear and thin, 2 = thick and eosinophilic) and purulent discharge (0, 2; 0 = absent, 2 = present). This produced a score of 0-100.⁸ The modified Lund Mackay Score was used before and 3 months after the surgery for objective evaluation of nose and paranasal sinuses.

The overall quality of life was assessed using rhinosinusitis disability index (RSDI). It consisted of 30 questions rated on 5 points Likert scale from never (scored as zero) to always (scored as 4). It had three subscale domains-physical (11 items), functional (9 items) and emotional (10 rhinosinusitis items).⁹ RSDI was used to assess quality of life before and 3 months after the surgery.

RESULTS

A total of 110 patients were enrolled in the study. The mean age of the patients was 39.78 years (Fig. 1). The male to female ratio was 1.68. The most common profession of the patient was shopkeeper (Fig. 2). Around 20 patients (18.2%) have a history of smoking and 45 patients (40.9%) have some form of allergic rhinitis.

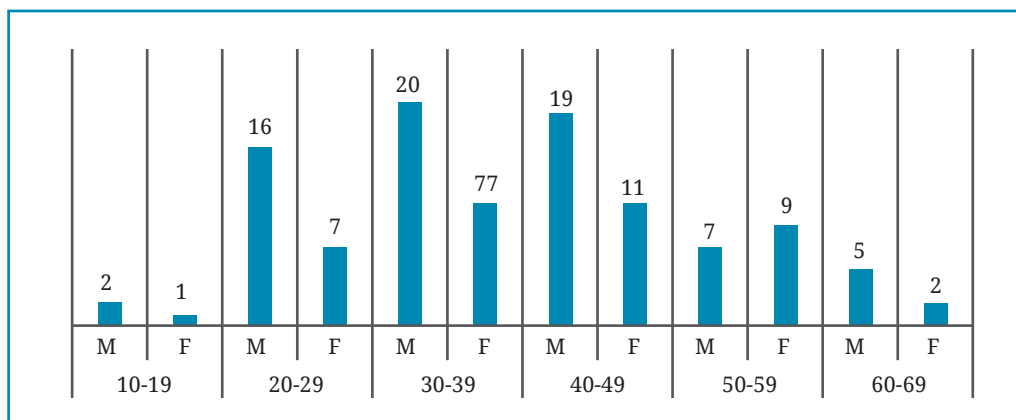


Fig. 1: Age and gender distribution of patients

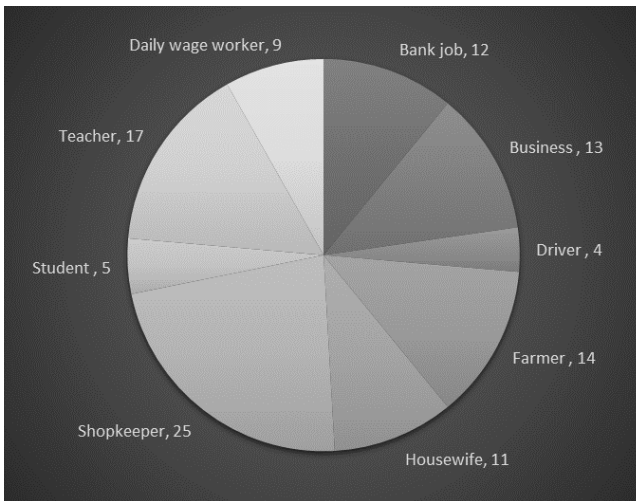


Fig. 2: Pie chart showing the profession of patients undergoing sinus surgery

The mean pre-operative RSDI was 91.55 ± 5.95 and the mean post-operative RSDI was 25.39 ± 7.84 (Fig. 3). When paired t-test was used, the difference of mean pre-operative RSDI score and mean post-operative RSDI score was 66.16. The 95.0% confidence interval of this difference ranged from 64.26 to 68.07. The two-tailed P value was less than 0.0001.

DISCUSSION

In this study, an attempt was made to quantify improvement in terms of subjective, objective and quality of life following functional endoscopic sinus surgery (FESS) and meticulous post-operative care involving medical therapy and nasal douching. All patients were re-evaluated post-operatively after three months.

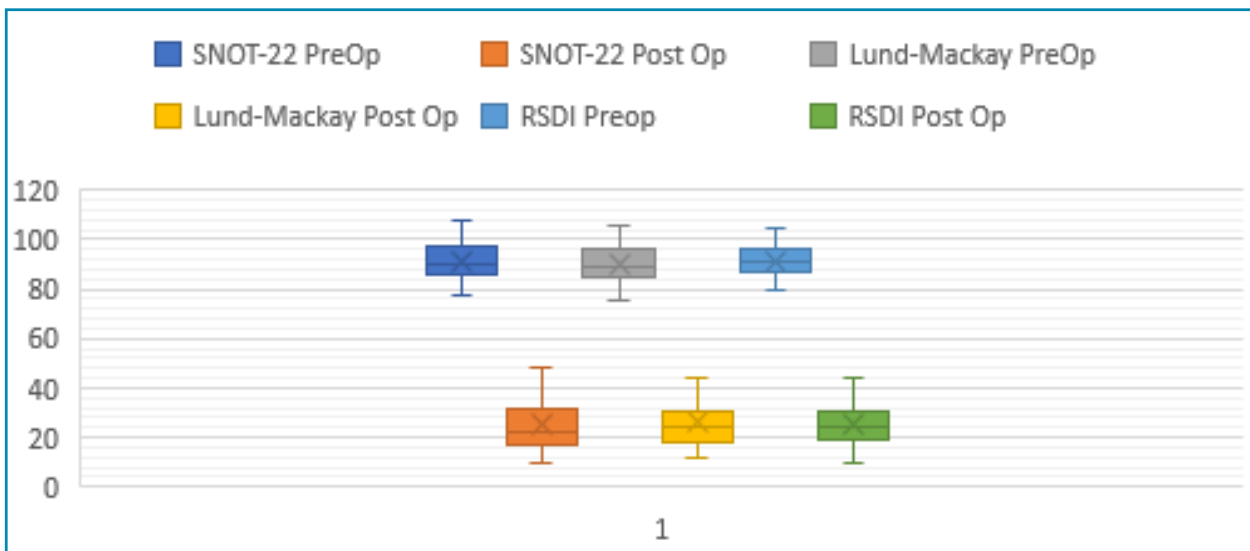


Fig. 2: Box whisker plot representing pre-op and post-op SNOT-22, modified Lund-Mackay and RSDI scores

The mean pre-operative SNOT-22 score was 90.96 ± 7.75 and the mean post-operative SNOT-22 score was 25.71 ± 9.89 (Fig. 3). When paired t-test was used, the difference of mean pre-operative SNOT-22 score and mean post-operative SNOT-22 score was 65.25. The 95.0% confidence interval of this difference ranged from 62.80 to 67.71. The two-tailed P value was less than 0.0001.

The mean pre-operative modified Lund-Mackay score was 90.39 ± 7.43 and the mean post-operative modified Lund-Mackay score was 25.85 ± 8.38 (Fig. 3). When paired t-test was used, the difference of mean pre-operative modified Lund-Mackay score and mean post-operative Lund-Mackay score was 64.54. The 95.0% confidence interval of this difference ranged from 62.30 to 66.77. The two-tailed P value was less than 0.0001.

A total of 110 patients with a mean age of 39.78 years were enrolled in the study. The male to female ratio was 1.68. 18.2% of patients have smoking history and 40.9% of patients have allergic rhinitis. The subjective, objective and quality of life improvement were assessed using SNOT-22 score, modified Lund-Mackay score and RSDI respectively. All the scores indicated significant improvement three months after FESS surgery.

The main limitation of this study was the duration of follow-up which was three months only. Long duration of follow-up was needed to see the long-term benefits of surgery. Kennedy *et al*¹⁰ reported residual disease endoscopically in 44.9% of patients with a mean follow-up of 18 months. Djukic *et al*¹¹ reported a recurrence of 32.9% with a mean follow-up of 12 months out of which 5.9% underwent revision surgery within a year.

Our study showed FESS performed in patients with chronic sinusitis achieved significant improvement in symptoms intensity, endoscopic score and quality of life score. Similar findings were reported in a study done by Djukic *et al*¹¹ who assessed quality of life using Short Form-36 Health Survey questionnaire, subjective score using Visual Analogue scale and objective findings using endoscopic and computerized tomography score. A systematic review by Smith *et al*¹² identified 45 studies to see the effect of FESS in the improvement of symptoms and/or quality of life. All studies demonstrated improvement in the CRS related symptoms and quality of life. Mishra *et al*¹³ study on 120 patients showed subjective improvement of symptoms following FESS.¹³ Another study

by Smith *et al*¹⁴ reported improvement in the quality of life in patients with CRS following FESS and this improvement was independent of age, sex, asthma and allergy. Birch *et al*¹⁵ used RSDI score on 53 patients with chronic sinusitis which was effectively used to determine their quality of life. From Nepal, two studies done by Mishra *et al*¹⁶ and Acharya *et al*¹⁷ showed improvement of symptoms and quality of life in patients with CRS following FESS surgery.

FESS performed in patients with chronic sinusitis achieved significant improvement in symptoms intensity, endoscopic scores and quality of life.

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