

Endoscopic Sinus Surgery (ESS) Outcome in the Treatment of Chronic Sinusitis: Southeast Nigeria Experience

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ABSTARCT

Background: Endoscopic Sinus Surgery (ESS) is becoming the preferred procedure for Chronic Rhinosinusitis (CRS) that are not responding to medical treatment because of its good outcome. However, most otorhinolarhingologists are still offering their patients open sinus surgeries for fear of poor outcome and complications.

Objective: To determine the outcomes and of endoscopic sinus surgery for Chronic Rhinosinusitis (CRS) that are not responding to medical treatment.

Design: This was a retrospective study that analysed the outcome of the patients who had ESS in the Southeast Nigeria.

Setting: Otorhinolaryngology department of Nnamdi Azikiwe University Teaching Hospital Nnewi, Southeast Nigeria.

Subjects: Twenty patients were seen within 2018 to 2020 and their information was retrieved from their case notes. The patient's demographic information; pre-operative symptoms and signs; paranasal sinus Computed Tomography (CT) findings; operative indications; surgery procedures and complications; short and long-time patients' reported outcome were used from the patient's folder. The descriptive analysis of the information obtained was performed using SPSS version 22.

Results: There was a satisfactory patient reported outcome for all the patients. Our patients are still under follow up. One out of the 8 asthmatics presented with recurrent nasal stuffiness but the patient responded to steroid nasal decongestant. Also, one of the two patients with fungal sinusitis had recurrence after 1 year of post endoscopic surgery. Patient

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had repeated endoscopic sinus surgery and repeated doses of oral fluconazole.

Conclusion: Our outcome measures are good and patients should be encouraged to do functional endoscopic sinus surgery instead of the conventional open paranasal sinus surgery when necessary.

Keywords: Endoscopic sinus surgery; Outcome; Experience; Patients

INTRODUCTION

Endoscopic sinus surgery is a minimal invasive surgery using endoscopes to directly visualize the sinuses when working in the paranasal sinuses to exenterate the diseased processes. Its advantages over conventional open sinus surgery in the treatment of chronic sinusitis include: no outward scarring of the face, minimally invasive surgery, less tissue damage, minimal pain, little post-surgical bleeding, few surgical complications, and long-lasting results [1,2]. Endoscopic sinus surgery is not common in Southeast Nigeria as at the time of this study and there is a need to determine the patients' reported symptom outcomes of endoscopic sinus surgery for Chronic Rhinosinusitis (CRS) that did not respond to medical treatment in Southeast Nigeria in every Ear, Nose and Throat center for a proper perspective in offering it as an alternative to open conventional sinus surgery. The outcomes measures of patients' reported complaints about ESS include nasal blockage, nasal discharge, anosmia, headache, post-nasal discharge, fetid breath and length of admission period due to the procedure as were used in this study.

In 2003, the American Academy of Otolaryngology-Head and Neck Surgery amended the definition of chronic rhinosinusitis to include radiological findings and endoscopic rhinoscopic examination findings in addition to major and minor factors of rhinosinusitis lasting more than 12 weeks [3,4]. Major factors included facial pain or pressure, nasal blockage, purulent nasal discharge or postnasal discharge, anosmia or hyposmia; Minor factors include fever, cough, headache, dental pain, halitosis, fatigue, and ear pain [5]. Endoscopic rhinosinuscopy findings include nasal polyps and purulent nasal discharge from the nose and or middle meatus. Radiological findings include engorged inferior turbinate, nasal polyps, opacification of paranasal sinuses, mucoperiosteal thickening of any/all the paranasal sinuses.

Endoscopic sinus surgery is a minimally invasive surgery using endoscopes to carry out surgical procedures in the nose and paranasal sinuses with the aim of treating a disease or correction of an abnormality in the nose or paranasal sinuses and mucociliary clearance function. It has been documented to have a better outcome than the conventional open surgical approach to nasal cavity or paranasal sinus diseases or abnormality like in chronic sinusitis [6,7].

Recently, Computer Assisted Navigation (CAN) Endoscopic Sinus Surgery (ESS) has been introduced for better precision and reduction in the risk of damaging some important adjacent vital structures. This innovation further makes the ESS to be a preferred surgery for chronic rhinosinusitis especially in the frontal recess surgery, decreasing the recurrence rate and reducing the total nasal resistance [8]. Blood loss has also been documented to be reduced because of less tissue damage. However, balloon sinuplasty is beginning to replace to replace FESS though it still uses endoscopes. ESS also gives opportunities to access the surrounding structures through the nose such as skull base surgeries, orbital decompression surgeries, dacryocystorhinostomy with minimal complications even septoplasty is also done through ESS [9-11].

Outcome of FESS is has been reported by many researchers to have offered the patient up to 91% to 100% symptom release or cure especially if it is due to chronic rhinosinusitis that is not responding to medical therapy [12-17].

There is paucity of literature in treatment of chronic rhinosinusitis that is not responding to medical treatment with endoscopic sinus surgery in West Africa. Some studies suggested that it could be due to relative indications for ESS in developing countries, ESS rate might depend on informed patient choice and the treatment strategies available and the cost can vary extensively because of differences in professional opinions [18,19]. Also availability of trained hands and equipment cannot be ruled out. The purpose of this study was to determine the outcomes of endoscopic sinus surgery for Chronic Rhinosinusitis (CRS) that did not respond to medical treatment and also to popularize ESS whenever it is indicated in the Southeast Nigeria.

MATERIALS AND METHODS

This work was a review of the outcome of ESS done in Southeast Nigeria from January 2018 to December, 2020. The common indication for ESS was chronic rhinosinusitis that is not responding to medical treatment. Other inclusion criteria was that all the patients were 18 years and above; there was no previous ESS in all the patients; no patient has intra cranial complications of chronic rhinosinusitis; All the patients were certified for elective general anaesthesia. The parameter used in this outcome evaluation was modified SINO-NASAL OUTCOME TEST (SNOT-22) "All rights reserved Copyright 2006-Washington University in St. Louis, Missouri". We used the term "modified" here because we needed information that was found in all the patients' case notes used for this study. The Patients' case notes were retrieved and the following information was extracted from each case note. Demographic information; Operative indications, CT imaging findings; Surgery procedures and complications; Short and long time surgery outcome like nasal blockage, nasal discharge, anosmia, headache, post-nasal discharge, recurrent sneezing bouts and length of patients stay in the hospital due to the ESS as were used in this study.; the descriptive analysis of the information obtained was done using SPSS. Patients' symptoms and signs were retrieved from the patients' case notes for data analysis before and after the ESS. The symptoms includes: Nasal blockage, Headache, Post nasal drip, Chronic Rhinorrhea, Anosmia and fetid breath while the signs were endoscopic rhinoscopy findings, nasal polyp, post nasal discharge, discharge from the nose and discharge from middle meatus.

RESULTS AND DISCUSSION

A total of 20 patients had ESS as a result of chronic rhinosinusitis that was not responding to medical treatment from January 2018 to December 2020. Out of which were 12 males and 8 females. The age range was between 18 to 73 years (Figure 1). The mean age was 36.6 and the standard deviation was ± 13.9 . The symptoms showed that nasal blockage and headache was common among 18 (90%) patients; 15 (75%) patients had postnasal drip and chronic mucopurulent anterior rhinorrhea and 10 (50%) patients had both anosmia and fetid breath (Table 1). The preoperative nasal endoscopy showed that bilateral nasal polyp, purulent discharge from the middle meatus and purulent rhinorrhea were common in 8 (40%) patients (Table 2). Eight patients were documented to be known asthmatics. The computerized tomographic scan finding of the paranasal sinuses revealed blockage of osteomeatal complex 90%, maxillary sinus opacity 60%, Ethmoidal sinus opacity 40%, frontal sinus opacity 40% and nasal polyps 90% (Figure 2).

Figure 1. Bar diagram of age.

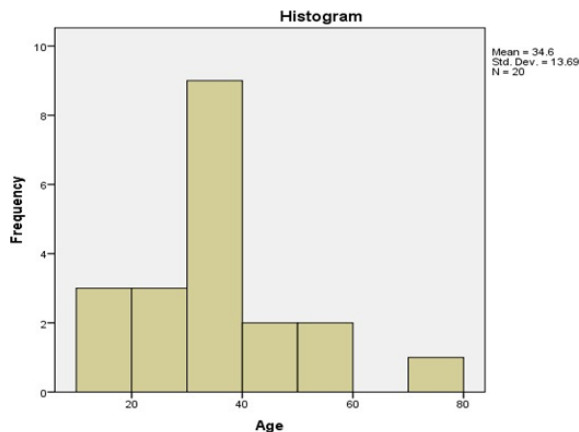


Figure 2. Preoperative CT scan findings (opacification of the sinuses and osteomatal complex blockage and polyps).

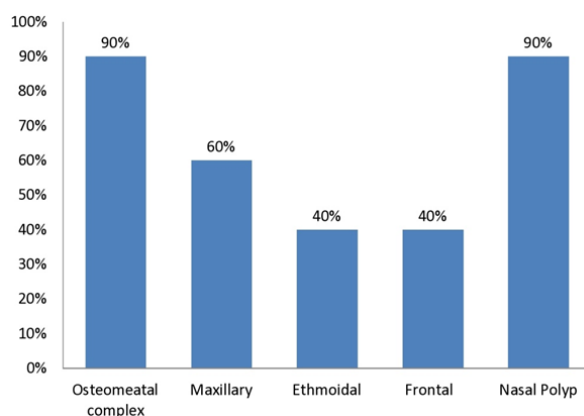


Table 1. Pre-operative symptoms.

	Nasal blockage	Headache	Post nasal drip	Chronic rhinorhea	Anosmia	Fetid breath
Yes	18 (90%)	18(90%)	15 (75%)	15 (75%)	10 (50%)	10(50%)
No	2 (10%)	2 (10%)	5 (25%)	5 (25%)	10 (50%)	10 (50%)
Total	20 (100%)	20 (100%)	20 (100%)	20 (100%)	20 (100%)	20 (100%)

Table 2: Endoscopic examination 2.

Endoscopic rhinoscopy finding	Bilateral nasal polyp	Nasal discharge from the nose	Nasal discharge from middle meatus
Yes	8 (40%)	8 (40%)	8 (40%)
No	12 (60%)	12 (60%)	12 (60%)
Total	20 (100%)	20 (100%)	20 (100%)

Apart from persistent chronic rhinosinusitis unresponsive to medical treatment other indication for surgery includes bilateral nasal polyps 90%, nasal blockage 90% and 50% had fungi sinusitis (Figure 3). Post-operative 6 weeks review showed a satisfactory patient reported outcome of 100% symptom free (Figure 4). Our patients are still under follow up. One patient out of the 8 asthmatics presented with recurrent nasal stuffiness but the patient responded to steroid nasal decongestant. Also one of the two patients with fungal sinusitis had recurrence after 1 year of post endoscopic surgery. She had repeat endoscopic sinus surgery and repeat doses of oral fluconazole.

Figure 3. Other indications for surgery.

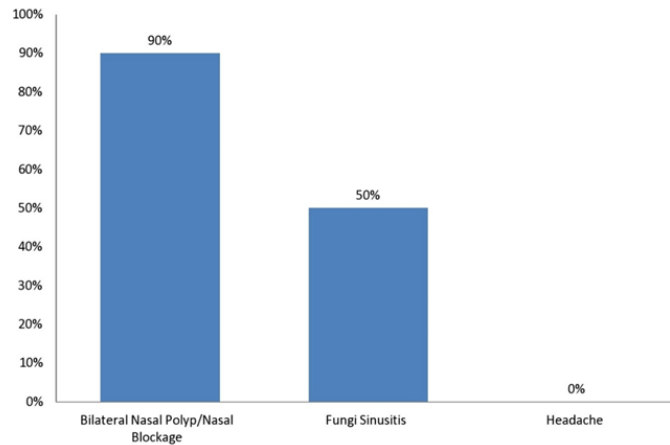
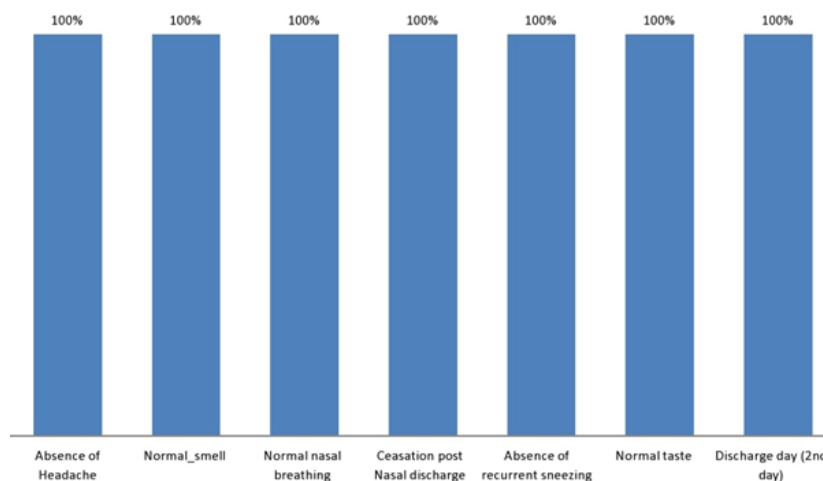


Figure 4. Post ESS symptom outcome.



Endoscopic sinus surgery is a minimal invasive procedure for chronic rhinosinusitis (CRS) that is not responding to medical therapy. The prevalence of this procedure is increasing among patients that need surgical treatment for their chronic rhinosinusitis. In this study we observed that males are approximately twice that of females. The male to female ratio is different from the works done by most authors. Hastan, et al. documented more females than males. Similarly, Ference, et al. Their explanation was that CRS is more common among women than men. Ference, et al. also reported a study, based on the Korea National Health and Nutritional Examination Survey, where the prevalence of CRS was higher in males compared with females and concluded that although these apparent contradictions may illustrate the potential effect of differences in study methodology, sampling, or disease definitions, alternatively, they may suggest intrinsic differences in sex-specific prevalence of CRS in different parts of the world. Other studies document that because there is a more female population than males and that women have access to health care services especially in places where there is no health insurance [20-22]. Some authors went on to say that the female predominance is rather due to exposure to jobs, which can easily cause rhinosinusitis, than in men [23]. The increase in the number of male patients rather than the females in this study could be due to the period (2019 to 2020) of this study when there was restriction of movement because of the COVID-19 pandemic.

The age incidence observed in this study is generally similar to the age incidence found in other studies with regards to chronic rhinosinusitis and functional endoscopic sinus surgery. The age range was 18 to 73 with mean

age were 36 years. The more affected was the working class group and they the more at risk of chronic rhinosinusitis. The other group is elderly which was also found in this study at 73 years [24-26]. The reported symptoms of nasal blockage, nasal discharge, anosmia, headache, post-nasal discharge, fetid breath and length of hospital stay during the ESS were used as the outcome measures in this study. Five out of the seven outcome measures used in this work are part of the three major and two minor symptoms of rhinosinusitis classification by the American Academy of Otolaryngology, Head and Neck Surgery (AAO-HNS). See Table 1 for these outcome measures. 90% of all the patients had nasal blockage and headache. Postnasal drip and anterior nasal discharge were 75% of the complaints while 50% of all the patients had anosmia and fetid breath as part of their reported complaint before the endoscopic sinus surgery. As part of the pre-operative assessment before the endoscopic sinus surgery, the most discomforting reported patients' symptoms were identified so as to enable the assessment of the outcome measures for the expected improved quality of life after ESS. This was part of the basis for choosing these seven symptoms in assessing the outcome of FESS in patients with medical resistant chronic rhinosinusitis. These symptoms are also contained in the Sino-Nasal Outcome Test (SNOT-22) adopted by Rhinologyologists [27-29].

The endoscopic findings used in assessing the ESS outcome of patients with the persistent chronic rhinosinusitis that is not responding to medical treatment in this study has also been used by many authors to evaluate the outcome of ESS. They include, presence of nasal polyps and discharge from the middle meatus [28,30]. Pre-operative assessment showed that 40% of all the patients had nasal polyps and purulent discharge from the middle meatus. Polyps usually cause nasal blockage and discomfort (Figure 1). This is one of the commonest indications for ESS [31-33]. The middle meatal discharge also causes an uncomfortable continuous irritating post nasal drip which makes the patient prefers surgery in persistence rhinosinusitis [34,35].

Computerized Tomographic (CT) finding before the ESS showed major factors for diagnosis of CRS as in the guide lines of AAO-HN. 90% of all the patients had nasal polyps and blocked osteomeatal complex. Blockage of the osteomeatal complex usually results to opacification of the maxillary sinuses ethmoidal and sometimes the frontal sinuses. In this case 60% of the patients had maxillary sinus opacity, 40% had opacity of the ethmoidal and frontal sinuses (Figure 1). These CT scan findings are in keeping with other similar studies seen CRS for ESS [36-38].

The indications for FESS in this study were mainly nasal blockage due to nasal polyposis or suspected fungi sinusitis from CT scan findings and clinical endoscopic examination [39]. 90% had nasal obstruction due to nasal polyps while 50% had suspected fungi sinusitis from the CT scan findings (Figure 2). Noninvasive Fungal Rhinosinusitis (FRS) is characterized by sinus opacification with high-density secretions on CT and T2 signal void on MRI [40]. Fungi Sinusitis is one of the major indications for endoscopic sinus surgery. The diagnosis is suspected when there is a hyperdense tissue in the CT scan of the nose or paranasal sinuses without bony erosion there is a need to rule out fungi sinusitis, inverted papiloma and or sinonasal carcinoma. Histology is the diagnosis of choice for nasal obstruction from nasal polyps. 90% of the patients had inflammatory polyps while 10% showed fungi sinusitis in their histology report.

The outcome of the Endoscopic Sinus Surgery after six weeks of the procedure was 100% good and satisfactory. All the presenting symptoms were completely gone. Patient was symptom free from the nose. There was a similar documentation free of symptom in other studies but with different percentages successes. Chakravarti, et al. recorded 83% symptom free at one year follow up [38]. The less than 100% symptoms free could be due to the visual analogue scale which included physical examination findings that was done after one year when disease

recurrence may have taking place. This because if the patient in not isolated from the cause of the sinusitis after FESS it can recure. Other authors with recorded between 83% to 97% symptom free ^[41].

CONCLUSION

The differences in the percentage outcome were concluded by a quote “An abundance of evidence exists supporting the efficacy of ESS to improve long-term Quality of Life (QOL) outcomes in patients with CRS. Both CRS-specific and general QOL improve after ESS to levels considered statistically significant and clinically relevant. Variability in individual patient QOL can in part be explained by demographic factors, medical comorbidities, and histologic inflammatory phenotypes”. Endoscopic sinus surgery gives a satisfactory symptomatic clinical outcome in patients with CRS that is not responding to medical therapy when other medical comorbidities and neoplastic conditions have been ruled out.

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