


Functional Endoscopic Sinus and Nasal Surgeries under Local Anesthesia: Our 15-Year Experience

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ABSTRACT

Introduction: Functional endoscopic sinus surgery (FESS) under local anesthesia (LA) is performed as a day-care procedure as an alternative to general anesthesia (GA).

Aim: This study assesses the outcomes of FESS performed under LA in two tertiary centers over a 15-year period by the main author.

Materials and methods: A retrospective data collection was conducted. All adults who underwent FESS under LA for a 15-year period from 2008 to 2022 in the Department of ENT (ORL-HNS), Dr Kamakshi Memorial Hospital and Prashanth Super Speciality Hospital, Chennai, Tamil Nadu, India, were included in this study. Data and information on preoperative assessment, surgical indications, sinuses operated on, intraoperative findings, postoperative complications, and follow-up were recorded.

Results: A total of 1,600 patients, among which 1,200 who met the inclusion criteria, were added to the study. The most common indications include chronic rhinosinusitis (CRS), nasal polyps, septal correction, turbinoplasty, dacryocystorhinostomy (DCR), and posterior nasal neurectomy. All paranasal sinuses were operated based on the pathology. In all cases, LA was used along with intravenous sedation. The majority of patients (90%) were discharged home the same day.

Conclusion: Functional endoscopic sinus surgery under LA is a safe, cost-effective, and feasible alternative to GA and is well tolerated by patients. Complications of GA can be avoided.

Keywords: Functional endoscopic sinus surgery, Local anesthesia, Nasal, Surgery.

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INTRODUCTION

Functional endoscopic sinus surgery (FESS) is a surgery routinely performed by ENT surgeons under general anesthesia (GA). FESS can also be performed as a day-care procedure under local anesthesia (LA) with sedation. In India, minimal FESS and septal corrections are still operated on under LA.

Data is collected to determine the outcomes of FESS and nasal surgeries performed under LA from 2008 to 2022 (15 years) in the Department of ENT (ORL-HNS), Dr Kamakshi Memorial Hospital and Prashanth Super Speciality Hospital, Chennai, Tamil Nadu, India.

AIM

To evaluate the feasibility of FESS and nasal surgeries under LA in tertiary care centers.

MATERIALS AND METHODS

A retrospective study design of all the patients who had undergone FESS under LA from 2008 to 2022 (15 years) in the Department of ENT (ORL-HNS), Dr Kamakshi Memorial Hospital and Prashanth Super Speciality Hospital, Chennai, Tamil Nadu, India. Patients who had undergone FESS, septoplasty, and nasal surgeries under LA in our centers were included, and incomplete data or those lost to follow-up were excluded. A total of 1,200 patients satisfied the inclusion criteria for the study. Information collected includes patients' age, sex, comorbidities, indications for the proposed surgery, type of surgery, intraoperative duration, postoperative pain score (visual analog score), and postoperative results. Proper operative notes documentation was done for each case, with

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details on the approach to the sinuses that were operated on, total surgical duration, and primary or revision surgery status. All of the surgeries were performed by the main author. Patients' data were analyzed and tabulated.

Patients selected for surgery were assessed a day prior and admitted at 6:00 PM. At 10:00 PM, patients were given alprazolam 0.5 mg, levocetirizine 5 mg, and pantoprazole 40 mg orally. They were then instructed to be nil oral from midnight until the morning of surgery, which mostly occurred between 6:00 AM and 10:00 AM. Most patients were preoperatively prepared with oral prednisolone for 5–7 days. Patients with allergic fungal rhinosinusitis (AFRS)

and fungal cases were administered oral tab prednisolone 20 mg and capsule itraconazole 200 mg per day for 5–15 days, preoperatively. We never pack the nose preoperatively outside the operating room (OR). Packing is done only on the operating table with endoscope guidance. The area around the nose was prepared with Povidone iodine 5% with eyes covered. The head was draped with the eyes covered. Intravenous fentanyl 50 µg was administered, and intravenous continuous administration of dexmedetomidine, depending on the patient's weight, was done until the end of surgery. Dexmedetomidine is an α -2 agonist used for sedation during various procedures for its analgesic and sedative properties. A loading dose of 1.0 µg/kg is followed by a continuous infusion of 0.2–0.7 µg/kg per hour, with the dosage titrated to achieve appropriate sedation goals tailored to the case, providing a low heart rate and hypotensive anesthesia, maintaining a mean arterial pressure range of 65–70 mm Hg.

All patients underwent preanesthesia check and evaluation. Written and informed consent was obtained from the patients to convert to GA if the patient did not co-operate during the procedure under LA with sedation. In all cases, standby anesthesia staff were present as part of monitored anesthesia care while administering fentanyl and dexmedetomidine.

The nasal cavity was anesthetized using roller gauze packs of various sizes soaked with a solution of adrenaline and 4% lidocaine in a 1:1 ratio [10 mL of adrenaline (1:1,000) and 10 mL of 4% lidocaine]. The packing was repeated 3–4 times over 5–10 minutes until a good decongestion effect was achieved. LA was administered as blocks using 0.5% ropivacaine with adrenaline (1:50,000). In all cases, transnasal sphenopalatine ganglion block or transoral greater palatine block were given on either side. Anterior ethmoidal, frontal, infraorbital, and inferior turbinate blocks were also administered depending on the working area. For septoplasty, infiltration on either side of the septum was performed for hydroelevation. Endoscopic sinus surgery, whether unilateral or bilateral, septoplasty, posterior nasal neurectomy, turbinoplasty, and conchoplasty were performed depending on the individual case. To address the collected secretions in the choana and nasopharynx intraoperatively, the patient was instructed to swallow timely to prevent aspiration. Hemostasis was achieved with topical adrenaline and lidocaine packing. We do not pack the nasal cavity

after surgery in all nasal and endoscopic sinus surgeries (ESS). The patients were monitored postoperatively for 6–8 hours and then discharged. Postoperatively, they were prescribed a course of oral β -lactam antibiotics, oral second-generation antihistamines, analgesics if needed, and nasal lavage from the 2nd postoperative day until 3 weeks, postoperatively. Intranasal steroid spray medication was started after the 1st postoperative week. Regular follow-up for endoscopic nasal toileting (to remove crusting and secretion) was scheduled after 2 weeks and subsequently after 2 months.

RESULTS

From 2008 to 2022, 1,600 patients underwent FESS and endonasal surgeries under LA. Retrospectively, data were documented from 1,200 individual cases; 400 patients were excluded from the study due to exclusion criteria or loss to follow-up. Among the included patients, there were 660 males and 540 females (Fig. 1). The majority of patients were in the 31–50 years age-group, comprising approximately 44% of the total. Patients aged 14–30 years accounted for around 35%, and those aged 51–85 years comprised 21%. The youngest patient operated on was a 14-year-old boy, while the oldest was an 85-year-old male, with a mean age of 35.2 ± 14.2 years. Around 73% of patients did not have any coexisting medical comorbidities, while the remaining 27% had known comorbidities such as hypertension (7%), cardiac disease (5%), diabetes mellitus (6%), bronchial asthma (4%), human immunodeficiency virus (HIV) (2%), and obstructive sleep apnea (OSA) (3%) (Fig. 2).

Chronic rhinosinusitis (CRS) without nasal polypsis (Table 1) constituted the majority of cases (55%), followed by CRS with nasal polypsis (15%), AFRS (12%), antrochoanal polyp (10%), deviated nasal septum (DNS) (6%), and other conditions. Around 74% of patients were primary cases undergoing surgery for the first time, while the remaining 26% had a history of previous surgery.

Functional endoscopic sinus surgery, septoplasty, turbinoplasty, posterior nasal neurectomy, conchoplasty, nasal procedures, and dacryocystorhinostomy (DCR) were performed based on the specific disease. The maxillary sinus, ethmoid sinus, sphenoid sinus, and frontal sinus were operated on according to the involved pathological site. The most common site involved was the maxillary sinus, followed by the ethmoids, sphenoid sinus, and frontal sinus.

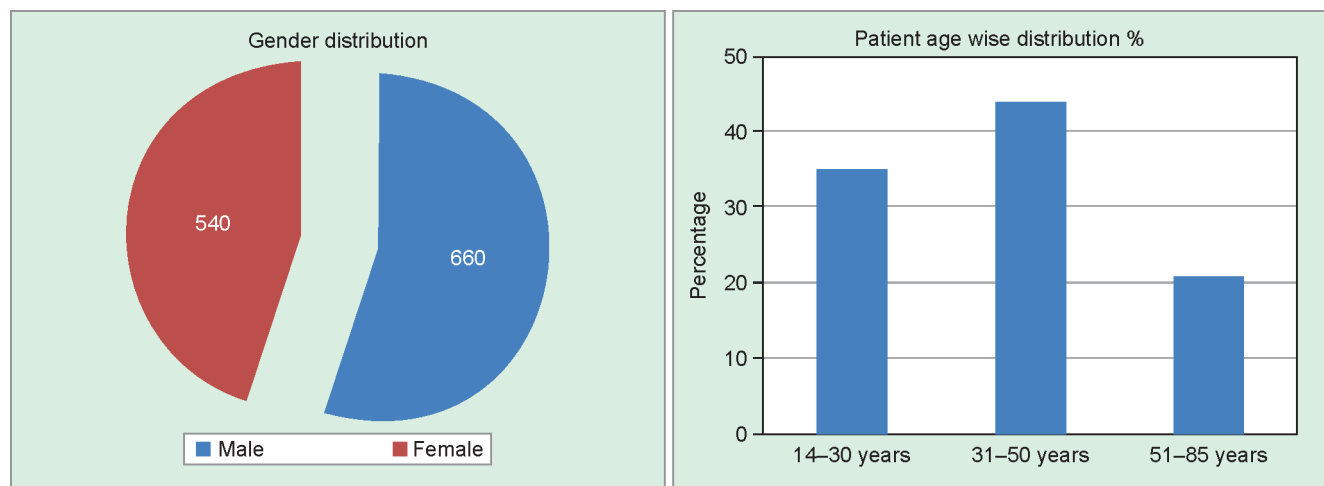


Fig. 1: Gender and age-wise distribution of the patients

Around 35% of patients underwent full-house FESS; 55% underwent bilateral endonasal procedures, and 30% underwent unilateral endonasal procedures. Around 12% underwent septal or turbinate procedures, and 5% underwent nasal procedures under LA. under LA with intravenous fentanyl with dexmedetomidine. The mean duration of FESS surgery was approximately 40 ± 25 minutes, and all surgeries were completed on time. The estimated average intraoperative blood loss was about 10–20 mL. No major intraoperative complications such as cerebrospinal fluid (CSF) leak, intraorbital injury, intranasal bleeding, or vasovagal syncope were encountered. We do not pack the nasal cavity postoperatively for any nasal or sinus surgeries. None of the patients developed postoperative epistaxis or synechia. In total, approximately 88% of our patients were discharged home on the same day, while 12% of long-distance patients were discharged home on the 2nd postoperative day. Around 4% percent of patients developed disease recurrence noted during follow-up, and revision surgery was performed after 6 months to 1 year, postoperatively.

DISCUSSION

Rhinological surgery performed under LA is not a new concept. A survey conducted by the American Rhinologic Society¹ in 2016 among its members showed that 99% of respondents performed day-care surgical procedures. On average, the majority of surgeons performed about 10–20 surgeries in 1 month. Endonasal surgeries gained popularity due to the advancement in surgical techniques and powered instruments which made it safe and adequate removal of pathology.² Newer techniques that can be performed under LA include FESS, septal correction, turbinateplasty, and posterior nasal neurectomy. The common indications for FESS surgery in our center were CRS with or without nasal polyposis, AFRS, antrochoanal polyps, inverted papilloma, sinolith, rhinolith, rhinosporidiosis, nasal allergy, etc. (Table 1). Our study, suggests all paranasal sinuses can be operated on under LA (Table 2). Prickett et al.,³ suggested cost of rhinology day care surgical procedures under LA was about 2.7 times less than the surgery under GA.

Functional endoscopic sinus surgery under LA has the advantage of quicker recovery, improvement of symptoms, and a lower incidence of postoperative epistaxis, nausea, and vomiting compared to GA.^{4,5} Patients who had undergone surgery under

LA were discharged the same day evening, with a shorter duration and stay in the hospital.⁶ Gittelman et al.,⁷ 232 patients, those who underwent rhinology surgeries under LA had low blood loss (~23 mL) compared to those who opted for GA (~58 mL). In our study, the estimated blood loss was about 5–30 mL, which falls between these two estimates. Factors influencing this include proper patient selection and operating on less extensive pathology under LA, resulting in lower intraoperative blood loss compared to patients with more extensive pathology who may experience higher blood loss. In our center, all patients were not packed postoperatively. The preference of surgeons regarding nasal packing may reduce the risk of bleeding postoperatively during pack removal and minimize nasal mucosa damage, which could lead to crusting and synechia formation.⁸

Complications of FESS under LA are significantly reduced because patients are aware of pain if the orbit or skull base is breached during surgery. Additionally, there is typically less or

Table 1: Diagnosis

CRS with nasal polyp	Inverted papilloma
CRS without nasal polyp	Septal angioma
AFRS	Dacryocystitis
Unilateral fungal ball	Rhinolith
Antrochoanal polyp	Sinolith
DNS	Rhinosporidiosis
Nasal allergy	Maxillary hemangioma
Vasomotor rhinitis	Mucocele
Epistaxis	Miscellaneous

Table 2: Surgeries done

Unilateral FESS	DCR
Bilateral FESS	Endoscopic Reverse Denker's
Septoplasty with postnasal neurectomy	Rhinolith removal
Turbinateplasty	Sphenopalatine artery (SPA) ligation
Conchoplasty	Miscellaneous
Rhinolith removal	

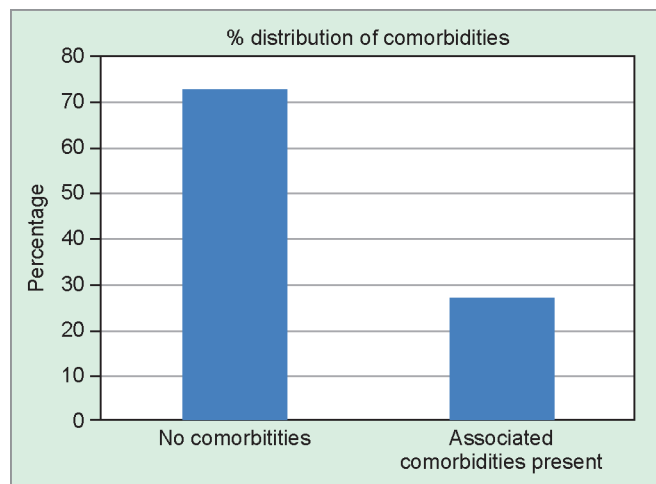
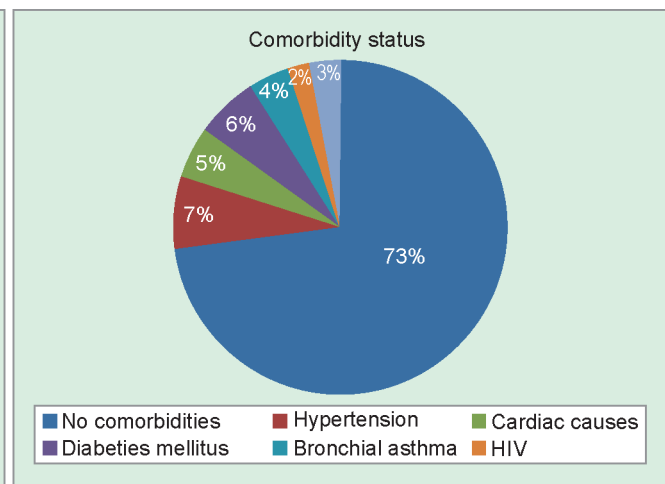


Fig. 2: Comorbidities status among patient



no bleeding during LA, and the good decongestant pack ensures clear delineation of anatomy during surgery. Over the past 15 years of this study, we have never encountered any intraoperative complications under LA. The postoperative infection rate was nil in our study, and none of the patients experienced aspiration or a vasovagal attack.⁹ Complication rates are minimized by proper evaluation and assessment of the patient's anxiety, ensuring adequate pain control with effective intravenous sedation and analgesia, and performing precise LA blocks with skilled surgical techniques.

Patient factors are crucial in determining the suitability for performing FESS under LA. The senior author suggests that currently, there are no universally accepted algorithms or assessment methods to determine whether a patient is suitable for FESS under LA. Proper counseling and explanation about the surgery under LA are of paramount importance. If the patient cannot tolerate the surgical procedure under LA, then for convenience and safety, it would be appropriate to operate under GA. Under LA, any sudden movement by the patients can have adverse outcome. Underlying medical illnesses, anxiety, and disease severity should also be considered prior to deciding whether to operate under LA or GA. The extent of FESS and nasal surgeries under LA is specific to the pathological site, the degree of involvement of the disease, and the patient's age.¹⁰

CONCLUSION

Functional endoscopic sinus surgery under LA is safe, cost-effective, and a viable alternative to GA. The scope of day-care rhinology and sinus procedures has the potential to grow with newer intravenous sedation, LA, local block techniques, and the use of the shaver (microdebrider) system.

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