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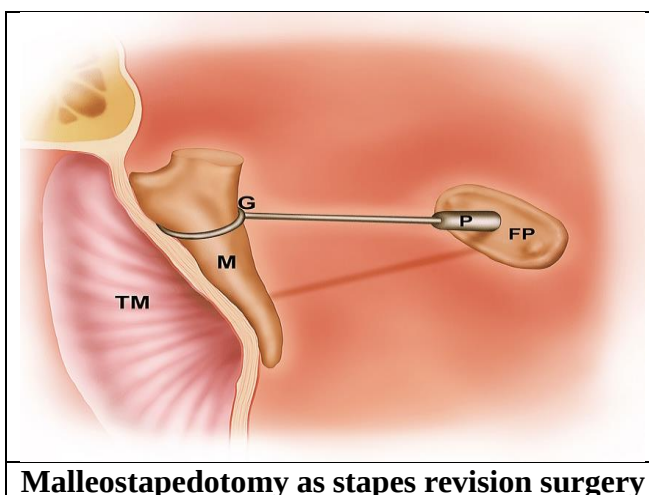
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Medical Team, Micro Labs

Evaluation and comparison of the surgical outcomes of endoscopic malleostapedotomy and endoscopic incudostapedotomy

Introduction: Stapes surgery is an effective treatment for conductive or mixed hearing loss caused by stapes footplate fixation, which is typically seen in otosclerosis and congenital stapes ankylosis. Incudostapedotomy is the normal procedure used when the stapes are repaired and there are no additional ossicular abnormalities. Malleostapedotomy, which secures the prosthesis to the malleus, must be used under these unfavorable circumstances.¹ There were significant progress has been made in stapes surgery trends, especially with the use of endoscopic techniques.² Several studies provide insight into the surgical outcomes of endoscopic stapes surgery, analyzing aspects such as surgical field visibility, operation time, surgeon learning curve, and patient outcomes. Even though malleostapedotomy can be performed totally with an endoscope, the majority of the investigation on endoscopic stapes surgery was restricted to traditional incudostapedotomy. Furthermore, no research has examined the differences in surgical results between endoscopic incudostapedotomy (EIS) and endoscopic malleostapedotomy (EMS).¹ So, this study assessed and compared the surgical results of endoscopic incudostapedotomy (ECID) and endoscopic malleostapedotomy (EMS).



Methods: In this retrospective study, 33 patients who had stapes surgery utilizing either EIS (EIS group) or EMS (EMS group) with their 36 consecutive ears were analyzed. Patient demographics, clinical characteristics, etiology, surgery length, hearing results, and complications such as dizziness, chorda tympani damage, and sensorineural hearing loss were all assessed. Pure-tone audiometry was used to test hearing function. The two groups were compared with respect to operational practicability across surgical phases, postoperative hearing, operation time, changing of strategy, and complications.

Results: The EMS and EIS groups had seven (19.4%) and 29 ears (80.6%), respectively. For both anchoring site exposure (42.9%) and fastening the prosthesis (100%), the EMS group had a higher proportion of moderate practicability than the EIS group (41.4%). The groups' postoperative hearing gains were similar, with EMS obtaining a mean air-bone gap improvement of 28.8 dB and EIS of 23.2 dB. Table 1 demonstrated that the ABG closure rates within 10 dB and 20 dB for the EMS group were 28.6% and 100%, respectively, and did not exhibit a statistically significant difference from the EIS group ($p = 0.103$). On the other hand, EMS surgeries took an extra 77.4 minutes on average. Both groups' rate of complications (EMS 14.3%, EIS 10.3%, $p = 1.000$) were similar.

	EMS group	EIS group	p-Value
Post op BC, mean (SD), dB	15.5 (5.1)	18.4 (12.5)	.984
Post op AC, mean (SD), dB	26.3 (9.1)	26.0 (12.8)	.534
Post op ABG, mean (SD), dB	10.7 (5.0)	7.5 (5.7)	.186
ABG improvement, mean (SD), dB	28.8 (6.9)	23.2 (9.0)	.105
ABG closure			.103
ABG within 10 dB, No. (%)	2 (28.6)	19 (65.5)	
ABG within 20 dB, No. (%)	7 (100)	29 (100)	
Operation time, mean (SD), min	201.4 (32.0)	124.0 (36.7)	< .001 ^a
Complication, No. (%)	1 (14.3)	3 (10.3)	1.000
Dizziness	0 (0)	1 (3.4)	
CTN injury	1 (14.3)	2 (6.9)	
SNHL	0 (0)	0 (0)	

Abbreviations: ABG, air bone gap; AC, air conduction; BC, bone conduction; CTN, chorda tympani nerve; SNHL, sensorineural hearing loss.
^a $p < .05$ between the two groups for a given parameter.

Table 1: Postoperative hearing outcomes, duration of operation, and complications compared between the EIS and EMS groups

Discussion: The results of this study were consistent with Iannella G et al., which demonstrated the viability of EMS in all but one patient with a postoperative ABG of less than 20 dB. After stapes surgery for otosclerosis, patients still have persistent conductive hearing loss.³ In comparison, class II congenital middle ear abnormalities were present in more than half of the study's EMS patients.¹

Conclusion: The current study concluded that surgical outcomes were similar for both EMS and EIS. As a result, the endoscopic technique appears to be a viable surgical substitute for microscopic malleostapedotomy, just as it has been used successfully for classical incudostapedotomy.

Endoscopic surgeries have the potential to establish malleostapedotomy as a surgical option, similar to traditional incudostapedotomy.

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Correlation between a tube in the upper airways and children's susceptibility to sinusitis

Introduction: Sinusitis is an inflammation of the mucosal lining of one or more paranasal sinuses. Clinical symptoms can be classified as acute (<30 days), subacute (30–90 days), or chronic (>90 days).¹ The endotracheal (ET) route remains the primary intubation method for both adults and children. Conversely, nasotracheal (NT) intubation is less prevalent; in adults and children, it makes up only 4% and 5.6% of advanced airway treatments, respectively. One major risk factor for nosocomial sinusitis, which can cause sepsis in critically ill individuals has been found to be the use of ET and NT tubes. Children may be more susceptible to sinusitis than adults due to smaller airways and structural changes.² Patients with an advanced airway usually get their nutrition through nasogastric (NG) or orogastric tubes, however there isn't much evidence linking these tubes to pediatric sinusitis. So, this study investigated whether NG or ET tubes could help PICU patients develop sinusitis.

Methods: This retrospective analysis included 65 patients and 162 pictures, 101 of which were computed tomography (CT) and 61 magnetic resonance imaging (MRI). A pediatric neuroradiologist performed radiological re-evaluations on children who had at least two cranial scans for this investigation. Radiological images were assessed for signs of sinusitis and nasopharyngeal (NF) secretions and for the presence of nasogastric (NG) and endotracheal (ET) tubes, respectively. The time intervals between the images were also noted.

Results: The sinusitis occurrence increased significantly ($p = 0.039$) between the first (43.3%) and second (66.6%) images. It was discovered that 2.5 days was the cut-off point for sinusitis onset [area under the curve: 0.50, 95% confidence interval (CI): 0.355-0.646]. The incidence of sinusitis or the development of NF secretion did not differ significantly between single and double tubes ($p = 0.389$). Additionally, there was no significant relationship between sinusitis and the existence of an ET or NG tube. However, 84% of images with an NG tube ($p = 0.003$) and 52% of images with an ET tube ($p = 0.004$) had NF secretions (Figure 1).

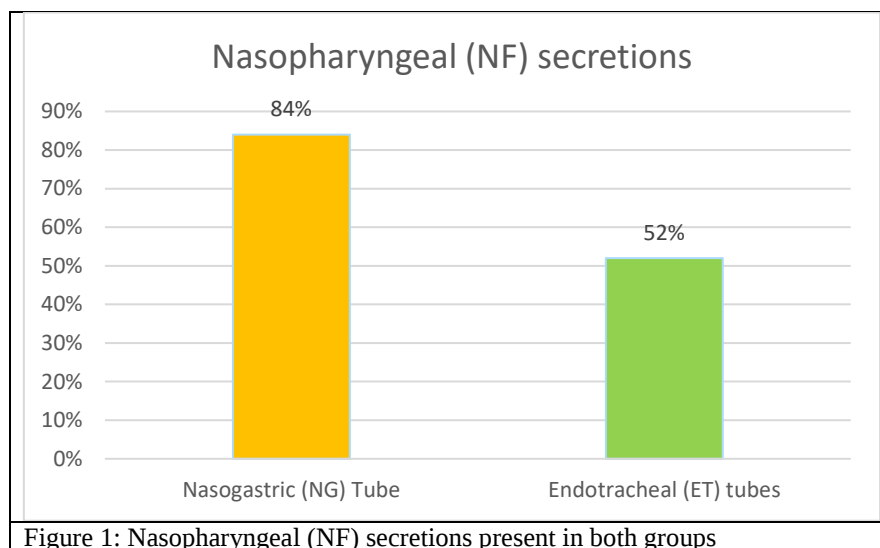


Figure 1: Nasopharyngeal (NF) secretions present in both groups

Discussion: This retrospective investigation revealed a significant association between NG and ET tubes and increased nasopharyngeal secretions, which may raise the risk of sinusitis in children in critical condition. In PICU patients undergoing cranial imaging for whatever reason, sinusitis was quite prevalent (46%), and its frequency increased by 30% over time. Sinusitis and higher secretions were linked to NG and ET tubes.² According to Metheny NA et al., patients with an ET tube had a 41% higher incidence of sinusitis compared to those with only an NG tube, and patients with both tubes had a 200% higher risk.³

Conclusion: This study concluded that insertion of NG and ET tubes, separately or in combination, clearly causes nasopharyngeal secretions to build up, which significantly delays clearance and causes critically sick children at risk for sinusitis. It was important to take this risk into account while caring for critically ill children who have these tubes because it rises gradually over time.

Higher nasopharyngeal secretions were significantly linked to both endotracheal (ET) and nasopharyngeal (NF) tubes, which may raise the risk of sinusitis in critically ill children.

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Effects of pharyngeal packing on antral cross-sectional area, gastric volume and post-operative complications

Introduction: The nasal cavity and paranasal sinuses have well-vascularized mucosa, which can cause significant bleeding during nasal surgery. Aspiration risk and the frequency of postoperative nausea and vomiting may rise if the blood's flow into the digestive system is not stopped. Pharyngeal packing is a common physical barrier used in nasal surgery to prevent blood intake.¹ Swallowing blood can cause nausea and vomiting during pharyngeal, orthognathic, and nasal operations in particular. To lessen the quantity of blood swallowed and avoid ingesting foreign objects like teeth, broken bone fragments, and tiny surgical instruments, "pharyngeal packs" are utilized.² In order to determine the risk of aspiration during surgery, ultrasound scanning was performed to measure the volume and content of the stomach. Gastric ultrasonography would provide information regarding the change in gastric volume brought on by blood ingestion if pharyngeal packing serves as a barrier to protect the aerodigestive tract.¹ So, this study was to explore the effects of pharyngeal packing on antral cross-sectional area, stomach volume, and post-operative problems.

Methods: In this prospective study, 180 patients were divided randomly to either the control group or the pharyngeal packing group. Demographic information, post-operative nausea and vomiting risk, surgery type and duration, and suctioned blood volume were collected. Ultrasound scanning was used to measure the size of the stomach antral. Post-operative nausea, vomiting, and sore throat were noted, along with their intensity. Patients were monitored to assess the occurrence and intensity of postoperative nausea, vomiting, and sore throat. Following surgery, data were collected in the post-anesthesia care unit after two hours and on the ward after twenty-four hours.

Results: Compared to the control group, the pharyngeal packing group had greater postoperative antral cross-sectional area and gastric capacity (Figure 1). There was a considerable decrease in the frequency and intensity of postoperative nausea and vomiting in the group who had pharyngeal packing. The control group in the ward experienced more frequent and severe sore throats. In contrast, functional endoscopic sinus surgery, septorhinoplasty, absence of pharyngeal packing, and lower physical status as defined by the American Society of Anesthesiologists were associated with post-operative nausea and vomiting within the ward. Post-operative nausea and vomiting within the first two hours after surgery were linked to an increased Apfel simplified risk score and post-operative antral cross-sectional area.

Discussion: In this study, the pharyngeal packing group's post-operative antral cross-sectional area and gastric capacity were considerably higher than those of the control group. Postoperative assessments of gastric volume, estimated antral cross-sectional area, cranio-caudal diameter, and anteroposterior diameter were considerably higher in both groups than pre-operative values.¹ Similar findings were found in the Temel ME et al., which indicated that the pharyngeal packing group and control groups had greater postoperative antero-posterior (AP) and cranio-caudal (CC) antral diameters as well as antero-sectional area (ACSA) than preoperatively.³

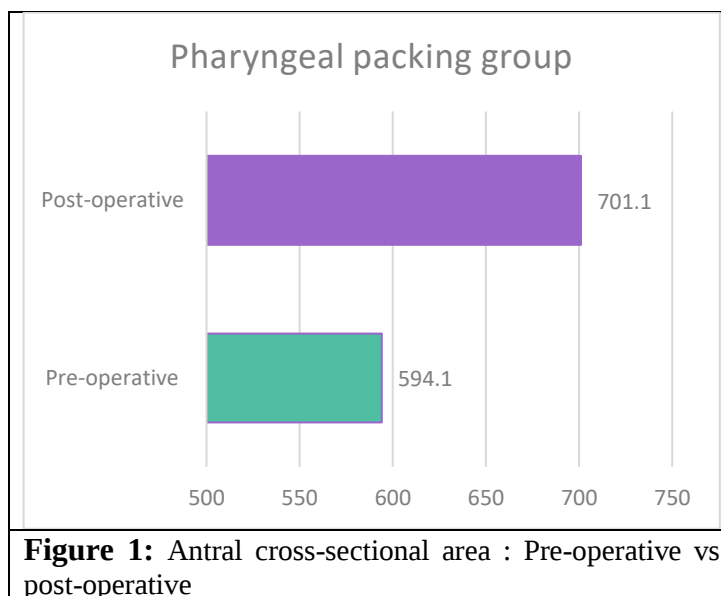


Figure 1: Antral cross-sectional area : Pre-operative vs post-operative

Conclusion: This study concluded that gastric ultrasound imaging revealed that gastric antral cross-sectional area and volume increase with blood hemorrhage during nasal surgical procedures. Pharyngeal packing lowered gastric volume and type of operation, and this was linked to a decrease in the frequency and intensity of postoperative nausea and vomiting as well as a lower incidence of sore throat.

Pharyngeal packing should be used in patients undergoing functional endoscopic sinus surgery or septorhinoplasty, as well as in those with low physical status and a high risk score.

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Case report on basilar artery infarction in allergic fungal rhinosinusitis

Introduction: Allergic fungal rhinosinusitis (AFRS) is a unique subtype of non-invasive chronic sinusitis caused by a localized allergic reaction to non-invasive fungal growth. The pathogenesis of AFRS was consistent with fungal colonization-induced, long-lasting, high-intensity T-helper type 2 allergic inflammation. Thick inspissated mucus and a large number of degranulating eosinophils were seen in the sinus cavities. Interleukin-5 and Interleukin-13, cytokines generated from T-helper type 2, fight the fungal hyphae in the mucus and were involved in localized eosinophilic buildup. There are many different types of fungi that have been documented in the literature to cause AFRS; the most frequently reported ones include *Aspergillus*, *Bipolaris*, *Curvularia*, *Exserohilum*, and *Drechslera* species.¹ Further, AFRS affects around 1-2% of the global population and it was diagnosed in immunocompetent patients with persistent rhinosinusitis symptoms and meeting the Bent and Khun criteria: 1. Nasal polyposis; 2. Type I hypersensitivity; 3. distinct features on computed tomography (CT); 4. eosinophilic mucin without invasion; and 5. positive fungal stain. Histopathological analysis was required for a conclusive diagnosis of invasive fungal sinusitis. Also, the fungal vascular invasion of the paranasal sinus mucosa results in necrosis, thrombosis, and infarction, ultimately causing tissue loss.² This case presented an immunocompetent male patient who had untreated chronic AFRS that was made worse by a basilar artery infarction as a result of the disease's compressive effect from an enlarged sphenoid sinus.

Case presentation: A 48-year-old male patient was admitted to the emergency room with a history of untreated chronic rhinosinusitis, a subjective fever linked with a decreasing level of consciousness, and a worsening headache. The emergency computed tomography (CT) scan of the brain was conducted as the patient's state of consciousness worsened, and the results showed a dense basilar artery, expansion and remodelling of all paranasal sinuses, and pan-opacification of all sinuses (Figure 1). Sinusitis and basilar artery thrombosis were found during a brain CT scan that was performed after consulting the ENT team. Following this, time-of-flight (TOF) magnetic resonance angiography of the cerebral arteries and dedicated magnetic resonance imaging of the brain were carried out, which verified the existence of basilar artery occlusion and the ensuing acute pontine infarction. The patient had emergency endoscopic sinus surgery on both sides.

All sinuses had mucus and fungal material (mud) inside them during surgery, and there had been significant bone remodelling and expansion—particularly in the sphenoid sinus—without any tissue necrosis (Figure 2). In order to verify the diagnosis, intraoperatively collected tissue specimens (mucosa and bone). Following surgery, the patient was intubated, placed on mechanical ventilation, and admitted to the intensive care unit. The patient's preoperative total IgE level was extremely high (6350 IU/ml). The histopathology report showed the rare discovery of necrotic cellular debris mixed with large cells (granuloma) as well as eosinophilic inflammatory cells with mucin and Charcot Leyden crystals and fungal hyphae without vascular and body invasion. A species of *Aspergillus* was produced by the tissue culture. Based on these results, the patient was diagnosed with AFRS.

A local intranasal steroid and amphotericin B were given concurrently to the patient to treat his allergic fungal sinusitis condition about a month after surgery, given the patient's significant morbidity and the histopathological findings of granuloma, a sign of invasion. In addition, to treat basilar artery thrombosis, the patient received a thrombolytic drug. The patient died within a month due to intraventricular and moderate subarachnoid hemorrhage, which was remarkable for acute hydrocephalus.

Discussion: Allergic fungal rhinosinusitis is a severe condition with devastating implications. Because the orbit was frequently affected due to its closeness to the sinuses, patients may have visual abnormalities or even blindness. Therefore, any delay in diagnosis could cause irreversible harm, necessitating immediate multidisciplinary management. In order to enhance the prognosis and visual results, quick surgical intervention was advised.¹ The identification

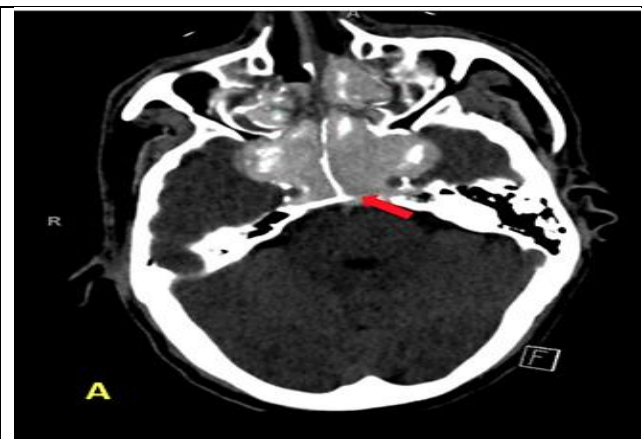


Figure 1: The unenhanced axial CT brain showing maxillary antra with sinus wall destruction and infiltration into the bilateral cavernous sinus and pre-pontine cistern, as well as complete hyper-attenuating soft tissue opacification of the enlarged sphenoid and ethmoid sinuses. A red arrow on a dense basilar artery indicates thrombosis.

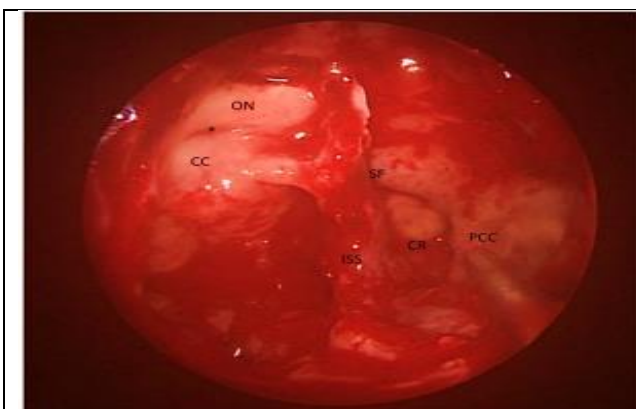


Figure 2: An intraoperative endoscopic image displaying the substantially enlarged sphenoid sinus together with indentations from the surrounding structures.

and treatment of fungal sinusitis caused by allergies constitute an ongoing clinical health issue. A CT scan was necessary to diagnose AFRS. Recurrences can be prevented by thorough surgical debridement and prolonged systemic and local steroid therapy.³

Conclusion: Chronic allergic fungal rhinosinusitis requires long-term follow-up because of its high recurrence rate and significant morbidity. Preoperative diagnosis and care were essential for AFRS, even though there were no widely recognized therapy guidelines for the condition.

Surgery is the primary treatment for allergic fungal rhinosinusitis, followed by long-term maintenance therapy that involves periodic sinus irrigation with local steroids to minimize mucus impaction.

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