



ORIGINAL RESEARCH PAPER

Otorhinolaryngology

A STUDY OF ROLE OF INFERIOR TURBINECTOMY IN TUBOTYMPANIC EAR DISEASE.

KEY WORDS: CSOM, Graft Uptake, Middle Ear, Turbinatectomy, Tympanoplasty.

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ABSTRACT	Background: Chronic suppurative otitis media is the most faced otological condition by Otorhinolaryngologists. It presents mostly with ear discharge and decreased hearing. It can be managed conservatively or with or without surgery. Objective: To study the role of inferior turbinatectomy in tubotympanic ear disease. Materials and Methods: This prospective study was carried out at the tertiary care center, Gujarat, India during May 2022 to February 2024. Study included 60 confirmed cases of unilateral/bilateral CSOM at the study setting area. Cases were randomly divided into two groups. Equal (30) number of patients underwent turbinatectomy + tympanoplasty (group 1) remaining other (30) patients underwent tympanoplasty (group 2). Results: Mean age in our study was 28year. The maximum number of patients belong to 18–30 years of age group. Nasal obstruction is a commonly associated symptom in patients with recurrent ear discharge. Symptoms like headache and nasal discharge are more common in patients with group-1 than group-2. Patients had mainly complaint of intermittent ear discharge and nasal obstruction. Normal ET function found in both group-1and group-2 were 25 (83.3%) and 22 (73.3%) respectively, While poor ET function in 05 (16.6%) and 08 (26.6%) respectively (p>0.05). Graft uptake rate in 90% cases of group 1 and 83.3% in group 2. Conclusion: Tympanoplasty is a beneficial procedure for the correction of the disease from the middle ear and hearing improvement. Bilateral inferior turbinatectomy when performed in patients with history of ear discharge causes improvement in eustachian function which leads to good surgical outcome. Therefore, it is recommended that preoperative evaluations of nasal symptoms and eustachian tube function should be routinely conducted before any middle ear surgery.
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INTRODUCTION
 In the gamut of otitis media, Chronic otitis media is serious as it causes persistent inflammation of mucosa in the middle ear and mastoid cavity and leads to some form of irreversible pathologic condition in the middle ear such as granulation tissue, ossicular changes, tympanosclerosis, tympanic membrane perforation and cholesteatoma¹. Chronic otitis media is classified as a tubotympanic disease characterized by persistent discharge from middle ear through presence of a central perforation in tympanic membrane. Atticoantral type of otitis media disease is characterized by the presence of attic retraction pocket, marginal perforation with or without cholesteatoma². The main functions of Eustachian tube are middle ear ventilation, clearance, mechanical and immunological defense.³

The leading causes of inferior turbinate hypertrophy are allergic rhinitis, vasomotor rhinitis, and compensatory hypertrophy due to septal deviation⁴. Treatment options for an enlarged turbinate include medication, injections, and freezing. When medical therapy fails, turbinate reduction surgery is commonly performed^{5,6}. After surgery, the nasal obstruction component decreases, and breathing improves. The eustachian tube functions better as a result of less nasal obstruction, which also improves middle ear ventilation.⁷

Medical treatments such as antihistamines, topical decongestants, and topical corticosteroids are commonly used to treat these conditions, principally to reduce nasal obstruction and restore comfortable nasal breathing. However, not all patients may respond to these medications. There might be slight improvement, or in some cases, there is no response at all, and they end up experiencing persistent

nasal block⁸. Surgical reduction of the inferior turbinate is warranted to relieve the nasal block caused by the hypertrophied inferior turbinate. Surgical reduction of the inferior turbinate involves removal of the mucosa, soft erectile tissue, and turbinate bone. Operative techniques to reduce the size of the inferior turbinate have been practiced since 1845. On functional failure of the ET leads to increased negative middle ear pressure. That can cause atelectasis of the tympanic membrane, retraction pocket in attic or posterior-superior quadrant, Adhesive otitis media and sometimes perforation of tympanic membrane.⁹

Chronic suppurative otitis media is the most faced otological condition by Otorhinolaryngologists. It presents mostly with ear discharge and decreased hearing. It can be managed conservatively or with or without surgery. Medical management of CSOM includes use of antibiotics and decongestants with symptomatic treatment of associated complaints. Tympanoplasty is the established surgery for tympanic membrane perforation routinely carried out by otolaryngologists. Most commonly used graft material for tympanoplasty is temporalis fascia. Other graft materials used are fascia lata, tragal perichondrium, tragal cartilage, fat^{10,11}. So, the present study was conducted with the objective to study the role of inferior turbinatectomy in tubotympanic ear disease.

MATERIALS AND METHODS
Study Setting and Design: This prospective study was carried out at the tertiary care center, Gujarat, India during May 2022 to February 2024 after ethical permission of Institutional Ethical committee.
Study Population: Study included 60 confirmed cases of

unilateral/bilateral CSOM at the study setting area. Cases were randomly divided into two groups. Equal (30) number of patients underwent turbinectomy + tympanoplasty remaining other (30) patients underwent tympanoplasty.

Inclusion Criteria: Patients having unilateral/Bilateral CSOM, patients of either sex with age group between 18 - 60 years, patients willing to give written informed consent, continuous tubotympanic ear discharge not responding to medication.

Exclusion Criteria: Patients having atticotranal CSOM, tubotympanic CSOM with sensorineural hearing loss, patients < 18 years and >60 years, congenital hearing disorder, previous history of ear surgery.

Data Collection: In the beginning, purpose of the study was explained to the subjects in their local language and the investigator took written informed consent from eligible candidates who agreed to participate. Patient details were incorporated on basis of the proforma thereby including chief complaints, past history of comorbidities, treatment history, general physical and systemic examination, detailed investigations have been done. All cases were subjected to routine preanesthetic checkup. A proforma was prepared for all the cases, findings were noted and treatment and follow up was charted. After clinical examination was over, routine blood investigations followed by fitness of anaesthesia were carried out. Nasal endoscopy performed. All patients underwent Pure tone audiometry (PTA) and X-ray mastoids. Surgery was carried out under local anaesthesia with sedation in majority patients while few were under general anaesthesia.

Data Entry & Analysis: The data were recorded in an Excel sheet and descriptive analysis was performed, of which data are presented in the tables. To know the association between dependent and independent variables chi-square was applied accordingly. P value less than 0.05 was considered as statistically significant.

RESULTS

In the present study total 60 numbers of patients included(n=60). 30 patients were randomly divided in each group: Group-1: Inferior Turbinectomy+ Tympanoplasty (n=30). Group-2:Tympanoplasty (n=30).

Table 1 shows that 60%, 16.6%, 23.3% study participants of group 1 and 53.3%,26.6%,20.0% of group 2 were belonged to age group 18-30, 31-50, 51-60 years respectively. Almost 46.7% & 53.3% study participants of group 1 and 43.3% & 56.7% of group 2 were male and female respectively. Symptoms like Ear Discharge, Hearing Loss, Nasal Blockage, Nasal Discharge, Headache were noted in 100%, 73.3%, 66.6%,60.0%, 40.0% study participants of group 1 and 100%, 80.0%,53.3%,40.0%,30.0% of group 2 respectively.

Table 1: Socio-clinical Characteristics of Study Participants [N=60]

Parameter	Group 1		Group 2	
	Number	%	Number	%
Age				
18-30	18	60	16	53.3
31-50	05	16.6	08	26.6
51-60	07	23.3	06	20.0
Gender				
Male	14	46.7	13	43.3
Female	16	53.3	17	56.7
Symptoms				
Ear Discharge	30	100	30	100
Hearing Loss	22	73.3	24	80.0
Nasal Blockage	20	66.6	16	53.3
Nasal Discharge	18	60.0	12	40.0
Headache	12	40.0	09	30.0

Table 2 shows that 83.3% & 16.6% study participants of group 1 and 73.3% & 26.6% of group 2 noted with normal and poor ET function respectively. Graft uptake rate noted in group 1 & 2 was 90% & 83.3% respectively. Post-op complications like Synechiae & Residual perforations noted in 6.7% & 10% study participants of group 1 and 0% & 16.6% of group 2 respectively.

Table 2: Comparison of Efficacy Indicators of Inferior Turbinectomy + Tympanoplasty and Tympanoplasty [N=60]

Parameter	Group 1		Group 2	
	Number	%	Number	%
ET Function				
Leaking	25	83.3	22	73.3
Poor	05	16.6	08	26.6
Graft Uptake Rate	27	90.0	25	83.3
Post-op Complication				
Synechiae	02	6.7	0	0.0
Residual perforations	03	10	05	16.6

Table 3 shows that 7(23.3%), 9(30%), 8(26.6%), 4(13.3%), 2(6.6%) study participants of group 1 and 9(30%), 6(20%), 8(26.6%), 4(13.3%), 3(10%) of group 2 noted with pre-operative hearing loss 30-35, 35-40, 40-45, 45-50, >50 dB respectively. Almost 4(13.3%),5(16.6%),8(26.6%),5(16.6%), 3(10%), 3(10%), 2(6.6%) study participants of group 1 and 1(3.3%), 2(6.6%), 6(20%), 8(26.6%), 7(23.3%), 4(13.3%), 2(6.6%) of group 2 noted with post-operative hearing loss 20-25,25-30,30-35,35-40, 40-45,45-50,>50 dB respectively.

Table 3: Comparison of Pre-op and Post-op Air Bone Gap Among Study Participants [N=60]

Air Bone Gap (in dB)	Group 1		Group 2	
	Pre-op	Post-op	Pre-op	Post-op
20-25	-	4(13.3%)	-	1(3.3%)
25-30	-	5(16.6%)	-	2(6.6%)
30-35	7(23.3%)	8(26.6%)	9(30%)	6(20%)
35-40	9(30%)	5(16.6%)	6(20%)	8(26.6%)
40-45	8(26.6%)	3(10%)	8(26.6%)	7(23.3%)
45-50	4(13.3%)	3(10%)	4(13.3%)	4(13.3%)
>50	2(6.6%)	2(6.6%)	3(10%)	2(6.6%)

DISCUSSION

In the present study total 60 numbers of patients included(n=60). 30 patients were randomly divided in each group: Group-1: Inferior Turbinectomy+ Tympanoplasty (n=30). Group-2:Tympanoplasty (n=30).

Mean age in our study was 28year. The maximum number of patients belong to 18–30 years of age group. In this study patients were selected irrespective of their gender. Out of the 60 patients, 33 were female and 27 were male, indicating increased female preponderance. All the patients presented with either unilateral or bilateral intermittent ear discharge. We have observed that nasal obstruction is a commonly associated symptom in patients with recurrent ear discharge. Symptoms like headache and nasal discharge are more common in patients with group-1 than group-2. Patients had mainly complaint of intermittent ear discharge and nasal obstruction. Some patients had associated complain of nasal discharge and headache. After inferior turbinectomy maximum improvement seen in symptoms of nasal blockage and nasal discharge which were about 60% and 53.3% respectively. Thus, due to the improvement in eustachian tube function secondary to inferior turbinectomy, the ventilation pathway of nose, eustachian tube and middle ear is enhanced leading to a relatively dry ear (53.3%). Present study observed nasal blockage in 60% cases and study done by Martinez SA et al¹² noted in 63% cases which is correlate with the present study.

Normal ET function found in both group-1and group-2 were 25 (83.3%) and 22 (73.3%) respectively, While poor ET

function in 05 (16.6%) and 08 (26.6%) respectively ($p>0.05$). On comparison, result of tympanoplasty in respect of graft uptake, it was analysed that patients with tympanoplasty + inferior turbinectomy had a better surgical outcome due to improvement of eustachian tube (ET) function after inferior turbinectomy. As per above chart no significant difference were seen in post operative complications with both groups. Residual perforation and synechia are two main complications seen. Patients with residual perforation were advice revision surgery. Synechia were noticed in 2 patients of group 1.

Present study observed the graft uptake rate in 90% cases of group 1 where study done by Cohn AM et al¹³ & Hemalatha P et al¹⁴ in 95% & 96% cases respectively which is comparable with the present study. Present study observed the graft uptake rate in 83.3% cases of group 2 where study done by Odat H et al¹⁵ & Salvador P et al¹⁶ in 95% & 85% cases respectively which is comparable with the present study.

Preoperatively, the hearing loss widely distributed across various intensity. Table 3 shows that in group-1, 30% of patients had hearing loss of 35-40db, 26.6% patients had hearing loss of 40-45db, 23% had hearing loss of 30-35db. In group-2, 30% had hearing loss of 30-35db, 20% had hearing loss of 35-40db, 27% had hearing loss of 40-45db. It was concluded that, after successful tympanoplasty improvement of average airborne gap in each frequency is around 10-20db.

COCNLUSION

Tympanoplasty is a beneficial procedure for the correction of the disease from the middle ear and hearing improvement. Bilateral inferior turbinectomy when performed in patients with history of ear discharge causes improvement in eustachian function which leads to good surgical outcome. Therefore, it is recommended that preoperative evaluations of nasal symptoms and eustachian tube function should be routinely conducted before any middle ear surgery.

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Conflict of Interest: None declared

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