



Evaluate the role and outcome of septoplasty in tubotympanic diseases –A randomized comparative study

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ABSTRACT

Introduction: persistent otitis media is classified as a tubotympanic disease and is characterized by vital perforation. Eustachian tube is the major focus in middle ear disease. Pathological results in the nose or the nasopharynx are moreover responsible for insufficient tubal function.

Objective: To evaluate the outcomes of septoplasty followed by myringoplasty and myringoplasty without septoplasty in patients with tubotympanic diseases in terms of Graft uptake, audiological outcome and late complications.

Materials and Methods: The study was conducted in the Department of Otorhinolaryngology GEMS, Ragolu, Srikakulam for a period of one year. A total of 52 patients who were suffering from tubotympanic diseases were treated with myringoplasty for the treatment of chronic suppurative Otitis Media. The patients were randomly divided in two groups of 26 each and were either treated with myringoplasty alone or septoplasty followed by myringoplasty after 6 weeks.

Results: The graft take up was 84.5% in septoplasty preceding myringoplasty and 80.7% in myringoplasty group. During our study success rate was found to be 84.6% in septoplasty preceding myringoplasty and Air bone gap was reduced to <20db in 92.3% of cases. In current study there was neither worsening of existing conductive hearing loss or development of fresh sensorineural hearing loss subsequent to surgical procedure.

Keywords: *Otitis Media, Myringoplasty, septoplasty. Hearing Improvement, audiology, Tubotympanic, Eustachian tube.*

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INTRODUCTION

In the range of otitis media, persistent otitis media is severe because it causes chronic inflammation of mucosa in the central ear and mastoid cavity in addition to some form of permanent pathologic condition in the middle ear such as granulation tissue, ossicular changes, tympanosclerosis, tympanic membrane tear and cholesteatoma.¹ Persistent otitis media is classified as a tubotympanic disease characterized by persistent discharge from middle ear through occurrence of a inner tear in tympanic membrane. Atticoantral type of otitis media disease is characterized by the presence of attic retraction pocket, marginal perforation with or without cholesteatoma.² The major functions of Eustachian tube are middle ear ventilation, clearance, mechanical and immunological defense.³ Eustachian tube also facilitates communication of the middle ear with the nasopharynx, nasal cavity, and ultimately with paranasal sinuses and dysfunction of ET leads to persistent otitis media.⁴ The thickness of Eustachian tube is with reference to 3mm and its distance end to end in adults is about 36 mm, and is separated into 2 portions, a bony portion which forms the cross third and is concerning 12 mm and a fibro cartilaginous component which forms the medial two-thirds. The Eustachian tube in human ear is heading for downward, forward, and medially as of the middle ear. The tube opens into nasopharynx with reference to 1.25 cm at the rear and somewhat underneath the posterior end of the inferior turbinate.⁵

The fibro cartilaginous component of Eustachian tube which opens into nasopharynx drains the secretions from the middle ear during mucociliary transport (MCT) system and the common cavity of the Eustachian tube prevents the aspiration of transferable secretions from the rhino pharynx keen on middle ear cavity.⁶ The tear due to persistent otitis media heals impulsively in majority of cases. Surgical closure is necessary if the perforation fails to heal impulsively or by conventional therapy. The repaired perforation helps in improving hearing by restoring the vibratory area of the tympanic membrane and through defending the surrounding window.⁷ Tympanoplasty, which is closing of perforation all along through ossicular reconstruction of hearing mechanism is the major surgical management for tubotympanic disease.⁸ Myringoplasty is closing of perforation of pars tensa of tympanic membrane as well as this process is with no operation of the ossicles or middle ear.⁹

Several researchers go on that surgical procedure of the nose ought to be performed previous to tympanoplasty but septal deviation or hypertrophy

of the conchae is seen in a patient with chronic otitis media as any pathology in nose or nasopharynx is dependable for reduced tubal function and insufficient tubal function is related through lesser hit rate of tympanoplasty in conditions of achieving a stabilized difficulty free ear.⁸ Nasal Septum deviations be able to be corrected by septoplasty. During septoplasty deformities in the nasal septum are corrected and the nasal septum is straightened which allows improved airflow through nose.⁹ This study was carried out to confirm the role of septoplasty in Tubotympanic type of Chronic Suppurative Otitis Media.

Objective: To assess the outcomes of septoplasty followed by myringoplasty and myringoplasty without septoplasty in patients among tubotympanic diseases in terms of Graft uptake, audiological outcome and late complications.

MATERIALS AND METHODS

Sample size with a total of 52 patients were admitted in the Department of Otorhinolaryngology GEMS Hospital, Srikakulam, Andhrapradesh, requiring myringoplasty for tubotympanic disease during the study period. All the 52 patients were included in the study and Informed consent was taken from all the participants before including them in study with a duration period of one year

Randomized clinical study to assess outcomes of myringoplasty alone and septoplasty followed by myringoplasty. The comparative study was done on following parameters: Graft uptake, Audiological outcome, Closure of AB GAP, SN hearing loss, Late complications, Re-perforation/ Residual perforation, Retraction. In the Study Population, every patients with complaints of ear discharge were screened for otitis media. Patients with tubotympanic disease requiring myringoplasty were included in the study after taking informed consent.

Inclusion Criteria with Chronic Suppurative Otitis Media - tubotympanic type with central perforation of unilateral and bilateral type with intact ossicular integration and deviated nasal septum, Pure tone average between 20-45 db hearing losses, Ear to be operated should be without discharge for at least 4 weeks before surgery, No Sensorineural Hearing Loss (Patient with Adequate Cochlear Reserve), Patients in the age group of 14 – 60 years.

Exclusion Criteria with Active discharging ear, patient with uncontrolled hypertension, and severe

anemia, Perforation caused due to ASOM or Traumatic rupture, Patient with immune compromised states like Diabetes, HIV and/or on Immunosuppressant drugs, Patients <14 years and > 60 years of age

Sampling technique: Every patients requiring myringoplasty were randomly divided into 2 groups by using lottery technique. Group A subjects (n=26) were operated by myringoplasty alone using temporalis fascia. Group B subjects (n=26) were operated by Septoplasty initially and then after 6 weeks were operated by myringoplasty using temporalis fascia.

Examination of study subjects: In every study subjects detailed history was elicited and clinical examination of ear, nose and throat was done with special reference to the ear and nose. An otoscopic examination was done to record the site and size of perforation. Every findings were confirmed with examination of the ear under microscope. Pure tone Audiometry was performed in the frequencies of 500, 1k, 2k, and 4k. Nose examination was conducted in detail about the septum and turbinate's. Functional nasal examination was performed. X-ray paranasal sinues were taken. Broad spectrum antibiotics were given to all cases. Dry aural toilet was done to remove debris and wax from the ears. Data was analyzed using MS excel and SPSS v 17.0. Results are interpreted in terms of percentages and chi square tests of significance was applied wherever required.

RESULTS AND DISCUSSION

A time period of 12 months was taken in to study. The complete information concerning with age, sex, clinical findings, preoperative air bone gap findings, intra-operative middle ear and ossicular pathology, type of reconstruction and postoperative air bone gap findings were noted. In the current study 52 cases were enrolled. Of the 52 cases, 26 of the participants belonged to group A (Myringoplasty alone) and 26 belonged to group B (Septoplasty followed by Myringoplasty).

The youngest patient in our study was 17 years old while the oldest patient was 45 years old. The normal frequency was 24 years for only myringoplasty group and 28 years for septoplasty followed by myringoplasty group. The current study results were comparable to a study conducted by Bozkus F et al¹⁰ where maximum incidence of Chronic otitis media was found in 21 -30 years of age group. Related results were found in a study conducted by Eryilmaz A et al¹¹ where maximum incidence of disease was found among 20-30 years of age group.

Among the patients undergoing only tympanoplasty, 38.5% were males and 61.5% were females. Among the patients undergoing septoplasty followed by myringoplasty, 53.8% males and 46.2% females. Almost equal incidence of disease was found among males and females in a study conducted by Bozkus Fetal.¹⁰

Table -1 Age Distibution

AGE GROUP	GROUP I		GROUP II	
	MYRINGOPLASTY		SEPTOPLASTY+MYRINGOPLASTY	
	NUMBER	%	NUMBER	%
14-20 YEARS	3	11.5	4	15.3
21-30 YEARS	9	34.6	9	34.6
31-40 YEARS	7	26.9	7	26.9
>40 YEARS	7	26.9	6	23
TOTAL	26	100	26	100

Table - 2: Gender Distribution

Gender	Group I		Group II	
	Myringoplasty		Septoplasty+Myringoplasty	
	Number	%	Number	%
Male	10	38.5	14	53.8
Female	16	61.5	12	46.2
Total	26	100	26	100

Table - 3: Pre Operative Air- Bone Gap

pure tone average (db)	Group I		Group II	
	Myringoplasty		Septoplasty +Myringoplasty	
	Total Number	%	Total Number	%
20-25	11	42.3	13	50.0
26-30	9	34.6	8	30.7
>30	6	23.1	5	19.3
Total	26	100	26	100

Among the patients who undergo myringoplasty, 42.3% had air bone gap <25db though.62% had a gap of 26 -30db and 23.1% had a gap of more than 30db. In the septoplasty followed by myringoplasty group, 50.0% had <25db air bone gap while 30.7% had gap of 26 -30 db and 19.3% had more than 30 db air bone gap. This results are different while compared to a study conducted by Fukuchi I., et al¹² where 100% of study people had pre- operative bone gap of >30db.

Among the patients who underwent myringoplasty only 84.6 % had a gain of 15 db while 15.4 % had a gain of > 15 db. Of the patients who underwent septoplasty followed by myringoplasty 92.3% had a gain of 15 db while 7.7 % had a gain > 15 db. The difference in the post -operative air bone gap among 2 groups was not found to be statistically significant using chi square test of significance. (p >0.05). The present study findings concurred with a

study by Fukuchi I, et al¹² where majority of patients had a gain of >15db.

The graft uptake rate was 80.7% for myringoplasty lone and intended for septoplasty followed by myringoplasty it was 84.5%. Persistent perforation was seen in 5 cases of myringoplasty grouping and 4 cases of septoplasty followed by myringoplasty group. Approximately 9 cases of myringoplasty only set had retracted tympanic membrane while in septoplasty followed by myringoplasty group had 6 cases only. The dissimilarity in the graft uptake between both the groups was initiate to be statistically not significant by means of chi square test of significance. (p>0.05). The current study results are related to a study conducted by Aditya MY, Dasgupta KS et al¹³ where graft uptake was found to be 84.5% in myringoplasty ended after septoplasty.

Table- 4: Post Operative Air- Bone Gap

AIR-BONE GAP CLOSURE	GROUP I		GROUP II	
	MYRINGOPLASTY		SEPTOPLASTY + MYRINGOPLASTY	
	TOTAL NUMBER	%	TOTAL NUMBER	%
<10 db	12	46.1	14	53.8
10-15 db	10	38.5	10	38.5
>15 db	04	15.4	02	7.7
TOTAL	26	100	31	100

*p >0.05, NS for UPTO 15 DB and >15 DB

Table-5: Post Operative Graft Status

Graft Status	group I		Group II	
	myringoplasty		Septoplasty+Myringoplasty	
	Total number	%	Total Number	%
Intact (Normal)	12	46.1	16	61.5
Intact (Retracted)	9	34.6	06	23.0
Persistent Perforation	05	19.2	04	15.4
Total	26	100	26	100

Table - 6: Post Operative Subject IVE Hearing Assessment

Hearing Assessment	Group I		Group II	
	Myringoplasty		Septoplasty+Myringoplasty	
	Total Number	%	Total Number	%
Significant Improvement	15	57.7	16	61.6
Mild Improvement	7	26.9	8	30.8
No Change	04	15.4	2	7.6
Worsened	0	0	0	0
Total	26	100	31	100

* P>0.05, NS

Approximately 57.7% patients who undergo myringoplasty merely had major subjective progress in hearing while 26.9% patients had mild improvement. About 61.6% patients who undergo septoplasty followed by myringoplasty had major subjective progress in hearing while 30.8% had mild improvement. The differentiation in the subjective hearing improvement was not found to be statistically significant by means of chi square test of significance. ($p>0.05$). Related findings were found in a study by Ucar *et al*¹⁴ where 92% study participants had hearing improvement subsequent to myringoplasty preceded by septoplasty.

CONCLUSIONS

The graft take up was 84.5% in septoplasty preceding myringoplasty and 80.7% in

myringoplasty group. During our study success rate was found to be 84.6% in septoplasty preceding myringoplasty and Air bone gap was reduced to <20db in 92.3% of cases. In current study there was neither worsening of existing conductive hearing loss or development of fresh sensorineural hearing loss subsequent to surgical procedure.

Septoplasty preceding Myringoplasty at least six weeks in advance is efficient in tubotympanic disease for achieving dry ear due to good uptake of the graft as well as progress of hearing. The normal phase gap among septoplasty and myringoplasty be supposed to be at least six weeks. Exclusion of Sino nasal disease earlier than ear surgery yields enhanced results. The role of Septoplasty in Tubotympanic Diseases is further fetching in bilateral ear diseases.

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