



EVALUATION OF THE EFFECT OF EUSTACHIAN TUBE FUNCTION AND MASTOID CELL PNEUMATISATION ON MYRINGOPLASTY

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ABSTRACT

Myringoplasty is one of the most commonly performed surgical procedures by the otorhinolaryngologists all over the world. Aim of my study is to study Eustachian tube function and mastoid pneumatization on graft uptake and hearing status after Myringoplasty. The study includes 50 Patients diagnosed with chronic otitis media and conductive hearing loss. The exclusion criteria are bilateral chronic otitis media and acute otitis media, coexisting nasal pathology, and recurrent episode of URTI. Based on my study, there is no definite relationship between pre-op status of Eustachian tube function and pre-op degree of mastoid pneumatization on result of Myringoplasty.

Keyword- Acute Otitis Media (AOM), Chronic Otitis Media (COM), Conductive Hearing Loss (CHL)

INTRODUCTION

Myringoplasty is one of the most commonly performed surgical procedures by the otorhinolaryngologists all over the world. It involves the reconstruction of the tympanic membrane perforation using a suitable graft material, which may be an autograft, allograft or a synthetic material¹.

Despite the continuous advancements in the approach & technique of performing the surgery, the incidence of unfavourable outcomes (eg. failure of graft take up, no improvement in air conduction thresholds) has been significant. A large number of factors have been implicated as prognostic in the outcome of myringoplasty in the past. The most significant of which include

the functional status of Eustachian tube, the condition of mastoid air cell system, the duration of disease & the condition of middle ear².

A detailed description of the eustachian tube was first given by Bartlomeus Eustachius in his book on the ear in 1562. He, however, did not give any opinion regarding its function³. Antonie Valsalva, an anatomist, described the bony part of Eustachian tube and for the first time discussed its function⁴.

Adam Politzer also stressed that the tube was responsible for aeration of the middle ear and it opened only during swallowing to permit an airflow into the tympanic cavity. He also devised the

time honoured retrograde fixed inflation test of Politzer⁵.

The present study is being undertaken to assess the combined influence of Eustachian tube functions & state of mastoid pneumatization on the outcome of myringoplasty in terms of graft take up & hearing gain. This study also attempts to assess the significance of correlation between the Eustachian tube functions & pneumatization of mastoid air cells.

Aims & Objectives are (1) To study the influence of eustachian tube functional status on graft take up & hearing status after myringoplasty.(2)To study the influence of mastoid pneumatization on graft take up & hearing status after myringoplasty.(3)To estimate the correlation between eustachian tube functional status & mastoid pneumatization.

MATERIAL & METHODS

The Present Study Was Conducted In The Department Of Otorhinolaryngology And Head And Neck Surgery Of The Santosh Medical College And Hospital, Ghaziabad. The study is interventional study which includes 50 cases which were selected from the OPD who complained of COM and CHL only. The period of study was from April, 2021 to March, 2022 .The inclusion and exclusion criteria are as follows-

INCLUSION CRITERIA-

- Age between 18 to 45 years.
- Unilateral safe COM.
- Dry ear for more than 6 weeks.
- Conductive hearing loss only.

EXCLUSION CRITERIA

- Bilateral COM. ,Unsafe COM, AOM.
- Sensorineural hearing loss.
- Coexisting nasal pathologies eg. Nasal polyps , cleft palate , allergic rhinitis, etc.
- Recent episode of U.R.I.
- External auditory canal pathologies eg. Otitis externa, otomycosis etc.

All the cases were thoroughly interrogated, examined and investigated, and the findings were recorded in the proforma.

All the selected patients were subjected to the following investigations:

- Hemogram and urine .routine examination.
- Pure tone audiometry.
- X-ray mastoid Law's lateral oblique view: The area of the mastoid air cells of the patients were assessed from the above mentioned X-ray using planimetry.
- Flourescein nasopharyngoscopy: This procedure was used to assess the eustachian tube function of the patients.

RESULTS AND OBSERVATIONS

A total number of 50 cases of dry central perforation were subjected to evaluation of Eustachian tube function and degree of mastoid pneumatization and operated upon a period of 12 months from April 2021 to April 2022.

Table 1- showing the age distribution of cases

Age groups in years	No. of cases	Percentage
11-20	6	12%
21-30	19	38%
31-40	20	40%
41-50	5	10%
Total	50	100%

Maximum number of patients was in the age group of 21-40 years (78%) Male: female ratio in the present study was (1:1.38) 21:29. (Table 1)

Table 2- showing the results of Valsalva manoeuvre

Tubal function	Number of cases	Percentage
Patent	32	64%
Blocked	18	36%
Total	50	100%

The above table indicates that the tube was patent on inflation in 32 cases (64%) subjectively and in 18 cases (36%), Valsalva manoeuvre was negative. (Table 2)

Table 3-Showing the area mastoid air cells in CSOM cases.

Area of mastoid air cells	Number of cases	Percentage
8 cm ²	24	48%
< 8 cm ²	26	52%
Total	50	100%

Table 4-Showing the results of flourescein dye method.

	Number of cases	Percentage
1. Dye appearing in nasopharnx with in 10 minutes	34	68%
2. Dye appearing after 10 minutes/not appearing at all	16	32%
Total	50	100%

Table 5-Showing area of mastoid air cells in normal ears.

Area of mastoid air cells	Number of cases	Percentage
8 cm ²	42	84%
< 8 cm ²	8	16%
Total	50	100%

Table 6-showing the results of graft take up at 8 weeks.

Results	Number of cases	Percentage
Graft accepted	38	76%
Graft rejected	12	24%
Total	50	100%

Table 7-showing correlation between Eustachian tube patency and graft take up.

Tubal function	Total cases	Graft taken		failure	
		No.	(%)	No.	(%)
Patent	34	26	(76.47)	8	(23.5)
Blocked	16	12	(75.00)	4	(25.00)
Total	50.	38	(76)	12	(24)

Table 8- Showing correlation between degree of mastoid pneumatization and functional results in 38 successful cases.

Area of mastoid air cells	No. of cases	Good	Satisfactory	Unsatisfactory
8 cm ²	18	8	4	6
< 8 cm ²	20	7	9	4
Total	38	15	13	10

DISCUSSION

A total of 50 cases in the age group of 18 to 45 years with unilateral central perforations (dry for more than 6 weeks) were subjected to eustachian tube function assessment and mastoid x-rays

In 38 cases there was successful graft take up, out of which 28 cases (73.6%) had satisfactory or good hearing improvement.

In 26 successful cases (out of 38 cases) with a normally functioning eustachian tube, 18 cases (69.22%) had satisfactory or good hearing gains. Whereas, in 12 successful cases (out of 38 cases) with a dysfunctioning Eustachian tube, 10 cases (83.34%) had satisfactory or good hearing gains.

In 18 successful cases (out of 38 cases) with well pneumatized mastoid air cell, 12 cases (66.6%) had satisfactory or good hearing gains.

In 20 successful cases (out of 38 cases) with poorly pneumatized mastoid air cells, 16 cases (75%) had satisfactory on good hearing gains.

Pneumatization Pattern and Status of the Mastoid Antrum in Chronic Otitis Media was done at Jawaharlal Nehru Medical College, Wardha, in 2022 .This review and the results emerging therein demonstrated that chronic inflammation of the middle

ear in children suppresses the development of pneumatization in the temporal bone. The volume of the middle ear is not large enough to cause a retraction pocket and hence we believe that antrum size and status are also important in the formation of a COM-like retraction pocket in inactive squamosal disease due to its ability to exert a greater negative middle ear pressure.⁷

A study done at Jawaharlal Lal Nehru Medical College quoted When Eustachian dysfunction is found and the disease is in inactive/early stage, we should address the cause of dysfunction first. Cases with primary sclerotic/diploic mastoid pneumatisation pattern but normal Eustachian function mostly require inside–out approach mastoidectomy for disease clearance and ventilation, as the mastoid is found to be contracted⁸.

CONCLUSION

There is no definite relationship between preoperative status of the eustachian tube as assessed Flourescein nasopharyngoscopy and the results of myringoplasty in terms of graft take up and postoperative hearing gain.

There is no definite relationship between preoperative status of degree of mastoid pneumatization and the results of myringoplasty in terms of graft take up and postoperative hearing gain .

There is no correlation between the eustachian tube functional status and the degree of mastoid pneumatization.

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The Author(S) Declared No Potential Conflicts Of Interest Concerning The

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ETHICAL APPROVALS

This Study Does Not Involve Experiments On Animals Or Human Subjects.

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