



ORIGINAL RESEARCH PAPER

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CORRELATION OF EUSTACHIAN TUBE FUNCTION WITH TYMPANOPLASTY OUTCOME

KEY WORDS: Eustachian tube function, Mucosal COM, Tympanoplasty.

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ABSTRACT

Background- Eustachian tube play a vital role in the pathogenesis of middle ear cleft disease. Normal eustachian tube function (ETF) is responsible for successful tympanoplasty outcome. Pre operative ETF test should be done. **Aim & objective-** To evaluate the role of Eustachian tube function in successful graft uptake in tympanoplasty. **Method -** a prospective study was done on 50 patients, with mucosal type of chronic otitis media (COM). Eustachian tube function (ETF) was assessed with various methods like impedance audiometry (Toynbee's method), methylene blue dye test etc, and correlation of graft uptake with preoperative ETF was done. **Result-** Out of 50 patients, 78% had normal tubal function and 22% had partially impaired tubal function. Tympanoplasty was successful in 92.3% patients with normal ETF and 54.5% patients with partially impaired ETF. **Conclusion-** There is a strong association between ETF and graft uptake. Thus, proving that eustachian tube plays a major role in the graft uptake. So preoperative ETF should be done.

INTRODUCTION -

Eustachian tube maintain equality of air pressure between middle ear and ambient atmosphere (ventilatory function), drainage of mucus from middle ear cavity to nasopharynx, (mucociliary function) and protection of middle ear from pathogens/foreign material present in nasopharynx. (1) (2) Dysfunction of eustachian tube play a vital role in the pathogenesis of middle ear cleft disease. (3) Success of reconstructive ear surgery as well as long term prognosis depends on proper functioning of Eustachian tube. Ventilatory function of eustachian tube can be tested by sonotubometry, tympanometry, photoelectric method, radiological studies and air pressure equalization technique. Besides it, there are several manoeuvres by which anatomical patency of eustachian tube can be checked like Valsalva, Politzer, and Toynbee manoeuvres. (4) Tympanoplasty is a procedure of choice to eradicate the disease from the middle ear and to reconstruct the hearing mechanism with or without tympanic membrane repair. (5) Several factors influence the success rate of tympanoplasty, such as patient's age, Eustachian tube function, perforation size, smoking, bilateral disease and septal deviation out of them eustachian tube function is considered as most important prognostic factor. (6) William's test is the test of tubal function in patients with intact tympanic membrane while Toynbee's test is the test of tubal function in perforated tympanic membrane. (7) So to achieve satisfactory result in tympanoplasty, a pre-operative testing of eustachian tube function is an important factor.

In this study, assessment of eustachian tube function was done in patients with COM with reference to its treatment outcome. Some patients had normal eustachian tube function and some had partially impaired ETF.

AIM AND OBJECTIVE -

To evaluate the role of eustachian tube function in successful graft uptake in tympanoplasty.

MATERIAL AND METHOD -

A prospective study was done on 50 patients who came to ENT OPD at Gandhi medical college Bhopal with tympanic membrane perforation and reduced hearing (mucosal type of COM) from January 2020 to June 2020. All patients underwent detailed history and complete ENT examination. It done to rule out other source of infection. Each patient was subjected to the following procedures like blood investigations, pus culture and sensitivity, pure tone audiometry, impedance audiometry, otoendoscopy, diagnostic nasal endoscopy and

plain X-ray both mastoids-Law's view.

Inclusion Criteria -

Patients in age group of 12-45 years with mucosal type of chronic otitis media with central perforation with no clinical evidence of active infection in ear, nose and throat.

Exclusion Criteria -

1. Patients with squamosal type of chronic otitis media with complication.
2. Chronic otitis media patients with age less than 12 year and above 45 years.
3. Mucosal type of chronic otitis media with other source of infection in ear nose & throat (URTI).
4. Chronic otitis media patients with sensory neural hearing loss.
5. Patient with congenital anomalies.
6. Patients who had already undergone tympanoplasty (revision case).

Assessment of eustachian tube function -

It was done by different clinical method like, Toynbee's test, tympanometry, radiological method (x-ray mastoid), methylene blue dye test etc.

Surgery -

Patient with normal or partially impaired ETF, underwent type 1 tympanoplasty. Temporalis fascia was used as a graft material in all cases. In partially impaired ETF patients, medication like steam inhalation, antihistaminic and antibiotics were given for longer duration to improve tubal function.

Post operative care -

Parenteral broad spectrum cephalosporine with analgesic was given for a period of one week then all sutures were removed followed by oral antibiotics for next one week. Post operative uptake of graft was assessed by microscopy and otoendoscopy after 1 week. Follow up otoendoscopy was done on 1st, 3rd and 6th month respectively. Hearing assessment was done at 3rd and 6th month.

RESULT -

In study population 36% (18) were males whereas 64% (32) were female. Eustachian tube function was analysed clinically and graft uptake was assessed by otoendoscopy with reference to ETF status. The result is tabulated and analysed. In this study we tried to find association between graft uptake and ETF which was statistically significant (P<0.05).

Table 1: Age wise distribution of patient –

Distribution by age		
Age group (year)	No. of patient	Percentage (%)
12- 25	21	42
25- 35	14	28
35-45	15	30
Total	50	100

Table 2: Distribution of study population based on Eustachian Tube function –

ET function	Number	Percentage (%)
Normal	39	78
Partially impaired	11	22
Complete impaired	0	0

Out of 50, 39 had normal ETF and 11 had partially impaired ETF.

Table 3: uptake of graft at 3 months

Tubal function	No of patients	Graft uptake	Graft failure
Normal	39(78%)	32(82%)	7(17.9%)
Partially impaired	11(22%)	3(27%)	8(72.7%)
Total	50	89.7%	38.4%

At 3 months graft uptake was 82% in normal ETF & 27% in partially impaired ETF.

Table 4: Uptake of graft at 6 months

Tubal function	No of patients	Graft uptake	Graft failure
Normal	39 (78%)	36(92.3%)	3 (7.6%)
Partially impaired	11 (22%)	6(54.5%)	5(45.4%)
Total	50	84%	16%

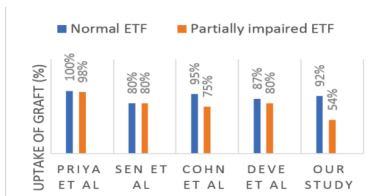
At 6 months graft uptake was 92.3% in normal ETF and 54.5% in partially impaired ETF.

DISCUSSION –

In this study on 50 patients with chronic otitis media (mucosal type), underwent the preoperative ETF test and significantly correlated with outcome after surgery. Patients with normal ETF showed a graft uptake when compared with those with impaired ETF. In present study most common affected age group was 12-25 year while mean age was 29.32 year. A study done by Shiromany et al had patients in age range from 12 to 64 years and mean age was 26.7 ± 10.18 years.

Quantitative methods for measuring preoperative tubal function in patients with perforated ear drum was done by Palva and Siedentop et al in 1963. ETF has been the centre of focus because of its primary role in the pathogenesis of otitis media and in the aeration of middle ear cavity. The ETF is most important determinant of surgical outcome in patients with COM (mucosal type). In 1979 Cohn et al, assessed ETF and they found 95% and 75% graft uptake in normal & partially impaired ETF respectively. (8)

In 2012 Priya et al found that 100% graft uptake in normal ETF and 98% in partially impaired ETF. (9) In 1998 Sen et al assessed ETF. Those with normal ETF was graft uptake of 80%, and 80% graft uptake was found in partially impaired ETF. (10) Vishal Dave et al found 87% graft uptake in normal eustachian tube and 80% in partially impaired eustachian tube. (3) In our study 92.3% of normal ETF and 54.5% of partially impaired ETF patient's uptake graft successfully.



Graph 1- ETF & graft uptake in various study

CONCLUSION –

In present study correlation between graft uptake and eustachian tube function was significant. P value is <0.05. Hence, there is a strong association between ETF and graft uptake. Thus, proving that eustachian tube plays a major role in the graft uptake. So preoperative ETF should be done.

Limitation- small sample size, no control group for comparison.

Conflict of interest-None declared.

Source of support – Nil.

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