

Original article:

Study of type 1 tympanoplasty by interlay technique

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ABSTRACT:

Chronic otitis media is an inflammatory process of mucosal lining of e and mastoid. The aim of surgery is to give patient dry, safe and functioning ear. The technique used in our study is interlay technique which is superior than conventional. Study was done on 30 patients between age group of 15 – 50 yrs in Feb 2016 to may 2017. It was done on moderate, central and dry perforations for minimum period of 3 months after audiological and anaesthetic evaluation and outcome was taken as positive or negative after 3 months of procedure. Out of 30, 27(90%) patients have successful graft acceptance and 3 (10%) have rejection. Type 1 tympanoplasty has excellent graft uptake and post operative hearing improvement by interlay technique with minimizing graft medialisation or lateralization complications.

INTRODUCTION:

COM is a major health problem in India, a developing country, especially in low socio economic strata (prevalence > 4%). Perforations result from infection or trauma out of which 80 % heal spontaneously (Galdstone et al., 1995). Repair of tympanic membrane called as myringoplasty or type 1 tympanoplasty (Wullstein classification) can be done with underlay (Shea), overlay (house) or interlay (Komune et al) techniques. In interlay technique graft (temporalis fascia) is placed between fibrous and mucosal layer. Underlay technique has disadvantages of graft medialisation, reduction in middle ear space and overlay has graft lateralization, formation of epithelial pearls and cholesteatoma rarely. In interlay technique graft is supported laterally by fibro-squamous layer and medially by mucosal layer. Preferred graft is temporalis because of low metabolic rate, less vascular requirement and resistant to infection. In the present study, an attempt is made to evaluate the results of type-1 tympanoplasty by interlay technique with respect to dry ear using temporalis fascia and improvement in hearing following surgery.

AIMS AND OBJECTIVES:

- 1) To evaluate the results of type 1 tympanoplasty by interlay technique
- 2) To assess the uptake of graft
- 3) To assess the hearing improvement
- 4) To study complications associated with interlay technique

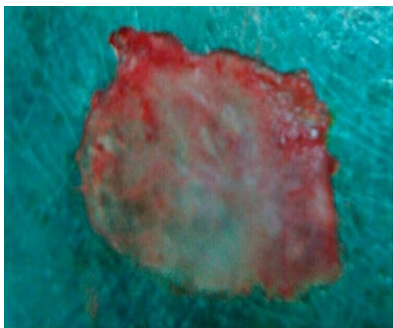
MATERIALS AND METHODS:

The present prospective study conducted in Sassoon hospital from Feb 2016 to may 2017 on patients between age group of 15 -50 after approval of ethical committee. 30 Patients of CSOM with moderate to large , dry ,central perforations are included for study .all type of relevant information collected from patients related to complaints, clinical findings, routine investigations including blood, x ray mastoid ,PTA . DNE and Microscopy carried to confirm findings and rule out any anatomical abnormality.

INCLUSION CRITERIA –Patient age group between 15-50 ,having conductive hearing loss with dry,central perforation for 3 months,undergoing surgery for first time and willing for follow up

EXCLUSION CRITERIA-having ossicular pathology,mixed or sensorineural hearing loss, wet ear,immunocompromised status, unfit patients due to comorbidity,previous surgery done ,with tympanosclerosis / granulations

Tuning fork tests and PTA done on all patients preoperatively.PTA was done with frequencies 500,1000,2000 for air and bone conduction and postoperatively after 3 months. All surgeries were done by same surgeon and anaesthetists under Gaby using post auricular approach and using temporalis fascia graft. 2% lignocaine with 1:100000 adrenaline infiltration given postaurally and four qudrants of EAC to achieve vasoconstriction. Postauricular Wilde’s incision taken 5 mm behind crease with 15 no. blade and graft harvested. After meatotomy tympanic membrane perforations margins freshened and tympanomeatal flap elevated. Fibro-squamous layer along with annulus elevated leaving behind mucosal layer .



Graft is kept between two layers. Whole assembly supported with gelfoam and flap reposition and suturing done. Patient kept on IV antibiotics for 3 days minimum.



Patients were advised oral antibiotics ,analgesics and antihistaminics after discharge. Stitches were removed after 7 days. Follow up was taken weekly in first and biweekly after. On last follow up visit ,PTA and microscopy was done to evaluate the results.

RESULTS AND DISCUSSION:

OBSERVATIONS AND RESULTS

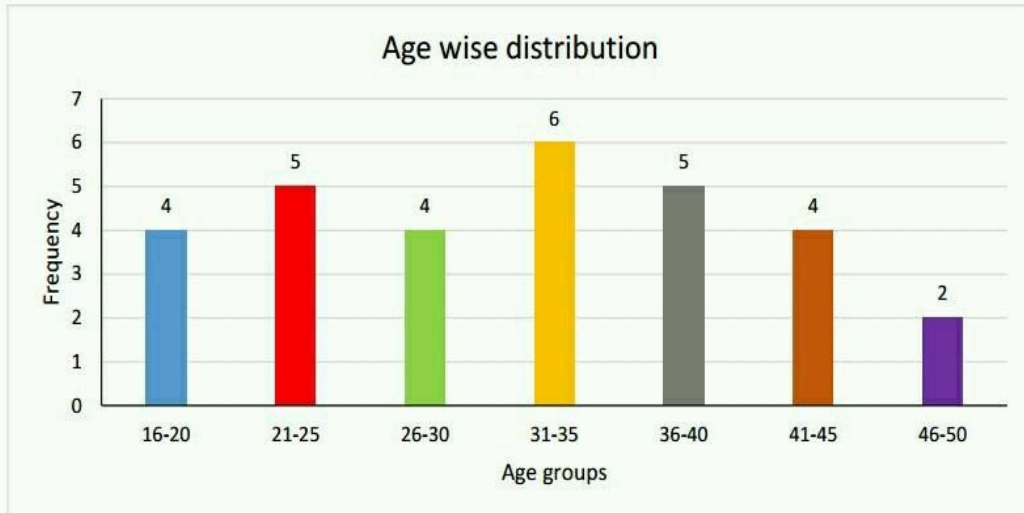
1) Age-wise distribution

Table - 1

| Range (years) | No. of patients | Percentage |
|----------------------|------------------------|-------------------|
| 16-20 | 4 | 13.33 |
| 21-25 | 5 | 16.66 |
| 26-30 | 4 | 13.33 |
| 31-35 | 6 | 20 |
| 36-40 | 5 | 16.66 |
| 41-45 | 4 | 13.33 |
| 46-50 | 2 | 6.66 |
| TOTAL | 30 | 100 |

MEAN AGE was 32.06 with SD of 8.75. maximum patients were from age group 31-35.

Figure- 1

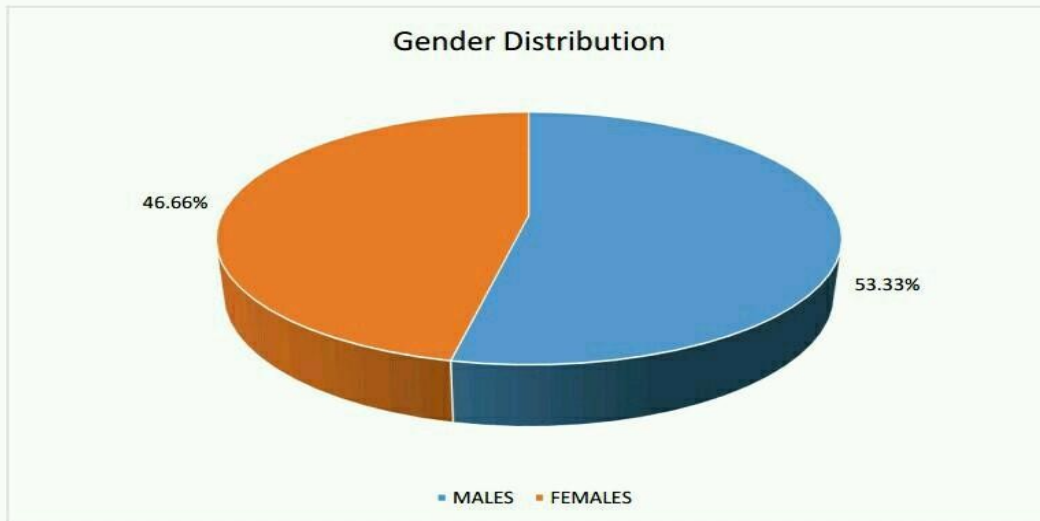


2) Sex distribution

Table - 2

| Gender | No. of patients | Percentage |
|----------------|------------------------|-------------------|
| Males | 16 | 53.33 % |
| Females | 14 | 46.66 % |
| Total | 30 | 100 |

Figure - 2



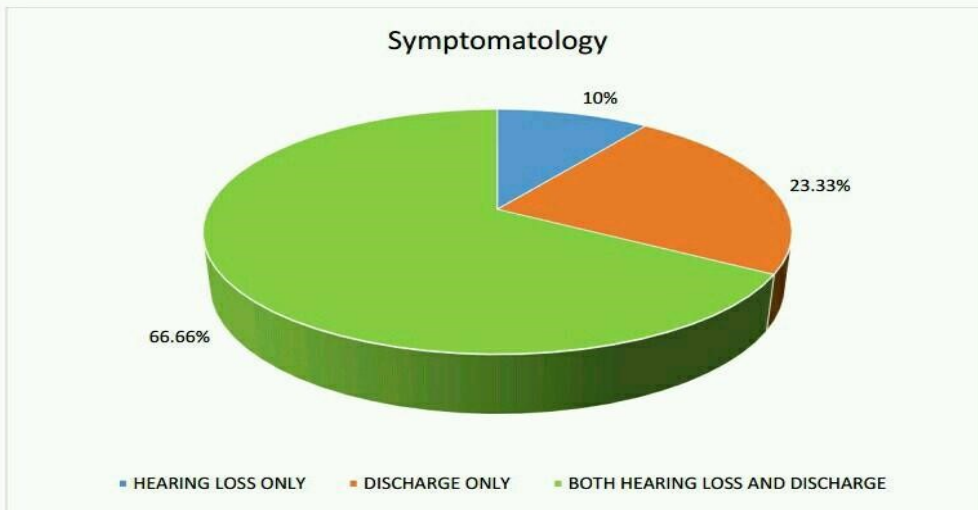
No of females were 14(46.66%) and males 16 (53.33%) showing a slight male preponderance.

3) Symptomatology

Table - 3

| Symptoms | No. Of patients | Percentage |
|---------------------------------|-----------------|--------------|
| Hearing Loss only | 3 | 10 % |
| Discharge only | 7 | 23.33 % |
| Both hearing loss and discharge | 20 | 66.66 % |
| Total | 30 | 100 % |

Figure - 3



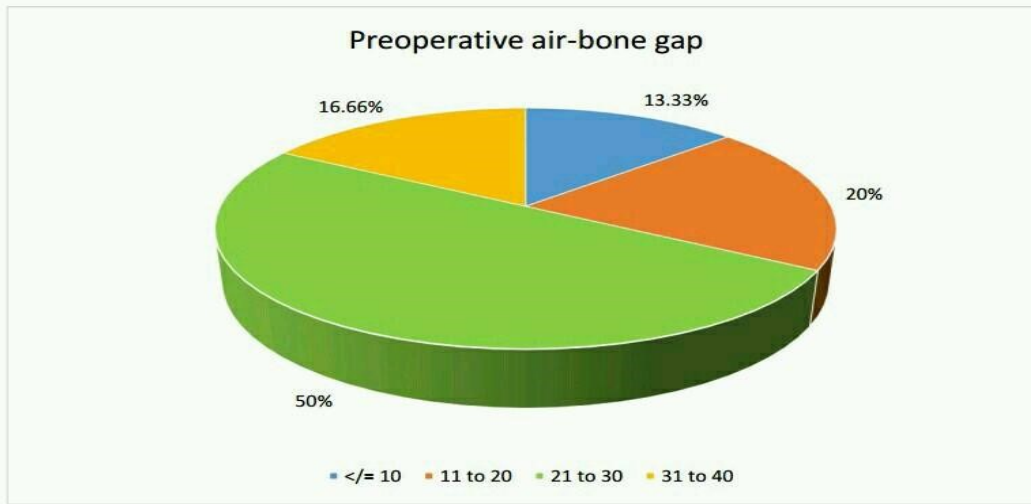
Majority of the patients (66%) in the study had both hearing loss and discharge. Patients with only discharge and only hearing loss were 23.33% and 10% respectively

5) Pre-operative Air-Bone Gap

Table - 5

| Range (dB) | No. of patients | Percentage |
|--------------|-----------------|-------------|
| ≤ 10 | 4 | 13.33% |
| 11-20 | 6 | 20% |
| 21-30 | 15 | 50% |
| 31-40 | 5 | 16.66% |
| Total | 30 | 100% |

Figure - 5



15 patients (50%) had preoperative ABG within 31-40 dB and 6 patients (20%) had between 11-20dB. While 5 cases (16.66%) had ABG between 31-40dB and 4 cases(13.33%) had less than 10dB.

6) Graft Uptake

Table - 6

| Graft Uptake | No. Of Cases | Percentage |
|---------------------|--------------|------------|
| A) Successful Cases | 27 | 90% |
| B) Failed Cases | 3 | 10% |
| Total | 30 | 100% |

Figure - 6



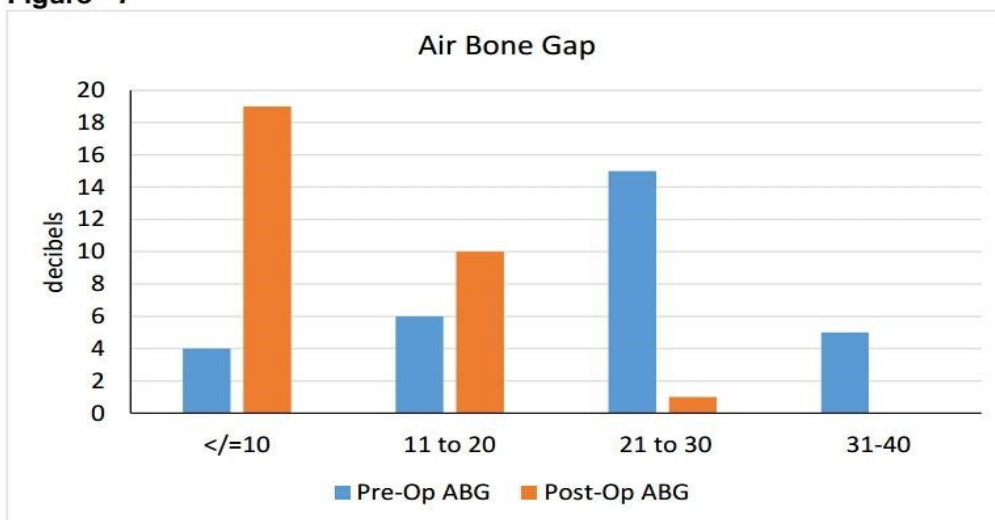
90% cases had successful graft uptake.

7) Post-Operative Air Bone Gap (ABG):

Table - 7

| Range (dB) | No. Of Patients | |
|--------------------|------------------|-----------------|
| | Pre-Op ABG | Post-Op ABG |
| A) </=10 | 4 (13.33%) | 19 (63.33%) |
| B) 11-20 | 6 (20%) | 10 (33.33%) |
| C) 21-30 | 15 (50%) | 1 (3.33%) |
| D) 31-40 | 5 (16.66%) | 0 (0%) |
| Total | 30 (100%) | 30(100%) |

Figure - 7

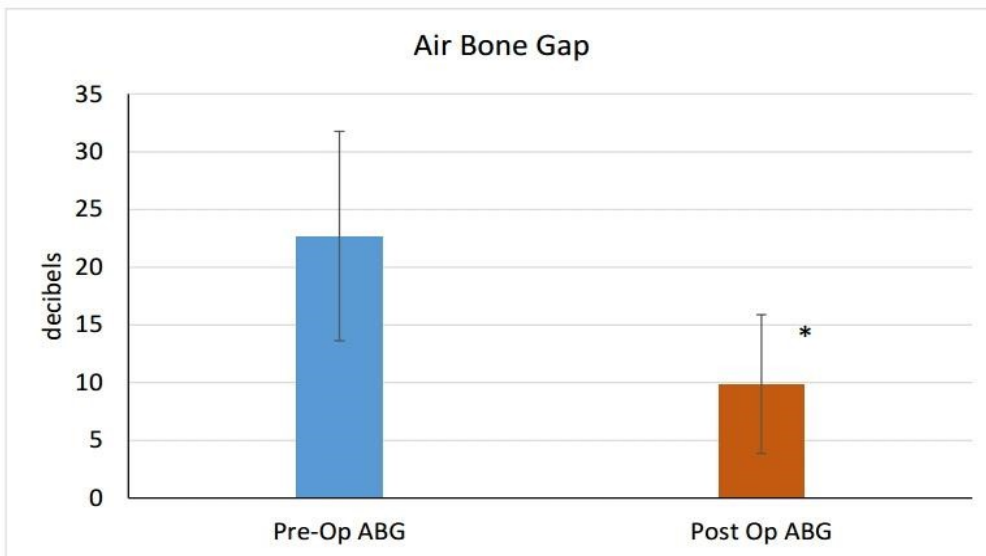


At the end of 3rd month, 63.33% cases had ABG within 10dB, 33.33% cases had ABG within 11-20dB and 0% had ABG >30dB .

Table - 8

| Pre-Op ABG (dB) | Post-Op ABG (dB) | Statistical test | P value |
|-----------------|------------------|---------------------------|---------|
| 22.7±9.07 | 9.88±6 | Wilcoxon signed rank test | <0.01 |

Figure - 8



The mean preop and postop ABG were 22.7+/-9.07 dB and 9.88+/-6 respectively. On comparing using Wilcoxon signed rank test, it was observed that the post op ABG was significantly lower compared to preop.

9) Complications:

Table - 9

| Complications | No. Of Patients | Percentage |
|-----------------------------------|------------------------|-------------------|
| Graft Medialisation | 0 | 0% |
| Graft Lateralisation | 0 | 0% |
| Perforation | 3 | 10% |
| Post Aural Wound Infection | 0 | 0% |
| Partial Flap Necrosis | 1 | 3.33% |
| Granular Myringitis | 0 | 0% |
| Alteration Of Taste | 0 | 0% |
| Total | 4 | 13.33% |

3(10%) cases had residual perforation of the tympanic membrane following episode of upper respiratory tract infection and 1 case (3.33%) had partial flap necrosis in the posterior part of the tympanomeatal flap.

CONCLUSION

1. Type-1 tympanoplasty by interlay technique results in excellent graft uptake and post operative hearing improvement.
2. The complications associated with underlay and overlay techniques like graft medialisation, lateralization are not seen in this technique.
3. The superiorly based circumferential flap along with canaloplasty when required gives the advantages of wide exposure. It also provides good anchoring to the graft all around the bony annulus with additional support of mucosal layer.
4. Thus, interlay technique is a preferred technique for central perforations of the pars tensa of the tympanic membrane.

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