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# Original Research

## Outcomes of type I underlay tympanoplasty using temporalis fascia graft in patients with large/subtotal perforation

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***ABSTRACT:***

**Background:** Chronic Otitis Media (COM) is a long-term infection or inflammation of the middle ear, typically lasting for weeks or months. It is characterized by recurring ear infections or ongoing drainage from the ear, even after an initial infection has healed. The present study assessed outcomes of type I underlay tympanoplasty using temporalis fascia graft in patients with large/subtotal perforation. **Materials &Methods:** 70 patients with COM with large/subtotal perforations of both genderswere operated on using a post-aural/endaural technique while under local anesthesia. For every patient, a temporalis fascia graft was taken.Pure tone audiogram (PTA) and speech reception thresholds (SRT) were carried out preoperatively and each postoperative visit i.e. at the end of 1, 3 6 and 24 months. **Results:** Out of 70 patients, 42 were males and 28 were females. Surgical approach used was end aural in 45 and post aural in 25 patients. Speech reception threshold preoperatively (dB) was 24 and postoperatively (dB) was 16. Pure tone audiogram (PTA) preoperatively (dB) was 31.5 and postoperatively (dB) was 15.2. Graft uptake was seen in 94% cases. The difference was significant (P< 0.05). **Conclusion:** Otologists have always faced the difficulty of repairing big or subtotal perforations, and temporalis fascia graft is the perfect autograft for the aforementioned use. Patients undergoing type I tympanoplasty for extensive and subtotal perforations can benefit from circumferential elevation of the tympanomeatal flap for improved morphological and functional results.

**Keywords:** Chronic Otitis Media, Pure tone audiogram, Speech reception threshold

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### INTRODUCTION

Chronic Otitis Media (COM) is a long-term infection or inflammation of the middle ear, typically lasting for weeks or months. It is characterized by recurring ear infections or ongoing drainage from the ear, even after an initial infection has healed. This condition can significantly affect a person's hearing and quality of life.[1]Type I Tympanoplasty refers specifically to the repair of the tympanic membrane (eardrum) without involving the ossicles (the small bones in the middle ear). This procedure is suitable for patients with a simple perforation of the eardrum caused by chronic otitis media, but no significant damage to the ossicles.[2]The underlay technique refers to how the graft is positioned. In the underlay approach, the graft is placed beneath the edges of the perforation in the eardrum, as opposed to the overlay technique, where the graft is placed over the perforation. The underlay method is the most common and provides better tissue healing and a lower complication rate.[3]

Type I underlay tympanoplasty using temporalis fascia graft is a surgical procedure used to repair a perforated eardrum (tympanic membrane) in patients with chronic otitis media (COM). This type of surgery helps restore the integrity of the eardrum, improve hearing, and reduce the risk of recurrent infections.[4]Despite being the gold standard for repairing tympanic membrane defects in chronic otitis media (COM), temporalis fascia graft is difficult for subtotal/large perforation as a result of its low rate of graft absorption.[5] It might be because there isn't much tympanic membrane (TM) left over for the graft's lateral support. While the morphological results of autologous cartilage grafting have been properly reported, previous literature has documented the varying hearing outcome during the postoperative period.[6]The present study assessed outcomes of type I underlay tympanoplasty using temporalis fascia graft in patients with large/subtotal perforation.

### MATERIALS & METHODS

The study was carried outon 70 patients with COM

with large/subtotal perforations of both genders.All gave their written consent to participate in the study.
Data such as name, age, gender etc. was recorded. Patients were operated on using a post-aural/endaural technique while under local anesthesia. For every patient, a temporalis fascia graft was taken.The perforations' edges were cleaned up.
The fibrous annulus and circumferential tympanomeatal flap were raised from the bony annulus all around, maintaining its pedal position at 12 to 1 o'clock anterosuperiorly. The osseous continuity was evaluated. Temporalis fascia underlay grafting was accomplished by stretching it antero-superiorly across the eustachian tube's lateral wall. Gel foams were then inserted into the middle ear and the Eustachian tube to fix it medially. After making sure the flap and the graft were nearly circularly aligned, the tympanomeatal flap was subsequently reposited back. There was medicinal gelfoam placed inside the external auditory canal. A dressing was used after double-layer suturing was used to seal the postaural/endaural incision. After 24 hours, the patients were released.Pure tone audiogram (PTA) and speech reception thresholds (SRT) were carried out preoperatively and each postoperative visit i.e. at the end of 1, 3 6 and 24 months. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

## RESULTS

**Table IDistribution of patients**

| Total- 70 | | |
|---|---|---|
| **Gender** | **Male** | **Female** |
| Number | 42 | 28 |

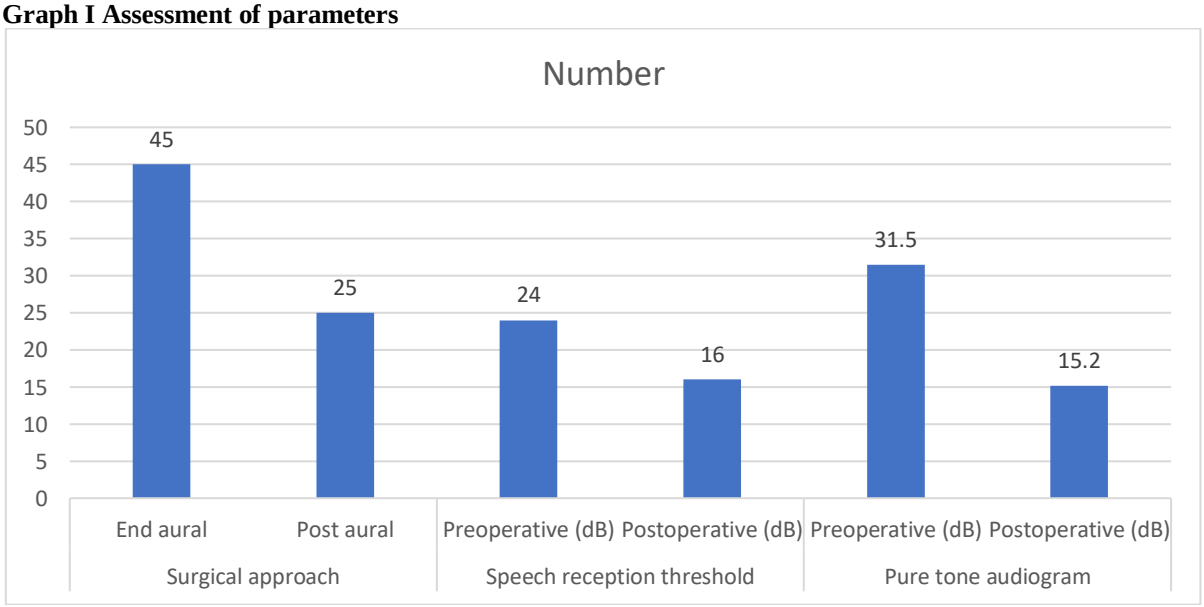
Table I shows that out of 70 patients, 42 were males and 28 were females.

**Table II Assessment of parameters**

| Parameters | Variables | Number | P value |
|---|---|---|---|
| Surgical approach | End aural | 45 | 0.01 |
| | Post aural | 25 | |
| Speech reception threshold | Preoperative (dB) | 24 | 0.04 |
| | Postoperative (dB) | 16 | |
| Pure tone audiogram | Preoperative (dB) | 31.5 | 0.02 |
| | Postoperative (dB) | 15.2 | |
| Surgical outcome | Graft uptake | 94% | - |

Table II, graph I shows that surgical approach used was end aural in 45 and post aural in 25 patients. Speech reception threshold preoperatively (dB) was 24 and postoperatively (dB) was 16. Pure tone audiogram (PTA) preoperatively (dB) was 31.5 and postoperatively (dB) was 15.2. Graft uptake was seen in 94% cases. The difference was significant (P< 0.05).

**Graph I Assessment of parameters**




## DISCUSSION

Temporalis fascia is the connective tissue found just beneath the skin over the temple area. This tissue is commonly used as a graft material in tympanoplasty because it is readily available, easy to harvest, and has excellent healing properties.[7] It is considered the gold

standard in tympanoplasty procedures.[8,9]The fascia is thin, flexible, and non-vascular, making it ideal for creating a strong and durable eardrum repair. Additionally, the temporalis fascia graft has a lower risk of rejection and complications compared to other grafts.[10]The present study assessed outcomes of type I underlay tympanoplasty using temporalis fascia graft in patients with large/subtotal perforation.

We found that out of 70 patients, 42 were males and 28 were females. Surgical approach used was end aural in 45 and post aural in 25 patients. Pradhan et al[11]demonstrated the surgical techniques and to compare the anatomical and functional outcomes of type I underlay tympanoplasty using temporalis fascia graft in patients with large/subtotal perforation. Temporalis fascia grafting was done in 60 patients having large/ subtotal perforations. Pure tone audiogram (PTA) and speech reception thresholds (SRT) were carried out preoperatively and each postoperative visit i.e. at the end of 1, 3 6 and 24 months.10 dB closure of air bone gap and 10 dB improvement in SRT were considered significant. The graft uptake rates were 92% the end of 24 months. 90% of patients had significant improvement in hearing (ABG ≥10 dB).The mean improvement of the SRT was 10 dB and 75% of the patients had significant gains in SRT.

We found that speech reception threshold preoperatively (dB) was 24 and postoperatively (dB) was 16. Pure tone audiogram (PTA) preoperatively (dB)was 31.5 and postoperatively (dB) was 15.2. Graft uptake was seen in 94% cases. Singh et al[12]evaluated the surgical success of a modified inlay tympanoplasty technique, known as circumferential subannular tympanoplasty, for anterior and subtotal perforations.A total of 58 adult patients of both sexes with anterior or subtotal perforations underwent circumferential subannular tympanoplasty under local anaesthesia. In this technique, after tympanomeatal flap elevation, the temporalis fascia graft is placed directly onto the annulus instead of being tucked underneath the tympanic membrane remnant. Outcome data were graft uptake and hearing improvement.This technique had a surgical success rate of 97 per cent and led to significant hearing improvement.Circumferential subannular tympanoplasty has a definitive role in managing anterior and subtotal perforations.

Bhat et al[13] in their study found that posterior and inferior perforations had a 90% success rate for repair, compared to only 67% of anterior perforations. There was a statistically significant reduction in air-bone gaps following myringoplasty, and the majority of patients felt that their ears were drier and had improved hearing. Myringoplasty is a successful procedure in the hands of consultants and trainees alike. The results are satisfactory enough to justify surgery purely for deafness and also in symptomatic children. There was a strong correlation between surgical success and resolution of symptoms and generally a satisfactory improvement in hearing.

The shortcoming of the study is small sample size.

## CONCLUSION

Authors found that Otologists have always faced the difficulty of repairing big or subtotal perforations, and temporalis fascia graft is the perfect autograft for the aforementioned use. Patients undergoing type I tympanoplasty for extensive and subtotal perforations can benefit from circumferential elevation of the tympanomeatal flap for improved morphological and functional results.

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