# Optimizing Outcome of Graft Efficacy in Endoscopic Type-1Tympanoplasty: Temporalis Fascia Versus Tragal Cartilage

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**ABSTRACT:**

**Introduction**: Tympanoplasty is a surgical procedure to renovate the mucosal variety of central perforation. Various graft materials are used for this. Among them, temporalis fascia and sliced tragal cartilage are equally popular with the surgeon.

**Method**: It was an impartial survey of the ENT inpatient departments of two specialized hospitals in Cumilla, Bangladesh. 200 patients were included in this study, of whom 150 underwent surgery using the temporalis fascia and 50 underwent surgery using the tragal cartilage.

**Result**: Males, rural, and poor populations suffer more from otitis media. Medium-sized perforation was the highest presentation. The result of the paired-sample t-test of Ab gap after tympanoplasty and refinement of Ab gap exhibited notable differences in both groups, with t=3.544, P<.001 in the temporalis fascia group, and t=-3.021, P=.004 in the tragal cartilage group. The paired-sample t-test of Ab gap before and after tympanoplasty was significant in both groups, with P<.001. The

success rate was 84.7% in the fascia group and 80% in the cartilage group.

**Conclusion**: The temporalis graft success rate superseded that of tragal cartilage. Availability of cartilage slicer increased the surgeon's use of tragal cartilage.

Keywords: Myringoplasty, tympanoplasty, tragal cartilage, graft, otitis media

**Introduction:**

Myringoplasty or type one tympanoplasty is an operation to renovate the tympanic membrane in chronic otitis media with perforation by different graft materials [1]. Heerman used temporalis fascia graft in 1958, yet it is the most popular graft for ENT surgeons [2]. The other commonly used graft materials were tragal cartilage and tragal perichondrium. The cause of the perforation was acute otitis media, which progressed to chronic otitis media and a permanent perforation [3]. Other causes included different types of traumatic injury such as a direct blow, isolated severe injury associated with temporal bone fracture, barotrauma, diving, and iatrogenic [4]. Tympanic membrane perforation may be asymptomatic; most patients presented with a discharging ear and hearing loss [5.6]. The indications for myringoplasty were recurrent aural discharge, hearing loss, and swimming without waterproof earplugs [7]. Contraindications of tympanoplasty were cholesteatoma, contralateral dead ear, and eustachian tube dysfunction [8,9]. The success of myringoplasty depends on the patient's age, infective case, condition of the other ear, reperforation rate, mastoid condition, and smoking [10, 11]. The autologous temporalis fascia graft is the most commonly used for all types of perforation, with success rates of 77-99% in adults and 34-94% in children [12]. Sliced tragal cartilage is now considered one of the best graft materials for larger perforations, and the success rate was 94% [13]. Some debate exists between temporalis fascia and sliced tragal cartilage, with the hearing gain being greater in temporalis fascia than in tragal cartilage. Long-term follow-up results up to 1 year showed that hearing outcomes were the same in both groups [14].

The study aimed to compare the most commonly used graft materials in tympanoplasty: temporalis fascia and tragal cartilage. The paperwork included appropriate patient selection, operative procedure, postoperative hearing outcomes, failures, and complications, with graft material being the best for the patients.

**Methods**:

It was an equitable survey of the ENT inpatient departments of two specialized hospitals, Comilla Medical College (http://www.comc.college.gov.bd) and Cumilla Medical Center PVT LTD (http://www.cumillamedicalcenter.com), from 15 August 2016 to 30 November 2025. Two hundred patients with inactive mucosal variety of com (Chronic otitis media) were included in the study, of whom one hundred and fifty underwent tympanoplasty with temporalis fascia graft, and fifty with sliced tragal cartilage. All essential investigations were completed before the procedure. Pure tone audiometry (PTA), Impedance audiometry, and Stapedial reflex test (SRT) were performed for hearing assessment, and a high-resolution CT (computed tomography) scan was performed for any mastoid air cells patency, ossicular chain demolition, and presence of any cholesteatoma in the middle ear cavity. Before surgery, all investigations were performed for local anesthesia and deep sedation, including injection of pethidine or nalbuphine hydrochloride for sedation. Preoperatively, we apply Veet hair removal cream in the vibrissae of the external auditory canal to remove the hair, which

frequently obstructs the telescopic view of the endoscope. Firstly, we use a local anesthetic agent, lidocaine hydrochloride 2% with adrenaline, to inject intradermally to cover the full auricular circumference, and use an insulin syringe or baby needle to infiltrate the external auditory canal. The anesthetist sedated the patient with injection pethidine and injection vergon, and maintained the sedation with injection propofol diluted with normal saline. A small incision was made in the posterior auricular region for harvesting a temporalis fascia graft. The graft was dried with a hair dryer for a minute. In the case of the tragal cartilage, we made an incision on the inner side of the cartilage while preserving the tragus, then sliced it with Mubarak Khan's slice machine. We use a small piece of cotton soaked in adrenaline to achieve hemostasis in the external auditory canal and tympanic membrane during incision of the posterior tympanomeatal flap and fashioning of the perforation margin. We use a small piece of Gelfoam to create a cushion beneath the tympanic membrane and to fix the graft over it. We use Supratule, a medicated non-stick gauze dressing soaked in paraffin and framymycin sulphate in the external auditory canal to prevent bacterial infections. After the operation, the patient was discharged on the first postoperative day; the dressing was changed on the 4th postoperative day, and Supratule was removed on the 12th postoperative day. The patient was advised to come for follow-up on the 15th day, three months, and six months after pack removal. We advised a PTA test at the three-month follow-up period.

Here, the definite variables of interest were gender, residential status, socioeconomic status, perforation size, postoperative outcome, and age in years; Ab gap before operation, Ab gap after operation, refinement of Ab gap, and follow-up time in months were the constant variables. All data were processed in SPSS 31. A significant p-value was set at <.05.

**Result:**

The definite variables were analyzed using frequencies and percentages (Table 1). The constant factors were investigated in mean and Std. Deviation, minimum, and maximum (Table 2). In Team One, men (120; 80%) were more prevalent than females (30; 20%); likewise, in Team Two, men were 41 (82%) compared with females 9 (18%). Residential status indicated that rural (124; 82.7%) was more than urban (26; 17.3%) in Team One, and rural (39; 78%) and urban (11; 22%) in Team Two. Socioeconomic status: poor was highest in both Team One and Two; in Team One, poor was 120 (80%), lower middle 18 (12%), and upper middle 12 (8%), and poor was 35 (70%), lower middle 11 (22%), and upper middle 4 (8%) in Team Two. Size of the perforation of tympanic membrane: medium was highest in both Team One and Two; medium was 115 (76.7%), big 26 (17.3%), and little 9 (6%) in Team One, and medium was 31 (62%), big 16 (32%), and little 3 (6%) in Team Two. Postoperative outcome: success was near to both Team One (84.7%) and Team Two (80%), success was 127 (84.7%), failure 12 (8%), and other 11(7.3%) in Team One, and success was 40 (80%), failure 7 (14%), and 3 (6%) in Team Two. The mean age was 36.14±9.35 years, minimum 18 and maximum 60 in Team One, and 40.12±9.952 years, minimum 22 and maximum 60 years in Team Two. The Ab (Air-bone) gap before operation was 15.88±1.969 dB (Decibel), minimum 13 and maximum 22 in Team One, and 17.04±2.610 dB, minimum 14 and maximum 22 in Team Two. The Ab (Air-bone) gap after operation was 9.20±3.034, minimum 0 and maximum 13 in Team One, and 6.96±3.010 dB, minimum 0 and maximum 10 in Team Two. The refinement of the Ab gap was 6.95±5.189 dB (minimum 2, maximum 28 dB) in Team One, and 10.48±5.548 dB (minimum 6, maximum 27 dB). The mean follow-up time in months was 2.56±4.678 months (minimum 1 month, maximum 24 months) in Team One, and 4.26±7.414 months (minimum 1 month, maximum 24 months) in Team Two.

Paired-Sample t-test performed on the Ab gap between Team One and Team Two before and after myringoplasty showed significant in both groups except for the result of t, t=19.441, P < .001in Team One, and t=16.156,

P < .001. The result of the paired-sample t-test of Ab gap after tympanoplasty and refinement of Ab gap exhibited notable differences in both groups, with t=3.544, P<.001 in Team One, and t=-3.021, P=.004 in Team Two [Table 3].

Univariate assessment of factors: the dependent variable was follow-up time in months, and sex, F=5.968, P=.016 in Team One, F=.128, P=.722 in Team Two, types of perforation, F=75.709, P=<.001in Team One, F=10.575, P=<.001in Team Two, sex*types of perforation, F=13.153, P=<.001 in Team Two, F=.195, P=.661, outcome of surgery, F=547.864, P=<.001 in Team One, F=984.523, P=<.001, reside, F=1.240, P=.267 in Team One, F=14.325, P=<.001 in Team Two, reside*types of perforation, F=1.018, P=.315, in Team One, F=15.282, P=<.001, in Team Two, and reside*types of perforation, F=4.867, P=.009, F=.429, P=.516, Team Two [Table 4].

Multivariate assessment of factors: the dependent variable was Ab gap after tympanoplasty and refinement of Ab gap: in sex, Ab gap after tympanoplasty, F=6.739, P=.010, refinement of Ab gap, F=3.910, P=.050 in Team One, Ab gap, F=.147, P=.731, refinement, F=.139, P=.771 in Team Two, types of perforation, Ab gap, F=39.061, P=<.001, refinement, F=78.954, P=<.001 in Team One, Ab gap, F=4.918, P=.012, refinement, F=6.818, P=.003 in Team Two, sex*types of perforation, Ab gap, F=13.061, P=<.001, refinement, F=9.431, P=<.001 in Team One, Ab gap, F=.024, P=.877, refinement, F=.014, P=.908 in Team Two, reside, Ab gap, F=.745, P=.390, refinement, F=.098, P=.754 in Team One, Ab gap, F=13.221, P=<.001, refinement, F=11.196, P=.002 in Team Two, reside*types of perforation, Ab gap, F=.990, P=.321, refinement, F=.051, P=.821in Team One, Ab gap, F=11.214, P=.002, refinement, F=12.114, P=.001in Team Two, and outcome, Ab gap, F=262.899, F=<.001, refinement, F=899.019, P=<.001 in Team One, Ab gap, F=221.083, P=<.001, refinement, F=80.066, P=<.001 in Team Two [Table 5].

Figures 1, 2, and 3 were the histograms of Ab gap before perforation, Ab gap after tympanoplasty, and refinement of Ab gap in Team One. Figures 4, 5, and 6 were the histograms of Ab gap before perforation, Ab gap after tympanoplasty, and refinement of Ab gap in Team Two.

**Table 1: Frequency and percentage of definite variables.**

| Determinants | Type | Team one | n-150 | Team two | n-50 | Total |
|---|---|---|---|---|---|---|
| | | Frequency | Percentage | Frequency | Percentage | |
| Gender | Male | 120 | 80% | 41 | 82% | 161 |
| | Female | 30 | 20% | 9 | 18% | 39 |
| Residential status | Rural | 124 | 82.7% | 39 | 78% | 163 |
| | Urban | 26 | 17.3% | 11 | 22% | 37 |
| Socioeconomic status | Poor | 120 | 80% | 35 | 70% | 155 |
| | Lower middle | 18 | 12% | 11 | 22% | 29 |
| | Upper middle | 12 | 8% | 4 | 8% | 16 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Size of the perforation | Little | 9 | 6% | 3 | 6% | 12 |
| | Medium | 115 | 76.7% | 31 | 62% | 146 |
| | Big | 26 | 17.3% | 16 | 32% | 42 |
| Postoperative outcome | Succes | 127 | 84.7% | 40 | 80% | 167 |
| | Failure | 12 | 8% | 7 | 14% | 19 |
| | Other | 11 | 7.3% | 3 | 6% | 14 |

**Table 2: Mean, Std. Deviation, Minimum, and Maximum of Constant Variables.**

| **Factors** | **Team One** | | **n-150** | | | **Team Two** | | **n-50** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Age In years** | **Ab gap before surgery** | **Ab gap after surgery** | **Refinement of Ab gap** | **Follow-up Time in month** | **Age In years** | **Ab gap before surgery** | **Ab gap after surgery** | **Refinement of Ab gap** | **Follow-up Time in month** |
| **Mean** | **36.14** | **15.88** | **9.20** | **6.95** | **2.56** | **40.12** | **17.04** | **6.96** | **10.48** | **4.26** |
| **Std. deviation** | **9.357** | **1.969** | **3.034** | **5.189** | **4.678** | **9.529** | **2.610** | **3.010** | **5.548** | **7.414** |
| **Minimum** | **18** | **13** | **0** | **2** | **1** | **22** | **14** | **0** | **6** | **1** |
| **Maximum** | **60** | **22** | **28** | **28** | **24** | **60** | **22** | **10** | **7** | **24** |

**Table 3: Paired-sample t-test of Ab gap before and after tympanoplasty.**

| Determinants | Team one | n-150 | Team two | n-50 |
|---|---|---|---|---|
| Ab gap before and After tympanoplasty | t | P value | t | P value |
| | 19.441 | <.001 | 16.156 | <.001 |
| Ab gap after tympanoplasty and refinement of Ab gap | 3.439 | <.001 | -3.021 | .004 |

**Table 4: Univariate assessment of variables: Dependent factor; Follow-up time.**

| Determinants | Team one n-150 | | Team two n-50 | |
|---|---|---|---|---|
| | F | P value | F | P value |
| sex | 5.968 | .016 | .128 | .722 |
| Types of perforation | 75.709 | <.001 | 10.575 | <.001 |
| Sex*types of perforation | 13.153 | <.001 | .195 | .661 |
| Outcome of surgery | 547.864 | <.001 | 984.523 | <.001 |
| reside | 1.240 | .267 | 14.325 | <.001 |
| Reside*types of perforation | 1.018 | .315 | 15.282 | <.001 |
| Reside*outcome of surgery | 4.867 | .009 | .429 | .516 |

**Table 5: Multivariate assessment of variables: Dependent factors; Ab gap after tympanoplasty and refinement of Ab gap after operation.**

| Determinants | Dependent factor | Team one n-150 | | Team two n-50 | |
|---|---|---|---|---|---|
| | | F | P value | F | P value |
| sex | Ab gap after tympanoplasty | 6.739 | .010 | .147 | .731 |
| | Improvement of Ab gap | 3.910 | .050 | .139 | .771 |
| Types of perforation | Ab gap after tympanoplasty | 39.061 | <.001 | 4.918 | .012 |
| | Improvement of Ab gap | 78.954 | <.001 | 6.818 | .003 |
| Sex*types of perforation | Ab gap after tympanoplasty | 13.061 | <.001 | .024 | .877 |
| | Improvement of Ab gap | 9.431 | <.001 | .014 | .908 |
| reside | Ab gap after tympanoplasty | .745 | .390 | 13.221 | <.001 |
| | Improvement of Ab gap | .098 | .754 | 11.196 | .002 |
| reside*types of perforation | Ab gap after tympanoplasty | .990 | .321 | 11.214 | .002 |
| | Improvement of Ab gap | .051 | .821 | 12.114 | .001 |
| outcome | Ab gap after tympanoplasty | 262.899 | <.001 | 221.083 | <.001 |
| | Improvement of Ab gap | 899.019 | <.001 | 80.066 | <.001 |

**Figure 1: Histogram of Ab gap before operation in the Team One group.**

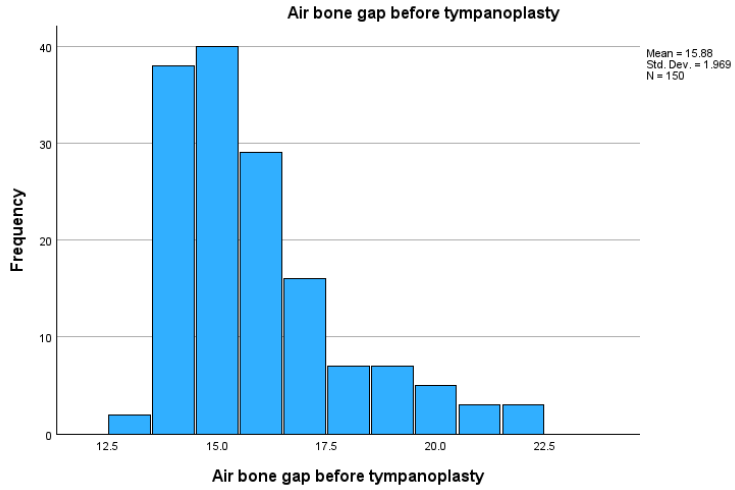



**Figure 2: Histogram of Ab gap after operation in the Team One group.**

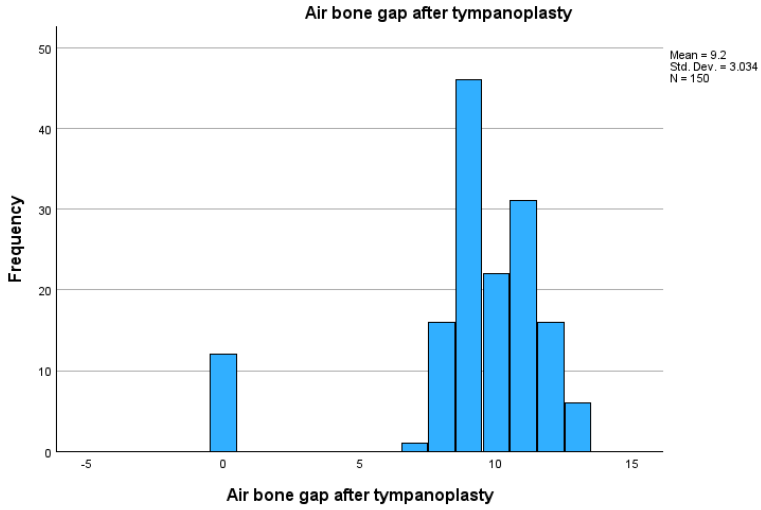



**Figure 3: Histogram of Ab gap refinement after the operation in the Team One group.**

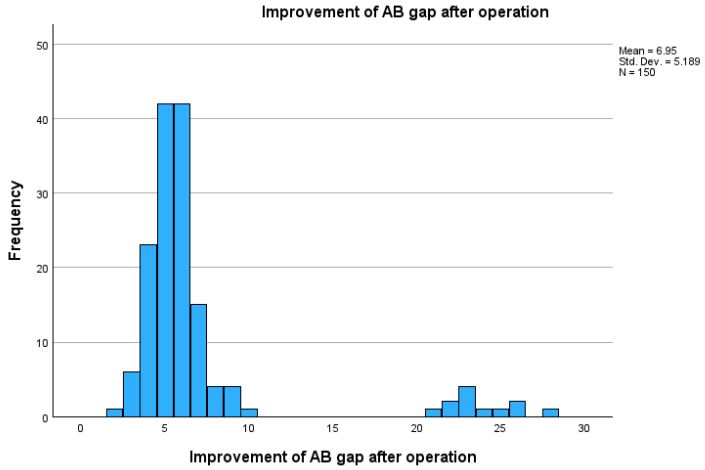


**Figure 4: Histogram of Ab gap before operation in the Team Two group.**

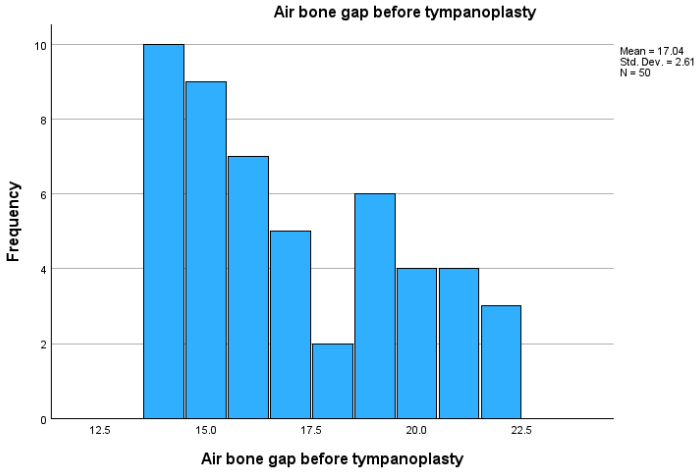



**Figure 5: Histogram of Ab gap after operation in the Team Two group.**

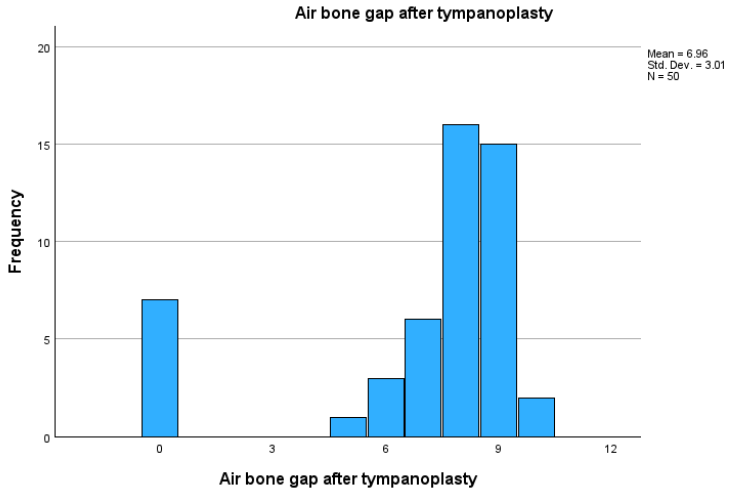
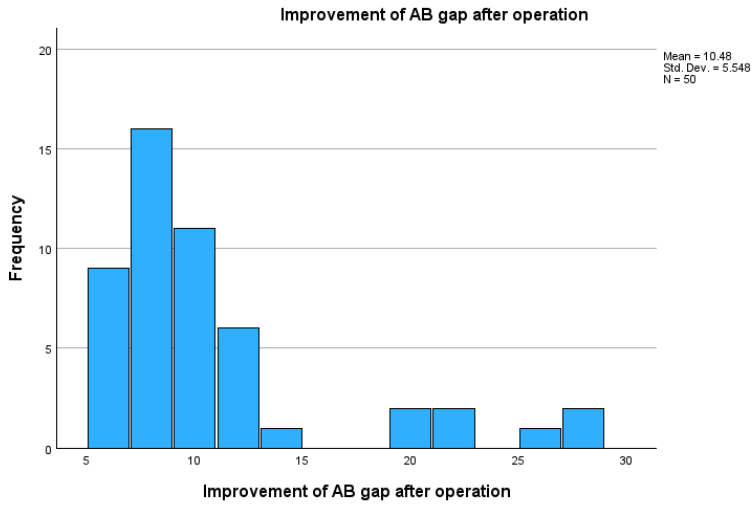



**Figure 6: Histogram of Ab gap refinement after the operation in the Team Two group.**



## 4. Discussion:

The surgeon chose the graft material that is appropriate for him. Some patients choose to undergo the operation without a scar mark or cutting the skin. The surgeon is also popular for the slogan that there is an operation without any incision or suturing in the patient's body. Tympanoplasty with tragal cartilage can help fulfill the patient's wishes. In this study, the success rate of temporalis fascia (84.7%) is a bit higher than that of tragal cartilage (80%). It depends on several factors, including surgeon and patient factors, as well as the advice given to the patient after the operation.

### 4.1 Gender:

In the present research, males dominated females: 120 (80%) males and 30 (20%) females in Team One; 41 (82%) males and 9 (18%) females in Team Two. Univariate assessment showed that sex and sex*types of perforation were significant in Team One, F=5.968, P=.016, F=13.153, P < .001; insignificant in Team Two, F=.128, P=.722, F=.195, P=.661. Multivariate assessment exhibited that sex and sex*types of perforation were meaningful in Team One, Ab gap after tympanoplasty, and refinement of Ab gap, F=6.739, P=.010, F=3.910, F=39.061, F=<.001, F=78.954, P=<.001; sex was negligible, and sex*types of perforation were considerable in Team Two, F=.147, P=.731, F=.771, F=4.918, P=.012, F=6.818, P=.003. Shinde V [15] reported that females outnumbered males in the temporalis fascia group: 13 females (52%) and 12 males (48%), whereas in the tragal cartilage group, the reverse was observed: 14 males (56%) and 11 females (44%). Tasrif SM [16] recorded 15 males (60%) and 10 females (40%) in the temporalis fascia group, and 14 males (56%) and 11females (44%) in the tragal cartilage group. Ozdamar K [19] documented 23 males (56.1%) and 18 females (43.9%) in the cartilage perichondrium group, and 25 males (62.5%) and 15 females (37.5%) in the temporalis fascia group. Ferlito S declared [20] 52 females (53.06%) and 46 males (46.93%) in the fascia group, and 24 males (54.54%) and 20 females (45.46%) in the cartilage group. Gender distribution is one of the influential demographic factors for evaluating the suffering population. Here, most researchers revealed that males were more susceptible than females.

### 4.2 Age:

The recent study showed that the mean age was 36.14±9.357 years (minimum 18, maximum 60) in Team One, and 40.12±9.529 years (minimum 22, maximum 60) in Team Two. Tasrif SM [16] reported that the mean age was 32.30±10.93 years, ranging from 16 to 58 years in both groups. Reddy R [17] recorded that the age of both groups ranged from 12 to 60 years. Mohanty S [18] documented that the mean age was 31.3±4.9 years in the cartilage group and 30.2±4.2 years in the fascia group, with a minimum of 12 and a maximum of 58 years, respectively. Ozdamar K [19] reported mean ages of 22.10±9.26 years in the perichondrium group and 21.68±11.40 years in the fascia group, with all patients aged above 18 years. Ferlito S declared [20] that the mean age was 52.5±18.9 years in the fascia group and 55.3±14.5 years in the cartilage group. The age distribution varied across geographic regions, and all researchers reported a minimum age of 18 years, similar to our study.

### 4.3 Residential and Socioeconomic Status:

In this paper, rural and poor people suffered more than urban and rich people. Rural were 124 (82.7%) and urban 26 (17.3%) in Team One, and rural 39 (78%) and urban 11 (22%) in Team Two. Poor: 120 (80%), lower middle 18 (12%), and upper middle 12 (8%) in Team One; poor 35 (70%), lower middle 11 (22%), and upper middle 4 (8%) in Team Two. Univariate scrutiny results were that residence and residence*types of perforation were notable in Team Two; residence was F=14.325, P < .001, and types of perforation were F=15.282, P<.001, and unremarkable in Team One; residence was F=1.240, P<.001, and types of perforation were F=1.018, P<.315. Residence*outcome of surgery was notable in Team One; F=4.867, P=.009, and unremarkable in Team Two; F=.429, P=.516. Multivariate evaluation indicated that residence and residence*types of perforation were meaningful in Team Two; residence was F=13.221, P<.001in

Ab gap after tympanoplasty and F=11.196, P=.002 in refinement of Ab gap after surgery; residence*types of perforation was F=11.214, P=.002 in Ab gap after tympanoplasty, F=12.114, P=.001 in refinement of Ab gap after surgery; unmeaningful in Team One; residence was F=.745, P=.390 in Ab gap after tympanoplasty, F=.098, P=.754 in refinement of Ab gap after surgery, residence*types of perforation were F=.051, P=.321 in Ab gap after tympanoplasty, F=.051, P=.821 in refinement of Ab gap after surgery. Residential and socioeconomic conditions were decisive factors, as in developing countries like Bangladesh. Here, poor people live in rural areas where ponds, tanks, and canals are available for bathing and cleaning. These are remarkable causes for ear disease and prolonged suffering from acute otitis media, and subsequently chronic otitis media. Health care facilities were not available in the rural area. Due to the distance to the tertiary care hospital, they could not receive surgical treatment on time and could not afford the cost of treatment. After treatment, most patients do not follow up regularly.

**4.4 Size of Perforation:**

The study reported that the perforations had three sizes. In Team One, medium perforation was 115 (76.7%), big perforation 26 (17.3%), and little perforation 9 (6%); in Team Two, medium perforation was 31 (62%), big perforation 16 (32%), and little perforation 3 (6%). Univariate appraisal of perforation types showed significant differences in F value for both teams: Team One, F=75.709, P<.001; Team Two, F=10.575, P<.001. Multivariate judgment of types of perforation was more notable in Team One than in Team Two; Team One, Ab gap after tympanoplasty was F=39.061, P<.001, and refinement of Ab gap, F=78.954, P<.001; Team Two, Ab gap after tympanoplasty, F=4.918, P=.012, and refinement of Ab gap, F=6.818, P=.003. Shinde V (15) reported that both groups had a subtotal perforation of 1 (2%), a large perforation of 16 (32%), a medium perforation of 26 (52%), and a small perforation of 7 (14%). Tasrif SM [16] reported that perforations were of two sizes in both groups: medium-sized perforations numbered 28 (56%), and small-sized perforations numbered 22 (44%). Mohanty S [18] divided tympanic membrane perforation into two types in both groups: greater than 50% was category two, and less than 50% was category one. Cartilage had 29 (33.33%) in category one and 58 (66.67%) in category two; fascia had 29 (29%) in category one and 71 (71%) in category two. Ozdamar K [19] documented perforation into three types: medium (25-50%), subtotal (>50%), and total (100%). Medium was 25 (60.9%), subtotal 14 (34.2%, and total 2 (4.9%) in perichondium group A, and medium was 26 (65.0%), subtotal 13 (32.5%), and total 1 (2.5%) in fascia group B. Ferlito S [20] separated perforations into two types in both groups:>50% and <50%. The size of the perforation influences the success rate. Every study differentiates it; more papers, divided into three types, support our work.

**4.5 Postoperative Outcome:**

The present inquiry indicated that the postoperative outcomes were: success 84.7% (127), failure 8% (12), and other 7.3% (11) in Team One; and success 80% (40), failure 14% (7), and other 6% (3) in Team Two. The other outcome was successful graft uptake, with complications such as hearing loss and tinnitus. The fascia group had 7.3% (11), of which hearing loss was 81.82% (9) and tinnitus was 18.18% (2), and the tragal group had 6% (3), of which hearing loss was 33.33% (1) and tinnitus was 66.67% (2). Univariate evaluation showed that postoperative outcomes were meaningful in both teams: Team One (F=547.864, P<.001) and Team Two (F=984.523, P<.001). Multivariate evaluation of postoperative outcome was also notable in both teams: Team One (Ab gap after tympanoplasty, F=262.899, P<.001; refinement of Ab gap, F=899.019, P<.001) and Team Two (Ab gap after tympanoplasty, F=221.083, P<.001; refinement of Ab gap, F=80.066, P<.001). Tasrif SM [16] recorded that success was 88% (22) and failure 12% (3) in the fascia group, and success was 60% (15) and failure 40% (10) in the cartilage group. Reddy R [17] reported that in the fascia group, success was 84.50% (60), failure 9.85% (7), and the other 7.04% (5); in the cartilage

group, success was 98.36% (60) and failure 1.63% (1). Mohanty S [18] divided success and failure based on perforation size; 50% or less was category one, and >50% perforation was category two. In category one, success was 68.9% (20), and failure was 31.1% (9) in the fascia group, and success was 89.6% (26), and failure was 10.4 (3) in the cartilage group; in category two, success rate was 83.1% (59), and failure was 16.9% (12) in the fascia group, and success rate was 93.1% (54), and failure was 6.9% (4). Ozdamar K [19] reported a success rate of 92.6% (38) and a failure rate of 7.4% (3) in the cartilage perichondrium group, and a success rate of 90% (36) and a failure rate of 10% (4) in the fascia group. Ferlito S [20] recorded a success rate of 84.69% (83) and a failure rate of 15.31% (15) in the fascia group, and a success rate of 90.91% (40) and a failure rate of 9.09% (4). The significant observation in the study papers was that logistical technical support for the cartilage slicer was available in developed countries; the success rate was high, and failures were fewer. Bangladesh is a developing country with limited logistical support; that's why the practice of cartilage grafting is lower. So, the success rate in the cartilage group was lower than in the fascia group.

**4.6 Ab Gap Before and After Tympanoplasty; Refinement of Ab Gap:**

This contemporary work reported that the mean Ab gap before and after surgery was 15.88±1.969 dB and 9.2o±3.034 dB, respectively; refinement was 6.95±5.189 dB in the fascia group. The mean Ab gap before and after surgery was 17.04±2.610 dB and 6.96±3.010 dB, respectively; the refinement was 10.48±5.548 dB in the cartilage group. Paired -sample t-test of Ab gap before and after tympanoplasty showed a significant in both groups, with t=19.441, P<.001 in the fascia group and t=16.156, P<.001 in the cartilage group; t-test of Ab gap after tympanoplasty and refinement of Ab gap exhibited a notable difference in both groups, with t=3.423, P<.001 in the Team One, and t=-3.021, P=.004 in the Team Two. Shinde V [15] reported that the mean Ab gap before and after tympanoplasty was 29.2±5.33 and 15±5.59 dB; refinement was 14.2±4.93 in the fascia group. The mean Ab gap before and after tympanoplasty was 27.4 and 10.4±5.18 dB; refinement of Ab was 17±4.93 dB in the tragal cartilage group, which was significant in postoperative Ab gap, P=.0041, and in refinement of Ab, P=.042. Tasrif SM [16] recorded that the mean Ab gap before and after operation in small perforation was 24.17±2.86, and 15±2.58 dB, P<.001, in medium perforation 32±3.15, and 20±3.13 dB, P<.001, refinement was 9.17±0.32 in small-size perforation, and 12±.02 in medium-size perforation, P<.001, in the fascia group; the mean Ab gap before and after operation in small perforation was 26.17±2.56 and 16±2.27 dB, P<.001, in medium perforation was 34.17±3.02 and 22±3.29 dB, P<.001, refinement was 10.17±.29 dB in small-size perforation and 12.17±0.27 dB, P<.001, in the cartilage group. Reddy R [17] reported that Ab gap closure <10 dB was 82% (49) cases and >10 dB was 18% (11) in the fascia group, and Ab gap closure <10 dB was 78% (45), and Ab gap >10 dB was 22% (13) in the cartilage group. Mohanty S [18] documented that the mean Ab gap before and after tympanoplasty was 27.7±4.47 and 10.18±3.21, respectively, and refinement of Ab gap ratio was 17±3.84% in the cartilage group; the mean Ab gap before and after tympanoplasty was 28.33±4.48 and 13.87±6.64, respectively, and refinement of Ab gap was 15.26±5.56 in the temporalis fascia group. The mean difference in postoperative Ab gap between the cartilage and fascia group was notable (P=.00096). The refinement between the two groups was substantial (P=.04). Ozdamar K [19] stated that the mean Ab gap before and after tympanoplasty was 27.3±4.7 and 14.60±6.2 dB, respectively; refinement of Ab gap was 12.90±4.88 dB in the cartilage perichondrium group. The mean Ab gap before and after tympanoplasty was 28.1±6.4 dB and 12.5±7.2 dB, respectively; the Ab gap refinement in the fascia group was 15.60±6.98 dB. The mean difference in preoperative and postoperative Ab gap between the cartilage and fascia group was notable (P<.01). Ferlito S declared [20] that the mean Ab gap before and after tympanoplasty was 20.3±3.0 and 4.9±0.09 dB in the fascia group. The mean Ab gap before and after tympanoplasty was 19.3±2.7 and

5.3±1.2 dB in the cartilage group. The mean difference in preoperative and postoperative Ab gap in the cartilage-and-fascia group was significant (P=.04). Each statement in each study was significant at its respective level, consistent with our documentation.

**4.7 Postoperative Follow-up:**

The postoperative follow-up was the major part of the treatment. If any complication arises at a step, it can be solved. The success rate sometimes increases in the follow-up treatment. The ongoing paper stated that the mean follow-up was 2.56±4.678 months (range: 1-24 months) in Team One, and 4.26±7.414 months (range: 1-24 months) in Team Two. The patient was advised to come for follow-up on the 15th day, three months, and six months after pack removal. We advised a PTA test at the three-month follow-up period. Shinde V [15] reported that all patients were advised to have a regular follow-up visit after 3 months, including an audiometric test. Tasrif SM [16] recorded that they scheduled follow-up visits at six and twelve weeks after the operation. At 12 weeks, the patient was advised to undergo an audiometric test to evaluate postoperative hearing status. Reddy R [17] reported that the patient follow-up schedule was at two weeks, six weeks, three months, one year, and two years. Postoperative audiometric evaluation was performed at six months after tympanoplasty. Mohanty S [18] documented that the patient follow-up schedule was at three months, six months, and one year. They evaluated graft uptake, and the postoperative audiometric evaluation included Ab gap differences after the postoperative period and the closure of the Ab gap. Ozdamar K [19] stated that the patient follow-up schedule was at one, three, and six months after tympanoplasty. An audiometric test was performed at the 6-month follow-up period. They included the success rate parameter, defined as Ab gap closure below 20 dB after the postoperative period. Ferlito S [20] stated that the patient follow-up schedule was at one, three, six, and twelve months, and once a year for five years after tympanoplasty. PTA testing was performed at every follow-up, and Tone Peak Level (TPL), Tolerance Pain Level, or hearing threshold level was measured at 500, 1000, 2000, and 4000 Hz. They also defined functional success as an Ab gap ≤ 20 dB. The study's follow-up schedule was similar to the post-surgery follow-up schedule across all papers, thereby maintaining the overall success rate of the outcome.

**5. Conclusion**:

Surgery is a vital measure to help the patient overcome suffering. A chronic illness like chronic otitis media mucosal variety has surgery as the last treatment. The surgeon's competence and patient selection are most crucial to the success of the surgery. In brief, the present study concluded that the conventional temporalis fascia method is the best, but the tragal cartilage showed a few differences from the fascia group. The availability of upgraded cartilage-slicing machines and the surgeon's expertise made further upgrading of the tragal cartilage group possible.

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