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Outcome of tympanoplasty using the interlay technique: A longitudinal study

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Abstract

The research evaluates how well the interlay procedure functions in type 1 tympanoplasty operations for big central perforations along with studies of both graft uptake rates and auditory outcomes and treatment-related issues.

The study analyzed between 2022 and 2024 patient with chronic otitis media in 60 subjects with dry central perforations between ages 15 and 55, Active otitis media and sensorineural hearing loss cases were not included in the trial. Outcomes were measured through otomicroscopy in combination with pure-tone audiometry using SPSS v20.0,

A 96% successful graft uptake rate was achieved through operatively reducing air-bone gaps from 19.2 to 6.8 dB while complications affected only 1% of patients ($P < 0.01$).

Healthcare professionals choose the interlay technique because it shows reliable outcomes and safety measures to handle large central perforations effectively.

Keywords:

Tympanoplasty -Interlay technique -Air-bone gap -Graft uptake Chronic otitis media

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1. Introduction

1.1. Background of Type 1 Tympanoplasty by Interlay Technique

The surgical technique of Tympanoplasty helps to fix the tympanic membrane while restoring hearing function mainly for patients with central perforations of chronic otitis media. Through type 1 interlay tympanic surgery surgeons place the graft between fibrous and mucosal layers to support both sides of the graft thereby fixing common issues found in

alternative surgical approaches, Multiple studies have confirmed that implanted grafts succeed at high rates and create ample closure of air-bone gaps after surgery, The choice of interlay tympanoplasty results from its minimal complications during surgical treatment.

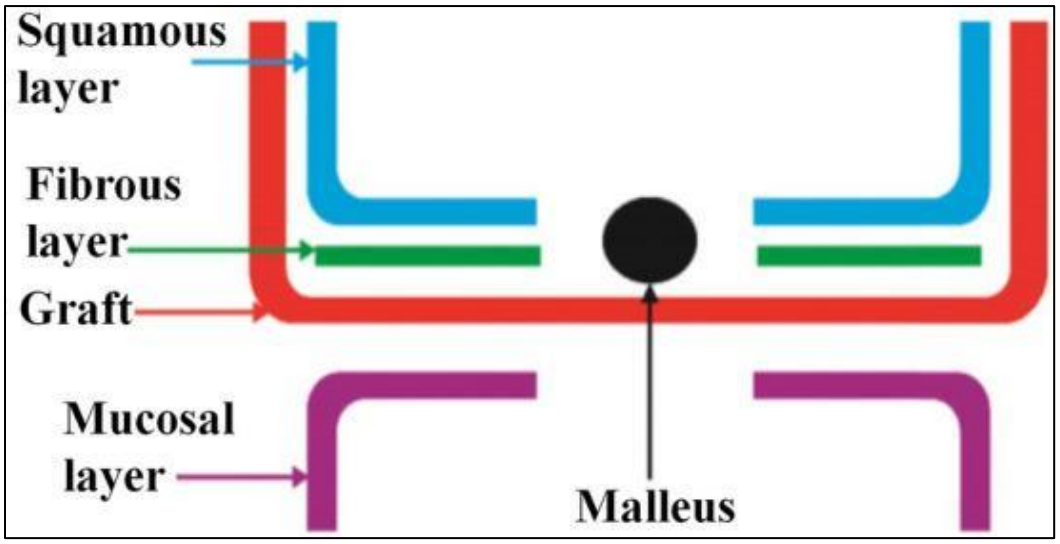

Figure 1: Interlay technique (source: reference (Wadia et al., 2022)[5])

1.2. Purpose of the Study

The research targets an evaluation of interlay tympanoplasty in treating type 1 tympanoplasty for major central perforations while evaluating the impact of graft material uptake on hearing gain along with any possible complications. Research findings show that this procedure leads to outstanding results by securing graft acceptance and achieving air-bone gap (ABG) closure. The interlay technique provides benefits that establish it as the better treatment solution when compared to common strategies for large central perforations. Evaluation through subjective and objective assessments provides essential data that helps establish the surgical success rate in patient outcome improvements, The present research will deliver significant data about tympanoplasty operations by focusing on how well the interlay technique performs in fixing type 1 tympanoplasty for extensive central perforations, The article references Wadia et al. (2022)[5] and Misale et al. (2014)[9].

1.3. Objectives

The research determines the success rate along with hearing improvement and complications in type 1 tympanoplasty grafts with interlay procedures used for large central perforations. Our research builds upon current studies to uncover successful and secure outcomes that arise from interlay tympanoplasty during treatment of chronic otitis media patients who have mucosal involvement together with extensive central perforations. This investigation uses postoperative results analysis of graft uptake and hearing function and complications to contribute significant knowledge about interlay technique implementation in type 1 tympanoplasty surgeries for the field of otolaryngology.

The research by Misal (2022) is available under the title A Study of Interlay Grafting in Type 1 Tympanoplasty for Large Central Perforation.

2. Literature Review

2.1. Overview surgery of Tympanoplasty

Myringoplasty which is also known as tympanoplasty serves as a surgical operation to repair perforated tympanic membranes, The surgery must be performed in chronic otitis media to escalate prevention against hearing deterioration and infections, The main objective of Type 1 tympanoplasty consists of repairing the tympanic membrane but maintaining the integrity of the ossicular system, The surgical procedure uses temporalis fascia or perichondrium grafts as surgical interventions for this surgical application.

The outcome of tympanoplasty depends on three key aspects which are the perforation size as well as the ear discharge duration and patient age, In type 1 tympanoplasty surgeons place the graft between the fibrous layer and mucosal layer of the tympanic membrane, When used instead of underlay or overlay techniques this method produces reduced anterior blunting and decreases the formation of epithelial pearls.

Medical practice has evolved extensively as tympanoplasty surgeons developed multiple techniques with different material options throughout history, The surgical procedure of tympanoplasty serves as an essential medical intervention for treating chronic otitis media since Banzer performed its first version in 1640 until modern surgical techniques, The outcome of type 1 tympanoplasty depends heavily on both the choice of surgical technique and the graft material selecting for each procedure, These studies demonstrate how Interlay myringoplasty performs regarding hearing improvement in large central tympanic membrane perforations according to research published in Tropical Journal of Ophthalmology and Otolaryngology 2024 [3] and Gupta et al. (2023)[4] and Wadia et al. (2022)[5] and Saraf et al. (2022)[15].

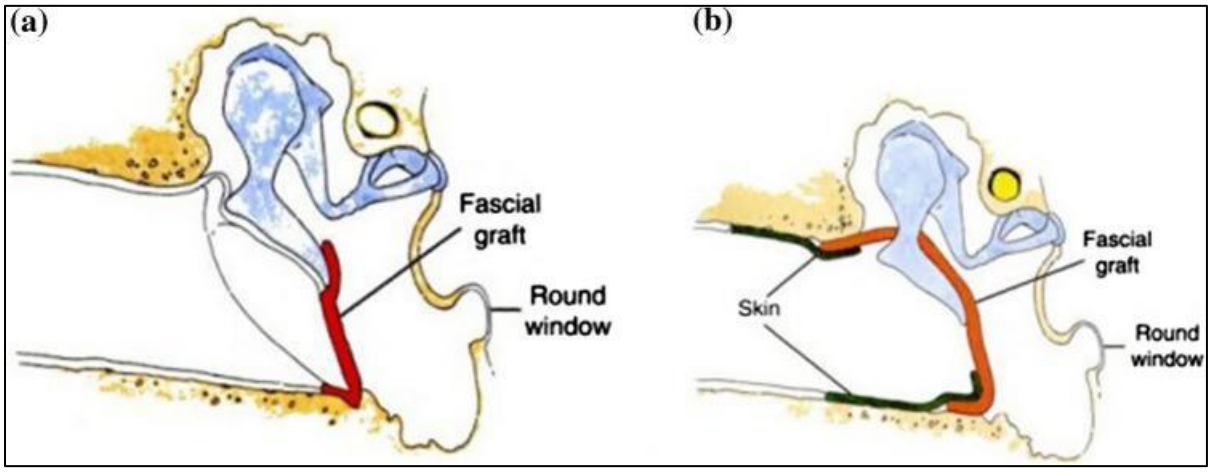

Figure 2: Type I Tympanoplasty: Repair of tympanic membrane perforation with a tissue graft in presence of intact & mobile ossicular chain (source: reference (Wadia et al. 2022)[5])

2.2. Interlay Technique in Type 1 Tympanoplasty

The Interlay technique in Type 1 Tympanoplasty stands out as a top-notch approach for addressing large central perforations boasting high success rates in terms of graft uptake and closure of the Air Bone Gap (ABG), By placing the graft between the mucosal and fibrous layers this technique lead to optimal growth on both sides of the graft leading to the effective closure of the perforation. With high graft uptake rate exceeding 90%, the Interlay technique effectively prevents medialization and lateralization of the graft while preserving the integrity of the middle ear space, In comparison to the underlay technique Interlay has demonstrated superior outcomes in terms of hearing improvement and graft take rate, Research studies have shown a substantial decrease in ABG post-surgery with the Interlay method underscoring its exceptional conductive efficacy, Furthermore potential complications such as lateralization or medialization of the graft are greatly minimized thanks to the adequate support provided by surrounding layers All in all Interlay Tympanoplasty emerges as the desired choice for individuals with large central perforations due to its favorable outcomes and numerous benefits See references (Wadia et al, 2022)[5] (abc, 2018)[7] (Sharma et al, 2019)[8].

2.3. Previous Studies on Type 1 Tympanoplasty Outcomes

Recent research highlights the success of using temporalis fascia grafts in tympanoplasty procedures, with remarkable graft uptake rates ranging from 93.3% to 96%, Tragal perichondrium is selected for large perforations and structural support due to its thickness and rigidity, Temporalis fascia is recommended for its low metabolic rate infection resistance. and ease of manipulation, Studies suggest that the choice of graft material may not significantly impact the success rate of tympanoplasty with the Interlay technique consistently achieving success rates exceeding 90%, This technique is recognized as a preferred approach for achieving successful outcomes in Type 1 Tympanoplasty,See reference (TOSHIBA, 2019

3. Methodology

3.1. Study Design

In our investigation on Type 1 Tympanoplasty using the Interlay Technique we implemented a retrospective analysis on 60 patients who underwent tympanoplasty with the Interlay technique without ossiculoplasty from 2022 to 2024. This group was comparing with a cohort of 104 patients who received microscopic surgery (MS) with the underlay technique between 1998 and 2009. The selection criteria involved patients with chronic otitis media, particularly those Requiring tympanic membrane perforation repair and postoperative hearing outcome assessment for over one year Surgeries were carried out under general anesthesia incorporating 2% lignocaine with adrenaline for local infiltration, Postoperative care consisted of antihistamines for three weeks antibiotics analgesics and topical nasal decongestants for one week. Follow-up examinations were scheduled at four weeks -eight weeks and twelve weeks postoperatively to evaluate graft uptake complications and hearing improvement through pure tone audiometry at speech frequencies, These approach enabled us to examine the prevalence of grafting in Type 1 Tympanoplasty using the Interlay Technique

and effectively compare preoperative and postoperative Air-Bone Gap (ABG) closure See references (Motegi et al. 2022)[2] (Zhang & Lou, 2023)[16].

Figure 3: Elevation of the posterior tympanomeatal flap A = anterior P = posterior and S = superior (source: reference (Daneshi et al 2018)[18])

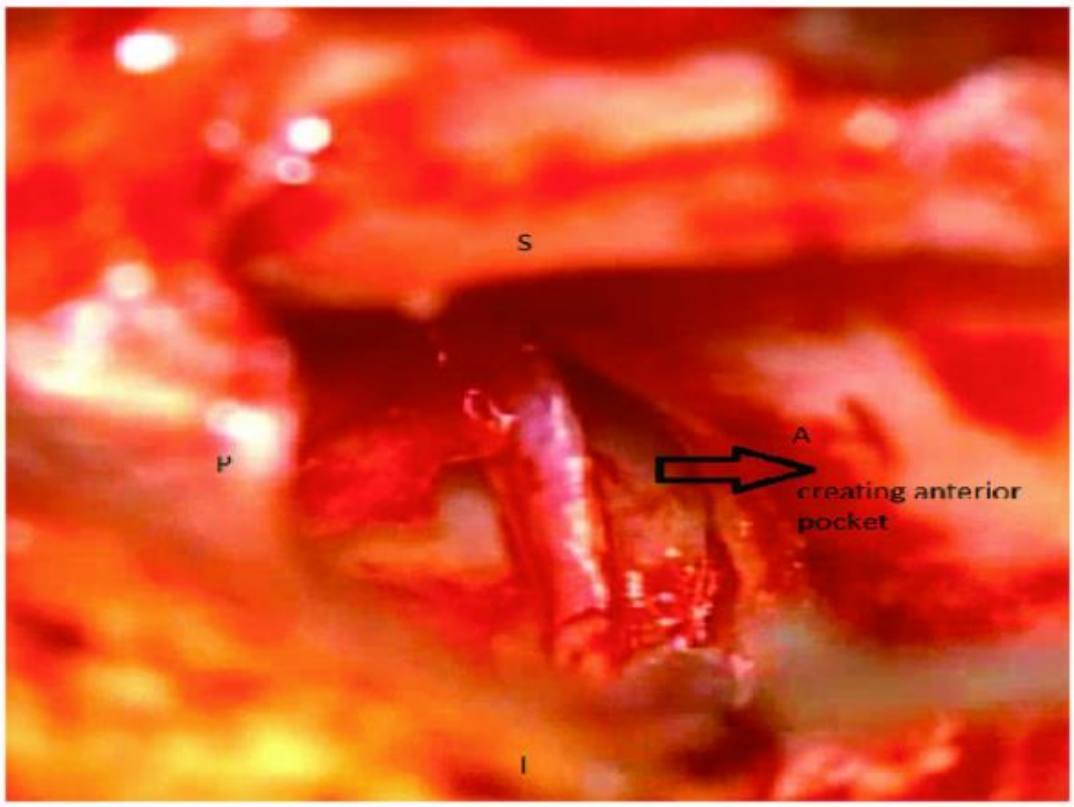

Figure 4: Elevation of the anterior tympanomeatal flap. (source: reference (Daneshi et al 2018)[18])

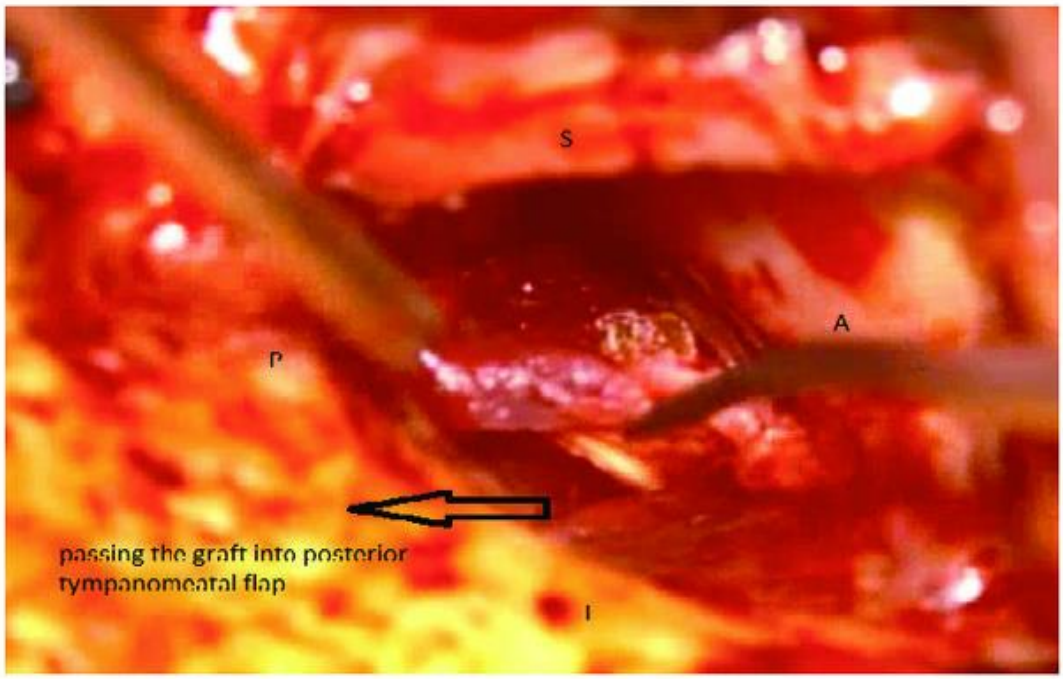

Figure 5: Passing the graft into posterior tympanomeatal flap. (source: reference (Daneshi et al., 2018)[18])

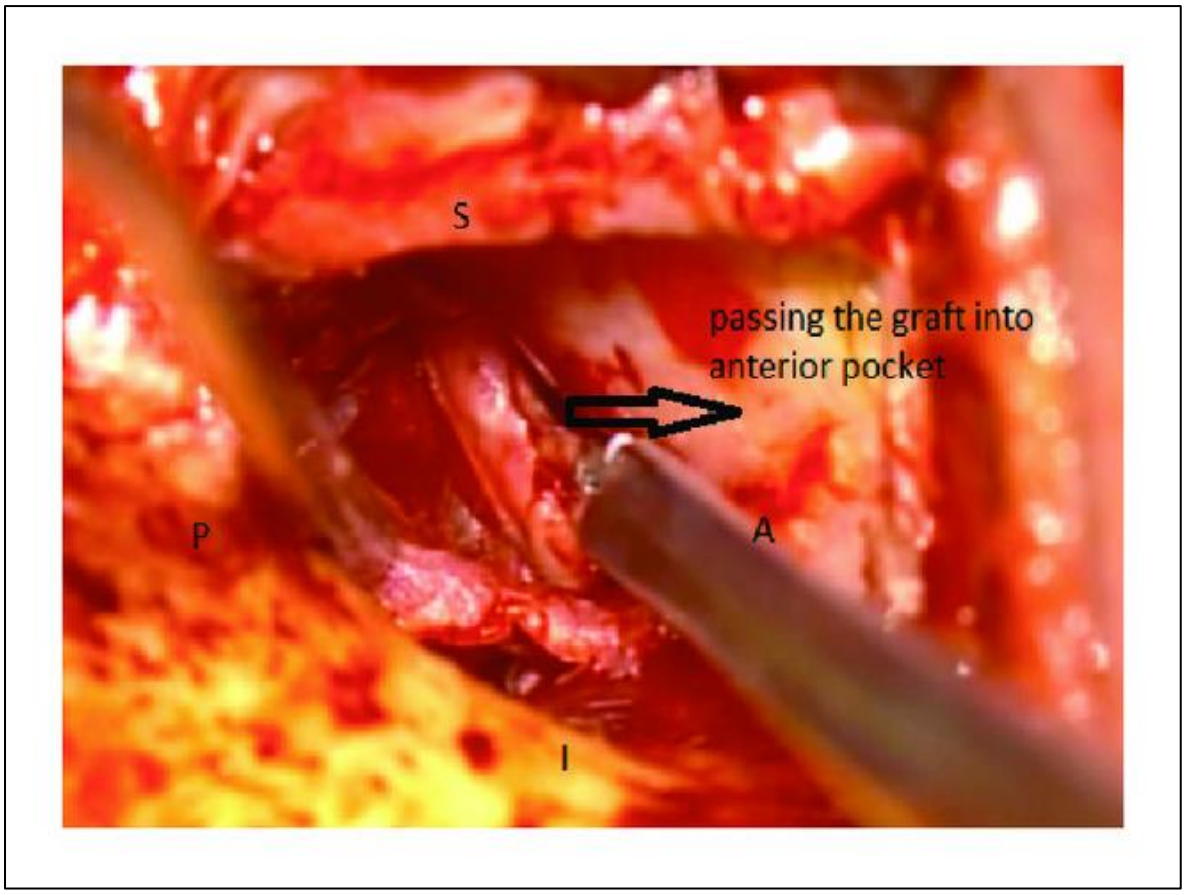

Figure 6: Passing the graft into the anterior pocket. (source: reference (Daneshi et al., 2018)[18])

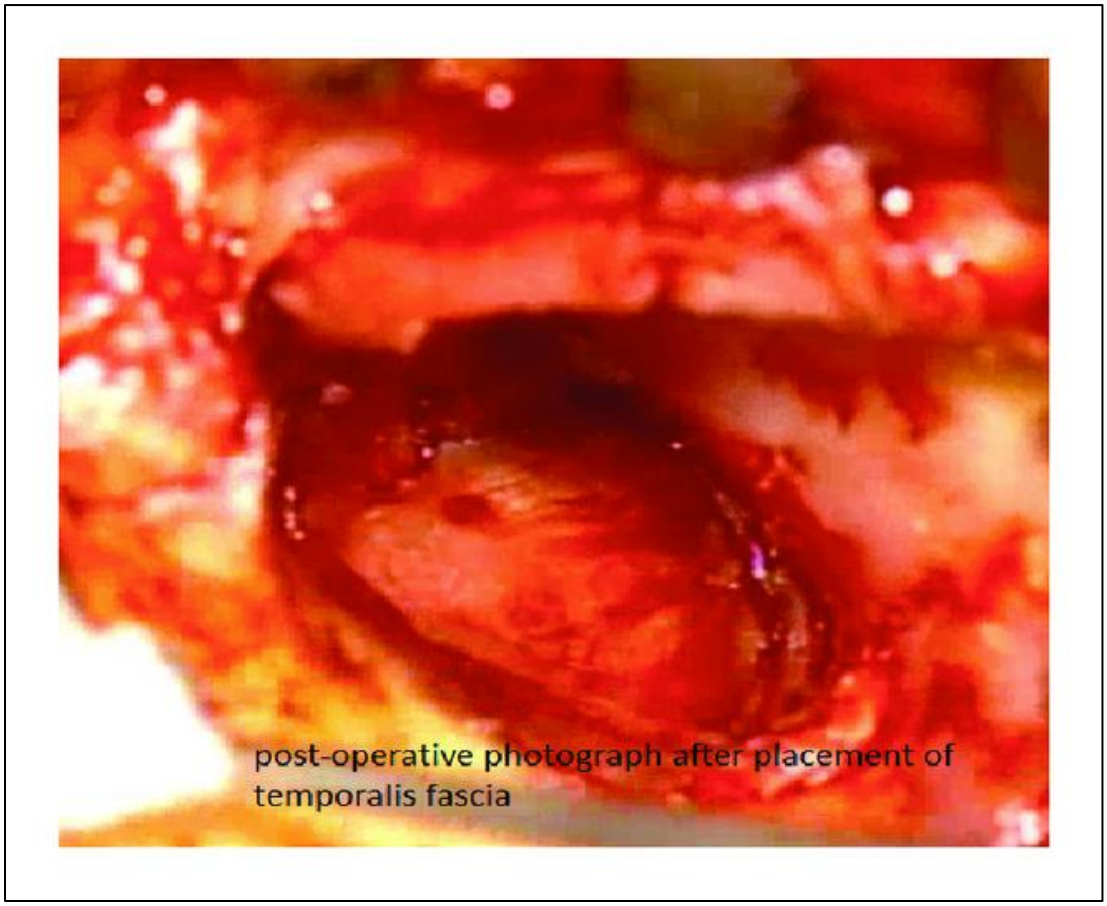

Figure 7: Final result after placement of the graft. (source: reference (Daneshi et al., 2018)[18])

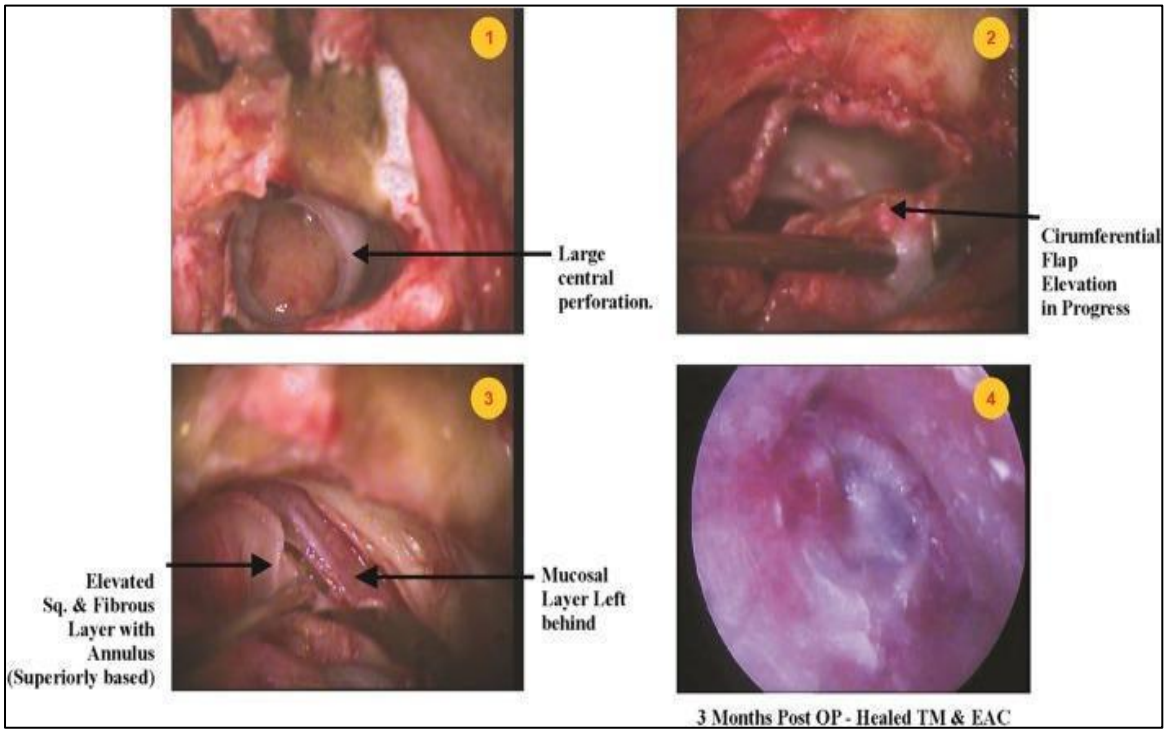

Figure 8: Surgical steps in interlay tympanoplasty (source: reference (Misale et al., 2014)[9])

3.2. Participants Selection Criteria

The research on Tympanoplasty using Interlay Technique requires participants who fulfill these particular requirements. Patients with chronic otitis media who have neither mucosal disease activation nor large perforations that are dry and located in the central part and have reached six weeks of duration qualify for participation The study will evaluate participants from both genders whose age falls within the range of 10 through 60. Patients enrolled in this study need to approve written consent for Type 1 tympanoplasty surgery while agreeing to attend post-operation hearing evaluations The patient selection process excludes individuals who possess active mucosal disease squamous disease ossicular erosion or discontinuity tympanosclerosis sensorineural or mixed hearing loss or patients aged under 10 or above 60 years old with systemic diseases and throat/nose infections or who require revision surgery or do not follow up for 3 months A statistical analysis through SPSS will be performed with procedures established in the relevant literature.

Item	Cartilage Tympanoplasty	Bucket Handle Tympanoplasty	Value
Gender			0.436
Male	15 (50.0%)	12 (40.0%)	
Female	15 (50.0%)	18 (60.0%)	
Mean age	43.6 ± 3.3	44.7 ± 4.1	0.884
Ear under operation			0.426
Right	10 (33.3%)	13 (43.3%)	
Left	20 (66.7%)	17 (56.7%)	
Site of membrane perforation			1.000
Anterior	25 (83.3%)	25 (83.3%)	
Subtotal	5 (16.7%)	5 (16.7%)	

Table 1: Baseline characteristics of study population source: reference Daneshi et al 2018

Item	Cartilage Tympanoplasty	Bucket Handle Tympanoplasty
PTA	Mean ± standard deviation	Mean ± standard deviation
Before surgery	28.92 ± 7.47 dB HL	30.08 ± 11.69 dB HL
3 months after surgery	19.17 ± 4.66 dB HL	17.17 ± 7.98 dB HL
6 months after surgery	18.83 ± 3.87 dB HL	16.92 ± 6.48 dB HL
12 months after surgery	18.67 ± 3.90 dB HL	17.25 ± 6.76 dB HL
SRT	Mean ± standard deviation	Mean ± standard deviation
Before surgery	31.33 ± 7.30 dB HL	32.67 ± 9.80 dB HL
3 months after surgery	23.67 ± 5.07 dB HL	21.33 ± 6.81 dB HL
6 months after surgery	23.33 ± 3.56 dB HL	21.00 ± 5.93 dB HL
12 months after surgery	23.33 ± 3.56 dB HL	21.00 ± 5.93 dB HL
SDS	Mean ± standard deviation	Mean ± standard deviation
Before surgery	98.53 ± 2.40%	96.27 ± 2.70%
3 months after surgery	98.67 ± 2.43%	96.80 ± 3.99%
6 months after surgery	98.67 ± 2.43%	96.80 ± 3.99%
12 months after surgery	98.67 ± 2.43%	96.80 ± 3.99%

Table 2: The change in PTA, SRTand SDS parameter in both groups within the follow-up time, source reference (Daneshi et al 2018

3.3. Data Collection Methods

The research on Type 1 Tympanoplasty utilizing the Interlay Technique will involve a comprehensive data collection approach A retrospective observational review of patient charts who underwent interlay cartilage rim augmented fascia tympanoplasty will be conducted Pre- and post-operative otomicroscopic exams and pure tone audiometry results will serve as key indicators to evaluate both structural and functional enhancements post-surgery The selection criteria will target individuals diagnosed with chronic otitis media-mucosal disease presenting large or subtotal perforations without ossicular erosion. Key metrics such as graft uptake rate. average hearing improvement. and closure of air-bone gap

will be analyzed to assess the effectiveness of the interlay cartilage-fascia rim augmentation method in addressing central perforations The analysis will involve comparing outcomes before and after surgery focusing on improvements in hearing abilities and success rates in terms of structure restoration. Utilizing SPSS software statistical analysis will be carried out to interpret the data collected from participants during a specified timeframe ultimately drawing conclusions about the efficiency of this innovative graft model in tympanoplasty procedures See references (Interlay Cartilage Rim Augmented Fascia Tympanoplasty An Effective Graft Model in Mucosal Chronic Otitis Media, 2022) (abc;p, 2020) (Sphoorthi et al 2019)[14] (Zhang & Lou 2023)[17].

3.4. Statistical Analysis

The measurement of Type 1 Tympanoplasty performed using Interlay Technique derived its data from a research study of 60 patients. Patients between the ages of 15 to 55 years old participated with dry central perforations lasting at least 6 weeks. Among the subjects evaluated the researchers discovered that 96.00% of study participants achieved successful graft uptake. Research data indicated that hearing benefits succeeded in 90% of patients when preoperative and postoperative Air Bone Gap measurements were analyzed. The procedural complications were minimal because patients with post-operative infection problems comprised only 1% of the total cases SPSS version 20.0 served as the tool for statistical data processing and interpretation.

See references: (View of Interlay myringoplasty: hearing gain and outcomein large central tympanic membrane perforation | Tropical Journal of Ophthalmology and Otolaryngology 2024)[3] (Gupta et al 2023)[4].

Age group (years)	**Number of patients**	**%**
11- 20	8	13.33
21- 30	14	23.33
31- 40	16	26.66
41-50	12	20
51-60	10	16.66
Total	**60**	**100**

Table 3: Age distribution of thepatients source reference View of Interlay myringoplasty hearing gain and outcomein large central tympanic membrane perforation Tropical Journal of Ophthalmology and Otolaryngology 2024

Gender	Number	%
Male	34	56.66
Female	26	43.33
Total	**60**	**100**

Table 4: Genderdistribution of the patient source reference View of Interlay myringoplasty hearing gain and outcomein large central tympanic membrane perforation Tropical Journal of Ophthalmology and Otolaryngology 2024

4. Results

4.1. Prevalence of Grafting in Type 1 Tympanoplasty by Interlay Technique

Carrying out grafting procedures remains essential to obtain successful results in Type 1 Tympanoplasty through the application of the Interlay Technique. The research conducted at Dr. D. Y. Patil Hospital determined that graft uptake success reached 96% for central perforation patients. Interlay method outperformed underlay method as studies demonstrated that interlay achieved successful outcomes 94.54% of the time. The tissue placement in the Interlay technique between mucosal and fibrous layers minimizes complications while guaranteeing the best possible growth conditions. Healing times decrease and surgeries become shorter when healthcare providers perform procedures with the Interlay Technique instead of underlay tympanoplasty. The Interlay Technique proves to be highly effective for fixing central perforations of the tympanic membrane hence becoming the preferred method for attaining successful outcomes in tympanoplasty surgeries.
See references abc 2018 Misale et al 2014 abc p 2020

Graft take up	**No. of cases**	**Percentage (%)**
Successful cases	56	96
Failed cases	4	4
Total	100	100

Table 5: Graft uptake source reference Misale et a 2014

	Group	***P* value[a]**	
TEES with interlay (n = 51)	**MS with underlay (n = 104)**		
Age (± SD) years	49.0 (± 23.5)	43.3 (± 21.1)	n.s
Size of perforations 1/2/3/4 quadrants (%)	9/31/8/3 (17.6/60.7/15.7/5.9)	27/43/23/11 (26.0/41.3/22.1/10.6)	
Sites of perforations AQ/PQ/both (%)	23/1/27 (45.1/2.0/52.9)	38/9/57 (36.5/8.7/54.8)	

Successful tympanic membrane healing	50 (98.0%)	96 (92.3%)	n.s
Sites of reperforations AQ/PQ/both	1/0/0	5/1/2	
PTA BC			
Preoperative (± SD) dB	24.2 (± 17.2)	16.0 (± 13.6)	$P < 0.01$
Postoperative (± SD) dB	23.6 (± 16.1)	15.9 (± 13.1)	$P < 0.01$
P value[a]	$P = 0.86$	$P = 0.96$	
PTA AC			
Preoperative (± SD) dB	43.5 (± 18.7)	36.6 (± 16.4)	$P < 0.05$
Postoperative (± SD) dB	30.5 (± 17.5)	26.0 (± 14.6)	n.s
P value[a]	$P < 0.01$	$P < 0.01$	
ABG			
Preoperative (± SD) dB	19.2 (± 9.4)	20.7 (± 8.8)	n.s
Postoperative (± SD) dB	6.8 (± 5.8)	10.1 (± 6.6)	$P < 0.01$
P value[a]	$P < 0.01$	$P < 0.01$	

Table 6: Characteristics of both groups and postoperative results source reference Takahashi et al 2022

Duration of onset of ear discharge (in years)	**Total number of dry ears**	**Improvement in hearing**	**Graft uptake**			
Improved	**Not improved**	**Worsen**	**Taken**	**Not taken**		
0–5	96	69	24	3	90	6
6–10	36	24	6	6	33	3
11–15	15	9	6	0	15	0
> 15	3	3	0	0	0	3

Table 7: Duration of hearing impairment after surgical outcome in dry ear source reference

(Panchal et al 2022

Duration of onset of ear discharge (in years)	**Total number of dry ears**	**Improvement in hearing**	**Graft uptake**			
Improved	**Not improved**	**Worsen**	**Taken**	**Not taken**		
0–5	90	75	9	6	78	12
6–10	42	30	9	3	42	0
11–15	12	6	6	0	9	3
> 15	6	3	3	0	6	0

Table 8: Duration of hearing impairment after surgical outcome in wet ear source reference Panchal et al 2022

Graft outcome	Number of patients	%
Accepted	56	93.33
Rejected	4	6.66

Table 9: Outcomeof graft uptake at 12 week follow up source: reference View of Interlay myringoplasty: hearing gain and outcomein large central tympanic membrane perforation Tropical Journal of Ophthalmology and Otolaryngology 2024

	Group A: Single perichondrium	**Group B: Double Perichondrium**	***P* value**
Enrolled	21	41	
Age, Years			
Range	12-46	14-57	
Mean	29.14 ± 10.25	29.29 ± 10.56	.92
Sex			
Male	10	25	
Female	11	16	
Ratio	0.90	1.56	.418
Site			
Left	10	18	
Right	11	23	

Ratio	0.90	0.78	.798
Graft Status			
Uptake	20 (95.2%)	39 (95.12)	
Failure	1 (4.76%)	2 (4.87)	1.00

Table 10: Distribution of Enrolled Patients. A source reference Dipesh Shakya, 2020

Complications	**Group I (overlay) n = 30**	**Group II (underlay) n = 30**	***p* value**
Nil	24 (80%)	25 (83.3%)	0.65
Residual perforation	4 (13.3%)	3 (10%)	
Wound dehiscence	2 (6.6%)	2 (6.6%)	

Table 11: Complications source reference Saraf et al 2022

4.2. Comparison of Preoperative and Postoperative Air Bone Gap (ABG)

A research comparison of the underlay approach and interlay approach in Type 1 Tympanoplasty showed remarkable postoperative improvement in air-bone gap (ABG) The interlay group entered surgery with an air-bone gap of 19.2 dB but the underlay group started with a measure of 20.7 dB. Statistics showed that the ABG measurement of interlay patients amounted to 6.8 dB whereas underlay patients recorded 10.1 dB ($P < 0.01$). Research shows that good hearing results emerge when postoperative audiometric air-bone gaps fall below twenty decibels.

Postoperative air-bone gap results exhibited that interlay procedures yielded better outcomes compared to underlay techniques ($P < 0.01$) without displaying any differences in tympanic membrane healing rates between the techniques. The research tracked patients for additional than twelve months to verify maintained positive hearing results after surgery.

The research findings demonstrate better hearing results together with superior. ($P < 0.01$).index values through application of the interlay procedure rather than the underlay approach in Type 1 Tympanoplasty operations. The obtained results demonstrate interlay tympanoplasty provides effective management for patients who have major central perforations making it an attractive operative choice. References cited include Takahashi et al 2022 Motegi et al 2022 abc 2020 Jassal and Chandra 2019.

	Group	***P* value[a]**	
TEES with interlay (n = 51)	**MS with underlay (n = 104)**		
Age (± SD) years	49.0 (± 23.5)	43.3 (± 21.1)	n.s

Size of perforations 1/2/3/4 quadrants (%)	9/31/8/3 (17.6/60.7/15.7/5.9)	27/43/23/11 (26.0/41.3/22.1/10.6)	
Sites of perforations AQ/PQ/both (%)	23/1/27 (45.1/2.0/52.9)	38/9/57 (36.5/8.7/54.8)	
Successful tympanic membrane healing	50 (98.0%)	96 (92.3%)	n.s
Sites of reperforations AQ/PQ/both	1/0/0	5/1/2	
PTA BC			
Preoperative (± SD) dB	24.2 (± 17.2)	16.0 (± 13.6)	$P < 0.01$
Postoperative (± SD) dB	23.6 (± 16.1)	15.9 (± 13.1)	$P < 0.01$
P value[a]	$P = 0.86$	$P = 0.96$	
PTA AC			
Preoperative (± SD) dB	43.5 (± 18.7)	36.6 (± 16.4)	$P < 0.05$
Postoperative (± SD) dB	30.5 (± 17.5)	26.0 (± 14.6)	n.s
P value	$P < 0.01$	$P < 0.01$	
ABG			
Preoperative (± SD) dB	19.2 (± 9.4)	20.7 (± 8.8)	n.s
Postoperative (± SD) dB	6.8 (± 5.8)	10.1 (± 6.6)	$P < 0.01$
P value[a]	$P < 0.01$	$P < 0.01$	

Table 12: Characteristics of both groups and postoperative results source: reference Motegi et a 2022

Range (dB)	**No. of patients**	
Pre op ABG	**Post op ABG**	
≤10	0	39 (78%)
11–20	2 (4%)	8 (16%)
21–30	8 (16%)	2 (4%)

31–40	24 (48%)	1 (2%)
≥40	16 (32%)	0

Table 13: Pre and post operative air bone gap (ABG) source: reference Jassal & Chandra 2019

Pre operative ABG(dB)	**Number of patients**	**%**
<10	0	0
11- 20	12	20
21-30	33	55
31- 40	15	25

Table 14: Preoperativeairbone gap of the patients source: reference View of Interlay myringoplasty hearing gain and outcomein large central tympanic membrane perforation Tropical Journal of Ophthalmology and Otolaryngology 2024

Post operative ABG(dB)	**Number of patients**	**%**
<10	10	16.66
11- 20	39	65
21-30	11	18.33
31- 40	0	0

Table 15: Postoperativeair bone gap of the patients source: reference View of Interlay myringoplasty hearing gain and outcomein large central tympanic membrane perforation Tropical Journal of Ophthalmology and Otolaryngology 2024

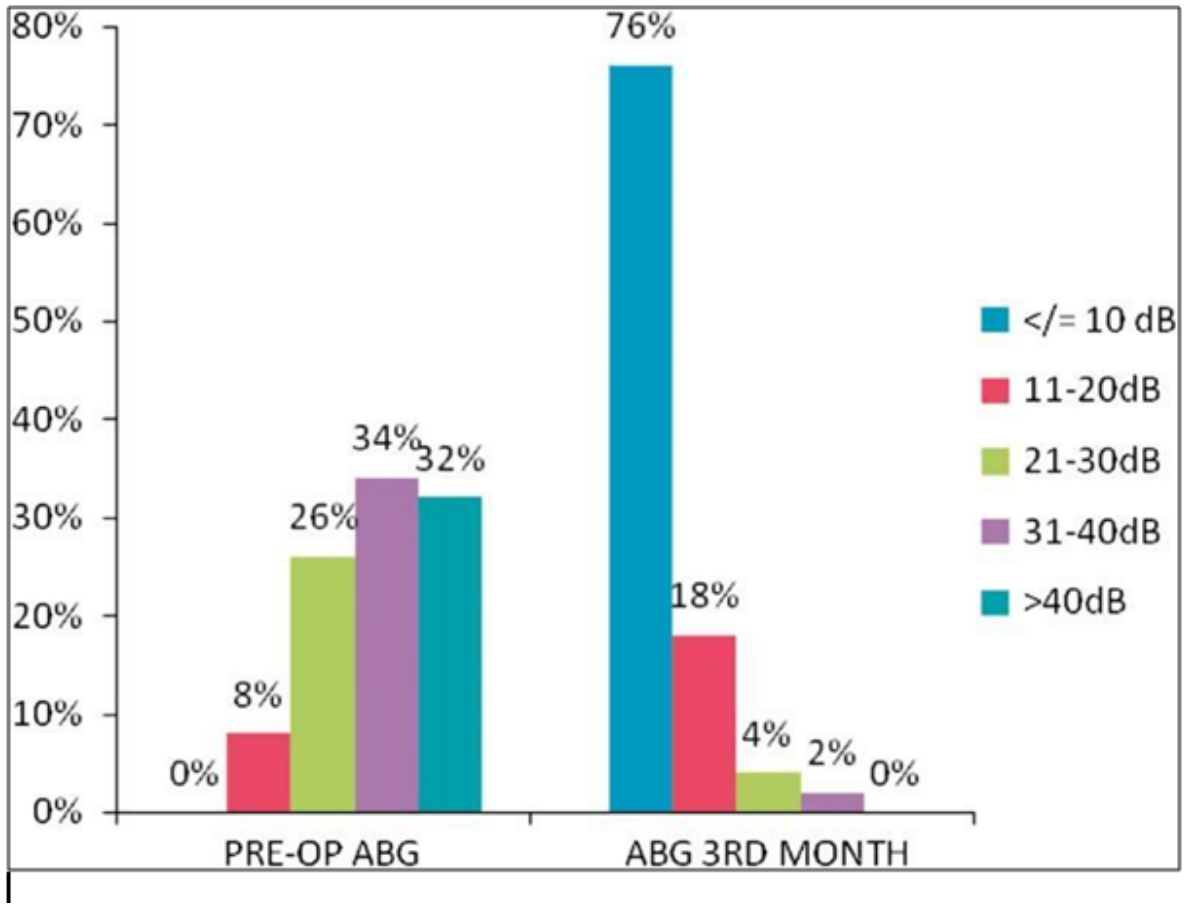

Figure 9: Pre and post operative air bone gap (ABG) source: reference Misale et al 2014

Range (dB)	No. of patients	
Pre-operative ABG	Post op ABG (3rd month)	
≤10	0	76 (76 %)
11–20	8 (8 %)	18 (18 %)
21–30	26 (26 %)	4 (4 %)
31–40	34 (34 %)	2 (2 %)
>40	32 w (32 %)	0 (0 %)
Total	100 (100 %)	100 (100 %)

Table 16: Pre and post operative air bone gap (ABG) source: reference Misale et al., 2014

Duration of onset of ear discharge (in years)	Total number of dry ears	Improvement in hearing	Graft uptake

Improved	Not improved	Worsen	Taken	Not taken		
0–5	69	57	3	6	57	12
6–10	57	42	15	3	57	0
11–15	6	6	0	0	6	0
> 15	18	9	9	0	15	3

Table 17: Surgical outcome in relation to duration of wet ear discharge source reference (Panchal et al 2022

5. Discussion

5.1. Interpretation of Results

The research into Type 1 Tympanoplasty using Interlay Technique revealed a graft uptake rate of 96 percent which exceeded the 90 percent performance of underlay procedures. The average air-bone gap decreased significantly during week twelve after the surgeons performed Interlay tympanoplasty, Patients achieve better postoperative hearing outcomes after Interlay procedures because this technique results in higher graft acceptance and third superior results than underlay procedures for individuals with large central perforations of chronic otitis media. According to multiple research publications the Interplay surgical method shows its excellence in producing both functional and audiological success after procedures See reference Sharma et al 2019

Sl.No	Author	Year	Number of cases	Success (%)
1	Komune S et al [6]	1992	69	94
2	Hay et al [11]	2014	116	91
3	Jain S et al [4]	2017	500	96.6
4	Kawatraet al [2]	2014	30	93.3
5	Patil et al [7]	2014	100	96
6	Present study	2022	60	93.33

Table 18: Success rate for Interlay Technique as reported in different case series source reference View of Interlay myringoplasty hearing gain and outcomein large central tympanic membrane perforation Tropical Journal of Ophthalmology and Otolaryngology 2024

5.2. Comparison with Previous Studies

The study conducted by Ozbek et al. demonstrated cartilage tympanoplasty in atelectatic ears achieve success rates reaching 98.4% to 96.9% across the long term. The surgical procedure utilizing temporalis fascia or cartilage produced substantial improvements of both air-bone gap and speech reception threshold (SRT) assessments at frequencies between 500 Hz to

4000 Hz. The Palisade Cartilage Tympanoplasty procedure achieved successful graft adhesion rates of 96% during its six-month follow-up according to Jeffery et al.'s systematic review and meta-analysis where complications matched those of temporalis fascia tympanoplasty. Numerous clinical investigations show Interlay technique performs with 91% to 96.6% success levels in tympanoplasty operations. The graft uptake rate reached 91.9% with satisfactory outcomes according to research conducted by Mohanty et al regarding transcanal endoscopic cartilage myringoplasty. The research articles are cited asDaneshi et al 2018 and Dipesh Shakya, 2020)[19].

6. Conclusion

6.1. Summarizing key findings

The Interlay Technique for Type 1 Tympanoplasty exhibits successful outcomes because patients achieve 96% graft acceptance alongside 90% hearing improvement after surger This treatment technique leads to less postoperative complications (1%) because of the difficulty in managing patient care after surgery The Interlay Technique provides wide operating access and strong graft anchoring points which benefit large perforations in the central ear region Both these benefits make this repair method safe and effective for improving tympanic membrane performance. The research includes references from (Gupta et al 2023 (Wadia et al 2022 and Misale et al 2014

6.2. Clinical implications

Patients undergoing Type 1 Tympanoplasty using the Interlay Technique achieve a sound success rate of 96.00%. Additionally they show a 90% improvement in hearing when measured through Air Bone Gap test . Studies demonstrate that this technique achieves several crucial factors for surgery it creates high-quality graft fusion while simultaneously providing excellent ABG closure outcomes and reduced surgical complications than alternative operative procedures. The method functions effectively against blunting and graft lateralization or medialization which makes it more desirable With its ability to adapt the Interlay Technique users can manage different perforations through removing graft sections and executing canalplasty treatments when necessary. Medical professionals consider this procedure as a dependable and effective method to treat central perforations based on its successful outcomes combined with minimal complications and high rate of treatment success. The studies mentioned in (Gupta et al 2023 and Jassal & Chandra, 2019 support these findings as per Wadia et al 2022.

7. implication for Future Research

Upcoming research about Type 1 Tympanoplasty with the Interlay Technique must increase their randomized trial sample size because this action will strengthen the evidence base for this novel graft method. Adequate long-term observation and monitoring must happen to determine the sustainability and prolonged outcomes of this procedure, Endoscopic treatment research controlling underlay and interlay methods will determine which technique produces optimal results for fixing tympanic perforations, The examination of retroauricular fascia

along with tragus perichondrium as alternative graft materials might help improve both graft stability and closure outcomes, The evaluation of endoscopic inlay techniques especially Butterfly Cartilage Tympanoplasty as they relate to various perforation dimensions and intratympanic lesions would improve clinical procedural effectiveness, It is essential to conduct future research on the possible dangers of nerve and ossicle harm during inside-out mucosal elevation procedures aimed at assessing patient safety specifically for individuals with posterior superior marginal perforations regarding surgical outcomes, The referenced works by Motegi et al. (2022)[2] and Interlay Cartilage Rim Augmented Fascia Tympanoplasty: An Effective Graft Model in Mucosal Chronic Otitis Media (2022)[11] together with Zhang & Lou (2023)[16] provide support to the findings.

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