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RESEARCH ARTICLE

"Anatomofunctional results of endoscopic ear surgery in patients with Simple Chronic Otitis Media in the Otorhinolaryngology Service of the Hospital de Clínicas"

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Abstract

Introduction: Perforations of the tympanic membrane (PMT) repre-sent a seriousear condition that can lead to conductive hearing loss, chronic infections and irreversible damage to the eardrum. Treatment for perforations is surgical reconstruction of the eardrum, known as myringoplasty and / or tympanoplasty. Objective: To evaluate the results anatomofunctional surgery tympanic perforation closure under endoscopic vision in patients with Chronic Otitis Media Simple of the Department of Otolaryngology at the Hos-pital de Clinicas. Methodology: Study observational and descriptive design transver-sal cross-cut retrospective association. Simple random probability sam-pling method. The sample size was 52 patients who underwent endo-scopic surgery to close the tympanic perforation. Results: 52 patients were included in the study, of which 63.5% were female and 36.5% male. The average age was 28 years. 88.5% had a diagnosis of unilateral simple chronic otitis media and 11.5% bilateral. Regarding the type of surgery, 65.4% of the surgeries performed were myringoplasty and 34.6% were Type Itympanoplasty; 57.7% were from the left ear and 42.3% from the right side. The grafts used were cartilage with atrial concha perichondrium (48.1%), followed by cartilage with tragus perichondrium (30.8%), and in smaller proportions the temporal muscle fascia (19.2%) and lastly ear lobe fat (1.9). Regarding the data analysis, the association between the type of graft used and the complete closure of the perforation, which was 94.2%, was not found to be significant (p> 0.05). Comparatively, the pre and postoperative audiometric controls show significant differences according to the two-tailed analytical calculation, but the results are not statistically significant (p ›0.05) when comparing the type of graft used. Conclusion: Almost all of the patients presented complete closure of the perforation at 6 months of control. The pre-surgical tonal audiometry reports presented moderate conductive hearing loss in the majority. The most frequently used grafts were cartilage and perichondrium of the tragus and atrial shell, with high anatomical and functional success rates, but without statistically significant differences between them. There were differences with a tendency to improve the tonal hearing averages between the pre and post-surgical controls, but this difference was not statistically significant when comparing the type of graft.
Keywords: Tympanoplasty, Myringoplasty, Graft, Audiometry

1 | INTRODUCTION

Perforations of the tympanic membrane (PMT) represent a serious ear condition that can lead to conductive hearing loss, chronic infections and, in some cases, irreversible damage to the eardrum. Tympanic membrane perforations often occur in conjunction with other pathologies such as otitis media, cholesteatoma, and barotrauma in the ear. [(1), (2), (3)]

Additionally, tympanic membrane perforations can be socially debilitating for patients, as hearing loss hinders effective communication in learning settings and during social gatherings. Current treatments for drilling involve drying treatments ear drops otic and surgical reconstruction of the tímpan or, which may be for myringoplasty and / or tympanoplasty. [(2), (4), (5)]

The goal of myringoplasty is to restore the integrity of the tympanic membrane and ensure hearing function that is as close to normal as possible. For this, numerous techniques have been described. [(6), (7)]According to the position of the connective graft with respect to the lamina propria or fibrous layer, two main variants can be distinguished: medial position (underlay of the Anglo-Saxon authors) or lateral position (overlay). There are also variants depending on the topography of the perforation, its size and possible reoperation. [(8), (9)]

The graft that is usually used is the temporal aponeurosis, although other connective tissues can be used, such as the perichondrium and even the cartilage of the tragus or the shell, fat, and others. Despite the wide variety of techniques, failure is always possible, sometimes depending on the procedure itself. The main causes of anatomical failure are secondary graft mobilization, leading to recurrence of perforation, lateralization, medialization, and occupation of the tympanomeatal angle. [(10), (11)]

The use of the rigid endoscope for middle ear surgery should be considered an adjunct to observation or a surgical tool. In recent years, there has been an increase in publications, probably reflecting an increase in surgeon acceptance and comfort with the endoscope. [(4), (12), (13)]

The main indications for endoscopic ear surgery include cholesteatoma and myringoplasty; however, the literature reflects a variety of other uses for the endoscope in middle and inner ear surgery. [(14) , (15)]

1.1 | MAIN GOAL

To evaluate the anatomical-functional results of surgery to close a tympanic perforation under endoscopic vision in patients with Simple Chronic Otitis Media from the Department of Otorhinolaryngology at the Hospital de Clínicas.

1.2 | SPECIFIC OBJECTIVES

- Quantify the success of perforation closure after endoscopic ear surgery.
- Describe the pre and post-surgical audiological results in patients undergoing surgery.
- Associate the success of perforation closure and hearing gain in relation to the type of graft used.
- Compare pre and post surgical pure tone audiometry results

2 | MATERIALS AND METHODS

Study, descriptive, observational design cutting cross retrospective cross - association.Simple random probability sampling method. The target population consisted of patients undergoing endoscopic ear surgery with a preoperative diagnosis of simple chronic otitis media.The accessible population

Supplementary information The online version of this article(10.52845/JORR/2021/2.2.1) contains supplementary material, which is available to authorized users.

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consisted of patients undergoing endoscopic ear surgery with a preoperative diagnosis of simple chronic otitis media at the Otorhinolaryngology Department of the Hospital de Clínicas in the period March 2014-March 2017. [16], [17]

The inclusion criteria taken into account were patients undergoing endoscopic ear surgery with a preoperative diagnosis of simple chronic otitis media in the Otorhinolaryngology Chair of the Hospital de Clinical in the period from March 2014 to March 2017, without otorrhea for more than 3 preoperative months and with a minimum follow-up of 6 months postoperatively. Patients with incomplete medical records, patients who abandoned follow-up or attended irregularly, and with audiometric results suggestive of oscillation chain disruption were excluded.

Regarding statistical issues, the EpiDat 3.1 statistical program was used to calculate the sample size for a population size of 55 patients undergoing endoscopic ear surgery during the years 2014 and 2017, with an expected proportion of 86.4% of closure complete tympanic perforation, 5% accuracy, 95% confidence level, the minimum sample size was 43 subjects. 52 subjects were included in the study. The working instruments used were the clinical records of the patients of the otology department, which contain the sociodemographic data, the report of the surgical technique, pre and post-surgical pure tone audiometry, as well as an Otoendoscopy report. The data were loaded into a data table in Microsoft Excel 2016 and the IBM SPSS 21.0 system, for statistical tests the absolute and relative frequency of the qualitative and quantitative variables was described. The data were processed and presented in graphs where measures of central tendency were used.

The study variables were age, sex, tympanic perforation size (represented in percentages according to the number of affected quadrants), pre and postoperative pure tone audiometry, type of ear surgery, type of graft used, days of hospitalization, postoperative anatomical and functional result at 6 months.Regarding ethical issues; Permission was requested from the head of the Otorhinolaryngology Service to access the file. This research does not require informed consent as it is an evaluation of secondary data. Data confidentiality was maintained.This study was submitted to evaluation and approved by the Ethics Committee of the Faculty of Medical Sciences of the Hospital de Clínicas.This work was funded by the authors. The authors declare no conflict of interest.

3 | RESULTS

52 patients were included in the study, of which 63.5% were female and 36.5% male. The average age was 28, with a minimum age of 6 years and a maximum of 64 years. 88.5% had a diagnosis of unilateral simple chronic otitis media and 11.5% bilateral. Regarding the type of surgery, 65.4% of the surgeries performed were myringoplasty and 34.6% were Type I tympanoplasty; 57.7% were from the left ear and 42.3 % from the right side.

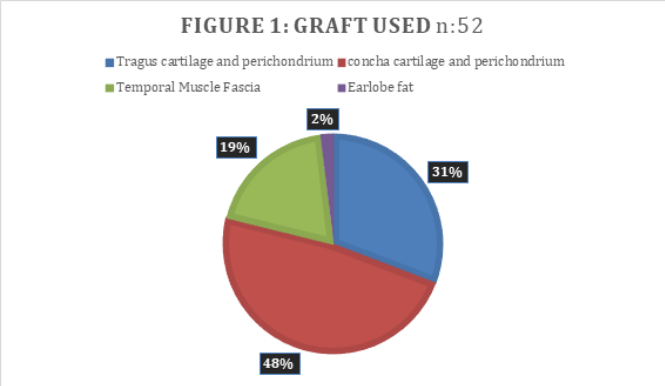

FIGURE 1: *The type of graft used is described in graph 1.*

Anatomical success, defined as complete closure of the perforation, occurred in 94.2% of the patients, residual perforation was found on control in the following 6 months in 5.8% of the cases.

Regarding the audiometries of the patients prior to surgery and in post-surgical controls, they are shown in the following graph.

Type graft * Success anatomical cross tabulation Count		Anatomical success		
		Full closure	Residual drilling	Total
Type of graft	Tragus cartilage and perichondrium	fifteen	1	16
	Shell cartilage and perichondrium	25	0	25
	Temporal muscle fascia	8	two	10
	Ear lobe fat	1	0	1
Total		49	3	52

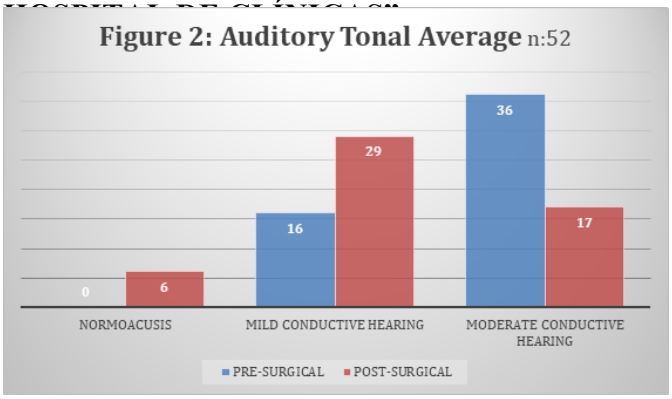

FIGURE 2: *Regarding the data analysis, the association between the type of graft used and complete closure of the perforation, no significant association was found (p> 0.05).*

Chi- square tests	Valué	gl	Asymptotic sig. (2-sided)
Pearson's Chi-square	5,324 [a]	3	, 150
Likelihood ratio	5,450	3	, 142
Linear by linear association	9,2052	1	, 337
N of valid cases			

To. 5 cells (62.5%) have expected a count less than 5. The minimum expected count is .06.

Graft type * Hearing improvement crosstabulation Correlations			Pre- surgical Auditory Tonal Average	Post-surgical Auditory Tonal Average
Spearman's Rho	Pre- surgical Auditory Tonal Average	Correlation coefficient	1,000	, 603 **
		Sig. (Bilateral)	.	, 000
		N	52	52
	Post- surgical Auditory Tonal Average	Correlation coefficient	, 603 **	1,000
		Sig. (Bilateral)	, 000	.
		N	52	52

Comparativamente controls audiometric pre and postoperative significant differences according to the analytical calculation of two lines, but the results are not ESTADI sticamente significant (p> 0.05) to the compare graft type used.

Count		Hearing improvement		
		Improvement	No improvement	Total
Type of graft	Tragus cartilage and perichondrium	7	9	16
	Shell cartilage and perichondrium	12	13	25
	Temporal muscle fascia	6	4	10
	Ear lobe fat	1	0	1
Total		26	26	52

The correlation is significant at the 0.01 level (2-tailed).

Chi- square tests	Value	gl	Asymptotic sig. (2-sided)
Pearson's Chi-square	1,690 [a]	3	, 639
Likelihood ratio	2,080	3	, 556
Linear by linear association	1,189	1	, 276
N of valid cases	52		

To. 2 cells (25.0%) have expected a count less than 5. The minimum expected count is .50.

4 | DISCUSSION

The myringoplasty or tympanoplasty type I transcanal has advantages such as faster and smaller the external incision procedure using an endoscope. In the last decade, an increase in endoscopic use in otological surgery has been observed. This technique can allow better visualization of hard-to-reach spaces.In this study where 52 ears were evaluated with a diagnosis of simple chronic otitis media with a history of more than 3 months of dry ear, a closure of the tympanic perforation was obtained with the use of a transcanal endoscope with a success rate of 94.5%. It is imperative and beneficial for the development of this technique and similar to other publications that show an average value of 93% cited by K. Munish et al [18], being also demonstrated with

statistically significant repair success figures. At six months, two patients had a residual perforation that could be due to improper graft size or faulty surgical technique. [18] Regarding our casuistry, we observed at 6 months with residual perforation in 3 patients related, two of them with use of temporal muscle fascia with poor postoperative care (water in the ear) and another with cartilage and tragus perichondrium of inadequate size for the size of the perforation.

Despite the failure of anatomical repair in only 5.5%, in all of them the residual perforations were smaller than the initial ones, a similar experience obtained by V Yurttas et al. [19] In this casuistry, a variety of graft types were used, where the most used was cartilage with perichondrium of the auricular shell (45.5%) and tragus (32.7%), which is easy to extract and produces similar audiometric and anatomical results. satisfactory such as results found by Calderón et al. [20]and Kaziktas et al. [21]obtained a success rate of 95.7% in tympanoplasties with tragus cartilage and 75% in tympanoplasties with temporal muscle fascia. In the same way, they demonstrated that it is an optimal procedure, particularly in cases of total perforation, atelectasis and otorrhea at the time of surgery [19] . [22].

This study tests audiometric measures comparatively before and after surgery express differences statistically if gnificativas at 6 months, these patients demonstrate subjective improvement (ask if the patient hears better than before surgery) hearing. Revised publications such as that by García L. et al obtained audiometric improvement results (p ‹0.01) .1 In this line of research it is determined that this endoscopic technique, as it presents less comorbidity than the classic retroauricular approach, was obtained in 80 % of patients stay in hospital for only 24 hours of hospitalization.

5 | CONCLUSION

Almost all of the patients presented complete closure of the perforation at 6 months of control.The presurgical tonal audiometry reports presented moderate conductive hearing loss in the majority, while in the post-surgical procedure they presented mild hearing loss and normal hearing loss in the majority. The most frequently used grafts were cartilage and perichondrium of the tragus and atrial shell, with high anatomical and functional success rates, but without statistically significant differences between them. There were differences with a tendency to improve the tonal hearing averages between the pre and postsurgical controls, but this difference was not statistically significant when comparing the type of graft.

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