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HEARING SUITE OF TYMPANOPLASTY AT TPLA ANTANANARIVO MADAGASCAR IN 2014

Andriamampionona G. B*
Otolaryngology Department, University Hospital, Andohatapenaka, Antananarivo, Madagascar. *Corresponding Author

Raharinantenaina H. A
Functional education department, Joseph Ravoahangy Andrianavalona University Hospital Centre Antananarivo-Madagascar.

Razafimandimby M R
Otolaryngology Department, University Hospital, Andohatapenaka, Antananarivo, Madagascar.

Rakotoarisoa A. H. N
Otolaryngology Department, University Hospital Place Kabary, Antsiranana, Madagascar.

ABSTRACT

Background: The tympanic perforation is a lesion very marked during a otologic affection; this organic entity can include a enormous auditive loss. The tympanoplasty constitutes a therapeutic option to improve this auditive failure. The objective of our descriptive retrospective study was to evaluate the auditive profit after a tympanoplasty. This study included all patients operated of a tympanoplasty to realize in the service Otorhinolaryngology of the TPLA of Madagascar over one 12 months period.
Results: A population of 50 patients was listed with a 32 years Middle Age and a sex-ratio with 0,5. Hearing loss was the most frequent reason for consultation. The central tympanic perforation of intermediate size dominates the organic clinical presentation. The tympanoplasty standard I to occupy the majority part of practiced intervention. The hearing improvement was revealed in 56% of the cases with an average auditive profit of 17,07 dB.
Conclusion: The tympanoplasty is a otologic surgery making it possible to improve the hearing acuteness. The average hearing profit of 17,07 dB into after operation is obtained at more half of our patients. The favorable result is especially detected on the tympanoplasty without rebuilding of the ossicles but in the event of signs of functional discomfort, patients are referred to a Physical Medicine and Rehabilitation department.

INTRODUCTION

An otological disease is often accompanied by either a damage to the tympanic membrane, or a lesion of the ossicular structures, or a combination of the two lesional entities (1). Any tympano-ossicular abnormality trivializes the auditory acuity (2,3). Otological surgery has an indispensable place in the restoration of auditory abnormalities by repairing the tympano-ossicular failure (4,5). Tympanoplasty defines any form of surgery to repair the tympanic membrane and/or one or more elements of the middle ear in order to reconstruct the hearing mechanism (1,3). This procedure is the final touch-up of most otological surgical procedures (1). The purpose of our work was to assess hearing gain after tympanoplasty.

METHODS

This was a retrospective study carried out over a 12-month period, from 1 March 2014 to 28 February 2015, in the otolaryngology department of the Tobi-pahasalamana Loterana Ambohibao Antananarive Madagascar. This study is of interest to patients operated for tympanoplasty of both types with audiometric results before and after the procedure All patients included in our research have benefited from clinical and functional control over an average setback of 6 months. All incomplete files are not retained. The average hearing gain is calculated from the difference in pre- and post-operative airborne thresholds over the four tonal audiometry frequencies (500 Hz, 1000 Hz, 2000 Hz, 4000 Hz) according to the formula of Monsell and Albu (appendix).

This present study focuses on the influence of age, gender, tympanic perforation, appearance of the rest of the tympanic membrane, condition of the controlateral ear, type of tympanoplasty and anatomical and functional results.

RESULTS

The study population included 50 patients with an average age of 32 years with extremes of 10 and 63 years. Female predominance was observed with a sex ratio of 0.5. The discovery of the tympanic perforation was dominated by hearing loss (Figure 1)

The tympano-ossicular lesion was often a result of otological infection (Figure 2). More than half of the cases had a central tympanic perforation (Table 1). Tympanic perforation was medium in 54% of the cases. The rest of the perforated eardrum was normal 72% of the time (Figure 3)

Myringoplasty (tympanoplasty type I) represents 46% of tympanoplasty cases (Table 2). During a regular follow-up of 6 months, the post-operative recovery was low, seen only in 8% of our patients. An average hearing gain of 17.07 dB was observed in more than half of the cases (Figure 4).

DISCUSSION

The average age of our patients was comparable to that of the authors of the literature. Tympano-ossicular injury occurred in all subjects regardless of age, but the active age category was electively affected (3,4,6).

A slight female predominance was evident in our research. A comparable proportion was revealed by the Arunabha and Mundra teams (3.7). Currently, no clear studies demonstrating this gender inequality in tympano-ossicular lesions.

Any tympano-ossicular abnormality is constantly accompanied by a poor hearing; which explains the predominance of this manifestation in our research. The authors of the literature report the same results suggesting a decrease in hearing acuity during a lesion of the tympanic structures.

The ossicular chain (tympanic membrane and osselets) plays a role in the transmission and amplification of sounds coming from the outside; which makes that a lesion of the various

components of this structure is at the origin of a transmission type deafness (8).

The tympanic lesion in our research was often of infectious origin. A similar etiology was mentioned by most authors of the literature (1,4). Any otological condition that causes otitis media is the cause of a perforation of the tympanic membrane and an ossicular lesion.

The tympanic perforation was central and of medium size in more than half of our case.The authors of the literature report a central but small perforation (3,5,9). The central location of the perforation depends on the normal anatomy of the tympanum membrane.

According to Bonfils, this membrane thickens at the periphery to form an annular bead, which explains the frequency of the central perforation less thickened part (10).
In our series, the otoscopic and microscopic atrial examination reveals a remnant of the tympanic membrane, often normal, rarely sclerosed or retracted. A study of comparable proportions was reported by Hardman team (11).

In our study, we listed auditory reports after tympanoplasty of the types combined. Most authors of the literature report a functional hearing study only on a type 1 tympanoplasty or myringoplasty (12). The difference in study subjects was only based on the choice of the author. A study of auditory function following tympanoplasty of different types would be desirable to consider post-operative functional results.

After several post-operative follow-up checks, the otoscopic results of the tympanic membrane scarring were very satisfactory. Average anatomical results were found by some authors of the literature with a fairly high number of post-operative tympanic perforations compared to ours (3,4,7,13). The tympanoplasty technic we performed was similar to those of the authors of the literature but this difference in results may be related to the number of study population. The continuation of anatomical scarring is also dependent on the average postoperative monitoring time. For Mouzali, the duration of monitoring and evaluation of surgical success was set at 12 months (14).

The functional results of the hearing improvements after tympanoplasty were in decibels (dB). The auditory evaluation was carried out by the practice of audiometry during each regular monitoring consultation. The hearing gain was calculated from the difference in the hearing threshold before the surgery and the postoperative hearing threshold. We considered as a functional improvement, all the highest hearing gains obtained during each check-up. In addition, the average hearing gain was measured from the Monsell 1995 formula and Albu in 1998.

In the literature all hearing gains greater than 10 decibels in aerial conduction were classified as success. In our research, hearing gain was slightly low compared to the results reported by some authors in the literature (4.5.14). On the other hand, we found an average hearing gain comparable to that of the literature (1,2,5).

Next to the auditory suite, we noticed functional discomforts like peripheral facial paralysis also homolateral transient vertigo. These patients were referred to a Physical Rehabilitation Medicine department for follow-up care.

CONCLUSION

Hearing loss is the main concern of patients when it comes to tympanic perforation. Tympanoplasty is a solution to restore this hearing loss. A considerable improvement in hearing was noted in particular for tympanoplasty without reconstruction of the bones. More than half of our study population experienced a favorable result with satisfactory average hearing gain but in the event of signs of functional discomfort, patients are referred to a Physical Medicine and Rehabilitation department.

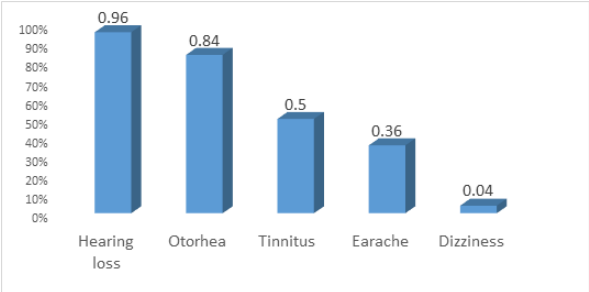

Figure 1: Distribution of patients according to the symptom of tympanic perforation

Comment: some patients present several clinical signs of tympano-ossicular lesion

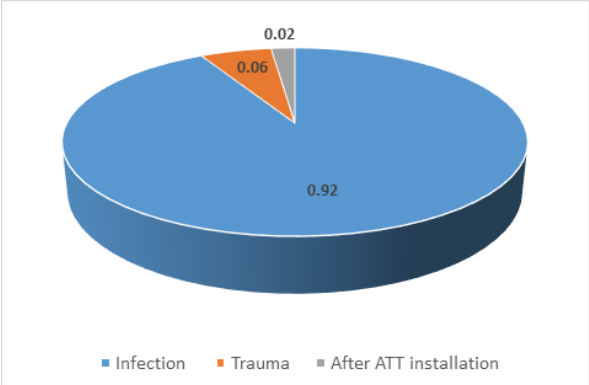

Figure 2: Patients distribution par the cause of tympano-ossicular lesion

Table 1:Topography Of Tympanic Perforation

Topography	Number of cases (n)	Percentage (%)
Antero-inferior	11	22
Antero-superior	0	0
Postero-inferior	5	10
Postero-superior	2	4
Central	27	54
Marginal	5	10
TOTAL	50	100

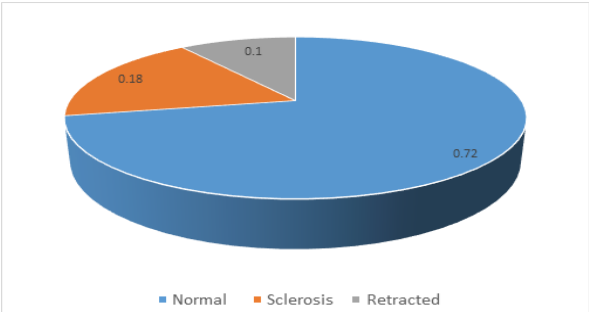

Figure 3: Types Of The Rest Of The Perforated Tympanic Membrane

Table 2:Types Of Interventions

Type of intervention	Number of cases (n)	Percentage (%)
Myringoplasty or tympanoplasty type I	23	46
Myringoplasty + ossiculoplasty	10	20
Myringoplasty + mastoidectomy	12	24

Myringoplasty+ ossiculoplasty + mastoidectomy	5	10
TOTAL	50	100

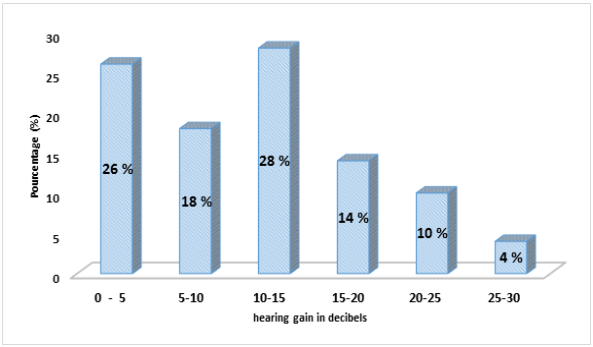

Figure 4: Post-operative functional results

Contributions From Authors
All authors read and approved the final version of the manuscript.

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Conflicts Of Interest
The authors declare no conflict of interest.

Annexes :
Monsell en 1995
CA postop ([500 + 1 000 + 2 000 +3 000] /4) - CA préop ([500+1 000+2 000+3 000] /4)

Albu en 1998
CA postop ([500 +1 000 + 2 000 (2 000 + 4 000) /2]/4) – CA préop ([500 + 1 000 + 2 000 (2 000 + 4 000)/2]/4)

CA : air conduction
Postop : post-operative
Préop : preoperative

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