



Hearing evaluation after successful myringoplasty

Mohammed Radef Dawood

Otolaryngology Department, College of Medicine, Mustansiriyah University, Baghdad, Iraq

Received 14 June 2017; revised 9 August 2017; accepted 9 August 2017

Abstract

Objectives: To assess postoperative hearing level, and factors that may have influence hearing improvement after myringoplasty.

Methods: Twenty six cases of successful myringoplasty were included in this prospective study. Patient parameters including age, gender, size and site of the perforation, mastoid status, and etiology were evaluated. Hearing levels were assessed as the mean air conduction (AC), and air-bone gap (ABG) at 500, 1000, and 2000 Hz, and their relation with aforementioned parameters were analyzed.

Results: The mean AC hearing gain was 22.373 dB and mean ABG reduction was 20.733 dB. The maximum AC hearing gain was 25.93 dB for subtotal perforation and 26.24 dB for big central perforation, and the maximum ABG reduction was 25.63 dB for subtotal perforation and 24.20 dB for big central perforation. Mean AC hearing gain was 23.01 dB, 22.72 dB, and 21.39 dB for 500, 1000, and 2000 Hz, respectively, and mean ABG reduction was 21.52 dB, 20.79 dB, and 19.86 dB for 500, 1000, and 2000 Hz, respectively. Patient age, gender, mastoid status and etiology did not seem to have any bearing on postoperative hearing improvement.

Conclusion: While patient parameters do not seem to correlate with hearing improvement following myringoplasty, the size and location of perforation appear to have an impact on postoperative hearing outcomes. Most hearing improvement appears to occur at 500 Hz.

Copyright © 2017, PLA General Hospital Department of Otolaryngology Head and Neck Surgery. Production and hosting by Elsevier (Singapore) Pte Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Keywords: Myringoplasty; Hearing loss; Tympanic membrane

1. Introduction

Myringoplasty is a common procedure in otology surgical practice, and refers to surgical repair of the tympanic membrane perforations. The most accepted indications are protection of the middle ear mucosa from the infection through external auditory canal, and hearing improvement. It was introduced by Berthold in 1878, but it was only in 1956 when Wullstein developed fundamental principles for modern practice (Wullstein, 1956). The underlay technique, described by Austin and Shea (1961) has become widely recognized as one of the most successful techniques. Hough modified this technique by utilizing temporalis fascia (Hough, 1970).

Different materials have been used to construct the tympanic membrane, the most accepted of which is temporalis fascia autograft and almost always the most favorable graft for its immunologically compatibility (Michael, 1972).

The most common surgical techniques used are underlay and overlay grafting, with transcanal or postauricular approach. The underlay technique is most preferred because, compared with the overlay technique, it gives a better access to middle ear and ossicles; while with regard to surgical approach, post-auricular approach is more preferable than transcanal route, because the grafting via ear canal through a speculum is regarded as more technically difficult (Jackson et al., 2010).

The tympanic membrane perforations mainly result from middle ear infections, trauma or iatrogenic causes (Sarker et al., 2011), and hearing loss from tympanic membrane perforation is usually less than 45 dB and of conductive type.

E-mail address: mohmadrade@yahoo.com.

Peer review under responsibility of PLA General Hospital Department of Otolaryngology Head and Neck Surgery.

More severe hearing loss more is usually associated with ossicular abnormalities (Browning, 2008).

There is no universal agreement regarding the standard criteria for reporting hearing results. A variety of methods have been applied by several researchers to record postoperative hearing assessment in the literature, and the parameters that are most often used are the mean (average) hearing gain, postoperative hearing level and air-bone gap (ABG). Hearing improvement is usually defined as hearing gain exceeding 10 dB or 20 dB, or reduction of ABG to within 10, 15, 20, or 30 dB, or achievement of the social hearing (0–30 dB HL). The American Academy of Ophthalmology and Otolaryngology recommend average hearing gain at frequencies of 500–2000 Hz, or a diminution of ABG, as measures of postoperative hearing outcomes (Gupta et al., 2016).

The aim of the current study was to assess postoperative hearing levels using different audiometric parameters and investigate factors that may influence outcomes after myringoplasty in term of hearing improvement.

2. Patients and methods

This was a prospective study involving 26 cases of successfully completed myringoplasty at ENT department of a private hospital from April 1st 2016 to April 1st 2017. All the operations were performed by a single surgeon under general anesthesia, through a postaural approach, using the underlay technique with autogenous temporalis fascia grafts.

The diagnosis was established after a relevant history, proper ENT examination with special attention to the ear of concern under a Carl Zeiss microscope with a 200 mms lens. The size of the tympanic membrane perforation was evaluated using the computer Auto CAD software Aperio Image Scope 11, in which the entire tympanic membrane (TM) and the area of perforation (P) were calculated, and the percentage area of perforation ($P/TM \times 100\%$) for each ear was measured. The perforation size was categorized as “small” (percentage perforation less than 25%), “medium” (25%–50%), “large” (50%–75%), or “subtotal” (more than 75%). Location of the perforation in the pars-tensa was documented in relation to the handle of the malleolus, as: “anterior central” (anterior to the handle), “posterior central” (posterior to handle), “central malleolar” (involving both halves), or “big central” (involving all quadrants of the tympanic membrane).

The study was dealing with selected cases of inactive mucosal chronic otitis media with persistent tympanic membrane perforations that fulfilled the following specific criteria;

Inclusion criteria

1. Age >18 years.
2. Dry central perforation for more than 12 weeks.
3. Normal hearing in the contralateral ear.
4. Functioning Eustachian tube and ossicular chain.
5. Duration of perforation or disease process <1 year.
6. Conductive hearing loss not exceeding 45 dB, with good cochlear reserve.

Exclusion criteria

1. Previous middle ear surgery or revision myringoplasty.
2. Tympanosclerosis or diseases of the external ear.
3. Mixed hearing loss on pure tone audiogram.
4. Pathological changes in the mucosa of the middle ear, such as polypoidal, atrophic mucosa, cholesteatoma, or granulation tissue.
5. Septic foci in the nose or paranasal sinuses; other relevant systemic medical conditions such as diabetes mellitus, tuberculosis, malignancy or pregnancy.

All the patients received CT scanning of the temporal bones for better evaluation of the middle ear mucosa clefts and the mastoid air cells.

The hearing level was assessed 1 week before the operation and at third month postoperatively, in an acoustically treated sound proof room, with a MI-300 clinical diagnostic pure tone audiometer recently calibrated “according to the international organization of standardization”. The Carhart and Jerger's technique was followed, and the mean air conduction (AC) threshold and air-bone gaps (ABG) over 500, 1000, and 2000 Hz were calculated.

The study was approved by the institutional ethical and scientific review board, and informed consents were obtained from all participating patients, as well as the hospital registration number.

Routine postoperative care and follow up were provided, weekly in the first month and then monthly up to 3 months, or longer as required by the patient's condition.

The operation was considered successful at three months postoperatively if the following criteria were met: intact, dry, and normal positioned graft under otoscopy, mean hearing level improvement by air conduction pure tone audiometry of 15 dB or more, or an ABG closure to within 15 dB.

2.1. Statistical analysis

Statistical analysis was done with the SPSS version 18 software (Statistical Package for Social Sciences, SPSS Inc, Chicago, Illinois, USA). Measurements were expressed as mean and standard deviation ($SD \pm$) for parametric data and as numbers and percentage for non-parametric data. The paired t test was used for comparison between pre and postoperative results within each group. The level of significance was set at $p < 0.05$.

3. Results

Of the 26 patients, 12 (46.15%) were male and 14 (53.84%) were female, with a mean age of 32.44 (± 7.66) years.

The size, site and etiology of the perforations, as well as mastoid status are recorded in Table 1.

Mean hearing levels before and after the myringoplasty are shown in Table 2, showing a mean postoperative air conduction hearing gain of 22.37 dB, and a mean air-bone gap reduction of 20.73 dB.

Download English Version:

<https://daneshyari.com/en/article/8806511>

Download Persian Version:

<https://daneshyari.com/article/8806511>

[Daneshyari.com](https://daneshyari.com)