



## Myringoplasty in children



Noa Rozendorn<sup>b</sup>, Michael Wolf<sup>a, b</sup>, Arkadi Yakirevich<sup>a, b</sup>, Yisgav Shapira<sup>a, b</sup>, Eldar Carmel<sup>a, b, \*</sup>

<sup>a</sup> Otorhinolaryngology Head and Neck Surgery, The Chaim Sheba Medical Center, Tel Hashomer, Israel

<sup>b</sup> Sackler School of Medicine, Tel-Aviv University, Israel

### ARTICLE INFO

#### Article history:

Received 18 July 2016

Received in revised form

17 September 2016

Accepted 20 September 2016

Available online 21 September 2016

#### Keywords:

Myringoplasty

Type I tympanoplasty

Tympanic membrane perforation

Pediatric

Success

Hearing

### ABSTRACT

**Background:** Tympanic membrane perforation (TMP) may be caused by acute and chronic otitis media, trauma and iatrogenic reasons. The goal of myringoplasty is to achieve a dry, self-cleansing ear with intact TM while preserving hearing. Literature review of myringoplasty outcome demonstrates results with different success rates and affecting factors.

**Objectives:** The aim of this study was to evaluate TMP closure (TMPC) rate and hearing improvement and to assess the effect of clinical and surgical parameters on residual and recurrent perforation.

**Materials and methods:** Retrospective chart analysis of pediatric patients who underwent myringoplasty between the years 2000–2015. Closure success rate and hearing improvement were evaluated. The influence of age and clinical and surgical variables over TMPC rate and recurrent perforation were examined.

**Results:** Our study cohort consisted of 165 myringoplasties in 151 children, with a mean age of 11.7 years ( $R = 4.8–17.9$ ,  $Me = 12.0$ ).

At one month follow-up (FU) TMPC rate was 88% (145/165). Among patients with successful TMPC a mean improvement of air bone gap (ABG) and speech reception threshold (SRT) were 9.9 dB,  $p < 0.001$  and 9.4 dB,  $p < 0.001$ , respectively.

58/145 (40%) patients with initial closure had a minimum FU of 6 months ( $Me = 12.0$ ), during which time 8/58 (13.8%) had a recurrent perforation. Surgery before 9 years of age was the only factor correlated with failed initial closure ( $p = 0.03$ ) and recurrent perforation ( $p = 0.02$ ).

**Conclusions:** Pediatric myringoplasty is associated with high TMPC rate. Hearing improvement is to be expected in most hearing impaired patients. Age under 9 years is associated with significantly higher rates of persistent and recurrent perforation.

© 2016 Elsevier Ireland Ltd. All rights reserved.

## 1. Introduction

Tympanic membrane perforation is a common pathology in the pediatric otolaryngological practice [1] and arises mainly as sequela of otitis media, installation of myringotomy tube or trauma [2]. Spontaneous resolution may occur [3,4] but a persistent perforation can result in hearing loss, limitation in water activity exposure and rarely cholesteatoma formation [2,5]. Successful closure rate

varies greatly throughout the literature and ranges from 35 to 94.9% [6–8]. Since the first description of surgical myringoplasty in 1878 and the later re-appearance of tympanoplasty in the literature in 1950 new techniques have emerged and different types of grafts have been used [9]. Surgery can be undertaken by permeal, endaural, postaural and endoscopic approach, each modality has its own advantages in relation to size and location of perforation, anatomy of the ear canal and simplicity of the procedure [10]. An endoscopic approach, for example, can be used for the repair of anterior perforations which are considered more challenging because of poor visualization [11]. Both autologous and allograft have been used to reconstruct the tympanic membrane, among them temporalis fascia, fascia lata, periosteum, perichondrium, cartilage, dura mater and pericardium and more recently there has been use of alloplastic graft [12]. However, there is still a lack of

\* Corresponding author. The Chaim Sheba Medical Center-Tel Hashomer, Ramat Gan 52621, Israel.

E-mail addresses: [noa.rzn@gmail.com](mailto:noa.rzn@gmail.com) (N. Rozendorn), [Michael.Wolf@sheba.health.gov.il](mailto:Michael.Wolf@sheba.health.gov.il) (M. Wolf), [Arkadi.Yakirevich@sheba.health.gov.il](mailto:Arkadi.Yakirevich@sheba.health.gov.il) (A. Yakirevich), [Yisgav.Shapira@sheba.health.gov.il](mailto:Yisgav.Shapira@sheba.health.gov.il) (Y. Shapira), [Eldar.carmel@sheba.health.gov.il](mailto:Eldar.carmel@sheba.health.gov.il) (E. Carmel).

clarity regarding which factors contribute to a successful closure, as different demographic and surgical parameters have been examined in the literature with inconsistent results [2–6,8,13–26]. There is also an ongoing controversy regarding the optimal age for surgery in order to achieve short and long term satisfactory results [27].

The aims of our study were to evaluate the closure rate of pediatric tympanic membrane perforation and hearing performance following successful surgery, and to assess the prognostic effect of patients' clinical and surgical parameters on short and long term results.

## 2. Materials and methods

Medical records of pediatric patients who underwent myringoplasty by different surgeons in Sheba medical center between the years 2000–2015 were reviewed.

Patients presenting with cholesteatoma, status post cochlear implantation surgery, combined procedure with mastoidectomy or ossiculoplasty and patients older than 18 years at time of surgery were excluded.

All statistical analyses were performed using SPSS v. 21.0 (IBM Corp., Armonk, NY, USA). An institutional ethics review board approval was granted for this retrospective study.

### 2.1. Patients

The following data was recorded for each patient: Demographic details, medical history, hearing examinations prior to and post-surgery, etiology, side, size, type and location of perforation, season at time of surgery (winter/summer), surgical approach and graft type. Morphological features of the perforation were based on sketches and on surgical reports. Size of perforation was regarded as under or above 50% of the total surface of the tympanic membrane. Type of perforation was considered as marginal if the annulus was involved, otherwise it was considered as central. All surgeries were performed in the underlay technique.

Descriptive statistics were presented as means  $\pm$  standard deviations for continuous variables and percentages for categorical variables.

### 2.2. Anatomical outcomes

Primary TMPC was determined as an intact membrane one month following surgery. Spontaneous recurrent perforation, insertion of ventilating tube (VT) and cholesteatoma formation were considered as long term complications and were analyzed only for patients with a minimal follow-up of 6 months.

### 2.3. Prognostic factors

Age differences between patients with successful and failed closures at the two evaluated time points were calculated (Student's *t*-Test). Each of the ages 6–11 was separately examined as a cut-off age for impact on surgery short and long term outcome (Pearson's chi-square and Fishers' exact test). The prognostic effect of the retrieved data on successful closure and complications was evaluated using either Chi square or Fisher's exact test.

### 2.4. Functional outcomes

Hearing examinations included both speech reception threshold (SRT) and air bone gap (ABG). ABG was determined by calculating the average of the four frequencies 500, 1000, 2000, 4000 Hz [5]. Evaluation of post-operative hearing outcome was performed only

for patients with an abnormal hearing prior to surgery considered as  $SRT > 10$  dB or  $ABG > 10$  dB. Hearing improvement was determined as post-operative  $SRT \leq 10$  dB or  $ABG \leq 10$  dB or absolute decrease in SRT or ABG of  $\geq 10$  dB. Hearing worsening was defined as an absolute increase in SRT or ABG of  $\geq 10$  dB [16].

## 3. Results

### 3.1. Study population

Overall, 269 myringoplasties met the inclusion criteria. After applying the exclusion criteria, as specified in Fig. 1, 165 primary myringoplasties in 151 patients were included in the study. Mean age of the 151 patients was 11.7 years  $\pm$  3.4 SD (R = 4.8–17.9 years, Me = 12.0); 57% were female with right ear involvement in 55%. The most common etiology for TMP was recurrent otitis media in 52.1% followed by self-extrusion of ventilation tube (38.8%), trauma (5.5%) and perforation due to unknown reason (3.6%).

### 3.2. Anatomical outcomes

Primary tympanic membrane closure rate at one month follow up was 88% (145/165).

Fifty-eight out of 145(40.0%) patients with initial closure of tympanic membrane had a minimal follow up of 6 months (Me = 12 months, SD =  $\pm$ 22.4). Recurrent perforation occurred in 13.8% (8/58) ears, insertion of VT was performed in 6.9% (4/58) and one patient (1.7%) developed cholesteatoma after a follow-up period of 48 months.

### 3.3. Prognostic factors

All results concerning the factors postulated as affecting primary tympanic membrane perforation closure and recurrent perforation are shown in Tables 1 and 2.

#### 3.3.1. Age

Mean age of patients with primary successful closure was 11.9  $\pm$  3.3 versus 9.9  $\pm$  3.6 years of patients with failed closure ( $p = 0.018$ ). Rates of persistent and recurrent perforation, VT insertion and overall unfavorable outcome at each of the evaluated cut-off ages, 6–11 years old, are presented in Table 3 and demonstrated in Fig. 2. Cut off ages above 9 and 10 years were both found to correlate significantly with lower rates of persistent perforation (8.9%;  $p = 0.032$  and 7.3%;  $p = 0.007$ , respectively). Cut off ages above 7 and 9 years were both found to correlate significantly with lower rates of recurrent perforation (9.8%;  $p = 0.048$  and 7%;  $p = 0.022$ , respectively).

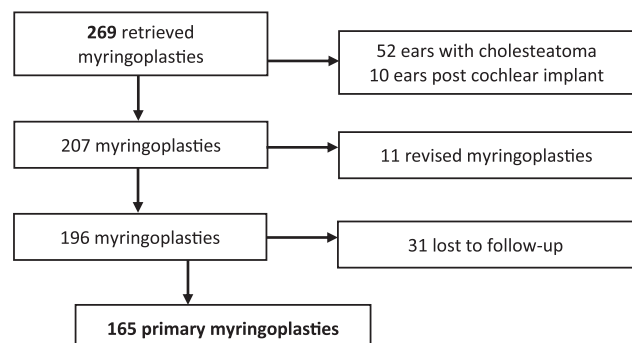


Fig. 1. Application of study inclusion and exclusion criteria.

Download English Version:

<https://daneshyari.com/en/article/6213037>

Download Persian Version:

<https://daneshyari.com/article/6213037>

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