The surgical outcome of myringoplasty in adults in the Royal Medical Services Amman-Jordon.

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Abstract

Objective: The aim of this study was to evaluate the outcome of graft take and rejection in myringoplasty in adults.

Patients and Methods: The total number of patients included in this study was 120 (70 males, 50 females) with an age ranging from 18-46 years. All these patients had dry central perforations for which they underwent myringoplasty. All myringoplasties were carried out under general anaesthesia using two surgical techniques, underlay technique in 60 patients and only technique in 60 patients. Temporalis fascia was used for grafting in all patients. Patients were followed up at weekly intervals for one month, fortnightly for two months and monthly for 6 months. In each follow up visit the ear was examined to assess whether the graft had taken or not, and the hearing threshold was assessed.

Results: the total number of patients was 120. 70 males (58.33%) and 50 females (41.66%). 38 patients (31.66%) were between 18 to 26 years of age. 53 patients (44.16%) were between 26 to 36 years of age. 29 patients (24.16%) were between 36 to 46 years of age. Thirty-eight patients (31.66%) were having small central perforations, and 53 patients (44.16%) medium size central perforation. Large central perforations were present in only 29 patients (24.16%). The underlay technique was used in myringoplasty in 60 patients (50%) and was successful in 52 patients (86.66%). The Onlay technique was used in 60 patients (50%) and was successful in 46 patients (76.66%). The overall success rate of myringoplasty in our study was 81.66%.

Conclusion: The findings of this study suggest that myringoplasty is a beneficial procedure in adults with dry central tympanic membrane perforation. The underlay technique gave a better success rate than the onlay technique.

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Introduction

Myringoplasty is a reconstructive operation of the tympanic membrane performed to prevent recurrent ear discharge and to improve hearing loss caused by tympanic membrane perforation, and was established for the first time by Berthold in 1879. He transferred free skin flap onto the perforation of the tympanic membrane. Later Politzer and Tangemann (1883, 1884) adjusted this method by removing the epithelium from the perforation edges. Between the 20s and 50s of the 20th century, Meshchersky, Temkin, Shambaugh et al used Tirshs free skin flaps of various thicknesses for this procedure. However, in the 60s and 70s Barteneva, Kozlov, and Guilford have shown that the use of the free skin flaps to be unacceptable due to the large number of post operative complications, such as necrosis, dermatitis, cholesteatoma, epidermal cysts. These complications were referred to as “flap disease”. By the the 80s, the majority of otosurgeons were convinced that the use of the transplants of mesodermal origin, such as fascia, vein, periosteum, or fat tissue in myringoplasty was preferable. Nevertheless, according to various authors temporal muscle fascia in myringoplasty was suggested for the first time by Wullstein in 1957.

In myringolpasty, a graft can be taken commonly from temporalis fascia and sometimes from Tragal perichondrium, vein or cartilage. The graft can be placed either medial to the remnant of the tympanic membrane (underlay) or lateral to the remnant of the tympanic membrane (onlay).

Initially, the onlay technique was used by otologist but with the passage of time, complications, such as lateralization of the graft, blunting of the anterior
angle were reported with this technique. It was Shea who first introduced the underlay technique in 1960. Since then, there has been progressive swing towards the underlay technique and a success rate of over 92% has been reported with this technique.

It is believed that the best results of myringoplasty both from morphological and functional points of view could be achieved in patients with tympanic membrane perforations. The percentage of the complications is significantly higher in patients with subtotal tympanic membrane defects. The most common complications are necrosis, graft rejection, incomplete perforation closure, and medial graft displacement.

The aim of this study was to evaluate the outcome of graft acceptance and rejection in adults who underwent myringoplasty in The Royal Medical Service in Jordan.

Material & methods
This retrospective study was carried out in the department of otorhinolaryngology, Royal Medical Services (Amman-Jordan) during a period of four years (April 2008 to April 2012).

The total number of patients included in this study was 120 (70 males, 50 females) with an age ranging from 18 to 46 years. All these patients had dry central perforation for which they underwent myringoplasty. All patients underwent a through pre-operative checkup.

All patients had good Eustachian tube function with dry middle ear mucosa. Preoperative assessment was carried out by tuning fork test and pure tone audiometric. Eustachian tube function was assessed by valsalva and the pressure changes were observed on the impedance meter. Non of the patients had active middle ear disease, ossicular discontinuity or sensorineural hearing loss. The air bone gap ranged from 30 to 40 dB.

All myringoplasties were carried under general anaesthesia using two surgical techniques, underlay technique in 60 patients and onlay technique in 60 patients. Temporalis fascia was used for grafting in all patients.

The onlay technique was carried out through endomeatal approach. After refreshing the edges of perforation, squamous epithelium was elevated from tympanic annulus and the tympanic membrane remnants. The graft was placed lateral to the annulus. The underlay technique was carried out through end aural approach. Large tymanomeatal flap based on superior vascular pedicle was elevated along the annulus. The graft was placed over the handle of the malleus, medial to the annulus. Meatal pack soaked in antibiotic ointment was placed for one week.

Patients were followed up at weekly intervals for one month, fortnightly for two months and monthly for six months. During each follow up visit the ear was examined to assess whether the graft had taken or not and hearing was assessed.

Results
The total number of patients was 120, 70 male (58.33%) and 50 female (41.66%). The distribution of the patients according to the age was 38 patients (31.66%) were between 18-26 years age. 53 patients (44.16%) were between 26-36 years age. 29 patients (24.16%) were between 36-46 years age.

The distribution of the patients according to the size of the perforation was: 38 patients (31.66%) had small central perforations, 53 patients (44.16%) had medium size central perforations. Large central perforations were present in only 29 patients (24.16%).

The underlay technique was used in myringoplasty in 60 patients (50%) and was successful in 52 patients (86.66%). The onlay technique was used in 60 patients (50%) and was successful in 46 patients (76.66%). The overall success rate of myringoplasty was (81.6%).

Discussion
Myringoplasty is a commonly performed procedure to repair a tympanic membrane perforation. The aim of the operation includes perforation closure with a dry stable grafted membrane and improvement in hearing level. Consequentially otorrhoea, otalgia, antibiotic use, social disruption would stop. Exploration of the middle ear and ossicular chain is a routine part of most myringoplasty operations. Successful outcome following myringoplasty is thought to be dependent upon a number of factors including experience of the surgeon, the nature of the perforation and the technique, the type of graft material used and the
positioning of the graft material in relation to the residual tympanic membrane.

Also, myringoplasty is more successful when there is no infection in the middle ear, mastoid, nose, and nasopharynx; these should be treated before doing myringoplasty. Deviated nasal septum, nasal polyps, and sinusitis should be treated surgically to improve the outcome in myringoplasty. Patent Eustachian tube is a prerequisite for myringoplasty.

We used temporalis fascia for grafting in our department as it is easy to harvest. It has a large surface area, a low metabolic rate and it doesn’t require any special preparation. Underlay and onlay are the most commonly used techniques for tympanic membrane perforation.\(^9\)

The overall success rate in this study of 81.6% is favourable compared to 82.2% reported by Kotecha and Fowler.\(^10\) The success rate for the underlay technique of 86.66% was better than that for onlay technique (76.66%). Similarly the average air bone gap closure for the underlay technique (22.5 dB) was better than that for the onlay technique (15 dB). These results agree with those reported by Black and Wormald.\(^8\)

**Conclusion**

The findings in this study suggest that myringoplasty is a beneficial procedure in adults with dry central membrane perforation. The underlay technique gave a better success rate than the onlay technique and is therefore recommended by the authors.

**References**