Auris Nasus Larynx xxx (2016) xxx–xxx

Contents lists available at ScienceDirect

Auris Nasus Larynx

journal homepage: www.elsevier.com/locate/anl

Endoscopic cartilage butterfly myringoplasty in children

Abdulvahap Akyigit [a,*], Turgut Karlidag [b], Erol Keles [b], Irfan Kaygusuz [b], Sinasi Yalcın [b], Cahit Polat [a], Orkun Eroglu [b]

[a] Elažiğ Education and Research Hospital, Clinic of ENT, Elazig, Turkey
[b] Firat University, Faculty of Medicine, Department of ENT, Elazig, Turkey

ARTICLE INFO

Article history:
Received 2 February 2016
Accepted 13 May 2016
Available online xxx

Keywords:
Butterfly myringoplasty
Endoscopic
Pediatric

ABSTRACT

Objective: The present study evaluated the results of the graft success rate and hearing gain of children who underwent endoscopic inlay butterfly myringoplasty due to chronic otitis media.
Methods: The study included 32 pediatric patients aged between 8 and 17, who had endoscopic inlay butterfly myringoplasty with the diagnosis of chronic otitis media between September 2012 and January 2015 in Elazig Training and Research Hospital Otorhinolaryngology Clinic and Firat University Otorhinolaryngology Clinic. All patients' demographics, perforation size, and hearing status were examined.
Results: Tympanic membrane perforation was ≤3 mm in 12 patients and between 3 and 6 mm in 20 patients. The air-bone gap (ABG) of the patients was 18.5 ± 6.29 dB preoperatively, 8.81 ± 3.53 dB postoperatively second month, 8.09 ± 3.55 dB postoperatively sixth month, and 7.96 ± 3.32 dB postoperatively 12th month. Two (6.3%) of the patients had postoperative myringitis. Two (6.3%) patients had recurrent perforation in the postoperative follow-ups.
Conclusion: In children, endoscopic inlay butterfly tympanoplasty is a surgical technique with short duration, high graft success, effective hearing reconstruction, and high levels of postoperative patient comfort.

1. Introduction

Several graft materials and graft placement methods are used in myringoplasty. The material most commonly used are fascia and perichondrium grafts [1,2]. The graft is placed as underlay or overlay with endaural or postauricular approach [3,4].

Eavey was the first to achieve good postoperative hearing outcomes with butterfly myringoplasty in selected small tympanic membrane perforations by using cartilage grafts. This technique is easier to apply relative to onlay and underlay tympanoplasty techniques, with the transcanal approach and without tympanomeatal flap elevation [3]. Afterwards, this technique was modified and used in large tympanic membrane perforations, too [4–6]. Furthermore, this technique is increasingly preferred because of its advantages, as it can be applied even in myringosclerotic membrane perforations, it improves postoperative patient comfort (depend on not to use of ear packing) and it reduces the cost of the operation by shortening the duration of the operation. Couloigner et al. [7] reported microscopic inlay butterfly cartilage tympanoplasty as a safe, short, and easy method in children.

The endoscopic approach has become popular recently in aural surgery. Sufficient vision can be provided endoscopically, especially when the perforation margins cannot be clearly evaluated otomicroscopically due to exostoses of the external auditory canal and when canaloplasty is required.

* Corresponding author at: Elazığ Education and Research Hospital, 23100 Elazığ, Turkey. Tel.: +90 5056191918.
E-mail address: cerrah23@gmail.com (A. Akyigit).

http://dx.doi.org/10.1016/j.anl.2016.05.005
0385-8146/

The present study examined the demographics, perforation sizes, and hearing statuses of pediatric patients in whom we performed endoscopic inlay butterfly myringoplasty due to chronic otitis media, and evaluated the effect of perforation size and preoperative air-bone gap (ABG) on postoperative hearing outcomes and operation success.

2. Patients and methods

This is a retrospective study that performed between September 2012 and January 2015 in the Elazig Training and Research Hospital Otorhinolaryngology Clinic and Firat University Otorhinolaryngology Clinic. The study included a total of 32 pediatric patients aged between 8 and 17 (mean: 13.9 ± 2.26), who had endoscopic inlay butterfly myringoplasty with the diagnosis of chronic otitis media. All patients' demographics, perforation size, perforation location (anterior, posterior or both quadrants (anterior–posterior)), and hearing status were retrospectively examined. The patients' ears that would be operated on were preoperatively evaluated using an endoscope (2.7 mm-diameter, 0° endoscope).

The American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS) guidelines were followed [8]. Data on pre- and post-operative pure-tone average and air-bone gap (ABG) were compiled, and the mean thresholds were determined at 0.5, 1, 2, and 4 kHz. The ABG was calculated using air conduction and bone conduction thresholds recorded on the same audiogram. Preoperative and postoperative ABGs were compared.

Patients who had discharge within last one month, who had an air-bone gap >30 dB, who had atrophy or retraction pouch of tympanic membrane, who had marginal perforation, who had cholesteatoma or granulation tissues, and who had perforation margins that could not be evaluated endoscopically were excluded from the study.

2.1. Surgical method

All patients were operated on under general anesthesia. Tympanic membrane perforation was evaluated using an endoscope (2.7 mm-diameter, 0° rigid endoscope). Perforation margins were endoscopically denuded using a pick. The middle ear and ossicle were checked through perforation. Perforation size was measured using a Fisch elevator. For bleeding management, gelfoam with 1/10,000 adrenaline was placed in the external auditory canal. Perichondrium-cartilage graft was prepared from tragal cartilage. Number 11 scalpel was used and created around about 0.5–1 mm groove along the circumferential border of the cartilage disk allowing the cartilage flanges. The graft was shaped at least 0.5 mm larger than the perforation margins by preserving perichondrium of both sides (Fig. 1).

The graft prepared was placed into the perforation using transcanal endoscopy. All margins were checked using a pick and the perichondrium on the lateral side of the graft was placed over the tympanic membrane. An aspirator was used to evaluate if the graft was medialized or lateralized. Gelfoam was placed on the graft and membrane margins. The tragal incision was sutured and trans-tragal suturing was done in order to avoid hematomas. Patients received oral systemic antibiotics for five days. The patient was discharged on the day of operation. Follow-up examinations were done on postoperative days 7, 15, and on second, sixth and 12th months. Pure-tone audiometry test was administered at the second, sixth and 12th months.

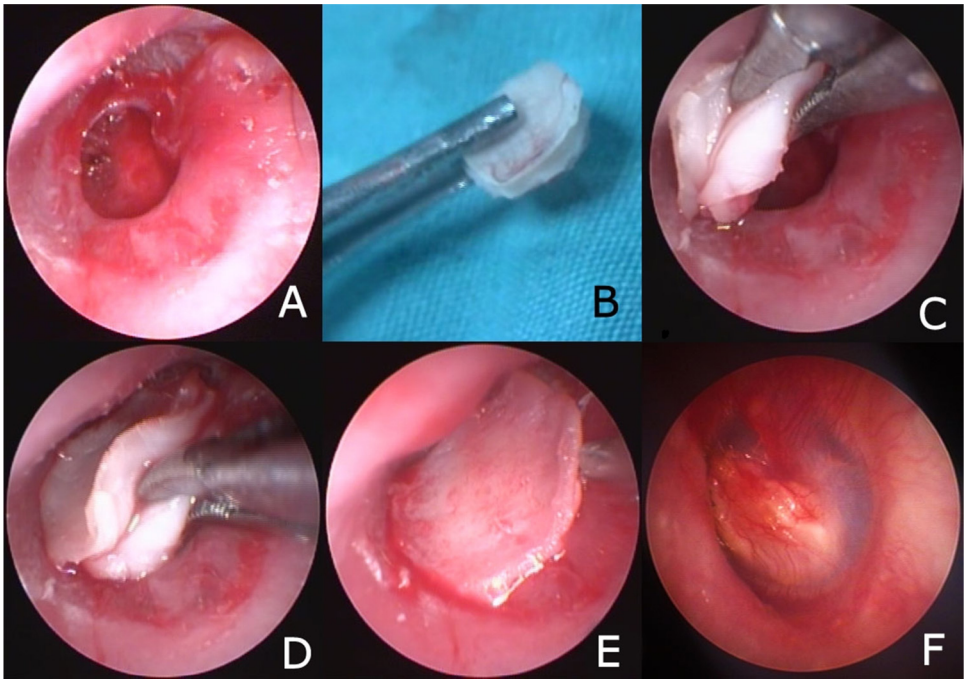

Fig. 1. Perforation appearance (A), graft preparation (B) and placement into perforation (C, D, E), endoscopic appearance of tympanic membrane in postoperative month six (F).

Please cite this article in press as: Akyigit A, et al. Endoscopic cartilage butterfly myringoplasty in children. Auris Nasus Larynx (2016), http://dx.doi.org/10.1016/j.anl.2016.05.005