

Bilateral Fat Graft Myringoplasty in Children

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Abstract

The results after simultaneous bilateral fat graft myringoplasties in children have not been previously reported in the literature. We report on 28 children who underwent bilateral fat graft myringoplasties as outpatient procedures under general anesthesia. The success rate was 91% at final follow-up, with only 16% of children requiring insertion of pressure-equalizing (PE) tubes following surgery. No complications were documented. We conclude that bilateral fat graft myringoplasties are safe to perform, with an excellent success rate, and are suitable as outpatient procedures.

Introduction

The ideal approach for closure of tympanic membrane perforations in children remains controversial. Although grafting of the perforation with temporalis fascia is frequently performed, there have been several reports of the successful use of adipose tissue from the ear lobule for closure of small unilateral perforations.¹⁻⁵ Fat has the advantage of being easily obtained with little morbidity associated with its harvesting.

Terry et al⁴ have documented the one-year success rate of fat graft myringoplasties as comparable to procedures using temporalis fascia. The procedure is technically expedient and can be carried out on an outpatient basis, with or without the need for intubation. Indeed, Gross et

al³ are of the opinion that adipose plug myringoplasties produce less otologic trauma than the insertion of PE tubes and have used this procedure to repair a small perforation in one ear in patients who have had a more extensive otologic procedure in the opposite ear.

The ease and simplicity of performing a fat graft myringoplasty allows for bilateral simultaneous repair of tympanic membrane perforations; the advantages being a single anesthetic and the limited need for postoperative care, which are important in a young child. However, the literature yields little information about this cost-effective procedure. We reviewed the records of 28 children who underwent bilateral fat graft tympanoplasties and report our findings.

Materials and Methods

Patient Population

The medical records of 28 children (18 male, 10 female; age range 3 to 16 years) who had undergone a bilateral adipose myringoplasty at the LeBonheur Childrens Medical Center from January 1990 to December 1994 were reviewed. Patients were included in the study based on set criteria (Table 1). Active allergies, rhinosinusitis and adenotonsillitis were optimally controlled prior to the operation. The follow-up period ranged from 4 to 20 months (mean 8.5 months).

The surgery was performed by fellows and attending physician staff under general anesthesia with an oral airway and a mask. The ears were prepared and draped using sterile techniques. The right ear lobule was infiltrated with 1% lidocaine with 1:100,000 epinephrine. The ears were examined under the microscope and the rim of the perforation carefully removed with a Rosen's needle and cup forceps. A small incision was made posterior to the ear lobule and a piece of fat extracted using sharp dissecting scissors. Care was taken to ensure that the graft was more than twice the size of each

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perforation and that sufficient tissue was available for both sides. The incision behind the ear lobule was closed with interrupted 4-0 chromic sutures. The middle ear was then packed with a single piece of gelfoam soaked in Cortisporin ear drops. The fat graft was inserted through the perforation in an hourglass fashion so that it covered both sides of the margins. The ear canal was then packed with antibiotic-moistened gelfoam pledgets and Cortisporin ointment placed over the pledgets.

An identical procedure was performed on the second ear. No ear dressing was employed and patients were discharged within four hours of surgery and instructed to keep the ears dry until the first postoperative visit which was three weeks after the procedure. Further follow-up was arranged every three months thereafter depending on the status of the ear.

Results

Successful closure of the perforation was observed in 51 of 56 ears (91%) at the final follow-up (Table 2). Among the graft failures, one patient had bilateral residual perforations and three were unilateral. Four patients (14%) required reinsertion of PE tubes after successful closure of the perforations. If postoperative insertion of PE tubes is considered a failed myringoplasty, then the success rate drops to 77%. The period from the time of surgery to that of PE tube insertion ranged from 3 to 18 months (mean 11 months). Three of the graft failures (60%) and three requiring postoperative PE tube insertion (75%) were in the 7 to 13-year age group (Table 3).

Discussion

The issue of bilateral simultaneous adipose myringoplasties in children has not been adequately addressed in the literature. Although previous studies^{3,5} have documented the performance of bilateral procedures, their outcomes were not assessed independently. The successful closure of 91% of the tympanic membrane perforations in this report, using ear lobe adipose tissue as a graft, is consistent with that of other tympanoplasty series.⁶⁻¹⁰ A PE tube had to be reinserted in 4 of 28 patients (14%) for recurrent otitis media. Deddens et al⁵ report a similar experience in their study wherein an additional tube was required in 18% of cases. We do not consider it a failure of the operation, as studies have shown that it does not indicate a higher than normal chance of a residual perforation after tube extrusion.¹¹ The higher initial success rate noted in the present study when compared to an earlier report from this institution,³ is probably due to the more

Table 1. Selection Criteria.

1. Bilateral dry central perforations not exceeding 25% of pars tensa.
2. Perforations present for at least 3 months.
3. A hearing threshold of better than 20 dB in both ears.
4. Absence of ossicular or mastoid pathology.
5. Absence of PE tubes in situ.

Table 2. Results.

	Number	Percentage (%)
Total ears	56	100
Successful closure	51	91
Graft failure	5	9
Postoperative PE tube insertion	8	14

Table 3. Distribution of Graft Failures and Postoperative PE Tube Insertion.

Age (in years)	No. of Patients	Graft Failures	Postoperative PE Tube Insertion
< 7	6	0	1
7-13	14	3	8
> 13	8	2	0

conservative selection procedure which evolved subsequently. Adipose myringoplasty was not recommended for any perforation occupying more than 25% of the pars tensa. Additionally, children who had a hearing loss of over 20dB, those in whom the conductive hearing loss could not be explained by the size of the perforation alone, and those who had previous ear surgery or active middle ear disease were offered a formal tympanoplasty with temporalis fascia.

The optimal age for tympanoplasty is a controversial issue. Although studies have assessed outcomes in various age groups, the findings have not been conclusive. Shih et al⁸ found a higher failure rate in children under 10 years of age. However, a recent report⁷ of 268 pediatric patients who were evaluated in three groups, 0 to 8 years, 9 to 12 years, and 13 to 19 years, found no difference in outcomes and concluded that there was no specific age at

which success rates improve. When we divided our patients into three age groups (Table 3), we noted the highest number of graft failures and postoperative PE tube insertions were in the 7 to 13-year age group. However, the absolute numbers were too small to make any meaningful contribution to analysis. The different findings in reported studies, including ours, lends support to the hypothesis that age alone cannot predict the outcome of a tympanoplasty.

No complications were documented during or after the procedures and all children went home a few hours after surgery. The 3% rate of sensorineural hearing loss reported in patients undergoing tympanoplastic procedures¹⁰ has not been observed in any study on adipose myringoplasty. As there is virtually no manipulation of the middle ear structures, the risk of iatrogenic otologic trauma is very low, making it safe to perform simultaneous bilateral myringoplasties. The cost-effectiveness of the procedure is evident as the need for a second operation is eliminated. The postoperative care required is minimal, and this is an important aspect of any surgical procedure performed on a child who may not cooperate for repeated examination and manipulation of the operated ear. The excellent success rates justify recommending simultaneous myringoplasties for children who have

bilateral small central perforations with essentially normal hearing. This single operation can eliminate recurrent otorrhea and allow bathing and swimming without the need for cumbersome water protection.

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