

# Surgical treatment of medial meatal fibrosis Report of four cases

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## Abstract

**Objective:** We describe four cases of medial meatal fibrosis, a rare condition of the external auditory canal, in which hearing improved following surgery.

**Methods:** Four patients with medial meatal fibrosis underwent surgical treatment and had been followed at the University of Tokyo during the last 5 years. We examined hearing improvement and recurrence. A patient had graft-versus-host disease (GVHD) with her urethra and vagina, and two patients had methicillin resistant *Staphylococcus aureus* (MRSA) infection with their affected ears.

**Results:** All cases got hearing improvement without any major complications.

**Conclusions:** Medial meatal fibrosis may be treated satisfactory with surgical interventions.

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**Keywords:** Medial meatal fibrosis; External auditory canal; Surgery

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## 1. Introduction

Medial meatal fibrosis (MMF) is a relatively rare condition in which the medial part of external auditory canal becomes obliterated by fibrous tissue. MMF is considered one of the acquired atresias of the external auditory canal. Based upon its etiology, MMF has been classified as postinflammatory, traumatic and postoperative. The term “postinflammatory acquired atresia” was used in the older literature [1–4]. Typically, in its early stage, granulation tissue and polyps appear on the tympanic membrane and/or the skin over the medial aspect of the external auditory canal due to persistent infection. If the underlying condition and infection are not treated, fibrous tissue proliferates subcutaneously, causing conductive hearing loss. Therefore, control of chronic infection is an essential component of treatment of MMF. To improve hearing, however, complete removal of the fibrous plug followed by reconstruction of the tympanic membrane and skin of the external auditory canal is

required. We covered the exposed raw surface of the tympanic membrane and medial aspect of the external canal with skin grafts in four patients with MMF, which provided satisfactory outcomes.

## 2. Materials and methods

Four patients with MMF underwent surgical treatment and had been followed at the University of Tokyo during the last 5 years. The patients’ age ranged from 25 to 66 years (Table 1). Both ears were involved in two patients, and involvement was unilateral in the other two. All patients complained of hearing loss, and three also complained of chronic otorrhea. Two patients had undergone tympanoplasty in the affected ear. Chronic otitis externa had been present in two patients, one of who had chronic graft-versus-host disease (GVHD) for 7 years after bone marrow transplantation for chronic myelogenous leukemia. The patient who had chronic GVHD (case 1) also had stenosis of the urethra and the vagina. All patients habitually scratched their ears with ear picks or cotton buds because of itching sensation in the ear.

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Table 1  
Demographics and clinical characteristics of patients with medial meatal fibrosis

Case No.	Age	Gender	Involved Side(s)	Etiology	Symptoms	Preoperative PTA	Preoperative AB gap	Postoperative AB gap	Follow-up Period (month)
1	25	F	Bilateral	Chronic infection by MRSA Chronic GVHD	Hearing loss Otorrhea	43 dB	30 dB	0 dB	43
2	55	M	Unilateral	Chronic infection by MRSA History of tympanoplasty	Hearing loss Otorrhea	76 dB	36 dB	1 dB	18
3	66	M	Unilateral	Chronic infection History of tympanoplasty	Hearing loss Otorrhea	55 dB	29 dB	3 dB	15
4	29	F	Bilateral	Chronic infection	Hearing loss	43 dB	29 dB	5 dB	15

MRSA, methicillin-resistant *Staphylococcus aureus*; GVHD, graft-versus-host disease; AB, air–bone; PTA, pure-tone average.

Otoscopic examination revealed funneling of the external auditory canal in its medial aspect. Persisting infection was obvious in three patients, two of who had methicillin resistant *Staphylococcus aureus* (MRSA) cultured from the purulent discharge. Pure-tone audiometric examination revealed conductive or mixed hearing loss in all affected ears: the pure-tone average ranged from 43 to 76 dB, and average air–bone gap ranged from 29 to 36 dB. High resolution computed tomography (HRCT) showed a soft tissue density occupying the medial portion of the external auditory canal (Fig. 1). The middle ear spaces and ossicular chain appeared normal in all patients.

All patients underwent removal of all fibrous tissue followed by skin grafting to the tympanic membrane and external auditory canal via the transcanal approach. Following elevation of the canal skin, the fibrous tissue was removed completely, preserving the lamina propria of the tympanic membrane (Fig. 2A). To identify the layer of the lamina propria below the fibrous tissue, we detected the short process of the malleus and then the handle. Exploratory tympanotomy was then performed to examine the ossicular chain. In one patient, the incus lenticular process was missing, and thus the

tragus cartilage was placed between the stapes capitulum and the eardrum. The ossicular chain was intact in the other three patients. Once the external bony wall of the canal was widened and smoothed, the lamina propria and exposed bony canal were covered with several pieces of thin split thickness skin grafts taken from the inguinal or retroauricular area (Fig. 2B). We did not use temporal muscle fascia or connective tissue for the reconstruction. The schemes of the surgical procedure are shown in Fig. 3. The external ear canal was then packed with gauzes impregnated with acromycin, which were removed 10 days later. Vancomycin was administered pre- and postoperatively for 2 weeks in patients with MRSA infection. The patient with chronic GVHD (case 1) received cyclosporin pre- and postoperatively. Patients were asked not to scratch their ears to avoid the possible recurrence.

### 3. Results

All patients had uneventful postoperative courses. Periodic otoscopic examination revealed that the external auditory canal remained widely patent, without signs of

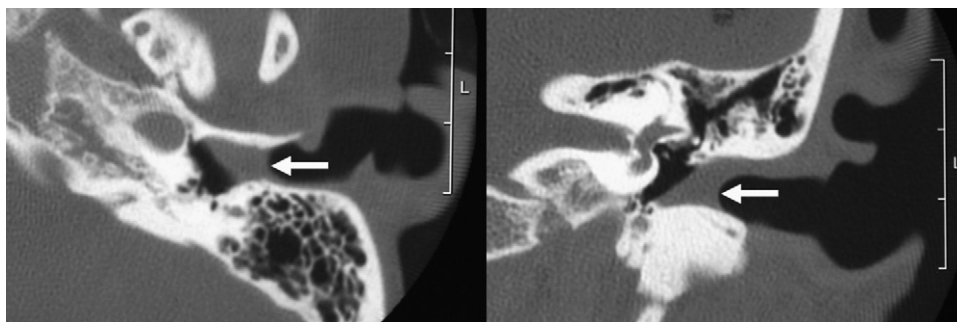


Fig. 1. Representative high resolution computed tomographic scans in a patient with medial meatal fibrosis (case 1), showing a soft tissue density (arrows) on the medial aspect of the external auditory canal without abnormalities in the middle ear spaces. Left: horizontal plane; right: coronal plane.

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