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## Attic cholesteatoma with closure of the entrance to pars flaccida retraction pocket

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### ABSTRACT

We report three patients with pars flaccida-type cholesteatoma (attic cholesteatoma) with closure of the entrance to the cholesteatoma at the time of surgery. These patients were diagnosed with attic cholesteatoma requiring surgery on the basis of abnormal findings of the pars flaccida, audiometry, and temporal bone computed tomography during the clinical course. Intraoperatively, cholesteatoma matrix and granulation tissue were observed behind the intact pars flaccida epithelium, which suggested that the entrance had apparently closed and the continuity with the cholesteatoma matrix disappeared after resolution of inflammation at the pars flaccida. In such patients, a normal pars flaccida may cause cholesteatoma to be initially overlooked, or misdiagnosed as congenital cholesteatoma. The diagnosis should be carefully made on the basis of the clinical course and the results of various examinations.

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## 1. Introduction

Pars flaccida-type cholesteatoma, or attic cholesteatoma, begins with retraction of the pars flaccida, progresses to the attic with debris accumulation, and ultimately causes bone destruction. We report three patients with attic cholesteatoma with otoscopically normal pars flaccida lesions just before surgery, although retraction, granulation, or debris accumulation in the pars flaccida was observed during the clinical course. On the basis of various test results, including audiological batteries and temporal bone computed tomography (CT), these patients were diagnosed with attic cholesteatoma requiring surgical inter-

vention. We also provide a literature-based discussion of these cases.

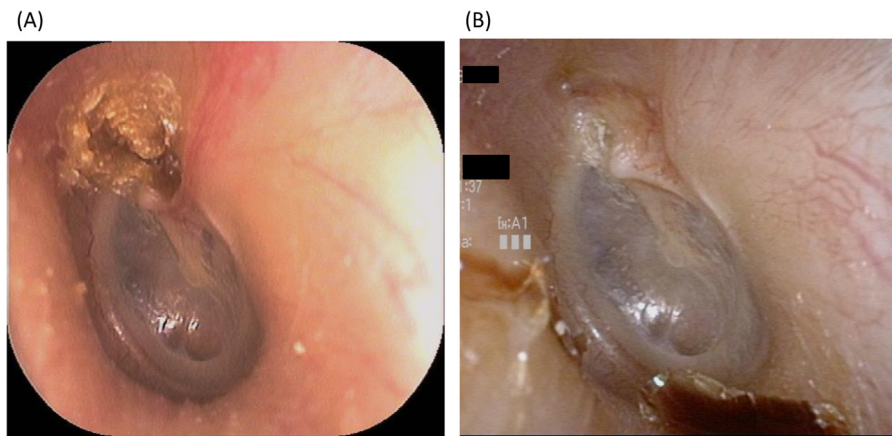
## 2. Case presentation

### 2.1. Case 1

A 42-year-old male visited a nearby otolaryngologist with complaints of hearing loss and discomfort in the right ear. He was referred to our hospital for suspected attic cholesteatoma in both ears. His initial evaluation revealed retraction and debris accumulation in the pars flaccida of the tympanic membrane of both ears. Pure-tone audiometry of the right and left ears demonstrated mean air-conduction hearing levels of 43.3 dB and 33.3 dB, respectively, at 500, 1000, and 2000 Hz. Temporal bone CT showed a soft-tissue shadow in the epitympanum in both ears. The patient was diagnosed with bilateral attic cholesteatoma and first underwent tympanoplasty on the right

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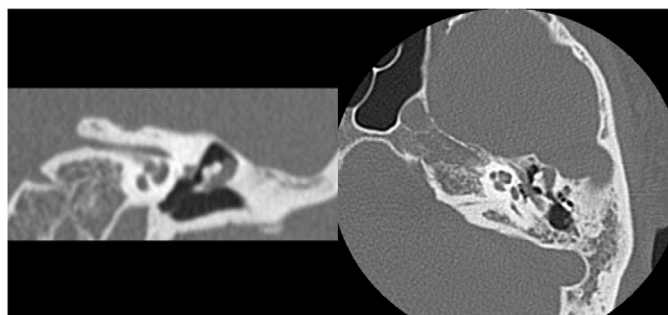
**Fig. 1.** Otoendoscopic findings of case 1. (A) At the first visit, retraction and debris accumulation are visible in the pars flaccida of the left ear. (B) Eight months after the first visit, the pars flaccida lesion had become nearly normal.

ear. While the patient was waiting for left ear surgery, the pars flaccida lesion in the left ear disappeared (Fig. 1). However, a soft-tissue shadow in the epitympanum was still observed on temporal bone CT prior to the left ear surgery (Fig. 2). Left tympanoplasty was performed 8 months after the right ear surgery.

Intraoperatively, cholesteatoma epithelium mixed with granulation tissue was observed on the lateral surface of the head of the malleus, located on the back surface of the pars flaccida epithelium. The cholesteatoma extended to the entire attic and antrum. After the cholesteatoma and granulation tissue were removed, with preservation of the ossicular chain, the surgery was completed by performing a type I tympanoplasty with canal wall reconstruction. The patient's postoperative course was unremarkable, and he is now being followed at our outpatient clinic.

## 2.2. Case 2

A 43-year-old male presented to a nearby otolaryngologist complaining of otalgia and otorrhea in the right ear. He was diagnosed with middle ear cholesteatoma and referred to our hospital. At the initial visit, evaluation under otomicroscopy revealed granulation tissue and otorrhea in the pars flaccida of the right ear. Pure-tone audiometry of the right ear demonstrated mean air-conduction hearing levels of 51.7 dB at 500, 1000, and 2000 Hz. The patient was diagnosed with



**Fig. 2.** Preoperative temporal bone CT images of case 1. A persistent soft-tissue shadow is seen lateral to the head of the malleus and the body of the incus. CT, computed tomography.

right ear attic cholesteatoma associated with otitis media with effusion, which required tympanoplasty. While the patient was awaiting surgery, he was treated with antibiotics. Three months after the first visit, the granulation tissue in the pars flaccida of the right ear was no longer seen and the lesion appeared normal, although the middle ear effusion was still present (Fig. 3). Temporal bone CT showed a soft-tissue shadow in the mesotympanum, epitympanum, and mastoid cavity, as well as partial destruction of the tympanic scutum and tegmen tympani in the right ear (Fig. 4).

At the time of tympanoplasty, the cholesteatoma extended from the malleus head to the short process of the incus with erosion of the tympanic scutum. It partially invaded behind the incus and hung on the horizontal portion of the facial nerve, resulting in exposure of the nerve. The destruction of the tegmen tympani suspected by CT images was not found. There was no continuity between the pars flaccida epithelium and the cholesteatoma matrix. Following eradication of the cholesteatoma, with preservation of the ossicular chain, type



**Fig. 3.** Preoperative otoendoscopic finding of case 2. The pars flaccida of the right tympanic membrane appears normal, without granulation tissue. Middle ear effusion is also noted in the right ear.

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