

# A Rare Complication of Chronic Otitis Media: Cerebellar Abscess

## Case Report

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## Abstract

Chronic otitis media (COM) and its associated complications are currently less common because of the popularity of imaging modalities such as computed tomography and magnetic resonance imaging and the increased use of antibiotics. Patients can be treated without any complications owing to early diagnosis. Despite all these new developments and opportu-

nities, complications of autogenous cerebellar abscess may develop and be fatal. In this case report, we present our own clinical experience regarding a patient with cerebellar abscess as a complication of COM.

**Keywords:** Chronic otitis media, complication, cerebellar abscess, surgery

## Introduction

Intracranial complications associated with chronic otitis media (COM) are problems encountered because of difficulties in the phases of diagnosis and treatment in the past. In the recent years, these complications are rarely observed owing to the increased antibiotics use and widespread imaging methods. However, intracranial complications developing secondary to COM can still be a problem, particularly in developing countries (1).

In this case report, we describe the clinical course of a patient who was admitted to the emergency service with complaints of imbalance and dizziness and was diagnosed with cerebellar abscess secondary to COM with cholesteatoma.

## Case Presentation

A 32-year-old male patient was admitted to clinic with complaints of gait disturbance, dizziness, imbalance, and fever that had started two days prior. On determining the medical history of the patient, it was learned that he had intermittent ear discharge and hearing loss beginning from his childhood. On physical examination of the patient, purulent secretion was detected in his left external auditory canal. The posterior wall of the external auditory canal was found to be protruding into the external

auditory canal. The left tympanic membrane of the patient could not be clearly evaluated because of protrusion. Tenderness on palpation was detected in the left mastoid bone. Horizontal-rotatory nystagmus was existent with a slow phase of movement towards the left and a fast phase towards the right. Romberg and dysmetria test was positive in the left upper extremity. Based on these findings, cranial computed tomography (CT) and magnetic resonance imaging (MRI) were performed. In the cranial CT scan, a soft tissue density completely obliterating the left middle ear cavity and mastoid cells was observed and at this level, a bone defect in the posterior and superior walls of the mastoid bone and a lesion (35×33×34 mm) pushing the 4<sup>th</sup> ventricle in the left cerebellar hemisphere were detected. In cranial diffusion MRI, a lesion interpreted as cholesteatoma filling the middle ear and mastoid cells and another lesion compatible with an abscess having a size of 35×33×26 mm and pushing the 4<sup>th</sup> ventricle in the left cerebellar hemisphere and the pons were observed (Figure 1).

Craniotomy and abscess drainage were urgently performed on the patient with the diagnosis of cerebellar abscess at the Department of Neurosurgery. The patient was followed up for 15 days at the Department of Neurosurgery and received



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treatment with postoperative parenteral 6×4 million-IU penicillin G potassium (penicillin G potassium vial, 1.000.000 IU; İ.E. Ulagay, İstanbul, Turkey) and 4×500-mg metronidazole (flagyl 0.5% 100 mL, Eczacıbaşı Drug Trade, İstanbul, Turkey). The patient, whose neurological findings got better and a normal level of consciousness was observed, was transferred to our clinics for tympanomastoidectomy because the patient had otogenic cerebellar abscess. Audiometric examination and temporal CT were performed. In the audiogram, very severe sensorineural hearing loss, having a mean air conduction of 120 dB and mean bone conduction threshold of 70 dB in the left ear, was detected. The temporal bone CT revealed destruction of the posterior wall of the external canal and mastoid bone by cholesteatoma. It was detected that there was soft tissue in the mastoid antrum and middle ear, no ossicle was observed, and there was a bone defect in

the left lateral semicircular canal. The patient underwent the operation with these findings. During the surgery, it was observed that the external auditory canal posterior wall was destroyed because of cholesteatoma, and there was an auto mastoidectomy cavity just behind the mastoid cortex. It was detected that there was an approximately 1×1 cm bone defect in the posterior dural and an approximately 1.5×1 cm bone defect in the middle fossa dural plates. Posteriorly the bone wall on the sigmoid sinus was eroded by cholesteatoma. There was not occlusion in the sigmoid sinus. The facial canal was dehiscence completely in the tympanic segment, and cholesteatoma turned to the medial of the facial nerve. Lateral and posterior semicircular canals were dehiscence. The cholesteatoma matrix was cleaned around the facial nerve, from the middle ear, and the semicircular canals. Ossicular chain was destroyed completely. For preventing brain

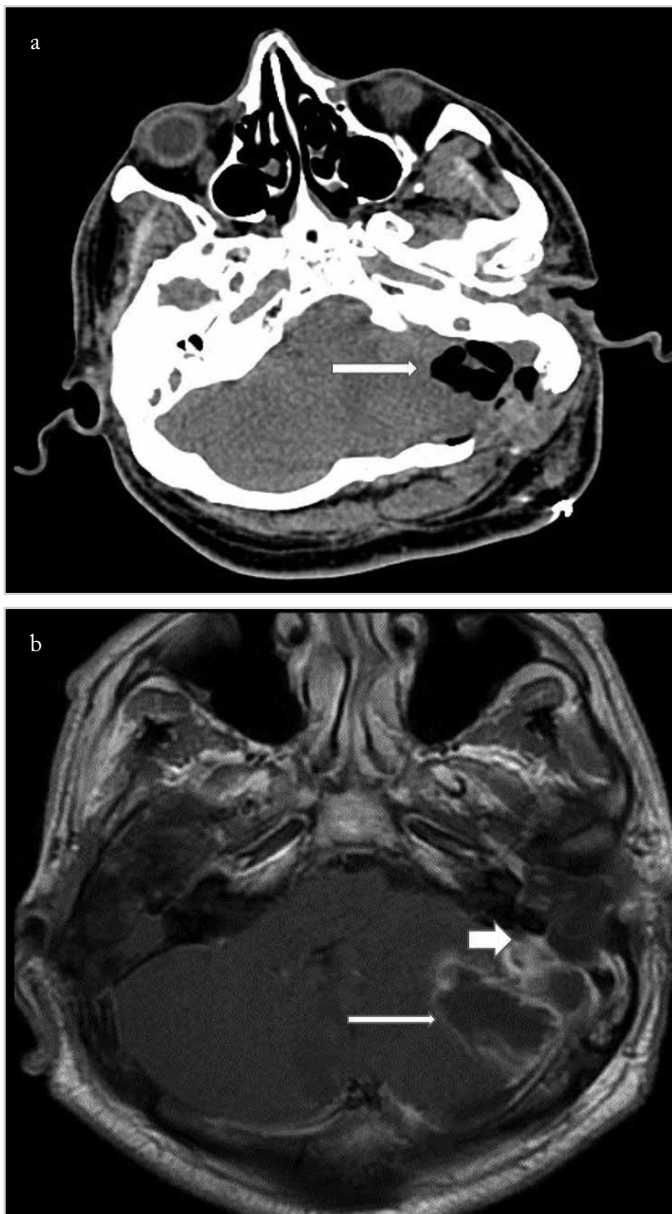


Figure 1. a, b. (a) Cerebellar abscess on cranial CT. (b) On T1-weighted contrast-enhanced axial section of cranial MRI, cholesteatoma with minimal peripheral contrast (thick arrow) and abscess lesion with lobulated contour with peripheral contrast (fine arrow) are observed

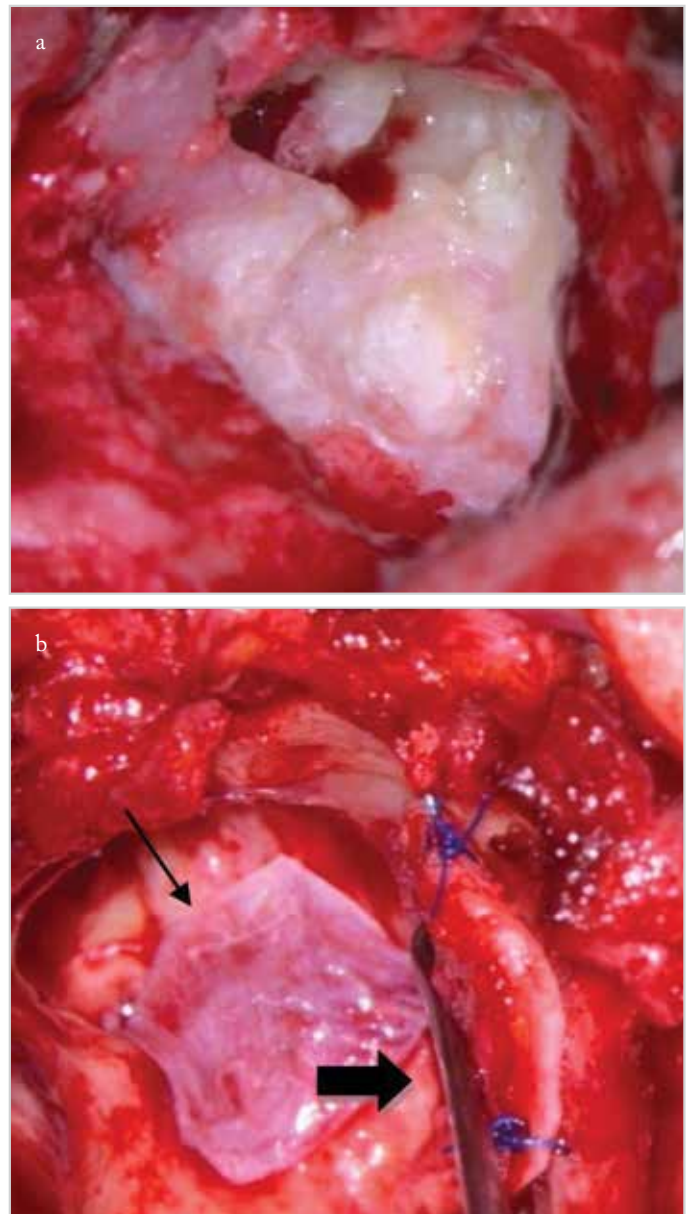


Figure 2. a, b. (a) The epithelium that completely fills the mastoidectomy cavity. (b) Conchal cartilage duraplasty (thick arrow), temporal facial graft covering the open facial nerve and semicircular canals (fine arrow)

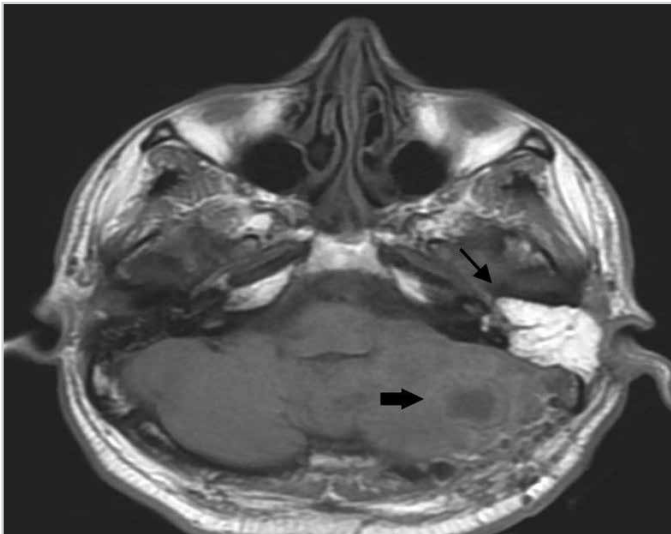


Figure 3. Axial section of cranial MRI at postoperative 3rd week; fine arrow: mastoidectomy cavity obliterated by fat graft taken from the abdomen; thick arrow: regressed abscess cavity

herniation, cartilage support to the sinodural angle was provided by drilling holes via a 0.6 mm burr into the healthy bone around the dural defect and fixing with prolene sutures. The temporal muscle fascia was laid over the open facial nerve and semicircular canals (Figure 2). The cavity was filled with fat tissue harvested from the abdominal region. Then, the external auditory canal was obliterated as a blind pouch. *Actinomyces europaeus* was isolated from the abscess culture taken during the operations. Facial nerve motor functions of the patient during postoperative follow-up were normal and the complaint of dizziness also decreased. In the radiological examinations conducted during the postoperative period, the abscess appearance regressed and cholesteatoma was not observed (Figure 3). No relapse was detected during the 18-month follow-up. Written informed consent was obtained from the patient for this study.

## Discussion

Today, otogenic brain abscesses are rarely seen owing to developing imaging methods and new-generation antibiotics. Although otogenic brain abscesses mostly occur in the temporal lobe and cerebellum, they less frequently develop in the parietal and occipital lobes (2). However, when the literature was reviewed, it was observed that there are also publications suggesting that cerebellar abscesses has four times more frequency than temporal lobe abscesses (3). Although the cerebellar abscess occurs in association with the defect in the Trautmann's triangle, it differs from the abscess arising in other locations because of difficulty in diagnoses and high mortality rates (2).

Complaints, such as headache, ear discharge, nausea, vomiting, and fever, can be seen in otogenic brain abscesses. In addition, ataxia, vertical nystagmus, and coordination disorder among extremities can be observed in cerebellar abscesses. Moreover, symptoms of brain stem pressure occurring in association with the mass effect of cerebellar abscess can be observed. This patient group should be kept under close vital and neurological examination follow-up for complications, such as encephalomen-

ingitis, potential convulsions, and high intracranial pressure that can result in mortality. No abnormality was detected in the vital follow-up of our patient who was admitted to the Emergency Department with complaints of ear discharge, ataxia, and loss of coordination among extremities.

When responsible microbiological agents in patients with cerebellar abscess are considered, strict anaerobic microorganisms are observed in addition to aerobic flora, and the most common agents are anaerobic streptococci. In addition to this, in the review by Sennaroglu and Sozeri (2), in which 41 patients with otogenic brain abscesses were examined, it was reported that the most commonly encountered microorganism was *Proteus*. Encountering gram-negative organisms frequently in the bacteriological cultures of patients with brain abscess makes us think that gram-positive organisms may be more sensitive to the currently prescribed antibiotics. In addition, gram-negative bacteria becoming more resistant to antimicrobial drugs may have changed the order of more frequent agents compared with the past. *Actinomyces europaeus* were isolated from the sample of intraoperative brain abscess culture, and to the best of our knowledge, this microorganism has not been reported up till now in patients with cerebellar abscess.

In the review of literature on the treatment of cerebellar abscess, different clinical approaches were found among health centers. In one of them, it was claimed that in the treatment of cerebellar abscess, the abscess should first be drained by a Neurosurgeon and then ear surgery should be performed after the clinical state of the patient improves (5). Another suggestion is that the otogenic abscess should be drained during tympanomastoidectomy (6). In our case, we preferred radical otologic surgery of cholesteatoma after craniotomy and abscess drainage was performed by the Department of Neurosurgery under high-dose of antibiotherapy.

## Conclusion

Although the patient in this case report was primarily admitted to the Department of Emergency for neurological complaints, the diagnosis of otogenic cerebellar abscess with complications was established through imaging. It is suggested that the importance of otoscopic examination of the ears should be remembered in patients admitted with complaints of ataxia and vertigo to the Department of Emergency, and otitis media and its complications should be considered in the differential diagnosis. With appropriate antibiotic therapy and surgical approach, successful outcomes without mortality and morbidity can be obtained in patients with cerebellar abscess.

**Informed Consent:** Written informed consent was obtained from patient who participated in this study.

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