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CASE REPORT

Stereotactic Management of Multiloculated Cerebellar Abscess Secondary to Middle Ear Cholesteatoma: A Case Report

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Objective: Aim of this paper is to report a case of multiloculated cerebellar abscess secondary to middle ear cholesteatoma and to review the literature.

Methods: Case report and literature review.

Discussion and Conclusion: Early diagnosis and management of intracranial complications of chronic otitis may be life-saving. The standard reported approach for the management of otogenic intracranial abscess is mastoidectomy in combination with abscess drainage, either by a craniotomy for abscess excision or by stereotactic drainage under CT guidance.

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Introduction

Intracranial cerebellar abscess is a life-threatening complication of chronic otitis media [1,2] and nowadays it is a disease prevalent in developing countries [1,2]. Mastoidectomy and abscess drainage have been recommended as the management of choice in otogenic intracranial abscess [1,2]. In this article, we report a case of a multiloculated cerebellar abscess secondary to chronic otitis media that was successfully managed by stereotactic drainage under CT guidance and radical mastoidectomy with tegmen tympany reconstruction.

Case report

S.I is a 70 years old woman that was addressed to our Department due to the onset of headache and vertigo with retropulsion since few days. She had a history of hypertension and hyperthyroidism. She was also complaining a occasional left ear discharge since few months. The ENT and the Neurosurgical evaluations disclosed the presence of horizontal left-beating nystagmus, mild left seventh nerve deficit (grade III House-Brackmann) and dysmetria of superior arts. Left ear micro-otoscopy depicted an attic crust and, after suctioning, keratin from an attic perforation.

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The audiogram showed a mild right pantonal sensorineural hearing loss and a left severe mixed hearing loss across all frequencies.

The CT scan performed at onset showed the presence of a left intraxial cerebellar mass, therefore the patient was addressed to a cerebral MRI that documented the presence of a left multiloculated cerebellar mass (Fig 1 A) with a fluid signal value at the T1 and T2 sequences. Temporal bone CT scans confirmed the otoscopically apparent of cholesteatoma, with a left erosion of the scutum and of the tegmen (Fig 1 B).

The patient was initially treated with ceftriaxone 2 gr/day and steroids; after two days of medical therapy, she underwent a radical mastoidectomy (Fig 1 D) with accurate cholesteatoma curettage, suction of purulent secretion and tegmen tympany reconstruction. Microbiological analysis on intraoperative samples documented the presence of Pseudomonas Aeruginosa. Seven days after ear surgery, the cerebellar abscess was managed by a stereotactic drainage under CT guidance. In this occasion microbiological sampling yielded no growth on culture.

The general condition of the patient improved and she was discharged from hospital 10 day after cerebellar surgery.

The follow up CT scan, performed 3 months after surgery, showed the presence of only a residual fibrous scar in the left cerebellar hemisphere (Fig 1 C).

So far, at ten months after surgery, the patient was found in good health (and no symptoms), with no signs of recurrence in her left ear.

Discussion and Conclusion

Intracranial complications of otitis media are still a condition of risk with a high mortality rate. In United States, the incidence of intracranial complications such as meningitis and intracranial abscesses in patients with chronic otitis media has been reported as 0.24–0.45% [1,2]. Nonetheless, in developing countries, the prevalence of middle ear infections and its intra-cranial complications is still a major public health problem (reported prevalence in South Asia of 15-20% for middle ear infections and 5-10% for intra-cranial complications) [3]; the most commonly reported intra-cranial complication is meningitis followed by brain and/or cerebellar abscess [3]. The mortality of otogenic intracranial abscess is considered in the range of 30-40%, in developing countries [3].

Early diagnosis and management of intracranial complications may be life-saving [1,2]. The standard reported approach for the management of otogenic intracranial abscess is mastoidectomy in combination with abscess drainage, either by a craniotomy for abscess excision or by stereotactic drainage under CT guidance [1,2].

Radical mastoidectomy with careful exploration of tegmen tympany is mandatory in order to reduce the rate of post-operative recurrence and to recreate tegmen integrity [3].

Recently, the role of minimally invasive procedures like stereotactic aspiration or lavage with endoscopic stereotactic evacuation in the treatment of intracranial abscesses has been highlighted, even in the case of multiloculated lesion, as in the case presented. Some authors have recorded the utility of stereotactic techniques in the management of brain abscesses; this procedure can be performed at the same time of the ear surgery or just after a few days [4,5,6]. There are several advantages of stereotactic aspiration; it is appropriate for deep-seated abscesses and for those lesion located in eloquent regions of the brain, because it provides a direct and rapid access to the abscess through a predetermined route, with minimal morbidity and mortality. Therefore, it is ideal for the management of abscesses in the thalamus, basal ganglia, brainstem and cerebellum, as it is minimally invasive [4,5,6]. In addition, stereotactic aspiration avoids the so-called leukotomy effect that can occur with a freehand aspiration technique and can also be performed on compromised patients under local anesthesia [4,5,6]. Furthermore it also offers a fast patient recovery, and the occurrence of complications, such as intracranial hemorrhage, is very low [4,5,6].

Reported treatment of intracranial abscesses also requires the use of broad-spectrum antibiotics; in their series, Sennaroglu and Sozeri found that the most common organism responsible for otogenic abscesses is Proteus mirabilis [7].

In the case presented, radical mastoidectomy and cerebellar stereotactic drainage under CT guidance

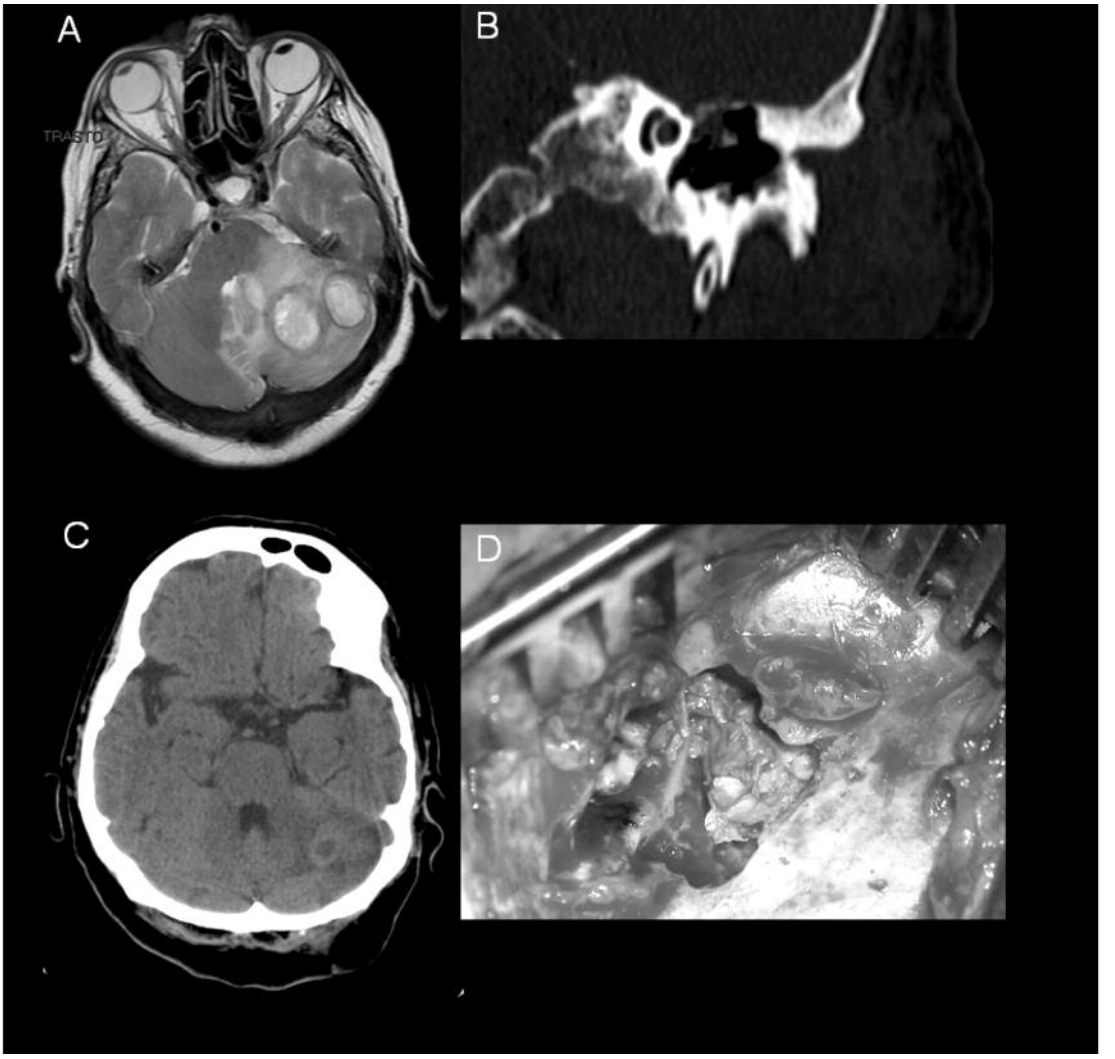

Figure 1. Brain MRI axial (**A**) scans showing multiple coalescent ring enhancing lesions in the left cerebellar hemisphere with a fluid signal value at the T1 and T2 sequences.
Coronal (**B**) high-resolution temporal bone CT scan documenting the presence of soft tissue in the epitympanum, erosion of the scutum and tegmen erosion.
Postoperative (3 months after surgery) axial brain CT scan (**C**) disclosing the presence of only a residual fibrous scar in the left cerebellar hemisphere.
Left ear (**D**); after mastoidectomy, cholesteatoma was found in the epithimpanum; tegmen erosions were identified and then sealed.

allowed a successful management of the disease, with a complete resolution of symptoms just after a few days.

In intracranial abscesses, early diagnosis and therapy are decisive factors for the chances of a full recovery. Mortality rates have improved as a result of early detection with neuroimaging, and they now have been reported to range between 10 and 20% in developed countries [4,5]. It is mandatory to completely sanitize the infection surgically in order to avoid lethal complication, especially in case of a delayed clinical course. Close interdisciplinary collaboration between ENT surgeons, neurosurgeons and neuroradiologists is desirable for a successful treatment.

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