

Case Report

A case of cholesteatomatous otitis media complicated with suppurative meningitis and venous sinus thrombosis

Hong-Yan Xi, Hai-Yan Yan, Duan-Hua Cao, Hong-Mei Wang, Jing-Zhe Han, Ye Ji

The First Department of Neurology, Hengshui Halison International Peace Hospital, Hengshui 053000, China

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Abstract: Objective: To observe the clinical manifestations, imaging features of a case of a patient with cholesteatomatous otitis media complicated with suppurative meningitis and venous sinus thrombosis and to explore the treatment method and prognosis. Method: The medical history of the patient and the data of physical examinations, imaging examinations and laboratory examinations were collected. Result: Lumbar puncture was performed for the patient: the cerebrospinal fluid was a pale yellow color with a pressure of 260 mm H₂O, the white blood cell count was $1500 \times 10^6/L$, cell typing: neutrophil accounted for 80%, sugar was 1.8 mmol/L, chloride was 118.6 mmol/L, protein was 1.86 g/L. This was diagnosed as suppurative meningitis. Cranial MRI suggested: 1. Abnormal signal was found on the right side of the region mastoidea, considered the possible suppurative inflammation, the right cerebellum was involved. 2. The sigmoid sinus signal on the right side increased, considered the right sigmoid sinus thrombosis. CT of the ear showed: cholesteatomatous otitis media in the right ear, the meninges and sigmoid sinus were also involved. The patient's condition was improved after being transferred to the ENT department for modified radical mastoidectomy. Conclusion: patients with cholesteatomatous otitis media complicated with suppurative meningitis and venous sinus thrombosis rarely present in the clinic, the clinical manifestations were headache, vomiting, fever and increased cerebrospinal fluid pressure, there is a need for early recognition and timely diagnosis, most have a good prognosis after active treatment.

Keywords: Otitis media, meningitis, venous sinus thrombosis, cholesteatoma

Introduction

A patient male, 36 years old, admitted with the main symptoms of headache, vomiting, and fever which had occurred for ten days on May 10, 2012. 10 days prior to admission, the patient had headache, vomited several times without apparent reason, non-projectile vomiting, the regurgitation was gastric content, not containing brown substance, complicated with fever, the highest temperature was 39.8°C, the lumbar puncture conducted at the local county hospital suggesting suppurative meningitis, having been treated with anti infection symptomatic therapy, the patient showed no significant improvement, and appeared lethargic, the patient visited our hospital for further diagnosis and treatment, physical examination: T39.2°C, lethargy, verbal fluency, bilateral pupils were of normal size and round, and

reacted to light sensitively, limb muscle strength was grade 5, bilateral Babinski signs were negative, the neck rigidity was the width of four fingers. The patient had been healthy in the past. No ear, nasal suppuration history. Lumbar puncture was performed at admission: cerebrospinal fluid was pale yellow with a pressure of 260 mm H₂O, white blood cell counting was $1500 \times 10^6/L$, cell typing: neutrophil accounted for 80%, sugar was 1.8 mmol/L, chloride was 118.6 mmol/L, protein was 1.86 g/L. Diagnosed as suppurative meningitis, symptomatically treated with "intravenous drips of ceftriaxone, and oral SMZ-SD-TMP". The patient had a better level of consciousness after two days, the body temperature reduced to normal. The patient still complained of headache, cranial MRI suggested: 1. An abnormal signal was found on the right side of the regiones mastoidea, considered the possible suppurative

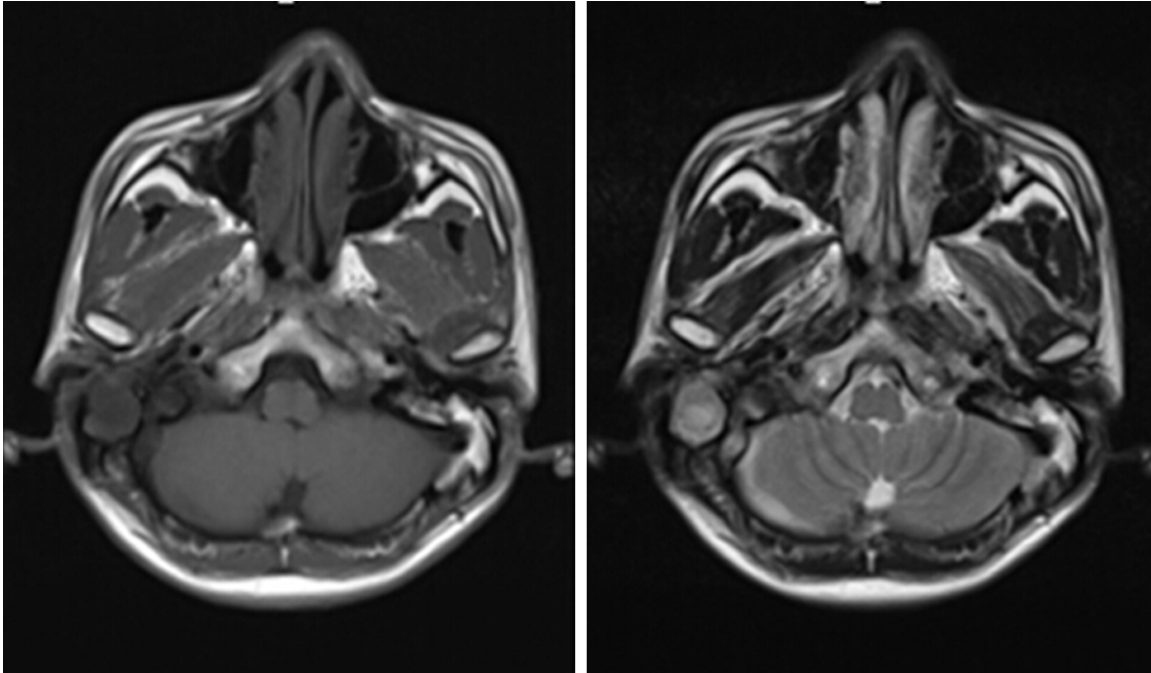


Figure 1. T1WI showed a slightly lower level of signal in the area of the right mastoid, T2WI showed a slightly higher level of signal, the flow void effect of the right sigmoid sinus was bad.

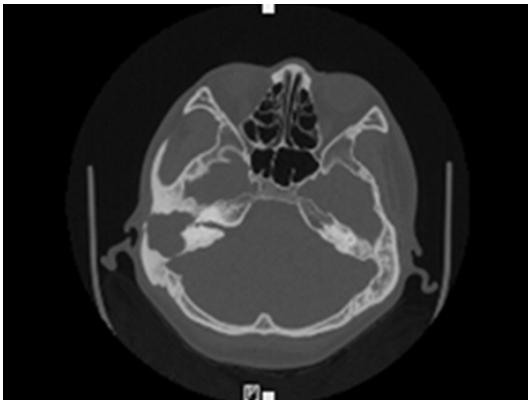


Figure 2. Bony destruction was found in the right mastoid and the tympanum of middle ear, the focus invaded into the meninges and sigmoid sinus at the posterosuperioron.

inflammation, and the right cerebellum was involved. 2. The sigmoid sinus signal on the right side increased, considered the right sigmoid sinus thrombosis, and treated with anti-coagulation therapy. CT of ear showed: cholesteatomatous otitis media of right ear, the meninges and sigmoid sinus were involved. The patient was transferred to the ENT department for modified radical mastoidectomy. The patient's condition improved 10 days after surgery, and he was then discharged.

Discussion

Cholesteatoma is not really a tumour, it refers to a cystic structure which lies in the middle ear mastoid cavity [1]. There are pouch like structures of keratinising squamous epithelium in the tympanum or mastoid cavity, the keratose in the pouch and the shedding epithelium accumulated or contained cholesterol crystals, and gradually expanded to form cholesteatoma with the tendency for bony wall destruction. Cholesteatoma can be divided into three categories in the clinic: congenital cholesteatoma, primary acquired cholesteatoma, secondary acquired cholesteatoma. The origin of cholesteatoma is not very clear, there are mainly four kinds of theories relevant to the mechanism of its formation [2]: bag shaped invagination theory; epithelial cell migration theory; middle ear mucosal theory; basal cell proliferation theory [3].

The clinical symptoms caused by cholesteatomatous otitis media were related to its predilection site, when the focus ruptured, it can cause meningitis. The main complications: 1. Intracranial complications: such as sigmoid sinus thrombosis, suppurative meningitis, cerebellum and cerebrum abscess, epidural ab-

scuss, arachnitis, hydrocephalus, cerebrospinal otorrhea, etc, and the former three are the most serious, which can eventually lead to death [4, 5]. 2. Intra temporal complications: in addition to mastoiditis, there are labyrinthitis and facial nerve paralysis. 3. Extracranial complications: pre-auricular and retro-auricular tympanic membrane abscess, sub-occipital abscess, deep cervical abscess, destruction of the ossicular chain, petrosal apex involvement, bony destruction of the sigmoid sinus, etc. The onset in this patient was encephalitis, in cranial MRI (see **Figure 1**): irregular abnormal signals were found in the area of the right mastoid, T1WI showed a slightly lower level of signal, T2WI showed a slightly higher level of signal, the signals were not uniform, and the boundary was clear, patchy abnormal signals were found in the adjacent right lateral cerebellum, T1WI showed a slightly lower signal, T2WI and FLAIR were slightly higher signals with a less clear boundary, the flow void effect of the right sigmoid sinus was bad and showed an increased signal. CT of Ear (see **Figure 2**): bony destruction was found in the right mastoid and the tympanum of the middle ear, auditory ossicles disappeared and the tympanum was expanded, the lateral semicircular canal, cochlea and vestibule on the right side were involved and bony destroyed, the focus invaded into the meninges and sigmoid sinus at the posterosuperior. To this patient, the cholesteatoma destroyed the surrounding bone and invaded into the sigmoid sinus resulting in the sigmoid sinus thrombosis, and invaded into the meninges resulting in the suppurative meningitis.

Currently, surgery remains the only treatment for cholesteatomatous otitis media, the major mode of operations: traditional radical mastoidectomy, modified radical mastoidectomy and intact wall canal radical mastoidectomy, atticotomy. For patients with confirmed or suspected intracranial and extracranial otogenic complications, surgical treatment should be performed immediately [6]. Suppurative meningitis and venous sinus thrombosis and other complications occurred in the patient, after the modified radical mastectomy, the recovery of the patient was good.

Disclosure of conflict of interest

None.

Address correspondence to: Jian-Guo Zhu, The Frist Department of Neurology, Hengshui Halison International Peace Hospital, No. 2 of Renmin Road, Taocheng District, Hengshui 053000, China. Tel: +86 13833821369; Fax: +86 0318-2181234; E-mail: jianguozhudoc@163.com

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