

Case report

Masked mastoiditis with meningitis : do we treat ct scan?

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Abstract

Otogenic infection is the most common cause of meningitis. Therefore, it should be ruled out during clinical assessment of a patient with any intracranial infection. Masked mastoiditis is a known intratemporal complication of acute otitis media after inadequate antimicrobial treatment. It is defined as inflammation of mucosal lining and bony structures of the mastoid air cells with an intact tympanic membrane. It should be regarded as the source of infection in a patient with meningitis and positive radiological findings of mastoiditis even though the patient does not have any evidence of ear infection clinically. We report a case of bacterial meningitis following masked mastoiditis in an 68-years-old man.

Keyword: Chronic Mastoiditis ; Otogenic ; Meningitis ; Masked Mastoiditis

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Case report

A 68-years-old Chinese man with underlying diabetes mellitus, hypertension and old CVA was admitted to PPUKM for deteriorating conscious level for 2 weeks. He talked incoherently and unable to recognise his own family members. The patient was afebrile without any neurological deficit and meningism. Family members denied any symptom and sign of ear infection such as otalgia and otorrhea. One month prior, he was admitted to medical ward for pneumonia. He was treated with IV antibiotic for 5 days and was discharged well.

Computed tomography (CT) of the brain showed density at left occiput with effacement of sulcus and edematous changes (Figure 1). Lumbar puncture result showed high level of cerebrospinal fluid (CSF) protein suggest TB meningitis so antituberculosis medicine was started along with IV Rocephine despite no organism grows obtain from CSF culture. Patient's condition deteriorate whereby he developed neck stiffness after 2 days of admission followed by loss of consciousness. He was intubated and ventilated in ICU for cerebral protection and self extubated after 2 days. ENT team was consulted for possible middle

ear infection as a source of infection. Otoscopic examination showed dull tympanic membrane on the right side and normal left tympanic membrane with no mastoid pain and swelling, however patient claim to have reduce hearing of the right ear. Pure tone audiometry (PTA) show profound hearing loss on the right side with type B tympanometry. CT scan temporal bone revealed fluid collection in right side of middle ear and mastoid cavity with irregularities of the tagmen tympani and tagmen mastoidii. Right cortical mastoidectomy was planned but delayed for 2 days due to electrolyte imbalance. Intraoperatively, granulation tissue was found occupying right mastoid air cell and antrum without presence of pus and cholesteatoma. Facial nerve was identified and preserved. Post operatively, patient developed pulmonary embolism due to poor ambulation, so he was kept in ward for S/C Clexane and Warfarin. After 10 days post operation, patient was discharged well. On follow up after 1 month, patient claim that his hearing level on the right side is still low. Repeat PTA and tympanometry show the same result as compared before the operation was done. Histopathological

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tissue examination appear as necrotic tissue without evidence of acute inflammation.

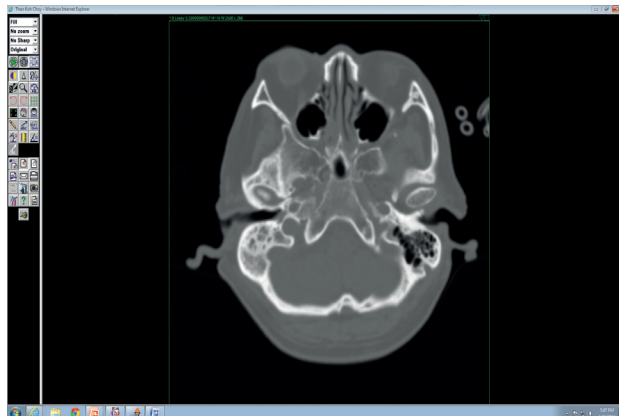


Figure 1 : Axial cut of Computed tomography (CT) scan of the brain showed soft tissue density in the right mastoid air cells together with features of chronic mastoiditis. Left mastoid air cells is well aerated.

Discussion

Meningitis is inflammation of the protective membranes covering the brain and spinal cord, known collectively as the meninges. The inflammation may be caused by infection with viruses, bacteria, or other microorganisms, and less commonly by certain drugs. Acute or chronic otitis media is the most common cause of meningitis¹. Masked mastoiditis is as subclinical infection described as inflammatory process of the mucosal lining and bony structures of the mastoid air cells with an intact tympanic membrane². It is a known intratemporal complication of otitis media which may present with prolonged courses of mild symptoms example subtle neurologic sign or may come with intracranial complication like meningitis or brain abscess³. In previous case series, otogenic meningitis rate reported were between 19 to 51 percent in ABM cases⁴⁻⁶. The development of intracranial complication of middle ear infection is thought to occur by one of three mechanism: direct extension of infection through bone breached by osteomyelitis or cholesteatoma, retrograde spread by thrombophlebitis or extension of

infection along anatomical pathway such as the round or oval windows, or through dehiscence as a result of congenital malformation⁽²⁾. Important symptoms suggesting an intracranial complication include headache, neckrigidity, fever, otorrhea, otalgia, hearing loss, vertigo, or other specific neurologic symptoms such as facial paralysis. Some cases may have a vague symptoms such as headache with fever and their appearance should make the clinician highly suspicious of a potential complication⁽⁷⁾. The diagnosis of meningitis is based on clinical symptoms, sign and laboratory findings. Cerebrospinal fluid obtained from lumbar puncture should be analysed for macroscopic appearance, biochemistry and organism growth after CT scan of brain was done⁸. Antimicrobial therapy should be initiated in any patient with suspected ABM, even before CT scanning. *S.pneumoniae* is the predominant microorganism, followed by *Hemophilus influenzae* responsible for ABM associated with ear infection⁹. In recent study, most of the episode of bacterial meningitis had no identified pathogen in the CSF culture with positivity rate as low as 17.8%¹⁰. The low bacterial count is probably due to commencement of antibiotics prior to admission.

Appropriate antimicrobial therapy for otogenic meningitis depends on the capability of the antibiotics to penetrate the CSF. The treatment should be continued for at least 14 days after CSF culture become negative despite slow clinical response. Clinical course should be monitored so surgical intervention can be performed immediately if antibiotic therapy is not successful. Even in the antibiotic era, the mortality rate from meningitis remains significant and reported in the range 8-38%^{4,10}. In order to reduce the high mortality rate of ABM, general practitioners, otolaryngologists, infection specialist and intensivist should work together to manage these patient with maximal degree of care.

Conflict of interest: None

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