

## **Case Report**

### **Temporal Myositis with Middle Fossa Epidural Abscess as the Complications of Acute Otitis Media**

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#### **Abstract**

Acute otitis media is an inflammatory process involving the mucoperiosteum of the middle ear cleft. The clinical spectrum can be extended from a self-limiting benign condition to a complicated disease with intracranial involvement. Intracranial and extracranial complications of acute otitis media is still occur in the modern antibiotic era and has potentially serious consequences with high mortality rate. We report a case of acute otitis media with temporal myositis and middle fossa epidural abscess which is rarely seen as the complications from the disease.

**Keywords:** otitis media; myositis; epidural abscess; osteomyelitis

#### **Introduction**

The incidence of acute otitis media with complications nowadays still exists even though have markedly reduced due to availability of antibiotics and well organized public health care systems. Most cases of acute otitis media are associated with inflammation of the mastoid cells which is called acute mastoiditis. From the mastoid region, the infection and inflammation can spread through mastoid bone or emissary vein to extracranial and intracranial area.<sup>1,2</sup> Streptococcus pneumonia is the most frequently cultured bacteria in acute otitis media and rarely Pseudomonas aeruginosa, Streptococcus pyogenes and Staphylococcus aureus. Some cases of acute mastoiditis may be incompletely treated with antibiotic and lead to serious complications which include intracranial, intratemporal and extratemporal. The complications may have serious consequences causing high morbidity and mortality rate. We report a rare complication temporal myositis with middle fossa epidural abscess which was due to unresolved acute otitis media.

#### **Case report**

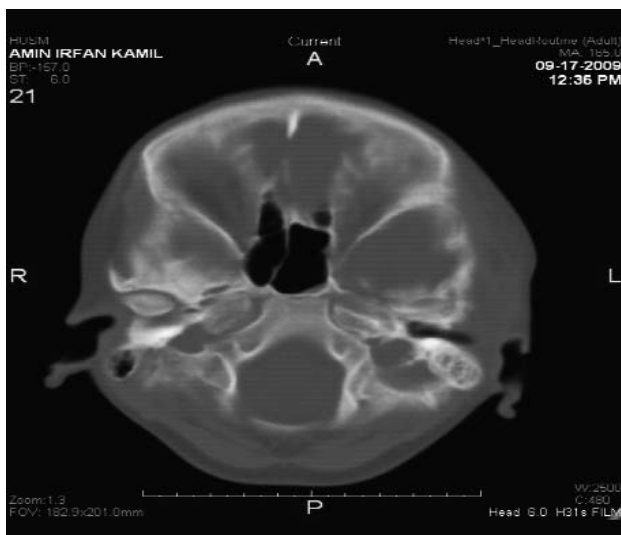
An 8 year-old boy presented to our clinic with left ear pain associated with non resolving high grade fever for a month. Initially, he was brought to a general practitioner with the main complaint of left ear pain for a few days. He was treated as ear infection and was given a course of oral antibiotics followed by another course after a week due to unresolved ear

pain. However, the patient's condition did not resolved instead worse. According to her mother, he didn't take both of the courses of the medications regularly. Three weeks later, he developed high grade fever again which was temporary relieved by paracetamol. The boy started to develop painful swelling above his left pinna. The swelling was gradually increasing in size. He also complained of reduced hearing on the same ear but denied any symptoms of ear discharge, tinnitus or vertigo. There was no history of upper respiratory and nasal symptoms such as rhinorrhea, sneezing or nasal blockage. On physical examination, the patient was alert and not ill looking. Ear examination revealed swelling and tenderness at the left temporal region above and antero superior to the auricle. The auricle was pushed inferiorly by the swelling. There was no mastoid tenderness. Otoscope examination showed absent light reflex with redness discolouration of the left tympanic membrane. The lymph nodes were palpable at level II, III and IV of the left neck. The facial nerve was intact. Tympanometry showed type B on the left ear but normal on the opposite ear. There was mild conductive hearing loss on pure tone audiometry on the left ear. Nasoendoscopy showed presence of adenoid hypertrophy.

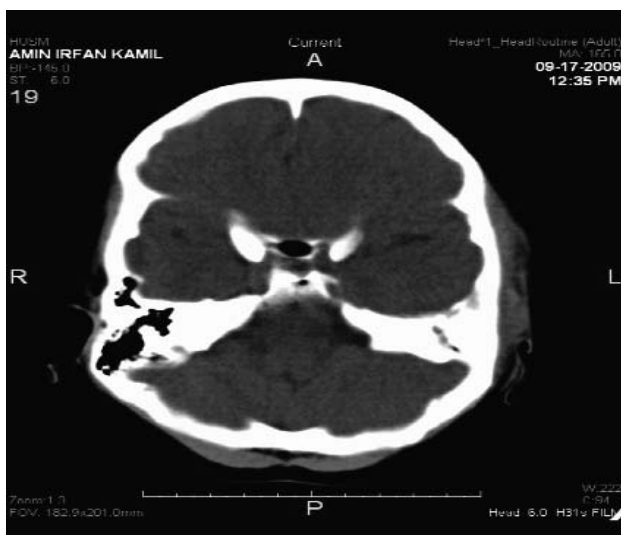
A high definition CT of the temporal bone revealed opacification of the left mastoid air cells and heterogeneously ill defined enhancing soft tissue lesions over the temporal region (fig. I). There was also evi-

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**Fig. I:** HRCT of the temporal bone showed temporal soft tissue abscess .



**Fig. II :** HRCT of the temporal bone showed small epidural abscess



**Figure III :** HRCT of the temporal bone showed cortical destruction of petrous bone

dence of left middle cranial fossa epidural abscess (fig. II) and temporal osteomyelitis with cortical destruction of the left petrous bone (fig. III).

The patient was treated with intravenous cefotaxime and metronidazole. He showed improvement clinically and was confirmed by serial laboratory evaluation and a repeat CT scan. The patient was discharged in good condition after 10 days.

### Discussion

Otitis media is a common ear problem in the school age children.<sup>3</sup> Since the modern antibiotics era and advance development of public health care systems, there are markedly reduced number of the incidence of complications of otitis media. The morbidity and mortality rate of these complications have also declined. However, we cannot ignore that there is still a possibility of this disastrous consequence of otitis media. A few reasons for these are in compliance, insufficient dosage of antibiotics, resistant and virulence bacteria, delay treatment and misdiagnosis.<sup>1</sup> Abnormality of the middle ear cleft also can interfere in proper diffusion of the antibiotics to the area of osteitis.<sup>1</sup> In this case, the boy had history of unresolved ear pain for 1 month. It may be due to no proper management and misdiagnosed by general practitioner and was aggravated by low compliance of antibiotics by the patient himself.

The patient in this case report presented with symptoms and signs of acute otitis media with temporal soft tissue swelling. Computed tomography (CT) of temporal bone revealed signs of acute mastoiditis, middle cranial fossa epidural abscess and temporal myositis with evidence of temporal osteomyelitis and cortical destruction of the petrous bone. An inflammatory process involving the mucoperiosteum of the middle ear cleft causing the underlying mucosa to be oedematous. When aditus is blocked by the oedematous and hyperplastic mucosa, secretions are trapped in the antrum and small air cells. These induce the process of osteitis of the air cells septa starting with demineralization of bone followed by the breakdown of its proteinaceous matrix.<sup>1,2</sup> Bone would be destructed and osteomyelitis occurred.

Mastoiditis can be divided into acute, subacute or chronic. The stages of acute mastoiditis include acute mastoiditis without periosteitis/osteitis, acute mastoiditis with periosteitis and acute mastoiditis with subperiosteal abscess. Subacute mastoiditis has also been termed as masked mastoiditis. At this

stage, the mastoid infection may not be obvious but it may cause another complication within the temporal bone. Infection from the mastoid can spread into the petrosal cells of the mastoid apex, which is called acute petrositis.<sup>4</sup> Mastoiditis with periosteitis can develop when infection within the mastoid spreads to the periosteum covering the mastoid process.<sup>4</sup> As can be seen in the CT scan, this patient even has cortical destruction of the petrous bone.

Once the osteitis occurred and aggravated by the granulation tissue filling the trabeculae, the vascularization of the mastoid mucosa become deteriorates and poor leading to low local tissue concentration of antibiotics and therefore reduced its effectiveness.<sup>5</sup> An uncontrolled infection may spread by direct progressing, in continuity osteitis or retrograde thrombophelbitis by the emissary vein to the surrounding structures.<sup>1,2</sup> These will lead to extracranial and intracranial complications. Furthermore, the unossified petrosquamous suture in tegmen tympani in children may allow direct passage of infection from middle ear to the meninges of middle cranial fossa.<sup>6</sup> These lead to the formation of epidural abscess as has been seen in this patient.

Temporal myositis occurs when the infection break through the zygomatic root. In this patient, it was evidenced by the auricle being deflected inferiorly due to the pressure effect of the swelling. The infection spreads by the way of anterior cells to the root

of the zygoma. It may perforate and initiate the inflammation penetration anteriorly under the lower edge of the temporal muscle.<sup>7</sup> The inflammation can infiltrate the whole of the temporal muscle and connective tissue layer. The condition was seen in the CT scan as an appearance of heterogeneously ill defined enhancing soft tissue lesions over the temporal region. High resolution computed tomography is the best imaging modality of choice for this disease. It can define clearly the regional anatomy, identification of bone destruction and presence of abscess or other diagnostic information.<sup>8,9</sup>

In this case, temporal myositis and epidural abscess were formed after three weeks from the initial symptoms. The complications happened due to uncontrolled infection because of incompletely treated with antibiotics. The infection might be spreading through emissary vein, temporal bone, meninges and also zygomatic root. The patient has been treated with intravenous antibiotics. He showed a very good response to the treatment and the recovery was uneventful. It was confirmed by a repeat CT scan.

Even in the era of advance medical care, the complications of acute otitis media is still possible to occur. Apart from a high clinical suspicious that health care personnel should be having, more medical education explaining about otitis media and the importance of compliance to the medications prescribed need to be done.

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