

A rare presentation of complicated acute otitis media: a case report

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SUMMARY

Extracranial complications of Acute Otitis Media (AOM) are uncommon but usually associated with severe adverse outcomes. Here we report the case of an 8-year-old Saudi boy who presented with left-sided facial oedema and proptosis, with ear pain and fever. Clinically, the patient had severe oedema in his left eye, confirmed by redness, and otitis media diagnosed by tympanometry. Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) showed a left mastoiditis and middle-ear collection of fluid, associated with severe soft-tissue oedema involving the orbit, zygomatic arch and temporoparietal region, without abscess formation. The diagnosis was AOM complicated by mastoiditis and soft-tissue oedema, and left eye proptosis. Considering the bodyweight of the patient, intravenous ceftriaxone and clindamycin were administered, followed by direct improvement. Oedema subsided 2 weeks later with the resolution of symptoms and, ultimately, complete healing. Clinicians should apply caution with complicated or refractory cases of AOM because of the potential lethal outcomes.

Key words: acute otitis media, facial oedema, proptosis, mastoiditis, zygomatic arch

INTRODUCTION

Acute Otitis Media (AOM) is a common localised infection in childhood which responds well to conventional treatment with antibiotics and rarely causes serious complications. In a few cases, the disease might cause several intra- or extra-temporal complications such as mastoiditis, facial palsy, subperiosteal or epidural suppuration, meningitis, or thrombosis of the paranasal sinuses [1]. The symptoms that accompany these complications can vary considerably: post-auricular pain, otalgia, and fever are the most widely reported. A definitive diagnosis of the intratemporal complications of AOM can be obtained with 87%-100% sensitivity using Computed Tomography (CT) of the temporal region [2]. Treatment of AOM with antibiotics, such as amoxicillin, is usually adequate as a first-line treatment, though infections caused by multidrug-resistant bacteria have been reported in recent decades [3]. Here we report a case of unusual clinical presentation of AOM associated with mastoiditis and soft-tissue oedema in the orbito-zygomatic arch and temporoparietal junction.

CASE REPORT

The patient was an 8-year-old Saudi boy complaining of multiple symptoms, including fever and pain in the ear. He also presented with proptosis and facial oedema on the left side. The patient had been diagnosed with severe oedema in his left eye, and this was confirmed by the redness of the eye and the diagnosis of otitis media. The latter diagnosis was made by tympanometry.

Clinical findings

The radiological findings revealed severe left-sided mastoiditis and a collection of fluid in the middle ear. The latter was associated with severe soft-tissue oedema, involving not only the orbit but also the zygomatic arch and the temporoparietal region, without abscess formation.

Diagnostic assessment

An 8-year-old boy presented with left facial oedema and proptosis associated with left-sided unilateral otalgia and fever. The patient had no significant medical or surgical history and no routine drug history, except for the antibiotics prescribed for the same condition by the primary health physician. The ocular examination on admission showed severe oedema and

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redness of the left eye. However, the patient had normal vital signs, full eye movement, normal vision, and normal pupillary reaction. The extraocular examination identified soft-tissue oedema and tenderness of the left zygomatic arch and temporal region (Figure 1). Otoloscopic examination revealed left otitis media with effusion, confirmed by tympanometry.



Fig. 1. Clinical presentation at the time of admission

The Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) examination identified serious complications including left mastoiditis and a middle-ear collection of fluid associated with severe soft-tissue oedema involving the orbit, zygomatic arch and temporoparietal region, without abscess formation (Figures 2 and 3).

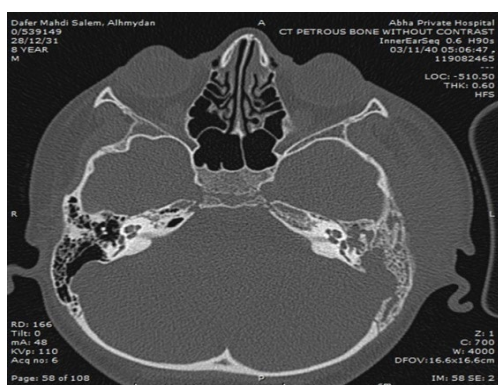


Fig. 2. CT scan of the petrous bone, without contrast, showing complete opacification of the left mastoid air cells and left middle ear cleft



Fig. 3. CT scan of the petrous bone, with contrast, showing complete opacification of the left mastoid air cells and left middle ear cleft

Complete opacification of the left mastoid air cells and left middle ear cleft was observed. The MRI data confirmed the collection of fluids in the left mastoid air cells and middle ear cleft, in addition to oedematous infiltration of the soft tissues and planes of the left orbit, left masseter muscle and left temporalis muscle (Figure 4).



Fig. 4. MRI showing the left mastoiditis and collection of fluid in the middle ear, associated with severe soft-tissue oedema involving the orbit, zygomatic arch, and temporoparietal region

Therapeutic intervention

According to the literature, children with persistent symptoms of AOM despite antibiotic therapy over 48-72 hours must be carefully re-examined [4]. A second-line agent, such as amoxicillin or clavulanate, must be used if appropriate. Otitis media with effusion in the middle ear is defined in the absence of acute symptoms [4]. It is worth noting that the use of decongestants, nasal steroids and antibiotics is ineffective in hastening the clearance of the fluid from the middle ear and, as a result, is not recommended [5]. Of relevance to this case, it is recommended that children with evidence of hearing loss, anatomic damage and language delay must also be referred to an otolaryngologist. Antibiotic-resistant bacteria remain a major challenge to public health. An analgesic plus antibiotic strategy is widely accepted for the improvement of bilateral AOM regardless of additional symptoms and signs [6]. Among children with mild symptoms, observation might be an alternative in those aged 6-23 months who, more importantly, have unilateral AOM. Observation might also be a suitable approach for children 2 years and older with either unilateral or bilateral AOM [7].

Based on the available literature, 2 out of 3 children with otitis media recover with the use of antibiotics. In recent years, the American Academy of Family Physicians has recommended against prescribing antibiotics for AOM in children who are 2 to 12 years old without severe symptoms [8]. However, this approach depends on whether the observation is a reasonable alternative. When feasible, a follow-up visit is typically scheduled to assess whether symptoms persist for more than 48-72 hours. If symptoms persist, the patient is prescribed antibiotic treatment [8].

The diagnosis of this case was based mainly on clinical examination and CT findings. The case was diagnosed as left AOM, complicated with mastoiditis and soft-tissue oedema in

the orbito-zygomatic arch and temporoparietal junction. The patient was admitted to the otolaryngology department for left myringotomy and insertion of a ventilation tube. Intravenous ceftriaxone and clindamycin were then administered based on bodyweight. The patient began to show improvement 2 days later: zygomatic arch oedema subsided and orbital oedema decreased dramatically.

Follow-up and outcomes

The patient was discharged and oral antibiotic treatment was continued, with a prescription of Augmentin. After 2 weeks, the patient visited the clinic, where a complete resolution of oedema and a major improvement in symptoms were noted. At follow-up 4 months later, the patient was observed to be completely healed (Figure 5).



Fig. 5. Follow-up visit after 4 months of treatment

DISCUSSION

The involvement of the zygomatic and orbital region in this case of AOM represents an unusual complication, which justifies its documentation in the literature for the first time. Clinicians must be highly cautious regarding complicated or refractory cases of AOM because of the potential lethal and often severe complications.

AOM is a disease usually diagnosed in patients with acute symptom onset and effusion in the middle ear. These patients also occasionally show physical evidence of inflammation in the middle ear, as well as symptoms such as irritability, fever and pain [9]. This disease is generally a complication of the dysfunction of the eustachian tube, which often occurs during the viral infection of the upper respiratory tract. *Hemophilus influenzae*, *Streptococcus pneumoniae* and *Moraxella catarrhalis* are three of the most common organisms isolated with fluid in the middle ear [10].

The management of AOM must begin with an adequate level of analgesia. The literature proposes that antibiotic

therapy can be deferred in children 2 years and older with mild symptoms. A high dosage of amoxicillin (8,290 mg per kg per day) is the choice of the therapeutic intervention for AOM in patients who are not practically allergic to penicillin [11].

AOM can easily be diagnosed based on the presented signs and symptoms, with or without an otoscopic examination of the tympanic membrane. The inflammatory process leads to the accumulation of either oedematous, suppurative or mucoid fluids in the middle ear and mastoid air cells. This is usually triggered by *Pseudomonas aeruginosa* or *Staphylococcus aureus* infections, which activate the innate immune system [12]. Antibiotic therapy at this stage has the potential to be effective in the control of infection in severe AOM [13]. When the infection is not controlled, complications might arise due to the swelling of the middle ear mucosa or involvement of mastoid air cells. Occasionally, as a normal anatomical variation, the extension of the temporal bone pneumatization can extend to the zygomatic arch [14]. Several possible mechanisms are involved in the spread of the infection from the middle ear through the mastoid process, including bone pneumatization, bone erosion and hematogenous seeding pathways [15]. The CT and MRI findings of the present case revealed a serious infiltration of the soft tissues and planes of the left orbit, left masseter muscle and left temporalis muscle. Thus, we assume that infection disseminated through bone pneumatization from the middle ear to the zygomatic arch and temporoparietal junction, towards the surrounding soft tissues and muscles. In our case, CT and MRI examination showed no bone erosion.

Ceftriaxone and clindamycin as a first-line treatment is effective in such cases [12]. In the literature, we identified no similar cases with the same clinical presentation of orbital and zygomatic involvement without pus formation. However, the research indicates that the complications of AOM can sometimes be lethal, particularly intracranial complications, such as meningitis, brain abscess and thrombosis [16].

CONCLUSION

Thus, clinicians should be prudent when treating refractory AOM cases. CT imaging is recommended in such cases, as it provides high accuracy in the detection of complications. The patient remained positive throughout the treatments, benefiting from the use of antibiotics. This treatment option, together with patient follow-up, satisfied both the patient and his parents.

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