Unusually positioned abscesses of the head and neck following suppurative otitis media

Introduction

Soft tissue abscesses are an uncommon complication of suppurative otitis media. They can present as a lump at several unusual sites in the head and neck and therefore may not initially be associated with otitis media. Awareness of this differential diagnosis of lumps in the head and neck is important as surgical drainage of the abscess and mastoid exploration and drainage are often necessary to avoid extensive osteomyelitis. Abscesses occur following dissection of pus along fascial planes or through the periosteum to sites including deep to the temporalis muscle, within the sternocleidomastoid or digastric muscles or overlying the zygomatic root.

This case describes a patient with an abscess beneath the temporalis muscle secondary to otitis media and mastoiditis, which was initially misdiagnosed as a soft tissue infection. The pathogenesis, diagnosis and management of extracranial abscesses following otitis media are discussed.

Discussion

Otitis media is a common disease particularly in children and in most cases responds well to antibiotic treatment. Complications following otitis media are uncommon in the postantibiotic era and can occur following either acute or chronic suppurative otitis media. They can be divided into intracranial and extracranial complications. Osma et al (2000) reported a 1.35% incidence of extracranial and a 1.97% incidence of intracranial complications in a study of 2890 cases of chronic otitis media. Intracranial complications consist of meningitis, brain abscesses, extradural abscess and lateral sinus thrombosis. Extracranial complications can be further divided into intratemporal and extratemporal complications (Knappe and Gregor, 1997); intratemporal including ossicular lesions, tympanic membrane perforation, facial nerve paralysis, mastoiditis, petrositis, labyrinthitis, and sensorineural hearing loss, and extratemporal comprising secondary abscesses.

Abscesses secondary to subperiosteal spread of infection can occur at distant sites in the head and neck and may be confused with other causes of such lumps. The otitis media symptoms may be mild and therefore not immediately associated with the soft tissue swelling. Intraosseous suppuration causing osteitis is described most often in the mastoid leading to destruction of the overlying cortex (Knappe and Gregor, 1997). Pus then spreads between the cortical bone and periosteum forming a periosteal abscess. The abscess formed is secondary to the mastoiditis which is in itself a complication of otitis media.

Case Report

A 5-year-old boy presented to the authors' paediatric admissions unit with a sudden onset of swelling of his left temple. He had a 4-day history of fever and otalgia. He had been prescribed cefalexin by his GP the previous day for suspected acute otitis media. His mother described him waking from his afternoon nap when she noticed, for the first time, a swelling over his left temple. He had a history of two previously treated episodes of acute otitis media in the preceding year.

On examination he was febrile with a temperature of 37.9°C. A tender, firm, non-erythematous swelling was present over his left temple and several left cervical lymph nodes were palpable. Otoscopy revealed bilaterally scarred tympanic membranes. Initial investigations revealed a white cell count of 31.2 x 10^9/litre with a neutrophilia of 27.5 x 10^9/litre and a C-reactive protein of 261 mg/litre. Intravenous cefuroxime was started to cover a suspected soft tissue infection. Skull radiographs showed no areas of osteolysis. Ultrasonography of the lump was reported as showing a small fluid collection beneath a soft tissue swelling overlying the left temple, separate to the skull vault.

Inflammatory markers returned to normal levels after a few days of antibiotic treatment. However, the temporal swelling was slow to resolve and he developed difficulty in opening his jaw fully. The original diagnosis was reconsidered and the opinion of a paediatric otolaryngologist was sought. A diagnosis of an abscess deep to the temporalis muscle (Luc's abscess) secondary to chronic suppurative otitis media was made and intravenous metronidazole was commenced in addition to cefuroxime. Computed tomography scanning, performed under sedation, revealed an ipsilateral mastoiditis with opacification of the mastoid air cells (*Figure 1*) and confirmed soft tissue thickening and a fluid collection overlying the left squamous temporal bone (*Figure 2*). Mastoid exploration and drainage were considered. However, as the swelling resolved completely and his clinical condition quickly improved, he was managed conservatively with a total of 2 weeks intravenous antibiotics.

Figure 1. Opacification of left-sided mastoid air cells.

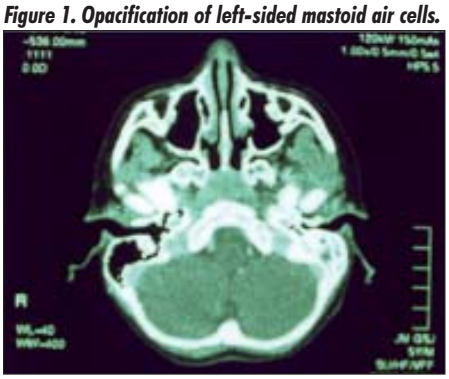
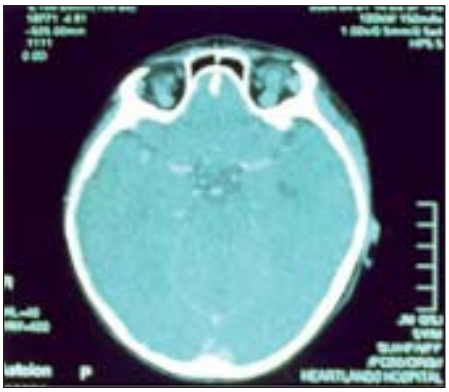


Figure 2. Soft tissue thickening and fluid collection over the left temporal bone.



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The commonest type of subperiosteal abscess (Gray and Hawthorne, 1992) is the postauricular abscess which lies over the external surface of the mastoid. Typically the auricle is displaced outwards, forwards and downwards. Perforation of the tip or inner surface of the mastoid can lead to pus dissecting along the fascial planes to form an abscess in the sternocleidomastoid muscle (Bezold's abscess) or digastric muscle (Citelli's abscess). Pus may also escape from the zygomatic root to form an abscess in front of the ear which may be confused with a parotid swelling. Pus can also track from the peritubular cells to form a parapharyngeal or retropharyngeal abscess.

As in the case described, pus can dissect through the periosteum and along the external auditory canal to a site deep to the temporalis muscle. This is described as a Luc's abscess (Spiegel et al, 1998). Luc's abscesses are slightly different from the other subperiosteal abscesses as osteitis is not necessary. Infection spreads directly from the middle ear rather than from the mastoid (Knappe and Gregor, 1997). Luc (1913) originally described a 'subperiosteal temporal abscess of otitic origin without intraosseous suppuration'. Luc also described that these abscesses tend to run a benign course, and Knappe and Gregor described the relative lack of systemic signs. The current case fits with these descriptions, making a full recovery with intravenous antibiotics only.

Zapalac et al (2002) reported a trend of increasing numbers of suppurative complications. They suggested this was likely to relate to increasing antibiotic resistance particularly in *Streptococcus pneumoniae*. Over a 7.5-year period ending in June 2000, they reported a non-significant increase in patients presenting to a tertiary children's centre with suppurative complications, from 21 patients with suppurative complications over the first 2.5 years of the study period to 37 patients over the final 2.5 years (P=0.11). The incidence of isolates of *S. pneumoniae* and resistant *S. pneumoniae* also increased during the study, paralleling the rising number of cases of suppurative complications.

Appropriate radiological imaging, e.g. computed tomography, is needed to confirm a mastoid abscess and the site and size of secondary abscesses. Abscess drainage and mastoid washout may be necessary. However, as in this case, some may respond to conservative management with intravenous antibiotics alone.

Conclusions

It is important to be aware of subperiosteal abscesses secondary to otitis media in the differential diagnosis of lumps in the head and neck, to avoid diagnostic and treatment delay. Appropriate imaging is necessary to confirm the diagnosis and surgical intervention is often needed to drain the soft tissue abscess and related osteomyelitis. **BJHM**

Gray RF, Hawthorne M (1992) *Synopsis of Otolaryngology.* 5th edn. Butterworth-Heinemann, Oxford

Knappe MV, Gregor RT (1997) Luc's abscess – a rare complication of middle ear infection. *J Laryngol Otol* **111:** 461–4

Luc H (1913) The sub-periosteal temporal abscess of otic origin without intra-osseous suppuration. *Laryngoscope* **23:** 999–1003

Osma O, Cureoglu S, Hosoglu S (2000) The complications of chronic otitis media: report of 93 cases. *J Laryngol Otol* **114:** 97–100

Spiegel JH, Lustig LR, Lee KC, Murr AH, Schindler RA (1998) Contemporary presentation and management of a spectrum of mastoid abscesses. *Laryngoscope* **108:** 822–8

Zapalac JS, Billings KR, Schwade ND, Roland PS (2002) Suppurative complications of acute otitis media in the era of antibiotic resistance. *Arch Otolaryngol* **128:** 660–3

Chilaiditi's syndrome

A previously well 83-year-old woman presented with a 2-week history of non-specific upper abdominal discomfort and vomiting. A chest radiograph (*Figure 1*) revealed interposition of the large bowel between the liver and the right hemi-diaphragm (Chilaiditi's syndrome).

Demetrius Chilaiditi, a Greek radiologist, first described this anatomical feature in 1910. Chilaiditi's sign is seen in 0.1–0.25% of chest radiographs and has an unexplained male to female ratio of 4:1. It is a radiographic term used when a portion of colon, usually the hepatic flexure, is interposed between the liver and right hemi-diaphragm. When symptomatic, this is referred to as Chilaiditi's syndrome.

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Figure 1. Chest radiograph showing Chilaiditi's sign.

Symptoms include intermittent mild abdominal pain, nocturnal vomiting, flatulence and dyspepsia. Many patients describe a feeling of pressure on the upper part of the abdomen, which resolves on lying down. Potentially serious complications include acute intestinal obstruction, respiratory distress and even cardiac arrhythmias.

The colon is normally 'anchored' by suspensory ligaments which prevent this potential interposition. Colonic redundancy (often secondary to chronic constipation), congenital malposition and malrotation can all lead to increased colonic mobility. Excessive aerophagia is also thought to play a role, especially in children, as a result of increased colonic air. Other predisposing factors include liver cirrhosis, diaphragmatic elevation (paralysis or eventration) and emphysema which all leave extra space for potential colon migration.

Chilaiditi's syndrome should be a differential diagnosis for abdominal pain. It may also mimic the potentially more serious finding of free air under the diaphragm. **BJHM**