

## Bezold's abscess: A rare complication of acute otitis media

Nasir F, Asha'ari ZA

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### Authors:

#### Zamzil Amin Asha'ari

(Corresponding author)

MMed ORL-HNS

International Islamic University

Malaysia, Kuantan, Pahang,

Malaysia

E-mail: zamzilamin@iium.edu.my

#### Fauziah Nasir

MS ORL

Hospital Tg Ampuan Afzan,

Pahang, Malaysia

### Abstract

Otitis media is a common disease encountered in the primary practice. Most cases are successfully treated with antibiotics without any sequelae. Because of these, potential serious complications of otitis media may be overlooked.

We report a rare case of Bezold's abscess, as a complication of otitis media and discuss its pathophysiology and management.

### Introduction

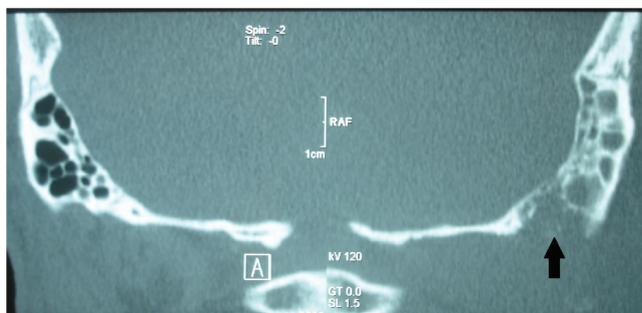
The overall incidence of complications of otitis media has markedly decreased since antibiotics came into widespread use. This has led to physicians being less familiar with the complications and subsequent delay in the diagnosis.<sup>1,2</sup> Complication of otitis media can be fatal, but it is often treatable if detected early. Immunocompromised patients such as those with diabetes mellitus are more prone to develop complications. Some of the complications do not manifest early, but a late manifestation may be noticeable only when the patient is in a dire state.

### Case report

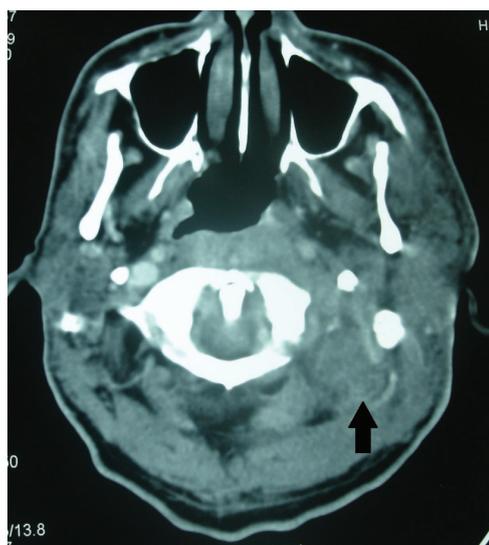
A 52-year-old gentleman with a history of diabetes mellitus complained of left ear discharge, reduced hearing and mild otalgia for 3 weeks. He did not seek treatment until many days later when he developed fever, left neck swelling and facial asymmetry. There was no odynophagia, dysphagia or difficulty in breathing. Examination revealed a left facial nerve palsy grade V (House-Brackmann<sup>3</sup> classification) with trismus. There was a left neck swelling extending from the infra-auricular region to level III of the neck. The swelling was inflamed, firm and tender. No mastoid swelling or tenderness was noted. Otoscopic examination revealed an inflamed left ear canal with scanty pus discharge. The tympanic membrane was obscured by the narrow swollen canal and

the discharge. Throat examination showed medialisation of the left lateral pharyngeal wall. Tonsils, epiglottis, arytenoids and vocal cord were normal.

Full blood count revealed neutrophil-predominant leucocytosis and his random blood sugar was 10.6 mmol/L. He was admitted and started on intravenous ampicillin/sulbactam 3 grams 8 hourly. The provisional diagnosis was acute otitis media and lymphadenitis. An urgent computed tomography (CT) scan of the temporal bone, brain and neck was done and that showed a soft tissue density within the left middle ear cavity and mastoid air cells with wide erosion at the posterior-inferior part of the mastoid, medial to the mastoid tip (**Figure 1**). There was abscess collection deep to the sternomastoid muscle below the mastoid tip erosion (**Figure 2**). The collection extended inferiorly along the paravertebral muscles until the seventh cervical vertebrae.



**Figure 1.** HRCT (High Resolution Computed Tomography) of the temporal bone showing a sclerotic left mastoid cavity with erosion at the left mastoid tip (arrow). This defect allowed the infection to spread inferiorly to the neck



**Figure 2.** Axial CT scan of the neck demonstrating abscess collection (multiloculated ring-enhanced lesion, arrow) within the left paravertebral muscles, medial to the sternomastoid border.

The patient was taken to surgery for left-modified radical mastoidectomy and drainage of the neck abscess. The postauricular incision was extended to the upper neck. Intra-operative findings were the presence of granulation tissues at the mastoid air cells that breached the bone at the mastoid tip. Pus was drained in a cavity deep to the sternomastoid and digastrics attachment at the mastoid bone. There was a bony dehiscence seen at the facial canal. Surgicel® was used to cover the exposed portion of the facial nerve. A corrugated drain was applied to the neck wound. Pus and tissue were sent for culture and sensitivity, which later grew *Klebsiella pneumoniae*. After the surgery, intravenous antibiotics were continued for a week with dressing over the neck wound. On day 9, the patient was discharged on oral antibiotics for two weeks. A month later on follow-up, the patient was clinically well with good wound healing. The left facial nerve palsy improved to grade III. The left ear and mastoid cavity were dry.

### Discussion

Friedrich Bezold (1842–1908), a German otologist first described Bezold's abscess in patients with acute otitis media. Bezold's abscess is described by modern day literature as an abscess arising within the substance of the sternomastoid/digastric muscle following the spread of pus through the tip of the mastoid

process.<sup>1</sup> In these patients, the pus escape through the medial side of the mastoid process into the incisura digastrica/medial border of the sternomastoid forming an abscess in the deep neck spaces. The pus may spread along the digastric muscle to the chin, filling the retromaxillary fossa, and along the course of the occipital artery. If left untreated, further deep extension may occur due to resistance to direct extension by the sternocleidomastoid, trapezius and splenius muscles. The pus may track along these muscles and if it reaches the deep muscles of the neck, it might extend to the transverse processes of the vertebrae as low as the second thoracic vertebrae.<sup>1</sup>

In poorly controlled diabetic patients, otitis media can deteriorate rapidly with the development of mastoid abscesses and other complications without warning because of impaired chemotaxis, reduced phagocytic function of polymorphonuclear leucocytes and impaired sensation due to sensory neuropathy. In this case, the patient initially presented with left ear discharge. However, he only sought medical treatment when he developed fever and a painful left upper neck swelling. It is important to note the association of neck abscesses with otitis media in this case and tie the diagnosis together, as it could have easily been misjudged as being two separate pathologies. Radiological examination, especially CT scan of the mastoid and neck is very useful in establishing the diagnosis. Gaffney (1991) suggested that CT scan should be done in every case of otitis media with neck swelling, because of the variable routes pus can spread within the neck.<sup>1</sup> CT scan also provides the best visualisation of the temporal bone and mastoid and is therefore the optimal imaging for the diagnosis of acute mastoiditis. The sensitivity of CT scan in diagnosing acute mastoiditis is very high and has been reported to be between 87% and 100%.<sup>4</sup> As in this case, CT scan of the neck with HRCT temporal bone permits identification of abscesses in the neck and involvement of the mastoid process, which enabled the surgeon to carefully plan his surgical approach. Evidence of mastoid origin tells the surgeon that a mastoidectomy is required in addition to drainage of the neck abscess.

The facial nerve is normally well protected in its bony canal. Facial nerve palsy that occurs in the acute setting, likely represents injury to a dehiscence, exposed facial nerve by bacterial

toxin with resultant neural oedema. The inflammation and oedema then extend to the portion of the nerve that is contained within the bony canal, leading to compression of the nerve and neuropraxia secondary to ischaemia.<sup>5</sup> In our case, mastoidectomy with facial nerve exploration was indicated. The nerve should be identified and decompressed several millimetre distal and proximal to the area involved.<sup>5</sup> Any granulation tissue should be exenterated.

Our patient suffered from coalescent mastoiditis, which is simply the term given to acute mastoiditis when mucoperiosteal disease extends to involve the bone with bony resorption. Mastoidectomy must be done for coalescent mastoiditis with careful exploration of the facial nerve and mastoid tip to look for fistulous opening into the soft tissue of the neck. Drainage of the neck abscess can be done through the same extended postauricular incision as in our case, or via a separate incision if the abscess collection is located in the lower part of the neck. A drain should be inserted at the dependent area.

Bacterial cultures obtained from the middle ear in patients with acute mastoiditis most commonly reveal *Streptococcus pneumoniae*,

*Haemophilus influenzae* and *Moraxella catarrhalis*. *Streptococcus pyogenes* and *Staphylococcus aureus* are frequently found in persistent acute mastoiditis. Less common organisms include *Pseudomonas aeruginosa* and gram-negative organisms such as *Escherichia coli* and *Klebsiella pneumoniae*.<sup>4</sup> Administration of intravenous broad-spectrum antibiotics should be initially instituted and can be changed according to the results of cultures and sensitivity of the pus taken at the time of surgery. In addition, in patients with diabetes mellitus, good sugar control is mandatory for disease control and better wound healing.

### Conclusion

Bezold's abscess is a rare but treatable complication of acute otitis media. Greater awareness and vigilance for the complications of otitis media is key for early diagnosis. In a case of otitis media with suspected neck abscess, CT scan of temporal bone and neck is important to diagnose abscess with otogenic origin.

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This manuscript is our own work, is not under consideration by another journal, and this material has not been previously published. Both authors have no conflict of interest to declare.

### How does this paper make a difference to general practice?

- Otitis media is a common ear infection often managed by primary care physicians
- Debilitating complications of otitis media are rare with proper diagnosis and modern antibiotic management
- However, serious complications such as neck abscesses can occur especially in immunocompromised patients

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