

Otomastoiditis Complicated by a Bezold Abscess and Extradural Empyema, Case Report

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DOI: <https://doi.org/10.36347/sasjm.2024.v10i10.041>

| Received: 11.09.2024 | Accepted: 15.10.2024 | Published: 18.10.2024

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Abstract

Case Report

Bezold's abscess is a rare deep neck abscess and is an intratemporal complication of mastoiditis, the infection erodes through the mastoid cortex to the attachment of the sternocleidomastoid (SCM) muscle. Once the infection has reached this space, it can progress into the infratemporal fossa and trip deep to the investing subcaste of the deep cervical fascia [1]. The spread of infection in this subcaste can lead to a progressive cellulitis/ abscess, but can also do toward the carotid jacket, and thrombosis of the internal jugular tone can do. It was first described by Friedrich Bezold in 1881[5]. Since antibiotics were introduced, the number of reported cases of Bezold's abscesses have significantly dropped. According to some authors, since 1967 there have been less than 100 reported cases in the English literature, only four cases in children under the age of five [1].

Keywords: Bezold abscess, otomastoiditis, abscess, computed tomography, mastoid.

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INTRODUCTION

Bezold abscess is a rare complication of mastoiditis in which cases are frequently well appearing but bear critical intervention to help serious sequelae [9]. It is an abscessed cervical infection originating from the mastoid attachment of the sternocleidomastoid (SCM) muscle.

Emergency physicians must be aware of this rare, serious complication of mastoiditis 1 According to some authors, since 1967 there have been less than 100 reported cases in the English literature, only four cases in children under the age of five [1].

We report a case of otomastoiditis complicated by a Bezold abscess and extradural empyema, diagnosed in a 8 YO boy with a history of fever and otorrhea.

CASE PRESENTATION

An 8-year-old boy without any major medical history to report., arrived at the emergency room for swelling of the left mastoid associated with otorrhea, all evolving for the past five days in a context of unmeasured fever. The patient shows a sudden onset of

altered consciousness for the past day. clinical examination found the patient is obtunded, stable hemodynamically and respiratorily.

Lab results showed Hyperleukocytosis with neutrophil predominance at $30.4 \times 10^3/\text{mm}^3$, C-reactive protein at 59 mg/L, and hemoglobin at 12 g/dl.

The patient's hospital course was initially complicated by recurrent fevers despite being on antibiotherapy, therefore, potential extension of the infection to the epidural space was suspected.

A computed tomography (CT) scan showed Otomastoiditis associated with a Left temporal and occipital subcutaneous collection extending to the ipsilateral retroauricular region, fairly well-defined, spontaneously hypodense with peripheral enhancement after contrast injection, also another Left temporal extradural collection, spontaneously hypodense with peripheral enhancement after contrast injection has been identified. The diagnosis of otomastoiditis with associated Bezold abscess and extradural empyema has been established.

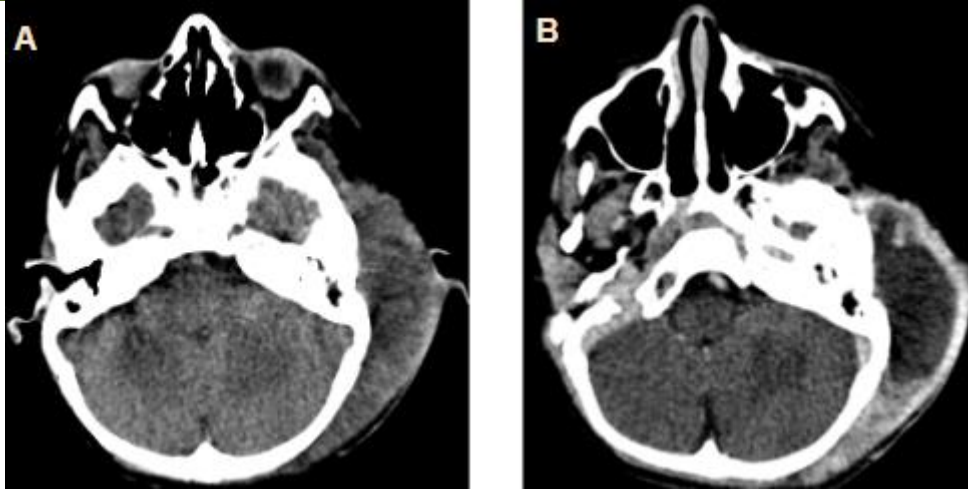


Figure 1: Cerebral CT scan in axial cut before (A) and after contrast agent injection (A) and after contrast agent injection (B) showing subcutaneous collection, Bezold abscess

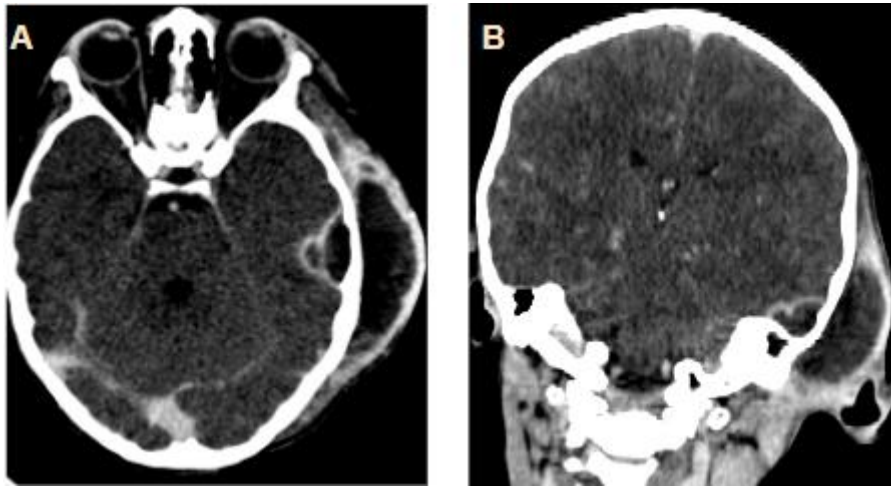


Figure 2: Contrast-enhanced CT scan in axial (A) and coronal (B) sections shows low-attenuation, extra axial collection in the left temporal region

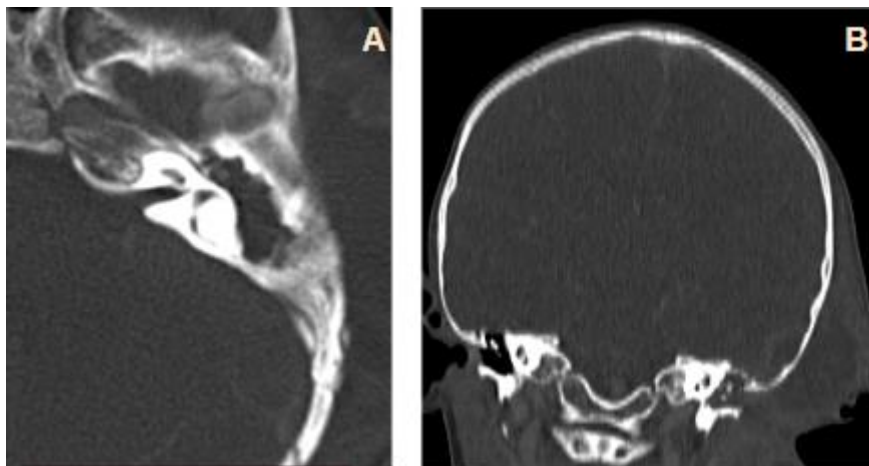


Figure 3: Axial (A) and coronal (B) CT scan of temporal bone shows opacification of left middle ear and osseous destruction of the left mastoid bone

DISCUSSION

The Bezold abscess is a severe and rare extracranial complication of acute suppurative

otomastoiditis or chronic cholesteatomatous otitis media [2].

The infection erodes through the cortex medium to the insertion of the sternocleidomastoid muscle, at the attachment point of the posterior belly of the digastric muscle, and extends into the infratemporal fossa. It is impalpable because it is deep to the investing layer of the deep cervical fascia that envelops the sternocleidomastoid muscle and trapezius muscle. As the mastoid air cells develop during late childhood, Bezold abscesses are typically observed in adults, where the overlying cortex is thinner [1].

Bezold's abscess is infrequently encountered, with fewer than 100 cases reported [4]. It typically occurs in patients with advanced mastoiditis, particularly in those who are immunocompromised [5].

Bezold and Siebenmann [3] were the first to describe abscesses in the neck arising from mastoiditis.

It is an abscessed cervical infection originating from the mastoid insertions of the sternocleidomastoid muscle, following a rupture of the cortical bone at the mastoid apex, typically after superinfection of chronic otitis media or coalescent mastoiditis via direct extension into the perimastoid tissues. After perforating the posterior aspect of the mastoid, the collection extends along the sternocleidomastoid muscle down to the hyoid bone, and less commonly to the supraclavicular region [1,7].

Mastoiditis is one of the common complications of Otitis media, Bezold abscess often occurs in well-pneumatized, thin mastoid tips. Further thinning of these pneumatized air cells is observed in coalescent mastoiditis. An ongoing inflammation in poorly ventilated mastoid air cells leads to erosion or breach of the lateral mastoid tip cortex, spreading the infection along with the deep neck spaces [6]. In the worst scenario, it may extend downward to cause mediastinitis [7].

Due to the proximity to the internal jugular vein, internal jugular vein thrombosis is a recognized complication [1].

The most commonly reported clinical manifestations include ear pain, ear discharge, fever, neck pain, and torticollis in the presence of previous ear infection [5]. The onset of headaches and altered consciousness should raise suspicion for an intracranial complication, most often a subdural empyema, a cerebral abscess, or a thrombophlebitis of a cerebral vein.

Computed tomography (CT) and magnetic resonance imaging (MRI) are crucial in managing intracranial complications, allowing for anatomical localization, clarification of the route of spread, and assessment of extension to neighboring structures.

On CT, the Bezold abscess appears as a hypodense formation with peripheral enhancement after contrast injection, characterized by a thick wall, poorly defined contours, adjacent fat modification, infiltration of the sternocleidomastoid muscle, spinal muscles, and superficial cellulitis.

On MRI, it is well-defined, with the center of the abscess showing low signal on T1, high signal on T2, and diffusion with a significant decrease in the apparent diffusion coefficient (ADC). The abscess capsule appears hypointense on T2 due to the presence of collagen and free radicals, and it enhances after gadolinium injection.

Diagnostic Differential is related to other deep neck abscesses (parapharyngeal, retropharyngeal, odontogenic, etc.), lymphoepithelial cyst of the parotid gland, suppurative parotitis, coalescent mastoiditis.

The treatment for a Bezold abscess generally involves surgical drainage and broad-spectrum antibiotic therapy tailored according to the antibiogram, with an average duration of 11 days. In cases of complicated otomastoiditis that are resistant to conservative antibiotic treatment, a petro-mastoid debridement or mastoidectomy may be recommended. The goal is to eradicate affected tissues, dry the ear, and create anatomical conditions that prevent the risk of recurrence [8].

Katayama *et al.*, recently reported a BZ in a patient who only complained of generalized weakness after months of resolution of OM without the typical neck presentation [8]. Therefore, it is important to be more vigilant in managing immunocompromised patients with a history of acute or recurrent ear infections.

CONCLUSION

Bezold's abscess is a rare condition that is less commonly seen today, likely due to quicker interventions for otitis media. Cholesteatoma significantly increases the risk of developing otitis media and can lead to complications like mastoiditis and Bezold's abscess. Understanding this type of abscess is essential, as failure to recognize it promptly can result in the infection spreading and potentially involving vascular structures or the mediastinum [4].

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