

# A rare case report of cholesteatomatous chronic otitis media complicated by Bezold abscess, Citelli abscess, and sigmoid sinus thrombosis

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## Informed Consent

The authors stated that the written consent was obtained from the patient presented with images in the study.

## Conflict of Interest

No conflict of interest was declared by the authors.

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## Abstract

This case report presents a rare manifestation of cholesteatomatous chronic otitis media complicated by Bezold abscess, Citelli abscess, and sigmoid sinus thrombosis in a 35-year-old man. The patient presented with restricted neck movement, neck pain, fever, difficulty in oral intake, left mastoid tenderness, and otorrhea. Physical examination demonstrated a firm, nonfluctuant swelling extending from the left submandibular region to level III of the neck, along with purulent discharge in the left external auditory canal. Laboratory evaluation revealed markedly elevated inflammatory markers. Imaging studies, including temporal computed tomography, contrast-enhanced temporal magnetic resonance imaging, and magnetic resonance venography, confirmed a Bezold abscess extending into the parapharyngeal space, a Citelli abscess extending from the left suboccipital region toward the prevertebral space, and chronic thrombosis of the left sigmoid and transverse sinuses. Urgent surgical management was performed, including radical mastoidectomy, abscess drainage, mastoid cavity obliteration with abdominal fat, and cul-de-sac closure. Low molecular weight heparin was initiated preoperatively and continued postoperatively for three months to manage sigmoid sinus thrombosis. Postoperatively, intravenous antibiotics were administered, and inflammatory markers were monitored daily. Follow-up magnetic resonance imaging confirmed successful fat obliteration of the mastoid cavity. The patient completed a 28-day antibiotic course without complications and was discharged in stable condition; no pathological findings were identified during follow-up. This case emphasizes the importance of rapid diagnosis and timely surgical intervention in rare but potentially life-threatening complications of cholesteatomatous chronic otitis media.

**Keywords:** Bezold abscess, cholesteatoma, Citelli abscess, sigmoid sinus thrombosis

## Introduction

Cholesteatoma is a destructive lesion of the middle ear and mastoid that is commonly associated with chronic otitis media. It typically presents with hearing loss, otorrhea, and inflammation; however, it may occasionally lead to severe extracranial complications. Bezold abscess is a rare but potentially life-threatening entity characterized by purulent material extending through an eroded mastoid cortex into deep cervical spaces, often involving the sternocleidomastoid and digastric muscles. Infection may spread to the parapharyngeal space, retropharyngeal space, mediastinum, and axilla, and proximity to the internal jugular vein may increase the risk of sigmoid sinus thrombosis [1,2]. Diagnosis can be challenging because presentations vary. Common symptoms include fever, deep neck pain, and otorrhea, with occasional facial nerve paralysis. Physical findings may be subtle due to containment by surrounding musculature, although skin involvement may occur in some patients [3].

Citelli abscess, located posterior to the mastoid process between the mastoid and occipital bones, is another rare complication. Its pathogenesis may involve spread through mastoid air cells or via mastoid emissary veins along the occipitomastoid suture line during mastoiditis [4]. Here, we report a case of cholesteatoma complicated by Bezold abscess, Citelli abscess, and sigmoid sinus thrombosis (SST), and we discuss clinical features, diagnostic considerations, surgical approach, and outcome.

## Case presentation

A 35-year-old man was referred to our clinic with restricted neck movement, severe neck pain, fever, difficulty in oral intake, left mastoid tenderness, and otorrhea. At an external center, oral antibiotics and topical ear drops had been initiated three days earlier; however, he was referred for further evaluation because of progressive symptom worsening. His medical history included a 27-day intensive care unit admission nine years earlier due to meningitis.

On initial evaluation, the patient's daytime body temperature ranged between 36.7 °C and 37.0 °C, with nocturnal spikes up to 39.0 °C–39.5 °C. Physical examination revealed an approximately 5 × 5 cm mass extending from the left submandibular region to level III of the neck. The mass was firm, nonfluctuant, and erythematous, and it was associated with restricted cervical movement and trismus. Oscopic examination demonstrated purulent discharge in the left external auditory canal. Neurological examination was unremarkable, and Kernig and Brudzinski tests were negative for meningeal irritation. Laboratory testing demonstrated marked elevations in inflammatory markers, particularly C-reactive protein (CRP), erythrocyte sedimentation rate, and procalcitonin. Following consultation with the Infectious Diseases department, intravenous vancomycin and meropenem were initiated.

Radiological evaluation was performed to assess osseous destruction related to otitis media and to delineate soft tissue extension. Temporal bone computed tomography showed soft tissue density completely obliterating the left middle ear and external auditory canal, along with marked bony erosion involving the mastoid air cells, superior wall, mastoid bone, and mastoid apex (Figure 1). Contrast-enhanced temporal magnetic resonance imaging revealed two distinct abscess foci. The first was a collection deep to the sternocleidomastoid muscle and deep lobe of the parotid gland, extending medially from the posterior mastoid process into the parapharyngeal space, consistent with a Bezold abscess (Figure 2). The second was a collection originating from the left suboccipital region, coursing along the posterior belly of the digastric muscle, and extending to the prevertebral space at the level of the C2 lamina, consistent with a Citelli abscess. Magnetic resonance venography demonstrated filling defects in the left sigmoid and transverse sinuses, consistent with chronic thrombosis (Figure 3). After confirmation of SST, a multidisciplinary assessment involving hematology and neurology was performed, and anticoagulation was initiated preoperatively with low molecular weight heparin (enoxaparin sodium 2 × 0.6 mL/day).

Figure 1: Coronal temporal bone CT showing erosion of the left mastoid apex (blue arrow).

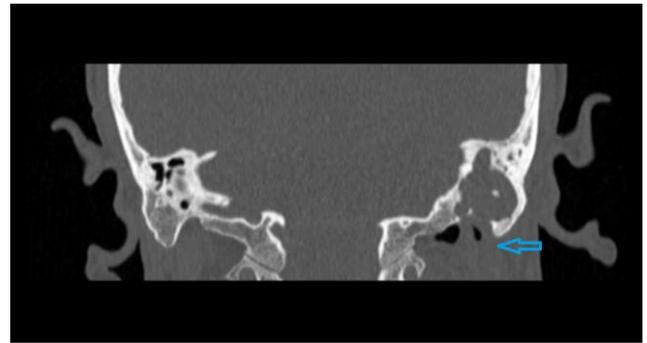


Figure 2: T2-weighted axial temporal MRI demonstrating a Bezold abscess (blue arrow).

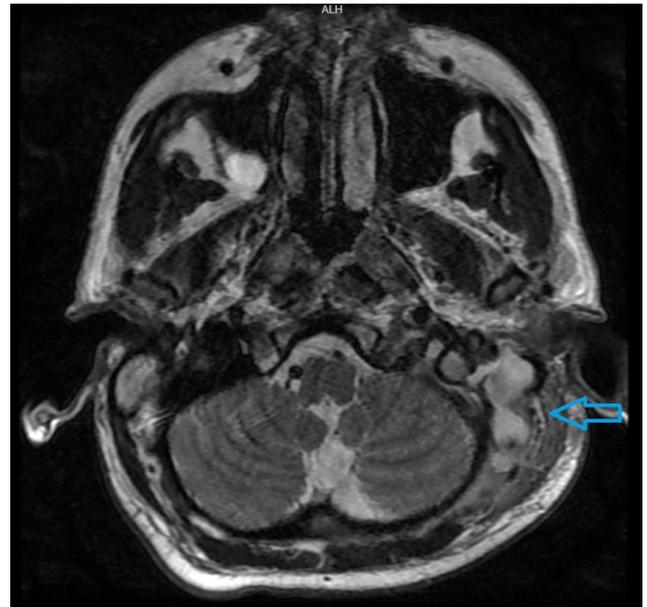
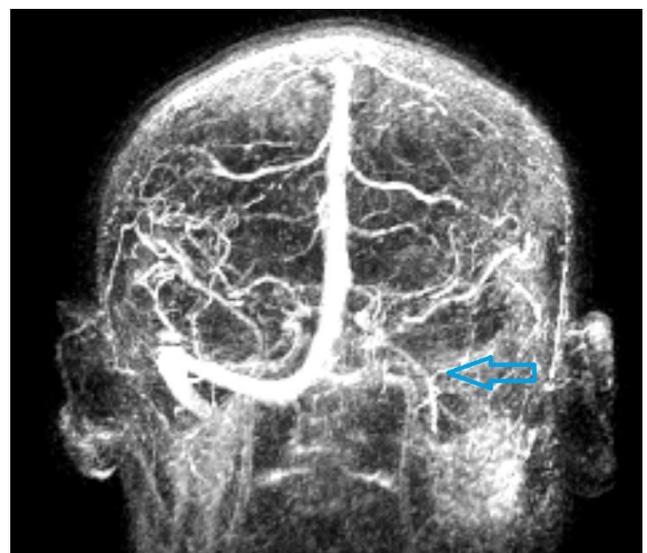


Figure 3: MR venography showing a filling defect in the left sigmoid and transverse sinuses (blue arrow).



The patient underwent emergency surgery for chronic otitis media complicated by Bezold abscess, Citelli abscess, SST, and mastoiditis. Intraoperatively, extensive cholesteatoma completely filled the mastoid cavity, and abscess formation was present. Bony erosion involved the tegmen mastoideum, tegmen tympani, mastoid apex, and occipital condyle, and obliteration was observed at the posterior wall overlying the sigmoid sinus. The abscess was drained by applying external pressure to the deep tissues of the sternocleidomastoid and digastric muscles. The middle fossa dura remained intact and was covered with granulation tissue and abscess debris. Radical mastoidectomy was performed, and the mastoid apex defect and fistulous connection

between the neck and mastoid cavity were closed by obliteration (Figure 4). The mastoid cavity was obliterated with abdominal fat (Figure 5), followed by cul-de-sac closure.

Postoperatively, intravenous antibiotics were continued, and facial nerve function remained intact. Anticoagulation was continued postoperatively, with a planned total duration of three months. Inflammatory markers decreased rapidly and consistently during follow-up, particularly CRP levels (Figure 6). Written informed consent was obtained from the patient for the use and publication of medical data, clinical photographs, and radiological images for scientific purposes.

Figure 4: Intraoperative findings demonstrating drainage of the Bezold abscess into the mastoid cavity (a); extensive cholesteatoma filling the mastoid cavity (b); post-debridement appearance of the cavity following cholesteatoma and abscess removal (c).

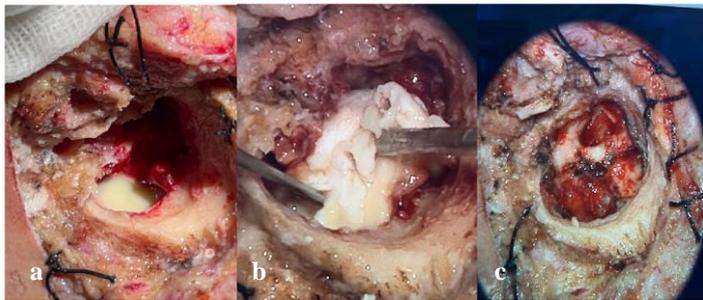


Figure 5: Postoperative day 3 T1-weighted temporal MRI showing fat obliteration of the mastoid cavity (blue arrow).

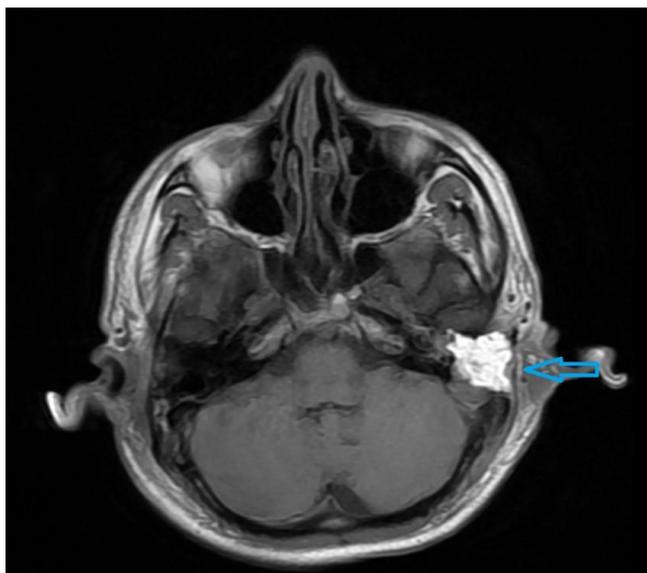
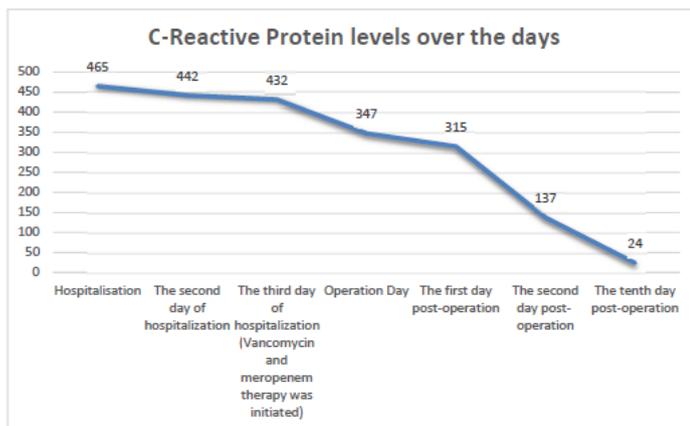


Figure 6: Daily monitoring of C-reactive protein (CRP) levels postoperatively.



## Discussion

Neck abscesses related to mastoiditis are rare in the antibiotic era; however, the coexistence of multiple complications, as observed in this case (Bezold abscess, Citelli abscess, and

lateral sinus thrombosis), may substantially complicate the clinical course. In the classic pathophysiology described by Bezold and Siebenmann, infection erodes the mastoid cortex and extends into deep cervical fascial planes [5]. In our case, the nonfluctuant hard mass on examination was consistent with an abscess located deep within the sternocleidomastoid and trapezius musculature. As reported, deep location and thick cervical fascia may limit superficial spread and reduce palpability, potentially delaying diagnosis [6,7].

Cholesteatoma is a key risk factor for severe complications. The extensive cholesteatoma and associated erosion of the mastoid apex and occipital condyle observed intraoperatively support the mechanism described in the literature, whereby pressure necrosis and enzymatic bone destruction create a conduit for purulent drainage into cervical spaces [4,8]. Additionally, the patient's history of meningitis and chronic otitis media suggests that pre-existing compromise of bony barriers may have facilitated spread.

Imaging is crucial because clinical findings may be subtle, and purulent material may remain sequestered within the mastoid cavity [9]. Despite initial antibiotic therapy, the progressive course and marked inflammatory response in this patient warranted advanced imaging. Computed tomography and magnetic resonance imaging were instrumental in delineating bone erosion, mapping the extent of Bezold and Citelli abscesses beyond what could be defined on physical examination, and identifying concomitant SST [8,10,11].

A notable aspect of this case is the presence of Citelli abscess in addition to Bezold abscess. While Bezold abscess typically extends inferiorly from the mastoid process, Citelli abscess spreads posteriorly toward the occipital region [4]. In our patient, extension to both the parapharyngeal space (Bezold) and the prevertebral space (Citelli) suggests multidirectional spread, potentially via mastoid emissary veins or along the occipitomastoid suture line. This pattern underscores the importance of comprehensive surgical planning to address all potential routes of extension.

Lateral sinus thrombosis associated with deep neck infection may occur due to perisinus inflammation or internal jugular vein compression. Fever, neck pain, and restricted movement are among the most frequent symptoms [7]. The patient's nocturnal fever spikes, torticollis, and neck pain were consistent with this presentation. Although the role of anticoagulation in SST remains debated, it has been recommended in selected settings to reduce the risk of septic embolism and to support recanalization [12]. In this case, favorable recovery was achieved through multidisciplinary management combining urgent surgery, anticoagulation, and prolonged parenteral antibiotic therapy.

## Conclusion

In conclusion, Bezold and Citelli abscesses should be considered in patients with deep neck masses arising in the setting of chronic otitis media with cholesteatoma. Early radiologic imaging and timely radical surgical management, including mastoidectomy and abscess drainage, may be life-saving, particularly in nonfluctuant deep neck masses and treatment-resistant infection.

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