

Acute Mastoiditis, That must be hard to hear!

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Background

- We present the case of a 6-year-old female who presented with prolonged fever and severe ear pain after failing two courses of outpatient antibiotics due to acute mastoiditis. Acute mastoiditis is a bacterial-induced inflammation of the mastoid bone and is the most common complication of otitis media. Most often seen in children, the two most common bacterial species seen in this disease process are *Streptococcus pneumoniae* and *Streptococcus pyogenes*. It is characterized by symptoms including ear pain, redness, warmth/swelling behind the ear, and fevers. Acute mastoiditis is typically diagnosed by a thorough clinical exam. However, a cranial computed tomography (CT) scan with intravenous contrast can be obtained if there are clinical findings of intracranial or extracranial complications. These can include meningeal signs, cranial nerve deficits, hearing loss or vertigo. Although rare, acute mastoiditis is the most common complication of acute otitis media and therefore the diagnosis should not be missed.

Objective

The objective is to review the clinical diagnosis of acute mastoiditis as well as its uncommon, but many and severe complications.

Case Presentation

- 6-year-old previously healthy female presented to the emergency department with a 15-day history of subjective fevers and left ear pain.
- She initially visited her pediatrician, was diagnosed with acute otitis media (AOM), and was provided a course of amoxicillin.
- Despite completion of her antibiotic course, on day 8 she went to the emergency department, was diagnosed with acute otitis externa and given a course of ciprofloxacin-dexamethasone ear drops.
- Four days later, she returned to the emergency department with worsening fevers, T-max 104°, and worsening ear pain.

Physical Exam

Vitals

Afebrile, HR: 134 bpm, BP: 107/69, O2 Saturation: 99% ORA

General: Sick appearing

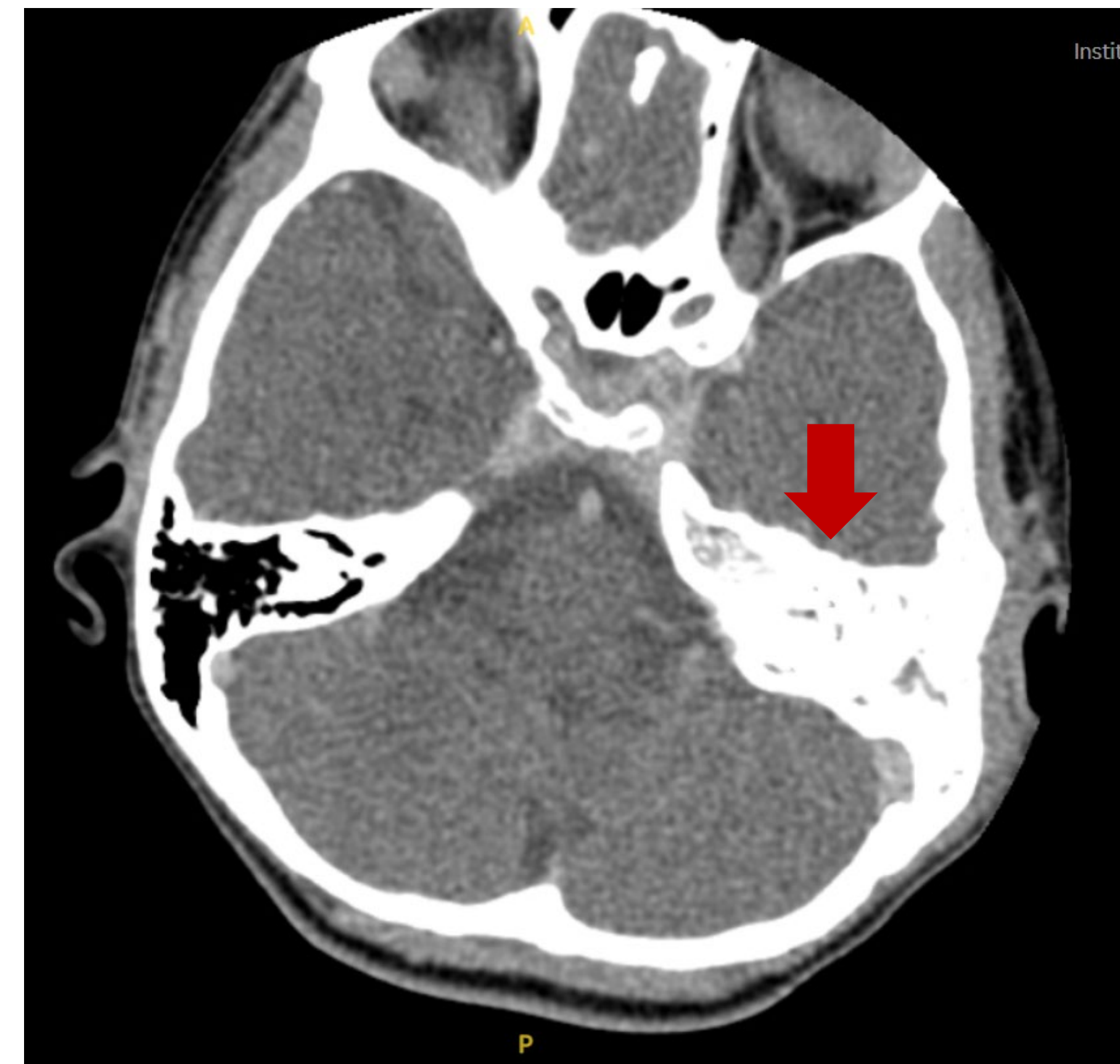
HEENT: direct visualization revealed the skin overlying the mastoid process was warm, tender and erythematous. Her otoscopic exam revealed a perforated tympanic membrane with thick white exudate (L). (+) nodes anterior cervical chain

Respiratory: CTA B/L

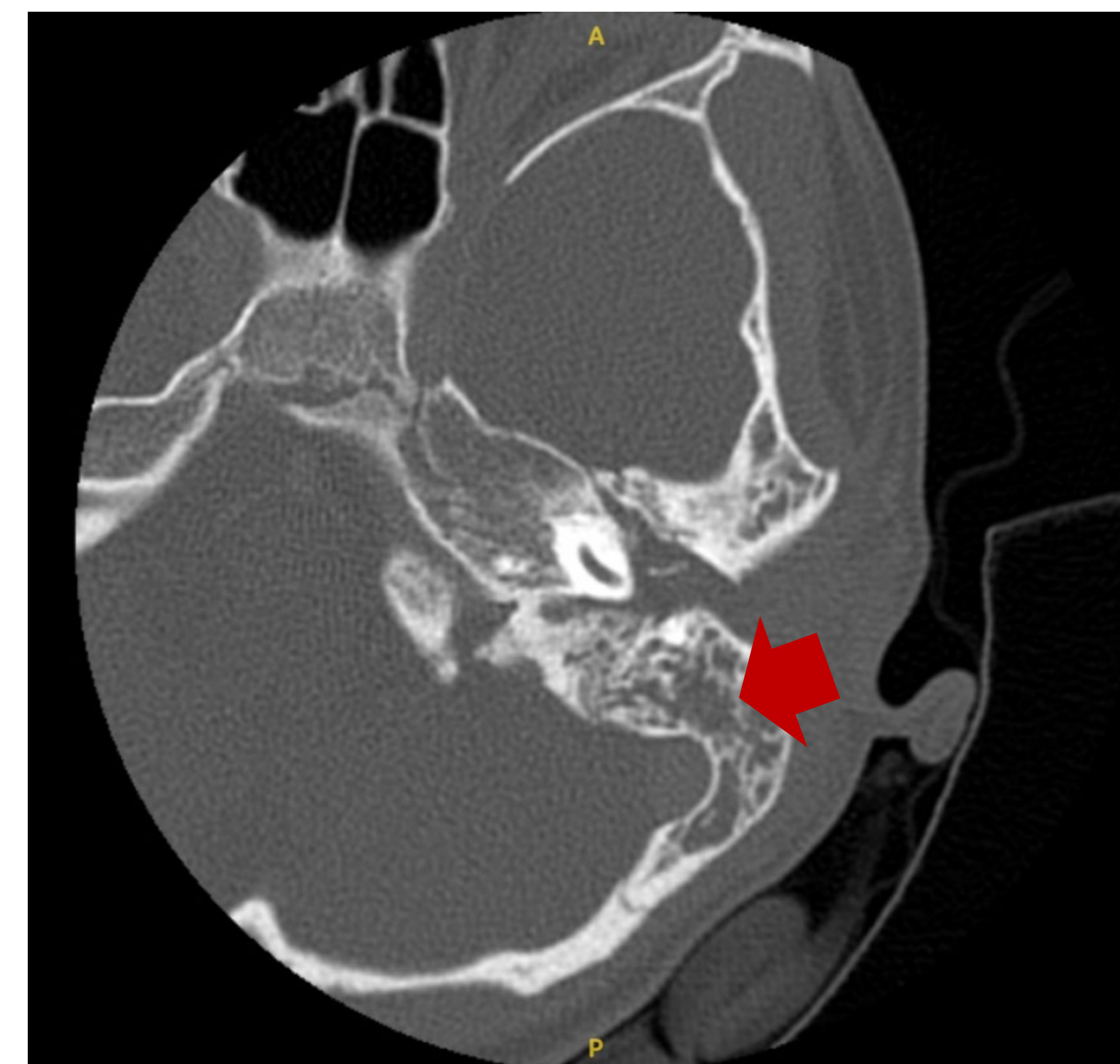
Cardiac: no murmurs

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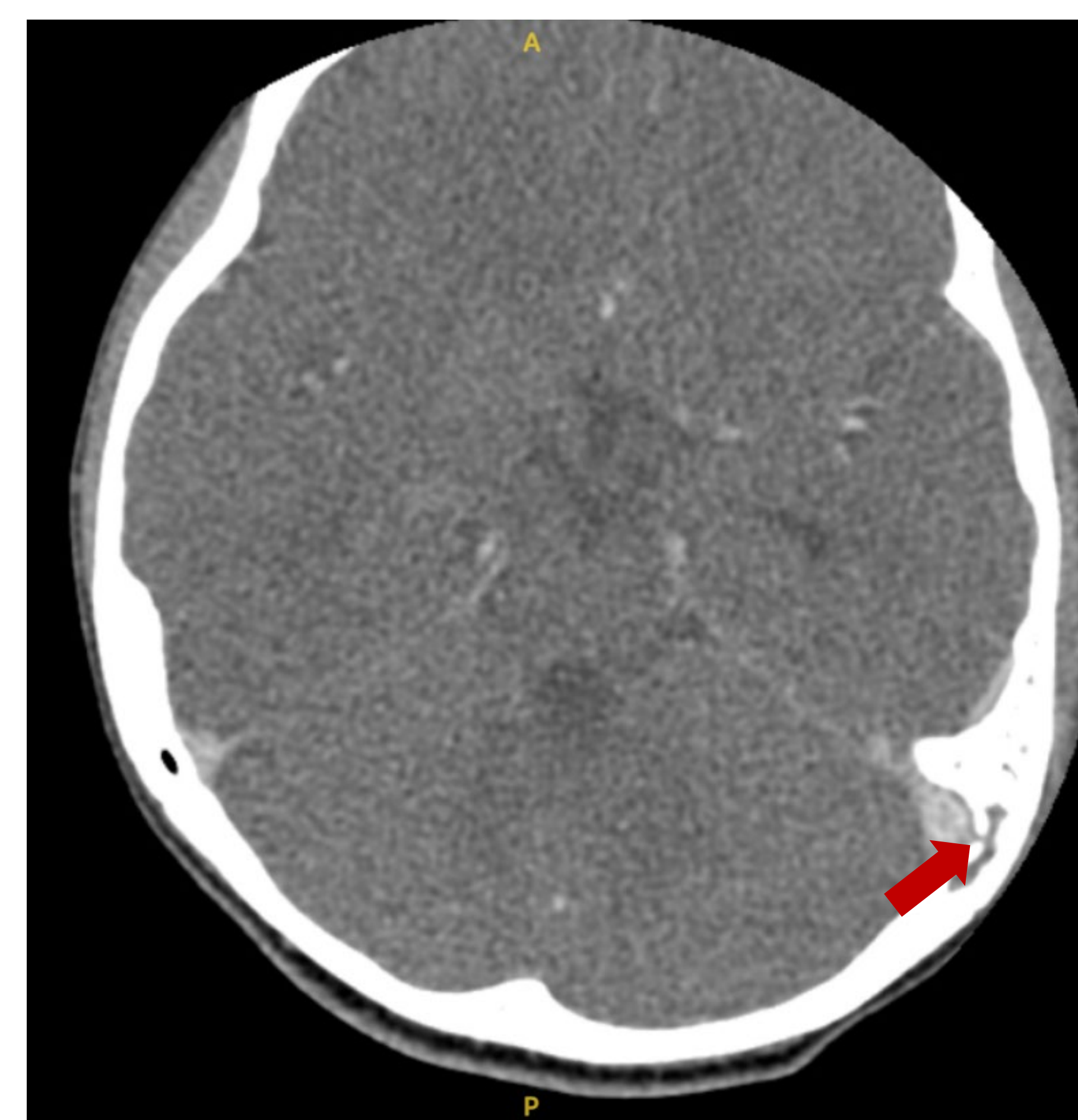
Diagnostic Imaging



• Figure 1: Complete opacification of the middle ear cavity and mastoid air cells



• Figure 2: Erosion of mastoid air cell with septations centrally



• Figure 3: Small region of dehiscence at the posterior tegmen mastoideum with intracranial hypoattenuation along the DVS suggesting intracranial extension

Discussion

- When uncomplicated, acute mastoiditis is treated with antibiotics designed to target the most common bacterial causes without the need for tympanocentesis or tympanostomy tube placement. However, the incidence of acute mastoiditis has been steadily increasing in the last two decades in developed countries which is thought to be due to antimicrobial resistance. [1] Therefore, a high index of suspicion must be maintained because delayed diagnoses can lead to poorer outcomes.
- The most common complication of acute mastoiditis is a subperiosteal abscess. [2] Clinically, the patient may present with severe post auricular tenderness and fluctuance causing displacement of the pinna. Diagnosed by ultrasound, this complication requires surgical drainage in addition to antibiotic treatment. If not treated swiftly, the patient may develop blindness, meningitis or deteriorate rapidly due to an intracranial abscess. [3]
- Other extracranial complications include facial nerve paralysis, labyrinthitis, osteomyelitis and Bezold abscess. Labyrinthitis and facial nerve paralysis occur due to the involvement of the surrounding vascular and neurological structures of the mastoid. Bezold's abscess originates from the erosion of the mastoid bone cortex medial to the attachment of the sternocleidomastoid muscle. [4] These complications often present similarly to that of acute mastoiditis. In addition to tympanocentesis and tympanostomy tube placement, surgical debridement or mastoidectomy may also be necessary. [5]

Conclusion

- Acute mastoiditis is characterized by symptoms such as ear pain, fullness, retro-auricular erythema and subjective fevers. Typically diagnosed by a clinician's physical exam, acute mastoiditis can present with symptoms representing intracranial and extracranial extension, including meningeal signs. In these cases, complicated infections should be diagnosed using a cranial CT scan.

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