

EM CASE OF THE WEEK.

BROWARD HEALTH MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE



Care Warriors

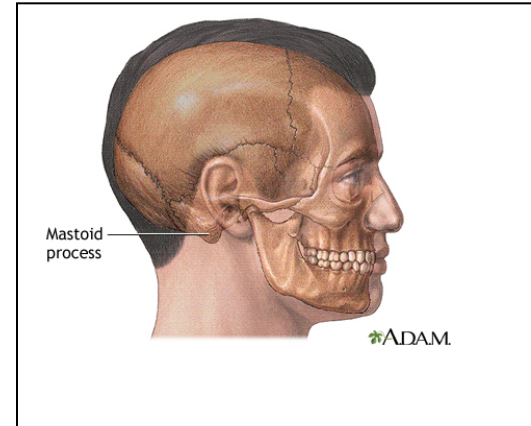
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| Vol 5 | Issue 35

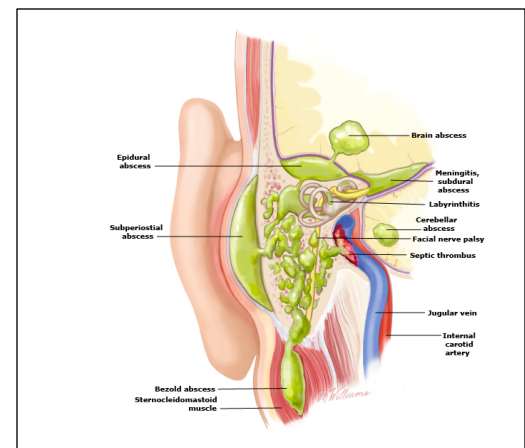
Mastoiditis

A 47-year-old female with PMH of thyroiditis presents to the ED with right ear pain for the past three days. The pain is throbbing and worsening. She has rarely experienced these symptoms before. She denies fever, chills, tinnitus, dizziness, and cough. She admits to clear discharge for 3 days. The patient is afebrile with vitals within normal limits. On physical exam, she has tenderness to pinna with traction, debris in external ear canal with inability to visualize TM, and mild tenderness at the mastoid. Which of the following is the most appropriate initial diagnostic step for this patient's condition?

- A. Audiometry**
- B. CT scan**
- C. MRI**



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Complications of acute mastoiditis include spread of infection to the intratemporal and intracranial areas

EM Case of the Week is a weekly "pop quiz" for ED staff.

The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

BROWARD HEALTH MEDICAL CENTER

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Warriors

The correct answer is B. CT scan is the most important diagnostic step when mastoiditis is a possibility. MRI should also be ordered if there is concern about an intracranial process like sigmoid sinus thrombosis or intracranial abscess.

Mastoiditis can be seen on CT when a patient has acute otitis media or chronic suppurative otitis media. The danger of mastoiditis is due to the close proximity of the mastoid process to the posterior cranial fossa, lateral sinuses, facial nerve canal, semicircular canals, and the petrous tip of the temporal bone. Mastoiditis is more common in children than adults. As otitis media is often being treated with antibiotics, the incidence of mastoiditis has decreased. It can occur with chronic suppurative otitis media with or without cholesteatoma. Of 3000 cases of chronic suppurative otitis media in Turkey over nine years, there were 25 cases of mastoid abscess.

Mastoiditis may present clinically with fever, ear pain posteriorly, and local erythema over the mastoid bone, edema of the pinna, and a pinna that is displaced downwardly and posteriorly. After CT and/or MRI have been ordered, the patient should be admitted and started on IV antibiotics.

Antibiotics for mastoiditis that is a complication of chronic otitis should cover for *S. aureus*, *Pseudomonas*, enteric gram-negative rods, *Strep. pneumoniae*, and *Haemophilus influenzae*. IV antibiotics used for chronic suppurative otitis media can be chosen with the help of an infectious disease specialist. There is high resistance to Penicillin G and ampicillin with poor response to erythromycin. Better response is seen with broader- spectrum antibiotics like mezlocillin and ceftazidime.



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The resistant organisms encountered in chronic suppurative otitis media were *Pseudomonas aeruginosa* and MRSA. Two studies found that ciprofloxacin and imipenem as well as aztreonam and ceftazidime worked well against *Pseudomonas*. However, a later study found that all patients with chronic suppurative otitis media that was resistant to topical ciprofloxacin had *Pseudomonas* resistant to ciprofloxacin; almost all of these bacteria were susceptible to imipenem. In another study with patients who had community-acquired MRSA, all of the bacteria were susceptible to TMP-SMX and 90% of the organisms was susceptible to rifampin.

In the patient with mastoiditis who fails treatment with IV antibiotics, mastoidectomy with debridement of the necrotic bone may be indicated. An adjunct therapy with mastoidectomy is myringotomy. If cholesteatoma is also present, tympanomastoidectomy removes the necrotic bone in the mastoid and cholesteatoma.

For a list of educational lectures, grand rounds, workshops, and didactics please visit BrowardER.com and **click** on the **"Conference"** link.

All are welcome to attend!



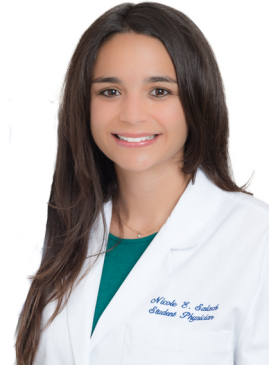
(<https://radiopaedia.org/cases/acute-otomastoiditis-1?lang=us>).

Opacification of the middle ear cleft, the mastoid antrum and the mastoid air cells a by fluid density.

Mastoidectomy is required when cholesteatoma travels beyond the middle ear, when granulation tissue buildup causes mastoid cells to be chronically infected due to poor aeration, or if there is a subperiosteal abscess overlying the mastoid cortex surface. The mastoid air cells are opened, and the tegmen tympani, sigmoid sinus, facial nerve, vestibular labyrinth, and ossicles are preserved. Success has been achieved when the disease is eradicated and the mastoid-middle ear system is better aerated. The two approaches used are intact canal wall versus canal wall down. In the first approach, the air cells of the mastoid are removed, but the posterior bony external auditory canal wall is left alone. If the disease requires or better visualization is needed, the posterior bony external auditory canal is removed. This approach usually leads to a decrease in hearing.

Take Home Points

- Chronic otitis media is a recurrent infection of the middle ear and/or mastoid with a tympanic membrane perforation. Purulent drainage through a perforated tympanic membrane can be labeled chronic suppurative otitis media.
- *Pseudomonas aeruginosa* and *Staphylococcal aureus* were the most commonly isolated aerobic bacteria in a study of chronic suppurative otitis media.
- Symptomatic mastoiditis is a serious complication of acute otitis media and chronic otitis media. Fever, pain of the ear, edema, and a displaced auricle may be present. Antibiotics should cover *S. aureus* and enteric gram-negative rods if chronic otitis is present. If there is an abscess, surgery may be required.



ABOUT THE AUTHOR

This month's case was written by Nicole Salach. Nicole is a 4th year medical student from NSU-COM. She did her emergency medicine rotation at BHMC in December and January of 2018 and 2019. Nicole Salach plans on pursuing a career in Pediatrics after graduation.

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