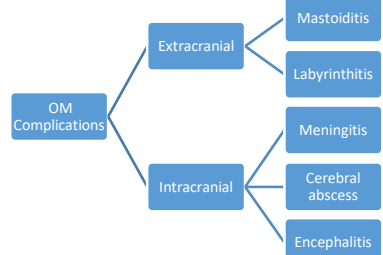


Big Trouble in Little Brain: A Case of Cerebellar Abscess

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Introduction

Otitis media (OM) is a common otologic condition in pediatric and adult populations and is a leading cause of health care visits, antibiotic prescriptions, and surgery. (1,5)



Most common causative bacteria of brain abscess are Streptococcus, Staphylococcus, Proteus spp., Klebsiella pneumoniae, and Escherichia coli, accounting for about 60% of cases. (9).

From the oral cavity, there are streptococcus viridans (particularly S. anginosus group), Actinomyces, Peptostreptococcus, Prevotella, Fusobacterium, Eikenella corrodens, Aggregatibacter actinomycetemcomitans. (7)

The case discusses a patient diagnosed with cerebellar abscess secondary to Actinomyces.



Clinical Course

History: 38-year-old African-American male who presented to the ED complaining of headache that began approximately 2 weeks prior to admission. On arrival patient was obtunded and poorly responsive. Per significant other, patient was also complaining of left-sided ear pain, radiating towards his left neck, stabbing, progressive, no alleviating factors. Patient decided to go to the ED on 2/14. CT scan at the time showed a nonspecific left squamous temporal soft tissue fluid collection suspicious for abscess with left cervical lymphadenopathy. Given Cefdinir 300 mg every 12 hours for 7 days and diclofenac. 4 days prior to admission, patient was complaining of worsening headache with blurry vision, chills, fevers, nausea and non projectile vomiting. On day of admission, had 3 witnessed seizures, CT scan at the time showed complete opacification of the left mastoid air cells and middle ear cavity.

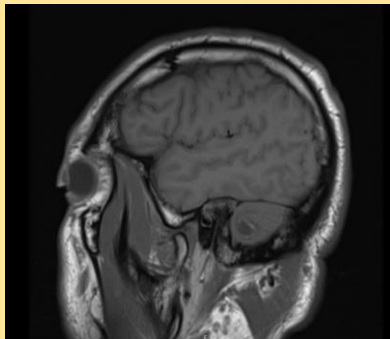
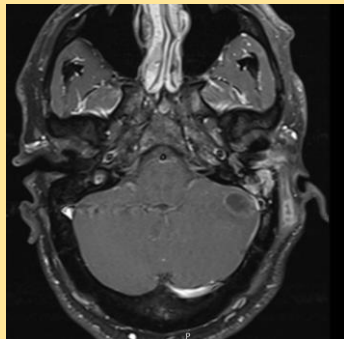
Pertinent Physical Exam Vital Signs: BP: 198/111 HR: 53, RR: 17, T: 97.5 Bilateral external auditory canal with presence of cerumen. Left tympanic membrane with yellow discharge and slight bulging.

Pertinent Labs WBC: 12.37, Plt: 447, Hb 13.5, Hct: 39.9, NA 131, K: 3.3, Cl: 97, HCO3: 26, Cr 1.3, BUN: 10, Ethanol 3, Ammonia <17 UDS: Positive marijuana.

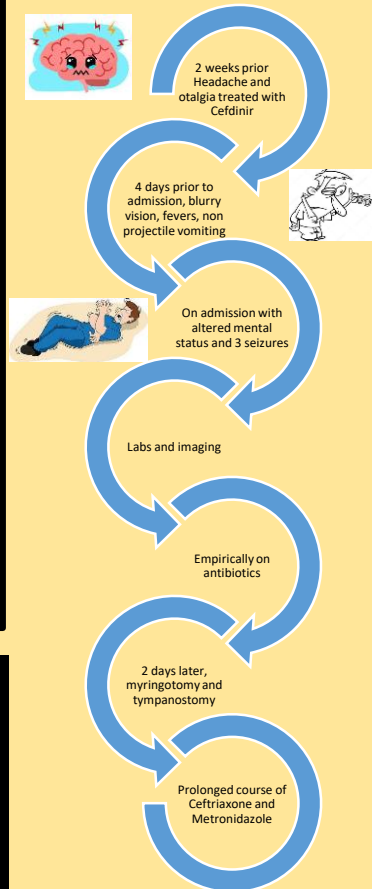
Lumbar puncture: CSF: Colorless WBC: 152, RBC: 603, Neutrophil: 44, Lymph: 42, Monocytes: 14, Xanthochromic: Negative, Glucose 37, TP: 124, LDH: 57. Negative for Acid fast, CMV, Enterovirus, Fungal, West Nile Virus, Cryptococcus, oligoclonal, HSV, VZV, E. coli.

Patients Progress

As patient was poorly responsive and unable to protect airway, patient was intubated and upgraded to the ICU, started empirically on Cefepime, vancomycin, acyclovir and dexamethasone for high suspicion of meningitis. Infectious disease, Otorhinolaryngology, Neurology and Neurosurgery consulted. With MRI showing cerebellar abscess, patient started on Flagyl. Taken to the OR two days later for left myringotomy with tympanostomy tube placement and culturing, incision and drainage and debridement left postauricular abscess. Cultures showed granulation tissue with acute and chronic inflammation with colonies of actinomyces organisms. With culture results, patient continued with ceftriaxone 2 g IV twice daily and oral Flagyl, anticipating a minimum of 6 weeks of treatment, with eventually transition to oral treatment for a couple of months. Repeat imaging 9 days later on CT scan showed: Persistent findings of otomastoiditis. Ill-defined peripherally enhancing collection along the left lateral cerebellum adjacent to the mastoids suspicious for abscess measuring up to at least 2.0 x 1.9 cm



Summary



Discussion

Brain abscess are considered the second most common intracranial complication of Otitis media after meningitis. With the cerebellum being one of the most common intracranial locations. (1,2)

Although anaerobes have been identified in many cases since 1981, it has been reported that causative bacteria cannot be demonstrated in approximately 30% of anaerobic abscesses (3).

Actinomyces are gram positive, anaerobic bacterium; involvement of the middle ear and mastoid is rare and might be caused by direct spread via the Eustachian tube from the nasopharynx. (3,4) It should be considered as one of the differential diagnosis for chronic suppurative otitis media patients with no improvement on medical treatment. The key to managing CNS actinomycosis is surgical debridement followed by an extended treatment with highly-bioavailable antibacterials with good CNS penetration (5).

There are many important factors to be considered in pathogenesis of actinomycosis infections, such as trauma due to dental extraction, manipulation or caries.(7)

Conclusion

This case was unique due to the relatively low number of brain abscesses that arise from Actinomyces infection. Strict anaerobic organisms are exceedingly rare for such a presentation, especially in a 38-year-old immunocompetent patient. It is important to keep this infection in mind especially if there is no response to the usual treatment for brain abscess. Therefore, it is important to keep anaerobic infection in mind when starting antimicrobial treatment before the identification of the causative organism. If left untreated, mortality rate of affected persons is as high as approximately 25% with life threatening sequelae, including meningitis and venous sinus thrombosis, and even in cured cases, 30% to 55% have neurological sequelae, such as seizures, persistent neurologic deficits, and behavioral changes. (6,9)



References

- 1- Duarte MJ, Kozin ED, Barshak MB, Reimshagen K, Knoll RM, Abdullahi KS, Welling DB, Jung DH. Orogenic brain abscesses: A systematic review. Laryngoscope Investig Otolaryngol. 2018 Apr 25;3(3):138-208. doi: 10.1002/liv.2.150. PMID: 30062135; PMCID: PMC6057112
- 2- Ahmad RU, Ashraf MF, Qureshi MA, Shehryar M, Tareen HK, Ashraf MA. Chronic Suppurative Otitis Media leading to cerebellar brain abscess, still a problem in 21st century: A case report. Ann Med Surg (Lond). 2022 Jul 31;80:104256. doi: 10.1016/j.amssurg.2022.104256. PMID: 36043785; PMCID: PMC9422287.
- 3- Radiansyah RS, Sugianto P, Cecilia C. Complete resolution of otogenic cerebellar abscess with conservative approach: Two case reports. Ann Med Surg (Lond). 2022 Jun 16;79:104001. doi: 10.1016/j.amssurg.2022.104001. PMID: 35860091; PMCID: PMC9289309.
- 4- Brouwer M.C., Tunkel A.R., McKhann G.M., 2nd, Van de Beek D. Brain abscess. N. Engl. J. Med. 2014;371(5):447-456. doi: 10.1056/NEJMr1301635.
- 5- Schilder AG, Marom T, Bhutta MF, Casselbrant ML, Coates H, Gisselsson-Solén M, Hall AJ, Marchisio P, Ruohola A, Venekamp RP, Mandel EM. Panel 7: Otitis Media: Treatment and Complications. Otolaryngol Head Neck Surg. 2017 Apr;156(4_suppl):S88-S105. doi: 10.1177/0194599816633697. PMID: 28372534.
- 6- Sahi D, Nguyen H, Callender KD. Mastoiditis. [Updated 2022 Aug 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK560877/>
- 7- Takahashi M, Nakanishi Y, Hamada Y, Hoshimoto Y, Aoki J, Karakida K. A Case of Brain Abscess Caused by Actinomyces Cardififormis and Parvimonas Micra. Tokai J Exp Clin Med. 2020 Dec 20;45(4):189-194. PMID: 33300589.
- 8- Cano EJ, Corsini Campioli C, Rodrigues AE, Erler MJ. New-onset seizures and a tangled up Gram's stain: Actinomyces brain abscess. IDCases. 2020 Dec 11;23:e01024. doi: 10.1016/j.idcr.2020.e01024. PMID: 33364170; PMCID: PMC7750544.
- 9- Sheikh MA, Alenzi S, Ahmadi AA, Mashrafi A, Alsayid H, Abdullah A. Actinomycosis of the Middle Ear and Mastoid. Med Arch. 2018 Oct;72(4):295-296. doi: 10.5455/medarh.2018.72.295-296. PMID: 30514999; PMCID: PMC6195014.