

Dr. William Detar:

Hello, welcome to the On-Call consults In <10 minutes series on ENT In a Nutshell, a compliment a Head Mirror's Online Survival Guide. I'm your host Will Detar and today we are joined by Dr. Matt Carlson, a board certified neurotologist. In this episode, we will cover otitis media, mastoiditis, and associated complications. Let's jump right in. Otitis media and mastoiditis or conditions associated with inflammation and usually infection involving the middle ear and mastoid, respectively. This episode will primarily focus on conditions that require prompt recognition and management in the acute setting, including acute otitis media, acute mastoiditis, and complications of otomastoiditis. Serous otitis media and uncomplicated chronic otitis media will not be discussed. Acute mastoiditis is a more severe extension of acute otitis media and additionally presents with tenderness and swelling over the mastoid process. Strep pneumoniae is the most common implicated bacterial species. Dr. Carlson, can you tell us about the differential diagnosis?

Dr. Matthew Carlson:

The differential diagnosis includes benign middle ear and mastoid effusion, otitis externa, myringitis, ear canal or tympanic membrane trauma, prior ear surgery with postoperative changes. It's not uncommon to see a large cartilage graft after tympanoplasty and sometimes that can be mistaken for infection. Myringosclerosis, Ramsay-Hunt syndrome, dermatologic conditions of the ear canal, perichondritis, ear foreign body, middle ear tumors, temporal bone malignancy, osteoradionecrosis or skull base osteomyelitis, a headache disorder, TMJ disorder, or referred otalgia. I think it's also useful to think of associated sequella for this episode. You can have subperiosteal abscess that presents with a prominent ear and mastoid swelling or fluctuance, tympanic membrane rupture with possible otorrhea, facial nerve paralysis, labyrinthitis presenting with mixed hearing loss, vertigo and nystagmus, lateral sinus thrombosis which may present with headache from elevated intracranial pressure and rarely picket fence fevers from periodic shedding of septic emboli. Petrous apicitis with components of Gradenigo's triad including otorrhea, abducens nerve palsy and retro orbital eye pain, meningitis, epidural, subdural, or parenchymal brain abscess that may present with minimal symptoms all the way to fever, altered mental status, aphasia, and seizures depending on location and severity.

Dr. William Detar:

And what about the disease presentation and what history do you take?

Dr. Matthew Carlson:

You'll want to ask about the exact timing and rate of progression. History of ear infections, ear surgery, or other notable ear history. Associated symptoms of dizziness, otalgia, otorrhea or hearing loss. Swelling or tenderness over the mastoid process, or there's a prominent ear present. Symptoms of cranial neuropathy, including facial nerve weakness, facial spasm, or diplopia on lateral gaze. Fever, photophobia, altered mental status, aphasia, headache, lethargy, or other symptoms of a more aggressive neurologic process. History of diabetes, immunocompromised status, or history of radiation, and then conditions associated with a hypercoagulable state. If lateral sinus thrombosis is suspected, particularly if the patient has a prior history of DVT or PE. Fever, fussiness, poor sleep, and ear tugging are more prominent symptoms in the younger population. And then whenever considering a surgical intervention. You'll want to start by asking about NPO status and anticoagulation status.

Speaker 3:

And what are the key supplies for this consult?

Dr. Matthew Carlson:

Otoscope, 512 hertz tuning fork, a culture swab or suction trap, and supplies to clean cerumen if that's required.

Speaker 3:

And can you tell us about the physical examination?

Dr. Matthew Carlson:

You'll want to start by examining the external ear with palpation of the mastoid for tenderness, swelling, or fluctuance. A prominent ear and mastoid fluctuance indicates a subperiosteal abscess. You'll want to perform detailed otoscopy looking for an inflamed tympanic membrane. Possible otorrhea from a perforation or swelling of the posterior ear canal skin or vascular strip. You'll also want to look for signs of a co-existing cholesteatoma including retraction, keratinous debris, or medial inflammatory polyp. Nuchal rigidity, pain with neck flexion or extension, torticollis, or upper neck and suboccipital swelling may indicate an upper neck abscess, such as a Bezold or Citelli's abscess. You'll want to perform a full cranial examination with particular attention to the facial nerve and extra ocular muscle movement and a 512 hertz tuning fork to evaluate for possible associated sensory or hearing loss.

Speaker 3:

And what diagnostic workup do you order in the acute setting?

Dr. Matthew Carlson:

The diagnostic workup is directed by a prioritized differential diagnosis and for this podcast, we'll focus on the acute workup of otitis media, mastoiditis, and associated complications. Uncomplicated acute otitis media is a clinical diagnosis and generally does not warrant imaging unless there's concern for a more aggressive process. The temporal bone CT scan with and without contrast may be obtained if clinical signs of mastoiditis are present. It's very common for ENT's to be consulted for radiological mastoiditis in the setting of scattered or scant mastoid effusion. It's really important to emphasize here that acute mastoiditis is a clinical diagnosis associated with pain, mastoid tenderness, and swelling. Limited mastoid or middle ear fluid without pain or related symptoms is not mastoiditis.

Radiologically acute mastoiditis will generally exhibit complete mastoid opacification with possible coalescence or breakdown of bony septa. There may be associated enhancement, edema, and abscess of the overlying soft tissue in the cortex may exhibit bony erosion. Absent contrast signal in the ipsilateral jugular vein or sigmoid sinus with peripheral enhancement is called the delta sign and it indicates probable lateral sinus thrombosis. A ring enhancing lesion with surrounding fat stranding deep to the SCM is concerning for a Bezold abscess. A fusiform ring enhancing lesion along the tegmen or posterior fossa bone plate with or without bony erosion may indicate epidermal abscess and ring enhancement with vasogenic edema within the temporal lobe or cerebellum indicates a cerebral abscess.

CT angiography with venography of the neck and head may be warranted in cases where the lateral sinus thrombosis is suspected. Although there are exceptions in most cases, an MRI is not retained in the very acute setting, but an MRI may be useful to examine for more subtle features of an intracranial or neck space infection. Furthermore, MRI may characterize labyrinthitis if suspected and potential progression of labyrinthitis to labyrinthitis ossificans better than what a CT can perform. An LP may be considered in cases where meningitis is suspected and cultures may be obtained for cases of

acute otitis media with associated complications or in higher risk populations, such as the immunocompromised.

Dr. William Detar:

And can you tell us about the acute treatment for these cases?

Dr. Matthew Carlson:

The identified cause of the underlying infection should be treated. For acute otitis media patients with uncomplicated otitis media, generally a 10 to 14 day course of oral antibiotic therapy with good strep or staph coverage, such as amoxicillin is sufficient. For patients with a PE tube or TM rupture topical drops may be used alone, reserving oral antibiotics for refractory infection. Patients with uncomplicated mastoiditis can be initially managed with tympanostomy tube placement, topical ear drops and IV antibiotic therapy. If improvement is not seen within 48 hours surgical treatment with cortical mastoidectomy is generally advisable. Transition to oral antibiotics is generally directed or dictated by clinical improvement or when culture directed therapy can be initiated. Oral antibiotic therapy is commonly continued for about a month after treatment onset. The management of facial nerve paralysis in the setting of otitis media is controversial, but at very least a myringotomy with PE tube placement and antibiotic therapy is recommended. While others will perform upfront cortical mastoidectomy.

The management of mastoiditis with subperiosteal abscess is also somewhat controversial. At least tympanostomy tube placement with IV antibiotics is warranted, needle drainage of the subperiosteal abscess can be attempted. I generally prefer to perform upfront tympanostomy tube placement and abscess drainage with cortical mastoidectomy in most patients.

Provided the patient is medically and neurologically stable, up-front tympanostomy tube placement and cortical mastoidectomy is generally recommended in cases of otomastoiditis with suppurative labyrinthitis, otogenic meningitis, or an intracranial infection. In cases of septic lateral sinus thrombosis consult with your attending and the infectious disease team to determine if anticoagulation should be used. Generally it's considered for more extensive or propagating clot. In most cases mastoidectomy with or without sigmoid sinus decompression is favored. However thrombectomy has fallen out of favor for lateral sinus thrombosis. Concomitant use of steroid therapy can be considered in cases of facial nerve paralysis or sensory neural hearing loss in the setting of suppurative labyrinthitis or meningitis or in cases with intracranial abscess and significant surrounding vasogenic edema. Referrals to neurosurgery, neurology, and infectious disease may be considered depending upon disease presentation and extent.

Speaker 3:

And can you tell us about the disposition and followup for these patients?

Dr. Matthew Carlson:

Patients with uncomplicated acute otitis media can generally be managed on an outpatient basis with oral antibiotic therapy or topical eardrops if a perforation or ear tubes are present. Patients may follow up if symptoms are persistent beyond the course of medical therapy. Patients with mastoiditis or complications of otomastoiditis are most commonly admitted to the hospital and their hospital course is dictated by the underlying condition.

Speaker 3:

So that concludes our episode on acute otitis media and mastoiditis with complications. Thank you for joining us and thank you, Dr. Carlson.