Nelson Abx 2016:
- Ceftriaxone (50 mg/kg/j) + clindamycine (40 mg/kg/j en 3 doses) IV
- Adolescent (risque de Pseudomonas et Hib): cefepime (150 mg/kg/j en 3 doses) et clindamycine (40 mg/kg/jen 3 doses) .

In Brief

Mastoiditis

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Author Disclosure

Dr Bunik has disclosed no financial relationships relevant to this article. This commentary does not contain a discussion of an unapproved/investigative use of a commercial product/device.

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Acute mastoiditis in children includes infection of the temporal bone associated with otitis media of less than 3 weeks' duration. Even with adequate availability of and treatment with antibiotics, mastoiditis can evolve quickly and cause cranial complications, with periosteal abscess being the most common. The mechanism of spread to mastoid air cells is by direct erosion of bone or through the mastoid emissary veins. Impaired air cell drainage in this context causes mastoiditis. Incidence is low and varies, depending on geographic areas and the rate of treated bacterial otitis media. It is most common in children younger than 2 years.

Clinical presentation most predictive of mastoiditis includes symptoms of ear pain, fever, and signs of postauricular swelling, tenderness, and erythema. A fluctuant mass can cause anterior displacement of the auricle. Duration of symptoms, before diagnosis and treatment, averages 10 days. More than 80% of children have a bulging or perforated tympanic membrane by otoscopic visualization.

Diagnosis is made by recognizing the clinical constellation above along with a radiologic evaluation most commonly by computed tomography but also by magnetic resonance imaging. Some common radiologic findings are the loss of definition of the bony septae that define the mastoid air cells along with soft tissue swelling. Pediatric patients most often have laboratory evidence on complete blood cell count of an elevated white blood cell count with an increase in immature neutrophils (a left shift).

The most common bacterial cause remains *Streptococcus pneumoniae*, even in the postpneumococcal conjugate vaccine era. Other organisms include *Staphylococcus aureus, Pseudomonas aeruginosa, Streptococcus pyogenes,* and *Haemophilus influenzae.*

Treatment usually includes both systemic antibiotics and surgical drainage. In terms of antibiotics, first choice for those without a history of chronic otitis should be intravenous ceftriaxone plus clindamycin, pending culture. More than 50% of children have been taking antibiotics, usually for otitis, at the time of admission. If the child has had a history of recurrent otitis media then ceftazidime, cefepime, or piperacillin-tazobactam should replace ceftriaxone for added *Pseudomonas* coverage. Cultures obtained perioperatively from the middle ear or mastoid should continue to guide antibiotic therapy during the hospitalization. Surgical treatment is usually required and ranges from myringotomy to more extensive surgery. Recently, more conservative management, consisting of retroauricular puncture and aspiration, has been studied as an alternative to traditional mastoidectomy. Preliminary results demonstrate that the retroauricular puncture has the advantage of a shorter hospital stay than with mastoidectomy.

Complications of mastoiditis occur in approximately 17% of cases at the time of presentation and include conductive hearing loss, facial palsy, and intracranial complications, such as sinus thrombosis, subdural and epidural abscesses, and meningitis.

Comments: Although there is a constellation of symptoms and physical findings commonly found in mastoiditis, there is a lack of consensus of the criteria. The incidence of mastoiditis has decreased with improved availability and use of antibiotics. Of note, the introduction of the pneumococcal 7-valent vaccine has not resulted in a further decrease in incidence, although the sample sizes of this study were small. As mentioned by Dr Bunik, *S pneumoniae* remains the most common organism in acute disease, whereas *Pseudomonas* is the most common pathogen in

chronic infections. Intracranial imaging by computed tomography or magnetic resonance imaging has been suggested in patients with neurologic signs, continued fever after 2 to 3 days of treatment, symptoms of vomiting, or lethargy. If magnetic resonance imaging is available, this modality is preferred because of higher sensitivity, less invasiveness, and no radiation. The decision of whether to operate has been evolving with more recent evidence. Immediate surgery is needed if intracranial complications are apparent. Most common surgical approaches have included mastoidectomy and tympanostomy tube placement. A new surgical strategy of retroauricular puncture with a tympanostomy tube has been proposed and in a small study demonstrated equal cure rates but a shorter hospital length of stay when compared with mastoidectomy. Clinicians must remain alert to the diagnosis of mastoiditis and initiate appropriate antibiotic administration with consultation with an otolaryngologist.

Janet Serwint, MD
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