Acute Otitis Externa Pain Can Be Severe, but Relief Can Be Had in the ED

BY JAMES R. ROBERTS, MD

The pain from acute otitis externa will bring patients to your ED rather quickly. The onset can be fast and the pain excruciating. It is not usually life-threatening, but emergency physicians should still be aware of the issues surrounding acute otitis externa and how to approach it in the ED. This syndrome has multiple causes, but is usually caused by a common bacterial infection.

Acute Otitis Externa: An Update
Schaefer P, Baugh RF
Am Fam Physician 2012;86(11):1055

This article was written for family physicians, but the issues and discussions are relevant to emergency clinicians. Otitis externa, often known as swimmer’s ear, involves diffuse infection and inflammation of the external canal, which may extend to the pinna or the tympanic membrane. This infection is usually a superficial skin or soft tissue infection, but it can occur on rare occasions, particularly in the elderly diabetic, deeply invade the surrounding soft tissue and the temporal bone, a condition known as malignant (necrotizing) otitis externa. Except for various skin disorders, fungus, and allergic reactions, acute otitis externa is essentially an infection caused by bacteria. The infection is often polymicrobial, but the two most common offenders are Pseudomonas aeruginosa and Staphylococcus aureus (occasionally MSRA).

One of the most common predisposing factors is swimming, especially in fresh water, hence the term swimmer’s ear. Numerous factors predispose patients to acute otitis externa, including various types of anatomic abnormalities such as canal obstruction and dermatologic conditions such as eczema, psoriasis, and seborrhea. Tumors can also mimic it. Some measures can prevent the condition if it is caused by swimming, such as using ear plugs, employing a hair dryer to evaporate the water from the ear canal after swimming, and avoiding manipulation of the ear canal. It has also been suggested that a few drops of acetic acid 2% antiseptic solution (Vosol) can be used two to three times a day for four to five days after water exposure. The effectiveness of these interventions has never been rigorously studied, and patients have difficulty complying with the regimen.

Acute otitis externa is easily diagnosed by signs and symptoms of canal inflammation. Maximum symptoms develop quickly, usually over 24-48 hours. Pain can be excruciating, and the degree correlates with the severity of the condition. Patients are generally afebrile, and a temperature higher than 101°F suggests extension beyond the canal or another diagnosis. Other symptoms include itching, ear fullness, hearing loss, or jaw pain. Canal inflammation is reproduced by pain from pressing on the tragus or pulling the pinna of the ear. (See photos.) Physical examination should include these mechanical evaluations as well as otoscopic visualization of the ear canal. The tympanic membrane should be intact. Malignant otitis externa should be suspected in older patients with diabetes or other types of immunocompromise, particularly in the presence of purulent otorrhea and severe pain. Malignant otitis is a medical emergency, essentially an infection that started in the ear canal but now has progressed to the surrounding soft tissue and bone. It is also associated with lymphadenopathy, fever, and facial nerve or other cranial nerve palsies.

The basic treatment for uncomplicated acute otitis externa is topical antimicrobials, with or without steroids. Topical therapy is highly effective first-line therapy for localized acute otitis externa. A Cochrane review did not find any meaningful differences in clinical outcomes based on class of drug (antibiotic vs. antiseptic), use of a quinolone v. nonquinolone, or for monotherapy v. combination drugs with or without a steroid. (Cochrane Database Syst Rev 2010;[1]:CD004740.)

The most commonly used topical preparations are aminoglycosides, neomycin/polymyxin B, quinolones, and acetic acid. A glucocorticoid addition is available for all preparations. The benefit of one agent over another has not been proven, although acetic acid alone is generally not used for an active infection. Topicals that include a corticosteroid produce a slightly more rapid waning of symptoms, but it is best to avoid topicals with neomycin because they are well known to produce a contact dermatitis. (See photo.) The most commonly used topicals are quinolones, but they are expensive without insurance or coupons and can cost $250-$300 for a bottle.

It is tempting in skin infections to give oral antibiotics, but do not routinely prescribe them. They have some adverse effects, can generate resistant organisms, and seem to be associated with recurrence. They are indicated, however, if the pinna or tissues beyond the canal is involved. Cultures are generally not obtained from the ear canal unless debridement is attempted (warm water irrigation is best). Cultures are not usually recommended. This infection is most often due to Pseudomonas, Staphylococcus, or mixed bacterial flora.
advise the patient to have the liquid instilled by another person. When the canal is markedly edematous, it may be difficult for the topicals to reach the entire area. Under these circumstances, placing a cotton wick permits antibiotic drops to reach the inner portion of the auditory canal.

The pain of acute otitis externa can be severe and even debilitating. NSAIDs or acetaminophen will help, but opioids for a few days should be administered to those severely affected. Instilling a topical anesthetic into the canal for prolonged pain relief is of no proven value and generally not suggested.

Acute otitis externa can be associated with copious material in the ear canal, and the American Academy of Otolaryngology recommends removing this debris before applying topical antibiotics, but no randomized trials have examined this particular procedure. It is generally not done in the ED, and can be very painful and often not tolerated by the patient. But consider removing debris in the ED if it is significant. Patients can be discharged for follow-up in two to three days. It is generally suggested that topicals be used for seven to 10 days.

Comment: This is not your most exciting case, but the patient with acute otitis externa will be grateful for your intervention. There is a paucity of high-quality trials evaluating various interventions for this condition. The Cochrane database systematic review from 2010 is a good assessment of a number of randomized controlled trials. (Cochrane Database Syst Rev 2010;1:CD004740.) It concluded that topical interventions did not appear to influence the outcome significantly, but suggested that acetic acid or steroids alone not be used.

A nice review of clinical efficacy of a variety of treatments can be found in BMJ, (2003;327(7425):1201; http://bit.ly/2G3QkwA.) This study evaluated randomized controlled trials available as of 2003 and concluded that symptoms lasted for about eight days in most patients and that antibiotic topical preparations with steroids produced the best results. The number of days until a cure was slightly lower in the antibiotic with steroids group. Corticosteroids alone or acetic acid alone were associated with the lowest cure rates. Acetic acid is an effective prophylaxis for swimmer’s ear, but there seems to be no rationale for its use as a topical in someone with acute otitis externa.

Removing debris from the external ear canal is often recommended but rarely done in the ED. It is painful and of theoretical but no real proven value. It is nearly impossible to get good analgesia of the canal. If debris removal is attempted or a wick is to be placed, first fill the entire canal with liquid cocaine (4% or preferably 10%). Keep the affected ear upright for 20-30 minutes before wick insertion, and use irrigation with warm water (preferred) or suction. Otolaryngologists can clear the canal under a microscope, which is probably the best way to remove debris.

It is advised that systemic antibiotics not be initially prescribed for acute otitis externa if only the ear canal is involved, but topicals deliver high antibiotic concentrations to the affected area compared with systemic antibiotics. Choosing the right topical is a somewhat complex issue, but there are a few FDA-approved ones. My interpretation of the literature is that acetic acid alone should not be used for active acute otitis externa, but it can be used with a glucocorticoid. Antibiotics with steroids appear to have the best cure rate, but there is no significant difference between preparations. Quinolones are expensive, and they (with or without steroids) are commonly used although there appears to be no better cure rate between them and non-quinolone antibiotics. Quinolones (ofloxacin and ciprofloxacin) provide excellent coverage against Pseudomonas and Staphylococcus aureus. Ciprofloxacin with dexamethasone (Ciprodex) appears to give good cure rates.

Ear drops can be very expensive, so advise the patient to check the internet for coupons. Polymyxin-neomycin-hydrocortisone suspension (Cortisporin) is the least expensive topical (about $100), but I generally do not prescribe it because the neomycin often produces contact dermatitis when it drips out of the ear. It’s probably best not to use an aminoglycoside because of the concern for ototoxicity. The benefit of adding glucocorticoids to topical antibiotics seems to be minimal. I have not seen it commented on to any great extent, but I generally suggest a dry cotton ball be placed in the ear after the individual has been lying down for 20 minutes. This keeps the ear drops from flowing out when the patient becomes upright. Stress to the patient that he should not allow water into the ear while showering, and he should use a cotton ball covered with ointment to prevent this.

### Topical Medications FDA Approved for Acute Otitis Externa

<table>
<thead>
<tr>
<th>Name</th>
<th>Bottle Size</th>
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<tbody>
<tr>
<td>Acetic acid otic (generic)</td>
<td>15 ml</td>
</tr>
<tr>
<td>Acetasol HC (generic)</td>
<td>10 ml</td>
</tr>
<tr>
<td>Cipro HC (trade)</td>
<td>10 ml</td>
</tr>
<tr>
<td>Ciprodex (trade)</td>
<td>7.5 ml</td>
</tr>
<tr>
<td>Cortisporin otic (trade)</td>
<td>10 ml</td>
</tr>
<tr>
<td>Floxin Otic (trade)</td>
<td>5 ml</td>
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<tr>
<td>Ofipril</td>
<td>1 ml</td>
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1. No topical preparation has shown clear benefit.
2. Acetic acid alone is not used for acute otitis externa, but can be used for prophylaxis after swimming.
3. There are currently no generic fluoroquinolone topicals. May cost up to $300 per bottle without insurance.

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**Compressing the tragus or pulling on the pinna will produce pain with otitis externa.**

**The debris in the ear canal can be seen in this more advanced form of otitis externa. Only topical antibiotic solutions are required. Systemic antibiotics are only needed if the pinna or other soft tissues beyond the canal are involved.**

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**INFOCUS**

**Otitis Externa**

Continued from previous page
Patients should be counseled about not putting devices in the ear canal to evacuate cerumen. The ear canal is generally self-cleaning, and many patients I have seen with acute otitis externa have tried to remove wax by a variety of methods. One report concluded that the use of cotton tip applicators was a leading cause of acute otitis externa. (Int J Pediatr Otorhinolaryngol 2004;68[4]:433.) Cerumen is actually desired because it produces a slightly acidic milieu that prohibits bacterial growth. Removing cerumen often precipitates an infection.

Patients generally experience reasonable improvement of symptoms in 48 hours, and referral to an otolaryngologist is not always required. It’s reasonable to have them see their primary care physician in three to four days if not improving rapidly.

Necrotizing otitis externa is rather uncommon, but is a potentially fatal complication of acute bacterial otitis externa. Patients should be treated with antipseudomonal antibiotics intravenously; be admitted to the hospital, and be referred to an otolaryngologist. I am not exactly sure how one can prove necrotizing otitis, but look for adenopathy, fever, and cranial nerve involvement. It is reported that the sedimentation rate is very high in this condition. Advanced cases will show progression to the temporal bone, probably best seen with a CT scan, but evidence of bone involvement can be delayed.Suspicion and evaluation for malignant otitis should be referred to ENT.

Occasionally a patient will present with hearing loss and will be found to have cerumen completely occluding the canal. This wax is generally removed easily by irrigation (often multiple times) with warm water, but it is desirable to add antimicrobial ear drops for a few days after the procedure. I have seen a number of patients present with significant pain who have had wax removed or tried to remove it themselves. Cerumen is protective of the ear and should be left alone unless it’s occluding the membrane.

It may be difficult to visualize the ear canal and tympanic membrane fully in a patient with acute otitis externa because of the pain. Be certain the tympanic membrane is intact before administering topical drops. Ofloxacin and ciprofloxacin/dexamethasone (Ciproflox) are approved and can be used if the TM is not intact or cannot be totally visualized. It is interesting that the FDA has recently approved a 6% otic solution of ciprofloxacin (Otiprio) designed for single-dose treatment of acute otitis externa. This preparation is effective against Pseudomonas and Staphylococcus and appears to have a good cure rate. It is supplied in a single-use vial containing 1 mL of 6% ciprofloxacin suspension. The one time use of these antibiotic drops is interesting, but the cost is $304 for one milliliter. (Drugs.com; http://bit.ly/2Qgy9Pb.)

My preferred topical for acute otitis externa is a quinolone with a steroid. Ofloxacin and ciprofloxacin are available with and without steroids. Added steroids are only minimally helpful, and your patients will be appreciative of a more rapid cure. Follow-up in 48-72 hours with a primary physician is not always necessary if there is rapid improvement in an otherwise straightforward case. Referral to an ENT is appropriate in severe cases, when malignant otitis is suspected, and for those not cured quickly (perhaps it is fungal or even a neoplasm).

An article from the American Academy of Otolaryngology outlines current clinical practice guidelines for acute otitis externa. (Otolaryngol Head Neck Surg 2014;150[1 Suppl]:S1.)

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Learning Objectives for This Month’s CME Activity: After participating in this CME activity, readers should be better able to diagnose and treat acute otitis externa.