

Otitis externa

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Otitis externa is a common presenting condition in general practice. The term covers a spectrum of inflammatory disorders of the external ear canal, ranging from the mildly irritating to the life-threatening, and which may be due to bacterial, fungal, allergic or simple physical and irritant stimuli.

In this article, some common features in the aetiology and management are considered first, before focussing on some different examples of otitis externa.

Normal physiology of the ear canal

- The skin of the external ear canal is unique in the manner in which the skin migrates from medial to lateral, carrying desquamated keratin and cerumen naturally out of the canal. Were it not for this mechanism, our ear canals would fill with desquamated skin and wax.
- In the cartilaginous portion of the canal, there are modified sebaceous and sweat glands which secrete cerumen, a chemically-complex compound which covers and impregnates the stratum corneum and acts as a barrier to delay the penetration of various substances including water, as well as micro-organisms, into the underlying epithelium.
- Cerumen is rich in lysozyme and other microbicidal enzymes, as well as being acidic and water-resistant. Removal of this protective coating is one of the chief predisposing factors in otitis externa.

Predisposing factors for otitis externa

These are common to many types of otitis externa. In many cases there are no obvious causes, but known predisposing factors include:

- Assiduous wax removal from the ear canals;
- Local trauma from cotton buds and other instruments such as hairclips, and fingernails;
- Aural exostoses ('surfer's ear') may stop the natural self-cleaning mechanism of the ear, as well as trapping water in the medial canal after swimming or washing hair;
- Frequent swimming ('swimmer's ear'), which washes the cerumen from the canals, causes maceration of the canal skin and may result in the introduction of microorganisms such as *Pseudomonas aeruginosa* to the ear;
- Tropical climates ('tropical ear');
- Diabetes and other disorders causing immunosuppression;
- Local irritants (such as hair dyes, some wax-softening drops, topical medications such as neomycin, as well as the preservatives and carriers in some topical medications);
- Systemic dermatological pathology (such as psoriasis, atopic dermatitis, seborrhoea).

Mainstays of management

- *Local ear toilet:*
 - Pouring topical medication into an ear canal full of desquamated skin, wax and the products of infection is not particularly effective.
 - Syringing has acquired something of a bad name, but gentle syringing is an old and effective way to clear the canal of many types of debris, and in many situations is the only available way of removing debris from an ear canal.
 - The canal should ideally be dried after syringing, either by dry mopping or by the instillation of some alcohol drops if there is no raw

surface or perforation (e.g. 70% ethanol). Dry mopping can be achieved using a wisp of cotton wool wound around the end of a wax probe (such as a Jobson-Horne probe), under adequate view using a headlight or equivalent.

- Needless to say, if the patient complains of pain during syringing it should be discontinued.
- If dizziness arises during gentle syringing, it is likely to be caused by the caloric effect on the labyrinth by water which is not at body temperature.
- Aural suction under microscopy or even through a suitable otoscope is probably somewhat safer, and the first choice if suitable equipment and skills are available.
- *Swabs for microbiology* – this may provide useful information, especially if a patient is not responding to initial treatment.
- *Topical corticosteroids and antibiotic/steroid preparations* (see below)
- *Topical astringent agents* (see below)
- *Ear canal wicks* (ideally Pope Otowicks, made of Merocel sponge, or simple ribbon gauze) when oedematous or very inflamed.
- *Systemic antibiotics in selected cases*
- *Prevention of recurrences:*
 - Avoidance of cotton buds and other instrumentation in the ear canals.
 - Water protection (ear plugs, swimming caps) while swimming and showering.
 - Astringent drops after swimming and washing hair.
 - Prompt attention at any sign of a recurrence.

Medications used in the treatment of otitis externa

Topical astringent drops

- Acetic acid 2%, in isopropyl alcohol or 70% ethanol
- Acetic acid 2%, hydrocortisone 1% in isopropyl alcohol or 70% ethanol
- 50:50 white vinegar and isopropyl alcohol
- Aluminium acetate 8% ear drops.

The first three are useful in prevention of recurrences, especially when swimming-induced, by drying and acidifying the canal skin. Two to three drops are inserted into each ear canal after leaving the water. Acetic acid is very active against pseudomonas.

Aluminium acetate drops are useful also in the treatment of acute otitis externa.

Antimicrobial-steroid drops

- Framycetin/Dexamethasone ear drops (Sofradex)
- Polymyxin B/Neomycin/Dexamethasone eye drops (Maxitrol) (used now instead of Colymycin S Otic drops, which are no longer available).

Both are useful in the management of acute otitis externa. Maxitrol is active against *Pseudomonas* and Sofradex less frequently so nowadays. Long-term use in chronic otitis externa is inadvisable because of the risk of developing skin sensitivity and also antibiotic resistance.

- Ciprofloxacin/Hydrocortisone drops (Ciproxin HC). Useful in the management of documented pseudomonas infections, as well as having no known risk of ototoxicity in ears with tympanic membrane perforations. Inappropriate use and over-use is strongly discouraged because of the concern of quinolone resistance increasing in the pseudomonas population.
- Clioquinol/Flumetasone (Locorten Vioform). Clioquinol has both antibacterial and antifungal properties, and is useful in milder cases of bacterial and fungal otitis externa.
- Gramicidin/Neomycin/Nystatin/Triamcinolone drops (Kenacomb)

may be useful in fungal otitis externa.

- Other antifungal drops (e.g. Miconazole lotion [Dakarin]).

Corticosteroid lotions

- Mometasone furoate (Elocon lotion)
- Betamethasone valerate (Betnovate lotion).

These preparations can be helpful in short courses to help settle a chronic otitis externa, once the initial infection has been controlled.

Corticosteroid creams and ointments

- Hydrocortisone cream (e.g. Locoid)
- Betamethasone cream (e.g. Betnovate)
- Betamethasone with clioquinol (e.g. Betnovate-C).

Useful in short courses, applied around inflamed conchal bowls and in the entrance of the ear canal.

Systemic antibiotics

- Used mainly when there is spread of infection outside the ear canal.
- Choice depends on the organism suspected, but commonly anti-staphylococcal agents for cellulitis arising from furunculosis, and anti-pseudomonal agents such as quinolones in severe pseudomonal infections.

Examples of otitis externa

1. Acute diffuse otitis externa
2. Acute localised otitis externa, e.g. furuncle of the ear
3. Chronic otitis externa
4. Necrotising ('malignant') otitis externa.

1. Acute diffuse otitis externa

- This painful condition is seen most frequently in hot, humid weather and in swimmers, though local trauma, such as from cotton buds, is another common trigger.
- The causative organism may be bacterial (commonly *Pseudomonas Aeruginosa* or *Staph Aureus*) or fungal (*Aspergillus* sp, which can also lead to tympanic membrane perforation).

Clinical features

- Itching, leading to increasing pain, which may be extreme, local tenderness, watery discharge, blocked sensation due to a conductive hearing loss, redness and oedema of the canal skin, sometimes completely blocking the lumen of the canal.
- Fungal infection is suggested if there is visible mycelial or sporangial debris, which may look like wet newspaper. Black debris in a very painful ear canal suggests the presence of *Aspergillus niger*.

Management

- Treatment is by local ear toilet by gentle mopping, gentle syringing or preferably by aural suction, topical antibiotic/steroid drops (e.g. Polymyxin B – Dexamethasone [Maxitrol] or Framycetin – Dexamethasone [Sofradex] drops), or in early cases, astringent drops such as Aluminium acetate 10%, Acetic Acid - alcohol (e.g. Vosol).
- If fungal material is seen, choose a drop with an antifungal agent, such as Kenacomb. Aural toilet is important to remove the bulk of the fungal material.
- If oedema is marked, packing the ear canal with a Merocel Otowick or some 0.5cm ribbon gauze will often help the topical medication to reach the deep canal and any secretions to reach the outside. The wick can be removed after one to two days as the oedema reduces.
- Analgesics as required.
- Systemic antibiotics are indicated mainly if there is spread of infection outside the ear canal.

Prevention

- Avoidance of local trauma.
- The use of astringent ear drops, such as Vosol, or 2% acetic acid, 1% hydrocortisone in SVR, after swimming and washing hair.
- The use of earplugs, either manufactured plugs or silicone putty, or BlueTac, when swimming or showering.
- If recurrent in surfers with aural exostoses, surgical removal of the

exostoses can prevent further problems.

2. Acute furuncle of the ear canal

Infections may develop in the hair follicles in the lateral part of the ear canal, as with hair follicles elsewhere, and are often due to *Staph. Aureus*.

Clinical features

- Itching, leading to pain and local tenderness. There is usually a visible localised abscess.
- Unless the rest of the canal becomes inflamed secondarily, the tympanic membrane is usually visible and looks normal.

Management

- Gentle aural toilet, insert an ear wick to apply some pressure to the furuncle, instil an astringent drop or an antibiotic-steroid drop with anti-staphylococcal activity.
- Analgesics as required.
- If there is any sign of spreading oedema or cellulitis, add an anti-staphylococcal antibiotic such as Flucloxacillin or Amoxil/Clavulanic acid.
- In most cases the furuncle discharges spontaneously. If spontaneous discharge has not occurred within two days, consider incision and drainage under local anaesthesia.

3. Chronic eczematous otitis externa

- These patients often have a vicious cycle of chronic skin irritation, the use of cotton buds to relieve itching, this leading to the removal of any normal wax which forms and to further abrasion and irritation.
- In many, the chronic use of antibiotic ear drops has led to sensitisation of the skin to the constituents of the drops, and discontinuation of these medications is often an important part of the management.

Clinical features

- Itching and irritation of the ear canals.
- The skin is often dry and scaly around the conchal bowl, and may

have a creamy exudate in the ear canal itself, which can lead to a blocked sensation in the ear due to a conductive hearing loss.

Management

- Local ear toilet by gentle syringing followed by dry mopping, or by suction if available. Astringent ear drops such as 2% acetic acid and 1% hydrocortisone in alcohol or Vosol are often all that is required, together with the use of corticosteroid creams such as around the conchal bowl if affected.
- Counselling is important to avoid predisposing factors such as cotton bud use.
- If the problem persists, a short course of stronger steroid preparations such as Mometasone or Betamethasone scalp lotion (two to three drops daily into the ear canal for a week) may achieve a rapid resolution.
- In patients who have recalcitrant problems despite intensive treatment, it is often helpful to take stock, stop the antibiotic drops which may have become the problem, clean the ear canal thoroughly and fill it with a pure steroid cream (e.g. Betamethasone) for a week, following the removal of which the ear canal has not infrequently settled down completely.
- In occasional cases in which the canal lumen has been almost obliterated by thickening and fibrosis of the canal skin, surgical meatoplasty can be helpful.

4. Necrotising ('Malignant') otitis externa

This unusual but formerly often fatal condition is seen mainly in elderly diabetic patients, and is due to a spreading infection due to *Pseudomonas Aeruginosa*, starting in the floor of the ear canal and leading to a fulminating osteomyelitis of the skull base, with facial and other cranial nerve palsies and death if untreated.

Clinical features

- Pain and aural discharge initially, later leading to the symptoms of the skull base involvement, cranial nerve palsies etc.
- Granulation tissue is usually visible in the floor of the ear canal.
- Swabs grow *pseudomonas*.

Management

- Rigorous diabetic control, if necessary as an inpatient.
- Local ear toilet, otowick, anti-pseudomonal/steroid drops.
- Long courses of systemic anti-pseudomonal antibiotics, the end-point of treatment being decided on the basis of scintigraphic evidence of complete resolution. This used to mean long periods of admission for intravenous medication, but now most patients are treated as out-patients on oral quinolones, once initial diabetic control and response to treatment is confirmed.
- Surgical debridement used to be the rule and is now seldom necessary.
- If pseudomonal drug resistance becomes a worsening problem as seems likely, we may revert to the old days in terms of treatment and outcomes of this condition. This is an important reason not to inappropriately use these agents in other cases.

Otitis externa: when to refer

- Unresolving acute or chronic otitis externa despite initial management
- Severe pain
- Failure to toilet the debris from the canal using the means available
- Recurrent infections
- When there is a need for surgical management of predisposing factors such as aural exostoses
- If there is a suspicion of necrotising otitis externa.

Competing interests

None declared