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## Practice

### ABC of Ear, Nose and Throat, 6th Edition

# Discharge from the Ear

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## Overview

Discharge from the ear is an unpleasant symptom that in some communities can result in stigmatisation

Before an accurate diagnosis can be made, the discharge should be cleared by microsuction or dry-mopping

Topical antibiotic/steroid drops are most effective in treating otitis externa

Discharge due to chronic otitis media occurs in the presence of a defect in the eardrum

Cholesteatoma can be associated with serious complications

Discharge from the ear is an unpleasant symptom that reflects infection, inflammation, trauma or rarely neoplasm of the external or middle ear (Box 1). Persistent ear discharge and its associated odour can result in stigmatisation and social isolation in some communities (Figure 1).

### **Causes of Discharging Ears**

Otitis externa (acute and chronic)

Otitis media (acute and chronic)

Trauma to the temporal bone

Neoplasms of the ear (very rare)

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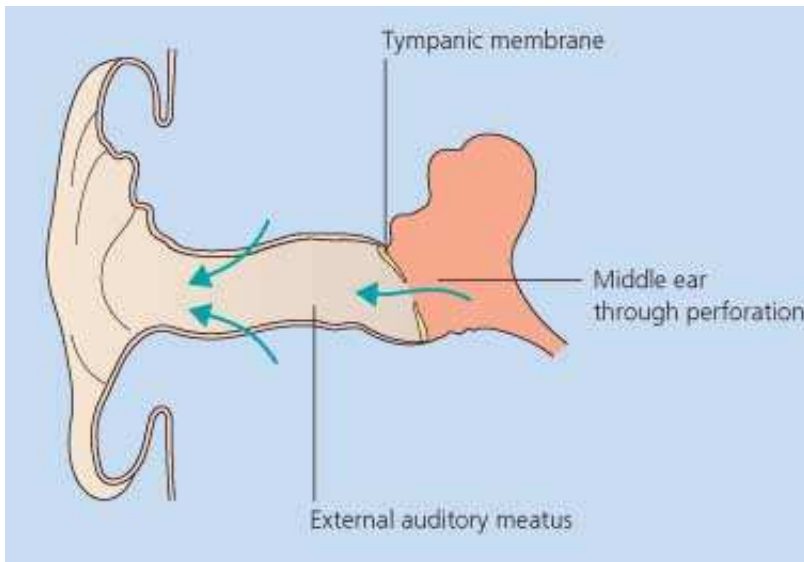
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Figure 1

Profuse ear discharge.

The discharge itself arises either from the skin of the external ear canal, the surface of the tympanic membrane (eardrum), or the lining of the middle ear cleft (Figure 2). Discharge from the middle ear cleft often is profuse and mucoid in nature, because of the mucosal lining of the middle ear. In the clinical management of a discharging ear, accurate diagnosis is important and is facilitated by thorough history taking and examination. ENT specialists have the advantage of the use of the operating microscope available in the outpatient setting (Figure 3). Using the microscope in combination with suction equipment allows the specialist to aspirate discharge and closely inspect the ear canal and tympanic membrane. In the primary care setting discharge can be removed by so-called dry-mopping using cotton wool on a suitable applicator.



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Figure 2

Where does discharge come from?



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Figure 3

The use of the operating microscope and suction in a patient with a discharging ear.

## Topical Medications for Discharging Ears

The most useful medications for the treatment of ear discharge are delivered

topically, usually in drop form, but also as ointments and creams. They contain a combination of antibiotics, antifungals, antiseptics, solvents and steroids. In this method, the ear to be treated is placed uppermost and drops instilled using the so-called displacement method. In this way pressure on the tragal cartilage forces the drops down the ear canal and, in the presence of a perforated eardrum, into the middle ear (Figure 4). The use of ear drops in the presence of a perforated eardrum is controversial, and centres around the use of preparations containing aminoglycoside antibiotics such as neomycin, gentamicin and framycetin. These antibiotics are particularly effective in discharging ears because they act against the Gram negative microorganisms such as *Pseudomonas aeruginosa* that are most commonly found in these conditions. Aminoglycosides given systemically are toxic to both the auditory and vestibular parts of the inner ear. In the UK, the “data sheets” for topical aminoglycoside preparations contraindicate their use in the presence of a perforated eardrum. Nevertheless British otologists widely use aminoglycoside ear drops in treating discharging ears. The risk to the inner ear from aminoglycoside ear drops is very small indeed. Current ENT-UK guidance (Philips et al. 2007) permits their use for actively discharging ears for up to 2 weeks at a time. Other antibiotics such as quinolones (ciprofloxacin and ofloxacin) are not ototoxic and are often effective. The overuse of quinolones, however, can theoretically lead to the development of bacteria resistant to these antibiotics.



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Figure 4

Administration of ear drops with tragal pressure.

## Chronic Otitis Externa

A number of factors predispose to the development of chronic otitis externa (Box 2). Normally the ear canal is kept clean by the process of epithelial migration. Desquamated skin from the deep ear canal is carried outwards where it mixes with cerumen produced by glands and is discharged from the ear canal as ear wax. Any factor that disturbs this natural process makes the development of chronic otitis externa more likely. Keen swimmers and surfers can develop bony overgrowth (exostoses) of the ear canal, which predispose to chronic infection (Figure 5). Trauma from the use of cotton buds, hearing aids or other foreign bodies can damage the ear canal skin and provide a potential portal for the entry of bacteria. Skin conditions such as seborrhoeic eczema and psoriasis result in over-accumulation of keratin debris and inflammation that can become infected. The overuse of antibiotic ear drops can result in chronic fungal otitis externa (Figure 6).

### Factors in the Development of Chronic Otitis Externa

Narrow ear canal including exostoses

Chronic skin conditions

Occlusion of the canal by a hearing aid or ear plug

Frequent swimming

Trauma to the ear canal including cotton buds

Wax (cerumen) impaction

Overuse of ear drops

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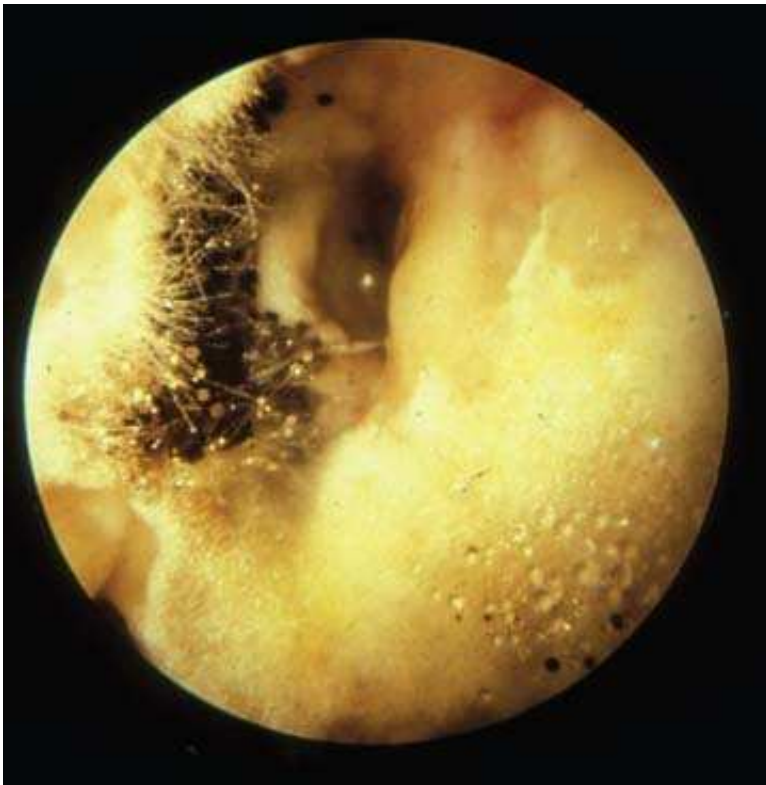


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Figure 5

Exostoses of the external auditory canal.



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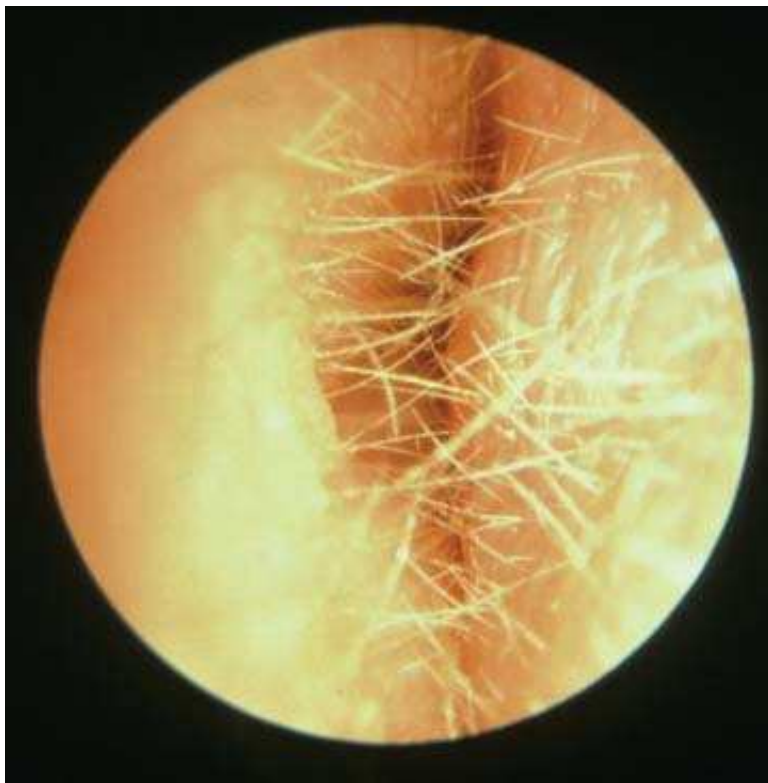
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Figure 6

Hyphae of *Aspergillus niger* seen in fungal otitis externa.

In addition to discharge, the principle symptom of chronic otitis externa is irritation and itching of the ear canal, which may provoke further trauma. Deafness is not prominent, but can occur. Examination reveals discharge in an ear canal that is often narrowed by swelling of the canal skin (Figure 7). Owing to swelling of the ear canal skin and debris in the ear canal, the tympanic membrane can frequently not be seen. A variant of chronic otitis externa is granular myringitis, with areas of granulation tissue on the surface of the drum itself.



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Figure 7

Swelling of the ear canal skin in otitis externa.

Preventative treatment includes avoidance of cotton buds, and water precautions when hair-washing and swimming. An effective method of preventing water ingress into the ear when hair-washing, is to use a plug of cotton wool moistened with paraffin jelly. Patients may need to avoid using a hearing aid until the condition has

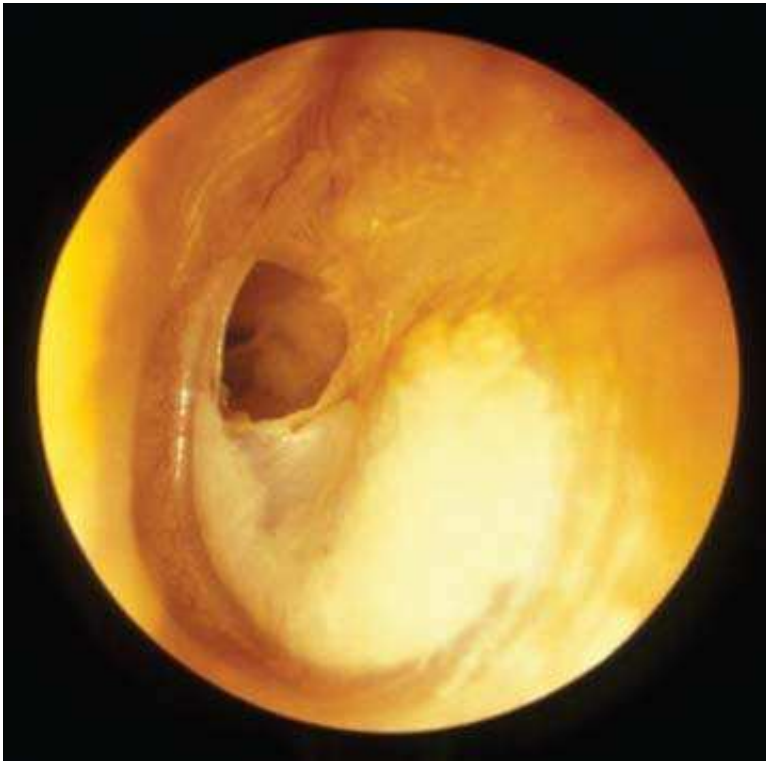


resolved. In the established case, treatment consists of removal of debris, followed by topical medications. Ideally debris should be removed under microscopic control. If a microscope is not available, dry-mopping with cotton wool or gentle syringing can be used. In resistant cases, a bacteriological swab to investigate the possibility of fungal infection is worthwhile. Topical steroid and antibiotic preparations can be used in drop or spray form. Fungal otitis externa usually responds to treatment with clotrimazole ear drops.

In some patients, surgical treatment may be helpful. Usually this would involve a meatoplasty procedure to widen the ear canal, particularly in the presence of canal exostoses. If a conventional hearing aid cannot be tolerated because of otitis externa then a bone-anchored hearing aid (BAHA) is an alternative.

## Chronic Otitis Media

Chronic otitis media implies a non-intact tympanic membrane allowing discharge to pass from the middle ear to the ear canal. Perforations of the tympanic membrane are described according to their anatomical location. An important landmark is the annulus of the tympanic membrane, which is the ligamentous circumferential part of the drum that inserts into the temporal bone in all but its superior part. Central perforations are in the pars tensa and are surrounded by some residual tympanic membrane or at least the annulus. The location of central perforations is denoted by their relationship to the handle of the malleus. These defects can hence be termed as anterior (Figure 8), posterior, inferior or subtotal. A subtotal perforation is a large perforation surrounded by a completely intact annulus (Figure 9). Marginal perforations usually occur in the posterior part of the tympanic membrane with loss of the annulus and exposure of the bony canal wall (Figure 10). Attic perforations occur in the superior pars flaccida part of the drum. Tympanic membrane perforations usually result from infections, but can sometimes be a result of trauma.



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Figure 8

Anterior tympanic membrane perforation.



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Figure 9

Subtotal tympanic membrane perforation.



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Figure 10

Marginal tympanic membrane perforation.

The symptoms of chronic otitis media are aural discharge and deafness. Deafness occurs with loss of the normal sound-conducting mechanism of the tympanic membrane and middle ear ossicles. Chronic otitis media is often associated with erosion of the incus or stapes.

Treatment of discharge in chronic otitis media consists of removal of debris from the ear canal by suction or dry-mopping, followed by topical medications.

### **Cholesteatoma**

Attic and marginal perforations can be associated with cholesteatoma (Figure 11). Cholesteatoma is the abnormal accumulation of skin, squamous epithelium, within the middle ear cleft and mastoid air cells. It has the appearance of a “sac” that communicates with the ear canal (Figure 12) and is usually pearly white.

Cholesteatoma has a tendency to progressively enlarge and can erode the bony structures of the middle and inner ear. Cholesteatoma can also spread outside the middle ear to the brain causing life-threatening complications. For this reason ears with cholesteatoma have traditionally been termed “unsafe”. The complications of cholesteatoma can be grouped into intratemporal and intracranial (Table 1).

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Table 1

### Complications of cholesteatoma

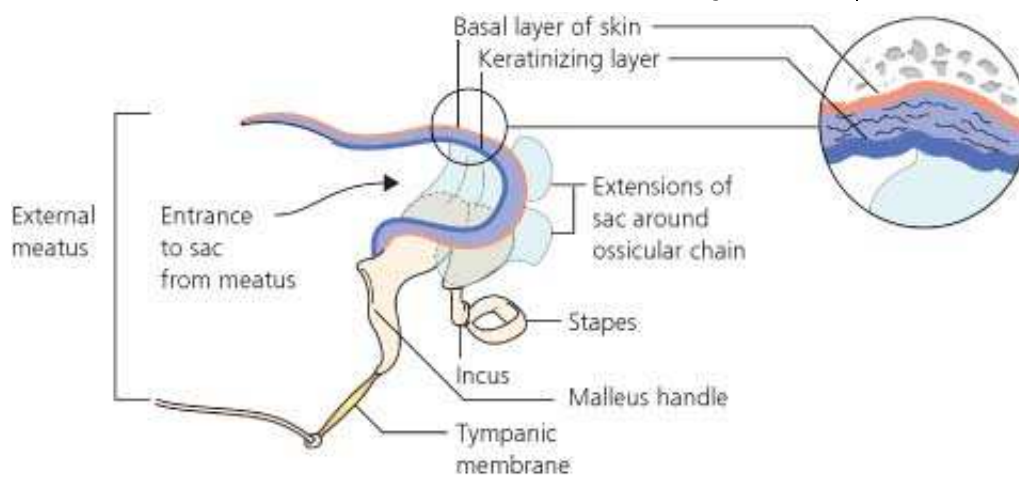


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Figure 11

Attic perforation with cholesteatoma.



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Figure 12

Cholesteatoma sac in attic.

## Surgery for Chronic Otitis Media

Definitive treatment of discharging ears with chronic otitis media is usually surgical. These operations have a number of objectives which include stopping discharge, improving hearing and rendering an ear “waterproof” to allow bathing and swimming. In addition ears with cholesteatoma should be made “safe”.

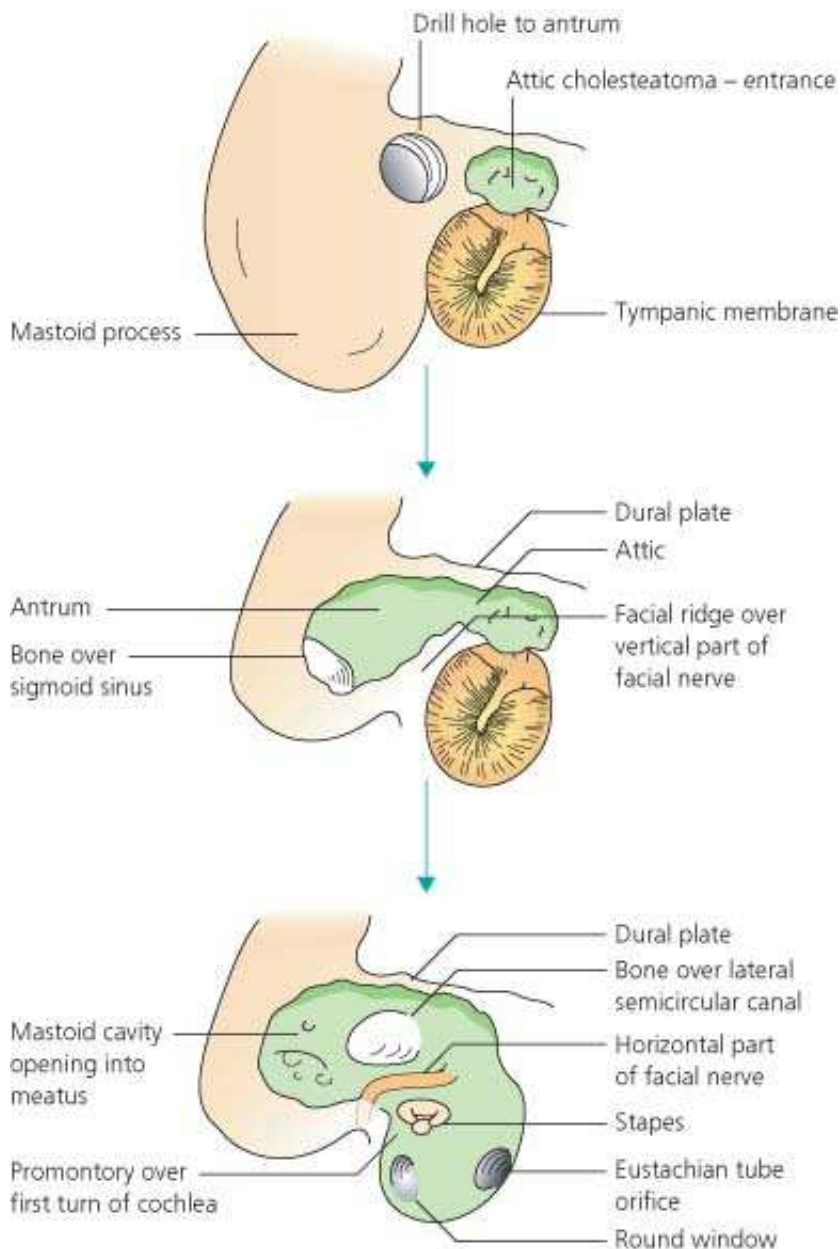
Treatment of a tympanic membrane perforation without cholesteatoma usually consists of a repair of the tympanic membrane or “myringoplasty”. The most used graft material is fascia taken from over the temporalis muscle through an incision behind or in front of the pinna. In addition, if the middle ear ossicles are damaged by disease an ossiculoplasty can be undertaken to improve hearing.

For ears with cholesteatoma, more extensive surgery is required. The traditional approach is to remove diseased and infected bone and to fashion a smooth, wide cavity opening into a widened external ear canal. As the ear heals the cavity becomes lined with skin and eventually becomes self cleaning through epithelial migration. Operations are named according to the extent of bone removal, which is dictated by the extent of disease.

Radical mastoidectomy is one extreme of this kind of operation. The mastoid antrum is opened with a drill and air cells opened to create a large hemispherical cavity. The incus and malleus are removed leaving only the stapes. Care is taken not to injure



the facial nerve, lateral semicircular canal, sigmoid sinus and dura (Figure 13). Lesser operations include atticotomy, atticoantrostomy and modified radical mastoidectomy. In these operations parts of the ossicular chain and tympanic membrane may be retained or reconstructed. The surgically widened ear canal also facilitates microscopic cleaning, which in some patients has to be undertaken on a regular basis.



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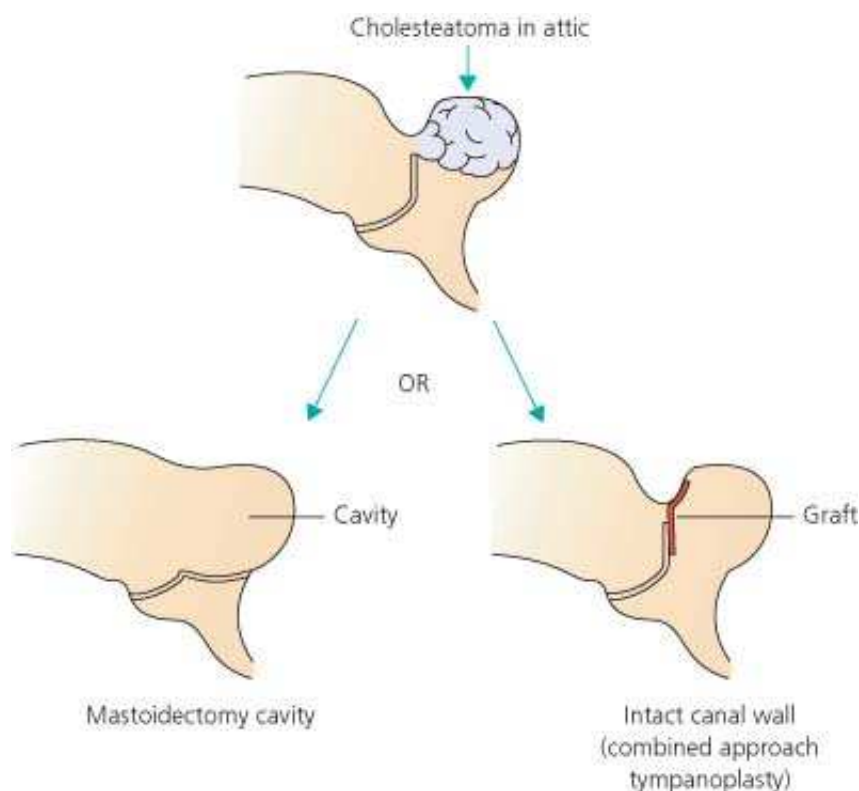
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Figure 13

Right radical mastoidectomy.

“Open” mastoidectomy cavities are liable to repeated infections and discharge, with

swimming being avoided. Alternative operations called “combined approach tympanoplasty” aim to retain the posterior ear canal wall and hence avoid an open cavity. These so-called “closed” operations are usually undertaken in two or more stages, with the second stage mainly performed to check for the presence of residual or recurrent cholesteatoma (Figure 14). As an open cavity is avoided, swimming is possible.



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Figure 14

Two strategies for treating cholesteatoma.

## Further Reading

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2. Phillips JS, Yung MW, Burton MJ, Swan IR. Evidence review and ENT-UK consensus report for the use of aminoglycoside-containing ear drops in the presence of an open middle ear. *Clin Otolaryngol* 2007;32:330–6.

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