

### **Ear Flushing**

The most important first step in the management of any case of otitis is to properly clean the external ear canal and flush the middle ear cavity if the tympanum is absent or diseased. The procedure should be performed at the initial visit after obtaining cytologic specimens and possibly a specimen for culture from the diseased ear. In mild cases of otitis, ear flushing may be performed with gentle restraint, but in most cases the ears are painful enough to warrant heavy sedation with propofol (Diprivan 1%, Zeneca) or ketamine and diazepam. In more severe cases of otitis externa and in most cases of otitis media, general anesthesia is necessary. In some of the most severe cases, in which the canals are extremely inflamed and swollen, systemic and topical therapy is initiated first, and a 3- to 14-day delay is necessary before cleaning. This allows the canal to open and the tympanic membrane to be visualized more easily. The flushing solution used depends on the degree of inflammation, the characteristics of the discharge, and the status of the tympanic membrane. Commonly used solutions are dioctyl sodium sulfosuccinate (DSS), CLEARx ear cleansing solution (DVM Pharmaceuticals), or squalane (Cerumene, Evsco Pharmaceuticals) for waxy discharges; and Epi-Otic (Allerderm/Virbac), tromethamine ethylenediaminetetraacetic (Tris EDTA), 0.05% to 0.2% chlorhexidine solutions, and 2.5% acetic acid (50:50 vinegar:water) or saline for purulent discharges. All of these solutions except saline have the potential to damage exposed middle-ear structures, although the caseous or purulent material being removed from the middle ear probably poses a greater threat. When the tympanum is known to be absent, a gentle solution such as 2.5% acetic acid or saline should be used if possible. Unfortunately many times these solutions alone do not remove the debris, and a more caustic cleaning solution must be used. At the end of the procedure it is important to flush the caustic solution out of the canal and middle ear completely with water or saline to minimize any damage the solution may cause.

### **In-Office Ear Flushing**

A bulb syringe (Daval, Inc.) or a No. 3 to No. 12 Fr red rubber feeding tube attached to a 6- to 12-ml syringe is an excellent and relatively safe flushing apparatus for in-office use. The wide end of the tube must be trimmed to accommodate the syringe hub. The tip is then cut off the other end so the final length of the tube is 4 to 6 inches or one to two times the length of the ear canal. Both straight and curved dull buck ear curettes (Edward Week & Co) can be used to remove large pieces of wax and debris. Once the horizontal canal has been cleared, it is usually easier to assess the status of the tympanic membrane. In many cases of chronic otitis, the tympanum is still difficult to visualize because the canal is stenotic secondary to lichenification and fibrosis. If the tympanum cannot be visualized, its status can be assessed indirectly by observing the curette catching on any bony prominence, the tube tip disappearing from view, the use of excessive tubing and fluid in the canal, or the act of the patient swallowing after infusion of fluid. Any of these observations would indicate a false middle ear or imperforate tympanum. If the tympanum is visually intact but this is a case of chronic otitis (>3 months' duration), a myringotomy using a dull buck curette may be necessary. A culture should always be taken from the middle ear if there is any evidence of fluid behind the membrane or if there is membrane

opacity and fibrosis. The hazards of deep ear cleaning include inadvertent rupture of the tympanum, vestibular dysfunction, auditory dysfunction, contact irritant and allergy, and introduction of other pathogens. The most common hazard is the potential rupture of the tympanic membrane. A normal tympanum is difficult to rupture; therefore, if the membrane ruptures with gentle manipulation, it was probably weakened and diseased. The occurrence of vestibular auditory dysfunction is unpredictable. In

the dog it is uncommon, usually mild, and most of the time lasts only a few hours to a couple of days. It occurs more frequently in the cat, and the signs are usually more pronounced and may be permanent. To avoid contact irritation, a gentle solution should be used whenever possible, or more caustic solutions must be rinsed out extremely well with water or saline. New pathogens can also be introduced into an already inflamed ear via unsterilized ear-cleaning equipment. Bulb syringes and feeding tubes should not be used for multiple patients. It is difficult to completely sterilize the rubber; therefore resistant strains of *Pseudomonas*, *Escherichia coli*, and *Proteus* can propagate.