Ear cleaning: its importance and what owners need to understand

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Categories : RVNs

Date : March 1, 2011

Sue Paterson MA, VetMB, DVD, DipECVD, MRCVS, explains that although ear cleaning may be simple for practice staff, it's not that clear cut

DOGS' ear canals are lined by skin and, therefore, they behave in many of the same ways that skin does on the rest of their bodies.

Skin cells move through well-defined growth stages, differentiation and then desquamation as they transit upwards from the stratum basale – the base of the epidermis – and to the top of the stratum corneum, from where they are desquamated or shed.

When this process occurs on the dog's body, skin cells are shed into the environment. However, as it occurs in the ear canal, cellular debris can potentially build up – which, in combination with wax and hair, could cause a blockage in the canal lumen. Epithelial migration is the mechanism that prevents this occurring in normal ears. It is well-recognised that cells within the walls of the canal migrate from the umbo, which is the point of greatest depression on the tympanic membrane, outwards to the walls and then upward to the external auditory meatus. This natural escalator carries canine tissue (such as dead skin cells, dried secretions and foreign material) up and out of the canal.

Epithelial migration is present in normal dogs and is essential for the natural cleaning of canine ears, but it becomes less effective as dogs age and is lost when the ear becomes diseased (Figure 1). Failure of epithelial migration can also be seen as idiopathic disease in some dogs. In these cases,

cleaning is not an adjunct to therapy but the therapy itself.

Where regular cleaning is not undertaken, or where it is ineffective, wax and debris build up at the base of the canal to form a large concretion referred to as a ceruminolith (Figure 2). This causes the dog discomfort and leads to head shaking, often secondary infection and, ultimately, damage to the tympanic membrane, as well as possible perforation and otitis media.

Ear cleaners, therefore, form an integral part of the therapy of any ear disease. In fact, there is a strong argument to suggest that every treatment protocol for otitis in dogs should include a cleaner. However, as well as prescribing an ear cleaner, it is also important to prescribe the right one and to ensure that an owner knows how to use it.

Owners rarely have any veterinary knowledge and often things that seem second nature to trained veterinary staff are less obvious to pet owners. The author has seen clients who had not realised that their dog's ear cleaner had to be used before the ear drops and not after. Although it seems a stupid mistake to make, if an owner is not given specific instructions as to how to use the products, and the practice's drug label doesn't tell them, they may use them in an inappropriate way and jeopardise therapy success.

During a busy clinic, it is all too easy to thrust a bag of ear cleaner and ear drops at owners seconds before smiling and proffering them the bill. It is, perhaps, not until the owners get home and open the bag that they realise they have two bottles of medication. One (the ear drops) may say apply six-to-eight drops daily, the other (the ear cleaner) may say apply to both ears once daily. So, as an owner with a first dog that has never had ear disease before, how does he or she use the cleaner? Does he or she apply six-to-eight drops of cleaner as well, and does it need to be wiped out afterwards?

At what time of the day is the cleaner applied in relation to the drops? If it's 7pm and the surgery is closed, they will do what they think is right, which may or may not be successful. It takes only a few minutes extra to explain how to use the cleaner and how important it is. Typically, instructions might say "flood the ear with cleaning solution, gently massage the canal for a minute and remove excess cleaner on to a wad of cotton wool".

Better still, you could demonstrate how to clean the ear in the consult or take the dog into the nurse consult room to clean the ear in front of owners and apply the first set of drops, so you can be confident they know how to use their drugs.

Problems

Organic debris within the ear canal can influence therapy success in a variety of ways. If a large amount of wax (cerumen) is within the ear, it can prevent adequate penetration of the active ingredients within the ear drop. This is particularly important in breeds that have a tendency to

produce excessive wax, such as spaniels, and in infections with pathogens, such as the yeast *Malassezia pachydermatis*. In these circumstances, cleaners with good ceruminolytic activity are essential.

Ceruminolytic cleaners remove wax and work in one of two ways (see Table 1 for some common ear cleaners). True ceruminolytic cleaners cause lysis of desquamated surface epithelial cells to break up the discharge. Cleaners containing such drugs as dioctyl sodium, calcium succinate or carbamide peroxide are a potent ceruminolytic. Although they are nice to use and clean the ear well, they can be an irritant in sensitive ears and have ototoxic potential. Lubricant cleaners tend to be much gentler as they loosen wax, rather than disrupt it, but they do leave a residue in the canal. Components of cleaners that produce lubricant ceruminolytic effects include squalene, propylene glycol triethanolamine polypeptide oleate condensate and mineral and vegetable oils. Squalene is unique in being one of the few ceruminolytics that has been shown in clinical trials to be safe in dogs' middle ears.

Purulent exudates inhibit the efficacy of many different drugs. The antibiotic polymyxin is particularly sensitive to pus and, although it is an excellent antibacterial, it is rendered useless unless the ear is cleaned thoroughly before use.

Similarly, aminoglycosides work best when the ear is clean and, although they are not as sensitive to the effects of pus as other antibiotics, fluoroquinolones also perform better after cleaning. Fusidic acid is one of the few drugs present in drops that will work in a dirty environment.

Gentle action

When infection is present, the ear canal can be swollen and ulcerated so a cleaner should, in addition to possessing antibacterial effects, be gentle on the friable ear canal. In many of these cases, especially in gramnegative infections where the ear drum is damaged, cleaners should also be selected with a high degree of middle-ear safety if possible (Figure 3).

Ceruminolytic cleaners should be used with care in these situations. Acids such as lactic acid or salicyclic acid added to cleaners can confer antibacterial activity; often because this produces a cleaning solution with a low pH. In other cases, such as acetic acid, it is the product itself that has an antipathogenic effect, rather than the change in acidity it produces.

Alcohol, particularly isopropyl alcohol, and parachlorometaxylenol are also thought to provide antibacterial action when added to ear cleaners. EDTA-tris is a unique product that has been launched in the UK in the past few years. It is recognised as being safe in the middle ear and has excellent activity against gram-negative bacteria. It is aqueous, so it helps to break up the slime produced by such bacteria as *Pseudomonas* and mucus produced from the mucoperiosteum of the middle ear in response to inflammation. This ability is key in allowing adequate antibiotic penetration into the discharge.

Continuation

Even after the pet’s ear problem has resolved, ear cleaning should continue. It may take some time for epithelial migration to return to normal and, in some cases, the damage has been so severe it never does. Selection of an ear cleaner depends on the previous disease and the dog’s lifestyle.

Where bacterial infection has been present, an antibacterial cleaner is probably most suitable for long-term therapy. In waxy ears, a ceruminolytic cleaner is important (Figure 4), and where epithelial migration is poor due to the age of the dog, cleaning with a gentle lubricant ceruminolytic is probably most pertinent.

Final thoughts

In summary, ear cleaners are a vital part of otitis therapy. The veterinary nurse can play an important part in advising clients on the type of ear cleaner that is suitable for their pets’ ear condition – and how to use it to gain maximum benefits.