

Update on ear infections: treatment and owner compliance

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ABSTRACT

Otitis – specifically, otitis externa – is a common problem in dogs, but less so in cats. Ear infections are among the 10 most frequent reasons for dogs to be presented, affecting 20% (*Veterinary Practice News*, 2015). This article discusses the aetiology of otitis externa, latest treatment developments and how to improve owner compliance.

Otitis externa (OE) is inflammation of the epithelium of the external ear canal. It commonly causes scratching, head shaking, odour, aural discharge, erythema, swelling of the pinna or ear canal and an alteration in ear carriage.

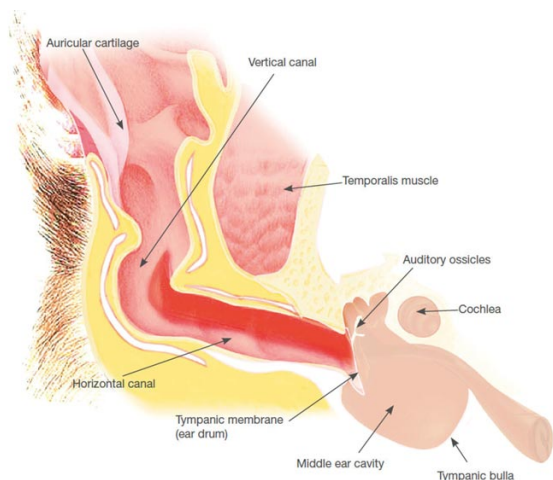


Figure 1. Normal ear. Image: © Dechra Veterinary Products.

Certain dog breeds – for example, poodles and spaniels – are recognised as being predisposed to

ear disease.

The external ear has two parts – the pinna and the external acoustic meatus. The external acoustic meatus is the canal that runs from the base of the pinna to the tympanic membrane (TM), or ear drum. It has a vertical and a horizontal auditory canal, which are lined with a modified skin that has very few hair follicles, and many ceruminous glands that secrete wax or cerumen to protect the ear canal (**Figure 1**).

OE often results when a change in the normal environment of the ear canal causes the glands lining the canal to enlarge and produce excessive secretions. When the tissue becomes inflamed, the ceruminous and sebaceous glands produce an excess amount of secretions. This will build up, cause epithelial cells to slough and the ear will become pruritic.

If OE remains untreated and progresses to the chronic stage, it can permanently alter the size of the ear canal. The epithelium will become thickened, fibrous, ulcerated and eventually stenotic from excessive scar tissue (**Figure 2**).

Aetiology

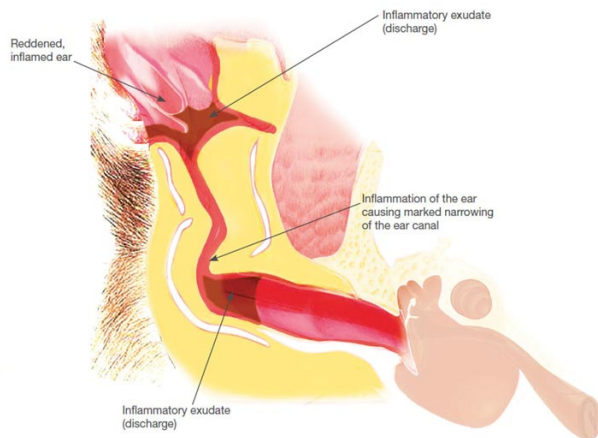


Figure 2. Otitis externa ear. Image: © Dechra Veterinary Products.

Otitis is usually due to an underlying cause, which can be divided into three groups:

- Predisposing – for example, excessive moisture, systemic disease and obstructive auricular disease as a result of poor conformation.
- Primary, such as foreign bodies, parasites (*Otodectes cynotis*; **Figure 3**), keratinisation disorders, endocrine disorders, neoplasia or polyps (cats) and allergic skin disease.
- Perpetuating or secondary, which exacerbates and prevents the resolution of the disease despite treatment of the primary cause. For example, otitis media, pathological changes or microbial infection such as *Pseudomonas*, *Staphylococcus intermedius*, *Malassezia*

pachydermatis, Proteus vulgaris and Escherichia coli.

Aural examination

Patients presented with aural problems should be examined by a veterinary surgeon to establish the underlying cause of the disease before a treatment plan is set in place. A full clinical history must be taken to help determine triggers for OE. Bilateral ear disease with pruritus is indicative of atopic dermatitis and systemic signs can be present in cases of underlying hypothyroidism or hyperadrenocorticism.



Figure 3. *Otodectes cynotis*. Image: © Bayer Animal Health.

Aural examination must include assessment of the pinnae, palpation of the vertical canal to assess pain and pliability of the cartilage, and examination of the ear canal and TM. An otoscopic examination is performed to investigate the otitis and check the condition of the vertical and horizontal ear canals, as well as to look at the appearance and integrity of the TM.

If only one ear appears to be involved, the healthy ear otoscopically must be examined first, as there may be discharge and/or erythema deep in the horizontal canal, invisible externally. If both ears appear affected on examination of the pinnae, perform otoscopy on the less severely affected ear first. A new cone must be used for the second ear to avoid cross-contamination.

Cytology

Aural discharge may be a useful indicator of otitis presence, but it is rarely possible to tell the cause

of the otitis from the type of discharge. Bacterial or yeast infections are usually responsible for the visible discharge. With bacterial infections, discharges are generally yellow or green and pruritic, whereas yeast infections tend to produce a greasy, dark brownish, waxy discharge.

Typically, ear mites cause a black, crumbly discharge; *Malassezia* a brown, waxy exudate; and *Pseudomonas* is classically associated with a grey to yellow/green mucoid discharge, but these are not mutually exclusive. The colour, consistency and smell of the otic discharge can give an indication of what to expect, but this is no substitute for cytology (**Figure 4**).



Figure 4. Ear wax/discharge. Image: © Dechra Veterinary Products.

With increasing concerns over antibacterial resistance in both human and veterinary fields, the use of topical antibiotics for the treatment of OE, without a specific diagnosis, should be avoided. Ear cytology is a quick and easy diagnostic and management tool, which should be used to indicate the infection type.

Identification of an underlying cause of infection is vital – especially where the otitis is recurrent or chronic. The presence of organisms can be determined by microscopic examination of smears. Knowledge of the likely antimicrobial susceptibility can be used to select appropriate antimicrobials (Beco et al, 2013).

Cytology technique

To take a cytology sample, using a cotton bud, remove a sample of otic discharge from the vertical canal and roll it on to several microscope slides, avoiding disrupting the cell components. One slide can be examined unstained and the other sample stained with an in-house stain, such as Diff-Quik.

Normal ears will only have squames and perhaps small numbers of cocci on microscopy, while neutrophils and bacteria suggest inflammation. *Malassezia* yeasts are generally easily recognised as peanut shaped and should be present in small numbers only in the normal ear. If bacteria are

seen, cocci are most likely to be staphylococci or *Streptococcus* and rods may be *Pseudomonas* or *Proteus* (Angus, 2004).

***Pseudomonas* otitis**

Pseudomonas is a secondary bacteria not normally found in a healthy ear canal. These cases often have a history of recurrent otitis. Bacterial resistance is a major problem with *Pseudomonas* otitis. Cytological sampling will demonstrate rods and neutrophils, and culture and sensitivity should always be performed. Clients should be informed treatment of *Pseudomonas* otitis is difficult, time consuming and expensive. Referral is often necessary in chronic presentations (**Figure 5**).

Staphylococcal otitis

Staphylococcal otitis occurs due to overgrowth of normal bacteria overgrowth within the ear canal. Discharge is ceruminous purulent and the ear canal is usually erythematous and swollen. Investigation should begin with cytology and treatment will include the use of a ceruminolytic cleaner and first line antibiotics (**Figure 6**).

***Malassezia* otitis**

Malassezia otitis is an overgrowth of a normal yeast organism and is a secondary factor in OE. Discharge is generally thick and ceruminous, and the ear canals can be erythematous. Ceruminous gland hyperplasia may be present in recurrent or severe cases. Treatment includes effective ear cleaning with a squalene-based product to remove waxy discharge and a topical ear medication with an anti-yeast drug, providing the TM is intact (**Figure 7**).

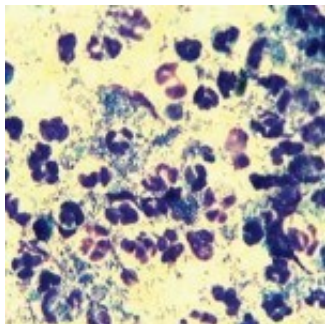


Figure 5. *Pseudomonas* infection on cytology from an ear. Image: Susan Paterson.

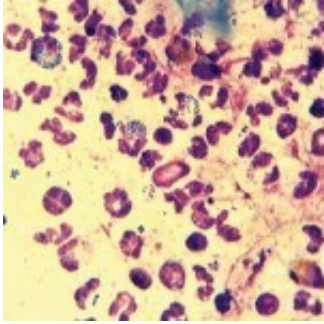


Figure 6. Staphylococcal infection from an ear. Image: Susan Paterson.

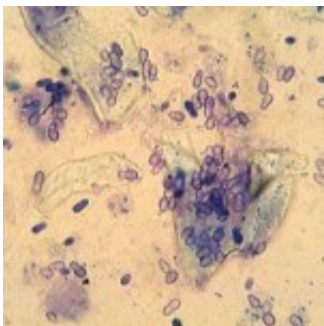


Figure 7. *Malassezia* and *Staphylococcus* on cytology from an ear. Image: Susan Paterson.

Treatment

Treatment will depend on the cytological findings, thus determining the choice of ear cleaners and topical medications, according to the infection isolated. Severe cases may require ear flushing under general anaesthesia.

The decision to treat chronic cases medically or surgically should be made on an individual basis, taking into account client and animal compliance, severity of disease, cost and underlying cause.

Ear cleaning is an essential part of treatment. Many otic antibiotic preparations work best when the ear is clean as some are less effective when purulent material is present.

In addition, if the ear is not clean, other topical medication cannot penetrate to the deeper parts of the ear and where the discharge is thick, appropriate ceruminolytic cleaners should be prescribed to break up the wax to allow antibiotics to permeate the discharge.

Side effects from ear cleaning are uncommon, but Horner's syndrome or deafness can occasionally occur (more likely in cats than dogs) and owners should be warned of these possibilities. Owners can continue to clean their pet's ears at home, but it is necessary to know whether the TM is intact because many cleaners are unsafe to use in the middle ear and some can cause further irritation to inflamed ears.

Home ear cleaning can help remove dirt and cerumen that can prevent medications from reaching inflamed areas, as well as get rid of allergens and microorganisms that may contribute to the inflammation or infection. *Malassezia* overgrowth can also occur after regular cleaning with some products due to the high humidity created within the ear canal.

Owner compliance



Figure 8. Ear wipe. Image: © Dechra Veterinary Products.

It's often hard to ensure an owner has fully understood what is required and has been sufficiently engaged to ensure compliance with any recommended treatment. Poor treatment compliance by owners is the most challenging aspect of managing OE cases (Kadence International, 2013).

To increase owner compliance, it is helpful to demonstrate ear cleaning and explain the cleaning process step by step:

- Hold the ear cleaning product over the ear opening and gently squeeze the prescribed amount of solution into the ear. Avoid squeezing the bottle too hard as a powerful stream into the ear can cause discomfort or irritate it. Avoid touching the insides of the ear with the tip of the bottle as this could lead to contamination of the bottle and risk perpetuating an infection into the ear. Alternatively, 1ml syringes can

- be used to administer the product to prevent contamination and provide the correct dose.
- Use the dog's own ear to close the ear opening and massage the base of the ear to distribute all of the liquid around inside the ear.
 - Let go of the ear and allow the dog to shake out the excess ear wash.
 - Finally, wipe a piece of cotton wool around the entrance to the ear canal and throughout the superficial portion of the ear canal (**Figure 8**).

Following this demonstration, it is also beneficial to get the dog owner to repeat the ear cleaning technique on the other ear under supervision.

Synthetic ear wicks can be useful if owners find drops difficult, the dog will not tolerate drops and where culture and sensitivity shows no appropriate licensed product.

Made of polyvinyl alcohol, they are characterised by a hard, compact structure, are placed in the animal's ear canals under sedation or anaesthesia and soaked with a solution usually containing antibiotics with or without ethylenediaminetetraacetic acid-tris and/or glucocorticoids.

The expansion produces a structure that adapts to the contours of the ear canal, slowly releasing the medications.

Latest developments

The most recent development in relation to ear infections is the release of a first line, two dose canine OE product. It is a triple combination otic gel (antibiotic, antifungal and anti-inflammatory) formulated as a single intraauricular application for the affected ear, with a repeated dose one week later.

This is likely to have a significant effect on compliance as it can be consultation led. The product is indicated for the treatment of OE in dogs associated with susceptible strains of bacteria (*Staphylococcus pseudintermedius*) and yeast (*M pachydermatis*).

Conclusion

Management of otitis can be complicated by underlying diseases and perpetuating factors, such as infections or otitis media. Cytology is an invaluable tool and should be performed on every presenting case to target the specific infection and decrease antibiotic use.

The veterinary nurse can play a vital role in promoting and undertaking cytology in practice. Client education and effective communication are critical in treating OE and the key to improving compliance relies on the quality of the interaction between the client and veterinary team.

- Reviewed by Hannah Barfoot.

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