

Veterinarian Lecture III - Diagnosis and Management of Chronic Otitis

Animals with chronic otitis can be frustrating to treat, both for veterinarians and pet owners. There are many factors which contribute to ear infection occurrence and chronicity, but it is helpful to consider that causes for otitis can be divided into primary, predisposing, and perpetuating factors.

Primary causes for otitis are conditions that, by themselves, can create otitis, and include **hypersensitivity reactions** (atopy, food allergy, or contact hypersensitivity to a topical medication), which cause ear canal inflammation, **ear ectoparasites** such as *Otodectes*, *Demodex*, and ear ticks, **ear canal masses or foreign bodies**, which cause canal irritation and obstruct normal epithelial migration, **endocrine diseases** such as hyperadrenocorticism and hypothyroidism, which can alter the ear canal lining and secretion of cerumen as well as suppress the immune system, **immune mediated diseases** such as pemphigus, systemic lupus, drug reactions, and erythema multiforme, which cause ear canal ulceration and inflammation, and **keratinization disorders**, such as sebaceous adenitis, primary seborrhea, and ichthyosis, which alter the epithelial lining and cerumen production in the ear canal.

Predisposing causes for otitis, are factors that, by themselves, cannot create otitis, but work in conjunction with primary causes or perpetuating factors to create an environment conducive to clinical disease. These include narrow ear canals such as in Shar peis, pendulous ear pinnae such as in cocker spaniels, increased ear canal moisture, as in dogs that swim frequently, and trauma or iatrogenic irritation of ear canals from use of Q tips or over cleaning with irritating topical products. Although predisposing causes are a factor in recurrent otitis, it is the opinion of myself and many dermatologists that too many cases of recurrent otitis are blamed on dogs that have floppy ears (“cocker ears”) or swim frequently, when the true underlying, often allergic, cause is being missed.

Perpetuating factors occur after the development of otitis due to a primary cause, and prevent the resolution of otitis. These include bacterial or yeast infections of the outer ear canal, otitis media (common in external ear infections lasting longer than 4-6 weeks), and ear canal fibrosis or calcification which occurs secondarily to chronic ear canal inflammation and infection. Once ear canal calcification occurs it cannot be reversed, only removed surgically, so it is important to aggressively address cases of chronic otitis before calcification occurs.

Thus when faced with a case of chronic or recurrent otitis, it is important to 1. identify and treat the primary and predisposing causes, 2. treat secondary and perpetuating ear infections, including otitis media in long standing cases, and, in my opinion an issue not frequently enough addressed, 3. flush the ears to remove accumulated pus and debris which make infections harder to resolve.

Identification of Primary Causes

An important part of identification of the primary cause of otitis is by taking a thorough history, such as age of onset of symptoms, other skin disease/pruritus suggestive of allergy, systemic signs of disease which would suggest an endocrinopathy, previous therapy and response to treatment, etc.

- Examples: Otitis in a young dog, which also has pedal pruritus suggests a primary allergic disease (remember, otitis can be the only sign of allergy!)
- Otitis in an older dog with no prior history of ear problems may be due to food allergy, endocrinopathy, or ear canal tumor.
- In a dog with chronic unilateral otitis and never any infection in the contralateral ear, consider an ear canal mass or foreign body vs. unrecognized otitis media.
- In a dog with ulcerative otitis on both ear canals and pinnae and ulcers +/- crusts elsewhere on face, feet or body, consider possible immune mediated disease.

In addition to a full history, full physical examination is necessary to identify skin lesions potentially consistent with allergy, endocrinopathy or immune mediated disease, and full otoscopic examination is necessary to identify potential ear canal masses or foreign bodies, as well as to assess degree of exudate and canal stenosis. Finally, ear swabs should be obtained to screen for ear canal parasites such as *Demodex* and *Otodectes*.

Identification and Treatment of Perpetuating Infections:

Identification of secondary infection requires ear cytology for bacteria and yeast, which should also be performed at each recheck to assess response to treatment. To perform otic cytology, a cotton swab is inserted a small distance into the ear canal to obtain exudate, the exudate is rolled onto a slide (one slide can be used for both ears, by rolling the swab longwise along each side of the slide and labeling sides right vs. left), the slide is briefly heat fixed, then stained with Diff Quik or similar stain and examined under 100X/oil immersion. Otic culture and sensitivity should be performed in chronic infections treated with multiple medications, or if rods consistent with often resistant *Pseudomonas* are identified on cytology. Treatment of otitis externa is by application of topical otic medications, continued for a week beyond normalcy. In cases of bacterial otitis, use antibiotic drops or ointments (ie. neomycin, gentamycin). To prevent development of bacterial resistance, fluoroquinolones should be reserved for cases of resistant *Pseudomonas* infection and for cases with a questionable tympanum. For cases of yeast otitis, use topical antifungal products such as clotrimazole, miconazole, thiabendazole, ketoconazole and nystatin. Use steroid containing products to reduce inflammation (pus/swelling) if needed. Many topical ear products contain a combination of products for mixed infections. For otic medications packaged in a tube, it is often easier for owners to apply the medication if it is repackaged into a dropper bottle.

Identification of otitis media is by a history of a chronic external ear infection with a duration of longer than 4-6 weeks and/or by identification of a thickened, abnormal or ruptured tympanum on otoscopic examination. An intact tympanum does not rule out otitis media. Some animals with otitis media may have symptoms such as Horner's syndrome, facial nerve paralysis, or a mild head tilt, but a more common manifestation of otitis media is a chronic ear infection which does not completely clear with topical medications, or keeps

rapidly recurring when topical medications are stopped. Other diagnostic tests which can support a diagnosis of otitis media include bulla radiographs, which can be falsely normal in up to 50% of cases, and CT scan, which is more sensitive, but usually requires referral. Treatment of bacterial otitis media is by administration of systemic antibiotics based on culture and sensitivity for a minimum of 4-6 weeks or longer. Yeast otitis media is treated by administration of oral antifungal medications (ie. ketoconazole, itraconazole or fluconazole 5-10mg/kg PO daily) for a minimum of 4 weeks. Since organisms and bacterial sensitivities can be different in the external and middle ears, bacterial culture is ideally obtained by inserting the culturette through a sterile otoscope into the middle ear, and via myringotomy if necessary. Myringotomy is also often helpful to enable flushing of exudate trapped in the middle ear, but is not essential to resolve otitis media if aggressive and appropriate systemic antibiotic therapy is used.

Flushing ear canals

Flushing infected ear canals is important to remove accumulated exudate which obstructs the canal, prevents topical medication penetration and inactivates some antibiotics, and perpetuates ear canal inflammation. If there is severe canal inflammation and stenosis, it is helpful to premedicate the dog for several days with anti-inflammatory dose of oral prednisone and oral antibiotics prior to flushing. It is important to inform the owner that there can uncommonly be complications associated with deep ear flushing, including temporary vestibular disease and deafness, but these symptoms can also be caused by letting the infection go untreated. To perform deep ear flushing, deep sedation (ie. xylazine or medetomidine) or general anesthesia is necessary. If general anesthesia is used, it is important to use a cuffed endotracheal tube to prevent flush fluid from passing through the eustachian tube and into the pharynx and trachea/lungs. Prior to flushing, it is helpful to instill a ceruminolytic cleaner (ie. Cerulytic) into the canal to loosen debris. The ear can then be flushed with a mild ear cleaner (ie. Epiotic), very dilute betadine in water or saline, or plain sterile saline or tepid water. If the tympanum is found to be ruptured, flush cleaners out with saline. Ear flushing can be performed thorough the otoscope via a 5-8 french red rubber urinary catheter trimmed to 4-5" in length or a tomcat catheter, although this latter catheter is more rigid and capable of causing more iatrogenic trauma to the ear canal. Alternatively, ear flushing can be performed via video-otoscopy, with the added benefits of increased magnification and documenting findings on video. If otitis is bilateral, separate ear flush materials should be used in each ear, to avoid cross contamination. Ear flushing may need to be repeated several times until infection is controlled. After ear flushing, the owners continue at home cleaning every 3-7 days until infection is controlled. I do not recommend daily cleaning or cleaning before topical ear medication administration, as too frequent cleaning can macerate the ear canals and dilute antibiotic preparations.

Choosing an Ear Cleaner

Ear cleaners can have multiple properties, including detergents and ceruminolytics, which help cleaning by emulsifying waxes and lipids, drying agents which help reduce moisture in the ear canal, and antimicrobial products to reduce bacterial or yeast organisms in the ear canal. Many ear cleaners offer a combination of functions.

Ceruminolytic cleaners (ie. Cerulytic) are used for ears that form large amounts of waxy exudate which needs to be dissolved. Potent ceruminolytic agents include surfactants (DSS) and detergents to emulsify waxes and lipids. Milder ceruminolytic agents include propylene glycol, glycerin, and mineral oil. Most ceruminolytics and detergents are contraindicated with a ruptured tympanum; Squalene is a milder surfactant cleanser, and may be safer if the tympanum is ruptured.

Drying agents (ie. Bur-Otic) can be used for prevention of “swimmer’s ear.” Examples of drying agents include alcohol, boric acid, benzoic acid, salicylic acid, acetic acid, aluminum acetate, sulfur, silicone dioxide. Pure drying agents are not the best choice for routine cleaning, as they do not effectively remove accumulated cerumen. Antimicrobial ingredients in ear cleaners include propylene glycol, acetic acid, salicylic acid, sulfur, aloe vera, chlorhexidene, alcohol, miconazole, ketoconazole. One or more of these ingredients are often incorporated into a combination ear cleaner.

Combination ear cleaners (ie. Epiotic) are appropriate for most dogs which need a mild ceruminolytic/mild drying formulation for routine cleaning, for prevention of cerumen accumulation and for ears which tend to be moist. Products with antimicrobial properties can also be helpful in preventing recurrent otitis.

Conclusion:

When faced with a case of chronic or recurrent otitis, it is important to 1. identify and treat the primary and predisposing causes, 2. treat secondary and perpetuating ear infections, including otitis media in long standing cases, and 3. flush the ears to remove accumulated pus and debris. If all of these elements are addressed, most cases of chronic otitis can be managed and the ear canal saved before surgical intervention is needed.