Otitis in the Dog
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Otitis is a common problem in the dog. There are multiple factors that predispose and perpetuate the problem, but there is always a primary cause. Diagnosis focuses on identifying which factors are influencing this animal’s disease process. Treatment addresses those factors to correct the problem. Preventative measures help mitigate reoccurrence and severity. Over time, the factors involved in this animal’s disease can and will change, necessitating an investigational approach if previous successful strategies no longer produce effective results.

Predisposing Factors

The normal conformation makes it a horrible drain. The epithelium is coated with a layer of cerumen to protect it against the effects of moisture and to trap debris. Material within the external canal is moved toward the external opening by epithelial migration. This conformation is further complicated by stenotic canals, heavy pendulous ears, and excessive hair at the opening or within the canal. The environment within the ear can also help primary factors initiate the disease process. Excessive moisture or heat within the canal is a problem, though the role of moisture in the canal may be over emphasized. Cerumen may be excessively produced, overwhelming the ability of epithelial migration to remove it effectively.

Primary Factors

Primary factors initiate the inflammatory disease. By far and away, the most common cause of otitis in the dog is allergies. Environmental allergies are the most common type, but food allergies can manifest as otitis. Other primary factors are trauma, such as foreign bodies, wax impaction, and inappropriate cleaning. Otic masses occur, mainly benign neoplasia or inflammatory polyps. Ceruminous adenocarcinoma is the most significant malignant neoplasm seen. Immune mediated diseases may manifest as otitis, but usually the pinnae changes will be more significant as well as characteristic lesions elsewhere on the patient. Parasites such as ear mites are rare in the dog, but are easy to identify if examined specifically. Finally, if the primary cause is not identified within these categories, consider rare conditions described in textbooks.

Perpetuating Factors

Once the ear is inflamed, a variety of factors complicate the case and require management. The first and foremost is an overgrowth of normal flora found within the canal. Yeast is the first and most common overgrowth seen, but cocci and rod bacteria overgrowths happen. Equally problematic are the progressive pathologic changes associated with inflammation. Acutely the epithelium swells and overproduces cerumen, causing stenosis and wax accumulation. More chronically, the epithelium
become hypertrophic, hyperkeratized, and folds, further complicating the conformational issues of the external canal. This **lichenification** is not very reversible and can predispose the ear to reoccurrence of the problem. If the epithelium should ulcerate and not re-epithelize, **fibrosis** occurs, paralyzing the epithelial migration necessary for normal ear health. Finally, the epithelium can undergo osseous metaplasia, calcifying. Once the ear has significant progressive pathologic changes, medical therapies are less useful and surgical solutions such as a total ear canal ablation should be considered.

**Otitis media** is commonly identified concurrent with otitis externa. In one study, 25% of dogs within three days of their first bout of otitis had a ruptured tympanum. In chronic, reoccurring otitis, this number rose to 75%. Many different thought processes exist on how this affects case outcome and therapeutic selection, with little scientific proof of any answer being found within the literature.

**Diagnosis**

There are a variety of diagnostics that can be applied to a case of otitis. **Cytology** is one of the most helpful of these to direct your anti-infective therapies and duration of therapy accurately. **Otoscopic exam** can be used to examine the external canal to the level of the tympanic membrane, but this is very hard to effectively perform in an awake patient when the canal has significant swelling and wax production. To be performed accurately, the patient should be under anesthesia and the ear cleaned thoroughly. **Video otoscopic** units greatly enhance this procedure’s effectiveness and utility, allowing documentation of findings and greater access through operative ports in the scope. **Ear mite preps** should be performed on all cases since they are inexpensive and accurate if mites are causing the problem, but understand most of them will be negative. **Culture and sensitivity** is indicated once cytology has identified a bacterial overgrowth. Performing a culture without a concurrent cytology is useless since the results of the culture cannot be accurately determined between normal flora and overgrowth. The sensitivity determined by most diagnostic laboratories reflects an expected response from systemic administration of the antibiotic, not a topical administration. Thus, this diagnostic has to be applied to the case with thought and understanding. **Biopsies** of masses and the skin can be performed to identify neoplasia, polyps, and immune mediated causes, though knowledge and understanding of normal anatomical features, such as the flaccid portion of the tympanic membrane, have to be employed. Finally **advanced imaging** such as CT scans can be helpful to evaluate the middle ear and involvement of surrounding structures prior to surgical therapies.

**Therapy**

Therapy for otitis is multimodal. **Flushing the ear** addresses the cerumen accumulation, dilutes the inflammatory mediators, and helps address moisture. Most ear flushes are a combination of chemicals that accomplish these goals. By far and away, the greatest benefit of an ear flush is the removal of wax. There are a variety of chemicals that can accomplish this, but **DSS** (docusate sodium) is the most effective as a daily flush. **Squalene** is another excellent Cerumenolytic, more effective than DSS but the oily nature of the chemical makes it unattractive for daily use. Employing it during an anesthetized deep ear cleaning is most effective. **Drying agents** such as alcohol and weak organic acids are also useful, though the amount of astringents such as alcohol has to be controlled. If the flush has enough alcohol for you to smell or cause a reaction, it is too much for inside an inflamed ear. If full strength alcohol was applied to the ear and the tympanic membrane was ruptures, permanent ablation
of the facial nerve has been seen. Finally antiseptics are available in commercial flushes, but chlorhexidine is extremely ototoxic and should never be instilled into the ear. Tris EDTA may be helpful in potentiating antibiotics such as aminoglycosides due to its ability to chelate calcium and affect the membrane pumps of bacteria such as pseudomonas.

Numerous **topical ointments** are available for the treatment of otitis. Most are combinations of steroids, antifungals, and antibiotics. This shotgun approach is valid due to the overgrowth of normal flora. If more specific therapies were applied, this may result in the overgrowth of the organisms not affected. In contrast, use of antibiotics in this fashion, selects for resistance of the bacteria. Thus, consideration of this must be used, preserving certain antibiotic classes only for use in bacterial overgrowth. The two most common classes of antibiotics in ear ointments are aminoglycosides and fluoroquinolones. The latter should only be used once pseudomonas is involved, trying to prevent resistance by using it for other types of overgrowth. While aminoglycosides have been associated with loss of hearing, this information has been derived mainly from its intravenous use in humans. I know of no study examining its effects used topically in the dog.

Two newer types of ointments have been marketed with extended durations of affects after administration. Once again, they are combinations of steroids, antifungals and antibiotics, this time florfenicol. While the compliance of these medications is enhanced, the ear is no longer being flushed regularly. This may lead to treatment failures and this antibiotic should have little effect on gram negative rods such as pseudomonas.

**Systemic medications** can also be prescribed. Short courses of **anti-inflammatory steroids** can greatly reduce the swelling and wax production. **Systemic antibiotics** should always be used in cases of bacterial overgrowth for an appropriate duration. Repeat cytology should be used to determine when the overgrowth has been resolved and antibiotic therapy can be stopped. **Pain** should be controlled with appropriate medications, such as NSAIDS. Care must be used to not prescribe NSAIDS and steroids simultaneously.

**Prevention**

In many dogs this problem is recurrent. Resolution of the inflammation and infection is obtained only for the signs to happen again. Once we have identified the interval of reoccurrence, we can begin therapies designed to lengthen this interval or prevent its reoccurrence. Managing the wax production and environment within the canal with a **regular ear flush** is the first step. Encourage the owner to routinely flush the ear, perhaps once a week, once a month, after bathing, after swimming, after grooming, or other logical intervals. If the primary cause is thought to be allergic, **management of the allergies** with any number of therapies may be effective. Consider a food trial in these patients as well.

**Surgery**

Once there are permanent pathologic changes to the ear such as fibrosis, hyperplasia, and calcification, total ear canal ablation is the treatment of choice. Unresolving, resistant bacterial infection would be another indication. In the hands of a capable surgeon, TECA is a very successful
procedure and completely resolves the problems for almost all the patients. Lateral ear canal resection can be helpful earlier in the course of the disease, but rarely results in a treatment free animal.