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In Practice/Vet Record print summary

Gp's Guide to Pseudomonas Otitis

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INTRODUCTION.

Pseudomonas is not usually isolated from normal dog's ears; it can account for up to 35% of cases of otitis externa and or media (Cole and others 1998) and is challenging to manage.

HISTORY & CLINICAL SIGNS

Dogs often present with an acute onset painful ear with a large amount of purulent exudate, one or both ears can be affected. The ear canal may be ulcerated. In chronic cases lichenification, hyperpigmentation and excoriation of the pinna may be present. Other clinical signs that may be seen or reported include:

- Head shaking
- Odour
- Head tilt
- Pain when opening the mouth or swallowing
- There may be other signs of skin disease, such as pedal pruritus.
- Vestibular signs – seen in some cases of otitis media
- Loss of hearing

A general physical examination and dermatological examination should be performed; it is important to check for any neurological deficits (head tilt, facial paralysis, nystagmus etc.) in cases where otitis media is suspected. Look for other signs of generalised skin disease.

DIAGNOSTIC TESTS

Cytology

Cytology should be performed in all cases of otitis externa. It is often better tolerated than otoscopy and will reveal rod shaped organisms and inflammatory cells. In some cases there is a mixed infection so coccoid bacteria and/or *Malassezia* may be seen but the *Pseudomonas* is the critical organism.

Otoscopy

This can be very challenging to perform in conscious patients. Often sedation or anaesthesia is required. It may be difficult to view the tympanic membrane.

Culture and sensitivity

Swabs should be sent for culture and sensitivity in all cases of *Pseudomonas* otitis. The sensitivity results may not be relevant when using topical treatments because the concentrations of drugs applied to the ear are much greater than those tested and may still be effective.

Treatment/management options

Treatment requires dedication; in some chronic cases it is not unusual for treatment to take 6 – 8 weeks with revisits every two weeks to monitor progress.

The aims of treatment are:

1) Eliminate the *Pseudomonas*

- a. Topical treatment remains the treatment of choice due to the poor blood supply to the ear canal. **However, the exception to this rule is when cases have neurological signs associated with their otitis media. In these cases, topical treatment should generally be avoided as it may exacerbate the neurological signs.**
- b. The following topical ear products are available in the U.K. and may be suitable to treat cases of *Pseudomonas* otitis:
 - i. Marbofloxacin (Aurizon®: Vetoquinol, Marbodex®: Norbrook Laboratories)
 - ii. Orbifloxacin (Posatex®: MSD)
 - iii. Gentamicin (Otomax®; MSD, Easotic®; Virbac)
 - iv. Polymixin B (Surolan®; Elanco, Aurimic: Animalcare)

None of these treatments is licensed to be used in an ear with a ruptured ear drum.

- c. Polymixin B should be effective in managing cases of *Pseudomonas* otitis, however, in the authors' experience in the U.K, success with this treatment seems to be limited.
- d. Tris-EDTA (TRizAural®; Dechra) is available as an alkaline solution. Even if culture and sensitivity indicate that a Gram-negative bacterium is resistant in vitro to a certain antibiotic, pre-treatment with Tris-EDTA may make the organism sensitive to the antibiotic in vivo. This product should be applied as a pre-treatment solution 20 to 30 minutes prior to applying topical antibiotic treatment, such as fluoroquinolones or gentamicin (Buckley and others 2013).

- e. Silver sulphadiazine (Flamazine cream®: Smith and Nephew). This product is not licensed for use in animals in the U.K. This is not ototoxic and so can be used in cases of otitis media. It is empirically suggested to mix 1.5 mls with 13.5 mls of saline, which is then mixed well to make a uniform suspension (Foster & DeBoer 1998). Apply 1-2 mls to the affected ear twice daily.
 - f. There are currently no topical products licensed to treat otitis media in the dog. Below are some suggested treatments that can be used when the tympanic membrane is ruptured. These products are off license. Clients should be warned of possible adverse effects and sign a consent form for off-label use. Regular monitoring is vital.
 - i. TrizAural pre-flush then one of the following
 - ii. Injectable enrofloxacin solution (Baytril®; Bayer 2.5%): water for injection in a 1 : 4 ratio. This is the author's preferred way to use this product. Instill 0.5-1 ml of the solution into the dog's ear twice daily.
 - iii. Flamazine® cream-suspension.
- 2) Reduce the inflammation in the ear canal
- a. Glucocorticoids are the most effective way to reduce inflammation and hyperplasia given systemically or topically. Typical oral doses for prednisolone range from 0.5-1 mg/kg once daily for a minimum of 10-14 days.
- 3) Provide analgesia
- a. Glucocorticoids are not an analgesic. Often opiate-based analgesics are used if required. E.g. Tramadol (2-5 mg/kg three times daily) or paracetamol-codeine (PARDALE-V).
- 4) Clean the ear
- This will enhance the effectiveness of the antimicrobial agents. There are many ear cleaning products on the market and most have a good antibacterial action. An ear flush under general anaesthesia is recommended in most cases of *Pseudomonas* otitis.

Challenges and considerations

- **Managing owners' expectations**

- Advise it may take at least 6 – 8 weeks to improve/resolve the problem and that if this has been a recurrent problem investigating the underlying cause (TABLE 1) will be essential to preventing relapses in the future.
- **Owner compliance**
 - Consider using a syringe to apply cleaner to the ear.
 - Always demonstrate the use of ear cleaners and drops to clients
- **Infection recurs when treatment is discontinued**
 - Usually happens when treatment is discontinued too early, always aim to treat for at least 7 – 10 days past cytological cure.
 - Primary, predisposing and perpetuating factors may not have been adequately addressed.
 - Often ear cleaning will need to be continued as maintenance therapy.
- **Follow up is vital**
 - Re-examination and cytology should be performed every 10-14 days.
- **Consider surgery when:**
 - Medical treatment fails or is not possible due to client or patient factors

Bottom line/conclusion

Pseudomonas otitis is perhaps the most challenging infection of the ear to manage. It is important that we treat these cases aggressively at first presentation and address any predisposing, primary, secondary or perpetuating factors that may be present. Topical treatment is the best way to manage cases without neurological signs. Successful management of these cases is more likely with a dedicated owner and regular re-examinations with cytology is vital.

1046 words

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TABLE 1 Predisposing, primary, secondary and perpetuating factors for otitis
Predisposing factors – these make the chance of developing otitis externa more likely by changing the environment in the ear canal, but alone will not cause otitis externa. These are explored in more detail elsewhere (Paterson 2016). Examples include:

- Conformation – e.g. pendulous ear canals, hairy ear canals, stenotic ear canals (occur naturally in some breeds such as the Shar Pei)
- Excessive moisture in the ear – as a result of swimming, excessive use of ear cleaners
- Inappropriate treatment – which may traumatise the ear canal

Primary factors – these factors can directly cause otitis externa

- Ectoparasites – *Otodectes*, demodicosis.
- Foreign bodies – grass seed
- Allergic skin disease (adverse food reaction, atopic dermatitis).
 - **Atopic dermatitis is the most common cause of otitis externa in the dog**
- Endocrinopathies - hyperadrenocorticism and hypothyroidism
- Immune-mediated disease – e.g. pemphigus foliaceus, juvenile cellulitis
- Keratinisation defects – e.g. sebaceous adenitis
- Immunosuppression – possible secondary to neoplasia or chemotherapy
- Neoplasia within the ear canal

Secondary factors – these factors contribute to or cause pathology in an abnormal ear, but will not create disease in normal ears, examples include yeast and bacterial overgrowth.

Perpetuating factors – these are the changes (anatomically or physiologically) that occur in an ear when chronic otitis is present and make it harder to manage medically. Examples include:

- Stenosis of the ear canal
- Ulceration
- Epidermal and glandular hyperplasia
- Otitis media