



**Diagnostic and Therapeutic Approach of Otitis Externa in Cats**

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**Abstract**

Otitis externa means mainly inflammation of the external ear canal distal to the tympanic membrane. Clinical, microscopical and bacteriological examination of 687 cats were examined throughout the present study From April 2012 to December 2015 before and after treatment, aged between 33 days and 2.8 years, brought in for their first veterinary examination to faculty of veterinary medicine, Cairo university hospital and private veterinary clinics. They were suffering from ear disease (otitis externa) with different discharges. They were classified into two groups, first group was mange group (632 cases out of 687, 92%) classified into 507 cases out of 687 (73.8%) with blackish exudates only, 113 cases out of 687 (16.4%) with blackish exudates and oozes pus, 9 cases out of 687 (1.3%) with blackish exudates and ear hematoma, 3 cases out of 687 (0.4%) with blackish exudates, oozes pus and head tilt. Second group consisted of negative mange group (55 cases, 8.1%) with purulent discharge and fetid odor. bacteriological examination revealed Staph. aureus 19 out 20 (95%) and Corynebacterium spp. 1 out of 20 (5%) in the group 1 before treatment. While group 2 revealed Staph. aureus 8 out 10 (80%) and Corynebacterium spp. 2 out of 10 (20%) before treatment. After topical treatment, samples from group 1 showed negative results except for Corynebacterium (19 out of 20, 95%), While group 2 showed negative results (10 out of 10, 100%). Antibiotic sensitivity testing displayed high sensitivity to rifampicin and clindamycin except resistant Corynebacterium spp. in the first group which prescribed to the owners. The present study concluded that Otodectes cyanotis was the most common cause of otitis externa. Treatment by deltamethrin and povidone iodine after ear cleaning was effective, faster and cheaper than other drugs.

**Introduction**

Otitis externa is inflammation of the external ear canal distal to the tympanic membrane. It may be acute or chronic and unilateral or bilateral. It is one of the most common reasons for pet animals to be presented to the veterinarian. Clinical signs can include any combination of headshaking, offensive odor, pain on palpation of the ear, exudate, and erythema. It was caused by primary causes as allergens, autoimmune diseases, endocrine diseases, foreign bodies and otoacariasis then secondary bacterial and fungal infections, Swinney et al. (2008) and Perego et al. (2014).

Prevalence of infection by Otodectes cyanotis was significantly ( $p < 0.05$ ) higher in cats aged between 3 and 6 months (17.58%) than in cats aged below 3 months (11.38%) by Lefkaditis et al. (2009). Otodectes cynotis is thought to be responsible for 50% or more of feline otitis externa cases (Griffin, 1993) and is considered to be very contagious to contact cats. This mite feeds on epidermal debris and tissue fluids from the superficial epidermis (cerumen). Cats with

infested ears show pruritus in 41.5% of cases and abnormal auricular secretions in 85.4% of cases (Sotiraki, 2001). Otodectes cynotis can cause a hypersensitivity reaction in some cats (Weisbroth et al., 1974 and Powell et al., 1980). Moreover, modification of environmental conditions in the external ear canal could create disequilibrium in the normal bacterial and fungal flora, causing secondary bacterial and fungal otitis externa.

Firstly, Rule out ear mites, the culprit in about half of all feline ear infections. It could be secondary to allergies, a mass, or possibly foreign bodies lodged in the ear canal. Diagnosing the condition may require sedation for X-rays, but treating ear infections usually isn't complicated. Antibiotics, anti-parasitics, antifungals, and corticosteroids are the most common treatments by Lefkaditis et al. (2009).

The objective of this study was to confirm the presence of secondary bacterial associated with otoacariasis and evaluate the efficacy of Deltamethrin and povidone iodine, an acaricide and antibacterial antifungal, respectively, for treatment of



the primary infestation and secondary yeast

#### Materials and methods

A total number of 687 cats aging from 33 days to 2.8 years with otic discharge admitted to faculty of veterinary medicine, Cairo university hospital and private veterinary clinics, during a period from April 2012 to December 2015.

#### I) Diagnostic studies

The cats of the present study exposed to thorough clinical examination, ear swabs and recording of clinical signs according to Kelly (1974). All discharges were examined by otoscope and microscopically before and after treatment for *Otodectes cyanotis*.

Bacteriological examination was done on 20 bacterial swabs from otodectic positive otitis externa cases and 10 bacterial swabs from

### Results

#### I) Diagnostic studies

The recorded clinical signs in the present study were discomfort by scratching or pawing at ear or shaking or tilting head in the direction of the painful ear. Other symptoms were black or yellowish discharge, redness or swelling of the ear flap or ear canal, waxy buildup on or near the ear canal, discharge from the ear that resembles coffee grounds (a symptom of ear mites), strong odor, hearing loss, loss of balance or disorientation

The present study classified 687 cases according to clinical presentation, microscopical examination and type of otic discharge into:

Group 1-Positive otodectic mange (632 cases out of 687, 92%) which consisted of:

A-507 cases out of 687 (73.8%) with blackish exudates only (fig. 1 and 3)

b-113 cases out of 687 (16.4%) with blackish exudates and oozes pus (fig. 2 and 4)

c-9 cases out of 687 (1.3%) with blackish exudates and ear hematoma

\*Figures of cats suffered from otitis externa:



Fig. (1): 2.5 years Persian queen showed blackish otic discharge

and bacterial ear infections.

otodectic negative otitis externa cases transferred to nutrient broth then cultivated to selective media of *Staph. aureus* (Mannitol salt agar) according to Bachoon (2008) and Anderson, Cindy (2013); and *Corynebacterium* spp. (Loefflers media) according to Murray, et al. (1995), Koneman, et al. (1997) and Forbes, et al. (1998); staining of bacteria was done by grams stain. Antibiotic susceptibility testing was done according to Jorgensen and Turnidge (2007)

II) Therapeutic trial using 0.5 % deltamethrin (Debomethrin, A.R.E.) topically in ear by swabbing and 1 % povidone iodine (Betadine, Mundipharma, Switzerland) repeated after 3 weeks after ear cleaning by glycerine bicarbonate according to Gortel (2004).

d-3 cases out of 687 (0.4%) with blackish exudates, oozes pus and head tilt  
group 2-negative otodectic mange (55 cases out of 687, 8.1%) with purulent discharge and fetid odor.

Bacteriological examination revealed *Staph. aureus* 19 out 20 (fig. 5-95%) and *Corynebacterium* spp. 1 out of 20 (5%) in the group 1 before treatment. While group 2 revealed *Staph. aureus* 8 out 10 (80%) and *Corynebacterium* spp. 2 out of 10 (20%) before treatment. After treatment, samples from group 1 showed negative results except for *Corynebacterium* (19 out of 20, 95%), While group 2 showed negative results (10 out of 10, 100%). Antibiotic sensitivity testing displayed high sensitivity to rifampicin and clindamycin except resistant *Corynebacterium* spp. in the first group.

#### II) Therapeutic trials:

Toxicity by debomethrin were observed in 6 out of 687 cats (0.9%) manifested by excessive salivation and lacrimation. Cure after 3 weeks in 622 out of 632 (98.4%) obtaining negative microscopical swabs for *Otodectes cyanotis*.



Fig. (2): 1.2 years Persian queen showed blackish otic discharge and pus



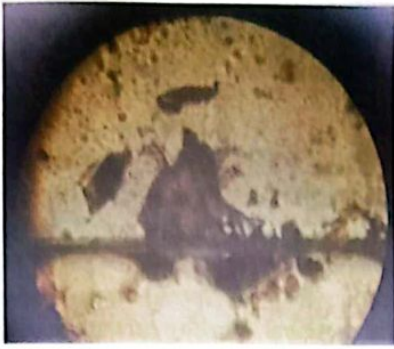


Fig. (3): *Otodectes cyanotis* in ear of cat of fig. 1 (10X microscope)

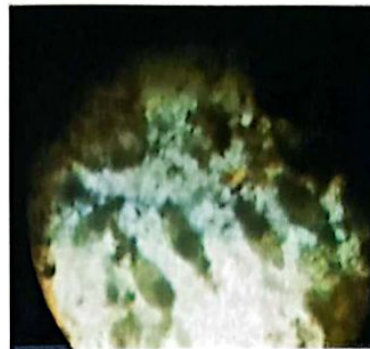


Fig. (3): *Otodectes cyanotis* in ear of cat of fig. 2 (10X microscope)

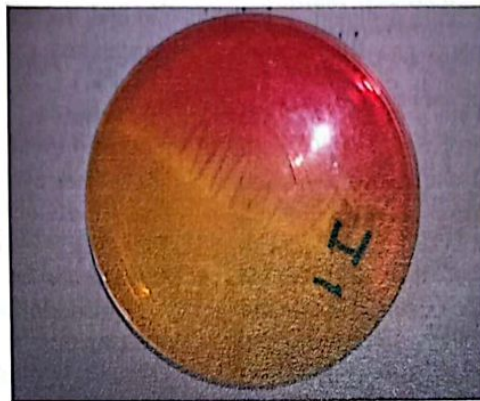


Fig. 5 culture of *Staph. aureus* showed that it fermented phenol red (pH indicator on mannitol salt agar media (changed media from red to yellow color)

#### Discussion

Feline otitis is reviewed by evaluating the predisposing, primary, and secondary causes, Kennis (2013). The recorded clinical signs in the present study were discomfort by scratching or pawing at ear or shaking or tilting head in the direction of the painful ear. Other symptoms were black or yellowish discharge, redness or swelling of the ear flap or ear canal, waxy buildup on or near the ear canal, discharge from the ear that resembles coffee grounds (a symptom of ear mites), strong fetid odor, hearing loss, loss of balance or disorientation

The present study classified 687 cases according to microscopical examination and type of otic discharge into two major groups, first group of Positive otodectic mange (632 cases out of 687, 92%) which consisted of 507 cases out of 687 (73.8%) with blackish exudates only, 113 cases out of 687 (16.4%) with blackish exudates and oozes pus, 9 cases out of 687 (1.3%) with blackish exudates and ear hematoma, 3 cases out of 687 (0.4%) with blackish

exudates, oozes pus and head tilt. The second group consisted of negative otodectic mange (55 cases, 8.1%) with purulent discharge and fetid odor. While Prego et al. (2014) recorded that *Otodectes cynotis* (as a sole agent or in combination) was the primary cause of otitis in 53.3% of cats. Cocci and rods, either alone or in combination with other agents, were perpetuating factors in 71.8% and 29.1% of cats, respectively. However bacteriological examination revealed *Staph. aureus* 19 out of 20 (95%) and *Corynebacterium* spp. 1 out of 20 (5%) in the group 1 before treatment. While group 2 revealed *Staph. aureus* 8 out of 10 (80%) and *Corynebacterium* spp. 2 out of 10 (20%) before treatment. After treatment, samples from group 1 showed negative results except for *Corynebacterium* (19 out of 20, 95%), While group 2 showed negative results (10 out of 10, 100%). Antibiotic sensitivity testing displayed high sensitivity to rifampicin and clindamycin except resistant *Corynebacterium* spp. in the first group.



In contrast, Henneveld (2012) recorded that *Corynebacterium* spp. may have been pathogenic. Antimicrobial sensitivities for *Corynebacterium* spp. were available for 54 isolates. Most isolates were susceptible to chloramphenicol (53/54), amikacin (50/54), tetracycline (50/54), gentamicin (46/54), and enrofloxacin (32/54). Among those antibiotics available in otic products, gentamicin and enrofloxacin would be rational choices for the empirical, topical therapy of *Corynebacterium* spp. on the other side, Josee et al. (2012) compared The efficacy of Oridermyl® (acaricidal/antibiotic/antifungal/anti-inflammatory ointment) and Revolution® (selamectin spot-on) was compared in a blinded randomized study on 24 adult cats with otocariasis. Twelve cats were treated once daily for 10 d with Oridermyl® and 12 cats were treated on Day 0 with Revolution®. Otitis was assessed with cytological counts of mean number of bacteria and yeast on Days 0 and 10, and scored clinically every other day. All auricular secretions were removed for mite count on Day 10. On Day 0, cytological examination confirmed the presence of secondary bacterial (24/24) and fungal (21/24) infections. No live mites were observed otoscopically after Day 4 and in auricular secretions at Day 10 in both groups. On Day 10, secondary infections were resolved for all cats treated with Oridermyl® but were present in all cats treated with Revolution®. Improvement in clinical signs of otitis over time was superior in the Oridermyl® group ( $P < 0.001$ ).

Otic flushing has the potential to help a number of cats with otitis externa. Because the diagnostic and therapeutic benefits of this procedure exceed its risks, veterinarians should offer otic cleaning for cats with poorly responsive or chronic otitis externa as mentioned by Gortel (2004).

Generally, unless your cat has picked up mites from another animal, ear infections are a secondary condition. That means they are actually the result of some other underlying disease problem. Here are some of the contributing causes and perpetuating factors for otitis externa infections, otitis media: An overgrowth of yeast or bacteria, or often, both, Wax

buildup in the ear canal, thick hair in the ear canal, allergies such as food or pollen, autoimmune diseases, tumors/polyps within the ear canal, ruptured eardrum, improper ear cleaning, foreign bodies such as bristle from grass, environmental irritants, Diabetes mellitus. Infections of the middle ear are usually the result of an infection that has spread there from the outer ear canal. Healthy ears are pale pink and have no visible debris or odor and minimal or no ear wax which result after ear cleaning by glycerine bicarbonate and 2 treatment by deltamethrin and povidone iodine. Treatment in the present study was faster and cost effective which achieved 98.4%.

#### Conclusion

The present study concluded that *Otodectes cyanotis* was the most common cause of otitis externa. The recorded secondary bacterial infections were *Staphylococcus* infection and *Corynebacterium* infection. Treatment by deltamethrin and povidone iodine after ear cleaning was effective, faster and cheaper than other drugs.

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#### الملخص العربي

العلاج البديل لسقوط الشعر المسبب بالقوباء في القطط العشار  
تكمّن أهمية مرض القوباء في انتقال المرض من القطط الى الانسان ويعتبر المسبب الشائع هو الميكروسبورم كينس في الانسان والحيوان وحيوانات مستأنسة أخرى ولقد اجريت الدراسة على 87 قطة عشار مصابة بمرض القوباء في الفترة من فبراير 2013 الى يوليو 2015 في مستشفى كلية الطب البيطري جامعة القاهرة وبعض العيادات الخاصة وتم العلاج بالعرقسوس كعلاج بديل وكانت الاعراض عبارة عن دوائر من سقوط الشعر مغطاة بقشور بسيطة.  
وتم اخذ كحّة جلدية لتأكيد التشخيص قبل وبعد العلاج للكشف عن فطر القوباء حيث ان مضادات الفطريات سواء الموضعية أو عن طريق الفم ممنوعة لانها تسبب التشوهات الجنينية لذلك كان هدف البحث هو ايجاد حل بديل امن اثناء الحمل كالعرقسوس كعلاج موضعي بديل تمت استجابة كاملة لحوالي 37 حالة من 87 حالة بنسبة 42% بينما منع انتشاره لباقي اجزاء الجلد في 40 حالة من 87 حالة بنسبة 45% وايضا نسبة فشل 13% لم يستجيبوا للعلاج وكان حجر الزاوية في الدراسة الحالية هو تقليص انتشار مرض القوباء في باقي اجزاء الجلد بدون اثار جانبية للقطط العشار.