



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; SP-12(10): 593-599
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www.thepharmajournal.com
Received: 16-08-2023
Accepted: 25-09-2023

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A pictorial expedition on clinico-diagnostic aspects of ear diseases in dogs

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Abstract

Ear diseases are common clinical entities at a private or government veterinary hospital. Affections of ears are often considered as part of regular dermatological caseload; however, recent trends in developed countries suggest that such conditions need to be explored separately for better understanding of their pathophysiology. Hence, a study was carried out to understand affections of ear from September-2022 to February-2023 at PGIVER, College of Veterinary Science & Animal Husbandry, Kamdhenu University, Rajpur (Nava), Himmatnagar. The present paper is a pictorial expedition into clinical and diagnostic aspects of ear diseases in dogs with a vision to generate a primary platform for veterinary practitioners to understand the disease process in presence of basic and/or absence of advanced diagnostic modalities.

Keywords: Ear diseases, dogs, clinical, diagnostic, pictorial expedition

Introduction

Dog has been domesticated by humans for different purposes and is often shown as a trustworthy companion. Currently, a wide range of dog breeds are available for different purposes. General healthcare of dogs depends on various factors where grooming and hygienic practices are directly related with ear and skin health. The ear health depends on understanding of pet owners about grooming and cleaning practices at home, maintaining hygienic conditions, knowledge and use of ear cleansing products etc. [1, 2]. Ear diseases involve infectious and non-infectious conditions which are required to be evaluated differently from common dermatological disorders [3].

Many ear diseases are found with ongoing dermatological issues which can be treated by incorporating specific treatment agents (e.g., ear cleansers, ear drops, systemic antibiotics etc.) in the treatment regime designed for skin disorders. Moreover, ear affection can also be found as an ongoing clinical ailment with surgical and gynecological disorders which might go unnoticed depending on type of chief complaint represented by the owners. Out of all diseases, otitis is the only condition which has been explored with scientific methods in different parts of the world; however, there is a possibility that etiological factors responsible for otitis may vary based on factors such as geography, abundance of pathogens, hygienic practices, season, ear care, availability of diagnostic facilities, availability of enough dog population etc. The present paper shows glimpse of symptoms of ear diseases as well as diagnostic approach for the same based on observations recorded during September-2022 to February-2023 at PGIVER, College of Veterinary Science & Animal Husbandry, Kamdhenu University, Rajpur (Nava), Himmatnagar.

Pictorial Expedition

Diagnostic aspects

The diagnostic methodologies for dermatological and ear (aural) disorders in dogs are mostly similar which could be one of the reasons behind inclusion of ear diseases in the registered cases of dermatological afflictions. Steps of diagnostic approach for ear diseases in dogs are described in Table-1.

Table 1: Brief information on some diagnostic modalities for ear diseases

Sr. No.	Approach/method	Remarks
1	Collection of details	Details pertaining to age, breed, gender, housing, grooming, feeding are required to be collected before handling any case. Such details can also help researchers to establish prevalence and incidence of ear diseases.
2	History taking/Anamnesis	Some ear diseases are directly related with grooming and other management aspects ^[2] . Information on occurrence of existing condition, its duration, frequency of occurrence, other ongoing abnormalities, management aspects, presence of other dominant animals, itching, bathing frequency, bathing protocol etc. are important and can be correlated with chief complaint.
3	Observation from a distance	Some clinical signs such as scratching of ears, head tilting, dropped ears, swollen ears, incoordination etc. can only be observed from distance. Such observations can indicate ongoing ear disorders.
4	General physical and clinical examination	Dogs with ear diseases should always be subjected to general clinical examination as the dogs may have other ongoing clinical ailment with concurrent ear disease. Cases brought or registered for surgical correction or gynecological checkup may also show ear disease as an ongoing/concurrent problem which can go unnoticed if physical examination is not conducted properly.
5	Examination of gross lesions	Gross lesions such as pustule, scales, erythema, papules, tick-bite dermatitis, alopecia, scab, excoriations etc. can be found in different types of conditions responsible for ear and skin diseases. They can help to identify exact etiology in many cases and can act as important sources of samples (e.g., pus from pustule).
6	Epiluminescopy	It is an easy, quick, reliable and non-invasive method. It can provide better visualization of local lesions. High quality camera, digital camera, handheld microscope, macro feature of smart phones etc. can be used.
7	Impression smear examination	It is an easy, reliable and relatively quick method. It can be used for microscopic examination with or without staining.
8	Trichography	Easy and quick method which is extremely helpful to understand hair structure, presence of mites in roots, fungal spores, cultural isolation especially by using hairs in case of fungal culture isolation etc.
9	Sticky tape technique	Easy and quick method. Samples collected by this method can be stained and evaluated microscopically.
10	Deep skin scrapings examination	Most common diagnostic test used for dermatological diseases. Scabs presence on ear pinna in case of canine scabies can be collected by this method.
11	Wood's lamp examination/ Ultraviolet torchlight examination	Easy, quick and non-invasive method which requires dark room/place for proper visualization of fluorescence. Some chemicals/creams present on lesion can also show fluorescence; hence, confirmatory diagnosis will require some other methods in addition to this method.
12	KOH mounts	Useful technique for evaluation of mites, spores etc.
13	Examination for ectoparasite	Grossly visible ectoparasites can indicate requirement of ectoparasitocidal drugs (topical or systemic).
14	Ear wax examination – bacteria, fungus and yeast	Ear wax can be collected directly on microscopic slide and stained with different stains to evaluate presence of bacteria, fungus and yeast. Bleeding and damage to ear drum should be avoided while collection.
15	Ear wax examination – ear mites	Direct examination of ear wax under microscope is important to identify presence of ear mites. Bleeding and damage to ear drum should be avoided while collection.
16	Otoscopy	Simple handheld otoscopes can be used for proper examination of ear canal and ear structure. This method gives proper superficial and deep visualization of lesions which can help to collect proper samples and perform ear cleaning.
17	Exhaustive laboratory diagnosis	Some of the confirmatory diagnosis can only be performed inside laboratory after proper and hygienic collection of samples from a clinical case. This includes bacterial, fungal and yeast cultural isolation.
17.a	Bacterial cultural isolation and identification	Bacterial cultural isolation can be performed on general media followed by specific media, staining and chemical tests as well as molecular methodologies for proper identification of bacterial pathogen responsible for ear disease. Identified bacterial pathogens can be subjected to antibiotic susceptibility test to select proper drugs.
17.b	Cultural isolation and identification for fungus and yeast	Some yeasts and fungus can be observed while performing microscopic examination of stained ear wax/swabs. However, confirm identification can only be achieved by isolation of such pathogens on general and specific media, staining, chemical and molecular tests.
18	Imaging studies	Some of the ear diseases may require use of advanced imaging techniques such as roentgenology, ultrasound examination, MRI, CT scan etc. for visualization of deep structural abnormalities ^[4] .

Clinical signs of ear diseases and some conditions affecting ear

Clinical signs indicative of ear affections and some ear diseases are shown in Picture-1 to Picture-31.



Picture 1: Dropped left ear in a case of otitis



Picture 2: Scratching/pawing on left ear



Picture 3: Head shaking in case of ear affection



Picture 4: Head tilting (left side) in a case of ear affection



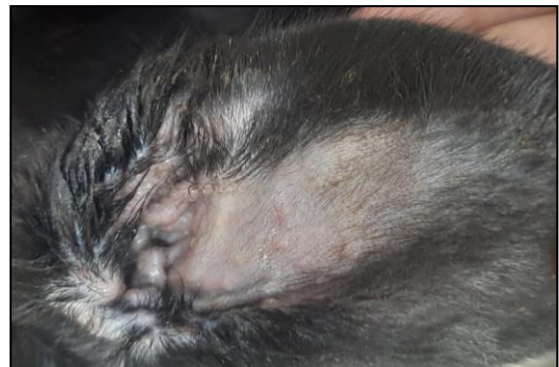
Picture 5: Traumatic injury on external side of ear pinna



Picture 6: Tearing injury on internal side of ear pinna



Picture 7: Presence of discharge and blood spots in case of septic wound on ear pinna



Picture 8: Discharge oozing out from ear canal and soiling of hair in case of simple bacterial otitis



Picture 9: Suppurative discharge in case of otitis



Picture 10: Severe discharge and presence of turmeric applied by owner in a case of otitis



Picture 11: Unclean and unhygienic ear



Picture 14: Reddening and thickening of pinna and webs in case of atopic dermatitis and otitis



Picture 12: Hematoma



Picture 15: Scales and scabs on ear with loss of hairs on ear pinna in canine scabies



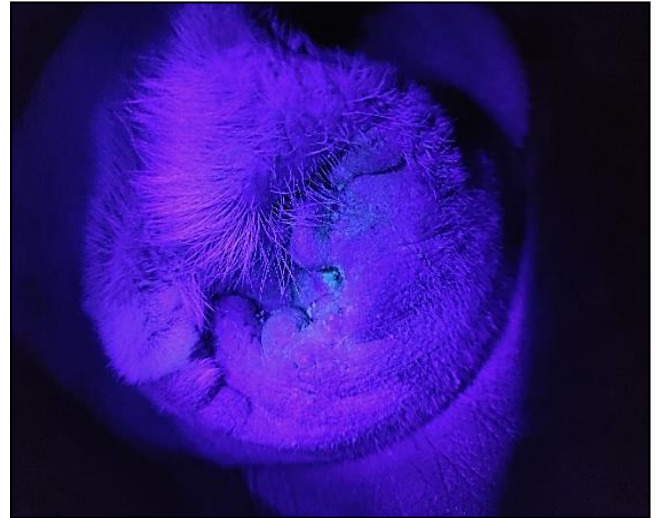
Picture 13: Wart on ear pinna



Picture 16: Tick infestation



Picture 17: Tick-bite and tick-bite dermatitis on ear pinna



Picture 20: Fluorescence observed when ear was subjected to UV torchlight examination



Picture 18: Focal lesion of pyoderma at base of ear



Picture 21: Stenotic ear canal as visualized by an otoscope



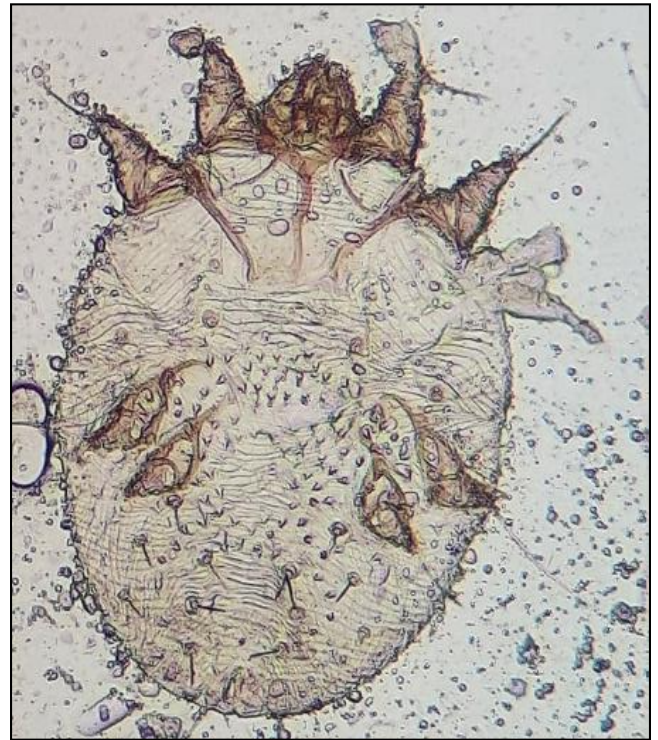
Picture 19: Otitis caused by yeast and bacteria



Picture 22: Bleeding from ear canal as visualized by an otoscope



Picture 23: Tick - *Rhipicephalus* spp.



Picture 26: Mite – *Sarcoptes* spp.



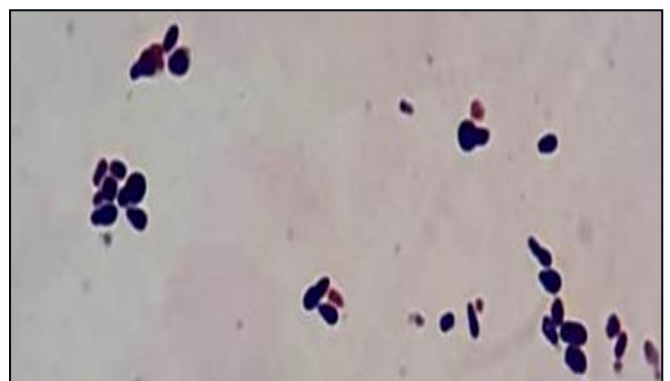
Picture 24: Louse – *Heterodoxus* spp.



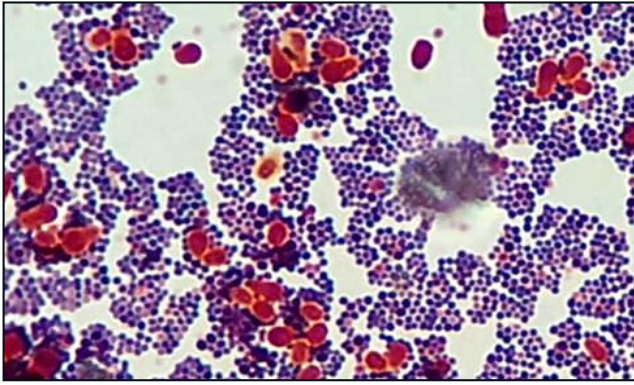
Picture 27: Mite – *Demodex canis*



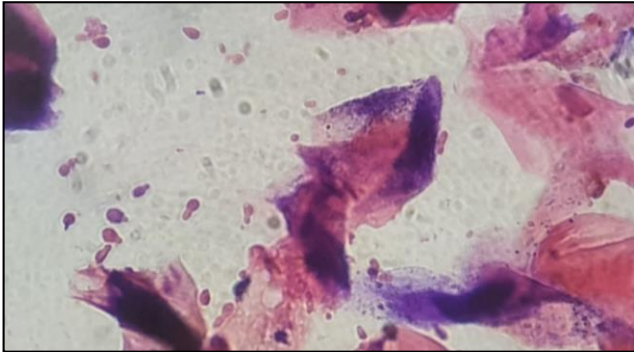
Picture 25: Louse – *Trichodectes canis*



Picture 28: Microscopic appearance of *Malassezia* spp. (Gram's stain)



Picture 29: *Malassezia* spp. and *Staphylococcus* spp. (Gram's stain)



Picture 30: *Malassezia* spp. in ear wax



Picture 31: Growth of dermatophytes on Dermatophyte Test Media (DTM)

Conclusion

The present paper has provided a pictorial expedition on common ear diseases, diagnostic approach and some of the important primary and secondary etiological factors of otitis in dogs. This expedition will help the veterinary practitioners, students and researchers to understand such conditions and conduct further studies in future. Moreover, dog-owners or caretakers or handlers can also benefit from this report to observe an ongoing ear disease problem at an early stage and report them to veterinarians for timely diagnosis and treatment. Generating such a pictorial review by incorporating more number of cases in a wider geographic area will definitely generate strong platform to study ear diseases in future.

Conflict of Interest

Authors declare no conflict of interest with regards to funding. All the cases were included in the study after obtaining owners' consent. The study was approved and recommended by the advisory committee and Director of Research & Dean PG Studies.

Acknowledgements

Authors acknowledge support received from staff members of VCC, VSR, VGO departments of the college, staff of PGIVER and authorities of KU, Gandhinagar.

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