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Clinical management of pyoderma in a Belgian Malinois: A case study

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Abstract

Dogs suffer from a wide range of dermatological disorders out of which, 'Canine Pyoderma' is the most commonly reported afflictions. It is caused by bacterial pathogens and has various predisposing factors responsible for frequent occurrence. It is also one of the most commonly studied skin diseases of dogs and a wide range of therapeutic agents are commercially available for its clinical management. This condition is found in all types and breeds of dogs; however, some of the rare imported breeds brought, bred and managed in India tend to suffer from pyoderma due to minor changes in their daily routine. Out of all working dogs, Belgian Shepherd is one of the intelligent, sensitive, confident, smart, trainable, alert and hardworking dog breeds which originated in Belgium and is now distributed throughout the world. Out of four major varieties of Belgian Shepherd, the Belgian Malinois is more commonly preferred in India. The present case study describes clinical management of canine pyoderma in a Belgian Malinois using oral antibiotic, medicated shampoo, topical cream, topical antiseptic and oral supplements for improvement of skin/coat quality along with guidance on managerial aspects which resulted in complete recovery within 15 days of treatment without any invasive approach.

Keywords: Canine pyoderma, Belgian Malinois, pyoderma, treatment

Introduction

The health of a dog's skin greatly depends on basic management practices adopted by dog owners. The knowledge level of dog owners regarding bathing, grooming, provision of supplements, deworming etc. varies remarkably among different owners and has relation with factors such as their socio-economic status, availability of resources, understanding importance of timely health checkup, available guidance, literacy level, monetary benefits associated with pet practice, availability of veterinary care in nearby areas, qualifications of person treating or attending clinical cases, types of skin related products to be used for healthy or abnormal skin/coat etc. These aspects are important to consider while screening dermatological as well as other systemic disorders in dogs. Any lacuna in basic healthcare and management (e.g., feeding, grooming, bathing, housing, preventing environmental stress, exercise etc.) invites unwanted diseases and disorders [1, 2, 3].

Idiopathic alopecia, idiopathic dermatitis, ectoparasitic skin diseases (e.g., tick, lice, flea and mite infestation), dermatophytosis, canine pyoderma, canine atopic dermatitis (CAD), skin tumors, skin lesions associated with hormonal disorders (e.g., hypothyroidism) etc. are commonly reported skin disorders at a government or private veterinary hospital [3]. Out of all dermatological afflictions, the 'Canine Pyoderma' is a common bacterial skin disease which occurs either as a primary condition or as an infection secondary to an ongoing skin problem. A wide range of research investigations have been carried out on pyoderma for identification of bacterial pathogens, antibiotic sensitivity testing to check antimicrobial resistance (AMR), suitable therapeutic options, alternative medicines (e.g., herbal formulations) etc. This condition can be treated with a combination of parenteral and topical medications effectively if the condition is identified and managerial errors are addressed at earliest. Successful outcome can take weeks to months for complete recovery and depends hugely on owner's compliance. The breed-wise, age-wise and gender-wise prevalence of pyoderma is also variable but, it has been documented in almost all common breeds, all age groups and dogs

belonging to both genders. Some of the breeds which are not native to a particular country or region may suffer from this condition due to improper knowledge and adoption of basic management practices specifically required for their general wellbeing. The present case study describes a protocol implemented to treat canine pyoderma in a Belgian Malinois. The protocol, hypothesis behind use of different components and monitoring have been described.

Case Details

An adult female working Belgian Malinois (a variety of Belgian Shepherd) was brought to Veterinary Clinical Complex (VCC), College of Veterinary Science & Animal Husbandry, Kamdhenu University, Himmatnagar with a history of dermatological issues which were non-responsive to earlier treatments.

Anamnesis

The caretaker/owner mentioned signs such as coat shedding, itching, bumps/eruptions felt while grooming, discomfort due to constant irritation which were non-responsive to previous treatment and no other severe systemic signs. Managemental history revealed that the patient was trained and kept at an official dog-housing facility, fed as per standard protocols, regularly dewormed, vaccinated against common infectious diseases, infrequent contact with stray dogs, patient working at different places as per assigned duties, bathing with normal bathing shampoo, no use of supportive tonics for skin health etc.

Diagnostic approach

Dermatological examination revealed presence of pustules on right lateral and caudal aspects of trunk/abdomen and ventral aspect of tail, redness and blackening of skin at lower abdominal region, reddening on medial aspect of left thigh, pruritus, coat shedding, irritability, single focal excoriation near ear, no dermatologic signs on face or lower aspects of legs [Picture-1(A), 2(A) & 3(A)]. Clipping of hairs revealed characteristic presence of pustules at ventral aspect of tail (Severity: +++-+) and right side of trunk (Severity: +----). Lesions on tail were more pronounced with presence of blood-mixed discharge. Examination of impression smear and deep skin scrapings from active lesions did not show presence of mites. The ultraviolet torchlight examination did not show presence of fluorescence on hairs around lesions. The case was diagnosed as canine pyoderma and a treatment protocol was planned. Mild atopy was also suspected considering the purpose of keeping and managemental history. Ectoparasites (e.g., ticks, lice and fleas) were not found.

Treatment

Therapeutic management included 05 different components (Table-1) and follow-up was advised after few days. Telemedicine and teleguidance were practiced between first two clinical checkups [Picture-1(B) & 3(B)] and after final checkup. Owner effectively complied with all instructions and the case resulted in successful recovery within 15 days of treatment [Picture-1(C), 2(B) & 3(C)] without recurrence till 30 days post-treatment.

Table 1: Treatment regimen planned for clinical management

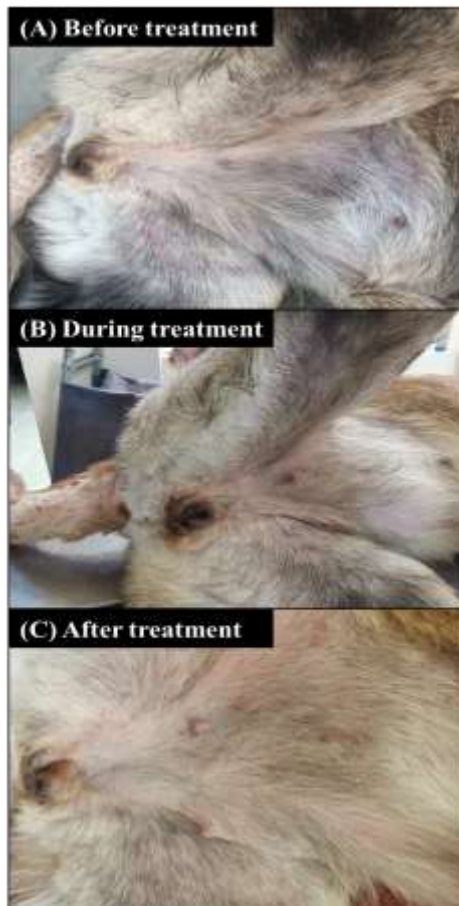
Sr. No.	Class	Name/Content of product	Frequency of administration/application
1	Oral antibiotic	Cephalexin	Daily as per standard dose rate for 07 days only
2	Medicated shampoo	Ketoconazole + Chlorhexidine Gluconate + Cetrimide	√×√××√××××××√×× (√= Bathing once a day; ×=No bathing)
3	Topical antiseptic (liquid)	Povidone Iodine	Twice a day on active lesions, daily till resolution of signs
4	Topical cream	Mupirocin + Fluticasone proprionate	10-15 minutes after application of topical antiseptic for 07 days
5	Oral syrup as supplement	Omega 3, 6, 9; Vit. A; Vit. D3; Vit. E; Biotin and Zinc	05 ml, twice a day, daily for 15 days



Picture 1: Ventral aspect of tail before (A), during (B) and after (C) treatment



Picture 2: Right side of trunk/abdomen before (A) and after (B) treatment



Picture 3: Lower abdomen before (A), during (B) and after (C) treatment

Discussion

At present, the interest to keep a wide range of dog breeds is found to be increasing throughout the world. Breeding and selling of imported dog breeds is also on the rise due to constant increase in the demands by pet-lovers. Most of the imported pure breeds bred in India adapt to the tropical climate; however, some breeds are susceptible to clinical abnormalities when management practices are changed.

Belgian Shepherd is one of the well-known breed of dogs which has 04 major known varieties out of which, Belgian Malinois is commonly preferred as working dogs (e.g., in Police Dog Squads). It is perceived that Belgian Malinois do not need special provisions like other breeds belonging to cold climates (e.g., Siberian Husky); hence, they are often

kept in facilities suitable for other working dogs such as Doberman Pinscher and German Shepherd.

Working dogs being managed with specific routine do not suffer from major clinical health issues; however, minor changes in their daily routine may result in clinical ailments. Working dogs are often taken to different areas where they come in contact with dirt, debris, excreta of stray dogs or other animals, gases, chemicals, vegetations, sewage water, insects, ectoparasites etc. on different terrains in different regions. This could result in spread of infectious diseases (e.g., canine parvovirus infection in non-vaccinated working dogs) or non-infectious conditions (e.g., atopic dermatitis or traumatic injuries) involving skin and other bodily systems.

Out of all conditions, dermatological afflictions are clearly visible and quickly noticed by owners/caretakers. The skin should be critically observed for presence of ectoparasites (e.g., ticks, lice, fleas), insect-bites, pollen, dirt, debris, excreta or discharges of other species, chemicals etc. in such working dogs after they return from duties in different areas because damage to skin barrier often invites infections and necessitate incorporation of barrier repairing agents^[4]. A wide range of bacterial (*i.e.*, canine pyoderma), fungal (*i.e.*, dermatophytosis), ectoparasitic (e.g., tick infestation, lice infestation, flea infestation, canine scabies, canine demodicosis) as well as non-infectious skin diseases (e.g., food associated skin hypersensitivity/food allergy, skin lesions associated with hypothyroidism) are documented in dogs.

The diagnosis of many skin diseases is challenging as some may require use of scientific facilities (e.g., microscope, Wood's lamp, bacterial cultural isolation, fungal isolation, laboratory chemicals, glasswares, dermoscope, hormonal profiling, blood reports, serum biochemistry in case of allergies etc.) which are not available at field level. This could be the reason behind limited or no response to repeated treatment attempts. In the present case, presence of pustules was conspicuous of bacterial skin infection while mites in skin scrapings, fluorescence on hairs, exothrix or endothrix on hairs and ectoparasites were not found. Thus, case was diagnosed as 'Canine Pyoderma'. It is one of the common skin disease which can be focal or generalized (depending on spread), deep or superficial (depending on involvement of skin layers), and primary or secondary to other skin diseases (e.g., demodicosis). Common bacterial pathogens responsible for pyoderma include *Staphylococcus aureus*, Methicillin Resistant *Staphylococcus aureus* (MRSA), *Staphylococcus pseudintermedius*, *Pseudomonas* spp. etc. The patient mentioned in the present study was also found to have pruritus which is not a common signs in all cases of localized pyoderma. Hence, mild atopy was also suspected.

The clinical recovery in canine skin diseases entirely depend on diagnosis, selection of treatment protocol and owner's compliance to instructions given by the veterinarian. Complete resolution of clinical signs may take days, weeks to months in different cases which have history of limited or no response to previous treatment attempts. The patient mentioned in the present case study was treated by incorporating oral antibiotic, medicated shampoo, topical antiseptic, topical cream containing antibiotic+glucocorticoid and oral supplement to promote skin health as mentioned in Table-2.

Table 2: Objectives for incorporation of 05 components in the treatment plan

Sr. No.	Component	Objective for use and other remarks
1	Oral antibiotic (Content: Cephalexin)	<ul style="list-style-type: none"> It was used to prevent further spread of bacterial infection It is widely available One of the basic and first choice for skin diseases in dogs Use at standard dose do not show major clinical side effects
2	Medicated shampoo (Content: Ketoconazole + Chlorhexidine Gluconate + Cetrimide)	<ul style="list-style-type: none"> It was used to clean/remove infective material, scales, hairs etc. from skin Ketoconazole is an antifungal agent which may prevent fungal infection Chlorhexidine gluconate decreases microflora on skin which may become pathogenic in case of damaged skin barrier Cetrimide reduces skin irritation and is often used to treat barrier damage
3	Topical antiseptic (Content: Povidone Iodine)	<ul style="list-style-type: none"> It was used to counteract active lesions to limit the spread in nearby areas It limits the spread of infection from pustules to surrounding areas
4	Topical cream having antibiotic + glucocorticoid (Content: Mupirocin + Fluticasone propionate)	<ul style="list-style-type: none"> It was used to reduce local infection and itching Mupirocin is one of the effective topical antibiotic against bacterial skin infections Fluticasone is a glucocorticoid which can be used to treat allergies
5	Oral supplement in form of syrup (Content: Omega 3, 6, 9; Vit. A; Vit. D3; Vit. E; Biotin and Zinc)	<ul style="list-style-type: none"> It was used as a supplement to promote skin health, prevent coat shedding and repair skin barrier Omegas protect damage from sun rays, reduce acne and have beneficial effect on hairs Vit. A is useful for healthy skin Vit. E moisturizes skin, helps to reduce hyperpigmentation and has antioxidant properties Biotin helps to reduce hair loss Zinc helps to reduce inflammation and promotes barrier healing

All medicines were provided and prescribed after obtaining owner's consent and providing necessary guidance for appropriate use. Clinical management did not involve any invasive treatment or injectable medicines. Parenteral administration of antifungal (e.g., ketoconazole), ectoparasiticide (e.g., ivermectin) and other drugs was avoided considering the case presentation; however, use of such drugs may be required in mixed infections. Monitoring of clinical outcome in such cases at periodic interval is of immense importance but, frequent visits to hospital has its disadvantages (e.g., travelling stress, travel expense etc.). Additionally, complex treatment strategies for skin diseases

can also alter the owner's perception [5]. Hence, telemedicine and teleguidance [6, 7] were preferred between first two checkups which could effectively guide us about response of the patient to selected protocol. The treatment regimen selected in the present case resulted in excellent recovery within a few days of treatment without recurrence till 30 days post-treatment where owner's compliance to the instructions played a key role [Picture-4]. Hence, it can be undoubtedly said that owner's compliance, telemedicine and teleguidance are also crucial for management of recurrent skin infections in dogs (i.e., teledermatology or teleconsultation for canine skin disease) [8, 9, 10].

**Picture 4:** Belgian Malinois after treatment

The details given in the present case study should be helpful to veterinary clinicians to perform early diagnosis, prevent misdiagnosis, avoid confusion with presumptive diagnosis of other conditions where secondary pyoderma occurs [11], select treatment protocol, understand properties of certain medicines and their applicability depending on signs, avoid administration of unnecessary drugs when diagnosis is difficult, practice telemedicine for effective monitoring, and importance of guidance to owners for use of medicines.

Conclusion

The case of pyoderma in a Belgian Malinois could be successfully managed by combination of parenteral and topical medications along with specific instructions on managerial aspects. Owner's compliance to instructions played pivotal role in clinical recovery within desired duration. Attempts should be made to correlate variations in basic management practices adopted by dog owners with occurrence of such dermatological disorders in dogs to reduce

the prevalence, use of medicines and antibiotic resistance in future.

Conflict of Interest & Ethical Approval

Authors declare no conflicts of interest with special regards to funding. This clinical case was managed as per routine clinical practice. Medicines were provided and prescribed after informing the owner. No injectable medications were given for treatment.

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