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Successful therapeutic management of scrotal contact dermatitis in a dog due to floor disinfectants

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Abstract
A 1.5-year-old male mongrel dog weighing 15 kgs was presented to Veterinary Hospital, Bhoiguda, College of Veterinary Science, P.V. Narsimha Rao Telangana Veterinary University, Hyderabad with a history of reduced activity and appetite, continuous licking of scrotal region since 15 days, improper gait and a history of use of phenolic compounds in the house as floor disinfectants. On physical examination, there was scrotal oedema and pain. There were erythematous, ulcerative lesions over the scrotal skin with purulent discharges. All the vital signs were within normal range. Microscopic examination of stained swab sample from the scrotum showed presence of both cocci and rods and antibiotic sensitivity test was done. The case was diagnosed as scrotal contact dermatitis based on the history and signalment. The dog was treated with antibiotic combination (gentamicin @ 4 mg/kg subcutaneously for 5 days and amoxicillin + clavulanic acid @ 10 mg/kg twice a day orally as tablets for 10 days), steroidal anti-inflammatory agent (prednisolone @ 0.5 mg/kg intramuscularly for 5 days and orally on alternate days for next 5 days), antihistamines (chlorpheniramine maleate @ 0.2 mg/kg intramuscularly for 5 days) and topical application of povidone iodine spray twice daily for 2 weeks. By 15th day complete healing of the scrotal skin was seen with no complications.

Keywords: Scrotal contact dermatitis, floor disinfectants

Introduction
Canine scrotum is a membranous pouch consisting of two layers: the skin and the dartos [1]. Due to its anatomical position management of scrotal infection is quite challenging [2].
An accidental or intentional contact of skin surface with harmful substances results in an inflammatory reaction termed as contact dermatitis (CD) [3]. Contact dermatitis can be classified as allergic contact dermatitis (ACD) and irritant contact dermatitis (ICD). Contact of skin surface to allergens results in type 4 delayed hypersensitivity reaction as seen in ACD while contact of skin surface to highly irritant substance without an adaptive immunological process is termed as ICD[3]. It is difficult to clinically distinguish ACD and ICD, as some substances act as both irritants and allergens [3].
Usage of phenolic floor disinfectants has shown severe reactions to canine skin. The mostly affected areas include ventral abdomen, scrotum, interdigital spaces, muzzle, lips and perineum as they directly come in contact with the floor [4].
In the present case, diagnosis and therapeutic management of contact scrotal dermatitis in a dog due to phenolic floor disinfectants is discussed.

Materials and Methods
A 1.5-year-old male mongrel dog weighing about 15 kgs was presented to Veterinary Clinical Complex, Bhoiguda, C.V.Sc, PVNRTVU, Hyderabad with the history of reduced activity and appetite, continuous licking of scrotal region since 15 days, improper gait and a history of use of phenolic compounds as floor disinfectants in the house. On physical examination, there was scrotal oedema and pain. There were erythematous, ulcerative lesions over the scrotal skin with purulent discharges (Fig. 1). The dog showed difficulty to stay in sitting posture and there was a wide stepping gait seen. All the vital signs were within the normal range. Microscopic examination of stained swab sample from the scrotum showed presence of both cocci and rods (Fig. 2). On performing antibiotic sensitivity test, the sample was highly sensitive to gentamicin, coxacillin, cefoperazone + sulbactam followed by moderate sensitivity to ceftiofur, moxifloxacin, enrofloxacin, amoxicillin + clavulanic acid and least sensitivity to methicillin (Table - 1). There was resistance to tetracycline, clindamycin, erythromycin, cefotaxime, levofloxacin antibiotics.

Fig 1: Erythematous and ulcerative lesions over scrotum when presented (day-0).

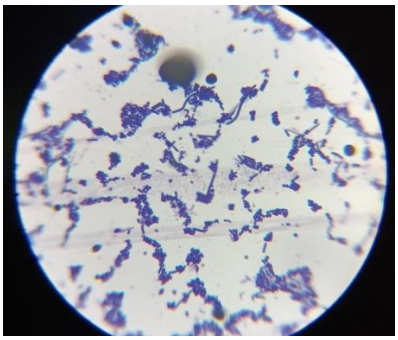

Fig 2: On staining of the swab, rods and cocci were seen.

Table 1: Antibiotic sensitivity test results

S. no.	Name of the Antibiotic	Result
1.	Moxifloxacin	Sensitive (++)
2.	Amoxicillin + Clavulanic acid	Sensitive (++)
3.	Levofloxacin	Resistant
4.	Enrofloxacin	Sensitive (++)
5.	Methicillin	Sensitive (+)
6.	Cefoperazone + Sulbactam	Sensitive (+++)
7.	Cefataxime	Resistant
8.	Erythromycin	Resistant
9.	Clindamycin	Resistant
10.	Tetracycline	Resistant
11.	Ceftiofur	Sensitive (++)
12.	Gentamicin	Sensitive (+++)
13.	Coxacillin	Sensitive (+++)

Based on the history of usage of phenolic disinfectants for floor cleaning, age of the dog and the condition of the scrotum, the case was diagnosed as scrotal contact dermatitis of the ACD type. Owner was advised to use pet friendly floor cleansers. The dog was treated with antibiotic combination (inj. gentamicin @ 4 mg/kg subcutaneously for 5 days and amoxicillin+clavulanic acid @ 10 mg/kg twice a day orally as tablets for 10 days), steroidal anti-inflammatory agent (prednisolone @ 0.5 mg/kg intramuscularly for 5 days and orally on alternate days for next 5 days), antihistamines (chlorpheniramine maleate @ 0.2 mg/kg intramuscularly for 5 days) and topical application of povidone iodine spray twice daily for 2 weeks. Application of Elizabethan collar was advised.

By day-4, dog was able to sit and walk without any difficulty. There was marked improvement in the scrotal skin condition from day-1 (Fig. 1) to day-5 (Fig. 3) to day-15 (Fig. 4).

Fig 3: Scrotum in the process of healing with the given treatment on day-5.

Fig 4: Complete healing of scrotum on day-15.

Results and Discussion

In comparison, canine skin (P^H is 5.5 to 7.5) is more alkaline than the human skin (P^H is 4.8 to 5.8) [5]. If the P^H is disrupted, canine skin gets susceptible for bacterial growth due to its alkaline nature. The canine epidermis is only 3-6 cell layered, whereas human skin is 5-10 cell layered [6, 7]. Though the overall thickness of the canine skin is greater than humans, the epidermis is thin comparatively and is easily damaged with irritants or allergens that are not P^H balanced for their skin. In comparison to ventral abdomen skin, scrotal skin being thin, wrinkled and sparsely haired, is more likely to be affected [8]. Various irritants such as human soaps, shampoos, disinfectants and detergents which are favourable to the P^H of the human skin cause severe inflammation of scrotum when exposed to them, resulting in necrotic and ulcerative lesions [9].

Unlike ICD, ACD develops after a period of 6 to 24 months after intermittent or continual exposure of the animal to the

antigen[3]. In the present case, the phenolic compounds were suspected to have caused ACD. Phenolic compounds have a dual nature *i.e.* they are with both hydrophilic and lipophilic properties. This dual nature allows them to breakdown cellular membranes, denature proteins, causing cell death and coagulative necrosis [10, 11].

In the present case, both cocci and rods were seen in the stained sample slide. The antibiotics were selected based on their sensitivity to the skin swab sample and local availability. The antibiotic combination was used as polymicrobial therapy to eliminate the bacterial infection. Steroidal therapy was used to suppress the heightened immune reaction due to ACD, and antihistamines also were used as supportive therapy. The topical therapy was used to augment the antibiotic therapy. The intense pruritus experienced by the dog because of the ACD led to continuous licking by the dog. The application of Elizabethan collar prevented this self-mutilation and allowed faster healing. By 15th day, there was complete healing of scrotal skin.

In the present case, withdrawal of usage of phenolic floor disinfectants, usage of pet friendly floor cleansers and appropriate treatment resulted in early recovery without complications.

Conclusion

Human disinfectants cause contact dermatitis in canines and therefore their use should be restricted in households with pets. Early diagnosis and appropriate treatment causes resolution of the symptoms caused by both ACD and ICD.

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