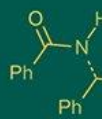


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Histopathological study on a juvenile pyoderma/puppy strangles in dachshund puppy

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Abstract

The present study was conducted at Veterinary College Hospital, Hebbal, Bengaluru. A male 5 months old dachshund puppy presented to Department of Veterinary Medicine, Veterinary college Hebbal, Bengaluru, in which cutaneous or skin diseases which was chronic in nature and refractory to the ongoing treatment. Clinically, the case was presented with typical lesions and was confined muzzle, peri-orbital region, chin, nasal planum and pinnae. Histology was characterized by dermis was often characterized by multiple discrete pyogranulomas, comprising of nodular clusters of numerous variable sized neutrophils and surrounded by larger epithelioid macrophages.

Keywords: Juvenile cellulitis, dachshund puppy, pyogranulomatous dermatitis, cutaneous lesions, histopathology, canine dermatology

Introduction

The skin forms an anatomical boundary between the body and its environment. It is the largest system in the body which provides protection against, physical, chemical and microbial injury, aids in thermoregulation, conservation of water, synthesis of vitamin D and sensory function. Hence, integument makes the principal organs of communication between the animal and its surroundings (Garland, 2013) [3].

The integument differs in structure from species to species as well as between regions of the body within an animal. Canine skin has two well defined layers, epidermis and dermis, lying in-so intimate association that they function as a single organ overlying the subcutis (Garland, 2013) [3].

Skin being the largest organ in the body is likely to be influenced by a plethora of infectious and non-infectious, environmental agents. In several veterinary facility 20 percent to 75 percent of dogs presented at the small animal clinics are known to be with a dermatological complaint (Scott *et al.*, 2001) [14].

Skin reactions to stimuli serves as an excellent indicator of many systemic conditions including infections, endocrinopathies and disorders of nutrition. The diseases of the skin are important, especially in canines and with the recent advances in diagnostics, recognition of a number of specific or non-specific conditions has been possible which has resulted in a tremendous expansion in the veterinary dermatology (Hill *et al.*, 2006) [6].

In dogs, the skin diseases could be due to parasitism, bacterial, fungal, allergies, immunological diseases, nutritional related dermatosis, hormonal disorders and cancers (Nichita and Marcu, 2010) [11].

Clinical examination

A male 5 months old dachshund puppy dog was presented to Department of Veterinary Medicine, Veterinary college Hebbal, Bengaluru, having recurrent cutaneous or skin lesion. Upon clinical examination, bilateral symmetrical alopecia, swelling and erythematous erosive lesions were seen on face included the muzzle, peri-orbital region, chin, nasal planum and pinnae with lesions extending to forelimbs. In few regions lesions were fistulated and condition was not responding to any antibiotics. Since the condition was rare, found to be recurrent and refractory to ongoing treatment, the case was further processed for biopsy and histopathology examination.

Methods and Materials

Punch biopsy

The dogs showing dermatological lesion was selected to perform skin punch biopsy. The hair over and around the site to be biopsied was clipped and swabbed with 70% alcohol taken care not to disturb the surface lesion. Mostly primary skin lesion and transition lesion were selected for biopsy. Representative tissue samples were obtained by using 6 mm punch biopsy [Punch biopsy needles-M/s Accu Sharp-6mm punch biopsy needles. (Lot number: BIPU0802223)] under local anaesthesia using 2% lidocaine 2mg/kg body weight, the punch biopsy was inserted using combination of forward pressure and unidirectional rotation motions and was advanced to the depth of the subcutaneous layer. The detached piece of skin was then gently lifted at one edge using the point of a sterile needle or fine rat toothed forceps and placed in container with at least 10 times their volume of 10% phosphate buffer formalin.

Histopathology

The biopsied sample was fixed in 10% neutral buffered formalin immediately and processed by routine paraffin embedding technique. Sections of 4-5 microns were cut using Leitz microtome with disposable blades and stained with Haematoxylin and Eosin.

Results

Upon clinical examination, bilateral symmetrical alopecia, swelling and erythematous erosive lesions were seen on face included the muzzle, peri-orbital region, chin, nasal planum and pinnae with lesions extending to forelimbs.

Histopathology of biopsy sample revealed, the epidermis was normal. The dermis was often characterized by multiple discrete pyogranulomas, comprising of nodular clusters of numerous variable sized neutrophils and surrounded by larger epithelioid macrophages. This typical pyogranuloma was present at the level of isthmus of hair follicle and inflammation was predominantly pustular and suppurative. Large clusters of neutrophils were present in dermis around the ruptured follicles. The dermis was characterized by dermal oedema with granulation tissues.

Discussion

Glossy coat and healthy skin are the hallmarks of cosmetic appearance of dogs. The integumentary system is one of the largest systems in the body, at the same time they are influenced by plethora of infectious and non-infectious agents. Skin being largest organ but have limited range of response, their pattern for different skin diseases is found in a similar manner. Thus, diagnosis makes quiet challenging in complicated versions of skin diseases. This renewed interest towards particular topic.

A case of juvenile sterile granulomatous dermatitis and lymphadenitis in dachshund male puppy of 5-month-old in present study, which usually occurs in young puppies between 3 to 24 weeks or 1 to 6 months of age as reported by Mason *et al.* (1989) [9], White *et al.* (2001) [15], Scott *et al.* (2001) [3] and Gross *et al.* (1992) [4].

Though there is no established gender predilection, some researchers have found that the incidence was higher in males (Mason *et al.*, 1989) [9].

Increased susceptibility to certain breeds such as dachshund were at higher risk as reported by Scott *et al.* (2001) [3] and were consistent with the above findings. The other breeds at

increased susceptibility are golden retrievers, Labrador retrievers, Siberian husky, Lhasa apso, Poodle, Spaniels according to, Miura *et al.* (2005) [10], Scott *et al.* (2001) [3] and Krishna *et al.* (2020) [8].

In the percentage occurrence of puppy strangles was 1.11 percent. The condition was said to be idiopathic, ill-defined etiology and rare disease as reported by earlier workers (Gross *et al.*, 1992; Scott *et al.*, 2001) [4, 14].

Clinically, bilateral symmetrical alopecia, swelling and erythematous erosive lesions seen on the muzzle, peri-orbital region (including eyelids), chin and pinnae, lesions extending to forelimbs (Gardbaum, 2009 and Gupta *et al.*, 2020) [2, 5]. Sub mandibular lymphadenopathy was observed as reported by Gupta *et al.* (2020) [5].

Other findings, such as sterile cutaneous pustules often developed in specified areas of muzzle, lips and eyelids. Otitis externa was common observation and ear pinna often indurated and oedematous. Small ulcers, draining tracts, seropurulent exudates, crusts may be developed from the ruptured pustules as reported by Gupta *et al.* (2020) [5]. Nodules over trunk, preputial/perineal areas have also been reported by Inga *et al.*, (2020) [7]. According to Basset *et al.* (2005) [1] older dogs revealed more conspicuous symptoms with pyrexia. While, Gardbaum (2009) [2] described lethargy, pyrexia and inappetence, joint pain with synovial fluid showed sterile neutrophilic inflammation in her studies.

Histologically, the epidermis was normal. The dermis was often characterized by multiple discrete pyogranulomas, comprising nodular clusters of numerous variable sized neutrophils and surrounded by larger epithelioid macrophages. This typical pyogranuloma was present at the level of isthmus of hair follicle, inflammation was predominantly pustular and suppurative. Large clusters of neutrophils were present in dermis around the ruptured follicles. The dermis was characterized by dermal oedema with granulation tissues. The observation of present study correlated well with those of earlier researchers (Scott *et al.*, 2001; Inga *et al.*, 2020 and Parihar *et al.*, 2022) [14, 7, 12].

In present study, rare case of puppy strangles was recorded with ill-defined etiology, which is said to be mainly encounter in a young pups less than 6months of age.



Fig 1: Photograph of puppy strangles showing symmetrical alopecia patches on the ventral abdomen.



Fig 2: Photograph of juvenile cellulitis/puppy strangles showing severe erosive lesions on the face included peri ocular regions and nasal planum.



Fig 3: Photograph of puppy strangles showing erosive lesions on the forelimb.

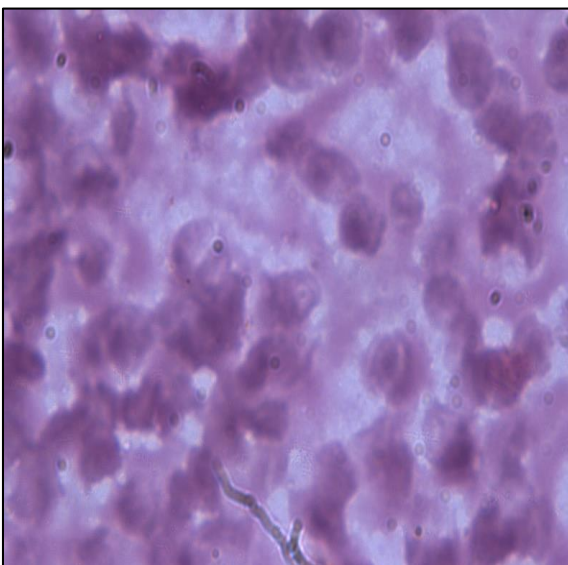


Fig 4: Photomicrograph of puppy strangles Grams staining cytology revealed no organisms thus, confirmed sterile pustules.

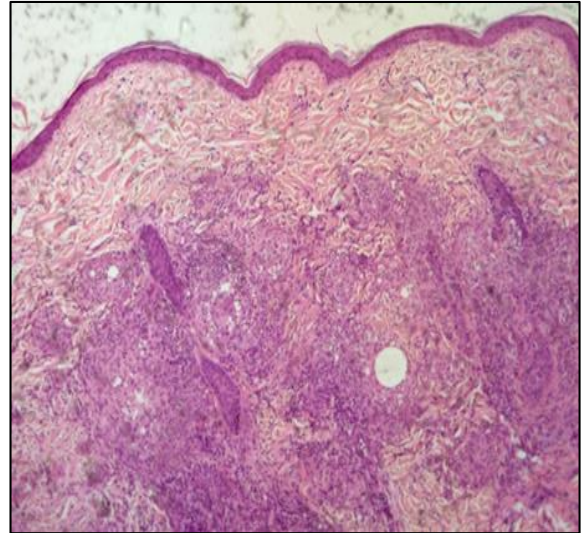


Fig 5: Photomicrograph of puppy strangles showing normal epithelium with dermal nodular pyogranulomatous lesions. H&E X50

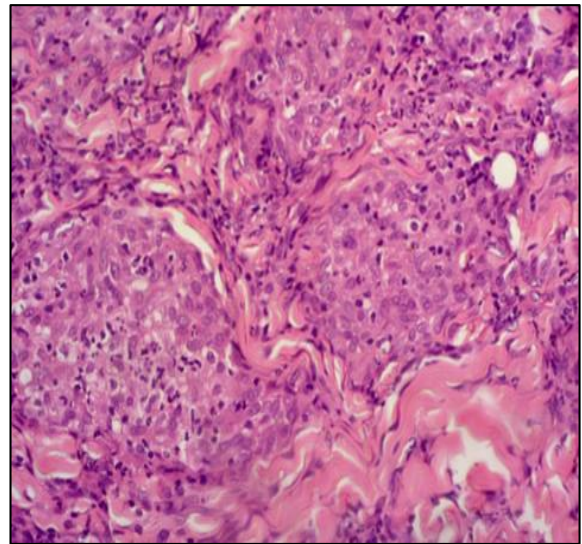


Fig 6: Photomicrograph of puppy strangles showing nodular lesions consisted epithelioid macrophages with foamy cytoplasm and neutrophils. H&E X400

Conclusion

Pet practices constitute a major portion of skin ailments with dermatological diseases. Dermatological diseases make an important part of daily clinical practice; require specific diagnosis for suitable therapeutic interventions. In the present case of unknown origin and pathology; along with appropriate history and clinical examination, the skin biopsy served as a gold standard technique and imparted collateral and confirmative evidence to conclude the diagnosis as juvenile pyoderma/puppy strangles.

Approval

The study protocol was reviewed and approved by Institutional Animal Ethical committee (IAEC), Veterinary college, Hebbal, Bangalore and the procedure was designed to avoid or minimize discomfort, distress and pain with IAEC approval No. VCH/IAEC/2022/39 dated: 10.08.2022.

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