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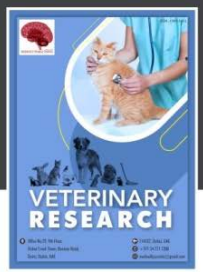

Concurrent Eosinophilic Granulomatous Dermatitis and Cutaneous Mucinosis in a Shar-Pei Dog

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Abstract: Canine Eosinophilic Granuloma (CEG) is a rare skin disease of unknown origin. The lesions comprise nodules or plaques, mostly localized in the oral cavity. To describe the clinical presentation, histological features, treatment and outcome of concurrent eosinophilic granulomatous dermatitis and cutaneous mucinosis in a Shar-Pei. A seven-year-old sharpie dog with a large nodule on the frontal region of head was referred to private veterinary hospital. Well circumscribed, soft cutaneous nodule observed in dermatological examination. Histopathological examination revealed microgranuloma structures with degenerated collagen fibers, surrounded by large amounts of eosinophils and other mononuclear inflammatory cells as well as deposit of mucin-like substance which stained with Alcian blue. The follow-up of the case 6 months later showed no evidence of tumor recurrence.

INTRODUCTION

Canine Eosinophilic Granuloma (CEG) is a rare benign skin disease of uncertain etiology. A genetic basis for the disease has been suggested; Siberian huskies and Cavalier King Charles spaniels seem to be genetically predisposed to the disease. Sporadic cases have been reported in other breeds such as Labrador retrievers, English setters and German shepherd dogs (Turnwald *et al*., 1981; Curiel *et al*., 1988; Scott *et al*., 2001). They are most common in the oral cavity and less frequent in haired skin such as inner thighs, ventral abdomen, flanks and prepuce (Bloom, 2006; Gross *et al*., 2008). This disease most commonly presents as single to multiple ulcerated lesions, in oral cavity, often on the lateral or ventral surfaces of the tongue or on the soft palate other infrequent locations are the external ear canal, the nasal planum and the trachea (Turnwald *et al*., 1981; Bloom, 2006; Bredal *et al*., 1996; Madewell *et al*., 1980; Poulet *et al*., 1991; Brovida and Castagnaro, 1992). Head skin eosinophilic dermatitis concurrent with mucinosis has not been previously reported in sharpie. The present study describes the morphopathological characteristics of mucinosis and eosinophilic granuloma in a Shar-Pei dog.

MATERIALS AND METHODS

Case report: A 7 year-old, male sharpie was presented for dermatological evaluation in private veterinary hospital in Tehran, Iran. The owner's concern was the appearance of a cutaneous nodule of 3 month's duration

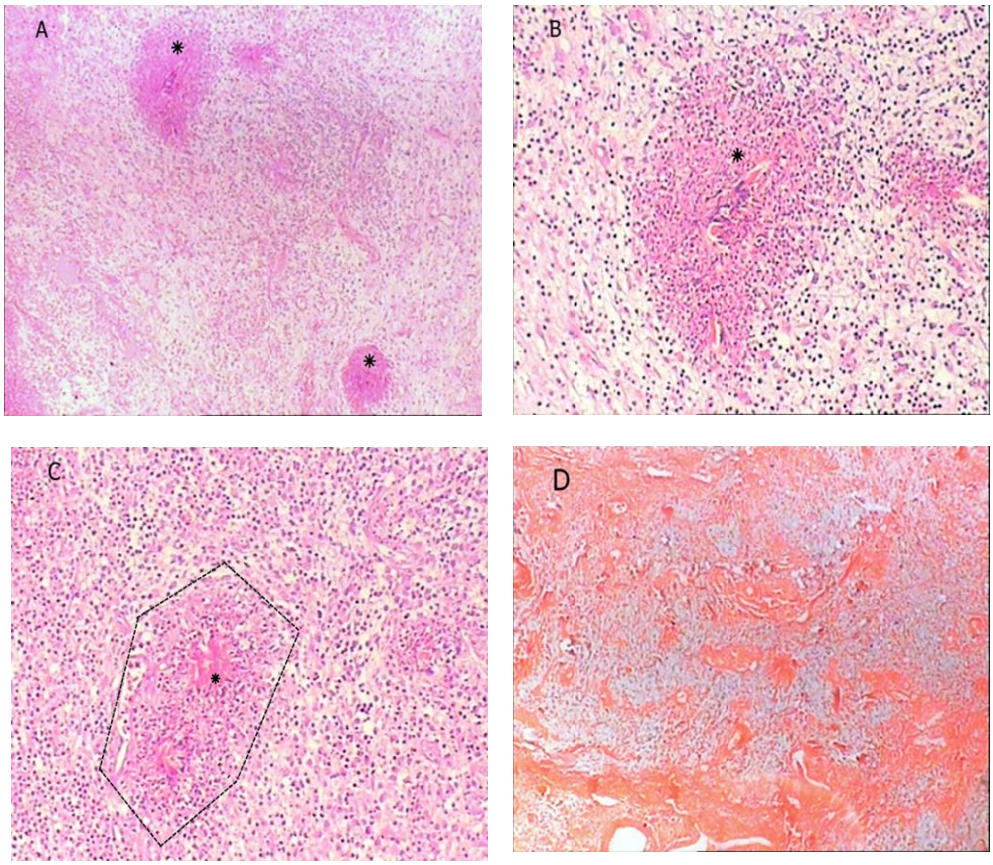

Fig. 1(A-D): (A) Intensive infiltration of eosinophils and other mononuclear cells in dermal layer. The flame structures with deeply eosinophilic stain are conspicuous (Asterisks). Hematoxylin and eosin x40, (B) Figure A with higher magnification. Eosinophils are surrounded the collagenous segment which produce the flame figure (asterisk). Hematoxylin and eosin x100, (C) The granuloma-like structure which enclosed by eosinophils and macrophage-epithelioid cells (dotted line) with central eosinophilic material (asterisk). Hematoxylin and eosin x100 and (D) Positive mucin staining in the dermal layer. The bluish matrix is placed between sheet of cells and disrupted collagen fibers. Alcian blue x40

on the head. The dog was in health on general physical examination. Dermatological examination showed a well circumscribed, soft cutaneous nodule on the frontal region of head. The lesion was not painful and was approximately 5 cm in diameter. The overlying skin was intact. Complete Blood Count (CBC) yielded results within the normal reference ranges. Surgical excision was conducted and followed by histopathologic examination before proceeding to any treatment.

A portion of the surgical specimen was used to investigate bacterial and fungal infections by culture on blood agar and Sabouraud's medium. Grossly, the nodule was solitary, round to oval shape, raised, alopecic and firm. On cut surface, the dermal nodule was well- demarcated by thickened capsule.

The appropriate tissues of the mass were fixed in 10% buffered formalin, routinely processed, stained with Hematoxylin and Eosin (H&E), Periodic Acid-Schiff (PAS) and Ziehl-Neelsen. Cultures for bacteria and fungi were also negative.

Histopathological examination showed intensive diffuse edema-like mucin with scant mononuclear inflammatory cells and fairly vascular dilation which was prominent features in dermal-epidermal junction, however, the epithelial layer had no changes. In the deeper layer, there was intense infiltration of inflammatory cells, chiefly consisted of eosinophils and lesser extent of other leukocytes like lympho-plasma cells and reacted macrophages (Fig. 1A). In the center of the lesion, the heavily disrupted collagen fibers were rimmed by eosinophils which made flame figures (Fig. 1B), embedded in a loose connective tissue stroma, nevertheless a few of them very similar to granuloma structures (Fig. 1C) mild fibrosis and perivasculitis were

also present, however, at the margin of the lesion intensive dense fibrosis was striking. No infectious agents were detected in sections stained with Ziehl-Neelsen and PAS but Alcian blue staining unveiled the large amounts of pale-bluish, mucin materials in the dermal layer (Fig. 1D) Examination under polarised light was negative for presence of foreign bodies. No recurrence of the skin lesion was observed during the following 6 months. In skin biopsies, the mucinous material was stained intensely with Alcian blue and bound strongly by the hyaluronan-binding protein.

RESULTS AND DISCUSSION

Mucin is a normal component of the dermis, although, the amount of dermal mucin decreases with age (Hashimoto and Niizuma, 1983; Lever *et al*., 1975; Muller *et al*., 1989). It is the ground substance surrounding collagen fibers, elastic fibers, vessels and appendages. Dermal mucin is a complex of protein and acid mucopolysaccharides, primarily hyaluronic acid and chondroitin sulfate B (dermatan sulfate). In hematoxylin and eosin-stained sections dermal mucin is faintly basophilic. Excessive accumulation of mucin within dermal tissue called mucinosis. The accumulated mucin consists of non-sulfated mucopolysaccharides and is mainly hyaluronic acid. It is metachromatic with basic dyes (giemsa, toluidine blue), stains with Alcian blue at pHs >1.0 and is largely removed by hyaluronidase digestion. Severity of lesion related to individual characterization and host immune response. Histopathological signs are differed from mild mucinosis with diffuse pattern or focal accumulation around adnexal structures with mild to moderate disruption of interdermal fibers or remarkable by proliferation of variable numbers of fibroblasts and mononuclear cells infiltration (Abd-El-Aal *et al*., 1981; Coskey and Mehregan, 1977; Scott, 1982; Valenzuela *et al*., 1984).

CEGs are rare lesions of uncertain origin with multiform clinical manifestation. It has been reported in the dog as a rare lesion of the skin and oral cavity (Bredal *et al*., 1996; Brovida and Castagnaro, 1992). Only few reports of skin lesion are documented in dogs. The reported lesions vary from multiple cutaneous nodules in ventral abdomen, prepuce, flanks or limbs to solitary lesions in eyelid, nasal skin and external ear canal (Turnwald *et al*., 1981; Poulet *et al*., 1991; Vercelli *et al*., 2005). This report describes eosinophilic granulomatous dermatitis in sharpie dog, a breed in which the disease has not been reported so far. In addition, our case was found on the head which consider as unusual site of eosinophilic dermatitis. The disease can develop with several pathogenic mechanisms which included, vasculitis, microangiopathy, disorders of fibrinolysis, phagocytic function and catabolic enzyme release, also traumas and hypersensitivity reactions. In this case there was no definitive evidence of any of these possible causes. In dogs, CBCs occasionally show eosinophilia in eosinophilic dermatitis (Curiel *et al*., 1988; Bredal *et al*., 1996; Scott, 1983). However, in this case the CBC was within normal range. Based on the gross findings, histopathologic features, this case was diagnosed as EG with mucinosis in dog.

CONCLUSION

To the best of our knowledge, this is the first documentation of CEG in shar-pei breed. The occurrence of CEG is not common in this location and has not been reported previously.

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