

Cutaneous Eosinophilic Granulomas in a Pet Holland Lop Rabbit (*Oryctolagus cuniculus*)

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ABSTRACT

A 2-year-old male intact pet Holland Lop rabbit (*Oryctolagus cuniculus*) was presented for routine bilateral orchiectomy at which time two distinct raised, alopecic, non-ulcerated skin masses over the right shoulder and caudal abdomen were observed on physical examination. Complete resection of both masses was attained via excisional biopsies which healed without complication. Histologically, the skin masses were identical and were composed of a mixed cellular dermal infiltrate of primarily eosinophils with macrophages, mast cells, lymphocytes, plasma cells, and heterophils. Based on these findings, a diagnosis of eosinophilic granuloma was made, indicating this rare condition should be considered in rabbits presented with similar lesions.

Key words: Eosinophilic Granuloma; Cutaneous; Dermatoses; Rabbit; *Oryctolagus cuniculus*.

INTRODUCTION

Eosinophilic dermatoses (ED) are conditions characterized by infiltration and/or degranulation of eosinophils within cutaneous tissues, these lesions having variable clinical presentations (1). In domestic felids, EDs are routinely diagnosed, often being associated with the eosinophilic granuloma complex (EGC) including eosinophilic plaques (EP), indolent ulcers (IU), and eosinophilic granulomas (EG) (2,3). Additionally, EDs are commonly reported in horses and infrequently in other species (e.g., dogs, humans) (1,2,4). In rabbits (*Oryctolagus cuniculus*), EDs are poorly described with only a single previous report of an EG-like lesion in a rabbit (5). This report describes an unusual eosinophilic dermatopathy in a pet rabbit in which both clinical presentation and microscopic description varied from the previous report.

CASE SUMMARY

A 2-year-old, 1.99 kg, male intact pet Holland Lop rabbit (*Oryctolagus cuniculus*) presented for a routine elective bilateral orchiectomy. The rabbit had no medical problems and experienced no major environmental changes previously.

The physical examination was unremarkable apart from two dermal lesions. On the right shoulder over the dorsal aspect of the scapula was a 7 mm by 5 mm skin pink-colored raised, alopecic, non-ulcerated erythematous cutaneous mass (Figure 1). A second lesion, of similar appearance, was noted on the right caudal abdomen and measured 4 mm by 3 mm. The rabbit did not display any signs of pruritus or excoriation.

Prior to the surgical procedure, a blood sample was collected from the lateral saphenous vein and submitted for a CBC and plasma biochemistry profile. The results were unremarkable when compared to normal reference ranges for rabbits (6,7). The rabbit was premedicated using intra-



Figure 1: Gross image of the right scapular mass from this pet Holland Lop rabbit. Mass measures 7 mm by 5 mm, is raised, alopecic, smooth, pink in color, and not noted to be either ulcerated or erythematous.

muscular 1mg/kg midazolam (West-Ward Pharmaceuticals Corp., NJ, USA), 0.05 mg/kg buprenorphine (Buprenex; Par Pharmaceuticals, Spring Valley, NY, USA) and 7mg/kg ketamine (Ketaset; Mylan, Rockford, IL, USA). General anesthesia was induced via face mask with 5% isoflurane (Akorn Inc., Lake Forest, IL, USA) in 100% oxygen and anesthesia was then maintained with 1-2% isoflurane after a 3.0-mm-sized endotracheal tube was placed endoscopically. A 24 g intravenous catheter was placed in both cephalic veins and 10

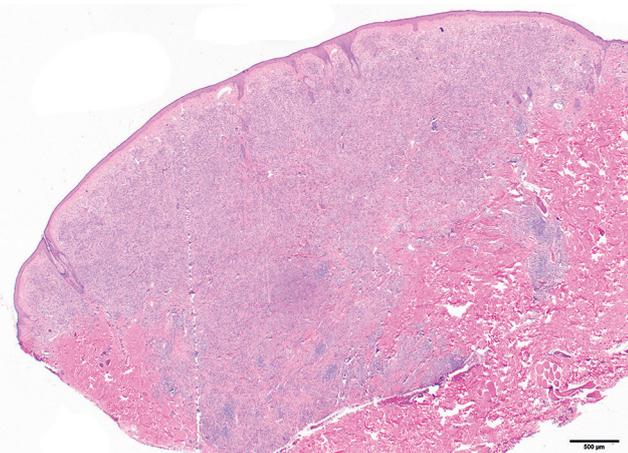


Figure 2: Low magnification microscopic image of the right scapular mass from this pet Holland Lop rabbit. Elevation of the epidermis by a dermal infiltrate is noted with no invasion of the epidermis or evidence of edema or ulceration.

ml/kg/hr fluid therapy (LRS; Lactated Ringer's solution; Abbott Laboratories Inc., Chicago, IL, USA) was administered by continuous rate infusion using a syringe pump throughout the duration of the procedure. The rabbit was kept on a heating pad. Heart rate and rhythm were monitored using a Doppler ultrasonic flowmeter (Ultrasonic Doppler Flow Detector Model 811; Parks Medical Electronic, Aloha, OR, USA) placed over the sternum and Lead III electrocardiogram (Mindray PM 9000 Vet Portable Veterinary Monitor; Mindray Medical USA Corp., Mahwah, NJ, USA) connected to the limbs. The respiration was monitored using inline capnography (Tidal Wave Sp Novamatrix Handheld Capnography Model 615; Novamatrix

Medical Systems Inc., Wallingford, CT, USA).

Following routine bilateral orchiectomy under general anesthesia, a full thickness excisional biopsy of both masses was obtained using a size-matched disposable Baker's biopsy punch (SklarTru-Punch disposable biopsy punch, 10 & 6 mm; Sklar, West Chester, PA, USA). The excised masses were preserved in 10% neutral buffered formalin and submitted to a veterinary diagnostic laboratory for histopathology. Following closure of both biopsy sites,

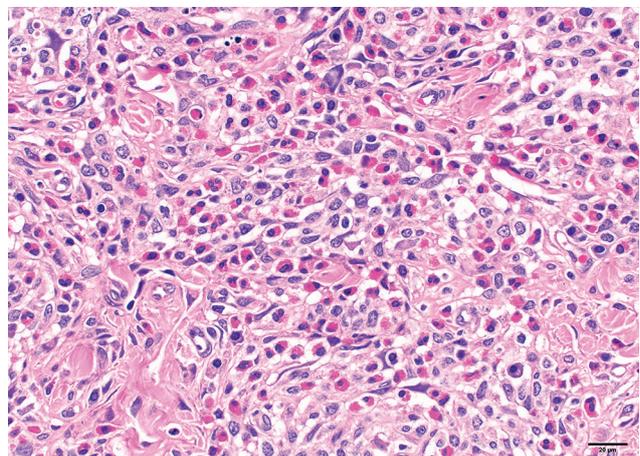


Figure 3: High magnification microscopic image of the right scapular mass from this pet Holland Lop rabbit. A mixed dermal infiltrate consisting primarily of eosinophils with mast cells, lymphocytes, plasma cells, and heterophils present.

flumazenil (Flumazenil injection; Ben Venue Labs, Bedford, OH USA) was administered for midazolam reversal and recovery. The rabbit recovered uneventfully. Follow up two weeks post-surgery, the owner noted no adverse issues with the rabbit reported to be clinically normal.

Histopathological examination of the shoulder mass revealed a superficial dermal infiltrate which elevated the overlying histologically normal epidermis (Figure 2). The cellular infiltrate was composed of mixed inflammatory cells primarily being eosinophils; however, including also macrophages, mast cells, lymphocytes, plasma cells and heterophils (Figure 3). Complete surgical excision was achieved with a lateral margin of at least 4 mm, and a deep margin of at least 2 mm. Examination of the abdominal mass revealed a similar lesion and cellular infiltrate. Surgical excision of this mass was also complete. Toluidine blue and Giemsa stains were both negative, ruling out the differential of mast cell tumors. Based on the dense populations of eosinophils observed on high power fields, the final diagnosis of both lesions were eosinophilic granulomas.

DISCUSSION

In small animal companion species, EGs are most often diagnosed in cats; however, EGs are also commonly reported in horses (2,4,8). In cats, they may present as multiple nodules around the oral cavity or as linear lesions located most commonly on the medial thigh (2). Lesions are often non-pruritic, erythematous, and alopecic (2,3). In cats, EGs are may be grouped within the EG complex (EGC) which include three clinically distinct manifestations (e.g., IU, EP, and EG) (2,3). In addition, EGC lesions may be histologically indistinguishable and have significant overlap in microscopic findings; additionally, all EGC lesions exfoliated eosinophils when a compression smear or skin scrape is performed (3). Due to microscopic similarities, it has been suggested that when discussing these lesions diagnostically, that they be described as Eosinophilic Dermatopathies (Eds) (3).

Eosinophilic dermatopathies are rarely reported in rabbits (9,10). A retrospective survey at a single university clinic of skin disease in 334 pet rabbits over 20 years reported only a single case of an ED, of unreported gross and microscopic description (9). A single case report of a 4-month-old male New Zealand White rabbit described EG-like lesions present both near the oral cavity and on several digits. Microscopically,

the historical case report lesions had cellular infiltration of the dermis and epidermis with microscopic evidence of both edema and ulceration of the superficial epidermal layers (5). In contrast, the presently reported rabbit was clinically asymptomatic with the masses incidentally identified at physical examination with both masses noted to have no gross evidence of ulceration or inflammation. Additionally, while the inflammatory cell types and populations appear to be similar to the historically reported case, the cellular infiltrate in the present case involved only the dermal layer with no evidence of edema or ulcerations in either mass.

An ED should be considered in cases of both ulcerative and non-ulcerative skin lesions in rabbits. Microscopic observation of eosinophils is required for diagnosis of an ED; therefore, microscopic evaluation of skin scrapes, aspirates, or biopsies including histology should be considered if pursuing definitive diagnosis (1-3). Additional studies are needed to determine fully the pathophysiology of EDs in rabbits.

Similar to the historical report of an EG-like lesion in a rabbit, no areas of suspected collagen degeneration are reported (5). Microscopically, ED lesions in cats are classically reported to have poorly marginated areas of eosinophilic granular debris around collagen bundles, resembling both collagen degeneration and flame figure lesions (i.e., eosinophilic degranulation surrounding collagen fibers) (3). In clinically diagnosed feline ED lesions (e.g., IU, EP, and EG), areas of collagen degeneration and flame figures have been reported together within the same lesion (2,3,11). Given this, it has been suggested that the presence of both lesions in cats with EDs may represent a progression of disease process, in which flame figures lesions preceded degeneration of collagen (12). A similar hypothesis exists for progression of lesions in the human ED, Well's syndrome (13,14). The authors note that while neither collagen degeneration or flame figure lesions are noted in the previous or current report of EDs in rabbits, it is unknown if a similar progression, as suggested in cats, is present in rabbit EDs. Further studies investigating progression of these rare dermatopathies are needed to clarify similarities with other species.

Etiology of EDs, regardless of species, are often reported to be multifactorial. In cats, dogs, and horses, associated causes may be hypersensitivity reactions to environmental allergens, insect bites (or imbedded insect parts), endogenous autoallergens, vaccinations, infectious agents (e.g., bacterial, viral, fungal), cutaneous parasitic infections (e.g., mites,

fleas), cutaneous trauma, or EDs may be idiopathic (8,15). Similarly, humans EDs are most commonly associated with allergic reactions from drugs, environmental antigens, atopic dermatitis and reactions to arthropod bites (16,17). It is currently unknown what initiates EDs in rabbits; however, similar etiologies such as a reaction to some environmental allergen or previous insect bite should be considered and investigated.

In summary, the present clinical case of an ED accounts for only the second report of an eosinophilic granuloma-like lesion in a rabbit. The present case contributes to our growing knowledge of rabbit skin diseases and it is suggested that clinicians should also consider this etiology when presented with rabbits showing similar dermal lesions.

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