Eosinophilic Granuloma in a Mule

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Abstract

**Background:** Skin lesions are the most common clinical complaints in animals. Thus non-neoplastic skin lesions in horses are under diagnosed, especially when laboratory resources are needed in field. Nevertheless the eosinophilic granulomas in mules are poorly reported in the international literature, including laboratory analysis and diagnosis, differential diagnosis, treatment and the evolution of the case.

**Case:** A 17-year-old mule was brought to our veterinary hospital with hard skin nodular lesions, which were irregular in shape and diameter. Body temperature was normal, and no alopecia, itching, erythema or pains were observed. Cytological examination by fine needle aspiration was done and the treatment was based on systemic dexamethasone for nine days and intralesional triamcinolone acetonic.

**Discussion:** The cytological examination by fine needle aspiration revealed a high cellularity of eosinophils, and the histopathology analysis confirmed the diagnosis of eosinophilic granuloma. Complete regression of the lesions was achieved after one week of treatment. Although previously reported in horses, eosinophilic granuloma is still poorly documented in mules. The treatment with systemic dexamethasone and intralesional triamcinolone acetonic was effective and lead to total remission.

**Keywords:** Granuloma collagenolytic; Mule; Non-neoplastic; Skin nodules

Introduction

Skin lesions are the most common clinical complaints, and although they are not considered a great economic problem, they often cause disfigurement of the animals leading to decreased commercial value or possible discomfort to varying extents. Similar to dogs and cats, equines frequently present dermatological conditions [1,2]. Sarcoïd and squamous cell carcinoma are the most common neoplastic tumors that affect equine skin [3]. Exuberant granulation tissue and eosinophilic granuloma the inflammatory are two of the three most common proliferative and non-neoplastic (however tumorous-like) lesions of horse skin [2-4].

One or more firm nodules that are not sore and do not itch, as well as alopecia and ulcerations characterize the disease. Moreover, the disease does not have any predisposing factors such as breed, sex or age [5,6]. Its etiology is still not completely understood; eosinophilic granuloma is related to hypersensitivity to insect bites, warmer seasons, and trauma in the location of the saddle [2,5]. The nodules can vary from 0.5 to 5.0 cm in diameter and generally occur on the animal’s back, rump, neck, and chest. Nonetheless, the nodules can be generalized and can appear in uncommon places such as members, eyelids, and mouth [5].

There are few studies related to proliferative non-neoplastic nodular lesions in equine, especially in the skin [3]. Although eosinophilic granuloma is one of the most common proliferative, non-neoplastic, nodular skin diseases in equine, only one case has been previously reported in mules [2-4]. Therefore, this study aimed to report the clinical findings, auxiliary exams and treatment of eosinophilic granuloma in a mule.

Case

A 17-year-old mule weighing 400 kg was brought to the veterinary hospital showing multifocal skin nodules. The owner stated that the lesions appeared gradually, starting from a single lesion on the rump. In a few days, the lesions were present on the rump, ribs, abdomen, flank, and vulva, finally reaching the neck and members. Still according to the owner, the appearance of the nodules coincided with a change in the wood shaving bedding.

During the physical examination, the mule was alert and showed normal vital parameters: respiratory rate of 8 bpm, heart rate of 20 bpm, normal oral mucosa color and normal gut movement. The lesions had a multifocal distribution; the vulva, rump (Figure 1), abdomen, ribs, neck, and members were affected. The nodules were firm, irregular in shape, movable, and sessile and ranged from 1 to 5 cm in diameter; they had a normal temperature and were non-pruriginous, non-alopecic, non-erythematous, and non-painful to palpation. One of
the lesions located on the lateral side of the right thoracic member presented an increase in volume and pain sensitivity.

Fine needle aspiration biopsy was performed on two of the nodules the material was sent to the laboratory for histological (hematoxylin and eosin (H&E) and cytological (Rosenfeld). The smears were highly cellular, with approximately 90 to 95% of non-degranulated eosinophils. Small numbers of neutrophils, lymphocytes, and macrophages were also observed (Figure 2). Cytological evaluation was compatible with eosinophilic inflammatory reaction.

Then, an excisional biopsy was performed on one of the right scapular nodules. A 10-cm incision was made lateral to the nodule, and the subcutaneous tissue was divulsed for closed excision of the nodule. During the procedure, it was verified that the nodule was in the subcutaneous tissue, just between the skin and the right deltoid muscle. For the subcutaneous suture, 2-0 Poliglactin 910 (Vicrill São Paulo, SP, Brazil) was used, and 2-0 nylon (Ethicon® - São Paulo, SP, Brazil) was used for the skin suture. The surgical wound was cleaned twice a day with polyvinylpyrrolidone iodine 10% (1% of free iodine – PVPI – Rioquímica - São Paulo, SP, Brazil).

Histopathological examination (hematoxylin and eosin [H&E]) revealed a substantial eosinophil infiltrate at the center of the nodule that was accompanied by areas of collagen degeneration (Figure 3) and was surrounded by epithelioid macrophages (Figure 4) and a thin layer of fibroblasts and collagen fibers; therefore, the patient was diagnosed with eosinophilic granuloma.

The treatment was based on corticoid administration and the removal of the possible causative factors. The main identified causative factors were bug bites and wood shaving bedding. Dexamethasone (Chemitec® - São Paulo, SP, Brazil) was administered at 0.1 mg/kg for three days, 0.05 mg/kg for another three days, and then 0.025 mg/kg for three days. In the lesion located at the metacarpophalangeal articulation of the right thoracic member, we opted for one single intralesional application of 5 mg of triamcinolone acetonide (Hertape Calier® - São Paulo, SP, Brazil), due to the characteristics of that lesion.

Nine days after the beginning of the treatment, the nodules had reduced significantly in size. The nodule located in the metacarpophalangeal articulation presented total regression within 48 hours post triamcinolone application. One week later, no nodules were present.
Discussion

Nodular lesions on equine skin are frequently related to neoplastic lesions due to its prevalence. Tumoral lesions such as squamous cell carcinoma and equine sarcoid are relatively common in the equine clinics [3,4]. Non-neoplastic lesions (such as granulomas, cysts, cutaneous amyloidosis, habronemiasis and calcinosi circumscripta) and proliferative non-neoplastic lesions (exuberant granulation tissue) are frequently found in horses; however, they are not well described in mules [2,3]. Therefore, eosinophilic granuloma may be considered a common lesion in equines but is rare in mules. In a retrospective study [3] it was found 23 eosinophilic granuloma cases in 116 skin lesion samples. From these 23 eosinophilic granuloma cases, only one occurred in mule whilst the other 22 were in in horses. Hence this is the only eosinophilic granuloma in mules described in the reviewed literature.

In the current case, the differential diagnosis included axillary nodular necrosis, bacterial furunculosis, abscess, urticaria, epidermal inclusion cysts, cutaneous lymphoma, skin amyloidosis, viral papular dermatitis and hypersensitivity to bug bite [5]. The differentiation between proliferative non-neoplastic nodular lesions is based on history, palpation, and clinical appearance. Confirming the diagnosis requires dermatopathological evidence of a granulomatous reaction and the appearance of flame figures around collagen bundles consisting of eosinophilic granules [1]. Additionally, calcification can be observed in older lesions. The fine needle aspiration biopsy showed eosinophilic infiltration, but histopathology was necessary to exclude all other differential diagnosis possibilities.

Although eosinophilic granuloma is a hypersensitivity reaction, regional differences in the antigenic stimuli may exist [3], such as verified in this study. Eosinophilic granuloma is usually a reaction to a bug or tick bite; [3] however, in this case, the splinters of the wood shaving were the agent most likely responsible for the hypersensitivity. Recognizing the causative factor is extremely important for treating the disease because the removal of this factor is the main key for a cure.

The treatment choice depends on the number and type of the nodular lesions, and the prognosis is usually good, mostly depending on the lesion extension. In a retrospective study [7-11], 68 horses were diagnosed with nodular skin disease, and only seven cases (10%) were diagnosed as eosinophilic granuloma [11]. The differences among authors in the literature is most likely caused by the fact that in cases of eosinophilic granuloma in the saddle or girth region, the attending veterinarian makes the diagnosis based only on the clinical findings [9]. Glucocorticoids are advocated as the principal means of treating these lesions [10,11]. Satisfactory results have been achieved with systemic corticoid therapy, with no need for surgical intervention [9]. Some authors recommend 1 mg/kg of prednisolone once a day for three weeks, and 5-10 mg intralesional methyl-prednisolone every 2 weeks [10]. The intralesional administration of corticoids depends on the size of the lesion and the presence of mineralization. In some cases in which corticoid therapy is ineffective, surgical removal is needed [10,11]. We opted for clinical treatment due to the number and distribution of the nodules. Because surgical removal would be inefficient, we administered decreasing daily doses of dexamethasone (0.1 mg/kg, 0.05 mg/kg, and 0.025 mg/kg) for nine days; this treatment coupled with a unique administration, by intralesional injection of 5 mg of triamcinolone acetonide were enough for complete regression of the lesions.

In conclusion, we present a case report of eosinophilic granuloma in a mule, diagnosed on histopathology. The treatment with systemic dexamethasone and intralesional triamcinolone acetonide was effective and lead to total remission.

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