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Case report

Cutaneous nodular fasciitis in the dog. Morphological and immunohistochemical study

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Abstract

Nodular fasciitis is a benign soft tissue lesion commonly diagnosed in human beings, but with rare description in dogs and cats. A female, spayed, 7.5 years old, otherwise healthy Labrador was examined because of a nodular growth of rapid development in the infraorbital region. The histopathological examination from the excisional biopsy revealed a well circumscribed proliferation of plump and moderately pleomorphic fibroblasts and vascular proliferation with a small central area of degeneration. Nodular fasciitis was diagnosed and several months pos surgical excision, no recurrence was observed. This report illustrates an histologically well circumscribed lesion of cutaneous nodular fasciitis in a dog, similar to some lesions in human beings and different from what is usually reported in veterinary patients.

Key Words: Nodular fasciitis, vimentin, cytokeratin, GFAP, S100, dog.

Introduction

Nodular fasciitis (NF), first described in human medicine as subcutaneous pseudosarcomatous fibromatosis (11), and also known as pseudosarcomatous fasciitis, is considered a benign, reactive lesion (8, 11), well described in human dermatology, but poorly reported in dogs and cats in scientific papers (3, 10).

NF in humans is perhaps the mesenchymal neoplasm that is most often misdiagnosed as a sarcomatous lesion, due to its fast growth and histological aspect (11). When described in dogs, NF is related mainly with ophthalmic lesions (1, 4). Information on cutaneous NF in dogs is restricted to a few textbooks (3, 6, 10). The purpose of this article is to describe the morphological and clinical findings of NF in a dog.

Case Report

A 7.5 year old, female, spayed, yellow Labrador was presented with the main complaint of a facial growth of rapid development (two weeks) localized in the infraorbital region. According to the owner, no known trauma had occurred; however, this possibility could not be ruled out due to history intense physical activity of the animal.

Physical examination showed an otherwise healthy dog with a one centimeter painless firm mass slightly adhered to the deep tissue covered by a normal skin appearance. Complete blood cell count, urinalysis, biochemical profile, chest X-rays, abdominal ultrasound, electrocardiogram and echocardiogram showed no abnormalities.

An excisional skin biopsy was performed, fixed in 10% buffered formalin and sent to the Service of Comparative Dermatopathology at Universidade Federal de Viçosa. The sample was routinely processed for paraffin-embedding and stained with haematoxilin and eosin and Masson trichrome. For immunohistochemistry, all serial section were placed on sylanized slides, dewaxed and rehydrated, according to the techniques previously described (2) The antibody used were: for vimentine, clone V9 (DakoCytomation, California, USA) diluted 1:50; for cytokeratin, clone AE1/AE3 (DakoCytomation, California, USA) diluted 1:50; for smooth muscle actin, clone 1A4 (a-SMA, Dakocytomation, Glostrup, Denmark) diluted 1:400, for endothelial cells factor VIII (code 0082 – Dako, 1:2000) and CD31 (clone JC70A, 1:40), a 1:100 dilution of polyclonal rabbit anti-S100A (S100, Dakocytomation, Glostrup, Denmark), and a 1:500 dilution of polyclonal rabbit anti-glial fibrillary acidic protein (GFAP, Dakocytomation, Glostrup, Denmark). The slides were washed in TRIS for 5 minutes and incubated with EnVision, a visualization system based on a unique enzyme-conjugated polymer and secondary antibodies (K4065, DakoCytomation, California, USA).

Histopathologic examination revealed a well circumscribed, non encapsulated cellular proliferation in the deep dermis and subcutaneous tissue, bellow the adnexal structures, at the level of muscle fibers (Fig. 1). This proliferative tissue was composed of plump, pleomorphic fusiform cells arranged in interlacing bundles along with vascular proliferation (Fig. 2). The vessels had narrow lumen, prominent endothelial cells, and a somewhat radial disposition near the center of the lesion. Edematous stroma and mild hemorrhage were present in the center of the mass (Fig. 3). Mitotic activity was moderate and also more frequent in the center of the lesion; a larger number of cells were found with mild anisokaryosis. Very mild foci of perivascular to intersticial infiltration by some lymphocytes and histiocytes could be found, but it was not a remarkable feature. The epidermis and adnexal structures and adjacent tissue had no morphologic alteration. The majority of the cells stained blue with Masson´s trichrome stain. However, some spindle cells localized mainly at the center of the lesion showed a red coloration (Fig. 4). Six months after surgical excision the animal was in good healthy without any signs of lesion recurrence.

The tissue proliferative spindle cells were strongly positive for vimentine (Fig. 5) and some cells were also moderately but variably positive for a-SMA (Fig. 6), negative for cytokeratin (but reacted with normal tissue epithelial cells), negative for factor VIII and CD31 (blood vessel endothelial cells positive) and completely negative for S100 and GFAP.

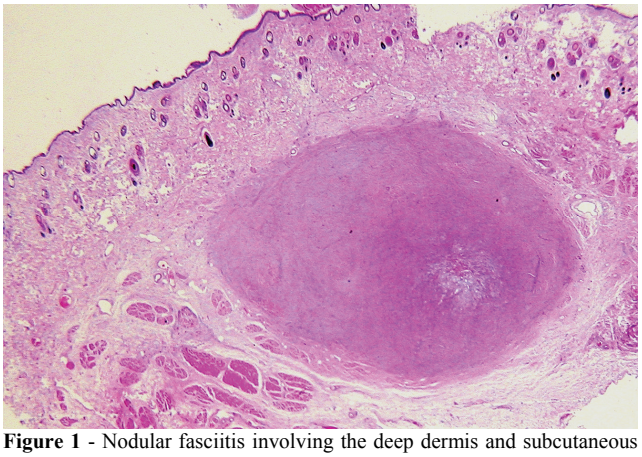

Figure 1 - Nodular fasciitis involving the deep dermis and subcutaneous tissue of a dog. Note the well circumscribed border of the lesion (HE X10).

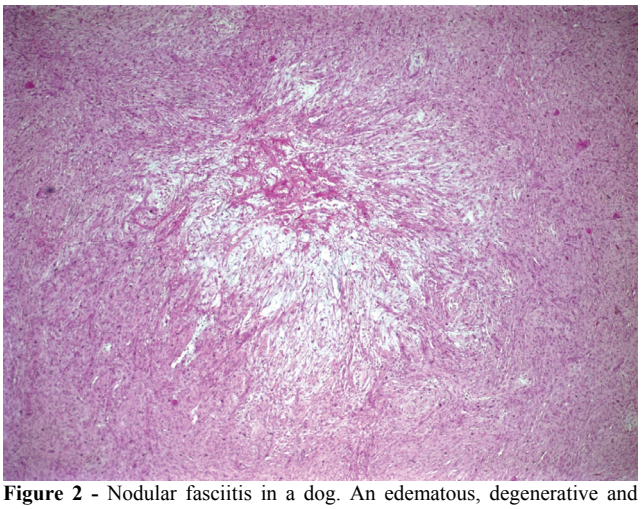

Figure 2 - Nodular fasciitis in a dog. An edematous, degenerative and myxoid stroma is located at the center of the lesion. The vessels show a somewhat radial disposition (HE X40).

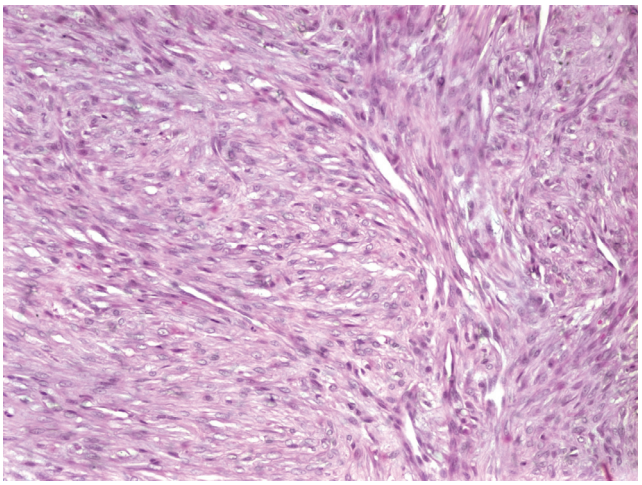

Figure 3 - Nodular fasciitis in a dog. A high cellular proliferation of plump fibroblastic cells is intermingled with blood vessels (HE X 400).

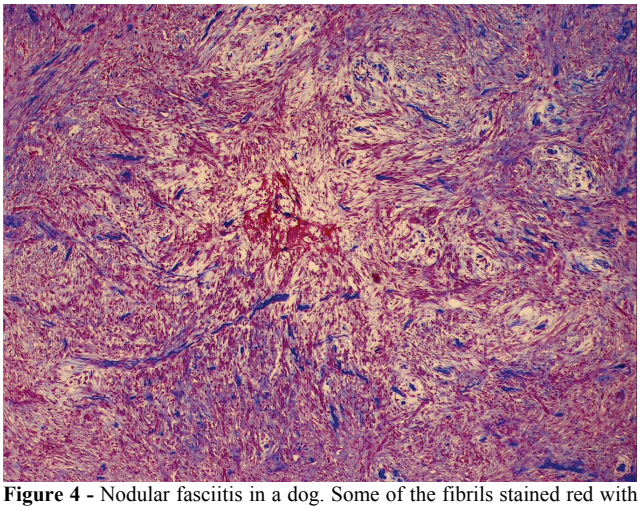

Figure 4 - Nodular fasciitis in a dog. Some of the fibrils stained red with Masson´s trichrome. Note also the hemorrhage (X200).

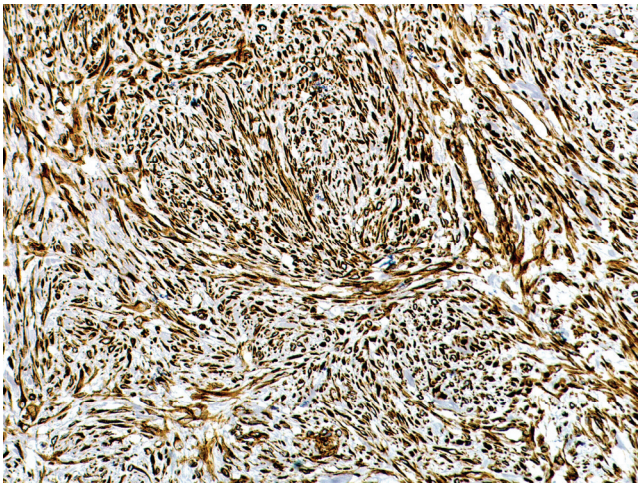

Figure 5 - Nodular fasciitis in a dog. The proliferative spindle cells strongly reacted positive with vimentin. (IHQ, hematoxilin counterstained, X300).

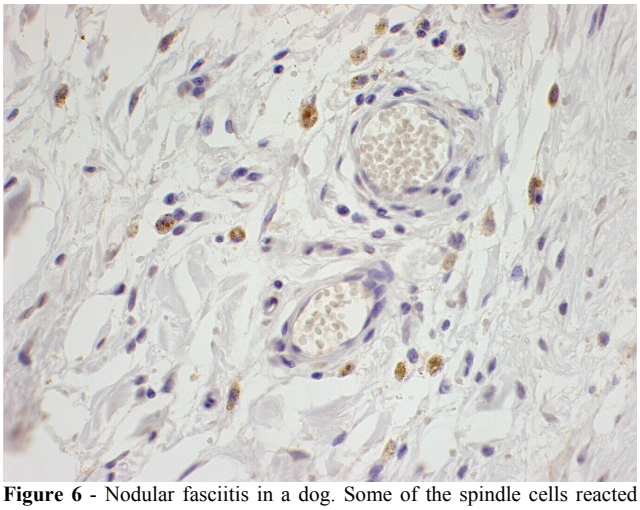

Figure 6 - Nodular fasciitis in a dog. Some of the spindle cells reacted positive with a-SMA – 1A4. (IHQ, hematoxilin counterstained, X400).

Discussion

Nodular fasciitis is a common and benign soft tissue lesion in humans (5). In humans, the lesions present a rapidly growing subcutaneous mass, reaching one to five centimeters in only a few weeks. The condition is most often seen in young or middle-aged adults. The subcutaneous nodules are often solitary and painful. Although the limbs and trunk are the mainly affected areas, any part of the body may be the target of this growth (5, 8).

In animals the condition presents as a benign, firm, non-circumscribed subcutaneous mass measuring from 0,2 to 5 centimeters in diameter (3, 10) and rarely involving the deep dermis (3). Lesions may be more frequent on the face, eyelids and head (10).

In human medicine there are different information regarding histopathologic findings in NF. The lesions are described as relatively well circumscribed (8) to poorly demarcated (5). Beyond the classical form, intradermal, ossifying, periosteal, proliferative and intravascular NF are reported in human medicine (8).

Histologically, NF in veterinary medicine is said to be poorly circumscribed (3, 10), with jagged or spiked margins (3). The present case, however, did not show this poorly demarcated pattern. The lesion margins were smooth, well circumscribed and normal collagen entrapment was not a feature. However, other morphological features of NF were present: proliferation of plump and mild to moderate atypical fibroblasts, vascular proliferation and a myxoid substance among collagen fibers. This well circumscribed border is also described for intradermal NF in human beings (9).

Interestingly the myxoid substance was more evident in the center of the lesion along with mild collagen degeneration. The spindle cells and fibers which stained red with Masson´s trichrome could represent myofibroblasts or immature or degenerated collagen fibers. This central area of edema and degeneration could represent the former morphological expression of an insult or merely an ischemic event, possibly associated with some form of vasculopathy.

Atypical fibroblasts, rapid growth and sometimes poor circumscription render the differential diagnosis or the misdiagnosis of sarcomatous lesions in human beings (11). Additional differential diagnosis of NF includes myxoma, fibrous histiocytoma and fibromatosis (11). In this case, fibroma, myxoma, fibrossarcoma, and myxofibrossarcoma were the main differential diagnosis. Fibrossarcoma and myxossarcoma were ruled out due the lesion well circumscription, lack of intense anysocariosis or atypical mitosis and prominent vasculature. Myxoma usually displays paucity of cells, poor vascularization and abundant myxoid stroma. Fibroma is paucicellular, has more collagenous stroma in a haphazard wave or repetitive array, the cells are smaller, uniform and atypical cells are not seen. Actually, on low magnification the lesion described here has fibroblastic and vascular proliferations that resemble “nodular” granulation tissue, as it has been described in human medicine (11).

The vimentin expression by the spindle cell demonstrates their mesenchymal origin but does not add any clue to the diagnosis. The positive stain of some cells with a-SMA confirms their myofibroblastic origin, which is clearly described for NF in humans (11) and in animals (3). The negative reactions of tumors cells to S100, GFAP and factor VIII-related antigen exclude or greatly decrease the possibility of melanocytic, neural or vascular origin of the tumors cells, respectively. However, as previously cited and for practical purposes, the most important aspects of the diagnosis are the histopathologic findings (3).

Only a slighted inflammatory lymphohistiocytic infiltration was present the case reported here, which is described in the literature (7), although scientific papers on cutaneous NF in dogs could not be found. If an animal disease is to receive the same nomenclature from the human counterpart, at least some criteria should be followed. Typically, NF in human medicine is described as a circumscribed lesion (8, 11), although infiltrative growth is also reported (5). Actually, some lesions, particularly those centered about the deep fascia are poorly circumscribed with an infiltrative pattern (11). So, the case reported here seems to represent a more superficial, nodular, circumscribed, and pauciinflammatory form of cutaneous NF in the dog. Since NF is assumed to be reactive, it is possible that the intensity of inflammatory process varies according to the time of evolution when the lesion is examined.

This putative benign biological behavior was confirmed by the clinical evolution. The dog had an uneventful recovery without local recurrence or metastasis six months post surgery. It seems that NF is a proliferative reactive process since in human cases, spontaneous regression usually follow incompletely excised lesions (5), although this phenomenon has not been reported in dogs (10). Indeed, in human medicine, the recurrence of a completely excised lesion prompts the reevaluation of the initial diagnosis of NF (5, 11).

There are no apparent breed, age or gender predisposition for NF (10). However, since trauma might be an etiological factor, the condition may occur more often in young and active animals (3). Pain or local sensitivity was not observed in the present case and, despite the fact that these signs are described in humans (8, 11), it is not an ordinary finding in animals (3).

Surgical removal is the treatment of choice, and the prognosis is good (3, 10).

In conclusion, this report describes an uncommon skin lesion in dogs, and show that NF may be manifested as well circumscribed nodular lesion similar to that seen in human beings.

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