FELINE CUTANEOUS LYMPHANGIOMA- CASE REPORT

LINFANGIOMA CUTÂNEO NUM GATO

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Abstract: *This article describes a case report of a feline cutaneous lymphangioma. Lymphangiomas (synonym: lymphangiomatosis) and lymphangiosarcomas are rare tumors, usually associated with skin, some are believed to be congenital in young animals associated with vascular abnormalities. In gross pathology description they are poorly defined, cavernous-spongy, soft and they may be identified along fascial planes, because of this it may be difficult to remove, so tumors tend to recur. In histopathology description we can see interconnecting channels lined by endothelium usually without erythrocytes, but these tumors do not have unique features..*

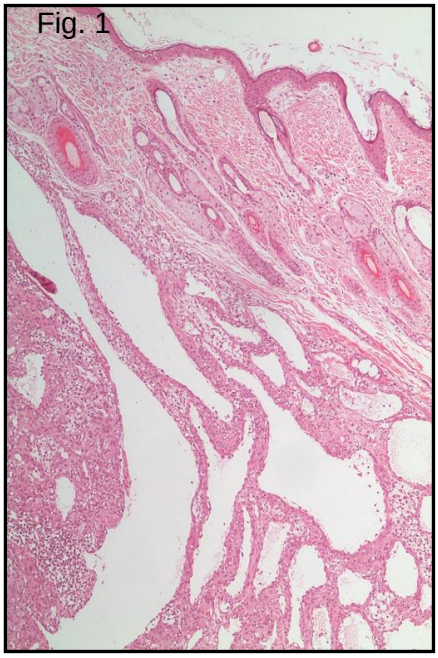
Resumo: *Este trabalho descreve um caso de linfangioma cutâneo felino. Linfangiomas (sinónimo: linfangiomatose) e linfangiosarcomas são tumores raros que habitualmente se encontram associados à pele. Pensa-se que em animais jovens possam mesmo ser congénitos e derivem de mal formações vasculares. Macroscopicamente são caracterizados por serem tumores pouco definidos, cavernosos-esponjosos, macios e passíveis de serem identificados ao longo de diferentes planos fasciais, essencialmente devido a esse facto torna-se difícil executar com sucesso a sua remoção cirúrgica, sendo a recurrência um comportamento frequente deste tipo de tumores. A descrição histopatológica assenta na presença de canais endoteliais lineares interconectados entre si e normalmente sem eritrócitos no seu lúmen, no entanto este tipo de tumores não possuem características que lhes sejam únicas*

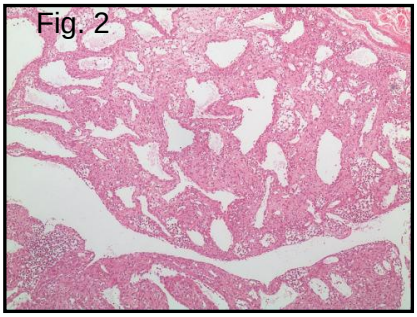
CASE REPORT

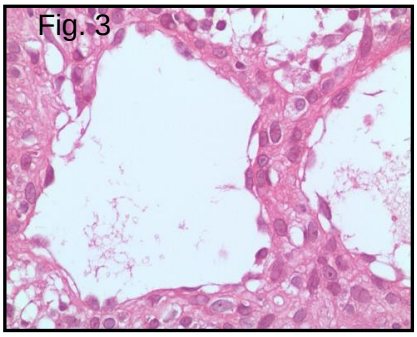
An 8 years-old male Persian cat presented in the local veterinarian, with a slow growing cutaneous nodule with 6 mm in diameter and 4 mm wide, near the upper eyelid. The nodule was removed by surgery and submitted for histopathology.

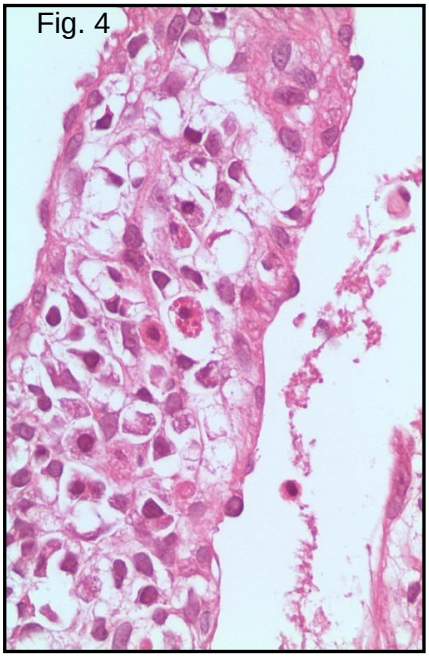
Tissue samples were fixed in 10% neutral formalin, processed routinely for paraffin embedding, sectioned at 3 µm, and stained with hematoxylin and eosin. The histological examination revealed a well-demarcated but unencapsulated nodule involving the dermis composed of numerous, dilated and irregular vascular structures lined by a single layer of endothelial cells (figure 1 and 2). The lumen of the vascular structures contained an erythrocyte-free proteinaceous fluid (figure 3). The endothelial cells were well-differentiated and no mitoses were seen. The supporting collagenous stroma was edematous and contained a mild infiltrate of lymphocytes, plasma cells and foamy macrophages (figure 4). The nodule was completely removed with wide margins. Immunohistochemistry demonstrated the endothelial cells to be positive for the lymphatic-specific marker LYVE-1 (brand ABCAM ref. Ab10278-100) at the dilution of 1:10 (figure 5 and 6).

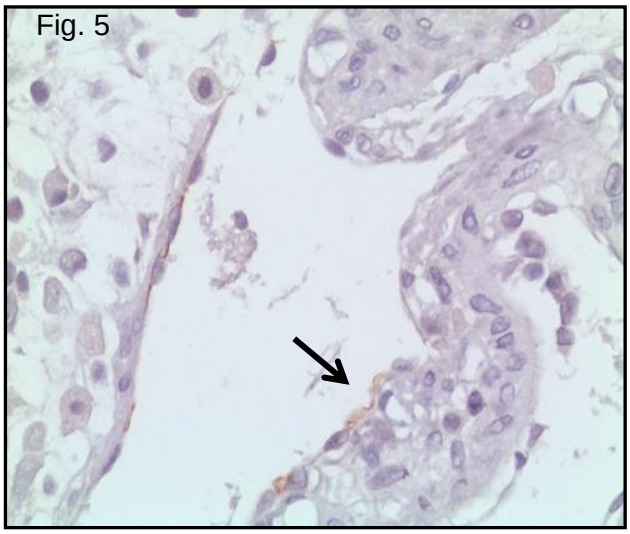
The histological findings and the immunohistochemistry staining were consistent with a diagnosis of cutaneous lymphangioma.











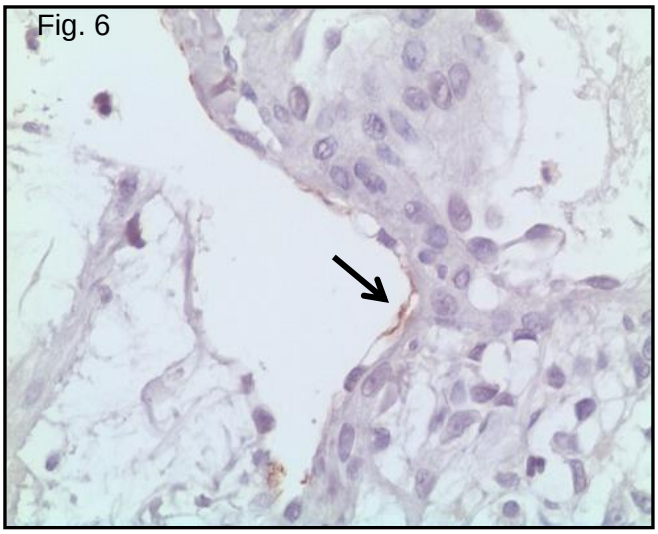


Figure 1 – Lymphangioma (H&E 40x) A well-demarcated but unencapsulated nodule involving the dermis composed of numerous, dilated and irregular vascular structures.
Figure 2 – Lymphangioma (H&E 100x) composed of numerous, dilated and irregular vascular structures.
Figure 3 – Lymphangioma (H&E 200x) with lumen of the vascular structures contained an erythrocyte-free proteinaceous fluid.
Figure 4 – Lymphangioma (H&E 400x) with supporting collagenous stroma was edematous and contained a mild infiltrate of lymphocytes, plasma cells and foamy macrophages.
Figure 5 – Lymphangioma immunohistochemistry staining for LYVE-1 Envision DAB: Mayer´s hematoxylin counterstain (H&E 400x). Arrow: cells with positive staining.
Figure 6 – Lymphangioma immunohistochemistry staining for LYVE-1 Envision DAB: Mayer´s hematoxylin counterstain (H&E 400x). Arrow: cells with positive staining.

DISCUSSION:

Lymphangioma is a bening tumor that arises from cells of embryonic mesodermal origin. In the case of lymphangioma the tissue of its source is the lymphatic endothelium.
Lymphangiosarcoma is a malignant version of lymphangioma and it occurs more often than the benign tumor (McGavin M. D. & Zachary J. F., 2007). However, some of the reported lymphangiosarcomas, may also represent lymphangiomas, as histologic differentiation is not evident (Gross *et al.*, 2005). Lymphangiomas are rare in domestic animals, for example, in a study performed in the Unites States was possible to calculate the frequency of canine and feline tumors in a defined population in Greater Tulsa area based on the annual dog and cat population presented to local veterinarians. A total of 1,127 specimens of canine tissues and 81 specimens of feline tissues were submitted to the registry in the first year of this study. Within a total of 899 canine tumors and 59 feline tumors, one canine lymphangioma and one canine lymphangiosarcoma as well as one feline lymphangioma were identified (MacVean *et al.*, 1978).
Cutaneous and subcutaneous lesions present as fluctuant swellings that may measure up to 18 cm in diameter, it is possible to have ulcers and tracts draining serous fluid or vesicles. Some lesions may be polypoid but usually they are solitary, well-defined masses as in this case (Gross *et al.*, 2005; Yamagami *et al.*, 2002). It is evident a predilection for intertriginous areas, in particular the groin and rear leg and most affected animals are less than 5 years of age with no sex predisposition (Gross *et al.*, 2005; Gontijo *et al.*, 2004). Metastases are rare but recurrence is common because the infiltrative growth of these tumors makes wide margins difficult to obtain. Early surgical excision can be curative. One reported case of lymphangioma was cured by radiation therapy (Meuten, 2002).
Histologically, lymphangiomas are characterized by a poorly circumscribed mass involving the dermis, subcutis, or both. The neoplastic cells resemble normal endothelial cells; however, the cells grow directly on bundles of dermal collagen, dissecting them and forming numerous clefts and channels. The lymphatic channels are composed of angular, dilated, and partially interconnected vascular structures lined by a single layer of uniform endothelial cells. The vascular channels contain small amounts of proteinaceous fluid and mixed mononuclear cells. Erythrocytes are rarely observed, but can be seen occasionally, presumably due to trauma or extravasations from nearby blood vessels. The endothelial cells lining the channels have minimal cytoplasm, elongated hyperchromatic nuclei, and inconspicuous nucleoli. Most of the neoplastic cells in the lymphangioma are bland, and mitoses are not evident. The connective tissue septa supporting the vascular structures frequently have an edematous or myxomatous appearance and contain a mild infiltrate of lymphocytes, plasma cells, and small numbers of mast cells (Gross *et al.*, 2005; Meuten, 2002).
The overlying epidermis may show acanthosis, spongiosis and, in some cases spongiotic vesiculation due to chronic leakage of plasma proteins. Ulceration is frequent as a secondary feature and results in marked granulation tissue formation. The malignant tumor differs little from its benign counterpart except for its increased cellular pleomorphism and poor demarcation (Gross *et al.*, 2005; Meuten, 2002).
The major differential diagnosis is bloodless cavernous hemangiomas and markedly vascular acrochordons. Architecturally, they are similar but usually lymphangiomas and cavernous hemangiomas are distinguished by the paucity of erythrocytes in the vascular spaces, stromal edema, mucine and lymphoplasmacytic infiltration which are features rarely observed in hemangiomas (Gross *et al.*, 2005). The observation of lymphoplasmacytic stromal infiltration and the presence of macrophages with intracytoplasmic foamy vacuoles that suggests lymph phagocytosis supported the diagnosis of a lymphangioma in this case.

Ultrastructurally, lymphangiomas and lymphangiosarcomas are reported with a thin and discontinuous but well-preserved basement membrane that may bridge over interendothelial gaps. thus forming the boundary between the lymphatic lumen and the interstitial connective tissue (Sauter B. *et al.*, 1998) opposing to hemangiomas or hemangiosarcomas, which have a continuous basement membrane (Gross *et al.*, 2005; Meuten, 2002; Sauter *et al.*, 1998). Another specific morphological feature of lymphatic capillaries presenting in lymphangiomas and lymphangiosarcomas is the intimate association with elastic and collagen fibers and fibrils that insert either directly or via microfilaments within the abluminal cell membrane. However, lymphatic capillaries lack the presence of accompanying pericytes (Sauter B. *et al.*, 1998). To differentiate lymphangioma or lymphangiosarcomas from vascular acrochordons it should be considered that the vessels in vascular acrochordons are less numerous when compared to lymphangiomas, and generally contain some red blood cells (Gross *et al.*, 2005).

Recently, new markers capable of distinguishing lymphatic vessels from blood vessels have been described, including podoplanin, PROX-1 (Prospero Homeobox Protein 1) and LYVE-1 (Lymphatic Vessel Endothelial receptor-1) (Gontijo *et al.*, 2004; Gross *et al.*, 2005).

The LYVE-1 molecule is the major receptor for the extracellular matrix glycosaminoglycan hyaluronan (HA). HA is diffusely present in the skin where its turnover is very rapid. For degradation it is transported through the lymphatic system to distant lymph nodes, and an HA receptor has been identified as almost exclusively expressed on lymphatic vessels. This receptor is absent in blood vessels. The marker LYVE-1 has recently been documented in cats (Gontijo *et al.*, 2004) and it was positive in this case, supporting our diagnosis

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