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Preputial lymphangioma in a stallion: First report

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Abstract

This short communication describes a case of a 30-year-old stallion with a mass on the base of the penis causing paraphimosis. The patient was submitted to anti-inflammatory and diuretic therapy with no signs of improvement, so 16 days after the lesion was detected, the animal was euthanized. Necropsy was performed, and histopathological assessment of the lesion was conducted. The mass was composed primarily of channels and cavernous structures, lined by elongated cells of vascular origin, located in the preputium. The lesion was diagnosed as a preputial lymphangioma. To the authors' best knowledge, the anatomical location of this neoplasm (which is rare in veterinary medicine) has not been previously reported.

KEYWORDS

equine, histopathology, immunohistochemistry, lymphangioma, neoplasia

A 30-year-old stallion with a body score condition of 2–3 on a scale of 10, presented with a swelling of the tissues around the dorsal aspect of the penis, adjacent to the penis glans. The lesion was apparently painless, and no temperature variations were detected. Godet test was negative. The mass resulted in paraphimosis, even though there were no signs of pain, discomfort, or difficulties during urination.

Initial approaches considered trauma as the most likely cause. Cytology/biopsy was not performed due to the stallion's advanced age and poor overall condition. The patient underwent therapy. For the first 2 days, flunixin meglumine (1.1 mg/kg, EV, SID) was administered, with additional local cold-water showers three times a day. Due to the lack of response, on the third day, therapy with dexamethasone (0.05 mg/Kg, EV, SID) and furosemide (2 mg/kg, EV, BID) was initiated. During the subsequent 3 days, there were no signs of improvement. For the following 2 days, 1 L of saline solution 0.9% with DMSO (dimethyl sulfoxide) 10% was slowly infused one time per day.

The swelling kept growing progressively. The advanced age, and poor general condition of the animal, as well as the constant growth of the mass, that did not respond to treatment, led the tutor to opt

for euthanasia. The animal was euthanized with T-61® (embutramide, mebezonium iodide and tetracaine) 16 days after the lesion was first detected.

Upon macroscopic examination of the reproductive tract, a mass protruding from the dorsal, ventral and right lateral aspects of the penis measuring 16 × 11 × 9 cm was detected. The lesion presented a spongy to moderately firm consistency and exudated gelatinous translucent yellow material on cross sections. The mass was composed of white to cream tissues with a glossy surface and indistinct borders. No other relevant changes were detected during the necropsy. The penis and adjacent tissues were collected and fixed in 10% buffered formalin for histopathological assessment.

Consecutive transverse sections of the mass were performed, and the samples were routinely processed, dehydrated, and embedded in paraffin wax. Consecutive 2 µm sections were performed in a microtome and dyed with haematoxylin–eosin stain (HE).

The microscopic examination revealed a neoplastic mass located in the foreskin's subcutaneous tissue, composed primarily of channels and cavernous structures, lined by elongated cells of vascular origin with flattened nuclei and scarce cytoplasm. The lumen of these channels was mainly optically empty. Neoplastic cells lining

the lacunar structures were well differentiated with no signs of pleomorphism or atypia, or mitotic activity. The neoplastic cell population was supported by abundant loose myxomatous stroma, with reticular organization (Figure 1).

Immunohistochemistry assay using the antibody anti-CD31 (clone JC70A [DakoCytomation]) was performed aiming to assess the histogenesis of the neoplastic population. The positive immunoreaction displayed by the elongated cells lining the cavernous spaces disclosed the vascular origin of the lesion, allowing its classification as a preputial lymphangioma (Figure 2).

Vascular tumours may be derived from blood (haemangiomas/haemangiosarcomas) or lymphatic vessels (lymphangiomas/lymphangiosarcomas). The latter are not common in veterinary medicine. They occur more often in dogs and cats and are mostly located at the subcutaneous tissue of the ventral midline and limbs. Some cases occurring in young animals are believed to be of congenital origin (Hendrick, 2017; Mauldin & Peters-Kennedy, 2016). Lymphangiomas usually present as masses with indistinct borders, typically located in the subcutaneous tissue. Their consistency ranges from gelatinous to spongy and serous exudate may be present. The microscopic picture is characterized by optically empty vascular channels or clefts lined by well-differentiated spindle cells with low mitotic activity (Hendrick, 2017; Hendrick et al., 1998).

Equine lymphatic tumours are rare, and to the best of the authors' knowledge, there are only two reports involving the male reproductive tract of horses. Turk et al. (1979) described a cystic infiltrative lymphangioma in a 6-month-old colt. The lesion had a multinodular appearance and was present in the left inguinal region, extending through the abdomen and retroperitoneal space, infiltrating the left lumbar muscles, mid-jejunum, left testicle and kidney, left inguinal and femoral canals and deep intermuscular fascia of the left hindlimb. The prognosis was poor due to progressive growth and secondary infection, so the animal was euthanized. More recently,

Voge et al. (2015) reported a lymphangioma in the right spermatic cord of a 4-year-old stallion.

Most of the tumours documented in the penis and foreskin of horses are of epithelial origin, namely squamous cell carcinomas and papillomas, melanomas or equine sarcoids (Edwards, 2008). The lesion here reported had a soft, spongy consistency and exuded gelatinous material that, along with the histological picture observed (characterized by lacunar spaces lined by well-differentiated fusiform cells), strongly suggested a vascular neoplasia. This presumptive diagnosis was confirmed by immunohistochemistry with antibody anti-CD-31. The optically empty lumens and the absence of red blood cells were compatible with a vascular neoplasm of lymphatic origin. Differentiation between lymphangioma and lymphangiosarcoma, although not always easy to achieve, was accomplished based on the well-differentiated neoplastic cell population – which did not exhibit signs of cellular pleomorphism or cytological atypia – and of the low mitotic activity observed. Despite the histological benign nature of the lesion, it exhibited ill-defined borders and an infiltrative behaviour, which might pose a challenge if considering surgical excision. Additionally, the animal's advanced age and poor general condition could reduce the likelihood of success. To the best of the authors' knowledge, this is the first report of a histologically confirmed preputial lymphangioma in a stallion.

Even though this lesion is rare in humans as well, some cases of lymphangioma of the penis have been reported. Individuals were young or adults with lesions arising spontaneously or associated with cellulitis, hidradenitis suppurativa or trauma. Six cases were surgically treated for aesthetic concerns, one with electrocoagulation with local anaesthesia and one with cryotherapy (Adikari et al., 2017; Bonini et al., 2019; Kalathia et al., 2020; Kumar et al., 2018; Macki et al., 2019; Piernick et al., 2018; Shah et al., 2005; Swanson, 2006).

Genetic and environmental factors, lymphatic drainage impairment or lymph overload are defined as the main aetiologies for

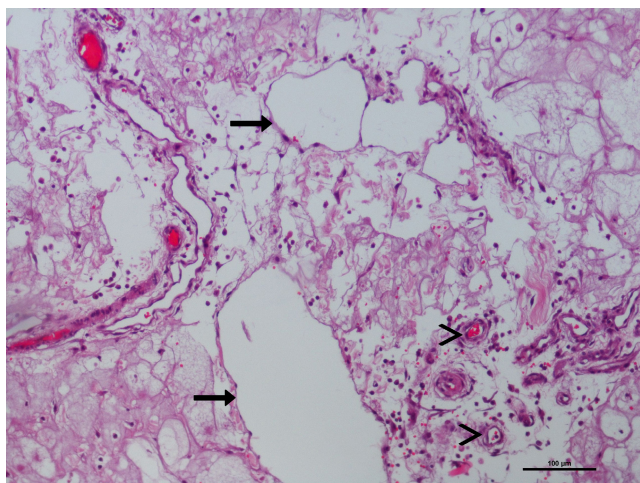


FIGURE 1 Microscopic examination revealing optically empty cavernous lymphatic vessels (arrows) surrounded by abundant loose stroma, HE, 10×.

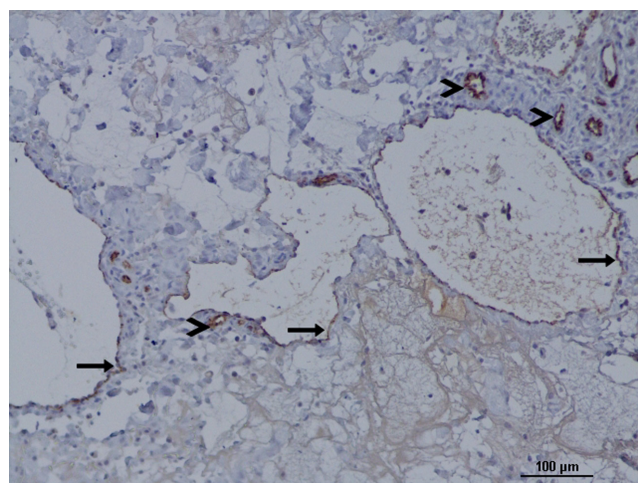


FIGURE 2 Cells lining cavernous structures display positive immunoreactivity for antibody anti-CD31, confirming their endothelial nature (arrows), ×10. Positive staining of small vascular vessels (arrow heads) were considered as positive internal controls of the immunohistochemical technique.

similar lesions (Wiegand et al., 2008). In this case, genetic factors are the least likely cause. Small undetected previous traumatic lesions might have healed with fibrosis, gradually causing lymphatic drainage impairment and eventually neoplastic development. Despite the inability to identify a cause for the development of the neoplasm, this report reinforces the fact that, although it is not the most frequent neoplastic lesion found in this particular anatomical location, vascular neoplasms should be considered as a differential diagnosis for preputial masses that are refractory to anti-inflammatory and antibiotic treatment.

AUTHOR CONTRIBUTIONS

TG and RC were responsible for the clinical evaluation and therapeutic plan. JEG, ACS and PDP performed the necropsy and histological examination of the material. JEG wrote the manuscript. ACS and PDP critically revised the manuscript for relevant intellectual content. All authors read and approved the final manuscript.

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CONFLICT OF INTEREST STATEMENT

None of the authors have any conflict of interest to declare.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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