Donkey preputial fibrosarcoma (*Equus asinus*): case report

**Abstract.** Little described in donkeys and of rare occurrence, fibrosarcoma is a malignant tumor of connective tissue. In this report, a 4-year-old donkey of the Pêga breed, used as a breeder, was referred to the Veterinary Hospital with a pendulum neoformation in the prepuce, according to the owner with 1 month of evolution. Clinically, the animal was painful and uncomfortable when the tumor was manipulated, and the wound was ulcerated and with a focus of myiasis. An excisional biopsy was performed, and the mass was referred for histopathological examination, where the diagnosis of fibrosarcoma was obtained. Clinical aspects, diagnostic method and histopathological findings will be discussed in this case report.

**Keywords:** neoplasia, prepuce, biopsy, histopathology.

**Introduction**

Fibrosarcoma is a rare malignant neoplasm that can occur in all domestic species and can grow anywhere on the organism (Hendrick, 2017). This neoplasm is derived from connective tissue fibers due to an immature proliferation of fibroblasts or undifferentiated spindle cells (Rizk et al., 2013).

The tumors can be circumscribed and infiltrative, recurrent, small or large, and metastasis is not usually common, with surgical excision being the treatment of choice (Hendrick, 2017).

Donkeys, specifically those of the Pêga breed, are widely used for breeding in Brazil, since their rusticity, strength and agility produce more resistant hybrids and of indisputable capacity for work, saddle or leisure (ABCJPêga, 2021). Due to the risk of extinction of different breeds of donkeys around the world, concern about the conservation and preservation of the species has grown (Santana & Bignardi, 2015). In view of this economic importance, reproductive management and attention to reproductive pathologies that involve the external genitalia of breeding donkeys are important for the maintenance of the species.

According to Top et al. (2008), fibrosarcoma is an uncommon tumor to affect the external genitalia of male horses. With few reports in the literature of horses and donkeys affected by this type of neoplasia, and none described specifically in the external genitalia of donkeys, this case report aims to show the clinical characteristics of the tumor, the diagnostic method performed and the histopathological findings in a case of fibrosarcoma in a donkey's prepuce.

**Methods**

A donkey (*Equus asinus*), 4 years old, fertile male, of the Pêga breed, used as a breeder, was sent to the Veterinary Hospital of the Federal University of Mato Grosso - Campus Sinop (Hovet-UFMT), due to the progressive growth of a tumor in the left side of the prepuce, according to the owner with 1 month of evolution.

In the physical examination, the animal was healthy, alert and active, responding aggressively to the examination of the affected region, possibly due to pain, and it was necessary to sedate it to clean the wound and remove the installed myiasis for better evaluation.

The mass, located in the left side of external lamina of the internal prepuce, was firm and pendulous, circular, with diameter of approximately 7 cm.
cm, already ulcerated, where myiasis was installed (Figure 1).

Due to the rapid tumor growth and the patient's purpose, a complete excision of the structure was chosen, that is, an excisional biopsy, since there was viable tissue for safe performance of the procedure and for later histopathological analysis.

As preoperative exams, complete blood count and blood biochemistry were performed, where in the results no alteration was presented, making the patient able to undergo surgery.

Due to the location of the tumor, the physiological differences of the asinine species for the metabolism of drugs compared to horses (Matthews & Van Loon, 2019) and because it is a minimally invasive surgery, it was decided to perform it with conscious and standing animal, contained in the horse stock, with anesthetic sedation protocol and local anesthesia.

With the animal fasted for 12 hours, appropriate sedation was achieved using an association of Detomidine (0.005-0.02mg / kg, IV) and Butorfanol (0.002-0.05mg / kg, IV) at the suggested donkey doses (Matthews & Van Loon, 2019). Subsequently, 20 ml of lidocaine was infiltrated through the skin, distributed around the tumor for local anesthesia. The surgical technique was based on the incision surrounding the tumor in the prepuce with a safety margin of 3 cm and then divulging until its complete removal, preserving and performing the hemostasis of the venous circulation where in the results no alteration was presented.

Due to the rapid tumor growth and the patient's purpose, a complete excision of the structure was chosen, that is, an excisional biopsy, since there was viable tissue for safe performance of the procedure and for later histopathological analysis.

The cells were spindle-shaped, with sparse and indistinct cytoplasm, with an elongated to oval nucleus, with few numbers of mitosis. Amid the neoplasm, there was a moderate amount of multifocal myxoid matrix.

In the epidermis, there was loss of multifocal epithelium (ulcer) (figure 3, B), with marked cell debris and moderate neutrophilic inflammatory infiltrate, that sometimes entered the superficial dermis. With these histopathological findings, a fibrosarcoma was diagnosed.

Results and discussion

In the literature there are few reports of fibrosarcomas in donkeys, all of them in female donkeys. In 1992, Bonfing & Ingenhost reported fibrosarcoma in a donkey's uterus, which was successfully treated with an ovariohysterectomy. In a retrospective study of affections in female farm animals, specifically in the perineum and vagina that were surgically treated, conducted by El-Maghraby (2002), a fibrosarcoma involving the donkey's vulva and perineum was reported, and surgical treatment with a success, without recurrence. Kassem et al. (2018) reported the case of a fibrosarcoma in a donkey's nasal cavity, but due to the aggressiveness of the case and the owner's decision, the animal was euthanized.

In horses, fibrosarcoma can occur at any age, with older horses being affected more frequently. (Knottenbelt et al., 2015). A retrospective study of 114 horses affected with tumors in the penis and prepuce, performed by Top et al. (2008), reported a single case of fibrosarcoma in the prepuce of an horse (0.9%) and classified it as an unusual type of neoplasm to affect the external genitalia of horses, in addition this study related the ages of the affected animals, whereas most were older animals, with an average age of 19.5 years.

The case described here is that of a donkey considered young because it is 4 years old, which makes it even more unusual, beyond the anatomical location of the tumor and the sex of the animal, the development of fibrosarcoma at that age.

In horses, tumors in the penis and prepuce frequently occur in the veterinary routine (Top et al., 2008; Knottenbelt et al., 2015; Scott & Hughes, 2015). Squamous cell carcinomas are the most common form of penile and prepuce neoplasia in horses (Top et al., 2008; Rizk et al., 2013; Klopfleisch, 2016). Donkeys, however, have a low incidence of reported cases of squamous cell carcinoma (Knottenbelt et al., 2015; Davis et al., 2016). In a study by Davis et al. (2016), sarcoid was the most common tumor in both donkeys and horses. In the literature, three cases of sarcoid are reported specifically in the donkey prepuce, one in Portugal (Oliveira et al., 2013) and two in Egypt (Rizk et al., 2013).

Since several diseases can affect the penis and prepuce of horses, there are several differential diagnoses (Scott & Hughes, 2015).
possibility of many clinical suspicions, both neoplastic (for example, sarcoide) and non-neoplastic (for example, exuberant granulation tissue or lesion by habronemosis), an excisional biopsy was chosen as a diagnostic method.

The decision to perform an excisional biopsy took into account the clinical characteristics of the tumor, as it is nodular and pendulous on the skin of the prepuce, firm on palpation, without adherence to the other structure of the donkey’s external genitalia and easily located for manipulation and surgical resection. According to Knottenbelt et al., (2015), well-defined tumors, easily accessible and with few anatomical implications are generally the ideal cases for surgical intervention. When the tumor has the properties that support this approach, the effects are very positive and it becomes the best way to obtain a faster diagnosis, which implies less pain, as it is a single procedure. Surgical resection, especially if it is precocious, of fibrosarcomas, is the best treatment option (Knottenbelt et al., 2015; Daleck & De nardi, 2016; Hendrick, 2017).

In addition to genetic mutations, several factors can promote the development of tumors, which are chemical, radiation, infection by microbiological agents, diet, age, stress and current diseases. Like other types of neoplasia, the etiology of fibrosarcoma is still unclear and may be related to all the factors previously mentioned (Knoffleisch, 2016). Schumacher et al. (1986) reports a case of a 2-year-old stallion, Quarter horse, who developed a fibrosarcoma in the gluteal region induced by burn, 9 months after the injury. According to Zachary (2017), traumas may predispose to the development of a fibrosarcoma subtype called keloidal, where histologically large hyalinized collagen fibers are circumvented by fibroblast cells; the histopathological examination of the reported case, however, did not present these microscopic findings, which does not allow us to state that trauma was a predisposing factor for the development of the tumor.

The clinical characteristics of the tumor in this reported case are consistent with those described in the literature, where fibrosarcomas are solitary nodules or masses, of dermal or subcutaneous location that, depending on their rapid growth, can become large tumors; its consistency and color vary according to the amount of collagen intercalated, being generally firm and whitish-gray in color (Knoffleisch, 2016; Hendrick, 2017); and frequently ulcerated in the epidermis (Knottenbelt et al., 2015).

Histologically, and according to the case described, fibrosarcomas consist of a proliferation of spindle-shaped mesenchymal tumor cells (fibroblasts) arranged in bundles, separated by a variable amount of collagenous stroma. These cells have sparse cytoplasm and an elongated or oval nucleus and few mitotic figures (Knoffleisch et al., 2015; Knoffleisch, 2016). According to Hendrick (2017) the number of mitotic figures in fibrosarcomas is variable, and their increase is associated with more aggressive tumors. With this reported case presenting few mitotic figures, it can be said that the tumor was a less aggressive fibrosarcoma.

![Figure 1](image-url)  
**Figure 1.** Clinical presentation of the preputial tumor in a 4-year-old donkey, located on the left side of the prepuce, with an ulceration on the extremity.
According to Knottenbelt et al. (2015) the most important differential diagnosis for a fibrosarcoma in horses would be a sarcoid, as it presents an identical histological appearance, and the nodular type sarcoid has more characteristics of a fibrosarcoma, however it has a limited vascular component that can be used for differentiation.

About the prognosis, fibrosarcomas are commonly locally invasive, but have little tendency to metastasize (Knottenbelt et al., 2015). In the case reported, total surgical excision with a safety margin of 3 cm allows for higher success rates curative, but the malignancy of this type of neoplasia, which is characteristically infiltrative, makes recurrence possible. According to Klopfleisch (2016), up to two thirds of fibrosarcomas after surgical excision develop recurrence, making the prognosis reserved in most cases. Four months after the surgery, the owner reported that there was no recurrence of the tumor in the donkey, which allows to consider the surgical procedure, for the performance of the excisional biopsy, a success.

Conclusion

For the equine veterinarian, prepuce tumors can be a clinical manifestation present in the routine and the report of this case reinforce that the occurrence of fibrosarcoma is rare but that it is an important differential diagnosis for cases of tumors in the external genitalia, both for donkeys and equines, since they are species with many peculiarities, but also many similarities. The good clinical evaluation of the tumor and the patient's condition is what allows the best elaboration of a diagnostic plan, allowing to obtain a prognosis with higher survival rates, even if a histological evaluation is performed afterwards to confirm the diagnosis.

References

ABCJPêga. Associação Brasileira dos Criadores de Jumento Pêga. 2021. https://abcjpega.org.br/historia-da-raca/

BONFIG H & INGENHORST I. Surgical removal of a pedunculated uterine tumor in a donkey mare. TierarztPrax, Vol. 20, p. 65-68, 1992.
DALECK, C. R. & DE NARDI, A. B. Oncologia em cães e gatos (2nd ed.). São Paulo, Brasil, Roca. 2016.

DAVIS, C. R., VALENTINE, B. A., GORDON, E., MCDONOUGH, S. P., SCHAFFER, P. A., ALLEN, A. L., & PESAVEGTO, P. Neoplasia in 125 donkeys (Equus asinus). Journal of Veterinary Diagnostic Investigation, vol. 28, p. 662–670, 2016. https://doi:10.1177/1040638716665659

EL-MAGHRABY, H.M. A Retrospective Study on Some Surgical Affections of The Perineum and Vagina in Farm Animals. Zag. Vet. J. Vol. 30, p. 84-100, 2002.

HENDRICK, M. J. Mesenchymal tumors of the skin and soft tissues. In D. J. MEUTEN (Ed.). Tumors in domestic animals (5th ed.). WileyBlackwell, Iowa, USA. p. 144-145, 2017.

KASSEM, I. G., BERNSTEIN, N., LOPES, P. R., DUARTE, P. C., MOREIRA, M. V. L., MIRANDA, F. G., NEPOMUCENO, A. C., MARANHÃO, R. P. A., ECCO, R., & PALHARES, M. S. Fibrosarcoma in the nasal cavity of a donkey. Brazilian Journal of Veterinary Medicine, Vol. 40, 2018. https://doi:10.29374/2527-2179.bjvm096018

Klopfleisch, R. Veterinary Oncology. Springer International Publishing Switzerland, 2016.

KNOTTENBELT, D. C., PATTERSON-KANE, J. C. & SNALUNE, K. L. Clinical Equine Oncology. Elsevier p.287-288, 2015.

MATTHEWS, N., & VAN LOON, J. P. A. M. Anesthesia, Sedation, and Pain Management of Donkeys and Mules. Veterinary Clinics of North America: Equine Practice, Vol. 35, p. 515-527, 2019. https://doi:10.1016/j.cveq.2019.08.007

OLIVEIRA, M., MOREIRA, A. R., MELO-FRANCO, B., MOREIRA, B., CUNHA, E., CABRAL NETO, G., FÉRE, S., PISSARRA, H., PELETEIRO, M. C. & SALES-LUÍS, J. P. Surgical Resolution of Preputial Sarcoid in a Donkey. Journal of Equine Veterinary Science, Vol. 33, p. 809–812, 2013. https://doi:10.1016/j.jevs.2012.12.009

RIZK, A., MOSBAH, E., KARROUF, G., & ABOU ALSOUD, M. Surgical Management of Penile and Preputial Neoplasms in Equine with Special Reference to Partial Phallectomy. Journal of Veterinary Medicine, p. 1–8, 2013. https://doi:10.1155/2013/891413

SANTANA, M. L., & BIGNARDI, A. B. Status of the genetic diversity and population structure of the Pêga donkey. Tropical Animal Health and Production, Vol.47, p. 1573–1580, 2015. https://doi:10.1007/s11250-015-0900-x

SCHUMACHER, J., WATKINS, J. P., WILSON, S. R., & FOREMAN, M. E. Burn-induced neoplasia in two horses. Equine Veterinary Journal, Vol.18, p. 410–412, 1986. https://doi:10.1111/j.2042-3306.1986.tb03669.x

SCOTT, V. H. L., & HUGHES, K. Diagnosis of equine penile and preputial masses: A clinical and pathological perspective. Equine Veterinary Education, Vol. 29, p. 10–14, 2015. https://doi:10.1111/eve.12476