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CASE REPORT
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Canine Trasmissible Veneral Tumor Vaginal with Ocular Metastasis - Therapeutic Decision Based on Ocular Ultrasound

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ABSTRACT

***Background*:** Canine transmissible venereal tumor (cTVT) is a contagious round cell tumor that can occur in ocular structures primarily and by metastasis. The objective of the present study is to report a case of vaginal cTVT with ocular metastasis that was based on the findings of ocular ultrasonography as the basis for the therapeutic decision.

***Case*:** A 2-year-and-9-month-old bitch without a defined breed (MBD), weighing 17 kg, complaining of a mass in her left eye which had been developing for 3 months, was presented for clinical care. It was reported that the animal had initially had a fight with a cat and presented with blepharospasm, opacity and an eyelid wound, evolving after 1 month to the mass reported. There was also an increase in volume in the vulva with a discreet bloody secretion, which was already present before the fight with the cat. On general physical examination, the vulvar and ocular masses were similar, being exophytic, reddish, friable, amorphous, ulcerated, alopecic and bleeding easily. No alterations were found in the search for metastases using chest X-rays, total abdominal ultrasound and fine needle puncture cytology of the inguinal and submandibular lymph nodes. Swab cytology and vaginal imprinting were carried out, which consisted of many round cells arranged in isolation. An imprint was also made of the eye lesion, which consisted of intense amounts of inflammatory cells with a predominance of degenerated neutrophils and moderate number of isolated round cells. It is therefore a plasmacytoid subtype of cTVT. The patient underwent an ocular ultrasound of the left eye, which was enlarged. The internal architecture was altered by the presence of a heterogeneous, irregular mass measuring 2.4 x 2.2cm, occupying more than 50% of the eyeball, including the region of the iridocorneal angle, extending to near the retina. Based on the clinical findings and complementary exams, exenteration of the left eye was recommended, followed by complementary chemotherapy with vincristine sulphate at the maximum tolerated dose. Histopathological examination of the eyeball showed a densely cellular, non-encapsulated tumor mass composed of rounded cells arranged in a mantle and supported by moderate fibrovascular stroma and marked marginal neovascularization. The biopsy concluded that the diagnosis was round cell neoplasia, with cTVT being probable, immunohistochemistry was requested for a confirmatory diagnosis but was not authorized by the owner due to the cost. Therefore, the final diagnosis of the case was defined based on the anamnesis, macroscopic tumor characteristics, ocular ultrasound and cytology as vaginal cTVT with ocular metastasis. The owner did not return with the animal to carry out the chemotherapy.

***Discussion*:** This report corroborates the already known profile of animals affected by cTVT in Brazil, as the patient was not neutered and had access to the street, even having interbred with stray animals. Ocular involvement by cTVT is considered uncommon and can make diagnosis more challenging, as it can be confused with other pathologies. Studies detailing clinical decision-making based on ocular ultrasound evidence are scarce in the literature. Therefore, ocular ultrasound can be a key factor in the decision to treat with chemotherapy or enucleation, as it can highlight the structures affected by the mass. Vincristine treatment appears to be most effective when internal structures are not involved. In this case, it was assumed that chemotherapy alone would likely not be effective, and therefore, exenteration was indicated. Ocular ultrasound evaluation can guide the decision-making process between medical and surgical treatment of ocular cTVT, but further studies evaluating the efficacy of this test are still needed.

Keywords: cancer, dog, eye, neoplasia.

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INTRODUCTION

Canine transmissible venereal tumor (cTVT) is a contagious round cell tumor that frequently occurs in dogs, especially strays. Although unusual anatomical locations have been reported in the literature, such as the nose, mouth and eyes, the most common site is the genitals [10]. However, when the tumor develops outside the external genital tract, the clinical presentation varies depending on the tumor site, manifesting as epistaxis, sneezing, epiphora, conjunctival congestion, halitosis, anorexia, weight loss, and dysphagia, among other signs [9].

Despite its low metastatic potential, CVT can spread lymphatically or hematogenously, although this occurs in less than 5% of cases [3]. cTVT can affect the eye both through metastasis [5] and primary implantation[2], and can damage various anatomical portions of the ocular bulb and its appendages, such as the corneas and sclera, but also deeper structures such as the iris and even the retina [12].

In this context, complementary tests such as ocular ultrasound can help with decision-making. This is because the treatment often used for cTVT is chemotherapy with vincristine sulfate [2]. However, the permanent involvement of structures associated with the risk of secondary glaucoma after treatment may be factors that contribute to the indication of enucleation [12].

The aim of this paper is to report a case of a round cell tumor, probably cTVT, originating in the vulva with metastases to the eye. It highlights the clinical and imaging findings that corroborate the findings of the histopathological examination.

CASE

A 2-year-and-9-month-old bitch without a defined breed (MBD), weighing 17 kg, complaining of a mass in her left eye which had been developing for 3 months, was presented for clinical care. It was reported that the animal had initially had a fight with a cat and presented with blepharospasm, opacity and an eyelid wound, evolving after 1 month to the mass reported. There was also an increase in volume in the vulva with a discreet bloody secretion, which was already present before the fight with the cat. It was reported that the animal has access to the street and may have crossed paths with stray dogs that live in the area. He denied any other complaints.

On general physical examination, the vulvar and ocular masses were similar, being exophytic, reddish, friable, amorphous, ulcerated, alopecic and bleeding easily (Figure 1). The physiological parameters were within the reference value for the species and the left eye and vulvar mucosa were intensely hyperemic. There were no other noteworthy alterations.

No alterations were found in the search for metastases using chest X-rays in 3 projections (ventrodorsal, left laterolateral and right laterolateral), total abdominal ultrasound and fine needle puncture cytology of the inguinal and submandibular lymph nodes, as well as in the hematological and biochemical tests of the kidney and liver profiles.

Swab cytology and vaginal imprinting were carried out, which consisted of many round cells arranged in isolation. The cytoplasm was well-defined, light blue, with cytoplasmic vacuolization, moderate anisocytosis, round nuclei with moderate anisocariose, predominantly aggregated chromatin and obvious nucleoli. There were also intact neutrophils and red blood cells at the bottom of the slide.

An imprint was also made of the eye lesion, which consisted of intense amounts of inflammatory cells with a predominance of degenerated neutrophils containing bacterial bacilli in their cytoplasm. A

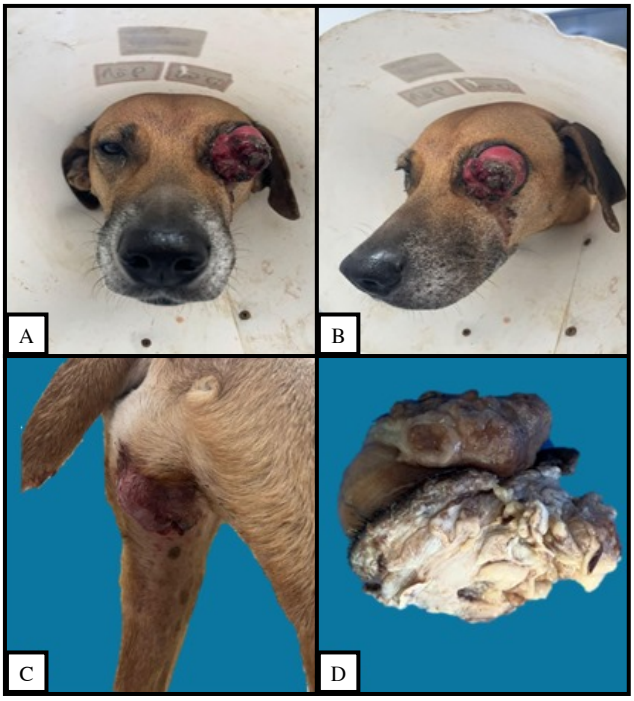

Figure 1. Macroscopic lesions in the left eye and vulva. A- Frontal plane of the left eye lesion. B- Lateral plane of the left eye lesion. C- Tumor in the vulva. D- Left eye with neoplasm after exenteration and fixation in 10% buffered formalin.

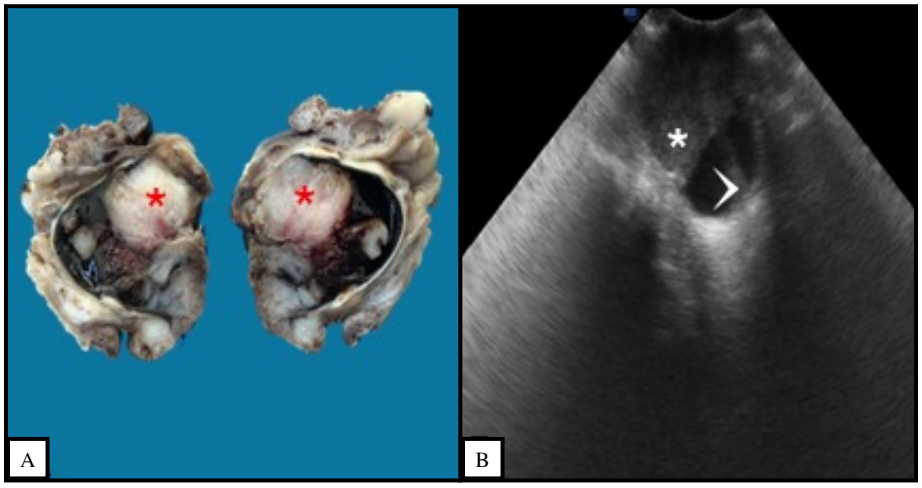

Figure 2. A- Left eye after exenteration and fixation in 10% formalin on a longitudinal section showing a mass (*) involving the ocular bulb. B- Ocular ultrasound image showing a squinted eye with increased axial length due to the presence of a heterogeneous, amorphous mass (*), extending from the cornea to near the retina, which showed multifocal areas of thickening and discrete foci of probable detachment (arrowhead).

moderate number of isolated round cells were also observed. These cells had well-defined basophilic cytoplasm with occasional vacuoles. Round nuclei, loose chromatin and evident nucleoli, moderate anisocytosis, intense anisocariose, intense number of atypical mitoses. At the bottom of the slide, there were nuclear fibers and red blood cells. It is therefore a plasmacytoid subtype of cTVT.

The patient underwent an ocular ultrasound of the left eye, which was enlarged. Its axial length was approximately 3.2 cm. The internal architecture was altered by the presence of a heterogeneous, irregular mass measuring 2.4 x 2.2 cm, occupying more than 50% of the eyeball, including the region of the iridocorneal angle, extending to near the retina. The retina also showed multifocal areas of moderate thickening and discrete foci of probable detachment (Figure 2).

Based on the clinical findings and complementary exams, exenteration of the left eye was recommended, followed by complementary chemotherapy with vincristine sulphate at the maximum tolerated dose. The surgical specimen was sent for biopsy. The macroscopic assessment revealed a left eyeball and adnexal tissues measuring 4 cm in diameter, with an irregular, firm, friable, brownish mass involving the entire eyeball. When cut, it was white, compact and trabecular, entering and displacing ocular structures (Figure 2).

Histopathological examination of the eyeball showed a densely cellular, non-encapsulated tumor mass composed of rounded cells arranged in a mantle and supported by moderate fibrovascular stroma and marked marginal neovascularization. The mass extends from the external ocular appendages to the retina, filling the anterior, posterior and vitreous chambers with no lens. The cells vary from round to oval with delimited, homogeneous, eosinophilic and occasionally vacuolized cytoplasm. The nucleus is round to oval, more evidently eccentric and with coarse chromatin. Pleomorphism is moderate, characterized by anisocytosis, anisokaryosis and binucleations. Moderate mitoses (1 to 19 per field at higher magnification [400x]). In the center of the mass there are multifocal areas composed of pyknotic cells, karyorrhexis and cell debris (necrosis). Between the neoplastic cells, there is a discreet mixed inflammatory infiltrate, composed of neutrophils and occasional lymphocytes, eosinophils and plasma cells. There is also moderate hemorrhage in the vitreous chamber (Figure 3).

The biopsy concluded that the diagnosis was round cell neoplasia, with cTVT being probable, but did not exclude mastocytoma, lymphoma and histiocytoma as differential diagnoses. Immunohistochemistry was requested for a confirmatory diagnosis but was not authorized by the owner due to the cost.

Therefore, the final diagnosis of the case was defined based on the anamnesis, macroscopic tumor characteristics, ocular ultrasound and cytology as vaginal cTVT with ocular metastasis.

The owner did not return with the animal to carry out the chemotherapy sessions, but she informed us by telephone that the animal still had vaginal bleeding, there was no new growth of the mass in the left orbital region and that she denied any other alterations.

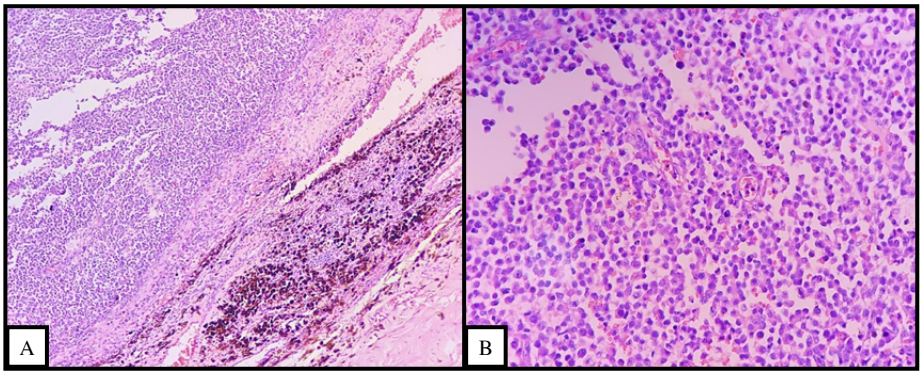

Figure 3. Photomicrography of histological slide stained by H&E demonstrating a densely cellular tumor mass composed of rounded cells arranged in a mantle and supported by moderate fibrovascular stroma and marked marginal neovascularization. [A- 200x. B- 400x].

DISCUSSION

cTVT is well documented throughout Brazil, and animals with free access to the street and who are not neutered are more likely to be affected [10], and these risk factors are also recognized in other countries [11]. The present report corroborates the above description, since the patient was not neutered and had access to the street, having even crossed paths with street animals.

The implementation of TVT in less common locations can make diagnosis more challenging, as it can be confused with other pathologies [1]. Ocular involvement by cTVT is considered uncommon [2,12]. And studies detailing evidence-based clinical decision--making are scarce in the literature. In this sense, this report points to the importance of ocular ultrasound imaging in clinical decision-making, since few studies have used this resource.

A study evaluated 21 cases of intraocular cTVT and showed that chemotherapy is not effective in cases where these structures are affected [12], since no case was successful with this treatment. In all cases, there was either a recurrence of the neoplasm or secondary glaucoma or uveitis unresponsive to treatment, which may be related to damage to sensitive tissues as well as passage through the blood-brain barrier of the drugs.

In this sense, ocular ultrasound can be a key factor in deciding whether to treat with chemotherapy or enucleation, as it can show the structures affected by the mass. Do Amaral et al. (2020) used ocular ultrasound and described a hyperechogenic amorphous structure with homogeneous echotexture, which caused distortion of the ocular bulb. In this case, treatment with vincristine was successful, corroborating the findings of another study [12], who reported that treatment seems to be more effective when there is no involvement of internal structures.

In the present report, the ocular ultrasound findings, such as the location of the mass and possible secondary lesions agreed with the biopsy results. The mass extended close to the retina and caused thickening and areas of retinal detachment. With these results, it was possible to assume that chemotherapy treatment would probably not be effective and therefore exenteration was indicated. In addition, the combination of surgical treatment followed by chemotherapy reduces the number of sessions and makes the treatment more effective for cTVT [6].

In relation to the diagnosis of this neoplasm, the macroscopic characteristics of the tumor are considered, but mainly the cytological findings. This is because cytology is considered an advantageous method over histopathology for diagnosing cTVT [7,9]. This advantage is due to cytology being a sensitive method for diagnosing round cell neoplasms, and it is the most used method for diagnosing cTVT [10]. Compared to histology, the cytological technique is less invasive and less costly, and in the specific case of cTVT, the cellular characteristics, which are better observed in cytology, allow it to be differentiated from other round cell tumors, including histiocytomas, mast cell tumors, lymphomas, plasma cell tumors and amelanotic melanomas [8]. In this sense, the case was concluded based on the cytological results.

One aspect that draws attention is the abandonment of treatment by the guardian. However, in another study also carried out in Brazil, treatment abandonment was reported in 40.1% of cases [4]. This is probably due to the cost of the medication, as well as the weekly monitoring required for complete treatment.

Evaluation with ocular ultrasound can guide decision-making between clinical and surgical treatment of ocular cTVT cases, but more studies are still needed. Further research evaluating the efficacy of this test to support the therapeutic decision is therefore necessary. However, as this is an unusual anatomical site, it is difficult to carry out prospective studies, so further individual reports and retrospective studies may be necessary.

The limitations of this study include the lack of immunohistochemistry, which is necessary for a conclusive biopsy. And, the lack of complete follow--up of the case due to treatment abandonment by the guardian.

It can be concluded that ocular cTVT is an uncommon site and that ocular ultrasound seems to be a promising test for deciding between chemotherapy or referral for surgery, although further studies are still needed.

***Declaration of interest*.** The authors report no conflict of interest. The authors alone were responsible for the content and writing of paper.

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