

## Conjunctival Melanoma in a Horse Treated by Tumor Resection and Cryotherapy

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### ABSTRACT

**Background:** Ocular melanoma is very rare compared to cutaneous melanoma in horses. Definitive diagnosis is made through histopathological examination and treatment options include surgical excision associated with cryotherapy, radiation therapy, and chemotherapy. In this report, we describe a case of conjunctival melanoma in a horse that has been treated successfully with surgical excision associated with cryotherapy.

**Case:** A 15-year-old male Percheron male was referred to the Ophthalmology Veterinary Section of the Federal University of Rio Grande do Sul (UFRGS), Porto Alegre, Brazil, with a history of a pigmented mass located on the lower eyelid of the left eye. Ophthalmologic examination revealed ocular discomfort, secretion and a pigmented mass in the left inferior bulbar conjunctiva. The dermatological examination revealed other melanomas in the perineal region. Complete blood count and serum chemistry profile were within normal ranges and prior to surgery the horse was treated with flunixin meglumine (1.1 mg/kg, IV, q 12 h). Sedation was performed with xylazine (0.4 mg/kg, IV) and detomidine hydrochloride (0.01 mg/kg, IV) and then the animal was placed in a retention trunk. The conjunctival mass was resected with a margin of safety. Liquid nitrogen was applied to the tumor site and the adjacent conjunctiva with a copper cryoprobe with one unit of liquid nitrogen. Histopathological examination revealed neoplastic cells containing pigmented melanocytes in the conjunctival submucosa, confirming the diagnosis of conjunctival melanoma. Postoperative treatment was performed with flunixin meglumine (1.1 mg/kg, IV, q 12 h) for 3 days and topical ophthalmic ointment containing neomycin, polymyxin B sulfate and dexamethasone twice daily for one week. Seven days after surgery, the lesion was healed. The patient was followed for 24 months after excision and there was no evidence of recurrence.

**Discussion:** Older horses are considered more predisposed to melanoma development, possibly because of the proliferation of melanocytes as a manifestation of aging, and in addition, cutaneous melanomas are common in gray horses and rare in other horse colors. In this case, the horse was a 15-year-old Percheron horse with gray hair. In horses, there is only one case of conjunctival melanoma documented in the literature. In both cases, the ophthalmic examination revealed a large, raised, heavily pigmented mass protruding from the bulbar conjunctiva. The only difference is that in the present case the location of the mass was in the inferior bulbar conjunctiva and in the case cited in the literature. The mass was located in the bulbar conjunctiva under the lateral corner. In this case, the diagnosis of conjunctive melanoma was based on clinical signs and confirmed by histopathological examination. It was decided to perform an excisional biopsy for treatment and to confirm the diagnosis of conjunctival melanoma. The choice of treatment depends very much on the clinical presentation, that in this animal, despite the neoplasia being extended, it was located only in the conjunctiva without involvement of the sclera and the eyelid. Therefore the decision was made to perform an excisional biopsy associated with cryotherapy. The purpose of such adjuvant therapy is to kill all residual tumor cells and prevent the recurrence of malignant tumors. In the present case, the surgical wound was cured one week after surgery. The surgical procedure in the case reported was performed under local anesthesia and sedation with the horse standing. To make this decision, consideration should be given to patient health, anesthetic risk, and additional risks during recovery from general anesthesia. In this case, surgical excision of the mass associated with cryotherapy was effective in the treatment of conjunctival melanoma in a horse.

**Keywords:** ocular, equine, melanocytic neoplasia, cryosurgery.

## INTRODUCTION

Cutaneous melanoma is highly prevalent in horses. These tumors are found most frequently in the perineal area, the external genitalia, the ventral surface of the tail and the parotid region [10]. Melanomas occur frequently in grey horses after the age of 5 years [1]. Ocular melanomas are uncommon in comparison to cutaneous tumors in horses [6]. The definitive diagnosis of melanomas requires a microscopic examination of biopsy specimens. In humans, treatment options for conjunctival melanoma include surgical excision, excision associated with cryotherapy, radiotherapy, and chemotherapy [2]. Melanomas located in the orbit, ocular adnexa, epibulbar area, or intraocular have been reported in horses [1,5]. However, a review of the literature reveals only a single documented case of melanoma located in the conjunctiva of a horse [6]. This report describes a case of melanoma involving the lower bulbar conjunctiva of a horse successfully treated with surgical excision associated with cryotherapy.

## CASE

A 15-year-old male grey Percheron horse was referred to the Ophthalmology Veterinary Section of the Federal University of Rio Grande do Sul (UFRGS), Porto Alegre, Brazil, was referred for the evaluation of a pigmented mass located on the lower eyelid of his left eye. The horse owner reported that the mass had been present for approximately two years but had recently increased in size. Upon clinical examination, the horse was with an optimum body condition score. An ophthalmic examination revealed blepharospasm, epiphora, ocular discharge, and a mass with 3 cm in diameter on the bulbar conjunctiva of the left eye (Figure 1A). Direct and consensual pupillary light reflex, palpebral reflex, menace response, and dazzle reflex were normal in both eyes. In addition, the remainder of the ophthalmic examination of the left eye was unremarkable. The right eye was normal. A dermatological examination revealed other melanomas in the perineal region.

Complete blood count and serum chemistry profile were within normal ranges. Surgical excision followed by cryotherapy and histopathological examination of the mass was recommended. Prior to surgery, the horse was treated with flunixin meglumine (Banamine injetável)<sup>1</sup> [1.1 mg/kg, IV, q 12 h]. The horse was sedated with xylazine (Sedomin)<sup>2</sup> [0.4 mg/

kg, IV], and detomidine hydrochloride (Dormium V)<sup>3</sup> [0.01 mg/kg, IV], and then placed in a restraint trunk.

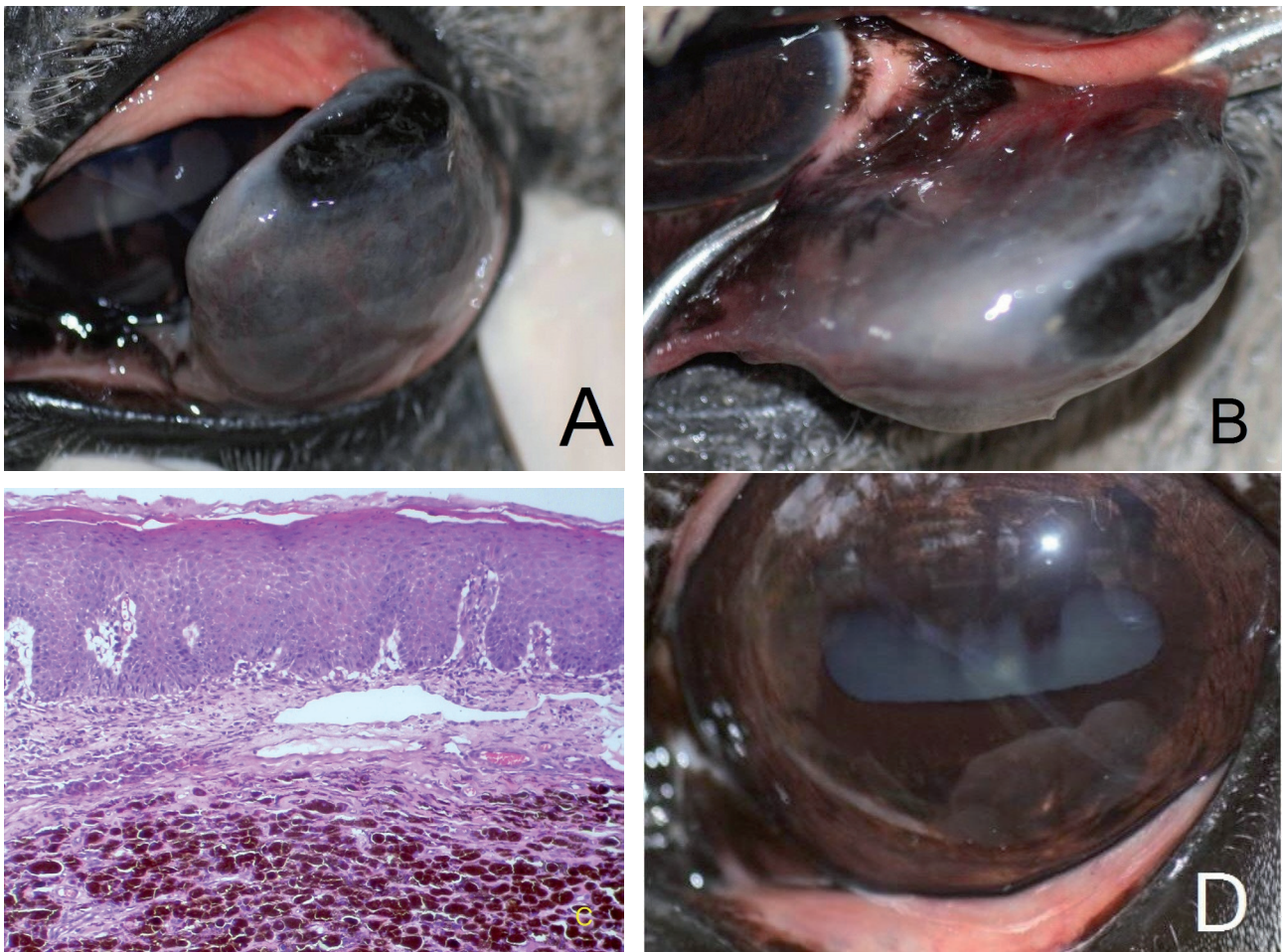
The surgical area was routinely prepared for aseptic surgery and the mass was exteriorized with two hemostatic forceps (Figure 1B). After instillation of topical anesthetic drops, lidocaine hydrochloride was infiltrated into the conjunctiva around the operation site. The conjunctival mass was totally resected with a safety margin. There is no involvement of the palpebral conjunctiva. Liquid nitrogen was applied to the tumor site and adjacent conjunctiva with a copper cryoprobe attachment with a liquid nitrogen unit<sup>4</sup>. Liquid nitrogen was used in two cycles of 10 s of freezing. The resected tissue was placed in 10% buffered formalin and submitted for histological examination in the Sector of Veterinary Pathology (SVP), Faculdade de Veterinária (FaVet), Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, RS, Brazil.

Postoperative treatment consisted of flunixin meglumine (1.1 mg/kg IV, q12 h) for 3 days and topical ophthalmic ointment containing neomycin, polymyxin B sulfate and dexamethasone twice daily for one week. No intraoperative complications occurred during the procedure. Minimal hemorrhaging was observed during the dissection of the mass. On the first day after surgery, the horse showed no signs of ocular discomfort. After one week, the horse was re-evaluated, revealing healing of the lesion. Histologically, the lesion was heavily pigmented with neoplastic cells containing pigmented melanocytes in the conjunctival submucosa (Figure 1C). Periodic evaluations were performed and there was no evidence of neoplasm recurrence 24 months post-surgery (Figure 1D).

## DISCUSSION

Cutaneous melanomas are common in grey horses and rare in other colors of horses [10]. Older horses are predisposed to the development of melanoma, possibly because of the proliferation of melanocytes as a manifestation of aging [10]. In this case, the horse was a 15-year-old Percheron horse with gray hair. Conjunctival melanomas are not reported frequently in humans and other animals [3,7-9,11]. In horses, there is only a single case of conjunctival melanoma documented in the literature [6].

The clinical presentation of melanoma in the present case was similar to that described in the previously reported case. In both cases, the ophthalmic exami-



**Figure 1.** Conjunctival melanoma in a horse. A- Darkly pigmented mass at the lower in lower bulbar conjunctiva. B- The tumor was exposed with two clamps. C- Histologic section showing conjunctiva well delimited. Neoplastic cells containing pigmented melanocytes in the submucosa. D- Appearance of the left eye two years after surgery. The horses left eye does not show any sign of tumor regrowth.

nation revealed a large, raised, heavily pigmented mass protruding from the bulbar conjunctiva. The difference is that, in the case cited by Moore and collaborators, the mass was localized in the bulbar conjunctiva under the lateral canthus, while in the present case report, the mass was localized in the lower bulbar conjunctiva.

The diagnosis of conjunctival melanoma in the present case was based on the clinical signs and confirmed by histopathology. In humans, it has been recommended that, if possible, conjunctival neoplasias should be managed using a no-touch technique by wide microsurgical excisional biopsy, and cryotherapy [3,7]. An incisional biopsy should be avoided to reduce the risk of tumor dissemination and possible recurrence. In this case, it was decided excisional biopsy for treatment and to confirm the diagnosis of conjunctival melanoma. The primary therapeutic approach to this tumor is extremely important, because incomplete removal is followed by tumor recurrence and distant metastasis [3,11].

The choice of treatment for malignant melanoma of the conjunctiva depends mainly on the clinical presentation. In the present case, despite the neoplasia being extended, it was located only in the conjunctiva without involvement of the sclera and eyelid. For this reason, the decision was made to perform an excisional biopsy associated with cryotherapy. Reports of the treatment of adnexal melanomas in horses are rare [1,6]. In the treatment of melanoma located on the human conjunctiva, the gold standard is wide surgical excision and cryotherapy to the margins [2,3]. In most cases, melanocytic neoplasms are susceptible to cryotherapy [2].

The goal of adjuvant therapy is to kill any residual tumor cells and prevent the recurrence of malignant tumors [11]. Complications associated with cryotherapy include cataracts, uveitis, scleral and corneal thinning, and phthisis bulbi [2]. In the present case, postoperative complications were not observed and the surgical wound was healed one week after

surgery. In cases where the conjunctival melanoma is more extensive, exenteration of the eyeball may be required [6].

In the case reported here, the surgical procedure was performed with the horse in station. The decision to perform the procedure in a standing patient rather than under general anesthesia depends on many factors, such as patient health, anesthetic risk, and additional risks during recovery from general anesthesia [4]. With this anesthetic protocol, it was possible to perform the procedure without complications. There are no publications in the literature comparing surgical treatment alone with surgical excision associated with adjacent therapies such as cryotherapy in horses, making it difficult to draw comparisons. A single report of primary malignant melanoma responded well to exenteration

following failed attempts at local excision combined with cryosurgery in a horse [6].

The findings indicate that melanoma must be considered in the differential diagnosis of the neoplasm that affects the conjunctiva in horses. In the present case, surgical excision of the mass associated with cryotherapy was effective in the treatment of a conjunctival melanoma in a horse.

#### MANUFACTURERS

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

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