






Reconstructive blepharoplasty after removal of palpebral squamous cell carcinoma in an equine – case report

[*Blefaroplastia reconstrutiva após remoção de carcinoma de células escamosas palpebral em equino - relato de caso*]

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ABSTRACT

Blepharoplasty in equines is rarely performed because periocular tissues present low mobility, especially in the lower eyelid, which frequently subjects this species to enucleation. Squamous cell carcinoma (SCC) is among the most common malignant neoplasms of the eyes and annexes, which increases local recurrences due to the lack of available safety margin. A 12-year-old Creole equine with a white coat presenting an ulcerative lesion on the lower right eyelid was treated. The treatment strategy considering the SCC suspicion was the surgical excision of the lesion and maintenance of the eye, followed by blepharoplasty for eyelid reconstruction. The hemi H-plasty technique was performed to reconstruct the right lower eyelid after a skin incision circumscribing the lesion and respecting a safety margin. Two parallel skin incisions were made from the base of the surgical wound, twice the length of the defect height, and small triangles of skin (Burow's triangles) were excised, and then the flap was advanced into the wound and fixed. No postoperative complications or tumor recurrence were observed during the following 24 months of follow-up, and the technique ensured the functional and aesthetic reconstruction of the region.

Keywords: blepharoplasty, equine, hemi H-plasty, squamous cell carcinoma

RESUMO

Blefaroplastias em equinos dificilmente são realizadas, em razão de os tecidos perioculares serem de baixa mobilidade, sobretudo na pálpebra inferior, o que frequentemente submete essa espécie à enucleação. O carcinoma de células escamosas (CCE) está entre as neoplasias malignas mais comuns de olhos e anexos, e isso aumenta as recidivas locais pela falta de margem de segurança disponível. Foi atendido um equino da raça Crioula, de 12 anos de idade e pelagem branca, apresentando lesão ulcerativa em pálpebra inferior direita. Considerando a suspeita de CCE, a estratégia de tratamento foi a excisão cirúrgica da lesão e a manutenção do olho, seguida de blefaroplastia para reconstrução palpebral. Após incisão de pele circunscrevendo a lesão e respeitando uma margem de segurança, realizou-se a técnica de hemi-H-plastia para reconstrução da pálpebra inferior direita. Duas incisões paralelas na pele foram realizadas a partir da base da ferida cirúrgica, sendo duas vezes o comprimento da altura do defeito, pequenos triângulos de pele (triângulos de Burow) foram excisados e, então, o retalho foi avançado para a ferida e fixado. Não se observaram complicações pós-operatórias nem recidiva tumoral durante os 24 meses seguintes de acompanhamento, além de a técnica ter garantido a reconstrução funcional e estética da região.

Palavras-chave: blefaroplastia, equino, hemi-H-plastia, carcinoma de células

INTRODUCTION

Squamous cell carcinoma (SCC), also called epidermoid carcinoma, is among the most common malignant neoplasms in the eyes and

annexes of equines and its complete excision can compromise the function of the eyelids when they are affected (Lavach and Severin, 1977). These tumors are highly invasive locally and very common in the lower eyelid, third eyelid, sclera, and cornea, in addition to being related to

ultraviolet radiation, especially in light-colored animals (Giuliano, 2011). Although metastases are not common, surgical removal is associated with a high rate of local recurrence of this neoplasm, as the affected sites usually have little skin available for a wide surgical margin and hence SCC involving eyelids and conjunctiva have a worse diagnosis (Dugan et al., 1991).

Among the therapeutic options for this neoplasm, surgical excision alone can be curative with free tumor margins of two centimeters, but surgical intervention for periocular SCC is often restricted to tumor reduction procedures (Giuliano, 2011). Blepharoplasty in horses, especially in the lower eyelid, is rarely performed because the periocular tissues have low mobility, which makes literature scarce (Giuliano, 2011). There are numerous blepharoplasty techniques described in the literature, but few cases are successfully described in this species (Lima, 2018). The sliding skin flap, also called hemi H-plasty, is a method for reconstructing the eyelid defect and margin after the excision of masses or debridement of wounds, which has been described as a good option for equines (Steinmetz et al., 2019).

Thus, this report aims to describe a Creole equine affected by squamous cell carcinoma in the lower right eyelid and surgical excision associated with hemi H-plasty for the reconstruction of the surgical wound, in addition to its challenges and benefits.

CASUISTRY

A 12-year-old female Creole equine weighing approximately 420 kg, with a white coat and presenting an ulcerative lesion in the lateral corner of the lower right eyelid (Fig. 1) with the evolution of three months, was treated at a University Veterinary Hospital. Initially, the physical examination of the animal showed no alterations and was followed by a complete ophthalmological examination, which included a positive pupillary reflex, a negative fluorescein test, and an intraocular pressure of 18 mm Hg in both eyes. After the complete evaluation of the animal and blood collection for assessment of hematological parameters, exeresis of the palpebral tumor was recommended, followed by blepharoplasty to correct the surgical defect.

Considering SCC as an initial suspicion due to the appearance and location of the lesion, the treatment strategy performed was surgical excision of the tumor and maintenance of the eyeball, followed by eyelid reconstruction. The animal was positioned in left lateral decubitus under general inhalation anesthesia when the surgical region was prepared, and a local anesthetic blockade was performed. A skin incision was made around the lesion after antisepsis, respecting a safety margin of 2cm. A portion of the lower eyelid and part of the lower palpebral conjunctiva were removed. The hemi H-plasty technique was performed after exeresis to reconstruct the right lower eyelid. Two parallel skin incisions were made from the base of the surgical wound, being twice the length of the height of the defect. Subsequently, small triangles of skin (Burow's triangles) were excised to avoid wrinkling of the base of the graft and relieve tension (Fig. 2A). After careful subcutaneous dissection under the skin graft, the flap was advanced into the wound and then fixed with 3-0 monofilament synthetic non-absorbable thread (Nylon, Shalon® Sutures, GO, Brazil) in a simple isolated suture pattern, with the eyelid rhyme stitches performed in an "8" pattern with 7-0 monofilament synthetic non-absorbable thread (Nylon, Shalon® Sutures, GO, Brazil). In addition, the edge of the flap was covered by the bulbar conjunctiva with absorbable synthetic monofilament polydioxanone thread (Bioline® Fios Cirúrgicos LTDA, GO, Brazil) in a simple continuous pattern (Fig. 2B).

The following drugs were administered systemically in the postoperative period: dipyrone 25mg/kg, TID, PO, for 7 days (Dipirona monoidratada solução oral, Medley, Campinas, SP, Brazil), flunixin meglumine 1 ml/45kg, SID, IM, for 3 days (Banamine®, MSD Saúde Animal, Rahway, USA), and antibiotic based on penicillin-G and streptomycin 1mL/8kg, single dose, IM (Penfort®, Ourofino, Cravinhos, SP, Brazil). An ointment based on neomycin sulfate and dexamethasone, TID, was used topically for 15 days. The skin sutures were removed after 15 days, without cicatricial interferences and with complete healing.

A tissue sample was fixed in a 10% buffered formalin solution and sent for histopathological examination, which confirmed the diagnosis of squamous cell carcinoma.



Figure 1. Ulcerative lesion in the lateral corner of the lower right eyelid.

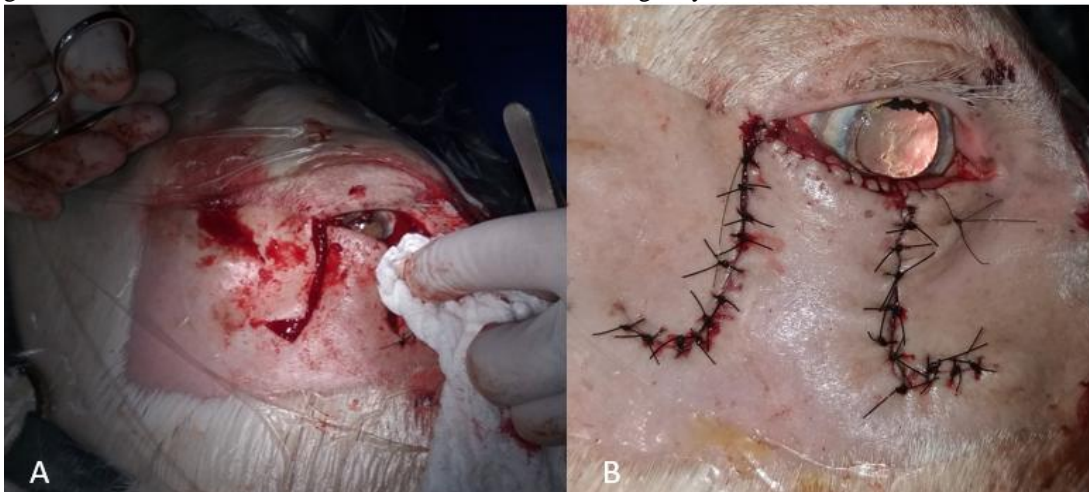


Figure 2. Surgical procedure steps for hemi-H blepharoplasty. A. Parallel skin incisions from the base of the wound and excision of Burow's triangles. B. Final aspect after suturing the skin in a simple isolated suture pattern, with the palpebral rhyme stitches performed in an "8" pattern and covering the edge of the flap with the bulbar conjunctiva.

DISCUSSION

Eyelids play an essential role in maintaining ocular health, and damage to the eyelid margin can lead to ocular complications, including eye pain, conjunctivitis, and ulcerative keratitis (Giuliano, 2011). Blepharoplasty in horses is rarely reported in the literature because of the challenges of sliding or moving the poorly mobile tissue around the eye, and, therefore, enucleation or exenteration may be necessary subsequently (Gelatt, 1967). The maintenance of

the eyeball and its annexes became possible with the blepharoplasty technique chosen in the presented case, showing the possibility to maintain the eyelids and their functions despite the particularities of equines.

According to Kafarnik *et al.* (2009), there is a greater risk of developing SCC in light-coated equines. However, breeds with dark periocular pigmentation also have a high incidence, as the pathogenesis of this tumor is not yet fully elucidated, although prolonged exposure to

sunlight is believed to play a significant role in its occurrence. Also, according to the authors, there is a higher prevalence of SCC in equines aged between 9 and 13 years old, which is in line with the described case, whose patient had a white coat and was 12 years old.

Several treatment modalities have been used for ocular SCC, mainly surgical excision (Mosunic *et al.*, 2004). The hemi H-plasty, or sliding skin flap, is a blepharoplasty technique described in numerous species but there are no reports of its execution in Creole equines according to the consulted literature. This technique is indicated in cases of palpebral agenesis, repair of extensive traumatic lesions, and after surgical excisions of tumors that affect more than one-third of the eyelid, according to the reported case (Peiffer *et al.*, 1981). The use of this technique requires the maintenance of some basic principles, such as the maintenance of the lower nasolacrimal duct due to its role in the lachrymal dynamics and the lining of the edge of the flap by the conjunctiva, avoiding injuries resulting from the friction of the hairs with the cornea (Peiffer *et al.*, 1981).

In addition to the technique used in the described case, other surgical techniques have been reported in the literature for excising SCC in horses. Although rarely performed in veterinary medicine, some techniques are commonly used for lower eyelid blepharoplasty in humans, such as the Destro and Hughes flaps and Destro VY skin advancement flap (Lima, 2018). According to Bortoletto *et al.* (2021), Destro VY technique was adapted in an equine for reconstruction of the lower eyelid after excision of squamous cell carcinoma in its total extension. The technique allowed the reconstruction of the external lamella of the eyelid, as well as maintaining vision and aesthetics, and is considered a feasible and effective technique for the species, guaranteeing the patient's quality of life. Studies comparing this technique with the one used in this case are still needed to establish the advantages of each one.

Besides surgical excision, other treatments also have been described for ocular SCC, depending on its extent and location, such as cryotherapy, radiotherapy, immunotherapy, laser ablation and chemotherapy (Giuliano *et al.*, 2008). According to Chen *et al.* (2004), the association of Mitomycin C, an alkylating agent with anti-

tumor action, associated with surgical excision is effective for the local control of ocular SCC and attested by the zero-recurrence rate at a mean of 27 months. In addition, according to Malalana *et al.* (2010), the recurrence rate of SCC in horses was 25% when treated with Mitomycin C alone and 23% when its use was associated with surgical excision and proved to be advantageous when compared to radiotherapy, as it is less expensive, more accessible and has no serious adverse effects. Intraoperative cryotherapy is also commonly used as an adjunctive therapy as it decreases the recurrence rate of tumor tissue and guarantees a safety margin (Giuliano *et al.*, 2008). Adjuvant therapies were not used in the described case due to lack of availability; however only surgical excision was resolute and there were no recurrences.

Although no postoperative complications were observed in the described case, the equine periocular skin is firmly adhered to the underlying fascia with poor superficial blood supply, making blepharoplasty procedures with a high risk of dehiscence or necrosis (Gelatt, 1967; Lavach and Severin, 1977). The thin, elastic eyelids of equines are fragile, and maintenance of eyelid function is paramount. Thus, surgical intervention for periocular SCC is often restricted to tumor clearance procedures (Giuliano, 2011). In addition, Rose and Mai (2022) used the hemi H-plasty technique in six equines with palpebral melanoma and the only complication resulting from the technique consisted of corneal injury due to friction of the suture on the cornea. Following the guidelines and principles regarding the technique allowed for guaranteeing the success of its use in the presented case, avoiding postoperative disorders, and ensuring the quality of the eye and its annexes.

The recurrence rate of ocular SCC in equines after isolated surgical removal was reported in 44.1% of cases, according to Mosunic *et al.* (2004). However, recurrences occurred only in 17% of cases when surgery was associated with adjuvant therapies, such as radiotherapy (Plummer *et al.*, 2007). Furthermore, King *et al.* (1991) observed a cure in 55% of equines submitted to surgical excision alone. In the case in question, although adjuvant therapies were not used, surgical excision was successful and no recurrence was observed during the following 24

months of follow-up, demonstrating the possibility of obtaining success only with the correct execution of the technique.

CONCLUSIONS

This case demonstrates that the use of the hemi H-plasty technique can be an effective alternative for the functional and aesthetic reconstruction of the lower eyelid of equines affected by SCC, ensuring the maintenance and functionality of the eyeball and its annexes, in addition to the quality of patient's life.

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