Marsupialization of lacrimal granuloma on the third eyelid in a canine. Case report

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ABSTRACT

The aim of this study was to describe the formation of a granuloma as a surgical complication following repositioning of the third eyelid lacrimal gland and the success of its surgical treatment using marsupialization in a dog. A three-month-old male French Bulldog was presented at the Uningá Veterinary Clinic with a primary complaint of a nodule in the lower medial region of the right eye. This medical complication developed after a previous surgical procedure by another veterinarian to reposition the third eyelid lacrimal gland. Suspecting a granuloma, cyst, or neoplastic growth, the animal underwent a marsupialization procedure, during which a fragment of the nodule wall was collected for histopathological analysis, which confirmed the diagnosis of a granuloma. Nine months of follow-up post-surgery showed complete recovery without complications. This case concluded that histopathological analysis is essential for accurate differential diagnosis of a lacrimal granuloma. Furthermore, careful burial of the third eyelid gland is recommended as an important measure to prevent granuloma formation. Finally, the study demonstrates that marsupialization can yield excellent results without compromising lacrimal function.

Keywords: canine, marsupialization, ophthalmology, surgery.

Marsupialización de granuloma lacrimal en el tercer parpado en un canino. Reporte de caso

RESUMEN

El objetivo de este estudio fue describir la formación de un granuloma como intercurrencia quirúrgica del reposicionamiento de la glándula lagrimal del tercer párpado y el éxito de su tratamiento quirúrgico por la técnica de marsupialización en un perro. Un Bulldog francés, macho, de tres meses de edad, fue atendido en la Clínica Veterinaria Uningá con la principal queja de la presencia de un nódulo en la región medial inferior del ojo derecho. Esta complicación médica se generó después de que otro profesional

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veterinario había reposicionado la glándula lagrimal del tercer párpado. Ante la sospecha de granuloma, quiste o neoformación tumoral, el animal fue sometido a un procedimiento quirúrgico de marsupialización, donde se recuperó un fragmento de la pared del nódulo para un análisis histopatológico que confirmó el diagnostico de granuloma. Se realizó seguimiento del caso nueve meses después del procedimiento quirúrgico y el resultado obtenido mostró una recuperación total del paciente sin ningún tipo de complicaciones. Se concluyó en este caso que la realización de un análisis histopatológico es fundamental para un diagnóstico diferencial acertado del granuloma lagrimal. Adicionalmente, se resalta que es muy importante la realización de una técnica cuidadosa de entierro de la glándula del tercer párpado con el fin de prevenir la formación de granulomas. Finalmente, se demuestra que la técnica de marsupialización puede aportar excelentes resultados sin comprometer la función lagrimal.

Palabras clave: canino, cirugía, marsupialización, oftalmología.

INTRODUCTION

The third eyelid, or nictitating membrane, is an ocular structure that functions to protect the cornea. Located within the nasal portion of the inferior conjunctival sac between the cornea and the lower eyelid, this structure is mobile (Peruccio 2018). In dogs, the third eyelid contains a cartilaginous component referred to as the "T" of hyaline cartilage, which provides rigidity to the membrane. At the base of the third eyelid lies the nictitating membrane gland, responsible for producing approximately 30% of the aqueous portion of the tear film (Wouk *et al.* 2009).

Gland prolapse is one of the most frequently reported conditions affecting the third eyelid in dogs (Barbé *et al.* 2016). Breeds most affected include Bulldogs, followed by Lhasa Apsos and, lastly, Shih Tzus (Queiroz *et al.* 2015). The etiology of third eyelid gland prolapse remains unclear, though one cause may involve laxity in the connective tissue that anchors the gland to the periorbital tissues (Barbé *et al.* 2016).

Surgical repositioning of the gland is considered the most effective treatment. Various techniques have been described for gland burial, which either anchor the gland to the periorbital periosteum and the base of the cartilaginous "T" or involve creating a conjunctival pocket to reposition and stabilize the gland in its anatomical location (Swanson & Hermann 2005).

The etiology of lacrimal cyst formation is primarily attributed to iatrogenic damage resulting from gland repositioning procedures; however, its occurrence is rare and may affect any area containing tear-producing glandular tissue (Lima *et al.* 2020). Given that one potential cause of lacrimal granuloma development in this case could be associated with prior surgical repositioning of the third eyelid gland, the objective of this study was to alert veterinarians to the possibility of granuloma formation as a surgical complication of lacrimal gland repositioning. Additionally, this study aimed to demonstrate a definitive diagnosis through histopathological analysis and, finally, to report the successful outcome achieved with surgical treatment using the marsupialization technique.

CASE REPORT PRESENTATION

Patient overview and reason for consultation

A three-month-old male French Bulldog, weighing four kilograms, was presented at the Uningá Veterinary Clinic by his owner with the primary complaint of a nodule in the lower region of the right eye. This nodule appeared following a procedure performed by a previous veterinarian to reposition the third eyelid gland.

Anamnesis and physical examination

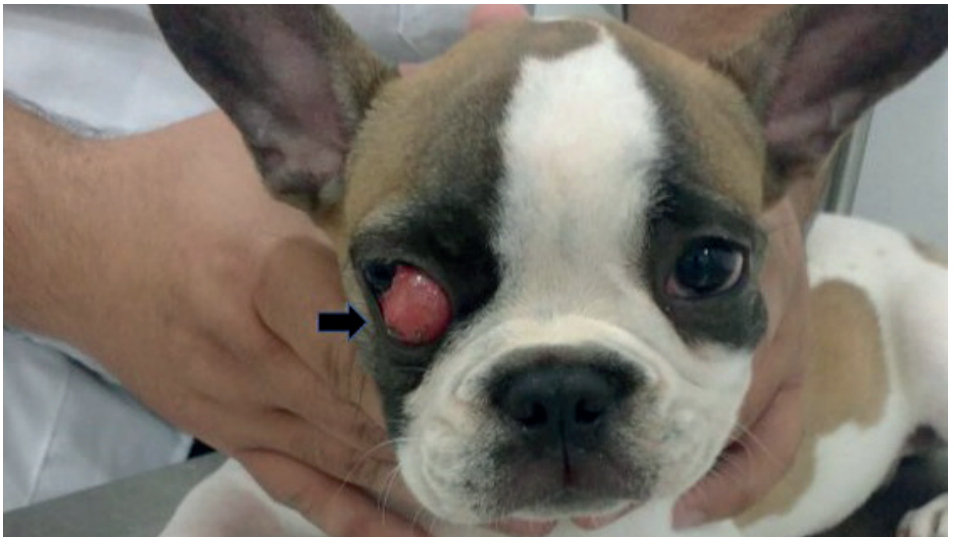
The owner reported that, after the appearance of the nodule, the animal had been taken back to the original veterinarian, who performed a puncture and complete drainage of the nodule, during which a transparent fluid was identified, according to the owner. While the drainage initially resolved the nodule, it recurred a few days later.

On general physical examination, all parameters were within the normal range for the species. Ophthalmic examination revealed a unilateral, pinkish, translucent nodule with a soft, painless consistency located in the lower medial region of the eye near the third eyelid (figure 1).

Initial clinical suspicions and surgical approach

Based on the information provided by the owner and the clinical findings, initial suspicions included lacrimal granuloma, conjunctival cyst, and less likely, neoplastic growth of the third eyelid. The owner was informed of the potential risk of dry keratoconjunctivitis resulting from excision of the third eyelid. Therefore, marsupialization of the palpebral conjunctiva of the third eyelid was chosen, along with an incisional biopsy for histopathological analysis to achieve a definitive diagnosis while preserving the natural

FIGURE 1. Photographic image of a three-month-old French Bulldog showing a unilateral pink nodule indicative of a lacrimal granuloma (arrow).



Source: own elaboration.

lacrimal function of the third eyelid gland. Complete blood count, serum alanine aminotransferase (ALT), and creatinine levels were within normal limits. The patient was subsequently prepared for surgery. Anesthetic induction was achieved with Propofol (4 mg/kg) and Ketamine (2 mg/kg) administered intravenously, with anesthetic maintenance via inhaled isoflurane.

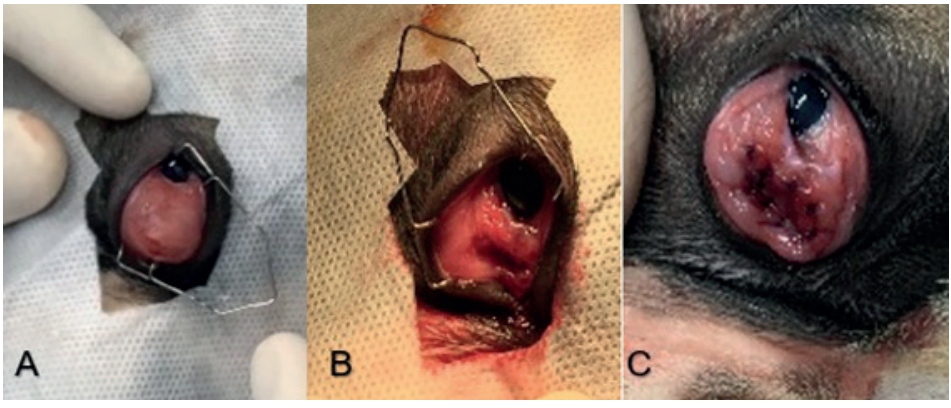
The surgical site was thoroughly aseptic-ated with a 10% povidone-iodine solution diluted in 0.9% NaCl (1:100). Sterile drapes were positioned, and a blepharostat was used to keep the eyelids open.

The procedure involved a full-thickness elliptical incision, approximately 1.0 cm in horizontal orientation, through the granuloma wall (palpebral conjunctiva of the third eyelid). This incision allowed for drainage of the contents, which appeared clear, suggesting a lacrimal origin. Following drainage, a simple interrupted suture was placed between the inner wall of the granuloma and the external surface of the palpebral conjunctiva of the nictitating membrane, thus creating a marsupialization. A 5-0 synthetic absorbable suture (polyglycaprone) was used (figure 2). The elliptical fragment excised from the cyst wall was submitted for histopathological analysis.

Clinical progression and follow-up plan

Post-surgery, the following medications were prescribed: Meloxicam (0.1 mg/kg orally every 24 hours for 3 days), Dipyrone (25 mg/kg orally every 12 hours for 5 days), Tobramycin (1 drop in the right eye every 6 hours for 5 days), and Diclofenac (1 drop in the right eye every 12 hours for 5 days). The use of an Elizabethan collar was recommended. After providing these instructions to the owner, a follow-up appointment was scheduled for 12 days post-surgery. Histopathological examination results indicated a focus of moderate fibroblast hyperplasia, disorganized and interspersed with a small number of lymphocytes and plasma cells. No bacterial, fungal, or parasitic agents were detected

FIGURE 2. Photographic images of a three-month-old French Bulldog during surgery. A. Pre-surgical setup with sterile drapes and blepharostat retractor; B. Full-thickness elliptical incision through the granuloma wall; C. Interrupted single sutures placed between the granuloma wall and the incision edges of the palpebral conjunctiva of the third eyelid.



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in the sample analyzed, supporting a granuloma diagnosis (figure 3).

Approximately two months post-surgery, the animal returned for evaluation, showing significant improvement with no visible abnormalities (figure 4). Consequently, the patient was discharged from the hospital.

FIGURE 3. Photographic image of the histopathological examination of a lacrimal granuloma on the eyelid at 40x magnification.

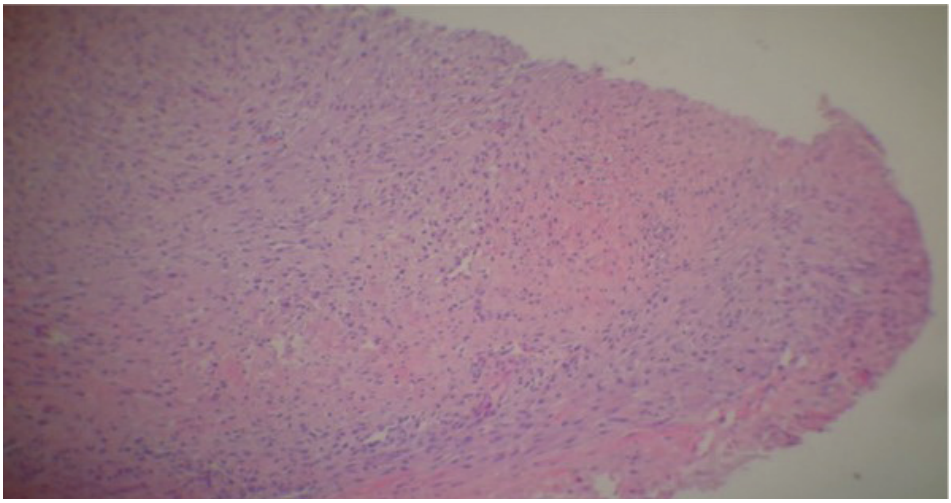

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FIGURE 4. Photographic images of a five-month-old French Bulldog showing full recovery two months post-surgery.

Source: own elaboration.

In subsequent evaluations conducted five and twelve months after the marsupialization of the granuloma, the patient demonstrated complete recovery without any complications (figures 5 and 6).

DISCUSSION

A cyst is defined as a cavity lined by epithelium and filled with liquid or semi-solid material. In contrast, a granuloma can be round or oval, characterized by a

FIGURE 5. Photographic images of an eight-month-old French Bulldog, showing no changes observed during the ophthalmologic examination five months after the surgical procedure.

Source: own elaboration.

FIGURE 6. Photographic images of a fifteen-month-old French Bulldog, showing no changes observed during the ophthalmologic examination twelve months after the surgical procedure.

Source: own elaboration.

middle area composed of granulomatous inflammatory cells surrounded by a peripheral zone of fibroblasts, which may contribute to the formation of a fibrous capsule (Ackermann 2018). While the distinction between a cyst and a granuloma is straightforward in pathology, it poses challenges during clinical evaluation, even when imaging studies are conducted (Pinheiro *et al.* 2007). Therefore, histopathological evaluation was essential for differentiating these conditions, including the exclusion of a neoplastic process (Barbé *et al.* 2016).

The differential diagnoses for lacrimal granuloma include neoplastic processes, cysts, subconjunctival fat protrusion, and myiasis (Delgado 2013; Lamagna *et al.* 2012). The challenge in clinically distinguishing between granulomas and cysts leads to the misclassification of many cases described in the literature as lacrimal cysts, as not all studies employed histopathology as a diagnostic tool (Barbé *et al.* 2016). Therefore, we suspect that granulomas may be more common than previously reported in the literature. Consequently, in the absence of documented cases of lacrimal granuloma, we will reference lesions described in the literature as lacrimal cysts to facilitate the discussion of this case.

The occurrence of primary cysts in the lacrimal gland and duct is uncommon. Lacrimal cysts may arise from a variety of causes, including congenital factors such as developmental defects in the lacrimal ducts, as well as acquired causes such as trauma or the presence of a foreign body in the ducts (Giuliano 2021). In this case, the tear granuloma developed after the third eyelid gland repositioning technique, with a suspicion of iatrogenic closure of the tear drainage ducts or obstruction due to cicatricial stenosis.

To prevent the formation of a tear granuloma, the surgeon must exercise caution to avoid obstructing the tear drainage system. In the case of the repositioning technique of Morgan, which is the most commonly used method by veterinarians in Brazil (Lopes 2019), we recommend that incisions made in the bulbar conjunctiva of the third eyelid at the margins of the prolapsed gland do not meet at their ends, as such union may critically obstruct tear drainage.

The protrusion of the gland is one of the most common changes observed in the third eyelid of dogs, particularly in Bulldogs, followed by Lhasa Apsos and Shi Tzus (Queiroz *et al.* 2015). This is consistent with the current case, in which the patient is a young French Bulldog that exhibited protrusion of the third eyelid gland prior to the development of the lacrimal granuloma.

The ocular clinical signs associated with the lacrimal granuloma in this patient align with the clinical manifestations described in the literature for lacrimal cysts. These signs include the presence of floating, elevated masses with rounded or ovoid shapes, characterized by a pinkish, translucent wall and a soft, painless texture upon palpation (Dawson *et al.* 2015).

Drainage of cysts and granulomas is a viable option; however, as demonstrated in the current case, recurrence is common. Therefore, the definitive technique to prevent recurrence is marsupialization, which involves creating a communication channel between the cyst and the external environment (Lima *et al.* 2020).

The third eyelid gland is responsible for producing 30-57% of the tear film, making its resection inadvisable (Holzlsauer *et al.* 2021). Furthermore, electron microscopy studies have shown that removal of this

gland leads to exfoliation of surface cells and a reduction in the thickness of the corneal cell layers (Saito *et al.* 2004).

Considering the critical function of the third eyelid gland, the choice of the marsupialization technique in this case is well justified, as it preserves the function of the gland and the integrity of the cornea.

Marsupialization is a well-documented technique used in the treatment of various conditions, including prostatic cysts (Smith 2008), arachnoid cysts (Zang *et al.* 2017), and sublingual mucoceles (ranulas) (Radlinsky & Fossum 2021). However, its application in the treatment of lacrimal cysts and granulomas is rarely reported. In this case, marsupialization proved to be a safe and effective method, yielding significant short-term and long-term results (Barbé *et al.* 2016; Lima *et al.* 2020).

The use of marsupialization for lacrimal granuloma treatment has led to satisfactory improvement in the patient, with no recurrences noted up to 360 days postoperatively. Additionally, this technique has maintained adequate corneal hydration, a benefit not typically observed following the excision of the third eyelid gland, which can result in dry keratoconjunctivitis (Barbé *et al.* 2016).

CONCLUSION

This case highlights the essential role of histopathological analysis in diagnosing lacrimal granuloma. Additionally, it underscores the precautions veterinarians must take when performing the repositioning technique of the third eyelid gland to prevent the formation of granulomas. Finally, it demonstrates that the marsupialization technique can yield excellent outcomes while preserving lacrimal function.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

ETHICAL APPROVAL STATEMENT

As this publication is a case report, approval from an ethics committee was not required. The guardian of the patient provided consent for both the surgical procedure and the scientific dissemination of the case report.

ARTIFICIAL INTELLIGENCE STATEMENT

It is hereby stated that no artificial intelligence technologies were employed in the preparation of this case report.

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