

Marsupialization of a Cyst of the Nictitating Membrane in a Dog

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ABSTRACT

Background: Prolapse of the nictitating membrane gland (PNMG) is the most common primary disorder of the third eyelid in dogs. The development of lacrimal cysts has been reported as a possible complication following surgical repositioning of the gland using the “pocket” technique, and such cysts may compromise lacrimal function and patient comfort. Although various surgical approaches have been described, nictitating membrane marsupialization has proven to be effective in managing these lesions. The objective of this case report was to describe the application of the marsupialization technique as a treatment for a nictitating membrane lacrimal cyst in a dog.

Case: A 6-month-old male Beagle presented with a history of a pink mass associated with the left nictitating membrane, causing mild ocular discomfort. The patient had a previous history of bilateral surgical correction of PNMG using the Pocket technique, performed 2 months earlier by a referral veterinarian. After the procedure, the patient showed progressive signs of ocular discomfort, such as epiphora, conjunctival hyperemia, blepharospasm, and mucopurulent discharge. The patient had been treated with Tobradex, applied 4 times daily to the left eye (OS), without improvement. During a complete ophthalmologic examination, a mass was observed upon eversion of the nictitating membrane, and it was fluctuant in consistency. No corneal, anterior chamber, or lens abnormalities were observed. Schirmer Tear Test 1 (STT 1) results were: right eye (OD), 11 mm/min; left eye (OS), 18 mm/min. The Fluorescein test was negative. Tonovet was performed, showing intraocular pressures of 15 mm Hg in the OD and 14 mm Hg in the OS. No changes were noted on indirect fundoscopy. Cytological examination of the mass was performed via fine needle aspiration under topical anesthesia Anestalcon (5 mg/mL), revealing absence of cellularity; the bacterial culture was negative, classifying the content as non-septic fluid. The diagnosis was a nictitating membrane lacrimal cyst (NMLC), and marsupialization was elected as the treatment. Postoperative recommendations included the use of an Elizabethan collar for 15 days. Prescribed medications included: amoxicillin with potassium clavulanate [22 mg/kg every 12 h for 10 days], prednisolone (0.5 mg/kg every 24 h for 7 days), topical ophthalmic treatment with Maxidex (1 mg/mL) 4 times daily for 7 days, Tobrex (0.3%) 4 times daily for 7 days, and the ophthalmic lubricant Hyabak (0.15%) 3 times daily for 10 days.

Discussion: Postoperative follow-up consisted of regular evaluations over a 2-year period, during which no aesthetic, clinical, or tear production alterations were observed. The marsupialization technique proved to be a safe and effective approach for treating nictitating membrane cysts secondary to PNMG correction via the conjunctival Pocket technique. This approach allowed for gland preservation, prevented recurrence of cystic cavities, and provided a satisfactory cosmetic outcome. This case highlights the importance of early diagnosis and appropriate surgical planning in managing complications following PNMG correction. Marsupialization not only resolves the cystic lesion but also maintains the tear production function of the gland, which is essential for ocular surface health. Further studies with larger patient populations could help validate this technique as a standard approach for similar cases.

Keywords: lacrimal cyst, marsupialization, nictitating membrane, dog.

INTRODUCTION

Among third eyelid disorders in dogs, prolapse of the nictitating membrane gland (PNMG) is the most frequently observed condition, commonly affecting young animals of predisposed breeds before 2 years of age, such as the American Cocker Spaniel, Lhasa Apso, Shih Tzu, Pekingese, Beagle, English Bulldog [6,7,14], Basset Hound, Boston Terrier, Shar-Pei, and Neapolitan Mastiff [13,19]. When exposed, surgical excision of the gland can reduce aqueous tear production by up to 26% within 3 to 7 months, leading to a high risk of keratoconjunctivitis sicca (KCS), and is therefore contraindicated [14,25]. Recommended treatments consist of surgical repositioning using anchoring techniques or conjunctival pouch techniques due to their favorable outcomes and the preservation of glandular structure and function [13,14]. Although rare, a postoperative complication is the formation of lacrimal cysts [11,13]. The etiology of these cysts remains unclear but is suspected to involve glandular duct obstruction due to surgical trauma or manipulation [5,7]. Marsupialization has emerged as a safe and effective surgical alternative for the treatment of such cysts, with only three successful cases documented in dogs. The objective of this case report is to describe the treatment of a lacrimal cyst of the nictitating membrane in a Beagle using the marsupialization technique, with a 2-year clinical follow-up.

CASE

A 6-month-old male Beagle was seen with a history of a pink mass in the medial canthus of the left eye (Figure 1A). The patient had a history of 2 previous surgeries in the past 2 months to correct bilateral PNMG. The repositioning of the gland was performed using the conjunctival pouch technique and since then the tutor has noticed a progressive increase in volume with signs of ocular discomfort such as epiphora, conjunctival hyperemia, blepharospasm, and ocular discharge progressing to mucopurulent discharge. The patient had been treated with Tobradex¹ 4 times per day without improvement.

A complete ophthalmologic examination was performed. A translucent subconjunctival swelling with a smooth surface, measuring approximately 20 mm, projected from the bulbar. When the nictitating membrane was everted, it revealed a mass extending from its base to the free margin. No abnormal changes were observed in the cornea, anterior chamber and lens.

STT 1² were: OD 11 mm/min and OS 18 mm/min. The Fluorescein² test was negative. Rebound tonometry Tonovet³ performed. The intraocular pressures were OD 15 mm Hg and OS 14 mm Hg. No abnormal changes were observed in indirect fundoscopy. Differential diagnosis included lacrimal cyst, parasitic cyst, abscess, cystic neoplasms, and suture reaction. Fine needle aspiration and cytology were performed using topical anesthesia with Anestalcon¹ (5 mg/mL). It was aspirated of 0.5 mL of clear fluid with a 23 G needle. Cytological examination showed absence of cellularity, the bacterial culture was negative; thus, being classified as non-septic liquid. The presumptive diagnosis was MN lacrimal cyst, and marsupialization was recommended. Preoperative bloodwork was performed. Complete blood count, serum biochemistry (urea, creatinine, ALT, FA, albumin, and bilirubin), and electrocardiogram were within normal limits. The dog was positioned in left lateral recumbent with the head slightly elevated. The eyelid surgical preparation was performed with a 10% povidone-iodine aqueous solution, while the conjunctival sac was washed with a povidone-iodine solution diluted in saline solution at a ratio of 1:50. Two stay sutures were applied on the free margin of the nictitating membrane with the intent of pulling up and exteriorizing the tissue, improving the approach.

A horizontal linear incision with a scalpel blade number 11 was made on the conjunctival surface, laterally to the third eyelid cartilage. A careful blunt dissection was performed in order to identify and isolate the cyst. Then, the cyst was gently pulled anteriorly by the incision line, exposing the conjunctival surface of the NM. A full-thickness incision of the cyst's wall was made, and its cavity was washed with 0.9% saline solution. The cyst wall in the conjunctiva of the adjacent NM was marsupialized using 5.0 Vicryl⁴ in a simple interrupted pattern (Figure 1B). Elizabethan collar was recommended for 15 days postoperatively.

Synulox⁵ [22 mg/kg, PO, every 12 h for 10 days], and Meticorten⁶ [0.5 mg/kg, every 24 h for 7 days], ophthalmic topical treatment with Maxidex¹ [1 mg/mL- 4 times per day for 7 days], Tobrex¹ [0.3% - 4 times per day for 7 days], and the ophthalmic lubricant Hyabak¹ [0.15% - 3 times per day for 10 days] were prescribed.

DISCUSSION

Fifteen days after the surgery, a moderate amount of mucoid discharge was still present, the NM

was hyperemic and protruded due to the edema, the stoma created was patent. Thirty days postoperatively, there was a significant improvement of the inflammatory process with a marked decrease of the edema, there was no presence of any cystic area, and the stoma was still open. The NM was still mildly hyperemic and mildly protruded with an approximately 3 mm, irregular, firm area, causing an elevated conjunctival surface of the NM (Figure 1C). Another fine needle aspiration was performed but the presence of liquid was not noticed. Cytological analysis revealed an inflammatory infiltrate with the presence of multinucleated cells with numerous macrophages, fibroblasts and lymphocytes;

such findings were compatible with fibrosis. The measurement of STT 1 was: OD 16 mm/min and OS 20mm/min.

Sixty days after the operation, the patient did not have any sign of ocular discomfort. The NM was in its usual anatomical position having a good cosmetic result; however, when pulling up the NM, it was still noticeable a small fibrous area and the stoma was closed. The measurement of STT 1 was within normality limits: OD 18 mm/min and OS 22 mm/min.

Re-evaluations were performed at 90, 120, 150, 180, 240, 340 days postoperatively, completing 1 year from the date of the surgical procedure. During

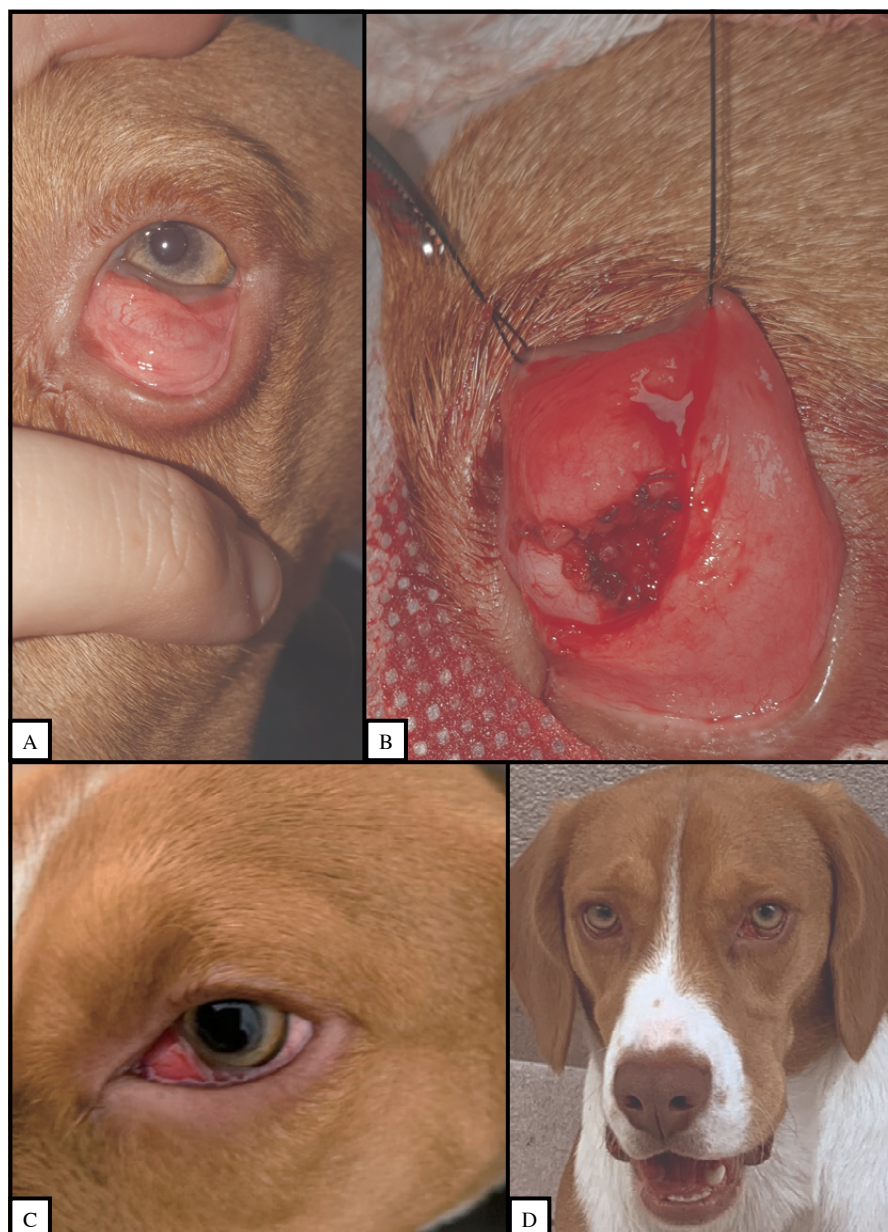


Figure 1. A- Lacrimal cyst of the nictitating membrane. B- Marsupialization of the cyst. C- Nictitating membrane mildly protruding. D- 300 days post-operative.

this entire follow-up period, the STT 1 test was within the normal range in every recheck, and there were no consistent reports of ocular discomfort and/or recurrences of both the gland prolapse or new cystic formation. The only exception is that in the follow-ups after 90, 120, and 150 days, the area of fibrosis in the conjunctival margin of the NM was still present, which had been gradually decreasing in size each follow-up. In the rechecks of 180 to 300 days postoperatively, the fibrosis was no longer observed. In the 2nd year, 2 follow-up rechecks were performed with an interval of 6 months and no cosmetic, clinical or STT 1 changes were seen (Figure 1D).

The marsupialization technique was effective for treating a lacrimal cyst in the NM secondary to surgery to correct PNMG using the conjunctival pouch technique in a Beagle dog. The technique allowed a good cosmetic result and ocular comfort, improving inflammation in addition to ensuring the maintenance of tear production due to preservation of the NM gland. For the surgical planning it is extremely important that the gland is not removed, once 48% of the dogs that had the gland surgically removed developed keratoconjunctivitis sicca [16]. In the 1st consultation, the STT 1 value of the right eye was slightly low and when compared to the left eye, it had a 40% lower tear production. This decrease in the STT 1 value may be associated with the glandular inflammatory process and the accumulation of tears inside the cyst, reducing its flow to the conjunctival fornix of the right eye. The chronic glandular inflammatory process may predispose to dry eye. About 41% of dogs with PMNG that did not underwent surgical treatment enveloped dry eye due to chronic exposure and inflammation [16]. With marsupialization and the use of topical and systemic anti-inflammatory drugs, 15 days after the operation, the STT 1 value of the right eye was already within the normal range. These findings are like the findings of [2], where 2 dogs showed a decrease in STT 1 values of 28% and 47% when compared to the contralateral eye in the 1st consultation.

The clinical signs observed in the present report were mucopurulent ocular discharge, conjunctival hyperemia, blepharospasm and a pink mass in the medial corner of the eye. The findings were like those found by Barbé [2] in 3 dogs with third eyelid cyst. The diagnosis of NM lacrimal cyst was based on the history of previous surgery for PMNG, clinical

aspects, and cytological analysis. Although it has not been performed in the current study, histopathological examination and/or immunohistochemical staining may be an auxiliary tool for the differential diagnosis. Conjunctival cysts are characterized by squamous epithelium with possible goblet cells and mucinous content [5]. The cysts contain positive immunostaining for smooth muscle actin and for myoepithelial cells [11]. In the present report, the formation of a fibrotic tissue on the conjunctival surface of the NM adjacent to the stoma was observed 30 days after the surgery. The fibrotic area gradually decreased until it disappeared after 150 days of surgery. The formation of fibrotic tissue may be related to the choice of suture type and thickness. In the present report, marsupialization was performed with 5.0 Vicryl. No other study has reported a similar postoperative finding in dogs undergoing marsupialization [2,9,12] preferably used monofilament synthetic non-absorbable sutures such as Prolene and Nylon respectively, both 6.0. The 5.0 suture thickness and the polyglactin 910 multifilament material may have generated greater tissue friction, potentiating a predominantly mononuclear inflammatory process. Dogs sutured with polyglactin 910 showed greater tissue reaction compared to those sutured with poliglecaprone 25 [10].

In conclusion the marsupialization was a safe, simple, and effective surgical technique for the treatment of lacrimal of the nictitating membrane secondary to prolapse of the nictitating membrane gland correction surgery using the conjunctival pouch technique in a dog. This procedure enabled the physiological function maintenance of the third eyelid gland and prevented the formation of a new cystic cavity and had a good cosmetic outcome.

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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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