



# Surgical Treatment of Prolapse of the Third Eyelid Gland in Dogs using Modified Morgan Pocket Technique

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## ABSTRACT

The aim of this retrospective study was to evaluate the clinical outcome, complications, recurrence rate, and results of the pocket technique in the treatment of prolapse of the third eyelid gland, cherry eye namely. Thirty eyes of 26 dogs diagnosed with prolapse of the third eyelid gland were included in the study. Conjunctivitis and ocular discharges were noticed in the affected eyes. The four cases were (15%) bilateral and twenty-two (85%) were unilateral. Of the dogs with unilateral disease, the affected eye was on the left side in 10 (45%) dogs and the right side in 12 (55%). Eighteen dogs were male and eight were female. Twenty-six dogs, 30 eyes with protrusion of the third eyelid gland were treated using Modified Morgan's pocket technique. In the postoperative period, the dogs were controlled 3 times with 7 day intervals and no clinical problem was detected. Modified Morgan pocket technique was used with 96.1 percent success rate for the re-positioning of prolapsed gland of the third eyelid in dogs.

**Key words:** Dog, Modified technique, Prolapse, Surgery, Third eyelid gland.

## INTRODUCTION

Prolapse or protrusion of the gland of the third eyelid (compared to glandular hyperplasia, hypertrophy, nictitating gland adenoma) is one of the most frequently encountered diseases of the dogs nictitating membrane (Hendrix, 2007). The cause of the cherry eye is unknown, a juvenile defect transmitted genetically or the weak attachment of connective tissue between the nictitating membrane and periorbital (Hendrix, 2007; Maggs, 2008; Edelmann *et al.* 2013) are possible etiological factors. Because of the inflammation subsequent the prolapse, the gland becomes hypertrophic. In most cases, re-placing of the swollen and thickened gland to its anatomical position is difficult (Dehghan *et al.* 2012).

Brachycephalic breeds have long been agreed as predisposed to gland prolapse. Anatomical conformation of the head and orbit is the possible reason of this predisposition (Maggs, 2008; Dehghan *et al.* 2012; Edelmann *et al.* 2013). Incidence of breeds such as the French and English bulldog American and English Cocker Spaniel, Beagle, Basset Hound, Boston Terrier, Shih-Tzu, Lhasa Apso and Pekingese was also reported as predisposed to cherry eye (Kaswan, 1985; Morgan, 1993; Hendrix, 2007; Plummer *et al.* 2008, Sapienza *et al.* 2014). Generally, prolapse is encountered in young animal, especially before 1 year of age (Kaswan 1985; Morgan 1993). Besides, it was recorded that the male dogs with cherry eye were overrepresented than females and unilateral cases were by far more common than bilateral in many reports (Kaswan, 1985; Morgan, 1993; Plummer, 2008; Dehghan *et al.* 2012).

The third eyelid gland provides 40 per cent of tears by many small ductules opened out on bulbar surface of the third eyelid. If the prolapsed gland is not repositioned for a long time, reduction of the tear production, persistent irritation, enlargement of the gland, ulceration and

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keratoconjunctivitis sicca may occur (Slatter, 2001). Formerly, excising of the gland totally or partially had been recommended as a treatment way to improve the animal's cosmetic (Magrane, 1971; Rickards, 1973). However, because the tear production of the gland significantly contributes to total tear amount needed by the eye, considering possible predisposing the dog to dry eye, surgical replacement of the gland comes forward as the most reasonable therapy (Chang and Lin 1980; Helper, 1982; Morgan, 1993; Stanley and Kaswan 1994; Saito *et al.* 2001).

## MATERIALS AND METHODS

### Animals

Twenty-six dogs were included in this study. The four cases were (15%) bilateral and twenty-two (85%) were unilateral. Of the dogs with unilateral disease, the affected eye was on the left side in 10 (45%) dogs and the right side in 12 (55%).

Eighteen dogs were male and eight were female. Breeds represented in our pool of participants included Mixed-breed (8), English Pointer (5), Turkish Kangal Dog (2), Beagle (2), Cane Corso (2) (Fig 1A), English Bulldog (1), Rottweiler (1), Presa Canario (1), Boston Terrier (1), American Bulldog (1), Pekingese (1) and Faraze Bulldog (1). The age range of dogs was 2 months - 7 years old and the length of affected time prior to surgery ranged from 1 week to > 1 year. All cases were treated prior to surgery for 3-4 days with a topical antibiotic (0.3% ofloxacin, Exocin® – Abdi İbrahim Pharmaceutical Industry) and corticosteroid (10 mg/ml prednisolone sodium phosphate, Norsol® – Mefar Pharmaceutical Industry).

In the history none of the dogs had eye problem before the appearance of pinkish fleshy mass on the medial canthus. The affected eye was palpated to differentiate the prolapsed gland from the cartilage eversion. On the basis of history, physical and clinical examination, the prolapse of the gland of third eyelid was diagnosed.

### Surgical protocol

The dogs were prepared for surgery as to the standard preoperative preparation principles of the periorbital area. General anesthesia was induced with combination of xylazine hydrochloride (1mg/kg, IM, Alfazyne® 2%, Egevet) and ketamine hydrochloride (11 mg/kg, IM, Alfamine® 10%, Egevet). Following endotracheal intubation, the anesthesia was maintained with isoflurane (2%-3.5%, Forane® Salvavidas Pharmaceutical) in oxygen. The dogs were positioned in lateral recumbency as affected eye facing upward on the operation table. The surgical area was draped carefully and then palpebral fissure was opened by placing an eyelid speculum. The third eyelid was exteriorized and everted to expose its bulbar surface. On each side of the prolapsed gland, two superficial curvilinear incisions parallel to the free margin on the bulbar side of the third eyelid were made (Fig 1B-C). The gland was placed into the pocket and the conjunctival edges were closed using 6/0-7/0 polyglactin 910 (Vicryl®, Ethicon) sutures, using a simple continuous suture pattern (Fig 1D-E-F).

In the bilateral cases, the procedure was repeated in the same manner in the second eye. After the surgical procedure, all of the patients were treated topically with ophthalmic ofloxacin (2x4 times/day, Exocin®, Abdi İbrahim Pharmaceutical Industry) and diclofenac sodium (2x4 times/day, Inflased®, Bilim Pharmaceutical Industry) for 10 days, systemic cefazolin sodium (20 mg/kg, Iespor®, I.E. Ulagay Pharmaceutical Industry) for 5 days. Due to possibility of interaction with healing of the suture line, local corticosteroid administration was not used after the operations. No postoperative complication was encountered and all dogs recovered uneventfully.

## RESULTS AND DISCUSSION

There were 26 dogs (30 eyes) diagnosed prolapse of the third eyelid gland and treated by using Modified Morgan pocket. The most frequently represented breed was the

crossbreed (30.77%), followed by English Pointer (19.23%), Turkish Kangal Dog (7.69%), Beagle (7.69%), English Bulldog (3.85%), Rottweiler (3.85%), Cane Corso (3.85%), Presa Canario (3.85%), Boston Terrier (3.85%), American Bulldog (3.85%), Pekingese (3.85%) and Faraze Bulldog (3.85%). The prolapse was unilateral in 22 cases (85%) and bilateral in 4 cases (15%). The affected eye was on right side in 16 cases (55.17%), left was 13 cases (44.83%). Gender was recorded as 18 (69%) males and 8 (31%) females of cases. Seventy-six percent of the dogs were <1-year-old, 16% were between 1 and 2 years old, and the remaining 8% were over 2 years old.

Etiologically there was no trauma or inflammation history, and the reason of the prolapse was determined as the weakness of the connective tissues which keep the gland in its anatomical position.

In postoperative period, the dogs were controlled 3 times in 7 days interval and no clinical problem was detected. Following period by phone call continued to 1 year. Recurrence was observed in only 1 case at the 3<sup>rd</sup> month of the surgery.

Diseases of the third eyelid is commonly encountered in dogs and prolapse of the third eyelid gland, or cherry eye, is the most often one among these diseases (Plummer *et al.* 2008; Mazzucchelli *et al.* 2012; Premont *et al.* 2012). Etiological factors are not known well, but a weakness of



**Fig 1A:** Unilateral prolapse of the third eyelid gland in a Cane Corso dog.  
**B-C:** Making parallel incisions through the bulbar conjunctiva anterior and posterior to the prolapsed gland.  
**D-E:** Repositioning of the gland and application of a single layer simple continuous suture.  
**F:** Postoperative appearance.

connective tissue attachment of the gland, which can be associated with genetically disorder, is especially emphasized (Singh *et al.* 2017; Dehghan *et al.* 2018). In our study, no underlying reason was detected as a possible reason of cherry eye except connective tissue weakness. According to database, prolapse of the of the third eyelid gland usually occurs at two or three months of age (Mazzucchelli *et al.* 2012). The age distribution of the dogs, with the ratio of younger than 1 years of age of 76%, of this study was consistent with the literature.

Most studies mention that the male dogs were more often suffer from cherry eye than females (Mazzucchelli *et al.* 2012; Sapienza *et al.* 2014; Multari *et al.* 2016). The condition was the same in our study. Male dogs (69%) with cherry eye were overrepresented than females (31%). There was a possible explanation in an experimental study which conducted by Cabral *et al.*, (2005). They found the male mongrel dogs have longer lacrimal glands and their superficial glands of the third eyelid are thicker comparing the females. Larger size of the gland may make male dogs more predisposed than female.

Also, cherry eye usually seen unilaterally, bilateral cases were infrequent. However, in unilateral cases, a prolapse can be occur at contralateral eye with passing time (Mazzucchelli *et al.* 2012; Sapienza *et al.* 2014; Multari *et al.*, 2016). Eighty-five percent of the cases (22 of 26 dogs) included in this study were unilateral and any sign of cherry eye was not seen in contralateral eye of these cases during following period. In bilateral cases (4 of 26 dogs), the 3 were younger than 10 months-old, but one was 7 years-old. One case was female (7 months-old), others were male. The interval between the gland prolapse of opposing eye was 2-5 week.

American Cocker Spaniel, Beagle, Bulldog, Pekingese, Neopolitan Mastiff is suggested as predisposed breeds to cherry eye (Plummer *et al.* 2008; Gomez, 2012). Also brachycephalic breeds are predisposed to cherry eye, due to the often formation of conjunctival inflammation because of their head anatomy, has long been agreed. However, there were only 4 brachycephalic dogs (15%) in our study and all of the crossbred dogs were mesocephalic.

Prolapsed gland of the third eye becomes inflamed in time and this inflammation affects the conjunctiva and creates discomfort for the affected animals. These animals usually suffer from reduced altered tear production and chronic conjunctivitis, ocular discharge (Slatter 2001; Dehghan *et al.* 2012; Peiffer 2002). Dogs with cherry eye were presented to our clinic with complain of only mild conjunctivitis and epiphora besides prolapsed gland which looks as dark pink to reddish mass on the third eyelid, as compatible with the literature.

The third eyelid gland contributes approximately 40 percent of the tear production and maintains aqueous tear production (Saito *et al.* 2001). For that reason, leaving the animal as untreated, or removing of the third eyelid gland may results in a reduced tear production, keratoconjunctivitis sicca namely. There are a lot of methods described such as

suturing the gland to the globe inferiorly (Slatter, 2001), orbital rim anchorage (Multari *et al.* 2016), suture anchor placement technique around the insertion of the ventral rectus muscle (Sapienza *et al.* 2014) for repositioning of the gland. However most useful and practical way is the modified Morgan pocket technique (Zabell, 2007). In our study, all animals were treated by using modified Morgan pocket technique with 96.1% per cent success rate.

There is always recurrence risk for the cherry eye patient following gland-sparing surgeries (Mazzucchelli *et al.* 2012; Multari *et al.* 2016; Singh *et al.* 2017). But, this risk can be minimized by presurgical precautions, proper surgical procedure and carefully postoperative care. Topical antibiotics and corticosteroids for initial treatment a couple of days before the surgery and postoperative local antibiotics and non-steroid anti-inflammatory agents may help to reduce the recurrence risk (Zabell, 2007). In our study, all of these procedures were implemented very sturdily, additionally, an Elizabethan collar was worn by the all dogs. Only in one case recurred and the anamnesis revealed that the dog unfortunately failed to use the elizabethan collar properly.

## CONCLUSION

Consequently, this study shows no need to avoid gland-sparing surgical of the modified Morgan pocket technique. Especially, the worries of owner dissatisfaction because of possible recurrence, sometimes drives some clinicians to remove the gland. But it was demonstrated by this work which has with 96.1 per cent success rate, surgical repositioning of the gland by using modified Morgan pocket technique is quite convenient method comparing with other treatment options such as conservative treatment and excision of a prolapse of the third eyelid gland.

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