

## Correction of bilateral cherry eye using the Morgan and modified Morgan techniques in a two-year old Boerboel dog: a case report

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### ABSTRACT

Cherry eye is a reddish follicular mass protruding from the margins of the nictitating membrane, and is characterized by swollen nictitating gland, redness, and glandular expression. Protrusion and hyperplasia of the third eyelid superficial gland has been identified as one of the leading causes of keratoconjunctivitis sica. A two-year old, male Boerboel, 43 kg, was presented with a bright pinkish mass on the middle sides of both eyes, which were not responsive to anti-inflammatory therapy. The mass appeared at different times. The masses were neither haemorrhagic nor infected. However, there were mucoid discharges from both eyes. Diagnosis of bilateral third eyelid prolapse was made based on history, clinical signs and examination of the lesions. The dog was restrained on sternal recumbency and prepared aseptically for surgery. The dog was premedicated with atropine sulphate at 0.02 mg/kg IM and xylazine at 1.5 mg/kg IM, and thereafter, anaesthetized with ketamine at 10 mg/kg IM. Morgan's technique was applied to the left eye, while the modified Morgan technique was applied on the right eye. Postoperatively, Elizabethan collar was placed on the dog. The dog was also placed on dexamethasone (Maxidex, norvatis, Switzerland) and ciprofloxacin eye drop (Ricin Ciprofloxacin, Ricin Pharmaceuticals, India) for 3 and 7 days respectively. The patient was followed up for four weeks postoperatively. Fourteen months later, the cherry eye reoccurred on the left eye. Cherry eye is common in brachycephalic dogs. The condition can occur in dogs less than 1 year of age and also in older dogs. The condition can be unilateral or bilateral. Surgical repositioning of the gland by Morgan's technique is associated with up to 35% recurrence rate, while modified Morgan's technique, which ensures better conjunctival pocket creation and enhance suture anchoring of the gland is associated with improved postsurgical outcome. It is therefore recommended that the modified Morgan's method be used for cases of cherry eye to enhance postoperative outcomes and recurrence associated with Morgan's technique.

**Keywords:** Cherry eye, nictitating gland, prolapse.

### INTRODUCTION

Third eyelid gland prolapse, also known as cherry eye or nictitating gland prolapse, is a reddish follicular mass protruding from the margins of the nictitating membrane, and is characterized by swollen nictitating gland, redness, and glandular expression (Deveci *et al.*, 2020; Hendrix, 2007). It is more common in young dogs, less than one year of age, and may be unilateral or bilateral (Ukwueze *et al.*, 2015), although when unilateral, it is likely to affect the second eye as time progresses (Plummer *et al.*, 2008; Maggs, 2018). It is one of the most common diseases affecting the ocular attachment, and the most frequent disease of the nictitating gland (Hendrix, 2007). It is common in certain breeds such as the Cocker Spaniel, Boston terrier, Bulldog, Pekingese, Neapolitan mastiff, Beagle, Cane corso, Lhasa

apso, Shih-tzu, and Basset hound (Rais *et al.*, 2015). The pathogenesis of the condition is still undetermined (Mazzucchelli *et al.*, 2012). Genetic predisposition and poor development of connective tissue of the base of the gland and periorbital tissue have been identified as important factors in the pathophysiology of the disease (Deveci *et al.*, 2020). Gland enlargement due to antigen stimulation has also been suggested as a predisposing factor to nictitating gland prolapse (Peruccio, 2018). There is no established sex disposition to the disease, but it has been reported to be more common in male dogs than in females (Mazzucchelli *et al.*, 2012). Protrusion and hyperplasia of the third eyelid superficial gland has been identified as one of the leading causes of keratoconjunctivitis sica Vania *et al.*, 2005). 1

Keratoconjunctivitis sica arises following self-mutilation, inflammation, enlargement, infection and desiccation (Ukwueze *et al.*, 2015). For the reason of this complication, treatment of third eyelid gland prolapse is imperative.

## CASE PRESENTATION

### CASE HISTORY

A two-year old, male Boerboel, weighing 43 kg, was presented to the Veterinary Teaching Hospital, Michael Okpara University of Agriculture, Umudike, with a complaint of a bright pinkish mass protruding from the middle sides of both eyes (Fig. I). The mass appeared first on the right eye when the dog was about 7 months of age, and subsequently occurred on the second eye at about 10 months of age. There was no history of head or ocular injury. Physiological and biochemical parameters were within the normal range for dogs.

### CLINICAL OBSERVATIONS

The heart rate, pulse rate, rectal temperature and respiratory rate were within the normal range for dogs. Physical examination indicated that the dog was alert and did not show any obvious signs of pain. The protruding masses were neither haemorrhagic nor infected. However, there were mucoid discharges from both eyes. There were previous attempts to reduce the swelling by pushing it back into the median canthus, but each attempt failed. The dog was also placed on anti-inflammatory eye drops, but the swelling did not resolve.

### DIAGNOSIS

Diagnosis of bilateral third eyelid prolapse was made based on history, clinical signs and examination of the lesions. Surgical treatment was thereafter indicated using the Morgan's technique on one eye and modified Morgan technique on the second eye to compare the outcome of both techniques on the same patient.

### TREATMENT

The dog was restrained on sternal recumbency. The palpebra of both eyes were washed and disinfected with 1% chlorhexidine. Both eyes were flushed with normal saline. The dog was premedicated with intravenous injection of atropine sulphate (0.02 mg/kg) and xylazine (1.5 mg/kg), and subsequently anaesthetized with ketamine (10 mg/kg). The head of the dog was draped for eye surgery. The Morgan technique was applied to the left eye, while the modified Morgan technique was applied on the right eye to compare the outcomes of both techniques on a single patient.

On the left eye, the nictitating gland was exteriorized by gentle traction with a pair of smooth forceps (Fig. II). A stay suture was placed at the apex of the gland, using a 3/0 Vicryl suture material. The stay suture was placed to allow for easy manipulation of the gland. Two parallel incisions, about 1

cm long, were made on the base of the gland, one on the bulbar surface and other on the palpebral surface of the gland. Tissues around both incisions were undermined to create a dead space. An initial knot was placed on the lateral aspect of the palpebral surface of the conjunctiva. The proximal lip of the incision on the palpebral surface was sutured with the corresponding lip of the incision on the bulbar surface. This closed the two incisions over the gland with one suture. As the suture advanced from the lateral aspect of the gland to the medial, the body of the gland was gently pushed into the dead space created, which acted as a pocket for the gland. The suture continued until the entire incision was closed. A final knot was placed on the medial aspect of the palpebral surface of the conjunctiva.

On the right eye, the same procedure as for the left eye was carried out. However, a second row of suture was run, from medial to lateral, incorporating the "buried" nictitating gland (Fig. IV). The final knot was placed on the lateral aspect of the palpebral surface of the conjunctiva.

Postoperatively, Elizabethan collar was placed on the dog. The dog was also placed on dexamethasone (Maxidex, norvatis, Switzerland) and ciprofloxacin eye drop (Ricin Ciprofloxacin, Ricin Pharmaceuticals, India) for 3 and 7 days respectively. The patient was followed up for four weeks postoperatively. Fourteen months postoperatively, the cherry eye reoccurred on the left eye (Fig VI).

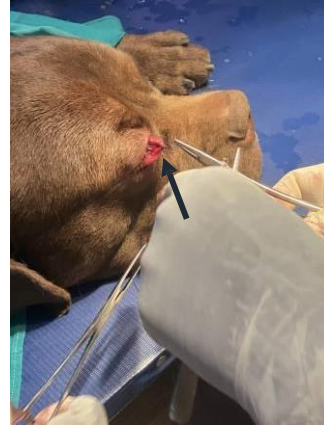
### DISCUSSION

Cherry eye has been reported to occur mainly in dogs less than one year old (Maggs, 2008). However, in the present case, cherry eye occurred in the patient which was over two years of age. Ukwueze *et al.* (2015) also reported cherry eye in a two-year dog of the same breed, and in the same geographical location (Umuahia, Abia State, Nigeria) as that in this case report. Similarly, Das *et al.*, (2022) reported the condition in a two and half year-old Labrador retriever in Bangladesh.

The occurrence of cherry eye in the Boerboel breed has been previously reported (Nesbit & Gerrand, 2011; Bekker & van der Linde-Smit, 2015; Ukwueze *et al.*, 2015; Skeenkamp & Brooks, 2018). However, the bilateral occurrence of the condition is not as common as unilateral cases (Dennis & Brooks, 2013; Gilger & Whitley, 2017; Sapienza & Mayordomo, 2018). Prior to the present case report, bilateral occurrence of cherry eye in the Boerboel has rarely been reported in Nigeria (Ogunole & Oyedipe, 2019), which substantiates the claim that globally the rate of occurrence of bilateral cherry eye is low. Generally, brachycephalic breeds are genetically predisposed to cherry eye (Fischer *et al.*, 2013; Storb *et al.*, 2015; Arnett *et al.*, 2017; Rowe & Rebhun, 2018). This is because the anatomical structure of the head makes them susceptible to the condition. The head of



**Figure I:** Patient presented with pinkish protrusions on the medial aspects of the eye. Arrows indicate the protrusions (cherry eye).



**Figure II:** Surgical repositioning of the prolapsed nictitating gland using the modified Morgan's technique. Arrow indicates prolapsed gland.



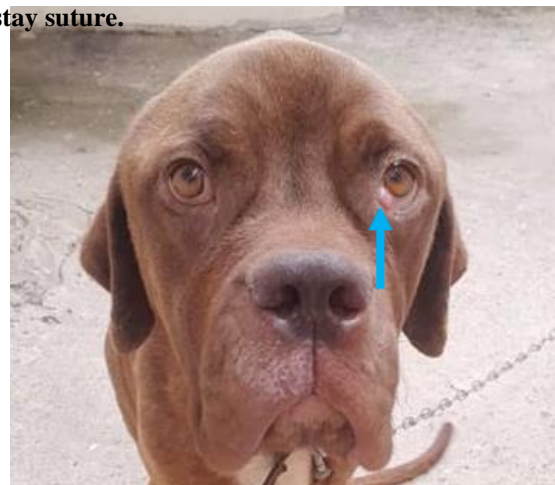
**Figure III:** Postoperative picture of the right eye, showing absence of nictitating gland.



**Figure IV:** Surgical correction of the cherry eye using the Morgan's technique. Arrow indicates a prolapsed nictitating gland, exteriorized with a stay suture.



**Figure V:** Postoperative picture of the left eye showing absence of prolapsed nictitating gland.



**Figure VI:** Re prolapsed nictitating gland on the left eye.

brachycephalic dogs have shallow eye sockets, prominent eyes, narrow palpebral fissure, relaxed eyelid tone, more forward positioned eye, smaller orbit, increased intraorbital pressure, etc, all of which contribute positively to the condition (Fischer *et al.*, 2013; Storb *et al.*, 2015).

Surgical excision and repositioning of the nictitating gland are the two surgical treatment options for cherry eye in dogs (Pavletic, 2017; Borrego & Barrios, 2018; Plummer & Galatt, 2018; Kim *et al.*, 2019). Surgical repositioning was used in this present case report.

Surgical gland excision is an older practice which involves the complete removal of the prolapsed gland and reattachment of the remaining tissues to the surrounding bone (Morgan, 2019). However, this method is associated with complications such as impaired tear production, keratoconjunctivitis sicca, infection and abscess formation (Kuhns, 2018; Morgan, 2019). On the other hand, surgical gland repositioning involves the reconstruction of the conjunctiva in such a way that the gland is return to its anatomical position and maintains its physiological functions. Surgical gland repositioning is reported to be a better management approach to cherry eye (Morgan, 2019). This is because this approach provides a permanent solution to the disease as well as reduces the risk of complications, particularly keratoconjunctivitis sicca (Morgan, 2019). Repositioning techniques include the Morgan's technique and modified Morgan's technique.

The patient in this case had a recurrence of cherry eye in the eye corrected by Morgan's technique. Morgan's technique has been reported to have a success rate of 60 – 75% (Slatter, 2001; Gilger, 2017; Peiffer, 2017). Recurrence may be due to insufficient anchoring of the gland, inadequate pocket creation or glandular tissue fragility (Slatter, 2001; Gilger, 2017; Peiffer, 2017). Any of these factors may have contributed to the failure of the Morgan's repositioning technique in our case.

In contrast to the Morgan's method, the modified Morgan's method has a risk of recurrence of less than 15% (Slatter, 2001; Gilger, 2017; Peiffer, 2017). The reason for the higher success rate has been reported to be increased pocket size for gland repositioning and suture reinforcement (Peiffer, 2017; Kumar, 2019). In our case, there was no recurrence in the eye in which cherry eye was corrected by the modified Morgan's technique.

## CONCLUSION

In conclusion, this report highlighted a rare case of bilateral cherry eye in a boerboel dog, of over two years of age, in Nigeria. There was recurrence of the condition on the eye corrected by the Morgan's method, while there was no recurrence in the eye which was corrected by modified Morgan's method. It is therefore recommended that the modified Morgan's method, which is associated with less

complications, be employed for the surgical treatment of cherry eye in dogs.

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