

Reconstruction of Bilateral Upper Eyelid Coloboma in a Domestic Shorthaired Cat Using Roberts and Bistner Technique

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ABSTRACT

A 1-year-old, male domestic short haired cat was presented to our Faculty of Veterinary Medicine, University of Istanbul-Cerrahpaşa due to complaints of blepharospasm and epiphora in both eyes present since birth. In the ocular examination, absence of a part of palpebra in both eyes and persistent pupillary membrane (PPM) in the left eye were observed. There was trichiasis irritating the corneas in both eyes. Bilateral palpebral defects and secondary trichiasis were repaired using a Roberts and Bistner technique. This technique provided a good cosmetic appearance and functional outcome to the patient. Roberts and Bistner technique is recommended in treating congenital, bilateral eyelid coloboma.

Keywords: Cat, eyelid margin, persistent pupillary membrane, trichiasis, upper eyelid coloboma.

Bir Kedide Bilateral Üst Göz Kapağı Kollobomunun Roberts ve Bistner Tekniği ile Rekonstrüksiyonu

ÖZ

Bir yaşında erkek sarı kedi, İstanbul-Cerrahpaşa Üniversitesi, Veteriner Fakültesi'ne, iki gözünde doğduğundan beri devam eden blefarospazm ve epifora şikayeti ile getirildi. Oftalmolojik muayenede her ikisinde mevcut olan üst göz kapağı agenezisi ve sol gözünde persistent pupillar membran olgusuna rastlandı. Bunlara ek olarak korneaları irrite eden trichiiazis de tespit edildi. Olguda teşhis edilen bilateral göz kapağı agenezisi ve buna bağlı oluşan sekonder trichiiazis, Roberts ve Bistner tekniği kullanılarak düzeltildi. Bu teknik hastaya iyi bir kozmetik görünüm ve işlevsel sonuç sağladı. Konjenital, bilateral göz kapağı kolobomunun tedavisinde Roberts ve Bistner tekniği önerilmektedir.

Anahtar Kelimeler: Göz kapağı kenarı, kedi, persistent pupillar membran, trisiyazis, üst göz kapağı kolobomu.

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INTRODUCTION

Eyelid agenesis, or commonly known as coloboma, is a congenital developmental anomaly characterized by lacking all or part of the eyelid (Ocelli and Neaderland 2011, Esson 2014). This problem has been reported in cats, dogs, horses, sheeps, Snow leopards, Texas cougar and humans (Cheng at al. 2006, Etemadi at al. 2013). It is a rare disease in small animals but is more common in cats than in dogs (Ocelli and Neaderland 2011, Etemadi at al. 2013, Reed at al. 2018).

This lesion, which affects the lateral portion of upper eyelid in cats, is mostly bilateral (Cheng at al.2006, Ocelli and Neaderland 2011). The aetiology has not been known exactly, but several causes containing a recessive genetic disorder and teratogenic effects have been reported (Whittaker at al.2010, Etemadi at al. 2013,Esson 2014). The clinical symptoms of the disease vary depending on the width and localization of the defect. The contact of the skin hairs to the cornea due to the absence of palpebral margin, causes ocular irritation and excessive tear production(Reed at al. 2018). Due to insufficient closure of the palpebral fissure, secondary exposure keratitis and keratoconjunctivitis sicca may occur(Whittaker at al.2010, Ocelli and Neaderland 2011, Etemadi at al. 2013). Medical treatment may be used in small eyelid lesions that do not cause severe ocular lesions, but this treatment may be inadequate because this lesion is usually in the form of large defects (Cheng at al.2006). Many surgical techniques have been reported, ranging from simple closure of smaller lesions to complex reconstruction procedures that was used for repairing large lesions of the eyelids (Cheng at al.2006,Whittaker at al.2010, Reed at al. 2018).

In this report, the treatment of bilateral, congenital eyelid coloboma in a cat using Roberts and Bistner surgical technique was evaluated.

CASE REPORT

A 1-year old male, domestic shorthair cat, was presented to Faculty of Veterinary Medicine, University of İstanbul-Cerrahpaşa with a history of ocular discomfort, blepharospasm and epiphora since birth. Ophthalmic examination revealed bilateral absence of part of upper palpebra and margins, skin hairs irritating the corneas, causing epiphora and blepharospasm (Figure 1-2). The palpebral fissures were not completely closed during the blink. Since the ocular surface was partially exposed, secondary keratitis and corneal vascularization developed in both eyes. Also there was a PPM that adhered to the cornea in the left eye (Figure 3). No other ocular and systemic anomaly was found in the examination. Because of

the corneal surface lesions and serious ocular discomfort in the patient, it was decided to correct the defects with surgical reconstruction method in both eyes. General anaesthesia was maintained with xylazine (1mg/kg, IV, Basilazine, Bavet, Turkey) and ketamine (5mg/kg IV, Ketalar®, Pfizer, Turkey) followed by 2% isoflurone (Forane®, Abbott, Turkey) in oxygen. Analgesia was provided by meloxicam (0.1-0.2mg/kg, SC, Melox, Nobel, Turkey) 2 hours before surgery. Cephalosporin (25 mg/kg IV, Iesef 500mg, Ibrahim Ethem Ulugay, Turkey) was given 30 min prior to surgery. Defects were repaired with rotational pedicle eyelid flaps that were formed from the lateral region of the lower eyelid.

SURGERY

Skin that containing trichiasis was dissected from the adjacent palpebral conjunctiva and then excised with tenotomy scissors. Thus, first eyelid recipient beds were formed (Figure 4). Rotational pedicle flaps that were formed from the lateral region of lower eyelids were used to fill the defect cavities. That flaps were created with 3 step incisions. The first incision of the flap was dorsal incision at a distance of 1-2 mm from the edge of the lower eyelid. The ventral incision was large enough to close the defect of the upper eyelid and was parallel to the dorsal incision. The incisions of the flap were made slightly more than the length of the defect. The incisions parallel to each other were combined with a vertical incision that was made from the region close to the medial canthus of the eyelid (Figure 5). The width of the flap incision was made wide enough to cover the defect to prevent secondary lower eyelid ectropion (Figure 6). The lower eyelid flap that containing skin, muscle and tarsus, was rotated to cover the upper eyelid defect and it was sutured to the recipient bed atraumatically with absorbable 8/0 PGA, simple sutures (Figure 7-8). The dissociated conjunctiva in the temporal region was fixed to the skin of the flap by simple continuous sutures to support the feeding of the flap and to prevent secondary necrosis.

Postoperatively, an Elizabethan collar was worn to prevent self trauma. Topical 0.3% ofloxacin (Exocin, Abdi Ibrahim, Turkey) 4 times a day and systemic amoxicillin and clavulanic acid (Synulox 50mg, Pfizer, Turkey) 2 times a day 12.5 mg/kg PO antibiotics against secondary infection;for inflammation topical % 0.15 diclofenac sodium (Inflased®, Bilim, Turkey) 2 times a day and systemic meloxicam (Metacam®, Boehringer Ingelheim, Australia) 0.05mg/kg PO were used.

24 hours after the operation, minimal swelling occurred in the eyelids. Warm compress was

applied 2-3 times daily for 1 week to accelerate the blood circulation of the eyelids. Although the eyelids and flaps were slightly oedematous, no necrosis occurred at the flaps tip or trunk (Figure 9). The swelling of the cat's eyelid disappeared completely, the ocular discomfort has decreased and sutures were taken within 2 weeks. There were

no complications such as flap loss, infection or ectropion. There was no problem with flap feeding and corneal protection in the patient was fully provided (Figure 10). The cat was followed for 4 months after the operation, but there was no recurrence similar to the first in the affected eyes (Figure 11).



Figure 1-2. Bilateral absence of temporal upper eyelid in a cat and presence of severe trichiasis that irritated the cornea.



Figure 3. The cat also had PPM that adherent to cornea in the left eye.



Figure 4. First, the upper eyelid recipient bed was formed by excising the colobomatous area and hairs that irritated the cornea.



Figure 5. Surgical incisions of flap.



Figure 6. The flap is wide enough to close the defect.



Figure 7. The lower eyelid flap is moved to the upper eyelid recipient bed.



Figure 8. The lower eyelid flap is sutured to the upper eyelid recipient bed with simple sutures using 3/0 nylon.



Figure 9. The appearance of the eyelid 1 week after surgery. No necrosis was seen, but mild swelling on the donor flap



Figure 10. The appearance of the cat 2 weeks after surgery. Eyelid swelling disappeared, ocular discomfort was reduced but still had conjunctival hyperaemia.



Figure 11. 3rd control of the cat 4 months after surgery. The patient had a perfect cosmetic appearance and a functional upper eyelid.

DISCUSSION

Congenital eye anomalies are less common than other organ anomalies. The eyelid coloboma is one of the important anomalies of the eye characterized by a partial or complete absence of the palpebra. The most common site of colobomas is the upper eyelid, especially the lateral part in cats (Reed et al. 2018). In this case, coloboma of the lateral 2/3 of the upper eyelid was diagnosed in both eyes.

It has been reported that occurs more frequently in Domestic Shorthair, Persian, Birman cats, although there is no breed predisposition (Cheng et al. 2006, Etemadi et al. 2013, Gelatt 2014). Eyelid coloboma may be a single lesion or associated with other ocular disorders such as microphthalmia, dermoids, PPM, lacrimal gland aplasia, retinal dysplasia, cataracts and anophthalmos (Cheng et al. 2006, Etemadi et al. 2013). In the present case, PPM was present in addition to the eyelid lesion in the left eye.

If treatment is not started in the early period except for cosmetic disorders, complications occur due to prolonged exposure of the ocular surface to external factors. It is very difficult to get a good result with medical treatment in ocular lesions of eyelid defects, so surgical treatment is often indicated. The method of surgical repair is determined by the size of the defect. If the size of defect is smaller than 1/3 of the width of the eyelid, primary closure is the ideal treatment after wedge-shaped excision. Larger defects require

reconstructive techniques that are more complex as the size and content of the defect increases (Whittaker et al. 2010, Reed et al. 2018).

Reconstruction is indicated for all defects that may cause secondary complications when not repaired. These complications include exposure keratitis, keratoconjunctivitis sicca, epiphora and lagophthalmus (Gelatt 2014). The main purpose of the reconstruction is to provide eyelid function, protect the eyeball and obtain a cosmetic appearance (Esson 2001, Gelatt 2014). The reconstruction of eyelid components including skin, muscle, tars and conjunctiva is important for the function of the upper eyelid (Etemadi et al. 2013, Trbolova 2014). In cases where primary suture is insufficient, various eyelid reconstruction techniques; Cutler-Beard, Mustarde, Bucket handle, sliding skin such as semi-circular and z-plasty skin flap have been described (Esson 2001, Reed 2018). The bilateral palpebral defect of this case was repaired using Robert and Bistner technique. This technique is used for repairing of full-thickness defects of the upper eyelid. In this technique, a rotational flap that was rotated from the lower eyelid, is a preferred surgical treatment intervention. The advantages of this flap include reconstructing the eyelid defect with similar tissue (Cheng et al. 2006, Trbolova 2014, Reed et al. 2018). Since there is no marginal area like normal eyelid edge in the rotational flap, hairs on the palpebral skin may usually turn towards the cornea and cause discomfort in the eye after surgery (Cheng et al. 2006). 4 weeks after the operation, no such

complication was encountered in our case. In addition, this procedure may cause complications such as ectropion of the lower eyelid after the operation (Reed et al. 2018). Ectropion was common in this disease compared to other complications, which did not develop in this patient.

In conclusion, a large number of upper eyelid reconstruction options are available. When evaluating them and choosing the appropriate one, it is necessary to select the method that gives the best result and causes the least damage.

The rotation flap of the lower eyelid can be said to be a technique that provides satisfactory results in both cosmetic and functional aspects in the treatment of rare eyelid coloboma.

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