Corneal Epithelial Inclusion Cyst in a Dog

João Antonio Tadeu Pigatto, Luciana Vicente Rosa Pacicco de Freitas, Luciane de Albuquerque & David Driemeier

ABSTRACT

Background: Intrastromal corneal cysts are uncommon lesions caused by the implantation of corneal epithelial cells in the stroma, and their subsequent intrastromal proliferation, which has often been secondary to trauma. Lamellar keratectomy has been the chosen treatment and diagnosis has been confirmed by histopathology. In this report, we describe a case of corneal epithelial inclusion cyst in a dog that was successfully treated with lamellar keratectomy.

Case: A 10 year old Yorkshire Terrier dog was referred to the Ophthalmology Section of the Veterinary Clinics Hospital of the Federal University of Rio Grande do Sul (UFRGS), presenting an abnormal appearance in the left cornea. The ophthalmic examination revealed a white and elevated mass, measuring approximately 3 mm in the left cornea. Thus, a superficial keratectomy was performed by utilizing an angled ophthalmic disc knife, under general anesthesia, and an operating microscope. In addition, a third eyelid flap was performed to protect the cornea. The postoperative treatment involved broad-spectrum antibiotic containing tobramycin 0.3%, and a non-steroidal anti-inflammatory solution of sodium diclofenac 0.1%, administered six times a day for two weeks. In addition, atropine sulphate 1% was applied once a day for five days. After three weeks of follow-up, the third eyelid flap was removed, and there was no evidence of corneal ulcer. After two years, no recurrence has been observed.

Discussion: Studies have indicated that the epithelial inclusion cyst is congenital or traumatic. In this case, the dog had a history of previous corneal ulceration occurring at the same site of the cyst. Regarding clinical signs, studies have reported that a corneal cyst does not cause ocular discomfort, although excessive tearing and blepharospasm have been reported. At the moment of examination, the dog presented ocular discharge, discomfort and conjunctival congestion. Normally, a definitive diagnosis is made after cytology or histopathology; however, the diagnosis of corneal cyst in this dog was confirmed through the histopathology of the mass after surgical excision. Keratectomy has been the chosen treatment to remove cysts. Although the recurrence of a cyst is not expected, it has been described fifteen months after the first keratectomy. The most likely explanation for this recurrence could be an incomplete and inadequate surgical excision of the original cyst. In this study, keratectomy was carried out and the entire cyst, along with its sac, was then removed. It is important to remove the cyst rather than draining it, once if the cyst and sac-cover are not totally removed, there is a great possibility of the cyst growing back and getting larger. After keratectomy pedicle conjunctiva graft, third eyelid flap, tissue adhesive, and therapeutic contact lens can be utilized. In this case, third eyelid flap was utilized after keratectomy. The concomitant medical therapy was realized with the topical utilization of broad-spectrum antibiotics in order to prevent bacterial contamination. In addition, the topical atropine sulphate 1% was utilized to dilate the pupil, helping to decrease pain associated with secondary uveitis; non-steroidal anti-inflammatory drug was utilized to control the inflammation. Lastly, the third eyelid flap suture was removed three weeks after surgery, and there was no evidence of corneal ulcer; periodic evaluations were realized every three months and there were no signs of recurrence after one year. In the present case, lamellar keratectomy associated with third eyelid flap was effective in the treatment of corneal epithelial inclusion cyst in a dog.

Keywords: corneal, lamellar keratectomy, canine.
INTRODUCTION

Corneal epithelial inclusion cyst, involving any of the four layers of the cornea, has been reported in human and dogs [4,8,12]. Epithelial cysts are caused by the implantation of corneal epithelial cells in the stroma and their subsequent intrastromal proliferation, which has often been secondary to trauma [1,3,8,12]. Furthermore, there is no breed known as predisposed to the epithelial inclusion cyst formation [1,4], and the inclusion of epithelial cysts occur as an increasing volume of white to pinkish color and high benign corneal, being most often unilateral [4,6-8]. Recently, in a study, cyst formation was typically located only in dorsolateral region or central cornea, which has been rarely reported as involving the sclera [11]. However, the same study reported the first case of multiple epithelial inclusion cysts in the cornea of a dog [11] and the differential diagnosis included corneal neoplasm, abscess, dermoid, bullous keratopathy, and iris prolapse [1,11]. The diagnosis has been confirmed by histopathology and keratectomy has been the chosen treatment [3,6,11,12]. A case is reported here in which a corneal epithelial inclusion cyst in a dog was successfully treated with lamellar keratectomy.

CASE

A 10 year old Yorkshire Terrier dog was referred to the Ophthalmology Section of the Veterinary Clinics Hospital of the Federal University of Rio Grande do Sul (UFRGS), Porto Alegre, RS, Brazil, presenting an abnormal appearance in the left cornea. The history revealed epiphora and blepharospasm seven days previously. Although on examination the dog demonstrated good clinical condition, its owner reported that the animal had a corneal ulcer six months prior to this consultation at the hospital, exactly where the cyst was located then. Schirmer tear test1 values were 19 and 17 mm in the left and right eye, and intraocular pressure2 was 16-17 mm Hg in its left and right eye, respectively. Fluorescein3 dye test was negative. Blepharospasm and photophobia were not present. Portable slit lamp4 examination showed white and elevated mass measuring approximately 3 mm in the left cornea with involvement of the epithelium and upper stroma (Figure 1).

The results of a complete blood count and serum biochemical profile were within normal reference range. Thus, a superficial keratectomy was performed utilizing an angled ophthalmic disc knife5, under general anesthesia, and an operating microscope. A third eyelid flap was performed utilizing a 4-0 nylon6 to protect the cornea. All excised tissue was placed in buffered 10% formalin, processed for light microscopy, and sections were stained with hematoxylin and eosin. The histopathological evaluation was performed by the Sector of Veterinary Pathology (SVP), Department of Veterinary Clinical Pathology, Faculdade de Veterinária (FaVet), Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, RS, Brazil (Figure 2). Moreover, the postoperative treatment involved broad-spectrum antibiotic (Tobramycin 0.3%)7 and a non-steroidal anti-inflammatory solution (sodium diclofenac 0.1%)8, administered six times a day, for two weeks. In addition, atropine sulphate 1% (atropine 1%)9 was applied once a day, for five days. Lastly, the third eyelid flap suture was removed three weeks after surgery, and there was no evidence of corneal ulcer. Periodic evaluations were realized every three months and there were no signs of recurrence of the cyst after one year (Figure 3).
DISCUSSION

Corneal cysts are uncommon and have been reported in human, dogs and llamas [1,4,8,10,11]. Corneal cysts have typically traumatic or congenital origin [1,4,10], and most referred canine cases present a history of ocular lesions [1,4]. In this case, the dog had a history of corneal ulceration occurring at the same site of the cyst. Recurrent corneal ulcer and previous keratectomy have been mentioned as possible causes for this cystic formation [1,3,7].

A previous study demonstrated that there is a relation between the formation of the cyst and trauma [1]. There is no known breed predisposition to epithelial [1]. In this report, the dog was the Yorkshire breed and had a history of prior corneal ulcer. Although some authors have reported that dogs with epithelial inclusion cyst do not present history of ocular discomfort [1,6,9], in the ophthalmic examination, blepharospasm, conjunctival congestion and mucous secretion, were then perceived. As in this report, other studies have demonstrated that the cysts and the region of the cornea are vascularized. In addition, as it has been observed, these cystic formations usually do not interfere with the results of other eye exams as a proof of fluorescein, tonometry, and direct and indirect ophthalmoscopy [1,3,9,11]. In a report on a large corneal epithelial inclusion cyst, intraocular pressure was not possible to be measured due to a large cyst [4].

In terms of clinical features, this case was similar to previous ones reporting corneal cysts in dogs, and corneal mass was presumptively diagnosed as a corneal epithelial inclusion cyst based on clinical examinations. Therefore, histopathology was necessary to make a definitive diagnosis and mostly for differentiating corneal cysts from corneal neoplasia, bullous keratitis, corneal abscess, dermoid and iris prolapse [1,11]. In this case, the diagnosis was based on history and clinical signs, being confirmed by the histopathology of the mass after keratectomy.

Thus, cytological examination has shown that the fluid inside the cystic necrotic material has been present as well as occasionally cellular debris calcium crystals [1], related to the cyst wall, this may have intact or degenerated epithelial cells.

Histopathology usually reveals that epithelial inclusion cyst is formed by a stratified squamous epithelium note. The cells, in the basal epithelium melanin granules, may contain the cytoplasm, while the lumen of the cystic structure can present amorphous substance, eosinophilia homogeneous material, cellular debris, macrophages and erythrocytes [1,6,9,11]. Histological examination revealed the presence of corneal tissue with cystic area containing keratin and absence of inflammation, presenting outbreaks of corneal epithelial proliferation in several layers, and confirming the diagnosis of epithelial inclusion cysts. The histological appearance was similar to that previously described.

For dogs with corneal cysts, the chosen treatment has been the superficial keratectomy [1,3,4,6,8,11,12]. After keratectomy pedicle conjunctiva graft, third eyelid flap, tissue adhesive, amniotic membrane, therapeutic contact lens can be, then, utilized [2,3].

In this report, the corneal cyst was removed from the dog, through lamellar keratectomy, and, as
keratectomy was superficial, the third eye flap was chosen to protect the cornea. Third eyelid flap is an excellent form of protection for the corneal epithelium during healing.

Usually, as in the case reported, recurrence of the CEIC has not been expected [9]. However, another case reported two smaller CEIC appearing fifteen months after the first keratectomy. Thus, lamellar keratectomy associated with third eyelid flap was effective in the treatment of corneal epithelial inclusion cyst in a dog.

REFERENCES