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Bilateral conjunctival graft for management of corneal ulcers in pug

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Abstract

A 10-month-old female pug presented to Veterinary clinical complex, College of Veterinary Animal Sciences, Udgir with a history of bilateral corneal abrasions and loss of vision from both eyes in the last three months. After an extensive examination involving a fluorescein stain test revealed bilateral corneal ulcers. The condition was diagnosed and the case was resorted to surgical correction. Preanaesthetic drugs were administered and the patient was prepared to be operated under gaseous anaesthesia (2% Isoflurane in 100% oxygen). The eyes were irrigated with sterile isotonic saline to remove debris and ciprofloxacin solution was instilled. The left eyeball was exteriorized with a wire eye speculum. A hood flap was dissected from the bulbar conjunctiva as close as possible to the lesion on the cornea. After dissecting the bulbar conjunctiva, further separation from the episclera was done, followed by positioning of the conjunctival graft over the globe ensuring the coverage of lesion on cornea without any traction. Anchoring of conjunctival graft on the cornea was done by using 5-0 vicryl in simple interrupted suture pattern. The procedure was repeated for the right eye as well, and conjunctival pedicle grafting was done. This was followed by antibiotic eye drops and bandaging to protect the eyes and to avoid infection. Routine post-operative antibiotic therapy was administered for five days. The animal had an uneventful recovery with the return of complete vision in the right eye on 15th day, moreover the ulcer of left eye is completely recovered with blurred vision.

Keywords: Bilateral conjunctival graft, corneal ulcers, pug

Introduction

One of the most prevalent corneal conditions in small animal practice is corneal ulcer (Tuntivanich 1993; Boruchoff and Foulks 1990) [15, 2]. Clinical symptoms of epiphora, pawing, blepharospasm, photophobia, and corneal opacity are shown by animals with corneal ulcers (Nasissse 1996; Wilkie and Whittaker 1997) [11, 19]. There are numerous underlying causes of keratitis, including trauma (abrasion, eyelash disease, foreign bodies, prolapsed eyes, entropion), chemical exposure (soap, acid, repellents), infection (bacterial, fungal, viral), metabolic diseases (endothelial disease, keratoconjunctivitis sicca, hypoandrogenism), and immune-mediated diseases (immune-mediated punctate keratitis) (Necas 1992; Kottman and Neaas 1993) [12, 8]. Gelatt and Gelatt (1995) [5] recommend categorising corneal ulcers based on their depth, size, aetiology, infection status, and collagenase activity. Corneal ulcers can grow quickly and require emergency medical or surgical intervention, even with prompt therapy (Glaze 1996) [4]. Incorrect treatment or diagnosis can cause corneal ulcers to worsen and evolve into punctate keratitis or descemetocoele (Nasissse 1996; Crispin 1993) [11, 3]. Most superficial corneal ulcers heal quickly without complications. Medical therapy, including topical antibiotics, mydriatic-cycloplegic drugs, and artificial tears, can effectively prevent infection, ease discomfort, and promote healing (Slatter & Kern 1990) [14]. Surgical therapy is recommended for deep corneal ulcers, recurring ulcers, and stromal melting at first presentation (Whitley 1991) [18]. Descemetocoele and perforated corneal ulcers are deemed surgical emergencies. Surgical treatment for corneal defects varies according on size and depth (Wilkie and Whittaker 1997) [19]. The most important features of treating deep corneal ulcers are to provide mechanical support to the weakened cornea and stop further corneal destruction with sound medical therapy (Boruchoff and Foulk 1990) [2].

Several surgical procedures have been documented, including corneoscleral grafting (Slatter 1990) ^[14], conjunctival grafts (Boisjoly *et al.* 1989) ^[11], third eyelid flap (Gelatt 1995) ^[5], and corneal transplantation (Severin 1995) ^[13]. Collagens and contact lenses are commonly used to prevent deep corneal ulcers, descemetocoeles, and perforating ulcers (Honig and Rapuano 1997) ^[6]. The third eyelid flap procedure is commonly used to treat superficial corneal ulcers, but it has certain drawbacks, including the possibility of corneal wound laceration during ocular movement (Nasisse 1996) ^[11]. Corneoscleral grafting and corneal transplantation are rarely undertaken due to severe complications and postoperative treatment (Morgan and Abrams 1994) ^[10].

Conjunctival grafts in dogs and cats can arise from the bulbar or palpebral conjunctiva. Gelatt and Gelatt (1995) ^[5] suggest that these cells enhance the corneal stroma by supplying fibroblasts, blood vessels, and epithelial cells that repair abnormalities and have antimicrobial and antiprotease/anticollagenase properties. The rotational bulbar pedicle graft is ideal for tiny animal corneas (Wilkie and Whittaker 1997; Wanichanon *et al.* 1996) ^[19, 17]. Rotational grafts allow animals to view around the graft and veterinarians to assess intraocular structures after surgical repair. A pedicle graft allows for easy monitoring of corneal health and pupil dilation, and does not interfere with topical medicine penetration (Tuntivanich *et al.*, 2001) ^[16].

Materials and Methods

A 10-month-old female pug presented with a history of bilateral corneal abrasions and loss of vision from both eyes in the last three months. After an extensive examination involving a fluorescein stain test revealed bilateral corneal ulcers (Fig. 1) The condition was diagnosed and the case was resorted to surgical correction with a conjunctival graft technique. The animal was sedated with Inj. Atropine sulphate @ 0.04 mg/kg, Inj. Xylazine @ 1 mg/kg and induction done by Inj. Propofol @ 4 mg/kg followed by maintenance with 2% isoflurane in 100% oxygen. The left eye was flushed with sterile, isotonic saline and ciprofloxacin and wiped with sterile swabs to remove debris. A wire eye retractor was used to exteriorize the eyeball (Fig. 2). A hood flap was dissected from the bulbar conjunctiva as close as possible to the lesion on the cornea (Fig. 3). After dissecting the bulbar conjunctiva, further separation from the episclera was done, followed by positioning of the conjunctival graft over the globe ensuring the coverage of lesion on the cornea without any traction.

The flap of the conjunctiva was rotated to fit into the corneal ulcer. Anchoring of conjunctival graft on the healthy cornea was done by using 5-0 vicryl in a simple interrupted suture pattern (Fig. 4). The procedure was repeated for the right eye as well, and conjunctival pedicle grafting was done. This was followed by antibiotic eye drops and bandaging to protect the eyes and avoid infection. Routine post-operative antibiotic therapy was administered for five days.

Results and Discussions

The animal had an uneventful recovery with the return of complete vision in the right eye (Fig. 5) on the 15th day moreover, the ulcer of the left eye is completely recovered with blurred vision with clearance of corneal opacity (Fig. 6). Corneal ulceration is a common condition in dogs and cats, and can be caused by ophthalmic or systemic disorders. Ulcerative keratitis and deep stromal ulcers are common in

brachiocephalic breeds, presenting as central or paracentral ulcers with rapid onset. Several factors contribute to ulcer development in these breeds.

Kern (1990) ^[7] found that these breeds show subnormal corneal sensitivity, less frequent blinking, central thinning of the precorneal tear film, and relative lagophthalmos.

Additionally, predisposing variables like distichiasis, trichiasis, and nasal fold trichiasis have been described. In small animal clinical practice, prevalent disorders include recurring corneal erosions, descemetocoeles, staphylomas, and feline sequestrations (McNeil, 1997) ^[9].

Conjunctival pedicle graft is a surgical treatment with a successful rate exceeding 90% (Wilkie and Whittaker 1997) ^[19]. This technique promotes corneal healing by strengthening weakened corneal stroma, providing fibroblasts, blood vessels and epithelial cells and offering antimicrobial, antiprotease and anti collagenase properties (Morgan and Abrams 1994) ^[10]. Furthermore the aim of the graft is to cover the defect and its closest surroundings, achieving conjunctival to corneal epithelium cell apposition over as much of the graft circumference as possible. Pedicle graft allows edge to edge apposition over at least 270^o of the graft margin and will ensure rapid acceptance of the graft, epithelial cell contact inhibition and cell to cell adherence and minimize scar formation (Wilkie and Whittaker 1997) ^[19].



Fig 1: Left eye and right eye with corneal ulcer



Fig 2: Exteriorization of eyeball with wire speculum



Fig 3: Hood flap dissection



Fig 4: Suturing of conjunctival flap



Fig 5: Right Eye



Fig 6: Lef eye

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