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Non-surgical treatment of Periorbital swelling, mild proptosis and corneal ulcer in brachycephalic breed of dog

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Abstract

A 5-year-old pug was diagnosed with proptosis, hyphema, glaucoma and corneal ulcer with high rectal temperature and felt pain around the orbit while doing palpation. Before performing enucleation, it is decided to subside the pain and to control infection as well as to reduce ocular pressure, certain medication like mannitol, NSAID, antibiotics (intravenous and eye ointment) were tried and the animal regained a normal vision.

Keywords: Brachycephalic, corneal, dog, enucleation, proptosis

Introduction

Proptosis is an emergency ophthalmic condition characterized by partial or complete rostral displacement of the eye globe with respect to the corresponding orbit (Wheler *et al.*, 2001) [12]. Proptosis may develop from blunt head trauma such as an automobile accident or fight with another animal. Small breed dogs especially brachycephalic breeds are on high risk for proptosis because of their prominent eye globes, shallow orbit and large palpebral fissure (Miller, 2008) [9]. Early action is needed to prevent permanent damage to eye ball *via* globe replacement surgery as proptosis leads to entrapment of the corresponding eyelids behind the globe (Wheler *et al.*, 2001 [12]; Crispin, 2005[3]) which results in swollen periorbital tissues that potentially reduce the vitality of the globe and possibly cause loss of vision (Crispin, 2005) [3]. Possible complications associated with proptosis included permanent strabismus, congestive glaucoma, avulsion of optic nerve, ulcerative keratitis, keratoconjunctivitis sicca, neuro-retinal degeneration, lateral exotropia and phthisis bulbus (Mandell and Holt, 2005; Ali and Mostafa, 2019) [8, 2].

Corneal ulcer is an inflammatory condition of the cornea involving loss of its outer layer. It is very common in dogs and is sometimes seen in cats. Causes include self-inflicted, trauma, eyelid abnormalities, thermal and chemical burns, immune mediated, facial paralysis, keratitis, absence of the protective tear film and infection with bacteria, viruses and fungal elements. Cornea consists of superficial epithelium, basement membrane, relatively acellular stroma, deeper Descemet membrane and single layer of endothelium. It maintains a strong and durable barrier between the eye and environment, as well as a transparent medium to permit passage of light and images into the posterior segments (Gelatt, 2018) [6].

Materials and Methods

A 5-year-old female pug breed was presented to the clinic with history of periorbital swelling, ulcerated cornea, hyphema and felt pain on palpation around the orbit along with infection present (Fig. 1). Because of the infection and pain, the rectal temperature was high with excessive panting was observed. Even though surgical correction was an option for this case, risk of anaesthesia in brachycephalic breed and the health status of animal need to consider before deciding to do operation.)

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Fig 1: Periorbital swelling, mild proptosis, corneal ulcers with ocular infection before treatment

Special consideration of anaesthesia requires in Brachycephalic breed and they are very prone to have partial or complete airway obstruction or serious respiratory depression and hypoxaemia because of their anatomical abnormalities include stenotic nares, an elongated soft palate, laryngeal collapse, hypoplastic trachea and laryngeal sacculae eversion and are not subjected to undergo general anaesthesia without proper medication and vigilant monitoring in the preoperative to recovery stages. Ali and Mostafa (2019) [2] reported that globe replacement surgery may lead to complications like strabismus, lateral exotropia and phthisis bulbi.

The treatment was initially done with mannitol injection IP (20% w/v) intravenously @ 4 ml/0.5 kg BW over 30 minutes with meloxicam @ 0.2 mg/kg BW intravenously for 5 days. To control infection, Amoxicillin tablet was given @10mg/kg BW and cyclosporine eye ointment was applied thrice daily after cleaning with normal saline (0.9%). Elizabethan collar was used from the first day onwards.

Results and Discussion

After three days of continuous treatment, the swelling in the eye greatly reduced and the eye ball has been placed in normal position with weak pupillary light reflex and the pain also subside within few days. Joksimovic *et al.*, (2023) [7] reported that amoxicillin was successfully used in treating different eye conditions in canine.

It's a well-known fact that Mannitol is a primary hyperosmolar agent and concentrations of 20% can reduce the cerebral perfusion pressure, intracranial pressure and cerebral blood flow (Adamik *et al.*, 2015) [1]. Ocular infection was drastically reduced and cornea was also under healing process and the animal started exhibit normal lifestyle without showing discomfort and depression (Fig. 2). Cyclosporine has been used for treating the inflammatory conditions affecting ocular surface and it can ameliorate the signs caused by the lymphocyte-driven inflammation in horse, dog and cat (Williams, 1997) [13]. Similarly, workers like Tofflemire *et al.*, 2015 [11] used normal saline (0.9%) along with other agents in eyes of canines.



Fig 2: After two weeks of treatment, the animal regained normal vision

The excessive periorbital swelling which makes the animal felt discomfort was the immediate steps need to taken for saving the animal as well as to avoid further complications. Because of the immediate treatment with early diagnosis, the animal responds the treatment quickly without loss of vision. Posporis *et al.*, (2019) [10] observed that early diagnosis and treatment eye problems have a positive outcome related to vision.

Further damage may lead to rupture of the optic nerve and destroy surrounding tissues in which enucleation was the only choice for saving the life of animal. Foote and Sebbag (2020) [5] described about enucleation in canine as a surgical solution to treat proptosis. To perform enucleation in brachycephalic breed was quite challenging due to anaesthetic risk is high and may need to further perform cosmetic surgery for better appearance. Brachycephalic breeds are predisposed to gastro-oesophageal reflux and obstructive airway syndrome which have significant effect on anaesthetic management and hence it is risky (Downing and Gibson, 2018) [4]. Periorbital swelling and corneal ulcers may be due trauma or allergies which can lead to leaks in the subcutaneous capillary beds cause swelling around the eyes and due to constant rubbing the eyes by the animal can lead tearing of the cornea with further ocular infection.

Conclusion

This article describes about the non-surgical treatment of unknown etiology periorbital swelling, mild proptosis, corneal ulcer with ocular infection using certain drugs like mannitol, meloxicam, normal saline and antibiotic like amoxicillin tablet and cyclosporine eye ointment. the treatment was responded very well by the animal with regaining of normal vision.

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