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Surgical Management of Traumatic Globe Prolapse in Companion Animal

Manju A[1], Aruljothi N[2], Tina Roshni[3], Gurunathan N[4]
1PG Scholar, 2Professor & Head,
3Assistant Professor, 4Assistant Professor
Department of Veterinary Surgery and Radiology,
Rajiv Gandhi Institute of Veterinary Education and Research, Puducherry-605009
***Corresponding Author:** manju190598@gmail.com
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Abstract:

The present case was recorded unilateral traumatic proptosis in a 12kg male mongrel dog of 2-year-old was presented to the department of VSR of Rajiv Gandhi Institute of Veterinary Education and Research College. Etiology was road accident. All clinical parameters were within the normal range. Physical examination revealed unilateral prolapse of eye globe with periorbital edema, haemorrhage, absence of menace and presence of miosis. Emergency management of traumatic proptosis was done surgically. Present case was clinically managed by adopting manual globe reduction approach with lateral canthotomy and tarsorrhaphy. Surgical intervention was successful in this present study because of early presentation with minimal displacement of globe. In conclusion, pet which had proptosis regaining of vision was higher if the injuries to globe and surrounding structure minimal and replacement was performed immediately.

Keywords: Canthotomy, Dog, Proptosis and Tarsorrhaphy.

Introduction:

Traumatic proptosis represents a critical ophthalmic emergency in dogs, defined by the partial or complete anterior displacement of the globe beyond the orbital margins. It typically arises following cranial trauma, such as vehicular accidents or aggressive encounters with other animals (Kumar *et al.*, 2022). This condition is more frequently encountered in brachycephalic breeds than in dolichocephalic breeds, primarily due to their shallow orbital conformation and widened palpebral fissures (Fossum, 2013; Rohit Kumar *et al.*, 2021). The clinical manifestations and choice of treatment depend on the severity of injury to the globe and surrounding extraocular structures. Hemorrhage and edema within the orbit, resulting from trauma, may further force the globe outward, thereby reduce its viability and increase the risk of vision impairment. Early therapeutic intervention is essential to preserve visual function and reduce the likelihood of complications (Crispin, 2005). Temporary tarsorrhaphy may be performed in cases with minimal tissue damage, whereas enucleation is indicated when there is extensive injury to the globe and extraocular tissues (Lesley and Boag, 2018). Even after successful repositioning of the globe, complications such as infection, strabismus, exposure keratitis, and permanent vision loss may develop.

The visual prognosis remains guarded due to potential stretching or compression of the optic nerve (Crispin, 2005; Kumar et al., 2022). Assessment of direct and consensual pupillary light reflexes provides a simple and reliable method for evaluating visual status.

Case Presentation:

History: A 12 kg two-year-old male mongrel was presented to the Veterinary Surgery and Radiology department of RIVER College, with a prolapsed, haemarrhogic left eye noticed. The cause of this condition due to road accident. Clinicophysical examination showed the vitals as a heart rate of 120 bpm, a temperature of 101.4°F, and a pulse rate of 120 bpm. The mucous membrane was pink and had a capillary refill time of <2 seconds. Physical examination revealed unilateral prolapse of left eye globe with mild periorbital edema, haemorrhage, absence of menace and presence of miosis noticed (Fig.1). Menace reflex was negative and Pupillary Light Reflex was sluggish on left eye. Based on the history and observation obviously the condition was diagnosed as traumatic proptosis. The treatment options for proptosis are enucleation, evisceration or replacement with tarsorrhaphy depending on viability of extraocular tissues and eye (Slatter 2008).

Patient Preparation and Anaesthesia:

The patient was aseptically prepared for surgery. The periorbital skin and eyelids of the left eye was aseptically prepared for the procedure by clipping the periorbital area and irrigating the periorbital tissues with 5% povidone-iodine ophthalmic solution. The patient was then sedated with diazepam (0.5 mg/kg IV) and anaesthesia was induced using propofol (1 mg/kg IV), followed by maintenance with 2% isoflurane inhalation.

Surgical Procedure and Post-Operative Care:

The prolapsed globes were carefully cleansed using sterile gauze swabs moistened with normal saline to eliminate surface contaminants. Surgical correction in this case involved repositioning of the displaced globe, aided by lateral canthotomy, and stabilization using temporary tarsorrhaphy. Postoperative therapy included topical administration of gentamicin eye drops thrice daily and flurbiprofen eye drops twice daily. Additionally, systemic antibiotic coverage was provided with cefotaxime @ 25 mg/kg orally for a duration of five days. An Elizabethan collar was applied to prevent self-inflicted injury, and routine antiseptic care of the surgical site was continued until complete healing and removal of sutures.

Result and Discussion:

Proptosis refers to the abrupt anterior displacement of the globe beyond the orbital margin, most frequently associated with blunt cranial trauma or bite wounds. In the present investigation, a male mongrel dog presented with proptosis following a road traffic accident. This observation aligns with the findings of Lesley and Boag (2018), who reported vehicular trauma and blunt injuries as predominant

causal factors of proptosis. Earlier reports by Gelatt (2011) and Lesley and Boag (2018) have emphasized that brachycephalic breeds exhibit a higher susceptibility to proptosis due to their characteristic craniofacial conformation. In contrast, the affected animal in this study was dolichocephalic, which deviates from the observations of Fossum (2013). This discrepancy could be attributed to variations in husbandry practices, as brachycephalic breeds are commonly reared indoors in regions such as India, thereby limiting their exposure to traumatic events. Nonetheless, proptosis may occur in any breed under conditions of severe trauma. Management in the present case involved manual repositioning of the globe followed by temporary tarsorrhaphy. The therapeutic approach was selected based on the degree of extraocular muscle involvement and the presence of associated complications, including corneal perforation and hyphema (Gelatt, 2011; Ali et al., 2019). Temporary tarsorrhaphy was indicated due to minimal muscular damage. Sutures were removed on the 10th postoperative day, with subsequent restoration of vision. Although previous literature suggests a comparatively favourable visual prognosis in brachycephalic breeds, successful visual recovery in this dolichocephalic dog may be attributed to early intervention and the absence of significant muscular injury.

Fig.1
Day-0

Fig.2

Fig.3
Day-10

Fig.1 - Periorbital edema, haemorrhage, absence of menace and presence of miosis

Fig.2- Manual globe reduction approach with lateral canthotomy and tarsorraphy

Fig. 3- Positioning of globe and vision was regained with positive PLR reflex.

Conclusion:

Treatments of proptosis depend upon the type, duration of trauma and damage to globe. In this case, the dog was presented within 24 hours of trauma with above mentioned history. The present case was managed by replacement of globe with lateral canthotomy followed by tarsoraphy (Fig.2). Tarsoraphy suture were removed 10 days after surgery. In this case positioning of globe and vision was regained with positive PLR reflex (Fig.3). Presence of direct or indirect PLR is a positive prognostic indicator (Peer *et al.*, 2020). Surgical intervention was successful in this case due to early presentation with minimum displaced

globe. Prognosis for vision following traumatic globe prolapse is generally guarded and depends on the extent of skeletal, extraocular and intraocular trauma. Partially displaced globe if managed within short period of time after injury can save the vision however the prognosis for severely damaged globe is poor.

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