

## Conservative surgical management of unilateral traumatic proptosis in an eight-week-old boerboel puppy

Foluso Bolawaye Bolaji-Alabi<sup>1\*</sup>, Adenike Olusola Olatunji-Akioye<sup>1</sup>, Bamidele Nyemike Ogunro<sup>2</sup>

<sup>1</sup>Department of Veterinary Surgery and Radiology, Faculty of Veterinary Medicine, University of Ibadan, Nigeria. <sup>2</sup> Veterinary Teaching Hospital, University of Ibadan, Nigeria.

### Abstract

Background: Traumatic proptosis is an ophthalmic emergency of concern in companion animal clinical practice, most breeders in Nigeria keep dogs in poorly organized facilities which often results in dog fights hence varying degrees of facial trauma occurs. This is becoming popular and one of the common causes of blindness in dogs. This study reports a case of dog fight which elicited acute traumatic proptosis of the right eye in an eight-week male Boerboel puppy. This was presented at Veterinary Teaching Hospital, University of Ibadan with a proptotic right eye. History revealed that the trauma was caused by an adult male dog kept in the same kennel. Physical and clinical examinations revealed pronounced rostral protrusion of the globe however, the retrobulbar trunk was intact, despite being swollen, it was still firmly attached to the eye socket. There was no visible injury to the globe. Hemogram revealed mild hemorrhagic hypoproteinemia, adequate platelet counts, and normal leukogram thus surgical intervention was not contraindicated. Tramadol (4mg/kg) was administered intramuscularly, proptosed eye was kept moistened with sterile isotonic solution and cold pack. Globe replacement, lateral canthotomy and temporary tarsorrhaphy were performed under deep sedation with xylazine/atropine and local block via infiltration of lidocaine (10mg) around the upper and lower orbital regions. This case report describes the surgical management and outcome of severe traumatic proptosis of the right eye despite highly displaced globe, intact retro bulbar trunk and timely presentation. The surgical intervention provided cosmetic result and alternative to enucleation of the entire eye structure.

**Keywords:** Cold compress, Critical care, Globe replacement, Ophthalmic emergency, Temporary tarsorrhaphy

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\*Corresponding Author: Foluso Bolawaye Bolaji-Alabi E.mail: follushoo@yahoo.com

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## Introduction

Traumatic proptosis is a serious ocular emergency, usually associated with partial or complete rostral deviation of the globe with respect to the corresponding orbit (Wheler et al., 2001; Ali and Mostafa, 2019). It is common among small breed dogs, especially the brachycephalic and a common cause of canine blindness (Ali and Mostafa, 2019). Several causes are traceable to proptosis in dogs; this ranges from minimal head trauma, breed peculiarities such as prominent eyeballs, large palpebral fissures and shallow orbits in toy breeds (Wheler et al., 2001; Mandell and Holt, 2005; Miller, 2008). Occasionally, the use of neck scruffs to restrain small breed of dogs may result in temporary proptosis (Mandel, 2000). In other breeds of dogs and cats, proptosis may develop due to violent head trauma as seen in automobile accidents, fights and scratch around the ocular region, resulting in ocular misalignment or displacement (Wheler et al., 2001; Subramanian and Birdsong, 2008; Lando et al., 2017). The effects of these traumatic changes include; inflamed periorbital tissues (which ultimately reduce the viability of the globe), corneconjunctival desiccation, ulceration, orbital fracture and blindness (Wheler et al., 2001; Crispin, 2005). Minimal damage to the extraocular muscle, presence of pupillary reflex, and absence of hyphema at initial presentation may indicate good prognosis (Mandell and Holt, 2005). Timely intervention via surgery (lateral canthotomy and temporary tarsorrhaphy) is important after stabilization of the affected patient (Wheler et al., 2001; Crispin 2005; Mandell and Holt, 2005; Miller, 2008). However, the outcome of surgery is usually influenced by severity of the trauma and time between injury and surgical

intervention (Mandell and Holt, 2005; Belknap, 2015). Management of ocular emergencies is generally complicated in dogs due to technical limitations and prognosis is usually guarded or poor for patients with severe trauma to the orbit, globe and optic nerve (Degner, 2007; Miller 2008; Ali and Mostafa, 2019). However, enucleation is usually recommended in severe cases of ruptured globe and severed extraocular muscles (Mandell and Holt, 2005).

## Case Presentation

An eight-week-old male Boerboel weighing 7.5kg was presented at the Veterinary Teaching Hospital, University of Ibadan, Nigeria with acute traumatic proptosis of the right eye (Figure 1). The globe was protruded rostrally beyond the orbital margin, but the ocular muscles were still intact. The owner reported that it happened an hour before presentation as a result of an attack by an adult Rottweiler in the same kennel. At presentation, the patient was calm despite showing signs of pain. With the exception of elevated respiratory rate (110 breaths per minute), vital signs were fairly normal: rectal temperature (38.3°C), heart rate (90 beats per minute); capillary refill time based on blanching the gum of the upper lip (1 to 2seconds). The proptosed eye was assessed for viability using ophthalmoscope and the retina was found to be intact. There was no avulsion of the extraocular muscles. No optic nerve cupping observed on ophthalmoscope. Also, pupillary reflex was present despite moderate, painful periorbital swelling and rostrally displaced globe without lacrimation. Cold compress wrapped with sterile gauze was placed of the swollen retrobulbar trunk while the globe was kept moistened with sterile physiological saline

(Figure 2). After about 20 minutes, the periorbital swelling reduced drastically, and the right periorbital area was prepared for aseptic surgery. Deep sedation was achieved with xylazine (1 mg/kg intramuscular injection; Biovita, a. s., Czech Republic) and atropine (0.04mg/kg intramuscular). Local block was achieved via skin bleb around the affected eye with 2% lidocaine (Andralocain + AD, Amakin Pharmaceutical Limited, India). Patient peri-operative stabilization process was achieved with lactated Ringer's solution (Ashmina Ltd, Nigeria) at 5ml/kg/h. Surgical procedure was as previously described by Vijay, 2023. However, the anesthetic technique in this case was modified by the use of both general and local anesthesia. Lateral canthotomy (5mm incision of lateral canthus) was done to allow gentle retrograde push of the globe back into the orbit (Figures 3 and 4). This was followed by temporary tarsorrhaphy (with three interrupted horizontal mattress stitches; figure 5) using size 2-0 nylon suture. The eye was dressed in sterile gauze and adhesive tape to maintain gauze pressure and drainage. After temporary tarsorrhaphy was done (Figure 5), Elizabethan collar was also placed on the neck to prevent self-mutilation of the eye

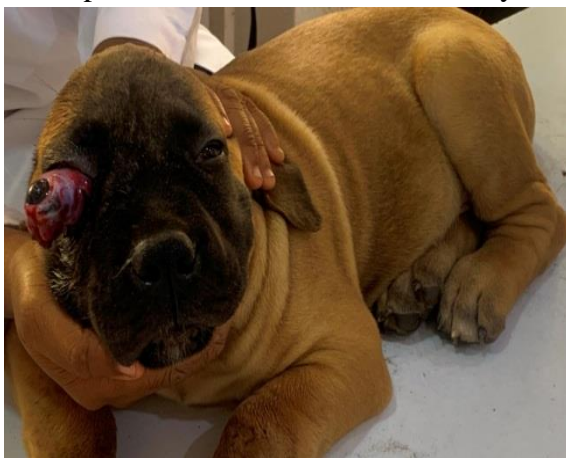


Figure1: Dog on initial presentation

(Figure 6). Antibiotic therapy with a bolus dose of amoxicillin at 10mg/kg i.v, via the cephalic vein through a pre-placed 21G (gauge) scalp vein set (Pamoxil, Yanzhou Xier Kangtai Pharmaceutical Co. Ltd., China) followed by a post-operative, oral amoxicillin (Amoxil, Medreich Ltd, India) regime prescribed at 15mg/kg twice daily for 5 days. Patient was presented for daily wound dressing to ensure close monitoring and prevent contamination of the wound. Recovery was uneventful as the patient was feeding well and playful when presented at the clinic for follow up evaluations. Sutures were removed after two weeks and shrunken corneoconjunctival region was observed despite no swelling, itching, exophthalmia or infection signs on the eye tissue. The aesthetic appeal of the eye was intact, and the eyelids reflex was uniform with the other eye. The puppy resumed normal activities without any sign of pain two weeks post-operation. The owner represented the dog subsequently, was satisfied with surgical outcome and the patient was discharged without any need for enucleation (Figure 7). Subsequent follow-up was done by a private veterinarian who initially referred the case and follow-up communication with the veterinarian revealed that recovery was uneventful.



Figure2: gauze-wrapped cold pack being applied





**Figure3: Lateral canthotomy being performed**



**Figure4: Temporary tarsorrhaphy being applied**



**Figure5: Post temporary tarsorrhaphy**



**Figure6: Sutured eye dressed with sterile gauze**



**Figure 7: Picture showing the affected eye after suture removal prior to discharge**

**Discussion and conclusion**

This clinical case report describes the conservative and surgical method of handling a highly displaced globe and swollen retro bulbar trunk in a puppy following an attack of an adult dog.

Traumatic proptosis is considered an ocular emergency and requires prompt attention to preserve both vision and aesthetic outlook of the eye (Brando et al., 2005). The degree of injury to the eyes varies and it is mostly of traumatic origin (Miller, 2008). The

severe rostral displacement of the viable and intact eyeball in this case made it unique because without proper clinical and physical examination, it could have been a condemned case which usually makes enucleation the only surgical option of management (Mandell and Holt, 2005). However, close examination of the proptosed eye revealed healthy appearance of the ocular muscle without trauma and an intact globe, suggesting the proptosis was a case of pulling/acute forward movement of the whole retrobulbar trunk from the socket without devitalization of ocular tissue. Cold compress applied to the swollen trunk rapidly reduced the swelling within a short period of time, thus making it reasonably smaller and easy to push back into the bony orbit. The success of this case might be partly due to the fact that common complicating signs such as conjunctivitis and keratitis which have been reported in cases of proptosis resulting from dog fights was not seen in this case (Sagar et al., 2016).

Canine traumatic proptosis resulting from dog fights is well documented but unlike most reported cases, the present case is being reported in a mesencephalic breed which is an uncommon finding in clinical practice (Ali and Mostafa, 2019). Despite previous report that indicated that patients assessed and operated by a veterinary ophthalmologist have better prognosis (Pe'er et al., 2020). Veterinarians can increase their success rate by making careful evaluation of the cases of proptosis and ascertain the devitalisation of the eye and supporting structures before opting for eye enucleation.

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