

A case study on Enucleation of eye for the correction of secondary glaucoma of a Non-descript cat



A Clinical Case Report Submitted By

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Abstract

Glaucoma is a group of diseases that have an abnormally elevated intraocular pressure that causes damage of optic nerve. A 1.6 year old non-descript female cat named as kalu was presented in the Teaching and Training Pet Hospital and Research Center, Purbachal, Dhaka with a history of periocular swelling since 3 months .On clinical examination there was absence of menace reflex and elevated intraocular pressure (35mm (Hg)). The confirmatory diagnosis of the case was vision less glaucoma in the left eye. Hence the affected eyeball was enucleated under general anesthesia.

Key words: Glaucoma, periocular swelling, Enucleation

Chapter 1 Introduction

Enucleation is the surgical procedure that involves removal of the entire globe and its intraocular contents, with preservation of all other periorbital and orbital structures (Margart.L.Pfeiffer, 2020). Removal of eye is indicated in animals in such cases when it has reached a point where it has no chance of being capable of return of sight and it is very painful to the patient (Mitchell, 2008). The most common reasons for enucleation include glaucoma (increased pressure inside the eye), neoplasia (cancer inside or around the eye), severe inflammation that cannot be cured by medication, injury or puncture to the eye by fighting with other animal or hitting of the eye with sharp object (Gilger et al., 1995). Once the surgery is complete, skin will cover the empty eye socket and once the fur grows back then the scar will be hardly seen.

Glaucoma is typically associated with elevated intraocular pressure (IOP) resulting from impaired aqueous humor outflow and leads to irreversible damage to the optic nerve and retina (Dubielzig et al., 2010). There are two types of glaucoma. Primary glaucoma is relatively common and has strong breed predilections in dogs but is rarely diagnosed in cats. Secondary glaucoma is as frequent as primary glaucoma and constitutes 95% to 98% of glaucoma cases in cats (Gillian and Leandro, 2015).

Glaucoma most often affects middle aged to older cats (Gillian and Leandro, 2015), although it can occur in kittens. Congenital glaucoma is very rare (Stole et al., 2007).

Topical medication such as prostaglandins miotics, β -blocking adrenergics and topical carbonic anhydrase inhibitors, are the primary drugs for treatment of glaucoma (Nick Whelan, 2014). Carbonic anhydrase inhibitors (CAIs) can decrease aqueous humor production in cats by over 40% (Stole et al., 2007). The β -blockers decrease IOP by reducing blood flow to ciliary body, thereby decreasing aqueous humor production (Lellan and Miller, 2011). While β -blocker, timolol, may have significant additive effects when combined CAIs in cats (Wang et al., 1999). Mannitol increase the osmotic concentration of blood perfusing the eye, causing a marked reduction in aqueous humor production and vitreous volume (Stadtbaumer et al., 2006). In secondary glaucoma, enucleation is performed to relieve pain.

1.2 Objectives

The objectives was to correct the case of secondary glaucoma in the cat.

Chapter 2 Materials and Methods

2.1 Case History

Non-descript, 1.6 year old female cat having 3.15 kg body weight named as kalu was presented In Teaching and Training Pet hospital and Research Center, Purbachal, Dhaka with a gross lesion of periorbital swelling and discharge of fluid from the affected eye.

2.2 Clinical Examination

The cat was apparently active on the day of presentation. Clinical examination of patients revealed normal rectal temperature (101°F), pulse and respiratory rate with normal appetite. On physical examination there was absent of both palpebral and menace reflex on left eye. There was also brownish discoloration of that eye. Intraocular pressure was measured using schiottz tonometer. The reading was 35 mm Hg. The normal intraocular pressure ranges from 15-25 mm Hg.

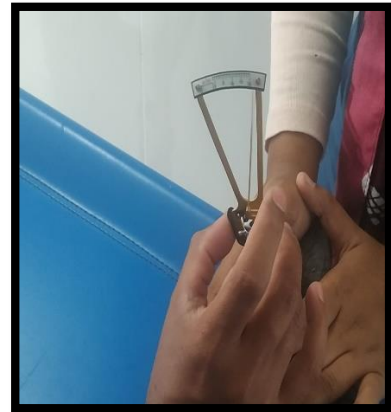


Fig A- Brownish Discoloration of eye. Fig B- Measurement of Intraocular pressure

2.3 Surgical Procedure

2.3.1 Preparation of patient:

Patient was brought to hospital with 8 hours fasting condition

2.3.2 Anesthesia:

Anesthesia was performed with a combination of xylazine followed by ketamine. Pre anesthesia was achieved by using Xylazine 1mg/kg intramuscularly (Inj. Xylazine (Indian immunological ltd.) and induction was performed by using Ketamin HCl 10mg/kg intramuscularly (Inj. Ketalar, Popular pharmaceuticals ltd.). Fluid therapy was maintained with isotonic saline solution 10ml/kg slow intravenously (Inf. NS, ACME laboratories Ltd.) during surgery.

2.3.3 Preparation of surgeon :

Surgeons were aseptically prepared by washing hands followed by wearing sterile cap, mask, gown and sterile gloves.

2.3.4 Surgical procedure:

Clipping and shaving was performed in periorbital area. Surgical site was make sterile by using 10% povidone Iodine (Liq. Viodin (Square pharmaceuticals) followed by 70% Alcohol.

There are mainly two surgical options for enucleation.

- a) Transpalpebral enucleation
- b) Subconjunctival enucleation

Transpalpebral enucleation:

This is the probably most usual way. This method involves suturing the palpebral fissure closed and removing the globe, nictitating membrane and conjunctiva as one encased unit to prevent contact between the remaining ocular surface and orbital content (Wolf, 1990).

Subconjunctival enucleation:

The main objectives of the subconjunctival technique are to remove the globe, nictitating membrane and eyelid margins in that order, while preserving as much as soft tissues as possible to minimize subsequent orbital depression (Slatter and Wolf, 1993; Kuhns, 1976).

2.3.5 Surgical procedure:

In this case, we followed transpalpebral surgical procedure.

Firstly, the eyelids were sutured together using braided silk. Using a scalpel blade (B.P blade no. 10), made elliptical full thickness incision about 5 mm away from the eyelid margins and join the incisions at the medial and lateral canthus of eye. Then grasped the incised eyelid margins by using Allis tissue forceps and started blunt dissection dorsally and then around the globe. There are medial and lateral canthal ligaments, when these ligaments were fully transected, the globe was become more mobile and free. Then the optic nerve and associated blood vessels were ligated with help of catgut by avoiding excessive tension over optic nerve. Excessive tension over optic nerve can damage the optic chiasm. The eye globe was removed just above the ligature. After that the periorbital tissues were sutured with vicryl (Vicryl, Ethicon) in a simple continuous pattern. And the skin was closed with simple interrupted suture with braided silk.



Fig C- Blunt dissection around eyeball



Fig D- Removal of eyeball



Fig E-Skin suture by using silk



Fig F- Post-operative 7days

2.3.6 Post-operative care:

Broad spectrum antibiotic was prescribed systematically to prevent secondary bacterial infection. Antibiotic includes ceftriaxone (Inj.Trizon, ACME laboratories ltd.) 50mg/kg intramuscularly, and antihistamine Diphenhydramine hydrochloride (Inj. Phenadryl vet, ACME laboratories ltd.) 0.5mg/kg intramuscularly for 7 days and NSAID Meloxicam (Inj. Melvet, ACME laboratories ltd.) 0.5mg/kg subcutaneously for 3days. It was advised to keep close observation after taking home. And also suggested to wear an Elizabethan collar until recovery.

Chapter 3 Results

On the basis of clinical examination we found blindness, watery discharge and elevated intra-ocular pressure in the left eye. So it was recommended to perform enucleation to relieve pain and discomfort. No complication were found in follow up history.

Chapter 4 Discussion

Enucleation is the most common orbital surgical procedure performed by veterinary ophthalmologists and general practitioners and is indicated in patients with blind, painful eyes or patients with nonresectable intraocular tumors (Spies, 2007).

Feline glaucoma, like human glaucoma is a condition in which the watery fluid contained in the front part of the eye, just behind the lens, is unable to drain normally. The resulting accumulation of this fluid puts pressure on the optic nerve which leads from the eye to brain. Nerve damage caused by this pressure prevents normal vision and if the condition progresses without treatment is likely to result in partial or total blindness (<https://www.vet.cornell.edu>). In one retrospective case study, 73% of glaucomatous cats were blind at the time of initial presentation (Blocker and van der Woerd 2001). Eyes with glaucoma require frequent monitoring and adjustment of medication. Over time, affected eyes may become less responsive to topical medication. Changes in medication or an enucleation may be needed, especially if the eye is blind and becoming larger (Lellan and Miller, 2011).

The type of surgical procedures available for glaucoma depends on whether the eye still has potential for vision. For visual eyes, intraocular pressure can be reduced by performing a cycloablation procedure and a drainage implant procedure. For permanently blind eyes the eyes can be enucleated.

In this case, there was absent both palpebral and menace reflex on left eye. And there was also brownish coloration of that eye. As the eye was blind so it was recommended to perform enucleation.

In case of subconjunctival enucleation, there are less bleeding than the transpalpebral method. But this technique is not indicated in patients with corneal ulcers or ocular infections. Easier access to the optic nerve is particularly important in cats because their tight palpebral fissures and short optic nerves make enucleation more challenging. The optic chiasm can be damaged if excessive traction is placed on the globe, resulting in possible blindness in the contralateral eye after enucleation (Stiles et al., 1993; Slatter, 2001).

The most common post-operative complication is hemorrhage within first few hours after surgery. However in this case, no complications were found in follow-up history.

Conclusion

In case of primary glaucoma it will respond with medication. But it was the case of secondary glaucoma, so enucleation is the best choice.

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