PHACOEMULSIFICATION AND INTRAOCULAR LENS IMPLANT IN DOGS: STUDY OF 6 CASES

S.K. Jhirwal, P. Bishnoi and T.K.Gahlot[1]
Department of Veterinary Surgery and Radiology, College of Veterinary and Animal Science
Rajasthan University of Veterinary and Animal Sciences, Bikaner- 334 001, Rajasthan, India

Received on: 18.12.2019
Accepted on: 17.03.2020

ABSTRACT

Cataracts are a common cause of visual impairment and blindness in dogs and have a wide variety of aetiologies, as well as the disabling effect on an animal. In the present study after the detailed ophthalmic examinations six clinical cases of dogs were surgically treated for cataract by phacoemulsification with implantation of intraocular lens. The return of ambulatory vision was observed in three cases and failure of vision was noted in three cases after surgery. Intraoperative complications such as miosis, hyphema and posterior capsule rupture were noticed at the time of surgery while corneal edema and posterior capsule opacity were reported as post-operative complications.

***Key words*:** Cataract**,** phacoemulsification, intraocular lens implant, miosis

Introduction

Cataract is opacity of the lens resulting from pathologic changes in lens protein composition or disruption of lens fiber arrangement. Cataracts or opacities of the lens of the eye are a leading cause of blindness or an increasing cause of vision loss in dogs (Beteg *et al.*, 2006). Significant vision deficits can occur when the lens is opaque from cataracts. It can occur at any stage of life in dogs irrespective of breed and sex. It also has multifactorial etiology that are categorised as heritable (genetic) disorders, senile (age related) degeneration, congenital (birth defects), traumatic (capsule rupture), toxic reaction in the lens (progressive retinal degeneration, uveitis, glaucoma) geographical location (UV light), nutritional (deficiency of an amino acid- arginine etc.), metabolic diseases (diabetes etc.) and electricity (electric shock during bites on wires) (Patil *et al.,* 2014).

Cataract can be diagnosed by both systemic and ophthalmic examinations which involve the assessment of vision (menace test and obstacle course test), reflex test (pupillary light reflex and corneal reflex) and ultrasonographical examination of eye (Mustafa *et al.,* 2014). Cataracts can be most easily diagnosed by retro-illumination through a dilated pupil.

There is no suitable medical therapy for treatment or prevention of cataract formation in canines. So, surgical removal of cataracts is the treatment of choice if restoration of vision is desired.

Materials and Methods

In the present study 6 clinical cases of cataracts were included which were presented at the Surgery and Radiology section of TVCC, CVAS, Bikaner (Rajasthan). History of age, sex, breed, eye affected, vision changes, any injury to eye, time elapsed since occurrence of opacity and use of recent medications and presence of diabetes were recorded.

All the cases of dogs presented with history and symptoms suggestive of cataract were examined by a series of diagnostic tests to decide the appropriate surgical treatment. Haematological examination and blood biochemistry (serum creatinine, BUN, ALT, AST, ALKP and Blood glucose) were recorded to rule out any concomitant disease or diabetes as a cause for cataract. Besides these, the posterior segment and other intraocular structures of the eye were evaluated by Direct and Indirect Ophthalmoscopy and B-mode ocular ultrasound with the help of a 5-14 MHZ linear Array probe. Electroretinography was performed in patients with cataract prior to surgical removal to ascertain that retina is functional.

After consideration of the general health conditions all the cases of cataract were selected for cataract surgery by phacoemulsification technique. Owners were advised to instilled antibiotic eye drop ciprofloxacin @ two drops b.i.d. for 7 days and eye drop tropicamide @ two drops b.i.d. for 2 days before the cataract surgery.

The induction of anaesthesia was achieved by a combination of inj. Atropine sulphate + inj. Xylazine + inj. Ketamine intramuscularly and maintained by 1 to 2% isoflurane till effect. Retrobulbar nerve block anaesthesia was also used by using 2% Lignocaine hydrochloride for preventing the movement of eye ball. Cataract surgery was performed with the help of Phacoemulsification unit and an operating microscope and an acrylic foldable Intraocular lens (IOL) of +41 D was implanted in all the six eyes as per the technique described by Gelatt and Wilkies (2011).

In this study, surgical outcome was graded, on the basis of surgical and visual results. The good surgical outcome was defined as the eye which had a completely clear cornea, normal in shape, minimal incision scar, round pupil with the presence of pupillary light reflex. The fair surgical outcome was defined as the eyes, which showed sufficient restoration of vision and presence of independent ambulatory movements. The failure of the surgery was defined as total corneal opacity, secondary glaucoma, severe anterior uveitis or atrophic bulbi following the cataract surgery (Patil *et al.,* 2014).

Results and Discussion

Cataract extraction is currently the elective surgical

[1]Retd. Professor and Re-employed, Department of Veterinary Surgery and Radiology, College of Veterinary and Animal Science

intervention most frequently performed in humans but in veterinary adoption of this procedure is increasing day by day **(**Honsho *et al.,* 2007). Highest incidence of cataract was recorded in Labrador retriever (50%, n=3) followed by German shepherd (33.33%, n=2) and Spitz (16.66%, n=1). Ramani *et al*. (2013) reported higher incidence in spitz dogs, this could be due to population difference at the location of study. All the cases were reported with bilateral cataracts.

After the detailed systematic and ophthalmic examinations 3 eyes were diagnosed with mature cataract and 2 eyes were diagnosed with immature cataract while 1 eye was diagnosed with hypermature cataract. Out of six dogs presented 4 were male and 2 female. Ramani *et al.* (2013) and Donzel *et al.* (2016) also reported higher incidence rate of cataract in male dogs as compared to female dogs.

In the vision function tests of 6 eyes; 2 eyes showed positive menace reflex test while 4 eyes showed negative menace reflex test. Corneal reflex test was found positive in 5 eyes and negative in 1 eye. For pupillary light reflex test 5 eyes showed positive reflex whereas 1 eyes showed negative reflex. Similarly, 5 eyes showed positive dazzle reflex test while 1 eye showed negative dazzle reflex test. None of the eyes under study took fluorescein dye and hence were negative for fluorescein dye test. Direct and indirect Ophthalmoscopy was conducted to assess the fundus but due to cataractous lens in none of the case the fundus was visible. Although the anterior segment was visible beyond the clear cornea and no other anterior segment abnormalities were recorded.

Phacoemulsification was successfully performed with anaesthetic regimen mentioned in materials and methods without encountering major intraoperative anaesthetic complication and a smooth uneventful recovery. Retrobulbar nerve block resulted in protrusion of eyeball and prevention of eyeball movement during phaco surgery.

In this study good surgical result was observed in 16.66% operated cases (n=1), fair in 33.33% (n=2) while failure was noted in 50% operated cases (n=3). In one case severe posterior capsular opacity prevented the return of vision.

References

Beteg F, Mates N and Muste A (2006) Cataracts in dog And actually trends in opacified lens removal. *Bulletin UASVM-CN, Vet. Med*. **63**: 186-198.

Donzel E, Arti L and Chahory S (2016) Epidemiology and clinical presentation of canine cataracts in France: a retrospective study of 404 cases. *Vet. Ophthalmol.* **20**(2): 1-9.

Gelatt KN and Wilkie DA (2011) Surgical procedures of the lens and cataracts. In: Veterinary Ophthalmic Surgery, eds. Gellat KN and Gellat JP, Elsevier Saunders, Gainesville, FL USA: 312-330.

Honsho CS, Oriá AP, Pigatto JAT and Laus JL (2007) Modified extracapsular extraction versus endocapsular phacoemulsification: intraoperative and immediate postoperative events. *Arq. Bras. Med. Vet. Zootec*. **59**: 105-113.

Mustafa Arican, Hanifi Erol, Kurtulus Parlak Umit Kamis and Nuri Yavru (2014) Comparison of the effects of intraocular pressure with phacoemulsification and extracapsular cataract extraction methods in dogs with cataract. *Eura. J. Vet. Sci*. **30**(4): 188-194.

Patil VN, Patil PB, Parikh PV, Talekar SH, Patil DB, Kelawala NH and Madhavi JS (2014) Cataract and ECCE – An evaluation on 60 canine cases registered at Anand, Gujarat (India) region. *Europ. J. Biomed. Pharm. Sci*. **3**(1): 326-339.

Ramani C, Manjokumar A, Shafiuzama Md. Nitin JD and Nagarajan L (2013) Incidence of cataract in dogs: A retrospective study. *Tamil Nadu J. Vet. Ani. Sci*. **9**(3): 231-233.