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REDUCTION OF CONJUNCTIVAL BALLOONING SECONDARY TO RETROBULBAR NERVE BLOCK FOR INTRAOCULAR SURGERY IN THE DOG

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Abstract

This report describes conjunctival ballooning as a result of subconjunctival accumulation of the injected fluid following retrobulbar block for intraocular surgery in the dog. A prospective study was conducted on seventeen cataract procedures in dogs of different breeds, weighing between 6.1 kg and 33 kg, aged between 12 weeks and 8 year old where retrobulbar nerve block was performed prior to surgery. Local anaesthetic (Lignocaine hydrochloride injection BP 2%) was diluted with different volumes of saline (2-5 mls) and the solution was slowly infiltrated into the orbit via a ventrolateral conjunctival approach until the globe was displaced anteriorly into a central gaze position. The purpose was to obtain a good eyeball positioning prior to phacoemulsification procedure. In 3 cases a subconjunctival ballooning was noticed with a doughnut appearance of the bulbar conjunctiva that precluded surgical access to the dorsal cornea. These cases required the use of fine scissors to make a radial cut in the elevated conjunctiva, until the swelling was reduced sufficient so as not to interfere with the surgical procedure. This communication records conjunctival ballooning as a complication of retrobulbar nerve block in the dog.

Key words: *anaesthesia, phacoemulsification, retrobulbar.*

INTRODUCTION

Topical and systemic drugs are commonly used in veterinary ocular surgery in the perioperative, intraoperative and postoperative period. Sedatives and anesthetic agents may cause changes in the extraocular muscle tone [1]. Surgical exposure of the eyeglobe is often impaired as most inhalational anesthetics produce a medio-ventral rotation of the eyeglobe that impedes access to the cornea, essential for corneal and intraocular surgeries.

Neuromuscular blockants have been used to create a fixed central rotation of the globe, akinesia of the extraocular muscles and mydriasis.

Retrobulbar injection of local anesthetic for intraocular surgery in dogs is a relatively recent technique in the veterinary world [2,3] being used as an alternative to balanced general anesthesia with muscle relaxation to cause central rotation of the globe and local analgesia.

Retrobulbar and peribulbar anesthesia can be used to maintain a fixed central gaze of the eyeglobe without affecting the respiratory system [1,7]. However, a few complications have been reported such as globe perforation, optic neuritis, respiratory arrest [8,9–16].

Retrobulbar injections with saline can enhance the presentation of the cornea, however they had been reported to produce inward compression of the posterior segment and additional pressure on the vitreous [17].

The injection is performed under general anesthesia with the objective of acquiring a good globe positioning and a good exposure of the cornea. The amount of saline is determined as the injection is performed. The needle is inserted ventro-laterally and directed towards the retrobulbar space, ventro-medially, external to the retrobulbar muscle cone or behind the globe. The saline is usually reabsorbed within half an hour to an hour [6].

Conjunctival ballooning has been reported in human ophthalmology journals to occur immediately after injection and it interfered with the surgical procedure [18,19].

Retrobulbar/peribulbar techniques have been reported in people with few complications [11,20–22].

Conjunctival chemosis may occur as a result of subconjunctival accumulation of infiltrative local anaesthesia, or from subconjunctival seepage of irrigating fluid through an incisional breech on the conjunctiva[18]. In man, a technique for managing this complication has been described [23–25]

MATERIALS AND METHODS

Prior to phacoemulsification procedure, all dogs received a physical examination, complete blood counts, serum chemistry profiles, and complete ophthalmic examinations, including slit-lamp biomicroscopy, indirect ophthalmoscopy and applanation tonometry (Tonopen).

They had been anesthetized by standard technique with no neuromuscular blockants and were positioned in dorsal recumbency using a vacuum pillow to stabilize the head. Following aseptic preparation of the cornea with aqueous 1% povidone-iodine solution, a drop of proxymetacaine solution (Minims Proxymetacaine 0.5% eye drops) was instilled into the conjunctival sac [26].

Local anesthetic (Lignocaine hydrochloride injection BP 2%) was diluted with saline (1:5) and different volumes of this solution were slowly infiltrated into the orbit via a ventrolateral conjunctival approach until the globe was displaced anteriorly into a central gaze position.

The purpose was to obtain a good eyeball positioning prior to intraocular procedure. The infiltration was continued until the globe was displaced anteriorly into a central gaze position (Figure 1, Figure 2). The eyes were evaluated for conjunctival ballooning. A prospective study of 17 cataract procedures identified three affected cases (Table 1).

Table 1.Volumes of retrobulbar solution used

Case	Lidocaine 2%, ml	Sterile saline, ml	Conjunctival chemosis 0, +, ++, +++
JRT, 4yo, 8 kg	1	5	0
Beagle, 2yo, 8 kg	1	5	0
Yorkshire Terrier, 8 yo, 5.5 kg	1	5	0
JRT, 4.7 kg, 6 yo	1	5	0
JRT, 5 yo 10 kg	2	5	+
American Bulldog, 12.3 kg, 12 weeks old	2	5	+++
Cocker Spaniel, 6 yo, 33 kg	2	5	0
Vissla, 2y7mo, 20kg	2	5	+++
Cocker Spaniel, 8 yo, 14.5 kg	2	5	+
Shih Tzu, 4 yo, 8.8 kg	1	5	0
Bichon, 5 yo, 6.15 kg	1	5	0
Collie, 14 weeks old, 6.2 kg	1	5	0
Boxer, 11 mo, 21 kg	2	6	+++
Cross Breed, 7yo, 12.4 kg,	2	6	0
Cross breed, 6 mo, 10.7 kg	2	6	0
JRT, 6 yo, 10.5 kg	2	5	0
Chow Chow, 8yo, 26.3 kg	2	6	0


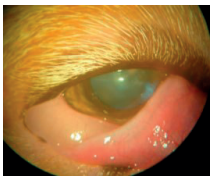

Figure 1, Figure 2. 12 weeks old, 12.3 kg, American Bulldog, traumatic cataract undergoing phacoemulsification; swelling of the third eyelid, following retrobulbar infiltration

By the time the site was prepared for the surgery, the entire bulbar conjunctiva had swollen to give a doughnut appearance restricting access to the peripheral cornea (Figure 3).

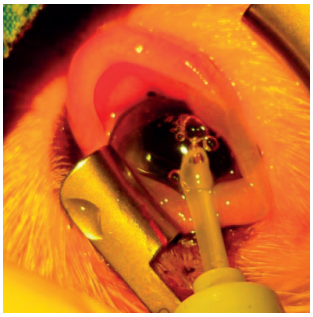

Figure 3. Conjunctival ballooning prior to phacoemulsification procedure.

Fine scissors were used to make a radial cut in the elevated conjunctiva. A blunt scalpel blade was used to apply pressure to the swollen conjunctiva and sweep the subconjunctival fluid away. This was continued until the swelling was reduced sufficient so as not to interfere with the surgical procedure. The conjunctival wound was left unsutured. Cataract surgery by phacoemulsification and aspiration proceeded uneventfully (Figure 4).

Figure 4. Postoperative aspect two hours after retrobulbar infiltration was performed

RESULTS AND DISCUSSIONS

Intraocular surgery requires muscle akinesia for a central fixation of the globe and surgical access to the cornea. Neuromuscular blocking agents have been used prior to intraocular surgeries to achieve extraocular muscle akinesia.

Retrobulbar anesthesia is an alternative to balanced anesthesia with muscle relaxation without involving respiratory muscle paralysis. The anesthetic solution is injected into the retrobulbar space by using a sharp needle or into the intraconal space using a blunt canula [5].

Complications are rare but are potentially severe associated with brainstem anesthesia, globe perforation and retrobulbar hemorrhage. [2] Peribulbar anesthesia is deemed safer because the needle is inserted internal to the muscle cone [4].

Akinesia was achieved in all eyes. All eyes rotated to ventral or medioventral directions prior to retrobulbar block. No resistance to injection was found in any eye and no eye became exophthalmic during the injection.

Ballooning of the conjunctiva or excessive overflow of the injected solution during the retrobulbar injection may indicate that the solution was not correctly injected and further studies should be conducted [12,19,23,25,27–29]

CONCLUSIONS

Retrobulbar injection can also be performed prior to conjunctival graft procedures in brachicephalic breeds in order to maintain a good central positioning of the eye.

Different volumes of saline and local anaesthetic were used successfully for retrobulbar block to achieve good positioning [3] prior to all cataract procedures.

Conjunctival ballooning occurred in only 17% of the cases.

This communication records conjunctival ballooning as a complication of retrobulbar nerve block in the dog. The complication is easy to correct but the occurrence suggests that further study of volumes, sites and routes of infiltration be established, with reference to the breed and conformation of the patient.

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