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Modified infra orbital approach for maxillary nerve block in dogs for rhinoscopic procedures

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Abstract

A trial had been conducted to assess the efficacy of modified infra orbital approach for maxillary block over infra orbital block for rhinoscopic procedures in dogs with nasal cavity disease. The dogs were subjected to clinical, haemato-biochemical and radiographic examination. Six dogs with nasal cavity disease were subjected to rhinoscopy. These dogs were fasted for 12 hours before anaesthetic induction. An indwelling intravenous catheter was placed. A cuffed endotracheal tube was placed and the cuff was inflated. The animals were administered with glycopyrrolate (@ 0.01-0.02 mg/kg SC / IM). Premedication with butorphanol (@ 0.2 – 0.4 mg/kg IM) and xylazine (@ 0.2 – 1.1 mg/kg IM) and induction of anaesthesia by propofol (@ 1-2 mg/kg IV) were done. Maintenance of anaethesia was carried out with ketamine (@ 5 mg/kg IV) and diazepam (@ 0.25 mg/kg IV) combination. Monitoring of electrocardiogram, blood pressure and oxygen saturation were done as per standard techniques. Monitoring of electrocardiogram, blood pressure and oxygen saturation were done as per standard techniques. Local infiltration with 2% lignocaine was done using infra- orbital approach on one side while modified infra- orbital method for maxillary block was used on other side of the dog. Rhinoscopy was carried out using anterior and posterior approach. The efficacy of technique was assessed based on response of the dog for irrigation used during rhinoscopy, biopsy and swab procedures. The results of the study indicated that modified infra orbital approach for maxillary nerve block suppressed the sneeze and other reflexes when compared infra orbital nerve block during rhinoscopy in dogs.

Keywords: dog- rhinoscopy- infra-orbital and maxillary nerve block.

Introduction

Nasal diseases of chronic nature are a common clinical complaint in canine practice. Several pathological conditions affecting the nasal cavities have been described in dogs. Common causes of chronic nasal disease in dogs are neoplasia, fungal rhinitis and idiopathic lymphoplasmacytic rhinitis. Other less common causes include nasal foreign body, rhinitis secondary to dental disease, parasitic rhinitis and primary ciliary dyskinesia (Meler *et al.,* 2008). Clinical signs are often insufficient for reliable differentiation between nasal lesions in dogs; therefore, definitive diagnosis requires ancillary imaging studies. Rhinoscopy is the modality of choice for direct and minimally invasive visualization of the nasal cavity and endoscopic guided biopsy collection in dogs is the gold standard for nasal disease diagnosis (Knotek *et al*., 2000). Sudden periods of arousal during rhinoscopy and nasal biopsy are often observed clinically and have potential to cause injury to patients and damage to endoscopy equipment. To decrease the likelihood of movement, rhinoscopy patients are often maintained at a deep plane of anaesthesia, which causes dose-dependent cardiorespiratory depression that can lead to hypotension and apnoea (Weil, 2009). A comparison of percutaneous maxillary nerve blocks and infraorbital nerve blocks in dogs undergoing rhinoscopy revealed that the maxillary nerve block is superior to the infraorbital block for preventing adverse reactions during rhinoscopy of the caudal portion of the nasopharynx (Cremer *et al*., 2013). Fizzano *et al*. (2017) modified infraorbital approach maxillary nerve blocks decreased procedural nociception in health dogs. A study was undertaken to assess the effect of modified infraorbital block in dogs with nasal cavity diseases.

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Materials and Methods

Dogs brought to Madras Veterinary College Teaching Hospital with history and signs suggestive of

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nasal cavity diseases like nasal discharge, stridor, foul-smelling breath, epistaxis, sneezing, respiratory distress or facial deformities were screened. These dogs were subjected to detailed clinical, haemato-biochemical and radiographic examinations. Six dogs diagnosed with nasal diseases based on these examinations were included for the study.

Patients were fasted for 12 hours before anaesthetic induction. An indwelling intravenous catheter was placed. A cuffed endotracheal tube was placed and the cuff was inflated. Anaesthetic protocol as described by Seymour and Gleed (1999) was followed. The animals were administered with glycopyrrolate (@ 0.01-0.02 mg/kg SC / IM). The animals were administered with glycopyrrolate (@ 0.01-0.02 mg/kg SC / IM). Premedication with butorphanol (@ 0.2 – 0.4 mg/kg IM) and xylazine (@ 0.2 – 1.1 mg/kg IM) and induction of anaesthesia by propofol (@ 1-2 mg/kg IV) were done. Maintenance of anaethesia was carried out with ketamine (@ 5 mg/kg IV) and diazepam (@ 0.25 mg/kg IV) combination. Monitoring of electrocardiogram, blood pressure and oxygen saturation were done as per standard techniques.

The examination of nasopharynx and choanae using caudal (posterior) rhinoscopy was done before performing rostral (anterior) rhinoscopy procedure. Rhinoscopy was performed as described by Tams (). Caudal rhinoscopy was performed by retroflexing a flexible endoscope over the free edge of the soft palate, so as to look forward the choanae. A flexible bronchoscope (3.5 mm diameter) or gastroscope (7.9 mm) with 180 degree of flexion was used for anterior rhinoscopy. A small diameter flexible endoscope (bronchoscope, Olympus type BF – 1T150, Japan) with two-way deflection or 2.7mm 30-degree arthroscope with cystoscopy sheath (Karl Storz, Germany) was used for anterior rhinoscopy. Irrigation for anterior rhinoscopy was provided from bags of 0.9 per cent saline fitted with standard delivery sets connecting to one of the stopcocks of the cannula or working channel of the flexible endoscope.

A small indentation dorsal to the third premolar tooth palpated through the oral mucosa was used to locate the infra orbital canal. Infra orbital nerve block (left side of 1st ,2nd & 3rd animal and right side of 4th ,5th & 6th animal) and modified approach for maxillary nerve block (right side of 4th ,5th, & 6th animal and left side of 1st, 2nd & 3rd animal respectively) were done in six animals. For the infraorbital nerve block, 22G needle was percutaneously inserted (Fig. 1) approximately 0.5 cm into the infraorbital canal (Viscasillas *et al*., 2013). Modified infraorbital approach for maxillary nerve block was done as described by Fizzano *et al*. (2017). For the modified infra orbital approach for maxillary block, over-the-needle catheter (20G; 5cm) was introduced in the infraorbital canal parallel to the maxilla and then directed caudally (Fig.2). Initially the catheter was passed upto 5 mm. After withdrawal of the needle a little bit within the catheter, catheter along with needle was advanced till the hub of the catheter touched the gingiva. Lignocaine (2%, 0.5 ml) was used in both the methods. After 15 minutes, samples for biopsy / cytology were taken from any mass or abnormal tissue of nasopharynx or choanae. Biopsy samples were obtained under direct visualization using endoscope. The purposeful movements including paddling, sneezing, head shaking, chewing, or licking during the irrigation and sampling for biopsy and cytology were recorded.

Fig. 1: Infra orbital nerve block

Fig. 2: Modified infra orbital approach for maxillary nerve block

Fig. 3: Anterior Rhinoscopy with rigid endoscope

Fig. 4 : Posterior Rhinoscopy with flexible endoscope

Fig. 5: Lateral radiograph of skull- Osteolysis of nasal bone dorsally with extra-nasal soft tissue swelling

Fig. 6: Increased soft-tissue density in the nasal cavity, particularly on right and obliteration of vomer bone

Fig. 7 :Biopsy: Posterior rhinoscopy

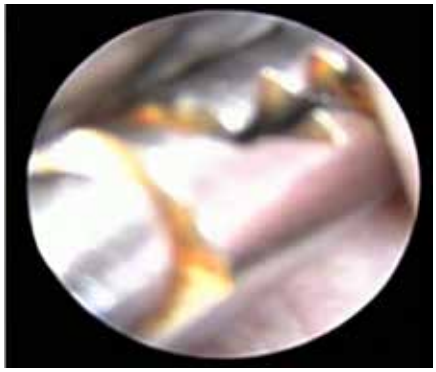

Fig. 8 :Biopsy: Anterior rhinoscopy

Results and Discussion

Movements like sneezing (100%), head shaking (83.33%), chewing (83.33%), licking (83.33%) and paddling (66.67%) were noticed during the rhinoscopic procedure of irrigation, taking samples for biopsy/ cytology on the side where infra orbital nerve block was employed. Noone (2001) reported that common adverse reactions during rhinoscopy included sneezing, gagging, and head movement and interfered with the rhinoscopy procedure, caused nasal and oral injury, or possibly damaged the instrument. These necessitated to increase the plane of anaesthesia for making a thorough endoscopic examination in dogs without adverse reactions. There were no such movements exhibited by the animal in which modified approach for maxillary nerve block was done and helped in irrigation and collection of samples for biopsy / cytology without sudden period of arousal. Cremer *et al*. (2013) opined

that compared to the infraorbital nerve block, the maxillary nerve block was somewhat more difficult to perform due to its anatomical location. Fizzano *et al.* (1997) in their on modified infraorbital approach for a maxillary nerve block for rhinoscopy with nasal biopsy of healthy dogs study reported that modified infraorbital approach resulted in evidence of decreased nociception, as determined on the basis of blood pressures and plasma cortisol concentrations associated with rhinoscopy and nasal biopsy and opined that this maxillary nerve block technique could help reduce cardiorespiratory effects of inhalation anaesthetics during nasal procedures. The disadvantage of advancing a hypodermic needle through the infraorbital canal may result in puncture of blood vessels, with the associated risks of intravascular injection or haematoma formation within the canal. Viscasillas *et al.* (2013) and Fizzano *et al.* (2017) on the basis of the results of the cadaver experiment, reported that a maxillary nerve block via a modified infraorbital approach would be expected to block sensory transmission to all nerves within the pterygopalatine region that provide sensory innervation to structures of the nose and face. Maxillary nerve block along with general anaesthesia Cremer *et al*. (2013) opined that compared to the infraorbital nerve block, the maxillary nerve block was somewhat more difficult to perform due to its anatomical location although maxillary nerve block decreased the adverse effects during rhinoscopy. Hence it is concluded that maxillary nerve block through modified infra orbital approach was better than infra orbital nerve block for endoscopic procedures involving sampling for biopsy/ cytology.

Conclusion

Modified infra orbital approach for maxillary nerve block was better than infra orbital nerve block for endoscopic procedures involving sampling for biopsy/ cytology.

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