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Local Anesthesia for Dental Procedures

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Take Home Message—Local anesthesia is invaluable for dental and maxillofacial surgery in the standing sedated horse. Nerve blocks of the maxillary and mandibular branches of the 5th cranial (trigeminal) nerve, local infiltration and topical anesthesia can be effectively used for effective pain control in equine dentistry.

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I. INTRODUCTION

The aim is to present the most commonly used nerve blocks and some regional applications of local anesthetics to facilitate dental and maxillofacial surgical procedures in standing sedated horses.

II. MATERIAL AND METHODS

Infraorbital Nerve Block Within the Pterygopalatine Fossa: Extraperiorbital Fat Body Insertion (EFBI) Technique

Anesthetized Structures

This block provides anesthesia of all equilateral maxillary cheek teeth, the maxilla including the lining of the maxillary sinuses, the mucous membranes of the nose, the equilateral canine tooth and the incisors, muzzle and nose on the injected side.

Preparation

A 3 x 3 cm rectangular skin area ventral of the temporal canthus of the eye and ventral of the zygomatic process is clipped and aseptic preparation is performed. A 3.5 inch 19 gauge (1.1 x 90 mm) spinal needle, sterile gloves and 10 – 20 ml of local anaesthetic are prepared. Sterile injection technique is mandatory.

Injection Technique

One to 2 ml of local anesthetic is infiltrated subcutaneously to desensitize the injection site. The skin is punctured at a point 1 cm ventral to the zygomatic process perpendicular to the temporal canthus of the eye. The spinal needle is then inserted horizontally and perpendicular to the skin surface. The tip is advanced to 45-50 mm depth. Subsequently the local anesthetic is slowly injected.

Complications

Inadvertent puncture of the infraorbital artery or the descending palatine artery can result in retrobulbar hematoma. Collapse and blindness as well as meningitis have also been reported (Nowak, Vogt, Zwick, personal communication).

Infraorbital Nerve Block at the Infraorbital Foramen

Anesthetized Structures

This block provides anesthesia of the rostral maxilla including the first and occasionally the second cheek tooth, the nose, muzzle and incisors on the injected side.

Preparation

Routine skin preparation is performed. A 19-22 gauge, 1.5-3.5 inch (0.9-1.1 x 40-90 mm) (spinal) needle and 5-10 ml of local anesthetic are required.

Injection Technique

The infraorbital foramen is located caudal to the midway point on a line from the rostral end of the facial crest to the nasal incisive notch (“3-finger technique”). It can be palpated after moving the levator labii superioris and levator nasolabialis muscles dorsally. Prior to deep insertion of the needle, the subcutaneous tissues should be infiltrated with 1-2 ml of local anesthetic to minimize adverse reactions of the horse. The skin is penetrated 1-1.5 cm rostral to this point with the needle angled in caudo-ventro-medial direction. Moderate to severe head and neck movements of the horse might occur when the nerve is hit by the needle. Following injection of parts of the local anesthetic at the infraorbital foramen the spinal needle can be carefully inserted into the infraorbital canal. Deposition of local anesthetic deep inside the infraorbital canal might extend the effect of the nerve block further caudally.

Inferior Alveolar Nerve Block at the Mandibular Foramen

Anesthetized Structures
Local anesthesia at this site will desensitize the equilateral mandibular cheek teeth, the entire mandible, the canine tooth, the incisors and the lower lip on the injected side.

**Preparation**

Clipping of the injection site, aseptic preparation and sterile injection technique is recommended. A 20 gauge, 6 inch (0.9 x 200 mm) spinal needle and 10 - 20 ml of local anesthetic solution are used.

**Injection Technique**

The nerve enters the mandibular canal on the medial side of the mandible. To localize the mandibular foramen, the intersection of a line along the occlusal surface of the maxillary cheek teeth and a perpendicular line through the lateral canthus of the eye is marked with a colored pen on the skin overlying the masseter muscle. The spinal needle is inserted directly ventral to this point. Aiming at the marker-point the spinal needle is advanced in dorso-lateral direction in close contact to the medial aspect of the mandibular bone. A second needle of the same length can be used on the lateral side for depth comparison. The prepared local anesthetic is injected when the appropriate depth of injection has been reached.

**Complications**

Bite injuries (auto mutilation) have been reported following bilateral nerve blocks at this location (Stoll, personal communication).

**Inferior Alveolar Nerve Block at the Mental Foramen**

The equilateral rostral mandible, canine and incisors and the lower lip are anesthetized.

**Preparation**

Routine skin cleaning is performed. A 20 gauge 1.5 inch (0.9 x 40 mm) needle and 5 ml local anesthetic solution are used.

**Injection Technique**

The mental foramen can be palpated on the lateral side of the mandible. It is located in a straight line dorsal to the caudal end of the symphysis of the right and left hemimandible. The depressor labii inferioris muscle needs to be displaced manually prior to injection. The needle is guided in a rostro-caudal direction towards and into the foramen and 5 ml of local anesthetic are gradually injected. Bending the needle prior to the injection might help to advance the needle deeper into the mandibular canal if needed.

**REFERENCES**