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Introduction
Two ophthalmic nerves are frequently deactivated ('blocked') during the equine ocular examination: the auriculopalpebral, or more precisely the palpebral branch of the facial nerve (CN VII), and the frontal (supraorbital) branch of the trigeminal nerve (CN V). When these nerves are blocked, akinesia and anesthesia, respectively, of the upper eyelid occurs. The retrobulbar block is also commonly performed in the horse to assist minor standing surgical procedures.

Regional nerve blocks

Regional akinesia
The orbicularis oculi muscle in horses is very strong and, therefore, akinesia of this muscle is required to open the eyelid for examination in many horses, especially horses that are in pain. The most common nerve blocked is the palpebral branch of the auriculopalpebral nerve, which innervates the orbicularis oculi muscle.

The auriculopalpebral nerve can be blocked sub-fascially in the depression just anterior to the base of the ear where the infraorbital foramen is located. The needle is then placed such that the needle points lateral to the base of the ear and slightly palmar to the infraorbital foramen. Once the needle is inserted into the infraorbital foramen, 1–2 ml of local anesthetic can be deposited. The needle is aspirated to ensure that the needle is not within the infraorbital nerve or artery. The needle is then advanced until sensation in the eyelid is lost, usually 1–2 cm, and 1–2 ml of local anesthetic can be aspirated and injected. Once the needle is removed, the site is massaged to facilitate anesthetic diffusion.

Regional akinesia and analgesia
Sensation to the eyelids is provided by the ophthalmic and maxillary divisions of the trigeminal nerve (CN V). The most common nerve to block is the frontal (supraorbital) nerve, which innervates most of the central upper eyelid and is the only sensory nerve to perform anterior or posterior chamber paracentesis for diagnostic purposes and enucleation. The retrobulbar nerve block normally required for examination. Anaesthesia of these nerves is sometimes necessary for eyelid and conjunctival surgeries or simple surgeries, as well as subpalpebral lavage placement in the horse.

The frontal (supraorbital) nerve is blocked as it emerges from the supraorbital foramen within the frontal bone. This foramen can be palpated as a small depression. A 25 gauge,½ inch needle is then inserted subcutaneously over the foramen, and 1–2 ml of anaesthetic is injected. Passing the needle into the foramen is not recommended because this may damage the supraorbital artery and vein, which exit the skull through the supraorbital foramen. Furthermore, if the needle inadvertently enters the periosteum surrounding the supraorbital foramen, this can be painful and the horse may react negatively.

Retrobulbar nerve block
Retrobulbar anaesthesia can be used as an adjunct to general anaesthesia in horses to reduce nystagmus and enophthalmos during corneal and intraocular surgery and prevent the need to give the horse neuromuscular blocking agents. It can also be used to perform standing eyelid and corneal surgeries, as well as to perform anterior or posterior chamber paracentesis for diagnostic purposes and enucleation. The retrobulbar nerve block temporarily blocks the optic (CN II) and oculomotor (CN III) nerves, the abducens nerve (CN VI), the trochlear nerve (CN IV), and the maxillary and ophthalmic branches of the trigeminal nerve (CN V).

The site for the retrobulbar injection above the zygomatic arch and caudal to the temporal process of the malar bone is preferred because it requires a single needle penetration, is not located near the globe, and if performed properly, avoids the direct location of the optic nerve. The orbital fossa above the dorsal orbital rim and zygomatic arch is clipped and aseptically prepped with povidone-iodine (Betadine) solution. A 22 gauge, ½ inch spinal needle (BD, Franklin Lakes, New Jersey) is placed through the skin perpendicular to the skull, in the orbital fossa just posterior to the posterior aspect of the dorsal orbital rim. The needle is advanced posterior to the globe until it reaches the retrobulbar orbital cone. When the needle advances to this location, the eye will have a slight dorsal movement as the needle passes through the fascia of the dorsal retrobulbar cone into the retrobulbar space. The needle is advanced until it just passes into the cone, evidenced by the sudden release of the eye back to normal position or a slight ‘popping’ sensation. Once the needle is positioned, 10–12 ml of 2% lidocaine HCl is injected into the retrobulbar space. Mepivacaine (Carbocaine) can also be deposited. Before injection, aspiration should be performed to make sure the needle is not positioned within a blood vessel. During the injection, the globe is pushed externally (i.e. slight
exophthalmos), indicating an accurate placement of anaesthetic. Onset of anaesthesia usually occurs within 5–10 min and duration of effect is approximately 1–2 h. Ocular sensation, blink reflex and vision will be compromised during this time, so box rest and protection of the eye with lubricants or a temporary tarsorrhaphy are recommended for 2–4 h after anaesthesia.

Further reading