Nerve blocks, analgesia and sedation for equine dentistry.

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Initial notes courtesy of Assoc Gary Wilson

The method of restraint used for dental procedures will depend on the procedure to be done, the skill level of the practitioner and the temperament of the horse. The aim is to ensure a safe and minimally traumatic experience for the horse, the handler and for the practitioner. To stand directly in front of a fractious horse and to attempt to do something unpleasant to that horse is bordering on suicidal. The practitioner is concentrating on what he/she is doing and if the horse should suddenly strike out or rear and strike, the practitioner will most often suffer severe injury. This risk of injury increases if metal gags are being used.

For this reason, in all but exceptionally quiet horses, some form of restraint is often required.

This may be in the form of psychological restraint ("horsemanship") where the practitioner has the ability to read the horse which, in turn, reacts accordingly to the practitioner's approaches. In a large number of horses some other form of restraint will be required even for non-painful procedures such as floating.

I look back now and wonder why I felt that I needed to fight with so many horses when dentistry was performed [to prove that I could do it!].

Even in “those days” it was great to turn up at the property and find a suitable horse crush to work in. I could then concentrate on doing my job instead of worrying if the horse was about to reduce my working life significantly.

NOTHING can replace a good crush!
Sedation

In fractious animals, it is often only possible to examine and perform the appropriate treatments with the animal sedated. If power instruments are to be used, sedation is mandatory. I truly believe that a complete oral examination can only be done in a sedated horse.

It must be remembered that there is a downside to this sedation. The horse will drop its head and require either the use of a dental halter, dental stand or an assistant to lift it to allow examination and treatment. Remember that these animals can, and often do, still react to painful stimuli and will be ataxic etc. in their response.

The type of sedation used will depend on the personal preferences of the veterinarian and also the level of restraint required. A combination of sedative and analgesic is the ideal for most equine dental procedures (e.g. xylazine and butorphanol; acepromazine, xylazine and butorphanol, detomidine and butorphanol).

Long procedures done under sedation can be easily done using a constant rate infusion technique. My normal procedure is to sedate the horse with detomidine i/v and then set up a drip of Hartman’s with detomidine added (10mg detomidine to a litre of Hartman’s). This can be run in at whatever rate is required to produce good sedation.

Local anaesthesia

Local infiltration is an easy procedure in the rostral oral cavity and is used for wolf tooth extraction primarily.

Regional anaesthesia

Regional nerve blocks for dental procedures are easy to perform in the equine and should be used for all painful procedures especially minor extractions such as wolf tooth extraction. Either 2% lignocaine or 2% mepivicaine can be used effectively for these techniques. Remember to allow 5 to 10 minutes for these blocks to work before performing painful procedures.
Maxilla

The infraorbital nerve can be blocked within the canal before it emerges. A 75 mm 18G needle is inserted into the canal for about 40mm and 5cc of local anaesthetic injected. This will block all but the last two cheek teeth.

Technique for infraorbital nerve block:

The infraorbital foramen may be palpated approximately 2cm caudal to the midpoint of a line from the nasomaxillary notch to the rostral end of the facial crest. A 75mm 18G needle is inserted into the infraorbital canal for 40mm and 5cc of local anaesthetic agent injected (digital pressure over the foramen prevents it from coming back out). The skin over the injection site is desensitised first with a bleb of anaesthetic and the horse twitched as almost all horses react to insertion of the needle. It is preferable to have the horse sedated with xylazine and butorphanol prior to the block, and wait 5 mins for the subcutaneous bleb to work!

THIS IS THE MOST USEFUL NERVE BLOCK YOU WILL EVER LEARN!

It took me at least three nerve blocks to become comfortable with my ability to perform them. I am sure you will feel the same.

Once you have perfected this block, all manner of surgery can be performed in this region without the need for general anaesthesia. I have personally repaired major facial trauma in a horse sustained during a float rollover utilising bilateral infraorbital nerve blocks.
Mandible

The inferior alveolar nerve supplies the mandibular teeth, alveoli, gingiva and the skin and mucosa of the lips and chin. The nerve enters the mandible medially at the mandibular foramen. Branches from this nerve supply the teeth before it exits via the mental foramen to supply the chin and lips.

The most suitable technique for blocking this nerve is to block before it enters the mandibular foramen. A 15cm 18G needle is inserted medially (held against the medial surface of the mandible) and passed vertically for a pre-determined distance and 15 - 20ml of anaesthetic injected. The mandibular foramen is located at a position designated by the intersection of a line extending back from the occlusal surface of the maxillary cheek teeth and a vertical line from the lateral canthus of the eye to the lowest point of the jaw (with the head in a normal position). It is helpful to mark the distance on the needle prior to insertion.

Attempts to block this nerve via the mental foramen are usually unsuccessful, as the diameter of the foramen is very variable and it is not uncommon to have 2 or even 3 foramen!

General anaesthesia

With certain horses and routinely for certain procedures, general anaesthesia will be required.

It must be remembered that adequate access to the oral cavity will be needed and this can be difficult if an endotracheal tube is being used. Total intravenous anaesthesia may be more beneficial. If necessary, nasal O$_2$ can be administered (this is mandatory for prolonged procedures).

Care needs to be exercised with the use of gags and the head should be effectively padded to avoid facial nerve damage. The head should also be lowered and suction used if necessary.
Detomidine Constant Rate Infusion

T = 0  Initial sedation of horse:

- 5mg butorphanol & 5mg detomidine iv CRI
- 20mg detomidine per 1L hartmann’s or isotonic saline solution

T = 10 mins

- Start CRI at 4 drops/second (720mL/hour)
- Halve rate every 15 mins or to effect

T = 25 mins

- CRI = 360mL/hour

T = 40 mins

- CRI = 180 mL/hour

Comment:

- Xyaline top ups worked well as needed.
ECONOMICAL TRANQUILIZER PROTOCOL
for use of Power Float
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PRINCIPLES

1) Acepromazine IV is a good muscle relaxant and anti-anxiety agent. It takes approx 20 mins to reach peak effect and lasts for a few hours.

DO NOT GIVE ACEPROMAZINE TO STALLIONS.

2) Xylazine IV takes effect within a few minutes and has a good working time of 10-12 minutes for dentistry.

3) Butorphanol 0.25 – 0.5 ml IV administered in the same syringe with xylazine AFTER the horse is already under the influence of xylazine potentiates the xylazine’s effects, and keeps the horse very still during dentistry. If you administer the butorphanol BEFORE the horse is sedated deeply enough with xylazine the horse will push forward and make the dental procedure more difficult.

PROCEDURES:

1) SEVERAL HORSES
Enter the barn and give 10 - 25 mg acp IV to the first 6-8 horses, then go get dental equipment set up while the acp is taking effect. Stallions are not given acp.

Once set up, give 150 mg XYLAZINE iv, wash out the mouth and apply the dental speculum. Then give another 1-1.5 ml of xylazine, as well as 0.25-0.5 ml torbugec in same syringe, and begin floating in 1-2 minutes. Add 1 – 1.5 ml xylazine increments as needed to very fractious horses (0.2 ml torb may also be necessary)

2) ONE HORSE
A) 10 - 20 MG ACP IV, 1.5 ML XYLAZINE IV in same syringe, wait 2-3 minutes (start dental chart) and give another 1.5-2.5 ml xylazine with 0.25-0.5 ml butorphanol. Start external oral exam and application of gag as you are waiting for the sedation to take effect.

Begin dental procedures within about 2 minutes. By waiting a short time before giving the torbugsic, you will avoid pushing to some degree.

B) Give the full 10-20 mg ACP IV + 2.5 ml XYLAZINE (250 MG) +0.25-0.5 ML TORBUGESIC all in the same syringe, and begin floating in about 3-5 minutes. The negative occurrence with this technique can be excessive forward pushing from the torbugsic because the xylazine has not sedated the horse initially to overcome rigidity and the pushing tendency.

The early administration of ACP give very good muscle relaxation. When a vet is in the beginning stage of using the Power Float the more expensive combination of detomidine/torbugsic may be preferred because it lasts longer and is also effective. It is important to give the detomidine 5 minutes to work though.

Once a practitioner has his/her speed up then the other tranquilizer regime can be used. When the dental procedure is finished, support and shake the head slowly as you exit the stall or stocks in order to prevent the horse from losing balance. Handle the horse yourself until the horse is in a safe place or recovered from sedation. Do not let the owner walk the horse out until you are certain the horse is recovered from the tranquilizer sufficiently. To prevent choke, ensure the horse doesn’t eat for an hour (though short green grass seems to be OK).

Devise a floating procedure plan that is efficient. Time is wasted by repeatedly floating a portion of the arcade, then doing a digital examination. I advise to first do a digital and visual examination, float the whole horse, then re-examine at the end of the procedure and touch up if necessary. You will find that with practice, few touch ups will be necessary. Wear a towel on your waste, or an apron to keep your hands clean. Clean hands will help keep the Power Float clean. Always wear eye, ear and breathing protection.

For assessment of how much to sedate a horse, palpate its mouth, bars, presence of wolf teeth etc. This examination will alert you to most of the very fractious horses. For these horses, adding 0.2-0.4 ml of detomidine to the initial ace/xylazine mix is very useful. Detomidine takes 5 mins to take effect.
A key point is the need to sedate initially - enough to avoid the release of catecholamines, which once released, require the use of large amounts of sedative to overcome.

Use of NSAID’s in equine dentistry.

Being a prey animal, horses have a heightened ability to disguise dental pain, both before and after treatments. Thus we need to consider this, and use pain relief as effectively as possible for maximal animal welfare.

I usually use Flunixin IV pre-operative when extracting abscessed teeth, due to the anti-prostaglandin effects it has, and then put the horse onto Phenylbutazone for 3-5 days post extraction.

Some veterinarians routinely prescribe PBZ following wolf tooth extraction. This tooth is not used in masticatory processes, and so long as the procedure has been performed under clean conditions and under the effect of local infusion of local anaesthetic, the justification for this is questionable, but further investigation and consideration is needed here.

If a horse has had a lengthy dental treatment procedure, especially where the gag was not let down every 10 minutes, or there was substantial trauma to the gingival and mucosa, NSAID’s are a good idea.

Dentinal process exposure can occur if significant amount of dentine has been removed in a procedure, and the surface is now close to the pulp cavity. NSAID’s will not reduce pain from dentinal process exposure, as the painful stimulation is via a basic osmotic effect on fluid in the odontoblast process. The best method to prevent ongoing dentinal pain is to apply a fluoride varnish to the exposed dentine, but a similar effect is likely achievable using a calcium hydroxide cement. Neither is likely to remain in place very long due to the masticatory abrasion in the horse.