Pain Management and Regional Nerve Blocks in Small Animal Dental Patients
Vickie Byard, CVT, VTS (Dentistry), CVJ
PetED Veterinary Education and Training Resources
Warminster, PA

It is fair to say that, anesthetically, dentistry can be very time intensive. Once the dental prophylaxis is completed, the patient’s mouth has been charted, and a full series of intraoral radiographs is ready for evaluation, some patients may have already been under anesthesia for over an hour. A patient that will undergo multiple extractions, oral surgery, endodontics, etc. can be anesthetized for 2-3 hours.

As an adjunct to general anesthesia, regional nerve blocks can be added to increase patient safety by dramatically decreasing the amount of inhalant anesthetics needed for such long procedures. Nerve blocks will also significantly improve post-operative comfort. During the pre-operative exam, it is often obvious when a procedure will include some level of discomfort. At this point, it is wise to plan on adding local anesthesia. The technician can calculate the dose of the chosen local anesthetic, prepare the syringe and label it accordingly.

Perform the regional block after the patient is under an appropriate level of general anesthesia, the monitoring devices are in place, the IV fluids are running and the condition of the patient is stable. This gives the block time to work before any pain is caused. It is infinitely better to prevent, than to treat pain.

There are a number of drugs used for local anesthesia, each varying in their dose, onset of action, duration, and toxicity. For simplicity, let’s concentrate on Bupivicaine*.

Bupivicain
Again, depending on the reference, onset of action has been reported as long as 20-30 minutes with a duration of 2.5-6 hours.

Five common dental blocks
1. Local infiltration
This method can be employed when only a small area requires anesthesia. The anesthetic agent can be injected into the gingiva, mucosa or periodontal ligament. When radiographs show bone loss around a specific tooth, a local anesthetic agent can be infiltrated apical to that tooth. Also, as an adjunct to an infraorbital block, the maxillary teeth can be blocked by infiltration palatal to that specific tooth. But, local infiltration of anesthetics is not the most effective means of blocking dental pain.

2. Infraorbital nerve block
The infraorbital foramen is easily palpated in the dog and cat. It can be found apical to the maxillary third premolar. Through this foramen passes several nerves that supply innervation to the maxillary arcade. Insert the needle through the buccal mucosa where it forms a crease and direct it towards the foramen in a rostrocaudal direction. Pass the needle until it is at the opening of the foramen. Aspirate in several planes. Slowly inject the agent in an attempt to bathe the exiting nerves supplying the rostral structures. When the more caudal teeth are to be blocked, finger pressure is held over the wheal of local to “force” the agent deeper into the foramen, thus blocking those structures.

Other sources recommend actually passing the needle just inside the foramen and instilling agent to block rostral structures and then advancing the needle gently into the foramen to instill more through the foramen (aspirating frequently). Digital pressure is used to prevent the local agent from then exiting from the foramen.

3. Maxillary block
Walk the needle around the most caudal aspect of the upper maxillary second molar. Pass the needle into the space just under the eye. This is where the nerves pass to enter the infraorbital foramen. Make sure you use sharp, short needle with a finger stop employed so as to not advance the needle into the globe of the eye. Do not pass this needle to full depth. Just advance it so that the bevel of the needle just passes underneath the soft palate. Do not advance aggressively. The globe of the eye is large in cats and many brachycephalic breeds.

4. Mandibular (or inferior alveolar) block
When attempting to block the mandibular structures, the mandibular nerve needs to be blocked. There are two ways to accomplish this. To block this nerve intraorally, slide your index finger along the mandible caudal to the last molar until you feel an indentation. With the other hand, introduce the syringe until the needle is at the opening of the foramen. Aspirate then inject.

Another method is called the Transcutaneous Approach or the Extraoral Approach. A small area of hair is clipped and prepped at the angle of the mandible. The foramen is palpated as in the previous method. The canine mandible has a notch anterior to the angular process (the cat does not). Insert the needle through the skin until the needle hits the mandibular notch. Then gently walk the needle medially then gently guide the needle to your other index finger. Your needle should be trapped between the Inferior Alveolar Foramen and your finger. When you are sure of your placement, aspirate, then inject.
5. Mental block
There are three mental foramina. The middle mental foramen is the largest. In large dogs this can be palpated apically between the first and second premolars. The needle is inserted under the submucosa just to the entrance of the foramen. Aspirate and inject. If the interest is in blocking the rostral mandibular structures put a minute’s worth of finger pressure to ensure the agent anesthetizes the incisors and canine.

In the cat, the needle is introduced through the submucosa into the labial frenulum and directed caudally. Aspirate and inject. Some important rules for administering local anesthetic agents:

- Do not attempt to instill the local anesthetic agent until the patient is completely under general anesthesia.
- If multiple sites are to be anesthetized, the total calculated dose must be divided by the number of sites.
- Change needles between sites. A sharp needle gives the anesthetist the best advantage for accurate placement. Dull needles require too much effort.
- Always, always aspirate prior to injecting.
- It is recommended to decrease the calculated amounts by 30%-40% for old or cachetic pets.
- Injection into infected tissue is contraindicated.
- Be aware that you may have the level of inhalant anesthesia low while working on one side of the pet. It is often necessary to increase the patient’s plane of anesthesia before turning them. It is possible to keep the anesthetic level so light that moving the patient may begin to awaken them.

Finally, the technician experienced in the use of dental blocks will notice the positive impact for his/her patients. The anesthetic procedure will be more even, the recoveries will be smoother, and the patients will be ambulatory and will eat sooner post-operatively. Just as importantly, client satisfaction will increase because they will perceive the experience as less stressful for their pet.

*In the past, I have always lectured that combining both Lidocaine and Bupivicaine provided both quick onset and long duration. Although, anecdotally this always seemed to work well, current literature suggests that when combining both drugs you are losing some of the duration of the Bupivicaine. I now use Bupivicaine alone in the syringe and my experience has showed no negative aspects of using it as a stand-alone agent.