

LOCAL & REGIONAL ANESTHESIA II

Local infiltration

Local infiltration requires extravascular placement by direct injection. The solution is placed by intradermal or subcutaneous injection using a 22 to 25-gauge needle and is slowly injected advancing the needle along the line of the proposed incision. The amount of anesthetic required depends on the size of the area to be anesthetized, the drug and the size of the patient. Generally, the lowest possible dose that will produce the desired effect should be administered. If a large area needs to be anesthetized, the local anesthetic may need to be diluted to prevent toxicity. Local anesthetics containing epinephrine should not be injected into tissues supplied by end arteries, such as phalanges, ears and tail. In conscious patients, subcutaneous administration is often painful, due in part to the acidic nature of the solution. Addition of sodium bicarbonate will decrease pain and hasten onset.

Peripheral nerve blocks

Injection of a local anesthetic solution into the connective tissue surrounding a particular nerve produces loss of sensation (sensory block) and/or paralysis (motor block) in the region

LOCAL & REGIONAL ANESTHESIA II

supplied by the nerve. Smaller volumes of drugs are needed to produce the block, reducing the danger of systemic toxicity.

Head

Useful nerve blocks for dental and other procedures involving the maxilla and mandible include infiltration of the infraorbital, mandibular and mental nerves. The infraorbital nerve is blocked at its point of emergence from the infraorbital canal. The needle is inserted either intraorally or extraorally 1 cm cranial to the bony lip of the infraorbital foramen. The infraorbital foramen can be palpated between the dorsal border of the zygomatic process and the gingival margin of the second/third premolar teeth. The needle is advanced into the infraorbital foramen. The area innervated by this nerve includes the upper lip and nose, roof of the nasal cavity, and the upper incisors, canine, premolars and first molar teeth.(6) The mandibular nerve is blocked either intraorally or extraorally at the point of entry of the nerve into the mandibular foramen. If an intraoral approach is used the mandibular nerve can be palpated as it runs ventrally along the vertical ramus of the mandible. The nerve is palpated with the index finger of one hand and the syringe with needle attached is introduced with the other hand. If an extraoral approach is used, the nerve is again palpated with the index

LOCAL & REGIONAL ANESTHESIA II

finger while the needle is inserted at the lower angle of the mandible rostral to the angular process. The needle is advanced against the medial surface of the ramus until it can be felt under the index finger. The area innervated by this nerve includes the incisors, canine, premolars, molars, and skin and mucosa of the chin and lower lip. The middle mental nerve can be blocked as it exits the middle mental foramen level with the second lower premolar. If the needle is advanced into the mental foramen, the area blocked includes the lower lip and the incisors, canine, premolars and first molar.(6)

Forelimb

The brachial plexus block is suitable for surgery on the front limb within or distal to the elbow. A spinal needle 22 to 20-gauge, 2.5–3.5 inches is suitable. The needle is inserted at the point of the shoulder, medial to the shoulder joint and directed towards the costochondral junction making sure to stay external to the thoracic cavity. The needle should be inserted until the tip is just caudal to the first rib and a line block is performed as the needle is withdrawn. Local anesthetic is deposited in close proximity to the radial, median, ulnar, musculocutaneous, and axillary nerves.

LOCAL & REGIONAL ANESTHESIA II

Alternatively, for surgery distal to the elbow, the individual nerves (median, ulnar, musculocutaneous and radial) may be infiltrated for analgesia below the elbow. The first three nerves can all be blocked together by approaching the medial side of the foreleg at the level of distal and middle thirds of the humerus between the biceps and the medial head of the triceps. The superficial branches of the radial nerve can be blocked as they pass over the dorsal surface of the elbow, where they lie next to the cephalic vein.

For onychectomy, nerve blocks of the superficial radial, the dorsal cutaneous and palmar branches of the ulnar nerve and the median nerve are a very useful procedure that not only facilitates surgery, but also results in good postoperative analgesia.

Thorax

Intercostal nerve blocks are administered to reduce the amount of other analgesics needed to treat postoperative pain and to improve postoperative pulmonary function following lateral thoracotomy. Intercostal nerve blocks can be performed prior to surgery or intraoperatively, either during or after thoracotomy. A minimum of two adjacent intercostal spaces both cranial and caudal to the incision must be blocked because of the overlap of

LOCAL & REGIONAL ANESTHESIA II

nerve supply. The site for needle placement is the caudal border of the rib near the intervertebral foramen.

Hindlimb

Anesthesia to the hindlimb distal to the hip can be achieved by selective blockade of the saphenous, common peroneal and tibial nerves. The superficial and deep fibular nerves and the tibial nerve can be blocked for procedures involving the foot.

Intra-articular administration

Most studies indicate that intra-articular bupivacaine is an effective method for providing postoperative analgesia. When compared with controls these patients require less postoperative pain medication (at least over the first 24 hours) and are able to get up and mobilize the joint sooner. The effectiveness of intra-articular bupivacaine has been confirmed in dogs.(7)

Intravenous block

Intravenous regional anesthesia (Bier block) produces anesthesia in the distal portion of the limb. An intravenous catheter is placed in either the cephalic or saphenous vein depending on the limb to be blocked. The limb is then exsanguinated by wrapping it with an Esmarch bandage and a rubber tourniquet is placed proximal to the bandage and the bandage unwrapped. Lidocaine 2.5–5.0 mg/kg is injected

LOCAL & REGIONAL ANESTHESIA II

intravenously under light pressure. Maximal anesthesia is achieved in 5-10 minutes.