

Numbing – Nose to Tail

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Abstract

In this paper, local anesthetic techniques for the most common surgical and medical conditions will be described. These include eye surgery, dehorning, castration, teat surgery, surgery of the foot and epidural anesthesia.

Résumé

Dans cet article, nous décrivons les techniques d'anesthésie locale utilisée pour les opérations chirurgicales les plus courantes : chirurgie oculaire, du trayon et du pied, écornage, castration et anesthésie épidurale.

Introduction

Due to the dangers of general anesthesia, local anesthetic techniques are commonly employed by food animal practitioners. Local anesthetic techniques are usually simple, cheap and have relatively few side effects. Common techniques used in practice will be described here and new techniques being studied will be mentioned. Unless otherwise stated, "local anesthetic agent" refers to either lidocaine or carbocaine. It is preferable to clip the hair and perform a surgical prep of the site before anesthetic agents are injected, particularly those injected deep into tissues.

Eye Surgery

The most common reason to perform surgery on the eye or eyelids is for squamous cell carcinoma. For anesthesia prior to hyperthermia or freezing of lid lesions, or H-plasty, a simple line block with local anesthetic will work. For lesions on the globe, it is helpful to proptose the globe for better exposure and immobilization. I try to proptose the globe without relaxation from a Peterson or retrobulbar block so there is less chance of abrasions and drying of the cornea following the procedure, especially if animals are traveling in an open trailer following the procedure. A topical local anesthetic for the eye should be applied.

For enucleation of the eye, I prefer the Peterson eye block. A small amount of local anesthetic is placed subcutaneously at the notch formed by the supraorbital

process and the zygomatic arch. A 14 gauge 1-inch needle is placed through the skin, then an 18 gauge, 6-inch needle slightly curved is placed through this needle and the tip aimed slightly caudal and ventral until I encounter bone. Although explanations of this technique by others describes repositioning the needle until it passes medial to the coronoid process of the mandible,³ I have rarely been successful at this. However, by depositing 20 ml of local anesthetic (after aspiration to make sure a vessel has not been entered), I am usually successful in obtaining anesthesia and resultant relaxation and protrusion of the globe. This technique does not block sensation to the lids. Blocking the auriculopalpebral branch of the facial nerve is described, but is not always successful and only blocks the lower lid. So, I prefer to block both upper and lower lids with a line of local anesthetic about 1-1/2-inch (3 cm) from the lid margins.

There is much debate amongst practitioners over the use of a Peterson eye block versus the retrobulbar block. Both can be effective if performed correctly, and both can have deadly side effects. The Peterson eye block is purportedly safer and more effective if done correctly, but is more difficult to perform.³

Dehorning

Blocking the cornual nerve desensitizes the horn for dehorning. 5-10 ml of a local anesthetic agent is deposited subcutaneously and relatively superficially midway between the lateral canthus of the eye and the base of the horn along the zygomatic process. Complete anesthesia may take 10 minutes to occur. In older animals with larger horns, a partial ring block, especially posterior to the horn, may be needed.

Castration

For knife castration, a line of local anesthetic agent is placed in the scrotum at the proposed incision site. Injection of a local anesthetic agent into each testicle is then performed. The volume of the agent depends on the size of the testes. I inject until I get back pressure. It is important to remove the testes within a few minutes of injection into the testes to prevent any toxic side effects from lidocaine or carbocaine.

Teat Surgery

For teat lacerations, an inverted V block immediately proximal to the laceration is usually sufficient. For severe, extensive lacerations, a complete ring block at the base of the teat may be necessary.

Surgery of the Foot

In general, intravenous regional anesthesia is preferred for surgery of the foot. A tourniquet is placed proximal to the fetlock immediately prior to injection (vein will be maximally distended immediately after the tourniquet is placed). Three sites of injection are available. One vein runs down the center of the dorsal aspect of the pastern. Another vein runs approximately 1-inch (2 cm) dorsal to the dewclaw, on both the lateral and medial sides of the foot. A 20 gauge needle or butterfly catheter is inserted into one of these veins and 15-20 ml of local anesthetic agent is administered. Alternatively, a 20 gauge 1-1/2-inch needle is inserted into the dorsal aspect of the pastern, in the groove between the proximal phalanges, just distal to the fetlock. Many times a vein is entered in the interdigital space and can be used to inject the anesthetic agent. It is only necessary to administer an anesthetic into one of these veins to provide anesthesia to the entire area distal to the tourniquet. The tourniquet can be safely left on for up to one hour to provide hemostasis during surgical procedures.

In feet with severe cellulitis, local intravenous anesthesia can be difficult. In these cases, a four point nerve block or a simple ring block will also work. The four-point nerve block anesthetizes the area from the pastern distally. To perform the procedure, a 20 gauge 1-1/2-inch needle is inserted into the dorsal aspect of the pastern, in the groove between the proximal phalanges, just distal to the fetlock. Five ml of lidocaine is administered deep, and another five ml superficially. This injection is repeated on the palmar/plantar aspect of the pastern, just distal to the dewclaws. Next, palpate the nerve over the lateral aspect of the fetlock, approximately 1-inch (2 cm) dorsal and proximal to the dewclaw. Administer five ml of lidocaine over the nerve and repeat on the medial side. The two interdigital injections performed in the four point block can be used for removal of an interdigital fibroma.

Epidural Anesthesia/Analgesia

Most bovine practitioners are familiar with the use of lidocaine and/or carbocaine for caudal epidural anesthesia, but other pharmacologic agents can be used with this technique. Epidural administration of xylazine (0.05 mg/kg) or xylazine/lidocaine combination offers

similar anesthesia to lidocaine, but the duration is longer (~4 hours) and systemic effects (sedation, salivation, ataxia) can occur. Because of the systemic effects, I do not use xylazine caudal epidurals for obstetric work. However, I have used it successfully in cattle that chronically strain due to rectal prolapse, vaginal irritation, etc. Although the duration of anesthesia is still relatively short, it's my opinion that the systemic effects are helpful in decreasing straining. I have not experienced problems with this technique, however Dr. Lyle George reports three cases of demyelination following xylazine epidural that caused these animals to be permanently paralyzed. He suggests that combination of lidocaine or carbocaine caudal epidural with systemic administration of xylazine is as effective as xylazine epidural administration, and has less potential for serious side effects.²

Epidural administration of opioids is another option for practitioners. Because they cause analgesia, but do not interfere with motor function, animals are less likely to become ataxic or recumbent. Also, the duration is longer (~12 hours for morphine). The disadvantages are that the analgesia is not as potent as lidocaine or carbocaine, and maximum effects of a morphine epidural may not occur for 2-3 hours or longer. Caudal epidural administration of morphine may be indicated for relief of pain in the perineum and to help reduce straining. Lumbosacral epidural administration of morphine may reduce pain during and after standing surgical procedures and may be used for pain relief in the rear limbs and pelvis. For maximum effects during surgery, lumbosacral epidural administration of morphine should be administered at least 2-3 hours prior to surgery, and routine local anesthetic techniques to anesthetize the flank should still be employed. The dose of morphine for epidural injection is 0.1 mg/kg diluted in 20 ml of sterile saline.^{1-3,5}

The combination of morphine and xylazine may be synergistic when administered epidurally.⁵

Other Techniques

Morphine (40-100 mg) can be injected directly into a joint, or used in the regional intravenous technique in the foot.² Morphine used in this manner may not totally eliminate pain, but may reduce the amount of other analgesics needed, such as NSAIDs.

Current Research

Ketamine hydrochloride is currently being studied for its potential analgesic benefits. It may interrupt spinal transmission of pain signals, which may lessen the hypersensitisation that occurs with chronic pain.⁴ It can be used systemically or epidurally. Experi-

mentally in cattle, 2.0 mg/kg diluted to a volume of 20 ml provided perineal analgesia for 63 minutes without systemic sedative effects.⁵

References

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4. Valverde A, Gunkel CI: Pain management in horses and farm animals. *J Vet Emerg Crit Care* 15:295-307, 2005.
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(enrofloxacin)

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Safety studies were conducted in feeder calves using single doses of 5, 15, and 25 mg/kg for 15 consecutive days and 50 mg/kg for 5 consecutive days. No clinical signs of toxicity were observed when a dose of 5 mg/kg was administered for 15 days. Clinical signs of depression, incoordination, and muscle fasciculation were observed in calves when doses of 15 or 25 mg/kg were administered for 10 to 15 days. Clinical signs of depression, inappetence, and incoordination were observed when a dose of 50 mg/kg had been administered for 3 days. No drug-related abnormalities in clinical pathology parameters were identified. No articular cartilage lesions were observed after examination of stifle joints from animals administered 25 mg/kg for 15 days.

A safety study was conducted in 23-day-old calves using doses of 5, 15, and 25 mg/kg for 15 consecutive days. No clinical signs of toxicity or changes in clinical pathology parameters were observed. No articular cartilage lesions were observed in the stifle joints at any dose level at 2 days and 9 days following 15 days of drug administration.

An injection site study conducted in feeder calves demonstrated that the formulation may induce transient reaction in the subcutaneous tissue and underlying muscle. No painful responses to administration were observed.

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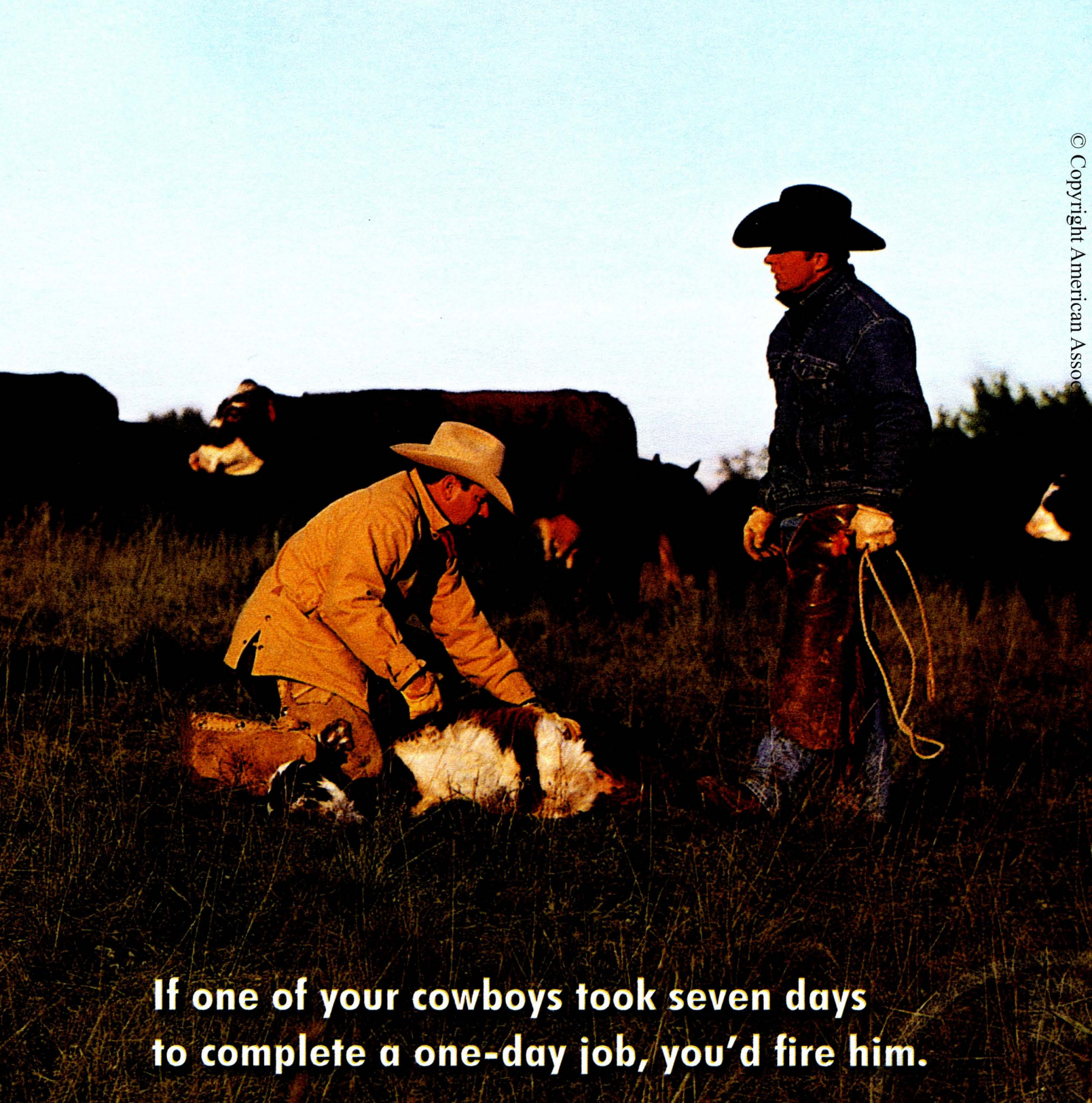
Quinolone-class drugs have been shown to produce erosions of cartilage of weight-bearing joints and other signs of arthropathy in immature animals of various species. No articular cartilage lesions were observed in the stifle joints of 23-day-old calves at 2 days and 9 days following treatment with enrofloxacin at doses up to 25 mg/kg for 15 consecutive days.

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