

Surgical Management of Orthopedic and Musculoskeletal Diseases of Feedlot Calves

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KEYWORDS

- Pain • Analgesia • Feedlot • Cattle • Lameness • Digit amputation • Pedal osteitis
- Joint ankylosis

KEY POINTS

- Musculoskeletal disorders can be readily recognized and should be addressed early.
- Some disorders are associated with predictable risk factors for development, such as handling methods and facility design, which should be critically evaluated as well.
- The observer should be able to differentiate musculoskeletal disorders of neurologic origin (spastic paresis) from lameness from primary musculoskeletal disease.
- Patient signalment should be part of the decision to treat and/or method of treatment.
- Indicated as well as contraindicated stabilization methods for fractures should be recognized.

PAIN MANAGEMENT

Calves suffering musculoskeletal pain may have acute or chronic pain established. Therefore, the opportunity to perform preemptive pain management eludes the clinician in these cases. However, prevention of pain associated with the surgical procedure is essential to prevent acute exacerbation of a pain condition that might cause the calf to develop a pathologic pain state that is unresponsive to routine drug therapy. Thus, surgical procedures of the foot and limb should be done after induction of local, regional, or general anesthesia. Although general anesthesia can be performed on feedlot calves under field conditions, most procedures are performed with local

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anesthesia administered with 2% lidocaine HCl by local infiltration, epidural infusion, or intravenous regional limb perfusion distal to a tourniquet. These techniques are highly effective for obtunding the surgical pain but provide limited postoperative analgesia. The analgesic period of effect for lidocaine is expected to be 60 to 90 minutes. Addition of epinephrine to the lidocaine mixture may extend the clinical period of analgesia. Sedation provides an opportunity to increase analgesia by using complementary drugs such as xylazine (α_2 agonist), butorphanol (mixed-agonist/antagonist opioid), and ketamine (neuroleptic, disassociative drug). These drugs, used individually or in various combinations, greatly improve the efficacy of pain management for the surgical procedure but offer little in the way of postoperative pain management.

The most reliable drugs available to feedlot veterinarians for management of musculoskeletal pain are nonsteroidal anti-inflammatory drugs (NSAIDs).¹ These drugs must be used selectively so as not to result in violative residues in meat. In general, recommended meat with holding time for lidocaine and the sedative drugs are less than 5 days. With NSAIDs, meat with holding times range from 24 hours (sodium salicylate) to greater than 60 days (phenylbutazone). Recently, the NSAID meloxicam has become popular as an effective analgesia and anti-inflammatory drug that is inexpensive, can be administered orally, and has a relatively short meat withholding period (< 21 days). However, this drug is not approved for use in food animals and must be prescribed under the regulations stipulated in the animal medical drug use clarification act (AMDUCA). The dosage most commonly used ranges from 0.5 to 1.0 mg/kg body weight administered every 24 to 72 hours. These NSAID drugs may have benefits to the patient, such as mitigation of pain, lessening of swelling, diminishing inflammation at the incision site and/or damaged tissues, and more rapid recovery after the procedure. Pain, uncontrolled inflammation, excessive swelling, local ischemia, and tissue injury can slow the rate of wound healing, suppress immune system function, and allow the establishment of infection. The use of steroids for management of pain and inflammation associated with surgery is discouraged because of concerns for increased risk of infection at the site of the surgical wound or associated with the disease process necessitating surgery. NSAIDs have been shown to have a beneficial effect on mitigation of pain and maintenance of normal behavioral activities in livestock. The bulk of this research has focused on routine husbandry surgical procedures such as castration and dehorning. In the authors' experience, aspirin (in any form) does not provide sufficient pain mitigation to justify its use with musculoskeletal disease or surgery.² The only advantage of sodium salicylate is the rapid elimination and short meat withholding times. This advantage rarely warrants its use because of the negligible clinical effect. Flunixin meglumine is a potent and effective NSAID for use in musculoskeletal disease.³ However, therapeutic blood concentrations are sustained only for up to 12 hours, and thus, frequent redosing is required. NSAID therapy for treatment of pre-existing and severe musculoskeletal disease may require days to weeks of therapy. Thus, NSAIDs that have rapid elimination times are less desirable. Phenylbutazone is effective, has a prolonged elimination time, and can be dosed infrequently, but the drug residue clearance for this drug is prolonged and unpredictable. Therefore, the authors neither use nor advocate using phenylbutazone in feedlot steers. Meloxicam is an increasingly popular NSAID because it possesses desirable potency, slow elimination times, and shorter drug residue clearance intervals even after repeated dosing.⁴

DIGIT AMPUTATION

Toe abscesses and distal limb trauma can result in localized and severe infection within the digit. Deep tissue involvement of the articular surfaces, tendon sheaths,

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