PERIOPERATIVE PAIN MANAGEMENT
AND
IMMEDIATE POSTOPERATIVE REHABILITATION IN THE SMALL
ANIMAL
ORTHOPEDIC PATIENT

Rick Wall, DVM, CCRP, DAAPM

Purpose of Discussion

This discussion is directed toward the education of the primary care veterinarian performing orthopedic surgical procedures. In the primary care practice it becomes the responsibility of the DVM and the veterinary technician to provide perioperative pain management and immediate postoperative physical medicine and rehabilitation (PM&R). Knowledge in these areas can improve patient care and outcome.

Objectives

• Briefly discuss pharmaceuticals in the management of pain in both the perioperative period and the postoperative period.
• The main focus of this discussion will be the role of rehabilitation, including physical medicine, in the immediate postoperative period.

Definitions

• For purposes of this discussion the perioperative period begins within 24 hours of surgery and extends approximately 24 hours following. The postoperative period begins immediately following surgery and extends for 10 to 14 days.
• Immediate postoperative rehabilitation begins prior to patient extubation to 10 to 14 days postoperative.
• Physical medicine and rehabilitation (PM&R), as defined in human medicine; The branch of medicine that deals with the diagnosis, treatment, and prevention of disease and disability by physical means such as manipulation, massage, and exercise, often with the aid of mechanical devices and with the application of heat, cold, electricity, radiation, or water. Also called physiatrics, physiatry. (1)

Key Pharmaceutical Points

• Opioids provide preemptive anesthesia - Mu agonists (morphine, oxymorphone, hydromorphone, fentanyl). Numerous preanesthetic formulas exist – www.vasg.org
• Epidurals – very effective for orthopedic procedures of the pelvis and hind limbs
  1. Local anesthetics block motor, sensory and autonomic blockade that can result in prolonged paresis.
  2. Opioids – more commonly used with morphine being the most common due to lower lipid solubility thus extending duration of analgesia. www.vasg.org
• Local anesthetics via nerve blocks, local infiltration and injection in joints.
Continuous rate infusion of opioids in combination with ketamine and lidocaine. Many formulas exist. CRI will improve the management of pain and reduce the amount of anesthesia required during surgery. Consider continuing CRI for 18 to 24 hours postoperative thus never letting pain become established. Urinary catheterization is necessary.

Oral analgesics for pain management include NSAIDs, tramadol, gabapentin, amitriptyline and opioids. In very small dogs sublingual buprenorphine is a good option (Dr. Jeff Ko, Professor of Anesthesiology – Purdue, recommends 60 micrograms/kg q12h sublingual).

Key Point for Immediate Postoperative Physical Medicine and Rehabilitation (PM&R)

A. The goals of immediate postoperative PM&R is as follows:
   1. Pain management
   2. Manage inflammation and edema due to the trauma of surgery
   3. Increase blood and lymph circulation
   4. Maintain improved joint range of motion
   5. Limit disuse atrophy
   6. Improve mobility

B. Immediate postoperative PM&R begins prior to extubation

C. PM&R modalities for the first 24 to 96 hours

   1. TENS – Transcutaneous Electrical Nerve Stimulation – manages pain by inhibiting the transmission of the pain signal centrally in the dorsal horn of the spinal cord (theory). Electrodes can be applied anywhere on the same spinal cord segment(s) as the surgical site. The intensity of the TENS is ramped up slowly until muscle contraction is seen then reduce slightly. Numerous units available via the internet, $50 to 100.
      - 30 minutes q6h
   2. Massage – manipulation of superficial and deep soft tissues. Massage helps to prevent adhesions, edema, relaxes soft tissues, improves venous return and lymphatic flow. Massage may cause the patient to relax. Strokes toward heart to aide in venous return.
      - q6h for 15 to 20 minutes
   3. Passive Range of Motion Exercises – flexion and extension of the surgical joint, and possibly adjacent joints, to the point of patient recognition. Passive ROM is not meant to be a painful experience however pain and edema may joint effusion may limit motion.
      - q6h, 20 Reps
   4. Cryotherapy – application of cold, the primary physiologic effects include, vasoconstriction, reduced blood flow, reduced cellular metabolism and permeability, decreased sensory and motor nerve conduction velocity, analgesia, prevention or reduction of trauma-induced edema. Ice packs, commercial cold water circulating units, crushed ice, etc. Place towel, usually moistened between ice and skin.
      - q6h, 15 to 20 minutes
   5. Slow controlled leash walking for 5 minutes 3 times daily. A slow speed encourages toe touching.

D. PM&R – 4 to 14 days

   1. Continue massage and increase the intensity toward the end of each session with frictional massage and transverse friction massage. One or two fingers pressed deeper in
the tissues, frictional is in the direction of the tissue or in circular strokes while transverse friction is performed perpendicular to tissues. Since this is generally performed by the owners 3 to 4 times daily is adequate. This type of massage can decrease adhesions within the surgical area or surrounding injured tissue.

2. Passive stretching exercises combined with passive ROM exercises to improve joint flexibility and extensibility of periarticular tissues, muscles and tendons. (2) Injury and the trauma of surgery results in adaptive shortening of the soft tissues. Add to these the immobility often associated with orthopedic patients and shortening and contraction can occur. As the patient recovers from the trauma of surgery and postoperative pain decreases stretching maybe come more aggressive. A simple definition of passive stretching is taking a joint slightly past the active joint range of motion. Once patient recognition is noticed, as in ROM exercises, slight but steady pressure is applied to move the limb past that point.

- q6 to 8h, 15 to 20 reps

3. Controlled exercise continues but times and distance can be increased, work up to 20 minutes 3 to 4 times daily. Incorporate weight-shifting exercises to encourage muscle contraction in the surgical limb.

Conclusions and Discussion

The aggressive pharmaceutical management of pain combined with physical medicine and rehabilitation will improve patient well being, enhance recovery and improve client’s perception of value. The primary care practitioner can easily implement these modalities immediately with only a small amount of education and capital expenditure. Technical staff members are eager to learn the modalities and can become the caregivers during patient hospitalization and educators to the clients upon discharge. Increased revenues can be generated with low overhead costs and clients rarely question the need for these services.

References