

Funded Study: Surgical techniques and post-operative pain and inflammation following limb amputation surgery

Study Title: Ultrasonic scalpel versus monopolar electrosurgery for limb amputations in the dog

Purpose of Study:

Amputation of a limb in dogs is a common surgical procedure indicated for the treatment of appendicular neoplasia, soft tissue injuries, orthopedic disease, and salvage for surgical complications. All amputation techniques require extensive surgical dissection through muscle tissue, which can be performed with sharp dissection, monopolar electrosurgery, or bipolar vessel sealing device.

There is minimal research evaluating surgical techniques and use of the various surgical devices available for use in this common procedure. The primary aim of this study is to evaluate intraoperative and postoperative differences between dogs undergoing amputation performed using ultrasonic scalpel versus monopolar electrosurgery. Secondary aims are to evaluate extent and degree of histologic tissue damage and surgeon perception and satisfaction of use of the devices for limb amputation. To our knowledge, a comparison between limb amputation using ultrasonic scalpel and monopolar electrosurgery has not been studied.

Eligibility Diagnostics:

Prior to study entry, patient owners will be charged an initial consultation fee and be financially responsible for, and required to have, the following diagnostics performed on their dog:

1. Screening blood work +/- urinalysis if not performed within 2 weeks
2. Imaging of the affected limb +/- thorax if indicated and not previously performed
3. ± Screening radiographs of other areas/limbs to rule out concurrent orthopedic disease

Inclusion Criteria:

- Dogs requiring limb amputation for any reason

Exclusion Criteria:

- Orthopedic disease other than the disease necessitating limb amputation
- Neurologic disease affecting ambulation
- Require concurrent surgery at a site other than the affected limb
- Fractious or aggressive demeanor

Treatment:

Study dogs will be randomly assigned to treatment Group US (amputation using ultrasonic scalpel) or Group ME (amputation using monopolar electrosurgery). Intra-operatively the skin incision for all dogs will be made with a scalpel blade. Dogs will then undergo musculoskeletal tissue transection using either the ultrasonic scalpel in high power setting (Group US) or monopolar electrosurgery in cutting mode (Group ME). Muscular tissue samples from the biceps femoris muscle at the site of transection will be submitted for histopathologic evaluation. Intra-operative blood loss will be calculated. Eligible dogs without contraindications (e.g., moderate to severe hepatopathy, azotemia, intra-operative hypotension, current steroid or non-steroidal anti-inflammatory without injectable form administration) will receive a non-steroidal anti-inflammatory injection prior to recovery.

All dogs will be hospitalized for a minimum of 48 hours following surgery for observation and will be initially administered IV analgesics with transition to oral NSAID (if eligible) and gabapentin. Pain assessments (using the Glasgow Composite Pain Scale-Short Form and a cutaneous sensory perception threshold device), incisional inflammation scoring, and PCV/TS will be performed at pre-determined intervals and rescue analgesics given as needed. Study dogs will be discharged on day two post-operatively with oral medications, an e-collar, and a sling. Study dogs must be rechecked at 14 days post-operatively at the University of Illinois for incision inflammation and pain scoring and a phone consultation at 30 days post-operatively must be performed to evaluate for late incisional complications.

At the conclusion of the study, surgeons and surgical house officers who participated in the surgeries will be surveyed regarding their impression of the ultrasonic scalpel and monopolar electrosurgery for canine amputation.

Compensation:

The cost of the PCV/TS, histopathology of the muscular sample and limb (if indicated), and one day of hospitalization and monitoring will be covered by the study, for dogs that meet all inclusion criteria. The cost of the soft tissue surgery consultation, any associated diagnostics (radiographs, lab work, culture/sensitivity, etc.), medications, and anesthetic/surgical related costs are the financial responsibility of the owner. There is no charge for the two-week post-operative recheck evaluation unless there are complications, the care and treatment of which are the financial responsibility of the owner.

Study Period: This is an ongoing clinical trial, and the investigators are seeking eligible dogs for study participation.

Contact Information:

If you have a dog that would be a good candidate or would like additional information, please contact Dr. Rachel Rivenburg at 217-333-5300 or rerivenb@illinois.edu. Any records and radiographs regarding the limb disease would be helpful to determine the dog's eligibility into the study, which can be emailed to Dr. Rivenburg or VTHSoftTissueSurg@vetmed.illinois.edu. Referring veterinarians and client calls are welcome.

