# Electrosurgery vs Cold Instruments in Midline Abdominal Incisions

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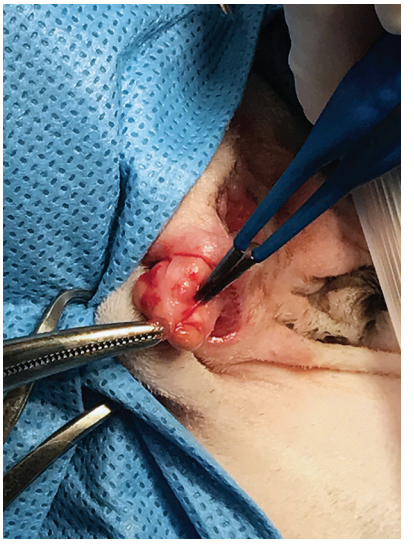
**In the Literature**

Meakin LB, Murrell JC, Doran ICP, et al. Electrosurgery reduces blood loss and immediate postoperative inflammation compared to cold instruments for midline celiotomy in dogs: a randomized controlled trial. *Vet Surg*. 2017;46(4):515-519.

## FROM THE PAGE ...

Concerns that healing after electrocautery is inferior as compared with healing after sharp dissection with cold instruments have been reported. Historically, a rodent model showed reduced tensile strength in abdominal incision healing with electrocautery use.[1] However, in most wound healing models, electrocautery has been used in coagulation mode, which is more destructive than lower voltage cutting mode. In addition, due to species differences, a direct correlation cannot be proven from rodents to dogs without direct examination.

▲ **FIGURE 1** Use of a polar instrument to create a parapatellar incision (ie, cutting mode) and to pinpoint individual vessels (ie, coagulation mode)



▲ **FIGURE 2** Use of a bipolar instrument for delicate tissue dissection and individual vessel coagulation. Bipolar has only one mode.

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This study examined routine sharp excision with scalpel blade and scissors versus electrocautery in cutting mode to create a midline abdominal incision from skin through the linea alba in 120 dogs. Dogs were evaluated in hospital at 24 and 48 hours postoperation for pain and incisional complications. Wound healing was found to be similar, with reduced blood loss documented in the electrosurgery group. Electrocautery was associated with significantly less incision redness at 24 hours postoperation as compared with cold instrument technique. Both groups were similar thereafter.

Although more precise evaluation of wound healing and follow-up would have been beneficial, this study can be helpful in providing assurance regarding the safe use of electrosurgery in routine abdominal incisions. This information is especially useful for anemic or coagulopathic patients, in which blood conservation is paramount. Caution should always be taken with the use of cautery to avoid excessive tissue damage. Pairing electrosurgery alongside traditional cold instruments likely leads to an optimal solution, maximizing the benefits of both techniques.

## … TO YOUR PATIENTS

Key pearls to put into practice:

1. Electrosurgery can be monopolar or bipolar. Monopolar requires a grounding source, typically a ground plate placed under the patient. A grounding plate must be adequately placed to avoid serious cautery burns. The bipolar type is self-grounding through the forceps tips and is typically more precise. Tips must be 1 mm apart to work appropriately.

2. Monopolar cautery has 2 modes: cutting and coagulation. Electrocautery in cutting mode is best for focal tissue dissection, whereas coagulation mode is best for individual bleeding vessels. Monopolar cautery requires a relatively dry field, whereas bipolar tolerates more fluid.

3. The use of traditional cold instruments, along with varying amounts of electrocautery, is likely beneficial to most surgical patients. Sharp skin and linea alba incisions can be paired with electrocautery in the subcutaneous region to achieve the benefits of both techniques.

## Reference

1. Kumagai SG, Rosales RF, Hunter GC, et al. Effects of electrocautery on midline laparotomy wound infection. *Am J Surg*. 1991;162(6):620-622.