Electrosurgery in Veterinary Practice

Laboratory Exercises

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COURSE OBJECTIVES

By the completion of the course, registrants will:

1. Be conversant regarding various electrosurgical wave forms, know the methods of production and modification and the effects of radio frequency energy.

2. Possess the technical and artistic skills of incising, excising, planing, coagulating, fulgurating and desiccating soft tissue.

3. Know the limitations of electrosurgical currents.

4. Have the ability to perform all avian surgical procedures using radio frequency energy.

Electrosurgery Laboratory Exercises

INTRODUCTION TO EXERCISES

1. In all of the following exercises, avoid touching the meat with your hand during practice. This may cause a minor shock to your skin. This effect does not occur clinically.

2. The power settings utilized in these exercises are comparable to those used in the clinical situation. However, settings may vary depending on tissue resistance, electrode size, tissue moisture and the electronic unit used. It is advisable to keep the meat slightly moist and at room temperature during practical sessions.

3. When cutting, hold the handpiece so that the straight or loop electrode is at a right angle to the tissue being incised. In most cases, only the tip of the electrode is at a

right angle. Embedding too deeply into the meat will produce excessive heat and cause tissue adherence.

4. Use sufficient current! Insufficient current will produce the same effects as above.

5. Keep electrodes clean. Tissue adhering to the electrodes will decrease efficiency of operation.

EXERCISE I - PAINTBRUSH EXERCISE (5 MINUTES)

Pressure is not necessary for electrosection. The cutting is done by the radio waves emanating from the electrode tip. The tip stays cool. Gentle, free movement of the electrode is similar to using a paintbrush. Therefore, with a paintbrush, make a number of 3 cm "straight line" incisions. The brush should be held as you would hold any writing instrument. The line should be thin, even and unbroken. Next, make full circle incisions by painting around the poker chip without touching the chip. Try several "S" shaped lines.

EXERCISE II - TUNING THE UNIT (20 MINUTES)

1. Plug in the handpiece and groundplate using the color coded jacks. Insert the fine wire electrode, place the meat on the groundplate. **Do not remove the plastic cover to the groundplate**. If the meat is too moist, pat it with a paper towel. Turn the current selection knob to **filter, fully rectified** (cut). Turn the power selector to high. Initiate the current by depressing the foot pedal. Make an incision in the meat. There will be a great deal of sparking and smoke. Gradually, turn the power setting down until you feel drag on the electrode. The tissue blanches, and tissue shreds adhere to the electrode tip. The power selector switch should then be turned up slightly until there is no drag and minimal spark. This is the optimal cutting current. The electrosurgical tip should not encounter resistance. The cut should be microsmooth, requiring no pressure on the electrode.

2. Remove the groundplate and make an incision. It will be necessary to turn up the power to achieve optimal cutting.

3. Place current selector on **fully rectified** (cut coag) and make several incisions in the beefsteak. Compare this current to the filtered current.

4. Using a loop electrode, take (biopsy) samples from the edge of the beef and from the middle of the meat. This must be done on filtered current. The electrodes should be moved as rapidly as possible.

5. Without depressing the foot switch, insert a forceps through the electrode loop and

grasp a bit of meat and pull upwards. Depress the foot switch and pull the handpiece towards you through the meat. This is the technique used for both biopsy sampling and the removal of small tumours.

6. With the loop electrode, try the TROUGHING technique on both filtered and fully rectified currents. Move the loop electrode backwards and forwards over the same area to trough out an area on the beefsteak. The loop electrode should be kept perpendicular to the surface of the meat. This technique can be used for rapid debulking of a tissue mass.

EXERCISE III - HEMOSTASIS (20 MINUTES)

1. Turn the current selector switch to **partially rectified** (hemo). Insert the ball electrode, turn the power dial up several lines from the optimal setting, touch the ball electrode to the meat surface without any pressure and depress the foot switch for one second. Move the ball electrode a few millimeters and repeat this step using 2, 3, 4 and 5 seconds respectively.

2. Repeat as above with a 2 second current surge, but turn up the power dial after each application. You should now have 2 lines of discolored dots. Take the scalpel blade and cut across the middle of each line to determine the depth of coagulation created both by increasing the time and the power.

3. Place the ball electrode on the tissue with the power setting between 3 and 4 and in a circular motion, coagulate the surface of the tissue in a 3 to 4 mm area. This technique will be used for coagulation of an oozing muscle area. With the scalpel blade, cut across the blanched area to determine the depth of coagulation.

4. Grasp the tissue with a hemostat. Raise the hemostat and touch the ball electrode to the hemostat. Initiate the current and the tissue at the end of the hemostat will blanch. Be sure to grasp the hemostat firmly. In this way, there will be no sparking from the hemostat to the hand.

5. Using the bipolar forceps, plug in the color coded jacks andrepeat step 4 using the forceps instead of the hemostat.