Electrocautery & Basic Endoscopy Procedures

St. James Healthcare Endoscopy Department
Butte, Montana
2012
1. TO UNDERSTAND THE BASIC PRINCIPLES OF ELECTROCAUTERY SAFETY.

2. BE ABLE TO EXPLAIN THE CORRECT APPLICATION OF AN ELECTROCAUTERY PAD, EQUIPMENT SET UP AND COMMUNICATION WITH ALL TEAM MEMBERS.

3. BE ABLE TO IDENTIFY THREE THINGS THAT WILL CHANGE YOUR EVERYDAY PRACTICE.
**ELECTROCAUTERY SAFETY: TEST YOUR KNOWLEDGE (TRUE/FALSE)**

- An important step during any electrocautery procedure is to verbalize to the MD completion of important electrocautery safety checks.
- Application of the grounding pad needs to face the cautery field.
- The heater probe is safe in an unprepped bowel and does not require a cautery pad.
- In CUT Mode the tissue heats slowly with the effect of fluid loss, steam release with cooling, and then coagulation = HEMOSTASIS.
- In the COAG Mode there is high-continuous energy 60-100 Watts.
**Equipment**

- Electrosurgical Generator
- Power Cord
- Active Cord
- Foot Pedal (remote control)
- Grounding (skin) pad
- Instrument – i.e. snare, bipolar probe or APC
Electrosurgical Units: Settings and Modes

- Power settings = Watts or Joules;
- CUT – tissue heats and cells explode;
- COAGULATION – tissue dehydrates and fulgurates;
- Blended Current – a combination of both (usually the case in Endoscopy);
Patient Safety: Best Practices

- Attach the Active Cord to the active instrument when MD is ready to initiate therapy;

- **Verbalize** to the MD the important safety checks, i.e. *patient grounded, cautery settings* and *active cord connected* to the instrument;

- Be fastidious in the management of active cords, pad connections and instruments, i.e. avoid proximity to the patient of any coiled instrument and/or active and cautery pad cord;

- Ensure the Skin Grounding pad is from a sealed package (to avoid dried gel and to ensure good skin contact);
Complete the Circuit: Grounding (Skin) Pad

Ensure proper adherence and connectivity of the Grounding Pad to avoid thermal injury.
Correct Vs. Incorrect Skin Grounding Pad Application

A GENERAL PRINCIPLE THAT DOES NOT NECESSARILY APPLY WITH ALL CAUTERY PADS. CHECK WITH THE MANUFACTURER. ERBE RECOMMENDS **EXAMPLE A** FOR CORRECT PLACEMENT.
Best Practices: Grounding Pad

Application:
- apply grounding pad according to manufacturer recommendations;
- apply the grounding pad to well vascularized tissue;
- avoid scar tissue or bony prominences;
- direct and secure skin pad to the patient;
- ASGE recommendations for internal devices and pregnancy;
**OTHER BEST PRACTICES:**

- **Rings and Body Jewelry** - ask patient to leave these at home or remove prior to procedure;

- **Hair Clipping** - follow manufacturer recommendation;

- **Tattoos** - avoid application over a tattoo site;
Types of Interventions

- Monopolar Coagulation - may be non-contact (i.e. Argon Plasma Coagulation) or contact (i.e. Hot Snare);

- Monopolar Cut - usually blended (i.e. Cut 1/ Coag 18);

- Bipolar - pure coag
Coagulation

- Tissue heats slowly with the effect of fluid loss, steam release with cooling, and then coagulation = HEMOSTASIS;
  - Bipolar - effective tamponade and hemostasis;
  - Monopolar - not really “pure coag”;
- WATT settings depend on electrosurgical generator;
Cutting

- Works best in tissue with low resistance, i.e. GI mucosa;
- Requires moist tissue (not fulgarized) and loose contact;
- Works better with high-continuous energy 60-100 Watts (mimics the scalpel with minimal coagulation);
Less cell explosion (cut) than pure-cut, and moderate desiccation + fulguration (coagulation);

Different levels of “blend” are set by the manufacturer;

In ERBE: Effect-1 = minimal coag; Effect-4 = maximal coag; ENDO-CUT uses Effect-3 (high coag blend-cut)
ERBE ICC - 200

AUTO CUT Setting

Power ON

Grounding Pad

Monopolar Cut/Coag

Bipolar

AUTO COAG Setting
ERBE: Which Pedal Do I Use?

- COAGULATION (Blue) unit is completely independent of CUT (Yellow) unit; Power setting in one side does not affect the other;

- BLEND-CUT current is a feature of the CUT (Yellow) unit. The degree of “blending” depends on the chosen mode (Endo-Cut);
Snare Polypectomy

- Higher risk of perforation in right colon or small bowel;

- Saline “pillow” or lift may be used for flat polyps;

- Settings depend on type of generator

- Close snare with mild to moderate pressure during electrocautery or to “cut through”;

- Some MD’s will shake the polyp or lift it from the tissue wall to avoid burning or contact injury;
Polypectomy
Monopolar Electrocautery

- Skin Pad Required – good contact and best applied near to site of the active electrode or instrument;

- Instrument Examples: hot snare, hot biopsy, bipolar probe (“Gold Probe”), Argon Plasma Coagulator (APC) probe, sphincterotome
The current may split (or divide) and follow more than one path to ground causing patient exposure to the risk of alternate site burns because:

(1) current follows the easiest, most conductive path;

(2) any grounded object, not just the generator, can complete the circuit;

(3) the surgical environment offers many alternative routes to ground;

(4) if the resistance of the alternate path is low enough and the current flowing to ground in that path is sufficiently concentrated, an unintended burn may be produced at the alternate grounding site.
Argon Plasma Coagulation (APC)

- Argon gas flows inside a hollow catheter;
- Skin Grounding Pad;
- Non-contact, coagulation effect (monopolar current in a wire inside the catheter);
- Short bursts (tap) or continuous movement “painting” is done to avoid deep tissue injury;
Bipolar Electrocautery

- Two or more small active electrodes very close to each other (the active and return electrode);
- Does not require a skin grounding pad;
- Colon Prep required (if lower GI bleed);
- Good coagulation at low settings;
Bipolar Electrocautery
Electrocautery Complications

- Skin Burn – avoid by ensuring appropriate grounding;

- Implantable device – avoid interference or device damage; by following pre-procedure guidelines to screen for

- Bowel Explosion – avoid by assessing quality of bowel prep;
Alternate site burn due to a grounded electrosurgical generator and a ground referenced ECG device. The ECG electrode provided the path of least resistance to ground with not enough current dispersal over a large enough area. The heat produced an alternate site burn under the ECG electrode due to current concentration.
Heater Probe

- Coagulates and Irrigates;

- Is not electrocautery (no sparks); safe in unprepared bowel.

- Has an electrically heated coil inside a Teflon-covered insulated cylinder;

- Power setting in Joules (Watts x Sec);

- Heater Probe Unit decides time needed to deliver the required energy;
Bleed Site Control: Other methods

- Prep- saline lift / chromoendoscopy to visualize polyp border (helps to prevent a bleeding complication);
- Hemoclips
- Sclero Injection – Epinephrine 1:10,000
- Band Ligator
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- Identify three things that will change your everyday practice.
References

THE END

A Healthy Sea Polyp

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(2009, Rev. 2012)