Soft-tissue CO₂ laser veterinary surgery

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For The Education Center

Laser surgery is in high demand by pet owners. Thousands of veterinarians around the globe have transitioned to CO₂ laser surgery, as it has numerous clinical benefits for patients and brings additional revenues to the practice.

The clinical advantages of the soft-tissue CO₂ laser are explained by the unique absorption coefficient of its wavelength. The advantages include:

Char-free and bloodless surgery. Combining the CO₂ laser wavelength and SuperPulse settings allows for approximately 1,000 times more photo-thermal cutting efficiency than diodes and approximately 10 times more coagulating efficiency than erbium lasers.

Controlled, repeatable and reproducible speed of tissue removal.

Close match between the coagulation depth of the SuperPulse CO₂ laser and the blood capillary diameters, as illustrated in Figure 1. This affords the clinician improved visibility of the surgical field, thus facilitating more accurate tissue removal.

Well-controlled depth of incision—unlike with hot-tip cutting diodes—and with dynamic range from millimeters to centimeters. It is proportional to laser power and inversely proportional to the laser beam spot size and the surgeon’s hand speed.

The focal spot diameter of the laser beam determines the quality of the laser cut.

The risk of postoperative edema is minimized due to the intraoperative closure of lymphatic vessels on the margins of the CO₂ laser incision.

Reduced postoperative pain and discomfort have been reported with CO₂ laser surgery.

CO₂ laser surgical wounds, unlike scalpel ones, are characterized by the minimal post-surgery activation of myofibroblasts and diminished wound contraction and scarring.

**Notable Differences**

Practical surgical lasers, such as Luxar-Accuvet and Aesculight, feature these distinct specifications:

- Air-cooled, all-metal tube, CO₂ laser resonator with a 45,000-hour lifetime.
- Air-cooled, low-voltage transistor-driven frequency power supplies.
- Customizable pre-sets.
- Disposable-free, pen-size, sterile laser handpieces.
- Flexible fiber.
- Built-in library of more than 1,000 clinical cases with settings, photos, videos and pre- and post-op recommendations from veterinarians.
- Air-cooled, low-voltage transistor-driven radio frequency power supplies.
- Precise control over the depth of incision, less traumatic surgery, excellent hemostatic ability and enhanced healing with minimal scarring make the SuperPulse CO₂ laser a safe and efficient alternative to a scalpel.

**REFERENCES**


Peter Vitruk is a founder of LightScalpel-Aesculight LLC. He is a member of the Institute of Physics in the United Kingdom and a member of the Science and Research Committee at the Academy of Laser Dentistry in the United States. He may be reached at 866-589-2722 or pvitruk@lightscalpel.com.