

A special advertising section

The CO₂ laser-assisted no-gauze spay

By Masahiro Seki, DVM
For the Education Center

At our small animal clinic we perform multiple surgeries a day. Our routine usage of Aesculight surgical CO₂ laser allows for greatly simplified soft-tissue surgeries, such as femoral head osteotomy and enucleation surgery¹ and ovariohysterectomy (OHE) described in detail in this article.

Background

OHE is a fundamental abdominal surgery and is one of the most frequently performed soft tissue surgeries in veterinary practices today.

The main complications of OHE, traditionally performed with a steel scalpel and electrocautery, are postoperative pain, hemorrhage, swelling and infection². At our clinic we perform all OHE procedures with a CO₂ surgical laser because this technique addresses all of the aforementioned complications.

Pets undergoing CO₂ laser-assisted OHE appear to feel less to no pain, and they recover and resume their usual activities faster than after the same procedure done with a scalpel and electrocautery.

Below is a step-by-step description of the “no-gauze” spay procedure performed with CO₂ laser on a young female cat. We refer to this procedure as no-gauze as there is no need to use gauze to manage bleeding, and we only use one or two moist gauzes as a backstop and for wiping off the “char.”

‘No-Gauze’ Spay

► Step 1: Initial skin incision.

The skin is incised (Figure 1) with the CO₂ laser set to 20 watts in the Super Pulse mode (Figure 2) with 0.25mm focal spot size. High power Super Pulse (SP) is especially effective as it assures minimum thermal damage to adjacent tissues. High power SP mode permits a surgeon to move the laser handpiece much faster, which minimizes thermal necrosis.

► Step 2: Subcutaneous tissue avulsion.

After the skin is incised in high power SP mode, the



Figure 1



Figure 2

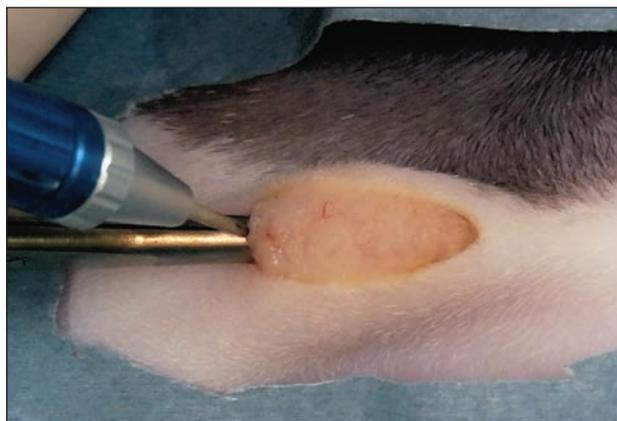


Figure 3

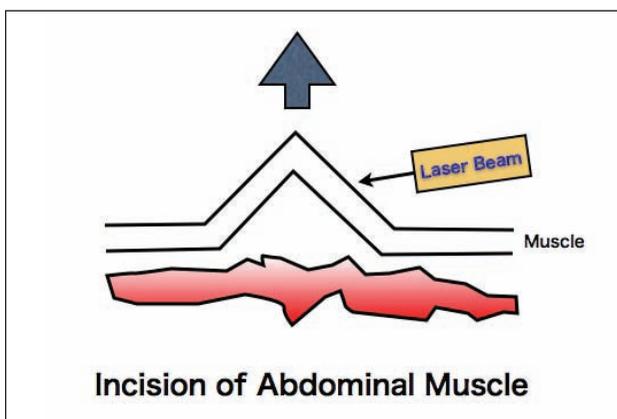


Figure 5



Figure 7

subcutaneous tissue is avulsed with Metzenbaum scissors; then the scissors are inserted under the subcutaneous tissue as a backstop and a laser incision is made (Figure 3), also with 0.25 mm spot size at 20 watts SuperPulse. Note the completely blood-free surgical field.

► Step 3: Abdominal muscle incision.

Linea alba is located and carefully picked up with forceps (Figure 4). The muscle tissue is pulled outward and laser beam is directed horizontally from the side so that the beam cannot pass through to the intraperitoneal organs (Figure 5). Then, a small hole is made through linea alba with 0.25mm spot size, using CO₂ laser setting 20W SP (Figure 6). Next, the winged groove director is inserted along peritonea, tension to membrane is applied and a laser cut is made (0.25mm spot size, 20W SP) (Figures 7 and 8).

► Step 4: Cutting the suspensory ligament.

The suspensory ligament is cut with a CO₂ laser after pulling the ovary out (Figure 9). The power setting of the laser is 8-10W CW, and the spot size is increased to 0.4-0.8 mm. The coagulation effect of the lower power density continuous wave (CW) mode on small blood vessels is more effective, and is recommended for the best hemostasis in highly vascular tissues. It is a much safer method with no bleeding, compared to the usual



Figure 4



Figure 6

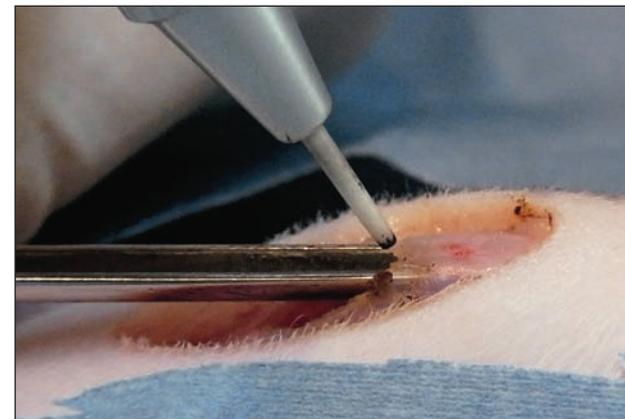


Figure 8



Figure 9



Figure 10

breaking of the ligament with the index finger.

► Step 5: Ligation and cutting of the blood vessel.

A figure-eight ligature is placed at the site. Then, using moistened gauze as a backstop, the blood vessel is cut with the laser beam (0.4-0.8 mm spot size, 8-10W CW) for coagulation (Figure 10).

► Step 6: Cutting the broad ligament.

The broad ligament is cut without ligation using 0.4-0.8mm spot size and the lower power setting of 6-8W CW. Note the complete lack of bleeding in the absence of ligatures (Figure 11).

► Step 7: Do the other ovary the same way.

► Step 8: Cutting the uterine body.

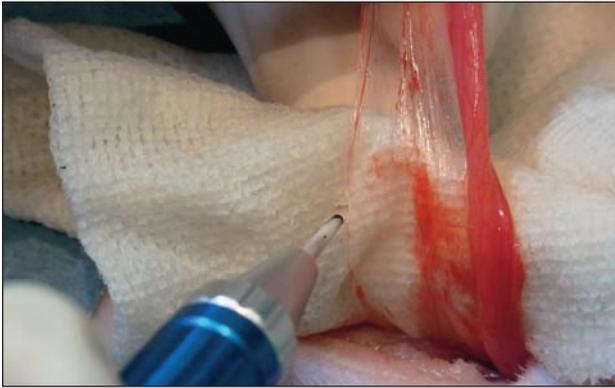


Figure 11



Figure 12

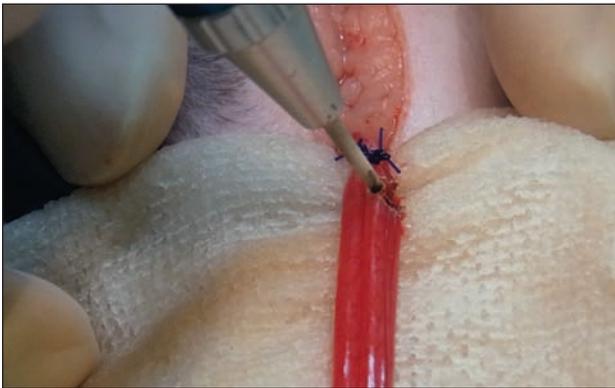


Figure 13



Figure 14

Ligation is done with a modified Miller's knot (Figure 12) and the uterine body is cut off using 0.4-0.8mm spot size and 8-10W CW setting of the CO₂ laser (Figure 13). Laser energy is applied to the uterine stump to

contract and sterilize.

► **Step 9: Closure.**

The abdominal walls are closed and the skin is sutured (Figure 14); wiping skin margins with moist

gauze sometimes is desirable if char traces are present. Stainless suture wire or skin stapler is used for suturing because they do not cause foreign body reaction and the animal doesn't want to lick the wound. Another advantage of suture wire is that it retains its oval loop shape which helps to avoid over-restriction of the skin. It makes the wound site heal beautifully.

Summary

A CO₂ laser assisted no-gauze spay is performed much faster than the conventional OHE procedure, and without the risk of post-operative complications and bleeding, allowing us to avoid post-surgery hospitalization. It is much appreciated by the pet owners and clinical personnel alike. ●

Dr. Masahiro Seki is the owner of a small animal clinic Animal Laser Center in Nagoya, Japan. He is the first board-certified veterinary laser surgeon in Japan. Dr. Seki is a diplomate of the American Board of Laser Surgery, and a director at the Japanese Laser Veterinary Science Society.

This Education Center story was underwritten by Aesculight of Woodinville, Wash.

REFERENCES...

1. Seki, Masahiro. "Introducing Veterinary CO₂ Laser Surgery in Japan." *Veterinary Practice News*, Oct. 2012, p. 24.
2. Welch Fossum, Theresa, et al. *Small Animal Surgery*. 3rd ed, St. Louis: Mosby, 2007, p. 726.

0.4 mm focal spot size setting*: Perianal Adenoma, Perianal Urethrostomy (feline), Vaginal Fold Excision, Ventriculocholecystectomy – Ventral Approach, Declaw Amputation, Vaginal Tumor, Stenotic Nares (feline), Dock Tail Removal, Neuter (canine), Neuter (feline), Vaginal Tumor, Stenotic Nares (feline), Ovariohysterectomy, Abscess Incision and Drainage, Digital Fibroma Excision, Incisional Biopsy (Achilles Tendon Mass), Interdigital Cornified Growth, Stifle Imbrication, Persistent Right Aortic Arch, Thyroidectomy, Hemangioma, Mammary Lumpectomy, Mastectomy, Tail Amputation Sebaceous Hyperplasia, Distichia, Indolent Ulcer, Granulation Tissue Under Tongue, Lingual Plasmacytoma, Sublingual Sialoceles, Tissue Sculpting, Tongue Growth, Anterior Cruciate Ligament, Anterior Cruciate Ligament Sever DJD, Hemilaminectomy and many more...

0.8 mm focal spot size setting*: Anal Sac Excision-Open, Perianal Adenoma, Vaginal Tumor, Aural Hematoma, Ear Canal Polyp, Abscess Incision and Drainage, Acral Lick Granuloma, Toenail Lasing, Entropion Correction, Indolent Ulcer, Gingivectomy, Buccal Mucosal Hyperplasia, Granulation Tissue Under Tongue, Tissue Sculpting, Oral Fibrosarcoma, Mucosal Hyperplasia, Hemilaminectomy, Tongue Growth, Lingual Stifle Imbrication and many more...

0.25 mm focal spot size setting*: Anal Sac Excision-closed, Meibomium Gland Tumor, Lateral Ear Resection, Laryngotomy and Laryngeal Chordectomy, Nasal Hyperkeratosis, Stenotic Nares (canine), Stenotic Nares (feline), Declaw Feline, Thyroidectomy, Eyelid Melanoma, Preputial Stricture, Perineal Urethrostomy (feline), Enterotomy, Feline Squamous Cell Carcinoma, Histiocytoma (lip), Squamous Cell Carcinoma (Third Eyelid), Entropion, Conjunctival Tuck, Gingivectomy, and many more...

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* Source: "A Compendium: CO₂ Surgical Laser Case Studies". © Copyright 2006-2012 Aesculight LLC.