A carbon dioxide laser significantly facilitates oral soft tissue surgery. Because it vaporizes blood vessels, the laser creates a clean surgical field. This enables the clinician to make conservative incisions and save time that otherwise would have been spent on hemostasis management.

CASE 1: Gingivectomy and Gingivoplasty
A 7-year-old male neutered boxer dog presented for severe gingival hyperplasia. Usually considered to be due to dental plaque, gingival hyperplasia can occur in all dogs but is more common in certain breeds and breeds appear to be overrepresented.

Physical examination revealed generalized and localized enlargement of the attached gingiva. The entire mouth was involved. Excess tissue almost completely covered the crowns of the teeth. Mandibular incisors were completely covered with hyperplastic tissue (Figure 1A). The owner noted it was difficult for the dog to eat hard food.

The diagnosis was gingival hyperplasia. It was decided to perform a CO2 laser gingivectomy and gingivoplasty to re-establish the original height and contour of the gingival margin.

Laser settings: (rotation) 4.6 W Continuous Wave with a 0.4-0.8 mm spot size

Tissue sculpture: 4.6 W Continuous Wave or Super Pulse with a 1.4 mm spot size

Procedure: After the patient was anesthetized, intraoral radiographs were taken to evaluate the teeth and other pathology. Laser energy was used to excise hyperplastic tissue, where it was possible to grasp and retract tissue creating the surgical area was coagulated to ensure that there was no bleeding. The remaining excess gingiva was ablated (vaporized). (Figures 2A-2B)

The first follow-up examination was performed 10 days after surgery and showed uncomplicated recovery (Figure 5A-5B). The remaining excess gingiva was ablated (vaporized). (Figures 2A-2B)

In many cases no sutures are necessary, which also shortens operative time. Reduced surgical time means less time under general anesthesia—this is especially beneficial for older patients.

Precise laser incisions also allow the clinician to spars the patient, unnecessary trauma in which the process of cutting, the laser coagulates lymphatic vessels, minimizing the potential for post-operative swelling. CO2 laser surgery is non-contact and the laser beam has a sterilizing effect, which decreases the potential for post-operative infection. Reduced trauma and swelling, combined with the diminished risk of infection, ensures less pain, faster post-operative recovery and improved healing.

This article describes three cases in which a flexible fiber waveguide CO2 laser was used to treat canine patients with hyperplastic gingiva, sublingual granulation tissue and benign growths on the tongue.

CASE 2: Removal of Sublingual Granulation Tissue
The canine patient presented for abundant granulation tissue that had formed underneath the tongue (Figure 7). This problem is commonly seen in small dog breeds, especially in older animals. It is frequently referred to as “gum chewers’ disease” because the formation of granulation tissue is caused by repeated biting trauma.

Laser settings: 4 watts in the Continuous Wave mode. Focal spot size is 0.4 mm (Figure 9).

Procedure: The patient was anesthetized and tenotomy was applied to the tongue. The lesion was outlined and excised with the laser. The laser energy was defocused and the surgical area was coagulated to ensure that there was no bleeding. (Figure 10)

The resulting surgical defect involved a fairly large area and it was decided to close the wound with sutures. The wounds were flushed with saline-soaked gauze pads. After the surgery was complete, the dog’s teeth were cleaned and polished (Figure 8).

There was absolutely no bleeding and the dog appeared to be comfortable after surgery. It was instructed to not to a CO2 laser, conventionally with a scalpel and bur, the procedure would have established the original height and contour of the gingival margin.

The first follow-up examination was performed 10 days after surgery and showed uncomplicated recovery. The re-check at 19 days post-operatively (Figure 5A-5B). The re-check at 19 days post-operatively showed complete healing of the laser surgical sites (Figures 5A-5B). The re-check at 19 days post-operatively showed complete healing of the laser surgical sites (Figures 5A-5B).

Summary
The flexible fiber waveguide CO2 laser makes surgery in vascular areas, such as the oral soft tissues, less challenging. Due to the advantages provided by the CO2 laser, namely, efficient hemostasis, reduced pain, swelling and risk of infection, laser surgery results in better clinical outcomes than scalpel. A CO2 laser may enable a non-specialist to add soft tissue surgical expertise to the current arsenal of surgical procedures.

Dr. Arza earned his DVM at the University of Tennessee in 1979. He was a small animal general practitioner for 23 years with a special interest in surgery and dentistry. He started using a surgical laser in 1996 and soon became a popular lecturer at conferences, universities and seminars. In 2002, he left private practice to join industry as an education trainer, consultant and lecturer. He conceived laser therapy expertise in 2005, and among other positions, he founded LiteCure LLC as its veterinary medical director. He is the co-author of both volumes of “Class IV Laser Therapy Treatment of Common Conditions” and contributor to the veterinary protocols programmed in LiteCure’s veterinary laser software.

Anya Glazkova, Ph.D., is a graduate of the University of Washington. She helps conduct laser surgery educational programs at Aesculight and LightScalpel LLC.
In many cases no sutures are necessary, which also shortens operative time. Reduced surgical time means less time under general anesthesia—this is especially beneficial for older patients. Precise laser incision allows the clinician to spare the patient unnecessary trauma. In the process of cutting, the laser coagulates lymphatic vessels, minimizing the potential for postoperative swelling. CO2 laser surgery is non-contact and the laser beam has a sterilizing effect, which decreases the potential for postoperative infection. Reduced trauma and swelling, combined with diminished risk of infection, ensures less pain, faster postoperative recovery and improved healing.

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The clinician should always loop hyperplastic gingival tissues, as the clinician appears alone is insufficient for a definitive diagnosis and therapeutic plan.

Laser settings: 4 watts in the Continuous Wave mode. Focal spot size was 0.4 mm or 0.8 mm spot size

Tissue sculpting: 4-6 W Continuous Wave or Super Pulse with a 1.4 mm spot size

Procedure: After the patient was anesthetized, introral radiographs were taken to evaluate the teeth and other pathology. Laser energy was used to excise hyperplastic tissue, where it was possible to grasp and retract tissue creating tension (Figures 2A-2B). The remaining excess gingiva was ablated (exposed). Lower incisors were exposed. Importantly, once the bulk of the hyperplastic tissue was removed, laser settings were changed to perform gingivoplasty; the power was slightly reduced and a larger 1.4 mm spot size was used (Figure 3). The gingival margin was excised to approximate the original normal contour of the gingiva (Figure 3).

Caution was taken to protect the teeth from direct exposure to the laser beam and to prevent the possibility of tissue bleeding. Abutting the teeth was avoided. After the surgery was complete, the dog’s teeth were cleaned and polished.

There was absolutely no bleeding and the dog appeared to be comfortable after surgery. If done without a CO2 laser, conventionally with a scalpel and bur,

Figure 6A: Immediate post-op view of the healed surgical area. The laser energy was used to excise the hyperplastic tissue, where it was possible to grasp and retract tissue creating tension (Figure 6A-6B). The remaining excess gingiva was ablated (exposed). Lower incisors were exposed. Importantly, once the bulk of the hyperplastic tissue was removed, laser settings were changed to perform gingivoplasty; the power was slightly reduced and a larger 1.4 mm spot size was used (Figure 3).

The resulting surgical area was coagulated and the sutures were removed.

If done without a CO2 laser, conventionally with a scalpel and bur,

Figure 6B: Intra-op view. Traction/tension was applied to the base of the tooth crown.

Laser settings: 4-6 W in the Continuous Wave mode with 0.4 mm or 0.8 mm spot size

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