Give CO₂ laser a try with oral ulceration

By Jan Bellows, DVM, Dipl. AVDC, Dipl. ABVP
For The Education Center

Oral ulcers are commonly found in the canine and feline nonkeratinized mobile alveolar mucosa, and on the tongue (Figures 1 and 2).

They often start when the protective covering of the mucus membranes is breached. Oral ulcers can be singular or multiple. They are generally round, or ovoid, and have circumscribed margins, erythematous haloes, and yellow or gray central surfaces. Clinical signs include inappetence, face rubbing, halitosis and drooling.

Oral ulcers arise from viruses, bullous mucocutaneous diseases, azotemia, local trauma, thermal or electric burns, and chemical injury (Figure 3) shows ulceration caused by ingestion of a caustic chemical), abnormal tooth position (Figure 4) and neoplasia (Figure 5).

Contact ulcers occur at the site of direct mucosal interaction with an irritant, allergen or antigen. Contact lesions are most commonly seen where the labial, buccal or lingual mucosa touches a prominent tooth surface in susceptible dogs or, more rarely, cats. They also have been called kissing ulcers and chronic ulcerative paradental stomatitis (CUPS) lesions. Figure 6-A shows contact mucositis and ulceration in a dog with a hyperimmune response to plaque.

Ulcers are actually mucosal wounds. Their persistence is dependent on the etiology and host’s repair as well as the chosen therapy. Treatment of oral ulcers involves eliminating the cause, thus allowing re-epithelialization to occur.

Topical medicaments with zinc ascorbate and zinc gluconate—Maxi/Guard oral cleansing gel from Addison Biological Laboratory, for example—help to stimulate collagen production, which is part of the healing process. Antimicrobial properties of the zinc ascorbate assist in the control of infection. Other therapies include tooth extraction, systemic anti-inflammatories, antimicrobials and CO₂ laser treatment.

Use of the CO₂ laser to photovaporize oral ulceration has met with favorable results both in human and veterinary medicine. Treatment with the CO₂ laser alleviates pain and swelling immediately after the procedure.

The 10.6-micrometer CO₂ laser wavelength has a high affinity for water, its main chromophore. This explains the laser’s ability to lower the bacterial load at the surgical site, as bacteria have high moisture content and are easily vaporized by the laser energy. In addition, the treatment leaves a protective covering over the surgical area.

Laser Technique

It is important to use wet gauze to protect the endotracheal tube from laser energy. Prior to the procedure, the oral cavity is irrigated with 0.12 percent chlorhexidine solution. The laser is set at 3 to 6 watts in continuous wave mode. We use the flexible fiber Aesculight CO₂ laser in our clinic (Figure 6-B).

The wide ablation nozzle is normally used for this procedure (Figures 6-C and 6-D), but, alternatively, a large focal spot size (0.8 mm or 1.4 mm) may be appropriate as well.

The ulcer is slowly circumscribed by gradually focusing in from the periphery toward the center of the lesion until the entire ulcer is “painted.” Generally, two or three laser passes are done. After each pass the char is wiped with a chlorhexidine-soaked gauze sponge. The char is left after the last pass to act as a mild protective cover (Figures 6-C, 6-D and 6-E).

Additionally, the clinician should remove the plaque and calculus that rub against the mucosa, causing irritation and ulceration, and polish the teeth. This should be followed by application of a plaque preventative gel such as OraVet, from Merial Ltd.

Postoperative instructions include softened food for three days. Analgesics and anti-inflammatory medications are dispensed for two days. 

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weeks after the surgery. Unless the case is severe, antimicrobials are not dispensed.

To decrease further accumulation of plaque and calculus, a stringent plaque-control regimen is instituted, including brushing teeth twice daily or at least wiping the buccal and labial surfaces of all teeth with commercial wipes infused with plaque and/or calculus retardants. Figure 6-F shows good clinical healing two weeks postoperatively. Figure 6-G depicts complete resolution of the ulceration at the two-month follow-up exam.

Some ulcers occur in areas where tissue is repeatedly traumatized, typically by a tooth or teeth. For example, Figure 7-A shows a chronic sublingual ulcer in a dog. We decided to treat this lesion by CO\textsubscript{2} laser excision to eliminate the ulcer together with the excess tissue.

For such a procedure, the Aesculight laser is used at 6 watts in the continuous mode with the focal spot size of 0.4 mm (Figure 7-B). The tissue with the ulcerated surface is grasped with tissue forceps to create and maintain tension. Laser energy is directed perpendicular to the target area, and an incision is made until excess tissue is removed.

If the resulting defect is large (Figure 7-C), sutures may be placed. No sutures are necessary for smaller defects.

**REFERENCES**


When faced with a patient that has an ulcer, the CO\textsubscript{2} laser is a wonderful instrument to help eliminate pain and aid in the healing process.

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Dr. Jan Bellows is certified by the Board of Veterinary Practitioners (canine and feline) and by the College of Veterinary Dentistry. He is past president of the American Veterinary Dental College, the Veterinary Dental Forum and the Foundation for Veterinary Dentistry.

This Education Center article was underwritten by Aesculight of Woodinville, Wash., the manufacturer of the only American-made CO\textsubscript{2} laser.

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**Soft Tissue Laser Symposium:**

**“ Everyday Laser Surgery with Advanced CO\textsubscript{2} Lasers, Accessories and Techniques”**

**Date:** Saturday, February 4, 2017  
**Time:** 5:30 PM - 6:45 PM  
**Location:** Hyatt Regency Orlando (FL)  
**Room:** Plaza International Ballroom D

**Speakers:**

**John C. Godbold, Jr., DVM**  
Stonehaven Veterinary Consulting  
Jackson, Tennessee

With a special interest in laser technologies, Dr. Godbold has been a frequent continuing education presenter throughout North America and Europe for more than 10 years, and has trained thousands of colleagues how to use their CO\textsubscript{2} lasers.

**Peter Vitruk, PhD, MInstP, CPhys, DABLS, MALD**  
Member, The Institute of Physics  
Director, Laser Physics & Safety Education, American Board of Laser Surgery  
Member, Science & Research Cmte, Academy of Laser Dentistry  
Founder, LightSculpel - AescuLight - LuxarCare

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**Figure 7-A.** Chronic sublingual ulcerated granuloma

**Figure 7-B.** CO\textsubscript{2} laser excision in progress. Note the lack of bleeding.

**Figure 7-C.** Sublingual defect ready for suturing