Surgical CO₂ laser corrects a common canine eye condition

By Neil Berger DVM, MS, DABS
For the Education Center

But surgical returns, faster surgical completion times, less postoperative pain and reduced operative bleeding are among the common benefits touted by CO₂ laser surgeons. One such procedure that general practitioners commonly seek is surgical correction of an inflamed gland of the nictitans, or “cherry eye.” It is not an emergency; however if left untreated, the patient can have chronic corneal irritation and a reduced visual field, in addition to an unsightly appearance that can be a concern for many pet owners (Figure 1). Improperly managed, removal of the inflamed gland will lead to keratinization or scarring of the dry eye. The following description of a successful conjunctival burial of the gland using a CO₂ laser to perform the procedure is a modification of Merganski’s (1993) protocol that has a reported 95 percent success rate.

Surgical procedure
Any dog can be affected by this condition however there is a predilection for puppies and brachycephalic breeds. Commonly, pet owners request this unsightly malady be repaired at the time of surgical sterilization however, it is easily corrected at any age as long as the patient is a good candidate for anesthesia. Once anesthetized, minimal preparation is required, and I generally engage the eye with sterile saline to remove any mucus, debris, or other potential sources of contamination (Figure 2).

To perform the procedure, I use a CO₂ laser to make a circumferential incision around the markedly inflamed gland. Experienced practitioners will understand that when this procedure is initiated with a scalpel that appreciable bleeding is expected. That should not occur when a CO₂ laser is used. The effect of CO₂ laser light on epidermis smaller than 0.5-mm in diameter causes denaturation of collagen, hemolysis of the underlying cells, coagulation of their base, and “capping,” or sealing, of the vessels in a process called photothermolysis or photocoagulation. This is the basic mechanism of concretion in free-beam mode that provides for a clean and dry incision made by a surgical CO₂ laser.

To guard against inadvertent exposure of the corneas to the 10.6 μm CO₂ laser wavelength, I recommend covering the eye with a monitored and flattened piece of soft cotton or several layers of sterile gauze. Other commercially available eye shields can be purchased as well. It doesn’t matter if the incision begins medially or laterally as long as it transects a large supporting eyelid skin covering the bulbar conjunctiva of the nictitans (Figure 3). This CO₂ laser exposure should be made no more than one half the distance between the top of the gland and the protected globe. To make the first portion of the incision in a single pass, I use 2 W continuous wave with a 0.25-mm-diameter spot, behind the posterior aspect of the inflamed gland (Figure 4).

To continue the incision around the anterior aspect of the gland (Figure 5), I often change the output mode of the CO₂ laser to superpulse (SP). This provides for significantly reduced dot formation due to the nature of this waveform. Although still using 2-4 W SP, the average amount of energy deposited into the tissue is reduced significantly, which results in more cutting efficacy and less burning effects. This is referred to as photodepolarization, or the sudden reappearance of target tissue without causing enucleation near to nearby tissue that needs to be preserved.

Once the incisions are made around the globe, the procedure is completed as described in the literature. The bulbar conjunctiva of the nictitans is undermined bluntly with fine scissors (Figures 6 and 7). The suturing begins from the palpebral conjunctiva laterally, through the nictitans. The incision is closed using 4-0 or 5-0 absorbable braided suture material, with a taper needle, in a continuous pattern, causing the gland to be tucked into a pocket made by the surgeon’s posterior incision and undermining. A second row of an inverting undermining. A second row of an inverting technique that improves upon existing surgical techniques in the treatment of this disease is achieved by using a CO₂ laser in a keratinized pocket. The surgical site is inspected immediately prior to recovery, the nictitans gland is inspected for any other abnormalities. Prior to surgery, the mucus is irrigated with sterile saline to wash away any gross contamination.

Postoperative care
Following the procedure, I recommend the patient to be fitted with an Elizabethan collar or other suitable device to prevent self-mutilation. Additionally, an ophthalmic antibiotic ointment should be used twice daily for one week postoperatively. As a protocol, appointment two weeks after the procedure, an examination should show complete healing of the bulbar conjunctiva and resolution of any tissue swelling. This is one representative of a surgical CO₂ laser used in an accepted surgical technique that improves on existing surgical standards to provide even better patient care.

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But surgical factors, faster surgical completion times, less postoperative pain and reduced operative bleeding are among the common benefits touted by CO₂ laser surgeons. One such procedure that general practitioners commonly find is surgical correction of an infiltrated gland of the nictitans, or “cherry eye.” It is not an emergency; however if left untreated, the patient can have chronic ocular irritation and a reduced visual field, in addition to an unsightly appearance that can be a concern for many pet owners (Figure 1). Inappropriate removal, or removal of the infiltrated gland will lead to keratoconjunctivitis sicca, a dry eye. The following description of a successful conjunctival bulbar of the gland using a CO₂ laser to perform the procedure is a modification of Mergari’s (1993) protocol technique that has a reported 95 percent success rate.

Surgical procedure

Any dog can be effectively treated by this condition however there is a predisposition for poodles and brachycephalic breeds. Commonly, pet owners request this unsightly malady to be corrected and “capped,” or sealed, of the vessels endothelial cells, constriction of their lumen, and a reduced visual field, in addition to an unsightly appearance that can be a concern for many pet owners (Figure 1). Inappropriate removal, or removal of the infiltrated gland will lead to keratoconjunctivitis sicca, a dry eye. The following description of a successful conjunctival bulbar of the gland using a CO₂ laser to perform the procedure is a modification of Mergari’s (1993) protocol technique that has a reported 95 percent success rate.

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Figure 1

FIGURE 1. The first incision made on the caudal aspect of the incision in a single pass, I use 2-4 W continuous wave with a 0.25-mm-diameter spot, behind the posterior aspect of the infiltrated gland (Figure 6).

The fist incision was made on the caudal aspect of the infiltrated nictitans gland using 2-4 W continuous wave with a 0.25-mm-diameter spot, behind the posterior aspect of the infiltrated gland (Figure 6). The fist incision was made on the caudal aspect of the infiltrated gland using a CO₂ laser to perform the procedure is a modification of Mergari’s (1993) protocol technique that has a reported 95 percent success rate.

To perform the procedure, I use a CO₂ laser to make a circumferential incision around the markedly infiltrated gland. Experienced practitioners will understand that when this procedure is initiated with a scalpel that appreciable bleaching is expected. That should not occur when a CO₂ laser is used. The effect of CO₂ laser light on capillaries smaller than 0.5 mm in diameter causes denaturation of capillary endothelial cells, contraction of their lumen, and a reduced visual field, in addition to an unsightly appearance that can be a concern for many pet owners (Figure 1). Inappropriate removal, or removal of the infiltrated gland will lead to keratoconjunctivitis sicca, a dry eye. The following description of a successful conjunctival bulbar of the gland using a CO₂ laser to perform the procedure is a modification of Mergari’s (1993) protocol technique that has a reported 95 percent success rate.

To continue the incision around the anterior aspect of the gland (Figure 5), I often change the output mode of the CO₂ laser to superpulse (SP). This provides for significantly reduced heat deposition due to the nature of this waveform. Although still using 2-4 W (60) the average amount of energy deposited into the tissue is reduced significantly, which results in more cutting effects and less burning effects. This is referred to as photothermolysis, or the sudden vaporization of target tissue without causing an eschar near to hot targets that need to be coagulated. The surgical site is covered at the use of electrolysis to complete the procedure.

Postoperative care

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FIGURE 2

The second incision made with 2-4 W superpulsed 0.25-mm spot completes a circumferential cut of the bulbar conjunctiva

The second incision made with 2-4 W superpulsed 0.25-mm spot completes a circumferential cut of the bulbar conjunctiva of the nictitans. (Figure 3). This CO₂ laser exposure should be made no more than one half the distance between the top of the gland and the protected globe. To make the first portion of the incision in a single pass, I use 2-4 W continuous wave with a 0.25-mm-diameter spot, behind the posterior aspect of the infiltrated gland (Figure 6).

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Postoperative care

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To perform the procedure, I recommend the patient to be fitted with an Elizabethan collar or other suitable device to prevent self-mutilation. Additionally, an ophthalmic antibiotic ointment should be used twice daily for one week postoperatively. At a checkup appointment two weeks after the procedure, an examination should show complete healing of the bulbar conjunctiva and resolution of any tissue swelling. This is in keeping with existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care. A review of the surgical CO₂ laser used in an accepted surgical technique that improves upon existing surgical standards to provide even better patient care.