Meibomian adenoma removal with the surgical \( \text{CO}_2 \) laser

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For the Education Center

Meibomian adenoma is a benign tumor arising from the meibomian (tarsal) glands located on the inner aspect of the eyelid (Figure 1). An enlarged meibomian adenoma is unsightly as well as mechanically irritating. The superficial aspect may become quite large and the base of the gland may extend deep into the lid tissues. Conjunctivitis and corneal ulceration are not uncommon sequelae.

\( \text{CO}_2 \) laser surgery is an excellent method for removal of meibomian adenoma as it allows for a bloodless surgical site [1-3]. Incomplete surgical removal of the gland often leads to regrowth and further irritation of the surrounding tissues. A case study presented below describes a precise and simple surgical technique for a complete removal of the meibomian gland with superb cosmetic results and with minimum discomfort for a patient.

**CO\(_2\) Laser Settings**

For this procedure the flexible fiber Aesculight laser is set at 15 watts Super Pulse (Figure 2) with a 0.25 mm tip. The tipless adjustable spot size Aesculight handpiece or a handpiece with a fixed spot size tip both work well.

**Procedure Preparation**

The lids and eye are cleansed with saline. A topical antibiotic ointment is applied to the eye and moist gauze is placed medial to the lid to protect the cornea (Figure 3). The hyperplastic gland may also be isolated with chalazion forceps.\(^1\,\,\,\,\,\,\,2\)

**Anesthesia**

\( \text{CO}_2 \) laser removal of meibomian adenoma is a short procedure and in many cases the surgery may be done under propofol. However, due to age of onset, older dogs may be intubated and maintained under general anesthesia.

We have had several calm older dogs that presented high anesthetic risks due to cardiac disease; those patients were treated using local anesthesia.

**Laser Technique**

The lack of bleeding during \( \text{CO}_2 \) laser surgery provides great visualization of the operating field and enables the surgeon to ensure the complete removal of the entire gland.

A distinct benefit of the \( \text{CO}_2 \) laser is extreme accuracy with the incision. Even a very sharp scalpel uses friction for cutting while the \( \text{CO}_2 \) laser does not distort the surgical field, i.e., it operates in a non-contact mode and the only thing that touches the target tissue is a highly focused beam of light.

The base of the adenoma may be visualized by rolling the lid laterally (as shown in Figure 1). This helps to determine the depth and width of the wedge resection. The lateral surface is incised along the margins of the tumor (Figures 4 and 5).

The incision is then continued full lid thickness (Figure 6). Dressing forceps or mosquito forceps are used to create tension to facilitate the incision process. The edges of the wound are examined to confirm complete resection. The wound edges are then cleaned with saline-soaked gauze to remove char, if there is any. Figure 7 shows the completed v-shaped resection.

**Incision Closure**

Multiple suture patterns are available in textbooks but the pattern described here is very simple and, when using this pattern, superficial sutures may not be necessary.

The closure is started at the ventral aspect of the incision using either 3-0 or 4-0 Monocryl. The needle is inserted at the ventral aspect of the incision and proceeds to the lid margin exiting the tissues very close to the lid margin (Figures 8 and 9a). The needle is then inserted at the opposite lid margin and exits at the base of the incision (Figure 9b).

This is repeated a second time (Figure 9c) and then the suture is gently tightened and a single knot is made at the base of the incision (Figure 9d). This will completely close the incision and appose the lid margins; the knot will remain completely buried. A slight ventral deviation may occur in the lid margin as shown.

*Figure 1: Meibomian adenoma.*

*Figure 2: \( \text{CO}_2 \) laser settings (view of the laser touchscreen).*

*Figure 3: Moist saline gauze protects the cornea.*

*Figure 4: Initial laser incision is placed to delineate the tumor.*

*Figure 5: The initial laser incision is complete. Note the bloodless surgical site.*

*Figure 6: The incision is continued through the full lid thickness. Tension created by the forceps makes the incision easier.*

*Figure 7: The excision of the meibomian adenoma is completed.*

*Figure 9a: Suture starts at the base of the incision margin (at the ventral aspect of the incision). The needle proceeds to the lid margin and exits the tissue very close to the lid margin.*

*Figure 9b: The needle is then inserted at the opposite lid margin and exits at the base of the incision.*

*Figure 9c: The steps in Figures 9a and 9b are repeated.*
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in Figure 11, but the lid will heal with a smooth margin (Figure 12). If needed, a cruciate pattern suture is placed in the skin (Figure 10). This suture pattern also starts at the ventral aspect of the incision and exits near the lid margin and re-enters at the opposite margin to finish at the base of the incision. The suture is tied externally and is removed in 10 days.

Post-Op Instructions
An E-collar or inflatable collar is used postoperatively with non-steroidal drops or antibiotic ointment used t.i.d. to q.i.d. until suture removal.

The same technique is used in upper and lower lid meibomian adenomas. Extremely large adenomas are removed using this technique with excellent results.

Summary
The flexible fiber Aesculight CO₂ laser is a superbly precise surgical tool. It does not distort the operating field as it cuts, because the target tissue is incised with a highly focused laser beam and no friction is created.

While cutting, the laser creates hemostasis; the absence of bleeding ensures excellent visibility and enables the surgeon to remove the meibomian adenoma quickly, with high precision and great cosmetic outcome.

In many cases, the CO₂ laser surgery also makes it possible to operate under local anesthesia, which is especially valuable for high anesthesia risk patients.

Figure 9d: The suture is gently tightened and a single knot is made at the base of the incision.

Figure 10: If needed, a cruciate pattern suture is placed in the skin.

Figure 11: Immediately post-operative view.
Figure 12: 10 day post-operative view.

REFERENCES...

Dr. Will Schultz graduated from Michigan State University in 1973, went into private practice and opened his companion animal practice in the fall of 1974. Dr. Schultz has been a board member on the Synbiotics Reproductive Advisory Panel, The Society for Theriogenology and The Theriogenology Foundation with speaking engagements at several veterinary conferences because of a special interest in canine reproduction. Soft tissue and orthopedic surgery are also areas of special interest and he has used laser surgery for more than 20 years. Dr. Schultz uses a 40-watt flexible waveguide CO₂ laser with constant and SuperPulse modes.

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