CO2 laser surgery for the treatment of elbow follicular cysts in the dog

By David Duclos, DVM, DACVD
For The Education Center

Follicular cysts (known as epidermal inclusion cysts or epidermoid cysts) are sometimes erroneously referred to as "subcutaneous cysts." A cyst is a dilation of the apical portion of the hair follicle lined by a layer of stratified cornifying epithelial cells minsculantly originating from the epidermis. These cysts may be solitary or multiple, firm to fluctuant, round and well-circumscribed. Follicular cysts vary in size from 2 mm to 35 mm. They are found in about a third of the non-pedigreed, non-inflamed tumor-like lesions removed in dogs.9 Postinfection in midline apical to older dog has been reported.5

Cysts may rupture releasing yellowish, brownish, or greyish material (keratin) into the surrounding dermis and subcutis. Keratin is highly resilient acting as a strong inflammatory response and secondary bacterial infection. The inflammation, especially with multiple cysts, may create the dog, lesions may become painful, present, or both, causing the dog to constantly lick and chew the affected area, which exacerbates the problem.

The therapy of choice for multiple follicular cysts is surgical removal. Using the laser allowed for precise surgery with a minimal incision so the wound edges can usually be sutured whereas with the traditional scalpel more tissue will need to be excised and wound closure over this pressure point will be more troublesome. The laser is used at high power in the initial phase because at this point we are ablating tissue that consists mostly of keratin, which is low in water content so more power density is needed. Once the keratin is removed lesser power is needed which allows the surgeon to avoid coagulation of the normal underlying tissues.14 With the CO2 laser is less painful and has less swelling. And in areas where there aren't large amounts of adjacent mobile skin close to the wound, like the elbow, less swelling results in superior postoperative tissue healing.

The patient Sadies, a 7.5-year-old female spayed Chesapeake Bay retriever, was brought in for follicular cysts on both elbows (Figure 1). The cysts percutaneously had become inflamed and then ruptured, with drainage. Initially the problem improved temporarily with the use of differin gel (available at our veterinary hospital). However, by the time of our visit to the dermatologist clinic these medications had not diminished the size of the follicular cysts. The owner reported that the elbow was extremely pruritic, and the dog constantly licked them, which exacerbated the problem.

The procedure

Laser equipment

The CO2 laser, laser model VI-455 (by Aesculight, Bothell, Wash.) was utilized with a straight handpiece and a ceramic laser mirror to accomplish the procedure. It was utilized with a straight handpiece and a ceramic laser mirror to accomplish the procedure. The CO2 laser is the only American-made CO2 laser. The laser was used with the manufacturer's handpiece and was operated with a foot pedal on the control panel. The laser was operated using the "Pulse" button on the control panel with an average power setting of 15 W. The laser had been used in the past with sterile saline on fine puffs and gentle pressure was applied to express the contents of the cysts. However, the laser surgeon ensured that no more cysts were seen after the first pass (Figure 2-D). The affected area on the left elbow was much smaller. The follicular cysts were removed in multiple laser passes (Figure 3-A). After each pass the surgical site was wiped with sterile saline on gentle pressure and gentle saline was applied to express the contents of the cysts. The laser surgeon ensured that no more cysts were seen after the first pass (Figure 2-D).

Postoperative care

To prevent an infection at the site, the patient was put on a three-week course of oral cephalixin (500 mg capsules, two capsules b.i.d.). This was continued because of all of the follicular contents coming out onto the surgical area. For pain management the patient was prescribed tramadol (50 mg tablets,1.5 to 3 tablets once or twice daily, as needed). Follow up

The patient was seen by a local veterinarian for bandage change at three days after the surgery, and then four days later. The bandages were changed in seven days. At the bandage changes, the suture sites were gently cleaned with chlorohexidine scrub and the area was patted dry. Then the suture site was covered with marpoxin 2% ointment and a Telfa pad, cast padding, and the usual outer bandage material. The patient was seen by the DogLeggs, so this was the best way to help her prevent her from bothering the bandage.

Wound closure

The surgical margins were approved and sutured (Vicryl™) was used for subcutaneous and nylon for cutaneous tissue. Post-op aspect of the surgical areas left and right elbows, with sutures in place. (Figure 4). A 2 in. length was then sutured with a horizontal mattress sutures.1 The procedure was facilitated by the ability of the CO2 laser to coagulate small blood vessels during the surgical procedure. The patient returned approximately a month post-op for removal of the suture material.

Figure 3-B: Intra-op view. The larger section of the elbow skin with multiple follicular cysts was ablated with a sterile gauze pad prior to wound closure (Figure 3-C).

Surgical procedure

The surgical area was aseptically prepared, including the clipping of overlying hair. The larger section of the follicular cysts on the right elbow was excised— it was removed with a single pass of the laser (Figure 2-A). Then, the edge of the incision was trimmed with a b. knife and retired, while the laceration was undermined with the laser beam and coagulated. In the process, two larger blood vessels were severed and had to be ligated. The remaining section of the elbow skin with multiple follicular cysts was ablated with several laser passes (Figure 2-C). After each pass the surgical site was wiped with sterile saline on gentle pressure and gentle saline was applied to express the contents of the cysts. However, the laser surgeon ensured that no more cysts were seen after the first pass (Figure 2-D).

Summary

This article describes a CO2 laser surgical procedure that in most cases corrects pruritus. Multiple follicular cysts on canine elbows, with sutures in place (Figure 2-C). This Education Center article was underwritten by Aesculight of Bothell, Wash., the manufacturer of the only American-made CO2 laser.
CO2 laser surgery for the treatment of elbow follicular cysts in the dog

By David Ducuin, DVM, DACVD
For The Education Center

Follicular cysts (known as epidermal inclusions or epidermoid cysts) sometimes erroneously referred to as sebaceous cysts) are a cystic dilation of the apical portion of the outer sheath of the hair follicle itself by a layer of stratified corneal epithelial cells multilaminated from the epidermis. These cysts may be solitary or multiple, firm to fluctuant, round and well-circumscribed. Follicular cysts vary in size from 2 mm to >5 cm. They are found in about a third of the nonneoplastic, noninflammatory tumor-like lesions removed in dogs. Predilection in middle-aged to older dogs has been reported.

Cysts may rupture releasing yellowish, brownish, or grayish material (keratin) into the surrounding dermis and subcutis. Keratin is highly resistant evoking a strong inflammatory response and secondary bacterial infection. The inflammation, especially with multiple cysts, may irritate the dog, lesions may become painful, present or both, causing the dog to constantly lick and chew the affected area, which exacerbates the problem.

The therapy of choice for multiple follicular cysts is surgical removal. Using the laser allowed for complete removal of the lesion along with the surrounding tissues. Post-op with the CO2 laser is less troublesome. The laser is used at high power in the initial phase because of all of the follicular contents could be expressed. All ablated tissue and debris were removed with a sterile gauze pad prior to wound closure (Figure 5).

Figure 3-B: The contents of the cysts were gently expressed and wiped away between each pass. Figure 4-C: All ablated tissues and debris were removed with a sterile gauze pad prior to wound closure. (Continued).

Summary
This article describes a CO2 laser surgical procedure that in most cases proves curative and resolves the problems caused by multiple follicular cysts on canine elbows, such as swelling, inflammation, draining hemorrhagic tracts, pruritus, pain, and secondary infection. This laser procedure combined both excision and vaporization of the affected skin containing follicular cysts.

Laser surgery allowed ablation of multiple layers of cysts and adjacent hair follicles without excessive thermal damage to the surrounding normal tissues. The procedure was facilitated by the ability of the CO2 laser to coagulate small blood vessels during the surgical procedure combined both excision and vaporization of the affected skin containing follicular cysts.

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