CO₂ laser correction of urethral prolapse

By William E. Schultz, DVM
For the Education Center

Urethral prolapse is a protrusion of the urethral mucosa beyond the end of the penis. Although recorded in other breeds, urethral prolapse is diagnosed more often in young male English bulldogs and Boston terriers. Although its exact cause is unknown, urethral prolapse is reported to be the result of sexual excitement or may be associated with genitourinary infections, or both.①,2 Urethral prolapse is not common. The clinical signs are occasional bleeding, tenesmus and aspread rather than focused urinary stream. Owners may notice a blood or dark red or purple area on the tip of the penis. Some dogs may unexpectedly lick the affected area, which may cause trauma to the exposed urethra. Self-inflicted trauma or drying may lead to necrosis of the protruding urethral mucosa.

Other issues potentially can cause hematuria and/or bleeding from the sheath and occasional tenesmus, with no urine production. He was an otherwise healthy dog with no other clinical problems. Physical examination revealed a urethral prolapse characterized by a deep red, small, doughnut-shaped mass protruding from the distal end of the penis (Figure 3-A). Anesthesia Prenasal complete blood count and chemistry panel were normal. The patient was premedicated with ketamine. General anesthesia was induced with propofol 20 and maintained with sevoflurane in oxygen via an endotracheal tube. Additionally, buprenorphine (analgesic) and carprofen (anti-inflammatory/analgesic) were administered parenterally during the anesthesia and prior to the procedure.

Laser Equipment and Settings

A 20-watt Aesculight surgical CO₂ laser (by LightScalpel LLC, Woodinville, Wash.) with a flexible hollow waveguide and tipless handpiece with >10-mm focal spot size were used. The laser was set at 8 to 10 watts continuous wave for the procedure. This setting allows for minimal tissue damage while controlling intraoperative hemorrhage.

Technique

The patient was placed in dorsal recumbency. The penis was extended from the sheath and clamped with Allen clamps. All tissue forceps were used to keep the sheath retracted (Figures 1 through 10). A metal urinary catheter was placed in the urethra (Figure 2). Plastic catheter is not recommended, as the laser beam might melt it. Small splinter forceps were used to create tension thus facilitating laser incision (Figure 5-A). The surgery started on the ventral surface of the penis. A small incision (3 to 4 millimeters) was made at the base of the prolapse through both penile and urethral mucosa to the level of the catheter (Figures 3-A and 3-B). The laser was always directed at a 90-degree angle toward the target tissue. The incision was examined, and any char was removed from the site with a saline-soaked gauze pad (Figure 3-C). The urethra was then grasped with tissue forceps and averted to the proximal penile tissue in order to prevent the retraction of the urethral mucosa within the tip of the penis (Figures 4-A and 4-B). 4-0 Monocryl sutures were placed. The incision was advanced circumferentially, with sutures placed in an interrupted pattern until the entire prolapsed tissue was removed (Figures 5-B through 5-H).

Postoperative Care

After the procedure, Olaf was sent home on carprofen (anti-inflammatory/analgesic) for one week. His activity was restricted during the first week. The patient had mild bleeding for the first three days, but it cleared rapidly. He had no complications and no tetanus postoperatively. It should be noted that excellent and a partial resection may cause bleeding initially. It is therefore recommended that an effort be made to limit exciting activity for the first week after the procedure. A mild tranquilizer may be used if necessary. The patient should wear an Elizabethan collar or inflatable protective collar until sutures removed. Sutures are removed 14 days after the surgery (light sedation may be used for this procedure).

References


Conclusion

In our clinic, the Aesculight CO₂ laser is always utilized for the correction of urethral prolapse. Compared to surgical surgery, the greatest benefit of using the laser for this procedure is the efficient hemostasis in this richly vascularized area. In addition, the lack of a tourniquet makes this surgery less traumatic to the penile tissue.

Figures

Figure 1-A: Preoperative aspect of the prolapsed urethral mucosa. All forceps keep the sheath retracted.

Figure 1-B: Metal catheter was placed as a backstop.

Figure 2: A small incision was made through the urethral and penile mucosa to facilitate laser incision.

Figure 3-A: Tension was applied to the exposed urethral tissue to facilitate laser incision.

Figure 3-B: A small incision was made through the urethral and penile mucosa at the ventral part of the penis.

Figure 3-C: Any char was removed from the site.

Figure 4-A: The urethral mucosa was sutured to the penile mucosa to prevent retraction.

Figure 4-B: This technique removes the need for stay sutures.

Figure 5: The incision was extended slightly around the circumference.

Figure 5-A: Tension was applied to the exposed urethral tissue to facilitate laser incision.

Figure 5-B: Small incision was made through the urethral and penile mucosa at the ventral part of the penis.

Figure 5-C: Any char was removed from the site.

Figure 6: The incised urethral and penile mucosa were sutured together.

Figure 7: Gradual resection was advanced circumferentially, with sutures placed in an interrupted pattern until the entire prolapsed tissue was removed (Figures 5-B through 5-H).

Figure 8: As the incision advanced, sutures were placed in an interrupted pattern.

Figure 9: Immediate postoperative view
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Other issues potentially can cause hematuria and/or bleeding from the sheath and occasional tenesmus, with no urine production. He was an otherwise healthy dog with no other clinical problems. Physical examination revealed a urethral prolapse characterized by a deep red, small, doughnut-shaped mass protruding from the distal end of the penis (Figure 1).

**Anesthesia**

Premedication complete blood count and chemistry panel were normal. The patient was premedicated with butorphanol. General anesthesia was induced with propofol 20 and maintained with sevoflurane in oxygen via an endotracheal tube. Additionally, hyperkalemia (analogous) and carprofen (anti-inflammatory/analogous) were administered parenterally during the anesthesia and prior to the procedure.

**Laser Equipment and Settings**

A 20-watt Aesculight surgical CO₂ laser (by LightScalpel LLC, Woodinville, Wash.) with a flexible hollow waveguide and tipless handpiece with a 6-mm-focal spot size was used. The laser was set at 8 to 10 watts continuous wave for the procedure. This setting allows for minimal tissue damage while controlling intraoperative hemorrhage. The patient was placed in dorsal recumbency. The penis were used to keep the sheath retracted (Figures 1 through 10). A metal urinary catheter was placed in the penile urethra (Figure 2). Plastic tissue forceps were used to keep the equatorial urethral mucosa exerted from the sheath and cleaned with diluted chlorhexidine. Allis tissue forceps were used to keep the urethral mucosa on the ventral part of the penis. The laser always was directed at a 90-degree angle toward the target tissue. The laser was set at 20 watts, directed toward the proximal penile tissue in order to prevent the retraction of the urethral mucosa within the tip of the penis (Figures 4-A and 4-B). A 4.0 Monocryl sutures were placed. The incision was advanced circumferentially, with sutures placed in an interrupted pattern until the entire prolapsed tissue was removed (Figures 3 through 9).

**Postoperative Care**

After the procedure, Olaf was sent home on carprofen (anti-inflammatory/analogous) for one week. His activity was restricted during the first three days, but it cleared rapidly. He had no complications and no tamponade postoperatively. It should be noted that excitation and a partial erection may cause bleeding initially. It is therefore recommended that a effort be made to limit exciting activity for the first week after the procedure. A mild tranquilizer may be used if necessary. The patient should wear an Elizabethan collar or inflatable protective collar until sutures removed. Sutures are removed 14 days after the surgery (light sedation may be used for this procedure).

**Conclusion**

In our clinic, the Aesculight CO₂ laser is always utilized for the correction of urethral prolapse. Compared to surgical surgery, the greatest benefit of using the laser for this procedure is the least hemostasis in this richly vascularized area. In addition, the lack of a tourniquet makes this surgery less traumatic to the penile tissues.

**References**


Will Schultz, DVM, graduated from Michigan State University in 1973 and opened his companion animal practice in the fall of 1974. Dr. Schultz has been a board member on the Synthetics Reproductive Advisory Panel, the Society for Theriogenology and the Theriogenology Foundation. He has held speaking engagements at several veterinary conferences, veterinary associations and national societies because of his special interest in canine reproduction and laser surgery. Schultz also is interested in soft tissue and orthopedic surgery. Schultz, who has more than 20 years of experience with laser surgery, uses a 40- watt flexible hollow-waveguide CO₂ laser.

This Education Center article was underwritten by Aesculight of Woodinville, Wash., the manufacturer of the only American-made CO₂ laser.