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Ultrasound Guided Endoscopic Laser Ablation (UGELAB) of Canine Distal Urinary Carcinomas

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## **Introduction**

Transitional cell carcinoma (TCC) of the trigone and urethra has traditionally presented a challenge in offering relief from obstruction and increasing longevity in affected patients. Ultrasound guided endoscopic diode laser ablation (UGELAB) is an effective palliative treatment for TCC in any bladder location but is particularly well suited to the distal urinary tract where such tumors have traditionally been considered nonresectable. It has been suggested that debulking of tumor mass in dogs with transitional cell carcinoma of the urinary bladder provides a mean survival time significantly longer than that of dogs in a nonsurgical group. <sup>(1)</sup> It was suggested in the same study that mean survival time was significantly shorter when the tumor was present in the urethra and trigone compared to dogs with no tumor in those locations regardless of the medical treatment type. <sup>(1)</sup>

Numerous surgical techniques have been described in the literature using conventional surgical instrumentation. The use of transurethral electrosurgery has been described by the respective authors as unsuccessful in female dogs. <sup>(2)</sup> Carbon dioxide laser treatment of the bladder has also been described, <sup>(3)</sup> but has the disadvantage of requiring a laparotomy and cystotomy with associated conventional healing periods and associated discomfort while providing the opportunity for malignant cells to spread elsewhere in the peritoneal cavity. Urethral stenting is a simple relatively non invasive means of providing relief from obstruction but, as described in publication, provides a very short mean survival time. <sup>(4)</sup>

UGELAB of tumors located in the distal urinary tract provides significant and rapid relief from tumor obstruction with minimal to no side effects to the patient and provides additional time for chemotherapeutic agents to be effective. UGELAB provides a very effective palliative method for relieving complete urethra obstructions, obstructive lesions of the cystourethral junction and trigone, temporarily relieves obstructive hydroureteral disease, and eliminates much of the tumor vascular supply.

Use of the transurethral diode laser surgery with the UGELAB technique maintains a closed system, requires little to no healing period, and provides constant flushing of malignant tumor cells from the urinary bladder. The recovery period is minimized and some patients return home the same day without any apparent discomfort. Function often returns to normal the same day as surgery. The procedure is relatively non invasive and can be repeated as often as needed. Tissue biopsies are obtained also through the closed system of endoscopy given that transplantation and seeding of TCC may occur when transabdominal sampling is performed. <sup>(5,6)</sup>

## **Prognostic Factors and Clinical Objectives**

Patients are staged prior to the procedure with full clinical-pathological assessment, thoracic and abdominal radiographs, and abdominal sonogram. Most patients do not present evidence of metastatic disease or significant metabolic compromise prior to the procedure.

Negative prognostic factors for non resectable TCC include clinical decline due to voiding difficulties, hydronephrosis/hydronephrosis and resultant renal failure, local and systemic metastatic disease, patient discomfort, and client negative impression of patient quality of life. Therefore, the clinical objectives of the UGELAB procedure is to maximize tumor volume reduction and minimize obstructive tumor bulk, increase urethral and ureteral patency to avoid hydronephrosis that would metabolically compromise the patient, eliminate tumor vasculature, abate clinical signs, and increase survival quality and duration. The decision to clinically intervene by means of the UGELAB procedure is based on the presence of any of the above negative prognostic factors as target for treatment.

**Adjunctive Treatment:** Given that many of the patients are referred from other facilities and are already being treated by the referring practitioner, NSAID treatment and various chemotherapy treatments have, at times, already been utilized in some patients prior to the UGELAB treatment. After UGELAB procedure most patients are treated with a NSAID, doxycycline, and omega 3 fatty acid as adjunct post-operative therapies. Post operative antibiotic therapy is ultimately based upon a culture and sensitivity and when other evidence of infection is present. Doxycycline is provided, as indicated, for its antimicrobial and potential antiangiogenic effects.<sup>(7)</sup>

## **Complications**

Potential complications during surgical procedure are fairly limited to perforation of the urinary tract during the procedure and perforation due to necrosis in the postoperative period. Careful ultrasonographic observation of laser energy penetration depth will greatly decrease the likelihood of such complications. Some dogs will experience some stranguria for several days to weeks. Hematuria, though uncommon postoperatively, is generally limited to only a few days.

## **Discussion/Conclusions**

**UGELAB is a successful alternative treatment for non-resectable transitional cell carcinoma tumors in female and male (by means of temporary perineal urethrostomy) dogs with comparable survival rates to those of other reported methods. The procedure is minimally invasive and repeatable with immediate relief from obstruction. This closed system technique has the advantage of no incisions, decreased healing time, no peritoneal exposure to tumor tissue and tumor flushing from the bladder. The use of ultrasound guidance provides very accurate application of laser energy and significantly decreases the chances of complications secondary to perforation. Most patients experience immediate relief of symptoms and client response to treatment has been extremely positive.**

Key Words:

Transitional Cell Carcinoma

Diode Laser

Power Doppler

Urethra

Ureter

Trigone

## References

1. Jana R, Josel B, Pagor C, et al. The role of surgical debulking in dogs with transitional cell carcinoma of the urinary bladder: a retrospective study of 122 dogs. VCS 2002 Proceedings, Abstract Sept, 12, 2002.
2. Liptak JM, Brutscher SP, Monnet E. Transurethral resection in the management of urethral and prostatic neoplasia in 6 dogs. *Vet Surg* 33[5]:505-16 2004 Sep-Oct.
3. Upton ML, Tangner CH., Payton ME, et al. Evaluation of carbon dioxide laser ablation combined with mitoxantrone and piroxicam treatment in dogs with transitional cell carcinoma. *JAVMA*, Vol228, No. 4, February 15, 2006.
4. Weisse C, Berent A, Todd K. Evaluation of palliative stenting for management of malignant urethral obstructions in dogs. *JAVMA*, Vol. 229, No.2, July 15, 2006.
5. Nyland TG, Wallack ST, Wisner ER. Needle-tract implantation following us-guided fine-needle aspiration biopsy of transitional cell carcinoma of the bladder, urethra, and prostate. *Vet. Radiol Ultrasound*. 2002 Jan-Feb; 43(1):50-3
6. Vignoli M, Rossi F, Chierici C. Needle tract implantation after fine needle aspiration biopsy (FNAB) of transitional cell carcinoma of the urinary bladder and adenocarcinoma of the lung. *Schweiz Arch Tierheilkd*. July 2007; 149(7):314-8.
7. Chun, R., *Antiangiogenic Strategies in Veterinary Oncology*. NAVC Proceedings 2006.