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## TRANSITIONAL CELL CARCINOMA

### What is transitional cell carcinoma?

Transitional cell carcinoma (TCC) is a malignant tumor of the cells that line the urinary tract. Transitional cell carcinoma can occur anywhere in the urinary tract, including the kidney, bladder, or urethra. TCC is the most common form of urinary bladder cancer in the dog. The most common site affected is the trigone, or neck, of the bladder, where the bladder joins the urethra. It is not uncommon for the tumor to extend into the urethra or, in males, into the prostate.

### What are the symptoms?

Symptoms of TCC often include frequent urination, straining to urinate, and blood in the urine. These symptoms may be partially and/or temporarily responsive to antibiotics. Urinary tract infections and irritation of the bladder secondary to stones can cause similar signs. In rare instances, the first symptom of TCC is an inability to urinate due to obstruction of the urinary tract by the tumor, or lameness secondary to bony metastases.

### How is it diagnosed?

When TCC is suspected, evaluation typically includes a complete blood cell count, serum chemistry profile, urinalysis, and urine culture. Abdominal ultrasound is useful in identifying a mass within the bladder and evaluating for the presence of metastatic disease to lymph nodes or other abdominal organs. Contrast X-ray studies can sometimes be helpful in evaluating tumors located primarily within the urethra. A biopsy and/or fine needle aspirate is usually needed, to confirm a diagnosis of TCC. Tumor cells may be present in the urine, but can also be confused with reactive cells associated with inflammation or infection. Methods of obtaining tissue samples include surgery (cystotomy), cystoscopy (scoping of the urinary tract), or via a urinary catheter or needle aspirate under ultrasound guidance. Methods such as ultrasound-guided fine needle aspirate or surgery, which involve approaching the mass through the body wall, can occasionally result in seeding the tumor along the site of needle placement or surgical approach. Once TCC is confirmed or strongly suspected, chest x-rays should be performed to check for spread of cancer to the lungs.



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## **How is it treated?**

### Surgery

Most TCCs are not readily amenable to surgical resection due to their location within the urethra or neck of the bladder. Surgery may be possible for tumors that occur at the apex of the bladder; however, many dogs do appear eventually to develop multifocal tumors of the urinary bladder.

### Radiation Therapy

Radiation therapy for TCC has not been well evaluated. Traditionally, radiation therapy has been used if the TCC has caused obstruction of the urinary tract and an inability to urinate. The purpose of radiation therapy in the case of obstruction is to shrink the tumor and relieve the obstruction for a period of time. More recently, radiation therapy has been evaluated for non-obstructed TCC and some of the results are promising. However, due to vital structures in the urinary tract, there is the potential for significant side effects. Your pet's oncologist can discuss the benefits and risks of radiation therapy for your pet.

### Chemotherapy

Several chemotherapy drugs have shown some efficacy against canine TCC, including mitoxantrone, carboplatin, doxorubicin, and vinblastine. Chemotherapy may help control the size of the primary tumor and delay the occurrence of metastatic disease. Typically, chemotherapy, in combination with a non-steroidal anti-inflammatory drug (see below), is the standard of care treatment for these tumors when wide surgical removal is not realistic.

### Non-Steroidal Anti-inflammatory Drugs (NSAIDs)

NSAIDs have potent pain-relieving and anti-inflammatory effects. NSAIDs have also been shown to have some anti-tumor effect against transitional cell carcinomas. NSAIDs for treatment of TCC are most commonly given orally on a daily or every other day basis. Piroxicam is the NSAID which has been most studied for treatment of TCC. However, other non-steroidal anti-inflammatory drugs may provide similar benefits.

### Palliation of urinary obstruction

Inability to eliminate urine from the body is rapidly life-threatening. A common problem with progression of transitional cell carcinoma is obstruction of urine voiding from the bladder due to the physical presence of the mass. Procedures such as surgical placement of a cystostomy tube (to allow urine to be removed directly from the bladder by the caregivers) or placement of a urethral stent (to attempt to maintain a patent urethra so that the patient can continue to void urine from the bladder) can sometimes help TCC patients by allowing continued elimination of urine from the body.



However, these procedures do not help if the problem is obstruction of the ureters preventing urine flow into the bladder from the kidneys.

**What is the prognosis?**

The long-term prognosis for TCC is generally poor, due to location and the often advanced stage of disease at diagnosis. The prognosis is better for tumors which can be surgically removed, but even so eventual local recurrence, development of additional urinary masses, and/or distant metastasis are common. Many dogs will have improvement of clinical signs with NSAIDs alone for several months, with a median survival time of about 6 months. The addition of chemotherapy drugs may extend median survival times to around 9 months. Most dogs are eventually euthanized due to urinary tract obstruction or kidney failure.