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# A Clinical Overview of Canine Bladder Transitional Cell Carcinoma

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**Abstract:**

Transitional cell carcinoma (TCC), also called urothelial carcinoma, is a common malignant tumour of the urinary bladder in dogs. Although bladder cancers are less frequent compared to other types of canine tumours, TCC is the most common among them. Scottish Terriers are considered to be at higher risk than other breeds. It is usually seen in females and is commonly diagnosed in older dogs. While the exact causes of TCC are not well understood, it has been observed in dogs with obesity, recurrent urinary tract infections (UTIs), or chronic inflammatory conditions of the bladder. Dogs previously treated with cyclophosphamide have also been reported to develop TCC. Clinically signs frequently noted include haematuria, changes in urinary patterns such as incontinence, pollakiuria, stranguria, abdominal pain, and excessive licking of the genitals. In some dogs, TCC may induce severe and recurrent cystitis. Due to metastasis, other systemic signs may also appear—for example, bone involvement can lead to lameness. In a few cases, the urethra and prostate may also be affected.

**Key words**: TCC, BRAF, Piroxicam, Mitoxantrone.

Diagnostic approaches include urine cytology, which may reveal exfoliated transitional tumour cells with anisocytosis and abnormal nuclei such as multi-nucleation; however, this method is currently considered to have low diagnostic value. The BRAF gene mutation test has gained significant importance in diagnosis, as this mutation is commonly found in canine TCC. Imaging techniques are non-invasive and highly useful. Ultrasonography of the bladder can reveal masses in more advanced cases, and computed tomography (CT), if available, provides similar diagnostic value. Biopsy, either via cystoscopy or cystotomy, though invasive, is necessary for accurate diagnosis, staging of the tumor, and to avoid misinterpretation with other conditions. Treating TCC is challenging. Surgical removal is usually

impractical, and radiation or laser therapy is often unavailable.

Chemotherapy remains the most common treatment approach. A combination of Piroxicam (0.3 mg/kg) and Mitoxantrone (5.5 to 6 mg/m$^2$ IV every 21 days for 4–5 cycles) has shown a good response. Piroxicam in combination with other chemotherapeutic agents such as cisplatin, carboplatin has also been reported, but these drugs carry a higher risk of side effects, particularly nephrotoxicity. Monotherapy with carboplatin, gemcitabine, doxorubicin, or vinblastine has been reported to show a poor response. However, metronomic administration of chlorambucil (4 mg/m$^2$ PO every 24 hours) was well tolerated, and 70% of dogs showed partial remission or stable disease, as reported by Schrempp *et al*., 2013. While undergoing chemotherapy, continuous monitoring, frequent evaluations, and repeated examinations are necessary to track disease progression and manage potential side effects. Treating TCC often takes time and can be stressful for pet owners; therefore, careful monitoring and supportive care are essential.

## Reference:

Schrempp DR, Childress MO, Stewart JC, Leach TN, Tan KM, Abbo AH, de Gortari AE, Bonney PL, Knapp DW. Metronomic administration of chlorambucil for treatment of dogs with urinary bladder transitional cell carcinoma. J Am Vet Med Assoc. 2013 Jun 1;242(11):1534-8. doi: 10.2460/javma.242.11.1534. PMID: 23683018.