

Public Abstract

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Title:Evaluation of Survivin, an Inhibitor of Apoptosis, in Canine Urinary Bladder Tissues

**Introduction:** Survivin is a protein that inhibits programmed cell death. It is overexpressed in human cancers, including human urinary bladder transitional cell carcinoma (TCC). TCC in dogs is a model for the human tumor. The objectives of this study were to identify survivin in canine TCC tissue, evaluate survivin expression in TCC, cystitis (inflammatory bladder), and normal urinary bladder tissues, and correlate survivin expression with cell proliferation. We aimed to demonstrate that survivin is overexpressed in canine urinary bladder TCC, and therefore, it may regulate cell proliferation and may serve as a target for therapy.

**Materials and Methods:** The survivin protein was evaluated with immunohistochemistry (IHC) in canine TCC, cystitis, and normal urinary bladder tissues. We also evaluated survivin messenger RNA (the message for the protein, mRNA) with reverse-transcriptase polymerase chain reaction (PCR). Lastly, we performed IHC for Ki-67, a marker for cell proliferation, on all tissues.

**Results:** Sixty-eight percent of the tumors and half of the cystitis samples were positive for survivin in the nucleus, whereas none of the normals were positive. Survivin was also found in the cytoplasm of tissues, but more normal samples had survivin in this part of the cell compared to cystitis and tumor tissue. Survivin mRNA was found in all tumor samples, and approximately half of the cystitis and normal bladder samples. Tissues with nuclear survivin had a higher cell proliferation than those without nuclear survivin.

**Conclusions:** As in human tissues, survivin is present in canine TCC, which further demonstrates that canine TCC is a model for the human disease. That survivin is present in all tissues evaluated shows that it is not likely to be a diagnostic test for tumors. However, the correlation between nuclear survivin and cell proliferation shows that nuclear survivin, but not cytoplasmic survivin, plays a role in cell proliferation and perhaps tumor progression. Thus, nuclear survivin may be a useful target for treatment of bladder tumors and an important tool to predict prognosis for patients.