



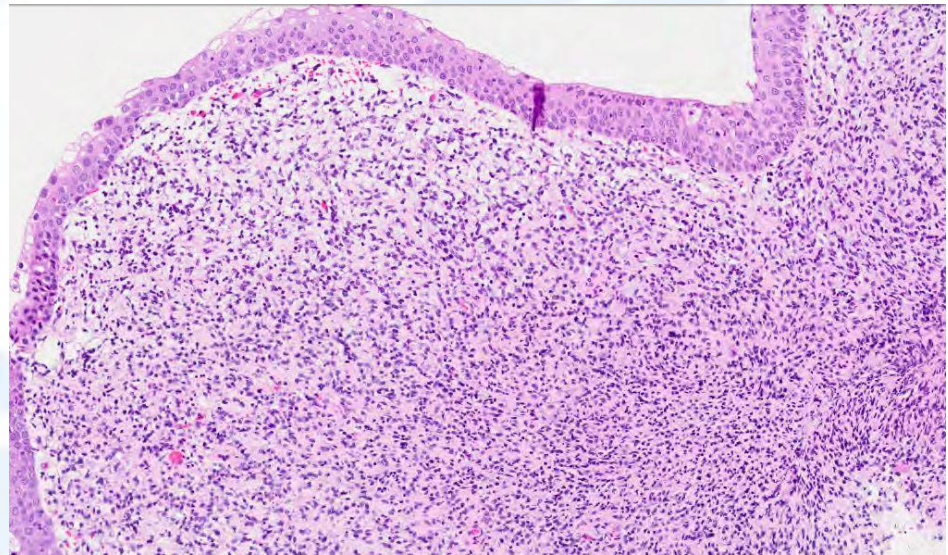
Diagnostic Exercise  
**From The Davis-Thompson Foundation\***

**Case #:** 155 **Month:** December **Year:** 2020

**Title:** Rhabdomyosarcoma of the urinary bladder in a dog

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**History:** A 10-month-old, female, intact Airedale terrier had been experiencing urinary accidents in the house for about 2 weeks prior to presentation to the referring veterinarian. The referring veterinarian performed an ultrasound-guided cystocentesis and saw a mass in the trigone region. Recheck ultrasound was performed after a week of antibiotics and there was no change in the mass. The patient was referred to the UC Davis William R. Pritchard Veterinary Medical Teaching Hospital (VMTH) for cystoscopy. An irregularly shaped, multi-lobular (botryoid), 1.5 x 3.3 cm mass was visualized in the left trigone region. The mass was in close proximity to the urethra and left ureter. Samples were taken by pinch biopsy and submitted for histopathology.



**Follow-Up Questions:**

*What are your differential diagnoses?*

*What diagnostic (histochemical, IHC) test would distinguish among these differentials?*

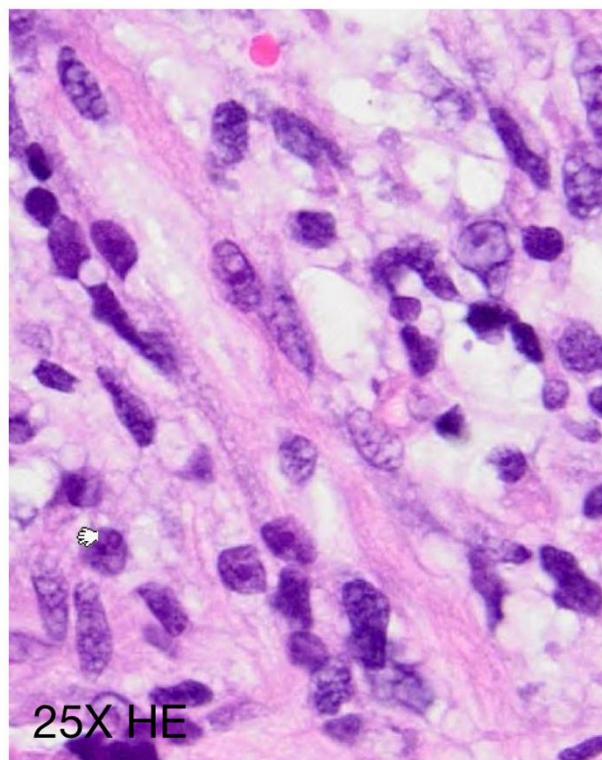
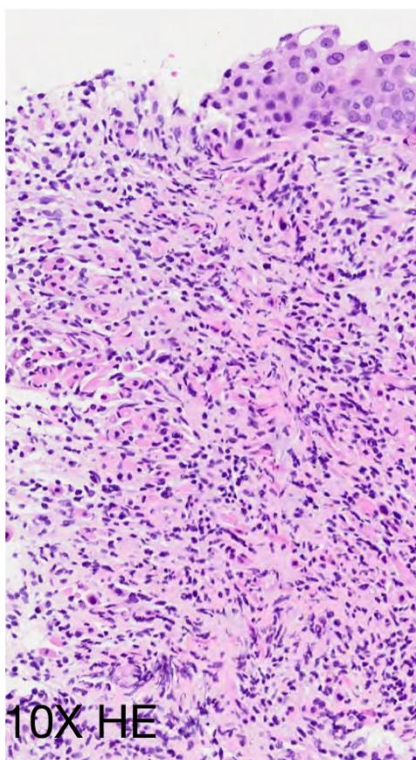
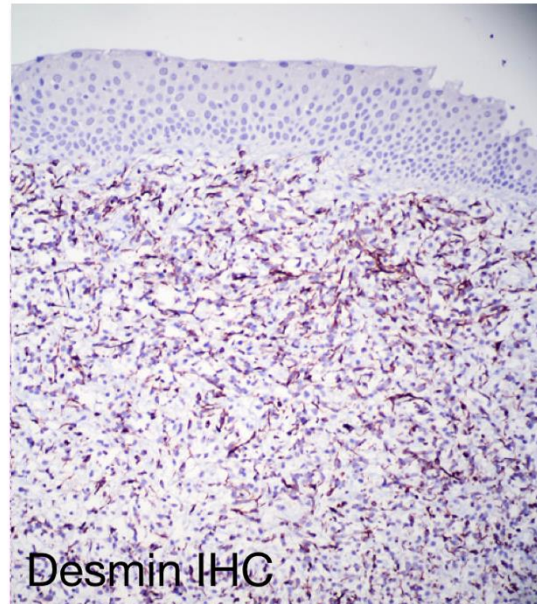
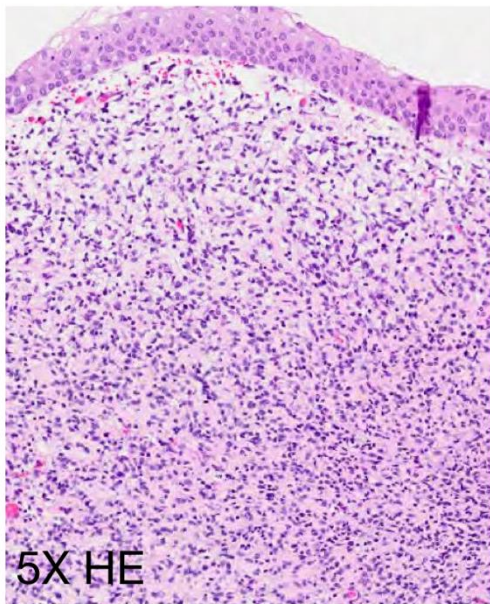
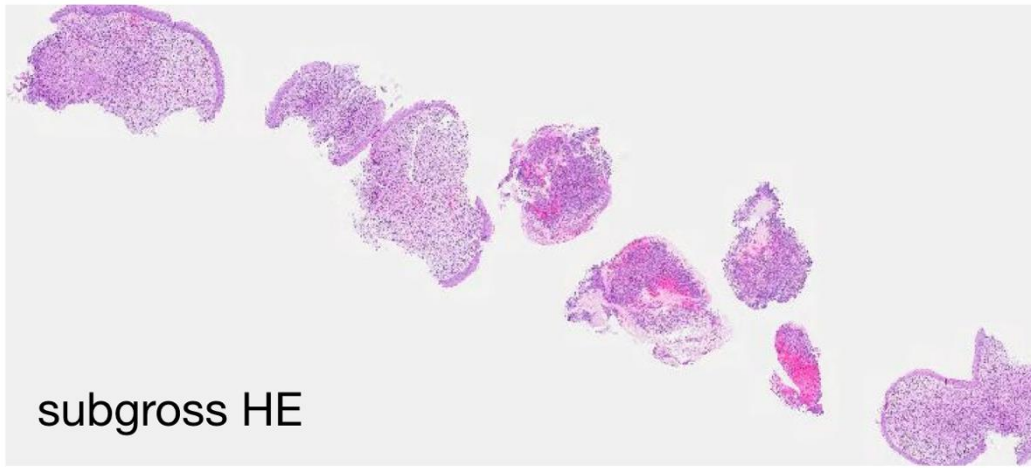
**Differential Diagnoses:** In this case, both inflammatory and neoplastic conditions should be considered. While transitional cell tumor is the most common tumor type in the dog, embryonal types of rhabdomyosarcoma can also occur in the bladder. Because the dog did not respond (size of mass remained unchanged) to antibiotics, biopsies were performed.

**Microscopic Findings:** Examined are eleven variably sized fragments of bladder mucosa and submucosa. Multiple fragments are obscured by large numbers of neutrophils and smaller numbers of lymphocytes, plasma cells, and histiocytes, as well as small foci of hemorrhage. In other sections, the submucosa is expanded by a moderately cellular, unencapsulated, poorly demarcated neoplasm composed of loosely arranged streams of mesenchymal cells supported by a fine fibrovascular to myxoid stroma. Neoplastic cells have variably distinct cell borders, scant pale eosinophilic to clear cytoplasm, and round to ovoid nuclei with coarsely stippled chromatin and occasionally one distinct nucleolus. Occasionally, scattered throughout the submucosa, cells contain more abundant brightly eosinophilic and striated cytoplasm and, regionally, many neoplastic cells are composed of disorganized striated muscle fragments. Rarely, there are large, rectangular cells containing multiple rowed nuclei and prominent striations (strap cells, 25X HE). There is moderate anisocytosis and anisokaryosis; no mitoses are noted.

**Diagnosis:** Urinary bladder: Rhabdomyosarcoma



Urinary  
bladder:



**Ancillary Diagnostic Tests:** Desmin: Neoplastic cells have cytoplasmic immunoreactivity.

### **Discussion:**

Botryoid rhabdomyosarcoma is a type of embryonal rhabdomyosarcoma that originates within a rest of pluripotent mesodermal cells formed from the urogenital ridge during embryogenesis (Caserto 2013). Although most commonly found within the urinary bladder, it can also develop within the cervix, uterus, or vagina (Cooper and Valentine 2017). This tumor is so named because of the characteristic gross appearance, referring to the grape-like, or botryoid, masses protruding from the mucosa of the urinary bladder. It is a rare tumor, typically affecting large breed dogs less than 2 years of age (Pletcher and Dalton L. 1981), and preferentially affecting females. In humans, this tumor typically affects juveniles under 15 years of age, and also predominantly affects females. Metastasis is rare (27%), and complications are related to local invasion and blockage of ureters as disease progresses. This tumor typically has a rapid growth rate and a poor prognosis.

Histologically, striations are not always present, as the neoplastic pluripotent cells can differentiate into any of the various developmental intermediates of striated muscle, usually within a myxomatous stroma, as is seen in developing muscle. Immunohistochemistry is often useful in achieving a definitive diagnosis. Botryoid rhabdomyosarcomas are immunoreactive to vimentin, desmin, muscle actin, sarcomeric actin, myogenin, myogenic differentiation 1, and variably immunoreactive to myoglobin. Neoplastic cells do not react to smooth muscle actin.

### **References:**

- Cooper B.J., Valentine B.A. 2017. Rumors of muscle: Botryoid rhabdomyosarcoma, p.456-457. In Meuten D.J. (Ed) Tumors in Domestic Animals, 5<sup>th</sup> Ed. John Wiley and Sons, Ames.
- Pletcher J.M., Dalton L. 1981. Botryoid rhabdomyosarcoma in the urinary bladder of a dog. Vet. Pathol. 18:695-7.
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\*The Diagnostic Exercises are an initiative of the **Latin Comparative Pathology Group (LCPG)**, the Latin American subdivision of The Davis-Thompson Foundation. These exercises are contributed by members and non-members from any country of residence. Consider submitting an exercise! A final document containing this material with answers and a brief discussion will be posted on the CL Davis website ([http://www.cldavis.org/diagnostic\\_exercises.html](http://www.cldavis.org/diagnostic_exercises.html)).

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