Canine Carcinomas Below the Belt: AGASACAs and TCCs

Apocrine gland anal sac adenocarcinoma (AGASACA) and transitional cell carcinoma (TCC) are two types of carcinomas that develop in dogs. Both tumor types are rarely curable but can have long survival times with long-term oncologic treatment.

Apocrine Gland Anal Sac Adenocarcinoma (AGASACA)

AGASACAs are tumors that develop within the anal sac, and account for <20% of perianal neoplasms. These tumors are usually unilateral, though bilateral disease does occur. Paraneoplastic hypercalcemia occurs in about 20-50% of AGASACA patients and is sometimes the first clinical sign reported for these patients.

Diagnosis

A physical exam should always include a rectal exam with palpation of both anal glands and emptying the glands if they are full to fully palpate for masses. If a mass is present in the area of the anal sac, a fine needle aspirate is typically sufficient for diagnosis. On cytologic review, AGASACAs tend to have a 'neuroendocrine-like' appearance.

Clinical Workup and Staging Diagnostics

Blood work that includes a total calcium should be performed if there is concern for AGASACA given that many patients are hypercalcemic due to the tumors' production of parathyroid hormone- related peptide (PTHrP). AGASACAs tend to metastasize locoregionally, though distant metastasis can occur. Abdominal radiographs may reveal enlarged sublumbar lymph nodes, or evidence of metastasis/ involvement of the lumbar vertebrae. More advanced imaging (ultrasound or CT scan) should be considered prior to surgery to evaluate for enlarged lymph nodes or other organ involvement.

Treatment

Surgery is the treatment of choice for dogs with no evidence of lymph node metastasis, as well as for dogs with locoregional lymph node metastasis. The true benefits of post-operative chemotherapy and radiation therapy are not clearly defined but due to the highly metastatic nature of AGASACA, chemotherapy is typically recommended. Radiation therapy can be considered for palliation of tumors that are not surgical. For gross disease, Palladia (toceranib phosphate) may have some anti-cancer effects.

Prognosis

Patients that undergo surgery of their primary tumor, plus metastatic lymph nodes, can experience a median survival time of over a year. Some patients can experience significantly extended survival times with repeated sublumbar lymph node extirpation.

Transitional Cell Carcinoma (TCC)

Canine TCC is more commonly diagnosed in female, small breed dogs. Some risk factors for TCC development include breed, female sex, lawn chemical exposure, and obesity. Breeds at increased risk are Scottish terriers, Shetlands, West Highland white terriers, and beagles. The most common clinical signs include hematuria, dysuria, and pollakiuria and often mimic the signs of urinary tract infections.

Diagnosis

Cytology

Cytologic diagnoses can be obtained from a free-catch urine sample and evaluated by a trained clinical pathologist on a cytospin sample of the urine. In female dogs, using a swab to sample inside the vaginal vault and then rolling onto a slide can also be a way to obtain a diagnosis as well. A traumatic catheterization can be performed; in some cases, tissue samples may be large enough for IHC, but typically they are not and instead a slide for cytology can be used for this. Fine needle aspirates of the mass should be considered a last resort as there is a small risk of tumor seeding.

Histology

Tissue for histology can be obtained by cystoscopy or by cystotomy. A cystotomy with tumor removal should be considered in patients with apical tumors; the procedure is then both therapeutic and diagnostic.

CADET BRAF and BRAF Plus Test

A relatively new, non-invasive test is now available for the diagnosis of bladder and prostatic TCC. This test is performed on a free-catch urine sample and sent to a lab for genetic testing. The tests specifically looks for mutations in the b-raf gene as well as for copy number variations. This test is 100% specific and 85% sensitive, therefore positive tests are consistent with a diagnosis of urinary or prostatic TCC[1].

Staging

TCC can metastasize locoregionally, though the life-limiting factor for these patients is usually progression of the primary tumor. Thoracic radiographs can be considered for complete staging, and abdominal ultrasound should be performed to assess local lymph nodes, to measure the mass, and to assess for evidence of ureteral obstruction.

Treatment

Chemotherapy is considered the mainstay of treatment for TCC patients and is typically coupled with a COX inhibitor such as piroxicam[2,3]. Surgery can be performed in some cases where the mass is not trigonal in location, and patients can do well long-term with this[4]. Radiation therapy can be utilized in either a palliative setting (to attempt to relieve an obstruction) or can be used for definitive treatment in addition to chemotherapy. In the case of a urethral or ureteral obstruction, placement of a stent can be used to alleviate the obstruction but eventually tumors progress through these and survival times are short.

Prognosis

Though these tumors are rarely curable, dogs can experience survival times of over a year with treatment and typically have a very good quality of life during the management of this disease.

References

1 Mochizuki, H., Shapiro, S. G. & Breen, M. Detection of BRAF Mutation in Urine DNA as a molecular diagnostic for canine urothelial and prostatic carcinoma. *PLoS One* **10**, e0144170, doi:10.1371/journal.pone.0144170 (2015).

2 Arnold, E. J. *et al.* Clinical trial of vinblastine in dogs with transitional cell carcinoma of the urinary bladder. *J Vet Intern Med* **25**, 1385-1390, doi:10.1111/j.1939-1676.2011.00796.x (2011).

3 Knapp, D. W. *et al.* Piroxicam therapy in 34 dogs with transitional cell carcinoma of the urinary bladder. *J Vet Intern Med* **8**, 273-278, doi:10.1111/j.1939-1676.1994.tb03232.x (1994).

4 Marvel, S. J., Seguin, B., Dailey, D. D. & Thamm, D. H. Clinical outcome of partial cystectomy for transitional cell carcinoma of the canine bladder. *Vet Comp Oncol* **15**, 1417-1427, doi:10.1111/vco.12286 (2017).