



Urothelial (transitional) cell carcinoma of the urethra in a 7-year-old Basset Hound

By Drs. Erin Roof and David Bruyette

Background

Lotus, a 7-year-old female Basset Hound, presented in May 2023 with a history of stranguria and inappropriate urination in the home. A urinalysis and abdominal ultrasound were unremarkable. Additional diagnostics were performed over the course of the next 6 months including multiple urinalyses, urine cultures and repeat abdominal ultrasound exams, all within normal limits. An ultrasound in November 2023 revealed what appeared to be debris in the bladder, thought to be crystals, yet retrohydropulsion of the bladder showed normal results. In February 2024, a cystoscopy performed at the University of Florida revealed proliferative urethral tissue and a biopsy was performed. Histopathologic results concluded presence of urothelial (transitional) cell carcinoma with tumor cells extending to the margins and frequent (over 40 in 10 HPF) mitotic figures. A staging CT and Cadet BRAF were performed. A BRAF mutation was detected. Lotus started treatment with piroxicam, vinblastine and Avmaquin and SearchlightDNA genomic tests were ordered.

Vidium Searchlight DNA analysis

Histopathology slides were sent to Vidium lab. SearchLight DNA testing revealed 2 mutation biomarkers and multiple lines of therapeutic options, including trametinib, an inhibitor of mitogen-activated extracellular signal-regulated kinase 1 (MEK1) and MEK2 activation and of MEK1 kinase activity.

Trametinib (kinase inhibitor) was incorporated into ongoing vinblastine treatment. Stereotactic radiation treatments were also administered as part of the protocol. The recommendation of trametinib was based on the candidate driver status, published evidence to support the use of the medication in canine or human cancers, drug availability, as well as dosing, safety and toxicity data in dogs.

Treatment

Lotus was treated with stereotactic radiation in March 2023 and started on a vinblastine protocol. Trametinib was added to the treatment in May 2024. She currently receives vinblastine intravenously every 28 days and 0.4mg trametinib daily orally, given at home by the owner. Lotus has experienced no side effects with the combination therapy.

Outcomes

Lotus' stranguria has been less prevalent and episodes of inappropriate elimination reduced. Monthly CBC, chemistry, urinalysis and UPC tests remain unremarkable. Lotus continues to have CT and Cadet BRAF tests quarterly. CT scan in September 2024 showed improvement of the distal urethral lesions. The remaining urinary tract was unremarkable, and no metastatic disease was detected. Fractional abundance of BRAF mutation did increase from June (1%) to September (24%). The plan is to continue treatments and monitoring as Lotus' condition remains stable and she has a good quality of life.

Conclusion

In Lotus' case, SearchLight DNA provided critical therapeutic insights based on the identification of BRAF mutations. This led to the use of a treatment protocol that has successfully stabilized her disease.

Clinician's Perspective

"SearchLight DNA has been valuable for those cases, such as Lotus, in which clients want to explore any and all treatment options that are available as well as further research for canine cancer."

Dr. Erin Roof
Animal Cancer Care Clinic
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SearchLight DNA Report Excerpt

Therapeutic Biomarkers			
Treatment Options Based on Mutations			
Drug	Mutation	Available for dogs	Used in humans
binimetinib	BRAF p.Val588Glu	No	Yes ^a
cobimetinib	BRAF p.Val588Glu	No	Yes ^a
dabrafenib	BRAF p.Val588Glu	No	Yes ^a
encorafenib	BRAF p.Val588Glu	No	Yes ^a
selumetinib	BRAF p.Val588Glu	No	Yes
trametinib	BRAF p.Val588Glu	Yes	Yes ^a
vemurafenib	BRAF p.Val588Glu	No	Yes ^a

If you have a case you'd like to perform SearchLight DNA analysis on please call (833) 794-0318 to speak with one of our clinicians or email us at info@vidiumah.com