

RADIATION THERAPY OFFERS NEW CANCER TREATMENT OPTION FOR FERRETS, BIRDS, AND OTHER SMALL PETS

Lauren Mingus | March 17, 2021

At the Flint Animal Cancer Center, we often say cancer doesn't care if you have two legs or four. It's also true that cancer doesn't care if you have wings, scales, or tiny claws.

"I see cancer daily, if not multiple times a day," said Dr. Matt Johnston, associate professor of avian, exotic, and zoological medicine at the James L. Voss Veterinary Teaching Hospital.

According to Johnston, the husbandry of zoological companion animals like ferrets, birds, hedgehogs, and guinea pigs has improved significantly over the last 40 years. Owners have a better understanding of the care and dietary needs, and as a result, these pets live longer. Longer lifespans leave these pets susceptible, just like people, dogs, and cats, to diseases of aging like cancer.

"In the 1980s, publications stated that hedgehogs were resistant to cancer," said Johnston. "Today, we know they are actually highly susceptible to tumors."

Historically, the standard treatment for cancer in zoological companion animals was surgery. Beginning in the mid-90s, chemotherapy provided another option, but the evidence of efficacy is still in its infancy.

"Radiation has always been tempting but cost-prohibitive," said Johnston. "Over the years, we have collaborated with radiation oncologists, but their linear accelerator, which delivers the radiation, is really too big to target tumors in the smallest pets accurately."

Novel use of technology offers new treatment opportunities.

In 2018, Dr. Keara Boss, assistant professor of radiation oncology and biology, and Dr. Del Leary, assistant professor of medical physics, worked to acquire a small animal irradiator to support their basic science radiation research programs. The technology was designed for translational research with laboratory rodent models.

About the same time, Flint Animal Cancer Center Radiation Oncology Technician Amber Prebble brought her 11-year-old daughter's pet rat, Silver Stream, to see Johnston.

"We thought he had a Zymbal's gland tumor and didn't think surgery was a great option," said Johnston. "With these tumors, the prognosis is generally considered poor."

With the news, Amber suggested irradiating the tumor using the newly acquired technology.

"When the small animal irradiator first arrived, we talked about using it to treat small mammals, those that are just too small for our linear accelerator," said Prebble. "Silver Stream's tumor gave us the opportunity. I knew it was a Hail Mary, but I wanted to give my daughter more time with him."

Boss, Leary, and Prebble asked for Johnston's assistance in providing anesthesia to Silver Stream, and that's when Johnston learned about the new technology.

Seven days after a single dose of radiation, Silver Stream's tumor shrank dramatically.

"It was really exciting to see the results," said Prebble. "More than that, Silver Stream was back to himself – playing and happy."

Through Silver Stream, Prebble paved the way for other pets. To date, Johnston, Boss, and Leary have collaborated to treat several small companion animals, including hedgehogs, guinea pigs, parrots, and ferrets.

Reni the ferret, cancer trailblazer

"I immediately clicked with Dr. Johnston the first time I connected with him through my ferret rescue," said Rita Yaroush, Johnston's client and long-time ferret guardian.

In late 2018, Yaroush brought her foster-fail ferret, Reni, to see Johnston after learning he was not a good candidate for surgery to treat adrenal syndrome.

"Adrenal tumors are very common in ferrets," said Johnston. "Surgery is the standard, but it is invasive and not without risk."

Having learned about the small animal irradiator, Johnston presented the idea to Yaroush.

"It was mind-boggling," said Yaroush. "I had several discussions with family and with my veterinary friends. Then I decided, I think I need to do this for the good of all ferretkind. I didn't want to miss an opportunity to help the rest of the ferrets in the world."

"Sometimes it takes a leap of faith to lead to discovery," said Johnston. "I'm grateful to Rita and Reni for having faith in the idea."

Boss and Johnston talked through the treatment plan with Yaroush, and in January 2019, Reni started weekly treatments. After the fifth treatment, the tumor was gone. Yaroush couldn't believe the results and excitedly shared Reni's triumph with her large network of ferret guardians and caregivers. Reni completed treatment in six weeks and enjoyed almost another year with Yaroush.

"It was a commitment, but I'm glad I chose to do it," said Yaroush. "I'm proud that Reni was the first."

Next Steps

Reni's results opened the door to explore the technology for other ferrets.

"Keara knows the radiation and the cancer side, and I bring the physiology, biology, knowledge of the species, and Del guides the physics of the treatment; it's a wonderful collaboration," said Johnston.

"I'm learning a lot," said Boss. "Matt has helped me learn more about exotics, and with Del's expertise, I'm learning how to make adjustments to the equipment and planning to improve dose delivery."

Teamwork over the last 18 months led to a new possibility of a clinical trial for ferrets with adrenal tumors. The goal is to gather enough data to support using the small animal irradiator as a standard treatment option.

"With every patient, no matter the size or the species, we learn a little more," said Boss. "I'm thrilled to have the opportunity to work with Matt and the patient families in our quest to conquer cancer in all species."

For more information, email Flint Animal Cancer Center Radiation Oncology or the Avian, Exotic, and Zoological Consult Service.