World's oldest penguin undergoes cancer radiation

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A toddler on Tuesday peered through thick glass as Tess – the world's oldest African penguin, representing an endangered species set to vanish in the child's lifetime – dove into her pool at the Pueblo Zoo. It was the penguin's first swim since Colorado State University veterinarians used specialized radiation to treat an aggressive form of skin cancer on her face.

At 40 years old, Tess is the oldest known African penguin, the matriarch of a dying species and a beloved member of the penguin exhibit at the Pueblo Zoo in southern Colorado. For the veterinarians who treated Tess for skin cancer in early December, she is a beacon on a planet with a dwindling variety of creatures.

"Some people would ask, 'Why are you putting all of these resources into an individual animal?' But, if this individual animal can tell a story that helps globally with the African penguin, then it's all worth it," said Dr. Matthew Johnston, a CSU veterinarian in Avian, Exotic and Zoological Medicine at the James L. Voss Veterinary Teaching Hospital.

An unusual patient

Two weeks ago, Tess ruffled her feathers and waddled under exam-room chairs as a CSU veterinary team prepared to treat the sarcoma between her beak and right eye.

"We have a whole team ready to be involved," Johnston said. "It's fun to collaborate to treat a species we rarely get to work with. It's the perfect opportunity to showcase radiation therapy in non-traditional patients."

Tess's condition is rare in penguins housed in indoor exhibits. Yet, aside from the cancer diagnosis, Tess seems the picture of health – notable because African penguins typically don't live past 20 years in the wild.

"If you didn't know her, you would never guess she's as old as she is," said Dr. Kathy Wolyn, Pueblo Zoo veterinarian. "That's why we wanted to pursue further treatment for her tumor."

The tumor was discovered a couple months ago: Zookeepers noticed injuries around Tess's eyes that failed to heal after a minor squabble over a nest box.

"We're lucky it was where it was, so we could see it," said Melanie Pococke, the zoo's main penguin keeper. Had the tumor been anywhere else, it could have been concealed by her dense, waterproof feathers, which number about 100 per square inch.

Wolyn surgically removed the mass and sent tissue samples to the CSU Veterinary Teaching Hospital for analysis. The tumor was cancerous, and quickly reemerged after the initial procedure.

"Whenever we remove a mass, there are always microscopic pieces that get left behind," Wolyn explained. "With my capabilities at the zoo, I could only do so much. CSU gives us access to new knowledge and technology."

Team Tess to the rescue

Tess's treatment at CSU involved veterinarians, residents, interns, staff

and students from exotics, oncology, radiology, anesthesiology and other specialty units. It was clear before the penguin's radiation treatment that she was a rare bird.

"I'm nervous. This is definitely a first time for me, and I feel like everyone is watching me," said fourth-year veterinary student Hailey Turner as she administered a pre-anesthetic medication in Tess's breast.

A CT scan confirmed a 1-by-1-by-.5 centimeter tumor, about the size of a pinto bean, on the right side of Tess's face. Dr. Jamie Custis, a radiation oncologist, hoped the small tumor could be mitigated with a single 21-minute, 59-second dose of electronic brachytherapy – a form of radiation delivered with state-of-the-art technology, which focuses beams so well that nearby tissues and organs are not harmed.

The non-invasive procedure caused a stir at the hospital, as students and staff jockeyed to see Tess.

"Whenever we get a patient like this, we look at the animal holistically," Johnston said. "It not only gives our students a chance to learn about the animal, but other specialists at our hospital get to see how their knowledge can be applied to these uncommon patients."

Tess left the hospital that evening, and snored the entire three-hour ride home, while nuzzled in her keeper's arms. In the two weeks since her treatment, the radiation has begun to cause the tumor tissue to die and slough. It will be weeks before doctors see the maximum response of the radiation and can fully gauge its effectiveness.

Reunited with her flock

After two weeks of isolated recuperation, Tess on Tuesday was released back into her habitat, marked with a sign that celebrates her "world's

oldest" title. Minor scabbing at her healing radiation site is not apparent to zoo visitors.

Identified by the pink band on her wing, Tess returned to her 50-degree exhibit and shuffled through the crowd of penguins with her 33-year-old mate, Mongo. The two checked their nest box to ensure everything was left untouched during Tess's medical leave, and brayed in excitement as they nestled into their home once again.

"I have always known that Tess is spectacular and extremely special. It was fun to see the excitement everyone had for her at the CSU vet hospital," Pococke said. "I know she has an even larger fan base now. She is an extremely tough girl and will not go down without a fight."

A fighting bird, a fighting species

The African penguin, native to waters along the southern African coastline, is threatened by a number of factors, including global climate change, Johnston said.

Anchovies are the food of choice for the African penguin, but the fish have shifted their travel patterns. Also problematic: The population has been undermined by people hunting penguin eggs and collecting guano – needed for nest sites – for use as fertilizer. An oil spill in 2000 coated 40 percent of the population with petroleum, and overfishing has further reduced their food sources.

The Pueblo Zoo's penguin experts said that during the last decade, the African penguin population has declined by nearly 60 percent; it has declined by 90 percent in the past 100 years. With this sharp decline, the African penguin is expected to be extinct in the wild within 20 years.

One glimmer of hope is that institutions like the Pueblo Zoo have helped

to create a complete genetic base from the penguins in captivity, with the capacity to breed for the next 100 years. So reintroduction in the wild is a possibility at some point in the future.

"If we can make people aware of these endangered species, with awareness comes action, and with action comes change. And, ultimately, we help," Johnston said.

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