

Researcher develops new treatment method for canine eye diseases

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Tacrolimus implant was developed as a result of collaborative work between ISU scientists and NICAST Ltd., an Israel-based biotechnology company). ISU
Courtesy photo

An Iowa State University researcher is exploring a new method of getting medicine to the eyes of infected dogs that is more effective and reliable than using eye drops.

Dr. Sinisa Grozdanic, an assistant professor of veterinary clinical sciences at Iowa State's College of Veterinary Medicine, is working with a drug manufacturer to develop a method of implanting biodegradable medicine into the tissue surrounding a dog's eyes. The medicine releases gradually and treats the infected eye for an entire year.

This is the first time the procedure has been tried to improve auto-immune corneal diseases that can cause pain, redness, inflammation and other eye problems for canines.

This type of drug application is designed to replace eye drops that may require an owner to put drops in a dog's eyes several times a day, sometimes without noticeable effect.

"With drops, immediately after putting them in the eye, there is a lot of medicine going where it needs to go," said Grozdanic. "Then the amount of medicine getting into the eye goes down quickly. Also, you have a specific time for how long that drug will be therapeutically active."

With drops, there are also other issues such as missing a dose and not getting all the medicine into a fidgety dog's eyes.

"It's a hassle for the owner to get the drops in. It is a hassle for the dog as well," he said.

By putting this small pellet inside the tissue surrounding the eye, medicine constantly gets to the needed area for an entire year, he said.

"With this new method, you don't miss a dose. And it works for 24 hours for an entire year."

The polymer is made by the company Nicast Ltd. in Israel, which is developing the technology for both animal and human use.

The technology the company uses is called electrospinning. In making the implant, the needed drug is mixed with a polymer and formed into ultra-fine fibers.

"From the fibers, a fabric is created, from which numerous medical

devices, including drug release devices, can be fashioned," said Benjamin Eliason, CEO of Nicast. "Various drugs can be incorporated into or onto the polymer fibers, or encapsulated inside miniature electrospun polymer capsules, and released inside the body over time."

To insert the medicine, Grozdanic makes a small incision in the dog's conjunctiva, the white tissue surrounding the eye. He then closes the opening with one, tiny stitch. The entire process takes just a few minutes and is done with local anesthetic.

To date, Grozdanic has used the new drug delivery method on six dogs. None of the dogs had been improving with the use of eye drops. Grozdanic is getting results with the new treatment.

"In all the dogs we saw positive results," said Grozdanic. "In some dogs, the results were spectacular. In some, the results were decent. The results were always positive. That's very good considering that they were non-responsive to treatment using other eye medication before receiving the implants," he said.

One of the dogs Grozdanic is working with is Gora, a military dog working for the Department of the Navy in Washington, D.C.

Last year, Dr. Shara Chance of the U. S. Army Veterinary Corps and Gora's veterinarian, diagnosed Gora with Pannus, an inflammation of the corneal surface of the eye and the conjunctiva. Chance treated the problem with eye drops but the condition got worse, she said.

Gora is a highly trained dog that works around high-profile people and needs to be comfortable and focused on her job, according to Chance. After Chance found Grozdanic's name on the Internet, she decided that his treatment method may help Gora.

Chance brought Gora to ISU to have the procedure done. Chance is happy with the results and Gora is back at work.

"She has had improvement in the appearance of her eyes, but more importantly, she has had improvement in her working ability," said Chance. "She is able to jump in and out of the truck and walks more confidently in crowds."

Source: Iowa State University

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