College Develops New Canine Kidney Transplant Procedure

Drs. Foster & Smith Educational Staff

Auburn University's College of Veterinary Medicine has developed a canine kidney transplant protocol that promotes increased tolerance of transplanted organs between unrelated dogs. It also offers the possibility that the transplant recipients may not be required to take high-doses of immunosuppressive drugs for the rest of their lives.

Drs. Clint Lothrop and Michael Tillson have been heading a team of veterinary researchers and clinicians that has shown that if simultaneous bone marrow and kidney transplants are performed, the dog receiving the new organ is much less likely to try to reject the organ.

"The big obstacle has always been that the recipient's immune system wants to reject the transplanted organ unless powerful immunosuppressive drugs are given for the rest of the dog's life" said Dr. Tillson, an associate professor of surgery in the Department of Clinical Sciences. "Our first research dog is still doing well more than five years after receiving a transplanted kidney, and it is no longer on immunosuppressive medications. Based on our overall results, we have started offering the option of a kidney transplant to clients whose dogs have end-stage kidney disease. We have performed several of the procedures in the last two months."

The research team developed the protocol from Dr. Lothrop's investigation into a certain type of bone marrow transplantation for treatment of a red blood cell disorder, pyruvate kinase deficiency. He showed that after the bone marrow transplantation corrected the enzyme deficiency, the dogs would also accept a skin graft from the donor dog as well.

"We reasoned that if a skin graft could be accepted after a bone marrow transplant, then maybe another organ, such as a kidney, might be less likely to be rejected when combined with a bone marrow transplant," said Dr. Lothrop, an internal medicine professor in the college's Scott-Ritchey Research Center. "After starting with genetically matched siblings, we have moved to unrelated dogs and have found we can still decrease the requirement for chronic immunosuppression. We feel it is because this protocol induces tolerance. Tolerance is a condition where the recipient's immune system accepts the transplanted organ as its own. Right now, we begin to decrease the immunosuppressive drug dosage around 60 days after the transplant surgery and see how much the medication can be reduced."

Dr. Lothrop stated that kidney failure had been considered a death sentence for dogs because of organ rejection and limited availability of hemodialysis. While kidney transplants have been performed previously, the dogs had to be on anti-rejection medications (immunosuppressive drugs) for life. This made the dogs more susceptible to illness and represented a significant financial commitment since it could cost more than $30 per day, or almost $11,000 per year, for large dogs.

"Increasing tolerance is the key, because without it, something as simple as kennel cough (an upper respiratory infection) could cause significant illness or even lead to the death of a dog on immunosuppressive drugs," added Dr. Lothrop. "And it should be less expensive for dog owners in the long-run, making a kidney transplant a more affordable option for them."

The first client animal to have the transplant was Talitha, a six-year-old dog belonging to William and Tammy Hanson of Mountain Home, Ark. "She was initially given a less than-one percent chance of survival," said Tammy Hanson. "We took her to several hospitals before learning of Auburn's new method. It's been a wonderful experience at Auburn and she is doing great."

Hanson said Talitha suffered kidney failure due to antifreeze poisoning at an entrance gate leading to the Hanson's sanctuary for abused and chronically ill dogs. Their non-profit organization, EDNAH, or Every Dog Needs a Home Animal Rescue and Sanctuary (870-467-5544), provides care for almost 200 dogs.

"Someone put out antifreeze near our gate and Talitha drank it," Hanson said. "Our local sheriff is working to help us find the person who did it. Talitha has been with us for three years, and her health was important enough for us to make some sacrifices to get the transplant. Hopefully, the new procedure will someday become a mainstream operation at veterinary hospitals."

Dog owners from New Orleans and Atlanta also have had their pets undergo the new transplant protocol at Auburn with the hope of extending their pets' lives. Another benefit of the transplant protocol is that the recipients' owners agree to provide loving homes for the dogs that served as the kidney donors.

"Just like humans who donate a kidney to a relative, the donor dogs can live healthy lives with a single kidney," Dr. Tillson said. "So, in effect, two dogs are getting better lives through the process."

Although numerous centers across the country offer feline kidney transplants, the kidney transplant program at Auburn is one of two centers with an active canine transplantation program. Auburn is the only program using this specific protocol that offers the chance of reducing or eliminating the requirement for long-term immunosuppressive drug therapy.

Participating faculty at Auburn include Drs. Clint Lothrop, Michael Tillson, Bill Brawner, Kristyn Donnelly, Merrilee Holland, Glenn Neimeyer, Pat Rynders, and Janet Welch. The Auburn veterinarians are also hoping to expand their research in a fight against canine and feline diabetes by using the same protocol to investigate transplanting insulin producing islet cells.

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organization, the College of Veterinary Medicine's Department of Clinical Sciences, and the Scott-Ritchey Research Center, a facility devoted to companion animal health.

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