http://www.ovc.uoguelph.ca/pettrust/

Headline: Improving Fracture Repair For Pets

Subhead: Repairing broken bones in companion animals, is no easy feat. In fact, some bone implant procedures come with a high risk of complications that can lead to repeated surgeries or even amputation. A U of G researcher is testing the latest technology in bone implants to help reduce these complications and give pets the same high standards of care as humans.

Body of story:
Using the latest technology in bone implants, Prof. Noel Moens is helping to boost the success of fracture repairs in pets.

Fracturing a bone, particularly a long bone, is quite common in dogs and cats and can be extremely painful. Not only that but repairing certain broken bones can have a high risk of complications only adding to the pet's suffering. In some cases, a fracture that fails to heal may require repeated surgical interventions or even amputation of the limb.

But Moens is trying to change that. With funding from Pet Trust, the clinical studies professor is testing the latest in orthopaedic implants with the aim of reducing the rate of complications. By lowering the risk, Moens is also hoping to decrease the amount of suffering experienced by the animal as well as lessen the overall financial burden on the owner.

"It's not uncommon for pets to have an amputation or be euthanized because the owners can't afford the surgery to repair the fracture or the high costs of complications that can sometimes follow," said Moens. "I am trying to test the tools we have available to us and improve the way we use these tools to see if we can better treat fractures, decrease complications and bring down the medical costs associated with these surgeries."

In a recent study, Moens, along with U of G engineering professor John Runciman, tested the effectiveness of a new type of implant called a locking bone plate on the femur of large breed dogs. The femur is the most common long bone fracture in dogs and cats consisting of almost half of all long bone fractures. This implant, which is currently used in human medicine and is starting to be used in veterinary medicine, works by attaching the plate to the bone with special locking screws.

Unlike the more common implant used in animals that relies on compressing the plate tightly against the bone to provide stability, this new implant firmly attaches to the plate itself and the bone. This technology not only improves the stability of the implant but also allows for space between the bone and the plate for blood to flow to the fracture.

“Decreasing the amount of damage to the blood supply and allowing new blood flow to develop around the fractured bone while also providing excellent stability is important in preventing infection and promoting healing,” said Moens.

The researchers found the locking plate implants were more effective in providing stability to long bone fractures compared to regular plates, however, the screws required for this type of implant are costly. Moens conducted a follow up study where he replaced some of the locking screws with regular, less expensive screws to see if it would achieve the same beneficial results.

“While it did decrease the overall strength, the implant was still effective,” he said. “By replacing some of the locking screws, we were was able to bring the cost of the implant down by several hundred dollars and that savings goes directly to the pet owner.”

The next step is to test a brand new miniature locking plate, which could be used on radial fractures in small dog breeds. The radial bone is one of the two bones in the forearm. Radial fractures are the third most common facture in dogs.

“They are even more common in miniature breeds because these dogs are often jumping down from high places or slipping out of their owner’s arms,” he said. “The impact of the landing can cause stress on their small bones.”

These types of fractures are difficult to fix and have a high risk of complication. The average long bone fracture repair surgery has a five to six per cent chance of complication, whereas repairing a radial fracture in a small dog can have a complication rate as high as 20 per cent, said Moens.

“The bone is so small that there is often not enough room to put all the screws in and therefore stability of the fracture is hard to achieve,” he said. “Also if complications arise, they are often very difficult to resolve because there isn’t enough bone left to work with.”

Small dogs also have very little muscle on the forearm so it’s an area with poor blood supply, which makes healing slow and difficult, he added. The blood supply is then compromised further by the placement of the bone plate.

Moens suspects the new implant technology could improve the success of these surgeries and decrease the overall complication rate.

"The miniature locking plates are smaller so they will likely fit better and will provide superior stability to the fracture than regular plates," he said. "One of the great benefits is the fact that they may preserve blood supply to the fracture better than conventional plates, making them ideal implants for these smaller dogs."

Moens is planning on comparing the strength of the new implant to the plates commonly used to repair these fractures. If the plates prove to be strong enough, he will then test the new implants on dogs undergoing surgery to determine if the locking plates can heal fractures faster and with fewer complications.

"Some complications are to be expected in surgery, however, improving fracture care and decreasing the risk of complication is the goal of this research and will ultimately improve the life of the animal and make the surgery more affordable. Just like with humans, we need to do what we can to ensure all pets have access to the best care."