



Introduction:

Dr. Mair has teamed up with the doctors of Elk Rapids animal hospital to offer advanced surgical services to our patients locally. We can provide these surgical services on an outpatient basis. Dr. Mair will also accept surgical referrals from veterinarians wishing to provide this service to their patients.

Dr. Jacqueline Mair, DVM, DACVS-sa, MBA:

Dr. Mair attended veterinary school at Michigan State University after working for 7 years in the financial industry. Upon completion of her degree she completed a one year rotating small animal internship at the Cummings School of Veterinary Medicine at Tufts University. Once completed she was accepted into a small animal surgical residency at Tufts University. After 3 years of specialized training in all areas of small animal surgery Dr. Mair completed board requirements and examination to become a Diplomate of the American College of Veterinary Surgeons.

Dr. Mair has 17 years of post-residency surgical experience. As a board-certified surgeon she has handled and continues to handle complex cases. Even what would normally be considered a routine case can have nuances that she is able to navigate given her training and experience.

Dr. Mair focuses on soft tissue, orthopedic and neurological surgery. While she has the ability to handle all areas of the surgical spectrum, not all cases can be managed on an outpatient basis. Dr. Mair works with each practice to determine the kinds of cases that can be managed locally.

What is a Veterinary Surgeon?

There are many specialties in veterinary medicine recognized by the American Veterinary Medical Association's American Board of Veterinary Specialties (ABVS). The American College of Veterinary Surgeons (ACVS) is the governing body for the specialty of surgery. A board-certified veterinary surgeon has undergone several years of additional training beyond the 4 years of veterinary school. The ACVS requires surgeons to have a minimum of 1 year of rotating internship which provides training in all areas of medicine. Once completed an intern may begin 3 years of surgical residency at a facility approved by the ACVS. All surgery residents must meet a series of requirements involving specific case load requirements, research and a rigorous examination upon completion. After successful completion of the examination the designation of diplomate of the ACVS is granted.

Surgical Procedures



Cranial Cruciate Ligament Rupture in the dog:

This is the most common orthopedic injury we see in the dog. It is caused by degeneration of the ligament which may or may not be associated with trauma in the dog.

The dog knee has all the same structures as the human knee. The cranial cruciate ligament in the dog is like the anterior cruciate ligament in the human. The dog undergoes a process of degeneration in the cranial cruciate ligament, which leads to rupture. A big difference between the dog's knee and our knee is that the top of our tibia is flat in all ways. The dog's tibia is usually flat from side to side but slopes backward from front to back. The dog's femur (the bone above the knee) sits on the top of the tibia which is a hill. The only structure keeping the femur in position on the tibia is the cranial cruciate ligament. So once this ligament tears the tibia shifts forward when dogs step on the limb. This abnormal motion causes pain and can damage the menisci. The menisci are c-shaped fibrocartilaginous cushions attached to the weight bearing surface of the tibia that are made for the femoral condyles to move in.

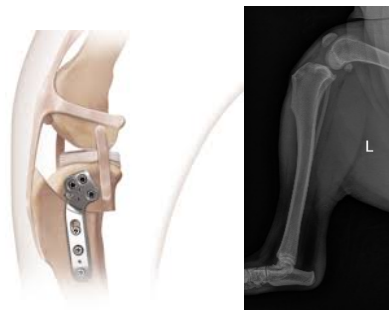
We do not reconstruct the cruciate ligament in dogs. Because the ligament is abnormal it usually tears in the middle. Once torn the body has an inflammatory response. This response can cause pain due to the effusion or excess fluid in the joint secondary to the tear. The body also has special cells that will remove the torn bits of the cruciate ligament over time.

In veterinary medicine stabilization of the dog knee takes place outside the joint capsule. So we do not use graft tissue or reconstruct the cruciate ligament itself. All the procedures we do either change the conformation of the tibia (osteotomy procedures) or mimic the cranial cruciate ligament to stop abnormal motion (cranial drawer or tibial thrust). The osteotomy procedures are tibial plateau leveling osteotomy or tibial tuberosity transposition. The procedures that utilize an implant to mimic the cranial cruciate ligament are fabellar-tibial suture (lateral suture or MRIT) or TightRope Implant technique.

1. Tibial Plateau Leveling Osteotomy (TPLO):

The TPLO changes the conformation of the dog's knee to make it more like ours. We perform a radial osteotomy in the top of the tibia to flatten the hill or the tibial plateau which is the weight bearing surface. Once this is done the dog can load or bear weight on their leg without having abnormal motion (tibial thrust).

The TPLO or tibial plateau leveling osteotomy has become the gold standard in stifle stabilization. This procedure can be done on any size dog. Studies suggest the TPLO results in the best long-term return to function. This is my preferred method of stabilization for the canine stifle.



2. TightRope Technique:

Dr. Cook developed the TightRope technique with Arthrex Veterinary Systems. This technique utilizes an orthopedic fibertape which is very strong. The implant is widely used in human medicine and has been successfully adapted to veterinary medicine. The implant mimics the cranial cruciate ligament outside the joint capsule. The implant is placed through two bone tunnels and runs in the same plane as the cranial cruciate ligament prior to rupture. The implant is anchored to the bone with a toggle on one end and a button on the other. This implant was designed to be used in very large dogs as an improvement on the traditional method of lateral suture or MRIT which used to use a piece of monofilament nylon suture or fishing line to hold the stifle stable. The TightRope technique utilizes an implant that is stronger and is placed through bone tunnels so does not rely on the integrity of soft tissue structures to hold it in place. I would consider this method a large breed older inactive dog. It is important to determine patients that receive this procedure to not have an activity level that will lead to complications with the implant. They must also not have concurrent disease such as diabetes, Cushing's (hyperadrenocorticism), which can lead to complications. Arthrex also makes a mini-TightRope implant which is a good choice for some small dogs in lieu of a MRIT.



3. MRIT (Modified retinacular imbrication technique) or Lateral Suture:

This is the original method of stabilization. This technique has been used for many years and is still used today due it is low technical requirements and cost. This procedure is well suited for some very small



dogs. MRIT or Lateral suture is still used today on larger dogs to keep the expense of stabilization down. This procedure places a piece of orthopedic fiber or monofilament suture from the fabella to the tibial crest. The suture is placed in the same plane as the cranial cruciate ligament prior to rupture. The pitfalls of this procedure is implant failure or failure of the fabellar ligaments holding the suture in place. Once this procedure fails there will be instability and another suture is required to stabilize the stifle. Dogs that have a lateral suture or MRIT will acquire more arthritis over time and generally their function is not as good when compared to the TPLO or Tightrope Technique.

The MRIT is appropriate in some dogs weighting less than 10kg. Although if the patient is young and very active failure can be a concern. In young very active small patients a TPLO or mini-tightrope can be performed.

4. Tibial Tuberosity Advancement (TTA):

The TTA is the second more common osteotomy procedure performed to stabilize the dog (canine) stifle after rupture of the cranial cruciate ligament. This procedure moves the tibial tuberosity or attachment of the patellar tendon cranially to reduce the patellar tendon and tibial plateau angle to about 90 degrees. This eliminates tibial thrust. Outcomes between the TTA and TPLO can be similar, the complication rate is similar as well. However, the TTA utilizes a cage or wedge within the proximal tibia to maintain this osteotomy. The goal is to have woven bone grow into the cage or wedge. If the patient acquires an infection this implant can be extraordinarily difficult to remove. In patients that have acquired an infection the TPLO plate is much more easily removed. I believe the TPLO gives the surgeon more flexibility than the TTA. I no longer perform the TTA and only perform TPLOs as they can be done on all my patients.

Medial Patellar Luxation

This is one of the most common orthopedic diseases in the dog. This has traditionally been more common in the small breed dogs (boston terrier, Pomeranian, Yorkshire terrier, miniature poodle). In the last 10 years the incidence in large breed dogs is much higher (Pitbull, Akita, Great Pyreneese are examples).

The medial patellar luxation is considered in the vast majority of cases to be a development or congenital disorder involving the entire extensor system of the hindlimb. Patellar luxation is seen in conjunction with a variety on concurrent orthopedic abnormalities in the hindlimb such as, hip dysplasia, malformation of the femur or tibia or both, fibrosis of the quadriceps muscles, patellar tendon may be excessively long. Because this is primarily a development disorder these dogs should not be bred.

Clinical signs associated with patellar luxation may be very mild (swinging limb gait) or may be severe with profound lameness (holding limb up), skipping lameness with dog shaking limb prior to using it.

This problem can frequently be diagnosed just by palpation of the knee joint. Radiographs of the hips and knees can help determine concurrent orthopedic disease in the entire limb. Many dogs will have luxations in both knees but some do not. It is not uncommon for a dog to present with a significant lameness in one knee but have luxation in both.



There are four grades of patellar luxation. The most concerning and those that require repair are generally a grade 3 or grade 4. In a grade 3 patellar luxation the patella moves in and out of the femoral groove continuously, but can be moved back into the groove. A grade 4 patellar luxation is the most severe and the most difficult to repair. These patellae are out of the groove and cannot be moved back into the groove.

Repair of a patellar luxation requires the following procedures: release of the tissues medial to the patella; deepening of the femoral groove and moving the patellar tendon attachment (tibial tuberosity transposition) to realign the quadriceps mechanism. There are occasions when the luxation and malformation is severe enough to require a corrective osteotomy.

Fracture Repair:

Fractures can occur in our pets for a variety of reasons. Most fractures can be repaired locally. Examples of fractures we can repair for you are:

Radius and ulna

Femoral fractures

Tibial Fractures



Primary Care Doctor: Name: _____
Address: _____
Phone #: _____
Email Address: _____

Client Information: Name: _____
Address: _____
Phone #: _____
Email Address: _____

Patient: Name: _____
Species: _____ Breed: _____
Age: _____ Sex: _____ Weight: _____

Reason For Referral:

Current Medication:

Known Allergies:

Concurrent Illnesses: (cushings, hypothyroidism, diabetes for example):

Laboratory Tests Complete:

Imaging Complete: (radiographs, ultrasound):

Laboratory tests and radiographs may be emailed to:
erah@elkrapidsanimalhospital.com