Cruciate Ligament Rupture

What is the cruicate ligaments' function and what does its rupture cause?

There are two cruciate ligaments inside the knee joint which cross between the two main bones of the leg, the femur and tibia. Their purpose is to stop forward and backward movement of the thigh relative to the lower part of the leg. When the knee is subject to twisting, especially when under load, a common injury is rupture of the cruciate ligaments, usually just the larger cranial cruciate ligament. Sometimes the ligament can just be partially torn, weakening it and often resulting in destabilisation of the knee and complete rupture down the track.

Some dogs, particularly large breeds, are born with bad hind limb conformation in which the plateau of bone on the top of the tibia is sloped too far forward and downwards. This causes excessive strain on the cranial cruciate ligament and can predispose these animals to rupturing the ligament. Being overweight is also often a contributing factor in these injuries.

Rupture of the cruciate ligament causes the knee to become unstable and results in excessive "sliding" movement of the top part of the leg relative to the bottom. This causes pain and inflammation within the joint and eventually leads to the development of arthritis. It can also result in tearing or crushing of the cartilage shock absorbers, or menisci, inside the knee, resulting in further pain.

How is it Diagnosed?

Usually cruciate ligament rupture can be diagnosed during a consultation after performing a few tests on the dog's leg to assess the stability of the knee joint. Sometimes if the animal is very tense or painful it is necessary to examine the knee under sedation or general anaesthetic to fully assess the knee's stability. Xrays can identify arthritic changes within the knee joint and predisposing factors which may have contributed to the rupture, such as poor joint conformation, but are not necessary to diagnose the rupture.

What are the Treatment Options?

Surgical

Surgical stabilisation of the knee joint is by far the best option for long term comfort and function of the limb. There are several different surgical techniques which have been developed over the years. All surgeries aim to remove damaged tissue from within the knee joint and to stabilise the knee in some way.

Once ligaments are ruptured they do not heal. Partial tears can heal a little, but only by replacing ligament tissue with scar tissue which is no where near as strong. For this reason the torn ligament is not able to be repaired. The pieces of torn ligament can cause inflammation and damage to the inside of the joint, so for this reason all remaining pieces of ruptured ligament are removed from the joint. The cartilage inside the joint is also inspected and any tears are trimmed.

At our practice we use the De Angelis stabilisation technique. This involves placing a tensioned permanent loop of nylon from the front of the tibia to the back of the femur on the outside of the joint. This mimics the function of the cranial cruciate ligament, reducing the forward and back movement which occurs when the ligament is ruptured.

Large breed dogs, particularly rottweilers and labradors benefit from a different surgery called a Tibial Plateau Leveling Osteotomy (TPLO). This operation involves changing the degree of slope of the top of the tibia by removing a wedge of bone. This reduces the forward and back sliding forces on the knee and eliminates the need for a cranial cruciate ligament. This operation can be preformed at the Adelaide Specialist and Referral Center or Adelaide Animal Hospital after referral from our practice. Because a deliberate "fracture" is made, this can be a longer and more painful recovery, but the joint is more anatomically stable afterwards.

Rehabilitation

After the surgery a strict program of rehabilitation must be followed in order for the surgery to be a success. This includes confinement for an appropriate length of time, then a gradual build up of activity and exercise. Physiotherapy exercises will also be prescribed and regular post-operative checks with the surgeon will be necessary to assess the dogs progress. Altogether the time taken for the dog to return to normal function can be from 6 to 12 weeks. If the dog is overweight it is also VERY important to loose excess weight to reduce the strain on the knees and aid rehabilitation and help prevent further damage.

If Surgery is Not Done

If the knee is not stabilised the cartilage inside the joint will continue to be damaged causing pain and leading to general degeneration and arthritis within the joint. Anti-inflammatories can be prescribed to help with this. Over time the joint will eventually stabilise itself by laying down scar tissue, however this method of stabilisation is much more traumatic to the joint and the dog. This type of healing does not result in a joint with normal movement or use, exacerbating arthritis and muscle problems elsewhere in the body. These changes are also usually permanent because the animal cannot maintain a normal body posture on an abnormal knee. Cats and small dogs cope reasonably well without surgery, but medium and large dogs often do not. Obviously surgery is still the best option in all cases.

Arthritis

Unfortunately, after the cruciate ligament is ruptured, some degree of oesteoarthritis will develop within the knee joint regardless of what action is taken. This involves the cartilage becoming damaged and inflamed which then causes more inflammation and further damage to the cartilage in a vicious cycle. As the cartilage degenerates it becomes worn down and can eventually expose the bone beneath it causing pain and further inflammation. These effects are greatly reduced by having surgery promptly after the ligament is ruptured and before a large amount of damage is done to the cartilage, but it is expected that the animal will still develop some degree of arthritis at some point during its life. Weight loss, anti-inflammatory medications, Cartrophen injections and dietary supplementation with fish oil / omega 3s and glucosamine can be used to control and prevent this and the appropriate uses of these can be recommended by the surgeon.