

## Patellar (Kneecap) Luxation (Medial or Lateral)

### What is a patellar luxation?

The patella (kneecap) is the flat, movable bone at the front of the knee (stifle). The kneecap is embedded in the lower end of the quadriceps muscle and forms a tendon (patellar tendon) that attaches to the shinbone. The patella usually runs in a groove of the thighbone (femur) when the stifle is flexed. When the patella pops out of this groove to either the inside (medial) or outside (lateral) a patellar luxation is diagnosed. This dislocation occurs when the knee is flexed and the groove in the thighbone isn't deep enough or the tendon doesn't properly hold the patella in place. Medial luxation of the kneecap is the more common of the two especially in small dogs. The conditions are classified by a grading system with Grade I being the least severe (mild instability without associated signs) through grade IV (complete, irreducible luxation), which is the most severe.



**Pre-Op side view  
showing luxating  
patella**



**Pre-Op bird's eye  
view showing  
luxating patella**



**Post-Op bird's eye  
view showing  
patella in place**



**Post-Op side view  
showing patella  
in place**

### What are the signs and symptoms of MPL and LPL?

Signs that your pet has this disorder may vary with the severity of the disease. This condition may cause your dog to carry his/her leg up during physical activity (lameness). Most pets affected with this condition will carry their leg up for a few steps, and then put it back down and be completely normal. This is due to the patella luxating and creating mechanical lameness that resolves once the kneecap goes back into place. Sometimes you can observe that dogs will kick their leg out in order to pop the kneecap back into place. The lameness may become more severe as time goes on. This is usually due to arthritis or worsening of the severity. Dogs with a high grade luxation do not show the typical 'skipping' lameness since the kneecap does not pop back into place. Dogs who are born with this disease in both legs may have a "bow legged" appearance.

## What are the long term effects of MPL/LPL?

The abnormal position of the kneecap does not allow for normal biomechanics of the knee joint. Depending on the severity, this may lead to exercise intolerance, lameness and pain. The cartilage lining the knee joint is meant to provide a smooth and cushioned area for the knee cap to glide along in a healthy knee. However, as time and the condition progresses, this cartilage may be worn away due to the repetitive motion of the abnormally placed kneecap. This leads to bone on bone interaction within the knee joint which causes pain and will eventually lead to arthritis and further disability. Lastly, dogs with patellar luxations are more prone to develop ruptures of the cranial cruciate ligament.

## What are the causes of patellar luxation?

In some rare cases, this disease can develop secondary to a traumatic injury. However, in most dogs the condition is present at birth (congenital) and is likely due to a misalignment of the bones and muscles of the hind limb that results in the luxation. In many dogs the attachment of the patellar tendon at the shinbone is out of line with the groove and thereby causes the patella to luxate. Many dogs with congenital patella luxation possess a shallow or nonexistent groove because this groove only develops if the patella runs in its correct location during development. Abnormal conformation of the hip joint (hip dysplasia), malformation of the thigh bone, malformation of the shin bone, tightness/atrophy of the quadriceps muscle, and an abnormally long or short patella tendon all can contribute to a congenital patella luxation condition.

## How do you diagnose patellar luxation?

Generally the diagnosis is made based upon palpation during the orthopedic exam. At the same time we will check whether there are other coexistent problems such as a rupture of the cruciate ligament. Xrays will need to be taken prior to surgery to assess the bone conformation and to rule out other problems. In cases of severe luxation it will also confirm the diagnosis since the patella can be seen outside the groove.

## How common is patellar luxation diagnosed?

Small breed dogs, typically in the miniature or toy family are predisposed to this condition. It is unknown how many percent of dogs are suffering from this disease but it is one of the most common causes of hind limb lameness in small dogs. Commonly affected breeds include Chihuahua, Yorkshire Terrier and Miniature Poodle. However, this disease has become more commonly diagnosed in large breed dogs as well. In large breeds the patella may also luxate to the outside.

## When is surgery needed?

Surgery is not warranted in all animals with a MPL or LPL. In general, surgery should not be necessary in animals with a Grade I patellar luxation. Animals that are showing no lameness and the 'skipping' gait is only observed very infrequently (i.e. a few times a year) may not need surgery either. The decision whether surgery is needed also depends on the age of the animal, concurrent diseases and your expectations. We are happy to help you make this decision.

## How do you repair a patellar luxation?

A wide variety of surgical treatment options are available. The decision regarding which technique is best for your pet will be made on an individual basis by us. Surgical repair may include one or a combination of the following techniques:

Trochleoplasty: Deepening of the groove that the kneecap resides so that the kneecap tracks better

Tibial Tuberosity Transposition: Repositioning of the point of attachment of the patellar tendon on the shinbone so that the quadriceps muscle pull is in straight alignment. The portion of the shinbone that is repositioned is held in place by two pins and sometimes a wire.

Soft tissue imbrications/release: The soft tissues on both sides of the patella are loosened on the side that the patella luxates to and tightened on the opposite side.

***Femoral osteotomy:*** If we are concerned that the thighbone is bowed to much, it may be necessary to correct this bowing by cutting the bone (=osteotomy) and straightening it. This procedure requires a bone plate to be applied and is usually only necessary in large dogs.

### **What are possible complications after the surgery?**

First of all it is important to realize that there will be some arthritis that will develop with time, depending on the severity of the luxation. Therefore, it is extremely important to keep your dog lean (which has been shown to decrease the amount of arthritis build up). Lifelong joint support supplements may also be a good idea. Since the surgery requires anesthesia, we will perform bloodwork prior to the surgery to make anesthesia safer. The most common complications directly related to the surgery include relaxation of the kneecap, migration of the pins and infection. In some animals a mild instability will persist but doesn't cause a clinical lameness, if lameness persists a second surgery is needed. Migration of the pins is easily addressed by removing the pins (as long as the bone is healed). If a tibial tuberosity transposition was performed, too much activity (in the early postoperative period) can result in failure of the attachment of the insertion of the patellar tendon which results in lameness and surgery is required. By following the exercise restriction guidelines, many of these complications can be avoided.

### **What is the recovery time from surgery?**

Depending on the surgical measures taken, the recovery time will vary. In general, your pet will be back to normal activity approximately 4 months after surgery. The more aggressive measures including bone alteration require a 6-8 week period of severely restricted activity. This includes strict confinement at home, short leash walks for bathroom use, and physical therapy. No running, jumping or rough-housing is allowed during this period since this may damage the repair. Although your pet may want to return to normal activity sooner than prescribed, it is imperative to restrict their activity in order to ensure proper bone healing and success in the long run. After the first 6-8 weeks your pet can slowly go back to normal activity by slowly introducing increased activity. We will create discharge instructions based on your pet's circumstances and go over them in detail when you pick them up from the hospital.

Please also see the following brochures that are pertinent to this disease:

- Pre-post surgical care
- NSAIDs
- CCL
- Arthritis