



# FUSION VETERINARY ORTHOPEDICS

## **Patella (Kneecap) Luxation**

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### **Introduction:**

Patella (kneecap) luxation is a common orthopedic problem affecting both our small and large canine friends. This condition typically results from abnormalities in bony development of the hind limbs with a mismatch between the soft tissues and the skeleton. The patella is a small bone that is part of the extensor (quadriceps) mechanism. It sits just inside the trochlear groove at the end of the femur (thigh bone). It helps to direct the pull of the quadriceps muscles in a way that a pulley redirects a cable. The patella is found within the patellar ligament, which attaches to the point of the tibia (shin bone). This mechanism allows for pain free and efficient extension of the stifle (knee). If the patella is luxated either to the inside or outside of the stifle, then this pulley system is severely affected causing pain and stress around the stifle. Furthermore, if the patella can pop in and out then wear and tear on the cartilage of both the patella and trochlear ridge occurs resulting in osteoarthritis. (OA).

### **How does this occur?**

Patella luxations occur from a developmental disorder that occurs after birth. The most common type of patella luxation is known as a medial patella luxation (MPL); however, lateral patella luxations (LPL) can occur. The exact causes are still unknown; however, it is thought that changes beginning at the hip are partially responsible. The changes at the hip result in a sequence of skeletal changes of the thigh and shin bones. The changes noted are outward bowing of the end of the thigh bone causing thigh bone to bend inward/outward (varus/valgus) and be turned outward/inward (external/internal torsion). Furthermore, the shin bone may develop with rotation in the knee or external/internal torsion of the bone so that the point of the shin will be in an abnormal location. Because of these changes the extensor mechanism has a tendency to pull the patella to the inside or outside of the knee. Lastly, the trochlear groove where the patella should be located is often times under-developed leaving it shallow or absent.

### **Clinical Signs and Diagnosis:**

Often an intermittent lameness will be noted beginning at a young age. It is common to note that dogs will have a bunny-hopping gait or will tend to skip. If the patella is popping in an out dogs will sometimes kick their leg out almost as if stretching it while walking or running. This occurs when the patella luxates and the dog is trying to get it back into a normal place. Sometimes a cry or yelp may be heard when the patella luxates, and the dog may hold the leg up and not use it. With long standing patella luxations muscle loss may be noted in one or both hind limbs. An orthopedic examination at Fusion Veterinary Orthopedics is needed to diagnose the problem as



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well as establish a grade of luxation from 1-4. A grade 1 patella luxation is classified as the patella being in the correct location; it can be luxated but pops back into place once pressure is released. This is differed from a grade 2 patella luxation where the patella is in the correct location, but once luxated will not easily pop back in. Grade 3 and 4 luxations, the patella is always in a luxated position, while with a grade 3 the patella can be reduced versus a grade 4 the patella can not be reduced. Radiographs (X-rays) and/or a CT scan are performed to determine the location of the patella, if there is any underlying arthritis, as well as any bony abnormalities.

## **How is this treated?**

For mild luxations (grade 1 and non-clinical grade 2), surgery is typically not indicated; however, formal rehabilitation at Fusion Veterinary Orthopedics to strengthen the quadriceps muscles and improve patellar tracking is beneficial. Furthermore, formal rehabilitation may help in preventing worsening of the clinical signs and avoidance of surgery in select cases. Surgery is indicated in cases of grade 3 and 4 luxations as well as with grade 2 luxations that are causing clinical signs. Your dog would be placed under general anesthesia; initially a small camera (arthroscopy) is inserted into the stifle (knee) to evaluate the structures. Following, an incision is made on either the inside or outside of stifle (knee). Once the stifle joint is exposed the trochlear groove will be evaluated. If it appears shallow, then a deepening of the groove will take place (trochleoplasty). This is completed by removing a small block of cartilage, deepening the underlying bone and replacing the cartilage back. If the groove is beyond repair it can be replaced by a patellar groove replacement. Additionally, the soft tissues on the side towards the luxation will be released while the soft tissues opposite the side of luxation will be tightened (imbricated). In addition, if the point of the shin is in an abnormal position, a cut is made and the bone is moved towards (tibial tuberosity transposition) the side opposite the luxation to improve the overall alignment. This cut in the bone is then held in place by small wires. If excessive rotation is noted an anti-rotational suture may be placed. In more severe cases the end of the thigh bone or shin bone may be cut and straightened and held stable by a bone plate.

## **What happens after surgery?**

After surgery you dog will need a period of rest and relaxation of about 8-12 weeks. This means no running, jumping, or playing. They will need to be taken outside on leash to urinate and defecate; excessive climbing up and down stairs or on and off furniture should be avoided. We recommend when not directly supervised that patients be placed in a crate, small laundry room or bathroom, or a small portion of the house sectioned off so that your dog can't overdo it. Excessive activity will lead to implant breakdown, soft tissue injuries, or delayed healing.



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If staples/sutures are present they will be removed, or the incision evaluated at approximately 2 weeks after surgery and radiographs will be needed at either 4-6 or 8-10 weeks after surgery to evaluate healing. At these rechecks an orthopedic exam will also be performed to ensure the surgical site is healing as expected.

Just as with people we recommend physical rehabilitation at Fusion Veterinary Orthopedics beginning 2 weeks after surgery. Rehabilitation will involve once to twice weekly formal rehabilitation sessions along with at home exercises. We have noted quicker healing, maintenance of muscle mass and range of motion, and superior outcome in the patients that undergo formal rehabilitation. Furthermore, rehabilitation offers an outlet of energy in controlled manner so that your dog is still able to maintain some activity while healing. Patients that have been treated conservatively usually require once to twice weekly rehabilitation for a period of about 3-6 months.

Following surgery, we recommend that patients begin oral joint supplements and omega-3 fatty acids, maintain a healthy body weight, and remain active once healed from surgery. These things will be the beginning blocks along with surgery to minimize and slow down the progression of OA.

## **Are there any complications?**

As with any surgery there is always the possibility for complications. Our team at Fusion Veterinary Orthopedics takes all precautions necessary to minimize any complications. Unfortunately, the most common complication after patella luxation repair is luxation of the patella; however, in most cases if this occurs it is typically to a lesser grade, and infrequently needs additional surgery. If the patella luxates after surgery and begins to cause a clinical problem, then additional surgery may be recommended. Other complications to consider are infection after surgery; however, infection rates are low after this type of surgery. Furthermore, to ensure keeping infection rates low you dog will receive antibiotics before, during, and in some cases after surgery. Additional, just as if any individual human or animal undergoes anesthesia, it is considered very safe, but there are risks involved. Because of this risk a complete physical exam and blood work is completed by our team. During surgery your pet will be always monitored by one our trained staff members to ensure the highest level of monitoring and safety.