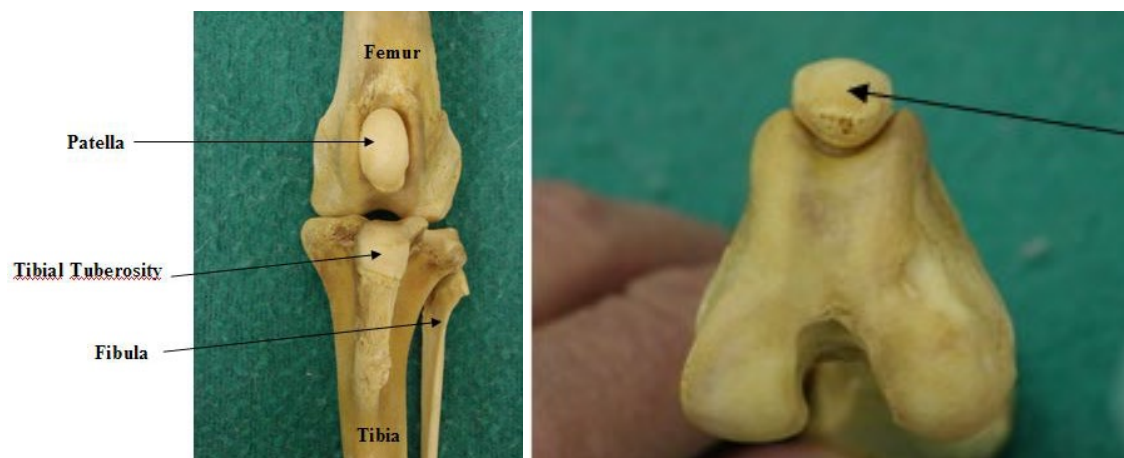


Patella Luxation

The patella or “kneecap” is a bony structure that attaches the quadriceps muscles to the patellar ligament. Normally it sits in a groove (femoral trochlea) and slides up and down on cartilage in this groove as the knee extends and flexes. (Figure 1) Patella luxation occurs when the patella pops outside the groove and slides against bone and other tissues instead of cartilage. In small breed dogs, medial patella luxation (MPL; patella pops to inside of groove) is a common problem. In other breeds medial (inside) or lateral (outside) patella luxation can occur. Symptoms that your pet may show vary depending on severity and duration of the patella luxation and if the patella luxation is unilateral (one knee) or bilateral (both knees). Intermittent hopping (Video 1: Patella luxation hopping) on a leg and decreased ability to jump up or climb stairs are common owner complaints.

Figure 1. Anatomy of knee showing normal relationship between patella and femoral trochlear groove.



Diagnosis

Patella luxation is diagnosed by findings in an orthopedic exam by feeling the patella pop outside of the groove. Patella luxation is graded based on severity; to some degree severity can guide clinical management and prognosis.

Grade 1: The patella normally stays inside the groove but can be pushed outside the groove during exam. Since patella luxation does not occur during normal activity, no treatment is required.

Grade 2: The patella pops outside of the groove during normal activities but it also can pop back into place without assistance. In general, the patella spends the majority of the time inside the groove. Often the first symptom at home is occasional hopping with the use of only one rear leg for a short period of time before a return to near normal function. Surgery is generally recommended for dogs with a Grade 2 patella luxation. Grade II patella luxation can progress to a Grade 3 patella luxation because the ridge that keeps the patella in its normal place wears down (becomes lower) making it easier and easier for patella luxation to occur. Although medical management is reasonable, surgery offers an excellent prognosis for near normal pet function. Arthritis in the knee will develop in dogs with a Grade 2 patella luxation.

Grade 3: The patella luxation is outside of the groove the majority of the time but it can still be manually reduced back into its normal position. Unfortunately, the patella will not stay in its normal position in these cases without surgery. Surgery is generally recommended for dogs with Grade 3 patella luxation. Although medical management is reasonable, surgery offers an excellent prognosis for near normal pet function.

Grade 4: The patella is outside of the groove all of the time and it cannot be manually reduced back into its normal position. Grade 4 patella luxation is commonly associated with complicated anatomic abnormalities. Since there are commonly complex anatomic abnormalities, nonsurgical management is generally ineffective in this situation. Surgery for Grade 4 patella luxation can also be challenging – each case is different so speak to the surgeon about potential benefits, risks and the possibility that multiple surgeries are needed.

It is also important to determine if there are concurrent anatomical abnormalities (e.g. the tibial tuberosity where the ligament attaches is abnormally positioned or the femur is too curved in shape). Finally, dogs with a patella luxation are predisposed to developing a torn cranial cruciate ligament and some dogs that have patella luxation initially present with a torn cranial cruciate ligament (CCLD). Radiographs of the knee help rule out other causes of pain; the patella may or may not be in the groove on the radiographs.

Treatment

Nonsurgical/Medical Management: Nonsurgical management of patella luxation may incorporate weight loss if needed, use of a nonsteroidal anti-inflammatory drug (NSAID), use of an omega-3 fatty acid diet (e.g. Purina J/M or Hills J/D), pain medication (e.g. Amantadine) if needed and controlled activity (e.g. leash walks, swimming, cavalettis). Regardless of a patient's treatment plan, medical management is often incorporated into the long-term treatment plan to limit symptoms from arthritis.

Tibial Tuberosity Transposition (TTT): The goal of TTT is to better **align the quadriceps mechanism**. It is very common that dogs with medial patella luxation have a tibial tuberosity that is too medial and TTT is performed to align it in the middle of the tibia. During this procedure the tibial tuberosity is cut off with a bone saw or osteotome, placed in its new position and then stabilized with pin(s) ± cerclage wire.

Femoral Trochleoplasty: The goal of this procedure is to deepen the femoral trochlea so the patella both rides on femoral cartilage sits and does not pop out of joint. While there are technically simple procedures that deepen the groove and sacrifice the cartilage, **it is important to preserve the cartilage** on the femur. This is best done with semicircular recession trochleoplasty (SCRT) (Video: SCRT Teaching Animation) or block recession. These techniques preserve the most cartilage on the femur. While the SCRT technique requires special equipment, it can be performed in all sized dogs and cats.

Postoperative care can vary but the use of antibiotics, analgesics, visual inspection of the incision for signs of infection, and exercise restriction (multiple 5-10 minute leash walks each day with limited access to stairs and jumping) for 6-8 weeks are common. Suture removal 2-weeks after surgery and recheck radiographs 6-8 weeks (to document bone healing) after surgery may be necessary. Once the bone is healed the implants are not needed but the implants are seldom removed unless they are infected or causing inflammation. Complications include infection, implant migration, recurrence of luxation and nonunion (not healing). Prognosis for dogs with a Grade 2 or 3 patella luxation is excellent

(90-95% of patients return to good pet function). Cost is approximately \$4500-6000 depending upon the luxation grade and implants needed.