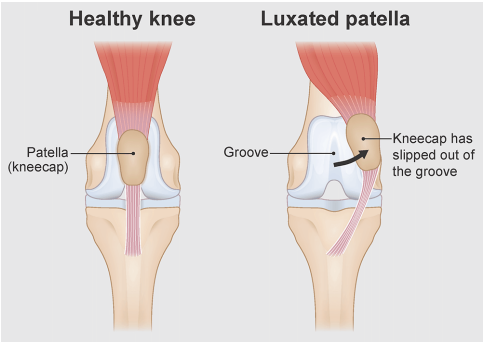
Canine Medial Patellar Luxation

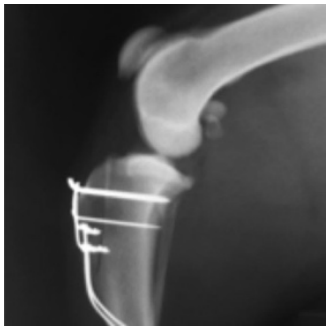
What is patellar luxation?



The patella or “kneecap” sits at the front of the knee within the quadriceps muscle and slides up and down within a groove. Patellar Luxation is when the kneecap slips out (dislocates) from the groove. This typically occurs secondary to malalignment of the quadriceps mechanism. Deformities in the hip, femur (thigh bone) and tibia (shin bone) develop during growth & contribute to poor alignment of the quadriceps muscle group "pulling" the patella out of position. Patella luxation may occur at this time or much later following a traumatic event; soft tissues that have previously resisted the “pull” created by the underlying problem of malalignment finally tear allowing the patella to luxate. A simple 4-grade system represents the severity of malalignment. Assessment is based on how often the patella is luxated and the ease of reduction; the patella luxates intermittently for grade 2, is permanently luxated for grades 3 & 4 and cannot be reduced for grade 4.

Patellar luxation is painful and destabilises the knee, placing increased strain on other joint stabilisers including the cranial cruciate ligament (CCL). Chronic patella luxation is a risk factor for tearing of the CCL. When the patella luxates there is abrasion between the underside of the patella and the trochlear ridges, resulting in permanent wear to the articular cartilage; a deep “ulcer” in the articular cartilage of the underside of the patella can eventually develop exposing the subchondral bone. This is painful and irreversible, increasing inflammation and the rate of progression of osteoarthritis. Patellar luxation is preferably treated as **early as possible** to minimise cartilage damage and strain on the CCL.

Treatment options



Surgery is primarily aimed at improving alignment; tibial tuberosity transposition corrects alignment at the level of the attachment of the patella tendon on the tibia; it sufficiently improves alignment in most cases. Releasing incisions are performed to relieving tension on the inside of the knee joint including release of the cranial belly of the Sartorius muscle. Imbrication is performed to tighten the outside of the knee joint. Rectangular block recession trochleoplasty may be performed to deepen the patella groove when the existing patellar groove is particularly shallow, however groove deepening is markedly invasive and should only be performed when necessary. These procedures will be sufficient to maintain the patella within the trochlear groove in most cases; however, sometimes the patella will continue to luxate despite these interventions. This is not unexpected given the complexity of the deformities from **hip to knee** that contribute to patellar luxation and the relatively simple alignment adjustment typically used to manage this condition. In cases of persistent luxation, more complex surgery to correct deformities of the **distal femur** and/or at the level of the **hip** may be necessary. For some grade 3 and particularly for Grade 4 luxations, these procedures may be necessary as components of the primary surgery.

The cranial cruciate ligament will also be assessed during exploration of the knee joint (patellar luxation increases strain on CCL). If tearing of the CCL is identified additional surgical procedures are typically necessary e.g. TPLO, IPLS iso-toggle.

Outcome and potential risks of surgery

Most dogs progress uneventfully following surgery to correct patella luxation and are eventually able to return to their normal activities. Many dogs improve significantly within the first month following surgery; nevertheless, it may take several months before a dog has **fully** recovered. Dogs with chronic knee problems and especially those with substantial muscle atrophy and/or dogs that have had previous surgery will progress more slowly.

As with any surgery, complications may arise as detailed below, although serious complications are uncommon.

- Infection is an uncommon complication as strict sterile technique is used during the surgery and antibiotics are administered during +/- after the procedure. Should an infection occur, early detection and treatment often result in rapid resolution, although sometimes removal of the implants may be required once the bone has healed.
- The pins and wire placed at the top of the shin bone are easy to feel under the skin. Excessive early activity may increase the risk of loosening or breakage of pins, wires and screws and/or fracture of the tibial tuberosity or trochlea which may necessitate further surgery.
- Repeated patella luxation gradually wears away the cartilage on the underside of the patella eventually exposing the underlying bone. Surgery to stabilise the patella cannot reverse historical articular cartilage damage/loss.

- Arthritis is usually present at the time of surgery and will invariably progress. Chronic patella luxation is usually associated with significant cartilage erosion; arthritis is typically more advanced. Previous knee surgery may also be associated with more severe arthritis. Unfortunately, it is not possible to reverse arthritic changes in the joint or recover eroded cartilage but stabilising the knee may reduce inflammation and slow the progression of arthritis.
- Partial or complete tearing of the patellar tendon in the recovery period is a rare but serious complication. Increased tendon loading and reduced blood supply in the postsurgical period may play a role, as may damage during surgery; obesity, age hormonal influences and excessive activity are potential risk factors.
- Persistence or recurrence of patella luxation may occur, including luxation in the opposite direction. Quadriceps malalignment involves deformities of the hip, femur, and tibia; whilst improving alignment at the level of the tibia will often be sufficient to resolve patella luxation it does not address all deformities present. Further surgery is indicated to manage persistent patellar luxation. This may include revising tibial tuberosity transposition, transposition of muscle attachments at the stifle or hip and distal femoral osteotomy to address femoral deformities.

Postoperative care

- A pad may be covering the wound at the time of discharge from the hospital. This can be removed after several days, or immediately if soiled. Medications e.g. Pain killers will be dispensed.
- Ice packs may also be helpful in the days following surgery to reduce swelling and improve comfort.

Confine appropriately to **eliminate running and jumping** for 8 weeks; choose appropriate confinement to achieve this for your dog; cage confinement is advised. Short **leash** walks in the garden (a few minutes four to six times daily) are recommended to allow toileting. Keep your dog at your side; use a lead of no more than 1-metre length.

- Two weeks following surgery: commence lead walking for 5 minutes at a time, two to three times daily.
- Three weeks following surgery: continue lead walking for 5 minutes at a time, two to three times daily.
- Four weeks following surgery: increase lead walking to 7 - 9 minutes at a time, two to three times daily.
- Five weeks following surgery: increase lead walking to 10 minutes at a time, two to three times daily.
- Six weeks following surgery: increase lead walking to 12 - 15 minutes at a time, two to three times daily.

X-rays are typically taken between four- and six weeks following surgery to assess implants and bone healing.

Staged unilateral MPL procedures versus bilateral MPL as a single procedure

Operating both knees together reduces total recovery time; however, the risk of complications may increase. The longer anaesthetic time increases the risk of anaesthetic complications; it also proportionately increases temporary suppression of the immune system, potentially increasing the risk of infection. Bilateral orthopaedic procedures may increase the risk of fixation failure, although the risk may be proportionately lower in smaller patients. Reported complication rates for dogs < 12 kg undergoing single surgery bilateral MPL procedures versus staged procedures are comparable; however, data is somewhat limited. To summarise, staged surgeries should be safer, particularly for compromised or geriatric dogs; however, the increased risk of operating both knees together is likely low for **small** healthy dogs.

Declaration:

I have read the preceding information; I am satisfied I have a sufficient understanding of the surgical management of patellar luxation; I hereby consent for my dog to undergo: (tick preference **and** strike out undesired option)

☐ **either** Left **OR** Right knee surgery as deemed appropriate by the surgeon (you may strike out undesired side)

☐ Bilateral MPL procedures in a single surgery.

Owner's name: Dog's Name:

Owner's signature: Date:

For further information and explanatory videos go to: bonevet.com.au/review-articles/patellar-luxation/

Mark Tonzing BVSc (Hons) MANZCVS (Small Animal Surgery) MRCVS
www.bonevet.com.au