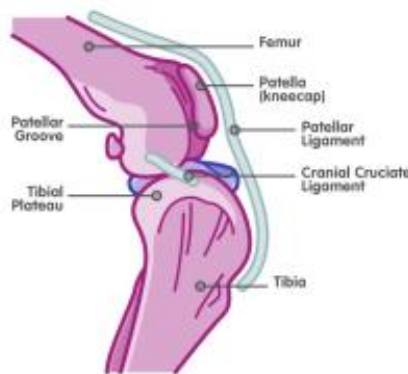


Patellar Luxation

The patella (kneecap) is the small bone at the front of the stifle (knee) that makes up part of the knee joint. As the stifle flexes and extends, the patella glides up and down within the trochlear groove at the end of the femur (thigh bone). In dogs with patellar luxation, the patella luxates (dislocates or “pops out”) out of its normal location. Because of this, the dog is unable to extend the knee joint properly and often results in a skipping lameness where the dog is seen to run on three legs. As well as the lameness caused by the mechanical problem, patella luxation will also result in a degree of pain and lead to osteoarthritis.

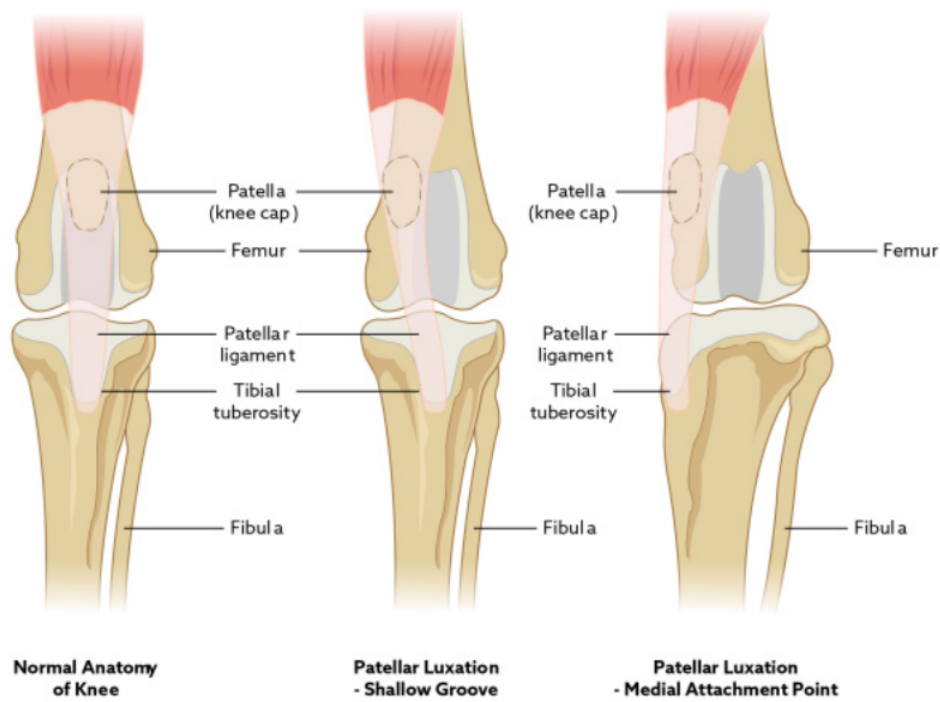


Patella luxation is a common developmental condition in dogs but quite rare in cats. More often, the patella luxates medially, to the inside of the leg. Medial patella luxation is common especially in small breed dogs, such as terrier types, Chihuahuas, Bichon Frise and Poodles, and can be a consequence of selective breeding for a preferred (bow-legged) conformation. Lateral patella luxation is less common, but can cause more problems, especially in larger breeds, or can be a result of trauma such as a road traffic accident.

The affected dogs are born with normal knees, but begin to develop abnormalities of the bones and muscles of the hindlimbs as they grow. When the powerful quadriceps mechanism starts to displace in this direction, it acts as a bowstring and causes the bones of the thigh (femur) and shin (tibia) to deform into a pronounced outwards bow. The groove that normally houses the patella does not develop properly and is too shallow for the patella to stay in it.

When the patella doesn't sit in the centre of the patella groove, it luxates and slips out of the groove instead. This is ultimately because three structures are not in a straight line;

1. Tibial tuberosity - the bone at the front of the tibia
2. Femoral sulcus - the groove in the lower femur
3. The muscles and tendons pulling on the patella.



What are the symptoms?

Most animals start showing signs as puppies or young adults, although mature dogs can also suffer from patellar luxation. You might notice your pet ‘skipping’ as they walk, with their hind leg carried off the ground for a few steps before quickly returning to normal. This happens when the patella slips out and stops when it goes back into the groove again. Some animals will limp continuously, especially if osteoarthritis has developed. If both knees are affected they may have difficulty walking, or move with a stiff, upright gait. This can sometimes be mistaken for hindlimb weakness due to a neurological condition.

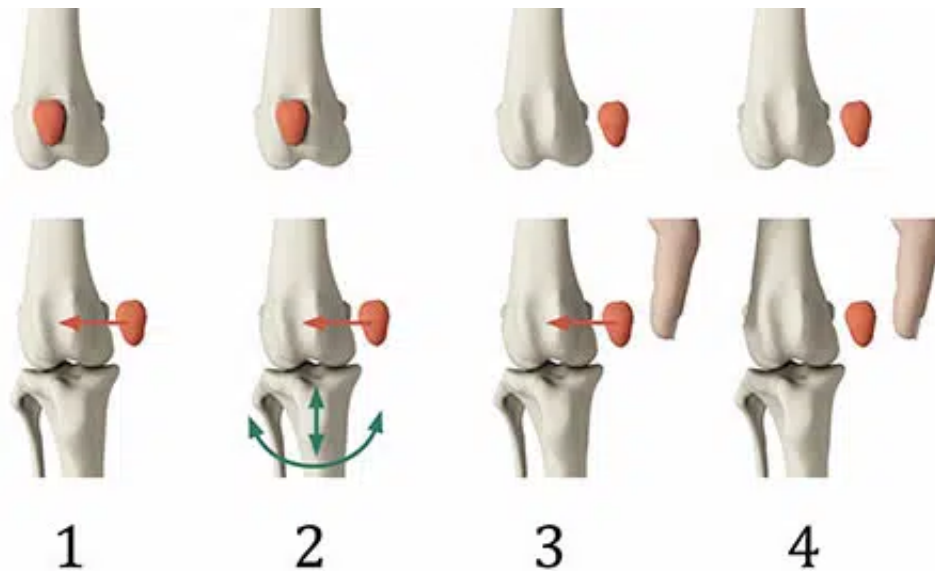
Patella luxation grading system

Grade 1: the patella can be pushed out of the groove digitally but as soon as the pressure is removed, the patella returns to its normal position.

Grade 2: the patella sits approximately half the time in the groove and half the time out of the groove. It can easily be manipulated in or out but has no tendency to stay in either position.

Grade 3: the patella spends almost all the time outside the groove and with pressure can be pushed back into the groove.

Grade 4: the patella spends all the time outside the groove and even with pressure the patella cannot be pushed back into the groove.



While the patella is out of the groove, it wears away at the ridge causing cartilage erosion and ulcers on the underside of the patella. The groove becomes shallower, making the problem worse. Degenerative joint disease then develops causing worsening of the pain and lameness. Over time, abnormal loading of the joint can also lead to tears in the cranial cruciate ligament.

Diagnosing patellar luxation

Your vet may be suspicious of luxating patella in your dog if you or they have noticed a skipping motion as they walk. The vet may be able to feel the patella popping in and out of the groove when they examine them. Sometimes dogs are too tense and nervous at the practice for the vet to be able to do a full examination while they are conscious, and your dog may require light sedation. The vet will most likely recommend x-rays or a CT scan of the hindlimbs to assess any physical abnormalities, bowing of the limb, depth of the trochlear groove and degree of osteoarthritis present.

Treatment for patellar luxation

The treatment required depends on the severity of the luxation. The vet will give your dog a diagnostic grade based on how mobile the kneecap is relative to the groove. There are four recognised diagnostic grades, with 1 being the lowest and 4 being the most severe (see above grading system).

For grade 1 patella luxation, patients can often be treated conservatively with a combination of anti-inflammatory medication, physiotherapy and hydrotherapy.

For grade 3 and 4 patellar luxation, surgery is strongly advised, and may also be recommended for grade 2 cases if your dog is presenting with persistent lameness.

Surgery for patellar luxation is incredibly effective, freeing 90% of dogs from lameness and dysfunction.

The surgery

The aim of surgery is to restore the normal alignment of the quadriceps muscle relative to the entire

limb. This requires reshaping of the bones and reconstruction of the surrounding soft tissues.

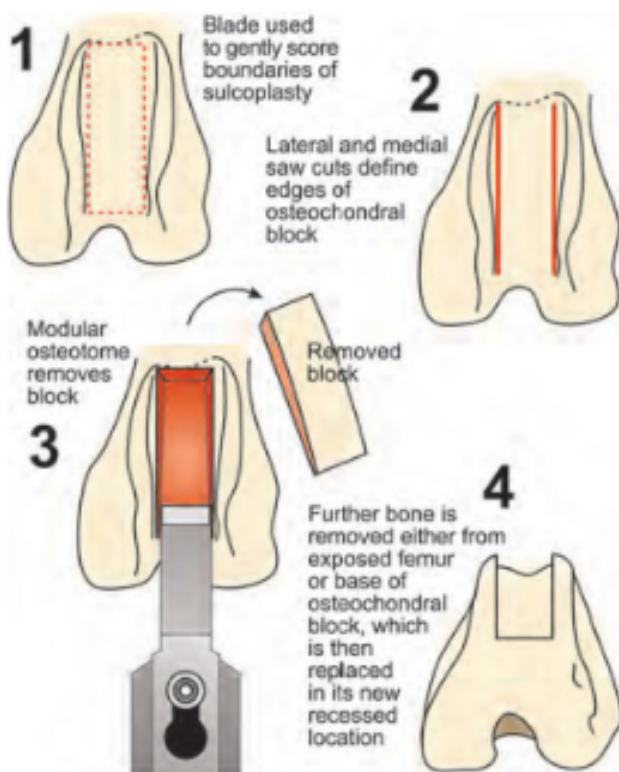
Wedge or Block Sulcoplasty

When the trochlear groove is very shallow, a procedure called a sulcoplasty can be performed to deepen the groove. This involves removal of a triangular wedge or block of bone, the groove is then deepened and the wedge replaced in a recessed position.

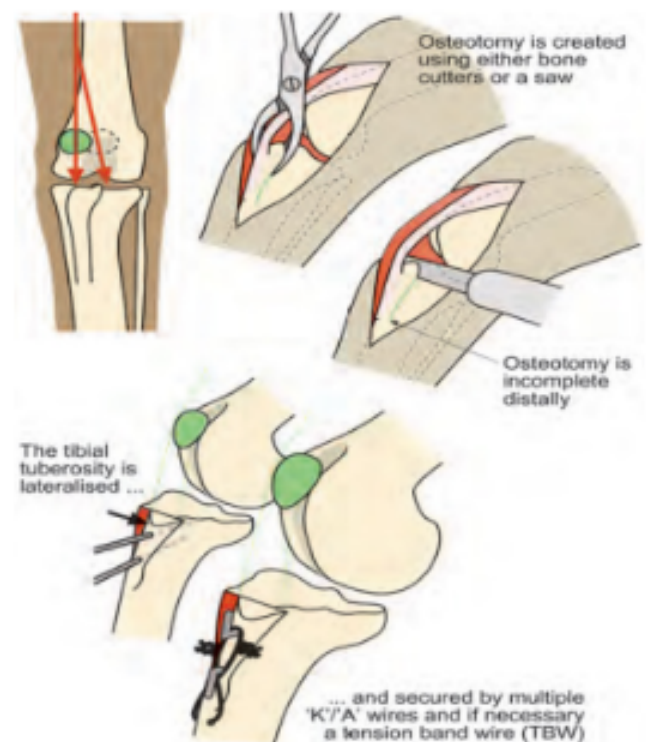
Tibial Tuberosity Transposition (TTT)

The TTT is most important part of the surgery to realign the insertion of the tendon spanning between the patella (kneecap) and tibia (shin bone). The top of the tibia that is attached to the tendon is cut and moved to a more appropriate position. It is pinned back into place and the bone heals gradually over the following 4-8 weeks. A tension band wire is often placed in addition to the pins so that the pull of the quadriceps muscle is effectively balanced by wire anchored to the tibia in the opposite direction.

Block Recession Sulcoplasty



Tibial Tuberosity Transposition Surgery

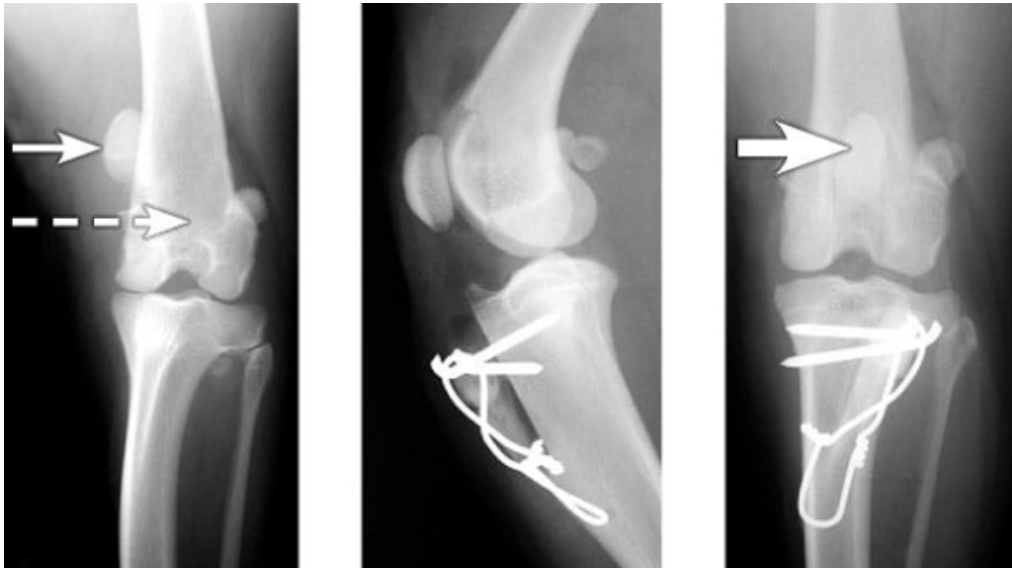


Femoral varus osteotomy

In dogs with severe bowing of the femur (thigh bone), sometimes the surgeon will have to straighten the femur by taking a wedge of bone out of the femur and repairing it with a plate and screws. CT scans are particularly useful when planning these complex corrections.

Soft tissue reconstruction

In most dogs affected by patellar luxation, the soft tissues on either side of the patella are either too tight or too loose. Reconstructions are usually performed to release the tight tissues on one side and tighten the loose tissues on the other side.



*Pre x-ray showing the displaced patella (white arrow) and the trochlear groove (dashed line),
and two post op x-rays showing the surgical repair*

Aftercare

- An Elizabethan (buster) collar should be worn at all times for the first 2 weeks.
- Pain relief (anti-inflammatories) will be prescribed for your dog for 4-6 weeks.
- Some surgeons will prescribe prophylactic antibiotics for the first week post operatively due to the presence of metal implants in the bone.
- Your dog should be rested in a cage at all times for the first 6 - 8 weeks, until the bone has healed. They can be taken out on short lead walks for toileting purposes only.

A post op check would be recommended about 5 - 7 days post surgery.

A recheck appointment is then recommended 6 weeks after surgery. Your dog will be sedated for X-rays to check that the bone is healing and there are no concerns with the implants.

If you have any problems before then, please contact your vet. It is better to have a recheck than miss a problem.

Time after surgery:

First 2 weeks	3 x 5 minute lead walks
2 - 4 weeks	3 x 10 minute lead walks
4 - 6 weeks	3 x 15 minute lead walks
6 - 8 weeks	3 x 20 minute lead walks
8 - 12 weeks	Gradual return to normal exercise
After 12 weeks	Normal activity

Potential Complications

- **Surgical site infection or infected implants** – this is usually due to the dog licking their wound. It can also occur during surgery, recovery or through haematogenous spread (through the blood stream) e.g. if they have had diarrhoea.
- **Seroma formation** – this is relatively common, it is an insignificant fluid accumulation round the wound. It usually improves without any treatment.
- **Implant failure** – this is very rare and is normally due to extreme activity in the post op period or incorrect selection of bone plate.
- **Bone fracture** – this is also very rare and is again, normally due to extreme overactivity.

Signs to watch out for;

- Swelling, heat or redness around the wound after surgery; this is often a seroma but it is always worth having it checked by a vet.
- Any discharge from the wound, especially if smelly or yellow.
- Sudden worsening of the lameness that lasts for more than 12 hours.

To book in for your pet in for a health check, please call us on 01423 228080 or visit www.clarohillvets.co.uk.