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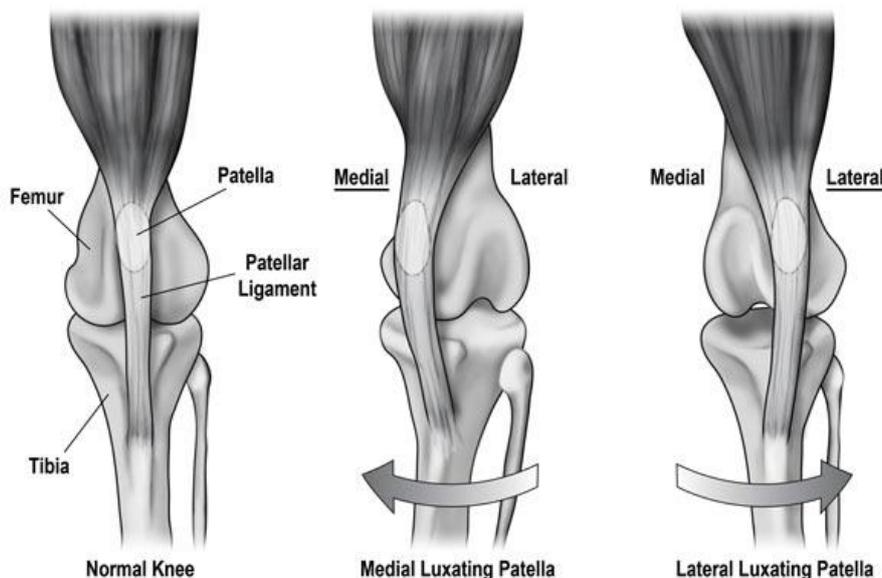
PATELLAR LUXATION

OUR GUIDE TO DEALING WITH A 'SLIPPING KNEECAP'

What is a luxating patella?

The patella is the correct medical name or the kneecap and luxation is a term used to describe something that has moved out of the correct anatomical position. The patella normally sits in a groove (the trochlear groove) on the front of the femur and when the knee (or 'stifle') is moved the patella slides back and forth in this groove. The quadriceps muscles on the front of the thigh attach to the patella via the patella ligament which then attaches to the top of the tibia (shin bone). The patella acts to help cushion the passage of this ligament across the front of the knee as the joint flexes and extends in normal motion.

In patellar luxation, the patella is pulled out of the correct position so that it glides outside of the groove - most commonly on the inside of the knee (a 'medial' patella luxation) but sometimes on the outside (a 'lateral' patellar luxation). In some dogs it only pops out of the groove occasionally and usually briefly (a grade 1), in others it pops out very frequently and will often stay out of position (a grade 2) and in the most severe cases the patella is never in the correct position (grade 3 and 4 depending on severity).



What are the symptoms of patellar luxation?

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The lameness caused by a luxating patella is often quite characteristic in that it tends to cause a sudden, intermittent hop which may or may not appear painful. Typically a dog may be running along quite normally and will then lift the affected leg and carry it when the patella luxates before resuming a normal gait when it pops back in. In grade 3 or 4 luxations the patella is located permanently out of the groove so a more persistent lameness is seen and the whole leg may be rotated inwards or outwards due to the pressure of the patella pushing on one side of the knee.

What causes the patella to 'luxate'?

The luxation is usually caused a twist in the leg at the level of the knee joint caused but either a bend in the femur or a slight deviation in the attachment of the patella ligament to the top of the tibia (the tibial 'tuberosity'). This is a developmental issue that is usually due to individual growth factors and genetics.

What breeds and age of dog are affected?

Usually smaller breed are affected though not exclusively - it is also fairly common in Staffordshire Bull Terriers and Springer Spaniels as well as some giant breeds. The problem usually first appears in young adults though it can appear in younger and older animals too.

How is the condition treated?

In **grade 1** luxations, medical management is usually acceptable and this may include taking measures to reinforce joint cartilage (such as joint supplements and cartrophen injections) as well hydrotherapy and K-laser to strengthen and support the muscles and tendons around the knee.

In **grade 2** luxations, many dogs will cope fine for several years but over time the continual movement of the patella in and out of the correct position causes erosion of the cartilage within the knee and eventually leads to arthritis.

In **grade 3 and 4** luxations, the degree of lameness is usually very debilitating and surgery is needed at a fairly early point to restore normal stifle joint function and prevent long term disability.

What does surgical treatment involve?

There are usually three steps to correcting a luxating patella:

(1) Correcting the alignment of the knee - the tibial tuberosity (or 'crest') transposition (TTT)

It is important that the groove in the femur (the patellofemoral groove) and the attachment of the patella ligament to the tibial tuberosity (also known as the tibial crest) are aligned in a straight line

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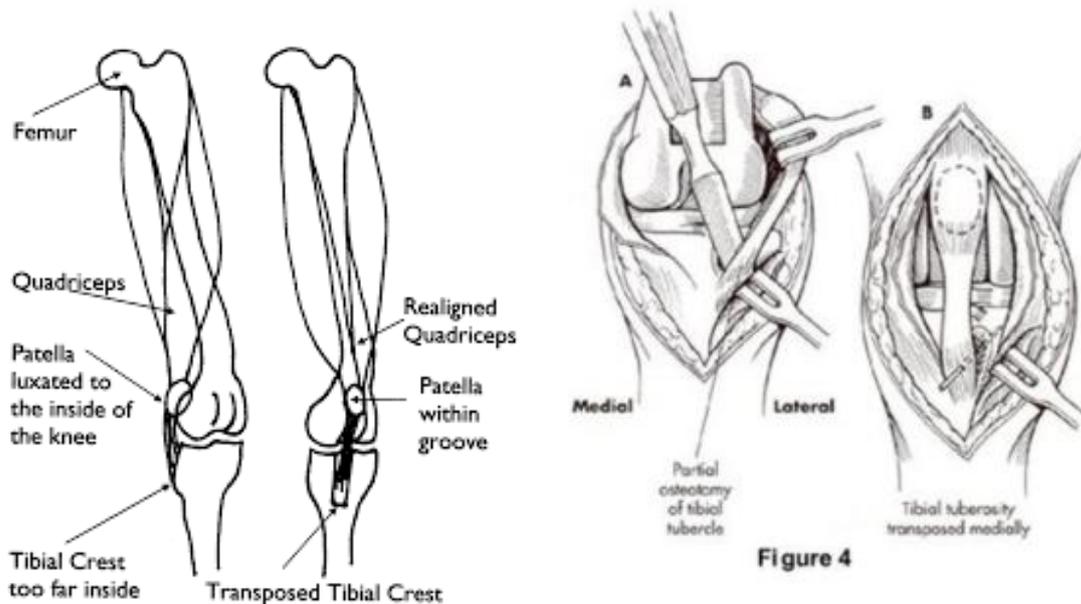
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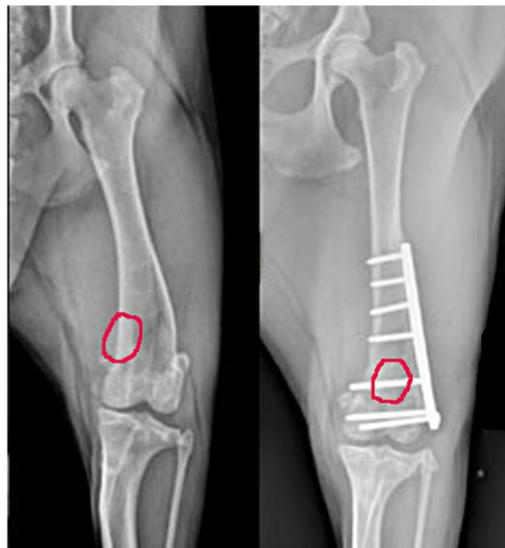
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so that there is no force acting to pull the patella out of position. This usually involves making a cut in the front part of the tibia to separate the tibial tuberosity from the rest of the bone and then moving it sideways to a more central position. A combination of pins and/or wires are then used to anchor it in the new position.



In some large breed dogs the patella luxation may occur due to a bow in the femur above the level of the knee joint and in these cases it may be necessary to perform a corrective osteotomy to straighten the femur. This involves cutting the femur, removing a wedge of bone and then tightly securing the cut ends with a strong plate.



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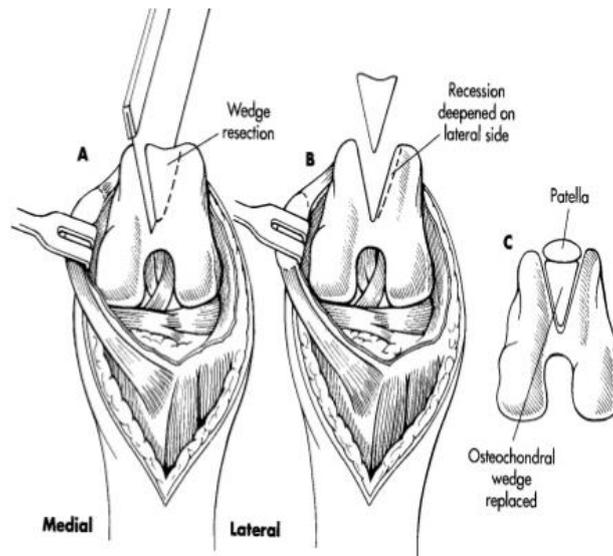
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(2) The sulcoplasty - improving the groove that the patella sits in

The front of the femur at the level of the knee has a cartilage-lined groove known as the trochlear groove which forms a channel for the plate to glide in as the knee is flexed and extended. In many cases of patellar luxation the trochlear groove is too shallow, either as a result of not forming properly or due to erosion and bone remodelling from the recurrent displacement of the patella from the groove. In grade 3 or 4 cases the groove may be completely absent.

To deepen the groove, a saw is used to cut a wedge of cartilage and bone from the surface of the channel. This wedge is carefully preserved for use as a graft later. The underlying bone is then cut back to deepen the groove, following which the wedge is implanted back into the groove. In this way the cartilage lining the groove is preserved and ensures that the patella will glide smoothly within the newly deepened channel.



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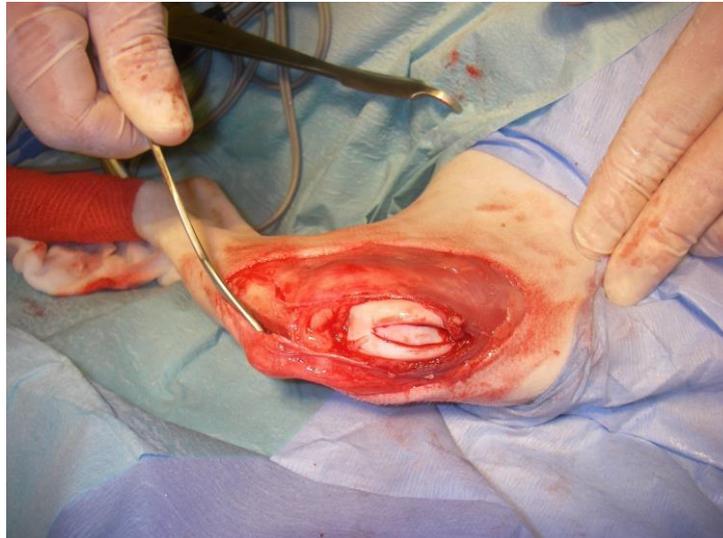
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The cut tibial crest is gently levered to the lateral/outside of the knee (left) and the deepened groove (sulcoplasty) can be seen on the right

(3) Soft tissue reconstruction

The patella has strong attachments to the soft tissues on either side of the knee joint. However with patella luxation, the attachments on one side can be too tight and on the other side too loose. Therefore to help keep the patella in a central position, these attachments often need to be loosened by stretching or cutting on one side (a 'patella release') and strengthened by adding tightening stitches on the other ('imbrication').

Once surgery has been completed, x-rays are taken to ensure that the metal implants are in the correct position and ensure that the newly adjusted tibial crest, patella and patellofemoral groove are well aligned. The patient is then ready to be woken up and start on the road to recovery.



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AFTERCARE

What to expect?

Your pet will almost certainly be hospitalised with us overnight following the surgery so we can give them medication, intravenous fluids and pain relief as required so be prepared to collect them the day following surgery.

It is important to remember that your pet will be recovering from a major surgical procedure and the after effects of the anaesthetic can make them a bit subdued and disorientated for few days so do not worry if they seem out of sorts and are not their normal self during this period. They will almost certainly also be feeling rather sore and uncomfortable so will need to be encouraged to settle quietly in a warm, familiar spot and sleep it off. The first few days are always the hardest in this respect but once the first 4 to 5 days have passed their behaviour should slowly return to normal. A thick duvet or memory foam mattress should be provided for bedding to help cushion the area and any bedding should be thoroughly washed to reduce the risk of infection. They will need to be kept in a very clean, dry environment at all times during the first 14 days whilst the skin incision heals to minimise the risk of any infection entering the wound.

They may also be a bit nauseous for a day or two so we usually recommend dividing their usual portion into several smaller meals for the first couple of days. Offering something palatable and easily digested like cooked chicken, white fish, cottage cheese or a chopped boiled egg with either rice, pasta or mashed potato is often advised - we can provide you with a tasty, high energy tinned diet for this period if requested.

It is quite normal after being starved for an anaesthetic for animals not to pass any stools for a few days so this should not be concern as long as they are eating well and drinking and urinating normally.

They must also not be allowed to lick the area excessively. A small t-shirt or buster collar must be used to keep the area protected if they are left alone for long periods.

The surgical site will need to be checked regularly in the first few days - at least twice a day. A slight ooze of blood is normal in the first two to three days and a degree of redness, bruising and a fluidy swelling may develop over a period of 4 to 5 days. This can be quite marked around the ankle area as gravity causes the fluid to gather below the operation site and is nothing to worry about. However if the ooze of blood seems excessive or the wounds appears to be opening up then we should be contacted. Any discharge can be cleaned away with cotton wool and a saline solution made by adding two teaspoons of salt to a pint of cool, previously boiled water. Any adhesive dressings applied to the wound post operatively may come unstuck in the days following surgery and there is no need to replace them as long as the incision looks clean and dry.

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Post-op checks

These are often carried out by a veterinary nurse after 4-5 days and then again after 10-14 days by a vet. We will then usually see them at 8 weeks for follow-up x-rays before a final check at 12 weeks to hopefully sign them off and give the green light to be let off the lead! The check-ups may be more frequent if concerns arise or if we administer cartrophen injections or laser therapy post-operatively (see later).

REHABILITATION:

ICE/COLD THERAPY (DAYS 1 to 3): To reduce swelling and discomfort we recommend applying a soft ice pack to the area for the first 3 days. A suitable ice pack can be made from a bag of peas wrapped in a clean hand towel and should be applied to the area for 10 minutes three times a day. Alternatively an ice cube can be gently moved across the skin surface around the outside of the wound.

WARM COMPRESS (DAY 5-14): This can be started after the first op check and only if the incision is clean and dry. Use a hot water bottle (with cover on ie not too hot - it should be comfortable to touch) to warm the knee for 10 minutes.

RANGE OF MOTION EXERCISES (DAY 5-28): These should be very gentle with no attempt to go beyond what is comfortable. Get them to lie on their good side and gently flex and extend the affected knee while supporting the leg. Being very patient and careful, perform 10 slow repetitions. Repeat this three times daily.

You should only do this is if it is within your pet's comfort level.

CONTROLLED EXERCISE PROGRAM:

Your pet will need to be restricted to house and garden rest for the first 14 days following surgery. They should be encouraged to get up and walk around every few hours rather than lying completely still as this will help reduce stiffness and improve the circulation to the area. They should be kept on a lead when visiting the garden to avoid any sudden movements. They should also be carried up any high steps or staircases for the first 6 weeks and any sofas/chairs etc should be out of bounds during this time as well.

Exercise in the form of controlled lead walking should be introduced as follows (days following surgery):

0-14: House/garden rest only (taken outside every few hours as above)

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Expect a fair amount of swelling and very little weight-bearing on the leg in the first 7 days; over the course of the second week they should be increasingly happy to put the leg to the ground and use it when walking.

14-28 days (2-4 weeks): 5-10 minutes slow lead walking two to three times a day.

During this period they will begin to use the leg most of the time but will be stiff and sore after resting.

28-42 days (4-6 weeks): 10-15 minutes lead walking two to three times a day.

You can also start doing some sit/stand exercises to improve the range of motion and reduce stiffness by getting them to repeatedly sit and stand for 10 repetitions twice daily. Use of a small treat can help with this! This should only be performed voluntarily - do not push down on the rump.

During this period they can be expected to be increasingly confident on the leg, generally using it fairly normally and will be gradually less stiff on it.

42-56 days (6-8 weeks): 15-20 minutes lead walking twice a day

By now they will begin to think that they can go back to normal but it is still very important to keep to the exercise plan as healing of cut bone and cartilage grafts will not be complete. Follow up x-rays are normally performed at the end of this period.

56-84 days (8-12 weeks): Allowed off the lead but exercise should be **controlled** (no balls or chasing squirrels etc) and limited to a maximum of 30 minutes two to three times a day for a further 4 weeks. Gentle swimming may be permitted during this period but only if it can be carefully controlled in a proper pool with clean water and if they can be carefully led into the water avoiding any big leaps etc.

After 12 weeks: They should be weight bearing fully on the leg now and can **gradually go back to normal** levels of exercise.

Remember that every dog is different and some take longer to recover than others – if there is a lot of arthritis present in the joint then recovery can take much longer and there may be a need for ongoing treatment for lameness. Likewise some dogs are very comfortable on the leg within a matter of days and may feel like using the leg normally. However always remember that with an osteotomy and sulcoplasty the cut bone and cartilage takes at least a couple of months to heal - the consequences of over exertion could be very serious indeed so stick to the exercise plan!

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MEDICATION AND ONGOING CARE

Your pet will be sent home with some anti-inflammatory medication, painkillers and antibiotics which should be given as advised - be sure to check when each medication should be given and complete the full course prescribed.

We usually recommend giving a course of weekly Cartrophen injections to assist the healing process commencing with the second post-operative check-up. This has a multitude of benefits including stimulating the production and repair of cartilage, joint fluid and ligaments. It also helps reduce scar tissue and inflammation as well as limiting the development of arthritis in later years.

We are now also offering post-operative K-laser therapy which can improve healing times and reduce pain following the surgery. K-laser can be used alongside the cartrophen for maximum benefit - visit www.natterjacksvet.com/laser for more.

If arthritis is already present in the stifle joint then good quality glucosamine and chondroitin supplements as well as oils rich in Omega 3 can help manage this condition going forward. Many contain additional ingredients such as the natural anti-inflammatory (Boswellia) which can provide additional benefits – ask us for advice on which products might be suitable for your pet.

COMPLICATIONS

With any surgery complications can and do occur - these are a rare but normal occurrence in a minority of cases (<5%) and are frustrating for all concerned. They often incur additional fees if further medication or surgery is required but we will keep you informed of these throughout. The main symptom of a complication would be if your pet was suddenly a lot more painful on the leg again and did not improve after 24 hours or so.

Perhaps the most common complication in the first few weeks following surgery is something known as a 'tibial tuberosity avulsion' which occurs when the pins that secure the cut part of the tibial bone work loose - often due to excessive exercise or repeated jumping up etc. The cut section of tibia is then pulled upwards due to the force of the quadricep muscles and patella ligament acting above. Revision surgery to anchor the tibial tuberosity in the correct position again is nearly always needed. Excessive activity can also lead to loosening of the cartilage implant in the newly deepened groove that the patella sits in and this does usually require surgery if the graft becomes badly displaced.

Despite every attention to sterility, surgical site infections can occur in approximately 2-3% of cases. These usually resolve with antibiotics but may require revision surgery if severe or persistent.

Later down the line, it is not unusual for the body to reject the pins and/or wires securing the tibial transposition. Typically a soft swelling will appear over the front of the knee and your pet may become acutely lame on the leg. Having long since healed the implants are no longer needed at this stage and surgery to remove the implants is fairly straightforward.

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A proportion of dogs (5-10%) may require further surgery if the patella continues to luxate i.e. slip out of position. Even with the corrective measures as described above, the pull of the quadriceps muscles on the patella is a dynamic force and further adjustments may be needed further down the line.

Also be prepared for the fact that patella luxation is a condition that often affects both legs and even though one side may only cause problems initially there is a good chance (up to 50%) that the other side may need corrective surgery as well so try to prepare yourself both emotionally and financially for this eventuality!

As with all major joint problems, arthritis can be expected to progress in time but this will be much less severe than would have been the case without the surgery. We will of course help you manage this should the need arise in the future.

As mentioned above, these issues are recognised, normal situations that can arise with the condition and not an indication of any fault or error on behalf of the practice. As such they may incur additional costs but we will endeavour to keep you informed of these throughout.

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