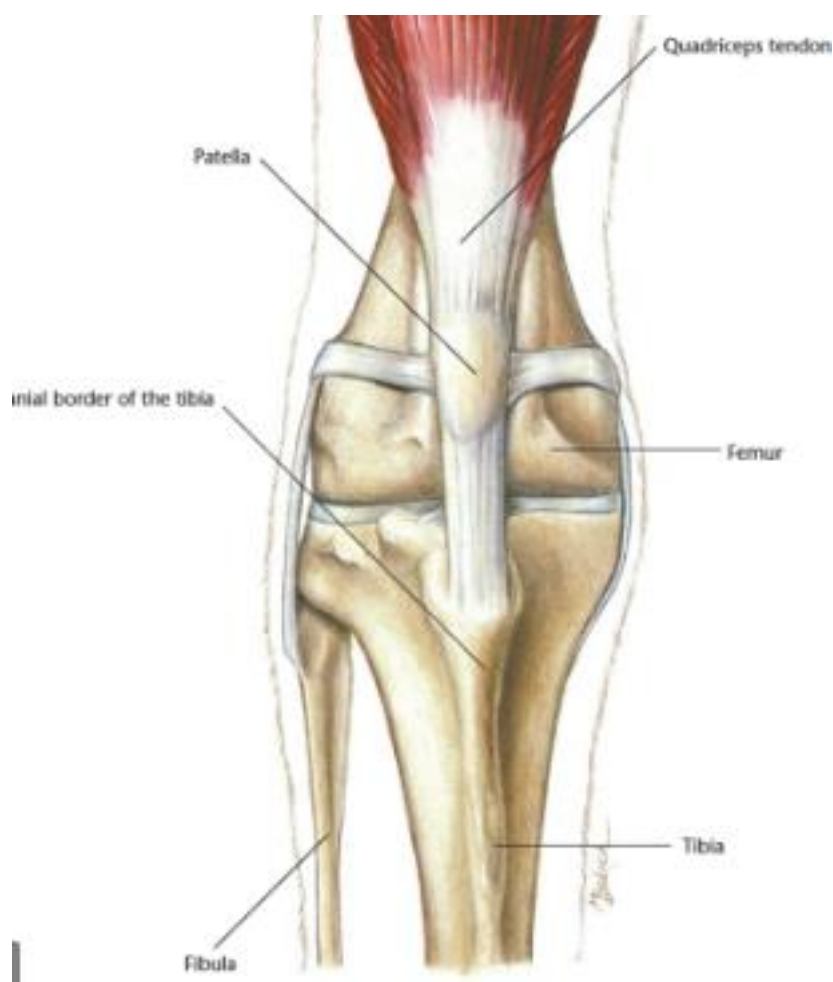


## Medial Patella Luxation

The canine stifle (knee) is a complex joint with the femur rotating over the tibial plateaux. The patella (knee cap) runs in a groove over the top of the femur and acts as a pulley attached to the quadriceps muscles forming the quadriceps mechanism which is responsible for weight bearing in the hindlimb.



### What is patella luxation?

The patella should run back and forth in the groove on top of the femur acting as a simple pulley. If the forces acting on the pulley don't pull straight back and forth the patella may be pulled off to one side either to the inside (medial) or outside (lateral). When this happens it is called patella luxation. It happens most frequently to the inside and hence Medial Patella Luxation (MPL).

### **Patella luxation grading and causes**

The degree of MPL is judged on a scale (1 to 4). Severe cases where the patella is always luxated and cannot be easily repositioned are graded 4, cases where the patella only occasionally comes out but spontaneously returns are graded 1. The grade of luxation is important as it has a direct influence on prognosis with surgery. The cause of the luxation is some form of bony change that leads to the direction of pull from the top of the quadriceps to the tibial tubercle being outside of the groove. This can be a change in the femur or the tibia and determining where this is, is vitally important to planning correction.

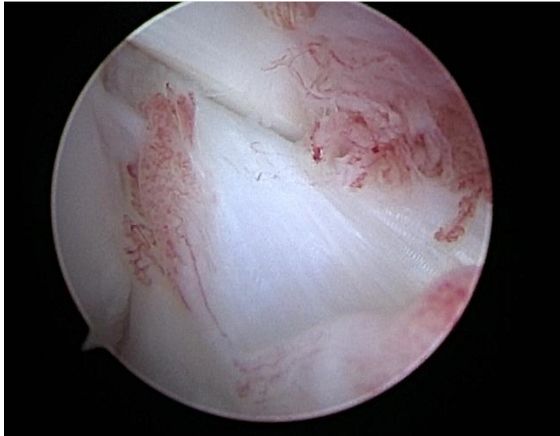


**Medial patellar luxation**

With the patella slipping off to the side occasionally or continuously the affect is both mechanical, painful and leads to stresses developing elsewhere in the joint as well as developing Osteo Arthritis (OA).

Clinically the signs you see depend on the grade of MPL and whether there are significant other problems such as Osteoarthritis (OA) and cruciate injury.

Grade 1/4 cases will only occasionally skip along on three legs, grade 2/4 cases will spend more time lame and may show signs of arthritis (pain and stiffness especially after rest). Grade 4/4 cases are usually very severely debilitated because the secondary changes present will prevent the patella from returning to the groove it should run in, in these cases there may be very severe OA present.



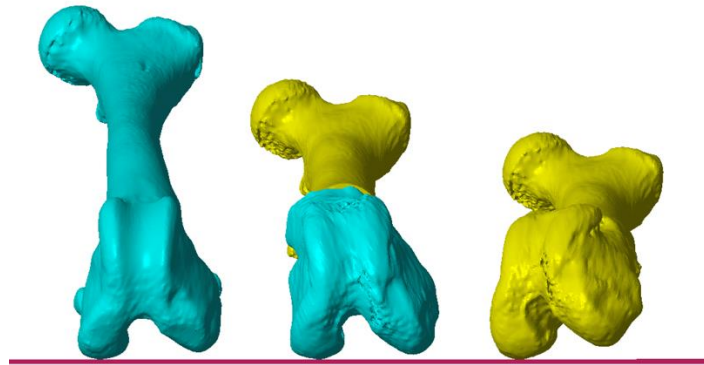
As well as the direct problem with the patella luxating significant further stress on the cruciate ligament will also occur and a link has been shown between patella luxation and cruciate ligament failure, added to this is the fact that should the cruciate fail it will also worsen the grade of luxation.

On the whole MPL is progressive, that is to say cases that have grade 1 as young dogs will go on to develop a worsening grade as they get older. Treating patella luxation early will hopefully prevent or slow down some of the other secondary problems and will prevent the grade of luxation from getting worse, **for this reason we advocate early surgical intervention and we also believe that dogs that show very early signs in the other leg should be carefully considered for prophylactic surgery** (treatment to prevent a problem developing in the future rather than treatment for a current problem).

### **Investigations**

Careful clinical examination to rule out other causes of lameness and to assess the extent of changes and mechanical derangement is an important start point as well as a discussion of your dog's individual lifestyle and requirements. Clearly what is right for a young active dog will be different for an elderly dog but on the whole the majority of dogs will benefit from surgery.

If that is the case then we need to determine what is the underlying cause for the luxation in the individual dog and this is where CT is now crucial. Our imaging starting point for all cases of patella luxation is now CT. This is the Gold Standard for assessment of femoral shape which is the key determining factor as to what surgery needs to be performed. Although this used to be done from radiographs a CT scan takes less time and is significantly more accurate.

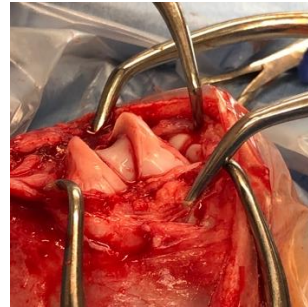


In the majority of cases the groove that the patella should run in will also be shallow because it has not formed normally, the CT scan gives us an excellent appreciation of the depth of the groove and also whether the progression of OA may have filled the groove with bony proliferations (osteophytes). From this we can then determine the best way to correct the patella luxation and more importantly minimise the risk of the surgery failing. Historically just applying one technique to surgical correction resulted in around 15% of cases failing to improve (this figure of 15% comes from a study published not that long ago and mirrors our previous experience), using our approach over the last three years (as of writing April 2020) our rate of failure has reduced to zero.

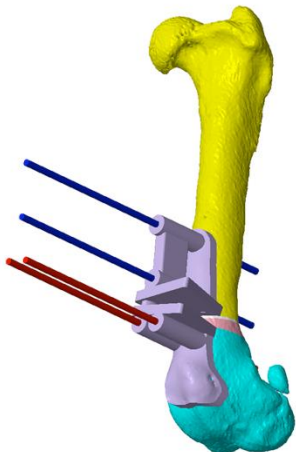


## Surgical Treatment

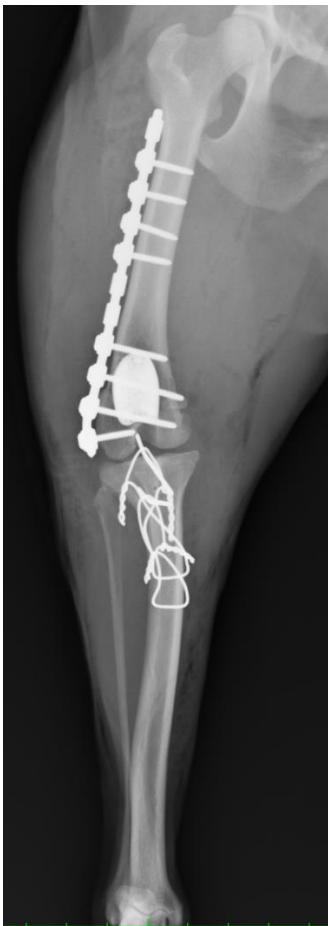
- For cases that have a relatively straight femur, only mild OA and a shallow groove we would expect the traditional surgery involving deepening the groove (sulcoplasty), tightening the stretched capsule (imbrication) and straightening the quadriceps pull by cutting the tibia (tibial crest transposition) to be successful.



- For cases with a significant bend of the femur or Grade 4 cases with a mild bend of the femur we would expect to see a substantial improvement with femoral osteotomy. This is planned using the CT scans and computer aided design technology to create custom made guides to perform the surgery to improve accuracy and reduce surgical time. This is a major surgical intervention and cases will usually need to be hospitalised for 48 to 72 hrs.



- For grade 4 cases with severe OA and absence of a groove we may consider Patella Groove Replacement. This requires that we remove the remains of the worn out groove and replace it with a synthetic groove. This is only performed when the groove is irreparably worn out. In most cases a TCT or femoral osteotomy is also required to correct the pull of the quadriceps.



- For cases that have also recently ruptured their cruciate ligament we may need to also stabilise the stifle, in these cases we may employ the TPLO procedure as well as an internal brace suture. This can be combined with either the TCT or femoral osteotomy as dictated by the CT scan.

All cases that have surgery will need to be confined to a cage for post op control for a minimum of 6 weeks, it is essential that patients are well acclimatised to the cage before surgery.