Proceedings of the
15th ESVOT Congress

September 15 - 18, 2010
Bologna, Italy

Reprinted in the IVIS website with the permission of ESVOT
Complications of patellar luxation surgery

The Queens Veterinary School Hospital, University of Cambridge, United Kingdom

INTRODUCTION
Patellar luxation is a disabling condition that commonly affects dogs and, less frequently, cats. Five percent of all orthopaedic cases presented to orthopaedic specialists and general practitioners in the UK had patellar luxation and it was 7th most common of the conditions presented. It used to be perceived as a small breed problem. In an early report 33 of 34 affected dogs were small breeds less than 15kg. It is now increasingly recognised in large breeds. Medial patellar luxation (MPL) is most common in all sized dog breeds. Lateral patellar luxation (LPL) was primarily thought to be a problem of large breeds but it is recognised that this is not always the case. Conformation studies have found that MPL is associated with a relatively long patellar ligament and patella alta in medium to giant breed dogs. Large-breed dogs with L:P values > 1.97 are considered to have patella alta. Proximal displacement of the patella within the femoral trochlear groove may be the problem in large-breed dogs. Conversely LPL is associated with a relatively long proximal tibia and patella baja. Surgery is commonly performed for patellar luxation when the condition is found to be the cause of lameness, or it is severe and likely to result in lameness if left untreated. There are numerous surgical techniques that can be used alone or in combination to correct the condition. These procedures consist of techniques to deepen the trochlear groove; techniques to improve tracking such as tibial tuberosity transposition; and soft tissue release and overlap techniques.

Complications that occur after patellar luxation surgery include:
- Tibial tuberosity implant loosening
- Tibial tuberosity fracture avulsion
- Relaxation
- Over correction - medial into lateral luxation
- Seroma
- Tibial and fibular fracture
- Sepsis
- LDE tendonitis
- Patella ligament rupture
- Lameness
- Trochlear wedge migration

How to prevent complications:
- Careful planning and attention to detail
- Correct alignment
- Ensure trochlear groove is deep enough
- Use a tension band wire in large and / or active dogs or if the TT is transposed a big distance
- Soft tissue techniques augment but do not replace realignment techniques
Dogs should be assessed by a good physical examination followed up by radiography. It is vital that the dog is carefully positioned for radiographs to ensure the bone shape is accurately represented. CT can also be used to evaluate bone shape and torsion. In cases with higher-grade luxations (III and IV) the patella will be luxated when the dog is radiographed, this will rotate the stifle and exacerbate or accentuate angulation or bone rotation. If at all possible take the radiograph with the patella reduced.

To reduce the chance of complications following patellar luxation surgery requires careful planning and attention to detail throughout all aspects of the surgery. The following discussion addresses points sequentially whereby complications are likely to occur and some possible ways to avoid them happening.

How to deepen the groove?

The groove is deepened most commonly by performing a block or wedge recession sulcoplasty. A wedge is easier to perform but does not deepen the groove at the proximal aspect as well as the block does. If the patella luxates when the stifle is extended or there is patella alta then a block recession would be more suitable than a wedge. In large dogs a block is recommended as patella alta is often present. The groove must be wide enough to accommodate the patella. The block or wedge must be tight to prevent dislodgement – small pieces of bone can be wedged in either side of the block to aid this. Appropriate instrumentation is required to cut the block – use of a thick osteotome will cause leverage and therefore possibly break the block. If the block breaks then pins can be inserted transversely through the femoral trochlear ridges and block to pin it in place.

How to avoid complications after tibial tuberosity transposition?

Complications can arise after tibial tuberosity transposition due to too small a fragment being cut, bilateral surgery or from asking too much of the ‘tension band’. To avoid complications ensure a large enough piece of bone removed – the base should end level to the tibial crest. Use a tension band made of orthopaedic wire in large and boisterous dogs, if the tuberosity has been rotated a large distance and if surgery is bilateral (ie if in doubt use a TBW). Do not use pins that are too large, two small ones are preferable. Use large gauge orthopaedic wire. Take care when placing the pins in the bone. The lateral aspect of the tibia is concave so the wire needs to be angled in a medial direction to ensure it engages bone. To avoid fracture do not place the pins directly through the insertion point of the patella ligament (this is also recommended for TPLO).

How to do soft tissue release?

Only release what is necessary. Do it a layer at a time, as there is a risk of doing too much of a release and resulting in luxation in the opposite direction. Seroma formation may be more common after soft tissue release.

Medial release – elevate the retinaculum and cut this parallel to the patella ligament. Then do a tenotomy of the sartorius caudal belly, finally a partial tenotomy of the vastus medialis – this tendon is often palpably taut. Only cut the joint capsule if essential and try and limit the proximal extent of the cut.

When to perform long bone osteotomies?

Well positioned radiographs should be taken and the femoral varus angles determined. The distal femoral varus angles vary with breed so when to correct must be determined for each individual dog. Angles >/= 12 degrees were corrected in 12 dogs with medial patellar luxation, combined with traditional corrective techniques with good success.

CONCLUSIONS

Careful planning including palpation, well positioned radiographs and meticulous surgical technique and attention to detail for each individual dog should all contribute to a lower complication rate. All surgically treated cases of patellar luxation in large breed dogs should be managed with a femoral trochleoplasty, a tibial tuberosity transposition (stabilised with K-wires and a tension band wire), and soft tissue releasing and tightening procedures. A reduction in complications was seen when trochlea recession was performed in combination with a tibial tuberosity transposition.

REFERENCES