

Developmental Patellar Luxation

Developmental medial patellar luxation is generally associated with small breed dogs but is also not uncommonly seen in large breed dogs. In the more severe forms it is associated with femoral and tibial deformities; lateral bowing of the distal femur (varus deformity), hypoplasia of the medial condyle, internal torsion of the tibial tuberosity, medial bowing of the proximal tibia and internal rotation of the foot. Additionally, absence of the patella from the femoral trochlea results in poor trochlear sulcus (groove) development.

Patellar luxation is graded from I to IV (after Singleton 1969):

Grade	Description	Tibial Torsion
I	Patella can be manually luxated but spontaneously reduces	
II	Patella intermittently spontaneously luxates and does not automatically reduce when luxated	Upto 30°
III	Patella is permanently luxated but can be reduced	30-60°
IV	Patella is permanently luxated and can't be reduced	60-90°

Clinical Signs & Diagnosis

Clinical signs are variable. Grade I luxations are generally incidental findings. Grade II lesions are often associated with an intermittent skipping lameness, when the patella luxates. The dog may kick the leg out backwards to try and reduce the patella into the trochlea. Between these episodes there is generally no lameness, unless full-thickness cartilage erosion has developed in the femeropatellar joint in which case there may be. The patella does not luxate in and out for grade III and IV dogs and so in young dogs there may be no overt lameness, but there is likely to be some form of a postural or gait abnormality; typically these dogs will have a crouched pelvic limb stance with a 'hocks out-toes in' stance.

It is common for dogs with developmental patellar luxation to present with lameness for the first time as adults. This may be associated with the development of clinical signs related to the stifle osteoarthritis (OA) that develops secondary to chronic luxation. Stifle pain can also be associated with the loss of cartilage from the underside of the patella due to chronic wear (cartilage does not have nerve endings so erosions only become painful once the subchondral bone is exposed).



Grades I-III patellar luxation are readily diagnosed on manipulation of the stifle, although it may sometimes be necessary to sedate the patient. Patellar instability should be assessed with the stifle fully extended and the tibia internally rotated (for medial luxation). Grade IV lesions, because the patella does not reduce, can be more difficult to recognise. Generally in these cases the trochlea can be felt at the most cranial aspect of the stifle and a dip is felt just distal to the trochlea where the patellar tendon would usually be found. Radiography is required to characterise the extent of the deformity and of any OA. Skyline views of the trochlea can be used to document the deepness of the trochlea but are not routinely performed. CT greatly facilitates surgical planning of more complex deformities.

Decision Making

Surgical decision making is straight-forward. Grade I lesions without clinical signs are not treated. If there are signs, a lateral soft tissue procedure (i.e. imbrication) may be sufficient. For all other grades of developmental luxation, persistent/recurrent luxation will lead to stifle OA and eventually loss of cartilage on the underside of the patella. Therefore these cases are treated surgically even in the absence of clinical signs. Grade II-IV cases have an underlying malalignment of the quadriceps mechanism, and so for long-term success this must be corrected via a tibial crest transposition and/or corrective wedge osteotomy (of the distal femur, if there is marked femoral varus). Additional procedures such as deepening of the trochlea, release of the medial parapatellar tissues and imbrication of the lateral parapatellar tissues are also often required, but will not be sufficient alone for long term correction of the luxation.

Surgery is generally a 5 stage procedure:

1. Assess intraarticular structures
2. Perform trochlear sulcoplasty (wedge or block recession; abrasion sulcoplasty must not be performed)
3. Perform medial release (if necessary)
4. Perform tibial crest transposition
5. Perform lateral imbrication

Some grade III and IV cases will benefit from corrective osteotomy of the distal femur.

Postoperative care

Patients receive opiate analgesia and cold packs for the first 24 hours or so. NSAIDs are started at anaesthetic induction and continued for 7-14 days. Patients are strictly rested until osteotomy healing is documented radiographically. This generally entails cage or kennel rest (or confinement to a small room without furniture) and short walks outside on a lead to go to the toilet.

Bilateral surgeries are usually staged; the second surgery being performed once the first osteotomy is well on the way to healing.

