

Medial Patellar Luxation

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Epidemiology

Medial patellar luxation is one of the most common causes of hindlimb lameness in the dog. Luxation may be medial, lateral, or bidirectional. Emphasis here will be discussion of medial patellar luxation. In some rarer cases, the luxation is traumatic with tearing or stretching of the lateral parapatellar joint capsule and/or fascia. Retrospective analysis showed 82% of cases were found to be developmental with medial luxation in 95 - 98% and lateral luxation in 2-5% lateral luxation in small breed dogs. of small-breed dogs. Bilateral medial patellar luxation is common, occurring in 50% to 65% of cases.

Classification

Grade 1 - the patella can be manually luxated with the stifle joint in full extension, but it returns to the trochlear groove immediately upon release of manual pressure. Incidental finding not usually associated with lameness

Grade 2 - internal tibial rotation at the stifle joint combined with stifle joint flexion causes the patella to luxate medially. Reduction occurs with stifle joint extension and external rotation. Typically causes intermittent, skipping lameness associated with luxation of the patella; the lameness spontaneously resolves with spontaneous patellar reduction. Mild skeletal abnormalities (if present) consist of femoral varus, tibial valgus, and internal tibial rotation at the level of the stifle joint

Grade 3 - patella is continuously luxated during ambulation, but it can be manually reduced. May be associated with mild, moderate, or severe lameness. Skeletal deformities in these cases are often more severe than in the lower grades, and commonly, femoral varus, tibial valgus, and internal tibial rotation are present at the level of the stifle joint. Lameness in these cases is likely related to the degree of cartilage erosion from the articular surface of the patella and the medial trochlear ridge of the femur. In severe, bilateral cases, the dog assumes a crouched gait with stifle joint hyperflexion and internal tibial rotation at the stifle joint.

Grade 4 - patella is permanently luxated and cannot be manually reduced. Commonly, marked femoral varus, proximal tibial valgus, and internal tibial rotation are noted. This condition can be quite debilitating; affected animals may develop a crablike posture and must be carried by their owners rather than walking. Acute onset of lameness, or acute worsening of chronic lameness, is often associated with the onset of concurrent cruciate ligament disease in these patients.

Pathophysiology

Most cases are a result of musculoskeletal malformations: such as a medially displaced quadriceps mechanism, lateral bowing of the distal femur, lateral distal

femoral torsion, proximal tibial deformity and femoral epiphyseal dysplasia. Medial patellar luxation results abnormal development of the trochlear groove. The abnormalities vary from a near-normal trochlea to an absent trochlear groove. During development the articulation of the patella within the trochlear groove exerts a physiologic pressure on the articular cartilage that retards cartilage growth and continued pressure by the patella is necessary for the development of the normal trochlear groove. If the patella is abnormally placed due to musculoskeletal malformation the physiologic pressure exerted by the patella on the trochlear articular cartilage is absent and the groove fails to develop with adequate depth. Growing animals with mild luxations show may have a relatively normal trochlear groove due to relatively normal patellar positioning. However, in growing animals with severe luxations the pressure required for groove development is absent and the trochlear groove does not form. Patellar luxation may occur as a complication secondary to treatment of cranial cruciate ligament disease and is reported to occur at a rate of 0.018% of all stabilization procedures for cruciate ligament disease. This is most common in dogs > 20 kg with Labrador Retrievers overrepresented.

Medical or Surgical Management

The decision to treat medically or surgically can be a challenge and is a discussion point with owners as the decision involves the dog's clinical history. Asymptomatic, older patients are usually good candidates for a conservative approach. Young animals where ongoing damage to the cartilage is likely or those with persistent lameness are more likely to benefit from surgical intervention. Surgery may be even more important in growing animals who are at risk for developing more pronounced skeletal deformities. These cases may benefit from corrective osteotomies and owners should be informed that multiple surgeries may be required. Multiple surgeries may also be warranted in cases with bilateral grade IV patellar luxations as bony abnormalities are often severe and multiple.

Surgical Management

There are multiple surgical techniques described for medial patellar luxation all with the aim of restoring and retaining patellar positioning within the trochlear groove. These techniques include medial retinacular release, lateral imbrication, trochleoplasty, tibial tuberosity transposition and rectus femoris transposition. Needless to say, these surgical procedures all require skill and practice. Many of these procedures should be reserved for the experienced orthopedic surgeon as they require special equipment and advanced training. In all cases, the primary problem is biomechanical in nature and attempting to use trochleoplasty and soft tissue release and imbrication will lead to unsatisfactory results unless the quadriceps mechanism containing the patella is realigned with the trochlear groove.

Corrective osteotomies of the femur and tibia are reserved for animals with severe skeletal abnormalities and detailed description is beyond the scope of this discussion as the expertise and equipment required for successful outcomes in these cases is great.

In more straightforward cases, trochleoplasty, medial retinacular release, tibial tuberosity transposition and lateral imbrication of the fascia can provide very satisfactory results.

These are accomplished by means of a lateral approach to the stifle joint. Trochleoplasty is required in most cases and is accomplished by means of the wedge or block recession technique. Once the trochlea is sufficiently deepened, patellar capture can be evaluated. In many cases, in order to get the patella in to the newly deepened trochlea, release of the medial retinaculum must be performed. Tibial crest is osteotomized and transposed laterally and held in place with one or two Kirschner wires. In the case of larger animals a figure of eight wire may be added to counteract the pull of the quadriceps mechanism adding stability to the transposed tibial tuberosity. Tibial tuberosity transposition is considered essential in virtually all cases as this is responsible for realignment of the mechanical forces of the quadriceps extensor mechanism.

References and Suggested Readings

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