

Patellar luxation

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Congenital luxation of the patella represents one of the most common orthopedic conditions in small animal practice. Medial luxations account for 75% to 80% of cases in all breeds. The majority of patients are small breed dogs including miniature and toy poodles, Yorkshire terriers, Pomeranians, Chihuahuas, Boston terriers, Pekingese, and cavalier King Charles spaniels (1–4). An increasing number of young, large breed dogs are being presented with medial patellar luxation, particularly the Akita, Labrador, golden retriever, malamute, boxer, and husky (1,4). Lateral luxation is less frequent but is most common in giant breeds, especially the St. Bernard (3,4). A few cases may show the ability to luxate both medially and laterally (2). Patellar luxation is seen infrequently in cats, especially in the Devon Rex and Abyssinian breeds, and has been associated in this species with congenital hypoplasia of the medial femoral condyle, a shallow trochlear groove, and hip dysplasia (2).

The overwhelming majority of patellar luxation are congenital and certainly hereditary, although a mode of inheritance has not been described (4,5). Occasionally, traumatic cases do occur when a blow is sustained to the retinacular structures, particularly on the lateral side of the stifle joint (4,5). Females have been reported to be 1.5 times more likely to be affected than males (4). Published estimates of the incidence of bilateral patellar luxation range from 20% to 52% (1,4). A survey of 59 surgical cases in our practice between April 1998 and September 2005 revealed that 74.5% of canine cases were in small breeds; 4 cases were in cats; and 58.5% of small breed canine cases were female. Bilateral luxation occurred in 46% of the small dogs but only 36% of the large dogs.

Patients with patellar luxation can be broadly classified into 3 categories:

1) Puppies and young adult dogs with an intermittent “skipping” gait. The owners describe the dog as pulling up the leg for several steps before returning it to the ground and then resuming normal ambulation with no sign of lameness. The nonweight-bearing phase corresponds with luxation or subluxation of the patella and the gait returns to normal when the luxation spontaneously reduces. As such, this represents a mechanical lameness, in that the patellar luxation impedes normal function of the stifle rather than producing significant pain. The skipping gait may be widely intermittent or may be almost continuous, depending on the severity of the luxation. Severely bilaterally affected dogs

may have major impairment of their ability to extend the stifle, thus presenting in a crouching, “pigeon-toed” stance with limited locomotory capacity (1,4–6).

- 2) Middle-aged or older dogs with a more constant hind limb lameness. Careful questioning of the owner is essential with these patients to determine the course of the lameness. If the luxating patella is responsible for the lameness, there will be a long-term history of intermittent lameness, including the characteristic “skipping gait.” The owner may comment that the dog has had a problem with the leg from time to time for as long as they can remember, but the symptoms seem to be getting worse. This is often due to eburnation of cartilage on the medial trochlear ridge and the underside of the patella (1,2,4). Osteoarthritic changes in the joint may also contribute to lameness in these patients, but this may be of somewhat lesser importance, since the degenerative changes seem to be slower in developing, are of a more minor nature, and are less clinically debilitating than the changes seen in rupture of the cranial cruciate ligament, for example (3,7). If questioning of the owner reveals an acute lameness or an acute worsening of an intermittent lameness, the patellar luxation is frequently a “red herring.” More often, rupture of the cranial cruciate ligament or other causes of acute lameness will be present as a more significant clinical entity (1,2,5,8).

Medial patellar luxation and rupture of the cranial cruciate ligament are intertwined in several ways. It is estimated that at least 15% to 20% of dogs with patellar luxation will eventually rupture their cranial cruciate ligament (1). This may be due to a combination of 3 factors: First, dogs with significant patellar luxation usually have internal rotation of the tibia, which puts stress on the cranial cruciate ligament. Second, the quadriceps musculature-patella-patellar tendon mechanism normally provides cranial stability to the stifle joint. In the dog with patellar luxation, a good portion of this mechanism is deviated medially, thus offering less resistance to forces that would tend to subluxate the proximal tibia cranially. Third, cartilage erosion and degenerative joint disease may create an environment in the stifle that promotes degeneration of the cranial cruciate ligament (1,5).

- 3) Asymptomatic dogs. A significant number of dogs with patellar luxation may show few or no clinical signs (1). Fewer large breed dogs with patellar luxation would fall into this category. Our practice data show a mean age at surgery in large dogs of 1.6 y (range 8 mo to 3.5 y), while the



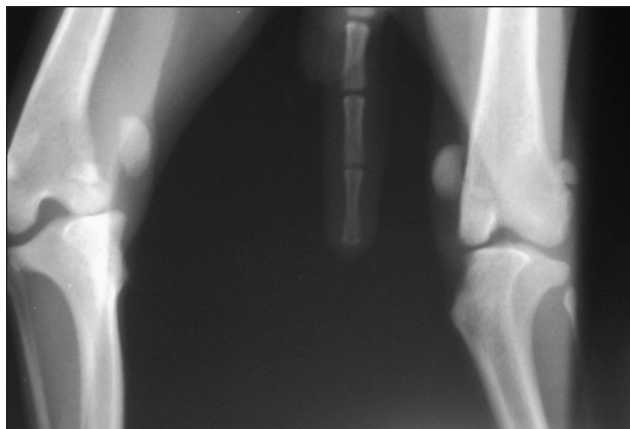


Figure 1. Bilateral Grade 4 medially luxating patellas in an adult poodle.

corresponding mean age in small dogs is 3.4 y (range 7 mo to 9 y). The younger age and narrower age range in large breeds suggest that larger dogs are less likely to be asymptomatic than smaller dogs.

A grading system based on the findings at physical examination has been developed for the categorization of patellar luxation. A Grade 0 patella luxation is normal and the patella will not luxate during the physical examination. A Grade 1 patellar luxation is one in which the patella will luxate when digital pressure is applied, usually with the stifle in extension, but will immediately return to its normal position when the pressure is removed. A Grade 2 patellar luxation is one in which the patella will readily luxate with digital pressure and tends to remain luxated. However, it can be returned to the trochlear groove and will remain in place most of the time. A Grade 3 patellar luxation is one where the patella is in the luxated position most of the time, although it can be returned temporarily to the trochlear groove with digital pressure. A Grade 4 patellar luxation is one where the patella is in the luxated position at all times and cannot be returned to the trochlear groove (1,4–6). While the grading system is useful in communicating the degree of patellar luxation, the anatomical abnormalities that might be present to produce the degree of luxation, which patients may require surgery at some point, and in suggesting the prognosis for surgical patients, there is a danger in reading too much into the classification system. For example, one cannot base recommendations for surgical repair solely on the grade of luxation present, because the correlation between the grade of luxation and the clinical signs is not strong. Many Grade 1 small dogs will never encounter lameness problems; however, others, especially many large breed dogs, will be clinically affected. On the other hand, nearly all Grade 3 and 4 dogs will show signs of lameness and disability. However, these signs are not always severe and, perhaps more importantly, some owners may not view the problem as significant in

the context of the limited physical demands placed on their dogs, especially in the case of the small breeds (5).

The next article in this series will deal with the pathogenesis of patellar luxation and how the pathogenetic theories lead towards surgical correction of the problem.

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