

Papillon Club of America Health & Genetics



LUXATED PATELLAS

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A luxated patella is a condition in which the kneecap slides out of place. Instead of gliding within the natural groove in the upper bone of the knee joint (the femur) it becomes displaced either to the inside or the outside of the joint. The displacement, or luxation, can be temporary or permanent, and it can be partial or complete.

In the case of most Toy Dogs, the luxated patella is much more likely to become displaced on the inner side of the knee joint rather than the outer side. This inside displacement is called medial patella luxation, or MPL.

Although MPL can result from trauma, it's much more likely to occur as a result of a genetic predisposition - and, in such cases, will often show up within the first year of a Toy Dog's life. The condition is prevalent in many Toy Dogs, including Affenpinschers, Brussels Griffons, Cavalier King Charles Spaniels, Chihuahuas, English Toy Spaniels, Havanese, Italian Greyhounds, Japanese Chins, Maltese, Miniature Pinschers, Papillons, Pekinese, Pomeranians, Toy Poodles, Silky Terriers, and Yorkshire Terriers.

What's not clear is why Toy Dogs are prone to this condition. Many experts believe that just being small makes the Toy Dog vulnerable to the patellas luxation. "Luxation may be a normal consequence of the miniaturization of the legs", says Denis Marcellin-Little, D.E.D.V., associate professor or orthopedic surgery at North Carolina State University's College of Veterinary Medicine.

And the problem isn't really in the knees, according to Kurt Schulz, D.V.M., DACVS, associate professor of surgical and radiological sciences at the University of California-Davis School of Veterinary Medicine. "The origin of patellar luxation is not in the (knee) joint primarily but in the long bones on either side of the joint" he explains.

"Breeding small dogs results in a higher incidence of torsion and bending of the tibia than in large dogs. Why this occurs, we are not certain."

Although experts believe that the patellar luxation is genetic in origin, "the genetic mechanisms are not very simple," Marcellin-Little says. "The genes have a much more subtle influence (on luxation) than those that are involved with other (health) conditions".

That's because there are many different reasons why Toy Dogs' kneecaps pop out of place. One dog's knee may have a groove that is too shallow for the kneecap to stay in place. Another may have ligaments that are too tight to allow for sufficient flexibility. Other factors that affect patellar luxation include the time it takes for a dog's legs to grow to maturity, and the time it takes for cartilage to mineralize. All of these structures and processes are affected, at least to some extent, by genetics.

TREATING PATELLAR LUXATION

The treatment of a Toy Dog's patellar luxation depends on two factors: the severity of the condition and the precise cause of the condition.

Veterinary orthopedists grade an animal's luxation according to severity. A grade of 1 is the least severe. In such cases, the knee generally is in the correct position but can be pushed out of place, however, the knee will immediately return to the correct position. A grade of 4 indicates that the knee is always out of position and cannot be popped back manually.

Dog with Grade 1 luxations may respond to medical management; restricted exercise, non-steroidal, anti-inflammatory medications, and conscientious monitoring. In more severe cases, however, surgery may be needed to return the kneecap to its proper position and correct the anatomical abnormality that prompted the luxation in the first place. However, because patellar luxations can result from a variety of causes, there are many opinions about the best way to treat patellar luxations, and these vary with the surgeon and the severity of the condition," Schulz says.

GRADING A LUXATED PATELLA

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| Grade 1 | The patella is usually in a normal position but can be pushed out of place. Once out of place (luxated), it promptly pops back to the normal position |
| Grade 2 | The patella can be in either a normal or luxated position. If luxated, it can be placed into a normal position and will stay there. If in a normal position, it can be manually luxated and will remain in that position |
| Grade 3 | The patella is usually in a luxated position. Although it can be placed manually into a normal position, it will promptly pop back into the luxated position |
| Grade 4 | The patella is always in a luxated position and can't be manually pushed back into a normal position. |

A new high-tech method could eventually result in more effective treatment of patellar luxations regardless of the cause. The technique, called rapid prototyping, uses computer images to develop models of body parts. Veterinary surgeons could then practice on the models before operating on the animals. For a Toy Dog with a luxated patella, rapid prototyping could result in faster, more customized and less traumatic surgical treatment than conventional surgery.

Marcellin-Little is hoping to use the technique to investigate the mechanism of cranial cruciate ligament ruptures in dogs. These ruptures, which correspond to anterior cruciate ligament ruptures in people, affect one out of five dogs with luxated patellas, he says.

According to Marcellin-Little, rapid prototyping could not only help individual Toy Dogs that suffer from patellar luxation, but also could help narrow the scope of research into the genetic roots of the condition. By developing models that enable scientists to study exactly how patellas luxation affects the knee and leg apparatus, geneticists can target their inquiries to those genes that are known to affect various aspects of that apparatus

MULTIPLE CHALLENGES

Unfortunately, surgical treatment for patellas luxation can be very expensive.

According to Cynda Seibert, a member of the Chihuahua Club of American's health committee, standard surgical treatment for one luxated patella costs at least \$1200, and currently, rapid prototyping is even more costly: when Denis Marcellin-Little used the technique to treat a German Shepherd Dog's hind leg cruciate ligament problems, the cost came to about \$6000.

For those reasons, improved data and prevention of the condition are two important strategies in the fight against patellar luxation. Some experts advise against breeding dogs with this condition because of its strong genetic component. Others, however, are concerned that the condition is so common that removal of all affected dogs from the gene pool is virtually impossible.

Experts agree that much remains to be learned about patellar luxation, including a better understanding of genetics, the physiological causes of the condition, the true prevalence of the condition, and effective ways to treat affected Toy Dogs.

SIGNS OF

PATALLAR LUXATION

- * Sudden pain while running
- * Lifting of affected leg off the ground
- * Range of motion pain
- * Bowlegged stance
- * Reluctance to walk or jump
- * Intermittent lameness

ANOTHER KIND OF LUXATION

Although medial patellar luxation (MPL) is one of the most common knee ailments in dogs - especially Toy Dogs - it's not the only trick that knees can play. Another form the condition can take is lateral patellar luxation (LPL). This occurs when the kneecap pops out of place and moves to the outside of the knee joint.

LPL Occurs less frequently than MPL, but its occurrence may be more widespread among various dog breeds. While MPL generally affects only Toy and small-breed dogs, LPL also affects very large breeds such as Great Danes and Irish Wolfhounds.

Large breeds affected by this condition tend to be affected in both knees, and show signs of the condition when young. By contrast, a Toy Dog or other small dog is not likely to show signs of LPL until it is well beyond puppyhood - generally about 4 or 5 years of age.

Indications and treatment of LPL are similar to those for MPL.