



Southern Counties

VETERINARY
SPECIALISTS

Patellar Luxation

Information Sheet

**Southern Counties Veterinary Specialists
Specialist Referral Service**

Relevant anatomy

- The stifle (knee) joint is the articulation between the femur (thigh bone) and the tibia (shin bone) in the hindlimb.
- The patella (the kneecap) is a small moveable bone which normally rides in a groove (the trochlear groove) at the bottom of the femur.
- The quadriceps muscle runs down the front of the thigh bone and attaches via the patella to the top of the tibia (at the 'tibial tuberosity', TT).
- Contraction of the quadriceps muscle pull the patella and the TT upward and straightens the stifle.
- The patella glides smoothly over the end of the femur as the stifle flexes and extends.
- Without a patella, the tendon of the quadriceps muscle would rub on the front of the femur.

Patellar luxation

Sometimes the patella slips sideways out of the groove. This is known as 'luxation'. Luxation is associated with the following anatomical abnormalities:

- Shallow trochlear groove (which allows the patella to slip out easily)
- Abnormal positioning of the tibial tuberosity (to either side)
- Bowing of the femur (as the quadriceps muscle originates at the hip, if the femur is bent, sideways forces will pull on the patella (the so-called "bowstring effect").

Slipping to the inside of the limb is called medial patellar luxation; slipping

to the outside of the leg is called lateral patellar luxation. In approximately 50% of cases medial patellar luxation occurs bilaterally (i.e. both stifles are affected).

The severity of patellar luxation ranges:

Grade I– normal positioning of the patella, luxation is possible with pressure, patella pops back into place when pressure is removed.

Grade II– patella pops in and out of the groove spontaneously.

Grade III– patella is permanently luxated, patella can be replaced with pressure, but pops out when pressure is removed.

Grade IV– patella is permanently luxated. No amount of pressure can return it to the groove.

Patellar luxation during growth

Normal growth of the hind limb relies on a correctly positioned patella. If the patella is luxated in a puppy, shallowing of the trochlear groove, abnormal positioning of the tibial tuberosity and femoral bowing usually worsen during growth, typically

Signs

- Lameness
- Hind limb skipping or stiffness. Dogs may occasionally hold up the effected leg whilst walking or running (as the patella pops out of the groove) and then spontaneously start using it again (when it pops back in).
- Vocalisation may be apparent depending of the severity of discomfort
- Inward or outward turning of the leg- severe cases may also be obviously bow-legged or knock-kneed.



exacerbating the severity of the luxation.

Consequences of patellar luxation

- With the patella out of its groove the cartilage layer on its under-side is eroded, and can eventually expose bone. This is painful.
- The abnormal position of the patella destabilises the stifle causing discomfort.
- When the patella is not in the correct position, the stifle joint cannot straighten normally.
- Instability in the stifle inevitably leads to the onset of osteoarthritis. There is no way of stopping the progression of arthritis, but by stabilising the patella and restoring normal biomechanics the rate of progression may be reduced and stifle function is restored.

Diagnosis

- Clinical history of lameness
- Palpation of patella moving in and out of groove

- X-rays are essential to assess any underlying deformity of the femur and/or tibia.
- Computed tomography (CT) allows us to more accurately assess any deformity.

Treatment

This involves surgical correction of the anatomy of the stifle such that the patella is appropriately located within the trochlear groove. Techniques include:

1. Deepening of the trochlear groove, making it harder for the patella to luxate. The technique involves removing the cartilage of the trochlear groove, removing some bone beneath and replacing the cartilage.
2. Moving the tibial tuberosity to realign the quadriceps origin and insertion. Termed “tibial tuberosity transposition” the technique involves cutting the bone at the site of attachment of the patellar ligament and reattaching it with pins and wires to hold the segment of bone in its new position. The image on the right

shows how repositioning the tibial tuberosity can encourage the patella to stay in place.

3. Loosening soft tissues on the side of the patella to which luxation was occurring and tightening soft tissues on the opposite side.

4. Straightening the femur and/or tibia if bowing is severe. This may involve cutting bones, realigning them and fixing them again with implants such as a plate and screws.

Success of treatment

Overall, surgical correction of patellar luxation is very successful.

However, in cases where bowing of the femur causes a significant “bowstring effect”, surgery directed at the stifle alone (i.e. deepening the groove, aligning the TT and soft tissue procedures) will be insufficient to restore a normal joint and straightening of the femur is necessary.

After-care following corrective surgery

- Most animals will go home the day after surgery.
- We strongly recommend a degree of restriction of activity for the first eight weeks after surgery. This should ideally involve confinement to a crate or a single room for the first four weeks. The surgical procedures involve cutting and reattaching bone, and so these patients should be treated as animals with healing fractures.
- To encourage controlled use of the limb after four weeks we recommend gentle lead walks (for 5-10 minutes three times daily) and physiotherapy. Treadmill hydrotherapy



can be beneficial post operatively and will help to improve muscle mass and range of joint motion. This can usually commence following removal of sutures (at 10-14 days following surgery).

- One of our surgeons will re-examine your animal approximately four weeks post operatively. This will usually include a follow up consultation and part-day hospitalisation to carry out radiographs. This re-examination is necessary to confirm bone healing and check that there are no complications with any of the implants.
- Based on this examination we will be able to advise you on further exercise/ rehabilitation requirements. Most animals are able to resume normal activity within 4 months of surgery.
- In some cases, especially smaller dogs and cats, there may be a requirement to remove the implants once the bone has healed. This is usually because of either implant loosening or irritation caused by the lack of covering tissue. This is a minor procedure (in comparison to original corrective surgery) and is only required in a small percentage of cases.



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