TTA surgery for cruciate ligament rupture
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What is TTA surgery?

TTA is the abbreviation for tibial tuberosity advancement. This a surgical procedure used to treat cranial (or anterior) cruciate ligament rupture in the knee joints of dogs. It involves cutting the top of the shin bone (the tibia), moving it forward and stabilising it in its new position in one of a number of ways.

Cranial cruciate ligament rupture is the most common cause of hind limb lameness in dogs. As a result, TTA and other operations that involve altering the shape of the tibia are common orthopaedic surgical procedures performed in dogs in specialist orthopaedic practices. (See also Cranial Cruciate Ligament Rupture Information Sheet)

How does TTA surgery work?

Following rupture of the cranial cruciate ligament, the knee (stifle) becomes unstable. When the dog takes weight on the limb this instability allows the shin bone (tibia) to move forward relative to the thigh bone (femur). The stifle feels as though it is ‘giving-way’ and this can cause the dog to appear severely lame.

One reason the tibia moves forward with weight-bearing is that the top of the bone (called the tibial plateau) is not perpendicular (90 degrees) to the tendon (the patellar tendon) that joins the knee cap (the patella) to the tibial plateau.

TTA surgery aims to make the tibial plateau perpendicular to the patellar tendon and, in doing so, to prevent the shin bone moving forwards. The knee then feels stable for the dog when weight-bearing, despite the fact that the ligament has been ruptured and not directly repaired.
Does my dog need TTA surgery?

Tibial tuberosity advancement surgery is only performed in dogs where the benefits of surgery outweigh the possible risks, and where alternative methods of treatment are less successful. It is primarily performed in medium and large breed dogs.

Candidates for TTA surgery are dogs with a ruptured cranial cruciate ligament that have persistent lameness and stifle joint instability. Young dogs and those with rupture of both of their ligaments are particularly good candidates.

What does TTA surgery involve?

Dogs need to be carefully evaluated to see if they need TTA surgery. Following the initial examination, additional palpation under sedation or light anaesthesia may be necessary. This may enable the detection of more subtle instability of the knee as occurs with partial rupture of the cranial cruciate ligament.

Very specific X-rays need to be obtained of the stifle and tibia. The presence and severity of osteoarthritis can be assessed and the angle of the top of the shin bone (the tibial plateau) measured. This enables planning prior to surgery. The position of the cut on the bone, the amount the bone needs to be advanced, and the size of implants to stabilise the bone in its new position can be evaluated. It may be necessary to take a sample of fluid (synovial fluid) from the knee and send it to a laboratory for analysis.

Surgery may be performed on the same or a different day from the investigations. Antibiotics and painkillers are administered at the time of anaesthesia and the limb is clipped from the level of the hip to the hock (ankle). Prior to performing the TTA a small incision or cut is made into the knee joint to enable inspection of the structures within it. Many dogs with ruptured cranial cruciate ligaments tear their cartilages (menisci). Damaged portions of the cartilages need to be removed. At the same time, remnants of the ruptured ligament can be trimmed.

X-rays are obtained at the end of the operation to assess the new angle of the top of the shin bone (the tibial plateau) relative to the patellar tendon and to check the position of the implants. A light bandage is sometimes applied. Most dogs can go home the day after surgery.

Aftercare

Aftercare following TTA surgery is very important, with rehabilitation taking a number of months. Courses of painkillers and antibiotics are prescribed at the time the pet goes home. If the dog tends to lick the wound excessively it may be necessary to use a plastic Elizabethan collar. Visits to your own veterinary surgeon are necessary within the first two weeks to check the wound and remove any sutures.

Exercise must be very restricted for the first few weeks until the soft tissues and cut bone heal, and at this stage is primarily for toileting purposes. It must be on a lead or harness to prevent strenuous activity, such as chasing a cat or squirrel. At other times confinement to a pen or a small room in the house is necessary with avoidance of jumping and climbing. After a few weeks, exercise may be gradually increased in a controlled manner (still on a lead). Hydrotherapy may be recommended.

A check-up at Willows is necessary six to eight weeks after the operation. Limb and stifle (knee) function are checked at this time. X-rays are obtained to evaluate healing of the bone cut (osteotomy). Depending on progress, advice is given regarding increasing exercise. Further clinical and radiographic examination may be necessary on an individual case basis.

Risks and complications

TTA surgery is associated with potential complications including infection, implant loosening and fracture. A small percentage of dogs that didn’t have an injured cartilage at the time of TTA surgery go on to tear it at a later date. In this event a sudden increase in lameness usually develops and a second operation (key hole or arthroscopic) is necessary to remove the torn piece of cartilage. However, although there is the potential for complications, in the majority of patients selected to undergo TTA surgery, knee pain is reduced and the function of the limb is markedly improved.

If you have any queries or concerns, please do not hesitate to contact us.
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