BoneVet ORTHOPAEDICS

Fractures of the Distal Femoral Physis

What is a distal femoral physeal fracture?

A distal femoral physeal fracture is within the stifle (knee) joint and involves the physis (growth plate).

Physes or growth plates are thin bands of cartilage located near the ends of long bones in growing animals. Longitudinal bone growth i.e. lengthening occurs from the physes. The physes are weaker than the surrounding bone so in young animals it is more common for the physes to separate (fracture) than for the surrounding bone to fracture. This may cause damage to the delicate cells of the physis responsible for bone growth such that the injured physis is no longer capable of growth, and the physis shuts down (physeal closure). The cells of the distal femoral physis are particularly prone to injury to the undulating surface of the physis, so it is common for distal femoral physeal closure to occur following fracture/separation.

Treatment options

Fractures of the distal femoral physis are typically repaired with crossed Kirschner-wires, although rush pins, tension-band wires, intra-medullary pins, plates and screws or external skeletal fixators may also be utilised.

Outcome and potential risks of surgery

Despite the fact that damage to the growth plate often causes it to cease growing, most dogs recover well after fracture repair. A shortened femur may develop, but often compensatory growth can occur from the top of the femur and even the tibia, such that overall limb length is not significantly reduced. The majority of dogs are therefore able to return to normal levels of activity without consequence.

Overall success rates with distal femoral physeal fracture repairs are typically very good, however, as with any surgery complications may arise and are detailed below, although serious complications are rare:

- Even though very uncommon, anaesthetic death can occur. With the use of modern anaesthetic protocols and careful monitoring the risk of problems with anaesthesia is minimised, but never eliminated.

- The bone is quite fragile in young animals and may occasionally suffer additional fractures during attempted repair.

- Infection is relatively uncommon if the fracture site was uncontaminated before surgery, as strict sterile technique is used during the surgery and antibiotics are administered during and after the procedure. Contamination of the wound in the early post-operative period may increase this risk e.g. your dog licking the wound in the first few days after surgery may significantly increase the risk of infection. Should infection occur, early detection and treatment generally results in rapid resolution, although sometimes removal of the implants may be required once the bone has healed. More serious problems may occur if infection progresses untreated. If you suspect an infection contact your VET immediately.

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• Excessive early activity will reduce the likelihood of the bone healing and will increase the risk of implant failure or loosening; very young animals have much softer bone than adults thus implant loosening occurs more readily.

• As the fracture is inside the joint it is inevitable that some degree arthritis will develop and progress. Fortunately the majority of patients recover excellent long term joint function despite this.

• The growth plate may have suffered significant damage at the time of fracture; this may result in complete arrest of physeal activity i.e. the growth plate "shuts down" and the bone stops growing. Fortunately the phenomenon of "compensatory growth" often occurs, in which growth occurs elsewhere in the limb to make up for lost growth from the inactive physis. e.g. the other end of the femur can provide some extra growth, as can the tibia. Very occasionally the early closure of the affected growth plate may result in more significant shortening of the limb as a whole and/or deformity of the femoral condyle. Consequences may include lameness and the potential for development of significant osteoarthritis due to abnormal joint loading.

• Even after the physis has healed it is still important to have a controlled, gradual increase in activity, similar to human patients undergoing rehabilitation following surgery. If activity is increased too quickly after surgery straining of joint structures may occur. Rest and anti-inflammatory medications typically resolve these problems.

Postoperative care

A pad may be covering the wound at the time of discharge from the hospital. This can be removed after several days, or immediately if soiled.

Medications e.g., Pain killers will be dispensed.

Ice packs may also be helpful in the days following surgery to reduce swelling and improve comfort.

Confine appropriately to **eliminate running and jumping** for 8 weeks; chose appropriate confinement to achieve this for your dog; cage confinement is advised. Short **leash** walks in the garden (a few minutes four to six times daily) are recommended to allow toileting. Keep your dog at your side; use a lead of no more than 1-metre length.

Always use a short lead when walking and maintain confinement at all other times; running, jumping and play must be avoided for at least 8 weeks.

X-rays should be performed approximately three to four weeks following surgery to assess implant position and healing.

Early implant removal may be recommended to increase the likelihood of continued physeal function. Implant removal may be also advised if causing irritation to soft tissues.

Declaration

I have read the information contained herein and am satisfied I have a sufficient understanding of the procedures my dog is scheduled to undergo, including potential complications that may occur and requirements for aftercare following surgery.

Owner's name: dog's Name:

Owner's signature: Date: