

Capital physeal fractures

What is a capital physeal fracture?



The hip joint is a "ball and socket" joint and is composed of the femoral head and acetabulum (part of the pelvis). The femoral head is the "ball" and the acetabulum is the "socket". The femoral neck connects the femoral shaft (thigh bone) to the femoral head. The physis is a cartilaginous growth plate between the "cap" of the femoral head (epiphysis) and the metaphysis at the top of the main bone segment in growing animals. Once growth stops the physis changes into bone. Capital physeal fractures occur when the "cap" or epiphysis pulls off the metaphysis and occurs in skeletally immature (juvenile) cats up to 10- 12 months of age, although in male neutered cats they may occur beyond 2 years of age.

Blood supply to the femoral head and neck may be damaged at the time of fracture. This will slow healing and typically results in some degree of bone resorption, which may continue for a period after repair. Damage to the fracture surfaces may occur if the animal tries to walk on the affected limb prior to surgery; this can make accurate reduction difficult or even impossible. Strength of the repair is limited by the relatively small bone segment proximally i.e. "cap" (epiphysis) of femoral head. Strict confinement is mandatory.

Fracture repair



Repair should be carried out as soon as reasonably possible, and ideally within 2 to 3 days of injury. Delayed repair may result in bone resorption and remodelling, which may increase the risk of fixation failure or otherwise negatively impact outcome.

Repair is typically accomplished with multiple Kirschner-wires, although a lag screw +/- anti-rotational Kirschner-wire may be used in larger cats.

Outcome and potential risks of surgery

An important factor affecting outcome is the degree of bone resorption that occurs both before and after surgery; this is influenced by the degree of damage to the blood supply (femoral neck or capital physeal fracture interrupt the segmental blood supply) and how quickly a compensatory blood supply can be established. A compromised blood supply results in bone resorption, delayed healing and a reduced ability to fight infections. Medical conditions may also affect healing e.g. diabetes, kidney disease. Another important factor affecting outcome is the integrity of fracture surfaces i.e. how well the surfaces fit back together. As the segments of bone are very small there is limited room for implants to engage the bone; it is therefore important that the bone segments fit together well to add both alignment and the stability to the repair. Physeal fractures typically heal faster than fractures through bone. If the fracture surfaces don't fit together well the likelihood of malalignment and/or repair failure is likely to be significantly higher.

Overall success rates with fracture repair are typically good, however, as with any surgery complications may arise and are detailed below:

- Infection is an uncommon complication as strict sterile technique is used during the surgery and antibiotics are administered during and potentially after the procedure.
- Interruption of blood supply can lead to bone necrosis and resorption; this can affect both the femoral neck and head, and if severe can lead to head deformation and/or collapse of the repair.
- Malunion occurs when a fracture heals in an incorrect position, leading to misalignment of the femoral head and neck. This misalignment can result in altered joint mechanics, pain, and reduced limb function.
- Excessive early activity will reduce the likelihood of healing and will increase the risk of implant failure or loosening.
- Premature physal closure; Injury to the growth plate may result in early closure, leading to an abnormally developed femoral head or leg length discrepancies in young, growing cats.
- Muscle atrophy: reduced use of the limb due to pain or immobility may lead to muscle wasting, complicating recovery.
- Even after the fracture 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.
- Osteoarthritis is a long-term complication that can develop following femoral capital physal fracture repairs. The altered joint mechanics and cartilage damage resulting from the fracture and surgical intervention may predispose to development of osteoarthritis in the longer term, although this is not likely to have a substantial impact on outcome.
- Implant removal is typically recommended.

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, but only if well tolerated.

Your cat should be kept confined to a cage to restrict activity. This should be comfortably large enough to accommodate water and food bowls, a bed and a litter tray. Maintain strict confinement for at least the first six weeks following surgery; only relax confinement when your Vet specifically advises you to do so.

X-rays should be performed approximately four weeks following surgery to assess fracture healing and implants.

Declaration:

I have read the preceding information and am satisfied I have a sufficient understanding of capital physal fracture repairs, including potential complications that may occur and requirements for aftercare following surgery. I hereby consent for my cat to undergo fracture repair.

Owner's name:

Cat's Name:

Owner's signature:

Date: