Fractures of the femoral neck (hip joint)

The femoral neck connects the femoral shaft (thigh bone) to the femoral head. 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". Fractures of the femoral neck may be intracapsular (inside the hip joint) or extracapsular (outside the hip joint). They may occur in dogs of any age but are most common in dogs under 12 months of age, although femoral capital physeal fracture/separation is more common than neck fracture in skeletally immature animals. Femoral neck fractures are more difficult to reduce and have less inherent stability than capital physeal separations, and bending forces on the implants are also greater due to the longer lever arm.

Blood supply to the femoral head and neck may be damaged at the time of fracture. This will slow healing and may also result in bone resorption. 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 (femoral neck and head), and as previously mentioned significant bending forces act on the femoral neck. Strict confinement is mandatory and an Ehmer sling is typically employed for 7 to 10 days to minimise loading in the early post-operative period and thus maximise the likelihood of a successful outcome.

Repair is typically accomplished with a lag screw +/- anti-rotational Kirschner-wire in larger dogs, and multiple Kirschner-wires (may be two to four but typically three) in smaller dogs.

Factors that may influence bone healing and therefore the likelihood of a successful outcome without complications include age (young animals heal more quickly than old animals), and the degree of damage to the blood supply – less blood supply to the healing bone results in delayed healing times and a reduced ability to fight infections. Medical conditions may also affect bone healing e.g. diabetes, kidney disease etc. Other factors that are important integrity of fracture surfaces i.e. undamaged, so the surfaces fit back together.

Overall success rates for fracture repair of the femoral neck are typically good, however as with any surgery complications may arise and are detailed below; the likelihood of complications is influenced by the factors discussed above, however a fracture with a guarded prognosis may heal without any complications and a fracture with an excellent prognosis may still suffer complications.

- 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.

- When the bone is in multiple pieces repair is much more difficult. Furthermore the pieces may be quite fragile e.g. there may be microfractures or even fissures in the individual bone pieces. Occasionally these bone pieces may suffer additional fractures during attempted repair. Bone in older dogs is more brittle and splinters more easily.

- 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. Statistically approximately 1 in 50 animals undergoing orthopaedic surgery are likely to develop a post surgical infection (this will be higher for risk factors such as soft tissue injuries, contaminated wounds or pre-existing disease in the patient). 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 very occasionally removal of the implants may be required once the bone has healed. More serious problems may occur if infection progresses untreated or if your dog suffers infection with a multiple resistance bacteria e.g. MRSA. If you suspect an infection contact your VET immediately.

- Excessive early activity will reduce the likelihood of the bone healing and will increase the risk of implant failure or loosening.

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- For intracapsular fractures (fractures inside the joint) it is inevitable that arthritis will develop and progress. Fortunately the majority of dogs recover very good joint function despite this.
- Fractures that had had previous, unsuccessful surgery have a more guarded prognosis, particularly if there has been prolonged disuse of the limb. Disuse results in atrophy (shrinking) and weakening of soft tissues such as muscles, ligaments and tendons, in addition to atrophy and "softening" (osteoporosis) of the bone.
  - Muscles can contract and suffer fibrosis; these changes may be permanent and will impact the degree of function that can be restored to the limb, even if bone healing is successfully achieved. Physiotherapy is an important aspect of treatment in these cases.
  - Weakened bone will not hold implants as well as "normal" bone. (An analogy is comparing placing screws into a hardwood as opposed to placing screws into a soft plastic.) Nevertheless, with specialised implants (e.g. locking plates & screws) satisfactory fixation of osteoporotic bone can be achieved, and with careful post-operative care good outcomes are still possible.
- Even after the bone 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.

AFTERCARE OF YOUR DOG FOLLOWING SURGERY:

Your dog should be kept confined (ideally to a large cage or alternatively a single room with **non-slip** flooring) to restrict activity. Short **leash** walks in the garden (a few minutes four to six times daily) are recommended to allow toileting. Confinement should be maintained at all times for at least the first six weeks following surgery; only relax confinement when your Vet specifically advises you to do so.

Ice packs for 10 to 15 minutes several times daily are recommended in the first few days following surgery to reduce swelling and improve comfort. Regular, gentle massage (sweeping motions upwards e.g. from ankle to hip) may help dissipate oedema fluid.

X-rays should be performed approximately four to eight weeks following surgery to assess implant position and healing. The actual timing of follow-up x-rays will be advised at discharge.

Hydrotherapy may be beneficial to recovery but should only be performed in a centre with qualified personnel. Only commence hydrotherapy when specifically advised to do so by your Vet.

Implant removal may be advised in certain situations e.g. very young animals, contaminated wounds.

DECLARATION:

I have read the information contained herein (2 pages) 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.

I hereby consent for my dog …… to undergo fracture repair as scheduled by my Vet.

Owner's signature: Witness:

Print name: Print name:

Date: Date:

EACH page must be signed - Email to forms@bonevet.co.uk or FAX to 0800 098 8245

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