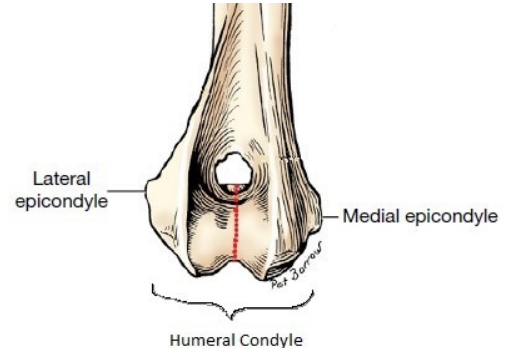




## Humeral Intercondylar Fissure (HIF and elbow fractures in Spaniels

### What is HIF?

The humeral condyle is the name given to the end of the bone at the top of the front leg. The humeral condyle, together with the two bones of the forearm (radius and ulna) makes up the elbow joint.. In some dogs, a crack or opening (fissure) can form across the humeral condyle, this is known a humeral intercondylar fissure (HIF), sometimes known as incomplete ossification of the humeral condyle (IOHC).



### What causes HIF?

The exact reason for the development of HIF remains unclear. In some young puppies HIF is likely a developmental problem, although the majority of dogs appear to develop HIF when they are adults. Spaniel breeds, in particular Springer Spaniels are most commonly affected, although in recent years HIF has been identified in other breeds such as the French bulldog and has even been described in a cat.

### What are the Signs of a Humeral Intracondylar Fissure?

Some dogs will develop a persistent and progressive limp in their affected front leg due to pain related to the HIF. Humeral intracondylar fissure can also predispose the elbow joint to developing a complete fracture or break. In such situations these fractures are often not caused by any major trauma, but can occur during normal exercise.

### How are Humeral Intracondylar Fissures Diagnosed?

Examination of your pet will generally identify elbow pain and often show reduced muscle in the affected leg. Large fissures or cracks within the humeral condyle can be detected on X-rays, however incomplete or subtle fissures can often only be diagnosed on a CT scan. Because HIF often affect both front legs, a CT scan both of elbows is usually recommended.



Normal elbow on the left and HIF on the right



## How can Humeral Intracondylar Fissures be Treated

When HIF is causing lameness surgery is recommended to reduce elbow pain, to hopefully resolve the dogs limp and to reduce the risk of the humeral condyle fracturing. The operation involves accurately placing a large screw across the humeral condyle through a small skin incision. In the past this operation carried a high risk of complications, including the build up of fluid under the skin (seroma) and infection. In recent years, new techniques have been developed for carrying out the operation which has led to a much reduced complication rate. In some patients HIF may be detected on an X-ray or a CT scan before it causes a problem for the dog. In such situations surgery to place a screw may be performed prophylactically.



## What can I expect if my pet is treated for a humeral intracondylar fissure?

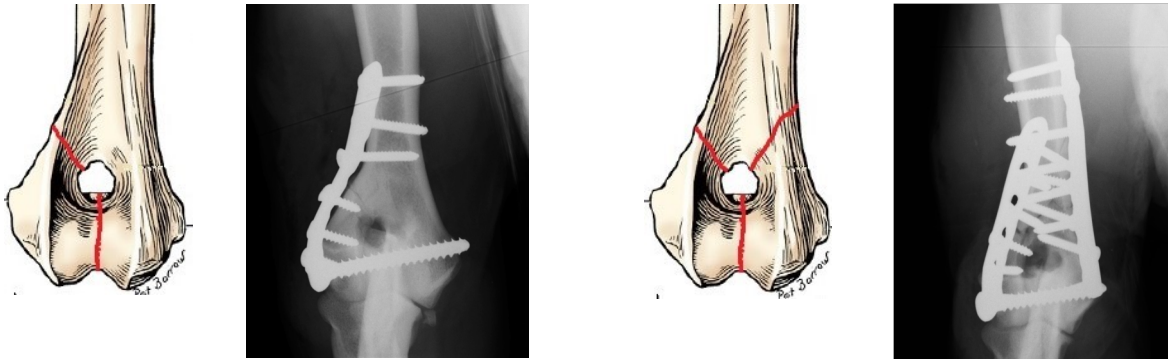
Most dogs are very comfortable following surgery and are able to go home the next day with only a light dressing. They can start walk and place weight on the limb within a day or two, off the lead exercise such as running or jumping must be avoided for approximately four weeks. Painkillers are given for a few weeks to ensure your pet is comfortable. Pets that have undergone surgery will need to be taken to their local vet for a check-up between at one and two weeks for a wound check. We will then plan to see your pet for reassessment after four weeks when follow up X-rays may be taken.

With new surgical techniques the complication rate following surgery is now much lower than in the past. The majority of dogs will recover well within a few weeks of the operation and can regain a normal quality of life. However, in the long term, we do not expect the HIF to heal. As a result dogs have to rely on the implanted screw to support their weight for the rest of their lives. With every step such dogs take, a small force is placed on the screw, and in some, over time, this can lead to the screw breaking. If this occurs, another operation may be required to replace the screw.



## Elbow fractures in Spaniels

HIF can predispose affected dogs to fracture of the elbow. When the humeral condyle breaks, the elbow joint is fractured and will not work properly. Fractures of the elbow joint are amongst the most common type of broken bone seen in dogs; they rarely occur in cats



Elbow fractures typically occur in two configurations. The most common are fractures affecting the outer aspect of the humeral condyle (75%). These are relatively straightforward to repair for an experienced surgeon and the prognosis is generally good. The other type of fracture is a more complicated fracture affecting both sides of the humeral condyle, with a Y-configuration (25% of cases). These are much more difficult to repair and the prognosis sometimes isn't quite as good.

Elbow fractures need to be treated with surgery to perfectly appose the joint surface. Any gap or step in the joint surface is poorly tolerated and leads to osteoarthritis and a poor outcome. Care is taken to perfectly reconstruct the joint surface and apply rigid fixation to allow an early return to function to maintain joint health.

Another consideration with these cases is that healing can be delayed or incomplete due to the underlying bone abnormality, so fixation has to be very strong in anticipation that the implants may need to provide prolonged support. Typically the humeral condyle is reduced and stabilised with a 4.5mm diameter bone screw with a bone plate up the outside of the bone for a lateral condylar fracture and two bone plates for a Y-fracture.

The prognosis for a fracture of the lateral aspect of the humeral condyle is generally good. Most dogs will go sound and can return to a good level of activity. Most working dogs will be able to return to work. Some arthritis is inevitable but it generally doesn't cause too much of a problem. The prognosis for a Y-fracture is less predictable, but most recover well and can still go for good walks. Some dogs do very well, go sound and can return to normal activity and work, but not all will recover to the same level of function and work performed before the injury.

### **What is the risk of a Spaniel with an IOHC fissure breaking its elbow?**

Lameness or fractures are not inevitable. A study published in 2017 followed 30 "normal" Spaniels known to have HIF fissures (34 elbow fissures) over a 2-4 year period. 6 developed fractures which had to be repaired and 2 went lame requiring surgery. So 18% got a fracture and overall 24% required surgery on the affected elbows

## **How common are IOHC fissures in Spaniels?**

A study published in 2012 screened 50 “normal” Springer Spaniels (100 elbows) and found IOHC fissures to be present in 7 dogs (8 elbows). So 14% of “normal” Spaniels may have these elbow fissures. Many dogs will run around all their lives without having any problems. Most affected dogs just have a fissure in one elbow, but some other studies suggest that up to 20-30% of affected dogs have the problem in both elbows. For this reason, when a Spaniel presents with a fractured elbow, screening of the opposite elbow by CT scan is always offered.

## **Practical issues for consideration**

Placement of a screw is recommended in cases of the HIF fissure causing lameness, but is optional in cases where the HIF fissure is an incidental finding. If a fracture does occur, then three-quarters are relatively straightforward to treat and the prognosis is good, but a quarter of fractures are Y fractures which can be very difficult and costly to treat with a more uncertain prognosis.

Y-fractures can be disastrous for a dog and result in euthanasia due to the expense involved in treatment. Placement of a prophylactic screw to eliminate the small risk of a Y-fracture alone may be justifiable in some cases because these injuries can be so catastrophic. Placement of a prophylactic screw is around 2/3rds of the cost of treating a fracture of the lateral aspect of the humeral condyle and around a quarter of the cost of treating a Y-fracture. Placement of a prophylactic screw is followed by 4 weeks of restricted exercise whereas the recovery period from a fracture is typically 12 weeks.