

## Humeral Intercondylar Fissure (HIF) or Incomplete Ossification of the Humeral Condyle (IOHC)

The elbow joint is made up of the bones of the forearm (the radius and ulna) and the humeral condyles. The humeral condyles are the two bony prominences at the end of the humerus (upper part of the limb). In some dogs, a fissure (crack) can develop between the two condyles, causing pain, lameness and making them prone to fractures. This is known as a **humeral intracondylar fissure (HIF)**, sometimes referred to as **incomplete ossification of the humeral condyles (IOHC)**.

The exact reason for the development of HIF is unclear. There are different schools of thought regarding this condition, hence why the terminology has been changed from IOHC to HIF in recent years.

It is thought that in some young puppies, it is a developmental problem. The humeral condyle develops as two secondary centres of ossification; medial and lateral. Usually between 8 and 12 weeks of age, the cartilaginous plate should ossify (turn to bone). Incomplete ossification of the humeral condyles (IOHC) refers to the failure of this process to happen and the persistence of the cartilaginous plate. Certain breeds are at greater risk, particularly springer spaniels, cocker spaniels and in more recent years, we have identified this in other breeds such as French bulldogs.

In older dogs that develop humeral intracondylar fissures (HIF), it is believed to be a stress fracture, due to wear and tear, and repetitive strain on the bone, potentially combined with an element of elbow dysplasia. In these patients, if they had a CT as an adolescent dog, we may well find that there were no concerns with the condyles and that they had fused as normal, but then gone on to develop a fissure later.

Fractures of the condyles can affect the lateral or medial condyle or both.



### Clinical signs

The failure of ossification, or the development of a fissure, predisposes the dog to fractures of the humerus. Often in these cases, minimal or no trauma is required to cause these fractures. They can

occur during normal exercise or jumping down out of a car boot for example. They will present to the vets with an acute onset, non-weight bearing lameness and pain.

Some dogs will develop a persistent and often progressive lameness in the affected forelimb(s), due to the pain associated with IOHC/HIF, and this may be detected before a fracture occurs.

## Diagnosis

Examination of your dog will generally allow a fracture to be suspected on palpation of the limb, due to pain, crepitus and the presence of a non-weight bearing lameness.

For dogs with fissures, but not a complete fracture, there may be elbow pain when they are palpated across the condyles and reduced muscling in the affected leg.

Radiographs (X-rays) can be used to assess the configuration of a fracture and sometimes detect the larger fissures or cracks, but it can be harder to detect a subtle or incomplete fissure.



*Bicondylar (Y) fracture*

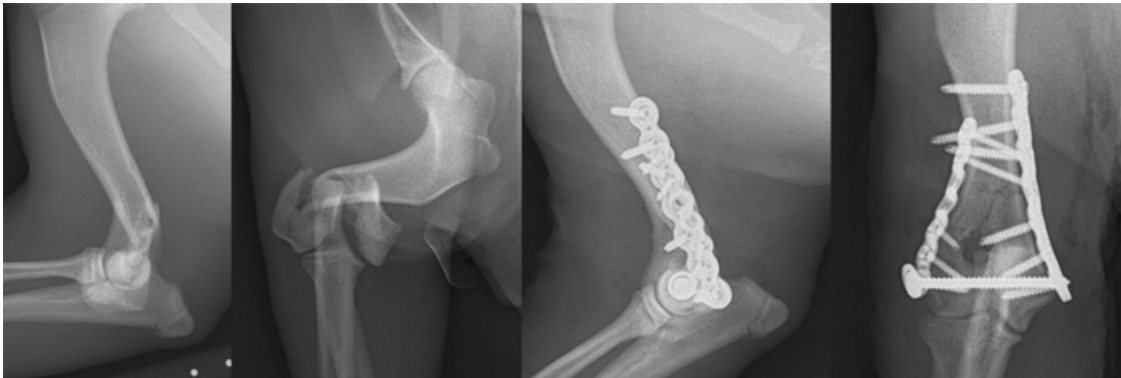
Often CT scans are preferred to allow us to examine the condyles in more detail, assess the fracture and plan surgical repair. As HIFs are often bilateral, a CT of both elbows is performed to check for a fissure in the other leg.



*Bilateral condylar fissures in a 5 month old springer spaniel puppy with propagation of the fracture up the humerus*

## Treatment

If a fracture has occurred, accurate surgical reduction of the fracture and fixation with plate(s) and screws would be required. This would also involve a large transcondylar screw to be placed across the two condyles.



*Pre and post op x-rays of the repair of a Y fracture*

In dogs that are found to have a HIF, or a dog with a fracture that has a HIF in the other elbow, prophylactic surgery would also be recommended to aim to reduce the lameness and reduce the risk of the humeral condyles fracturing in future. The operation involves making a small skin incision over the elbow, and creating sequentially larger drill holes across the humeral condyles, to accurately place a large screw.



Prophylactic transcondylar screw

## Aftercare

- An Elizabethan (buster) collar should be worn at all times for the first 2 weeks.
- Pain relief (anti-inflammatories) will be prescribed for your dog for 4-6 weeks.
- Some surgeons will prescribe prophylactic antibiotics for the first week post operatively due to the presence of metal implants in the bone.

- Your dog should be rested in a cage at all times for the first 6 – 8 weeks, until the bone has healed. They can be taken out on short lead walks for toileting purposes only.

A post op check would be recommended about 5 – 7 days post surgery.

A recheck appointment is then recommended 6 weeks after surgery. Your dog will be sedated for X-rays to check that the bone is healing and there are no concerns with the implants.

If you have any problems before then, please contact your vet. It is better to have a recheck than miss a problem.

### **Time after surgery:**

First 2 weeks	3 x 5 minute lead walks
2 – 4 weeks	3 x 10 minute lead walks
4 – 6 weeks	3 x 15 minute lead walks
6 – 8 weeks	3 x 20 minute lead walks
8 – 12 weeks	Gradual return to normal exercise
After 12 weeks	Normal activity

### **Potential Complications**

- **Surgical site infection or infected implants** – this is usually due to the dog licking their wound. It can also occur during surgery, recovery or through haematogenous spread (through the blood stream) e.g. if they have had diarrhoea.
- **Seroma formation** – this is relatively common, it is an insignificant fluid accumulation round the wound. It usually improves without any treatment.
- **Implant failure** – this is very rare and is normally due to extreme activity in the post op period or incorrect selection of bone plate.
- **Bone fracture** – this is also very rare and is again, normally due to extreme overactivity.

### **Signs to watch out for;**

- Swelling, heat or redness around the wound after surgery; this is often a seroma but it is always worth having it checked by a vet.
- Any discharge from the wound, especially if smelly or yellow.
- Sudden worsening of the lameness that lasts for more than 12 hours.

### **Prognosis**

The prognosis for recovery and return to normal exercise is generally good. Dogs with HIF or fractures associated with HIF may be prone to osteoarthritis in the elbow sooner than non-affected dogs, but can generally regain a normal quality of life.

**To book in for your pet in for a health check, please call us on 01423 228080 or visit [www.clarohillvets.co.uk](http://www.clarohillvets.co.uk).**