

## **Canine Elbow Dysplasia**

### **What is Elbow Dysplasia?**

Elbow dysplasia is a general term used to identify an inherited disease of the elbow in medium to large breed dogs. Juvenile, male dogs are most commonly affected. Four main conditions make up this disease and can occur independently or in conjunction with one another. These conditions include:

- Fragmented Medial Coronoid Process (FCP)
- Osteochondrosis Dissecans (OCD) of the medial humeral condyle
- Ununited anconeal process (UAP)
- Joint incongruity between the humerus, ulna, and radius

The cause of elbow dysplasia is not completely understood. However, it is believed to be due to a combination of a genetic predisposition and environmental factors (such as activity level, obesity, and high calorie diets). Incongruity, meaning that the joint does not fit well, is likely a contributing factor in all four conditions that make up the disease complex known as elbow dysplasia.

### **Clinical Signs of Elbow Dysplasia**

The most common indication that a dog may have elbow dysplasia is a front leg lameness in a young large-breed dog. However, older dogs may present with a different variety of elbow dysplasia or symptoms secondary due to the arthritis that develops if the condition is left untreated as a puppy. Some breeds such as Labrador Retrievers, Rottweilers, Bernese Mountain Dogs, Newfoundlands, German Shepherd Dogs and Golden Retrievers are commonly affected. Exercise typically makes the lameness worse. Although the disease is almost always present in both elbows, 80% of dogs may only appear lame in one leg. The lameness may also seem intermittent or shift from one front leg to the other. When both front legs hurt, dogs do not limp constantly, which may make the problem less obvious. These dogs are frequently stiff when rising, less willing to play and tire easily.

### **Anatomy of the Canine Elbow Joint**

The elbow joint consists of three bones (humerus = upper arm bone, radius and ulna = forearm bones) that fit together perfectly to allow flexion and extension motion in the front leg. A problem with any one of these bones can create an improper fit (i.e. incongruity) as the bones interact within the joint.

### **Fragmented Coronoid Process (FCP)**

The coronoid process is a term used to describe the tip of the ulna bone. The humerus fits inside this notch and articulates with the coronoid process. The part on the inner side of the coronoid process commonly becomes separated from the rest of the ulna, thus leading to the descriptive term "fragmented coronoid process". This piece of bone acts like a "pebble in the shoe" and irritates the joint and causes pain when walking.

Many theories have been proposed to explain why the piece of bone develops abnormally and eventually becomes loose. These theories include failure of transition of cartilage to bone during development, and excessive wear and tear on the coronoid process due to joint incongruity which places abnormal stresses on the developing bone. Treatment of FCP requires arthroscopic removal of the fragment and if the incongruity is severe, the bone that is too long may need to be cut to restore congruency of the elbow joint. A subset of

dogs may develop FCP as adults. In some cases, an acute traumatic episode may be responsible for the fragmentation. However, it is also possible that there was always incongruity in the joint (i.e. mild elbow dysplasia), making the coronoid process more susceptible to damage.

### **Osteochondrosis of the Medial Humeral Condyle (OCD)**

Cartilage is the normal coating of any joint in the body that ensures that motion is frictionless, smooth and pain-free. Without cartilage covering the joint, the joint surface becomes rough and uneven resulting in motion becoming painful. Over time, arthritis develops, limiting the range of motion in the joint, and further causing pain and discomfort. In the normal dog, growth occurs by transformation of cartilage into bone. Osteochondrosis Dissecans is an abnormality of this transformation in growing dogs. This abnormality can lead to development of abnormal cartilage, and eventually create a loose flap of cartilage within the joint. This development causes pain and inflammation similar to FCP. Treatment consists of arthroscopic removal of the abnormal cartilage and debridement of the bone to allow healing. Sometimes we can replace the cartilage from another joint, which is called the OATS procedure. The goal is to facilitate that the cartilage defect fills in with new cartilage (fibrocartilage). This cartilage is not as strong as the original cartilage, however, which is why some progression of arthritis is expected despite surgical treatment.

### **Ununited Anconeal Process (UAP)**

Elbow joint incongruity can lead to abnormal pressure forces acting on the top part of the ulna bone called the anconeal process, the tip of the bone. This part of the bone then fails to fuse to the rest of the ulna bone and becomes a separate fragment. Usually the fusion of these two pieces of bone occurs by five to six months, which is when this disease can easily be diagnosed. Most commonly affected are German Shepherd Dogs. Treatment options include removal of the anconeal process, or reattachment of the anconeal process to the ulna coupled with a cut in another part of the ulna to release the abnormal pressure in the elbow. We will determine the best treatment for your dog on an individual basis (depending on age, degree of arthritis, size of the fragment etc).

### **Diagnosis**

The diagnosis is based upon signalment, history, physical examination and further diagnostics. Palpation of the elbow joint usually shows decreased range of motion, pain upon flexion and extension and joint effusion. Radiographs (X-rays) are a good start to classify the type of Elbow Dysplasia; however, CT (Cat-scan) and/or arthroscopy are most commonly used in addition since X-rays do not show cartilage. Arthroscopy has been shown to be the most sensitive way to assess for cartilage damage.

### **Prognosis**

It is very important to realize that – in comparison with the hip joint – at this point we do not have veterinary implants that allow for consistently successful replacement of the elbow joint. Therefore, it is extremely important to prevent the elbow joint from becoming arthritic, which is the main reason for joint replacements. The end-result of Elbow Dysplasia is arthritis, which can be debilitating and very painful. Even though the above mentioned surgical procedures do not totally prevent the development of arthritis, they slow the progression of arthritis formation. For this reason, it is also extremely important to pursue lifelong medical management for osteoarthritis. This commitment will help in the long-term to give your pet a better quality of life!