



d.c. Vets, inc.

## Elbow Dysplasia

Elbow dysplasia is an inherited disease which primarily affects intermediate and large breed dogs. A high incidence of occurrence has been noted in the Bernese Mountain Dog, German Shepherd, Rottweiler, Golden Retriever, and Labrador Retriever. Other breeds affected are the Newfoundland, Saint Bernard, Mastiff, Springer Spaniel, Australian Shepherd, Chow Chow, Shar-Pei, Shetland Sheepdog, and some Terrier breeds. Typically, both elbows are affected. However, unilateral elbow dysplasia is also recognized.

Elbow dysplasia is characterized by varying degrees of elbow incongruity, bony fragments (bone chips), and ultimately, severe arthritic change. The term was introduced to describe generalized osteoarthritis (arthritis) of the elbow joint in which the anconeal process may be ununited, the medial coronoid of the ulna may be fragmented, and osteochondrosis of the humeral condyle may be present. Clinically, the symptoms range from an intermittent lameness in some affected dogs to severe, crippling disease in others.

### Development

The elbow joint is composed of three bones (radius, ulna, and humerus) which must all grow together and fit perfectly. The radius is the main weight bearing bone. The ulna serves more as a lever arm for the extensor muscles of the elbow joint. The normal elbow joint is characterized by a smooth transition from the ulnar joint surface to the radius joint surface. The medial coronoid process of the ulna sits level with or slightly below the surface of the radius.

In a dysplastic elbow, the medial coronoid process and the edge of the ulnar surface lie above the level of the adjoining radius, creating a step between the radius and ulna and causing incongruity of the joint. This incongruity alone is often a source of pain and lameness. The height of the step may vary from barely noticeable to a

distance of four millimeters. When this occurs, the weight bearing force on the ulna is increased, resulting in excessive pressure on the medial coronoid process. This leads to fragmentation of the coronoid. This usually occurs when the dog is between five and seven months of age. The fragments are often the size of a rice grain or larger. Incomplete fragmentation in the form of cracks or fissures can also occur. A superficial to deeply grooved "kissing lesion" is often present on the humeral articular surface opposite the fragment. A cartilage flap or OCD (osteochondritis dissecans) lesion may also be present. Secondary arthritis becomes evident at six to seven months of age.

Compensatory adjustments during growth may occur in some dogs, tending to minimize unequal growth rates between the three bones and moving the ulna distally to better conform to the radius. However, excessive force is then placed on the anconeal process at the top of the ulnar articular surface. This force will cause a failure of ossification and lead to an ununited anconeal process.

The onset of pain usually occurs between four and six months of age and corresponds with the fragmentation of the coronoid, the development of OCD, and/or failure of ossification of the anconeal process. Joint fluid entering through fissures and cracks in the cartilage causes marked pain. The fragments are a constant irritant, causing more pain, a more severe lameness, and more rapid progression of arthritis.

### Clinical Signs

Affected dogs are frequently lame or have an abnormal gait. The gait is often characterized by excessive paddling or flipping of the front feet. The animal may either hold the elbows out or tucked in and often stands with the feet rotated outward. Many sit or lie down much of the time

or play for shorter periods of time than other dogs of comparable age. They are often described as quiet or even lazy. Frequently, they are stiff when rising and tire easily. Exercise typically makes the lameness worse. In dogs with bilateral elbow dysplasia, the lameness may seem intermittent or shift from one front leg to the other. When both front legs hurt, dogs do not limp constantly. Rather, they shift weight off their elbows by altering their gait and stance. These dogs will only limp when one elbow is more painful than the other. On examination, manipulation of the elbow is often resisted. Swelling and crepitus (grating) may be palpated. The swelling may be worse after exercise. In some cases, the joint will be thickened. Muscle atrophy may also be present.

**Diagnosis**

The diagnosis of elbow dysplasia is made from a combination of clinical signs, palpation of the joints, and radiographs (x-rays). Correct radiograph technique is critical for making the diagnosis. Radiographs will reveal the incongruity of the joint. Sclerosis (increased bone density) of the ulnar notch is evident. OCD lesions and ununited anconeal processes are often evident. While the fragments of the coronoid process cannot readily be seen on x-ray, the coronoid process will be missing. Arthritis is often present and can be mild to severe.

**Treatment**

Treatment of elbow dysplasia is often a combination of medical and surgical management. The objectives of therapy are to relieve pain and maintain limb function as well

as to keep the dog at as normal an activity level as possible. Surgical removal of the fragments is recommended before the development of severe arthritis occurs. While the choice of surgical technique (arthroscopy or traditional surgery) may vary, the results are similar. Unfortunately, this disease is progressive. Improvement is expected, but not normality. Medical therapy consists of weight control, moderate exercise, and anti-inflammatory medications. Each case is evaluated for the degree of discomfort and arthritic change before a final treatment choice is selected.

All immature dogs with fragmentation of the coronoid, OCD, or an ununited anconeal process are surgical candidates. Recent studies suggest that, if an ununited anconeal process is detected early enough, an ulnar osteotomy (cutting the ulna) to relieve the stress may allow the process to unite in a normal fashion. Dogs with mild to moderate incongruity and minimal arthritis have the best prognosis. Even dogs with marked incongruity and large lesions benefit from surgery due to the decrease in pain. Dogs that have a combination of an ununited anconeal process and a fragmented coronoid have a poor prognosis.

Mature dogs with mild to moderate arthritis may also be considered for surgery. The objective is to slow the progression of the arthritic change

**D. C. Vets, Inc.****Tommy L. Walker, DVM, MS, Diplomate, ACVS****website: [www.dcvets.org](http://www.dcvets.org)****email: [info@dcvets.org](mailto:info@dcvets.org)****Offices****40280 Hurley Lane, Paeonian Springs, VA 20129****phone: 540-882-4666 fax: 540-882-4776****12106 Nebel Street, Rockville, MD 20852****(inside Metropolitan Emergency Animal Clinic, Inc.)****phone: 301-770-1260 fax: 301-770-1261**