

Elbow Dysplasia

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Elbow dysplasia, more commonly seen in fast-growing large breed puppies, is not a simple condition to understand nor easy to explain. Elbow dysplasia is really a syndrome in which one or more of the following conditions are present:

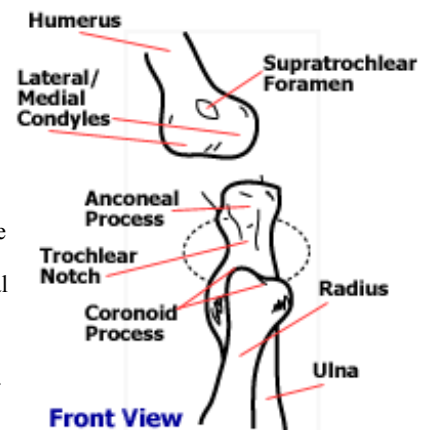
- Osteochondrosis
- Fragmentation of the coronoid process
- Ununited anconeal process
- Elbow incongruity

Normal bone growth

Many bones in a newborn puppy are not just one piece of bone, but several different pieces of bone with cartilage in between. This is especially true of long bones of the limbs. As the puppy grows, the cartilage changes into bone and several pieces of a bone fuse together forming one entire bone. For instance, the ulna, a bone in the forearm starts out as 4 pieces of bone that eventually fuse into one.

Normal elbow anatomy

In the healthy dog, the elbow joint itself is fairly complicated. The elbow of the dog corresponds to ours anatomically but rests relatively closer to the chest wall than it does in man. The bones that form the joint are the humerus, ulna, and radius. The lower end of the humerus has two rounded knobs (the lateral and medial condyles) on it with a hole between them that extends completely through the bone (the supratrochlear foramen). The radius and ulna bones basically act as one bone as they are held tightly together by several ligaments. They move together at all times. The upper end of the ulna has a hook-like process that fits neatly into the supratrochlear foramen of the humerus and a curved ridge called the trochlear notch that fits against and rotates between the medial and lateral condyles. At the base of this notch and on either side of it are the medial and lateral coronoid processes that the condyles of the humerus rest on, therefore supporting the weight of the dog. Finally, there is the upper end of the radius that also lies between the coronoid processes of the ulna and it also helps support the weight of the animal as it is transmitted down through the humerus. In the normal dog, all of these surfaces that rub or articulate against each other are covered with cartilage and are perfectly smooth. They are constantly lubricated by the joint fluid that is contained by the capsule that surrounds the joint.



Osteochondrosis

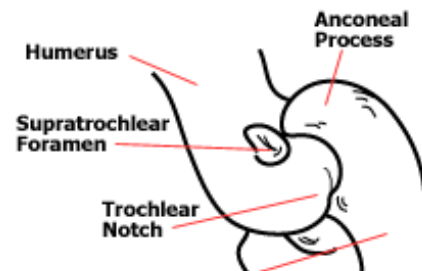
In osteochondrosis, there is an abnormality of the cartilage and the bone underneath it. In the elbow joint, this most commonly occurs on the medial condyle of the humerus. The cause of osteochondrosis may include genetic factors, trauma, and nutrition. The signs of this abnormal bone growth usually develop between 6 and 9 months of age, and generally appear as lameness. Osteochondrosis is more common in rapidly growing, large breed puppies. In the condition termed osteochondrosis dissecans, a portion of cartilage loosens from the underlying bone. It may break loose and float free in the joint, or remain partially attached to the bone like a flap. In either case, this is an extremely painful situation.

Fragmentation of the medial coronoid process (FMCP)

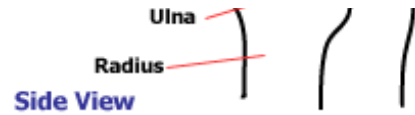
Fragmentation means that the bone in this area of the ulna starts breaking up or degenerating. This occurs very early in the life of the dog, oftentimes before six months of age. We see it mostly in the larger breeds such as the German Shepherd, Golden Retriever, Rottweiler, Doberman, and the giant breeds. However, as we become better at diagnosing this disorder, it is being recorded in more and more breeds even some of the smaller ones such as the Springer Spaniel, Cocker Spaniel, and German Shorthair. Although the exact cause is unknown, it is thought to have strong genetic transmission, as it has been found to be passed from generation to generation in certain lines of several breeds. Osteochondrosis and a fragmented coronoid process frequently occur in the same joint.

Ununited anconeal process (UAP)

Generally, by 20-24 weeks of age, the anconeal process should have fused with the ulna. In UAP, the hook, or anconeal process, never attaches correctly to the rest of the ulna as the puppy is developing, but rather floats loose. It is held fairly close to where it should be by ligaments between it and other portions of the bone, but it is not solid enough to remain exactly where it should. This leads to joint instability, preventing the humerus and ulna from interacting correctly. Additionally, the loose anconeal process is often caught abnormally between the ends of the ulna and humerus thus irritating and bruising the articular surfaces.



An ununited anconeal process is commonly found by itself with the elbow dysplasia syndrome, although in larger breeds it is often seen with fragmentation of the medial coronoid process.



Elbow incongruity

If the radius and ulna do not grow at the same rate of speed, a condition called elbow incongruity can occur. This causes wear and tear on the cartilage as the humerus does not meet the appropriate surfaces on the radius and ulna. Thus some points of contact are overloaded and this can lead to fragmentation of the medial coronoid process and other abnormalities.

Symptoms of elbow dysplasia

Patients with elbow dysplasia will usually display an obvious limp, may hold the leg out from the body while walking, or even attempt to carry the front leg completely, putting no weight on it at all. Signs may be noted as early as four months of age. Many affected animals will go through a period between six and about twelve months of age, during which the clinical signs will be the worst. After this period, most will show some signs occasionally, but they will not be as severe. As these dogs continue to mature, there will probably be permanent arthritic changes occurring in the joint. This will cause many obvious problems and it may become necessary to utilize oral or injectable medications to make the animal more comfortable. Elbow dysplasia is therefore a lifelong problem for the affected animals. Some of these patients can be helped with surgery. In some, surgery can even eliminate the problem totally.

Diagnosis of elbow dysplasia

Many dogs will have more than one of the conditions that may contribute to elbow dysplasia. In addition, both elbows may be involved. The symptoms of front leg lameness and pain in the elbow lead us to think about elbow dysplasia as a diagnosis. However, there are other conditions that can affect the front leg of a young dog that will mimic the signs of elbow dysplasia very closely. Therefore, it is necessary to take radiographs (x-rays) of the elbow(s) to verify the diagnosis.

Of the above three, an ununited anconeal process is by far and away the easiest to show with x-rays. The fragmentation of the medial coronoid process and the osteochondrosis can be more difficult. The dog generally needs to be heavily sedated or anesthetized to obtain good x-rays, since the limb needs to be manipulated and positioned in ways that are often painful. High quality radiographs are a must. In addition, it may be necessary to have the radiographs sent to an expert veterinary radiologist who can discern the very minor changes that may appear in a dog with elbow dysplasia.

Treatment of elbow dysplasia

Treatment of elbow dysplasia varies with what distinct abnormalities are present. Fragmented coronoid process and osteochondrosis are often treated medically, without surgery. The young dog is placed on a regular, low-impact, exercise program (swimming is often preferred). Weight is managed carefully. Medications such as nonsteroidal anti-inflammatory drugs (NSAIDS) are given to decrease pain and inflammation. Depending on the severity of the condition, surgery may be performed to remove the fragmented process or cartilage flap.

Ununited anconeal process is usually treated with surgery in which the ununited process is removed. In some instances, small pins or screws may be used to join the process with the rest of the ulnar bone.

Prognosis

Usually, after the dog is 12 to 18 months of age, the lameness will have become less severe and some dogs will function very well. The long-term prognosis (outlook), however, is guarded. Usually, degenerative joint disease (arthritis) will occur as the animal ages, regardless of the type of treatment.