Elbow Dysplasia

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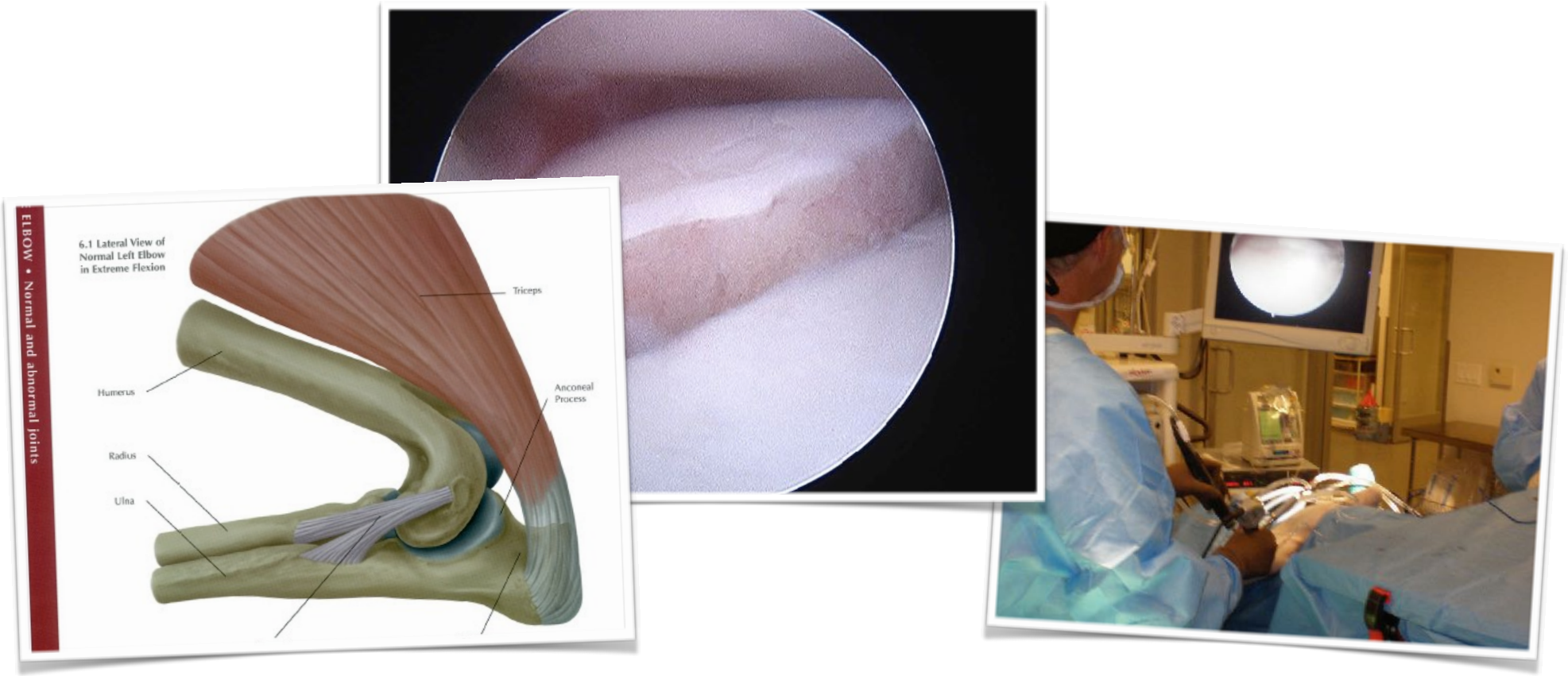
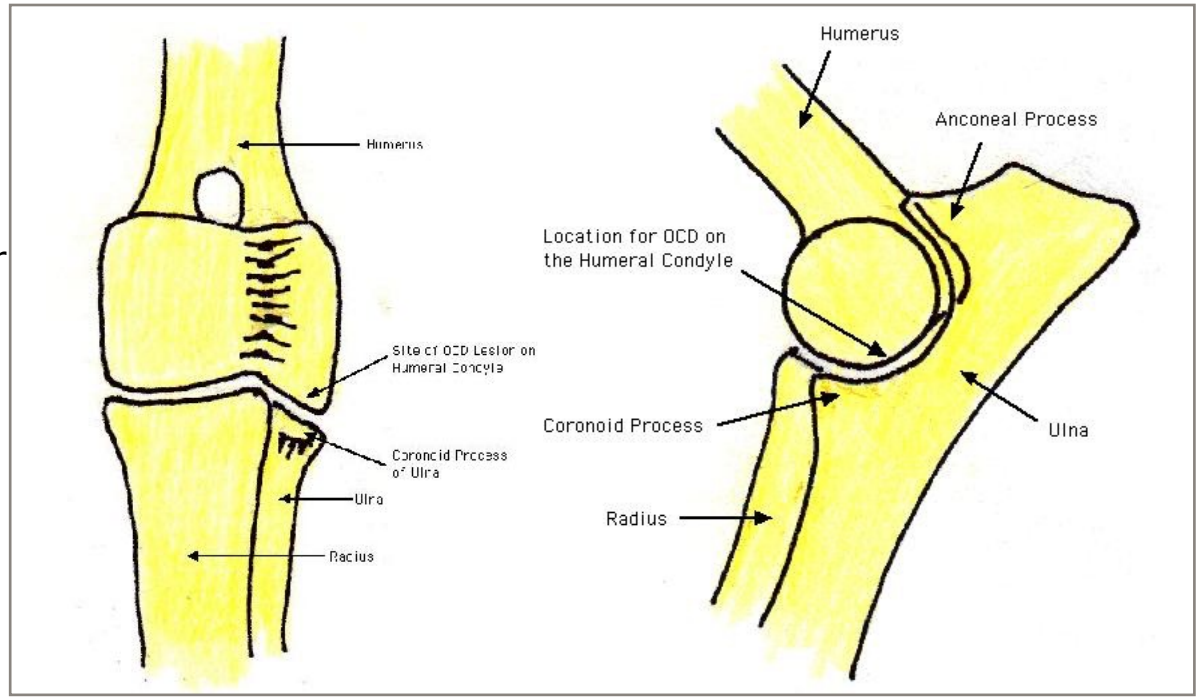


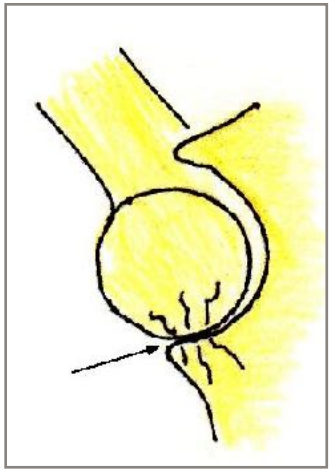
INTRODUCTION



The elbow is a complex joint made up of three bones, the humerus in the upper arm and the radius and ulna in the lower forearm. The top of the radius is flat and supports the humerus. This is the weight bearing bone in the forearm. The top of the ulna curves around the humerus to allow the normal movements of the elbow joint.

In young, fast growing, large breed puppies and in dogs bred to have crooked legs, abnormal development of the elbow joint may occur. This abnormality, **Elbow Dysplasia**, may result in damage to the joint surface cartilage or failure of portions of bone to fuse properly. Left untreated, severe, crippling osteoarthritis will occur. For the most part, this condition is inherited and can be passed on to offspring. Elbow dysplasia may manifest itself as a variety of different conditions.

Coronoid Disease

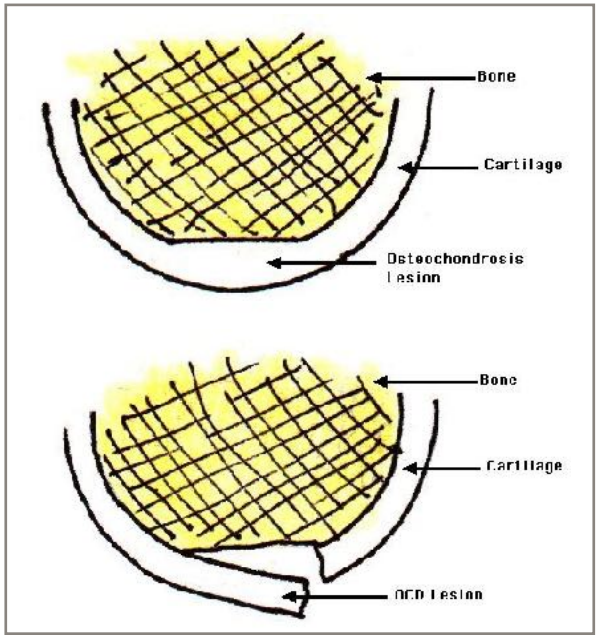


The point at the bottom part of the ulna in the elbow that curves around the humerus is called the coronoid process. If there is incongruity that is a disparity in the lengths of the radius and ulna even transiently during rapid growth, the coronoid process can become traumatized and fragmented.

The diagnosis can often be difficult because early damage to the cartilage can not usually be seen on x-rays. We are often suspicious of the diagnosis with careful orthopedic examination. Scintigraphy (bone scans) and CT scans may localize the problem and detect incongruity not visible on radiographs. Arthroscopy or open arthrotomy may be required to confirm the diagnosis.

The fragments in the coronoid process (fragmented coronoid process or FCP) must be surgically removed to avoid severe, crippling arthritis. Despite even early diagnosis and early surgical removal, some irreversible damage may have already occurred making arthritis inevitable. The ultimate goal of the surgery is thus to minimize the severity of the arthritis that will develop. Thus, the earlier surgery can be performed, the less arthritis may eventually develop. In addition to removing the damaged cartilage, procedures to encourage new cartilage formation (cartilage microfracture) and to take the load off of the coronoid process by removing a small piece of the ulna (ulnar ostectomy) or equalize the lengths of the radius with the ulna (radial lengthening osteotomy), may be beneficial and recommended.

Osteochondritis Dissecans



Osteochondrosis is a developmental abnormality of the cartilage of puppies leading to sites where the cartilage is thicker than normal. There is a localized separation of the articular cartilage from the underlying bone. This can lead to the formation of a cartilage flap, known as Osteochondritis Dissecans (OCD).

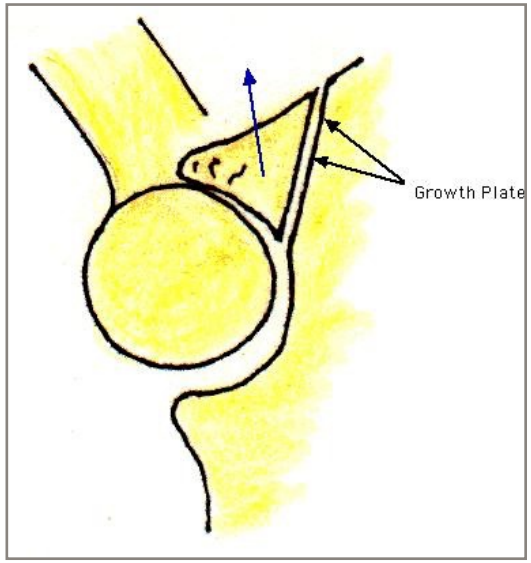
OCD can be present in more than one joint even though the patient appears lame in only one leg. Thus, radiographs of other joints may be necessary. The most common areas affected are in the shoulder, in the elbow, in the stifle (knee) and in the hock (ankle).

This condition is usually seen in fast growing, large breed puppies although it can be seen in some families of smaller dogs. Overfeeding high protein/high calorie diets and over supplementing with vitamins and minerals, especially calcium, can worsen or accelerate its development in fast growing puppies. Although the the OCD flap may occur as a result of a minor trauma, the underlying osteochondrosis may be hereditary and passed on to offspring.

The flap and any free floating fragments cause pain and inflammation. Clinical signs of pain usually begin by 6 months of age and can be manifested as limping, soreness, stiffness or mild gait abnormality. Surgical removal of the flap will help to eliminate this pain. New healthy cartilage will grow into this area within about 3 weeks. The initial cartilage regrowth is soft and cannot withstand the loads of high impact activity. This cartilage continues to mature for 8 weeks to become a firmer more durable form of cartilage. Thus, strict rest is necessary during this entire 2 month healing period. After surgery, patients

must be kept confined to a small area for 8 weeks and only walked on a leash. Normal activity may be resumed after that time.
Despite even early diagnosis and early surgical removal, some irreversible damage may have already occurred making arthritis inevitable. The ultimate goal of the surgery is to relieve pain, encourage healthy cartilage regrowth and minimize the severity of the arthritis that may develop.

Ununited Anconeal Process



The point at the top of the curve is called the anconeal process. The anconeal process develops separately from the rest of the ulna and should unite or fuse by 5 months of age.

Incongruity of the elbow joint or disparity between the rate of growth of the radius and the ulna may result in pressure on the point of the anconeal process preventing it from uniting with the rest of the ulna. This free floating ununited anconeal process (UAP) causes pain and inflammation. This condition is often seen with FCP.

Surgical removal of this process will eliminate the pain and minimize the severity of arthritis that will develop. However, as is the case with fragmented coronoid process, development of arthritis is inevitable. If ununited anconeal process is identified early enough, before the process is completely detached, a corrective osteotomy (bone cut) in the ulna below the joint may allow the preservation and eventual fusion of the anconeal process to the rest of the ulna. This surgery must be performed in puppies less than 4 1/2 to 5 months of age.

Osteoarthritis

If severe osteoarthritis is present, surgical procedures to decrease the weight bearing load on the affected portion of the joint or joint replacement may be required (*see* ***Elbow Injury/Arthritis*** *Informational Handout*).

A majority of patients will have more than one of these problems in the elbow, have problems in both elbows or other joints or may also have hip dysplasia. Thus, dogs with elbow dysplasia must be evaluated for other orthopedic problems, as well.

Your pets surgeon can advise you on which techniques may be best for your pet.

ABOUT THE AUTHOR
Dr. Kenneth Bruecker, DVM, MS, DACVS, DACVSMR
Board Certified Veterinary Surgery
Board Certified Veterinary Sports Medicine and Rehabilitation

A San Fernando Valley native, Dr. Bruecker attended Pierce College then received his bachelors degree in Animal Science from the University of California at Davis.

He graduated from the University of California at Davis, School of Veterinary Medicine in 1983. After one year of general small animal practice in San Fernando, Dr. Bruecker completed an additional year of clinical internship at the West Los Angeles Veterinary Medical Group. He received his master of science degree at the completion of a three year surgical residency at Colorado State University and moved back to Ventura County in 1988 to establish specialty veterinary care. Dr. Bruecker is Founder, Medical Director and Chief of Surgery at the Veterinary Medical and Surgical Group in Ventura, California. He also provides consulting and training services throughout the world.

Dr. Bruecker provided regular surgical support for practices in the state of Hawaii from 1996 through 2011.

In 2015, Dr. Bruecker founded Continuing Orthopedic Veterinary Education (COVE), a company whose mission is post-graduate veterinary orthopedic education, training, mentoring and surgical coaching around the world.

Board Certified in Surgery since 1990, Dr. Bruecker's primary clinical interests are spinal surgery, sports medicine/orthopedics (including arthroscopy, TPLO, TTA, and limb deformity correction), minimally invasive surgery (such as laparoscopy) and peri-operative pain management. He is well respected for his expertise in arthroscopy, limb deformity, disorders of the knee, fracture management and disorders of the spine. He has authored numerous articles and book chapters on Wobbler syndrome, treatment of intervertebral disk degeneration and spinal fracture management. He is an active participate in working groups on elbow dysplasia, shoulder injuries, advanced techniques in small animal arthroscopy and cranial cruciate ligament repair. Dr. Bruecker was the first to offer TPLO surgery, TTA surgery, cementless hip replacement, arthroscopy and laparoscopy to owners of pets in Ventura, Santa Barbara and San Luis Obispo Counties, as well as to the State of Hawaii. He holds a patent for the first locking Triple Pelvic Osteotomy plate used to treat hip dysplasia. He has been an innovator in the development of many new surgical techniques and orthopedic implants.

Dr. Bruecker became a Diplomate of the American College of Veterinary Sports Medicine and Rehabilitation in 2015 and thus is now Board Certified in this field, as well as surgery.

Dr. Bruecker is a past program chair of Neurosurgery for the American College of Veterinary Surgeons and a past program chair for the veterinary technician program for the American College of Veterinary Surgeons. He served as the orthopedics program director for 2004 and 2005 for the American College of Veterinary Surgeons. He was also program director for orthopedics, pain management and anesthesia for the 2006 American Veterinary Medical Association annual symposium. He has served as the program chair for the Association for Veterinary Orthopedic Research and Education (AVORE). He is a past Executive Board Member (2004-2007) and is Past-President (2014-2015) of the Veterinary Orthopedic Society.

Due largely to his commitment to education and training, Dr. Bruecker was chosen as the Veterinarian of the Year by the California Veterinary Medical Association in 2004. He is an invited speaker and educator throughout the United States, Latin America, South America, Europe, Asia and the South Pacific on a variety of topics in orthopedics (fracture management and arthroscopy), neurosurgery and pain management. He splits his time between global veterinary education and clinical practice.

Dr. Bruecker and his family farm avocados and citrus in Ventura County. He is an enthusiast of classic cars.