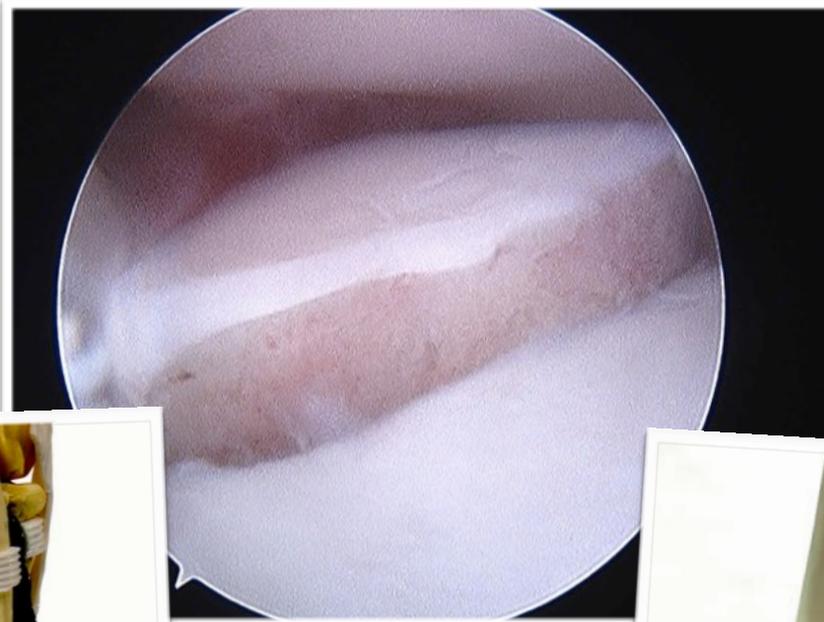


Elbow Injury/Arthritis

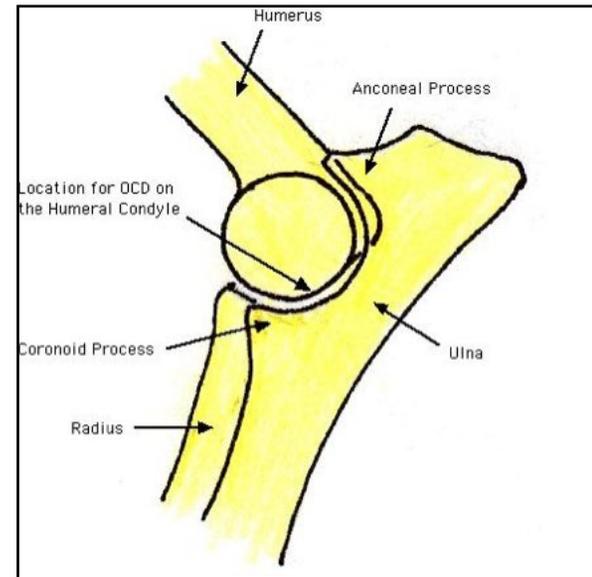
Kenneth A. Bruecker, DVM, MS, DACVS, DACVSMR



Introduction

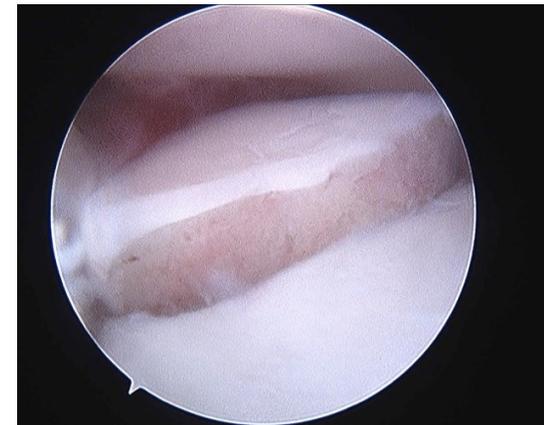
The elbow is a complex joint made up of three bones, the humerus in the upper arm and the radius and ulna in the lower forearm. The top of the radius is flat and supports the humerus. This is primary the weight bearing bone in the forearm. The top of the ulna curves around the humerus to allow the normal 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 cartilage or failure of portions of bone to fuse properly. Left untreated, severe, crippling arthritis will occur. Injuries (such as "jump down syndrome") or fractures and other disorders can also result in crippling, painful end-stage osteoarthritis. If medical management and physical therapy alone is unsuccessful in restoring pain-free use of the limb, then surgery to salvage pain-free use is indicated. There are currently a number of different surgical options:



Arthroscopic Procedures

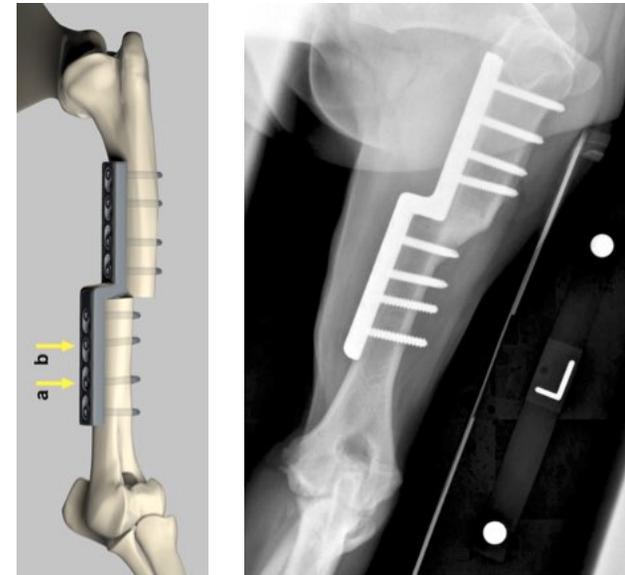
Arthroscopy allows the surgeon to visualize the inside of the elbow joint and assess the severity of cartilage damage. If focal areas of cartilage are damaged or fragments of cartilage and bone are found, removal of these damaged areas may be sufficient to restore use and slow the progression of osteoarthritis. Commonly we will find damage to the coronoid process, alone. Removal of the damaged coronoid process (sub-total coronoidectomy) can be a very effective therapy for many years in some dogs. If the cartilage damage or loss is severe, additional procedures to reduce the weight bearing load of the



damaged portion of the joint or replace/resurface the damaged portions of the joint may be required.

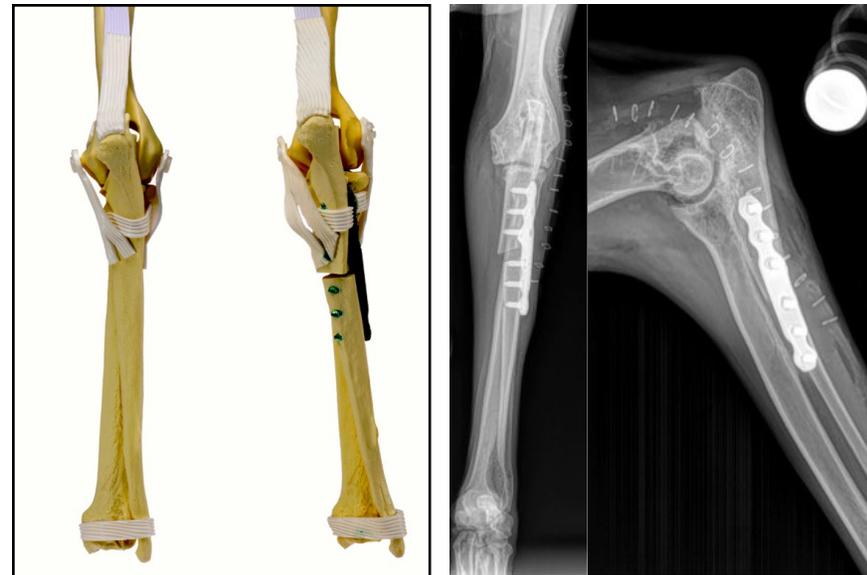
Sliding Humeral Osteotomy (SHO)

During the Sliding Humeral Osteotomy (SHO) procedure, the humerus is cut in half (osteotomy) and the bottom portion slid over to redistribute the loads in the elbow to areas of the joint with healthy cartilage and off the areas of "bone-on-bone" pain. A specially designed bone plate is applied to stabilize the SHO throughout the bone healing phase. Research suggests this will decrease the load on the damaged portion of the joint by about 35%, making many patients again pain-free or managed more effectively with anti-inflammatory medications.



Proximal Abducting Ulna Osteotomy (PAUL)

In the PAUL procedure, the ulna is cut (osteotomy) at a precise location below the elbow to shift the weight off of the damaged portion of the joint, as with the SHO procedure. A titanium bone plate and screws designed specifically for this procedure is applied to stabilize the osteotomy.



Canine Unicompartement Elbow (CUE)

The Canine Unicompartement Elbow (CUE) is a resurfacing procedure wherein small metal and plastic plugs are inserted into the surfaces of the the elbow joint. These two implants then ride on each other, minimizing the bone on bone contact.



Partial Elbow Replacement (PER) or Total Elbow Replacement (TER)

Surgical removal of the joint cartilage and replacement with a prosthetic elbow, known as Elbow Replacement, is now a viable surgical treatment option for some patients due to the recent development of newer prosthetics and techniques. With this procedure, the cartilage of the joint is removed with a precision reamer and replaced with a high density plastic and stainless steel prosthesis, thereby restoring range of motion and pain-free use. Prostheses that replace only a part of the elbow are being developed and may be clinically available in the future, as well.



Denervation

Denervation, or removal/destruction of the nerve endings responsible for feeling pain might be accomplished with radiation therapy.

Regenerative Medicine/Stem Cell Therapy

Stem cell therapy is gaining favor as a minimally invasive treatment option to treat osteoarthritis. Fat can surgically harvested from your pet in a minimally invasive fashion. This fat or adipose tissue is processed and undifferentiated mesenchymal (precursor) cells are isolated and concentrated. This process requires a few days. These cells are then injected into the affected joint. These are your pet's own cells and thus pose no risk of transmitting disease or rejection. Surplus cells are stored at sub-freezing temperatures and can be injected at later dates without need to surgically harvest more fat. Platelet Rich Plasma (PRP) is also gaining some interest in musculoskeletal injury and osteoarthritis treatment. A blood sample is drawn from the patient, spun down in a special centrifuge and separated into various layers or components. The plasma layer that has high concentration of platelets is retrieved and injected into the affected tissue. This is PRP. PRP is not stem cells, but like the fat derived cells, it is a stimulator or recruiter of the body's own healing and response. This process takes only a few minutes. Alternatively, stem cells can be retrieved from bone marrow, sent to the laboratory and cultured. After 2-3 weeks in cell culture, enough stem cells have grown to be injected into the affected joint. In general, reactivation of these cultured stem cells with PRP is required. Although, growth of new healthy cartilage is not expected, clinical improvement may be noted for many weeks to months. These are your pet's own cells and thus pose no risk of transmitting disease or rejection. Regenerative Medicine might be expected to be more effective when combined with surgeries that alter the biomechanics of the joint (such as sub-total coronoidectomy and SHO or PAUL).

Physical Rehabilitation

Certified Canine rehabilitation Therapists (CCRT) are the Physical Therapists of the veterinary profession. CCRT guided exercises and treatments, such as low level laser (Cold Laser) can improve the outcomes with surgery.

Your pet's surgeon can advise you on which therapies 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 participant 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.