

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.

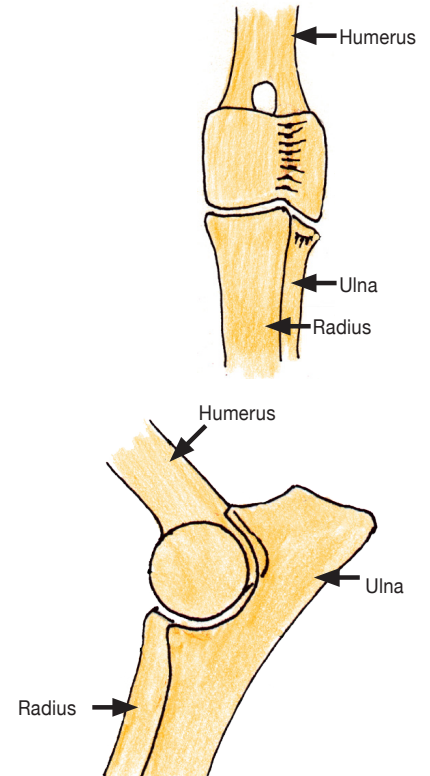
In young, fast growing, large breed puppies and in dogs bred to have crooked legs, abnormal development of the elbow joint may occur. This abnormality, elbow dysplasia, may result in damage to the cartilage or failure of portions of bone to fuse properly. Left untreated, severe, crippling arthritis will occur. Injuries (such as “jump down syndrome”) and other disorders can also result in crippling, painful end-stage osteoarthritis. If medical management 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.



Elbow Arthroscopy



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 in the medial compartment. 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.

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Sliding Humeral Osteotomy (SHO)



Total Elbow Replacement

Joint Resurfacing

An alternative to the SHO in patients with only medial compartment cartilage loss and “bone on bone” pain is the Canine Unicompartement Elbow or CUE. In this procedure, a small portion of the joint surface is replaced with a stainless steel plug and a polyethylene plug that glide against each other relieving the bone on bone contact. This procedure is investigational and VMSG surgeons are participating in this international investigational study.

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

Excision of the joint (or just the medial compartment) and replacement with a prosthetic elbow, known as Total (or Partial) Elbow Replacement, may 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 — Surgery and Radiation

Denervation, that is removing or destroying the nerve endings responsible for feeling pain might be accomplished with surgery (neurectomy) or non-invasive radiation therapy. Radiation therapy might be considered prior to surgical options in some patients.

Stem Cell Therapy — Regenerative Medicine

Stem cell therapy, or Regenerative Medicine as the broader category is known, is gaining favor as a minimally invasive treatment option to treat osteoarthritis. Fat is 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



ELBOW SALVAGE

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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 to injury. Alternatively, actual 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. Although, growth of new healthy cartilage is not expected, clinical improvement may be noted for many months. Stem cells might be expected to be most effective when combined with PRP and surgeries that alter the biomechanics of the joint (such as sub-total coronoidectomy and SHO). Your pet's surgeon can advise you on which technique may be best for your pet. [VMSG](http://www.vmsg.com)