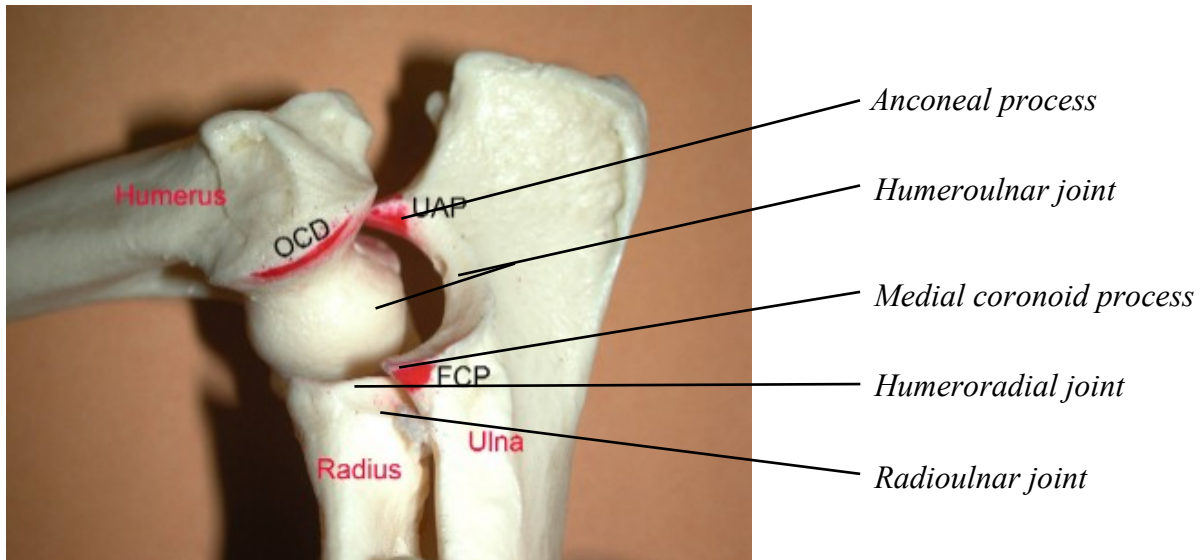


Elbow Dysplasia

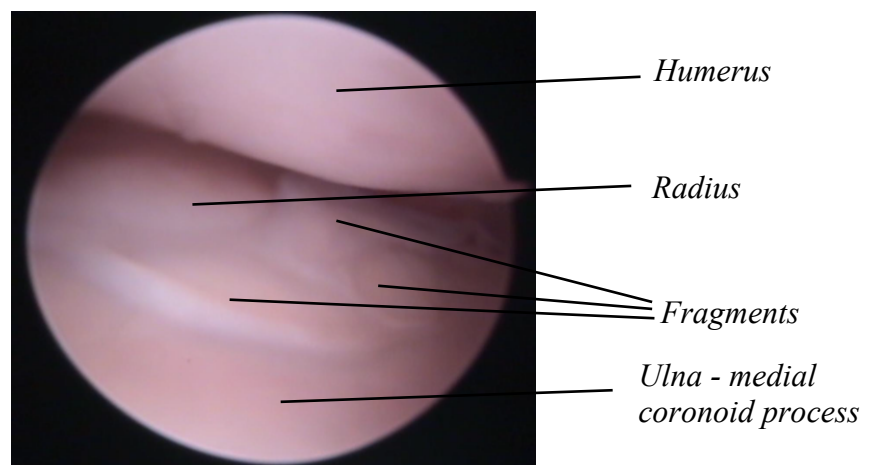
The elbow is a complex hinge joint formed from 3 bones - the humerus, radius and ulna. Within the elbow joint, there are actually 3 separate joints - one between the humerus and ulna (humeroulnar joint), the humerus and radius (humeroradial joint), and radius and ulna (radioulnar joint). The elbow has to bend (flex), straighten (extend) and allow rotation of the paw (pronation - away from the trunk - and supination - towards the trunk). It is the radioulnar joint that allows pronation and supination to occur. As dogs do not have to brush their teeth or comb their hair, it could be argued that pronation and supination are less important than in humans, but it comes in handy when running around corners! The situation in dogs is also different in that the elbow is a weightbearing joint, and thus subjected to a lot more stress and strain than in people.



The humeroradial joint is positioned more towards the outside, or lateral side. The humeroulnar joint is more on the body, or medial, side of the joint. We tend to refer to the medial side as the medial compartment of the joint, and the lateral side as the lateral compartment.

Elbow dysplasia ("bad growth") is a catch-all term that includes several conditions. Some, such as osteochondritis dissecans (OCD), do not appear to be related to the other conditions that have been identified, but there is a clear relation between some others, for example fragmented medial coronoid process (FMCP) and medial compartmental disease (MCD).

In order for the joint to function properly without excessive wear, all 3 bones have to fit together perfectly, so any growth disturbance can lead to an incongruent joint. Any incongruity will lead to abnormal wear, with potentially severe consequences. It seems that an excessively tight humeroulnar joint is the most common scenario we face. Our understanding of the various disease processes is still in its infancy, but excessive pressure here is blamed for causing parts of the medial coronoid process to fracture or



Arthroscopic view of a dog's elbow joint affected by FMCP

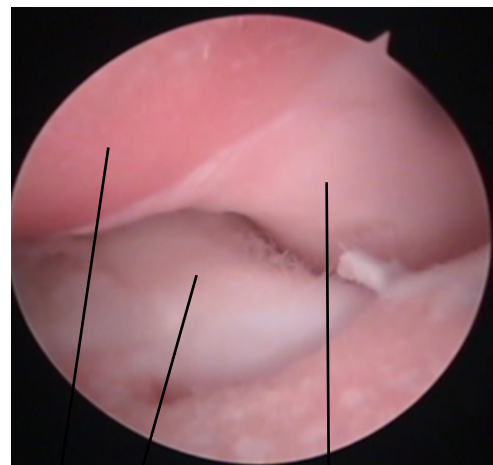
fragment (FMCP). The fragmented bone is dead, and as joint cartilage has no pain receptors, it is thought that the pain is caused by inflammation of the synovial membrane joint lining in the area of the fragments. Removal of the fragments seems to ease the symptoms in most cases, and can easily be accomplished by arthroscopy ('keyhole' surgery). This is probably the most common elbow disorder that we see in young dogs, and seems to be most frequently seen in retriever and mastiff breeds, but we are also seeing it in less 'traditional' breeds such as staffies. Patients make a rapid recovery from this minimally invasive surgery, and are usually able to take weight on the operated leg the same day. As the fragments of bone are dead, we do not attempt to screw them back into place.

Unfortunately, fragment removal does not relieve pressure within the medial compartment. Eventually, this may lead to rubbing away, or eburnation, of the joint cartilage, and severe pain. Once the outer layer of cartilage is lost, wear continues at a much more rapid pace, as the outer layers contain tangential fibres that resist wear and create less friction. As the joint wear is mainly medial, this side tends to collapse, leading to a varus stance (leg bowed outwards at the elbow) further increasing the pressure on the medial compartment. We have unfortunately seen dogs as young as 18 months of age with this degree of wear. However, the lateral compartment of the joint consisting of the humeroradial joint, is usually in very good condition.

A technique that fell out of favour for the treatment of early MCD is proximal ulnar osteotomy, also known as a dynamic ulnar osteotomy. This involves sectioning the ulna distal to the coronoid in order to allow the proximal ulna to move and relieve pressure within the joint. Patients do tend to be lame for 2 months post-op, though a newer, double-slanted cut does seem to go a long way towards improving this. Medium to long term follow-up on these cases strongly suggests that they 'do better' than fragment removal alone, so this is a technique we are returning to when arthroscopy of an elbow shows early cartilage wear. It is also a useful technique to use where there is a clearly incongruent joint, as these x-rays demonstrate.

Fortunately, new treatments continue to be developed. We have already started using the sliding humeral osteotomy (SHO) to unload the medial compartment, and early results are encouraging. Early total elbow replacements (TERs) had disappointing results, but a new cartridge resurfacing prosthesis (the TATE elbow) shows more promise, though results seem to be no better than a SHO. A novel technique is being developed by Jimi Cook in the USA where a unicompartamental elbow replacement is inserted. Initial results are encouraging, however the 1st clinical case was operated on just 9 months ago, so more follow-up is needed, and it will be at least 2-3 years before these implants are commercially available. In the meantime, the SHO remains our mainstay for the treatment of pain associated with severe cartilage erosions. Please see our separate sheet on the sliding humeral osteotomy for more information - you can find it here: www.thvs.co.uk/sho.pdf

Finally, some researchers suggest that the biceps muscle plays a role in MCD. The tendon inserts partly on the radius, but it also has a large attachment to the medial ulna caudal and distal to the medial coronoid process. It is thought that contraction of the biceps causes the ulna to externally rotate, pressing the tip of the medial coronoid against the radius and contributing to fragmentation, as well as increasing medial compartment pressure. A bicipital ulnar release procedure (BURP for short - one of the silliest acronyms out there!) seems to relieve pain in many patients that have no significant articular cartilage wear but where removal of the fragments has not resolved the lameness



Radius Healthy cartilage on lateral humeral condyle
Medial humeral condyle with complete loss of joint cartilage