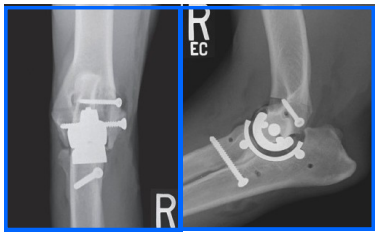
SALVAGE SURGERY

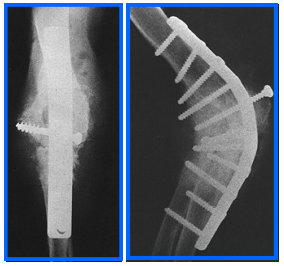
Occasionally the combination of the elbow dysplasia and osteoarthritis in the adult dog causes persistent elbow pain that cannot be controlled.
For these cases there are two surgical options:-

ELBOW REPLACEMENT



Total elbow replacement involves replacing the painful joint with metal and plastic components (humeral and radioulnar prostheses). Very strict care should be taken following this surgery to avoid complications such as dislocation of the prostheses, though in the long term, a pain-free and functional elbow can be achieved.

ELBOW JOINT FUSION (ARTHRODESIS)



Fusion (arthodesis) of the elbow joint results in a pain-free limb. The joint is fused at a comfortable, somewhat flexed angle and dogs learn to cope following this procedure by swinging the limb sideways a little rather than straight forward. However, functional outcome following this procedure may be poor. Significant complications may arise with elbow arthrodesis.

LIVING WITH ELBOW DYSPLASIA

Long term prognosis is variable.

Some dogs will benefit from surgery to improve congruity or to remove fragments (arthoscopically or surgically, as described), but even in those cases which become sound after surgery, a degree of stiffness and intermittent lameness, especially after exercise, is to be expected due to the inevitable progression of osteoarthritis.

Some dogs can be managed successfully long term with conservative treatment (with or without the need for anti-inflammatory medication) and are able to maintain an acceptable quality of life.

Salvage procedures will only be performed in cases with significant lameness when all other means of management have been explored.

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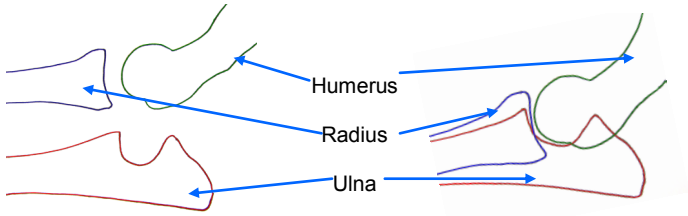
ELBOW DYSPLASIA

RELEVANT ANATOMY

The elbow joint consists of three bones: the humerus, radius and ulna

Normal function of the joint relies on all 3 bones fitting together correctly (this is termed 'congruity').



Side view of the bones of the elbow separated and in normal alignment

ELBOW DYSPLASIA

The term elbow dysplasia simply means abnormal development of the elbow joint.
When all three bones fail to grow at the same rate, the joint no longer fits properly (it is 'incongruent').
The bones of an incongruent joint rub or knock together leading to damage to the soft tissues of the joint (cartilage and joint capsule) and small fractures (microfractures) within the bone.
Elbow dysplasia is a collective term that includes several possible consequences of **elbow incongruity**:

- **ununited anconeal process** and
- **fragmented medial coronoid process**.

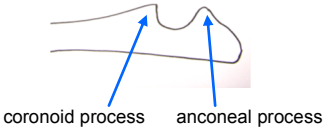


Diagram of top-end of the ulna

A further condition called **osteochondritis** (OC), is also included within the term elbow dysplasia. In this condition the cartilage (particularly on the inner aspect of the end of the humerus, or 'medial part of the humeral condyle') becomes abnormally thick and starts to pull away from the underlying bone. When a cartilage flap develops the condition is called osteochondritis dissecans (OCD). The exposed bone under the flap is very sensitive, and small fragments of cartilage may float freely in the joint space. Therefore there is discomfort when the elbow joint moves.

SIGNS

- Forelimb lameness following exercise and stiffness after rest.

As this is a developmental condition, signs often first occur in young growing dogs (five to eight months of age).
The soft tissues of the unstable joint thicken and the bone toughens, leading to a reduction in discomfort in some dogs at around the time of skeletal maturity (ten to fourteen months).
Development of osteoarthritis will begin early in life and may rapidly progress in these dogs, so lameness often returns between three and seven years of age.

Sometimes adult dogs will be presented to us with lameness and/or osteoarthritis secondary to elbow dysplasia despite having never been diagnosed with the condition earlier in life.

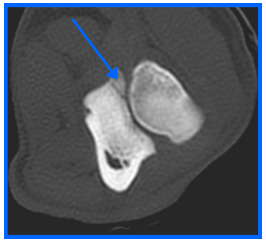
DIAGNOSIS

- Forelimb muscle wastage (atrophy).
- Discomfort on manipulation of the affected elbow.
- Swelling around the affected joint.
- Reduced range of movement.

- **X-rays** can show us abnormalities in joint congruity and bony changes associated with elbow dysplasia. However, the various structures of the elbow joint overlie one another in standard x-rays (see right)

X-ray side view of the elbow

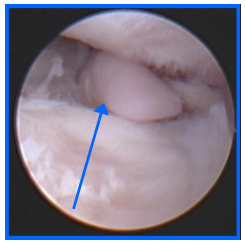
CT image showing a loose fragment of medial coronoid process.



- **Computed tomography (CT)** is the preferred imaging method. This advanced form of imaging allows us to view small slices (cross sectional images) of the anatomy and may highlight small lesions (e.g. fragmented coronoid process, see left) which are difficult to detect with conventional radiography.

- **Arthroscopic examination** (placing a small camera into the joint) is a more direct way of diagnosing elbow dysplasia and assessing the damage to the surface of the joint and the associated soft tissues.

Arthroscopy showing a loose fragment of medial coronoid process.



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TREATMENT

- **Conservative management** (exercise restriction, weight loss, physiotherapy and medications).

◊ Each dog will have an exercise threshold beyond which elbow pain will increase again. The trick is to stay below the threshold.
◊ Overweight dogs must be placed on a diet. Regular monitoring of weight may be necessary, due to a decrease in exercise.
◊ A specifically designed physiotherapy plan (which may include hydrotherapy) compiled by an experienced animal physiotherapist can be beneficial in improving joint function and comfort.
◊ Pain killers (anti-inflammatory drugs) may be indicated to make the dog more comfortable. Long term drug therapy should be avoided where possible, due to potential side effects.

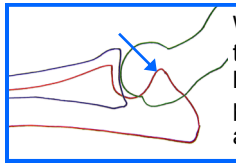
- Surgical intervention is necessary in dogs that have significant lameness or those that do not respond well to conservative therapy within a few weeks.

FRAGMENT REMOVAL

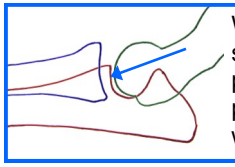
Removal of loose fragments of cartilage and bone can reduce joint discomfort.
This can be done either arthroscopically or via a more direct approach called an arthrotomy (opening up the joint via a surgical incision).
Recovery, especially following arthroscopic surgery, tends to be rapid. Unfortunately lameness may not improve in some cases. This is usually due to underlying joint incongruity or advanced secondary osteoarthritis.

ULNAR OSTEOTOMY

This surgery aims to improve the loading of the elbow joint **in the young dog** where the three bones do not fit together normally, with either the radius or the ulna being too short.



Where the ulna is too short, the humerus puts pressure on the anconeal process.



Where the radius is too short, the humerus puts pressure on the coronoid process especially during weight-bearing.

By cutting the ulna bone ('ulna osteotomy') or removing a section of ulna ('ulna ostectomy') the alignment of the joint may be improved.

Recovery from this procedure can be slow, but it can improve function in some cases.