

Ask the Physiotherapist?
Osteochondrosis (OCD)

Introduction:

Skeletal disorders?

Osteochondrosis is a skeletal problem that is characterised by the abnormal differentiation of growth cartilage, joint cartilage (a) and epiphyseal plate or growth plate (b).

Figure A illustrates a schematic drawing of an elbow joint in a growing dog

The condition shows changes in both the bone and cartilage tissue, however the primary disturbance to the tissue is in the cartilage lesion (the injury).

Osteochondrosis (OCD) (osteo = bone chondo = cartilage) is defined as a failure of endochondral ossification, a failure of the normal transformation process from cartilage to bone tissue that occurs in the bones during growth. Endochondral ossification occurs at the epiphyseal plate (growth plate) at the end of the long elbow bone, but also in the joint cartilage. In the event of a disturbance the growth rate will be reduced in a localised area and the cartilage will remain cartilage for longer than normal.

It thickens and can cause fractures. When these changes occur under the joint cartilage, the fracture that has formed can reach the surface of the cartilage and the whole cartilage flake can loosen (Figure B). Contact between the bone tissue under the cartilage (where there are free nerve endings) and the joint cartilage occurs. This often causes pain and limping.

Osteochondrosis is the accepted veterinary medical term that is used and which refers to and is considered to cover conditions in which abnormal development has occurred due to a failure of endochondral ossification. Various other terms are also used such as osteochondrosis dissecans and osteochondritis dissecans. Osteochondritis dissecans implies that there is a loose body of cartilage in the joint with the subsequent secondary development of inflammation. Osteochondrosis dissecans means diffuse cartilage changes/cartilage injuries as well as a loose body in the joint.

Cases of osteochondrosis have been recorded in various joints in dogs, such as:

- Shoulder - caudal humerus (ball)
- Elbow - medial condyl humerus, medial coracoid process ulna, anconeal process
- Carpus - distal metaphase Ulna
- Foot - palmar sesamoid bone
- Hip - acetabulum (hip cup)
- Knee - lateral condyl, medial condyl
- Ankle - talus, medial and lateral edge as well as medial malleol tibia
- Changes to the spine and neck vertebrae

Medium large and large dog breeds are most affected, though the condition has also sometimes been recorded in smaller breeds of dog without the owner noticing any symptoms (discovered during autopsies).

Development of disorder

A growing skeleton is dependent on a timed development process when it comes to the normal development of joint cartilage and epiphyseal plate. See Figure A. Cartilage growth is a process involving degeneration, calcification, vascularisation and osseous expansion.

In cases of osteochondrosis the disturbed endochondral ossification causes areas with increased cartilage thickness either in the articulated area or on the epiphyseal edges.

Poor nourishment of the articulated area (joint) will lead to the thickened cartilage and the formation of fractures, fissures, and some of these will progress to separation or cause slightly or completely loose bits of cartilage. Inflammation of the joint with new secondary degeneration caused by wearing of the joint due to this may result and also cause a dog to limp.

The painful condition of the joint and the degree to which inflammation is activated varies vis-à-vis severity and duration from dog to dog.

The literature refers to dogs' elbow and ankle joints as being the joints most likely to be subjected to the clear wear and tear degeneration referred to above.

Causation

The cause of osteochondrosis has been investigated and looked at by many researchers and there appears to be agreement that the disorder has a multifaceted basis where a combination of symptoms together possibly causes the condition to develop. Earlier research indicates that transition with resultant rapid growth and weight increase is important factors (Hedhammer et al 1974).

Hormonal effects could be the reason why more male dogs have been recorded with cases of rapid growth (Olsson, 1981).

Later studies have shown that a certain inherited factor is of significance vis-à-vis the development of osteochondrosis. (Guthrie and Pidduck, 1990, Grondalen and Lingaas 1991, Studdert et al 1991.)

It appears that a combination of diet, hormonal effects and inherited factors all have an effect vis-à-vis rapid growth and abnormal endochondral ossification.

The areas damaged in each individual joint depend on how a load is borne by the joint and suggests that micro-traumas in a joint's cartilage is of significance when it comes to the further development of the condition.

As far as most of the investigations that have been carried are concerned one sees that male dogs experience OCD osteochondrosis symptoms twice as often as bitches do.

Diagnosis

A diagnosis of osteochondrosis is based on a description, clinical history, clinical findings and x-ray findings. The extent of a limp will depend on which joint is involved and whether the condition is unilateral or bilateral (unilateral = one side, bilateral = both sides).

It is possible for both forelegs and hind legs to develop osteochondrosis. It is also possible for two different joints in the same extremity to develop the condition. A bilateral limp can be more difficult to diagnose than a unilateral limp.

Usually one finds pain in the joint(s), which are affected when the joint is passively manipulated in a clinical examination situation.

One can also see the limp when the dog is in motion, i.e. when it's walking, trotting or running if one gets the dog to perform these motions in a clinical examination situation.

Diagram 1: below is an example of osteochondrosis in the shoulder.

A diagnosis of osteochondrosis was made through a combination of clinical and radiological findings
X-ray findings are here seen on the caudal (ball section) of the humerus ball – where it is marked OCD injury

Diagram 2: osteochondrosis in the elbow

Normal canine elbow

Injured canine elbow – loose body

Diagram 3: degenerative (wear) joint disorder elbow joint

Diagram 4: osteochondrosis in the elbow

Schematic diagram illustrating that there are various conditions that it may be important to differentiate between in a clinical situation in order to obtain as correct a picture as possible of the disorder and pertinent diagnosis.

In addition to ordinary x-ray examinations, both CT (computer tomography) and arthroscopy can be useful examination methods when subjecting a dog to a full-blown examination.

I won't go into further detail concerning the condition and symptoms with respect to the list provided by way of introduction to the article.

The three schematic diagrams are intended as illustrations when it comes to describing the diagnosis OCD in dogs. Should any readers want sources from scientific articles within veterinary medicine that shed further light on this diagnosis and condition, I can be contacted via e-mail, telephone or fax.

In the next issue of *Fuglehunden* I will, as a follow-up to this article, try to shed light on the various forms of therapy that are used and which can be used when dog owners have been presented with a diagnosis of osteochondrosis regarding their hunting dog.

Good hunting!

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