

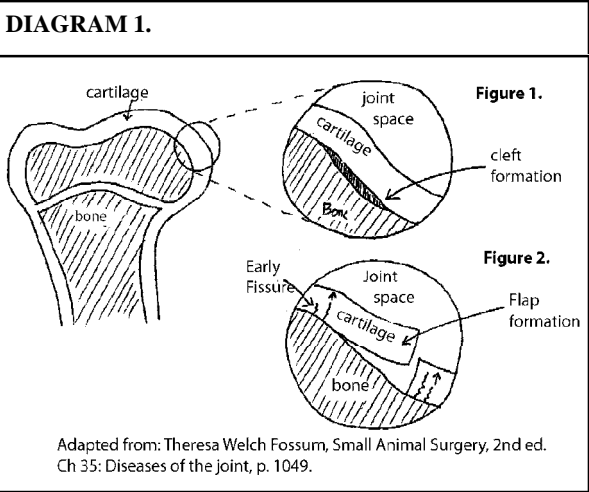
Osteochondritis Dissecans (OCD)

by
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This article was prepared by request from club members wanting to know more about OCD, particularly of the shoulder, after several club dogs were diagnosed with this condition. Unfortunately, I may not shed as much light on this disease as folks may have wished, but I've done my best to summarize what we currently know, and don't know, about this important juvenile orthopedic disease. As you will see, it is a frustrating condition. Exact causes are still not known, but figure to probably be multi-factorial.

What is OCD?

Osteochondritis dissecans, or OCD for short, is a widely-recognized and important cause of lameness in young, growing, large-breed dogs. It is mostly seen in breeds that mature at weights exceeding 60 pounds. Affected hunting breeds include retrievers, setters, pointers (including our beloved Wirehaired Pointing Griffons) and vizslas. Joints affected by OCD include the shoulder, elbow, stifle (knee joint) and hock (ankle joint), with the shoulder joint being the most frequently involved.



Osteochondrosis or OC is the general term used to describe a metabolic disease process that affects the normal sequence of cartilage calcification in joints. In a nut shell, that means there is a failure of normal bone formation from cartilage in growing pups which leads to cartilage thickening. This is where all the problems start. Since cartilage cells derive their nutrients from joint fluid through passive diffusion, cells in the thicker areas are deprived of nutrients and die off. Cartilage

death causes a cleft or space to develop over time between the calcified and non-calcified tissues (see Diagram 1, Figure 1).

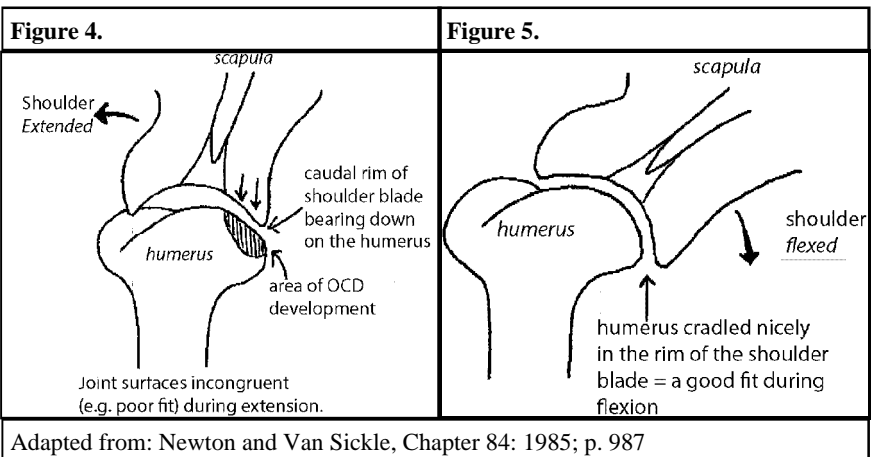
This diseased cartilage is especially vulnerable to injury, and cannot tolerate even normal levels of activity. Vertical cracks or fissures begin to form (see Figure 2, Diagram 1, with some fissures eventually communicating with the joint space to form a loose flap of cartilage (see Figure 2). Once a cartilage flap has formed, the condition is known as osteochondritis dissecans or OCD. Quite surprisingly, it is not until the actual flap forms that animals start to exhibit any kind of pain.

Possible causes?

So we understand what happens to the cartilage, but the big question everyone is asking is why? And more importantly, can something be done to prevent it? Unfortunately veterinary medical researchers have been trying to answer that question for decades with only limited success. Genetics, rapid growth, over-nutrition (especially excess dietary calcium), trauma, and hormonal influences have all been implicated. What the statistics do shows us, is that affected dogs have several common risk factors. Included among these are, age (4-8 months old at time of clinical onset), size (large and giant breed dogs), and gender (3:1 predilection for males). Breed is also a risk factor. A hereditary component has long-since been suspected, but so far, the genetic link has only been definitively proven in the Yellow Labrador Retriever. Owners are strongly urged not to breed affected dogs, and to consider carefully the risk of breeding animals with affected littermates.

Nutrition, and the role it may play in development of osteochondrosis in young dogs is an area of continued interest and ongoing research. Many independent studies have demonstrated that overfeeding pups (i.e. excess energy, protein, calcium, phosphorus and Vitamin D intake) in general results in an increased incidence of OCD. Details behind this consistent finding are still being worked out, but so far, it appears that neither excess energy nor excess protein in the diet are to blame. Calcium however, has been shown to be a significant factor. The theory is, increased calcium causes increased calcitonin activity (a hormone important in calcium and phosphorus metabolism) resulting in delayed mineralization of cartilage. Potential roles of excess phosphorus and Vitamin D have not been adequately demonstrated so far.

Trauma is often blamed for causing OCD. As the primary event causing OCD though, this is probably not likely. Trauma as a secondary event however, is suspected to be quite common. Recall that thickened cartilage is known to be a point of weakness. We know that it's prone to injury even under normal conditions of daily activity, especially once fissures have developed. Consider for a moment, how common shoulder OCD is in dogs and when it tends to manifest. Consider also, that in the EXACT same spot where shoulder OCD lesions tend to develop, joint cartilage in growing large breed



pups remains significantly thicker up until 4-5 months of age. Coincidence? Maybe not. Not only is this area in the shoulder joint the last to experience ossification in normal developing pups, it is also unfortunately, a point of maximal concussion in the joint. (diagrams 4 and 5).



One Shoulder Done and One to Go: Dale Aho, D.V.M. examines **Burley of Salmon River** after first surgery for OCD.
(Photo by Rem DeJong)

Diagnosis, Treatment and Prognosis

When dogs are brought to veterinarians for evaluation, the presenting complaint is usually for a front leg lameness with a history of gradual onset. Owners frequently report the lameness improves with rest, worsens with exercise and generally affects one leg. On physical examination, pain is usually exhibited when the affected shoulder is hyper-extended or flexed. Often, some degree of muscle atrophy can be detected along the shoulder blade.

While suspicion for the disease begins with history and physical exam, x-rays are needed for definitive diagnosis. Since OCD is generally symmetric, both legs should be x-rayed even if the dog is only showing pain on one side. Positioning is also key to making the diagnosis, so sedation may be requested for nervous, painful, or hyperactive animals. Remember, these patients are often youngsters! The most common abnormality seen on x-ray is an irregular or flattened contour to the joint surface. "Joint mice" are also commonly seen. "Joint mice" is a slang term used to describe pieces of cartilage that have broken off, become calcified over time so they are visible on x-ray, and they are free-floating in the joint space itself. These fragments essentially behave like a pebble in a shoe whenever the animal moves. Ouch!

Treatment options for shoulder OCD involve medical management (conservative) or surgery. Conservative treatment benefits a few dogs, but is generally considered unrewarding. If a therapeutic trial is attempted, 6 weeks rest minimally is needed, and anti-inflammatory pain medication may be prescribed. If lameness resolves, surgery is not indicated and the patient is considered very fortunate. If lameness persists or reoccurs after the 6 week rest period, which usually what happens, then the flap should be removed.

Surgery is preferred in the early stages of the disease to speed recovery and minimize development of osteoarthritis. Whether done by arthroscopy or athrotomy, the goal is always the same. Remove the necrotic flap(s) of cartilage and scrape the surface defect sufficiently to expose bleeding subchondral bone. This curetting is important to stimulate in-growth of reparative cells that will build up a fibrous sort of cartilage called "fibrocartilage" to replace the lost articular cartilage and fill in the surface defect.

How quickly patients heal from surgery, and the degree to which they return to full function, is dependent on several factors. Most important of these are stage of the disease at time of surgery, location of the actual lesion (weight bearing vs. non-weight bearing surface) and initial size of the cartilage defect. A good outcome is generally expected after surgery for shoulder OCD because the relatively large size and simple shape of this joint space allows adequate access to and visualization of most joint surfaces. Conversely, elbow, knee and ankle joints have variable outcomes following surgery because of their complicated joint conformation and much smaller joint spaces limiting access to diseased areas. Therefore, prognosis is guarded with stifle (knee) or tarsal (ankle) OCD and only fair for elbow OCD. Despite surgery, these patients often experience progressive arthritic changes leading to intermittent joint pain and chronic lameness. Prognosis for shoulder OCD on the other hand is quite good. Approximately 75% of patients are considered normal following OCD surgery, and another 23% are improved. This is great news for breeds affected by this particular joint disease, including our beloved griffons.

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