

OSTEOARTHRITIS UPDATES (PART I): THE COAST APPROACH TO DIAGNOSIS

David Dycus, DVM, MS, CCRP, DACVS-SA
Ortho Vet Consulting, LLC

Key Points:

- Osteoarthritis (OA) is a condition that affects the entire joint where inflammation is a key player
- At minimum the diagnosis should be based on a combination of history, clinical signs, orthopedic examination, and radiographs
- To have the best outcome a diagnosis and thus management should be instituted as early in the course of disease as possible
- Using the COAST approach allows veterinarians to move from a retroactive approach to osteoarthritis management to a proactive approach to osteoarthritis management

Osteoarthritis (OA) is a chronic, progressive disease that affects both dogs and cats. It has been noted that up to 20% of adult dogs and 60% of adult cats have radiographic evidence of OA. However, recent data would suggest that close to 40% of dogs in age from 8 months to 4 years have radiographic evidence of OA and of the population studied almost 24% had clinical evidence of OA. Interestingly, of the dogs with radiographic OA, about 60% had clinical OA. The overall outcome of osteoarthritis is centered on destruction of the articular cartilage and breakdown of the joint. Unfortunately, many individuals consider OA to be an “old dog” disease. This is simply not true! Osteoarthritis in the dog is usually secondary to something else such as a cranial cruciate ligament tear, etc. Technically, anything that causes abnormal motion to a joint can lead to OA. In fact, many of our canine patients develop OA secondary to developmental orthopedic problems.

The impact of OA has many negative implications, and it has been noted as being the number one source of chronic pain in the dog. With pain comes a decreased activity level, which over time leads to joint stiffness, increased periarticular fibrosis, loss of joint range of motion, exacerbation of cartilage breakdown, and weight gain. All these implications create a vicious cycle that has an overall negative impact on patients’ quality of life and can interfere with the human-animal bond.

Veterinary professionals should think of OA as more of a diffuse global joint problem rather than an isolated event. The final pathway of OA is failure of the joint so our goal should be to prolong the life of the joint and improve our patient’s quality of life. We need to think of the joint like an organ where there is cross talk amongst various tissues rather than only think about the damage to the articular cartilage. The synovium, joint capsule, peri-articular tissues, articular cartilage, as well as the subchondral bone all play a role in OA.

The history will vary pending where on the OA spectrum a pet may be. Owners may complain about their pets having a reluctance to exercise, stiffness, lameness (that may or may not improve), inability to jump, or even some behavioral changes. Remember that cats are not small dogs, and they can have fewer signs. The biggest complaint from owners with cats suffering from OA is a reduction in activity, reluctance to jump, an unkempt appearance, and aggression.

Orthopedically, dogs may show disuse muscle atrophy (ensure to rule out any neurogenic atrophy), a reduced range of motion, pain or discomfort on range of motion, crepitus, and joint effusion. Objective information is key in knowing if our patient are improving when we institute some form of management. I would suggest adding a **numerical grading scale** (such as I-V) for lameness, **measurement of limb circumference** for muscle atrophy, and **goniometry** for range of motion. Adding these 3 things to your examination in patients with OA will allow one to truly know if their patients are improving.

Cats can be tricky to examine so allowing them performance tests is encouraged to see how the cat moves and interacts with its environment. One true test is to place the cat on exam table with its carrier below. Most cats will easily jump from the exam table to their carrier. Any reluctance to want to do so raises concern about possible joint pain.

A philosophical question that we must ask ourselves: Can we diagnose a patient with OA based on history, clinical signs, and examination findings? I would suspect this is the point where many of our patients are tagged with this diagnosis. Unfortunately, we need additional diagnostics to aid in confirming our diagnosis.

Radiographs are key to aiding in the diagnosis of OA. However, just as with any diagnostic modality there are limitations. Radiographs only provide bony information, they are taken in a non-weight bearing position, and osteophytes are useful to diagnose OA, but they are not pathognomonic for OA. Furthermore, the value of osteophytosis for staging OA is controversial and does not correlate with OA progression. Probably the biggest issue with radiographs is that they do not correlate with clinical signs.

Other additional diagnostic modalities include CT, MRI, and arthroscopy. Arthroscopy is probably the most valuable means to objectively evaluate the cartilage. However, it is a surgical procedure and can be costly to perform. It does allow the evaluation of the cartilage, which can then be classified by the Modified Outerbridge score. However, if you don't perform arthroscopy and radiographs are helpful to diagnose but don't help stage for monitoring for progression of OA is there some type of additional subjective based assessment? The Canine Orthopedic Index (COI) was developed and validated in 2014 to provide reliable assessment of dogs with OA in terms of staging as well as response to treatment. It can be downloaded at www.canineorthopedicindex.com.

While the above information is helpful in establishing a diagnosis and instituting a management plan, **we as a profession need to do a better job of identifying patients with OA as early in disease process as possible.** Our current approach to OA is **retro-active**, we wait until there are clinical signs where quality of life can be affected. I truly believe we need to move to a more **pro-active** approach. This would mean identifying pets in the early parts of disease before clinical signs, or recognizing pets that are "at risk".

Personally, I think we can have the most profound effect on our patients for OA management if we begin the process early. The best way to do this is through the COAST approach. **COAST stands for Canine OsteoArthritis Staging Tool**; this metric was published

in The Veterinary Journal in 2018. It is an aid for veterinary team members to take a pro-active approach as well as stage specific diagnosis and monitoring for patients with OA.

The benefits of the COAST approach are numerous and include:

- Regular evaluation of preclinical dogs as well as those clinically affected by OA
- Facilitates early detection of changes and allows timely intervention
- Improves the understanding of the impact of OA on the dog
- It allows a consistent approach to evaluation
- It allows for a multi-disciplinary team approach to care, and encourages better communication

To begin the process there is an opportunity of information gathering that can be started with your support staff and the owner through a detailed history.

Part one involves grading the dog. The owner will participate by filling out some type of clinical metrology index (CMI) such as the canine brief pain inventory index (CBPI). In addition, they can classify their dogs degree of discomfort as none, low level, moderate level, or unbearable. The veterinarian will then grade the dog based on static posture (measuring limb circumference is helpful) as well as lameness (using a numerical grading scale is helpful).

Part two the veterinarian will grade the joint(s) by evaluating pain upon manipulation as well as the range of motion (goniometry is helpful). The joint is also graded via radiography (remember the fact that radiographs are needed as part of the minimum database...☺).

Part three is combining the information overall and determining the severity score and stage. This is completed by placing a check mark in the box for each part under the description of low/normal, mild, moderate, or severe. Each category from grading the dog and grading the joint(s) will get a check box. The description with the most check marks will determine the overall severity score and from there an overall severity of OA is given as “preclinical”, “mild”, “moderate”, or “severe”.

Interestingly, if there is a difference of 2 grades in a category (for example grading the dog as “mild” but grading the joint as “severe”) would result in a mismatch. Should this occur re-evaluation is recommended and consideration is give to the possibility of other diseases causing the dogs clinical signs (even if there is radiographic evidence of OA present).

For me, I think the “preclinical” grade is where we can have the most profound effect; within the “preclinical” grade a dog can be a COAST score of 0 or 1. A grade of 0, is clinically normal, no OA risk factors. While a grade 1 is clinically normal, but OA risk. It is the grade 1 dogs that we need to learn to identify to begin some form of “baseline management” (discussion of the “baseline management” is beyond the scope of this proceeding). Therefore, I would recommend beginning to adopt the COAST approach to all dogs, in particular medium to large breed dogs at the age of 6 months.

In summary OA is a common problem in both YOUNG and OLD dogs. The driving force is inflammation that creates a vicious cycle of joint destruction. There are periods of clinical relief followed by periods of exacerbation. However, we need to learn to identify patients as

early as possible to have the best chance at long term management or even alteration of disease progression. **So, initiating the COAST approach is critical for us to move from a retro-active approach to OA management to a pro-active approach to OA management.**

References:

Cachon T, Frykman O, Innes JF, et al. Face validity of a proposed tool for staging canine osteoarthritis: Canine OsteoArthritis Staging Tool (COAST). The Veterinary Journal 2018;235:108.