

A New Diagnostic Tool for Elbow Dysplasia Promises Earlier Treatment

A veterinary orthopedic team at North Carolina State University has found a new way to diagnose elbow dysplasia in Labrador Retrievers that promises earlier treatment and hope for alleviating pain and eventually elimination of the disease.

Elbow dysplasia is a developmental, hereditary disorder that causes lameness and gait abnormalities in large-breed dogs. The Labrador Retriever is one of the breeds most affected. Denis Marcellin-Little, D.E.D.V., associate professor of orthopedic surgery at North Carolina State University's College of Veterinary Medicine, estimates that one of five Labrador Retrievers has elbow dysplasia.

But unlike hip dysplasia, canine elbow dysplasia can be difficult to detect. The result is that breeders and owners often don't know their dogs have the disorder until the affected animals are in considerable pain.¹ However, in a study funded by the American Kennel Club Canine Health Foundation, Marcellin-Little and several other researchers at North Carolina State have come up with a way to diagnose elbow dysplasia very early in a Lab's life.

What Is Elbow Dysplasia?

Elbow dysplasia is caused by a group of diseases that, singly or in combination, lead to this crippling disorder. The most common disease is called fragmentation of the medial coronoid process (FCP), or bone chips in the elbow. In addition to the bone chips within the joint, other areas of the joint lose cartilage.

The cause of the disease is believed to be abnormal growth of the three bones that make up the elbow joint. This abnormal growth causes the joint to fit poorly, which in turn leads to the formation of the bone chips.²

A Lab with FCP faces a painful future if the disease is not detected. Symptoms include lameness, pain when the elbow is manipulated, and reduced range of movement.³ The lameness or pain may be especially pronounced after exercise. Many dogs with this condition throw their legs outward while they walk, so they look as though they are flapping wings. They may also raise their front paws while they're walking so they appear to be paddling.¹

These symptoms may begin to show as early as four months of age.¹ However, unlike hip dysplasia, the symptoms of FCP and other forms of elbow dysplasia often are not easily discerned. "This disease is a silent stalker," says Marcellin-Little. "It's not nearly as obvious as hip dysplasia. It's often diagnosed later in life than other diseases. The signs are more subtle [than for hip dysplasia] but the disease is no less devastating."

If the disease is undetected, the continued presence of bone chips in the elbow joint can lead to irreversible arthritis. Consequently, a key component of any FCP treatment strategy is to discover the condition before the arthritis occurs. In other words, early detection—ideally during early puppyhood—is vital to successful treatment.

Unfortunately, FCP has often eluded such detection efforts. "It is the most difficult type [of elbow dysplasia] to see in an x-ray," says Marcellin-Little. "A CT scan can help, but it is very expensive. An MRI can also help, but the set-up needs to be precise—and it also is very expensive." In addition, most veterinarians don't have easy access to such technology.

A New View

Marcellin-Little and his North Carolina State colleagues decided to try to find a way to make x-rays better able to detect elbow dysplasia. They theorized that a simple change in the dog's position on the examination table would yield a better view of the affected elbow, and that the resulting x-ray images would clearly show the presence of FCP.

"In a conventional x-ray, the dog is lying on its side with its paws down," Marcellin-Little explains. "We tried lifting the paw up 35 degrees. That would give a different projection than a conventional x-ray does."

The team calls this new projection the distomedial-proximolateral oblique radiographic view, or DIMPLO. To lift a dog's forelimb to the required 35-degree elevation, the team places a customized foam wedge on the examination table. Then, with the dog lying on its side on the table, the elbow joint is bent at a right angle and the forelimb is placed in the wedge. The X-ray beam is centered over the elbow of the forelimb that is placed in the wedge.

Although the results varied considerably, depending on who viewed the x-rays, the DIMPLO view was found to identify FCP in most instances, and was shown to be more sensitive to the presence of FCP than two of the four conventional projections.

Marcellin-Little and his team then proceeded to work with dogs that had histories of forelimb lameness. Of the 53 dogs examined in this part of the study, 23 were Labs. Each dog's affected limb was viewed with conventional X-rays and the DIMPLO view. After the X-ray, each dog with FCP underwent arthroscopic surgery to remove the bone chips. Three professional examiners viewed the X-rays without knowing which dogs had surgery to alleviate the FCP.

The results of this part of the study varied somewhat, because of the possibility of an erroneous reading by an examiner. The team employed a special statistical technique to account for this possibility of human error - and still found that, as Marcellin-Little says, "the DIMPLO view tops other views."

Treating Elbow Dysplasia

Treatment options for FCP and other forms of elbow dysplasia depend on the severity of the individual Lab's case. Lab owners can ease their dogs' distress through a program of weight control and moderate exercise. Helping an overweight Lab pare off its extra poundage, or helping a lean Lab to stay that way, can reduce pressure on the diseased joint. Regular sessions of exercises that bear little or no weight, such as swimming and leash walking, will improve the

stability of the affected joints, add strength to the surrounding muscles, and enhance the health of the fluid in the joints.⁴

A Lab with mild or intermittent lameness may benefit most from a conservative treatment approach. Analgesics or anti-inflammatory agents such as aspirin or Rimadyl prescribed by a veterinarian can be used during periods of lameness, particularly before exercise.

For more advanced cases, arthroscopic surgery to remove the bone chips may be the best option. Such surgery is far less invasive than conventional surgery, because the small instruments needed for arthroscopic surgery require only a very small incision. Conventional surgery may help reduce lameness in affected dogs, but a far larger incision is needed than for arthroscopy. However, arthroscopy is not as widely available as conventional surgery.⁴

The best treatment for elbow dysplasia in Labrador Retrievers is twofold: preventing the condition from occurring in the first place and getting treatment quickly to those dogs that have the condition. Marcellin-Little believes that the DIMPLO X-ray view can help accomplish both objectives. Because the DIMPLO technique illuminates the presence of FCP more readily than conventional x-ray positioning, it can be used to evaluate Lab puppies as young as four months of age.

"I would suggest that at-risk dogs and dogs for breeding be looked at for both hips and elbows at four months of age," Marcellin-Little says. By following that recommendation, dogs that already have elbow dysplasia can be removed early from the gene pool so that future generations are not affected. Moreover, those same dogs can have the benefit of treatment that occurs early enough to forestall the onset of arthritis. Either way, the result is a win-win situation for both the Lab and its owner.

1 Orthopedic Foundation for Animals. OFA Elbow Registry. Northwest Rotwiler Fanciers. <http://www.halcyon.com/nwrf/ofa.htm>.

2 J.D., Wheat Veterinary Orthopedic Research Laboratory: "Canine Elbow Dysplasia Research Program." University of California Davis School of Veterinary Medicine. <http://www.vetmed.ucdavis.edu/VORL/canine.html>.

3 Lavelle, R. Elbow Disease in Growing Dogs. <http://www.acay.com.au/~dissi/elbow/htm>.

4 Reed, AL. Elbow Dysplasia: A Brief Overview. <http://www.schaferhund.com/elbowdysplasia.htm>.

OFA Maintains Elbow Dysplasia Database

The Orthopedic Foundation for Animals (OFA), a nonprofit organization based in Columbia, Mo, maintains an elbow dysplasia database to assist owners and breeders in breeding healthy dogs.

Breeders can learn about dogs they may be planning on using in their breeding program; however, availability of information on individual dogs is subject to the owner's consent. Breeders also can provide copies of OFA elbow certification records for new puppy owners and other breeders or refer them to the OFA database on the Web site for information.

As of December 2001, information on 16,831 Labrador Retrievers had been submitted to OFA. Abnormal elbows appeared in 12.6 percent of the radiographs submitted.

For information, please call the OFA at 1-800-442-0418 or visit the OFA Web site at www.offa.org.