

# When your patient's hips swing like Marilyn Monroe

Canine hip dysplasia and the secondary arthritis it causes can be a tricky treatment to navigate. Here's an in-depth look at what to do.

*By Matthew Brunke, DVM, CCRP,  
CVPP, CVA, and David Dycus,  
DVM, MS, CCRP, DACVS*



**H**ow many of us have seen a patient walk into the clinic with a noticeable hip sway, like a runway model? That's likely hip dysplasia—one of the most common orthopedic conditions in dogs. It leads to joint inflammation, which causes secondary osteoarthritis. We often hear with older dogs, "Oh the dog developed hip dysplasia." We perform a radiographic examination and they often have arthritic changes. As you know, the dog didn't just develop hip dysplasia. The dog had hip dysplasia and now has secondary arthritis because of it.

### What went wrong?

Hip dysplasia has a very complex inheritance—multiple genes combined with environmental influences lead to the development of what we perceive as hip dysplasia. If it were as simple as saying, "Take two dogs with bad hips, breed 'em together, you get bad hips. Take two dogs with good hips, breed 'em together, you get good hips," we would have eliminated it by now. But it was originally described in 1935 and we still fight with what really causes hip dysplasia. Think of it like baking a cake: If you take all of the ingredients and you put all of them in

perfectly, your cake's gonna taste pretty good. If you flub one or two ingredients, you may not notice a big difference. But if you start making multiple mistakes in the ingredients along the way, your cake's not going to turn out very well. In this unfortunate mixture of genetics and environmental factors, the result is a bad hip.

What hip dysplasia really comes down to is laxity. What causes the laxity? Development can cause it, as can biomechanics of the hip, genetic influences, the amount of joint fluid produced, nutrition, pelvic muscle mass, weight and growth, and hormonal or environmental factors. Thus, hip dysplasia and the secondary arthritis it causes is the clinical manifestation of the above. And it's not all of these—it can be just two or three.

### Digging into diagnosis

It's time to get definitive about your diagnosis. Some key factors:

**Signalment.** Typically, large-breed, fast-growing dogs are affected. Young dogs (immature) can have clinical signs due to hip laxity, while older dogs (mature) may not have laxity but have secondary osteoarthritis—and those are the ones that we approach like our osteoarthritis (OA) patients.

### Physical examination

**findings.** Remember the previously mentioned dog walking down the hallway like a runway model with a nice hip sway? The severity of clinical signs depends on the severity of the disease. The lameness can be intermittent, progressive or severe. Make sure to



rule out all other possible causes like neurologic or cardiovascular issues or muscle atrophy. Here's the kicker: Any non-weight-bearing lameness, especially in a mature dog, is rarely caused by hip dysplasia but instead is commonly due to a ruptured cranial cruciate ligament. If an older dog has muscle atrophy, it can be hard to determine if the disuse is because of hip pain or neurogenic muscle atrophy from lack of intervention to the muscles that can be seen in dogs with lumbosacral disease. Another common finding in dogs with hip dysplasia and osteoarthritis is pain in the groin area, which we suspect is due to discomfort in the iliopsoas. We would argue that 100% of dogs with hip dysplasia and associated hip osteoarthritis have sensitivity in their iliopsoas, but not every single dog that has sensitivity in their iliopsoas has underlying hip dysplasia or hip osteoarthritis. Virtually any condition that alters the biomechanics of the hind limb can create secondary iliopsoas discomfort.

**Radiography.** Radiographs are needed to help identify hip laxity (or lack of femoral head coverage by the acetabulum) in immature dogs and osteoarthritis in mature dogs. To prevent

creating a nondiagnostic image, sedated, orthogonal views of the pelvis are needed for proper evaluation. The two primary methods of radiographic screening for hip dysplasia are the Orthopedic Foundation for Animals (OFA) view and the PennHIP method. The OFA is a ventrodorsal pelvic view with the patient's legs extended. It can be used to evaluate for hip conformation and the presence of arthritis. To be OFA-certified, the dog must be 24 months of age. The PennHIP method can be used in dogs as young as 16 weeks. It involves obtaining three radiographs, which are used to determine the distraction index (DI), or amount of laxity present in the joints.

### **Treatment to get away from the sway**

Treatment for hip dysplasia can be broken into conservative and surgical management. Surgical management in the immature dog is for prevention or laxity improvement. This is completed utilizing the juvenile pubic symphysiodesis (JPS) or double or triple pelvic osteotomy (DPO/TPO) in immature dogs. A JPS can be considered in “at-risk” breeds or in lines of dogs

with previously documented hip dysplasia. For JPS to be effective it should be completed by 16 weeks of age, but absolutely not after 18 weeks of age. A DPO/TPO is considered in patients between 6 and 13 months of age (as long as there is no evidence of osteoarthritis). More definitive surgical options include a femoral head and neck osteotomy (FHNO/FHO) or a total hip replacement (THR/THA); these procedures are usually reserved for dogs that have failed conservative management. An FHO or THR can be considered in both immature and mature dogs. Ideally, a dog needs to be about 10 to 12 months of age before considering a THR. In addition, we do not recommend that immature dogs or dogs that could possibly undergo a THR at a later date undergo an FHO.

Conservative management can play a role in controlling clinical signs in both immature and mature dogs. To goal of conservative management in immature dogs is to control pain and maintain range of motion, along with maintenance of pelvic limb musculature. Conservative management of mature dogs is focused on osteoarthritis management as with any

joint. In both immature and mature dogs, NSAIDs, chondroprotectants, omega-3 fatty acids and formal rehabilitation management are very effective.

The overall goals of conservative management are:

- 1** Control pain.
- 2** Maintain comfortable range of motion (especially in extension).
- 3** Maintain muscle mass.

The cycle of conservative management should begin with controlling pain so that a patient can comfortably exercise. Including daily exercise will help with maintaining range of motion and muscle mass. In addition, daily exercise with diet will help control body weight, which in return leads to less stress on the joints and, thus, more comfort for daily exercise. During periods of worsening of clinical signs, additional multimodal management should take place and may include pharmaceuticals, joint injections, formal rehabilitation therapy and at-home exercise plans.

Regardless, early detection is key—in susceptible breeds, hip palpation should begin by 12 weeks of age. If a dog has a positive Ortolani sign, comes

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from a susceptible breed or has a history of hip dysplasia in the line it should undergo a PennHip evaluation. If a dog has a high DI, then a JPS can be considered at 16 to 18 weeks of age.

### **Rehabilitation: Back to a normal gait**

The goals of rehabilitation in orthopedic patients with hip dysplasia include maintaining or improving muscle mass, building muscle support around the lax or arthritic joint, reducing pain and encouraging weight loss.

Physical modalities can include thermotherapy (cold and warm packs). The benefits of cryotherapy are established and warm compresses can be used to relieve pain, cause vasodilation and also help to warm up stiff, tight tissues to begin other exercises.<sup>1</sup>

Therapy by light amplification by stimulated emission of radiation (y'know, LASER) has become very popular in recent years. There are different wavelengths, amplitudes, treatment times and other factors that must be considered. This process has also been called photobiomodulation and has been proposed to activate cytokines and other tissue factors, decrease pain and inflammation and

increase wound healing. Remember to always use goggles for both humans and patients to avoid damage to the eyes (doggles, anyone?).

Manual therapies are skilled hand movement techniques intended to improve tissue extensibility, increase range of motion, induce relaxation, mobilize or manipulate soft tissues and joints, modulate pain and reduce swelling and inflammation. These can include massage and joint mobilization. The basic principles of joint mobilization work from physiologic motions and accessory motions. Physiologic motions are normal active motions that are available at a joint (e.g. flexion, extension, abduction and internal rotation). Accessory motions are movements that can't be performed actively (e.g. distraction, compression, glides, spins and rolls).

Therapeutic exercises are the “meat and potatoes” of rehabilitation. These are designed to work a patient from a recumbent position back to normal (or as close as possible) activity following injury or insult. Exercises in this group can include Cavaletti rails, balance boards, balance disks or other core strengthening equipment. Once walking on a flat nonslip surface

is achieved, adding varying degrees of difficulty (uphill, through different traction, etc.) can be included. Sit-to-stand exercises and core strengthening with dancing exercises are also helpful. Daily leash walks are also essential to their exercise regimen. The key is to keep the patient moving and building.

### **Did we sway you?**

To sum it all up, hip dysplasia has a complex pathophysiology with the predominant feature being joint laxity. Many factors contribute to joint laxity. Clinical signs will vary depending on the stages of disease—but remember, an older dog that is acutely non-weight-bearing will often have a cruciate rupture, not be experiencing its first signs of hip dysplasia. A thorough physical examination with good-quality radiographs is needed. Early detection is key so if needed a JPS can be completed. If the patient is over 18 weeks of age, early identification will help you counsel the owners on the appropriate initial conservative management options and what to expect in the future.

### **Reference**

1. Millis D, Levine D. Aquatic therapy. In: *Canine rehabilitation and physical therapy*. 2nd ed. Philadelphia: Elsevier, 2014.