



# Hip Dysplasia

## Basics

### OVERVIEW

- The failure of normal development (known as “malformation”) and gradual deterioration, leading to loss of function, (known as “degeneration”) and osteoarthritis of the hip joints (known as the “coxofemoral joints”)
- The hip joint is composed of the “ball” (known as the “femoral head”) and the “socket” (known as the “acetabulum”)

### GENETICS

- Complicated pattern of inheritance, multiple genes involved (known as “polygenetic transmission”)
- Development of hip dysplasia (HD) determined by an interaction of genetic and environmental factors
- Heritability index varies between breeds

### SIGNALMENT/DESCRIPTION OF PET

#### Species

- Dogs—one of the most common skeletal diseases seen in dogs
- Cats—incidence is significantly lower than in dogs

#### Breed Predispositions

- Large-breed dogs—Saint Bernard’s, German shepherd dogs, Labrador retrievers, golden retrievers, Rottweilers
- Smaller breed dogs—may be affected; less likely to show clinical signs
- Cats—more commonly affects purebred cats; reportedly affects approximately 18% of Maine coon cats

#### Mean Age and Range

- Begins in the immature dog
- Clinical signs—may develop after 4 months of age or may develop later due to osteoarthritis (form of joint inflammation [arthritis] characterized by chronic deterioration or degeneration of the joint cartilage)

#### Predominant Sex

- Dogs—none
- Cats—more common in female cats than male cats

### SIGNS/OBSERVED CHANGES IN THE PET

- Depend on the degree of joint looseness or laxity; degree of osteoarthritis and duration of the disease
- Early disease—signs related to joint looseness or laxity
- Later disease—signs related to joint degeneration and osteoarthritis
- Decreased activity
- Difficulty rising
- Reluctance to run, jump, or climb stairs
- Intermittent or persistent hind-limb lameness—often worse after exercise
- “Bunny-hopping” or swaying gait
- Narrow stance in the hind limbs



- Painful hip joints
- Joint looseness or laxity—characteristic of early disease; may not be seen in long-term (chronic) hip dysplasia due to arthritic changes in the hip joint
- Grating detected with joint movement (known as “crepitus”)
- Decreased range of motion in the hip joints
- Loss of muscle mass (known as “atrophy”) in thigh muscles

## CAUSES

- Genetic susceptibility for hip looseness or laxity
- Rapid weight gain, nutrition level, and pelvic-muscle mass—influence development and progression of hip dysplasia

## RISK FACTOR

- Not applicable

## Treatment

### HEALTH CARE

- May treat with conservative medical therapy or surgery
- Outpatient, unless surgery is performed
- Depends on the pet's size, age, and intended function; severity of joint looseness or laxity; degree of osteoarthritis; veterinarian's preference for treatment; and financial considerations of the owner
- Physiotherapy (passive joint motion)—decreases joint stiffness; helps maintain muscle integrity
- Swimming (hydrotherapy)—excellent form of physical therapy; encourages joint and muscle activity, without increasing the severity of joint injury

### ACTIVITY

- As tolerated by the pet
- Swimming—recommended to maintain joint mobility, while minimizing weight-bearing activities

### DIET

- Weight control—important; decreases the pressure applied to the painful joint as the pet moves; minimize weight gain associated with reduced exercise
- Supplementation with omega-3 fatty acids in commercial diets designed for rapidly growing large-breed dogs—or as a supplement may decrease severity of hip dysplasia signs

### SURGERY

#### Triple Pelvic Osteotomy (TPO) or Double Pelvic Osteotomy

- Corrective orthopedic surgical procedure; designed to re-establish corresponding surfaces (known as “congruity”) between the “ball” (femoral head) and the “socket” (acetabulum) making up the hip joint
- Immature pet (6–12 months of age) is surgical candidate
- The surgeon will rotate the “socket” (acetabulum)—to improve coverage of the “ball” (femoral head); correct forces acting on the joint; minimize the progression of osteoarthritis (form of joint inflammation [arthritis] characterized by chronic deterioration or degeneration of the joint cartilage); may allow development of a more normal joint, if performed early (before joint deterioration or degeneration develops); osteoarthritis frequently progresses when viewed on X-rays, even though not apparent as signs of HD in the dog

#### Juvenile Pubic Symphysiodesis

- Surgical procedure to fuse the pubis (part of the pelvis) bones together
- The pelvis develops from matching bones on the right- and left-side of the body; the area where the two sides meet is composed of cartilage and is called a “symphysis”; the pubis is a part of the pelvis; the surgical procedure fuses the pubic symphysis at an early age (using electrocautery)
- Causes the “socket” (acetabulum) to better cover the “ball” (femoral head)
- Improves relationship of corresponding surfaces of the joint and joint stability—similar effects as TPO, without surgical metal implants
- Minimal postoperative problems; easy to perform—must be performed very early (3–4 months of age) to achieve

effect; minimal effect achieved if performed after 6 months of age

### **Total Hip Replacement**

- Indicated to salvage joint function in mature dogs, with severe osteoarthritis that is unresponsive to medical therapy
- Pain-free joint function—reported in more than 90% of post-surgical cases
- Hip joint replacement in only one leg provides acceptable function in approximately 80% of cases; stage (staggered) replacement of both is now chosen by about half of owners
- Complications—dislocation (luxation); damage to the sciatic nerve; infection

### **Excision Arthroplasty**

- Surgical removal of the “ball” part of the hip joint
- Removal of the “ball” (femoral head and neck) to eliminate joint pain; the muscles “act” as the joint
- Primarily a salvage procedure—for significant osteoarthritis—when pain cannot be controlled medically or when total hip replacement is cost-prohibitive
- Best results—small, light dogs (weighing less than 20 kg or 44 lbs); pets with good hip musculature
- Slightly abnormal gait often persists following surgery
- Postoperative loss of muscle mass (muscle atrophy) in the hind limbs—common, particularly in large dogs

### **Denervation Procedure**

- Does not improve joint fit or reduce arthritis
- Little evidence to prove or disprove the procedure, recently reported it does not improve the hip but may slow development of further signs

## **Medications**

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive

- Pain-relieving drugs (known as “analgesics”) and anti-inflammatory drugs—minimize joint pain (and thus stiffness and loss of muscle mass [muscle atrophy] caused by limited usage); decrease inflammation of the lining of the joint (known as “synovitis”); drugs that relieve pain and decrease inflammation include carprofen; etodolac; deracoxib; firocoxib
- Medical therapy—does not correct the structural or biomechanical abnormality; deterioration or degeneration of the hip joint likely to progress; medical therapy often provides only temporary relief of signs
- Dietary supplementation with omega-3 fatty acids decreases inflammation
- Glucosamine and chondroitin sulfate—may have a cartilage protective effect in osteoarthritis; recent evidence suggests that they are not, or are only minimally effective

## **Follow-Up Care**

### **PATIENT MONITORING**

- Monitor signs, degree of lameness, and changes seen on x-rays (radiographs)—assess progression
- Medical treatment—if poor response or initial response is followed by deterioration of condition, the veterinarian may change the dosage of medication or try a different medication, or consider surgical intervention
- Triple pelvic osteotomy—monitored by x-rays (radiographs), taken periodically; assess healing, metal-implant stability, reestablishment of corresponding surfaces between the “ball” (femoral head) and the “socket” (acetabulum) making up the hip joint (that is, joint congruence), and progression of osteoarthritis
- Hip replacement—monitored by x-rays (radiographs) yearly; assess metal implant stability

### **PREVENTIONS AND AVOIDANCE**

- Best prevented by not breeding dogs affected with hip dysplasia
- Pelvic x-rays (radiographs)—may help identify dogs with actual bony changes of hip dysplasia; may not identify all dogs carrying the genes for the disease
- Do not repeat dam–sire breeding that result in affected offspring
- Special diets designed for rapidly growing large-breed dogs—may decrease severity of hip dysplasia

## **EXPECTED COURSE AND PROGNOSIS**

- Joint deterioration or degeneration usually progresses—most pets lead normal lives with proper medical or surgical management
- Added weight of pregnancy may worsen signs in breeding female

## **Key Points**

- Hip dysplasia has a complex genetic (inherited) basis, involving multiple genes
- Development of hip dysplasia determined by an interaction of genetic and environmental factors
- Medical therapy is designed to relieve signs (known as “palliative therapy”); it does not “cure” the disease, because the joint instability is not corrected
- Joint deterioration or degeneration often progresses, unless a corrective orthopedic surgical procedure is performed early in the disease
- Surgical procedures can salvage hip-joint function once severe joint deterioration or degeneration occurs

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