

HIP DYSPLASIA

Your dog has been diagnosed with hip dysplasia, which is one of the most common orthopedic conditions in dogs. Millions of dogs are affected by this condition. The hip joint is a ball and socket joint with the ball component arising from the femur (the bone between the knee and the hip joint) and the socket portion of the joint arising from the pelvic bone (acetabulum). The ball and socket lie in very intimate contact with one another; this unique joint configuration allows the wide range of motion of the hip joint.

Hip dysplasia is a developmental problem involving excessive laxity (looseness) between the ball and socket portions of the hip joint such that the intimate contact between the components is lost. The exact cause of this laxity is not known and many theories including hereditary/genetic, metabolic, hormonal, dietary, and trauma have been proposed. In reality, the cause is likely multifactorial (a combination of the above factors acting together). Heredity is known to play a significant role and we therefore recommend that dogs with hip dysplasia not be bred.

Patients with hip dysplasia will often exhibit pain, lameness, and intolerance to exercise. In young patients (< 2 years of age), the pain is generally the result of stretching of the tissue that surrounds the joint (joint capsule) and damage to the cartilage surfaces from the joint laxity present, with resultant inflammation. As this process continues, the joint capsule will thicken and the bones may remodel significantly, in some cases leading to an improvement in symptoms as the inflammation subsides. This improvement usually occurs at 14-16 months of age and some patients are relatively pain free for a significant period of time. As chronic arthritis develops, pain may return later in a patient's life. The pain is due to progressive deterioration of the joint cartilage which in some cases disappears altogether, resulting in bone on bone contact. These dogs may show difficulty rising or lying down, weakness in the hindend, and lameness.

The severity of symptoms and the age of the patient at the onset of clinical signs, as well as the progression of the disease are variable and each patient must be assessed individually. The diagnosis of hip dysplasia is confirmed using x-rays but the x-rays alone do not dictate the options for treatment of a given patient.

The treatment method varies depending upon the severity of symptoms, the age of the pet, and it's general health.

Treatment options include:

1. Conservative/ nonsurgical
2. Juvenile Pubic Symphysiodesis (JPS)
3. Double or Triple Pelvic Osteotomy (DPO, TPO)
4. Femoral Head and Neck Ostectomy/ Excision (FHO)
5. Total Hip Replacement (THR)

Conservative/nonsurgical treatment involves weight reduction (or maintenance of a lean body composition); regular, moderate exercise; and use of anti-inflammatories and nutraceuticals. A multimodal approach is used and a separate hand-out will be provided that discusses this in greater detail.

There are several surgeries that are performed on dog's with hip dysplasia before they reach skeletal maturity. Early diagnosis is critical so that these surgical options can be considered before the "window of opportunity" passes (typically prior to one year of age). Juvenile pubic symphysiodesis (JPS) is a procedure that alters the growth of the pelvis by surgically fusing the bones of the floor of the pelvis by applying an electrical current to the tissue. After the procedure, the acetabulum begins to rotate outwardly, providing greater coverage to the femoral head and reducing hip laxity (looseness) and providing better joint congruity (fit). To be maximally effective, JPS needs to be performed between 4 and 5 months of age.

Triple pelvic osteotomy/ double pelvic osteotomy (TPO/DPO) are also procedures that improve joint congruity and reduce hip laxity. These procedures involve making two or three cuts in the pelvis to isolate the acetabulum (socket), and repositioning the acetabulum so that greater coverage of the femoral head is achieved. Bone plates and screws are used to secure the acetabulum in the new position. TPO and DPO are best performed at an early age (5-10 months), before significant joint remodeling or arthritis has occurred. While it was once thought that these procedures halted the progression of arthritis, this is no longer thought to be the case. They do however appear to make dogs more comfortable in the short to medium term, probably by reducing the instability and inflammation present and may reduce the need for later hip replacement. Both TPO and DPO are major surgeries that require strict attention to postoperative care and may involve infrequent but significant complications.

Femoral head and neck osteotomy/ excision (commonly referred to as FHO) is a salvage procedure for treatment of clinically advanced hip dysplasia/ DJD. FHO involves surgical removal of the femoral head and a portion of the femoral neck, eliminating painful bone to bone contact and allowing the development of a "pseudoarthrosis" or false joint. The cut surface of the femur rides against the soft tissues around the hip joint (in some cases a muscle flap is interposed between the femur and hip socket), improving function through relief of discomfort. The femur tends to ride a bit higher on the pelvis after FHO but most dogs compensate for this by extending their knee and hock joints slightly. FHO tends to work best in smaller dogs; the results of the procedure become much more inconsistent as dogs exceed 50-60 lbs. bodyweight. Dogs that are generally weak in the hindend or have severe muscle atrophy prior to surgery also tend not to do as well and take much longer to recover from the procedure. The advantages of FHO are the simplicity and speed of the procedure and the relatively low cost. The disadvantages are the inconsistent results achieved in larger dogs, the failure to return full function and range of motion to the affected hip in most cases, and the relative inability to revise a FHO if the outcome is suboptimal. Physical therapy is a critical part of the recovery from FHO- dogs that engage in early, aggressive physical therapy tend to begin to use the operated limb faster and ultimately have a more functional postoperative result.

Total hip replacement (THR) involves the removal of the femoral head and neck as well as the cartilage of the hip socket (acetabulum) and replacement with titanium or stainless steel prostheses. Total hip replacement affords the best opportunity for a patient (particularly large, active dogs) with severe hip pathology return to normal, painfree function. THR has been

performed in dogs since the 1970s. The original total hip components were secured with a bone cement that bonded the implants to the bone. Cemented THRs worked relatively well but complications such as infection or loosening over time often doomed the prostheses to removal. Revision of a loose or infected cemented THR was very challenging and often unsuccessful. Since the early 2000s, cementless THRs have become more common and have very high success rates (90-95%) in the hands of experienced surgeons. The Zurich cementless implant is secured to the femur using screws and the cup (acetabular component) is press fit. Over 6-8 weeks, bone grows into and onto the implants to permanently fix them in place. This implant has low complication rates, with dislocation and femur fracture being two of the most common. Implants can also loosen over time, but unlike cemented prostheses, cementless implants are amenable to revision, where loose components are replaced with new implants. Recovery from cementless THR is quite rapid and once healed (8-12 weeks), dogs can return to a normal level of activity. Only 25-30% of patients require bilateral THR. The procedure can be performed in dogs as young as 9-10 months of age and with body weights ranging from 45-140lbs. Soon, an extended range of implants will allow Zurich THR in significantly larger patients.

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