Indications for Total Joint Replacement in Dogs and Cats William D. Liska, DVM, DACVS Gulf Coast Veterinary Specialists Houston, TX

Total hip replacement in dogs is most commonly performed to restore a pain free joint and normal function due to pain resulting from osteoarthritis (OA) secondary to hip dysplasia. Additionally, any cause of non-septic OA may be an indication, whether the etiology is traumatic, developmental, acquired, or idiopathic.

Not all animals presenting with hip pain are imminent THR candidates. Animals with coxofemoral OA, with or without clinical signs or previous attempt to alleviate pain non-surgically, are only potential THR candidates. Nonsurgical pain management is generally the first option recommended before surgery. If pain management is only partially effective and/or clinical signs worsen, surgery is indicated. Pain management combined with attaining an ideal body condition score may delay surgery in some instances, but weight reduction and exercise are sometimes difficult to implement. If uncomplicated unrelenting hip pain is present, a THR recommendation should be made to improve the quality of life of the pet.

Total hip replacement is becoming more common in cats and small breed dogs. Just as in large breed dogs, OA secondary to hip dysplasia is the predominant indication for THR in cats and small dogs. Other problems, including coxofemoral luxation, avascular necrosis, or physeal fractures, are common indications for THR in small dogs and cats. In one report, hip luxation, avascular necrosis, and capital physeal fractures were the respective indications for 15 (23%), 17 (26%), and 11 (17%) of 66 small breed THR's (Liska 2010). Other recent case series have also reported the use of THR for the treatment of capital femoral physeal fractures and for avascular necrosis of the femoral head (Jankovits et al. 2012; Kalis et al. 2012). THR has also been performed to manage unsuccessful femoral head ostectomy (Liska et al. 2010).

Patient age is an important consideration both physiologically and anatomically. Ideally, the animal has reached skeletal maturity (closed physeal plates) of about 9-10 months prior to surgery. Surgery should be delayed in immature animals until the acetabular growth plates are closed, while surgery prior to closure of the capital physeal plate is inconsequential. Surgery may be performed if the physeal plate at the base of the greater trochanter is only partially closed. However, this growth plate could separate during surgery and require reduction and stabilization. The status of the distal femoral physeal plate is also inconsequential since it is not disrupted during preparation of the femoral canal.

The stage of hip dysplasia seen in dogs presenting between the ages of 5 to 12 months of age is important in the timing of surgery. A favorable window of opportunity may exist in young dogs with severe coxofemoral subluxation or developmental luxation. For these patients, it is generally advantageous to recommend surgery early rather than waiting until the animal and the disease have progressed to advanced pathology. Chronic hip dysplasia may result in severe morphologic changes making surgery more technically challenging. The adverse changes include: luxation, acetabular hypoplasia, dorsal acetabular rim wear, lateral drift of the proximal-medial femoral cortex, medialization of the greater trochanter, sclerosis of the proximal aspect of the femoral medullary canal, narrowing of the femoral isthmus, lateralization of the proximal aspect of the femur, and muscle atrophy including contracture of the hip musculature muscles resulting from hip luxation. The muscle atrophy and contracture make rearticulation of the prosthetic joint more difficult and increase the risk of luxation after surgery.

Concurrent orthopedic and neurological disease is often present in patients presenting for THR surgery. These conditions may exacerbate the clinical signs of hip dysplasia or may lead one to incorrectly attribute the severity of the clinical signs to the hip joint. Degenerative myelopathy and lumbosacral disease may produce symptoms similar to severe bilateral hip dysplasia.

A thorough physical examination including neurological evaluation must be undertaken to rule out or to identify concurrent disease conditions during the planning process. Concurrent neurological or orthopedic disease must be carefully assessed and may necessitate postponement of THR until these conditions are resolved or evaluated in light of the patient's overall condition or function.

Ipsilateral or contralateral orthopedic pathology, such as medial patella luxation (MPL) or cranial cruciate ligament (CCL) injury, are frequently present concurrent with hip pathology. Hip dysplasia and MPL appear to be significantly correlated in cats. When concurrent hip and knee problems are suspected, it must be determined whether symptoms (lameness and/or pain) originate at the hip, the knee, or both. If both joints are responsible for clinical signs, the hip and knee procedures are in most cases staged, with the knee problem usually being a higher priority.

Serious and often life threatening medical conditions must also be considered. Patients with concurrent systemic disease must be treated with caution. Examples include uncontrollable bacterial dermatitis, neoplasia, coagulopathy, and compensated heart, liver, or renal failure. Likewise, the systemic effects of immunosuppression, diabetes mellitus, Cushing's disease and generalized immune mediated polyarthropathy may pose a significant risk to the THR patient. Thoughtful preoperative assessment and owner counseling is recommended if THR surgery is contemplated, even after successful treatment of these or similar diseases. Consideration should be given to testing for Von Willebrand factor deficiency in predisposed breeds.

Septic arthritis is an absolute contraindication for THR. The presence of ipsilateral hindquarter or generalized dermatitis, otitis externa, urinary tract infection, and periodontal disease should be resolved prior to surgery.

Even though neoplasia with or without metastatic disease may be a relative contraindication, neoplasia localized to the hip region may not be. It is feasible to implant a custom-made prosthesis in selected cases. The prosthesis fixation is typically cemented and shielded if immediate postoperative radiation therapy is anticipated. Osteointegration fixation of porous coated implants is adversely affected by radiation at 2 weeks, but not at 4 or 8 weeks. The porous coated area of the prosthesis should also be shielded from radiation until ingrowth has ceased. Bone that has been irradiated prior to joint replacement surgery may not be well vascularized to maintain prosthesis fixation, and it may be more predisposed to fracture when exposed to redistributed loads from the prosthesis.

When financial constraints preempt THR surgery, a femoral head and neck ostectomy (FHO) may be an option in selected cases. An FHO carries the risk of not achieving acceptable pain relief and restoration of function in all breed sizes (Off et al. 2010). An FHO disrupts the normal hip biomechanics, results in limb leg length discrepancy, unpredictable pain relief, and may require prolonged rehabilitation (Liska et al. 2009). In some cases, it is possible to revise a painful FHO to a THR, but an FHO should never be advised as an interim procedure.

References

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