CANINE HIP RESURFACING

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Outcomes for canine total hip arthroplasty (THA) have been reviewed. Common complications include femoral fracture (1.5 – 13.1%), prosthesis luxation (1 - 18%), and aseptic loosening (2.1 – 18%). Owner assessment of the outcome of THA in dogs was reported as good to excellent in 84.1% of respondents in one study. While favorable, these results highlight the need for improved outcomes with lower patient morbidity.

Commercially available canine THA implant systems require removal of the femoral head and neck for implant placement and as such are not considered bone stock preserving techniques. Presentation of bone stock in human THA offers the advantage decreased postoperative morbidity, the potential for biomechanics resembling the non-dysplastic hip and increased options for revision surgery. Currently available canine implant systems utilize a metal-on-polyethylene (MOP) design for the load bearing surface. Durability of MOP has been reported with runaway wear and resultant aseptic loosening the primary concern. With any load bearing surface utilized with joint replacement, the longevity of the implant must parallel the longevity of the patient, otherwise, implant revision is imperative. Metal-on-metal (MOM) hip bearing were first described in humans in the 1960s with reported advantages including excellent wear properties (documented with large femoral head design), self-healing capacity and absent runaway wear. The progression to large head MOM bearing loads has provided the additional advantage of improved prosthesis stability due to periprosthetic space limitation, decreased impingement and the theoretical stability provided by improved elastohydrodynamic properties.

Hip resurfacing (HR) has been considered as a major evolutionary step in human hip arthroplasty in the 21st century. HR was originally described in human in the 1948. Initial implants utilized a MOP design. Implant survivorship results were fair (88% 5 year survivorship) with aseptic loosening the primary mode of failure. Current generation HR implants utilize a cobalt-chromium-molybdenum alloy MOM design. This MOM design in conjunction with improved instrumentation and implantation techniques have resulted in 98% 5 year survivorship and overall complication rates less than 5.5%. Reported advantages of HR include 1) Durable implant fixation with a cementless acetabular component and cemented femoral head "cap" 2) Improved biomechanics attributed to the large bearing surface that results in increased impingement-free range of motion and a decreased risk of dislocation. 3) Bearing surfaces that allow increased longevity due to a reduced risk of osteolysis attributed to the lack of polyethylene.

Canine HR implant systems are currently not available commercially. Phase 1 of a clinical trail of a MOM HR implant system is currently underway. Indications for canine HR, mechanical testing results and the initial data collection of clinical cases utilizing this novel system will be discussed.

References

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