Zurich Cementless Total Hip Replacement

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KEYWORDS

• Total hip replacement • Hip dysplasia • Cementless • Dog • Zurich

KEY POINTS

- Total hip replacement (THR) is considered the gold standard for treatment of intractable pain from hip dysplasia.
- THR procedures are divided into 2 main categories: cemented and cementless, with hybrid a combination of the 2.
- The Zurich Cementless THR system is a purely cementless system, which uses a combination of press-fit (acetabular component) and locking screw (femoral component) fixation.
- The Zurich THR system was designed to address the main challenge facing cemented systems (aseptic loosening) while providing the benefit of immediate stability with its novel locking screw implantation system for the femoral stem rather than a conventional press fit design.
- The Zurich THR system is reported to have similar success rates to other THR systems and is an effective treatment option for various orthopedic conditions of the coxofemoral joint in medium to giant breed dogs.

INTRODUCTION

Canine THR is an accepted method for treatment of various painful orthopedic conditions affecting the coxofemoral joint. The goal of THR for dogs with hip dysplasia is to return a chronically lame patient whose discomfort is refractory to conservative management to near-normal or normal function.[1] THR involves the surgical replacement of the femoral head and acetabulum with manufactured implants. Canine hip dysplasia, traumatic coxofemoral luxation, femoral head and neck fractures, and failed femoral head and neck ostectomy (FHO) are among the most common indications for canine THR.[2–6] Current THR systems can be broadly categorized as cemented, cementless, or hybrid (combination of cemented and cementless implants). Cemented THR systems achieve both short-term and long-term stability with the use of polymethyl methacrylate as the interface between the implant and bone. Cementless THR systems

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achieve short-term stability by various methods depending on the implant system used (press-fit, locking screw fixation, or screw-in implants) and long-term stability via bone in-growth (on-growth) into implants.[5–7]

The Zurich Cementless THR (Kyon, Zurich, Switzerland) was developed at the University of Zurich in the late 1990s[6] (**Fig. 1**). The Zurich THR system uses a novel locking screw implantation system for application, coupled with a unique microinterlock bone on-growth for long-term stability of the femoral component. The Zurich acetabular component uses an initial press-fit stabilization followed by long-term stabilization via bone in-growth through a porous design of the cup (multiple small holes for bone in-growth).[8,9] Numerous publications have reported the surgical technique and outcomes for the Zurich THR.[3,6,10]

INDICATIONS/CONTRAINDICATIONS

Zurich THR has been reported as a treatment modality for canine hip dysplasia, fractures of the femoral head and neck, chronic or nonreducible luxations, failure of various hip surgeries (triple pelvic osteotomy, FHO, dorsal acetabular rim arthroplasty, and toggle pin procedure), and revision of THR performed with an alternate system.[3,6,10,11] There are no reported contraindications specific to the Zurich THR (Vezzoni A, personal communication, 2016). General contraindications for THR should be considered with the Zurich THR (**Table 1**).

Signalment for reported clinical cases of Zurich THR is varied but currently limited to medium to giant breed dogs. Reported breeds include mixed breed dog, German shepherd dog, golden retriever, Labrador retriever, Newfoundland, Rottweiler, Bernese mountain dog, border collie, pit bull, Belgian shepherd, Doberman, Hovawart, Leonberger, flat-coated retriever, greater Swiss mountain dog, Irish setter, Magyar vizsla, and riesenschnauzer.[3,6,10] Reported patient age at the time of Zurich THR is also varied, with ages ranging from 4.5 months to 12.6 year old.[6,10] Zurich THR is well documented in intact male dogs, castrated male dogs, intact female dogs, and spayed female dogs.[3,6,10]

Fig. 1. Fifth-generation Zurich THR femoral and acetabular implants.