

Mid-Term Outcomes of a Conical Tapered Stem for Atypical Femoral Anatomy in Total Hip Arthroplasty

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INTRODUCTION:

Atypical or dysplastic femoral anatomy in total hip arthroplasty (THA) can be challenging to manage. Most studies reporting on the outcomes of a splined, conical tapered stem in this patient population have limited small sample sizes or short- to midterm follow up. The objectives of this study were to determine implant survivorship, patient satisfaction, functional outcomes, radiographic evidence of osseointegration, implant subsidence, and complications of THA with a conical tapered monoblock stem in a large cohort of patients with atypical femoral anatomy at intermediate-term follow up.

METHODS:

We performed a retrospective review of all consecutive primary THA performed using a single conical tapered prosthesis for atypical proximal femoral anatomy at our academic institution from July 2007 to February 2017. Three-hundred-two patients with proximal femoral deformities undergoing 320 primary THAs were included. Indications for surgery included developmental hip dysplasia (n=207), Legg-Calve Perthes disease (n=43), neuromuscular condition (n=22), childhood trauma including septic arthritis (n=24), juvenile rheumatoid arthritis (n=10), revision of hip arthrodesis (n=7), multiple epiphyseal dysplasia or spondyloepiphyseal dysplasia (n=7). Average age at time of surgery was 49.4 years (range, 18.8 to 85.6 years) and 131 (40.9%) of patients were female. Mean follow-up time was 10.1 years (range, 5.2 to 15.5 years). Kaplan-Meier analysis was used to determine implant survival, validated patient-reported outcomes were collected, and radiographs were analyzed by 2 independent reviewers.

RESULTS:

Survivorship of the conical tapered stem was 99.0% (95% CI: 97.6% to 100%) with stem revision as the end point and 98.2% (95% CI: 96.5% to 100%) with reoperation for any reason as the end point at 10-years follow up. In total, four stems were revised; two for infection, one for chronic hip dislocation, and one for a distal stem fracture with aseptic loosening. At final follow up, mean patient satisfaction score was 89.2 (range, 60 to 100), mean UCLA score was 6.1 (range, 5.0 to 8.0), mean WOMAC score was 19.5 (range, 8 to 38), mean OHS was 40.8 (range, 20.0 to 48.0), and mean FJS was 80.4 (range, 64 to 95). All stems showed radiographic evidence of osseointegration with mean subsidence of 1.5 mm (range, 0.1 to 8.2 mm) at most recent follow up.

DISCUSSION AND CONCLUSION:

The use of this conical tapered stem in patients with complex femoral anatomy undergoing primary THA is associated with excellent component survivorship, high-levels of patient satisfaction, excellent functional outcomes, and reliable radiographic evidence of osseointegration with minimal stem subsidence at intermediate-term. This study provides outcomes for this stem with the largest cohort in the literature at a mean of 10.1 years follow up.