

Twenty- to Thirty-Year Follow-up Results of Cementless Total Hip Arthroplasty Using a Third-Generation Alumina-on-Alumina Ceramic or Alumina-on-Highly Cross-Linked Polyethylene Bearing

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INTRODUCTION: We determined the long-term (≥ 20 -years) clinical outcomes of proximal loading anatomic cementless femoral stems with alumina ceramic-on-ceramic (C-O-C) or alumina ceramic-on-highly cross-linked polyethylene (C-O-HXLPE) bearings.

METHODS: Consecutive primary total hip arthroplasty (THA) procedures were performed in 250 patients (500 hips; 140 men, 110 women) aged < 65 years. This is a series of bilateral THA patients that were randomized to receive a C-O-C bearing one side and a C-O-HXLPE on the other side. The mean age at the time of THA was 45.9 years (range, 31–65 years), with a mean follow-up of 25.5 years (range, 20–30 years). Osteolysis was assessed using radiographs and computed tomography scans, while polyethylene wear was measured using computer software program.

RESULTS: No hip in either group had osteolysis. The mean polyethylene penetration rate of the HXLPE liner was 0.041 ± 0.005 mm/yr. The survival rate in the C-O-C bearing group was 96.8% (95% CI, 92%–100%) for the femoral component and 97.2% (95% CI, 92%–100%) for the acetabular component at 25.5 years. In the C-O-HXLPE bearing group, the survival rate for both femoral and acetabular components was 97.6% (95% CI, 92%–100%) at 25.5 years.

DISCUSSION AND CONCLUSION: At a mean follow-up of 25.5 years, a proximal loading anatomic cementless femoral stem with alumina C-O-C or alumina C-O-HXLPE bearings demonstrated excellent long-term function, with osteolysis on ceramic femoral head or acetabular liner fractures.