Wear-related Revision Rates Following Total Hip Arthroplasty with Marathon Highly Crosslinked Polyethylene in Patients Younger than 50

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Patients undergoing total hip arthroplasty (THA) with conventional polyethylene historically experienced high rates of failure secondary to wear and osteolysis. While highly cross-linked polyethylene (HXPE) has substantially decreased wear rates and subsequent osteolysis, few studies have analyzed HXPE in young, active patients. The purpose of this study was to determine the outcome of primary THAs performed with Marathon HXPE (DePuy, Warsaw, IN) in patients under 50 years old.

METHODS:

Using a single institution's database, we retrospectively analyzed 232 primary THAs performed from 1999 to 2010 with Marathon HXPE in patients younger than 50 years old. Outcome measures included all-cause revision, wear-related revision rates, survivorship, and hip scores (HHS). The mean patient age at the time of surgery was 42.0 (range, 18.5 to 49.8 years) with a mean follow-up of 10.4 years (range, 2.7 to 18.1 years). Cobalt-chromium femoral heads were used in the majority of cases (66%) and ceramic heads in 34% of cases. The femoral head sizes ranged from 28-36mm in diameter.

RESULTS:

The all-cause revision rate was 5.6% (n=13) with instability being the most common cause for revision (n=8) followed by aseptic loosening (n=3). In one of the 13 revision cases, the Marathon liner was not revised, and is still in situ. The 20-year survivorship with revision as an endpoint was 88.5%. There were no wear-related revisions and no revisions for fracture or infection. In cases with follow-up, the average HHS increased from 46.7 (range, 10.0-75.0) preoperatively to 87.4 (range, 31.0-100.0) postoperatively. Three liners were available for visual inspection and showed burnishing or some deformation secondary to impingement and subluxation. Three additional liners underwent oxidation testing and were found to have no evidence of in situ oxidation.

DISCUSSION AND CONCLUSION: In this young, active patient population, Marathon HXPE did not result in any wearrelated revisions.

	N=232 (%)
Demographics	
Age (range)	42 (18.5-49.8)
Sex (Female)	140 (60.3%)
BMI (range)	28.5 (17.7-53.7)
Diagnosis	
Osteoarthritis	123 (53.0%)
Dysplasia	40 (17.2%)
Osteonecrosis	37 (15.9%)
Post traumatic arthritis	14 (6.0%)
Rheumatoid arthritis	9 (3.9%)
Unknown	9 (3.9%)

 Table 1. Patient demographics and preoperative diagnoses