

No Revisions Attributable to Wear of Highly Cross-Linked Polyethylene Liners: A Minimum 20-Year Follow-Up Study

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INTRODUCTION: Total hip arthroplasty (THA) survivorship has significantly improved since the introduction of highly cross-linked polyethylene (HXLPE) liners. However, long-term outcome data are limited. Our aim is to evaluate implant survivorship, liner wear rates, and clinical outcomes after primary THA using HXLPE liners with a minimum potential follow up of 20 years.

METHODS: Between 1999 and 2001, 690 primary THAs utilizing 28-mm femoral heads and HXLPE liners from a single manufacturer were identified using our institutional total joint registry. Femoral heads were composed of metal in 96% of cases and ceramic in 4%. Mean age was 56 years, 48% were female, and mean BMI was 29.5 kg/m². Survivorship analyses, including all cases, were performed. There were 197 hips with radiographs at 18.5 years and beyond. Linear HXLPE liner wear rates as well as inclination and anteversion angles were determined utilizing these radiographs.

RESULTS: At 20 years, survivorship free of revision was 94%, free of reoperation was 92%, and free of complication was 81%. There were no documented wear-related revisions. The linear wear rate at a mean of 20.3 years postoperatively was 0.02 mm/year. There was no statistically significant difference in measured wear observed between the first available postoperative radiographs and those taken at more than 18.5 years postoperatively. The use of elevated liners, patient BMI, and acetabular component inclination and anteversion angles were not associated with increased wear rates. Mean Harris Hip Scores improved from 52 preoperatively to 90 at greater than 18.5 years.

DISCUSSION AND CONCLUSION: Primary THAs using HXLPE liners demonstrate excellent survivorship and clinical outcomes at long-term follow up with no wear-related revisions. Wear rates of HXLPE liners at 20 years are exceedingly low and are not significantly impacted by patient BMI or acetabular component position.