Long Term Follow Up of Thin Polyethylene Liners in Total Hip Arthroplasty

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INTRODUCTION: Using thin polyethylene liners with large diameter femoral heads in total hip arthroplasty (THA) may decrease the risk of instability. The purpose of this study was to investigate the long-term survivorship of thin highly crosslinked polyethylene (HXLPE) liners.

METHODS:

This was a retrospective cohort study of patients who underwent primary THA for osteoarthritis at a single institution. Patients who received an HXLPE liner with a thickness of 3.9, 5.9, or 7.9 mm and a variety of femoral head and cup sizes were included. Demographic, surgical information, patient-reported outcome measures, and long-term outcomes were collected.

RESULTS:

Of the 4,951 cases included, 92 utilized a 3.9 mm liner, 2,690 utilized a 5.9 mm liner, and 2,169 utilized a 7.9 mm liner, with respective mean length of follow up of 4.48 (range 1.23 – 12.17), 6.13 (range 1.0 – 12.12), and 6.05 years (range 1.0 – 12.35). There was no significant difference in revisions or reoperations between the cohorts. Among those revised, 7.9 mm liners were more likely to have the indication of instability when compared to 5.9 mm liners (0.092% versus 0.038%), while the 3.9 mm group had no revisions for instability. No 3.9 mm liners were revised for polyethylene wear. At 6 months postoperatively, HOOS-JR was significantly greater in patients with a 3.9 mm liner (P=0.004). At 2, 5, and 10 years postoperatively, HOOS-JR was equivalent across all groups (P=0.76, P=0.098, P=0.685, respectively). At 5 years postoperatively, the 3.9 mm group had a significantly lower improvement in HOOS-JR (P=0.036), but this difference equalized between groups at 10 years.

DISCUSSION AND CONCLUSION: Thin and standard size HXLPE liners in THA have similar long-term functional and clinical outcomes. Liners of 3.9 mm may safely be used while providing the benefit of reduced revision for instability.

Kaplan-Meier Curve: 1-Year Revision

Kaplan-Meier Curve: 2-Year Revision

Kaplan-Meier Curve: 10-Year Revision