

Polyethylene Wear in Total Hip Arthroplasty with Dual Mobility Concepts – minimum five year follow up

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Introduction: Dual mobility cups (DMC) aim to optimize jumping distance and reduce the risk of dislocation. Their dual articulation design may increase friction and subsequent wear. This study evaluates mid-term wear following total hip arthroplasty (THA) with DMC, comparing outcomes based on liner.

Materials and Methods: Patients who underwent total hip arthroplasty (THA) with a DMC at Uppsala University Hospital, minimum five-year follow-up, were included. The cohort was divided into two groups based on the type of liner used, Vitamin E-infused polyethylene (VEPE) and standard polyethylene (PE). Lateral and AP radiographs were obtained postoperatively and at follow-up. 2D and 3D wear was analyzed using PolyWare (Draftware Inc, Warsaw, IN) software. Joint function was assessed using PROMs and HHS.

Results: The initial analysis encompassed the first 25 hips measured. In the VEPE group, total 2D median wear was 1.6 mm (0.32-4.1) with an annual wear rate of 0.17 mm/year (0.051-0.36), whereas in the PE group, these values were 2.1 mm (0.32-2.5) and 0.15 mm/year (0.023-0.25), respectively. The annual 3D wear rate for the VEPE group was 53 mm³/year (4.0-240), compared to 33 mm³/year (2.5-86) in the PE group. No statistically significant difference was observed.

Conclusion: Wear rates exceeded the osteolysis threshold for 2D wear, however, no osteolysis was observed. No significant difference in wear rates was found between VEPE and standard PE liners. Caution is advised when considering DMC for younger patients and those with high activity levels.