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Modified acetabular component liner designs are not superior to standard liners at reducing the risk of revision - an analysis of 151,096 cementless total hip arthroplasties from the German Arthroplasty Registry - Published Online: 1 Jul 2022 Doi: <https://doi.org/10.1302/0301-620X.104B7.BJJ-2021-1791.R1>

Aims

Registry studies on modified acetabular polyethylene (PE) liner designs are limited. We investigated the influence of standard and modified PE acetabular liner designs on the revision rate for mechanical complications in primary cementless total hip arthroplasty (THA).

Methods

We analyzed 151,096 primary cementless THAs from the German Arthroplasty Registry (EPRD) between November 2012 and November 2020. Cumulative incidence of revision for mechanical complications for standard and four modified PE liners (lipped, offset, angulated/offset, and angulated) was determined using competing risk analysis at one and seven years. Confounders were investigated with a Cox proportional-hazards model.

Results

Median follow-up was 868 days (interquartile range 418 to 1,364). The offset liner design reduced the risk of revision (hazard ratio (HR) 0.68 (95% confidence interval (CI) 0.50 to 0.92)), while the angulated/offset liner increased the risk of revision for mechanical failure (HR 1.81 (95% CI 1.38 to 2.36)). The cumulative incidence of revision was lowest for the offset liner at one and seven years (1.0% (95% CI 0.7 to 1.3) and 1.8% (95% CI 1.0 to 3.0)). No difference was found between standard, lipped, and angulated liner designs. Higher age at index primary THA and an Elixhauser Comorbidity Index greater than 0 increased the revision risk in the first year after surgery. Implantation of a higher proportion of a single design of liner in a hospital reduced revision risk slightly but significantly ($p = 0.001$).

Conclusion

The use of standard acetabular component liners remains a good choice in primary uncemented THA, as most modified liner designs were not associated with a reduced risk of revision for mechanical failure. Offset liner designs were found to be beneficial and angulated/offset liner designs were associated with higher risks of revision.

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