Outcomes of mixing and matching components in total hip arthroplasty: a population-based study

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INTRODUCTION:

Most manufacturers specify that surgeons should use all the components of their total hip arthroplasty (THA) system to avoid working 'off-label'. Despite this, studies show that mixing certain components in THA (acetabular component and liner with a different manufacturer's femoral stem and head) can produce comparable, or even superior results to matched THA. Our primary aim was to compare all-cause revision rates for mixed and matched THA in Ontario, Canada.

METHODS:

We identified adults undergoing primary elective THA between 2012 and 2020 in Ontario, Canada, using administrative databases. We used propensity score matching to adjust for relevant confounding variables between groups. We used Chi-Square and Fisher Exact tests to compare dichotomous outcomes, and Wilcoxon Rank Sum tests to compare continuous outcomes between matched groups.

RESULTS:

We identified 906 patients who received mixed THA implants, and 65,131 who received matched THA implants. Patients who received mixed-component THA implants were more likely to be younger, female, have fewer comorbidities, receive surgery at a teaching hospital, receive bone-cement, and be discharged home compared to those who received matched-component THA implants. Following propensity score matching, we retained 824 patients who received mixed-component THA implants, and 8,240 who received matched-component THA implants, with no statistically significant differences in patient or hospital characteristics. We found no significant difference in revision rate (mixed: 1.6%; matched: 1.7%, $p = 0.7965$), or indications for revision. However, patients in the matched group had a significantly longer mean length of hospital stay (3.23 ± 2.29 days) compared to the mixed group (2.84 ± 2.25 days, $p < 0.001$).

DISCUSSION AND CONCLUSION:

While mixing THA components from different manufacturers seems a relatively rare practice in Ontario, Canada, this study supports the data from other large database studies that mixing femoral with acetabular THA components from different manufacturers does not produce higher rates of revision compared to matched THA.