

Primary Total Knee Arthroplasty Performed Using High-Viscosity Cement Is Associated with Higher Odds of Revision for Aseptic Loosening

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Introduction: Aseptic loosening (AL) is the most common reason for revision total knee arthroplasty (TKA). An association between high viscosity cement (HVC) and AL has been suggested by small, uncontrolled, case-series. This study sought to determine whether HVC use during primary TKA is independently associated with the development of AL requiring revision. Our null hypothesis was no difference in revision for AL rates between cement type groups.

Methods: We retrospectively analyzed a prospectively collected database to identify all primary TKAs from January 2007 through December 2016. Patients with less than two years follow-up were excluded. Cement type used during the primary procedure was divided into two groups (HVC: Simplex HV, Palacos, Cobalt; and low viscosity cement (LVC): Simplex). Data on potential confounders including age, body mass index (BMI), preoperative diagnosis, antibiotics in the cement, and implant type were collected. Outcomes including no revision, revision for a reason other than AL and revision for AL were collected. Multivariable logistic regression analysis was used to determine whether HVC is independently associated with revision for AL.

Results: 10,016 patients were included. Revision for AL was significantly higher in the HVC cohort (91/4791; 1.9%) vs. the LVC cohort (48/5224; 0.92%) ($p < 0.001$). After controlling for potential confounders, logistic regression demonstrated HVC to be independently associated with higher odds of revision for AL (OR: 2.17, 95% CI: 1.46-3.21, $p < 0.001$). Younger age was associated with higher odds of revision for AL (OR: 0.96, 95% CI: 0.94-0.98, $p < 0.001$). Preoperative diagnosis, BMI and antibiotics in cement were not associated with AL, although implant manufacturer and type dynamically influenced rates of revision for AL in the HVC cohort.

Conclusions: Though HVC is an attractive option for use in primary TKA, this adequately sized and appropriately controlled study demonstrates higher odds of revision for AL when using HVC with multiple different implant types.