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Paper #165

Posterior Stabilized TKR with Non-Cross-Linked Polyethylene Have Double the Risk of Revision of Infection Compared to Minimally Stabilized TKR with Cross-Linked Polyethylene: An Analysis of 336,997 Prostheses from the AOANJRR

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Summary:
In a registry analysis the revision risk for postoperative infection in TKR was influenced by both TKR design and polyethylene type with PS TKR design and NXLPE both being associated with an increased long-term rate of revision for infection when compared to MS TKR with XLPE.

Abstract:

Background

Infection of Total Knee Replacements (TKRs) remains concerningly frequent, devastating for patients and an increasingly significant public health burden. While both TKR design and polyethylene type can independently affect survivorship, their influence on revision risk for infection is unknown. Therefore, we examined the effects of TKR stability design and polyethylene bearing type on the long-term revision risk for infection in TKR by comparing four different cohorts, Minimally Stabilized (MS) TKRs with Cross-Linked Polyethylene (XLPE) to MS TKRs with Non-Cross-Linked Polyethylene (NXLPE), Posterior Stabilized (PS) TKRs with XLPE and PS TKRs with NXLPE.

Methods

National registry revision data for surgeon-reported infection in primary TKR for osteoarthritis were obtained from September, 1999 to December, 2015 for four patient cohorts defined by the TKR design and polyethylene type they received. Revisions =6 months were censored to reduce confounding bias. Hazard Ratios were adjusted for age, sex and antibiotic cement usage.

Results

There were 336,997 included primary TKR of which 1,651(0.48%) underwent revisions for infection. Compared to MS TKR with XLPE, the age, sex and antibiotic cement usage adjusted risk of revision for infection was 25% higher in MS TKR with NXLPE (HR=1.25 (95% CI 1.07 1.45) p=0.003), 89% higher for PS TKR with XLPE (HR=1.89 (95% CI 1.52, 2.35) p<0.001), and 102% higher for PS TKR with NXLPE (HR=2.02 (95% CI 1.72, 2.37) p<0.001). PS TKR with NXLPE had a 62% higher risk of infection compared to MS TKR with NXLPE (HR=1.61 (1.43,1.83) p<0.001). The revision for infection risk for PS TKR with XLPE was the same as PS TKR with NXLPE (HR=1.08 (0.88,1.32) p=0.481).

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Conclusion

Minimally Stabilized TKR with non-cross-linked polyethylene had a 25% greater long-term risk of revision for infection and Posterior Stabilized TKR with non-cross-linked polyethylene had a 102% greater long-term revision risk for infection when compared to Minimally Stabilized TKR with cross-linked polyethylene.