

Paper #25

Tourniquet Use Improves Cement Penetration and Reduces Radiolucent Line Progression After TKA

Vishal Hegde, MD, Daniel N. Bracey MD, PhD, Roseann M. Johnson, BS, Anna C. Brady, BS, Douglas A. Dennis, MD, Jason M. Jennings, MD

Introduction: Although the effect of tourniquet use on functional outcomes during total knee arthroplasty (TKA) is controversial, there is little data examining cementation. We aim to study the effect of tourniquet use on cement penetration and radiolucent lines (RLL).

Methods: Between September 2011 and October 2015, patients undergoing primary TKA with a single surgeon, implant and cement with minimum 5-year follow-up were retrospectively reviewed at a single institution. Tourniquet use was defined as a minimum 30 minutes, while no tourniquet was 0 minutes. Patients were 1:1 matched (n=61 per group) by age (± 5), gender, BMI (± 5) and duration of follow-up (± 2 years). Cement penetration and RLL were measured on the tibia at 6 weeks, and RLL at 1-, 2- and 5-years postoperatively using the Knee Society Radiographic Evaluation System. Outcomes were evaluated using Student's t-tests.

Results: There was no difference in postoperative tibial component axis (0.68 vs. 0.5 degrees valgus, $p=0.43$). Cement penetration was significantly increased in the tourniquet group in AP zones 1 (2.16mm vs. 1.03mm, $p<0.0005$), 2 (2.23 vs. 1.51, $p<0.0005$) and 5 (8.56 vs. 6.3, $p=0.009$), and lateral zones 1 (2.89 vs. 2.17, $p<0.0005$), 2 (2.86 vs. 2.12, $p<0.0005$), 3P (3.99 vs. 3.5, $p=0.039$) and 5 (8.18 vs. 5.93, $p=0.006$). There was no difference in AP zones 3M (4.18 vs. 4.3, $p=0.656$) and 3L (4.48 vs. 3.95, $p=0.073$), or lateral zone 3A (3.8 vs. 3.6, $p=0.304$). Progression of RLL >2 mm was observed in 27.8% (17/61) vs. 11.4% (7/61) in the tourniquet group ($p<0.005$). There were two failures for aseptic tibial loosening in the no tourniquet group vs. zero in the tourniquet group.

Conclusions: Tourniquet use improves cement penetration and reduces RLL progression. Dryer surfaces without blood and marrow contents during cementation may improve penetration, resulting in an improved cement mantle and potentially reducing the risk of aseptic loosening.

Notes
