



Paper #3

Tourniquet use during TKA and Its Effect on Recovery of Quadriceps Strength and Lower Extremity Function: A Randomized, Double-blind, Control Trial

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Introduction: Limited information exists on the impact of tourniquet use on muscle strength and lower extremity functioning. The purpose was to examine differences in quadriceps strength, pain and range of motion (ROM) in a group of patients undergoing simultaneous bilateral TKA with a tourniquet used on one limb.

Methods: Twenty-seven patients (54 lower extremities; 61.4 ± 6.1 years; 15 male) participated. Patients were randomized to receive tourniquet-assisted TKA (TQT) on one limb while the contralateral limb underwent TKA without tourniquet use (NOTQT). Tourniquets were inflated to 250 mmHg in the TQT until released at wound closure and were only used in the NOTQT group during component cementation. Quadriceps strength, assessed by a maximal voluntary isometric contraction, resting pain levels, and knee ROM were assessed preoperatively, the second postoperative day, one month and three months following TKA. Paired t-tests were used to compare differences between limbs.

Results: Average tourniquet times were 50.81 ± 11.53 minutes for the TQT group and 8.65 ± 5.67 minutes for the NOTQT group. Average blood loss was 84.29 ml (intraoperatively) and 202.44 ml (postoperatively) in the TQT group compared to 152.00 ml (intraoperatively) and 255.94 ml (postoperatively) for the NOTQT group. No significant difference in quadriceps strength was observed on postoperative day two. At one and three months following surgery, NOTQT limbs demonstrated significantly greater quadriceps strength [1 month quad strength: NOTQT= 88.98 ± 43.19 N-m; TQT= 77.71 ± 35.08 N-m ($p=0.0005$); 3 month quad strength: NOTQT= 139.31 ± 49.77 N-m; TQT= 128.96 ± 45.92 N-m ($p=0.03$)]. On the second post-operative day, resting pain scores trended significantly lower in NOTQT vs. TQT ($p=0.09$). One month after TKA, resting pain scores were significantly lower in NOTQT vs. TQT ($p=0.02$), but were similar at 3 months ($p>0.05$). No differences in knee ROM were observed ($p>0.05$).

Conclusion: Tourniquet use during TKA surgery negatively impacted quadriceps strength and affected patients' pain reports, even one month following surgery.
