# Tourniquet Use Does Not Impact Trajectory of Total Knee Arthroplasty Early Recovery: A Prospective, Randomized Controlled Trial with Daily Remote Monitoring

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INTRODUCTION:
The impact of tourniquet use on recovery after total knee arthroplasty remains controversial. Prior studies report results at two or three timepoints after total knee arthroplasty (TKA). In this prospective, single blinded, randomized controlled trial, we investigated the effect of tourniquet use on early recovery after TKA using a wrist-based activity monitor and a smartphone app-based patient engagement platform (PEP).
METHODS: A total of 107 patients undergoing primary TKA for osteoarthritis were randomized to tourniquet use (TQ+) or no tourniquet (TQ-) use from incision through implantation of the final implants. All patients utilized a PEP and wrist-based activity sensor for one week preoperatively and 90 days postoperatively to collect daily step counts, VAS pain scores and narcotic consumption, as well as weekly Oxford Knee Score (OKS) and monthly Forgotten Joint Score (FJS). Independent sample t-tests were used for continuous data and Chi-squared and Fisher's exact tests were used for discrete data. Linear mixed models were used for longitudinal analysis of patient outcomes over the study period.
RESULTS:
Fifty-four patients were randomized to TQ+ and 53 patients to TQ-. Greater than 80% of patients in both groups were compliant with daily data collection more than 80% of the study period (72 of 90 days). There was no difference in age (p=0.412), gender (p=0.546), calculated perioperative blood loss (p=0.937), length of surgery (p=0.399), and length of hospital stay (p=0.261) between groups. Tourniquet use did not have a statistically significant impact on daily VAS pain (p=0.583) or opioid consumption (p=0.060), weekly OKS (p=0.189) or monthly FJS (p=0.629).
DISCUSSION AND CONCLUSION:
Using a smartphone based patient engagement platform and wrist based wearable activity sensor to collect daily patient data, we found that tourniquet use has no significant negative impact on daily pain and function in the first 90 days after primary TKA.