

Outcomes of Tourniquet vs Tourniquet-less Revision Total Knee Arthroplasty

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INTRODUCTION: Total knee arthroplasty (TKA) is a successful and effective treatment for patients with severe end-stage osteoarthritis. Over the next decade, we are projected to encounter a substantial increase in the number of patients requiring total knee arthroplasty. Tourniquet is commonly used throughout the entirety of the procedure to limit blood loss and increase surgeon operative visibility. However, tourniquet use has been associated with complications, including infection, DVT, and nerve injuries. The debate remains as to whether the benefits of tourniquet outweigh the potential risks. Previous outcomes on tourniquet-less primary TKA showed a potential decrease in opioid use post primary TKA. This study will compare clinical outcomes between tourniquet vs. tourniquet-less TKA following revision TKA.

METHODS: A total of 1021 patients who underwent revision knee surgery was evaluated. Amongst the 1021 patients, 129 patients underwent TKA without tourniquet, while 892 patients underwent TKA with tourniquet. Patient demographics as well as clinical information including risk factors, readmission and re-revision rates were evaluated (Table 1). Student's t-test and chi squared analysis were used to establish significant differences between the groups with respect to demographics and outcomes.

RESULTS: Patients were matched with respect to demographics and comorbidities (Table 1). There were no significant differences in revision surgery indications for revision aside from instability. The average pressure of the tourniquet was 270.4 ± 25.37 (mmHg) and the average time of the tourniquet was 98.16 ± 36.57 (min). Compared to TKA with tourniquet use, blood loss was significantly increased in tourniquet-less TKA ($p=0.008$). With respect to early post-operative complications, there was no significant difference in 30-, 60-, or 90- day readmission. However, tourniquet use had odds ratios >1.0 for early post-operative return to the hospital within 30-, 60-, and 90- days for all indications of failure and for aseptic indications of failure. There was no significant difference between the groups with respect to re-revision, length of stay, or infection risk (Table 1).

DISCUSSION: Tourniquets are commonly used in revision TKA to provide better visualization and facilitate cementing techniques. The findings of this study suggest no difference in clinical outcomes, with regards to readmission and re-revision rates, between tourniquet and tourniquet-less revision TKA. However, the use of tourniquet has been associated with long term nerve injury and infection, thus this study demonstrates that select patients may benefit from tourniquet-less revision TKA in both the short-term and long-term setting.

SIGNIFICANCE/CLINICAL RELEVANCE: This study illustrates that there is no difference in clinical outcomes between tourniquet and tourniquet-less revision TKA. However, as the use of tourniquet has been associated with long term nerve injury and infection, this study demonstrates that select patients may benefit from tourniquet-less revision TKA in both the short-term and long-term setting.

Table 1: Comparison of patient demographics and clinical outcomes between both study cohorts.

Characteristics	No tourniquet use (N=129)	Tourniquet use (N=892)	p-value
Age	67.0 ± 10.4	66.4 ± 10.8	0.616
Gender	72 males/57 females	510 males/382 females	0.770
BMI	32.8 ± 7.2	32.7 ± 7.5	0.917
Laterality	52 left/77 right	429 left/463 right	0.098
30-day readmission	13 (10.08%)	105 (11.77%)	0.574
60-day readmission	17 (13.18%)	145 (16.26%)	0.371
90-day readmission	22 (17.05%)	169 (18.95%)	0.606
Re-revision	15 (11.63%)	122 (13.68%)	0.523
Re-revision due to infection	10 (7.75%)	55 (6.17%)	0.325
Re-revision due to aseptic indication	5 (3.88%)	67 (7.51%)	0.132
Blood loss (mL)	372.8 ± 291.9	287.4 ± 320.9	0.008
Length of Stay (days)	4.7 ± 6.1	4.7 ± 3.9	0.508