Tourniquetless Total Knee Arthroplasty with Modern Perioperative Protocols Decreases Pain and Opioid Consumption in Females

Michael M. Kheir MD, Mary Ziemba-Davis BA, Julian E. Dilley BS, Mark Hood Jr. MD, R. Michael Meneghini MD
Indiana University School of Medicine, Indianapolis, IN, USA

Background: Studies have observed that tourniquet use results in greater pain in the immediate postoperative period. Two of three studies noted a related increase in analgesia consumption. We examined the relationship between tourniquet use and pain and opioid consumption in the early postoperative period following TKA performed with modern perioperative pain protocols.

Methods: Retrospective study of 203 consecutive primary unilateral cemented TKAs performed by a single surgeon at a single academic institution between Jan 2016 and Mar 2017. Inclusion Criteria: secondary to primary, traumatic, or inflammatory osteoarthritis. Exclusion Criteria: antiplatelet medications except aspirin, clotting disorder, unplanned tourniquet disruption, or preexisting periarticular hardware. The same surgical approach, computer-aided navigation, implants, and modern perioperative pain, clinical, and rehabilitation protocols implemented in all cases. Tourniquet Group (n = 93): Inflated at 250 mm Hg from incision to sterile dressing. No Tourniquet Group (n = 91): Tourniquet not inflated during cementation. Cement mantle optimized with CO2 gas compression. Patient-reported pain scores on a 10 point scale (none to severe) recorded every four hours by nursing staff were averaged to derive an overall pain score during the first 24 hours following surgery. Narcotics consumed during the first 24 hours were recorded and standardized to morphine milligram equivalents.

Results: Analysis was performed separately for females and males because the tourniquet group had significantly more females than the no tourniquet group (p = 0.019). Demographics and covariates are presented in Table 1. Chart A: Females with a tourniquet reported more post-operative pain in the first 24 hours after surgery than females without a tourniquet (2.7 vs. 1.9, p = 0.002). Pain scores did not differ in either group based on the presence of depression (p ≥ 0.245). Chart B: Females with a tourniquet consumed significantly more opioids in the first 24 hours following surgery than females without a tourniquet (42.8 vs. 18.8 morphine equivalents, p < 0.001). There were no differences in pain (Chart A) or amount of opioids consumed (Chart B) among males with and without a tourniquet.

Conclusion: Tourniquet use has been associated with increased postoperative pain but the effect on opioid consumption and modulating factors such as patient sex is not well known. We observed that female patients with tourniquets compared to those without tourniquets reported significantly higher pain and opioid consumption in the first 24 hours after surgery. Pain and opioid consumption did not vary based on tourniquet use in male patients. Avoiding tourniquet use for females may be a relatively risk-free adjunct to minimize opioid consumption during hospitalization. Further study is warranted to elucidate the factors accounting for different outcomes in females and males.

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