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Adding genicular and anterior femoral cutaneous nerve blocks for knee arthroplasty analgesia, randomized double blinded trial

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Introduction

Our standard peripheral nerve block regimen for total knee arthroplasty (TKA) includes adductor canal nerve block (ACB) and infiltration between the popliteal artery and capsule of the knee (IPACK). However, patients still report moderate to severe post-operative pain. Genicular nerve block (GN) and anterior femoral cutaneous (AFCN) nerve block are emerging techniques that might provide complementary analgesia coverage. This study aimed to examine the analgesic efficacy of adding GN and AFCN to our current regimen.

Materials and Methods

This double-blinded, randomized controlled clinical trial was approved by our Institutional Review Board (#2023-0063) and registered on ClinicalTrials.Gov (NCT05980546). TKA patients provided consent between June 12, 2023 and September 4, 2025. Eligible participants were randomized to the control group (ACB, IPACK) or intervention group (ACB, IPACK, GN, AFCN)

(Figure 1). All patients received standardized pain management regimens. The primary outcomes were the worst numeric rating scale (NRS) pain in the post-anesthesia care unit (PACU) and cumulative opioid consumption (morphine milligram equivalents, MME) 24 hours after induction end. Secondary outcomes included NRS pain, opioid consumption, Brief Pain Inventory Short Form, satisfaction, readiness for discharge, and blinding up to 7 days postoperatively (POD). Statistical analysis used a significance level of 0.05 and included chi-square tests (categorical variables), t-test or Mann-Whitney U tests (continuous variables), and regression using generalized estimating equation model (longitudinal analysis).

Results/Case Report

A total of 244 participants were enrolled, with 238 analyzed. There were 121 patients in the control group and 117 in the intervention group. The median (Q1, Q3) ages were 67.0 (61.0, 73.0) and 65.0 (61.0, 72.0), and the median body mass indexes were 28.7 (26.5, 30.6) and 27.6 (25.4, 30.3) (Table 1). The worst median (Q1, Q3) NRS pain scores in the PACU were 7.0 (6.0, 8.0) in the control group and 7.0 (5.0, 8.0) in the intervention group (p=0.06, Table 2), and cumulative opioid consumption in the first 24 hours were 60.0 (35.0, 78.0) MME and 45.0 (30.0, 75.0) MME in the control and intervention groups respectively (p=0.07, Table 3). For the secondary outcomes of NRS pain, opioid consumption, Brief Pain Inventory Short Form, satisfaction, and readiness for discharge, there were no differences observed except median (Q1, Q3) opioid consumption on POD1 after induction end was statistically significant between the control group (22.5 (15.0, 37.5) MME) and intervention group (15.0 (7.5, 30.0) MME) (p=0.023) (Table 2 & Table 3). Blinding was preserved in both groups.

Discussion

With the addition of GN and AFCN blocks to our standard peripheral nerve block regimen including ACB and IPACK blocks for TKA patients, our study showed no differences in worst NRS pain in the PACU, at POD1, POD2 or POD7. Neither were there any clinically meaningful differences in opioid consumption across these observed timepoints.

References

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