

Perioperative Outcomes Between Cryoneurolysis Needle Configurations in Total Knee Arthroplasty

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INTRODUCTION: Pain management following total knee arthroplasty (TKA) is crucial for optimizing patient recovery. Cryoneurolysis, which targets sensory nerves for temporary analgesia, is available in two configurations: 3-short-needle (3SN) and single-long-needle (LN). This study compares outcomes of both configurations to a control group (CG) without cryoneurolysis, hypothesizing that LN will provide superior pain control.

METHODS: We retrospectively analyzed a 1:1:1 matched cohort of 318 patients (106 per group). All surgeries were performed by a single fellowship-trained surgeon between 6/2018-9/2024. Demographic data and perioperative details were collected from electronic medical records. Matching was based on gender and preoperative opioid usage, with age (± 5 years) and BMI (± 5 kg/m²) allowed limited variability. Primary endpoints included length of stay and opioid usage. A one-way ANOVA was used to check for significant differences between the three groups, and a Tukey's test was applied to compare each group.

RESULTS: The female-to-male ratio was 78:28 across all groups. Five patients in each cohort used opioids preoperatively. Average ages for the LN, 3SN, and CG groups were 70.48, 69.42, and 69.33 years ($p = .3902$), respectively. Average BMIs were 31.67, 31.09, and 31.30 ($p = .792$). The LN group had the shortest LOS (1.19 days) compared to 1.88 days in the 3SN group and 1.94 days in the CG group ($p < .005$), with Tukey's test showing significance between LN and the other two groups. The LN group had lower total MME usage (29.80) compared to 3SN (159.93) and CG (140.03) groups ($p < .005$, Tukey's test indicating significance between LN and 3SN/CG). No significant differences were found between 3SN and CG for either LOS or MME usage.

DISCUSSION AND CONCLUSION: LN cryoneurolysis was associated with a shorter length of stay and reduced opioid consumption compared to both 3SN and CG, suggesting better pain management and potential opioid reduction after TKA.