Effects of Multimodal Pain Management on Inpatient Falls after Total Knee Arthroplasty

Abstract ID# 21913
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Summary: Continuous femoral nerve block after total knee arthroplasty was associated with reducing pain, but may increase the risk of inpatient falls. Since quadriceps muscle weakness due to nerve blocks also limited rehabilitation, a nerve block technique to preserve muscle strength should be considered to prevent inpatient falls.

Data: Background: Postoperative analgesic management in total knee arthroplasty (TKA) has been reported to be important not only in contributing to patient satisfaction and clinical outcomes, but also in reducing hospital stay and medical costs. The effectiveness of periarticular multimodal drug injection (PMDI) and femoral nerve block (FNB) in pain management after TKA has been reported. While continuous FNB can be expected to relieve pain, reduced quadriceps muscle strength due to FNB often limits a patient’s ability to participate in rehabilitation program. The purpose of this study was to investigate the effects of different analgesic management methods on postoperative functional recovery and falls following TKA.

Methods: This retrospective cohort study included 186 patients with unilateral TKA (54 males, 132 females, age 75.1 years). Patients were divided into three groups depending on postoperative analgesic management: PMDI alone (PMDI group; n=56, 13 males, 43 females, age 74.0 years), continuous FNB with PMDI (cFNB group; n=80, 28 males, 52 females, age 75.6 years), and single-shot FNB with PMDI (sFNB group; n=50, 13 males, 37 females, age 74.0 years). The following data were extracted; gender, age, body mass index, comorbidities, side of surgery, preoperative walking ability, dose of postoperative opioid, postoperative complications, postoperative delirium, postoperative Falls episode, numerical rating scale of pain (NRS) at 2, 6, 12, 24 hours, 1, 2, 7 days after surgery and discharge, days from surgery to initiate walking with a cane, length of hospital stay, and knee range of motion and walking ability at discharge. In order to compare variables among three groups, Kruskal Wallis test and Chi-square test were used for statistical analysis. Results: There were no significant differences in patient demographic data among the three groups. The mean postoperative NRS was not significantly different at each time point among the three groups, but there were significantly more patients in the cFNB group who showed NRS of 3 or less on the 3rd postoperative day compared to PMDI and sFNB groups (p=0.04). There was no significant difference in postoperative opioid requirements among the three groups. Patients in the cFNB group were more likely to fall after surgery compared to patients in the PMDI and sFNB groups (cFNB; n=8 (10.0%), PMDI; n=1 (1.8%), sFNB; n=1 (2.0%), p=0.05). Also, patients in the cFNB group demonstrated a significantly delayed initiation of walking with a cane compared with other groups (cFNB; 8.0 days, PMDI; 6.4 days, sFNB; 6.3 days, p=0.01). There were no significant differences in knee range of motion and walking ability at discharge, and length of hospital stay among the groups (p=0.93, 0.34 and 0.45, respectively). Conclusion: This study suggested that cFNB after TKA was associated with reducing pain, but may increase the risk of falls as well as show delayed gait recovery due to quadriiceps muscle weakness. Therefore, preservation of quadriceps muscle strength is a key for safe and quick functional recovery when using a nerve block for pain management after TKA. An appropriate nerve block technique to preserve muscle strength including adductor canal block should be considered to prevent inpatient falls.

Category: Knee - Arthroplasty

Intraoperative Low Reliability of the Tibial Anteroposterior Axis “Akagi’s Line” is Correlated with Poor Clinical Outcomes after Total Knee Arthroplasty

Abstract ID# 22301
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Summary: The tibial anteroposterior axis “original Akagi’s line” defined on CT was not replicated intraoperatively and the intraoperative poor detection of Akagi’s line could be the reason for the tibial component rotational error and worse postoperative clinical outcomes in total knee arthroplasty.

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