

Δ Periarticular Multimodal Analgesia Decreases Postoperative Pain in Tibial Plateau Fractures: A Double Blind Randomized Controlled Pilot Study

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Purpose: While some lower extremity fractures can be managed with a peripheral nerve block, the risk of masking symptoms of compartment syndrome in tibial plateau fractures may preclude these patients from receiving this treatment. The use of periarticular multimodal analgesia injections is increasing and has become commonplace in some surgeries. However, there are no data on the effectiveness of local periarticular multimodal analgesia for tibial plateau fractures. We hypothesized that closed tibial plateau fracture patients receiving the local multimodal analgesic medications would experience a significant decrease in visual analog scale (VAS) pain scores and require less narcotic usage for 24 hours postoperatively as compared to a placebo group.

Methods: Patients aged between 18 and 79 years with an isolated closed tibial plateau fracture (AO41-B and C) were prospectively enrolled and randomized in a 1:1 double blinded fashion to either a placebo or active medication treatment arm. After open reduction and internal fixation of the tibial plateau fracture, gel-foam sponges soaked in either multimodal analgesic solution or normal saline were placed deep (morphine, clonidine, ketorolac) and superficial (morphine, epinephrine, bupivacaine) to the fascia. Patients were followed for 24 hours postoperatively every 4 hours with VAS pain scores and narcotic usage was recorded. Patients were monitored postoperatively for complications including compartment syndrome, infection, and nonunion.

Results: The planned study was terminated prior to completion due to higher than anticipated rates of infection (18%), distributed equally among active (3 infections) and placebo (2 infections) groups, raising concerns that this may have been due to the presence of the delivery device (gel foam). 28 patients were enrolled—15 in the active group and 13 in the placebo group. Patients in the active medication group had significantly decreased pain scores at hours 4 ($P = 0.005$, 4.2 vs 6.9), 8 ($P = 0.05$, 5 vs 7), and 12 ($P = 0.02$, 3.8 vs 6.2) postoperatively. Pain scores were also decreased in the active group at hours 16 ($P = 0.10$, 4.5 vs 6.5), 20 ($P = 0.08$, 4.6 vs 6.4), and 24 ($P = 0.10$, 4.8 vs 6.5) but did not reach significance. There was a nonsignificant trend toward decreased overall narcotic usage postoperatively in the treatment group ($P = 0.152$). No events of compartment syndrome or nonunion were noted.

Conclusion: The use of local multimodal periarticular analgesia for closed tibial plateau fractures appears to be beneficial for short-term pain control postoperatively, and improved acute pain control is associated with better long-term outcomes. Concerns regarding an implantable delivery vehicle leading to infection has warranted a change in method of drug administration, and the study is now being completed with medicine or control being locally injected rather than delivered with sponges. Completion of the full study will permit us to validate or refute these findings.

Δ OTA Grant

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.