

## Can We Minimize Anesthesia for Hip Fracture Surgery? A Feasibility Study of Monitored Anesthesia Care and Soft-Tissue Infiltration With Local Anesthesia (MAC-STILA)

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**Purpose:** A trial of monitored anesthesia care (MAC) with soft-tissue infiltration with local anesthesia was developed for hip fracture patients deemed too ill to receive anesthesia. Following success in 3 patients with no untoward complications, a new anesthesia protocol for intertrochanteric (IT) hip fracture fixation with a short cephalomedullary nail (CMN) using MAC and soft-tissue infiltration with local anesthesia (MAC-STILA) was instituted. This study evaluates the efficacy of the protocol.

**Methods:** All patients with an OTA 31.A1-3 IT hip fracture presenting to an urban Level-I trauma center from July 2019 to November 2019 treated with a short CMN underwent a new intraoperative anesthesia protocol using MAC-STILA. Medications used for MAC varied per case and were recorded. STILA was standardized with 2.5 mg/kg of 0.25% bupivacaine mixed with 100 cc of saline injected into 3 standard incision sites with sterile technique. A 1:1:1 matched cohort of patients who underwent spinal or general anesthesia for fixation of OTA 31.A1-3 IT fractures with a short CMN were used for comparison. Patient demographics, injury characteristics, intraoperative measures, postoperative pain scores, narcotic and Tylenol use, hospital quality measures, and inpatient cost were recorded. Standard statistical tests were used to compare all aforementioned data points.

**Results:** A total of 60 patients (20 each: MAC, general, spinal) were identified. The most common MAC agents used were ketamine (104 units) and propofol (179 units). There were significant differences among the groups regarding mean minimum and maximum intraoperative heart rate with MAC-STILA protocol, demonstrating the best maintenance of normal heart rate parameters (60-100 bpm),  $P = 0.005$ ,  $P = 0.025$ . There was no difference in procedural time between all cohorts ( $P = 0.79$ ). In the postanesthesia care unit (PACU), MAC-STILA patients reported consistently lower pain scores (visual analog scale [VAS]  $<1$ ) than spinal or general patients (VAS  $>1$ ) for the first 3 hours. PACU narcotic usage was nearly 2 times less than the general cohort and within 1 mEq of the spinal cohort. Through 48 hours postoperatively, MAC-STILA and spinal cohorts had similar narcotic usage ( $\sim 24$  mEq) with 5 times less than the general cohort (130 mEq). There were no significant differences in length of stay, minor or major complications, inpatient mortality, or 30-day readmissions. MAC-STILA and general cohorts ambulated 30 feet prior to discharge compared to spinal patients who ambulated 12 feet. There was no difference in inpatient cost among cohorts.

**Conclusion:** This feasibility study demonstrates safety for the MAC-STILA protocol with comparison to spinal and general anesthesia. The MAC-STILA protocol is a viable option for treatment of OTA 13.A1-3 IT fractures, and may be the preferred method for patients with severe medical comorbidities.