Acute Tibial Shaft Fractures and Peripheral Nerve Blocks: Opioid Usage Versus Masking of Acute Compartment Syndrome

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Purpose: Peripheral nerve blocks (PNBs) are common in elective orthopaedic procedures and are associated with decreased opioid use and shorter hospital stays. However, usage of PNBs in acute tibia shaft fractures remains controversial due to perceived risk of masking signs and symptoms of acute compartment syndrome (ACS). This study hypothesized that PNBs would reduce postoperative opioid requirements. Secondly, concomitant postoperative ACS was evaluated.

Methods: This study retrospectively evaluated patients aged 18-79 with acute tibial shaft fractures treated with intramedullary fixation within 7 days of injury at a Level I trauma center between 2018 and 2022. The following patients were excluded: ACS prior to fixation, previous tibia fracture, and other operative long bone, pelvic or spine injuries. The primary outcome was postoperative opioid requirement measured by morphine milligram equivalents (MME). Incidence of postoperative ACS was recorded.

Results: 317 patients were screened and 246 were eligible. 78 patients (32%) received PNBs and 168 (68%) did not. There were no significant differences in demographics, injury mechanism, isolated/polytrauma, or American Society of Anesthesiologists score between groups. MME were significantly lower in the PNB = yes group compared to the PNB = no group at 24 hours (194 vs 492, $P<0.001$), 48 hours (246 vs 687, $P<0.001$), and 72 hours (314 vs 975, $P = 0.003$). MME per hour in PNB = yes was 10.4 vs 5.7 in PNB = no ($P<0.001$). PNB = yes averaged 3.3 postoperative inpatient days compared to 4.4 days for PNB = no ($P = 0.40$). There were 3 cases of ACS in PNB = no and 1 in PNB = yes ($P = 0.20$). All 3 patients without a PNB were diagnosed within 2 days of surgery and underwent fasciotomies without evidence of muscle necrosis. The patient with a PNB was discharged on postoperative day 1, re-presented to the hospital 5 days postoperatively, underwent fasciotomies, and was found to have anterior and lateral compartment necrosis.

Conclusion: PNBs following acute tibial shaft fractures were associated with decreased opioid requirements up to 72 hours. As one patient presented with ACS and muscle necrosis 5 days postoperatively, extreme vigilance is required to assess for ACS when a PNB is utilized.