Liposomal Bupivacaine in Postoperative Pain Control after Foot and Ankle Procedures: A Prospective Randomized Controlled Study

Brendan Charles Smith, Anna Ng[1], Ajith Malige[2], James Robert Lachman
[1]ASB, [2]Cedars-Sinai Kerlan Jobe Institute

INTRODUCTION: Surgeons' response to the nationwide opioid epidemic has included using alternatives to narcotic pain medications. Regional anesthesia has provided options to reduce narcotic consumption after surgery. Liposomal Bupivacaine(LB) is not FDA approved for use in nerve blocks in the lower extremity, though it is approved for more dangerous blocks (interscalene for example) in the upper extremity. The literature on LB in foot and ankle surgery has been limited to local infiltration and no major study has explored its efficacy when used in lower extremity peripheral nerve blocks. In this study, we compare local LB infiltration with LB used in peripheral nerve blocks in the lower extremity and compare both of these techniques with the current standard of care, a non-LB peripheral nerve block.

METHODS: All patients undergoing surgery in a single surgeon foot and ankle practice were enrolled in this IRB approved, prospective, randomized controlled study. Patients having surgery between January 2022 – January 2023 were randomized to one of three study arms: Group 1 Anesthesia administered ultrasound guided nerve block with local anesthetic only, Group 2 Anesthesia administered ultrasound guided nerve block with LB/local only mix, or Group 3 Surgeon administered infiltrative field block with LB/local mix. The primary outcomes collected included the amount of narcotic pain medication required in the PACU, oral morphine equivalents (OME) up to postoperative day 4 and after postoperative day 4, subjective duration of nerve block, and patient-reported outcomes (PROMIS Pain Interference/Depression/Physical Function). Collection was obtained via chart review from hospital EMR, and phone calls made to patients during specific time intervals after surgery. Analysis was performed.

RESULTS: After exclusion of 110 patients, 248 patients met inclusion criteria. Ninety-eight underwent perineural popliteal or popliteal adductor block with LB/local mix, 70 underwent popliteal or popliteal adductor block with local only (Group 2), 80 underwent surgeon administered local field block with LB/local mix (Group 3). Median PACU morphine equivalents required for pain control were significantly lower in Groups 1 and 2 (0 OME) compared to local field block (7.5 OME) ($p< 0.05$). Median OME utilized up to POD 4 and median OME utilized after POD 4 were both significantly lower in the LB/local mix perineural block group ($p< 0.05$) compared to Groups 2 and 3. Duration of block effect was significantly higher in the LB/local mix group compared to Groups 2 and 3 ($p< 0.05$).

DISCUSSION AND CONCLUSION: Preoperative perineural blocks containing a mix of LB and local anesthetic significantly reduce PACU, early postoperative, and mid postoperative narcotic use of patients undergoing outpatient foot and ankle surgery. The duration of effect of perineural block is significantly extended with addition of LB to the block mixture. Consideration should be given to the use of LB blocks in foot and ankle surgical procedures to reduce patient postoperative narcotic requirements.

	Group 1 (Liposomal Bupivicaine Peripheral Nerve Block)	Group 2 (Local Anesthetic Only Peripheral Nerve Block)	Group 3 (Liposomal Bupivicaine in Field block/ Local infiltration)	P<0.05
n (248 total)	98	70	80	
Type of Surgery Hindfoot Forefoot/Midfoot	62 (63.3%) 36	47 (67.1%) 23	41 (51.3%) 39	
PACU Morphine Equivalents	12	7.8	15.4	P<0.05*
Median Oral Morphine Equivalents (Days 0-4)	30.0	48.7	41.3	P<0.05*
Medina Oral Morphine Equivalents (Days 4-)	30.0	48.7	37.5	P<0.05*
Duration of Nerve Block (hrs)	79	31	37	P<0.05*