

The Effect of Adding Liposomal Bupivacaine to Bilateral Ultrasound-Guided Erector Spinae Plane (ESP) Block to Multilevel Lumbar Spinal Fusion Surgery

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BACKGROUND

- Interfascial plane blocks are often implemented as part of enhanced recovery after surgery (ERAS) protocols to decrease postoperative pain, post operative nausea and vomiting (PONV), length of stay (LOS) and enable earlier ambulation and return of bowel function
- Currently no consensus exists on the optimal interfascial plane block for lumbar spinal fusion surgery – case reports show ESP block is effective in improving pain for lumbar spinal surgeries
- Unclear whether the addition of liposomal bupivacaine to ESP block will have long term benefits for patients undergoing lumbar spinal fusion surgery
- **Hypothesis:** Patients who receive ESP block with liposomal bupivacaine in addition to plain 0.25% bupivacaine will have decreased opioid usage and improved pain scores when compared to standard ESP block with only plain 0.25% bupivacaine

METHODS

IRB approved single center, double blind prospective RCT

Inclusion criteria:

- Adults 18-85 years old
- Undergoing 1-2 level lumbar spinal fusion surgery

Exclusion criteria:

- History of chronic opioid, alcohol, or drug use
- Hepatic and/or renal insufficiency
- Patients on immunosuppressive therapy
- Pregnant patients
- ASA >4
- Known allergies or intolerance to drugs used in the study

- Patients randomized to control group (ESP block solution containing 0.25% bupivacaine) or intervention group (ESP block solution containing 0.25% bupivacaine + liposomal bupivacaine)
- Standardized GA and pain control protocol

Primary Objective: Compare postoperative IV opioid consumption (MME) among 2 groups for the first 72 hours

Secondary Objectives: Compare severity of pain postoperatively, general quality of recovery using QoR-15 questionnaire, incidence of PONV, time to ambulation, analgesia satisfaction, hospital LOS

RESULTS

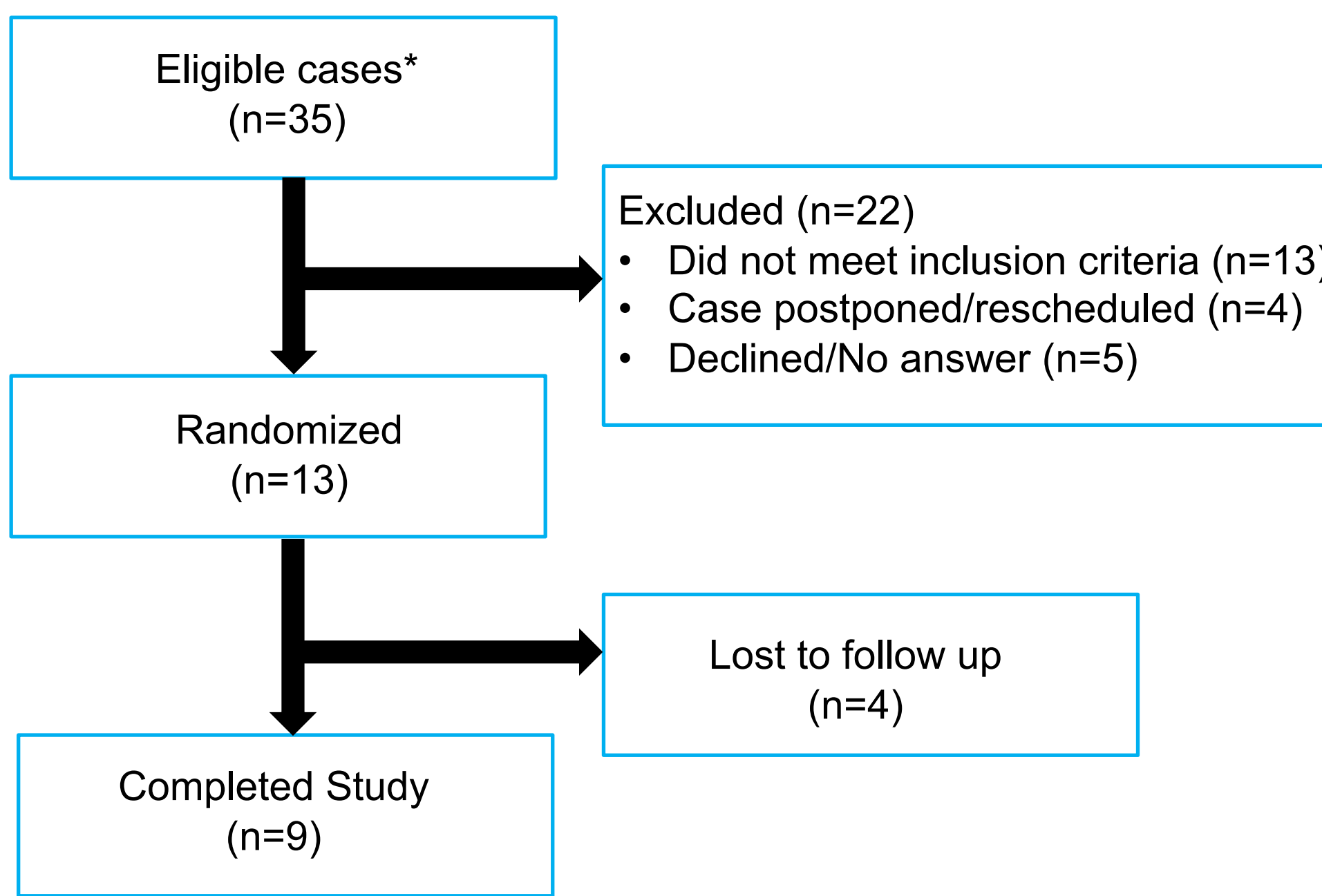


Figure 1. Enrollment – flow diagram of study population. *Eligibility was expanded to include all 1-2 level posterior lumbar spinal fusion surgeries

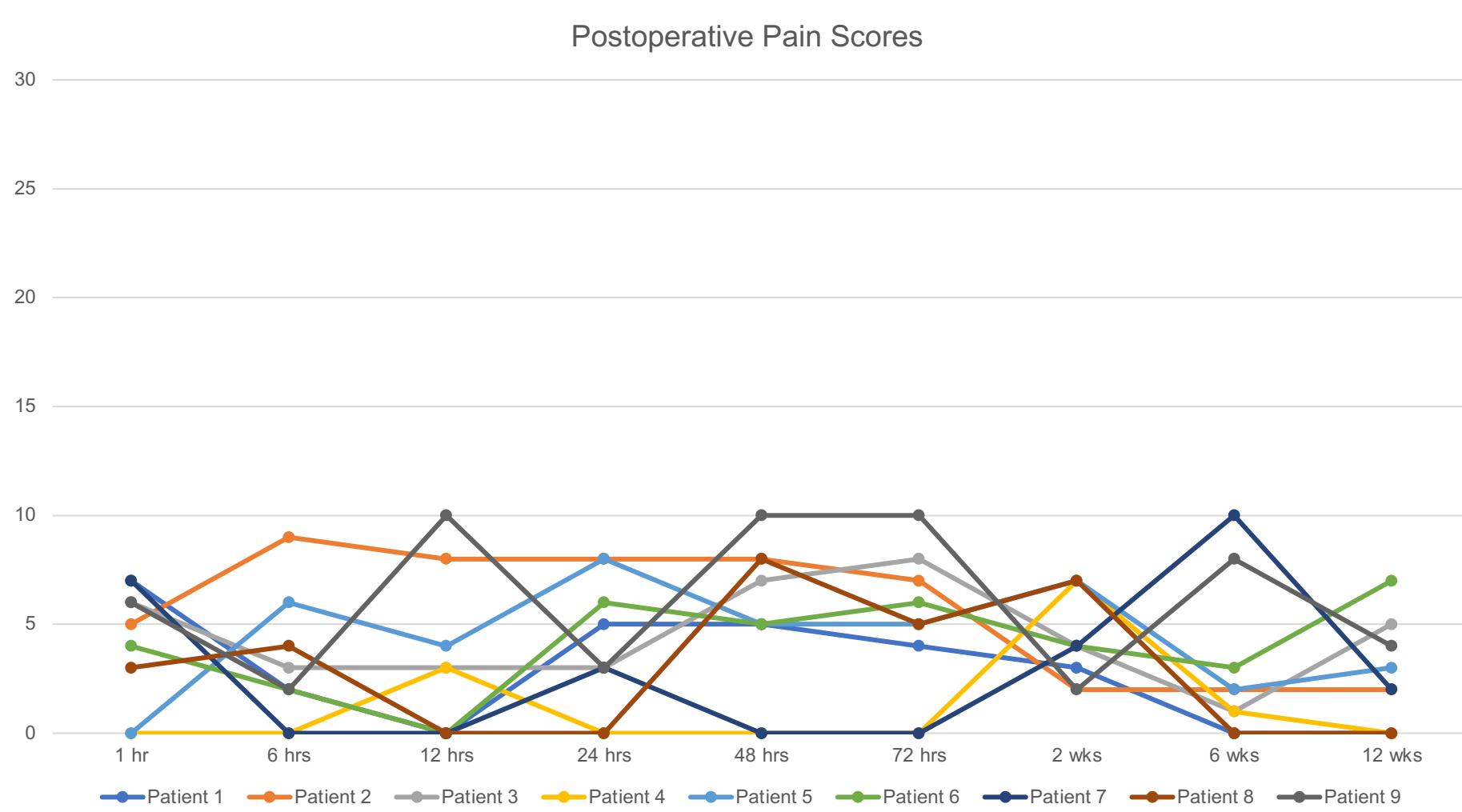


Figure 2. Patient reported post operative pain scores.

Study duration: May 2022- February 2024

- 9 patients underwent randomization and completed the study within 2 years
- Original goal of 80+patients, based on a power of 80% and a error 0.05 with an effect size of a 50% reduction in MME required for pain control
- Difficulty was met recruiting patients in a timely fashion
- Decision made to abort study, data discarded per IRB

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DISCUSSION

- Based on the data, patients were on average satisfied with their analgesia based on an average score of 8/10, MME pain scores at 72 hours post op of 13, and 72 hr QoR-15 scores of 116 indicating moderate recovery

- Significant difficulty in recruitment of patients led to study termination

- Attempts to increase recruitment include widening surgical criteria to include multilevel spinal fusions and doubling the original number of participating surgical attendings

ESP Block

- Meta-analysis of 12 RCTs on ESP block for spinal surgery showed ESP block decreased PONV, post op pain scores, and opioid consumption
- Shows promise in extensive pain control, providing abdominal wall and visceral analgesia

Liposomal bupivacaine

- FDA approved to produce postsurgical local analgesia via an interscalene brachial plexus nerve block, sciatic nerve block in the popliteal fossa, and adductor canal block
- Safety and efficacy have not been established in the ESP block or other nerve blocks

- Further investigation is needed to evaluate whether or not the addition of liposomal bupivacaine in an ESP block will have long term benefits for patients undergoing lumbar spinal fusion surgery

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