



Intrathecal morphine versus paravertebral blocks for breast reconstruction with deep inferior epigastric artery perforator flap

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INTRODUCTION

Breast reconstruction with deep inferior epigastric artery perforator (DIEP) flap can be associated with significant acute postoperative pain and longer hospital stay given the complex nature of the procedure compared to implant-based breast reconstruction techniques.¹ Commonly used analgesic options for DIEP flap reconstruction patients include multimodal analgesia with opioids and non-opioid adjuncts and peripheral nerve blocks.^{2,3} No prior studies to date have been performed examining the analgesic effects of ITM in this surgical population.

PRIMARY OUTCOME: Opioid consumption measured in oral morphine equivalents (MEQ) in mg from the postoperative anesthesia care unit (PACU) until the morning of postoperative day (POD) 2 between the two groups.

Secondary outcomes included pain scores as expressed in Numeric Rating Scale (NRS; 0-10), length of stay (LOS), and adverse events.

MATERIALS AND METHODS

Between October 2022 and August 2023, 52 patients presented for breast reconstruction with DIEP flap and were offered ITM in the preoperative area for postoperative analgesia (1 case was aborted due to bronchospasm). After confirmation of cerebrospinal fluid, 200-300 micrograms of preservative-free morphine were then injected and the needle withdrawn (43 patients received 300 micrograms, 7 patients received 250 micrograms, and 2 patients received 200 micrograms). The historical comparison group included an equal number of 51 patients who presented for DIEP flap breast reconstruction between May 2021 and September 2022 and received preoperative PVBs.

RESULTS

- Primary outcome:**
 - Opioid consumption: ITM group lower opioid consumption in PACU, from PACU to POD 1, and from POD 1 to POD 2; Figure 1*
- Secondary outcomes:**
 - Pain scores: ITM group lower median pain scores in PACU and from PACU to POD 1; similar pain scores from POD 1 to POD 2; Figure 2*
 - Length of stay: ITM group decreased LOS (1 day versus 2 days; $p < 0.001$)*

Table 1. Patient demographics and surgical characteristics

	ITM group (n=51)	PVB group (n=51)
Age (years)	52 (45-57)	49 (43-59)
Gender identity (n)		
Female	51 (100)	51 (100)
Male	0	0
ASA classification (n)		
1	0 (0)	1 (2)
2	29 (57)	27 (53)
3	22 (43)	22 (43)
Patients taking preoperative opioids (%)	2 (4)	2 (4)

Values are reported as median (interquartile) or number (percentage of subjects); ASA = American Society for Anesthesiologists; ITM = intrathecal morphine; PVB = paravertebral block.

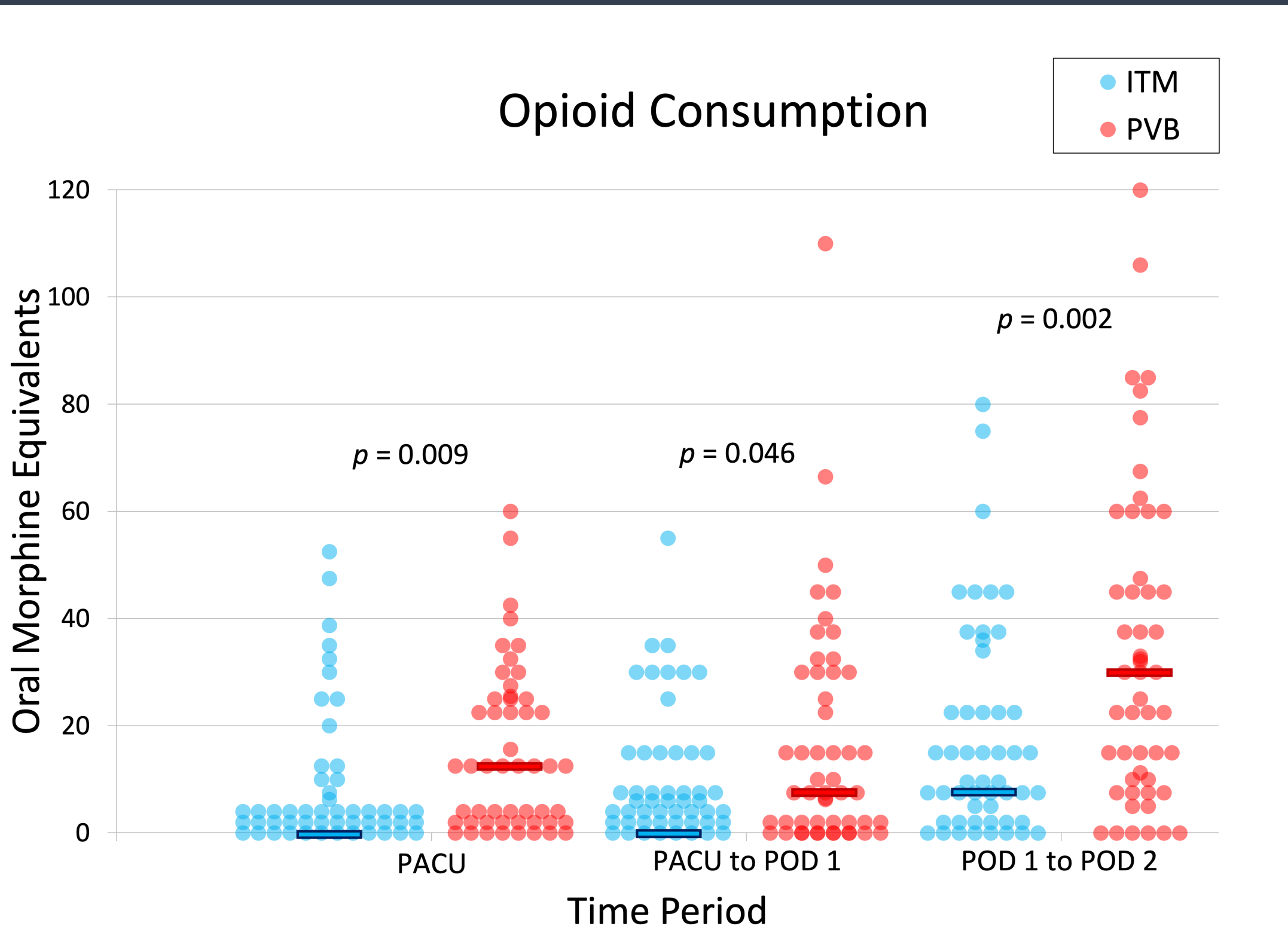


Figure 1. Median opioid consumption in oral morphine equivalents for the postoperative time periods between the two groups. Horizontal bars represent the overall median for that time period. PACU = postoperative anesthesia care unit; POD = postoperative day; ITM = intrathecal morphine; PVB = paravertebral block.

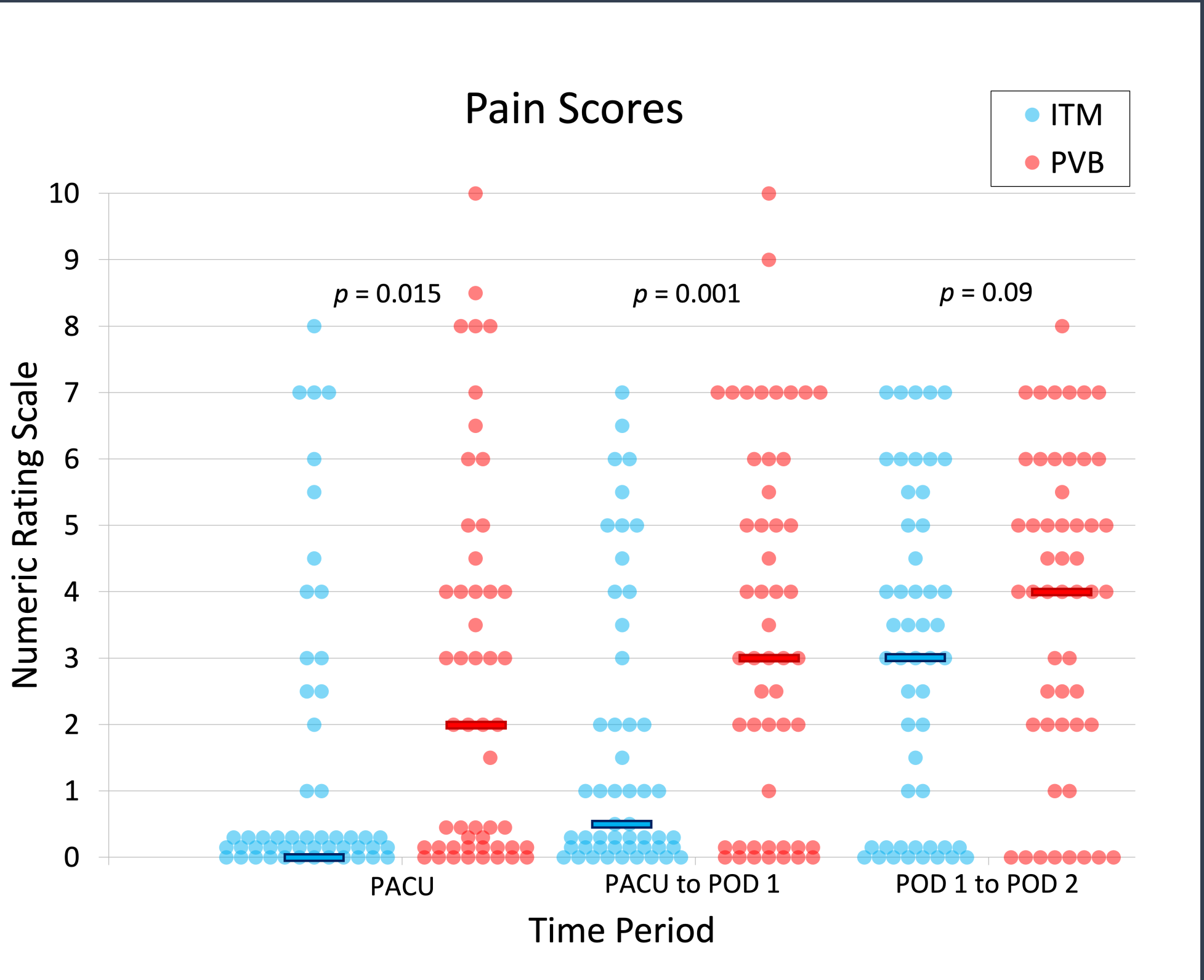


Figure 2. Median numeric rating scale pain scores (0-10) for the postoperative time periods between the two groups. Horizontal bars represent the overall median for that time period. PACU = postoperative anesthesia care unit; POD = postoperative day; ITM = intrathecal morphine; PVB = paravertebral block.

RESULTS (CONT.)

- Adverse outcomes:**
 - ITM group: 20/51 patients (39%)
 - Low blood pressure/hypotension in 17 patients, pruritis in 2 patients, nausea/vomiting in 1 patient, suspected postdural puncture headache in 1 patient, delayed awakening in 1 patient
 - No instances of apnea events or respiratory depression
- PVB group: 20/51 patients (39%)
 - Low blood pressure/hypotension in 17 patients, uncontrolled pain in 2 patients, hypoxia in 1 patient, upper extremity weakness in 1 patient, difficulty swallowing in 1 patient, vasovagal code event in 1 patient, loss of consciousness/seizure event in 1 patient, swelling/pain at catheter site in 1 patient, and delayed catheter removal in 1 patient due to heparin administration

DISCUSSION

Preoperative ITM administration for postoperative analgesia following DIEP flap breast reconstruction appears to be a safe and potent analgesic modality. This retrospective case-control study represents the first study examining the effects of ITM in this surgical population. For patients undergoing DIEP flap breast reconstruction, ITM appears to result in decreased opioid consumption from PACU to POD 2 and decreased pain scores in the PACU to POD 1 compared to PVBs.

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