

INTRODUCTION

Femoral nerve blocks (FNB), adductor canal blocks (ACB) and the interspace between the popliteal artery and capsule of the posterior knee (IPACK) blocks are common techniques for regional analgesia during anterior cruciate ligament (ACL) reconstruction. Liposomal bupivacaine is a U.S. Food and Drug Administration approved agent, providing up to 72 hours of extended-release bupivacaine. It is theorized and substantiated in basic science literature that the addition of dexamethasone to liposomal bupivacaine, may prolong the analgesic duration.

The purpose of this exhibit is to:

- Characterize pain control and opioid consumption after the combination of ACB and IPACK regional blocks with liposomal bupivacaine
- Compare liposomal bupivacaine vs liposomal bupivacaine combined with dexamethasone to determine the effect on postoperative narcotic use and analgesic efficacy

MATERIALS & METHODS

This is a prospective, blinded (patient, surgeon, research personnel) randomized controlled trial of a continuous series of primary bone-patellar tendon-bone or quadriceps tendon autograft ACL reconstructions at a single institution by 5 fellowship trained sports medicine surgeons. Patients were randomized in a 1:1 ratio into one of two arms:

Group #1 (Control): 30 mL Liposomal bupivacaine + 5 mL of 0.5% bupivacaine evenly distributed and administered in adductor canal and IPACK block

Group# 2 (Experimental): 30 mL Liposomal bupivacaine + 5 mL of 10 mg of preservative free Dexamethasone and 0.5% bupivacaine evenly distributed and administered in adductor canal and IPACK block

All nerve infiltrations were performed by a single anesthesiologist. A standardized, postoperative multimodal pain control regimen was prescribed to all patients, which included scheduled ketorolac 10 mg, acetaminophen 1000 mg, metaxalone 800 mg, and as needed oxycodone 5 mg.

Through RedCap surveys, participants provided outcomes on postoperative days (POD) 0 – 7 of:

- Opioid Consumption
- Visual Analog Scale (VAS) Pain Scores
- Satisfaction with Pain Control
- Perceived Block Duration

RESULTS

At the time of analysis, 91 patients underwent primary autograft ACL reconstruction and completed follow up surveys from the day of surgery through postoperative day 7. There were 42 patients in group #1 and 49 patients in group #2.

On average, patients consumed 1.6 oxycodone tablets from POD 0 - 7 with no difference observed between group #1 and group #2 (1.2 tablets vs 1.9; p = 0.4). The average VAS score was 36.1 (SD 17.9) with no differences between group #1 and group #2 (36.6 vs. 35.6; p = 0.8). There was no difference in subjective block duration between group #1 and group #2 (5.1 vs. 5.5; p = 0.4). Overall, 85.4% of patients were satisfied with their pain control.

Table 1. Postoperative Opioid Consumption, Pain, and Patient Satisfaction

	Total Data	Group #1	Group #2	p-value
	N=91	N=42	N=49	
Oxycodone Tablet Consumption (POD 0-7) ^a	1.6	1.2	1.9	0.4
VAS Score (POD 0-7) ^b	36.1 (17.9)	36.6 (18.8)	35.6 (17.3)	0.799
Patient Satisfaction (POD 0-7) ^c	85.4 (13.8)	86.5 (13.7)	84.4 (14.0)	0.475
Subjective Block Duration (Days) ^d	5.33 (2.14)	5.14 (1.96)	5.49 (2.29)	0.438

Data is presented as mean (standard deviation) unless otherwise noted. a) measured number of oxycodone 5 mg tablets consumed. b) measured on a 100 mm VAS pain scale. c) measured out of a score of 100. d) measured by asking patients each day if they still felt the effects of their block (yes/no); the block duration was considered as the last day patients felt the effects of their block.

38.7% of patients required no opioids postoperatively (Group #1: 41.7% vs. Group #2: 37.5%; p = 0.7).

DISCUSSION

A single-shot of liposomal bupivacaine with or without dexamethasone via ACB and IPACK block provides excellent pain control and minimizes opioid consumption following bone-patellar tendon-bone or quadriceps tendon autograft ACL reconstruction. Nearly 40% of patients did not require opioids postoperatively, making opioid-free ACL reconstruction a realistic possibility for many patients. When narcotics were required, the dose of opioids was minimal with patients requiring 1.6 tables of oxycodone on average. Interestingly, although prior reports suggest a prolonged duration when liposomal bupivacaine is combined with dexamethasone, we found no difference in opioid consumption, VAS score, patient satisfaction, or subjective block duration between patients who did and did not receive dexamethasone with their local block. Future research should compare outcomes of liposomal bupivacaine and dexamethasone with bupivacaine and dexamethasone to guide anesthesiologists’ plan for regional anesthesia in ACL reconstruction.

REFERENCES

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