# Efficacy of Local Infiltration Anesthesia versus Interscalene Brachial Plexus Block for Postoperative Pain Control after Arthroscopic Rotator Cuff Surgery: A Non-Inferiority Trial

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INTRODUCTION: The interscalene brachial plexus block (ISB) is a highly effective regional technique for managing postoperative pain following shoulder surgery. However, it requires an experienced anesthesiologist and ultrasound guidance to ensure both efficacy and safety. In contrast, local infiltration anesthesia (LIA) is a simpler, surgeon-performed technique commonly used for pain control in various orthopedic procedures. Nonetheless, its effectiveness in arthroscopic rotator cuff (ARC) surgery remains controversial when compared to ISB.

METHODS: Patients undergoing arthroscopic rotator cuff surgery were randomized to receive either ISB (20 ml of 0.375% bupivacaine) or LIA administered to the subacromial space and arthroscopic portal incisions (20 ml of 0.5% bupivacaine, 1 ml of ketorolac [30 mg/ml], and 19 ml of normal saline). Postoperative pain was assessed using VAS, with a non-inferiority margin set at 1.4. Morphine consumption was recorded using an intravenous patient-controlled analgesia (PCA) device. Data are presented as mean ± standard deviation.

RESULTS: Fifty-six patients (28 per group) were analyzed with comparable baseline characteristics. LIA demonstrated non-inferior pain control at 24 hours postoperatively (VAS: LIA 1.3 ± 1.5 vs. ISB 1.7 ± 2.3; mean difference –0.4, 95% CI –1.45 to 0.65; $p > 0.05$), as the upper bound of the confidence interval did not exceed the non-inferiority margin. However, VAS scores were significantly higher in the LIA group at 0, 6, and 12 hours postoperatively ($p < 0.001$). Additionally, cumulative morphine consumption at 24 hours was significantly greater in the LIA group compared to the ISB group (20.2 ± 17.1 mg vs. 9.0 ± 6.3 mg; $p = 0.02$), as was intraoperative fentanyl requirement (171.8 ± 54.4 mcg vs. 131.3 ± 38.9 mcg; $p < 0.001$). Patient satisfaction and complication rates were similar between groups.

DISCUSSION AND CONCLUSION:

Local infiltration anesthesia (LIA) was non-inferior to interscalene brachial plexus block (ISB) for pain control at 24 hours after arthroscopic rotator cuff surgery. However, ISB provided superior analgesia during the immediate postoperative period (0–12 hours) and was associated with significantly lower intraoperative and postoperative opioid consumption.