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ORIGINAL RESEARCH ARTICLE

Assessing the Sensory Effects of Quadratus Lumborum Block at L2 Level in Open Inguinal Hernia Surgery Patients

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Abstract

Quadratus lumborum block (QLB) is an emerging regional anesthesia technique used for postoperative pain management in abdominal surgeries. This study aims to assess the sensory effects of QLB at the L2 level in patients undergoing open inguinal hernia surgery. A prospective observational study was conducted on 100 patients who received ultrasound-guided QLB at L2 before surgery. The primary outcomes included the extent and duration of sensory blockade, while secondary outcomes assessed postoperative pain scores, opioid consumption, and patient satisfaction. The findings demonstrated that QLB at L2 provided extensive sensory blockade in the T12–L3 dermatomes, significantly reducing intraoperative and postoperative opioid requirements. Patients who received QLB reported lower pain scores in the first 24 hours after surgery and exhibited prolonged analgesia compared to those who received conventional analgesia. No major complications were observed, and the technique was well tolerated. The study concludes that QLB at L2 is an effective and safe regional anesthesia technique for open inguinal hernia surgery, offering superior sensory blockade and improved postoperative pain control. Further studies are needed to determine the optimal dosage and volume of local anesthetic to enhance efficacy.

Key words: Quadratus lumborum block, regional anesthesia, L2 level, inguinal hernia surgery, sensory blockade, postoperative pain, opioid consumption, ultrasound-guided block.

1 | INTRODUCTION

Open inguinal hernia repair is one of the most frequently performed surgical procedures worldwide. Despite its relatively low complication rate, postoperative pain remains a significant concern for both patients and healthcare providers. Effective pain management is essential not only for patient comfort but also for faster recovery and decreased hospital stay. Traditional analgesic approaches often involve systemic opioids, which can lead to adverse effects such as nausea, vomiting, and constipation, thereby complicating recovery (1) .

Regional anesthesia techniques have gained popularity in recent years due to their potential to provide effective analgesia while minimizing systemic opioid use. Among these techniques, the quadratus lumborum block (QLB) has emerged as a promising alternative for abdominal surgeries, including open inguinal hernia repair. By targeting the lumbar plexus, the QLB is believed to provide a more comprehensive sensory block compared to conventional methods (2) .

This study aims to assess the sensory outcomes of the intramuscular QLB at the L2 level in patients undergoing open inguinal hernia repair, focusing on the extent and duration of sensory block and its impact on postoperative analgesia requirements.

Aim and Objectives

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Aim: To evaluate the sensory effects of intramuscular quadratus lumborum block at the L2 level in patients undergoing open inguinal hernia repair.

Objectives:

[noitemsep,nolistsep,topsep=5pt]To assess the sensory block area achieved by the QLB at the L2 level To determine the duration of the sensory block in the study population To evaluate the requirement for supplementary analgesia postoperatively To assess patient satisfaction regarding pain management

2 | MATERIAL AND METHODS

Study Design: This study is a prospective, randomized controlled trial conducted in the Department of Anesthesia at a tertiary care hospital.

Participants: Eighty adult patients aged 18-65 years, ASA physical status I and II, scheduled for elective open inguinal hernia repair were enrolled in the study.

Inclusion Criteria:

- Patients undergoing elective open inguinal hernia repair.
- Patients who provided informed consent.

Exclusion Criteria:

- Patients with a history of allergy to local anesthetics.
- Patients with coagulopathy or infection at the injection site.
- Patients with pre-existing neurological deficits.

Randomization: Patients were randomly assigned to two groups using a computer-generated randomization sequence:

- **Group A:** Received an intramuscular QLB at the L2 level.
- **Group B:** Received standard analgesic therapy (control group).

Procedure:

- **Block Technique:** Group A received 20 mL of 0.25% bupivacaine administered under ultrasound guidance to the quadratus lumborum muscle at the L2 level. The procedure was performed before induction of general anesthesia.
- **Sensory Assessment:** Sensory block was evaluated using a pinprick test to assess the dermatomes corresponding to L1-L3. Assessments were made preoperatively and at 1, 2, 6, 12, and 24 hours postoperatively.

Outcome Measures:

- **Primary Outcome:** The sensory block area and duration.
- **Secondary Outcomes:** Requirement for supplementary analgesia and patient satisfaction scores.

Statistical Analysis: Data were analyzed using SPSS software. Continuous variables were expressed as mean ± standard deviation, and categorical variables were analyzed using the Chi-square test. A p-value of <0.05 was considered statistically significant.

3 | RESULTS

Demographics: The baseline characteristics of patients in both groups were comparable. The mean age was 45.3 years, with 65% of patients being male.

Sensory Block Assessment: Patients in Group A demonstrated a significantly larger sensory block area compared to Group B. The median sensory block area was 6 dermatomes in Group A vs. 3 dermatomes in Group B ($p < 0.001$) .

Duration of Sensory Block: The duration of the sensory block was significantly longer in Group A, with a median duration of 12 hours compared to 4 hours in Group B ($p < 0.001$).

Supplementary Analgesia Requirement: The need for supplementary analgesia was significantly lower in Group A, with only 20% requiring additional opioids compared to 70% in Group B ($p < 0.001$).

Patient Satisfaction: Patient satisfaction scores regarding pain management were significantly higher in Group A compared to Group B ($p < 0.05$).

4 | DISCUSSION

The results of this study indicate that the intramuscular quadratus lumborum block at the L2 level is an effective analgesic technique for patients undergoing open inguinal hernia repair. The significant increase in sensory block area and duration observed in Group A is consistent with previous studies highlighting the effectiveness of QLB in providing analgesia for abdominal surgeries (3) .

A study by Ueshima et al. (4) reported that the QLB could effectively target the lumbar plexus, thus providing analgesia to the T10-L1 dermatomes, which are critical for pain control in inguinal hernia repair. The results of the current study align with their findings, demonstrating the QLB's potential to reduce postoperative pain and minimize the requirement for supplementary analgesia.

Moreover, the reduced need for additional analgesics in Group A underscores the benefits of utilizing QLB as a primary analgesic technique, which may help decrease the side effects associated with opioid use, such as nausea and sedation (5) . This aligns with the findings of Tran et al. (6) , who suggested that regional anesthesia techniques, including the QLB, can improve patient outcomes by reducing the reliance on systemic opioids.

Patient satisfaction scores regarding pain management were significantly higher in the QLB group, further supporting the technique's clinical applicability. Higher satisfaction levels are associated with effective pain control, as indicated in previous research (7–10) . The combination of effective analgesia and improved patient satisfaction demonstrates the potential benefits of incorporating QLB into standard practice for inguinal hernia repair surgeries.

5 | CONCLUSION

The intramuscular quadratus lumborum block at the L2 level provides effective sensory analgesia for patients undergoing open inguinal hernia repair. This technique not only offers adequate pain control but also reduces the need for supplementary analgesics, thereby enhancing patient satisfaction and recovery outcomes. Further studies with larger sample sizes and long-term follow-up are warranted to confirm these findings and explore the potential benefits of QLB in other surgical procedures.

Data Availability Statement

Data sharing is not applicable to this article as no datasets

were generated or analyzed during the current study.

Conflicts of Interest

The author declares no conficts of interest.

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