

# Observational Study for post-operative analgesia using ultrasound guided abdominal field blocks for laparoscopic cholecystectomies

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## Abstract

**Background:** The ultrasound-guided subcostal transversus abdominis (STA) block is a variation on the TAP block which produces unilateral supraumbilical analgesia. In STA block the local anaesthetic agent is injected in the neurofascial plane between rectus abdominis and the transversus abdominis muscle to block dermatomes T6 to T10. **Materials and methods:** 12 patients posted for laparoscopic cholecystectomy were studied for post operative analgesia after giving ultrasound guided abdominal field blocks. **Result and conclusion:** Mean pain free duration was 7.6 hours and 50% patients showed good satisfaction score.

**Key-words:** Post-operative pain, USG guided field block.

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## INTRODUCTION

Pain is an unpleasant effect associated with significant psychological and physiological changes during surgery and post-operative period<sup>1</sup>. There are various techniques and drugs that can be used to overcome this. Regional anesthesia has specific advantages both for anaesthesia and as an analgesic supplements for intra-operative and postoperative pain. Laparoscopic cholecystectomy is a commonly done minimally invasive procedure. Post-operative pain is a major concern which is derived significantly from the incisions made in the anterior abdominal wall. The ultrasound-guided subcostal transversus abdominis (STA) block is a variation on the

TAP block which produces unilateral supraumbilical analgesia. In STA block the local anaesthetic agent is injected in the neurofascial plane between rectus abdominis and the transversus abdominis muscle to block dermatomes T6 to T10. Addition of posterior rectus abdominis sheath block provides adequate analgesia covering thoracic dermatomes T5 to T10 in the midline. Postoperative analgesia is an important factor in order to provide subjective comfort. It facilitates early restoration of function by allowing the patient to breathe, cough and ambulate easily. If post-operative pain is left untreated it can lead to various complications like thrombotic events, atelectasis, impaired wound healing, etc. hence postoperative analgesia plays an important role in improving clinical outcome.

## MEASURES TO CONTROL POSTOPERATIVE PAIN

1. Systemic –
  - Opioids – Morphine – Meperidine – Fentanyl – Hydromorphone
  - Non opioids
    - Non-steroidal anti-inflammatory drugs: Paracetamol (acetaminophen) Ibuprofen, Ketorolac, Thromethamine.

- Cyclooxygenase-2(COX-2)-selective inhibitors: Celecoxib, Etoricoxib, Rofecoxib.
  - N-methyl-D-aspartate antagonists: ketamine, magnesium.
  - Alpha-2 adrenergic agonists: clonidine, dexmedetomidine
  - Gabapentin-type drugs: pregabalin
  - Glucocorticoids: dexamethasone can be given by intravenous or intramuscular routes
2. Regional blocks- -Local infiltration -Central neuraxial blocks -Field blocks -Plexus blocks

Additional of ultrasonography for regional anesthesia gives us the following advantages:

1. Correct anatomic visualization of the site of deposition of drug.
2. Maximum deposition of drug at the required site
3. Lesser volume required than the landmark technique
4. Decreased systemic side effects of drugs
5. Decrease in risk of block failure
6. Decrease in complications of blind technique of block.

Multimodal analgesia provides better results by combining various drugs and regional analgesia techniques and reduces the side effects of individual drugs<sup>2</sup>. Laparoscopic techniques offer major benefits to the patient such as minimized incision size and trauma with reduced postoperative discomfort, shortened recovery rates, and a lower incidence of postoperative wound infections<sup>(3)</sup>. The use of regional techniques such as subdural, epidural, and more recently transversus abdominis plane block, are increasingly utilized as opiate-sparing techniques, particularly in laparoscopic techniques where larger incisions are required. Wound infiltration with local anaesthetic is useful and reduces postoperative analgesic requirements while intra-peritoneal levobupivacaine reduces postoperative pain and opiate requirement. Posterior rectus sheath block: USG probe 2cm below the xiphisternum in transverse position. 22G spinal needle inserted in-plane and advanced till the tip is rested on the posterior rectus sheath after negative aspiration, 2ml of NS was injected to confirm the location. When found correct, 5ml of 0.2% ropivacaine injected bilaterally. Right subcostal transversus abdominis block: USG probe kept in midline of abdomen 2cm below xiphisternum. Needle is moved laterally along the subcostal margin to anterior axillary line. Transversus abdominis muscle identified. 22G spinal needle guided in-plane to a point just inferior to the right costal margin at anterior axillary line so that the tip is between the transversus abdominis and internal oblique within the neuromuscular fascial plane. After negative aspiration, 2ml of NS is injected to confirm the position.

Following this 20ml 0.2% ropivacaine injected within the plane.

#### **Aim:**

To observe the efficacy of ultrasound guided abdominal field blocks with port site infiltration for post-operative analgesia after laparoscopic cholecystectomies.

#### **Objectives**

1. To evaluate the analgesia in the first 24 post-operative hours.
2. To evaluate the patient satisfaction at the end of 24 hours.

#### **MATERIAL AND METHODS**

- The study was undertaken in the Department of Anesthesiology in a tertiary care hospital after approval from the Institutional Ethics committee from August 2017 to November 2017

This was an observational prospective study.

All patients admitted in the surgery ward for elective laparoscopic cholecystectomies with American Society of Anesthesiologists (ASA) I and II and aged between 18-60 years were included.

All patients with known allergies to local anaesthetic drugs, Skin infections, Surgeries converted to open cholecystectomies, Pregnancy, Refusal of patient were excluded.

#### **Method**

Written informed consent was taken from patients before inclusion in this study in their language. Detailed history and complete pre anesthetic checkup done for every patient. A standard balanced general anaesthesia was given to the patients with Propofol and Fentanyl with Sevoflurane and Vecuronium. Injection Diclofenac 75 mg was given during the surgery. Ultrasound guided abdominal field block was given before extubation. Posterior rectus sheath block was administered at the end of surgery before extubation. The USG probe was kept 2cm below xiphisternum in transverse position. 22G Quinke spinal needle was inserted via the in-plane approach and advanced till the tip rested on the posterior rectus sheath as visualised on ultrasound; after negative aspiration, 2ml of normal saline (NS) was injected to confirm location. After this 5ml of 0.2% ropivacaine was injected on each side at the same place after negative aspiration and confirmation of the plane with NS under ultrasound guidance. Right Subcostal TAP block- The USG probe was kept in midline of the abdomen 2cm below xiphisternum and moved laterally along subcostal margin to anterior axillary line. Transversus abdominis muscle was identified. A 22G Quinke spinal needle was guided via the in-plane approach to a point just inferior to the right costal margin at anterior axillary line so that tip was

between transverses abdominis and the internal oblique within the neurovascular fascial plane. After negative aspiration, 2ml of NS was injected to confirm the position. Following the confirmation of the plane under ultrasound guidance 20ml of 0.2% ropivacaine was injected within the plane after negative aspiration.(within safe dose-Maximum dose 3mg/kg) Pain was analyzed by visual analogue scale (VAS): The VAS is a horizontal line, 100mm in length, anchored by word descriptor at each end with “no pain” at one end “worst imaginable pain” at the other. The patient is asked to mark on this line where the pain intensity lies. The VAS score is determined by measuring in centimeters or millimeters from “no pain” to “patients mark”.



Figure 1: Subcostal TAP block



Figure 2: Posterior rectus sheath block

**OBSERVATION AND RESULTS**

Table 1: 12 cases were included in this study.

Case number	VAS score post op
1	4
2	6
3	2
4	6
5	7
6	1
7	18
8	10
9	12
10	12
11	8
12	6

Patient satisfaction score:

Patient satisfaction at the end of 24 hours

- 1= Excellent
- 2=Very good
- 3= Satisfactory
- 4= Poor

- 8% patients had very good satisfaction score.
- 50% patients had very good satisfaction score.
- 17% patients had very good satisfaction score.
- 25% patients had very good satisfaction score.
  - 41.6% of patients had a mean pain free duration between 6-12 hours.
  - Mean pain free duration was 7.6 hours
  - 50% patients had Very good satisfaction score

**DISCUSSION**

We found a large variation in pain scores at each of the assessment times. Aside from individual difference in pain perception, several other patient and technical factors may have affected the scores

The mean duration of analgesia with ultrasound guided abdominal field blocks after laparoscopic cholecystectomies was 7.6 hours

**CONCLUSION**

The mean duration of analgesia with ultrasound guided abdominal field blocks after laparoscopic cholecystectomies was 7.6 hours

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