



The Impact of Ultrasound-Guided Subcostal Transversus Abdominis Plane (SCTAP) Block on Postoperative Pain Relief in a Patient Undergoing Cholecystectomy: A Case Report

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ABSTRACT

Introduction: Handling post-operative pain in cholecystectomy requires several considerations, especially in terms of pain management. Various multimodal analgesia strategies to optimize postoperative pain control include epidural catheter placement, intravenous opioids, and the recently introduced ultrasonography (USG)-guided subcostal transversus abdominis plane (SCTAP) block. This case report aims to describe the postoperative analgesic effectiveness of ultrasound-guided SCTAP block in a patient undergoing open cholecystectomy. **Case presentation:** A 57 year old female patient with a diagnosis of multiple cholelithiasis, cholecystitis, was planned to undergo cholecystectomy, under general anesthesia and SCTAP block, with an ultrasound probe placed under the costal margin, the transversus abdominis muscle fascia was identified and local anesthetic infiltration laterally with bupivacaine plain 0.25 % 20 ml each on the left and right sides. Postoperatively, the patient returned to the room and received oral analgesics without opioids for pain management. **Conclusion:** Ultrasound-guided SCTAP blocks provide effective postoperative analgesia, reduce the need for postoperative analgesics, while supporting recovery after open cholecystectomy.

1. Introduction

Major abdominal surgery includes a wide range of surgical procedures with varying postoperative pain and analgesic requirements. Therefore, postoperative pain management strategies must consider individual factors and the surgical procedure performed.¹ Traditionally, opioids have been used to treat postoperative pain. However, increasing awareness of the side effects of opioids has led to a shift toward non-opioid techniques and medications for postoperative analgesia.²

A growing range of studies shows that optimal pain management not only facilitates patient well-being but

also improves postoperative recovery. The enhanced recovery after surgery (ERAS) protocol uses a multimodal analgesic regimen that includes non-opioid drugs and regional anesthesia techniques to minimize perioperative opioid use with the aim of speeding the patient's postoperative recovery. Common regional anesthetic techniques used in the ERAS pathway include neuraxial blocks and peripheral nerve blocks.³

Transversus abdominal plane (TAP) block is a peripheral nerve block that has recently gained attention due to its effectiveness in providing analgesia to the anteriolateral abdominal wall. Under ultrasound

(USG) guidance, a TAP block can be performed safely by injecting local anesthetic into the neurofacial plane between the internal oblique muscle and the transversus abdominis muscle.⁴ This case report aims to describe the postoperative analgesic effectiveness of ultrasound-guided SCTAP block in a patient undergoing open cholecystectomy.

2. Case Presentation

A female patient aged 57 years (60 kg, 165 cm), presented with complaints of right upper abdominal pain. Findings on magnetic resonance cholangiopancreatography (MRCP) showed multiple cholelithiasis accompanied by cholecystitis. Anesthesia was induced according to protocol, followed by endotracheal intubation. SCTAP blocks are

performed bilaterally under ultrasound guidance. The list of perioperative medications is presented in Table 1.

The operation was completed smoothly without any complications. The total operation time is 115 minutes, and the total anesthesia time is 150 minutes. After extubation, the patient was transferred to the post-operative anesthesia care unit (PACU) and observed for two hours. During postoperative care, the patient received oral analgesics, which included 500 mg paracetamol every 6 hours and 400 mg ibuprofen every 8 hours. The patient again reported NRS pain scores at 0, 6, 12, 18, 24, 30, 36, 42 and 48 hours. As a result of this procedure, the patient received an excellent analgesic effect during the postoperative period (Figure 1).

Table 1. Perioperative medications.

Medication	Dose	Total dose	Objective
Premedication			
Midazolam	0.05 mg/kg	3 mg	Anxiolytic
Induction			
Propofol	2-3 mg/kg	100 mg	Sedation
Fentanyl	1-3 mcg/kg	100 mcg	Analgesic
Atracurium	0.3-0.6 mg/kg	30 mg	Muscle relaxant
Maintenance			
SCTAP block	0.25 % volume 20 ml	40 ml	Analgesic
Propofol	50-150 mcg/kg/minute	1200 mg	Sedation
Atracurium	0.1 mg/kg/minute	20 mg	Muscle relaxant
Ibuprofen	10-15 mg/kg	400 mg	NSAID

Description: NSAIDs: Nonsteroidal anti-inflammatory drugs.

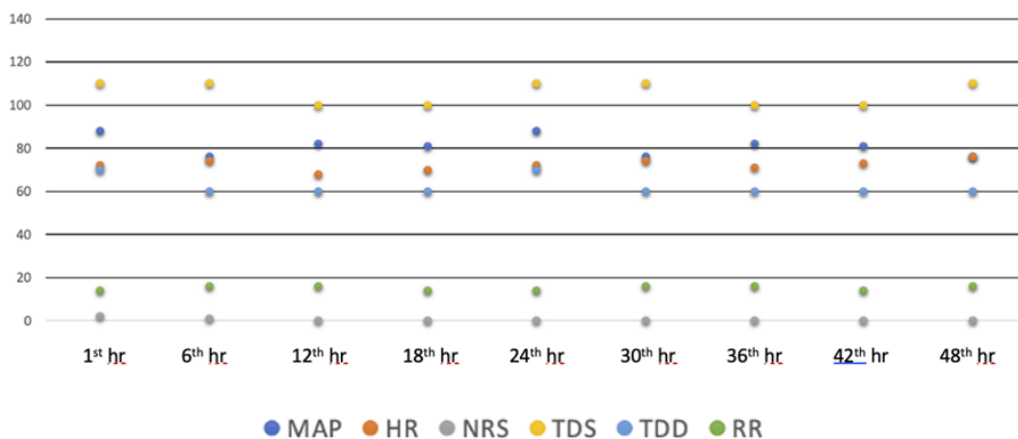


Figure 1. Postoperative hemodynamic profile while in the room.

Notes: MAP: mean arterial pressure; HR: heart rate; NRS: numerical rating scale; TDS: systolic blood pressure; TDD: diastolic blood pressure; RR: respiratory rate.

3. Discussion

There are several factors to consider before implementing TAP blocks in routine clinical practice, including factors related to the patient and surgery, alternatives, and techniques to be used. The introduction of ultrasound-guided SCTAP has made TAP blocks an attractive option as part of multimodal postoperative pain management. Ultrasound techniques have made TAP blocks easier to perform. SCTAP block is a block by injecting a local anesthetic

solution in the transverse abdominis plane, the quality of the block depends on the approach and volume given. Blocks specifically block abdominal innervation, including the ilioinguinal, iliohypogastric, and/or intercostal.¹² In this case, surgery was planned under general anesthesia and TAP peripheral nerve block with an ultrasound-guided subcostal approach (SCTAP) to block peripheral nerves at the level of T7-T10 (Figure 2).

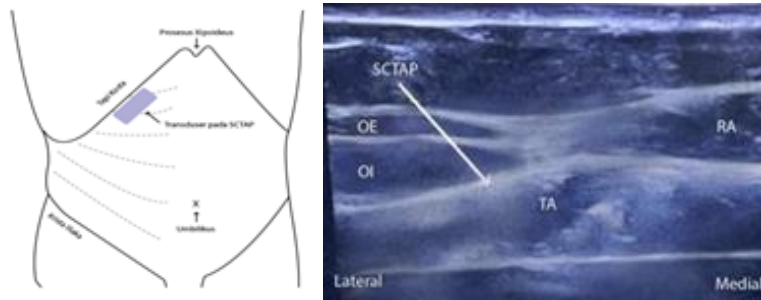


Figure 2. Position of ultrasound transducer (left); Sonoanatomy of the subcostal approach to the transversus abdominis plane (TAP) block (right).

Description: TA: transversus abdominis muscle; RA: rectus abdominis muscle; OE: external oblique muscle; OI: internal oblique muscle.

Ultrasound-guided SCTAP block, a peripheral nerve block technique and a component of multimodal analgesia has demonstrated satisfactory results in providing efficient postoperative analgesia in cholecystectomy cases. Various previous studies have demonstrated the effectiveness of SCTAP blocks for postoperative pain control as a complement to general anesthesia in various abdominal operations.⁵ Studies from recent years have established epidural blocks as the gold standard for pain management following abdominal surgery. SCTAP blocks, via various approaches, provide several advantages over epidural blocks. SCTAP blocks may be used in cases where an epidural block is contraindicated, such as patients with coagulation problems or infection at the epidural puncture site.⁶ Additionally, a study conducted by Petchka et al. showed that patients who received TAP blocks for postoperative pain management had significantly shorter hospital stays.⁷

Several factors may be related to achieving this good block effect. First, injection multipoint in

ultrasound-guided SCTAP is able to block painful stimuli. These findings are in line with previous reports that used bilateral continuous TAP blocks to achieve adequate postoperative analgesia.⁸ Second, the benefits of TAP Block include reduced postoperative opioid requirements and reduced risk of nausea and vomiting. TAP Block is important because of its safety, ease of implementation, and effectiveness of pain control in multimodal pain management with increased patient satisfaction and reduced contribution to the opioid crisis.⁹ Third, according to Abdalah et al., choosing a TAP block can be used as an option where there are conditions such as hypersensitivity to NSAIDs, kidney disorders, concurrent use of nephrotoxic drugs, or a history of peptic ulcer disease.¹⁰ In this patient, there were no complications related to the SCTAP block procedure, such as visceral damage or bleeding. This can be attributed to the application of the ultrasound-guided block technique.

4. Conclusion

The SCTAP block can be an effective analgesia option for patients after undergoing cholecystectomy surgery.

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