

# ULTRASOUND GUIDED THORACIC PARAVERTEBRAL AND COELIAC PLEXUS BLOCK FOR OPEN CHOLECYSTECTOMY IN A PATIENT WITH MULTIPLE CO-MORBIDITIES : A CASE REPORT

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## ABSTRACT

### Introduction

Ultrasound guided nerve blocks are gaining popularity these days due to its higher accuracy and reduced incidence of complications. Ultrasound guided unilateral paravertebral block in combination with unilateral coeliac plexus block and unilateral Rectus sheath block in patients with multiple co-morbidities provides adequate anesthesia for surgery and it also reduces incidences of mortality, morbidity and hospital stay in comparison to General anesthesia and spinal / epidural anesthesia. Paravertebral block, Coeliac plexus block and Rectus sheath blocks can be performed with higher success rate with the use of ultrasound.

### KEYWORDS

*Coeliac plexus block; open cholecystectomy; paravertebral block; rectus sheath block, ultrasound.*

## INTRODUCTION

Open Cholecystectomy is commonly performed under general anesthesia with endotracheal intubation using muscle relaxant or regional anesthesia using either high spinal blocks or thoracic epidural technique.<sup>1</sup> In patients having multiple cardiopulmonary problems ultrasound guided unilateral right thoracic paravertebral block in combination with right coeliac plexus block and right sided Rectus sheath block can be safely used for patients planned for open cholecystectomy as this is a routine practice in our institute.<sup>2,3,4</sup>

## CASE REPORT

A 72 years old patient ASA III who was 65kg by weight was scheduled for open cholecystectomy. The patient was under medication for COPD since 20 yrs, hypertensive under medication since 16 yrs and was diabetic since 10 yrs under medication and with oral anti diabetic medications his blood sugar level was within normal/acceptable level.

His pulmonary function test (PFT) report showed obstructive lung disease pattern and he had moderate mitral regurgitation, tricuspid regurgitation with ejection fraction of 27% in echocardiography. The detail of the anaesthesia and surgical risk was discussed with the patient during pre anesthetic check up. Considering the comorbid conditions and the anaesthesia risk, the patient was given the choice for regional anesthesia with ultrasound guided Thoracic Paravertebral and Coeliac plexus block. A written consent was taken for the procedure from the patient and patient party.

On arrival to the operation theatre, patient was confirmed, file reviewed and the ASA standard monitors were attached. The oxygen saturation was 92% at room air, non invasive blood pressure was 140/90 mm of Hg, electrocardiogram showed normal sinus rhythm. The patient was kept on left lateral position and oxygen was supplemented with the face-mask. Pre-procedural sedation was given with inj. Midazolam 0.5mg and Fentanyl 25 microgram intravenously. Natural landmark technique was used to identify vertebral prominence C7 and T7 was scanned and marked. Using sterile technique, scanning of Thoracic paravertebral space was done obliquely using a high frequency linear probe of 5-12Hz.<sup>5</sup> The transverse process was identified as hyper echoic structure while pleura was identified as a mobile hypo echoic structure and finally the right thoracic paravertebral space was identified.<sup>6</sup> Using in plane technique of needle insertion, a 26G Quincke spinal needle was inserted. Once the tip of the needle was visualized in the paravertebral space, 20 ml of 1.5% lignocaine with adrenaline was with the patient still in the left lateral position, right sided coeliac plexus was approached from posterior side. A curvilinear probe with frequency of 2-5 MHz was used to scan coeliac plexus. The first lumbar vertebrae and upper pole of right kidney was identified in transverse view. The scanning image was optimized to get the kidney and vertebral body in focus. Using sterile

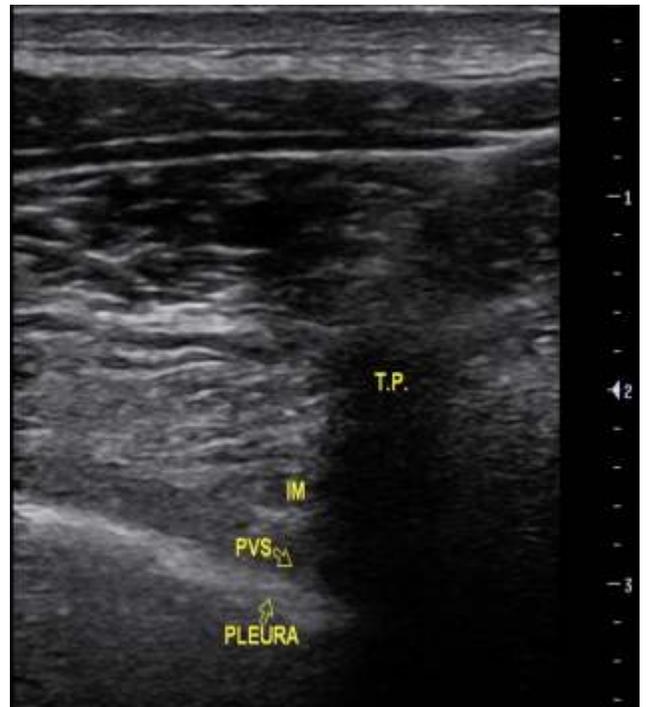
technique, 26 gauge Quincke spinal needle was used via out of plane technique to reach anterolateral side of vertebrae.<sup>8</sup> The depth of the coeliac plexus was confirmed in the image from skin to anterior surface of vertebral body. 15ml of 1% plane lignocaine was administered. Before injecting the local anesthetic drug, 300 ml of Plasmalyte was administered intravenously to prevent hypotension.

The patient was turned supine and linear probe right sided rectus sheath was used to scan the right sided rectus sheath where 3ml of 1.5% lignocaine with adrenaline was deposited.<sup>9</sup>

The average time for the procedure took around 8-10 minutes as this is a routine procedure for open cholecystectomy in our institution.<sup>3,4</sup>

Adequacy of the block was checked using spirit swab, (for cold and hot) and tooth forceps for pain.

The surgery was started once the block effect was achieved adequately. The patient was kept awake through out the surgery and the patient comfort was assessed intermittently. There was no any adverse event in the intraoperative periods. The patient had stable hemodynamic status through out the surgery. The duration of surgery was 20 minutes and at the end of surgery, the patient was transferred to surgical ICU for postoperative hemodynamic monitoring. Oral feeding was started after two to three hours. Intravenous paracetamol 500mg three times a day was used as a postoperative analgesia while intravenous bolus fentanyl 25mcg was used as rescue analgesia. The patient was discharge to home on 3<sup>rd</sup> post operative day.



**Figure:** Showing Ultrasound image of Paravertebral block using Linear probe, PVS- Paravertebral space, IM-Intercostal muscle, TP- Transverse process.

## DISCUSSION

General anesthesia with endotracheal intubation and regional anesthesia (thoracic epidural or high spinal block) are generally preferred mode of anesthesia for scheduled open cholecystectomy cases. However, for avoiding complications in multiple-comorbid patients, ultrasound guided thoracic paravertebral block in combination with coeliac plexus block and rectus sheath block can be an alternative technique over general anesthesia or regional anesthesia. It has added safety due to real-time visualization of needle tip thereby preventing the untoward complications like pneumothorax, hemo-pneumothorax, pleural injury and vascular injury.

Several literature have already established the effectiveness of the USG guided blocks for post operative analgesia. Eldeen et al<sup>7</sup> in their study concluded that thoracic paravertebral block provides effective post-operative analgesia following open cholecystectomy with more hemodynamic stability and much lesser side effects as compared to thoracic epidural blocks.

Agrawal A et al<sup>1</sup> in their study showed with the use of ultrasound there is further enhanced safety of paravertebral block, prolonged pain relief and reduced opioid use. Similarly our case also showed if paravertebral block was performed under sonographic guidance by visualization of needle tip the procedural complications could be reduced along with greater pain relief.

Karm M-H<sup>8</sup> in their study showed in a patient with acute cholecystitis with common bile duct stone, coeliac plexus

block may be a useful alternative method for pain control. Similarly in our study, visceral pain during open cholecystectomy was adequately reduced by the use of coeliac plexus block and could be an alternative to opioid use avoiding opioid-induced severe complications.

In our case we attempted USG guided right thoracic paravertebral block in combination with right coeliac plexus block and right sided rectus sheath block as an anesthetic technique. Complications related with the procedure can be reduced with the use of ultrasound along with proper needle visualization. The technique also ensured adequate muscle relaxation and optimal intraoperative as well as post-operative analgesia with stable hemodynamics.

## CONCLUSION

A further study with enrolment of adequate number of patients will be required to draw significant positive conclusions. However, at this stage it can be accepted that - USG guided blocks can be delivered safely to patients with multiple comorbidities, and these block techniques can be an alternative technique to general anesthesia with endotracheal intubation or neuroaxial blocks.

## CONFLICT OF INTEREST

None

## FINANCIAL DISCLOSURE

None

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