



Ultrasound guided Pectoral nerves block (PEC) I, II and Serratus Anterior Plane (SAP) block as primary anaesthetic for Video- Assisted Thoracoscopic Surgery (VATS)

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Abstract

Introduction: Nearly all thoracic procedures are performed under general anaesthesia. In this report, we present successful application of Pectoral nerves (PEC I and II) and Serratus Anterior Plane (SAP) block for video-assisted thoracoscopic surgery (VATS) as an alternative to general anaesthesia.

Case Report: A 67 year old male was scheduled to undergo VATS for drainage of pleural effusion and biopsy. He had other comorbidities including hypertension, atrial fibrillation, coronary artery disease and peripheral vascular disease. Due to patient's and family's wish to avoid general anaesthesia, monitored anaesthesia care with PEC I, II and serratus anterior block was scheduled. The procedure lasted for an hour. Postoperatively, the patient remained pain free for 24 hours. At discharge from the recovery his visual analogue pain score was 0 out of 10 and no analgesic had to be administered to him post – operatively.

Conclusion: PEC block I & II, and serratus anterior block is an effective, easy to administer, low risk technique for patients posted for VATS and ensures effective peri-operative analgesia.

Keywords: Video- Assisted Thoracoscopic Surgery (VATS), regional anaesthesia, Pectoral nerves block (PEC I & II).

Introduction

Nearly all thoracic procedures are performed under general anaesthesia. However regional anaesthesia can be considered as an alternative technique for high risk patients with comorbidities, because it has minimal effects on

haemodynamics and respiratory physiology. In this report, we present successful application of pectoral nerves PEC I and II and Serratus Anterior Plane block for video- assisted thoracoscopic surgery (VATS) as a sole anaesthetic technique.

Case History

A 67 year old male, 56 kilograms, 170 centimeters with a BMI of 19.4 kg/m² was scheduled to undergo VATS for drainage of pleural effusion and biopsy. He was a reformed smoker and had been diagnosed with other comorbidities including hypertension, atrial fibrillation, coronary artery disease and peripheral vascular disease. He underwent PTCA to LCA occlusion 7 years ago and was on two anticoagulants. On physical examination, he was febrile to 38° celcius(100.7° F), BP was 130/80mmHg, and pulse was irregularly irregular with rate of 130- 150/ minute. Breath sounds were reduced over the right side of the lung and crepitations heard on auscultation. Right side was dull to percussion. 2 D Echocardiography suggested global hypokinesia with LVEF 35%. Previously the case was postponed twice in the last 10 days.

Due to patient's and family's wishes to avoid general anaesthesia, monitored anaesthesia care with PEC I, II and serratus anterior block was scheduled. The procedure was explained in detail to the patient. After obtaining informed consent and high risk consent for anaesthesia and post-operative ventilator support, we described VAS to the patient (VAS; 0: no pain, 10: maximal pain).

Patient arrived to the operation theatre with IV access in situ. Standard monitoring consisted of non - invasive blood pressure, pulse oximetry and electrocardiography. With the patient lying in supine position, right side of the chest was painted and draped using a sterile technique. A high frequency linear ultrasound probe was positioned inferiorly and perpendicular to the clavicle just lateral to the pectoral groove. The fascial plane between pectoralis major and pectoralis minor muscle was identified using colour Doppler, while looking for the pulsations from the pectoral branch of the thoracoacromial artery running adjacent to the lateral pectoral nerve. A 5 cm 23 gauge short bevel needle was advanced into this fascial plane using an in - plane technique. After negative aspiration, 10 ml of 0.375% ropivacaine was injected and the spread of local anaesthetic

was visualised with ultrasound as smooth separation of the muscle fibres during injection.

For giving PEC II block, the probe was moved distally towards third rib. With an in plane medial to lateral approach, 10 ml of ropivacaine 0.375% was injected.

At the level of 5th rib and at the mid axillary line, serratus anterior and lattismusdorsi muscle were identified. The fascial plane between the two muscles was reached with an in- plane approach and 40 ml of ropivacaine 0.375% was injected. We waited for 20 minutes before the start of the procedure. The procedure lasted for an hour and was uneventful with no change in the haemodynamic parameters. Intraoperatively heartrate varied between 120- 130/minute showing irregularly irregular rhythm. Arterial oxygen saturation varied between 92 – 97% on venturi mask. Non - invasive blood pressure was between SBP 120 – 140 mmHg and DBP between 80 – 90 mmHg. The patient complained of slight discomfort while pleural biopsy was been taken. Injection fentanyl 50 mcg was supplemented twice. Postoperatively, the patient remained without complains of pain for 24 hours. At discharge from the recovery his visual analogue pain score was 0 out of 10 and no analgesic had to be administered to him post – operatively and Aldrete score was 9 out of 10.

Discussion

PEC I and II blocks described by Blanco (2011&2012) are alternative regional techniques first described for patients posted for elective breast surgeries^{1,2} and insertion of subpectoral prosthesis where the distension of these muscles can be extremely painful. These blocks also provide good analgesia for traumatic chest injuries, iatrogenic pectoral muscle dissections, pacemakers, Port-a-caths and chest drains.²These are reliable, easy to administer and associated with a lower incidence of complications, especially with the use of ultrasonography. In this report, we have presented succesful application of pectoral nerves block PEC I and II along with SAP block

as an alternative anaesthetic for VATS since PEC blocks alone would be insufficient for VATS because various other nerves supply lateral chest wall. The PEC I block is a fascial plane block where local anaesthetic is deposited between the pectoralis major and pectoralis minor muscles targeting the lateral (C5, 6, 7) and median pectoral nerves (C8, T1).³ Pec II blocks the intercosto-brachial, intercostals III-IV-V-VI and the long thoracic nerve in addition to the pectoral nerves (modified PEC I).²

SAP block is a newer ultrasound guided regional block which provides paresthesia in the dermatomes of T2 to T9.⁴

Regional anaesthesia will result in better pain control (both intra and post operatively), better control of stress response and lesser respiratory complications as compared to administration of systemic opioids under general anaesthesia. This will reduce the risk of pulmonary complications and perioperative morbidity significantly. In addition, chronic pain after thoracic surgery is common and may persist for several years, use of regional analgesia techniques may decrease this complication.

Hence the recent concept of non intubated surgery with regional anaesthesia for high risk patients has been introduced. Various regional anaesthesia techniques for thoracic surgeries are available. Thoracic epidural and paravertebral blocks are considered gold standard techniques among these. However, there is a risk of inadvertent entry of needle into the vertebral canal with these procedures and consequent spinal cord injury. Neuraxial hematomas, hypotension, vomiting and urinary retention following thoracic epidural injections, total spinal blockade, pneumothorax, and neural damage following paravertebral block, and local anaesthetic toxicity following intrapleural block are some of the reported complications.⁵ Therefore, the application of these procedures is debatable and an alternative path to progress is needed.

However, the easier application of the combination of pectoral nerves block PEC I and II along with SAP block may be beneficial for monitored anaesthesia care in patients with severe cardiopulmonary problems. We suggest that controlled studies should be carried out to investigate the effectiveness of these blocks for VATS.

Conclusion

Combination of PEC block I & II, along with serratus anterior block is an effective, easy to administer, low risk technique for patients posted for VATS and ensures effective perioperative analgesia.

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