Multimodal opioid-free analgesia for VATS thoracotomy using split-dose erector spinae plane blocks: A case report

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Abstract

Introduction. Here we report on a medically challenging case, in which split-dose erector spinae plane blocks (ESPB) using liposomal bupivacaine and pectoralis I/II blocks were used to produce an opioid-free outcome.

Methods. We retrospectively reviewed the medical chart on a 60-year-old, 55kg woman with past medical history significant for right renal cell carcinoma, status post nephrectomy, and lung metastasis' who presented with a pleural effusion requiring a right VATS thoracoscopy with talc pleurodesis.

Results. After the split-dose erector spinae plane blocks (ESPB) were performed using liposomal bupivacaine and pectoralis I/II blocks, the patient was extubated and transferred to the post-anesthesia care unit with no report of pain. She was given scheduled acetaminophen, per surgical protocol, during her hospital course. Her pain scores using the visual analog scale ranged between 0 and 3 for the entirety of her hospital stay. She did not require any opioids at any time during the hospitalization and was discharged home on postoperative day 5.

Discussion. The use of split dose ESPBs with pectoralis I/II blocks, in conjunction with a multimodal analgesic protocol, resulted in an opioid-free perioperative period. Increased usage of this approach may provide significant benefits for both patient morbidity and satisfaction.

Conclusion. The potential that this multimodal anesthetic approach may hold for significantly improving postoperative pain control in this patient population warrants further investigation. medically challenging case, in which split-dose erector spinae plane blocks (ESPB) using liposomal bupivacaine and pectoralis I/II blocks were used to produce an opioid-free outcome.

Introduction

Regional pain management can be useful in minimizing pain after a VATS thoracotomy. Fascial plane blocks can help to decrease opioid consumption, improve patient pain scores, and decrease duration of hospitalization. However, the fascial plane block typically requires a larger volume of local anesthetic to be effective, which can lead to inadequate analgesia when factors such as multiple surgical incision ports and a low total body weight are present. Here, we report on a medically challenging case, in which split-dose erector spinae plane blocks (ESPB) using liposomal bupivacaine and pectoralis I/II blocks were used to produce an opioid-free outcome.

Materials and Methods

We retrospectively reviewed the medical chart on a 60-year-old, 55kg woman with past medical history significant for right renal cell carcinoma, status post nephrectomy, and lung metastasis' who presented with a pleural effusion requiring a right VATS thoracoscopy with talc pleurodesis. Other comorbid conditions included hypertension and systemic lupus erythematosus. The patient disclosed having a severe intolerance to long-acting opioids with GI distress to both hydromorphone and morphine. Physical examination revealed a frail body habitus, diminished breath sounds on the right, and dyspnea. After a thorough discussion, the patient consented to both erector spinae blocks and pectoralis I/II blocks. This case report was approved by the St Vincent's Medical Center Institutional Review Board (Bridgeport, CT). The patient gave written consent for publication of non-identifying medical information and Health Insurance Portability and Accountability Act authorization.

Results

After administering intravenous midazolam 2 mg and positioning in the sitting position, the operating team performed right-sided ultrasound-guided ESPB at the T-4 and T-10 levels. After wide chlorhexidine 4% preparation, an ultrasound transducer probe (SonoSite PX, SonoSite Inc, Bothell, WA) was positioned in a longitudinal orientation to obtain a parasagittal view. The T4 transverse process was identified as a hyperechoic structure with acoustic shadowing below. A hyperechoic 22-gauge needle (B-Braun, Melsungen, Germany) was inserted in a caudal-to-cranial direction using the in-plane technique. Under ultrasound guidance, the needle tip was directed to make contact with the transverse process. After verifying the needle tip position, an admixture of 10cc of 1.3% liposomal bupivacaine and 10cc of bupivacaine 0.25% was injected in 5cc aliquots. This procedure was repeated at the T10 level. After performance of the ESPB, general anesthesia was induced with propofol 150 mg and rocuronium 50 mg. Intubation with a left sided double-lumen endotracheal tube was facilitated by administering 4ml of aerosolized 4% lidocaine to the vocal cords under direct visualization. Anesthesia was maintained with intravenous dexmedetomidine 0.4 mcg/kg/hr and ketamine 15 mg/hr. Pectoralis I/II blocks were performed after the induction of general anesthesia. For the Pecs I block, a hyperechoic 22-gauge needle was advanced into the tissue plane between the pectoralis major and pectoralis minor muscles at the vicinity of the pectoral branch of the acromiothoracic artery. After confirmation of correct needle tip placement, 5mL of 0.25% Bupivacaine admixed with 5 mg Decadron were injected. For the Pecs II block, 10 ml of Bupivacaine 0.25% was deposited at the level of the third rib above the serratus anterior muscle. After successful completion of ESPB and Pec I/II blocks, the right video-assisted thoracotomy was performed. Intravenous acetaminophen 1000mg was given at the end of the procedure. Shortly thereafter, the patient was extubated and transferred to the post-anesthesia care unit with no report of pain. She was given scheduled acetaminophen, per surgical protocol, during her hospital course. Her pain scores using the visual analog scale ranged between 0 and 3 for the entirety of her hospital stay. She did not require any opioids at any time during the hospitalization and was discharged home on postoperative day 5.

Figure 1: Ultrasound probe position for PECS Block

Figure 2: Ultrasound probe position for ESP Block

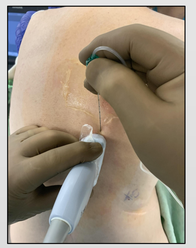

Figure 3: Ultrasound image for PECS block

Discussion

The use of split dose ESPBs with pectoralis I/II blocks, in conjunction with a multimodal analgesic protocol, resulted in an opioid-free perioperative period. We believe that combined regional anesthesia techniques may be underutilized in this patient population; as a result, we propose that increased usage can provide significant benefits for both patient morbidity and satisfaction. Importantly, the anesthetic regimen included the preemptive analgesic administration of dexmedetomidine and ketamine, which helped to reduce the patient's perioperative opioid requirements. Further, the administration of liposomal bupivacaine may have been helpful in decreasing the peak plasma level of local anesthetic, which may have been useful given the relatively large volume used.

Conclusion

In this patient, the combination of intraoperative conduction blockade utilizing split dose ESPB with liposomal bupivacaine and pectoralis blocks, and the administration of perioperative anti-inflammatory agents, may explain the robust analgesic effect observed in this case report. The potential that this multimodal anesthetic approach may hold for significantly improving postoperative pain control in this patient population warrants further investigation.

References

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