Opioid-Sparing Pain Management for Robotic Thymectomy Converted to Open Sternotomy in a Myasthenia Gravis Patient

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Figures

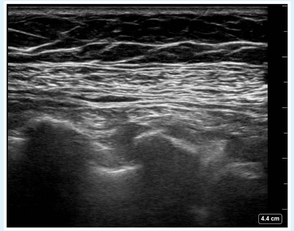

Figure 1a. Ultrasound imaging showing anatomy prior to pectoserratus block.

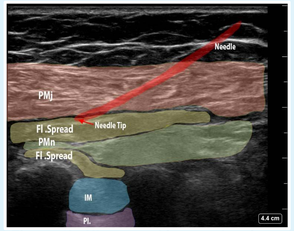

Figure 1b. Ultrasound image showing needle and anesthetic spread with false-color overlay.

PMj= pectoralis major; PMn= pectoralis minor; ISM= intercostal muscle; Pl= pleura.

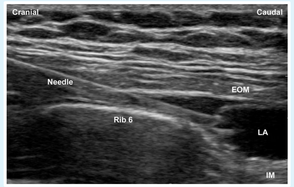

Figure 2. Sagittal ultrasound image of the EOI block.[6]

EO= external oblique muscle; LA= local anesthetic; ICM= intercostal muscles.

Introduction

Myasthenia Gravis (MG) is an autoimmune condition involving autoantibodies against postsynaptic acetylcholine receptors and is the most common disease of the neuromuscular junction.[1] Management of MG patients is particularly challenging for anesthesia providers as there are significant interactions between the disorder, disease treatment and anesthetic medications such as neuromuscular blocking agents and opioids.[1,2] In most patients with seropositive MG, the thymus is implicated in the production of these autoantibodies and thymectomy is often indicated for improvement or cure of the disease.[3]

Although opioids have been a mainstay of analgesia in the recent past, regional analgesia techniques have been shown to be effective in improving post-operative pain control and pulmonary function.[1] More specifically, the serratus anterior plane block (SAPB) has been seen to provide good analgesia in the T2-T7 distribution, and has been shown to be as effective as thoracic epidural anesthesia, while providing more hemodynamic stability.[4] Both SAPB and Pectoral Fascial II blocks have been shown to have improved late-postoperative pain with a decreased rescue fentanyl dose requirement compared with intercostal nerve block in thoracotomy.[5]

Case Report

A 79-year-old 122 kg female with mild dementia and history of severe post-operative nausea/vomiting was diagnosed with new onset MG due to thymoma. Of importance, the patient disclosed having a severe intolerance to long-acting opioids with GI distress to both hydromorphone and morphine. After a thorough discussion, the patient consented to regional analgesia to improve post-surgical pain with the goal of reducing or eliminating opioid requirement.

Case Report (cont'd)

Robotic thymectomy via left thoracoscopic approach was planned using narcotic-sparing TIVA technique. General anesthesia was induced with propofol and remifentanil and maintained with propofol, ketamine, and remifentanil infusions.

Left pectoserratus (Fig 1a/b) and deep serratus anterior blocks were performed post-induction using 30 mL of 0.25% bupivacaine and 10mL liposomal bupivacaine. Shortly after incision, the surgeon switched to right thoracoscopic approach for improved exposure.

A branch of the innominate vein was avulsed during the resection, requiring an emergent conversion to open sternotomy. At the end of surgery, bilateral T4 deep parasternal intercostal and Right oblique intercostal blocks were performed. The patient was transferred intubated to the ICU and was extubated within 4 hours. She did not require any pain medications until POD2.

Discussion

Regional anesthesia is recommended for myasthenic patients to reduce anesthetic requirements and as a part of multimodal postoperative pain management.[1,2] In this case, the original analgesia plan had to be modified due to changes in surgical techniques. Initially, 30ml of 0.25% bupivacaine and 10mL liposomal bupivacaine were used.

As the operation continued to evolve, subsequent block selection and volume was guided and limited by the maximal safe dose of local anesthetic.[2] At the end of the case we considered various combinations of fascial plane blocks to give us optimal coverage with the lowest amount of local anesthetic. We felt that 80 mL 0.25% bupivacaine would be a safe amount and that we should not exceed 20 mL liposomal bupivacaine as per the manufacturer's recommendation.

Discussion (cont'd)

The recently described external oblique intercostal block (Fig 2) was ideal to cover the right thoracotomy ports and the mediastinal chest tube exit site.[6] We used 30ml of 0.25% bupivacaine and 5 mL liposomal bupivacaine. Bilateral deep parasternal intercostal blocks at T4 using 10 mL of 0.25% bupivacaine and 2.5 mL liposomal bupivacaine per side were chosen for sternotomy incision. Avoiding narcotics and creatively using multiple regional analgesia techniques allowed this patient to have a comfortable and uneventful recovery.

References

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