

Peri-Operative Pain Control for Single-Port VATS

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Introduction

Video-Assisted Thoracoscopic Surgery (VATS) is known to cause significant postoperative pain which can negatively impact pulmonary function, increase the risk of pulmonary complications, and reduce patient satisfaction. Traditionally, multi-port VATS involves several incisions, often resulting in considerable generalized chest wall pain. At our institution, intercostal nerve blocks along with postoperative single-shot paravertebral blocks (PVBs) and a multimodal pain regimen have been routinely utilized. However, single-port VATS has become increasingly common due to its potential benefits. It has been hypothesized that single-port VATS may reduce generalized chest wall pain due to fewer incisions, but it can lead to more localized port site pain and referred diaphragmatic discomfort due to the single port location and size. Despite the single incision, postoperative pain remains a significant concern.

Case 1

- 73-year-old female with adenocarcinoma scheduled to undergo a robotic pulmonary upper lobectomy via a single-port VATS approach.
- A 5 cm subcostal incision was made between the 8th and 9th intercostal spaces for port placement.
- The surgical team did intercostal nerve blocks and the anesthesia team did a single shot PVB at T7-T8 using 20cc of 0.25% bupivacaine.
- Post operatively, the patient was placed on a multi modal analgesic regimen.
- POD1: 10/10 pain. Placed on a Dilaudid PCA and continued multi modal analgesia, but pain continued to be an issue.
- She was discharged POD4 in stable condition with pain being managed on an oral regimen.

Case 2

- 67-year-old female with incidental pulmonary amyloidosis who underwent right upper and lower lobe wedge resections via a single-port VATS approach.
- A 5 cm subcostal incision was made between the 8th and 9th intercostal spaces for port placement.
- Prior to extubation a PVB catheter was inserted at T8-9.
- On POD0 the patient was started on an intermittent infusion of 0.25% bupivacaine at 12cc/2 hr.
- On POD1, the patient's major complaint was lower back pain with mild chest tube site pain, which resolved with a single dose of Tylenol.
- By POD2, the patient reported well-controlled pain. The patient's chest tubes and PVB catheter were removed on POD2 and she was discharged home.



Figure 1. Single port prior to docking the robot.



Figure 2. 5 cm subcostal incision.

Discussion

- It is thought that a single port should be associated with less pain due to a single incision instead of multiple incisions throughout the chest.
- Classic multi-port robotic cases use 3-4 port sites and patients often endorse significant chest wall pain.
- These cases illustrate that despite the use of single-port VATS, post-operative pain remains a significant issue.
- We hypothesized that continuous PVB infusion offers superior analgesia over traditional single-shot PVBs by providing sustained pain relief for the larger single incision.
- A PVB catheter proves to provide adequate analgesia to cover the large single incision.
- A multi-modal analgesic regimen should be used to help provide relief from the referred diaphragmatic pain.
- The second case shows that the use of a PVB catheter, in conjunction with a multimodal analgesic regimen, may improve patient outcomes by reducing pain, promoting early ambulation, and enhancing patient satisfaction.
- As single port sites get smaller in future procedures, we anticipate to see more overall benefits; such as reduced length of stay, decreased reports of uncontrolled pain, earlier ambulation, decreased postoperative complications, and increased patient satisfaction.

References

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