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Erector Spinae Plane Blocks for Enhanced Recovery After Esophagectomy (ESPERE): A Preliminary Analysis

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Introduction

Thoracic epidural analgesia is considered the gold standard for post-esophagectomy acute pain management. At our institution, epidural-associated hypotension occurred frequently and concerns were raised on its potential contribution to anastomotic leak rates following minimally invasive esophagectomy (MIE). After a retrospective quality assessment confirming these concerns, we sought to match MIE with a "minimally invasive" regional analgesic technique in order to decrease postoperative complications. This led to the development of the Erector Spinae Plane blocks for Enhanced Recovery following Esophagectomy (ESPERE) pathway. This retrospective study aims to compare the clinical outcomes of before and after implementation of the ESPERE pathway. We hypothesized that postoperative opioid requirements would be greater, but that postoperative hypotension and anastomotic leak would be less in the ESPERE group.

Materials and Methods

We initially conducted a review of patients who underwent Ivor-Lewis or McKeown MIE via right video-associated thoracoscopic (VATS) approach for esophageal pathology under combined epidural-general anesthesia at our hospital between January 2019 and June 2020. Postoperatively, an epidural catheter was defined as held if local anesthetic was paused at any point through postoperative day (POD) 1 due to hypotension (mean arterial pressure < 65 mm Hg) potentially necessitating intervention with fluids, vasopressors, and/or escalation of care. The incidence of epidural catheters being held was tabulated.

Following discussion of this retrospective analysis, we developed the Erector Spinae Plane blocks for Enhanced Recovery following Esophagectomy (ESPERE) pathway. Preoperatively, patients undergoing MIE would receive bilateral T5-6 ESPB catheters. Postoperatively, these catheters were connected to programmable infusion pumps providing intermittent boluses of ropivacaine 0.2% at 10-15 ml every two hours in an alternating fashion. Multimodal analgesia included acetaminophen, ketorolac/ibuprofen, gabapentin/pregabalin, oxycodone, and hydromorphone via patient-controlled analgesia. ESP catheters were discontinued on POD5 through POD7. Total opioid consumption through POD7 and incidence of esophageal leak, as diagnosed by the thoracic surgical team, were monitored during the hospital stay. This study was approved by the Stanford University Institutional Review Board with a waiver to consent individual patients.

Results/Case Report

In the retrospective analysis, 58 patients who underwent MIE via VATS approach under epidural-general anesthesia were included. Median and interquartile total postoperative opioid requirements are displayed in Figure 1. Postoperatively, 25 patients' epidurals (43%) were held on POD1 due to hypotension requiring intervention. For this group, median postoperative opioid requirements were 403 mg MME (IQR 172 – 600 mg). 11 of these 25 patients (44%) subsequently developed esophageal leaks (Figure 2). At time of analysis, 18 patients were included in the ESPERE pathway. Median total postoperative opioid requirements was not significantly different from the epidural group, at 295 mg MME (IQR 144 – 175 mg, $t(30) = 0.24$, $p = 0.81$). 1 patient had documentation of hypotension due to postoperative atrial fibrillation. Another patient (5.6%) in the ESPERE pathway who did not have postoperative hypotension was empirically diagnosed with and treated for esophageal anastomotic leak. The relative risk of hypotension due to epidural analgesia compared to ESPERE was 7.76 (95% CI 1.13 – 53.3, $p = 0.04$). The relative risk of esophageal leak was 1.77 (95% CI 0.15 – 20.3 $p = 0.66$).

Discussion

Epidural analgesia is believed to provide optimal pain control and thus facilitate enhanced recovery following esophagectomy, even conferring a survival benefit (1). However, its concomitant sympathectomy and technical demands are not without complications, such as hypotension and breakthrough pain due to inadequate sensory levels (2). Hypotension is a major risk factor for the development of anastomotic leak (3). Given the high rates of epidurals being paused and their association with postsurgical esophageal leak at our hospital, we created the ESPERE pathway as an alternative strategy to provide multimodal analgesia for this patient population.

In this analysis, we were surprised to find that not only was median postoperative opioid consumption similar between the epidural and ESPERE groups, but also that esophageal leak among ESPERE patients was lower. Decreased incidence of hypotension is an obvious factor, but earlier utilization of nonopioid analgesia, particularly non-steroidal anti-inflammatory drugs, may be a contributing role in mitigating pain whilst decreasing opioid requirements.

While this analysis is preliminary, we find the ESPERE pathway to be highly promising as a way for "minimally invasive" regional anesthesia to match minimally invasive surgery (4).

References

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Disclosures

No

Tables / Images



