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Continuous epidural infusion anesthesia and analgesia in gynecologic oncology patients: Less pain, more gain?☆,☆☆

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HIGHLIGHTS

- CEI as part of post-operative pain management results in improved pain scores.
- The observed higher rate of VTE among women with CEI merits further investigation.

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ABSTRACT

Objective. There is a lack of consistent data regarding gynecologic oncology (GO) patients and the use of neuraxial anesthesia for post-operative pain management. Our objective was to compare the use of continuous epidural infusion (CEI) as part of post-operative pain management to more traditional management schemes.

Methods. GO patients undergoing laparotomy from July 1st, 2011 through July 31st, 2012 were identified. Patient demographic data and peri-operative details were abstracted from the medical record. The primary outcome was a mean patient visual analog pain score. Secondary outcomes included length of stay, post-operative urinary tract infection (UTI) and venous thromboembolic (VTE) events.

Results. There were 237 laparotomies during the study time period. Fifty-six women had CEI for post-operative pain management and 181 did not. Patients with CEI had lower pain scores on POD #0 (3.8 vs 5.3, $p < 0.01$), #1 (2.6 vs 4.0, $p < 0.01$) and #2 (2.5 vs 3.5, $p < 0.01$) compared to women without CEI. There was no difference in the length of stay between those with and without CEI (103 vs 94 h, $p = 0.32$). Women with CEI did have a longer length of urinary catheterization (56 vs 26 h, $p = 0.01$) but not an increased rate of UTI (5.5% vs 1.8%, $p = 0.24$). There was a higher rate of post-operative VTE events among women with CEI (8.9% vs 1.7%, $p = 0.02$).

Conclusions. In this small series, GO patients undergoing laparotomy had improved post-operative pain control when their analgesia regimen included CEI. However, the higher rate of VTE events among CEI users is concerning and merits further investigation.

Introduction

Epidural analgesia is an effective therapy for the management of pain after major abdominal surgery. Patient controlled analgesia (PCA) with intravenous (IV) opioids had been considered the gold standard for pain management following major abdominal surgery and results in superior pain control compared to conventional opioid analgesia [1]. More recently, in the general surgical literature, several randomized controlled studies have shown that patients with thoracic epidurals for post-operative analgesia using a combination of opioid and local anesthetic have improved pain scores compared to patients treated with PCA [2–4].

The use of epidural analgesia specifically in gynecologic oncology patients has also been examined and the results have been inconsistent. A prospective cohort study among gynecologic oncology patients suggested that use of patient controlled epidural analgesia (PCEA) did not improve pain management after surgery [5]. In contrast, a prospective, randomized controlled trial among women undergoing laparotomy for a gynecologic diagnosis found that patients treated with morphine–bupivacaine PCEA had significantly less post-operative pain than those given an IV morphine PCA [6]. Most recently, a retrospective

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cohort study suggested that the use of PCEA after laparotomy for gynecologic malignancy is associated with decreased narcotic use and improved pain control without increasing complications or length of hospital stay [7]. Interestingly, all of these studies performed in gynecologic oncology patients examined the use of PCEA, instead of continuous epidural infusion (CEI), which may provide improved analgesia compared to PCEA [8].

In the past decade, the role of minimally invasive surgery in gynecologic cancer has been evolving. Historically the majority of staging surgeries were performed via laparotomy, while in the current decade most surgeries are performed with minimally invasive techniques. Nevertheless, there are certain procedures, such as the removal of large pelvic masses and complex ovarian cancer debulking surgeries, which are best approached via traditional laparotomy and vertical incision. Patients at the University of Virginia Medical Center undergoing laparotomy have the option of choosing neuraxial analgesia, CEI specifically, as this is what is recommended by the Acute Pain Service, for post-operative pain control but offering this option has not been universally accepted among surgeons. Some have expressed concern for: the potential failure of CEI to control post-operative pain while placing the patient at risk for placement related complications; the possibility of decreased perioperative ambulation or prolonged bed rest and associated morbidity; the need for protracted urinary catheterization and possibility of increased rates of urinary tract infection (UTI); and the potentially longer length of stay due to epidural related nursing concerns. We therefore undertook the current retrospective study to compare post-operative pain management which included CEI to post-operative pain management which did not include CEI for gynecologic oncology patients undergoing laparotomy. Our primary outcome was a mean patient visual analog pain score on each post-operative day. Our secondary outcomes were length of hospital stay, duration of urinary catheterization, rates of UTI and venous thromboembolic (VTE) events.

Materials and methods

Study approval was obtained from the University of Virginia Institutional Review Board for Health Sciences Research. Using gynecologic oncology fellows' surgical case logs, all patients on the gynecologic oncology service undergoing laparotomy between July 1st, 2011 and July 31st, 2012 were identified. Each patient's clinical information was reviewed using an institutional electronic medical record. Information abstracted included: demographic details, clinical data including medical comorbidities, operative details including surgical procedure, anesthesia and operative time, chosen method(s) for post-operative pain management, post-operative pain scores, and post-operative outcome data. Exclusion criteria consisted of chronic narcotic use, defined as daily narcotic use in the 30 days prior to surgery, known voiding problems, and known ambulation difficulties.

Four attending gynecologic oncologists performed all surgical procedures. All patients received general anesthesia during their operation. As per institutional protocol, patients preparing to undergo laparotomy were approached by the Acute Pain Service (APS), in the pre-operative area. Candidates were offered placement of an epidural catheter prior to surgery so that CEI could be a component of their post-operative pain management. Patients who had an epidural placed did not have low molecular weight heparin (LMWH) prior to surgery, whereas women who did not have an epidural placed did have pre-operative LMWH for VTE prophylaxis. As directed by APS protocol, women who had an attempt at epidural placement, had their LMWH injection was held for 12 h post epidural placement due to the potential risk of epidural hematoma.

Intraoperative management of epidural anesthesia was at the discretion of the attending anesthesiologist. Post-operatively, women who had successful placement of an epidural catheter typically had CEI alone for pain management until they were taking sufficient oral intake such that oral pain medications could be added. Women who opted to not have an epidural catheter placed were given PCA with IV opioids for post-operative pain management. Women with CEI were typically evaluated by both APS and the primary surgical service for poorly controlled pain post-operatively. After evaluation by both services and exclusion of underlying, more significant etiologies for pain, either the rate of CEI was adjusted, or additional medications were added to the pain regimen, potentially including PCA with IV opioids.

The primary outcome was the mean pain score on each post-operative day. As per institutional protocol, each patient's pain was assessed using a 10-point visual analog scale (VAS) graded from 0 (no pain) to 10 (the worst possible pain). Patient pain assessments were performed by nurses on the post-operative floor. Secondary outcomes of interest included length of hospital stay (hours), duration of urinary catheterization (hours) as a surrogate measure of patient immobility, rates of significant post-operative nausea, post-operative UTI as determined by positive urine culture, and VTE events within 30 days of discharge. Length of hospital stay was determined by calculating the difference between the end of surgery time and the time the discharge order was placed. The duration of urinary catheterization was determined by calculating the difference between the end of surgery time and the time that the order for catheter removal was placed. The presence or absence of post-operative complications was assessed by reviewing the complete medical record from each patient's hospital stay as well as all outpatient visit notes and laboratory values within 6 weeks of discharge.

Statistical analysis was performed using IBM SPSS Statistics 21 software (SPSS Inc.). Means were compared using an independent sample's *t*-test and proportions were compared using Fisher's exact test or Chi-square test. A p-value <0.05 was considered significant.

Results

A total of 271 gynecologic oncology patients had laparotomies between July 1st 2011 and July 31st, 2012. Of this group, 34 had a history of significant opioid use in the month prior to surgery and were excluded from the analysis. Of the remaining 237 women, a total of 56 had a CEI as part of their post-operative pain management and 181 did not (Fig. 1). Among the 56 patients who had CEI, 34 (61%) required the addition of PCA with IV opioids. The demographics of the study population are presented in Table 1. There was no difference in age, race, BMI, prevalence of medical comorbidities or proportion of patients with a cancer diagnosis between groups.

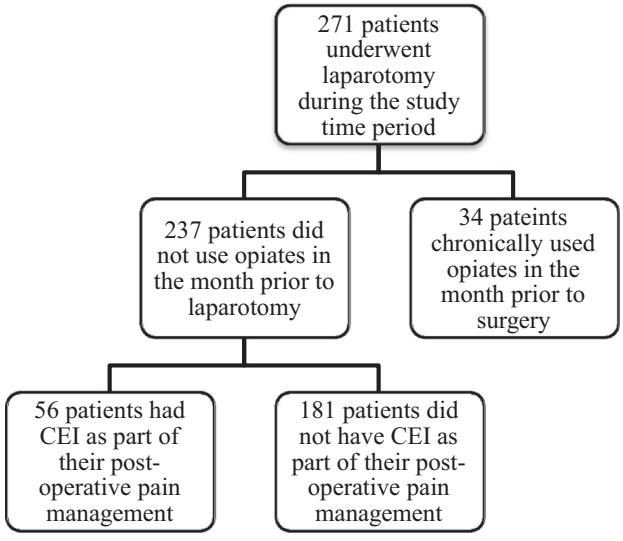

Fig. 1. Patient identification and exclusion.

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