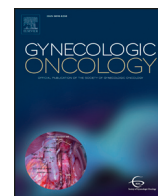




Contents lists available at ScienceDirect

Gynecologic Oncology

journal homepage: www.elsevier.com/locate/ygyno

Minimizing pain medication use and its associated costs following robotic surgery

Jeremie Abitbol^a, Rebecca Cohn^a, Sandra Hunter^b, Marcelo Rombaldi^a, Eva Cohen^c, Roy Kessous^a, Nick Large^c, Ari Reiss^a, Susie Lau^a, Shannon Salvador^a, Walter H. Gotlieb^{a,*}

^a Division of Gynecologic Oncology, Jewish General Hospital, McGill University, Montreal, Quebec, Canada

^b Pain Management Division of Surgery, Jewish General Hospital, McGill University, Montreal, Quebec, Canada

^c Pharmacy Department, Lady Davis Institute of Research, Jewish General Hospital, McGill University, Montreal, Quebec, Canada

HIGHLIGHTS

- Robotic surgery is associated with less use of pain medications post-operatively.
- The reduction in pain medications is associated with a decrease in analgesia-related costs.
- The routine use of patient-controlled analgesia is not required after robotic surgery.

ARTICLE INFO

Article history:

Received 12 August 2016

Received in revised form 4 November 2016

Accepted 7 November 2016

Available online xxxx

Keywords:

Robotic surgery

Pain

Analgesics

Costs

ABSTRACT

Introduction. Minimally invasive surgery (MIS) has been associated with diminished postoperative pain and analgesia requirements. The objective of the current study was to evaluate the use of analgesia in the post-operative period following robotic surgery for endometrial cancer.

Methods. All consecutive patients who underwent robotic surgery for the treatment of endometrial cancer were included in this study. The timing, dose, and type of analgesics administered postoperatively were recorded from patients' electronic medical record. Data was compared to a matched historical cohort of patients who underwent laparotomy before the introduction of the robotic program.

Results. Only eight patients (2.4%, 5 during the first 25 cases and 3 following mini-laparotomy) received patient-controlled analgesia (PCA) following robotic surgery. Most patients' pain was alleviated by over-the-counter analgesics (acetaminophen, non-steroidal anti-inflammatories). In comparison to laparotomy, patients who underwent robotic surgery required significantly less opioids (71 mg vs. 12 mg IV morphine, $p < 0.0001$) and non-opioids (4810 mg vs. 2151 mg acetaminophen, 1892 vs. 377 mg ibuprofen, and 1470 mg vs. 393 mg naproxen; all $p < 0.0001$).

Conclusion. Patients require less analgesics (opioids and non-opioids) following robotic surgery in comparison to conventional laparotomy, including the elderly and the obese. The diminished pain medication use is associated with some cost savings.

© 2016 Published by Elsevier Inc.

1. Background

In 1986 and again in 1996, the World Health Organization (WHO) developed guidelines to alleviate pain resulting from cancer and its treatments [1,2], yet to this day pain in cancer patients continues to be undertreated [3,4]. To further diminish post-surgical pain and limit

the use of opioids, minimally invasive laparoscopic surgery (MIS) has been championed as a less traumatic approach to surgery. Since the introduction of robotically assisted surgery, more patients have been able to benefit from the minimally invasive technique [5].

Recently, we reported that 40% of patients did not take any analgesics for pain at the time of their first post-op visit [6]. Using validated psychometric instruments, we demonstrated that pain severity, pain interference with daily life, and use of treatments for pain returned to pre-surgery levels within 3 weeks of surgery [manuscript submitted for publication]. In the current study, we evaluate the use of pain

* Corresponding author at: Division of Gynecologic Oncology, McGill University - Jewish General Hospital, 3755 Cote Ste. Catherine Road, Montreal, QC H3T 1E2, Canada.

E-mail address: walter.gotlieb@mcgill.ca (W.H. Gotlieb).

medications during the post-operative hospital stay following surgery for endometrial cancer.

2. Methods

All consecutive patients who underwent robotic surgery for endometrial cancer were included in this study. A trained research assistant extracted medications, doses, routes of administration, and time of administration for every patient in the post-operative period, from every chart on the hospital's electronic medical record system. Time of administration was described as having been given after surgery on postoperative day 0 (POD0), POD1, and every day thereafter (POD2+). Patient characteristics and clinical data were obtained from a prospective computerized departmental database. Direct costs associated with the administration of pain medications were gathered from the hospital's pharmacy and purchasing departments. The following costs were included: medications, needles, syringes, Patient Controlled Analgesia (PCA)-associated costs (PCA syringe, catheter, tubing, dressing, and labor costs for preparations by pharmacy personnel), epidural-associated costs (epidural kits, bags, tubing, labor costs for preparations, and anesthesiologist's fees for epidural injection and follow-up). All costs were expressed in 2015 Canadian dollars.

Since 2009, over 95% of patients with endometrial cancer undergo robotic surgery in our center, virtually eliminating laparotomy for this indication. We therefore evaluated pain medication usage in a cohort of consecutive patients treated by laparotomy for endometrial cancer, just prior to the introduction of the robotic platform. Electronic medical records were reviewed for both cohorts. Due to the greater number of patients in the robotic cohort, patients from the historical cohort were matched by stage (as a proxy for extent of disease) and age (as it can affect a drug's pharmacokinetics) in a 1:3 ratio to those treated by robotic surgery. Institutional IRB approval was obtained for this study. Outcomes were compared for statistical differences between the two cohorts using the Mann–Whitney *U* test, the chi-squared test, or Fisher's exact test, where applicable, using the STATA statistical software (StataCorp). A significance level of $p < 0.05$ was used throughout the study.

3. Results

A total of 356 patients were treated for endometrial cancer by robotically assisted surgery since the introduction of the robotics program in December 2007 until April 2013, the time at which this study was designed. No differences in procedures occurred since that time. Sixteen patients were excluded because the final pathology demonstrated non-cancerous or benign disease ($n = 4$), the presence of multiple malignancies ($n = 6$), re-operation within the same admission ($n = 3$), incomplete pain medication chart ($n = 1$), or conversion to laparotomy for intolerance to Trendelenburg ($n = 2$). Patients who underwent a mini-laparotomy for the removal of large uteri ($n = 6$) remained included in the robotic cohort, leaving 340 robotic cases for analysis.

The mean age was 65 years, and 34% were ≥ 70 years old (Table 1). The mean body mass index (BMI) was 32 kg/m², 51% were obese and 19% morbidly obese (BMI > 40). Most patients had stage IA disease (62%) and most tumors were of endometrioid histology (74%).

The average surgical time (skin incision to closure) was 240 min (95%CI 234 to 245 min) with a mean estimated blood loss (EBL) of 70 mL (95%CI 60 to 80 mL). Patients stayed in the hospital, on average, 1.6 days (95%CI 1.4 to 1.7 days, median 1 day).

Pain medication use is tabulated in Table 2. Most patients' pain was alleviated by acetaminophen (mean 2294 mg) and NSAIDs (mean 461 mg ibuprofen, 375 mg naproxen). As part of the anesthesia protocol for minimally invasive procedures, patients were administered intravenous fentanyl (mean 53 mcg) in the Post-Anesthesia Care Unit. The average dose of morphine administered was 1.3 mg intravenously, 3.1 mg subcutaneously, and 1.2 mg orally. Only eight (2.4%) patients were on

Table 1

Baseline characteristics of all patients with robotic surgery.

	Robotic (n = 340)
Age, mean (SD)	64.8 (11.5)
BMI, mean (SD)	31.9 (8.7)
ASA	
1	10.3%
2	62.1%
3	27.1%
4	0.6%
Final histology	
Endometrioid	73.8%
Serous	10.9%
Clear cell	5.0%
Carcinosarcoma	4.1%
Adenosquamous	3.5%
Mucinous	1.2%
Sarcoma	1.2%
Unclassified	0.3%
Grade	
1	42.1%
2	23.8%
3	34.1%
Surgical stage	
IA	61.5%
IB	16.2%
II	5.0%
IIIA	3.5%
IIIB	0.6%
IIIC	10.9%
IVA	0.6%
IVB	1.8%

Patient Controlled Analgesia (PCA), six on IV morphine and two on IV fentanyl. No patients required continuous epidural analgesia. Five of

Table 2

Pain medication use following robotic surgery.

Medication	Full robotic sample (n = 340)			
	n	Mean	SD	Median
Acetaminopen				
Acetaminopen	300	2294.0	2293.4	1650
NSAIDs				
Ibuprofen	145	461.2	702.0	0
Toradol	34	1.0	3.0	0
Naproxen	122	375.4	655.7	0
Diclofenac (PO/PR)	20	7.1	32.0	0
Meloxicam	2	0.1	1.1	0
Ketoprofen	0	0.0	0.0	0
Rofecoxib	0	0.0	0.0	0
Indomethacin	0	0.0	0.0	0
Celecoxib	1	0.6	10.8	0
Oral opioids				
Codeine	20	3.2	15.1	0
Oxycodone	4	0.1	1.1	0
Hydromorphone (PO)	24	0.3	1.9	0
Morphine				
Morphine (IV)	48	1.3	4.2	0
Morphine (SC)	69	3.1	10.0	0
Morphine (PO)	43	1.2	3.8	0
Other				
Fentanyl (IV)	177	0.05	0.07	0.03
Neurontin (PO)	2	3.5	45.9	0
Demerol (IV/IM)	4	0.3	2.7	0
Hydromorphone (IV/SC)	17	0.1	0.4	0
Empracet (PO)	10	1.3	8.4	0
Patient-controlled analgesia				
# on PCA	8			
Morphine (IV PCA)	6	0.83	7.19	0
Fentanyl (IV PCA)	2	0.002	0.04	0
Continuous epidural analgesia				
# on CEA	0			
Morphine IV equivalence				
Including PCA/CEA	280	12.8	17.1	7.8

Note: All doses presented are in milligrams (mg).

Download English Version:

<https://daneshyari.com/en/article/5695895>

Download Persian Version:

<https://daneshyari.com/article/5695895>

[Daneshyari.com](https://daneshyari.com)