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Opioid Use Following Bariatric Surgery: Results of a Prospective Survey

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Abstract

Background—Opioid use after bariatric surgery is not clearly understood. Few guidelines exist to inform opioid prescribing practices after bariatric surgery.

Objective—To understand opioid use following bariatric surgery.

Setting—University Hospital.

Methods—Bariatric surgery patients at a single center were prospectively surveyed at the time of their post-operative visit (January-May 2018). Patients were asked about their opioid use following surgery, whether they received education about opioid use, and what they did with leftover medications. Demographic and operative details were obtained from the medical record.

Results—Among 33 patients, the majority (n=29, 88%) were female with a median age of 40 (20–68) and body mass index of 44.8 (33–78.5). Most patients had leftover narcotics (n=25, 73%). The median number of pills used was 15 (0–48). Only 12 patients (36%) thought that they had been prescribed “too much” pain medication. Most patients reported receiving education about expectations for post-operative pain (n=22, 69%); few recalled education about reducing or stopping opioids (n=13, 40%). More than half of patients (n=17, 53%) kept their leftover opioids rather than disposing of them or bringing them to an approved turn in location.

Conclusions—Despite most patients having leftover opioids following surgery, few patients recognized possible over prescription. Education regarding opioid use following surgery is inconsistent, potentially contributing to the amount of retained opioids currently available. Future guidelines should focus on determining the appropriate amount of opioids to be prescribed following surgery and standardizing and improving education given to patients.

Keywords

Bariatric Surgery; Opioids; Patient Education

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Introduction

The United States (US) is currently experiencing an opioid epidemic. More than five million adults abuse opioids¹ and 33,000 individuals die annually from opioid overdoses.² Opioids cause or contribute to one death every 36 minutes.¹ Many patients develop opioid addiction or dependence after exposure to legally obtained medications following surgery: prior studies demonstrate that while approximately 6% of patients have sustained opioid use one year following surgery⁴ (which is similar to the rate among surgical patients in general)³ up to 15% of patients have sustained opioid use 7 years following bariatric surgery.⁴ Other patients who develop opioid dependence or addiction do so through diversion of opioids.¹ Diversion occurs when drugs that were legally prescribed are then used by someone else in an illegal manner. Over half of patients who used pain relievers state that they acquired the drug from a friend or relative, and in most of these cases the friend/relative had obtained the pain medication via prescription from a physician.⁵

To counter this, increasing attention is being given to educate patients about proper disposal methods of leftover narcotics, as well as how to determine the optimal amount of narcotics to prescribe to reduce excessive amounts of leftover narcotics. The Food and Drug Administration (FDA) has instructions on their website detailing acceptable methods of disposal of unused medications, including drop off at an approved take-back location (such as a local pharmacy with a drug disposal program), disposal in household trash after mixing with an unpalatable substance (e.g. coffee grounds or cat litter), and flushing medication down the toilet.⁶ However, it is not clear that the providers writing prescriptions or the patients receiving prescription drugs are aware of these guidelines. In response, some governments have taken action in an attempt to regulate opioid prescribing. For example, the state of Washington has imposed limits on the length of opioid prescribing in the acute perioperative setting.⁷ The Centers for Disease Control (CDC) suggest that when treating acute pain, the prescription should start at the lowest effective dosage taking into account the expected duration of pain. Generally three days of treatment is sufficient, and they recommend not giving more than seven days' worth of treatment to start.⁸ Other guidelines suggest giving no more than 200 oral morphine equivalents (OME) at a time.²

Government regulation and disposal of excessive opioid prescriptions would not be necessary if providers were able to determine the precise amount of narcotics required for acute pain following elective surgery. There is a lack of data on the amount of opioid medication used by patients after surgery, and variability exists between providers based on training experience.⁹ For post-operative patients, the amount of opioid required varies by operation, and for common operations such as laparoscopic cholecystectomy and open inguinal hernia repair, most patients take fewer than one third of the prescribed doses with only 2% requesting a refill, possibly indicating that narcotics are over-prescribed.¹⁰

Given the ongoing challenges in this field, we sought to better understand opioid behaviors within our institution by administering a survey to post-operative patients undergoing elective bariatric surgery. We aimed to describe patterns of opioid use following bariatric surgery in an effort to improve and standardize our delivery of care.

Methods

This prospective survey was distributed to patients at a single center at the time of their post-operative visit from January-May 2018. This study was approved by the Institutional Review Board at our center. Adult English-speaking patients were offered a paper-based survey in the clinic and an included self-consent form that was signed. The survey was developed for this study. Chart review was performed to obtain basic demographic information (age, sex, body mass index (BMI), insurance type), operative details (operation type, length of stay), and information about discharge opioid prescriptions. Operation type was described as “sleeve gastrectomy,” “Roux-en-Y gastric bypass,” and “other.” All operations were performed laparoscopically, as is typical, with the exception of one gastrojejunal revision that was performed in an open fashion. Prescribed dose of narcotics was converted to morphine equivalents using a standard conversion calculator.⁸

In the survey, patients were asked questions about left over pain medication, length of opioid use, adjunctive pain use, and whether they asked for a refill at any time. As part of their pre-operative education, all patients receive information from the clinic regarding post-operative pain control, how to taper opioid use, and how to dispose of opioids. In the survey, we asked patients whether they recalled receiving education about reducing or stopping opioid pain medication and whether they recalled receiving education about disposal of excess pain medication. Patients who stated they “did not remember” if teaching occurred were considered not to have recalled receiving education. Patients were also asked if they recalled receiving instruction on how to dispose of medication after surgery, which is currently standard in our clinic. Additional questions related to storage and disposal methods, prior substance use, and information about educational level and self-described race or ethnicity. A complete copy of the survey and the medication disposal teaching tool can be found in the Appendix.

Results

Among 33 patients who completed the survey, the majority (n=29, 88%) were female with a median age of 40 (20–68) and BMI of 44.8 (33–78.5). Most patients (n=19, 61%) described their race/ethnicity as Caucasian or white. Rates of laparoscopic sleeve gastrectomy and laparoscopic Roux-en-Y gastric bypass were similar. Four patients had their operation listed as “other” and these operations included laparoscopic assisted trans-gastric endoscopic retrograde cholangiopancreatography, removal of laparoscopic adjustable band, open revision of gastrojejunal anastomosis, and laparoscopic conversion of prior sleeve gastrectomy to Roux-en-Y gastric bypass. Over half of patients (n=17, 53%) reported a history of chronic pain, while fewer than one quarter of patients (n=6, 18%) had a documented history of opioid use in their medical record. (Table 1)

The majority of patients reported having leftover narcotics (n=25, 73%). The median prescribed morphine equivalent dose was 225mg (150mg-450mg) and the most commonly prescribed pain regimen was oxycodone 5mg tablets, with 30 dispensed. The median number of pills used by patients was 15 (0–48). All patients used some form of adjunctive pain control, with the most common adjunct being acetaminophen (n=26, 79%). The most

common reason for stopping opioid pain medication was “my pain was controlled without taking opioid medication” (n=14, 54%). Despite the majority of patients reporting leftover pain medication, only 12 patients (36%) thought that they had been prescribed “too much” pain medication. Seven patients (21%) requested a refill of medications following their operation. (Table 2)

While most patients recalled receiving education about pain control or expectations for post-operative pain (n=22, 69%), fewer than half of patients recalled education about stopping or reducing opioid use once they started (n=13, 40%). Despite uniform teaching on medication disposal, only one quarter of patients recalled receiving instructions on disposal of pain medication (n=8, 25%). The majority of patients kept their opioid pain medication in a locked (n=8, 25%) or private location (n=14, 44%), while nearly one third of patients kept theirs in an open or visible location (n=19, 31%). More than half of patients (n=17, 53%) kept their leftover opioids. No patient reported flushing opioids down the toilet or disposing of them in the garbage, but 3 patients (9%) brought leftover pills to a take-back location. (Table 3)

Discussion

In this study, we surveyed 33 patients who had recently undergone bariatric surgery and had been prescribed opioid pain medication for post-operative pain. While the majority of patients had excess opioids remaining, more than half of patients thought that they had been given either too few opioids or “just the right amount.” Similarly, most patients who had leftover opioids kept them rather than disposing of them in an FDA-approved fashion. While many patients recalled receiving education about post-operative pain expectations, few patients were counseled on reducing or stopping their opioid intake, and few recalled how to dispose of any leftovers. Based on these findings, it is clear our current education paradigm regarding opioid use and disposal is not sufficient. This presents an opportunity to standardize and improve these important components of perioperative care. Opportunities exist to standardize counseling in the outpatient pre-operative setting and during the index hospital admission after surgery, both in our written and verbal instructions. Our plan is to consider different teaching strategies and institute a more standardized educational program for our patients in the pre-and peri-operative period, as well as add teaching to our discharge instructions on this topic. In addition, the amount of prescribed narcotics can be reduced as well. This would be done with the goal of re-administering this survey to understand how those changes affected patients’ perception of their pain control and their understanding and behaviors surrounding narcotic pain medicine.

Post-bariatric surgery patients are at particularly high risk for complications related to opioid use. In the Longitudinal Assessment of Bariatric Surgery study, 14.2% of opioid naïve patients reported opioid use at 7 years following their operation.⁴ At baseline, patients with obesity exhibit alterations in the areas of the brain that process and respond to opioids.^{11,12} This may in part explain why patient with obesity receive more opioids than patients without obesity following elective surgery.² Early qualitative work also suggests that post-bariatric surgery patients may be at risk for substance abuse disorders due to “addiction transfer” following surgery.¹³ The premise behind “addiction transfer” is that patients are replacing

one addictive behavior (food consumption) with another (opioids, alcohol, etc.).¹³ Beyond concerns with addiction in general, there is evidence that ongoing opioid use may actually impact outcomes among bariatric surgery patients. In a cohort of >27,000 bariatric patients from Michigan, previously opioid-naïve patients with persistent opioid use lost less weight, had lower scores for psychological wellbeing, body image, and depression, and were overall less satisfied with the outcome of their surgery compared to those without persistent opioid use.¹⁴ Taken together, it is clear that prevention of opioid use disorders following bariatric surgery is a high-priority for patients with obesity. An opioid reduction strategy may also enhance safety in this patient population in which obstructive sleep apnea further increases the risk of postoperative complications related to opioid use and its associated respiratory depression.

Opioid use is a significant problem in the US. From the late 1990s-2010, there was a 7-fold increase in opioid sales with a concomitant increase in opioid-related deaths of more than 300%.¹⁵ The US population consumes more opioid medication than any other country in the world, and more than half of patients who report using opioids for a non-medical purpose received those drugs from a relative or friend.¹ In addition to state and federal laws governing prescribing practices, a key component that is often missing is education of both providers and patients about how opioids should be ideally used to prevent adverse outcomes, including diversion of prescribed opioids.¹⁵ We found this to be the case in our study: most patients had leftover narcotics that they then kept, potentially increasing the risk of opioid diversion where a friend or relative could later use or abuse those medications. In addition, few patients reported receiving adequate education to prevent this from occurring.

Prior studies indicate that surgeons over-prescribe narcotic pain medications in the post-operative period. For patients undergoing routine operations, the majority of patients report consuming fewer than 15 opioid pills following discharge from the hospital, and in most cases consume fewer than half of all pills that are prescribed.^{16,17} The Opioids After Surgery Workgroup recently published consensus guidelines from expert opinion for common surgical procedures. For example, an opioid naïve patient following laparoscopic cholecystectomy is recommended to receive 0–10 pills of oxycodone 5mg, while a patient following an open hysterectomy is recommended to receive 0–20 pills.¹⁸ Among patients undergoing bariatric surgery, recent recommendations from a single-center study suggest that the appropriate amount for most patients is 8–15 pills.¹⁹ This is directly in line with our study, where the median number of pills used was 15. Our typical discharge prescription, however, was twice this amount, or 30 tablets. One reason for this may be the inability to electronically prescribe or refill narcotic pain medications in our state. Returning for narcotic prescription refills can be a hardship for patients and family members, exacerbated by the large geographic area our academic medical center serves. Accurately assessing provider attitudes related to narcotic prescription must also be part of a comprehensive strategy to judiciously limit their use and warrants more study. In the interim, we have already moved towards prescribing fewer opioids at discharge and will continue to do so in the future. Surgeons should also be aware of Prescription Monitoring Programs (PMPs) that allow providers to track opioid prescriptions for individual patients requesting refills. One such example is PMP AWAReE designed by Appriss Health.

Another challenge is that it is difficult, if not impossible, to calculate a precise amount of narcotics for each patient, especially for those who may only stay 1–2 days in the hospital. This is reflected in studies that find wide variation in the amount of prescribed narcotics following common operations.¹⁰ One study found that nearly half of patients who used no opioids in the 24 hours prior to discharge were still provided with opioid prescriptions at discharge, despite evidence that their post-operative pain had resolved.²⁰

On the patient side, there is a lack of awareness regarding proper methods of disposal for leftover opioids, despite having received instructions on how to do so.²¹ In our study, the most common behavior was to simply keep leftover narcotics, rather than dispose of them or return them, which is in line with prior studies.^{21,22} This represents a significant opportunity for improving patient education. Data suggests that these patient behaviors may improve with increased perioperative opioid education and easily accessible strategies for disposal. For example, a recently published randomized controlled trial indicates that providing patients with an activated-charcoal bag to allow for in-home disposal of leftover narcotics is associated with a nearly four-fold increase in proper disposal compared to patients who received usual care or education alone.²³ Other studies have demonstrated better success with educational interventions (up to five-fold higher reported rates of proper opioid disposal) which may indicate this to be a viable option for the future.^{24,25}

There are several limitations to this study. The first is the relatively small number of patients who completed the survey. Given this we were underpowered to detect potential associations between patient demographics, pre-operative education, and opioid disposal methods. We distributed the survey to 50 consecutive post-operative patients, with a response rate of 66%. Secondly, information obtained about opioid education, length of post-operative opioid use and disposal methods were obtained based on patient recollection and may be subject to recall bias. As noted previously, education about opioid use and disposal following surgery is a standard component of our pre-operative education, but not all patients recalled receiving this information.

Conclusion

In this study, we found that the majority of patients following bariatric surgery retained opioids even after their pain had resolved. In addition, we found that few patients recalled receiving education about reducing or stopping their opioid use, or recalled how to properly dispose of unused pills. This was a pilot study specifically focusing on patients within our own institution, but the findings from this study are more broadly generalizable to other bariatric surgery practices, as well as potentially non-bariatric surgery practices. Future guidelines should focus on determining the appropriate amount of opioids to be prescribed following bariatric surgery, as well as standardizing educational instructions given to all patients. Based on these findings, we plan to reduce the amount of opioids being prescribed after elective bariatric surgery and implement more structured pre-operative and inpatient education surrounding post-operative opioid use and opioid disposal at our institution. These important interventions deserve a follow-up study to see their effects.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1:

Demographics of patients participating in the survey.

Characteristic	N=33
Median age (range)	40 (20–68)
Female (%)	29 (88)
Median body mass index (range)	44.8 (33–78.5)
Self-described race/ethnicity	
Caucasian/White (%)	19 (61)
African American (%)	4 (13)
Hispanic (%)	3 (10)
Asian (%)	1 (3)
Other (%)	4 (13)
Operation type	
Lap Sleeve Gastrectomy (%)	15 (45)
Lap Roux-en-Y Gastric Bypass (%)	14 (42)
Other (%)	4 (12)
Self-reported chronic pain (%)	17 (53)
Prior documented opioid use (%)	6 (18)
Insurance type (%)	
Commercial (%)	12 (36)
Medicare (%)	6 (18)
Medicaid (%)	15 (45)

Table 2:

Description of pain medication use following surgery.

Variable	N=33
Median total days of post-op opioid use [range]	5 (0–12+)
Median total days with 3+ doses of opioid [range]	2 (0–12+)
Median prescribed morphine equivalents [range]	225 (150–450)
Had any opioid remaining (%)	24 (73)
Median number of pills used [range]	15 (0–48)
Used any adjunct (%)	33 (100)
Use of adjuncts	
Acetaminophen (%)	26 (79)
Non-steroidal anti-inflammatory drugs (%)	2 (6)
Gabapentin (%)	2 (6)
Muscle Relaxant (%)	5 (15)
Non-medication (%)	10 (30)
Reason for stopping pain medication	
Pain well controlled (%)	14 (54)
Desire to avoid side effects (%)	1 (4)
Undesired symptoms (%)	1 (4)
Not applicable (took all the meds) (%)	4 (15)
Other (%)	6 (23)
Perception of amount of prescribed opioid	
Too much (%)	12 (36)
Just right (%)	14 (42)
Too little (%)	7 (21)
Asked for a refill following surgery	7 (21)

Table 3:

Behavior of patients related to pain medication usage and disposal.

	N=33
Received education about expectations for post-operative pain	22 (69)
Received education about stopping/reducing opioid pain medication	13 (40)
Received instructions on disposal of leftover opioids	8 (25)
Storage location of pain medication	
Locked location (%)	8 (25)
Private but unlocked location (%)	14 (44)
Open or visible location (%)	19 (31)
Disposal method for leftovers	
Kept(%)	17 (53)
Flushed (%)	0
Garbage (%)	0
Brought to take-back location (%)	3 (9)
Other (%)	1 (3)
Not applicable (took all the meds) (%)	11 (34)

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