Published in final edited form as:

Clin J Pain. 2016 August ; 32(8): 689–694. doi:10.1097/AJP.0000000000000316.

The fibromyalgia survey score correlates with preoperative pain phenotypes but does not predict pain outcomes after shoulder arthroscopy

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Abstract

Objectives—Fibromyalgia characteristics can be evaluated using a simple, self-reported measure, which correlates with postoperative opioid consumption following lower-extremity joint arthroplasty. The purpose of this study was to determine if preoperative pain history and/or the fibromyalgia survey score can predict postoperative outcomes following shoulder arthroscopy, which may cause moderate-to-severe pain.

Methods—In this prospective study, 100 shoulder arthroscopy patients completed preoperative validated self-report measures to assess baseline quality of recovery score, physical functioning, depression/anxiety, and neuropathic pain. Fibromyalgia characteristics were evaluated using a validated measure of widespread pain and comorbid symptoms on a 0–31 scale. Outcomes were assessed on postoperative days 2 (opioid consumption [primary], pain, physical functioning, quality of recovery score) and 14 (opioid consumption, pain).

Results—Fibromyalgia survey scores ranged from 0–13. The cohort was divided into tertiles for univariate analyses. Preoperative depression/anxiety ($p < 0.001$) and neuropathic pain ($p = 0.008$) were higher, and physical functioning was lower ($p < 0.001$), in higher fibromyalgia survey score groups. The fibromyalgia survey score was not associated with postoperative pain or opioid consumption; however, it was independently associated with poorer quality of recovery scores ($p = 0.001$). The only independent predictor of postoperative opioid use was preoperative opioid use ($p = 0.038$).

Discussion—Fibromyalgia survey scores were lower than those in a previous study of joint arthroplasty. Although they distinguished a negative preoperative pain phenotype, fibromyalgia scores were not independently associated with postoperative opioid consumption. Further research

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is needed to elucidate the impact of a fibromyalgia-like phenotype on postoperative analgesic outcomes.

Keywords

pain; supraclavicular nerve block; shoulder arthroscopy

Introduction

Shoulder arthroscopy is a minimally invasive procedure that can cause moderate-to-severe postoperative pain.[1] However, it is unclear if preoperative characteristics could be used to identify shoulder arthroscopy patients at risk for poorer postoperative outcomes. Measures that may influence postoperative outcomes include psychological factors,[2] degree of pain[3] and physical functioning,[4] overall pain sensitivity,[5] and preoperative opioid use.[6]

Fibromyalgia, which is characterized by the centrally mediated augmentation of pain and sensory processes, may also influence postoperative outcomes.[7] Although the cause of fibromyalgia cannot be detected through examinations,[8] its mechanistic underpinnings have been demonstrated.[9] In 2011, a self-report questionnaire that assesses widespread body pain and comorbid symptoms of fibromyalgia was created. This questionnaire evaluates the fibromyalgia survey score as “a continuum of sensitivity and symptomatology,” which may correlate with adverse pain outcomes[10], and may be used epidemiologically to detect “fibromyalgia-like” characteristics outside of pure fibromyalgia cohorts.[9] A recent study showed that lower-extremity joint arthroplasty patients with higher fibromyalgia survey scores were younger, had greater preoperative pain, consumed more opioids preoperatively, had negative psychological profiles, and consumed more opioids postoperatively even when accounting for other preoperative measures.[11] In another study, the fibromyalgia survey score was predictive of postoperative opioid consumption in patients undergoing hysterectomy.[12]

Whether preoperative pain history or the fibromyalgia survey score can predict pain outcomes after ambulatory shoulder arthroscopy, which causes a wide range of postoperative pain, is unknown. The fibromyalgia survey score has not been characterized in this patient population. In this prospective, observational cohort study, multiple validated self-report questionnaires were used to assess fibromyalgia survey scores and other measures in shoulder arthroscopy patients. Given the known central nervous system abnormalities in fibromyalgia, including higher endogenous opioid levels and lower μ -opioid receptor availability,[13, 14] we hypothesized that higher preoperative fibromyalgia survey scores would independently predict poorer postoperative outcomes. The primary outcome was opioid consumption on postoperative day (POD) 2.

Materials and Methods

Patient Identification and Recruitment

This prospective, observational cohort study was approved by the Institutional Review Board at the Hospital for Special Surgery (#2013-002), and written informed consent was obtained from all patients in the holding area prior to surgery. The reporting of this study conforms to the STROBE Statement.[15] Patients (18–80 years old) undergoing shoulder arthroscopy between August 2013 and January 2014 were assessed for eligibility. Exclusion criteria included allergies to study medications (e.g., non-steroidal anti-inflammatory drugs [NSAIDs] and opioids), contraindications to supraclavicular nerve blocks, non-English speakers, chronic opioid use, and open procedures. Chronic opioid use was defined by daily use of any opioid for 5 of the 7 days prior to surgery.

Surgical and Anesthetic Procedures

Patients undergoing any type of shoulder arthroscopy, including rotator cuff repairs, subacromial decompressions, labral repairs, stabilizations, debridements, and biceps tenodesis, were enrolled. All patients were scheduled to receive a supraclavicular nerve block containing 30–45 ml of a combination of 1.5% mepivacaine and 0.5% bupivacaine. Patients also received either intravenous (IV) sedation (up to 5 mg midazolam, propofol infusion, up to 100 mcg fentanyl) or general anesthesia (midazolam, propofol infusion, nitrous oxide, isoflurane, up to 100 mcg fentanyl) at the discretion of the anesthesiologist after determining patient and surgeon preferences. Intravenous famotidine (20 mg), ondansetron (4 mg), dexamethasone (4 mg), and ketorolac (30 mg) were administered. In the post-anesthesia care unit, patients were not prophylactically given opioid medication unless they requested medication or had numerical rating scale (NRS) pain scores greater than 3. Patients were prescribed opioids (oxycodone/acetaminophen or hydrocodone/acetaminophen) and NSAIDs (Naproxen) for postoperative use.

Surgery types were divided into “more-painful” and “less-painful” groups. Rotator cuff repairs, labral repairs, stabilizations, and biceps tenodesis were classified as “more painful.” [16] Decompressions and debridements were classified as “less painful.”[16]

Preoperative Phenotyping

The following self-report measures were assessed preoperatively using validated instruments, as previously described:[11] (1) Pain severity at the surgical site (average of worst, least, and average pain scores; taken from Brief Pain Inventory), (2) Widespread pain (Michigan Body Map), (3) Neuropathic pain at the surgical site (PainDETECT),[17] (4) Physical functioning (PROMIS-Physical Function-Short Form 1, ©2008; <http://www.nihpromis.org>), (5) Quality of Recovery-9,[18] (6) Depressive and anxiety symptoms (Hospital Anxiety and Depression Scale),[11, 19] (7) Catastrophizing (Coping Strategies Questionnaire),[20] and (8) Symptom severity scale.[11] Using the 2011 Survey Criteria for Fibromyalgia described previously,[10, 11] the widespread pain index (0–19) and symptom severity scale (0–12) were added to generate the fibromyalgia survey score (0–31). Patients were divided into tertiles based on the distribution of fibromyalgia survey scores within the cohort.

Demographic information was collected from electronic medical records. Intraoperative data, including type of arthroscopy, anesthetic type, block induction end time, and nerve block components, were obtained from anesthesia and peripheral nerve block records.

Assessment of Acute Pain

POD 2 follow-ups were performed via telephone surveys, and POD 14 follow-ups were performed via telephone or online surveys, depending on each patient's preference. On POD 2, patients answered questions regarding opioid consumption, pain scores (at rest, with movement, worst pain, least pain, and average pain), neuropathic pain (PainDETECT), physical functioning (PROMIS), and quality of recovery (Quality of Recovery-9). Patients were also asked to report the time at which their blocks completely wore off, and block duration was calculated from induction end time. On POD 14, opioid consumption and pain scores were recorded. All opioid amounts were converted to oral morphine equivalents.[21]

Statistical Analysis

Data were collected and managed using Research Electronic Data Capture (REDCap; National Center for Advancing Translational Science of the National Institute of Health, UL1TR000457) tools hosted at the Hospital for Special Surgery.[22] REDCap was also used to administer online surveys to patients who preferred online to telephone information gathering.

The primary outcome was opioid consumption on POD 2. The power analysis was calculated using the scaled dataset by Brummett and colleagues.[11] The power for the association between opioid consumption and the fibromyalgia survey score was based on a test of a fibromyalgia coefficient in a linear regression model, where the fibromyalgia coefficient was 1.8 and the residuals standard error was 20, thus giving an effect size of 0.4. To detect the association at 90% power ($\alpha = 0.5$), a total N of 68 would be needed, assuming a similar distribution of fibromyalgia survey scores in this shoulder surgery cohort. We chose a sample size of 100 to account for drop-outs, exclusions, and withdrawals, as well as the possibility of a narrower range of fibromyalgia survey scores in this patient population.

For descriptive data, univariate analyses were performed, and the means and standard deviations (SDs) are presented. Outcome measures (opioid consumption [primary], change in pain scores, and change in quality of recovery) were analyzed using linear mixed models that were conducted to assess the independent contributions of the demographic and phenotypic variables. Model-based hypotheses testing and backwards variable selection were conducted using likelihood ratio tests. [11] $P < 0.05$ was considered to be significant. To correct for possible overfitting and to have an unbiased assessment of the model's predictive performance, regularized variable selection was done using adaptive LASSO and the Bayesian Information Criterion (BIC).

Results

Patient Enrollment

A total of 178 patients were assessed for eligibility. Fifty-three patients were excluded for the following reasons: allergy to study medication (n=8), contraindication to nerve block (n=9), non-English speaking (n=3), chronic opioid use (n=7), planned arthrotomy (n=1), not appropriate per provider (n=7), and logistical reasons (n=18; e.g., research staff coverage). The remaining 125 patients were approached. Of these, 100 (80%) patients agreed to participate. No significant differences in sex ($p=0.648$), race ($p=0.772$), or age ($p=0.393$) were observed between study participants and patients who declined study participation. Three patients did not receive nerve blocks, as per the anesthesiologist's decision in the operating room, and were excluded from the study. Another two patients withdrew prior to POD 2: one developed unrelated complications, and the other was advised by her personal care provider to withdraw from the study. Three patients could not be reached for postoperative follow-ups (Figure 1). Data analysis was performed for the remaining 92% of patients.

Distribution of Fibromyalgia Survey Scores

Fibromyalgia survey scores ranged from 0–13, out of a maximum of 31 (Figure 2; mean [SD]: 5.0 [3.3]). For univariate analyses, subjects were divided into tertiles, which were referred to as “very-low” (0–2; n=35), “low” (3–6; n=33), and “moderate” (7–13; n=24) groups (Table 1).

Basic Demographics and Preoperative Phenotypes

There were no significant differences in age (Table 1). There were a higher percentage of females in the moderate group compared to the very-low group ($p=0.031$). A larger percentage of Caucasians was observed in the low group compared to the moderate group ($p<0.001$).

Preoperatively, higher fibromyalgia survey scores were associated with increased pain severity at the surgical site ($p=0.047$). Neuropathic pain scores were significantly different between very-low and low or moderate groups. No differences in the duration of pain at the surgical site were observed between very-low and low groups; however, longer durations were reported in the moderate group compared to the low group ($p=0.047$). Few patients took opioids prior to surgery, as patients with chronic opioid use (defined as daily use of any opioid for 5 of the 7 days prior to surgery) were excluded from the study, and preoperative opioid use was not significantly different between groups (Table 1).

Lower results on preoperative physical functioning and quality of recovery scores were also associated with increases in fibromyalgia survey scores, and significant differences among groups were observed (Table 1). Depressive symptoms (0–21) were significantly greater in the moderate group than the low group ($p=0.003$). Anxiety symptoms (0–21) were also significantly different between low and moderate groups ($p=0.027$) and between very-low and moderate groups ($p<0.001$). In addition, significant increases between groups were observed for catastrophizing (0–36).

Furthermore, no differences in surgery type or anesthesia type were observed between the three tertiles of fibromyalgia survey scores.

Univariate Postoperative Pain Outcomes

The primary outcome of opioid consumption was assessed on POD 2. No differences in opioid consumption were observed between the three tertiles of fibromyalgia survey scores (Table 2). There were also no differences in the self-reported duration of the nerve block. No significant differences in pain severity scores were observed between groups. There were significant differences in physical function on POD 2, but the differences in quality of recovery and neuropathic pain were not significant in univariate analyses.

On POD 14, however, there was an association of increased opioid consumption with higher fibromyalgia survey scores. At this time point, opioid consumption was much higher in the low group than in the very-low group. Pain severity was only significantly different between very-low and low groups ($p=0.016$) (Table 2).

Multivariate Postoperative Pain Outcomes

A multivariate linear mixed model including all of the preoperative measures was used to determine characteristics independently associated with postoperative opioid consumption. Preoperative opioid use was associated with increased postoperative opioid consumption. As expected, the POD 14 time point was also associated with increased post-operative opioid consumption. No other associations were found (Table 3). Regularized variable selection using adaptive LASSO did not yield a better model per BIC (2172.49 for the regularized vs. 2164.10 for the reported model). The intercept represented the mean value of post-operative opioid consumption when all characteristics were set as “0.”

Similar multivariate linear mixed models were used to determine independent predictors of other postoperative outcomes. In particular, the fibromyalgia survey score was independently associated with poorer overall recovery, as measured by the change in quality of recovery score from baseline to POD 2. Preoperative opioid use and male sex were also independently associated with poorer recovery (Table 4). Regularized variable selection yielded a model with inferior BIC (916.13, regularized vs. 840.67, reported model), and is not reported. Model diagnostics was done using standardized residual plots and did not reveal any violation of model assumptions. Although the study was underpowered to robustly analyze individual item level data from the quality of recovery questionnaire, each item was assessed individually. The fibromyalgia survey score was independently associated with worse scores on the “Been free from headache, backache, or muscle pains” item (item level data not shown).

Discussion

This is the first study to examine whether the preoperative pain history, along with the fibromyalgia survey tool, could predict postoperative pain outcomes in shoulder arthroscopy patients. Higher fibromyalgia survey scores were not independently associated with postoperative opioid consumption in this patient population. Preoperatively, higher fibromyalgia survey scores were associated with a worse pain phenotype, including higher

depressive/anxiety symptoms, catastrophizing, and neuropathic pain, as well as decreased physical functioning and quality of recovery scores. Although the primary outcome was negative, lower preoperative fibromyalgia survey scores were independently associated with increased postoperative quality of recovery scores.

Shoulder surgeries are commonly performed to treat musculoskeletal pain.[23] Although patients undergoing lower-extremity joint replacement represent a population with more severe pain and dysfunction, it is possible that similar pain phenotypes could be seen in a shoulder surgery population. As was seen in the present study, the fibromyalgia survey score was recently shown to be associated with a worse preoperative pain phenotype in lower-extremity joint replacement patients.[11] In the previous study, the fibromyalgia score was also independently associated with higher postoperative opioid consumption, suggesting that it can predict postoperative pain outcomes. This led to the hypothesis that the fibromyalgia survey score may predict postoperative pain outcomes in other cohorts. Shoulder arthroscopic surgeries can potentially result in moderate-to-severe pain,[1, 23] although they are less invasive than lower-extremity joint replacement surgeries. On POD 2, the lowest tertile of fibromyalgia survey scores had significantly better physical function when compared to the other groups, as well as non-significant trends in lower opioid consumption, pain scores, and neuropathic pain.

In multivariate modeling, the only outcome measure that correlated with the continuous fibromyalgia score was the change in the quality of recovery scale. The specific components of this scale that were independently associated with the fibromyalgia survey score were the incidence of headaches, backaches, or muscle pains. The quality of recovery questionnaire has been used to evaluate post-surgical and post-anesthetic recovery.[24] This correlation suggests that certain preoperative aspects of patients with higher fibromyalgia survey scores, such as headaches, backaches or muscle pains, can predict decreases in the quality of recovery after surgery.

The fibromyalgia survey scores in our cohort ranged from 0 to 13 with a mean score of 5.0 (SD 3.3), and only two patients had a score of 13. In this population, with fibromyalgia survey scores that were overall low and in a relatively narrow range, the scores were not independent predictors of postoperative pain. Furthermore, this range was substantially narrower than that reported in lower-extremity joint arthroplasty patients, in which the mean score was 6.4 (SD 4.2), with approximately 8.5% with a score of 13 or greater.[11]

Another distinguishing feature of the cohort in this study was the exclusion of patients chronically taking opioids preoperatively. The rationale was to exclude opioid-tolerant patients to better assess opioid responsiveness; however, doing so may have also excluded patients that were more “fibromyalgia-like.” Studies have shown that many patients with fibromyalgia are prescribed opioids,[25, 26] despite expert opinion that they are not efficacious.[9] Another study from a tertiary care pain clinic found that patients taking opioids with persistently high pain despite opioid therapy appeared more fibromyalgia-like.[27] In the study of lower-extremity replacement surgeries,[11] the highest fibromyalgia tertile was more likely to be taking opioids and also on higher doses. Whereas preoperative opioid use was similarly predictive of increased postoperative opioid use, the fibromyalgia

survey score predicted additional variance. In our study, however, of the 178 patients who were assessed for eligibility, only 7 (4%) patients were excluded for chronic opioid use.

In the present study, patients in the low fibromyalgia group consumed more opioids postoperatively and had higher pain scores than patients in the very-low fibromyalgia survey score group on POD 14. It is therefore possible that the moderate use of opioids in the low group confounded the outcomes with respect to the fibromyalgia survey score. Patients in the highest fibromyalgia tertile were also more likely to have had surgery that was deemed less painful, although this was not significant.

Although the fibromyalgia survey score did not appear to predict postoperative pain outcomes, there are several strengths of this study. It is the first to assess fibromyalgia survey scores in shoulder arthroscopy patients, and the outcomes data were collected prospectively. It is also the first to assess the fibromyalgia measure in an ambulatory setting, as the previous study by Brummett et al. was performed in an inpatient setting with more complicated surgeries.[11]

Our findings further increase our knowledge of acute post-surgical pain, especially with regard to fibromyalgia and other pain-related factors, such as anxiety and quality of recovery. Despite a great deal of interest in the topic, predicting and adequately treating acute and subacute pain remains challenging. Many experts have suggested that measures of depression, anxiety, and catastrophizing can predict pain and opioid use postoperatively; however, these measures were not independently associated with the acute pain outcomes assessed in this population.

Limitations

The range of fibromyalgia scores was quite narrow, as compared to the lower-extremity joint arthroplasty study.[11] Fibromyalgia scores in that cohort ranged from 0–31, whereas the maximum score in our cohort was 13. It is unclear if the different results in this study compared to the lower-extremity joint arthroplasty study are related to different surgical procedures or patient populations with a different extent of “fibromyalgia-ness”. Another possible explanation for differing results is that in this study, opiates were given for pain scores >3, whereas criteria were not specified in earlier studies. Furthermore, it is unknown if general anesthesia alone, without a peripheral nerve block, would result in similar findings. It may be that the use of a structured regional anesthesia protocol and multimodal analgesic regimen led to a lower effect size for opioid consumption, thereby leaving the study underpowered to detect any differences. Given that this is the first study to ever investigate the associations between higher fibromyalgia scores and opioid consumption in a shoulder surgery population, power was determined using data from knee and hip arthroplasty.[11] We also excluded patients who used opioids daily, whereas these subjects were included in the arthroplasty study. However, out of the 178 patients that were assessed for eligibility, only 7 were excluded for having chronic opioid use. Lastly, given the narrow, lower range of fibromyalgia survey scores in this cohort, it is possible that a difference would have been seen with a larger cohort.

Conclusions

The fibromyalgia survey score did not predict postoperative opioid consumption and pain in shoulder arthroscopy patients at our institution. However, the measure did predict poorer quality of postoperative recovery, thus indicating a possible need for closer follow-up. Higher fibromyalgia scores were also associated with a worse preoperative pain phenotype. This suggests that it can be reliably used as a simple means to categorize patients preoperatively. Further studies are needed to determine whether the fibromyalgia survey measure can be used to predict postoperative pain after other types of surgical procedures in different outpatient populations.

Acknowledgments

Conflicts of Interest and Sources of Funding: This study was supported by the Research and Education Fund (Department of Anesthesiology, Hospital for Special Surgery) and the National Center for Advancing Translational Science of the National Institute of Health (UL1TR000457; REDCap). D.M.D. received consultancy fees and royalties from Biomet, Inc. (unrelated to current work). L.V.G. received consultancy fees and payment for lectures from Biomet, Inc. (unrelated to current work). C.M.B. received consultancy fees from Biomet, Inc. and grants from American Society of Regional Anesthesia and Pain Medicine Chronic Pain Research, RO1 AR 060392, and the Michigan Genomics Initiative (unrelated to current work). For the remaining authors, none were declared.

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Figure 1.

STROBE flow diagram. The numbers of eligible, excluded, approached, declined, and consented patients are shown. All consented patients completed baseline phenotyping assessments. After surgery, 8 patients were excluded for various reasons, and the assessment of acute pain outcomes was performed in 92 patients.

Figure 2. Distribution of fibromyalgia survey scores. In this patient population, fibromyalgia survey scores ranged from 0 to 13, out of a maximum of 31.

Table 1

Basic Demographics And Preoperative Phenotypes

	Very Low (n=35)	Low (n=33)	Moderate (n=24)	P Value (Overall Regression)	P Value (Very Low vs. Low)	P Value (Very Low vs. Moderate)	P Value (Low vs. Moderate)
Age (yrs)	51 (16.2)	47 (13.9)	50 (13.0)	0.565	0.311	0.882	0.441
Sex (% female)	22.9	39.4	50	0.085	0.139	*0.031	0.426
Race (%)							
Caucasian	82.9	90.9	70.8	*0.044	0.058	0.544	*<0.001
African American	5.7	9.1	8.3				
Other	0.1	0	0.2				
Fibromyalgia survey score (0–31)	1.5 (0.6)	4.4 (1.3)	9.1 (1.8)	*<0.001	*<0.001	*<0.001	*<0.001
Pain severity at surgical site (0–10)	3.6 (2.2)	4.3 (1.7)	5.4 (2.2)	*0.004	0.143	*0.001	*0.047
Neuropathic pain (1–11[+38])	4.2 (4.0)	6.7 (5.5)	8.1 (5.3)	*0.008	*0.035	*0.003	0.295
Duration of pain in surgical site (days)	505 (660)	341 (308)	706 (1021)	0.139	0.325	0.268	*0.047
Opioid use (% on opioids)	2.8	9.1	4.2	0.510	0.266	0.787	0.460
Physical Functioning (0–50)	43.9 (5.2)	39.1 (6.8)	36.6 (6.1)	*<0.001	*0.001	*<0.001	0.123
QoR-9 (0–18)	16.6 (1.5)	16.2 (1.6)	14.8 (2.2)	*<0.001	0.360	*<0.001	*0.002
Anxiety symptoms (0–21)	2.9 (2.2)	4.2 (2.9)	6.2 (4.7)	*0.001	0.091	*<0.001	*0.027
Depressive symptoms (0–21)	1.7 (1.9)	2.3 (2.1)	4.1 (2.7)	*<0.001	0.209	*<0.001	*0.003
Catastrophizing (0–36)	1.4 (2.5)	2.4 (2.7)	5.6 (5.7)	*<0.001	0.297	*<0.001	*0.001
Surgery (% less painful)	2.9	6.1	12.5	0.349	0.517	0.149	0.400
Anesthesia (% IV sedation with SCB)	97.1	90.9	100	0.156	0.266	0.304	0.065

* P<0.05; QoR-9: Nine-item quality of recovery assessment score; IV: intravenous; SCB: supraclavicular block. Unless otherwise noted, results are "mean (standard deviation)."

Table 2**Postoperative Outcomes**

	Very Low (n=35)	Low (n=33)	Moderate (n=24)	P Value (Overall Regression)	P value (Very Low vs. Low)	P Value (Very Low vs. Moderate)	P Value (Low vs. Moderate)
Postoperative day 2							
Opioid consumption (OME)	55.6 (33.2)	72.4 (56.7)	60.1 (44.4)	0.301	0.130	0.710	0.317
Pain severity (0-10)	4.3 (2.2)	4.8 (1.7)	5.1 (1.6)	0.279	0.285	0.123	0.578
Neuropathic Pain	4.4 (4.2)	5.6 (3.7)	6.6 (4.7)	0.130	0.240	*0.046	0.361
QoR-9	15.6 (2.6)	14.7 (2.4)	14.5 (3.5)	0.245	0.180	0.132	0.783
Physical Functioning	33.8 (5.8)	29.3 (5.1)	27.0 (5.5)	*<0.001	*0.008	*<0.001	0.208
Block duration (min)	1465 (251)	1577 (274)	1451 (296)	0.731	0.505	0.935	0.491
Postoperative day 14							
Opioid consumption (OME)	112 (103)	206 (181)	146 (102)	*0.018	*0.005	0.361	0.111
Pain severity (0-10)	2.5 (2.2)	3.7 (2.0)	3.2 (1.8)	0.051	*0.016	0.175	0.422

* P<0.05; OME: oral morphine equivalents; QoR-9: Nine-item quality of recovery assessment score. Results are “mean (standard deviation).”

Table 3
Multivariate Analysis of Total Postoperative Opioid Consumption (Best Model)

	Estimate (Regression Coefficient)	SE	P value
Intercept	58.345	10.894	* <0.001
Time-POD 14	91.523	12.042	* <0.001
Preoperative opioid use	82.643	39.222	* 0.038

* P<0.05; POD: postoperative day; SE: standard error.

Table 4
Multivariate Analysis of Quality of Recovery Score (Best Model)

	Estimate (Regression Coefficient)	SE	P value
Intercept	16.125	0.460	* <0.001
Time-POD 2	-1.022	0.296	* 0.001
Sex (M)	1.231	0.382	* 0.002
Fibromyalgia survey score	-0.185	0.056	* 0.001
Preoperative opioid use	-1.649	0.773	* 0.036

* P<0.05; POD: postoperative day; M: male; SE: standard error.