# Comparison of Total Inpatient Opioid Usage in Postoperative Bariatric Patients Managed With and Without Continuous Lidocaine Infusion

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## Abstract

Enhanced recovery after surgery (ERAS) protocols have shown to decrease morbidity and length of hospital stays, but remain highly variable by institution for bariatric surgery. Opioid-naïve bariatric surgery patients may also have greater risk of chronic opioid usage. Our study aimed to determine the effectiveness of continuous lidocaine infusions in reducing postoperative opioid use in bariatric surgery patients.

## Methods

We conducted a retrospective cohort study of 116 elective bariatric surgery patients who underwent robotic sleeve gastrectomy, Roux-en-Y gastric bypass, or bypass revisions between 9/3/2021 to 3/1/2022. Our institution's incorporation of continuous lidocaine infusion into our ERAS protocol initiated on 11/1/2021. There were 46 patients from 9/3/2021 to 10/29/2021 under the non-lidocaine infusion protocol and seventy patients from 11/1/2021 to 3/1/2022 under the lidocaine infusion protocol. Our exposure variable was whether or not patients received lidocaine infusions post-operatively. Our main outcome variables were total opioid use during the hospitalization calculated in morphine milligram equivalents and length of hospital stay in hours. Study variables were selected based on previous literature and potential confounding effects without our exposure or outcome variables. Subgroup analyses between the total MME used in the lidocaine infusion and non-infusion groups were performed by surgery length in hours, gender, and BMI subgroups. Continuous variables were compared using Student's t-test and categorical variables using Chi-square tests. Analyses were performed using SAS 9.4.

## Results

No significant differences were observed between lidocaine infusion and non-lidocaine infusion groups with age, gender, race, BMI subgroups, past surgical history, chronic pain history, chronic pain medication and opioid use, 30-day readmission rates, type of surgery (robotic sleeve gastrectomy, Roux-en-Y gastric bypass, or gastric bypass revision), whether or not a hiatal hernia repair was also performed, surgery time in hours, or type of TAP block used. Patients that underwent robotic sleeve gastrectomies demonstrated significantly lower overall MME use during their hospitalization in the lidocaine infusion group compared to those in the non-infusion group (94 MME versus 118 MME, p=0.03).

**Table 1. Characteristics of study participants overall and by case and non-case status**

| Characteristic | Overall | No Lidocaine Drip | Lidocaine Drip | P [b] |
|---|---|---|---|---|
| **Total, N (%)** | 116 (100) | 46 (39.7) | 70 (60.3) | |
| **Age, y, mean (SD)** | 41.4 (10.2) | 42.3 (10.9) | 40.8 (9.8) | 0.42 |
| **Gender, N (%)** | | | | |
| **Female** | 97 (83.6) | 38 (32.8) | 59 (50.9) | 0.81 |
| **Male** | 19 (16.4) | 8 (6.9) | 11 (9.5) | |
| **Race, N (%)** | | | | |
| **White** | 42 (36.2) | 21 (18.1) | 21 (18.1) | 0.22 |
| **African American** | 71 (61.2) | 24 (20.7) | 47 (40.5) | |
| **Hispanic** | 1 (0.9) | 0 | 1 (0.9) | |
| **Asian** | 1 (0.9) | 0 | 1 (0.9) | |
| **Middle Eastern** | 1 (0.9) | 1 (0.9) | 0 | |
| **Tobacco Use, N (%)** | | | | |
| **Never** | 87 (75.0) | 30 (25.9) | 57 (49.1) | **0.05** |
| **Current** | 0 | 0 | 0 | |
| **Former** | 29 (25.0) | 16 (13.8) | 13 (11.2) | |
| **Alcohol Use, N (%)** | | | | |
| **Never** | 47 (40.5) | 18 (15.5) | 29 (25.0) | 0.71 |
| **Current daily** | 1 (0.9) | 0 | 1 (0.9) | |
| **Current occasional** | 58 (50.0) | 25 (21.5) | 33 (28.5) | |
| **Former** | 10 (8.6) | 3 (2.6) | 7 (6.0) | |
| **Other Substance Use, N (%)** | | | | |
| **Never** | 104 (89.7) | 42 (36.2) | 62 (53.5) | 0.12 |
| **Current** | 5 (4.3) | 0 | 5 (4.3) | |
| **Former** | 7 (6.0) | 4 (3.5) | 3 (2.6) | |
| **Weight, kg, mean (SD)** | 125.2 (27.6) | 125.3 (26.8) | 125.2 (28.3) | 0.99 |
| **BMI, kg/m², mean (SD)** | 45.6 (8.3) | 45.5 (7.8) | 45.6 (8.7) | 0.95 |
| **<25** | 1 (0.9) | 0 | 1 (0.9) | 0.87 |
| **25 to <30** | 3 (2.6) | 1 (0.9) | 2 (1.7) | |
| **30 to <35** | 4 (3.5) | 2 (1.7) | 2 (1.7) | |
| **35 to <40** | 15 (12.9) | 7 (6.0) | 8 (6.9) | |
| **>40** | 93 (80.2) | 36 (31.0) | 57 (49.1) | |
| **Past Surgical History [a]** | | | | |
| **No** | 40 (34.5) | 13 (11.2) | 27 (23.3) | 0.25 |
| **Yes** | 76 (65.5) | 33 (28.5) | 43 (37.1) | |
| **Chronic Pain, N (%)** | | | | |
| **No** | 100 (86.2) | 39 (33.6) | 61 (52.6) | 0.71 |
| **Yes** | 16 (13.8) | 7 (6.0) | 9 (7.8) | |
| **Chronic Pain Med Use, N (%)** | | | | |
| **No** | 97 (83.6) | 37 (31.9) | 60 (51.7) | 0.45 |
| **Yes** | 19 (16.4) | 9 (7.8) | 10 (8.6) | |
| **Chronic Opioid Use, N (%)** | | | | |
| **No** | 105 (90.5) | 40 (34.5) | 65 (56.0) | 0.29 |
| **Yes** | 11 (9.5) | 6 (5.2) | 5 (4.3) | |
| **Readmissions within 30 days, N (%)** | | | | |
| **No** | 113 (97.4) | 46 (39.7) | 67 (57.8) | 0.15 |
| **Yes** | 3 (2.6) | 0 | 3 (2.6) | |

[a] PSH – major abdominal, orthopedic/spinal
[b] p-values obtained through t-test for continuous and chi-square for categorical variables

**Table 2. Total MME between case and non-case status, overall and by subgroups**

| MME | Overall, N (%) | Overall MME | No Lidocaine Drip | Lidocaine Drip | P [a] |
|---|---|---|---|---|---|
| **Overall MME (SD)** | 116 | 109 (55.0) | 118 (54.5) | 103 (55.0) | 0.15 |
| **Surgery** | | | | | |
| **Sleeve** | 91 (78.5) | 103 (52.6) | 118 (54.0) | 94 (49.9) | **0.03** |
| **RYGB** | 21 (18.1) | 130 (64.5) | 118 (61.6) | 142 (68.0) | 0.42 |
| **Revision** | 4 (3.5) | 123 (31.1) | 105 | 35 (20.3) | 0.61 |
| **Gender** | | | | | |
| **Female** | 97 (83.6) | 108 (54.6) | 114 (51.5) | 104 (56.7) | 0.41 |
| **Male** | 19 (16.4) | 113 (58.4) | 138 (67.0) | 95 (46.5) | 0.12 |
| **BMI, kg/m²** | | | | | |
| **<25** | 1 (0.9) | 93 | - | - | |
| **25 to <30** | 3 (2.6) | 160 (53.8) | 105 (n/a) | 188 (35.4) | 0.31 |
| **30 to <35** | 4 (3.5) | 73 (27.6) | 81 (44.2) | 64 (5.3) | 0.63 |
| **35 to <40** | 15 (12.9) | 114 (57.2) | 128 (65.0) | 101 (50.3) | 0.38 |
| **>40** | 93 (80.2) | 108 (55.2) | 118 (54.2) | 102 (55.4) | 0.16 |

[a] Other TAP block either not administered or not specified
[b] p-values obtained through t-test for continuous and chi-square for categorical variables

**Table 3. Length of stay between case and non-case status, overall and by subgroups**

| Length of Stay | Overall, N (%) | Overall MME | No Lidocaine Drip | Lidocaine Drip | P [a] |
|---|---|---|---|---|---|
| **LOS, hours (SD)** | 116 | 36 (18.9) | 40 (22.8) | 34 (15.6) | 0.09 |
| **Surgery, hours (SD)** | | | | | |
| **Sleeve** | 91 (78.5) | 34 (14.8) | 35 (9.9) | 33 (15.8) | 0.66 |
| **RYGB** | 21 (18.1) | 46 (32.5) | 56 (25.0) | 37 (25.5) | 0.18 |
| **Revision** | 4 (3.5) | 31 (11.5) | 49 (n/a) | 26 (0.7) | **<0.01** |
| **Gender, hours (SD)** | | | | | |
| **Female** | 97 (83.6) | 37 (20.1) | 40 (24.6) | 34 (16.5) | 0.17 |
| **Male** | 19 (16.4) | 33 (10.5) | 38 (11.2) | 30 (9.1) | 0.11 |
| **BMI, kg/m², hours (SD)** | | | | | |
| **<25** | 1 (0.9) | 25 | - | - | |
| **25 to <30** | 3 (2.6) | 39 (11.2) | 49 | 34 (10.1) | 0.44 |
| **30 to <35** | 4 (3.5) | 27 (2.4) | 27 (1.3) | 28 (3.9) | 0.84 |
| **35 to <40** | 15 (12.9) | 35 (10.3) | 37 (11.2) | 33 (9.8) | 0.51 |
| **>40** | 93 (80.2) | 37 (20.6) | 41 (25.1) | 34 (16.8) | 0.13 |

[a] p-values obtained through t-test for continuous and chi-square for categorical variables

## Conclusion

**ERAS protocols in numerous surgical specialties, including bariatric and endoscopic surgeries, have consistently shown to decrease morbidity and length of hospital stays. Protocols, however, have remained variable by institution.**

**At our institution, patients undergoing robotic sleeve gastrectomies have shown to require significantly less opioid medication by MME during their hospitalization in those receiving continuous lidocaine infusion compared to those who did not. This present study suggests that incorporating continuous lidocaine infusion postoperatively for bariatric sleeve patients may reduce the need for opioid dependence during the recovery period.**

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## References

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