Preoperative Opioids and Postoperative Complications After Hernia Repair

[1] Jad Mazboudi; [2] Bryan Yavari; [1] Matthew L. Hovancsek; [1] Keshav Nandakumar; [2] Aria Soltankhah; [2] Joshua A. Rokaw, MD

[1] **Creighton University Arizona Health Education Alliance**
[2] **University of Arizona College of Medicine - Phoenix**

Creighton UNIVERSITY | Arizona Health Education Alliance

INTRODUCTION

Chronic pain affects a substantial share of patients presenting for elective hernia repair, and opioids remain among the most widely prescribed agents for its long-term management despite growing awareness of their risks. Preoperative opioid exposure has been linked to a range of physiologic effects that may plausibly worsen surgical recovery: opioid-induced bowel dysfunction slows gastrointestinal motility and raises the risk of postoperative ileus, opioid-mediated immunosuppression may impair wound healing and increase susceptibility to infection, and central respiratory depression can compound the pulmonary risks of anesthesia and abdominal surgery.

Despite these plausible mechanisms, the real-world impact of preoperative opioid use on outcomes after hernia repair specifically has not been well characterized in a large, generalizable population. Using a large multi-institutional real-world database, we compared 180-day postoperative outcomes between hernia repair patients with and without documented preoperative opioid use.

MATERIALS AND METHODS

This retrospective cohort study used TriNetX, a large multi-institutional real-world database.

- Index event: date of hernia/fascial repair; outcomes assessed over the following 180 days
- Preoperative opioid exposure defined as ≥ 1 opioid analgesic fill within the 1-year window before repair, identified via outpatient pharmacy claims
- Outcomes (MI, stroke, heart failure, respiratory failure, infection, opioid-related disorders, paralytic ileus) each excluded patients with a prior occurrence of that specific outcome before the index event
- Risk ratios, odds ratios, and z-tests were calculated for each outcome in the matched cohorts, with statistical significance set at α = 0.05
- Analyses were performed using TriNetX's built-in statistical platform, which applies greedy nearest-neighbor 1:1 propensity score matching without replacement

Patients Identified

Cohort 1 (opioid-exposed): n = 22,860
Cohort 2 (opioid-naïve): n = 51,410
Hernia/fascial repair, ICD-10-PCS

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1:1 Propensity Score Matching

Matched on age, sex, race, ethnicity, and 13 comorbidities
(hepatic, biliary, GI, musculoskeletal, metabolic, cardiovascular, pulmonary, substance use)

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Matched Cohorts

n = 22,440 per cohort
All standardized differences <0.06

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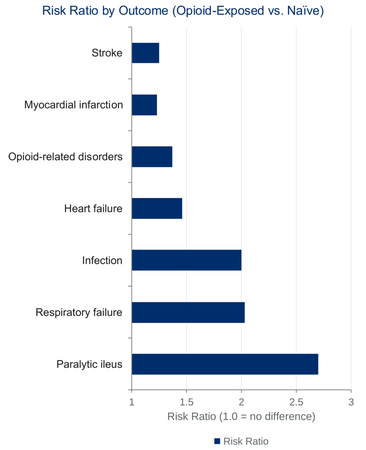
180-Day Outcome Assessment

MI, stroke, heart failure, respiratory failure, infection, opioid-related disorders, paralytic ileus - each excluding prior occurrence

RESULTS

After 1:1 propensity score matching, cohorts were well balanced across all matched demographic and comorbidity variables (all standardized differences <0.06). Patients with documented preoperative opioid exposure had significantly higher 180-day risk across five of the seven assessed outcomes, with effect sizes ranging from a 37% to a 170% relative increase in risk:

Outcome	Exposed	Naïve	RR (95% CI)	p-value
Paralytic ileus	5.4%	2.0%	2.70 (2.42 - 3.01)	<0.001
Respiratory failure	3.6%	1.8%	2.03 (1.79 - 2.29)	<0.001
Infection	4.8%	2.4%	2.00 (1.80 - 2.23)	<0.001
Heart failure	1.7%	1.1%	1.46 (1.24 - 1.72)	<0.001
Opioid-related disorders	0.7%	0.5%	1.37 (1.07 - 1.75)	0.012
Myocardial infarction	0.5%	0.4%	1.23 (0.93 - 1.62)	0.147
Stroke	0.5%	0.4%	1.25 (0.93 - 1.68)	0.134



Exposed = documented preoperative opioid use; Naïve = no documented preoperative opioid use (both matched cohorts, n = 22,440 each).

Paralytic ileus showed the largest association (RR 2.70; 5.4% vs 2.0%), followed by respiratory failure and infection. Myocardial infarction and stroke were not statistically significant. Findings were consistent across risk ratio, odds ratio, and risk difference analyses.

DISCUSSION

Preoperative opioid exposure was associated with higher rates of paralytic ileus, respiratory failure, and infection after hernia repair, consistent with known opioid effects on gastrointestinal motility, respiratory drive, and immune function.

Paralytic ileus showed the largest association (RR 2.70; 5.4% vs 2.0%), suggesting that preoperative opioid exposure may be an important perioperative risk marker in this population.

Because this was a retrospective claims-based study, causality cannot be established and residual confounding remains possible. These findings support further evaluation of opioid-sparing strategies and prospective, dose-stratified studies.

STUDY COHORT AT A GLANCE

74,270
Total patients identified (22,860 opioid-exposed + 51,410 opioid-naïve)

22,440
Patients per cohort after 1:1 propensity score matching

<0.06
Standardized difference across all 17 matched covariates

180
Days of postoperative outcome follow-up

REFERENCES

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