



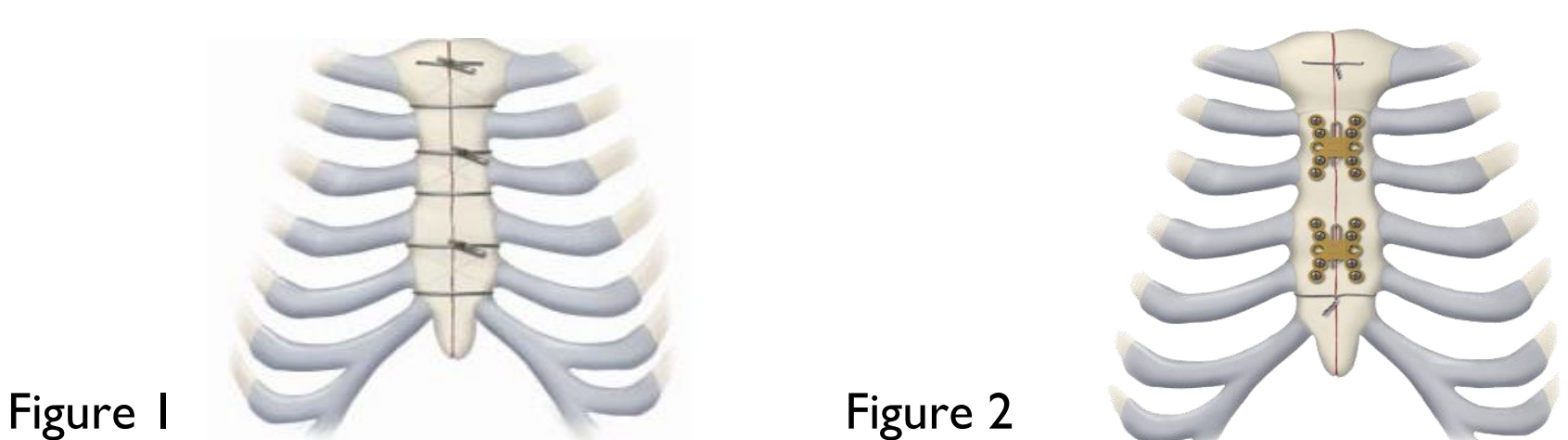
Sternal Plate Versus Wire Closure: Predictors and Short-Term Outcomes



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INTRODUCTION

- 700,000 U.S. patients undergo midline sternotomy each year for open-heart surgery.
- Stainless steel wires remain the standard for closure, with recovery lasting ~8 weeks (Figure 1).



- Sternal plates have recently emerged as an alternative or adjunct fixation method and are now recommended in enhanced recovery after cardiac surgery guidelines (Figure 2).
- Primary goal:** To identify patient factors associated with the choice of fixation and to evaluate differences in postoperative outcomes.

METHODS

- Design:** Retrospective review of adult patients (≥18) undergoing median sternotomy (Jan 2022–Jan 2024) at Albany Medical College
- Groups:** Patients categorized by fixation type (wires or plates); exclusions included LOS >120 days, undocumented fixation, or missing data.
- Data:** Demographics, comorbidities, operative details, LOS, opioid/adjunct analgesic use, and complications (reoperation, 30-day readmission).
- Analysis:** ANOVA/Kruskal–Wallis for continuous variables; Chi-square/Fisher’s exact for categorical; p<0.05 significant.

RESULTS

Table 1

- A significant difference in BMI was observed between the two groups, with plate fixation patients having a higher median BMI of 31.5 (28.2–35.7) compared to 28.4 (24.7–32.6) in the wire closure group (Figure 1).
- Postoperative opioid use was significantly lower in the plate group, with a median of 117.6 (66.9–183.6) mg OME compared to 161.7 (96.0–251.1) mg OME in the wire group (p = 0.005) (Figure 2).
- Cardiopulmonary bypass time was significantly longer in the plate group, with a median of 149.0 (67.0–186.0) minutes compared to 120.0 (45.0–155.0) minutes in the wire group (p = 0.008).
- There were no significant differences between groups in hospital length of stay or acute pain levels as measured by VAS scores.

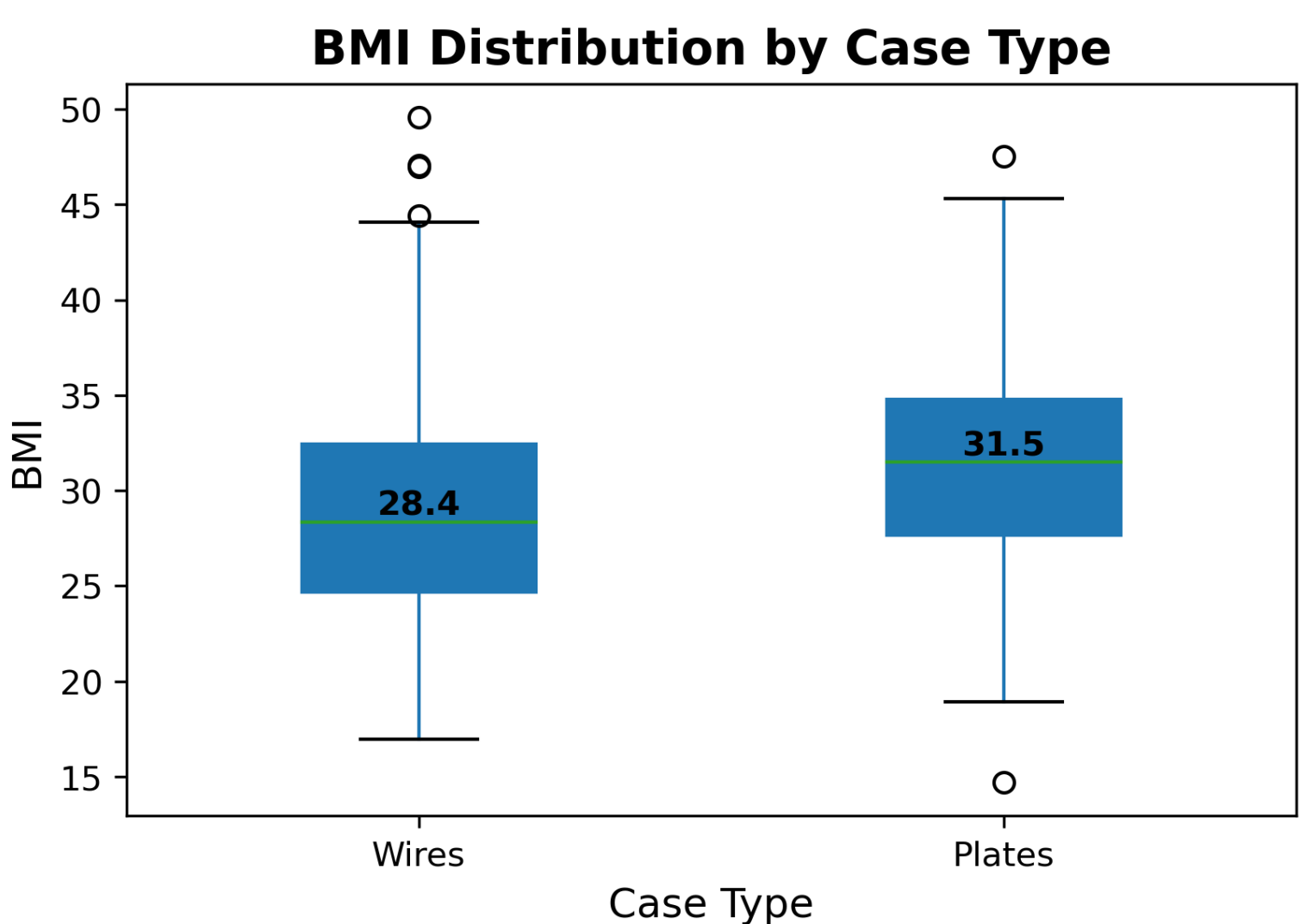


Figure 1

Table 1: Patient Characteristics and Measured Outcomes

Patient Characteristics		
	Wires (n=145)	Plates (n=83)
Age (Years)	65.0 (58.0, 70.0)	67.0 (60.0, 71.0)
Body Mass Index (kg/m²)	28.4 (24.7, 32.6)	31.5 (28.2, 35.7)
Male	108 (74.5%)	66 (79.5%)
Measured Outcomes		
Cardiopulmonary Bypass Time (Minutes)	120.00 (45.00, 155.00)	149.00 (67.00, 186.00)
Hospital Length of Stay (Days)	10.0 (7.0, 14.0)	9.0 (6.0, 12.0)
Postoperative Length of Stay (Days)	8.0 (6.0, 10.5)	7.0 (5.0, 9.0)
Average Pain Score in First 24 Hours	4.00 (0.00, 5.67)	4.00 (0.00, 5.00)
Opioid use from Extubation to 48hrs (OME)	97.2 (57.6, 144.8)	83.1 (47.7, 114.6)
Opioid use from 48hrs to Discharge (OME)	45.0 (7.5, 135.0)	22.5 (0.0, 75.0)
Total Opioid Use (OME)	161.7 (96.0, 251.1)	117.6 (66.9, 183.6)

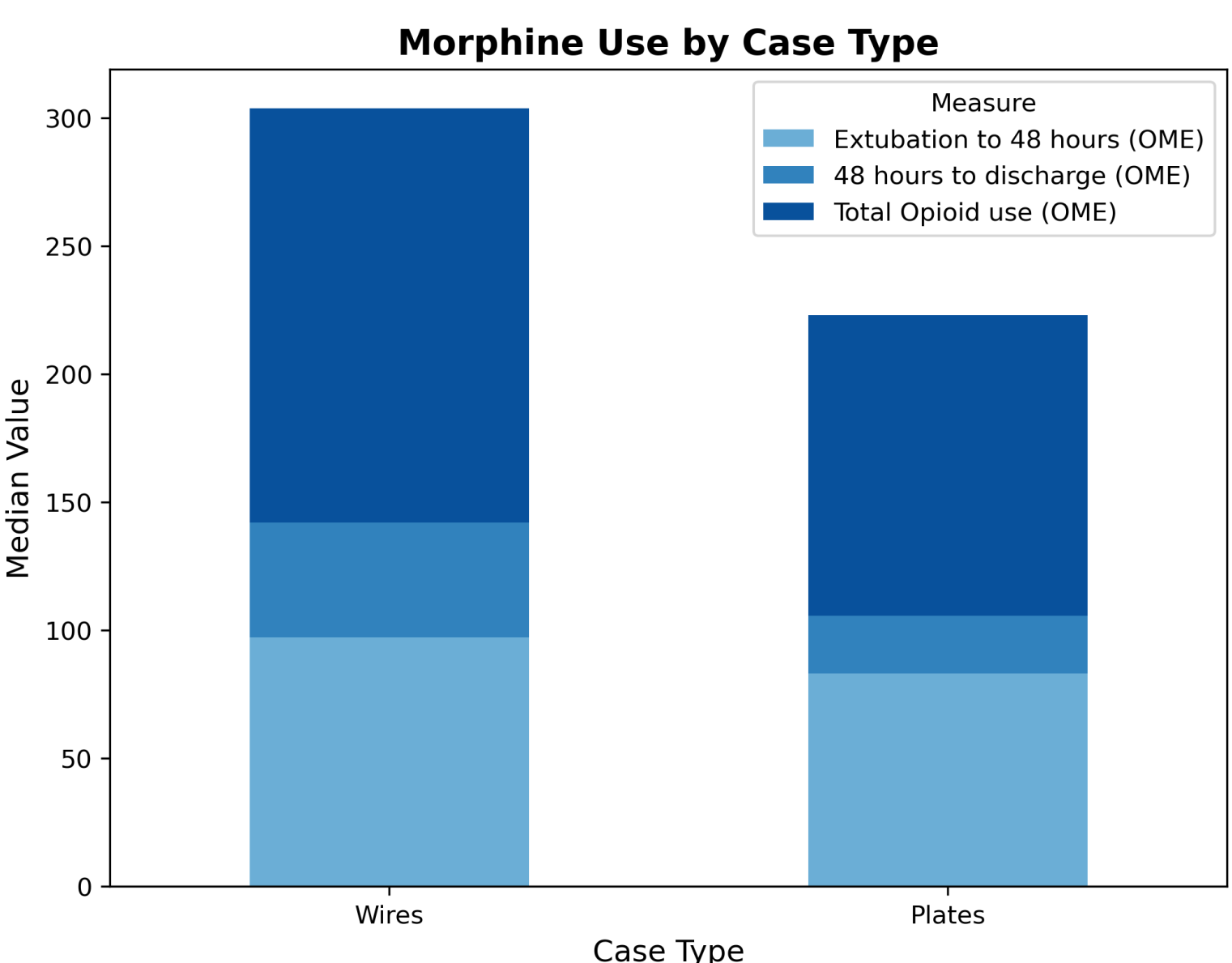


Figure 2

DISCUSSION

- Plates more often used in higher-BMI patients (likely for improved sternal stability)
- Longer bypass times in the plates group, potentially reflecting greater surgical complexity or the higher BMI of these patients.
- Significantly lower postoperative opioid use with plates
- No differences in pain scores or hospital length of stay
- Strengths:** large sample size, contemporary cohort
- Limitations:** retrospective design, potential surgeon selection bias

CONCLUSIONS

- Plate fixation was safe and effective for sternal closure.
- More frequently chosen in higher-BMI patients, reflecting surgeon concern for stability.
- Longer bypass times likely reflect case complexity, not fixation method.
- Future work should assess cost-effectiveness, respiratory outcomes, and patient-centered measures.

REFERENCES

