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Abstract

Introduction: Since the introduction and widespread adoption of laparoscopic surgery, ongoing efforts have aimed to optimize and enhance this minimally invasive approach. Among these innovations is robotic surgery, supported by the development of multiple platforms worldwide. While laparoscopic surgery is firmly established in modern practice, robotic surgery has yet to be fully integrated. A key point of debate is whether robotic surgery provides meaningful advantages over laparoscopy in terms of patient outcomes and healthcare efficiency, particularly given concerns about longer operative times.

Methods: A retrospective review was conducted of all cholecystectomies performed at a single center in 2024, regardless of surgical approach or indication. Data collected included operative time, length of stay, diagnosis, and final pathology. Surgeons were categorized by robotic experience: early adopters (>12 months of experience) and late adopters (<12 months). Operative times were then compared among early adopters, late adopters, and laparoscopic cases.

Results: A total of 514 cholecystectomies were performed in 2024: 95 laparoscopic and 418 robotic. Mean operative time was 124.5 minutes (range: 27–314) for laparoscopic and 141.5 minutes (range: 23–449) for robotic cases. Among robotic procedures, early adopters had a mean operative time of 136.1 minutes (range: 23–449), while late adopters averaged 123.4 minutes (range: 44–396). Conversion to open occurred in 3/95 (3%) laparoscopic cases, 4/276 (1.5%) early adopter cases,, and 2/137 (1.5%) late adopter cases..

Conclusions: Robotic cholecystectomy is reported to have a shorter learning curve compared with laparoscopy. Although early in the learning process operative times are longer, efficiency appears to improve with increased experience, showing times similar if not faster than laparoscopy. A key limitation of this study is the lack of “console time” data, which would allow for a more accurate assessment of active operative duration in robotic cases.

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- Among these innovations is robotic surgery, supported by the development of multiple platforms worldwide.
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- A key point of debate is whether robotic surgery provides meaningful advantages over laparoscopy in terms of patient outcomes and healthcare efficiency, particularly given concerns about longer operative times.

Graphs

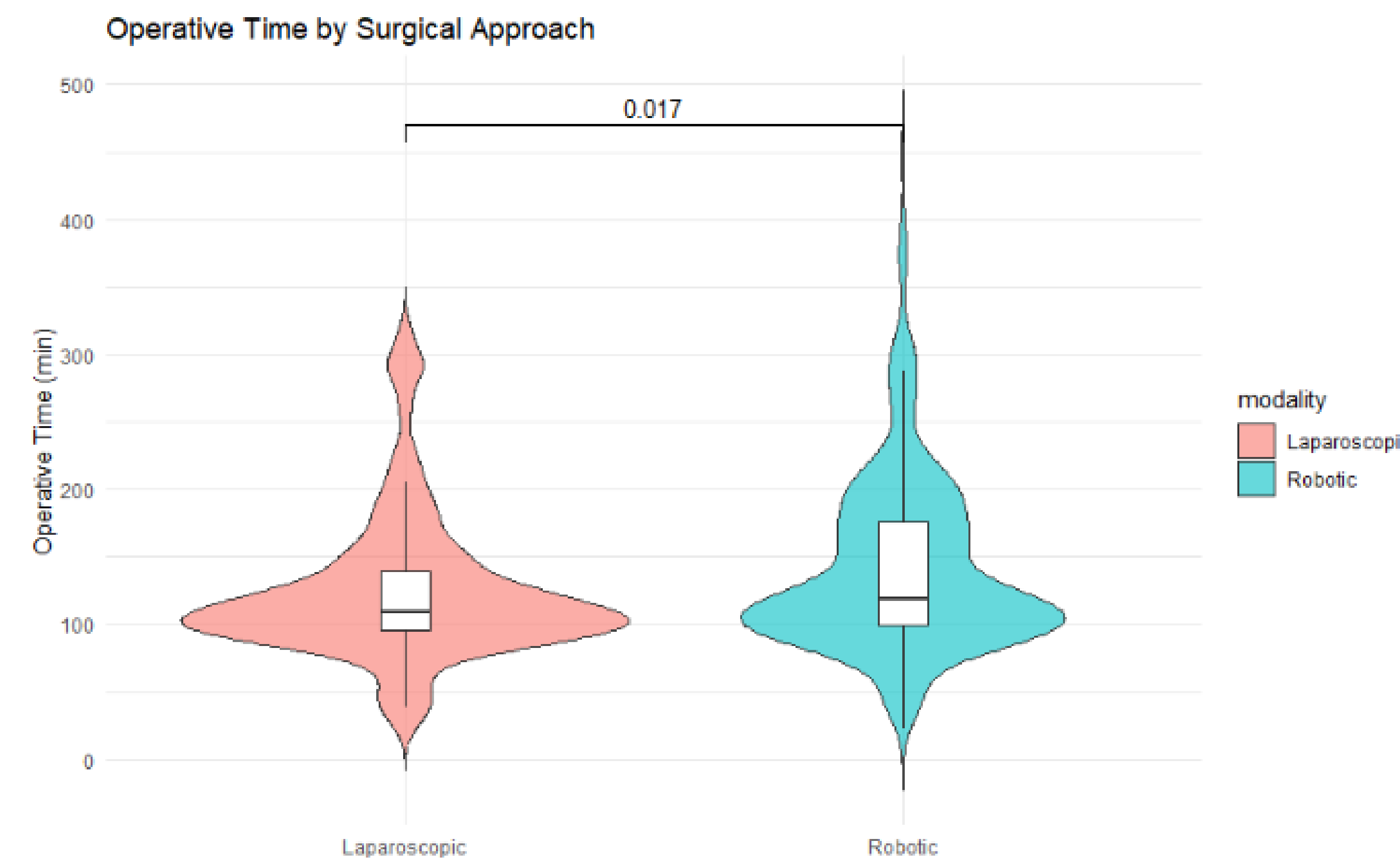


Figure 1: operative time distribution between laparoscopic and robotic cholecystectomy

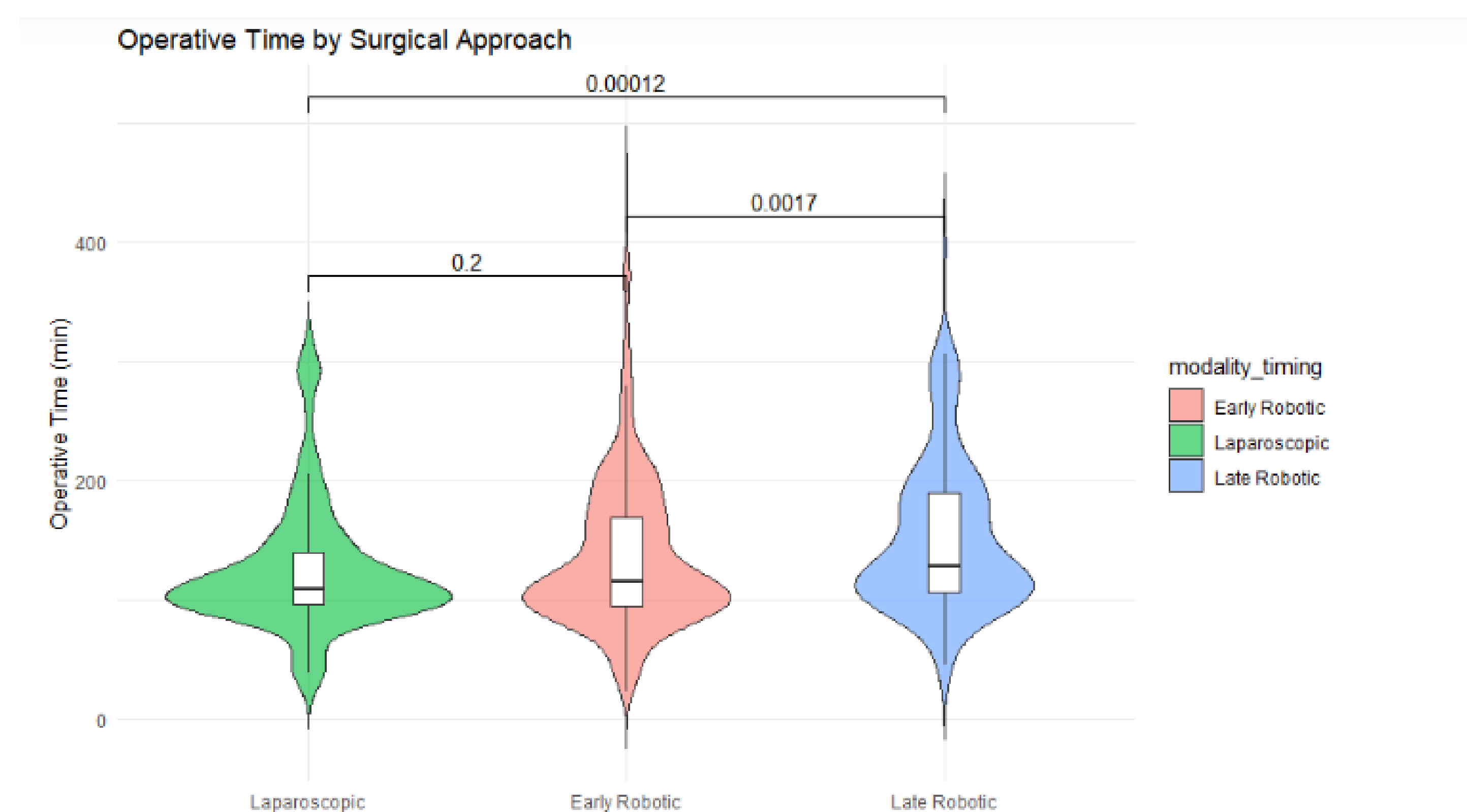


Figure 2: Operative time distribution between laparoscopic and robotic cholecystectomy, separated by early adopters and late adopters.

Methods

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