Adoption and Comparative Outcomes of Robotic vs. Laparoscopic Cholecystectomy

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Introduction

- Laparoscopic cholecystectomy (LC) has become the standard of care over open approach over the past decades in the US.
- However, increasing number of cholecystectomies are currently being performed using robotic platforms with constant advancement in surgical robotic technique.

Objective

- Examine the robotic cholecystectomy (RC) adoption trend at our institution.
- Compare perioperative outcomes between open vs laparoscopic vs robotic cholecystectomy.

Methods

- We identified all patients who underwent cholecystectomy as the index operation at our institution from January 2016 through July 2022.
- Surgical approach and clinical outcomes (including perioperative complications, same-day discharge, and 30-day readmission rates) were collected.
- Change in surgical approach over time was calculated using a simple linear regression.
- Comparison of means were conducted using a two-tailed two-sample t-test.
- Rate comparisons were conducted using a two-tailed two proportion z-test.

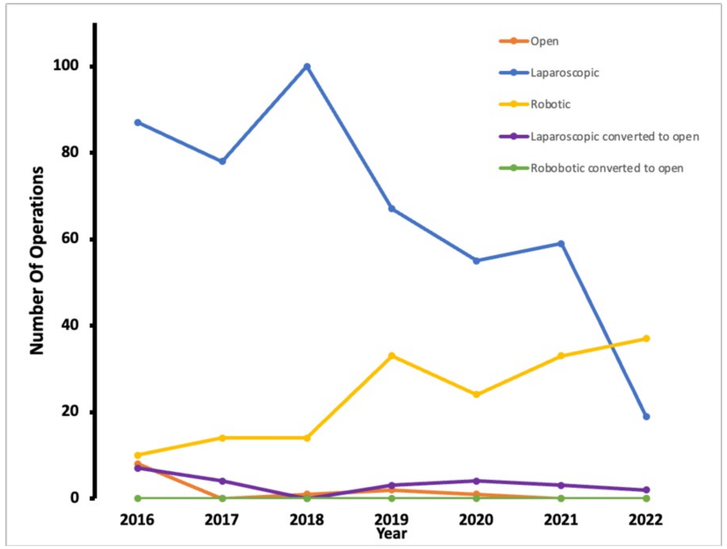


Figure 1. Trend in Surgical Approach for Cholecystectomy

Table 1. Clinical outcomes following laparoscopic and robotic cholecystectomies.

	Laparoscopic (n=488)	Robotic (n=165)	p-value
Age			
Mean (SD)	59.8 (15.8)	60.8 (15.6)	0.4664
Median (Range)	62 (29-97)	64 (22-93)	
Surgical Complications	48 (9.8%)	22 (13.3%)	0.2077
Same-day Discharge	136 (27.9%)	73 (44.2%)	0.0002
30-day Readmissions	34 (7.0%)	12 (7.3%)	0.8966
Conversion to Open	23 (4.8%)	0	

Results

- 665 patient underwent a cholecystectomy as the index operation during the study period.
- The most frequently used surgical approach was laparoscopic, (n=488, 73.4%), followed by robotic (n=165, 24.8%), and open (n=12, 1.8%).
- Linear regression analysis demonstrated that increasing proportion of RC was statistically significant (p=0.04) with decreasing number of LC over the study period [**Figure 1**].
- Age, perioperative complications and 30-day readmission rates were not significantly different between RC vs LC, but RC patients were more likely to be discharged on the same day of surgery (44.2% vs 27.9%, p=0.0002) [**Table 1**].
- There were 23 conversion to open from LC (4.8%), but none of RC cases converted to open.

Conclusions

- This longitudinal review reflects increasing adoption of RC at our institution.
- The higher rate of same-day discharge after RC may be due to patient selection bias and surgeons' preference, while perioperative complication rates and 30-day readmission rates were not significantly different between the two MIS approaches.
- Significant rise in robotic utilization over the recent years combined with comparable outcomes to laparoscopic approach suggests that robotic surgery will continue to extend its horizon.
- We plan to study further how other variables, such as surgical urgency, preoperative diagnosis, surgeons' preference, and patient comorbidities could influence choice of surgical approach.