



LAPAROSCOPIC VERSUS OPEN SURGERY IN EMERGENCY GENERAL SURGERY (EGS)
IS ASSOCIATED WITH LOWER SHORT AND LONG-TERM MORTALITY

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Introduction

Traditional approaches to EGS have been with open techniques in the emergency patient, however as laparoscopic training has increased, utilization of laparoscopy in EGS has become more common. The aim of this study was to evaluate the use of laparoscopic surgery for common EGS procedures within our integrated EGS network. We hypothesized that laparoscopy would be associated with improved outcomes.

Methods

Our integrated regional health care system’s EGS registry created from AAST EGS ICD-9 codes was queried from January 2013-October 2015. Procedures were grouped according to their laparoscopic or open status. Partial colectomy(PC), inguinal hernia repair(IHR), umbilical hernia repair(UHR), ventral hernia repair(VHR), lysis of adhesions(LOA), cholecystectomy, appendectomy, and exploratory laparotomy were included. Standard descriptive and univariate tests were performed, and a multivariable logistic regression (MVR) controlling for open status, age, BMI, Charlson Comorbidity Index(CCI), trauma tier, and resuscitation diagnosis was performed.

Results

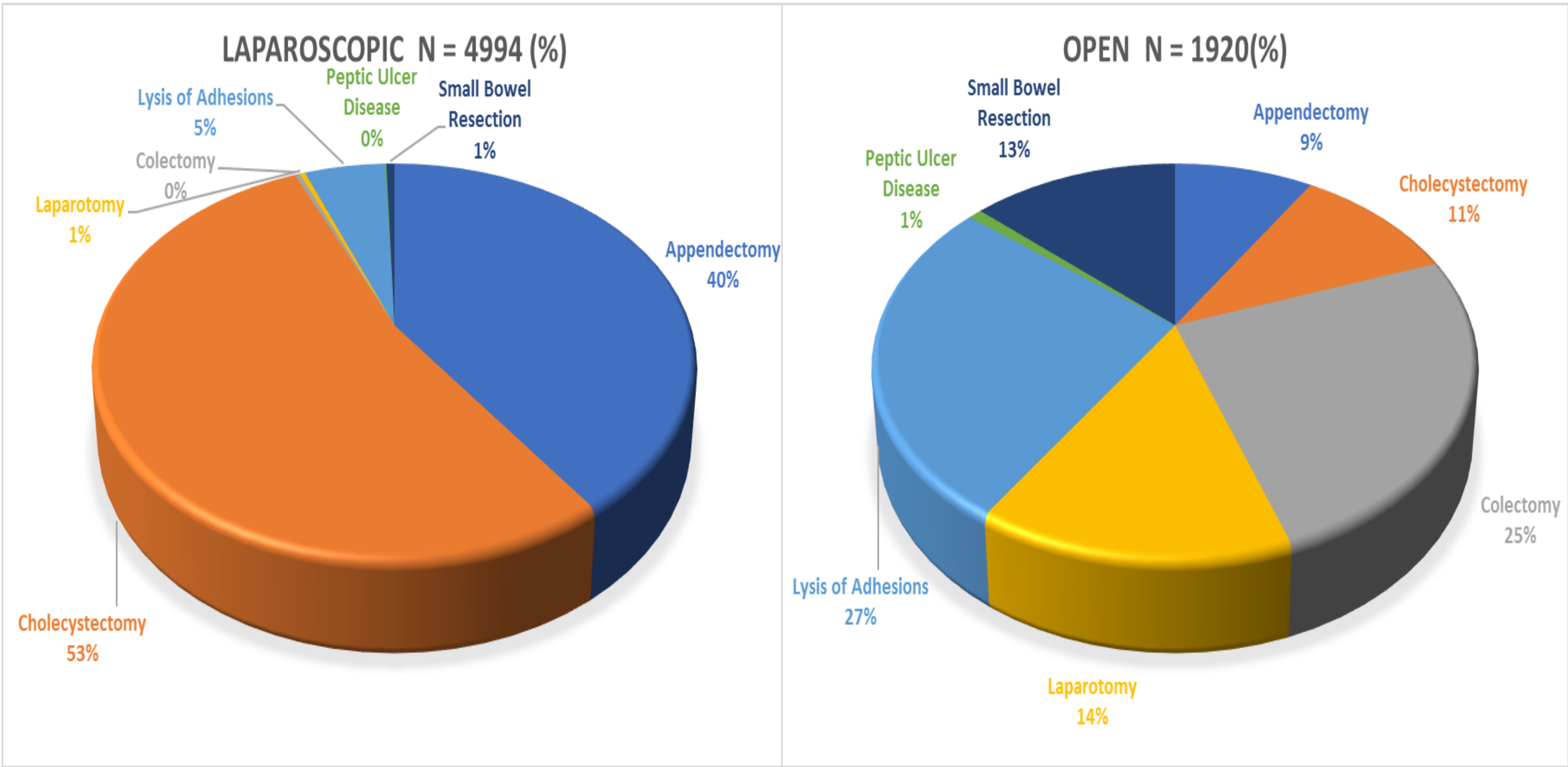


Figure 1. Laparoscopic and Open Surgery by Operative Type

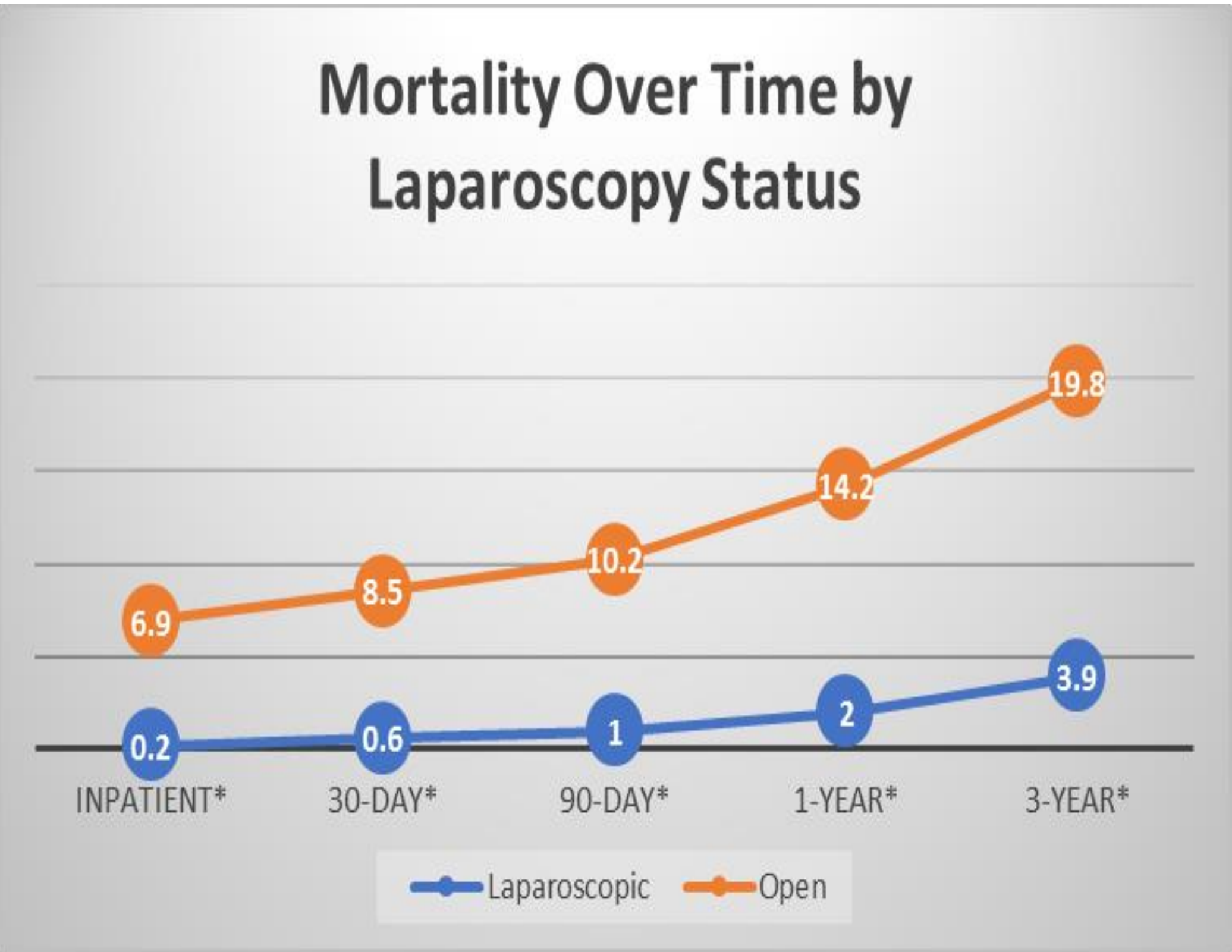


Figure 2. Mortality by Laparoscopy Status

Table 1. Multivariate Analysis: Inpatient Mortality			
	OR	95% CI	p value
Open Surgery vs Lap	9.62	5.05-18.35	<0.0001
Age: 18-44	ref		
45-54	1.81	0.74-4.46	0.828
55-64	2.31	0.98-5.43	0.327
65+	3.15	1.36-7.27	0.006
CCI score (per point increase)	1.21	1.13-1.28	<0.0001
Trauma Designation: Level 1	ref		
Level III	0.5	0.32-0.79	<0.0001
Non-Trauma Center	0.24	0.15-0.39	<0.0001
Resuscitation Diagnosis	9.78	9.00 -10.63	<0.0001
Procedure Counts (per increase in each procedure)	0.79	0.69 - 0.89	<0.0001

Results

Of 60,604 EGS patients identified over the 33-month period, 7,280(12.0%) had an operation, and 6,914(11.4%) included the above surgery types. There were 4,994 (72.2%) surgeries performed laparoscopically. The percentage of surgeries by type are displayed in Figure 1. There were: (% Lap vs open) 2,892 cholecystectomies(91.7vs8.3%); 2,202 appendectomies(91.1% vs. 8.9%); 330 laparotomies(1 vs 100%); 840 LOA(28.3% vs. 71.7%); 566 PC(22.4vs77.6%); 839 VHR(42.7vs57.3%); 252 UHR(20.2vs79.8%); and 167 IHR(9.6vs90.4%). Laparoscopic surgery patients were on average younger, with higher BMI, lower CCI score, less likely to be at a Level I center or have a colorectal, soft tissue, or resuscitation diagnosis, and had fewer operations (p<0.001 for all). Mortality over time by open surgery status is displayed in Figure 2 and was statistically higher at all time points in the open group (p<0.001 for all). On multivariate analysis (Table 1), open surgery had the highest association with inpatient mortality with an OR 9.6 (5.0-18.4), which was followed by resuscitation diagnosis, OR 9.3 (6.2-14.0), and Age 65+ OR 3.1 (1.4-7.3). A similar trend was seen in the MVR for 30- and 90-days and 1- and 3-year mortality.

Discussion

In our EGS network 12% of patients had a surgery, and 72% of them were performed laparoscopically. Patients undergoing open approach had significant increased odds of mortality, even after controlling for confounders. When patients are appropriate candidates for laparoscopy, determining methods to make this available to the patient may improve EGS outcomes. Additionally, transfer to referral centers to surgeons with complex laparoscopic skill set may benefit EGS patients with complex operative needs.

Contact

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