

Robotic-Assisted Emergency Surgery in High-Risk Patients:

Feasibility, Safety and Institutional Experience in a Diverse Emergency Surgery Population

Zeynep Bilgili, MD; Ellis Yeo; Anupamaa Seshadri, MD; Sofia Volpi, MD; Daniel Bent, MD; Charles Cook, MD; Alexander Chacon, MD; Timothy Borjas, MD; Gabriel Brat, MD; Stephen Odom, MD; Amy Wyrzykowski, MD; Alok Gupta, MD; Charles Parsons, MD

Beth Israel Deaconess Medical Center, Harvard Medical School

Background & Aims

Robotic-assisted surgery (RAS) has recognized benefits in elective settings, but its role in **emergency general surgery (EGS)** among medically complex patients is uncertain.

We evaluated the feasibility and safety of RAS in high-risk EGS patients managed by an acute care surgery (ACS) service at a tertiary academic center.

Methods

Study Design: Retrospective review of all robotic EGS procedures performed from March 2023 through August 2025.

Inclusion Criteria: High-risk patients defined as ASA class $\geq$ III or Charlson Comorbidity Index (CCI) $\geq$ 3.

Outcomes: Conversion to open, length of stay (LOS), 30-day complications, readmission, reoperation, and mortality.

Operative Timing: Start times categorized as Daytime (0700–15:00), Evening (1500–23:00), or Night (2300–0700).

Analysis: Descriptive statistics summarized distributions.

Results

346

Total Robotic
EGS Cases

229 (66.2%)

High-Risk
Patients

2.2%

Conversion
to Open

Procedure Distribution (High-Risk Patients, n = 229)

Procedure	n	%
Cholecystectomy	144	62.9
Appendectomy	20	8.7
Ventral Hernia Repair	15	6.6
Gastrostomy/Access	14	6.1
Exploratory/Adhesiolysis	13	5.7
Colorectal/Bowel	12	5.2
Inguinal Hernia Repair	10	4.4

30-Day Outcomes (High-Risk, n = 229)

Outcome	n (%)
Complications	13 (5.7%)
Readmission	12 (5.2%)
Reoperation	6 (2.6%)
Conversion to Open	5 (2.2%)
30-Day Mortality	0 (0%)

Operative Time

Mean Op Time (min)	SD (min)
125.9	$\pm$ 57.4

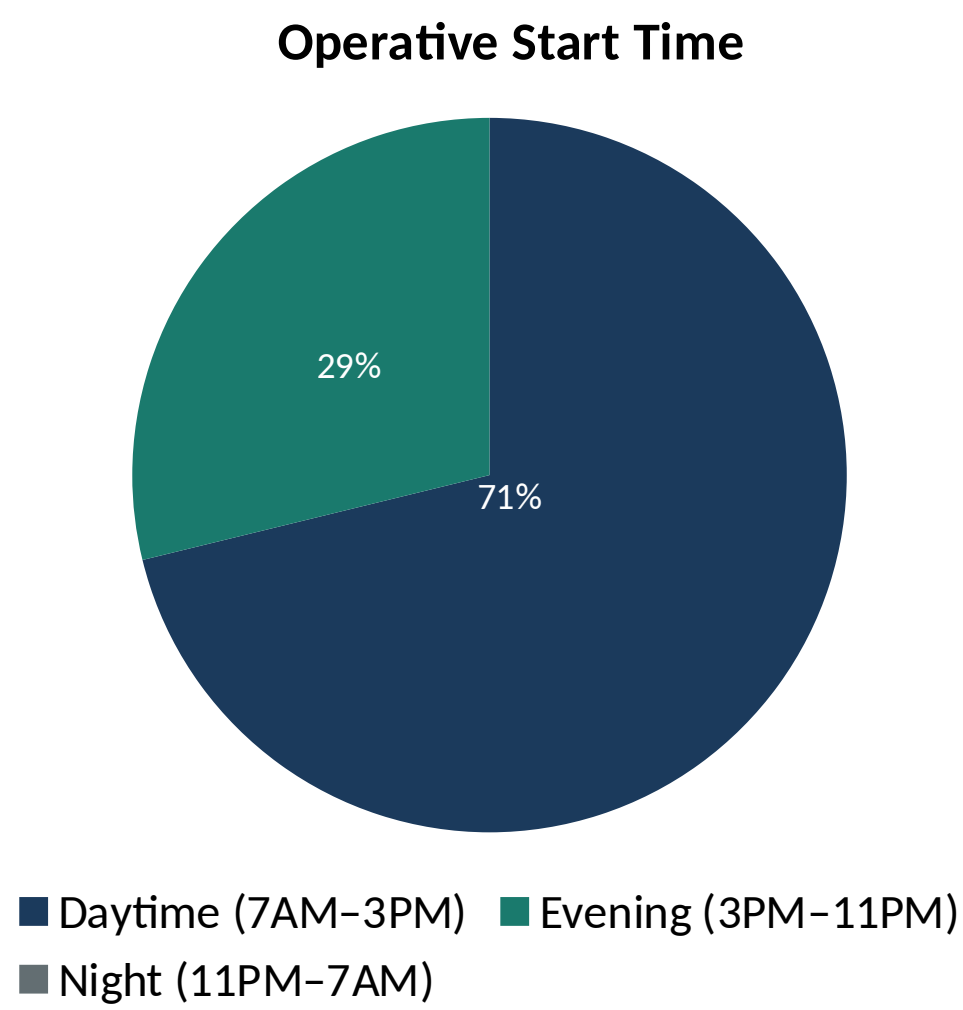
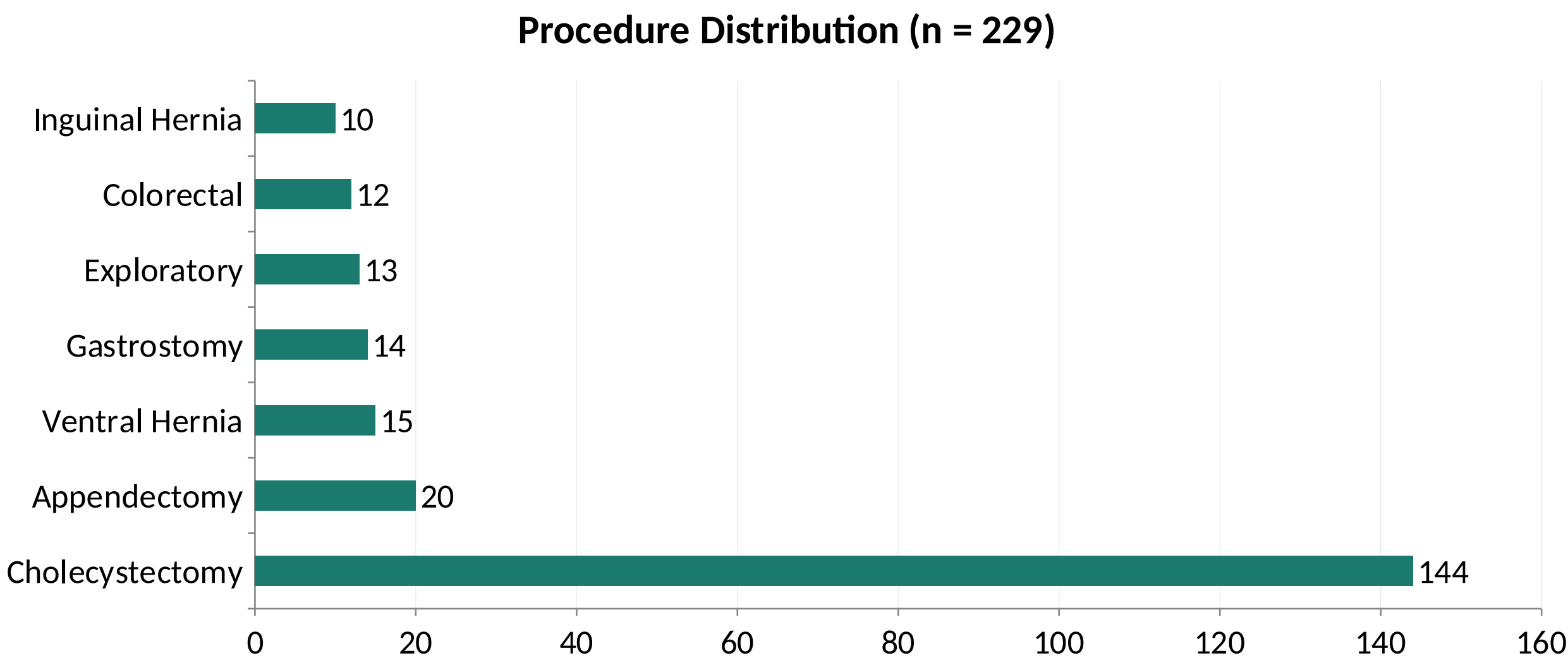
Impact of Complications

Although complications were rare, affected patients accounted for:

75% of readmissions | 83% of reoperations

Median LOS: 6 days (complicated) vs 2 days (uncomplicated)

Data



Time of Day	n	%
Daytime	163	71.2
Evening	66	28.8
Night	0	0.0

Conclusion

In a large single-center experience, RAS was safely implemented in high-risk EGS patients, with:

Low conversion rate (2.2%)

Low complication rate (5.7%)

Zero 30-day mortality

Although uncommon, complications were associated with disproportionate readmissions, reoperations, and prolonged LOS.

These findings support the feasibility of robotic platforms for medically complex emergency patients and provide a replicable model for expanding minimally invasive access in ACS programs.

Key Takeaway

Robotic-assisted surgery is a feasible and safe approach for high-risk emergency general surgery patients at experienced centers.

Contact Us



ubilgili@bidmc.harvard.edu
cparsons@bidmc.harvard.edu
<https://research.bidmc.org/charles-parsons>