Emergent Robotic Versus Laparoscopic Surgery for Perforated Gastrojejunal Ulcers: A Retrospective Cohort Study of 44 Patients

TD Robinson, MD, MPH; J Sheehan, BS; P Patel, MD; AG Marthy, MD; JA Zaman, MD, FACS; TP Singh, MD, FACS

BACKGROUND

- Marginal ulcer formation at the gastrojejunal anastomosis remains a significant complication of Roux-en-Y gastric bypass (RYGB), with an incidence as high as 16%.
- Approx. 1% of patients with RYGB will suffer gastrojejunal perforation requiring emergency surgery.
- Use of the surgical robot for emergency general surgery has not been reported in the literature.

METHODS

- Retrospective cohort analysis.
- 5-year study period, from 2015 through 2019.
- Three operating surgeons.
- 700-bed academic referral hospital, accredited by MBSAQIP.

RESULTS

- 44 patients
  - 24 robotic repair
  - 20 laparoscopic repair
- No initial or conversion to open surgery.
- No differences in patient characteristics.
- No difference in time-of-presentation to time-of-incision.
- 54% of robotic repairs performed off-hours.

Table 1. Outcomes by surgical approach for repair of gastrojejunal ulcer perforation (mean, except where noted)

	Robotic (24)	Laparoscopic (20)	*p*
Time in room to surgery start (min)	25	31	0.01
Conversion to open (%)	0	0	
Operating time (min)	85	98	0.15
Mortality (%)	0	0	
Complication (%)	8.3	25	0.14
Clavien-Dindo Score (median)	2	2.2	0.76
Return to OR (%)	4.2	0	0.37
Discharge to home (%)	83.3	85	0.88
30-day presentation to ED (%)	8.3	10	0.85
30-day readmission (%)	8.3	10.5	0.81
Hospital length of stay (days)	4.9	5.2	0.82

Table 2. Postoperative complications.

Complication	Clavien-Dindo Score
Robotic (24)	
Return to OR for retained needle after incorrect count	3
Port site hematoma, on coumadin, managed conservatively	1
Laparoscopic (20)	
Pelvic abscess, percutaneous drainage	3
Abscess	2
Cystitis	2
Pneumonia	2
NSTEMI	2

Table 3. Initial surgical approach by surgeon.

	Robotic (24)	Laparoscopic (20)
Surgeon A	23	4
Surgeon B	1	11
Surgeon C	0	5

Note: No patients included in the study were initially approached with open surgery; two patients initially approached laparoscopically were converted to open surgery.

Table 4. Total inpatient and procedural costs by surgical approach.

	Robotic (24)	Laparoscopic (20)	*p*
Total Inpatient Costs ($)			
median	16,405	11,274	0.002
mean	18,376	16,086	0.27
Procedural Costs ($)			
median	10,484	5,178	0.002
mean	9,658	5,629	<0.001

CONCLUSIONS

- Outcomes from robotic repair noninferior to laparoscopic repair.
- Nationally, robot used for 9.4% of all bariatric surgeries, but only 2.1% of emergent bariatric surgeries.
- The surgical robot is a neglected tool in emergency general surgery.

REFERENCES

1. Patel RA, Brolin RE, Gandhi A (2009) Revisional operations for marginal ulcer after Roux-en-Y gastric bypass. Surg Obes Relat Dis 5:317–322

2. Binenbaum SJ, Dressner RM, Borao FJ (2007) Laparoscopic repair of a free perforation of a marginal ulcer after Roux-en- Y gastric bypass: a safe alternative to open exploration. JSLS 11:383–388

3. Chin EH, Hazzan D, Sarpel U, Herron DM (2007) Laparoscopic repair of a perforated marginal ulcer 2 years after gastric bypass. Surg Endosc 21:2110

4. St. Jean MR, Dunkle-Blatter SE, Petrick AT, (2006) Laparoscopic management of perforated marginal ulcer after laparoscopic Roux-en-Y gastric bypass. Surg Obes Relat Dis 2:668

5. Wheeler AA, De La Torre RA, Fearing NM (2011) Laparoscopic repair of perforated marginal ulcer following Roux-en-Y gastric bypass: a case series. J Laparoendosc Adv Surg Tech A 21:57–60

6. Felli E, Brunetti F, Disabato M, Salloum C, Azoulay D, De'Angelis N (2014) Robotic right colectomy for hemorrhagic right colon cancer: a case report and review of the literature of minimally invasive urgent colectomy. World J Emerg Surg 9:32

7. Von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Van- denbroucke JP (2014) The strengthening the reporting of observa- tional studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. Int J Surg 12:1495–1499

8. Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program. https://www.facs.org/quality-programs/ mbsaqip/registry-request. Accessed 1 April 2020

ALBANY MEDICAL CENTER
KNOWN FOR OUR EXPERTISE. CHOSEN FOR OUR CARE.

KNOWN FOR OUR EXPERTISE. CHOSEN FOR OUR CARE.