Northwell Lenox Hill Hospital

Comparison between Robotic and Laparoscopic Approaches in Bariatric Surgery Conversions: An MBSAQIP Analysis

Northwell Bariatrics

Gregory A. Wasserman DO PhD, Kyle Mobbs MD, Ruben Salas Parra MD, Mitchell S. Roslin MD, Marc Bessler MD, Filippo Filicori MD, Vikrom K. Dhar MD

Department of Surgery, Northwell Health, Lenox Hill Hospital, New York, NY and New Hyde Park, NY

Background

- Outcome comparisons between robotic and laparoscopic approaches in bariatric surgery have been previously reported, however, there remains limited consensus regarding the superiority of either technique.
- Despite this, utilization of robotic surgery has grown significantly, especially in conversion bariatric procedures.
- In the current study, we evaluated utilization of robotics in bariatric conversions and compared outcomes between laparoscopic and robotic approaches.

Methods

- The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database was queried for all patients undergoing conversion of sleeve gastrectomy (SG) to roux-en-y gastric bypass (RYGB), biliopancreatic diversion with duodenal switch (BPD/DS), or single anastomosis duodenoileostomy (SADI) during the years 2021 and 2022 (n = 22,895).
- Perioperative and 30-day postoperative outcomes were analyzed and stratified by procedural approach.
- Categorical variables were assessed using Chi-square or Fishers exact test and continuous variables were assessed using two-tailed unpaired student's t test.

	SG to RYGB (n=20431)					SG to BPD/DS (n=1416)					SG to SADI (n=1048)				
	Robot (n=6461)		Lap (n=13970)			Robot (n=539)		Lap (n=877)			Robot (n=392)		Lap (n=656)		
	N		N		p value	N		N		p value	N		N		p value
Mean LOS, days (SD)	1.64	1.904	1.65	1.777	0.141	1.6	1	1.62	1.193	0.433	1.71	2	1.48	1.13	0.20
Superficial SSI, n (%)	24.0	0.4	140	1.0	**<0.001**	1	0.2	5	0.6	0.417	1	0.3	0		0.37
Deep incisional SSI, n (%)	9	0.1	24	0.2	0.709	1	0.2	1	0.1	1.000	1	0.3	0		0.37
Organ space SSI, n (%)	50	0.8	125	0.9	0.414	9	1.7	6	0.7	0.107	6	1.5	9	1.37	0.80
Leak, n (%)	22	0.3	70	0.5	0.119	4	0.7	5	0.6	0.738	4	1.0	6	0.91	1.00
Wound disruption	5	0.1	11	0.1	1	0		0			0	0.0	1	0.15	1.00
Bleeding, n (%)	28	0.4	123	0.9	**<0.001**	5	0.9	4	0.5	0.314	0	0.0	0		
Bowel obstruction, n (%)	121	1.9	184	1.3	**0.003**	12	2.2	3	0.3	**0.002**	1	0.3	3	0.46	1.00
Transfusion requirement, n (%)	63	1.0	199	1.4	**0.008**	3	0.6	1	0.1	0.157	1	0.3	3	0.46	1.00
Unplanned intubation, n (%)	8	0.1	23	0.2	0.566	2	0.4	1	0.1	0.562	1	0.3	0		
Unplanned ICU admission, n (%)	39	0.6	123	0.9	**0.043**	4	0.7	6	0.7	1.000	3	0.8	3	0.46	0.68
Ventilator > 48 h, n (%)	10	0.2	20	0.1	0.845	1	0.2	1	0.1	1.000	2	0.5	0		0.14
PE, n (%)	17	0.3	20	0.1	0.076	1	0.2	2	0.2	1.000	0	0.0	0		
Pneumonia, n (%)	25	0.4	58	0.4	0.808	1	0.2	1	0.1	1.000	1	0.3	1	0.15	
Septic shock, n (%)	8	0.1	17	0.1	1	4	0.7	0		**0.021**	1	0.3	0		0.37
Acute renal insufficiency, n (%)	0	0.0	9	0.1	0.065	2	0.4	1	0.1	0.145	1	0.3	0		0.37
UTI	24	0.4	78	0.6	0.09	2	0.4	2	0.2	0.638	1	0.3	2	0.30	1.00
VTE requiring therapy	11	0.2	26	0.2	0.862	0		0			1	0.3	1	0.15	1.00
C Diff	2	0.0	6	0.0	1	0	0.0	2	0.2	0.528	1	0.3	0		0.37
Cardiac arrest requiring CPR, n (%)	2	0.0	7	0.1	0.728	0		0			0	0.0	0		
Reoperation, n (%)	188	2.9	393	2.8	0.719	16	3.0	15	1.7	0.135	11	2.8	13	1.98	0.40
Reintervention, n (%)	138	2.1	307	2.2	0.795	9	1.7	9	1.0	0.332	3	0.8	5	0.76	1.00
Readmission, n (%)	510	7.9	974	7.0	**0.019**	37	6.9	38	4.3	**0.050**	21	5.4	25	3.81	0.28
Mortality, n (%)	8	0.1	22	0.2	0.6954	1	0	1	0.1	1.000	0		0		

Results

- From 2021 to 2022, robotic utilization for conversion bariatric surgery increased significantly from 27.3% to 36.6% ($p < 0.01$), though most cases were still performed laparoscopically.
- A majority of conversions were from SG to RYGB (89.2%), followed by SG to BPD/DS (6.2%), and SG to SADI (4.6%). For SG to RYGB conversions, rates of superficial surgical site infection (SSI) (0.4% vs. 1.0%), bleeding (0.4% vs. 0.9%), transfusion (1% vs. 1.4%), and unplanned ICU admission (0.6% vs. 0.9%) were significantly lower in the robotic group (all $p<0.05$).
- Conversely, rates of bowel obstruction (1.9% vs. 1.3%) and 30-day readmission (7.9% vs. 6.3%) were higher in the robotic SG to RYGB group.
- For SG to BPD/DS conversions, rates of bowel obstruction (2.2% vs. 0.3%) and septic shock (0.7% vs. 0.0%) were significantly higher in the robotic group (all $p<0.05$).
- For SG to SADI conversions, there were no statistically significant differences in outcomes.

Conclusions

- Utilization of robotic approach for conversion bariatric surgery has increased in recent years and may be justified given an associated improvement in specific outcomes including SSI, bleeding, transfusion, and ICU admission rates in RYGB.
- Despite these measures, there remains a need for further evaluation and improvement given increased rates of bowel obstruction and readmission.

Disclosure Information

None