



Laparoscopic versus Robotic Approach for Single Anastomosis Duodeno-Ileal Bypass with Sleeve Gastrectomy (SADI-S): A 2020–2023 MBSAQIP Database Analysis

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Background: In recent years, Single Anastomosis Duodeno-Ileal Bypass with Sleeve Gastrectomy (SADI-S) has gained increasing interest and adoption, due to its simplified single-anastomosis technique and superior weight loss outcomes compared to other malabsorptive procedures. No large cohort studies have compared the laparoscopic and robotic techniques. This study aimed to evaluate and compare the early outcomes of these two approaches.

Methods: An analysis of the MBSAQIP database was conducted in patients who underwent SADI-S as a primary or revisional procedure between 2020 and 2023. Thirty-day perioperative bariatric outcomes, complication rates, and mortality were analyzed and compared between the laparoscopic (L-group) and robotic (R-group) approaches.

Results: Among 7,450 patients who underwent SADI-S, 62.7% (n = 4,671) were in the L-group, while 37.3% (n = 2,779) were in the R-group. Primary SADI-S was performed more frequently in the L-group (65.5%), whereas revisional SADI-S was more common in the R-group (43.4%). The R-group demonstrated higher preoperative BMI (49.3 vs 47.6, p<0.001), as well as higher rates of drain placement (13.6% vs10.2%, p<0.001) and conversion to open (0.6% vs 0.2%, p=0.043). However, the L-group had lower operative time (158.8 vs 122.5 min, p<0.001). In terms of postoperative complications, the R-group showed higher overall unplanned hospital care utilization (UHCU), such as 30-day readmission, reoperation, and emergency visit (15.5% vs 13.4%, p=0.010), but no significant difference in surgical complications, such as surgical site infection (1.5% vs 1.8%), anastomotic leaks (0.8% vs 0.8%), or gastrointestinal bleeding (0.6% vs 0.4%). In the multivariate analysis, the surgical approach (robotic vs. laparoscopic) was not found to be independently associated with an increased risk of complications. Subgroup analysis by year demonstrated a trend toward decreased 30-day complication rates from 2020 to 2023 (L-group: 5.7% to 3.6%, R-group: 5.8% to 4.3%), with no significant difference between groups.

Conclusion: Both robotic and laparoscopic SADI-S demonstrated comparable 30-day complication rates, confirming the safety and feasibility of the procedure. The robotic group demonstrated higher rates of overall UHCU, with no significant differences in surgical site infections, leaks, or gastrointestinal bleeding. The trend from 2020 to 2023 demonstrates a consistent improvement in surgical outcomes.

Intra and postoperative outcomes of bariatric patients that underwent SADIS in USA 2020-2023.

Outcomes *	Total (n=7450)	Robotic (n=2779)	Laparoscopic (n=4671)	p-value
Length of the procedure (min)	136 ± 64.4	158.8 ± 65.2	122.5 ± 59.9	<0.001
Hospital Stay (days)	1.60 ± 1.72	1.57 ± 1.69	1.61 ± 1.74	0.294
Intraop/Postop complications in the first 30 days.	290 (3.8)	114 (4.1)	176 (3.7)	0.471
SSI	126 (1.6)	52 (1.8)	74 (1.5)	0.352
Anastomotic leak	62 (0.8)	23 (0.8)	39 (0.8)	0.973
Pneumonia	33 (0.4)	6 (0.2)	27 (0.5)	0.022
PE	15 (0.2)	8 (0.2)	7 (0.1)	0.198
AKI	15 (0.2)	7 (0.2)	8 (0.1)	0.452
UTI	23 (0.3)	11 (0.3)	12 (0.2)	0.295
Cardiac arrest	6 (0.08)	5 (0.17)	1 (0.02)	0.019
MI	4 (0.05)	2 (0.07)	2 (0.04)	0.599
Sepsis	21 (0.2)	7 (0.2)	14 (0.2)	0.706
Gastrointestinal tract bleed	45 (0.6)	13 (0.4)	32 (0.6)	0.241
UHCU	1057 (14.2)	432 (15.5)	625 (13.4)	0.010
Unplanned intubation	16 (0.2)	6 (0.2)	10 (0.2)	0.987
Intra or post operative transfusion	62 (0.8)	19 (0.6)	43 (0.9)	0.276
Readmission 30 days	365 (4.8)	148 (5.3)	217 (4.6)	0.188
Reoperation 30 days	177 (2.3)	69 (2.4)	108 (2.3)	0.639
Emergency visit 30 days	668 (8.9)	284 (10.2)	384 (8.2)	0.003
Unplanned admission to ICU 30 days	61 (0.8)	25 (0.8)	36 (0.7)	0.622
Death	10 (0.13)	6 (0.21)	4 (0.08)	0.137
SSI=Surgical site infection; MI= myocardial infarction; ICU= intensive care unit; %TWL= percentage of total weight loss; %EBMIL= Percentage excess BMI loss; AKI= acute kidney injury; UTI= urinary tract infection. *Continuous data are shown as the mean±standard deviation and categoric data as number (%) *Chi-square † T-Student Bold values are statistically significant				

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Year	Total (n=7450)	Robotic (n=2779)	Laparoscopic (n=4671)	p-value
Intraop/Postop complications in the first 30 days *	290 (3.8)	114 (4.1)	176 (3.7)	0.471
2020	51 (5.8)	16 (5.8)	35 (5.7)	*0.989
2021	54 (3.9)	19 (5)	35 (3.4)	*0.178
2022	63 (2.9)	18 (2.5)	45 (3.2)	*0.375
2023	122 (3.9)	61 (4.3)	61 (3.6)	*0.368
UHCU *	1057 (14.1)	432 (15.5)	625 (13.3)	*0.01
2020	136 (15.4)	41 (14.9)	95 (15.7)	*0.755
2021	187 (13.5)	58 (15.4)	129 (12.8)	*0.206
2022	271 (12.7)	108 (15)	163 (11.6)	*0.023
2023	463 (15)	225 (15.9)	238 (14.3)	*0.228
* Includes= Bowel obstruction, Transfusion, sepsis, Deep vein thrombosis requiring therapy, Myocardial infarction, Cardiac arrest requiring CPR, Cerebrovascular accident (stroke), urinary tract infection, Acute renal failure, ventilator use >48h, Pulmonary embolism, pneumonia, Wound disruption/dehiscence, anastomotic leak, Surgical site infection. * Includes=Emergency visit, Intervention within 30 days, Readmission within 30 days, Reoperation within 30 days, Unplanned ICU admission within 30 days, Unplanned intubation *Chi-square				