Minimally Invasive Converted to Open versus Upfront Open Surgeries for Rectal Cancer - Short Term Outcomes

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Background

- Extensive literature supports that minimally invasive surgery (MIS) have significantly better short-term outcomes than open surgery
  - Limited studies on how MIS converted to laparotomy compares to planned laparotomy

Aim: Compare the short-term outcomes between planned open and MIS converted to open surgeries for rectal cancer

Methods

- Queried ACS NSQIP (2016-2022): N=2,957 patients
- Two Cohorts:
  - Upfront Open Group (N=2,551)
  - MIS Converted to Open (MISC) Group (N=406)
- Propensity Score Matching:
  - By confounding variables:
    - Ascites, BMI, dyspnea, COPD, hypertension, principle procedure, sex, tumor location
  - Each group: N=400
- Primary Outcome: postoperative complications rate
  - Secondary Outcomes: unplanned readmission, 30-day mortality, length of stay
- Statistical Tests:
  - Chi-Squared Analysis
  - Logistic and Linear Regression Analysis

Results

Univariate Analysis	Upfront Open (N=400)	MISC (N=400)	p-value
Demographics			
Age, Years	62.7	63.1	0.702
BMI, Kg/m2	28.9	29.5	0.340
Male (%)	289 (72.2)	278 (69.5)	0.437
Race			0.996
Asian	20 (5.0)	19 (4.8)	
*AA**	26 (6.5)	26 (6.5)	
White	225 (56.2)	231 (57.8)	
Other	129 (32.3)	124 (31.0)	
Outcomes			
Any Complications	171 (42.8)	195 (48.8)	0.103
Unplanned Readmission	66 (16.5)	74 (18.5)	0.515
30-Day Mortality	2 (0.5)	5 (1.2)	0.451
Length of Stay, Days	7.00	6.00	0.015
Superficial SSI**	29 (7.2)	35 (8.8)	0.515
Deep Incisional SSI**	9 (2.2)	6 (1.5)	0.604
Organ Space SSI**	30 (7.5)	43 (10.8)	0.140
Anastamotic Leak	6 (1.5)	13 (3.2)	0.16
Ileus	91 (22.8)	101 (25.2)	0.728
Myocardial Infarcation	7 (1.8)	0 (0.0)	0.015

Multivariable Regression Analysis

Compared to the Upfront Open approach, the MISC approach has:

- No significantly increased odds of any complication
- No significantly increased odds of unplanned readmission
- No significantly increased odds of 30-day mortality
- An association with a 0.869-day shorter length of stay

Conclusion

Upfront open and minimally invasive converted to open surgeries for rectal cancer exhibit similar 30-day post-operative outcomes.

Since completed MIS offers advantages over open surgeries, and since our study showed no disadvantages of MISC, MIS should be attempted as the default surgical approach for rectal cancer patients.