Outcomes for Colectomy for Colon Cancer in the Elderly Population

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Objective:

- As the population ages, there is an increased need for surgical metrics specific to the elderly population.
- The goal of this study is to analyze short-term outcomes for colon cancer resection among the elderly.

Methods:

- Retrospective review of National Surgical Quality Improvement Program (NSQIP).
- Colon cancer resections between 2012-2019.
- Separated by age into a >65yrs cohort and <65 yrs cohort.
- Associations between categorical variables were analyzed using Chi-squared or Fisher's exact test.
- Two-tailed t-test or Mann-Whitney U-test were used for continuous variables.
- Variables with a significant association ($p<0.1$) were entered into a multivariate regression model for death.

Results:

- Evaluated 96,763 colectomies for colon cancer.
- 36,569 cases in the younger cohort and 56,158 cases among those aged >65 yrs.
- Younger age was more commonly associated with Hispanic ethnicity, MIS, smoking, preoperative chemotherapy and bowel preparation.
- Older age was associated with increased medical comorbidities including hypertension, diabetes, and congestive heart failure.

Table 1. Univariate Postoperative Outcomes by Age Group.

Variables	Overall Population N=96763	Age Group <65 (n=38064)	Age Group >65 (n=58699)	P value
Mortality (%)	1305 (1.3%)	153 (0.4%)	1152 (2.0%)	<.001
<12 LN Harvest (%)	3687 (7.2%)	1313 (6.5%)	2374 (7.7%)	<.001
Prolonged Ileus (%)	7593 (12.4%)	2440 (10.1%)	5153 (13.9%)	<.001
Positive Margins (%)	239 (6.7%)	92 (7.2%)	147 (6.5%)	.443
Wound Infection (%)	6907 (7.1%)	2803 (7.4%)	4104 (7.0%)	.029
Sepsis (%)	1971 (2.0%)	758 (2.0%)	1213 (2.1%)	.428
Anastomotic Leak (%)	1598 (2.6%)	634 (2.6%)	964 (2.6%)	.898
Dehiscence (%)	654 (0.7%)	227 (0.6%)	427 (0.7%)	.016
Pneumonia (%)	1879 (1.9%)	375 (1.0%)	1504 (2.6%)	<.001
PE (%)	617 (0.6%)	171 (0.4%)	446 (0.8%)	<.001
DVT (%)	984 (1.0%)	319 (0.8%)	665 (1.1%)	<.001
UTI (%)	1713 (1.8%)	449 (1.2%)	1264 (2.2%)	<.001
Stroke (%)	269 (0.3%)	35 (0.1%)	234 (0.4%)	<.001
MI (%)	747 (0.8%)	101 (0.3%)	646 (1.1%)	<.001
Postop Transfusion (%)	9017 (9.3%)	2411 (6.3%)	6606 (11.3%)	<.001
Return to OR (%)	3758 (3.9%)	1409 (3.7%)	2349 (4.0%)	.019
Readmission (%)	8126 (8.4%)	2827 (7.4%)	5299 (9.0%)	<.001
Length of Stay (days)	6.42 ± 6.082	5.57 ±5.171	6.98 ± 6.547	.000

Lymph Node (LN), Pulmonary Embolism (PE), Deep Vein Thrombosis (DVT), Myocardial Infarction (MI)

Table 2. Univariate and Multivariate Regression for Mortality.

Factors	Univariate OR	Univariate 95% CI	Univariate *p* value	Multivariate OR	Multivariate 95% CI	Multivariate *p* value
Age >65 Years	4.800	4.189 - 5.875	<.001	3.414	3.362 - 3.509	<.001
Male Gender	1.396	1.242 - 1.571	<.001	1.437	1.161 - 1.682	<.001
CHF History	5.027	4.059 - 6.225	<.001	2.462	1.152 - 3.175	<.001
COPD History	2.710	2.327 - 3.156	<.001	1.655	1.307 - 2.196	<.001
Dyspnea	2.234	1.943 - 2.569	<.001	1.471	1.181 - 1.888	<.001
Dependent Status	4.105	3.443 - 4.894	<.001	2.853	1.767 - 3.142	<.001
Dialysis	2.577	1.619 - 4.102	<.001	1.927	1.017 - 3.649	.020
Preop Weight Loss	2.220	1.816 - 2.715	<.001	1.391	1.015 - 1.905	.040
Elective	.316	.280 - .355	<.001	.559	.456 - .687	<.001
ASA Category >3	3.985	3.255 - 4.878	<.001	2.759	1.672 - 3.127	<.001
Mechanical Prep	.537	.458 - .630	<.001	1.500	1.229 - 1.960	.019
Oral Antibiotics	.513	.434 - .607	<.001	.633	.591 - .911	.005
Open Approach	2.700	2.327 - 3.133	<.001	2.181	1.796 - 2.649	<.001

- Older age was associated with significantly worse oncologic and short-term postoperative outcomes (table1).
- In a multivariate regression model, age >65, dependent functional status, dyspnea, male sex, CHF, COPD, dialysis, steroid use, non-elective surgery, higher ASA class, open approach and preoperative oral antibiotics were independent predictors for death.

Conclusions:

- There are unique and significant risk factors for 30-day postoperative mortality after colectomy among the elderly population.
- Open approach, higher ASA classification, and CHF history were associated with the highest risk for mortality among older patients undergoing colon cancer resection.
- Older patients should be monitored closely and be screened for comorbidities in order to improve outcomes for colectomy in the management of colon cancer.