Comparison of the Characteristics and Outcomes of Colon Cancer Patients Treated with Laparoscopic Colectomy versus Open Colectomy

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Objectives

- Describe the demographic and clinical characteristics and outcomes of colon cancer patients treated with laparoscopic colectomy compared with those treated with open colectomy
- Determine the characteristics associated with treatment type (laparoscopic vs. open colectomy) among patients with colon cancer

Background

- Surgery recommended for most patients diagnosed with colon cancer
- Laparoscopic surgery for treatment of colon cancer
  - Benefits
  - Slow adoption

Methods

- Linked dataset: Nebraska Cancer Registry and Nebraska hospital discharge data
  - ICD-9-CM procedure codes 17.30-17.39, 45.70-45.79 and 45.81-45.83 identified hospitalizations during which these surgeries were performed
  - Linkage with registry yielded 1,062 colon cancer (C18.0-C18.9) cases diagnosed during 2008-2011
  - 302 (28.4%) cases had laparoscopic colectomy and 760 (71.6%) had open colectomy

Methods

- Descriptive analysis
  - Demographics
  - Clinical characteristics
  - Outcomes
- Multivariate analysis (logistic regression)
  - Characteristics associated with surgical treatment type

Results

	Laparoscopic	Open	P-value
Gender			
% Female	53.6	53.4	0.95
Age at Diagnosis (mean years)	67.8	70.4	0.004
Place of Residence			
% Urban	53.9	40.1	<0.001
Race/Ethnicity			
% Non-Hispanic White	95.0	94.7	0.84
Insurance Status			
% Private	28.9	22.2	0.008
% Medicare/Medicaid	60.3	69.3	
% None	0.0	1.1	
% Other & Unknown	10.7	7.3	

Results

	Laparoscopic	Open	P-value
Behavior			
% Invasive	97.7	99.2	0.09
Primary Site			
% Cecum	29.8	23.0	0.15
% Appendix	1.7	4.7	
% Ascending colon	19.5	20.1	
% Hepatic fixture	5.3	5.8	
% Transverse colon	7.8	11.8	
% Splenic fixture	4.0	4.3	
% Descending colon	6.0	4.5	
% Sigmoid colon	23.5	23.7	
% Other	2.7	2.0	

Results

	Laparoscopic	Open	P-value
Stage at Diagnosis (SEER)			
% Early (in situ & local)	54.0	41.2	<0.001
Stage at Diagnosis (AJCC)			
% Early (Stage 0,I,II,IIIa)	72.2	55.8	<0.001
Tumor Size (mean cm)	3.8	4.4	<0.001
Lymph Nodes Positive (mean #)	4.4	6.3	0.03
Grade/Differentiation			
% Moderate	65.2	64.9	0.41
Histology			
% Adenoma or adenocarcinoma	88.1	85.4	0.25
Comorbidities			
% None	63.6	58.2	0.21

Results

	Laparoscopic	Open	P-value
Admission Type			
% Elective	89.7	80.8	<0.001
Length of Stay (mean days)	6.0	8.5	<0.001
Total Hospital Charges (mean $)	45888.72	55132.62	0.005
Recurrence			
% No	82.5	73.2	0.005
% Yes	1.7	3.8	
% Never Disease-free	15.8	23.0	
Vital Status			
% Alive	91.4	81.5	<0.001

Results

	Odds Ratio (95% Confidence Intervals)	P-value
Age at Diagnosis (years)		
<60	1.97 (1.24, 3.15)	0.03
60-69	1.61 (1.03, 2.53)	
70-79	1.64 (1.07, 2.51)	
80+	Referent	
Place of Residence		
Rural	0.62 (0.46, 0.85)	<0.001
Urban	Referent	
Stage at Diagnosis (AJCC)		
Early	1.74 (1.24, 2.43)	0.001
Late	Referent	
Tumor Size	0.93 (0.87, 0.996)	0.04

Conclusions

- Laparoscopic surgery has become a common treatment option for colon cancer patients
- Younger age, early stage at diagnosis, and smaller tumor size significantly increase odds of receiving laparoscopic surgery
- Rural residence significantly decreases odds of receiving laparoscopic surgery

Limitations

- Did not examine place of treatment or distance to treatment
- Did not consider other treatment received
- No information on BMI or surgical/post-surgical complications
- Broad urban/rural classification scheme
- Short follow-up period

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