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Emergency presentation of colorectal cancer at a regional hospital: An alarming trend?

Results of a study conducted at Vernon Jubilee Hospital found colorectal cancer patients presenting on an emergency basis had an increased length of stay and increased need for placement in a long-term care facility when compared with nonemergency patients.

ABSTRACT

***Background*: Colorectal cancer is the most common cause of cancer-related death in nonsmokers in Canada. Age is an important risk factor. Colorectal cancer emergencies occur in 6% to 34% of cases and are associated with higher morbidity and mortality, longer hospital stay, advanced pathologic stage, poor long-term survival, and higher health care costs.**

***Methods*: All cases of colorectal cancer at the Vernon Jubilee Hospital over a 1-year period were studied in order to compare emergency and nonemergency presentations. Patient demographics, clinical parameters, and outcomes were compared using the Fisher exact test, 2-tailed student *t* test, or Wilcoxon signed rank test. A probability value of <.05 was considered significant.**

***Results*: During the study period, 75 patients (mean age 72.3 years) required treatment for colorectal cancer. Of these 75 patients, 32 (43%) presented on an emergency basis; 59% of these 32 emergency patients presented with obstruction, 9% with perforation, and 34% with hemorrhage. Nonemergency patients did not present with any of these concerns. Sixty-nine percent of the emergency patients had previously undergone a colonoscopy, but none within the previous year compared with 95% of the nonemergency patients who had within the previous year. The length of stay for emergency patients was 24 days compared with 11 days for nonemergency patients (*P* <.05). In addition, 25% of emergency patients required subsequent placement in a long-term care facility compared with only 2% of nonemergency patients who required such care after (*P* <.05). Emergency patients also had a worse overall pathologic stage (2.8 vs 2.0, *P*< .05), had a worse T stage (3.2 vs 2.5, *P* <.05), and were more likely to present with metastases (28% vs 7%, *P* <.05) and positive surgical margins (13% vs 0%, *P* <.05).**

***Conclusions*: Emergency patients had worse outcomes than nonemergency patients, in agreement with findings in the literature, although the emergency presentation rate of 43% was higher than rates seen in the literature. This may be due to the high proportion of those aged 65 and older in Vernon (22% vs 14.6% in the province as a whole), which offers a peek into BC's future over the next 25 to 30 years as the number of people in this age group is projected to increase to 24% by 2036. The prospect of an aging population and the results of this study both support establishing a provincial screening program to reduce the costly incidence of colorectal cancer emergencies.**

Background

Colorectal cancer is the second most common cancer in men and the third most common cancer in women in Canada. Every year 21 500 new patients are diagnosed and 8900 die from

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Table 1. Demographic and clinical data for colorectal cancer cases at Vernon Jubilee Hospital, 1 April 2009 to 31 March 2010.

Patient characteristics	Emergency presentation	Nonemergency presentation
N	32	43
Mean age (range)	73.3 years (40–93)	71.7 (46–91)
Male sex	24* (75%)	24 (56%)
ASA class (mean)	3.2*	2.4
Colonoscopy	22* (69%)	41 (95%)
Family physician involved	31 (97%)	42 (98%)
Clinical features		
Obstruction	19* (59%)	0 (0%)
Perforation	3 (9%)	0 (0%)
Hemorrhage	11* (34%)	0 (0%)
Anemia	12 (38%)	7 (16%)
All operations	31 (97%)	43 (100%)
Right hemicolectomy	10 (31%)	13 (30%)
Left hemicolectomy	1 (3%)	3 (7%)
Anterior resection	10 (31%)	21 (49%)
Abdomino-perineal resection	2 (6%)	2 (5%)
Colectomy/proctocolectomy	3 (9%)	3 (7%)
Loop colostomy/open-close	5 (16%)	1 (2%)
Subsequent operation	6 (19%)	4 (9%)
Emergency surgery	29* (91%)	0 (0%)
Ostomy	15 (47%)	9 (21%)

*$P < .05$

colorectal cancer, making it the most common cause of cancer-related death in nonsmokers.[1] The lifetime risk of colorectal cancer is 5%, with an incidence of 15 to 20 per 100 000 in persons 60 to 65 years old. This increases to 40 to 50 per 100 000 in persons over 75 years.[2] Between 1986 and 2006 the percentage of the population aged 65 and older increased in British Columbia from 9.8% to 14.6%,[3] and is projected to increase to 24% by 2036.[4] Thus, though the age-standardized incidence of colorectal cancer is stable, the overall incidence in BC will continue to increase as a result of an increased proportion of older British Columbians.

The proportion of colorectal cancer cases that present as an emergency varies in the recent world literature from 6% to 34%.[5-10] Emergency presentation has been associated with higher morbidity,[5,6,9] higher perioperative mortality,[6,8-10] a longer hospital stay,[5] advanced pathologic stage,[6,7] and poorer long-term survival.[6-8,10]

The Vernon Jubilee Hospital (VJH) is a 148-bed regional hospital that serves a population of 66 000 in the immediate vicinity and a population of over 120 000 in the region. There are five full-time-equivalent general surgeons who all perform elective and emergency colorectal surgery. After colorectal cancer emergencies were observed to be very high at VJH, a study was proposed to quantify these cases, to compare the incidence of emergency presentations to those described in the current literature, and to examine the outcomes of patients with emergency versus nonemergency presentation of colorectal cancer.

Methods

All cases of colorectal cancer at the Vernon Jubilee Hospital over a 1-year period, 1 April 2009 to 31 March 2010, were examined. This period corresponds to the fiscal year, for which admission data are more readily assembled by health records staff. All surgeons consented to their charts being reviewed for this study and patient confidentiality was strictly maintained. Emergency presentation was defined as presenting to the emergency department at any point during the study period or requiring emergency admission following an outpatient colonoscopy because of acute or impending complete obstruction.

Patient demographics, clinical parameters, length of stay, outcomes, and pathology results were recorded in a Microsoft Excel 2010 spreadsheet. Categorical results were compared using the Fisher exact test. Continuous variables were compared using the 2-tailed student *t* test or the Wilcoxon signed rank test where appropriate. An Internet-based statistical calculator was used.[11] A probability value of $< .05$ was considered significant.

Results

During the study period, 75 patients (mean age 72.3 years) were treated for colorectal cancer at Vernon Jubilee Hospital. Of these 75 patients 32 (43%) presented on an emergency basis; 28 presented to the emergency department and 4 were admitted directly after scheduled colonoscopy because of acute or impending complete ob-

struction and were included in the emergency group. **Table 1** summarizes the demographic and clinical data for both emergency and nonemergency presentations.

All but one emergency patient had surgery. This one patient died after presenting to the emergency department with previously undiagnosed widespread metastatic colorectal cancer. One patient in the nonemergency group had laparoscopic surgery. All other patients had open procedures. Forty-one nonemergency patients were diagnosed with colorectal cancer on colonoscopy and two were diagnosed by barium enema prior to surgery. None of the emergency patients had undergone a colonoscopy within the previous year, although one patient was on the wait list. Twenty-two patients had a colonoscopy more than 1 year prior to presentation. Sixteen went on to have emergency surgery and two were discharged for long-course neoadjuvant chemoradiation followed by scheduled surgery. Thirteen emergency patients had emergency surgery immediately.

Table 2 summarizes the outcomes and pathology for both emergency and nonemergency presentations. The length of stay was significantly longer in the emergency group. In the nonemergency group there was one patient with a hospital stay of 173 days. Excluding this one patient the range of stay for nonemergency patients was 2 to 25 days. In the emergency group eight patients stayed in hospital for more than 30 days. A quarter of emergency patients required long-term placement in a care facility after treatment, even though they were independent prior to emergency admission. Only one nonemergency patient required long-term care after treament. Surgical and medical complications were higher in the emergency group but the difference was not significant. The overall 30-day mortality for both groups was 4% and 1-year mortality was 21%.

Table 2. Outcomes and pathology for colorectal cancer cases at Vernon Jubilee Hospital, 1 April 2009 to 31 March 2010.

	Emergency presentation	Nonemergency presentation
N	32	43
Length of stay, days (range)	24* (6–126)	11 (2–173)
30-day readmission	4 (13%)	5 (12%)
New long-term care placement	8* (25%)	1 (2%)
Surgical complications	14 (44%)	8 (19%)
Anastomotic leak	1	1
Bladder rupture	1	0
Bleeding	4	0
Bowel obstruction	1	1
Deep abscess	2	1
Fascial dehiscence	1	2
Prolapsed stoma	1	0
Wound infection	3	3
Medical complications	14 (44%)	8 (19%)
Acute myocardial infarction	1	0
Arrhythmia	1	2
C. difficile	0	1
DVT/PE	5	0
Electrolyte disturbance	3	1
Hematuria	1	1
Pneumonia	1	1
Stroke	1	0
Urinary retention	0	1
Urinary tract infection	1	1
Total complications	20† (63%)	13 (30%)
30-day mortality	2 (6%)	1 (2%)
1-year mortality	11 (34%)	5 (12%)
Overall pathologic stage, mean	2.8*	2.0
T stage, mean	3.2*	2.5
Positive lymph nodes, N1/N2	16 (50%)	13 (30%)
Metastases, M1	9* (28%)	3 (7%)
Positive margins	4* (13%)	0 (0%)

*P <.05

†Some patients had more than one complication

The overall pathologic stage was higher in the emergency group, as was the T stage. More patients in the emergency group presented with metastases and emergency patients were more likely than nonemergency patients to have positive surgical margins. All patients had adenocarcinoma except for one in the emergency group, who had cloacogenic squamous cell carcinoma of the anus.

Table 3. Comparing emergency presentation (EP) with nonemergency presentation of colorectal cancer: Significant differences in outcomes at Vernon Jubilee Hospital and in world literature.

Study	Country and number of patients	EP* rate	EP length of stay	EP complications	EP 30-day mortality	EP long-term mortality	EP advanced pathologic stage
Vernon Jubilee Hospital study	Canada 75	43%	Longer	NS*	NS	NS	Yes
Bass 2009[10]	Ireland 356	34%	NR*	NR	Higher	Higher	Yes
Sjo 2008[9]	Norway 1129	25%	NR	Higher	Higher	NR	Yes
Biondo 2005[8]	Spain 266	22%	Longer	NR	Higher	Higher	Yes
Wong 2008[7]	Australia 1823	19%	NR	NR	Higher	Higher	Yes
Merkel 2007[6]	Germany 1496	11%	NR	Higher	Higher	Higher	Yes
Coco 2005[5]	Italy 787	6%	Longer	Higher	NS	NS	Not†

*Abbreviations: EP—emergency presentation; NS—not significant; NR—not reported †Patients were matched for tumor stage in this case-control study

Conclusions

Table 3 compares the findings of this study with those from other similar studies. Generally, there is uniformity in the association of emergency presentation with a longer length of stay, increased morbidity, increased in-hospital mortality, long-term mortality, and advanced pathologic stage. This study showed the same findings or trends with the exception of in-hospital mortality (6%), which compared quite favorably with the other studies. Coco and colleagues[5] conducted a study of 787 patients where the 50 emergency patients were then matched for age, tumor location, stage, and comorbidities with 50 nonemergency case controls and found that the in-hospital and long-term mortality rates were the same between the two groups. However, length of stay and complications in Coco's study were higher in the emergency group despite being matched for pathologic stage.

Patients 80 years or older have the same outcomes as younger patients after surgery for colorectal cancer unless they have an emergency presentation or have poor functional status.[12] In this study there were three perioperative mortalities within 30 days of surgery: one 81-year-old in the nonemergency group and two patients, 55 and 70, in the emergency group. Out of 21 patients age 80 or older (10 emergency and 11 nonemergency) 20 survived the perioperative period.

Advanced age, poverty, and lack of a family physician are associated with colorectal cancer emergencies.[13,14] In this study, the average age of all patients was 72.3 years and most patients in both groups had a family physician. The US Preventive Health Task Force recommends patients over 75 years who have been previously screened on a regular basis not be screened any further, that patients 75 to 85 be screened only if their health status is good, and that patients over 85 not be screened at all.[2] These recommendations seem at odds with the fact that 17 of the 32 emergency patients in this study were 75 or older. Could their emergency admissions have been prevented if they were screened? More importantly, which screening test would have been the most effective?

Vernon, BC, is a mid-sized city with a mid-sized regional hospital and an aging population that offers a unique glimpse into the future of health care in BC. In 2006 Vernon's 65 and older population was 22%, compared with 14.6% for BC.[3] By 2036, Vernon's 65 and older population is projected to increase to 27.4%, in contrast to 24% for the whole of BC.[4] In other words, the proportion of elderly citizens in Vernon today is roughly what the province as a whole can expect in 25 to 30 years.

This study found a high rate of colorectal cancer emergencies—43% compared with 6% to 34% in the literature.[5-10] In addition to the advanced age of the general Vernon population, another factor contributing to colorectal cancer emergencies may be the lack of an effective provincial colorectal cancer screening program. Countries with a national screening program, such as Germany, Italy, and Australia, have published emergency presentation rates of 6% to 19%[5-7] in contrast to rates of 22% to 34% in countries that do not have programs, such as Spain, Norway, and Ireland.[8-10]

Currently, there are colorectal cancer screening guidelines in BC, but these presume the patient has a family physician and that the guidelines are followed. Unlike screening for cervical cancer or breast cancer, where patients can refer themselves for screening, there is no such option for colorectal cancer and as a result only 37% of those eligible are screened.[15] Colorectal cancer screening in Canada, in terms of both rates and adherence to guidelines, is poor, and screening in BC may be worse than in other provinces.[16] Screening with fecal occult blood testing[17] or flexible sigmoidoscopy[18] has been shown to reduce emergency admissions. The fecal immunochemical test is a more sensitive test that offers a potentially less costly alternative to colonoscopy on a population basis[19] and can be distributed by mail to the difficult-to-screen population.[20] Primary screening with colonoscopy has also been shown to reduce mortality from colorectal cancer[21] and is cost-effective.[22]

In this study, colorectal cancer patients who presented on an emergency basis had an increased length of stay and increased need for placement in a long-term care facility, increasing the cost of their care compared with nonemergency patients. Vernon's high colorectal cancer emergency rate of 43% portends what BC may face in future, and suggests that a comprehensive screening program able to serve the province's elderly at-risk population is needed to reduce the incidence of colorectal cancer emergencies and consequent poor outcomes and increased cost.

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Competing interests

None declared.

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