Original Article

A Retrospective Study of Elderly Colorectal Cancer Patients – the Longitudinal Result

Shih-Lun Lo[1]
Hsin-Chung Lee[1,2]
Ming-Hung Shen[2]
Shih-Chang Chang[2]
[1]*Department of Surgery,*
[2]*Division of Colorectal Surgery, Cathay General Hospital, Taipei, Taiwan*

Key Words
Colorectal cancer;
Age;
Elderly;
Survival

Purpose. To examine the longitudinal result of colorectal cancer (CRC) in elderly patients aging over 80 at the Cathay General Hospital (CGH).
Materials and Methods. This study used a retrospective longitudinal research approach. Information of cancer stage at initial diagnosis, treatment data, and outcomes were obtained from CGH medical records and the registry database of colorectal cancer. The overall survival rate was analyzed in this study as well.
Results. There were 234 elderly CRC patients aging over 80 receiving treatment at the CGH from January of 2000 to December of 2010. 176 octogenarians and nonagenarians were diagnosed with colon cancer, and 58 other elderly patients were diagnosed with rectal cancer. The 5-year overall survival rate was as follows: colon cancer: stage I: 67.1%, stage II: 39.6%, stage III: 17.4%, stage IV: 9.8%; rectal cancer: stage I: 40.9%, stage II: 24.1%, stage III: 57.1%, stage IV: 0%.
Conclusion. In this study, elderly CRC patients have significantly worse overall survival rate than younger CRC patients. The phenomenon may result from age-related declines in organ functions and medical comorbidities. It is possible that elderly patients have less tolerance to the surgical treatment and toxicity of chemotherapy. There are more challenges in treating elderly patients. Therefore, further studies are required for treating elderly patients with CRC.
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Octogenarians and nonagenarians comprise a rapid growing group of Taiwan's population. The risk of developing cancer increases as you age. CRC is the third most common cancer in Taiwan. The incidence of CRC is uncommon for a patient under the age of 50, but the rate increases exponentially up to about age 85. While the former is mostly caused by hereditary and family factors, the latter is more sporadic and environmentally related.[1] The incidence of CRC increases and more elderly patients are having CRC. Therefore, it is important to know the impact of age on outcomes after a patient is diagnosed with CRC. The care of elderly patients is complicated due to high numbers of comorbidities, which increase the operative risk, the risk of postoperative morbidity and mortality, and less tolerance of chemotherapy. This study is a retrospective review of CRC in elderly patients at the Cathay General Hospital (CGH).

Methods

All patients having colon cancer and rectal cancer at the CGH (2000-2010) were identified in the CGH

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Correspondence to: Dr. Shih-Chang Chang, Department of Surgery, Cathay General Hospital, No. 280, Sec. 4, Ren-Ai Road, Taipei, Taiwan. Tel: +886-02-2708-2121; Fax: +886-02-2709-7984; E-mail: samson1319@gmail.com

colorectal cancer registry database. All patients who were diagnosed with colon cancer and rectal cancer under treatment at the CGH were included. Those patients without follow-up records were excluded from the study. Data collection was performed on: age, sex, date of diagnosis, site of cancer, cancer stage at initial diagnosis, treatment, and date of death if the patient was deceased. All CRC patients were divided into two groups, with one group of patients younger than 80 years old and the other group of patients older than 80 years old. Statistical analyses were performed using Chi-square test to determine significance in non-parametric variables. Kaplan-Meier curves were used for the overall survival rate analysis. The p value < 0.05 was considered to be significant.

Results

From January of 2000 to December of 2010, 1308 patients with CRC were identified in the CGH cancer registry database (Table 1). On the whole, 13.4% (176) of patients with colon cancer and 4.4% (58) of patients with rectal cancer were 80 years of age or older. The cancer stage at initial diagnosis between older and younger patients was quite different. Almost sixty percent elderly CRC patients were diagnosed with stage II or III while nearly forty percent of younger CRC patients were diagnosed with stage III (Table 1). Elderly CRC patients had significantly lower cancer resection and chemotherapy rate ($p < 0.01$) (Table 2) when comparing to younger CRC patients. In the elderly patient group, patients with colon cancer had about 33.1% of 5-year survival rate and patients with rectal cancer had about 33.2% of 5-year survival rate (Table 3). Comparing to the elderly patient group regarding the cancer staging related 5-year overall survival rate, the group of younger patients under age 80 had better overall survival prognosis in different staging (Table 4). Life table method was used for survival analysis. In the elderly group, the overall 2-year and 5-year survival rates of colon cancer and rectal cancer stratified by staging were shown in Fig. 1 and Fig. 2. However, stage III CRC patients without chemother-

Table 1. Characteristic of all colorectal cancer patients

	≧ 80 y/o	< 80y/o	*p* value
Patient No.	234 (18%)	1074 (82%)	
Gender			NS
Male	106 (45%)	515 (48%)	
Female	128 (55%)	559 (52%)	
Site			NS
Colon	176 (75%)	675 (63%)	
Rectum	58 (25%)	399 (37%)	
Stage- colon			$p < 0.05$
I	30 (17%)	105 (16%)	
II	54 (30%)	197 (29%)	
III	56 (31%)	253 (37%)	
IV	36 (22%)	120 (18%)	
Stage- rectum			$p < 0.05$
I	14 (24%)	93 (23%)	
II	19 (33%)	90 (22%)	
III	15 (26%)	164 (41%)	
IV	10 (17%)	52 (14%)	

Table 2. Resection and chemotherapy for colorectal cancer patients

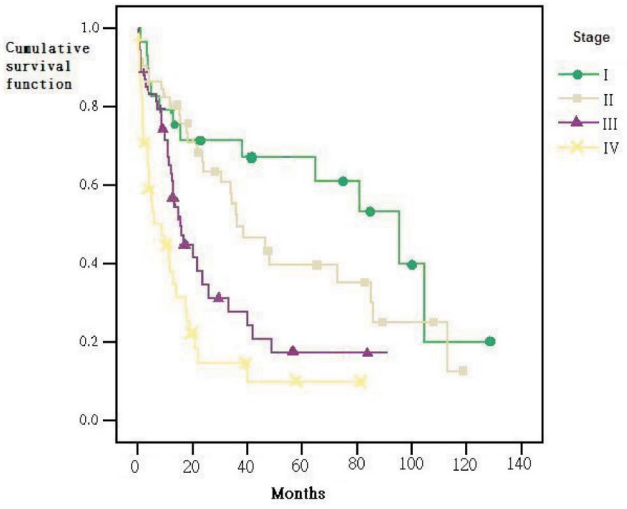
	≧ 80 y/o	< 80y/o	*p* value
Colon			
Resection	142 (76%)	635 (94%)	$p < 0.01$
Non-resection	34 (24%)	40 (6%)	
Chemotherapy	41 (23%)	358 (57%)	$p < 0.01$
Non-chemotherapy	135 (77%)	317 (43%)	
Rectum			
Resection	40 (69%)	351 (88%)	$p < 0.01$
Non-resection	18 (31%)	48 (12%)	
Chemotherapy	13 (22%)	223 (56%)	$p < 0.01$
Non- chemotherapy	45 (78%)	176 (44%)	

Table 3. Elderly patient group overall survival

≧ 80 y/o		1 year	2 year	3 year	5 year
Overall survival rate	Colon Ca	67.4%	48.4%	42.0%	33.1%
	Rectal Ca	75.8%	60.8%	55.6%	33.2%

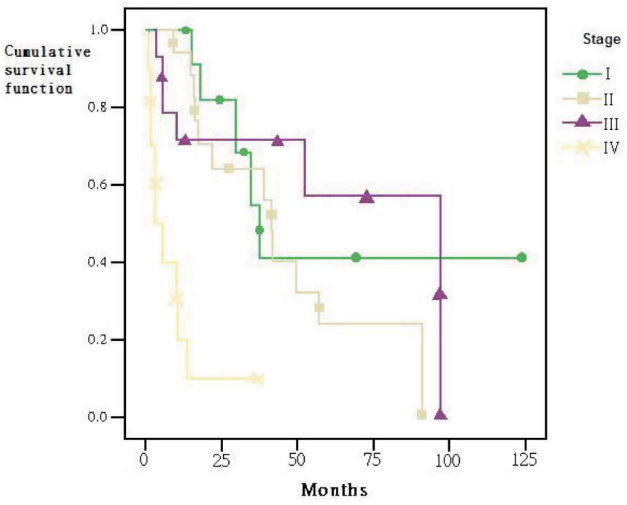
Table 4. Colorectal cancer 5-year overall survival rate for different stage

	≧ 80 y/o group		< 80y/o group	
	Colon	Rectum	Colon	Rectum
Stage I	67.1%	40.9%	96.9%	84.9%
Stage II	39.6%	24.1%	88.3%	73.9%
Stage III	17.4%	57.1%	69.9%	61.7%
Stage IV	9.8%	0%	17.5%	17.3%



Overall survival rate	Two year	Five year
Stage I	71.6%	67.1%
Stage II	63.4%	39.6%
Stage III	34.7%	17.4%
Stage IV	14.7%	9.8%

Fig. 1. Overall survival rate of elderly patients with colon cancer stratified by staging.



Overall survival rate	Two year	Five year
Stage I	81.8%	40.9%
Stage II	64.2%	24.1%
Stage III	71.4%	57.1%
Stage IV	10.0%	-

Fig. 2. Overall survival rate of elderly patients with rectal cancer stratified by staging.

apy had poorer overall survival rate ($p < 0.001$), which was shown in Fig. 3.

Discussion

Most of the CRC patients (89.3%) in this study received cancer resection operations. Compared with younger patients, less percentage (77.7%) of elderly patients received surgical resections. A cohort study showed that octogenarians and nonagenarians comprised 26% of all patients undergoing colon cancer resection and 16% of all patients undergoing rectal cancer resection from 1994 to 2005.[2] However, old age itself was not an absolutely independent and negative prognostic factor for CRC surgery. Selected individuals aged more than 75 years, who were reasonably good candidates for elective surgery with curative intent, could achieve excellent long-term results.[3] The majority of older patients with CRC underwent surgery with improved outcomes if compared with non-operative management. Nevertheless, many patients who were not selected for surgery died of unrelated causes, reflecting that good surgical selection criteria were needed. Patients undergoing surgery during an urgent/emergent admission have an increased short-term mortality risk.[4] Elderly patients were more likely to die from cardiopulmonary problems after surgical interventions than either from their primary disease or from the surgery undertaken for it.[5] Careful

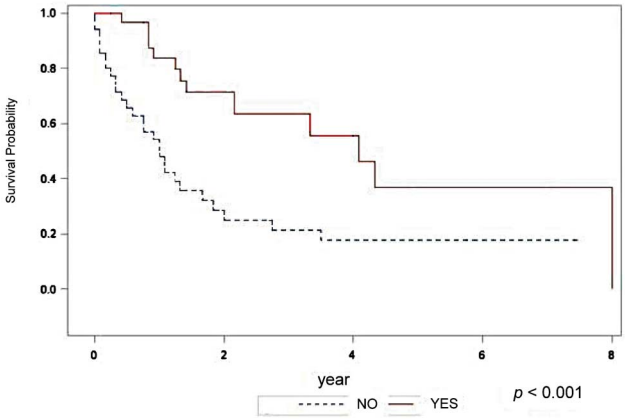


Fig. 3. Overall survival rate in elderly group stage III CRC patient with/without chemotherapy. ($p < 0.001$).

consideration should be given to selection of patients for surgery by taking account of previous functional and comorbid conditions to avoid cardiopulmonary complications. If this was done, long-term cancer-specific outcomes of elderly patients could be similar to those of younger patients. Thus, surgery should not be withheld based on age alone.[6] Patient selection should focus on the clinical status and ASA class of the patient rather than age.[7] Therefore, a rationale for CRC screening in the elderly patients not only increased the CRC detection rate but also reduced the rate of emergency operation, which increased survival in elderly CRC patients. The decisions about CRC screening and surveillance in older adults were complex and challenging.[8] A review of 242 consecutive elderly (≥ 65 y of age) CRC patients underwent either open or minimally invasive surgery (MIS). The overall length of hospital stay in the MIS group was decreased by 40%, 50% decrease in SICU stay and 66% decrease in cardiac complications. Minimally invasive colorectal resection led to improved short-term outcomes and no difference in oncologic outcomes in the elderly patients. The study showed that age alone should not be a contraindication to laparoscopic CRC resection.[9]

In this study, less elderly patients received chemotherapy. Surveillance, Epidemiology and End Results (SEER) database review of adjuvant chemotherapy used in elderly patients with stage III colon cancer revealed that use of adjuvant therapy substantially declined with increasing age: 58% of those aged 75-79 years, 34% of those aged 80-84 years and 11% of those aged 85-89 years received adjuvant chemotherapy.[10] When it comes to anticancer treatment, old age is associated with a lower recourse to standard therapy, especially for patients over 80 years old.[11] Cancer prevalence was high among elders yet treatment rates appeared extremely low, despite evidence of well-tolerated treatment. Chemotherapy toxicity concerns and elderly patient's comorbidities might inhibit elderly patients from pursuing definitive chemotherapy treatment. Physicians have been reluctant to consider adjuvant chemotherapy in elderly CRC patients because surgery alone was the cornerstone of this condition and chemotherapy-induced toxicity was perceived as deleterious in the elderly patients. However, there was strong evidence that adjuvant 5-FU-based chemotherapy was associated with a survival benefit in the elderly CRC population. In a pooled analysis of three randomized trials involving 3351 patients, adjuvant chemotherapy decreased similarly the risk of relapse before and after 70 years old.[12] It has been demonstrated that performing adjuvant chemotherapy for stages II and III CRC yielded an overall survival benefit of 7% and 10% at 8 years, respectively. The stage III elderly CRC patients without adjuvant chemotherapy in this study had poorer overall survival rate. There is nowadays solid evidence that supports the use of adjuvant chemotherapy in elderly CRC patients without unacceptable toxicity.[13] Age alone should not be a deterrent to the use of cutting-edge chemotherapy. Chronological age alone appears to impact colorectal surgeons' decisions to refer patients for adjuvant therapy. Sociodemographic and physiological factors further decrease the likelihood of referral of older patients. A lack of consensus among surgeons suggests that more research is needed both to predict how older patients with cancer will react to treatment, and to determine how information from emerging evidence can be best used to assist physicians' treatment decisions.[14] Fit elderly patients are good candidates for standard adjuvant chemotherapy; the safety of adding targeted agents warrants further investigation. Evaluation using a comprehensive global assessment tool can help identify elderly patients who are most likely to benefit from chemotherapy and other treatment agents.[15,16] Currently, there is no consensus within the geriatric or oncology communities regarding a standard assessment that can identify those older adults at risk for chemotherapy toxicity. Existing oncology performance status measures (such as Karnofsky performance status, Eastern Cooperative Oncology Group performance status, comprehensive geriatric assessment or vulnerable elders survey VES-13) are applied to all adult patients with cancer regardless of age to estimate functional status, assess eligibility for clinical trials, and predict treatment toxicity and survival. However, these tools were validated in younger patients and do not address the heterogeneity in the aging process.[17] There is an urgent

need to include older patients in clinical trials for CRC and to understand and use geriatric assessment scoring systems to identify those elderly CRC patients most likely to benefit from optimum treatment. With poor outcomes, what can surgeons and oncologists do to improve the care of the extremely elderly CRC patient? This study suggests that it requires further investigations regarding elderly CRC patients and geriatric CRC oncology.

Conclusion

In this study, elderly CRC patients have significantly worse overall survival rate than younger CRC patients. The phenomenon may result from age-related declines in organ functions and medical comorbidities. The elderly patients may have less tolerance to the surgical treatment and toxicity of chemotherapy. Advanced age can affect patients and physicians to choose intensive anti-cancer therapy, even if patients are highly functional and lack comorbidities. Education on tailoring cancer treatment and a greater use of comprehensive geriatric assessment may reduce cancer undertreatment in the geriatric population.[18] We have more challenges in treating elderly CRC patients. After the multi-disciplinary treatment team discussion, individualized treatment plans for elderly CRC patients are considered very important. Further investigations on treating elderly CRC patients are required to identify treatment strategies that may improve survival in this vulnerable cohort.

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原　著

老年人大腸直腸癌病人回顧性縱向分析

羅世倫[1]　李興中[1,2]　沈明宏[2]　張世昌[2]

[1]國泰綜合醫院　外科部　[2]大腸直腸外科

目的　本研究的目的是探討在國泰綜合醫院八十歲以上的結腸直腸癌患者的縱向分析結果。

材料與方法　本研究採用回顧性縱向研究設計。從國泰綜合醫院結腸直腸癌註冊資料庫和病歷得到結腸直腸癌癌症分期診斷，治療數據和結果。我們分析八十歲以上的結腸直腸癌患者總體生存率。

結果　自 2000 年 1 月至 2010 年 12 月共有 234 位八十歲以上的結腸直腸癌患者在國泰綜合醫院接受治療。176 位八十歲以上患者被診斷為結腸癌和 58 位確診為直腸癌。5 年總生存率為如下：結腸癌：I 期：67.1%，II 期 39.6%，III 期 17.4%，IV 期：9.8%；直腸癌：I 期：40.9%，II 期：24.1%，III 期 57.1%，IV 期：0%。

結論　在我們的系列中，八十歲以上老人結腸直腸癌患者的總生存率比年輕患者有顯著更差的存活率。這種現象可能是因為年齡相關的器官功能衰退和其他合併症。老年患者對於手術治療和承受化療副作用的耐受性較低。對於老年患者，我們有更多治療上的挑戰。

關鍵詞　結腸直腸癌、年齡、老年、存活率。