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ORIGINAL ARTICLE

The incidence and clinical associated factors of interval colorectal cancers in Southern Taiwan

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Background/Purpose: Interval colorectal cancer (CRC) is an emerging issue in CRC screening and surveillance. The frequency of interval CRC and its associated factors have not been well studied in Eastern Asia. We aim to clarify the factors associated with interval CRC.
Methods: CRC patients who had negative colonoscopy results 6–36 months prior to cancer diagnosis were defined as cases of interval CRC. Patient characteristics, past history, colon preparation, colonoscopy findings, and pathology were retrospectively evaluated. A total of 670 patients with colorectal adenocarcinoma by pathology who also underwent colonoscopy before diagnosis from January 2005 to November 2014 were recruited.
Results: Twenty-two (3.28%) patients (65.7 ± 9.2 years old; 9 male) were diagnosed with interval CRC. The interval CRCs were predominantly located at the rectum and cecum, and presented as earlier stage cancers (Stage I and Stage II: 86.4%, Stage III and Stage IV: 13.6%). Factors associated with interval cancer include end-stage renal disease (ESRD) (hazard ratio: 10.494, 95% confidence interval: 2.131–51.681) and shorter ascending colon withdrawal time (interval cancer: noninterval cancer 2.00±0.82: 4.91±3.74 minutes; hazard ratio: 0.561, 95% confidence interval: 0.345–0.913). Prior polypectomy and tumor size also tended to be related to interval CRC.

Conclusion: The prevalence of interval CRC in the present study is 3.28%. Comorbidity with ESRD and shorter ascending colon withdrawal time could be factors associated with interval CRC. Good colon preparation for the patients with ESRD and more ascending colon withdrawal time could reduce the interval CRC.

Introduction

Colorectal cancer (CRC) is the third most common malignancy worldwide.[1,2] Because more fecal occult blood testing and screening colonoscopies are being performed, the incidence of CRC has increased with a significant reduction of mortality rate.[3] In the current guidelines for patient screening after polypectomy or colonoscopy, surveillance intervals are recommended according to the findings of the index colonoscopy and risk classification. Compared with people who had never undergone colonoscopies, patients with previously negative colonoscopy had a significantly reduced risk of CRC.[4]

The definition of interval CRC varied, from CRCs diagnosed 1–36 months after negative colonoscopy, to those cases diagnosed 6–36 months after negative colonoscopy.[5] A meta-analysis review from the Mayo Clinic analyzed 12 population-based multicenter studies and determined the following characteristics of interval CRC: more arise in the proximal colon, it occurs in older patients and those with more comorbidities or diverticular disease, and is less present at an advanced stage.[5] Rabeneck et al[6] reported the importance of colonoscopy operator training as endoscopists' experience may affect the odds ratio of interval cancer. Moreover, quality indicators such as adenoma detection rate and withdrawal time appeared to be important assessments of colonoscopy performance.[7,8]

A cohort study regarding interval CRC in Taiwan patients is lacking and we therefore conduct the present study with cancer-specific, demographic, and procedural data. Our aim was to study the prevalence of interval CRCs and clarify the associated factors of interval CRCs in Taiwan patients.

Methods

Patient characteristics

We retrospectively reviewed the medical records of patients who had been diagnosed with CRC between January 1, 2005, and November 30, 2014, in a medical center in south Taiwan. We used a pathology database to identify patients with colorectal adenocarcinoma compatible with the diagnosis and determined which patients had received negative colonoscopy 6–36 months before the diagnosis of CRC. Younger patients under the age of 18 years, those with a history of inflammatory bowel disease, previous diagnosis of CRC, a history of polyposis, or those whose endoscopic examination failed or was performed by flexible sigmoidoscopy, were excluded.

The definition of interval CRC was a negative colonoscopy between 6 months and 36 months prior to the pathologic diagnosis of CRC.[9,10] By contrast, patients with a negative colonoscopy more than 36 months prior to the pathologic diagnosis of CRC are categorized as the detected CRC group. We collected basic information (age, sex, body mass index, comorbidities, and descriptions of colonoscopies performed) at the time of the index colonoscopy. The characteristics of the cancer included location (cecum, ascending colon, transverse colon, descending colon, sigmoid colon, and rectum), as well as tumor size, tumor stage, and histologic grade according to the pathology reports. In unresectable cancers, tumor sizes were obtained by computer tomography or colonoscopic measurement. The indications for the examination (diagnosis or polypectomy), operator experience, quality of the bowel preparation, and withdrawal time were collected and compared. We took at least six pictures with recorded time from cecum, hepatic flexure, splenic flexure, sigmoid descending junction, rectosigmoid junction, and anus during withdrawing colonoscopy. The landmarks of the cecum were the appendiceal orifice and ileocecal valve; hepatic flexure was defined as a gray-blue colored impression of the liver, splenic flexure as a gray-blue colored impression of the spleen, sigmoid descending junction defined as the angle by pelvic brim and the forward-projecting sacral promontory. The rectum was defined as 15 cm proximal to the anal verge.[11] The withdrawal time during cecum to hepatic flexure was defined as ascending colon withdrawal time. During the study period, colon preparation used either polyethylene glycol (Niflec, China Chemical & Pharmaceutical Co., Ltd., Taipei, Taiwan) or magnesium citrate (MAGVAC oral solution, Purzer Pharmaceutical Co., Ltd., Taipei, Taiwan) administered the day before and the day of the procedure using a split bowel preparation strategy. Colonoscopies were performed using an Olympus CF Q260 or H260 colonoscopy (Olympus Optical Co., Ltd., Tokyo, Japan) with real-time video recording. Senior colonoscopists were defined as endoscopists with more than 2 years of experience in colonoscopy (more than 500 colonoscopies/year). This study was approved by both the Institutional Review Board and Ethics Committee of Chang Gung Memorial Hospital.

Statistical analysis

All results were expressed as means ± standard deviations for continuous data and as frequencies or percentages for categorical data. Distributions of continuous variables were analyzed by Pearson correlation and the Student *t* test or