Case Analysis

Synchronous Colorectal Carcinoma

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Key Words
Synchronous colorectal cancer

Purpose. The reported incidence of synchronous colorectal carcinoma ranged between 2-5%.[1-6] The purpose of this study was to analyze the patients with diagnosis of multiple colon cancers and results of en bloc resection for synchronous colorectal cancers.
Materials and Methods. From Jan 1999 to Dec 2008, a total of 1,583 patients underwent surgical resection of primary colorectal cancers by a single surgeon were reviewed. The incidence and characteristics of synchronous lesions were evaluated.
Results. There were a total of 25 patients (1.58%) diagnosed as having synchronous colorectal carcinoma. Seventeen patients were male and eight patients were female. Age ranged from 49 to 84 years old, with an average of 69.7 years old. Synchronous colorectal cancer occurs at older age and occurs more frequently in the group of male. Operative mortality was 12% (3/25).
Conclusion. Synchronous colorectal cancers are not infrequent. Surgeons should be alert about the possibility of presence of multiple lesions and be able to avoid second operation for missing lesion.
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Synchronous colorectal cancer, defined as two or more primary colorectal cancers identified in the same time. Each tumor must be clearly malignant as determined by histological evaluation, geographically separate and distinct. Not infrequently the patients had two or more synchronous colorectal cancers and reported incidence of synchronous cancer was between 2-5% in large series.[1-6]

Resection of synchronous carcinomas might not only increase the patient's chance of cure, but also avoid second or multiple operations. Despite its importance, a preoperative colonoscopy of the entire colon is often unobtainable due to bowel obstruction by the tumor, poor bowel preparation or limitations associated with available facilities.[7]

The aim of this study was retrospectively analyze the patients with diagnosis of multiple cancers and results of en bloc resection for synchronous colorectal cancers in a 10 year period.

Materials and Methods

From Jan 1999 to Dec 2008, a total of 1,583 patients underwent resection of primary colorectal cancers by a single surgeon (TCH) at our institute. There were 958 colon cancers and 625 rectal cancers. There were 822 males and 761 females. Age ranged from 19 to 95 years, with an average of 64.4 years. There were 226 patients with Dukes' A tumors, 499 patients with Dukes' B tumors, 615 patients with Dukes' C tumors and 243 patients with Dukes' D tumors (Table 1).

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All lesions were distinct cancers separated by normal mucosa and bowel wall, with invasion of malignant cells below the muscularis mucosa. Neoplastic polyps with carcinoma in situ were classified as benign.

Patients with ulcerative colitis, familial polyposis coli, metachronous colon cancer, or histology other than adenocarcinoma were not included. Each tumor must have a definite pathologic picture of malignancy; metastasis or recurrence from another colorectal cancer was also excluded.

All cancers detected at the same time of surgery or detected within 6 months were defined as synchronous cancer, otherwise were considered as metachronous cancer.

Regular preoperative evaluation included barium contrast enema and/or colonoscopy, and computed tomography (CT) of abdomen. Other examinations, such as magnetic resonance imaging (MRI), ultrasound of abdomen and small bowel series were ordered when needed.

When two or more colorectal lesions were identified, the most advanced lesion was regarded as the index lesion and other lesions were designated as the concurrent lesions.

Tumors were classified to right-side colon or left-side colon depending on the location proximal or distal to splenic flexure.

We retrospectively reviewed the medical records of the patients with multiple primary colorectal cancers. Tumor stages were determined according to the modified Dukes' classification.

Results

Of the 25 patients (1.58%) with multiple primary colorectal cancers, seventeen patients were male and eight patients were female. There was significantly more men in the group with synchronous cancers than in the group with single cancer ($p < 0.001$). Age ranged from 49 to 84 years old, with an average of 69.7 years old.

Surgical procedures for colorectal cancers included 10 right hemicolectomies, seven anterior resections, five subtotal colectomies, five sigmoid colectomies, three abdominoperineal resections, two left hemicolectomies and one Hartmann's procedure (Table 2). Some patients accepted two procedures based on the clinical judgment.

All of 25 cases had two synchronous cancers and six patients (24%) were not known to have multiple cancers prior to operation. Four of these six patients presented with acute colonic obstruction.

The Dukes' classification of the index lesions was A in two cases (8%), B in eight cases (32%), C in 11 case (44%), and D in four case (16%) (Table 1).

The synchronous tumors were located in the same side of the colon in 12 patients and different side in 13 patients.

Seven patients had 11 complications following surgery. Respiratory failure was the most common complication which occurred in four patients (16%), followed by two patients with urinary tract infection, and one patient each of wound infection, anastomotic leakage, renal failure, gastrointestinal bleeding and pelvic bleeding (Table 3).

Operative mortality was 12% (3/25). Two patients died of respiratory failure and one patient died of mas-

Table 1. Stage in all patients with colorectal cancer and synchronous colorectal cancers seen in 10 years (1999-2008)

Dukes' stage	Number of all patients	Number of synchronous colorectal cancer
A	226	2
B	449	8
C	615	11
D	243	4
Total	1,583	25

Table 2. Operative procedure in patients with synchronous colorectal cancer

Operative procedure	Number of patients
Right hemicolectomy	10
Subtotal colectomy	5
with ileocolic anastomosis	2
colorectal anastomosis	3
Left hemicolectomy	3
Sigmoid colectomy	5
Anterior resection	7
Hartmann's resection	1
APR	3

Table 3. Operative complications in patients with synchronous colorectal cancer

Complication	Number of patients	%
Respiratory failure	4	16
Urinary tract infection	2	8
Wound infection	1	4
Anastomotic leakage	1	4
Renal failure	1	4
Gastrointestinal bleeding	1	4
Pelvic bleeding	1	4

*Seven patients had 11 complications

sive upper gastrointestinal bleeding.

Three patients were excluded for survival analysis because they died of postoperative complications. Five-year survival rate of the 22 patients was 45.4%. The survival curve in patients with multiple colorectal cancers is shown in Fig. 1. Five-year survival rate of the Dukes' A, B, C was 100%, 67.5%, 33.3% respectively. No patient with Dukes' D lesion survived over 5 years. The survival curve of different stages in patients with synchronous colorectal cancers is shown in Fig. 2.

Discussion

One of the difficulties to assess synchronous cancers is that there is no consistent definition of synchronous colon cancer in the literature. Synchronous and metachronous cancers were often mixed together as "multiple colon cancer" in early studies.[2]

Some studies considered cancers diagnosed less than 6 months after diagnosis of the index tumor to be synchronous. In other studies, cancers diagnosed within a year of the initial diagnosis were classified as synchronous.[8,9]

Synchronous colorectal adenocarcinoma is not rare with a reported incidence between 2-5% in large series. In this series, there were 25 cases of synchronous colorectal cancers in 1,583 cases of primary colorectal adenocarcinoma (1.58%).

Several studies revealed no significant difference in tumor size, age, gross features and gender incidence between multiple and single colorectal cancers.[6,10] In some studies, multiple primary colorectal cancers are more predominant in males.[11]

Difference of age at diagnosis between multiple

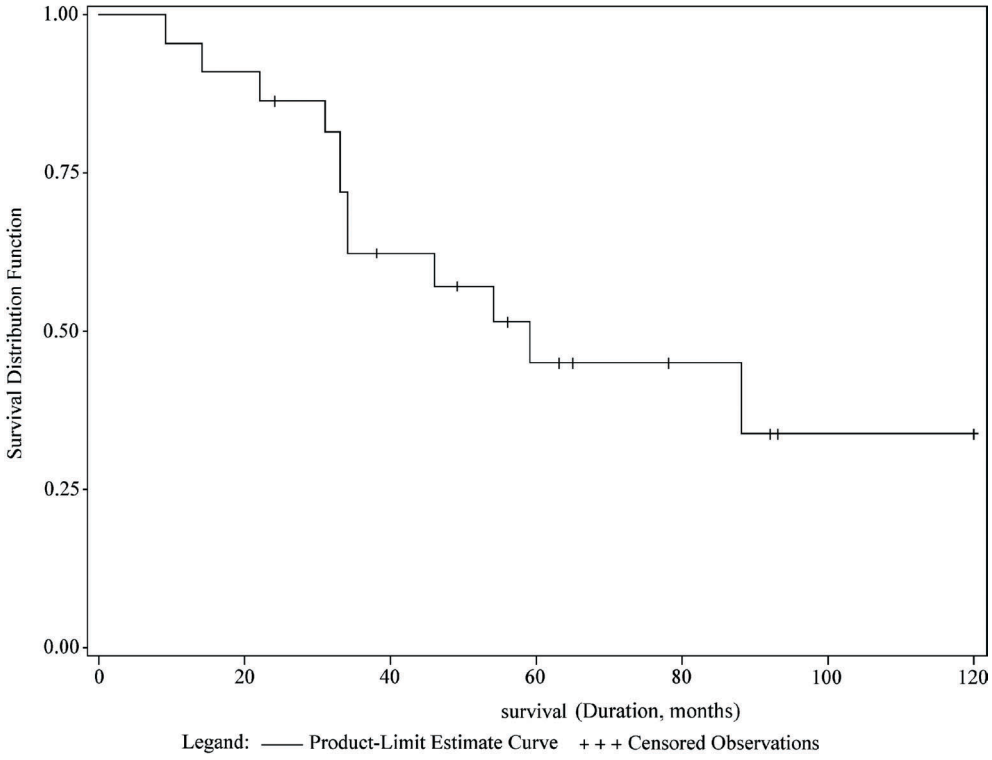

Fig. 1. Survival curve in patients with multiple colorectal cancers.

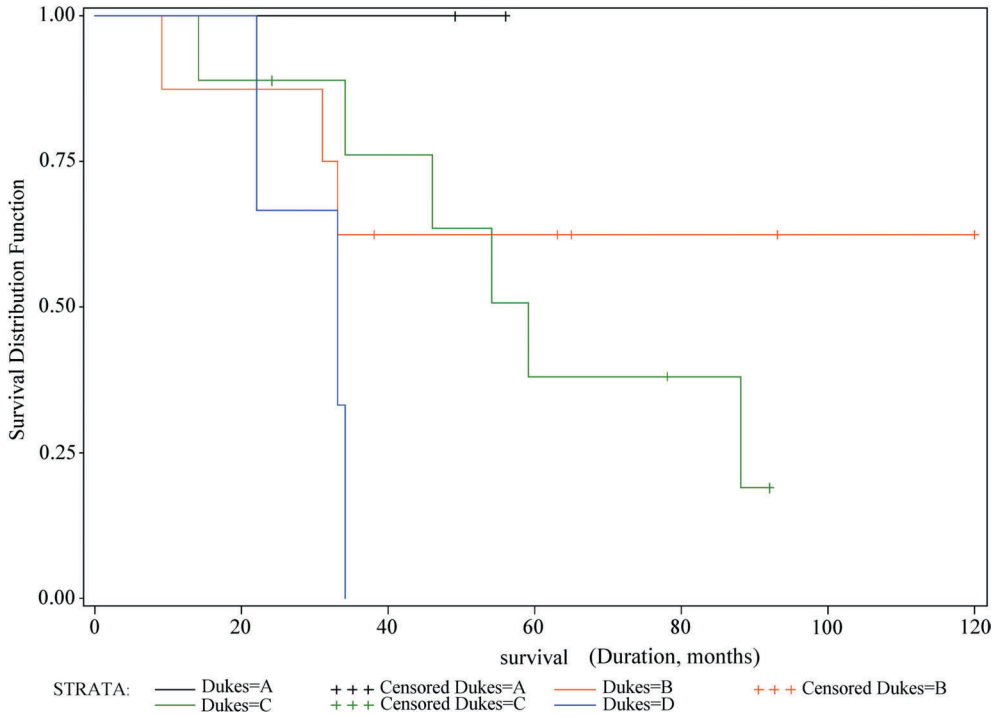

Fig. 2. Survival curve of different stages in patients with synchronous colorectal cancers.

and single colorectal cancers is also a subject for discussion. Some series revealed a younger age at diagnosis for synchronous cancers,[12] but others showed a similar age distribution for multiple and single cancers.[4] In this study, the mean age of patients with synchronous cancers was higher than single cancers (69.7 y/o: 64.4 y/o).

The preoperative accurate diagnosis of multiple synchronous colorectal carcinomas remains difficult. The accuracy of preoperative diagnosis is still not satisfactory and the second location is often missed. Optical colonoscopy is regarded as the most sensitive and the most specific total-colon examination for identification of colorectal cancer.[13] Other techniques, such as intraoperative palpitation, barium enema, and intraoperative colonoscopy, are commonly performed to assess the intestine proximal to the site of obstruction. Finan et al.[14] found only 42% of 59 synchronous cancer patients were diagnosed preoperatively, and 24% were detected at surgery, 34% were found incidentally on pathological specimen. Chen et al.[4] reported that 66% (31/47) of synchronous cancers were omitted during preoperative barium enema and/or colonoscopy. Some authors suggested that palpation of the whole colon and rectum is extremely important.[15] But some studies showed intraoperative palpation of the colon is not always a sensitive method. When the second cancer is at an early stage, intraoperative palpation might miss up to 40 percent of synchronous lesions.[4] So if there is incomplete examination of the large bowel at the time of diagnosis, a colonoscopy is required soon after surgery.[16]

A study suggests that 18-fluorodeoxyglucose positron emission tomography/computed tomography (PET/CT) colonography may become the primary diagnostic tool to examine the colon proximal to the obstructive colorectal cancer. There were no false-negative or false-positive proximal colorectal cancers by PET/CT colonography in 13 cases. However, a potential weakness of the study was the small sample size.[17]

In our group, preoperative diagnostic rate of synchronous colorectal cancers reached 76% (19/25). The synchronous lesions could not be identified preoperatively because occluded distal lesions made it difficult to detect the proximal lesions. In the patients with occluded tumors, some studies showed that computed tomographic colonography could assess the entire colon preoperatively, and synchronous lesions

were detected and treated at the time of elective surgery. And the sensitivity of computed tomographic colonography could reach 83.7%.[18]

The choice of type of the operative procedure for multiple colorectal carcinomas remains controversial. Some authors proposed radical operations such as subtotal colectomy to remove enough length of intestines and numbers of local lymph nodes to prevent future development of metachronous tumors.[19] Some experts recommended a more conservative approach for older patients and radical procedures for younger patients with regionally confined non-metastatic disease.[20] We agree with the second opinion because major surgery such as subtotal colectomy could increase morbidity in older patients.

It is the authors' intention not to compare the prognosis of single and multiple colorectal cancer because there is a huge difference of the number of patients between two groups and controversies in the literature. In many studies, there was no difference in survival between the patients with primary multiple and single colorectal cancers. And there were only minor differences in stage distribution. Postoperative survival in synchronous tumor cases was not worse than that in single tumor cases, and was mainly dependent on the pathological stage and curability of the index lesions.[9] However, some studies reported better survival in synchronous cancers[21] and some studies reported worse survival in synchronous cancers.[9,22] In the present study, postoperative mortality was significantly higher in synchronous cases than in single tumor cases. It is relatively a small series. Although it was just an assumption, we assumed that older age and poor general condition were possible factors contributed to the high mortality rate.

Conclusion

In this series, synchronous carcinomas were not as high as previously reported and surgical mortality appeared higher than most series of colectomy for cancer. Synchronous colorectal cancers are not infrequent. Surgeons should be alert about the possibility of presence of multiple lesions and be able to avoid second operation for missing lesion.

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病例分析

同步發生的大腸直腸癌

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目的 文獻報告同步發生的大腸直腸癌發生率約在 2% 至 5%。這篇回顧性研究分析，主要是分析罹患多發性大腸直腸癌的病患及手術治療同步發生的大腸直腸癌的結果。

方法 從 1999 年 1 月到 2008 年 12 月，共有 1,583 位罹患原發性大腸直腸癌並接受手術切除的患者，這些患者都接受同一位外科醫師的手術治療。我們從這些患者中去分析同步發生的大腸直腸癌的發生率及各項特性。

結果 共計有 25 位病患 (1.58%) 罹患同步發生的大腸直腸癌被診斷出來。17 位病患是男性，八位為女性。年齡從 49 歲至 84 歲，平均年齡為 69.7 歲。同步發生的大腸直腸癌發生於較年老族群且在男性族群較易發生。手術死亡率為 12% (3/25)。

結論 同步發生的大腸直腸癌並不罕見。外科醫師應該對大腸癌可能會有多發性有所警覺，以避免因錯失病灶而需要再度手術。

關鍵詞 同步發生的大腸直腸癌。