Case Report

Laparoscopic radical resection of gastric cancer and metachronous colon cancer—a case report

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Abstract: Due to the favorable prognosis of gastric cancer (GC), the incidence of second primary cancer (SPC) accompanied with GC has increased. Here, we reported a case of a 69-year-old male patient with metachronous GC and colon cancer, who had undergone laparoscopic radical resection of distal GC 4 years ago. During this hospitalization, the patient underwent laparoscopic radical resection of left hemicolectomy for metachronous colon cancer. Few literatures have reported that patients with metachronous GC and colon cancer can receive laparoscopic surgery successfully. The patient recovered well and was discharged on day 10 post-operation. The pathologic specimen was identified as metachronous colon cancer. We concluded that GC patients need regular standard follow-up programs after undergoing operations. For multiple primary cancers (MPCs), treatments need to be individualized and comprehensive. Laparoscopic surgery is recommended as an appropriate option.

Keywords: Metachronous; multiple primary cancers (MPCs); gastric cancer (GC); laparoscopic surgery; case report

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Introduction

Gastric cancer (GC) is the fourth most common cancer among both men and women in developed countries (1). In China, GC is the second most common cancer among men, the third among women, and the second leading cause of cancer-related mortality (2). With the advancements in GC diagnosis and treatment, the overall survival of GC patients has been prolonged; which has led to the rise in incidences of second primary cancer (SPC) accompanied with GC. Few literatures have reported that patients with metachronous GC and SPC can receive laparoscopic surgery successfully. In this study, we report a case with metachronous GC and colon cancer who received successful laparoscopic surgery for these two cancers. Billroth (3) first reported multiple primary cancer (MPC) in 1889, and the first systematic study of MPC was delivered by Warren and Gates in 1932 (4). The diagnostic criteria of MPC by Warren and Gates have been widely used. These criteria are: (I) each cancer must be determined as malignant by histologic evaluation; (II) each cancer must be geographically separate and distinct; (III) the possibility of metastasis of each cancer must be eliminated. The incidences of MPC in patients with GC range from 1.1–8.0% (5-7) in previous study. According to the interval of diagnosis between MPC, multiple cancers may develop metachronous or synchronously. Synchronous MPC was defined as those with an interval within 6 months. On the other hand, metachronous MPC are defined as those with an interval of more than 6 months (8-10). In this study, we report a metachronous MPC, as the colorectal cancer (CRC)

which was diagnosed 49 months later after the diagnosis of GC. The histopathological examination revealed that both of them were primary cancers. Many metachronous primary cancers developed within 5 years after the diagnosis of first primary cancer. A Korean study reported that the mean occurrence interval for metachronous cancer was 25.5 months in GC patients (8,11). As a result, it is important to summarize a regular standard follow-up procedure for post-operation management of GC patients, and individualized as well. Also, minimal invasive treatments are needed to optimize their prognosis. We present the following case in accordance with the CARE guideline (12).

Case presentation

A 69-year-old man was admitted to our hospital for further evaluation and treatment of colon cancer. The patient's diagnosis and treatment process were briefly outlined in the timeline (*Figure 1*). Four years ago, he had been diagnosed with early-stage GC and undergone laparoscopic radical resection of distal GC. The pathologic specimen revealed a well-differentiated intramucosal adenocarcinoma with no lymph nodes metastasis (0/9), and with negative resection margins (T1M0N0, stage IA) (*Figure 2*). Sequential adjuvant therapy was not performed, and the patient was followed up regularly with no evidence of recurrence. Forty-nine months later, the patient had undertaken a colonoscopy due to a symptom of left upper abdomen colic, which revealed a cauliflower-like mass in the splenic flexure of colon (*Figure 3*). Histopathological examination revealed that the patient had developed adenocarcinoma. Laboratory test showed white blood cell (WBC) 5.2×10^9/L, hemoglobin 101 g/L, total protein (TP) 56.7 g/L, albumin (ALB) 33.2 g/L, carcinoembryonic antigen (CEA) 1.62 (normal range, 0–5) ng/mL, and carbohydrate antigen 19-9 (CA19-9) 11.62 (normal range, 0–37) IU/mL. Fecal occult blood test was negative. Further, abdominal ultrasound, abdominal computed tomography (CT) scan and gastroscopy found no evidence of distant metastasis or recurrence of GC. The patient underwent laparoscopic radical resection of left hemicolectomy. The pathologic specimen revealed a moderately differentiated adenocarcinoma, which had invaded the subserosa, with no lymph nodes metastasis (0/9), and with negative resection margins (T3M0N0, stage IIA) (*Figure 4*). The patient recovered well, with no obvious complications, and was discharged on the 10th day after the operation. There was no family history related to the patient's case.

Discussion

In patients with GC, the most common SPC is CRC, followed by lung cancer (5-7,9,13,14). The high incidence of CRC in GC patients may be attributed to the genetic and environmental factors. Several studies have revealed higher incidences of SPC in GC patients with microsatellite instability (MSI) (15,16). Nevertheless, Kim *et al.* (17) reported that MSI or p53 overexpression was not effective in predicting GC patients developing metachronous or synchronous CRC. This is so because GC and CRC have different etiologic pathways; which make it tough to evaluate the relationship between them. Sonnenberg *et al.* (18) reported that 2.35-fold risk for CRC was detected in patients with *H. pylori* gastritis. Since *H. pylori* infection is one of the recognized risk factors for GC, it may be another risk factor for GC patients to develop CRC (19).

Previous studies have revealed that age, male gender, blood type, tobacco, alcohol, chemotherapy, radiotherapy, an early stage of GC, multiplicity of GC, and family tumor history are all risk factors of SPC development (6,8,11, 20-22). Male and elderly GC patients tend to develop SPC more frequently. A Polish study (6) reported that GC patients had synchronous or metachronous cancers. Patients with synchronous cancer were older (68.0±10.3) years while the metachronous cancer patients were 59.9±11.1) years. Furthermore, GC patients with blood type O were more likely to develop SPC (56.2% *vs.* 31.6%, respectively, P=0.002). Cigarette smoking and alcohol drinking were also reported as risk factors for SPC development in GC patients; which may be explained by the field cancerization effect (5,8,23,24). Chemotherapy and radiotherapy of initial cancer were considered to increase the incidence of SPC (6,22). However, some studies reported that adjuvant chemotherapy may not be an independent risk factor for developing SPC (25,26). Ławniczak *et al.* (6) and Muela Molinero *et al.* (27) found that most GC patients with MPC, had either their first- or second-degree relatives as cancer victims; particularly GC. Due to the favorable prognosis of early-stage GC, there is a high risk of SPC development in

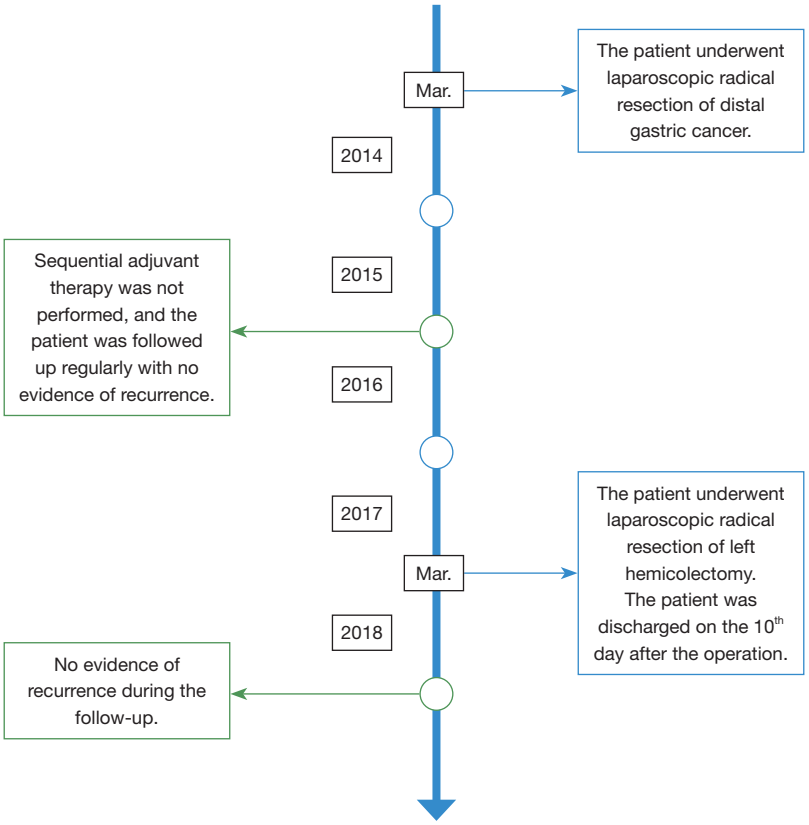

Figure 1 The timeline of interventions and outcomes.

patients with early-stage GC (8,11,20).

In GC patients with SPC, a comparison of synchronous SPC, and metachronous SPC revealed that the latter had a better prognosis (14,21). Ikeda *et al.* (28) reported that the 10-year survival rate of GC patients without SPC was 69.3%. The survival rate in synchronous SPC was 40.1%; while in metachronous SPC was 75.2%. This difference may be due to routine follow-up after treatment for first primary cancer, which increases the opportunity of early detection. Also, metachronous SPC occurs in early-stage and more frequently among GC. The main cause of death for MPC, either in first primary or second cancer is still unclear. For metachronous MPC patients, the first primary cancer seems to be the major cause of death. In contrast, for synchronous MPC patients, SPC seems to be the major cause of death (8,28).

For most MPC patients, surgery is recommended for curative option. However, traditional open radical resection is feasible but traumatic; especially for MPC patient who may have undergone two or more surgeries before. In this case, we performed laparoscopic surgery for both GC and metachronous colon cancer. The patient recovered smoothly with no obvious complications, and was discharged on the 10th day after the operation. Intraperitoneal adhesions caused by previous operations are always a concern for surgeons. The advantage of laparoscopic surgery is that it is minimally invasive and causes less postoperative adhesions; which make it feasible for performing repeated operations for MPC patients. Furthermore, laparoscopic surgery has been identified as feasible and safe for metachronous CRC, regardless of whether previous surgery was minimally invasive or open, and with short-term benefits (29,30). Otherwise, with the development of diagnostic techniques, the rate of detection of early-stage GC has been improved. Endoscopic resection has been widely accepted for curing early-stage GC in Japan and Korea, which has been proved

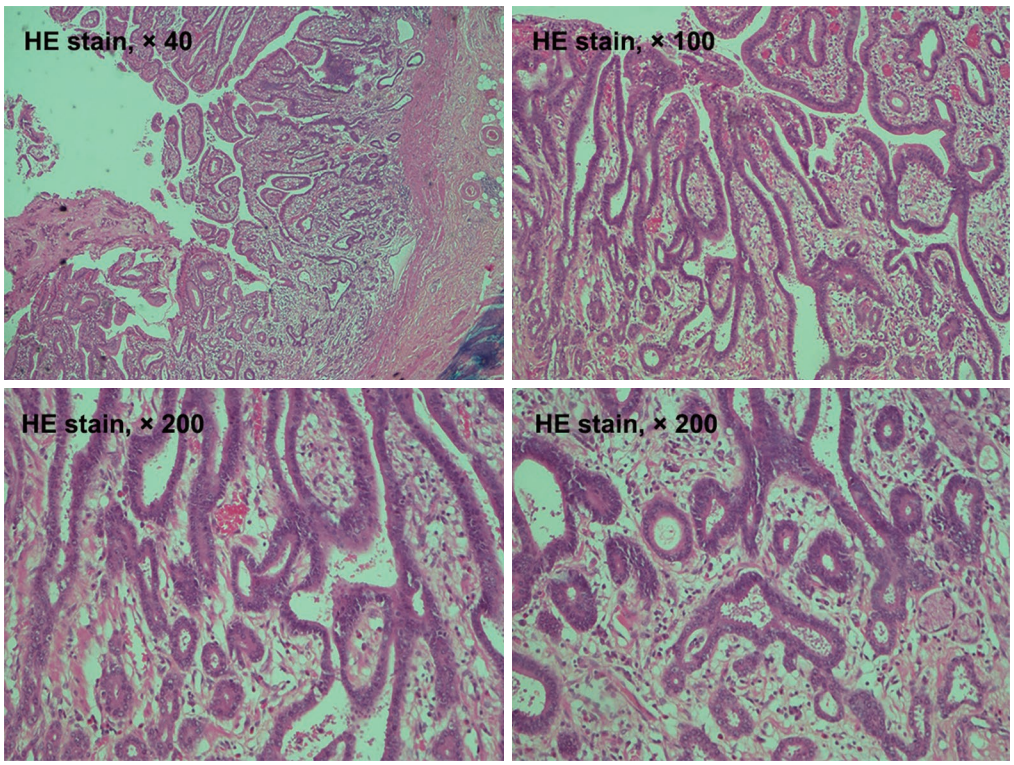

Figure 2 Histopathological finding of GC (HE stain). HE, hematoxylin and eosin; GC, gastric cancer.

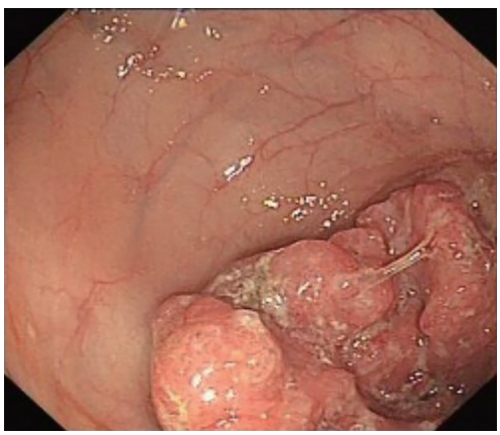

Figure 3 Colonoscopy revealed a cauliflower-like mass in the splenic flexure of colon, and histopathological examination revealed adenocarcinoma.

feasible, convenient, and minimally invasive (31,32).

Most SPC are always diagnosed due to more symptoms during the follow-up examination (33). Thus, a study (8), which included 3,066 GC patients, was used to develop a monogram for predicting metachronous MPC. The selected parameters include gender, age, the multiplicity of GC, stage of GC, and tumor size as 5. The c-index was 0.72, which means that this nomogram had a certain predictive accuracy. Compared with other predicted methods, this nomogram had better prediction. However, the small incidence of MPC in GC patients (70 in 3,066 patients) limits the generalization of the study result. Just as the author indicated, further external validation with independent patient cohorts is required to improve the accuracy of prediction.

Conclusions

A regular standard follow-up program should be established for GC patient, in order to determine the MPC. Treatment for MPC should be more individualized and comprehensive. Minimally invasive surgery may be an appropriate option. An efficient predictive tool is demanded, which can improve the prognosis of GC survivors.

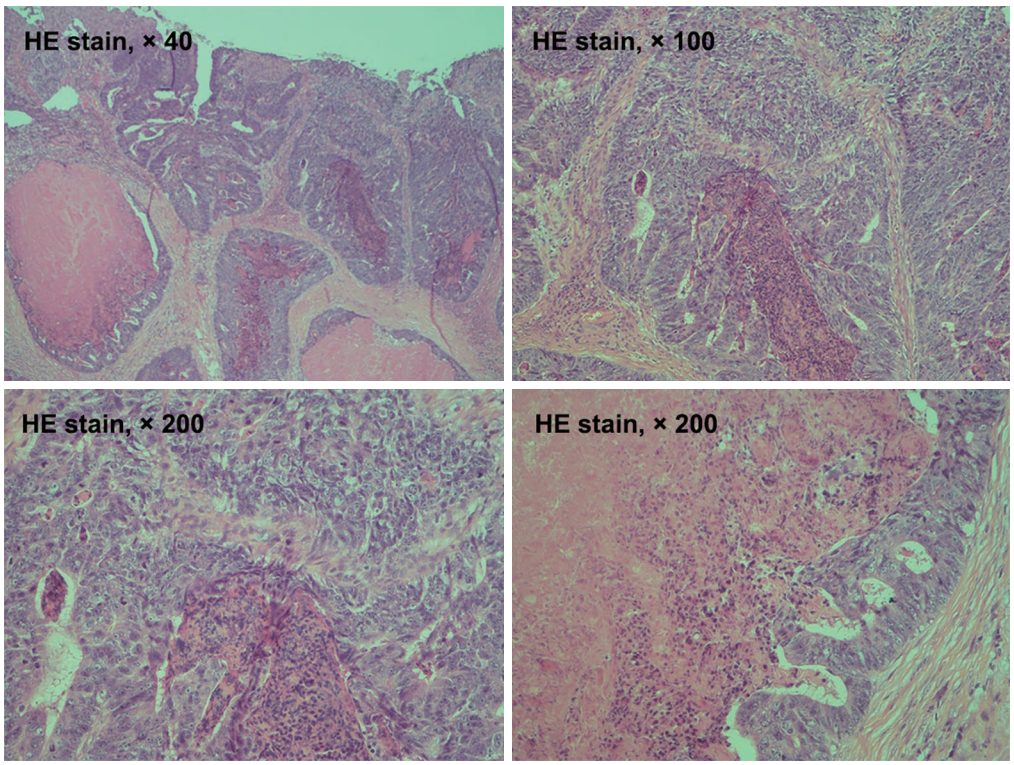

Figure 4 Histopathological finding of colon cancer (HE stain). HE, hematoxylin and eosin.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at http://dx.doi.org/10.21037/tcr.2020.01.44). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in studies involving human participants were in accordance with the Declaration of Helsinki (as revised in 2013). This study was ethically approved by the Ethics Committee of Sir Run Shaw Hospital of Zhejiang University (No. 20180518-021). Written informed consent was obtained from the patient for publication of this case report and accompanying figures.

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