Peritoneal Dissemination of Early Gastric Cancer: Report of a Case

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Abstract

Recurrence of early gastric cancer is rare, with an incidence of less than 10% in Japan. Using peritoneal lavage cytological examination, we detected tumor cells in the peritoneal cavity of a 73-year-old man undergoing surgery for early gastric cancer. Peritoneal dissemination of early gastric cancer is rare. Thus, we summarized the clinicopathological findings of the total 15 cases of peritoneal dissemination of early gastric cancer documented in the English medical literature, including this case. All of the patients had a tumor size >2 cm, submucosal invasion, differentiated adenocarcinoma, lymph node metastasis, and a shorter disease-free interval (average 33.1 months) than patients with other types of recurrent early gastric cancer, and the involvement of both recurrent lymph nodes and peritoneal dissemination. Based on this analysis, we conclude that patients with early gastric cancer, especially if the tumor is >2 cm with submucosal invasion, should be examined carefully for any form of recurrence.

Key words Early gastric cancer · Peritoneal dissemination · Peritoneal lavage cytological examination · Growth pattern

Introduction

According to the Japanese Classification of Gastric Carcinoma, early gastric cancer is defined as a tumor confined to the mucosa or submucosa. The prognosis after surgery for early gastric cancer is favorable, with 10-year disease-specific survival rates of about 90% in Japan and Western countries. Early gastric cancer is potentially curable by surgery, but recurrence may develop after resection.1–3 Although several case-control studies have been conducted in Japan to identify the clinicopathologic features of these exceptional cases, the number of patients was too small to provide any significant data,4,5 and it was impossible to predict recurrence in the form of peritoneal dissemination of early gastric cancer. To detect free cancer cells in the peritoneal cavity at the time of surgery, conventional peritoneal lavage cytological examination has been shown to be a feasible measure to predict early peritoneal seeding and a poor prognosis for patients with gastric cancer.6 According to a recent report, the survival time of patients with positive cytology based on a peritoneal lavage cytological examination [CY(+)] for gastric cancer was almost the same as that for patients with macroscopic peritoneal dissemination.7 We investigated the relevance of peritoneal dissemination, including CY(+), in patients with early gastric cancer, based on a review of case reports in the English medical literature.

Case Report

A 73-year-old Japanese man was admitted to the National Kyushu Cancer Center for investigation of epigastric pain, without anorexia or vomiting. His carcinoembryonic antigen, carbohydrate antigen (CA) 19–9, and CA125 levels were within the normal range. Endoscopy showed a IIc superficial depressed lesion in the middle of the stomach, and biopsies confirmed moderately differentiated adenocarcinoma. We performed a distal gastrectomy 5 days later. The tumor invaded the submucosa (Fig. 1), but no lymph node metastasis was found. During surgery, we performed a peritoneal lavage cytological examination, which revealed tumor cells in the lavage fluid [CY(+)] (Fig. 2). We recognized...
lymphatic involvement, but no vascular involvement. As a result, the operation was considered to be non-curative. After the operation, we collected peritoneal fluid through the drainage tube and confirmed tumor cells in the peritoneal cavity. The patient was discharged on the 27th postoperative day, but continued treatment with oral 5'-deoxy-5-fluorouridine (5'-DFUR) for 3 years. He is still doing well without any sign of recurrence 6 years after his operation.

Discussion

In Japan, recurrence of early gastric cancer is rare, with an incidence of less than 10%. Many investigators have described the patterns of early gastric cancer recurrence, which tends to manifest as hematogenous metastasis, rather than as peritoneal dissemination, or local and lymph node metastasis. In fact, the incidence of peritoneal dissemination from early gastric cancers ranges from 0.4% to 1.2%. Our search of the English medical literature revealed only 15 cases of early gastric cancer with peritoneal dissemination (Table 1). The disease-free interval for early gastric cancer ranged from 10 to 119 months (average 50.4 months), which is longer than that for advanced gastric cancer. According to the clinicopathological findings, patients with recurrent peritoneal dissemination after surgery for early gastric cancer tended to have a tumor larger than 2.0 cm, submucosal tumor invasion, differentiated adenocarcinoma, and lymph node metastasis. Furthermore, patients with recurrent peritoneal dissemination had a shorter disease-free interval (average 33.1 months) than those with other forms of recurrent early gastric cancer (such as lymph node metastasis and hematogenous spread), and the involvement of both recurrent lymph nodes and peritoneal dissemination.

Kodama et al. identified two different growth patterns in early gastric cancer; namely, superficial spread (Super) and the penetrating type (Pen).11 Super is defined as a lesion with a diameter of more than 4 cm, confined to the mucosa or partly invading the submucosa. Pen is defined as a lesion with a diameter of less than 4 cm invading the submucosa in a wide penetrating fashion. The Pen type of tumor tends to be associated with a worse prognosis than the Super type of tumor because the p53 gene plays a role in the expansion of gastric cancer.12 The Pen type is further divided into the Pen-A type and the Pen-B type. The Pen-A type grows expansively with complete destruction of the muscularis mucosa, whereas the Pen-B type grows downward, infiltratively, with fenestration of the muscularis mucosa. Maehara et al. reported that the prognosis of super type early gastric cancer was better than that of Pen type early gastric cancers, and that the recurrence of the Pen-A type tended to be associated with hematogenous metastasis, whereas that of the Pen-B type tended to be associated with peritoneal dissemination.13 Our patients had a Pen-B type tumor, with tumor cells in the peritoneal cavity. Peritoneal carcinomatosis from gastric cancer is thought to originate from the detachment of cancer cells from the serosal surface of the primary tumor into the

Fig. 1. Histological examination revealed a penetrating-B type tumor invading the submucosa (H&E stain). m, Mucosa; sm, submucosa; mp, muscularis propria

Fig. 2. Microscopy of the peritoneal lavage fluid showing tumor cells (Giemsa stain)