Efficacy of Paclitaxel and S-1 in a Patient with Advanced Pseudomyxoma Peritonei Concomitant with Gastric Cancer

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Abstract

Pseudomyxoma Peritonei (PMP) is a rare disease characterized by disseminated intra-peritoneal implants and mucinous ascites. There is currently no standard treatment strategy for PMP.

Presentation of case: We present an unusual case of advanced PMP concomitant with early gastric cancer in a 61-year-old male. In the first operation, in December 2007, the gastric cancer was unrespectable by extensive resection of the primary lesion and the removal of mucinous material are considered the most effective. However, in most cases complete excision is difficult, and various treatments are attempted, including chemotherapy. Here we present an atypical case of PMP that was concurrent with early gastric cancer. The patient could survive after surgical treatments and systemic chemotherapy.

Keywords: Pseudomyxoma peritonei; Chemotherapy; Gastric cancer

Introduction

Pseudomyxoma peritonei (PMP) is a rare disease characterized by disseminated intra-peritoneal implants and mucinous ascites. Although there is currently no standard treatment strategy for PMP, resection of the primary lesion and the removal of mucinous material are considered the most effective. However, in most cases complete excision is difficult, and various treatments are attempted, including chemotherapy. Here we present an atypical case of PMP that was concurrent with early gastric cancer. The patient could survive after surgical treatments and systemic chemotherapy.

Case presentation

A 61-year-old male underwent surgery for a left inguinal hernia in 2003 at another hospital, and mucinous ascites was detected at that time. No treatment was administered. In September 2007, abdominal distention appeared and abdominal computed tomography (CT) revealed edmassive mucinous ascites with septations and a partially scalloping spleen, which were characteristic of PMP (Figure 1a). Gastrointestinal endoscopy uncovered early gastric cancer.

In December 2007, surgery was executed for both gastric cancer and PMP. However, observing multiple peritoneal implants and dissemination to the stomach and small intestinal walls, the radical surgery to excise the gastric cancer was cancelled, and appendectomy, excision of the greater momentum, and incomplete cytoreduction were performed to treat the PMP. From pathological findings, we diagnosed the PMP as originating from the appendix (Figure 2).

After the PMP operation, the patient received 8 cycles of systemic chemotherapy with S-1120 mg/body (3 weeks on continuous medication and 2 weeks off) and paclitaxel (Taxol, PTX) 80 mg/m² (on days 1 and 15). Owing to the adverse event of peripheral neuropathy for PTX, the regimen was changed from PTX to irinotecan (CPT-11) 80 mg/m² (on days 1 and 15) with S-1 120 mg/body (3 weeks on continuous medication and 2 weeks off) for 3 weeks. We considered that S-1 was still effective, and therefore we continued basal use of S-1. After almost 1 year of systemic chemotherapy, CT showed that mucinous ascites disappeared, and we were able to perform a subtotal gastrectomy to remove early gastric cancer. Afterwards, with the intermittent administration of irinotecan (CPT-11) in addition to the basal use of S-1, the patient survived more than five years. To the present day, systemic therapy is still being administered, and might lead to stabilization of disease.

Figure 1: Enhanced abdominal CT scans throughout treatment. (a) Before the first operation. (b) After chemotherapy, demonstrating the reduction of ascites. (c) Before the third operation.
were remarkably decreased (Figure 1b) and the patient's serum carcinoembryonic antigen (CEA) level was reduced by a large margin (Figure 3). We judged that systemic chemotherapy was effective and decided to perform surgery to treat gastric cancer in January 2009.

During the cancer operation, we found that the previous dissemination on the stomach and small intestinal walls had disappeared, and we were able to perform a subtotal gastrectomy according to the standard protocol. Pathological findings indicated well-differentiated adenocarcinoma of the stomach and small intestinal walls had disappeared at the second operation. Administration of PTX provides effective control of malignant ascites. The concentration of PTX in ascites is maintained within the optimal level for the treatment of cancer cells for up to 72 h after intravenous administration [9]. Moreover, the effect of S-1 is also expected, as a previous study demonstrated a successful outcome with capcitabine, apro-drug of 5-FU [10]. In that exploration, a phase 3 study evaluating the use of concurrent mitomycin C and capecitabine in patients with advanced unrespectable PMP, 15 of 39 assessable patients (38%) benefited from the chemotherapy regimen, which resulted in either reductions in mucinous deposition or stabilization of progression.

In the present case, combination of S-1 and PTX surely helped to remove gastric cancer after incomplete cytoreduction surgery; we observed that the disseminated tumor cells that were spread extensively on the gastric and intestinal walls had disappeared at the second operation. Administration of PTX provides effective control of malignant ascites. The concentration of PTX in ascites is maintained within the optimal level for the treatment of cancer cells for up to 72 h after intravenous administration [9]. Moreover, the effect of S-1s is also expected, as a previous study demonstrated a successful outcome with capcitabine, apro-drug of 5-FU [10]. In that exploration, a phase study evaluating the use of concurrent mitomycin C and capcitabine in patients with advanced unrespectable PMP, 15 of 39 assessable patients (38%) benefited from the chemotherapy regimen, which resulted in either reductions in mutinous deposition or stabilization of progression.

Serum CEA is often useful to evaluate the efficacy of therapy in patients with PMP in many cases [11]. In our case, CEA level was...
also useful for following disease progression. Judging from CEA level, from April 2009 to May 2010 (between the second and third operation), the combination of S-1 and CPT-11 was apparently more effective for disease control than S-1 alone (Figure 3). Every dose of CPT-11 decreased the rising CEA level. Almost 1 year of intermittent administration of CPT-11 in addition to the basal use of S-1 led to the stabilization of CEA level. The effect of CPT-11 in PMP treatment is reportedly limited to the HIPEC procedure; CPT-11 has been employed at concentrations of 100-360 mg/m² [5,12]. The 80 mg/m² dose of CPT-11 by intravenous injection with S-1 led to disease stabilization, and had no adverse events. Our regimen of CPT-11 combined with S-1 is based on our previous study [13] of advanced and recurrent colorectal cancer, and was changed to prolonged S-1 administration to improve the patient's tolerance. Although the effect of systemic chemotherapy on PMP remains questionable, we suggest that systemic chemotherapy might be considered in a palliative setting for patients with recurrent or advanced disease.

It is rare to have other cancer at the same time as PMP [14]. While researching the origin of PMP, we should be careful regarding the possibility of other concomitant cancer. Moreover, we should consider multidisciplinary treatment when it is impossible to treat both PMP and a concomitant cancer in a single operation.

More clinical experience and additional studies are needed to determine the benefit of systemic chemotherapy. This case report emphasizes the efficacy of S-1 plus PTX or CPT-11 as systemic chemotherapy against advanced PMP.

Author Contributions

Hirofumi YAMAMOTO performed the operation and provided substantial information regarding the patient's case. All authors have read and approved the final manuscript.

References