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A case of multiple synchronous quadruple cancers of the stomach, sigmoid colon, rectum, and pancreas



Atsushi Nanashima^a, Tetsuro Tominaga^{b,*}, Takashi Nonaka^b, Kouki Wakata^b, Masaki Kunizaki^b, Shuichi Tobinaga^b, Yori-hisa Sumida^b, Shigekazu Hidaka^b, Naoe Kinoshita^c, Terumitsu Sawai^d, Takeshi Nagayasu^b

^a Division of Surgical Oncology and Regulation of Organ Function, Miyazaki University Graduate School of Medicine, Miyazaki, Japan

^b Department of Surgery, Division of Surgical Oncology, Nagasaki University Graduate School of Biomedical Science, 1-7-1 Sakamoto, Nagasaki, Japan

^c Department of Pathology, Division of Surgical Oncology, Nagasaki University Graduate School of Biomedical Science, 1-7-1 Sakamoto, Nagasaki, Japan

^d Department of Cardiopulmonary Rehabilitation Science, Division of Surgical Oncology, Nagasaki University Graduate School of Biomedical Science, 1-7-1 Sakamoto, Nagasaki, Japan

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ABSTRACT

INTRODUCTION: Multiple primary neoplasms are relatively rare, but their incidence has increased because of aging and improvements in diagnostic imaging.

PRESENTATION OF CASE: A 67-year-old man presented with epigastric pain. On upper gastrointestinal endoscopy, an ulcer was seen at the gastric angle, and biopsy showed moderately differentiated adenocarcinoma (AC). Colonoscopy demonstrated a 15-mm lesion in the sigmoid colon and a submucosal lesion in the lower rectum. The biopsy showed well differentiated AC and neuroendocrine tumor (NET). In addition, abdominal CT and MRI showed a 14-mm nodular lesion in the pancreatic body suggesting pancreatic duct cancer. Based on the above findings, four synchronous cancers, including the pancreas, stomach, sigmoid colon and rectum, were diagnosed, and surgery was performed. A midline incision was made in the upper abdomen, and a distal gastrectomy, pancreatic body and tail resection, and sigmoidectomy were performed. Trans-anal tumor resection was performed for the rectal lesion. Histopathology showed invasive pancreatic duct cancer, moderately differentiated AC of the stomach, moderately differentiated AC of the sigmoid colon, and NET G1 of the rectum. The patient had no postoperative complications, 4 years 3 months after resection, and he was disease-free from all of the cancers.

DISCUSSION: The strategy of perioperative diagnosis and treatment for multiple primary tumors is usually difficult. This process was performed by consulting a cancer board, which could be useful as a practice guideline.

CONCLUSION: This patient in whom four tumors were completely resected at the same time and who has had a good clinical course was reported.

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1. Introduction

Reports of multiple primary neoplasms have recently been increasing because of population aging and improvements in diag-

nostic imaging, but reports of synchronous quadruple cancers are relatively rare [1]. The diagnosis, therapeutic strategy, and choice of operative method are difficult in synchronous multiple cancers [2]. The interesting case of a patient in whom four tumors, including pancreatic cancer, were completely resected at the same time and who has had a good clinical course is described. The work has been reported in line with the SCARE criteria [3].

2. Presentation of case

A 67-year-old man visited our hospital for a chief complaint of epigastric pain. He had no history of past illness and no relevant family history. His laboratory data were normal, including tumor markers such as PIVKAI, CEA, DUPAN-2, and CA19-9. On upper gastrointestinal endoscopy, an ulcer was seen at the gastric angle

Abbreviations: AC, adenocarcinoma; NET, neuroendocrine tumor.

* Corresponding author at: Department of Surgery, Division of Surgical Oncology, Nagasaki University Graduate School of Biological Sciences, 1-7-1 Sakamoto, Nagasaki 852-8501, Japan.

E-mail addresses: a.nanashima@med.miyazaki-u.ac.jp (A. Nanashima), tomitetsu2000@yahoo.co.jp (T. Tominaga), tnonaka@nagasaki-u.ac.jp (T. Nonaka), kou-waka@hotmail.co.jp (K. Wakata), kunisakimasaki2002@yahoo.co.jp (M. Kunizaki), sh.toby577@gmail.com (S. Tobinaga), y-sumida@nagasaki-u.ac.jp (Y. Sumida), hidaka-s@nagasaki-u.ac.jp (S. Hidaka), daimonji@nagasaki-u.ac.jp (N. Kinoshita), sawai@nagasaki-u.ac.jp (T. Sawai), nagayasu@nagasaki-u.ac.jp (T. Nagayasu).

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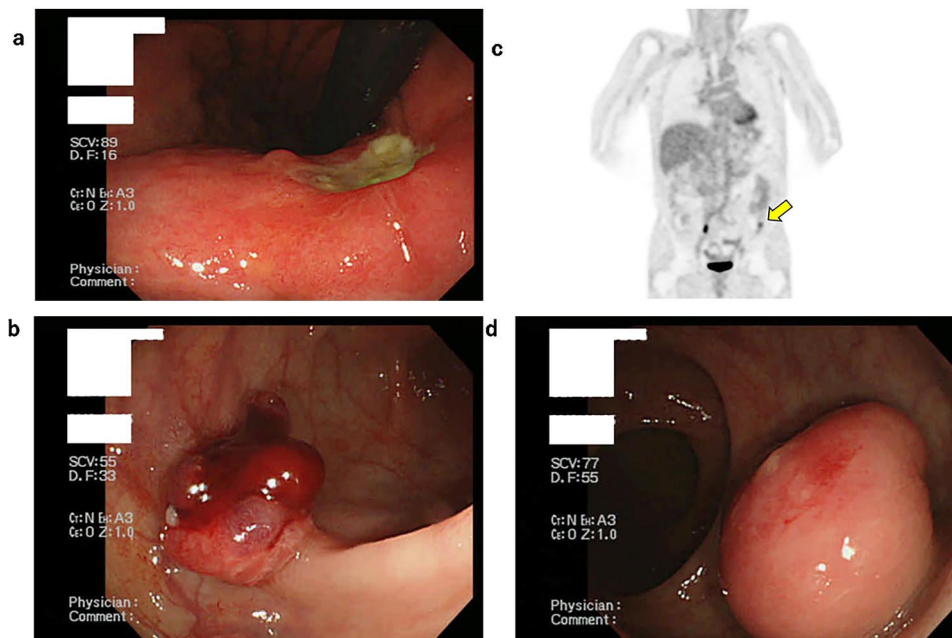


Fig. 1. Examination of gastrointestinal tract. Upper gastrointestinal endoscopy shows an ulcer at the gastric angle in the lesser curvature of the stomach (a). PET-CT shows a hot spot in the sigmoid colon (b). Colonoscopy shows a 15-mm protruding lesion in the sigmoid colon, and a submucosal lesion is also seen in the lower rectum (c,d).

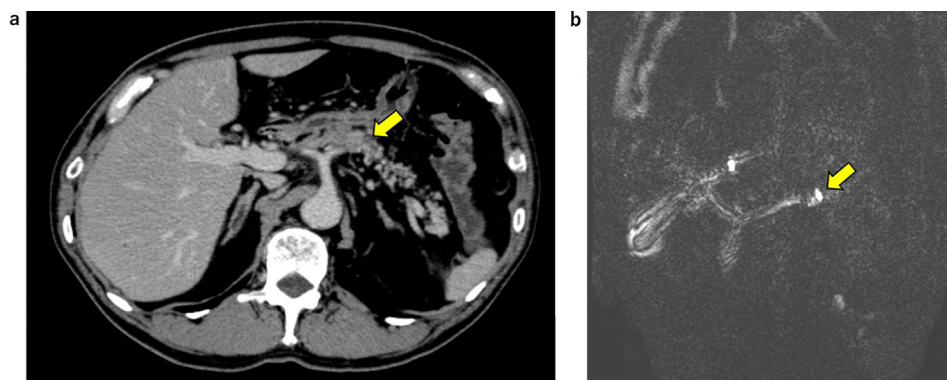


Fig. 2. Examination of pancreas. Abdominal enhanced CT shows atrophy and dilation of the main pancreatic duct in the pancreatic body and tail. A 14-mm nodular lesion is associated with parenchymal atrophy in the pancreatic body (a). Abdominal contrast MRI with diffusion-weighted imaging shows a 15-mm high-intensity signal area at the same site, suggesting pancreatic duct cancer (b).

in the lesser curvature of the stomach, and biopsy of the lesion revealed moderately differentiated adenocarcinoma (AC) (Fig. 1a). Colonoscopy showed a 15-mm protruding lesion in the sigmoid colon, and biopsy showed well differentiated AC (Fig. 1b). PET-CT showed hot spot in the sigmoid colon (Fig. 1c). In the lower rectum, a submucosal lesion was also seen, and EUS-FNA showed carcinoid tumor (Fig. 1d). In addition, abdominal contrast CT showed dilation of the main pancreatic duct in the pancreatic body and tail, as well as a 14-mm nodular lesion associated with parenchymal atrophy in the pancreatic body (Fig. 2a). On abdominal contrast MRI with diffusion-weighted imaging, a 15-mm high-intensity signal area was seen at the same site, suggesting pancreatic duct cancer (Fig. 2b).

Based on the above examinations, this patient had four synchronous cancers, including pancreatic cancer (cT1N0M0cStage I), gastric cancer (cT1bN2M0cStage IIB), sigmoid colon cancer (pT2N0M0 pStage I), and a rectal neuroendocrine neoplasm. It was decided that each tumor was early stage and resectable, so each tumor was resected during one operation. A midline incision was

made in the upper abdomen. There was no ascites or peritonitis carcinomatosa. Then, a distal gastrectomy with lymph node dissection was performed. After that, intra-operative ultrasonic examination of the body of the pancreas was performed. There was no extracapsular invasion of tumor. The tumor was 13 mm in size, and the pancreatic duct of the tail side of the tumor was dilated. The pancreatic body, pancreatic tail, and spleen were resected. Sigmoid colon cancer was palpable in the middle of the sigmoid, and sigmoidectomy with lymph node dissection was performed. Finally, transanal tumor resection was performed for the rectal lesion.

Histopathology showed invasive pancreatic duct cancer (pT1N0M0 pStage I) (Fig. 3a), moderately differentiated AC of the stomach (pT2N0M0 pStage I) (Fig. 3b), moderately differentiated AC of the sigmoid colon (pT2N0M0 pStage I) (Fig. 3c), and NET G1 of the rectum (Fig. 3d). The patient's postoperative course was good, and he was discharged from hospital on postoperative day 20. He received adjuvant chemotherapy for six months, and 4 years 3 months after resection, the patient was disease-free from all cancers.

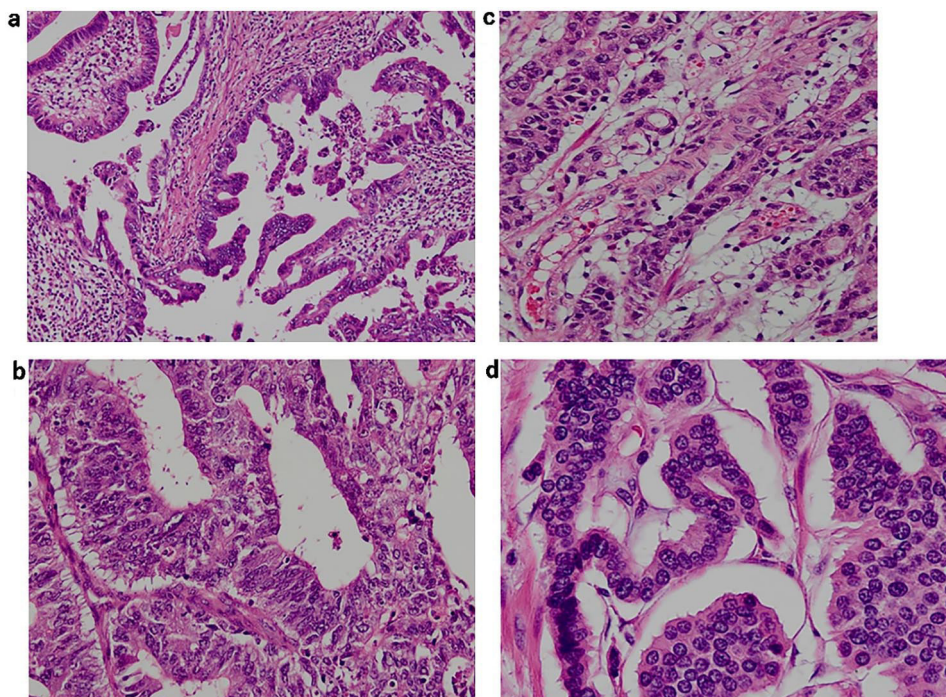


Fig. 3. Histopathological findings. Histopathology shows papillary well differentiated adenocarcinoma in the pancreatic duct (HE, $\times 40$) (a). In the stomach, moderately differentiated adenocarcinoma with ulcer formation is seen in the gastric angle (HE, $\times 100$) (b). In the sigmoid colon, moderately differentiated adenocarcinoma is seen (HE, $\times 200$) (c). In the rectum, there is a nodular spreading tumor in the submucosal layer with rosette formation, which was finally diagnosed as NET G1 of the rectum (HE, $\times 200$) (d).

3. Discussion

A rare case of synchronous quadruple cancers of the stomach, sigmoid colon, rectum, and pancreas was reported. In 1932, Warren and Gates reported that, in cases of multiple primary tumors, each tumor should show specific malignant findings; each tumor should differ in site, and one tumor should not be a metastatic focus from another [4]. Furthermore, multiple primary cancers are classified as synchronous and metachronous [5]. Synchronous tumors are observed at the same time or within six months, and metachronous tumors are observed at a greater than six-month interval. In the present case, since the four tumors were found within two months, they could be considered synchronous quadruple cancers.

Multiple primary tumors, especially quadruple tumors, are rare [1]. However, reported cases have recently been increasing, probably because of widespread cancer screening and improvements in diagnostic imaging technology. In addition the increased screening results in more pick up these tumors [6]. In this report, one primary tumor was a pancreatic tumor, and a quadruple cancer case including a pancreatic lesion is very rare. The reasons for this are that pancreatic cancer is difficult to diagnose definitively. In the present case, it was diagnosed using thin-slice enhanced CT and MRI. In the near future, the incidence of multiple primary tumors including pancreatic tumor may increase with further improvements in diagnostic modalities.

The risk factors and reasons for the diagnosis of multiple primary tumors have been reported to include: an increasing discovery rate with improved diagnostic techniques; the number of cancer patients has increased due to population aging; immunologic and genetic defects; familial susceptibility; prolonged exposure to carcinogens especially tobacco; and radiation therapy or chemotherapy for primary cancer [7–12]. In the present case, the patient's grandfather had bladder carcinoma, and his mother had colon cancer, suggesting a familial susceptibility.

It seems somewhat excessive to suggest a complete whole body examination to look for multiple primary tumors in a patient with one primary cancer. PET-CT can be a useful modality for detecting multiple primary tumors, but PET is an expensive examination, and it is not covered by insurance in early-stage cancer¹³. Indeed, in the present case, only the sigmoid colon cancer was visible on PET, with no hot spots in the pancreas and rectum. It is important to keep in mind the possibility of multiple primary tumors during the preoperative whole body examination.

In our previous study, multiple primary tumors had a relatively better prognosis because they were early stage cancers with a low incidence of distant metastasis [12,13]. Thus, to improve the long-term prognosis, it is important to perform complete resection for multiple organ tumors. However, this may require multiple operations or large incisional surgery because of the need to approach several organs, which is very invasive for patients. In the present patient, each cancer was diagnosed at an early stage with no lymph node metastases, and reconstructions did not interfere with each other. Thus, it was determined that curative resection was possible in one operation. Furthermore, transanal endoscopic microsurgery was performed for the rectal tumor, and the pancreas, stomach, and sigmoid colon cancer were resected through one middle upper abdominal incision in order to decrease invasiveness. For multiple primary cancers, it is very useful to consult a cancer board and with specialists for each organ [14]. It was reported that multidisciplinary discussion could improve coordination, communication, and decision making, and hopefully produce more positive outcomes [14,15]. In the present case, a cancer board was consulted for preoperative diagnosis, adequateness of the treatment strategy, and follow-up after surgery. Finally, this patient received six-month adjuvant chemotherapy with 5-FU for the cancer of the pancreas.

4. Conclusion

A rare case of multiple synchronous quadruple cancers of the stomach, sigmoid colon cancer, rectum, and pancreas was reported.

Curative resection was achieved through one incisional wound and one-stage surgery. Multiple primary tumors might be increasing because of the aging population and improvements in diagnostic imaging. It is crucial that an adequate preoperative examination, plan of operation, and postoperative follow-up using cancer board.

Conflicts of interest

None.

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Ethical approval

Not applicable.

Consent

Written and signed consent from the patient to publish a case report has been obtained.

Author contributions

Atsushi Nanashima, Tetsuro Tominaga, Takashi Nonaka, came up with the study concept. Kouki Wakata, Masaki Kunizaki, Shuichi Tobinaga, Yoriyhisu Sumida, and Shigekazu Hidaka collaborated in the patient's medical care. Naoe Kinoshita examined the pathology. Terumitsu Sawai, Takeshi Nagayasu reviewed the manuscript. All authors have approved the final article should be true and included in the disclosure.

Guarantor

Tetsuro Tominaga.

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