A 66-Year-Old Man Presenting with Port-Site Metastatic Gastric Adenocarcinoma 4 Years After Laparoscopic Resection of a Rectal Adenocarcinoma

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Patient: Male, 66-year-old

Final Diagnosis: Gastric cancer • port site metastasis

Symptoms: Swelling

Medication: —

Clinical Procedure: —

Specialty: Oncology

Objective: Rare disease

Background: There is a recognized association between synchronous and metachronous colorectal and gastric adenocarcinoma. This report describes a 66-year-old man presenting with port-site metastatic gastric adenocarcinoma 4 years after laparoscopic resection of a rectal adenocarcinoma.

Case Report: A 66-year-old male rectal cancer survivor presented to the clinic with a painless mass at the previous laparoscopic anterior resection port site. Physical examination revealed a soft port-site mass measuring 5×4 cm. Abdominal CT revealed enlargement of the right rectus abdominis muscle and thickening of the gastric fundus. A biopsy of the right abdominal wall mass revealed metastatic adenocarcinoma. Immunohistochemistry (IHC) testing was positive for cytokeratin 7 (CK7) and CDx2 and negative for cytokeratin 20 (CK20). The possible primary malignancy was upper gastrointestinal, and it was less likely to be colorectal in origin. Subsequently, the upper endoscopy revealed a friable, erythematous gastric mucosa. Biopsy revealed an invasive moderately differentiated gastric adenocarcinoma with positive IHC for CK7 and CD2 and negative for CK20. The rectal adenocarcinoma pathology slides were reviewed, and IHC testing showed negative CK7 and positive CK20. Patient was known to have multiple comorbidities with poor functional status. The tumor board decision was made to manage him palliatively with best supportive care for the diagnosis of metastatic gastric cancer.

Conclusions: This report has presented a case of possible metachronous gastric adenocarcinoma with port-site metastasis following resection of a rectal adenocarcinoma. Clinicians should be aware of the association between synchronous and metachronous colorectal and gastric adenocarcinoma and the challenges associated with the diagnosis.

Keywords: Neoplasms, Multiple Primary • Stomach Neoplasms

Abbreviations: CEA – carcinoembryonic antigen; CT – computed tomography; CK7 – cytokeratin 7; CK20 – cytokeratin 20; FDG – fluorodeoxyglucose; IHC – immunohistochemistry; MPN – multiple primary neoplasms; PSM – port-site metastasis; PET – positron emission tomography; SPC – second primary cancer; PSA – prostate-specific antigen; TTF-1 – thyroid transcription factor-1

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**Background**

Multiple primary neoplasms (MPN) are defined as the detection of 2 or more histologically different malignancies in the same patient that are not the result of extension, relapse, or metastasis of the first cancer [1]. The prevalence of multiple primary cancers in the literature is reported to be between 0.7% and 12% [2]. If the second neoplasm is diagnosed within 6 months of detection of the first neoplasm, it is classified as synchronous, and if diagnosed after 6 months, it is classified as metachronous second primary cancer (SPC) [3]. The incidence of MPN has increased due to the increased survival of patients with initial cancers and improved techniques of cancer detection [4].

Survivors of colorectal carcinoma have an elevated risk of developing a second neoplasm compared to the general population, with an incidence of 20% [5,6]. Colorectal adenocarcinoma is reported as the most common SPC in colorectal cancer survivors, followed by prostate and breast cancers [5,7]. Second primary gastric cancer is less common in colorectal cancer survivors, with 2-5% occurrence in many reports [5,7,8]. The incidence of synchronous and metachronous SPC in gastric cancer is about 3%. Colorectal carcinoma is the most common SPC in gastric cancer [9,10]. However, the risk of synchronous colorectal adenoma at the time of gastric cancer diagnosis is much higher, with an estimated occurrence of 39% [11].

The main challenge in the presence of a new lesion in a cancer survivor patient is to differentiate between metastasis of the first primary cancer and SPC. The role of immunohistochemistry (IHC) study is crucial and more beneficial in this scenario [12]. Cytokeratin 7 (CK7) and CDx2 IHC testing are positive in most of the gastric cancer patients, while in colorectal cancer mutation is rare [12-14]. Moreover, cytokeratin 20 (CK20) IHC testing is commonly used in colorectal cancer [12]. In the present report, the initial diagnosis of the port-site mass was a rectal origin metastasis, as it is the most common metachronous SPC [7,8]. However, the evidence of endoscopic and radiological gastric mass along with IHC testing of port-site and gastric lesions makes our diagnosis in favor of invasive gastric adenocarcinoma with port-site metastasis.

There were few reports of synchronous gastric and colorectal cancer managed with simultaneous surgical interventions. They reported good surgical and oncological outcomes, with an average follow-up of 26 months [15,16]. Metachronous primary gastric cancer in colorectal survivors was uncommonly reported; in 2 reports they were diagnosed more than 10 years after colorectal cancer [17-19]. This report describes a 66-year-old man presenting with port-site metastatic gastric adenocarcinoma 4 years after laparoscopic resection of a rectal adenocarcinoma.

**Case Report**

A 66-year-old male smoker with known history of diabetes mellitus, hypertension, chronic kidney disease, atrial fibrillation, ischemic heart disease, and subsequent heart failure with ejection fraction of 33% presented with a history of rectal cancer managed surgically with laparoscopic low anterior resection, and his follow-up surveillance was unremarkable for 4 years. During his surveillance, the patient was on regular clinical follow-up with history, physical examination, and carcinoembryonic antigen (CEA) level every 3-6 months. Also, he underwent annual computed tomography (CT) chest, abdomen, and pelvis, and colonoscopy at 1 and 3 years after resection. He then presented to the clinic reporting he had a soft, painless swelling at the previous laparoscopic low anterior resection port site in the lower right abdomen, and reported a history of loss of appetite. There were no night sweats, weight loss, nausea,

![Figure 1](image_url). CT scan of the abdomen showing (A) a homogeneous high-density mass involving the right rectus abdominis muscle (large arrows) and (B) a focal, exophytic, ill-defined, low-density mass adherent to the gastric fundus (small arrows).
vomiting, or upper gastrointestinal bleeding. The patient denied any history of abdominal pain, constipation, melena, or rectal bleeding. Physical examination revealed a non-tender, soft port-site mass measuring 5×4 cm. Office sigmoidoscopy showed an intact stapler line with no obvious mucosal changes. He was then electively admitted for further investigation. The CEA level was 24.620 ng/mL. CT of the abdomen and pelvis revealed a homogeneous high-density mass of the right rectus abdominis muscle (Figure 1A). The stomach was not distended, but there was a thickening of the gastric fundus (Figure 1B) and an unremarkable colorectal anastomosis staple line with no sign of local recurrence (Figure 2). CT chest did not reveal any intrathoracic metastasis. A Tru-Cut biopsy of the abdominal wall mass was taken and sent for histopathological examination.

Microscopic examination of the abdominal wall mass revealed moderately differentiated adenocarcinoma (Figure 3A). IHC testing showed that the malignant cells were positive for CK7 (Figure 3B) and CDx2. CK20 (Figure 3C), thyroid transcription factor-1 (TTF-1), and prostate-specific antigen (PSA) were negative. Based on these findings, a diagnosis of metastatic adenocarcinoma with a possible upper gastrointestinal origin was made.

Subsequently, an upper endoscopy was performed, which revealed a friable, erythematous gastric mass directly below the gastroesophageal junction in the lesser curvature.
gastroesophageal junction in the lesser curvature of the stomach (Figure 4). Biopsy was performed, and histopathological examination showed an invasive adenocarcinoma with moderately differentiated tumor cells (Figure 5A) with positive IHC testing for CK7 (Figure 5B) and CDX2. CK20 was negative (Figure 5C), whereas HER2/neu was equivocal (2+). The rectal cancer pathology slides (Figure 6A-6C) were reviewed. They showed well-to-moderately differentiated adenocarcinoma with negative CK7 (Figure 6B) and positive CK20 (Figure 6C). These findings were in favor of primary gastric adenocarcinoma. Colonoscopy was unremarkable for new or recurrent disease.

The case was discussed by the Tumor Board and the decision was made to perform a positron emission tomography (PET) scan. The PET scan (Figure 7A, 7B) showed a fluorodeoxyglucose (FDG)-avid gastric mass and isolated right rectus abdominis muscle mass with no other suspicious area, which confirmed gastric cancer with port-site metastasis. The case was discussed again by the Tumor Board and the decision was made to treat the patient palliatively with best supportive care. Unfortunately, the patient died at home 4 months later.
Discussion

Improved management strategies and outcomes in oncology, as well as the implemented surveillance programs, increased the detection of MPNs [20,21]. To assist early SPC detection, it is crucial to comprehensively investigate any cancer patient with new concerns. In this case, a soft swelling at the previous port site of rectal cancer surgery turned out to be a metastatic primary gastric cancer.

The development of SPC in the presence of or after the development of another primary cancer is a rare but well-recognized condition [2]. Survivors of cancer have a 14% increased risk of developing another primary neoplasm compared to the general population [1]. The risk factors that have been described in the development of MPN include genetic alterations, environmental factors such as smoking and alcohol consumption, immunological factors, chemotherapy administration, and ionizing radiation treatment [3,7]. In a recent report, 2 cases of metachronous gastric cancer were diagnosed within 2 years after surgical resection of colorectal cancer and adjuvant chemotherapy; the author questioned the role of chemotherapy in gastric tumorigenesis, but the evidence presented was weak [19]. Sahni et al reported a metachronous gastric cancer 10 years after colorectal cancer in a patient with a significant family history of gastrointestinal malignancies and unidentifiable gene mutation. The patient was managed with radical total gastrectomy and adjuvant chemotherapy [18]. Our patient presented with metastatic metachronous gastric cancer 4 years after surgical resection of rectal cancer. He did not receive adjuvant chemotherapy. Moreover, he denied any family history of malignancies. Unfortunately, due to his poor physical condition, the patient was beyond any curative management.

Gastric cancer is the second most common cause of cancer-related deaths worldwide [22]. In the early stages, gastric carcinoma is usually asymptomatic. It can present with weight loss, abdominal pain, anorexia, nausea, dyspepsia, dysphagia, or hematemesis when advanced. There are various sites for the metastasis of gastric cancer; the most common site is the liver, followed by the peritoneum and lymph nodes [23]. The location of the cancer within the stomach has been shown to play a role in the metastatic site, as cancers in the cardia tend to metastasize to the lungs and nervous system, while non-cardia cancers favor the peritoneum [23]. The British Society of Gastroenterology recommends using image-enhanced endoscopy with biopsies as the best modality for surveillance of patients at risk of gastric cancer. This surveillance should be offered every 3 years to patients with gastric atrophy or metaplasia affecting the body and antrum. The patient should be closely followed every 6 months if they have high-grade dysplasia and every 12 months for low-grade dysplasia [24].

Port-site metastasis (PSM) is the presence of tumor cells at the site of trocar insertion during the laparoscopic removal of cancer. If metastatic cells are confined to the port site and there is no evidence of metastases at any other location, this is termed solitary port-site metastasis. Non-solitary port-site metastasis is the simultaneous presence of metastatic cells at the port site and other locations [25]. The incidence of PSM after laparoscopic surgery for colorectal carcinoma is reported to be 1% [26]. The exact etiology of PSM remains uncertain; however, contamination of the wound site, pneumoperitoneum, immune response, and surgical approach have been suggested as contributory factors to the development of PSM [25]. In this report, we present an uncommon case of port-site metastasis of a second primary gastric as an initial presentation in a rectal cancer survivor patient. To the best of our knowledge, this is the first reported case in the English medical literature of such a presentation.

PET scans provide information about the metabolic status of tumor cells. The accuracy is affected by many factors, such as tumor size, histological type, tumor location, and physiological uptake by the gastric cells [27]. It is useful for the detection of distant metastasis, lymph node involvement, relapse, and
response of the tumor(s) to treatment [28, 29]. The European Society for Medical Oncology suggests that the use of PET scans improves staging of gastric cancer by identifying distant metastasis and involved lymph nodes [30].

The prognosis of patients with metastatic gastric cancer remains poor despite the availability of various treatment options. Chemotherapy remains the mainstay of treatment for these patients, as it offers increased survival and provides good control of symptoms [31]. Furthermore, HER2 status is very important before initiating therapy, as the addition of trastuzumab significantly improves the survival rate in patients with overexpressed HER2 [32]. Best supportive care using nutritional support and palliative care options is another strategy that can be used for patients with advanced gastric carcinoma to improve quality of life [33].

Our patient had multiple comorbidities, including cardiac and renal compromise; therefore, he had a high risk for chemotherapy. After discussion with the patient, his family, and the Tumor Board, the decision was made to treat the patient palliatively with best supportive care. He was managed with a focus on quality of life as an outpatient until he died a few months later.

Conclusions

This report has presented a case of possible metachronous gastric adenocarcinoma with a rare presentation as a metastasis to the port-site following resection of a rectal adenocarcinoma. Clinicians should be aware of the association between synchronous and metachronous colorectal and gastric adenocarcinoma and the challenges associated with the diagnosis.

Declaration of figures’ Authenticity

All figures submitted have been created by the authors who confirm that the images are original with no duplication and have not been previously published in whole or in part.

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