

Case Report



A Case of Advanced Gastric Cancer with Para-Aortic Lymph Node Metastasis from Co-Occurring Prostate Cancer

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Conflict of Interest

No potential conflict of interest relevant to this article was reported.

ABSTRACT

An 84-year-old man was diagnosed with two synchronous adenocarcinomas, a Borrmann type IV advanced gastric adenocarcinoma in his antrum and a well-differentiated Borrmann type I carcinoma on the anterior wall of the higher body of his stomach. Pre-operatively, computed tomography of the abdomen revealed the presence of advanced gastric cancer with peri-gastric and para-aortic lymph node (LN) metastasis. He planned for palliative total gastrectomy owing to the risk of obstruction by the antral lesion. We performed a frozen biopsy of a para-aortic LN during surgery and found that the origin of the para-aortic LN metastasis was from undiagnosed prostate cancer. Thus, we performed radical total gastrectomy and D2 LN dissection. Post-operatively, his total prostate-specific antigen levels were high (227 ng/mL) and he was discharged 8 days after surgery without any complications.

Keywords: Stomach neoplasms; Prostatic neoplasms; Lymphatic metastasis; Lymph nodes

INTRODUCTION

Although the incidence of gastric cancer has gradually declined, it remains the second most common cancer in Korea after thyroid cancer, according to the Korea Cancer Registry statistics in 2010 [1]. Additionally, it is the third most common cause of cancer-related mortality worldwide. Overall survival rates for gastric cancer have increased to over 50% for the first time in 10 years (1993–1995, 42.8%; 2009–2013, 73.1%) in the Republic of Korea. We believe the improvement in the survival rates is because of developments in therapeutic techniques such as surgery or chemotherapy. An increase in cases of early gastric cancer has been recorded during all national cancer screenings [2].

In most cases, people undergo radical surgery in Stage I–III and combined resection is possible even in Stage IV gastric cancer, where the tumor infiltrates directly into organs around the gastric cancer. However, if there is metastasis to distant organs, lymphatic seeding to para-aortic lymph nodes (LNs), or peritoneal seeding, then reduction surgery does not increase the survival rate [3,4].

We report an interesting case of advanced gastric cancer that was expected to be Stage IV because of the presence of para-aortic LN metastasis observed prior to surgery. Initially, we planned to perform palliative surgery, but eventually performed radical surgery because we found during surgery that the metastasis in the para-aortic LN originated from co-occurring cancer of the prostate.

CASE REPORT

An 84-year-old man presented to the hospital with a 2-week history of dyspepsia. He was evaluated by endoscopy and diagnosed with two synchronous adenocarcinomas, one a Borrmann type IV advanced gastric adenocarcinoma in his antrum (**Fig. 1A, B**), and the other a Borrmann type I well-differentiated carcinoma in the anterior wall of the high body of his stomach. Pre-operatively, computed tomography of his abdomen showed advanced gastric cancer with peri-gastric and para-aortic LN metastasis. The involved para-aortic LNs were located below the left renal vein (**Fig. 1C**), near the left aortic bifurcation and left internal iliac artery (**Fig. 1D**). The preoperative endoscopic gastric biopsy showed varied findings, from well-formed glands to poorly-differentiated solid sheets of tumor cells (**Fig. 2A**). The tumor cells were variable in size and shape and showed high nuclear-to-cytoplasmic ration, vesicular nuclei, and occasionally prominent nucleolus. Mitotic activity was noted frequently even in the well-formed glands.

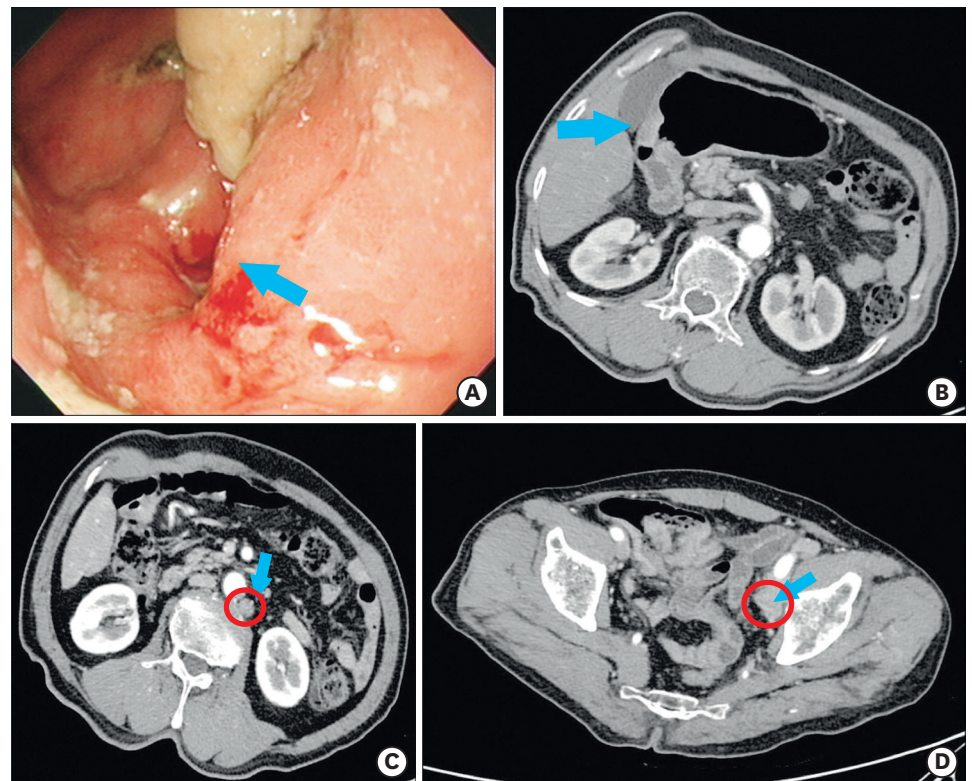


Fig. 1. (A) Gastrofibroscopic findings indicate a pyloric canal that is nearly obstructed by an encircling cancer mass (blue arrow). (B) Wall thickness in the pyloric area was found on a CT scan (blue arrow). (C) Enlarged LNs in left para-aortic area (red ring). (D) Enlarged LNs in left iliac area (red ring). CT = computed tomography; LN = lymph node.

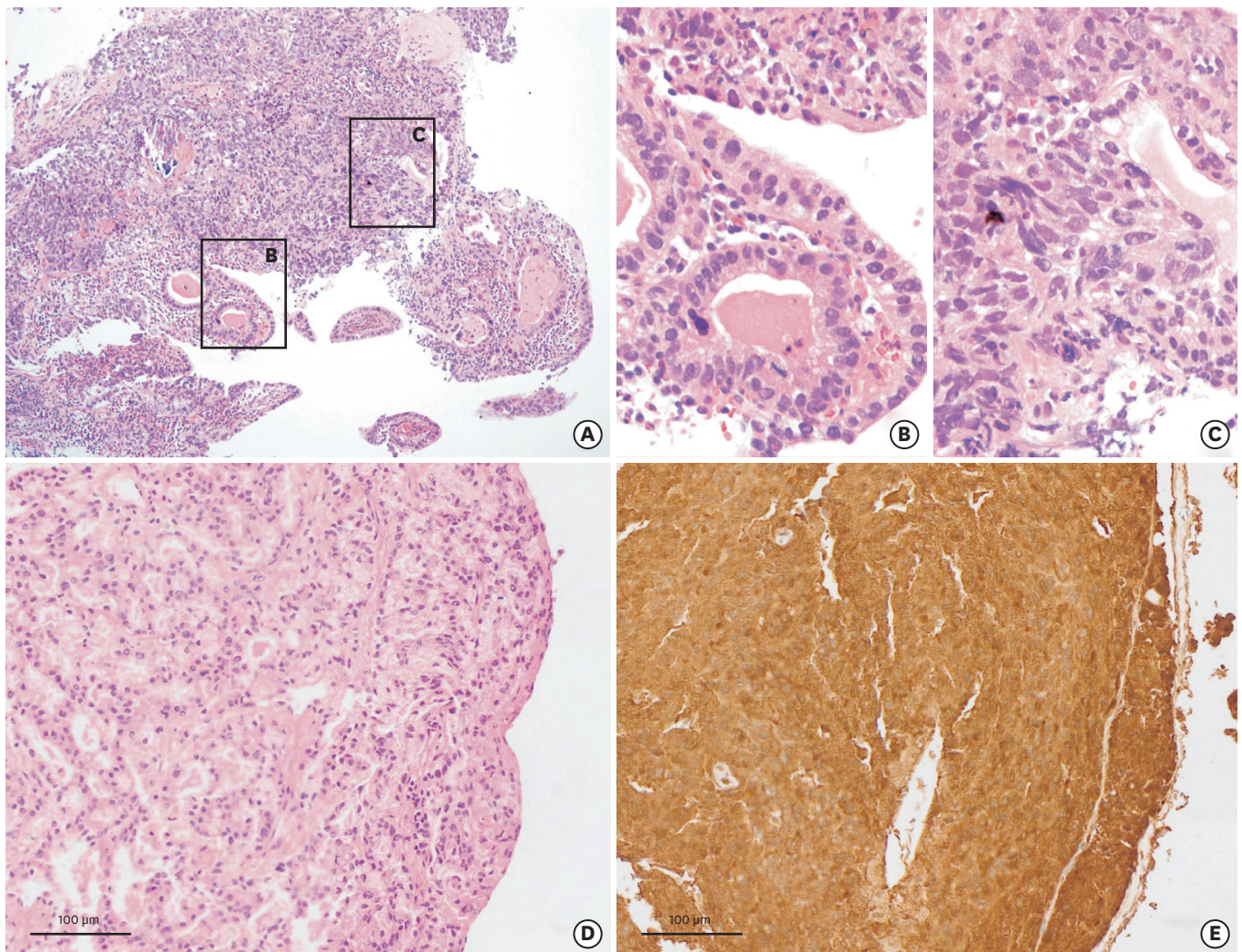


Fig. 2. Pathologic findings of the preoperative endoscopic gastric biopsy and the frozen para-aortic lymph node. (A) The endoscopic specimen showed varied findings, from well-formed glands to solid sheets of tumor cells (H&E, $\times 100$). (B) Even in the well-formed glands, mitosis was frequently noted (H&E, $\times 400$). (C) In the sheets, the tumor cells were variable in size and shape and showed vesicular nuclei rather than uniform small round nuclei (H&E, $\times 400$). (D) The para-aortic lymph node showed well-differentiated adenocarcinoma with a low nuclear-to-cytoplasmic ratio and low cellular atypia (H&E, $\times 200$). (E) The tumor cells are strongly positive for the anti-prostate specific antigen antibody (PSA, $\times 200$).

Pre-operative clinical staging indicated that he had T3–4, N2–3, M1, and Stage IV (American Joint Committee on Cancer 7th edition) gastric cancer. Owing to risk of obstruction by the antral lesion, we planned to perform palliative total gastrectomy. A pick-up biopsy of a para-aortic LN (16b1; **Fig. 1C**) was performed during surgery. The LN was sent for frozen biopsy, and the pathologic report on the frozen LN specimen showed packed well-formed glands with relatively uniform small nuclei. Most of the nuclei were located basally, unlike the gastric biopsy specimen, and the pathologist suggested that the metastasis in the para-aortic LN originated from undiagnosed prostate cancer (**Fig. 2B**). On the basis of this report radical total gastrectomy and D2 LN dissection was performed instead of palliative gastrectomy with D1 LN dissection. Post-operative blood levels of total prostate-specific antigen (PSA) were 227 ng/mL (normal values < 5 ng/mL). In addition to the abnormally high blood levels of PSA, post-operative immunohistochemical staining of the para-aortic LN was positive for PSA (**Fig. 2C**). Thus, the patient received a positive diagnosis of prostate cancer. However, he refused a

prostate biopsy, and started hormonal therapy for prostate cancer. He was discharged 8 days after surgery without any complications.

DISCUSSION

The incidence of gastric cancer has gradually declined and the frequency of Stage IV gastric cancer has also declined from 20.1% in 1995 to 14.5% in 2004, and to 10.8% in 2009, in the Republic of Korea [2]. One-year and 3-year survival rates for Stage IV gastric cancer patients are 52% and 12%, respectively. The number of metastasized LNs is an excellent prognostic factor, and in combination with the depth of stomach wall invasion acts as an important factor in staging of gastric cancer [5]. Distant LN metastasis, in combination with the presence of tumor, node, metastasis (TNM) stage IV cancer, is thought to indicate peritoneal or liver metastasis. Per the Japanese Gastric Cancer Association classification of LN stations, LN stations 1–12 and 14v are defined as regional LNs, and any other nodes are distant LNs; for example, the posterior surface of the pancreatic head (LN No. 13), middle colic vessels (LN No. 15), and the para-aortic LN (LN No. 16) [4,6].

In cases without complications such as bleeding or obstruction, the treatment strategy for M1 cancers is palliative chemotherapy alone instead of gastrectomy with chemotherapy [7]. The authors of the recent randomized controlled REGATTA (gastrectomy plus chemotherapy versus chemotherapy alone for advanced gastric cancer with a single non-curable factor) trial reported that the mean survival time of patients undergoing gastrectomy and chemotherapy was 14.3 months, and for those undergoing chemotherapy alone it was 16.6 months [3]. During anti-cancer therapy, the rate of treatments for side effects in Grade 3 and 4 cancers was also higher in patients treated with gastrectomy and chemotherapy than with chemotherapy alone. A post hoc subgroup analysis suggested that overall survival time was significantly shorter in patients treated with gastrectomy and chemotherapy than in those treated with chemotherapy alone in patients with tumors in the upper-third of stomach versus those with tumors in the mid and lower-third. The authors concluded that the difference in survival between patients with varied tumor locations is associated with compliance with chemotherapy, consistent with the MAGIC (medical research council adjuvant gastric infusional chemotherapy) trial [7]. In our case, because the patient had dyspepsia with antral mass-induced gastric outlet stasis, the authors decided to perform palliative total gastrectomy because of the risk of obstruction.

Differential diagnosis of primary organs when adenocarcinoma has spread to the LNs is difficult, especially in frozen section examinations. In this case, the pathology report of the frozen section test was “Metastatic adenocarcinoma is observed. However, there is a high possibility that the primary organs are more likely to be a prostate rather than a stomach, and it needs to be verified by immunostaining later.” This conclusion was based on two findings. First, the tumor of the frozen LN biopsy was different from the preoperative gastric biopsy specimen. The gastric biopsy slide showed moderate to severe nuclear atypia and poorly formed glandular structures, but the pathologic findings from the frozen LN specimen did not. Second, the pathologic findings of the frozen biopsy were very similar to prostate adenocarcinoma. Prostate adenocarcinoma sometimes has severe cellular atypia, but generally, the structural or cellular atypia is mild. In the frozen specimen, relatively homogeneous cells, a low nuclear-cytoplasmic ratio, and well-preserved gland structures were observed, all suggestive of a metastatic prostatic tumor. The pathologist

recommended that PSA staining be performed later, and we found that post-operative immunohistochemical staining of the para-aortic LN was positive for PSA.

When patients with gastric cancer show para-aortic LN metastasis, their cancer is classified as Stage IV. However, LN metastasis around the aorta develops more frequently in prostate and endometrial cancers than in gastric cancer [8]. In prostate cancer, metastases occur in bone (84% cases), followed by distant LNs (10.6%), liver (10.2%), and the thorax (9.1%). Patients with prostate cancer have multiple metastases in 18.4% cases [9]. In endometrial cancer, para-aortic LN invasion is observed in 12% of cases and intraperitoneal (pelvic) LN invasion in 17%. Para-aortic LN invasion occurs in 51% of patients who have an intra-abdominal LN invasion [10].

In conclusion, we report a patient who was expected to be diagnosed with Stage IV gastric cancer because of the presence of para-aortic LN metastasis that was identified before surgery. However, he was finally diagnosed with curative gastric cancer co-occurring with prostate cancer that had metastasized to the para-aortic LNs. We recommend that patients with gastric cancer who show para-aortic LN metastasis undergo a pre-operative work-up to rule out the presence of prostate and endometrial cancers.

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