Metastatic Seminoma in the Duodenum: Diagnosis with Endoscopy Followed by Successful Treatment

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Abstract

Seminomas rarely metastasize to the gastrointestinal tract. In general, these lesions metastasize to the lungs or retroperitoneal lymph nodes. A 34-year-old Japanese man who had undergone orchiectomy for seminoma two years earlier experienced shortness of breath and tarry stools. The patient presented at our hospital and was diagnosed with metastatic seminoma to the third portion of the duodenum on double balloon endoscopy. He was effectively treated with chemotherapy and continues to progress well, with no episodes of recurrence.

Key words: seminoma, duodenum, endoscopy


Introduction

Testicular tumors, such as embryonal carcinomas, teratomas, yolk sac tumors and choriocarcinomas, are divided into two groups: pure seminomas and non-seminomas. These lesions rarely metastasize to the gastrointestinal (GI) tract. The incidence of non-seminomas is less than 5% (1), while that of pure seminomas, which are less likely than non-seminomas to metastasize to the GI tract, is less than 1% (2). Most cases of metastatic seminomas in the GI tract were diagnosed at autopsy or during abdominal surgery in past reports, and only three cases diagnosed on endoscopy prior to treatment have been reported (3-5). However, there are no reports regarding follow-up of the patient’s clinical course with endoscopy after chemotherapy for the treatment of metastatic seminomas. The present report is the first to address this issue.

Case Report

A 34-year-old man who had undergone orchiectomy for seminoma two years earlier presented to our hospital with tarry stools and shortness of breath. A physical examination was almost normal, except for a slight fever (37.3°C). The laboratory findings revealed a hemoglobin level of 9.1 g/dL (range: 11.1-15.2 g/dL) and HCG-β (β-human chorionic gonadotropin; normal: less than 0.1 ng/mL) level of 0.3 ng/mL. The patient had received medical examinations and tumor marker assessments every three to four months as well as abdominal plane computed tomography (CT) scans every six months after orchiectomy. He was unable to undergo contrast CT because he was receiving treatment for severe bronchial asthma.

The patient promptly underwent upper esophagastroduodenoscopy (EGD) in order to investigate the source of the continuous gastrointestinal bleeding. EGD revealed the oral side of a protruded lesion in the third portion of the duodenum. Furthermore, a 10-cm low-density mass was detected in the duodenum and para-aortic area on abdominal plane CT (Fig. 1). An upper GI series demonstrated a 10-cm protruded lesion in the second to third portion of the duodenum (Fig. 2). Double balloon endoscopy (DBE) showed a tumor overlaid with normal mucosa accompanied by an ulcer that narrowed the intestinal lumen (Fig. 3). Histopathology revealed atypical cells in the mucous membrane with

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Figure 1. Abdominal plain CT shows a 10-cm low-density tumor in the duodenum (A) and para-aortic LN swelling (B).

Figure 2. An upper GI series reveals a 10-cm protruded lesion in the 2nd portion to 3rd portion of the duodenum.

Discussion

Seminomas often metastasize to the lungs, liver, bone, brain and retroperitoneal lymph nodes, where the lymphatic drainage of the testis is located. The most frequent mode of metastasis to the GI tract is direct invasion from the retroperitoneal lymph nodes, and ileal and jejunal metastases are more common than those to the stomach, colon and duodenum.

Seminomatous metastasis to the duodenum is rare. Most previous cases of such lesions were diagnosed at autopsy or during abdominal surgery, while only four cases, including ours, of seminomatous metastasis to the duodenum diagnosed on endoscopy have been reported in the literature (3-5). In the present report, we describe a rare and valuable case in which we were able to confirm the diagnosis and follow the patient’s clinical course using endoscopy.

In this case, the metastatic lesion was discovered on endoscopy before the disease became too severe, unlike that observed in the other three reported cases. In the report by Jeffery et al. (3), tumor invasion to the inferior vena cava resulted in pulmonary embolism. In addition, Senadhi et al. (4) documented a case of hemodynamic deterioration due to tumor hemorrhage in which emergency surgery to stop the bleeding was required. Altamar et al. also reported a case of anal bleeding and profound anemia (5.4 g/dL) in a patient with a metastatic tumor (5). In each of these previous reports, the patient’s condition worsened and/or grave complications occurred due to a delay in diagnosis. In contrast, the early detection of the lesion in our case likely contributed to the improvements in the patient’s clinical course.

According to the NCCN (National Comprehensive Cancer Network) Clinical Practice Guidelines in Oncology, most cases of testicular tumor are first treated with orchiectomy, after which chemotherapy or radiation therapy are performed depending on the disease stage and tissue type. The recommended treatments for stage I seminoma after orchiectomy include surveillance, carboplatin monotherapy and radiotherapy. In general, the most suitable therapy should be selected based on the individual case after carefully considering the advantages and disadvantages of each treatment option. Patients are recommended to undergo one or two cycles of treatment with carboplatin, the dose of which is calculated according to the following formula: 7 × [glomerular filtration rate (GFR, mL/min) + 25] mg (7). Radiotherapy with a total dose of 20 Gy administered in 10 fractions is also rec-
Figure 3. DBE reveals a tumor whose oral side is covered with dilated white villus (A). The center of the tumor is an ulcer spreading from the dorsal side and occupying 3/4 circumference of the lumen (B).

Figure 4. Photomicrograph showing atypical cells with large round nuclei, clear polygonal cytoplasm (A: original magnification ×10; B: original magnification ×40). Immunoperoxidase staining is positive for c-kit (C), a specific marker of seminoma, and D2-40 (D), which is specific for germ cell tumor.

ommended. The radiotherapy field includes the retroperitoneal lymph nodes, as well as the area spanning from the bottom of the 11th thoracic vertebra to the inferior margin of the fifth lumber vertebra, with a width of approximately 10 centimeters, involving both ends of the transverse processes (8).

The relapse-free rate at five years for carboplatin monotherapy is 94.7%, compared to 96.0% for radiotherapy (9). However, the rate of second malignancy has been reported to be 1.2% following carboplatin treatment, versus 2.8% after radiotherapy (9). Moreover, radiotherapy has been shown to result in a decrease in the sperm concentration, which is associated with infertility (10). Although surveillance without additional treatment is often selected in order to prevent late complications of chemotherapy or radiotherapy in such cases, the rate of recurrence can be as high as 15-20% (11).

In the present case, three options were offered to the patient. He ultimately chose surveillance because he was concerned about the side effects of chemotherapy and radiotherapy. We considered that he may have already harbored a
small metastatic lesion in the duodenum prior to orchiectomy or that the tumor may have newly developed during observation after the above described procedure. In the latter case, we speculate that lymphatic metastasis occurred because minute tumor cells possibly remaining after orchiectomy entered the para-aortic lymph nodes via the lymph nodes along the testicular vein, thus invading the duodenum, which is located near the para-aortic region, and forming the metastatic lesion. If additional radiation or chemotherapy had been performed after the operation, relapse may have been prevented. Furthermore, if the patient had undergone enhanced CT at follow-up after orchiectomy, even earlier detection of the metastatic lesion may have been possible.

Chemotherapy normally exhibits a 90% success rate in patients with pure seminomas. However, it has been reported that pure seminomas with GI metastasis usually demonstrate a lower response rate (60%) (12). Therefore, it is important to detect metastasis to the GI tract at an early stage and initiate treatment as soon as possible. Common surveillance methods after orchiectomy include physical examinations, the measurement of tumor markers, as well as chest X-ray and abdominal CT studies. Consequently, gastrointestinal lesions may be missed, thus evading detection.

While GI metastasis of testicular tumors is uncommon, the development of manifestations in the GI tract during observation after orchiectomy should lead to suspicion of GI metastasis. Furthermore, survey of the small bowel should be performed to detect small intestinal lesions, as well as both EGD and colonoscopy.

In conclusion, we herein presented an educational case of pure testicular seminoma with metastasis to the third portion of the duodenum in which we were able to diagnose the patient and monitor the curative effects of chemotherapy using double balloon endoscopy.

The authors state that they have no Conflict of Interest (COI).

References