

Case Report

Pathological analysis of collision (double primary) cancer in the upper digestive tract concomitant with gastric stromal tumor: a case report

Xun Sun¹, Yabin Zou¹, Yueming Hao², Hongjing Cheng², Changli Zhou², Xiangwei Meng²

Departments of ¹Pathology, ²Gastroenterology, First Hospital of Jilin University, Changchun 130021, China

Received May 18, 2015; Accepted June 27, 2015; Epub October 1, 2015; Published October 15, 2015

Abstract: Carcinoma of the esophagus and cardiac cancer are common malignancies, while multiple primary cancers in the esophagus and cardia is rarely encountered and easily misdiagnosed. Multiple primary cancers mean the same organs (tissues) or different organs (tissues) have two or more than two primary malignant tumors at the same time or in sequence in the same individual. The case below of two independent primary lesions is double primary carcinoma which meets the diagnosis standard of multiple primary cancers. Gastrointestinal stromal tumor is the most common stromal tumor, which is usually considered as originating from Cajal cells in the gastrointestinal tract or mesenchymal stem cells with the mutation of KIT or PDGFRA gene. Study on stromal tumor with digestive tract cancer is less both at home and abroad, while double primary carcinoma with stromal tumor is rare, which has not been reported at present. Although scholars have different viewpoints on the prognosis, but the full understanding of this disease can be as a warning for the future work and to avoid misdiagnosis.

Keywords: Squamous cell carcinoma, mucinous adenocarcinoma, double primary carcinoma, stromal tumor, immunochemistry, histopathology

Introduction

Multiple primary cancers in the esophagus and cardia is rarely encountered and easily misdiagnosed (misdiagnosis rate as high as 83.3-100%) [1]. In the case described below, only the lower esophageal mass was identified by pre-operative gastroscopy, while the cardiac mass was observed after surgical resection. This situation is consistent with the literature and can be easily misdiagnosed. A double primary cancer concomitant with stromal tumor is even less common and has not been reported yet. In this report, we describe a case of double primary esophageal and cardiac cancer concomitant with gastric stromal tumor (GST) at First Hospital of Jilin University.

Case report

The patient was a 70-year-old man who was admitted to First Hospital of Jilin University after 2 months of upset stomach with 20 days

of choking sensation after eating. During gastroscopy, a circumferential, ulcerated, polypoid mass was observed in the esophagus about 34 cm below the incisors, with fresh bleeding and uneven bottom; it was partially covered by filthy moss and red blood crust. The surrounding mucosa showed dike-like apophysis and the lesion involved the cardia and subcardia. A poorly and moderately differentiated squamous cell carcinoma (SCC) was observed in the pathological results of the gastroscopic biopsy. This case was clinically diagnosed as esophageal cancer and treated by lower esophageal resection.

General observations of postoperative pathological characteristics

The resected lower esophagus and a small part of the connected gastric wall (fixed) were submitted for examination. The esophagus was 9 cm in length and 2-4.2 cm in diameter; the connected gastric wall was 12 cm × 4 cm × 3.5 cm

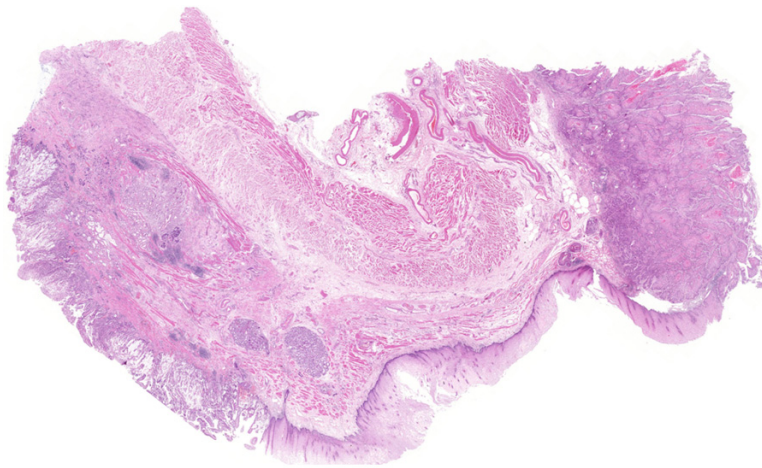


Figure 1. The mucous adenocarcinoma appears at the left, and the normal region is in the middle, and the squamous cell carcinoma is presented at the right.

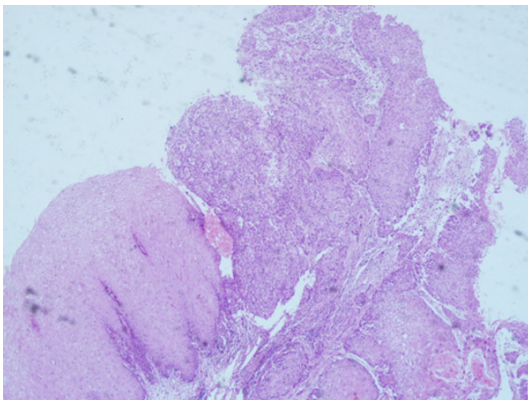


Figure 2. Squamous cell carcinoma (HE10 × 4).

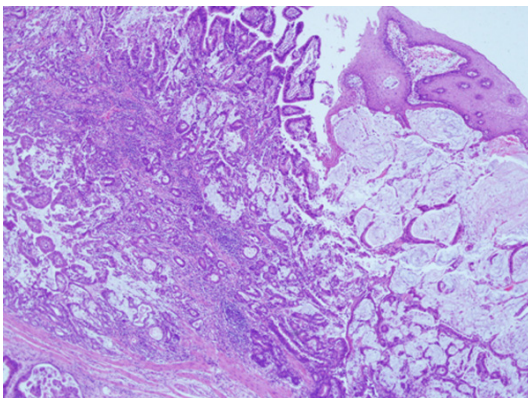


Figure 3. Mucinous adenocarcinoma (HE10 × 4).

in volume. The upper part was attached with a suture. An ulcerated mass (mass 1) was observed in the esophagus, 1 cm away from the lat-

eral cut edge of the esophagus and 5 cm from lateral cut edge of the stomach, with a mass volume of 7 cm × 3 cm × 1 cm; the mass surface was necrotic and the cut surface was grayish-white, solid, and tough. A second ulcerated mass (mass 2) was observed near the mucosal surface at the junction of the squamous and columnar epithelium, 9 cm away from the lateral cut edge of the esophagus, 2.5 cm from the lateral cut edge of the stomach, and 1.5 cm from mass 1; the mass volume was 3.5 cm × 2.2 cm × 1.0 cm. A subserosal nodular mass (mass 3) was observed

1 cm from the lateral cut edge of the stomach; the capsule was complete and smooth with a diameter of 1 cm.

Gastrosopic observations of postoperative pathological characteristics

In mass 1, a moderately differentiated SCC was observed in the whole layer of the esophagus. The cells of the SCC were round, oval, or polygonal, and approximately uniform in size. We observed localized keratosis with occasional intercellular bridges (**Figure 2**). The SCC had metastasized to the lymph nodes surrounding the esophagus (**Figure 4**).

In mass 2, a mucinous adenocarcinoma (MAC) was observed in the entire layer at the junction between the esophagus and stomach. Floating cancer cells with adenoid and streak patterns were noted in many mucus pools (**Figure 3**). The MAC had metastasized to lymph nodes surrounding the gastric cardia (**Figure 5**). A normal tissue area of 1.5 cm was visible between masses 1 and 2 (**Figure 1**). The image was acquired using an automatic digital section scanning system (Precice 500; Unic Technologies, Beijing, China).

Mass 3 was a stromal tumor located in the gastric subserosa with a diameter of 1 cm. The mitotic figure of mass 3 was <2/50 HPF, with extreme low malignant potential. The tumor was composed of long spindle cells in a braided arrangement (**Figure 6**). The following immunohistochemistry results were observed: CD117

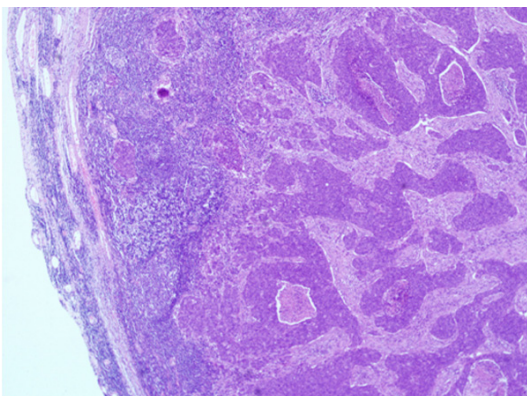


Figure 4. Lymph node metastases of squamous cell carcinoma (HE10 $\times$ 4).

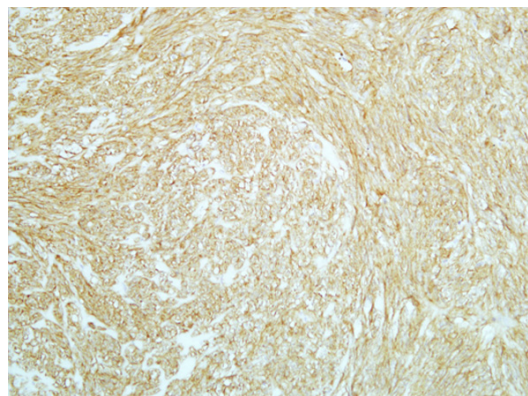


Figure 7. Gastrointestinal stromal tumor shows CD117 (+) (10 $\times$ 20).

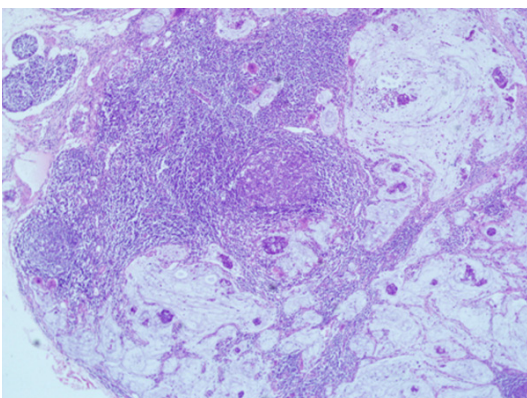


Figure 5. Lymph node metastatic of mucinous adenocarcinoma (HE10 $\times$ 4).

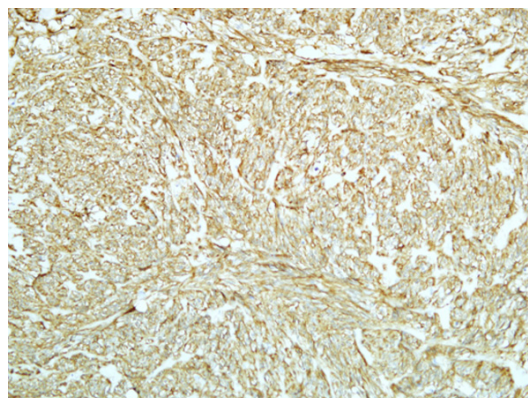


Figure 8. Gastrointestinal stromal tumor shows Dog-1 (+) (10 $\times$ 20).

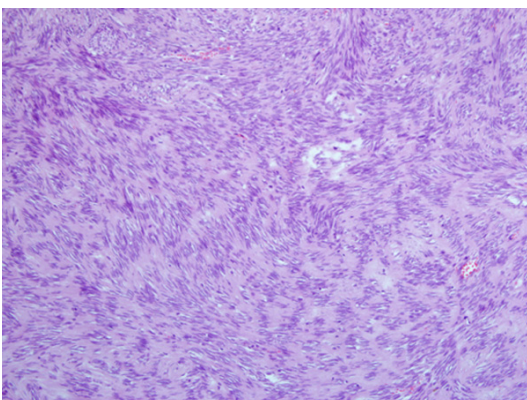


Figure 6. Gastrointestinal stromal tumor (HE10 $\times$ 10).

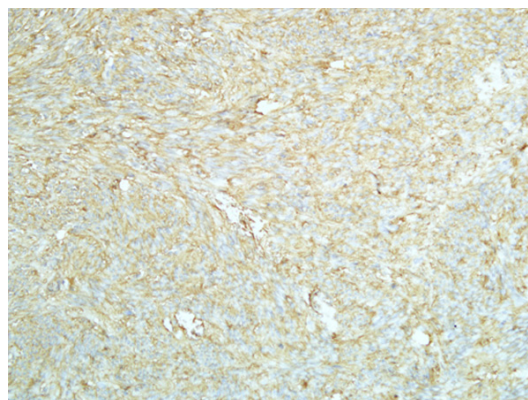


Figure 9. Gastrointestinal stromal tumor shows CD34 (+) (10 $\times$ 20).

(+), Dog-1 (+), CD34 (+), Ki-67 (+, <1%), S-100 (-), Desmin (-), and SMA (-) (**Figures 7-9**). For histological observation, raw materials and specimens were subject to hematoxylin and eosin

staining and Envision immunohistochemical staining, and labeled with CD117, Dog-1, CD34, SMA, Desmin, S-100, and antibodies. Immunohistochemistry reagents were obtained from

the S-P kit (Maixin, Fuzhou, China). Grading and prognostic evaluation were performed following the postoperative risk grading standards for primary stromal tumors after resection, as described by Joensuu et al. [2] and the Chinese Consensus on Diagnosis and Treatment of Gastrointestinal Stromal Tumor (2013 edition) [3].

Discussion

Although esophageal and gastric cardiac cancers are both common malignant tumors, double primary esophageal and gastric cardiac cancer is relatively rare and its incidence has been reported to be 0.08-0.87% in China [4, 5]. A double primary cancer concomitant with GST is even less common, with no reports available in China or other countries. The definition of multiple primary cancers was proposed by Warren and Gates in 1932 [6], which refers to the simultaneous or successive development of two or more primary malignant tumors in the same or different tissues or organs of an individual (excluding metastatic cancer). Simultaneous multiple primary cancer is also known as synchronous cancer, which means that the first and second tumors are diagnosed simultaneously or within a diagnostic interval of 6 months. If the diagnostic interval is >6 months, the tumor is defined as metachronous cancer [7]. The patient reported here met the diagnostic criteria of simultaneous multiple primary cancer, namely, a double primary cancer. Esophageal SCC occurred at the lower esophagus and metastasized to the lymph nodes surrounding the esophagus, while MAC occurred at the gastric cardia and metastasized to lymph nodes around the gastric cardia in this patient. Moreover, there was a normal tissue area of 1.5 cm between the esophageal SCC and MAC, excluding the possibility of metastasis and infiltration and indicating two independent primary lesions. The incidence of esophageal cancer concomitant with gastric cancer is higher in men than in women, and the cardia is the most common region for gastric cancer [8, 9]. In this case, gastric cancer was observed in the gastric cardia, which was consistent with previous literature. Furthermore, a subserosal nodular mass with a diameter of 1.0 cm diameter and located 1 cm away from the lateral cut edge of the stomach was confirmed as a stromal tumor by immunohistochemistry. Stromal tumors are

among the most common mesenchymal tumors of the gastrointestinal tract. It is generally believed that stromal tumors originate from Cajal cells in the gastrointestinal tract or mesenchymal stem cells, with mutations in the KIT or PDGFRA genes [10].

There are few reports of stromal tumors concomitant with gastrointestinal cancer in the world. Currently, the largest cohort study reported in the literature was a retrospective study of 228 cases by Agaimy et al. [11]. With recent developments of diagnostic technology, there has been attention from domestic and international scholars focusing on the diagnosis and treatment of gastrointestinal stromal tumor, and therefore, reports of gastrointestinal cancers complicated with GST are gradually increasing. There are mixed views with regard to the prognostic impact of such cancers. Liu et al. [12] suggested that the prognosis of patients with gastric cancer concomitant with GST mainly depends on the gastric cancer itself and the concomitant GST. A concomitant GST that is usually observed during intraoperative or postoperative pathological examination has a small diameter, low Fletcher grade, low recurrence rate after complete resection, and overall good prognosis, and therefore, does not have a large influence on the patients' prognosis. The main cause of poor overall prognosis for these patients is mostly concomitant gastric cancer observed during the progressive stage, which has an overall low long-term survival rate and poor prognosis, which has a greater influence on the prognosis of patients with gastric cancer concomitant with GST. However, Lee et al. [13] believed that the prognosis for patients with GST is relatively poor if it is concomitant with gastric cancer, regardless of the Fletcher grade. In patients with GST concomitant with gastrointestinal cancer, the stromal tumors have short diameters and often occur in the serosa. These tumors are difficult identified preoperatively and therefore, they are mostly discovered during intraoperative or postoperative pathological examination of the gastric cancer. Additionally, concomitant GST can be easily missed in postoperative diagnosis. Therefore, it is necessary to prompt the surgeon and pathologist to examine the entire primary disease organ carefully and other abdominal organs intraoperatively or postoperatively to prevent misdiagnosis.

Disclosure of conflict of interest

None.

Address correspondence to: Dr. Xiangwei Meng, Department of Gastroenterology, First Hospital of Jilin University, 71 Xinmin Street, Changchun 130021, China. E-mail: xiangweimeng2003@163.com

References

- [1] Xie J, Wang LS, Meng F, et al. Missed Diagnosis and Prevention of Multicentric Tumors of Upper Alimentary Tract-Report of 28 Patients. Chinese Journal of Clinical Oncology and Rehabilitation 1998; 5: 43-45.
- [2] Joensuu H. Risk stratification of patients diagnosed with gastrointestinal stromal tumor. Hum Pathol 2008; 39: 1411-9.
- [3] COCS gastrointestinal stromal tumor Expert Committee. The consensus of diagnose and treatment for gastrointestinal stromal tumors in China. Chinese Clinical Oncology 2013; 18: 1030-1037.
- [4] Ruose S, Qishan W. Clinical analysis of 32 cases of esophageal and gastric multiple primary carcinoma. China Journal of Endoscopy 2004; 10: 67-68.
- [5] Guan FS, Liu ZC, Zhao XJ, et al. Early diagnosis and treatment of multi-primary esophageal cancer and double primary esophageal and cardiac cancer. Chin J Thorac Cardiovasc Surg 2003; 19: 80-81.
- [6] Warren S, Gates O. Multiple primary malignant tumors: a survey of the literature and a statistical study. Am J Cancer 1932; 16: 1358-1414.
- [7] Natsugoe S, Matsumoto M, Okumura H, Ishigami S, Uenosono Y, Owaki T, Takao S, Aikou T. Multiple primary carcinomas with esophageal squamous cell cancer: clinicopathologic outcome. World J Surg 2005; 29: 4649.
- [8] Kato H, Tachimori Y, Watanabe H, Mizobuchi S, Igaki H, Yamaguchi H, Ochiai A. Esophageal carcinoma simultaneously associated with gastric carcinoma: Analysis of clinicopathologic features and treatments. J Surg Oncol 1994; 56: 122-127.
- [9] Hamabe Y, Ikuta H, Nakamura Y, Kawasaki K, Yamamoto M. Clinicopathological features of esophageal cancer simultaneously associated with gastric cancer. J Surg Oncol 1998; 68: 179-182.
- [10] Lasota J, Miettinen M. KIT and PDGFRA mutations in gastrointestinal stromal tumors (GIST). Semin Diagn Pathol 2006; 23: 91-102.
- [11] Agaimy A, Wunsh PH, Sobin LH, Lasota J, Miettinen M. Occurrence of other malignancies in Patients with gastrointestinal stromal tumors. Semin Diagn Pathol 2006; 23: 120-9.
- [12] Liu XL, Wang JB, Huang CM, Zheng CH, Li P, Xie JW, Lin JX. Clinicopathologic features and prognostic factors of gastric gastrointestinal stromal with synchronous gastric cancer. Zhonghua Wei Chang Wai Ke Za Zhi 2012; 15: 247-250.
- [13] Lee FY, Jan YJ, Wang J, Yu CC, Wu CC. Synchronous gastric gastrointestinal stromal tumor and signet-ring cell adenocarcinoma: a case report. Int J Surg Pathol 2007; 15: 397-400.