

## Gastric metastasis from ovarian carcinoma: A case report and literature review

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**Author contributions:** Zhou JJ managed the patient, reviewed the literature and prepared the manuscript; Miao XY revised the manuscript; and both authors have read and approved the final version for submission.

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Received: June 20, 2012 Revised: August 14, 2012

Accepted: August 25, 2012

Published online: November 21, 2012

### Abstract

An isolated parenchymal gastric metastasis from ovarian carcinoma without any other sites of recurrence is extremely rare. Only two cases have been reported, both of which were symptomatic. We herein report such a case without any symptoms. A 61-year-old woman presented with a high cancer antigen-125 level without any other clinical manifestation. A subsequent <sup>18</sup>F-fluorodeoxyglucose (<sup>18</sup>F-FDG) positron emission tomography/computed tomography scan revealed a submucosal mass with hypermetabolism of <sup>18</sup>F-FDG (standardized uptake value: 5.36) in the gastric antrum. The final pathology after gastric antrectomy showed a metastatic gastric tumor from a primary ovarian carcinoma. We also performed an extensive literature review about gastric metastasis from ovarian carcinoma published until recently, and this is the first case of an isolated parenchymal gastric metastasis from ovarian carcinoma without any symptoms.

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**Key words:** Ovarian carcinoma; Gastric antrum; Metastasis; Submucosal tumor; Parenchymal tumor

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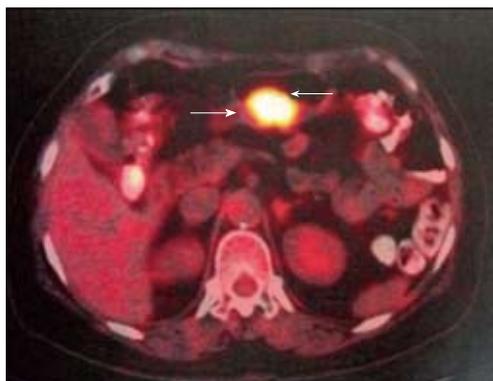
Zhou JJ, Miao XY. Gastric metastasis from ovarian carcinoma: A case report and literature review. *World J Gastroenterol* 2012; 18(43): 6341-6344 Available from: URL: <http://www.wjgnet.com/1007-9327/full/v18/i43/6341.htm> DOI: <http://dx.doi.org/10.3748/wjg.v18.i43.6341>

### INTRODUCTION

Ovarian carcinoma usually metastasizes along the peritoneum throughout the pelvic and abdominal cavity, such as pelvic wall, omentum and mesentery. Gastrointestinal involvement is not common. Even it happens, gastrointestinal tract metastasis of ovarian carcinoma is merely limited to serosa. Solitary parenchymal gastric metastasis from ovarian carcinoma is extremely rare, and only two cases have been reported in English up till now<sup>[1,2]</sup>. We herein present a case of gastric metastasis from ovarian carcinoma without any symptoms and other sites of recurrence.

### CASE REPORT

In December 2011, a 61-year-old woman was admitted to our hospital because of a high cancer antigen (CA)-125 level of up to 116.5 U/mL (normal, < 35U/mL), and she had no epigastric pain and fullness, hematemesis, melena, weight loss and any other clinical manifestations. In 1999, she underwent optimal debulking cytoreductive surgery in our hospital for ovarian adenocarcinoma, followed by ten cycles of adjuvant chemotherapy with cisplatin and cyclophosphamide. In May 2006, when her CA-125 level increased to 57.9 U/mL, she received



**Figure 1**  $^{18}\text{F}$ -fluorodeoxyglucose positron emission tomography/computed tomography shows a hypermetabolic lesion (standardized uptake value: 5.36) in the gastric antrum (arrows).

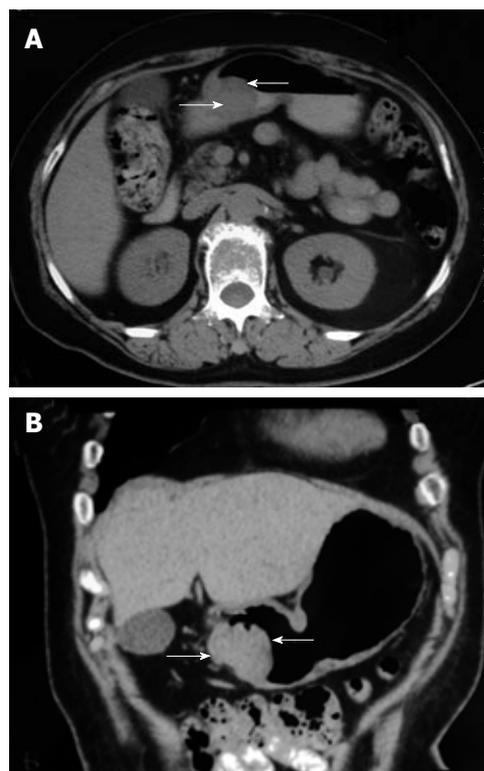
another ten cycles of adjuvant chemotherapy with taxol, cyclophosphamide, carboplatin and bleomycin. CA-125 level was tested every two months and it exceeded the normal range again in December 2011.

$^{18}\text{F}$ -fluorodeoxyglucose positron emission tomography/computed tomography ( $^{18}\text{F}$ -FDG PET/CT) scanning for ruling out the recurrent ovarian carcinoma that was suspected due to the CA-125 level.  $^{18}\text{F}$ -FDG PET/CT revealed a mass located in gastric antrum with high  $^{18}\text{F}$ -FDG uptake (standardized uptake value: 5.36) (Figure 1), and there were no any other lesions with high  $^{18}\text{F}$ -FDG uptake in the abdominopelvic region. A subsequent non-contrast-enhanced CT displayed a 2.4 cm  $\times$  3.0 cm submucosal mass in the gastric antrum (Figure 2), which had not been found in the CT scanning done on April 4, 2010. The patient could not tolerate and refuse to take endoscopic examination, so we performed gastroenterography instead. Upper gastroenterography also showed clearly a lesion with a tiny ulceration on the surface of gastric mucosa (Figure 3).

The patient then underwent local gastrectomy. During the operation, we found that both mucosa and serosa were involved, but there was no intumescent lymph node around the gastric antrum. The incision of gastric antrum was fixed with a double-layer hand-sewn suture transversely.

On cut section, a gray-white tumor of 3.2 cm  $\times$  2.8 cm  $\times$  3.5 cm was situated in the muscularis propria and bulged into the serosa. Microscopically (Figure 4A), serous papillary adenocarcinoma cells infiltrated into normal gastric tissues with cancer embolus in the vessels. There was a deep ulceration on the overlying mucosa. A non-metastatic lymph node was found in the specimen. Values of the immunohistochemical detection of the tumor cells (Figure 4B) were: CA-125 (+++), Wilms' tumor-1 (+++), estrogen receptor (++), cytokeratin 7(+), cytokeratin 20(-), progesterone receptor (-) and CDX-2 (-). The immunohistochemical staining result supported the final diagnosis of gastric metastasis from ovarian serous adenocarcinoma.

CA-125 level was decreased to 53.1 U/mL on the



**Figure 2** An abdominal computed tomography shows a low density, 2.4 cm  $\times$  3.0 cm intramural mass of gastric antrum with tiny ulceration (arrows), which is suggestive of a gastric submucosal tumor, such as gastrointestinal stromal tumor. A: Cross section; B: Coronal section.

7th postoperative day. Her postoperative course was unremarkable and she was discharged on the 9th day after operation. When this manuscript was submitted, she had no experience of recurrent disease.

## DISCUSSION

Metastatic disease involving stomach is unusual. A study found 17 metastases to the stomach among 1010 patients with malignant tumors, giving a frequency of 1.7%<sup>[3]</sup>. Another series of autopsies discovered 92 gastric metastases among 7165 cases, with a rate of 1.28%<sup>[4]</sup>. Most gastric metastases arise from primary breast cancer, followed by melanoma and lung cancer. The incidence of gastric metastases was 3.6% (25/694) in patients with breast cancer and 1.3% (10/747) in patients with lung cancer. No study had analyzed the incidence of gastric metastasis from ovarian carcinoma due to the extremely rare occurrence. According to our review of the literature, there has been no report of gastric metastases from ovarian carcinoma in Chinese.

We performed a very comprehensive review of all case reports of gastric metastasis from ovarian carcinoma. Until this April, ten other reports (Table 1) in English could be searched in PubMed. Patient age ranged from 42 years to 70 years. Two cases<sup>[10,12]</sup> were diagnosed with primary ovarian carcinoma simultaneously, the longest time from diagnosis of primary tumor to discovery

Table 1 Literature review

Author	Age	Histology	Recurrence sites	Recurrence time	Symptoms	Survival
Sangha <i>et al</i> <sup>[1]</sup>	55	NR	Stomach	7 yr	Belching reflux, epigastric discomfort	NED NR
Pernice <i>et al</i> <sup>[2]</sup>	42	Adenocarcinoma G3	Stomach + perigastric area	18 yr	Asymptomatic	12 mo NED
Taylor <i>et al</i> <sup>[5]</sup>	62	Serous adenocarcinoma G3	Lung + liver + stomach	10 mo	Haemorrhagy	6 mo DOD
Kobayashi <i>et al</i> <sup>[6]</sup>	48	NR	Spleen + pancreas+ sigmoid colon	21 yr	Hemorrhage, partial bowel obstruction	NR
Dupuychaffay <i>et al</i> <sup>[7]</sup>	65	Adenocarcinoma G3	Stomach + diaphragm + pancreas + peritoneal nodes	16 yr	Fever, aasthenia, anorexia, epigastric pain	NR
Bechade <i>et al</i> <sup>[8]</sup>	51	Adenocarcinoma G3	Stomach + peritoneal nodes + ovaries	NR	Hemorrhage	ED NR
Jung <i>et al</i> <sup>[9]</sup>	49	Serous ovarian adenocarcinoma	Gastric antrum + presacral area	52 mo	Asymptomatic	18 mo NED
Carrara <i>et al</i> <sup>[10]</sup>	70	Adenocarcinoma	Gastric body	Simultaneously	Mild anemia, dyspepsia	NR
Majeurs <i>et al</i> <sup>[11]</sup>	61	Serous adenocarcinoma G3	Stomach + sigmoid colon	7 mo	Epigastric discomfort, vomit	18 mo DOD
Kang <i>et al</i> <sup>[12]</sup>	55	Adenocarcinoma	Gastric antrum + pelvic cavity	Simultaneously	Epigastric pain, abdominal distention	12 mo NED
Present case	61	Adenocarcinoma G3	Gastric antrum	12 yr	Asymptomatic	5 mo NED

DOD: Death of disease; NR: Not report; ED: Evident disease; NED: Not evident disease.



Figure 3 Upper gastroenterography shows a lesion in the gastric antrum (arrows). The antrum was partially obstructed by the mass.

of gastric metastasis being 18 years<sup>[2]</sup>. Clinical manifestations were diversified and nonspecific, and three cases were asymptomatic (3/11, 27.27%).

Due to the extremely low incidence, it is hard to make a correct diagnosis of gastric metastasis from ovarian carcinoma. According to our literature review, some cases<sup>[2,9]</sup> only presented with CA-125 levels beyond normal range but without any symptoms. Since CT scanning, gastroenterography and gastroscopy all showed a submucosal tumor of stomach, a wrong diagnosis of gastrointestinal stromal tumor<sup>[12]</sup> would be easily made<sup>[12]</sup>. So, when a patient has a history of ovarian carcinoma, especially when her CA-125 level is high, metastasis from ovarian carcinoma should be considered. <sup>18</sup>F-FDG PET/CT can be useful. In our case, <sup>18</sup>F-FDG PET/CT scanning revealed a high metabolic uptake lesion of gastric antrum, which is similar to the findings as described by other authors<sup>[2,12]</sup>.

Ovarian carcinoma is more likely to metastasize along the peritoneal surface, but the mechanism of gastric metastasis remains unclear, it may be because of the rich

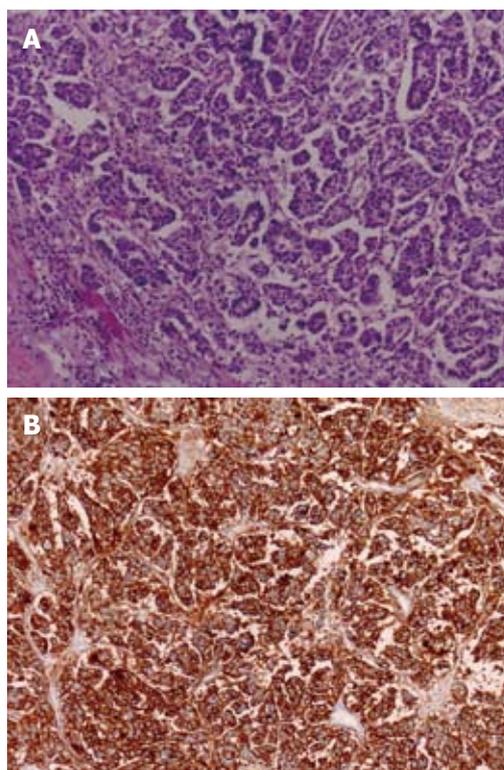


Figure 4 Pathological manifestation of the neoplasm. A: Microscopically, the tumor is composed of irregular sheets of cells with a high-grade nuclear atypia (HE stain,  $\times 100$ ); B: Immunohistochemically, the tumor cells are immunoreactive for cancer antigen 125 ( $\times 100$ ).

blood supply of stomach. Local excision without radical lymphadenectomy following adjuvant chemotherapy is effective and recommended for metastases of ovarian carcinoma. The prognosis of gastric metastases of ovarian carcinoma remains unknown, according to our literature review, a one-year survival rate can be expected optimistically (5/6, 83.33%).

## ACKNOWLEDGMENTS

We want to thank our colleagues from the Department of Pathology for providing the pathological pictures.

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S- Editor Gou SX L- Editor A E- Editor Xiong L