

# Colon cancer with ovarian metastasis during pregnancy: a case report

Yin Min<sup>1</sup>, Chen Aiping<sup>2\*</sup>

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## ABSTRACT

**Background:** Colorectal cancer with ovarian metastasis is quite rare, especially during pregnancy.

**Case Presentation:** A 43-year-old pregnant Chinese woman at 36 weeks gestation presented with a big adnexal mass and constipation. The patient underwent an elective cesarean section and delivered a normal baby. Intraoperative frozen section pathology revealed differentiated adenocarcinoma with necrosis in the right ovarian tumor. In the further exploration of abdominal cavity, sigmoid colon cancer was diagnosed.

**Conclusion:** Diagnosis of colorectal cancer during pregnancy is challenging for clinicians because of the non-specific symptoms which are common during pregnancy. Once diagnosed, several factors should take into consideration to determine the treatment.

**Keywords:** Colon cancer, ovarian metastasis, pregnancy, constipation, cancer in pregnancy.

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Correspondence to: Chen Aiping

\*The Affiliated Hospital of Qingdao University, Qingdao, China.

Email: [chenaiping516@163.com](mailto:chenaiping516@163.com)

Full list of author information is available at the end of the article.

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## Background

The occurrence of cancer during pregnancy varies from 0.07% to 0.1%. Colorectal cancer is one of the eight most common malignancies in pregnancy [1]. Ovary is one of the common metastasis sites of malignant tumor. In normal population, the probability of metastasis of colon cancer to ovary is 3%–8% [2]. Constipation is a common symptom complained by pregnant women. However, common symptoms of colorectal cancer include hematochezia, change of stool excretion habits, constipation, and anemia, all of which are commonly seen in pregnancy. Here, we report a case of colorectal cancer with ovarian metastasis who was presented with a big adnexal mass and constipation. The purpose of this case report is to increase awareness about colorectal cancer in pregnant women given the similarity of symptoms between normal pregnancy and cancer.

## Case Presentation

The patient was a 43-year-old woman at 36 weeks adnexal mass and constipation. She did her prenatal examination regularly in their local hospital. She presented abdominal distension, especially the right lower abdomen, and constipation for over 1 month. She denied blood per rectum. Ultrasonography in our hospital revealed a 15.5 cm × 10.3 cm × 7.9 cm cystic-solid mass with mixed echo on the right side of the gravid uterus with a normal fetus (Figure 1). The laboratory examination showed carbohydrate antigen 125 67.45 U/ml, carbohydrate antigen 19-9 130.00 U/ml, and carcinoembryonic antigen 6.86 ng/ml.

Physical examination revealed neither vaginal discharge nor decreased fetal movement. She has a history of hysteromyoma for 2 years without any treatment and the patient did not mention any positive family history of cancer when she was asked. According to the ultrasonography and tumor markers, the big adnexal mass was highly suspected ovarian originated. In view of the risk of tumor rupture during transvaginal delivery, a cesarean section and exploratory laparotomy were recommended. Elective cesarean section was performed at 36 weeks of gestation, and a normal baby weighing 2,940 g was delivered. Apgar score of 1 and 5 minutes was 10 points. Intraoperative frozen section pathology revealed differentiated adenocarcinoma with necrosis in the right ovarian tumor. In the further exploration of abdominal cavity, a tumor about 4 cm was observed in the middle segment of the sigmoid colon, penetrating the serosa, and scattered in the uterine and rectal pits. After consultation with gastrointestinal surgery and Gynecology Department, the patient's condition was fully communicated with his family members. Considering that the patient had no requirement of reproduction, the family members asked for debulking surgery. Therefore, an extensive cytoreduction surgery was conducted, including hysterectomy, bilateral salpingo-oophorectomy, pelvic and abdominal aortic lymph node dissection, larger omentectomy, and appendectomy. Sigmoid colon resection and colostomy were performed. The total operation took 8 hours, and the blood loss was

about 1,000 ml, with 1.5 units of packed red blood cells administered during the operation.

Postoperative pathology revealed differentiated adenocarcinoma with necrosis in the right ovarian tumor. The immunohistochemistry result showed CK7 (-), CK20 (+), CDX-2 (+), Villin (+), ER (-), PR (-), Pax-8 (-), p16 (+), p53 (-), WT-1 (-), Vimentin (-), 60% Ki-67 (+), and HNF1b (-). Combined with history and immunohistochemistry, it is consistent with metastasis originated from colon. Adenocarcinoma of the sigmoid colon is moderately differentiated, and metastasis is seen in the intestinal lymph nodes (8/16). Placenta not sent for the pathological examination. Further treatment was carried out in the Oncology Department of our hospital. Postoperative PET/CT was performed and revealed both lung and liver metastasis (Figure 2). The patient was in stage IVB (T<sub>4b</sub>N<sub>2b</sub>M<sub>1b</sub>). So far, eight cycles of “XELOX” chemotherapy have been performed. The multiple nodules in both lungs and liver were slightly smaller than before. After eight cycles of “XELOX” chemotherapy, oxaliplatin was discontinued and capecitabine combined with amphetamine was maintained. The patients were generally in good condition and the disease did not progress. Now, the child is 1-year old and in good health during the follow-up.

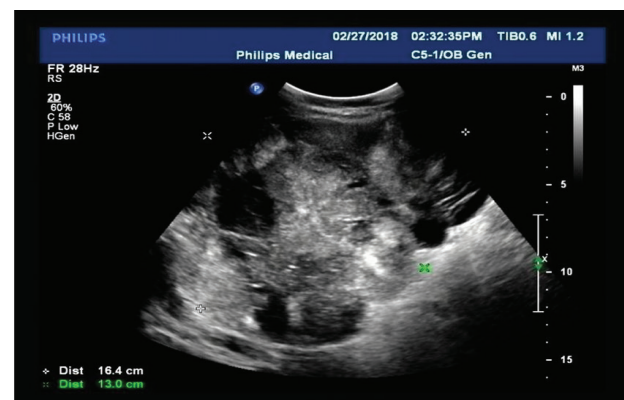
## Discussion

The incidence of cancer during pregnancy varies from 0.07% to 0.1%, and the most common types are cervical cancer, breast cancer, melanoma, and leukemia. Colorectal cancer is one of the eight most frequent malignancies among pregnant women [1]. Delayed childbearing and an increasing frequency of colorectal cancer (CRC) in younger patients may increase CRC incidence in pregnancy [3]. Ovarian metastasis was reported to be likely in colon cancer associated with pregnancy. In normal population, the probability of colon cancer metastasis to ovary is 3%–8% [2]. However, the risk of ovarian metastases in colon cancer during pregnancy is as high as 25% [4], which are related to poor prognosis.

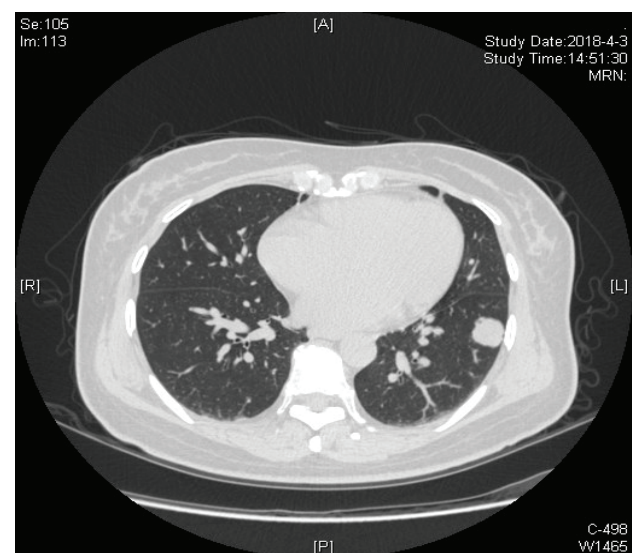
The clinical presentations of colorectal cancer in pregnancy are similar to those of non-pregnant women. Common symptoms of colorectal cancer include hematochezia, change of stool excretion habits, constipation, and anemia. Constipation is a non-specific symptom experienced during the pregnancy; however, it is also one of the earliest symptoms of colorectal cancer. Because these symptoms are generally found in normal pregnancy, most of the cases can be easily missed and are diagnosed in advanced stages. In Bernstein’s study of CRC during pregnancy, presentation with advanced disease (stages III and IV) was found in 59% of cases [5]. Similarly, in the newly publication, the majority of patients (73.2%) presented with advanced disease [3]. Diagnosis of colorectal cancer during pregnancy may be complicated by the assumed risk of imaging modalities and unwillingness to

perform such imaging during pregnancy. Endoscopy is the main method for the diagnosis of colorectal cancer. It is believed to have a low risk during pregnancy [6]. Maternal benefits should be weighed against fetal risks. In this case, the patient’s tumor was located in the middle sigmoid colon, without rectal bleeding. Constipation occurred more than 1 month ago, mistaken for the normal symptom in late pregnancy due to fetal head compression, being one of the main reasons for this patient’s delayed diagnosis until near term labor. This allows more spread of cancer and makes it difficult to treat.

How to adopt the treatment of this problem is another challenge. After the diagnosis of malignancy has been established, a review of outcomes and expectations with the patient and her family should occur as soon as possible. The necessary treatment must balance oncological outcomes with the effect on the pregnancy, and decisions regarding the management of pregnancy include termination, iatrogenic prematurity, or intentional delay in treatment of the maternal malignancy. Several factors should be considered, such as the wishes of the patient/family,



**Figure 1.** Ultrasonography revealed a 15.5 cm × 10.3 cm × 7.9 cm cystic-solid mass with mixed echo.



**Figure 2.** Postoperative CT revealed lung metastasis.

stage of cancer diagnosis, gestational age, and effects of the specific therapeutic option [7]. Adjuvant chemotherapy is mainly determined by the patients. The risk and benefits should be discussed with the patient [8]. Multi-agent chemotherapy in the first trimester is highly teratogenic, with a 15%–25% miscarriage and malformation rate [9]. The use in the first trimester is only warranted in metastatic high-burden disease, when the mother gives up continue pregnancy. In the second and third trimesters, chemotherapy is safer although it is associated with an increased incidence of small for gestational age, especially for platinum-based chemotherapy [10]. CRC chemotherapy is 5-fluorouracil (5-FU) and oxaliplatin based. 5-FU based regimens are standard for pregnant patients with breast cancer and are well studied [11]. In a newly published report, 12 patients (eight colon cancer and four rectal cancer) received 5-FU-based chemotherapy in the second and third trimester, and five of these regimens given during pregnancy contained oxaliplatin.

As for the surgical treatment, the current recommendation is that patients who undergo surgery in early pregnancy can be treated with chemotherapy in the third trimester. If diagnosed in late pregnancy, chemotherapy can be used after delivery [12]. Generally speaking, before 20 weeks of pregnancy, treatment delay can cause disease progression and increase the possibility of tumor metastasis, leading to compromise of the mother's life. In a report of 41 cases, the miscarriage rate for patients undergoing surgery within the first 20 weeks of pregnancy was 14.3%, which is similar to the miscarriage rate of the general population (15%), indicating that operating before the 20th week is relatively safe [3]. In the second 20 weeks of pregnancy, in order to win the time for lung maturation of the fetus, surgery can be delayed [13,14]. Radical surgery after the 20th week of gestation is challenging in colon cancer and almost impossible in rectal cancer due to the enlarged uterus. As for the mode of delivery, it is not affected by cancer, with the exception of a cesarean section owing to a distal tumor obstructing the birth canal or anterior rectal wall carcinoma [8]. After vaginal delivery, surgery is typically performed several weeks later. If a cesarean section is required for obstetric reasons, the decision whether to resect the tumor during the same procedure or to wait till the delivery depends on several factors. Colon cancers can usually be resected during the same operation as the cesarean section. In this case, given the fact that there is possibility of mass rupture and intra-abdominal hemorrhage during vaginal delivery, cesarean section was selected and exploratory surgery was performed. The patient was diagnosed during cesarean section, and the tumor had spread to ovary, peritoneum, omentum, rectum, and uterine pit.

In summary, colorectal cancer is a rare but devastating event for pregnant women. And, it can be masked by the symptoms that can be attributed to normal pregnancy. Therefore, the clinical symptoms and signs that cannot

be explained by pregnancy alone should be paid enough attention by clinicians, especially to the mass of progressive growth. Other examinations like endoscopy, tumor markers, and magnetic resonance imaging should be performed as early as possible if necessary, in order to discover malignant tumors at early stage and avoid missing the best time of treatment.

#### List of Abbreviations

CDX-2	Caudal type homeobox 2
CK	Cytokeratin
CRC	Colorectal cancer
ER	Estrogen receptor
HNF1b	Hepatocyte nuclear factor 1 homeobox B
Pax-8	Paired box gene 8
PR	Progesterone receptor
WT-1	Wilms tumor protein 1

#### Specialty

Gynecology and Obstetrics.

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#### Conflicts of interests

The authors declare that they have no conflict of interest.

#### Consent for publication

A written informed consent to publish/present this case was obtained from the patient.

#### Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

#### Author details

Yin Min<sup>1</sup>, Chen Aiping<sup>2</sup>

1. Qingdao University, Qingdao, China

2. The Affiliated Hospital of Qingdao University, Qingdao, China

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### Summary of the case

<b>Patient (gender, age)</b>	1	Female, 43
<b>Final diagnosis</b>	2	Sigmoid colon cancer with ovarian metastasis
<b>Symptoms</b>	3	Adnexal mass and constipation
<b>Medications</b>	4	None
<b>Clinical procedure</b>	5	An extensive cytoreduction surgery was performed including hysterectomy, bilateral salpingo-oophorectomy, pelvic and abdominal aortic lymph node dissection, larger omentectomy and appendectomy. Sigmoid colon resection and colostomy was performed.
<b>Specialty</b>	6	Gynecology and Obstetrics