



## Original Article

## Difficulty in diagnosis and different prognoses between colorectal cancer with ovarian metastasis and advanced ovarian cancer: An empirical study of different surgical adoptions



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## ABSTRACT

**Objective:** To determine the clinical manifestations and optimal management of female patients with advanced colorectal cancer (CRC) metastasis in ovaries mimicking advanced ovarian malignancy.

**Materials and Methods:** A retrospective medical records review of female patients with primary CRC metastasis to ovaries, which were initially diagnosed as ovarian malignancy, and treated between 2001 and 2013. Clinical presentations, pathologic findings, and treatment outcomes were analyzed.

**Results:** In total, 19 cases were collected in the study through a hospital tumor registry. The mean age of the patients at the time of diagnosis was 45 years (range, 28–63 years). The most common symptoms were abdominal pain or increased abdominal girth (63%). None of them had rectal bleeding. The ratio of cancer antigen-125 to carcinoembryonic antigen was available in 13 out of 19 patients (less than 25 in 76.9%). Barium enema or colonoscopic exam was only performed in 10 outpatients. None of them had a positive finding. All 19 patients went for surgery, all of them had ovarian metastasis but only eight of them had bilateral involvement, and 14 of them had carcinomatosis. All patients went for either optimal cytoreduction surgery or suboptimal cytoreduction surgery. The patients who received optimal cytoreduction surgery had a significant better progression-free and overall survival than those who did not.

**Conclusion:** Clinical manifestations of primary CRC with ovarian metastasis may be confused with advanced ovarian cancer. Negative barium enema or colonoscopic exam cannot rule out the possibility of CRC. For patients with a cancer antigen-125 to carcinoembryonic antigen ratio less than 25, 76% are good reference of CRC metastasis to ovaries. Optimal cytoreduction surgery like that used for treating advanced ovarian cancer had a better prognosis than suboptimal cytoreduction colorectal cancer treatment.

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## Introduction

Ovaries are not an unusual site for cancer metastasis. However, colorectal cancer (CRC) is the most common cancer metastatic to ovaries [1,2]. The incidence of ovarian metastasis was between 4%

and 30.8% of primary CRC found in previous studies [1,2]. Metastatic ovarian tumor can be discovered as an adnexal mass in a patient with a prior history of colon cancer and this metachronous recurrence is more likely to be accurately diagnosed before surgery. It has been reported that 2% of the patients with primary CRC develop metachronous ovarian metastases within 2 years after primary resection [3]. Otherwise, CRC with synchronous ovarian metastasis are often discovered at the time of surgery as advanced ovarian cancer by a gynecologic oncologist. In order to give the right pre-operative diagnosis and appropriate management, we review those

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clinical features, laboratory data, and treatment prognosis difference in order to provide better management.

## Materials and methods

After Institutional Review Board approval, the medical records of patients with primary CRC which was diagnosed initially as ovarian cancer and treated at the study center from 2001 to 2013 were retrospectively reviewed. A total of 2191 female patients with primary CRC were diagnosed in this period. Among them, 91 patients (4.15%) with ovarian metastasis were diagnosed, including 65 patients with synchronous (2.97%) and 26 patients with metachronous (1.19%) ovarian metastasis. Among these 91 patients, 19 patients with ovarian metastasis were diagnosed as primary ovarian cancer before surgery.

The patients' characteristics, symptoms, image studies, preoperative serum carcinoembryonic antigen (CEA) and cancer antigen-125 (CA-125) values, stage of disease, ovarian involvement, and type of surgical treatment were collected for analysis. Optimal cytoreductive surgery was defined as "less than 1 cm of residual disease remaining after surgery." Progression-free survival (PFS) and overall survival (OS) were defined as the interval from the date of diagnosis to the first evidence of progression and disease-specific death, respectively. Progression of the disease was defined as image findings and/or persistent elevation of tumor markers. PFS and OS were estimated using the Kaplan–Meier method and compared using a log-rank test. All statistical analyses were performed using SPSS software for Windows, version 19 (SPSS Inc., Chicago, IL, USA). A *p* value of less than 0.05 was considered to indicate statistical significance.

## Results

Nineteen female patients, who met the previously described conditions, were identified. The mean age of patients was 45 years (range, 28–63 years). The most common presenting symptoms were abdominal pain or increased abdominal girth (63%). Five of them (26.3%) presented as acute abdomen with suspected tumor rupture and emergent exploratory laparotomy was performed under the impression of suspected ovarian cancer. Only three patients had gastrointestinal tract symptoms. Two patients

complained of poor appetite and one had diarrhea. Two patients were pregnant at the time of diagnosis (Table 1). One of them was found to have a pelvic mass at prenatal examination by ultrasonography. Preoperative barium enema or colonoscopic examination was only administered to 10 patients (52%). All of them were negative but one patient was suspected of having possible rectal cancer. This patient received emergent exploratory laparotomy due to acute abdomen. The preoperative image study is shown in Table 2. Pretreatment serum CEA and CA-125 were available for 15 patients and the values were elevated (>5 U/mL) in 14 patients (93.3%) and (>35 U/mL) in 12 patients (80%). The ratio of CA-125/CEA was available for 13 patients, demonstrating a ratio of ≤25 in 10 patients (76.9%; Table 1). Initial surgery was performed by a gynecologic oncologist in all cases. A frozen section was elicited in 16 patients and metastatic tumors were suspected in only seven patients (43.8%). The report from the frozen sections was as follows: colon cancer: one case; appendiceal mucinous adenocarcinoma: one case; suspected metastatic adenocarcinoma: five cases; endometrioid adenocarcinoma: four cases; mucinous adenocarcinoma: two cases; adenocarcinoma: two cases; and borderline tumor: one case (Table 3).

During surgery, nine had optimal cytoreduction (residual tumor ≤1 cm in maximal diameter) and the other 10 patients had sub-optimal surgery. After a complete pathologic study, the location of primary cancer in this study was as follows: rectum: six cases, sigmoid colon: six cases; ascending colon: two cases; hepatic flexure colon: one case; descending colon: one case; cecum: one case; and appendix: two cases (Table 3). At the time of surgery, five patients had isolated ovarian metastasis. Among these five patients, three had pelvic lymph node metastasis. For the other 14 patients, 13 had carcinomatosis and one had pulmonary metastasis. These patients all underwent salpingoophorectomy with or without hysterectomy, debulking of metastatic tumors, and colorectal surgery according to the operative finding (Table 3).

Postoperative chemotherapy was offered to all patients, most commonly with a combination of 5-fluorouracil and leukovorin monthly for 6 months.

All patients had ovarian involvement but five patients had confined metastasis to the ovaries. They had a median overall survival time of 28 months (range, 15–51 months) compared with 16 months (range, 3–58 months).

**Table 1**  
Clinical findings of patients with ovarian metastasis. CA-125 = cancer antigen-125; CEA = carcinoembryonic antigen.

No.	Age (y)	Gravida	Para	CEA	CA-125	CA-125/CEA	Symptom	Special condition
1	57	5	4	518	268	0.51	Abdominal distention Diarrhea	
2	44	6	3	5.84	52.2	8.9	Abdominal pain	Acute abdomen
3	36	2	1	15.3	785	51	Pelvic mass during prenatal exam	Pregnancy 22 wk
4	39	3	2	—	—	—	Abdominal pain	Acute abdomen
5	33	0	0	—	173	—	Poor appetite Body weight loss	
6	45	2	2	12.3	31	2.52	Abdominal pain	
7	31	2	2	24	302	12.5	Abdominal distension	
8	41	1	0	16.7	15.2	0.91	Vaginal bleeding	Acute abdomen
9	34	?	?	29.6	—	—	Abdominal pain	Acute abdomen
10	55	4	3	10.2	38.29	3.74	Abdominal pain	
11	63	6	3	164	190	1.15	Abdominal distension Poor appetite	
12	36	4	0	—	146.2	—	Abdominal pain	Pregnancy 35 wk
13	51	2	2	15.4	—	—	Abdominal pain	Acute abdomen
14	45	3	2	—	—	—	Abdominal fullness	
15	59	5	5	11.9	499.5	42	Abdominal pain	
16	54	6	4	31.4	105.7	3.3	Abdominal fullness	
17	28	0	0	4.43	626.7	141.4	Abdominal mass	
18	55	7	4	17.1	9.6	0.56	Abdominal mass	
19	57	2	2	64.9	578.7	8.91	Abdominal pain	

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