



An unusual presentation of solitary ovarian metastasis from colorectal cancer in an elderly woman: a case report

Fei Tang¹, Limei Ji¹, Kaiqiang Hu², Liujuan Shao¹, Min Hu¹

¹Gynaecology Department, Jinhua Municipal Central Hospital, Jinhua, China; ²Gynaecology Department, Jinhua Maternal & Child Health Care Hospital, Jinhua, China

Contributions: (I) Conception and design: F Tang, L Ji; (II) Administrative support: F Tang; (III) Provision of study materials or patients: K Hu; (IV) Collection and assembly of data: L Shao, M Hu; (V) Data analysis and interpretation: M Hu, F Tang; (VI) Manuscript writing: All authors; (VII) Final approval of manuscript: All authors.

Correspondence to: Min Hu, MD. Gynaecology Department, Jinhua Municipal Central Hospital, No. 365, Renmin East Road, Wucheng District, Jinhua 321000, China. Email: dannis1995@163.com.

Background: There have been cases of colorectal cancer (CRC) metastasizing into the ovary. This study reports a case involving solitary ovarian metastasis (OM) from CRC, which is very rare in the absence of other pelvic and peritoneal metastases. This atypical clinical presentation added to the complexity of the diagnosis.

Case Description: We report a case of solitary OM-CRC in a 48-year-old woman. The patient underwent CRC surgery and refused follow-up after three rounds of chemotherapy. Approximately 14 months later, the patient presented with vaginal bleeding for 2 months. The magnetic resonance imaging (MRI) showed a huge solid cystic mass in the right adnexa. Intraoperatively, the right ovary was found to be enlarged and smooth without adhesions. By careful examination of the abdominal cavity, no metastatic lesions were found in the left ovary and uterus, and no seedings were found in the rest of the pelvis and abdomen. After removal of the uterus and bilateral adnexa, the histologic examination revealed metastatic adenocarcinoma of the right ovary with a considered rectal carcinoma of origin. Positive staining for multiple tumor-associated markers, which further established the primary nature of CRC. These findings support a possible diagnosis of primary CRC and ovarian metastases. The patient recovered well after the operation and no recurrence or metastasis was seen 18 months after the operation.

Conclusions: Solitary ovarian metastases from CRC can be better managed and treated by increasing clinicians' vigilance for this rare condition. This helps to improve the patient's prognosis and quality of life.

Keywords: Colorectal cancer (CRC); solitary ovarian metastasis (solitary OM); ovarian metastasis from colorectal cancer (OM-CRC); treatment; case report

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Introduction

Colorectal cancer (CRC) is the second leading cause of cancer-related death worldwide, and caused an estimated one million deaths in 2020 (1-3). Nearly 15–30% of CRC patients experience metastasis, and 20–50% of initial restricted disease cases evolve into metastasis (4-6). The most prevalent site of metastasis is the liver, followed by the lung, peritoneum, and distant lymph nodes (5,7,8).

Women with CRC face the risk of not only developing metastatic disease in the ovaries but also the possibility of a primary ovarian cancer (9). Previous research has demonstrated a correlation between CRC and the emergence of primary ovarian malignancies (10). The occurrence of ovarian metastases from CRC (OM-CRC) has now been widely reported, with a prevalence ranging from 2.1% to 13.6% in women following surgery for CRC (11).

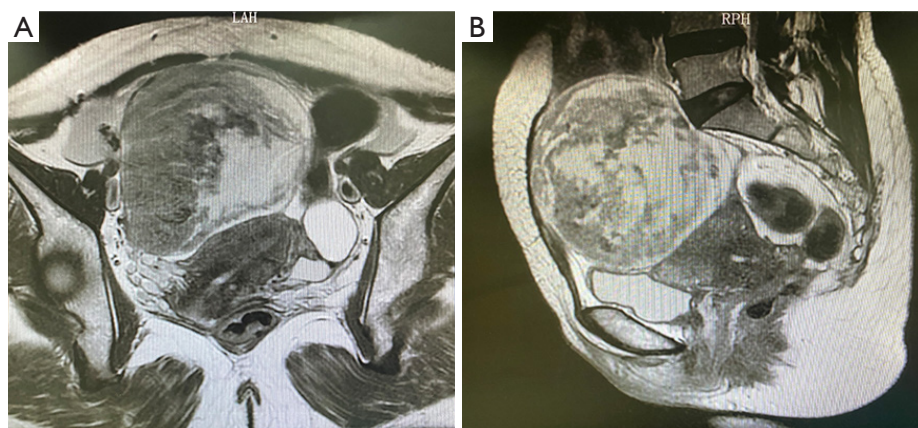


Figure 1 MRI on November 2, 2022 showed a huge solid cystic mass (13 cm × 12 cm × 12 cm) in the right adnexa. LAH, left anterior hip; RPH, right posterior hip; MRI, magnetic resonance imaging.

In addition, OM-CRC often occurs in perimenopausal women aged over 50 years, and has atypical manifestations, such as abdominal pain and distension, decreased body mass, and raised abdominal girth (12,13). We report here a case of isolated OM-CRC without other pelvic or peritoneal metastases. This is very rare in clinical practice, and this solitary implies that the cancer has not yet spread widely. The importance of this phenomenon lies in the need for colorectal surgeons and obstetricians and gynecologists to be aware of this possibility for timely diagnosis and treatment. Therefore, early recognition and aggressive surgical treatment may help to completely remove the tumor, which in turn significantly improves the patient's prognosis and quality of life. We present this article in

accordance with the CARE reporting checklist (available at <https://jgo.amegroups.com/article/view/10.21037/jgo-24-411/rc>).

Case presentation

As the timeline shows (Figure S1), we followed the case for a total of 16 months. A 48-year-old woman underwent elective surgery for CRC (the pathological result of which is unknown) at a local hospital, underwent three rounds of Folfox chemotherapy after surgery. However, the patient's subsequent need to return to work in a timely manner led to her refusal of follow-up treatment. Fourteen months after surgery, the patient began to experience vaginal bleeding that lasted for 2 months. Subsequently, after the patient signed an informed consent form, it was discovered that the results of imaging and surgical exploration showed a large solid cystic mass in the patient's right ovary, and it was determined that there was a high probability of OM-CRC.

The patient presented to our Department of Obstetrics and Gynecology after the onset of symptoms: the magnetic resonance imaging (MRI) showed a huge solid cystic mass (13 cm × 12 cm × 12 cm) in the right adnexa, and also confirmed the wall of the mass was thin (Figure 1); The abdominal computed tomography (CT) scan also showed no seedings and ascites in the pelvis and abdominal cavity. The laboratory tests showed mild anemia (hemoglobin: 9.2 g/dL) and elevated tumor markers [carcinoembryonic antigen (CEA): 15 ng/mL, carbohydrate antigen 19-9 (CA 19-9): 135 IU/mL, and cancer antigen 125 (CA 125): 422.5 IU/mL]; We observed intraoperatively that the

Highlight box

Key findings

- Colorectal cancer (CRC) presents with solitary ovarian metastasis (OM) from CRC in the absence of other pelvic or peritoneal metastases.

What is known, and what is new?

- CRC is usually prone to multiple metastases and accompanied by an unfavorable prognosis.
- Our new finding is that the patient's postoperative pathologic diagnosis was solitary OM-CRC.

What is the implication, and what should change now?

- Due to the limited number of clinical cases, OM-CRC remains an incompletely understood complication in patients. The present case description aims to extend physicians' understanding of this disease to improve its identification and therapy.

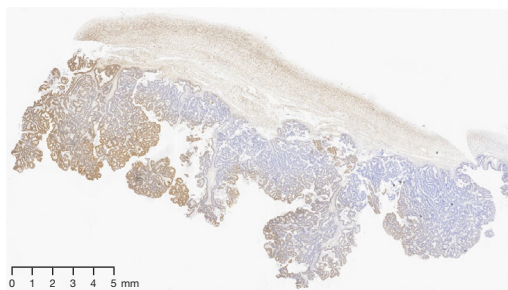


Figure 2 Pathologic findings during surgery were shown using hematoxylin-eosin staining and confirmed that the patient had metastatic adenocarcinoma of the right ovary.

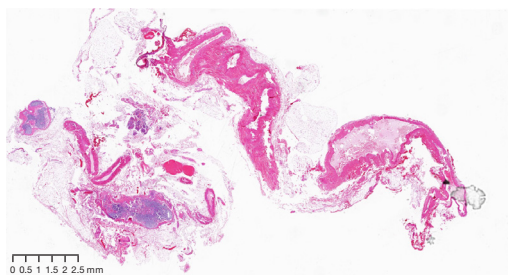


Figure 3 Histopathology report based on hematoxylin-eosin staining method showed CRC as the origin and the right ovary as the site of metastasis. CRC, colorectal cancer.

right ovary was enlarged (13 cm × 12 cm × 12 cm) and its surface was smooth and free of adhesions. Significantly, after exploring the abdominal cavity meticulously, no metastatic lesion was observed in the left ovary and uterus, nor was any form of seeding observed in the other pelvic cavity and abdominal cavity. For this reason, we excised the patient's uterus and bilateral appendages in the usual treatment pattern; As shown in *Figure 2*, the pathologic findings during surgery showed metastatic adenocarcinoma of the right ovary, and consequently, a possible rectal origin was considered. The postoperative course also developed well and the patient was discharged from the hospital. Notably, we confirmed the origin of the case as CRC based on a histopathology report, with the right ovary as the site of metastasis (*Figure 3*). Finally, the patient's intraoperative tissue samples were stained by immunohistochemistry and revealed a pattern of expression of some markers: cytokeratin 7 (CK7⁻, *Figure 4A*), cytokeratin 20 (CK20⁺, *Figure 4B*), caudal type homeobox 2 (CDX2⁺, *Figure 4C*), and marker of proliferation (Ki-67⁺, 30%) (*Figure 4D*). This supported the diagnosis of OM-CRC and further confirmed the primary nature of CRC.

Following surgery, the patient experienced a successful recovery, leading to the decision for adjuvant chemotherapy

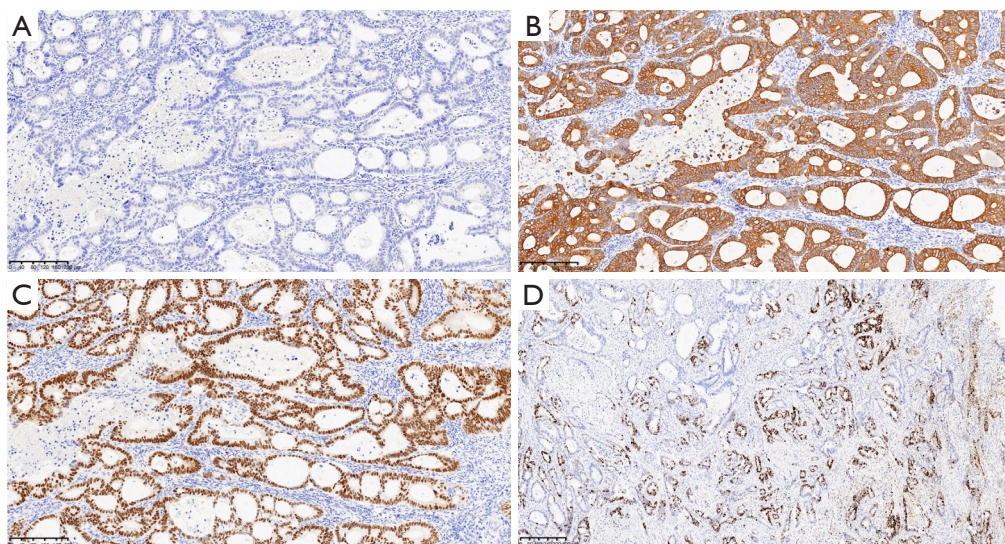


Figure 4 Hematoxylin-eosin staining immunohistochemistry reveals extra-ovarian sources in patients. (A-D) Staining markers for CK7⁻, CK20⁺ (10×), CDX2⁺ (10×), and Ki-67⁺ (30%) (4×) of tissue samples are shown.

in a multidisciplinary consultation. Treatment consisted of 12 cycles of oxaliplatin, 5-fluorouracil (5-FU), and folinic acid. To date, there have been no signs of relapse or metastasis 18 months post-operation. All procedures performed in this study were in accordance with the ethical standards of the national research committees and with the Declaration of Helsinki (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

Discussion

Ovaries are a relatively common site of secondary tumors (14,15). Kubeček *et al.* reported that OM accounts for about 10–25% of all ovarian malignancies, about 39% of which stem from gastrointestinal tumor (16). The tumors that commonly causes OMs include breast, colorectal, endometrial, stomach, and appendix cancer (17). Thus, it is of utmost importance to determine the origin of the cancer, as treatment plans differ substantially based on the origin.

Based on the patient's previous history of CRC, histopathologic features, and immunohistochemical results in this case, a diagnosis of extra-ovarian metastatic carcinoma stemming from CRC was made. After surgery to excise the uterus and bilateral appendages, we further explored the pathogenesis of the ovarian cyst. Combined, the pathological results and histopathological report confirmed that the diagnosis of OM-CRC. CK7⁻, CK20⁺, CDX2⁺, and Ki-67⁺ are the representative molecular pathological characteristics of OM-CRC (18–21). Further, they are also helpful biomarkers in evaluating the prognosis of OM-CRC patients.

The metastasis mechanism of OM-CRC is controversial, and mainly includes the following four proposed pathways: implant metastasis, hematogenous spread, lymphatic spread, and contact dissemination (13). Several authors are of the view that blood transmission is the most likely pathway by which tumor cells reach the ovaries (22,23). The ovaries of premenopausal women have higher blood circulation, making tumor cells conducive to hematogenous metastasis. Metastases are common bilaterally, and about 50% of patients with OM have peritoneal metastasis at the same time (24). In addition, other cases have been noted of patients undergoing ovarian metastases in order to preserve fertility in women with CRC, which can also contribute to recurrence of the metastasized ovaries (25). Therefore,

there is a significant focus on the prevention of OM when possible.

It is generally accepted that the degree of tumor metastasis is a vital indicator influencing the prognosis of patients with OM-CRC (22,26). If metastasis is restricted to the ovaries or pelvic cavity, the prognosis may be relatively favorable, and it is easier to realize entire cell reduction surgery. However, when metastasis spreads beyond the pelvic cavity, especially to the peritoneum, patient prognosis is usually unfavorable (23,27). To the best of our knowledge, this patient presented with solitary OM of adenocarcinoma in the right ovary, and no other organ was involved, which is rare. The patient has a good prognosis, and treatment and follow-up are ongoing.

Conclusions

Due to the limited number of clinical cases, OM-CRC remains an incompletely understood complication in patients. The present case description sought to extend physicians' understanding of this disease to improve identification and therapy.

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Footnote

Reporting Checklist: The authors have completed the CARE reporting checklist. Available at <https://jgo.amegroups.com/article/view/10.21037/jgo-24-411/rc>

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Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <https://jgo.amegroups.com/article/view/10.21037/jgo-24-411/coif>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the national research committees and with

the Declaration of Helsinki (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

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References

- Hong P, Nie L, Jiang Z. PLOD3 Promotes Tumor Progression and is Related to Poor Prognosis in Colorectal Cancer via SOX4/Wnt/ β -Catenin Signaling Pathway. *Journal of Biological Regulators and Homeostatic Agents* 2023;37:1187-200.
- Sung H, Ferlay J, Siegel RL, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA Cancer J Clin* 2021;71:209-49.
- Gupta K, Elfiky A, Patel E. Clinical Evidence for the Benefits of Neoadjuvant Chemotherapy and Immunotherapy in Colon Cancer: A Concise Review. *Discov Med* 2023;35:928-35.
- Ma S, Zhu X, Xin C, et al. RCN3 Expression Indicates Prognosis in Colorectal Cancers. *Oncologie* 2022;24:823-33.
- Cervantes A, Adam R, Roselló S, et al. Metastatic colorectal cancer: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up. *Ann Oncol* 2023;34:10-32.
- Kawakami T, Yamazaki K. The role of biomarker in later-line treatment for metastatic colorectal cancer. *J Gastrointest Oncol* 2023;14:1178-80.
- Lin L, Zeng X, Liang S, et al. Construction of a co-expression network and prediction of metastasis markers in colorectal cancer patients with liver metastasis. *J Gastrointest Oncol* 2022;13:2426-38.
- Wang T, Tang L, Ouyang B, et al. Clinical significance and changes to the immune microenvironment of colorectal cancer patients with liver metastasis. *J Gastrointest Oncol* 2023;14:206-12.
- Shin DW, Choi YJ, Kim HS, et al. Secondary Breast, Ovarian, and Uterine Cancers After Colorectal Cancer: A Nationwide Population-Based Cohort Study in Korea. *Dis Colon Rectum* 2018;61:1250-7.
- van der Meer R, de Hingh IHJT, Coppus SFPJ, et al. Primary ovarian cancer after colorectal cancer: a Dutch nationwide population-based study. *Int J Colorectal Dis* 2022;37:1593-9.
- Hamasaki S, Fukunaga Y, Nagayama S, et al. Decision-making in postoperative chemotherapy for ovarian metastasis from colorectal cancer: a retrospective single-center study. *World J Surg Oncol* 2022;20:28.
- Kammar PS, Engineer R, Patil PS, et al. Ovarian Metastases of Colorectal Origin: Treatment Patterns and Factors Affecting Outcomes. *Indian J Surg Oncol* 2017;8:519-26.
- Al-Busaidi IS, Bailey T, Dobbs B, et al. Complete resection of colorectal cancer with ovarian metastases combined with chemotherapy is associated with improved survival. *ANZ J Surg* 2019;89:1091-6.
- Mazidimoradi A, Momenimovahed Z, Khani Y, et al. Global patterns and temporal trends in ovarian cancer morbidity, mortality, and burden from 1990 to 2019. *Oncologie* 2023;25:641-59.
- Tang Z, Xin D, Liu W, et al. A Comparative Study of the Clinical Effects of Targeted Treatments with Nilaparib and Olaparib on Recurrent Ovarian Cancer. *Journal of Biological Regulators and Homeostatic Agents* 2023;37:1679-84.
- Kubeček O, Laco J, Špaček J, et al. The pathogenesis, diagnosis, and management of metastatic tumors to the ovary: a comprehensive review. *Clin Exp Metastasis* 2017;34:295-307.
- de Waal YR, Thomas CM, Oei AL, et al. Secondary ovarian malignancies: frequency, origin, and characteristics. *Int J Gynecol Cancer* 2009;19:1160-5.
- Byun JH, Ahn JB, Kim SY, et al. The impact of primary tumor location in patients with metastatic colorectal cancer: a Korean Cancer Study Group CO12-04 study. *Korean J Intern Med* 2019;34:165-77.
- Li J, Liu Y, Du K, et al. Endometriosis in para-aortic lymph node resembling a malignancy: a case report and literature review. *BMC Womens Health* 2022;22:101.
- Aldaoud N, Erashdi M, AlKhatib S, et al. The utility of PAX8 and SATB2 immunohistochemical stains in distinguishing ovarian mucinous neoplasms from colonic and appendiceal mucinous neoplasm. *BMC Res Notes* 2019;12:770.

21. Hrudka J, Fišerová H, Jelínková K, et al. Cytokeratin 7 expression as a predictor of an unfavorable prognosis in colorectal carcinoma. *Sci Rep* 2021;11:17863.
22. Xu KY, Gao H, Lian ZJ, et al. Clinical analysis of Krukenberg tumours in patients with colorectal cancer—a review of 57 cases. *World J Surg Oncol* 2017;15:25.
23. Fujiwara A, Noura S, Ohue M, et al. Significance of the resection of ovarian metastasis from colorectal cancers. *J Surg Oncol* 2010;102:582-7.
24. Kowalczyk KA, Wysocki WM. On the border of medical specialties: ovarian metastasis from colorectal cancer. *Ginekol Pol* 2021. [Epub ahead of print]. doi: 10.5603/GP.a2021.0162.
25. Bodofsky S, Hong S, Botros GN, et al. Ovarian transposition and metachronous ovarian metastasis in a premenopausal colorectal carcinoma patient: a case report. *J Gastrointest Oncol* 2021;12:3141-7.
26. Zhou F, Ding J. Prognosis and factors affecting colorectal cancer with ovarian metastasis. *Updates Surg* 2021;73:391-8.
27. Tan KL, Tan WS, Lim JF, et al. Krukenberg tumors of colorectal origin: a dismal outcome—experience of a tertiary center. *Int J Colorectal Dis* 2010;25:233-8.

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