Postoperation of cervical cancer with intestine metastasis: a case report and literature review

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Abstract

Background: Cervical cancer can infiltrate locally and directly spread to adjacent organs including the vagina, peritoneum, urinary bladder, ureters, rectum, and paracervical tissue, but the intestine metastasis from cervical cancer is extremely rare, which can easily be misdiagnosed.

Case presentation: Here, we report a case about a 45-year-old postoperative cervical cancer patient with metastases to small intestine and sigmoid colon who presented abdominal distention and dull pain due to intestinal obstruction. The patient underwent exploratory laparotomy, and two intestinal segments including the tumors were resected. The postoperative pathological diagnosis illustrated sigmoid colon and terminal ileum metastatic squamous cell carcinoma.

Conclusions: This case demonstrates that intestine metastasis must be considered in the differential diagnosis of acute abdomen in patients with cervical cancer even at an early tumor stage.

Keywords: Intestinal obstruction, Cervical cancer, Metastasis, Ileum, Sigmoid colon

Background

Cervical cancer is a worldwide disease which ranks as the second most common malignant disease and also the third most common cause of cancer death among women [1]. More than 90 % of cases are attributed to human papillomavirus (HPV) infection [2]. Most cases occur in developing countries, as no effective screening procedures are available [3]. Over the past decades, the survival of patients with cervical carcinoma has significantly improved attributing to early screening and the rapid development of concurrent cisplatin-based chemotherapy and radiotherapy [4, 5]. In spite of the prolonged survival, the patients are also at an increased risk of recurrence and metastases, which are the main causes of death. The primary routes in cervical carcinoma metastases are direct local extension and lymphatic dissemination, while hematogenous dissemination occurs infrequently, which usually occurs with advanced tumor or uncommon pathologic types, such as adenosquamous or neuroendocrine tumors. In general, cervical cancer can spread to adjacent organs including the vagina, peritoneum, urinary bladder, ureters, rectum, and paracervical tissue. Meanwhile, Common distant metastatic sites include the lungs, bones, and liver [6], but cervical cancer metastases to the small intestine and sigmoid colon are rare. Here, we present the first reported case of a cervical cancer patient with simultaneous metastases to the small intestine and sigmoid colon, based on our knowledge.

Case presentation

A 45-year-old woman was admitted to our department with a 5-day history of abdominal distention and dull pain, especially at the upper umbilical region, and vomiting of gastric content.
passage of stools or flatus. She had an erect abdominal plain radiograph which showed intestinal obstruction in a local hospital previously.

A careful medical history was taken on admission. Three years ago, she suffered from cervical cancer and had a radical hysterectomy with adnexectomy. The postoperative pathological diagnosis is cervical moderately differentiated squamous cell carcinoma with its maximum diameter to 9 mm and infiltration depth to 2 mm. No lymph node metastasis was found in the bilateral pelvic and common iliac lymph node. It was diagnosed with International Federation of Gynecology and Obstetrics (FIGO) stage IB1 cervical cancer. After the operation, she had a 3- to 6-month follow-up but did not have any radiotherapy or chemotherapy.

On physical examination, her vital signs were stable. There were no lesions in the oropharynx and nasopharynx. She had abdominal light distension and a loud gurgling sound. No abdominal tenderness and rebound tenderness were found. Rectal examination and bimanual vaginal examination had no obvious abnormalities including lump and bleeding. Analysis of blood tests was unremarkable except the elevating of squamous cell carcinoma antigen (SCCA) and CA125. An erect abdominal plain radiograph was rechecked, showing the upper left intestine expanding and fluid levels with a stepladder pattern. Abdominal contrasted computed tomography (CT) showed intestinal obstruction with a thickened bowel wall in the terminal ileum (solid yellow arrow in a) and upper sigmoid colon (feint yellow arrow in b). Abdominal magnetic resonance (MR) revealed a thickened bowel wall in the terminal ileum (solid yellow arrow in c) and upper sigmoid colon (feint yellow arrow in d). MR imaging also showed an unremarkable uterus stump (solid yellow arrow in e).

**Fig. 1** Abdominal computed tomography (CT) scan. CT scan revealed lower intestinal obstruction with a thickened bowel wall in the terminal ileum (solid yellow arrow in a) and upper sigmoid colon (feint yellow arrow in b). Abdominal magnetic resonance (MR) revealed a thickened bowel wall in the terminal ileum (solid yellow arrow in c) and upper sigmoid colon (feint yellow arrow in d). MR imaging also showed an unremarkable uterus stump (solid yellow arrow in e).
inflammation (Fig. 2). Chest CT and X-ray had no obvious abnormality.

The patient was fasted and received passive gastric decompression along with total parenteral nutrition on admission. Abdominal distention eased on the first day. In consideration of the patient’s condition and the imaging examination and colonoscopy results, exploratory laparotomy was performed. Widespread intestinal adhesion and two firm tumors (2*2 cm and 3*2 cm separately) with a local thickened intestine wall at the end of the ileum and upper sigmoid colon were noted. She underwent segmental intestine resection and had end-to-end anastomosis. The postoperative pathological diagnosis showed squamous cell carcinoma (Fig. 3). After the operation, up until now (4 months), the patient has been treated with four cycles of a docetaxel-cisplatin combination chemotherapy regimen (day 1, 75 mg/m² docetaxel; days 1–3, 25 mg/m² cisplatin, per 21 days).

Discussion
In the present case, the patient underwent segmental intestine resection, and the pathological result indicated squamous cell carcinoma. Excluding possible primary lesions like oropharynx, nasopharynx, lung, and esophagus cancer, with the characteristics of outside-to-inside invasion from the pathology result, indicating the primary lesion in the abdominal or pelvic cavity, cervical cancer
with small intestine and sigmoid colon metastases was diagnosed.

After precise calculation, the 10-year incidence of distant metastases was 3 % for stage IA, 16 % for stage IB, 31 % for stage IIA, 26 % for stage IIB, 39 % for stage III, and 75 % for stage IVA in cervical cancer patients [7]. The most frequently observed metastatic sites were the lungs, bones, liver, supraclavicular nodes, and para-aortic nodes etc. (Table 1). Unusual metastases can be seen in the skin and soft tissues [8], breast [9], pericardium [10], umbilical region [11], labia and introitus area [12], thyroid gland [13], oral cavity [14], and skeletal muscle [15]. Cervical cancer metastatic to the intestine is a rare occurrence. Table 2 provides a comprehensive review of the published cases of intestine metastases from cervical cancer in the English literature dating back to 1976. Things did not go the way we thought because not only do cervical cancer metastases to the intestine occur at an advanced tumor stage, but they also occur at an early stage, even at stage IA. The case presented here is the first report of cervical cancer with simultaneous small intestine and sigmoid colon metastases.

Table 1 The main metastatic sites of cervical cancer

| metastatic sites | Percent |
|------------------|---------|
| Nodes            | 8.6     |
| Supraclavicular  | 3.0     |
| Para-aortic      | 3.0     |
| Inguinal         | 2.3     |
| Mediastinal      | 1.7     |
| Iliac            | 1.3     |
| Cervical         | 0.8     |
| Axillary         | 0.5     |
| Other            | 1.8     |
| Lung             | 5.7     |
| Bone             | 3.8     |
| Peritoneum       | 0.6     |
| Liver            | 2.2     |
| Gastrointestinal tract | 8.0 |
| Stomach [17]    | <2.0    |
| Ileum [27]       | 1.2–3.2 |
| Spleen [28]      | 1.6–30.0|
| Ovary [29]       | 1.3–6.3 |
| Heart [30]       | 1.2     |
| Brain [31]       | 0.4–1.2 |
| Skin and subcutaneous tissue [32] | 0.1–2.0 |

*Modified and updated from [26]

The intestine metastases usually occur through the lymphatics to the bowel serosa and less commonly via intraperitoneal dissemination, direct spread, and hematogenous spread [16–18]. As for the present case, another explanation is surgical factor, for tumor dissemination may be caused by reckless operation. Although the possible metastatic route is distinct, the rarity of intestine metastases is still unclear now [19]. Sigmoid colon metastases are rarely seen and may be because of the relatively short intestinal segment. While small intestine accounted for a large space in the enterocelia. So, the low incidence rates of small intestine metastases are notable, and several associated mechanisms have been raised as follows [20–24]: (1) the intestine has abundant immune protection with numerous lymphoid cells and large secretions of IgA in the mucosa and submucosa of the intestine; (2) a rapid refresh rate of small intestinal mucosa may inhibit the tumorigenesis; (3) liquefied chyme may cause less mucosal irritation, then reduces mechanical injury and inflammation [19].

In general, a small intestine and sigmoid colon metastatic tumor indicates a poor prognosis. Bleeding and obstruction, as well as non-specific symptoms such as abdominal discomfort, gas distension, and vomiting, are common clinical features. Some reasons may cause a misdiagnosis and delay the treatment: (1) non-specific gastrointestinal symptoms may easily be seen as a symptom of tumor progression or adverse drug reaction; (2) lack of awareness of metastatic tumor; (3) ordinary CT scanners cannot find minimal lesions, especially in the small intestine. Once intestine metastasis is suspected, contrast-enhanced CT, endoscope, and even exploratory laparotomy should be operated. Typical features of intestinal metastases include intestinal wall thickening and stiffness, submucosal spread, and ulcers. Typically, metastases are submucosal or subserosal, which make the primary and secondary tumors easily distinguishable; besides, cytokeratin immunohistochemistry may help to differentiate the two. Metastatic cervical carcinoma is usually positive for CK7, epithelial membrane antigen, and CK5/6 and negative for CK20 [25]. The treatment for a small intestine and sigmoid colon metastatic tumor from cervical squamous cell carcinoma remains debatable because of the lack of enough cases to compare the efficacy of different treatments. Laparotomy seems to be the common choice if the patients are physically capable (Table 2). Chemotherapy could also be employed as a palliative treatment.

Conclusions
This report presents a rare case of small intestine and sigmoid colon metastases of cervical cancer that caused...
| No. | Author [Ref.] | Year | Age | Pathologic type | Stage of SCCA of cervix at diagnosis | Previous treatment | Interval time | Symptom | Metastasis sites | Confirmation of diagnosis | Treatment | Outcome |
|-----|---------------|------|-----|-----------------|-------------------------------------|-------------------|--------------|---------|-----------------|----------------------------|-----------|---------|
| 1   | Bradley Watson [27] | 1976 | 47  | Adenosquamous carcinoma | Stage IV | None | Synchronous | Intermittent central abdominal pain associated with vomiting | Small intestine | Laparotomy | Segmentary intestinal resection | NA |
| 2   | Gurian, L. [17] | 1981 | 64  | Squamous cell carcinoma | Stage IIIB | None | Synchronous | Occult bleeding | Duodenum | Endoscopy | Refused surgical intervention | Death |
| 3   | Mathur, S. K. [18] | 1984 | 35  | Squamous cell carcinoma | Stage IV | None | Synchronous | Central abdominal angina, persistent vomiting and constipation | Terminal ileum | Laparotomy | Right hemicolecotomy | Recovery |
| 4   | Christopherson, W. [33] | 1985 | 42  | Squamous cell carcinoma | Stage IIIB | NA | 2 years | Intermittent nausea and vomiting, upper abdominal pain | Ileum, transverse colon | Laparotomy | Segmentary intestinal resection | Recovery |
| 5   | Hulecki, S. J. [34] | 1985 | 48  | Squamous cell carcinoma | Stage IB | NA | 7 years | Gross hematuria from the conduit | Ileum | Endoscopy | Laparotomy | Recovery |
| 6   | Misonou, J. [16] | 1988 | 69  | Squamous cell carcinoma | Stage IA | Hysterectomy | 13 years | Sudden onset of pan-peritonitis | Small intestine | NA | NA | NA |
| 7   | Singla, M. [35] | 2011 | 48  | Squamous cell carcinoma | NA | Radiation therapy | 2 years | Right hypochondriac pain | Hepatic flexure of colon | Laparotomy | Right extended hemicolecotomy | Recovery for 2 years |
| 8   | Kanthan, R. [19] | 2011 | 49  | Squamous cell carcinoma | Stage IIA | Chemotherapy and radiation treatment | 2 years | Upper-gastrointestinal bleeding | Duodenum esophagogastro duodenoscopy | None | Died of multiple organ failure |
| 9   | Lee T.H. [36] | 2011 | 50  | Squamous cell carcinoma | Stage IIA | Hysterectomy with systemic chemotherapy | 2 years | Epigastric pain | Ampulla of vater | Endoscopy | Chemotherapy | NA |
| 10  | Raphael, J. C. [37] | 2011 | 57  | Squamous cell carcinoma | Stage IV | None | Synchronous | Persistent epigastric pain and vomiting | Pyloroduodenal region | Endoscopy | Chemotherapy | NA |
| 11  | Sugimoto, T. [38] | 2013 | 84  | Adenocarcinoma | Stage III | Radiation therapy | 3 months | Epigastric pain | Ileum | Laparotomy | The necrotic part of the ileum resection | 4 months survival |
| 12  | Joshi, S. R. [39] | 2013 | 50  | Squamous cell carcinoma | Stage II | Wertheim's hysterectomy | 5 months | Abdominal pain, vomiting and intermittent fever | Ileocaecal region | Laparotomy | Segmentary intestinal resection | NA |
| 13  | Datta, S. [40] | 2013 | 55  | Squamous cell carcinoma | Stage IIIB | Chemoradiation | 3.5 years | Abdominal pain, vomiting, constipation | Ileocaecal region | Laparotomy | Right hemicolecotomy | NA |
| 14  | Barlin, J. N. [41] | 2013 | 37  | Adenosquamous carcinoma | Stage IB | Radical hysterectomy | 1.5 years | Hematochezia | Sigmoid colon | Colonoscopy | Rectosigmoid resection | Recovery |
| 15  | Iliescu, L. [42] | 2014 | 70  | Squamous cell carcinoma | Stage IIA1 | Radiation therapy followed by curative surgery | 2 years | Intermittent subocclusive symptoms, fatigue, nausea | Terminal ileum | Laparotomy | Segmentary intestinal resection | NA |
| No. | Author(s) | Year | No. | Tumor Type       | Stage | Treatment          | Symptoms                                           | Location       | Procedure          | Recovery            |
|-----|-----------|------|-----|------------------|-------|--------------------|---------------------------------------------------|----------------|--------------------|---------------------|
| 16  | Debasish, B. [43] | 2014 | 43  | Squamous cell carcinoma | NA    | Total abdominal hysterectomy | 8 months Symptoms of chronic intestinal obstruction | Terminal ileum | Laparotomy          | Right hemicolectomy  |
| 17  | Nagarekha, K. [44] | 2014 | 50  | Squamous cell carcinoma | NA    | Hysterectomy with bilateral salpingo-oophorectomy | 3 months Vomiting and abdominal pain               | Jejunum        | Laparotomy          | Segmentary intestinal resection |
| 18  | Hui Qiu [45] | 2015 | 46  | Squamous cell carcinoma | Stage IIB | Chemoradiotherapy | 4 years Acute abdominal pain                       | Ileocaecal region | Laparotomy          | Segmentary intestinal resection | Recovery for 2 years |

NA: not available from original literature.
obstruction. Clinicians should be aware that intestine metastasis must be considered in the differential diagnosis of acute abdomen in patients with cervical cancer even at an early tumor stage.

Consent
Written informed consent was obtained from the patient for publication of this Case report and any accompanying images. This report adhered to the tenets of the Declaration of Helsinki.

Abbreviations
CT: computed tomography; FIGO: International Federation of Gynecology and Obstetrics; MRI: magnetic resonance imaging; SCCA: squamous cell carcinoma antigen.

Competing interests
The authors declare that they have no competing interests.

Authors’ contributions
XY and ZW contributed equally to the manuscript. JH is the corresponding author of the manuscript. XY participated in the design of the study. ZW reviewed the literature. ZZ collected the patient’s data and provided the figures. XY, ZW, YL were involved in drafting the manuscript. JH revised the manuscript. All authors read and approved the final manuscript.

Acknowledgements
The authors would like to thank the members of the group for useful discussions and Dr. Dang Wu for language assistance.

The work was supported by grants from the Zhejiang Provincial Natural Science Foundation of China (No. Y15H160095). Written informed consent was obtained from the patient for publication of the study.

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Received: 8 September 2015 Accepted: 30 December 2015
Published online: 06 January 2016

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