Abstract  This report describes the case of a 34-year-old premenopausal woman in whom bilateral huge ovarian metastases were found immediately after initial surgery for sigmoid colon cancer. Both ovaries had been intact at the time of sigmoidectomy, but 2 months later, she complained of persistent vaginal bleeding, and large bilateral metastases were detected in both ovaries. Oophorectomy with intraperitoneal chemotherapy proved ineffective and the patient died 3 months later, after a second operation, from peritoneal dissemination. This case report serves to demonstrate the importance of searching for synchronous or nonsynchronous metastases to the ovaries after surgery for colon cancer in young women. Consideration should also be given to the feasibility of performing prophylactic oophorectomy or administering intensive chemotherapy in association with colon resections for carcinoma for premenopausal women because of the ineffectiveness of these modalities as treatment for metastatic disease.

Key words  Colon cancer · Ovarian metastasis · Oophorectomy

Introduction

The ovaries are not an uncommon site for metastatic carcinomas arising from the gastrointestinal tract, breast, and genitourinary tract,1,2 and frequently, the secondary disease is more clinically significant than the primary tumor. Furthermore, these metastatic ovarian tumors may be difficult to differentiate from a primary ovarian neoplasm. The colon is the most frequent site of primary tumors that may metastasize to the ovary, and the following case report illustrates the difficulties involved in treating ovarian metastasis from colorectal cancer in a young premenopausal woman, and the associated poor prognosis.

Case Report

A 34-year-old woman was admitted to our hospital for investigation of anal bleeding. A total colonoscopy in association with biopsy confirmed a diagnosis of sigmoid colon cancer. Her history included spina bifida, for which she had undergone an operation 5 years previously. Her father had undergone surgery for colon cancer at the age of 40.

Sigmoidectomy with regional lymph node dissection (D2) was performed, and the tumor depth was found to be the subserosa (ss). No evidence of liver metastasis or peritoneal dissemination was seen at the initial operation. A total of 16 lymph nodes were resected (No. 241, 5 nodes; No. 242, 4 nodes; No. 252, 7 nodes), and microscopically, three of the five nodes in No. 241 were positive for metastases. After sigmoidectomy for the sigmoid colon cancer, the histological diagnosis was moderately differentiated adenocarcinoma (ss, tub2, ly1, v1, infα, n1(+) (No. 241, 3/5)). The macroscopic and histological findings are shown in Fig. 1A–C. At the time of the first laparotomy, both ovarian capsules were intact, and no sign of ovarian metastases was found.

The patient presented again 2 months later with vaginal bleeding and marked abdominal distension. Computed tomography (CT) scan revealed massive ascites and large bilateral pelvic masses (Fig. 2B), but no such mass was evident on the CT scan done just before the initial operation (Fig. 2A). A diagnosis of bilateral huge ovarian metastases from colon cancer was made. The laboratory data obtained on the second admission are outlined in Table 1. A second laparotomy was performed, revealing huge ovarian tumors as shown in Fig.
Although cytology of the ascites was negative, 100 ml of ascites was centrifuged and examined by Papanicolau staining. There was still no sign of liver metastasis or peritoneal dissemination at the second operation. The right ovary measured 16 × 15 × 9 cm and weighed about 1500 g, and the left ovary was almost the same size. A bilateral salpingo-oophorectomy demonstrated the presence of numerous large cystic areas with a granular papillary surface on the cut surface, with solid mottled and hemorrhagic areas (Fig. 3B, C). The histological diagnosis was papillary cystadenocarcinoma (Fig. 4). The patient’s postoperative course was uneventful and she was discharged 3 weeks later; however, peritonitis carcinomatosa developed soon after, and despite intraperitoneal chemotherapy comprised of three doses of 5-fluorouracil 500 mg in 500 ml saline, she died as a result of peritonitis carcinomatosa 3 months after her second operation.

**Discussion**

Kruckenberg’s tumor is defined as a metastatic ovarian tumor. In Japan, most primary lesions that metastasize to the ovaries are gastric cancers and sometimes colon cancers, whereas in North America and Europe the primary lesions are most often colon cancers and breast cancers. Colon cancer metastasis to the ovary is seen in 3.4%–7.4% of patients at the time of initial laparotomy and in 1.5% during postoperative follow-up. The pathological findings from ovarian metastasis differ slightly from those of the primary tumors, as seen in our patient in whom the ovarian metastases were papillary cystadenocarcinoma, whereas the primary tumor was moderately differentiated adenocarcinoma; however,