



Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Colon liver metastasis complicated with tumor thrombus in the bile duct: A case report

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ARTICLE INFO

Article history:

Received 13 June 2018

Accepted 30 June 2018

Available online 9 July 2018

Keywords:

Colorectal cancer
Liver metastasis
Bile duct
Tumor thrombus
Case report

ABSTRACT

INTRODUCTION: Hepatectomy including conversion therapy is recommended for colorectal liver metastasis (CRLM). CRLM complicated with bile duct tumor thrombus (BDTT) is rare, even though there are more opportunities to perform hepatectomy for CRLM in recent years.

PRESENTATION OF CASE: A 76-year-old Japanese man with a history of right hemicolectomy for ascending colon carcinoma presented with a portal hepatic tumor and the dilatation of the right bile duct found by computed tomography (CT) eighteen months after the colectomy. Magnetic resonance imaging confirmed a tumor in liver segment VIII, and magnetic resonance cholangiopancreatography and endoscopic retrograde cholangiopancreatography showed a mass in the hilar bile duct. Bile cytology did not prove carcinoma. The patient underwent right and caudate lobectomy with extrahepatic biliary tract resection plus hepaticojejunostomy. Histopathological examination revealed that both the tumor in liver segment VIII and the BDTT comprised moderately differentiated tubular adenocarcinoma, originating from the previous colon carcinoma. Six months after hepatectomy, CT revealed tumor recurrence in the residual intrahepatic bile duct. Radiation therapy was administered for the recurrent lesion, which reduced the tumor size temporarily. Despite the multimodal therapy, the disease progressed and the patient died one year after the hepatectomy.

DISCUSSION: Some studies reported no correlation between CRLM bile duct invasion and clinical outcomes, but there is no available evidence focused on BDTT which is of an advanced stage in the bile duct invasion.

CONCLUSION: Hepatectomy is a common therapeutic procedure for CRLM, but CRLM with BDTT might be associated with a bad prognosis.

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1. Introduction

Hepatectomy is recommended when colorectal liver metastasis (CRLM) is conducive to curative resection, with a post-hepatectomy 5-year survival rate ranging from 35 to 58% [1–4]. Even in cases of initially unresectable CRLM, conversion hepatectomy can sometimes be performed after effective downsizing by chemotherapy. Adam reported 5- and 10-year survival rates of 33% and 27%, respectively, in patients with initially unresectable disease who underwent resection after downsizing via chemotherapy [5]. Over recent years, progress in colorectal cancer treatment has created more opportunities for patients with CRLM to undergo hepatectomy, but CRLM with bile duct tumor thrombus (BDTT) is rare in

clinical practice. This work has been reported in line with the SCARE criteria [6].

2. Presentation of case

A 76-year-old Japanese man underwent right hemicolectomy with lymph node dissection for ascending colon cancer, which was categorized as T3N1aM0 Stage IIIB in UICC, pathologically moderately differentiated adenocarcinoma. The patient subsequently received adjuvant chemotherapy with tegafur/uracil plus leucovorin. However, this treatment was discontinued after two cycles due to interstitial pneumonia.

Eighteen months after hemicolectomy, the patient had no complaint, but computed tomography (CT) revealed a hepatic portal tumor with right biliary tract dilatation (Fig. 1a, b). Serum testing indicated liver dysfunction with AST of 84 IU/L, ALT of 65 IU/L, alkaline phosphatase of 1197 IU/L, and gamma-glutamyl transpeptidase 851 of IU/L, while the total bilirubin level was normal

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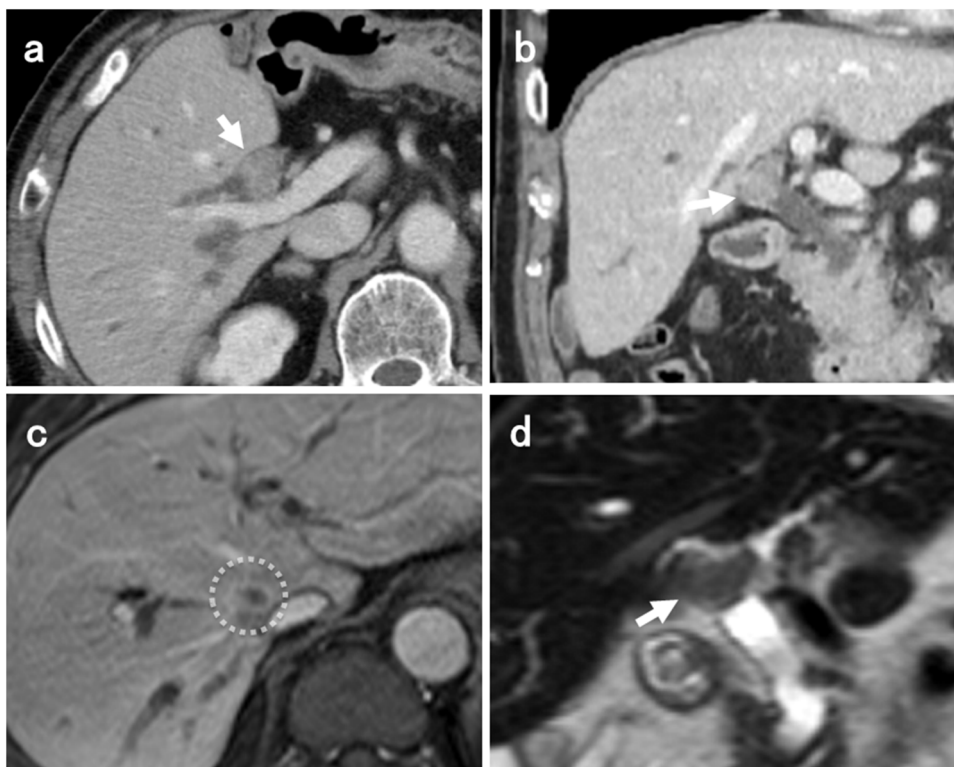


Fig. 1. Preoperative image.

Axial (a) and coronal (b) images acquired by preoperative contrast-enhanced computed tomography (CECT) revealed a perihilar tumor (arrows). (c) Contrast-enhanced magnetic resonance imaging showed a ring-enhanced tumor in liver segment VIII (dotted circle). (d) Magnetic resonance cholangiopancreatography revealed a perihilar tumor involving the bilateral extrahepatic bile ducts (arrow).

(0.6 mg/dL). Tumor markers test results were within the normal range, with CEA of 4.9 ng/mL and CA19-9 of 17.8 U/mL. Magnetic resonance imaging and magnetic resonance cholangiopancreatography revealed a ring-enhanced low-intensity area in liver segment VIII involving the biliary tract (Fig. 1c, d). Endoscopic retrograde cholangiopancreatography showed that the hepatic portal tumor extended from the hilar bile duct to the bilateral extrahepatic bile ducts. Bile cytology did not prove carcinoma. Although preoperative diagnosis was not definitive for primary cholangiocarcinoma or metastatic cancer, hepatectomy was planned.

The patient underwent right and caudate lobectomy with resection of extrahepatic biliary tract plus hepaticojejunostomy. Macroscopic examination revealed that a 12-mm tumor had developed in liver segment VIII, invaded the adjacent biliary tract, and

formed a tumor thrombus in the bile duct (Fig. 2). Microscopic examination showed that both the liver tumor and BDTT comprised moderately differentiated tubular adenocarcinoma (Fig. 3). These pathological findings supported a diagnosis of liver metastasis with BDTT that had originated from the previous colon cancer. The tumors had the KRAS (G12V) mutation. We detected no malignant cells in the resected stump of the biliary tract, and no metastasis in the dissected lymph nodes along the hepatoduodenal ligament.

Postoperatively, physical examination and blood test was performed every two months. Six months after hepatectomy, the patient exhibited a high total bilirubin level of 3.1 mg/dL and CA19-9 level of 455 U/mL. A CT scan showed a recurrent tumor developing in the biliary tract on the hepaticojejunostomy and intra-hepatic bile duct dilatation (Fig. 4). The patient was administered radiation



Fig. 2. Macroscopic examination of the resected specimen.

A 12-mm tumor in liver segment VIII, which invaded to the adjacent biliary tract and progressed along the right hepatic duct to the tumor thrombus was revealed.

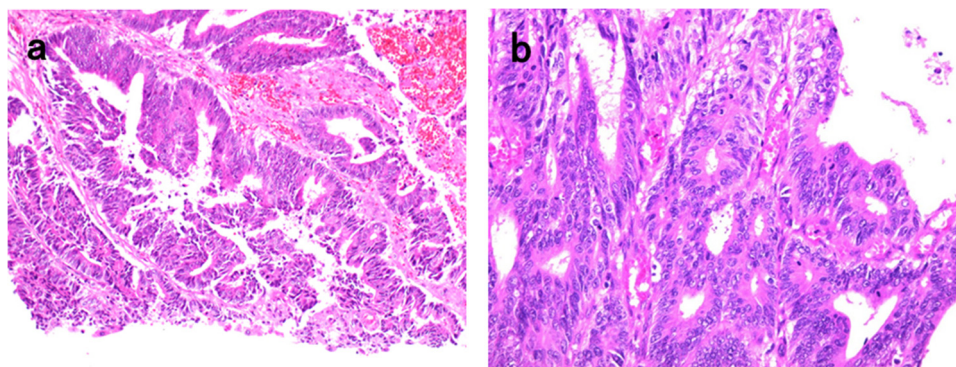


Fig. 3. Histopathological examination.

(a) Both the liver tumor and bile duct tumor thrombus comprised moderately differentiated tubular adenocarcinoma (HE staining, 200 \times). (b) Histopathological findings of primary colon cancer (HE staining, 200 \times). Overall, these findings indicated that the liver tumor was compatible with metastatic disease from colon carcinoma.

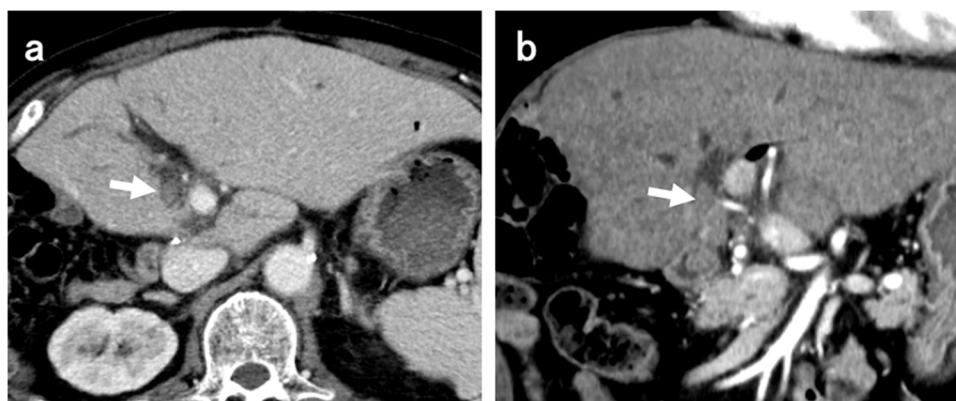


Fig. 4. Postoperative image six months after hepatectomy.

Axial (a) and coronal (b) images acquired by contrast-enhanced computed tomography (CECT) at six months after hepatectomy revealed recurrence in the biliary tract on the hepaticojejunostomy (arrow) with intra-hepatic bile duct dilatation.

therapy (2 Gy per fraction, 50 Gy total) to reduce the tumor size and relieve obstructive jaundice. However, the tumor progressed again, leading to the patient's death one year after the hepatectomy (two years and seven months after the primary surgery).

3. Discussion

Liver is the most common site of metastasis from colorectal cancer. The Japanese Society for Cancer of the Colon and Rectum report a 10.9% rate of synchronous CRLM, and a 7.1% rate of metachronous CRLM [1]. Knijn et al. analyzed nine papers describing bile duct invasion of CRLM and reported a 30.2% rate of bile duct invasion in patients with CRLM [7–13]. However, there were few reports about CRLM forming intrabiliary tumor mass. We used the term of BDTT for intrabiliary tumor mass in this report, because BDTT is often used in the field of hepatology under the similar disease state [14].

BDTT is defined as a tumor mass that develops within a bile duct. Zeng describes a model of HCC invasion and metastasis of BDTT, in which tumor cells invade the submucosa of adjacent small bile ducts, disseminate along the biliary tract, intrude into the bile duct lumen, and finally form BDTT [14]. During the course of bile duct invasion, BDTT is considered to be of an advanced stage. Compared to HCC, BDTT is extremely rare in CRLM.

In therapeutic strategies for CRLM, a negative resection margin is considered the most important factor. Most studies report that prognostic factors include the size and number of CRLM and organ metastasis except to the liver [15–19]. Additionally, some evidence indicates that age, high CEA level, and pathology of poorly differentiated adenocarcinoma are also prognostic factors [15–19].

Some studies have not found any correlation between CRLM bile duct invasion and clinical outcomes [7,20]. In our present case, hepatectomy was performed for CRLM with BDTT since the pre-hepatectomy examination revealed no lymph node or extrahepatic organ metastases. The patient had a negative surgical margin, non-multiple CRLM, pathology of moderately differentiated adenocarcinoma and low CEA level, but he had a poor prognosis. This case indicated that CRLM with BDTT might be associated with a bad prognosis, because BDTT is categorized as an advanced stage of bile duct invasion.

4. Conclusion

We reported here a case of metachronous CRLM with BDTT. To date, there is no available evidence guiding therapy for CRLM with BDTT. Hepatectomy is a common therapeutic procedure for CRLM, but our experience indicates that CRLM with BDTT might be associated with a bad prognosis.

Conflict of interest statement

The authors declare no potential conflict of interest.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical approval

Ethical approval for a case report is not required by our institution.

Consent

Written informed consent was obtained from the patients for the information to be included in our manuscript. His information has been de-identified to the best of our ability to protect his privacy.

Authors contribution

Yoshifumi Watanabe collected the data and wrote the initial draft of the manuscript. Hiroshi Tamagawa contributed to interpretation of data, and assisted in the preparation of the manuscript. All other authors have contributed to data interpretation, and critically reviewed the manuscript. All authors approved the final version of the manuscript, and agree to be 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.

Registration of research studies

It is not applicable because this work is a case report.

Guarantor

Yoshifumi Watanabe.

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