Case Report

Successful Concomitant Surgery for Abdominoperineal Resection and Right Hepatic Lobectomy with Thrombectomy

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Abdominal ultrasonography examination in a 70-year-old man revealed a hepatic mass in the right hepatic lobe. The examination revealed a hepatic tumor with tumor thrombosis in the right portal vein, and rectal carcinoma. To prevent cavernous transformation of the veins, intestinal bleeding, and ascites, we performed concomitant surgery for abdominoperineal resection and right hepatic lobectomy with tumor thrombectomy. The pathological findings of the resected specimens from the rectum and right hepatic lobe showed a moderately differentiated adenocarcinoma. Consequently, we diagnosed the patient as having rectal carcinoma and metastatic hepatic tumor with portal vein tumor thrombosis. We show that operating simultaneously on these conditions improved the prognosis for the patient. Moreover, the elevated tumor markers in the patient decreased dramatically 4 months after the surgery. The patient had no recurrence and was treated with continued adjuvant chemotherapy. This is the first successful case reported of concomitant surgery of abdominoperineal resection and right hepatic lobectomy with thrombectomy.

Key words: Portal vein Tumor thrombosis, Colorectal carcinoma, Concomitant surgery

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INTRODUCTION

The cause of portal vein tumor thrombosis by neoplastic disease is generally associated with hepatocellular carcinoma. Pathological findings of metastatic hepatic tumor originating from colorectal carcinoma typically show microscopic tumor invasion into the intra-hepatic portal vein. However, macroscopic tumor thrombosis occupying the main portal branch is rare in patients with liver metastases with the incidence of macroscopic portal vein tumor thrombosis found to be 0.4–2.8%^{1,2)}. Nowadays, surgical resection of colorectal liver metastases is the best-known treatment to improve its long-term prognosis. In the case presented here, surgery was performed on an advanced rectal carcinoma and a large metastatic hepatic tumor, which had extended to become right portal vein tumor thrombosis. Portal vein tumor thrombosis causes liver failure, variceal bleeding³⁾, and systemic prothrombotic states such as hypercoagulability conditions⁴⁾. Thus, we performed abdominoperineal resection with hepatic right lobectomy followed by right portal vein tumor thrombectomy. We reported successfully on an operation comprising of abdominoperineal resection and right hepatic lobectomy with thrombectomy for the right portal vein tumor thrombus in a patient with advanced rectal carcinoma. To the best of our knowledge, there are no reported cases where abdominoperineal resection surgery has been combined with

right hepatic lobectomy concluding with right portal vein tumor thrombectomy until now.

CASE REPORT

A 70-year-old man was detected to have a hepatic mass in the posterior region of the liver by abdominal ultrasonography examination during one of his routine visits to the doctor due to congestive heart failure. He was admitted to our hospital to be examined for liver tumor. Laboratory analysis on admission, revealed elevated serum levels of the following tumor makers (the normal range for each parameter is enclosed in the parentheses): carcinoembryonic antigens (CEA), 596.4 IU (0.0–5.0 IU) and carbohydrate antigens 19-9 (CA 19-9), 153 IU (0–37 IU). However, carbohydrate antigens 125 (CA 125), α -fetoprotein (AFP), and protein induced by vitamin K antagonist-II (PIVKA-II) were all within the normal range. The results of a complete blood count test, coagulation test, and biological parameters were all normal as well. Moreover, pre-operative liver function were ICG 15R; 10.5%, Liver damage A, Child-pugh classification A. Abdominal ultrasonography examination revealed a hepatic tumor (97 × 87 mm in diameter), which was localized to the hepatic right lobe, and a tumor thrombus in the right portal vein. Color Doppler showed poor pulsatile blood flow at the margin and internal parts of the tumor. Enhanced computed tomography (CT) demonstrated the presence of a large tumor about 90 mm in

Fig. 1 Image findings.

Enhanced computed tomography (CT) demonstrated a large tumor about 90 mm in diameter in the right hepatic lobe of the liver, and a tumor thrombus in the portal vein (arrow). The tumor thrombus extended from the right portal vein to the main trunk of the portal vein.

Fig. 2 Image findings.

Abdominal angiography of portal phase revealed the defect from the root of right portal vein (arrow).

diameter in the right hepatic lobe, and tumor thrombus in the portal vein (Fig. 1). Abdominal angiography revealed a defect of the right portal vein at portal phase, and showed that the tumor thrombus extended from the right portal vein to the main trunk of the portal vein (Fig. 2). Furthermore, a tumor that was 50 mm in diameter in the rectum was also detected. Therefore, we performed retrograde colonography and colonoscopy.

Fig. 3 Image findings.

Retrograde colonography revealed a protruded lesion about 50 mm in diameter occupying space from the lower rectum to the higher rectum.

Fig. 4 Intra-operative findings.

During the thrombectomy, the portal vein thrombus was easily removed from the right portal vein to the main trunk.

Retrograde colonography revealed a protruded tumor about 50 mm in diameter at the lower rectum (Fig. 3). The biopsy findings of colonoscopy revealed a moderate differentiated adenocarcinoma. We diagnosed the patient as suspected metastatic tumor of the liver from rectal carcinoma. We thought that it was possible to perform right hepatic lobectomy, because right portal vein was completely the obstruction.

The patient underwent an abdominoperineal resection and right hepatic lobectomy with thrombectomy for right portal vein tumor thrombus. First, we performed an abdominoperineal resection for his rectal carcinoma. The tumor was located in the lower rectum

A

B

Fig. 5 Macroscopic findings.

A resected specimen of the liver showed that metastatic multiple-nodules occupied the lobe and that the tumor thrombus was growing in the right hepatic portal vein (arrow) (A). Macroscopic findings of the resected rectal carcinoma showed a type 2 tumor that was 55 × 50 × 6 mm in size (B).

with no invasion into the perirectal tissue. The abdominoperineal resection was easily performed without any trouble during the operation. After closing the lower abdominal incision, we performed a laparotomy under the three arms incision for the right hepatic lobectomy with tumor thrombectomy. In the portal vein, a hepatic tumor about 10 cm in diameter was located at the right lobe of the liver. The portal vein thrombus was easily removed from the trunk of the portal vein to the right portal vein (Fig. 4). Subsequently, we performed the liver hanging maneuver during hepatic parenchymal resection to prevent decompression of the inferior vena cava, and to reduce blood loss during preparation of the liver. At last, blood flow to the left portal vein was rectified. The total operation time was 460 minutes, and the total operative blood loss was 415 ml, and a blood transfusion was not required. A resected speci-

A

B

Fig. 6 Microscopic findings.

Microscopic findings of a resected rectal carcinoma specimen revealed a moderately differentiated adenocarcinoma (hematoxylin-eosin stain, × 100) (A). Microscopic findings of a specimen of the resected hepatic tumor revealed a moderately differentiated adenocarcinoma (hematoxylin-eosin stain, × 100). Metastatic hepatic tumor excluded normal hepatic parenchyma to the right (B).

men of the liver showed that metastatic multiple-nodules occupied the right lobe of the liver, and that the tumor thrombus was growing in the portal vein (Fig. 5A). A resected specimen from the rectum showed a tumor that was 55 × 50 mm in diameter at the lower rectum (Fig. 5B). The patient's postoperative course was uneventful, and he left the hospital 2 weeks after the surgery. The pathological findings of the rectum and the right hepatic lobe showed a moderately differentiated adenocarcinoma (Fig. 6). Consequently, we diagnosed the patient with rectal carcinoma and metastatic hepatic tumor with the portal vein tumor thrombus. Final stage was Rb, pSS/A, ptub 2, ply1, pv1, pN0 (0/7), pH2 (Grade B), Stage IV.

The patient postoperatively received regular outpa-

intravenous l-leucovorin (250 mg/m²/day, 2-hr infusion) plus 5-Fluorouracil (600 mg/m²/day, bolus), in the outpatient clinic 4 weeks after the surgery. The elevated tumor markers decreased 4 months after surgery: CEA, 3.1 IU (0.0–5.0 IU) and CA19-9, 13 IU (0.0–37 IU). On his 4 months postoperative follow-up, he was found to be recovering well with no lung metastasis or recurrence detected.

DISCUSSION

Approximately half of all the patients with colorectal carcinoma present at some stage with hepatic metastases⁵). Nowadays, surgical resection of colorectal liver metastases is the best available treatment for an improved long-term prognosis. Surgical treatments are seldom carried out in patients with metastatic tumor thrombus of colorectal carcinoma. Generally, the relative difficulty of the hepatectomy is determined by the location of the tumor with respect to the hepatic portal region, inferior vena cava, and hepatic vein. If it is possible to perform a curative operation, the hepatectomy for hepatic colorectal metastases will be performed⁶). The rate of hepatic resection for hepatic colorectal metastases is reported to be 40–52.3% in Japan^{7, 8}). The 5-year survival rate after hepatic resection for hepatic colorectal metastases is reported as 20–58%^{9–13}). Here, we presented a successful operation in which abdominoperineal resection and right hepatic lobectomy was performed concomitantly with thrombectomy for the right portal vein tumor thrombus in a patient with rectal carcinoma. To the best of our knowledge, such a surgery has not been previously reported.

The overall incidence of portal vein thrombus at autopsy is 0.05–0.5%¹⁴). Portal vein thrombus is considered to progressively lead to portal hypertension due to obstruction of the portal blood flow. Portal thrombosis is known to cause thrombocytopenia by hypersplenism, esophageal varix, gastric varix, hepatic encephalopathy, and ascites. Etiological factors of portal vein thrombus presented both locally and systemically can lead to decreased portal flow. Systemic factors can be systemic prothrombotic states, such as hypercoagulability and myeloproliferative disorder⁴). Furthermore, local factors can be tumors, surgery, and intra-abdominal inflammation conditions, and incidence due to local factors ranges from 10–50%^{3, 15}). Macroscopically, the reported incidence of portal vein tumor thrombus similar to that observed in our patient case is 0.4–2.8%^{1, 2}), so this is a rare case.

Janssen et al³) reported the etiology and determinants of survival of portal vein thrombosis for 172 patients with portal vein thrombosis. The mortality of patients with portal vein thrombosis is associated with concurrent medical conditions, nor is related to mani-

festations of portal hypertension. The causes of death in most patients with portal vein thrombosis are cancer, liver failure, and variceal bleeding. Moreover, 27% of such patients are intermittently treated with anticoagulation therapy. Therefore, the removal of the tumor thrombosis improve patient's quality of life because the complications of liver failure and systemic prothrombotic states can lead to increased amounts of bleeding, surgical time, and difficulty of intra-operative manipulation. Thus, we performed right hepatic lobectomy with thrombectomy following abdominoperineal resection. During hepatectomy, we performed the hanging maneuver¹⁶) for right hepatectomy to prevent bleeding, rupture of the tumor, tumor cell dissemination, and hemodynamic instability. Consequently, the operation time was 460 minutes, and the total operative blood loss was 415 ml with no blood transfusion needed.

The rate of recurrence after hepatic resection for hepatic metastases is reported as 14.8%¹⁷) to 25%¹⁸), and pulmonary metastases are discovered at 21 ± 12 months¹⁸). However, these studies were on patients that were not the same as our case. Because our patient case of metastatic hepatic tumor with portal vein tumor thrombosis is rare, to our knowledge, the recurrence rate for such a case cannot be determined. In simultaneous colorectal and hepatic resection, disease-free survival at 3 and 5 years were 37.7% and 26.5%¹⁹), respectively, and the 5-year survival rate was 36–38%^{19, 20}). We suggest that a one-step procedure (simultaneous resection of colorectal carcinoma and synchronous metastatic hepatic tumor) results in better long-term outcomes than a two-step procedure, especially in patients with metastatic hepatic tumor combined with portal vein tumor thrombosis as in our case.

In conclusion, our patient with a metastatic carcinoma of the liver from rectal carcinoma associated with tumor thrombosis extending to the main duct of portal vein underwent a successful right hepatic lobectomy with resection of the portal vein. We showed that operating simultaneously on these conditions is preferential for a better surgical outcome and quality of life, if the patient is not presented with distant metastasis, multiple hepatic metastases, and bleeding tendency. The patient's CEA and CA 19-9 decreased to normal ranges 4 months after the surgery. Our patient remained healthy with no evidence of recurrence 4 months after the surgery. It is necessary to receive early adjuvant chemotherapy to prevent metastatic tumor of the lung.

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