

CASE REPORT

More than 7-year survival of a patient following repeat hepatectomy for total 20 colon cancer liver metastases

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A 54-year-old man was transferred with sigmoid colon cancer combined with multiple bilobar liver metastases. Nine metastases were in the left lobe and 5 metastases were in the right lobe. After low anterior resection, all 9 lesions in the left lobe were completely removed by wedge resections. Because the remnant liver volume after multiple wedge resection of the left lobe was not sufficient to perform a right hepatectomy simultaneously, we planned a two-stage hepatectomy. Right portal vein embolization was performed one week after the first liver operation. A right hepatectomy was safely performed 22 days after the first hepatectomy. A recurrent mass developed in the segment III 18 months after the right hepatectomy. Radiofrequency ablation (RFA) was performed to remove that lesion. Five other metastases developed 18 months after RFA whereby multiple wedge resections were performed. The patient has survived for more than 7 years after the first liver operation.

Key Words: Colorectal neoplasms, Neoplasm metastasis, Liver, Hepatectomy

INTRODUCTION

Curative hepatic resection is currently accepted as the most effective treatment for patients with colorectal cancer liver metastases (CRLM). Recent reports showed that the mortality rate has decreased to less than 1%, and 5-year survival rates have increased after hepatectomy in these patients [1]. However, only 10 to 20% of the patients with CRLM are eligible for curative surgical procedures at the time of presentation [2]. The main cause of this low resectability is multiple bilobar liver metastases (MBLM). To

overcome this problem, multidisciplinary approaches were produced such as neoadjuvant chemotherapy, radiofrequency ablation (RFA), portal vein embolization (PVE), and two-stage hepatectomy [3]. Another problem is that the recurrent metastatic disease develops in most patients after liver resection, which mainly occurs in the liver. In this situation, repeat hepatectomy for recurrent liver metastasis can be performed safely and provide survival benefits [4].

In the case presented here, a patient initially had MBLM and recurrent lesions develop twice, yet, he was success-

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fully managed with multidisciplinary approaches. The patient is now alive without disease, for more than 7 years after initial operation.

CASE REPORT

A 54-year-old man was referred to our department with sigmoid colon cancer combined with MBLM in November 2003. The sigmoid colon cancer infiltrated the pericolic fat tissue without lymph node invasion in the preoperative colon study. Nine metastatic lesions were preoperatively detected in the liver (5 lesions in the right lobe and 4 lesions in the left lobe) (Fig. 1). Mean size of right side lesions was 4.3 ± 1.2 cm and mean size of left side lesions was 1.5 ± 0.6 cm. We planned to resect the sigmoid colon cancer and perform staged hepatectomy; a simultaneous right hepatectomy with wedge resection of the left side metastases. The preoperative carcinoembryonic antigen (CEA)

level was 75.9 ng/mL.

The sigmoid colon cancer was completely removed by low anterior resection. The pathologic findings of the sigmoid colon cancer specimen were moderately differentiated adenocarcinoma, pericolic fat tissue infiltration, and no invasion of lymph nodes.

The staged hepatectomy was carried out 10 days after low anterior resection. Intraoperative ultrasonography (IOUS) was performed to detect the hepatic metastatic lesions. In contrast to the preoperative findings, a total of 9 lesions were detected in the left lobe. Therefore, we devised a new plan to perform non-anatomical resection of left side metastases followed by right hepatectomy after increasing the expected remnant liver volume. Mean size of left lobe lesions was 10 ± 2 mm. All lesions of the left lobe were completely removed with the cavitron ultrasonic surgical aspirator (CUSA; Integra LifeSciences Co., Plainsboro, NJ, USA). Abdominal computed tomography (CT) was checked the day after the first operation and the ex-

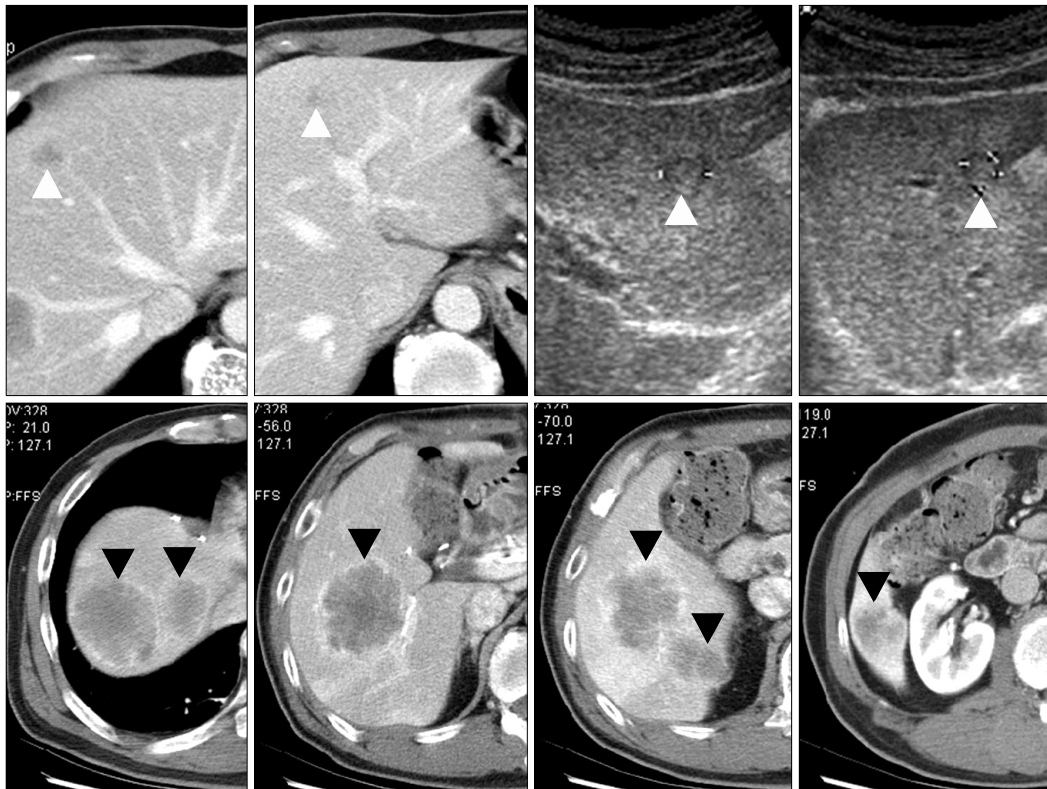


Fig. 1. Initial abdominal ultrasonography and computed tomography. Four lesions in left lobe and 5 lesions in right lobe were found (white arrow, metastases in left lobe; black arrow, metastases in right lobe).

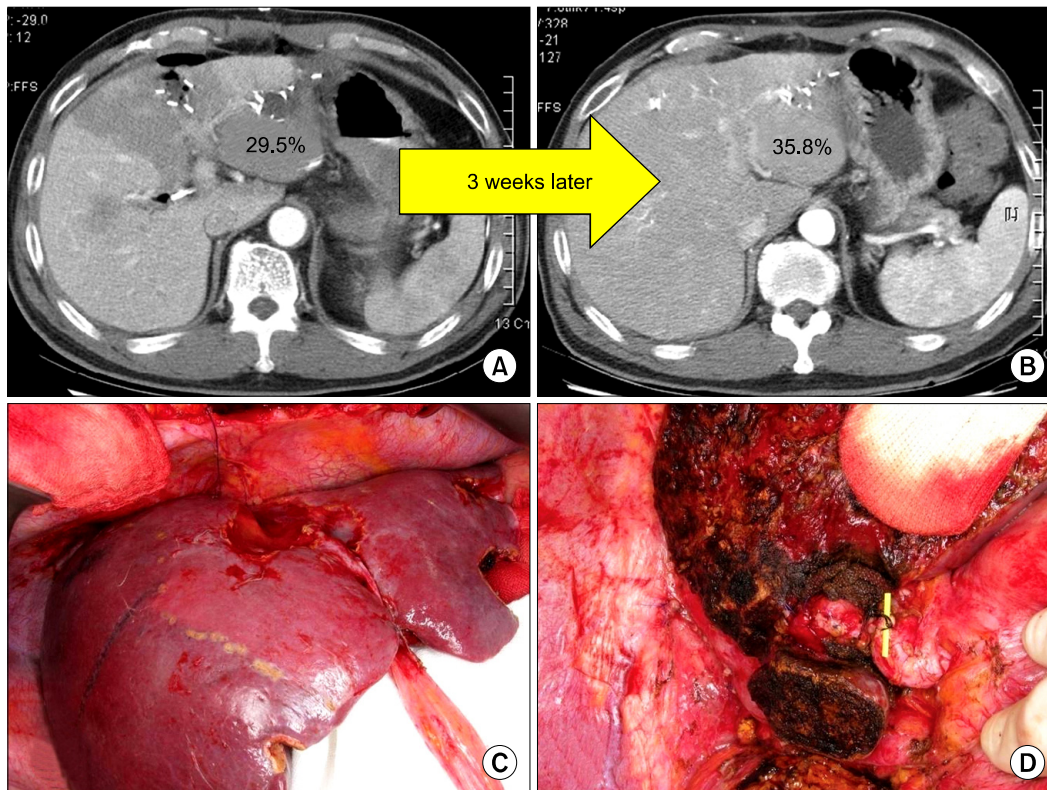


Fig. 2. (A) Abdominal computed tomography (CT) that was checked the day after first hepatectomy. Expected remnant liver volume was measured to be 29.5%. (B) Abdominal CT that was performed three weeks after first hepatectomy. Expected remnant liver volume increased to 35.8%. (C) Hypertrophied left lobe found in second hepatectomy. (D) Right hepatectomy was performed according to anatomical demarcation line.

pected remnant liver volume was measured at 29.5% (Fig. 2A). Embolization of the right portal vein was performed one week after the first hepatectomy. The patient recovered uneventfully. Abdominal CT was performed three weeks after the first operation and the expected remnant liver volume had increased to 35.8% (Fig. 2B). No metastatic lesions of the non-anatomically resected left lobe were found in the CT.

The second-stage operation was consequently performed 22 days after the first liver operation. Hypertrophied left lobe was found (Fig. 2C). IOUS was rechecked to determine any metastatic lesions in the future remnant liver and there were no lesions. Therefore, the right hepatectomy was safely performed (Fig. 2D). The CEA level was 2.67 ng/mL 10 days after the second liver operation. The patient received 9 cycles of infusional 5-fluorouracil, leucovorin, and oxaliplatin (FOLFOX-4) chemotherapy after two-stage hepatectomy.

A recurred mass developed in segment III 18 months after the second liver operation (Fig. 3B). Extracorporeal RFA was performed to remove a recurrent lesion. After RFA, the patient received 12 cycles of oral capecitabine. Unfortunately, 5 other metastases developed 18 months after RFA (Fig. 4). The third liver operation was performed and all metastatic lesions were completely removed by multiple wedge resections. The patient recovered uneventfully and received 6 cycles of infusional 5-fluorouracil, leucovorin, and irinotecan (FOLFIRI) chemotherapy after the third operation. He has survived for more than 7 years after the first operation (Fig. 5). The last CEA level was 3.35 ng/mL.

DISCUSSION

Over the last decade, the concept of treatment for CRLM

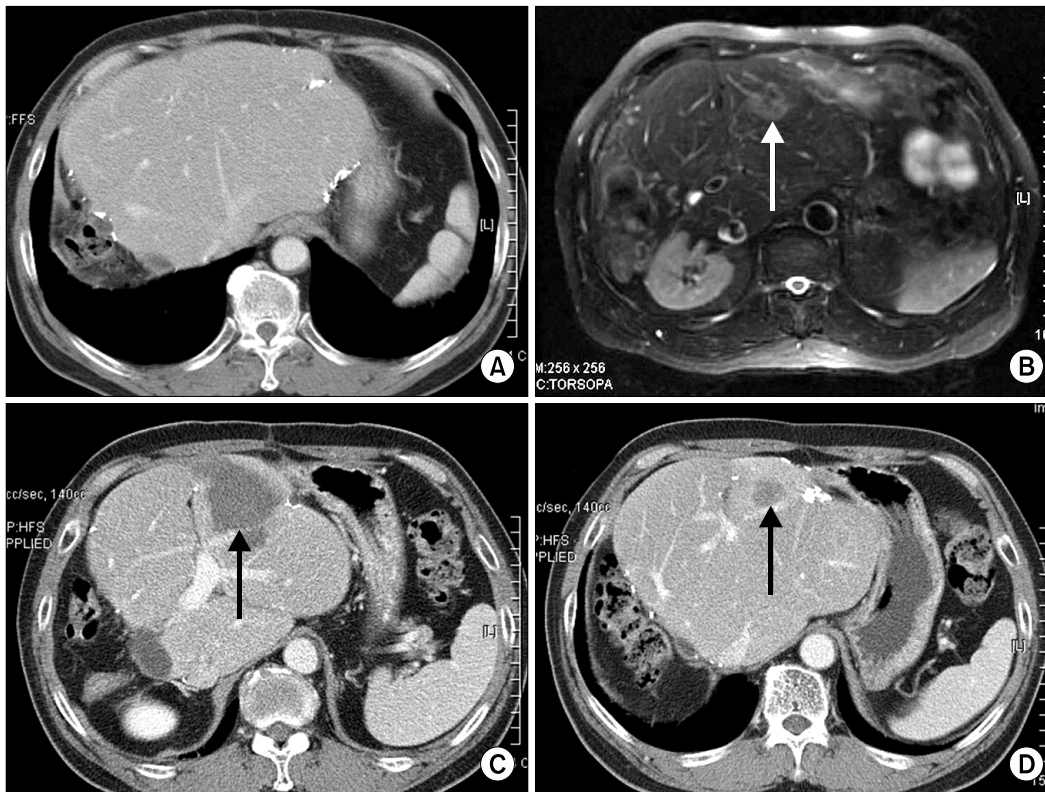


Fig. 3. (A) Abdominal computed tomography (CT) taken at 15 months after second-stage hepatectomy showed no recurrent lesion. (B) Magnetic resonance image taken at 18 months after second-stage hepatectomy. Single recurrent mass (arrow) developed in remaining liver. (C) Abdominal CT checked after radiofrequency ablation (arrow, post-radiofrequency ablation lesion). (D) Abdominal CT taken at 14 months after radiofrequency ablation showed no other recurrent lesion (arrow, post-radiofrequency ablation lesion).

has significantly changed. Many therapeutic options were introduced for curative hepatic resection, such as a novel regimen of chemotherapy, PVE, staged hepatic resection and RFA. As a result, more patients with CRLM could become candidates for curative surgical resections.

Traditionally, hepatectomy has been considered a controversial treatment strategy in cases with the presence of 4 or more colorectal metastatic lesions. However, recent studies have shown good results after hepatic resection in such cases [5]. Of particular interest, Imamura et al. [6] reported a case in which a patient had 22 metastatic nodules and underwent PVE and repeated hepatic resections. The author reported that disease-free survival time was 5 years 4 months after the repeat hepatic resection. Minagawa et al. [5] reported that 10-year survival rate of patients with 4 or more metastases after hepatic resection was 29%, which was almost equal to the long-term survival of patients with one solitary lesion. At present, it has been generally

accepted that the number of metastases does not significantly influence prognosis, if satisfactory resection could be achieved [5].

As one such innovative modality, two-stage hepatectomy with PVE was produced to increase curability in patients with MBLM. PVE can be used to induce compensatory hypertrophy of the future remnant liver in patients who have inadequate liver volume. However, it also carries potential negative side effects. PVE can be associated with promotion of tumor growth in the future remnant liver [7], and enhancement of the disease recurrence [8]. Therefore, two-stage hepatectomy was developed. Metastases in the future remnant liver should ideally be resected before PVE. Then, major hepatic resection can be performed after PVE in patients with initially unresectable MBLM. Adam et al. [9] were the first to report a case undergoing this two-stage hepatectomy procedure combined with PVE. Unfortunately, the patient died of post-

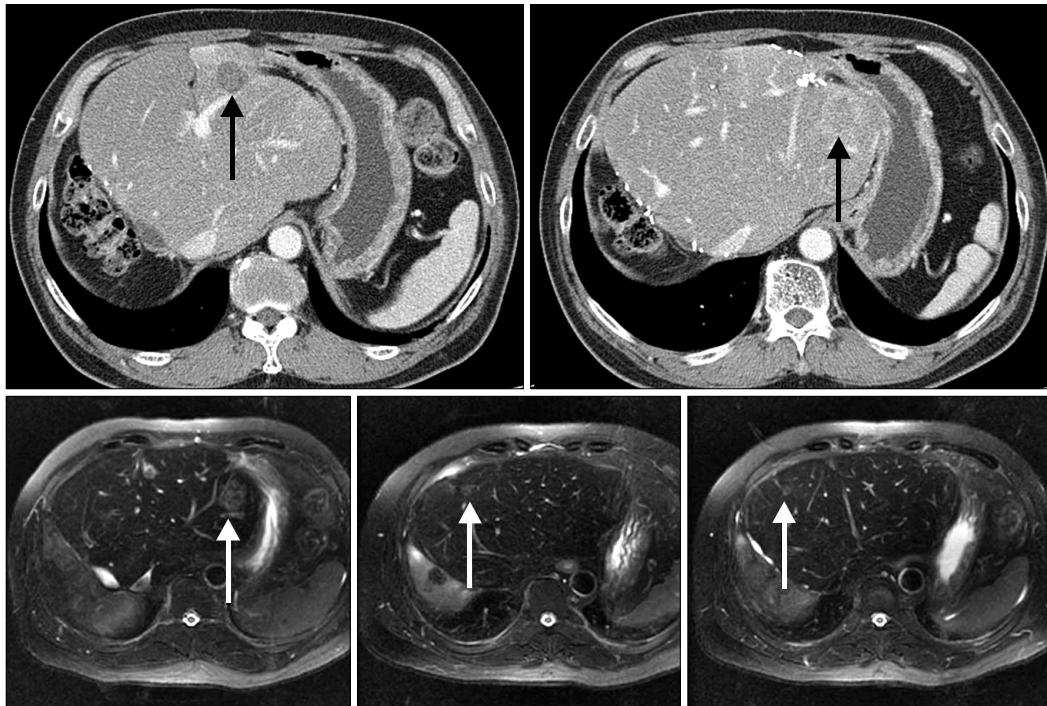


Fig. 4. Abdominal computed tomography and magnetic resonance image taken at 36 months after second-stage hepatectomy (arrows, multiple recurrent lesions).

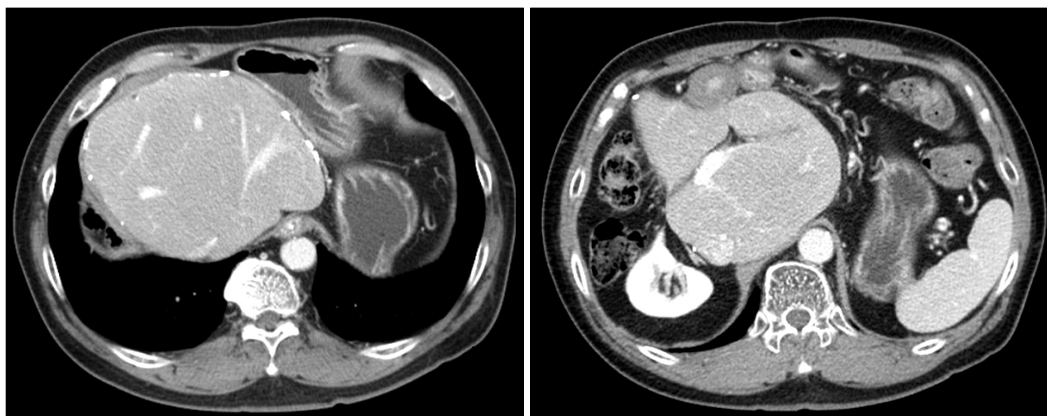


Fig. 5. Abdominal computed tomography taken at 7 years after initial hepatectomy. No recurrent lesion was found.

operative complications. Jaeck et al. [7] then reported that this strategy was successfully applied to patients with initially unresectable MBLM. In our case, two-stage hepatectomy with PVE was applied and the initial 14 lesions were completely resected. IOUS by a specialist also greatly contributed to removing all lesions.

Unfortunately, 60 to 70% of patients undergoing liver resection for colorectal metastases develop disease recur-

rence. Several articles have reported that one-third of patients with recurrent liver metastases are suitable for repeat liver resection [10]. And repeat hepatectomy for patients with CRLM is a safe procedure that can provide long-term survival equal to that of a previous hepatectomy [4]. RFA may be an alternative therapeutic option for recurrent lesions, but to date, no randomized, controlled trials of outcome of RFA for recurrence of CRLM compared with

surgical resection exist; and the role of RFA is not yet well defined. In our case, the patient was successfully treated with RFA for one lesion and repeat wedge resections for five lesions in second recurrence.

In conclusion, we have reported that 20 accumulated metastatic lesions were successfully managed with multidisciplinary and aggressive approaches in a patient with MBLM from colorectal origin. The patient is now alive without recurrence, more than 7 years after initial operation.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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