

Clinical Case of Treatment of Liver Metastasis in Our Practice

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Abstract

The golden standard for the treatment of colorectal liver metastases is surgical resection. However, less than 20% of patients can survive liver resection. Careful preparation for future liver resection, in the form of 3D modeling, segmentation, liver volumetry, and calculation of the future liver remnant (FLR), the remnant liver volume to body weight ratio (FLR/BWR ratio) significantly reduce the risk of post-hepatectomy liver failure (PHLF). This clinical case demonstrates that by following the basic principles of preoperative resection planning, careful surgical technique, using intraoperative ultrasound, and postoperative treatment, it is possible to perform large liver resections without the development of severe complications.

Keywords: Liver volumetry; FLR/BWR ratio; Post-hepatectomy liver failure.

Introduction

A 62-year-old woman was diagnosed with rectal cancer two years ago. On 04/01/2020 the patient underwent anterior rectal resection. Nine months after the operation, metastasis of the 6th segment of the liver was diagnosed. The CT examination on 29/12/2020 showed there was a hypo vascular formation of the 6th segment of the liver up to 50x40x52 mm. The patient underwent the radiofrequency ablation (RFA) of the 6th segment of the liver and chemotherapy (1 course of FOLFOX,9 courses of capecitabine). On the control CT examination, the disease

progressed, and the size of the lesion increased to 98x86x88 mm. Considering the hepatotoxicity of chemotherapy to this patient and the marked progression of the disease, we decided to consider operative treatment in the volume of liver resection.

Diagnostic assessment

Identifying sufficient future liver remnant, 3D modeling, segmentation and volumetry of the liver were performed. The tumor (histologically a metastasis of the colorectal adenocarcinoma) occupied at the right part of

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the liver-segments 5,6,7,8, and grew into the right hepatic vein in its middle third. The volume of the metastasis was 355.9cm³, which occupied 57%of the right lobe volume. The future liver remnant was 38.52%, enough to perform a right hepatectomy (the FLR norm

is 20-30% for an unchanged liver) [1]. Further calculations of the FLV/TLV ratio (27.7%) and the FLR/BWR ratio (1.75%) showed that the patient could undergo the right hepatectomy and sufferer would not develop PHLF [7].

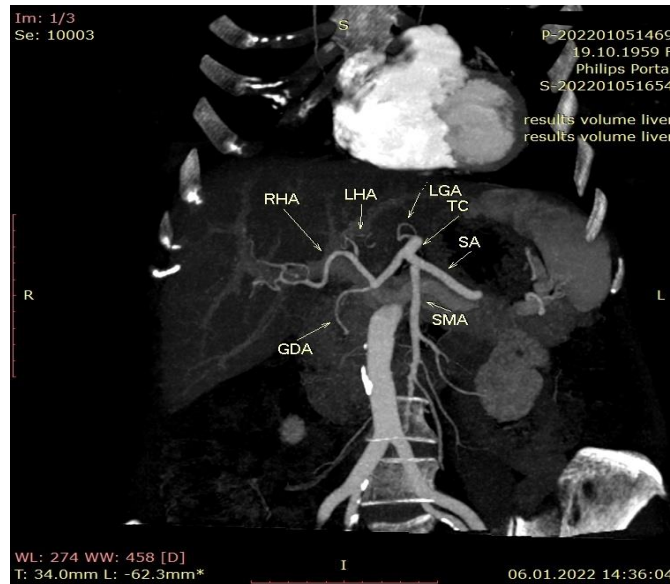


Figure 1

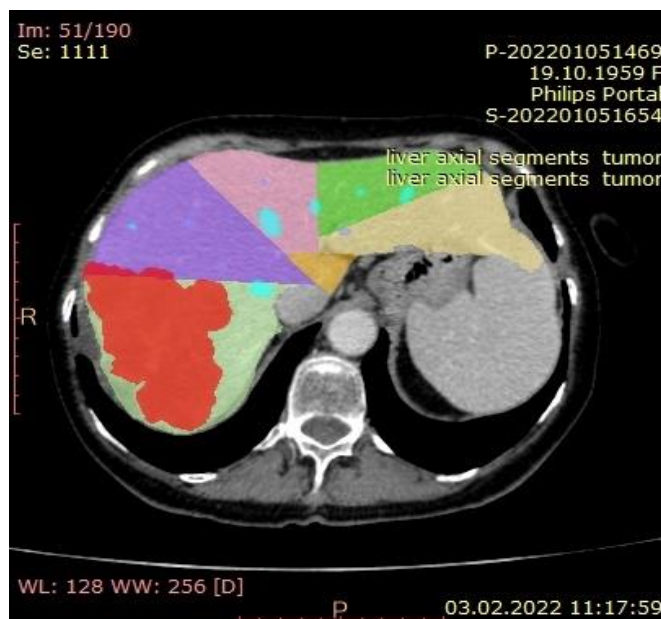


Figure 2

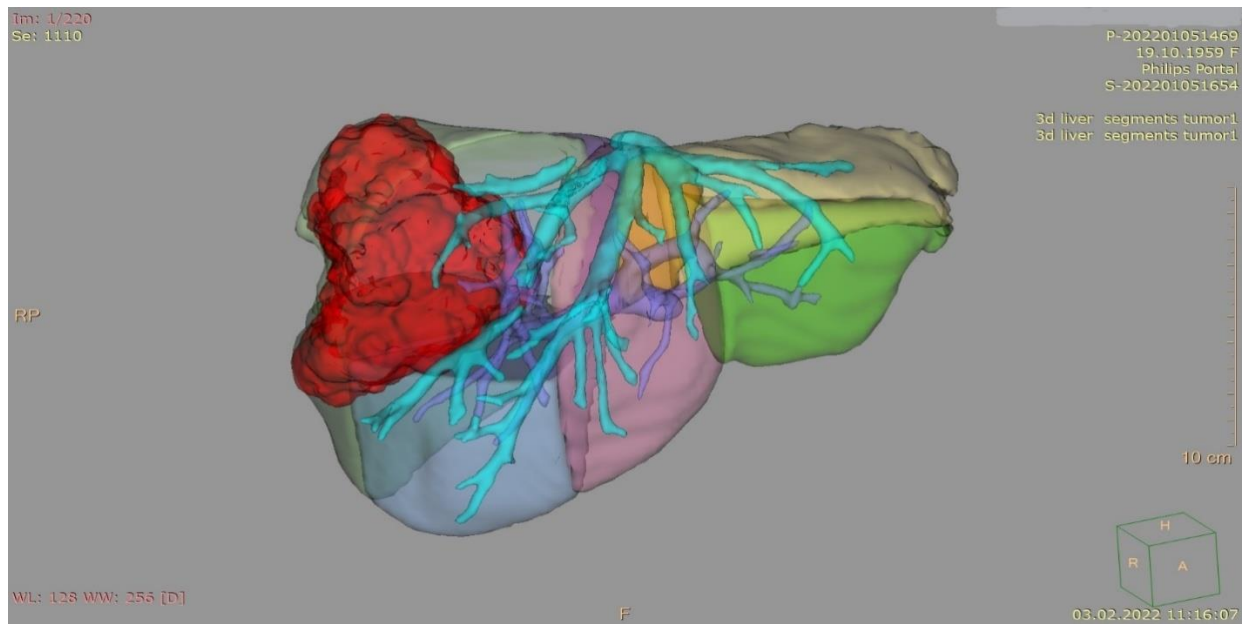


Figure 3

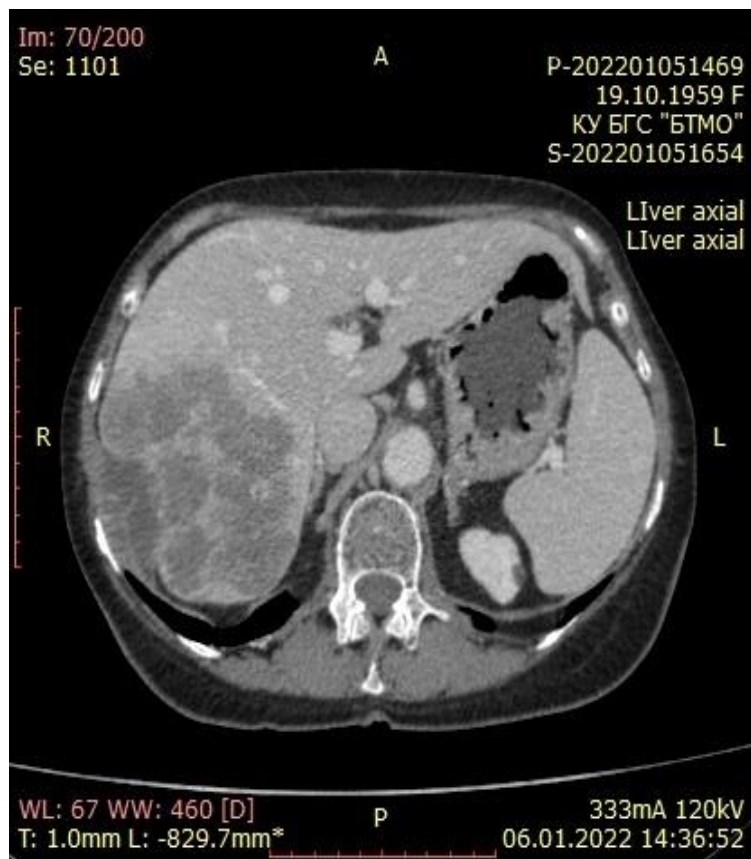


Figure 4

Treatment

After preoperative preparation, on 27/05/2022. the following operations were performed: laparotomy, right hepatectomy with partial resection of the diaphragm, cholecystectomy, and drainage of the right pleural and abdominal cavities. During the operation, intraoperative ultrasound used actively to search for silent metastases in the

left lobe of the liver and to localize the hepatic veins and glissonean pedicles, it was that 2 cm of the right hepatic vein from the confluence with the inferior vena cava was free of tumor infiltration, which allowed the right hepatic vein to be safely tied at its confluence with the inferior vena cava. Dissection of the liver parenchyma was carried out by the clamp-crushing technique (kellyclasia) [6].

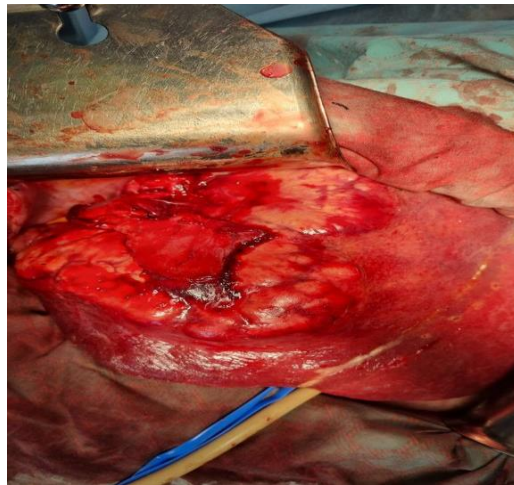


Figure 5

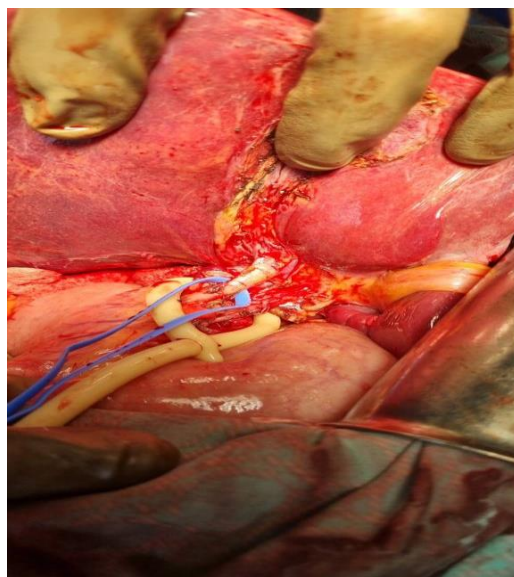


Figure 6

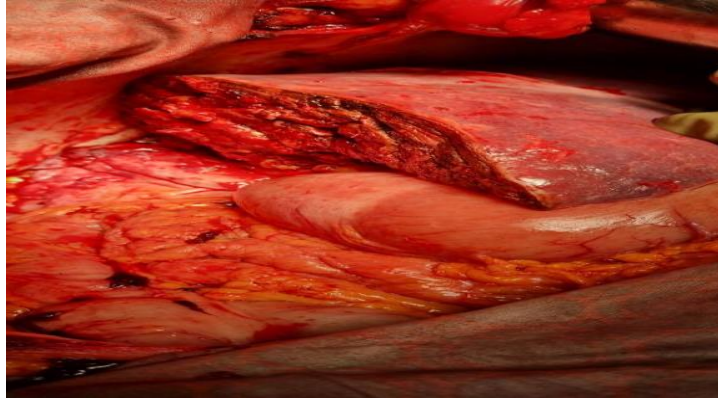


Figure 7



Figure 8



Figure 9

In order to prevent the development of PHLF, especially hepatic encephalopathy, in the post-operative period, treatment was aimed at the rapid recovery of intestinal function (cleansing enemas, metoclopramid, proserin), detoxification (rifaximin, lactulose), infection treatment (cephalosporins+sulbactam, metronidazole), and enteral nutrition [2-4]. Lab results on the 3rd day after surgery: Bilirubin 44 μ mol/L, Total protein 51g/L, Albumin 28g/L, Creatinine 67 μ mol/L, Urea 12.7 μ mol/L, Prothrombin index 92%. A clinical evaluation of the severity of encephalopathy was 0 points on the CHESS scale. The stage of hepatic encephalopathy was on level 0. We assessed the severity of PHLF as Grade A according to ISGLS [4]. Lab results on the 5th day after surgery: Bilirubin 24.1 μ mol/L, Total protein 46g/L, Albumin 26g/L, Creatinine 71 μ mol/L, Urea 6.4 μ mol/L, Prothrombin index 82.9%. The patient was transferred from the intensive care unit to the abdominal ward on the 6th day. On the 10th day after surgery, the patient was discharged from the hospital.

Follow-up

One month after the operation, the patient feels well and has no complaints. Ultrasound

examination showed no signs of recurrence in the liver and an absence of ascites. Biochemical parameters were within normal limits: Bilirubin 17.4 μ mol/L, Total protein 76g/L, Albumin 41g/L, Creatinine 87 μ mol/L, Urea 3.0 μ mol/L.

Conclusion

1. Surgical treatment of liver metastases remains the meaningful option in patients' treatment with colorectal cancer, especially after a lack of response to chemotherapy and RFA.
2. An important role is played by the evaluation of the resectability of the portion of the liver with metastases and the assessment of the future remnant of the liver. 3D modeling, segmentation and volumetry of the liver significantly help to solve the issue of the volume of liver resection and the prognosis of the development of PHLF.
3. Pre-operative preparation and post-operative treatment should primarily be aimed at prevention and treatment of PHLF.

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