

Left superior hepatectomy and segment 6 resection for colorectal cancer metastasis invading the left hepatic vein: An actual parenchyma preserving technique

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Abstract: Introduction: Hepatic metastasis is the most common form of distant spread of colorectal cancer (CRC) with about 50% occurrence rate. Liver resection (LR) with R0 margins is the only curative treatment and is believed to have improved the long-term out-come of these patients. Because of a chemotherapeutic injury to the liver, preservation of as much parenchymal volume as possible to minimize the risk of liver failure is the most important issue in these group of patients. Our present report describes a parenchyma preserving technique with left superior hepatectomy and segment 6 resection in a case. Case Report: A 64- year- old woman presented to our instution with a colorectal liver metastasis. PET-CT scan showed solitary liver lesions in segment 2-4a and 6. A left superior hepatectomy (segment 2 and 4a) and segment 6 resection was performed with glissonian approach and clomp-crush technique. Left hepatic vein was ligated without blocking the venous and biliary drainage of segment 4b and segment 3. Pathological examination of the specimen showed tumor-free margins (R0 resection). Discussion: Developments in imaging modalities provide an improved visualization of hepatic segmental anatomy and also provide volumetric calculation on the liver. This allows a successful planning for segmental liver resections with a minimum risk of postoperative liver failure. Factors that were considered contraindications for the surgery, such as number of metastases, tumor size, synchronous metastases and the presence of extrahepatic disease, must be evaluated as prognostic factors and must not prevent these patients opportunity of being treated. The main consideration is to achieve a complete R0 resection. A 1cm-R0 surgical margin width has been considered to avoid local intrahepatic recurrence and optimize long-term survival after hepatic resection for colorectal cancer metastases but tumor biology is a more important predictor for intrahepatic recurrence rather than milimetres. Conclusion: Preservation of as much parenchymal volume as possible in order to minimize the risk of liver failure is required in liver resections with chemotherapeutic liver injury. Drainage of the remaining liver segments into the retrohepatic vena cava via the retrohepatic veins and communicating veins between adjacent hepatic veins may allow adequate liver outflow and remaining functional liver parenchyma in selected cases with hepatic vein invasion.

Keywords: Colorectal Neoplasms, Hepatic Veins, Hepatectomy, Liver, Neoplasm Metastasis

1. Introduction

Hepatic metastasis is the most common form of distant spread of colorectal cancer (CRC) with about 50% occurrence rate [1]. Liver resection (LR) with R0 margins is the only curative treatment and is believed to have improved the long-term out-come of these patients [1]. Because of a chemotherapeutic injury to the liver, preservation of as much

parenchymal volume as possible to minimize the risk of liver failure is the most important issue in these group of patients [2]. Patients with R0 resection of liver metastases have a 5-year survival rate of approximately 45% and a 10-year overall survival rate of 25% [3]. These results have increased efforts to optimize patients with isolated hepatic disease who are initially seemed unresectable to a technically resectable state by combining preoperative

chemotherapy, ablative techniques, surgery, portal vein embolization and staged resections [4]. Our present report describes a parenchyma preserving technique with left superior hepatectomy and segment 6 resection in a case.

2. Case Report

A 64-year-old woman presented to our institution with a colorectal liver metastasis. She had undergone an anterior resection for a nodal positive sigmoid adenocarcinoma with bilobar wide liver metastasis (pT3, N1a, M1) at 2011. Adjuvant chemotherapy had been initiated. After a 2-years period, a PET-CT scan showed solitary liver lesions in segment 2-4a and 6 (Figure 1). A left superior hepatectomy (segment 2 and 4a) and segment 6 resection was performed with glissonian approach and clamp-crush technique. (Figure 2). Left hepatic vein was ligated without blocking the venous and biliary drainage of segment 4b and segment 3. Mean operation time was 270 minutes and mean blood loss was 800cc. Pathological examination of the specimen showed tumor-free margins (R0 resection). The patient tolerated the operation well without an evidence of liver insufficiency and she was discharged on postoperative day 7. Adjuvant chemotherapy had been initiated and after 6 months, a new PET-CT scan showed no evidence of tumor recurrence (Figure 1).

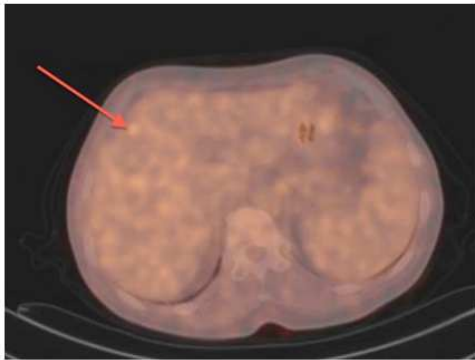


Figure 1A. Preoperative PET-CT scan shows segment 2-4a metastases in the liver (Red arrow shows metastasis).

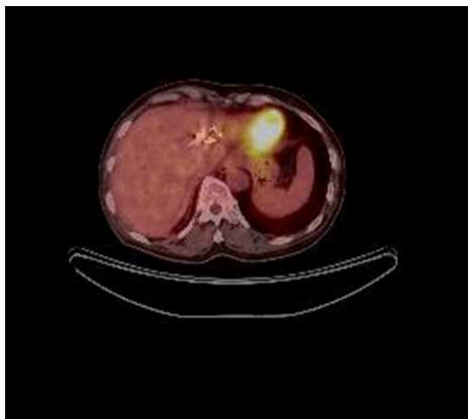


Figure 1B. Postoperative PET-CT scan shows no tumor recurrence at left superior hepatectomy location.

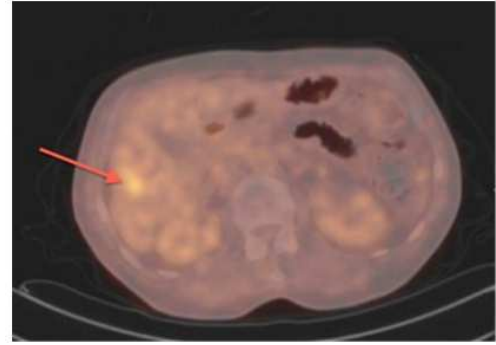


Figure 1C. Preoperative PET-CT scan shows segment 6 metastases in the liver (Red arrow shows metastasis).

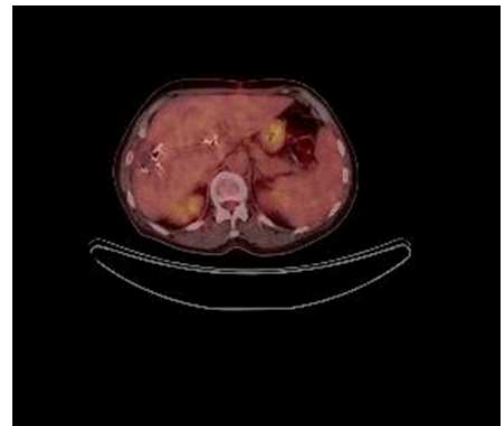


Figure 1D. Postoperative PET-CT scan shows no tumor recurrence at segment 6 resection location.



Figure 2A. Perioperative image of left superior hepatectomy.



Figure 2B. Perioperative image of segment 6 resection.



Figure 2C. Perioperative image of liver after left superior hepatectomy and segment 6 resection..

3. Discussion

Surgical resection of colorectal liver metastasis requires a precise intrahepatic anatomical information [2]. Developments in imaging modalities provide an improved visualization of hepatic segmental anatomy and also provide volumetric calculation on the liver [2]. This allows a successful planning for segmental liver resections with a minimum risk of postoperative liver failure [2]. Factors that were considered contraindications for the surgery, such as number of metastases, tumor size, synchronous metastases and the presence of extrahepatic disease, must be evaluated as prognostic factors and must not prevent these patients opportunity of being treated [5, 7]. Multidisciplinary therapies including chemotherapy, surgery, and regional therapy have alone and in combination significantly improved the survival of patients with metastatic colorectal cancer. Patient treatment should be discussed by a multidisciplinary tumor board, consisting of surgeons, medical oncologists, radiologists, and other key members [6,10]. The main consideration is to achieve a complete R0 resection [7]. A 1cm-R0 surgical margin width has been considered to avoid local intrahepatic recurrence and optimize long-term survival after hepatic resection for colorectal cancer metastases but tumor biology is a more important predictor for intrahepatic recurrence rather than millimetres [8,9]. So 1-cm rule is no longer considered as a contraindication for hepatic surgery in colorectal cancer metastases [8]. Neoadjuvant chemotherapy is reserved for marginally resectable metastases [7].

4. Conclusion

Preservation of as much parenchymal volume as possible in order to minimize the risk of liver failure is required in liver resections with chemotherapeutic liver injury. Drainage

of the remaining liver segments into the retrohepatic vena cava via the retrohepatic veins and communicating veins between adjacent hepatic veins may allow adequate liver outflow and remaining functional liver parenchyma in selected cases with hepatic vein invasion.

Consent

All the authors should confirm that the patient has given their informed consent for the case report to be published.

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