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ORIGINAL ARTICLE – HEPATOBILIARY TUMORS

Unusual Techniques for Preserving Surgical and Oncologic Safety in Hepatectomy of Advanced Adrenal Malignancy with Vena Cava and Liver Invasion

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ABSTRACT

Background. Status in terms of major vascular structure invasion is a crucial factor for successful major hepatic resection. In particular, surgery for advanced tumors with inferior vena cava (IVC) invasion is difficult and may even be dangerous for the patient, having high risk of massive bleeding and greater chance of embolic complications such as stroke, bowel ischemia, and pulmonary venous thrombosis. For such reasons, many surgeons hesitate to carry out such surgical resection, and even if they do so, may not totally remove the tumor including the part inside the IVC, achieving R1 resection. For safe and radical surgery, various surgical techniques are required. We report herein three cases of major hepatectomy with IVC invasion and discuss several surgical tips.

Patients and Methods. From March 2011 to February 2014, we retrospectively reviewed three cases of adrenal malignancy with liver and IVC invasion. Based on the severity of the malignant tumor, each case illustrates a different method to address surgical complications and maintain oncologic safety. Case 1: A 34-year-old woman was diagnosed with adrenocortical tumor during medical examination. Tumor invaded the right lobe of the liver and very close to the IVC. Fortunately, there was little thrombosis inside the IVC; we performed right hemihepatectomy and adrenalectomy, then resected the IVC wall close to the tumor and repaired the IVC side wall using 4-0 Prolene. Case 2: A 54-year-old woman who complained of abdominal discomfort visited our hospital. Abdominal computed tomography (CT) scan revealed huge adrenal mass with liver and IVC invasion. Thrombosis inside the IVC extended to the right atrium. We decided to carry out veno-veno bypass during operation in collaboration with heart surgeon. After application of veno-veno bypass, the right atrium wall was opened and the tumor thrombus removed. We then carried out right hemihepatectomy and adrenalectomy. Supra- and infrahepatic vena cava were clamped during tumor thrombectomy to prevent embolic complications. Case 3: A 51-year-old woman who complained of headache and hypertension visited our hospital and was diagnosed with huge adrenal tumor. Tumor invaded to the right lobe of the liver and encased the IVC. The tumor totally invaded the IVC, and massive bleeding was expected during dissection. We resected the tumor including IVC en bloc, and reconstructed IVC with artificial graft (Dacron) under veno-veno bypass.

Results. In case 1, there was no surgical complication. The patient was discharged 7 days postoperatively and underwent adjuvant chemotherapy (Mitotane) after discharge. Unfortunately, multiple hepatic metastases were identified 4 months after operation. She died 6 months after surgery. In case 2, there was no surgical complication after surgery. The patient was discharged 10 days postoperatively. Multiple liver and lung metastases were identified 4 months after operation, and pulmonary embolism was also diagnosed on chemotherapy. She died 16 months after operation. In case 3, the patient had no surgical complication in the immediate postoperative period and was discharged 14 days after surgery. Pheochromocytoma was confirmed in pathologic report. One month after discharge, she underwent interventional balloon dilatation due to short

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segmental collapse of suprahepatic IVC. At 42 months after surgery, she was still alive with no relapse.

Discussion. In advanced-stage malignant tumor, the conflict between achieving oncologic R0 resection and patient safety remains an unsolved issue. In particular, more advanced surgical technique is required when the tumor invades large vessels such as the vena cava. Previous reports on cases of advanced tumor invading liver and IVC have described the technical difficulties.[1,2] Wakayama et al. reported cases of successful thrombectomy under veno-veno bypass in hepatocellular carcinoma with IVC and right atrium invasion,[3] and Vicente et al.[4] reported surgical resection of IVC thrombus without cardiopulmonary bypass. Major vascular invasion of the tumor is known to be a poor prognostic factor for survival. However, some reports state that, if the tumor invades major vascular structure, complete tumor removal might be helpful for patient survival due to the biologic features of the tumor.[2,5,6] This video report does not describe any new techniques, but is more helpful for junior surgeons in educational terms. The limitation of this report is that we could not show good oncologic long-term survival after surgery. However, no fatal complications related to the surgical procedure occurred, by managing the tumor thrombus during the operation. We present three techniques with differing aggressiveness. The techniques illustrated in this video represent a good option to achieve patient surgical safety.

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