Drawback of PVE: Oncologic perspectives

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ABSTRACT

Portal vein embolization (PVE) is essential to prepare safe major hepatectomy in patients with small volume of future remnant liver (FRL). PVE has another role of expansion in surgical indication for colorectal cancer liver metastasis (CRLM) in both lobe. However, there is a drawback in oncologic perspectives. Some investigators found tumor progression after PVE. There are 2 patterns in these patients. Pattern 1 is tumor growth in embolized liver, and pattern 2 is tumor growth in nonembolized liver segments. Previous studies showed that 10-33% of patients experienced tumor growth after PVE and tumor volume after PVE increased 1.2-2.1 times compared with pre PVE state. Liver growth rate after PVE was compared between normal parenchyma and tumor portion. Tumor growth rate was faster than that of normal parenchyma after PVE and tumor growth rate after PVE was faster than those of pre PVE state and non-PVE tumor. Disease progression after PVE causes unresectable state in 6.4 - 33% of PVE patients due to extra and intrahepatic tumor progression. Recent meta-analysis showed 85% of PVE patients underwent surgery as intended and 11.3 % of 1088 patients experienced disease progression after PVE. In oncologic outcomes, early recurrence after resection in PVE patients was reported in

several studies. However, recent meta-analysis showed that recurrence free survival (OR 0.78; 95 % CI 0.42–1.44; p=0.41), overall survival (OR 0.80; 95 % CI 0.56–1.14; p=0.22) were not related with PVE. However, analysis for oncologic outcome was limitations such as aggressive tumor biology in PVE patients, invisible micrometastasis, and different responsiveness for chemotherapy. The causes of tumor growth after PVE were assumed such cytokines and growth factor including expression of TGFb, HGF, alteration in hepatic arterial flow, and cellular host response promoting local tumor growth. Based on these potential mechanism, there are strategies to reduce tumor growth after PVE. Sequential TACE and PVE is reasonable option for HCC. Neoadjuvant chemotherapy reduce disease progression during PVE period in patients with CRLM. Previous studies showed that PVE patients who were administered chemotherapy after PVE showed similar FRL hypertrophy compared with patients without chemotherapy. Furthermore, additional anti-antiogenic agent (bevacizumab) showed similar hypertrophic effect for nonembolized liver segments after PVE. In conclusion, 10-30% patients experienced tumor progression after PVE through various potential pathways. Despite tumor progression after PVE, it is essential to prepare safe major hepatectomy in patients with small volume of FRL. Preoperative chemotherapy with bevacizumab does not impair liver regeneration after PVE. Further research should focus on stratifying high risk patients and identifying tumor biology.