

Liver Cancer and Cirrhosis: Expanding the Limits of Resectability with Novel Surgical Techniques - The Associating Liver Partition and Portal Vein Ligation for Staged Hepatectomy Approach

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Liver cirrhosis has an annual incidence rate of around 14–26/100,000 inhabitants and approximately 170,000 people die from complications of cirrhosis per year. It is a well-known risk factor for the development of hepatocellular liver cancer.^[1]

A significant percentage of patients with liver cirrhosis will presumably need surgical treatment at some point, due to the development of primary or secondary liver cancer. Due to their impaired liver capacity and the consecutive increased morbidity and mortality, these patients are stratified in prognostic subgroups, according to the grade of cirrhosis. This is reflected in the Child–Pugh–Turcotte system score or the model for end-stage liver disease (MELD) score. Currently, the Barcelona clinic liver cancer classification (BCLC) recommends non-operative management in all cirrhotic patients except for the ones with child a cirrhosis and no signs of portal hypertension. However, over the past two decades, the advances of chemotherapy regimens and the development of new surgical approaches have expanded the limits of resectability. When a curative R0 liver resection is undertaken, one of the main purposes is the preservation of an adequate future liver remnant (FLR) to avoid post-operative liver failure. For patients with a normal liver function, an FLR of over 25% is adequate. For patients with cirrhosis though, and in the absence of portal hypertension, an FLR of at least 40% is required. The associating liver partition and portal vein ligation for staged hepatectomy (ALPPS) approach is a relatively novel surgical technique that induces

a considerable hypertrophic response that peaks in a period of only 10 days and renders a major liver resection feasible in the most challenging cases.^[1–3]

According to current literature, ALPPS has been reported to be feasible in cirrhotic patients and induces a significant increase in FLR within a short period of time. This allows completion of the two-staged strategy and reduces the possibility of cancer regression as opposed to the PVE technique used until nowadays.^[4,5]

Cirrhotic patients classified as BCLC Stage B or C has successfully been treated with ALPPS with better outcomes compared to the conventional medical treatment such as sorafenib. Extensive hypertrophy was induced in patients with low-grade fibrosis while a smaller degree of hypertrophy was observed in cirrhotic livers.^[4,6]

Nonetheless, a MELD score of more than 10 before Stage 2 has been shown to be a predictive risk factor for adverse outcome. Patient age over 60 years is another risk factor for reduced overall survival. In addition, the increased morbidity and mortality of this surgical procedure urge to cautiously select the patients (whether cirrhotic or not cirrhotic) that can and will ultimately benefit from it.^[2,4,6] New, less aggressive hybrid techniques that maintain the principles of ALPPS (such as laparoscopic ALPPS or radiofrequency assisted ALPPS) may alter the prevailing balances and render the technique feasible for the most challenging cases.^[6]

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In conclusion, ALPPS is a novel surgical technique for resection of liver cancer that has divided the medical community with its conflicting results. The possibility to treat patients with unresectable liver cancer is counterbalanced by its increased morbidity and mortality. Early data on long-term oncologic outcomes are promising. ALPPS seems to be able to expand the limits of liver cancer treatment.^[2,3,6]

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