

ALPPS Procedure. The New Frontier in Advanced Liver Surgery. Single Centre Experience and Literature Review

Adrian Hotineanu, Serghei Burgoci, Eduard Bortă
Department of Surgery No. 2, Nicolae Testemitanu State University of Medicine and Pharmacy,
Chişinău, Republic of Moldova

Abstract

Introduction: Presentation of the first experience of a liver surgery center in applying an innovative procedure - ALPPS (Associating Liver Partition and Portal vein ligation for Staged hepatectomy) for massive liver tumors. This method has been performed in the surgery clinic 2 since 2018 in patients with massive primary or metastatic liver tumors, whose future residual liver volume is considered too small to perform curative liver resection safely. Until recently, these conditions assigned large tumors occupying more than 75-90% of the liver to the group of unresectable tumors. Prospectively, the ALPPS procedure was evaluated to convert unresectable liver tumors due to the small residual liver volume into resectable ones. Literature data were systematically reviewed using PubMed, Scopus, Google Scholar.

Materials and methods: Since June 2018, 18 ALPPS procedures were performed in patients aged 62 ± 8 years. Indications for surgical resection were liver metastases of colorectal cancer in 7 cases, perihilar cholangiocarcinoma in 4 cases, hepatocellular carcinoma in 6 cases, and GIST metastases 1 case. From the literature data we analyzed articles from 2014 to 2019.

Results: Residual liver volume was calculated on CT angiography using the program included in the Siemens[®] machine software and was 252 ± 115 ml ($19.4 \pm 6.2\%$) before ALPPS-1 and 542 ± 165 ml ($30.7 \pm 6.5\%$) before ALPPS-2 ($P < 0.001$). The increase in residual liver volume between the two procedures was $60.4 \pm 38\%$ (range: 31-110%, $P < 0.001$). The mean time between the first and second procedure was 9.4 ± 2.3 days. Average hospital stay was 28.4 ± 9.2 days. Postoperative morbidity 34.8%, mortality 0. Survival at 18 months was 100%.

Conclusion: The ALPPS technique allows us to increase the resectability rate in patients with initially unresectable liver tumors with favorable postoperative outcomes. Careful selection of patients for a major complex procedure such as ALPPS allowed us to avoid postoperative mortality. Liver cirrhosis, cholestasis, and intraoperative hemorrhage are major factors for the development of postoperative morbidity.

Key words: unresectable liver tumors, residual liver volume, liver volumetry, liver resection, right portal vein ligation, post-hepatectomy liver failure