

Parenchyma Sparing ALPPS – Ultrasound Guided Partition Through Segment 4 to Maximize Resectability (with video)

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Abstract

Background: Associating liver partition and portal vein ligation (ALPPS) has evolved as a treatment strategy for patients with liver tumors who are not amenable for upfront hepatectomy because of an insufficient future liver remnant (FLR). Aim of this study was to test the applicability of ultrasound guided parenchyma sparing surgery to ALPPS concept, by non-anatomically shifting the plane of transection in favor of FLR, resulting in a new technical variant of ALPPS, entitled parenchyma sparing ALPPS (psALPPS).

Materials and Methods: Patients who could not safely undergo right trisectionectomy ALPPS because of insufficient FLR were considered eligible for psALPPS, consisting in liver partition through segment 4 using ultrasound guidance.

Results: Between April 2017 and April 2021, five patients with median age of 68 years (range: 66-78), four male and one female, underwent psALPPS for colorectal liver metastases (N=2), intra-hepatic cholangiocarcinoma (N=2), and hepatocellular carcinoma (N=1). Standardized FLR (sFLR) for segments 2-3 before stage 1 surgery would have been a median of 11.6%. PsALPPS could double the sFLR at stage 1 resulting in an increase of ps-sFLR from a median of 22.7% (at stage 1) to 34.0% (at stage 2) after a median interstage interval of 15 days. All patients tolerated surgery well and no major complications were recorded.

Conclusions: Applying the principles of parenchyma sparing surgery to ALPPS offers the advantage to maximize FLR and simultaneously reduce ischemic injury of segment 4 compared to conventional ALPPS. In this way, psALPPS may markedly increase resectability while reducing morbidity.

Key words: two stage liver resection, parenchymal sparing liver resection, ALPPS, future liver remnant, regenerative surgery