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## Laparoscopic Versus Open Anatomical Liver Resection For Hepatocellular Carcinoma: A Systematic Review And Meta-Analysis

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**Background** : Open anatomical liver resection (OALR) has been accepted as an effective and oncologically safe treatment for hepatocellular carcinoma (HCC). However, studies on laparoscopic anatomical liver resection (LALR) are still lacking. Although laparoscopic left lateral sectionectomy (LLS) has been accepted as a safe LALR for HCC, further researches on other LALRs are still needed. This study analyzed and compared pooled short- and long-term outcomes of LALR and OALR for HCC.

**Methods** : Comprehensive literature searches were performed in PubMed, Embase, and Cochrane library and manual searches for studies published until July 2021 on analyzing LALR versus OALR for HCC. Pooled risk ratios (RR) and weighted mean differences (WMD with 95% confidence intervals (95% CI) were calculated using either the random effects model.

**Results** : Eighteen studies with total 1812 patients (LALR 760, OALR 1052) were included in this meta-analysis. In short-term outcomes, LALR had longer operation time (WMD 64.14, 95% CI [30.70, 97.57],  $p=0.0002$ ) but had less blood loss (WMD -143.46, 95% CI [-229.34, -57.57],  $p=0.001$ ), morbidity (RR 0.63, 95% CI [0.53, 0.75],  $p<0.0001$ ), and hospital stays (WMD -3.25, 95% CI [-4.73, -1.77],  $p<0.001$ ) than OALR, and there was no significant difference in transfusion rate, tumor size, resection margin, R0 resection rate, and severe morbidity (Clavien-Dindo grades III & IV). In long-term outcomes, the hazard ratio (HR) of both overall survival (OS) (HR 0.79, 95% CI [0.63, 0.99],  $p=0.04$ ), and disease free survival (DFS) (HR 0.82, 95% CI [0.69, 0.97],  $p=0.02$ ) of pooled data of 18 studies showed that LALR group had a higher long-term survival than the OALR group.

**Conclusions** : Major and minor LALR should be accepted for the treatment of HCC in terms of clinical advantages of short- and long-term outcomes.

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