Long-term perioperative outcomes of pure laparoscopic liver resection versus open liver resection for hepatocellular carcinoma: a retrospective study


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Background

Laparoscopic treatment for hepatocellular carcinoma (HCC) has increased. We retrospectively compared the perioperative and long-term oncological outcomes of laparoscopic liver resection (LLR) with those of open liver resection (OLR) for hepatocellular carcinoma (HCC) in well-matched patient groups using propensity score matching (PSM).

Methods

We reviewed medical records of patients with HCC who underwent liver resection between July 2007 and April 2016 at our center. In total, 2335 patients were included in this study and divided into LLR (n=264) and OLR (n=2071) groups. For group comparisons, 1:2 PSM was used with covariates of baseline characteristics, including tumor characteristics and surgical liver resection procedures.

Results

Operative details of patients who underwent LLR and OLR after propensity score matching

<table>
<thead>
<tr>
<th>LRR</th>
<th>OLR</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoperative clinical stage (M)</td>
<td>6 (20)</td>
<td>5 (20)</td>
</tr>
<tr>
<td>ALP (IU/L)</td>
<td>297.7 (351.47)</td>
<td>287.7 (360.17)</td>
</tr>
<tr>
<td>ALT (IU/L)</td>
<td>203.5 (264.13)</td>
<td>203.6 (360.17)</td>
</tr>
<tr>
<td>Total bilirubin (mg/dL)</td>
<td>1.48 (3.18)</td>
<td>1.50 (4.16)</td>
</tr>
<tr>
<td>Rightsided (n, %)</td>
<td>203.7 (46.47)</td>
<td>201.7 (45.04)</td>
</tr>
<tr>
<td>Blood transfusion (n, %)</td>
<td>0.80 (1.8)</td>
<td>0.80 (1.8)</td>
</tr>
<tr>
<td>Proliferating activity (n, %)</td>
<td>0.80 (1.8)</td>
<td>0.80 (1.8)</td>
</tr>
<tr>
<td>Operative time (min, mean±SD)</td>
<td>233.97 (299.18)</td>
<td>233.97 (299.18)</td>
</tr>
<tr>
<td>Maximum pain score (VIA)</td>
<td>6.8 (4.3)</td>
<td>6.8 (4.3)</td>
</tr>
<tr>
<td>Hospital stay (days, mean±SD)</td>
<td>6.6 (4.6)</td>
<td>6.6 (4.6)</td>
</tr>
<tr>
<td>Resection margin, R0:R1</td>
<td>2.4 (1.4)</td>
<td>2.4 (1.4)</td>
</tr>
<tr>
<td>Postoperative complications (n, %)</td>
<td>3 (1.17)</td>
<td>2 (0.9)</td>
</tr>
<tr>
<td>Aspergillus</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Postoperative bleeding</td>
<td>0 (0)</td>
<td>0 (0)</td>
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<tr>
<td>Liver abscess</td>
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<td>0 (0)</td>
</tr>
<tr>
<td>Risk Index</td>
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<td>2 (0.8)</td>
</tr>
<tr>
<td>Formal vascular resection</td>
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<td>0 (0)</td>
</tr>
<tr>
<td>Portal vein reconstruction</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Perioperative blood loss, mL (mean±SD)</td>
<td>225.19 (276.15)</td>
<td>225.19 (276.15)</td>
</tr>
<tr>
<td>Intraabdominal fluid collection</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Bili</td>
<td>1.0 (0.0)</td>
<td>1.0 (0.0)</td>
</tr>
<tr>
<td>INR</td>
<td>1.0 (0.0)</td>
<td>1.0 (0.0)</td>
</tr>
<tr>
<td>ASA classification</td>
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<td>1 (0.2)</td>
</tr>
<tr>
<td>Thrombocytopenia</td>
<td>0.0 (0)</td>
<td>0.0 (0)</td>
</tr>
<tr>
<td>Delirium</td>
<td>1 (0.2)</td>
<td>1 (0.2)</td>
</tr>
<tr>
<td>Apneic oxygenation</td>
<td>1 (0.2)</td>
<td>1 (0.2)</td>
</tr>
<tr>
<td>Other failure</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Child–Baltimore grade (CBG)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>HAI</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>IGR</td>
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<td>1.0 (0.0)</td>
</tr>
<tr>
<td>V</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>CO2 (mmHg)</td>
<td>1.0 (0.0)</td>
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Operative details of patients with cirrhosis who underwent LMH and OMH after propensity score matching

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Survival rates of the entire cohort. Overall survival rates (A) and recurrence-free survival rates (B) of the PSM patients from the entire cohort.

Conclusion

Long-term oncological outcomes were comparable between LLR and OLR for selected patients. LLR was associated with many benefits, even for selected patients with cirrhosis who underwent major hepatectomy. LLR for HCC performed by an experienced surgeon could be considered a safe and feasible alternative to OLR for selected patients.