Laparoscopic Liver Resection

Ten year experience in one center

Tran Cong Duy Long MD.
Nguyen Hoang Bac MD.

University Medical Center Ho Chi Minh City Vietnam
Laparoscopic Liver Resection in UMC Ho Chi Minh City Vietnam

- The development progress
- Surgical techniques
- Short and long-term results
Laparoscopic Liver Resection

Surgical techniques
Technical demanding in liver resection

Inflow control

Total inflow control
Selective inflow control

Outflow control

Low CVP (Anesthesiologist assistance)
IVC Clamping

Parenchymal transection

Surgical instrument, energy devices,…
Surgeon experience, skill…
Total inflow control - Pringle maneuver

- Decrease blood supply
- Minimize bleeding
- Total liver ischemia
- Non-anatomic liver resection
Hemi inflow control

- No dissection in liver hilus
- Decrease post-op ascites
- Selective inflow control
- Minimize remnant ischemia

Simple and effective for peripheral tumor in cirrhotic liver
Technical innovation

Left lateral Sectionectomy
Innovation in the technique

Segmentectomy 3
Technical innovation

Left Medial Sectionectomy
Laparoscopic Major Hepatectomy...?

Liver hilar dissection
Glissonean structures
Technical innovation
Liver Hilar Dissection

Extrahepatic Approach
  Intra Glissonian Dissection
  Individual ligation
Intrahepatic Approach
  Extra Glissonian Dissection

How’s … in laparoscopic techniques?
Intra Glissonean Dissection
Individual ligation

Isolating Portal Vein, Artery and Bile duct
  Time consuming
  Avoiding complication
  (Abnormal variation)
  Increasing ascites
Anatomical Sectionectomy ?
  Segmentectomy ?

Suitable for Right or Left Anatomic Hepatectomy
Extra Glissonean Approach
Right hepatectomy

University Medical Center - Ho Chi Minh - Vietnam
Extra Glissonean Approach
Left hepatectomy

University Medical Center - Ho Chi Minh - Vietnam
Parenchymal-sparing liver resection
Laparoscopic Anatomic Sectionectomy

University Medical Center - Ho Chi Minh - Vietnam
Technical innovation

Right Anterior Sectionectomy

University Medical Center - Ho Chi Minh - Vietnam
Laparoscopic right posterior sectionectomy

Right posterior Glissonean pedicle clamping

Anatomical transection plane
Laparoscopic liver resection
Extra Glissonean Dissection

Minimizing liver hilus dissection
Decreasing ascites
Avoiding complication (Anatomic variation)

Selecting inflow control
(Sectors Gilssonean pedicles)
Identifying sector limitation
Performing Anatomic Resection
Minimize bloodloss
Better oncologic results
Extra-Glissonean Approach

Feasible and effective

in laparoscopic liver resection technique

University Medical Center in Ho Chi Minh - Vietnam
How to do
Liver parenchymal transsection

Criteria steps of technique

• Selective Glissonean pedicle occlusion
• Low CVP maintenance
• Anatomical transection
  
  Intersegmental plane

• Caudate approach
Laparoscopic liver resection

Caudate approach

“…to the liver hilum and IVC”

(Source: Wakabayashi et al)
How to do liver parenchymal transection…

• **Instruments**

  Harmonic scalpel

  CUSA

  Bipolar

  Hem o lok

  Stapler
Recent cases...
with a tumor located in caudate lobe
Lap caudate lobectomy
Laparoscopic Liver Resection

Short and long term results
Our result of Lap liver resection

From Jan, 2007 to Jun, 2014

275 patients
Indicated for Lap Liver Resection

04 cases
Diagnostic Lap

260 cases
Lap Liver Resection

11 cases
Conversion
Patients features

Tumor size

Mean tumor size: 3,85 cm.
(1 cm, 12 cm)

Stage of disease, BCLC classification

Very early  (BCLC 0): 13,8%
Early      (BCLC A): 65,0%
Intermediate (BCLC B): 21,2%
<table>
<thead>
<tr>
<th>Type of resection</th>
<th>Quantity</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>One segment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Segment II</td>
<td>11</td>
<td>4.2</td>
</tr>
<tr>
<td>Segment III</td>
<td>11</td>
<td>4.2</td>
</tr>
<tr>
<td>Segment IV</td>
<td>14</td>
<td>5.4</td>
</tr>
<tr>
<td>Segment V</td>
<td>22</td>
<td>8.5</td>
</tr>
<tr>
<td>Segment VI</td>
<td>51</td>
<td>19.6</td>
</tr>
<tr>
<td>Segment VII</td>
<td>7</td>
<td>2.7</td>
</tr>
<tr>
<td>Segment VIII</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>Two segments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posterior sector</td>
<td>9</td>
<td>3.5</td>
</tr>
<tr>
<td>Anterior sector</td>
<td>7</td>
<td>2.7</td>
</tr>
<tr>
<td>Segment V &amp; VI</td>
<td>20</td>
<td>7.7</td>
</tr>
<tr>
<td>Left lateral sector</td>
<td>82</td>
<td>31.5</td>
</tr>
<tr>
<td>Three segments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left liver</td>
<td>13</td>
<td>3.0</td>
</tr>
<tr>
<td>Central hepatectomy</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>Four segments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right liver</td>
<td>9</td>
<td>3.5</td>
</tr>
<tr>
<td>Total</td>
<td>260</td>
<td>100</td>
</tr>
</tbody>
</table>
Safety of laparoscopic liver resection

Overall complications: 13 patients (5 %)

<table>
<thead>
<tr>
<th>Complications</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>247</td>
<td>95,0</td>
</tr>
<tr>
<td>Bile leakage</td>
<td>2</td>
<td>0,77</td>
</tr>
<tr>
<td>Ascites</td>
<td>4</td>
<td>1,54</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>2</td>
<td>0,77</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>2</td>
<td>0,77</td>
</tr>
<tr>
<td>Pleural effusion</td>
<td>3</td>
<td>1,15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>260</td>
<td>100</td>
</tr>
</tbody>
</table>

Clavien-Dindo Classification: I (8 patients), II (2 patients)
- IIIA: 1 patient with pleural effusion → Thoracentesis
- IIIB: 2 post op hemorrhage → Reoperation

No mortality
The disease-free survival rate after 1, 3, 5 year were 79.3%, 56.0%, 46.8%.

The overall survival rate after 1, 3, 5 year were 96.4%, 78.7%, 77.3%.

The Survival results were comparable with open surgery.
Summary

With experience in performing
Laparoscopic liver resection

- Feasible and safe
- Optimal technique
  - Extra Glissonean pedicle dissection
  - Caudate approach
- Extended Indication: major, central liver resection
- Oncologic results: comparable with open surgery