World Practices: Parenchyma section
On the one hand laparoscopy does reduce the bleeding...
Early and Long-term Oncological Outcomes After Laparoscopic Resection for Colorectal Liver Metastases

A Propensity Score-based Analysis

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<table>
<thead>
<tr>
<th>Variables</th>
<th>OA Group</th>
<th>LA Group</th>
<th>Estimated Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early outcomes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade III-V complications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>103</td>
<td>134</td>
<td>0.27 0.14–0.51</td>
</tr>
<tr>
<td>Y</td>
<td>50</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Inhospital transfusions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>104</td>
<td>131</td>
<td>0.33 0.18–0.59</td>
</tr>
<tr>
<td>Y</td>
<td>49</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>90-day mortality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>147</td>
<td>150</td>
<td>0.49 0.12–1.99</td>
</tr>
<tr>
<td>Y</td>
<td>6</td>
<td>3</td>
<td></td>
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</tbody>
</table>
On the other hand, bleeding is the main fear...

Open 12.6%

Lap 11.5%

>2,000 ml
The question is not whether an hemorrhagic accident will happen but when?

<table>
<thead>
<tr>
<th>1</th>
<th>... When to think to it and how to prevent it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>... How to manage it?</td>
</tr>
</tbody>
</table>
When to think to it?

- Cirrhosis
- Chemotherapy SOS - CASH
- NASH
When to think to it?

Prospective database of 627 resections
1 point = OT ≥ 190 min, blood loss ≥ 100 ml or conversion rate ≥ 4.2%

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ante Wedge</td>
<td>Post Wedge</td>
<td>Left Lateral</td>
</tr>
<tr>
<td>N</td>
<td>94</td>
<td>59</td>
<td>38</td>
</tr>
<tr>
<td>Operative time</td>
<td>120</td>
<td>172</td>
<td>135</td>
</tr>
<tr>
<td>Blood loss</td>
<td>0</td>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td>Conversion</td>
<td>0%</td>
<td>1.7%</td>
<td>0%</td>
</tr>
<tr>
<td>Score</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Anterior: 2, 3, 4b, 5, 6
Posterior: 1, 4a, 7, 8

Kawaguchi Ann Surg 2017
When to think to it?
How to prevent it?

> Patient medical history, pathology and tumors, liver function…

> Selection of cases according to your own experience +++

> Respect and knowledge of individual anatomy

Wang World J Gastro 2006

Systematic review of the use of pre-operative simulation and navigation for hepatectomy: current status and future perspectives
Hallet J, Gayet B, Tsung A, Wakabayashi G, Pessaux P, 2nd ICC.

How to prevent it?

Individual anatomy, simulation, navigation, virtual endoscopy
<table>
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<th>Hemorrhagic accident…</th>
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<tbody>
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<tr>
<td>2</td>
<td>… how to manage it?</td>
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</tbody>
</table>
Reducing bleeding during transection:

- A liver Surgeon
- An advanced Laparoscopist
- An Ultrasonographer
- Using a safe hemostatic parenchymal dissection: Your technique!
A safe dissection for anatomical LR? Follow the veins

Left Hepatectomy extended to segment 1

Scissors
Bipolar
Ultrasound scissors
Right angle
Clips
Suction + bipolar
Stappler + vascular clamp
Cusa, Ligasure, Forceps for Kellyclasy, Needle holder…
Inflow control

Pringle maneuver intermittent or continuous, tape or clamp, global or artery

Modified Pringle Maneuver for Laparoscopic Liver Resection

Takesu Nomi, MD, PhD, David Fuku, MD, PhD, Aditya Agrawal, MD, Mahendran Govindasamy, MD, Kenichiro Araki, MD, PhD, and Brice Gayet, MD, PhD

Cochrane Review 2009
How to manage it?

Bipolar forceps: stop coagulating after removal!
How to manage it?

Bipolar forceps: direct contact “one touch”
How to manage it?

Compression and/or Fibrillar Surgicel®

Control of bleeding during laparoscopic hepatectomy:
Compression of liver parenchyma
How to manage it? With calm!

Vascular clamp and stapling or suturing

Hemostasis by vascular clamp
Bipolar: clean, “open”, removed when still active on a clear field.
How to manage it?
Conclusion

No LLR if you are not a laparoscopic AND liver surgeon

In order to manage a hemorrhagic event during a laparoscopic hepatectomy, you must

  Know how to anticipate
  Know how to prevent: know and follow the rules (Veins!!)
  Know how to manage
  Convert safely (no active massive bleeding!)