How to perform a safe right hepatectomy

Olivier Soubrane
Dpt of HPB Surgery and Liver Transplant
Beaujon Hospital
Clichy, France
Disclosure

Fee from Integra Lifesciences for ILLS lecture
The risk of right hepatectomy

Safety: do no harm

Literature:
• Mortality: 1–4%
• Morbidity:
  – Overall: 30-60%
  – Severe (grade 3-4): 10-30%

Benchmark of RH in live healthy donors:

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<table>
<thead>
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<tbody>
<tr>
<td>Mortality</td>
<td>0.02%</td>
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<tr>
<td>Morbidity</td>
<td>12%</td>
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<td>3.8%</td>
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Poon et al, Ann Surg 2004
Kamiyama et al, J Am Coll Surg 2010
Dokmak et al, HPB 2013
The main risk of liver surgery

Hemorrhage and allogeneic transfusions:
- Increase morbidity
  - Bacterial sepsis
  - Organ-system failure
- Increase tumor recurrence
- Decrease patient survival

Control blood loss is a key-point for safety
Facts for reducing blood loss...

- EBM (+++) level 1b
  - Anterior approach (Liu Ann Surg 2006)
  - Low CVP (Wang, World J Gastroenterol, 2006)
  - Hypoventilation (Hasegawa Arch Surg 2002)
  - Intermittent clamping (Cochrane Review 2009)

- Laparoscopic approach (level 2)
  - Pneumoperitoneum (Croome, Arch Surg 2010)
The caudal approach: a standardized right hepatectomy based on facts

- Target: limit blood loss and morbidity
- Association of evidence-based facts to limit blood loss
- Oncologic rule: "no touch" technique

Four steps:
1. Inflow control
2. Transection
3. Mobilization
4. Externalization

Caudal approach... 

- Caudal view
- Magnified vision
- Meticulous dissection
- Pneumoperitoneum pressure

Tomishige et al. World J Gastrointest Surg, 2013
The caudal approach

Patient position
Port sites
Devices and instruments

Bipolar + Cusa

86% of 5202 donor hepatectomies use CUSA
1. Inflow control

- Intra-fascial control of the right portal pedicle
  - Oncologic advantage
  - Delineation of Cantlie line
- Intermittent Pringle on demand
1. Inflow control

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**Four steps:**
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4. Externalization
2. Parenchymal transection

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• CUSA
  – Liver “excavation” (G. Honda)
• Bipolar coagulation
  – The “rescue instrument” (B. Gayet)
• Meticulous dissection of HV
  – “we do not harm what we see” (G. Wakabayashi)
2. Parenchymal transection

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- **CUSA**
  - Liver “excavation” (G. Honda)

- **Bipolar coagulation**
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- **Meticulous dissection of HV**
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Four steps:
1. Inflow control
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• Control of the right bile duct
• Section of segment 1
• Adapt closure method to hilar plate thickness
2. Parenchymal transection

Four steps:
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- Control of the right bile duct
- Section of segment 1
- Adapt closure method to hilar plate thickness
2. Parenchymal transection

- Dissection of RHV
- Stapling is safe

Four steps:
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Four steps:
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• Be prepared to manage complications
• Vascular clamp in the room
• Stitching is better than converting
3. Right liver mobilization

- Section of right triangular ligament
- Devascularized right liver
- Oncologic safety

Four steps:
1. Inflow control
2. Transection
3. Mobilization
4. Externalization
4. Specimen externalization

- Remote incision
- 15mm trocar
- Big bag
4. Specimen externalization

- Remote incision
- 15mm trocar
- Big bag
Conclusions (1)

• Safety of lap right hepatectomy can be obtained by:
  – Technical standardization: caudal approach in 4 steps
  – Limiting blood loss by inflow control and
  – Meticulous parenchymal section
  – No touch technique for oncologic safety
Conclusions (2)

• The caudal approach is the standardized laparoscopic version of the anterior approach from open surgery

• It may provide the safest method for right hepatectomy