Update in abdominal Surgery in cirrhotic patients

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Cirrhosis

- Prevalence in France (1%)*

- Patients had better survival
  - Better management of the underlying disease
  - Better management of the complications
    - Portal hypertension
    - Hepatocellular carcinoma

* Inserm data, Novembre 2012 in collaboration with Dr Richard Moreau, inserm unity 773, university paris VII, Beaujon hospital
10% of cirrhotic can need surgery

Surgery in cirrhotic

- Hepatic surgery
- Extra hepatic surgery
  - Intraabdominal
  - Extraabdominal
- Surgery of the proper complications of cirrhosis
  - Parietal surgery
  - Ascites

Surgery in cirrhotic patients = associated with increased mortality and morbidity
Why high morbidity and mortality?

- Altered liver function
  - Coagulation abnormalities
  - Platelet dysfunction
- Associated comorbidities
  - Cardiovascular
  - Pulmonary
  - Renal
  - Diabetes
  - Malnutrition with the risk of infection

Simple umbilical hernia repair can decompensate the liver function leading to liver transplantation

Belghiti J et al, Rapport AFC 1993
Douard R et al, Gastroenterol Clin Biol 2009
Increased mortality after extrahepatic surgery

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Number</th>
<th>Mortality</th>
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<tbody>
<tr>
<td>Ziser A et al</td>
<td>1999</td>
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<td>Farsworth N et al</td>
<td>2004</td>
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<td>Del Olmo JA</td>
<td>2003</td>
<td>135</td>
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<td>Befeler AS</td>
<td>2005</td>
<td>53</td>
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<td>Neeff H</td>
<td>2011</td>
<td>138</td>
<td>28%</td>
</tr>
<tr>
<td>Kim DH</td>
<td>2014</td>
<td>79</td>
<td>24%</td>
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</table>

Mean = 20% (11-28)
Mortality is more increased with urgent surgery compared to elective

<table>
<thead>
<tr>
<th>Author</th>
<th>year</th>
<th>urgent</th>
<th>elective</th>
<th>p</th>
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<tbody>
<tr>
<td>Carbonell AM</td>
<td>Hernia 2005</td>
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<tr>
<td>Farsworth N</td>
<td>Am J Surg 2004</td>
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<td>Neeff H</td>
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<td>47%</td>
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<td>Nguyen GC</td>
<td>Dis Colon Rectum 2009</td>
<td>9%</td>
<td>2%</td>
<td>P&lt;0,0001</td>
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</table>
Main risk factors for postoperative mortality

**The patient**
- Male gender
- Age > 70 year
- Associated comorbidities

**The liver**
- Child score
- MELD score
- ASA score
- Ascites
- Bilirubin >1.5mg/dl
- Albumin level <3mg/dl
- Sodium <130

**The surgeon**
- Intraoperative hypotension
- Blood transfusion
- Blood loss > 150ml
- Hemoglobin level <10g/dl
- Transfusion
- Duration of surgery

**Liver function**
- Patient selection
- Surgical safety
## Classification Child Turcotte Pugh (CTP)

**Two parameters are subjective!**

<table>
<thead>
<tr>
<th></th>
<th>1 pt</th>
<th>2 pt</th>
<th>3 pt</th>
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<tbody>
<tr>
<td>Encephalopathy</td>
<td>absent</td>
<td>confusion</td>
<td>coma</td>
</tr>
<tr>
<td>Ascites</td>
<td>absent</td>
<td>discreet</td>
<td>mild</td>
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<tr>
<td>Bilirubin</td>
<td>&lt;35</td>
<td>35-50</td>
<td>&gt;50 µmol/L</td>
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<tr>
<td>Albumin</td>
<td>&gt;35</td>
<td>28-35</td>
<td>&lt;28 g/L</td>
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<td>PT (%)</td>
<td>&gt;60</td>
<td>35-60</td>
<td>&lt;35</td>
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</table>

- **Child A**: score 5-6
- **Child B**: score 7-9
- **Child C**: score 10-15

## MELD score (only objective parameters)

- Serum bilirubin
- Creatinine
- International normalized ratio (INR)
For selection! CTP or MELD score?

<table>
<thead>
<tr>
<th>Author</th>
<th>Journal, year</th>
<th>CTP</th>
<th>MELD</th>
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</thead>
<tbody>
<tr>
<td>Farnsworth N et al</td>
<td>Am J Surg 2004</td>
<td>similar</td>
<td>Similar better in urgent situation</td>
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<tr>
<td>Befeler AS et al</td>
<td>Arch Surg 2005</td>
<td></td>
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<tr>
<td>Teh et al</td>
<td>Gastroenterology 2007</td>
<td></td>
<td>better</td>
</tr>
<tr>
<td>Kim DH et al,</td>
<td>ANZ J Surg 2014</td>
<td></td>
<td>better</td>
</tr>
<tr>
<td>Neeff H</td>
<td>J Gastrointest Surg 2011</td>
<td></td>
<td>better</td>
</tr>
</tbody>
</table>

Both are complementary

- CTP (ascites and encephalopathy)
- MELD (renal function)
Risk Factors for Mortality After Surgery in Patients With Cirrhosis

Major digestive, orthopedic and cardiac surgery (n=772) compared to patients with cirrhosis undergoing minor surgical procedure (n=303) or ambulatory (n=562)

Limit = MELD score at 8

Teh SH et al, Gastroenterology, 2007
Increased mortality with advanced Child score

<table>
<thead>
<tr>
<th>Author, journal</th>
<th>Number</th>
<th>Child (A)</th>
<th>Child (B)</th>
<th>Child (C)</th>
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</thead>
<tbody>
<tr>
<td>Mansour A et al, Surgery 1997</td>
<td></td>
<td>10%</td>
<td>30%</td>
<td>82%</td>
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<tr>
<td>Telem DA et al, Clin Gastroenterol Hepatol 2010</td>
<td>100</td>
<td>2%</td>
<td>12%</td>
<td>12%</td>
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<tr>
<td>Neeff H et al, J Gastrointest Surg 2011</td>
<td>138</td>
<td>10%</td>
<td>17%</td>
<td>63%</td>
</tr>
</tbody>
</table>

Biases: More urgent surgery in patients with Child C!
Other parameters
Liver atrophy

Child A liver cirrhosis
No liver atrophy
Major liver resection possible

Child A liver cirrhosis
Liver atrophy
Minor liver resection not possible
Other parameters!

- **Platelet**
  - Essentiel for liver regeneration (Lesurtel M et al, Science 2006)

- **In liver surgery**
  - Platelet $< 100,000 = \text{increased post operative morbidity}$ (Jarnagin WR et al, Ann Surg 2002)

- **Platelet $< 73,000 = \text{Increased mortality (25\%)}$** (Kaneko K et al, World J Gastroenterology 2005)
How to select for surgery?

Surgery in cirrhotic

Child A, MELD < 8
Surgery is feasible

Child B, MELD (8-14)
Surgery can be feasible
Minor or major surgery
Optimisation
the liver function
the patient
the surgery

Child C, MELD >14
Surgery is contraindicated
Elective surgery

• **Optimisation of the liver function**
  
  – Treatment of the underlying disease
  – Downstaging the child or MELD score
  – Treatment of portal hypertension
    • Surgical shunts (no more indicated)
    • TIPS

• **Optimisation of the patient**

  – Associated comorbidities
  – Good patient and disease selection

• **Optimisation of the surgery**

  – Safe and non haemorrhagic
  – Benefit of the laparoscopic approach
## TIPS before extrahepatic surgery

- Reduces porto-systemic gradient
- Less bleeding
- Less risk of ascites

<table>
<thead>
<tr>
<th>Author</th>
<th>Journal, year</th>
<th>number</th>
<th>Feasibility</th>
<th>Mortality</th>
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<tbody>
<tr>
<td>Azoulay D et al</td>
<td>JACS, 2001</td>
<td>7</td>
<td>86%</td>
<td>14%</td>
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<td>Gil A et al</td>
<td>EJSO, 2004</td>
<td>3</td>
<td>100%</td>
<td>0%</td>
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<tr>
<td>Vinet E et al,</td>
<td>Can J Gastroenterol, 2006</td>
<td>18</td>
<td></td>
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<tr>
<td>Schlenker C et al</td>
<td>Surg Endosc, 2009</td>
<td>7</td>
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<td>Kim JJ et al</td>
<td>J Clin Gastroenterol, 2009</td>
<td>25</td>
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<td>26%</td>
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<tr>
<td>Lian L et al,</td>
<td>Dis Colon Rectum, 2012</td>
<td>2</td>
<td>100%</td>
<td>0%</td>
</tr>
</tbody>
</table>
TIPS: no benefit!

18 patients with TIPS
17 patients without TIPS
CTP was higher in the TIPS group (7.7 vs 6.2)

Vinet E et al, Can J Gastroenterol, 2006
Elective surgery (TIPS)

• Indications
  – Patients with portal HT!
    • Child A - B
    • MELD 8-14
      • Meld > 18: poor outcome after TIPS
      • Meld > 24: TIPS is not recommended

• Efficiency 2-4 weeks after TIPS placement
  – No indication in emergent surgery!
Main abdominal extra hepatic surgery in cirrhotic

• **Parietal (umbilical hernia)**
  – General population = 3%
  – Cirrhotic patients = 20%
  – **Complications are frequent**

• **Gallbladder stones**
  – Incidence = 30% (twice the general population)
  – **Complications are rare**

• **Colorectal cancer**
• **Peptic ulcer (not actually)**
• **Oesophageal cancer**
• **Gastric cancer**
• **Bartiatric surgery**
• **Other**

Giuseppe Curro et al, JSLS 2005
Csikesz NG et al, J Am Coll Surg 2009
The role of the surgeon!

• Select patients who can really benefit from surgery

• Optimisation and preparation (extreme and minor)
  – Acute cholecystitis
  – Colorectal cancer with occlusion: stent rather than urgent surgery

• If possible delay surgery until liver transplantation

• Safe and non haemorrhagic surgery
Elective major surgery
Good preparation

62 year old male, alcoholic cirrhosis
Bile duct cancer: whipple resection is needed (Child B)
Endoscopic biliary drainage (conversion to Child A)
Enteral nutrition
Laparoscopic whipple
Laparoscopic Whipple with venous resection

Uneventful postoperative course
Alive 2 years after resection

Postoperative CT scan
Laparoscopic approach

Avoid large abdominal wall incision and suppression of collateral circulation

Minimal dissection! Avoid ascites

Less bleeding in selected patient
Acute cholecystitis
54 year, male
Alcoholic cirrhosis

Child B; PT =38%; Bilirubin =75

Percutaneous drainage and antibiotics
Alcohol withdrawal
PT=68%; Bilirubin: normal

Delayed cholecystectomy
Postoperative ascites well controlled
Alcoholic cirrhosis (child B) waiting list for LT
Perforated ulcer

Conservative treatment (Taylor method)
Accelerated LT

Liver transplantation
Avoid general anesthesia: local anesthesia

Small umbilical hernia ++++
The skin is denervated
Avoid unnecessary surgery!

This is not an incarcerated umbilical hernia!

Importance of the CT scan in emergency +++
Delay surgery until liver transplantation

Paucisymptomatic umbilical hernia
Not preserved liver function test
Avoid surgery for bad prognosis disease
Benefits from surgery is very limited

Cirrhosis

Advanced pancreatic cancer with venous invasion
Conclusion

- Surgery in cirrhotic patients can be needed in 10% of cases
- Surgery, even minor, is associated with high morbidity and mortality especially in emergency situations
- For selection, child and MELD scores are complementary
- Child A and some child B can be operated after careful optimisation of
  - The liver function
  - The associated comorbidities
  - The disease management
  - The surgery