HCC – new frontiers in treatment

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Overview

• Epidemiology
• Etiology
• Clinical presentation
• Diagnosis
• Treatment
• Prognosis
Overview

- Epidemiology
- Etiology
- Clinical presentation
- Diagnosis
- Treatment
- Prognosis
Introduction

• Most common primary hepatic malignancy
• Annual incidence is 782000 people annually*
• Globally accounts for 9.2% of all new cancer cases
• 5th most common cancer in males and 8th in females
• Around 84% occur in less developed regions
• Annual mortality is 746000*
• Worldwide it is the second leading cause of cancer-related death

HCC in Africa

- High prevalence in all Sub-Saharan African countries
- Most common cause of cancer-related death in men and the 3rd most common in women
- Annual fatality ratio is 0.96
- Occurs at a younger age
- A large percentage present in non-cirrhotic livers
- Present with larger tumours
- Present more often metastatic disease
Etiology

- Chronic hepatitis B infection
- Chronic hepatitis C infection
- Dietary aflatoxin B$_1$ exposure
- Metabolic syndrome (NAFLD/NASH)
- Alcohol abuse
- Iron-overload (inherited and acquired)

- Cirrhosis of any cause
- Smoking
- Tyrosinosis
- $\alpha_1$ antitrypsin deficiency
- etc.
Etiology in Africa

• Historic main etiological factors
  – chronic hepatitis B infection
  – aflatoxin exposure
  – dietary iron overload

• Emerging etiological factors
  – alcoholic liver disease
  – NAFLD/NASH
  – chronic hepatitis C
Clinical presentation

• Symptomatic tumour

• Incidental finding examining liver disease

• Screening of high-risk populations
Diagnosis and staging

Liver nodule

< 1 cm

- Repeat US at 3 months

Growing/changing character

Yes

- HCC

Yes

No

Other contrast enhanced study (CT or MRI)

Arterial hypervascularity AND venous or delayed phase washout

No

Biopsy

> 1 cm

4-phase MDCT/dynamic contrast enhanced MRI

Arterial hypervascularity AND venous or delayed phase washout

No

Biopsy

Yes

Arterial hypervascularity AND venous or delayed phase washout

No

Biopsy

Investigate according to size

Diagnosis and staging

Liver nodule

< 1 cm

Investigate according to size

No

No

Yes

MDCT/ dynamic enhanced MRI

> 1 cm

One imaging
Ultrasound out
AFP out
Biopsy selective

No

Yes

Biopsy

Gd-EOB-DTPA (Primovist® /Eovist®)
Gadolinium ethoxybenzyl diethylenetriaminepentaacetic acid

<table>
<thead>
<tr>
<th></th>
<th>Pre-contrast</th>
<th>Arterial phase</th>
<th>Portovenous phase</th>
<th>Delayed phase</th>
<th>Hepatobiliary phase</th>
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<tbody>
<tr>
<td>CE-MDCT</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
</tr>
<tr>
<td>ECCM-MRI</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
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<tr>
<td>Gd-EOB-DTPA-MRI</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<td>✔</td>
</tr>
</tbody>
</table>

CE-MDCT: contrast-enhanced multi-detector computed tomography
ECCM-MRI: MRI with extracellular contrast media
Gd-EOB-DTPA-MRI: gadoxetic acid-enhanced MRI
The Liver Imaging Reporting And Data System (LI-RADS)

Diagnostic Categories:

- **LR-NC**: Not categorizable (due to image omission or degradation)
- **LR-1**: Definitely benign
- **LR-2**: Probably benign
- **LR-3**: Intermediate probability of malignancy
- **LR-M**: Probably or definitely malignant, not necessarily HCC
- **LR-4**: Probably HCC
- **LR-5**: Definitely HCC
- **LR-TIV**: Tumor in vein
Treatment Response Categories

- LR-TR Nonevaluable: Treated, Response not evaluable (due to image omission or degradation)
- LR-TR Nonviable: Treated, Probably or definitely not viable
- LR-TR Equivocal: Treated, Equivocally viable
- LR-TR Viable: Treated, Probably or definitely viable
Treatment

• Based on the Barcelona Clinic Liver Cancer (BCLC) staging system
• Based on the modified Union of International Cancer Control (mUICC) staging system
• Based on the Child-Pugh class of liver function
• Based on tumor resectability (resectable or unresectable)
The unmet clinical needs of the BCLC guidelines

• Assumptions
  • Universally homogenous disease
  • Homogenous stage stratification
  • Work-up possibilities are available
  • All treatment possibilities are available

• Does not account for heterogeneity
  • Exists for stage A
  • Lacking stage B
Heterogeneity of Patients with Intermediate (BCLC B) Hepatocellular Carcinoma: Proposal for a Subclassification to Facilitate Treatment Decisions

Luigi Bolondi, MD, Andrew Burroughs, MBChBHons, FMedSci, Jean-François Dufour, MD, Peter R. Galle, MD, PhD, Vincenzo Mazzaferro, MD, Fabio Piscaglia, MD, PhD, Jean Luc Raoul, MD, PhD, Bruno Sangro, MD, PhD

<table>
<thead>
<tr>
<th>Examples of Patients with Intermediate HCC</th>
<th>Patient 1</th>
<th>Patient 2</th>
<th>Patient 3</th>
<th>Patient 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilirubin (mg/dl)</td>
<td>0.9</td>
<td>1.6</td>
<td>2.6</td>
<td>1.9</td>
</tr>
<tr>
<td>Albumin (g/dl)</td>
<td>4.8</td>
<td>3.6</td>
<td>3.0</td>
<td>2.7</td>
</tr>
<tr>
<td>Ascites</td>
<td>No</td>
<td>Mild</td>
<td>Mild</td>
<td>Refractory</td>
</tr>
<tr>
<td>Hepatic encephalopathy</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Child–Pugh class</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Number of HCC tumors</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Diameter of the 2 largest HCC</td>
<td>35–16 mm</td>
<td>60–45 mm</td>
<td>19–18 mm</td>
<td>19–18 mm</td>
</tr>
<tr>
<td>Potential treatment</td>
<td>Surgery versus combined TACE + ablation</td>
<td>TACE</td>
<td>TACE (?)</td>
<td>None</td>
</tr>
<tr>
<td>Potential for cure (estimated probability of total tumor necrosis)</td>
<td>65%</td>
<td>20%</td>
<td>&lt;5%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Liver resection
Principles

- R0 resection
- Sufficient future liver remnant
- No extra-hepatic metastases
Liver resection
Current guidelines

Barcelona criteria

Very early stage (0)

- Single lesions
- < 2 cm in size
- Child-Pugh score A
- Normal portal pressure
- Normal bilirubin
- Performance status 0
Liver resection
Current clinical practice

Guidelines are challenged:

• Multiple lesions
• Large lesions
• Portal hypertension
# Liver resection

## Results

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Year</th>
<th>Patients (n)</th>
<th>Mortality/morbidity</th>
<th>5-yr survival</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BCLC 0-A HCC with portal hypertension</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capussotti et al.</td>
<td>2006</td>
<td>66</td>
<td>6.1%/34.8%</td>
<td>40.80%</td>
</tr>
<tr>
<td>Ishizawa et al.</td>
<td>2008</td>
<td>136</td>
<td>-/10%</td>
<td>56.00%</td>
</tr>
<tr>
<td>Cucchetti et al.</td>
<td>2009</td>
<td>79</td>
<td>4.5%/38.5%</td>
<td>56.50%</td>
</tr>
<tr>
<td>Ruzzeneente et al.</td>
<td>2011</td>
<td>29</td>
<td>2.2%/33.7%</td>
<td>57.3%/72.4%</td>
</tr>
<tr>
<td>Santambrogio et al.</td>
<td>2013</td>
<td>63</td>
<td>0.5%/28.6%</td>
<td>48.00%</td>
</tr>
<tr>
<td><strong>BCLC A-B multiple HCCs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ishizawa et al.</td>
<td>2008</td>
<td>126</td>
<td>-/15%</td>
<td>58.00%</td>
</tr>
<tr>
<td>Ruzzeneente et al.</td>
<td>2009</td>
<td>30 (≤ 3 nodules)</td>
<td>-/ -</td>
<td>46.00%</td>
</tr>
<tr>
<td>Ho et al.</td>
<td>2009</td>
<td>97 (≤ 3 nodules)</td>
<td>-/ -</td>
<td>40.00%</td>
</tr>
<tr>
<td>Huang et al.</td>
<td>2010</td>
<td>26 (≤ 3 nodules)</td>
<td>0% /27.8%</td>
<td>69.20%</td>
</tr>
<tr>
<td>Torzilli et al.</td>
<td>2013</td>
<td>54 (&gt; 3 nodules)</td>
<td>-/ -</td>
<td>12.00%</td>
</tr>
<tr>
<td>Zhong et al.</td>
<td>2013</td>
<td>58 (&gt; 3 nodules)</td>
<td>3.1%/28.0%</td>
<td>24.00%</td>
</tr>
<tr>
<td><strong>BCLC B large HCC</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pawlik et al.</td>
<td>2005</td>
<td>300 (≥ 10 cm)</td>
<td>5.0% /-</td>
<td>27.00%</td>
</tr>
<tr>
<td>Pandey et al.</td>
<td>2007</td>
<td>166 (≥ 10 cm)</td>
<td>3.0%/30.0%</td>
<td>28.60%</td>
</tr>
<tr>
<td>Cho et al.</td>
<td>2007</td>
<td>61 (&gt; 5 cm)</td>
<td>1.6%/ -</td>
<td>52.90%</td>
</tr>
<tr>
<td>Ruzzeneente et al.</td>
<td>2009</td>
<td>46 (&gt; 5 cm)</td>
<td>-/ -</td>
<td>29.00%</td>
</tr>
<tr>
<td>Yamashita et al.</td>
<td>2011</td>
<td>53 (≥ 10 cm)</td>
<td>3.8%/24.5%</td>
<td>35.00%</td>
</tr>
<tr>
<td>Zhong et al.</td>
<td>2013</td>
<td>199 (&gt; 5 cm)</td>
<td>3.1%/28.0%</td>
<td>41.00%</td>
</tr>
<tr>
<td><strong>BCLC C HCC with macrovascular invasion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pawlik et al.</td>
<td>2005</td>
<td>102 (PVTT and HVI)</td>
<td>5.9%/-</td>
<td>10.00%</td>
</tr>
<tr>
<td>Le Treut et al.</td>
<td>2006</td>
<td>26 (PVTT and HVI)</td>
<td>11.5%/38.5%</td>
<td>13.00%</td>
</tr>
<tr>
<td>Ruzzeneente et al.</td>
<td>2009</td>
<td>17 (PVTT and HVI)</td>
<td>-/-</td>
<td>20.00%</td>
</tr>
<tr>
<td>Inoue et al.</td>
<td>2009</td>
<td>49 (PVTT)</td>
<td>0%/-</td>
<td>39%/41%</td>
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<tr>
<td>Ban et al.</td>
<td>2009</td>
<td>45 (PVTT)</td>
<td>0.0%/21.1%-23.1%</td>
<td>22.40%</td>
</tr>
<tr>
<td>Chok et al.</td>
<td>2013</td>
<td>88 (PVTT)</td>
<td>3.4%/37.1%</td>
<td>11.2%-14.3%</td>
</tr>
<tr>
<td>Wang et al.</td>
<td>2013</td>
<td>25 (HVI)</td>
<td>0.0%/40.0%</td>
<td>13.50%</td>
</tr>
</tbody>
</table>
Right Portal Vein Ligation Combined With In Situ Splitting Induces Rapid Left Lateral Liver Lobe Hypertrophy Enabling 2-Staged Extended Right Hepatic Resection in Small-for-Size Settings

Andreas A. Schnitzbauer, MD,* Sven A. Lang, MD,* Holger Goosmann, MD,‡ Silvio Nadalin, MD,§ Janine Baumgart, MD,¶ Stefan A. Farkas, MD,* Stefan Fichner-Feigl, MD,* Thomas Loffl, MD,¶ Armin Goralczyk, MD,¶ Rüdiger Hörlbel, MD,* Alexander Kroemer, MD,* Martin Loss, MD,* Petra Rittmeier, MD,* Marcus N. Scherer, MD,* Winfried Padberg, MD,¶ Alfred Königsrainer, MD,§ Hauke Lang, MD,|| Alan Uned, MD,¶ and Hans J. Schlau, MD*

Current indications

![Bar chart showing current indications for different years.](data:image/png;base64,SGVsbG8gd29ybGQgZnVuY3Rpb24gbW9kZS4i)

- Other
- HCC
- Biliary tumor
- CRLM

Liver transplantation
Principles

• Removes tumour
• Cures liver dysfunction
• Prevents new tumour formation, not metastases
• Patients with low risk for metastatic disease are selected

• HCC transplants compete with other indications
• Highly dependent on donor supply
Liver transplantation
Current guidelines

Barcelona criteria

Very early or early stage (0;A)

- 1-3 lesions*
- ≤3 cm in diameter*
- Child-Pugh score A-B
- Performance status 0

* Milan criteria – ≤5 cm was added as a size limitation for single lesions

OS when transplanted within the BCLC >70% at 5 years
Liver transplantation
Current clinical practice

Expanding transplant criteria

Cons

• Increase need for organs
• Increase waiting times
• Saturating waiting lists with worse outcomes
• Increase drop-outs
• Impairs intention-to-treat results
Milan criteria
• 1 lesion ≤5 cm
• 3 lesions ≤3 cm in diameter

University of California San Francisco (UCSF) criteria
• 1 nodule ≤ 6.5 cm
• or 2–3 nodules ≤ 4.5 cm; total tumour diameter ≤ 8 cm

‘Up-to-seven’ criteria
• sum of the size of largest tumour and tumour number ≤ 7

HCC Metro ticket

HCC “Metro Ticket” - The further the distance, the higher the price

- Number of nodules
- Tumor Size (cm)

Expected 5-year Survival:
- 75-80%
- 50-75%
- 35-50%
Local ablation
Principles

- Radiofrequency ablation (RFA) ✓
- Microwave ablation (MWA) ✓
- Laser ablation (LA) ✗
- Cryoablation ✗
- Ethanol ablation ✓✗
- Irreversible electroporation (IRE) ✓
- High-intensity focused ultrasound (HIFU) ✗
- Stereotactic body radiation therapy (SBRT) ✓✗
Completed Needle Placement
Local ablation
Current guidelines

Barcelona criteria

Very early or early stage (0;A)

- 1-3 lesions
- ≤3 cm in diameter
- Child-Pugh score A/B
- Performance status 0

\[
\text{tumour} \leftarrow \text{function surrogates} \leftarrow \text{general condition}
\]
Local ablation
Current practice

> 3 cm in size – increase in local recurrence rates
> 3 lesions – oncological more advanced
### Local ablation

#### Results

<table>
<thead>
<tr>
<th></th>
<th>Within</th>
<th>Outside</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>96–100 %</td>
<td>78 – 98 %</td>
</tr>
<tr>
<td>3 year</td>
<td>53–92 %</td>
<td>33–94 %</td>
</tr>
<tr>
<td>5 year</td>
<td>41–77 %</td>
<td>20–75 %</td>
</tr>
</tbody>
</table>

Median overall survival

Embolization Principles
Embolization Principles

• Transarterial embolization (TAE)

• Transarterial chemoembolization (TACE)
  – conventional – Doxorubicin/Lipiodol emulsion
  – Doxorubicin-loaded drug-eluting beads (DEB)

• Transarterial radioembolization (TARE)
  – Iodine-131-labelled Lipiodol
  – microspheres loaded with Yttrium-90 (β emitter with short tissue penetration)

Llovet JM, Bruix J. Hepatology 2003;37:429–42
E}

Embolization
Current guidelines

Barcelona criteria

Intermediate stage (B)
• Large multi-nodular tumour
• Child-Pugh score A/B function surrogates
• Performance status 0 general condition

Llovet JM, Bruix J. Hepatology 2003;37:429-42
Embolization
Current practice

Embolization outside the BCLC criteria

Indication
• Intermediate-stage (BCLC B) HCC

Absolute contraindications
• Child-Pugh B ≥8
• Extensive tumour with massive replacement of both entire lobes
• Severely reduced portal vein flow (portal vein occlusions; hepatofugal blood flow)
• Untreatable arteriovenous fistula
• Renal failure (creatinine ≥2 mg/dL; creatinine clearance <30 mL/ min)

Relative contraindications
• Tumour size ≥10 cm
• Compromised organ function (active cardiovascular disease; active lung disease)
• Untreated varices at high risk of bleeding
• Bile-duct occlusion or incompetent papilla due to stent or surgery

Embolization
Results

• Heterogeneity in reported overall survival

• **Prospective studies:** mean OS 3.4-31 months

• **Retrospective studies:** mean OS 8.5-48 months

• Doxorubicin-loaded drug-eluting beads (DEB) can cause complete necrosis of <5 cm HCC nodules

• TARE - ? curative modality
Oncologic treatment
Sorafenib (Nexavar)

**Sorafenib in Advanced Hepatocellular Carcinoma**

- Median OS - 10.7 months in the sorafenib group vs. 7.9 months in the placebo group (p<0.001)
- Modest advantage

---

**Adjuvant sorafenib for hepatocellular carcinoma after resection or ablation (STORM): a phase 3, randomised, double-blind, placebo-controlled trial**

- Median recurrence-free survival – 33.3 months in the sorafenib group vs 33.7 months in the placebo group (p=0.26)
- No advantage

---

<table>
<thead>
<tr>
<th>Subtype</th>
<th>Frequency in Surgical Pathology Specimens (%)</th>
<th>Prognosis $^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steatohepatitic</td>
<td>20</td>
<td>Similar</td>
</tr>
<tr>
<td>Clear cell</td>
<td>7</td>
<td>Better</td>
</tr>
<tr>
<td>Scirrhoux</td>
<td>4</td>
<td>Similar to better</td>
</tr>
<tr>
<td>Cirrhotomimetic</td>
<td>1</td>
<td>Worse</td>
</tr>
<tr>
<td>Combined hepatocellular-cholangiocarcinoma</td>
<td>1</td>
<td>Worse</td>
</tr>
<tr>
<td>Fibrolamellar carcinoma</td>
<td>1</td>
<td>Similar to better</td>
</tr>
<tr>
<td>Combined hepatocellular and neuroendocrine</td>
<td>&lt;1</td>
<td>Worse</td>
</tr>
<tr>
<td>Granulocyte colony-stimulating factor producing</td>
<td>&lt;1</td>
<td>Worse</td>
</tr>
<tr>
<td>Sarcomatoid</td>
<td>&lt;1</td>
<td>Worse</td>
</tr>
<tr>
<td>Carcinosarcoma</td>
<td>&lt;1</td>
<td>Worse</td>
</tr>
<tr>
<td>Carcinosarcoma with osteoclast-like giant cells</td>
<td>&lt;1</td>
<td>Worse</td>
</tr>
<tr>
<td>Lymphocyte rich</td>
<td>&lt;1</td>
<td>Better</td>
</tr>
</tbody>
</table>

**Provisional subtypes**

<table>
<thead>
<tr>
<th>Subtype</th>
<th>Frequency</th>
<th>Prognosis $^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromophobe</td>
<td>1–2</td>
<td>Unclear</td>
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<tr>
<td>Combined hepatocellular-cholangiocarcinoma with stem cell features</td>
<td>&lt;1</td>
<td>Unclear</td>
</tr>
<tr>
<td>Lipid rich</td>
<td>&lt;1</td>
<td>Unclear</td>
</tr>
<tr>
<td>Myxoid</td>
<td>&lt;1</td>
<td>Unclear</td>
</tr>
<tr>
<td>Syncytial giant cell</td>
<td>&lt;1</td>
<td>Unclear</td>
</tr>
<tr>
<td>Transitional cell</td>
<td>&lt;1</td>
<td>Unclear</td>
</tr>
</tbody>
</table>

$^a$ Compared with conventional hepatocellular carcinoma.
Systemic therapy for advanced hepatocellular carcinoma: an update

Jasmin Radhika Desai¹, Sebastian Ochoa¹, Petra Alexandra Prins¹, Aiwu Ruth He¹

Table 1 Relative frequency of genetic mutations in HCC

<table>
<thead>
<tr>
<th>Pathway and function</th>
<th>Target</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telomere stability</td>
<td>TERT promoter</td>
<td>60</td>
</tr>
<tr>
<td>Wnt/β-catenin pathway</td>
<td>CTNNB1</td>
<td>40</td>
</tr>
<tr>
<td>p53/cell cycle control</td>
<td>TP53</td>
<td>25</td>
</tr>
<tr>
<td>Chromatin remodeling</td>
<td>ARID1A</td>
<td>15</td>
</tr>
<tr>
<td>RAS/PI3K/mTOR</td>
<td>RPS6KA3</td>
<td>10</td>
</tr>
<tr>
<td>FGF signaling</td>
<td>FGF19</td>
<td>5</td>
</tr>
<tr>
<td>VEGF signaling</td>
<td>VEGFA</td>
<td>3</td>
</tr>
</tbody>
</table>

HCC, hepatocellular carcinoma.

Table 2 Selected drugs for HCC treatment and their molecular targets

<table>
<thead>
<tr>
<th>Drug</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADI-PEG20</td>
<td>Arginine</td>
</tr>
<tr>
<td>Bevacizumab</td>
<td>VEGF</td>
</tr>
<tr>
<td>Brivanib</td>
<td>VEGFR-2, FGFR-1</td>
</tr>
<tr>
<td>Cabozantinib</td>
<td>VEGFR, RET, c-MET</td>
</tr>
<tr>
<td>Cediranib</td>
<td>VEGFR, PDGFR, c-KIT</td>
</tr>
<tr>
<td>Cixutumumab</td>
<td>IGF-1R</td>
</tr>
<tr>
<td>Erlotinib</td>
<td>EGFR</td>
</tr>
<tr>
<td>Everolimus</td>
<td>mTOR</td>
</tr>
<tr>
<td>Ipilimumab</td>
<td>CTLA-4</td>
</tr>
<tr>
<td>Lenvatinib</td>
<td>VEGFR, PDGR, FGFR, RET, SCFR</td>
</tr>
<tr>
<td>Linifanib</td>
<td>VEGFR, PDGFR</td>
</tr>
<tr>
<td>Nivolumab</td>
<td>PD-1</td>
</tr>
<tr>
<td>Orantinib</td>
<td>VEGFR, PDGFR, FGFR</td>
</tr>
<tr>
<td>Ramucirumab</td>
<td>VEGFR</td>
</tr>
<tr>
<td>Regorafenib</td>
<td>VEGFR, PDGFR, RET, c-KIT, BRAF, FGFR</td>
</tr>
<tr>
<td>Sorafenib</td>
<td>VEGFR, PDGFR, RAF</td>
</tr>
<tr>
<td>Sunitinib</td>
<td>VEGFR, PDGFR, RET, c-KIT</td>
</tr>
<tr>
<td>Tivantinib</td>
<td>c-MET</td>
</tr>
<tr>
<td>Tremelimumab</td>
<td>CTLA-4</td>
</tr>
</tbody>
</table>

HCC, hepatocellular carcinoma.
Prognosis

• Liver resection*  >70% 5 year survival
• Local ablation*  >70% 5 year survival
• Transplantation* >75% 5 year survival
• TACE  20 mo improved survival
• Sorafenib  2.9 mo improved survival
• Best supportive care

*Treated within the Barcelona criteria

Llovet JM, Bruix J. Hepatology 2003;37:429–42
MDT conference

- Radiologist
- Anaestetist
- Pathologist
- Surgeon
- Oncologist

Patient

Thank you