Liver directed treatment of HCC in Africa

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Overview

• The problem?

• Our experience

• Treatment options
The Problem

• HCC currently not a surgical disease in most of Africa
  – For many reasons...

• Even in high resource environments – minority of patients with single HCC eligible for resection.

• But…. high risk population is obvious

• So how can liver directed treatment begin/expand?
  – Transplantation
  – Resection
  – Ablation
  – Embolization
  – Radiation
  – HIFU, etc
  – Chemotherapy
The Problem

- HCC currently not a surgical disease in most of Africa
  - For many reasons...

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- So how can liver directed treatment begin/expand?
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  - **Resection**
  - Ablation
  - Embolization
  - Radiation
  - HIFU
  - Chemotherapy
No Patients to Resect or Transplant: An Analysis of Patients with Hepatocellular Carcinoma Admitted to a Major African Referral Hospital

Adam Gyedu · William R. Shrauner · T. Peter Kingham

- 2007-2013
- 204/465 charts available
  - 50% of patients died on hospitalization
- Zero resections/ablutions
- <8% eligible for surgery/ablation
- 72% best supportive care only
Who are we talking about?

Very early stage (0)
- Single <2 cm
- Child-Pugh A, PS 0

Early stage (A)
- Single or ≤3 nodules <3 cm
- Child-Pugh A–B, PS 0

Intermediate stage (B)
- Large multinodular
- Child-Pugh A–B, PS 0

Advanced stage (C)
- Portal invasion
- Extrahepatic spread
- Child-Pugh A–B, PS 1–2

Terminal stage (D)
- Child-Pugh C, PS 3–4

Potential candidate for liver transplantation
- No
- Yes

Portal pressure Bilirubin
- Normal
- Increased

Ablation
Resection
Transplant
Ablation

TACE
Sorafenib
BSC

Curative treatments
Palliative treatments

Forner, Lancet, 2012
My experience

• 7 year collaboration with Dr. Alatise, Nigeria

• Theaters in Malawi, Sierra Leone, Ghana

• HPB surgery in New York
HCC resection can be curative

- 212 patients underwent resection
  - 1996-2006: median follow-up **13 years**, median OS 4.2 years

Surgery: resection for large (>10cm HCC) can lead to long term survival

- 1985-2002
  - 82 pts with tumors > 10 cm vs. 111 pts <10 cm
- 5-year survival rates – large tumors 33% vs. small tumors 39% (p=0.56)
- Operative mortality 2% (large tumors) vs. 6% (smaller tumors, p= NS)
- Vascular invasion, EBL > 2L predicted worse OS

Liau, Cancer, 2005; 104:1948-1955
Morbidity and mortality have decreased over time

<table>
<thead>
<tr>
<th></th>
<th>'93-'99 n=1275</th>
<th>'00-'06 n=1465</th>
<th>'07-'12 n=1412</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complications</td>
<td>53.2% (679)</td>
<td>34.3% (502)</td>
<td>19.9% (281)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Estimated blood loss (ml, median, IQR)</td>
<td>650 (310-1110)</td>
<td>400 (200-750)</td>
<td>300 (200-565)</td>
<td>0.003</td>
</tr>
<tr>
<td>Major complications</td>
<td>13.2% (169)</td>
<td>11.2% (164)</td>
<td>9.8% (138)</td>
<td>0.017</td>
</tr>
<tr>
<td>ASA score (range)</td>
<td>-</td>
<td>2 (2-3)</td>
<td>3 (2-3)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>90-day mortality</td>
<td>5.2% (66)</td>
<td>2.3% (34)</td>
<td>1.6% (22)</td>
<td>&lt;0.001</td>
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Parenchymal preservation is key

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<tr>
<td>Hospital mortality rate</td>
<td>29%</td>
<td>2%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Lobe or greater</td>
<td>61%</td>
<td>16%</td>
<td>&lt;0.01</td>
</tr>
</tbody>
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Yamanaka, J Gastroenterol; 35:613-621; 2000
Training for liver surgery

– Theoretical
  • Videos/books/equipment
  • Online ultrasound courses

– Practical
  • Partnerships with global HPB community
  • North Africa, South Africa, India, South America
  • One or two centers in a country
  • Palliative procedures/biopsies
  • Learning from past: parenchymal preservation
Technical requirements

• Preoperative
  – Good CT scan/ultrasound for staging
  – Liver function/size assessment
  – Radiologists/Surgeons
• OR infrastructure
  – Ultrasound
  – Suction
  – Clamp and ties
  – Retractor/exposure
  – Blood bank
  – ANESTHETIST
  – Surgeon
• Post operative care
Liver surgery for all pathologies

• Alatise et al, Audit of management of gallbladder cancer in a Nigerian tertiary health facility
  – 1990-2010
  – 31 pts
  – 67% diagnosed intraoperatively
  – 4/31 patients underwent radical cholecystectomy

• Metastatic colorectal cancer

• Benign pathology: adenomas; cyst fenestration; hydatid cysts
Ablation

• Phantom training

• US training

• Newest microwave devices easy to use and easy to over ablate

• Percutaneous or intraoperative

• Can be used for resections
Results of ablation in Egypt

90 pts randomized to 3 groups, <= 3 tumors, all <= 5cm

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<tr>
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<th>ETOH</th>
<th>RFA</th>
<th>RFA/ETOH</th>
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<tbody>
<tr>
<td>1st treatment complete</td>
<td>0%</td>
<td>56%</td>
<td>87%</td>
</tr>
<tr>
<td>1.5 yr survival</td>
<td>63%</td>
<td>76%</td>
<td>86%</td>
</tr>
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Arterial embolization

• Requires fluoro and imaging

• Can be performed in OR
  – Ligation of hepatic artery with insertion of catheter treatment in OR

• Bland embolization is effective

• Not curative
<table>
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<tr>
<th></th>
<th>Number of Patients</th>
<th>Procedure</th>
<th>Outcome</th>
</tr>
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<tbody>
<tr>
<td>McDermott</td>
<td>5 pts</td>
<td>Intraop angiogram</td>
<td>Safe if normal liver function</td>
</tr>
<tr>
<td>Balasegaram</td>
<td>24 pts</td>
<td>Intraop angiogram</td>
<td>-5 pts prolonged survival -¾ deaths with PV thrombosis</td>
</tr>
<tr>
<td>Fortner</td>
<td>23 pts</td>
<td>Preop angiogram Patent PV Infusion catheters</td>
<td>-2/6 HCC pts early mortality</td>
</tr>
</tbody>
</table>

McDermott, Annals of Surgery; 187:1; 1978
Fortner, Annals of Surgery; 178:2; 1972
Balasegaram, Am J Surgery; 124, 1972
Hepatic collateral arterial supply

- 26 routes of collateral flow to liver

- 20 patients studied after hepatic artery ligation
  - Within 6 weeks
  - 9 with phrenic revascularization
  - 8 from porta hepatis
  - 7 splenic hilum

Plengvanit, Annals of Surgery, 175:1, 1972
Obesity Trends* Among U.S. Adults
BRFSS, 1985

(*BMI $\geq 30$, or $\sim 30$ lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1991

(*BMI ≥30, or ~ 30 lbs. overweight for 5’4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 1996

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 2004

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults
BRFSS, 2010

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)
Conclusions

• HIV piggyback

• Prevention/screening: vaccination, high and average risk screening
  – many patients will ignore – so always a role for therapy and surgery

• HPB community is active and camaraderie is high
  – Take advantage of this with a structured long term approach (Nicaragua)
  – Realistic goals
    • Small number of centers
    • Learn from history
      – Who not to operate on – gross vein invasion, high AFP...
      – Minor hepatectomies
      – Secondary outcomes of building liver directed approach
        » Tx other diseases
        » Job satisfaction
    • Effective treatment exists: surgery, ablation – huge deficit