**RESECTION FOR HEPATOCELLULAR CARCINOMA**

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CASL HCC Consensus Conference
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**Surgical Management of HCC**

BCLC Staging and treatment schedule

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**Treatment Algorithm in HCC at UHN**

- Resection Transplant
- RFA
- TACE
- Sorafenib
- Radiation +/- Chemo
- TARE

- Curative Treatments
- Palliative Treatments
  - Level 1 evidence
  - Emerging evidence

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**Resection for HCC Consensus statements**

- Surgery is first line therapy for patients with single (and selected multifocal) HCC who have well preserved liver function (Child Pugh A) [Level 2A].

- Important predictors for the function of the future liver remnant include portal hypertension (platelets <100, presence of varices, or HVPG >10mmHg) and a normal serum bilirubin [Level 2B].

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**Resection for HCC Patient Selection**

- Management of 2 concurrent diseases
- Well preserved liver function
  - Childs-Pugh A/B7
  - Normal Bilirubin, no ascites
  - Lobar atrophy, varices, caudate hypertrophy
- Limited portal hypertension
  - Platelets >100,000
  - HVPG <10mmHg

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**Surgical Resection of HCC Patient Selection**
Hepatic Venous Pressure Gradient (HVPG)
- Wedge hepatic venous pressure
- Surrogate measure of portal pressure
- Borderline cases
- Thrombocytopenia for other causes (ITP)

HCC Resection Patient Selection
- ICG Retention
  - Limited availability in Canada
  - ICGR15 <15% predicts mortality and liver failure after major hepatectomy
- Future Liver Remnant Volume
  - >30% w/o cirrhosis
  - 40% w/ cirrhosis
- Portal Vein embolization
  - Growth and rate are predictive of outcome
  - “Stress test”

Patient Selection is the Key

Patient Selection
- High Volume HPB Surgical Centre
  - CCO: >50 liver resections per year
- Multidisciplinary HCC management
  - Hepatology, Interventional Radiology
- 90 Day mortality rate <7%

Literature for Resection in HCC

Resection for HCC
- Hong Kong Experience
  - HBV associated HCC
  - 30% major hepatectomy
  - 6% multifocal
  - In-hospital mortality 2.7%
- 5-year outcomes
  - DFS: 50.4%
  - OS: 70.3%
**Resection Technique: Anatomic vs Non-anatomic**

- Balancing factors
  - Surgical Margin
  - Liver preservation
  - Intrahepatic spread
  - Vascular invasion

**Predictors of poor outcome**
- Bilobar disease
- Grade, vascular invasion, cirrhosis

**Anatomic vs Non-anatomic**

- Meta-analysis
- 9036 pts
- 18 studies
- Superior oncologic outcomes with AR
  - DFS: RR 1.38 (p=0.001)
  - OS: RR 1.14 (p=0.001)
- Pts with NAR more likely to have severe liver dysfunction
- Benefit of AR mostly in HCC with vascular invasion

**Oncologic Outcomes for HCC following Resection**

- Operative (90-day) mortality <5-7%
- 5-Year Overall Survival: 65-80%
- 5-year Disease Free Survival: 40-70%
- Predictors of outcome
  - Tumour Size
  - Tumour Number
  - Vascular invasion
  - Anatomic Resection
  - Extrahepatic extension
  - Severity of Cirrhosis

**Transplant vs Resection for HCC**

- Long standing debate
  - Difficult to get unbiased opinion
- Early cancer in the compensated cirrhotic
- Milan or Expanded Criteria for transplant
- Only 12% of pts with HCC will be eligible for both transplant and resection
Resection and Transplantation for HCC

TABLE 1. Long-Term Outcome of Patients with Hepatocellular Carcinoma Stratified by Prognostic Variables and Treatment Modality

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Prognostic Variables</th>
<th>Stage (0-7)</th>
<th>5-Year DFS (%)</th>
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Recurrence rate significantly higher with resection

Overall survival same/ slightly better with transplantation

Rhabari, Ann Surg 2011

Resection vs Transplant in HCC

- Transplant pts were “unresectable”
- Patient selection
  - Not the same patients
- Drop offs while on waiting list
  - Intention to treat analysis
- Survival calculated from date of transplant or listing

Resection vs Transplant within Milan criteria

- 337 patients
- Age <65, R0 resection, Milan Criteria

University of Toronto Experience

- Patients within Milan Criteria
  - 321 Resection
  - 340 Transplant
  - 30% Bridging Tx
  - Recurrence rates
    - Resection: 44%
    - Transplant: 15%
- 30 drop outs on waiting list
  - Transplant: 15%

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Resection vs Transplant

Pros and Cons

- **RESECTION**
  - **Pros**
    - Available resource
    - Increasingly safe
    - Recurrence often treatable
  - **Cons**
    - High recurrence rate
    - Post-op Liver failure
    - Good liver function

- **TRANSPLANT**
  - **Pros**
    - Addresses liver disease and cancer
    - Low recurrence rate
    - Poor liver function
  - **Cons**
    - Organ availability
    - Immunosuppression
    - Recurrence is rapidly fatal

Resection vs RFA

- **Radiofrequency ablation**
  - Preferred option
  - Early disease
  - Impaired Liver function
  - Non-transplantable
- **Comparisons difficult**
  - Surgical vs Radiologic Literature
  - Now 3 RCTs

A Prospective Randomized Trial Comparing Percutaneous Local Ablative Therapy and Partial Hepatectomy for Small Hepatocellular Carcinoma

- Solitary tumour <5cm
- Screened 3775 pts
- 380 randomized RFA vs Resection
- 19/90 pts randomized to RFA had resection

Chen Ann Surg 2006

A Prospective Randomized Trial Comparing Percutaneous Local Ablative Therapy and Partial Hepatectomy for Small Hepatocellular Carcinoma

- ITT analysis
- No difference in OS or DFS
- LOS shorter with RFA
- No difference when crossovers removed
- No difference when stratified by size
Randomized 230 pts
- Within Milan Criteria
- Suitable for RFA/Res
  - CP A/B
  - ICG15R<20%
  - Plt>50,000
- Mostly HBV
- Higher %age of large tumours (>3cm) in resection group
- 7 RFA pts had resection

Multivariate predictors of OS and DFS
- Resection vs RFA
- Age
- Hepatitis (HBV>HCV>Other)

168 pts
- ≤2 tumours
- ≤4 cm
- ICGR15<30%
- Plt>50,000
- 50% CP B pts
- 50% poorly diff tumours

Multifocal HCC
- 54 Resection
- 17 RFA + Resection
- Matched for tumour size, number and
Surgical Resection of HCC

Laparoscopic Resection for HCC

Advantages of MIS Liver Surgery

- Smaller incisions
- Reduced post-op pain
- Less peritoneal trauma
- Lower physiological stress
- Expedited recovery, shorter length of stay

Advantages in HCC

- Decreased physiologic stress
- Lower levels of IL-6,8, TNF, cortisol
- More moderate fluid shifts
- Maintenance of abdominal wall collaterals
- Lower rates of post-op ascites, encephalopathy, liver failure

Long-Term Survival Analysis of Pure Laparoscopic Versus Open Hepatectomy for Hepatocellular Carcinoma In Patients With Cirrhosis

- Emerging experience
- French 351 cases (9)
- Hong Kong 32 cases
- Similar Oncologic outcomes
- Decreased LOS
- Decreased blood transfusions

1. Soubrane O HPB 2013

Toronto Experience
Thank You...