



# HCC: Multidisciplinary Approach



- John Seal, MD - Transplantation Surgery
- Juan Gimenez, MD - Interventional Radiology
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# Hepatocellular Carcinoma: Case Presentation



- 16 F weight loss / early satiety / elevated AST/ALT
  - No history of liver disease
  - FHx: MGM breast CA, MGF colon CA
- CT scan
  - Large left lobe liver mass
  - Portal vein thrombosis
  - Bile duct collaterals / cavernous transformation
  - No extrahepatic disease
- Biopsy
  - Hepatocellular carcinoma (fibrolamellar subtype)

# Hepatocellular Carcinoma: Case Presentation

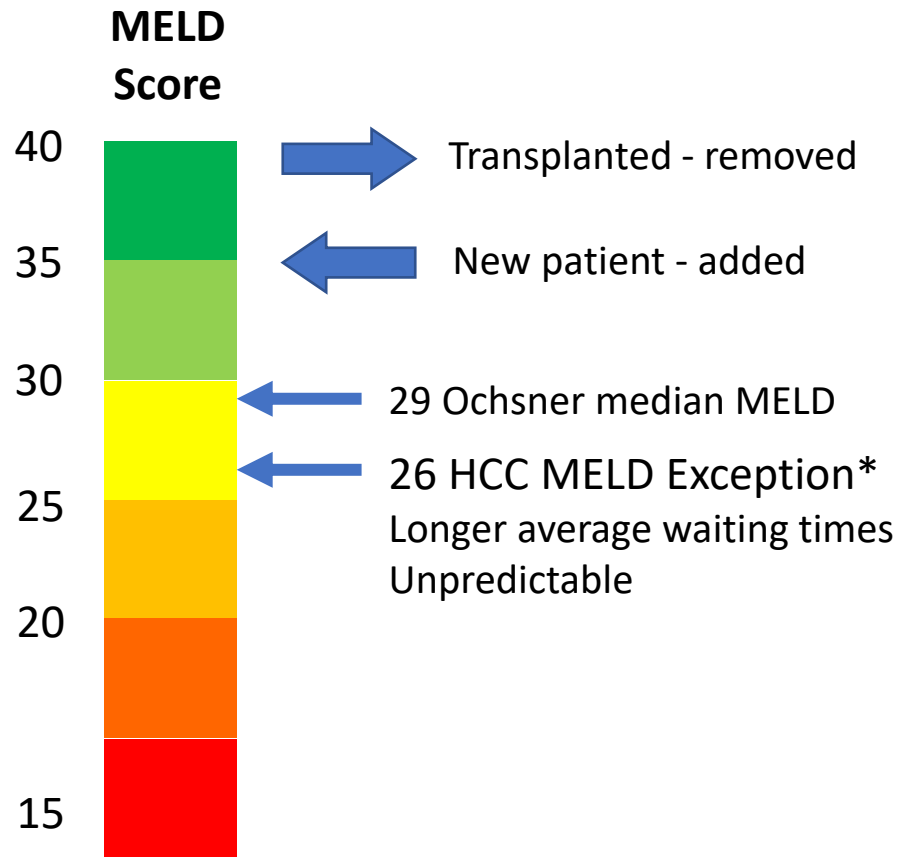
Surgical options: Resection or Transplant



# Hepatocellular Carcinoma: Surgical Treatment

|                          | Liver Resection                     | Liver Transplant                      |
|--------------------------|-------------------------------------|---------------------------------------|
| Access                   | Readily available                   | Wait time   drop out   living donor*  |
| Underlying liver disease | Limits options                      | Liver disease treated with transplant |
| Remnant liver volume     | Limits extent of resection (PVE)    | Not applicable                        |
| Risk of recurrence       | > 50% with underlying liver disease | ~10% all stages                       |
| Long term health         | Minimal impact                      | Lifelong immunosuppression            |
| Socioeconomic factors    | Surveillance for recurrence         | Caregivers, long term management      |

# Hepatocellular Carcinoma: Path to Transplant

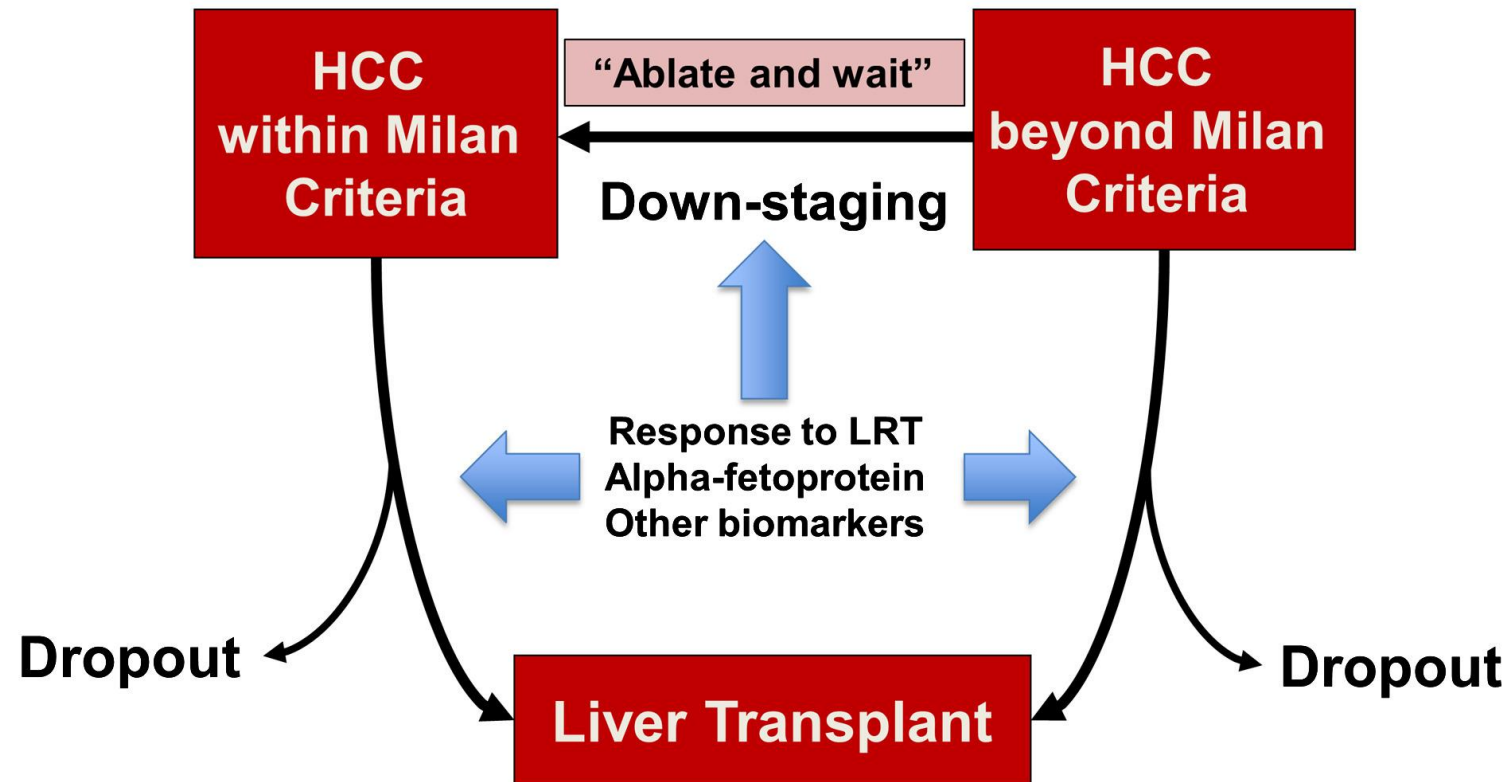


## MILAN Criteria

- 1 lesion  $\leq$  5 cms.
- $\leq$  3 lesions  $\leq$  3 cms.

- Evaluation for transplant
- Locoregional therapy
- 6 months stability within Milan criteria
- Listed with MELD exception MMaT-3
- Wait time for transplant highly variable
  - Patient size
  - Proximity to transplant center (late allocation)
  - Surgical complexity
  - Blood group

# Hepatocellular Carcinoma: Path to Transplant



## UCSF - UNOS criteria:

- 1 tumor <8 cm
- 2-3 tumors each <4.5 cm
- 4-5 tumors each < 3 cm
- Sum total <8 cm
- No vascular invasion

Modified from Clinical Liver Disease 2019, 1:20-25

# Hepatocellular Carcinoma: Surgical Treatments

- Living Donor Liver Transplantation
  - Control access to and timing of liver transplantation
  - Allows for broader consideration of tumors outside standard criteria
- Tumors <2cm: “Ablate and wait”

Liver Resection  
De novo tumors (single)  
Childs A\*  
Poor transplant candidate  
Small tumors  
(Robotic Surgery)

Resection or Liver Transplant  
  
Childs B cirrhosis  
  
Multifocal disease  
  
Location of tumor  
  
Patient factors  
  
NASH / Hepatitis C

Liver Transplant  
Childs C cirrhosis  
Unresectable tumors  
Portal hypertension



# **HCC:**

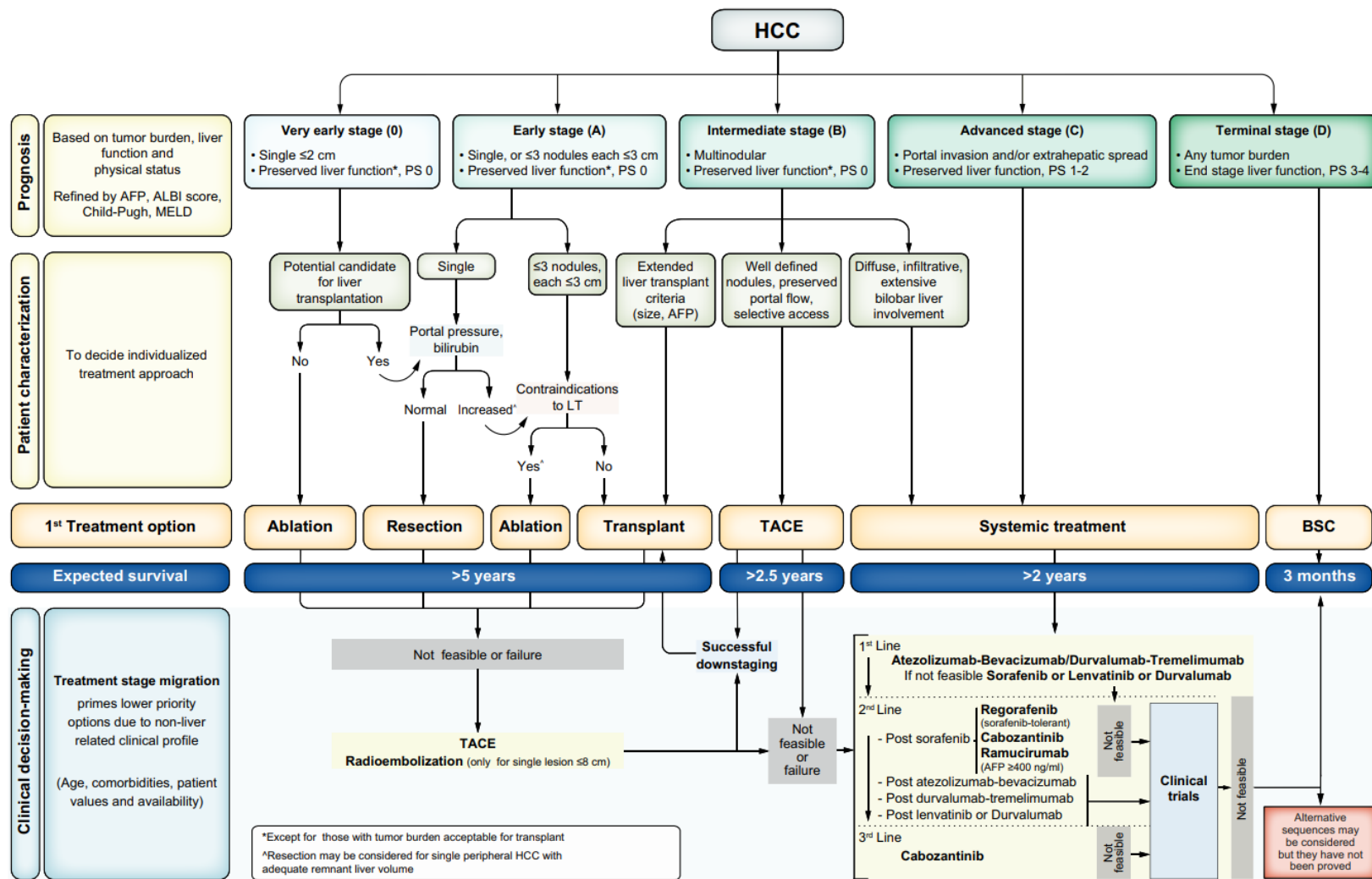
## **Locoregional therapies**

**Juan Gimenez, MD**  
**Interventional Radiology**

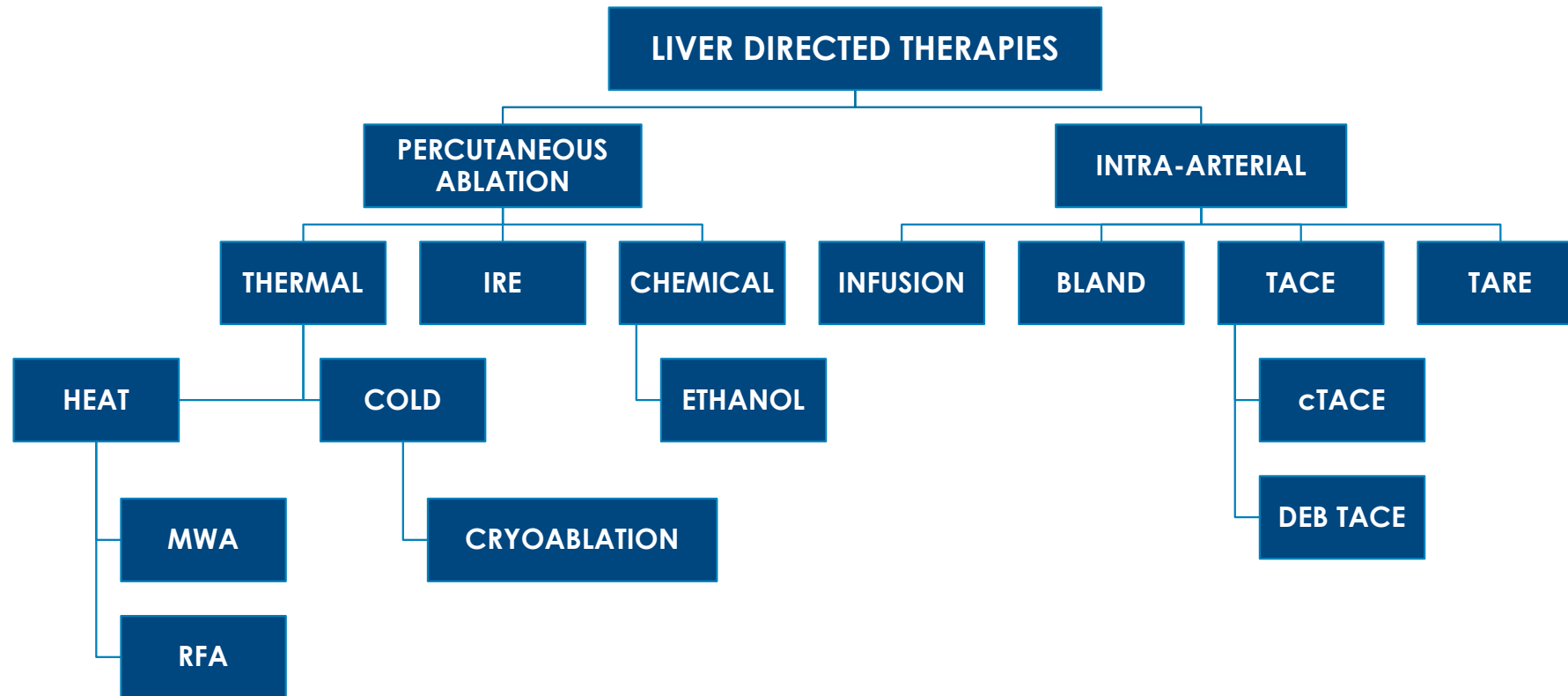
**Ochsner Health**  
**New Orleans, LA**



# BCLC Algorithm

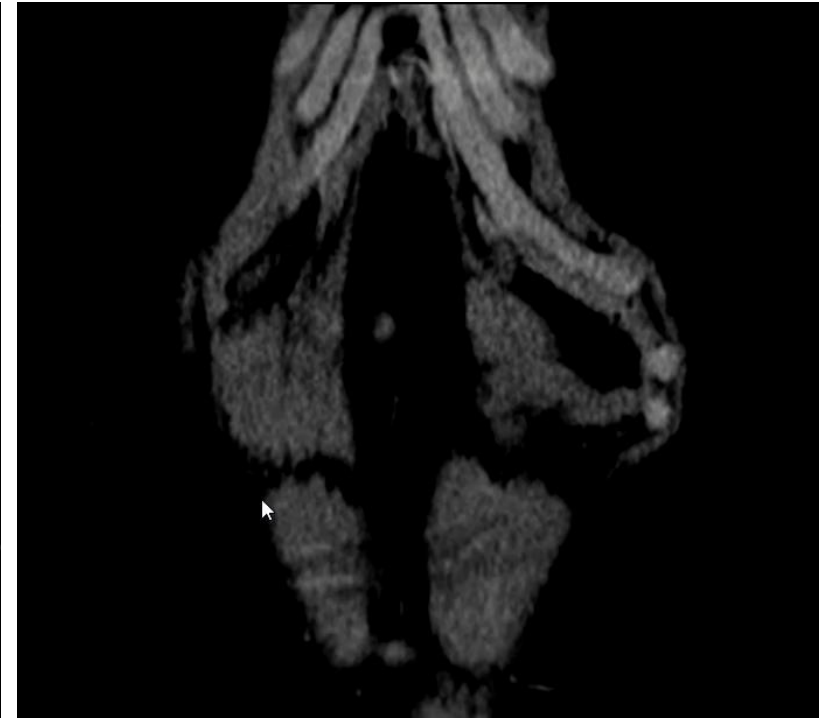


# Liver Directed Therapies



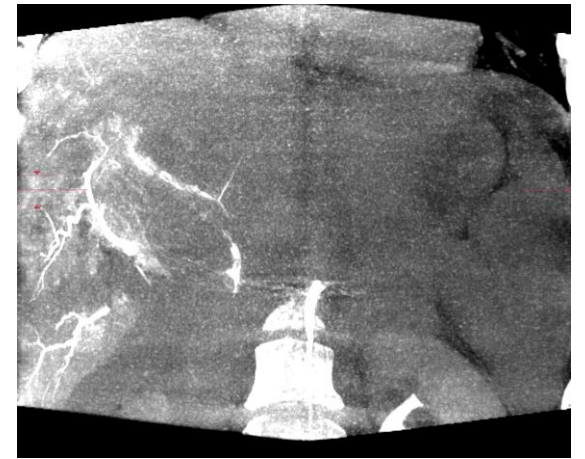
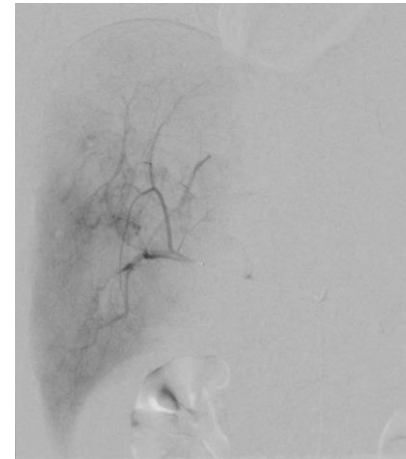
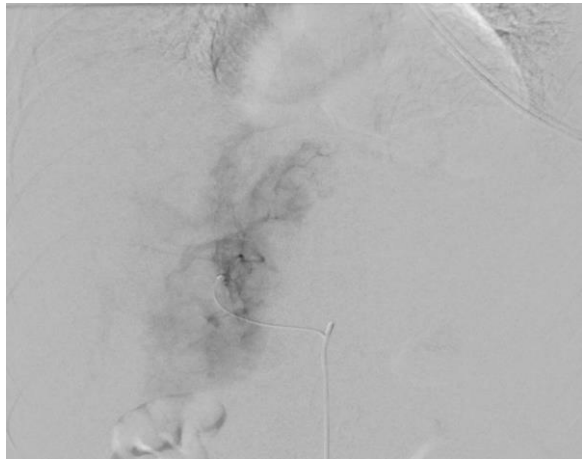
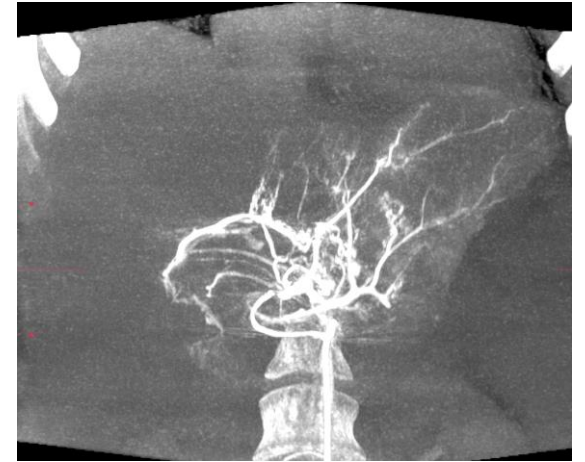
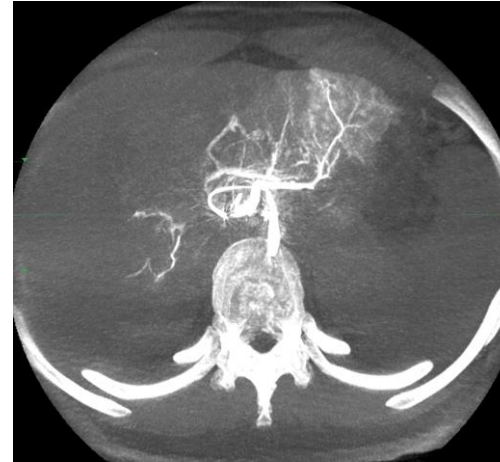
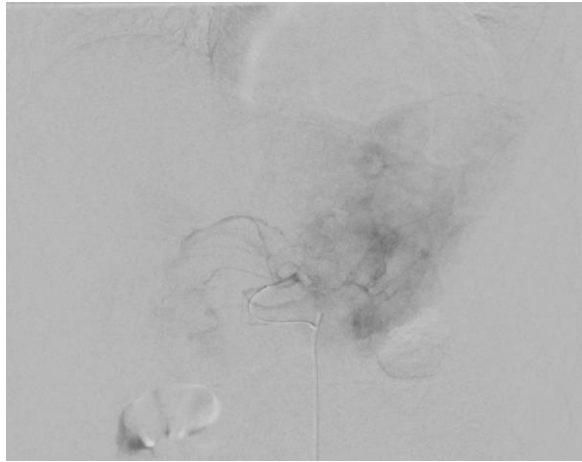
# Case Presentation

- 16 yo female w 8.9 cm fibrolamellar HCC invading entire portal vein (BCLC C)
- CP A (5 points), MELD 11 points, AFP normal



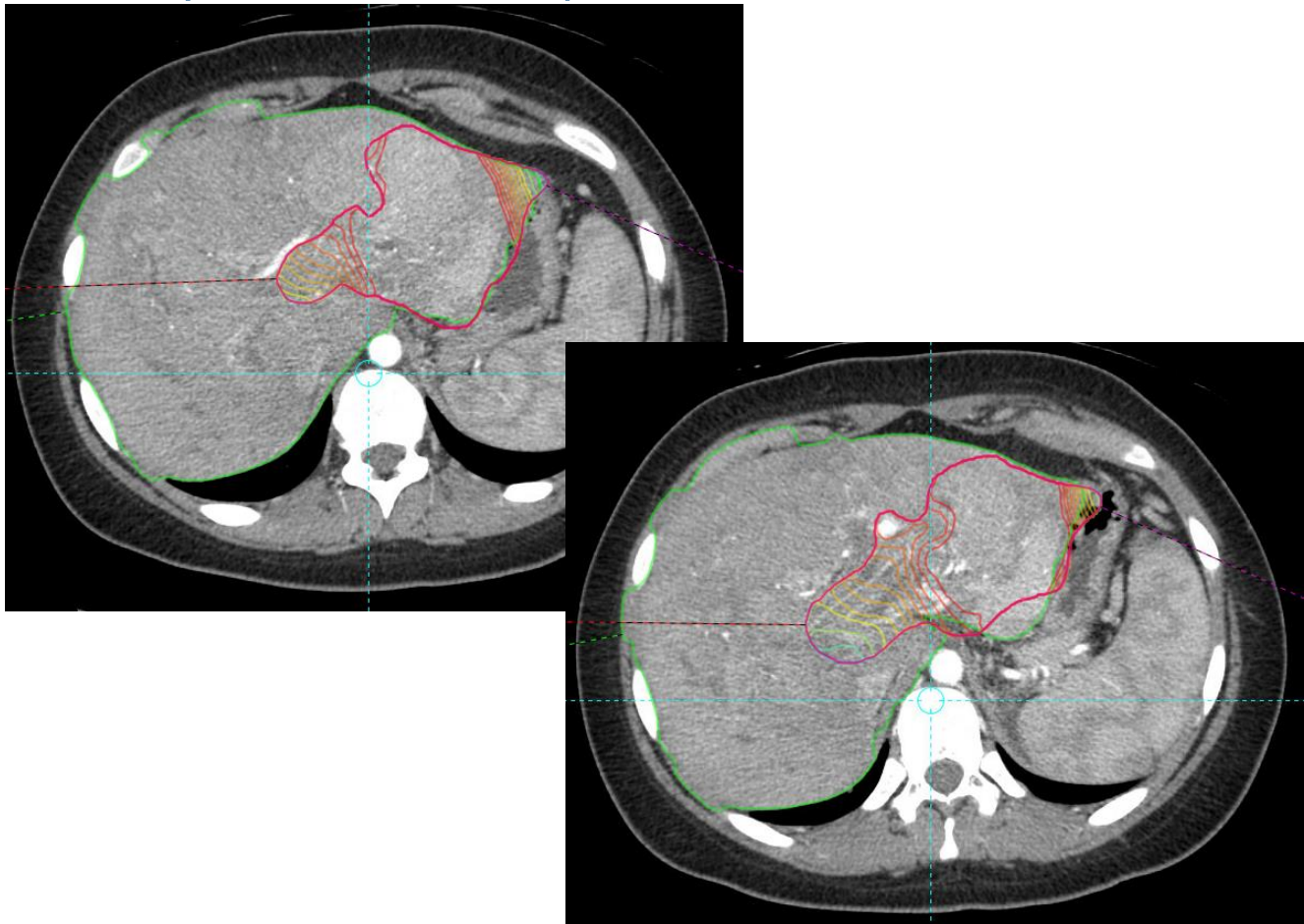
# Case Presentation

- Mapping



# Case Presentation

- Dosimetry – Multicompartment



|                            |        |                           |
|----------------------------|--------|---------------------------|
| Whole liver volume         | 2458.7 | cm <sup>3</sup>           |
| Lung Shunt Fraction        | 2.2    | % <i>Manually entered</i> |
| Previous dose to the lungs | 0.0    | Gy                        |
| Residual Fraction          | 2.0    | % <i>Default</i>          |

|  |                                     |
|--|-------------------------------------|
|  | Perfused volume 1                   |
| Volume, cm <sup>3</sup>                  | 467.5                               |
| Perfused Fraction, %                     | 19.0                                |
| Calculate                                | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> Summation mode  |                                     |
| Activity, GBq                            | 3.94                                |
| Perfused tissue absorbed dose, Gy        | 392.3                               |
| Perfused tumor absorbed dose, Gy         | 400.0                               |
| Perfused viable tumor absorbed dose, Gy  |                                     |
| Perfused normal tissue absorbed dose, Gy | 86.9                                |

⚠ VOI quality check: overlaps accepted

✓ Volume consistency check: OK

|   |          |
|---|----------|
| Totals                                  |          |
| Num. Perfused Volumes                   | 1        |
| Required activity                       | 3.94 GBq |
| Perfused fraction                       | 19.0 %   |
| Perfused tissue absorbed dose           | 392.3 Gy |
| Perfused tumor absorbed dose            | 400.0 Gy |
| Perfused viable tumor absorbed dose     | Gy       |
| Perfused normal tissue absorbed dose    | 86.9 Gy  |
| Whole liver normal tissue absorbed dose | 0.6 Gy   |
| Current lung absorbed dose              | 4.2 Gy   |
| Cumulative lung absorbed dose           | 4.2 Gy   |

# Case Presentation

- F/U



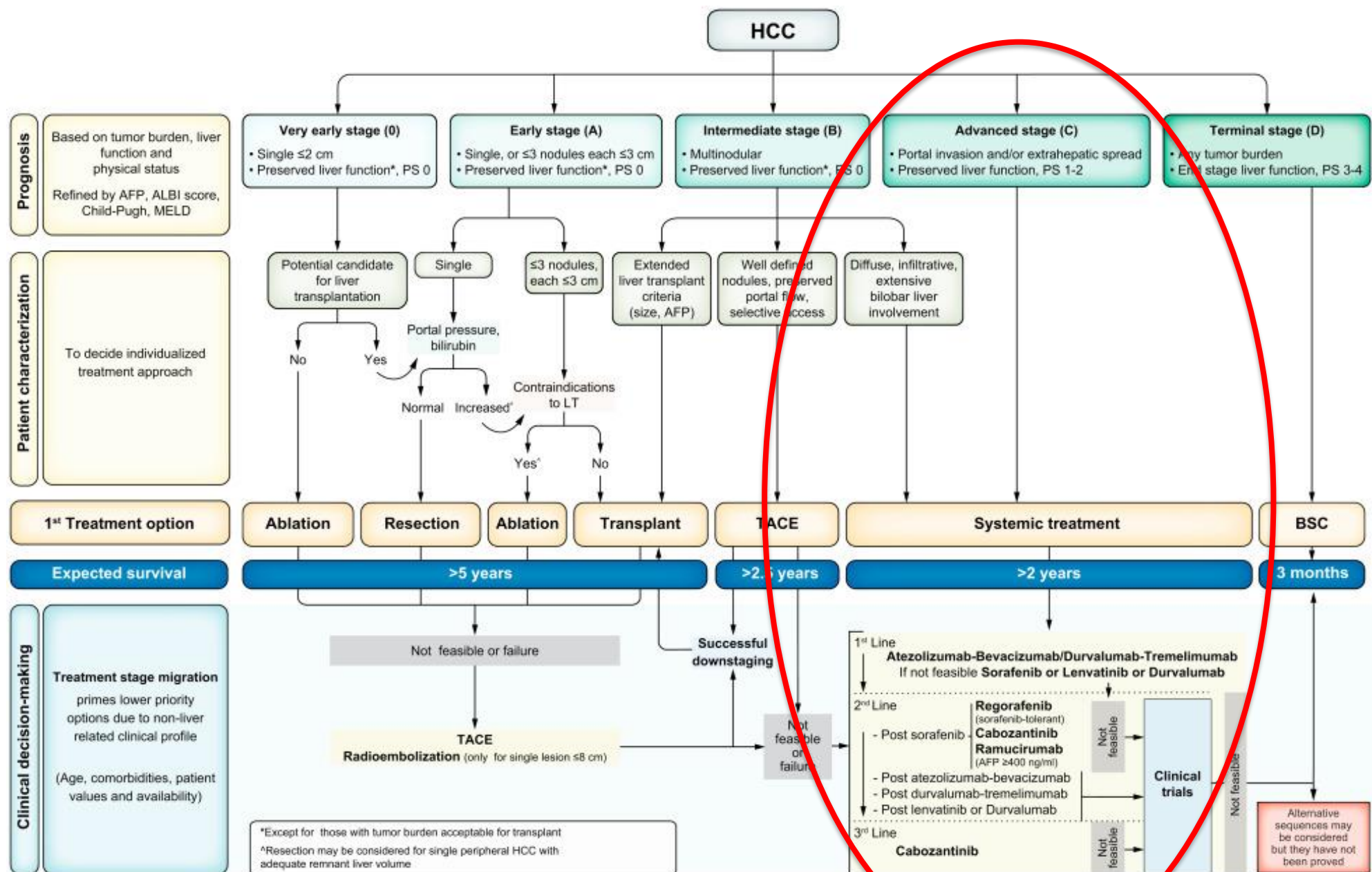
1 month



3 months



8 months



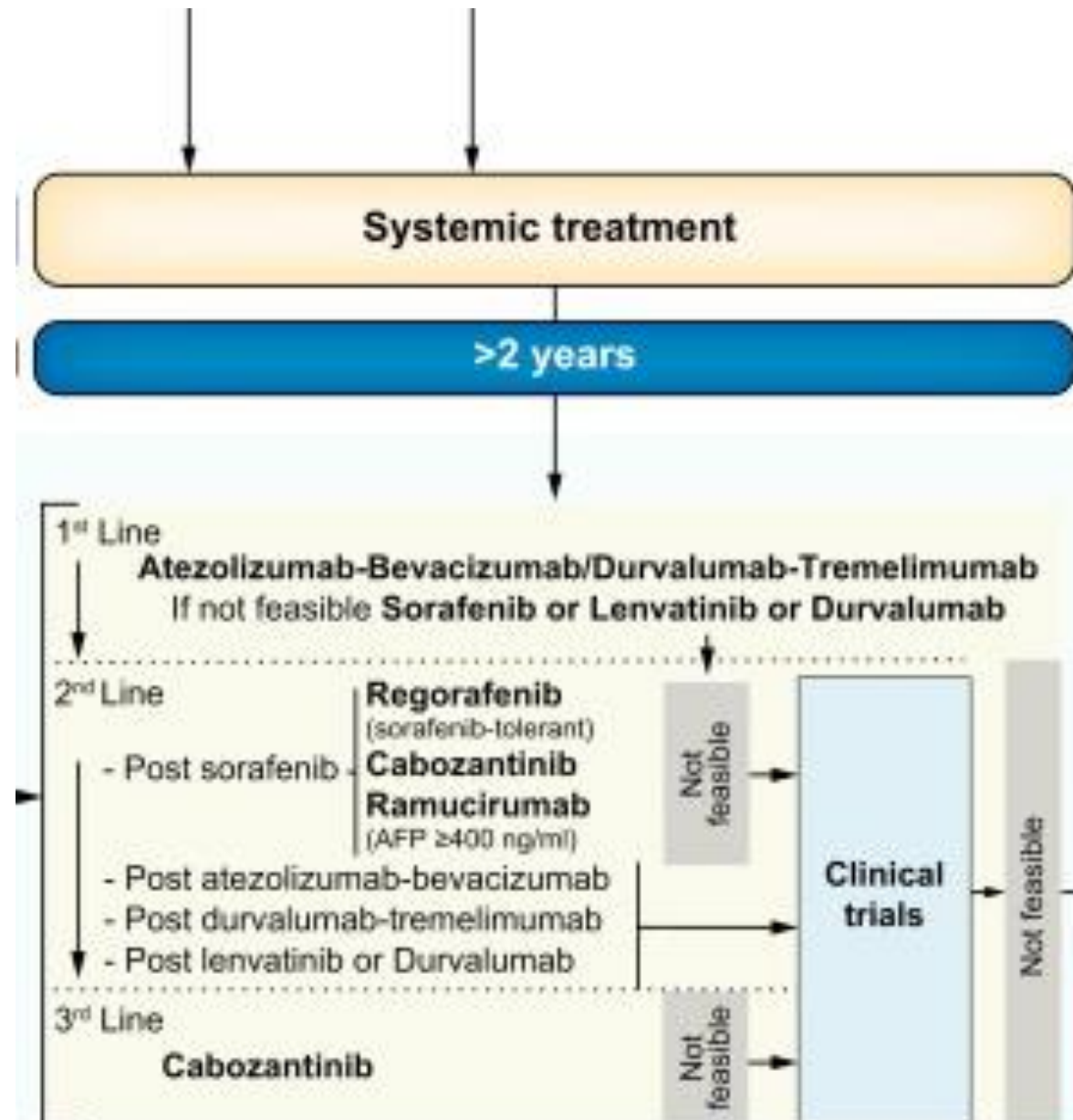


# HCC: Systemic therapies

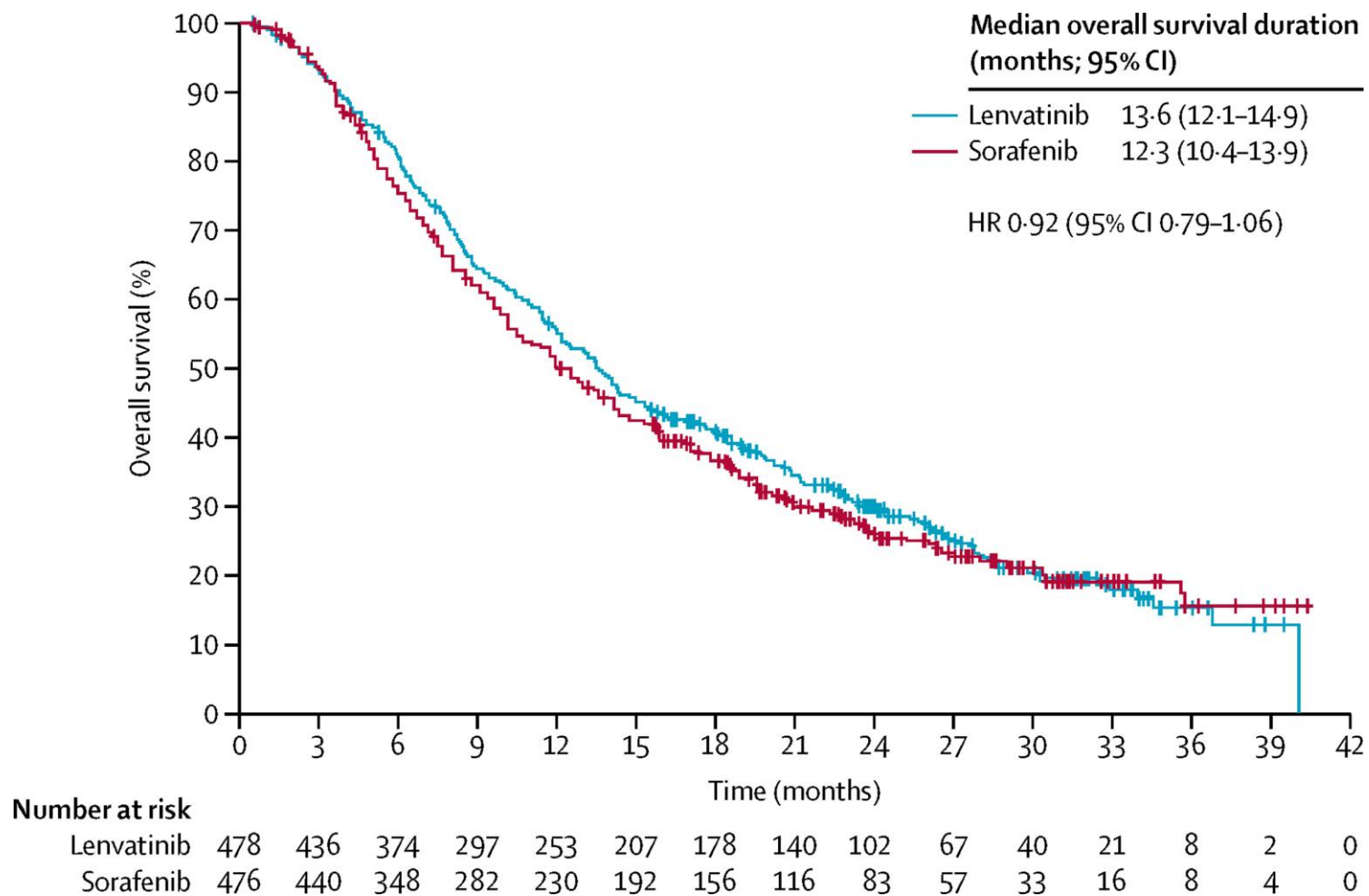
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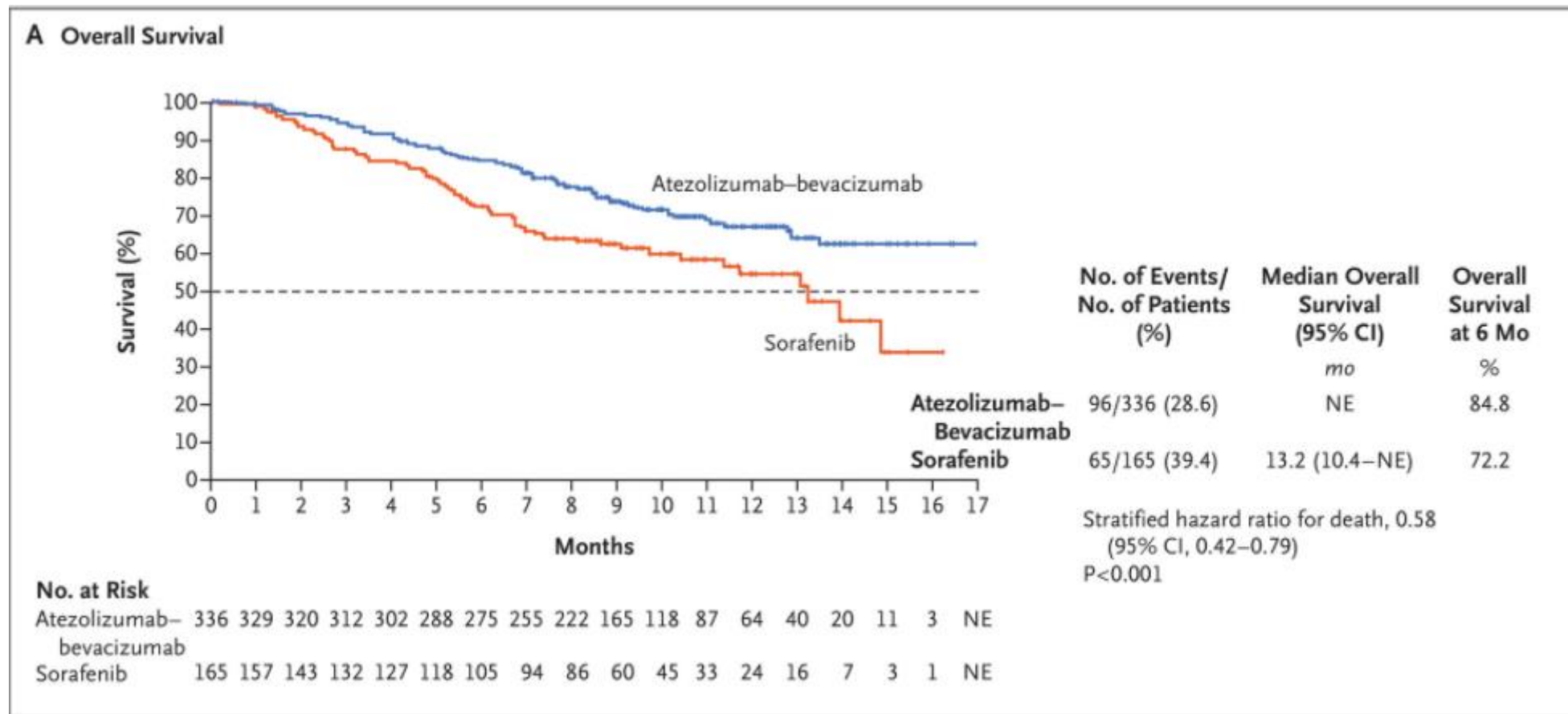




# REFLECT – 1<sup>st</sup> line Lenvatinib



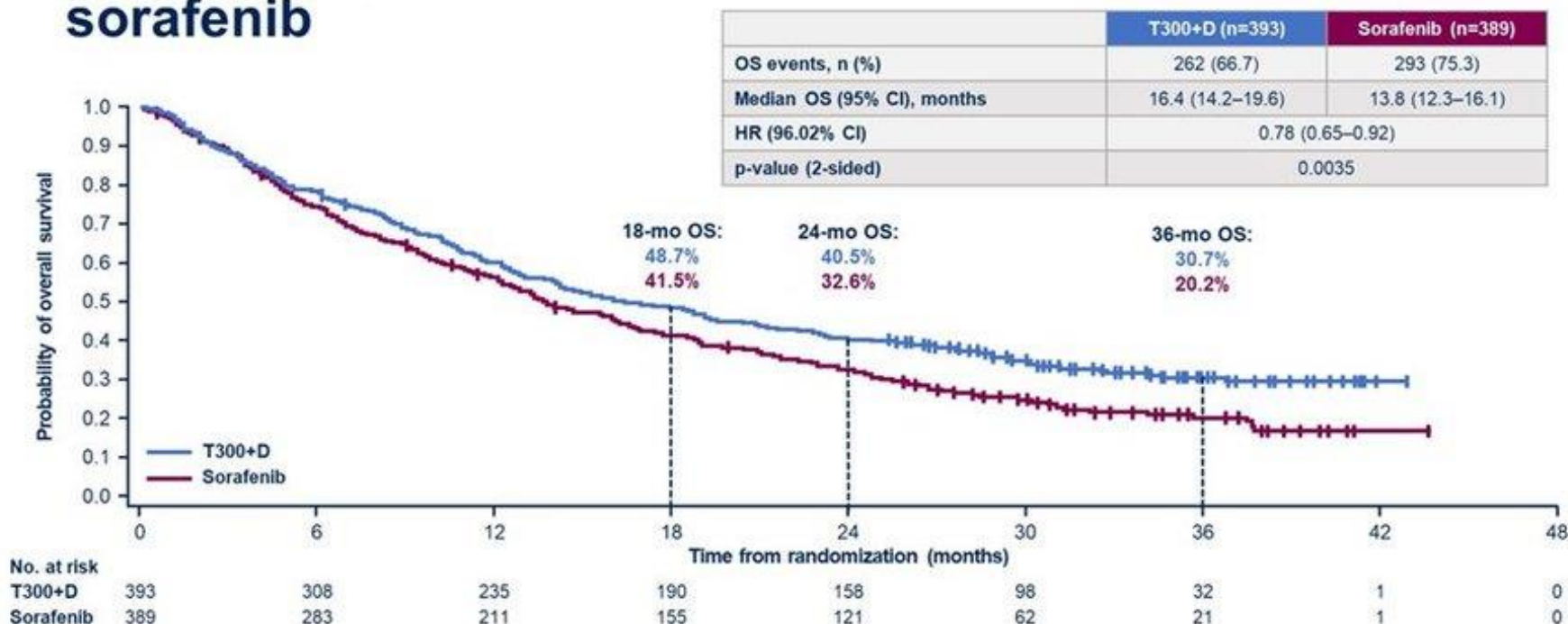
# IMBrave150 – 1<sup>st</sup> line Atezolizumab + Bevacizumab



# HIMALAYA – 1<sup>st</sup> line Durvalumab + Tremelimumab

9

## Primary objective: overall survival for T300+D vs sorafenib



Data cut-off: August 27, 2021. Median duration of follow-up was 33.18 (95% CI, 31.74–34.53) months for T300+D and 32.23 (95% CI, 30.42–33.71) months for sorafenib. CI, confidence interval; HR, hazard ratio; OS, overall survival; T300+D, tremelimumab 300 mg × 1 dose + durvalumab 1500 mg Q4W.

ASCO Gastrointestinal  
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#GI22

PRESENTED BY: Ghassan K Abou-Alfa, MD, MBA

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# Potential **benefits** for combination locoregional + systemic therapy

- Increasing immunogenicity of tumors
  - Release of neoantigens, priming immune activation
- Earlier treatment of micro-metastatic disease
- Downstaging tumors to curative therapy
  - Ablation
  - Surgical resection
  - ? Transplant

# Potential **disadvantages** for combination locoregional + systemic therapy

- Increased toxicity with combination is possible
- Safety of VEGF inhibition with locoregional therapies
- Potential to overtreat patients with earlier stage (BCLC B) disease who may yet (ever?) need systemic therapy
  - Earlier exposure to irAEs
- Financial toxicity



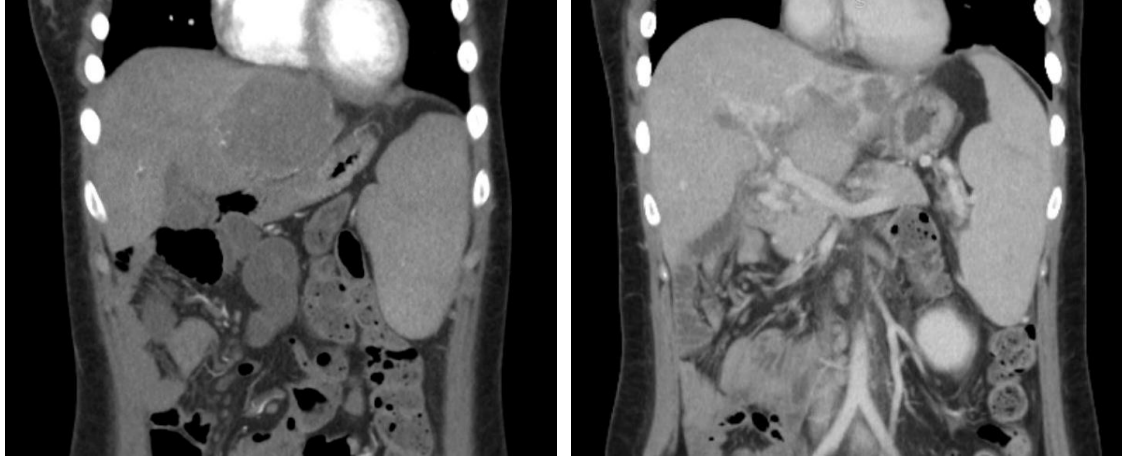
# **HCC: Liver Transplantation**

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Transplantation Surgery**

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New Orleans, LA**



# Hepatocellular Carcinoma: Case Presentation



- Neo-adjuvant treatment
  - Yttrium 90 x 2
  - 5-FU – nivolumab – interferon systemic therapy
  - Tumor regression, persistent PV thrombosis
  - Re-staging without evidence of extrahepatic disease
- Approved for liver transplant
  - Sister approved as living donor
  - Nivolumab held 60 days prior to LDLT
- Living Donor Liver Transplant
  - Uneventful recovery
  - NED with 1 year follow up

# Hepatocellular Carcinoma: Summary

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- Multi-disciplinary treatment team is critical to management of HCC
- Liver transplantation is an essential standard of care for treatment of HCC
- Rapid evolution of new systemic agents allows for personalized treatment plans
- Living donor liver transplant broadens the scope of treatment options especially for advanced disease