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Background/Aims:

- The GALAD score, which incorporates the biomarkers AFP, AFP-L3% and DCP, has excellent performance for detection of hepatocellular carcinoma (HCC).
- However, its accuracy in evaluating treatment response and predicting recurrence prediction is unknown.
- We aim to evaluate the accuracy of these biomarkers in predicting the presence of post-treatment viable tumor and HCC recurrence.**

Methods:

Population: Single-institution, retrospect cohort study. Deep6 software was used to identify patients who had HCC biomarkers obtained from May 2019-current.

Inclusion criteria:

- History cirrhosis or chronic hepatitis B infection, HCC diagnosis, and curative surgical or locoregional treatment (Y-90, TACE, ablation).
- HCC biomarkers obtained greater than 1 month post-treatment.

LAD score: Because the study cohort already has known HCC, we removed the demographic factors to calculate a score based solely on the biomarkers (the “LAD” score). The LAD score is calculated from the following formula:

$$.04 \times (\text{AFP-L3}) + 2.34 \times \log(\text{AFP}) + 1.33 \times \log(\text{DCP})$$

Evidence of viable tumor was determined by imaging, biopsy, or liver explant pathology after transplant.

Survival analysis for tumor recurrence was performed in patients with non-viable tumor on initial post-treatment imaging.

Figure 1: Patient identification and selection

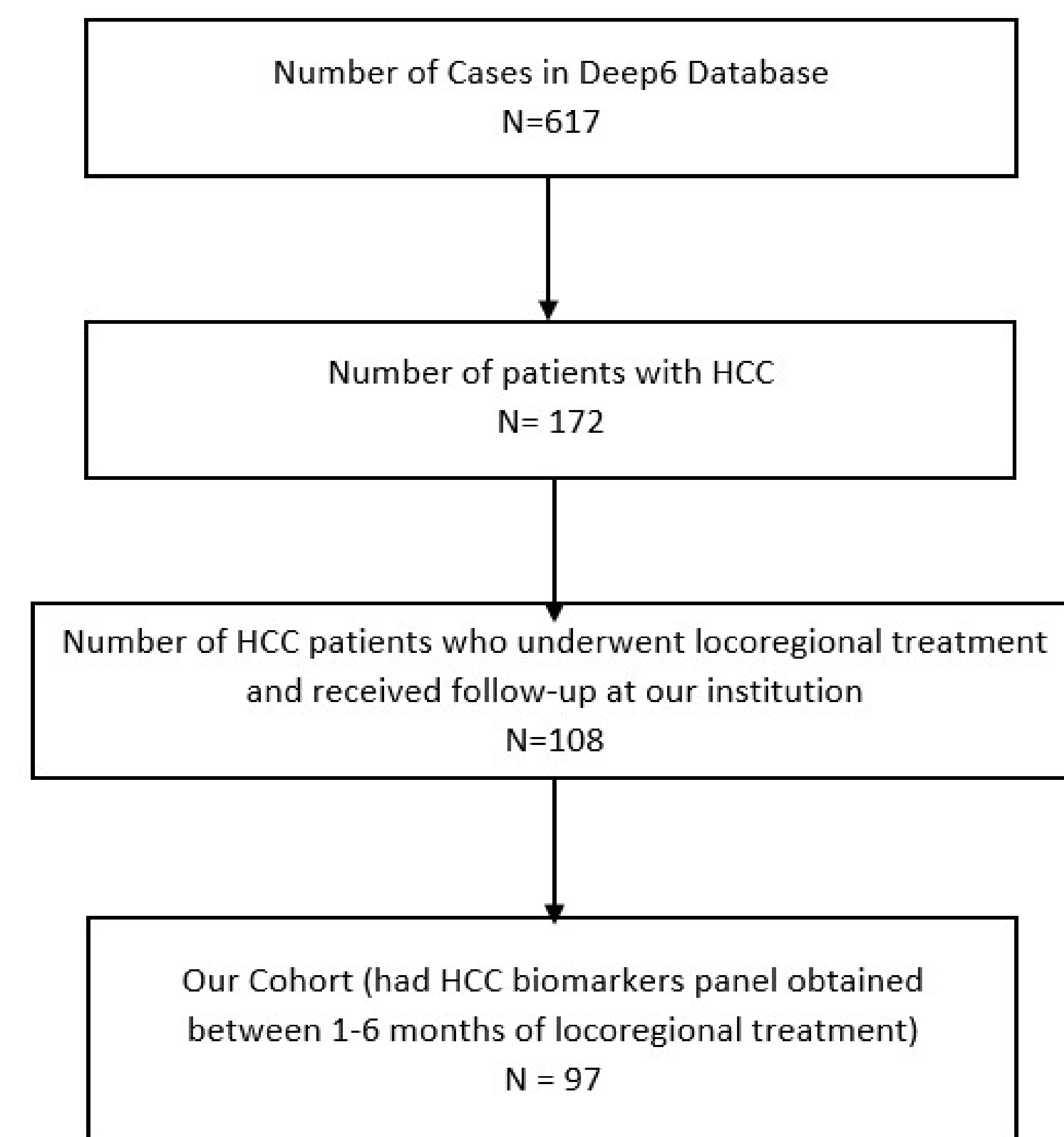
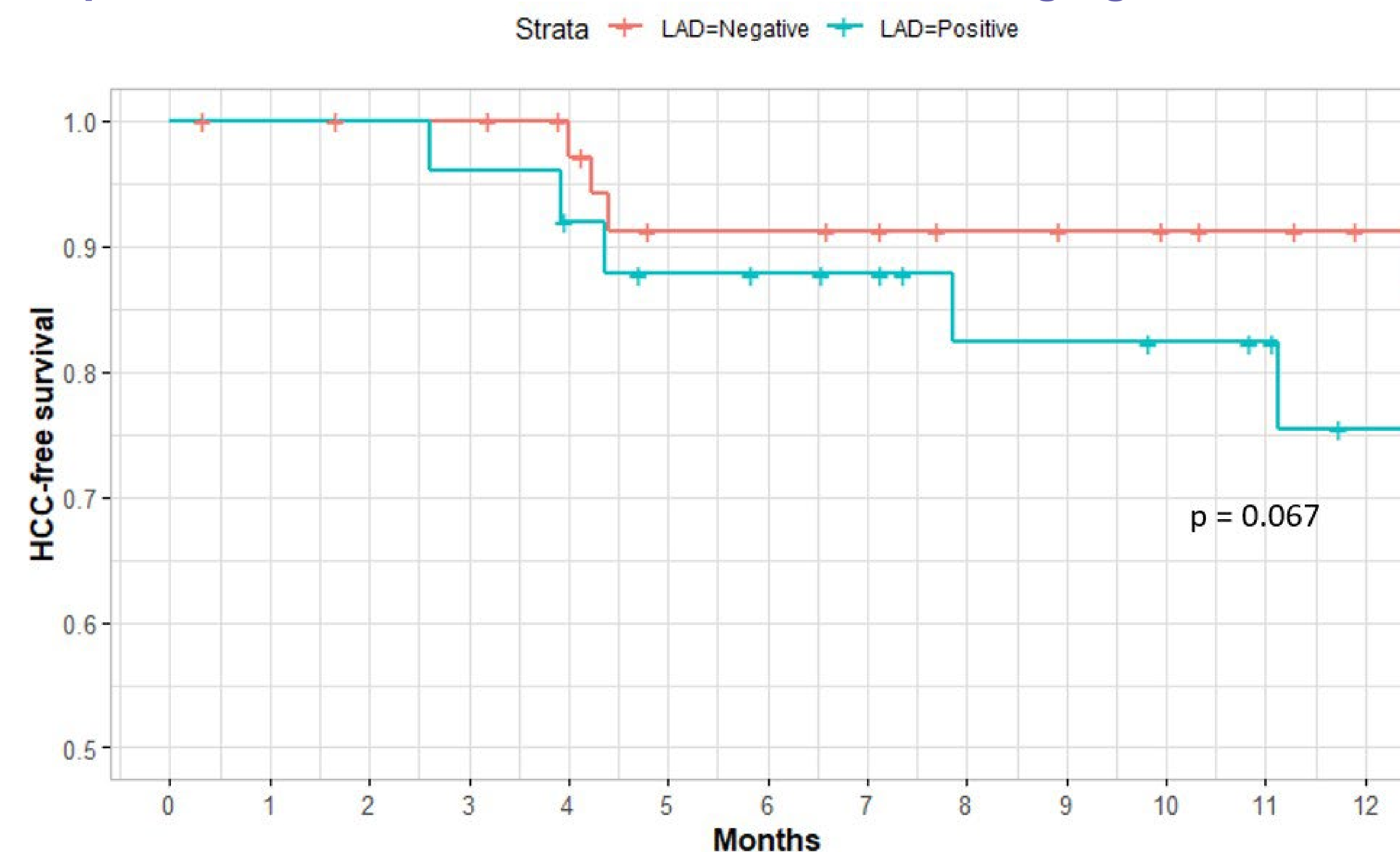


Table 1: Patient demographics

Category	Incidence (%)
Age at time of treatment	
< 65	34 (35.1%)
≥ 65	63 (64.9%)
Sex	
Male	52 (66.7%)
Female	26 (33.3%)
Treatment modality	
TACE	47 (48.6%)
Y90	29 (29.9%)
Ablation	16 (16.5%)
Surgical resection	7 (7.20%)
Number of treatment incidents	
1	63 (80.8%)
2	11 (14.1%)
3	4 (4.12%)

*Total number used for patient variables (sex, number of treatment incidents) is 78. Total number used for treatment variables (age at time of treatment, modality) is 97

Figure 2: HCC recurrence in LAD-positive vs LAD-negative patients with non-viable tumor on initial imaging



Results:

- 78 patients (97 treatments) with surveillance imaging and biomarkers were analyzed. Mean age at time of HCC detection was 67 years, a third of patients were female, and the most common treatment modality was TACE (see **Table 1** for details).
- 34.0% of cases had a viable tumor on initial post treatment images.
- The optimal LAD cutoff was calculated at 2.23, yielding a sensitivity and specificity of 87.4% and 60.9% for detection of viable tumors, respectively.
- After median follow up of 21.3 months, 11 cases (17.2%) developed recurrent HCC (mean time to recurrence 3.5 months) among cases with post-treatment non-viable tumor.
- A total of 7 recurrence cases (64%) had a positive LAD score at negative post-treatment surveillance images. Positive LAD score had a borderline association with recurrence (HR 3.17; 95%CI [0.92, 10.92], p = 0.067 – see **Fig 2**).

Conclusions:

- LAD score is increased in most HCC patients with post-treatment viable tumors.
- It may provide benefit in risk stratification for HCC recurrence.

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