

Supplementary Table 1 Univariate and multivariate Cox regression analysis of overall survival of GAR after propensity score matching

Variables	HR (95%CI)	P value	HR (95%CI)	P value
Gender (male/female)	0.890 (0.662-1.198)	0.442		
Age (≥ 60 / < 60 years)	0.893 (0.723-1.104)	0.297		
HBV (positive/negative)	1.007 (0.817-1.243)	0.945		
HCV (positive/negative)	0.966 (0.515-1.812)	0.914		
Alcohol (yes/no)	1.013 (0.819-1.252)	0.908		
Diabetes (yes/no)	0.693 (0.465-1.034)	0.072		
Hypertension (yes/no)	0.794 (0.565-1.116)	0.185		
GAR-High	1.460 (1.184-1.800)	< 0.001	1.567 (1.267-1.938)	< 0.001
ALT levels ≥ 40 , U/L	0.922 (0.746-1.140)	0.453		
ALP levels ≥ 125 , U/L	1.061 (0.827-1.361)	0.643		
Serum AFP ≥ 500 , ng/mL	1.117 (0.906-1.378)	0.300		
Child-Pugh A vs B/C	1.556 (1.237-1.956)	< 0.001	1.413 (1.114-1.793)	0.004
Lymph node metastasis	1.208 (0.980-1.489)	0.077		
Extrahepatic metastasis	1.407 (1.093-1.812)	0.008	1.253 (0.958-1.638)	0.100
PVTT	1.566 (1.271-1.930)	< 0.001	1.519 (1.181-1.952)	0.001
BCLC stage A vs B vs C vs D				
A	1	0.002	1	0.180
B	1.105 (0.693-1.763)	0.674	0.576 (0.334-0.996)	0.048
C	1.663 (1.147-2.411)	0.007	0.720 (0.446-1.162)	0.178
D	3.151 (1.311-7.574)	0.010	1.086 (0.424-2.785)	0.863
Number of tumors ≥ 2	1.693 (1.299-2.206)	< 0.001	1.860 (1.366-2.533)	< 0.001
Tumor diameter, cm				
< 3	1	0.002	1	0.002
$\geq 3, < 5$	1.462 (0.918-2.329)	0.109	1.600 (0.990-2.586)	0.055
$\geq 5, < 10$	1.615 (1.074-2.428)	0.021	1.548 (1.007-2.380)	0.046
≥ 10	2.149 (1.411-3.274)	< 0.001	2.140 (1.380-3.320)	0.001

GAR-High: $\text{GAR} \geq 4.75$; HBV: Hepatitis B virus; HCV: Hepatitis C virus; ALT: Alanine aminotransferase; ALP: Alkaline phosphatase; AFP: Alpha-fetoprotein; PVTT: Portal vein tumor thrombus; BCLC: Barcelona Clinic Liver Cancer.

Supplementary Table 2 Baseline characteristics of the training and validation sets

Variables	Total (<i>n</i> = 1231)	Training cohort	Validation cohort	<i>P</i> value
Patients	1231	862	369	
Gender				0.923
Female	187 (0.15)	132 (0.15)	55 (0.15)	
Male	1044 (0.85)	730 (0.85)	314 (0.85)	
Age ≥ 60 years	501 (0.41)	359 (0.42)	142 (0.38)	0.331
HBV	749 (0.61)	521 (0.60)	228 (0.62)	0.704
HCV	38 (0.03)	30 (0.03)	8 (0.02)	0.298
Alcohol	482 (0.39)	336 (0.39)	146 (0.40)	0.897
Diabetes	122 (0.10)	87 (0.10)	35 (0.9)	0.824
Hypertension	178 (0.14)	132 (0.15)	46 (0.12)	0.225
GAR-High	525 (0.43)	368 (0.43)	157 (0.43)	1
ALT levels ≥ 40, U/L	639 (0.52)	447 (0.52)	192 (0.52)	1
ALP levels ≥ 125, U/L	714 (0.58)	492 (0.57)	222 (0.60)	0.346
Serum AFP ≥ 500, ng/mL	528 (0.43)	356 (v41)	172 (0.47)	0.096
Child-Pugh class				0.787
A	920 (0.75)	641 (0.74)	279 (0.76)	
B	297 (0.24)	210 (0.24)	87 (0.24)	
C	14 (0.01)	11 (0.01)	3 (0.01)	
Lymph node metastasis	617 (0.50)	424 (0.49)	193 (0.52)	0.348
Extrahepatic metastasis	238 (0.19)	156 (0.18)	82 (0.22)	0.11

PVTT	484 (0.39)	330 (0.38)	154 (0.42)	0.284
BCLC stage				0.593
A	177 (0.14)	128 (0.15)	49 (0.13)	
B	188 (0.15)	137 (0.16)	51 (0.14)	
C	853 (0.69)	587 (0.68)	266 (0.72)	
D	13 (0.01)	10 (0.01)	3 (0.01)	
Number of tumors ≥ 2	890 (0.72)	613 (0.71)	277 (0.75)	0.177
Tumor diameter, cm				0.826
< 3	172 (0.14)	125 (0.15)	47 (0.13)	
$\geq 3, < 5$	216 (0.18)	150 (0.17)	66 (0.18)	
$\geq 5, < 10$	491 (0.40)	345 (0.40)	146 (0.40)	
≥ 10	352 (0.29)	242 (0.28)	110 (0.30)	

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