

**Supplementary Table 1 Uni- and multivariable Fine-Gray analysis in validation cohort**

Characteristics	Univariable Fine-Gray Analysis			Multivariable Fine-Gray Analysis		
	$\beta$ Value	SHR	<i>P</i> value	$\beta$ Value	SHR	<i>P</i> value
Age (years)	-0.010	0.990 (0.963, 1.020)	0.460			
Tumor size (mm)	0.019	1.020 (1.010, 1.030)	<0.001	0.014	1.010 (1.004, 1.020)	0.007
Neutrophil ( $\times 10^9$ )	0.129	1.140 (0.951, 1.360)	0.160	0.086	1.090 (0.843, 1.410)	0.510
Lymphocyte ( $\times 10^9$ )	0.083	1.090 (0.704, 1.680)	0.710			
Platelet ( $\times 10^9$ )	0.001	1.000 (0.997, 1.010)	0.650			
Monocyte ( $\times 10^9$ )	1.490	4.430 (1.140, 17.300)	0.032			
Albumin (g/L)	-0.040	0.961 (0.906, 1.020)	0.180			
Total bilirubin (umol/L)	0.013	1.010 (0.996, 1.030)	0.140			
ALT (U/L)	0.001	1.000 (0.998, 1.000)	0.790			
AST (U/L)	0.001	1.000 (0.998, 1.000)	0.370			
Creatine (umol/L)	0.006	1.010 (0.984, 1.030)	0.620			
INR	-1.410	0.245 (0.019, 3.210)	0.280			
Intratatumoral fibrosis						
low	Ref					
high	1.250	3.490 (1.840, 6.620)	<0.001	1.121	3.070 (1.598, 5.890)	<0.001
MVI						
negative	Ref					
positive	1.400	4.040 (2.040, 8.000)	<0.001	1.409	4.090 (1.867, 8.970)	<0.001
Gender						
female	Ref					
male	0.334	1.400 (0.584, 3.340)	0.450			
Liver cirrhosis						

absence	Ref		
presence	-0.453	0.636 (0.330, 1.220)	0.170
AFP (ng/mL)			
≤200	Ref		
>200	0.234	1.260 (0.662, 2.410)	0.480
Tumor grade			
well/moderately	Ref		
poorly	0.718	2.050 (1.090, 3.850)	0.025
Satellite lesion			
absence	Ref		
presence	0.918	2.500 (1.330,4.700)	0.004
VETC pattern			
absence	Ref		
presence	0.448	1.560 (0.824, 2.970)	0.170
Underlying liver diseases			
absence	Ref		
HBV	-0.317	0.729 (0.309, 1.720)	0.470
others	-0.363	0.695 (0.155, 3.120)	0.640

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Data in parentheses are 95% CIs. HBV, hepatitis B virus; ALT, alanine aminotransferase; AST, aspartate aminotransferase; INR, international normalized ratio; AFP, alpha-fetoprotein; MVI, microvascular invasion; VETC, vessels that encapsulate tumor clusters; Ref, reference; SHR, subdistribution hazard ratio.

### Supplementary 2 Prognostic performance of ITF compared with Nomogram

Variables	Training cohort		<i>P</i> value	Validation cohort		<i>P</i> value
	ITF	Nomogram		ITF	Nomogram	
C-index	0.654 (0.611-0.697)	0.799 (0.770-0.830)	< 0.001	0.562 (0.467-0.663)	0.779 (0.703-0.848)	< 0.001
1-year AUC	0.739 (0.696-0.782)	0.850 (0.812-0.887)	< 0.001	0.649 (0.533-0.765)	0.836 (0.742-0.931)	< 0.001
2-year AUC	0.729 (0.688-0.769)	0.850 (0.816-0.884)	< 0.001	0.683 (0.585-0.781)	0.842 (0.765-0.919)	< 0.001

Data in parentheses are 95% CIs. The two-tailed *P*-value for the difference in the C-index and 1- and 2-year AUCs between the nomogram and the ITF-only model was calculated via a non-parametric bootstrap approach with 1000 resamples. AUC, area under the curve; ITF, intratumoral fibrosis.