Supplement Table 1. Baseline characteristics of the validation cohort.

	Total n=182	Without overt HE (n=149)	With overt HE (n=33)	P value
Demographics and clinical characteristics				
Age (per year)	57.1 (12.8)	55.4 (12.5)	65.1 (11.2)	<0.001
Sex (Male)	110 (60.4%)	84 (56.4%)	26 (78.8%)	0.029
Etiology of cirrhosis				0.095
Virus related	109 (59.9%)	90 (60.4%)	19 (57.6%)	
Alcohol related	12 (6.6%)	7 (4.7%)	5 (15.2%)	
Others	61 (33.5%)	52 (34.9%)	9 (27.3%)	
TIPS indication				0.033
Variceal bleeding	167 (91.8%)	140 (94.0%)	27 (81.8%)	
Refractory ascites	15 (8.24%)	9 (6.04%)	6 (18.2%)	
L3 SMI (cm^2/m^2)				
Male	41.3 (8.7)	42.8 (8.7)	36.6 (7.0)	0.001
Female	34.7 (5.9)	35.0 (3.7)	32.4 (6.0)	0.140
Sarcopenia (Yes)	146 (80.2%)	114 (76.5%)	32 (97.0%)	0.015
Child-Pugh score	7.03 (1.35)	6.92 (1.32)	7.55 (1.42)	0.025
Child-Pugh class				0.031
A	72 (39.6%)	63 (42.3%)	9 (27.3%)	
B	102 (56.0%)	82 (55.0%)	20 (60.6%)	
C	8 (4.40%)	4 (2.68%)	4 (12.1%)	
MELD	11.0 (3.09)	10.9 (3.18)	11.3 (2.64)	0.531
MELD-Na	11.5 (4.07)	11.5 (4.17)	11.8 (3.64)	0.643
Laboratory parameters				
Bilirubin (μmol/L)	23.9 (13.7)	24.3 (13.8)	22.4 (13.2)	0.460

Albumin (g/L)	31.1 (6.24)	31.2 (6.16)	30.8 (6.67)	0.775
Creatinine (µmol/L)	64.4 (23.3)	62.4 (18.9)	73.3 (36.1)	0.102
Sodium (mmol/L)	139 (3.84)	139 (3.83)	138 (3.89)	0.454
Prothrombin time (s)	16.4 (2.72)	16.4 (2.77)	16.1 (2.51)	0.435
INR	1.40 (0.25)	1.41 (0.26)	1.35 (0.23)	0.231
Radiological findings				
Ascites				0.249
No	87 (47.8%)	80 (53.7%)	7 (21.2%)	
Mild	54 (29.7%)	41 (27.5%)	13 (39.4%)	
Moderate	30 (16.5%)	20 (13.4%)	10 (30.3%)	
Severe	11 (6.1%)	8 (5.37%)	3 (9.1%)	
Portal vein thrombosis	42 (23.1%)	34 (22.8%)	8 (24.2%)	1.000
TIPS treatment				
PrePPG	23.0 (5.94)	23.5 (6.17)	21.8 (5.21)	0.235
PostPPG	11.8 (4.86)	12.5 (4.81)	9.83 (4.57)	0.037
PPGchange	11.3 (4.18)	11.1 (4.37)	11.9 (3.63)	0.379

SMI skeletal muscle index, MELD model for end-stage liver disease, INR international normalized ratio, PPG portal pressure gradient

Supplement Table 2. Performance of three models in the validation cohort.

Indices	Model 1	Model 2	Model 3
Discrimination			
c statistic	0.69 (0.58-0.79)	0.73 (0.64-0.82)	0.78 (0.68-0.86)
Calibration			
Brier score	0.14 (0.11-0.17)	0.14 (0.11-0.16)	0.13 (0.10-0.15)
P value[*]	0.18	0.32	0.21
Overall			
performance	11.2	17.4	23.6
R^2 value (%)	278	268	257
AIC			

Model 1/2/3 indicates the core/sarcopenia/full model.

† NRI were calculated with reference to model 1 (model 2/model 3 vs. model 1)

* P value was calculated by Hosmer-Lemeshow goodness-of-fit test.

NRI Net reclassification improvement, AIC Akaike information criterion.

Supplement Table 3. Performance of three models in the derivation cohort using only available data (n=224).

Indices	Model 1	Model 2	Model 3
Discrimination			
c statistic	0.67 (0.59-0.74)	0.71 (0.64-0.78)	0.76 (0.70-0.83)
NRI[†]			
NRI for events		3.4 (-12.3 – 29.4)	22.4 (0 – 42.8)
NRI for non-events	reference	4.0 (-5.9 – 26.4)	10.8 (-2.8 – 28.3)
Overall NRI		7.4 (-3.0 – 36.4)	33.2 (7.2 – 58.5)
P value		0.364	0.012
Calibration			
Brier score	0.17 (0.15-0.20)	0.17 (0.14-0.19)	0.16 (0.13-0.18)
P value[*]	0.48	0.69	0.13
Overall performance			
R^2 value (%)	9.7	15.9	23.4
AIC	254	245	233

Model 1/2/3 indicates the core /sarcopenia /full model.

† NRI were calculated with reference to model 1 (model 2 /model 3 vs. model 1)

* P value was calculated by Hosmer-Lemeshow goodness-of-fit test.

NRI Net reclassification improvement, AIC Akaike information criterion.

Supplement Table 4. Hazard ratio and regression coefficients of each variable fitted with Fine and Gray regression model.

Variable	Core model sHR (95%CI)	coefficient	Sarcopenia model sHR (95%CI)	coefficient	Full model sHR (95%CI)	coefficient
Intercept	…	…	…	…	…	…
Age	1.03 (1.01-1.05)	0.03	1.03 (1.01-1.05)	0.03	1.02 (1.00-1.04)	0.02
Child-Pugh class						
B	3.82 (1.41-10.4)	1.34	3.30 (1.21-9.02)	1.19	3.14 (1.16-8.46)	1.14
C	5.36 (1.67-17.2)	1.76	4.51 (1.42-14.3)	1.51	4.59 (1.43-14.7)	1.52
Sarcopenia	…	…	3.09 (1.59-6.31)	1.13	3.25 (1.87-5.93)	1.18
Post-TIPS PPG	…	…	…	…	0.88 (0.82-0.95)	-0.13

sHR subdistributional hazard ratio, PPG portal pressure gradient.