

## Supplementary material

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Supplementary Figure 1. Forest plot of subgroup analysis of overall survival for patients with persistent albumin-bilirubin grade deterioration after the initial transarterial chemoembolisation relative to patients receiving sorafenib

	Post-TACE PABD group		Sorafenib group						
Subgroups	no. of	Median OS,	no. of	Median OS,	_		HR(95%CI)	P value	P for interaction
	patients	months (95%CI)	patients	months (95%CI)					
Up-to-7									0.298
Within	14	19.63(3.81-35.46)	5	5.17(3.91-6.43)	-		0.269(0.084-0.867)	0.019	
Beyond	67	7.63(4.34-10.92)	57	5.11(4.23-5.98)	-		0.662(0.455-0.962)	0.030	
Up-to-11									0.504
Within	42	10.20(5.19-15.21)	15	5.37(3.89-6.84)			0.450(0.231-0.875)	0.016	
Beyond	39	8.00(5.00-11.00)	47	4.94(4.01-5.88)	<b>—</b>	4	0.673(0.429-1.055)	0.083	
mALBI grade									0.237
1 or 2a	53	11.50(8.53-14.47)	37	6.60(3.61-9.59)	<b>—</b>		0.472(0.299-0.745)	0.001	
2b	28	3.47(1.91-5.02)	25	4.39(3.44-5.35)	-		0.830(0.471-1.462)	0.517	
mALBI and up-to-7 subgroups									0.058
mALBI 1 or 2a, within up-to-7	8	29.57(6.24-52.90)	5	5.17(3.91-6.43)			0.335(0.145-0.776)	0.003	
mALBI 1 or 2a, beyond up-to-7	45	10.57(6.38-14.74)	32	6.60(3.85-9.35)	<b>⊢</b>		0.753(0.591-0.960)	0.020	
mALBI 2b, within up-to-7	6	6.40(0-19.64)	25*	4.39(3.44-5.35)	-	4	0.646(0.397-1.053)	0.071	
mALBI 2b, beyond up-to-7	22	3.07(2.42-3.72)	25	4.39(3.44-5.35)	<b>⊢</b>		1.021(0.757-1.378)	0.891	
mALBI and up-to-11 subgroups									0.071
mALBI 1 or 2a, within up-to-11	25	13.37(7.82-18.92)	12	5.76(1.14-10.37)			0.561(0.371-0.847)	0.004	
mALBI 1 or 2a, beyond up-to-11	28	11.50(4.75-18.25)	25	6.60(2.62-10.58)	<b>-</b>		0.762(0.571-1.016)	0.061	
mALBI 2b, within up-to-11	17	5.07(1.48-8.65)	3	4.52(1.03-8.01)	-		0.718(0.373-1.383)	0.313	
mALBI 2b, beyond up-to-11	11	3.07(1.16-4.97)	22	4.10(2.68-5.52)	-	•	1.209(0.832-1.757)	0.316	
					0.0 0.5 1.	0 1.5	2.0		
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Abbreviations: 95% CI = 95% confidence interval; HR = hazard ratio; mALBI grade = modified albumin-bilirubin grade; PABD = persistent albumin-bilirubin grade deterioration; TACE = transarterial chemoembolisation

<sup>\*</sup> The overall survival of all patients with mALBI grade 2b receiving sorafenib was used as a control because there were no patients in this subgroup

Supplementary Figure 2. Forest plot of subgroup analysis of overall survival for patients with persistent albumin-bilirubin grade deterioration after the initial transarterial chemoembolisation relative to patients receiving supportive care

	Post-TACE PABD group		SC group						
Subgroups	no. of patients	Median OS, months (95%CI)	no. of	Median OS, months (95%CI)	_		HR(95%CI)	P value	P for interaction
Up-to-7									0.900
Within	14	19.63(3.81-35.46)	16	5.40(0-26.11)	-		0.561(0.364-0.865)	0.006	
Beyond	67	7.63(4.34-10.92)	73	2.47(2.07-2.88)	<b>⊢</b>		0.636(0.529-0.764)	< 0.001	
Up-to-11									0.548
Within	42	10.20(5.19-15.21)	36	3.71(5.19-15.21)	<b>⊢</b>		0.657(0.512-0.842)	0.001	
Beyond	39	8.00(5.00-11.00)	53	2.47(2.02-2.92)	<b>⊢</b>		0.634(0.504-0.799)	< 0.001	
mALBI grade									0.271
1 or 2a	53	11.50(8.53-14.47)	33	3.61(2.20-5.02)			0.606(0.474-0.774)	< 0.001	
2b	28	3.47(1.91-5.02)	56	2.28(1.79-2.76)	<b>⊢</b>		0.752(0.592-0.957)	0.019	
mALBI and up-to-7 subgroups									0.296
mALBI 1 or 2a, within up-to-7	8	29.57(6.24-52.90)	5	15.38(0-40.38)	-	-	0.488(0.236-1.007)	0.036	
mALBI 1 or 2a, beyond up-to-7	45	10.57(6.38-14.74)	28	3.32(1.79-4.84)	<b></b>		0.604(0.463-0.786)	< 0.001	
mALBI 2b, within up-to-7	6	6.40(0-19.64)	11	5.40(0-19.47)	-		0.742(0.435-1.266)	0.266	
mALBI 2b, beyond up-to-7	22	3.07(2.42-3.72)	45	2.18(1.40-2.96)	<b>—</b>		0.766(0.585-1.004)	0.051	
mALBI and up-to-11 subgroups									0.407
mALBI 1 or 2a, within up-to-11	25	13.37(7.82-18.92)	11	4.29(1.20-7.39)	-	4	0.659(0.442-0.982)	0.035	
mALBI 1 or 2a, beyond up-to-11	28	11.50(4.75-18.25)	22	3.32(1.92-4.72)	<b></b>		0.608(0.445-0.832)	0.001	
mALBI 2b, within up-to-11	17	5.07(1.48-8.65)	25	2.57(0.23-4.90)	<b></b>	-	0.748(0.537-1.044)	0.084	
mALBI 2b, beyond up-to-11	11	3.07(1.16-4.97)	31	2.08(1.50-2.66)	-	<del>     </del>	0.820(0.575-1.168)	0.269	
					0.0 0.5 1	.0 1.5	i		
					Favors TACE	Favors SC			

Abbreviations: 95% CI = 95% confidence interval; HR = hazard ratio; mALBI grade = modified albumin–bilirubin grade; PABD = persistent albumin–bilirubin grade deterioration; SC = supportive care; TACE = transarterial chemoembolisation

## Supplementary Figure 3. Forest plot of subgroup analysis of overall survival for patients in the non-persistent albumin-bilirubin grade deterioration group after the initial transarterial chemoembolisation relative to patients receiving sorafenib

	Post-TACE non-PABD group Sorafenib group							
Subgroups	no. of	Median OS,	no. of	Median OS,	_	HR(95%CI)	P value	P for interaction
	patients	months (95%CI)	patients	months (95%CI)				
Up-to-7								0.718
Within	54	33.93(27.83-40.04)	5	5.17(3.91-6.43)	<b>—</b>	0.128(0.045-0.366)	< 0.001	
Beyond	165	20.90(16.62-25.18)	57	5.11(4.23-5.98)	<b>⊢</b>	0.225(0.160-0.315)	< 0.001	
Up-to-11								0.106
Within	147	27.43(22.06-32.81)	15	5.37(3.89-6.84)	H	0.117(0.063-0.217)	< 0.001	
Beyond	72	17.30(14.13-20.47)	47	4.94(4.01-5.88)	<b>—</b>	0.318(0.212-0.478)	< 0.001	
mALBI grade								0.738
1 or 2a	107	28.03(22.96-33.11)	37	6.60(3.61-9.59)	<b>⊢</b>	0.187(0.122-0.287)	< 0.001	
2b	112	19.97(15.55-24.38)	25	4.39(3.44-5.35)	<b>→</b>	0.178(0.109-0.291)	< 0.001	
mALBI and up-to-7 subgroups								0.938
mALBI 1 or 2a, within up-to-7	23	29.57(19.38-39.76)	5	5.17(3.91-6.43)	<b>—</b>	0.145(0.043-0.494)	< 0.001	
mALBI 1 or 2a, beyond up-to-7	84	25.20(17.65-32.75)	32	6.60(3.85-9.35)	<b>⊢</b>	0.186(0.116-0.297)	< 0.001	
mALBI 2b, within up-to-7	31	33.73(32.21-37.26)	25*	4.39(3.44-5.35)	H	0.091(0.041-0.203)	< 0.001	
mALBI 2b, beyond up-to-7	81	17.10(13.73-20.47)	25	4.39(3.44-5.35)	<b>—</b>	0.231(0.140-0.380)	< 0.001	
mALBI and up-to-11 subgroups	;							0.153
mALBI 1 or 2a, within up-to-11	78	28.17(20.92-35.41)	12	5.76(1.14-10.37)	<b>→</b>	0.124(0.059-0.261)	< 0.001	
mALBI 1 or 2a, beyond up-to-11	29	22.70(11.95-33.45)	25	6.60(2.62-10.58)	<b>—</b>	0.227(0.120-0.429)	< 0.001	
mALBI 2b, within up-to-11	69	27.30(18.33-36.27)	3	4.52(1.03-8.01)	<b>I</b>	0.028(0.006-0.131)	< 0.001	
mALBI 2b, beyond up-to-11	43	10.77(5.20-16.34)	22	4.10(2.68-5.52)	-	0.336(0.191-0.591)	< 0.001	
					0.0 0.2 0.4 0.6 0.8	1.0		
					Favors TACE			

Abbreviations: 95% CI = 95% confidence interval; HR = hazard ratio; mALBI grade = modified albumin–bilirubin grade; TABD = temporary albumin–bilirubin grade deterioration; TACE = transarterial chemoembolisation

<sup>\*</sup> The overall survival of all patients with mALBI grade 2b receiving sorafenib was used as a control because there were no patients in this subgroup

Supplementary Figure 4. Forest plot of subgroup analysis of overall survival for patients in the non-persistent albumin-bilirubin grade deterioration group after the initial transarterial chemoembolisation relative to patients receiving supportive care

	Post-TAC	CE non-PABD group	SC group						
Subgroups	no. of patients	Median OS, months (95%CI)	no. of patients	Median OS, months (95%CI)	_		HR(95%CI)	P value	P for interaction
Up-to-7		, ,							0.069
Within	54	33.93(27.83-40.04)	16	5.40(0-26.11)	<b>—</b>		0.169(0.087-0.331)	< 0.001	
Beyond	165	20.90(16.62-25.18)	73	2.47(2.07-2.88)	<b>H</b> →		0.138(0.098-0.193)	< 0.001	
Up-to-11									0.736
Within	147	27.43(22.06-32.81)	36	3.71(1.04-6.38)	<b>⊢</b>		0.155(0.101-0.236)	< 0.001	
Beyond	72	17.30(14.13-20.47)	53	2.47(2.02-2.92)	<b>⊢</b>		0.192(0.126-0.293)	< 0.001	
mALBI grade									0.989
1 or 2a	107	28.03(22.96-33.11)	33	3.61(2.20-5.02)	<b>⊢</b>		0.154(0.097-0.245)	< 0.001	
2b	112	19.97(15.55-24.38)	56	2.28(1.79-2.76)	₩-		0.164(0.112-0.242)	< 0.001	
mALBI and up-to-7 subgroups									0.318
mALBI 1 or 2a, within up-to-7	23	29.57(19.38-39.76)	5	15.38(0-40.38)	<b>─</b> ◆	<b>-</b>	0.274(0.093-0.809)	0.012	
mALBI 1 or 2a, beyond up-to-7	84	25.20(17.65-32.75)	28	3.32(1.79-4.84)	₩—		0.121(0.072-0.204)	< 0.001	
mALBI 2b, within up-to-7	31	33.73(32.21-37.26)	11	5.40(0-19.47)	<b>⊢</b>		0.124(0.051-0.299)	< 0.001	
mALBI 2b, beyond up-to-7	81	17.10(13.73-20.47)	45	2.18(1.40-2.96)	<b>⊢</b>		0.160(0.103-0.249)	< 0.001	
mALBI and up-to-11 subgroups	;								0.676
mALBI 1 or 2a, within up-to-11	78	28.17(20.92-35.41)	11	4.29(1.20-7.39)	<b>—</b>		0.199(0.098-0.404)	< 0.001	
mALBI 1 or 2a, beyond up-to-11	29	22.70(11.95-33.45)	22	3.32(1.92-4.72)	<b>—</b>		0.165(0.082-0.332)	< 0.001	
mALBI 2b, within up-to-11	69	27.30(18.33-36.27)	25	2.57(0.23-4.90)	<b>⊢</b>		0.144(0.082-0.251)	< 0.001	
mALBI 2b, beyond up-to-11	43	10.77(5.20-16.34)	31	2.08(1.50-2.66)	<b></b>		0.196(0.114-0.336)	< 0.001	
					0.0 0.2 0.4 0.6 Favors TACE	0.8 1.	0		

Abbreviations: 95% CI = 95% confidence interval; HR = hazard ratio; mALBI grade = modified albumin-bilirubin grade; SC = supportive care; TABD = temporary albumin-bilirubin grade deterioration; TACE = transarterial chemoembolisation