

Supplemental Figure 1.

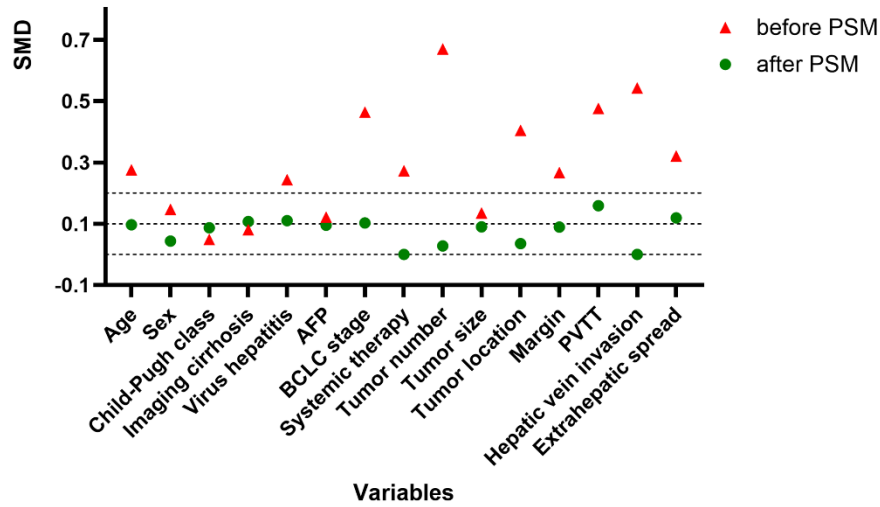


Figure legends. Love plot displaying SMDs of baseline variables before and after PSM. Variables are listed on the x-axis. The y-axis represents SMD values. Dashed lines at 0.1 and 0.2 indicate thresholds for acceptable balance. **Abbreviations:** SMD, standardized mean differences; PSM, propensity score matching; AFP, alpha-fetoprotein; BCLC, Barcelona clinical liver cancer staging system; PVTT, portal vein tumor thrombosis.

Supplemental Figure 2.

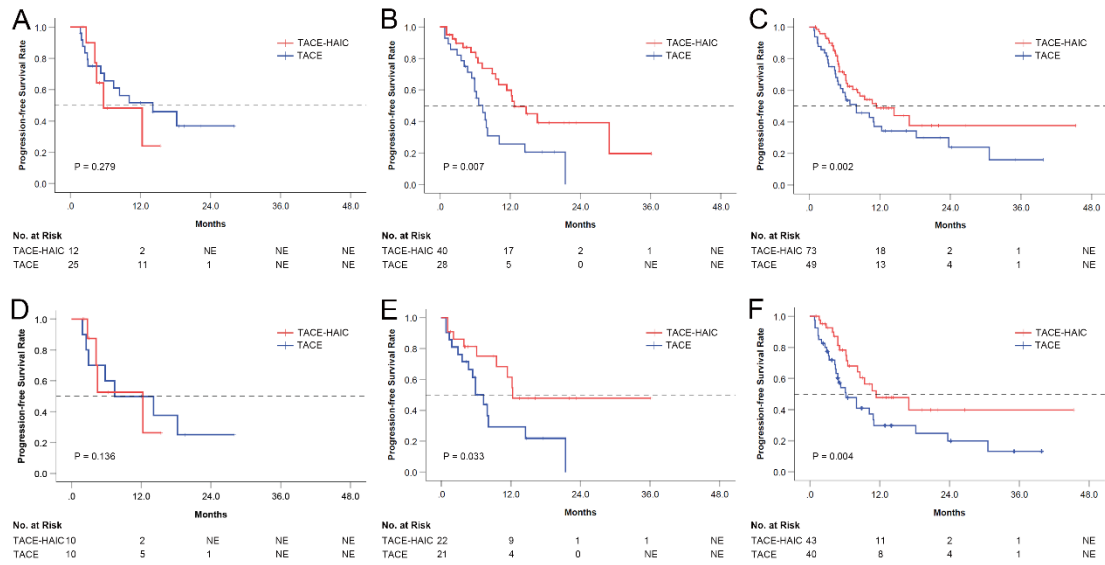


Figure legends. Kaplan-Meier curves comparing progression-free survival between the two groups before (A–C) and after PSM (D–F), stratified by systemic treatment regimen. Panels A and D: no systemic therapy; B and E: sintilimab plus bevacizumab; C and F: camrelizumab plus apatinib. **Abbreviations:** TACE, transcatheter arterial chemoembolization; HAIC, hepatic arterial infusion chemotherapy; PSM, propensity score matching. NE, could not be evaluated.

Supplemental Figure 3

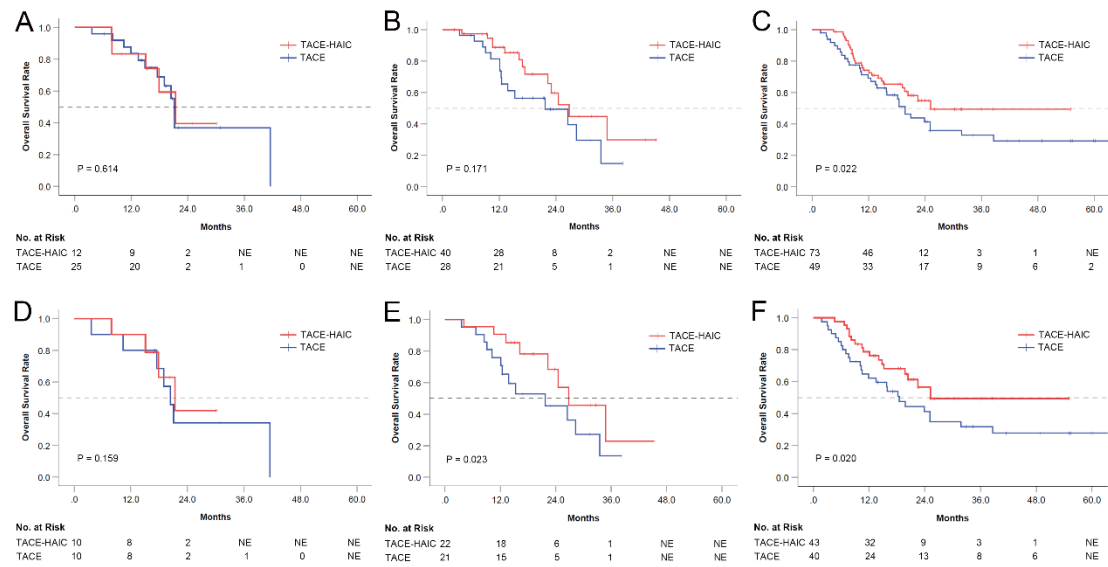


Figure legends. Kaplan-Meier curves comparing overall survival between the two groups before (A–C) and after PSM (D–F), stratified by systemic treatment regimen. Panels A and D: no systemic therapy; B and E: sintilimab plus bevacizumab; C and F: camrelizumab plus apatinib. **Abbreviations:** TACE, transcatheter arterial chemoembolization; HAIC, hepatic arterial infusion chemotherapy; PSM, propensity score matching. NE, could not be evaluated.

Supplemental Table 1 SMD of variables

Variables	SMD	
	before PSM	after PSM
Age	0.2760	0.0970
Sex	0.1471	0.0438
Child-Pugh class	0.0488	0.0871
Imaging cirrhosis	0.0805	0.1073
Virus hepatitis	0.2436	0.1103
AFP	0.1215	0.0951
BCLC stage	0.4646	0.1025
Systemic therapy	0.2732	0.0000
Tumor number	0.6706	0.0276
Tumor size	0.1354	0.0904
Tumor location	0.4054	0.0350
Margin	0.2673	0.0897
PVTT	0.4765	0.1589
Hepatic vein invasion	0.5434	0.0000
Extrahepatic spread	0.3213	0.1192

Abbreviations: SMD, standardized mean difference; PSM, propensity score matching; AFP, alpha-fetoprotein; BCLC, Barcelona clinical liver cancer staging system; PVTT, portal vein tumor thrombosis

Supplementary Table 2 Distribution of AFP changes after PSM

AFP value	TACE (n=77)	TACE-HAIC (n=77)	P
Decreased to normal	9 (11.7)	15 (19.5)	0.183
Decreased > 50%	28 (36.4)	32 (41.6)	0.509
Decreased < 50%	6 (7.8)	7 (9.1)	0.772
Increased < 50%	4 (5.2)	6 (7.8)	0.513
Increased > 50%	16 (20.8)	4 (5.2)	0.003
Not elevated (AFP-negative)	14 (18.2)	13 (16.9)	0.832

Notes: results are expressed as number of patients and (percentages).

Abbreviations: AFP, alpha-fetoprotein; PSM, propensity score matching; TACE, transcatheter arterial chemoembolization; HAIC, hepatic arterial infusion chemotherapy

Supplemental Table 3 Analyses of prognostic factors for progression free survival after PSM

Variate	Univariate		Multivariate	
	HR (95% CI)	<i>P</i>	HR (95% CI)	<i>P</i>
Age (years)	0.953 (0.934, 0.973)	0.001	0.950 (0.929, 0.972)	0.009
Sex (male)	0.871 (0.400, 1.895)	0.727		
Child-Pugh class B	1.314 (0.824, 2.096)	0.252		
Imaging cirrhosis (Y)	0.800 (0.509, 1.258)	0.334		
AFP (ng/ml)				
≤ 400	reference			
> 400	1.362 (0.854, 2.172)	0.195		
Group				
TACE	reference		reference	
TACE-HAIC	0.503 (0.323, 0.800)	0.003	0.407 (0.256, 0.648)	< 0.001
BCLC stage		0.016		0.023
A	reference		reference	
B	3.283 (1.103, 9.773)	0.033	1.812 (0.587, 5.593)	0.301
C	4.282 (1.552, 11.810)	0.005	3.141 (1.108, 8.905)	0.031
Tumor number ≥ 10	1.845 (1.120, 3.038)	0.016	1.342 (0.715, 2.518)	0.360
Margin				
continuous capsule	reference		reference	
non-continuous capsule	2.912 (1.265, 6.704)	0.012	1.948 (0.828, 4.582)	0.127
Tumor location			0.279	
one lobe	reference			
left/right lobe	1.399 (0.736, 2.656)	0.305		
multiple liver lobes	1.680 (0.885, 3.187)	0.112		
PVTT		0.406		
none	reference			
vp1-2	1.676 (0.893, 3.145)	0.108		
vp3	1.094 (0.624, 1.919)	0.753		
vp4	0.974 (0.523, 1.814)	0.934		
Hepatic vein invasion (Y)	2.750 (1.422, 5.319)	0.003	2.694 (1.368, 5.306)	0.004
Extrahepatic spread (Y)	1.986 (1.244, 3.172)	0.004	1.722 (1.068, 2.777)	0.026

Notes: HRs and 95% CI and corresponding *P* values were calculated by Cox regression analysis.

Abbreviations: PSM, propensity score matching; AFP, alpha-fetoprotein; TACE, transarterial chemoembolization; HAIC, hepatic arterial infusion chemotherapy; BCLC, Barcelona clinical liver cancer staging system; Vp classification: The Liver Cancer Study Group of Japan ranks portal vein tumor thrombosis (PVTT) into five types, from Vp0 to Vp4.

Supplemental Table 4 Analyses of prognostic factors for overall survival after PSM

Variate	Univariate		Multivariate	
	HR (95% CI)	<i>P</i>	HR (95% CI)	<i>P</i>
Age (years)	1.597 (0.645, 3.955)	0.311		
Sex (male)	0.982 (0.964, 1.000)	0.055		
Child-Pugh class B	1.932 (1.228, 3.040)	0.004	1.863 (1.176, 2.953)	0.008
Imaging cirrhosis (Y)	0.897 (0.569, 1.415)	0.641		
AFP (ng/ml)				
≤ 400	reference			
> 400	1.386 (0.821, 2.343)	0.222		
Group				
TACE	reference		reference	
TACE-HAIC	0.562 (0.391, 0.889)	0.043	0.519 (0.325, 0.829)	0.006
BCLC stage				
A	reference		reference	
B	1.188 (0.444, 3.175)	0.731	0.512 (0.168, 1.567)	0.241
C	2.028 (0.875, 4.699)	0.099	0.643 (0.223, 1.855)	0.414
Tumor number ≥10	1.993 (1.177, 3.375)	0.010		
Margin				
continuous capsule	reference		reference	
non-continuous capsule	2.101 (1.006, 4.388)	0.048	1.841 (1.281, 2.645)	0.001
Tumor location				
one lobe	reference			
left/right lobe	1.206 (0.646, 2.250)	0.556		
multiple liver lobes	1.540 (0.818, 2.898)	0.181		
PVTT				
none	reference			
vp1-2	1.370 (0.709, 2.650)	0.349		
vp3	1.146 (0.652, 2.013)	0.636		
vp4	0.932 (0.499, 1.742)	0.826		
Hepatic vein invasion (Y)	0.623 (0.252, 1.541)	0.305		
Extrahepatic spread (Y)	1.951 (1.240, 3.070)	0.004	1.616 (0.971, 2.688)	0.065

Notes: HRs and 95% CI and corresponding *P* values were calculated by Cox regression analysis.

Abbreviations: PSM, propensity score matching; AFP, alpha-fetoprotein; TACE, transarterial chemoembolization; HAIC, hepatic arterial infusion chemotherapy; BCLC, Barcelona clinical liver cancer staging system; Vp classification: The Liver Cancer Study Group of Japan ranks portal vein tumor thrombosis (PVTT) into five types, from Vp0 to Vp4.

Supplementary Table 5 Systemic therapies of patients

Variable	before matching			after matching		
	TACE (n=110)	TACE-HAIC (n=132)	<i>P</i>	TACE (n=77)	TACE-HAIC (n=77)	<i>P</i>
Systemic therapies (%)			0.048			0.592
None	25 (22.7)	12 (9.1)		10 (13.0)	10 (13.0)	
Sorafenib	2 (1.8)	2 (1.8)		2 (2.6)	0 (0)	
Lenvatinib	6 (5.5)	5 (3.8)		4 (5.2)	2 (2.6)	
Sintilimab plus bevacizumab	28 (25.5)	40 (30.3)		21 (27.3)	22 (28.6)	
Camrelizumab plus apatinib	49 (44.5)	73 (55.3)		40 (51.9)	43 (55.8)	

Abbreviations: TACE, transarterial chemoembolization; HAIC, hepatic arterial infusion chemotherapy.

Supplemental Table 6 Related adverse events in the matched cohorts

Adverse events	Any grade			Grade 3-4		
	TACE-HAIC (n=77)	TACE (n=77)	<i>P</i>	TACE-HAIC (n=77)	TACE (n=77)	<i>P</i>
Fever	40 (51.9)	43 (49.4)	0.747	1 (1.3)	2 (2.6)	1.000
Nausea/vomiting	35 (45.5)	20 (26.0)	0.012	5 (6.5)	4 (5.2)	1.000
Abdominal pain	21 (27.3)	33 (42.9)	0.043	9 (11.7)	12 (15.6)	0.481
Diarrhea	7 (9.1)	5 (6.5)	0.548	2 (2.6)	1 (1.3)	1.000
Transaminase						
ALT elevation	50 (64.9)	57 (74.0)	0.221	13 (16.9)	15 (19.5)	0.676
AST elevation	58 (75.3)	63 (81.8)	0.326	14 (18.2)	16 (20.8)	0.684
Leukopenia	16 (20.8)	15 (19.5)	0.841	5 (6.5)	2 (2.6)	0.442
Thrombocytopenia	27 (35.1)	15 (19.5)	0.030	5 (6.5)	1 (1.3)	0.209
Hand-foot skin reaction	14 (18.2)	12 (15.6)	0.667	4 (5.2)	2 (2.6)	0.681
Hypertension	12 (15.6)	9 (11.7)	0.481	2 (2.6)	1 (1.3)	1.000
Proteinuria	4 (5.2)	4 (5.2)	1.000	1 (1.3)	2 (2.6)	1.000
Hypothyroidism	7 (9.1)	5 (6.5)	0.548	1 (1.3)	1 (1.3)	1.000
Immune hepatitis	2 (2.6)	1 (1.3)	1.000	1 (1.3)	0 (0.0)	—
Liver abscess	0 (0.0)	3 (3.9)	0.245	0 (0.0)	3 (3.9)	0.245
Groin hematoma	2 (2.6)	3 (3.9)	1.000	0 (0.0)	0 (0.0)	—

Notes: values are presented as n (%).

Abbreviations: TACE, transarterial chemoembolization; HAIC, hepatic arterial infusion chemotherapy; AST, aspartate transaminase; ALT, alanine transaminase.