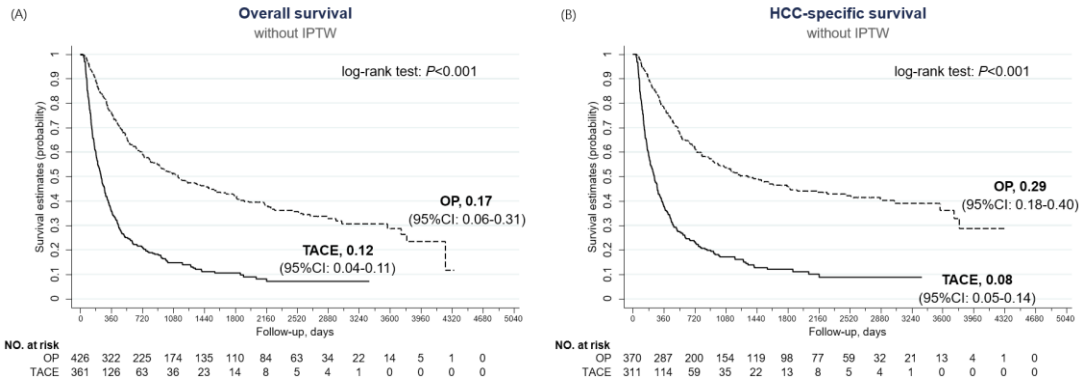
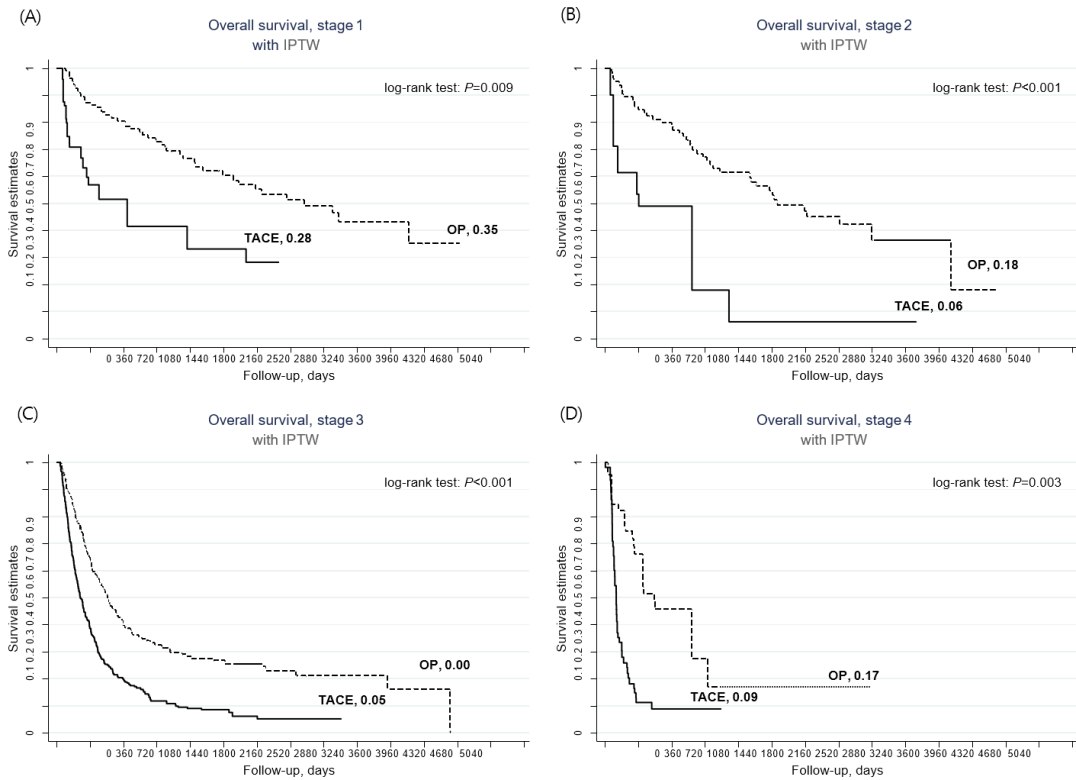


Supplementary Figure 1 hepatocellular carcinoma ≥ 10 cm patients had worse outcome than hepatocellular carcinoma < 10 cm patients after surgery. A: Overall survival; B: Disease-free survival; C: HCC-specific survival. Estimated without IPTW. DFS: Disease-free survival; HCC: Hepatocellular carcinoma; IPTW: Inverse-probability of treatment weighting; L-HCC: HCC ≥ 10 cm; OS; Overall survival; S-HCC: HCC < 10 cm.



Supplementary Figure 2 Liver resection, when comparing to transarterial chemoembolization, can provide a better long-term outcome for selected L-HCC. A: Overall survival; **B:** HCC-specific survival. Estimated without IPTW. HCC: Hepatocellular carcinoma; IPTW: Inverse-probability of treatment weighting; L-HCC: HCC ≥ 10 cm; OS; Overall survival; TACE: Transarterial chemoembolization.



Supplementary Figure 3 Liver resection is better than transarterial chemoembolization for selected. A: TNM stage I; B: TNM stage II; C: TNM stage III; D: TNM stage IV L-HCC patients. Estimated with IPTW. HCC: Hepatocellular carcinoma; IPTW: Inverse-probability of treatment weighting; L-HCC: HCC \geq 10 cm; OS; TACE: Transarterial chemoembolization.

Supplementary Table 1 Number of participants with missing data for each variable of interest, *n* (%)

Variables	Total (<i>n</i> = 3985)	S-HCC (< 10 cm) (<i>n</i> = 3559)	L-HCC (\geq 10 cm) (<i>n</i> = 426)
Alpha-Fetoprotein	201 (5.0)	178 (5.0)	23 (5.4)
Albumin	221 (5.5)	201 (5.6)	20 (4.7)
Alkaline Phosphatase	336 (8.4)	307 (8.6)	29 (6.8)
AST	114 (2.9)	104 (2.9)	10 (2.3)
ALT	99 (2.5)	92 (2.6)	7 (1.6)
Bilirubin-direct	644 (16.2)	594 (16.7)	50 (11.7)
Bilirubin-total	107 (2.7)	101 (2.8)	6 (1.4)
ICG-15	553 (13.9)	507 (14.2)	46 (10.8)
PT	145 (3.6)	138 (3.9)	7 (1.6)

ALT: Alanine aminotransferase; AST: Aspartate aminotransferase; HCC: Hepatocellular carcinoma; ICG-15: Indocyanine green retention test at 15 minutes; L-HCC: HCC \geq 10 cm; S-HCC: HCC < 10 cm; PT: Prothrombin time

Supplementary Table 2 Demographic data of patients with hepatocellular carcinoma

CC ≥ 10 cm, operation vs transarterial chemoembolization, *n* (%), (*n* = 787)

Variables		Total	Hepatectomy ¹	TACE ²	<i>P</i> -value
Number		787 (100)	426 (54)	361 (46)	
Gender	Male	637 (81)	345 (81)	292 (81)	0.970
	Female	150 (19)	81 (19)	69 (19)	
Age	≤ 20	6 (1)	5 (1)	1 (<1)	0.001
	21-40	77 (10)	52 (12)	25 (7)	
	41-60	329 (42)	190 (45)	139 (39)	
	≥ 61	375 (48)	179 (42)	196 (54)	
Diabetes	Yes	120 (15)	67 (16)	53 (15)	0.720
	No	667 (85)	359 (84)	308 (85)	
Hypertension	Yes	199 (25)	119 (28)	80 (22)	0.073
	No	588 (75)	307 (72)	281 (78)	
HBV surface antigen	Positive	404 (51)	225 (53)	179 (50)	0.430
	Negative	383 (49)	201 (47)	182 (50)	
Anti-HCV antibody	Positive	120 (15)	44 (10)	76 (21)	< 0.001
	Negative	667 (85)	382 (90)	285 (79)	
Cigarette smoking	Yes	123 (16)	50 (12)	73 (20)	0.001
	None or abstinent	664 (84)	376 (88)	288 (80)	
Alcohol consumption	Yes	95 (12)	45 (11)	50 (14)	0.160
	None or abstinent	692 (88)	381 (89)	311 (86)	
Betel nut	Yes	31 (4)	16 (4)	15 (4)	0.770

	None or abstine nce	756 (96)	410 (96)	346 (96)	
AJCC 6 th stage (2002-2009)		279	194	85	< 0.001
	I	68 (24)	62 (32)	6 (7)	
	II	44 (16)	40 (21)	4 (5)	
	III	153 (55)	85 (44)	68 (80)	
	IV	14 (5)	7 (4)	7 (8)	
AJCC 7 th stage (2010-2015)		508	232	276	< 0.001
	I	52 (10)	33 (14)	19 (7)	
	II	72 (14)	66 (28)	6 (2)	
	III	327 (64)	121 (52)	206 (75)	
	IV	57 (11)	12 (5)	45 (16)	
AJCC 6 th and 7 th stage		787	426	361	< 0.001
	I	120 (15)	95 (22)	25 (7)	
	II	116 (15)	106 (25)	10 (3)	
	III	480 (61)	206 (48)	274 (76)	
	IV	71 (9)	19 (5)	52 (14)	
BCLC stage ^c					< 0.001
	A	4 (0.8)	4 (1.61)	0 (0)	
	B	211 (40.0)	120 (48.4)	91 (32.6)	
	C	300 (56.9)	122 (49.2)	178 (63.8)	
	D	12 (2.3)	2 (0.80)	10 (3.6)	
Variables		Total mean ± SD	Hepatectomy mean ± SD	TACE only mean ± SD	<i>P</i> -value
Tumor size	Cm	13.11± 4.11	13.14 ± 4.95	13.07 ± 2.82	0.800
Age	year-ol d	58.0 ± 14.4	55.7 ± 14.3	60.7 ± 14.1	< 0.001
Alpha-Fetoprot ein	ng/mL	52033 ± 186451	40532 ± 178925	63032 ± 193012	0.130
Albumin	g/dL	3.4 ± 0.7	3.5 ± 0.7	3.3 ± 0.7	< 0.001

Alkaline Phosphatase	U/L	196.9 ± 225.1	161.1 ± 221.4	239.7 ± 222.4	< 0.001
AST	U/L	171.7 ± 307.7	121.8 ± 261.2	231.6 ± 346.6	< 0.001
ALT	U/L	116.3 ± 235.0	92.2 ± 217.0	145.2 ± 252.2	0.002
Bilirubin-direct	mg/dL	0.6 ± 1.3	0.4 ± 0.6	0.9 ± 1.9	< 0.001
Bilirubin-total	mg/dL	1.5 ± 2.1	1.1 ± 1.0	2.0 ± 2.9	< 0.001
ICG-15	%	8.8 ± 7.2	8.0 ± 5.8	13.2 ± 11.0	< 0.001
PT	Second	12.7 ± 3.0	12.0 ± 2.6	13.6 ± 3.2	< 0.001

¹ Patients with HCC larger than or equal to 10cm who underwent hepatectomy; excluded 30-d mortality; ² Patients with HCC larger than or equal to 10 cm who were primarily treated with TACE; excluded 30-d mortality. Cases with missing BCLC stage were excluded. ALT: Alanine aminotransferase; AJCC: American Joint Committee on Cancer; AST: Aspartate aminotransferase; BCLC: Barcelona Clinic Liver Cancer; HBV: Hepatitis B virus; HCC: Hepatocellular carcinoma; HCV: Hepatitis C virus; ICG-15: Indocyanine green retention test at 15 minutes; OP: Operation; PT: Prothrombin time; SD: Standard deviation; TACE: transarterial chemoembolization

Supplementary Table 3 Number of participants with missing data for each variable of interest, *n* (%)

Variables	Total (<i>n</i> = 787)	Hepatectomy (<i>n</i> = 426)	TACE (<i>n</i> = 361)
Alpha-Fetoprotein	43 (5.5)	23 (5.4)	20 (5.5)
Albumin	50 (6.35)	20 (4.7)	30 (8.3)
Alkaline Phosphatase	58 (7.37)	29 (6.8)	29 (8)
AST	24 (3.05)	10 (2.3)	14 (3.9)
ALT	18 (2.29)	7 (1.6)	11 (3)
Bilirubin-direct	128 (16.3)	50 (11.7)	78 (21.6)
Bilirubin-total	18 (2.29)	6 (1.4)	12 (3.3)
ICG-15	331 (42.06)	46 (10.8)	285 (78.9)
PT	33 (4.19)	7 (1.6)	26 (7.2)

ALT: Alanine aminotransferase; AST: Aspartate aminotransferase; ICG-15: Indocyanine green retention test at 15 min; PT: Prothrombin time; TACE: Transarterial chemoembolization.

Supplementary Table 4 Treatment outcome of patients with hepatocellular carcinoma ≥ 10 cm, operation *vs* transarterial chemoembolization group, *n* (%), (*n* = 787)

	Hepatectomy ¹ (<i>n</i> = 426)	TACE ² (<i>n</i> = 361)	<i>P</i> -value
90-d mortality	34 (7.8)	106 (27.5)	< 0.001
Follow-up times (d) (mean \pm SD)	1175.3 \pm 1034.2	440.4 \pm 540.9	< 0.001
Recurrence status			< 0.001
Yes	256 (60.1)	13 (3.6)	
No	101 (23.7)	6 (1.7)	
Never disease free	69 (16.2)	342 (94.7)	
Recurrence pattern			< 0.001
Local ^c	131 (51.2)	4 (30.8)	
Regional ^d	10 (3.9)	0 (0)	
Combined ^e	36 (14.1)	1 (7.7)	
Distant	47 (18.4)	7 (53.8)	
Death without recurrence	32 (12.5)	1 (7.7)	
Final status			< 0.001
Alive	175 (41.1)	50 (13.9)	
Death - liver cause	195 (45.8)	261 (72.3)	
Death - other cause	56 (13.1)	50 (13.9)	
Overall survival (d) (median (IQR))	801.5 (362-1818)	243 (123-480)	< 0.001
1-year OS rate	323 (75.8)	130 (36.0)	< 0.001
3-year OS rate	227 (53.3)	63 (17.5)	< 0.001
5-year OS rate	197 (46.2)	54 (15.0)	< 0.001

¹Patients with HCC larger than or equal to 10cm who underwent hepatectomy; excluded 30-day mortality; ²Patients with HCC larger than or equal to 10cm who were primarily treated with TACE; excluded 30-day mortality. Local recurrence includes recurrence at resection margin/remnant liver or trocar site. Regional recurrence includes recurrence at adjacent organs/regional LNs, or both. Combined recurrence includes local and regional recurrence. HCC: Hepatocellular carcinoma; IQR: Interquartile range; OP: Operation; OS: Overall survival; SD: standard deviation; TACE: transarterial chemoembolization.