A novel scoring system predicts adjuvant chemolipiodolization benefit for hepatocellular carcinoma patients after hepatectomy

Supplementary Materials

Supplementary Table S1: Univariable analysis of tumor recurrence and OS in the primary cohort

Variable	Tumor recurrence		OS	
	P	HR (95.0%CI)	*P*	HR (95.0% CI)
Age, years				
> 50 vs. ≤ 50	0.50	0.95 (0.81–1.11)	0.09	0.84 (0.69–1.03)
Gender				
Male vs. Female	0.13	1.21 (0.95–1.55)	0.40	1.14 (0.84–1.57)
HBsAg,				
Positive vs. Negative	0.02	1.31 (1.04–1.64)	0.04	1.36 (1.02–1.82)
HBeAg				
Positive vs. Negative	0.02	1.23 (1.04–1.45)	0.07	1.22 (0.98–1.51)
HBcAb				
Positive vs. Negative	0.10	1.29 (0.95–1.76)	0.23	1.26 (0.86–1.86)
HCVAb				
Positive vs. Negative	0.46	0.83 (0.51–1.37)	0.10	0.51 (0.23–1.13)
Cirrhosis				
Positive vs. Negative	0.78	1.02 (0.87–1.20)	0.93	1.01 (0.82–1.24)
AFP, ng/mL				
> 400 vs. ≤ 400	< 0.001	1.39 (1.18–1.64)	0.02	1.30 (1.05–1.60)
PT, second				
> 12 vs. ≤ 12	0.11	1.14 (0.97–1.34)	0.91	1.01 (0.83–1.24)
PLT, ×10⁹/L				
>100 vs. ≤ 100	0.46	1.08 (0.89–1.30)	0.12	1.22 (0.95–1.56)
ALB, g/L				
> 40 vs. ≤ 40	0.27	0.91 (0.77–1.07)	0.70	1.04 (0.84–1.30)
ALT, U/L				
>40 vs. ≤40	0.004	1.26 (1.08–1.48)	0.32	1.11 (0.91–1.36)
TBIL, μmol/L				
≤ 34 vs. > 34	0.70	1.15 (0.57–2.30)	0.70	0.83 (0.31–2.21)
WBC, ×10⁹/L				
> 4 vs. ≤ 4	0.26	1.12(0.92–1.38)	0.10	1.25(0.96–1.63)
Tumor number				
Multiple vs. Single	< 0.001	1.94(1.60–2.35)	< 0.001	2.06 (1.63–2.60)
Tumor diameter, cm				
3–5 vs. ≤ 3	< 0.001	1.60 (1.24–2.06)	< 0.001	1.96 (1.35–2.85)
> 5 vs. 3–5	< 0.001	2.86 (2.28–3.57)	< 0.001	4.50 (3.23–6.26)
MVI				
Presence vs. Absence	< 0.001	3.12 (2.66–3.66)	< 0.001	3.10 (2.53–3.80)

| Variable	Tumor recurrence		OS	
	P	HR (95.0%CI)	*P*	HR (95.0% CI)
Tumor capsule				
Incomplete vs. Complete	< 0.001	1.48 (1.26–1.74)	< 0.001	2.16 (1.76–2.65)
Edmondson–Steiner				
III/IV vs. I/II	< 0.001	1.43 (1.19–1.72)	< 0.001	1.59 (1.25–2.03)
Blood transfusion				
Yes vs. No	0.01	1.34 (1.06–1.69)	0.22	1.21 (0.89–1.64)
Surgical margin, cm				
≤ 1 vs. >1	0.003	1.29 (1.09–1.52)	0.001	1.46 (1.17–1.81)
Hepatectomy				
Anatomical vs. Non–anatomical	0.98	1.00 (0.85–1.18)	0.65	1.05 (0.85–1.29)
ACL				
ACL vs. non–ACL	0.52	0.95 (0.80–1.12)	0.76	0.97 (0.78–1.20)

Supplementary Table S2: Clinicopathologic characteristics of patients treated with or without ACL with a score of ≥ 10

Variable	Primary cohort			Validation cohort		
	Non–ACL	ACL	P value	Non–ACL	ACL	P value
	(*n* = 71)	(*n* = 36)		(*n* = 24)	(*n* = 17)	
Age, years						
≤ 50	32 (45.1%)	26 (72.2%)	0.008**	15 (62.5%)	8 (47.1%)	0.33
> 50	39 (54.9%)	10 (27.8%)		9 (37.5%)	9 (52.9%)	
Gender						
Male	64 (90.1%)	31 (86.1%)	0.53	19 (79.2%)	14 (82.4%)	0.99*
Female	7 (9.9%)	5 (13.9%)		5 (20.8%)	3 (17.6%)	
HBsAg						
Positive	62 (87.3%)	30 (83.3%)	0.57	20 (83.3%)	12 (70.6%)	0.56*
Negative	9 (12.7%)	6 (16.7%)		4 (16.7%)	5 (29.4%)	
HBeAg						
Positive	20 (28.2%)	10 (27.8%)	0.97	6 (25.0%)	2 (11.8%)	0.51*
Negative	51 (71.8%)	26 (72.2%)		18 (75.0%)	15 (88.2%)	
HBcAb						
Positive	66 (93.0%)	34 (94.4%)	0.99*	24 (100.0%)	17 (100.0%)	0.99*
Negative	5 (7.0%)	2 (5.6%)		0 (0.0%)	0 (0.0%)	
HCVAb						
Positive	0 (0%)	1 (2.8%)	0.73*	1 (4.2%)	1 (5.9%)	0.99*
Negative	71 (100.0%)	35 (97.2%)		23 (95.8%)	16 (94.1%)	
Cirrhosis						
Yes	40 (56.3%)	16 (44.4%)	0.24	11 (45.8%)	8 (47.1%)	0.94
No	31 (43.7%)	20 (55.6%)		13 (54.2%)	9 (52.9%)	
AFP, ng/mL						
≤ 400	30 (42.3%)	19 (52.8%)	0.30	10 (41.7%)	11 (64.7%)	0.15
> 400	41 (57.7%)	17 (47.2%)		14 (58.3%)	6 (35.3%)	
PT, second						
≤ 12	34 (47.9%)	19 (52.8%)	0.63	11 (45.8%)	7 (41.2%)	0.77
> 12	37 (52.1%)	17 (47.2%)		13 (54.2%)	10 (58.8%)	

| Variable	Primary cohort			Validation cohort		
	Non–ACL	ACL	P value	Non–ACL	ACL	P value
	(n = 71)	(n = 36)		(n = 24)	(n = 17)	
PLT, ×10⁹/L						
≤ 100	11 (15.5%)	4 (11.1%)	0.54	1 (4.2%)	4 (23.5%)	0.17*
> 100	60 (84.5%)	32 (88.9%)		23 (95.8%)	13 (76.5%)	
ALB, g/L						
≤ 40	33 (46.5%)	10 (27.8%)	0.06	7 (29.2%)	7 (41.2%)	0.42
> 40	38 (53.5%)	26 (72.2%)		17 (70.8%)	10 (58.8%)	
ALT, U/L						
≤ 40	36 (50.7%)	11 (30.6%)	0.05	14 (58.3%)	6 (35.3%)	0.15
> 40	35 (49.3%)	25 (69.4%)		10 (41.7%)	11 (64.7%)	
TBIL, μmol/L						
≤ 34	2 (2.8%)	0 (0.0%)	0.79*	0 (0.0%)	0 (0.0%)	0.99*
> 34	69 (97.2%)	36 (100.0%)		24 (100%)	17 (100%)	
WBC, ×10⁹/L						
≤ 4	10 (14.1%)	3 (8.3%)	0.58*	4 (16.7%)	5 (29.4%)	0.56*
> 4	61 (85.9%)	33 (91.7%)		20 (83.3%)	12 (70.6%)	
Tumor number						
Single	30 (42.3%)	22 (61.1%)	0.07	15 (62.5%)	15 (88.2%)	0.14*
Multiple	41 (57.7%)	14 (38.9%)		9 (37.5%)	2 (11.8%)	
Tumor diameter, cm						
≤ 3	0 (0.0%)	0 (0.0%)	0.99*	0 (0.0%)	0 (0.0%)	0.99*
3–5	0 (0.0%)	0 (0.0%)		0 (0.0%)	0 (0.0%)	
> 5	71 (100.0%)	36 (100.0%)		24 (100.0%)	17 (100.0%)	
MVI						
Presence	71 (100.0%)	36 (100.0%)	0.99*	24 (100.0%)	17 (100.0%)	0.99*
Absence	0 (0.0%)	0 (0.0%)		0 (0.0%)	0 (0.0%)	
Tumor capsule						
Complete	0 (0.0%)	0 (0.0%)	0.99*	0 (0.0%)	0 (0.0%)	0.99*
Incomplete	71 (100.0%)	36 (100.0%)		24 (100.0%)	17 (100.0%)	
Edmondson–Steiner						
I/II	8 (11.3%)	3 (8.3%)	0.89*	4 (16.7%)	1 (5.9%)	0.58*
III/IV	63 (88.7%)	33 (91.7%)		20 (83.3%)	16 (94.1%)	
Blood transfusion						
Yes	18 (25.4%)	7 (19.4%)	0.50	3 (12.5%)	6 (35.3%)	0.18*
No	53 (74.6%)	29 (80.6%)		21 (87.5%)	11 (64.7%)	
Surgical margin, cm						
≤ 1	70 (98.6%)	32 (88.9%)	0.08*	22 (91.8%)	17 (100.0%)	0.63*
> 1	1 (1.4%)	4 (11.1%)		2 (8.3%)	0 (0.0%)	
Hepatectomy						
Anatomical	48 (67.6%)	19 (52.8%)	0.13	17 (70.8%)	12 (70.6%)	0.99*
Non–anatomical	23 (32.4%)	17 (47.2%)		7 (29.2%)	5 (29.4%)	

*Continuity Correction test.

** The median ages of the non–ACL and ACL groups were 51.0 vs. 47.0 years ($p=0.06$).
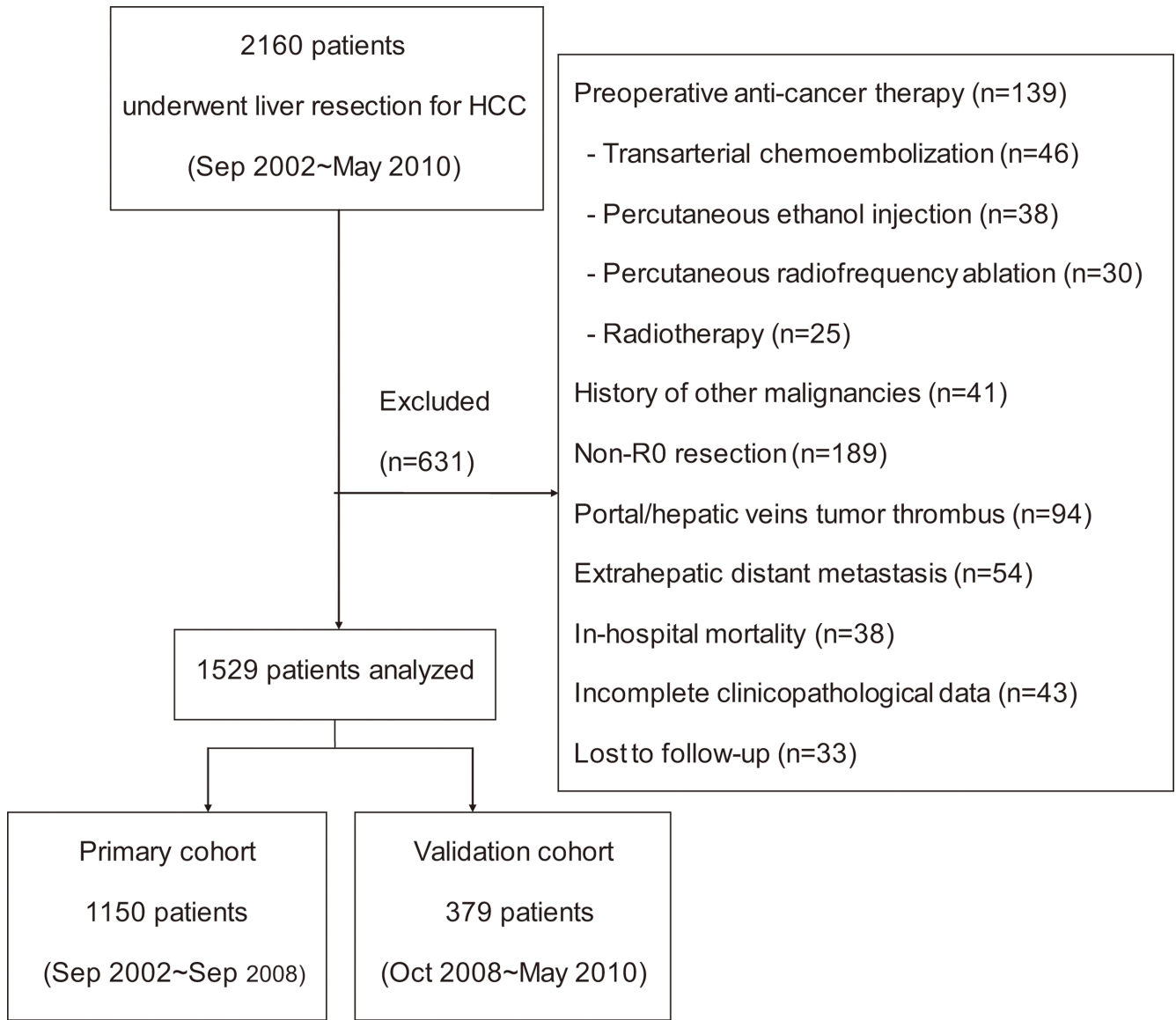
**Supplementary Figure S1: Flow chart of the study.**
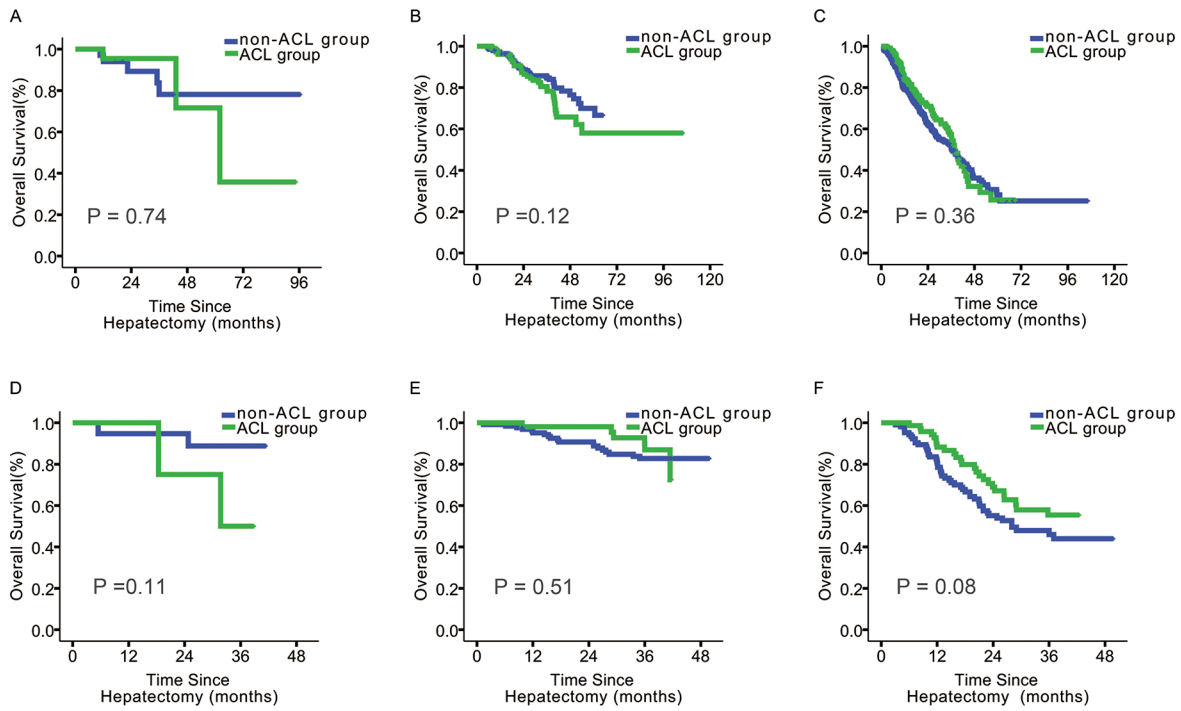
Supplementary Figure S2: Impact of ACL on OS in patients with HCCs at different BCLC stages. (A, B, C) OS of patients at stage 0, A and B in the primary cohort respectively; (*p* = 0.74, 0.12 and 0.36) (**D, E, F**) OS of patients at stage 0, A and B in the validation cohort respectively. (*p* = 0.11, 0.51 and 0.08).
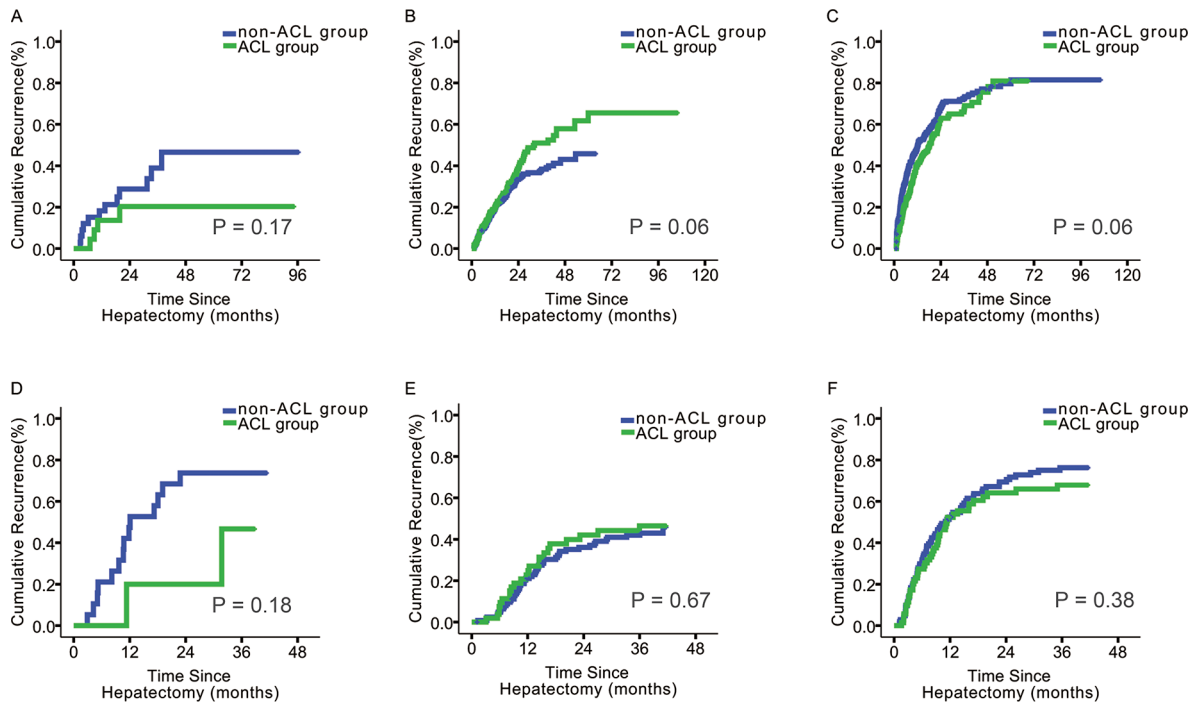
Supplementary Figure S3: Impact of ACL on tumor recurrence in patients with HCCs at different BCLC stages. (A, B, C) Tumor recurrence of patients at stage 0, A and B in the primary cohort respectively; (*p* = 0.17, 0.06 and 0.06) (**D, E, F**) Tumor recurrence of patients at stage 0, A and B in the validation cohort respectively. (*p* = 0.18, 0.67 and 0.38).
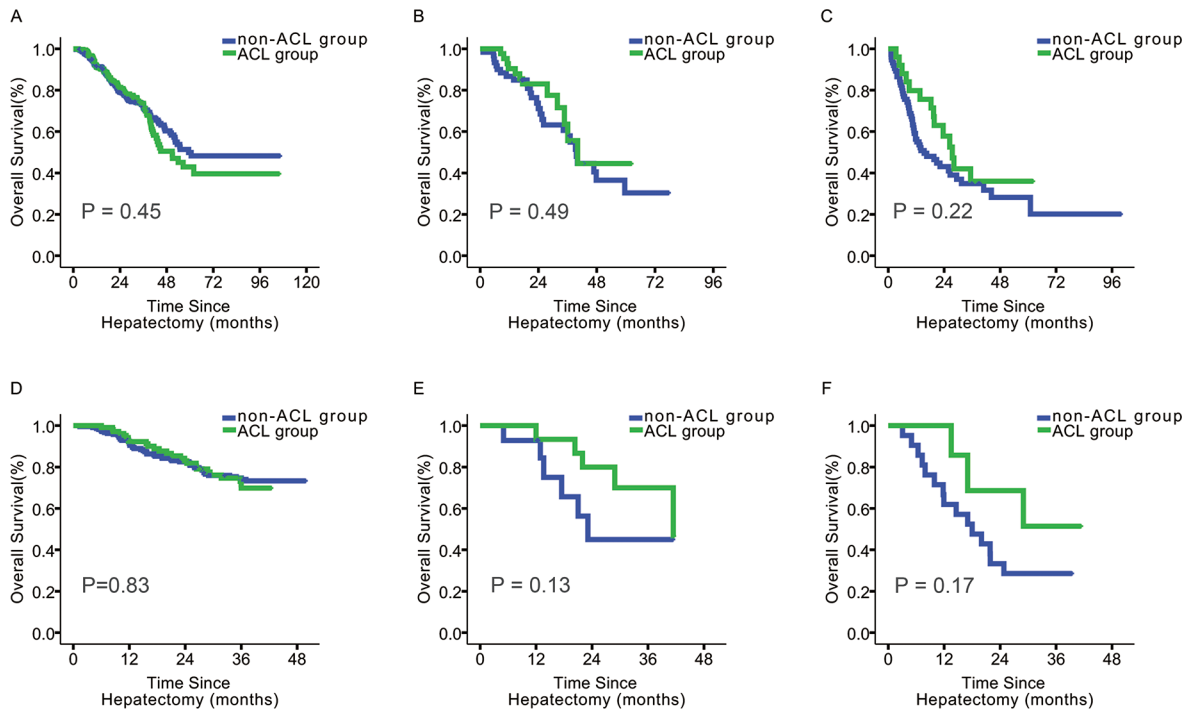
Supplementary Figure S4: Impact of ACL on OS in patients with HCCs at different 7th TNM stages. (**A, B, C**) OS of patients at stage I, II and III in the primary cohort respectively; (p = 0.45, 0.49 and 0.22) (**D, E, F**) OS of patients at stage I, II and III in the validation cohort respectively. (p = 0.83, 0.13 and 0.17).
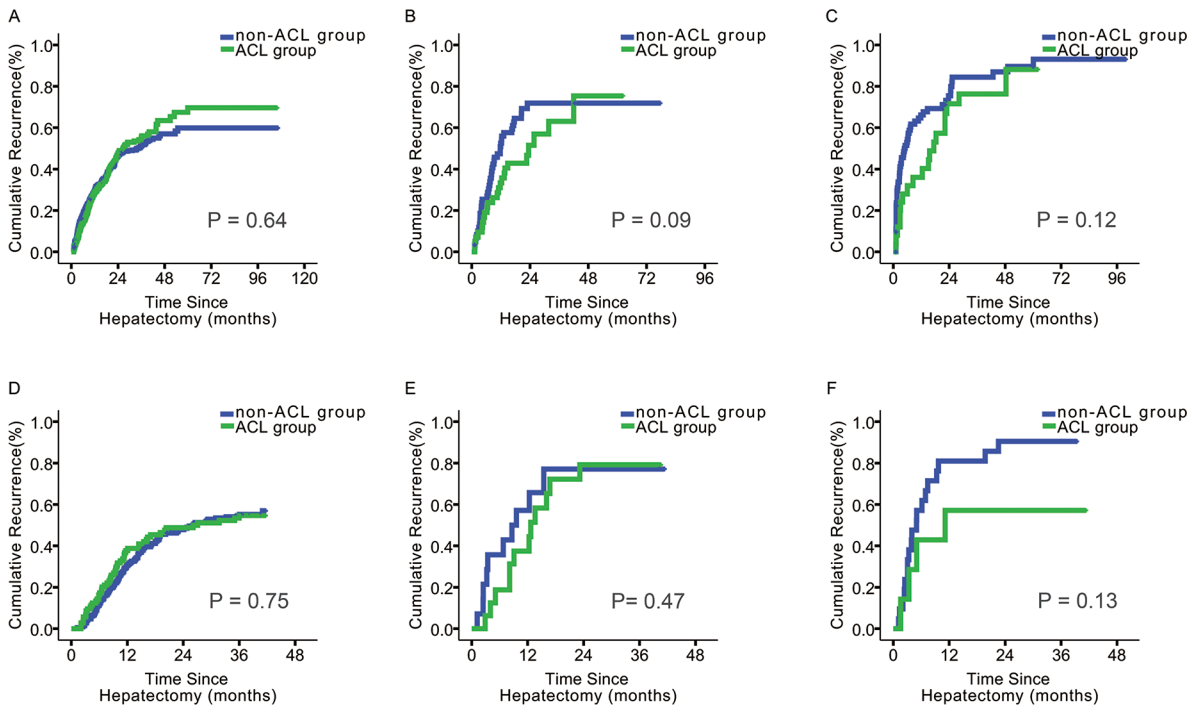
Supplementary Figure S5: Impact of ACL on tumor recurrence in patients with HCCs at different 7th TNM stages. (**A, B, C**) Tumor recurrence of patients at stage I, II and III in the primary cohort respectively; (p = 0.64, 0.09 and 0.12) (**D, E, F**) Tumor recurrence of patients at stage I, II and III in the validation cohort respectively. (p = 0.75, 0.47 and 0.13).