

Table S1. The recurrence and overall survival rates in 172 HBV-related HCC patients

Early recurrence (%)			Overall recurrence (%)			Overall survival (%)		
Year	aSAA Low	aSAA High	Year	aSAA Low	aSAA High	Year	aSAA Low	aSAA High
0.5	1.2	18	1	1.2	38.5	1	98.8	79.7
1	1.2	38.5	3	9.7	75.1	3	95.1	25.8
2	4.9	63.7	4	26.8	89.2	4	84.1	16.3

HBV, hepatitis B virus; HCC, hepatocellular carcinoma.

Table S2. Cox regression analysis of overall survival in HBV-related HCC patients with aSAA high or low expression

Variables	Univariate		Multivariate	
	HR (95% CI)	P Value	HR (95% CI)	P Value
Preoperative Factors				
Age, mean (SD), Years	1.00(0.98-1.01)	0.601	NA	NA
Sex, male vs Female	1.20(0.38-3.77)	0.760	NA	NA
DM, yes vs no	0.10(0.01-0.72)	0.023	0.27(0.04-2.01)	0.201
HP, yes vs no	0.80(0.45-1.43)	0.452	NA	NA
Alcohol abuse, yes vs no	1.10(0.67-1.81)	0.694	NA	NA
Antiviral treatment, no vs yes	0.86(0.60-1.24)	0.417	NA	NA
HBV-DNA, ≥ 2000 vs < 2000 IU/ml	3.75(2.55-5.52)	<0.001	1.52(0.98-2.37)	0.062
AFP, >400 vs ≤ 400 ng/ml	1.57(1.08-2.28)	0.018	0.95(0.62-1.46)	0.815
PLT, mean (SD), $100 \times 10^9/L$	1.00(1.00-1.01)	0.009	1.00(1.00-1.00)	0.829
CRP, ≥ 10 vs < 10 , mg/L	2.98(2.01-4.40)	<0.001	1.11(0.68-1.80)	0.682
TBIL, mean (SD), $\mu\text{mol/L}$	0.99(0.95-1.02)	0.472	NA	NA
ALB, mean (SD), g/L	1.01(0.97-1.05)	0.732	NA	NA
AST, mean (SD), 40U/L	1.00(1.00-1.00)	0.253	NA	NA
ALT, mean (SD), 44U/L	1.00(1.00-1.00)	0.591	NA	NA
BCLC, B/C vs 0/A	1.41(0.97-2.06)	0.073	NA	NA
Child-Pugh grade, B vs A	0.56(0.23-1.38)	0.208	NA	NA
aSAA, high vs low	8.79(5.57-13.86)	<0.001	4.15(2.38-7.23)	<0.001
Intraoperative and Pathological Factors				
Hepatectomy extension, major vs minor	1.89(1.30-2.75)	0.001	1.09(0.70-1.68)	0.708
Tumor Number, >1 vs 1	1.06(0.67-1.65)	0.813	NA	NA
Tumor size, mean (SD), cm	1.16(1.12-1.20)	<0.001	1.07(1.02-1.12)	0.010
Cirrhosis, yes vs no	0.74(0.51-1.08)	0.117	NA	NA
Satellite lesions, yes vs no	1.06(0.67-1.65)	0.813	NA	NA
Tumor capsule, presence vs absence	0.72(0.50-1.03)	0.071	NA	NA
MVI, presence vs absence	4.34(2.92-6.44)	<0.001	2.05(1.29-3.27)	0.002
Edmondson-Steiner grade, III-IV vs I-II	3.20(1.61-6.37)	0.001	1.69(0.81-3.52)	0.161

HBV, hepatitis B virus; HCC, hepatocellular carcinoma; SD, standard deviation; DM, diabetes mellitus; HP, hypertension; AFP, alpha fetoprotein; PLT, platelets; CRP, C-reactive protein; TBIL, total bilirubin; ALB, albumin; AST, aspartate aminotransferase; ALT, alanine aminotransferase; BCLC, Barcelona Clinic Liver Cancer staging; MVI, microvascular invasion.

Table S3. Patterns of HCC Recurrence

Pattern	aSAA-high (n=76)	aSAA-low (n=55)	P-value
Type of recurrence			
Intrahepatic recurrence	63(82.9)	46(83.6)	0.956
Extrahepatic metastasis	8(10.5)	5(9.1)	
both of intrahepatic and extrahepatic recurrences	5(6.6)	4(7.3)	
No. of intrahepatic recurrence			
Single	28(44.4)	33(71.7)	0.008
Multiple	35(55.6)	13(28.3)	

HCC, hepatocellular carcinoma

Table S4. Cox regression analysis of overall survival in HCC patients with posthepatectomy recurrence

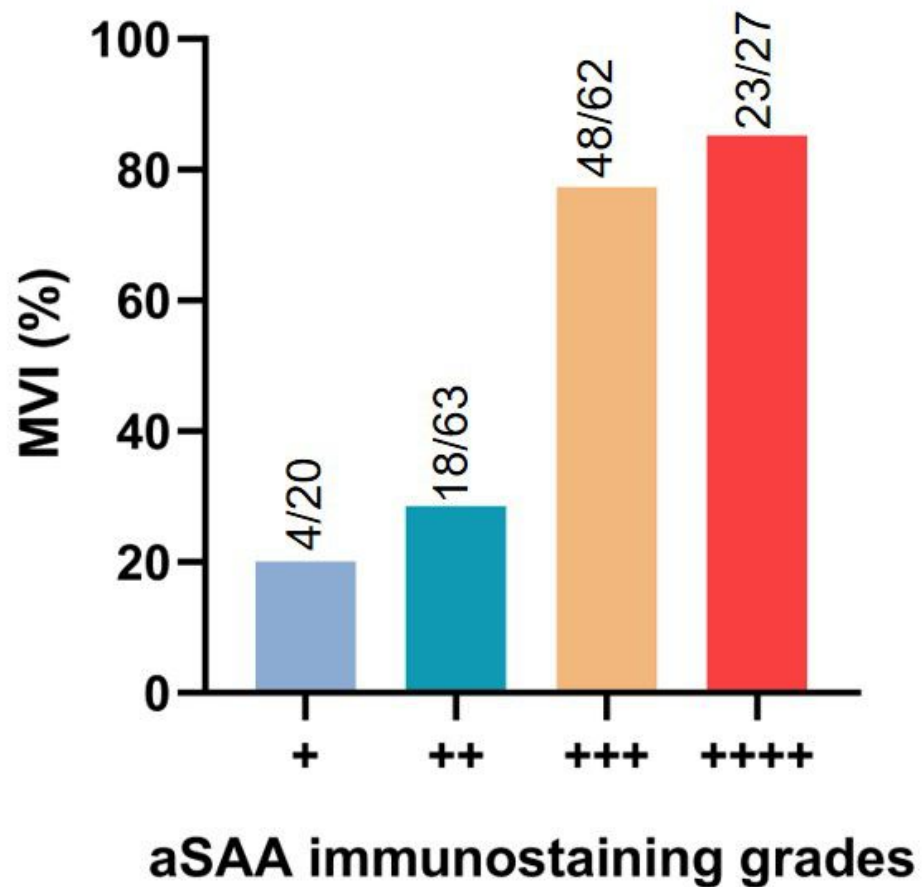
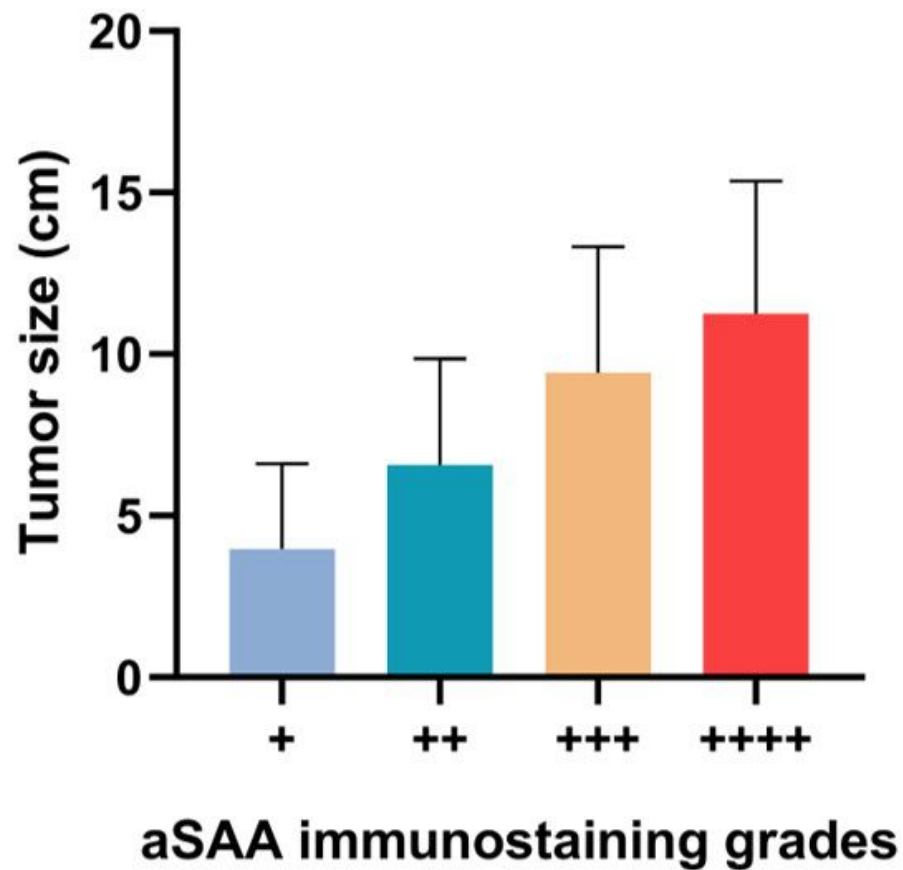
Variables	Univariate		Multivariate	
	HR (95% CI)	P Value	HR (95% CI)	P Value
Preoperative Factors				
Age, mean (SD), Years	0.99(0.98-1.01)	0.370	NA	NA
Sex, male vs Female	1.08(0.34-3.42)	0.893	NA	NA
DM, yes vs no	0.11(0.02-0.82)	0.031	0.49(0.06-3.9)	0.502
HP, yes vs no	0.79(0.44-1.40)	0.418	NA	NA
Alcohol abuse, yes vs no	1.11(0.68-1.82)	0.675	NA	NA
Antiviral treatment, no vs yes	1.04(0.72-1.51)	0.833	NA	NA
HBV-DNA, ≥ 2000 vs < 2000 IU/ml	3.00(2.05-4.40)	<0.001	1.08(0.67-1.74)	0.743
AFP, > 400 vs ≤ 400 ng/ml	1.30(0.90-1.88)	0.169	NA	NA
PLT, (mean (SD), $100 \times 10^9/L$)	1.00(1.00-1.01)	0.059	NA	NA
CRP, ≥ 10 vs < 10 , mg/L	2.54(1.71-3.78)	<0.001	1(0.67-1.5)	0.992
TBIL, mean (SD), $\mu\text{mol/L}$	1.00(0.97-1.04)	0.793	NA	NA
ALB, mean (SD), g/L	1.01(0.97-1.05)	0.587	NA	NA
AST, mean (SD), 40U/L	1.00(1.00-1.00)	0.297	NA	NA
ALT, mean (SD), 44U/L	1.00(1.00-1.00)	0.240	NA	NA
BCLC, B/C vs 0/A	0.96(0.66-1.41)	0.853	NA	NA
Child-Pugh grade, B vs A	0.62(0.25-1.52)	0.294	NA	NA
aSAA, high vs low	6.36(4.07-9.94)	<0.001	3.26(1.88-5.65)	<0.001
Intraoperative and Pathological Factors				
Hepatectomy extension, major vs minor	1.18(0.81-1.72)	0.396	NA	NA
Tumor Number, > 1 vs 1	0.75(0.48-1.18)	0.215	NA	NA
Tumor size, mean (SD), cm	1.11(1.07-1.16)	<0.001	1.05(1-1.1)	0.067
Cirrhosis, yes vs no	0.86(0.59-1.25)	0.431	NA	NA
Satellite lesions, yes vs no	0.75(0.48-1.18)	0.215	NA	NA
Tumor capsule, presence vs absence	0.85(0.59-1.21)	0.358	NA	NA
MVI, presence vs absence	3.74(2.48-5.62)	<0.001	1.12(0.67-1.87)	0.674
Edmondson-Steiner grade, III-IV vs I-II	2.80(1.39-5.64)	0.004	1.67(0.78-3.56)	0.189
Posthepatectomy treatment for recurrence				
Drugs treatment	1.00(Reference)		1.00(Reference)	
TACE/RFA vs Drugs treatment	0.13(0.07-0.21)	<0.001	0.10(0.05-0.19)	<0.001
Repeat hepatectomy vs Drugs treatment	0.03(0.01-0.06)	<0.001	0.03(0.01-0.08)	<0.001

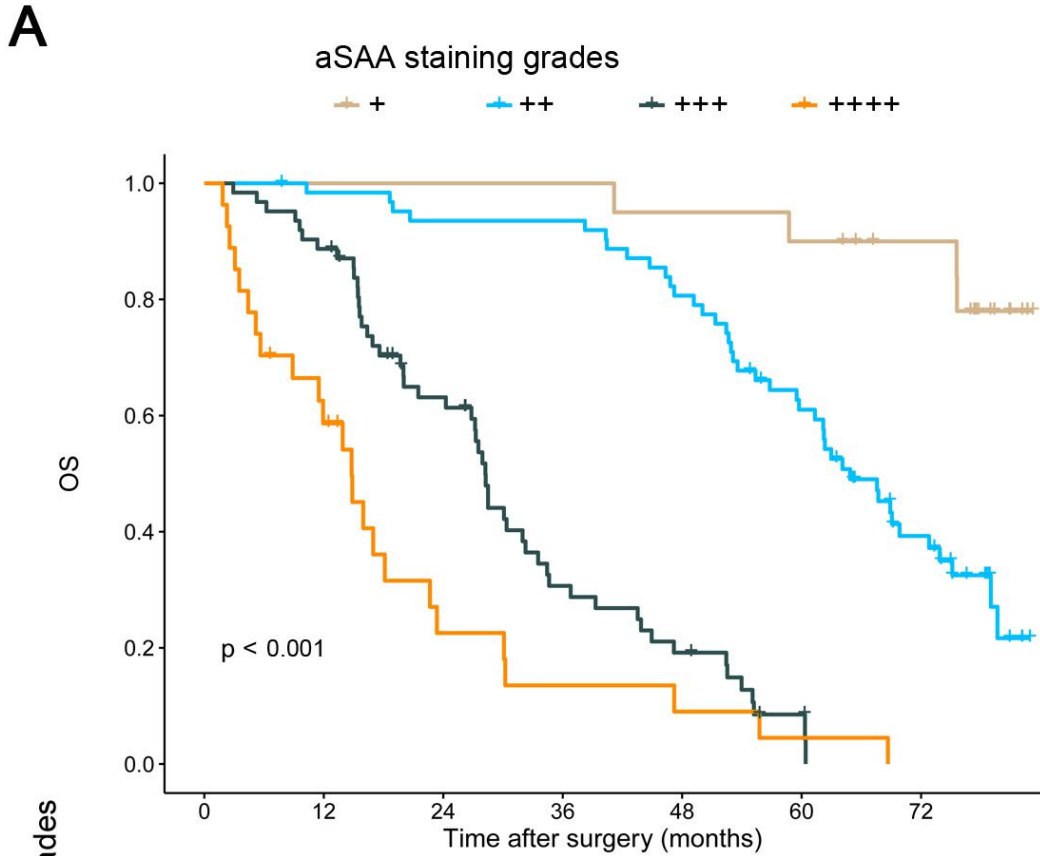
HCC, hepatocellular carcinoma; SD, standard deviation; DM, diabetes mellitus; HP, hypertension; HBV, hepatitis B virus; AFP, alpha fetoprotein; PLT, platelets; CRP, C-reactive protein; TBIL, total bilirubin; ALB, albumin; AST, aspartate aminotransferase; ALT, alanine aminotransferase; BCLC, Barcelona Clinic Liver Cancer staging; MVI, microvascular invasion. Trans-arterial chemoembolization, TACE; Radiofrequency ablation, RFA.

Table S5. Cox regression analysis of early tumor recurrence in aSAA-high group patients

Characteristics	Univariate	P Value	Multivariate	P Value
	HR (95% CI)		HR (95% CI)	
Preoperative Factors				
Age, mean (SD), Years	1.00(0.97-1.02)	0.786	NA	NA
Sex, male vs Female	0.68(0.16-2.80)	0.593	NA	NA
HP, yes vs no	0.52(0.19-1.45)	0.214	NA	NA
Alcohol abuse, yes vs no	0.86(0.42-1.76)	0.681	NA	NA
Antiviral treatment, no vs yes	0.47(0.26-0.84)	0.011	0.59(0.33-1.07)	0.084
HBV-DNA, ≥ 2000 vs < 2000 IU/ml	2.42(1.31-4.46)	0.005	2.25(1.21-4.19)	0.010
AFP, > 400 vs ≤ 400 ng/ml	0.95(0.55-1.63)	0.846	NA	NA
PLT, mean (SD), $100 \times 10^9/L$	1.00(1.00-1.00)	0.655	NA	NA
CRP, ≥ 10 vs < 10 , mg/L	1.17(0.69-2.00)	0.554	NA	NA
TBIL, mean (SD), $\mu\text{mol/L}$	0.99(0.94-1.05)	0.770	NA	NA
ALB, mean (SD), g/L	1.05(0.98-1.12)	0.158	NA	NA
AST, mean (SD), 40U/L	1.00(1.00-1.00)	0.785	NA	NA
ALT, mean (SD), 44U/L	1.00(1.00-1.00)	0.606	NA	NA
BCLC, B/C vs 0/A	0.94(0.54-1.65)	0.843	NA	NA
Child-Pugh grade, B vs A	0.59(0.08-4.26)	0.599	NA	NA
Intraoperative and Pathological Factors				
Hepatectomy extension, major vs minor	2.03(1.19-3.47)	0.010	1.40(0.79-2.47)	0.251
Tumor Number, > 1 vs 1	0.76(0.38-1.51)	0.431	NA	NA
Tumor size, mean (SD), cm	1.12(1.05-1.19)	< 0.001	1.07(1.00-1.15)	0.038
Cirrhosis, yes vs no	0.87(0.50-1.53)	0.639	NA	NA
Satellite lesions, yes vs no	0.76(0.38-1.51)	0.431	NA	NA
Tumor capsule, presence vs absence	0.88(0.51-1.51)	0.639	NA	NA
MVI, presence vs absence	4.03(1.59-10.18)	0.003	2.57(0.97-6.83)	0.059
Edmondson-Steiner grade, III-IV vs I-II	2.36(0.73-7.56)	0.150	NA	NA

HBV, hepatitis B virus; HCC, hepatocellular carcinoma; SD, standard deviation; DM, diabetes mellitus; HP, hypertension; AFP, alpha fetoprotein; PLT, platelets; CRP, C-reactive protein; TBIL, total bilirubin; ALB, albumin; AST, aspartate aminotransferase; ALT, alanine aminotransferase; BCLC, Barcelona Clinic Liver Cancer staging; MVI, microvascular invasion.

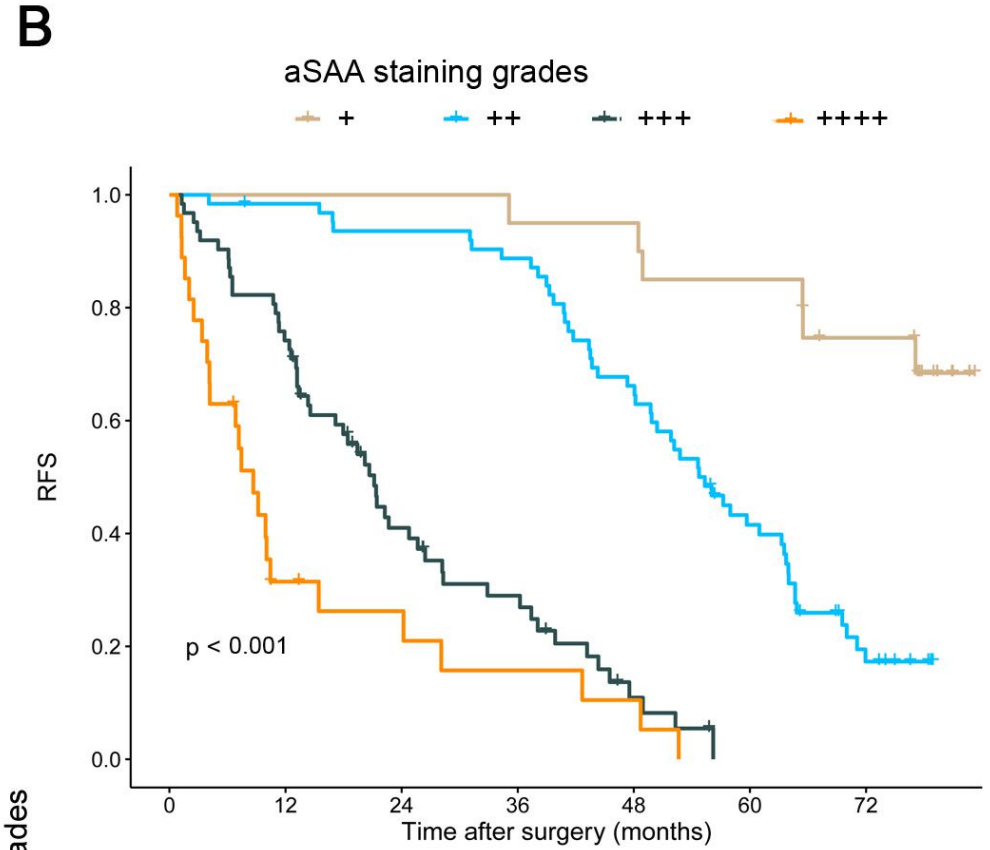
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aSAA staining grades

		Number at risk						
		0	12	24	36	48	60	72
+	20	20	20	20	20	19	18	15
++	63	61	58	58	50	36	19	
+++	62	55	35	16	10	3	0	
++++	27	15	5	3	2	1	0	

Time after surgery (months)



aSAA staining grades

		Number at risk						
		0	12	24	36	48	60	72
+	20	20	20	19	19	17	13	
++	63	61	58	55	41	24	8	
+++	62	46	22	14	4	0	0	
++++	27	7	5	3	2	0	0	

Time after surgery (months)