

Supplementary Table 1 Multivariate analysis of factors associated with poor OS in male and female patients

Parameters		HR	95% CI	<i>p</i>
<i>Male</i>				
Age (years)	>65 vs. ≤65	1.278	1.148-1.424	<0.001
Treatment	Non-Curative vs. Curative	3.238	2.825-3.712	<0.001
Anti-HCV (+)	No vs. Yes	1.170	1.028-1.333	0.018
ALT (U/L)	>40 vs. ≤40	1.161	1.038-1.299	0.009
ALK-P (U/L)	>100 vs. ≤100	1.246	1.098-1.413	0.001
AFP (ng/ml)	>20 vs. ≤20	1.640	1.455-1.848	<0.001
Tumor sizes (cm)	≥5 vs. <5	1.656	1.455-1.848	<0.001
Vascular invasion	Yes vs. No	1.975	1.738-2.243	<0.001
ALBI grade	2 vs. 1	1.762	1.549- 2.005	<0.001
	3 vs. 1	3.697	3.079-4.440	<0.001
<i>Female</i>				
Age (years)	>65 vs. ≤65	1.689	1.352-2.110	<0.001
Treatment	Non-Curative vs. Curative	2.416	1.891-3.085	<0.001
ALK-P (U/L)	>100 vs. ≤100	1.483	1.197-1.838	<0.001
AFP (ng/ml)	>20 vs. ≤20	1.308	1.038-1.649	0.023
Numbers of tumor	>1 vs. 1	1.849	1.501- 2.278	<0.001
Tumor sizes (cm)	≥5 vs. <5	2.367	1.885-2.947	<0.001
Vascular invasion	Yes vs. No	1.941	1.522-2.475	<0.001
ALBI grade	2 vs. 1	1.639	1.270-2.114	<0.001
	3 vs. 1	2.914	2.063-4.115	<0.001

HR = hazard ratio; CI = confidence interval; ALK-P = alkaline phosphate; PT INR = prothrombin time international normalized ratio; AFP = alpha-fetoprotein; ALBI = Albumin-Bilirubin

Supplementary Table 2 Analysis of factors associated with poor OS in patient who received curative therapy

Parameters		Univariate			Multivariate		
		HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>
Age (years)	>65 vs. ≤65	1.558	1.373-1.767	<0.001	1.518	1.275-1.807	<0.001
Sex	Female vs. Male	1.050	0.913-1.208	0.491			
HBsAg (+)	No vs. Yes	1.205	1.051-1.383	0.008			
Anti-HCV (+)	Yes vs. No	1.218	1.055-1.406	0.007			
Albumin (g/dL)	<3.5 vs. ≥3.5	2.042	1.780-2.343	<0.001			
Bilirubin (mg/dL)	>1.0 vs. ≤1.0	1.464	1.282-1.673	<0.001			
ALT (U/L)	>40 vs. ≤40	1.182	1.043-1.340	0.009			
ALK-P (U/L)	>100 vs. ≤100	1.671	1.441-1.938	<0.001			
PT-INR	>1.1 vs. ≤1.1	1.600	1.403-1.825	<0.001	1.253	1.030-1.524	0.024
AFP (ng/ml)	>20 vs. ≤20	1.643	1.448-1.864	<0.001	1.510	1.270-1.794	<0.001
Numbers of tumor	>1 vs. 1	1.515	1.313-1.748	<0.001	1.504	1.251-1.809	<0.001
Tumor sizes (cm)	≥5 vs. <5	1.418	1.233-1.631	<0.001	1.549	1.292-1.857	<0.001
PLT (x1000/mm ³)	≤100 vs. >100	1.641	1.434-1.878	<0.001			
Vascular invasion	Yes vs. No	2.127	1.644-2.754	<0.001	1.693	1.233-2.324	0.001
ALBI grade	2 vs. 1	2.092	1.835-2.385	<0.001	1.636	1.369-1.956	<0.001
	3 vs. 1	3.200	2.389-4.284	<0.001	2.666	1.702-4.174	<0.001

HR = hazard ratio; CI = confidence interval; HBsAg = hepatitis B surface antigen; HCV = hepatitis C virus; ALT = alanine aminotransferase; ALK-P = alkaline phosphate; PT INR = prothrombin time international normalized ratio; AFP = alpha-fetoprotein; PLT = platelet; ALBI = Albumin-Bilirubin

Supplementary Table 3 Analysis of factors associated with poor OS in patient who received non-curative therapy

Parameters		Univariate			Multivariate		
		HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>
Age (years)	>65 vs. ≤65	0.885	0.813- 0.964	0.005	1.254	1.118-1.406	<0.001
Sex	Male vs. Female	1.182	1.066- 1.311	0.002			
HBsAg (+)	Yes vs. No	1.220	1.114- 1.355	<0.001			
Anti-HCV (+)	No vs. Yes	1.393	1.257- 1.544	<0.001	1.302	1.142-1.485	<0.001
Albumin (g/dL)	<3.5 vs. ≥3.5	1.960	1.796- 2.139	<0.001			
Bilirubin (mg/dL)	>1.0 vs. ≤1.0	1.786	1.638- 1.947	<0.001			
ALT (U/L)	>40 vs. ≤40	1.257	1.153- 1.372	<0.001	1.136	1.008-1.280	0.036
ALK-P (U/L)	>100 vs. ≤100	2.028	1.812- 2.270	<0.001	1.337	1.166-1.533	<0.001
PT-INR	>1.1 vs. ≤1.1	1.476	1.354- 1.610	<0.001			
AFP (ng/ml)	>20 vs. ≤20	2.039	1.844- 2.254	<0.001	1.547	1.351-1.772	<0.001
Numbers of tumor	>1 vs. 1	1.152	1.055- 2.257	0.002			
Tumor sizes (cm)	≥5 vs. <5	2.552	2.309- 2.820	<0.001	1.928	1.664-2.234	<0.001
PLT (x1000/mm3)	>100 vs. ≤100	1.425	1.282-1.583	<0.001			
Vascular invasion	Yes vs. No	2.826	2.584-3.091	<0.001	1.851	1.637-2.093	<0.001
ALBI grade	2 vs. 1	1.897	1.687- 2.132	<0.001	1.792	1.541-2.084	<0.001
	3 vs. 1	3.915	3.339-4.511	<0.001	3.658	3.033-4.412	<0.001

HR = hazard ratio; CI = confidence interval; HBsAg = hepatitis B surface antigen; HCV = hepatitis C virus; ALT = alanine aminotransferase; ALK-P = alkaline phosphate; PT INR = prothrombin time international normalized ratio; AFP = alpha-fetoprotein; PLT = platelet; ALBI = Albumin-Bilirubin

Supplementary Table 4 Demographics of the curative treatment group

Characteristics	All (n = 2707)	Male (n = 1938)	Female (n = 769)	<i>p</i>
Age	65 (57-74)	64 (55-73)	68 (61-75)	< 0.001
HBsAg (+/-) (%)	1340/932 (59.0%/41.0%)	1071/604(63.9%/36.1%)	269/328(45.1%/54.9%)	< 0.001
Anti-HCV (+/-) (%)	676/1472 (31.5%/68.5%)	384/1133(25.3%/74.4%)	292/339(46.3%/53.7%)	< 0.001
ALBI grade (1/2/3) (%)	1452/1118/91 (54.6%/42.0%/3.4%)	1083/758/65 (56.8%/39.8%/3.4%)	369/360/26 (48.9%/47.7%/3.4%)	< 0.001
BCLC (0/A/B/C/D)	515/1418/599/138/22 (19.1%/52.7%/22.3%/5.1%/0.8%)	328/1015/458/107/16 (17.0%/52.8%/23.8%/5.6%/0.8%)	187/403/141/31/6 (24.3%/52.5%/18.4%/4.0%/0.8%)	< 0.001
Child-Pugh class (A/B/C)	2325/205/33 (90.7%/8.0%/1.3%)	1674/144/24 (90.9%/7.8%/1.3%)	651/61/9 (90.3%/8.5%/1.2%)	0.861
Albumin (g/dL)	3.9 (3.6-4.2)	4.0 (3.6-4.3)	3.8 (3.4-4.2)	< 0.001
ALT (U/L)	36 (24-60)	37 (25-59)	34.5 (23-62)	0.170
AST (U/L)	38 (26-62.75)	37 (26-58)	42 (28-72)	0.143
ALK-P (U/L)	79 (63-106)	78 (63-103)	84 (63-114)	0.287
γGT (U/L)	44 (26-84)	45 (27-89)	41 (23-70.75)	< 0.001
Bilirubin (mg/dL)	0.73(0.52-1.04)	0.74 (0.53-1.08)	0.70 (0.51-0.99)	0.007
PT-INR	1.06 (1.01-1.12)	1.06 (1.01-1.12)	1.06 (1.01-1.12)	0.944
Platelets (x1000/mm ³)	149 (104.75-200)	155 (111-204)	136 (88-189)	0.054
Maximum tumor size (cm)	3.0 (2.0-4.6)	3.0 (2.1-4.9)	2.6 (1.8-4.0)	< 0.001
Number of tumors (1 / > 1)	2127/555 (79.3%/20.7%)	1519/399 (79.2%/20.8%)	608/156 (79.6%/20.4%)	0.825
Vascular invasion (+/-) (%)	134/2514 (5.1%/94.9%)	98/1799 (5.2%/94.8%)	36/715 (4.8%/95.2%)	0.693
AFP	15.29 (4.72-131.76)	13.89 (4.55-119.00)	19.77 (5.34-157.25)	0.545

Continuous variables are expressed as the median with 25th and 75th percentiles.

HBsAg = hepatitis B surface antigen; HCV = hepatitis C virus; ALBI = albumin-bilirubin; BCLC = Barcelona Clinic Liver Cancer; ALT = alanine aminotransferase; AST = aspartate aminotransferase; ALK-P = alkaline phosphatase; γGT = γ-glutamyl transpeptidase; PT-INR = prothrombin time international normalized ratio; AFP = alpha-fetoprotein

Supplementary Table 5 Demographics of the non-curative treatment group

Characteristics	All (n = 2596)	Male (n = 2015)	Female (n = 581)	<i>p</i>
Age	66.5 (56-78)	65 (55-78)	70 (61-78)	< 0.001
HBsAg (+/-) (%)	1216/1031 (54.1%/45.9%)	1037/750(58.0%/42.0%)	179/281(38.9%/61.1%)	< 0.001
Anti-HCV (+/-) (%)	642/1484 (30.2%/69.8%)	406/1240(24.7%/75.3%)	236/244(49.2%/50.8%)	< 0.001
ALBI grade (1/2/3) (%)	537/1537/469 (21.1%/60.4%/18.4%)	437/1180/354 (22.2%/59.9%/18.0%)	100/357/115 (17.5%/62.4%/20.1%)	0.045
BCLC (0/A/B/C/D)	38/370/702/1124/346 (1.5%/14.3%/27.2%/43.6%/13.4%)	28/257/540/918/258 (1.4%/12.8%/27.0%/45.9%/12.9%)	10/113/162/206/88 (1.7%/19.5%/28.0%/35.6%/15.2%)	< 0.001
Child-Pugh class (A/B/C)	1439/837/174 (58.7%/34.2%/7.1%)	1136/631/141 (59.5%/33.1%/7.4%)	303/206/33 (55.9%/38.0%/6.1%)	0.083
Albumin (g/dL)	3.4 (3.0-3.8)	3.4 (3.0-3.9)	3.3 (2.9-3.7)	< 0.001
ALT (U/L)	47 (30-78)	48 (30-81)	43 (27-68)	< 0.001
AST (U/L)	74 (44-133)	74 (44-133)	75 (45.75-132)	0.707
ALK-P (U/L)	135 (96-216)	138 (98-223.25)	129 (92-190)	0.020
γGT (U/L)	133 (66-258.5)	144 (70-268.5)	101 (49.25-210)	0.479
Bilirubin (mg/dL)	1.02 (0.65-1.80)	1.03 (0.66-1.82)	0.99(0.60-1.77)	0.004
PT-INR	1.13 (1.05-1.23)	1.13 (1.05-1.23)	1.125 (1.05-1.24)	0.500
Platelets (x1000/mm ³)	161 (107-235.5)	167.5 (112-239)	142 (93.5-221.5)	0.003
Maximum tumor size (cm)	7.7 (4.1-11.5)	8.0 (4.4-12.0)	6.15 (3.575-10.0)	< 0.001
Number of tumors (1/ > 1)	1016/1557 (39.5%/60.5%)	771/1224 (38.6%/61.4%)	245/333 (42.4%/57.6%)	0.105
Vascular invasion (+/-) (%)	1112/1443 (43.5%/56.5%)	915/1066 (46.2%/53.8%)	197/377 (34.3%/65.7%)	< 0.001
AFP	230 (12.80-6143.00)	219.97 (11.97-6141.00)	251.17 (17.32-6152.00)	0.946

Continuous variables are expressed as the median with 25th and 75th percentiles.

HBsAg = hepatitis B surface antigen; HCV = hepatitis C virus; ALBI = albumin-bilirubin; BCLC = Barcelona Clinic Liver Cancer; ALT = alanine aminotransferase; AST = aspartate aminotransferase; ALK-P = alkaline phosphatase; γGT = γ-glutamyl transpeptidase; PT-INR = prothrombin time international normalized ratio; AFP = alpha-fetoprotein