Supplementary data

Table S1. Univariate analyses of recurrence-free survival

	Hazard ratio (95% CI)	p value
Univariate analysis		
Age (>61 years vs. ≤60 years)	0.80 (0.54-1.17)	0.245
Sex (male vs. female)	1.08 (0.68-1.71)	0.751
Etiology		
HBV vs. non-viral	1.02 (0.58-1.79)	0.951
HCV vs. non-viral	1.12 (0.59-2.13)	0.720
Grade (grade 3 vs. grade 1, 2)	0.78 (0.48-1.26)	0.312
AFP (>20 vs. ≤20 ng/ml)	0.97 (0.66-1.42)	0.856
AJCC (stage II, III vs. stage I)	1.33 (0.90-1.95)	0.153
ICOS$^+$Foxp3$^+$ cell density (high vs. low)*	1.00 (0.68-1.46)	0.980
All Foxp3$^+$ cell density (high vs. low)*	0.86 (0.58-1.26)	0.435
Ratio of ICOS$^+$Foxp3$^+$/all Foxp3$^+$ cells (high vs. low)*	1.33 (0.91-1.96)	0.143
ICOS$^-$Foxp3$^+$ cell density (high vs. low)*	0.81 (0.55-1.19)	0.275
All ICOS$^+$ cell density (high vs. low)*	1.10 (0.75-1.61)	0.620
ICOS$^+$Foxp3$^-$ cell density (high vs. low)*	1.00 (0.68-1.47)	0.989
Distance of ICOS$^+$Foxp3$^-$ cells to the nearest ICOS$^+$ Foxp3$^+$ cell (short vs. long)*	0.99 (0.68-1.45)	0.959
CD3$^+$ cell density (high vs. low)*	1.08 (0.73-1.58)	0.708
CD8$^+$ cell density (high vs. low)*	0.80 (0.55-1.17)	0.249
CD68$^+$ cell density (high vs. low)*	0.87 (0.59-1.27)	0.463

*the cutoff level was median

HBV, hepatitis virus B; HCV, hepatitis C virus; AFP, α-fetoprotein.

Table S2. Univariate and multivariate analyses of overall survival

	Hazard ratio (95% CI)	p value
Univariate analysis		
Age (>61 years vs. ≤60 years)	0.76 (0.48-1.20)	0.239
Sex (male vs. female)	1.24 (0.69-2.21)	0.476
Etiology		
HBV vs. non-viral	0.85 (0.45-1.60)	0.607
HCV vs. non-viral	0.72 (0.34-1.53)	0.400
Grade (grade 3 vs. grade 1, 2)	0.99 (0.58-1.70)	0.978
AFP (>20 vs. ≤20 ng/ml)	1.58 (1.00-2.50)	0.051
AJCC (stage II, III vs. stage I)	2.34 (1.48-3.69)	**<0.001**
$ICOS^+Foxp3^+$ cell density (high vs. low)*	1.48 (0.94-2.34)	0.090
All $Foxp3^+$ cell density (high vs. low)*	1.46 (0.92-2.30)	0.108
Ratio of $ICOS^+Foxp3^+$/all $Foxp3^+$ cells (high vs. low)*	1.33 (0.85-2.10)	0.213
$ICOS^-Foxp3^+$ cell density (high vs. low)*	1.42 (0.90-2.25)	0.130
All $ICOS^+$ cell density (high vs. low)*	1.31 (0.83-2.06)	0.249
$ICOS^+Foxp3^-$ cell density (high vs. low)*	1.19 (0.76-1.88)	0.443
Distance of $ICOS^+Foxp3^-$ cells to the nearest $ICOS^+Foxp3^+$ cell (short vs. long)*	1.66 (1.05-2.62)	**0.032**
$CD3^+$ cell density (high vs. low)*	0.71 (0.45-1.12)	0.143
$CD8^+$ cell density (high vs. low)*	0.84 (0.54-1.33)	0.462
$CD68^+$ cell density (high vs. low)*	0.91 (0.58-1.44)	0.700
Multivariate analysis[#]		
AJCC (stage II, III vs. stage I)	2.30 (1.46-3.63)	<0.001
Distance of $ICOS^+Foxp3^-$ cells to the nearest $ICOS^+Foxp3^+$ cell (short vs. long)*	1.60 (1.01-2.53)	0.045

*the cutoff level was median

[#]estimated by cox proportional hazards model

HBV, hepatitis virus B; HCV, hepatitis C virus; AFP, α-fetoprotein.