

Supplementary Table S1. Cox regression analysis for treatment response.

Variables in the Equation B	SE	Wald	df	Sig.	Exp(B)	95,0% CI for Exp(B)	
						Lower	Upper
BCLC Stage		1,240	2	0,538			
BCLC Stage A	-0,637	0,591	1,163	1	0,281	0,529	0,166 1,683
BCLC Stage B	-0,593	1,177	0,253	1	0,615	0,553	0,055 5,556
Curative treatments	-2,614	1,108	5,565	1	0,018	0,073	0,008 0,643
Cirrhosis	-0,603	0,614	0,965	1	0,326	0,547	0,164 1,823
Disease progression	1,433	0,628	5,212	1	0,022	4,191	1,225 14,344
Portal venous involvement	-0,007	1,316	0,000	1	0,996	0,993	0,075 13,104

Abbreviations: B, regression coefficient; SE, standard error; Wald, Wald chi-square statistic; df, degrees of freedom; Sig., statistical significance (p value);

Exp(B), exponentiated regression coefficient (hazard ratio); CI, confidence interval; BCLC, Barcelona Clinic Liver Cancer.

Supplementary Table S2. Evolution of Tumour Response and Diameter Measurements Over Multiple Follow-Ups

	Overall, n (%)
Diameter (1st FU)*	7.3 (1.3 - 30)
Imaging Outcome (1st)	
<i>CR</i>	7 (15.2)
<i>PD</i>	3 (6.5)
<i>PR</i>	22 (47.8)
<i>SD</i>	14 (30.4)
Diameter (2nd FU)*	4.6 (0 - 14.7)
Imaging Outcome (2nd)	
<i>CR</i>	9 (21.4)

<i>PD</i>	5 (11.9)
<i>PR</i>	21 (50.0)
<i>SD</i>	7 (16.7)
Diameter (3rd FU)*	0 (0 - 12.2)
Imaging Outcome (3rd)	
<i>CR</i>	6 (20.0)
<i>PD</i>	3 (10.0)
<i>PR</i>	16 (53.3)
<i>SD</i>	3 (10.0)
<i>Resected</i>	2 (6.7)
Diameter Outcome (4th)*	5.6 (0.8 - 11.8)
Imaging Outcome (4th)	
<i>CR</i>	8 (33.3)

<i>PD</i>	6 (25.0)
<i>PR</i>	7 (29.2)
<i>SD</i>	3 (12.5)
Diameter Outcome (5th)*	5.7 (4.2 - 7.5)
Imaging Outcome (5th)	
<i>CR</i>	3 (30.0)
<i>PD</i>	2 (20.0)
<i>PR</i>	5 (50.0)
Diameter (6th FU)*	7.4 (5.4 - 7.8)
Imaging Outcome (6th)	
<i>CR</i>	9 (75.0)
<i>PR</i>	2 (16.7)
<i>SD</i>	1 (8.3)

*Numeric variables were presented as median (minimum-maximum) or mean $\pm$ standard deviation.

Abbreviations: CR: Complete response, FU: Follow-up, PD: Progressive disease, PR: Partial response, SD: Stable disease.

Supplemental Table S3. SEM Analysis for 6-Month Outcome (Model Parameter Estimates)

Pathway	Estimate_B	Std_Estimate_beta	Std. Error	z- value	p- value	95% CI (Lower, Upper)
Curative Treatments ← AFP	-0.127	-0.216	0.078	-1.635	0.102	(-0.280, 0.025)
Curative Treatments ← BCLC Stage	-0.213	-0.329	0.092	-2.321	0.020	(-0.393, -0.033)
Curative Treatments ← Age at SIRT	-0.004	-0.081	0.006	-0.575	0.566	(-0.016, 0.009)
Curative Treatments ← Sex	0.195	0.151	0.175	1.115	0.265	(-0.148, 0.538)
6-Month Outcome ← Curative Treatments	0.248	0.122	0.327	0.757	0.449	(-0.394, 0.889)
6-Month Outcome ← BCLC Stage	0.087	0.066	0.234	0.373	0.709	(-0.372, 0.546)
6-Month Outcome ← Diffuse Tumour	-0.628	-0.165	0.633	-0.992	0.321	(-1.867, 0.612)
6-Month Outcome ← AFP	0.111	0.093	0.180	0.616	0.538	(-0.242, 0.465)
6-Month Outcome ← Age at SIRT	-0.006	-0.069	0.014	-0.440	0.660	(-0.033, 0.021)
6-Month Outcome ← Sex	-0.093	-0.036	0.417	-0.224	0.823	(-0.911, 0.724)
BCLC Stage ← Diffuse Tumour	1.060	0.365	0.383	2.770	0.006	(0.310, 1.809)
BCLC Stage ← AFP	0.001	0.001	0.114	0.009	0.993	(-0.222, 0.224)
BCLC Stage ← Age at SIRT	-0.025	-0.372	0.008	-3.049	0.002	(-0.042, -0.009)
BCLC Stage ← Sex	-0.120	-0.060	0.268	-0.449	0.654	(-0.645, 0.405)

Indirect Effect (AFP)	0.080	0.178	0.449	0.653	(-0.268, 0.428)
Indirect Effect (Diffuse)	-0.535	0.587	-0.911	0.362	(-1.686, 0.616)
Indirect Effect (Age)	-0.009	0.013	-0.713	0.476	(-0.035, 0.016)
Indirect Effect (Sex)	-0.055	0.413	-0.134	0.893	(-0.865, 0.754)

Abbreviations: AFP, alpha-fetoprotein; BCLC, Barcelona Clinic Liver Cancer; SIRT, selective internal radiation therapy; Estimate_B, unstandardised regression coefficient; Std_Estimate_beta, standardised regression coefficient; Std. Error, standard error of the estimate; CI, confidence interval.

Supplemental Table S4. SEM Analysis for 12-month Outcome (Model Parameter Estimates)

Pathway	Estimate_B	Std_Estimate_beta	Std. Error	z- value	p- value	95% CI (Lower, Upper)
Curative Treatments ← AFP	-0.127	-0.216	0.078	-1.635	0.102	(-0.280, 0.025)
Curative Treatments ← BCLC Stage	-0.213	-0.329	0.092	-2.321	0.020	(-0.393, -0.033)
Curative Treatments ← Age at SIRT	-0.004	-0.081	0.006	-0.575	0.566	(-0.016, 0.009)
Curative Treatments ← Sex	0.195	0.151	0.175	1.115	0.265	(-0.148, 0.538)
12-Month Outcome ← Curative Treatments	0.501	0.184	0.535	0.938	0.348	(-0.547, 1.550)
12-Month Outcome ← BCLC Stage	-0.086	-0.049	0.366	-0.236	0.813	(-0.804, 0.631)
12-Month Outcome ← Diffuse Tumour	-0.335	-0.066	0.928	-0.361	0.718	(-2.155, 1.484)
12-Month Outcome ← AFP	0.093	0.058	0.294	0.315	0.753	(-0.483, 0.668)
12-Month Outcome ← Age at SIRT	-0.020	-0.165	0.022	-0.907	0.364	(-0.062, 0.023)
12-Month Outcome ← Sex	-0.652	-0.186	0.683	-0.955	0.340	(-1.991, 0.686)
BCLC Stage ← Diffuse Tumour	1.060	0.365	0.383	2.770	0.006	(0.310, 1.809)
BCLC Stage ← AFP	0.001	0.001	0.114	0.009	0.993	(-0.222, 0.224)
BCLC Stage ← Age at SIRT	-0.025	-0.372	0.008	-3.049	0.002	(-0.042, -0.009)
BCLC Stage ← Sex	-0.120	-0.060	0.268	-0.449	0.654	(-0.645, 0.405)
Indirect Effect (AFP)	0.029		0.295	0.097	0.923	(-0.550, 0.607)

Indirect Effect (Diffuse)	-0.427	0.817	-0.522	0.601	(-2.028, 1.175)
Indirect Effect (Age)	-0.019	0.021	-0.903	0.367	(-0.061, 0.023)
Indirect Effect (Sex)	-0.544	0.689	-0.790	0.429	(-1.894, 0.806)

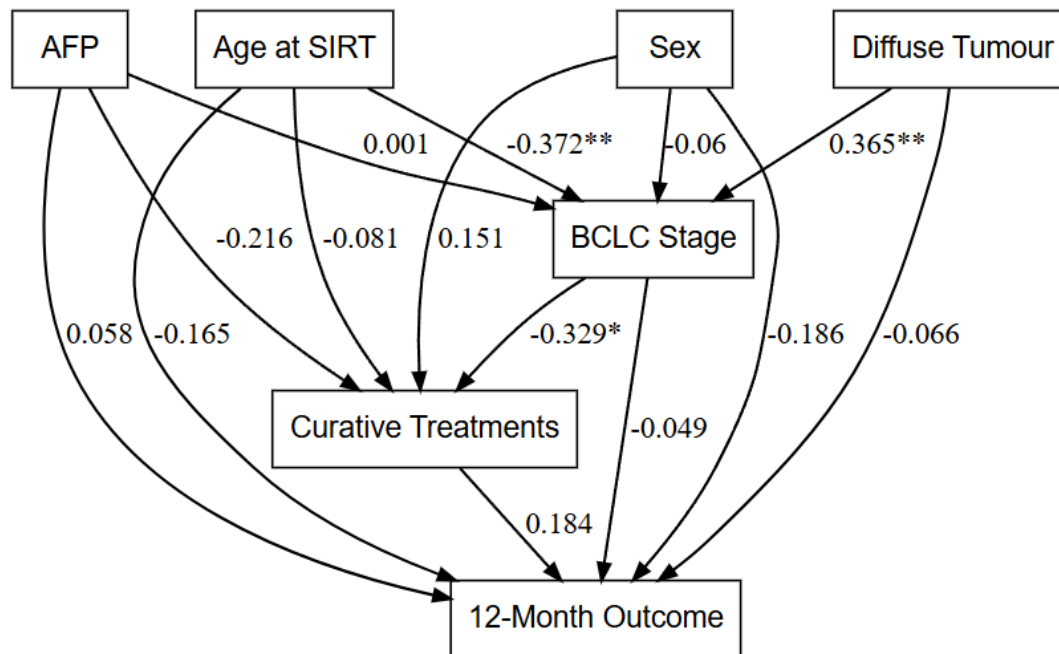
Abbreviations: AFP, alpha-fetoprotein; BCLC, Barcelona Clinic Liver Cancer; SIRT, selective internal radiation therapy; Estimate_B, unstandardised regression coefficient; Std_Estimate_beta, standardised regression coefficient; Std. Error, standard error of the estimate; CI, confidence interval.

Supplemental Table S5. SEM Analysis for Final Outcome (Model Parameter Estimates)

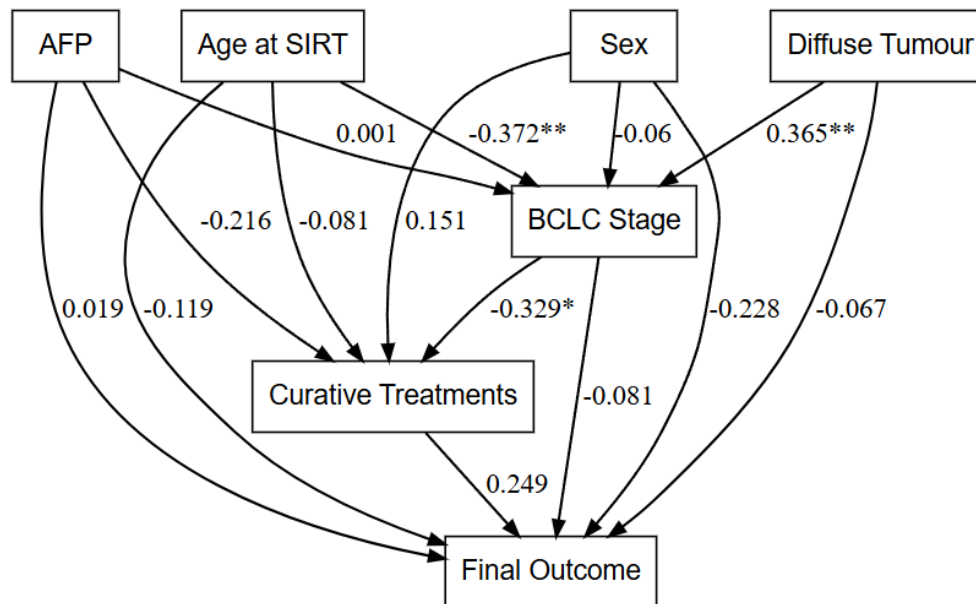
Pathway	Estimate_B	Std_Estimate_beta	Std. Error	z- value	p- value	95% CI (Lower, Upper)
Curative Treatments ← AFP	-0.127	-0.216	0.078	-1.635	0.102	(-0.280, 0.025)
Curative Treatments ← BCLC Stage	-0.213	-0.329	0.092	-2.321	0.020	(-0.393, -0.033)
Curative Treatments ← Age at SIRT	-0.004	-0.081	0.006	-0.575	0.566	(-0.016, 0.009)
Curative Treatments ← Sex	0.195	0.151	0.175	1.115	0.265	(-0.148, 0.538)
Final Outcome ← Curative Treatments	0.618	0.249	0.388	1.591	0.112	(-0.143, 1.379)
Final Outcome ← BCLC Stage	-0.131	-0.081	0.278	-0.470	0.638	(-0.675, 0.414)
Final Outcome ← Diffuse Tumour	-0.313	-0.067	0.750	-0.418	0.676	(-1.784, 1.157)
Final Outcome ← AFP	0.027	0.019	0.214	0.128	0.898	(-0.392, 0.447)
Final Outcome ← Age at SIRT	-0.013	-0.119	0.017	-0.785	0.432	(-0.045, 0.019)
Final Outcome ← Sex	-0.730	-0.228	0.495	-1.475	0.140	(-1.699, 0.240)
BCLC Stage ← Diffuse Tumour	1.060	0.365	0.383	2.770	0.006	(0.310, 1.809)
BCLC Stage ← AFP	0.001	0.001	0.114	0.009	0.993	(-0.222, 0.224)
BCLC Stage ← Age at SIRT	-0.025	-0.372	0.008	-3.049	0.002	(-0.042, -0.009)
BCLC Stage ← Sex	-0.120	-0.060	0.268	-0.449	0.654	(-0.645, 0.405)
Indirect Effect (AFP)	-0.051		0.215	-0.239	0.811	(-0.473, 0.370)

Indirect Effect (Diffuse)	-0.452	0.697	-0.648	0.517	(-1.818, 0.915)
Indirect Effect (Age)	-0.012	0.016	-0.756	0.450	(-0.043, 0.019)
Indirect Effect (Sex)	-0.594	0.500	-1.188	0.235	(-1.573, 0.386)

Abbreviations: AFP, alpha-fetoprotein; BCLC, Barcelona Clinic Liver Cancer; SIRT, selective internal radiation therapy; Estimate_B, unstandardised regression coefficient; Std_Estimate_beta, standardised regression coefficient; Std. Error, standard error of the estimate; CI, confidence interval.



Supplemental Figure S1. Structural Equation Model Showing the Direct and Indirect Effects of Clinical Variables on 12-Month Outcome by mRECIST



Supplemental Figure S2. Structural Equation Model Showing the Direct and Indirect Effects of Clinical Variables on Final Radiological Outcome by mRECIST