

Table S1 Prognostic factors of liver metastasis and poor prognosis in the training cohort in details

Factors	Group	Liver metastasis					Poor prognosis				
		Yes	No	Univariate	Multivariate	HR (95% CI)	Yes	No	Univariate	Multivariate	HR (95% CI)
				P value	P value				P value	P value	
Gender				0.818					0.849		
	Male	15	190				3	59			
	Female	8	89				3	35			
Age, years				0.325					0.946		
	≥56	8	141				4	53			
	<56	15	137				2	41			
FOWARC group				0.649					0.591		
	Radiation + 5 FU	9	85				2	22			
	Radiation + FOLFOX	6	93				1	35			
	FOLFOX	8	101				3	37			
HBV infection				0.079	0.037	3.885(1.084-13.929)			0.605		
	Chronic HBV infection	0	27				0	12			
	Occult HBV infection	2	57				2	22			
	No HBV infection	21	195				4	60			
Anemia				0.057	0.059	0.144(0.019-1.079)			0.953		
	Yes	1	59				2	22			
	No	22	220				4	72			
ALT >40 U/L				0.188					0.895		
	Yes	3	17				1	6			
	No	20	261				5	88			
AST >40 U/L				0.516					0.253		
	Yes	1	8				0	2			
	No	22	270				6	92			
ALB >35 g/L				-					null		
	Yes	23	278				6	94			
	No	0					0	0			
CA19-9 >37				0.758					0.637		
	Yes	4	40				1	14			
	No	19	237				5	80			
CEA >5				1					0.89		
	Yes	7	91				2	37			
	No	16	186				4	57			
Pretreatment T stage				0.721					>0.99		
	2 or 3	18	226				4	71			
	4	5	52				2	23			
Pretreatment N stage				0.9604					0.686		
	0	4	55				1	18			
	1	11	132				2	45			
	2	8	92				3	31			
Clinical stage 3				0.7872					0.699		
	Yes	19	224				5	76			
	No	4	55				1	18			
Tumor length				0.7859					0.239		
	≥4 cm	15	174				2	62			
	<4 cm	8	105				4	32			
Mesorectal fascia involvement				0.885					0.004	0.191	1.866(0.733-4.748)
	Positive	7	89				3	6			
	negative	16	190				3	88			
Postoperative T stage				0.0788	0.464	1.756(0.389-7.929)			0.434		
	0 to 2	9	165				2	55			
	3 or 4	14	114				4	39			
Postoperative N stage				0.165					0.011	0.741	0.828(0.272-2.527)
	1 or 2	7	49				4	15			
	0	16	223				2	79			
Lymph node number				0.04	0.014	0.349(0.150-0.809)			0.354		
	<12	10	185				0	24			
	≥12	13	94				6	70			
Pathological differentiation				0.8226					0.031	0.044	0.335(0.116-0.969)
	Poor or mucinous	2	31				3	10			
	High or median	19	248				3	84			
Tumor nodule				0.023	0.005	4.208(1.530-11.569)			0.021	0.024	3.45(1.182-10.071)
	Yes	7	34				3	9			
	No	16	245				3	85			
Vascular invasion				0.117					0.429		
	Yes	2	6				1	2			
	No	21	273				5	92			
Neural invasion				0.207					0.001	0.003	5.008(1.745-14.374)
	Yes	3	18				3	3			
	No	20	261				3	91			
Efficacy of neoadjuvant therapy				0.158					0.287		
	0 or 1	7	126				1	45			
	2 or 3	16	150				5	49			
HER-2				0.585					0.839		
	Positive	6	46				2	40			
	Negative	11	113				4	46			
Microsatellite stable				0.577					0.699		
	Yes	20	213				6	89			
	No	1	19				0	5			
Tumor to anal verge				0.146					0.866		
	≥5	17	163				3	42			
	<5	6	116				3	52			
ypTNM stage				0.069	0.777	0.782(0.142-4.301)			0.331		
	2 or 3	16	139				6	69			
	0 or 1	7	140				0	25			

ALT, alanine transaminase; AST, aspartate transaminase; ALB, serum albumin; CA19-9, carbohydrate antigen 19-9; CEA, carcinoembryonic antigen.

Table S2 Relationship between with and without radiation or oxaliplatin in liver metastasis and poor prognosis

Group	Liver metastasis			Poor prognosis		
	Yes	No	P value	Yes	No	P value
Radiation			0.891			0.931
	Yes	15		3	57	
	No	8		3	37	
Oxaliplatin			0.328			0.952
	Yes	14		4	72	
	No	9		2	22	

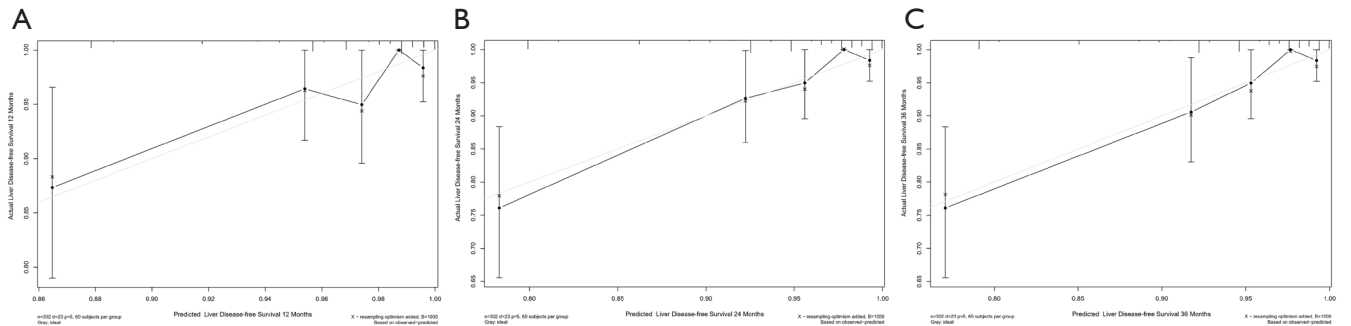


Figure S1 Calibration curve for predicting patients liver disease-free survival at 1-year (A), 2-year (B), and 3-year (C) in training cohort.

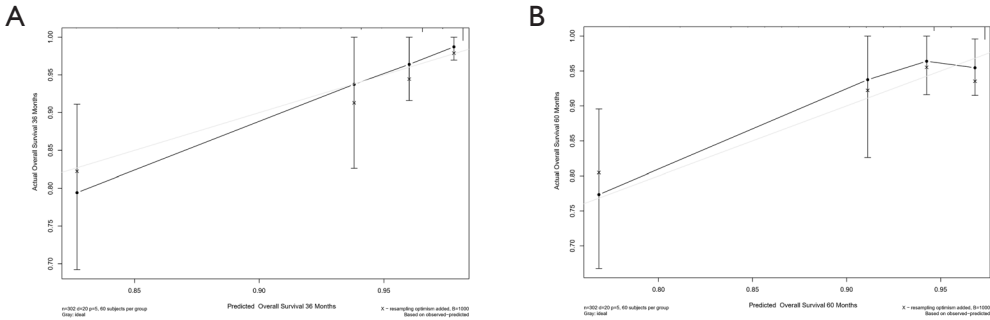


Figure S2 Calibration curve for predicting patients overall survival at 3-year (A) and 5-year (B) in training cohort.

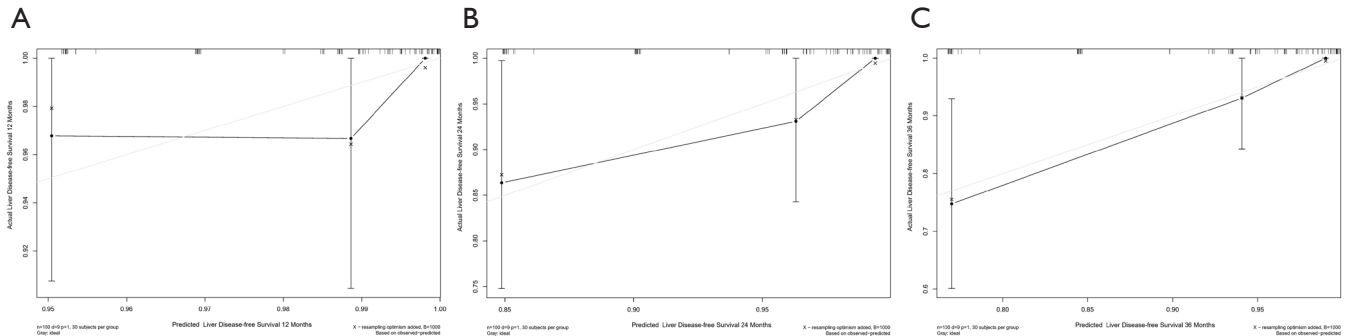


Figure S3 Calibration curve for predicting patients liver disease-free survival at 1-year (A), 2-year (B), and 3-year (C) in validation cohort.

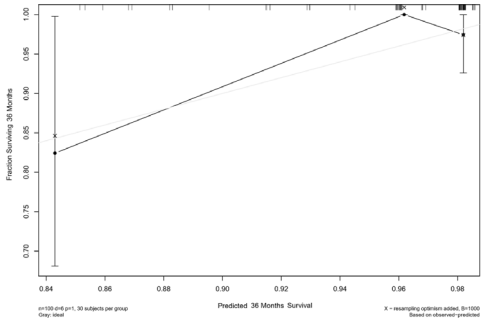


Figure S4 Calibration curve for predicting patients overall survival at 3-year in validation cohort.