

Figure S1 Screen shot of the online calculator.

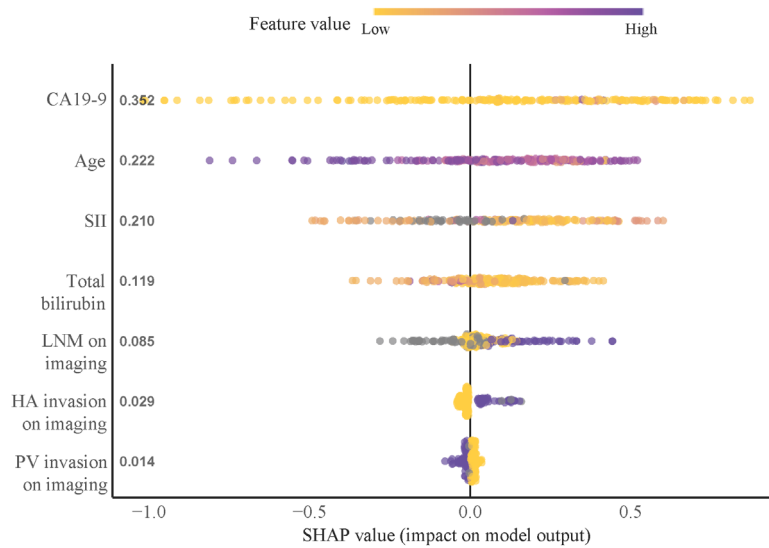
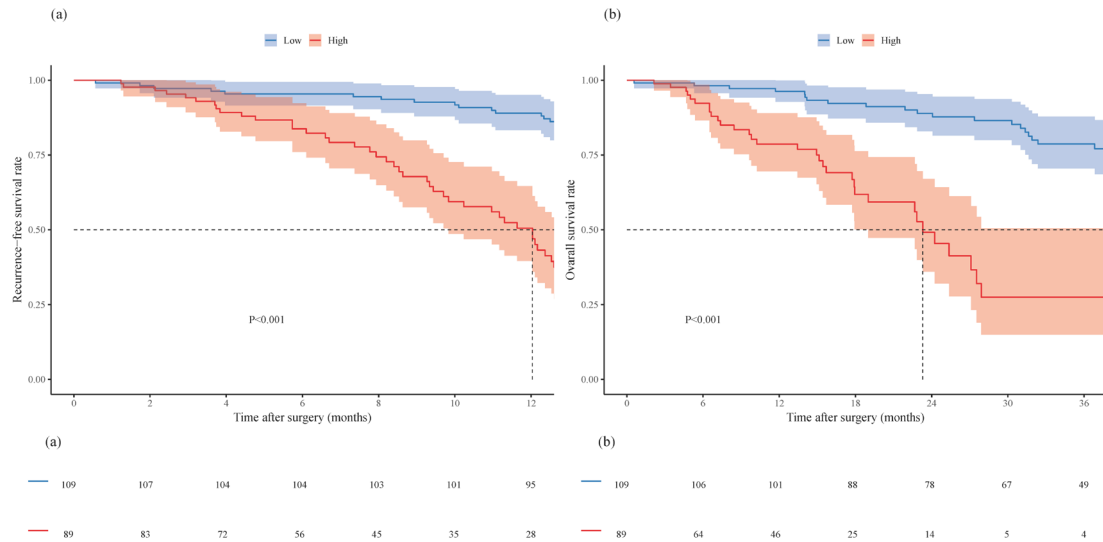


Figure S2 SHapley Additive exPlanations (SHAP) summary plot demonstrating weightages of preoperative clinicopathological factors in predicting very early recurrence. CA19-9, carbohydrate antigen 19-9; SII, systemic immune-inflammation index; LNM, lymph node metastasis; HA, hepatic artery; PV, portal vein.



**Figure S3** Kaplan-Meier curves demonstrating the differences in recurrence-free survival (A) and overall survival (B) stratified by risk group for very early recurrence according to preoperative risk model.

**Table S1** Recurrence pattern of initial recurrence

Variables	Patients with recurrence, n = 269	Non-VER, n = 204	VER, n = 65
Local recurrence only, n (%)	90 (33.5)	76 (37.2)	14 (21.5)
Distant recurrence only, n (%)	66 (24.5)	56 (27.5)	10 (15.4)
Local and distant recurrences, n (%)	26 (9.7)	22 (10.8)	4 (6.2)
Liver	23 (8.6)	20 (9.8)	3 (4.6)
Lung	12 (4.5)	11 (5.4)	1 (1.5)
Bone	3 (1.1)	2 (1.0)	1 (1.5)
Peritoneum	22 (8.2)	18 (8.8)	4 (6.2)
Lymph node	13 (4.8)	13 (6.4)	0 (0.0)
Other sites	3 (1.1)	3 (1.5)	0 (0.0)
Unknown specific distant recurrence site	33 (12.3)	27 (13.2)	6 (9.2)
Unknown, n (%)	87 (32.3)	50 (24.5)	37 (56.9)

VER, very early recurrence.

**Table S2** Baseline characteristics and clinicopathological variables in the additional analysis cohort

Characteristics	Total, n=198	Non-VER, n=180 (90.9%)	VER, n=18 (9.1%)	P value
Age, year, median (IQR)	69 (60-74)	69 (61-74)	69 (61-77)	0.48
Sex, male, n (%)	121 (61.1)	111 (61.7)	10 (55.6)	0.80
Year of surgery, 2011-2023, n (%)	185 (93.4)	169 (93.9)	16 (88.9)	0.75
Region, western, n (%)	167 (84.3)	150 (83.3)	17 (94.4)	0.37
Preoperative chemotherapy, n (%)	16 (8.1)	15 (8.3)	1 (5.6)	>0.99
Jaundice, n (%)	135 (68.2)	121 (67.2)	14 (77.8)	0.52
Portal vein embolization, n (%)	57 (28.8)	55 (30.6)	2 (11.1)	0.14
Total bilirubin (mg/dL), median (IQR)	1.20 (0.62-2.31)	1.12 (0.60-2.30)	1.58 (1.00-2.76)	0.13
SII, median (IQR)	725 (450-1337)	722 (448-1339)	780 (548-1030)	0.96
CA19-9 (U/mL), median (IQR)	90.5 (22.1-405.0)	81.5 (22.0-420.0)	147.5 (69.6-308.5)	0.31
LN metastasis on imaging, n (%)	56 (28.3)	50 (27.8)	6 (33.3)	0.78
Hepatic artery invasion on imaging, n (%)	40 (20.2)	36 (20.0)	4 (22.2)	0.51
Portal vein invasion on imaging, n (%)	51 (25.8)	50 (27.8)	1 (5.6)	0.08
Type of resection, n (%)				0.03*
Extrahepatic bile duct resection only	10 (5.1)	9 (5.0)	1 (5.6)	
Right hepatectomy	11 (5.6)	10 (5.6)	1 (5.6)	
Left hepatectomy	6 (3.0)	6 (3.3)	0 (0.0)	
Extended right hepatectomy	65 (32.8)	60 (33.3)	5 (27.8)	
Extended left hepatectomy	65 (32.8)	57 (31.7)	8 (44.4)	
Right trisectionectomy	17 (8.6)	17 (9.4)	0 (0.0)	
Left trisectionectomy	15 (7.6)	15 (8.3)	0 (0.0)	
Central hepatectomy	3 (1.5)	1 (0.6)	2 (11.1)	
Others	6 (3.0)	5 (2.8)	1 (5.6)	
Lymphadenectomy, n (%)	193 (97.5)	175 (97.2)	18 (100.0)	>0.99
Combined vascular resection, n (%)	60 (30.3)	52 (28.9)	8 (44.4)	0.27
Intraoperative frozen section analysis, n (%)	31 (15.7)	30 (16.7)	1 (5.6)	<0.001*
Intraoperative blood loss, median (IQR)	700 (400-1470)	700 (400-1372)	750 (300-1961)	0.91
Operative time, minute, median (IQR)	549 (380-639)	552 (377-643)	539 (456-632)	0.94
Number of harvested LN $\geq$ 6, n (%)	133 (67.2)	124 (68.9)	9 (50.0)	0.17
AJCC T category, T3 or T4, n (%)	53 (26.8)	46 (25.6)	7 (38.9)	0.35
AJCC N category, N1 or N2, n (%)	91 (46.0)	81 (45.0)	10 (55.6)	0.54
AJCC stage, n (%)				0.17
Stage I	19 (9.6)	19 (10.6)	0 (0.0)	
Stage II	63 (31.8)	59 (32.8)	4 (22.2)	
Stage IIIA	19 (9.6)	15 (8.3)	4 (22.2)	
Stage IIIB	6 (3.0)	6 (3.3)	0 (0.0)	
Stage IIIC	72 (36.4)	63 (35.0)	9 (50.0)	
Stage IVA	19 (9.6)	18 (10.0)	1 (5.6)	
Tumor size, cm, median (IQR)	2.8 (2.0-4.0)	2.8 (2.0-4.0)	3.0 (2.3-3.7)	0.60
Tumor differentiation, poor, n (%)	54 (27.3)	48 (26.7)	6 (33.3)	0.74
Microvascular invasion, n (%)	111 (56.1)	99 (55.0)	12 (66.7)	0.48
Perineural invasion, n (%)	164 (82.8)	150 (83.3)	14 (77.8)	0.79
Margin status, R1, n (%)	83 (41.9)	72 (40.0)	11 (61.1)	0.14
Severe complications, n (%)	79 (39.9)	70 (38.9)	9 (50.0)	0.51
Adjuvant chemotherapy, n (%)	89 (44.9)	81 (45.0)	8 (44.4)	0.21
Recurrence, n (%)	98 (49.5)	80 (44.4)	18 (100.0)	<0.001*

\*, P value <0.05. VER, very early recurrence; SII, Systemic Immune Inflammation Index; CA19-9, Carbohydrate antigen 19-9; LN, Lymph node; AJCC, The American Joint Committee on Cancer.