

Supplementary Table 1 Baseline characteristics of patients in the hepatectomy group and the *ex vivo* liver resection and autotransplantation group

Variable	Levels	Hepatectomy (N=545)	ELRA (N=165)	<i>P</i>
Gender	Female	275 (50.5%)	97 (58.8%)	0.074
	Male	270 (49.5%)	68 (41.2%)	
History of Previous Hepatectomy	None	446 (81.8%)	140 (84.8%)	0.438
	Yes	99 (18.2%)	25 (15.2%)	
Lesion Size	<5cm	47 (8.6%)	5 (3%)	<0.001
	5 ≤ - < 10cm	217 (39.8%)	37 (22.4%)	
	10 ≤ - < 15cm	192 (35.2%)	61 (37%)	
	15 ≤ - < 20cm	76 (13.9%)	47 (28.5%)	
	≥ 20cm	13 (2.4%)	15 (9.1%)	
Lesion Number	Single	358 (65.7%)	114 (69.1%)	0.473
	Multiple	187 (34.3%)	51 (30.9%)	
Lesion Location	Single Liver Lobe	333 (61.1%)	75 (45.5%)	<0.001
	Multiple Liver Lobes	212 (38.9%)	90 (54.5%)	
	No Abnormality	248 (45.5%)	25 (15.2%)	<0.001

Variable	Levels	Hepatectomy (N=545)	ELRA (N=165)	<i>P</i>
Type of Vascular Invasion by the Lesion	Only Invaded the Portal Vein	91 (16.7%)	21 (12.7%)	
	Only Invaded the Hepatic Vein	37 (6.8%)	18 (10.9%)	
	Only Invaded the Inferior Vena Cava	10 (1.8%)	4 (2.4%)	
	Invaded Two Types of Vessels Simultaneously	124 (22.8%)	63 (38.2%)	
	Invaded Three Types of Vessels Simultaneously	35 (6.4%)	34 (20.6%)	
	No Abnormality	281 (51.6%)	37 (22.4%)	
Degree of Lesion Invasion of the Bile Duct	Only Compressed the Bile Duct	125 (22.9%)	56 (33.9%)	<0.001
	Invaded the Bile Duct	139 (25.5%)	72 (43.6%)	
WBC	Median (IQR)	6.72 (5.50 to 7.99)	6.08 (5.09 to 7.80)	0.005
Hb	Median (IQR)	131.00 (113.00 to 144.00)	113.00 (101.00 to 128.00)	<0.001
PLT	Median (IQR)	253.00 (200.00 to 311.00)	237.00 (179.00 to 299.00)	0.033

Variable	Levels	Hepatectomy (N=545)	ELRA (N=165)	P
ALT	Median (IQR)	27.79 (18.00 to 52.22)	31.64 (19.56 to 59.00)	0.101
GGT	Median (IQR)	69.00 (35.30 to 154.00)	110.89 (60.60 to 232.30)	<0.001
DBil	Median (IQR)	1.86 (0.30 to 4.10)	1.86 (0.30 to 5.49)	0.513
IBil	Median (IQR)	7.59 (4.68 to 11.52)	9.37 (6.44 to 14.21)	<0.001
ALB	Median (IQR)	37.70 (34.21 to 40.50)	36.67 (33.79 to 40.00)	0.112
GLO	Median (IQR)	39.36 (33.47 to 45.30)	44.20 (38.19 to 50.50)	<0.001
Scr	Median (IQR)	59.86 (48.68 to 70.38)	49.92 (42.71 to 65.00)	<0.001
BUN	Median (IQR)	4.40 (3.58 to 5.40)	3.90 (3.17 to 4.90)	<0.001
UA	Median (IQR)	268.00 (212.00 to 332.88)	244.75 (206.04 to 298.96)	0.009
ALP	Median (IQR)	131.71 (91.00 to 240.00)	207.60 (134.46 to 381.68)	<0.001
TT	Median (IQR)	20.40 (19.20 to 21.50)	21.30 (20.10 to 22.20)	<0.001
PT	Median (IQR)	12.00 (11.20 to 12.90)	12.80 (11.90 to 14.20)	<0.001
APTT	Median (IQR)	34.20 (31.70 to 36.90)	34.80 (31.60 to 38.00)	0.076

ALP: Alkaline Phosphatase; ALB: Albumin; ALT: Alanine Aminotransferase; APTT: Activated Partial Thromboplastin Time; AST: Aspartate Aminotransferase; BUN: Blood Urea; DBil: Direct Bilirubin; ELRA: *Ex vivo* Liver Resection and Autotransplantation;

Variable	Levels	Hepatectomy (N=545)	ELRA (N=165)	<i>P</i>
GLO: Globulin; GGT: γ -Glutamyl Transferase; Hb: Hemoglobin; IBil: Indirect Bilirubin; PLT: Platelet Count; PT: Prothrombin Time; RBC: Red Blood Cell Count; Scr: Serum Creatinine; TP: Total Protein; TT: Thrombin Time; WBC: White Blood Cell Count;				

Supplementary Table 2 Baseline characteristics of patients in the training set and validation set

Variable	Levels	Training Set (N=474)	Validation Set (N=236)	<i>P</i>
Gender	Female	239 (50.4%)	133 (56.4%)	0.158
	Male	235 (49.6%)	103 (43.6%)	
History of Previous Hepatectomy	None	393 (82.9%)	193 (81.8%)	0.788
	Yes	81 (17.1%)	43 (18.2%)	
Lesion Size	<5cm	33 (7%)	19 (8.1%)	0.293
	5 ≤ - < 10cm	169 (35.7%)	85 (36%)	
	10 ≤ - < 15cm	166 (35%)	87 (36.9%)	
	15 ≤ - < 20cm	82 (17.3%)	41 (17.4%)	
	≥ 20cm	24 (5.1%)	4 (1.7%)	
Lesion Number	Single	312 (65.8%)	160 (67.8%)	0.660
	Multiple	162 (34.2%)	76 (32.2%)	

Variable	Levels	Training Set (N=474)	Validation Set (N=236)	<i>P</i>
Lesion Location	Single Liver Lobe	279 (58.9%)	129 (54.7%)	0.324
	Multiple Liver Lobes	195 (41.1%)	107 (45.3%)	
	No Abnormality	195 (41.1%)	78 (33.1%)	
Type of Vascular Invasion by the Lesion	Only Invaded the Portal Vein	71 (15%)	41 (17.4%)	0.436
	Only Invaded the Hepatic Vein	36 (7.6%)	19 (8.1%)	
	Only Invaded the Inferior Vena Cava	10 (2.1%)	4 (1.7%)	
	Invaded Two Types of Vessels Simultaneously	118 (24.9%)	69 (29.2%)	
	Invaded Three Types of Vessels Simultaneously	44 (9.3%)	25 (10.6%)	
	No Abnormality	218 (46%)	100 (42.4%)	
Degree of Lesion Invasion of the Bile Duct	Only Compressed the Bile Duct	118 (24.9%)	63 (26.7%)	0.658
	Invaded the Bile Duct	138 (29.1%)	73 (30.9%)	
WBC	Median (IQR)	6.61 (5.36 to 8.00)	6.46 (5.45 to 7.80)	0.465
Hb	Mean ± SD	126.73 ± 21.52	123.23 ± 26.09	0.076

Variable	Levels	Training Set (N=474)	Validation Set (N=236)	<i>P</i>
PLT	Median (IQR)	247.00 (197.00 to 307.00)	257.50 (192.50 to 314.00)	0.454
ALT	Median (IQR)	28.30 (17.90 to 57.00)	30.82 (18.72 to 49.88)	0.880
GGT	Median (IQR)	73.97 (37.00 to 172.83)	81.83 (43.64 to 178.51)	0.339
DBil	Median (IQR)	1.88 (0.30 to 4.36)	1.83 (0.30 to 4.30)	0.514
IBil	Median (IQR)	7.68 (4.90 to 11.89)	8.38 (5.61 to 12.38)	0.197
ALB	Median (IQR)	37.49 (34.20 to 40.40)	37.41 (33.80 to 40.35)	0.540
GLO	Median (IQR)	40.04 (33.70 to 46.70)	40.72 (35.41 to 46.10)	0.231
Scr	Median (IQR)	57.68 (47.29 to 69.39)	58.37 (47.00 to 69.42)	0.920
BUN	Median (IQR)	4.29 (3.50 to 5.34)	4.20 (3.44 to 5.13)	0.592
UA	Median (IQR)	264.79 (209.00 to 333.40)	255.31 (211.23 to 318.36)	0.313
ALP	Median (IQR)	144.65 (93.82 to 282.01)	156.62 (95.73 to 313.78)	0.225
TT	Median (IQR)	20.60 (19.40 to 21.60)	20.60 (19.30 to 21.90)	0.701
PT	Median (IQR)	12.20 (11.30 to 13.20)	12.10 (11.30 to 13.15)	0.812
APTT	Median (IQR)	34.30 (32.00 to 37.40)	34.05 (31.40 to 37.15)	0.280
Type of Surgery	Hepatectomy	364 (76.8%)	181 (76.7%)	1.000
	ELRA	110 (23.2%)	55 (23.3%)	

Variable	Levels	Training Set (N=474)	Validation Set (N=236)	P
ALP: Alkaline Phosphatase; ALB: Albumin; ALT: Alanine Aminotransferase; APTT: Activated Partial Thromboplastin Time; AST: Aspartate Aminotransferase; BUN: Blood Urea; DBil: Direct Bilirubin; ELRA: <i>Ex vivo</i> Liver Resection and Autotransplantation; GLO: Globulin; GGT: γ -Glutamyl Transferase; Hb: Hemoglobin; IBil: Indirect Bilirubin; PLT: Platelet Count; PT: Prothrombin Time; RBC: Red Blood Cell Count; Scr: Serum Creatinine; TP: Total Protein; TT: Thrombin Time; WBC: White Blood Cell Count;				

Supplementary Table 3 The details of the intersection of features selected by three methods

Only REF	Only MRMR	Only LASSO	REF And MRMR Not LASSO	MRMR And LASSO Not REF	REF And LASSO Not MRMR	REF And MRMR And LASSO
ALT	APTT			Lesion Number	DBil	PLT
	History of					
UA	Previous Hepatectomy			Lesion Location	ALB	IBil

TT	GLO	Degree of Lesion
		Invasion of the Bile Duct
	ALP	Scr
		WBC
		Lesion Size
		PT
		GGT
		Hb
		Type of Vascular
		Invasion by the Lesion

ALP: Alkaline Phosphatase; ALB: Albumin; ALT: Alanine Aminotransferase; APTT: Activated Partial Thromboplastin Time; AST: Aspartate Aminotransferase; BUN: Blood Urea; DBil: Direct Bilirubin; GLO: Globulin; GGT: γ -Glutamyl Transferase; Hb: Hemoglobin; IBil: Indirect Bilirubin; LASSO: Least Absolute Shrinkage and Selection Operator; mRMR: Minimum Redundancy Maximum Relevance; PLT: Platelet Count; PT: Prothrombin Time; RBC: Red Blood Cell Count; RFE: Recursive Feature Elimination; Scr: Serum Creatinine; TP: Total Protein; TT: Thrombin Time; WBC: White Blood Cell Count;

