

Table S1 Distribution of cases by post-operative diagnosis

Post-op diagnosis	HeRS =1	HeRS =2	HeRS =3	HeRS =4	Total cohort
Total, n [%]	476 [11]	1,877 [42]	1,676 [37]	481 [10]	4,510
155.0, n [%]	313 [66]	1,360 [72]	1,134 [67]	274 [57]	3,081 [68]
155.1, n [%]	96 [20]	312 [17]	382 [23]	166 [34]	956 [21]
155.2, n [%]	40 [8]	132 [7]	97 [6]	26 [5]	295 [7]
155 (unspecified), n [%]	27 [6]	73 [4]	63 [4]	15 [3]	178 [4]

Diagnosis codes are specified as follows: 155.0, malignant neoplasm of liver, primary; 155.1, malignant neoplasm of intrahepatic bile ducts; 155.2, malignant neoplasm of liver, not specified as primary or secondary. HeRS, hepatectomy risk score.

Table S2 Firth logistic regression for HeRS only model

Variable	OR estimate (95% CI)	P value
Intercept	0.009 (0.004–0.024)	<0.001
HeRS =1	1.0 (reference)	N/A
HeRS =2	2.90 (1.10–7.65)	0.031
HeRS =3	5.85 (2.25–15.16)	<0.001
HeRS =4	12.29 (4.64–32.51)	<0.001

HeRS, hepatectomy risk score; OR, odds ratio; CI, confidence interval; N/A, not applicable.

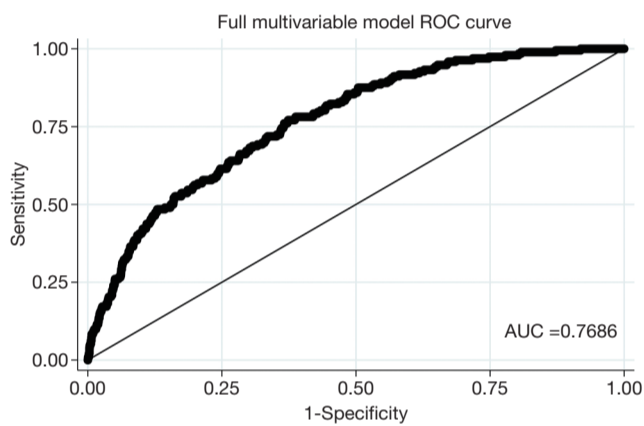


Figure S1 Full multivariable model ROC curve.

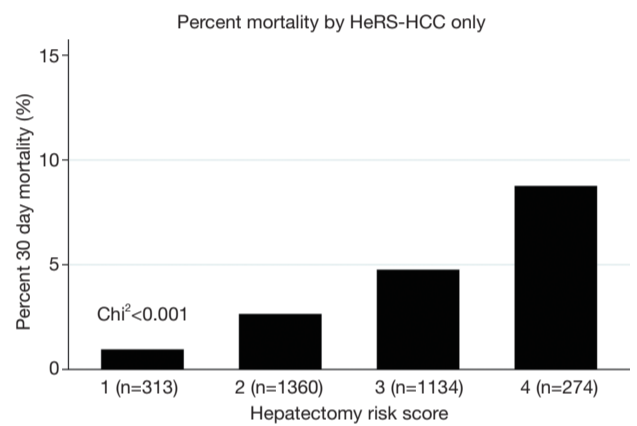


Figure S2 Mortality by HeRS for primary liver parenchymal and biliary ductal intrahepatic neoplasms.

Table S3 Full multivariable logistic regression

Variable	OR estimate (95% CI)	P value
Intercept	0.003 (0.0004–0.021)	<0.001
HeRS =1	1.0 (reference)	N/A
HeRS =2	2.35 (0.84–6.60)	0.104
HeRS =3	3.93 (1.42–10.90)	<0.009
HeRS =4	7.51 (2.63–21.44)	<0.001
Age (in years)	1.03 (1.02–1.05)	<0.001
Sex (1= male, 0= female)	1.55 (1.10–2.18)	0.012
BMI	1.02 (0.99–1.05)	0.150
ASA class (1= greater than 2; 0= less than 2)	2.27 (1.26–4.07)	0.006
Functional status (1= dependent, 0= independent)	2.88 (1.30–6.37)	0.009
Smoker within 1 year of surgery (1= yes, 0= no)	1.18 (0.80–1.72)	0.407
Dyspnea at rest or on exertion (1= yes, 0= no)	1.08 (0.66–1.78)	0.747
Ascites at time of surgery (1= yes, 0= no)	0.613 (0.25–1.51)	0.284
Weight Loss >10% in past 6 months (1= yes, 0= no)	1.43 (0.85–2.40)	0.177
Platelet count <100 (1= yes, 0= no)	3.58 (2.26–5.66)	<0.001
Albumin at time of surgery (g/dL)	0.53 (0.41–0.69)	<0.001
Steroid use at time of surgery (1= yes, 0= no)	2.02 (1.02–4.02)	0.045
History of COPD (1= yes, 0= no)	0.93 (0.50–1.74)	0.823
History of hypertension (1= yes, 0= no)	0.91 (0.64–1.28)	0.575
History of insulin dependent diabetes (1= yes, 0= no)	1.14 (0.73–1.80)	0.560
History of bleeding disorder	0.93 (0.51–1.70)	0.811

Odds ratio (OR) estimates for the Full Multivariable Model. HeRS, hepatectomy risk score; CI, confidence interval; ASA, American Society of Anesthesiologists; COPD, chronic obstructive pulmonary disease; BMI, basic metabolic index; N/A, not applicable.

Table S4 HeRS only logistic regression-neoplasm of primary liver parenchyma only analysis (n=3,081)

Variable	OR estimate (95% CI)	P value
Intercept	0.01 (0.003–0.03)	<0.001
HeRS =1	1.0 (reference)	N/A
HeRS =2	2.8 (0.86–9.18)	0.087
HeRS =3	5.17 (1.60–16.63)	0.006
HeRS =4	9.92 (2.95–33.32)	<0.001

OR, odds ratio; HeRS, hepatectomy risk score; CI, confidence interval; N/A, not applicable.

Table S5 Full multivariable model for neoplasm of primary liver parenchyma only analysis

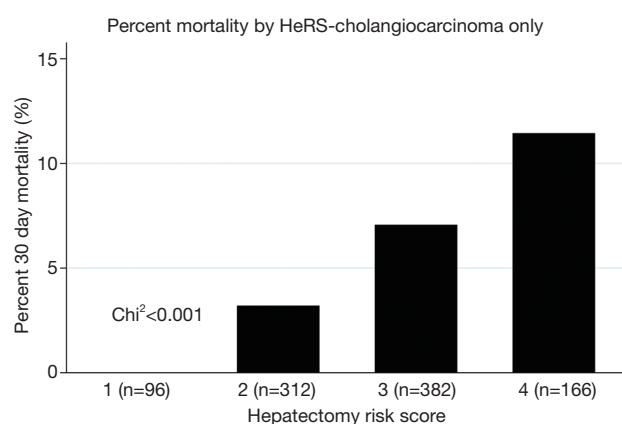
Variable	OR estimate (95% CI)	P value
Intercept	0.008 (0.006–0.10)	<0.001
HeRS =1	1.0 (reference)	N/A
HeRS =2	1.90(0.57–6.30)	0.293
HeRS =3	2.66 (0.81–8.75)	0.11
HeRS =4	4.5 (1.31–15.8)	0.02
Age (in years)	1.03 (1.01–1.06)	0.002
Sex (1=male, 0=female)	1.72 (1.08–2.76)	0.023
BMI	1.01 (0.98–1.05)	0.400
ASA class (1= greater than 2; 0= less than 2)	2.12 (1.00–4.47)	0.049
Functional status (1= dependent, 0= independent)	2.75 (0.98–7.70)	0.054
Smoker within 1 year of surgery (1= yes, 0= no)	1.20 (0.75–1.92)	0.447
Dyspnea at rest or on exertion (1= yes, 0= no)	0.96 (0.50–1.83)	0.905
Ascites at time of surgery (1= yes, 0= no)	0.40 (0.11–1.41)	0.153
Weight loss >10% in past 6 months (1= yes, 0= no)	1.32 (0.65–2.69)	0.445
Platelet count <100 (1= yes, 0= no)	3.53 (2.06–6.03)	<0.001
Albumin at time of surgery (g/dL)	0.43 (0.31–0.61)	<0.001
Steroid use at time of surgery (1= yes, 0= no)	1.65 (0.63–4.32)	0.304
History of COPD (1= yes, 0= no)	1.01 (0.46–2.23)	0.982
History of hypertension (1= yes, 0= no)	0.92 (0.59–1.43)	0.710
History of insulin dependent diabetes (1= yes, 0= no)	1.29 (0.75–2.21)	0.353
History of bleeding disorder	0.96 (0.47–1.98)	0.922

OR, odds ratio; HeRS, hepatectomy risk score; CI, confidence interval; ASA, American Society of Anesthesiologists; COPD, chronic obstructive pulmonary disease; BMI, basic metabolic index; N/A, not applicable.

Table S6 Optimal multivariable model for neoplasm of primary liver parenchyma only analysis

Variable	OR estimate (95% CI)	P value
Intercept	0.013 (0.001–0.12)	<0.001
HeRS =1	1.0 (reference)	N/A
HeRS =2	1.90 (0.58–6.29)	0.291
HeRS =3	2.66 (0.81–8.745)	0.106
HeRS =4	4.59 (1.33–15.84)	0.016
Age (in years)	1.03 (1.01–1.05)	0.001
Sex (1= male, 0= female)	1.65 (1.04–2.63)	0.033
ASA class (1= greater than 2; 0= less than 2)	2.26 (1.08–4.71)	0.030
Platelet count <100 (1= yes, 0= no)	3.25 (1.94–5.42)	<0.001
Albumin at time of surgery (g/dL)	0.43 (0.31–0.60)	<0.001

OR, odds ratio; HeRS, hepatectomy risk score; CI, confidence interval; ASA, American Society of Anesthesiologists; N/A, not applicable.

**Figure S3** ROC curves for neoplasm of primary liver parenchyma only analysis.