

Table S1 Demographic and oncological information of the whole cohort, overweight (BMI >25 kg/m²) and non-overweight patients

Variable	All patients (n=115)	BMI>25 (n=60)	BMI≤25 (n=55)	P value
Age	60 (52-66)	61 (54-67)	60 (49-66)	0.38
Sex (M)	70 (61%)	43 (72%)	27 (49%)	0.01
BMI, kg/m ²	25.0 (22.0-28.0)	28.0 (26.0-30.0)	22.0 (20.0-24.0)	<0.001
ASA score				0.47
I	5 (4%)	2 (3%)	3 (6%)	
II	46 (40%)	28 (47%)	18 (33%)	
III	59 (51%)	28 (47%)	31 (56%)	
IV	5 (4%)	2 (3%)	3 (6%)	
Primary tumor location				0.55
Coecum	3 (3%)	1 (2%)	2 (4%)	
Ascending colon	21 (18%)	8 (13%)	13 (24%)	
Transverse colon	3 (3%)	1 (2%)	2 (4%)	
Descending colon	6 (5%)	4 (7%)	2 (4%)	
Sigmoid colon	33 (29%)	20 (33%)	13 (24%)	
Rectum	49 (43%)	26 (43%)	23 (42%)	
Synchronous metastases	97 (84%)	50 (83%)	47 (86%)	0.75
More than 3 metastases	45/95 (47%)	22/49 (45%)	23/46 (50%)	0.62
KRAS status (mutated)	38/95 (40%)	15/47 (32%)	23/48 (48%)	0.11
Portal vein embolization	50 (44%)	28 (47%)	22 (40%)	0.47
Preop. platelet counts (/nL)	232 (173-293)	235 (174-282)	226 (172-310)	0.66
Preop. albumin (g/dL)	4.2 (3.6-4.5)	4.1 (3.5-4.5)	4.3 (3.7-4.5)	0.43
Preop. chemotherapy				
Cycles	6 (5-8)	6 (4-8)	6 (6-8.75)	0.19
Oxaliplatin	78 (68%)	38 (63%)	40 (73%)	0.28
Anti-VEGF	43 (37%)	17 (28%)	26 (47%)	0.06
Anti-EGFR	37 (32%)	23 (38%)	14 (26%)	0.09
Median SH (%)	10.56% (0.4-34.6%)	7.03% (0.2-21%)	12.2% (2.1-39.2%)	0.15
Staged resection	48 (42%)	28 (47%)	20 (36%)	0.26
ALPPS	20 (17%)	10 (17%)	10 (18%)	0.83
Liver R0	100 (87%)	49 (82%)	51 (93%)	0.08
Previous liver resection/ablation	17 (15%)	6 (10%)	11 (20%)	0.13
Operating time	250.5 (210-333)	252 (220-322)	250 (189-345)	0.76
Liver fibrosis	58/94 (62%)	28/48 (58%)	30/46 (65%)	0.49

Values given as median (1st quartile – 3rd quartile) or absolute and relative frequencies. BMI, body mass index; ASA, American Society of Anesthesiology score; KRAS, Kirsten rat sarcoma viral oncogene homolog; Anti-VEGF, anti-vascular endothelial growth factor; Anti-EGFR, anti-epidermal growth factor; SH, Splenic hypertrophy; ALPPS, associating liver partition and portal vein ligation for staged hepatectomy.

Table S2 Outcomes of the whole cohort, overweight (BMI>25 kg/m²) and non-overweight patients

Outcome	All patients (n=115)	BMI>25 (n=60)	BMI≤25 (n=55)	P value
Intraop. Transfusions (units)	1 (0-6)	3 (0-7)	0 (0-4)	0.03
Complications (Clavien-Dindo)				
CD1	87 (76%)	44 (73%)	43 (78%)	0.55
CD2	60 (52%)	36 (60%)	24 (44%)	0.08
CD3a	38 (33%)	22 (37%)	16 (29%)	0.39
CD3b	20 (17%)	12 (20%)	8 (15%)	0.44
CD4a	14 (12%)	5 (8%)	9 (16%)	0.19
CD4b	6 (5%)	5 (8%)	1 (2%)	0.12
CD≥3	52 (45%)	28 (47%)	24 (44%)	0.74
Median CCI	27.6 (17.3-47.3)	27.6 (22.6-48.9)	25.7 (12.2-45.4)	0.35
CCI >50	26 (23%)	14 (23%)	12 (22%)	0.85
Liver-specific complications	59 (51%)	30 (50%)	29 (53%)	0.77
POD5 serum bilirubin (mg/dL)	0.86 (0.505-1.52)	0.91 (0.59-1.44)	0.71 (0.46-1.63)	0.49
POD5 INR	1.09 (1.04-1.2575)	1.10 (1.05-1.28)	1.09 (1.01-1.24)	0.25
Length of ICU stay	1.0 (1-2)	1 (1-2)	1 (1-2)	0.93
Length of hospital stay	11 (8-25)	10.5 (8-25)	14 (9-24)	0.66

Values given as median (1st quartile – 3rd quartile) or absolute and relative frequencies. CD, Clavien-Dindo; CCI, Comprehensive Complication Index; POD5, postoperative day 5; INR, international normalized ratio; ICU, Intensive Care Unit.

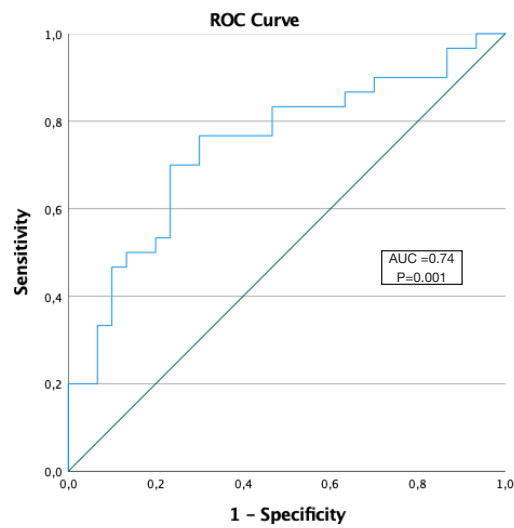


Figure S1 Predictive capability of splenic hypertrophy for liver-specific complications among overweight patients (BMI >25 kg/m²).

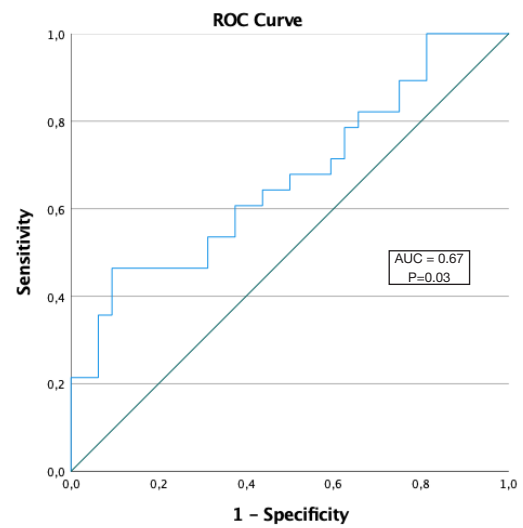


Figure S3 Predictive capability of splenic hypertrophy for CD ≥ 3 complications among overweight patients (BMI >25 kg/m²).

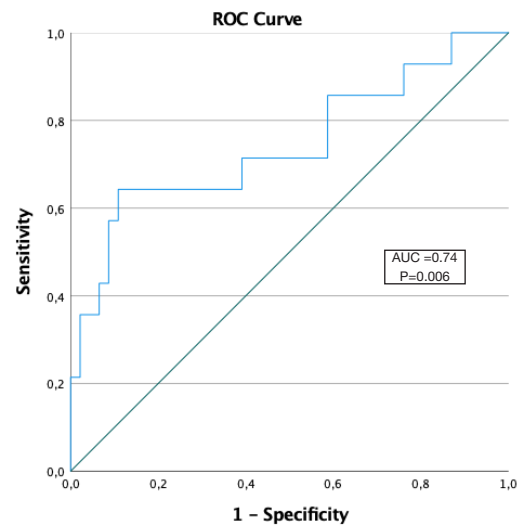


Figure S2 Predictive capability of splenic hypertrophy for CCI >50 among overweight patients (BMI >25 kg/m²).

Table S3 Demographic and oncological information of patients with SH above or up to 8.38%, among overweight patients (BMI>25 kg/m²)

Variable	All patients (n=60)	SH>8.38% (n=28)	SH≤8.38% (n=32)	P-value
Age	60 (54-67)	60 (55-68)	59 (53-66)	0.63
Sex (M)	43 (72%)	17 (61%)	26 (81%)	0.08
BMI, kg/m ²	28.0 (26.0-30.0)	27.0 (26.0-31.0)	28.0 (26.0-30.0)	0.60
ASA score				0.60
I	2 (3%)	1 (4%)	1 (3%)	
II	28 (47%)	13 (46%)	15 (47%)	
III	28 (47%)	14 (50%)	14 (44%)	
IV	2 (3%)	0 (0%)	2 (6%)	
Primary tumor location				0.36
Coecum	1 (2%)	1 (4%)	0 (0%)	
Ascending colon	8 (13%)	6 (21%)	2 (6%)	
Transverse colon	1 (2%)	0 (0%)	1 (3%)	
Descending colon	4 (7%)	1 (4%)	3 (9%)	
Sigmoid colon	20 (33%)	8 (29%)	12 (38%)	
Rectum	26 (43%)	12 (43%)	14 (44%)	
Synchronous metastases	50 (83%)	24 (86%)	26 (81%)	0.74
More than 3 metastases	22/49 (45%)	14/25 (56%)	8/24 (33%)	0.11
KRAS status (mutated)	15/47 (32%)	7/19 (37%)	8/28 (29%)	0.55
Portal vein embolization	28 (47%)	11 (39%)	17 (53%)	0.28
Preop. platelet counts (/nL)	235 (174-282)	199 (159-259)	245 (187-311)	0.04
Preop. albumin (g/dL)	4.1 (3.5-4.5)	3.6 (3.0-4.5)	4.2 (3.8-4.4)	0.27
Preop. chemotherapy				
Cycles	6 (4-8)	6 (4-11)	6 (5-8)	0.76
Oxaliplatin	38 (63%)	23 (82%)	15 (47%)	0.005
Anti-VEGF	17 (28%)	8 (29%)	9 (28%)	0.75
Anti-EGFR	23 (38%)	7 (25%)	16 (50%)	0.09
Staged resection	28 (47%)	16 (57%)	12 (38%)	0.13
ALPPS	10 (17%)	8 (29%)	2 (6%)	0.04
Liver R0	49 (82%)	21 (75%)	28 (88%)	0.21
Previous liver resection/ablation	6 (10%)	5 (18%)	1 (3%)	0.09
Liver fibrosis	28/48 (58%)	17/22 (77%)	11/26 (42%)	0.01
Operating time	252 (220-322)	248 (202-291)	261 (221-348)	0.13

Values given as median (1st quartile – 3rd quartile) or absolute and relative frequencies. BMI, body mass index; ASA, American Society of Anesthesiology score; KRAS, Kirsten rat sarcoma viral oncogene homolog; Anti-VEGF, anti-vascular endothelial growth factor; Anti-EGFR, anti-epidermal growth factor; SH, splenic hypertrophy; ALPPS, associating liver partition and portal vein ligation for staged hepatectomy.

Table S4 Demographic and oncological information of patients with SH above or up to 20.06% among overweight patients (BMI>25 kg/m²)

Variable	All patients (n=60)	SH>20.06% (n=15)	SH≤20.06% (n=45)	P value
Age	60 (54-67)	61 (51-71)	59 (54-65)	0.65
Sex (M)	43 (72%)	10 (67%)	33 (73%)	0.62
BMI, kg/m ²	28.0 (26.0-30.0)	28.0 (26.0-31.0)	28.0 (26.0-30.0)	0.88
ASA score				0.63
I	2 (3%)	1 (7%)	1 (2%)	
II	28 (47%)	8 (53%)	20 (44%)	
III	28 (47%)	6 (40%)	22 (49%)	
IV	2 (3%)	0 (0%)	2 (4%)	
Primary tumor location				0.054
Coecum	1 (2%)	1 (7%)	0 (0%)	
Ascending colon	8 (13%)	5 (33%)	3 (7%)	
Transverse colon	1 (2%)	0 (0%)	1 (2%)	
Descending colon	4 (7%)	1 (7%)	3 (7%)	
Sigmoid colon	20 (33%)	3 (20%)	17 (38%)	
Rectum	26 (43%)	5 (33%)	21 (47%)	
Synchronous metastases	50 (83%)	12 (80%)	38 (84%)	0.70
More than 3 metastases	22/49 (45%)	8/14 (57%)	14/35 (40%)	0.28
KRAS status (mutated)	15/47 (32%)	4/11 (36%)	11/36 (31%)	0.73
Portal vein embolization	28 (47%)	8 (53%)	20 (44%)	0.55
Preop. platelet counts (/nL)	235 (174-282)	191 (133-244)	240 (180-293)	0.02
Preop. albumin (g/dL)	4.1 (3.5-4.5)	3.5 (2.8-4.1)	4.2 (3.8-4.5)	0.003
Preop. chemotherapy				
Cycles	6 (4-8)	6 (5-10)	6 (4-8)	0.79
Oxaliplatin	38 (63%)	14 (93%)	24 (53%)	0.005
Anti-VEGF	17 (28%)	5 (33%)	12 (27%)	0.58
Anti-EGFR	23 (38%)	5 (33%)	18 (40%)	0.68
Staged resection	28 (47%)	12 (80%)	16 (36%)	0.006
ALPPS	10 (17%)	7 (47%)	3 (7%)	0.001
Liver R0	49 (82%)	13 (87%)	36 (80%)	0.71
Previous liver resection/ablation	6 (10%)	2 (13%)	4 (9%)	0.63
Liver fibrosis	28/48 (58%)	9/12 (75%)	19/36 (53%)	0.18
Operating time	252 (220-322)	239.5 (177-269)	261 (221-337)	0.14

Values given as median (1st quartile – 3rd quartile) or absolute and relative frequencies. BMI, body mass index; ASA, American Society of Anesthesiology score; KRAS, Kirsten rat sarcoma viral oncogene homolog; Anti-VEGF, anti-vascular endothelial growth factor; Anti-EGFR, anti-epidermal growth factor; SH, splenic hypertrophy; ALPPS, associating liver partition and portal vein ligation for staged hepatectomy.

Table S5 Demographic and oncological information of patients with SH above or up to 25.15% among overweight patients (BMI>25 kg/m²)

Variable	All patients (n=60)	SH>25.15% (n=14)	SH≤25.15% (n=46)	P value
Age	60 (54-67)	63.5 (54-71)	59 (54-65)	0.36
Sex (M)	43 (72%)	10 (71%)	33 (72%)	>0.99
BMI, kg/m ²	28.0 (26.0-30.0)	28.5 (26.0-31.3)	27.5 (26.0-30.0)	0.56
ASA score				0.68
I	2 (3%)	1 (7%)	1 (2%)	
II	28 (47%)	7 (50%)	21 (46%)	
III	28 (47%)	6 (43%)	22 (48%)	
IV	2 (3%)	0 (0%)	2 (4%)	
Primary tumor location				0.03
Coecum	1 (2%)	1 (7%)	0 (0%)	
Ascending colon	8 (13%)	5 (36%)	3 (7%)	
Transverse colon	1 (2%)	0 (0%)	1 (2%)	
Descending colon	4 (7%)	1 (7%)	3 (7%)	
Sigmoid colon	20 (33%)	2 (14%)	18 (39%)	
Rectum	26 (43%)	5 (36%)	21 (46%)	
Synchronous metastases	50 (83%)	11 (79%)	39 (85%)	0.69
More than 3 metastases	22/49 (45%)	7/13 (54%)	15/36 (42%)	0.45
KRAS status (mutated)	15/47 (32%)	3/10 (30%)	12/37 (32%)	1.00
Portal vein embolization	28 (47%)	8 (57%)	20 (44%)	0.37
Preop. platelet counts (/nL)	235 (174-282)	182 (132-234)	241 (182-293)	0.01
Preop. albumin (g/dL)	4.1 (3.5-4.5)	3.5 (2.8-4.1)	4.2 (3.8-4.5)	0.003
Preop. chemotherapy				
Cycles	6 (4-8)	6 (5-11)	6 (4-8)	0.95
Oxaliplatin	38 (63%)	13 (93%)	25 (54%)	0.009
Anti-VEGF	17 (28%)	4 (29%)	13 (28%)	>0.99
Anti-EGFR	23 (38%)	5 (36%)	18 (39%)	>0.99
Staged resection	28 (47%)	11 (79%)	17 (37%)	0.01
ALPPS	10 (17%)	7 (50%)	3 (7%)	<0.001
Liver R0	49 (82%)	12 (86%)	37 (80%)	0.66
Previous liver resection/ablation	6 (10%)	2 (14%)	4 (9%)	0.62
Liver fibrosis	28/48 (58%)	9/11 (82%)	19/37 (51%)	0.09
Operating time	252 (220-322)	243 (171-270)	256.5 (220-335)	0.26

Values given as median (1st quartile – 3rd quartile) or absolute and relative frequencies. BMI, body mass index; ASA, American Society of Anesthesiology score; KRAS, Kirsten rat sarcoma viral oncogene homolog; Anti-VEGF, anti-vascular endothelial growth factor; Anti-EGFR, anti-epidermal growth factor; SH, splenic hypertrophy; ALPPS, associating liver partition and portal vein ligation for staged hepatectomy.

Table S6 Outcomes of patients with SH above or up to 8.38%, among overweight patients (BMI>25 kg/m²)

Outcome	Patients with BMI 25+ (n=60)	SH>8.38% (n=28)	SH≤8.38% (n=32)	P value
Intraop. Transfusions (units)	3 (0-6.75)	3 (0-8)	3 (0-6)	0.89
Complications (Clavien-Dindo)				
CD1	44 (73%)	20 (71%)	24 (75%)	0.76
CD2	36 (60%)	21 (75%)	15 (47%)	0.03
CD3a	22 (37%)	13 (46%)	9 (28%)	0.14
CD3b	12 (20%)	8 (29%)	4 (13%)	0.12
CD4a	5 (8%)	2 (7%)	3 (9%)	>0.99
CD4b	5 (8%)	4 (14%)	1 (3%)	0.18
CD≥3	28 (47%)	16 (57%)	12 (38%)	0.13
Liver-specific complications	30 (50%)	21 (75%)	9 (28%)	<0.001
Median CCI	27.6 (22.6-48.9)	40.3 (24.2-55.7)	25.7 (12.2-44.1)	0.04
CCI>50	14 (23%)	10 (36%)	4 (13%)	0.03
POD5 serum bilirubin (mg/dL)	0.92 (0.59-1.44)	0.96 (0.7-1.5)	0.88 (0.51-1.38)	0.26
POD5 INR	1.1 (1.05-1.28)	1.08 (1.05-1.23)	1.13 (1.06-1.28)	0.63
Length of ICU stay	1 (1-2)	1(1-3)	1 (1-1)	0.02
Length of hospital stay	10.5 (8-25)	15 (9-35)	9 (8-22)	0.06

Values given as median (1st quartile – 3rd quartile) or absolute and relative frequencies. CD, Clavien Dindo; CCI, Comprehensive Complication Index; POD5, postoperative day 5; INR, international normalized ratio; ICU, Intensive Care Unit.

Table S7 Outcomes of patients with SH above or up to 20.06%, among overweight patients (BMI>25 kg/m²)

Outcome	All patients (n=60)	SH>20.06% (n=15)	SH≤20.06% (n=45)	P value
Intraop. Transfusions (units)	3 (0-6.75)	4 (3-10)	1 (0-6)	0.02
Complications (Clavien-Dindo)				
CD1	44 (73%)	11 (73%)	33 (73%)	>0.99
CD2	36 (60%)	13 (87%)	23 (51%)	0.02
CD3a	22 (37%)	9 (60%)	13 (29%)	0.03
CD3b	12 (20%)	7 (47%)	5 (11%)	0.006
CD4a	5 (8%)	2 (13%)	3 (7%)	0.59
CD4b	5 (8%)	3 (20%)	2 (4%)	0.09
CD≥3	28 (47%)	12 (80%)	16 (36%)	0.003
Liver-specific complications	30 (50%)	12 (80%)	18 (40%)	0.007
Median CCI	27.6 (22.6-48.9)	52.1 (35.7-63.5)	25.7 (17.2-43.9)	0.001
CCI>50	14 (23%)	9 (60%)	5 (11%)	<0.001
POD5 serum bilirubin (mg/dl)	0.92 (0.59-1.44)	0.94 (0.6-1.49)	0.91 (0.58-1.41)	0.77
POD5 INR	1.1 (1.05-1.28)	1.21 (1.06-1.41)	1.09 (1.04-1.22)	0.14
Length of ICU stay	1 (1-2)	2 (1-4)	1 (1-2)	0.03
Length of hospital stay	10.5 (8-25)	33 (17-76)	9 (8-14.5)	<0.001

Values given as median (1st quartile – 3rd quartile) or absolute and relative frequencies. CD, Clavien Dindo; CCI, Comprehensive Complication Index; POD5, postoperative day 5; INR, international normalized ratio; ICU, Intensive Care Unit.

Table S8 Outcomes of patients with SH above or up to 25.15% among overweight patients (BMI>25 kg/m²)

Outcome	All patients (n=60)	SH>25.15% (n=14)	SH≤25.15% (n=46)	P value
Intraop. Transfusions (units)	3 (0-6.75)	5 (3-10)	1.5 (0-6)	0.01
Complications (Clavien-Dindo)				
CD1	44 (73%)	10 (71%)	34 (74%)	>0.99
CD2	36 (60%)	12 (86%)	24 (52%)	0.03
CD3a	22 (37%)	8 (57%)	14 (30%)	0.07
CD3b	12 (20%)	7 (50%)	5 (11%)	0.004
CD4a	5 (8%)	2 (14%)	3 (7%)	0.58
CD4b	5 (8%)	3 (21%)	2 (4%)	0.08
CD≥3	28 (47%)	11 (79%)	17 (37%)	0.006
Liver-specific complications	30 (50%)	11 (79%)	19 (41%)	0.02
Median CCI	27.6 (22.6-48.9)	53.5 (39.0-72.6)	25.7 (18.3-43.8)	0.003
CCI>50	14 (23%)	9 (64%)	5 (11%)	<0.001
POD5 serum bilirubin (mg/dl)	0.92 (0.59-1.44)	0.93 (0.59-1.54)	0.92 (0.58-1.38)	0.78
POD5 INR	1.1 (1.05-1.28)	1.22 (1.06-1.46)	1.09 (1.04-1.20)	0.11
Length of ICU stay	1 (1-2)	2 (1-4)	1 (1-2)	0.02
Length of hospital stay	10.5 (8-25)	34 (18-78)	9 (8-14)	<0.001

Values given as median (1st quartile – 3rd quartile) or absolute and relative frequencies. CD, Clavien Dindo; CCI, Comprehensive Complication Index; POD5, postoperative day 5; INR, international normalized ratio; ICU, Intensive Care Unit.

Table S9 Association of demographic and oncological factors with postoperative liver-specific complications, among overweight patients (BMI>25 kg/m²)

Perioperative factor	Univariable log regression analysis		Multivariable log regression analysis	
	OR (95% CI)	P value	OR (95% CI)	P value
Metachronous metastases	1.625 (0.408-6.469)	0.49		
Age	1.019 (0.964-1.076)	0.51		
Sex (F)	1.179 (0.383-3.629)	0.78		
ASA score	0.586 (0.251-1.366)	0.22		
Cycles of chemotherapy	1.055 (0.918-1.212)	0.45		
Spleen growth (%)	75.799 (3.174-1810.307)	0.008		
Above SH 8.38% cutoff	7.667 (2.424-24.245)	<0.001	7.355 (2.257-23.967)	<0.001
Oxaliplatin (y/n)	4.571 (1.452-14.389)	0.009		
Immunotherapy	0.300 (0.090-1.002)	0.05	0.328 (0.086-1.254)	0.10
Portal vein embolization	1.308 (0.473-3.615)	0.61		
<i>KRAS</i> (mutated)	0.756 (0.218-2.623)	0.66		
Preop. platelets <150/nL	1.300 (0.313-5.404)	0.72		
Liver R0	0.800 (0.215-2.972)	0.74		
Previous liver resection/ablation	5.800 (0.635-53.012)	0.12		
Preop. albumin (g/dl)	0.441 (0.167-1.168)	0.10		
Primary tumor location	1.018 (0.706-1.467)	0.93		
Staged resection	2.259 (0.802-6.364)	0.12		
Fibrosis	1.410 (0.446-4.464)	0.56		
Operating time	0.997 (0.990-1.003)	0.33		
Surgical technique (lap. vs. open)	1.120 (0.577-2.174)	0.74		
Intraop. transfusions (units)	1.003 (0.902-1.116)	0.96		
Simultaneous resection liver & primary tumor	3.222 (0.316-32.889)	0.32		

Results given as odds ratios (OR) with 95% confidence intervals (95%CI). Factors with P<0.1 in the univariable analysis were considered for inclusion in the multivariable regression model. To avoid a multicollinearity effect, not all eligible variables were included in the multivariable logistic regression analysis. BMI, body mass index; ASA, American Society of Anesthesiology score; SH, splenic hypertrophy; *KRAS*, Kirsten rat sarcoma viral oncogene homolog.