

Supplementary Table 1 Definitions or interpretation of variables

Variables	Definitions or interpretation
BMI	A BMI < 24.0 kg/m ² was defined as low BMI (including underweight and normal weight), while ≥ 24.0 kg/m ² was defined as high BMI (including overweight and obesity).
Weight gain or weight loss	A weight change exceeding 5% was recorded as either weight gain or weight loss during the period between the initiation of neoadjuvant chemotherapy and the time of surgery
Primary colorectal tumour	
Primary tumour site	The locations of primary colorectal cancer were classified as either colon or rectum. 'Primary site, colon' indicates that the primary tumor was located in the colon.
Lymph nodal metastasis	Lymph nodal metastasis was divided into two groups (positive and negative) based on the presence or absence of regional lymph node metastasis.
Liver metastases	
Synchronous	Liver metastases detected at the time of primary tumor diagnosis were referred to as "synchronous," which includes patients with incidental liver metastases discovered during surgery. Otherwise, they were termed "metachronous."
Diameter of largest metastases	The diameter represents either the size of a single metastasis or the largest among multiple liver metastases.
Multiple	More than one liver metastases were defined as multiple.

metastases

Bilobar distribution Bilobar distribution was defined as the presence of multiple liver metastases located in two lobes of the liver.

Preoperative chemotherapy details

Oxaliplatin-based regimen Oxaliplatin-based regimens include (e.g. Cape OX, FOLFOX), Irinotecan-based regimens include (e.g. FOLFIRI and FOLFOXIRI).

Bevacizumab It was divided into two groups: “bevacizumab” and “non-bevacizumab” based on whether received combined bevacizumab or not.

Therapy delayed or dose reduced Chemotherapy cycle delayed or dose reductions due to various reasons.

Surgical details

Laparoscopic According to the surgical approach, it was divided into laparoscopic and open approach.

Simultaneous “Simultaneous” was defined as simultaneous resection of the primary colorectal cancer and liver metastases.

Pringle manoeuver Preventive hepatic duodenal ligament inflow blood occlusion method.

Postoperative details

Morbidity (Dindo-Clavien II-V) The occurrence of complications at Clavien-Dindo grade II and higher was recorded.

Length of hospital stay The length of hospital stay after surgery was recorded.

Pathology details

Complete tumour response	The assessment of pathological responses to chemotherapy was based on the tumour regression grade (TRG) system proposed by Mandard et al. (Figure 1). TRG grade 1-2 was defined as complete tumour response, while TRG grade 3-5 was defined as poor tumour response.
Steatosis	The percentage of steatosis in involved hepatocytes was assessed and graded into the following categories: absent (0%), grade 1 (1-30%), grade 2 (31-60%) and grade 3 (>60%).
Sinusoidal dilatation	Sinusoidal dilatation was scored according to the pathological grade system published by Rubbia-Brandt et al: absent, grade 1, grade 2 and grade 3.

BMI: Body mass index.

Supplementary Table 2 Multivariate regression analysis of factors for complete tumour response

Item	Multivariable
	OR (95%CI) P value
Male	0.47 (0.17, 1.32) 0.151
Low BMI	4.56 (1.42, 14.63) 0.011
Oxaliplatin-based regime	2.69 (0.63, 11.59) 0.184
Bevacizumab	3.02 (1.10, 8.33) 0.033
CEA<10ng/ml	3.84 (1.19, 12.44) 0.025
Severe sinusoidal dilatation	0.17 (0.03, 0.90) 0.037

BMI: Body mass index; CEA: Carcinoembryonic antigen.

Supplementary Table 3 Stratified analysis of association between body mass index and pathological response to chemotherapy

X= low BMI	N	Complete response		tumour	P value
		OR (95%CI)	P value		
Gender					0.439
Female	41	2.5 (0.6, 11.1)	0.229		
Male	85	5.8 (1.2, 28.0)	0.027		
Age					0.056
<60 years	72	2.5 (0.8, 8.3)	0.122		
≥60 years	54	inf. (0.0, Inf)	0.994		
Hypertension					0.804
no	76	3.4 (0.9, 12.8)	0.078		
yes	50	4.4 (0.8, 24.5)	0.090		
Lymph nodal metastasis ¹					0.165
Negative	35	12.8 (1.4, 118.3)	0.025		
Positive	77	2.4 (0.7, 8.2)	0.162		
Primary site					0.924
Rectal	64	3.8 (1.0, 15.3)	0.057		
Colon	62	4.3 (0.8, 21.5)	0.079		
Synchronous					0.463
Metachronous	43	2.1 (0.3, 13.0)	0.420		
Synchronous	83	4.9 (1.3, 18.5)	0.018		
Diameter of largest metastases					0.396
< 3.0 cm	80	2.8 (0.7, 11.0)	0.132		
≥ 3.0 cm	46	7.1 (1.4, 37.7)	0.021		

¹ Primary tumour Lymph nodal status data was available in 112 patients.

Number of metastases				0.516
Single	65	2.9 (0.7, 11.6)	0.142	
Multiple	61	5.7 (1.2, 28.6)	0.032	
Cycles of chemotherapy				0.817
<6	94	3.7 (1.1, 12.1)	0.030	
≥6	32	5.0 (0.5, 48.9)	0.167	
Preoperative CEA level				0.904
<10 ng/ml	74	3.6 (1.1, 12.0)	0.040	
≥10 ng/ml	52	4.2 (0.4, 40.2)	0.216	
Chemotherapy regimen				0.099
Irinotecan-based	31	0.6 (0.0, 7.1)	0.668	
Oxaliplatin-based	95	5.7 (1.6, 21.0)	0.008	
Combined with bevacizumab				0.232
No	81	2.3 (0.6, 9.3)	0.239	
Yes	45	8.5 (1.6, 44.5)	0.011	

Log likelihood ratio test for Interaction test was applied in this study.

BMI: Body mass index; CEA: Carcinoembryonic antigen.