

Supplementary Table S1. Univariable analysis of clinicopathological characteristics associated with liver involvement among patients with synchronous metastatic disease

VARIABLE	CATEGORY	LIVER METASTASIS (<i>N</i> = 62)	OTHER METASTATIC SITES (<i>N</i> = 21)	UNADJUSTED OR (95% CI)	TEST	<i>P</i> VALUE
Age (years)	>55	47 (75.8)	11 (52.4)	2.85 (1.01–8.02)	Pearson χ^2	0.043
	≤55	15 (24.2)	10 (47.6)	Reference		
Sex	Male	33 (53.2)	13 (61.9)	0.70 (0.25–1.93)	Pearson χ^2	0.489
	Female	29 (46.8)	8 (38.1)	Reference		
Tumor size (cm)	>5.5	15 (24.2)	9 (42.9)	0.43 (0.15–1.21)	Pearson χ^2	0.103
	≤5.5	47 (75.8)	12 (57.1)	Reference		
Tumor location	Right-sided	21 (33.9)	5 (23.8)	1.64 (0.53–5.09)	Pearson χ^2	0.390
	Left-sided	41 (66.1)	16 (76.2)	Reference		
Invasion depth (pT stage)	pT3–4	60 (96.8)	20 (95.2)	1.50 (0.13–17.44)	Fisher's exact	1.000
	pT1–2	2 (3.2)	1 (4.8)	Reference		
Tumor perforation	Present	5 (8.1)	3 (14.3)	0.53 (0.11–2.42)	Fisher's exact	0.411
	Absent	57 (91.9)	18 (85.7)	Reference		
Lymph node metastasis	Present	49 (79.0)	18 (85.7)	0.63 (0.16–2.46)	Fisher's exact	0.750
	Absent	13 (21.0)	3 (14.3)	Reference		
Tumor deposits	Present	10 (16.1)	4 (19.0)	0.82 (0.23–2.95)	Fisher's exact	0.744
	Absent	52 (83.9)	17 (81.0)	Reference		
Proximal/ distal resection margin	Positive	4 (6.5)	0 (0.0)	NE	Fisher's exact	0.568
	Negative	58 (93.5)	21 (100.0)	Reference		
Radial resection margin*	Positive	5 (35.7)	3 (42.9)	0.74 (0.12–4.73)	Fisher's exact	1.000
	Negative	9 (64.3)	4 (57.1)	Reference		
MMR status	dMMR	3 (4.8)	2 (9.5)	0.48 (0.08–3.11)	Fisher's exact	0.597
	pMMR	59 (95.2)	19 (90.5)	Reference		
Histological subtype	Mucinous adenocarcinoma	3 (4.8)	7 (33.3)	0.09 (0.02–0.39)	Fisher–Freeman– Halton exact test (Monte Carlo)	<0.001
	Conventional adenocarcinoma	58 (93.5)	12 (57.1)	Reference		
	Signet-ring cell carcinoma	1 (1.6)	2 (9.5)	0.10 (0.01–1.23)		
Tumor grade	High grade (Poorly differentiated)	9 (14.5)	6 (28.6)	0.42 (0.13–1.38)	Fisher's exact	0.191
	Low grade (Well/ Moderately differentiated)	53 (85.5)	15 (71.4)	Reference		
Poorly differentiated clusters (PDC)	High	35 (56.5)	13 (61.9)	0.80 (0.29–2.20)	Pearson χ^2	0.662
	Low/intermediate	27 (43.5)	8 (38.1)	Reference		
Tumor budding	High	32 (51.6)	14 (66.7)	1.23 (0.40–3.75)	Fisher–Freeman– Halton exact test (Monte Carlo)	0.009
	Intermediate	17 (27.4)	0 (0.0)	NE		
	Low	13 (21.0)	7 (33.3)	Reference		
Intratumoral lymphocytic infiltration	Absent	15 (24.2)	13 (61.9)	0.19 (0.02–1.81)	Fisher–Freeman– Halton exact test (Monte Carlo)	0.006
	Low	41 (66.1)	7 (33.3)	0.98 (0.10–9.39)		
	High	6 (9.7)	1 (4.8)	Reference		

VARIABLE	CATEGORY	LIVER METASTASIS (N = 62)	OTHER METASTATIC SITES (N = 21)	UNADJUSTED OR (95% CI)	TEST	P VALUE
Peritumoral lymphocytic infiltration	High	26 (41.9)	7 (33.3)	Reference	Pearson χ^2	0.486
	Low	36 (58.1)	14 (66.7)	0.69 (0.25–1.95)		
Crohn-like lymphoid reaction	Present	32 (51.6)	14 (66.7)	0.53 (0.19–1.50)	Pearson χ^2	0.230
	Absent	30 (48.4)	7 (33.3)	Reference		
Lymphovascular invasion	Present	53 (85.5)	16 (76.2)	1.84 (0.54–6.28)	Fisher's exact	0.330
	Absent	9 (14.5)	5 (23.8)	Reference		
Venous invasion	Present	14 (22.6)	3 (14.3)	1.75 (0.45–6.82)	Fisher's exact	0.540
	Absent	48 (77.4)	18 (85.7)	Reference		
Perineural invasion	Present	36 (58.1)	14 (66.7)	0.69 (0.25–1.95)	Pearson χ^2	0.486
	Absent	26 (41.9)	7 (33.3)	Reference		

Data are presented as n (%). Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) were calculated for liver metastasis versus no liver involvement among patients with synchronous metastatic disease. For variables with more than two categories, category-specific ORs were calculated relative to the indicated reference category, whereas the reported P value represents the overall association across all categories. Pearson's chi-square test was used when expected cell-count assumptions were satisfied, and Fisher's exact test was used for sparse 2 × 2 tables. The Fisher–Freeman–Halton exact test with Monte Carlo estimation was used for sparse tables with more than two categories. All P values are two-sided. NE indicates that the OR could not be estimated because of a zero cell.

"Other metastatic sites" refers to patients with synchronous metastatic disease without liver involvement.

*Radial resection margin status was available for 21 patients, including 14 patients with liver metastasis and seven patients without liver involvement.

Abbreviations: CI, confidence interval; dMMR, deficient mismatch repair; MMR, mismatch repair; NE, not estimable; OR, odds ratio; PDC, poorly differentiated clusters; pMMR, proficient mismatch repair.

Supplementary Table S2. Univariable analysis of clinicopathological characteristics associated with peritoneal involvement among patients with synchronous metastatic disease

VARIABLE	CATEGORY	PERITONEAL METASTASIS (N = 13)	OTHER METASTATIC SITES (N = 70)	UNADJUSTED OR (95% CI)	TEST	P VALUE
Age (years)	>55	6 (46.2)	52 (74.3)	0.30 (0.09–1.00)	Fisher's exact	0.054
	≤55	7 (53.8)	18 (25.7)	Reference		
Sex	Male	8 (61.5)	38 (54.3)	1.35 (0.40–4.53)	Pearson χ^2	0.629
	Female	5 (38.5)	32 (45.7)	Reference		
Tumor size (cm)	>5.5	6 (46.2)	18 (25.7)	2.48 (0.73–8.35)	Fisher's exact	0.183
	≤5.5	7 (53.8)	52 (74.3)	Reference		
Tumor location	Right-sided	3 (23.1)	23 (32.9)	0.61 (0.15–2.44)	Fisher's exact	0.746
	Left-sided	10 (76.9)	47 (67.1)	Reference		
Invasion depth (pT stage)	pT3–4	13 (100.0)	67 (95.7)	NE	Fisher's exact	1.000
	pT1–2	0 (0.0)	3 (4.3)	Reference		
Tumor perforation	Present	2 (15.4)	6 (8.6)	1.94 (0.35–10.87)	Fisher's exact	0.605
	Absent	11 (84.6)	64 (91.4)	Reference		
Lymph node metastasis	Present	12 (92.3)	55 (78.6)	3.27 (0.39–27.22)	Fisher's exact	0.446
	Absent	1 (7.7)	15 (21.4)	Reference		
Tumor deposits	Present	6 (46.2)	8 (11.4)	6.64 (1.78–24.76)	Fisher's exact	0.007
	Absent	7 (53.8)	62 (88.6)	Reference		
Proximal/distal resection margin	Positive	1 (7.7)	3 (4.3)	1.86 (0.18–19.42)	Fisher's exact	0.501
	Negative	12 (92.3)	67 (95.7)	Reference		
Radial resection margin*	Positive	0 (0.0)	8 (42.1)	NE	Fisher's exact	0.505
	Negative	2 (100.0)	11 (57.9)	Reference		

MMR status	dMMR	3 (23.1)	2 (2.9)	10.20 (1.51–68.77)	Fisher's exact	0.026
	pMMR	10 (76.9)	68 (97.1)	Reference		
Histological subtype	Mucinous adenocarcinoma	6 (46.2)	4 (5.7)	24.75 (4.91–124.87)	Fisher–Freeman–Halton exact test	<0.001
	Conventional adenocarcinoma	4 (30.8)	66 (94.3)	Reference		
Tumor grade	Signet-ring cell carcinoma	3 (23.1)	0 (0.0)	NE		
	High grade (Poorly differentiated)	4 (30.8)	11 (15.7)	2.38 (0.62–9.12)	Fisher's exact	0.239
	Low grade (Well/Moderately differentiated)	9 (69.2)	59 (84.3)	Reference		
Poorly differentiated clusters (PDC)	High	9 (69.2)	39 (55.7)	1.79 (0.50–6.36)	Pearson χ^2	0.365
	Low/intermediate	4 (30.8)	31 (44.3)	Reference		
Tumor budding	High	11 (84.6)	35 (50.0)	5.97 (0.72–49.85)	Fisher–Freeman–Halton exact test	0.092
	Intermediate	1 (7.7)	16 (22.9)	1.19 (0.07–20.54)		
	Low	1 (7.7)	19 (27.1)	Reference		
Intratumoral lymphocytic infiltration	Absent	10 (76.9)	18 (25.7)	8.33 (2.05–33.84)	Fisher–Freeman–Halton exact test	0.003
	Low	3 (23.1)	45 (64.3)	Reference		
	High	0 (0.0)	7 (10.0)	NE		
Peritumoral lymphocytic infiltration	High	4 (30.8)	29 (41.4)	Reference	Pearson χ^2	0.471
	Low	9 (69.2)	41 (58.6)	1.59 (0.45–5.67)		
Crohn-like lymphoid reaction	Present	10 (76.9)	36 (51.4)	3.15 (0.80–12.42)	Pearson χ^2	0.089
	Absent	3 (23.1)	34 (48.6)	Reference		
Lymphovascular invasion	Present	11 (84.6)	58 (82.9)	1.14 (0.22–5.81)	Fisher's exact	1.000
	Absent	2 (15.4)	12 (17.1)	Reference		
Venous invasion	Present	2 (15.4)	15 (21.4)	0.67 (0.13–3.34)	Fisher's exact	1.000
	Absent	11 (84.6)	55 (78.6)	Reference		
Perineural invasion	Present	11 (84.6)	39 (55.7)	4.37 (0.90–21.20)	Pearson χ^2	0.051
	Absent	2 (15.4)	31 (44.3)	Reference		

Data are presented as n (%). Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) were calculated for peritoneal metastasis versus no peritoneal involvement among patients with synchronous metastatic disease. For variables with more than two categories, category-specific ORs were calculated relative to the indicated reference category, whereas the reported P value represents the overall association across all categories. Pearson's chi-square test was used when expected cell-count assumptions were satisfied, and Fisher's exact test was used for sparse 2 × 2 tables. The Fisher–Freeman–Halton exact test was used for sparse tables with more than two categories. All P values are two-sided. NE indicates that the OR could not be estimated because of a zero cell.

“Other metastatic sites” refers to patients with synchronous metastatic disease without peritoneal involvement.

*Radial resection margin status was available for 21 patients, including two patients with peritoneal metastasis and 19 patients without peritoneal involvement.

Abbreviations: CI, confidence interval; dMMR, deficient mismatch repair; MMR, mismatch repair; NE, not estimable; OR, odds ratio; PDC, poorly differentiated clusters; pMMR, proficient mismatch repair.