

Supplementary materials

Table1. Clinical and histopathological characteristics of patients.

Clinical and histopathological features (n=48)	Number	Percent%
Age (19-84 years) (given as mean $\pm$SD)	58.40 $\pm$ 16.98	
Age groups		
< 60 years	20	41.67
$\geq$ 60 years	28	58.33
Gender		
Men	28	58.33
Women	20	41.67
Macroscopic appearance		
Annular mass	11	22.92
Fungating mass	18	37.50
Ulcerating mass	19	39.58
Tumor location		
Left side	16	33.33
Right side	14	29.17
Rectum	18	37.50
Inflammatory reaction		
Mild	7	14.58
Moderate	19	39.58
Severe inflammation	22	45.83
Desmoplastic reaction		
Mild	35	72.92
Moderate	11	22.92
Severe	2	4.17
Tumor grade		
Well	2	4.17
Moderate	44	91.67
Poor	2	4.17

Tumor size		
T1	1	2.08
T2	10	20.83
T3	36	75.00
T4	1	2.08
Positive lymph node		
N0	24	50.00
N1	15	31.25
N2	9	18.75
Lymphovascular invasion		
Negative	26	54.17
Positive	22	45.83
Tumor budding		
Low (0-4) buds	12	25.00
Intermediate (5-9) buds	14	29.17
High (10 or more) buds	22	45.83
Perineural invasion		
not present	34	70.83
Present	14	29.17
Tumor deposits		
Not present	42	87.50
Present	6	12.50
Tumor necrosis		
Not present	15	31.25
Present	33	68.75
Survival rate		
<3 years	13	27.08
3-<5 years	6	12.50
≥ 5 years	29	60.42

Data are presented as n, %, or mean $\pm$ standard deviation (SD). CRC, colorectal cancer; LVI, lymphovascular invasion; PNI, perineural invasion; T, tumor invasion depth; N, lymph node involvement.

Table 2. Correlation of clinicopathological characteristics and survival rate with positive and negative gene mutations in *NRAS*, *KRAS*, and *PIK3CA* among CRC patients.

Characteristics (n=48)	Gene mutation expression in no (%)								
	<i>NRAS</i>			<i>KRAS</i>			<i>PIK3CA</i>		
	Negative (n=23)	Positive (n=25)	p value	Negative (n=25)	Positive (n=23)	p value	Negative (n=40)	Positive (n=8)	p value
Age									
<60 years	7 (35.00)	13 (65.00)	0.1300	10 (50.00)	10 (50.00)	0.8071	15 (75.00)	5 (25.00)	0.1904
≥60 years	16 (57.14)	12 (42.86)		15 (53.57)	13 (46.43)		25 (89.29)	3 (10.71)	
Gender									
Men	12 (42.86)	16 (57.14)	0.4064	15 (53.57)	13 (46.43)	0.8071	24 (85.71)	4 (14.29)	0.6005
Women	11 (55.00)	9 (45.00)		10 (50.00)	10 (50.00)		16 (80.00)	4 (20.00)	
Macroscopic appearance									
Fungating	10 (55.56)	8 (44.44)	0.6031	10 (55.56)	8 (44.44)	0.4884	16 (88.89)	2 (11.11)	0.7113
Ulcerating	9 (47.37)	10 (52.63)		11 (57.89)	8 (42.11)		15 (78.95)	4 (21.05)	
Annular	4 (36.36)	7 (63.64)		4 (36.36)	7 (63.64)		9 (81.82)	2 (18.18)	
Tumor location									
Left	6 (37.50)	10 (62.50)	0.5653	7 (43.75)	9 (56.25)	0.5894	14 (87.50)	2 (12.50)	0.0653
Right	7 (50.00)	7 (50.00)		7 (50.00)	7 (50.00)		9 (64.29)	5 (35.71)	
Rectum	10 (55.56)	8 (44.44)		11 (61.11)	7 (38.89)		17 (94.44)	1 (5.56)	

Inflammatory reaction									
Mild	4 (57.14)	3 (42.86)	0.3373	3 (42.86)	4 (57.14)	0.1853	5 (71.43)	2 (28.57)	0.3894
Moderate	11 (57.89)	8 (42.11)		13 (68.42)	6 (31.58)		15 (78.95)	4 (21.05)	
Severe	8 (36.36)	14 (63.64)		9 (40.91)	13 (59.09)		20 (90.91)	2 (9.09)	
Desmoplastic reaction									
Mild	16 (45.71)	19 (54.29)	0.2234	17 (48.57)	18 (51.43)	0.1209	30 (85.71)	5 (14.29)	0.4146
Moderate	7 (63.64)	4 (36.36)		8 (72.73)	3 (27.27)		9 (81.82)	2 (18.18)	
Severe	0 (0.00)	2 (100)		0 (0.00)	2 (100.00)		1 (50.00)	1 (50.00)	
Lymphovascular invasion									
Negative	13 (50.00)	13 (50.00)	0.7534	14 (53.85)	12 (46.15)	0.7904	20 (76.92)	6 (23.08)	0.2603
Positive	10 (45.45)	12 (54.55)		11 (50.00)	11 (50.00)		20 (90.91)	2 (9.09)	
Tumor grade									
Poor	1 (50.00)	1 (50.00)	0.9962	1 (50.00)	1 (50.00)	0.3829	2 (100.00)	0 (0.00)	0.3646
Moderate	21 (47.73)	23 (52.27)		22 (50.00)	22 (50.00)		37 (84.09)	7 (15.91)	
Well	1 (50.00)	1 (50.00)		2 (100.00)	0 (0.00)		1 (50.00)	1 (50.00)	
Depth of invasion									
T1	1 (100.00)	0 (0.00)	0.4291	0 (0.00)	1 (100.00)	0.4877	1 (100.00)	0 (0.00)	0.9233
T2	6 (60.00)	4 (40.00)		6 (60.00)	(100.00)		8 (80.00)	2 (20.00)	
T3	16 (44.44)	20 (55.56)		19 (52.78)	4 (40.00)		30 (83.33)	6 (16.67)	

T4	0 (0.00)	1 (100.00)		0 (0.00)	17 (47.22) 1 (100.00)		1 (100.00)	0 (0.00)	
Lymph node involvement									
N0	13 (54.17)	11 (45.83)	0.5621	12 (50.00)	12 (50.00)	0.2742	20 (83.33)	4 (16.67)	0.2369
N1	7 (46.67)	8 (53.33)		10 (66.67)	5 (33.33)		11 (73.33)	4 (26.67)	
N2	3 (33.33)	6 (66.67)		3 (33.33)	6 (66.67)		9 (100.00)	0 (0.00)	
Tumor budding									
Low	6 (50.00)	6 (50.00)	0.9519	7 (58.33)	5 (41.67)		8 (66.67)	4 (33.33)	
Intermediate	7 (50.00)	7 (50.00)		8 (57.14)	6 (42.86)	0.6981	13 (92.86)	1 (7.14)	0.0751
High	10 (45.45)	12 (54.55)		10 (45.45)	12 (54.55)		19 (86.36)	3 (13.64)	
perineural invasion									
Not present	16 (47.06)	18 (52.94)	0.8529	17 (50.00)	17 (50.00)	0.6525	29 (85.29)	5 (14.71)	0.6757
Present	7 (50.00)	7 (50.00)		8 (57.14)	6 (42.86)		11 (78.57)	3 (21.43)	
Tumor deposits									
Not present	22 (52.38)	20 (47.62)	0.1908	23 (54.76)	19 (45.24)	0.3257	35 (83.33)	7 (16.67)	1.0000
Present	1 (16.67)	5 (83.33)		2 (33.33)	4 (66.67)		5 (83.33)	1 (16.67)	
Tumor necrosis									
Not present	8 (53.33)	7 (46.67)	0.6125	10 (66.67)	5 (33.33)	0.2209	11 (73.33)	4 (26.67)	0.2358

Present	15 (45.45)	18 (54.55)		15 (45.45)	18 (54.55)		29 (87.88)	4 (12.12)	
Survival rate									
<3 years	6 (46.15)	7 (53.85)	0.2259	4 (30.77)	9 (69.23)		10 (76.92)	3 (23.08)	
3-<5 years	1 (16.67)	5 (83.33)		2 (33.33)	4 (66.67)	0.0703	6 (100.00)	0 (0.00)	0.4512
≥ 5 years	16 (55.17)	13 (44.83)		19 (65.52)	10 (34.48)		24 (82.76)	5 (17.24)	

Data are presented as n and%. CRC, colorectal cancer; *NRAS*, neuroblastoma RAS viral oncogene homolog; *KRAS*, Kirsten rat sarcoma viral oncogene homolog; *PIK3CA*, phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit alpha; LVI, lymphovascular invasion; and PNI, perineural invasion.