

DNA ploidy

* , † , ‡
 * . * . * . * . * . † . ‡
 _____ : DNA ploidy S
 _____ : 117 Hedley
 method flow cytometry DNA ploidy
 Duke B, C S 75 DNA ploidy
 _____ : 40 (34.2%) aneuploidy histogram DNA aneuploidy
 Dukes' Dukes B
 DNA ploidy ($p=0.048$).
 _____ : DNA ploidy S B
 _____ : , DNA ploidy

가 DNA ploidy S DNA
 ploidy

가
 (1 3) 가 가
 1996 6 1998 7
 118
 가 Duke A ()
 117 53 : 64 (1:1.2)
 9) 9) 5, 6) 4) 5) 10 17)
 ulcerative state 18) DNA ploidy가 DNA
 aneuploidy 가 (93%) Duke B, C S
 (64%) (Table 1). DNA
 ploidy Duke B, C S
 75

Table 1. Patient Characteristics

Characteristics	Number of patients (%)	
	N=117	
Age (Median)	27 - 87 (61) yr.	
M : F	53 : 64	
Stage	B	59 (50)
	C	50 (43)
	D	8 (7)
Location	Colon	42 (36)
	Rectosigmoid	75 (64)

Table 2. Adjuvant Therapy in Stages B and C Rectosigmoid Colon Cancer

Stage B	Aneuploidy (11)*			Diploidy (30)		
	B1	B2	B3	B1	B2	B3
None	3	4	0	4	5	0
RT [†] alone	0	0	0	0	0	0
CTx [‡] alone	0	3	1	3	9	0
RT+CTx	0	0	0	1	8	0

Stage C	Aneuploidy (12)			Diploidy (22)		
	C1	C2	C3	C1	C2	C3
None	0	3	0	0	8	0
RT alone	0	0	0	0	0	0
CTx alone	4	1	0	0	2	0
RT+CTx	4	0	0	0	10	2

* Total Number of Patients, [†] RT : Radiation Therapy
[‡] CTx : Chemotherapy

Table 2

5-FU based regimen 3
 5000 cGy
 3000 cGy

가

(CEA)

2.

Flow cytometry system Coulter EPICS Elite
 Hedley¹⁹⁾

50 mm

3 5

xylene 30

absolute ethanol 30 2 95%,

70%, 50% ethanol 30 1
 , 0.5% pepsin solution 30 37
 trypsinase Propidium iodide DNA
 . 47 mm pore sized Nylon mesh single cell suspension
 DNA histogram .

3. DNA ploidy

DNA histogram G0/G1, S G2/M peak
 G0/G1 DNA content 2 G2/M
 peak 가 diploidy , G0/ G1 peak
 aneuploidy . DNA
 histogram ploidy pattern diploidy aneuploidy
 , , , ,
 S B, C

Chi-square

Aneuploidy 40 (34%) , diploidy 77 (66%)
 DNA ploidy

1.

50 , 50 aneuploidy가
 . Table 3
 aneuploidy가

2.

WHO classification²⁰⁾

106 adenocarcinoma , 11

mucinous carcinoma
 (Table 3).

3.

Table 3
 DNA ploidy
 4

가 perirectal fat
 DNA ploidy

4.

5. Duke (Table 3).
 well, moderate, poorly
 differentiation aneuploidy diploidy (Table 3).
 6. S B, C
 S 75
 DNA ploidy
 DNA ploidy ()
 (Table 4).

75 Duke B diploidy 30 3
 , aneuploidy 11 2
 DNA ploidy (Fig. 1A).

Table 4 The Correlation between TNM Stage and DNA Ploidy

TNM	Aneuploidy (%)	Diploidy (%)	p-value
T1	0 (0)	2 (100)	0.183
T2	3 (33.3)	6 (66.7)	
T3	18 (28.6)	45 (71.4)	
T4	1 (100)	0 (0)	
N0	10 (24.4)	31 (75.6)	0.699
N1	7 (36.8)	12 (63.2)	
N2	5 (33.3)	10 (66.7)	

Table 3 DNA Ploidy Pattern and Clinicopathologic Findings and Stage

Parameter	DNA ploidy		p-value
	Aneuploidy (%) (N=40)	Diploidy (%) (N=77)	
Age			0.341
<50	5 (25.0)	15 (75.0)	
50	35 (36.0)	62 (64.0)	
Sex			0.222
Male	15 (28.3)	38 (71.7)	
Female	25 (39.0)	39 (61.0)	
Depth of invasion			0.358
Mucosa	4 (44.4)	5 (55.6)	
Muscle	1 (25.0)	3 (75.0)	
Perirectal fat	35 (35.3)	64 (64.6)	
Into an other organ	0 (0)	5 (100)	
MAC † Stage			0.811
B1	5 (38.5)	8 (61.5)	
B2	13 (31.0)	29 (69.0)	
B3	1 (25.0)	3 (75.0)	
C2	16 (35.6)	29 (64.4)	
C3	3 (60.0)	2 (40.0)	
D	2 (25.0)	6 (75.0)	
Histology			0.611
Adeno Ca ‡	37 (34.9)	69 (65.1)	
Mucinous Ca	3 (27.3)	8 (72.7)	
Differentiation			0.358
Well	12 (31.6)	26 (68.4)	
Moderate	21 (36.2)	37 (63.8)	
Poor	7 (33.3)	14 (66.7)	

*Total Number of Patients, † Modified Astler Coller, ‡ Carcinoma

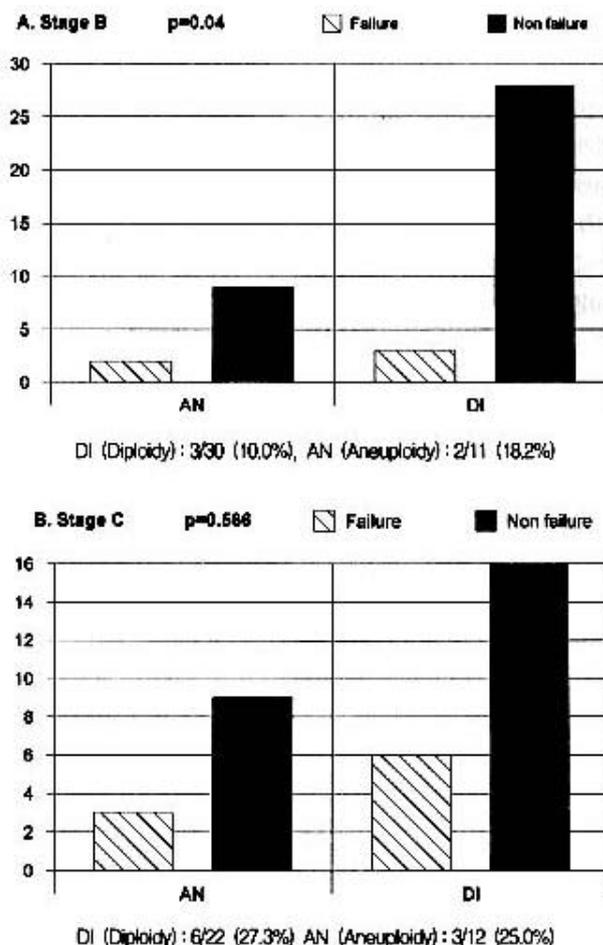


Fig. 1. The correlation between DNA ploidy and failure pattern in Dukes stage B and C rectosigmoid colon cancer.

aneuploidy 40 (34%) diploidy 77 (66%) . , 49% 73% nondiploid rate .^{24 26)} DNA ploidy DNA ploidy 가 , Dukes 가 , vascular invasion .^{27 35)} DNA ploidy , Lanza³⁶⁾ type proximal site mucinous carcinoma (p<0.005) . Salud³⁷⁾ 107 DNA ploidy (p=0.016) DNA ploidy (p= 0.010), (p=0.015)가 DNA ploidy , Heiman³⁸⁾ 40 50 DNA ploidy , Dukes DNA ploidy가 Kouri³⁹⁾ 157 DNA aneuploidy Seo⁴⁰⁾ 144 aneuploidy DNA ploidy 가 Jones^{21, 27, 29, 35, 39)} DNA ploidy heterogeneity, size, Duke B, C S DNA ploidy Duke B (p=0.048) Jones²¹⁾ 123 Dukes B DNA aneuploidy 가 Bianchi²²⁾ 34

Duke C , DNA ploidy가 가 Bosari²³⁾ 213 가 Duke A B aneuploidy 가 (p=0.01) Lee⁴¹⁾ DNA ploidy가 92 Duke , TNM , Suh⁴²⁾ 84 , DNA ploidy 가 , ploidy , Nam⁴³⁾ paraffin-embedded tissue fresh tissue DNA ploidy Duke B S DNA ploidy , Fig. 1 가 Table 2 , Duke B C B1, B2, B3 C1, C2, C3 가 Duke B C , DNA ploidy DNA ploidy

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Abstract

The Correlation between DNA Ploidy and the Clinicohistologic Findings in Colorectal Cancer

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Purpose : DNA ploidy pattern was shown to correlate with several clinicohistologic findings in several tumors. Aim of this study was to evaluate the correlation of the clinicohistologic findings in colorectal cancer and the failure pattern in rectosigmoid cancer with DNA ploidy.

Materials and Methods : DNA flow cytometry using the Hedley methods on paraffin embedded specimen from 117 patients with colorectal cancers after curative resection was performed. We tried to find the correlation between DNA ploidy and various clinicohistologic findings. And then the correlation DNA ploidy and the failure pattern in 75 patients of rectosigmoid cancer was analyzed.

Results : Forty samples (34.2%) from tumors gave aneuploidy histogram. There was no significant difference in the frequency of DNA aneuploidy in terms of age, sex, depth of invasion, location and Dukes stage. But there was a significant correlation between DNA ploidy and the failure rates in Dukes stage B rectosigmoid cancer ($p=0.048$).

Conclusions : These findings suggest that DNA ploidy pattern shows the correlation with the treatment failure rates in Dukes stage B rectosigmoid, but not with many other clinicohistologic findings. However, more patients will be needed to disclose these findings.

Key Words : Colorectal cancer, DNA ploidy