

SITE DISTRIBUTION OF COLORECTAL CANCER: A RETROSPECTIVE STUDY OF 1198 CASES

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A retrospective study investigating 1198 cases of colorectal cancer was undertaken to ascertain whether the site distribution pattern of colorectal cancer changed according to time trends and was influenced by age and/or sex. These patients were divided into two groups according to two five-year calendar periods from 1979 to 1988 (group A: 1979-1983; group B: 1984-1988). In both groups, a considerable portion of cancers were located in the rectum (group A: 50%; group B: 51%). Comparing these patients, we found no significant change in site distribution between these two groups ($p=0.34$), neither was there any significant change in the distribution pattern by sex among patients of the same or different groups. The percentage of old patients above the age of 70 in the right colon cancer group remained unchanged between these two calendar periods (14% vs. 14%). But both male and female patients of group B were significantly older than those of group A (male: 60.6 ± 1.9 vs. 56.0 ± 2.6 ; female: 57.7 ± 2.1 vs. 54.6 ± 2.5 ; $p < 0.05$). We conclude that in spite of increase in number and mean age of patients with colorectal cancer which was thought to be the consequence of longer life expectancy, analysis of our data did not give support to the phenomenon of "aging gut" or rightward shift of colon cancer observed in western countries. (Chinese J Gastroenterol 1990; 7: 116-121)

Key Words: *distribution, colorectal cancer, age, sex*

Colorectal adenocarcinomas are not uniformly distributed throughout the large bowel. Rectal and sigmoid and right-sided cancers account for a disproportionally high percentage of cancers in the large bowel. The actual mechanisms are unclear.

In the past two decades, several western clinicians have noted an anatomic shift in the distribution of the colorectal cancers towards the right side of the colon [1]. Some investigators using age-specific and sex-specific analysis method have drawn the conclusions that patients with right colon cancers are older

than those with distal colorectal cancers and women made up a higher percentage of patients with proximal colon cancers [2-4]. But this changing pattern is not verified universally [5].

Since the implications of changing distribution of colorectal cancers are important in regard to both etiology and detection of this neoplasm and few data concerning eastern people which are in general at low risk for colorectal cancers have been reported, the present study attempted to ascertain any significant change in the distribution of colorectal cancers in this oriental society.

MATERIALS AND METHODS

During the 10-year period between 1979

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and 1988, 1198 cases of colorectal cancers were verified histologically at the National Taiwan University Hospital. The charts were reviewed and age, sex, and tumor location were recorded for each case. All were adenocarcinomas. Patients with synchronous cancer, inflammatory bowel disease, or familial adenomatous polyposis were excluded from this study.

There were 662 male and 536 female patients. For the analysis of time trends, the study period was divided into two five-year calendar periods (group A: 1979-1983; group B: 1984-1988). To simplify the description of anatomic locations, the tumors were assigned into four major anatomic sites: 1) the right colon: the cecum and ascending colon; 2) the transverse colon: the hepatic flexure, transverse colon, and splenic flexure; 3) the left colon: the descending colon and sigmoid colon; 4) the rectum: the rectosigmoid junction and rectum. The anatomic site was documented by radiologic, endoscopic, or surgical reports.

The mean age of each group was expressed in years \pm standard error of the mean. Chi-square analysis was used to evaluate the statistical significance between proportions and values of $p < 0.05$ were considered significant.

RESULTS

There were 300 men and 236 women in group A and 362 men and 300 women in group B. The age distributions of both groups were shown in Fig. 1. For either sex, the number of cases increased apparently in patients over 50 and declined in patients over 70 of both groups. Anatomic distribution of tumors in four major sites in proportions according to the two five-year calendar periods is shown in Fig. 2. In both groups, a considerable portion of cancers were located in the rectum (group A: 50%; group B: 51%). The site distribution of tumors, however, showed no significant change with time ($p = 0.34$). The tumor distribution according to age in the four major sites is shown in Table 1. The patients in the 5th, 6th, and 7th decades accounted for over 70% of the patients in both groups; fur-

thermore, when they were subgrouped into four major sites, the tendency remained. Besides, the percentage of old patients above the age of 70 in the right colon cancer group did not differ between these two calendar periods (14% vs. 14%). Except for right colon cancer, the colorectal cancers of the other three anatomic sites increased proportionally in number with time (Rectum: 267 vs. 338; Left colon: 143 vs. 189; Transverse colon: 51 vs. 65; and Right site colon: 75 vs. 70). The mean ages of male and female patients in both groups are shown in Table 2. The patients of group B were significantly older than those of group A in both sex (male: 60.6 ± 1.9 vs. 56.0 ± 2.6 ; female: 57.7 ± 2.1 vs. 54.6 ± 2.5 ; $p < 0.05$). Patients presenting with transverse colon cancers were younger than those of the other three anatomic groups, but no statistical significance was found ($p < 0.1$). The female patients were all younger than their counterparts without statistical significance. Distribution of patients in the four major sites according to sex is shown in Table 3. In either sex, there was no significant difference in the percentage of tumors in various anatomic sites of the large bowel among patients of the same or different groups.

DISCUSSION

Recently, many western authors have called attention to a significant rise in the incidence of cancers in the proximal colon. Published reports since the 1960s have been in agreement on development of rightward shift of colorectal cancer along with a decrease of rectal cancer [6,7], although the actual mechanisms are unknown. Increase of life expectancy is supposed to be a potential causative factor [8], therefore the theory of "aging gut" [9] is proposed.

Analysis of our data disclosed that the distribution pattern of colorectal cancers was quite stationary during the past 10 years, and this trend remained true when it was compared with the previous data reported by Hsu [10] in 1979 at the same hospital. Unlike the situation in western countries, the percentage of right colon cancer of colorectal cancer at

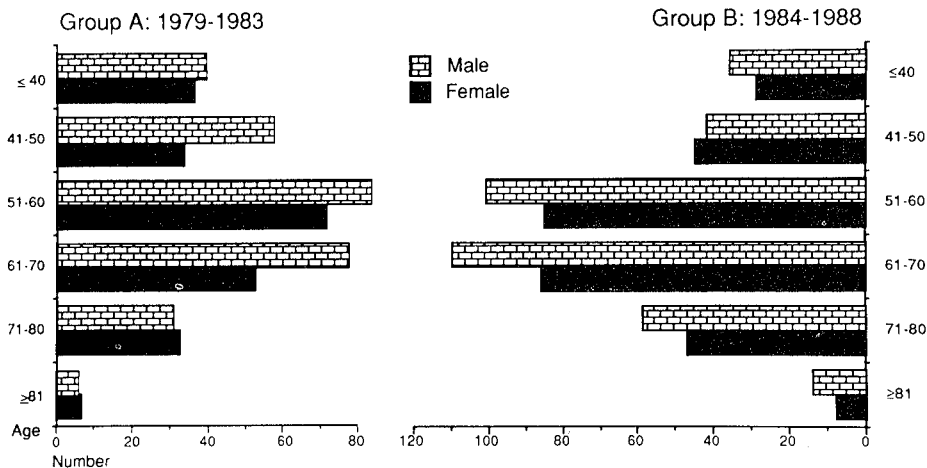


Fig. 1. Age distribution of the patients studied.

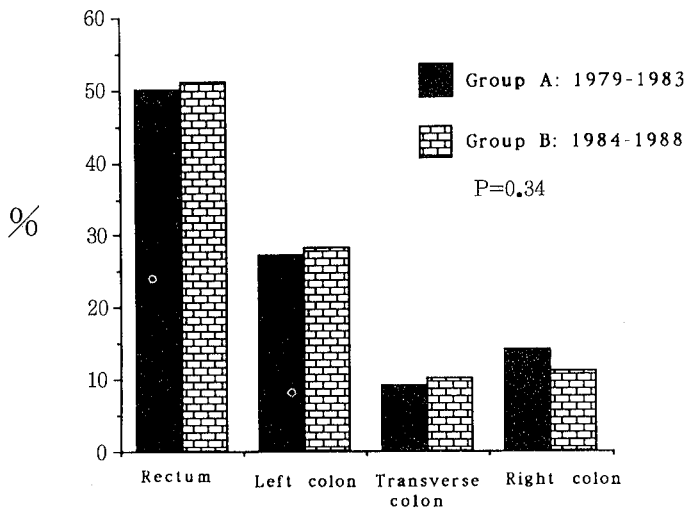


Fig. 2. Proportion of colorectal cancer in four anatomic sites.
* No statistically significant difference was noted.

our hospital was around 10% unchangedly during the past 3 decades, though the mean age for colorectal cancer increased significantly.

A number of factors have been cited as explanations for the anatomic shift in colorectal cancer, such as improved diagnostic method, more frequent removal of rectal pol-

yps, and alternation of bile salt metabolism, which was thought to be a kind of putative colonic carcinogen [11]. We hold the same opinion, but our data failed to support the concept of “aging gut”. Although the number and mean age for colorectal cancer increased with time in our series, it seemed directly due to aging and to the increasing age of the popula-

Table 1. The Correlation Between Age and Anatomic Distribution of Colon Cancer.

Age (year)	Tumor Distribution (%)							
	Rectum		Left colon		Trans. colon		Right* colon	
	A (n=267)	B (n=338)	A (n=143)	B (n=189)	A (n=51)	B (n=65)	A (n=75)	B (n=70)
≤40	17	9	13	9	14	13	8	12
41-50	16	12	20	13	22	19	12	13
51-60	28	30	33	26	20	32	34	21
61-70	22	29	24	29	28	24	32	40
71-80	14	16	8	19	12	9	11	14
≥80	3	4	2	4	4	3	3	0

* no statistical significance.

Table 2. The Correlation Between Age, Sex and Anatomical Distribution of Colon Cancer.

Site	Mean Age (year)			
	Male		Female [†]	
	A	B*	A	B*
Rectum	56.3±3.4	61.1±1.4	54.6±2.4	57.2±1.2
Left colon	55.7±1.7	61.8±1.4	54.2±2.1	57.6±1.8
Transverse colon [‡]	53.2±1.3	57.1±5.3	49.6±2.9	57.4±4.9
Right colon	57.3±2.5	58.4±2.3	58.9±3.3	60.9±4.2
Total	56.0±2.6	60.6±1.9	54.6±2.5	57.7±2.1

* p<0.05 when compared with group A.

[†] p<0.05 when compared with the male group.

[‡] p<0.1 when compared with the other three anatomic groups.

tion at risk. The incidence of right colon cancer did not increase in parallel with that of the other colorectal cancers. On the contrary, it declined, though no statistical significance could be found. These results were quite similar to the Japanese report by Ishiguro [12] in 1988. Obviously, there is a discrepancy between ethnic groups.

The female patients in our study, unlike western people, were always younger than

their counterparts, which might be an early expression of oncogen or an effect of sex hormone. In order to determine the possible role of sex hormone by menopause in this situation, further investigations in a prospective study are being undertaken at this hospital.

It is concluded that whatever the basic explanation for the unique anatomic distribution is, the actual mechanism involved in the

Table 3. Patient Proportions in Four Anatomic Sites According to Sex.

Group	Rectum		Left colon		Transverse colon		Right colon	
	Male	Female	Male	Female	Male	Female	Male	Female
A: No. of cases	147	120	84	59	28	23	41	34
(%)	55%	45%	59%	41%	55%	45%	55%	45%
B: No. of cases	184	154	105	84	36	29	37	33
(%)	54%	46%	56%	44%	55%	45%	53%	47%

No statistically significant difference was found.

development of colorectal cancer may differ from one site to another and from western people to eastern people.

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結腸直腸癌的位置分佈： 1198 病例之回溯性研究

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本回溯性研究的目的是在於分析並探討台大醫院在過去十年中，結腸直腸癌位置分佈 (site distribution) 的演變情形，並與國外的報告相互比較其差異。共有 1198 個腺癌病例合於研究標準，按照診斷的年份，把這些病例歸類到兩個五曆年族群 (A:1979-1983; B:1984-1988)。在這兩個族群中，再按位置，年齡，性別加以區分統計；我們比較分析這兩個五曆年族群得如下結果：1. 在這十年當中，結腸直腸癌的位置分佈相當穩定，直腸癌在兩族群中都佔一半左右的比率 (A:50%; B:51%)，其它部位腸癌的比率亦無明顯變動。2. 不論男女，B族群的平均年齡均有意義地較A族群高 (男 60.6 ± 1.9 vs. 56.0 ± 2.6 ; 女 57.7 ± 2.1 vs. 54.6 ± 2.5)，這主要是人口老化導致高年病患增加之故。3. 女性患者的平均年齡均較男性低 (如上數據所示)，原因未明，可能是致癌基因 (Oncogen) 及性荷爾蒙扮演著某些特定角色。4. 在四個主要解剖學位置上，結腸直腸癌病患的男女比率，不論是同一族群中或者是不同族群中互相比較都幾乎相同，雖然我國人口有明顯老化的現象，腸癌的診斷技術亦有長足的進步，但是並沒有發生如西方國家的腸道老化 (aging gut) 現象 (直腸癌比率下降，右邊結腸癌比率上昇)。我們認為結腸直腸癌的起因，和病灶分佈部位在各民族間可能有所不同。(中消醫誌1990; 7: 116—121)

關鍵語：分佈，結腸直腸癌，年齡，性別