

Surgical Treatment for Dukes D Colorectal Cancer

**Yasuhisa YAMAMOTO, Hiroyuki IMAI,
Sueharu IWAMOTO and Tsukasa TSUNODA**

*Division of Gastroenterological Surgery,
Department of Surgery,
Kawasaki Medical School, Kurashiki 701-01, Japan*

Accepted for publication on June 6, 1995

ABSTRACT. A retrospective study of the strategy of treatment for Dukes D colorectal cancer was made by comparing survival rates in relation to the factors of the disease. From among the 974 cases of colorectal cancers for which surgery was performed during the last 20 years, we studied 183 cases of Dukes D, classifying them according to four factors of the disease (liver metastasis: 106 cases, peritoneal dissemination: 40 cases, distant lymph node metastasis: 25 cases, and lung metastasis: 12 cases). There were some cases with involvement of more than one factor, however, we categorized them according to which factor was most significant to avoid repetition.

The three-year and five-year survival rates with regard to the factors were as follows, respectively; peritoneal dissemination: 28.0%, 14.0%, lung metastasis: 10.7%, 0%, liver metastasis: 8.2%, 4.9%, and distant lymph node metastasis: 4.4%, 4.4%. No significant difference was revealed in either three or five years survival rate between lung metastasis and the other factors. However, better results were achieved in cases with peritoneal dissemination than either cases with liver metastasis or distant lymph node metastasis cases ($p < 0.05$). Also better prognosis ($p < 0.05$) was recognized in cases with liver metastasis than that in cases with distant lymph node metastasis. There were some five-year survivors among patients who underwent combined resection of the primary tumor and the metastatic lesion. Therefore, in spite of the patients with Dukes D stage, aggressive surgery and multidisciplinary treatment should be indicated to improve surgical results for advanced colorectal cancer.

Key words: Dukes D colorectal cancer — synchronized metastasis — multidisciplinary treatment

As far as we know, 10% to 20% of colorectal cancers have synchronized distant metastasis. Therefore, the proper treatment for these metastases along with control of the original tumor is important. Among liver metastases, lung metastases, peritoneal dissemination and distant lymph node metastases (factors of Dukes D colorectal cancer), there were only a few cases in which both the original tumor and the metastasis could be resected during the primary operation. Consequently, the prognosis following surgery was very poor.

To improve the surgical results for colorectal cancer, it is of course important to increase the cure rate of early cancers by early detection as well as to urgently improve the cure rate for patients with extremely advanced cancers.

In this paper, we report the results of a retrospective study for each factor in our Dukes D cases and consider how to improve the cure rate based on these results.

METHODS

During the 20 years between January 1974 and December 1993, we surgically treated 974 cases with colorectal cancer. From among them we studied 183 cases in the Dukes D category, which were classified according to four factors; liver metastasis: 106 cases, peritoneal dissemination: 40 cases, distant lymph node metastasis: 25 cases, and lung metastasis: 12 cases. These cases were further classified as to the site of the cancer, as to whether the primary cancer was resected or not, and as to whether the metastatic lesion was resected or not.

Furthermore, we made a statistical study of one-year, three-year, and five-year survival rates with regard to each factor. To avoid repetition, we categorized the case with plural factors into a single one that seemed to be the most serious. In this report, we did not study whether adjuvant therapy, such as chemotherapy or irradiation, was performed because of the multifarious protocols.

We calculated the cumulative survival rate by the Kaplan-Meier method and evaluated any significant differences by the Cox-Mantel method.

RESULTS

We treated 183 cases with Dukes D colorectal cancer composing 18.8% of the total 974 cases. The ratios of the four factors characterizing Dukes D against the total colorectal cancer were as follows; liver metastasis: 106 (10.9%), peritoneal dissemination: 40 (4.1%), distant lymph node metastasis: 25 (2.6%), and lung metastasis: 12 (1.2%).

Considering the 106 cases with liver metastasis at first surgery, we performed combined resection of primary lesion and liver metastasis in seven cases (15.2%) out of 46 colon cancers and in six cases (10.0%) out of 60 rectal cancers. Among the unresected patients, we had 5 cases with colon cancer (10.9%) and 10 cases with rectal cancer (16.7%) (Table 1).

TABLE 1. Dukes D colorectal cancer with liver metastases (N=106)

Operation	Colon	Rectum
Primary lesion		
Resected	7(0)	6(1)
+ liver resection		
Resected	34(0)	44(1)
Unresected	5(0)	10(0)
Total	46(0)	60(2)

() Number of 5-year survivors

Concerning peritoneal dissemination, there were 29 patients (72.5%) with colon cancer, far more than 11 cases (27.5%) with rectal cancer. We performed combined resection of only eight disseminated lesions (colon: seven, rectum: one) which were very close to the primary lesion and four out of eight cases (colon: three, rectum: one) survived more five years. There were no unresected cases of colon cancer with peritoneal dissemination, however, there were four (36.3%) among cases with rectal cancer (Table 2).

TABLE 2. Dukes D colorectal cancer with peritoneal dissemination (N=40)

Operation	Colon	Rectum
Primary lesion		
Resected including	7(3)	1(1)
peritoneal dissemination		
Resected	22(0)	6(0)
Unresected	0(0)	4(0)
Total	29(3)	11(1)

() Number of 5-year survivors

Twenty-five cases with distant lymph node metastasis were detected around the paraaorta partially including left supraclavicular lymph node (Virchow's node). There were 7 patients (46.7%) out of 15 with unresected rectal cancer, more than those (20.0%) with colon cancer. One case of sigmoid colon cancer with lymph node dissection of the paraaorta was classified as Dukes D because of the paraaortic lymph node metastasis, but the patient survived five years (Table 3).

TABLE 3. Dukes D colorectal cancer with distant lymph node metastases (N=25)

Operation	Colon	Rectum
Primary lesion		
Resected	8(1)	8(0)
Unresected	2(0)	7(0)
Total	10(1)	15(0)

() Number of 5-year survivors

We had 12 cases of Dukes D with lung metastasis, six cases each from the colon and the rectum. There were no cases of resection including the metastasis nor any with five-year survival (Table 4).

TABLE 4. Dukes D colorectal cancer with lung metastases (N=12)

Operation	Colon	Rectum
Primary lesion		
Resected	6(0)	5(0)
Unresected	0(0)	1(0)
Total	6(0)	6(0)

() Number of 5-year survivors

In Table 5 we compared the one-year, three-year, and five-year survival rates for the four factors. The largest number of five-year survival cases (14.0%) existed among patients with peritoneal dissemination, and a significant difference ($p < 0.05$) was found in comparison with liver metastasis (4.9%) (Fig 1).

TABLE 5. Survival rates of Dukes D colorectal cancer

Factor	1-year	3-year	5-year	
Peritoneal dissemination (N=40)	67.0%	28.0%	14.0%	
Lung Metastases (N=12)	53.5%	10.7%	0%	
Liver metastases (N=106)	49.8%	8.2%	4.9%	
Distant lymph node metastases (N=25)	31.1%	4.4%	4.4%	

* * P < 0.05

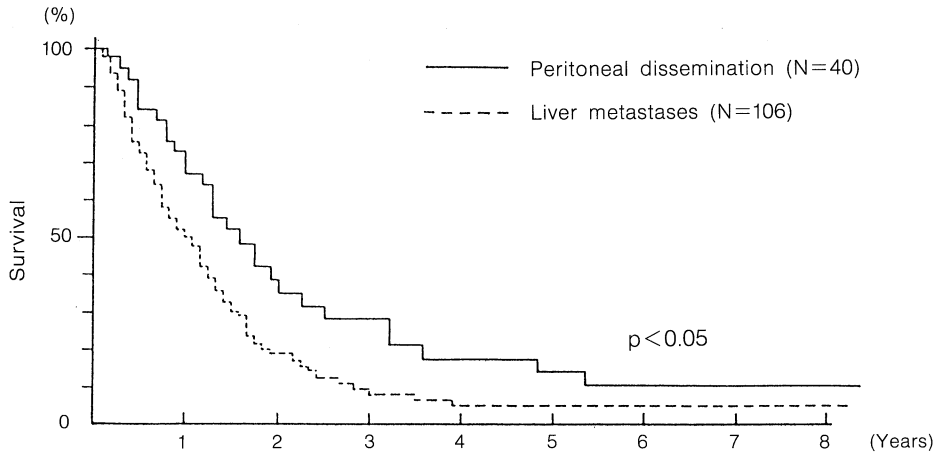


Fig 1. Survival rates of Dukes D colorectal cancer comparing peritoneal dissemination with liver metastases

Furthermore, we observed a significant difference ($p < 0.05$) in comparison with distant lymph node metastasis (4.4%) (Fig 2).

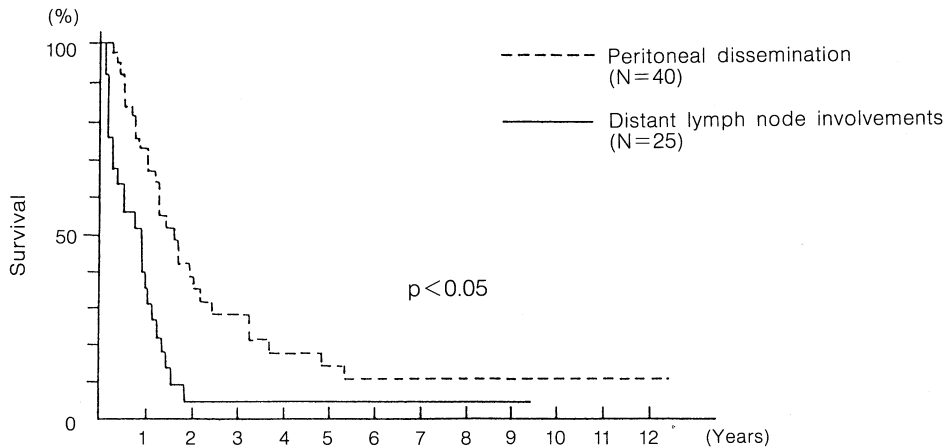


Fig 2. Survival rates of Dukes D colorectal cancer comparing peritoneal dissemination with distant lymph node involvements

Similarly, the prognosis of the patients with liver metastasis was much better ($p < 0.05$) than that of those with distant lymph node metastasis (Fig 3).

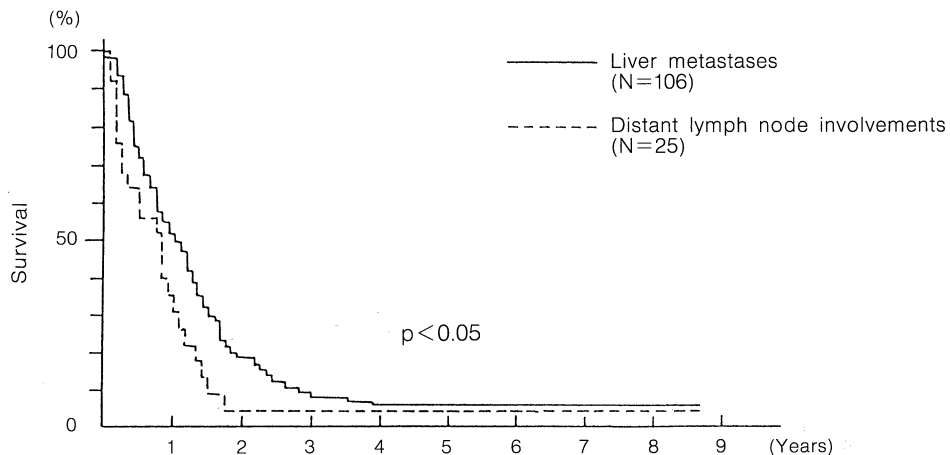


Fig 3. Survival rates of Dukes D colorectal cancer comparing liver metastases with distant lymph node involvements

However, there was no statistical difference in survival rate between lung metastasis and peritoneal dissemination, and there was no significant difference among the other factors (Fig 4).

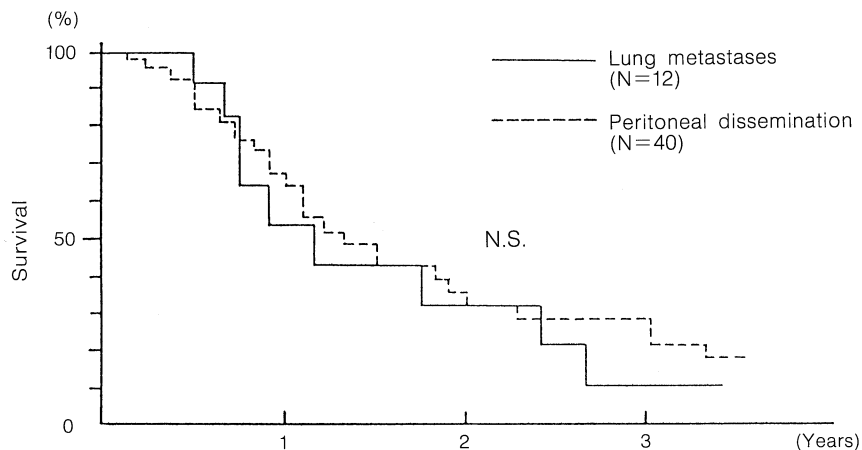


Fig 4. Survival rates of Dukes D colorectal cancer comparing lung metastases with peritoneal dissemination

DISCUSSION

Among Dukes D cases, we had 106 cases of liver metastasis, making up 10.9% of all the cases. This ratio was almost the same as Mäkelä's 12%.¹⁾ Considering the ratios of colon and rectal cancer, which were 10.2% and 11.4%, respectively, there was no difference between the two regions. There were 13 cases (12.3%) in whom both the primary lesion and the liver tumor were resectable, but only one of them survived five years. The surgery record for metachronous liver metastasis seemed to be much better. When liver resection was done on solitary metastatic lesion, Wagner *et al*²⁾ reported that 25% had five-year survival, and he also reported that there was a significant difference ($p < 0.001$) between resected and non-resected cases.

However, Vogt *et al*³⁾ reported that he resected liver tumors in 36 cases with synchronized liver metastasis of colorectal cancer and 20% of them survived five years. He also noted that 21 of 36 cases had liver recurrence and he performed second resection on 7 cases, who showed a significantly better survival rate ($p < 0.05$) than the remaining 14 cases.

Regarding the 40 (4.1%) cases with peritoneal dissemination, there were more cases originating from colon cancer ($N=29$) than from rectal cancer ($N=11$). The reason seemed to be that, anatomically, peritoneal dissemination hardly occurred in the lower rectum situated under peritoneal reflection.

Our results showed that the prognosis was better ($p < 0.05$) for the peritoneal dissemination cases than for liver metastasis group and also better ($p < 0.05$) than for the distant lymph node metastasis group. We believe this was because we were able to resect eight cases of peritoneal metastasis (colon: seven, rectum: one) which existed very close to the primary lesion and, among these eight cases, four (colon: three, rectum: one) survived five years. One patient, a 62-year-old female who had a little peritoneal dissemination along an ascending colon cancer has survived for 12 years and 5 months. These results support that combined resection of metastasis should be performed as much as possible for a longer survival period. Morrow⁴⁾ and his group suggested prophylactic bilateral oophorectomy for females in order to prevent peritoneal recurrence, but we noted only a few ovarian metastasis.

We had 12 cases (colon: 6, rectum: 6) of lung metastasis (1.2%), and had no patients with combined resection. However, Saclarides *et al*⁵⁾ reported that they performed lung resections on 23 cases of lung metastasis including 4 synchronized cases and 16% of them survived five years.

We had only a small number of lung metastasis (12 cases), so we didn't observe any significant difference in comparison with other factors such as peritoneal dissemination.

We had 25 cases (2.6%) of distant lymph node metastasis, mainly with paraaortic lymph nodes, and many of them were incomplete with lymph node dissection. Therefore, their three-year and five-year survival rates were only 4.4% and 4.4%, respectively.

Although there had been few reports on survival rate of Dukes D colorectal cancer with distant lymph node metastases, we experienced a case with relatively longer survival in this study. She was a 52-year-old female in whom metastases from a sigmoid colon cancer were detected by paraaortic lymph node dissection, and she had survived eight years and eight months after surgery to date.

As for postoperative mortality, Lau *et al*⁶⁾ reported that they had postoperative deaths in 17% of their obstructive colorectal cancer cases. We had only four cases (2.2%) of death within 30 days after surgery among Dukes D cases. Two of them accompanied with multiple liver metastases and the others with distant lymph node metastases. Despite Dukes D colorectal cancer we were able to operate on patients with a fewer number of complications.

In this study, we did not mention chemotherapy and irradiation because of the multifarious protocols, however, a prospective study under controlled trials⁷⁾ is absolutely necessary. As for the latest form of chemotherapy, we inject high-dose 5-fluorouracil (5-FU) under hyperalimentation, and sequential therapy using Methotrexate and 5-FU.

Multidisciplinary treatment used together with these protocols is expected to be effective.

Combined resection of metastases should be performed as much as possible for Dukes D colorectal cancer, and multidisciplinary treatment including effective chemotherapy after the surgery may improve the treatment record for advanced cases.

ACKNOWLEDGMENTS

We wish to express our thanks to David H. Waterbury and Ohrai Fujikawa for preparation of this manuscript.

REFERENCES

- 1) Mäkelä J, Haukipuro K, Laitinen S, Kairaluoma MI: Surgical treatment of recurrent colorectal cancer. *Arch Surg* **124**: 1029-1032, 1989
- 2) Wagner JS, Adson MA, Heerden JAV, Adson MH, Ilstrup DM: The natural history of hepatic metastases from colorectal cancer. *Ann Surg* **199**: 502-508, 1983
- 3) Vogt P, Raab R, Ringe B, Pichlmayr R: Resection of synchronous liver metastases from colorectal cancer. *World J Surg* **15**: 62-67, 1991
- 4) Morrow M, Enker WE: Late ovarian metastases in carcinoma of the colon and rectum. *Arch Surg* **119**: 1385-1388, 1984
- 5) Saclarides TJ, Krueger BL, Szeluga DJ, Warren WH, Faber LP, Economou SG: Thoracotomy for colon and rectal cancer metastases. *Dis Colon Rectum* **36**: 425-429, 1993
- 6) Lau PW, Lorentz TG: Results of surgery for malignant bowel obstruction in advanced, unresectable, recurrent colorectal cancer. *Dis Colon Rectum* **36**: 61-64, 1993
- 7) Yamamoto Y, Imai H, Iwamoto S, Kasai Y, Tsunoda T: Multidisciplinary treatment for advanced rectal cancer. *Kawasaki Med J* **20**: 29-35, 1994