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Role of Lateral Lymph Node Dissection in Rectal Cancer Treatment

Yasuhisa YAMAMOTO, Hiroyuki IMAI, Masakazu MURAKAMI, Tadahiko KUBOZOE, Tomoyuki TAKEO and Tsukasa TSUNODA

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

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ABSTRACT. Since the flow of lymph vessels from the rectum moves in part into the lateral area of the pelvis, dissection of the lateral lymph nodes has been carried out in selected patients with rectal cancer. In this study, 478 patients (Dukes A: 157, B: 147, C: 174) who were treated during the last 22 years (January 1974 to December 1995) were reviewed. These cases were classified as to two sites of cancer, the upper and middle rectum (Rs+Ra) and the lower rectum (Rb), and as to whether the lateral lymph nodes were dissected (LDG) or not (non-LDG). The dissection rates of LDG for Rb showed a higher ratio in Dukes B (61.1%) and C (62.7%) than in A (33.7%) and those for Rs+Ra. The pathological findings of 170 cases of LDG revealed 12 cases (7.1%) with lymph node involvement. Although there were no significant differences, the one-, three-, and five-year survival rates for patients with LDG were better in Rs+Ra (100.0%, 86.1%, 86.1%) and Rb (96.9%, 90.3%, 82.3%) for Dukes B than those with non-LDG (Rs+Ra: 92.2%, 78.6%, 70.4% and Rb: 95.2%, 70.4%, 65.3%). Therefore, the lateral lymph nodes should be dissected prophylactically in selected cases such as Dukes B and C rectal cancer to prolong survival periods.

Key words: curative resection for rectal cancer — local recurrence — lateral lymph node dissection

Among patients of Kawasaki Medical School Hospital, local recurrence of rectal cancer has developed more frequently than that of colon cancer.[1] To improve the surgical results for rectal cancer, it is essential to prevent or reduce local recurrence after curative resection. The lymphatic flow of the rectum moves in three directions, 1) upward along the superior rectal artery to the inferior mesenteric artery, 2) laterally along the middle rectal artery to the internal iliac artery, and 3) downward along the inferior rectal artery to the inguinal region. It would seem that attempts at lateral lymph node dissection for rectal cancer should contribute to improvement of the cure rate and to reduction of postoperative relapse, since part of the flow of the lymph vessels from the rectum streams into the internal iliac area through the lateral ligament.

山本康久，今井博之，村上正和，久保添忠彦，竹尾智行，角田　司

For more than 20 years we have dissected the lateral lymph nodes in selected patients who were intraoperatively suspected of those involvements from rectal cancer. This retrospective study was performed to clarify whether or not those dissections actually contributed to better results.

MATERIALS AND METHODS

During the last 22 years (January 1974 to December 1995), 478 patients with rectal cancer (Dukes A : 157, B : 147, C : 174) have been curatively treated in the Department of Surgery at Kawasaki Medical School Hospital (Table 1). We studied 75 cases with upper rectal (Rs) cancer (Dukes A : 19, B : 33, C : 23), 199 cases with middle rectal (Ra) cancer (Dukes A : 55, B : 60, C : 84), and 204 cases with lower rectal (Rb) cancer (Dukes A : 83, B : 54, C : 67). To make clear the differences of tumor sites (upper vs. lower) and two types of treatment, these cases were further classified as to two sites of cancer (Rs+Ra vs. Rb) and as to whether the lateral lymph nodes were dissected (lateral dissected group, LDG) or not (non-LDG). The lymph nodes of the internal iliac and obturator regions were defined as "lateral" in this study. The LDG included both complete dissection and sampling removal of the lateral lymph nodes to distinguish from non-LDG.

T1 2 ? 5 1. Number of patients with rectal cancer

Site	Lateral Dissection	Dukes Classification			Total
		A	B	C	
Upper(Rs)	Yes	2	4	4	10
	No	17	29	19	65
Middle(Ra)	Yes	6	20	31	57
	No	49	40	53	142
Lower(Rb)	Yes	28	33	42	103
	No	55	21	25	101
Total		157	147	174	478

In addition, a statistical study of one-year, three-year, and five-year survival rates was made with regard to each Dukes stage and both types of lymph node dissection. We calculated the cumulative survival rate by the Kaplan-Meier method and evaluated any significant differences by the Cox-Mantel method.

RESULTS

The overall one-, three-, and five-year survival rates for patients with upper or middle rectal cancer (Rs+Ra) with regard to each Dukes stage were as follows, respectively; Dukes A: 97.2%, 95.4%, and 88.9%, B: 94.4%, 80.7%, and 74.7%, C: 89.4%, 67.3%, and 55.5%, and those for lower rectal cancer (Rb) patients were; Dukes A: 96.3%, 94.7%, and 92.9%, B: 96.2%, 82.3%, and 75.5%, C: 87.1%, 50.1%, and 39.9%. There were significant differences ($p<0.01$) in the survival rates between each stage, but no statistically significant difference was found between Rs+Ra and Rb of the same stage (Table 2).

T12?5 2. Overall comparison of survival rates following curative resection for rectal cancer

Dukes Classification	Site of cancer (n)	1-Year (%)	3-Year (%)	5-Year (%)
A	Rs+Ra (74)	97.2	95.4	88.9
	Rb (83)	96.3	94.7	92.9
B	Rs+Ra (93)	94.4	80.7	74.7
	Rb (54)	96.2	82.3	75.5
C	Rs+Ra (107)	89.4	67.3	55.5
	Rb (67)	87.1	50.1	39.9

Rs: upper rectum Ra: middle rectum Rb: lower rectum

Comparisons between the two types of treatment (LDG and non-LDG) for each stage were made. The dissection rates of the LDG for Rb showed a higher ratio in Dukes B (61.1%) and C (62.7%) than in A (33.7%) and those for Rs+Ra (Dukes A: 10.8%, B: 25.8%, and C: 32.7%). Although there was no significant difference, LDG results were better than non-LDG results excluding Dukes C of Rs+Ra and Dukes A of Rb (Table 3, 4). Pathological findings for 170 LDG cases (Rs+Ra: 67, Rb: 103) revealed 12 (7.1%) cases (Rs+Ra: 3, Rb: 9) with lymph node involvement. The one-, three-, and five-year survival rates between LDG and non-LDG were compared according to the sites of the cancer. No statistical difference was found, but better results were disclosed in Rs+Ra and Rb of each Dukes B cancer (Fig 1, 2).

T12?5 3. Survival rates for upper and middle (Rs+Ra) rectal cancer following lateral lymph node dissection

Dukes Classification	Lateral dissection (n)	1-Year (%)	3-Year (%)	5-Year (%)
A	Yes (8)	100	100	100
	No (66)	96.8	94.8	87.3
B	Yes (24)	100	86.1	86.1
	No (69)	92.2	78.6	70.4
C	Yes (35)	85.7	65.9	47.3
	No (72)	91.5	68.0	59.8

T1 2 ? 5 4. Survival rates for lower (Rb) rectal cancer following lateral lymph node dissection

Dukes Classification	Lateral dissection (n)	1-Year (%)	3-Year (%)	5-Year (%)
A	Yes (28)	96.3	91.9	86.5
	No (55)	96.3	96.3	96.3
B	Yes (33)	96.9	90.3	82.3
	No (21)	95.2	70.4	65.3
C	Yes (42)	87.4	58.5	41.7
	No (25)	86.5	34.5	34.5

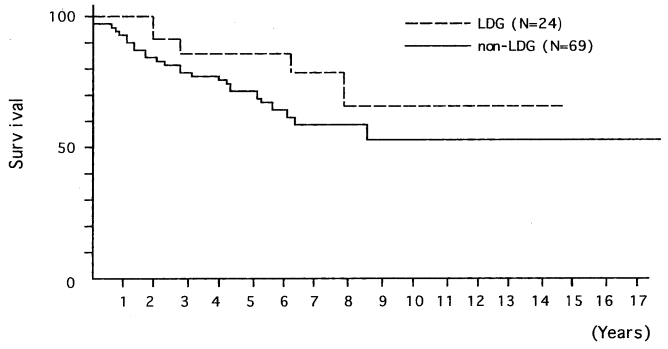

Fig 1. Survival rates following curative resection for upper and middle (Rs+Ra) rectal cancer of Dukes B
The results were better in LDG (N=24) than in non-LDG (N=69).

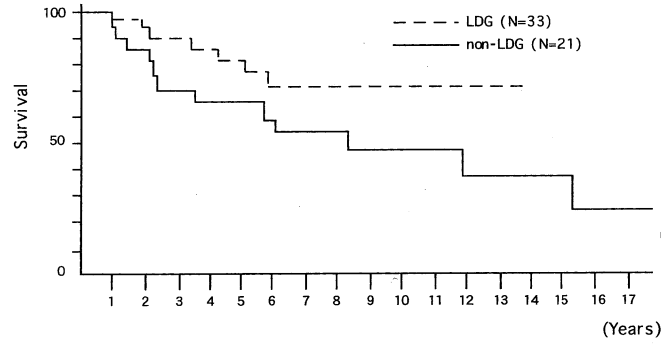

Fig 2. Survival rates following curative resection for lower (Rb) rectal cancer of Dukes B
The results were better in LDG (N=33) than in non-LDG (N=21).

DISCUSSION

In an attempt to determine whether lateral lymph node dissection for rectal cancer confers any survival advantage on patients over non-dissection, the outcome of 478 cases was reviewed. Our retrospective study revealed that the lateral lymph node dissection rates for the lower (Rb) rectum were higher in Dukes B (61.1%) and C (62.7%) than in A (33.7%) and those for the upper and middle (Rs+Ra) rectum. Consequently, pathological findings revealed 12 (7.1%) cases (Rs+Ra : 4.5%, Rb : 8.7%) with lateral lymph node involvement. Hojo *et al*[2] found no metastases in the lateral lymph nodes of rectal cancers limited to the mucosa and submucosa, 8.8% in patients with upper rectal cancer and 23% in those with lower rectal cancer. Since our group who underwent lateral lymph node dissection included cases with sampling removal of the lateral lymph nodes, the incidence of pathological involvement was only 7.1%. To prevent local recurrence and enhance survival, extended operations with aggressive lymph node dissection may be recommended. These methods, however, have a poor risk for postoperative urinary and sexual complications.[3] For this reason, they have been restricted to cases of advanced tumors with a documented evidence of lymph node involvement.[4]

As we have already reported,[5] prophylactic distant node dissection for advanced cancer (Dukes B) of the rectum and sigmoid contributed to improvement of survival rates ($p<0.01$) in cases treated in our department. Although there was no significant difference in this study, patients who underwent lateral lymph node dissection for Rs+Ra and Rb for Dukes B rectal cancer had longer survival periods than those who did not. These results clearly indicate that the lateral lymph nodes should also be dissected prophylactically for advanced rectal cancer to improve survival rates. Therefore, we expect that better results will be achieved by aggressive treatments combined paraaortic and lateral lymph node dissections for Dukes B and C cases. Furthermore, to prevent local recurrences and improve survival rates, it has been widely recognized that total mesorectal excision for distal spread of rectal cancer is essential.[6]

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