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Nerve-sparing Surgery for Advanced Rectal Cancer Patients: Special Reference to Dukes C Patients

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Abstract. Several nerve-sparing operations for advanced rectal cancer that aim to preserve genitourinary function without compromising tumor clearance have been developed in Japan. The aim of this study was to evaluate the survival and local recurrence of these procedures in Dukes B and C patients. A total of 177 patients with advanced rectal cancer underwent curative nerve-sparing surgery (NSS) over the last 11 years; 52 were Dukes B patients and 54 were Dukes C. Altogether 36 had Dukes C1 and 18 had Dukes C2 tumors, 13 with lateral lymph node metastases, designated lateral LN(+). The 5-year survival rate was 92% for Dukes B, 67% for Dukes C1, and 39% for Dukes C2 patients: 11% for Dukes C2 patients with lateral LN(+). The local recurrence rate was 6% for Dukes B, 11% for Dukes C1, and 33% for Dukes C2 patients: 20% for the lateral LN(−) group and 39% for the lateral LN(+) group. Almost all of the patients undergoing NSS could micturate spontaneously, but preservation of sexual function was not as successful. Although there is no guarantee of preserving satisfactory sexual function, our NSS is an acceptable procedure for Dukes B, C1, and C2 patients without lateral lymph node metastases.

Various techniques and approaches have been developed for the treatment of advanced rectal cancer. Local recurrence is always a major problem following "curative surgery." The aim of surgical treatment for advanced rectal cancer is to excise the tumor completely. Therefore extended pelvic lymphadenectomy with total mesorectal excision (TME), which came into wide application after its introduction into Japan, has achieved good survival rates for treatment of advanced rectal cancer [1, 2]. The importance of lateral spread of rectal cancer was also demonstrated elegantly by Quirke et al. [3], who showed that 38% of patients with rectal cancer may have tumor at the lateral resected margin. Heald et al. [4, 5] have advocated the addition of complete mesorectal excision to standard anterior resection, reporting a local recurrence rate of only 4%. Their figures for local recurrence and survival (projected 5-year survival rate 87% for patients with Dukes B and 58% for those with Dukes C tumors) are equal to the results reported in our country using radical abdominal and pelvic lymphadenectomy.

The extended resection performed in Japan resulted in a high rate of genitourinary dysfunction because the pelvic autonomic nervous system, such as hypogastric nerves and pelvic plexuses, was sacrificed to excise the tumor completely by this procedure. To avoid these troublesome complications, nerve-sparing surgery (NSS) with wide pelvic lymphadenectomy for advanced rectal cancer has been performed in Japan since 1984. In our department NSS has been performed on Dukes A patients since 1981 with satisfactory results, and relatively good genitourinary functions has been maintained by NSS. In 1984 various types of nerve preservation were suggested by Moriya et al. and others [6–8] depending on the level of nerve dissection. We have also applied NSS to patients with Dukes B and C tumors since 1984. The aim of this retrospective study was to evaluate survival and local recurrence in regard to these procedures in Dukes B and C patients undergoing NSS.

Patients and Methods

The records of patients undergoing "curative" NSS with lymphadenectomy for advanced rectal cancer at the middle and lower third of the rectum were examined. Advanced rectal cancer is defined as carcinoma that invades within or beyond the proper muscle layer of the rectum. "Curative resection" means there is no macroscopic or pathologic evidence of residual local disease and no macroscopic distant metastases.

A total of 177 patients underwent "curative" NSS with pelvic lymphadenectomy for advanced rectal cancer at our department between April 1984 and January 1995. Almost all of those patients were operated on by the same surgeons (N.S. and H.S.). Among them, 54 had Dukes C tumors, and these were the case analyzed (Table 1). The evaluation of the stages of rectal cancer was performed in accordance with Dukes classification [9, 10], and the degree of lymph node metastases was in accordance with the criteria of J.S.C.R.C. [11]. Dukes C2 patients were classified into two groups based on the lymph node metastases as to whether they had lateral lymph node metastases or not: lateral LN(−) or lateral LN(+). There was no operative mortality, and no patients have been lost during follow-up. The median age was 64 years (range 27–78 years), and the median follow-up term was 57 months (range 24–157 months).

Lumboaortic lymphadenectomy up to the base of the interior mesenteric artery and total mesorectal excision (TME) with lat-

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Table 1. Applied nerve-sparing surgery according to Dukes stage, April 1984 to January 1995.

	Nerve-sparing surgery (NSS)		
Dukes stage	BPAN (%)	UPAN (%)	PPAN (%)
A (n = 71)	65	5	1
B (n = 52)	2	31	19
C (n = 54)	0	6	48
C_1 (n = 36)		6	30
C_2 (n = 18)			18
Total (n = 177)	67 (37.9%)	42 (23.7%)	68 (38.4%)

BPAN: bilateral preservation of the autonomic nerves; UPAN: preservation of the autonomic nerves including unilateral preservation of the hypogastric nerve (UPH) and bilateral preservation of the pelvic nerve (BPPN) type; PPAN: partial preservation of the autonomic nerves including BPPN, unilateral preservation of only the pelvic nerve (UPPN), and partial preservation of only the pelvic nerve (PPPN) types.

eral lymphadenectomy were carried out in all of the patients. The cleaning area for our lymphadenectomy is shown in Figure 1. During this procedure the lumbar splanchnic nerve (LSN) was carefully identified and preserved. The superior hypogastric plexus, hypogastric nerve (HN), and pelvic nerve plexus (PNP) were preserved if possible because sympathetic function (including emission, lubrication, and some component of orgasm and resolution) result from innervation by the hypogastric nerves. The parasympathetic nerve functions (including primarily bladder contraction, erection or vulvar engorgement, and bulbocavernosus spasm) are mediated by the anterior sacral nerve roots of S2, S3, and S4. On either side of the pelvis, the autonomic nerves join at the lateral ligament of the rectum, forming a pelvic autonomic nerve plexus from which the final nerve pathways are directed to the genitourinary visceral compartment. The various symptoms of urinary and sexual dysfunction are due to the injured part of the autonomic nervous system. Unilateral or partial sacrifice of the nervous system, or sacrificing all the nerves except the sacral nerve (S4), was sometimes done in cases of one-sided mesorectal invasion by rectal cancer or pararectal or lateral lymph node metastases.

There were six types of NSS: bilateral preservation of the autonomic nerve [BPAN], unilateral preservation of the hypogastric nerve and bilateral preservation of pelvic nerve (UPH + BPPN), unilateral preservation of the autonomic nerve (UPAN), bilateral preservation of only the pelvic nerve (BPPN), unilateral preservation of only the pelvic nerve (UPPN), partial preservation of only the pelvic nerve (S4) (PPPN) (Fig. 1). Therefore, our NSS was classified broadly into three groups: bilateral, unilateral, and partial preservation of the autonomic nerves (BPAN, UPAN, and PPAN). UPAN and UPH + BPPN were included in the UPAN group; and BPPN, UPPN, and PPPN were included in the PPAN group. The NSS type in each patient was selected according to preoperative staging by endorectal ultrasonography (US), computed tomography (CT), or magnetic resonance imaging (MRI) and intraoperative findings.

BPAN procedures were performed basically in patients with Dukes A tumor. The UPAN procedures were done mainly in Dukes B patients, and the PPAN operations in Dukes C patients. Especially the PPPN operations were applied mainly to Dukes C2 patients with lateral lymph node metastases. According to TNM staging, BPAN was applied basically to patients with T2N0M0 tumors, UPAN to patients with T3N0M0 tumors, PPAN or UPAN to patients with T3N1M0, and PPAN to patients with TanyN2,3M0. These criteria are based not only on the close interrelation between tumor and autonomic nerves but also on grades of lymph node metastases. The sphincter-saving operation was done in almost all of the middle-third rectal cancer patients and in 75% of those with lower third involvement. All patients were surveyed for recurrent disease using careful physical examination, carcinoembryonic antigen (CEA) blood level, US of the liver, barium enema or colonoscopy, chest radiography, and CT of the pelvis and the abdomen at 3 to 6 months after surgery. Also, the patients with clinical suggestion of recurrence underwent MRI, positron emission tomography (PET), and CT-guided needle biopsy for the definite diagnosis.

The postoperative urinary function in all patients undergoing any type of NSS was investigated 6 to 12 months after operation using interviews and questionnaires. The urinary function was evaluated in terms of incontinence, retention, and pollakiuria. In terms of postoperative sexual function, 47 male patients under 60 years of age were investigated at the same time using the same methods in the presence of their spouses. Sexual function was investigated through the medical records and the questionnaire; criteria were cessation of the sexual relationship, ability to achieve erection, and ability to achieve ejaculation. Male sexual functions in the BPAN and UPAN groups were also evaluated.

Survival curves were calculated according to the life-table methods. The overall survival curve includes all deaths, but deaths from intercurrent disease are excluded from the cancer-related mortality curve. The survival curves were compared by log-rank analysis, Cox-Mantel test, and generalized Wilcoxon test. Chi-squared analysis also helped us assess the results obtained.

Results

In 177 patients undergoing curative NSS, 54 were Dukes C patients (71 with Dukes A, 52 with Dukes B). Among 54 patients with Dukes C tumors, 36 were Dukes C1, and 18 were Dukes C2 patients (Table 1). Among 18 Dukes C2 patients, 13 had lateral lymph node metastases [LN(+)]; 5 had only lymph node metastases at the main vascular tie without lateral lymph node metastases [LN(−)] (Table 2). The incidence for each group of NSS is shown in Table 1. There were 67 (38%) patients with BPAN surgery, 42 (24%) with UPAN, and 68 (38%) with PPAN. As for the NSS types, BPAN was performed mainly in Dukes A patients, UPAN or BPPN in Dukes B patients, UPPN in Dukes C1 patients, and UPPN or PPPN in Dukes C2 patients.

All of the patients were surveyed for more than 2 years after operation. The survival curves following curative NSS are shown in Figure 2. The cumulative 5-year survival rate was 93% in Dukes A patients, 92% in Dukes B patients, and 57% in Dukes C patients. The 10-year survival rate was 93% in Dukes A patients, 74% in Dukes B patients, and 40% in Dukes C patients. There was a significant difference between Dukes A/B and Dukes C patients ($p < 0.05$).

The sites of failures during follow-up are presented in Table 3. Of 177 patients, 33 (19%) developed recurrent tumors; 14 tumors were pelvic recurrences including an anastomotic site (8%), 12 were in the liver (7%), 9 in the lung (5%), and 5 at other sites. The local recurrence (including anastomotic recurrence) rate was 8%.

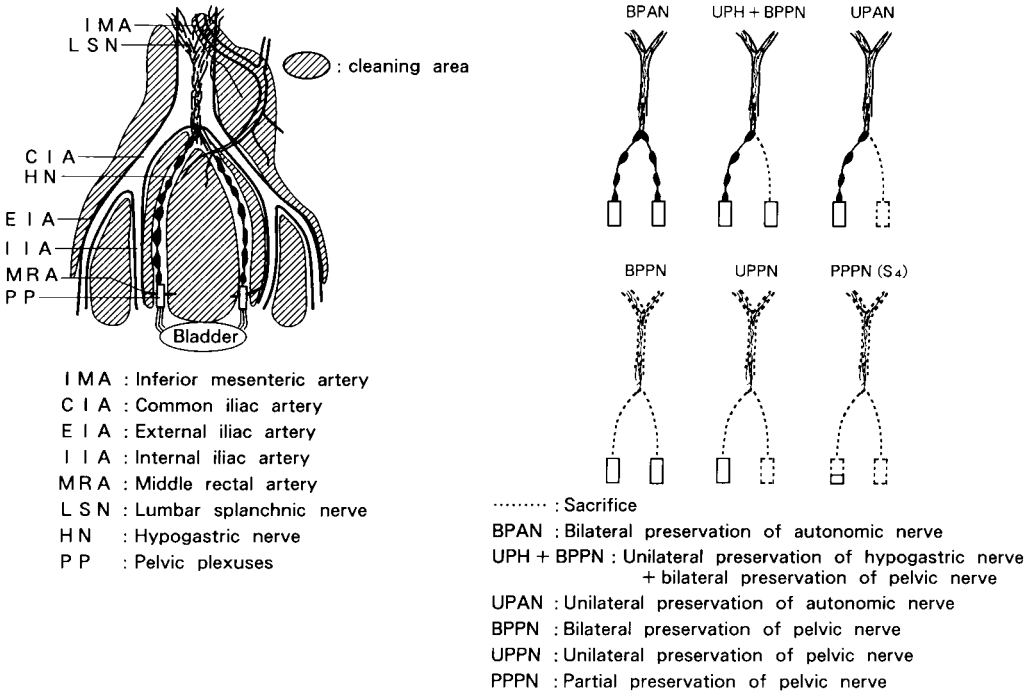

Fig. 1. There are six types of nerve-sparing surgery (NSS) with lymphadenectomy for advanced rectal cancer.

Table 2. Dukes C2 patients of NSS.

Location	Lymph node metastases		
	Lateral LN(−)	Lateral LN(+)	Total
Middle third	3	2	5
Lower third	2	11	13
Total	5	13	18

Lateral LN(−): negative lateral lymph node involvement; lateral LN(+): positive lateral lymph node involvement.

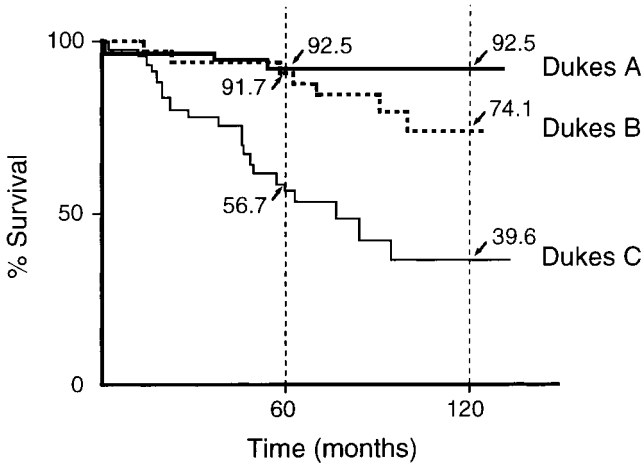

Fig. 2. Survival following NSS according to Dukes stage. There was a significant difference between Dukes A/B and Dukes C patients ($p < 0.05$). Dukes A ($n = 71$), Dukes B ($n = 52$), Dukes C ($n = 54$).

According to Dukes stage, there was 1 local recurrent tumor (at an anastomotic site 1%) for Dukes A, 3 (6%) for Dukes B, and 10 (19%) in Dukes C (Table 4). The difference between Dukes A and C is statistically significant ($p < 0.01$). Concerning the incidence of local recurrence in Dukes C patients, 4 of 36 Dukes C1 patients (11%) and 6 of 18 Dukes C2 patients (33%) developed local recurrence (Table 4). Although there was no significant difference between Dukes C1 and C2 patients, the local recurrence rate in Dukes C2 patients was higher than in Dukes C1 patients (Table 4). In Dukes C2 patients, the local recurrences were analyzed according to lateral lymph node metastases (Table 5). Five of thirteen patients (39%) with lateral lymph node metastases [lateral LN(+)] and one of five patients (20%) without lateral lymph node metastases [lateral LN(−)] developed local recurrence. Although there was no significant difference between those two groups, the local recurrence rate in the lateral LN(+) group was higher than in the lateral LN(−) group.

The survival curves in Dukes C1 and C2 patients are shown in Figure 3. The cumulative 5-year survival rate was 67% in Dukes C1 patients and 39% in Dukes C2 patients. The cumulative 10-year survival rate was 54% in Dukes C1 patients and 20% in Dukes C2 patients. There was a significant difference between Dukes C1 and C2 patients.

The survival curves in Dukes C2 patients according to lateral lymph node metastases are shown in Figure 4. In the lateral LN(−) group, fortunately all of them (5 patients) remained alive for 5 years (two patients developed local recurrence or distant metastasis), and the cumulative 10-year survival rate was 33%. In the lateral LN(+) group, the cumulative 5-year survival rate was only 11%, and there were no 10-year survivors.

As far as the postoperative urinary function is concerned, 177 patients who underwent NSS were investigated 6 to 12 months

Table 3. Recurrence following NSS.

Parameter	No.	%
No. of patients	177	100
Relapsing patients	33	18.6
Site		
Pelvis	14	7.9
Liver	12	6.8
Lung	9	5.1
Other	5	2.8

Table 4. Local recurrence rate according to Dukes stage.

	Recurrence	
Dukes stage	No.	%
A	1/71	1.4
B	3/52	5.8
C	10/54	18.5
C_1	4/36	11.1
C_2	6/18	33.3

Table 5. Local recurrence in Dukes C2 patients according to lateral lymph node metastases.

Local recurrence	Lateral LN(+)	Lateral LN(−)	Total
Present	5 (38.5)	1 (20.0)	6 (33.3)
Absent	8	4	12
Total	13 (100)	5 (100)	18 (100)

The local recurrence rate was higher in the lateral LN(+) group than in the lateral LN(−) group, but there was no significant difference statistically.

Numbers in parentheses are percents.

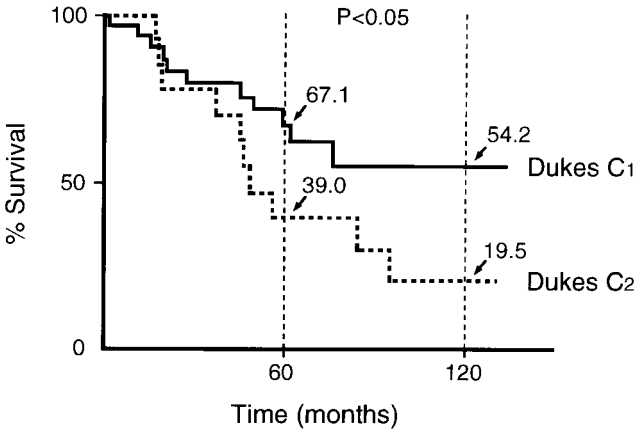

Fig. 3. Survival of Dukes C_1 and C_2 patients following NSS. There was a significant difference between Dukes C_1 and C_2 patients ($p < 0.05$). Dukes C_1 ($n = 36$), Dukes C_2 ($n = 18$).

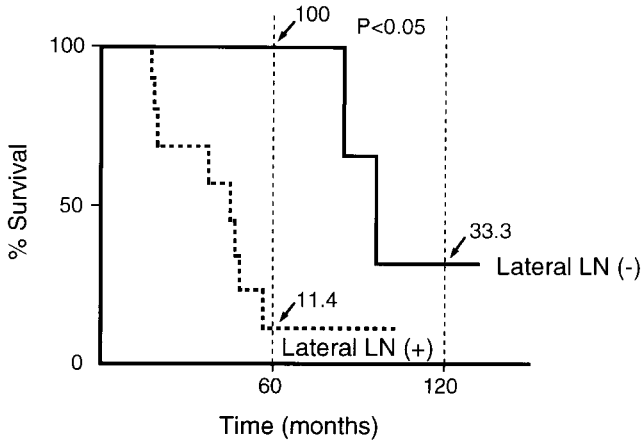

Fig. 4. Survival in Dukes C_2 patients following NSS according to lateral lymph node metastases. There was a significant difference between the negative lateral lymph node metastases [lateral LN(−)] and the positive groups [lateral LN(+)] in Dukes C_2 patients ($p < 0.05$). lateral LN(−), $n = 5$; lateral LN(+), $n = 13$.

after operation. All of them had normal urinary function preoperatively. Of 177 patients, 175 (99%) maintained self-voiding activity after surgery. The results of postoperative urinary dysfunction according to the type of NSS are shown in Table 6. Mild dysfunction (pollakiuria) was observed in 23% of patients with BPNP surgery, in 41% with UPPN, and in 56% with PPPN. Retention or incontinence was found in 1% with BPNP, in 15% with UPNP, and in 44% with PPPN. Although there were no self-catheterization patients in either the BPNP or the UPNP groups, two patients (22%) with PNPP required self-catheterization for retention or incontinence.

As far as sexual function is concerned, 47 male patients under 60 years of age undergoing NSS were investigated at the same time. They had normal sexual activity preoperatively. The results of the postoperative male sexual function according to the group of NSS are shown in Table 7. In the BPAN group, normal erection was retained in 77% and normal ejaculation in 57%. Although normal erection was retained in 71% of the UPAN group, ejaculation was normal in only 29%. That is, a satisfactory sexual activity was maintained in 57% of the BPAN group and in only 29% of the UPAN group. About 70% of the patients in whom the unilateral nervous system was preserved had either diminished and absent ejaculation or retrograde ejaculation.

Discussion

From the 1970s to the 1980s extended radical lymphadenectomy with TME was performed frequently in patients with locally advanced rectal cancer in Japan. The guiding principle behind this lymphadenectomy is excision of both the mesenteric and extramesenteric lymphatic drainage, including en bloc dissection of the retroperitoneum between the ureters and lymphadenectomy of the surrounding inferior vena cava and aorta (from the level of the third portion of duodenum to the iliac vessels) and sacral nerve roots in the pelvis. Therefore the autonomic nerves for genitourinary function are sacrificed. This radical procedure for advanced rectal cancer has resulted in both improved survival and decreased local recurrence [1, 2]. However, urinary and sexual dysfunction following this procedure was recognized as a serious problem. The major site of injury leading to urinary difficulties is damage to the pelvic plexus. If the anterior branch of S4 remains intact on one side, bladder sensation and hence voiding should not be significantly affected [12]. Preservation of sexual function is

Table 6. Incidence of urinary dysfunction following NSS.

Type of NSS	Urinary dysfunction		
	Pollakiuria	Retention	Incontinence
BPPN (n = 100)	23 (23.0)	1 (1.0)	0
UPPN (n = 68)	28 (41.2)	8 (11.8)	2 (2.9)
PPPN (n = 9)	5 (55.6)	3 (33.3)	1 (11.1)

BPPN: including BPAN and UPH + BPPN types; UPPN: including UPAN type.

Numbers in parentheses are percents.

Table 7. Male sexual function following NSS (≤60 years old).

Type of NSS	Erection(+)	Ejaculation(+)
BPAN (n = 30)	23 (76.7)	17 (56.7)
UPAN (n = 17)	12 (70.6)	5 (29.4)

Erection(+): complete erectile capacity; ejaculation(+): satisfactory ejaculative capacity.

Numbers in parentheses are percents.

much more difficult [6], as it seems necessary to preserve the autonomic nerves completely and the blood supply [13]. Therefore nerve-sparing surgery (NSS), which aims to preserve the hypogastric and pelvic plexuses without compromising tumor clearance, was developed in Japan. Several kinds of NSS, depending on the degree of nerve preservation, have been tried [6–8].

We have applied several kinds of NSS to patients with Dukes B and C tumor since 1984 at our department. BPAN, which totally preserves the autonomic nervous system, was performed mainly in Dukes A patients, UPAN or PPAN in Dukes B patients, and PPAN in Dukes C patients. These NSS procedures (BPPN, UPPN, PPPN) are partial nerve-sparing procedures, leaving the contralateral side of the hypogastric nerve or the total or partial pelvic plexus on one side (or both). In our experience, the chance of injuring the autonomic nervous system during lymphadenectomy was low. There are two important points to consider during operation: confirming the location of the bilateral hypogastric nerves that come down to the pelvic nerve plexuses while adhering to the proper rectal fascia, and confirming the presence of the pelvic nerve plexuses that are close to the bilateral rectal side wall at the level of peritoneal reflection. The layer of the rectum at those two parts of the autonomic nervous system that tend toward the rectal wall are freed carefully to avoid injury to the autonomic nervous system. The neuroanatomic study by Smith and Ballantyne [14] demonstrated that the main trunks of the nerves to the bladder and proximal urethra lie in the outer layer of the pelvic nerve plexuses. Therefore it is likely that even in patients with advanced rectal cancer a sufficient lateral margin may be obtained when partial NSS is performed.

There were some doubts about performing NSS in patients with advanced rectal cancer because some surrounding tissue of the total or partial autonomic nervous system remained after these procedures, and there was a potential for increasing the local recurrence rate and decreasing the survival rate in comparison with extended radical lymphadenectomy. In addition, we worried about whether NSS was possible for patients with Dukes C tumor. Recent histopathologic reports suggest that perineural invasion is a rare but recognized event, casting doubt on the oncologic wisdom of nerve-sparing [15, 16]. To solve these problems, the long-term survival and local recurrence rate following NSS were investigated in this study.

In our experience, the 5-year survival rate was 93% in Dukes A patients, 92% in Dukes B patients, and 57% in Dukes C patients. The 10-year survival rate was 93% in Dukes A patients, 74% in Dukes B patients, and 40% in Dukes C patients. These results are comparable with the survival rates reported by Hojo et al. [2] using the extended radical lymphadenectomy (5-year survival rate 88% for Dukes B and 61% for Dukes C), by Heald and Karanjia [4] using the TME (5-year survival rate 87% for Dukes B and 58% for Dukes C), and by Enker et al. [17] using en bloc pelvic lymphadenectomy. This local recurrence rate following NSS was 8% (1% for Dukes A, 6% for Dukes B, 19% for Dukes C). These figures are comparable with the results by Hojo et al. [2] who used extended lymphadenectomy (6% for Dukes B and 24% for Dukes C), and by others [1, 4, 16, 18]. The survival and local recurrence rates following NSS compared well with those of extended lymphadenectomy. The surgical results achieved by both Heald and Enker demonstrated 3% to 8% local recurrence at these same tumor stages, primarily without radiation therapy [19], but the local recurrence rate and the incidence of patients in Dukes C2 stage with lateral lymph node metastases are not clear in their reports, and it seems that dissection of lateral lymph node metastases is impossible with TME. In our study, there were 13 patients (7%) with lateral lymph node metastases. If lateral lymphadenectomy had not been performed, our results would be worse. Our results were fortunately similar to the results reported by Moriya et al. [8] and Cosimelli et al. [20] using NSS.

It should be kept in mind that local recurrence is seen in about 11% of Dukes C1 patients and about 33% of Dukes C2 patients—20% of the lateral LN(−) group, 38% of the lateral LN(+) group—and the survival rate among Dukes C2 patients may be poor. There was a significant difference in the survival between Dukes C1 and C2 patients; in particular, the survival rate in Dukes C2 patients with lateral LN(+) was poorer (5-year survival rate 11%). There was a significant difference between the LN(−) and LN(+) groups. Although the difference was not significant the local recurrence rate in the lateral LN(+) group was higher than in the lateral LN(−) group. The survival rates in Dukes C1 patients (5-year survival rate 67%) and Dukes C2 patients without lateral lymph node metastases [LN(−)] were acceptable.

A number of factors influence local recurrence: patient-related, tumor-related, and surgery-related. It is well known that lymphatic cancerous spread can occur in the direction of lateral lymphatics or extramesenteric ones in advanced rectal cancer at or below the peritoneal reflection. Recent work suggests that the principal cause of local recurrence is incomplete excision at the circumferential margin or failure to excise carcinoma that has involved the distal mesorectum [3, 18]. Moreover, it is common opinion that the higher recurrence rates of lower rectal lesions may be caused by the limited space in the pelvis, especially in male patients, permitting easier spread of the tumor to nearby tissue, making it difficult to eradicate it completely.

Based on these results, it seems that for Dukes C2 patients with lateral LN(+), there is no indication for NSS and that a more complete en bloc clearance of the pelvic lateral wall including the autonomic nervous system is necessary for local control. This more extended radical procedure, which was reported by Hojo et al. [2] and Moriya et al. [1], means excision of the internal iliac

vessels just below the branch of the superior vessels, including the sympathetic and parasympathetic nerves to the genitourinary tract. It is believed by many Japanese surgeons that this form of more extended radical excision reduces the local recurrence rate and prolongs survival. Unfortunately, genitourinary function usually is sacrificed with this procedure, so, the procedure is not accepted by surgeons in the West [21].

Recently, we have come to the opinion that Dukes C2 patients with lateral lymph node metastases be treated as if they have a systemic disease, and an adjuvant therapy such as irradiation or chemotherapy be given for better control. We based this opinion on the fact that it was difficult to cure such patients by our NSS with lymphadenectomy.

In the recent studies, excellent results in genitourinary function were reported by Hojo et al. [6], Enker [13], and Cosimelli et al. [20] using NSS or TME. In our experience, almost all of the NSS patients were able to sustain spontaneous urination. This result means that a self-voiding activity could be maintained if the pelvic nerve plexuses are not sacrificed completely. However, it was difficult to maintain satisfactory sexual function by partial NSS. Undoubtedly, our NSS does not guarantee totally normal sexual and bladder functions, but identification and accurate preservation of the hypogastric nerves and, above all, the parasympathetic trunks allow the surgeons to spare at least one side of the nerve branches. If possible, preservation of the entire pelvic autonomic nervous system such as by TME is the best way to prevent genitourinary disturbance after operation. To avoid these complications, it is important to decide preoperatively and intraoperatively whether the patient will benefit by more extended radical excision.

Conclusions

It may be concluded that our NSS with lymphadenectomy for advanced rectal cancer is an acceptable procedure in Dukes B and C1 patients and in Dukes C2 patients without lateral lymph node metastases [lateral LN(−)] to obtain a cure and good quality of life. It also seems necessary for Dukes C2 patients with lateral lymph node metastases [lateral LN(+)] that a more extended radical excision or an adjuvant therapy should be added to prevent local recurrence.

Résumé

On a récemment développé au Japon plusieurs types d'interventions pour traiter le cancer du rectum tout en épargnant l'innervation, c'est à dire, en préservant la fonction génito-urinaire sans compromettre le caractère carcinologique de l'exérèse. Le but de cette étude a été d'évaluer la survie et la récidive locale de ces procédés chez des patients ayant un cancer stade B ou C de Dukes. 177 patients ayant un cancer «avancé» ont eu une intervention épargnant l'innervation du rectum (IEI) pendant les 11 dernières années. Cinquante-deux étaient des Dukes B et 54, des Dukes C; parmi ces derniers, 36 avaient un cancer du stade Dukes C1 et 18 avaient un cancer du stade Dukes C2—13 ayant des métastases ganglionnaires latérales [LNL(+)]. La survie à 5 ans était de 92% lorsqu'il s'agissait d'un stade Dukes B, 67% pour le stade Dukes C1, et de 39% pour le stade Dukes C2 [11% lorsqu'il s'agissait de patients Dukes C2 avec LNL(+)]. Le taux de récidive locale a été de 6% chez les patients Dukes B, de 11% chez les patients Dukes C1 et de 33% chez les patients Dukes C2 [20% chez les patients LNL(−), 39% chez les patients LNL(+)]. Presque tous les patients ayant eu une intervention avec IEI ont pu garder une miction spontanée, mais la préservation de la fonction sexuelle n'a pas connu le même taux de succès. Bien qu'il n'existe aucune garantie de préservation de la fonction sexuelle, notre intervention avec IEI est acceptable en cas de cancer au stade Dukes B, C1 et C2 sans métastases ganglionnaires latérales.

Resumen

En el Japón recientemente se han desarrollado diversos tipos de operaciones con preservación neural en pacientes con cáncer rectal avanzado, los cuales pretenden conservar la función genitourinaria sin comprometer los márgenes de resección. El propósito del presente estudio fue evaluar las tasas de supervivencia y recurrencia con el uso de estos procedimientos en pacientes con tumores Dukes B y C. En los últimos 11 años hemos practicado resección curativa con preservación neural (RPN) en 177 pacientes con cáncer rectal avanzado: 52 Dukes B y 54 Dukes C; 36 eran tumores Dukes C1 y 18 eran Dukes C2, 13 de ellos con metástasis ganglionares laterales [NL laterales (+)]. La tasa de supervivencia a 5 años fue de 92% en los Dukes B, 67% en los Dukes C1 y 39% en los Dukes C2 [11% en los Dukes C2 con NL laterales (+)]. La tasa de recurrencia local fue de 6% en los Dukes B, 11% en los Dukes C1 y 33% en los Dukes C2 [20% en tumores con NL laterales (+), 39% en los tumores con NL laterales (+)]. Casi todos los pacientes sometidos a RPN mantuvieron la capacidad de micción espontánea, pero no se logró la preservación de la función sexual. Aunque no hay garantía de preservación de una función sexual satisfactoria, nuestra RPN es un procedimiento aceptable para pacientes con tumores Dukes B, C1 y C2 con metástasis ganglionares laterales.

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Invited Commentary

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The paper by Norio Saito and his colleagues is timely because of an increased enthusiasm for nerve-sparing rectal excision to treat low and mid rectal cancers. As the technical difficulties with anastomotic leaks were resolved, attention was paid to decreasing the incidence of pelvic recurrence after sphincter-saving procedures. Heald's landmark paper on total mesorectal excision (TME) demonstrated the need for TME to lower the pelvic recurrence rates. Recent work in Europe and Japan has pointed out that the pelvic autonomic nerves essentially lie outside the investing fascia, which circles the rectum, and the mesorectum. Therefore even with stage C cancers, where there are positive lymph nodes in the mesorectum, complete dissection of the mesorectum and removal of the rectum allowing a low colorectal anastomosis is certainly possible without sacrificing the pelvic autonomic nerves.

The authors clearly have demonstrated that an acceptable cure rate and low pelvic recurrence rate can be achieved in patients with Duke's B and to a lesser degree in Duke's C1 cancers. However, the results of their nerve-sparing procedure for Duke's C2 cancer are less than ideal. The authors clearly recognize the limitation of a nerve-sparing proctectomy, even if it is associated with a wide lymphadenectomy. There is ample and mounting evidence in the literature that the best alternative for the treatment of patients with extensive involvement of the mesorectum, either by direct invasion or lymph node involvement, is preoperative chemoradiation therapy to downstage the tumor. With this technique, it is possible to achieve an element of "sterility" in the lymphatics as well as in the mesorectum from tumor cells, allowing a lower pelvic recurrence rate and hopefully better survival.

A question can be raised whether preoperative chemoradiation therapy would allow a "clean" dissection of the rectum and its mesorectum, allowing preservation of the pelvic autonomic nervous system. This indeed is possible in most cases unless there is an extensive "T4" tumor extending into the perirectal issue involving either the pelvic side wall or the presacral or Denonvillier's fascia. Under these circumstances the nerve directly involved with the tumor extension may have to be sacrificed. The paper by Saito and his colleagues has contributed significantly to our knowledge of the anatomy and the resultant genitourinary disturbances based on partial or complete sacrifice of the pelvic autonomic nerves.

Nerve-sparing proctectomy for rectal cancer is a procedure that should be attempted in virtually all patients. When preoperative evaluation of the tumor points toward deep extension of the tumor into perirectal tissues (T3 or T4), preoperative chemoradiation therapy should be utilized to downstage the tumor for a curative resection with preservation (complete or partial) of the pelvic autonomic nervous system, allowing the patient normal bladder and sexual function.