Total Pelvic Exenteration for Locally Advanced Colorectal Carcinoma
—Postoperative Complications—

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Summary: This study was designed to clarify the postoperative major complications of total pelvic exenteration for locally advanced colorectal cancer. Twenty-six patients (primary disease: 17, recurrent disease: 9) were retrospectively studied. Major complications developed in 30.8% (8 of 26); in 23.5% (4 of 17) for a primary disease and in 44.4% (4 of 9) for a recurrent disease. Only 2 patients (7.7%) died within 30 days after the operation; one patient died of hepatic failure and another of pelvic sepsis. Postoperative ileus developed at a high rate of 11.5% (3 of 26). Ileo-ileal anastomotic leakage developed at a rate of 7.7% (2 of 26) and it commonly occurred following irradiation. The remaining one patient had gastrointestinal bleeding. These 6 patients surviving the operation were successfully managed conservatively. Conclusion was as follows: Total pelvic exenteration should be performed carefully and aggressively regardless of the development of postoperative complications.

Key words: total pelvic exenteration — colorectal cancer — morbidity — mortality — prognosis

Introduction

Although total pelvic exenteration for an advanced colorectal cancer localized to the pelvic region remains a formidable procedure, such aggressive surgical procedure is required for a curative treatment of a primary or recurrent disease. The complete removal of involved adjacent organs (such as the vagina, uterus, bladder, and prostatic gland) has been shown to be effective in controlling the local disease and improving symptoms. However, severe complications may develop compared with a standard resection for colorectal carcinoma (Bonfanti et al. 1982; McGlone et al. 1982; Sugarbaker and Corlew, 1982; Pittman et al. 1984; Orkin et al. 1989; Hafner et al. 1992). This study was designed to clarify the postoperative major complications of total pelvic exenteration for locally advanced colorectal cancer.
**Subjects and Methods**

Total pelvic exenteration was performed on 26 patients with a primary or recurrent colorectal cancer during the period from January 1975 to March 1992 at the Kurume University. These patients were retrospectively studied with respect to major postoperative complications. Seventeen patients (14 males and 3 females) had a primary disease, with a mean age of 55.1 years (range, 42 to 88 years), and 9 patients (3 males and 6 females) had a recurrent disease, with a mean age of 55.9 years (range, 33 to 67 years).

Preoperative radiotherapy was performed in 3 patients (two with a primary disease and one with a recurrent disease).

A major complication is defined as a significant complication requiring a further surgical procedure or long-term hospitalization. Operative mortality is defined as death within 30 days after the total pelvic exenteration.

The postoperative pathological stage was defined according to the new, internationally accepted, fourth edition of the UICC TNM classification (Hermanek and Sobin, 1987; Beahrs et al. 1988).

**Results**

**Clinical findings of patients with a primary disease**

Rectal cancer was diagnosed in 17 patients with a primary disease. This group includes a cancer of the rectosigmoid colon in one patient, a cancer of the upper rectum in 5 patients, and a cancer of the lower rectum in the remaining 11 patients. Of these 17 patients, 10 had a well differentiated adenocarcinoma, 5 a moderately differentiated adenocarcinoma, one a poorly differentiated adenocarcinoma, and one a mucinous adenocarcinoma.

Seven patients were in stage II, 8 patients were in stage III, and 2 patients were in stage IV.

Urinary diversion was performed with an ileal conduit, first introduced by Bricker (1950), in 13 patients. Ureterocutaneostomy was performed in 4 patients.

**Clinical findings of patients with a recurrent disease**

As to the original site, a cancer of the lower rectum affected 5 patients, a cancer of the rectosigmoid colon 2 patients, a cancer of the ascending colon one patient, and a cancer of the anal canal affected one patient. Of these 9 patients, 2 patients showed a well differentiated adenocarcinoma, 5 a moderately differentiated adenocarcinoma, one a mucinous adenocarcinoma, and one a signet ring cell carcinoma.

For patients with a recurrent disease, the classification of the original primary tumor was Stage I in one patient, Stage II in 2 patients, and Stage III in the other 6 patients.

As to the previous treatments for the original primary tumors, low anterior resection was performed in one patient with lower rectal cancer and in one patient with rectosigmoid colon cancer. Abdominoperineal resection was performed in the other 4 patients with lower rectal cancer and in the one patient with anal canal cancer. The Hartmann procedure was performed in the remaining
patient with rectosigmoid colon cancer, and right hemicolectomy in the patient with ascending colon cancer.

Urinary diversion was performed with an ileal conduit in 7 patients. Ureterocutaneostomy was performed in 2 patients.

Invasion of adjacent organs or structures

Macroscopically, 15 of the 17 patients with a primary disease had urinary bladder invasion, 11 had seminal vesicle, 8 had prostate, 2 had ureter, 2 had vagina, and one had sacrum invasion. Microscopic invasion of adjacent organs or structures was demonstrated in 13 patients (76.5%) with a primary disease. There were 12 with urinary bladder invasion, 9 with seminal vesicle, 7 with prostate, 2 with ureter, 2 with vagina and one with sacrum invasion.

All patients with a recurrent disease had urinary bladder invasion, 2 had uterus, 4 had vagina, 4 had ureter, 3 had pelvic cavity, one had sacrum, and one had ileum invasion.

All patients with a recurrent disease showed evidences of microscopic invasion to the adjacent organ.

Postoperative complications and mortality

As shown in Table 1, the overall major complication rate was 30.8% (8 of 26) and the overall mortality rate was 7.7% (2 of 26).

Of the 17 patients who had a primary disease, 4 had a major complication (23.5%). Two of these 4 patients had postoperative ileus and recovered with conservative therapy. One patient had an ileo-perineal fistula due to ileo-ileal anastomotic leakage. This patient had previously received radiotherapy for a uterine cervical cancer 19 years ago. Several re-operations were performed for the leakage. She recovered and has survived 3 years to date. The remaining one patient, who received preoperative radiotherapy for a primary disease, died of pelvic sepsis 20 days after the operation. The operative mortality rate was therefore 5.9% (1 of 17).

Of the 9 patients who had a recurrent disease, 4 had a major complication

| TABLE 1. |
| Postoperative major complications of total pelvic exenteration |
| Primary disease | Recurrent disease | Total |
| (n=17) | (n=9) | (n=26) |
| Ileus | 2 | 1 | 3 |
| Gastrointestinal bleeding | 1 | 1 | 2 |
| Ileo-perineal fistula due to ileo-ileal anastomotic leakage | 1 | 1 | 2 |
| Hepatic failure | 1 (11.1) | 1 |
| Pelvic sepsis | 1 (5.9) | 1 |
| Total | 4 (23.5) | 4 (44.4) | 8 (30.8) |

†: Numbers in parentheses indicate percentages.
‡: operative death. Overall operative mortality rate was 7.7% (2 of 26).
Postoperative ileus and upper gastrointestinal bleeding developed in one patient each, and both were successfully treated conservatively. One patient had an ileo-perineal fistula due to ileo-ileal anastomotic leakage, and had previously received radiotherapy for a uterine cervical cancer 17 years ago. This patient was successfully managed conservatively. The remaining patient fell into shock due to intraoperative massive bleeding (30,000 ml), and died of hepatic failure 26 days after the operation. The operative mortality rate was therefore 11.1% (1 of 9).

**Discussion**

Pelvic exenteration for locally advanced pelvic cancer was first reported by Brunschwig (1948). Appleby (1950) applied the same surgical principles in a series of eight male patients who had undergone proctocystectomy. This procedure can provide a reasonable treatment option for either primary or recurrent disease. However, this procedure has always been associated with considerable postoperative complications. Although the criteria for reporting postoperative complications may vary among authors, it develops at a high rate of 26% to 100% (Eckhauser et al. 1979; Boey et al. 1982; Jakowitz et al. 1985; Lopez et al. 1987; Hafner et al. 1992). Excluding minor complications, the following causes of complications have been reported (Ledesma et al. 1981; Boey et al. 1982; Jakowitz et al. 1985; Lindsey et al. 1985; Lopez et al. 1987); urologic and gastrointestinal complications such as ureteroenenterostomy or enteroenterostomy anastomotic leakage, small bowel obstruction and perineal fistula. In our series, a considerable number of patients had complications that met our criteria for major complications. Major complications developed in 23.5% of cases with primary disease and in 44.4% of cases with recurrent disease. Ileo-ileal anastomotic leakage was one of the severe complications and it commonly occurred following radiotherapy for uterine cervical cancer. Chronic radiation damage, particularly endarteritis, may have had a bad influence on the intestinal anastomosis. Lopez et al. (1987) also reported that both short- and long-term complications were especially apparent in patients who had undergone the operation for carcinoma of the cervix after primary treatment by irradiation.

Pelvic sepsis developed in one patient who had previously received preoperative radiation therapy for a primary tumor. In this patient, Gram-negative bacteria may have easily infected the pelvic cavity because of severe diabetes mellitus and radiation damage. Although it is difficult to define the term “unresectable” in reference to extensive pelvic cancers, preoperative irradiation therapy may convert an unresectable tumor to a resectable one (Pillepich et al. 1978). Careful attention should be paid to the high complication rate caused by prior irradiation as described by some authors (Jakowitz et al. 1985; Hafner et al. 1992).

The overall mortality rate of 7.7% (2 of 26) in our series is similar to that in recent reports (Boey et al. 1982; Lopez et al. 1987; Hafner et al. 1992). This rate can be expected to be further reduced in the future by improved preoperative planning.
and postoperative management. Boey et al. (1982) also attributed recent improvement to better patient selection, greater attention to technical detail, and improved nutritional and respiratory care during the perioperative period. In our series, although major complications developed at a high rate, most patients were successfully managed conservatively. Total pelvic exenteration can provide a symptomatic relief from cancer in the majority of patients and also improve the quality of their lives for the time remaining to them. We conclude that total pelvic exenteration for locally advanced colorectal cancer should be performed carefully and aggressively regardless of the development of complications.

References


