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Aggressive surgical treatment with bony pelvic resection for locally recurrent rectal cancer

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Abstract

Background: In the current era of total mesorectal excision, local relapse remains a main cause of recurrence. Although standard treatment for locally recurrent rectal cancer (LRRC) has not been established, R0 resection represents the only potentially curative treatment. However, extended surgery accompanying bony pelvic resection is technically demanding and is still challenging.

Methods: Studied were 35 patients with LRRC who underwent combined resection of bony pelvis between August 2006 and October 2013. Safety and prognostic factors for survival were analyzed. Median follow-up was 33 months.

Results: Sacrectomy was performed in 32 patients and 3 patients underwent combined resection of the pubis and ischium. The dominant operative procedure was total pelvic exenteration in 30 (86%) patients. R0 resection was achieved in 27 (77%) patients. No patients died. Pelvic sepsis was the most frequent complication (40%). Recurrence developed in 20 (57%), with the lung the most frequent site (10 patients). Three-year local relapse-free survival (LRFS) and disease-free survival (DFS) were 72.1% and 32.7%, respectively. On multivariate analysis, R1 resection was the only independent risk factor for local recurrence ($p = 0.010$), and concomitant liver metastasis and initial non sphincter-preserving surgery were independent predictors of worse DFS ($p = 0.008$ and $p = 0.042$, respectively).

Conclusions: Aggressive surgical treatment combined with bony resection for carefully selected patients with LRRC was safe with a high rate of R0 resection and favorable LRFS. However, DFS was not satisfactory even after R0 resection and the main cause was lung metastasis. Preventing distant recurrence might be a key to improve survival.

Keywords: Local recurrence; Rectal cancer; Bony resection; Sacrectomy

Introduction

Introduction of total mesorectal excision (TME) and preoperative radiotherapy (RT) have been dramatically improved local control after resection of rectal cancer.[1,2] In some large randomized trials, the local relapse rate after rectal resection following fluorouracil-based chemo-RT was reported to be 5.6–8.1% in Western countries.[3–6] In Japan, the current standard treatment for locally advanced rectal cancer is surgical treatment without RT followed by adjuvant chemotherapy, and lateral lymph node dissection is recommended for patients with low rectal cancer. In these circumstances, the local-relapse rate in Japan was reported to be 9%.[7] Local relapse has not been eradicated even in the era of TME and is still a main cause of recurrence worldwide.

Local recurrence after rectal resection is a tragic event for patients as it is accompanied by several cumbersome symptoms, such as unmanageable pain in the perineum or lower legs, bleeding or discharge from the self-disintegrated tumor, or bowel obstruction.[8–11] These distressful symptoms cause a loss of quality of life (QOL) of the patients. Although various approaches including surgical resection,

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RT, chemotherapy, and their combinations, have been attempted, a standard treatment for locally recurrent rectal cancer (LRRC) has not yet been established and complete surgical resection (R0 resection) remains the only potentially curative treatment.

For R0 resection in LRRC fixed to the pelvic wall, combined resection of bony pelvis is sometimes required, which is technically demanding and is still a challenging procedure. The resected bony pelvis is dominantly the distal sacrum followed by the pubis and ischium.[11] This type of resection can be offered only by a special surgical team that includes colorectal, urological and orthopedic surgeons in medical center, of which there are very few. The aim of this study was to assess the safety of aggressive surgical treatment accompanying bony pelvic resection according to the type of bony resection and to evaluate the prognostic factors for survival.

Patients and methods

Patients

Patients were selected from our prospective colorectal cancer database maintained at Nagoya University Hospital, Nagoya, Japan. Between August 2006 and October 2013, 42 consecutive patients with locally recurrent rectal cancer received surgical resection with curative intent. Of those, 35 patients underwent combined resection of the bony pelvis and eligible for this study. Two of the 35 (5.7%) patients underwent their initial surgery in our department and the other 33 patients were referred from other hospitals.

Preoperative assessment and surgical indication

All patients received a baseline assessment for resectability that included chest and abdominopelvic computed tomography (CT), pelvic magnetic resonance imaging, and ^{18}F-fluorodeoxyglucose positron emission tomography-CT. All patients were selected as candidates for surgical resection in pre-treatment multidisciplinary conferences. Basically, surgical resection was indicated from the results of two determinations: the recurrent tumor should be localized within the pelvis and whether distant metastasis was present. A few liver metastases that were amenable to R0 resection were indications for resection with curative intent. Exclusion criteria included the following: tumor extension into the sacral promontory indicating the impracticality of S1 nerve preservation, growth into the sciatic notch, leg edema secondary to lymphatic or venous obstruction, and invasion of the external iliac artery.

According to the site of the recurrence, tumors were divided into 5 different types. Anterior recurrence invaded the urinary bladder, prostate, seminal vesicle, uterus, or vagina. The posterior type included invasion of the sacrum and coccyx. Lateral recurrence involved invasion of the pelvic sidewall. Anastomotic recurrence, which occurred after anterior resection, often extended into the posterior or lateral pelvic wall. Perineal recurrence sometimes invaded the pubis or ischium (Fig. 1). Although assigning a definite grouping was difficult because in many instances the tumor has plural features, the dominant type of the recurrent tumor was recorded. Anterior recurrence was mainly manifested by non-fixed recurrent tumors and did not usually require combined resection of the bony pelvis, therefore no patients with anterior recurrence were included in this study.

Treatment

In patients whose surgical margins were threatened according to the preoperative assessment, multidisciplinary conferences recommended preoperative RT. All patients were recommended to receive neoadjuvant and/or adjuvant chemotherapy, although the administration was at the discretion of each clinician. Surgical team members included colorectal, urological and orthopedic surgeons. The fundamental surgical process of combined resection of the sacrum was based on the previously described technique of total pelvic exenteration with distal sacrectomy.[12,13] In brief, composite resection of the sacrum was basically performed in a 3- or 4-stage procedure, which consists of the abdominal phase and the perineal phase in the lithotomy position, the sacral phase in the prone position, and the reconstruction phase in the supine position. Since 2010, perineal manipulation has been modified for incorporation into the sacral phase.

Sacrectomy was divided into the three groups: high amputation, transection of the sacrum above the intervertebral disk between the first and second sacrum with sacrifice of the bilateral second sacral nerve; low amputation, transection below the inferior margin of the third sacrum; and middle amputation, which was defined as the intermediate. Transabdominal sacral transection without the sacral phase was adopted in some patients undergoing low amputation.

Previously, we reported the surgical procedure of combined resection of the pubis and ischium.[14] Briefly, the intrapelvic venous network was intercepted, and then transection of the pubis and/or ischium using a threadwire was performed by orthopedic surgeons.

No patients received intraoperative RT in this series. To reduce the rate of postoperative pelvic sepsis, we adopted omental flap as far as possible. Reconstruction using the myocutaneous flap did not be introduced in this series.

Follow-up

Mortality was defined as death from any cause during the hospital stay or within 90 days after surgery. Urinary tract infection was defined when patients were febrile and white blood cell in the urine was positive. As surrogate markers of QOL, the need for a narcotic drug at 1 year after surgery was recorded. The number of patients who had