Laparoscopic Prophylactic Oophorectomy Plus N3 Lymphadenectomy for Advanced Rectosigmoid Cancer

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Background: The primary aim of the present retrospective study was to evaluate the feasibility and efficacy of laparoscopic prophylactic oophorectomy plus N3 lymph node dissection for patients with rectosigmoid cancer. The secondary aim was to explore the clinicopathologic features of ovarian micrometastasis from rectosigmoid cancer.

Methods: We performed 244 laparoscopic resections of rectosigmoid cancer in women during a 6-year period. In them, 34 patients (13.9%) were subjected to prophylactic oophorectomy plus N3 lymphadenectomy in addition to the standard anterior or low anterior resection of rectosigmoid cancer, because the patients presented with ovarian cystic lesions, tethering of the ovary to the primary rectosigmoid tumor, and/or pelvic ascites accumulation, which were postulated as the indicative findings for the synchronous ovarian micrometastasis. The surgical procedures are detailed in the attached video. The surgical outcomes were compared between patients with (n = 34) and without (n = 210) these two additional procedures. In analyzing the clinicopathologic features of ovarian micrometastasis, we included both cases of laparoscopic (n = 34) and traditional open surgery (n = 30), whose prophylactic oophorectomy was performed by the same surgical indications.

Results: Although the operation time was significantly longer (264.2 ± 24.5 vs. 192.5 ± 24.2 minutes, \( P < .0001 \)) in patients with prophylactic oophorectomy and N3 lymphadenectomy, there was no significant difference between patients with and without the two additional procedures in blood loss, wound length, postoperative complications, diverting ileostomy, and mortality. Although flatus passage, hospitalization, postoperative pain, and return to partial activity were statistically different between the study groups, they were deemed clinically unimportant because the difference of mean was very small. Foley removal was delayed in patients with N3 lymphadenectomy by 2 days. With respect to surgical efficacy, we found that patients undergoing the two additional procedures could collect significantly more lymph nodes (22.0 ± 4.0 vs. 14.4 ± 2.4, \( P < .0001 \)) for pathologic staging and facilitated upstaging of nodal status in three patients (8.8%). Patients undergoing prophylactic oophorectomy plus N3 lymphadenectomy could achieve good oncologic outcome, with the

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estimated 5-year survival rate of 62.5% and 69.2% in patients with and without ovarian micrometastasis, respectively. Clinicopathologically, patients with ovarian micrometastasis (n = 15) tended to have vascular invasion of tumor cells, as compared with those without (n = 49). However, ovarian micrometastasis was not related to menstrual status of patients, tumor location, tumor size, morphology, differentiation, mucin production, T stage, nodal invasion, and level of carcinoembryonic antigen.

**Conclusions:** Laparoscopic surgical techniques could be safely applied to perform prophylactic oophorectomy plus N3 lymphadenectomy with acceptable efficacy in a highly selected subset of patients with rectosigmoid cancer.

**Key Words:** Laparoscopic surgery—Prophylactic oophorectomy—N3 lymphadenectomy.

Prophylactic oophorectomy during the surgical treatment of rectosigmoid cancer has been controversial. The pros indicate that the rate of clinically undetectable or microscopic metastasis from a colorectal primary tumor to the ovaries ranges up to 7% in retrospective studies.1–10 Moreover, premenopausal women are perhaps more likely to be unrecognized variants of hereditary nonpolyposis colorectal cancer (Lynch syndrome) and thus more likely to benefit from oophorectomy, given their increased incidence of ovarian cancer.11,12 The cons include the concern that bilateral oophorectomy renders the patient either reliant on hormone replacement therapy or subject to the side effects of estrogen loss, such as atherosclerosis and osteoporosis.13

In our institution, we did not consider that bilateral prophylactic oophorectomy was warranted in all patients of colorectal cancer. This procedure has been limited to patients with findings indicative of ovarian micrometastases, such as tethering of one or both ovaries to the primary rectosigmoid tumor, presence of ovarian cystic lesions, and/or accumulation of ascites in the pelvis. Although the only randomized, prospective trial of prophylactic oophorectomy in colorectal cancer showed no survival benefits between the oophorectomy and no oophorectomy groups,10 we challenged the concept because the surgical indications in this study were too loose. Because this study included all Dukes' stage B and C cases and the incidence of ovarian micrometastasis in patients assigned to prophylactic oophorectomy was zero, it was conceivable that the survival would be without marked difference between patients with and without prophylactic oophorectomy.

On the basis of our initial clinical experience, we considered that patients with clinical findings suggestive of a synchronous ovarian micrometastasis would be the ideal cases to perform prophylactic oophorectomy and get the oncologic benefits, yet unproven. Similarly, the effectiveness of N3 lymph node dissection for the surgical treatment of rectosigmoid cancers remains controversial, although many Japanese colorectal surgeons have been enthusiastic in performing this procedure with their firm belief that extensive removal of extramesenteric lymphatic and perineural tissues would have translated into a survival benefit.14,15 On the other hand, with the progress of laparoscopic techniques in the resection of colorectal malignancies,16 we were curious to know if laparoscopic approach can be safely applied to perform these two complex surgical procedures additional to a standard laparoscopic resection of rectosigmoid cancer.

For the above-mentioned reasons, the present study was therefore conducted, the primary aim of which was to explore the feasibility and efficacy of laparoscopic prophylactic oophorectomy plus N3 lymph node dissection for the treatment of advanced rectosigmoid cancer in women. Furthermore, the clinicopathologic features of patients with ovarian micrometastasis were investigated. We believe further clarification of the clinicopathologic characteristics of ovarian micrometastasis from colorectal cancer will facilitate better treatment for the patients.

**PATIENTS AND METHODS**

**Patient Selection**

This study was started in January 2000. Patients were recruited to undergo laparoscopic prophylactic oophorectomy and N3 lymphadenectomy in addition to a pure laparoscopic anterior or low anterior resection for rectosigmoid cancer according to appropriate eligibility criteria. The inclusion criteria were as follows: (1) clinically tumor-node-metastasis (TNM) stage II or III rectosigmoid adenocarcinomas with the presence of one or more of the following concomitant findings including: ovarian cystic lesions, ascites accumulation in the Douglas pouch, and tethering of one or both ovaries to the primary tumor mass (this was because we hypothesized that