



Suprarenal lymphadenectomy with nephrectomy for refractory ovarian cancer

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Abstract: The effect of debulking surgery is not vague in patients with refractory ovarian cancer because of drug-resistant tumor biology showing rapid growth. However, it can be considered to be beneficial for selected patients expected to show tumor response by postoperative treatment because the better perfused small tumors may favor the action of cytotoxic therapy. Among them, patients with enlarged lymph nodes and *BRCA* mutations can show a relatively high rate of response and improved survival by systematic lymphadenectomy followed by poly ADP ribose polymerase (PARP) inhibitors. However, the resection of enlarged lymph nodes above the renal vein may not be familiar to gynecologic oncologists, in particular, for patients who had undergone previous debulking surgery followed by repetitive chemotherapy. Thus, this video will show the step by step procedure of suprarenal lymphadenectomy and *en bloc* resection of kidney and suprahilar lymph nodes for complete resection of refractory ovarian cancer.

Keywords: Refractory ovarian cancer; suprarenal lymphadenectomy; nephrectomy; olaparib

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Introduction

The role of debulking surgery is not still clear in patients with heavily pretreated patients with recurrent ovarian cancer. In platinum-resistant recurrent ovarian cancer, the surgical effect may decrease due to chemo-resistant tumor biology showing rapid growth (1). In platinum-sensitive recurrent ovarian cancer, the effect of surgical resection has also been reported to reduce by adding bevacizumab to chemotherapy, even though the effect of debulking surgery has been shown to improve survival in the era of chemotherapy (2).

However, the resection of a poorly vascularized tumor that may represent drug resistance and a higher growth fraction can be beneficial because the better perfused small tumors may favor the action of cytotoxic therapy (3). For supporting this hypothesis, recent studies showed the

potential of debulking surgery in selected patients with platinum-resistant recurrent tumor, especially, who had isolated or resectable tumors (4,5).

In particular, systematic lymphadenectomy is effective for improving survival in patients with bulky lymph nodes relapse (6), and postoperative treatment with poly ADP ribose polymerase (PARP) inhibitors can be considered for heavily pretreated patients with *BRCA* mutation because they show a relatively high rate of overall response (31–65%) (7,8), compared with conventional chemotherapy (10–15%) (9).

Thus, we will show the surgical procedure of suprarenal lymphadenectomy for a patient who showed refractory disease represented by lymph node metastasis alone (Video 1). She showed a progression-free survival of more than 12 months after the postoperative treatment of olaparib due to germline *BRCA* mutation. Although some reports showed relevant surgical skills in patients with primary disease

(10,11), we think that this video will help learn systematic lymphadenectomy from common iliac to suprahilar areas not familiar to gynecologic oncologists step by step because of severe adhesion by previous debulking surgery and repetitive chemotherapy.

Operative techniques

Patient selection

A 56-year-old woman visited our clinic for treating refractory ovarian cancer who showed progressive disease after repetitive chemotherapy. Previously, she underwent suboptimal cytoreduction for stage IIIC high-grade serous adenocarcinoma of the ovary, remaining the left suprahilar and aortocaval metastatic lymph nodes. After that, she had received sixth-line chemotherapy for about 4 years before the visit.

Preoperative imaging studies showed enlarged lymph nodes in the paraesophageal, suprahilar, retrocrural, para-aortic, and common iliac areas. In particular, metastatic lymph nodes encircled the left renal vessels. Moreover, the patient showed a germline *BRCA1* mutation. For improving the effect of olaparib as a palliative treatment, we first considered complete resection of metastatic lymph nodes because of drug resistance. For resecting paraesophageal lymph nodes, she received video-assisted thoracoscopic surgery. After that, we performed systematic pelvic and para-aortic lymphadenectomy with left nephrectomy for complete resection, and resection levels, including the suprahilar area, were defined as the guideline by Korean Gynecologic Oncology Group (12).

Operative procedure

Under general anesthesia, the patient took the lithotomy position. After the midline incision is made from the xiphoid process to the pubis, we mobilized the colon and both ureters for exposure of all enlarged lymph nodes and the prevention of iatrogenic injury. Then, we performed systematic lymphadenectomy from common iliac (level 2) to suprahilar areas above level 4.

First, we demarcated the resection tumors between common iliac (level 2) and low para-aortic area (level 3) because of severe adhesion by previous debulking surgery. We then resected enlarged lymph nodes consecutively in presacral (level 2), common iliac (level 2), low para-aortic, and aortocaval areas (level 3). Thereafter, we resected high

para-aortic lymph nodes in line with the resection plane (level 4).

Although we tried to resect enlarged lymph nodes in left suprahilar lymph nodes above level 4, we failed to resect tumors completely. Thus, we resected gastro-colic and gastro-splenic ligaments with exposure of the pancreas, and then, we got the extended view of the suprarenal area. Thereafter, we completely resected right suprahilar and retrocrural lymph nodes and then removed enlarged lymph nodes near the superior mesenteric artery. However, we failed to remove left suprahilar lymph nodes because of severe adhesion to left renal vessels. Thus, we performed *en bloc* resection of the kidney and left suprahilar lymph nodes after ligation of the left renal artery and vein.

In the course of performing the procedure above, severely adhesion between the enlarged lymph nodes and the major blood vessels or organs might preclude complete resection of metastatic tumors. For safe resection of the enlarged lymph nodes, it is helpful to check their boundary through palpation and demarcation. Subsequently, through meticulous dissection and resection by using Metzenbaum scissors, right angle forceps or sealing device is performed without damaging major blood vessels or organs. If complete resection of the enlarged lymph nodes is impossible, the operator can also consider *en bloc* resection of the major organs such as the kidney, as shown in this video if the removal is expected to improve prognosis.

All procedures took 3 hours and 20 minutes, and the estimated blood loss was 650 mL. She was discharged on the twelfth day without complication and showed a progression-free survival of more than 12 months after postoperative treatment by using olaparib.

Comments

Suprarenal lymphadenectomy as a part of systematic lymphadenectomy can be feasible and effective in selected patients with refractory ovarian cancer, especially, who showed lymph node metastasis alone and expectation for the effect of targeted therapy such as PARP inhibitors against *BRCA* mutation.

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Footnote

Conflicts of Interest: Both authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/gs.2020.04.08>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. This study was approved by the Institutional Review Board from Seoul National University College of Medicine & Seoul National University Hospital (No. H-1906-034-1038).

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