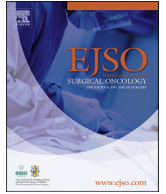




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## Minimally invasive salvage lymphadenectomy in gynecological cancer patients: A single institution series

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### ABSTRACT

**Background:** to assess the feasibility of minimally invasive surgery in the management of lymph-nodal recurrences of gynecological cancers, in terms of surgical and oncological outcomes.

**Methods:** we retrospectively collected patients with isolated lymph-nodal recurrent disease of gynecological malignancies who underwent to minimally invasive lymphadenectomy at Catholic University of the Sacred Heart in Rome (Italy), from January 2013 to November 2017.

**Results:** Forty patients were considered eligible (31 LPS, 9 Robot); 24 (60.0%) with an ovarian cancer, 8 (20.0%) with a cervical cancer and 8 (20.0%) with an endometrial cancer recurrence. The most frequent site of lymph-nodal recurrence was represented by the aortic region (47.5%), while 18 patients (45.0%) experiencing pelvic lymph-nodal recurrence, 2 (5.0%) both pelvic and aortic relapse, and only 1 (2.5%) had an hepato-celiac lymph node recurrence. No patient required a laparotomic conversion. Median operative time was 220 min, median EBL was 80 mL, and median post-operative hospital stay was 2 days. There were 2 (5.0%) intra-operative and 4 (10.0%) post-operative complications, of which 2 were grade 3. The median follow-up was 22.5 months, and during this time 15 patients showed another relapse with a median time to progression of 12 months. Seven women died because of the disease. The 2-year post-relapse disease-free survival (PR-DFS) was 54.7%, and the 2-year post-relapse overall survival (PR-OS) was 79.3%.

**Conclusions:** In our experience minimally invasive surgery is a valid therapeutic approach in very select patients with localized lymph-nodal recurrence of gynecological cancers, with benefits about peri and post-operative morbidities and without compromising their oncological outcome.

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### Introduction

Therapeutic strategy for gynecological cancer patients bearing lymph node recurrences has not been established in an univocal manner, and represents a clinically challenging situation for gynecologic oncologists. Indeed, plan of treatment is selected on the basis of multiple factors including anatomical site of relapse,

infiltrative pattern, primary treatment(s), chemo- and/or radio sensitivity, and clinical characteristics of patients [1–7]. Consequently, it is difficult to select which patients with recurrent disease will benefit from surgery: indeed, the role of surgery in the recurrent setting is totally different compared to the upfront treatment, thus requiring a careful balance between expected benefits and potential morbidity.

As far as lymph node relapse is concerned, some biological and clinical lines of evidence suggest that lymph node recurrences from ovarian cancer would be better managed with surgery than medical treatment, given the low growth rate, and a relatively more indolent behaviour compared to parenchymal and peritoneal disease

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[4,8,9]. On the other hand, management of lymph node relapse from endometrial and cervical cancer appears mainly conditioned by previous treatment used in primary setting (exclusive or adjuvant radiation) [10–12].

There are currently very few evidences on the role of the minimally invasive surgery (MIS) in patients with lymph node recurrence of gynecological cancers [13–19]. However, Ramirez suggests that in the era of personalized approach and innovative biotechnology a laparoscopic or robotic approach for resection of an isolated recurring disease should be considered and that such procedures should only be performed by surgeons with advanced skills in complex MIS [20].

The current study presents the results of a retrospective analysis of a series of patients with lymph node recurrence managed with MIS; peri- and post-operative results, as well as clinical outcomes have been evaluated.

## Material and methods

After obtaining the Institutional Review Board (CICOG-20-4-18\80) approval, we performed a retrospective review and analysis of data of patients who underwent minimally invasive lymphadenectomy for recurrent gynecological malignancies at the Gynecologic Oncology Unit of the Catholic University of Rome, Italy, from January 2013 to November 2017.

All patients had already provided a written informed consent for their data to be collected and analyzed for scientific purpose, according to our institutional policy. Inclusion criteria of this retrospective analysis were the following: all patients with recurrent cancer disease localized to pelvic and/or aortic lymph node regions documented by high quality imaging (i.e. CT scan, PET/CT scan) underwent minimally invasive lymphadenectomy. Exclusion criteria were represented by: presence of extra-abdominal disease documented by radiological exams or diffuse peritoneal carcinomatosis documented at time of laparoscopic abdominal evaluation, presence of ascites, and documentation for any medical or intra-operative reasons precluding MIS approaches.

The following data were retrieved from medical records and included: age, body mass index (BMI), tumor histology and International Federation of Gynecology and Obstetrics (FIGO) stage at time of initial diagnosis, previous surgery. As far as operative outcomes are concerned we planned to collect data relative to: operative time, estimated blood loss (EBL), length of post-operative hospital stay, and morbidities. Data about intra- and post-operative complications occurring within 30 days from surgery were retrieved; surgical morbidity was classified according to Memorial Sloan Kettering Cancer Center (MSKCC) surgical grading system [21].

All patients underwent preoperative radiological examinations to evaluate the extension and site of the disease and its anatomical relationship with the peritoneal and retroperitoneal structures (evaluation of possible involvement of the ureters, bowel, nerves and vessels) in order to better plan the work of the surgeon. Post-operative radiological work-up were performed in order to assess the issue of residual disease and to plan adjuvant treatments.

## Statistical analysis

Descriptive analysis of data was carried out; post-relapse disease-free survival (PR-DFS) and post-relapse overall survival (PR-OS) were calculated from the date of salvage lymphadenectomy to documentation of disease progression or the date to death of disease, respectively.

The SPSS statistical software program, version 17.0 (SPSS Inc., Chicago, IL, USA) was used.

## Results

During the study period, 125 patients with recurrent gynecological cancer underwent pelvic and/or aortic or hepato-celiac lymphadenectomy in our oncological center; 40 of them were approached with MIS.

All demographic and clinical characteristic of patients are shown in **Table 1**: median age was 58 years (range 33–77), 10 patients were older than 65 years, and median BMI was 26 (range 19–34).

Twenty-two patients underwent previous lymphadenectomy at time of primary surgical treatment; median time to relapse after primary surgery was 23 months (range 8–180).

The most frequent localization of lymph node recurrence was represented by the aortic region (47.5%); there were 18 patients (45.0%) experiencing pelvic lymph nodes recurrence, and 2 patients (5.0%) with both pelvic and aortic relapse. Only 1 patient (2.5%) had experienced lymph node recurrence at the level of hepato-celiac region.

Details about surgical procedures at salvage lymphadenectomy and pathological findings are summarized in **Table 2**; laparoscopy was the most frequent approach to salvage lymphadenectomy accounting for 77.5% of cases. Pathological evaluation of resected recurrent disease confirmed neoplastic involvement in all cases; in the whole series, median number of metastatic lymph nodes was 2 (range 1–15) and median tumor size was 22 mm (range 10–55). Complete removal of lymph node disease was confirmed by post-operative radiological examination in all cases.

## Peri-operative outcomes and morbidity

As far as perioperative outcomes are concerned, median operative time was 220 min (range 85–480), and median EBL was 80 mL (range 20–300). Median post-operative hospital stay was 2 days (range 1–13) (**Table 3**).

**Table 1**  
Demographic and patient characteristics.

Characteristics	N. (%)
<i>All cases</i>	40
<b>Age, years</b>	
<b>Median (range)</b>	58 (33–77)
N. cases $\geq 65$ yrs	10 (25.0)
<b>Body Mass Index (BMI), kg/m<sup>2</sup></b>	
<b>Median (range)</b>	26 (19–34)
N. cases with BMI $\geq 30$	11 (27.5)
<b>N. previous abdominal surgeries</b>	
<b>Median (range)</b>	2 (1–6)
<b>Previous lymphadenectomy</b>	
No	18 (45.0)
Yes	22 (55.0)
<b>Interval from primary surgery</b>	
<b>Median (range)</b>	23 (8–180)
<b>Type of gynecological cancer</b>	
<b>Ovarian cancer</b>	24 (60.0)
Early stage	3
Advanced stage	21
<b>Cervical cancer</b>	8 (20.0)
Early stage	2
Locally Advanced	6
<b>Endometrial cancer</b>	8 (20.0)
Low risk	4
Intermediate-High risk	4
<b>Primary treatment</b>	
Radical Surgery + Adjuvant Chemotherapy	24 (60.0)
Radical Surgery	5 (12.5)
Neo-Adjuvant Chemotherapy + Radical Surgery	11 (27.5)
<b>Site of recurrence</b>	
Aortic LNs	19 (47.5)
Pelvic LNs	18 (45.0)
Aortic and pelvic LNs	2 (5.0)
Hepato-celiac LNs	1 (2.5)

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