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Original Article

Laparoscopic Splenectomy for Secondary Cytoreduction in Ovarian Cancer Patients With Localized Spleen Recurrence: Feasibility and Technique

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ABSTRACT **Study Objective:** To investigate the feasibility of laparoscopic splenectomy in patients with recurrent ovarian cancer with isolated spleen metastasis.

Design: (Canadian Task Force classification III).

Setting: Tertiary referral centre in Rome, Italy.

Patients: Eight women with an isolated platinum-sensitive splenic relapse of ovarian cancer.

Intervention: Between February 2013 and May 2015, 8 women with an isolated platinum-sensitive splenic relapse of ovarian cancer were submitted to laparoscopic splenectomy.

Measurements and Main Results: All patients underwent laparoscopic splenectomy without conversion to an open approach. The median estimated intraoperative blood loss was 100 mL (range, 50–200 mL). The median operating room time was 200 minutes (range, 80–275 mL). No intraoperative complication occurred, and no intraoperative blood transfusions were required. The median length of hospital stay was 3 days (range, 2–5 days). Complete tumor resection was achieved in all patients. The median interval from surgery to adjuvant chemotherapy was 16 days (range, 14–24 days). After a median follow-up of 23 months (range, 6–32 months), no secondary recurrence or death of disease has been observed.

Conclusion: Our findings indicate that a laparoscopic approach for spleen removal is feasible in selected patients with a splenic relapse of ovarian cancer when performed in a tertiary referral center by a well-trained surgeon. Journal of Minimally Invasive Gynecology (2016) 23, 425–428 © 2016 AAGL. All rights reserved.

Keywords: Laparoscopy; recurrent ovarian cancer; splenectomy

It is well known that surgical secondary cytoreduction can improve oncological outcomes in women with a platinum-sensitive localized relapse of ovarian cancer [1,2]. Nevertheless, there are very few reports in the literature on patients submitted to splenectomy for isolated splenic recurrent ovarian cancer (ROC) [3]. In recent years, minimally invasive surgery (MIS) techniques have been increasingly used in surgical and gynecologic oncology practice, because they offer multiple advantages over traditional laparotomy, including smaller incisions, improved visualization, less blood loss, reduced need for analgesics, decreased morbidity, more rapid recovery, and shorter time to the initiation of adjuvant therapy [4,5]. In particular, MIS has been used successfully in selected patients with ROC, with a lower incidence of morbidities compared with conventional open surgery, apparently with no compromise of survival [6–13]. For these reasons, the combination of secondary cytoreduction and laparoscopy may represent an attractive therapeutic option for managing patients with isolated splenic platinum- sensitive ROC.

Given these assumptions, we evaluated the feasibility of this approach in a prospectively collected series of woman

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with isolated spleen recurrence. We analyzed early and late postoperative complications, as well as oncological outcomes.

Patients and Methods

Since October 2011, at the Division of Gynaecologic Oncology of the Catholic University in Rome and Campobasso, we have been taking a laparoscopic surgical approach for patients with ROC with an isolated pattern of relapse who meet the following criteria: good clinical performance status (Eastern Cooperative Oncologic Group performance status 0–2), platinum-free interval >6 months, isolated or discrete (<3 nodules) pattern of recurrence (peritoneal, lymph node, or parenchymal), adequate and precise radiologic localization of recurrent disease using positron emission tomography computed tomography (PET-CT), and absence of ascites found on the preoperative workup or at the beginning of the laparoscopic procedure [9].

Between February 2013 and May 2015, 8 patients with ROC with an isolated splenic lesion meeting the foregoing criteria were selected for MIS and underwent successful laparoscopic splenectomy (Table 1). Given their clinical and surgical characteristics, all 8 patients were enrolled in a randomized Phase III clinical trial currently underway in our institution (HORSE [HIPEC in Ovarian recurrence: Randomized trial on Survival Evaluation]; NCT01539785), and 3 of them were also submitted to hyperthermic intraperitoneal chemotherapy (HIPEC).

Table 1

Patients' clinicopathological characteristics and treatment details

Characteristic	Value
All cases, n	8
Age, yr, median (range)	57 (45–68)
FIGO stage, n (%)	
IC	1 (10)
IIIC	7 (90)
Tumor histotype, n (%)	
Serous	7 (90)
Endometrioid/clear cell	1 (10)
Tumor grade	
G1	0 (0)
G2 or G3	8 (100)
Residual tumor at PDS	
0	8 (100)
PFI-1, mo, median (range)	24 (9–40)
EBL, mL, median (range)	100 (50–200)
Operative time, min, median (range)	200 (80–275)
Hospital stay, d, median (range)	3 (2–5)
Time to adjuvant chemotherapy, d, median (range)	16 (14–24)
PFI-2, mo, median (range)	23 (6–32)

EBL = estimated blood loss; FIGO = International Federation of Gynecology and Obstetrics; PDS = primary debulking surgery; PFI-1 = primary platinum-free interval; PFI-2 = secondary platinum-free interval.

Informed consent for surgery was obtained from each patient. Patient demographic, surgical, postoperative, and follow-up data were obtained from patient charts, collected prospectively in the context of the HORSE trial. The university's Institutional Review Board agreed with the purposes of the present analysis.

The procedures were performed by senior surgeons (G.S., V.C., and V.G.) with extensive training and experience in gynecologic oncology and in MIS. Data on International Federation of Gynecology and Obstetrics (FIGO) disease stage at the primary cytoreduction, type of surgery, histological type and grade, operating time, estimated blood loss (EBL), length of hospital stay, and residual tumor at the end of surgery were collected prospectively. Intraoperative and early postoperative complications were recorded according to the Chassagne classification scheme [14]. The patients were discharged once they were medically stable and able to tolerate oral intake. All patients received vaccination for *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Neisseria meningitidis*. All patients underwent a PET-CT scan 1 month after surgery to exclude any localization of disease not removed or detected during laparoscopic surgery. Intravenous adjuvant chemotherapy was started as soon as it could be tolerated.

The primary platinum-free interval (PFI-1) was defined as the time between the end of primary treatment and the first recurrence. The secondary progression-free interval (PFI-2) was defined as the time between secondary cytoreduction and the secondary recurrence of disease diagnosed by physical examination, marker assay, or radiologic imaging or date of last follow-up.

Surgical Technique

All procedures were performed using a transumbilical or left upper quadrant open laparoscopy approach, with a 10-mm balloon trocar. A rigid 5- or 10-mm scope (EndoEYE; Olympus Winter & Ibe, Hamburg, Germany) or a flexible 0 degree or 3-dimensional (3D) camera system were used. Three or 4 abdominal ancillary trocars were placed in the lower and/or upper abdomen after careful surgical intraoperative consideration. Perioperative antibiotic therapy and postoperative thromboembolic prophylaxis with low molecular weight heparin were used routinely.

The surgical procedures were performed in an integrated minimally invasive operating room with high-definition laparoscopic equipment (EndoAlpha; Olympus). The procedures included a careful laparoscopic inspection of the abdomen and pelvis to assess the absence of carcinomatosis and/or other neoplastic lesions. Lysis of adhesions was performed to free all intra-abdominal structures. Various laparoscopic instruments and techniques were used to achieve optimal cytoreduction, including sharp scissors or bipolar graspers (Olympus), Thunderbeat (Olympus) and Caiman (Aesculap, BBraun) operating instruments, ultrasonic