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Original Article

Long-Term Follow-Up After Laparoscopic Management of Endometrial Cancer in the Obese: A Fifteen-Year Cohort Study

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ABSTRACT **Study Objective:** To assess the surgical outcomes and long-term results of laparoscopic treatment of endometrial cancer in obese patients, and compare these results with those of nonobese women.

Design: Retrospective cohort study (Canadian Task Force classification II-2).

Setting: Two referral cancer centers.

Patients: Fifty-two obese and 155 nonobese women with clinical stage I endometrial cancer managed by laparoscopy from 1990–2005 in two referral centers.

Interventions: Demographic, surgical, perioperative and pathological characteristics of obese women and nonobese women with endometrial cancer treated by laparoscopy were analyzed and then compared. Recurrence-free and overall survival was calculated by use of Kaplan-Meier method.

Measurements and Main Results: Median BMI of the study population was 26.2 Kg/m^2. Median BMI among obese patients was 34.2 Kg/m^2. The conversion rate was independent from the BMI of the patient (3.8% vs 4.5%, p = .80). Neither mean operative time (187.5 vs 172 min, p = .11) neither hospital stay (5.2 vs 4.9 days, p = .44) were related with BMI. Lymphadenectomy was considered not feasible in 7 obese (17%) and 8 nonobese (7%) women (p = 0.09). Fewer lymph nodes were retrieved among obese women (8 versus 11, p <.0002). No differences were found between the groups in terms of perioperative complications. Median follow-up was 69 and 71 months for the obese and nonobese, respectively (p = .59). Overall and disease-free 5-year survival rates did not differ between obese and nonobese patients (90.3% and 87.5% versus 88.5% and 89.8%, respectively).

Conclusion: Despite some limitations, the laparoscopic approach seems to be particularly useful for obese patients with endometrial cancer, with similar survival and recurrence rates and without any more complications compared to the nonobese population. Journal of Minimally Invasive Gynecology (2011) 18, 589–596 © 2011 AAGL. All rights reserved.

Keywords: Laparoscopy; Endometrial cancer; Obesity; Long-term follow-up; Survival

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Endometrial cancer is a disease of the affluent, developed world, where epidemiological studies have shown that ≥40% of its incidence can be attributed to excess body weight [1]. This relationship can be interpreted in the light of alterations in endogenous hormone metabolism and the "unopposed estrogen" hypothesis, which proposes that endometrial carcinoma may develop as a result of the mitogenic effects of estrogens, when these are insufficiently

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counterbalanced by progesterone [2]. Several studies have reported that between 60–68% of women with early-stage endometrial cancer are obese [3,4], and that the risk of death for morbidly obese women with EC is 6.25 times higher than for women who are not obese [5]. In addition to increasing the risk of endometrial cancer, obesity may place a patient at increased risk for medical comorbidities including diabetes and cardiovascular diseases [6]. Therefore obese women with endometrial cancer are often allocated to the category of high surgical risk. For the medically operable candidates with early-stage disease, surgery is the primary treatment. Staging surgery includes peritoneal washings, total hysterectomy and bilateral salpingo-oophorectomy. Although lymphadenectomy is recommended [7,8], it remains controversial [9]. Historically, the staging procedure has been performed via a midline vertical incision. However, abdominal surgery in obese patients is difficult due to limited access and it is associated with increased morbidity and wound complications [10,11].

Laparoscopy offers several advantages and lower morbidity than laparotomy for patients undergoing surgical treatment for endometrial cancer and today it is considered to be the preferred approach [12–15]. However, our knowledge about its feasibility and oncological safety in obese women with endometrial carcinoma is still limited. Although to date several studies have addressed this issue [11, 16–27], most of them included a limited number of patients, with a short follow-up period.

The objective of this study is to present the surgical outcomes and long-term follow-up of laparoscopic management of endometrial cancer in a consecutive cohort of obese patients, and compare these results with those of nonobese patients with endometrial carcinoma treated laparoscopically during the same period.

Patients and Methods

The medical records of 207 consecutive patients with early-stage (clinical stage I) endometrial cancer who underwent laparoscopic staging at Clermont-Ferrand University Hospital and Jean Perrin Cancer Center between February 1990 and December 2005 were retrospectively reviewed. Institutional Review Board exemption was granted by both centers because of the retrospective nature of this study.

For the purposes of this analysis we defined obesity as body mass index (BMI) ≥ 30 kg/m^2, and morbid obesity as BMI ≥ 40 kg/m^2. From the databases of the two centers we identified 52 (25.1%) obese patients and 155 nonobese women, to be included in the study group.

Data collected included patient age, parity, menopausal status, BMI, operating time, conversion to laparotomy, need for blood transfusion, intraoperative and postoperative complications, length of hospital stay, histological grade, number of lymph nodes yielded, FIGO 1988 surgical stage, adjuvant therapy, duration of follow-up and development of disease recurrence, site of recurrence or death.

It should be noted that although the FIGO staging changed in 2009 [28], this change occurred after the creation of our database. Therefore all our patients were staged and managed according to the old system. Moreover most studies about laparoscopic management of endometrial cancer, including most recent trials [12–15], are based on the old system. Additionally, since no prognostic difference between the two systems for stage I endometrial carcinoma has been noted [29], we have used the old system in this report unless otherwise stated.

Preoperative work-up included pelvic examination, chest X-ray, and abdomino-pelvic magnetic resonance imaging (MRI) in most cases. Preoperative histology was obtained by dilation and curettage or office biopsy (endometrial sampling) using a Pipelle.

During the study period the laparoscopic approach was attempted in all women with early-stage endometrial cancer, unless there were specific contraindications for laparoscopic surgery. Contraindications for laparoscopy were the following: anesthetic contraindication to pneumoperitoneum, limited vaginal access or/and a bulky uterus where vaginal removal might require morcellation and presence of gross adenopathies at MRI.

The pneumoperitoneum was created by Veress needle insertion in the abdominal left upper quadrant as previously described [30]. Laparoscopy started with a meticulous inspection of all the pelvic and abdominal structures looking for peritoneal disemination. If there was evidence of peritoneal spread we converted to laparotomy for completion of debulking and staging. The laparoscopic procedure included: peritoneal washing for cytological examination, total laparoscopic hysterectomy with bilateral salpingo-oophorectomy (TLH/BSO) and pelvic $\pm$ para-aortic lymphadenectomy depending on frozen section or preoperative histology results (Video). Operating times were recorded from the pneumoperitoneum creation to the skin closure, including time waiting for frozen section evaluation. Hospital stay was defined as the number of days from operation to hospital discharge.

Pelvic lymphadenectomy was performed for all women with myometrial invasion, grade 3 tumours and those who had non-endometrioid histology. The nodes yielded were routinely retrieved in an endoscopic bag and sent to the pathologist for frozen section (Video). Paraaortic lymphadenectomy was performed only if the pelvic nodes were shown to be involved at frozen section.

Our technique for TLH/BSO has been described previously (Video) [31]. To display the vaginal fornices and the uterine vessels we routinely used a uterine manipulator (*Clermont-Ferrand*, Karl Storz, Tuttlingen, Germany) with a smooth tip specially designed for use in oncology. Although the coagulation of the tubes before uterine cannulation is not our systematic practice, it was done in some cases according the surgeon's preferences.

Infracolic omentectomy was performed in cases of high-risk histologic subtype and grade 3 tumours.