



## Original research

## Early endometrial carcinoma therapy in morbid obesity: A retrospective study comparing open and laparoscopic



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### HIGHLIGHTS

- The laparoscopic surgery therapeutic outcomes for the endometrial cancer patients with morbidly obese in China.
- The incidences of complication of the laparoscopic surgery group were significantly lower.
- The hospital stay of the laparoscopic surgery group was shorter.
- Laparoscopic surgery is a safe and rational therapeutic strategy for the morbidly obese endometrial cancer patients.

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### ABSTRACT

**Object:** The present study sought to explore the therapeutic outcome of laparoscopic surgery for the endometrial cancer patients with morbidly obese in china.

**Methods:** The morbidly obese patients with clinical stage I or II endometrial cancer received laparoscopic surgery (LS) at the Obstetrics and Gynecology centers of PLA general hospital between November 2012 and November 2014. The clinical outcomes of these surgeries were compared with a historical cohort of similar morbidly obese patients who had received the open surgery (OS). In the present study, the morbidly obesity was defined as the body mass index was bigger than 40 kg/m<sup>2</sup>. The basic characteristics of the involved patients, the therapeutic effects of the surgery, as well as the incidence of perioperative complications were systematically compared between the two groups.

**Results:** Totally 120 patients were included in the present study (respectively 60 patients in the LS group and the OS group). There was no statistical difference between the LS group and the OS group in terms of patient age or BMI. However, the incidence of intraoperative complication in the LS group was significantly lower than that in the OS group (5.0% vs. 16.7%;  $P = 0.04$ ). Moreover, the incidence of postoperative complication in the OS group was higher than that in the LS group (20.0% vs. 6.7%;  $P = 0.03$ ). The length of hospital stay in the LS group was longer than that in the OS group (6 vs. 11 days;  $P = 0.02$ ). Furthermore, the rates of (pelvic) lymph node dissection and para-aortic node dissection in the LS group were not significantly different from the OS group.

**Conclusion:** LS is verified to be a safe and rational therapeutic strategy for the endometrial cancer patients with morbidly obese. The incidence of perioperative complications is significantly lower in comparison with the OS.

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## 1. Introduction

Endometrial cancer is one of the most common causes of the cancer-related death in the United States, and results in more than

8100 death in 2013 [1]. Recent investigations suggest that endometrial cancer accounts for 6–9% of all women cancer in Western countries. Generally, the open surgery (OS) is considered as a classic therapeutic strategy for this disease [2]. Obesity, as a strong risk factor for the etiology of endometrial cancer, may also correlate with the survival and prognosis of these patients. The prevalence of obese is increasing in the overweight population, and developing into a significant health problem [3]. The World Health

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Organization and Health Canada divide the obesity into 3 categories based on the body mass index (BMI): class I (BMI, 30–35 kg/m<sup>2</sup>), class II (BMI, 35–40 kg/m<sup>2</sup>), and class III (BMI > 40 kg/m<sup>2</sup>) [4]. The morbidly obese population, which is defined as patient having a body mass index  $\geq 40$  kg m<sup>2</sup>, increased by 70% between 2000 and 2010. Particularly, it is more common among the females in American [5].

The incidence of endometrial cancer is increasing in the obese population. Recently, several studies based on the morbidly obese population proposed that the laparoscopic surgery (LS) should act as a feasible therapeutic method for the endometrial cancer and it might result in fewer perioperative complications than the OS [6,7]. However, a randomized, controlled trial compared the therapeutic effects between the LS and OS, and found that LS showed no benefit in terms of the incidence of complications [8]. Theoretically, it is always hypothesized that these elder patients with obese would benefit more from LS compared with the younger patients [9–11]. Nevertheless, there is no systematical research that particularly concentrates on the therapeutic strategy for these endometrial cancer patients with morbidly obese hitherto. Therefore, the present study sought to testify the whether the surgical outcomes of LS was comparable to the OS for the morbidly obese patients. It was found that the incidence of perioperative complications of LS was significantly lower in comparison with the OS. For the first time, our research verified that the LS could act as a safe and feasible therapeutic strategy for the endometrial cancer patients with morbidly obese in China.

## 2. Methods

### 2.1. Study design and patients

This trial was designed as a retrospective study. The study protocol was approved by the Human Research Ethics Committees of PLA General Hospital and all of the related patients. The standard surgical approach of OS was compared to the experimental surgical procedure of LS. The inclusion criteria of the enrolled patient included: a) the diagnosis of endometrioid-type endometrial cancer was verified by preoperative histological examination; b) the myometrial invasion was less than 50%; c) no evidence of lymph node metastasis was found by the preoperative imaging examination; d) the patient was older than 18 years with the BMI > 40 kg/m<sup>2</sup>. Particularly, these patients with nonendometrioid histology were verified by preoperative biopsy and were excluded from current analysis.

### 2.2. Surgical procedure and data collection

All patients received a bowel preparation and a 3-days prophylactic antibiotic treatment preoperatively (oral administration of metronidazole at the dose of 0.4 g, 3 times/day). Subsequently, all patients were subjected to the hysterectomy combined with pelvic lymphadenectomy. The LS was performed following the previously described techniques [12]. Briefly, the patient was placed in lithotomic position and a uterine manipulator was positioned (MU070, AB Medica, S.p.A., Lainate, Italy). According to our institution protocol, the pelvic lymphadenectomy includes external iliac, superficial and deep obturator nodes in case of grade 1 with deep or grade 2 with more than one-third myometrial invasion tumor. Finally, the vaginal wall was transected using the monopolar coagulation and all the specimens were retrieved from the vagina. The basic characteristics of patients, the tumor staging, grading and histotypes, the surgical operating time, the blood loss, the incidences of operative or post surgical complications, the conversion rates to laparotomy, the incidence of blood transfusion, as well as the length of hospital stay were compared between the two groups. The post-surgical complication was defined as an adverse event

occurred within 30 days after surgery.

### 2.3. Statistical analysis

The Normally distributed continuous variables were presented as mean  $\pm$  standard error of the mean (S.E.M.). The categorical variables were expressed as absolute number or percentages. All of the statistical analyses were performed using the SPSS 16.0 software (SPSS Inc., Chicago, Illinois, USA). Student's *t*-test was used to analyze the normally distributed, descriptive continuous variables. Chi-square test or Fisher's exact test was used to compare the qualitative variables. Differences were considered statistically significant if the *P* value was equal to or less than 0.05.

## 3. Results

### 3.1. Patient groups and basic characteristics

From January 2013 to December 2015, totally 120 morbid obesity patients with endometrial cancer (FIGO stage I–II) were drawn from six participating tertiary Obstetrics centers and were screened for the enrollment. There were respectively 60 patients in the LS group and OS group. The basic characteristics of patients in the LS group and OS group were shown in Table 1. The average age of the LS group was 61 years old (range between 41 and 87 years) and the average BMI was 46.3 kg/m<sup>2</sup> (range 40–66.4 kg/m<sup>2</sup>). Meanwhile, the average age of the OS group was 62 years (range 39–84 years) and the average BMI was 45.8 kg/m<sup>2</sup> (range 40–75 kg/m<sup>2</sup>). No statistically significant difference was founded between the two groups in terms of age (Student's *t*-test. *P* = 0.45) or BMI (Student's *t*-test. *P* = 0.16).

Furthermore, the patients in both groups had similar pelvic surgery history. The histological examinations suggested that the pathology of all the patients were endometrioid-type endometrial cancer. In the LS group, there were 12 patients at the Stage IA, 23 patients were at the Stage IB, 5 patients were at the Stage IC, 15 patients were at the Stage IIA and 5 patients were the at Stage IIB; Meanwhile, in the OS group, there were 11 patients at the Stage IA, 25 patients at the Stage IB, 3 patients at the Stage IC, 16 patients at

**Table 1**

The basic characteristics of patients in the LS group and OS group.

	(LS) N = 60	(OS) N = 60	<i>P</i> value
Age (median; range) years	61 (40–87)	62 (39–84)	0.45 <sup>a</sup>
BMI (median; range) kg/m <sup>2</sup>	46.3 (40–66.4)	45.8 (40–75)	0.16 <sup>a</sup>
Previous abdominal surgery			0.75 <sup>b</sup>
Yes	10	9	
No	50	51	
Histological subtype			>0.99 <sup>c</sup>
Endometrioid adenocarcinoma	60	60	
FIGO stage			0.46 <sup>b</sup>
IA	12	11	
IB	23	25	
IC	5	3	
IIA	15	16	
IIB	5	5	
IIIA/IIIB/IIIC	0	0	
IVA/IVB	0	0	
Grade			0.12 <sup>b</sup>
1	43	45	
2	9	8	
3	8	7	

LS: laparoscopic surgery; OS: open surgery; BMI: body mass index.

Data are expressed as median (range) or absolute number (%).

<sup>a</sup> Student's *t*-test.

<sup>b</sup> Chi-square test.

<sup>c</sup> Fisher's exact test.

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