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Obesity is not a Rate Limiting Step during Open Procedures in Endometrial Cancer Surgery

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Abstract

Objective: To determine the role of obesity on the dissected lymph node counts during endometrial cancer surgery.

Materials and Methods: Two hundred endometrium cancer patients who had surgical staging between January 2012 and January 2016 at Zekai Tahir Burak Woman's Health Education and Research Hospital were analysed retrospectively for dissected lymph node counts with regard to the obesity classification. Operations were performed by four senior gynecological oncologists and no self-retaining retractors had been used during the operations.

Results: Median age of the patients was 58 and median body mass index (BMI) was 31.8 kg/m^2 (ranging 20.1-51.2 kg/m^2). The number of mean dissected lymph nodes for pelvic and paraaortic areas were 40.2 ± 16 and 18.1 ± 9.6, respectively. Endometrioid, serous and clear cell histology were detected in 79.1%, 6% and 5.5% of cases, respectively. The mean number of dissected lymph node counts in pelvic and paraaortic lymph node groups were categorized due to BMI status and analysed for BMI <30 *vs.* ≥ 30 (non-obese *vs.* obese), BMI <35 *vs.* ≥ 35 (below class II obesity *vs.* class II-III obese) and BMI <40 *vs.* 40 (non-class III obese *vs.* class III obese) kg/m^2. There were not any statistical differences between the groups for dissected lymph node counts.

Conclusion: During staging surgery for endometrial cancer, obesity is not a rate-limiting step for pelvic and paraaortic lymphadenectomy, even the surgical team does not use any self-retaining retractors.

Keywords: Obesity; Endometrial cancer; Lymphadenectomy; Pelvic; Paraaortic

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Introduction

Endometrial cancer is the most common gynecologic malignancy in the world. Since, many patients are diagnosed with an early stage disease, lymphadenectomy is generally not necessary and prognosis is quite well [1]. On the other hand, lymph node dissection is a mandatory step during the surgical treatment of most high grade and high stage endometrial cancers [2]. Obesity is an important risk factor for the development of endometrial cancer and has a correlation with survival and prognosis [3]. Obesity is generally linked with a well-differentiated endometrial cancer, however some studies showed a significant impact of obesity on worse prognosis [4,5], actually the effect of obesity on survival is a debate [6]. The prevalence of obesity is increasing tremendously in the world and obesity is not only a risk factor for metabolic and cardiovascular diseases [7] but also carcinogenesis [8]. Mainly, obesity is categorized into 3 groups due to the body mass index (BMI) by the World Health Organisation (WHO). BMI values, 30.0-34.9, 35.0-39.9 and ≥ 40.0 kg/m^2 are named as class I, II and III obesity, respectively. Meanwhile, obesity may cause disadvantages during the surgical treatment of endometrial cancer and it may generate some difficulties and adverse outcomes [9]. Here, we analysed the role of obesity on the number of dissected lymph node counts during endometrial cancer surgery in open procedures.

Materials and Methods

Two hundred endometrial cancer patients who had surgical staging between January 2012 and January 2016 at Zekai Tahir Burak Woman's Health Education and Research Hospital were analysed retrospectively. Patients who had the diagnosis of endometrial cancer preoperatively by endometrial sampling with pipelle or curettage were scheduled for hysterectomy with or without bilateral salpingo-oophorectomy. Lymphadenectomy was performed due to Mayo Clinic criteria [10], except from low risk patients; grade 1 or 2 endometrioid type with myometrial invasion ≤

Table: The relationship between BMI and number of dissected lymph nodes for pelvic and paraaortic area.

	Obese *vs.* non-obese		
	≥30 kg/m^2 (n=122, 61%)	<30 kg/m^2 (n=78, 39%)	p
Pelvic lymph node count (n)	40.8 ± 17.4	39.3 ± 13.5	>0.05
Paraaortic lymph node count (n)	18.3 ± 10.2	17.7 ± 8.8	>0.05
	Class II-III obese vs below class II obesity		
	≥35 kg/m^2 (n=62, 31%)	<35 kg/m^2 (n=138, 69%)	p
Pelvic lymph node count (n)	38.8 ± 17.1	40.9 ± 15.4	>0.05
Paraaortic lymph node count (n)	16.6 ± 9.6	18.7 ± 9.6	>0.05
	Class III obese vs non-class III obese		
	≥40 kg/m^2 (n=25, 12.5%)	<40 kg/m^2 (n=175, 87.5%)	p
Pelvic lymph node count (n)	39.2 ± 22.1	40.4 ± 15	>0.05
Paraaortic lymph node count (n)	15.9 ± 11	18.4 ± 9.4	>0.05

50% and tumor diameter ≤ 2 cm. Patients were categorized and analyzed due to BMI status <30- ≥ 30, <35- ≥ 35 and <40- ≥ 40 kg/m^2. Laparoscopic lymphadenectomy, sentinel lymph node biopsy and open procedures in which self-retaining retractors used were exclusion criteria for the study. Institutional Board Approval and informed consent was maintained for the study.

Operations were performed with the mentorship of four senior gynecological oncologists and systematic pelvic and paraaortic lymph node dissection were performed to all patients. Laparotomy with midline vertical incision, taking lymph nodes around the external iliac vessels, obturator region, and common iliac vessels bilaterally and paraaortic area up to the level of left renal vein was the standart procedure for all patients. External iliac lymph nodes, obturator lymph nodes and common iliac nodes were included in pelvic lymph node group and lymph nodes above the common iliac vessels up to left renal vein were included in paraaortic node group. Pathological specimens were evaluated by senior gynecological pathologists working at the hospital. Statistical analyses were performed by using Student's t test.

Results

Two hundred patients were operated for endometrial cancer; hysterectomy with bilateral salpingo-oophorectomy, omentectomy and systematic pelvic-paraaortic lymphadenectomy was the standart of surgery for all patients. Median age of the patients was 58 with a range of 32 to 81 years. Median BMI was 31.8 kg/m^2 with a range of 20.1 to 51.2 kg/m^2. The number of mean dissected lymph nodes for pelvic and paraaortic regions were 40.2 ± 16 and 18.1 ± 9.6 respectively. Endometrioid, serous, clear cell, mucinous and mixed type histology were detected in 159 (79.1%), 12 (6%), 11 (5.5%), 4 (2%) and 14 (7%) patients respectively. The mean number of dissected lymph node counts in pelvic and paraaortic lymph node groups were categorized due to BMI status and analysed for BMI <30 *vs.* ≥ 30 (non-obese *vs.* obese), BMI <35 *vs.* 35 (below class II obesity *vs.* class II-III obese) and BMI <40 *vs.* 40 (non-class III obese *vs.* class III obese) kg/m^2 (Table). There were not any statistical differences between the groups for dissected lymph node counts.

Discussion

The dissemination pattern of endometrial cancer figures predominantly the lymphatic pathway. However, therapeutic lymphadenectomy to all patients with endometrial cancer is not an accurate method because of the increased risk of morbidity due to aggressive surgery. Injury to major vessels or nerves, lymphedema and potential perioperative gastrointestinal complications with other early and late complications may increase the length of hospitality and cause invasive interventions [11]. On the other hand, lymphatic metastases lead to upstaging of patients, by the way, these patients need adjuvant therapies to prolong Disease Free Survival (DFS) and Overall Survival (OS). Actually, some risk factors may foresee the risk of lymphatic metastasis and gynecologic oncologists need to categorize patients according to risk stratification [12]. The rationality of lymphadenectomy; whether pelvic or paraaortic, the upper limit of lymphadenectomy and the optimal lymph node numbers needed to be retrieved during lymphadenectomy are the controversial issues of endometrial cancer surgery. If pelvic lymph nodes are positive for metastasis, paraaortic node involvement is 60% and 70% in patients with endometrioid and non-endometrioid histology, respectively [10]. Moreover, these patients mostly have metastasis above inferior mesenteric artery (IMA) and left renal vein is the upper surgical margin for paraaortic lymphadenectomy [13,14]. Lymph node counts are potential markers of an adequate lymphadenectomy by the way, increased number of retrieved lymph nodes is considered as a surrogate marker of improved survival. The Gynecologic Oncology Group Surgical Procedures Manual suggested to retrieve a minimum of 10 lymph nodes [15]. Moreover, an improved rate of survival was found when 10 to 12 lymph nodes were removed [16,17] and a review of 11,443 patients showed an increased rate of lymphatic dissemination when 21 to 25 lymph nodes were removed [18]. Despite being a modifiable risk factor, obesity rates are increasing among women [19] and the relationship between obesity and endometrial cancer is well-known. The influence of obesity on surgery and intraoperative complications in gynecologic malignancies were evaluated by Salman et al. [20] and they did not find any major effect of obesity but there are some surgical difficulties during the operation of obese patients, like poor exposure.

In this article, patients were analysed due to BMI value with 3 cut-off levels (Table). No differences were detected for obese and non obese patients in the number of harvested lymph nodes and when obesity was categorized, the result was also similar. Pavelka et al. [4] analysed the median number of dissected lymph nodes for obese patients during endometrial cancer surgery and did not detect any differences between the groups according to BMI categorization as <30, 30-40 and >40 kg/m^2; the median number of pelvic and

paraaortic nodes with regard to BMI levels were [16-18] and [7,6] respectively. Everett et al. [21] also demonstrated the feasibility of adequate lymphadenectomy in morbidly obese patients. Santoso et al. [22] found similar findings that the harvested lymph node counts were not lower in obese patients than the thinner counterparts. Akbayır et al. [23] analysed endometrial cancer patients in 3 groups due to the BMI level; <25, 25-29.9 and ≥ 30 kg/m^2 and did not find any differences in harvested lymph node counts however, Martra et al. [24] found significantly different median node counts for non-obese (15 nodes, <30kg/m2) and obese (10 nodes, ≥ 30 kg/m^2) patients.

Regarding these clinical implications, many surgeons suggested some technical methods to gain exposure during the surgery of obese patients, like modified surgical incisions, panniculectomy or surgical retractors [25-28]. Although these techniques have some advantages, it is not always possible to carry out these methods.SS

Study Limitations

This is a retrospective single center study. Despite similar studies in the literature, during these operations any self-retaining retractors have not been used, this is a technical difference in the study design. Additionally, in this study obesity was classified into 3 groups due to the WHO classification.

Conclusion

These findings show that obesity is not a limitation of surgery during endometrial cancer operations. If the patient needs surgical staging, lymphadenectomy could be performed successfully without any sacrifice in surgical endpoint, even without using self-retaining retractors.

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