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Comparison of laparoscopic and open surgery in obese patients with endometrial cancer

Endometrium kanserli obez hastalarda laparoskopik ve açık cerrahinin karşılaştırılması

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ABSTRACT

Aim: The aim of the study is to compare the results of total laparoscopic hysterectomy and total abdominal hysterectomy in obese women with endometrial cancer (EC).

Materials and Methods: Patients with endometrial cancer whose BMI ≥30 kg/m^2 and who were undergone total laparoscopic hysterectomy (n=68) or total abdominal hysterectomy (n=161) were included in the study. Demographic and histopathological features, disease-free survival and overall survival of the patients were recorded. All these data of laparoscopy and laparotomy patients were compared with each other.

Results: No significant difference was observed between two groups in terms of stage, tumor grade, histology, lymph node dissection rate and number of removed lymph nodes. Cardiovascular diseases were more common in laparotomy group (p=0.002). ASA (American Society of Anesthesiologists) score was higher in laparotomy group (p=0.001). Perioperative and postoperative complications were similar in both groups. The operation time was significantly longer and postoperative hospital stay was significantly shorter in the laparoscopy group (p<0.0001). There was no significant difference between two groups in disease-free survival and overall survival. The overall survival rate was 90.7% in the laparoscopy group and 95.1% in the laparotomy group (p = 0.789).

Conclusion: Our results showed that in obese patients with EC, laparoscopy had similar oncological outcomes with laparotomy and was also more beneficial for patients in terms of a shorter hospital stay.

Keywords: Laparoscopy, laparotomy, endometrial carcinoma, obesity, comorbidity.

ÖZ

Amaç: *Çalışmanın amacı endometrial kanserli obez hastalarda total laparoskopik histerektomi ve total abdominal histerektomi sonuçlarının karşılaştırılmasıdır.*

Gereç ve Yöntem: *Vücut kitle oranı ≥30 kg/m^2 olan endometrial kanserli hastalardan total laparoskopik histerektomi (n=68) ve total abdominal histerektomi (n=161) uygulanmış olanlar çalışmaya dahil edildi. Hastaların demografik ve histopastolojik özellikleri, hastalıksız sağ kalım ve toplam sağ kalım süreleri kaydedildi. Laparoskopi ve laparotomi grubunun verileri birbirleri ile karşılaştırıldı.*

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Bulgular: *İki grup arasında, evre, tümör derecesi, histoloji, lenf nodu diseksiyonu yapılma oranı ve çıkarılan lenf nodu sayısı açısından anlamlı fark görülmedi. Kardiyovasküler hastalıklar laparotomi grubunda belirgin fazla izlendi (p=0,002). ASA (Amerikan Anestezistler Derneği) skoru laparotomi grubunda daha yüksek idi (p=0,001). Peroperatif ve postoperatif komplikasyonlar laparotomi ve laparoskopi gruplarında benzer idi. Laparatomi grubunda; operasyon süresi belirgin kısa iken, postoperatif hastanede yatış süresi laparoskopi grubuna göre belirgin artmış idi (p<0,0001). İki grup arasında hastalıksız sağ kalım ve genel sağ kalım süreleri açısından belirgin fark saptanmadı. Laparoskopi grubunda genel sağ kalım %90,7 iken, laparotomi grubunda %95,1 saptandı (p=0,789).*

Sonuç: *Sonuçlarımız endometrial kanserli obez hastalarda laparoskopinin laparotomi ile benzer onkolojik sonuçlara sahip olmakla birlikte hastanede kalış süresindeki kısalık ile hastalar için daha konforlu olduğunu gösterdi.*

Anahtar Sözcükler: *Laparoskopi, laparotomi, endometrial kanser, obezite, komorbidite.*

INTRODUCTION

The most prevalent gynecologic malignancy in Turkey is endometrial cancer (EC). The incidence of EC is 9.8 cases per 100.000 (1). Endometrial cancer is usually seen after menopause in women (2, 3). Because postmenopausal bleeding is usually the first and early symptom, 75 percent of patients can be found out at an early stage (3, 4). Hysterectomy and bilateral salpingo-oophorectomy is the accepted treatment for endometrial cancer (5). Lymph node sampling (pelvic and paraaortic/pelvic) is carried out for staging (6).

Endometrial cancer is related to obesity, and patients who have endometrial cancer are mostly obese. Surgery is difficult and risky because of raised comorbidity rate and technique problems in obese patients. In open surgery to reach the pelvic organs is difficult, and the morbidity rate, especially wound infection, is increased in the postoperative period. (7, 8). Minimally invasive surgery has emerged in these patients. Although some authors support that obesity is one of the relative contraindications for laparoscopic surgery (9), surgical site infection risk reduction, short hospitalization time, and early recovery led this technique to be advantageous for obese patients.

This study compared total laparoscopic hysterectomy and total abdominal hysterectomy outcomes in obese women with endometrial cancer. We tried to identify oncological outcomes, especially the safety and complications of these methods for these patients.

MATERIALS and METHODS

The patients' records after endometrial cancer surgery between 2010 and 2017 at the Obstetrics and Gynecology Department of a University School of Medicine were retrospectively reviewed from the clinic's database. We got informed consent from the patients. The principles of Helsinki Declaration 2008's were used as a guideline for this study (10). The Faculty of Medicine Research Ethics Committee approved this study with the decision number of 18-9/55. We identified 231 patients whose body mass index (BMI) ≥30 kg/m2 and included them in the study. Patients whose final pathology was revealed other than endometrial adenocarcinoma and who had a synchronous tumor of the genitourinary tract were excluded. Laparotomy was performed in 161 of these patients, and laparoscopy was performed in 68 patients. The International Federation of Gynecology and Obstetrics (FIGO) staging method was used for the patients who underwent laparotomy and laparoscopy (11). Sentinel lymph node mapping procedures weren't used. TLH procedure is basically performed according to the classification system described by Harry Reich (12). As an important point, we used open entry technique, took all specimens out of the vagina, did not use morcellation technique and sutured vaginal cuff using laparoscopic technique.

Two groups were defined as laparotomy and laparoscopy. All patients' records were examined, and their demographic characteristics such as age, parity, BMI, and menopause status were recorded. All patients were evaluated for having comorbidities like diabetes mellitus (DM), hypertension (HT), cardiovascular disease, endometriosis, chronic obstructive pulmonary disease (COPD), a history of thromboembolism or renal disorder. ASA scores of all patients were recorded. Operative time, postoperative hemoglobin (Hgb) and hematocrit (Htc) decline, perioperative complications (intestinal system injury, urinary system injury, bleeding, conversion), and postoperative complications (infection, urinary system complications, intestinal system complications) were recorded.

Histology, grade, stage, lymph node dissection rate and the count of removed lymph nodes were

recorded. Postoperative hospital stay was recorded. The follow-up reports were used to calculate each patient's overall survival and disease-free survival times. Both of the data from the laparoscopy and laparotomy patients were compared.

Statistical Analysis

The continuous variables were compared using Mann-Whitney U tests, while the nominal variables were compared using Chi-Square or Fisher's exact tests. For survival analysis, Kaplan-Meier method was used.

P values that resulted from two-sided tests were considered to designate a statistically significant difference if they were <0.05. SPSS version 15.0 (Chicago, Illinois, United States) was used for statistical analyses.

RESULTS

The laparotomy group had 161 patients and the laparoscopy group had 68 patients. The laparotomy group had a higher average age and parity. The BMI, on the other side, did not differ between the two groups. The comorbidities like HT, DM, endometriosis, COPD, history of thromboembolism, and renal disorder, had similar rates in the two groups (p>0.05). However, in the laparotomy group, cardiovascular disease rate was higher (p=0.03) (Table-1). Moreover, the laparotomy group's ASA score was statistically higher than the laparoscopy group's (p=0.001). There were no differences between the two groups in terms of intraoperative complication rates (p=0.515). One bowel injury and two blood transfusions were recorded in the laparotomy group. A patient in the laparoscopy group had to be converted to laparotomy due to increased partial carbon dioxide pressure in the Trendelenburg position. Histologic subtype, stage and grade of disease are similar in the two groups (p=0.398, 0.213 and 0,284, respectively). In both groups, the rate of lymphadenectomy was similar (p=0.380) (laparotomy group %59.62, laparoscopy group %66.17). Moreover, no significant difference was found between the two groups in terms of the number of removed lymph nodes and metastatic lymph nodes (p=0.299 and 0,813, respectively) (Table-2).

The rates of postoperative complications did not differ between the two groups (p=0.144). In the laparotomy group, one ileus, one re-laparotomy and three blood transfusions were recorded. In the laparoscopy group, two patients were admitted to the hospital within 90 days. Postoperative hemoglobin decrease was observed at the same rate in each group (p=0.125). The laparotomy group had a significantly shorter operation time (p<0.0001). The laparotomy group had a significantly longer stay in the hospital after surgery (p<0.0001), detailed in Table-3. Wound infection and chylous acid were not recorded in either group during the follow-up period.

There is no difference for adjuvant therapy between the two groups, neither in radiotherapy (p=0,864) nor in chemotherapy (p=0.744).

Disease-free survival for five years was 95.1% in the laparotomy group and 94.5% in the laparoscopy group (p=0.747). Overall survival for five years was 93.7% in the laparotomy group and 90.7% in the laparoscopy group (p=0.789). Differences were not statistically significant (Table-2).

Table-1. Clinical data in patients with endometrial cancer.

	Laparotomy (n = 161)	**Laparoscopy (n = 68)**	**P value**
Age (median, range)	61.89 (39-83)	56.18 (35-76)	<0.001
Parity (median, range)	2.8 (0-14)	2.22 (0-8)	0.013
BMI (median, range)	36.58 (30-65)	35.8 (30-56)	0.491
Previous surgery (n, %)	37 (23.0)	12 (17.6)	0.481
Hypertension (n, %)	82 (50.9)	28 (41.2)	0.195
Diabetes mellitus (n, %)	50 (31.1)	15 (22.1)	0.2
Renal disorders (n, %)	2 (1.2)	1 (1.5)	1
Endometriosis (n, %)	3 (1.9)	0 (0)	0.557
COPD (n, %)	3 (1.9)	0 (0)	0.557
History of thromboembolism (n, %)	6 (3.7)	1 (1.5)	0.677
Cardiovascular diseases (n, %)	24 (14.9)	1 (1.5)	0.002

Table-2. Histopathological parameters of the patients.

	Laparotomy (n:161)	**Laparoscopy (n:68)**	**P value**
FIGO Stage			0.213
Ia	95 (59 %)	47 (69.11 %)	
Ib	34 (21.11 %)	9 (13.23 %)	
II	13 (8.07 %)	4 (5.88 %)	
IIIa	3 (1.86 %)	3 (4.41 %)	
IIIb	1 (0.62 %)	0	
IIIc	11 (6.83 %)	4 (5.88 %)	
IVa	1 (0.62 %)	0	
IVb	3 (1.86 %)	1 (1.47 %)	
Tumor Grade			0.284
I	53 (32.91 %)	20 (29.41 %)	
II	70 (43.47 %)	43 (63.23 %)	
III	38 (23.6 %)	5 (7.35 %)	
Histology			0.398
Endometrioid	97 (60.24 %)	45 (66.17 %)	
Serous	8 (4.96 %)	1 (1.47 %)	
Clear-cell	4 (2.48 %)	0	
Mixed	34 (21.11 %)	18 (26.47 %)	
Carcinosarcoma	7 (4.34 %)	1 (1.47 %)	
Others	11 (6.83 %)	3 (4.41 %)	
LN dissection			0.380
(+)	96 (59.62 %)	45 (66.17 %)	
(-)	65 (40.37 %)	23 (33.82 %)	
Number of Dissected Lymph Nodes			0.299
1-5	11 (11.45 %)	10 (22.22 %)	
6-10	50 (52.08 %)	11 (24.44 %)	
11-15	15 (15.62 %)	14 (31.11 %)	
16-20	9 (9.37 %)	8 (17.77 %)	
21-25	4 (4.16 %)	0	
26-30	3 (3.12 %)	1 (2.22 %)	
31-35	2 (2.08 %)	1 (2.22 %)	
36-40	1 (1.04 %)	0	
41-45	1 (1.04 %)	0	
Number of Metastatic Lymph Nodes			0.813
0	83 (86.45 %)	41 (91.11 %)	
1-5	12 (12.5 %)	4 (8.88 %)	
6-10	1 (1.04 %)	0	
11-15	0	0	
16-20	1 (1.04 %)	0	
Follow-up period (months)	68 (7-120)	59 (7-79)	0,438
Disease-free survival (5-year)	95.1%	94.5%	0.747
Overall survival (5-year)	93.7%	90.7%	0.789

Table-3. Clinical data in patients with endometrial cancer.

	Laparotomy (n = 161)	**Laparoscopy (n = 68)**	**P value**
Operation time (min) (Median, range)	155.43 (50-330)	186,91 (120-300)	<0,001
Postoperative hospital stay (day) (Median, range)	6,01(1-14)	4,35 (0-8)	<0,001

DISCUSSION

Obesity puts women at risk for endometrial cancer and raises surgical complications due to technological difficulties and comorbidities. Particularly, cardiovascular diseases as comorbidity lead the surgeon to laparotomy as a surgical approach. The aim of this study was to compare the results of laparoscopic and open surgery in obese patients with endometrial carcinoma. Wang et al. reported a meta-analysis that included studies comparing laparoscopy and laparotomy in endometrial carcinoma patients. Obesity was not a criterion in the studies of the meta-analysis. The meta-analysis showed total laparoscopic hysterectomy was related to lower risks of total complications (p=0,002), major complications (p=0,042), and postoperative complications (p=0,003). However, there was no noticeable difference in the risk of intraoperative complications (p=0,919) and mortality (13). It was showed laparoscopic surgery is beneficial for patients with endometrial carcinoma, but obesity was not evaluated separately. Since our study was a retrospective study, it was apparent that there was bias in patients' selection. In our study, patients in the laparotomy group had significantly more comorbidities. Nevertheless, there is another fact that it is challenging to operate more complicated patients with comorbidities by laparoscopy. In this context, it is not easy to design a randomized study. Studies randomly designed with a higher number of patients, if possible, might better elucidate us in terms of complications in obese patients with endometrial cancer.

Obesity has been shown to increase intraoperative and postoperative complications in studies comparing obese and non-obese patients with endometrial cancer. Bouwma et al. reported in a systematic review that conversion to laparotomy was remarkably higher in obese patients; also, wound infection and antibiotic use were more common in open surgery. Laparoscopic surgery in obese patients was related to less complication rate (14). Consequently, recently published articles indicate that laparoscopic surgery is safe in these obese patients (15, 16).

As the previous studies reported, laparotomy prolonged hospital stay, and laparoscopy accelerated the patients' return to daily life (17-21). All these studies show that minimally invasive surgery can be used in patients with endometrial cancer for their comfort.

Some studies have compared robotic surgery, laparoscopy and laparotomy (22-25). In a study by Chan et al. laparoscopic and robotic surgery had fewer complications and shorter hospitalization than open surgery in morbidly obese patients with endometrial cancer. The complication rate of robotic surgery was higher than laparoscopic surgery, but it was not statically significant. This study's limitations were the minimally invasive procedures performed only in early-stage diseases and evaluated only the short-term results (26). According to a review by Shemshedini et al., complications are rare when endometrial carcinoma is treated with minimally invasive surgery. Also, robotics is a better option than laparoscopy if high adipose tissue would limit appropriate dissection (27).

In our study number of patients with late-stage disease is similar in laparoscopy and laparotomy groups. However, since many studies included patients with early-stage endometrial cancer, the advantages or harms of laparoscopy in late-stage disease could not be determined (28, 29). In many studies, surgeons do not prefer laparoscopic approach in late-stage disease. Simultaneously, inadequate Trendelenburg position because of comorbidity and limited movement due to adipose tissue are the reasons why laparoscopy is not preferred. We think that these difficulties can be ignored in laparoscopic surgeries performed by experienced surgeons.

Although the number of patients with late-stage disease is similar in laparoscopy and laparotomy groups, a small number of these patients is our study's limitation. Therefore, outcomes of laparoscopic surgery in late-stage disease could not be demonstrated. With further studies including a larger sample size of patients with late-stage endometrial carcinoma, laparoscopy benefits will be more clearly demonstrated.

CONCLUSION

There is a higher risk for obese women to develop endometrial carcinoma. The surgical technique of standard procedure that includes hysterectomy and bilateral salpingo-oophorectomy in obese patients affects perioperative and postoperative morbidity. With more practice, laparoscopic surgery does not increase surgery-related morbidity. Also, it has postoperative advantages like shorter hospitalization and faster resuming full activity fast, without any negative effect on oncological outcomes.

Conflict of interest: There is no conflict of interest.

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