

# Comparison of total laparoscopic hysterectomy and abdominal hysterectomy; A retrospective study in a tertiary center southeastern Turkey

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## Abstract

**Aim:** This study aimed to compare the morbidities of abdominal and laparoscopic hysterectomies to determine the most appropriate hysterectomy method and to identify possible risks when planning surgery.

**Material and Methods:** The records of 50 patients who underwent abdominal hysterectomy (group 1) and 213 patients who underwent total laparoscopic hysterectomy (group 2) between January 2017 and March 2018 in our obstetrics and gynecology clinic were reviewed retrospectively.

**Results:** In patients included in our study, the analgesic requirement was found to be significantly higher in Group 1 than in Group 2 ( $4.62 \pm 1.41$  and  $4.02 \pm 1.54$ , respectively). While the mean hospital stays in group 1 was significantly higher than in group 2 ( $2.56 \pm 1.24$  days,  $2.07 \pm 0.76$  days, respectively), the mean operation time was higher in group 2 than in group 1 ( $96.70 \pm 40.85$  min and  $141.29 \pm 42.35$  min, respectively). The postoperative hematoma and urethral injury is seen in group 2 were significantly higher than group 1 ( $p=0.04$  and  $p=0.04$ , respectively).

**Conclusion:** The advantages of laparoscopic hysterectomy were shorter duration of hospitalization and less analgesic needs, while the disadvantage of this method was the longer duration of surgery, greater the risk of urinary system complications, and the need for a turn to laparotomy. Therefore, when planning laparoscopy, peri-operative preparations should be made in terms of long surgical time and management of possible complications.

**Keywords:** Abdominal hysterectomy; complications; laparoscopic hysterectomy

## INTRODUCTION

Hysterectomy is one of the most common gynecological operations performed worldwide. Today, the prevalence of hysterectomy is increasing. However, there is no consensus on the optimal hysterectomy procedure (1,2).

Laparoscopic hysterectomy (LH), which is widely used today, was first described in 1988. Although the operation time was longer in the first application period of TLH, this process decreased to the level of abdominal hysterectomy at the end of the learning process (3). Compared with abdominal hysterectomy (AH), laparoscopic hysterectomy has been reported to have a higher complication rate, especially urinary tract injuries (4). In contrast, there are studies reporting that laparoscopic hysterectomy is a safe and feasible method with a low complication rate of (5-7).

In this study, we aimed to compare the morbidities of

abdominal and laparoscopic hysterectomies and to determine the most appropriate hysterectomy method and to determine possible risks when planning the surgery.

## MATERIALS AND METHODS

In this study, the records of abdominal hysterectomy (group 1) and total laparoscopic hysterectomy (group 2) patients performed between January 2017 and March 2018 in our gynecology and obstetrics clinic were reviewed retrospectively. The ethical principles for medical research involving humanitarian issues envisaged in the Declaration of Helsinki were applied (Diyarbakir Gazi Yaşargil Training and Research Hospital ethics committee no: 5/2018).

While Group 1 included 50 patients who underwent abdominal hysterectomy or abdominal hysterectomy with salpingo-oophorectomy group 2 included 213 patients

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who underwent total laparoscopic hysterectomy or total laparoscopic hysterectomy with salpingo-oophorectomy. Patients were evaluated for surgical indication, body mass index (BMI), parity, duration of operation, blood loss, length of hospital stay, analgesic requirement, transition from laparoscopy to laparotomy, and intraoperative and postoperative complications.

Indications for surgery were classified as myoma uteri, abnormal uterine bleeding, adnexial mass, chronic pelvic pain, tuboovarian abscess, and endometriosis. Complications were defined as bladder injury, ureter injury, bowel injury, blood transfusion, surgical site infection, postoperative ileus, postoperative hematoma, and vascular injury. Intraoperative blood loss and postoperative analgesic requirements were also compared between the groups. Age, parity, body mass index (BMI), operation time, blood loss, hospitalization time, analgesic requirement were compared in both groups. General anesthesia was given to the patients in both groups, and endotracheal intubation was performed. Transitions from laparoscopy to laparotomy were recorded.

### Abdominal Hysterectomy Procedure

Depending on the size of the uterus and the indication of surgery, AH was opened with a Pfannenstiel incision or a midline vertical incision. The uterus was clamped on both sides, and then the bilateral ligamentum rotundum was cut and ligated. If salpingo-oophorectomy is to be performed, infundibulopelvic ligaments, if not, ovarian proprium ligaments are kept bilaterally and cut and ligated. The peritoneum was opened towards the spatium vesico-uterinum, and the bladder was separated from the cervix. Uterine arteries were cut and ligated after holding on both sides. Bilateral cardinal and uterosacral ligaments were involved and then cut and ligated. Clamps were inserted into the vagina at the end of the cervix, and uterus and adnexes were separated from the vagina. The vagina was closed with vicryl (polyglactin 910) no.1. Abdominal fascia was closed with vicryl (polyglactin 910) no.1.

### Laparoscopic Hysterectomy Procedure

The patients were moved to Trendelenburg position after the operation was started in dorsal lithotomy position under general anesthesia by endotracheal intubation. All patients received peri-operative cefuroxime 1 g i.v. Bladder catheter and orogastric tube were applied to all patients. The uterine manipulator was placed in the cervix. After disinfection and sterile closure, the veres needle was inserted after a small incision in the umbilicus, and the abdomen was inflated with CO<sub>2</sub> to a pressure of 15 mmHg. The optic was placed on a 10 mm trocar opening from the umbilicus. The pressure was then reduced to 12 mm Hg. After all the abdominal organs were seen, 5 mm trocars were inserted from the right, left pararectal and left paraumbilical regions. Bipolar electrocoagulation (LigaSure™, Covidien Company, MA, USA) was used as energy modality. In patients undergoing salpingo-oophorectomy, the operation was started by holding the infundibulo-pelvic ligaments. Only in cases

where hysterectomy was performed, the operation was started by holding the ovarium proprium ligaments. The ligaments were kept in two sides, coagulated; cut, and then bilateral ligamentum rotundum, uterine vesical fold of the peritoneum were involved, and coagulated and cut. The bladder was separated from the uterus, the uterine artery was held, coagulated, and then the parametrial tissue around the cervix was dissected with the help of ligasure. Peripheral colpotomy was performed over the uterosacral ligament, and the uterus was totally separated from the vagina. The uterus and adnexa were removed from the vagina outside the abdomen. The vaginal cuff was closed laparoscopically or vaginally with vicryl (polyglactin 910) no. 1.

### Statistical analyses

We performed all statistical analyzes using SPSS software (Version 26.0; SPSS Inc., Chicago, IL, USA). Demographic data were calculated using descriptive statistics. Mean and standard deviations were used to describe the data. Kolmogorov-Smirnov test was used to assume the normal distribution of variables. Continuous variables were compared by independent t-test and Chi-square test.

## RESULTS

The mean age of patients who underwent abdominal hysterectomy (group 1) was  $48.28 \pm 8.26$  years, while the mean age of patients undergoing total laparoscopic hysterectomy (group 2) was  $50.15 \pm 7.52$  years. The mean parity was found to be  $4.70 \pm 2.37$  in group 1 and  $4.57 \pm 2.62$  in group 2. The mean BMI was found to be  $26.66 \pm 3.80$  in group 1, and the mean BMI was  $26.40 \pm 3.54$  in group 2. The mean analgesic need was found to be  $4.62 \pm 1.41$  days in group 1 and  $4.02 \pm 1.54$  days in group 2. In group 1, the need for analgesics was found to be significantly higher. The mean length of hospital stay was found to be  $2.56 \pm 1.24$  in group 1, while the mean length of hospital stay was  $2.07 \pm 0.76$  in group 1, and the duration of hospitalization was higher in groups 1. The mean operation time was  $96.70 \pm 40.85$  min in group 1 and  $141.29 \pm 42.35$  min in group 2. There was a statistically significant difference between the groups in terms of mean operation time. The decrease in postoperative hematocrit was  $3.28 \pm 2.28$  in group 1 and  $4.14 \pm 5.50$  in group 2 (Table 1).

Characteristics	Grup 1 (Mean±SD)	Grup 2 (Mean±SD)	Significant (p)
Age	48.28±8.26	50.15±7.52	0.12
BMI	26.66±3.80	26.40±3.54	0.65
Parite	4.70±2.37	4.57±2.62	0.76
Hospital stay (day)	2.56±1.24	2.07±0.76	<b>0.01</b>
Surgery time (min.)	96,70±40.85	141.29±42.35	<b>&lt;0.001</b>
Analgesic need (day)	4.62±1.41	4.02±1.54	<b>0.01</b>
Hematocrit decrease	3.28±2.28	4.14±5.50	0.08

The most common causes of surgery in group 1 were myoma uteri (26 patients, 52%, abnormal uterine bleeding (11 patients, 22%), adnexal mass (7 patients, 14%), endometriosis (3 patients, 6%), uterine prolapse, respectively. (2 patients, 4%) and chronic pelvic pain (1 patient, 2%). In group 2, the most common causes of surgery were abnormal uterine bleeding (N: 73, 34.28%), myoma uteri (N: 68, 31.92%), adnexal mass (N: 31, 14.56%), endometriosis (N: 27, 12.67%), uterine prolapse (N: 8, 3.75%), and chronic pelvic pain (N: 6, 2.82%) (Table 2).

**Table 2. Indications for hysterectomy**

Indications	Grup 1 N (%)	Grup 2 N (%)	Total N (%)
Myoma uteri	26 (52)	68 (31.92)	94 (35.75)
Abnormal uterine bleeding	11 (22)	73 (34.28)	84 (31.94)
Adnexal mass	7 (14)	31 (14.56)	38 (14.45)
Endometriosis	3 (6)	27 (12.67)	30 (11.40)
Uterine prolapse	2 (4)	8 (3.75)	10 (3.80)
Chronic pelvic pain	1 (2)	6 (2.82)	7 (0.76)

When complications were compared between the groups, complications were seen in 5 (10%) of the patients in group 1, and in 23 (10.79%) of the patients. The postoperative hematoma and urethral injury is seen in group 2 were significantly higher than group 1 (Table 3.). In Group 1, 18 (36%) patients had previous abdominal surgery, while in group 2, 49 (23%) patients had previous abdominal surgery. In 10 of the patients who underwent laparoscopic hysterectomy, laparoscopy was changed from laparoscopy to laparotomy.

**Table 3. Surgical complications**

Indications	Grup 1 N (%)	Grup 2 N (%)	Significant (p)
Surgical site infection	2 (4)	5 (2.34)	0.51
Blood transfusion	1 (2)	5 (2.34)	0.88
Postoperative hematoma	0 (0)	4 (1.87)	<b>0.04</b>
Postoperative ileus	2 (4)	2 (0.94)	0.29
Ureter injury	0 (0)	4 (1.87)	<b>0.04</b>
Bladder injury	0 (0)	2 (0.94)	0.49
Bowel injury	0 (0)	1 (0.47)	0.62

## DISCUSSION

AH has started to be replaced with laparoscopic hysterectomy with endoscopic experience. The advantages of LH were shorter duration of hospitalization and less analgesics needs, while the disadvantage of this

method was the longer duration of surgery, greater the risk of urinary system complications, and the need for a turn to laparotomy (8,9).

In this study was performed in a single-center tertiary hospital and abdominal hysterectomy and laparoscopic hysterectomy were compared; 213 patients underwent laparoscopic hysterectomy, while 50 patients underwent abdominal hysterectomy. This demonstrates that abdominal hysterectomy has been replaced by LH. Laparoscopic surgery has many advantages in gynecology compared to laparotomy (10). Laparoscopic hysterectomy is a minimally invasive surgical procedure. A Cochrane review with 5102 patients evaluated different methods of hysterectomy for benign gynecologic diseases reported that patients undergoing laparoscopic hysterectomy (LH) had significantly lower mean blood loss, shorter return to normal activities, and a lower infection rate than those undergoing abdominal hysterectomy (11).

In this study, 18 (36%) patients had previous abdominal surgery in group 1, while this number was 49 (23%) in group 2. The possible reason for this is that abdominal hysterectomy is preferred in patients with previous abdominal surgery because of the inadequate laparoscopy experience. The most common indication for surgery in the AH group was myoma uteri, while the most common anomaly in the LH group was abnormal uterine bleeding. The possible reason for this is that AH is preferred in cases of myoma uteri due to surgical difficulty. In the studies, the duration of surgery was found to be higher in the LH group than AH (12,13). In another study of 1,647 cases, with increasing surgical experience, the duration of surgery in LH was reported to decrease from 115 minutes to 90 minutes (3). In this study, the duration of surgery was significantly longer in the LH group than in the AH group. Possible reasons for this are; loss of time due to post-anesthesia administration of the uterine manipulator, and all surgeons with more and less LH experience were included.

In a study, the duration of hospitalization in the AH group was found to be longer than in the LH group (14). In this study, the mean hospital stay in the AH group was found to be  $2.26 \pm 1.20$  days, while the mean hospital stay in the LH group was  $2.13 \pm 0.76$ . Accordingly, the duration of hospital stay was lower in the LH group. While studies have reported higher blood loss in AH, we found that blood loss was higher in LH. The possible reason for this is the prolonged operative time and insufficient hemostasis due to insufficient experience (1,13).

The incidence of urinary tract injury has been reported to be higher in patients undergoing TLH than in patients with AH (15,16). Similarly, we found that urinary tract injury was more common in the LH group. We found that all three patients with ureteral injury were patients who underwent TLH for myoma uteri. This may indicate that the risk of ureteral injury may be higher in patients with myoma uteri.

It has been reported that previous abdominal surgery,

obesity, large uterus, and absence of clinician experience increase the risk of conversion from laparoscopy to laparotomy. In this study, we switched from laparoscopy to laparotomy in 10 cases. As a reason; The lack of surgical experience in 8 cases and myoma uteri in 2 cases. Therefore, this possibility should be explained to the patient before surgery.

The limitations of our study were that the operations were performed by multiple surgeons, and it was a single-center cross-sectional study.

## CONCLUSION

In conclusion, the advantages of laparoscopic hysterectomy were shorter duration of hospitalization and less analgesics needs, while the disadvantage of this method was the longer duration of surgery, greater the risk of urinary system complications, and the need for a turn to laparotomy. Therefore, when planning laparoscopy, perioperative preparations should be made in terms of long surgical time and management of possible complications. In addition, the increase in surgical experience in laparoscopy can both shorten the duration of surgery and decrease the possible complications. However, multicenter and long-term studies are needed.

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