

Original study

Comparison of hysterectomy methods performed due to benign uterine pathologies

Benign uterus patolojileri için yapılan histerektomi metodlarının değerlendirilmesi

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ABSTRACT

The aim of this study is to compare the intraoperative and postoperative complications of laparoscopic and abdominal approaches in hysterectomies performed for benign indications in our clinic.

This is a retrospective, cross-sectional study. Between 01.09.2021 and 01.02.2024, the medical records and surgical reports of 209 patients who underwent total abdominal hysterectomy (TAH) and total laparoscopic hysterectomy (TLH) for benign uterine pathologies at the Department of Obstetrics and Gynecology, Namık Kemal University Faculty of Medicine in Tekirdağ were analyzed. The two different hysterectomy approaches were compared in terms of operation time, blood loss, major complications, and length of hospital stay.

The average age of the 209 patients included in the study was 48.34 ± 7.9 years. The most common indication for hysterectomy was abnormal uterine bleeding (AUB) in 47.8% of cases, followed by myomas in 17.7%. A total of 134 patients (64.6%) underwent TAH, and 74 patients (35.4%) underwent TLH. In 16 patients (8.1%), the procedure was converted from laparoscopic to open surgery. No significant differences were found between the groups in terms of age, parity, and gravidity ($p > 0.05$). There were no statistically significant differences in preoperative and postoperative hemoglobin (Hb) levels between the TAH and TLH groups ($p > 0.05$). No significant differences were found in operation times and hospital stay duration ($p > 0.05$). The average uterine size and average myoma size were significantly larger in the TAH group ($p < 0.05$). Perioperative complication rates were similar between the groups ($p > 0.05$). The need for blood transfusions and analgesics was significantly higher in the abdominal hysterectomy group ($p < 0.05$).

Laparoscopic hysterectomy offers several advantages over abdominal hysterectomy, including shorter recovery time, less postoperative discomfort, and better cosmetic outcomes. Major complication rates are similar for both approaches. In cases where vaginal hysterectomy is not suitable, laparoscopic approach should be preferred over abdominal approach.

Keywords: Laparoscopy; hysterectomy; uterine pathology.

ÖZET

Bu çalışmanın amacı kliniğimizde benign endikasyonlar nedeniyle yapılan histerektomilerde laparoskopik yaklaşım ile abdominal yaklaşımın intraoperatif ve postoperatif komplikasyonlarının karşılaştırılmasıdır.

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Çalışma retrospektif, kesitsel çalışmadır. 01.09.2021-01.02.2024 tarihleri arasında Tekirdağ Namık Kemal Üniversitesi Tıp Fakültesi Kadın Hastalıkları ve doğum kliniğinde benign uterin patolojiler nedeniyle total abdominal ve total laparoskopik histerektomi yapılan 209 hastanın dosyaları ve ameliyat raporları analiz edildi. İki ayrı histerektomi yaklaşımı operasyon süresi, kan kaybı, majör komplikasyonlar ve hastanede yatış süresi açısından karşılaştırıldı.

Çalışmaya dahil edilen 209 hastanın ortalama yaşı 48.34 ± 7.9 yıl, histerektomi endikasyonları % 47.8 ile anormal uterin kanama (AUK) ilk sırada yer alırken, % 17.7 ile myom ikinci sırada yer almaktadır. 134 (%64.6) olguya TAH, 74 (%35.4) olguya ise TLH yapılmıştır. 16 (%8.1) olguda laparoskopiden açık cerrahiye dönülmüştür. Demografik özellikler açısından gruplar karşılaştırıldığında hastaların yaş ortalaması, Parite sayısı gravide sayısı açısından gruplar arasında fark saptanmamıştır ($p > 0.05$) TAH ve TLH yapılan olguların preoperatif ve postoperatif Hb değerleri arasında istatistiksel fark saptanmadı ($p > 0.05$). Ameliyat süreleri, hastanede kalış süresi açısından yöntemler arasında fark saptanmadı ($p > 0.05$). TAH yapılan hastalarda ortalama uterus boyutları ve ortalama myom büyüklüğü açısından anlamlı olarak yüksek bulunmuştur ($p < 0.05$). Peroperatif komplikasyon oranları benzer olarak bulundu ($p > 0.05$). Transfüzyon ve analjezik ihtiyacı abdominal histerektomi yapılan olgularda anlamlı olarak daha yüksek bulunmuştur ($p < 0.05$)

Laparoskopik histerektomi abdominal histerektomiye göre kısa iyileşme süresi, daha az postoperatif rahatsızlık, daha iyi kozmetik sonuçlar gibi birçok avantaja sahiptir. Her iki yaklaşımdaki majör komplikasyon oranı benzerdir. Vajinal histerektominin uygun olmadığı hastalarda laparoskopik yaklaşım abdominal yaklaşıma tercih edilmelidir.

Anahtar kelimeler: Laparoskopi; histerektomi; uterin patoloji.

INTRODUCTION

Hysterectomy is the most commonly performed gynecological surgery in women for benign reasons. The majority of cases are caused by uterine leiomyoma, endometriosis, abnormal uterine bleeding, and pelvic organ prolapse (1). With the development of minimally invasive methods, such as vaginal, laparoscopic, or robotic-assisted hysterectomy, their use has increased in up to 93% of cases. Total laparoscopic hysterectomy (TLH) is associated with advantages over abdominal approaches, such as faster return to postoperative activities, shorter hospital stays, less intraoperative blood loss, fewer wound complications, less postoperative pain, and lower mortality (2). A Cochrane analysis of 47 randomized controlled trials comparing total abdominal hysterectomy (TAH) with TLH recommends minimal invasive hysterectomy for benign indications due to its advantages, including a faster return to normal activities (1).

Major complications in hysterectomy are rare, but since it is one of the most commonly performed procedures in women, efforts to reduce the risks associated with this procedure have the potential to impact public health. Referring patients to surgeons with sufficient experience and volume in major gynecological procedures may be one such effort to reduce these risks. In gynecology, this includes abdominal myomectomy, hysteroscopic myomectomy, cancer surgery, pubovaginal sling insertion, and pelvic reconstruction (3).

Although laparoscopic hysterectomy was first described by Reich in 1989, until 2010, only 20-30% of hysterectomies were performed laparoscopically. In a meta-analysis comparing total laparoscopic hysterectomy and total abdominal hysterectomy, patients who underwent TLH had fewer perioperative complications, less blood loss, shorter hospital

stays, and less postoperative morbidity (4).

This retrospective study compares the operation time, complications, postoperative hospital stay, and analgesic requirements between patients who underwent total abdominal and total laparoscopic hysterectomy for benign conditions in a tertiary health center.

MATERIAL and METHOD

This study is retrospective and cross-sectional. A total of 209 patients who underwent surgery for benign uterine pathologies between 01.09.2021 and 01.02.2024 at the Gynecology and Obstetrics Clinic of Tekirdağ Namık Kemal University School of Medicine were included. The local ethics committee approved the study (date and number: 2024 / 2024.58.03.22). Patients who underwent hysterectomy due to malignancy, postpartum hemorrhage, or vaginal hysterectomy were excluded. Data were obtained from hospital records. The following parameters were evaluated: age, parity, gravida, surgical indications, surgical method, operation time, perioperative complications, conversion rates from TLH to TAH, pre- and postoperative hemoglobin (Hb) levels, postoperative analgesic use, and hospital stay duration.

The operation time was defined as the time from the beginning of the skin incision to the full closure of the skin, measured in minutes. Hemoglobin values were measured 24 hours before and 6 hours after the operation. All patients received 1 g of cefazolin IV 1 hour before surgery, and the same dose was repeated at the 12th postoperative hour. Low molecular weight heparin was administered subcutaneously 8 hours after surgery as a prophylactic dose for thromboembolism and continued every

24 hours during hospitalization. Postoperatively, all patients received intravenous (IV) paracetamol (100 ml flakon, 3X1), IV/intramuscular (IM) dexketoprofen trometamol (3X1), and if additional analgesia was needed, Petidin hydrochloride (1X1 IV) was given.

Statistical methods

Data were entered into the computer and analyzed using the SPSS Windows 18.0 (Statistical for Social Sciences, IBM SPSS Inc, USA) software. Descriptive statistics such as mean, standard deviation, frequency, and percentage were presented with tables and graphs. Independent sample t-tests (or Mann Whitney U test) were used for comparisons between two independent groups. Chi-square (χ^2) test was used for comparisons of categorical variables. A p-value <0.05 was considered statistically significant.

RESULTS

The mean age of the 209 patients included in the study was 48.34 ± 7.9 years, with a mean gravida of 2.88 ± 1.66 and a mean parity of 2.34 ± 1.26 . The most common indication for hysterectomy was abnormal uterine bleeding (AUB) in 47.8%, followed by myoma in 17.7%. 26.8% of the cases were postmenopausal, 43.5% had a history of cesarean section, and 55.5% had a history of abdominal surgery. A total of 134 (64.6%) patients underwent TAH, while 74 (35.4%) patients underwent TLH. In 16 (8.1%) cases, laparoscopic surgery was converted to open surgery. Detailed demographic data, surgical indications, and operation data are presented in Tables 1 and 2.

Table 1: Demographic characteristics of the patients included in the study.

	Average \pm SD/ n, %
Age (year)	48.31 \pm 7.9
Parity	2.34 \pm 1.2
Gravty	2.88 \pm 1.3
Preoperative Hb(gr/dl)	11.93 \pm 1.6
Postoperative Hb(gr/dl)	10.4 \pm 1.2
Operation time (minute)	155.82 \pm 37.7
Lenght of hospital stay(day)	4.24 \pm 1.6
Uterine sizes (mm)	435.19 \pm 624
Number of myomas	1.84 \pm 2
Largest myoma diameter (mm)	3.90 \pm 4.6
Menopause	56(%26.8)
Pozitive C/S history	91(%43.5)
PozitivePrevious abdominal surgery	116(%55.5)
Conversion from laparoscopy to open surgery	16(%8.1)
SD: Standard Deviation, Hb: Hemoglobin, CS: Caeseran Section	

Table 2: Indications for hysterectomy

	TAH (n=135, %)	TLH (n=74, %)	Total (n / %)
Myoma	32	5	37 %17.7
Endometrial polyp	11	19	30 %14.4
Adnexal mass	6	3	9 %4.3
AUB	70	30	100 %47.8
PMB	9	3	12 %5.7
Hyperplasia with atypia	1	5	6 %2.9
Hyperplasia without atypia	4	3	7 %3.4
Prophylactic hysterectomy	2	6	8 %3.8
Total	135 % 64.6	74 % 35.4	209 %100
TAH; Total abdominal Hystrectomy, TLH: Total Laparoscopic Hysterectomy, AUB: Anormal uterine bleeding, PMB: Post-menopausal bleeding			

A comparison of preoperative, perioperative, and postoperative data between the groups is provided in Table 3. In terms of demographic characteristics, the

average age of patients in the TAH group was 47.59 ± 6.81 years, while the TLH group was 49.7 ± 9.5 years ($p = 0.07$). Parity was 2.35 ± 1.1 in the TAH

group and 2.32 ± 1.4 in the TLH group ($p = 0.44$). Gravida was 2.93 ± 1.6 in the TAH group and 2.77 ± 1.7 in the TLH group, with no statistically significant difference ($p = 0.21$). The percentage of menopausal patients was significantly higher in the TLH group (41.8%) compared to the TAH group (18.5%)

($p = 0.000$). A history of cesarean section was found in 47.4% of TAH patients and 36.4% of TLH patients ($p = 0.12$). A history of other abdominal surgeries was found in 60.7% of TAH patients and 45.9% of TLH patients ($p = 0.04$).

Table 3: Comparison of demographic and operative characteristics of patients undergoing hysterectomy.

		TAH (n=135)	TLH (n=74)	p value
Age		47.59±6.81	49.7±9.5	0.07
Paritte		2.35±1.1	2.32±1.4	0.44
Gravidity		2.93±1.6	2.77±1.7	0.21
Menopause	Yes	25 (%18.5)	31 (%41.8)	0.000
	No	110 (%81.5)	43 (%58.2)	
History of C/S	Yes	64 (%47.4)	27 (%36.4)	0.12
	No	71 (%52.6)	47 (%36.4)	
History of abdominal surgery	Yes	82 (%60.7)	34 (%45.9)	0.04
	No	53 (%39.3)	40 (%54.1)	
Preoperative Hb (gr/dL)		11.68±1.6	12.38±1.6	0.67
Postoperative Hb (gr/dL)		10.29±1.3	10.6±1.1	0.07
Operation time (minute)		158±36.8	150±36.7	0.95
Peroperative complication	Yes	5 (%2.96)	2 (%2.7)	0.9
	No	130 (%97.04)	72 (%97.3)	
Postoperative complication	Yes	27 (%20)	8 (%10.8)	0.56
	No	108 (%80)	66 (%89.2)	
Length of hospital stay (day)		4.89±1.5	3.05±1.1	0.48
Need additional analgesics	Yes	34 (%25.1)	1 (%1.35)	0.000
	No	101 (%74.9)	73 (%98.65)	
Blood transfusion	Yes	32 (%23.7)	9 (%12.6)	0.04
	No	103 (%57.6)	65 (%87.4)	
Uterine sizes (mm)		585.9±733.3	166.44±104.68	0.000
Number of myomas		2.27±2.2	1.07±1.5	0.001
Largest myoma diameter (mm)		5.16±5	1.62±2.5	0.000

TAH; Total abdominal Hystrectomy, TLH: Total Laparoscopic Hysterectomy, Hb: Hemoglobin, CS: Cesarean Section, Hb: Hemoglobin.

In perioperative data, the operation time was 158 ± 36.8 minutes for TAH and 150 ± 36.7 minutes for TLH. No statistically significant difference in operation times was found ($p = 0.95$). The hospital stay was 4.89 ± 1.5 days for TAH and 3.05 ± 1.1 days for TLH, but no statistically significant difference was found ($p = 0.48$). Uterus size was significantly larger in the TAH group (585.9 ± 733.3 mm) compared to the TLH group (166.44 ± 104.68 mm) ($p = 0.000$). Similarly, the mean myoma diameter was 2.27 ± 2.2 cm in the TAH group and 1.07 ± 1.5 cm in the TLH group ($p = 0.001$).

In terms of complications, the perioperative complication rate was 2.96% in TAH and 2.7% in TLH ($p = 0.9$), and the postoperative complication rate was 20% for TAH and 10.58% for TLH ($p = 0.56$). Blood loss and the need for transfusion were significantly higher in TAH patients ($p = 0.04$).

DISCUSSION

Approximately 90% of hysterectomies are performed for benign reasons and are among the most common gynecological procedures, often done due to benign conditions such as abnormal uterine bleeding, prolapse, or uterine fibroids. Around 30% of women undergo this surgery by the age of 60 (5). Today, the available methods for hysterectomy include Total Abdominal Hysterectomy (TAH), Vaginal Hysterectomy, Laparoscopic Hysterectomy (LH), Laparoscopic Subtotal Hysterectomy, and Robotic-Assisted Hysterectomy. Laparoscopic hysterectomy is a minimally invasive method that can be safely performed by surgeons with the proper equipment and experience. Due to its advantages, including less postoperative pain, lower blood loss,

shorter hospital stays, and faster recovery, laparoscopic hysterectomy is preferred over abdominal hysterectomy for nearly all benign gynecological conditions and a significant proportion of malignant cases. In recent years, minimally invasive gynecological surgery has become much more widespread, and hysterectomy is the most commonly performed major gynecological surgery. Currently, laparoscopic methods are used in about 50% of hysterectomy cases by gynecologists (6, 7). In this study, the most frequent indication for hysterectomy was abnormal uterine bleeding (AUB) (47.8%), followed by myoma (17.7%). In a similar study by Buhur et al., fibromyoma was the leading indication for hysterectomy (50.1%), with AUB being second (21.6%) (8).

One of the factors that influence the transition from TLH to open surgery is adhesions. In patients with a history of previous cesarean sections, midline surgeries, endometriosis, or pelvic infections, adhesions should be suspected. High-resolution transvaginal ultrasonography can detect adhesions and help estimate the surgical risk preoperatively. Furthermore, the presence of laterally located myomas and particularly those with a uterine size greater than 10 cm increases the likelihood of conversion to open surgery (9). In this study, 18 cases (8.1%) were converted from laparoscopy to open surgery. The history of cesarean section was similar in both laparoscopic and open surgery cases. However, patients undergoing open surgery with a history of midline abdominal incision were found to have a higher conversion rate. Due to the small number of patients who were converted from laparoscopic to open surgery, statistical analysis was not performed.

When the results of this study were analyzed, no statistically significant difference was found between TLH and TAH regarding intraoperative data. The average surgical duration was similar in both groups (158±36.8 minutes for TAH and 150±36.7 minutes for TLH, $p=0.95$). Perioperative complications were observed in 2.96% of TAH cases and 2.7% of TLH cases ($p=0.9$). The need for intra/postoperative transfusion was higher in TAH cases ($p<0.05$). The main advantages of laparoscopic hysterectomy over abdominal hysterectomy include less blood loss, less postoperative pain, and faster return to daily activities (10).

In this study, the perioperative complication rate was 2.96% for TAH and 2.7% for TLH, with no statistically significant difference ($p=0.9$). One factor influencing complications in laparoscopic hysterectomy is the surgeon's experience. In a study by Vree et al., it was found that the surgical duration, intraoperative blood loss, and complication rates in laparoscopic hysterectomy were related to the surgeon's experience. However, no significant difference was noted in the outcomes when high-volume surgeons (>50 hysterectomies/year) performed the surgery (11). Balikoglu et al. (12) stated that while complications in laparoscopic hysterectomy are not

affected by the surgeon's experience, the concern about complications decreases as the surgeon's experience increases. Another study found that intraoperative complications were higher during the initial stages of learning, and thus, the complication risk should be considered in surgeons' learning curves. The same study also showed that laparoscopic surgery performed by experienced surgeons has notable advantages over open surgery (13). Louie et al. (14) also reported that, although uterine size is an independent risk factor for complications after hysterectomy, even with significantly enlarged uteri, the complication rate for abdominal hysterectomy is higher than for laparoscopic hysterectomy. Therefore, they suggested that a large uterus is not a sufficient indication for abdominal hysterectomy and that laparoscopic hysterectomy can be safely performed in such cases in experienced centers. Another study concluded that laparoscopic hysterectomy can be safely performed in centers with high experience even in cases with a uterus weighing more than 1 kg (15).

Regarding postoperative hospital stay, no significant difference was found between the surgical methods ($p=0.48$). The total uterine size, average fibroid diameter, and the largest fibroid removed were significantly larger in abdominal hysterectomy cases ($p<0.05$). Postoperative complications were found at similar rates in both surgical methods ($p>0.05$). However, the need for analgesia after surgery was higher in TAH cases ($p<0.05$).

In a study comparing 10-year intestinal obstruction rates between minimal invasive and open hysterectomy, abdominal hysterectomy was found to be associated with 54% higher rates of bowel obstruction compared to minimally invasive hysterectomy (laparoscopic or vaginal) (16). Furthermore, when performed with the correct indications, hysterectomy can improve quality of life and sexual function. Beyan et al. found that TLH was superior to TAH in improving sexual function, although there was no significant difference between the two methods regarding quality of life (10).

In conclusion, laparoscopic hysterectomy is increasingly being used in gynecological surgeries. It offers several advantages over open hysterectomy, including a faster recovery process, less postoperative pain, and fewer complications. As seen in this study, laparoscopic hysterectomy is a safe and low-complication method when performed by experienced surgeons in suitable centers.

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Declaration of AI and AI-assisted Technologies in the Writing Process

During the preparation of this work, the authors used ChatGpt-3.5 in order to check spell and grammar. After using this tool, the authors reviewed and edited the content as needed and took full responsibility for the content of the publication

The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the local Ethics Committee (date and number: 2024 / 2024.58.03.22).

Conflict of interests

The authors declare no conflict of interest.

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Author contributions

EKC designed the research study. EKC performed the research. EKC and BT acquisition of data, EKC and BT analyzed and interpretation of data,. EKC participated in drafting the manuscript or revising it critically for important intellectual content. All authors contributed to editorial changes, read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

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