

Laparoscopic Hysterectomy Versus Conventional Total Abdominal Hysterectomy

Laparoskopik Histerektomiye Karşı Total Abdominal Histerektomi

Fedi ERCAN,^a Berna GENCEL,^a Büşra ÇUBUK,^a Hüseyin GÖRKEMLİ^a

^aDepartment of Obstetrics and Gynecology, Necmettin Erbakan University Meram Faculty of Medicine, Konya

ABSTRACT

Objective: Hysterectomy can be performed by vaginal, abdominal, and laparoscopic routes. Laparoscopic hysterectomy (LH) has been reported as an alternative to traditional total abdominal hysterectomy (TAH) with benefit of early recovery, shorter hospital stay and less operative complications. This study compared LH versus TAH in terms of duration of surgery, intraoperative complication, mean specimen weight, and duration of hospital stay. **Material and Methods:** This is a retrospective comparative study among one hundred thirty-nine patients who underwent LH or TAH for various indications in the Department of Obstetrics and Gynaecology of the Meram Medicine School of Necmettin Erbakan University from January 2008 to December 2017. The data of the patients meeting the set criteria were obtained from the hospital records and hospital based computerized coding system. Study groups have included two groups of patients: 74 patients treated by LH, 65 patients treated by classic TAH. **Results:** The LH took longer time (115.9±8.6 min. versus 76.6±13.0 min.) than the TAH (p<0.001). Hemoglobin decline in the first postoperative day was 1.5±0.5 g / dL in the LH group and 2.4 ± 0.4 g / dL in the TH group (p=0.001). Mean duration of hospital stay was significantly shorter in LH group 1.6±0.4 days versus 2.2±0.6 days in TAH group (p<0.001). **Conclusion:** LH is an effective alternative to TAH with the advantage of less first postoperative day hemoglobin drop, and short hospital stay.

Key Words: Abdominal hysterectomy; hysterectomy; laparoscopic hysterectomy; laparoscopy

ÖZET

Giriş: Histerektomi vajinal, abdominal ve laparoskopik yöntemlerle yapılabilir. Laparoskopik histerektomi (LH), daha erken iyileşme, kısa hastanede kalış süresi ve daha az operatif komplikasyonlar açısından geleneksel total abdominal histerektomiye (TAH) alternatif bir yöntemdir. Bu çalışmada, LH ile TAH'nin ameliyat süreleri, ameliyat sırasındaki komplikasyonlar, hastanede yatış süreleri ve çıkarılan spesmen ortalama ağırlıkları açısından karşılaştırılmıştır. **Gereç ve Yöntemler:** Bu çalışma Ocak 2008-Aralık 2017 tarihleri arasında Necmettin Erbakan Üniversitesi Meram Tıp Fakültesi Kadın Hastalıkları ve Doğum Anabilim Dalı'nda çeşitli endikasyonlar ile LH ve TAH uygulanmış 139 hastanın değerlendirildiği retrospektif bir çalışmadır. Hastaların verileri hastane kayıtlarından ve hastane tabanlı bilgisayarlı kodlama sisteminden elde edilen kriterler ile toplanmıştır. Çalışma iki hasta grubunu içermektedir: LH yapılan 74 hasta ve TAH yapılan 65 hasta.

Bulgular: LH, TAH'dan daha uzun sürdü (115,9±8,6 dk, 76,6±13,0 dak.) (p<0,001). LH grubunda postoperatif birinci günde ortalama hemoglobin düşüşü 1,5±0,5 g/dl iken, TAH grubunda 2,4±0,4 g/dl idi (p=0,001). Ortalama hastanede yatış süresi LH grubunda 1,6±0,4 gün iken, TAH grubunda 2,2±0,6 gün olarak anlamlı şekilde daha kısaydı (p<0,001). **Sonuç:** LH postoperatif daha yüksek hemoglobin seviyeleri ve daha kısa hastanede kalış süresi ile TAH'ye etkili bir alternatiftir.

Anahtar Kelimeler: Abdominal histerektomi; histerektomi; laparoskopi; laparoskopik histerektomi

TJRMS 2018;2(1):14-8

Geliş Tarihi/Received: 27.03.2018

Kabul Tarihi/Accepted:12.09.2018

Yazışma Adresi/Correspondence:

Fedi ERCAN

Necmettin Erbakan University Meram Faculty of Medicine, Department of Obstetrics and Gynecology,
Konya, TÜRKİYE/TURKEY
fediercan@gmail.com

Copyright © 2018 by Üreme Tıbbi Cerrahi Eğitim Araştırma ve Uygulama Vakfı

Hysterectomy is one of the most common surgical procedures.¹ It was first successfully performed in the 19th century using vaginal or abdominal incisions. Innovations in technology led to the performance of the first laparoscopic hysterectomy (LH) in 1989, but it was only from 1991 onwards that this surgical method of removing the uterus began to be used.^{2,3} However, laparoscopic surgery has some limitations such as increased operating time and longer training period.⁴ Two-dimensional views with reduced depth perception, rigid instruments and bad ergonomic circumstances may also result in a surgeon's fatigue and awkward positioning. Till now, several studies have confirmed the feasibility of LH as a safe method with better postoperative recovery, reduced need of analgesics and shorter hospital stay.⁵ Whereas, total abdominal hysterectomy (TAH) has been the most popular method but it is more invasive and is associated with more blood loss, delayed in recovery and longer hospital stay.⁶

In this retrospective cohort study, LH was compared to traditional TAH.

MATERIALS AND METHODS

This is a retrospective comparative study including one hundred thirty-nine patients who underwent LH or TAH for various benign indications in the Department of Obstetrics and Gynaecology of the Meram Medicine School of Necmettin Erbakan University from January 2008 to December 2017. The study protocol was approved by the ethics committee of the university hospital. We have included two groups of patients: 74 patients treated by LH, 65 patients treated by classic TAH. The patients were informed about the surgical procedure and consent was given for performing the surgery.

SURGICAL APPROACHES

All the procedures were performed under general anaesthesia, endotracheal intubation, Foley catheterisation, standard prophylactic cephalosporin antibiotic, and wore sequential compression devices on their upper and lower legs. In the cases treated by LH, an intrauterine manipulator was used.

TAH is defined as an abdominal hysterectomy with a 10-cm to 15-cm pfannenstiel incision in the abdominal wall, through which the standard operation is carried out.⁷ Patients usually require a 2-day to 5-day hospitalization, followed by a 6-week recovery time.

All LH and TAH procedures were performed by same senior gynaecologist (Gorkemli H. M.D.). All LH operations were performed by using the same technique.. An abdominal incision was made at the base of the umbilicus. After creation of pneumoperitoneum using the Veress needle at an angle of 45-90°, a 10-mm trocar (Versaport Plus®, Covidien, Mansfield, USA) was inserted via the umbilicus for the camera. In all cases, 2 additional 5-mm ports were inserted under direct visualization from medial and superior to the anterior superior iliac spine. The V-Care uterine manipulator (VCARE®, Conmed, Hannover, Germany) was used for uterus manipulation. After abdominal inspection and cytologic washing (if indicated), the round ligaments were cauterized and cut using a 5-mm ligasure scalpel (Blunt Tip Laparoscopic Sealer/Divider®, Covidien, Mansfield, USA). The posterior leaf of the broad ligament was opened, and the infundibulopelvic or utero-ovarian ligament was coagulated and incised ligasure scalpel. The posterior leaf of the broad ligament was dissected toward the uterosacral ligament. The uterine artery was coagulated and sectioned using ligasure scalpel. The cervicovaginal junction was opened using the tipped needle unipolar cautery, and the vaginal cuff was closed via vaginal approach by using the No. 1 Vicryl (Pegeleak®, Dogsan, Turkey).

Several clinico-pathological parameters were analysed: age, BMI, past medical history, preoperative and postoperative clinical and laboratory parameters, and complete data regarding the surgical procedure. Operative times (from incision to placement of the final abdominal or vaginal closure suture), histopathological findings, mass of the surgical specimen (calculated from the dimensions recorded on the pathology report), and length of hospital stay (defined as the total number of inpatient hospital days excluding the day of admission) were also analysed. Total operative time was meas-

ured from the moment of the abdominal incision to the last suture. Intraoperative and immediate postoperative complications were defined as complications occurring during surgery and within 24 hours after surgery, respectively. Complete blood counts were measured at 24 h postoperatively.

Major complications included haemorrhage requiring transfusion or reoperation, haematoma requiring transfusion or surgical drainage, visceral injury (to bladder, bowel, or ureter), relaparotomy, pulmonary embolism and major anaesthesia problems. Minor complications included infection or temperature of more than 38°C on twice six hours apart (excluding the first 24 hours after surgery), haematoma not requiring transfusion or surgical drainage, deep vein thrombosis and minor anaesthesia problems. Delayed postoperative complications (more than 24 hours after surgery), return visits to the emergency room and hospital readmissions were recorded. The postoperative follow-up period ranged from six months to five years.

DATA MANAGEMENT AND ANALYSIS

Statistical analysis was undertaken using the SPSS software version 16.0 (SPSS, Chicago, IL). Means and standard deviations were used to describe continuous variables, and frequencies and percentages were used to describe categorical variables. Student's t test and Fisher's exact test were used to compare demographic and clinical characteristics between groups, as appropriate. A p-value of < 0.05 was considered statistically significant.

RESULTS

One hundred thirty-nine patients, who underwent total hysterectomy were included in this study. The characteristics of the groups of patients are presented in (Table 1). The mean age of the patients in LH group was 47.0±5.9 years and that of TAH group was 45.7±4.7 years (p=0.25). Twelve (16.2%) patients in the LH group and 10 (15.3%) patients in the abdominal hysterectomy group had a history of previous abdominal operation (p=0.65). These differences were not statistically significant.

TABLE 1: Clinical features and operative results of the patients included in the study.

	LH (n=74)	TAH (n=65)	P-value
Age (years)	47.0±5.9	45.7±4.7	0.25
BMI (kg/m ²)	24.1±2.0	26.5±2.7	0.16
Prior abdominal surgery	12 (16.2%)	10 (15.3%)	0.65
Hb drop (g/dl)	1.5±0.5	2.4±0.4	<0.001
Duration of surgery (min.)	115.9±8.6	76.6±13.0	<0.001
Length of hospital stay (day)	1.6±0.4	2.2±0.6	<0.001
Specimen weight (gr)	240.5±90.7	296.4±126.2	0.01
Blood transfusion	4 (5.4%)	4 (6.1%)	0.57
Post-operative fever	3 (4.0%)	4 (6.1%)	0.47
Vault infection	2 (2.7%)	3 (4.6%)	0.52
Bladder injury	2 (2.7%)	1 (1.3%)	0.56

Data are given mean ± standard deviation or number (percentage).

LH: Laparoscopic Hysterectomy; TAH: Total Abdominal Hysterectomy; BMI: Body mass index; Hb: Hemoglobin.

The two types of procedures were used for similar conditions. The conditions for which hysterectomy was performed are presented in (Table 2). In both groups the most common indication for hysterectomy was uterine leiomyoma (50.0% and 73.8%).

Patients in the LH group had significantly longer mean operative time than patients in the TAH group (115.9±8.6 versus 76.6±13.0 min., p<0.001). The mean duration of hospital stay for patients in LH group was significantly shorter when compared to TAH group (1.6±0.4 versus 2.2±0.6 days) which was statistically significant (p<0.001).

Patients in the TAH group had significantly heavier mean specimen weight than patients in the

TABLE 2: Indications for hysterectomy.

	LH (n=74)	TAH (n=65)
Leiomyoma	37 (50.0%)	48 (73.8%)
Adenomyosis	4 (5.4%)	1 (1.5%)
AUB	22 (29.7%)	11 (16.9%)
Endometrial hyperplasia	8 (10.8%)	3 (4.7%)
CIN	3 (4.1%)	2 (3.1%)
Total	74 (100%)	65 (100%)

Data are number (percentage).

AUB: Abnormal Uterine Bleeding; CIN: Cervical intraepithelial neoplasia.

LH group (240.5 ± 90.7 versus 296.4 ± 126.2 gram, $p=0.01$). First postoperative day hemoglobin drop was significantly lower in LH as opposed to TAH (1.5 ± 0.5 versus 2.4 ± 0.4 g/dl, $p < 0.001$).

Intraoperative complication in the LH group was two cases (2.7%) of bladder injury. Postoperative complications in the LH group were fever after surgery in three patients (4.0%) and vault infection in two patients (2.7%). Intraoperative complication in the TAH group was one case (1.3%) of bladder injury. Postoperative complications in the TAH group were fever after surgery in four patients (6.1%) and vault infection in three patients (4.6%) diagnosed 10 days after surgery in seven different patients. The incidence of complications was uncommon and was similar in each group. No bowel or ureteric injury was reported. In this study, there was no need to convert from LH to TAH.

DISCUSSION

In this retrospective study we aimed to compare LH and TAH in a nine years period (2008-2017). This study we found that LH is as safe as TAH, as previously reported.^{8,9} The purpose of this study was to evaluate the results of operating time, perioperative complications, and duration of hospitalization to help clinicians decide between LH and TAH.

Studies report that LH takes longer operation time than TAH. Cohen et al. and Chopin et al. reported correspondingly that operation time for LH is statistically significant longer than TAH (10,11). But Seracchioli et al. reported no statistically significant difference about LH and TAH operation time at their clinical trial which includes 122 women who have bigger uterus than 14th gestational week.¹² Similarly, Ribeiro et al. found out operation time shorter for vaginal hysterectomy, found out no difference between TAH and LH in their randomized prospective study which consisted of 60 patients and compared abdominal, vaginal and laparoscopic hysterectomy.¹³ In our study the operation time was greater for LH (115.9 ± 8.6 min.) than for TAH (76.6 ± 13.0 min.). This difference was statistically significant ($p < 0.001$). The

long duration of surgery in the LH group may be related to the experience of the surgical team.

In our study the mean hospital stay was significantly shorter after LH than after TAH (1.6 ± 0.4 days versus 2.2 ± 0.6 days, $p < 0.001$). Length of hospital stay after LH has been addressed by only one small randomized trial ($n=49$) that focused on patient satisfaction (there were no significant differences between outpatient and inpatient procedures) and quality of life, which was significantly worse in the outpatient group on two and four days after surgery.¹⁴ The uterine weight was higher in patients who underwent TAH group. This result was statistically significant (240.5 ± 90.7 versus 296.4 ± 126.2 gram, $p=0.01$). First postoperative day hemoglobin drop was significantly lower in LH as opposed to TAH (1.5 ± 0.5 versus 2.4 ± 0.4 g/dl, $p < 0.001$). However, this may also be due to the fact that the surgical specimen is heavier in the TAH group.

There are studies that calculate blood loss during surgery. In these studies, more blood loss was reported during TAH.^{15,16} In our study blood loss was not calculated during the operation.

The rate of serious complications associated specifically with a laparoscopic approach is overall low. Up to half of complications occur at the time of abdominal access for camera or port placement.¹⁷ Complications can also arise from abdominal insufflation, tissue dissection, and hemostasis.¹⁸ Some investigators reported that LH involves a high rate of major complications during the initial learning period of the surgeon.^{19,20} Others concluded that LH is a safe procedure even when performed by a variety of surgeons with different skill levels.²¹ According to our experience, the rate of complications of LH was low and similar to TAH (2.7% versus 1.3%). This rate was similar to the 3% complication rate reported by Chopin et al.^{11,22,23}

CONCLUSION

In summary, this retrospective study demonstrates that LH can be safely done with a low and reasonable complication rate, and a shorter hospital stay but with longer operation time than the traditional TAH.

REFERENCES

- Cengiz H, Dagdeviren H, Kanawati A, Kaya C, Ekin M. Is gynaecological laparoscopic surgery safe for elderly women? A comparison study. *Obstet Gynaecol* 2014;34(7):616-9.
- Barker MA. Current Issues with Hysterectomy. *Obstet Gynecol Clin North Am* 2016;43(3): 591-601.
- Nezhat F, Nezhat C, Gordon S, Wilkins E. Laparoscopic versus abdominal hysterectomy. *J Reprod Med* 1992;37(3):247-50.
- Vickers AJ, Savage CJ, Hruza M, Tuerk I, Koenig P, Martínez-Piñero L, et al. The surgical learning curve for laparoscopic radical prostatectomy: a retrospective cohort study. *Lancet Oncol* 2009;10(5):475-80.
- Silva-Filto AL, Werneck RA, Magalhaes RS, Belo AV, Triginelli SA. Abdominal versus vaginal hysterectomy: a comparative study of the postoperative quality of life and satisfactions. *Arch Gynecol Obstet* 2006;274(1):21-4.
- Garry R, Fountain J, Mason S, Hawe J, Napp V, Abbott J, et al. The eVALuate study: two parallel randomised trials, one comparing laparoscopic with abdominal hysterectomy, the other comparing laparoscopic with vaginal hysterectomy. *BMJ* 2004;328(7432):129.
- Berek DD. *Berek & Novak's Gynecology*. Philadelphia: Lippincott Williams & Wilkins; 2012. p.1254-5.
- Meikle SF, Nugent EW, Orleans M. Complications and recovery from laparoscopic-assisted vaginal hysterectomy compared with abdominal and vaginal hysterectomy. *Obstet Gynecol* 1997;89(2):304-11.
- Einarsson JI, Suzuki Y. Total laparoscopic hysterectomy: 10 steps toward a successful procedure. *Rev Obstet Gynecol* 2009;2(1):57-64.
- Cohen SL, Vitonis AF, Einarsson JI. Updated hysterectomy surveillance and factors associated with minimally invasive hysterectomy. *JLS* 2014;18(3).
- Chopin N, Malaret JM, Lafay-Pillet MC, Fotso A, Foulot H, Chapron C. Total laparoscopic hysterectomy for benign uterine pathologies: obesity does not increase the risk of complications. *Hum Reprod* 2009;24(12):3057-62.
- Seracchioli R, Venturoli S, Vianello F, Govoni F, Cantarelli M, Gualerzi B, et al. Total laparoscopic hysterectomy compared with abdominal hysterectomy in the presence of a large uterus. *J Am Ass Gynecol Laparosc* 2002;9(3):333-8.
- Ribeiro SC, Ribeiro RM, Santos NC, Pinotti JA. A randomized study of total abdominal, vaginal and laparoscopic hysterectomy. *Int J Gynaecol Obstet* 2003;83(1):37-43.
- Kisic-Trope J, Qvigstad E, Ballard K. A randomized trial of day-case vs inpatient laparoscopic supracervical hysterectomy. *Am J Obstet Gynecol* 2011;204(4):307.
- Perino A, Cucinella G, Venezia R, Castelli A, Cittadini E. Total laparoscopic hysterectomy versus total abdominal hysterectomy: an assessment of the learning curve in a prospective randomized study. *Hum Reprod* 1999;14(2):2966-99.
- Katherine A, O'Hanlan MD, Gloria SH, Anne-Caroline G, Suzanne L, Mirjam L. Total laparoscopic hysterectomy versus total abdominal hysterectomy: cohort review of patients with uterine neoplasia. *JLS* 2005;9(3):277-86.
- Magrina JF. Complications of laparoscopic surgery. *Clin Obstet Gynecol* 2002;45(2):469-80.
- Trottier DC, Martel G, Boushey RP. Complications in laparoscopic intestinal surgery: prevention and management. *Minerva Chir* 2009;64(4):339-54.
- Visco AG, Barber MD, Myers ER. Early physician experience with laparoscopically assisted vaginal hysterectomy and rates of surgical complications and conversion to laparotomy. *Am J Obstet Gynecol* 2002;187(4):1008-12.
- Harkki-Siem, Sjoberg J. Evaluation and learning curve of the first one hundred laparoscopic hysterectomies. *Acta Obstet Gynecol Scand* 1995;75(8):638-41.
- Walsh CA, Walsh SR, Tang TY, Slack M. Total abdominal hysterectomy versus total laparoscopic hysterectomy for benign disease: a meta-analysis. *Eur J Obstet Gynecol Reprod Biol* 2009;144(1):3-7.
- Mäkinen J, Johansson J, Tomás C, Tomás E, Heinonen PK, Laatikainen T, et al. Morbidity of 10110 hysterectomies by type of approach. *Hum Reprod* 2001;16(7):1473-8.
- Malinowski A, Makowska J, Antosiak B. Total laparoscopic hysterectomy--indications and complications of 158 patients. *Ginekol Pol* 2013;84(4):252-7.