

Comparison of laparoscopy-assisted hysterectomies with conventional hysterectomies

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ABSTRACT

الأهداف: مقارنة النتائج قبل وبعد العملية الجراحية المبكرة لاستئصال الرحم بالمنظار (LAVH)، وعملية استئصال الرحم عن طريق المنظار عبر عنق الرحم (LASH) مع عملية استئصال الرحم التقليدية بواسطة عملية شق البطن أو المهبل، بما في ذلك المريضات اللواتي يخضعن لاستئصال الرحم الكامل أو الجزئي نتيجة لمرض نسائي خبيث.

الطريقة: أجريت دراسة وصفية غير عشوائية وتجربة سريرية، تمت مقارنة ثلاث طرق مختلفة لعملية استئصال الرحم: عبر المنظار – عن طريق المهبل – عن طريق شق البطن، في قسم أمراض النساء والولادة – كلية العلوم الطبية بجامعة تابرز – إيران، خلال الفترة ما بين يناير 2005م وحتى ديسمبر 2007م، بما في ذلك جميع المريضات اللواتي لديهن إشارة لإزالة الرحم نتيجة لمرض خبيث. تمت المصادقة على الدراسة من قبل لجنة الأخلاق الطبية ومركز الأبحاث بالمنطقة.

النتائج: تم القيام بإجمالي عدد 288 عملية لاستئصال الرحم: استئصال الرحم عن طريق شق البطن 165 مريضة (57.2%)، استئصال الرحم عن طريق المهبل 85 مريضة (29.5%) واستئصال الرحم عبر المنظار 38 مريضة (13.19%). كان يصاحب عمليات استئصال الرحم عبر المنظار (LASH) (LAVH) نقاط منخفضة للألم بشكل ملحوظ، معدلات أقل للمضاعفات، أقل في فقدان الدم، فترة بقاء أقصر في المستشفى، مع تكلفة أقل للمستشفى وقابلية إعادة استخدام الأجهزة إحصائياً ($p=0.03$).

خاتمة: إن عملية استئصال الرحم عبر المنظار مفضلة عن استئصال الرحم عبر شق البطن أو عبر المهبل. وعلى الرغم من أن عملية استئصال الرحم عبر المهبل لديها أقل مضاعفات وسريعة الشفاء، كذلك بالنسبة لمستوى رضا المريضة مقارنة مع تلك التي تكون عبر شق البطن ولكنها كانت محدودة للمريضات ذوات الولادات العديدة مع بعض درجات الراحة.

Objective: To compare operative and early postoperative outcomes of laparoscopic-assisted vaginal hysterectomy (LAVH) and laparoscopy

assisted supracervical hysterectomy (LASH) with conventional hysterectomy by laparotomy or vaginally, including patients undergoing total or subtotal hysterectomy for benign gynecologic disease.

Methods: Three different methods of hysterectomies: laparoscopic, vaginal, and abdominal, were compared at the Department of Obstetrics and Gynecology of Tabriz University of Medical Sciences, Tabriz, Iran, including all patients with indication of uterus removal for benign uterine disease from January 2005 to December 2007. The regional medical research ethics committee approved the study.

Results: A total of 288 hysterectomies were performed: 165 (57.3%) abdominal hysterectomy, 85 (29.5%) vaginal hysterectomy, and 38 (13.2%) laparoscopic-assisted hysterectomy. Laparoscopy assisted hysterectomy (LAVH, LASH) was associated with significantly lower early postoperative pain scores and complication rates, less blood loss, short hospital stay, and resulted in lower hospital charge with reusable devices statistically ($p=0.03$).

Conclusion: Laparoscopy is preferred to abdominal hysterectomy by laparotomy and to vaginal hysterectomy. Though vaginal hysterectomy had less complications and rapid recovery and patient satisfaction as compared with abdominal, but it was limited for multiparous patients with some degree of pelvic organ prolapse.

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Hysterectomy is one of the most commonly performed major surgical procedures in gynecology, and approximately 20% of women undergo this type of surgery before the age of 60. The most common indications are hemorrhagic disorder and uterine fibroid. The most common procedure is the conventional abdominal approach (67%), and vaginal hysterectomy (VH).^{1,2} Vaginal hysterectomy is preferred when there is no contraindication due to less morbidity and faster recovery,² but it demands more experience and no need for oophorectomy. Recently, technical improvements have facilitated endoscopic surgery with more visual capability and patient satisfaction in more surgical fields including gynecology.^{3,4} We aim to compare operative and early postoperative outcomes of laparoscopic-assisted hysterectomy (laparoscopic-assisted vaginal hysterectomy [LAVH], and laparoscopy assisted supracervical hysterectomy [LASH]) with conventional hysterectomy by laparotomy or vaginally, in a prospective non-randomized clinical trial including patients undergoing total or subtotal hysterectomy for benign gynecologic disorders.

Methods. This study was conducted at the Department of Obstetrics and Gynecology of Tabriz University School of Medicine, Tabriz, Iran, between January 2005-December 2007. Two hundred and eighty-eight patients who were candidates for hysterectomy due to benign uterine disorders were divided into 3 groups based on observation and physical examination. Selection of patients for each method of surgery was based on the surgery group decision based on their gynecologic exam. We obtained informed consent to include their charted data in the study, and the regional medical research ethics committee of Tabriz University School of Medicine approved the study. Interventions included 3 different methods of hysterectomies: laparoscopic, vaginal and abdominal. All the patients who underwent non-radical hysterectomy for a primary diagnosis of vaginal bleeding, not controlled medically, or because of pelvic organ relaxation, in a case control manner for demographic point matching were included (age, weight, indication for surgery, and uterine size). The patients with malignancy or with severe medical diseases were excluded; all patients were matched except for genital relaxation or prolapse in VH cases. The method of abdominal hysterectomy was the traditional extrafascial hysterectomy by Pfannenstiel or midline incision with the use of 1/0, 2/0 delayed absorbable sutures for homeostasis. For laparoscopy, we used STORZ operative laparoscopy equipment (STORZ, Totlingene, Germany) including Robi bipolar forceps (STORZ, Totlingene, Germany), and bipolar scissors or Ligasure (STORZ, Totlingene, Germany) for coagulation, withholding the uterus just with grasping forceps. For

removing the uterus in subtotal hysterectomy, we used electric morcellator (STORZ, Totlingene, Germany), or we removed the uterus body by a small (1.5 cm) incision through the main port entrance by keeping the tissue under the incision, and morcellate it with scalpel under direct vision. In the case of LAVH, we used the same reusable equipment until the last pedicle of parametrial tissue, and then continuing the operation vaginally by dissecting the posterior and anterior vaginal mucus and entering the peritoneal cavity removing the uterus after suturing the uterosacral and cardinal ligaments, then closing the vaginal cuff by placing a purse string on the vault peritoneum and repairing the vaginal mucosa. The method of VH was the traditional one, by entering the peritoneal cavity through the Douglas pouch in anteriorly, and then suturing the pedicles with delayed absorbable sutures (Vicryl 1). All the cases were performed by one surgeon to ensure uniformity and familiarity with the procedure.

Data were expressed as mean \pm SD and frequency percentage. The Kolmogorov-Smirnov statistics were used for testing normality for continuous variables. These were analyzed with one-way analysis of variance (ANOVA). For significant difference between groups, Tukey's post-Hoc test was used. A *p*-value less than 0.05 was considered statistically significant. The Statistical Package for Social Science version 14.0 (SPSS Inc., Chicago, IL, USA) was used for statistical analysis.

Results. A total of 288 hysterectomies were performed over 3 years (165 [57.3%] abdominal hysterectomy, 85 [29.5%] VH, and 38 [13.2%] laparoscopic assisted hysterectomy) (Table 1). The mean age was 52.5 \pm 5.1 years. The mean weight of patients was 65.2 \pm 8.4 kg. The mean weight of samples was 180.2 \pm 30.8 grams. There were no statistically significant differences in

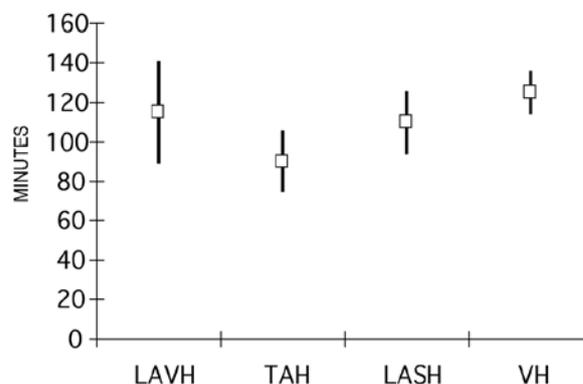


Figure 1 - Duration of surgery in any kind of hysterectomy. LAVH - laparoscopic-assisted vaginal hysterectomy, TAH - total abdominal hysterectomy, LASH - laparoscopy assisted supracervical hysterectomy, VH - vaginal hysterectomy.

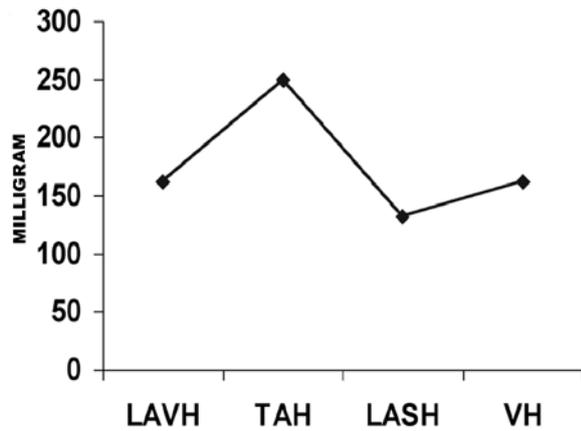


Figure 2 - Analgesic use in each kind of hysterectomy. LAVH - laparoscopic-assisted vaginal hysterectomy, TAH - total abdominal hysterectomy, LASH - laparoscopy assisted supracervical hysterectomy, VH - vaginal hysterectomy

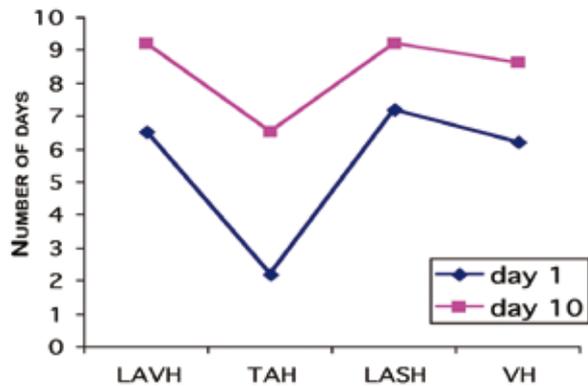


Figure 3 - Scale of post-operative activity. LAVH - laparoscopic-assisted vaginal hysterectomy, TAH - total abdominal hysterectomy, LASH - laparoscopy assisted supracervical hysterectomy, VH - vaginal hysterectomy

age, weight, and body mass index between the groups (Table 1). The most common pathology was disordered proliferative endometrium and fibroids. The mean operating time for LAVH was 120.4 ± 25.7 , and 115.4 ± 10.2 minutes for LASH, approximately 30 minutes longer than TAH (90.7 ± 15.1 minutes), a significant difference, but the same as for traditional vaginal method (120.6 ± 15.7), and because of coincident colporrhaphy with LAVH and VH, the coincidental colporrhaphy was carried out in the last 2 methods ($p=0.003$) (Figure 1). The drug requirement to control pain during hospitalization after TAH was almost double compared with LAVH and vaginal hysterectomy ($p=0.004$) (Figure 2). The estimated blood loss for TAH group was the same as for LAVH with colporrhaphy group ($p=0.26$), but more than LASH and LAVH without colporrhaphy. The difference in post operative activity levels that was assessed on a scale of 1 (extremely limited activity) to 10 (no limits on activity) for LAVH and LASH groups, the day after the operation was significantly higher than TAH (6.5, 7.2) / (2.2), and it was more obvious 10 days later, 9.2 for LAVH and LASH groups compared with 6.5 for TAH groups (Figure 3).

Discussion. Several indications and diseases in gynecology can be managed via laparoscopic surgery. Published reports have documented the advantage of laparoscopy over open surgery.⁵ Laparoscopy with excellent anatomic view, provides better vision of the intraperitoneal viscera, and promotes better hemostatic facilities than laparotomy.⁴ In using the laparoscopic method, there is a possibility of coincidental surgery² because of smaller incision, there is less bleeding, less pain, and shorter recovery time.² In obese patients, the laparoscopic method had better results than laparotomy⁶ because of short hospital stay, and the total expense is low.⁷ In our study, the patients who underwent LAVH

Table 1 - The results of the patients according to treatment groups, (N=288).

Variables	LAVH (n=20)	TAH (n=166)	LASH (n=18)	VH (n=85)	P-value
Age (years)	51.2 ± 3.4	55.7 ± 2.1	53.1 ± 4.7	54.9 ± 3.3	0.74
Weight (kg)	64.2 ± 7.2	61.7 ± 4.8	67.1 ± 4.8	65.1 ± 5.2	0.39
Length of hospital stay (days)	2.4 ± 0.3	4.5 ± 0.5	2.1 ± 0.7	2.3 ± 0.8	0.04
Hemoglobin drop (mg/dl)	2.5 ± 0.4	3.2 ± 0.5	1.8 ± 0.5	1.8 ± 0.6	0.26
Analgesic use (mg)	150 ± 25	225 ± 50	120 ± 25	150 ± 25	0.04
Colporaphy	+	-	-	+	-
Postoperative activity level, (day 1)	6.5	2.2	7.2	6.2	0.01
Postoperative activity level (day 10)	9.2	6.5	9.2	8.6	0.03

LAVH - laparoscopic-assisted vaginal hysterectomy, TAH - total abdominal hysterectomy, LASH - laparoscopy assisted supracervical hysterectomy, VH - vaginal hysterectomy

or LASH procedures and VH had shorter hospital stay, less postoperative analgesia, and faster recovery than TAH.

The operation time was shorter for TAH than LAVH and LASH. The time consumed in LASH was for removing tissue, and in LAVH and vaginal cases for performing colporrhaphy. In the TAH, a coincidental colporrhaphy was unusual. The return to complete activity with LASH and LAVH was more feasible. In a review of articles by Johnson⁸ et al with 3643 participants in 27 studies, they concluded that the laparoscopic method had shorter hospital stay and faster recovery time than laparotomy assisted surgery, and the difference between the vaginal approach and laparoscopy was not significant,⁸ while urinary system injury was more severe in laparoscopic cases. In this study, converting from laparoscopy to laparotomy was 7%.⁸

Mettler et al,⁹ in a review and evaluation of real benefits of laparoscopy assisted hysterectomy concluded, that these techniques are advantageous to patients if performed for the appropriate indication and in particular, sub-total or supracervical hysterectomy, with the cervix remaining in its place, is associated with fewer complications and very favorable outcome for the patient. In Ottosen et al's⁶ study with 120 candidates for hysterectomy by comparing 3 methods, the duration of surgery was longer, but the hospital stay and recovery time was shorter. Persson et al,¹ in a study on 119 hysterectomy candidates for benign uterine disorders, had not observed significant difference in complications or need for transfusion among the 3 methods. In a report of LAVH in a university hospital, Fylstra and Carter¹⁰ concluded that LAVH, when used as an alternative to abdominal hysterectomy in patients not considered candidates for VH, decreased the need for abdominal hysterectomy with fewer complications, shorter hospital stay, and increased residents' experience with vaginal surgery.

In a comparative analysis of hysterectomies, Aniliene et al¹¹ concluded that abdominal hysterectomy was the most common procedure performed. The type of hysterectomy influenced the complication rate after laparoscopic and vaginal hysterectomies. Schindlbeck et al,¹² in comparing the total laparoscopic, vaginal, and abdominal hysterectomy found that for many patients, THL is a safe and less invasive alternative, especially towards AH, and shows significantly better post-operative reconstitution.

The limitation of our study includes equipment availability for laparoscopic cases and sample size for matching.

In conclusion, as laparoscopy assisted hysterectomy (LAVH, LASH) was associated with significantly lower early postoperative pain scores and complications rates, less blood loss, shorter hospital stay, and resulted in lower

expense (with reusable devices) statistically, laparoscopy is preferred to abdominal hysterectomy by laparotomy and to VH. Although VH had less complications and rapid recovery and patient satisfaction, it was limited for multiparous patients with some degrees of relaxation. We suggest further meta-analysis for comparing the 3 methods. It must be mentioned that less operative complications by any approach demand more expertise, and to improve endoscopic surgery, it must be included in the educational curriculum of gynecological residents.

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