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Two-year Experience with Laparoscopically Assisted Vaginal Hysterectomy (LAVH) in Maharaj Nakorn Chiang Mai Hospital : A Retrospective Comparative Study with Total Abdominal Hysterectomy

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ABSTRACT

Objective To describe our experience with laparoscopically assisted vaginal hysterectomy (LAVH) and compare the results with total abdominal hysterectomy (TAH).

Design Retrospective comparative study.

Setting Department of Obstetrics and Gynaecology, Chiang Mai University.

Subjects Forty eight LAVH patients and 48 TAH controls who were operated on between August 1998 and August 2000.

Methods Medical records of the LAVH cases were reviewed. The next patients who had a TAH served as controls. Controls were matched with regard to age (± 5 years) and body weight (± 10 kg).

Main outcome measures Operative times, amount of blood loss, postoperative analgesic requirement, days in hospital and serious complications.

Results Baseline characteristics in both groups were comparable. Operative time was significantly longer (p=<0.001) in the LAVH group (176.5 ± 43.5 minutes) than the TAH group (121.4 ± 31.2 minutes). There was no significant difference in the amount of estimated blood loss (LAVH group 354.2 ± 205.2 ml; TAH group 397.9 ± 253.9 ml). A case of bowel injury and one of ureteral injury occurred in the LAVH group. No serious complications occurred in the TAH group. The median number of Meperidine dosage was significantly lower in the LAVH than that in the TAH group (median of 1 versus 2 doses, p=0.034). Hospital stay was significantly shorter in the LAVH group (median of 3 versus 4 days, p=0.001). No patient required blood transfusion.

Conclusions LAVH is an excellent alternative to TAH. It offers several benefits over TAH such as less postoperative pain and shorter hospital stay. However, LAVH needs a learning period and a longer operative time.

Key words: laparoscopically assisted vaginal hysterectomy, LAVH, TAH

Hysterectomy, with or without concomitant salpingo-oophorectomy, is the most common major gynecologic surgical procedure. In the past, gynecologic surgeons had to decide whether to remove the uterus abdominally or vaginally. Total vaginal hysterectomy (TVH) has many advantages over total abdominal hysterectomy (TAH) 1 such as: 1) less post-operative ileus because of minimal bowel manipulation, 2) no morbidity associated with abdominal incisions, 3) earlier ambulation and less need for postoperative pain medication, 4) less postoperative adhesion, 5) more tolerance from elderly patients, 6) less technical difficulties in obese patients and 7) easier repair of vaginal wall relaxation. However, TVH can not be performed in all patients. Contraindications include suspected adnexal pathology, pelvic pain of unknown etiology, invasive cervical or endometrial cancer, pelvic inflammatory disease (PID), and suspected intra-abdominal diseases of the bowel or appendix that require exploration.[1] TVH also has limitations in that it allows for limited exposure of the pelvic organs.[1]

Laparoscopically Assisted Vaginal Hysterectomy (LAVH) is a procedure that combines laparoscopic surgical techniques and instrumentation with those of vaginal hysterectomy. With this approach, many patients previously contraindicated for TVH can have their uterus removed vaginally and benefit from TVH without compromising their safety. The advantages of LAVH comprise a smaller incision, less post operative pain, shorter hospital stay, faster recovery and minimal abdominal scar.[2-4] Several authors have reported on LAVH as an improved alternative to conventional abdominal hysterectomy.[5-10] Complications of hysterectomy, such as bleeding, infection, anesthetic problems or injury to the bowel or bladder, are not increased in LAVH.[2-4] Generally, laparoscopic hysterectomy results in less blood loss, less bowel irritation and also less post-operative pain.[2-4] Since patients can ambulate earlier, other complications such as thromboembolism and pulmonary problems are reduced.

Although Galen et al.[11] reported LAVH in an outpatient setting in 1994, this kind of procedure could not be performed in our department until August 1998 because of equipment limitations. The purpose of this study was to review our experience with LAVH at Maharaj Nakorn Chiang Mai Hospital and to compare the result and safety with those of TAH performed during the same period.

Material and Methods

From August 1998 to August 2000, 48 patients underwent LAVH with or without salpingo-oophorectomy. They were compared to 48 control patients who had TAH performed with or without salpingo-oophorectomy during the same period. Controls were selected from the next patients who had their uterus removed abdominally. They were matched to cases with regard to age (± 5 years), and body weight (± 10 kg). The inclusion criteria for LAVH were: 1) uterine size not larger than that after 12 weeks of pregnancy; 2) a preoperative hemoglobin level of >10 gm%; and 3) no underlying cardiac or pulmonary disease, which would prohibit a laparoscopic procedure. Exclusion criteria included extensive endometriosis or adhesions, fused hip joint and a narrow pubic arch with a stenotic vagina.

LAVH was performed by 6 endoscopic surgeons using similar techniques. Patients gave written informed consent and were admitted one day prior to their operation. Ampicillin at 1 gm was given intravenously approximately 1-2 hours before the operations. General anesthesia with endotracheal intubation was employed in all cases. Patients were draped in a sterile fashion in the dorsal lithotomy position, with an indwelling Foley catheter inside the bladder. A uterine elevator was placed and pneumoperitoneum achieved with carbon dioxide (CO2). A 10-mm trocar was introduced through an umbilical incision. Two to three suprapubic incisions were made (depending on surgeons) for the insertion of operative instruments. During the operation, patients were placed in the Trendelenburg position. Any adhesion, if present, was divided until the adnexae could be freely mobilized. Both round ligaments were

desiccated by bipolar forceps and cut with scissors. Infundibulopelvic ligament or fallopian tubes and ovarian ligaments were desiccated and cut in a similar manner, depending on whether the adnexae were to be removed or not. Broad ligaments were cauterized and cut just above the uterine vessels. Vesicouterine peritoneum was cut open with scissors and the bladder was dissected from the uterus by hydrodissection. Both uterosarcal ligaments were desiccated with bipolar forceps and cut with scissors. A sponge was then placed vaginally in the posterior fornix and the cul-de-sac was cut with a unipolar electrode until the vagina was entered. The anterior fornix was cut open in a similar manner. All operative instruments were removed from the abdominal cavity. Conventional vaginal hysterectomy was then continued. After closing the vaginal vault, the abdominal cavity was re-inflated. The pelvic cavity was examined laparoscopically. All bleeding sites were coagulated and irrigated with lactated Ringer's solution until clear. Then the scope and operative instruments were removed. Carbon dioxide was released before withdrawal of all trocars, and the abdominal wounds were closed with subcuticular sutures.

TAH with or without bilateral salpingo-oophorectomy was performed in the control group by the faculty and residents using standard surgical techniques.

Stata Statistical Software (Stata Corporation, College Station, TX) was used for data analysis and the statistical tests were considered significant at $P<.05$. Paired t-tests, Wilcoxon matched-pair signed-ranks tests and Chi-square tests were used as appropriate.

Results

There was no significant difference in any baseline characteristics of the subjects who underwent LAVH or TAH with or without bilateral salpingo-oophorectomy (Table 1). Most of the patients (73%) were residents of Chiang Mai province and worked as government officials (25%). The indications for hysterectomy were not significantly different in the two groups (Table 2).

Operative time was significantly longer ($p=<0.001$) in the LAVH group (176.5 ± 43.5 minutes) than in the TAH group (121.4 ± 31.2 minutes). However, there was no significant difference in the amount of estimated blood loss in the two groups (354.2 ± 205.2 ml and 397.9 ± 253.9 ml in the LAVH and TAH groups respectively).

LAVH was performed in conjunction with adnexal surgery in 30 out of 48 cases. Of these 30 cases, twenty-eight had unilateral or bilateral salpingo-oophorectomy, one had ovarian cystectomy and one had bilateral salpingo-oophorectomy with lysis of pelvic adhesion. Operative times and amounts of estimated blood loss were not significantly different in the groups with and without additional adnexal surgery (Table 3).

A serious complication occurred in two cases (4.2%) in the LAVH group, but none occurred in the TAH group. Both complications were encountered during the first four months when LAVH was introduced. The first case underwent exploratory laparotomy to repair a bowel injury followed by a colostomy. The second case also needed laparotomy to repair ureteral injury.

Meperidine at 50 mg was prescribed post-operatively for pain relief every 4-6 hours as requested by the patients. The median number of Meperidine dosage was found to be significantly lower ($p=0.034$) in the LAVH group (median = 1 dose, range 0-4 doses) than in the TAH group (median = 2 doses, range 2-4 doses). The median number of days in hospital in the LAVH group (median = 3 days, range 1-8 days) was also significantly shorter ($p=0.001$) than in the TAH group (median = 4 days, range 1-7 days). No patient in either group required a blood transfusion .

Table 1. Baseli.e characteristics

Characteristics	LAVH (n=48)	TAH (n=48)	p
Age (years)	43.4 ± 6.3	44.8 ± 6.8	0.306
Body weight (kg)	54.4 ± 8.2	53.0 ± 6.6	0.367
Uterine weight (g)	129.5 ± 76.6	152.7 ± 103.6	0.294
Nulliparous	6 (12.5)	10 (20.8)	0.273
Multiparous	42 (87.5)	38 (79.2)	
Residences			0.668
Muang Chiang Mai	8 (16.7)	9 (18.7)	
Suburbs of Chiang Mai	27 (56.3)	26 (54.2)	
Lampoon	7 (14.5)	3 (6.3)	
Chiang Rai	1 (2.1)	4 (8.3)	
Other Provinces	5 (10.4)	6 (12.5)	
Occupations			0.237
Government official	14 (29.2)	10 (20.8)	
Employee	10 (20.8)	11 (22.9)	
Agriculture	9 (18.8)	10 (20.8)	
Housewife	8 (16.7)	14 (29.2)	
Merchant	7 (14.5)	3 (6.3)	

Data were presented as mean ± SD, or n (%)

Table 2. Indications for operation

Diagnosis	LAVH (n=48)	TAH (n=48)
Myoma uteri / Adenomyosis	19	26
CIN / CIS / MIC	12	14
Endometriosis / Endometrioma	10	4
Pelvic pain	1	-
Ovarian cyst	3	3
Dysfunctional uterine bleeding	1	1
Relaxation of Vaginal Outlet	2	-

P=0.062

CIN = Carcinoma intraepithelial neoplasia

CIS = Carcinoma in situ

MIC = Microinvasive cancer

Table 3. Operative times and amounts of estimated blood loss in patients undergoing LAVH with or without additional adnexal surgery

	LAVH alone (n = 18)	LAVH with adnexal surgery (n = 30)	p
Operative time	172.9 ± 42.2	178.6 ± 44.9	0.6685
Estimated blood loss	330.6 ± 163.7	368.3 ± 228.0	0.5427

Data were presented as mean ± SD

Discussion

Laparoscopic visualization of the pelvic cavity enables gynecologic surgeons to lyse pelvic adhesion, resect fallopian tubes and ovaries, and perform surgery on pathological adnexae. With the added advantages of laparoscopy, many patients previously contraindicated for TVH can now be safely treated with LAVH.

In this retrospective study, we compared the first 48 cases of LAVH performed in our hospital with another 48 patients who underwent TAH during the same two-year period. Patients were matched in terms of age and body weight, and there was no significant difference in other baseline characteristics. However, patients could still differ in other unknown aspects, as the allocation of treatment was not randomized.

Our finding agreed with many previous reports[5,10,12,13] in that the operative time for LAVH was significantly longer than that for TAH. However, the mean operative time (± S.D.) for LAVH in our series (176.5 ± 43.5 minutes) was somewhat longer than those times reported in literature (79-146 minutes).[5,12,13,14] This could be due to the fact that LAVH was a relatively new surgical procedure in our institute. Contrary to many other reports, the estimated blood loss in our series was not significantly different between the two groups. This reflected a bias in favor of TAH, as surgeons were more familiar with its long-established techniques than those of the relatively new LAVH.

Patients in the LAVH group required significantly fewer analgesic drugs in the postoperative period, which suggested that they experienced less postoperative pain. This was understandable, as LAVH was performed through smaller abdominal incisions and it involved less tissue trauma and minimal bowel manipulation. As a consequence, patients were able to ambulate earlier. This was reflected in our finding that patients in the LAVH group had a significantly shorter mean duration of hospital stay than in the TAH group. Although two patients suffered a serious complication in the LAVH group, they made an uneventful recovery after immediate surgical exploration. Both cases encountered these problems during the initial 4 months of the LAVH procedure. As experience accumulated, there were no further cases of serious intraoperative or postoperative complications.

In conclusion, this study confirms that LAVH is an excellent alternative to TAH. It offers several benefits over TAH such as less postoperative pain, earlier postoperative ambulation and a shorter hospital stay. However, LAVH still needs a learning period and it requires a longer operative time, which can be exacerbated by inadequate skills of the surgeons. Other disadvantages include a need for sophisticated and costly equipment. When LAVH was performed by experienced surgeons in properly selected cases, the occurrence of complications was not higher than in TAH.

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