

# A Comparative Study Between Laparoscopically Assisted Vaginal Hysterectomy and Vaginal Hysterectomy: Experience in a Tertiary Diabetes Care Hospital in Bangladesh

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## ABSTRACT

**Objective:** The study was undertaken to compare the efficiency and outcome of Laparoscopic Assisted Vaginal Hysterectomy (LAVH) and Vaginal Hysterectomy (VH) in terms of operative time, cost, estimated blood loss, hospital stay, quantity of analgesia use, intra- and postoperative complication rates and patients recovery. **Materials and Methods:** A total of 500 diabetic patients were prospectively collected in the study period from January 2005 through January 2009. The performance of LAVH was compared with that of VH, in a tertiary care hospital. The procedures were performed by the same surgeon. **Results:** There was no significant difference in terms of age, parity, body weight or uterine weight. The mean estimated blood loss in LAVH was significantly lower when compared with the VH group (126.5±39.8 ml and 100±32.8 ml), respectively. As to postoperative pain, less diclofenac was required in the LAVH group compared to the VH group (70.38±13.45 mg and 75.18±16.45 mg), respectively. **Conclusions:** LAVH, is clinically and economically comparable to VH, with patient benefits of less estimated blood loss, lower quantity of analgesia use, lower rate of intra- and postoperative complications, less postoperative pain, rapid patient recovery, and shorter hospital stay.

**Key words:** Bangladesh, laparoscopically assisted vaginal hysterectomy, vaginal hysterectomy

## INTRODUCTION

Hysterectomy is one of the most common, major gynecological surgical procedures performed. Even though there are numerous benefits of vaginal over abdominal hysterectomy, 70–80% of all hysterectomies are performed abdominally.<sup>[1]</sup> Vaginal hysterectomy is associated with lower morbidity and more rapid postoperative

recovery than abdominal hysterectomy.<sup>[2,3]</sup> This technique is not frequently performed in patients with a uterine lesion. Most of the conditions listed as relative contraindications to VH can be treated laparoscopically when a hysterectomy is not appropriate.<sup>[4,5]</sup> Also laparoscopic evaluation has shown that the preoperative decision that VH is contraindicated is often wrong, leading to the inappropriate choice of total

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abdominal hysterectomy (TAH) rather than VH.<sup>[6]</sup> Finally, hysterectomy may be performed laparoscopically rather than by laparotomy.<sup>[6,7]</sup>

Since Harry Reich first described the laparoscopic hysterectomy (LH) technique in 1989, laparoscopically assisted vaginal hysterectomy (LAVH) has become a popular alternative to abdominal hysterectomy in cases difficult to manage via the vaginal route alone.<sup>[8]</sup> Since then, numerous articles using the same procedure have been published and a variety of different methods have also been suggested to improve this surgical technique.<sup>[9-15]</sup> Laparoscopically assisted vaginal hysterectomy (LAVH) has become an alternative to conventional abdominal hysterectomy, and a lot more patients prefer the laparoscopic approach for cosmetic purposes and for the faster postoperative recovery rate.<sup>[16-21]</sup>

## OBJECTIVE

The aim of the study is to compare the efficiency of LAVH with VH in terms of operative time and cost, estimated blood loss, hospital stay, analgesic, intra- and postoperative complication rates, and patient recovery.

## MATERIALS AND METHOD

### Study design

It is a prospective comparative study.

### Place of study

The study was carried out in a tertiary care hospital, BIRDEM, Dhaka.

### Sample size

Five hundred diabetic samples were scheduled for hysterectomy. They were divided into two groups. The outcomes measured for the two groups were studied comparatively in terms of demographic and socioeconomic details; uterine weight, indication for operation, operation time, cost, estimated blood loss, postoperative pain control, hospital stay, time to return to normal activity, intra- and postoperative complication rates, patients recovery time, and histopathology summary. Samples were drawn as per availability.

### Duration of the study

The study was carried out from January 2005 to December 2008. Patients undergoing LAVH, and VH by the same surgeon for non-malignant conditions were included.

### Inclusion criteria

The inclusion criteria for these two procedures were to ensure that: The uterine size of the diabetic patients did not exceed the size equivalent to 20 weeks of pregnancy, and the patient did not have cardiac or pulmonary diseases; no contraindications for the lithotomy position.

### Exclusion criteria

The exclusion criteria for LAVH and VH were: If the size of the uterus was more than 20 weeks pregnancy size and if the patient had a history of two or more cesarean sections previously.

### Surgical procedures

All surgical procedures were performed between day 7 and 15 of the menstrual cycle by the same consultant. Informed consents were obtained before surgery. They were admitted to the hospital on the day of operation. Blood sugar level was well-controlled (postprandial blood sugar was within 5 – 8 mmol/L). Second-generation cephalosporin was administered intravenously as a prophylactic antibiotic approximately half an hour before the operation. Surgical techniques were performed under general anesthesia and spinal anesthesia. A Foley catheter and uterine manipulator were inserted after the introduction of anesthesia. Finally, the patient was placed in the Trendelenburg position. No medical or mechanical vasoconstriction was used in either procedure. The length of operating time was recorded as the time from the first surgical incision to the time at which all wounds were closed and dressed. Blood loss at operation was estimated according to normal practice by measurement of all aspirated blood and weighing of all swabs, together with an estimate of blood that was shed (into the perineal bag attached to collect the blood loss) during the vaginal operations.

The preoperative hemoglobin concentration was compared with that observed on the first day after the operation. Bowel preparation was performed in all patients. The hospital stay was tracked in whole days. In no case redo surgery or readmission to the hospital was necessary.

Laparoscopically assisted vaginal hysterectomy was performed as follows: Under general anesthesia, the pneumoperitoneum was created by insufflating carbon dioxide. A 10 mm metallic trocar was inserted through the subumbilical incision for the 10 mm video laparoscope (Karl Storz, Tuttingen, Germany). Two other ancillary parts of 5 mm calibers were created laterally to the inferior epigastric vessels in the lower abdomen for

insertion of ancillary instruments through metallic trocars. The left lower quadrant puncture was the major portal for operative manipulation. LAVH began with electro-coagulation and transection of the bilateral round ligaments using Force Triad (Ligasure). In patients who desired to preserve the ovaries, the fallopian tubes and ovarian ligaments were transected, whereas, in those who preferred removal of the ovaries, the infundibulopelvic ligaments were isolated, coagulated, and transected. Then the vesico-uterine peritoneum was opened. Placing a gauze ball through the vagina into the anterior fornix soaked with methylene blue, the bladder peritoneum was mobilized and then anterior colpotomy was performed with monopolar electrocautery until the methylene blue-soaked guaze was visible and the same procedures were followed in posterior colpotomy. The vaginal procedures began after anterior and posterior colpotomies. The vesicocervical, uterosacral, cardinal ligaments, and uterine vessels were clamped, transected, and sutured until vaginal hysterectomy was completely done. Closure of the vaginal vault concluded the vaginal phase. Finally, the pelvic cavity and abdomen were laparoscopically re-evaluated and lavaged after hemostasis, if necessary. Vaginal hysterectomy (VH) was performed in a Trendelenburg position, with maximum adduction of the legs. After sterile coverage, the vaginal situs was inspected using a Sims speculum and three forceps fixated the portio cervicis. A circumferential incision was made, the bladder was distracted from the anterior cervix and the spatium vesicouterinum opened. Following this, the Douglas peritoneum was opened, a larger speculum was placed and the bowels were pushed back. Both the ligaments of the sacro-uterine were clamped, cut and ligated, and then the parametria were disconnected in a similar manner, close to the uterus, presenting the situs, using a Breisky specula. The tubes and adnexal were inspected for pathologies and ligated separately. After removal of the uterus, the peritoneum was closed circumferentially with extraperitonealization of the adnexal stumps. The sacro-uterine ligaments were joined together and absorbable sutures were used to close the vagina.

The patients were discharged after bowel peristalsis, apyrexia, and patient ambulation, and there was no need of a narcotic analgesic.

Complications were recorded as follows: postoperative Hb decrease, febrile morbidity (defined as a tympanic temperature 38.3°C or higher, in two consecutive measurements at least six hours apart excluding the first 24 hours), an excessive amount of bleeding or hemorrhage requiring transfusion intraoperatively, injury to a major

blood vessel or organ, that is, bowel, bladder, or ureter, urinary tract infection, incisional wound infection, vault granuloma, and readmission to the hospital during the follow-up period for a problem directly related to the procedure.

### Statistical analyses

All statistical analyses were performed with SPSS 10.1 for windows (SPSS Inc. Chicago, IL),  $P < 0.05$  was considered to be statistically significant. Student's t-test, chi-square test, and Fisher exact test were used when appropriate.

## RESULTS

There were no statistically significant differences between the groups as to the mean age, parity, pre- and postoperative Hb% levels, and the mean uterine weight. The postoperative necessity of analgesics and the length of hospital stay did not differ between the LAVH and VH groups.

Five patients in the LAVH group and seven patients in the VH group needed blood transfusion. Five and three patients presented with postoperative fever or febrile infections in the LAVH and VH groups, respectively.

Table 1 shows the clinical characteristics of the patients. There was no significant difference in terms of age, parity, body weight, uterine weight, and prior pelvic surgery between the two study groups.

Values are expressed as mean±SD Table 2 shows the indications for surgery in the three groups, myoma uteri being the main cause for the majority of patients.

**Table 1: Basic clinical characteristics of the study subjects**

	LAVH	VH
Age (year)	44.7±3.5	42.7±5.8
Parity	2(1-3)	3(2-4)
Body weight (Kg)	59±6.0	57.4±7.7
Uterine weight (g)	273.2±126.4	265.6±76.9

LAVH: Laparoscopically assisted vaginal hysterectomy, VH: Laparoscopic hysterectomy

**Table 2: Indications of hysterectomy percentage distribution of study subjects**

Indication	LAVH N (%)	VH N (%)
Fibroid uterus	149 (59.60)	139 (55.60)
Endometriosis	26 (10.40)	23 (9.20)
PID	35 (14.00)	34 (13.60)
Cervical dysplasia	6 (2.40)	9 (3.60)
DUB	34 (13.60)	45 (18.00)

DUB: Dysfunctional uterine bleeding, PID: Chronic pelvic pain, LAVH: Laparoscopically assisted vaginal hysterectomy, VH: Laparoscopic hysterectomy, Values are expressed as case number (%)

**DISCUSSION**

Table 3 shows that the operation time was slightly longer and the operation cost was higher in the LAVH group compared to the VH group; 64.83±11.09 minutes versus 60.20±14.20 minutes and 393 US dollars versus 357 US dollars. The mean estimated blood loss in the LAVH and VH groups was lower (126.5±39.8 ml and 100±32.8 ml). This was verified by the postoperative fall of the Hb level. As for postoperative pain, significantly less diclofenac was required in the LAVH and VH groups (70.38±13.45 mg and 75.18±16.45 mg). The postoperative hospital stay and the time to return to work in the LAVH and VH groups (1.45±0.69 and 1.16±0.62 and 2.42±1.06 versus 2.82±1.08 days respectively).

Table 4 shows the intraoperative and postoperative complications, respectively. Intraoperative complications in the LAVH and VH groups required blood transfusion in two and three cases, respectively. Postoperative Hb decrease was not significantly different between the two modalities. Postoperative complications in the LAVH group included five cases of febrile morbidity, and in the VH group, the number of the patients was three. Urinary tract infection in the LAVH and VH groups were three and three cases, respectively. Incisional wounds were absent in both the LAVH and VH groups. Vault granuloma was present in the LAVH and VH groups 1 and 2, respectively. There was no surrounding visceral injury like bladder trauma, bowel trauma, ureteral trauma, laparotomy or rehospitalization in any of the groups.

Laparoscopic assisted hysterectomy was first described by Reich *et al.* (1989).<sup>[8]</sup> There have been various modifications of the technique. At that time, they distinguished between LH and LAVH, on the basis of the approach for ligation of the uterine arteries, LH if the uterine arteries were ligated laparoscopically and LAVH if they were ligated vaginally.<sup>[22,23]</sup>

A report by Kovac *et al.*<sup>[15]</sup> showed that performing a laparoscopy before abdominal hysterectomy allowed 90% of the hysterectomies scheduled abdominally to be performed as uncomplicated vaginal procedures. As not all gynecologists were prepared to perform difficult vaginal procedures, LAVH might be an opportunity to become familiar with the vaginal approach.<sup>[24]</sup> LAVH was introduced to allow surgeons with limited experience in vaginal surgery to remove the uterus without an abdominal incision in the presence of pelvic adhesion, endometriosis, adnexal disease or large uterus.<sup>[25]</sup>

The time of discharge from the hospital and the time to resume normal activity or complete recovery were proposed as better criteria for the patients' postoperative clinical judgment.

In our study the length of hospitalization and the mean time to resume normal activity were less in LAVH than in the VH group.

As for the estimated blood loss, there was no significant difference between the LAVH and VH groups, which was similar to most of the previous studies.<sup>[12,15]</sup> Patients in the LAVH group needed significantly less analgesics compared to those in the VH group.<sup>[11,12,14,16]</sup> Also hospital stay for patients with LAVH was significantly shorter than that for patients in the VH group. This has been well supported by most earlier studies.<sup>[14,15,17,18]</sup> With regards to the operative cost, it still remains without a consensus. The author found that the operative cost for the LAVH group was slightly higher than that for the VH group.<sup>[11,14,16,18]</sup> As demonstrated by one study if reusable instrumentation is used and operative times made efficient, the operative cost for the LAVH group may be reduced to less than that of the VH group.<sup>[19]</sup> Time to return to work was shortened in the LAVH group and VH group as in other studies.<sup>[20,21]</sup> One of the pitfalls about LAVH and VH is that all cases were successful. Nevertheless, multiple myoma and large uterus are often barriers. Thus accurate preoperative diagnosis is essential. However none of the cases in the LAVH and VH groups were converted to TAH.

**Table 3: Characteristics and clinical variables of the study subjects**

	LAVH	VH
Operative time (min)	64.8±11.1	54.8±12.3
Operative cost (Median) US\$	393	321
Estimated blood loss (ml)	126.5±39.8	100±32.8
Quantity of analgesics (Diclofenac mg)	70.4±13.5	75.2±16.5
Hospital stay (days)	1.5±0.7	1.2±0.7
Time to return to work (Days)	2.4±1.1	2.8±1.1

Values are mean±SD or case number (%), DUB: Dysfunctional uterine bleeding, CIN: Cervical Intraepithelial Neoplasia, LAVH: Laparoscopically assisted vaginal hysterectomy, VH: Laparoscopic hysterectomy

**Table 4: Complication of hysterectomy in patients among the three groups**

	LAVH	VH
Intraoperative		
Requiring blood transfusion (%)	2	3
Postoperative		
Hb decrease (Mean±SD)	1.2±0.7	1.3±0.6
Febrile (> 38oC)	5	3
Urinary tract infection	3	3
Incisional wound infection	0	0
Vault granuloma	1	2

LAVH: Laparoscopically assisted vaginal hysterectomy, VH: Laparoscopic hysterectomy



Early discharge from hospital also has major cost implications in the LAVH group than in the VH group. Quicker recovery in the postoperative period and in the interval between surgery and return to work are two major advantages with the laparoscopic and vaginal procedures.

Our data justify that LAVH is clinically and economically comparable to VH, with patient benefits of less postoperative pain and shorter hospital stay. Thus, in patients with no need for abdominal surgery (e.g., no significant adhesions or endometriosis) vaginal hysterectomy seems a better and faster approach than TAH. The incidence of complications are low for the two groups.

### CONCLUSION

The patients were quite similar in the two groups and group assignment was not based on patient selection of surgical procedure or on the physicians' selection of particular patients, it was based on the assignment of the attending surgeon. Similar skills were compared, as all operations were performed by the same senior surgeon. We think, if reasonable, based on our results, we suggest the following conclusions.

First, many patients traditionally treated with abdominal hysterectomy could be treated via VH or LAVH.

Second, surgical time for LAVH was slightly greater than that for VH. (Technologic improvements, such as endoscopic stapler cultures, may decrease the difference.)

Third, blood loss with LAVH was minimal as LigaSure was used.

Fourth, postoperative pain was less with LAVH than with VH.

Fifth, hospital stay was shorter with LAVH than with VH. Although VH and LAVH could be done successfully on an outpatient basis, our result suggests that if similar criteria are used regarding flatus or bowel movement, absence of fever, toleration of a regular diet, unassisted ambulation, and minimal narcotic analgesia use, LAVH and VH shorten the need for hospitalization by 1.5 days. Finally, LAVH has no consequential cost benefit over VH, when only hospital costs are considered.

Our study justifies only the conclusion that LAVH is clinically and economically comparable to VH with patient benefits of less postoperative pain and shorter hospital stays. Thus, in patients with no need for abdominal surgery (eg. no significant adhesions or endometriosis)

vaginal hysterectomy seems a better and faster approach than LAVH.<sup>[26]</sup> Although, a gynecological surgeon trained in operative laparoscopy may reasonably perform an LAVH instead of a TAH in many patients where a vaginal hysterectomy is not appropriate.

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