

Original Article

Laparoscopic Assisted Vaginal Hysterectomy: A Case Control Comparative Study with Total Abdominal Hysterectomy

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Abstract :

This case control study was conducted in the department of Gynae & Obstetrics, Sir Salimullah Medical College & Mitford Hospital (SSMC & MH), Dhaka, during the period of January 2008 to December 2008 to compare the length of operation, blood loss, length of hospital stay, drug requirements for pain and post-operative pain and activity levels between Laparoscopically Assisted Vaginal Hysterectomy (LAVH) & Total Abdominal Hysterectomy (TAH). A total of 50 patients who met some eligibility criteria were consecutively included in the study and matched in a case control manner for age, weight, diagnosis & uterine size. The procedures were performed by the same surgeon. On average, LAVH operations took significantly longer than TAH operations ($P < 0.001$). Equal number of patients of both groups (40%) needed blood transfusion. No significant difference about haemoglobin level compared to TAH group on 3rd POD ($P = 0.246$). However total amount of analgesics needed was much higher in the TAH group than that of the LAVH group (243.7 ± 40.3 VS 182.1 ± 69.6 mg; $P = 0.005$) and the total cost of operation was significantly less in the TAH group (4500 ± 500 takas) than in the LAVH group (6500 ± 500 taka) ($P < 0.001$). It was observed that LAVH group produced earlier relief from pain in terms of pain VAS on 3rd POD, ($P < 0.001$). LAVH is less painful, has a shorter length of hospital stay and quicker return to work than TAH. Moreover LAVH does not increase intra or postoperative complications.

Key words : LAVH, TAH, Hemoglobin, Uterine size, Per-operative, Complications.

Introduction :

Hysterectomy is a frequently performed gynaecologic procedure worldwide, second only to caesarean delivery¹. Approximately 6,000,000 hysterectomies are performed in the United States each year and 20% of women in the UK undergo hysterectomy before the age of sixty. Historically the uterus has been removed by either the abdominal or vaginal route. The vaginal operation is preferable when there are no contraindications because of lower morbidity and quicker recovery. The VALUE study suggested that 67% of surgeons still used the abdominal approach as

the operation of choice, particularly when dealing with pelvic pathology or carrying out oophorectomy².

Since it was first reported by Reich et al in 1989² laparoscopically assisted vaginal hysterectomy (LAVH) has gained widespread acceptance. Laparoscopic dissection of the para-uterine tissues to the level of the uterine arteries (LAVH) or to include the uterine arteries (laparoscopic hysterectomy) also permits oophorectomy or dissection of adhesions under direct vision more easily than vaginal route. Farquhar and Steiner found a growth of hysterectomies performed with laparoscopic assistance (0.3-9.9%) with an associated decline in the proportion of hysterectomies performed abdominally (in USA during 1990-1997)².

Now a days laparoscopic hysterectomy is considered a substitute for abdominal hysterectomy and not for vaginal hysterectomy. Laparoscopic hysterectomy has never been indicated for hysterectomy if the operation is feasible by the vaginal route. Much effort have been put into randomized control trials which compares laparoscopically assisted vaginal hysterectomy (LAVH) and total abdominal hysterectomy^{3,4}.

Laparoscopically assisted vaginal hysterectomy is a

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useful adjunct to transvaginal hysterectomy for lysis of extensive adhesions and sometimes for certain concomitant adnexals and sometimes for certain concomitant adhesions surgery. Besides, LAVH can also secure almost all the main blood supplies to the uterus, i.e., the uterine vessels and the adnexal collaterals⁵⁻⁷.

Disadvantages of Laparoscopic hysterectomy in comparison with total abdominal hysterectomy are: it is associated with long operating time, more hospital costs. Furthermore, hysterectomy performed via the laparoscope is an advanced and technically difficult procedure requiring a depth of experience and training in operative laparoscopy⁸.

Materials and Methods :

It was a prospective case control study conducted in the department of Gynae and Obstetrics, Sir-Salimullah Medical College, Mitford Hospital, Dhaka over a period 12 months from January to December 2008. Patients receiving LAVH and TAH at SSMC & MH were included in this study. The women diagnosed with non-invasive diseases of the uterus like dysfunctional uterine bleeding, fibroid uterus ≤ 12 weeks size, adenomyosis, pelvic pain, chronic cervicitis were included in this study. Women diagnosed with uterine prolapse, endometriosis, extensive pelvic adhesion, adnexal mass, cervical carcinoma, multiple fibroids ≥ 14 weeks size were excluded from the study. Considering the limitations of availability of routine cases meeting all the eligibility criteria, sample size for each group was taken as 25. A total of 50 patients who met the above mentioned eligibility criteria were consecutively included in the study.

The demographic variables included in the study were age, socio-economic condition, parity, past obstetric history. The per-operative variables were blood transfusion needed and injury to the bladder, while postoperative outcome variables were pain Visual Analog Scale (VAS), level of Hb, day of discharge, day of disappearance of pain, total amount of analgesics needed, total cost of operation. Proper permission was taken for this study from the Ethical Committee of SSMC, Mitford Hospital, Dhaka, Bangladesh.

TAH was performed with the patients placed in the supine position. After disinfection abdomen was opened by either a paramedian verticle or a pfannenstiel incision. A paired clamps were placed on round ligaments, fallopian tubes & infundibulo pelvic ligaments and then cut and sutured. Then peritoneum of the uterovesical pouch was divided and second clamp was made to cut uterine vessels and 3rd clamp was

made to cut Mackendrot's and uterosacral ligaments and then ligated. Uterus was removed and vaginal vault were repaired with interrupted suture.

In LAVH, patients were positioned on operating table in the lithotomy position with the legs titled slightly forward. A uterine manipulator was introduced through the vagina before the abdominal incision. A 10mm trocar and canula was inserted first infraumbilically⁹ to hold the optic camera. A 5mm trocar along with another¹⁰ mm trocar was inserted in the lower abdomen. The stage-IV LAVH¹⁰ began with electrocoagulation and transection of the bilateral round ligaments, the fallopian tubes and ovarian ligaments. Bilateral uterine arteries were identified and the vesico-uterine peritoneum was opened to make the subsequent hysterectomy easier to perform. The vaginal procedures began with anterior and posterior colpotomies by a circumferential incision along the uterine cervix. The vesicocervical, cardinal and utero-sacral ligaments were clamped, cut & sutured. After that the uterine vessels and the adnexal collaterals had been clamped, cut and sutured. The final vaginal cuff closure was also being accomplished from below. Once the vaginal cuff was closed, the peritoneal cavity was insufflated, inspected laparoscopically for hemostasis and irrigated with warm normal saline solution⁹. The operative time was calculated from the first incision to the end of wound closure.

Data were processed and analyzed using SPSS (Statistical Package for Social Sciences). The test statistics used to analyze the data were descriptive statistics, Fisher's Exact Probability Test and Chi-square test. For all analytical tests, the level of significance was at 0.05 and $P < 0.05$ was considered significant. The summarized data were presented in the form of tables and charts.

Results :

A total of 50 women were included in this study to compare the peroperative and postoperative complications and outcome of patient of LAVH and TAH performed for same indications.

The most of the patients of TAH & LAVH groups were within 40 years of age, which are 64% & 60% respectively. More than one quarter (32%) of the patients were operated for DUB, 26% for fibroid, 12% for adenomyosis, 12% for PID and 18% for chronic cervicitis. The patients of LAVH group have had significantly higher mean operation time compared to that of TAH group ($P < 0.001$). The patients of LAVH

group also have had general anaesthesia (100%) while TAH group had only 12%. Equal number of patients of both groups (40%) needed blood transfusion.

Regarding Type of anaesthesia used; Table-I shows that 88% of women of TAH group needed spinal anaesthesia and only 12% needed general anaesthesia. On the other hand all the women of LAVH group needed general anaesthesia.

Table I : Comparison of type of anaesthesia between groups (n=50)

Type of anaesthesia	Group	
	TAH (n=25)	LAVH (n=25)
Spinal	22 (88%)	0 (0%)
G/A	03 (12%)	25 (100%)

Regarding Operation time; Table-II shows that 72% of TAH group required <60 minutes for operation to be completed, and 28% required 60-90 minutes. In contrast majority (92%) LAVH group needed 60-90 minutes for completion of operation and 8% needed >90 minutes. The patients of LAVH group have had significantly higher mean operation time compared to that of TAH group (p=<0.001).

Table II : Comparison of operation time between groups (n=50)

Operation time in minutes	Group		p-value #
	TAH (n=25)	LAVH (n=25)	
<60	18 (72%)	0 (0%)	<0.001
60-90	7 (28%)	23 (92%)	
>90	0(0%)	2 (8%)	

Data were analyzed using Pearson Chi-Square (x²) Test and level of significance was 0.05.

Regarding blood transfusion stated in table-III; 11 women (44%) of TAH and 10 women (40%) of LAVH group needed blood transfusion. All the women of TAH group and 70% of LAVH group needed 1 unit of blood. Rest of the LAVH group needed 2 units but none of women of TAH needed. There is no significant difference in terms of blood transfusion need (p=0.613) (Table-3).

Table III : Comparison of blood transfusion between groups (n=50)

Blood transfusion	Group		p-value #
	TAH (n=25)	LAVH (n=25)	
Needed	11 (44%)	10 (40%)	0.613
Not needed	14 (56%)	15 (60%)	

Data were analyzed using Fisher Exact Test and level of significance was 0.05.

Table-IV shows the suture materials needed; More than three fourth (80%) of the total abdominal hysterectomy group required 5 suture materials and rest 20% required 6 suture materials. In the LAVH group 60% of the patients required 4 suture materials and rest 40% of the patients required 5 suture materials. No significance difference was observed between groups with respect to suture materials required (p = 0.268)

Table IV : Comparison of suture materials between groups (n=50)

No of suture materials needed	Group		p-value #
	TAH (n=25)	LAVH (n=25)	
4	0 (0%)	10 (40%)	0.268
5	20 (80%)	15 (60%)	
6	5 (20%)	0 (0%)	

Data were analyzed using Pearson Chi-Square (x²) Test and level of significance was 0.05.

No bladder or bowel injuries found in both the groups. But one patient of LAVH group needed to switch over to abdominal hysterectomy due to per-operative hemorrhage. Apart from this exceptional issue, both the groups mean same results in per-operative complications.

Table-V shows the postoperative outcome between groups. The haemoglobin level on 3rd postoperative day between groups was not significant (p=0.246). However, the total amount of analgesics needed was much higher in the TAH group than that of the LAVH (p=0.005) and the total cost of operation was significantly less in the TAH group than that in LAVH group (p<0.001). Difference was also observed between the groups in terms of pain VAS on 3rd POD and day of discharge (p<0.001).

Table V : Comparison of postoperative outcome between groups (n=50)

Outcome	Group		P value#
	TAH(n=25)	LAVH (n=25)	
Pain VAS on 3 rd POD (0-10 cm)	5.0 ± 1.0	3.5 ± 1.5	<0.001
Level of Hb on 3 rd POD (gm/dl)	10.4 ± 0.4	10.6 ± 0.46	0.246
Day of Discharge	5.64 ± 1.36	3.8 ± 1.7	<0.001
Total amount of analgesics needed (mg)	273 ± 40.3	152.1 ± 69.6	0.005
Total cost of operation (Taka)	4500 ± 500	6500 ± 500	<0.001

Data were analyzed using Pearson Chi-Square (x²) Test and level of significance was 0.05.

Discussion :

Women in our study who underwent LAVH had a shorter hospitalization but longer operating room time than those having TAH. They also experienced much more rapid recuperation and much quicker return to normal activities. The primary advantage of TAH is clearly the shorter operating time; the primary advantages of LAVH are shorter hospitalization, reduced requirement for drugs to control postoperative pain and faster return to normal activities.

An important public policy issue now confronts us. As it is currently performed LAVH is more expensive than TAH. The issue is whether the benefits of shorter convalescence and faster return to the work force, shorter hospitalization, and less need for narcotics for post operative pain outweigh the disadvantage of the higher cost. If total health care system costs are evaluated, the short term disability cost of 2 weeks of recovery after laparoscopic hysterectomy should be compared with disability cost of 6 to 8 weeks of recovery after abdominal hysterectomy⁹.

A greater proportion of LAVH than TAH were performed with the consultant as the primary operator. We feel that the reasons for this are two fold. Firstly, the number of LAVH performed for benign disease remains low and therefore the experience gained, even by consultant staff, often takes a considerable time. The eVALuate study⁸ concluded that is reflected in the higher number of conversions to laparotomy in the LAVH group, where some of the conversions to laparotomy may have been avoided if greater experience had been accrued. The second issue is the time LAVH takes in comparison to TAH. It is recognized that surgeons in training will take longer to perform surgical procedures than those who have been trained. One perception of LAVH is that the procedure takes longer and this has been shown in a number of studies, including this one, to be the case.

Although limited data was gathered on the post operative recovery phase, the results of this study are similar to those of others, i.e. that patients undergoing LAVH benefit from a quicker and less complicated recovery than TAH with discharge from hospital more than 2-3 days earlier and significantly less requirement for analgesia. These factors reduce the indirect costs of the surgery, but this must be offset against the longer operating times needed for LAVH².

Conclusion :

There are some advantages as well as disadvantages in LAVH, compared to TAH. However, in Bangladesh the situation is not yet favorable. Factors affecting the

uptake of LAVH include surgeon's experience and training in these techniques. Laparoscopically assisted technique in the field of gynaecology is newer one. Training on the laparoscopically assisted technique and concomitant reduction of anesthesia and surgeons charges might have promising impact in this field.

References :

1. Wilcox L, Koonin L, Pokras R, Strauss L, Xia Z, Peterson H. Hysterectomy in the United State 1988-90. *Obstet Gynecol* 1994; 83:549-55.
2. McCracken G, Hunter D, Morgan D, Price, JH. Comparison of Laparoscopic Assisted Vaginal Hysterectomy, Total Abdominal Hysterectomy and Vaginal Hysterectomy. *Ulster Med J* 2006; 75 (1):54-8.
3. Olsson J, Ellstrom M, Hahlin M. A randomized prospective trial comparing laparoscopic and abdominal hysterectomy. *Br J Obstet Gynaecol* 1996; 103:345-50.
4. Marana R, Busacca M, Zupi E, Garcea N, Paparella P, Catalano G. Laparoscopic assisted vaginal hysterectomy versus total abdominal hysterectomy: a prospective, randomized, multicenter study. *Am J Obstet Gynecol* 1999; 6:185-93.
5. Richardson R, Bournas N, Magos A. Is laparoscopic hysterectomy a waste of time? *Lancet* 1995; 345:36-41.
6. Reich H. Laparoscopic hysterectomy. *Surg Laparosc Endosc* 1992; 2:85-8.
7. Kohler C, Hasenbein K, Klemm P, Tozzi R, Schneider A. Laparoscopic assisted vaginal hysterectomy with lateral transection of the uterine vessels. *Surg Endosc* 2003; 17:485-90.
8. Garry R, Fountain J, Mason S, Hawe J, Napp V, Abbott J, et al. The eVALuate study: two parallel randomised trails, one comparing laparoscopic with the abdominal hysterectomy, the other comparing laparoscopic with the vaginal hysterectomy. *BMJ* 2004; 328 (7432):129-33. Epub 2004 Jan 7.
9. James C, Jisum R, Amy K. Laparoscopic-Assisted Vaginal Hysterectomy: A Case Control comparative Study with Total Abdominal Hysterectomy. *OBGYN.net Publications*. 1-8.
10. Magos A, Bournas N, Sinha R, Richardson R, O'Connor H. Vaginal hysterectomy for the large uterus. *Br J Obstet Gynaecol* 1996; 103:246-51.