

OPERATIVE SKILLS

Non-descended Vaginal Hysterectomy—Is a Reasonable Alternative to LAVH?

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Abstract: This randomized case control clinical trial has been designed to assess whether non-descended vaginal hysterectomy (NDVH) can be performed as an alternative to laparoscopic assisted vaginal hysterectomy (LAVH).

The study was conducted in the Department of Gynaecology and Obstetrics, Bangabandhu Sheikh Mujib Medical University (BSMMU) Hospital, Dhaka over a period of one year. Patients admitted for hysterectomy were the study population. DUB, fibroid uterus ≤ 12 weeks size and adenomyosis were inclusion criteria. A total of 30 patients were consecutively selected and then randomly assigned by lottery method for LAVH and NDVH. The test statistics used to analyze the data were descriptive statistics, Fisher's Exact Probability test and Mann Whitney Test.

The mean age, socioeconomic condition, duration of marriage, parity, size of the uterus and indications of operation was similar in both groups. The patients of LAVH group have had significantly higher mean operation time ($p < 0.001$). One patient of LAVH group has got bladder injury and the operation had to be switched over to abdominal hysterectomy. The LAVH group exhibited significantly less hemoglobin level on 3rd postoperative day ($p < 0.001$). However, the total amount of analgesics needed was much higher in the NDVH group ($p < 0.005$) and the total cost of operation was significantly higher in the LAVH group ($p < 0.001$). No difference was observed in terms of day of discharge and day of disappearance of pain.

Laparoscopically assisted technique in the field of gynecology of the developing country is newer one. Training on the laparoscopic technique and concomitant reduction of anesthesia and surgeon charges is very much necessary to make the technique popular. Considering the operating time and expenditure the non-descended method might be a very good alternative to laparoscopic one especially in the developing country.

Keywords: Non-descended vaginal hysterectomy, LAVH.

INTRODUCTION

Hysterectomy is frequently performed gynecologic and obstetric procedure worldwide, second only to cesarean delivery.¹

Historically, the uterus has been removed either by 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 use the abdominal approach as the operation of choice, particularly when dealing with pelvic pathology or carrying out oophorectomy.² Much effort have been put into randomized control trials which compares laparoscopically assisted vaginal hysterectomy (LAVH) and total abdominal hysterectomy,³ but very few studies have compared the merits and demerits of LAVH with those of vaginal hysterectomy, particularly in dealing with non-descended uterus.

Since it was first reported by Reich et al in 1989,⁹ 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) and also permits oophorectomy or dissection of adhesions under direct vision more easily than this can be achieved at vaginal hysterectomy (NDVH). Farquhar and Steiner found that between 1990 and 1997, in the USA, there was a growth in the number of hysterectomies performed with laparoscopic assistance (0.3-9.9%) with a concomitant decline in the proportion of hysterectomies performed by other procedures. However, there are ample evidences in favor and against laparoscopically assisted techniques.²

In a randomized trail, Summitt et al⁴ found that outcomes for transvaginal hysterectomy were similar to those for LAVH, but with significantly lower costs. Richardson et al⁵ concluded that LAVH is a waste of time and money. Despite convincing evidence that transvaginal hysterectomy is more favorable and can be done successfully in most women with enlarged uteri⁶,

increased operative time is usually needed^{6,7} and the surgeons may encounter greater risks when dealing with a large uterus, for example, protracted procedure and potential complications challenging their operative skills and patience. In addition, significant blood loss remains a major disadvantage in removing a large uterus, in which access to the uterine vessels sometimes becomes difficult or even impossible.⁸ A clear consensus exists that the mainstay of hysterectomy is to secure the blood supply.^{9,10} As the world's first surgeon to perform a laparoscopic hysterectomy (Reich¹⁰) emphasized in his review that the sine qua non for LAVH is ligation of the uterine vessels. A surgeon's reluctance to perform vaginal procedures due to a lack of training or experience, especially in dealing with a significantly enlarged uterus, may contribute to the preference for LAVH. The only formal guideline available is the uterine size by the American College of Obstetricians and Gynecologist that transvaginal hysterectomies are preferred in women with a uterus no larger than 12 weeks of gestation size (approximately 280 to 300 g).¹¹ A recent study by Kovac¹² favored transvaginal hysterectomy for uterine weight less than 280 g and some reports¹³ have demonstrated the benefits of LAVH in dealing with a much larger uterus. A rationale for the guideline based on research data is therefore needed.

Recently the evaluate study concluded that LAVH was associated with a significantly higher rate of major complications than total abdominal hysterectomy (TAH). LAVH took longer time to perform but was associated with less pain, quicker recovery and better short-term quality of life measures.

Laparoscopic surgery is developing rapidly in various fields of medicine including gynecology. In our country, most gynecologists are trained to do abdominal hysterectomy and vaginal hysterectomy. Recently they are getting training on laparoscopic technique at home and abroad and are interested to apply their newly earned skills. But the more important question is whether the laparoscopically assisted technique can be applied successfully in all cases of hysterectomy. Research data presented so far have shown that laparoscopically assisted technique brings good result in selective cases. However, more study is needed particularly in the context of our country. The purpose the present study was to compare different aspect of LAVH with NDVH. The variables studied were operation time, preoperative complications, postoperative complications, hospital stay and cost of operation.

MATERIALS AND METHODS

The present study was a randomized comparative clinical trial, conducted in the Department of Obstetrics and Gynecology of

BSMMU Hospital, Dhaka over a period of one year from July 2007 to June 2008. Patients admitted for hysterectomy were the study population. Dysfunctional uterine bleeding, fibroid uterus (≤ 12 weeks size) and adenomyosis were the inclusion criteria. Patient with uterine prolapse, endometriosis, extensive pelvic adhesion, adenexal mass, vaginal stenosis and invasive cervical carcinoma were excluded. A total of 30 patients who met the above mentioned eligibility criteria and given informed consent were consecutively included for the study. For random allocation of patients into groups there were 2 cards, one card was marked with "A" and another marked with "B". Patients were asked to draw a card blindly. Patients who drew cards marked "A" were allocated into LAVH Group and patients with cards marked "B" were allocated into NDVH Group.

The demographic variables included in the study were age, socioeconomic condition and parity. The peroperative variables were type of anesthesia required, blood transfusion needed, injury to the bladder, bowel or other structures and any other difficulties encountered. While postoperative outcome variables were pain VAS, level of hemoglobin on 3rd day, day of disappearance of pain, total amount of analgesics needed, day of discharge and total cost of operation. Permission was taken for this study from the Ethical Committee of the institute.

Transvaginal hysterectomy was performed according to the procedure described by (Joel-Cohen¹⁴) under spinal anesthesia.

LAVH was done under general anesthesia. Hysterectomy began with electrocoagulation and transection of the bilateral round ligaments. In patients who desired to preserve the adnexa, the fallopian tube and ovarian ligament were transected, whereas in those who preferred a salpingo-oophorectomy, the infundibulopelvic ligaments were isolated, ligated and transected. Bilateral uterine arteries were identified and the vesicouterine peritoneum was opened to make the subsequent hysterectomy easier to perform. The vaginal procedures began with anterior and posterior colpotomy. The vesicocervical, cardinal and uterosacral ligaments were transected. After the uterine vessels and the adnexal collaterals had been secured uterus brought out and then vault was repaired.

The operative time was calculated from the first incision to the end of wound closure.

The test statistics used to analyze the data were descriptive statistics, Fisher's Exact Probability Test and Mann Whitney Test. For all analytical tests, the level of significance was set at 0.05 and $p < 0.05$ was considered significant.

RESULTS

The mean age of NDVH and LAVH groups were 44.25 ± 4.01 and 42.43 ± 3.897 years respectively (Table 1). They are of

Table 1: Comparison of age between LAVH and NDVH Groups (n = 30)

Age (years)	Group		p-value [#]
	NDVH (n = 16)	LAVH (n = 14)	
≤ 40	5(31.3)	8(57.1)	0.350
40-45	3(18.8)	2(14.3)	
> 45	8(50.0)	4(28.6)	
Mean ± SD	44.2 ± 4.0	42.4 ± 3.9	

#Data were analyzed using **Fisher Exact Test** and **level of significance** was 0.05. Figures in the parentheses denote corresponding%

same age group (p 0.350). Approximately 63% of women of NDVH group and 43% of LAVH group were poor, while 37.5% of NDVH group and 57.1% of LAVH group were middle class. The socioeconomic conditions of the groups were comparable (p 0.464). Duration of marriage depicts that over two-third (68.8%) of women of both the group was married for > 25 years.

About 56% of women of NDVH group had parity 2-4 and the rest had parity 5-7. In the LAVH group 71% and 14% of women had 2-4 and 5-7 live-births respectively. Nearly 15% of LAVH group had the experience of 8-10 live-births (Table 2). There was no significant difference regarding parity between the groups (p 0.095).

One-quarter of women of NDVH group and 42.9% of LAVH group had size uterus of 8 or < 8 weeks. On the contrary, three-quarter of women of NDVH group and 57.1% of women of LAVH group had uterus ranging from 9-12 weeks size. Size is similar in both the groups (Table 3).

Indications for operation showed that one-quarter (25%) of the patients in NDVH group were operated for DUB, 37.5% for fibroid and another 37.5% for adenomyosis. In the LAVH group majority (71.4%) were operated for fibroid, 21.4% for DUB and 7.2% for adenomyosis (Fig. 1).

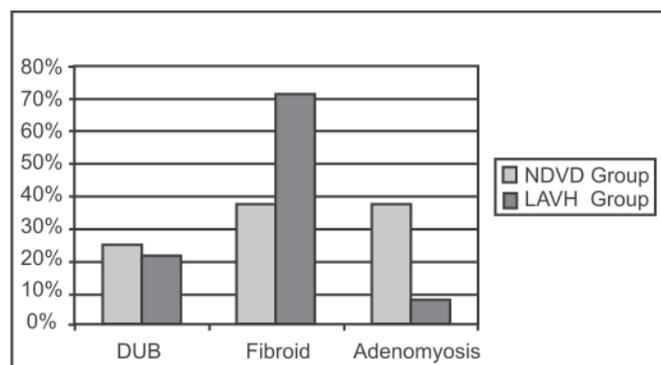


Fig. 1: Comparison of groups by indications for operations

Table 2: Comparison of parity between groups (n = 30)

Parity	Group		p-value [#]
	NDVH (n = 16)	LAVH (n = 14)	
2-4	9(56.3)	10(71.4)	0.095
5-7	7(43.8)	2(14.3)	
8-10	00	2(14.3)	

#Data were analyzed using **Fisher Exact Test** and **level of significance** was 0.05. Figures in the parentheses denote corresponding%

Table 3: Comparison of size of uterus between groups (n = 30)

Size of uterus (weeks)	Group		p-value [#]
	NDVH (n = 16)	LAVH (n = 14)	
≤ 8	4(25.0)	6(42.9)	0.442
9-12	12(75.0)	8(57.1)	

#Data were analyzed using **Fisher Exact Test** and **level of significance** was 0.05. Figures in the parentheses denote corresponding%

Before surgery majority of patients of NDVH and LAVH groups, 81.3% and 85.7% respectively had hemoglobin level less than 11 gm/dl. The distribution of anemia between groups was almost homogeneous, p=0.851.

Three-quarter NDVH group required < 90 minutes for operation to be completed and the rest 25% required 90 to 120 minutes. In contrast majority (92.9%) of LAVH group needed >2 hours for completion of operation. The patients of LAVH group have had significantly higher mean operation time compared to that of NDVH group; p was < 0.001 (Table 4).

Thirty one percent women of NDVH group and 57.1% of LAVH group needed blood transfusion during surgery. Each of them needed 1 unit blood. There was no significant difference about blood transfusion between the groups (p 0.269).

Table 4: Comparison of operation time between groups (n = 30)

Operation time (minutes)	Group		p-value [#]
	NDVH (n = 16)	LAVH (n = 14)	
< 90	12(75.0)	00	< 0.001
90-120	4(25.0)	1(7.1)	
>120	00	13(92.9)	
Mean ± SD	81.7 ± 10.2	145.3 ± 30.5	

Data were analyzed using **Mann Whitney Test** and **level of significance** was 0.05. Figures in the parentheses denote corresponding %

Table 5: Comparison of postoperative outcome between groups (n = 30)

Outcome	Group		p-value [#]
	NDVH (n = 16)	LAVH (n = 14)	
Pain VAS on 3rd POD (0-10 cm)	5.0 ± 0.6	4.2 ± 1.54	0.124
Level of Hb on 3rd postoperative day (gm/dl)	10.9 ± 0.4	9.62 ± 0.5	< 0.001
Day of discharge	4.2 ± 0.6	5.21 ± 3.1	0.250
Day of disappearance of pain	4.7 ± 0.4	5.21 ± 3.1	0.837
Total amount of analgesics needed (mg)	243.7 ± 40.3	182.1 ± 69.6	0.005
Total cost of operation (Taka)	5762 ± 412	8207 ± 501	< 0.001

Data were analyzed using **Mann Whitney Test** and **level of significance** was 0.05

More than two-third (68.7%) of the vaginal hysterectomy group required 4 suture materials and rest 31.3% required 3 suture materials. In the LAVH group 57.1% of the patients required 4 suture materials and remaining needed 3. The difference observed was not significant (p 0.510). One patient of LAVH group has got bladder injury and operation had to be switched over to abdominal hysterectomy.

Regarding postoperative outcome the LAVH group exhibited significantly lower hemoglobin level compared to NDVH group on 3rd postoperative day (p<0.001). However, the total amount of analgesics needed was much higher in the NDVH group than that of the LAVH group (p < 0.005) and the total cost of operation was significantly less in the NDVH group (5762 ± 412 Taka or 75 US\$) than that in the LAVH group (8207 ± 501 Taka or 125 US\$) (p < 0.001). No difference was observed between the groups in terms of pain VAS on 3rd POD, day of discharge and day of disappearance of pain (Table 5).

Only 15% of women of LAVH group experienced fever after operation as opposed to none in the NDVH group but the difference is not significant.

DISCUSSION

Nowadays the laparoscopic surgery is broadly used in various fields of medicine. It has also entered into the practices of gynecologists. Because the technique is relatively new, it needs more time to gain wide acceptance and reasonable skill. In the present study mean age of the patients were 44.2 ± 4.0 and 42.4 ± 3.9 years. Majority of the patients in either group had uterus size ranging from 9-12 weeks and major indications for operation were fibroid uterus.

The patients of LAVH group have had significantly higher operation time compared to those NDVH group (p < 0.001). In a study conducted by Chang *et al*¹⁵ LAVH group had longer

operative time than the transvaginal hysterectomy group. But when they further stratified their patients by uterine weight using cut-off value at 350 gm, they found a significantly longer operative time for transvaginal hysterectomy than LAVH. The average operative time was much shorter in the transvaginal hysterectomy group; 80 minutes for transvaginal hysterectomy compared with 118 minutes for LAVH, p < 0.5, when the uterine weight was less than 350 g, whereas a reverse condition was seen (139 minutes for transvaginal hysterectomy compared with 118 minutes for LAVH, p < 0.05) when the uterine weight was 350 g or more. This finding is further fortified by correlation analysis between uterine weight and operation time. A significant linear regression between uterine weight and operation time was seen in the transvaginal hysterectomy group. However, the correlation between uterine weight and operation time was not significant in the laparoscopically assisted vaginal hysterectomy group.

Unger⁴ also showed a linear relationship between uterine weight and operating time. However, Das and Sheth did observe a substantial increase in operation time even at increased uterine volume. As the present study was conducted on small sample size (30 subjects), we have no scope to further stratify our sample and thereby we could not see the effect of weight on operation time.

Need of blood transfusion was comparatively high in the LAVH group (57.1%) than that in the NDVH group (31.3%) which is, however, not consistent with findings of other studies.¹⁵ Kohler¹⁶ reported that laparoscopic coagulation hemostasis of the uterine vessels was associated with less blood loss. Besides, LAVH can also secure almost all the main blood supplies to the uterus, i.e. the uterine vessels and the adnexal collaterals.^{5,9,10} Thus, the blood loss is comparatively reduced in LAVH than that in the NDVH provided the operation is performed with a

skilled hand. Significant blood loss remains a major disadvantage in removing a large uterus, in which access to the uterine vessels sometimes becomes difficult or even impossible.⁸ A clear consensus exists that the mainstay of hysterectomy is to secure the blood supply.⁵⁻¹⁰ In our setting, although the size of the uterus was almost equally distributed between groups, need for blood transfusion was higher in LAVH group than that in the NDVH, probably because it is relatively a new practice for the surgeons in our country.

Number of suture material needed during operation was almost equally distributed between groups. As level of hemoglobin was assessed on 3rd postoperative day the LAVH group exhibited anemia significantly more than their NDVH counterpart which may be attributed to more blood loss in the former group than the latter group ($P < 0.001$). However, the former group experienced early disappearance of pain symptoms compared to the latter group as evident by less total amount of analgesics needed following operation. Richardson¹⁷ however, did not find any difference in terms of complication rates, blood loss, analgesics requirement and recovery.

The LAVH group incurred a significantly higher average cost of operation (8207 ± 501 Taka or 125 US\$) as opposed to NDVH group (5762 ± 412 Taka or 75 US\$); $p < 0.001$. The reason of higher cost in case of LAVH group is the charge of general anesthesia as well as higher surgeon charge. No study data comparing total operating cost between LAVH and NDVH were found available. However, one study¹⁸ comparing cost of operation between abdominal hysterectomy and LAVH showed significantly lower average operation cost in abdominal hysterectomy (\$10,511) than that in LAVH (\$12,814) a difference of \$2303. The charge was very low in the present study as because the hospital where the study was conducted is a non-profit public hospital. No other outcome variables like pain VAS, day of disappearance of pain and day of discharge was observed to be different between the groups ($p > 0.05$).

CONCLUSION

The present study intended to compare the outcome between laparoscopically assisted vaginal hysterectomy and non-descended vaginal hysterectomy. The important findings were LAVH required significantly higher operation time compared to NDVH, the cost of operation was significantly higher and need for postoperative analgesic was significantly lower in LAVH group. The other outcome variables like pain VAS, day of disappearance of pain and day of discharge did not demonstrate any significant differences between the groups.

Thus, considering the cost and operation time it can be concluded that non-descended vaginal hysterectomy may be a suitable alternative to laparoscopically assisted vaginal hysterectomy specially in whose part of the world where the surgeons are not very much skilled on laparoscopy.

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