

Research Article

Comparison of Operative Time, Intraoperative Blood Loss, and Surgical Complications between Non-Descent Vaginal Hysterectomy and Total Laparoscopic Hysterectomy for Benign Uterine Lesions: A Comparative Observational Study

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ABSTRACT

Background: Non-descent vaginal hysterectomy (NDVH) and total laparoscopic hysterectomy (TLH) are minimally invasive approaches for hysterectomy in women with benign uterine disease. Selection of the surgical route requires consideration of operative efficiency, blood loss, complications, available resources, and surgical expertise.

Objective: To compare operative time, intraoperative blood loss, and surgical complications between NDVH and TLH for benign uterine lesions.

Methods: This comparative observational study included 50 women undergoing hysterectomy for benign uterine lesions at a tertiary care hospital. Twenty-five underwent TLH and 25 underwent NDVH. Operative time, intraoperative blood loss, complications, and conversion to laparotomy were compared.

Results: Mean operative time was significantly longer with TLH than NDVH (112.92 ± 37.64 vs 55.36 ± 25.84 minutes; $p < 0.05$). Mean blood loss was also significantly higher with TLH (114 ± 46.32 vs 90 ± 27.38 mL; $p < 0.05$). Complications occurred in four patients overall: bladder and bowel injury in the TLH group and excessive bleeding and urinary tract infection in the NDVH group. Two TLH cases required conversion to laparotomy.

Conclusion: In this study, NDVH was associated with shorter operative time and lower intraoperative blood loss than TLH, while overall complications were infrequent in both groups.

Keywords: Non-Descent Vaginal Hysterectomy, Total Laparoscopic Hysterectomy, Operative Time, Blood Loss, Surgical Complications, Benign Uterine Disease.

INTRODUCTION

Hysterectomy is one of the most frequently performed major gynecological surgical procedures and is undertaken for a wide range of benign and malignant conditions. A substantial proportion of hysterectomies are performed for benign uterine disorders, making selection of an appropriate surgical route an important aspect of gynecological practice.[1] In India, benign indications account for the majority of hysterectomies, emphasizing the need for approaches that are safe, effective, and appropriate to available healthcare resources.[2]

Several surgical routes are available for hysterectomy, including abdominal, vaginal, laparoscopic, and laparoscopic-assisted

approaches. The choice of route is influenced by uterine size and shape, accessibility of the uterus, presence of extrauterine disease, previous pelvic surgery, need for concurrent procedures, available technology, surgeon training and experience, and patient preference.[3] Selection of an appropriate route is particularly relevant in benign disease, where minimizing surgical morbidity while achieving effective treatment is an important objective.

The vaginal route represents a minimally invasive approach because the uterus is removed through a natural orifice without requiring abdominal incisions. Non-descent vaginal hysterectomy (NDVH) extends the vaginal approach to women without uterine prolapse and can be used for several benign

uterine conditions. Techniques such as uterine bisection, myomectomy, wedge debulking, and intramyometrial coring may facilitate vaginal removal of a larger uterus.[4] NDVH has the additional advantages of avoiding specialized laparoscopic equipment and, in appropriate patients, may provide an effective surgical option in resource-limited settings.

Total laparoscopic hysterectomy (TLH), in contrast, enables the principal surgical steps to be performed laparoscopically under direct visualization. Advances in laparoscopic instrumentation, energy devices, optics, and surgical training have contributed to the increasing use of TLH for benign gynecological conditions.[5] The laparoscopic approach provides advantages associated with minimally invasive surgery, but it requires appropriate infrastructure, specialized instruments, and laparoscopic expertise and may involve a longer learning curve.[6]

Evidence comparing hysterectomy routes has demonstrated differences in operative and postoperative outcomes. Roy et al. compared TLH, laparoscopically assisted vaginal hysterectomy, and NDVH for benign uterine disease and reported that NDVH was associated with shorter operating time, lower blood loss, less postoperative pain, and quicker recovery, although vaginal surgery may have limitations in women with a large uterus, pelvic adhesions, or a need for adnexal surgery.[7]

Patel and Chakravarty also compared laparoscopic and vaginal hysterectomy and noted that NDVH avoids the need for specialized laparoscopic instruments and extensive exposure to general anesthesia, whereas laparoscopic hysterectomy offers advantages such as small surgical scars and may be useful when the vaginal route is technically difficult.[8] The choice between the two procedures therefore depends not only on perioperative outcomes but also on patient characteristics, surgical expertise, uterine pathology, and available facilities.

Operative time and intraoperative blood loss are particularly important measures when comparing surgical approaches. Prolonged operating time may increase operating-room utilization and resource requirements, whereas excessive blood loss may increase perioperative morbidity. Previous comparative studies have reported varying results for these parameters. Chattopadhyay et al. observed a longer operative duration with TLH than NDVH, while differences in other perioperative outcomes were comparatively smaller.[9]

MATERIALS AND METHODS

Study Design and Setting

This was a comparative observational study conducted at a tertiary care hospital.

A total of 50 patients fulfilling the predefined inclusion and exclusion criteria were included and divided into two groups according to the surgical procedure performed:

- **TLH group:** 25 women who underwent total laparoscopic hysterectomy.
- **NDVH group:** 25 women who underwent non-descent vaginal hysterectomy.

The mode of surgery was decided by senior consultants, and all procedures were performed by qualified gynecologists. All procedures were performed by the same surgeon.

Eligibility Criteria

Inclusion Criteria

Women were included if they:

1. Women undergoing NDVH or TLH for benign lesions.
2. Women providing informed and written consent for participation.

Exclusion Criteria

Women were excluded if they:

1. Were unwilling to undergo hysterectomy.
2. Had a histopathological report showing malignancy.
3. Developed anesthetic complications.

Preoperative Assessment

Eligible women underwent routine preoperative evaluation and provided informed consent. Standard perioperative protocols, including prophylactic antibiotics, thromboprophylaxis, and appropriate attention to surgical technique, were followed.

Clinical and operative details were documented by the investigator. All hysterectomy specimens were subsequently sent for histopathological examination, and the final diagnosis was recorded according to the histopathological report.

Surgical Procedures

Total Laparoscopic Hysterectomy

TLH was performed under general anesthesia. After positioning, painting, and draping, a uterine manipulator was introduced vaginally. A 10-mm primary umbilical port and three 5-mm accessory ports were used. Pneumoperitoneum was created with carbon dioxide and maintained at approximately 14–15 mmHg. The round ligaments were coagulated and divided, followed by the utero-ovarian or

infundibulopelvic ligaments as required. The uterovesical peritoneal fold was opened and the bladder mobilized. After skeletonization, the uterine vessels were coagulated and divided. The cardinal and uterosacral ligaments were subsequently divided, followed by circumferential colpotomy. The specimen was removed vaginally, hemostasis was confirmed, and the vaginal vault was closed laparoscopically.

Non-Descent Vaginal Hysterectomy

NDVH was performed under regional spinal anesthesia. Following cleaning and draping, the cervix was held with a vulsellum and saline infiltration was performed. A circumferential incision was made around the cervix, the pubovesicocervical ligament was divided, and the bladder was displaced upward.

The anterior and posterior pouches were opened, followed by clamping, division, and ligation of the uterosacral and cardinal ligaments. The uterine vessels were then secured. Where necessary, uterine bisection, debulking, myomectomy, or a combination of these techniques was used to facilitate removal. After vaginal delivery of the uterus, hysterectomy was completed according to the described technique.

Outcome Measures

For the present paper, the principal outcomes were operative time, intraoperative blood loss, surgical complications, and conversion to laparotomy.

Operative Time

Operative duration was recorded for each procedure. In this study, operative time was defined as the interval from the beginning of the surgical procedure until completion of surgery

Intraoperative Blood Loss

Blood loss was assessed during both procedures.

For NDVH, blood loss was calculated from the volume collected in the suction aspirator together with blood absorbed by surgical mops. A fully soaked standard 5×7-inch mop was considered equivalent to 100 mL, while a half-soaked mop was considered equivalent to 50 mL.

For TLH, blood loss was calculated by determining the difference between the volume of fluid introduced into the pelvic cavity for irrigation and the volume of fluid aspirated into the suction bottle.

Surgical Complications

Intraoperative and postoperative complications were recorded. The complications documented in the study included bladder injury, bowel injury, excessive bleeding, and urinary tract infection.

Conversion to Laparotomy

The need for conversion from the planned minimally invasive procedure to laparotomy was recorded. In this study, conversion occurred in two TLH cases because of bladder and bowel injury, whereas no NDVH case required conversion.

Statistical Analysis

Data were entered and analyzed using Microsoft Excel and SPSS software. Descriptive statistics, including means and percentages, were used to summarize the data. The Student's t-test and Chi-square test were applied as appropriate for comparisons between groups. A p-value <0.05 was considered statistically significant.

RESULTS

Table 1. Baseline characteristics of the study participants

Characteristic	TLH (n=25)	NDVH (n=25)	p-value
Mean age (years)	49.88±3.99	49.48±4.12	>0.05
Mean parity	2.28±0.89	2.80±0.95	>0.05
Age 41–45 years, n	5	6	
Age 46–50 years, n	9	10	
Age 51–55 years, n	8	7	
Age 56–60 years, n	3	2	

Table 2. Distribution of indications for hysterectomy

Indication	TLH, n (%)	NDVH, n (%)	Total, n (%)
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Fibroid	10 (40)	14 (56)	24 (48)
AUB	10 (40)	7 (28)	17 (34)
Adenomyosis	3 (12)	3 (12)	6 (12)
Endometrial hyperplasia	2 (8)	1 (4)	3 (6)
Total	25 (100)	25 (100)	50 (100)

p>0.05.

Table 3. Comparison of intraoperative blood loss and operative time

Outcome	TLH (n=25)	NDVH (n=25)	p-value
Intraoperative blood loss (mL), mean±SD	114±46.32	90±27.38	<0.05
Operative time (min), mean±SD	112.92±37.64	55.36±25.84	<0.05

Table 4. Surgical complications according to route of hysterectomy

Complication	TLH, n	NDVH, n	Total, n (%)
Bladder injury	1	0	1 (2)
Bowel injury	1	0	1 (2)
Excessive bleeding	0	1	1 (2)
UTI	0	1	1 (2)
Total complications	2	2	4 (8)

p>0.05.

Table 5. Conversion to laparotomy

Conversion to laparotomy	TLH, n (%)	NDVH, n (%)	Total, n (%)
Yes	2 (8.0)	0 (0)	2 (4.0)
No	23 (92.0)	25 (100)	48 (96.0)
Total	25 (100)	25 (100)	50 (100)

DISCUSSION

The present comparative observational study evaluated intraoperative outcomes of total laparoscopic hysterectomy (TLH) and non-descent vaginal hysterectomy (NDVH) for benign uterine lesions. The principal findings were that NDVH was associated with significantly shorter operative time and lower intraoperative blood loss than TLH. Overall complications were uncommon and numerically equal between the two groups, although the types of complications differed. Two patients in the TLH group required conversion to laparotomy, whereas no conversion occurred in the NDVH group.

The two groups were broadly comparable with respect to demographic characteristics. Mean age was 49.88±3.99 years in the TLH group and 49.48±4.12 years in the NDVH group, while mean parity was 2.28±0.89 and 2.80±0.95, respectively; neither difference was statistically significant. Fibroid uterus was the most common indication for hysterectomy, accounting for 48% of all cases, followed by abnormal uterine bleeding (34%), adenomyosis (12%), and endometrial hyperplasia (6%).

A major finding was the significant difference in intraoperative blood loss. Mean blood loss was 114±46.32 mL with TLH compared with

90±27.38 mL with NDVH ($p<0.05$). Similar findings have been reported previously, with higher mean intraoperative blood loss following TLH (98.63±23.97 mL) compared with NDVH (85.67±20.39 mL).[10] However, another comparative study reported mean blood loss of 206.75±53.32 mL with TLH and 202.43±29.92 mL with NDVH, with no statistically significant difference between the procedures.[11] These variations indicate that intraoperative blood loss may be influenced by surgical technique, patient selection, uterine pathology, surgeon experience, and institutional practices.

Operative duration showed an even more pronounced difference. Mean operative time was 112.92±37.64 minutes for TLH and 55.36±25.84 minutes for NDVH ($p<0.05$). Previous comparative evidence has similarly demonstrated a longer mean operative duration with TLH (120±45.32 minutes) than with NDVH (90±20.50 minutes), although the difference was not statistically significant in that study.[12] A substantially longer operative time for laparoscopic hysterectomy compared with NDVH has also been reported elsewhere, consistent with the direction of the present findings.[8]

The longer operative duration observed with TLH may be considered in the context of the

additional technical steps inherent to the laparoscopic approach. In the present study, TLH involved establishment of pneumoperitoneum, placement of one primary and three accessory ports, laparoscopic dissection and coagulation of vascular pedicles, colpotomy, and laparoscopic vault closure. NDVH, in contrast, uses a natural-orifice approach and does not require laparoscopic port placement or pneumoperitoneum. Available evidence also indicates that TLH requires specialized equipment and greater laparoscopic expertise, whereas NDVH can be performed using comparatively conventional surgical resources.

Overall, complications occurred in 4 of 50 patients (8%), with two complications in each group. Bladder injury and bowel injury occurred in the TLH group, whereas excessive bleeding and urinary tract infection occurred in the NDVH group. The difference in overall complications was not statistically significant ($p>0.05$). Previous evidence has reported no intraoperative complications among patients undergoing NDVH, whereas bladder and ureteric injuries were observed in the laparoscopic group.[13] Another study reported no major complications but documented minor complications, including urinary tract infection, among women undergoing NDVH.[14] Given the small number of complications in the present study, individual complication rates should be interpreted cautiously.

Conversion to laparotomy was required in two patients (8%) undergoing TLH, one following bladder injury and the other following bowel injury. No conversion occurred in the NDVH group. Similar observations have been reported previously, with three conversions to laparotomy documented in the TLH group and none in the NDVH group.[13] Other comparative evidence has also demonstrated differences in intraoperative outcomes between laparoscopic and vaginal hysterectomy approaches.[15]

CONCLUSION

In women undergoing hysterectomy for benign uterine lesions, NDVH was associated with significantly shorter operative duration and lower intraoperative blood loss than TLH. Mean operative time was 55.36 ± 25.84 minutes with NDVH compared with 112.92 ± 37.64 minutes with TLH, while mean blood loss was 90 ± 27.38 mL and 114 ± 46.32 mL, respectively. Overall complications were infrequent and occurred in two patients in each group, with no

statistically significant difference between the groups. Two TLH procedures required conversion to laparotomy, whereas no conversion was reported with NDVH.

These findings indicate that, within the studied population, NDVH was associated with favorable intraoperative efficiency. However, the route of hysterectomy should be individualized according to uterine pathology, patient characteristics, available resources, and surgical expertise.

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