

Comparative Study of Total Laparoscopic Hysterectomy versus Non-Descent Vaginal Hysterectomy Conducted in a Tertiary Care Centre

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Abstract: Background: Hysterectomy refers to removal of uterus; there are different routes of hysterectomy-abdominal, vaginal, laparoscopic and robotic assisted laparoscopy. Any two routes can be combined. Choice of route of surgery is based on uterine size, mobility, accessibility, and whether pathology confined to uterus alone, surgeon's decision and expertise and patient's choice. Decision is made based on up-to-date evidences. Ideal route of hysterectomy is one with low morbidity, cost effectiveness, less operating time, minimal blood loss, less duration of hospital stays, it should be minimally invasive and better patient satisfaction. This study aims to match intra and post operative outcomes of NDVH and TLH, and to assess most feasible and to assess effective route of hysterectomy. Aim and Objective: To compare laparoscopic and vaginal hysterectomy for a non-descent uterus with respect-blood loss by drop of hemoglobin, operative time, intra operative and postoperative complications, rate of conversion to open abdominal procedures, Length of stay in hospital, post-operative pain, and ambulation time. Methods: Patients are selected on the basis of inclusion and exclusion criteria, and randomizing them into 2 groups with 53 patients in each group. Intra-operative & post-operative parameters will be recorded, and for each parameter a P value will be calculated and a value of <0.05 will be statistically significant. Results: It was also noted in our study additional surgical procedures for extrauterine pathologies were done significantly more in TLH compared with NDVH. 83.9% cases of TLH had underwent additional procedures along with TLH could be attributed to better visualization with TLH. Our study found mean ambulation time in TLH group as 15 hrs and NDVH as 17 hrs. We found ambulation time of TLH was significantly less compared with NDVH and this can be attributed to the lesser postoperative pain in TLH group. The mean pain score, sum of 4th post operative hour, 24th postoperative hour and 3rd post operative day pain scores using visual analogue scale was observed to be 12.2 in TLH and 14.5 in NDVH. We found that patients who underwent TLH had significantly lower post operative pain compared to patients undergoing NDVH. The mean drop in haemoglobin in NDVH group was 0.7 g/dl and TLH group was 0.6g/dl. Our study found less blood loss with TLH compared with NDVH, this could be attributed to the experience of the surgeon as the TLH at the centre studied is performed by surgeons with minimum of 10 years' experience. Operative time. NDVH was found less compared with TLH and this was found statistically significant in our study. In our study, the intraoperative complications are significantly more with TLH compared with NDVH. Out of 56 cases studied, 1 bowel and 1 ureteric injury was reported and in NDVH cases 1 bladder injury was reported. 16.1% cases of TLH and 3.6% cases of NDVH reported intraoperative complications. Conclusions: TLH is associated with less post operative pain, earlier ambulation, better management of extrauterine pathologies. NDVH associated lesser intraoperative complications and lesser operative time. Decision on approach depends on the pathology involved, the size of the uterus, prior surgical history, availability of equipment and surgeons experience and skill. We found similar outcome for NDVH and TLH provided the centre we conduct the surgeries should be provided with experienced surgeons and modernised equipments.

Keywords: TLH, NDVH, Minimal invasive surgery comparison, Total laparoscopic hysterectomy, Non descent vaginal hysterectomy, Post operative outcomes, Intra-operative outcomes

1. Introduction

Surgical removal of uterus, which is the most common major gynecological surgery performed globally. The decision on surgery depends on indications for surgery, surgeons training and preference, uterine size, presence and absence of any associated pelvic pathologies and patient's choice. Hysterectomy is often performed for benign pathologies like abnormal uterine bleeding with or without uterine fibroids or endometrial hyperplasia, done usually when fails to retort to medical management. Different approaches are-vaginally (Nondescent vaginal hysterectomy, vaginal hysterectomy), abdominally or by laparoscopic route (total laparoscopic hysterectomy (TLH), Laparoscopic assisted vaginal hysterectomy (LAVH), and vaginally assisted laparoscopic hysterectomy (VALH)) and Robotic assisted hysterectomy. In line with SOGC & ACOG

guidelines, Hysterectomy should be vaginally done whenever "technically" feasible option. The uterine-size guideline by ACOG claims that vaginal hysterectomy is suitable in women with mobile uterus < or = 12 weeks gestational size (approximately 280 g).

Several patient factors may influence the surgeon's choice of approach to hysterectomy, like multiparous women with heavy menstrual bleeding who opt for hysterectomy may preferably opt for a vaginal approach. However, with the suspicion of endometriosis, the surgeon will more likely be decline vaginal route and get inclined to an abdominal or laparoscopic approach. With regards to enlarged fibroid uterus, surgeons' experience and skills will influence the surgical approach to hysterectomy. Each gynaecologist will have individualized priority in indications for the approach to hysterectomy for benign disease, based largely on their

surgical skills and the patient characteristics like uterine size and descent, extra-uterine pelvic pathology, previous pelvic surgery and other features such as obesity, nulliparity and the need for oophorectomy. Since there are multiple approaches to hysterectomy, each with specific advantages and disadvantages, superiority among each aspect should be known to surgeon with respect to patient related outcomes. However, the more approaches exist, the more challenging it becomes to decide on the best approach for each individual woman. Decision is made based on up-to-date evidences. Ideal route of hysterectomy is one with low morbidity, cost effectiveness, less operating time, minimal blood loss, less duration of hospital stays; it should be minimally invasive and better patient satisfaction. This study aims to match intra and post operative outcomes of NDVH and TLH, and to assess most feasible and to assess effective route of hysterectomy.

2. Methods

Patients are selected on the basis of inclusion and exclusion criteria, and randomizing them into 2 groups with 53 patients in each group. Intra-operative & post-operative parameters will be recorded, and for each parameter a P value will be calculated and a value of <0.05 will be statistically significant.

Inclusion Criteria

- Non-descent uterus
- Uterine mobility present
- Benign indication
- Age \geq 30 yrs
- Uterine size < 16 weeks
- age \leq 55 yrs

Exclusion Criteria

- Patients with umbilical hernia
- Patients with prolapse uterus
- Sling operations done before for prolapse uterus
- Laparoscopic assisted vaginal hysterectomy
- Gynecological malignant disorder
- Restricted mobility of uterus
- Uterine size more than or equal to 16 weeks

Primary outcome of this study include drop in Hemoglobin, early ambulation, post operative pain. Secondary outcome includes the length of hospital stay, rate of conversion to open abdominal procedures, intra operative and postoperative complications.

Histopathological reports and postoperative checkup are followed up.

The outcome of surgical procedure is analyzed by statistical methods e. g., tabulation, proportion & percentage, mean & SD. Prevalence of each outcome are calculated. Appropriate test for significance was applied, P value of <0.05 was considered significant

3. Results

The age group studied was between 35-55, mean age group who underwent TLH was 47.1 and NDVH was 48.5 years. Mean BMI of patients underwent TLH was 27.2 kg/m² and NDVH was 26 kg/m². 64.3% patients who underwent TLH were P₂, 23.2% were P₁, 7.1% P₃, 3.6% nulliparous and 1.8% P₄. 66.1% patients who underwent NDVH were P₂, 19.6% P₃, 7.1% were P₁, 7.1% P₄ and 0% nulliparous. NDVH patients had higher order parity compared with TLH patients. 26.8% patients who underwent NDVH had parity more than 2 than compared with 8.95% of TLH patients. Higher order parity was found to be statistically significant with p value <0.01. Patients underwent NDVH had vaginal deliveries (94.6%) more than caesarean. 57.4% patients who underwent TLH had caesarean, 35.2% had vaginal delivery.

32.1% patients who underwent TLH had 1 comorbidity and among NDVH group 46.4% had 1 comorbidity and 26.8% who underwent TLH had more than 1 comorbidity and 10.7% in NDVH group had more than 1 comorbidity.

82.1% patients who underwent TLH had history of abdominopelvic surgery in past compared with 46.4% among NDVH group. Of these surgeries 73.9 % major surgeries in TLH group and 19.2 % in NDVH group. History of previous abdominopelvic surgery was found statistically significant with p value < 0.01.

52.7% patients who underwent hysterectomy presented with heavy menstrual bleeding (HMB), 6.3% with dysmenorrhea, 5.4% HMB following long period of amenorrhoea, 3.6% with frequent menstrual cycles, 2.7% presented with intermenstrual spotting, 2.7% with UTI, 1.8% with mass lower abdomen, 1.8% asymptomatic, 0.9% presented with urge incontinence, 0.9% with family history of endometrial carcinoma and low backache in 0.9%. Uterine size studied was <16 weeks, 37.5 % patients who underwent TLH and NDVH had 12 weeks sized uterus. 33.9% TLH group had 14 weeks sized uterus and 23.4 % NDVH group had 14 weeks sized uterus. 8 weeks size uterus in 5.4% patients of TLH and 8.9% of NDVH. 23.2% patients in TLH group had 10 weeks size and 30.4% in NDVH group had 10 weeks size.

AUB-L was the indication for 42.9% cases in TLH group and 46.4% in NDVH group. Followed by AUB-A in 25% of patients in TLH group and 39.3% in NDVH group. AUB-M, AUB-P, AUB-E, AUB-O, fibroid uterus, adenomyosis, endometrial hyperplasia and cervical polyp are other indications.

83.9% patients who underwent TLH had concurrent procedure for adnexal pathology and 37.7% patients who underwent NDVH only underwent procedure for adnexal pathology. Adnexal pathology is more addressed during laparoscopic surgery compared with NDVH and was found statistically significant with p value <0.01. Mean haemoglobin drop in patients underwent TLH was 0.6 g/dl and NDVH was 0.7 g/dl.

Table 1: Comparison of Drop in HB based on type of surgery

Type of surgery	Mean	SD	N	T	P
TLH	0.6	0.3	56	0.94	0.351
NDVH	0.7	0.4	56		

Mean operative time in TLH was 76.5minutes and NDVH was 53.8 minutes. NDVH required lesser operative time compared with TLH, was found statistically significant with p value <0.01

Out of 56 cases, 53 cases of TLH and 54 cases of NDVH haven't reported any intraoperative complications.1 case of ureteric injury and 1 case of bowel injury was reported among TLH patients and 1 bladder injury reported in NDVH patient. Occurrence of intraoperative complication is more with TLH compared with NDVH; it was found statistically significant with p value < 0.05.

Table 2: Distribution of intra operative complications based on type of surgery

Intra operative complications	TLH		NDVH	
	Count	Percent	Count	Percent
Nil	53	94.6	54	96.4
Bleeding	1	1.8	1	1.8
Bladder injury, Bleeding	0	0.0	1	1.8
Bowel injury, Bleeding	1	1.8	0	0.0
Ureteric injury, Bleeding	1	1.8	0	0.0

Out of 56 cases, 48 cases of TLH and 45 cases of NDVH no postoperative complications were reported.7 cases of TLH reported pyrexia, 1 case of TLH reported reduced urine output.6 cases of NDVH had urinary retention, 4 cases had pyrexia, 2 case had UTI, 1 case of vault prolapsed

Table 3: Distribution of post operative complications based on type of surgery

Post operative complications	TLH		NDVH	
	Count	Percent	Count	Percent
Nil	48	85.7	45	80.4
Urinary retention	0	0.0	5	7.2
Pyrexia	7	12.5	3	5.4
UTI	0	0.0	1	1.8
Vault hematoma	0	0.0	1	1.8
Reduced urine output on post op day1	1	1.8	0	0.0
Urinary retention, Pyrexia, UTI	0	0.0	1	1.8

Out of 56 cases, 2 cases of TLH and 1 case of NDVH was converted into laparotomy.

Table 4: Comparison of laparotomy conversion based on type of surgery

Laparotomy conversion	TLH		NDVH		χ^2	P
	Count	Percent	Count	Percent		
No	54	96.4	55	98.2	0.34	0.558
Yes	2	3.6	1	1.8		

85.7% patients in TLH and 80.4 % in NDVH group stayed in hospital for 3-4 days.14.3% patients in TLH and 19.6% patients in NDVH group stayed more than or equal to 5 days.

Table 5: Comparison of hospital stay based on type of surgery

Hospital stays	TLH		NDVH		χ^2	P
	Count	Percent	Count	Percent		
3 – 4	48	85.7	45	80.4	0.57	0.45
>=5	8	14.3	11	19.6		

Mean total pain score in TLH is 12.2 and NDVH is 14.5 and total pain score in TLH was less than NDVH, was found statistically significant with p value<0.01

Table 6: Comparison of pain score (4 th hour +24 th hour+3rd day) based on type of surgery

Type of surgery	Mean	SD	N	T	P
TLH	12.2	1.4	56	8.19	p<0.01
NDVH	14.5	1.5	56		

Mean ambulation time post TLH was 15 hours and post NDVH was 17.2 hours. Early ambulation noticed in TLH compared with NDVH and it was found statistically significant with p value <0.01.

Table 7: Comparison of ambulation based on type of surgery

Type of surgery	Mean	SD	N	T	P
TLH	15	2	56	5.45	p<0.01
NDVH	17.2	2.2	56		

4. Discussion

In our study, the mean age group of patients who underwent hysterectomy was between 46-55 years, 46-50 years in TLH group and 50-55 years in NDVH group. This observation was similar with studies of Patel R et al⁽¹⁾ and Ghadei R et al⁽²⁾. The mean parity was 2 in NDVH group and 2 in laparoscopic hysterectomy group which is comparable with sarada Murali et al⁽³⁾ which found mean parity of 1-3 among patients who underwent hysterectomy Mean BMI among patients in each group was between 25-29.9 kg/m², reviewed study by Uikey P⁽⁴⁾ et al showed mean BMI between 21-22 kg/m². The demographic characteristics i. e., age, parity and BMI of both groups were comparable.

In our study, 52.7% patients had heavy menstrual bleeding as chief complaint which was comparable with study by Neelgund SM et al⁽⁵⁾. In the above reviewed study 63.4% presented with menorrhagia. In our study it was found that the duration of symptoms in more than 50% patients was for a period of less than or equal to 3 months.

In our study, 94.6% patients who underwent successful NDVH had vaginal mode of delivery and 57.4% patients who underwent TLH had caesarean deliveries. Statistically significant association was found between vaginal mode of delivery and success of NDVH.

In our study 82.1% patients in TLH group had history of prior abdominopelvic surgeries out of this 73.9% cases were major surgeries, it was found that there statistically significant association, when there is history of abdominopelvic surgeries TLH is successful compared with NDVH. Similar interpretations were noted in ACOG Committee Opinion No.444⁽⁶⁾.

In our study, 42.9% in TLH group and 46.4% in NDVH group had AUB-L as indications for surgery, whereas most reviewed studies including with sarada Murali et al⁽³⁾ found fibroids as indication followed by AUB.37.5% patients of both groups, uterus had mean size of 12 weeks, uterine size was comparable for both groups.

The mean duration of surgery in NDVH group was 53.8min and TLH was 76.5min which was compared with the study done by sarada Murali et al⁽³⁾, which showed the duration of 40min in NDVH group and 120 minutes in TLH group. Operative time of NDVH was found less compared with TLH and this was found statistically significant in our study.

The mean blood loss in our study was 48.8 ml in NDVH group, and 41 ml in TLH group and whereas it was 50 ml in NDVH and 80-100ml with TLH in reviewed study by sarada Murali et al⁽³⁾. Our study found less blood loss with TLH compared with NDVH, this could be attributed to the experience of the surgeon as the TLH at the centre studied is performed by surgeons with minimum of 10 years' experience.

The mean drop in haemoglobin in NDVH group was 0.7 g/dl and TLH group was 0.6g/dl and observation made in reviewed study by Bhatt S⁽⁷⁾ reported NDVH group with 1.20 g/dl and TLH group with 0.91 g/dl haemoglobin drop. In both NDVH and TLH group 5.4% patients required blood transfusion.

The mean pain score, sum of 4 th post operative hour, 24 th postoperative hour and 3rd post operative day pain scores using visual analogue scale was observed to be 12.2 in TLH and 14.5 in NDVH. We found that patients who underwent TLH had significantly lower post operative pain compared to patients undergoing NDVH and is consistent with study by Bhatt S⁽⁷⁾.

Our study found mean ambulation time in TLH group as 15 hrs and NDVH as 17 hrs. we found ambulation time of TLH was significantly less compared with NDVH and this can be attributed to the lesser postoperative pain in TLH group. Similar outcome is observed in study by Bhatt S⁽⁷⁾.

It was also noted in our study additional surgical procedures for extrauterine pathologies were done significantly more in TLH compared with NDVH.83.9% cases of TLH had underwent additional procedures along with TLH could be attributed to better visualisation with TLH.

In our study, the intraoperative complications are significantly more with TLH compared with NDVH. Out of 56 cases studied, 1 bowel and 1 ureteric injury was reported and in NDVH cases 1 bladder injury was reported.16.1% cases of TLH and 3.6% cases of NDVH reported intraoperative complications. Similar interpretations were made in study by sarada Murali et al⁽³⁾.

Our study showed that, laparotomy conversion rate in TLH as 3.6% and NDVH as 1%, this could be attributed to the intraoperative complications which was found higher with TLH.

A post operative complication with TLH was about 14.3% and NDVH 19.6%. In TLH group 12.5% patient had postoperative fever and in NDVH group 9% had urinary retention. Postoperative complications were found similar in both groups. The same was reported in the reviewed study by sarada Murali et al⁽³⁾.

Post-op stay in hospital was 3-4 days in NDVH and TLH groups in our study which was compared same with the study done by sarada Murali et al⁽³⁾. This could be attributed to the similar postoperative complications in both groups.

5. Conclusion

TLH is associated with less post operative pain, earlier ambulation, better management of extrauterine pathologies. NDVH associated lesser intraoperative complications and lesser operative time. Decision on approach depends on the pathology involved, the size of the uterus, prior surgical history, availability of equipment and surgeons experience and skill. We found similar outcome for NDVH and TLH provided the centre we conduct the surgeries should be provided with experienced surgeons and modernised equipments. These decisions may reduce generalisability of this study.

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