



A COMPARATIVE STUDY OF NON-DESCENT VAGINAL HYSTERECTOMY AND TOTAL LAPAROSCOPIC HYSTERECTOMY FOR BENIGN INDICATIONS - A SINGLE CENTRE EXPERIENCE

Obstetrics & Gynaecology

Dr Anuradha Pilaniya	MBBS, MS, Resident Doctor, Department of Obstetrics and Gynaecology, SMS Medical College & Attached Group of Hospitals Jaipur, Rajasthan.
Dr Suman Chaudhary	MBBS MS FMAS, Associate professor, Department of Obstetrics and Gynaecology, SMS Medical College & Attached Group of Hospitals Jaipur, Rajasthan.
Dr Deepa Chaudhary	MBBS MS FMAS, Associate professor, Department of Obstetrics and Gynaecology, SMS Medical College & Attached Group of Hospitals Jaipur, Rajasthan.
Dr Suniti Verma	MBBS MS FMAS, Senior Professor, Department of Obstetrics and Gynaecology, SMS Medical College & Attached Group of Hospitals Jaipur, Rajasthan.
Dr Sumeet Sidhu	MBBS, MS, Resident Doctor, Department of Obstetrics and Gynaecology, SMS Medical College & Attached Group of Hospitals Jaipur, Rajasthan.
Dr Amrita Yadav	MBBS, MS, Resident Doctor, Department of Obstetrics and Gynaecology, SMS Medical College & Attached Group of Hospitals Jaipur, Rajasthan.

KEYWORDS

INTRODUCTION

Hysterectomy is the second most frequently performed surgery on women of reproductive age after caesarian section worldwide¹. In India, the incidence of hysterectomy is 4-6% of adult women population, in 90% of cases the indications are benign conditions². Common benign indications for hysterectomy are symptomatic uterine leiomyomas (51.4%), abnormal uterine bleeding (41.7%), endometriosis (30%), and prolapse (18.3%)³. Approach to hysterectomy can be either abdominal or vaginal, with recent advances in technology various minimally invasive approaches such as laparoscopic, robotic and vNOTES approach are also increasingly being used by gynaecologist.⁴

The decision of optimal approach to hysterectomy for a patient depends on multiple factors such as the uterine pathology, uterine size, uterocervical descent, presence of associated pathology e.g. endometriosis, adnexal masses, likelihood of presence of pelvic adhesions, previous abdominal surgeries and the surgeon's preference. American college of Obstetrician and Gynecologists concluded that vaginal hysterectomy is route of choice, it is associated with better outcome as compared to other approaches of hysterectomy⁵. In some instance approach is obvious e.g. if the uterus size is 20 weeks or larger, a total abdominal hysterectomy (TAH) may be the optimal approach. While in cases with uterine prolapse, with coexisting cystocele and rectocele, a vaginal hysterectomy (VH) and repair will be the best approach. However there is a group of patients where either of three approaches can be applied⁶. Total laparoscopic hysterectomy (TLH) requires specialized equipments, energy based sophisticated devices, general anaesthesia therefore the total cost of surgery is more as compared to routine surgery. The use of non-descent vaginal hysterectomy (NDVH) gave us another promising route of access to uterus which has become a now a better alternative to abdominal hysterectomy for benign uterine pathology.

Laparoscopic hysterectomy was initially associated with longer operating time and intra-operative injuries were also more. However, as the skills of the surgeons have improved and with the use of advanced energy based laparoscopic instruments today both the above concerns have been allayed. Laparoscopic hysterectomy offers the advantage of direct visualization of abdomen and pelvis under magnification therefore meticulous dissection and adhesiolysis can be done under vision whenever required. But, it has a steep learning curve, requires modernized OT set-ups equipped with energy based sophisticated instruments which maybe a limiting factor more often at low-resource centres as in semi-urban and rural hospitals and may put a greater financial burden for the patient as compared to vaginal hysterectomy⁶. So here stands the place for Non-descent vaginal hysterectomy (NDVH) where there is no scar at all, operative time is less, also reduced intraoperative bleeding and post-operative

morbidity, which can be done with the regular infrastructural OT setup⁷. In cases with larger for uterus hysterectomy can be facilitated by bisection, wedge debulking and morcellation. This study is a prospective, comparative, single centre, hospital based study of NDVH and TLH performed. This study compared the operative time, blood loss, pain score, hospital stay, intra-operative and post-operative complications in the two study groups.

MATERIAL AND METHOD:

We carried out a prospective comparative study at a tertiary care centre associated with S.M.S medical college, Jaipur over a period of one year. Total 64 women undergoing hysterectomy for benign indication was included in the study with 32 cases in one group of NDVH and 32 cases in other group of TLH. Demographic characteristics, indication of hysterectomy, operative time, intra-operative blood loss, intra and post-operative complications, postoperative pain score, duration of hospital stay and change in Hb were compared between both the groups.

Inclusion Criteria:

- Cases of benign pathology of uterus.
- Cases with uterine size 12 weeks or less.
- Cases willing to give consent.

Exclusion Criteria:

- Prolapsed uterus.
- Restricted mobility of uterus.
- Uterine, cervical, ovarian malignancy.

METHODOLOGY

64 Women undergoing hysterectomy on basis of inclusion and exclusion criteria were selected. Informed consent of the women was taken prior to study.

Institute review board and ethical committee approval was taken. Randomization was done to allocate women in each group.

The major steps of TLH were as follows: All cases were performed under general anaesthesia. Patient was positioned in low lithotomy, after painting and draping the uterine manipulator was introduced per vaginally. Pneumoperitoneum was created with Verres needle using carbon dioxide, supraumbilical primary port (10 mm) was inserted, and the intraperitoneal pressure was maintained around 14-15 mmHg throughout the surgery. Three accessory ports -two ipsilateral 5 mm ports and one contralateral 5 mm port were used. The round ligaments were cauterized and cut using vessel sealing forceps followed by the utero-ovarian/infundibulopelvic ligaments. The procedure is done on other side too. After incising anterior uterovesical fold of peritoneum bladder was mobilized downwards. Uterine vessels were cauterized

and cut using bipolar forceps and scissors respectively. Bilateral cardinal and uterosacral ligaments were also taken care using vessel sealing forceps. Vaginal vault was incised along cervicovesical junction using monopolar hook cautery by a circumferential incision. The specimen was removed vaginally. Finally endosuturing of vaginal vault was done with vicryl no. 1 suture.

The surgical steps in NDVH were as follows : The cases were performed under spinal or epidural anaesthesia. After painting and draping, self retaining catheterization of bladder was done by a foley's catheter and anterior lip of cervix was held with vulsellum. Circumferential incision was made at cervicovaginal junction, the vesico-cervical fascia was cut by sharp dissection and bladder was mobilized upwards. Uterosacral were palpated posteriorly and posterior pouch was opened in between them. Anterior peritoneum was opened also. Bilateral uterosacral and cardinal ligaments were clamped, cut and ligated. Bilateral uterine vessels were clamped, cut and ligated. Uterus was often bisected then it was delivered and hysterectomy was completed by applying bilateral cornual clamps, cutting and ligating them. When needed uterine debulking was also done. Suture used was vicryl no 1, the vault was closed meticulously after achieving hemostasis and instruments count.

Intra-operative parameters – operative time, blood loss

postoperative condition – pain score using VAS score, hospital stay,

postoperative complications. All cases were followed for period of 45 days.

Statistical Analysis:

Linear variables are described as mean and SD and are compared using unpaired t test. Categorical variables are described as percentages and are compared using X2 test/fisher exact test. P-value <0.05 will be taken as significant.

RESULTS:

1. Demographic characteristics (Table 1) - The mean age in NDVH group was 45.15±5.12 years and in TLH group was 45.4±5.27 years. According to age cases were uniformly distributed in both groups. All cases in both groups were multiparous. 18 (56.25%) cases in NDVH group and 22 (68.75%) cases in TLH group had history of prior surgery. Majority of cases i.e 18 (56.25%) in NDVH and 20(62.5%) in TLH group has no associated co-morbidity. Many cases were anemic but prior to surgery their hemoglobin was improved.

Table 1: Distribution Of Cases According To The Sociodemographic Characteristics

Sociodemographic characteristics	NDVH group	TLH group
Mean age	45.15 +- 5.12 yrs	45.4 + 5.27 yrs
Parity		
<P3	17 cases	16 cases
>= P4	15 cases	16 cases
History of prior surgery	18 cases	22 cases
Co-morbidities		
No	18 cases	20 cases
Hypertension	3 cases	4 cases
DM	2 cases	1 cases
Hypertension + DM	1 cases	1 cases
BMI> 25kg/m2	2 cases	1 cases
Hypothyroidism	1 cases	3 cases
Others	5 cases	2 cases
Indication for hysterectomy		
AUB-L	23 cases	25 cases
AUB-A	7 cases	5 cases
AUB-P	1 cases	0 cases
AUB-M	1 cases	2 cases

2. Indication for hysterectomy (Table 1): AUB-L was the most common and AUB-A was the second most common indication for hysterectomy in both study groups. In NDVH group 23(71.88%) cases & in TLH group 25 (78.12%) cases indication of hysterectomy was AUB-L. According to indication of hysterectomy cases were uniformly distributed in both groups.

3. Operative time (Table 2): In NDVH group in majority i.e. 26 (81.25%) cases operative time was less than 60 min. In TLH group in

majority i.e. 21 (65.63%) cases operative time was 61-120 min. In NDVH group operative time did not extend beyond 120 min in any of the cases while in TLH group in 11 cases operative time extended beyond 120 min. The difference in the mean operative time was statistically significant. It was higher in TLH group (115.56±16.35 min) as compared to NDVH group (55±6.43min) (p value=<0.0001).

Table 2 Distribution Of Cases According To The Operative Time (min)

Operative time (min)	NDVH group Number of cases	TLH group Number of cases
<60	26	0
61-120	6	21
>120	0	11
Total	32	32
Mean ±SD	55±6.43 min	115.56±16.35 min

P Value- <0.0001(S)

Table 3: Distribution Of Cases According To Blood Loss (ml) During Surgery

Blood loss (ml)	NDVH Group Number of cases	TLH Group Number of cases
60-90ml	7	12
91-120ml	20	15
>120ml	5	5
Total	32	32
Mean±SD	97.31±15.34 ml	96.43±15.96 ml

P value – 0.8228 ns

4. Intra-operative blood loss (Table 3): Majority 20 (62.5%) cases in NDVH and 15 (46.88%) cases in TLH group had blood loss of 91-120ml during surgery. In NDVH group, 7 (21.88%) cases and in TLH group 12 (37.5%) cases intra-operative blood loss was between 60 to 90 ml. 5 (15.62%) cases in both groups had intra-operative blood loss of more than 120 ml. Mean blood loss was 97.31±15.34 ml in NDVH group & 96.43±15.96 ml in TLH group. The difference in mean blood loss in both groups was statistically insignificant (P value=0.8228).

Table 4: Distribution Of Cases According To Pain Score Postoperatively

VAS Pain Score	NDVH group Number of cases	TLH group Number of cases
Mild (1-2)	9	4
Moderate (3-4)	11	13
Severe (5-6)	8	11
Very severe (7-8)	4	3
Worst (9-10)	0	1
Total	32	32

P value- 0.54(NS)

5. Post-operative pain score (Table 4): Majority of cases 11(34.38%) in NDVH group and 13 (40.63%) in TLH group experienced moderate pain postoperatively. 15 (46.88%) cases in TLH group and 12 (37.5%) cases in NDVH group experienced severe or worst pain postoperatively however this difference was not statistically significant.

Table 5: Distribution Of Cases According To Duration Of Hospital Stay

Duration of hospital stay (days)	NDVH group Number of cases	TLH group Number of cases
4-5	14	28
6-7	18	4
Total	32	32
Mean±SD	5.68±0.69 days	5.03±0.47 days

P value - <0.0001(s)

6. Hospital stay (Table 5): The mean duration of hospital stay was significantly higher in NDVH group (5.68±0.69 days) than in TLH group (5.03±0.47days) (p value <0.0001). In TLH group majority i.e. 28 cases were discharged on day 4 or 5. Only 4 cases in TLH group were discharged on day 6 or 7. While in NDVH group majority i.e. 18 cases were discharged on day 6 or 7. In NDVH group 14 cases were discharged on day 5.

Table 6: Distribution Of Cases According To Postoperative Complications

Postoperative complication	NDVH group	TLH group
	Number of cases	Number of cases
Fever	5	1
UTI	2	1
BPV	1	1
None	24	29
Total	32	32

P value -0.32(NS)

7.Hb change: The mean level of change in Hb was same in both groups (0.44 ± 0.28 gm/dl). The difference was statistically insignificant (p value= 1.000).

8. Post-operative complications (Table 6): Fever and urinary tract infections were the common postoperative complications however majority of cases had uneventful postoperative period.

DISCUSSION

In present study the mean age in NDVH group was 45.15 ± 5.12 years and in TLH group was 45.4 ± 5.27 years (Table 1), which was similar to the studies by Kansara V et al⁷, Sarada Murali et al⁸ and Dewan et al⁹ in which 40-50 years was the most common age group in both NDVH and TLH study groups. Many authors have concluded that there is increased prevalence of AUB in this age group which may be because of the fact that these women are perimenopausal, their cycles become intermittently anovulatory, endometrium remains in the disordered proliferative phase.

In our study leiomyoma of uterus was the most common indication of hysterectomy these women mostly presented with abnormal uterine bleeding but a few also had pain abdomen as the presenting complaints. Adenomyosis of uterus (AUB-A) was the second most common indication (Table 1). These results were similar to the findings of Dewan R et al⁹ and Sarada Murali et al⁸ who have also concluded that fibroid uterus was the most common indication of hysterectomy. K Betha et al¹² carried out a retrospective study with primary goal to classify women with AUB according to PALM COEIN classification system. They found that the most common cause of AUB was fibroid in 30.4% of cases.

In present study mean operative time in NDVH group was 55 ± 6.43 min and TLH group was 115.56 ± 16.35 min this is statistically significant difference indicated by p value (<0.0001) (table 2). Similar studies by Patel R et al¹¹, Matteson et al¹⁴, Roy K K et al¹⁵ and Chattopadhyay S et al¹⁶ showed that TLH have longer operative duration in comparison to NDVH. Fuzayel et al¹⁷ reported that the mean duration of surgery for NDVH was 96.78 min and for TLH was 101.26 min but it was not significant statistically (p value 0.0715). Multiple factors effect the operative time of a surgical procedure. According to the study done by J Carugno et al¹⁸ obesity, history of pelvic surgery and limited surgeon experience were common factors associated with longer duration of surgery in patients undergoing laparoscopic hysterectomy.

In our study mean blood loss in NDVH group was 97.31 ± 15.34 ml and in TLH group was 96.81 ± 11.59 ml. difference in blood loss between both groups was statistically insignificant (P value= 0.4002) (Table 3). Mean change in Hb in both groups was 0.44gm/dl which is statistically insignificant (p value =1.000). Similarly insignificant difference in blood loss and change in Hb postoperatively were reported by studies done by Muller A et al¹⁹, Aniliene R et al²⁰, Mortem M et al²¹ and Sapna B Jain et al²². While in study by Nager O et al²³, Nimbannavar et al²⁴ and Patel R et al¹¹ blood loss was significantly more in NDVH group as compared to TLH group. In study by Roy K K¹⁵ and Sarada Murali et al⁸ mean blood loss was more in TLH group (120ml) than the NDVH group (50ml) and this difference was statistically significant. Higher blood loss in laparoscopic surgeries may be due to fact that the transected vessels remain open till occlusion is achieved by laparoscopic coagulation devices, but with advancement in coagulation devices blood loss in TLH is progressively reducing. In vaginal surgeries, the transected vessels remain occluded by a clamp till the suture is tied and we used bipolar cautery for dissection, therefore blood loss was less.

There were no major intraoperative complication in our study, which

was consistent in findings with study by Chattopadhyay S et al¹⁶.

In NDVH group, 2 cases were converted to laparotomy. In first case uterine fundus was broad, there were 2 intramural fibroids extending laterally up to pelvic sidewalls, therefore uterus could not be delivered vaginally and hysterectomy completed with laparotomy. Another case for NDVH was converted to abdominal hysterectomy because of obliterated pouch of douglas. In TLH group, 1 case was converted into laparotomy. In this case there was bleeding point which could not be reached due to excessive adhesions hence laparotomy was done. These cases were not included in study. In study by Aratipalli J et al²⁵; 5 patients of TLH group had conversion to laparotomy in view of adhesions and gut injury while in NDVH group none of patients required laparotomy.

Majority of cases 11(34.38%) in NDVH group and 13 (40.63%) in TLH group experienced moderate pain postoperatively. However, the difference in overall pain score between both the groups was statistically insignificant (P value 0.54) (Table 4), which was consistent in findings with study done by Roy K K et al¹⁵. While Chattopadhyay S et al¹⁶ in their study found that postoperative pain was significantly lower in TLH group than NDVH group. In our study more cases in TLH group had higher level of pain than NDVH group. Less pain in NDVH group may be due to absence of incision on the abdomen, bowel is not handled and prolonged effect of spinal anesthesia, while in TLH there are three to four incisions on abdomen, gaseous distension, bowel handling, longer duration and no residual effect of general anesthesia after surgery contributed to increased pain VAS score.

The mean duration of hospital stay in our study in NDVH group was 5.68 days and in TLH group was 5.03 days & was significantly higher in NDVH group (p value <0.0001) (Table 5). Bhatt et al⁴⁹ reported that the mean duration of hospital stay was 6.13 days in NDVH group and 5.6 day in TLH group and difference was significant.

Postoperative complications in our study noticed were fever, UTI and bleeding per vaginum (Table 6). Nimbannavar H et al²⁴ in their study reported that 20% cases in NDVH group and 15% cases in TLH group had febrile episodes postoperatively.

CONCLUSION

In modern era of technology as instruments and surgeon's expertise are improving day by day, robotic and laparoscopic surgeries are being preferred by surgeons and sometimes by patients too. But vaginal hysterectomy remains original minimal invasive surgery with less operative time, less postoperative pain, done under spinal anaesthesia and faster return to normal activity. It does not require expensive instruments and OT setups, hence should be preferred, especially in low resource setting. However, in cases with extensive pelvic adhesions and in obese patients, TLH is better option as it allows dissection under direct vision.

REFERENCES:

- Keshavarz H, Hillis SD, Kieke BA, Marchbanks PA. Centre for Disease control (CDC) MMWR. Hysterectomy surveillance-United States, 1994-1999. Surveillance Summaries. 2002;51:1-8.
- Singh AJ, Arora AK. Effect of uterine prolapse on the lines of rural North Indian women. Singapore. J Obstet Gynecol. 2003;34:52-8.
- ACOG Committee Opinion Number 701, June 2017. Choosing the route of hysterectomy for benign disease. Obstet Gynecol 2017;129:e155-9.
- Koike E, Kotani Y, Tobiume T, Tsuji I, Nakai H et al. Introduction of Total Laparoscopic Hysterectomy as a Substitute for Laparoscopically Assisted Vaginal Hysterectomy: A Comparison of the First 23 Cases. Gynecol Obstet (Sunnyvale). 2014; 4:211.
- Ekanayake C, Pathmeswaran A, Kularatna S, Herath R, Wijesinghe P. Cost evaluation, quality of life and pelvic organ function of three approaches to hysterectomy for benign uterine conditions: study protocol for a randomized controlled trial. Trials. 2017 Nov 25;18(1):565.
- Neelam Nalini, Bajeta, S Singh, Harsh Vardhan Singh. Clampless non descent vaginal hysterectomy: A novel art. Int. J Reprod Contracept Obstet Gynaecol 2015 June;4(3):25-9.
- Kansara, Vijay & Chaudhari, Jaydeep & Desai, Ajesh. (2020). A comparative study of non-descent vaginal hysterectomy and total laparoscopic hysterectomy. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 9. 777. 10.18203/2320-1770.ijcog20200376.
- Sarada Murali M, Khan A. A Comparative Study of Non-descent Vaginal Hysterectomy and Laparoscopic Hysterectomy. J Obstet Gynaecol India. 2019 Aug;69(4):369-373.
- Dewan R, Agarwal S, Minocha B, Sen SK. Nondescent vaginal hysterectomy - an experience. J Obstet Gynecol India. 2004;54(4):376-8.
- Mamta sharma, Alka M aurya, Rinku Kumari. Distribution of causes of abnormal uterine bleeding according to PALM COEIN classification in tertiary health centre and its histopathological correlation. International journal of reproduction, contraception, obstetrics and gynaecology. 2021 Apr; 10(4): 1373-78.
- Patel R, Chakravarty N. Comparative study of laparoscopic hysterectomy versus vaginal hysterectomy. Int J Med Sci Public Health. 2014;3(3):335-7.
- Kalpna Betha, Lavanya Malavatu, Sreeveena Talasani. Distribution of causes of

- abnormal uterine bleeding using new FIGO classification system-PALM COEIN: a rural tertiary hospital based study. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2017; 6(8): 3523-27.
13. Barkha Gurjar, Sony. Incidence of AUB as a reason of hysterectomy: a one year study. *Journal of Medical Science and Clinical Research*. 2017 June; 5(6): 23883-87.
 14. Matteson KA, Phipps MG, Raker C, Sacco LJ, Jackson AL. Discussion: 'Laparoscopic versus vaginal hysterectomy for benign pathology' by Candiani et al. *Am J Obstet Gynecol*. 2009 Apr;200(4):e1-6.
 15. Roy KK, Goyal M, Singla S, Sharma JB, Malhotra N, Kumar S. A prospective randomised study of total laparoscopic hysterectomy, laparoscopically assisted vaginal hysterectomy and non-descent vaginal hysterectomy for treatment of benign diseases of uterus. *Arch Gynecol Obstet*. 2011;284(4):907-12.
 16. Chattopadhyay S, Patra KK, Halder M, Mandal A, Pal P, Bhattacharya S.A. Comparative study of total laparoscopic hysterectomy and non descent vaginal hysterectomy for treatment of benign disease of uterus. *Int J Repord Contracept Gynaecol* 2017;6:1109-112.
 17. Fuzayel AB, Bhadra B, Choudhury N, Shyam DJ. Total laparoscopic hysterectomy versus non-descent vaginal hysterectomy: An observational study. *Int j recent trends sci technol*. 2017;24(2):40-3.
 18. Jose Carugno, Anthony Gyang, Frederick Hoover. Physician Risk Estimation of Operative Time: A Comparison of Risk Factors for Prolonged Operative Time in Robotic and Conventional Laparoscopic Hysterectomy. *Journal of Gynecologic Surgery*. 2014 Feb; 30(1): 15-19.
 19. Muller A, Thiel FC, Renner SP, Habenle, Beckmann MW. Hysterectomy-a comparison of approaches. *Dtsch Arztebl Int*. 2010;107(20):353-9.
 20. Aniulienė R, Varzgalienė L, Varzgalis M. A comparative analysis of hysterectomies. *Medicina (Kaunas)*. 2007;43(2):118-24. 8.
 21. Morton M, Cheung VY, Rosenthal DM. Total laparoscopic versus vaginal hysterectomy: a retrospective comparison. *J Obstet Gynaecol Can*. 2008;30:1039-44.
 22. Sapna B. Jain, Nishi Mitra, N. Singh, Sangam Jha. Keyhole to no hole hysterectomy - A retrospective analysis of NDVH and TLH in a teaching hospital. *Indian Journal of Obstetrics and Gynecology Research*. 2018;5(1):89-92.
 23. Oby Nagar, Akanksha Sharma, Vijay Shankar. A comparative study of total laparoscopic hysterectomy and non-descent vaginal hysterectomy for treatment of benign diseases of uterus. *International Journal of Clinical Obstetrics and Gynaecology*. 2018; 2(4): 63-68.
 24. Harshal Nimbannavar, Amey Chugh, Amulya Rama, Himadri Bal. Comparative study of non-descent vaginal hysterectomy and total laparoscopic hysterectomy performed for benign gynaecological conditions. *IJRCOG*. March 2021; 10(3):993-8.
 25. Aratipalli J, Bandi B. Comparison of outcome between total laparoscopic hysterectomy and vaginal hysterectomy in a non-descent uterus in a tertiary care hospital. *Int J Appl Res*. 2018;4(12):197-201.
 26. Candiani M, Izzo S, Bulfoni A, Riparini J, Ronjoni S, Marconi A et al. Laparoscopy vs vaginal hysterectomy for benign pathology. *Am J Obstet Gynecol*. 2009;200(4):368.