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Original Research Article

Comparative study of non-descent vaginal hysterectomy and total laparoscopic hysterectomy performed for benign gynaecological conditions

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ABSTRACT

Background: Hysterectomy is a common surgical procedure frequently performed in the day-to-day practice of gynaecology. Non-descent vaginal hysterectomy (NDVH), which is an art of gynaecological surgeons, has established its place in the realm of gynaecological surgeries. Total laparoscopic hysterectomy (TLH) has a steep learning curve, requires modernized OT set-up including special endoscopic instruments and may not be available in all centres. Non-descent vaginal hysterectomy is a viable alternative in such a scenario. Hence these two surgeries have been compared in this study.

Methods: A total 40 patients undergoing hysterectomy for various benign indications, were included for the study. They were divided into two groups of 20 each. One group underwent TLH and the other NDVH. Demographic profile and other perioperative events were compared and statistically analysed.

Results: NDVH group experienced more pain and required a greater number of analgesic doses. The intraoperative blood loss was more in NDVH group and duration of surgery was significantly higher in NDVH group. Rest of the parameters were by and large comparable. The incidence of bladder injury was more in the TLH group as compared to NDVH group.

Conclusions: Both NDVH and TLH have their pros and cons. In a given case the final decision will depend on a number of variables like human, financial and medical.

Keywords: Hysterectomy, Non-descent vaginal hysterectomy, Total laparoscopic hysterectomy

INTRODUCTION

Hysterectomy is universally the most common surgery performed in the field of gynaecology.¹ The route of hysterectomy is generally based on multiple factors like indication of surgery, size of the uterus, presence of other comorbidities, individual surgeon's expertise and preference, and these days, also the patient's preference. In India, the rate of hysterectomy is about 4-6% of adult Indian women out of which 90% are carried out for benign indications.²

Total laparoscopic hysterectomy (TLH) requires specialised equipment and cost involved is more compared to routine surgery. The advent of non-descent vaginal hysterectomy (NDVH) gave us another route of access and has become a competing alternative to abdominal hysterectomy for benign uterine pathology. NDVH is generally performed under spinal anaesthesia contrary to TLH which is done under general anaesthesia with its attendant paraphernalia.

Initially gynaecologists started laparoscopic hysterectomy as laparoscopic-assisted vaginal hysterectomy (LAVH) and subsequently after gaining more expertise switched

over to TLH. Laparoscopic hysterectomy, to start with, was associated with longer operating time and rise in the rate of intra-operative injuries. However, as time passed the skills of the surgeon improved and today in expert hands both these concerns have been allayed.

Recent reviews have suggested that whenever feasible vaginal hysterectomy should be the operation of choice for gynaecologists. TLH, presently is considered a better alternative to abdominal hysterectomy.³

Total laparoscopic hysterectomy is a modern concept. It has a steep learning curve, requires modernized OT set-ups and special laparoscopic instruments which may not be available in all centres, more so in semi-urban and rural hospitals and it poses a greater financial burden for the patient when compared to vaginal hysterectomy. Non decent vaginal hysterectomy is a viable alternative in such situations. Yet total laparoscopic hysterectomy is becoming popular because of its minimal invasiveness and overall better outcome. Keeping all these factors in mind we planned to carry out a study comparing NDVH and TLH and evaluate their pros and cons.

METHODS

This prospective cohort observational study was carried out at Dr. D.Y Patil medical college and hospital, department of obstetrics and gynaecology, Pune between January 2019 and February 2020. The sample size was 40 patients. The sample size was calculated by considering the mean postoperative VAS score from the available literature.⁴ VAS score in NDVH was 2.88 ± 1.166 and TLH was 1.80 ± 1.118 . Entering these values in WinPepi software the calculated sample size obtained was 38, that is, 19 in each group.⁵ We rounded off the total number to 40 patients, 20 in each group.

The sole inclusion criteria for the study were patients posted for hysterectomy for benign gynaecological pathology. The exclusion criteria were uterine size more than 12 weeks, utero-vaginal prolapse, proven or suspected malignancy, broad ligament fibroid, endometriosis, history of any previous major abdominal surgery, patient having co-morbidities like hypertension, diabetes mellitus, or any other major systemic disease.

The participants were included as and when they were admitted and 20 patients listed for NDVH formed the group A and 20 undergoing TLH constituted group B. Written informed consent for participation in the study was obtained from all the cases. Data including history taking, physical examination and necessary investigations including appropriate imaging studies were obtained from the case files. Informed consent was taken from all patients for the specific surgery she underwent in the prescribed format as per standard protocol.

The preoperative preparation and post-operative management were as per laid down norms for the

respective surgeries with Peglec bowel preparation being done for all TLH cases. All the cases were operated by experienced faculty of the institution.

The time of commencement of the operation for NDVH started from the moment of saline infiltration into the sub-vaginal tissue and for TLH starting time was incision on the port-site. The final closure of the vault was considered the end point for NDVH and the suturing of all the port-site incisions considered the end point of TLH.

The major steps of TLH were as follows: All cases were done under general anaesthesia. After positioning, painting and draping, the uterine manipulator was introduced per vaginally and fixed. One primary port (10 mm) was inserted in the umbilical area, pneumoperitoneum was created using carbon dioxide and the intraperitoneal pressure was maintained around 14-15 mmHg throughout the surgery. Three accessory ports (two 5 mm ports on left side and one 5 mm port on right side) were used. The round ligaments were cauterised and cut using vessel sealing forceps followed by the utero-ovarian/infundibulopelvic ligaments, as per requirement, were cauterised and cut in same manner. The uterovesical fold of peritoneum was then incised using unipolar cautery and bladder was mobilised. Skeletonization of uterine vessels were done and these vessels were cauterised and cut using bipolar forceps and scissors respectively. Bilateral cardinal and uterosacral ligaments were cauterised and cut using vessel sealing forceps. Vaginal vault was then opened along cervicovesical junction using unipolar cautery by circumferential incision. The specimen was removed vaginally. Thereafter after ensuring haemostasis, vaginal vault was closed by endosuturing with polyglactin 910 suture.

The surgical steps carried out in NDVH were as follows: The cases were done under spinal anaesthesia. After painting and draping, bladder was emptied by a metal catheter and anterior lip of cervix was held with vulsellum. 1:200000 adrenaline in saline or plain saline infiltration was done in sub-vaginal space. Circumferential incision was made around the cervix, the pubo-vesico-cervical fascia was cut and bladder mobilized upwards till the anterior peritoneum covering the uterus was visible. The anterior peritoneum was opened carefully by applying two artery forceps and cutting in between. Posterior pouch was opened subsequently. Uterosacral and cardinal ligaments were clamped, cut and ligated. Bilateral uterine vessels were clamped, cut and ligated. After delivering the uterus, hysterectomy was completed by applying bilateral cornual clamps, cutting and ligating it properly. All the pedicles were ligated with polyglactin 910 suture and they were rechecked for any bleeding or oozing. Finally, the vault was closed meticulously with same suture material.

Intra-operative data including the type of anaesthesia, duration of surgery, blood loss, and any complications during the surgery were noted from documents. Complications were divided into major and minor groups. The complications which were considered major in this study were organ (bowel, bladder, and ureter) injury, major haemorrhage with blood loss >500 ml or requiring blood transfusion, conversion to laparotomy in a case of TLH or re-exploration in NDVH. Minor complications were fever, urinary tract infection, respiratory tract infection, wound infection, and vault problems. Temperature $\geq 100^{\circ}\text{F}$ was taken as postoperative fever for the evaluation.

Blood loss during TLH was calculated by the difference between the volume of fluid introduced into the pelvic cavity for irrigation purposes and the volume of fluid aspirated during the operation. For NDVH the estimation of blood loss was calculated by weighing surgical mops and gauze pieces before (dry state) and after (blood-soaked gauze and mops) the operation plus any blood collected in the suction bottle. One gram increase in the weight of a blood-soaked surgical mop or gauze was considered one mL of blood loss by the gravimetric method.⁶ If any irrigation was done, that volume of fluid introduced was deducted from the total fluid collected in the suction bottle.

Postoperative pain was assessed during the first 24 hours after surgery using a visual analogue scale, from 0 for no pain to 10 for maximum pain. Using a ruler, the score was determined by measuring the distance in mm on the 10-centimetre line between the “no pain” anchor and the patient’s mark, providing a range of scores from 0 to 100mm. The following cut off points were considered: 0 to 4mm is no pain, 5 to 44 mm is mild pain, 45 to 74 mm is moderate pain, 75 to 90 mm is severe pain and 91 to 100mm is worst pain

All patients were put on intravenous tramadol 100 mg 8 hourly for 48 hours and need for any additional analgesia considered as a parameter for the study.

Data were entered in EXCEL sheet, tabulated and analysed by using Epi 7/WinPepi/SPSS. Quantitative data summarised by using mean and SD. Qualitative data summarised by using proportions. Appropriate tests of statistical significance such as Chi-square, t-test and paired t-test were used.

Institutional ethical committee clearance was obtained before the commencement of the study.

RESULTS

The mean age of the participants in the NDVH group was 44.4 years and for TLH 43.4 years and hence there was no statistically significant difference between the two groups. The socioeconomic class (based on Kuppuswamy scale) distribution in the groups were restricted to class

III, IV and V and none in socioeconomic classes I and II. Patients in the NDVH group had a mean BMI of 25.10 whereas in TLH the mean BMI was 26.2.

In the present study, all participants in the NDVH group received regional anaesthesia and whereas in TLH the group, all participants received general anaesthesia.

Table 1: Distribution of participants based on indication as per FIGO classification of AUB in NDVH and TLH group.

Variable	Frequency	%	
Indication (NDVH group)	AUB-A	3	15
	AUB-L	7	35
	AUB-M	5	25
	AUB-O	3	15
	AUB-P	1	5
	Not yet classified	1	5
Indication (TLH group)	AUB-A	6	30
	AUB-L	9	45
	AUB-M	1	5
	AUB-O	2	10
	AUB-P	2	10

AUB-L was the most common indication in both the groups

Table 2: Comparison of intra operative and post-operative complications in NDVH and TLH groups.

Variable	Group		P value	
	NDVH	TLH		
Intra-op	Nil	19	16	0.151
	Intra operative bleeding	0	1	0.311
	Bladder injury	1	3	0.291
Post-op	Nil	13	7	0.057
	Hematuria	1	4	0.151
	Fever	4	3	0.677
	Paralytic ileus	0	2	0.426
	Wound gape	0	2	0.426
	Others	2	2	1.000

Bladder injury was the more common intraoperative complication in TLH group as compared to NDVH but this difference was not significant statistically and febrile morbidity and hematuria were the most frequent postoperative complications in NDVH and TLH group respectively.

The mean number of analgesic doses per patient in the NDVH group was 6.6 and in TLH group was 6.05. The difference between the groups was not statistically significant (Table 3).

There was no statistically significant difference in VAS score between the groups (Table 4).

The mean value of intra-operative blood loss in the NDVH group was more compared to TLH and the difference was statistically significant (Table 5).

There was no statistically significant difference in duration of surgery between the groups (Table 6).

Table 3: Comparison of mean analgesic dose received in NDVH and TLH groups.

Variable	Group	Mean	SD	Mann-Whitney U	P value
No. of analgesic doses	NDVH	6.6	1.95	170.50	0.84
	TLH	6.05	1.95		

Table 4: Comparison of VAS score for pain in NDVH and TLH groups.

Variable		NDVH		TLH		P value
		No. of participants	%	No. of participants	%	
VAS score	Mild	6	30	7	35	0.73
	Moderate	7	35	8	40	0.74
	Severe	4	20	5	25	0.70
	Worst	3	15	0	0	-

Table 5: Comparison of intra operative blood loss in NDVH and TLH groups.

Variable	Group	Mean	Std. Deviation	Mann-Whitney U	P value
Intra-operative blood loss	NDVH	230.00	67.804	129.00	0.045
	TLH	182.16	77.463		

Table 6: Comparison of duration of surgery in NDVH and TLH groups.

Variable	Group	Mean	Std. Deviation	Mann-Whitney U	P value
Duration of surgery	NDVH	1.30	0.470	137.00	0.083
	TLH	1.58	0.507		

Table 7: Comparison of duration of hospital stay in NDVH and TLH groups.

Variable	Group	Mean	Std. Deviation	Mann-Whitney U	P value
Duration of hospital stay	NDVH	6.60	1.818	60.500	0.000
	TLH	4.85	1.531		

The mean duration of hospital stay in NDVH group was 6.60 days and that in TLH 4.85 days. This higher duration of hospital stay in NDVH was a statistically significant difference ($p < 0.001$).

DISCUSSION

In our study, in both the groups the commonest indication for surgery was leiomyoma (Table 1). Study by Patel et al showed that fibroid and DUB were the most common indications of hysterectomy in the TLH group while DUB was the most common indication in the NDVH group.⁷ Study by Khandelwal et al reported that DUB was the commonest indication for hysterectomy in both groups.⁸

Major intraoperative complications encountered in this study were organ injury (in the form of either bladder, ureteric or bowel injury) and significant intraoperative haemorrhage (Table 2). The only major complication in the NDVH group was bladder injury in 5% of the cases, whereas in the TLH group 15% of cases had bladder injury and 5% of cases had a significant intra-operative

haemorrhage. Study by Aratipalli et al reported that, in NDVH group equal number (2% each) of bladder injury, bowel injury and ureteric injury were found, whereas in TLH group also an equal number of the bladder and ureteric injury (2% each) were reported.⁹

Postoperative complications noticed in our study were hematuria, febrile morbidity, vault infection, paralytic ileus, dehiscence of laparoscopic port entry wounds and some post-anaesthetic complications (Table 2). In the NDVH group, 5% of cases had hematuria, 20% had febrile morbidity and 10% of cases had vault infection. In the TLH group, 20% of cases had hematuria, 15% had febrile morbidity, equal number (10% each) of paralytic ileus, wound dehiscence and anaesthetic complications. Among anaesthetic complications one case had hypercarbia and other had hypotension (unrelated to surgery). Both patients were shifted to SICU for overnight observation and both had uneventful recovery in the postoperative period. A study by Sarada Murali et al reported one case of pelvic abscess which was treated

conservatively and post-op ileus was seen in two cases of laparoscopic hysterectomy.¹⁰

In our study, none of the patients who underwent TLH had the severest grade of pain in the post-operative period. 15% of cases in the NDVH group had the worst pain (Table 4). A study by Chattopadhyay et al reported that patients who underwent TLH had significantly lower post-operative pain compared to patients undergoing NDVH, which was statistically significant.⁴ Similar findings were also noted in a study by Patel et al.⁷

The mean volume of intra-operative blood loss in the NDVH group was significantly more (230 ml) than the TLH group (182.16 ml) as reflected by the p-value of 0.045 (Table 5). Blood loss reported varies in other studies. Nagar et al noted that intraoperative blood loss was significantly less in the TLH group than in the NDVH group (86.37 v/s 119.17 ml) $p < 0.001$.¹¹ Murali et al noted that, in NDVH, 35% of surgeries had blood loss of 30-50 ml and 32% had blood loss of 50-80 ml. In TLH, 50% had blood loss between 80 and 100 ml, that is, more than the NDVH group. The excess blood loss in the TLH group here was statistically significant ($p < 0.001$).¹⁰

In the present study mean duration of surgery in NDVH was 1-hour 30 minutes ± 0.470 and TLH was 1-hour 58 minutes ± 0.507 (Table 6). There was no statistically significant difference in duration of surgery between the groups. Similarly, Fuzayel et al noted that the mean duration of surgery in NDVH was 96.78 minutes ± 8.041 and in TLH it was 101.26 minutes ± 8.448 , which was not significant statistically (p value 0.0715).¹²

The mean duration of hospital stay in the NDVH group was 6.60 days and that in TLH 4.85 days in our study (Table 7). The duration of hospital stay was higher in the NDVH group as compared to TLH and this difference was statistically significant. Bhatt et al showed that the average duration of hospital stay was 6.13 days in NDVH group and 5.60 days in the TLH group and the difference was statistically significant.¹³ Candiani et al, also concluded that laparoscopic hysterectomy results in the shorter hospital stay.¹⁴

Limitations

All surgeons have their own individual learning curve. The relative expertise of the surgeon in a particular surgery was a variable which can influence the duration of surgery. This particular variable has not been taken into account in our study and may be considered as a limitation.

CONCLUSION

Today we are concentrating more and more on minimally invasive surgeries. Hence NDVH and TLH are becoming more prevalent. By and large both these surgeries are

comparable though each of them has its own pros and cons.

Intraoperative blood loss, postoperative pain and duration of hospital stay were all more in the NDVH group. However, in low resource settings, NDVH takes precedence over TLH because of less complexity of procedure and NDVH does not require sophisticated equipment. NDVH also has the advantage of being more affordable for the economically challenged sections without compromising on efficacy or safety.

It is generally accepted that TLH is a better route of surgery for obese patients in whom NDVH may be difficult. TLH can be considered as an alternative to abdominal hysterectomy for those in whom NDVH is not feasible. The disadvantages of NDVH mentioned above are all advantages of TLH. The drawbacks of TLH include more incidence of organ injuries like bladder injury, longer operating time and being highly equipment dependant.

At the end, the choice of surgery is situational. It will depend upon the nature of the pathology, availability of resources, skills of the surgeon and most importantly the desire of the patient.

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