

Comparative Study of Outcomes in Patients Undergoing Laparoscopic Assisted Vaginal Hysterectomy and Simple Vaginal Hysterectomy

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Abstract

Introduction: Hysterectomy can be performed by Abdominal, Vaginal, Laparoscopic and Robotic routes.

Aim: Study compares the outcomes of patients undergoing Vaginal hysterectomy with that of Laparoscopic assisted vaginal hysterectomy.

Materials and Methodology: This prospective randomized study, was done in the Department of OBG in Gandhi hospital, between February 2014 and July 2015, after ethical committee approval. 50 women underwent Vaginal hysterectomy and another 50 Laparoscopic assisted Vaginal Hysterectomy. Parameters like Age, Parity, BMI, History of Previous Caesarean, Medical illnesses like Hypertension and Diabetes, Uterine size, Indication for Hysterectomy, Operating time, blood loss, visceral injury, Postoperative fever, Urinary tract infection, Fall in Haemoglobin, Blood transfusions, Pain on day three, Day of Ambulation and Hospital stay were studied. Statistical analysis was done between the two groups on the parameters, using Chi-square test for qualitative parameters and Student "t" for quantitative variances.

Results: There was no gross discrepancy in the "Mean value" in two groups regarding the above studied parameters, excepting the Operating time, which was almost double in Laparoscopic assisted vaginal hysterectomy. Indications constituted the same for both the groups.

Discussion: "P" value was insignificant in relation to age, parity, BMI, Previous Caesareans, medical illnesses, uterine volume, blood loss, fall in hemoglobin, blood transfusions, visceral injuries, postoperative fever, UTI, Pain, and day of ambulation.

Indications for hysterectomy are comparable with other studies. The "P" value was significant for the operation time.

Conclusions: Operating time is less in SVH. LAVH has higher complication rate.

Key words: Simple Vaginal Hysterectomy (SVH); Laparoscopic Assisted Vaginal Hysterectomy (LAVH); Intra Operative Outcomes; Postoperative Outcomes; Demographic Data; Operating Time; Visceral Injuries.

Introduction

Indications for hysterectomy are symptomatic myomas, adenomyosis, dysfunctional uterine bleeding with failed medical therapy, endometriosis and pelvic organ prolapse. There are different routes for hysterectomy: vaginal, abdominal, laparoscopic and robotic assistance. Factors that determine the surgical route of hysterectomy¹⁶:

1. Estimated uterine size
2. Previous caesarean or pelvic surgery
3. Need to perform oophorectomy
4. Presence of PID or endometriosis
5. Restricted mobility of uterus
6. Contracted bony pelvis with narrow vagina
7. Skill or experience for vaginal surgery

Vaginal route was largely practiced for prolapsed uterus initially. In 1990, ACOG¹ established guidelines for the route of hysterectomy stating that vaginal hysterectomy can be performed safely in women with uterus <12 weeks size (280-300 grams). Laparoscopy assisted vaginal hysterectomy has evolved to the stages where even large masses

and malignancies can be handled. Three different major subtypes of laparoscopic hysterectomy are defined by the extent of laparoscopic dissection performed during the procedure.

Laparoscopic Assisted Vaginal Hysterectomy (LAVH) is where part of the hysterectomy is performed by laparoscopic surgery and part vaginally, but the laparoscopic component of the operation does not involve division of the uterine vessels.

Laparoscopic Hysterectomy is where the uterine vessels are ligated laparoscopically but part of the operation is performed vaginally (VALH).

Total Laparoscopic Hysterectomy (TLH) is where the entire operation including suturing of the vaginal vault is performed laparoscopically and there is no vaginal component except for the removal of the uterus.

With the evolution of laparoscopy, surgical techniques to remove increasingly large size uterus and surgical techniques to handle bladder adhesions through vaginal route also developed.

Vaginal and laparoscopic approaches are the preferred choice, as they are associated with reduced morbidity and faster recovery of normal activities.

The present study aims to compare the outcomes of patients undergoing laparoscopic assisted vaginal hysterectomy with that of simple vaginal hysterectomy.

Aims and Objectives

Aim of the study

To compare the outcomes of patients undergoing laparoscopic assisted vaginal hysterectomy with that of simple vaginal hysterectomy.

Objectives of the study

- a. To compare the surgical and immediate postoperative outcome of patients undergoing LAVH with that of SVH.
- b. To find out whether SVH is as good as LAVH as regards to postoperative recovery.

Materials and Methodology

This randomized study, was done in the Department of Obstetrics and Gynaecology in Gandhi hospital, Secunderabad as a prospective one, between February 2014 and July 2015, after ethical committee approval. 100 women who were admitted with gynaecological problems and who had completed their family were the material with

50 being subjected to Simple Vaginal hysterectomy and in another 50 Laparoscopic assisted vaginal hysterectomy was performed.

Management Protocol

History and Examination

For each case, presenting complaints, duration of complaints and history regarding medical treatment and surgeries in the past was taken. General, systemic examination, Gynaecological, abdominal, per speculum and per vaginal examination was done.

Investigations

The following investigations were done:

1. Blood grouping and typing, HIV, HBSAG
2. Complete blood picture
3. Random blood sugar, Urea
4. Serum creatinine, electrolytes
5. Complete urine examination
6. Thyroid profile
7. Chest x ray PA view, ECG
8. Ultrasound abdomen and pelvis
9. Pap smear
10. Endometrial biopsy

All the cases underwent pre anaesthetic check up. The surgical approach of hysterectomy was decided by the treating surgeon.

Operative Techniques

Vaginal Hysterectomy (VH)

After appropriate anaesthesia, patient is placed in the lithotomy position with the buttocks just over the table's edge. Bimanual examination is done to assess uterine mobility and descent. After antiseptic cleaning and draping, Bladder is catheterised. Labial stitches are applied on both sides for good exposure. Sims speculum is placed into the posterior wall of vagina to expose the cervix and another one is used to elevate the anterior vaginal wall. Right angle retractor displaces one lateral vaginal wall and exposes the cervix.

- a. Grasping and circumscribing the cervix
- b. Dissection of vaginal mucosa and bladder advancement
- c. Posterior cul-de-sac entry
- d. Uterosacral ligament ligation
- e. Cardinal ligament ligation
- f. Uterine artery ligation
- g. Delivery of the uterus

- h. Utero-ovarian and round ligament ligation
- i. Haemostasis
- j. Peritoneal closure
- k. Vaginal mucosa closure

Few modifications when required, included usage of Ligasure in to cut and coagulate the pedicles instead of ligating with sutures and morcellation, bisection, myomectomy or intramyometrial coring in cases with large uterus.

Laparoscopic Assisted Vaginal Hysterectomy (LAVH)

After anaesthesia, patient is placed in dorsal lithotomy position with legs placed in Allen stirrups. A bimanual examination is done. Abdomen, perineum and vagina is cleaned with povidone-iodine solution. A Foley catheter is placed to drain the bladder. A uterine manipulator is introduced.

The Veress needle, primary trocar (10mm) and two secondary trocars (5mm) (right and left lateral ports) are inserted.

- a. Separation of adnexa
- b. Dissection of bladder/peritoneum
- c. Transformation to the vaginal route
- d. Ligation of ligaments, uterine artery and vault closure

Parameters Evaluated

Demographic data

- Age
- Parity
- BMI
- Previous LSCS/ pelvicsurgery
- Medical comorbidities
- Diagnosis
- Uterinesize

Intraoperative data

- Mean operatingtime
- Intraoperative bloodloss

[(wet mops weight - dry mops weight) + blood collected in suction bottle] (1 ml of blood weighs approximately 19mg)

- Bladder/bowel/ureterinjury

Postoperative data

- Postoperativefever
- Urinary tract infection(UTI)
- Vaginal cuff cellulitis/local haematoma (if any)
- Fall in haemoglobin (preoperative Hb and

- Second postoperative dayHb)
- Need for bloodtransfusion
- Day 3 pain level index (visual analoguescale)
- Postoperative day ofambulation
- Length of postoperative hospitalstay

Visual Analogue Scale for Pain

All the above mentioned parameters were compared in two groups and results were analysed.

Statistical analysis

The statistical analysis was used to examine differences within the two groups between the analysed parameters.

The tests used for statistical calculations are as follows:

1. Chi-square test for use in the analysis of the difference between two proportions (for qualitative parameters compared in twopopulations)
2. Student "t" test for testing the significance of the difference between two proportions or percentages (for quantitative variances which distribution fulfilled the assumptions ofnormality)

A "P" value less than 0.05 is considered as statistically significant.

Observations and Results

100 cases were studied. Simple Vaginal hysterectomy (SVH) was performed in 50 patients and Laparoscopic assisted vaginal hysterectomy (LAVH) was done in another 50cases. They were compared for intraoperative, postoperative parameters and results were analysed.

For testing the equality of means between the two groups, student's t test was carried out for the characteristics of continuous nature. In all the cases, "P" value was noted.

- a. If "P" value is >0.05, it is concluded that the two groups are homogenous and the difference is notsignificant.
- b. If "P" value is <0.05, it is concluded that the two groups are not homogenous and the difference issignificant.

1) Patient demographic characteristics

The demographic characteristics of patients in the two groups are shown in table 1 Mean, standard deviation and "P" values of the age, parity and BMI were determined.

"P" value for age was 0.28, for parity was 0.48 and for BMI was 0.11. As all the three "P" values are >0.05, it indicates that there was no significant difference between the groups with reference to age, parity and BMI.

Table 1: Demographic data

Group	N	Age in Years		Parity		BMI	
		Mean	SD	Mean	SD	Mean	SD
SVH	50	49.36	9.25	2.7	0.93	21.314	1.26
LAVH	50	47.2	10.81	2.58	0.78	21.714	1.19
Mean		48.28		2.64		21.514	

2. Surgical history

24% of LAVH group and 16% of SVH group had undergone previous Caesarean section.

Table 2: Cases with previous history of caesarean section.

Group	Cases with Previous Caesareansection	
	Number	Percentage
SVH	8	16%
LAVH	12	24%

3. *Medical history:* The numbers in each group were almost similar and the "P" value was insignificant.

Table 3: Number of cases with medical co-morbidities.

Medical Comorbidity	SVH	LAVH
HTN	10	9
DM	4	3

4. *Indications for hysterectomy:* DUB, Fibroid, Adenomyosis constituted major indications.

Table 4: Number of patients in each group based on indication for hysterectomy.

Diagnosis	SVH	LAVH
Fibroid	17	19
DUB	20	16
Adenomyosis	10	9
Chroic Pid	1	3
Atypical Hyperplasia	2	3

5. *Uterine size:* The mean in SVH was 8.85 and 9.33 in LAVH.

Table 5: Mean uterine size in each group.

Group	Uterine Size in Weeks Mean (SD)
SVH	8.85(2.76)
LAVH	9.33(2.60)

Intraoperative Parameters

1. *Mean Operating time:* It was about an hour in SVH and double the time in LAVH.

Table 6: Mean Operating Time for each Group.

Type of Procedure	Operating Time in Minutes Mean (SD)	"t" value	df	"P" value
SVH	60.9(19.27)	17.66	98	<0.0001
LAVH	135.4(22.75)			

2. *Intraoperative bloodloss:* Blood loss was calculated from the difference in weight of wet mops and dry mops along with the blood collected in suction bottle. Mean blood loss was higher in LAVH.

Table 7: Mean blood loss in milliliters for each group.

Type of Procedure	Blood Loss In Milliliters Mean(SD)	"t" value	df	"P" value
SVH	80.12 (8.651)	1.04	98	0.29
LAVH	82.88 (16.50)			

3. *Visceral injury:* In LAVH group, bladder injury occurred in three patients, while in SVH, none happened.

Postoperative Parameters

1. *Postoperative fever:* Four patients in SVH group and two in LAVH developed it.
2. *Urinary tract infection:* Two patients in SVH group and one in LAVH had it.
3. *Fall in haemoglobin:* Fall in haemoglobin was measured by the difference between preoperative and second postoperative day haemoglobin levels. Mean fall in haemoglobin level also followed same order with LAVH (0.76 gm%) > SVH (0.74 gm%).

Table 8: Mean fall in Haemoglobin in each group.

Type of Surgery	Fall in Haemoglobin in Gram% Mean (SD)	"t" value	df	"P" value
SVH	0.742 (0.174)	0.71	98	0.47
LAVH	0.766(0.161)			

4. *Blood transfusion:* Blood transfusion was given in 4 cases in SVH and 5 cases in LAVH group.

Table 9: Number of cases requiring postoperative blood transfusion in each group.

Type of Surgery	Number of Cases Requiring Transfusion	Number of Cases Without Transfusion	"t" value	df	"P" value
SVH	4	46	0.12	1	0.72
LAVH	5	45			

5. *Pain level index on day 3:* The mean was 2.18 in SVH group and 2.02 in LAVH.

Table 10: Mean day 3 pain level index in each group.

Type of Surgery	Pain Level Index on Day 3 Mean (SD)	"t" value	df	"P" value
SVH	2.18 (0.66)	1.24	98	0.215
LAVH	2.02(0.622)			

6. *Postoperative day of ambulation:* The mean in SVH group was 1.3 and in LAVH it was 1.12.

Table 11: Mean postoperative day of ambulation in each group.

Type of Surgery	Postoperative Hospital Stay in Days. Mean (SD)	"t" value	df	"P" value
SVH	1.3(0.58)	1.37	98	0.17
LAVH	1.12(0.718)			

7. *Mean postoperative hospitalstay:* In our study mean postoperative hospital stay for SVH was 4.82 days and 4.76 days in LAVH.

Table 12: Mean postoperative hospital stay in each group.

Type of Surgery	Postoperative Hospital Stay in Days. Mean (SD)	"t" value	df	"P" value
SVH	4.82(1.04)	0.33	98	0.73
LAVH	4.76(0.71)			

Discussion

Age, Parity and BMI:

"P" value was insignificant between two groups in relation to age, parity and BMI.

Table 13: Mean age, parity and BMI of two groups along with "P" value.

Factor	SVH (n=50)	LAVH (n=50)	P Value
Age	49.36+/-9.25	47.2+/-10.81	0.28
Parity	2.7 +/- 0.93	2.58 +/- 0.78	0.48
BMI	21.314 +/- 1.26	21.714 +/- 1.19	0.11

Age, parity and BMI of the present study were comparable with other studies as shown below.

Table 14: Comparison of mean age, parity and BMI with other studies.

Study	Age (Years)	Parity	BMI (kg/m2)
E.David Montefiore et al ³	51.4 +/- 10.3	2 +/- 1.6	25 +/- 5.7
Rosenthal et al ⁴	47.65	2.20	
Present study	48.28	2.64	21.514

Hence, the above mentioned factors did not affect the outcome of parameters evaluated.

Previous Surgical and Medical History

"P" value was 0.45 which nullifies the effect of previous caesarean section on the difference in parameters evaluated between the two groups. Each group contains almost equal percentage of hypertensive and diabetic patient.

Table 15: Comparison of indications with other studies.

Indication	Shital T. Mehta et al ⁵	Sujata N. Datti et al ⁶	Present study
DUB	41%	39.7%	36%
Fibroid	35%	20.7%	36%
Adenomyosis	20%	13.8%	19%
Chronic PID	4%	25.7%	4%

Indications for hysterectomy in our study are comparable with other studies as shown in table 15.

No major difference was found in mean uterine volume between vaginal hysterectomy and laparoscopic assisted vaginal hysterectomy group (Ewelina Litwinska et al, 2014) and in our study.

Intra and Postoperative Parameters

Time was noted from the first incision on the mucosa/skin to the last suture. The "P" value calculated using t test between two groups was <0.0001 which was statistically significant. Mean difference in operating time in our study was 74.5 mins (65.27 to 83.73minutes). According to Summitt et al⁷, mean time taken was in the following order LAVH>SVH. Mean difference in operating time between laparoscopic and vaginal hysterectomy was 55.40 mins (40.86 to 69.94 minutes).

Blood Loss, Fall in Haemoglobin and Blood Transfusion

The "P" value calculated using t test between two groups was 0.29 which was statistically not significant.

P value between SVH and LAVH groups for requiring blood transfusion was

0.72 (>0.05) which was not statistically significant.

According to Walsh et al⁸, there was no difference in estimated blood loss between two operative approaches (VH & TLH, p=0.16).

Rosenthal et al⁴ compared the outcomes of TLH (n=109) and VH (n=43). There was no statistically significant difference in estimated blood loss (p=0.35) and mean postoperative haemoglobin change (p=0.96).

The results of study by Walsh et al and Rosenthal et al regarding blood loss and postoperative

haemoglobin change was comparable with our study.

According to O Donnez et al⁹, bladder injuries occurred in 0.44% of women undergoing vaginal hysterectomy and 0.31% of women after laparoscopic procedures. There was no significant difference in the rate of ureteral lesions after vaginal (0.33%) and laparoscopic hysterectomy (0.25%).

Patients were monitored with daily temperature chart during their hospital stay. Patients with increased temperature (>38°C) for more than 24 hours of duration were investigated for the source of infection and treated accordingly.

Out of 4 cases of postoperative fever in SVH group, 2 cases were due to UTI, one was due to upper respiratory tract infection and another due to blood transfusion.

In LAVH group, there were 2 cases of fever. One case was due to UTI and another case was of unknown origin.

There were no cases of wound infection and pelvic collection in our study.

In the study by Makinen et al¹⁰, infections (wound, intra abdominal, vaginal infections, UTI, fever of unknown origin, etc.) were the most frequent complications with an incidence of 10.5%, 13% and 9% in the abdominal, vaginal and laparoscopic hysterectomy groups respectively. The highest infection rate (7.3%) was observed in UTI in vaginal hysterectomy group.

In an analysis by Johnson et al¹¹, laparoscopy was associated with fewer infections (OR 0.32), fewer episodes of fever (OR 0.65) when compared with abdominal and vaginal hysterectomy.

In our study, the difference in the pain scoring system between two groups was found to be statistically insignificant with p value 0.215, as has been noticed by Soriano D et al¹⁵.

According to eVALuate¹², Schindlbeck et al studies, one of the advantages of laparoscopy over TAH and VH is less pain (p<0.01).

“P” value of mean day of ambulation between SVH and LAVH groups was insignificant as has been noticed by Soriano D et al¹³ and Johnson et al¹¹.

P value between two groups is 0.17 (>0.05) which was not a statistically significant difference.

The eVALuate¹² study confirmed faster postoperative recovery, lesser hospital stay by Laparoscopy. The same was observed by Cochrane review¹⁴ Warren et al¹⁵, Massimo Candiani et al.¹⁶

Mean hospital stay was more in SVH group than LAVH but P value was 0.73 (>0.05) was insignificant. The same was observed by Darai et al¹⁷, Soriano D et al¹³

Table 16: Comparison of mean hospital stay with other studies.

Study	SVH [mean(sd)]	LAVH [mean(sd)]
Darai et al ¹⁹	5.3(2.1)	5.7(3)
Soriano et al ¹⁵	5.3(2.1)	5.7(3.1)
Present study	4.82(1.04)	4.76(0.71)

Conclusions

Operating time is less in SVH than LAVH.

LAVH has high complication rate. Vaginal hysterectomy is the choice of approach whenever feasible.

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