

Outcome of total laparoscopic hysterectomy in relation to the size of the uterus

Virupakshi Ajjammanavar, Vinodini P., Jayashree S.*

Department of Obstetrics and Gynecology, JSS Medical College, JSS Academy of Higher Education and Research, Mysore, Karnataka, India

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***Correspondence:**

Dr Jayashree S,

E-mail: drjayashrees@gmail.com

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ABSTRACT

Background: Laparoscopic hysterectomy is a safe and feasible technique to manage benign uterine pathology as it offers minimal postoperative discomfort; with shorter hospital stay, rapid convalescence and early return to the activities of daily living. However, to date very few studies have been reported on safety and feasibility of total laparoscopic hysterectomy (TLH) in large sized uteri. The present study was planned to evaluate the intra-operative and post-operative parameters in relation to size of the uterus during TLH.

Methods: This study was a comparative study. Fifty women with uterine size less than 12 weeks (Group 1) and fifty women with uterine size more than or equal to 12 weeks (Group 2) for whom TLH was planned for benign indications were included in the study. Intra-operative and post-operative parameters like blood loss, duration of surgery, post-operative pain and complications were compared between the two groups. Comparison was done using independent sample t test. A probability ('p' value) of less than or equal to 0.05 at 95% confidence interval was considered as statistically significant.

Results: The mean age of the patients in both the groups was matched (44.82 years vs. 43.96 years). The mean operative time (48.80±14.12 minutes vs. 77.3±35.11 minutes; p <0.001) and blood loss (40.10±18.25ml vs. 70.6±65.46 ml; p=0.002) were significantly high in Group 2 compared to Group 1. The mean pain scores were similar in both the groups at 6 hours, 24 hours and at the time of discharge. No significant complications were noted in both the groups.

Conclusions: TLH is safe, feasible and acceptable for large size uterus (>12 weeks). However, it is associated with longer operative time, and greater amount of blood loss.

Keywords: Blood Loss, Complications, Operative Time, Pain Score, Size of Uterus, TLH

INTRODUCTION

Hysterectomy is the second most frequently performed major surgical procedure on women all over the world, next only to caesarean section.¹ In India, the incidence of hysterectomy is about 4-6% of adult Indian women out of which 90% are performed for benign indications.² There are three main approaches to hysterectomy - abdominal, vaginal and laparoscopic, but yet there are controversies regarding the optimal route for the procedure.³ It has been 20 years since Harvey Reich performed the first total

laparoscopic hysterectomy.⁴ A meta-analysis by the Cochrane Library showed that the benefits of LH versus AH were lower intraoperative blood loss, shorter duration of hospital stay, speedier return to normal activities, fewer wound or abdominal wall infections and fewer unspecified infections or febrile episodes at the cost of longer operating time and more urinary tract (bladder or ureter) injuries.⁵ Most studies set an upper limit for uterine size, usually 15 to 16 weeks gestation or weight more than 500 grams as large uterus.⁶ It was suggested that very enlarged uteri should be treated by laparotomy.

The difficulties with enlarged uteri are limited access to uterine vascular pedicles depending on size and location of myomas, and high risk of complications such as haemorrhage. Other concerns of laparoscopic management of large uteri are the risk of bowel and urinary tract injury due to poor exposure, difficulty in extracting the uterus, and duration of the procedure. However, TLH is technically feasible and safe procedure when performed by experienced surgeons with certain modifications regardless of the size of the uterus.⁷

The present study was planned to evaluate the intra operative and post-operative parameters in relation to size of the uterus during total laparoscopic hysterectomy and to evaluate the safety and acceptability of TLH for large size uterus (>12 weeks).

METHODS

The present study was a comparative study done at the department of obstetrics and gynecology, JSS Hospital, Mysore, a tertiary care teaching hospital attached to JSS Medical College, Mysore.

A total of 100 women undergoing total laparoscopic hysterectomy for benign diseases were divided into two groups of 50 each - Group 1 –uterine size less than 12 weeks and Group 2 –uterine size more than or equal 12 weeks. Patients with endometriosis, malignant disease (suspected and confirmed) and uterine prolapse were excluded from the study.

Prior to the commencement of study, the ethical clearance was obtained from the Institutional Ethics Committee, JSS Hospital, Mysuru. The eligible women were explained about the nature of the study and a written informed consent was obtained.

After the enrolment, demographic data and detailed history were obtained, clinical examination and relevant investigations were done, and the women were evaluated for the indication for hysterectomy. The data obtained was recorded on the predesigned proforma.

Majority of the procedures were done using general endotracheal anesthesia without or with orogastric tube suction to minimize bowel distension and some were done under spinal anaesthesia. The patient's left arms were placed at her side and shoulder braces at the acromioclavicular joint were positioned. Trendelenburg position was given up to 40°.

Patients were evaluated for intra operative parameters like blood loss (Blood loss was calculated by subtracting amount of saline used during surgery from total amount of fluid collected in the suction bottle), duration of the surgery (the time between the first incision on the skin and the last suture on the skin). Post-operative pain was monitored in terms of Visual Analogue Score (VAS) at 6 hours, 24 hours and at discharge. Visual analogue scale

was explained to the patient during pre-operative visit considering zero as no pain and 10 as maximum pain point (Figure 1). Complications like large vascular injuries, gastrointestinal system injuries, urinary system injuries, a change of the operation to laparotomy, and the need for re-operation due to any reason were accepted as major complications.

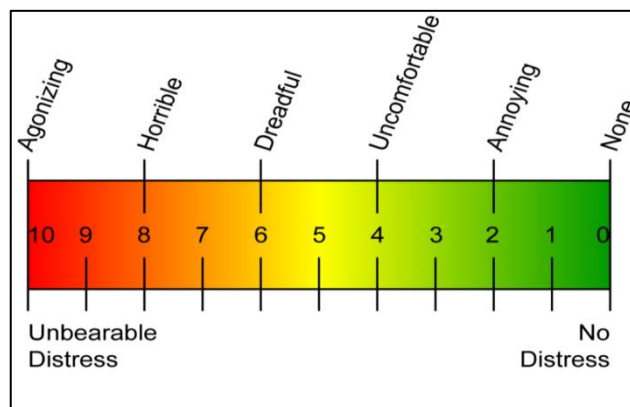


Figure 1: Visual analogue scale.

The data was entered into the Microsoft Excel spreadsheet and was analyzed using SPSS statistical software version 20.0. The categorical data was expressed as rates, ratios and percentages and comparison was done using Fishers exact test and chi-square test. Continuous data was expressed as mean ± standard deviation and the comparison was done using independent sample t test. A probability ('p' value) of less than or equal to 0.05 at 95% confidence interval was considered as statistically significant.

RESULTS

The data obtained from Group 1 and Group 2 was analysed and the final result and observations were tabulated and interpreted. Most of the women were aged between 41 and 45 years in both the groups. The mean age of the patients in both the groups also showed no statistically significant difference (44.82 years vs. 43.96 years).

Majority of the women were multipara in both the groups (78% each; p=0.423). In this study, the mean uterus size was 154.00±71.82g in Group 1 and 406.10±344.50 g (p<0.001) in Group 2 (Table 1).

Table 1: Weight of uterus.

Uterus weight (g)	Group 1		Group 2		T value	P value
	Mean	SD	Mean	SD		
	154	71.82	406.1	344.5	-5.066	<0.001

In Group 1, 16% of women had undergone 1 caesarean section and 8% of women had undergone 2 caesarean sections.

Table 2: Indications for TLH.

Indication	Group 1		Group 2	
	Number	%	Number	%
Adenomyosis	11	22.00	2	4.00
Fibroid	32	64.00	26	52.00
Fibroid with PID	7	14.00	19	38.00
Fibroid with ovarian and adnexal mass	0	0	3	6.00
Total	50	100	50	100

In group 2, 8% of women had undergone 1 caesarean section and 12% of women had undergone 2 caesarean sections. Three patients in group 1 and 5 patients in group 2 had undergone a pelvic surgery other than LSCS in the

past. The most common indication for hysterectomy was fibroid uterus (64% in group 1 and 52% in group 2). The other causes of hysterectomy are as depicted in the table (Table 2).

The mean operative time was 48.80±14.12 minutes in group 1 and 77.3±35.11 minutes in group 2. The difference was statistically significant. Blood loss (40.10±18.25ml vs. 70.6±65.46 ml; p=0.002) was also significantly high in group 2 compared to group 1 (Table 3). The mean pain scores were similar in both the groups at 6 hours, 24 hours and at the time of discharge. (Table 4) No major complications were noted in both the groups. None of the cases in both the groups were converted to laparotomy.

Table 3: Comparison of operative time and blood loss.

Intra operative findings	Group 1 (n=50)		Group 2 (n=50)		t value	p value
	Mean	SD	Mean	SD		
Operative time (minutes)	48.8	14.12	77.3	35.11	-5.325	<0.001
Blood loss (mL)	40.1	18.25	70.6	65.46	-3.173	0.002

Table 4: Pain score.

Intervals	Group 1		Group 2		t value	p value
	Mean	SD	Mean	SD		
6 hours	5.98	0.89	6.1	0.89	-0.723	0.471
24 hours	3.7	0.61	3.7	0.81	<0.001	1.000
At discharge	0.68	0.58	0.44	0.73	1.807	0.074

DISCUSSION

There are many surgical advantages to laparoscopy, particularly magnification of anatomy and pathology, access to the uterine vessels, vagina and rectum, and the ability to achieve complete hemostasis and clot evacuation. Patient advantages are multiple and are related to avoidance of a painful abdominal incision. They include reduced duration of hospitalization and recuperation and an extremely low rate of infection and ileus.⁸ However limited studies have been done on the feasibility of TLH in women with large uterus. Also, there are no definite guidelines concerning the procedure for a large uterus, and the literature is vague regarding the best surgical procedure for these cases.⁹

Many gynecologists consider the following as indications for an abdominal approach to hysterectomy: uterine size greater than 12 weeks; nulliparity with lack of uterine descent; previous pelvic surgery; extrauterine pelvic pathology (endometriosis, adhesive disease); narrow vagina; poor uterine mobility without access to the uterine vasculature; obesity; need for oophorectomy and cancer. These are relative contraindications for

laparoscopic surgery in gynecology, where most surgeons would be better served by doing a laparotomy. With the assistance of expert laparoscopic training, the majority of these patients can be spared a laparotomy. In most cases where vaginal access and/or access to the uterine vessels is limited and little or no uterine mobility exists, a laparoscopic hysterectomy can be considered.⁸

Furthermore, to perform laparoscopic hysterectomy in patients with bulky uterus, it is necessary to use a uterine manipulator with a long tip to reach the uterine fundus, allowing the manipulation of the entire uterus. The placement of trocars more cranial allows a greater surgical field and greater mobility of the laparoscopic instruments. The use of 30 degrees laparoscope allows a greater range of visual fields and facilitates some surgical steps during the procedure for enlarged uteri.¹⁰

The demographic characteristics and obstetric history was similar in both the groups ruling out the possible bias in the study results. However, the indications of hysterectomy differed in both the groups significantly. Fibroid uterus was the most common indication followed by adenomyosis.

A critical factor in considering the degree of difficulty of a laparoscopic operation is the number of previous surgeries the patient has had. Previous surgeries cause adhesions, and adhesions can make the next operation much more difficult. Severe adhesion cases can be so long and time consuming that the surgeon makes no progress and converts to a laparotomy.⁸ In this study, although majority of women had not undergone any surgery in the past, there were 8 women with previous 1 LSCS and 4 women with previous 2 LSCS in Group 1. In group 2, 4 patients had undergone 1 caesarean section and 6 patients had undergone 2 caesarean sections. Three patients in group 1 and 5 patients in group 2 had undergone a pelvic surgery other than LSCS in the past. But none of the above patients suffered any major complications. None of the cases were converted to laparotomy in present study.

In the present study, the mean operative time was significantly more in Group 2 (77.3±35.11 minutes) when compared with Group 1 (48.80±14.12 minutes) ($p<0.001$). Similar observations were reported by Wattiez et al who compared women undergoing total laparoscopic hysterectomy for uteri $> 300g$ and $\leq 300g$, and only the operative time was higher in the large sized uterus (156min) vs. 108 minutes in small sized uterus; $p<0.001$.⁶ Yavuzcan, A. et al also performed a study on evaluation of the outcomes of laparoscopic hysterectomy for normal and enlarged uterus and found longer operative time in patients with enlarged uterus.¹¹ Wang et al also demonstrated a prolonged operative time (91.1 min) in large sized uterus vs. 77.4 minutes in small sized uterus; $p<0.01$ during laparoscopic assisted vaginal hysterectomy for uteri of increased size.¹² One more study by Macciò A et al to analyze whether a large uterine size was associated with increased rate of intraoperative and postoperative surgical complications in patients who underwent TLH on the data from 461 consecutive TLHs performed by a single surgeon found that increased uterine size was significantly associated with longer operative time.¹³

The mean blood loss recorded in small uterus group was significantly low (40.10±18.25 mL) compared to large uterus group (70.6±65.46 mL) and the difference was statistically significant ($p=0.002$) in this study. Wang et al¹² (2004) found increased intraoperative blood loss of 570 ml in large sized uterus vs. 262 ml in small uterus; $p< 0001$. Again, these findings were consistent with the studies by Yavuzcan A et al and Macciò A et al.^{11,13}

In the present study, the mean pain scores based on VAS at 6 hours interval were slightly low in small uterus group compared to large uterus group (5.98±0.89 vs. 6.10±.89) but the difference was not statistically significant ($p=0.471$). Also, at 24 hours, the mean pain scores were almost similar in Group 1 and Group 2 (3.70±0.61 vs 3.7±0.81). The mean pain scores at discharge were least in small as well as large uterus group (0.68±0.58 vs. 0.44±0.73; $p=0.074$). These findings suggest that, pain

after TLH is independent of uterus size. Wattiez et al reported no difference in the need for analgesia in women undergoing total laparoscopic hysterectomy for uteri $> 300g$ and $\leq 300g$.⁶

No complications were noted in both the groups in the present study. In a study by Yavuzcan A et al also none of the patients had postoperative fever and no major complication was observed in large uterus group- A finding consistent with the present study. Another study by Macciò A et al to analyze whether a large uterine size was associated with increased rate of intraoperative and postoperative surgical complications in patients who underwent TLH on the data from 461 consecutive TLHs performed by a single surgeon, found no significant difference in intraoperative and postoperative complications- again a finding strongly in agreement with the present study but prior surgery was predictive of postoperative complications in the study by Macciò A et al.^{11,13}

Overall, the present study shows that TLH is a safe technique in cases of enlarged uteri and the outcomes are similar to that of small uteri without any complications. However, the significantly higher operative time and blood loss noted in the study may be explained by the variation in experience and skill of the surgeons performing laparoscopic procedure as in this study the laparoscopic hysterectomy was not performed by a single surgeon but by various experienced surgeons. Also, the findings derived from the present study require further validation due to potential limitations of the study, viz. the results of this study were biased by indications for TLH as significantly more number of women in small uteri group had adenomyosis as an indication for TLH. Also, the number of cases of fibroid with PID was significantly high in large uteri group. Furthermore, the present study was single centre study involving relatively small sample size. Hence further multi-centric studies involving large sample size and after controlling indications for TLH are required to validate the findings from the present study.

CONCLUSION

With adequate training in laparoscopic surgery and with proper technique, TLH can be performed successfully in most women with enlarged uteri, with no increase in complication rates and short-term recovery. In skilled hands, these patients could benefit from all the advantages related to minimally invasive approach such as minimal blood loss, short hospital stay and prompt recovery, obtaining a satisfactory result.

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