

# Clinical Outcomes of Total Laparoscopic Hysterectomy (TLH): Seven Years' Experience in a Public Hospital

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## Abstract:

**Objective:** *The aim of the study was to explore the surgical outcomes of total laparoscopic hysterectomy.*

**Materials and methods:** *This was a prospective analysis of total Laparoscopic Hysterectomy (TLH) done between January, 2012 to December, 2018 in Shaheed Suhrawardy Medical College and Hospital. Demographic data, clinical criteria, intra operative and postoperative outcome data were recorded. Data were collected in a predesigned Data collection sheet. Follow up records done during discharge from the hospital, one week and four weeks postoperatively.*

**Results:** *Total 298, laparoscopic hysterectomy were performed during the period. Among them 96 % (n=286) for benign and 4 % (n=12) for malignant condition were included in the study population. Mean age of the patients was 45.4 ± 5.6 years, mean parity was 1.9 ± 0.64 and the mean body mass index was 27.48 ± 0.57. The most common benign disease was leiomyoma, 51.7 %. Among the study cases 21.8% (n=65) had history of at least one previous abdomino-pelvic surgery. Maximum size of uterus removed was 28 weeks and maximum patients, 48% (n=143) had uterine size of 10-14 weeks. The operating time was variable between 50 min to 180 min and in the course of time, the mean operating time dropped from 130 min to 60 min. The mean length of hospital stay was 2 days and the return to normal activities was within 2 weeks.*

*Major complications observed among 3.7 % of cases among them 2(0.67%) bladder injury, 2(0.67%) vesico-vaginal fistula (VVF), 3(1.0%) ureterovaginal fistula (UVF) and 4(1.3%) peroperative hemorrhage requiring blood transfusion. Among the 7 cases of urological complications, one patient with VVF and one patient with UVF needed relaparotomy. Ultimately all cases were managed without any residual problem. Conversion to laparotomy was 0.3 % (n=1) of case.*

**Conclusion:** *TLH offers the benefit of minimally invasive surgery to the patient and is a safe and acceptable alternative to standard hysterectomy for various gynaecological indications.*

**Keywords:** *Total laparoscopic hysterectomy, Per operative complications, Follow up.*

## Introduction:

Hysterectomy is the commonest major gynecological operation and a vast majority of the procedures are performed for benign conditions<sup>1,2</sup>. There are three

approaches to hysterectomy; abdominal, vaginal and laparoscopic hysterectomy. The indications for laparoscopic hysterectomy are similar to the generally accepted indications for abdominal hysterectomy.

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Nowadays, laparoscopy is being increasingly adopted in addition to the traditional open access. Data from the United States, in 2000, 74.5% of hysterectomies were abdominal, 22.2% vaginal and 3.3% laparoscopic; in contrast, in 2010, only 36.6% of hysterectomies were abdominal and 17.2% were vaginal while 43.5% of cases were laparoscopic<sup>3</sup>. There are many advantages of laparoscopic approach like avoidance of painful abdominal incision, shorter hospital stay, faster recovery and early return to activities. Reich in 1989-first performed laparoscopic hysterectomy<sup>4</sup>. In Bangladesh, first diagnostic laparoscopy was started in 1978 by Prof T. A. Chowdhury and in 1996, Prof. Laila Arzumand Banu & Dr. Sarder A. Nayeem performed the first LAVH<sup>5</sup> in Bangladesh. Since the introduction of laparoscopic hysterectomy, several modifications have been described. These are laparoscopy assisted vaginal hysterectomy (LAVH), laparoscopy assisted supracervical hysterectomy (LSCH) and total laparoscopic hysterectomy (TLH)<sup>6,7</sup>. In TLH, the laparoscopic dissection continues until the uterus lies free of all attachments in the peritoneal cavity, the uterus is removed through the vagina or through one of the ports with the help of morcellation if necessary. After removal, vagina is closed by intracorporeal sutures laparoscopically<sup>8</sup>. Laparoscopic hysterectomy has a longer learning curve during which the risk of complications is relatively higher than abdominal hysterectomy<sup>9</sup>. Later gynecologic surgeons have made many efforts to improve the technique thereby shortening the learning curve and improve outcomes, reducing iatrogenic urinary-tract injuries, intra operative blood loss, hospitalization time, and recovery time<sup>10</sup>. Now with the improvement of surgical skills, it has been considered as a day care surgery<sup>11</sup>. The aim of this study was to explore the surgical outcomes of total laparoscopic hysterectomy.

### Materials and methods

This was a descriptive type of prospective study, done from January, 2012 to December, 2018. Total 298 cases of total laparoscopic hysterectomy were performed in Shaheed Suhrawardy Medical College & Hospital. All cases suitable for laparoscopic hysterectomy were included. Patients with the contraindications for laparoscopic hysterectomy and those refused to have laparoscopic surgery were excluded from the study. Demographic data, clinical criteria of all patients together with intraoperative and postoperative outcome data were recorded during preoperative, post operative and follow up period.

### Surgical Technique

After counseling the patient, informed consent was obtained. Bowel preparation was given, the day before surgery in outdoor basis and kept nil per oral for a minimum of 6 hours. Patients were admitted on the day of operation. All patients received preoperative intravenous prophylactic antibiotics.

The patient under general anesthesia in the modified semi-lithotomy position, and deep Trendelenburg position with a bolster under the buttocks the operation was started. This position offers elevation of the pelvis and results in drop of the intestines cephalad. Bladder catheterization was done. The surgeon always stand by the left side of the patient.

Four laparoscopic ports were used according to size of the uterus. Usually the primary trocar (10 mm) was placed supraumbilically mostly by blunt techniques and sometimes by open method. After insufflation with carbon dioxide, a 10-mm telescope was introduced, and entry site was inspected for any injury. Then three secondary 5 mm ports were introduced, two on left and one on right side or suprapubic region. Palmer's point entry was done in patients with suspected adhesions with multiple previous surgeries.

Harmony scalpel, bipolar and monopolar diathermy were used as energy source. The pelvis and abdomen were inspected for every- adhesions, endometriotic spots, size of uterus, tubal, and ovarian pathology. A 5-mm myoma screw was inserted into the uterine fundus and uterus retracted cephalad, and to the left. Since 2014, a vaginal manipulator was used for vaginal manipulation. The right round ligament, ovarian ligament and the fallopian tube were coagulated and cut by Harmonic scalpel. The anterior leaf of broad ligament was opened and an anterior "U" incision taken through the uterovesical fold. The urinary bladder was dissected out over the cervix by sharp and blunt dissection. Right sided uterine artery was skeletonized and first coagulated by bipolar then cut by harmonic. With continuous traction on uterus the posterior peritoneum and parametrial tissue on the lateral aspect of cervix was coagulated and cut by harmonic. The dissection was always kept above the level of the uterosacral ligament. Then same procedure done on the left side. At this moment a vaginal colpo-bulger was used to clearly delineate the cervico-vaginal junction. A circular incision was given thereby cutting the Mckenrods and uterosacral ligament and opening of vault. For patients with removal of ovaries, the infundibulopelvic ligament was cauterized by bipolar forcef and cut by Harmonic. In all cases bilateral salpingectomy was done.

Specimen retrieved either by vaginal/laparoscopic morcellation depending on the size of the uterus. Vault was closed laparoscopically with vicryl no. 2-0 intra-corporeal suture. Adequate hemostasis was achieved.

**Data Analysis**

Statistical analysis was performed using SPSS for windows, version v 20.0.

**Result:**

Since 2012, a total 298, laparoscopic hysterectomy were performed. Among them 96 % (n=286) for benign cases and 4% (n=12) for malignant cases. For benign cases, all were total laparoscopic hysterectomy.

Mean age of the patients was 45.4 ± 5.6 years. Regarding parity, 4.5% were nulliparous while the mean number of children were 1.9 ± 0.64 in multiparous group. The mean body mass index was 27.48 ± 0.57.

Indications for benign diseases were leiomyoma 51.7%, adenomyosis 15.7%, endometriosis 9.5%, abnormal uterine bleeding (AUB) 7.4%, ovarian cyst 5.6%, pelvic inflammatory disease 4.5%, post-menopausal bleeding 2.8 % and endometrial hyperplasia 2.8 % ( Table-I). Among 12 malignant cases, 5 patients were early stage endometrial cancer and underwent TLH with bilateral salpingo-oophorectomy (BSO) with bilateral pelvic lymph nodes dissection(PLND), 5 patients with borderline ovarian malignancies encountered TLH with BSO with omentectomy with bilateral PLND and 2 patients with early stage carcinoma cervix had radical hysterectomy with PLND (Table-II).

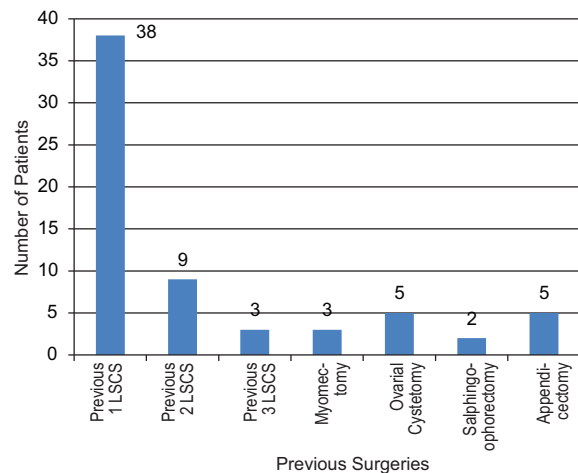
Regarding previous surgery 21.8% (n=65) had history of one previous abdomino-pelvic surgery. Of these, 58.4 % (n = 38) had previous one lower segment caesarean section (LSCS), 13.8 % (n = 9) had 2 LSCS, 4.6 % (n = 3) had three LSCS, 4.6 % (n=3) had myomectomy, 7.7 % (n = 5) had ovarian cystectomy, 3.0%(n=2) had unilateral salpingo-oophorectomy and 7.7%(n=5) had appendicectomy (Fig-1). Maximum size of uterus operated was 28 weeks and maximum patients, 48.0 % (n = 143) had uterine size of 10-14 weeks (Fig-2). Morcellation of the uterus needed in 8.1 % (n = 24) of cases. Vault was closed laparoscopically in 95.0 % (n=283) cases and vaginally in 5.0%(n=15) cases.

**Table-I**  
*Indications of Total Laparoscopic Hysterectomy (TLH) for benign cases (n=286)*

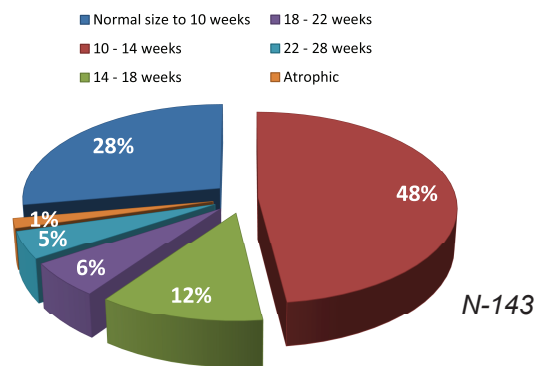
Indications	Number	%
Leiomyoma	148	(51.7)
Adenomyosis	45	(15.7)
Endometriosis	27	(9.5)
Abnormal Uterine Bleeding (AUB)	21	(7.4)
Ovarian cyst	16	(5.6)
Pelvic Inflammatory Disease	13	(4.5)
Post-menopausal bleeding	8	(2.8)
Endometrial hyperplasia	8	(2.8)

**Table-II**  
*Indications of total Laparoscopic Hysterectomy (TLH) for malignant cases (n=12)*

Indication	Number of patients
Endometrial carcinoma	5
Borderline ovarian malignancy	5
Early stage carcinoma cervix	2

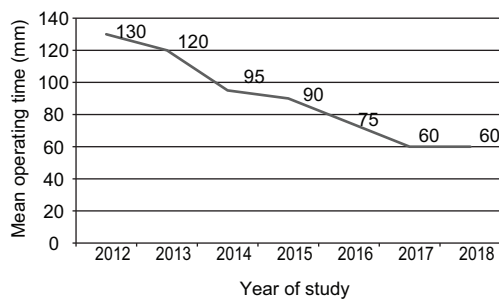


**Fig-1: Hysterectomy in patient with previous surgeries (n = 65)**

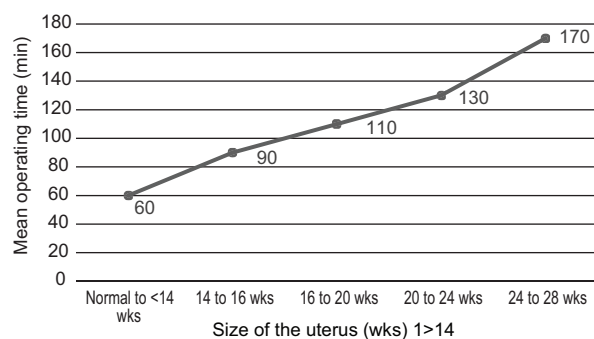


**Fig-2: Laparoscopic Hysterectomy and size of the uterus**

The operating time was between 60 min to 180 min for benign cases. In the course of time, the mean operating time dropped from 130 min to 60 mins (Fig-3). The mean operating time varied according to the size of the uterus from 60 min to 170 min (Fig-4). The mean operating time for malignant cases was 180 min. The mean length of hospital stay was 2 days and return to normal activities within 2 weeks.



**Fig-3:** Mean operating time (Size of uterus <14 weeks)



**Fig-4:** Mean operating time according to the size of uterus for the year 2017 & 2018

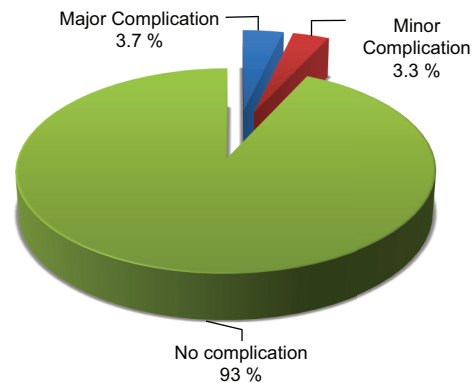
Concomitant procedures performed in 8.4 % (n = 25) of the patients, including cholecystectomy in 4.0%(n=12), appendectomy in 1.7%(n= 5), pelvic floor repair in 1.7%(n= 5) and hernia repair in 1.0%(n=3) patients (Table-III).

**Table- III**  
Concomitant procedure (n= 25) 8.4%

Concomitant surgery	Number of patients
Cholecystectomy	12 (4%)
Appendectomy	5 (1.7%)
Pelvic floor repair	5 (1.7%)
Repair of Hernia	3 (1%)

There was no complications in 93.0% ( n=277) of the procedure, minor complications were seen in

3.3 %(n=10)of cases and major complications were observed in 3.7%(n=11) of cases (Fig-5). Conversion to laparotomy was only in 0.3% (n=1) case.



**Fig – 5:** Complication rate

Minor complications were slight p/v bleeding, wound infection, UTI and vault granuloma (Table-IV) and managed conservatively.

**Table-IV**  
Minor Complications, 3.3% (n= 10)

Type of complication	Number of patients
Slight P/V bleeding	4
Wound infection	3
UTI	2
Vault granuloma	1

Patients having major complications, 0.67%(n=2) had bladder injury, 0.67%(n=2) had vesico-vaginal fistula(VVF), 1.0%(n=3) had ureterovaginal fistula (UVF) and 1.3%(n=4) had intra operative hemorrhage requiring blood transfusion. Among the 2 patients with bladder injury, one needed conversion to laparotomy due to extensive adhesion, then repair was done and in another patient repair was done laparoscopically. Among 2 cases of VVF, both were detected on 7<sup>th</sup> postoperative day, one completely healed by continuous catheterization for 21 days and another repaired after 3 months. Among 3 patient who developed UVF, 2 developed on 2<sup>nd</sup> postoperative day, they underwent cystoscopy and double j stents were kept in ureters for 4 weeks and then recovered completely. In 2 cases of UVF, later on detected and they had some developmental problems. Another patient who developed UVF on 7<sup>th</sup> POD, did not come for follow up timely and she needed laparotomy after one month and re-implantation of ureter done in bladder. These patients were recovered without any residual problem. Table-V

**Table-V**  
Major Complications, 3.7% (n= 11)

Complications	N (%)	Management	Course
Bladder Injury	2 (0.67)	Sutured intra-operatively - One needed conversion to laparotomy due to extensive adhesion. - Another repaired laparoscopically - Catheterize for 21 days	Uneventful Long-term F/U – no problem
VVF	2 (0.67)	Both were detected on 7th POD. - One completely healed by catheterization for 21 days. - Another repaired after 3 months.	In long term F/U- no residual symptoms
UVF	3 (1)	Two detected on 2 <sup>nd</sup> POD, completely healed by stenting in ureters for 4 weeks Another needed reimplantation of ureter in bladder after 1 month	In long term F/U.- no residual symptoms
Intra-operative haemorrhage requiring blood transfusion	4 (1.3)	Blood transfusion given	In long term F/U. no residual symptoms

**Table-VI**  
Outcome of Laparoscopic hysterectomy, review of the literature.

Author	Operative time (min)	Hospital stay (days)	Complications	Rate of conversion
Gudia & Samarria (2005) <sup>16</sup>	60 -180 min	2.7	Overall – 8.5% Bladder in – 0.83% Ureter in – 0.55% Bowel – 0.55% One patient – died	1.6%
O' Halan et al (2017) <sup>17</sup>	75 – 185 min	1.4 ± .9	Overall – 10% Bladder – 1.6% Ureter – 1.2% Bowel – 0.4%	0.6%
Puntambeker et al (2008) <sup>13</sup>	35 – 140 min	2.21±1.1	Overall – 5.7% Bladder – 1.4% Ureter – 0% Bowel – 0.7%	No conversion
Moon et al (2011) <sup>18</sup>	60 – 145 min	5.4±2.9	Overall – 1.4% Bladder – 0.48% Ureter – 0.19% Bowel – 0.19%	4.2%
Begum et al (2015) <sup>19</sup>	110 – 180 min	2.89±1.26	Overall – 2% Bladder – 2%	5%
Bettaiah et al (2016) <sup>28</sup>	20 – 120 min	2 ± 0	Overall – 4.8% Bladder – 0.23% Ureter – 0.47% Bowel – 0 %	0.9%
Present study	50 – 180	2 ± 0	Overall – 7% Bladder – 1.3% Ureter – 1% Bowel – 0 %	0.3%

**Discussion:**

Total laparoscopic hysterectomy is a substitute for abdominal hysterectomy but not for vaginal hysterectomy. A 2009 Cochrane review stated that vaginal hysterectomy should be performed in preference to abdominal procedures, and that laparoscopic procedure should be considered when the vaginal approach is not possible<sup>12</sup>.

Initially the laparoscopic hysterectomy was started by an expert laparoscopic surgeon who did not use manipulator<sup>13</sup>. After 2 years of our experience, we observed that the introduction of manipulator through vaginal route made the job easier. For new laparoscopic surgeons, we advise to use the manipulator and colpobulger of any form in addition to manipulation by myoma screw. It is not mandatory to use a vaginal manipulator. Nevertheless, Kiel surgeons<sup>14</sup>, Palanivelu<sup>8</sup> and Mishra<sup>15</sup> decided to use a manipulator for lot of advantages. Another problem is proper case selection. As an initial procedure larger size uterus should not be handled and with increasing experience gradually increased size of uterus and other complicated cases should be included.

This study observed 298 cases of total laparoscopic hysterectomy. The demographic data including age, parity and body mass index were similar to other studies<sup>16,17</sup>. The most common indication for TLH in our study was leiomyoma (51.7%) which is similar to the study done by Moon<sup>18</sup> and Begum<sup>19</sup>.

Most recent studies present TLH as safe, being performed for various indications including malignancy<sup>20-21</sup>. In this study, laparoscopic hysterectomy were started for malignant cases since 2017. Total 12 malignant cases were operated. Endometrial carcinoma were 5 in number. The use of laparoscopic surgery is advocated in international recommendations and guidelines for the treatment of early-stage endometrial cancer<sup>22,23</sup>. Patients operated for border line ovarian malignancy were 5 in number. A Cochrane analysis(2013) came to the conclusion that the existing evidence is insufficient for a scientific evaluation of the benefits and risks of laparoscopy compared to laparotomy to treat early-stage (FIGO stage I) ovarian cancer<sup>24</sup>. In contrast to uterine cancer, the question whether to use laparoscopy in ovarian cancer is still controversially discussed<sup>25</sup>.

About 21.8 % ( $n = 65$ ) had at least one previous abdominopelvic surgery, among them previous

caesarean section was the commonest. Initially, patient with history of one caesarean sections were included, gradually history of two and then three caesarean sections cases were included. In this study, no cases were excluded for multiple operations.

Concomitant procedures were performed in 8.4% cases, without the need for conversion to laparotomy. My co-author was a laparoscopic surgeon, he performed the surgical procedures.

Although the laparoscopic hysterectomy techniques were not identical in all series, our results are nevertheless comparable with those already published regarding operative time, hospital stay, major complications and rate of conversion ( Table 6)<sup>13,16-19,28</sup>.

Different studies observed that TLH is safe and can be performed for a larger size uterus<sup>27</sup>. In this study initially, TLH was done where uterus was less than 20 weeks size but later on bigger sizes were included and maximum sizes operated was 28 weeks size.

The operative time varies between 50 min to 180 min for benign cases. In the course of time, the mean operating time dropped from 130 min to 60 min for uterine size less than 14 weeks. The operating time seems to be dependent not only on the surgeon's experience but also on factors, such as the number of previous operations, size of the uterus and BMI of the patients.

It is well established that performing TLH involves a learning curve that, with improved skills and technique, will result in a safer procedure with improved outcomes<sup>29</sup>.

Laparoscopy is a safe route provided the surgeons are well trained, because then the rate of complications is not higher than that observed with laparotomy or by vaginal route<sup>28</sup>. In this study the rate of major complication was 3.7%. Complications are slightly higher than some studies<sup>20,21</sup> because of inclusion of complicated patients.

The mean length of hospital stay was 2 days and return to normal activities within 2 weeks.

Initially, laparoscopic hysterectomy was criticized due to its technical difficulty, increased operative time, and increased number of complications particularly ureteric, bladder, and bowel injuries. But subsequently, studies have shown that laparoscopic hysterectomy has been advantageous compared to

abdominal hysterectomy which include patient's satisfaction, decreased hospital stay and early return to normal life<sup>29</sup>. Also, laparoscopy allows for easier access to uterine vessels and ureter due to its high-definition imaging and vision magnification.

Personal experience and daily teaching, however, have shown that the changeover to laparoscopic hysterectomy is not only difficult, but also complicated. This can only be avoided by making the operations more structured and teaching it as early as possible<sup>14</sup>. In public hospitals, patient load is more, operation theatre staffs are not well trained, problems in equipment, lack of cooperation from other supporting staffs and in private hospitals involvement of the cost act as barriers of laparoscopic hysterectomy.

The limitations in our study were that all operations were not done in a single center and estimations of blood loss was not measured in a precise fashion.

#### Conclusion:

This study shown that TLH can be performed in most of the benign indications and some malignant cases. It gives the benefit of minimally invasive surgery to the patient like less post-operative infection, less blood loss, and early post-operative recovery with some minimum complications. So, TLH is a safe and acceptable alternative to standard hysterectomy in the hand of expert with improved surgical equipment and in comfortable setting.

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