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Total Laparoscopic Hysterectomy in Women with Previous Cesarean Section: An Observational Study

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Abstract **Original Research Article**

Background: Cesarean sections (CS) and hysterectomies are common gynecological surgeries, with CS rates increasing recently. Patients undergoing hysterectomy with a history of CS face higher risks, such as blood loss and urologic injuries, due to pelvic adhesions, which occur in 30%-90% of those with prior laparotomies. The choice of hysterectomy method is crucial, with options including abdominal, vaginal, laparoscopic, and robotic approaches. Laparoscopic hysterectomy, particularly total laparoscopic hysterectomy (TLH), offers benefits like reduced blood loss and faster recovery, though it remains challenging in patients with prior CS. ***Aim of the study:*** The study aims to evaluate how previous cesarean deliveries affect the outcomes of total laparoscopic hysterectomy (TLH). ***Methods:*** This cross-sectional observational study involved 110 patients undergoing total laparoscopic hysterectomy (TLH) at in the Department of Obstetrics and Gynecology, Bangabandhu Sheikh Mujib Medical University (BSMMU) and in two private Hospitals Dhaka, Bangladesh, from February 2019 to January 2023. Following ethical approval. Patients were divided into two groups: Group A (55 patients) had a previous cesarean section, and Group B (55 patients) did not. Inclusion criteria included women over 30 with a history of cesarean section, while exclusions were for those with laparotomy or genital malignancy. Data on surgery duration, complications, and recovery were analyzed using SPSS, with significance set at $p<0.05$. ***Result:*** The study compared two groups of patients undergoing total laparoscopic hysterectomy, focusing on demographic, clinical, and intraoperative variables. The majority were aged 40-49 years, with similar BMI and parity. Common indications included abnormal uterine bleeding (27.27% in Group A vs. 30.91% in Group B; p=0.325). Chronic pelvic pain was more frequent in Group A (25.45% vs 9.09%; p=0.266). Mean operative time was longer in Group A (73.72±16.47 vs. 59.26±10.57 minutes; p=0.192), while hospital stays and complication rates, including bladder injury (3.64% vs. 1.82%; p=0.694), were similar. ***Conclusion:*** This study shows that total laparoscopic hysterectomy (TLH) is a safe and effective option for women with a history of cesarean section (CS). Despite challenges like adhesions and longer operative times, TLH resulted in comparable outcomes for operative time, hospital stay, and complications, offering benefits such as reduced blood loss and faster recovery.

Keywords: Total Laparoscopic Hysterectomy and Previous Cesarean Section.

INTRODUCTION

Cesarean sections (CS) and hysterectomies are among the most commonly performed surgeries done in obstetrics and gynaecology [1]. With CS rates rising in recent decades, patients undergoing hysterectomy or other gynecologic surgeries face complications, particularly those with a history of CS [2]. Pelvic adhesions develop in one to two-thirds of women with previous CS, increasing the risk of injury to surrounding organs, such as the bladder, ureters, and bowel [3]. These adhesions complicate surgery by extending operative times and challenging dissection, particularly between the bladder and uterus [4]. Intra-abdominal adhesions in patients with prior laparotomies occur in 30%-90% of cases [5]. Rates of intra-peritoneal adhesion formation during subsequent CS range from 24% to 46%, escalating with the number of deliveries, from 43%-75% in the third CS to 83% in the fourth [6]. The choice of hysterectomy method in women with a history of CS is critical. Approaches include abdominal, vaginal, laparoscopic, and robotic hysterectomy, with abdominal

hysterectomy remaining the most common despite guidelines recommending vaginal hysterectomy for eligible cases [7, 8]. Laparoscopic hysterectomy offers distinct advantages, such as reduced blood loss, shorter hospital stays, and quicker recovery, making it the preferred choice for many cases [9]. Since the late 1980s, total laparoscopic hysterectomy (TLH) has evolved and is now commonly used for gynecological indications, including abnormal uterine bleeding, myomas, and adenomyosis [9]. With advances in instrumentation, reduced laparoscopy costs, and increased surgeon expertise, laparoscopic hysterectomy (LH) has begun to replace abdominal hysterectomy (AH) for various indications [10]. TLH offers a magnified view of pelvic anatomy, minimizing the risk of bleeding and organ damage, though it remains challenging in patients with prior CS due to adhesions [11,12]. Recent studies show that complication rates for TLH have improved to approximately 3% [13]. Studies are needed to understand the long-term outcomes of TLH in patients with prior CS. With the rising incidence of CS and its associated complexities, our study aims to evaluate how previous cesarean deliveries affect the outcomes of total laparoscopic hysterectomy (TLH).

METHODOLOGY & MATERIALS

This cross-sectional observational study was conducted on 110 patients who underwent total laparoscopic hysterectomy (TLH) in the Department of Obstetrics and Gynecology, Bangabandhu Sheikh Mujib Medical University (BSMMU) and two private Hospitals in Dhaka, Bangladesh, from February 2019 to January 2023, following ethical approval. The patients were categorized into two equal groups of 55 based on their history of cesarean section.

Group A (N=55): Total laparoscopic hysterectomy (TLH) with previous cesarean section.

Group B (N=55): Total laparoscopic hysterectomy (TLH) without previous cesarean section.

Inclusion Criteria:

- Women over 37 years old.
- History of previous cesarean section.

Exclusion Criteria:

- Women with a history of laparotomy for any reason other than cesarean section.
- Women with malignancy of genital organs.

Surgical Procedure:

The surgery begins with the patient under general anesthesia. Four small incisions for one 10 mm 30-degree telescope and three 5 mm for laparoscopic instruments were made in the abdomen. After visualizing the pelvic organs on a monitor, detaches the uterus from the surrounding tissues, including the ligaments, bladder, blood vessels, and the upper part of the vagina. The uterus is then removed through the vagina or, if too large, in pieces by vaginal scalpel morcellation. This method minimizes blood loss, reduces postoperative pain, and shortens recovery time compared to traditional open surgery. To minimize variability due to the surgeon's skill, only one surgeon with 11 years of experience in gynaecological laparoscopic surgery performed all the TLH procedures during the study period.

Data Collection:

Informed written consent was obtained from all participants, and data were collected using a structured proforma. The outcome variables included the duration of surgery (from port opening to closure), conversion to laparotomy, intraoperative complications (such as excessive bleeding, urinary tract injury, bowel injury), the need for blood transfusion, and the total days of postoperative hospital stay.

Data Analysis:

Data were recorded in Microsoft Excel and analyzed using IBM SPSS version 26.0. Continuous data were presented as mean and standard deviation, while categorical data were presented as frequency and percentage. T-tests and Chi-square tests were applied to continuous and categorical data, respectively. A p-value of less than 0.05 was considered statistically significant.

RESULT

A total of 110 patients participated in this study, divided into two groups: Group A and Group B, each consisting of 55 patients. The age distribution indicated that the majority of patients in both groups were aged 40-49 years, with 49.09% in Group A and 52.73% in Group B. The mean age was slightly lower in Group A at 49.44±5.81 years compared to 51.26±6.05 years in Group B. The Body Mass Index (BMI) was similar between the two groups, with Group A averaging 24.21±1.38 kg/m² and Group B averaging 24.63±1.47 kg/m², showing no significant difference (p=0.308). Additionally, parity was comparable, with a mean of 2.33±0.84 in Group A and 2.51±1.06 in Group B, yielding a p-value of 0.795, indicating no significant difference between the groups (Table 1). The clinical indications for total laparoscopic hysterectomy were also assessed in the study. The most common indication in Group A was abnormal uterine bleeding, affecting 27.27% of patients, while Group B reported a similar percentage at 30.91%, with a p-value of 0.325, indicating no significant difference. Chronic pelvic pain was reported in 25.45% of Group A patients compared to only 9.09% in Group B, although this difference was not statistically significant (p=0.266). Adenomyosis was present in 11(20.00%) cases of Group A and 9(16.36%) cases of Group B (p=0.339), while fibroids were reported in 16.36% of Group A and 21.82% of Group B, yielding a p-value of 0.137. Endometriosis was noted in 7.27% of Group A and 9.09% of Group B (p=0.471), and postmenopausal bleeding occurred in 3.64% of Group A and 5.45% of Group B (p=0.348). There were no cases

of cervical precancer in Group A, while Group B had 3.64% of patients affected (p=0.536). Endometrial hyperplasia and pyometra were noted in one patient each in Group B, with respective p-values of 0.289 and 0.172, indicating no significant differences between the groups (Table 2). The study also assessed intraoperative outcomes and complication rates. The mean operation time was longer in Group A at 73.72±16.47 minutes compared to 59.26±10.57 minutes in Group B, though this difference was not statistically significant (p=0.192). The length of hospital stays averaged 2.22±0.41 days in Group A and 1.45±0.93 days in Group B, with no significant difference observed (p=0.638). Complication rates included urinary bladder injury, which occurred in 3.64% of Group A and 1.82% of Group B (p=0.694). The ureteral injury was not reported in any patient in any group, and blood transfusion rates in group A were 18.18% and group B was 10.9%, with p- the value of 0.747 (Table 3).

Table 1: Demographic profile of patients undergoing total laparoscopic hysterectomy (N=110)

Variables	Group A (n=55)		Group B (n=55)		P-value
	n	%	n	%	
	Mean±SD				
Age (years)					
37-39	4	7.27	3	5.45	0.393
40-49	27	49.09	29	52.73	
50-59	20	36.36	16	29.09	
≥60	4	7.27	7	12.73	
	49.44±5.81		51.26±6.05		
BMI (kg/m^2)	24.21±1.38		24.63±1.47		0.308
Parity (times)	2.33±0.84		2.51±1.06		0.795

Table 2: Clinical indications for total laparoscopic hysterectomy in patients (N=110)

Indications	Group A (n=55)		Group B (n=55)		P-value
	n	%	n	%	
Abnormal uterine bleeding	15	27.27	17	30.91	0.325
Chronic pelvic pain	14	25.45	5	9.09	0.266
Adenomyosis	11	20.00	9	16.36	0.339
Fibroid	9	16.36	12	21.82	0.137
Endometriosis	4	7.27	5	9.09	0.471
Postmenopausal bleeding	2	3.64	3	5.45	0.348
Cervical precancer 2/3	0	0.00	2	3.64	0.536
Endometrial hyperplasia	0	0.00	1	1.82	0.289
Pyometra	0	0.00	1	1.82	0.172

Table 3: Intraoperative outcomes and complication rates in total laparoscopic hysterectomy (N=110)

Variables	Group A (n=55)		Group B (n=55)		P-value
	n	%	n	%	
	Mean±SD				
Operation time (min)	73.72±16.47		59.26±10.57		0.192
Length of hospital stay (days)	2.22±0.41		1.45±0.93		0.638
Urinary bladder injury	2	3.64	1	1.82	0.694
Ureteral injury	0	0	0	0	
Blood transfusion	10	18.18	6	10.9	0.747

*No conversion to laparotomy, major vessel injury or mortality.

DISCUSSION

In this study analyzing total laparoscopic hysterectomy (TLH) in women, data were collected from 110 patients divided equally into two groups: those with a history of cesarean section (CS group, n=55) and those without (non-CS group, n=55). The mean age between the two groups was comparable, with the CS group at 49.44±5.81 years and the non-CS group at 51.26±6.05 years (p=0.393). This finding is similar to Lindquist *et al.*, (2017), who reported an average age of 40.2 years for patients without a prior cesarean and 40.0 years for those with their first cesarean delivery [14]. The mean BMI and parity were also similar across groups, with the CS group showing an average BMI of 24.21±1.38 kg/m² and the non-CS group at 24.63±1.47 kg/m² (p=0.308). The average parity was 2.33±0.84 for the CS group and 2.51±1.06 for the non-CS group, with no statistically significant difference (p=0.795). These results align with those reported by Lim *et al.*, (2016), who found a mean BMI of 23.8±3.4 kg/m² and a parity of 2.3±1.1 in the non-CS group, and a BMI of 24.0±3.52 kg/m² with a

parity of 2.4±1.2 in the prior CS group (p=0.500) [15]. The primary clinical indication for TLH in both groups was abnormal uterine bleeding, observed in 27.27% of the CS group and 30.91% of the non-CS group. These findings are consistent with Neupane *et al.*, (2020), who reported abnormal uterine bleeding in 24.61% of the CS group and 30.76% of the comparator group [16]. Other indications, such as chronic pelvic pain, ovarian cysts, fibroids, endometriosis, postmenopausal bleeding, cervical precancer, endometrial hyperplasia, and pyometra, did not show significant differences, with p-values exceeding 0.1. This result is in line with findings from Neupane *et al.*, (2020) [16]. Intraoperative outcomes, including operative time and hospital stay, were also similar between the groups. The mean operative time was 73.72±16.47 minutes for the CS group and 59.26±10.57 minutes for the non-CS group. This was comparable to previous studies that reported a mean operative time of 80 minutes (range: 30–240) [17] and shorter than others reporting 113±42.6 minutes [18]. The average hospital stay was 2.22±0.41 days for the CS group and 1.45±0.93 days for the non-CS group, consistent with other research showing no significant difference in hospital stay between groups [19-21]. Rattanakanokchai *et al.*, (2019) conducted a meta-analysis involving 54,815 women undergoing hysterectomy across 26 studies and reported a higher incidence of complications, such as urinary tract injuries, in patients with prior cesarean sections [22]. In a study of 509 laparoscopic hysterectomies, 1% of cases had bladder injuries, with previous cesareans doubling the risk (OR 2.04) [23]. However, some research has shown fewer complications in TLH. For instance, Sinha *et al.*, (2010) studied 261 women with at least one prior cesarean section and found only two cases of urinary bladder injury, both detected and managed intraoperatively, with no ureteric injuries [17]. Similarly, Koroglu *et al.*, (2018) reviewed 505 TLH cases and identified one bladder injury in each group and only one ureteric injury in the CS group [19]. Wang *et al.*, (2010) reported bladder injuries in 1.2% (5/433) of non-CS cases and 5% (7/141) of CS cases, with ureteric injuries occurring in 1.4% of CS cases [24]. The causes included thermal damage from bipolar diathermy and ureter transection during uterine manipulator insertion [24]. Our study shows that while there are differences in the mean operation time and length of hospital stay between Group A and Group B, these differences are not statistically significant ($p = 0.192$ and $p = 0.638$, respectively). Similarly, the incidence of urinary bladder injury (3.64% in Group A vs. 1.82% in Group B), the absence of ureteral injury in both groups, and the need for blood transfusion (18.18% in Group A vs. 10.9% in Group B) also showed no significant differences ($p > 0.05$). These findings suggest comparable safety and efficacy profiles between the two groups for the evaluated variables.

Limitations of the study: This study has limitations, including its observational and cross-sectional design, which limits causal inference between prior cesarean sections and TLH outcomes. The findings are based on short-term postoperative data, necessitating longer follow-up to assess the long-term effects of TLH in patients with a history of cesarean section.

CONCLUSION AND RECOMMENDATIONS

Our study demonstrates that total laparoscopic hysterectomy (TLH) is a viable and effective surgical option for women with a history of cesarean section (CS). Despite the complexities associated with prior CS, such as increased operative time and risk of adhesions, TLH showed comparable outcomes in terms of operative time, hospital stay duration, and complication rates between patients with and without previous CS. The incidence of intraoperative complications, including urinary bladder injuries and blood transfusion requirements, did not significantly differ between the groups. These findings support the feasibility and safety of TLH in patients with a history of CS, offering benefits like reduced blood loss and faster recovery.

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