

Research Article

Clinical Profile and Outcome of Patients Undergoing Total Laparoscopic Hysterectomy: A Prospective Study from a Secondary Care Hospital in Karachi

Sana Ashfaq^{1,*}, Mubushra Samina², Maria Jabeen³, Summaiya Manzoor⁴, Humaira Tahir⁵, Saira Bhatti⁶

¹Department of Obstetrics and Gynecology, Koohi Goth, Karachi, Pakistan.

²Department of Obstetrics and Gynecology, Karachi Institute of Medical Science, Karachi, Pakistan.

³Department of Obstetrics and Gynecology, Liaquat National Hospital, Karachi, Pakistan.

⁴Department of Obstetrics and Gynecology, Usman Memorial Hospital, Karachi, Pakistan.

⁵Department of Obstetrics and Gynecology, Sindh Employees' Social Security Institution (SESSI), Karachi, Pakistan.

⁶Department of Obstetrics and Gynecology, Civil Hospital, Karachi, Pakistan.

Abstract: Background: The American Association of Gynecologic Laparoscopists recommends that numerous hysterectomies for non-cancerous conditions ought to be performed with laparoscopy. The patient's obstetric history significantly influences the outcomes. Information on the clinical profiles of patients receiving total laparoscopic hysterectomy (TLH) is rarely documented from Pakistan.

Objective: To present our experience of clinical profile of patients undergoing TLH in our secondary care institution at Koohi Goth hospital in Karachi.

Materials and Methods: The present prospective observational study was performed in Obstetrics & Gynecology Department in Koohi Goth Hospital from 1st August 2018 to 31st December 2023 after obtaining the institutional formal ethical approval (Ref: KGH/HR/134). All of the procedures were performed by single gynecologist having more than 5 years of experiences in performing laparoscopic hysterectomy. Information regarding patients' demographics, clinical characteristics, procedure information and outcomes were documented.

Result: Total 100 cases were analyzed with mean age of 45 ± 7.8 years. Average BMI was 25.3 ± 8.1 Kg/m². Almost one-third of patients (32%) had history of previous surgery. The commonest surgical indication was uterine fibroids (54%), and while the least of post-menopausal bleeding. Average surgery duration was 124.26 ± 44.74 minutes. Few patients developed complications (7%) including ureter injury (2%), wound infection (2%), vault infection (2%), and bladder injury (2%). All of complications were seen in either obese females or patients with history of previous surgery.

Conclusion: The present study found that minimally invasive TLH is a safe approach which is easily accessible and harmless for patients with minimal complication rate. Patients with previous history of surgery and elevated body mass index should be given additional care and attention to avoid complexity.

Keywords: Uterine bleeding, Fibroids, Post-menopausal bleeding, Laparoscopy, Hysterectomy, Ovarian function.

INTRODUCTION

A hysterectomy is a commonly conducted gynecological procedure aimed at fully or partially removal of uterus due to several medical issues, such as fibroids, pelvic organ prolapse, endometriosis, and cervical or ovarian cancer [1, 2]. Hysterectomy may be conducted as a treatment for non-cancerous or cancerous conditions. Around 80%-90% hysterectomies are performed either an inpatient or outpatient basis [3]. Hysterectomy with surgical resection of the ovaries triggers menopause, whereas taking away uterus itself is leads to a reduction in ovarian function [4]. In numerous regions globally, hysterectomy ranks as the second most prevailing non-obstetric procedure following surgical birth [5].

A total hysterectomy involves extraction of uterus and cervix, which may be done via vaginal, abdominal, or laparoscopic surgical methods. Various factors affect the choice of surgical approach to perform hysterectomy for the benign cases, which influences by surgeon's expertise and patient's health status, including uterine size, parity, existence of extrauterine pelvic disorders, and past history of pelvic surgery [6, 7].

In comparison to "conventional" surgical methods such as open laparotomy, the smaller quantity and dimensions of laparoscopic trocars were associated with better cosmetic outcomes and pain management while ensuring equivalent surgical safety [8, 9]. A laparoscopic technique is viable for almost all benign and the majority of malignant gynecological conditions, and it is favored over laparotomy due to its lower pain, blood loss, post-operative complications, length of hospital stay, and recovery

* Address correspondence to this author at the Department of Obstetrics and Gynecology, Koohi Goth, Karachi, Pakistan.
Email: sanaashfaq96@gmail.com

duration [10, 11]. Currently, minimally invasive surgery is the standard treatment for various gynecological conditions and is the most commonly executed gynecological surgical technique. The American Association of Gynecologic Laparoscopists recommends that numerous hysterectomies for non-cancerous conditions be performed laparoscopically, as growing evidence indicates that laparoscopic hysterectomy leads to reduced perioperative morbidity in comparison to abdominal hysterectomy [12].

As total laparoscopic hysterectomy (TLH) has become more commonly used globally, the range of indications has grown [13]. In addition, multiple factors must be taken into account prior to organizing a laparoscopic hysterectomy. A key factor is the size and weight of the uterus. The patient's obstetric history significantly influences the outcomes. Obesity may also affect TLH results [14]. Information about the clinical profiles of patients undergoing TLH is rarely documented from Pakistan. The data may differ from one country to another due to various factors, including the surgeon's experience and expertise, clinical indications, and other patient characteristics. Therefore, in this study, we intend to share our experience regarding the clinical profiles of patients undergoing TLH at our secondary care facility in Karachi.

MATERIALS AND METHODS

This prospective observational study was performed in Obstetric & Gynecology Department at Koohi Goth Hospital from 1st August 2018 to 31st December 2023. The study was performed with the institutional formal ethical approval (Ref: KGH/HR/134). Participation of patients was made with their written informed consent. Patients of age 18 years and above with a confirmed diagnosis of uterine fibroids, abnormal uterine bleeding, and postmenopausal bleeding showing indications for TLH were included. Patients with uterine cancers, genital prolapse and adnexal issues with potential malignancy were excluded. Malignant disease was excluded through standard lab tests, ultrasound, and biopsy. A sample size of 76 patients was came out via taking frequency of wound infection in 10.81% patients from previous study [15] at a 95% confidence interval and 7% margin of error [15]. Sample size calculation was performed using online available calculator Open-Epi.

All procedures were conducted by a single gynecologist with over 5 years of experience in performing hysterectomies. Prior to surgery, patients had standard evaluations, which included blood tests, gynecological check-ups, gynecological ultrasound imaging and endometrial biopsy. Patients were administered antibiotic prophylaxis (with cephalosporin provided after anesthetic induction). The process was carried out following the induction of general anesthesia. All patients underwent routine catheterization at the start of the procedure. The patient was positioned trendelenburg while under general anesthesia with endotracheal intubation. The vagina and abdomen were cleaned with disinfectant. A direct trocar insertion method was applied at the inferior margin of umbilicus or above umbilicus at Lee

Haung point depending upon the size of uterus. A 10mm trocar was inserted at this site, which served as the primary or telescope port. In case of midline incisions Palmer's point was used. For handling issue of arising periumbilical adhesions, a comparable trocar was initially inserted in the left upper quadrant (Palmer's point) following gastric deflation using orogastric tube suction. The two secondary ipsilateral and one contralateral port inserted under direct vision to avoid injury to inferior epigastric artery and other visceral injury. The method for total laparoscopic hysterectomy with bilateral Salpingo-oophorectomy (TLH/BSO) involves performing all surgical steps, including the vaginal closure, entirely through laparoscopic ports. When the uterus was excessively large to be extracted whole through the vagina, vaginal morcellation was also performed. Morcellation was performed using a morcellator to cut the uterus into smaller pieces so that it could be removed more easily through tiny laparoscopic incisions. The catheter was taken out the next day, once the patient was able to mobilize and after routine care patient discharged home in 24 hours.

Patient features including sociodemographic, clinical history, and procedure related details and complications were documented in the pre-designed study proforma. The time taken for the procedure was measured from the start to the finish of the surgery.

STATISTICAL ANALYSIS

Statistical package SPSS version 27 was used to perform statistical analysis. Frequencies were computed for categorical variables while numerical variables were presented as mean $\pm$ standard deviation.

RESULT

Total 100 patients were studied and analyzed. Mean age of patients was 45 ± 7.8 years. Average BMI was 25.3 ± 8.1 Kg/m². More than half of patients had no comorbidity and no history of previous surgery. Out of 32 patients with history of surgery, commonest procedure was 22 cesarean section, 4 laparotomy, 4 bilateral tube ligation and 2 appendectomy. Table 1 displays summary of patients' sociodemographic and clinical features.

Table 1. Summary of Patients' Sociodemographic and Clinical Features (Age, BMI, Parity, Comorbidity, History of previous Surgery).

Patients' Features	Frequency	Percentage
Age Groups		
18-30 years	6	6
31-39 years	0	0
41-49 years	84	84
>50 years	10	10
Parity		
Nulliparous	15	15

Continue

Continue

Primiparous	30	30
Multiparous	65	65
Body Mass Index		
Underweight (<18.5 kg/m ²)	5	5
Normal weight (18.5-22.9 kg/m ²)	22	22
Overweight (23-24.9 kg/m ²)	30	30
Obese (≥25 kg/m ²)	36	36
History of Previous Surgery		
Yes	32	32
No	68	68

The commonest surgery indication was uterine fibroids (54%) followed by abnormal uterine bleeding (27%), CP child (6%), adenomyosis (5%), endometrial hyperplasia (3%), HMB (3%) and PMB (2%). More than half of the patients underwent TLH (55%) whereas TLH approach was combined with other procedures (45%). Majority of the procedures required surgery time ≤120 minutes. There was no need of additional procedures (Table 2).

Table 2. Summary of Procedure Related Details.

Procedure Details	Frequency	Percentage
Surgery Indication		
Uterine fibroids	54	54
Abnormal uterine bleeding	27	27
CP child	6	6
Adenomyosis	5	5
Endometrial hyperplasia	3	3
HMB	3	3
PMB	2	2
Type of Surgery		
TLH	55	55
TLH + BSO	42	42
TLH + RSO	2	2
TLH + LSO	1	1
Surgery Duration		
≤120 minutes	85	85
>120 minutes	15	15
Need of Additional Procedures		
Yes	0	0
No	100	100

HMB: Heavy menstrual bleeding, PMB: Postmenopausal bleeding, TLH: Total laparoscopic hysterectomy, TLH + BSO: Total laparoscopic hysterectomy with bilateral Salpingo-Oophorectomy, TLH + RSO: Total laparoscopic hysterectomy with right Salpingo-Oophorectomy, TLH + LSO: Total laparoscopic hysterectomy with left Salpingo-Oophorectomy.

Few patients experienced complication (7%). Complications of ureter injury (2%), wound infection (2%), vault infection (2%)

and bladder injury were observed (Table 3).

Table 3. Summary of Procedures Complications and Outcomes.

Complications	Frequency	Percentage
Ureter injury	2	2
Wound infection	2	2
Vault infection	2	2
Bladder injury	1	1

DISCUSSION

The current study presents a case series of 100 patients who underwent TLH. Average age of our patients was 45 years. Available literature also reports LH is more commonly performed in middle age females [16-20]. Median age of 45 years is also reported from another Pakistani study [16]. Mean age of 49.6±6.5 was reported in a study of Mereu L *et al.* [18]. Isono W *et al.* [18] found a mean age of 47.5 ± 6.1 years in their retrospective case series. The age range was 40-45 years in a case series on TLH analyzing 5 cases for unusual difficult cases [20].

Consideration of BMI is one of the important factor when planning hysterectomy as many clinicians think obesity is a concern for safety and feasibility of the surgical approaches [21]. In our study average BMI was 25.3 ± 8.1 Kg/m² whereas 36% patients were obese. In a study of Mereu L, *et al.* average BMI was 25.8±5.6 [17]. Most of the patients planned to undergo TLH were found to have had elevated BMI levels (≥25 kg/m²) (62%) in Subburaj L, *et al.* [17]. Some of researchers did not measure BMI in their study when studying surgical hysterectomy [16, 17]. Obesity itself also gives rise to uterine pathologies that increase the need for hysterectomy [22]. Thus, consideration of body mass index is important when planning hysterectomies.

A key element for peri-operative decision making is previous surgery. The procedure could be converted to laparotomy because of adhesions caused from prior abdominal procedures [23, 24]. The present study demonstrated that. On the other hand, another Pakistani study reported that history of previous abdominal pelvic surgery in one-third patients [16]. In an investigation of Subburaj L, *et al.* almost half of the patients (52%) underwent abdominal surgeries including c-section, myomectomy, tubectomy and multiple other abdominal surgeries [17]. In a cohort of Mereu L, *et al.* [18], 19% had history of laparoscopic procedures and 41% had history of laparotomy.

The most frequent TLH indication in current study was uterine fibroid (55%) followed by AUB (27%), CP child (6%), adenomyosis (4%), HMB (3%) and PMB (2%). Fibroid is also reported as commonest indication of hysterectomy among other studies [16, 17]. However, there are some studies did find fibroid as indication of the procedure [18]. Seo ES, *et al.* [23] found endometrial polyp as rare indication of TLH in their report (5.7%). Endometrial hyperplasia is also reported as hysterectomy indication in literature which we did not find in our data pool [18, 19,

23]. Adenomyosis was rare indication in our study, in contrast to this, it was seen in around quarter (23.8%) of patients in a study of Isono W, *et al.* [19].

The present study demonstrated average operative time of 124.26±44.74 which is comparable with other studies [18, 25]. There are some studies which are reporting higher or shorter duration of the procedures [16, 17]. Dojki and her co-worker reported a higher median operative time of 175 minutes [16]. Subburaj L, *et al.* [17] reported that few of their cases took longer than 120 minutes for procedure completion (5%). The variation in operative time could be due to different surgical approaches, surgeons' experience and their patient complications.

The study found a small proportion of patients (7%) experienced post-operative complications. Ureter injury (2%), surgical site infection (2%), vault infection (2%) and bladder injury (1%) were seen in our analysis. Our findings are consistent with existing literature which also report complication incidence was rare following hysterectomy. Overall complication rate in literature varies from 4.4%-10%. In existing literature variation has been for different types of complications including ureter injury (0.3%-0.5%) [19, 25], vault injury (1%-2.7), bladder injury (0.5%-2%) [16, 17] and wound infection (1.8%-2.4%) [16, 19].

CONCLUSION

The present study found that minimally invasive TLH is a safe approach which is easily accessible and harmless for patients with minimal complication rate. Patients with previous history of surgery and elevated body mass index should be given additional care and attention to avoid complexity.

ABBREVIATIONS

CP: Cerebral Palsy.

HMB: Heavy Menstrual Bleeding.

PMB: Postmenopausal Bleeding.

TLH: Total Laparoscopic Hysterectomy.

TLH/BSO: Total Laparoscopic Hysterectomy with Bilateral Salpingo-Oophorectomy.

TLH + RSO: Total laparoscopic Hysterectomy (TLH) with a Right Salpingo-oophorectomy.

TLH + LSO: Total laparoscopic Hysterectomy with Left Salpingo-oophorectomy.

AUTHORS' CONTRIBUTION

Sana Ashfaq: Conceptualization, Study Design, Writing Draft, Final approval, final proof to be published.

Mubushra Samina: Study Design, Critical review and revision the manuscript.

Maria Jabeen and Summaiya Manzoor: Writing Draft.

Humaira Tahir and Saira Bhatti: Methodology, Data analysis and interpretation.

ACKNOWLEDGEMENTS

Declared none.

ETHICAL DECLARATIONS

Data Availability Statement

Data are available upon reasonable request. The data used to support the findings of this study are available from the corresponding author upon request.

Ethical Approval

The study was performed with the institutional formal ethical approval (Ref: KGH/HR/134).

Consent to Participate

Informed consented.

Consent for Publication

All of the authors give consent for publication of this manuscript.

Conflict of Interest

Declared none.

Competing Interest/Funding

Declared none.

Use of AI-Assisted Technologies

The authors declare that no generative artificial intelligence (AI) or AI-assisted technologies were utilized in the writing of this manuscript, in the creation of images/graphics/tables/captions, or in any other aspect of its preparation.

REFERENCES

- [1] InformedHealth.org. In brief: Hysterectomy (surgical removal of the womb). Cologne, Germany: Institute for Quality and Efficiency in Health Care (IQWiG) 2006-2021; Bookshelf ID: NBK525761. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK525761/>
- [2] Edler K, Tamussino K, Fülöp G, Reinstadler E, Neunteufel W, Reif P, *et al.* Rates and routes of hysterectomy for benign indications in Austria 2002-2014. *Geburtshilfe Frauenheilkd* 2017; 77(5): 482-6.
- [3] Cappuccio S, Li Y, Song C, Liu E, Glaser G, Casarin J, *et al.* The shift from inpatient to outpatient hysterectomy for endometrial cancer in the United States: Trends, enabling factors, cost, and safety. *Int J Gynecol Cancer* 2021; 31(5): 686-93.

- [4] Desai S, Singh RJ, Govil D, Nambiar D, Shukla A, Sinha HH, *et al.* Hysterectomy and women's health in India: Evidence from a nationally representative, cross-sectional survey of older women. *Womens Midlife Health* 2023; 9(1): 1. doi: 10.1186/s40695-022-00084-9.
- [5] Kumari P, Kundu J. Prevalence, socio-demographic determinants, and self-reported reasons for hysterectomy and choice of hospitalization in India. *BMC Womens Health* 2022; 22(1): 514. doi: 10.1186/s12905-022-02072-7.
- [6] Augusto CF, Caraça DB, Podgaec S. Epidemiological analysis of hysterectomies performed at the public health system in the largest Brazilian city. *Rev Assoc Med Bras* (1992) 2021; 67(7): 937-41. doi: 10.1590/1806-9282.20210093.
- [7] Alkatout I. Laparoscopic hysterectomy: Total or subtotal?-Functional and didactic aspects. *Minim Invasive Ther Allied Technol* 2022; 31(1): 13-23.
- [8] Vitale SG, Gasbarro N, Lagana AS, Sapia F, Rapisarda AMC, *et al.* Safe introduction of ancillary trocars in gynecological surgery: the "yellow island" anatomical landmark. *Ann Ital Chir* 2016; 87: 608-11.
- [9] Laganà AS, Vitale SG, Palmara V, Ban Frangež H, Triolo O. Transvaginal specimen removal in minimally invasive surgery: Feasibility and possible complications during the incision of the posterior vaginal wall. *World J Urol* 2017; 35(7): 1155-6.
- [10] Levy L, Tsaltas J. Recent advances in benign gynecological laparoscopic surgery. *Fac Rev* 2021; 10: 60. doi: 10.12703/r/10-60.
- [11] Angeles MA, Martínez-Gómez C, Migliorelli F, Voglimacci M, Figurelli J, Motton S, *et al.* Novel surgical strategies in the treatment of gynecological malignancies. *Curr Treat Options Oncol* 2018; 19(12): 73. doi: 10.1007/s11864-018-0582-5.
- [12] Giannini A, D'Oria O, Bogani G, Di Donato V, Vizza E, Chiantera V, *et al.* Hysterectomy: Let's step up the ladder of evidence to look over the horizon. *J Clin Med* 2022; 11(23): 6940. doi: 10.3390/jcm11236940.
- [13] Driessen SR, Baden NL, van Zwet EW, Twijnstra AR, Jansen FW. Trends in the implementation of advanced minimally invasive gynecologic surgical procedures in the Netherlands. *J Minim Invasive Gynecol* 2015; 22(4): 642-7.
- [14] Isoyama K, Matsuura M, Hayasaka M, Nagao S, Nishimura Y, Yoshioka T, *et al.* Nationwide trends in and regional factors associated with minimally invasive hysterectomy for benign indications in Japan. *Eur J Obstet Gynecol Reprod Biol* 2023; 289: 129-35.
- [15] Shrestha S, Joshi R, Tamrakar R, Sharma B. Study on clinical profile of patients undergoing abdominal hysterectomy and their clinico-pathological correlation. *J Chitwan Med Coll* 2019; 9(2): 65-71.
- [16] Dojki SS, Bano A. Outcome of total laparoscopic hysterectomy. *J Coll Physicians Surg Pakistan* 2018; 28(6): 427-30.
- [17] Subburaj L, Saravanan S, Kumar R. Clinical profile of patients undergoing laparoscopic hysterectomy. *J South Asian Fed Obstet Gynaecol* 2020; 12(5): 277-80.
- [18] Mereu L, Carlin R, Pellegrini A, Guasina F, Berlanda V, Tateo S. Total laparoscopic hysterectomy for benign disease: Outcomes and literature analysis. *Gynecol Surg* 2018; 15: 1-7.
- [19] Isono W, Tsuchiya A, Honda M, Saito A, Tsuchiya H, Matsuyama R, *et al.* A retrospective study of 323 total laparoscopic hysterectomy cases for various indications and a case report treating caesarean scar pregnancy. *J Med Case Rep* 2020; 14: 1-8.
- [20] Vijaykumar CR, Swathi VS. Case series on total laparoscopic hysterectomy for unusual difficult cases. *Int J Curr Sci (IJCS-PUB)* 2022; 12(3): 265-8.
- [21] McMahon MD, Scott DM, Saks E, Tower A, Raker CA, Matteson KA. Impact of obesity on outcomes of hysterectomy. *J Minim Invasive Gynecol* 2014; 21(2): 259-65. doi: 10.1016/j.jmig.2013.08.707.
- [22] O'Hanlan KA, Emeney PL, Frank MI, Milanfar LC, Sten MS, Uthman KF. Total laparoscopic hysterectomy: Making it safe and successful for obese patients. *JSLs: J Soc Laparoscopic Rob Surg* 2021; 25(2): e2020-00087.
- [23] Seo ES, Lee SH, Chon SJ, Jung SY, Cho YJ, Lim S. Influence of previous abdominal surgery on clinical outcomes of patients undergoing total laparoscopic hysterectomy. *Obstet Gynecol Sci* 2018; 61(3): 379-85. doi: 10.5468/ogs.2018.61.3.379.
- [24] Noor N, Das A, Roy KK, Bharti J, Nair VG, Rai R. Extraperitoneal laparoscopy in severe intra-abdominal adhesions: A safe alternative to laparotomy. *Gynecol Minimal Invasive Therapy* 2021; 10(3): 181-3.
- [25] Briët JM, Mourits MJ, van Leeuwen BL, van den Heuvel ER, Kenkhuis MJ, Arts HJ, *et al.* Age should not be a limiting factor in laparoscopic surgery: A prospective multicenter cohort study on quality of life after laparoscopic hysterectomy. *Clin Interv Aging* 2018; 13: 2517-26. doi: 10.2147/CIA.S172965.