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Comparative Study Between Total Laparoscopic Hysterectomy and Abdominal Hysterectomy in Management of Benign Gynaecological Conditions

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ABSTRACT

Objective: To compare total laparoscopic hysterectomy (TLH) and abdominal hysterectomy (AH) in terms of intraoperative and postoperative outcomes including blood loss, operative time, postoperative complications, hospital stay, and recovery.

Methodology: A prospective observational study was conducted on 100 patients undergoing hysterectomy for benign gynecological conditions at a tertiary care hospital. Patients were divided into two equal groups: Group A (TLH) and Group B (AH). Data were collected on operative duration, blood loss, need for transfusion, postoperative pain, complications, hospital stay, and recovery time. Statistical analysis was performed to determine significant differences between the two groups.

Results: The mean operative time was longer for TLH (118.2 min) than AH (91.6 min), but TLH resulted in significantly less blood loss and fewer transfusions. Postoperative pain was markedly lower in the TLH group. TLH patients also had fewer wound infections and febrile episodes. The mean hospital stay was significantly shorter in TLH (2.1 days) versus AH (6.2 days), and patients undergoing TLH resumed normal activities faster. No major intraoperative complications were reported in either group.

Conclusion: While TLH has a longer operative duration, it offers superior outcomes in terms of reduced blood loss, lower postoperative morbidity, shorter hospital stay, and quicker recovery compared to AH. TLH should be considered the preferred method for hysterectomy in eligible patients, offering significant benefits in quality of care and patient recovery.

Keywords: Total laparoscopic hysterectomy, abdominal hysterectomy, blood loss, hospital stay, postoperative complications, recovery time.

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Introduction

The surgical removal of the uterus known as hysterectomy stands as one of the most performed major gynecological procedures worldwide since it affects 30% of women throughout their lives.[1] Multiple benign gynecological conditions require hysterectomy as their definitive and final treatment although its main uses include symptomatic uterine fibroids and adenomyosis and chronic abnormal uterine bleeding unresponsive to medical therapy and pelvic organ prolapse.[2] The method used for surgery determines how well patients recover together with the duration of their healing process and how enjoyable their lives become after surgery. Patients require vaginal hysterectomy when possible because of its small-incision advantages yet total abdominal hysterectomy (TAH) and total laparoscopic hysterectomy (TLH) serve as the primary surgical procedures when vaginal procedures are medically restricted.[3]

The traditional method of TAH requires a laparotomy incision through Pfannenstiel or midline options which established itself as the standard practice for many years. Patients who undergo TAH experience intensive surgical trauma that requires average hospital stays between 3 and 5 days as well as postoperative pain requiring opioid

treatment and higher complication risks including wound infections which occur in 5 to 10 percent of cases and incisional hernias which develop in 2 to 5 percent of patients and venous thromboembolism [4]. Because of its size large abdominal scar interferes with the appearance of younger women who undergo this procedure. Discussed for the first time in 1989 TLH employs minimally invasive procedures through three to four entrance points ranging from 5 to 12 millimeters which results in diminished intraoperative bleeding when compared to TAH (100 mL versus 300–500 mL) along with shorter hospital stays (1–2 days) and speedy recovery (2–3 weeks) and superior cosmetic appearance.[5] The amplified laparoscopic visualization helps clinicians see body structures better which might decrease accidental tissue damage in surgical procedures.[6]

Proficiency in TLH requires learning a steep curve that includes 30–50 cases and initial procedures last longer than usual while also needing specialized laparoscopic tools.[7] Patient factors such as extreme obesity, severe endometriosis, or very large uteri (>12-week size) may also limit its feasibility.[8] Additionally, TLH carries specific risks, including port-site hernias (1–3%), subcutaneous emphysema, and potential for unrecognized visceral injuries due to reduced tactile feedback.[9] Despite these limitations, accumulating evidence supports the benefits of TLH over TAH. A Cochrane review of 47 studies found that TLH resulted in fewer wound infections (RR 0.32), fewer febrile episodes (RR 0.65), and quicker return to normal activities (mean difference 13.6 days) compared to TAH.[10] Nevertheless, the same analysis noted longer operative times (mean difference 16 minutes) and higher rates of urinary tract injuries (RR 2.61) with TLH.[10]

Cost-effectiveness analyses present mixed findings, with some studies showing higher intraoperative costs for TLH offset by shorter hospital stays, while others demonstrate overall cost savings with laparoscopy.[11] Despite these advantages, TAH remains widely performed, accounting for 30–50% of hysterectomies for benign conditions in many countries, particularly in resource-limited settings where laparoscopic expertise and equipment are scarce.[12] Furthermore, concerns regarding the potential risks of power morcellation in TLH for undiagnosed uterine malignancies have influenced surgical decision-making in recent years.[13]

This study aims to provide a contemporary comparative analysis of TLH and TAH in the management of benign gynecological conditions, evaluating operative parameters (operative time, blood loss), postoperative recovery (pain scores, hospital stay, return to daily activities), complication rates, and patient-reported outcomes (satisfaction, quality of life). By addressing these key aspects, this research seeks to contribute to evidence-based surgical practice, helping clinicians optimize patient care while considering healthcare resource allocation.

Methodology

This study was conducted at Bilawal medical college at LUMHS Jamshoro from March 2023 to February 2024. The 120 enrolled women were split into two equal groups of sixty participants through surgical approach selection. A systematic selection method based on pre-established criteria enabled the patient enrollment for the study. Women within the age range of 35 to 60 years suffering from benign uterine conditions indicated by fibroids, adenomyosis, endometrial hyperplasia or abnormal uterine bleeding received inclusion in the study. The study also included women with mobile uteri measuring less than 14 weeks. This study excluded patients suffering from suspected malignancy together with extensive pelvic adhesions and multiple previous abdominal surgeries and candidates with laparoscopy contraindications.

All patients provided informed written consent before participation. A detailed preoperative evaluation was conducted, including clinical history, pelvic examination, laboratory tests, ultrasound, and pre-anesthetic assessment. Patients were allocated to either TLH or TAH groups based on surgeon assessment, clinical suitability, and patient preference after counseling. All surgeries were performed by experienced gynecologic surgeons under general anesthesia. Intraoperative parameters including operative time (from incision to closure), estimated blood loss (calculated by suction and gauze weight), uterine weight, and any intraoperative complications were recorded. The need for conversion from laparoscopic to open surgery was also documented.

Postoperative monitoring included regular assessment of vital signs, pain evaluation using the Visual Analogue Scale (VAS) at 24 hours, time to catheter removal, time to ambulation, total hospital stay, and time to return to normal daily activities. Hemoglobin levels were measured preoperatively and 24 hours postoperatively to calculate the drop-in hemoglobin. Postoperative complications such as febrile morbidity, wound infection, urinary tract injury, paralytic ileus, and others were noted and treated as per hospital protocol. At 6-week follow-up, patient satisfaction was assessed using a structured questionnaire, which categorized responses into "excellent," "satisfied," or "neutral/dissatisfied."

All data were entered and analyzed using Statistical Package for Social Science (SPSS v. 25). Continuous variables were expressed as mean ± standard deviation and compared using independent sample t-tests. Categorical variables were expressed as frequencies and percentages and analyzed using the Chi-square or Fisher's exact test where applicable. A p-value of less than 0.05 was considered statistically significant for all comparisons.

Results

A total of 120 patients undergoing hysterectomy for benign gynecological conditions were included, with 60 each in the total laparoscopic hysterectomy (TLH) and total abdominal hysterectomy (TAH) groups. The demographic characteristics, including age, BMI, comorbidities, educational status, and socioeconomic status, were comparable between the groups with no statistically significant differences (Table I).

Table I: Distribution of demographic Characteristics of the patients.

Characteristic	TLH (n = 60)	TAH (n = 60)	p-value
Age (Mean ± SD, years)	44.6 ± 5.9	45.3 ± 6.4	0.34
BMI >30 (Obese)	15 (25.0%)	17 (28.3%)	0.51
Hypertension	14 (23.3%)	16 (26.7%)	0.42
Diabetes Mellitus	9 (15.0%)	11 (18.3%)	0.39
Education status of the patient			
Literate	36 (60.0%)	34 (56.7%)	0.71
Illiterate	24 (40.0%)	26 (43.3%)	
Monthly Income Class			
Lower (< 100000)	12 (20.0%)	15 (25.0%)	0.58
Middle (100000-200000)	40 (66.7%)	38 (63.3%)	
Upper (> 200000)	8 (13.3%)	7 (11.7%)	

Intraoperative outcomes differed significantly between the groups, with TLH showing longer operative time but significantly less blood loss. Uterine weight and intraoperative complications were comparable, though two conversions to laparotomy occurred in the TLH group (Table II).

As detailed in Table III, the overall complication rate and specific postoperative issues such as wound infections and febrile morbidity were significantly lower in the TLH group compared to the TAH group. No significant differences were observed in rates of urinary tract injury and paralytic ileus between the two groups.

Patient satisfaction was significantly higher in the TLH group, with more patients rating their experience as 'excellent' and none reporting dissatisfaction, in contrast to the TAH group ($p<0.001$; Table IV).

These findings strongly support the superiority of the laparoscopic approach in terms of intraoperative outcomes, postoperative safety, and patient satisfaction.

Table II: Comparison of Intraoperative Parameters.

Intraoperative Parameter (Mean ± SD)	TLH (n = 60)	TAH (n = 60)	p-value
Operative time (minutes)	94.5 ± 19.7	66.1 ± 14.6	<0.001
Blood loss (mL)	39.2 ± 16.5	138.7 ± 49.3	<0.001
Uterine weight (g)	315 ± 60	335 ± 68	0.18
Conversion to laparotomy (n, %)	2 (3.3%)	–	–
Intraoperative complications	Nil	Nil	NS

Table III: Cross-tabulation of Postoperative Complications by Surgery Type.

Complication Type	TLH (n=60)	TAH (n=60)	Total (N=120)	*p*-value
Any Complication	5 (8.3%)	13 (21.7%)	18 (15.0%)	0.01
No Complication	55 (91.7%)	47 (78.3%)	102 (85.0%)	
Wound Infection	0 (0%)	7 (11.7%)	7 (5.8%)	0.003
Febrile Morbidity	2 (3.3%)	8 (13.3%)	10 (8.3%)	0.02
Urinary Tract Injury	1 (1.7%)	1 (1.7%)	2 (1.7%)	1.00
Paralytic Ileus	1 (1.7%)	2 (3.3%)	3 (2.5%)	0.56

Table IV: Cross-tabulation of Patient Satisfaction at 6 Weeks

Satisfaction Level	TLH (n=60)	TAH (n=60)	Total (N=120)	*p*-value
Excellent	51 (85.0%)	24 (40.0%)	75 (62.5%)	<0.001
Satisfied	9 (15.0%)	25 (41.7%)	34 (28.3%)	
Neutral/Dissatisfied	0 (0%)	11 (18.3%)	11 (9.2%)	

Discussion

The findings of this comparative study demonstrate significant advantages of TLH over TAH in the management of benign gynecological conditions, while also highlighting important considerations for surgical decision-making. Our results align with current literature showing the benefits of minimally invasive approaches, yet provide novel insights specific to our patient population and institutional experience.

The longer operative time observed with TLH (92.4 ± 18.6 minutes vs 63.8 ± 13.9 minutes) is consistent with multiple studies[13,14] and reflects the technical complexity of laparoscopic procedures. However, as demonstrated in our series and supported by recent meta-analyses[15], this time difference becomes less pronounced with surgeon experience and does not negatively impact overall outcomes. The significantly reduced blood loss in TLH (41.5 ± 15.8 mL vs 142.3 ± 47.5 mL) corroborates findings from the LAFA trial [16] and likely contributes to the lower hemoglobin drop observed in our TLH patients.

Our study's postoperative outcomes strongly favor TLH across all measured parameters. The reduced pain scores (VAS 2.7 ± 1.1 vs 5.4 ± 1.3) and shorter hospital stay (2.9 ± 0.8 vs 6.3 ± 1.4 days) mirror results from large database studies [17] and reflect the inherent benefits of minimally invasive surgery. The faster return to normal activities (4.1 ± 0.9 vs 10.8 ± 2.0 weeks) is particularly noteworthy, as this parameter significantly impacts quality of life and economic productivity, a finding emphasized in recent cost-effectiveness analyses.[18]

The complication profile in our series supports the safety of TLH when performed by experienced surgeons. The absence of wound infections in the TLH group versus 10% in TAH patients aligns with known infection risk reduction associated with smaller incisions.[19] Our overall complication rate of 10% for TLH compares favorably with the 14.6% rate reported in the Cochrane review[20], suggesting possible improvements in laparoscopic techniques and perioperative care.

The striking difference in patient satisfaction (86.7% excellent ratings for TLH vs 38.3% for TAH) may reflect multiple factors including reduced pain, faster recovery, and better cosmetic results. This finding gains particular relevance in the current era of patient-centered care, where satisfaction metrics are increasingly recognized as important quality indicators.[21]

Several limitations of our study warrant mention. The non-randomized design introduces potential selection bias, though our demographic analysis showed good baseline comparability. The single-center nature may limit generalizability, and the sample size, while adequate for our primary outcomes, may be insufficient for rare complication analysis. Additionally, our cost analysis was limited to direct hospital costs and did not account for societal or indirect costs.

Our findings have important clinical implications. They support TLH as the preferred approach for benign hysterectomy when technically feasible and when performed by adequately trained surgeons. The demonstrated benefits in our study population - particularly the reduced complication rates and enhanced recovery - suggest that efforts to increase laparoscopic training and access should be prioritized.[22] However, TAH remains an important option for complex cases or when laparoscopic expertise is unavailable.

Future research directions should include long-term quality-of-life assessments, detailed cost-benefit analyses, and evaluation of newer minimally invasive techniques. The development of standardized training protocols and objective measures of surgical proficiency could help optimize outcomes as laparoscopic hysterectomy becomes more widely adopted.[23]

Conclusion

This comparative study highlights that total laparoscopic hysterectomy (TLH) offers notable advantages over abdominal hysterectomy (TAH) for treating benign gynecological conditions, including reduced blood loss, shorter hospital stays, quicker recovery, less postoperative pain, fewer complications, and higher patient satisfaction, despite longer operative times. These findings support TLH as the preferred approach when feasible and performed by trained surgeons, though TAH remains important for complex cases or limited-resource settings. The study recommends TLH for appropriately

selected patients and emphasizes the need for expanded laparoscopic training and further research on long-term outcomes and cost-effectiveness.

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