

A Comparative Study between Total Abdominal Hysterectomy and Total Laparoscopic Hysterectomy Done for Gynecological Conditions at a Tertiary Health Care Centre

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Abstract

Background: Total laparoscopic hysterectomy (TLH) is increasingly used for the management of benign gynaecological conditions because of its minimally invasive nature and favourable postoperative recovery. However, it may require greater surgical expertise and longer operative time than total abdominal hysterectomy (TAH). This study compared the safety and perioperative outcomes of TLH and TAH.

Methods: This comparative study included women undergoing hysterectomy for benign gynaecological conditions. Patients were divided into TLH and TAH groups and compared with respect to baseline characteristics, operative time, intraoperative blood loss, intraoperative complications, and postoperative analgesic and antibiotic requirements, duration of hospital stay, postoperative complications, and patient satisfaction.

Results: The baseline demographic and clinical characteristics, including age, BMI, uterine size, and indications for surgery, were comparable between the groups. Fibroid uterus was the most common indication. TLH was associated with significantly longer operative time than TAH (98.72 ± 21.36 vs. 74.38 ± 16.44 minutes; $p < 0.0001$), but significantly lower intraoperative blood loss (118.56 ± 46.38 vs. 286.44 ± 84.72 mL; $p < 0.001$). Intraoperative complication rates were comparable between groups (6% vs. 6%; $p = 0.51$), with conversion to laparotomy required in 6% of TLH cases. Prolonged analgesic requirement was significantly lower following TLH (14% vs. 36%; $p = 0.03$). Hospital stay was also significantly shorter with TLH (3.42 ± 1.16 vs. 6.18 ± 1.94 days; $p < 0.0001$). Patient satisfaction was significantly higher following TLH (94% vs. 78%; $p = 0.02$).

Conclusion: TLH provides significant advantages over TAH in terms of reduced blood loss, postoperative analgesic requirement, shorter hospital stay, and greater patient satisfaction, despite a longer operative time. With appropriate patient selection and adequate surgical expertise, TLH represents an effective and safe approach for hysterectomy in women with benign gynaecological conditions.

Keywords: Total Laparoscopic Hysterectomy; Total Abdominal Hysterectomy; Benign Gynaecological Conditions; Minimally Invasive Surgery; Operative Time; Postoperative Recovery.

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Introduction

Hysterectomy is the second most commonly performed surgical procedure among women worldwide and the most common gynecological operation after cesarean section in many countries. [1-2] Prevalence varies by region, with higher rates in developed nations. [3-4]

Community-based cross-sectional studies across diverse Indian populations report prevalence rates of 1.7–7.8%, with uterine fibroids and abnormal uterine bleeding (particularly menorrhagia) identified as the leading indications, including in studies from Andhra Pradesh. [5-6] Despite its

therapeutic value, hysterectomy carries significant physiological and psychological sequelae. [7] These include early menopause (especially with bilateral oophorectomy), sexual dysfunction, metabolic disturbances, osteoporosis, cardiovascular risk, and psychological morbidity such as anxiety, depression, and perceived loss. [8] Patient preference following adequate counselling remains an important determinant of surgical approach. [9]

Hysterectomy is classified by surgical route into abdominal, vaginal, or laparoscopic (including

laparoscopic-assisted vaginal hysterectomy), and by extent of tissue removal, namely total, subtotal (supracervical), radical, and pan-hysterectomy. [10] Total hysterectomy entails removal of the uterus and cervix. [11] Abdominal hysterectomy, performed via an abdominal incision, is preferred for large uterine size, suspected pelvic adhesions, malignancy, or when optimal exposure is required, owing to concerns over blood loss, prolonged operative time, and organ injury risk with alternative approaches. [12]

Advances in minimally invasive surgery have increased adoption of laparoscopic hysterectomy. This technique uses a fiber-optic laparoscope for high-resolution visualization of pelvic anatomy through small incisions, enabling complex procedures with minimal tissue trauma. [13]

Total laparoscopic hysterectomy (TLH) is now a preferred approach in selected patients, offering reduced intraoperative blood loss, minimal postoperative hemoglobin decline, lower wound infection rates, reduced postoperative pain, earlier catheter removal and ambulation, shorter hospital stay, faster recovery, and superior cosmetic and satisfaction outcomes. [14-15]

However, TLH requires specialized training, advanced equipment, and a substantial learning curve, with longer operative times reported early in training and increased risk of ureteral or bladder injury in complex cases. [16-17] Surgical safety is therefore highly dependent on operator skill, experience, and institutional resources.

Abdominal hysterectomy remains relevant in resource-limited settings lacking laparoscopic infrastructure and is technically less demanding for large uterine masses, though it is associated with greater postoperative pain, longer hospitalization, higher surgical site infection risk, and delayed recovery relative to laparoscopic techniques. [18]

Both approaches carry risk of intraoperative and postoperative complications, including hemorrhage, infection, thromboembolism, visceral injury (bladder, ureters, intestines, rectum, nerves), sexual dysfunction, vaginal cuff dehiscence, urinary incontinence, and pelvic floor dysfunction. [19]

Given the parallel relevance of minimally invasive and conventional techniques, systematic evaluation of their comparative effectiveness is warranted. Surgical selection should be guided by clinical indication, safety profile, operative outcomes, and post-procedural quality of life. [20] This study therefore aims to compare the effectiveness and outcomes of abdominal versus laparoscopic hysterectomy to determine the optimal surgical approach for women requiring gynecological surgical management.

Material and Method

Study Setting: The study was conducted in the Department of Obstetrics and Gynaecology of a tertiary care centre after obtaining approval from the Institutional Ethics Committee.

Study Population: The study population consisted of gynaecology patients undergoing hysterectomy.

Study Period: The study was conducted over a period of two years.

Study Design: A comparative analytical study design was adopted.

Sample Size: All gynaecological patients undergoing hysterectomy during the study period who met the inclusion criteria and provided informed consent were included in the study.

Inclusion Criteria

1. Gynaecological patients undergoing hysterectomy, either by laparoscopic or abdominal technique, were included.
2. Only elective procedures were included in the study.
3. Hysterectomies performed for gynaecological indications were included.
4. Patients who were willing to participate and provided written informed consent were included.

Exclusion Criteria

1. Vaginal hysterectomies were excluded.
2. Emergency hysterectomies were excluded.
3. Patients with severe anemia were excluded.
4. Patients with diabetes mellitus were excluded.
5. Patients receiving steroids or immunosuppressant drugs were excluded.
6. Patients who were not willing to participate were excluded.
7. Patients presenting with foul-smelling vaginal discharge were excluded.
8. Hysterectomies performed for obstetric causes were excluded.

Methods of Data Collection

Detailed Research Plan: In this study, gynaecological patients were recruited from the Department of Obstetrics and Gynecology after obtaining approval from the Institutional Ethical Clearance Committee. Written informed consent was obtained from all participants.

Gynaecological patients who were planned to undergo hysterectomy for the treatment of gynaecological conditions and who fulfilled the inclusion criteria were enrolled in the study.

Patient details were recorded in a structured proforma, including a detailed history of presenting complaints, high-risk factors, past medical history,

history of drug usage, infections, and postoperative complications. General physical examination, systemic examination, and per speculum (P/S) and per vaginal (P/V) examinations were performed for all patients.

All women underwent complete blood count estimation at the time of enrollment. Hematological assessment was performed using an automated blood count analyzer as part of routine evaluation.

All women were subjected to laboratory investigations, including hemoglobin (Hb), total leukocyte count (TLC), differential leukocyte count (DLC), bleeding time, clotting time, renal function tests (RFT), liver function tests (LFT), hepatitis B surface antigen (HBsAg), and human immunodeficiency virus (HIV) testing.

Two groups matched for age, weight, presenting complaints, past medical history, and other relevant factors were studied. The same medications were administered to both groups, and hysterectomies were performed by the same gynaecological unit under similar operative conditions.

- Group A: Included patients undergoing total abdominal hysterectomy.
- Group B: Included patients undergoing total laparoscopic hysterectomy.

Comparisons between the two groups were performed by assessing parameters during the preoperative, intraoperative, and postoperative periods for a duration of three months.

Parameters for Comparison

Preoperative Parameters

- Chief complaints of the patients
- Uterine size
- Preoperative preparation required

Intraoperative Parameters

- Operative time
- Incidence of ureteric and bladder injury
- Incidence of bowel injury
- Intraoperative blood loss
- Incidence of conversion to open surgery
- Anesthetic complications

Postoperative Parameters

- Incidence of secondary infections
- Need for re-exploration
- Requirement of antibiotics and analgesics
- Incidence of infections
- Length of hospital stay
- Overall cost of treatment

Informed consent was obtained from each participant, and detailed information regarding the purpose of the study was provided to all participants. Complete confidentiality of patient data was maintained by the principal investigator.

Statistical Analysis: Data were collected using a structured proforma and entered into Microsoft Excel sheets. Statistical analysis was performed using appropriate statistical software. Qualitative data were expressed in terms of proportions. Quantitative data were expressed as mean and standard deviation. Comparison of mean values between the two groups was performed using the unpaired t-test to assess the significance of differences between groups.

Observations and Results:

Table 1: Baseline Demographic and Clinical Characteristics of Study Groups

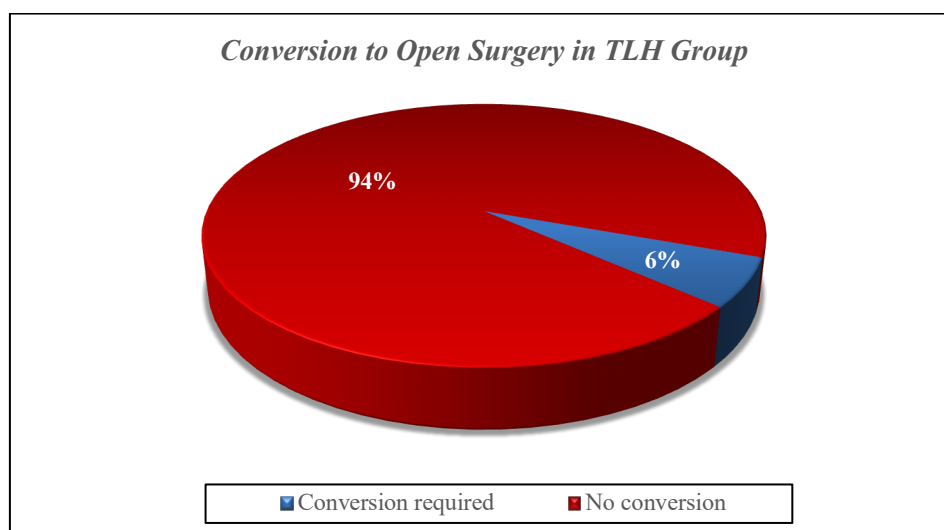
Parameter	Group A (TAH) n=50	Group B (TLH) n=50	P-value
Age (years), Mean $\pm$ SD	47.12 $\pm$ 7.52	45.96 $\pm$ 6.88	0.78
Weight (kg), Mean $\pm$ SD	59.64 $\pm$ 8.12	58.92 $\pm$ 7.86	0.67
BMI (kg/m ²), Mean $\pm$ SD	24.86 $\pm$ 3.18	24.24 $\pm$ 2.94	0.78
Uterine size (weeks), Mean $\pm$ SD	11.84 $\pm$ 2.62	11.26 $\pm$ 2.48	0.25
Indication for hysterectomy			
Fibroid uterus	21 (42.0%)	19 (38.0%)	0.98
Dysfunctional uterine bleeding	11 (22.0%)	13 (26.0%)	
Adenomyosis	7 (14.0%)	8 (16.0%)	
Endometriosis	4 (8.0%)	5 (10.0%)	
Chronic pelvic pain	3 (6.0%)	2 (4.0%)	
Other indications	4 (8.0%)	3 (6.0%)	

Baseline demographic and clinical characteristics were comparable between both groups. No significant difference was observed in mean age, weight, BMI, or uterine size between TAH and TLH groups ($p > 0.05$). Fibroid uterus was the most common indication for hysterectomy in both groups, followed by dysfunctional uterine bleeding, with no significant difference in indications between the groups (Table 1).

Table 2: Comparison of Preoperative and Operative Parameters between TAH and TLH Groups

Parameter	Group A (TAH) n=50	Group B (TLH) n=50	P-value
Preoperative preparation			
Blood transfusion required	6 (12.0%)	4 (8.0%)	0.53
Bowel preparation	14 (28.0%)	18 (36.0%)	0.48
Preoperative antibiotics	50 (100%)	50 (100%)	—
Additional medical optimization	9 (18.0%)	7 (14.0%)	0.62
Operative time (minutes), Mean $\pm$ SD	74.38 $\pm$ 16.44	98.72 $\pm$ 21.36	<0.0001
Intraoperative blood loss (ml), Mean $\pm$ SD	286.44 $\pm$ 84.72	118.56 $\pm$ 46.38	<0.001

Preoperative preparation requirements were comparable between both groups, with no significant difference in blood transfusion, bowel preparation, or additional medical optimization ($p>0.05$). The mean operative time was significantly higher in the TLH group compared with the TAH group (98.72 $\pm$ 21.36 vs 74.38 $\pm$ 16.44 minutes, $p<0.0001$). In contrast, intraoperative blood loss was significantly lower in the TLH group (118.56 $\pm$ 46.38 vs 286.44 $\pm$ 84.72 ml, $p<0.001$) (Table 2).

**Figure 1: Conversion to Open Surgery in TLH Group**

Among patients undergoing TLH, conversion to open surgery was required in 3 cases (6.0%), while the remaining 47 patients (94.0%) completed the procedure laparoscopically (Figure 1).

Table 3: Comparison of Postoperative Outcomes and Complications between TAH and TLH Groups

Parameter	Group A (TAH) n=50	Group B (TLH) n=50	P-value
Intraoperative organ injuries			
Bladder injury	2 (4.0%)	1 (2.0%)	0.51
Ureteric injury	1 (2.0%)	1 (2.0%)	
Bowel injury	0	1 (2.0%)	
No organ injury	47 (94.0%)	47 (94.0%)	
Postoperative recovery parameters			
Hospital stay (days), Mean ± SD	6.18 ± 1.94	3.42 ± 1.16	<0.0001
Postoperative infections			
Wound infection	3 (6.0%)	0	0.08
Urinary tract infection	2 (4.0%)	1 (2.0%)	0.56
Vault infection	4 (8.0%)	0	0.04
No infection	41 (82.0%)	49 (98.0%)	0.39
Postoperative intervention			
Resuturing required	2 (4.0%)	0	0.15
No resuturing required	48 (96.0%)	50 (100%)	
Medication requirement			
Prolonged analgesic requirement (>5 days)	18 (36.0%)	4 (8.0%)	0.002
Prolonged antibiotic requirement (>5 days)	9 (18.0%)	1 (2.0%)	0.01

Intraoperative organ injuries were comparable between the two groups, with no significant

difference observed ($p=0.51$). The mean duration of hospital stay was significantly lower in the TLH

group compared with the TAH group (3.42 ± 1.16 vs 6.18 ± 1.94 days, $p < 0.0001$). Postoperative infections, including wound infection, urinary tract infection, and vault infection, were less frequent in the TLH group.

The requirement for resuturing was observed only in the TAH group, while prolonged analgesic and antibiotic requirements were significantly higher in the TAH group compared with the TLH group ($p < 0.05$) (Table 3).

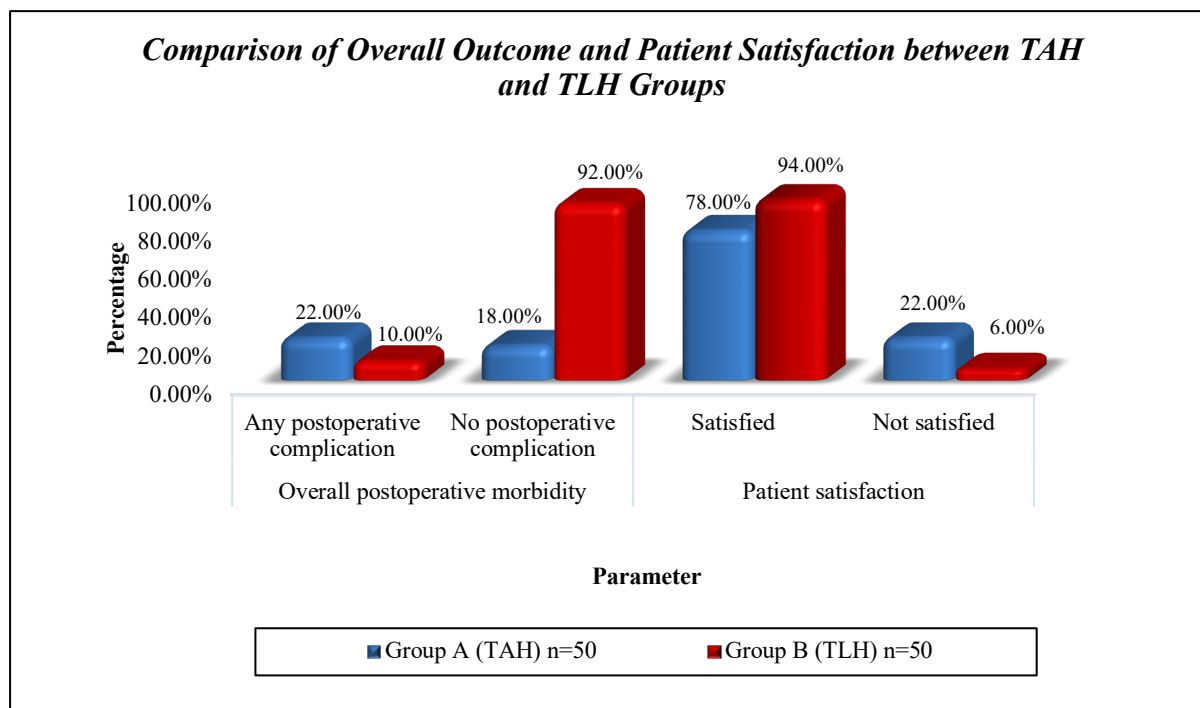


Figure 2: Comparison of Overall Outcome and Patient Satisfaction between TAH and TLH Groups

Overall postoperative morbidity was significantly higher in the TAH group compared with the TLH group (22.0% vs 10.0%, $p = 0.01$). Patient satisfaction was significantly higher among patients undergoing TLH compared with TAH (94.0% vs 78.0%, $p = 0.02$) (Figure 2).

Discussion

The present study demonstrates that total laparoscopic hysterectomy (TLH) offers several perioperative and postoperative advantages over total abdominal hysterectomy (TAH) in women undergoing hysterectomy for benign gynecological conditions. The two groups were comparable with respect to age, BMI, uterine size, and indications for surgery, with fibroid uterus being the most common indication. This baseline comparability supports the validity of subsequent intergroup comparisons. Similar demographic and clinical profiles have been reported in previous comparative studies. [10-12] TLH was associated with a significantly longer operative time than TAH in the present study (98.72 ± 21.36 vs. 74.38 ± 16.44 minutes; $p < 0.0001$). This finding is consistent with most previous comparative studies, which have attributed the longer duration to the technical complexity of laparoscopic dissection, identification of pelvic structures, uterine manipulation, and the learning curve associated

with minimally invasive surgery. [11] However, variations among studies indicate that operative duration is influenced by surgical expertise, patient selection, uterine size, adhesions, and institutional experience. [12] With increasing laparoscopic experience and structured training, operative time may progressively decrease. [13]

Despite the longer operative duration, TLH resulted in significantly lower intraoperative blood loss than TAH (118.56 ± 46.38 vs. 286.44 ± 84.72 mL; $p < 0.001$). This finding is consistent with previous studies reporting lower blood loss and a smaller postoperative haemoglobin decline following laparoscopic hysterectomy. [11,20] The improved haemostatic control and magnified visualization provided by laparoscopy may contribute to this benefit. [21]

The overall rate of intraoperative complications was comparable between the two groups (6% each; $p = 0.51$), although conversion to laparotomy occurred in 6% of TLH cases. Similar studies have reported no significant difference in intraoperative complications between laparoscopic and abdominal approaches. These findings suggest that, when performed by appropriately trained surgeons, TLH can be undertaken safely, although careful identification of the ureters, bladder, bowel, and

major pelvic vessels remains essential. [10,11,21,22]

A clear postoperative benefit of TLH was observed in the present study. Patients undergoing TAH required prolonged analgesia more frequently than those undergoing TLH (36% vs. 14%; $p=0.03$), while prolonged antibiotic use was also more common after TAH. These findings are consistent with previous studies demonstrating lower postoperative pain and reduced analgesic requirements following minimally invasive hysterectomy. [22-23]

Hospital stay was significantly shorter following TLH than TAH (3.42 ± 1.16 vs. 6.18 ± 1.94 days; $p<0.0001$). This finding is highly consistent with previous comparative studies and represents an important clinical advantage of minimally invasive surgery. Earlier mobilization, reduced postoperative pain, smaller incisions, and fewer wound-related problems may collectively contribute to faster recovery and earlier discharge. [23]

Postoperative morbidity also favoured TLH. Although urinary tract infection and wound-related complications were not consistently different between groups, hematoma/seroma formation was significantly higher in the TLH group in the present study. Overall, previous studies generally demonstrate a lower postoperative complication burden following laparoscopic hysterectomy, particularly with respect to wound infection and abdominal wound morbidity. Differences between studies may reflect variations in sample size, definitions of complications, patient characteristics, and surgical expertise.

Importantly, patient satisfaction was significantly higher following TLH than TAH (94% vs. 78%; $p=0.02$). Similar improvements in satisfaction and cosmetic outcomes have been reported in previous studies. The combination of reduced postoperative pain, shorter hospitalization, faster recovery, and smaller surgical incisions may explain the greater patient preference and satisfaction associated with minimally invasive hysterectomy. [23-24]

Overall, the present findings indicate that TLH provides substantial benefits over TAH in terms of blood loss, postoperative recovery, hospital stay, and patient satisfaction, despite requiring a longer operative time. The comparable intraoperative complication rates further support its safety when performed by experienced surgeons. Therefore, TLH may be considered a preferred approach for appropriately selected women with benign gynecological disease, provided adequate surgical expertise and resources are available. The choice of route, however, should remain individualized according to patient characteristics, uterine size,

pelvic pathology, previous surgery, surgeon expertise, and available institutional facilities.

Conclusion

The present study demonstrates that Total Laparoscopic Hysterectomy is a safe and effective alternative to Total Abdominal Hysterectomy for the management of benign gynecological disorders. The incidence of major intraoperative complications and re-exploration was comparable between the two approaches, indicating that TLH can be performed safely when appropriate expertise and infrastructure are available.

The reduced postoperative morbidity and enhanced recovery observed in the laparoscopic group highlight the clinical benefits of minimally invasive surgery. Therefore, whenever feasible and in the presence of adequate surgical expertise, Total Laparoscopic Hysterectomy should be considered the preferred surgical approach for women requiring hysterectomy for benign gynecological conditions.

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