Comparative Study of Peri-Operative Outcome Following Laparotomy Versus Laparoscopic Technique of Abdominal Hysterectomy for Benign Gynaecological Lesions

Dr. N.V.L. Apoorva[1], Dr. Subhashree Chatterjee[2], Dr. V.B. Bangal[3]

[1]Junior Resident,[2]Associate Professor,[3]Professor & Head of Department

Department of Obstetrics and Gynaecology
Dr. BVP Rural Medical College, PIMS (DU), Loni, Maharashtra, India

Corresponding Author:
Dr. N.V.L. Apoorva
Email: apoorva.nathi@gmail.com

Abstract

Background: Hysterectomy is commonly performed for benign gynecological conditions. With advances in minimally invasive surgery, laparoscopic hysterectomy is increasingly preferred due to reduced blood loss, postoperative pain, and hospital stay, along with faster recovery. However, procedure selection depends on uterine size, prior surgeries, available facilities, and surgical expertise. Owing to limited long-term comparative data, this study evaluates and compares peri-operative outcomes of abdominal, vaginal, and laparoscopic hysterectomy performed at our center over a 12 months period from January 2025 to December 2025. **Aim**: To compare the peri-operative outcomes of laparotomy and laparoscopic techniques in abdominal hysterectomy performed for benign gynecological conditions, with respect to operative time, blood loss, intra- and postoperative complications, postoperative pain, and duration of hospital stay. **Material and methods:** A prospective study was conducted over a period of 12 months at a tertiary care center. A total of 90 women diagnosed with benign uterine pathology and fulfilling the inclusion criteria were enrolled. They were equally divided into two groups of 45 each: Group A underwent abdominal hysterectomy by laparotomy, and Group B underwent laparoscopic hysterectomy. Standard perioperative protocols, including antibiotic prophylaxis and postoperative analgesia, were followed in both groups. Data on operative time, intraoperative and postoperative complications, pain relief requirements, postoperative recovery parameters, and duration of hospital stay were collected and statistically analyzed, with a p-value < 0.05 considered significant. **Results:** Intraoperative complications such as bowel and bladder injuries occurred in the abdominal group (2% and 4.4%, respectively), and 2% had bowel injury in TLH group, with no cases of hemorrhage in either group. Operative time was longer for TLH (164.9 vs 106.3 minutes, $p < 0.0001$), but blood loss was markedly lower (153.7 ml vs 475.9 ml, $p < 0.0001$), and postoperative hospital stay was shorter in the laparoscopic group (3.3 vs 4.1 days, $p = 0.0002$). Duration of antibiotic use was similar between the groups ($p = 0.5$). These findings indicate that laparoscopic hysterectomy, despite longer operative time, provides the advantages of reduced blood loss, shorter hospital stay, and faster overall recovery. **Conclusion:** Laparoscopic hysterectomy has clear advantages over abdominal hysterectomy, including less blood loss, reduced pain, shorter hospital stay, and quicker recovery. The choice of technique depends on patient factors like history of chronic illness, general health, body mass index, and presence of medical comorbidities such as anemia, diabetes, hypertension, or cardiopulmonary disease, which may influence anesthesia tolerance and surgical risk, financial problems etc and the surgeon's expertise; hence, gynecologists should be skilled in all hysterectomy methods. Laparoscopic hysterectomy should be preferred when feasible. This comparative study confirms its superiority over conventional abdominal hysterectomy.

Keywords: Abdominal hysterectomy; Laparotomy; Laparoscopic hysterectomy; Benign gynecological lesions; Peri-operative outcomes

Introduction

Hysterectomy is the most common gynecologic surgery, mainly performed for benign conditions.[1] Hysterectomy remains one of the most frequently performed gynecological surgeries, predominantly for benign conditions, despite the availability of alternative treatments.[2] Since the introduction of laparoscopic hysterectomy in 1989, its use has steadily increased due to improved visualization, feasibility in larger or non-prolapsed uteri, and the ability to perform concomitant procedures.[3] Compared to abdominal hysterectomy, laparoscopic hysterectomy is associated with less postoperative pain, shorter hospital stay, faster recovery, and better patient-reported outcomes measured using tools such as Visual Analogue Scale(VAS) and patient satisfaction scores.[4] VAS is a subjective measure used to assess the intensity of pain, usually represented by a 10-cm line ranging from "no pain" to "worst pain imaginable," on which the patient marks their pain level.

Minimally invasive approaches, particularly laparoscopic hysterectomy, are increasingly preferred over laparotomy due to reduced morbidity, blood loss, pain, hospital stay, and faster recovery, despite longer operative time and higher costs. [5]

The choice of hysterectomy depends on uterine size, prior abdominal surgeries, and the surgeon's expertise. Laparoscopic hysterectomy (LH) offers advantages such as shorter hospital stay, minimal blood loss, reduced analgesic needs, smaller incisions, faster recovery, and lower patient-related costs.[6,7] However, it is associated with longer operative time, limited availability of laparoscopic facilities, and a steep learning curve. Although LH is preferred and provides superior visualization of pelvic anatomy, many gynecologists still favor abdominal hysterectomy.[8]

Aim: To compare the peri-operative outcomes of laparotomy and laparoscopic techniques in abdominal hysterectomy performed for benign gynecological conditions, with respect to operative time, blood loss, intra- and postoperative complications, postoperative pain, and duration of hospital stay.

Objective : To assess the patients satisfaction among both the procedures

Material and methods: A prospective study was conducted at a tertiary care center over a period of 12 months from January 2025 to December 2025. A total of 90 women who met the inclusion and exclusion criteria and underwent abdominal hysterectomy for benign uterine pathology were included in the study. The cases were equally divided into two groups: Group A comprised 45 women who underwent hysterectomy by laparotomy, and Group B included 45 women who underwent hysterectomy using the laparoscopic technique.

Inclusion criteria

- Women aged 40–49 years (perimenopausal) undergoing hysterectomy for benign gynecological conditions
- Uterine size ≤16 weeks of pregnant uterus
- Willingness to participate with written informed consent

Exclusion criteria

- Patients with precancerous lesions, malignancy, or uterine prolapse
- Uterine size >16 weeks of pregnant uterus
- Patients unfit for surgery or anesthesia, or cases requiring conversion to laparotomy

Data regarding patient age, indication for hysterectomy, surgical technique, duration of surgery and anesthesia, intraoperative complications, postoperative nursing care, analgesic requirements, duration of parenteral fluid therapy, time to ambulation, infective morbidity, surgical site infection, length of hospital stay, late wound-related complications, and postoperative rest period were collected. The data were analyzed and compared between the two groups using percentages and the chi-square test, with a p-value <0.05 considered statistically significant.

Results: in present study total 90 cases were studied. Among them 45 cases were distributed in both groups each.

Group A: Total Abdominal Hysterectomy- 45 cases

Group B: Total Laproscopic Hysterectomy- 45 cases

Table 1: Demographic data of study population

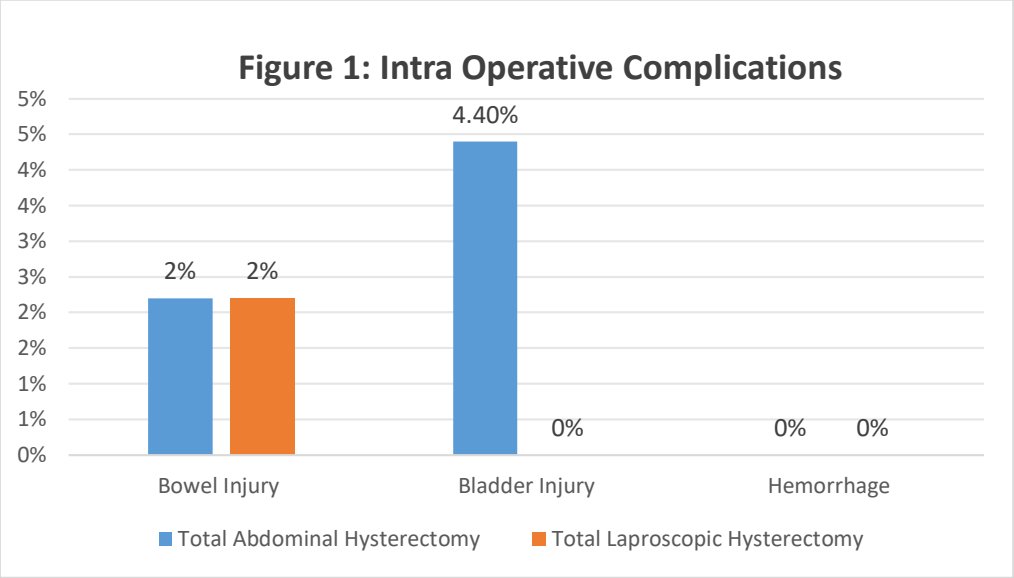
Parameters	Total Abdominal Hysterectomy		Total Laproscopic Hysterectomy		P value
	Mean	SD	Mean	SD	
Age in years	45.3	5.8	47.5	6.1	0.08
BMI in kg/m^2	26.3	2.8	25.8	2.1	0.3
Parity	3.1	1.5	3.2	1.7	0.76

Table 1 presents the baseline demographic characteristics of patients undergoing abdominal and laparoscopic hysterectomy. The mean age of patients was slightly higher in the laparoscopic group (47.5 years) compared to the abdominal group (45.3 years), though the difference was not statistically significant ($p = 0.08$). Similarly, body mass index (BMI) and parity were comparable between the two groups, with no significant differences observed ($p > 0.05$). This indicates that both groups were well-matched in terms of age, BMI, and obstetric history, minimizing confounding factors in comparing surgical outcomes.

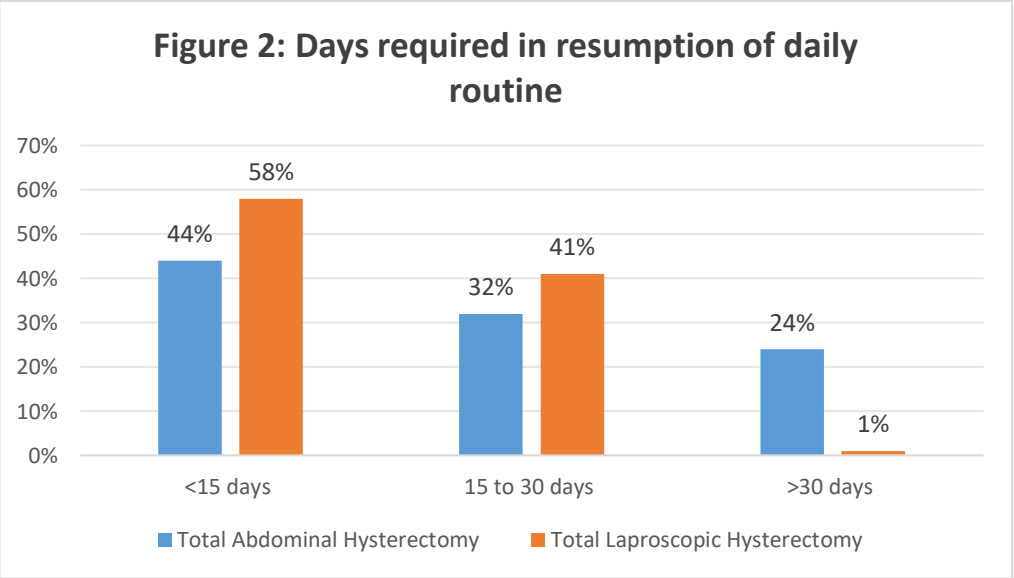
Table 2: Details on examination

Parameters	Total Abdominal Hysterectomy		Total Laproscopic Hysterectomy		P value
	Mean	SD	Mean	SD	
Post operative stay in days	4.1	1.1	3.3	0.9	0.0002*
Duration of antibiotic use in days	7.8	1.2	7.6	1.8	0.5
Operative time in min	106.3	45.7	164.9	59.2	<0.0001*
Blood loss in ml	475.9	51.8	153.7	35.1	<0.0001*

Table 2 compares key operative and postoperative parameters between abdominal and laparoscopic hysterectomy groups. postoperative hospital stay was shorter in the laparoscopic group (3.3 vs 4.1 days, $p = 0.0002$). Operative time was longer for laparoscopic hysterectomy (164.9 vs 106.3 minutes, $p < 0.0001$), but blood loss was markedly lower (153.7 ml vs 475.9 ml, $p < 0.0001$). Duration of antibiotic use did not differ significantly between groups ($p = 0.5$). These findings highlight the advantages of laparoscopy in reducing blood loss and hospital stay despite longer operative times.



The figure 1 compares intraoperative complications between abdominal and laparoscopic hysterectomy. Bowel and bladder injuries occurred in the abdominal group (2% and 4.4%, respectively) and only bowel injury(2%) was seen in TLH group. No cases of hemorrhage were observed in either group.



The figure 2 shows the duration of postoperative recovery in patients undergoing abdominal versus laparoscopic hysterectomy. A higher proportion of laparoscopic patients (58%) resumed normal activities within 15 days compared to the abdominal group (44%). Recovery between 15–30 days was also slightly higher in the laparoscopic group (41% vs 32%), while prolonged recovery beyond 30 days was much more common after abdominal hysterectomy (24% vs 1%), highlighting faster recovery with the laparoscopic approach.

Table 3: Patients satisfaction among study population

Patient satisfaction	Total Abdominal Hysterectomy	Total Laproscopic Hysterectomy
Excellent	5	12
Very good	15	22
Good	21	10
Fair	3	1
Poor	1	0
Total	45	45

Patient satisfaction was higher in the total laparoscopic hysterectomy group, with more patients reporting excellent and very good satisfaction compared to the total abdominal hysterectomy group. Fair and poor satisfaction ratings were observed mainly in the abdominal hysterectomy group, indicating better overall patient satisfaction following the laparoscopic approach.

Discussion:

The comparison between the TAH and TLH group shows that both groups were similar in weight, height, BMI, gravidity, and parity, though the TLH group was slightly older (52.78 vs 49.34 years, $p = 0.02$). Postoperative hospital stay was significantly shorter in the TLH group (3.00 vs 3.84 days, $p < 0.001$), and estimated blood loss was markedly reduced (152.0 vs 477.4 mL, $p < 0.001$). Operative time was longer in the TLH group (164.0 vs 108.8 min, $p < 0.001$), while duration of antibiotic use was comparable. These findings confirm that TLH, despite longer operative time, offers advantages of reduced blood loss and faster recovery, consistent with previous observations. Study by **Aydin SE et a**l showed that comparison between TAH and TLH are largely consistent with previous observations regarding laparoscopic versus abdominal hysterectomy. Patients in the TLH group were slightly older (52.78 vs 49.34 years, $p = 0.02$), but other demographic parameters such as weight, height, BMI, gravidity, and parity did not differ significantly, indicating comparable baseline characteristics.[1] Study by **Uwais et al** showed similar findings having mean age of 48.5 in TLH group and 48.8 in TAH group, mean parity 3.6 in TLH group and 3.2 in TAH group, mean BMI 30.3 in TLH group and 28.4 in TAH group.[4]

In present study Postoperative hospital stay was significantly shorter in the TLH group (3.00 vs 3.84 days, $p < 0.001$), highlighting the faster recovery associated with minimally invasive surgery. Operative time was significantly longer for TLH (164.0 vs 108.8 minutes, $p < 0.001$), consistent with the increased technical demands of laparoscopic procedures, similarly in study by **Uwais et al** it was seen that mean hospital stay in days was 1.5 and 2.5, mean opeartive time of surgery was 157.4 and 149.3 min among TLH and TAH group respectively. [4]

Estimated blood loss was markedly lower in the TLH group (152.0 vs 477.4 mL, $p < 0.001$), confirming the advantage of laparoscopy in reducing intraoperative bleeding. Duration of antibiotic therapy was similar between groups ($p = 0.334$). Study by **Uwais et al** showed that EBL was 327.8 and 471.1 among TLH and TAH group respectively. Overall, these results align with prior findings showing that laparoscopic hysterectomy, while taking longer to perform, results in significantly less blood loss and shorter hospitalization compared to open abdominal hysterectomy.[4]

Figure 1 illustrates intraoperative complications in abdominal versus laparoscopic hysterectomy, showing that bowel and bladder injuries occurred in the abdominal group (2% and 4.4%, respectively), while bowel injury was reported 2% in the laparoscopic group. Study done by **Uwais et al** bleeding was mainly seen among TAH cases ad Bladder injury was mainly seen among TLH cases as intraoperative complications. Figure 2 depicts postoperative recovery duration, revealing that a higher proportion of laparoscopic patients (58%) resumed normal activities within 15 days compared to the abdominal group (44%), and recovery between 15–30 days was slightly higher in the laparoscopic group (41% vs 32%). Notably, prolonged recovery beyond 30 days was far more frequent after abdominal hysterectomy (24% vs 1%), indicating that laparoscopic hysterectomy is associated with faster postoperative recovery. [4] In study by **Gavahane et al** showed that distribution of cases according to intraoperative complications shows that bladder injury occurred only in the abdominal hysterectomy group (TAH, 1.9%), while bowel injury and primary hemorrhage were absent in both groups. Injury to viscera was observed exclusively in the laparoscopic hysterectomy group (TLH, 0.95%), and no cases required conversion to laparotomy. In terms of intraoperative blood loss, the majority of TAH cases (40%) experienced blood loss between 200–300 ml, whereas most TLH cases (66.33%) had blood loss of less than 50 ml. The mean blood loss was substantially higher in the abdominal group (240 ml) compared to the laparoscopic group (70 ml), indicating that TLH is associated with lower intraoperative complications and significantly reduced blood loss. [2]

Postoperative resumption of routine activities differed notably between the two groups. In the abdominal hysterectomy group (TAH), no patients resumed activities within the first week, while in the laparoscopic group (TLH), 1.9% resumed within one week. By two weeks, 14.2% of TAH patients had resumed normal activities compared to 53.3% in the TLH group, and at three weeks, 25.7% of TAH versus 41.9% of TLH patients had resumed. At four weeks, 30.4% of TAH patients were back to routine activity, whereas only 2.8% of TLH patients required this long. Recovery beyond five weeks occurred only in the TAH group (23.8% at five weeks, 5.7% at six weeks or more). The mean time to resume routine activities was significantly shorter in the TLH group (2.64 ± 0.97 weeks) compared to the TAH group (4.67 ± 1.32 weeks), highlighting faster postoperative recovery with laparoscopic hysterectomy was showed in study by **Gavhane SP et al**[2]

Findings from other studies like **Kovac SR et al** and **Boike GM et al** were the longest surgical times were 210 minutes for abdominal and 240 minutes for laparoscopic hysterectomy, with average operating times ranging from two to four hours in expert reports.[9, 10] Shortest times were reported by surgeons performing over 100 laparoscopic procedures (65–180 minutes). **Aniuliene et al** reported less blood loss in laparoscopic versus abdominal hysterectomy (123.4 vs. 308.5 ml).[11] In the present study, mean blood loss was 220 ml for abdominal and 38 ml for laparoscopic hysterectomy. Major intraoperative complications occurred in 1.9% of abdominal and 0.95% of laparoscopic cases. Ambulation occurred earlier in laparoscopic cases (14 vs. 25 hours), with shorter intravenous therapy (16 vs. 35 hours) and catheter duration (12 vs. 24 hours). Hospital stay was significantly shorter for laparoscopic hysterectomy (2.14 vs. 6.64 days), consistent with previous studies like **Aniuliene R and Deprest JA** respectively.[11, 12] Overall patient satisfaction was higher following total laparoscopic hysterectomy compared to total abdominal hysterectomy in present study.

Conclusion: Laparoscopic hysterectomy provides several advantages over conventional abdominal hysterectomy, including reduced operative blood loss, less postoperative pain, shorter hospital stay, and faster recovery. The selection of surgical technique depends on the patient's clinical condition and the gynecologist's expertise. Therefore, gynecologists should be proficient in all hysterectomy techniques to ensure optimal, individualized patient care. In contemporary practice, laparoscopic hysterectomy should be considered the preferred approach whenever feasible. During the learning phase, endoscopic surgeons must exercise patience and perform procedures under the supervision of experienced mentors, progressing to independent practice only after acquiring adequate skills. This comparative study reinforces the superiority of laparoscopic hysterectomy over abdominal hysterectomy in terms of perioperative outcomes.

Limitation of the Study:

The study was conducted at a single center and involved a limited population, which may limit the generalizability of the results to other settings or populations.

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