

Surgical Trends and Clinical Outcomes of Hysterectomy for Benign Gynecological Diseases: A Retrospective Study

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Abstract:

Background: Hysterectomy is a common definitive surgical treatment for benign gynecological diseases, but evolving surgical approaches require periodic evaluation of trends and outcomes.

Aim: To analyze surgical trends and clinical outcomes of hysterectomy for benign gynecological conditions.

Methodology: This retrospective observational study included 80 women who underwent hysterectomy for benign indications at a tertiary care center. Data regarding demographic profile, indications, surgical approach, intraoperative findings, and postoperative outcomes were collected and analyzed using descriptive statistics.

Results: Most patients were aged 41–60 years (72.5%). The commonest indication was uterine fibroid (37.5%), followed by abnormal uterine bleeding (22.5%). Total abdominal hysterectomy (52.5%) was the most frequently performed procedure. Vaginal, laparoscopic, and laparoscopic-assisted approaches accounted for 20%, 17.5%, and 10%, respectively. Postoperative complications occurred in 22.5% of patients, while 77.5% had uneventful recovery. Minimally invasive procedures, particularly total laparoscopic hysterectomy, showed the shortest hospital stay (3.2 ± 0.7 days).

Conclusion: Hysterectomy for benign conditions is most common in perimenopausal women, with fibroids as the leading indication. Although abdominal hysterectomy remains predominant, minimally invasive techniques offer better recovery and shorter hospitalization.

Keywords: Hysterectomy, Benign Gynecological Diseases, Surgical Trends, Clinical Outcomes, Retrospective Study.

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Introduction

Hysterectomy is one of the most routinely performed major surgical procedures globally and is the definitive surgical treatment for a variety of gynecological diseases [1]. It is a surgical procedure where the uterus is removed with or without the cervix and adnexal structures depending on the type of pathology and patient. While there are multiple conservative medical and minimally invasive treatment options, hysterectomy remains indicated for women with persistent symptoms, recurrent disease, failure of medical management, and for those who no longer need to preserve fertility. With ongoing surgical advances, anaesthetic techniques as well as pre- and post-surgical care, hysterectomy is a more secure surgical treatment, and recovery is quicker, complications less frequent, and the procedure less traumatic. Hence, the assessment of the existing surgical practice and the results of surgical interventions has gained greater significance for optimizing patient care.

The vast majority of hysterectomies performed around the world are for benign gynecological diseases. These are such as uterine fibroids (leiomyoma), abnormal uterine bleeding (AUB), adenomyosis, endometriosis, chronic pelvic pain, benign ovarian tumor, and pelvic organ prolapse. Of these, uterine fibroids are the most common reason for hysterectomy due to heavy periods, dysmenorrhea, pelvic pain, infertility, anemia and decreased quality of life [2]. Likewise, adenomyosis and endometriosis can contribute to painful periods, chronic pelvic pain and heavy periods that can have a negative impact on physical, emotional and social health. Another significant indication that requires conservative treatment is pelvic organ prolapse, especially in postmenopausal women. For women with severe or recurrent symptoms, the definitive treatment is hysterectomy; other treatments for patients (hormonal therapy, endometrial ablation, uterine artery

embolization and myomectomy) may be appropriate for selected patients [3].

The surgical method of hysterectomy has undergone significant changes in the last few decades [4]. The abdominal hysterectomy, which offers excellent exposure of the pelvic organs, has been considered the standard procedure for the management of large uteri, extensive adhesions and complex pelvic pathology. It is, however, known to cause more pain after surgery, more blood loss, longer hospital stays, slower recovery and higher chances of wound problems after surgery than the minimally invasive methods are. Such constraints have prompted other surgical techniques to be used when possible.

“For women with uterine prolapse, vaginal hysterectomy is considered the preferred approach, and in some patients with few pelvic abnormalities, the operative time, postoperative complications, and cost of care are less with vaginal surgery; recovery is quicker [5]. Similarly, laparoscopic hysterectomy has become popular because of the benefits of minimally invasive surgery such as decreased postoperative pain, less blood loss during surgery, shorter hospital stay, quicker return to normal activity, and enhanced cosmetic results. Further advances in laparoscopic instruments, energy devices and imaging have broadened its use in nonmalignant gynecologic diseases [6]. However, the method of surgery will be determined by patient age, uterine size, previous pelvic surgery, adnexal disease, surgeon experience, institutional capabilities, and patient preference.

Evaluation of clinical outcomes after hysterectomy is necessary to assess safety and efficacy of the various surgical approaches [7]. Major outcome measures are operating time, blood loss, transfusion requirement, surgical complications and recovery time and infection after surgery, urologic and bowel injuries. The careful assessment of these parameters gives valuable information about surgical performance and can identify areas for enhanced patient safety and quality of surgical care [8]. Moreover, the tracking of hysterectomy trends can support clinical decision-making and help implement the most relevant surgical techniques for each patient.

Retrospective studies provide valuable information on the patient population undergoing hysterectomy, the range of benign gynecological disease requiring surgical treatment, changing surgical practices and clinical outcomes in the course of day-to-day practice. Studies like this are especially useful for understanding institutional experiences and what factors are related to surgical decision making and recovery. Additionally, they can offer proof that can inform future clinical practice, utilization of resources and quality of gynecological surgical care.

Thus, the aims of this current retrospective study were to assess the trends in surgery and outcomes of hysterectomy performed for benign gynecological

diseases. The aim of the study is to characterise patients, indications for surgery, the patterns of surgical approaches, the findings during the operation, postoperative complications and overall clinical outcome. This study should add to the existing literature with detailed data on current hysterectomy techniques and outcomes to facilitate evidence-based approaches to the management of women with benign gynecological conditions undergoing hysterectomy.”

Methodology

Study Design: The present study was conducted as a retrospective observational hospital-based study. The study evaluated the surgical trends and clinical outcomes of hysterectomy performed for benign gynecological diseases by reviewing the available hospital records of eligible patients.

Study Area: The study was conducted in the Department of Obstetrics and Gynaecology, Jan Nayak Karpoori Thakur Medical College and Hospital, Madhepura, Bihar, India.

Study Duration: The study was carried out over a period of one year from December 2024 to November 2025.

Study Participants: The study included women who had undergone hysterectomy for benign gynecological diseases during the study period and whose complete medical records were available in the hospital database.

Inclusion Criteria

- Women who underwent hysterectomy for benign gynecological diseases during the study period.
- Patients aged 18 years and above.
- Patients who underwent abdominal, vaginal, laparoscopic, or laparoscopic-assisted vaginal hysterectomy.
- Patients with complete medical records, including demographic details, clinical presentation, operative findings, postoperative outcomes, and histopathological reports.
- Patients whose final diagnosis confirmed a benign gynecological condition.

Exclusion Criteria

- Women who underwent hysterectomy for malignant gynecological diseases.
- Patients with obstetric indications requiring hysterectomy.
- Patients with incomplete or missing medical records.
- Women who underwent hysterectomy outside the study period.
- Patients who underwent emergency hysterectomy due to traumatic or life-threatening conditions.

Sample Size: A total of 80 patients who fulfilled the eligibility criteria were included in the study.

Procedure: After obtaining institutional permission, the medical records of eligible patients were retrospectively reviewed from the Department of Obstetrics and Gynaecology and the hospital record section. Data were collected from inpatient case files, operation theatre registers, discharge summaries, laboratory and imaging reports, operative notes, anaesthesia records, postoperative records, and histopathological reports. Demographic details, presenting complaints, comorbidities, clinical diagnosis, indications for hysterectomy, and preoperative investigations were recorded. Information regarding the type of hysterectomy performed, associated surgical procedures, operative duration, intraoperative blood loss, blood transfusion, and intraoperative complications was also collected. Postoperative outcomes, including complications, duration of hospital stay, need for reoperation, and histopathological findings, were reviewed to assess the clinical outcomes and confirm the benign nature of the disease. All collected data were entered into a structured data collection sheet and verified for completeness and accuracy before analysis. Surgical trends were evaluated based on the frequency of different hysterectomy techniques, while clinical outcomes were assessed using operative findings, postoperative recovery, complications, and hospital stay. Patient

confidentiality was maintained throughout the study.

Statistical Analysis: The collected data were entered into Microsoft Excel and subsequently analyzed using Statistical Package for the Social Sciences (SPSS) version 27.0. Descriptive statistics were used to summarize the data. Continuous variables were presented as mean and standard deviation, whereas categorical variables were expressed as frequencies and percentages. Appropriate statistical tests, including the Chi-square test for categorical variables and Student's t-test or one-way analysis of variance (ANOVA) for continuous variables wherever applicable, were used to compare different surgical approaches and clinical outcomes. A p-value of <0.05 was considered statistically significant.

Result

Table 1 shows the distribution of patients according to age group among the 80 study participants. The highest proportion of patients belonged to the 51–60 years age group, comprising 30 (37.5%) participants, followed by 41–50 years with 28 (35%) participants. Patients aged ≤40 years accounted for 12 (15%) of the study population, while those older than 60 years represented 10 (12.5%) participants. Overall, the findings indicate that the majority of patients were between 41 and 60 years of age, with the 51–60 years age group constituting the largest proportion of the study population.

Table 1: Distribution of Patients According to Age Group (n = 80)		
Age Group (Years)	Number (n)	Percentage (%)
≤40	12	15
41–50	28	35
51–60	30	37.5
>60	10	12.5
Total	80	100

Table 2 presents the indications for hysterectomy among the 80 study participants. Uterine fibroid (leiomyoma) was the most common indication, accounting for 30 (37.5%) cases. This was followed by abnormal uterine bleeding in 18 (22.5%) patients and adenomyosis in 12 (15%) patients. Uterovaginal prolapse was reported in 10 (12.5%) cases, while

endometrial hyperplasia accounted for 6 (7.5%) cases. Benign ovarian cyst was the least common indication, observed in 4 (5%) patients. Overall, uterine fibroid emerged as the leading indication for hysterectomy, followed by abnormal uterine bleeding, together constituting the majority of surgical cases in the study population.

Table 2: Indications for Hysterectomy Among the Study Participants (n = 80)		
Indication	Number (n)	Percentage (%)
Uterine fibroid (Leiomyoma)	30	37.5
Abnormal uterine bleeding	18	22.5
Adenomyosis	12	15
Uterovaginal prolapse	10	12.5
Endometrial hyperplasia	6	7.5
Benign ovarian cyst	4	5
Total	80	100

Table 3 presents the surgical approaches used for hysterectomy among the 80 study participants. Total abdominal hysterectomy (TAH) was the most frequently performed procedure, accounting for 42 (52.5%) cases. Vaginal hysterectomy (VH) was the second most common approach, performed in 16 (20%) patients, followed by total laparoscopic hysterectomy (TLH) in 14 (17.5%) patients.

Laparoscopic-assisted vaginal hysterectomy (LAVH) was the least commonly used technique, undertaken in 8 (10%) cases. Overall, the abdominal approach remained the predominant surgical method, while minimally invasive and vaginal procedures together constituted a substantial proportion of hysterectomies performed in the study population.

Table 3: Surgical Approaches Used for Hysterectomy (n = 80)

Surgical Approach	Number (n)	Percentage (%)
Total Abdominal Hysterectomy (TAH)	42	52.5
Vaginal Hysterectomy (VH)	16	20
Total Laparoscopic Hysterectomy (TLH)	14	17.5
Laparoscopic-Assisted Vaginal Hysterectomy (LAVH)	8	10
Total	80	100

“Table 4 presents the intraoperative and postoperative clinical outcomes among the 80 study participants who underwent hysterectomy. The majority of patients experienced no postoperative complications, with 62 (77.5%) demonstrating an uneventful recovery. In contrast, 18 (22.5%) patients developed at least one postoperative complication during the

study period. Overall, the findings indicate that most hysterectomy procedures were associated with favorable clinical outcomes, while postoperative complications occurred in less than one-quarter of the patients, suggesting a generally safe surgical profile for the procedures performed.

Table 4: Intraoperative and Postoperative Clinical Outcomes (n = 80)

Outcome	n	%
No postoperative complication	62	77.5
At least one complication	18	22.5
Total	80	100

Table 5 presents the duration of hospital stay according to the surgical approach among the 80 study participants. Patients who underwent total abdominal hysterectomy (TAH) had the longest mean hospital stay, with 5.8 ± 1.2 days. This was followed by vaginal hysterectomy (VH), which had a mean hospital stay of 4.3 ± 0.8 days. Patients undergoing laparoscopic-assisted vaginal hysterectomy (LAVH) had a

mean stay of 3.8 ± 0.9 days, while those treated with total laparoscopic hysterectomy (TLH) experienced the shortest hospitalization, with a mean stay of 3.2 ± 0.7 days. Overall, minimally invasive surgical approaches were associated with shorter hospital stays compared to the abdominal approach.

Table 5: Duration of Hospital Stay According to Surgical Approach (n = 80)

Surgical Approach	Number of Patients (n)	Mean Hospital Stay (Days) $\pm$ SD
Total Abdominal Hysterectomy (TAH)	42	5.8 ± 1.2
Vaginal Hysterectomy (VH)	16	4.3 ± 0.8
Total Laparoscopic Hysterectomy (TLH)	14	3.2 ± 0.7
Laparoscopic-Assisted Vaginal Hysterectomy (LAVH)	8	3.8 ± 0.9

Discussion

The present study revealed that the most prevalent indication for hysterectomy for benign gynecological diseases was uterine fibroid, the age range of the patients was middle aged, and abdominal hysterectomy was the most commonly employed surgical procedure. These results are similar to those from previous studies, but there are some differences around the globe depending on surgical skill, resident access to minimally invasive procedures, and geography.”

“In this study, most patients were aged between 41–60 years (72.5%) and the highest proportion was in 51–60 years age group (37.5%). This is consistent with several previous studies, which indicated that hysterectomy for non-cancer causes is most frequent at the perimenopausal age. Most hysterectomies were found to occur between 40 and 55 years of age, in a population-based study reported by Farquhar et al. (2002) [9] with the most common reason for surgery being symptomatic fibroids and abnormal uterine bleeding. In the USA, the age of 45–54 was also

the peak age for hysterectomy, indicating that this age group had greater symptom burden and failed to respond to conservative management as seen by Merrill 2008 [10]. This smaller percentage of younger women in our study also aligns with the global pattern of fertility-sparing strategies among younger women (less than 40 years) as suggested in clinical guidelines [11].

As far as indications, the largest percentage of hysterectomy was for uterine leiomyoma (37.5%) followed by abnormal uterine bleeding (22.5%) and adenomyosis (15%). This trend is similar to the international data, in which fibroids continue to be the most common benign indication for hysterectomy. Vilos et al. 2015 [12] conducted a large retrospective study where leiomyoma comprised almost 40–45% of hysterectomies performed due to a benign condition. Likewise, the National cohort reported by Wright et al. in 2013 [13] had more than one third of cases with a diagnosis of fibroids as their main indication, followed by abnormal uterine bleeding. The high prevalence of fibroids in our study may be attributed to the fact that they are most common in reproductive age women when medical treatment is not effective, requiring definitive surgery for pelvic pressure and heavy menstrual bleeding and infertility.

The second most frequent indication in our study was AUB which is similar to Thakar et al. (2002) [14] who found AUB to be a significant reason for hysterectomy in primary care practice particularly among women over 40 years of age. Adenomyosis was found in 15% of the cases in our study, which is a bit more than some Western studies but in line with the fact that an increasing number of cases of adenomyosis have been recognized as a significant cause of dysmenorrhea and heavy menstrual bleeding in modern gynecological practice.

As far as surgical approach, the most frequently used was total abdominal hysterectomy (TAH, 52.5%), followed by the vaginal hysterectomy (20%), total laparoscopic hysterectomy (17.5%) and laparoscopic-assisted vaginal hysterectomy (10%). The trend is global and in many resource-limited environments, abdominal hysterectomy is still more prominent than minimally invasive surgery (MIS). Likewise, Aarts et al. (2015) [15] found in a Cochrane review that laparoscopic hysterectomy is becoming more popular, and that although its safety is similar there is a longer operative time. They also commented that abdominal hysterectomy is still indicated in situations of large size uterus, adhesions and in suspected cases of malignancy, which may account for its continued prevalence in our study.”

“The present study showed that minimally invasive procedures were correlated with shorter hospital stays, and the shortest was for TLH (3.2 ± 0.7 days) compared to TAH (5.8 ± 1.2 days). This is in line

with Aarts et al. (2015) who found that patients undergoing laparoscopic and vaginal hysterectomy suffered from significantly less hospital stay and quicker recovery than those undergoing abdominal hysterectomy. In a similar study, Jahan et al. (2011) [16] showed that both vaginal and laparoscopic hysterectomy significantly limited the postoperative morbidity and hospital stay when compared to TAH. Smaller incisions, decreased postoperative pain and earlier mobilization are responsible for the fewer hospitalizations that were reported in MIS.

In the present study, the postoperative complications occurred in 22.5% and a satisfactory recovery was obtained in 77.5% of the patients. The complication rates are similar to those reported in previous studies. Ellessawy et al. 2015 [17] noted that the overall complication rate varied from 18% to 25%, depending on the surgical approach employed, with the most frequently observed complications being urinary tract injury and infection. The relatively low incidence of complications does not diminish the significance of surgical skill and the proper selection of patients, particularly for those undergoing laparoscopic-assisted surgery, as evidenced by the fact that some complications occurred in our study.

The results of this study confirm the extensive worldwide literature and data which show that hysterectomy is a safe and effective definitive procedure in women with benign gynecological diseases. Despite its continued dominance in many centers, however, minimally invasive surgery is clearly gaining ground globally as it has an excellent recovery profile following surgery.”

Conclusion

In the present retrospective study, hysterectomy for benign gynecological diseases was most commonly performed in women aged 41–60 years, with uterine fibroid emerging as the leading indication. Total abdominal hysterectomy remained the predominant surgical approach, although minimally invasive techniques such as vaginal and laparoscopic hysterectomy were also frequently utilized. Overall clinical outcomes were favorable, with most patients experiencing uneventful recovery and a relatively low complication rate. However, minimally invasive procedures demonstrated clear advantages in terms of shorter hospital stay and faster postoperative recovery compared to abdominal hysterectomy. The study highlights that despite advances in surgical techniques, abdominal hysterectomy continues to be widely practiced, particularly in complex cases or resource-limited settings. At the same time, the findings support the gradual shift toward minimally invasive approaches due to improved safety and recovery outcomes. These results emphasize the importance of individualized surgical planning to optimize patient care and outcomes in benign gynecological conditions.

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