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Original Article

Frequency of Intra-Operative and Post-Operative Complications of Hysterectomy: A Retrospective Cross-Sectional Study

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ABSTRACT

Background: Hysterectomy is a commonly performed major gynecological procedure, but it may be associated with important intra-operative and post-operative complications that influence patient safety, recovery, and healthcare burden. Objective: To determine the frequency and pattern of intra-operative and post-operative complications among patients undergoing abdominal and vaginal hysterectomy at Farooq Hospital, Lahore. Methods: This retrospective cross-sectional observational study included 84 women aged 20–60 years who underwent abdominal or vaginal hysterectomy during a four-month study period. Patients undergoing laparoscopic hysterectomy were excluded. Data were collected using a structured proforma and included demographic characteristics, parity, surgeon-related variables, type of hysterectomy, indication for surgery, intra-operative complications, and post-operative complications. Data were analyzed using SPSS version 27.0 and summarized as frequencies and percentages. Results: Abdominal hysterectomy was performed in 48 patients (57.1%) and vaginal hysterectomy in 36 patients (42.9%). The most common indications were fibroid uterus (26.2%), heavy bleeding (23.8%), and prolapse (21.4%). Intra-operative complications occurred in 65 patients (77.4%), most commonly bowel injury and pelvic bleeding (15.5% each), followed by bladder injury (14.3%) and ureteric injury (13.1%). Post-operative complications occurred in 69 patients (82.1%), most commonly wound infection (14.3%), anuria (13.1%), and hematoma (11.9%). Conclusion: Hysterectomy was associated with a considerable intra-operative and post-operative complication burden in this cohort. Route-wise complication reporting and inferential analysis are recommended in future studies. Keywords: Hysterectomy, abdominal hysterectomy, vaginal hysterectomy, intra-operative complications, post-operative complications, gynecological surgery.

INTRODUCTION

Hysterectomy remains one of the most frequently performed major gynecological procedures worldwide and is used for a range of benign and emergency indications, including fibroid uterus, heavy menstrual bleeding, uterovaginal prolapse, endometriosis, ovarian pathology, and uterine rupture. Although the procedure is effective for definitive management of many gynecological conditions, it is associated with clinically important intra-operative and post-operative complications, including bowel injury, bladder injury, ureteric injury, pelvic bleeding, hemorrhage, wound infection, anuria, hematoma, pulmonary embolism, incisional hernia, seroma, urinary retention, and anesthesia-related morbidity (1).

The route of hysterectomy is an important determinant of perioperative outcome. Abdominal hysterectomy provides wider operative exposure and remains necessary in patients with large uterus, suspected malignancy, dense adhesions, or complex pelvic pathology, but it is generally associated with greater tissue trauma, increased blood loss, wound-related morbidity, delayed mobilization, and longer recovery. Vaginal hysterectomy avoids an abdominal incision and is often associated with reduced operative trauma, fewer wound complications, shorter hospital stay, and faster functional recovery when performed in appropriately selected patients. However, route selection is influenced by uterine size, pelvic anatomy, indication for surgery, surgeon expertise, institutional resources, and patient-related risk factors, which makes direct comparison clinically important rather than purely procedural (2).

Existing literature generally supports lower morbidity with vaginal hysterectomy in suitable benign gynecological cases, while abdominal hysterectomy continues to play an essential role where vaginal access is technically unsafe or inadequate. Despite this broader evidence, complication patterns vary across settings because of differences in patient selection, surgical training, perioperative protocols, and availability of specialist support. Local hospital-based data are therefore important for identifying the most frequent complications in routine clinical practice and for guiding surgical counseling, risk stratification, operative planning, and post-operative surveillance (3).

The present study was designed to address this local evidence gap by evaluating intra-operative and post-operative complications among patients undergoing abdominal and vaginal hysterectomy at Farooq Hospital, Lahore. The study specifically focuses on patients rather than surgeon perceptions, thereby correcting the earlier inconsistency between the abstract and methods. The primary objective was to determine the frequency and pattern of intra-operative and post-operative complications of hysterectomy, while the comparative objective was to assess whether complication profiles differed between abdominal and vaginal hysterectomy among patients undergoing surgery for gynecological indications.

MATERIALS AND METHODS

This study was conducted as a retrospective cross-sectional observational study at Farooq Hospital, Lahore, over a four-month period. The retrospective cross-sectional design was selected because the objective was to evaluate the frequency and distribution of intra-operative and post-operative complications among patients who had already undergone hysterectomy during the defined study period, rather than to test an intervention or follow a prospective cohort over time. The study population comprised women aged 20–60 years who underwent abdominal or vaginal hysterectomy, including both elective and emergency procedures, during the study period. Patients who underwent laparoscopic hysterectomy were excluded to maintain a focused comparison between abdominal and vaginal routes, and patients with incomplete essential records were not included in the final analysis.

A total sample size of 84 patients was used, calculated at a 95% confidence level with an 8% margin of error and population correction factor as specified in the study protocol. Purposive sampling was applied, and eligible cases were selected according to predefined inclusion and exclusion criteria. The exposure variable was the route of hysterectomy, categorized as abdominal hysterectomy or vaginal hysterectomy. The main outcome variables were intra-operative complications and post-operative complications. Intra-operative complications included bowel injury, bladder injury, pelvic bleeding, ureteric injury, hemorrhage, vascular injury, genitourinary tract injury, or absence of intra-operative complication. Post-operative complications included wound infection, hemorrhage, anuria, hematoma, pulmonary embolism, incisional hernia, seroma, urinary retention, anesthesia-related complications, or absence of post-operative complication.

Data were collected using a structured proforma based on hospital records and operative documentation. The extracted variables included age group, parity, surgeon qualification, professional position of the operating surgeon, type of hysterectomy, indication for hysterectomy, intra-operative complications, and post-operative complications. To reduce information bias, data were recorded using uniform operational definitions for each complication, and entries were checked for completeness and internal consistency before analysis. Selection bias was minimized by applying the same eligibility criteria across both abdominal and vaginal hysterectomy cases. Potential confounding by patient and procedural factors was addressed descriptively through reporting of age, parity, indication for surgery, and surgeon-related characteristics.

Data were entered and analyzed using SPSS version 27.0. Categorical variables were summarized as frequencies and percentages. The distribution of demographic characteristics, surgical indications, hysterectomy route, intra-operative complications, and post-operative complications was presented in

numbered tables. For comparative analysis between abdominal and vaginal hysterectomy, categorical variables should be assessed using the Chi-square test or Fisher's exact test where expected cell counts are small. A p-value of <0.05 should be considered statistically significant. Where applicable, odds ratios with 95% confidence intervals should be calculated to quantify the magnitude of association between surgical route and complication occurrence. Missing or incomplete records should be excluded from variable-specific analysis, and final denominators should be reported clearly in each table.

Ethical principles were followed throughout the study. Patient confidentiality and anonymity were maintained during data extraction, entry, and analysis. Data were used only for research purposes and were stored securely with restricted access. The study was conducted according to institutional ethical requirements, and informed consent was documented according to the protocol. Data integrity was maintained by using a standardized data collection sheet, reviewing entered data against source records, and preserving a consistent denominator of 84 patients across methods, results, tables, and abstract.

RESULTS

A total of 84 patients undergoing hysterectomy were included in the analysis. Abdominal hysterectomy was performed in 48 patients (57.1%), while vaginal hysterectomy was performed in 36 patients (42.9%). Because complication frequencies were available only as overall aggregate counts and not stratified by surgical route, inferential comparison between abdominal and vaginal hysterectomy could not be performed from the available dataset.

Table 1. Demographic Characteristics of Patients (n = 84)

Variable	Category	Frequency (n)	Percentage (%)
Age	25–30 years	10	11.9
	31–40 years	24	28.6
	41–50 years	32	38.1
	>50 years	18	21.4
Parity	0–2	20	23.8
	3–4	34	40.5
	>5	30	35.7

Most patients were aged 41–50 years (n = 32, 38.1%), followed by 31–40 years (n = 24, 28.6%). The lowest proportion belonged to the 25–30 years age group (n = 10, 11.9%). Regarding parity, most patients had parity of 3–4 (n = 34, 40.5%), followed by parity ≥5 (n = 30, 35.7%), indicating that hysterectomy was more frequent among multiparous women.

Table 2. Surgeon-Related Characteristics (n = 84)

Variable	Category	Frequency (n)	Percentage (%)
Qualification	MBBS	8	9.5
	FCPS	60	71.4
	MCPS	14	16.7
	Other	2	2.4
Professional position	Consultant	30	35.7
	Registrar	24	28.6
	PGR	30	35.7

Most procedures were performed by FCPS-qualified surgeons (n = 60, 71.4%). Consultants and postgraduate residents each performed 30 procedures (35.7% each), while registrars performed 24 procedures (28.6%).

Table 3. Type of Hysterectomy (n = 84)

Type of hysterectomy	Frequency (n)	Percentage (%)
Abdominal hysterectomy	48	57.1
Vaginal hysterectomy	36	42.9
Total	84	100.0

Abdominal hysterectomy was the more commonly performed procedure, accounting for 48 cases (57.1%), compared with 36 cases (42.9%) of vaginal hysterectomy.

Table 4. Indications for Hysterectomy (n = 84)

Indication	Frequency (n)	Percentage (%)
Fibroid uterus	22	26.2
Heavy bleeding	20	23.8
Prolapse	18	21.4
Ovarian cyst	10	11.9
Endometriosis	8	9.5
Uterine rupture	4	4.8
Others	2	2.4
Total	84	100.0

The most common indication for hysterectomy was fibroid uterus (n = 22, 26.2%), followed by heavy bleeding (n = 20, 23.8%) and prolapse (n = 18, 21.4%). Less frequent indications included ovarian cyst (n = 10, 11.9%), endometriosis (n = 8, 9.5%), uterine rupture (n = 4, 4.8%), and other causes (n = 2, 2.4%).

Table 5. Intra-Operative Complications (n = 84)

Intra-operative complication	Frequency (n)	Percentage (%)
Bowel injury	13	15.5
Pelvic bleeding	13	15.5
Bladder injury	12	14.3
Ureteric injury	11	13.1
Hemorrhage	8	9.5
Vascular injury	4	4.8
Genitourinary tract injury	4	4.8
No intra-operative complication	19	22.6
Total	84	100.0

Overall, 65 patients (77.4%) experienced an intra-operative complication, while 19 patients (22.6%) had no recorded intra-operative complication. The most frequent intra-operative complications were bowel injury and pelvic bleeding, each observed in 13 patients (15.5%), followed by bladder injury in 12 patients (14.3%) and ureteric injury in 11 patients (13.1%). Hemorrhage was reported in 8 patients (9.5%), while vascular injury and genitourinary tract injury were each reported in 4 patients (4.8%).

Table 6. Post-Operative Complications (n = 84)

Post-operative complication	Frequency (n)	Percentage (%)
Wound infection	12	14.3
Anuria	11	13.1
Hematoma	10	11.9
Hemorrhage	8	9.5
Anesthesia complications	8	9.5
Incisional hernia	6	7.1
Urinary retention	6	7.1
Pulmonary embolism	4	4.8
Seroma	4	4.8
No post-operative complication	15	17.9
Total	84	100.0

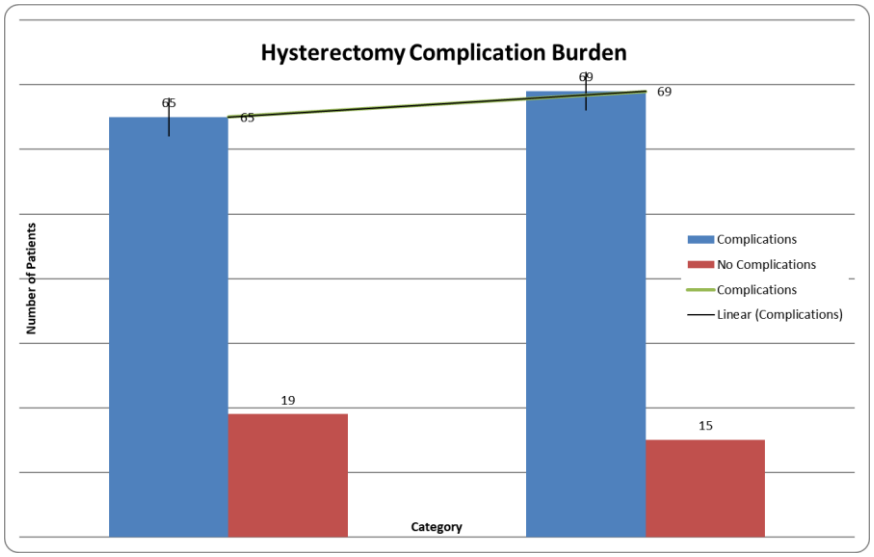

Figure 1. Comparative Burden of Intra-Operative and Post-Operative Complications

Post-operatively, 69 patients (82.1%) experienced at least one recorded complication, while 15 patients (17.9%) had no post-operative complication. Wound infection was the most common post-operative complication (n = 12, 14.3%), followed by anuria (n = 11, 13.1%) and hematoma formation (n = 10, 11.9%). Hemorrhage and anesthesia-related complications were each reported in 8 patients (9.5%). Incisional hernia and urinary retention were each observed in 6 patients (7.1%), while pulmonary embolism and seroma were the least frequent complications, each occurring in 4 patients (4.8%).

Table 7. Overall Complication Burden Derived from Aggregate Data (n = 84)

Complication domain	Any complication n (%)	No complication n (%)
Intra-operative complications	65 (77.4)	19 (22.6)
Post-operative complications	69 (82.1)	15 (17.9)

The complication burden showed that post-operative complications were slightly more frequent than intra-operative complications. Overall, 69 patients (82.1%) had a recorded post-operative complication compared with 65 patients (77.4%) who had an intra-operative complication. The proportion of patients without complications was higher intra-operatively (22.6%) than post-operatively (17.9%).

Figure showed, intra-operative complications were recorded in 65 of 84 patients (77.4%), while post-operative complications were recorded in 69 of 84 patients (82.1%). The post-operative complication burden exceeded the intra-operative burden by 4 patients, corresponding to an absolute difference of 4.7 percentage points. This pattern suggests that post-operative surveillance should remain a key clinical priority after hysterectomy, particularly for wound infection, anuria, hematoma, hemorrhage, urinary retention, and anesthesia-related complications.

DISCUSSION

The present study evaluated intra-operative and post-operative complications among 84 patients undergoing hysterectomy at Farooq Hospital, Lahore. Abdominal hysterectomy was more frequently performed than vaginal hysterectomy, accounting for 48 cases (57.1%) compared with 36 cases (42.9%). The most common indications were fibroid uterus (26.2%), heavy bleeding (23.8%), and prolapse (21.4%), indicating that most procedures were performed for benign gynecological conditions. This pattern is consistent with previous evidence showing that fibroids, abnormal uterine bleeding, and prolapse remain major indications for hysterectomy in routine gynecological practice (1–4).

Intra-operative complications were recorded in 65 patients (77.4%), while 19 patients (22.6%) had no intra-operative complication. The most frequent intra-operative events were bowel injury and pelvic bleeding, each occurring in 13 patients (15.5%), followed by bladder injury in 12 patients (14.3%) and

ureteric injury in 11 patients (13.1%). These findings suggest that visceral and urinary tract injuries were clinically important sources of intra-operative morbidity in this cohort. Previous comparative studies have emphasized that organ injury during hysterectomy is influenced by surgical route, pelvic adhesions, uterine size, endometriosis, previous pelvic surgery, and surgeon experience (5–8). Although abdominal hysterectomy is generally associated with greater tissue handling and wider dissection, the present dataset did not provide complication counts separately by route; therefore, direct statistical comparison between abdominal and vaginal hysterectomy could not be performed without raw cross-tabulated data.

Post-operative complications were slightly more frequent than intra-operative complications, occurring in 69 patients (82.1%), while 15 patients (17.9%) had no post-operative complication. Wound infection was the leading post-operative complication (14.3%), followed by anuria (13.1%), hematoma (11.9%), hemorrhage (9.5%), and anesthesia-related complications (9.5%). The predominance of wound infection and hematoma is clinically relevant because these complications may prolong hospital stay, increase antibiotic use, delay mobilization, and raise the risk of readmission. Earlier studies have similarly reported higher wound-related morbidity after abdominal hysterectomy because of abdominal incision, tissue trauma, and delayed ambulation, whereas vaginal hysterectomy is generally associated with fewer wound complications and faster recovery in appropriately selected patients (9–12).

The findings should be interpreted with caution because the study used aggregate complication frequencies rather than route-specific complication tables. The stated hypothesis required comparison of intra-operative and post-operative complications between abdominal and vaginal hysterectomy, but the available results did not provide sufficient stratified data to calculate p-values, odds ratios, confidence intervals, or adjusted associations. This limits the ability to determine whether the observed complication burden was independently related to surgical route or influenced by indication, age, parity, emergency status, surgeon qualification, or baseline clinical risk. Future analyses should therefore present complication outcomes separately for abdominal and vaginal hysterectomy and apply Chi-square or Fisher's exact tests with odds ratios and 95% confidence intervals.

Despite these limitations, the study highlights important areas for clinical improvement. The relatively high frequency of bowel, bladder, ureteric, and bleeding-related complications indicates the need for careful pre-operative assessment, risk stratification, documentation of previous pelvic surgery, and availability of senior surgical support in complex cases. The high post-operative complication burden further supports strict infection-control protocols, early recognition of urinary complications, wound surveillance, appropriate thromboprophylaxis, early mobilization, and structured follow-up. These steps are especially important in single-center hospital settings where surgical outcomes can be improved through standardized perioperative pathways and continuous audit.

CONCLUSION

This study found that hysterectomy was most commonly performed for fibroid uterus, heavy bleeding, and prolapse, with abdominal hysterectomy used more frequently than vaginal hysterectomy. Intra-operative complications were recorded in 77.4% of patients, most commonly bowel injury, pelvic bleeding, bladder injury, and ureteric injury, while post-operative complications were recorded in 82.1% of patients, most commonly wound infection, anuria, hematoma, hemorrhage, and anesthesia-related complications. Although vaginal hysterectomy is generally supported in the literature as the preferred route for suitable benign gynecological conditions because of lower morbidity and faster recovery, this study could not statistically compare abdominal and vaginal hysterectomy because route-specific complication data were not available. Future studies should use larger multicenter samples, route-wise complication reporting, and inferential analysis to generate stronger evidence for surgical decision-making.

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