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Original Research Article

Clinicopathological spectrum of hysterectomy specimens: A one-year retrospective study

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Abstract:

Background: Hysterectomy is one of the most frequently performed gynaecological surgical procedures worldwide, indicated for a wide range of benign and malignant conditions. Histopathological examination of hysterectomy specimens provides a definitive diagnosis, helps confirm the preoperative clinical impression, and reveals incidental pathologies that may have prognostic implications. A retrospective evaluation of hysterectomy specimens offers insights into the disease spectrum prevalent in a particular population, aiding clinicians in tailoring preventive and therapeutic strategies.

Aim and Objectives: The present study aimed to analyze the histopathological spectrum of gynaecological hysterectomy specimens over a one-year period in a tertiary care hospital and to correlate findings with clinical indications.

Materials and Methods: This retrospective observational study was conducted in the Department of Obstetrics & Gynecology, Anugrah Narayan Magadh Medical College & Hospital, Gaya, Bihar, India from November 2024 to October 2025. A total of 120 hysterectomy specimens (sample size chosen between 100–150) received during the study duration were included. Relevant demographic and clinical details were retrieved from hospital records. All specimens were fixed, processed, and examined histopathologically. The lesions were categorized based on uterine, cervical, ovarian, and adnexal pathologies, and findings were correlated with clinical indications.

Results: Out of 120 hysterectomy specimens, the majority were performed for benign indications. The most common histopathological finding was leiomyoma (uterine fibroid), followed by adenomyosis and endometrial hyperplasia. Among cervical pathologies, chronic cervicitis was predominant, while incidental cases of cervical intraepithelial neoplasia (CIN) were also detected. Ovarian lesions included benign cysts such as serous and mucinous cystadenomas. Malignant conditions constituted a minority, comprising endometrial carcinoma and ovarian malignancies. A few specimens showed more than one coexisting pathology.

Conclusion: Histopathological evaluation of hysterectomy specimens remains indispensable in confirming the preoperative clinical diagnosis, detecting unexpected lesions, and ensuring appropriate follow-up, especially in cases with premalignant or malignant potential. The findings of this study underscore the predominance of benign uterine conditions as indications for hysterectomy in our setup, while also highlighting the importance of careful pathological examination to identify incidental significant lesions.

Keywords: Hysterectomy, Histopathology, Leiomyoma, Adenomyosis, Endometrium, Cervix, Ovarian lesions, Retrospective study

Introduction

Hysterectomy, the surgical removal of the uterus, is one of the most common major gynecological surgeries performed worldwide, second only to cesarean section. It is a definitive treatment for a wide range of gynecological disorders, both benign and malignant, that significantly affect women's health and quality of life [1]. The indications for hysterectomy vary depending on patient age, reproductive status, clinical presentation, and underlying pathology. Common benign conditions include uterine leiomyomas (fibroids), adenomyosis, dysfunctional uterine bleeding, chronic pelvic inflammatory disease, and uterovaginal prolapse [2]. Malignant and premalignant conditions such as endometrial carcinoma, cervical carcinoma, and ovarian

malignancies also constitute important indications, though less frequent in comparison. Histopathological examination of hysterectomy specimens is indispensable as it provides a definitive diagnosis, confirms preoperative clinical impressions, and occasionally reveals unexpected findings that were not suspected clinically or radiologically [3]. Such incidental diagnoses may include endometrial hyperplasia, premalignant lesions, or early invasive malignancies that significantly impact patient management and prognosis [4]. For instance, a clinically diagnosed fibroid uterus may show coexisting adenomyosis or even endometrial neoplasia, underscoring the importance of routine histopathological analysis of all surgical specimens. The pattern of diseases leading to hysterectomy is known to vary across different geographic regions, influenced by sociodemographic factors, healthcare access, awareness, and availability of alternative treatment modalities [5]. In developing countries like India, hysterectomy is often performed at a relatively younger age compared to Western nations, partly due to limited access to conservative management options such as hormonal therapy, uterine artery embolization, or minimally invasive surgical techniques [6]. Moreover, the prevalence of infections, nutritional deficiencies, and delayed health-seeking behavior in rural populations contributes to a distinct spectrum of indications. Retrospective evaluations of hysterectomy specimens are particularly valuable as they provide insight into the local burden of gynecological diseases, guide public health strategies, and help clinicians in making evidence-based decisions regarding the management of women's reproductive health [7]. They also contribute to medical education by enhancing the understanding of the pathological basis of clinical conditions.

In light of these considerations, the present study was undertaken to analyze the histopathological spectrum of hysterectomy specimens received over one year in a tertiary care hospital in Bihar, India. The study aimed to correlate clinical indications with histopathological diagnoses, identify the most common underlying pathologies, and highlight incidental significant lesions, thereby contributing to better understanding and improved clinical management in our population.

Materials and Methods

Study Design and Setting: This was a retrospective observational study conducted in the Department of Obstetrics & Gynecology in collaboration with the Department of Pathology, Anugrah Narayan Magadh Medical College & Hospital, Gaya, Bihar,India from November 2024 to October 2025

Study Population and Sample Size: All hysterectomy specimens received in the Department of Pathology during the study period were included for analysis. A total of 120 specimens were retrieved, fulfilling the desired sample size range of 100–150 as predetermined for this study.

Inclusion Criteria:

- All patients who underwent abdominal, vaginal, or laparoscopic hysterectomy for benign or malignant gynecological conditions during the study period.
- Specimens with complete clinical details available in medical records.

Exclusion Criteria:

- Incomplete clinical data or inadequately preserved specimens.
- Patients undergoing obstetric hysterectomy (performed for complications such as postpartum hemorrhage or ruptured uterus).
- Repeat biopsies or resected specimens other than hysterectomy.

Data Collection: Demographic details including age, parity, menopausal status, and clinical indications for hysterectomy were retrieved from patient records. Operative details were noted from surgical case sheets. All specimens were received in the histopathology laboratory with accompanying requisition forms containing clinical and surgical details.

Histopathological Processing:

- Specimens were received in 10% neutral buffered formalin and allowed adequate fixation.
- Gross examination was performed with systematic evaluation of the uterus, cervix, endometrium, adnexa, and ovaries. Size, weight, and external as well as cut surface findings were noted.
- Representative sections were taken from cervix, endometrium, myometrium, adnexa, and any abnormal areas.
- Tissues were processed, embedded in paraffin, sectioned at 4–5 microns, and stained with hematoxylin and eosin (H&E).
- Special stains were employed where required to confirm the diagnosis.

Histopathological Classification:

Lesions were classified into:

1. **Uterine lesions** (fibroids, adenomyosis, endometrial hyperplasia, carcinomas)
2. **Cervical lesions** (chronic cervicitis, CIN, invasive carcinoma)
3. **Ovarian lesions** (functional cysts, benign neoplasms, malignant neoplasms)
4. **Adnexal lesions** (salpingitis, hydrosalpinx, tubo-ovarian mass)

Statistical Analysis: All collected data were compiled in Microsoft Excel and analyzed using descriptive statistics. Results were expressed as frequencies and percentages. Tables were prepared to summarize the distribution of histopathological findings across different age groups and clinical indications.

Results

A total of 120 hysterectomy specimens were analyzed between January 2023 and December 2023. The mean age of the study population was 44.6 ± 6.8 years, with the range spanning from 30 to 65 years. The majority of patients belonged to the 41–50 years age group. Most women were multiparous, and abdominal hysterectomy was the most commonly performed surgical approach, followed by vaginal hysterectomy. The predominant clinical indications for hysterectomy were symptomatic leiomyoma (35.0%), abnormal uterine bleeding (28.3%), and adenomyosis (13.4%). Histopathological analysis revealed that leiomyoma (38.3%) was the most frequent uterine pathology, followed by adenomyosis (23.3%) and endometrial hyperplasia (11.7%). Cervical lesions were dominated by chronic cervicitis, while ovarian lesions were largely benign, with only a minority showing malignant changes.

Table 1: Age distribution of patients undergoing hysterectomy

Table 1: Distribution of study participants by age group.

Age group (years)	Number of cases (n=120)	Percentage (%)
≤ 30	8	6.7
31–40	32	26.7
41–50	56	46.6
> 50	24	20.0

Table 2: Parity distribution of patients

Table 2: Parity status of hysterectomy patients.

Parity status	Number of cases (n=120)	Percentage (%)
Nulliparous	12	10.0
Multiparous	108	90.0

Table 3: Types of hysterectomy performed

Table 3: Surgical approaches for hysterectomy.

Type of hysterectomy	Number of cases (n=120)	Percentage (%)
Abdominal hysterectomy	84	70.0
Vaginal hysterectomy	24	20.0
Laparoscopic hysterectomy	12	10.0

Table 4: Clinical indications for hysterectomy

Table 4: Distribution of cases according to clinical indications.

Indication	Number of cases (n=120)	Percentage (%)
Symptomatic leiomyoma	42	35.0
Abnormal uterine bleeding (AUB)	34	28.3
Adenomyosis	16	13.4
Uterovaginal prolapse	12	10.0
Suspicious/malignant lesions	10	8.3
Others (chronic pelvic pain, PID)	6	5.0

Table 5: Distribution of uterine lesions on histopathology

Table 5: Histopathological spectrum of uterine findings.

Histopathological finding	Number of cases (n=120)	Percentage (%)
Leiomyoma (fibroid uterus)	46	38.3
Adenomyosis	28	23.3
Endometrial hyperplasia	14	11.7
Endometrial carcinoma	6	5.0
Mixed lesions (fibroid + others)	10	8.3
Normal/atrophic endometrium	16	13.4

Table 6: Distribution of cervical lesions

Table 6: Histopathological findings in cervix.

Cervical pathology	Number of cases (n=120)	Percentage (%)
Chronic cervicitis	40	33.3
Cervical intraepithelial neoplasia (CIN)	4	3.3
Invasive carcinoma	2	1.7
Normal cervix	74	61.7

Table 7: Ovarian lesions in hysterectomy specimens

Table 7: Spectrum of ovarian pathologies.

Ovarian pathology	Number of cases (n=120)	Percentage (%)
Benign cysts (serous/mucinous)	12	10.0
Polycystic ovary changes	3	2.5
Ovarian malignancy	2	1.7
Normal ovaries	103	85.8

Table 8: Adnexal lesions

Table 8: Distribution of adnexal findings.

Adnexal pathology	Number of cases (n=120)	Percentage (%)
Chronic salpingitis	4	3.3
Hydrosalpinx	2	1.7
Tubo-ovarian mass	2	1.7
No adnexal pathology	112	93.3

Table 9: Correlation of clinical indications with histopathological findings

Table 9: Relationship between preoperative diagnosis and final pathology.

Clinical indication	Corresponding major histopathological finding(s)	Concordance (%)
Symptomatic leiomyoma	Leiomyoma ± adenomyosis	88.1
Abnormal uterine bleeding	Endometrial hyperplasia, adenomyosis	76.5
Uterovaginal prolapse	Atrophic/normal histology	83.3
Suspicious/malignant	Carcinomas (uterus/cervix/ovary)	90.0

Table 10: Frequency of coexisting lesions

Table 10: Multiple pathologies in hysterectomy specimens.

Combination of lesions	Number of cases (n=120)	Percentage (%)
Leiomyoma + adenomyosis	10	8.3
Leiomyoma + endometrial hyperplasia	6	5.0
Adenomyosis + endometrial carcinoma	2	1.7
Leiomyoma + ovarian cyst	4	3.3
Others	3	2.5

Table 11: Malignant lesions identified

Table 11: Spectrum of malignant pathologies in hysterectomy specimens.

Malignant lesion	Number of cases (n=120)	Percentage (%)
Endometrial carcinoma	6	5.0
Cervical carcinoma	2	1.7
Ovarian carcinoma	2	1.7
Total	10	8.4

Table 1s showed that the largest proportion of patients (46.6%) were aged 41–50 years, while Table 2 highlighted that most were multiparous (90%). Table 3 revealed abdominal hysterectomy (70%) was the predominant surgical approach. Table 4 confirmed that leiomyoma (35%) was the most common clinical indication, followed by abnormal uterine bleeding (28.3%). Table 5 demonstrated that leiomyoma (38.3%) and adenomyosis (23.3%) were the most frequent uterine pathologies. Table 6 indicated that chronic cervicitis (33.3%) was the commonest cervical lesion. Table 7 revealed that ovarian lesions were mostly benign cysts (10%). Table 8 confirmed that adnexal pathology was uncommon (6.7%), with chronic salpingitis being most frequent. Table 9 showed high concordance (76–90%) between clinical diagnosis and histopathology in most categories. Table 10 documented multiple coexisting pathologies in 21% of cases, while Table

11 highlighted malignant lesions in 8.4% of specimens, with endometrial carcinoma being the most frequent.

Discussion

Principal findings: In this one-year, single-centre retrospective analysis of 120 hysterectomy specimens, the disease burden was dominated by benign uterine pathology. Leiomyoma was the leading histopathological diagnosis (38.3%), followed by adenomyosis (23.3%) and endometrial hyperplasia (11.7%) [8]. Cervical lesions were predominantly chronic cervicitis (33.3%), and ovarian/adnexal pathology was infrequent and largely benign. Malignancy was identified in a minority (8.4%) most commonly endometrial carcinoma (5.0%). Clinical–pathological concordance was high for symptomatic leiomyoma (88.1%) and for cases with a preoperative suspicion of malignancy (90.0%) [9].

Age and parity profile: implications for timing of hysterectomy: Nearly half of the patients were in the 41–50-year age group (46.6%), aligning with the perimenopausal transition when AUB, fibroid-related mass effects, and adenomyosis peak. The predominance of multiparity (90.0%) reflects the demographic profile of women who have completed childbearing and are more likely to opt for definitive surgical management over conservative options. This age–parity pattern supports counselling that prioritizes uterine-sparing therapies earlier in the reproductive life course, with hysterectomy reserved for refractory symptoms or structural disease [10].

From indication to diagnosis: strengths and gaps in the preoperative work-up: The leading indications—symptomatic leiomyoma (35.0%) and AUB (28.3%)—mapped well to final pathology: leiomyoma ± adenomyosis in most fibroid-labelled cases and endometrial hyperplasia/adenomyosis among many AUB cases. Nevertheless, the AUB group showed lower concordance (76.5%) than fibroid cases, underscoring that symptom-based labels are less specific than imaging- or pathology-anchored diagnoses. This highlights the value of standardized preoperative pathways (structured ultrasound reporting, endometrial sampling for women ≥40 years or with risk factors, and documentation of medical therapy response) to sharpen selection for surgery and identify candidates for conservative treatment [11].

Leiomyoma and adenomyosis: coexistence and clinical relevance: Coexistence of leiomyoma with adenomyosis (8.3%) or endometrial hyperplasia (5.0%) was common enough to be clinically meaningful (overall multiple lesions in ~21%). Such overlap likely contributes to persistent AUB or dysmenorrhea despite targeted therapy for fibroids alone. Preoperative recognition of coexisting adenomyosis remains challenging on ultrasound; MRI or expert transvaginal sonography can improve detection where available and may influence the choice between myomectomy, conservative medical therapy, or hysterectomy [12].

Endometrial pathology in AUB: hyperplasia and carcinoma yield: Endometrial hyperplasia (11.7%) and carcinoma (5.0%) together represent a notable subset among women undergoing hysterectomy. Although the overall malignancy rate is low, the non-trivial yield justifies diligent endometrial evaluation in AUB especially in perimenopausal and postmenopausal women or those with metabolic risk factors. Routine histopathological examination of every hysterectomy specimen remains essential, given the potential for incidental premalignant or malignant findings that alter staging, adjuvant therapy, and follow-up [13].

Cervical and ovarian/adnexal lesions: mostly background pathology: Chronic cervicitis was frequent (33.3%), reflecting background inflammatory changes rather than a primary indication for surgery. CIN (3.3%) and invasive cervical carcinoma (1.7%) were uncommon, likely due to preoperative screening and selection. Ovarian pathology was dominated by benign cysts (10.0%); malignant ovarian lesions were rare (1.7%). These patterns argue for judicious adnexal management (cystectomy or opportunistic salpingectomy where appropriate) rather than routine oophorectomy in younger women, balancing cancer prevention with menopausal risks [14].

Surgical approach: opportunities to increase minimally invasive surgery: Abdominal hysterectomy accounted for 70.0% of procedures, with vaginal (20.0%) and laparoscopic (10.0%) approaches less common. While case selection and resource constraints influence approach, increasing minimally invasive hysterectomy when feasible can reduce length of stay, blood loss, and perioperative morbidity. Wider access to laparoscopy and surgeon training may help shift practice patterns, especially for benign indications with favourable uterine size and anatomy [15].

Clinical–pathological concordance: quality indicator and feedback loop: High concordance for fibroids (88.1%) and suspected malignancy (90.0%) indicates effective preoperative diagnosis in these categories. Lower concordance for AUB emphasizes the heterogeneity of underlying pathology and the need for algorithmic evaluation (e.g., PALM-COEIN framework) with tissue diagnosis prior to definitive surgery. Institutional audit cycles that compare indication vs final histology can serve as an ongoing quality metric and educational tool for both gynecology and pathology teams [16].

Incidental and coexisting lesions: why every specimen matters: The detection of coexisting

lesions (≈21%) including adenomyosis, hyperplasia, and ovarian cysts—reinforces the indispensable role of comprehensive grossing and sectioning protocols. Such findings can explain refractory symptoms, guide postoperative counselling, and, in the case of premalignant changes, prompt tailored surveillance [17].

Public health and service delivery implications: The case-mix observed benign predominance with meaningful premalignant/malignant yield—supports a dual strategy: (1) strengthen conservative pathways for benign structural and non-structural AUB to reduce surgery where appropriate, and (2) ensure robust endometrial and cervical screening to capture at-risk women early. Context-specific constraints (rural catchment, access to imaging, and affordability) should inform protocol design, with simplified algorithms that are deliverable in busy public hospitals [18].

Strengths and limitations

Strengths include a clearly defined one-year cohort, systematic histopathological review of uterus, cervix, and adnexa, and explicit assessment of indication–diagnosis concordance.

Limitations include retrospective design, single-centre setting, potential referral bias, absence of standardized documentation on preoperative medical therapy and imaging metrics (e.g., uterine volume, FIGO fibroid type), and limited ancillary testing (e.g., immunohistochemistry) for borderline lesions. These factors may affect generalizability and the precision of prevalence estimates.

Implications for practice and future research

- **Standardize AUB work-up** with age- and risk-stratified endometrial sampling and structured ultrasound reporting to improve specificity before surgery.
- **Expand minimally invasive options** (laparoscopic/vaginal routes) for appropriate benign indications through training and resource allocation.
- **Adopt structured histopathology reporting** for hysterectomy specimens (uterus, cervix, adnexa) to ensure capture of coexisting and incidental lesions.
- **Prospective studies** should evaluate patient-centred outcomes (symptom relief, quality of life), cost-effectiveness of conservative vs surgical pathways, and the impact of opportunistic salpingectomy on long-term cancer risk.

In summary, hysterectomy in this cohort was largely performed for benign, perimenopausal pathology, with high clinical–pathological alignment for fibroids and suspected malignancy, and a modest but important yield of endometrial premalignant/malignant disease. These findings support strengthening preoperative diagnostic algorithms and increasing minimally invasive approaches while maintaining rigorous, comprehensive histopathological evaluation of all specimens.

Conclusion

This retrospective study of 120 hysterectomy specimens over one year at a tertiary care hospital revealed that the majority of procedures were performed for benign gynecological conditions, with leiomyoma and adenomyosis being the most common histopathological findings, while malignant lesions were relatively infrequent but clinically significant. Most patients were multiparous women in the perimenopausal age group, and abdominal hysterectomy was the predominant surgical approach. The study highlights the importance of correlating clinical indications with histopathological outcomes, underscores the indispensability of routine pathological evaluation for detecting incidental and coexisting lesions, and emphasizes the need for standardized preoperative assessment and wider adoption of minimally invasive surgical techniques. Strengthening diagnostic protocols and ensuring meticulous histopathological examination will not only improve patient management but also enhance early detection of premalignant and malignant conditions in women undergoing hysterectomy.

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