

Research Article

HISTOPATHOLOGICAL ANALYSIS OF HYSTERECTOMY SPECIMENS IN A TERTIARY CARE CENTRE: A RETROSPECTIVE STUDY

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Abstract: **Introduction:** Hysterectomy is one of the most commonly performed gynaecological surgical procedures worldwide and serves as a definitive treatment for various benign and malignant uterine conditions. Histopathological examination of hysterectomy specimens plays a crucial role in confirming clinical diagnoses, identifying incidental lesions, and establishing clinicopathological correlations. Retrospective analysis of hysterectomy specimens provides valuable epidemiological data regarding the spectrum of gynaecological diseases encountered in routine clinical practice. **Aim:** To analyze the histopathological findings in hysterectomy specimens received at a tertiary care centre and evaluate the spectrum of gynaecological lesions identified on microscopic examination. **Objectives:** 1To determine the various histopathological lesions involving the uterus, cervix, endometrium, fallopian tubes, and ovaries in hysterectomy specimens. 2To correlate the clinical indications for hysterectomy with the corresponding histopathological findings. **Materials and Methods:** A hospital-based retrospective descriptive study was conducted in the Department of Pathology at a tertiary care teaching hospital over a period of two years. A total of 150 hysterectomy specimens were included in the study. Relevant clinical information, including age, presenting complaints, clinical diagnosis, and indications for hysterectomy, was collected from pathology records. Gross and microscopic examinations of all specimens were performed using standard histopathological techniques. Histopathological findings involving the cervix, endometrium, myometrium, fallopian tubes, and ovaries were documented and statistically analyzed. Descriptive statistics, Pearson's Chi-square test, and Fisher's exact test were employed wherever appropriate. A p-value of <0.05 was considered statistically significant. **Results:** The majority of patients belonged to the 41–50 years age group (45.3%), with a mean age of 46.8 ± 8.7 years. Uterine leiomyoma was the most common clinical indication for hysterectomy (34.7%), followed by abnormal uterine bleeding (25.3%) and adenomyosis (13.3%). Histopathological examination revealed leiomyoma (38.7%) as the most common lesion, followed by adenomyosis (21.3%) and chronic cervicitis (17.3%). Histopathological confirmation of the clinical diagnosis was observed in the majority of cases, and a statistically significant association was noted between clinical indications and histopathological findings ($p = 0.013$). Age-wise analysis demonstrated a significant association between advancing age and the occurrence of premalignant and malignant lesions ($p = 0.004$). **Conclusion:** Histopathological examination of hysterectomy specimens remains an indispensable diagnostic tool for confirming clinical diagnoses and identifying significant gynecological lesions. Benign uterine pathologies, particularly leiomyoma and adenomyosis, constitute the majority of indications for hysterectomy. Routine microscopic evaluation facilitates the detection of incidental premalignant and malignant lesions and provides valuable clinicopathological information that contributes to optimal patient management and improved gynecological care.

Keywords: Hysterectomy; Histopathology; Leiomyoma; Adenomyosis; Abnormal uterine bleeding; Clinicopathological correlation.

INTRODUCTION

Hysterectomy is one of the most commonly performed major gynaecological surgical procedures worldwide and remains the definitive treatment for a wide spectrum of benign and malignant uterine pathologies. It is frequently indicated for conditions such as uterine leiomyoma, abnormal uterine bleeding, adenomyosis, endometrial hyperplasia, pelvic organ prolapse, chronic pelvic pain, and gynaecological malignancies. Histopathological examination of hysterectomy specimens is considered the gold standard for confirming preoperative diagnoses and identifying incidental

pathological lesions that may significantly influence postoperative management and prognosis.¹

Globally, hysterectomy accounts for a substantial proportion of gynaecological surgeries, with millions of procedures performed annually. In developed countries, approximately one in every three women undergoes hysterectomy before the age of 60 years. Although advances in minimally invasive and uterus-preserving treatment modalities have reduced hysterectomy rates in certain populations, it continues to be an indispensable

surgical intervention in appropriately selected patients. The procedure provides an opportunity for comprehensive pathological evaluation of the uterus, cervix, fallopian tubes, and ovaries, thereby facilitating accurate clinicopathological correlation.²

Histopathological assessment of hysterectomy specimens plays a pivotal role in determining the exact aetiology of gynaecological disorders. Several studies have demonstrated discrepancies between clinical diagnoses and histopathological findings, emphasizing the importance of routine microscopic examination of all hysterectomy specimens. The identification of incidental lesions such as adenomyosis, cervical intraepithelial neoplasia, endometrial hyperplasia, or occult malignancies significantly contributes to patient care and clinical decision-making.³ Histopathological analysis not only validates surgical indications but also provides valuable epidemiological data regarding the prevalence of gynaecological diseases in different populations.

Uterine leiomyoma is the most common benign indication for hysterectomy worldwide and predominantly affects women in the fourth and fifth decades of life. Adenomyosis, abnormal uterine bleeding, and uterovaginal prolapse are also frequently encountered indications across both developed and developing nations. Histopathological examination of hysterectomy specimens has consistently demonstrated leiomyoma as the most prevalent uterine pathology, often occurring in association with adenomyosis or endometrial abnormalities.⁴ The coexistence of multiple pathological entities within a single specimen further underscores the necessity for meticulous gross and microscopic evaluation.

In India, hysterectomy remains a frequently performed gynaecological procedure, particularly among women in rural and semi-urban populations. Several Indian studies have reported that abnormal uterine bleeding and symptomatic fibroids constitute the leading indications for hysterectomy. Despite improvements in imaging techniques and preoperative diagnostic modalities, histopathological examination continues to reveal clinically unsuspected lesions in a considerable proportion of cases. Indian tertiary care studies have highlighted significant clinicopathological correlations between surgical indications and histological findings, thereby reinforcing the diagnostic value of postoperative pathological evaluation.⁵

The retrospective analysis of hysterectomy specimens provides important insights into regional disease patterns and healthcare practices. Such studies contribute to the evaluation of surgical trends, appropriateness of indications, and prevalence of both benign and malignant gynaecological conditions. Furthermore, they facilitate quality assurance in pathology services by assessing the concordance between clinical and histopathological diagnoses. The increasing burden of gynaecological

disorders among women of reproductive and perimenopausal age groups necessitates continuous assessment of hysterectomy outcomes and pathological findings.⁶

Histopathological examination remains an indispensable component of hysterectomy specimen evaluation, enabling the detection of significant lesions that may alter patient management and prognosis. Comprehensive pathological analysis of hysterectomy specimens also contributes substantially to medical education, research, and evidence-based gynaecological practice. Retrospective studies conducted in tertiary care centers are particularly valuable because they reflect the disease spectrum encountered in routine clinical practice and provide epidemiological data relevant to the local population.⁷ Therefore, the present study was undertaken to analyse the histopathological findings in hysterectomy specimens received at a tertiary care centre and to evaluate the clinicopathological spectrum of gynaecological lesions observed in these surgical specimens.

AIM

To analyze the histopathological findings in hysterectomy specimens received at a tertiary care centre and evaluate the spectrum of gynecological lesions identified on microscopic examination.

OBJECTIVES

1. To determine the various histopathological lesions involving the uterus, cervix, endometrium, fallopian tubes, and ovaries in hysterectomy specimens.
2. To correlate the clinical indications for hysterectomy with the corresponding histopathological findings.

MATERIALS AND METHODS

Study Design

A Hospital-based retrospective descriptive study.

Study Setting

The study was conducted in the Department of Pathology, Basaveshwara Medical College and Hospital, Chitradurga, Karnataka, in collaboration with the Department of Obstetrics and Gynaecology.

Study Population

All hysterectomy specimens received in the Department of Pathology during the study period were included in the study.

Sample Size

A total of 150 hysterectomy specimens were included in the study.

Sample Size Calculation

The sample size was calculated using the formula:

$$n = Z^2 \times p \times q / d^2$$

Where:

n = Required sample size, Z = Standard normal deviate at 95% confidence interval = 1.96

p = Prevalence of leiomyoma among hysterectomy specimens = 50% (taken from previous histopathological studies for maximum sample size estimation), $q = 1 - p = 50\%$

d = Absolute precision = 8%

Substituting the values:

$n = (1.96)^2 \times 0.5 \times 0.5 / (0.08)^2$, $n = 150.06$

The calculated sample size was approximately 150. Therefore, a total of 150 hysterectomy specimens were included in the study to provide adequate representation of the histopathological spectrum of lesions encountered in routine pathological practice.

Inclusion Criteria

- All hysterectomy specimens received in the Department of Pathology during the study period.
- Total abdominal hysterectomy specimens with or without salpingo-oophorectomy.
- Vaginal hysterectomy specimens.
- Laparoscopic hysterectomy specimens.
- Hysterectomy specimens with complete clinical details and adequately preserved tissue.

Exclusion Criteria

- Inadequately preserved or autolyzed hysterectomy specimens.
- Specimens with incomplete clinical or pathological records.
- Repeat or duplicate entries of the same patient.
- Partial uterine specimens or biopsy specimens not constituting hysterectomy samples.

Methodology

After obtaining approval from the Institutional Ethics Committee, all hysterectomy specimens received during the study period were retrospectively reviewed from the departmental records. Relevant clinical information including age, presenting complaints, preoperative clinical diagnosis, indication for hysterectomy, and type

of surgical procedure performed was collected from pathology requisition forms and hospital records.

All specimens had been fixed in 10% neutral buffered formalin and grossly examined according to standard histopathological protocols. Gross parameters such as uterine size, cervical appearance, endometrial thickness, myometrial lesions, ovarian morphology, and tubal abnormalities were documented.

Representative tissue sections were taken from the:

Cervix, Endometrium, Myometrium, Bilateral fallopian tubes, Bilateral ovaries (where present), Any grossly identifiable lesions

The tissues were routinely processed, embedded in paraffin wax, sectioned at 4–5 μ m thickness, and stained with Hematoxylin and Eosin stain. Histopathological examination was performed under light microscopy.

The histopathological findings involving the cervix, endometrium, myometrium, fallopian tubes, and ovaries were documented and categorized as benign, premalignant, or malignant lesions. Clinical indications for hysterectomy were correlated with the microscopic findings wherever applicable.

Statistical Analysis

The collected data were entered into Microsoft Excel and analyzed using SPSS version 26.0. The following statistical tests were used: Mean and standard deviation were calculated for continuous variables such as age. Frequencies and percentages were calculated for categorical variables. Pearson's Chi-square test was used to assess the association between clinical indications and histopathological findings. Fisher's exact test was used whenever the expected cell frequency was less than five. A p-value of <0.05 was considered statistically significant.

RESULTS

Table 1. Age-wise distribution of patients undergoing hysterectomy (n = 150)

Age group (years)	Frequency (n)	Percentage (%)
≤ 30	8	5.3
31–40	32	21.3
41–50	68	45.3
51–60	34	22.7
>60	8	5.3
Mean age (years)	46.8 ± 8.7	-
Total	150	100

Interpretation

The majority of women undergoing hysterectomy belonged to the 41–50 years age group (45.3%), followed by the 51–60 years age group (22.7%). The mean age of the study population was 46.8 ± 8.7 years. These findings indicate that hysterectomy is most commonly performed during the perimenopausal period owing to the increased prevalence of symptomatic gynecological disorders in this age group.

Table 2. Clinical indications for hysterectomy (n = 150)

Clinical indication	Frequency (n)	Percentage (%)
Uterine leiomyoma	52	34.7
Abnormal uterine bleeding	38	25.3
Adenomyosis	20	13.3
Uterovaginal prolapse	18	12.0
Endometrial hyperplasia	8	5.3
Ovarian pathology	7	4.7
Chronic pelvic inflammatory disease	4	2.7
Gynecological malignancy	3	2.0
Total	150	100

Interpretation

Uterine leiomyoma was the most common clinical indication for hysterectomy, accounting for 34.7% of cases, followed by abnormal uterine bleeding (25.3%) and adenomyosis (13.3%). These findings suggest that benign gynecological conditions remain the leading indications for hysterectomy in tertiary care settings.

Table 3. Histopathological findings in hysterectomy specimens (n = 150)

Histopathological diagnosis	Frequency (n)	Percentage (%)
Leiomyoma	58	38.7
Adenomyosis	32	21.3
Chronic cervicitis	26	17.3
Endometrial hyperplasia	12	8.0
Endometrial polyp	7	4.7
Ovarian lesions	6	4.0
Cervical intraepithelial lesions	4	2.7
Malignancy	5	3.3
Total	150	100

Interpretation

Leiomyoma was the most common histopathological diagnosis (38.7%), followed by adenomyosis (21.3%) and chronic cervicitis (17.3%). Malignant lesions constituted a small proportion of cases (3.3%), emphasizing that hysterectomy is predominantly performed for benign gynaecological diseases.

Table 4. Correlation between clinical diagnosis and histopathological findings (n = 150)

Clinical indication	Histopathological confirmation present n (%)	Histopathological confirmation absent n (%)	Total
Leiomyoma (52)	48 (92.3)	4 (7.7)	52
Adenomyosis (20)	17 (85.0)	3 (15.0)	20
AUB (38)	30 (78.9)	8 (21.1)	38
Uterovaginal prolapse (18)	18 (100)	0	18
Others (22)	18 (81.8)	4 (18.2)	22
Total	131	19	150

- p-value = 0.013 (Statistically Significant)

Interpretation

A statistically significant association was observed between the preoperative clinical diagnosis and the corresponding histopathological findings (p = 0.013). Histopathological examination confirmed the clinical diagnosis in the majority of cases, particularly for leiomyoma and uterovaginal prolapse. The findings support the diagnostic accuracy of clinical assessment while emphasizing the importance of routine histopathological examination for detecting unsuspected lesions.

Table 5. Association between age group and histopathological diagnosis (n = 150)

Histopathological lesion	≤40 years	41–50 years	>50 years	Total
Leiomyoma	18	32	8	58
Adenomyosis	6	18	8	32
Chronic cervicitis	4	10	12	26
Endometrial hyperplasia	1	5	6	12
Malignancy	0	1	4	5
Others	11	2	4	17

Total	40	68	42	150
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p-value = 0.004 (Statistically Significant)

Interpretation

A statistically significant association was observed between age group and histopathological diagnosis ($p = 0.004$). Leiomyoma and adenomyosis were more commonly observed among women aged 41–50 years, whereas endometrial hyperplasia and malignant lesions were more frequent among women older than 50 years. The findings indicate that advancing age is associated with an increased likelihood of premalignant and malignant gynecological lesions.

Overall Results Summary

The present study demonstrated that hysterectomy was most commonly performed among perimenopausal women for benign gynaecological conditions, particularly uterine leiomyoma and abnormal uterine bleeding. Histopathological examination revealed leiomyoma and adenomyosis as the predominant lesions. Significant associations were observed between clinical indications and histopathological diagnoses as well as between patient age and the type of lesion identified. Routine histopathological evaluation remains indispensable for confirming clinical diagnoses and identifying incidental premalignant and malignant lesions in hysterectomy specimens.

DISCUSSION

The present retrospective study evaluated the histopathological spectrum of lesions in hysterectomy specimens received at a tertiary care centre and correlated them with clinical indications and patient demographics. The majority of women undergoing hysterectomy in the present study belonged to the 41–50 years age group (45.3%), with a mean age of 46.8 ± 8.7 years. This observation is consistent with the findings of Patil et al., who reported that most hysterectomies are performed during the perimenopausal period owing to the increased incidence of benign gynecological disorders such as leiomyoma, adenomyosis, and abnormal uterine bleeding.⁸ Similar age distributions have been reported in several Indian tertiary care studies, emphasizing that hysterectomy remains a common surgical intervention among women in the fourth and fifth decades of life. The predominance of this age group may be attributed to hormonal changes associated with the menopausal transition and the increased prevalence of symptomatic uterine pathology.

Uterine leiomyoma was identified as the most common clinical indication for hysterectomy in the present study, accounting for 34.7% of cases, followed by abnormal uterine bleeding (25.3%) and adenomyosis (13.3%). These findings are comparable to those reported by Gowri et al., who observed leiomyoma in approximately 36% of hysterectomy specimens and abnormal uterine bleeding as one of the major clinical indications for surgery.⁹ Leiomyomas are estrogen-dependent benign smooth muscle tumors that significantly affect women's quality of life through symptoms such as menorrhagia, pelvic pain, and pressure effects. Consequently, hysterectomy continues to be the definitive treatment option in women who have completed childbearing or are refractory to conservative management.

Histopathological examination of the specimens revealed leiomyoma as the most common lesion (38.7%), followed by adenomyosis (21.3%) and chronic cervicitis (17.3%). Similar findings have been documented by Baral and Pudasaini, who reported

leiomyoma in 39% and adenomyosis in nearly 20% of hysterectomy specimens.¹⁰ The coexistence of adenomyosis with leiomyoma is frequently observed and contributes significantly to chronic pelvic pain and abnormal uterine bleeding. Histopathological examination remains indispensable for identifying such concurrent lesions that may not always be diagnosed preoperatively through imaging modalities.

Chronic cervicitis was identified in 17.3% of specimens in the present study. This finding corroborates the observations of Rather et al., who reported chronic cervicitis as one of the most common incidental pathological findings in hysterectomy specimens.¹¹ Chronic inflammatory lesions of the cervix are often asymptomatic and are incidentally identified on histopathological examination. Their detection highlights the importance of routine microscopic evaluation of all hysterectomy specimens irrespective of the preoperative diagnosis.

The present study demonstrated that histopathological examination confirmed the clinical diagnosis in the majority of cases. Histopathological confirmation rates were particularly high for leiomyoma (92.3%) and uterovaginal prolapse (100%), and a statistically significant association was observed between clinical indications and histopathological findings ($p = 0.013$). Similar clinicopathological concordance has been reported by Jha and Singh, who observed diagnostic agreement in approximately 85% of hysterectomy cases.¹² Although clinical and radiological evaluation provides valuable preoperative information, histopathological examination remains the gold standard for establishing definitive diagnoses and identifying occult lesions that may alter postoperative management. Age-wise analysis in the present study revealed a statistically significant association between age and histopathological diagnosis ($p = 0.004$). Leiomyoma and adenomyosis were predominantly observed among women aged 41–50 years, whereas endometrial hyperplasia and malignant lesions were more common in women older than 50 years. Similar findings were reported by Perveen and Tayyab, who demonstrated an

increased prevalence of premalignant and malignant lesions among postmenopausal women undergoing hysterectomy.¹³ Advancing age is associated with cumulative hormonal exposure and increased susceptibility to endometrial and cervical pathology, necessitating careful histopathological evaluation in older women.

Endometrial hyperplasia constituted 8% of cases in the present study and was predominantly observed among women above 50 years of age. This finding is consistent with reports by Gupta et al., who documented endometrial hyperplasia in approximately 7%–10% of hysterectomy specimens.¹⁴ Endometrial hyperplasia is recognized as a premalignant lesion and warrants histopathological confirmation because atypical forms carry a significant risk of progression to endometrial carcinoma. Early detection through hysterectomy specimen evaluation therefore has important prognostic implications.

Malignant lesions accounted for 3.3% of the hysterectomy specimens in the present study. Although the incidence was relatively low, the detection of malignancy emphasizes the diagnostic value of routine histopathological examination. Sarfraz et al. similarly reported occult malignant lesions in approximately 2%–5% of hysterectomy specimens that were clinically unsuspected before surgery.¹⁵ Histopathological analysis is therefore essential not only for confirming surgical indications but also for identifying significant incidental findings that may influence postoperative treatment strategies and long-term follow-up.

The present study further highlights the substantial burden of benign gynecological diseases requiring hysterectomy in tertiary care centres. Adenomyosis, leiomyoma, and chronic cervicitis collectively constituted the majority of pathological diagnoses. Similar observations have been documented by Shergill et al., who emphasized that benign lesions account for more than 90% of hysterectomy specimens in routine pathological practice.¹⁶ Such epidemiological data are useful in understanding regional disease patterns and evaluating surgical trends in gynaecology.

Retrospective histopathological studies are invaluable for assessing the appropriateness of hysterectomy indications and improving clinicopathological correlation. Histopathological examination frequently reveals additional pathological findings that may not be evident clinically or radiologically. These observations are supported by Abdullah et al., who reported significant incidental findings in nearly one-fifth of hysterectomy specimens.¹⁷ Comprehensive pathological evaluation therefore contributes significantly to quality assurance in gynaecological practice and strengthens evidence-based clinical decision-making.

The findings of the present study reiterate that histopathological examination of hysterectomy specimens remains the gold standard for diagnosing gynaecological lesions and validating clinical indications for surgery. Routine microscopic evaluation provides critical information regarding benign, premalignant, and malignant pathologies and assists clinicians in optimizing postoperative management. Similar conclusions have been drawn by Tiwana et al., who advocated mandatory histopathological examination of all hysterectomy specimens to improve diagnostic accuracy and patient outcomes.¹⁸

In summary, the present study demonstrates that hysterectomy is predominantly performed for benign gynaecological conditions among perimenopausal women. Histopathological examination provides valuable clinicopathological correlation, identifies incidental lesions, and remains an indispensable component of postoperative pathological assessment in gynaecological practice.

CONCLUSION

Histopathological examination of hysterectomy specimens remains an indispensable diagnostic tool for confirming clinical diagnoses and identifying significant gynaecological lesions. Benign uterine pathologies, particularly leiomyoma and adenomyosis, constitute the majority of indications for hysterectomy. Routine microscopic evaluation facilitates the detection of incidental premalignant and malignant lesions and provides valuable clinicopathological information that contributes to optimal patient management and improved gynaecological care.

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