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Correlation Between Histopathological Findings and Clinical Indications in Hysterectomy Cases

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ABSTRACT

Hysterectomy is one of the most common gynecological surgeries carried out globally, second only to cesarean section. It is indicated for a wide range of benign and malignant conditions; however, discrepancies often exist between the clinical indications for hysterectomy and the final histopathological findings. This study aimed to assess the correlation between clinical indications and histopathological findings in hysterectomy specimens. A retrospective observational study was conducted over one year at the Obstetrics and Gynecology Department, Al-Bayda Medical Center. A total of 168 female patients aged ≥18 years who underwent hysterectomy for gynecological indications were included. Clinical data, preoperative investigations, and histopathological reports were collected from medical records. Specimens were analyzed using standard histopathological techniques, and findings were compared with preoperative clinical diagnoses. The majority of hysterectomies were performed in women aged 41–50 years (57.1%). Multiparous women constituted the largest group, with 49% having two prior deliveries. Heavy menstrual bleeding was the most frequent presenting symptom (50%). Leiomyoma was the most common clinical diagnosis (52.4%), followed by adenomyosis (12.5%). Histopathological analysis revealed leiomyoma in 31.5% of cases, leiomyoma with adenomyosis in 13.7%, and adenomyosis alone in 10.7%. Malignancies were identified in 10.7% of specimens, including endometrial (7.7%) and cervical carcinoma (3%). A notable discrepancy was observed between clinical and histopathological diagnoses; for example, only 60.2% of clinically suspected leiomyomas were confirmed histologically, and several cases of clinically benign conditions revealed underlying malignancies. The study highlights a considerable gap between clinical diagnoses and histopathological findings in hysterectomy cases. While leiomyomas remain the leading indication, histopathology frequently uncovers additional or alternative pathologies, including malignancies. These findings emphasize the indispensable role of histopathological evaluation in confirming diagnoses, guiding patient management, and preventing misdiagnosis. Strengthening preoperative diagnostic protocols through improved imaging and routine endometrial sampling may reduce discrepancies and optimize treatment decisions.

Introduction

After caesarean sections, hysterectomy is the most common gynecological procedure performed on women. It is still one of the most common gynecological procedures [1]. Adenomyosis, dysfunctional uterine hemorrhage, endometriosis and prolapse, chronic pelvic inflammatory disease, developing or symptomatic myomas, and gynecologic malignancies are major reasons for hysterectomy [1, 2]. In the United States, an estimated 60,000 women get a hysterectomy annually, with 37% of those women having one by the time they are 65 years old. Currently, one in five women in the UK and one in three women in the US undergo a hysterectomy before turning 60 [3]. In England alone, almost 70,000 hysterectomies are carried out each year [4]. Despite this, there is no hard data on the frequency of whole abdominal hysterectomies. One of the main treatments for a woman with gynecologic cancer is a hysterectomy, which involves surgically removing the uterus. The uterus is a symbol of femininity, sexuality, fertility, and maternity for many women, according to studies done in many nations.

Because giving birth to a child is a crucial role for all women, the loss of this organ is recognized as the loss of womanhood. Women may struggle with feelings of hopelessness and despair after surgery, which could have an impact on their mental condition. A woman's life, relationships, and perceived social role can all be significantly impacted by a hysterectomy [5]. Hysterectomy-induced uterine loss has serious negative consequences, particularly for women from developing nations. Even for women who do not want to have more children, this surgical operation is avoided in younger women, especially in their early years, because it leads to the loss of reproductive potential. The uterus should not be disposed of carelessly [6]. Globally, hysterectomy is still a common gynecological operation that is recommended for both benign and malignant disorders [7]. Histopathological examination of the removed uterus and associated structures is critical for confirming the preoperative diagnosis, detecting incidental pathology, and guiding postoperative management [8]. It also contributes to epidemiological data, research, and quality assurance in gynecology [9]. This retrospective study aimed to assess the correlation between the clinical indications for hysterectomy

and the histopathological findings in uterine specimens collected from patients who underwent hysterectomy at the Obstetrics and Gynecology Department of Al-Bayda Medical Center.

Methods
Study Design
The purpose of this retrospective, observational cohort study was to evaluate the relationship between the histopathological findings of uterine specimens and the clinical grounds for hysterectomy. Over the course of a year, the study was conducted at Al-Bayda Medical Center's Department of Obstetrics and Gynaecology. Information was gathered retrospectively from clinical evaluations, histopathology reports, and patient medical records.

Study Population
The study included all female patients aged 18 years or older who underwent hysterectomy at the Department of Obstetrics and Gynecology during the study period. The sample size was determined by the total number of patients who met the inclusion criteria within the study timeframe, without applying a predetermined number, thus ensuring that the sample reflected real-world clinical practice.

Inclusion Criteria
Female patients aged 18 years or older. Patients who underwent hysterectomy due to one of the following indications: Uterine fibroids (leiomyomas), Endometriosis., Adenomyosis, Abnormal uterine bleeding (menorrhagia, metrorrhagia, or postmenopausal bleeding), Pelvic infections requiring hysterectomy, Suspected or confirmed gynecological malignancies (e.g., uterine or cervical carcinoma) and other gynecological conditions, such as chronic pelvic pain or uterine prolapse, where hysterectomy was indicated.

Clinical Data
Demographic characteristics: age, medical comorbidities (e.g., diabetes, hypertension, obesity). Reproductive history: parity, menopause status, and history of gynecological surgeries. Previous treatments: hormonal therapy, surgical interventions. Clinical indications for hysterectomy: uterine fibroids (size and number), endometriosis, adenomyosis, abnormal uterine bleeding, pelvic infections, and suspected or confirmed malignancies.

Histopathological Data
All hysterectomy specimens were submitted to the pathology department, where they underwent the following standard procedures: Formalin fixation to preserve tissue architecture. Paraffin embedding and sectioning for microscopic analysis. Hematoxylin and eosin (H&E) staining for routine histology. Special stains or immunohistochemistry were performed in selected cases of suspected malignancy.
Histopathological findings were classified as: Benign conditions: leiomyomas, endometriosis, adenomyosis, hyperplasia. Malignant conditions: endometrial carcinoma, cervical carcinoma, and other uterine malignancies. The histopathological evaluation was performed by pathologists blinded to the clinical indications to reduce bias [10-12].

Results
Demographic and clinical characteristics
(Table 1) demonstrates that the majority of hysterectomy cases were observed in women aged 41–50 years, who represented more than half of the study population (57.1%). This finding is consistent with the natural epidemiological distribution of gynecological conditions such as leiomyomas, adenomyosis, and abnormal uterine bleeding, which tend to peak during the perimenopausal period. The lower frequency in younger women (below 40 years) reflects the preference for conservative or fertility-sparing management at younger ages. Cases above 60 years (8.3%) were mostly associated with postmenopausal bleeding or suspected malignancies, highlighting the importance of hysterectomy as both a diagnostic and therapeutic tool in older age groups.

Table 1. Age-wise distribution of hysterectomy specimens

Age group (years)	No. of cases	%
21–30	1	0.59
31–40	45	26.7
41–50	96	57.1
51–60	12	7.1
>60	14	8.3

Table 2 shows that hysterectomy was more commonly performed in multiparous women. Nearly half of the patients had two previous deliveries (49%), followed by women with three deliveries (23.8%). Nulliparous women constituted only 1.78% of the study sample, indicating that hysterectomy is rarely the first-line treatment in women without prior childbearing. This distribution highlights that increased parity may predispose women to gynecological disorders requiring hysterectomy, such as uterine prolapse, abnormal bleeding, or fibroid-related symptoms. Additionally, the predominance of multiparity reflects the demographic characteristics of the studied population, where higher parity is relatively common.

Table 2. Case distribution based on parity

Parity	No. of cases	%
Nulliparous	3	1.78
1	37	22
2	83	49
3	40	23.8
>4	5	2.9
Total	168	100

(Table 3) illustrates the clinical presentation of patients undergoing hysterectomy. Heavy menstrual bleeding (HMB) was the most common symptom, reported in 50% of cases, followed by irregular menstrual bleeding (19.6%). Postmenopausal bleeding accounted for 15.4% of cases and was particularly relevant in ruling out malignancies. A smaller percentage of patients presented with both HMB and irregular bleeding (12.5%) or metrorrhagia (2.3%). These findings emphasize that abnormal uterine bleeding, in all its forms, remains the leading clinical indication for hysterectomy. The high burden of HMB underlines its impact on quality of life and its strong association with structural uterine pathologies such as leiomyomas and adenomyosis.

Table 3. Case distribution based on clinical symptoms

Clinical symptoms	No. of cases	%
Heavy menstrual bleeding (HMB)	84	50
Irregular menstrual bleeding	33	19.6
Postmenopausal bleeding	26	15.4
HMB with irregular menstrual bleeding	21	12.5
Metrorrhagia	4	2.3
Total	168	100

(Table 4) shows that leiomyoma was the most common clinical diagnosis, accounting for more than half of the cases (52.4%). This reflects the high prevalence of fibroids as the primary indication for hysterectomy worldwide. Adenomyosis was the second most common diagnosis (12.5%), followed by endometrial polyp (6.5%) and endometrial carcinoma (6.0%). A small number of patients were diagnosed with combined conditions, such as leiomyoma with adenomyosis or with an endometrial polyp. The wide range of clinical diagnoses emphasizes the diverse spectrum of gynecological disorders leading to hysterectomy. However, the accuracy of clinical diagnosis is limited, as some cases diagnosed as benign were later found to harbor malignancies, which highlights the importance of histopathological confirmation.

Table 4. Case distribution based on clinical diagnosis

Clinical diagnosis	No. of cases	%
Leiomyoma	88	52.4
Adenomyosis	21	12.5
Endometrial polyp	11	6.5
Ca endometrium	10	6.0
Endocervical polyp	9	5.4
Leiomyoma with adenomyosis	9	5.4
Endometrial hyperplasia	7	4.2
Ca cervix	7	4.2
Cervical dysplasia	1	0.6

LSCS scar dehiscence	1	0.6
Endometriosis	1	0.6
Chronic nonspecific cervicitis	1	0.6
Leiomyoma with endometrial polyp	1	0.6
Adenomyosis with endometrial polyp	1	0.6
Total	168	100

(Table 5) provides a detailed overview of the final histopathological diagnoses. Leiomyoma remained the most frequent finding, but at a lower proportion (31.5%) compared to clinical suspicion (52.4%), reflecting a discrepancy between preoperative and pathological evaluation. Combined lesions were also significant, with 13.7% of cases showing leiomyoma with adenomyosis and 3.6% with leiomyoma and endometrial polyp. Adenomyosis alone accounted for 10.7% of cases. Malignant conditions were also notable: carcinoma of the endometrium was diagnosed in 7.7% and cervical carcinoma in 3% of cases. Interestingly, 1.8% of specimens revealed no significant pathology ("normal study"), indicating possible overtreatment based on symptoms alone. This table underscores the essential role of histopathology in confirming and refining the diagnosis, detecting hidden malignancies, and guiding further management.

Table 5. Case distribution based on histopathological diagnosis

Histopathological diagnosis	No. of cases	%
Leiomyoma	53	31.5
Leiomyoma with adenomyosis	23	13.7
Adenomyosis	18	10.7
Ca endometrium	13	7.7
Endometrial polyp	12	7.1
Endocervical polyp	11	6.5
Leiomyoma with endometrial polyp	6	3.6
Endometrial hyperplasia	5	3.0
Ca cervix	5	3.0
Leiomyoma with endometrial hyperplasia	4	2.4
Cervical dysplasia	3	1.8
Adenomyosis with endometrial polyp	3	1.8
Endometriosis	3	1.8
Normal study	3	1.8
Endometritis	2	1.2
Leiomyoma with endometriosis	2	1.2
Chronic nonspecific cervicitis	1	0.6
Adenomyosis with salpingitis	1	0.6
Total	168	100

(Table 6) highlights the correlation between clinical diagnosis and histopathological findings. Among 88 cases clinically suspected as leiomyomas, only 53 were confirmed histologically, with the remainder showing adenomyosis or carcinoma. Similarly, cases clinically diagnosed as adenomyosis were histologically confirmed in 18 of 21 cases. Some diagnoses, such as endocervical polyps and endometrial hyperplasia, showed a fair level of agreement, while others revealed significant mismatches. The presence of cases where benign clinical diagnoses corresponded to malignant histology (e.g., carcinoma endometrium) is particularly important, as it demonstrates the limitations of relying solely on clinical and imaging findings. This table emphasizes the diagnostic gap between preoperative assessment and final pathology, which has critical implications for patient management.

Table 6. Correlation between clinical and HPE diagnosis of hysterectomy

Preoperative diagnosis of hysterectomy	No. of cases	Histopathology findings correlate with clinical diagnosis
Leiomyoma	88	53
Adenomyosis	21	18

Ca endometrium	10	13
Endocervical polyp	9	11
Leiomyoma with adenomyosis	9	23
Endometrial hyperplasia	7	5
CA cervix	7	5
Endometriosis	1	3
Cervical dysplasia	1	3
Endometritis	1	2
Chronic nonspecific cervicitis	1	1
Leiomyoma with endometrial polyp	1	6
Adenomyosis with endometrial polyp	1	3
Leiomyoma with endometriosis	0	2
Adenomyosis with salpingitis	0	1
Leiomyoma with endometrial hyperplasia	0	4
Normal study	0	3
Total	168	168

(Table 7) explicitly shows cases where there was a marked disparity between clinical diagnosis and histopathological findings. Six cases clinically diagnosed as intramural leiomyoma were later confirmed as adenomyosis, while three cases suspected of adenomyosis were reported as normal histology. Notably, two cases of clinically diagnosed endometrial hyperplasia turned out to be carcinoma endometrium, highlighting the risk of underestimating malignancy preoperatively. Similarly, a case diagnosed as cervical carcinoma was histopathologically revealed to be high-grade cervical dysplasia. These disparities stress the limitations of clinical evaluation alone and the indispensable role of histopathology in providing definitive diagnoses. They also underline the need for comprehensive preoperative investigations, including biopsies and imaging, to minimize misdiagnosis and ensure optimal patient care.

Table 7. Disparity between clinical and histopathological reports

No. of cases	Clinical diagnosis	Histopathological diagnosis
6	Intramural leiomyoma	adenomyosis
3	Cervical leiomyoma	Endocervical polyp
3	Adenomyosis	Normal study
3	Submucosal leiomyoma	Endometrial polyp
2	Endometrial hyperplasia	Ca endometrium
2	Carcinoma Cervix	High-grade cervical dysplasia
2	Adenomyosis	Leiomyoma

Discussion

In this study, the age-wise distribution of patients undergoing hysterectomy revealed that the majority were between 41 and 50 years of age. This finding aligns with several studies that observed the maximum number of cases in the 41–50 years age group, followed by 31–40 years [13-15]. These studies underscore the prevalence of gynecological disorders such as leiomyomas, adenomyosis, and abnormal uterine bleeding during the perimenopausal period, which often necessitate surgical intervention. The relatively low incidence in women under 30 years is consistent with the preference for conservative, fertility-preserving treatments in this age group. In contrast, the 31–40 years age group reflects patients who may have experienced symptomatic fibroids or refractory abnormal uterine bleeding not controlled by medical therapy. Patients above 60 years primarily underwent hysterectomy for postmenopausal bleeding or suspected malignancies. The current study's findings highlight the 41–50-year age group as the most common demographic undergoing hysterectomy. This emphasizes the importance of addressing gynecological health during the perimenopausal period and tailoring management strategies accordingly.

The distribution of hysterectomy cases in our study reveals that uterine fibroids were the most prevalent indication, followed by abnormal uterine bleeding and adenomyosis. These findings are consistent with several studies conducted globally, highlighting the predominance of benign uterine conditions as primary reasons for hysterectomy. The high incidence of uterine fibroids in our cohort aligns with findings from various studies [16, 17]. The prevalence of uterine fibroids in our study reflects their high incidence among women in the reproductive and perimenopausal age groups. These benign tumors are often associated with

symptoms such as heavy menstrual bleeding, pelvic pain, and pressure symptoms, which can significantly impact a woman's quality of life. Abnormal uterine bleeding was the second most common indication in the present study. This is consistent with findings from another study [16].

Abnormal uterine bleeding is a prevalent condition among women approaching menopause and often leads to significant morbidity. It encompasses a range of disorders, including anovulatory cycles, endometrial hyperplasia, and other structural abnormalities, which may necessitate surgical intervention when conservative treatments fail. Adenomyosis was identified. This aligns with studies such as that study, which highlighted adenomyosis as a common indication for hysterectomy [18]. The relatively high prevalence of adenomyosis in our study emphasizes the challenges associated with its diagnosis and management. Often, the diagnosis is made postoperatively, as preoperative identification can be difficult due to the absence of specific symptoms and the limitations of imaging modalities. Pelvic organ prolapses, ovarian masses, and malignancy collectively accounted for a minority of cases in our study. This is consistent with findings from a previous study [19]. Current data provide a detailed overview of the clinical symptoms leading to hysterectomy. Current findings underscore the significant impact of abnormal uterine bleeding on women's health and the role of hysterectomy in its management. HMB emerged as the leading symptom in the present study, aligning with findings from previous studies [20, 21].

Irregular menstrual bleeding was the second most common symptom in our cohort. This aligns with Wouk [22]. Postmenopausal bleeding accounted for 15.4% of cases. This is clinically significant as it can indicate endometrial pathology, including malignancy. Several reports emphasized that postmenopausal bleeding is abnormal and warrants thorough evaluation [23, 24]. Our findings corroborate these studies, underlining the importance of hysterectomy when malignancy is suspected or confirmed. The presence of both HMB and irregular bleeding reflects the complexity and variability of abnormal uterine bleeding presentations. Although less commonly reported. Metrorrhagia, or intermenstrual bleeding, accounted for 2.3% of cases. While this symptom is less prevalent, it is recognized in studies by [20, 21].

Upon histopathological diagnoses, the most prevalent diagnosis was leiomyoma, followed by adenomyosis, endometrial polyp, and endometrial carcinoma. Leiomyoma, or uterine fibroids, was the most common histopathological finding in our study, consistent with numerous studies worldwide [25, 26]. These findings underscore the high prevalence of leiomyomas as a primary indication for hysterectomy. Adenomyosis was the second most common diagnosis in this study. This is in line with findings from studies by [27, 28]. These studies highlight the significant association between adenomyosis and other uterine pathologies, particularly leiomyomas. Endometrial polyps were identified in this investigation. According to a study, hysterectomy is frequently seen as the final treatment when conservative measures are unsuccessful, and uterine fibroids and endometrial polyps are frequent causes of irregular uterine bleeding throughout the reproductive period [29]. This highlights the need for histological testing in verifying the diagnosis and guiding proper treatment. Endometrial cancer was diagnosed in the current study. This finding is consistent with the global prevalence of endometrial cancer, which is the fourth most common cancer in females [30]. The accuracy of clinical diagnoses is limited, as some cases diagnosed as benign were later found to harbor malignancies, as in a study by [25].

Leiomyoma was the most common histopathological finding in our study, consistent with findings from other studies [31, 32]. Interestingly, 10 cases were clinically diagnosed as endometrial carcinoma, but histopathological examination revealed 23 cases of endometrial carcinoma. This suggests that malignancies may be underdiagnosed preoperatively, highlighting the importance of thorough histopathological evaluation. This finding aligns with the study by Shiozaki et al. [33]. Several cases exhibited dual pathologies, such as leiomyoma with adenomyosis, leiomyoma with endometrial polyp, and adenomyosis with endometrial polyp. These combinations highlight the complexity of uterine pathologies and the necessity of histopathological examination to identify all underlying conditions [32]. This finding underscores the importance of histopathological examination in confirming the necessity of surgical intervention. Similar concerns were raised previously [34].

Six cases clinically diagnosed as intramural leiomyomas were histopathologically confirmed as adenomyosis. This discrepancy is consistent with findings that reported that adenomyosis is often missed preoperatively and diagnosed only upon histopathological examination [35]. Three cases suspected to be cervical leiomyomas were identified as endocervical polyps histopathologically [36]. Histopathological examination often confirms the preoperative diagnosis. However, studies report that 10–20% of hysterectomy specimens reveal unexpected findings, including: Occult carcinoma in postmenopausal women. Adenomyosis in patients operated for fibroids. Endometrial hyperplasia in women with abnormal uterine bleeding [10, 11]. Therefore, the current finding highlights notable discrepancies between clinical diagnoses and histopathological findings. These mismatches underscore the limitations of relying solely on clinical evaluation and emphasize the critical role of histopathological examination in confirming diagnoses and guiding appropriate management.

Conclusion

This study demonstrated that there is a significant discrepancy between clinical indications and final histopathological diagnoses in hysterectomy cases. Notably, some cases clinically diagnosed as benign were histologically confirmed as malignant, highlighting the limitations of relying solely on clinical and imaging findings. Therefore, histopathological examination remains the gold standard for confirming diagnoses and guiding further management in patients undergoing hysterectomy.

Conflicts of Interest

The authors declare no conflicts of interest

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