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Original article

Histopathological Spectrum of Concurrent Uterine Lesions Associated with Adenomyosis: A Retrospective Study at a Referral Tertiary Care Center

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Abstract
Adenomyosis is a common gynecological condition characterized by the presence of endometrial glands and stroma within the myometrium. It is often discovered incidentally on histopathological examination and is associated with other uterine pathologies, including leiomyoma, endometrial hyperplasia, and malignancy. This retrospective study aimed to assess uterine histopathological patterns associated with adenomyosis in hysterectomy specimens from patients presenting with abnormal uterine bleeding. The study was conducted in the Department of Pathology at the National Cancer Institute in Sabratha, Libya, from January 2014 to December 2024. Data were retrieved from medical records and histopathology reports of patients who underwent total hysterectomy, with or without adnexal removal, during this period, and were confirmed to have adenomyosis. A total of 122 cases were analyzed using IBM SPSS Statistics version 25.0. The median age was 50.0 years (mean ± SD: 51.26 ± 6.6 years). The most common symptom was abnormal uterine bleeding. A significant correlation (P < 0.001) was found between PMB and synchronous malignant findings. Moreover, estrogen-dependent lesions such as leiomyomas and endometrial hyperplasia can coexist with adenomyosis. It is crucial that more molecular and clinical testing be conducted for a comprehensive evaluation.
Keywords. Adenomyosis, Leiomyoma, Endometrial Hyperplasia, Hysterectomy, Postmenopausal Bleeding.

Introduction

Adenomyosis is a gynecological disorder characterized by the presence of benign endometrial tissue, including glands and stroma, within the myometrium [1,2]. This abnormal placement leads to diffuse uterine hypertrophy [1]. In 1860, the German pathologist Carl von Rokitansky described adenomyosis as cystsarcoma adenoids uterinum [3]. The prevalence of this disorder ranges from 12% to 52% among women of reproductive age [1]. In nulliparous women, prevalence appears higher, reaching 24.4%, often in association with endometriosis [1]. Histologically, adenomyosis is diagnosed when endometrial glands and stroma are found 2.5-4 mm beyond the endomyometrial junction within the myometrium [3]. The pathophysiology of adenomyosis is not fully understood [4], but elevated estrogen levels and disruption or invagination of the endometrium into the myometrium are contributing factors [5]. Elevated estrogen levels in postmenopausal women may reflect a higher incidence of the disease in this group [6]. Researchers indicate that adenomyosis is frequently associated with other uterine pathologies, such as endometrial polyps, endometrial hyperplasia, leiomyoma, and malignancy [7-10].

Material and Methods

This retrospective study was conducted at the Pathology Department of the National Cancer Institute in Sabratha, Libya, over 10 years. Following ethical approval from the National Cancer Institute Ethics Committee,122 patients who underwent total hysterectomy (transvaginal, abdominal, or laparoscopic), with or without adnexal removal, were included. Patients with histopathologically confirmed adenomyosis between January 2014 and December 2024 were included. Cases lacking clinical details or not diagnosed with adenomyosis were excluded. Demographic data, including age, clinical presentation, specimen type, and pathological diagnosis, were collected from medical records and histopathology reports.
Statistical analysis was performed using SPSS Statistics software, version 25. Continuous variables (age) are presented as mean ± standard deviation. Categorical variables are expressed as frequencies (n) and percentages. The Chi-square test was used to determine the statistical significance of the association between clinical and pathological variables. A p-value of <0.05 was considered statistically significant.

Results

A total of 122 hysterectomy specimens with histopathologically confirmed adenomyosis were analyzed. Patients' ages ranged from 40 to 79 years, with a median age of 50.0 years (mean ± SD: 51.26 ± 6.6 years). On the basis of age group analysis, the 46–50-year group was the largest, comprising 49 patients (40.2%), followed by the 51–55-year group (n = 30; 24.6%) and the 40–45-year group (n = 18; 14.8%). Women over 60 represented the smallest group, accounting for only 8.2% of cases (Table1).

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Table 1. Distribution of patients by age group (n=122)

Age group (years)	n	Percentage (%)
(mean ± SD: 51.26 ± 6.6)		
40-45	18	14.8
46-50	49	40.2
51-55	30	24.6
56-60	15	12.3
> 60	10	8.2

The most frequent symptom examined (Table 2), postmenopausal bleeding, was the most predominant symptom, reported in 56 patients (45.9%), followed by abnormal uterine bleeding in premenopausal women (n = 52; 42.2 %). Other symptoms were reported in 10 cases (8.2%).

Table 2. Clinical symptoms of patients with adenomyosis

Presenting symptoms	n	%
Postmenopausal bleeding	56	45.9
Abnormal uterine bleeding premenopausal	52	42.2
Menorrhagia	4	3.3
Other symptoms: pelvic pain, dysmenorrhea, and dyspareunia	10	8.3

The correlation with other uterine histopathological lesions was also examined and classified in Table 3. Isolated adenomyosis was identified in 12 cases (9.8%). The remaining 111 patients (90.2%) had concomitant uterine pathology. Uterine leiomyoma was the most common coexisting lesion, found in 47 (38.5%)cases, followed by endometrial hyperplasia in 28 cases (23.0%). The majority of hyperplasia cases were without atypia (n = 24; 19.7%), whereas endometrial hyperplasia with atypia was present in 4 cases (3.3%).

Endometrial polyps were identified in 18 (14.8%) patients. Endometrioid adenocarcinoma was identified in 3 cases, ranging from grade 1 to grade 3, and all presented with postmenopausal bleeding.

Table 3. Uterine pathology associated with adenomyosis in hysterectomy specimens

Associated pathology	N	%
Isolated adenomyosis	12	9.8
Uterine leiomyoma	47	38.5
Endometrial hyperplasia-total	28	23.0
Without atypia	24	19.7
With atypia	4	3.3
Proliferative endometrium	20	16.4
Endometrial polyp	18	14.8
Secretory endometrium	9	7.4
Atrophic endometrium	5	4.1
Disorder of the proliferative endometrium	5	4.1
Inactive endometrium	2	1.6
Endometrial carcinoma	3	2.5

Discussion

Abnormal uterine bleeding is one of the most common presentations of gynecological disease, and adenomyosis is one of the causes of these symptoms [6], which affects women's quality of life. It is often diagnosed incidentally[4]; however, advances in diagnostic techniques have improved the accuracy of diagnosis [2]. In our retrospective study of 122 hysterectomy specimens from 2014 to 2024, the mean age of patient was 51.26 ± 6.6 adenomyosis was the most common finding in the 41-50 age group, with 49/122 (40.2%), which is similar to findings reported by Shivananjiah et al., Sagar et al., and Gopinath (50%, 59.8%, and 63%, respectively) in the 40-50 age group [11,8,10].

Patients with adenomyosis may be asymptomatic or present with abnormal uterine bleeding, dysmenorrhea, and menorrhagia[2]. Less common symptoms include chronic pelvic pain and dyspareunia [2]. In our study, postmenopausal symptoms were the most prevalent, occurring in 56/122 (45.9%), followed by abnormal uterine bleeding in 52 cases (42.2%). Ten patients (8.3%) had symptoms including dysmenorrhea and dyspareunia, and only four patients presented with menorrhagia (3.3%). In contrast to Gopinath and Vaidya (2021), who reported abnormal vaginal bleeding (92%) and dysmenorrhea (84%) as the most common symptoms[10], our findings differ. This discrepancy could be attributed to our mean age of 51.26 ± 6.6, which reflects the peri-and postmenopausal transition. During this period, there is significant hormonal fluctuation in postmenopausal women, with decreases in progesterone levels [12].

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There is also hyperestrogenemia, which increases the proliferative effect on the endometrium [12], as well as the influence of our study setting as a specialized tertiary oncology center (National Cancer Institute, Sabratha – Libya). The patient who presented with postmenopausal bleeding was referred to this institute for a definitive diagnosis.

Histopathological diagnosis associated with adenomyosis in the current data was leiomyoma, endometrial hyperplasia, endometrial polyp, disorder of proliferative endometrium, and endometrial adenocarcinoma. The most common coexisting lesion was leiomyoma, 38.5%. This finding is consistent with a previous study, which showed 41.4% [8], while the previous studies identified 19-57% [11]. The coexistence of leiomyoma with adenomyosis could be the result of hyperestrogenemia and alteration in growth factor and disruption in endometrial and myometrium boundaries; however, the exact mechanism is not fully understood [13].

Endometrial hyperplasia was identified in 23.0%; this association was significant, as reported by Parazzini et al. [14], whereas Ranaei et al. reported only 0.5% of cases[9]. Adenomyosis is an estrogen-related lesion, and elevated estrogen levels increase the risk of endometrial hyperplasia [6]. The least common coexisting estrogen-dependent lesions were endometrial polyps and proliferative disorder of the endometrium. Endometrial polyps were observed in 14.8% of adenomyosis cases, whereas Shivananjiah et al. found 9.09% [4].

Endometrial carcinoma was confirmed in only three cases (2.5%). Hyperestrogenemia seems to be the cause of the coexistence of these pathologies with adenomyosis.

Limitation

This study represents a single tertiary referral center in Libya. Future studies should include multicenter studies in Libya and larger samples of the target population to provide further molecular and clinical data.

Conclusion

To conclude, adenomyosis can coexist with other estrogen-dependent uterine pathologies. Notably, the diagnosis of adenomyosis declined with age. Significantly, adenomyosis is often associated with more serious conditions, in postmenopausal women, such as endometrial hyperplasia and carcinoma, which require further management; consequently, it is crucial to conduct more molecular prospective studies to assess this disorder.

Acknowledgment

Conflicts of Interest: The authors declare no conflict of interest.

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