

The Prevalence of Adenomyosis in Patients Who Underwent Hysterectomy for Benign Gynecological Diseases

Benign Jinekolojik Hastalıklar Nedeniyle Histerektomi Yapılan Hastalarda Adenomyozis Prevalansı

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Abstract

Objective: Adenomyosis is a common benign gynecological condition, yet its exact prevalence and associated factors remain subjects of investigation. This study aimed to determine the prevalence of adenomyosis in patients who underwent hysterectomy for benign indications at our clinic and to analyze the demographic and clinical characteristics associated with the condition.

Method: This retrospective study was conducted at the University of Health Sciences Turkey, Prof. Dr. Cemil Taşcıoğlu City Hospital. The histopathology reports of 1734 patients who underwent hysterectomy for benign reasons between January 2016 and December 2020 were reviewed. Patients were divided into two groups based on the presence or absence of adenomyosis. Demographic data, clinical presentations, surgical indications, and co-existing pathologies were compared between the groups. Statistical analysis was performed using SPSS 27.0.

Results: Adenomyosis was histopathologically confirmed in 526 of the 1734 patients, yielding a prevalence of 30.3%. Patients in the adenomyosis group had significantly higher mean age (51.4 vs. 50.2 years, $p<0.001$), gravida (4.49 vs. 3.67, $p<0.001$), and parity (3.21 vs. 2.77, $p<0.001$). The most common presenting symptom in the adenomyosis group was abnormal uterine bleeding (59.2%). Leiomyoma was the most frequent co-existing pathology, found in 48.9% of adenomyosis cases. Notably, pure adenomyosis without any accompanying pathology was identified in 22.6% of the cases.

Öz

Amaç: Adenomyozis sık görülen benign bir jinekolojik durum olmasına rağmen, kesin prevalansı ve ilişkili faktörler hala araştırma konusudur. Bu çalışmanın amacı, kliniğimizde benign nedenlerle histerektomi yapılan hastalarda adenomyozis prevalansını belirlemek ve bu durumla ilişkili demografik ve klinik özellikleri analiz etmektir.

Yöntem: Bu retrospektif çalışma, Sağlık Bilimleri Üniversitesi, Prof. Dr. Cemil Taşcıoğlu Şehir Hastanesi'nde gerçekleştirildi. Ocak 2016 ile Aralık 2020 arasında benign nedenlerle histerektomi yapılan 1734 hastanın histopatoloji raporları incelendi. Hastalar, adenomyozis varlığına veya yokluğuna göre iki gruba ayrıldı. Demografik veriler, klinik prezentasyonlar, cerrahi endikasyonlar ve eşlik eden patolojiler gruplar arasında karşılaştırıldı. İstatistiksel analiz için SPSS 27.0 kullanıldı.

Bulgular: Bin yedi yüz otuz dört hastanın 526'sında histopatolojik olarak adenomyozis doğrulandı ve prevalans %30,3 olarak bulundu. Adenomyozis grubundaki hastaların yaş ortalaması (51,4'e karşı 50,2 yıl, $p<0,001$), gravida (4,49'a karşı 3,67, $p<0,001$) ve parite (3,21'e karşı 2,77, $p<0,001$) anlamlı olarak daha yüksekti. Adenomyozis grubunda en sık görülen semptom anormal uterin kanama (%59,2) idi. En sık eşlik eden patoloji, adenomyozis olgularının %48,9'unda bulunan leiomyom idi. Dikkate değer bir şekilde, olguların %22,6'sında herhangi bir ek patoloji olmaksızın saf adenomyozis tespit edildi.

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Abstract

Conclusion: The prevalence of adenomyosis in our study population was significant, confirming its common occurrence in patients undergoing hysterectomy for benign causes. Advanced age, high gravidity, and parity were identified as significant associated factors. These findings underscore the importance of considering adenomyosis in the differential diagnosis of abnormal uterine bleeding and other common gynecological complaints.

Keywords: Adenomyosis, benign gynecological diseases, leiomyoma, hysterectomy, prevalence

Öz

Sonuç: Çalışma popülasyonumuzda adenomyozis prevalansı anlamlı olup, benign nedenlerle histerektomi yapılan hastalarda sık görüldüğünü doğrulamaktadır. İleri yaş, yüksek gravida ve parite önemli ilişkili faktörler olarak tanımlanmıştır. Bu bulgular, anormal uterin kanama ve diğer yaygın jinekolojik şikayetlerin ayırıcı tanısında adenomyozisin dikkate alınmasının önemini vurgulamaktadır.

Anahtar kelimeler: Adenomyozis, benign jinekolojik hastalıklar, histerektomi, leiomyom, prevalans

Introduction

Adenomyosis is a benign gynecological condition defined by the presence of ectopic endometrial glands and stroma within the myometrium, accompanied by surrounding smooth muscle hypertrophy and hyperplasia (1,2). This pathological process often results in uterine enlargement and may contribute substantially to gynecological morbidity, particularly among women of reproductive and perimenopausal age (3,4). Despite increasing recognition, adenomyosis continues to pose diagnostic and clinical challenges due to its heterogeneous presentation and frequent coexistence with other uterine disorders (5).

Although the precise pathophysiological mechanisms underlying adenomyosis remain unclear, several hypotheses have been proposed. The most widely accepted theory suggests that disruption of the endometrial-myometrial junctional zone facilitates the invagination of basal endometrial tissue into the myometrium (6,7). Alternative mechanisms include metaplastic transformation of Müllerian remnants and structural or functional alterations of the uterine junctional zone, often described as the “archimetra” (6,8). These mechanisms may act synergistically, contributing to the development and progression of adenomyosis in susceptible individuals (9).

Given that many cases are asymptomatic or present with non-specific symptoms that overlap with other common conditions like leiomyomas, the true prevalence of adenomyosis is likely underestimated (3). Understanding the frequency of this condition and its associated clinical and demographic factors is crucial for accurate diagnosis and effective management. This study was therefore conducted to determine the prevalence of adenomyosis in a large cohort of patients who underwent hysterectomy for benign gynecological indications at a tertiary care

center and to identify the key characteristics of this patient population.

Materials and Methods

The study was conducted at the Department of Obstetrics and Gynecology, University of Health Sciences Turkey, Prof. Dr. Cemil Taşcıoğlu Hospital, after receiving approval from the institutional ethics committee (approval no: 282, date: 06.07.2020). Due to the retrospective nature of the study, the requirement for informed consent was waived by the ethics committee. The study included all patients who underwent hysterectomy for benign gynecological indications between January 2016 and December 2020.

Patient data were retrieved from hospital records and the electronic information system. A total of 1734 patients were included in the final analysis. Patients with malignancies or those with incomplete data were excluded. The collected data included demographic characteristics (age, gravida, parity, number of abortions, and cesarean sections), menopausal status, co-morbidities, previous uterine surgeries, surgical indications, type of hysterectomy (total abdominal, vaginal, or total laparoscopic), and postoperative complications.

All hysterectomy specimens were processed and examined in the pathology department of our hospital. The histopathological diagnosis of adenomyosis was based on the established criterion of finding endometrial glands and stroma at a depth of at least 2.5 mm from the endometrial-myometrial junction (1,10).

Statistical Analysis

For statistical analysis, patients were divided into two groups: Those with a histopathological diagnosis of adenomyosis (adenomyosis group) and those without (control group). The statistical analysis was performed

using SPSS for Windows, version 27.0 (SPSS Inc., Chicago, IL, USA). The distribution of variables was assessed using the Kolmogorov-Smirnov test. Non-normally distributed continuous variables were compared using the Mann-Whitney U test, while categorical variables were analyzed using the chi-square test. A p-value of less than 0.05 was considered statistically significant.

Results

Of the 1734 patients who underwent hysterectomy for benign indications during the study period, adenomyosis was confirmed by histopathological examination in 526 patients, resulting in a prevalence of 30.3%. The remaining 1208 patients formed the control group.

Demographic and Clinical Characteristics

The demographic and clinical characteristics of the adenomyosis and control groups are compared in Table 1. The mean age of patients in the adenomyosis group was significantly higher than in the control group (51.4±8.4 vs. 50.2±9.5 years, $p<0.001$). Similarly, patients with adenomyosis had significantly higher mean gravida (4.49±2.74 vs. 3.67±2.45, $p<0.001$), parity (3.21±2.13 vs. 2.77±1.92, $p<0.001$), and number of abortions (0.52±0.96 vs. 0.35±0.78, $p<0.001$). There were no statistically significant differences between the groups regarding the history of cesarean section, rates of co-morbidities such as

hypertension and diabetes, or history of previous uterine surgery ($p>0.05$).

Surgical Details and Co-existing Pathologies

The most common indication for hysterectomy in the adenomyosis group was myoma uteri (37.6%), followed closely by abnormal uterine bleeding (36.9%). The distribution of hysterectomy types (abdominal, vaginal, laparoscopic) did not differ significantly between the two groups ($p>0.05$).

Co-existing pathologies were common, with only 22.6% of patients (n=119) having pure adenomyosis. The most frequently encountered co-existing pathology was leiomyoma, present in 48.9% (n=257) of the adenomyosis cases. Other associated findings included benign ovarian cysts (12.9%), endometrial polyps (9.5%), and endometriosis (3.4%), as detailed in Table 2.

Among patients with adenomyosis, 86.7% were symptomatic. The most common complaint was abnormal uterine bleeding, reported by 59.2% of symptomatic patients, followed by pelvic pain (21.1%) and uterine prolapse (20.2%).

Discussion

In this large retrospective cohort of patients who underwent hysterectomy for benign gynecological indications,

Table 1. Comparison of demographic and clinical characteristics

Characteristic	Adenomyosis (+) (n=526)	Adenomyosis (-) (n=1208)	p-value
Age (years, mean ± SD)	51.4±8.4	50.2±9.5	<0.001
Gravida (mean ± SD)	4.49±2.74	3.67±2.45	<0.001
Parity (mean ± SD)	3.21±2.13	2.77±1.92	<0.001
Abortus (mean ± SD)	0.52±0.96	0.35±0.78	<0.001
Previous C-section (%)	82.6	84.5	0.643
Premenopausal status (%)	39.2	37.2	0.431

SD: Standard deviation

Table 2. Co-existing pathologies in patients with adenomyosis (n=526)

Pathology	Number of patients (n)	Percentage (%)
Leiomyoma	257	48.9
Benign ovarian cysts	68	12.9
Endometrial polyp	50	9.5
Endometriosis	18	3.4
Simple hyperplasia	11	2.1
Cervical dysplasia	9	1.7
Atrophic endometrium	9	1.7
Pure adenomyosis (none)	119	22.6

adenomyosis was histopathologically confirmed in 30.3% of cases. This prevalence falls within the broad range reported in previous studies and reflects the well-documented variability across different populations and diagnostic approaches (11-13). Differences in histopathological criteria, the extent of specimen sampling, and patient characteristics have been proposed as major contributors to the wide variation in reported prevalence rates (10,14). In this context, the prevalence observed in our cohort provides a representative estimate for patients treated at a tertiary care center.

A notable finding of this study is the association between adenomyosis and increased age, gravidity, and parity. These associations support current concepts regarding the pathogenesis of adenomyosis, particularly theories emphasizing mechanical and hormonal factors affecting the endometrial-myometrial interface. Repeated pregnancies and childbirth are thought to induce microtrauma at the junctional zone, thereby facilitating the displacement of endometrial tissue into the myometrium (6,14,15). In contrast, a history of prior uterine surgery, including cesarean section, was not significantly associated with adenomyosis in our cohort. This observation suggests that physiological processes related to pregnancy and parturition may play a more prominent role than surgical disruption alone, consistent with findings reported in several previous studies (14,16).

The clinical presentation in our cohort was dominated by abnormal uterine bleeding (59.2%) and pelvic pain (21.1%), consistent with the classic symptom profile of adenomyosis (3,17). However, these symptoms are non-specific and frequently serve as primary indications for hysterectomy. Co-existing pathologies were present in 77.4% of patients, with leiomyomas being the most common (48.9%), which often complicates preoperative attribution of symptoms to adenomyosis alone (3,4). Nevertheless, the identification of pure adenomyosis in 22.6% of cases underscores that adenomyosis can be the sole cause of clinically significant uterine pathology.

Non-invasive diagnostic modalities, particularly transvaginal ultrasonography and magnetic resonance imaging, have shown increasing accuracy in identifying adenomyosis preoperatively (18-20). Additionally, adenomyosis has been associated with genitourinary symptoms such as overactive bladder, further broadening its clinical spectrum (21). Notably, had a preoperative diagnosis been established, the 22.6% of patients with

pure adenomyosis in our cohort could have potentially been managed with conservative approaches, such as the levonorgestrel-releasing intrauterine system, which has demonstrated efficacy in alleviating adenomyosis-related dysmenorrhea and menorrhagia (22,23). This finding highlights the clinical importance of improving preoperative diagnostic accuracy, as it may enable a substantial proportion of patients to avoid hysterectomy.

Study Limitations

The main limitation of our study is its retrospective design, which relies on the accuracy and completeness of existing medical records. This design prevents the establishment of causal relationships and may be subject to selection bias, as only patients who underwent hysterectomy were included. The strengths of the study include its large sample size and the use of definitive histopathological diagnosis for all cases, providing a high degree of diagnostic certainty.

Conclusion

Our results confirm that adenomyosis is a frequent histopathological finding among patients undergoing hysterectomy for benign gynecological indications, with a prevalence of 30.3%. Advanced age, higher gravidity, and increased parity were identified as significant factors associated with the presence of adenomyosis, highlighting the potential contribution of reproductive history to disease development. Given the non-specific nature of its clinical presentation and its frequent coexistence with other uterine pathologies, adenomyosis should be considered even when alternative diagnoses appear more prominent.

From a clinical perspective, these findings underscore the importance of maintaining a high index of suspicion for adenomyosis in multiparous women presenting with abnormal uterine bleeding or pelvic pain. Although histopathological examination remains the definitive diagnostic method, further prospective studies are warranted to improve non-invasive diagnostic strategies, particularly through advances in ultrasonography and magnetic resonance imaging, and to better clarify the natural course of the disease.

Ethics

Ethics Committee Approval: The study was conducted at the Department of Obstetrics and Gynecology, University of Health Sciences Turkey, Prof. Dr. Cemil Taşcıoğlu Hospital, after receiving approval from the institutional ethics committee (approval no: 282, date: 06.07.2020).

Informed Consent: Due to the retrospective nature of the study, the requirement for informed consent was waived by the ethics committee.

Footnotes

Authorship Contributions

Surgical and Medical Practices: A.B., V.M., Concept: A.B., V.M., Design: A.B., V.M., Data Collection or Processing: A.B., Analysis or Interpretation: A.B., V.M., Literature Search: A.B., Writing: A.B., V.M.

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