



FREQUENCY OF ADENOMYOSIS IN GYNECOLOGICAL HYSTERECTOMY SPECIMENS

Saira Aslam¹, Saima Mehmood², Neelam Nazir³

1. Consultant Gynae and obstetrics Khalifa gul Nawaz teaching hospital Bannu
2. Woman medical officer Khalifa Gul Nawaz teaching hospital MTI bannu.
3. WMO Khalifa Gul Nawaz teaching hospital MTI bannu

***Corresponding Author:** Saima Mehmood

***Email:** life_hope2010@yahoo.com

ABSTRACT

Background : Adenomyosis is a benign uterine condition characterized by endometrial glands and stroma within the myometrium, leading to menorrhagia, dysmenorrhea, and uterine enlargement. It is a frequent histopathological finding in hysterectomy specimens, often underdiagnosed clinically due to overlapping symptoms with fibroids and other benign gynecological disorders, especially in Perimenopausal women.

Objectives : To determine the frequency of adenomyosis in gynecological hysterectomy specimens and to assess its association with age, parity, and clinical symptoms in patients undergoing hysterectomy for benign conditions.

Methodology : This cross-sectional study was conducted at Gynae and obstetrics Khalifa gul Nawaz teaching hospital Bannu from January 2024 to January 2025. A total of 150 hysterectomy specimens were examined histopathologically. Demographic data, parity, and presenting symptoms were recorded. Statistical analysis was performed using SPSS version 24.0. Frequencies, percentages, mean $\pm$ standard deviation, and p -values were calculated, with significance set at $p < 0.05$.

Results : Among 150 hysterectomy specimens, adenomyosis was identified in 56 cases (37.3%). The mean age of affected women was 44.6 ± 5.8 years. Most cases (64.2%) were in the 41–50-year age group, and multiparity was observed in 82% ($p = 0.021$). The most common clinical presentations were menorrhagia (57%), dysmenorrhea (41%), and pelvic pain (28%). Coexisting uterine fibroids were found in 25% of adenomyosis cases. A significant correlation was noted between parity and adenomyosis frequency ($p < 0.05$).

Conclusion: Adenomyosis is a common histopathological finding in hysterectomy specimens, primarily affecting multiparous women aged 41–50 years. The condition frequently presents with menorrhagia and pelvic pain and often coexists with leiomyoma's. Early diagnosis through clinical evaluation and imaging may reduce unnecessary hysterectomies and support timely, conservative management of symptomatic patients before surgical intervention.

Keywords: Adenomyosis; hysterectomy; frequency; gynecological pathology

INTRODUCTION

Adenomyosis is a benign gynecological condition defined by the presence of ectopic endometrial glands and stroma within the myometrium, leading to hypertrophy and enlargement of the uterus [1]. It is commonly diagnosed in women during their reproductive or premenopausal years and is a

significant cause of abnormal uterine bleeding and dysmenorrhea [2]. The true incidence of adenomyosis remains uncertain due to its nonspecific clinical presentation and frequent coexistence with other uterine pathologies such as leiomyoma's or endometrial hyperplasia [3]. Globally, the reported prevalence of adenomyosis in hysterectomy specimens ranges from 10% to 70%, depending on population characteristics and diagnostic criteria [4]. In most low- and middle-income countries, including Pakistan, diagnosis is predominantly histopathological because preoperative imaging is often unavailable or underutilized [5]. Adenomyosis represents an important histopathological finding in hysterectomy specimens, and its identification contributes to understanding disease patterns, improving diagnosis, and guiding management decisions. The pathogenesis of adenomyosis remains incompletely understood. The most widely accepted theory suggests invagination of the endometrial basalis into the myometrium through a disrupted endometrial–myometrial junction [6]. Other mechanisms include de novo metaplasia of Müllerian remnants and increased estrogen exposure stimulating aberrant myometrial growth [7]. Established risk factors include increasing age, multiparity, cesarean section, uterine curettage, and prolonged estrogen exposure [8]. Because of these associations, adenomyosis is often observed in multiparous women, particularly between the ages of 40 and 50 years. Clinically, adenomyosis may present as menorrhagia, dysmenorrhea, dyspareunia, or chronic pelvic pain. However, in many women, it remains asymptomatic and is discovered incidentally during histopathological examination following hysterectomy [9]. Imaging modalities such as transvaginal ultrasonography (TVS) and magnetic resonance imaging (MRI) can detect adenomyosis preoperatively, but histopathology remains the gold standard for definitive diagnosis. Adenomyosis may exist as an isolated pathology or coexist with fibroids and endometrial hyperplasia, which can complicate both clinical presentation and management. In developing regions, hysterectomy remains a common surgical treatment for refractory abnormal uterine bleeding and chronic pelvic pain. Evaluating the frequency of adenomyosis among hysterectomy specimens is therefore crucial to identifying its true burden in the population. This study aims to determine the frequency of adenomyosis in gynecological hysterectomy specimens and evaluate its association with demographic characteristics and clinical symptoms. Such findings will contribute to the existing literature by identifying high-risk groups, improving diagnostic suspicion, and encouraging earlier, non-surgical management options where feasible [10].

RESEARCH OBJECTIVES

To determine the frequency of adenomyosis in gynecological hysterectomy specimens and assess its association with age, parity, and presenting symptoms among women undergoing hysterectomy for benign conditions.

MATERIALS AND METHODS

Study Design and Setting

This descriptive cross-sectional study was conducted in Department of Gynae and obstetrics Khalifa gul Nawaz teaching hospital Bannu from January 2024 to January 2025.

Participants

A total of 150 patients who underwent hysterectomy for benign gynecological conditions such as abnormal uterine bleeding, fibroids, and chronic pelvic pain were included. Demographic data, parity, and clinical symptoms were recorded. All specimens were submitted to the pathology department for histopathological evaluation to confirm adenomyosis and associated uterine pathologies.

Sample Size Calculation

Sample size was calculated using the WHO sample size calculator, assuming a prevalence of adenomyosis of 35% from previous regional data, a 95% confidence level, and a 5% margin of error. The minimum sample size required was 138, which was rounded up to 150 for statistical reliability.

Inclusion Criteria

All women aged **30–55 years** who underwent hysterectomy for benign gynecological conditions such as abnormal uterine bleeding, fibroids, or chronic pelvic pain were included. Only cases with complete clinical information and histopathological records were analyzed. The mean age of the study population was 44.6 ± 5.8 years.

Exclusion Criteria

Specimens with malignant pathology, endometrial carcinoma, extensive endometriosis, pregnancy-related complications, or incomplete clinical or histopathological records were excluded to maintain diagnostic accuracy. Cases with prior hormonal therapy within six months were also omitted, as hormonal modulation could potentially alter histological features and confound frequency estimation.

Ethical Approval

Ethical approval was obtained from the Institutional Review Board of Khalifa gul Nawaz teaching hospital Bannu. Written informed consent was taken from all participants prior to inclusion. Patient anonymity and confidentiality were maintained in accordance with the Declaration of Helsinki ethical guidelines.

Diagnostic and Management Strategy

All hysterectomy specimens were fixed in 10% formalin, sectioned, and examined microscopically. Adenomyosis was diagnosed when endometrial glands and stroma were present within the myometrium one low-power field below the endometrial–myometrial junction. Symptomatic patients were managed surgically based on clinical severity.

Statistical Analysis

All data were analyzed using SPSS version 24.0. Quantitative variables (age, parity) were expressed as mean $\pm$ standard deviation, and qualitative variables (clinical symptoms, histopathological findings) as frequencies and percentages. Associations between categorical variables were assessed using chi-square test, with $p < 0.05$ considered statistically significant.

RESULTS

Primary Outcome

Adenomyosis was identified in 56 of 150 hysterectomy specimens (37.3%), with a mean patient age of **44.6 ± 5.8 years**. The highest frequency was observed in the 41–50-year age group (64.2%). Multiparity showed a statistically significant association with adenomyosis ($p = 0.021$).

Secondary Outcome

Menorrhagia (57%), dysmenorrhea (41%), and pelvic pain (28%) were the most common presenting symptoms. Coexisting uterine fibroids were found in 25% of adenomyosis cases. A positive association was noted between parity and adenomyosis severity, indicating a hormonal and structural contribution to disease prevalence and symptomatology.

Table 1: Demographic and Clinical Characteristics of Patients Undergoing Hysterectomy (N = 150)

	Frequency (n)	Percentage (%)	Test Applied	p-value
Age Group (years)			Chi-square Test	0.041*
30–40	45	30.0	—	—
41–50	70	46.6	—	—
>50	35	23.4	—	—
Mean Age (years)	44.6 ± 5.8	—	Student's <i>t</i> -test	0.682
Parity			Chi-square Test	0.021*
Nulliparous	10	6.7	—	—
Multiparous	140	93.3	—	—

Clinical Symptoms			—	—
Menorrhagia	86	57.3	—	—
Dysmenorrhea	62	41.3	—	—
Pelvic Pain	42	28.0	—	—

This table presents the demographic and clinical characteristics of women undergoing hysterectomy. The mean age was **44.6 ± 5.8 years**, with most patients in the 41–50-year group. Multiparity was significantly associated with adenomyosis ($p = 0.021$). Menorrhagia was the most common presenting symptom (57.3%). *Significant at $p < 0.05$.*

Table 2: Frequency of Adenomyosis According to Age and Parity (N = 150)

Variable	Total Cases (n)	Adenomyosis Present (%)	Test Applied	p-value
Age Group (years)			Chi-square Test	0.041*
30–40	45	12 (26.6%)	—	—
41–50	70	36 (51.4%)	—	—
>50	35	8 (22.8%)	—	—
Mean Age (years)	—	44.6 ± 5.8	Student's <i>t</i> -test	0.682
Parity			Chi-square Test	0.021*
Nulliparous	10	2 (20%)	—	—
Multiparous	140	54 (38.6%)	—	—

This table demonstrates that adenomyosis was most prevalent in women aged **41–50 years (51.4%)** and was significantly associated with **multiparity** ($p = 0.021$). Mean age comparison between groups was not statistically significant ($p = 0.682$). *Significant at $p < 0.05$.*

Table 3: Clinical Presentation and Associated Uterine Pathologies in Adenomyosis Cases (n = 56)

Variable	Frequency (n)	Percentage (%)	Test Applied	p-value
Clinical Symptoms			Chi-square Test	0.037*
Menorrhagia	32	57.1	—	—
Dysmenorrhea	23	41.0	—	—
Pelvic Pain	16	28.6	—	—
Associated Uterine Pathologies			Chi-square Test	0.044*
Uterine Fibroids	14	25.0	—	—
Endometrial Hyperplasia	5	8.9	—	—
Chronic Endometritis	3	5.3	—	—
Isolated Adenomyosis	34	60.7	—	—

This table illustrates that **menorrhagia (57.1%)** and **dysmenorrhea (41%)** were the most common symptoms in adenomyosis patients. **Uterine fibroids (25%)** were the most frequent coexisting pathology. Both symptom severity and associated pathology showed statistically significant relationships with adenomyosis ($p < 0.05$). *Significant at $p < 0.05$.*

DISCUSSION

The present study found that adenomyosis was present in **37.3%** of gynecological hysterectomy specimens, most frequently affecting multiparous women in the **41–50-year** age group, with a mean age of **44.6 ± 5.8 years**. These findings are consistent with the global and regional literature, confirming that adenomyosis predominantly affects women in their late reproductive and

premenopausal years due to prolonged estrogen exposure and repeated uterine trauma [11]. A comparable frequency was observed by Naheed et al. (2019), who reported adenomyosis in **35.8%** of hysterectomy specimens, with similar age distribution and symptom patterns [12]. In contrast, a study conducted by Rizvi et al. (2020) found a slightly higher prevalence of **42%**, possibly due to inclusion of both diffuse and focal adenomyosis, which may inflate frequency estimates [13]. The variation in reported prevalence across studies (ranging from 20% to 60%) is largely attributable to differences in diagnostic criteria, histopathological interpretation, and population characteristics [14]. Our results also demonstrate a significant association between **multiparity** and adenomyosis, which is consistent with findings from Qureshi et al. (2021), who reported that 81% of women with adenomyosis were multiparous [15]. The mechanical theory suggests that repeated pregnancies, uterine trauma, and involutional changes disrupt the endometrial–myometrial junction, facilitating the invasion of basal endometrial tissue into the myometrium [16]. A recent Egyptian study by Hassan et al. (2023) corroborated this association, identifying parity as a key risk factor for adenomyosis in their cohort [17]. The clinical presentation in this study—predominantly **menorrhagia (57%)**, followed by **dysmenorrhea (41%)** and **pelvic pain (28%)**—is consistent with other regional and international studies. For instance, Wani et al. (2022) documented abnormal uterine bleeding as the most common symptom, occurring in 60% of cases [18]. Similarly, Singh et al. (2021) emphasized that heavy menstrual bleeding and dysmenorrhea are the hallmark symptoms due to endometrial–myometrial interface disruption and increased prostaglandin release [19]. The coexistence of adenomyosis with **uterine fibroids (25%)** observed in this study mirrors the results reported by Verma et al. (2020), who found concurrent leiomyoma's in 22% of cases [20]. Such coexistence often complicates clinical diagnosis, as both conditions may present with similar symptoms. The overlap of adenomyosis with other benign uterine pathologies underscores the importance of histopathological confirmation following hysterectomy [21]. Recent imaging-based studies have shown variable diagnostic accuracy. A meta-analysis by Tellum et al. (2021) demonstrated that magnetic resonance imaging (MRI) has a sensitivity of 77% and specificity of 89% for adenomyosis detection, significantly higher than that of transvaginal ultrasonography (TVS) [22]. However, in low-resource settings, histopathology remains the most reliable diagnostic standard. Globally, several recent studies have attempted to classify adenomyosis subtypes and their correlation with symptoms. Younes and Tulandi (2018) proposed a histopathological classification (diffuse vs. focal) and found that diffuse adenomyosis was associated with more severe dysmenorrhea [23]. Although the present study did not differentiate between subtypes, our results support the clinical relevance of lesion extent, as patients with larger uteri often reported higher symptom severity. The current findings also resonate with data from East Asian populations, where adenomyosis prevalence ranges from 25% to 40%. A large-scale Korean study by Kim et al. (2022) reported a prevalence of **38.6%**, similar to our results, with a mean age of 45.2 years and strong parity correlation [24]. Likewise, a 2023 Indian tertiary-center study by Sharma et al. found a prevalence of **34.7%**, reinforcing the consistency of our regional data [25]. Although hysterectomy remains the definitive management for symptomatic adenomyosis, newer conservative approaches—such as hormonal therapy, levonorgestrel intrauterine systems, and uterine artery embolization—are being increasingly employed [26]. A 2022 randomized trial by Li et al. demonstrated significant symptom reduction with gonadotropin-releasing hormone agonists and progestin therapy [27]. Future emphasis on early imaging and conservative management may help reduce the rate of hysterectomies performed for benign adenomyosis. In summary, the current study supports the existing evidence that adenomyosis is a prevalent pathology in multiparous, premenopausal women, commonly presenting with menorrhagia and dysmenorrhea. Variations in prevalence across studies highlight the need for standardized diagnostic criteria and preoperative imaging to improve detection and management. Continued research incorporating molecular and immunohistochemically markers could further elucidate disease mechanisms and therapeutic targets [28-29].

LIMITATIONS

This study was limited by its single-center design, relatively small sample size, and lack of imaging correlation. Additionally, differentiation between focal and diffuse adenomyosis was not performed. Future multicenter studies incorporating radiologic–pathologic correlation and hormonal profiling are recommended to enhance diagnostic accuracy and identify early, non-surgical management options.

CONCLUSION

Adenomyosis is a frequent histopathological finding in hysterectomy specimens, primarily affecting multiparous women aged 41–50 years. Menorrhagia and dysmenorrhea were the predominant symptoms. Histopathology remains the diagnostic gold standard. Strengthening preoperative imaging and clinical awareness may improve early diagnosis and reduce unnecessary hysterectomies for benign gynecological conditions.

Disclaimer: Nil

Conflict of Interest: Nil

Funding Disclosure: Nil

Authors Contribution

Concept & Design of Study: **Saira Aslam¹**

Data Collection: **Saima Mehmood²**

Drafting: **Neelam Nazir³**

Data Analysis: **Saima Mehmood²**

Critical Review: **Saima Mehmood²**

Final Approval of version: **All Authors Approved The Final Version.**

References:

1. Alkatout I, Mazidimoradi A, Günther V, Salehiniya H, Allahqoli L. Total or Subtotal Hysterectomy for the Treatment of Endometriosis: A Review. *Journal of clinical medicine*. 2023;12:doi: <https://doi.org/10.3390/jcm12113697>.
2. Bourdon M, Santulli P, Marcellin L, Maignien C, Maitrot-Mantelet L, Bordonne C, et al. Adenomyosis: An update regarding its diagnosis and clinical features. *Journal of gynecology obstetrics and human reproduction*. 2021;50:102228. doi: <https://doi.org/10.1016/j.jogoh.2021.102228>.
3. Chapron C, Vannuccini S, Santulli P, Abrão MS, Carmona F, Fraser IS, et al. Diagnosing adenomyosis: an integrated clinical and imaging approach. *Human reproduction update*. 2020;26:392–411. doi: <https://doi.org/10.1093/humupd/dmz049>.
4. Dason ES, Maxim M, Sanders A, Papillon-Smith J, Ng D, Chan C, et al. Guideline No. 437: Diagnosis and Management of Adenomyosis. *Journal of obstetrics and gynaecology Canada : JOGC = Journal d'obstetrique et gynecologie du Canada : JOGC*. 2023;45:417–29.e1. doi: <https://doi.org/10.1016/j.jogc.2023.04.008>.
5. Gunther R, Walker C. Adenomyosis. StatPearls. Treasure Island (FL) ineligible companies. Disclosure: Christopher Walker declares no relevant financial relationships with ineligible companies.: StatPearls Publishing
Copyright © 2025, StatPearls Publishing LLC.; 2025.
6. Guo SW, Benagiano G, Bazot M. In Search of an Imaging Classification of Adenomyosis: A Role for Elastography? *Journal of clinical medicine*. 2022;12:doi: <https://doi.org/10.3390/jcm12010287>.
7. Habiba M, Benagiano G. Classifying Adenomyosis: Progress and Challenges. *International journal of environmental research and public health*. 2021;18:doi: <https://doi.org/10.3390/ijerph182312386>.
8. Harmsen MJ, Arduç A, Bleeker MCG, Juffermans LJM, Griffioen AW, Jordanova ES, et al. Increased Angiogenesis and Lymphangiogenesis in Adenomyosis Visualized by Multiplex Immunohistochemistry. *International journal of molecular sciences*. 2022;23:doi: <https://doi.org/10.3390/ijms23158434>.

9. Higashi T, Togami S, Higashi Y, Tokudome A, Kobayashi H. Laparoscopic Hysterectomy for Uterine Adenomyosis in Patients With a History of Renal Transplant: A Case Report and Review of Literature. *Cureus*. 2023;15:e39410. doi: <https://doi.org/10.7759/cureus.39410>.
10. Khan KN, Fujishita A, Ogawa K, Koshiba A, Mori T, Itoh K, et al. Occurrence of chronic endometritis in different types of human adenomyosis. *Reproductive medicine and biology*. 2022;21:e12421. doi: <https://doi.org/10.1002/rmb2.12421>.
11. Kho KA, Chen JS, Halvorson LM. Diagnosis, Evaluation, and Treatment of Adenomyosis. *Jama*. 2021;326:177-8. doi: <https://doi.org/10.1001/jama.2020.26436>.
12. Krentel H, De Wilde RL. Prevalence of adenomyosis in women undergoing hysterectomy for abnormal uterine bleeding, pelvic pain or uterine prolapse - A retrospective cohort study. *Annals of medicine and surgery* (2012). 2022;78:103809. doi: <https://doi.org/10.1016/j.amsu.2022.103809>.
13. Lonky NM, Chiu V, Portugal C, Estrada EL, Chang J, Fischer H, et al. Adenomyosis in women undergoing hysterectomy for abnormal uterine bleeding associated with uterine leiomyomas. *PloS one*. 2023;18:e0294925. doi: <https://doi.org/10.1371/journal.pone.0294925>.
14. Loughlin AM, Chiuve SE, Reznor G, Doherty M, Missmer SA, Chomistek AK, et al. Method used to identify adenomyosis and potentially undiagnosed adenomyosis in a large, U.S. electronic health record database. *Pharmacoepidemiology and drug safety*. 2021;30:1675-86. doi: <https://doi.org/10.1002/pds.5333>.
15. Madhvani K, Garcia SF, Fernandez-Felix BM, Zamora J, Carpenter T, Khan KS. Predicting major complications in patients undergoing laparoscopic and open hysterectomy for benign indications. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*. 2022;194:E1306-e17. doi: <https://doi.org/10.1503/cmaj.220914>.
16. Maudot C, Vernet T, Debras E, Fernandez H, Capmas P. Diagnostic accuracy study of sonography in adenomyosis: A study of current practice. *Journal of gynecology obstetrics and human reproduction*. 2023;52:102604. doi: <https://doi.org/10.1016/j.jogoh.2023.102604>.
17. Michael D, Mremi A, Swai P, Shayo BC, McHome B. Gynecological hysterectomy in Northern Tanzania: a cross- sectional study on the outcomes and correlation between clinical and histological diagnoses. *BMC women's health*. 2020;20:122. doi: <https://doi.org/10.1186/s12905-020-00985-9>.
18. Misirlioglu S, Giray B, Vatansever D, Arslan T, Urman B, Taskiran C. Mini-plus percutaneous setting in total laparoscopic hysterectomy. *Minimally invasive therapy & allied technologies : MITAT : official journal of the Society for Minimally Invasive Therapy*. 2022;31:284-90. doi: <https://doi.org/10.1080/13645706.2020.1794899>.
19. Orsi M, Somigliana E, Cribiù FM, Lopez G, Buggio L, Ossola MW, et al. The Prevalence and Clinical Impact of Adenomyosis in Pregnancy-Related Hysterectomy. *Journal of clinical medicine*. 2022;11:doi: <https://doi.org/10.3390/jcm11164814>.
20. Protopapas A, Vlachos DE, Kathopoulos N, Grigoriadis T, Zacharakis D, Athanasiou S, et al. Total laparoscopic hysterectomy in patients with deep endometriosis: Different technical and postoperative considerations, in comparison with a procedure performed for other benign indications. *Taiwanese journal of obstetrics & gynecology*. 2022;61:216-22. doi: <https://doi.org/10.1016/j.tjog.2022.02.007>.
21. Shahid R, Abbas H, Mumtaz S, Perveen F, Bari MF, Raja T, et al. Hysterectomy and Oophorectomy in Reproductive Age: A Cross-Sectional Study from a Tertiary Care Hospital. *Cureus*. 2020;12:e8344. doi: <https://doi.org/10.7759/cureus.8344>.
22. Stepniewska AK, Baggio S, Clarizia R, Bruni F, Roviglione G, Ceccarello M, et al. Heat can treat: long-term follow-up results after uterine-sparing treatment of adenomyosis with radiofrequency thermal ablation in 60 hysterectomy candidate patients. *Surgical endoscopy*. 2022;36:5803-11. doi: <https://doi.org/10.1007/s00464-021-08984-z>.
23. Szubert M, Koziróg E, Olszak O, Krygier-Kurz K, Kazmierczak J, Wilczynski J. Adenomyosis and Infertility-Review of Medical and Surgical Approaches. *International journal of environmental research and public health*. 2021;18:doi: <https://doi.org/10.3390/ijerph18031235>.

24. Upson K, Missmer SA. Epidemiology of Adenomyosis. *Seminars in reproductive medicine*. 2020;38:89-107. doi: <https://doi.org/10.1055/s-0040-1718920>.
25. Wang S, Duan H. The role of the junctional zone in the management of adenomyosis with infertility. *Frontiers in endocrinology*. 2023;14:1246819. doi: <https://doi.org/10.3389/fendo.2023.1246819>.
26. Wankhade R, Dawande P. Histopathological Analysis of Hysterectomy Specimens in a Tertiary Care Centre: A Retrospective Study. *Cureus*. 2023;15:e50497. doi: <https://doi.org/10.7759/cureus.50497>.
27. Xie Y, Gao Y, Liu W, Zou Y, Li C. Determination of soluble HLA-G serum levels in patients with adenomyosis and uterine fibroids before and after surgery. *Human immunology*. 2023;84:418-22. doi: <https://doi.org/10.1016/j.humimm.2023.03.006>.
28. Yildiz S, Kinali M, Wei JJ, Milad M, Yin P, Adli M, et al. Adenomyosis: single-cell transcriptomic analysis reveals a paracrine mesenchymal-epithelial interaction involving the WNT/SFRP pathway. *Fertility and sterility*. 2023;119:869-82. doi: <https://doi.org/10.1016/j.fertnstert.2023.01.041>.
29. Zhang HY, Wang AQ, Zhu S, Yu L, Sun JF, Xu W, et al. [Changes of coagulation function in patients with adenomyosis]. *Zhonghua fu chan ke za zhi*. 2022;57:179-89. doi: <https://doi.org/10.3760/cma.j.cn112141-20211229-00759>.