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**BRIEF REPORT**

# Preventable surgical complication: insights from 33 abdominal wall endometriosis cases

## Önlenebilir cerrahi bir komplikasyon: 33 karın duvarı endometriozis olgusunun bulguları

Güven Erdoğrul[1], Güvenç Diner[1], Samed Sayar[1], Hacer Ece Özcan[1], Tuna Ayaş[1]

[1]Mersin City Training and Research Hospital, Mersin, Türkiye

**Abstract**

**Purpose:** The aim of this study was to report the diagnosis, treatment and follow-up results of patients operated with the diagnosis of abdominal wall endometriosis and to investigate its preventability.

**Materials and Methods:** This retrospective study included 33 patients who underwent surgery for abdominal wall endometriosis between 2021 and 2024. Diagnostic processes, treatment and follow-up results of the patients were evaluated. Patients were analyzed in terms of age, during from the last pelvic surgery to endometriosis excision, endometriosis location, endometriosis size, mesh use and recurrence.

**Results:** 33 patients were included in the study and the mean age was 32.91±5.64 years. Endometriosis lesions were detected at the Pfannenstiel incision line in all patients, 32 of them had a history of cesarean section and 1 patient had a history of oophorectomy. The lesions were located in the right corner in 19 patients, in the left corner in 12 patients and in the midline of the incision line in 2 patients. Follow-up period was 47.24±25.07 months and no recurrence or hernia was observed in any of the patients.

**Conclusion:** Abdominal wall endometriosis is a preventable complication, and it is necessary to avoid using the remaining vicryl in the fascia during uterine closure during cesarean section and to prevent intraoperative contamination.

**Keywords:**. Caesarean, endometriosis, excision

**Öz**

**Amaç:** Bu çalışmada karın duvarı endometriozisi tanısı ile opere edilen hastaların tanı, tedavi ve takip sonuçlarını bildirmek ve önlenebilirliğini araştırmak amaçlandı.

**Gereç ve Yöntem:** Bu retrospektif çalışmaya 2021 ile 2024 tarihleri arasında karın duvarı endometriozisi tanısı ile opere edilen 33 hasta dahil edildi. Hastaların tanı süreçleri, tedavi ve takip sonuçları değerlendirildi. Hastaların yaş, son pelvik cerrahiden endometriozis eksizyonuna kadar geçen süre, endometriozis yerleşim yeri, endometriozis büyüklükleri, mesh kullanımı ve nüks durumu açısından analiz edildi.

**Bulgular:** Çalışmaya 33 hasta dahil edilmiştir ve yaş ortalaması 32,91±5,64 yıl olarak hesaplandı. Hastaların hepsinde endometriozis lezyonları Pfannenstiel insizyonu hattında tespit edilmiştir ve 32'sinin öyküsünde sezaryen, 1 hastanın öyküsünde ise ooferektomi mevcuttu. Lezyonların yerleşimi incelendiğinde; 19 hastada sağ köşede, 12 hastada sol köşede ve 2 hastada insizyon hattının orta hattında olduğu belirlenmiştir. Takip süresi 47,24±25,07 ay olan hastaların hiçbirinde nüks ve herni izlenmedi.

**Sonuç:** Karın duvarı endometriozisi önlenebilir bir komplikasyon olup, sezaryen sırasında uterus kapatılmasında kullanılan ve kalan vikrilin fasyada kullanılmaması ve intraoperatif kontaminasyonun önlenmesi gerekmektedir.

**Anahtar kelimeler**: Caesarean, endometriosis, excision

Address for Correspondence: Güven Erdoğrul, Mersin City Education and Research Hospital, Department of General Surgery, Mersin, Türkiye Email: cerraherdogrul@gmail.com
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## INTRODUCTION

Endometriosis is a disease characterized by the presence of endometrial tissue outside the uterus, which can occur in both pelvic and extrapelvic areas[1]. While it is predominantly found in the pelvic area, extrapelvic localization is rare and can lead to various clinical symptoms[2].

Abdominal wall endometriosis (AWE) is a rare condition defined by the presence of endometrial tissue within the abdominal wall muscles and subcutaneous fat tissue[3]. The incidence of AWE varies between 0.03% and 3.5%, typically manifesting around the age of 35[4,5]. AWE most commonly develops after pelvic surgeries such as cesarean section, hysterectomy, and appendectomy, and the most common type is cesarean scar endometriosis[6]. The leading theory of AWE development is iatrogenic implantation of endometrial tissue during surgery[7]. However, in rare cases, AWE can also be observed in patients who have not undergone abdominal surgery[8].

The most common clinical findings of AWE include cyclic pain associated with the menstrual cycle, a palpable mass in the surgical scar, and a history of gynecological surgery[9]. Ultrasonography (USG) is the first-line imaging modality in the diagnostic process, with advanced imaging techniques such as magnetic resonance imaging (MRI) or computed tomography (CT) used when necessary. The definitive diagnosis is established through histopathological examination after surgical excision[10,11,12].

Malignant transformation of AWE is rare, with an estimated incidence of 0.3–1.0%[13]. Treatment options include minimally invasive methods such as high-intensity focused ultrasound (HIFU), cryoablation, radiofrequency ablation (RFA), and microwave ablation (MWA). However, wide surgical excision is currently considered the gold standard[10,14].

This study is a short report written to contribute to the literature on the prevention of AWE and aims to evaluate the diagnosis, treatment, and follow-up processes of patients who underwent surgery for AWE.

## MATERIALS AND METHODS

### Study design and sample

This retrospective study was conducted at Mersin City Training and Research Hospital, including a total of 33 patients surgically treated for abdominal wall endometriosis (AWE) and histopathologically diagnosed with endometriosis between August 2021 and November 2024. Patient data were retrieved from the hospital information management system, discharge summaries, and outpatient clinic records. In cases of missing or incomplete data, patients were contacted directly to obtain the necessary information. Inclusion criteria encompassed patients with a confirmed histopathological diagnosis of endometriosis following surgical intervention. Exclusion criteria included patients without a histopathological diagnosis of endometriosis (n=7), those with inaccessible data, or those who failed to attend postoperative follow-up appointments.

### Procedure

Ethical permission for this study was obtained from the Mersin University, Medical Faculty Clinical Research Ethics Committee, with approval dated 27/11/2024 and reference number 2024/1160. The study adhered to the principles of the Declaration of Helsinki, ensuring all patient data were handled confidentially and used solely for research purposes.

Data were systematically collected from electronic medical records, including demographic details, clinical history, preoperative diagnostic findings, surgical details, and postoperative outcomes. Follow-up data were gathered at intervals of 3 to 6 months post-surgery to monitor patient recovery and identify any complications or recurrences. All data were anonymized to protect patient privacy and stored securely in compliance with institutional data protection protocols.

#### Diagnostic procedures

Patients with a preliminary diagnosis of AWE underwent initial evaluation using ultrasonography (USG) to assess lesion characteristics. In cases where USG results were inconclusive, additional imaging modalities, such as magnetic resonance imaging (MRI) or computed tomography (CT), were employed to confirm the diagnosis (see Figures 1 and 2). When deemed necessary, a preoperative biopsy was performed under ultrasound guidance to obtain tissue samples for histopathological analysis, aiding in the confirmation of endometriosis prior to surgery.

#### Surgical procedure

All patients provided written informed consent prior

to surgery, following a detailed explanation of the procedure, risks, and expected outcomes. Surgical intervention involved a wide excision of the endometriotic lesion, performed by making an incision along the previous surgical scar to access the lesion (see Figures 3 and 4). The excision aimed to remove all visible endometriotic tissue while preserving surrounding healthy tissue. In select cases, at the discretion of the operating surgeon, a surgical mesh was placed to reinforce the abdominal wall and prevent hernia formation. A surgical drain was placed in all patients at the conclusion of the procedure to manage postoperative fluid accumulation. The drain was removed once daily drainage volume decreased below 10 cc, typically within a few days post-surgery.

### Histopathological analysis

Tissue samples obtained during surgery were sent to the pathology department for histopathological examination. The diagnosis of endometriosis was confirmed based on the presence of endometrial glands and stroma in the excised tissue. This step ensured that only patients with a definitive histopathological diagnosis were included in the final analysis.

### Follow-up protocol

Postoperative follow-up was conducted at 3- to 6-month intervals to assess patient recovery, monitor for complications, and evaluate for potential recurrence of endometriosis. Follow-up visits included clinical examinations and, when indicated, imaging studies to detect any residual or recurrent lesions. Patients who failed to attend follow-up appointments were excluded from the study to ensure data reliability.

### Statistical analysis

Data analysis was performed using SPSS (Statistical Package for Social Sciences) version 21.0. Descriptive statistical methods, including mean, standard deviation, median, and percentage, were used to summarize demographic characteristics, clinical findings, and surgical outcomes. Continuous variables were expressed as mean ± standard deviation, while categorical variables were reported as frequencies and percentages. Statistical tests were selected based on data distribution and are detailed in the results section where applicable.

**Table 1. Characteristics of patients**

| | |
|---|---|
| Number of patients | 33 |
| Age of the patients (years) | 32.91±5.64 (23-50) |
| Duration from last pelvic surgery to endometriosis excision (months) | 47.24±25.07 |
| Endometriosis lesion dimension (millimeter) | 28.12±9.73 |
| Endometrioma location (right corner /left corner / middle) | 19/12/2 |
| Mesh (+/-) | 9/24 |
| Follow-up period (months) | 21.85±22.83 (4-86) |
| Recurrence | 0 |

## RESULTS

The mean age of the 33 patients included in the study was 32.91±5.64 years. The average lesion size was 28.12±9.73 mm. The mean duration from pelvic surgery to AWE excision was 47.24±25.07 months. The average postoperative follow-up period was 21.85±22.83 months (4-86), during which no complications or recurrences were observed.

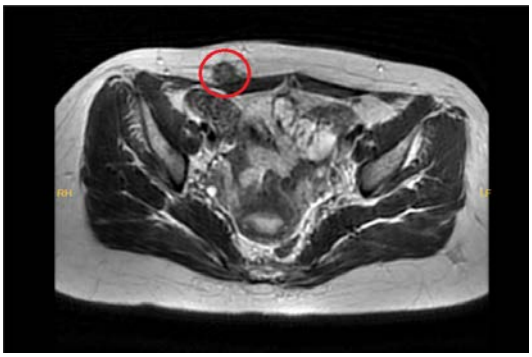

**Figure 1. Magnetic resonance image of endometriosis**

**Figure 2. Computed Tomography image of endometriosis.**

**Figure 3. Endometriosis excision**

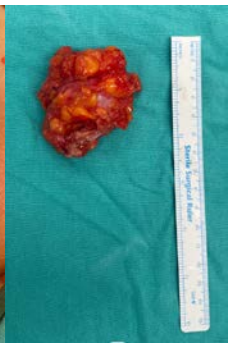

**Figure 4. Excised endometriosis.**

All endometriosis lesions were detected along the Pfannenstiel incision line. Among the patients, 32 had a history of cesarean section, while one had a history of oophorectomy. Regarding lesion localization, 19 cases were in the right corner, 12 in the left corner, and 2 in the midline of the incision. During surgery, a mesh was placed in 9 patients, whereas 24 patients underwent primary repair. No cases of hernia were observed during the follow-up period (Table 1).

## DISCUSSION

Endometriosis is characterized by the presence of functional endometrial tissue outside the uterus, most commonly in the pelvic area[1,2]. However, it can also rarely occur in the abdominal wall, particularly within surgical scars following pelvic surgeries such as cesarean sections[3].

The most widely accepted mechanism for AWE development is iatrogenic implantation of endometrial tissue[15]. Most patients present with a palpable mass in the incision area and cyclic pain. USG is the first-line diagnostic tool, with contrast-enhanced CT or MRI used for further evaluation when necessary. Although treatment methods such as HIFU, cryoablation, RFA, and MWA have been suggested, wide surgical excision remains the most effective treatment[14,16]. Even in recurrent cases, surgical excision is the first-line option[9]. Untreated cases have the potential for malignant transformation over time[17].

With the increasing rate of cesarean sections, the incidence of abdominal wall endometriosis is also expected to rise[18,19]. Given that iatrogenic implantation is the most common mechanism, intraoperative preventive measures should be implemented. These include avoiding the use of uterine sutures on the abdominal wall and ensuring meticulous intraoperative cleaning[7,9].

This study found that most lesions were located at the incision's corner regions, particularly on the right side (the surgeon's side). Similar findings have been reported in the literature, suggesting that this could be due to the use of vicryl sutures in the fascial corners when closing the uterus. Although not recommended in clinical practice, uterine sutures are sometimes used for fascial repair, which may contribute to AWE formation[9].

AWE is a preventable complication, and the need for reoperation and associated complications can be avoided by proper selection of suture materials during cesarean section and adherence to intraoperative sterilization measures[20]. Although no recurrences were observed in our study, the relatively short follow-up period limits our ability to assess long-term outcomes, as recurrence rates increase with longer follow-ups[6].

In conclusion, in patients with a history of pelvic surgery, a palpable mass along the incision line and cyclic pain should raise suspicion for abdominal wall endometriosis and should be evaluated using ultrasonography. Advanced imaging techniques such as CT may be necessary to confirm the diagnosis and plan surgery. Although mesh placement during surgery did not significantly impact hernia formation in the short term, long-term follow-up is required to assess its effectiveness. AWE is largely preventable, and measures such as avoiding the use of suture materials remaining from uterine closure during cesarean sections within the fascia and preventing intraoperative contamination are necessary to reduce its occurrence. In addition, since recurrence rates and hernia formation increase with longer follow-up periods, there is a need for retrospective or prospective studies with longer follow-up periods.

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