

The clinical characteristics and surgical approach of scar endometriosis: A case series of 14 women

Faik Tatli¹, Orhan Gozeneli¹, Hacer Uyanikoglu^{2*}, Ali Uzunkoy¹, Huseyin Cahit Yalcin¹, Abdullah Ozgonul¹, Osman Bardakci¹, Adnan Incebiyik², Muhammet Emin Guldur³

¹Department of General Surgery, Faculty of Medicine, Harran University, Sanliurfa, Turkey, ²Department of Obstetrics and Gynecology, Faculty of Medicine, Harran University, Sanliurfa, Turkey, ³Department of Pathology, Faculty of Medicine, Harran University, Sanliurfa, Turkey

ABSTRACT

Scar endometriosis, also referred to as abdominal wall endometriosis (AWE), is a rare form of endometriosis that usually develops in the scar after obstetric or gynecological surgeries, including cesarean section (CS). Recently, the occurrence of scar endometriosis has been increasing together with the increase of CS incidence. Scar endometriosis can be clinically misdiagnosed as hernia, lipoma, or hematoma. Here we retrospectively analyzed the clinical aspects of scar endometriosis and surgical approach in 14 patients from a tertiary hospital, who were treated by surgery, between 2012 and 2017. The mean age was 32.71 ± 8.61 years (range: 19–45). Palpable mass and cyclic pain at the scar site were the most common complaints. Twelve patients had previously undergone CS, and two patients had undergone a surgery of ovarian endometrioma. The preoperative diagnosis was determined with ultrasonography (US), magnetic resonance imaging (MRI), or computed tomography (CT). Preoperatively, scar endometriosis was diagnosed in 12/14 patients (85.7%), while 2 patients (14.3%) were diagnosed with inguinal hernia. The treatment was surgical excision in all patients; in addition, mesh repair surgery was performed in 1 patient with recurrent scar endometriosis. Postoperatively, endometriosis was confirmed by histology in all patients. The average size of endometriomas was 24.71 ± 6.67 mm (range: 11–35). No woman had concurrent pelvic endometriosis. In the follow-up period (mean: 9 months) the recurrence of endometriosis was not observed. Scar endometriosis should be considered in all women of reproductive age presenting with cyclic pain and swelling in their abdominal incision sites.

KEY WORDS: Abdominal wall endometriosis; cesarean section; surgery

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INTRODUCTION

Endometriosis is defined as the presence of endometrial glands and stroma outside of the uterine cavity [1]. The incidence of endometriosis in women of reproductive age is reported to be around 5–15% [2]. Depending on the area where it develops, endometriosis is characterized as endopelvic or extrapelvic. Endopelvic endometriosis is more common and it can develop in different structures such as ovaries, uterosacral ligaments, pelvic peritoneum, recto-uterine pouch, cervix, vagina, and round ligament. Although rarely, endometriosis may also occur in extrapelvic structures, including abdominal wall, urinary and gastrointestinal tract, skin, brain, and lungs [3,4].

Abdominal wall endometriosis (AWE) that develops at the site of the surgical incision after obstetric or gynecological surgeries, including cesarean section (CS), is called scar or incisional endometriosis [5]. The incidence of AWE after CS is 0.03–1% of women that underwent obstetric or gynecological surgeries. The symptoms and signs of scar endometriosis may be ambiguous [5]. Thus, AWE can be misdiagnosed by clinicians as hernia, lipoma, or hematoma [6]. Because patients with scar endometriosis generally have complaints of cyclic pain and swelling at their incision site, surgery is often required for both the treatment and definitive diagnosis [7,8].

Although the pathophysiology of scar endometriosis is not completely understood, one of the most accepted theories proposes that it is caused by the inoculation of endometrial tissue into operation scar. Namely, endometrial tissue is inoculated directly in the surgical wound during the procedure, keeping the endometrial cells viable. It is assumed that endometriosis develops when these cells proliferate under hormonal stimulus or when they lead to the development of

*Corresponding author: Hacer Uyanikoglu, Department of Obstetrics and Gynecology, Faculty of Medicine, Harran University, Yenisehir Campus, 63300, Sanliurfa, Turkey. Phone: +94143183097; Fax: (0414)318319. E-mail: huoglu@hotmail.com

metaplasia in the surrounding tissue. In addition, the endometrial tissue may reach the wound through the lymphatic or vascular pathways [9].

Here we retrospectively analyzed the clinical aspects of scar endometriosis and surgical approach in 14 patients from a tertiary hospital.

MATERIALS AND METHODS

We retrospectively analyzed 14 patients who underwent surgery for endometriosis at our hospital between January 2012 and January 2017, and for which endometriosis was confirmed by pathology. The study design was in accordance with the guidelines of the Declaration of Helsinki (Second revision, 2008) and approved by the local ethics committee (11.05.2017/05).

Demographic characteristics, clinical features, types of previous surgical procedures, imaging methods used for diagnosis, and type of surgery for endometriosis were recorded from patient medical files. Any signs of erythema, induration, or purulent effluent at the site of incision were considered as wound infection.

Statistical analysis

All analyses were performed using IBM SPSS Statistics for Windows, Version 20.0. (IBM Corp., Armonk, NY). All data were expressed as mean \pm standard deviation (SD). The Pearson correlation coefficient was used for correlation analysis between the patient age and size of the mass and number of previous CS surgeries. A p value <0.05 was considered statistically significant.

RESULTS

The mean age of the patients was 32.71 ± 8.61 years (range: 19–45). Palpable mass and cyclic pain at the scar site were the most common complaints. Twelve patients had previously undergone CS, and 2 patients had undergone a surgery of ovarian endometrioma. The preoperative diagnosis was determined with US in 7 patients, MRI in 1 patient, and with CT in 6 patients. Preoperatively, AWE was diagnosed in 12/14 patients (85.7%), while 2 patients (14.3%) were diagnosed with inguinal hernia.

In all patients, the treatment was surgical excision of endometriosis and approximately 1 cm of the peripheral tissue. In addition, mesh repair surgery was performed in 1 patient with recurrent AWE (number 7), due to fascial defect (Table 1). Wound infection was detected in 2 patients (14.2%). The mean hospitalization time was 2.71 ± 1.0 days (range: 2–6).

Postoperatively, endometriosis was confirmed by

histology in all patients (i.e. endometrial glands and stroma were observed microscopically, Figure 1). The average size of endometriomas was 24.71 ± 6.67 mm (range: 11–35). No woman had concurrent pelvic endometriosis. During the follow-up period (mean: 9 months), the patients were not receiving a therapy for endometriosis, such as oral contraceptives or dienogest. They only used antibiotics and non-steroids in the postoperative period. The recurrence of endometriosis was not observed during the follow-up period.

No correlation was observed between the size of the mass and patient age and number of previous CS surgeries (all $p > 0.05$).

DISCUSSION

AWE that occurs at the incision site (scar endometriosis) is a very rare condition, and a few reports are available in the literature. The incidence of scar endometriosis varies from 0.2% to 0.45%. However, most of the reports on scar endometriosis are limited by the small number of patients [9]. In this study, we retrospectively analyzed the clinical aspects of scar endometriosis and surgical approach in 14 patients from a tertiary hospital.

Although the risk factors for scar endometriosis are not well known, it has been shown that previous uterine surgery, especially CS, is the most common risk factor for this condition [10,11]. As a possible cause of AWE after CS, the iatrogenic implantation of endometrial tissue into the abdominal fascia and subcutaneous tissue during the procedure has been suggested [12]. However, this theory does not explain the development of endometriosis in distant organs. According to Halban [13], endometrial cells leave the uterus, pass into the lymphovascular system, enter the peripheral circulation of the distant organ, and eventually reach the organ [13]. Recently,

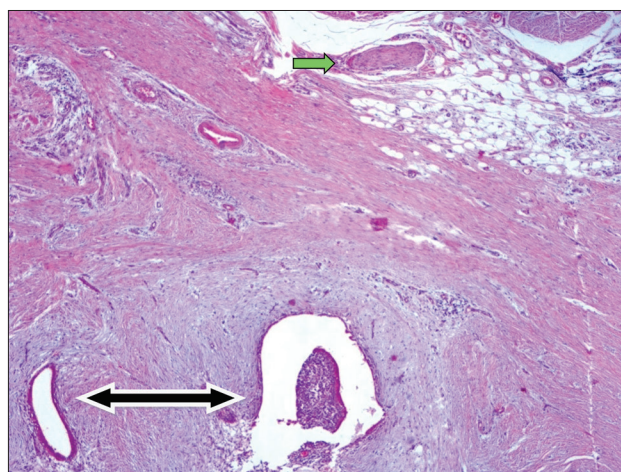


FIGURE 1. Hematoxylin and eosin (H&E)-stained section of excised tissue showing endometrial glands (black arrow), fibrous stroma, and a peripheral nerve in the deep dermis (green arrow) at high power magnification (x40).

TABLE 1. Clinical and demographic characteristics of patients with abdominal wall endometriosis in the surgical scar

Patient number	Patient age	Previous operation	Main complaint	Lesion location	Size of mass (mm)	Prediagnosis	Radiology	Surgical procedure
1	34	2 CS	Pain, swelling	Right lateral CS incision	18×8	AWE	US	Excision
2	20	1 CS	Swelling	Left lateral CS incision	11×8	AWE	US	Excision
3	42	3 CS	Pain, swelling	Left lateral CS incision	24×16	AWE	US	Excision
4	45	2 CS	Pain, swelling	Right lateral CS incision	22×10	AWE	MRI	Excision
5	19	1 CS	Swelling	Left inguinal area	35×10	Inguinal hernia	US	Excision
6	37	3 CS	Pain, swelling	Left lateral CS incision	25×20	AWE	US	Excision
7	30	2 CS, operated AWE	Pain, swelling	Midline CS incision	30×10	AWE	CT	Excision+Mesh repair
8	33	Ovarian endometrioma	Swelling	Left lateral CS incision	21×12	AWE	CT	Excision
9	43	3 CS	Pain, swelling	Right lateral CS incision	25×18	AWE	US	Excision
10	42	1 CS	Pain, swelling	Left inguinal	30×10	Inguinal Hernia	US	Excision
11	29	1 CS	Pain, swelling	Left lateral CS incision	32×18	AWE	CT	Excision
12	23	2 CS	Swelling	Left lateral CS incision	30×21	AWE	CT	Excision
13	35	Ovarian endometrioma	Pain, swelling	Midline CS incision	27×11	AWE	CT	Excision
14	26	1 CS	Pain, swelling	Right lateral CS incision	16×13	AWE	CT	Excision

AWE: Abdominal wall endometriosis; CS: Cesarean section; CT: Computed tomography; MRI: Magnetic resonance imaging

the occurrence of scar endometriosis has been increasing together with the increase of CS incidence. For this reason, strategies have been recommended to prevent the occurrence and recurrence of scar endometriosis. For example, Ozel et al. [14] suggested that some practices during CS, such as precise control of bleeding, washing of the abdominal cavity before the closure of the abdomen, and minimizing the subcutaneous dead space, might be effective for decreasing the incidence of scar endometriosis [14].

Clinically, scar endometriosis is difficult to diagnose, but several symptoms commonly occur, including cyclic pain during menstruation [15] and swelling in the pelvic region. Similarly, most of our patients had been referred to the hospital due to their complaints of cyclic pain and swelling at the incision site. In a recent study, Khan et al. [16] showed that patients with AWE had significantly higher parity and body mass index, and more cyclic localized abdominal pain compared to controls. Additionally, they found that cyclic localized abdominal pain, absence of dysmenorrhea, and previous laparotomy were independently associated with AWE [16]. Although we did not evaluate parity, body mass index, and presence of dysmenorrhea, we showed that there was no correlation between the size of the mass and age and the number of previous CS surgeries. The discrepancy between our and the study of Khan et al. [16] may be due to some of the

limitations of our study, including the retrospective nature, smaller sample size, and shorter follow-up period.

Because scar endometriosis is a rare clinical entity and often mimics other clinical conditions, the preoperative diagnosis is difficult. Among the methods that may be useful in diagnosing scar endometriosis are ultrasound (US), computed tomography (CT) and magnetic resonance imaging (MRI), as well as US-guided fine needle aspiration biopsy (FNAB) [17,18]. On US, AWE appears as cystic, solid, or heterogeneous mass [10]. On CT, AWE is usually observed as a confined solid or mixed mass. The foci of bleeding in the lesion are typically visible with both contrast CT and MRI [15,19]. In addition, Medeiros et al. [18] showed that US-guided FNAB can be a useful and inexpensive method in diagnosing AWE [18]. In our study, 7 patients were diagnosed with US, 1 patient with MRI and 6 with CT, and we did not use FNAB as a diagnostic tool for scar endometriosis.

The most common treatment options for scar endometriosis include medical therapy and surgery [2,20]. The medical therapy is aimed both to relieve the symptoms and to suppress the amplifying effect of hormones on the lesion; nevertheless, if the medical therapy is ineffective, surgical excision may still be required [17]. Minimally invasive cryoablation treatment, injection of alcohol into the lesion, or wide local excision of the lesion may be useful in some cases [21,22]. However, surgical

excision, which is both diagnostic and curative, remains the most effective treatment for scar endometriosis. This excision should include clear margins at least 1 cm away from the solid tissue. In cases where a large excision is required, polypropylene mesh should be applied to the lesion to prevent incisional hernia [10,15,20]. For example, Pas *et al.* [23] suggested that repair of large post-excisional deficits with mesh is important in women who are planning for pregnancy [23]. In our study, all patients were treated with surgery, and in one case of recurrent AWE, the endometriosis was repaired with mesh because of the presence of an extensive wound defect. There was no recurrence of AWE or occurrence of hernia in this patient during the follow-up period.

CONCLUSION

Scar endometriosis should be considered in all women of reproductive age with a history of gynecological interventions and presenting with cyclic pain and swelling in their abdominal incision sites. A proper surgical resection may be considered as the definitive treatment option for scar endometriosis.

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DECLARATION OF INTERESTS

The authors declare no conflict of interests.

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