

ABDOMINAL WALL ENDOMETRIOSIS: AN OVERLOOKED BUT POSSIBLY PREVENTABLE COMPLICATION

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SUMMARY

Objective: To find ways of preventing abdominal wall endometriosis through a retrospective case review.

Materials and Methods: A retrospective study of 22 patients presenting with 26 postoperative abdominal wall masses. All masses were pathologically proved to be scar endometriosis between September 1994 and September 2006. The age, parity, symptoms and duration, previous surgeries, interval between previous surgery and current operation, initial diagnosis, and the 26 sites and size of endometrioma were recorded and analyzed.

Results: About 60% of the patients were in the fourth decade of life. All 22 cases, except one with mid-trimester hysterotomy, had previous cesarean section (CS). Three cases had vertical midline incision for CS, and the other 19 had Pfannenstiel incision, 18 of which were for CS and one for hysterotomy. Of the 22 cases, only three had multiple endometriomas, i.e. one case had three foci and the other two cases had two foci each. Twenty-three endometriomas were found in the Pfannenstiel incision group; 19 out of the 23 foci (82%) were located in either corner of the Pfannenstiel incision wounds (with right side predominance in 13 out of 19). Three endometriomas were noted in vertical midline incisions and two were in the upper corner. Three endometrioma excisions were done during repeated CS.

Conclusion: Abdominal wall endometriosis may be caused by iatrogenic inoculation of the endometrium into the surgical wound. It is strongly recommended that, at the conclusion of the surgical procedure, the abdominal wound be cleaned thoroughly, particularly at both corner sites (especially the operator's side). If an abdominal wall endometriosis is encountered after CS but the patient plans to have future pregnancy and the symptoms are mild, excision of the endometrioma may be deferred until the next indicated CS. [*Taiwan J Obstet Gynecol* 2008;47(1):42-48]

Key Words: abdominal wall endometrioma, abdominal wall endometriosis, cesarean section, hysterotomy, scar endometriosis

Introduction

Extrapelvic endometriosis is a relatively rare phenomenon. The majority of extrapelvic endometriosis involving scar tissue occurs following obstetric or gynecologic procedures, such as hysterotomy, episiotomy [1], cesarean

section (CS) [2], amniocentesis (rarely) [3,4] and laparoscopic procedures [5]. Abdominal wall endometriosis may be more common than reflected in the literature and has a distinct presentation and treatment. Moreover, concerning the rising CS rate, the prevention of scar endometriosis is worthy of our attention [6,7].

A PUBMED search revealed many case series detailing the diagnosis and management of abdominal wall endometriosis [1,2,7-10], but recommendations for its prevention are rarely mentioned [1,2,7]. In this retrospective study, we have attempted to find simple and effective ways of preventing abdominal



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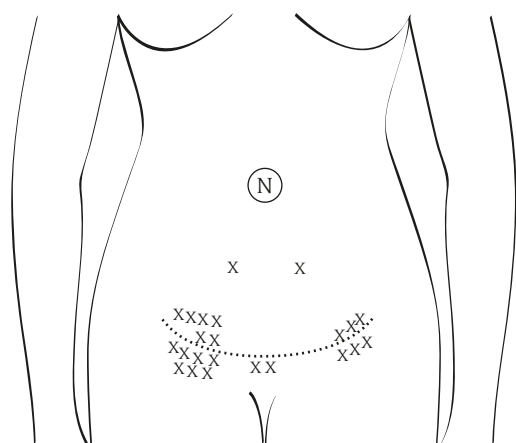


Figure 1. Anatomic location of 23 endometrioma foci in Pfannenstiel incision scars.

wall scar endometriosis by analyzing and discussing the anatomic locations of endometriomas.

Materials and Methods

We reviewed the medical records of patients treated at Han-Ming Hospital in Changhua, Taiwan for pathologically proven scar endometriosis from September 1994 to September 2006. We searched for case histories of patients who presented with abdominal wall tumor or mass.

This retrospective study included 22 patients presenting with 26 postoperative abdominal wall masses. All masses were proved to be scar endometriosis (by wide excisional biopsy under spinal anesthesia or general anesthesia with mask and were confirmed by pathology). Slides stained with hematoxylin and eosin were reviewed in all cases, and special stains were used when indicated. The age, parity, symptoms and duration, previous surgeries, interval between previous surgery and the time of excision of scar endometriosis, initial diagnosis, and 26 sites and size of endometriomas were recorded and analyzed (Figures 1 and 2). Follow-up information covering 6 months to 12.5 years with no recurrence had been noted so far.

Results

The study group comprised patients between the ages of 26 and 43 years with parity ranging from 1 to 5. About 60% of the patients were in the fourth decade of life.

All 22 cases, except one with mid-trimester hysterotomy, had previous surgery for CS. Of the 22 patients, three had vertical midline incisions for CS and the

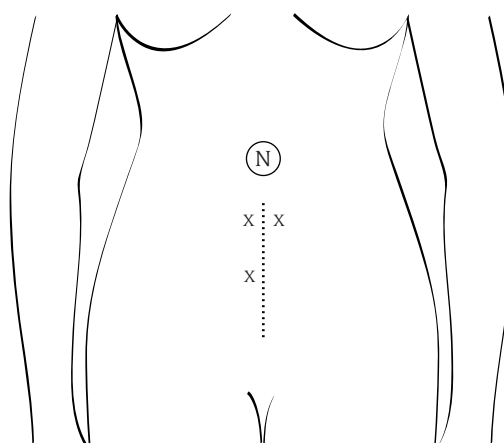


Figure 2. Anatomic location of three endometrioma foci in midline vertical incision scars.

remaining 19 cases had Pfannenstiel incisions, 18 of which were for CS and one for hysterotomy. Of these 22 cases, only three had multiple endometriomas, i.e. one case had three lesions and the other two cases had two lesions each. Twenty-three endometriomas were found in the Pfannenstiel incision group. Nineteen foci in these 23 (82%) were located in either corner of the Pfannenstiel incision wounds, with 13 out of 19 being in the right corner (Figure 1). For the midline incision group, three endometriomas were found, two being in the upper corner of the wounds (Figure 2).

All patients but two had different severity of periodic pain associated with menses and tumor mass (or masses) inside or near a surgical scar. The duration of their symptoms ranged from 6 months to 12 years. Three patients had had successful pregnancies after the development of scar endometriosis due to previous CS and had excision of the scar endometrioma during the repeated CS. This 22-case series is summarized in Table 1.

In view of the possibility of scar endometriosis, all masses were widely excised. Microscopic sections all revealed endometrial glands and stroma scattered in the fibrocollagenous scar tissue (Figure 3). In some specimens, the ectopic endometrium was found infiltrating into the muscle fibers (Figure 4). In three cases, the characteristic decidual reaction was observed surrounding the endometrial glands (Figure 5).

Discussion

Endometriosis is defined as the presence of endometrial glands and stroma outside the uterus. This ectopic finding occurs in the abdominal wall in 0.03% to 1.08% of women with previous history of obstetric or gynecologic procedures, particularly after hysterotomy [1].

Table 1. Profile of patients with abdominal wall endometriosis: current report (22 cases)

No.	Age (yr)	G, P, no. of CS and A	Previous surgery and incision	Presentation (duration, yr)	Interval (yr)*	Site and size	Initial diagnosis	Surgery
1	31	G3P3 CS1	CS with Pfannenstiel incision	Cyclic pain with mass (2.5)	3	Right lateral, 5 cm	Abdominal wall tumor	Wide excision
2	43	G2P2 CS2	CS with Pfannenstiel incision	Cyclic painful mass with bluish skin (12)	13	Right lateral, 6 cm	Abdominal wall endometriosis	Wide excision
3	31	G2P2 CS2	CS with Pfannenstiel incision	Cyclic pain with mass (1)	2	Right lateral, 4 cm	Abdominal wall endometriosis	Wide excision
4	32	G2P2 CS2	CS with Pfannenstiel incision	Non-cyclic tender mass (2)	3	Left lateral, 3 cm	Abdominal wall tumor	CS and wide excision
5	28	G1P1 CS1	CS with Pfannenstiel incision	Cyclic painful mass with bluish skin (4)	5	Right lateral, 6 cm	Abdominal wall endometriosis	Wide excision
6	37	G7P2 CS1 A5	CS with Pfannenstiel incision	Cyclic pain with masses (6)	7	Right rectus muscle, 3 cm; left rectus muscle, 3 cm; right lateral, 5 cm	Abdominal wall endometriosis	Wide excision
7	35	G4P3 A1 (Hysterotomy)	Hysterotomy at 19 weeks' gestation with Pfannenstiel incision	Cyclic pain with masses (7)	8	Right lateral, 2 cm; midwound, 4 cm	Abdominal wall endometriosis	Wide excision
8	31	G2P2 CS2	CS with Pfannenstiel incision	Cyclic pain with mass (5)	7	Right lateral, 4 cm	Abdominal wall endometriosis	Wide excision
9	31	G5P2 CS1 A3	CS with midline incision	Cyclic pain with mass (1.5)	2	Upper margin, 4 cm	Abdominal wall endometriosis	Wide excision
10	34	G2P2 CS2	CS with Pfannenstiel incision	Cyclic painful mass with bluish skin (3)	4	Right lateral, 5 cm	Abdominal wall endometriosis	Wide excision

11	41	G3P5 CS1	CS with Pfannenstiel incision	Cyclic painful mass with bluish skin (9.5)	10	Left lateral, 6 cm	Abdominal wall endometriosis	Wide excision
12	39	G2P2 CS2	CS with Pfannenstiel incision	Cyclic pain with mass (8)	10	Left lateral, 7 cm	Abdominal wall endometriosis	Wide excision
13	32	G2P2 CS2	CS with Pfannenstiel incision	Cyclic pain with mass (2)	4	Left lateral, 5 cm	Abdominal wall endometriosis	Wide excision
14	27	G1P1 CS1	CS with midline incision	Cyclic pain with mass (1)	2	Upper margin, 3 cm	Abdominal wall endometriosis	Wide excision
15	30	G2P2 CS2	CS with Pfannenstiel incision	Non-cyclic tender mass (4.5)	5	Right lateral, 4 cm	Abdominal wall tumor	Wide excision
16	33	G2P2 CS2	CS with Pfannenstiel incision	Cyclic pain with mass (3)	4	Right lateral, 4 cm	Abdominal wall endometriosis	Wide excision
17	33	G2P2 CS2	CS with Pfannenstiel incision	Cyclic pain with mass (0.5)	5	Left lateral, 4 cm	Abdominal wall endometriosis	Wide excision
18	29	G3P3 CS2	CS with Pfannenstiel incision	Cyclic pain with mass (3.5)	4	Left lateral, 4 cm	Abdominal wall endometriosis	CS and wide excision
19	29	G4P4 CS4	CS with midline incision	Cyclic pain with mass (2.5)	4	Midwound, 5 cm	Abdominal wall endometriosis	Wide excision
20	35	G2P2 CS2	CS with Pfannenstiel incision	Cyclic pain with mass (0.5)	2.5	Right lateral, 4 cm	Abdominal wall endometriosis	Wide excision
21	26	G2P2 CS1	CS with Pfannenstiel incision	Cyclic pain with masses (3.5)	4	Right lateral, 2 cm; midwound, 4 cm	Abdominal wall endometriosis	Wide excision
22	30	G3P3 CS2	CS with Pfannenstiel incision	Cyclic pain with mass (1.5)	4.5	Right lateral, 2 cm	Abdominal wall endometriosis	CS and wide excision

*Interval in years from last cesarean section or hysterotomy until time of excision of scar endometriosis; symptoms may have been present earlier. G = gravidity; P = parity; CS = cesarean section; A = abortion.

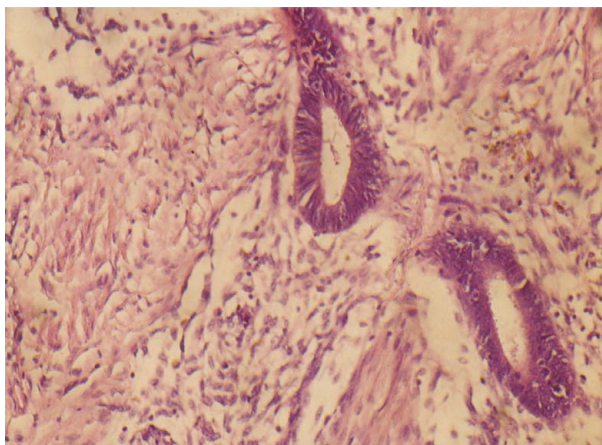


Figure 3. Endometrial glands and stroma scattered in fibro-collagenous scar tissue (hematoxylin and eosin, $\times 200$).

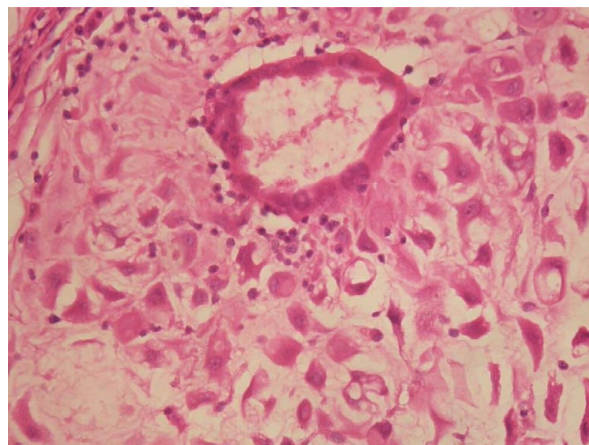


Figure 5. Stromal cells with decidual changes surrounding the endometrial gland (hematoxylin and eosin, $\times 200$).

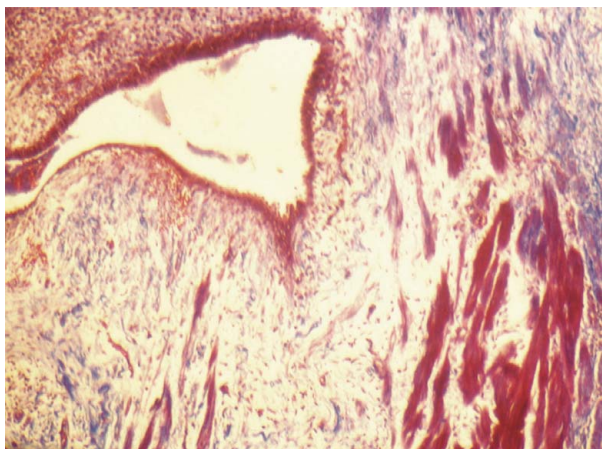


Figure 4. Endometrial glands and stroma infiltrating the abdominal wall muscle (trichrome stain, $\times 100$).

Abdominal wall endometriosis should always be considered when a mass appears in or near a CS scar or other gynecologic operative procedure sites. The time from CS to the onset of symptoms varies considerably and ranges from months to 17.5 years, with an average of 30 months [8,11,12]. Esquivel-Estrada et al described a diagnostic triad consisting of periodic waxing and waning pain accompanying the patient's menstrual cycle, history of CS (or other gynecologic surgery), and tumor inside or near the surgical scar [13]. However, Rao et al [14] and Blanco et al [15] reported that cyclical pain, as in abdominal wall endometriosis, was characteristic but uncommon in their series. From a literature review (Table 2), it appears that the diagnosis of abdominal wall endometriosis may become difficult if cyclical pain is not present. The duration of symptoms is also variable and ranged from 6 months to 12 years in our series. The pathogenesis of abdominal wall endometriosis is best explained by a combination of theories. The most practical and popular theory is that

of direct implantation; during the surgical procedure, endometrial tissue is seeded into the wound [16]. From this point, the tissue either proliferates under the same hormone influences as the endometrium in the uterus or induces metaplasia of the surrounding fascial tissue to form an endometrioma. Alternatively, endometrial cells may reach a CS scar via lymphatic or hematogenous routes and subsequently grow into an endometrioma by the mechanism described above [16].

It is believed that during the surgical procedure, when the uterine cavity is opened, there is some risk of decidualized endometrium implantation. However, only infrequent case reports of abdominal wall endometriosis following obstetric or gynecologic procedures have appeared in the literature. The antiapoptotic function of the survivin gene may play an important role in endometriotic implant survival and invasion [17–19].

There also has been a report of endometrioid carcinoma developing in abdominal wall endometriosis 17 years after previous hysterotomy [20]. Case reports of malignant transformation of scar endometriosis have been sporadically reported worldwide [21].

Laparoscopy is by far the gold standard for evaluating and diagnosing pelvic and peritoneal endometriotic implantations [22]. Ultrasonography, computed tomography scan, magnetic resonance imaging, and needle biopsy cytology are useful noninvasive techniques [23–26] when differential diagnosis, such as incisional hernia, suture granuloma and abdominal wall tumor, are encountered or more information about an already known scar endometrioma is needed.

In general, the treatment of choice for abdominal wall scar endometriosis or CS scar endometrioma is surgical excision, even for recurrent cases. Wide excision with at least a 1 cm margin and/or patch grafting for fascia defect have been emphasized [8,15].

Table 2. Profile of patients with abdominal wall endometriosis: literature review

Reference	Year	No. of cases	Previous surgery or procedure	Presentation		Initial diagnosis	Management
				Cyclic pain	Non-cyclic pain		
11	1965	26	CS				Wide excision
3	1979	1	Amniocentesis				
1	1980	14	CS1, hysterotomy 12, puerperal sterilization 1	13	1		Wide excision
2	1989	5	CS	4	1	Abdominal wall endometriosis	Wide excision
12	1993	7	CS	3	4	Abdominal wall tumor	Wide excision
5	1995	1	Laparoscopy	0	1	Abdominal wall tumor	Wide excision
4	1997	1	Third-trimester amniocentesis	1	0	Abdominal wall endometriosis or tumor	Wide excision
7	2002	6	CS	0	6*	Incision hernia, suture granuloma or abdominal wall tumor	Wide excision
8	2002	1	CS	0	1	Abdominal wall tumor	Wide excision and repair with mesh
9	2002	2	CS	2	0	Abdominal wall endometriosis	Wide excision
15	2003	12	CS	5	7	Abdominal wall endometriosis, abdominal wall tumor or incision hernia or inguinal hernia	Wide excision with PTFE graft for fascia repair
13	2004	25	CS	25	0		Wide excision
26	2004	1	CS	1	0	Foreign body granuloma or abdominal wall endometriosis	Wide excision
10	2006	1	CS	1	0	Abdominal wall endometriosis	Wide excision
14	2006	6	CS	1	5	Incisional hernia or scar endometrioma	Wide excision
Current report		22	CS21, hysterotomy 1	20	2	Abdominal wall endometriosis or tumor	Wide excision

*Cyclic pain related to menses was not mentioned. CS = cesarean section; PTFE = polytetrafluoroethylene.

Medical therapies used in the treatment of endometriosis include nonsteroidal anti-inflammatory agents, oral contraceptives, and analogs of gonadotropin-releasing hormone (GnRH). All medical treatments are equally effective, with 80% to 85% of patients having symptomatic improvement. The major differences are

their side effects [22]. A combination of surgical excision and postoperative adjuvant therapy, with either GnRH-agonist or danazol, is recommended [27].

Many obstetricians are trained to clean the endometrial cavity with a moist or dry sponge after placental removal just before uterine closure during a CS. This

procedure may deliver an increased inoculum of endometrial tissue to the abdominal wound if the used sponge is not discarded immediately after cleaning the uterine cavity [2]. The suture material used for suturing the uterus should not be reused during the closure of the abdominal wound [1]. The abdominal wall wound should be cleaned thoroughly and irrigated vigorously with saline solution before closure [2,7]. In our series, lesions of scar endometrioma were more common in corner sites, i.e. 2/3 in midline vertical incision scars and 19/23 in Pfannenstiel incision scars, with right side predominance (Figures 1 and 2). This phenomenon may be due to more operators standing on their patient's right side during surgery and the endometrial inoculums not being easily found and removed. Three patients with CS scar endometriosis had a smooth succeeding pregnancy without any infertility problems. They all received repeated CS associated with wide excision of the scar endometrioma.

In conclusion, abdominal wall endometriosis may be caused by iatrogenic inoculation of endometrium into the surgical wound. It is currently regarded as a rare disease entity. However, in the light of the rising CS rate, it may become more common. So, it is strongly recommended that the abdominal wound be cleaned thoroughly at the conclusion of the surgical procedure, particularly at both corner sites (especially the operator's side). If an abdominal wall endometriosis is encountered after CS but the patient plans to have future pregnancy and the symptoms are mild, excision of the endometrioma may be deferred until the next indicated CS.

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