Scar endometriosis: not a rare cause for a painful scar

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Abstract

Introduction. Endometriosis has been described as the presence of endometrial tissue outside uterine cavity. Scar endometriosis (SE) is a rare disease reported in 0.03-1.08% of women following gynaecologic surgery. In our retrospective observational cohort study we studied anamnesis, symptoms, surgical procedures and outcomes linked to scar endometriosis in our medical experience from 2004 to 2018.

Methods. We reviewed the medical records of 46 patients with a histopathological diagnosis of SE. All patients had a history of at least one previous caesarean section (n=46, 100%). Forty-two patients (91.3%) complained gradually growing nodular abdominal mass near or adjacent to caesarean incision scar, while only 4 patients (8.6%) complained aspecific abdominal pain. Ultrasound scan was performed in all patients (n=46, 100%) and mean size of the nodules at US was 26.8 ± 13.8 mm.

Results. All patients underwent surgery. Seven patients (15.2%) needed mesh implantation, while 39 patients (84.8%) underwent local resection with reconstruction of muscle fascia. Mean follow-up was 31.6 ± 14 months and no patients reported local recurrence of disease.


Key words: Scar endometriosis, caesarean section, nodular abdominal mass, painful scar

Introduction

Endometriosis is the presence of endometrial tissue outside the uterus1. The incidence of endometriosis is unknown, but it is believed that 10-15% of all women in their reproductive age develop endometriosis and 25-35% of infertile women have endometriosis2. Scar endometriosis (SE) is quite rare, its incidence develops in 1% of women following obstetric or gynaecological surgeries1.

Literature has been focused on the association between SE and caesarean section1, but SE may also due to previous gynaecological surgical procedure5. Time between caesarean section and SE diagnosis may be from several months to several years6.

SE usually presents as a nodule in the previous incision, in some patients a wrong diagnosis could lead to a wrong diagnosis of incisional hernia, abscess or suture granuloma4.

Absence of characteristic symptoms and unusual site of the lesion could cause a difficult or delayed diagnosis. Most typical finding is a palpable mass, painful and bigger during menses and history of caesarean section. Ultrasonography (US), Computerized Tomography (CT) and Magnetic Resonance Imaging (MRI) can help clinicians, but diagnosis needs to be confirmed by histological examination.

Materials and methods

This retrospective observational cohort study is based on clinical and imaging findings of 46 patients with a histopathological diagnosis of SE, compared to previous reported results.

Patients with SE were collected from comprehensive surgical database of Gynaecology and Surgery Department where we are honoured of working. We reviewed all the records of patients with histological diagnosis of SE from December 2004 to December 2018. We included only patients who underwent surgical excision and with pathological examination of the specimen confirming endometriosis abdominal wall diagnosis. Women in which endometriosis was limited to the peritoneal layer alone were excluded from our analysis.

Medical records of patients were collected such as historical data: age at time of excision, pregnancies/abortion, known pelvic endometriosis, previous surgery, excision made by a gynaecologist surgeon or a general surgeon, incision type (open vs. laparoscopic), time between last caesarean section and onset of symptoms, pain ‘s characteristics (cyclic with menses vs continuous), initial diagnosis.

Clinical data were collected: physical examination (palpability of nodule/s), US features (lesion size, site, echotexture,
presence of central vascularity with Doppler, presence of pelvic endometriosis), other imaging scans if performed (CT scan or MRI), fine needle biopsy, type of excision (using or not a mesh to repair the wall defect), operative time, hospital stay, postoperative complications, histological features, follow-up and recurrences.

Statistical analysis was performed using SPSS version 20 (IBM, Armonk, NY). Continuous data are reported as mean and standard deviation (SD) when normally distributed, and as median and minimum and maximum when not normally distributed. Comparisons of normally distributed, continuous data were made with Student’s t-test and ANOVA. Non-normally distributed, continuous data were analysed with Mann-Whitney U tests. Categorical data were analysed with Chi-squared and Fisher exact tests, and are presented as counts and percentages.

Results

There were 46 patients with a mean age of 32 ± 4.5 years. The mean number of pregnancies and abortions were 1.74 and 0.31 respectively. All patients had a history of at least one previous caesarean section (n=46, 100%). Only 4 patients (8.7%) had a previous diagnosis of pelvic endometriosis.

Twelve patients (26%) underwent previous surgery: 4 for endometriosis, 5 for appendectomy, 2 for cholecystectomy and 1 appendectomy; all these procedures were performed laparoscopically.

Mean time from last caesarean section and onset of symptoms were 24 ± 14 months and 17 ± 12 months respectively. Forty-two patients (91.3%) complained gradually growing nodular abdominal mass near or adjacent to caesarean incision scar, while only 4 patients (8.6%) complained aspecific abdominal pain. Predominant symptoms were pain (n=46, 100%), either cyclical associated with menses (n=39, 84.8%) either continuous (n=7, 15.2%). Physical examination revealed palpable masses in all patients (n=46, 100%). The nodule was fixed to the surrounding tissue.

An Ultrasound scan with colour Doppler was performed in all patients (n=46, 100%), and the most frequent finding was a hypoechoic nodule with hyperechoic spots or strands (due to fibrosis) spiculated margins, and a peripheral hyperechoic ring (complete or incomplete) (Fig. 1). The mean size of the nodules at US was 26.8 ± 13.8 mm. At colour Doppler vascular pedicle or central vascularisation were not observed (Fig. 2). During the exam all patients were investigated also for pelvic endometriosis and only in 5 patients (10.8%) the exam was positive. In 3 patients (6.5%) an MRI was also performed, in one case because the lesion was very small (16 mm), in the other case because the US findings were suggestive also for pelvic endometriosis. No further investigations, like CT scan or FNA, were performed.

Following physical examination and radiological/US scans all patients underwent surgery.

In our series the nodules were more often near or adjacent to their caesarean incision scar (n=42, 91.3%). Even if the nodule was few centimetres distant from the caesarean scar, we performed the new incision on the previous one. The nodules had elongated and irregular shape and a heterogeneous macroscopic structure. To provide a wide-margin surgical excision the nodules were removed with at least 1 cm of free margin, including abdominal wall tissue fixed to the nodules (Fig. 3).

Fig. 1. hypoechoic nodule with hyperechoic spots spiculated margins and an incomplete peripheral hyperechoic ring

Fig. 2. Vascular pedicle/central vascularisation wasn’t observed in echo-colour-doppler ultrasound

Fig. 3. The nodules had elongated and irregular shape and a heterogeneous macroscopic structure
Seven patients (15.2%) needed mesh implantation in order to repair abdominal wall defect, while 39 patients (84.8%) underwent local resection with direct reconstruction of muscle fascia. Mean operative time was 37 ± 12 minutes and mean hospital stay was 2 days.

The postoperative course was uneventful in 100% of patients. Histological findings confirmed the diagnosis of abdominal wall endometriosis in all patients and the mean size of the lesions was 38.6 ± 12.7 mm. Mean follow-up was 31.6 ± 14 months and no patients reported local recurrence of disease.

Discussion

Endometriosis is reported in 15-44% of women in reproductive age undergoing laparoscopy or laparotomy. The most common location is the pelvis, while the intestinal tract is probably the most common extragenital site, with a reported incidence of 5% out of all sites of endometriosis. Endometriosis inside a scar is an uncommon phenomenon. It’s mostly associated with caesarean section and its estimated incidence is 0.03-0.40% among all women.

Scar endometriosis is described as a mass located near or inside a surgical scar, most frequently after a caesarean section, although it has been described also after hysterectomy and laparotomy. Seydel reported an estimated incidence of 1-2% after lower abdominal surgery, while Minaglia reported an incidence of 0.08% after caesarean section over a 30 years follow-up.

In Horton’s review, including cases reported in literature from 1951 to 2006, 455 cases of abdominal wall endometriosis were identified, 57% associated with a caesarean section scar, and 11% with a hysterectomy. We reported a series of 46 patients with a mean age at diagnosis of 32 ± 4.5 years. In our series all patients had at least one previous caesarean section while only 12 patients (26%) had previous low abdomen surgery, in particular 4 cases (8.7%) had undergone surgery for pelvic endometriosis. All surgical procedures were laparoscopic.

Two different theories have been suggested to explain pathogenesis of SE. The first one supposed that endometrial cells may be transported to ectopic sites, especially during surgical procedures, where the cell may implant into the scar. An alternative theory postulate that primitive pluripotential mesenchymal cell may differentiate to form endometrial cells under special circumstances.

On the other hand, many patients with SE have no history or signs of pelvic endometriosis, suggesting that SE could be caused by the dissemination of endometrial cells into the wound at the time of the surgery, especially in cases of previous caesarean section. Because of the low capacity of proliferation of well-differentiated cells, some Authors suggested migration theory into the abdominal wall and proliferation of mesenchymal stem cell at the time of uterine surgery.

As previously reported all patients of our series were within reproductive age, had a history of at least one caesarean section and had an abdominal nodule in their caesarean incision scar at physical examination. Only 4 of them (8.7%) had a history of pelvic endometriosis and only in 4 cases (8.7%) US revealed a pelvic endometriosis unknown. These findings suggest an etiology induced by implantation during caesarean procedures. SE seems to be caused by the dissemination of endometrial cells into the wound at the time of the surgery.

The most common presenting symptom of SE is painful abdominal or pelvic wall mass inside or nearby a previous surgical incision, usually a caesarean section. A cyclic pain, related to the patient’s menses, is high suggestive of SE. However, there is no accordance whether is mostly cyclical or non-cyclical pain. Symptoms occur at the time of menstruation and include abdominal or pelvic pain associated to swelling; symptoms are less common without menses.

Francica, in his series of 33 SE, reported that larger the nodule, the more chronic pain is complained, although there was no statistical difference. Ozel reported about 18 patients complaining abdominal pain mostly cyclical (73%), related to the larger diameter of the masses in their series. The Author assumed that as the mass grew and reached a large size, the pain became more cyclically.

In our series patients complained gradually growing nodular abdominal mass in or adjacent to caesarean incision scar. Continuous pain was reported in only 7 cases (15.2%) and it was no related to nodule size (28.5 mm vs 26.8 mm, p n.s.).

Symptoms of SE appear from several months to many years after a gynaecologic or obstetric surgical procedure. In literature has been reported that the median age at the time of the diagnosis is 31.7-34 year and symptoms develop after an average time of 3.6 years from surgery, although the time between surgery and diagnosis varies widely.

In our series the median age at the diagnosis was 32 ± 4.5 years, and all the women were fertile both at the moment of the symptom’s appearance and the diagnosis. The symptoms revealed after an average time of 17 ± 12 months and the mean interval time from the last caesarean procedure was 24 ± 14 months.

Francica reported a mean interval between the last caesarean section and hospital admission of 3 years, and the duration of symptoms before diagnosis of 25.7 months. In larger SE (from 30 to 60 mm) the mean interval between last caesarean section and diagnosis (5.5 vs 3.3 years; <0.001) and the mean duration of symptoms (43.0 vs 17.4 months; p<0.01) were both longer than those observed in patients with smaller SE (from 7 to 26 mm).

These data suggest that SE diagnosis could be a challenge. Differential diagnosis includes abscess, suture granuloma, neoplasm, cyst, incisional hernia soft tissue sarcoma, desmoid tumours, lymphadenopathy, lipoma, hematoma or metastatic cancer.

US, CT scan, and MRI findings could be not specific. Moreover patients with larger SE usually underwent inconclusive diagnostic procedure (CT, MRI, FNA, laparoscopy) looking for the origin of lower abdominal pain.

Ultrasound is usually the first diagnostic tool used to evaluate a painful l mass of the abdominal wall identified at clinical examination. US findings of SE differ from those of ovarian endometriosis, appearing as a round cystic mass with regular margins, thickened wall, and homogeneous
pelvic endometriosis. was 40 mm at US and the US features were suggestive for examination20. It’s often necessary more imaging15,16,27,28.

However, it may be difficult to distinguish SE from other process at unenhanced and contrast enhanced CT, but correlation with clinical and us findings could be helpful28.

MRI imaging is preferred in younger patients, because of the lack of ionizing radiation and its improved tissue characterization. At MRI SE appears as hyperintense heterogenous nodule associated with anterior abdominal wall surgical scarring on both T1- and T2-wighted images, although this finding may vary26-30.

As reported in literature MRI can be more useful for small lesions and it allows a better identification between muscles and the subcutaneous tissue than CT scan due to its high spatial resolution28.

In our series all the patients (100%) underwent an US scan, performed by the same radiologist. The 46 SE ranged in diameter from 13 to 40,6 mm, and in the most of cases lesions were allocated in the context of the muscle, with evolvement of surrounding tissue.

US findings associated with clinical data were so suggestive of SE that no further investigation was needed. None CT scan was performed (0%), and only 3 women (6,5%) needed MRI. One of the 3 patients had a very small nodule (16 mm) and according to the literature MRI shows more accuracy in small lesions28. In the other patients the nodule was 40 mm at US and the US features were suggestive for pelvic endometriosis.

As reported by other authors SE may be represent a difficult diagnosis and it’s often necessary more imaging examination29.

Some authors proposed fine-needle aspiration biopsy for differential diagnosis of SE but this invasive method may provide to inconclusive results26-31,32.

Diagnostic pitfalls could lead to many consequences. First of all, the nodule can grow in the abdominal wall, changing its characteristics at clinical examination and at imaging either. Furthermore, the possibility to perform many and not always strictly necessary exams trying to get to a correct diagnosis obviously has a negative cost-effect and may cause a delay in the diagnosis itself and in the consequent treatment.33

Although SE is a challenging diagnosis, our work up for painful abdominal mass near caesarean section allowed to not have misdiagnosis prior to surgery. Clinical history, physical examination and US findings are strongly suggestive of scar endometriosis. Recent studies tried also to find biomarkers useful for endometriosis diagnosis.35 In our experience other imaging procedures, such as MRI, could be performed only in doubtful cases or in presence of concomitant pelvic endometriosis, avoiding invasive exam as FNA that could be inconclusive.

Surgical excision is the treatment of choice for SE, even for recurrence. In consideration of recurrence risk (4,3% after surgery)11 and of malignant degeneration34 treatment consists in the wider excision of the lesions, with at least 1 cm of free margin, including abdominal wall tissue fixed to the nodules19,36.

Muscle involvement and/or underlying fascia requires the en-bloc resection of myofascial elements. In these cases, a mesh repair may be necessary7. In our series only 7 patients (15,2%) presented nodule strongly fixed with the myofascial elements of abdominal wall. In order to obtain a wide excision we performed an en-bloc resection that required the implantation of a mesh to repair the defect. In case of local excision without involvement of abdominal wall direct reconstruction of muscle was performed (n=39, 84,8%). In our experience, the possibility of a further pregnancy must be taken into account in the choice of the type of intervention. The presence of a mesh can be an obstacle in the following caesarean procedure. We performed a mesh repair only in case of defects of more of 4 cm involving the muscle and the underlying fascia or if the nodule was in the lateral side of Pfannenstiel’s incision. In our experience the use of intraperitoneal mesh with 3D laparoscopic surgery, would be a great solution in these cases 37-41.

Conclusion

In conclusion high suspicion of scar endometriosis are painful nodule in the abdominal scar especially with a history of previous gynaecological or obstetric surgery.

Efforts should be made to make a preoperative diagnosis with the help of clinical history, physical examination and US scan. Medical treatment is not helpful. Wide surgical excision is the treatment of choice. Patient should be informed about recurrence risk and recruited for a long follow-up.

Conflict of interest: none to declare

Funding source: none to declare.

References