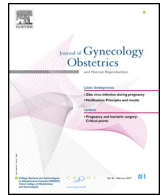




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Original Article

Trauma and endometriosis. A review. May we explain surgical phenotypes and natural history of the disease?

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ABSTRACT

Objective. – The study was performed to evaluate whether trauma is an initial event of development of endometriosis.

Method. – Using *Medline* database from January 1960 up to December 2014, a systematic review was made of all published studies using the keywords trauma, healing, injury, infection, hyperperistaltism, stretch and endometriosis, adenomyosis and trauma. Studies and review articles written in French and/or in English related to the topic were included and reviewed independently by two authors.

Results. – The role of trauma is well-established for endometriotic lesions diagnosed in surgical scars. Various traumas including delivery, uterine curettage or incision, intraperitoneal hemorrhage, or occult pelvic inflammatory diseases could be involved to explain other localizations of the disease. Many data suggested that the healing process, particularly growth factors and the associated estrogen production, may facilitate the implantation and the growth of ectopic endometrial cells. After the initial, a traumatic event, the phenotype of the disease would depend on the tissue in which the endometriotic lesion grows.

Conclusions. – The present literature review may support a potential role of a trauma as an initial event of endometriosis.

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Introduction

Endometriosis, whose prevalence and economic consequences are high [1,2], is often described as enigmatic and poorly understood.

All of the hypotheses proposed to explain the disease, from retrograde menstruation to stem cells [3–9], may occur in every woman. But as only 10% of the women of reproductive age have the disease [1], another mechanism or event seems necessary to explain the development of the disease. In the same way, we do not know why, at surgery, surgical phenotypes are so diverse and we are unable to propose a spontaneous and logical evolution of the disease. In our search for a marker of the activity or aggressiveness of endometriosis [10], we have been using more and more sophisticated scientific instruments, raising the same questions with different words, but we have not significantly improved the management of our patients.

Abdominal wall endometriotic nodules may be induced by a surgical trauma, [11] which explains the phenotype of the disease.

During surgery, we noticed that vaginal examinations used to assess the limits of deep nodules in the posterior cul-de-sac may induce rupture of small endometriotic cysts sometimes complicated by a small hemorrhage. On the basis of the clinical data, we recently proposed three hypotheses [12]. First, the extent or the surgical phenotype of the disease may be related to the initial anatomic localization, type, and severity of the trauma [12–14]. Second, in most clinical situations, if the trauma is stopped and the injured tissue is repaired properly, the severity (i.e., the number and the extent of endometriotic lesions) will not increase significantly [12]. Third, true recurrences of the disease may be rare, unless a new trauma induces further endometriotic lesions [12].

The most essential feature of our hypotheses is that trauma may trigger endometriosis [12]. To evaluate whether trauma is an initial event of development of endometriosis, we undertook a systematic review of the literature.

Methods

A primary computerized search was performed in *Pubmed* and *Medline* for papers published from January 1960 up to December 2014. We searched using the following mesh or

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keyword terms: “endometriosis and trauma or wound or injuries”, “endometriosis and healing or wound healing”, “endometriosis and hyperperistalsis”, “endometriosis and infection”, “endometriosis and stretch”, “endometriosis and traumatic stress”, “estrogens and healing”, “adenomyosis and trauma”. Only English and French language publications were included. The abstracts were reviewed by two of the authors (MC, NB). Using abstracts, papers were classified in 3 categories: case report, studies demonstrating and/or hypothesizing an association between endometriosis and trauma, and non-relevant studies. Papers about scar endometriosis or malignant transformation of scar endometriosis were included when a large number of cases or a detailed review of the literature was found, or when they reported an unusual location of the disease. Papers on the role of trauma were included when this problem was the main objective of the study, or if a specific trauma could be discussed from the results of the paper because it studied a possible cause such as pelvic infection. Additional studies were retrieved from the reference lists of the selected papers or were selected from additional *Pubmed* research performed on specific issues such as experimental, adolescent or recurrent endometriosis (Fig. 1). Potential biases such as perioperative medical treatment, biopsies to confirm the diagnosis and adequate staging of the disease were checked in clinical studies. Methods and experimental protocol were carefully reviewed in experimental studies looking for possible methodological biases.

Mechanical trauma and endometriosis

Well-defined trauma and scar

The searches for endometriosis and trauma and endometriosis and injury, endometrioma and healing identified many case reports about scar endometriosis and malignant transformation of scar endometriosis [11,15–17]. Endometriosis in cesarean, perineal and cervical scars and trocar sites after laparoscopy were often reported [11,17]. Less common cases included a gluteal mass causing cyclic sciatica in a patient who, 6 years previously, suffered a gunshot wound in the ipsilateral buttock which induced an abortion at 5 months of pregnancy [18]. Two cases of vulvar endometriosis in teenagers were reported following a vulvar trauma or ulceration which occurred during menses [19,20]. Ver-mesh reported a case of bladder endometriosis likely induced by a bladder injury [21]. After cesarean section, this risk is increased when the hysterotomy occurs early in the pregnancy and in patients who have heavy menstrual flow [22]. A prospective cohort study demonstrated that, in addition to the risk of scar endometriosis, women with a previous cesarean section have an increased risk of pelvic endometriosis, possibly suggesting that this obstetrical surgical trauma may also facilitate pelvic endometriosis [23]. In the same way, Schweppe and Ring reported that the recurrence rate was two times higher among patients who

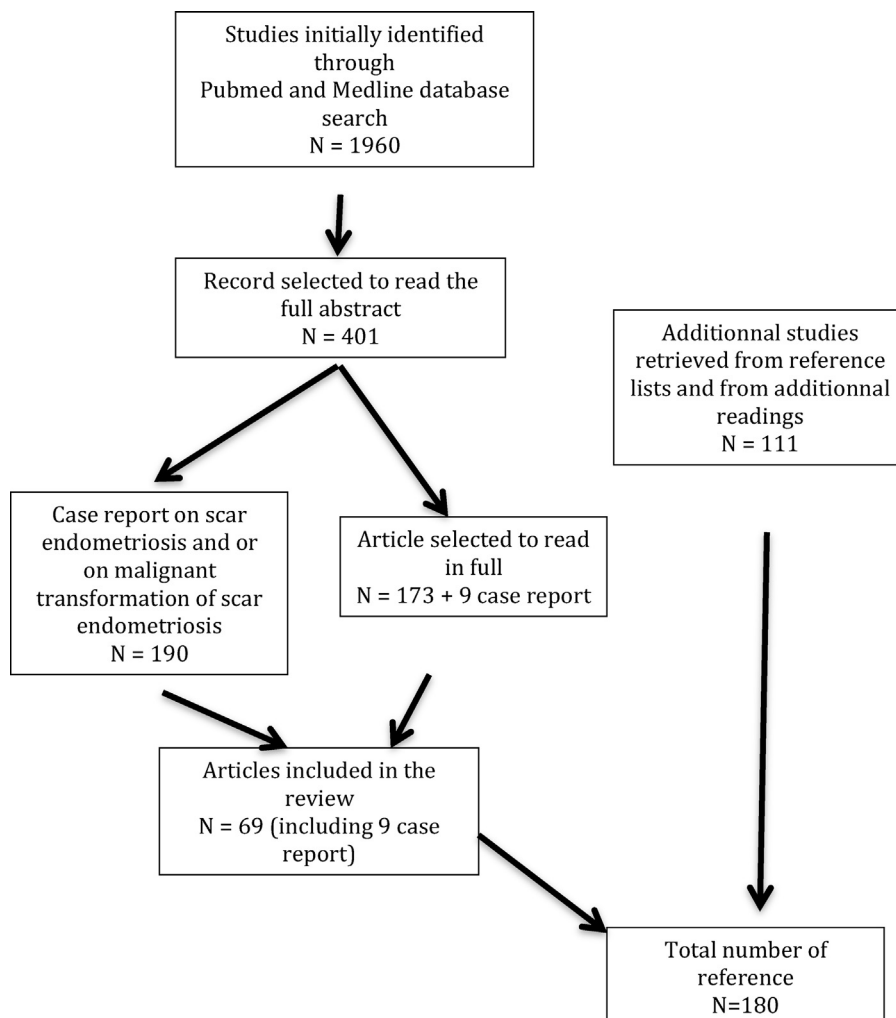


Fig. 1. Flow diagram 1.

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