

Abdominal wall endometriosis – clinical pattern and treatment

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Abstract

Endometriosis is a benign inflammatory disease that affects a large proportion of women in their reproductive age. A peculiar type is the one situated on the postsurgical scars in the form of endometriomas. Whilst most patients with this pathology do not have a history of pelvic endometriosis, the explanation for its appearance is the theory of implantation of endometriotic cells during surgery, as well as the existence of primitive, pluripotent mesenchymal cells that have undergone differentiation and metaplasia processes. Pain is the main symptom of this condition, accompanied frequently by the appearance of an abdominal wall mass, which are both influenced by menstrual periods. Endometriosis is an estrogen-dependent disease, thus the medical treatment could comprise contraceptives-containing progesterone, as well as antiestrogens, but the long-term success rate is low, the treatment of choice being the surgical one.

Keywords: endometriomas, postsurgical appearance, medical treatment, surgical cure

Rezumat

Endometrioza este o afecțiune inflamatorie benignă ce afectează o proporție mare din femeile de vârstă reproductivă. Un tip particular este cel situat pe cicatricile postchirurgicale sub formă de endometrioame. Deși majoritatea pacienților cu această patologie nu au un istoric de endometrioză pelviană, explicația pentru apariția acesteia este teoria implantării celulelor endometriale în timpul intervenției chirurgicale, precum și existența celulelor mezenchimale primitive, pluripotente, care au suferit procese de diferențiere și metaplazie. Durerea este principalul simptom al acestei afecțiuni, însoțită frecvent de apariția unei mase tumorale la nivelul peretelui abdominal, care sunt influențate de etapele ciclului menstrual. Endometrioza este o boală estrogen-dependentă, astfel încât tratamentul medicamentos poate cuprinde contraceptive care conțin progesteron, precum și antiestrogeni, dar rata de succes pe termen lung este scăzută, tratamentul de elecție rămânând cel chirurgical.

Cuvinte-cheie: endometrioame, apariție postintervenții chirurgicale, tratament medicamentos, vindecare chirurgicală

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Introduction

Endometriosis, a benign inflammatory disease that affects up to 15% of women during the reproductive period⁽¹⁾, represents the presence of functional endometrial tissue (glandular and stromal cells) outside the uterine cavity, most commonly located in the peritoneal cavity: the parietal peritoneum, ovaries, uterine ligaments, large intestine, urinary tract, especially the bladder. Although it is a common cause of pelvic pain, endometriosis is difficult to diagnose because of the diverse clinical picture it creates⁽²⁻⁵⁾. About 11% of women are affected by endometriosis, the exact prevalence being difficult to determine⁽⁶⁻⁸⁾.

The occurrence of endometriosis is explained by several theories, the most popular being the reflux of endometrial cells during menstruation and their implantation in the pelvis. However, this phenomenon cannot explain the presence of endometriosis outbreaks within the parenchymal organs (lungs, brain) or inside the intestinal wall (Sampson). Other accepted theories would be the theory of immunological alteration, the wrong differentiation of pluripotent celomic epithelium or progenitor stem cells⁽⁹⁾ and the lymphovascular dissemination theory (Halban). This states that some of

the endometrial cells pass through the uterine lymphovascular channels and reach the peripheral circulation, from where they can be implanted in any location⁽¹⁰⁻¹²⁾.

The main symptoms of endometriosis are pelvic pain, dyspareunia, dysmenorrhea, irregular menstruation, infertility, urinary or gastrointestinal symptoms that occur cyclically, simultaneously with the menstrual period. The symptomatology given by this pathology depends especially on the place where the lesions are found and not so much on their size⁽¹³⁾.

Even though in most cases endometriosis is located in the pelvis, it can rarely appear outside the pelvic cavity, especially in the postsurgical scars, in the form of endometriomas. Most patients with this pathology do not have a history of pelvic endometriosis, which supports the hypothesis of implantation of endometriotic cells in the tissue surrounding the incision and adjacent areas during surgery⁽¹⁴⁾. In addition to this theory, the occurrence of endometriomas in the abdominal wall can also be explained by the theory of metaplasia. This explains the appearance of endometriomas by the existence of primitive, pluripotent mesenchymal cells that have undergone differentiation and metaplasia processes, which resulted in mature and functional endometrial tissue.

Incidence

Most commonly, extraperitoneal endometriosis is found in the postoperative scars with an incidence of 1-2%⁽¹⁵⁾, representing 1.9-2.6% of all endometriosis cases^(16,17). Endometriomas are especially present in the post-caesarean scars with an incidence of 0.03-0.4%⁽¹⁸⁾. Following a study led by Leite et al. in 2009, they estimated that the rate of occurrence of endometriomas following obstetric surgery was between 0.03% and 3.5%⁽¹⁹⁾. The appearance of endometriomas following laparoscopic surgery, at the level of scars after trocarization, is between 0.5% and 7%, according to Chmaj-Wierzchowska⁽²⁰⁾. The first case mentioned in literature was in 1995.

The presence of endometriotic foci at the level of the abdominal wall is the most frequent localization of extrapelvic endometriosis⁽²¹⁾. Of the patients with endometriomas outside the pelvic cavity, only 26% are diagnosed with pelvic endometriosis⁽²²⁾.

Another less commonly encountered extraperitoneal localization of endometriosis is at the level of the episiotomy scar^(23,24). Their incidence is more frequent in patients who after vaginal birth require a subsequent uterine curettage. The main symptom is the appearance of a painful swelling at the level of the scar. The curative treatment is the excision of the lesion as a whole together with apparently healthy tissue. There have been reported cases where the endometrioma also affected the anal area, and for it to be completely excised, primary sphincteroplasty was also needed⁽²⁴⁾.

The most well-known risk factors for abdominal wall endometrioma are hysterectomy, increased parity, and increased menstrual flow⁽²⁵⁾. Multiparous patients aged 25-35 years old appear to be most commonly affected.

Although the appearance of endometriomas at the level of the abdominal wall is associated with caesarean section or with a gynecological surgery, there are cases in different studies where the endometrioma was diagnosed without any surgical history. One of the cases encountered is that of a patient who had three spontaneous births without associated complications, without abortions, but who had intense dysmenorrhea episodes that started shortly before the menstrual period and were accentuated during this period. During the investigations performed for the described symptomatology, the patient was diagnosed with a 4.3-cm uterine leiomyoma and an abdominal mass in the left iliac fossa of 2.9 cm. For the removal of the leiomyoma, a laparoscopic myomectomy was performed, in which the peritoneal cavity was inspected, without revealing anything pathological. The excision of the abdominal formation was made by a small incision that showed a hardened formation, with a dense, chocolate content of 3/4 cm, which after the histopathological examination was confirmed as endometriosis⁽²⁶⁾.

Symptoms

The dominant symptom of this condition is pain, which can be amplified by menstrual periods or

continuous. Also, in the majority of cases cited in different studies, it is described the appearance of a mass that becomes more sensitive to palpation and more voluminous during the menstrual period.

Diagnosis

Most of the time, the correct diagnosis of these tumors is difficult at first sight, requiring further investigations. The preoperative diagnosis of endometriomas is about 20%⁽²⁷⁾. For an easier diagnosis of this condition, the Esquivel triad can be used, which includes:

1. Palpable mass
2. Cyclic pain, which overlaps the menstrual period
3. Caesarean section⁽²⁶⁾.

The time elapsed from the moment of intervention to the onset of symptoms varies from a few months to eight years, according to Horton et al.⁽²⁸⁾ The main hint in the diagnostic algorithm is the exacerbation of local symptoms, with the occurrence of a high intensity pain, together with the increase in volume of the formation, all synchronized with the onset of the menstrual period. It was observed that there was an indirect connection between the size of the formation, the intensity of the pain and the time elapsed since the surgery. In contrast to patients with reduced volume tumors (less than 3 cm), patients who presented with large masses (greater than 3 cm) presented a more attenuated symptomatology, which started later and took a longer period from the time of surgery to the time of presentation to the hospital.

The symptoms, dimensions and invasion of the adjacent tissue are variables that cannot be expected. The largest meta-analysis, done by John D. Horton et al., comprising 455 patients diagnosed with endometrioma, revealed that 57% had a history of caesarean section and only 20% had no surgical history. Ninety-six percent of patients had a tumor formation, 87% had pain, and only 57% reported the cyclical presence of symptoms⁽²⁸⁾. The average period from the initial surgery to the moment of the symptomatology appearance in case of this population group was 3.6 years. Of all patients included in the study, only 13% had a history of pelvic endometriosis, which had the same incidence as the one among the general population. The recurrence of endometrioma was reported in 4.3% of the patients⁽²⁸⁾.

The Doppler ultrasound evaluation of the abdominal wall reveals a solid mass, hyperechoic, with present vascularization, the sensitivity of this investigation being 92%, but with low specificity⁽²⁹⁻³¹⁾. The ultrasound appearance is diverse and nonspecific, ranging from solid, mixed, to simple or multicystic formations⁽³¹⁾. The ultrasound aspect cannot be correlated with the menstrual period in all patients. Doppler ultrasound revealed that large masses tended to receive vascularization from the abdominal rectus muscles due to deep extension, whereas small lesions located in the subcutaneous adipose layer had a poor vascularization and thus explained the limited growth⁽³²⁻³⁴⁾. The presence of a central vascular axis at the level of the tumor most often indicates

the malignant origin. The lack of vascularization of the formation is a benign element⁽³⁵⁾. However, ultrasound evaluation is not considered a viable option for establishing a definite diagnosis.

The use of contrast tomography is another viable diagnostic variant⁽²⁹⁾ which can highlight a density formation ranging from solid, mixed to cystic consistency.

Magnetic resonance imaging (MRI) has the best resolution, higher than CT and Doppler ultrasound⁽³⁶⁾. MRI can describe more accurately the local anatomy and can define better the composition of the soft tissue, but it does not have the capacity to diagnose with certainty the investigated mass, with few exceptions: lipoma and hematoma^(22,37). Most commonly, endometriosis lesions appear hyperintense in the T2 sequence⁽³⁸⁾. The use of magnetic resonance imaging is justified by its ability to accurately determine the location of the formation, the presence of other incipient lesions, reduced in size, the hemorrhagic process that accompanies endometriosis lesions and the level of infiltration of the underlying tissues.

No pathognomonic imaging feature has yet been highlighted⁽³⁹⁾, which is why the use of computed tomography or magnetic resonance imaging as a diagnostic method is not indicated. The highest risk of confusion using these diagnostic methods is with the malignant tumors of the soft tissues^(15,40,41).

The certainty diagnosis for abdominal wall endometrioma can be made before the surgical excision by fine needle biopsy (FNA – fine needle aspiration), with the risk of spreading the endometrial cells at the time of puncture. Therefore, it is advisable to include the puncture site in the excised tissue area. If endometrial tissue is extracted by puncture, an accumulation of endometrial, stromal and macrophage cells filled with hemosiderin will be observed. For a definite diagnosis, only two of these three aspects are needed. The correct diagnosis based on this procedure is extremely difficult to realize⁽⁴²⁾.

For a differential diagnosis with abdominal wall endometriomas, there could be included: hernia, granuloma, cellulite, sebaceous cyst, lymphadenopathy, lipoma, hematoma, abscess, phlegmon, lymphoma, desmoid tumors, primary or secondary malignancies⁽⁴³⁾.

Treatment

The treatment of choice for the abdominal wall endometrioma is the surgical one. Surgical treatment involves the complete excision of the formation along with large safety margins, although this often involves the excision of the underlying musculoaponeurotic structures, with the creation of a defect that will require the installation of a polypropylene surgical mesh⁽⁴⁴⁾.

The practice of excision with large safety margins is justified by the high risk of recurrence of the endometrioma and by the risk of neoplastic transformation of the remaining endometrial cells^(45,46). If the excision of the mass has not been performed correctly, seromas will appear at the level of the postoperative scar, with

the reappearance of the formation accompanied by the preoperative cyclical pain⁽⁴⁷⁾.

A less invasive, but still early-stage form of treatment is represented by percutaneous cryoablation and radiofrequency ablation⁽²⁸⁾. In order to perform these procedures, a detailed and precise imaging diagnosis is needed, which will evaluate the extent of the lesion to the adjacent structures. Because the tumor-forming cells are estrogen dependent, the drug treatment with contraceptives containing progesterone, antiestrogens (danazol) and GnRh agonists such as leuprolid acetate has also been tried⁽⁴⁸⁾. Their success rate is low, the treatment of choice being the surgical one⁽⁴⁹⁾.

Another way of using contraceptives, also for therapeutic purposes, is to be given preoperatively. Because endometriomas tend to change their size depending on the menstrual cycle, sometimes they become difficult to spot. Shimpei Nara et al. administered preoperatively combined oral contraceptives (Planovar®) to maintain the mass to its maximum dimensions when performing the surgery⁽⁵⁰⁾. This process can minimize relapses because the formation can be completely excised, reducing the risk of omitting endometriotic fragments in adjacent tissue planes^(50,51).

Malignancy

The risk of malignancy of endometriosis in clear cell carcinoma is less than 1%. The risk factors for this process are represented by age, the presence of the endometrioma during the menopause, and the size of the mass larger than 9 cm. The 5-year survival rate for endometriomas is 80%. The risk of malignancy of endometriotic outbreaks in the scars is three times higher than the risk of ovarian cancer in the general population⁽⁵⁰⁾. Although endometrial lesions associate neoplastic foci with low degree of differentiation, the prognosis is favorable^(50,52). Most patients with neoplastic changes are pre-menopausal or menopausal^(53,54). Yu et al. presented two possible mechanisms of neoplastic transformation: one by estrogen stimulation, and the other by the presence of chronic inflammation⁽⁵⁵⁾.

Patients with a history of ovarian endometriosis have a higher risk of developing ovarian neoplasm than the general population^(50,52). Modessit et al. have established several criteria according to which patients with an increased risk of neoplasia can be identified: patients with endometriosis for a long period, diagnosis of endometriosis at an early age, endometriosis associated with infertility or a history of fertility treatment and the presence of endometriosis⁽⁵²⁾.

The first case of malignant transformation of endometriosis outbreaks was reported in 1925 by Sampson, who proposed three criteria according to which the diagnosis can be established as soon as possible. These criteria are: the presence of endometriosis foci in the immediate vicinity of neoplastic foci within the tumor formation, establishing the presence of endometrial tissue by histopathological analysis, and the absence of primary tumors. In addition to these three criteria, one

was added: the presence of areas of metaplasia between the areas of endometrial tissue and those of tumoral tissue⁽⁵⁴⁾. Currently, there are few cases found in literature that present the malignant transformation of endometriotic outbreaks from postoperative scars. The forms of neoplasm that have been found from endometriosis are: endometrioid endometrial cancer, clear cell carcinoma, stromal endometrial sarcomas, serous endometrial cancer⁽⁵⁶⁻⁵⁸⁾. Following a meta-analysis that evaluated 27 publications, the prognosis appears to be a negative one. However, the patients were followed for less than five years, without being able to specify precisely the life expectancy in these cases⁽⁵⁶⁾.

Prevention

In order to prevent the appearance of endometriomas in scars, it is indicated that the edges of the wound should be abundantly flushed with saline before suturing⁽⁵⁹⁾, along with the use of the endo-bags and the use of contraceptives after endometriosis surgery⁽⁶⁰⁾.

Other methods of prophylaxis of endometriosis are intraoperative behavior in the case of caesarean section and hysterectomy⁽⁶¹⁾. Removing the uterus outside the pelvic cavity before making the segment incision seems to be a method that greatly reduces the risk of endometriomas^(57,61). The use of other needles for the abdominal wall suture than those used for suturing the uterine segment incision⁽⁶¹⁾, excision of the remaining yellow body after hysterectomy⁽²⁸⁾, irrigation of the peritoneal cavities with high pressure and high quantity of

saline⁽⁵⁸⁾, avoidance of the use of sponges for cleaning the endometrial cavity⁽⁶²⁾, and the use of hormone treatment after hysterectomy⁽⁶³⁾ are some of the prophylactic methods that can be addressed.

Conclusions

Abdominal wall endometrioma is a pathology becoming more and more common, affecting especially women aged between 20 and 40 years old. The average interval in the onset of symptomatology depends from patient to patient, but it ranges between 2 and 5 years after caesarean section. The characteristic symptoms are represented by the appearance of a painful mass on the abdominal wall, with strong intensifying pain and increase in volume during menstrual periods. There are cases of abdominal wall endometrioma that are not associated with a history of surgery. The patients presenting with abdominal wall endometriosis have no greater predisposition to develop pelvic endometriosis than the general population. The diagnosis of this condition can be established after a suggestive medical history and a carefully made clinical examination. If the diagnosis is uncertain, it is possible to use imaging methods or fine needle aspiration technique. The medical treatment does not show satisfactory results. The gold standard for wall endometriosis is the excision of the endometrioma with wide margins. ■

Conflicts of interests: The authors declare no conflict of interests.

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