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Endometriosis: Overview and Management Options: A Review Article

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ABSTRACT

Endometriosis is a chronic disease that is basically benign but can cause innumerable symptoms including infertility. The reason is the lining of the uterus (endometrium), which grows outside the uterus and there also behaves in a cycle-dependent manner. Severe pain before and during the period (dysmenorrhea), especially with adenomyosis, is suspect. This form of endometriosis also often causes pain during sex. If the intestine is affected, it can lead to cycle-dependent digestive difficulties or chronic abdominal pain outside of menstruation, problems with urination can indicate endometriosis of the bladder. The diagnosis is initially made according to the principle of exclusion: If neither cysts, fibroids nor hormonal causes are possible triggers for the symptoms mentioned above, it could be endometriosis. In some cases, foci of endometriosis can already be seen on the ultrasound, for example if they affect the fallopian tubes or ovaries. Often, however, the disease cannot be diagnosed in this way, but above all it cannot be ruled out. Just a laparoscopy (laparoscopy) or a hysteroscopy gives certainty. The chance of discovering endometriosis foci and successfully removing them is many times higher. However, just as important as the medical equipment in the operating room is a surgeon who knows how to use it. In the case of severe infestation, especially of the intestines and bladder, a separate, interdisciplinary intervention is sometimes necessary. For this purpose, surgical colleagues, for example from urology, can be called in. If the endometriosis infestation and the associated psychological stress is very strong and family planning has already been completed, removal of the uterus (hysterectomy) can also be considered. Even these more complex operations are now mostly minimally invasive and can be performed with the laparoscopic keyhole technique.

Key words: Endometriosis, Gynaecological, Infertility, Pelvic pain, Ultrasound

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INTRODUCTION

The Endometriosis is a chronic disease that affects women of reproductive age. It consists of the presence of endometrial tissue outside the uterus. This tissue, which usually lines the uterine cavity, grows at the beginning of the menstrual cycle, transforms after ovulation to allow the implantation of a possible embryo, and flakes off during menstruation to re-grow in the next cycle [1]. Tissue outside the uterus responds in a similar way, whereby repeated cycles of growth and shedding (haemorrhage) lead to inflammation and fibrosis, which is sometimes associated with collections of blood and endometrial cell debris, called endometriomas, and nicknamed “chocolate cysts” for its dark brown content [2].

The presentation of endometriosis can vary from a mild involvement that goes unnoticed or causes slightly more painful periods to more serious disease, such as deep endometriosis, which also affects organs outside the reproductive system, such as the intestine [3]. Locations like this one, intestinal, are difficult to access surgically. The endometriosis in the ovary or ovarian is the presentations frequently in clinical practice because it is a

cyst or ovarian cyst, or more, with an image sonographic feature, so more easily recognizable and that leads to high suspicion of the diagnosis.

Ectopic endometrial tissue may also appear in the uterus. This endometriosis “in the uterus” refers only to the muscle, or the serosa (the superficial layer of the organ), since the uterine cavity has, as we have already discussed, endometrial tissue [4]. When endometrial tissue is found inside the muscular layer of the uterus, that is, outside the endometrial cavity but limited to the uterus, it is called adenomyosis. It's a disease, in a way, related to endometriosis, but in the uterus.

The main symptom of endometriosis is abdominal pain. They often occur together with the menstrual period, but also during or after sexual intercourse. The pain can sometimes be stronger, sometimes weaker and radiate into the lower abdomen, back and legs [5]. They are often experienced as cramping and can be accompanied by nausea, vomiting and diarrhoea. How the pain is expressed also depends on where the endometriosis foci have settled in the abdominal cavity. For example, they can grow on the outside of the uterus or in the wall of a fallopian tube. The ovaries, the area between the uterus and rectum (Douglas space) and the associated connective tissue are also often affected [6]. When the ovaries or fallopian tubes are affected, fertility is often impaired. Sometimes foci of endometriosis also form in organs such as the bladder or intestines, which can lead to problems with urination and bowel movements. Severe endometriosis can severely reduce quality of life and performance [7].

Causes and risk factors of endometriosis

Exactly how endometriosis develops is still unclear despite intensive research. But there are different theories about it. One of them is the so-called procrastination or transplant theory: It assumes that cells in the lining of the uterus are carried from the uterine cavity to other parts of the body. This should happen either via the circulatory system or via "reverse" (retrograde) menstruation - that is, via a backflow of menstrual blood via the fallopian tubes into the abdomen.

In fact, it is known that retrograde menstruation occurs in nine out of ten women [8]. In theory, it would therefore be entirely conceivable that mucous membrane cells from the uterus could get into the abdominal cavity in this way [9].

The metaplasia theory forms a contrast to the transplant theory: According to it, the mucous membrane cells of the endometriosis foci arise directly on the spot (for example in the ovaries) and are not carried there from the uterus. Instead, for unknown reasons, they are said to develop from local cells that arose from the same embryonic cell line as the uterine lining cells during development in the womb [9]. This could explain why endometriosis can also occur in men (albeit extremely rarely) - the original embryonic tissue is also found in them.

Other factors could also contribute to the development of endometriosis, for example a disrupted interaction between hormones. A malfunction of the immune system is also discussed: Normally, the immune system ensures that cells from a certain organ cannot settle in other parts of the body. In addition, antibodies against uterine lining can be detected in the blood of some patients [10]. These antibodies trigger inflammation in the endometriosis focus. However, it is not yet known whether these antibodies are the cause or the consequence of endometriosis.

Genetic factors could also play a role in the development of endometriosis. This is because sometimes the disease occurs in several women in the same family [11]. However, there is no evidence that endometriosis is directly hereditary.

Endometriosis: Diagnostic techniques

The definitive diagnosis of endometriosis is made by analysing tissue obtained by biopsy of an affected organ. Naturally, it is not always possible or desirable to undergo this test, so treatment is often initiated by the strong suspicion raised by signs and symptoms, in the context of a compatible clinical history and by other, less invasive tests. It is increasingly considered that the visualization of characteristic lesions in laparoscopy can make a diagnosis, even without biopsy [12].

The vaginal ultrasound is the preferred method to initially characterize the disease, because it is fast, essentially painless, and reliable to identify large lesions of endometriosis. As with any ultrasound (and any test), the experience of the doctor performing the endometriosis is important [13]. A gynaecologist who specializes in endometriosis will find it easier to find small lesions, but any gynaecologist will have sufficient experience in ultrasound to detect the lesions on a clinical basis and to identify the most common ultrasound features of the disease (Figure 1).

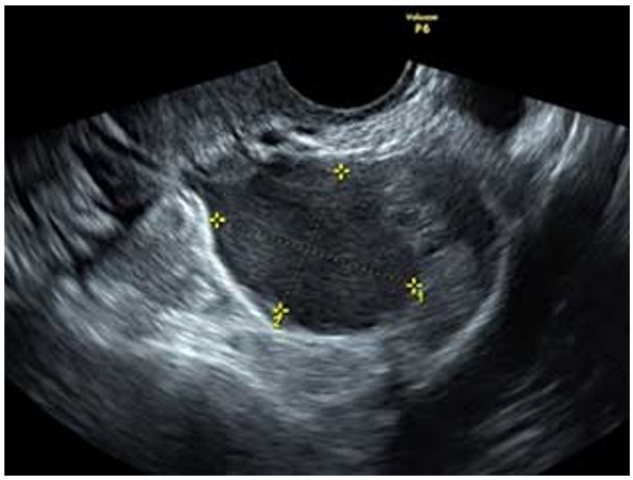

Figure 1: A typical ultrasound image of an endometriosis cyst in the ovary is shown.

The nuclear magnetic resonance (NMR) is the method of choice when it is necessary to evaluate disease more

small lesions (but above 5 mm), not identifiable by ultrasound, for example deep endometriosis lesions, or when it is necessary to plan surgery in a complex presentation of the disease [14].

The laparoscopic or laparoscopy is increasingly an important component in the diagnosis and treatment of endometriosis [15]. It is established as a diagnostic component, given the relative ease of identifying specific characteristics of endometriotic lesions, and allows for treatment, asserting itself as a “one-step” approach in experienced hands [16].

The differential diagnosis (diseases that must be excluded) of endometriosis cysts of the ovaries and other structures, namely tubes, sometimes involves ovarian cancer [17]. The CA 125, a commonly used marker to distinguish malignant ovarian disease, endometriosis often appears high, so that its interpretation must be careful, since in these cases its ascent may be (and usually is) "normal" [18].

Endometriosis and fertility

The Endometriosis is often the cause of infertility. Up to 50% of women with endometriosis have difficulty getting pregnant and up to 50% of women with infertility have endometriosis. This is not to say that pregnancy is not possible: people with endometriosis can get pregnant naturally. It all depends on the extent of the disease (rather than the pain) and on the organs and locations involved [19]. For example, if the fallopian tubes are involved in a fibrotic process, they may be occluded and not allow for spontaneous pregnancy (oocytes and sperm are not meeting). In these cases of bilateral occlusion, regardless of the cause, pregnancy can only be possible through Medically Assisted Procreation (PMA) techniques, such as In Vitro Fertilization (IVF) [20]. There are several mechanisms by which a pregnancy in women with endometriosis can be difficult or prevented:

Ovarian dysfunction. The ovaries lose their normal ability to regularly produce and release oocytes (the female cells involved in fertilization). This can happen by several mechanisms, including the presence of endometriomas (“cysts”);

Tubal dysfunction. The fallopian tubes can lose the ability to capture and transport oocytes, or become occluded, preventing the oocytes to be fertilized and the embryos to pass into the uterus.

Sperm inactivation. Inflammatory phenomena may lead to sperm inactivation by antibodies or macrophages (cells that protect the body), that is, lead to a reaction by the body against sperm.

Sexual dysfunction. Disease-related pain can prevent or hinder the frequency of desirable sexual contact for pregnancy to occur.

Endometriosis management options

If endometriosis does not cause problems and does not get worse, therapy is usually not needed. Close medical checks are advisable, however. The cause of endometriosis is unknown. This is why there is still no specific therapy that could cure the disease. But there are treatment options. Which therapy or therapy combination is best should be decided on an individual basis. The age of the woman plays a role as well as the question of whether family planning has been completed or whether there is a desire to have children.

Surgery for endometriosis

A laparoscopy - a small operation - is often needed to confirm the diagnosis (see Diagnosis section). This intervention also offers the possibility of therapy. Surgical removal of the affected areas or obliteration (for example with electricity or laser) is the method of choice, particularly in the case of extensive endometriosis. Surgery is also necessary if tissue presses on the ureter, causing urinary congestion in the kidney. If this disorder is not corrected, the kidney could be damaged [21]. There is also evidence that the removal of endometriosis tissue is beneficial in the event of involuntary childlessness, and that following the procedure, the likelihood of pregnancy increases.

Depending on the location of the endometrial foci, surgery through the vagina may also be possible. Sometimes a more extensive surgical procedure with an abdominal incision (laparotomy) is necessary - especially in the case of an extensive disease involving the bladder, bowel, or other structures [22]. This operation should be well planned. If possible, the operating doctor should have a lot of experience with endometriosis treatment, for example in a certified endometriosis centre or work with doctors in other relevant fields. The patient should speak to the doctor in detail beforehand about the possible advantages and disadvantages of the procedure. Even after an operation, the disease can come back and cause problems again [23].

Once the family planning has been completed, a removal of both fallopian tubes and ovaries and/or a hysterectomy may be possible, depending on the case. However, this step must be carefully considered and planned, and can then be considered as the very last option.

Medication for endometriosis

Different drugs are used for endometriosis

Pain reliever and anticonvulsant medication can relieve stressful symptoms if necessary. However, they can also have side effects. The intake should be discussed with the doctor.

The gynecologist can prescribe certain hormonal contraceptives (progestin-emphasized "birth control pills" or "hormonal IUDs") or hormone preparations (GnRH analogues) that reduce the influence of female sex hormones on the endometriosis cells and / or suppress the menstrual period [24]. In this way, the disease is silenced for a while, so to speak. The hope is that the endometriosis tissue will regress during this phase.

Often, however, the desired effect only occurs for a short time and the disease returns as soon as the therapy is interrupted. Side effects, such as hot flashes or mood swings, can also occur with GnRH analogues. In the case of extensive endometriosis and for women who want to have children, medication alone is usually not a permanent solution [25].

Women who have become pregnant despite endometriosis (for example through fertility treatment) can hope that the disease will improve after the pregnancy. Because even pregnancy can "dry out" endometriosis, making it less active.

Some women try complementary therapies such as relaxation methods or change their diet. It has not been scientifically proven whether this can alleviate the symptoms of endometriosis (26). Studies suggest that physical activity, for example, or procedures such as acupuncture or manual therapy may help relieve the pain.

It is not always possible to alleviate all symptoms. Well-founded pain therapy is then important. Also, not every endometriosis patient who wants to have children will become pregnant. Exchanging ideas with other sufferers can help to cope better with the disease.

Complementary therapies

Some women with endometriosis use alternative / complementary healing methods for their symptoms [27]. The palette ranges from medicinal plants and homeopathy to acupuncture, relaxation, and movement techniques (such as yoga or tai chi) and psychological pain management training to chiropractic treatments and TENS (transcutaneous electrical nerve stimulation). A lifestyle change (more exercise, reducing stress, etc.) should also be helpful.

Such alternative/complementary healing methods can improve the symptoms and the quality of life of some patients, even if there is no scientific evidence of their effectiveness. Anyone interested in such procedures should discuss their application and possible side effects with an experienced doctor or therapist [28].

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