Prevention

Women (especially postmenopausal women) should report any abnormal vaginal bleeding or discharge to the doctor. Controlling obesity, blood pressure, and diabetes can help to reduce the risk of this disease. Women on estrogen replacement therapy have a substantially reduced risk of endometrial cancer if progestins are taken simultaneously. Long term use of birth control pills has been shown to reduce the risk of this cancer. Women who have irregular periods may be prescribed birth control pills to help prevent endometrial cancer. Women who are taking tamoxifen and those who carry the hereditary nonpolyposis colorectal cancer gene should be screened regularly, receiving annual pelvic examinations.

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ORGANIZATIONS

American Cancer Society. 1599 Clifton Rd. NE, Atlanta, GA 30329. (800) 227-2345. <http://www.cancer.org/>.

Cancer Research Institute, National Headquarters. 681 Fifth Ave., New York, NY 10022. (800) 992-2623. <http://www.cancerresearch.org>.

Gynecologic Cancer Foundation. 401 North Michigan Ave., Chicago, IL 60611. (800) 444-4441. <http://www.wcn.org>.

National Cancer Institute, National Institutes of Health. 9000 Rockville Pike, Bethesda, MD 20892. (800) 422-6237. <http://cancernet.nci.nih.gov/>.

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Lata Cherath, PhD
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Endometriosis

Definition

Endometriosis is a condition in which bits of the tissue similar to the lining of the uterus (endometrium) grow in other parts of the body. Like the uterine lining, this tissue builds up and sheds in response to monthly hormonal cycles. However, there is no natural outlet for the blood discarded from these implants. Instead, it falls onto surrounding organs, causing swelling and inflammation. This repeated irritation leads to the development of scar tissue and **adhesions** in the area of the endometrial implants.

Description

Endometriosis is estimated to affect 7% of women of childbearing age in the United States. It most commonly strikes between the ages of 25 and 40. Endometriosis can also appear in the teen years, but never before the start of menstruation. It is seldom seen in postmenopausal women.

Endometriosis was once called the "career woman's disease" because it was thought to be a product of delayed childbearing. The statistics defy such a narrow generalization; however, pregnancy may slow the progress of the condition. A more important predictor of a woman's risk is if her female relatives have endometriosis. Another influencing factor is the length of a woman's menstrual cycle. Women whose periods last longer than a week with an interval of less than 27 days between them seem to be more prone to the condition.

Endometrial implants are most often found on the pelvic organs—the ovaries, uterus, fallopian tubes, and in the cavity behind the uterus. Occasionally,

this tissue grows in such distant parts of the body as the lungs, arms, and kidneys. Newly formed implants appear as small bumps on the surfaces of the organs and supporting ligaments and are sometimes said to look like "powder burns." **Ovarian cysts** may form around endometrial tissue (endometriomas) and may range from pea to grapefruit size. Endometriosis is a progressive condition that usually advances slowly, over the course of many years. Doctors rank cases from minimal to severe based on factors such as the number and size of the endometrial implants, their appearance and location, and the extent of the scar tissue and adhesions in the vicinity of the growths.

Causes and symptoms

Although the exact cause of endometriosis is unknown, a number of theories have been put forward. Some of the more popular ones are:

- Implantation theory. Originally proposed in the 1920s, this theory states that a reversal in the direction of menstrual flow sends discarded endometrial cells into the body cavity where they attach to internal organs and seed endometrial implants. There is considerable evidence to support this explanation. Reversed menstrual flow occurs in 70–90% of women and is thought to be more common in women with endometriosis. However, many women with reversed menstrual flow do not develop endometriosis.
- Vascular-lymphatic theory. This theory suggests that the lymph system or blood vessels (vascular system) is the vehicle for the distribution of endometrial cells out of the uterus.
- Coelomic metaplasia theory. According to this hypothesis, remnants of tissue left over from prenatal development of the woman's reproductive tract transforms into endometrial cells throughout the body.
- Induction theory. This explanation postulates that an unidentified substance found in the body forces cells from the lining of the body cavity to change into endometrial cells.

In addition to these theories, the following factors are thought to influence the development of endometriosis:

- Heredity. A woman's chance of developing endometriosis is seven times greater if her mother or sisters have the disease.
- Immune system function. Women with endometriosis may have lower functioning immune systems that have trouble eliminating stray endometrial cells. This would explain why a high percentage of women experience reversed menstrual flow while relatively few develop endometriosis.
- Dioxin exposure. Some research suggests a link between the exposure to dioxin (TCCD), a toxic chemical found in weed killers, and the development of endometriosis.

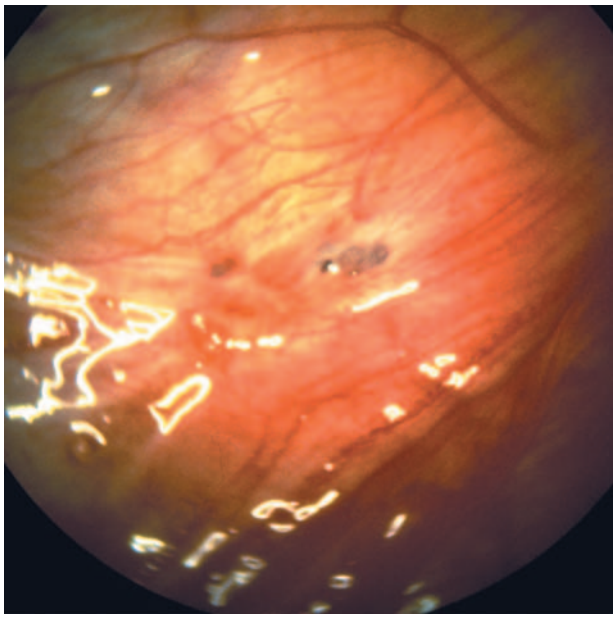
While many women with endometriosis suffer debilitating symptoms, others have the disease without knowing it. Paradoxically, there does not seem to be any relation between the severity of the symptoms and the extent of the disease. The most common symptoms are:

- Menstrual **pain**. Pain in the lower abdomen that begins a day or two before the menstrual period starts and continues through to the end is typical of endometriosis. Some women also report lower back aches and pain during urination and bowel movement, especially during their periods.
- Painful sexual intercourse. Pressure on the vagina and cervix causes severe pain for some women.
- Abnormal bleeding. Heavy menstrual periods, irregular bleeding, and spotting are common features of endometriosis.
- **Infertility**. There is a strong association between endometriosis and infertility, although the reasons for this have not been fully explained. It is thought that the build up of scar tissue and adhesions blocks the fallopian tubes and prevents the ovaries from releasing eggs. Endometriosis may also affect fertility by causing hormonal irregularities and a higher rate of early **miscarriage**.

Diagnosis

If a doctor suspects endometriosis, the first step will be to perform a **pelvic exam** to try to feel if implants are present. Very often there is no strong evidence of endometriosis from a physical exam. The only way to make a definitive diagnosis is through minor surgery called a **laparoscopy**. A laparoscope, a slender scope with a light on the end, is inserted into the woman's abdomen through a small incision near her belly button. This allows the doctor to examine the internal organs for endometriotic growths. Often, a sample of tissue is taken for later examination in the laboratory. Endometriosis is sometimes discovered when a woman has abdominal surgery for another reason such as **tubal ligation** or **hysterectomy**.

Various imaging techniques such as ultrasound, computed tomography scan (CT scan), or magnetic resonance imaging (MRI) can offer additional



An endoscopic view of endometriosis on pelvic wall. *(Custom Medical Stock Photo. Reproduced by permission.)*

information but aren't useful in making the initial diagnosis. A blood test may also be ordered because women with endometriosis have higher levels of the blood protein CA125. Testing for this substance before and after treatment can predict a recurrence of the disease, but the test is not reliable as a diagnostic tool.

Treatment

How endometriosis is treated depends on the woman's symptoms, her age, the extent of the disease, and her personal preferences. The condition cannot be fully eradicated without surgery. Conservative treatment focuses on managing the pain, preserving fertility, and delaying the progress of the condition.

Pain relief

Over-the-counter pain relievers such as **aspirin** and acetaminophen (Tylenol) are useful for mild cramping and menstrual pain. Prescription-strength and over-the-counter nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Motrin, Advil) and naproxen (Naprosyn), are also effective. If pain is severe, a doctor may prescribe narcotic medications, although these can be addicting and are rarely used.

Hormonal treatments

Hormonal therapies effectively tame endometriosis but also act as contraceptives. A woman who is hoping to become pregnant would take these medications for a period of time, then try to conceive within several months of discontinuing treatment.

- Oral contraceptives. Continuously taking estrogen-progestin pills tricks the body into thinking it is pregnant. This state of pseudopregnancy means reduced pelvic pain and a temporary withering of endometrial implants.
- Danazol (Danocrine) and gestrinone are synthetic male hormones that lower estrogen levels, prevent menstruation, and shrink endometrial tissues. On the downside, they lead to weight gain and menopause-like symptoms, and cause some women to develop masculine characteristics.
- Progestins. Medroxyprogesterone (**Depo-Provera**) and related drugs may also be used in treating endometriosis. They have been proven effective in minimizing pain and halting the progress of the condition, but are rarely used because of the high rate of side effects.
- Gonadotropin-releasing hormone (GnHR) agonists. These estrogen-inhibiting drugs successfully limit pain and prevent the growth of endometrial implants. They can cause **menopause** symptoms, however, and doses have to be regulated to prevent bone loss associated with low estrogen levels.

Surgery

Removing the uterus, ovaries, and fallopian tubes is the only permanent method of eliminating endometriosis. This is an extreme measure that deprives a woman of her ability to bear children and forces her body into menopause. Endometrial implants and ovarian cysts can be removed with **laser surgery** performed through a laparoscope. For women with minimal endometriosis, this technique is usually successful in reducing pain and slowing the condition's progress. It may also help infertile women increase their chances of becoming pregnant.

Alternative treatment

Although severe endometriosis should not be self-treated, many women find they can help their condition through alternative therapies. Taking vitamin B complex combined with **vitamins** C, E, and the **minerals** calcium, magnesium, and selenium can help the depression and lack of energy that may accompany endometriosis. B vitamins also counteract the side effects of hormonal drugs. Other women have found relief when they turned to a macrobiotic diet. Less extreme **diets** that cut out sugar, salt, and processed

KEY TERMS

Adhesions—Web-like scar tissue that may develop as a result of endometriosis and bind organs to one another.

Dioxin—A toxic chemical found in weed killers that has been linked to the development of endometriosis.

Endometrial implants—Growths of endometrial tissue that attach to organs, primarily in the pelvic cavity.

Endometrium—The tissue lining the uterus that grows and sheds each month during a woman's menstrual cycle.

Estrogen—A female hormone that promotes the growth of endometrial tissue.

Hormonal therapy—Use of hormone medications to inhibit menstruation and relieve the symptoms of endometriosis.

Laparoscopy—A diagnostic procedure for endometriosis performed by inserting a slender, wand-like instrument through a small incision in the woman's abdomen.

Menopause—The end of a woman's menstrual periods when the body stops making estrogen.

Retrograde menstruation—Menstrual flow that travels into the body cavity rather than being expelled through the uterus.

foods are sometimes helpful, as well. Mind-body therapies such as relaxation and visualization help women cope with pain. Other avenues to combat pain include **acupuncture** and **biofeedback** techniques. Still other women report positive results after being treated by chiropractors or homeopathic doctors.

Prognosis

Most women who have endometriosis have minimal symptoms and do well. Overall, endometriosis symptoms come back in an average of 40% of women over the five years following treatment. With hormonal therapy, pain returned after five years in 37% of patients with minimal symptoms and 74% of those with severe cases. The highest success rate from conservative treatment followed complete removal of implants using laser surgery. Eighty percent of these women were still pain-free five years later. In cases that don't respond to these treatments, a woman and her doctor may consider surgery to remove her reproductive organs.

Prevention

There is no proven way to prevent endometriosis. One study, however, indicated that girls who begin participating in aerobic **exercise** at a young age are less likely to develop the condition.

Resources

ORGANIZATIONS

Endometriosis Association International Headquarters. 8585 North 76th Place, Milwaukee, WI 53223. (800) 992-3636. <http://EndometriosisAssn.org>.

Stephanie Slon

Endometritis *see* Pelvic inflammatory disease

Endorectal ultrasound

Definition

Endorectal ultrasound (ERUS) is a procedure where a probe is inserted into the rectum and high frequency sound waves (ultrasound waves) are generated. The pattern of echoes as they bounce off tissues is converted into a picture (sonogram) on a television screen.

Purpose

ERUS is used as a diagnostic procedure in **rectal cancer** to determine stage of the tumor and as a post-radiation, presurgical examination to assess extent of tumor shrinkage. ERUS can also be used in cases of anal **fistula** (an abnormal passage) and problems with the anal sphincter muscles (muscles that control the opening and closing of the anus).

Precautions

Normal precautions should be taken with any diagnostic procedure. Since the population in which this procedure is normally done is elderly, the imaging staff should be extra cautious about stressing the patient. The procedure is invasive and may be embarrassing to some. Other patients may be anxious about their medical condition since endorectal ultrasounds are not routine. This places an added burden on