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Diseases of the female reproductive system. Part II.

Tutorial for practical lessons of gynecology for students of the 5th course of medical faculty

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ABBREVIATIONS

MC – Menstrual cycle

COC- combined oral contraceptives

IUD – intrauterine device

PV – per vaginum

IUI – intrauterine insemination

AIH – artificial insemination husband

AID – artificial insemination donor

IVF – in vitro fertilization

ICSI – intracytoplasmatic sperm injection

GIFT – gamete intrafallopian transfer

ZIFT – zygote intrafallopian transfer

STDs – sexually transmitted diseases

LAM – lactational amenorrhea method

CONTENTS

PREFACE

According to the resolution of the World Assembly of health care of UN from 1995 the preservation of the reproductive health is established on the global level by the WHO as a priority branch

According to WHO statistics for 2012 cervical cancer contributed to almost 8% of all cancers (excluding non-melanoma skin cancer). This tutorial acknowledges the students with prophylactic measures, early diagnosis of background, premalignant and malignant diseases of female genitalia.

The knowledgement of the symptoms, diagnosis, differential diagnosis of basic diseases and acute states in gynecology is compulsory for every doctor nowadays.

Background and premalignant diseases of female genitalia

Background and premalignant diseases of vulva

Non-neoplastic epithelial disorders of vulvar skin:

1. Lichen sclerosus
2. Squamous cell hyperplasia
3. Other dermatoses

Etiology:

1. Traumatic factors
2. Autoimmune (thyroid disease,pernicious anemia, diabetes)
3. Allergic (cosmetics, synthetic underwear, fragnances)
4. Irritation
5. Nutricional (deficiency of folic acid, vit. B12, riboflavin)
6. Infection(fungus)
7. Methabolic
8. Systemic (heparic, haematological)
9. Drugs (β blockers, angiotensin converting enzyme inhibitors)

Squamous cell hyperplasia of the vulva

Squamous cell hyperplasia (SCH) is an abnormal growth of the skin of the vulva. It usually occurs before the menopause.

The signs and symptoms. The main symptom is itchiness around the vulva, which may be pink or red, or have raised white patches. SCH usually affects the hood of the clitoris, the outer lips (labia majora), the groove between the outer and inner lips (labia minora) and the back of the entrance to the vagina. The affected skin may also extend to the thighs. Scratching causes thick, hardened patches on the vulva to appear.

Diagnosis. A biopsy (under local anaesthetic) is often performed to diagnose this problem as many things can trigger itching on the vulva.

Treatment. The symptoms generally stop with the correct treatment. The most common treatment is with powerful steroid creams. These should be used sparingly twice a day for several weeks. In over 90% of cases, steroid creams, usually combined with a moisturiser, relieve the symptoms of itching. Once the symptoms have been relieved, a simple moisturiser (called an emollient) can maintain remission**.** A small amount of women find benefit from a simple moisturiser. An alternative treatment is with a drug called tacrolimus, however this has side effects such as burning and soreness and requires careful surveillance and as yet remains very much a second line treatment. Patients can help themselves by avoiding potential irritants such as perfumed soap, biological detergents, fabric conditioners, talcum powder etc. Shaving might also lead to irritation**.**

Lichen sclerosus

Lichen sclerosus is an uncommon skin condition. It used to be called lichen sclerosus et atrophicus, but it is often now just called lichen sclerosus. It most commonly affects the genital skin (vulva) of women. Less commonly it affects other areas of the skin. It can occur at any age but most commonly occurs following menopause menopause.

Fig.1.1 Lichen sclerosus of vulva

Distribution. The entire vulva is involved, lesion encircles the vestibule, it involves clitoris, labia minora, inner aspects of labia major and the skin around the anus. It is usually bilateral and bisymmetrical. It does not involve the vestibule or extent into the vagina or anal calan.

Etiology. The cause is possibly an autoimmune disease. This is when the body's immune system attacks a part of the body. This causes inflammation and damage to the affected part of the body. In people with lichen sclerosus the genital area of skin may be attacked by some parts of the immune system which then causes inflammation. However, this has not been proved and it is not known what triggers lichen sclerosus to develop.

Clinics. Dyspareunia, sleepleness, dysuria, the skin looks white and is thin. Difficulty with mictirition and even retention of urine may happen, narrowing of vaginal introitus, subepithelial haemorrhages due to scratching.

Diagnosis. Appearance, clinics, biopsy (hyperkeratosis, paraceratosis, acanthosis, presence of inflammatory cells).

Treatment. A strong steroid ointment or cream, a moisturising (emollient) cream or ointment instead of soap to clean the genital area. This is also soothing. Avoid bubble baths, scented soap, detergents, perfumes, etc, to the genital skin (vulva) of women. These may irritate the skin and make symptoms worse. Lubricants are useful during sex if having sex is painful. A vaginal dilator may be advised if a person has any narrowing of the vaginal opening. An operation to widen the opening of the vagina is occasionally needed in women with severe lichen sclerosus which has caused narrowing of the vaginal entrance

Other dermatoses: Vulvar Crohn’s disease, psoriasis etc.

Condiloma accuminata is caused by HPV infection**.** Almost 50 types of HPV is known nowadays. Mostly on the external genitalia they are caused by the 6 and 11^{th} types. Types 16, 18, 31, 33 along with the development of the condiloma can cause cell atypia, dysplasia cancinoma in situ and invasive cancer.

Premalignant lesions. They include the vulvar intraepithelial neoplasia.

VIN I – corresponds to mild cellulal atypia. The lesion is limited to the deeper one-third of the epithelium

VIN-II – corresponds to moderate cellular atypia. The lesion is limited upto middle-third of the epithelium

VIN-III – corresponds to severe cellular atypia and carcinoma in situ. The abnormal cells involve whole thickness of the epithelium. There is no stromal invasion.

Diagnosis. Clinics (pruritus vulvae, lump or bleeding from a vulvar ulcer, symptomless), local examination a lesion in vulva with white, grey, pink or dull red colour, raised from the surface and often multifocal), cytologic screening (not useful and not reliable), biopsy.

Treatment. Generally conservative management (since only 10 pecrent proceed into cancer). Medical (fluorinated steroid ointment), local excision, laser therapy, cryo surgery and LEEP, simple vulvectomy.

Background and premalignant diseases of the cervix

Papanicolau classification of the smears:

Grade I – normal cells

Grade II- slightly abnormal, suggestive of inflammatory change, repeat smear after treating the infection

Grade III- a more serious type of abnormality, usually indicative of need for biopsy

Grade IV – distinctly abnormal, possibly malignant and definitely requiring biopsy

Grade V – malignant cells seen

Erosion of the cervix

Is a condition in which the squamous epithelium covering the vaginal portion of the cervix is replaced by columnar epithelium which is continuos with that lining the endocervix.

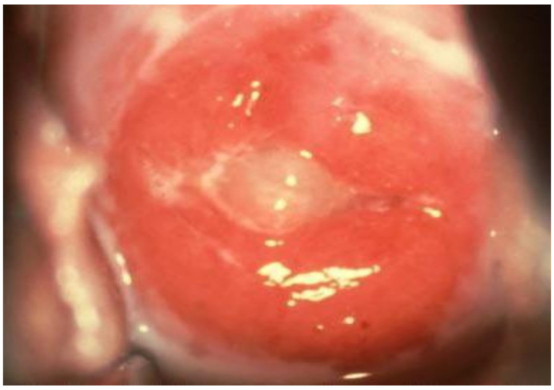


Fig.1.2. Erosion of the cervix

Congenital erosion. A simple erosion is an oestrogen-dependent condition, apart from birth is does not occur before puberty or in the posmenopausal state.

Erosion associated with chronic cervicitis. The maceration of the squamous epithelium leads to the desquamation of the cells, in process of healing, columnar epithelium from the cervical canal grows over and covers the denuded area, after variable interval, the squamous epithelium of the vaginal portion of cervix replaces the columnar epithelium of the erosion. Sometimes the columnar epithelial cells of endocervix undergo squamous change (epidermization). The blocked glands under the squamous epithelium are called nabothian follicles.

Hormonal or papillary erosion. It is common during pregnancy and taking hormonal contraceptives. These erosions can become infected by micro-organisms.

IMPORTANT!!! Congenital (physiological) ectopic cervix can continue till the age of 23. These patients should receive medical supervision with regular cytologic investigations and do not need to undergo treatment.

Symptoms

1. Asymptomatic

2. Profuse mucoid discharge, sometimes mucopurulent and rarely blood-stained discharge

3. Postcoital bleeding

Diagnosis: a reddened area around the external os, with its inner margin continuous with the endocervical lining and with well defined outer margin.

Treatment.

1. Asymptomatic do not need treatment
2. Diatermy cauterization.
3. Cryosurgery
4. Laser therapy
5. Conization operation

Ectropion

A cervix which has been badly lacerated during childbirth shows the condition of ectropion which tends to evert the endocervical canal. Chronic cervicitis usually accompanies ectropion, and the main symptom is a mucopurulent discharge.

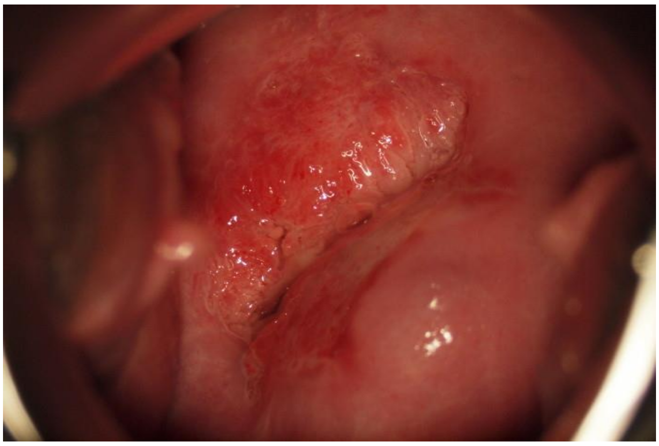


Fig. 1.3. Cervical ectropion

Treatment – excision of scar tissue and suturing the edges of the torn cervix.

Cervical polypi.

Mucous polypi arise from the mucous membrane of the cervical canal. The polypus is pedunculated, the pedicle being attached to the mucous membrane of the cervical canal.

Symptoms (increased vaginal discharge, as they bleed easily the patient may complain of irregular and poscoital bleeding).

Diagnosis. Speculum examination (a red vascular swelling which bleeds easily on touch and is covered by smooth glistening epithelium bathed in clear mucous), biopsy.

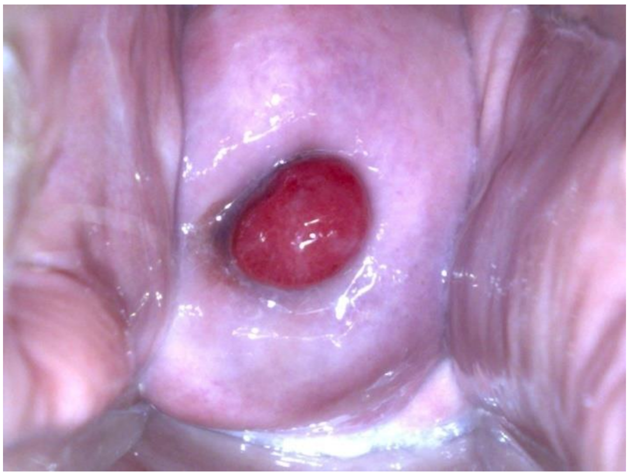


Fig.1.4. Cervical polypi

Treatment - avulsion or torsion always with microscopic examination

Chronic endocervicitis

Is a long-term irritation of the inside of the cervical canal. It effects about half of all women at some point in their life. It can be caused by allergies to douches, tampons, spermicides, or condoms, an overgrowth of the normal bacteria in the vagina (bacterial vaginosis), or sexually transmitted diseasessuch as chlamydia, gonorrhea,and herpes.

Treatment would be anitbiotics or anti-viral agents in the case ofherpes infection. Left untreated, endocervicitis can cause cervical erosion and cause problems with conception and birth.

Premalignant lesions of the cervix

Cervical intraepithelial neoplasia:

CIN I (mild) undifferentiated cells cover basal one-third,

CIN II (moderate) – cover balsa half to two-thirds

CIN III (severe) – whole thickness exept one or two superficial layers and cancer in situ – covers whole thickness)

Risk factors :

1. Infection :HPV 16, 18, 31, 33, HIV, Chlamydia
2. Early sexual intercourse (less than 16 years)
3. Sexually transmitted diseases
4. Early age of first pregnancy
5. Too many or too frequent births
6. Low socioeconomic status
7. Multiple sexual partners
8. Husband whose previous wife died of cervical malignancy
9. Oral pill users
10. Smoking habits

Diagnosis:

1. PAP smear
2. HPV DNA testing
3. Visual inspection with acetic acid
4. Colposcopy (white epithelium, aceto white epithelium, punctuation, mosaic, atypical blood vessels, irregular surface contour.
5. Cervicography
6. Biopsy

Treatment.

CIN-I – observation, Pap smear follow up at 6 months or HPV DNA at 12 months. If tests are negative – screening

CIN-II – Commonly large loop (electrosurgical) excision of transformation zone (LLETZ) is done, cryotherapy, electrodiathermy, cold coagulation, laser vaporization, cone excision is possible.

CIN – III and CIS –Conisation, LLETZ, local ablative methods are used, depending on age of patient, desire for reproduction etc.

Hysterectomy is done if CIN extents to vagina, if it is associated with ither gynecological problems, CIN III, cancer phobia, etc.

PREVENTION OF CERVICAL CARCINOMA. Cervarix - is a vaccine against certain types of human papillomavirus, cervical carcinoma and pre-cancerous conditions of the cervix. Cervarix is injected IM into deltoid muscle. The administration scheme is 3 doses every 0, 1 and 6 months.

Contraindications to vaccination:.

- Hypersensitivity to the active substances or to any of the excipients.
- Severe systemic diseases .
- Pregnancy .
- Thrombocytopenia or any coagulation disorders since bleeding may occur following an intramuscular administration.
- Febrile conditions .

Endometrial hyperplasia

Endometrial hyperplasia is a characterized by a proliferation of endometrial glands resulting in a greater gland-to-stroma ratio than observed in normal endometrium.. The proliferating glands vary in size and shape and cells may have cytologic atypia.

Categories — The WHO classification of endometria hyperplasia is based upon two features:

●The glandular/stromal architectural pattern of the endometrium, which is described as either simple or complex

●The presence or absence of nuclear atypia

This results in four possible categories of endometrial hyperplasia:

●Simple hyperplasia without atypia

●Complex hyperplasia without atypia

●Simple atypical hyperplasia

●Complex atypical hyperplasia

Simple atypical hyperplasia is rare, and many reports use the term atypical hyperplasia to refer to all women with either simple or complex atypical hyperplasia.

Simple versus complex hyperplasia — Simple and complex endometrial hyperplasia are characterized by the following features:

●Simple hyperplasia consists of glands that are mildly crowded. They are frequently cystically dilated with only occasional outpouching. Mitoses may or may not be present in the glandular cells.

●Complex hyperplasia consists of glands that are crowded (>50 percent gland to stromal ratio); the gland-to-stroma ratio is higher in complex compared to simple hyperplasia. The glands appear disorganized and have luminal outpouching. Mitoses are typically present..

Nuclear atypia — Nuclear atypia is the presence of nuclear enlargement; the chromatin may be either evenly dispersed or

Risk of carcinoma — Using the WHO classification, the presence of nuclear atypia is the most important indicator of the risk of endometrial carcinoma in women with endometrial hyperplasia.

Risk factors — The risk factors for endometrial hyperplasia are the same as those for endometrial carcinoma. Most of these risk factors involve exposure of the endometrium to continuous estrogen unopposed by a progestin. This effect may be due to endogenous or exogenous hormone. Physiologically, estrogen stimulates endometrial proliferation during the normal menstrual cycle; this effect is buffered by progesterone, which inhibits endometrial proliferation and stimulates differentiation in preparation for implantation of an embryo.

Clinical presentation— Endometrial hyperplasia typically presents with abnormal uterine bleeding and is most common in women who are postmenopausal and with increasing age in premenopausal women. Occasionally, women with no abnormal uterine bleeding present with abnormal findings on cervical cytology.

Evaluation of women with suspected endometrial neoplasia — Women with a clinical presentation suspicious for endometrial hyperplasia are evaluated initially with physical examination. Pelvic sonography may also be performed to exclude another etiology of abnormal uterine bleeding or to assess endometrial thickness in postmenopausal women., bacleriological and bacteroscopy, hormonal investigation of the state of hypothalamus-pituitary-gonad system, investigation of the function of the thyroid gland, test of glucose tolerance.

Diagnosis — Endometrial hyperplasia is a histologic diagnosis made based upon the results of evaluation of an endometrial biopsy, curettage sample, or hysterectomy specimen.

Treatment

<u>I stage</u> – Removal of modified endometrium followed by morphological study and determination of further management depending on the type of pathology of the endometrium.

<u>II stage</u> -hormonal therapy to suppress the endometrium. The duration of this stage – 6 months months with repeated histological investigation in 3 and 6 months. In case in 3 months we have a histological verification of endometrial hyperplasia , the correction nof hormonal therapy is done, in women with atypical forms of hyperplasia – the method of treatment is discussed with the oncologist. Hormonal therapy is used in women of reproductive age, in peri- and postmenopause – only if

non-atypical hyperplasia is present. Medications, used for hormonal therapy indcule gestagens (didrogesterone, medroxyprogesterone acetate, etc.) and GnRH agonists.

III stage – optimization of the hormonal status with the prophylaxes of hyperestrogenaemia. In reproductive age – to restore the two phase menstrual cycle, in perimenopause – mesonsasis.

IV stage – dispensary observation for 5 years after effective hormonal therapy and 6 mothns after operative treatment.

Indications for operative treatment:

- Complex non atypical hyperplasia of endometrium in case of non effective conservative treatment for 3 months
- Simple atypical and complex non atypical hyperplasia in case of non effective therapy in 6 months.
- In menopause – complex atypical after conducting the diagnosis, complex atypical and complex non atypical in case of non effective conservative treatment

Types of operative treatment include:

- Hysteroscopic endometrial ablation of loop resection
- Hysterectomy.

MCQs

1. Which os the following statements concerning congenital ectopic cervix is true:

A. Can continue till age 23

B. Requires large loop excision

C. Requires conization operation

D. Is accompanied by a high malignant risk

2. The first line treatment of endometrial hyperplasia of the women of childbearing age (if D&C <u>was not done</u> in the last 3 months) is:
    A. Combined oral contraceptives
    B. Hemostatic therapy
    C. Diagnostic curettage of cervical canal and uterine cavity
    D. Hysterectomy
    E. Observation
3. The treatment of premalignant lesions of vulva is in most cases:
    A. Generally conservative management
    B. Medical
    C. Local excision
    D. Laser therapy
    E. Vulvectomy
4. Normal cells in Papanicolau smear correspond to:
    A. Grade I
    B. Grade II
    C. Grade III
    D. Grade IV
    E. Grade V

5. Cervarix is :

    A. An antibiotic used mostly for treatment of cronix endocervicitis

    B. A hormonal drug used for suppression of endometrial hyperplasia

    C. A hormonal ointment used for treatment of lichen sclerosus

    D. A vaccine against certain types of human papillomavirus, cervical carcinoma and pre-cancerous conditions of the cervix.

Key answers

1. A
2. C
3. A
4. A
5. D

Malignant diseases of female genitalia

Vulvar cancer

The incidence of vulvar cancer is approximately 2-5% among all the oncogynecological pathology. It is a rare type of cancer. Generally vulvar cancer affects women 65-70 years old, and is rarely oserved among yong women. Typical localization includes labia majora et minora, clitoris, utetra, posterior commissure, rarely Bartholin’s glands.

Etiology:

- Hormonal changes in the reproductive system during menopause and postmenopause. In case of unfavourable conditions proliferative and dysplastic changes with futher malignant transformation occure in vulvar tissues.
- Often is observed after background and premanignant diseases of vulva.
- Human papilloma virus (HPV)
- Sexually transmitted infections - women with antibodies to the herpes simplex virus type 2 have been linked to a higher increase of vulval cancer.
- Smoking**-** studies have revealed an association between regular smoking and vulval cancer, ranging from a three-fold to six-fold increase. If the regular smoker also has HPV infection, the risk is much higher still.
- Human immunodeficiency virus (HIV)-
- Psoriasis
- Frequent change of sexual partners
- Adipositas
- Arterial hypertension
- Diabetes mellitus

Classification:

By origin

- Primary – if cancer originated in vulva
- Secondary – if cancer originated in another part and then spread to the vulva

By histological type:

- Squamous cell carcinoma (about 90%)
- Vulvar melanoma
- Adenocarcinoma
- Sarcoma
- Verrucous carcimona

By the type of tumour growth:

- Exophytic growth
- Knotted
- Ulcerative
- Infiltrative-edematous vulva cancer.

According to the international clinical classification the spread of vulvar cancer is evaluated by the FIGO stages (0-IV) and TNM criteria (T- primary tumour, N- regional lymph nodes, M- distatnt metastasis)

Stage 0 (Tis) – preinvasive vulvar cancer

Stage I (T1) – the tumour is located in vulva or perineum, and is not bigger than 2 cm

- **IA (T1A)** – stromal invasion less than 1 cm
- **II (T1B)** –stromal invasion more than 1 cm

Stage II (T2) – the tumour is located in vulva or perineum, but the size of it is bigger than 2 cm

Stage III (T3 N1) – the tumour growth may spread to vagina, lower parts of urethra, anus, regional lymph nodes from one side.

Stage IV A (T4 N2) – tumour growth may spread to the mucous membrane of the urinary bladder, upper parts of urethra, rectum, lymph nodes from both sides.

Stage IVB (M1) – not depending on the spread of tumour growth distatnt metastasis are present.

Symptoms:

- Typical early symptoms include itching, irritation, burning, that have wavelike pattern and enhanced at night.
- Dyspareunia (painful sexual intercause), dysuria (painful urination)
- As the tumour spreads, raw and sensitive tissues may be seen, ulcers, pain and serous, bloody or purulent discharges may be present.
- In late stages - massive bleeding, edema of mons pubis, extremities, constipation, subfebrile temperature, fatigue.

Diagnosis:

- Gynecological examination. Visual inspection of the external genitalia in case of vulvar cancer may reveal small knots, hyper or hypopigmented skin tissues
- Vulvoscopy (Colposcopy)
- Smears from vagina, cervix and the pathological tissue (cytological, bacteriological)
- Biopsy with histological verification – is the obligatory method for conducting the diagnosis
- Ultrasonography of the genitalia, inner organs and lymph nodes, chest X-ray, cystoscopy, anoscopy, rectoscopy. If needed – consultations of other specialists.

Treatment:

Most often in case of vulvar cancer surgical and radiation therapy are used.

1. **Surgery** for vulval cancer includes the use of a radical vulvectomy, where the entire vulva is surgically removed, and possibly the removal of lymph nodes as well. If the cancer has spread to adjacent organs, such as the urethra, vagina or

rectum, the surgery will be more extensive. In cases of early vulval cancer the procedure is less radical.

- Laser surgery - an option during the early stages of the cancer.
- Excision - the surgeon attempts to remove all of the cancer and some healthy tissue around it.
- Skinning vulvectomy - the top layer of skin where the cancer is located is surgically removed. Skin from another part of the body can be used to replace what was lost (skin graft)
- Radical vulvectomy - the whole vulva is surgically removed, including the clitoris, vaginal lips and the opening to the vagina. Usually includes nearby lymph nodes as well.

2. **Radiation therapy** - if lesions (tumors) are very deep, local radiotherapy may be used before surgery to make them smaller. Radiotherapy may also be used to treat lymph nodes.
3. **Chemotherapy** - often used with radiotherapy as part of palliative care**.**

Reconstructive surgery - sometimes the area can be reconstructed; this depends on how much tissue was removed. Plastic surgery reconstruction involving skin-flaps can be performed. Skin can sometimes be grafted from another part of the body.

Prognosis: Further prognosis depends on initial stage of vulvar cancer and the type of treatment conducted. The most aggressive type of vulvar cancer is cancer, located in the area of clitoris and with infiltrative-edematous type of tumour growth.

Vaginal cancer

Primary vaginal cancer is 1-2% from all malignant tumours of female genitalia. Secondary (metastatic) – is more often. The primary tumour in this case is located in cervix, endometrium, ovaries, etc.

Etiology:

- Chronic infection (HPV 16 and 18)
- Inflammatory processes

- Hereditary predisposition
- Endocrine disorders
- Decrease of the immune status
- Chronic irritation of the vaginal walls (use of pessaries in case of genital prolapse)
- Smoking
- Premalignant diseases, cervical and vaginal cancer, premalignant disease of vagina – intraepithelial neoplasia (dysplasia) of vagina

Classification:

By origin

- Primary – if cancer originated in vagina
- Secondary – if cancer originated in another part and then spread to the vagina

By histological type:

- Squamous cell carcinoma (about 95%)
- Melanoma
- Adenocarcinoma
- Sarcoma

By the type of tumour spread:

- endophytic
- exophytic growth

Vaginal cancer is classificated by the TNM criteria and FIGo stages. The tumours with the involvement of external genitalia are classified as vulvar cancer, with the spread to the vaginal part of the cervix – to the cervical cancer.

Stage 0 (Tis) – preinvasive vaginal cancer (in situ)

Stage 0 (T1)- the tumour is located in vagina, diameter less than 2 cm

Stage II (T2) – the tumour spreads to the paravaginal tissues, but does not reach the pelvic walls, diameter of the tumour more than 2 cm

Stage III (T3 or N1) – the tumour spreads to the pelvic walls, the presence of regional metastasis

Stage IV A(T4) – cancer spreads to the urethra, urinary bladder, rectum, pelvic walls, perineum, the presence of regional metastasis

Stage IVB (M1) – the presence of distant metastasis

Symptoms:

- Often on the early stages of the diseases no symptoms are present. Possible symptoms may include discomfort and itching in the area of genitalia.

- As the tumour growth progresses bloody, serous or purulent discharges may be present

- Abnormal vaginal bleedings (during menopause or in the middle of the menstrual cycle) or postcoital (after sexual intercourse)

- less specific signs include difficult or painful urination, pain during intercourse, and pain in the pelvic area, pain in the area of mons pubis, perineum, that irradiate to the back

- Fatigue, anaemia, rise of body temperature, edema of extremities.

Diagnosis:

- Gynecological examination with visual inspection of the vaginal walls may reveal depending on the type of tumour spread an infiltrare, ulcer, papillary overgrowth.
- PAP smear
- Biopsy
- Colposcopy

To exclude metastasis of the primary tumour of vagina the following methods are used:

- Diagnostic curettage of the cervical canal and uterine cavity (Dilation and curettage or D&C)
- Ultrasound of the genitalia
- Rectoromanoscopy

- Secretory urigraphy
- Cystoscopy
- Ultrasound of the inner organs
- Chest X-ray
- Mammography
- MRI and CT if needed

Management

Type of treatment used for vaginal cancer depends on the stage, age of the patient, her somatic status, desire to have children, etc.

Types of treatment include:

1. Surgical – in case of non invasive tumour – electroincision, if multicentral tumour growth – vaginectomy and hysterectomy. Criodestruction is considered to be a rather effective method of treatment. In case of invasive tumour growth the indications for surgical treatment are limited: if the tumour is located in the upper part of vagina in women of young and average age – the resection of the upper third of vagina along with hysterectomy is performed, if combined with the cervical cancer – compulsory radical hysterectomy with pelvic lymph node disection.
2. Chemotherapy is used more rarely - local application.
3. Radiotherapy – is the main method of treatment in case of invasive vaginal cancer. It includes distant and endovaginal radiotherapy, in case of late stages radiotherapy of parametrial tissues and pelvic lymph nodes is used.
4. Combination of several methods

Cervical cancer was once one of the most common causes of cancer death. The American Cancer Society's estimates for cervical cancer in the United States for 2015 are: about 12,900 new cases of invasive cervical cancer will be diagnosed, about 4,100 women will die from cervical cancer. Cervical cancer tends to occur in midlife. Most cases are found in women younger than 50.

Etiology:

Risk factors:

- Human papillomavirus (HPV) infection appears to be involved in the development of more than 90% of cases (high-risk types (16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 73, and 82)
- Smoking- women who smoke are about twice as likely as non-smokers to get cervical cancer
- Immunnosuppression
- Chlamydia infection
- Diet low in fruits and vegetables
- Overweight
- Long term use of oral contraceptives
- Intrauterine device use
- Family history of cervical cancer (if the mother or sister had cervical cancer, the chances of developing the disease are 2 to 3 times higher than if no one in the family had it).
- A lot of sexual partners

Direct causes of cervical cancer are still investigated.

Classification:

By the histological type:

- Squamous cell cancer with the localization in the ectocervix (85-95%)
- Adenocarcinoma that is growing from endoceervix (5-15%)

By the type of growth:

- Exophytic
- Ulcerative
- Endophytic (infiltrative) is more rare but has the worst prognosis

Clinical features:

Occurs in young women usually multiparous in the childbearing period of life. They have previous history of poscoital or intermenstrual bleeding which they ignored

1. Irregular or continued vaginal bleeding, poscoital bleeding, blood-stained or offensive discharge
2. Irregular menses
3. Pelvic pain
4. Leucorrhoea
5. Leg oedema
6. Bladder symptoms

Diagnoses:

1. Clinical investigation (the cervix bleeds on touch or an ulcer with edges that bleed on touch, uterus is bulky due to pyometra in advanced stage when the cervix gets blocked by growth, the rectal examination reveals thickened induration of uretrosacral ligaments)
2. PAP smear
3. CT scan
4. Positron emission tomography scan): A procedure to find malignant tumor cells in the body. A small amount of radioactive glucose (sugar) is injected into a vein. The PET scannerrotates around the body and makes a picture of where glucose is being used in the body. Malignant tumor cells show up brighter in the picture because they are more active and take up more glucose than normal cells do.
5. MRI

6. Ultrasound
7. Cystoscopy
8. Laparoscopy

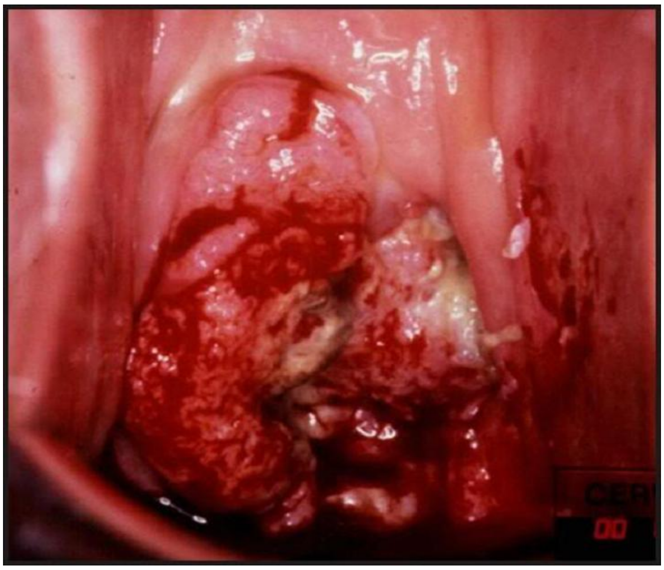


Fig.2.1. Cervical cancer

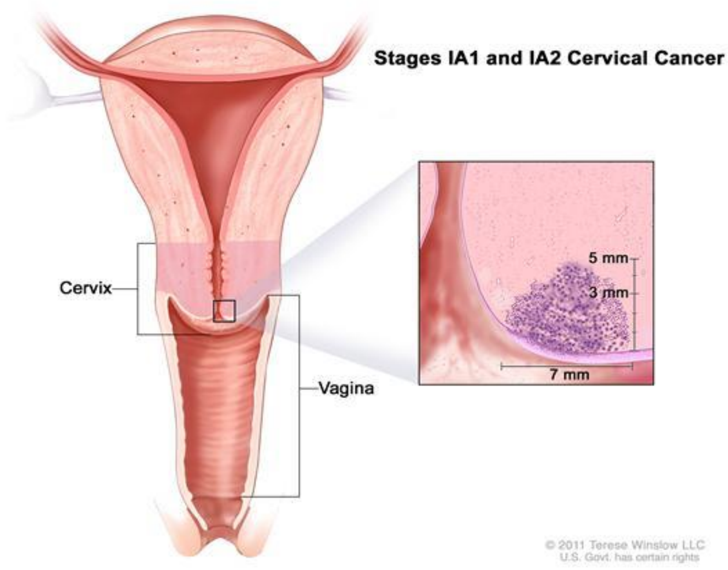
There are three ways that cancer spreads in the body.

Cancer can spread through tissue, the lymph system, and the blood:

- Tissue. The cancer spreads from where it began by growing into nearby areas.
- Lymph system. The cancer spreads from where it began by getting into the lymph system. The cancer travels through the lymph vessels to other parts of the body.
- Blood. The cancer spreads from where it began by getting into the blood. The cancer travels through the blood vessels to other parts of the body.

Stage I

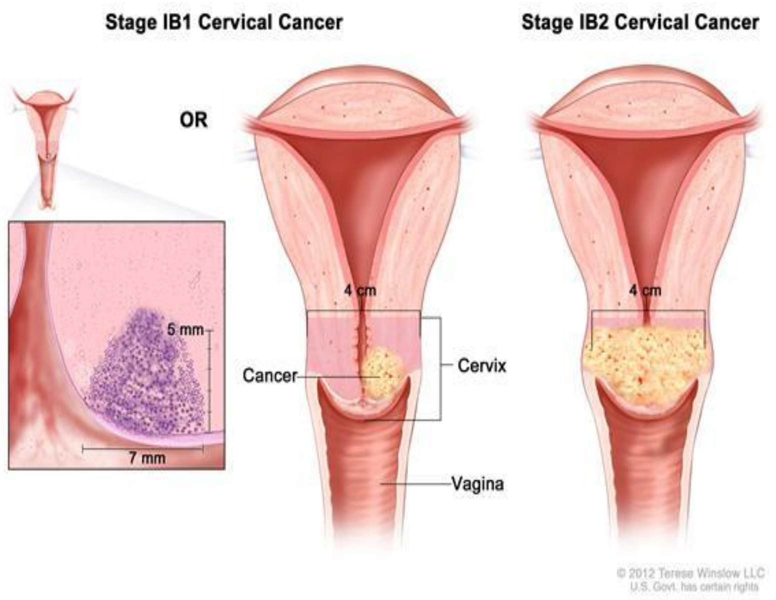
IA (T1 A) – cancer tumour invasion up to 5 mm and horizontal spread up to 7 mm.



- I A1 (T1 A1) – stromal invasion up to 3mm with horizontal spread up to 7 mm
- I A2 (T1 A2) – invasion of the tumour from 3 to 5 mm, horizontal spread up to 7 mm.

Fig.2.2. Stages IA1 and IA2 of cervical cancer

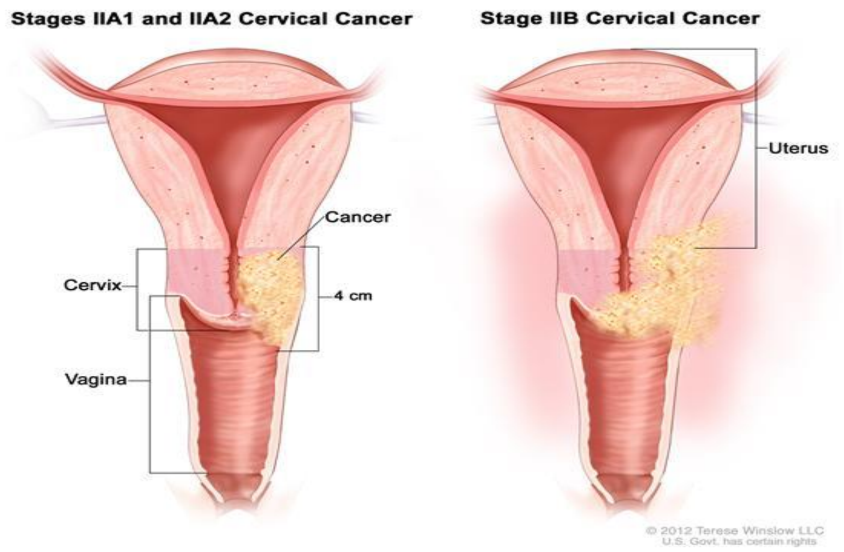
Stage IB (T1 B) – by macroscopy cervical cancer is defined, that is located in the cervix, or by microscopy the lesion is more than IA2 (T1A).



- IB1(T1 B1) – by macroscopy the lesion does not exceed 4 cm
- Ib2 (T12) – by macroscopy the lesion is more than 4 cm

Fig.2.3. Stages IB1 and IB2 of cervical cancer

Stage II the tumour spread beyond the cervix, the lower third of vagina and pelvic walls are intact.

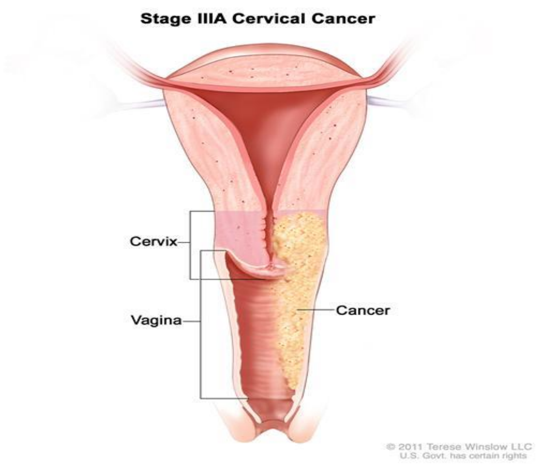


IIA (T2A) – the tumour infiltrates the upper and middle third of the vagina or uterine body without invasion to parametrium

- IIb (T2B) – the tumour infiltrated parametrium, but does not reach pelvic walls

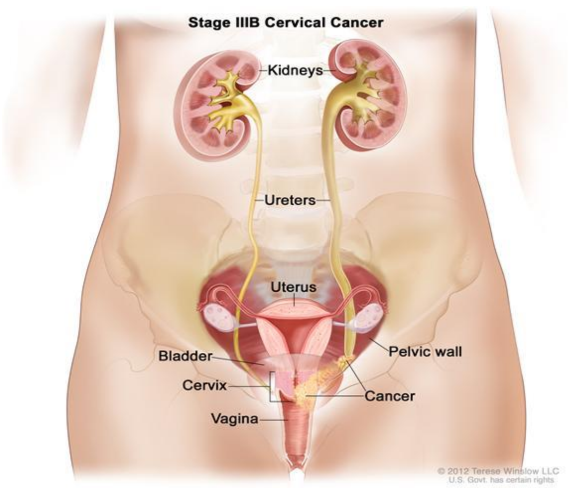
Fig. 2.4. Stages IIa1, IIA2 and IIb of cervical cancer

Stage III is characterized by the spread of cancer beyond cervix with invasion to parametrium up to the pelvic walls or involvement of the lower thrird of vagina with development of hidronephrosis



IIIA (T3A) – the tumor involves the lower third of vagina but does not invade the pelvic walls

Fig. 2.5. Stage IIA of cervical cancer



IIIB (T3B) – the tumor invades the pelvic walls or causes hydronephrosis or secondary kidney changes

Fig.2.6. Stage IIIB of cervical cancer

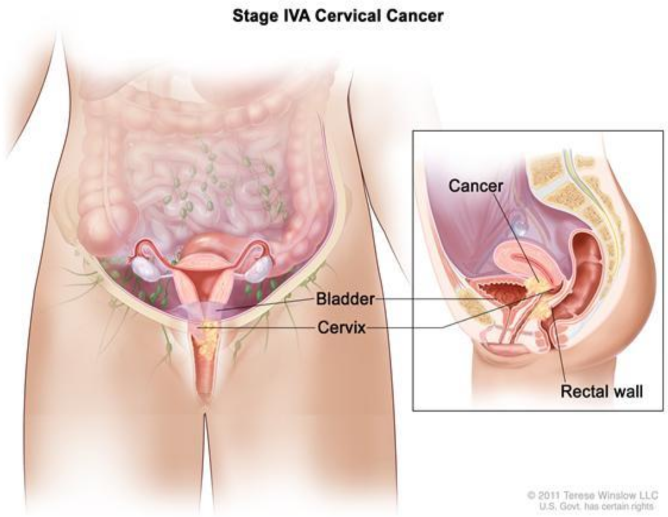


Fig. 2.7. Stage IVA of cerical cancer

Stage IV

Cancer spreads into the adjacent organs or beyond pelvis.

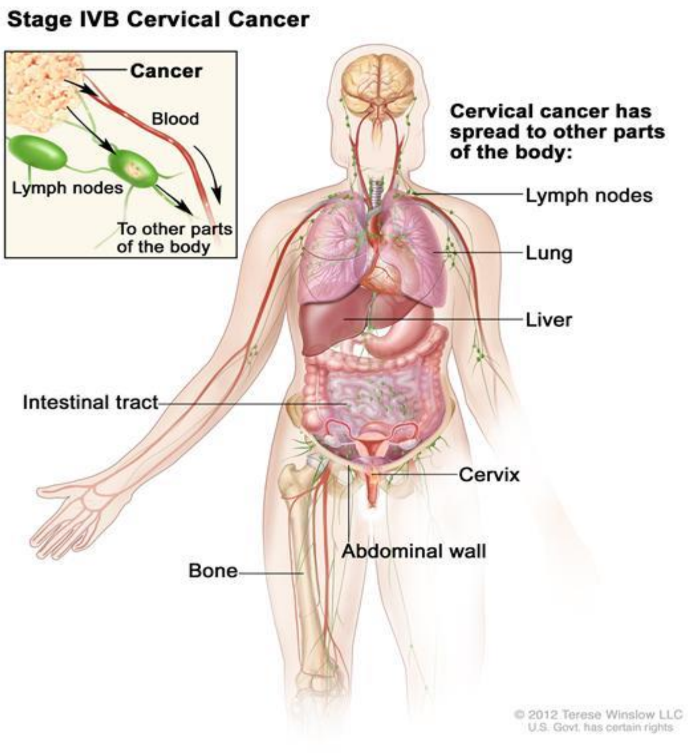


Fig. 2.8. Stage IVB of cervical cancer

Treatment includes surgical, radio and chemotherapy. The type of treatment of combination of different types of treatment depend on the stage of tumour progression, age of the patient, somatic stattu, the desire to have children in future.

Stage IA1 – conization or hysterectomy

Stage IA2- extended hysterectomy and lymph node sampling , fertility – conversing trachelectomy, radiotherapy,

Stages IB and IIA – Werthheim's hysterectomy (hysterectomy with adnexas, pelvic lymph nodes, medual one-third of parametrium on either side and upper one third of vagina, sparing sacral nodes) or Schauta's operation (extended vaginal hysterectomy with most of vagina and median portion of the parametrium, this is preceded by laparoscopic pelvic lymphadenectomy or followed later by extraperitoneal lymphadenectomy), radiotherapy, combined therapy .

Stages IIB, III and IV – chemoradiotherapy, recurrent growth following radiotherapy can be treated by hysterectomy in a small central growth or exenteration operation

Probable complications of cancer (causes of death):

1. Uraemia
2. Haemorrhage
3. Sepsis
4. Cachexia
5. Metastases

Endometrial carcinoma

Adenocarcinoma (also called endometrial cancer) begins in the lining of the uterus and is the most common type of uterine cancer. The incidence of endometrial cancer is rising due largely to increased incidence of obesity, which is an important risk factor for this disease. In 2014 an estimated 54,870 women in the United States will be diagnosed with uterine endometrial cancer. It is estimated that 10,170 deaths from this disease will occur in 2014.

Predisposing factors:

1. Oestogen (unopposed and unsupervised administration of hormone replacement therapy)
2. Chronic non-ovulatory cycles

3. A strong familial predisposition Uterine cancer may run in families where colon cancer is hereditary
4. Age (about 75% are postmenopausal)
5. Parity (it is quite common in unmarried and in married nulliparity)
6. Late menopause
7. Tamoxifen
8. Obesity, hypertension and diabetes (in 30%)
9. Fibroid
10. Endometrial hyperplasia (precedes in about 25%)

Prevention

Following factors can lower the risk of uterine cancer:

1. Long lasting taking birth control pills
2. Thoroughful investigation of women with taking into account the risk factors for EC before prescribing hormonal replacement thrapy (HRT)
3. Maintaining a healthy weight
4. If diabetic, maintaining good disease control such as regularly monitoring blood glucose levels

Pathology: may le localized and diffuse. Distant metastasis include lungs, liver, brain, bones.

Clinical features:

1. Asymptomatic
2. Menorrhagia or irregular periods in perimenopausal women
3. Postmenopausal bleeding
4. History of PCOD or HRT
5. Obese, hypertensive or diabetic women
6. Pain and lump appear in advanced stages

Investigation:

1. Bimanual and speculum examination – a bulky uterus (due to the growth itself or due to associated fibroid or pyometra), in advanced stages the cervix is bulky and os patulous with the growth protruding through the os, a metastatic vaginal growth is visible near the urethra.
2. Pap smear (not reliable)
3. Aspiration cytology
4. Fractional curettage to the naked eye endometrial curretings appear plentiful, pale and friable with histological investigation. Most common type is adenocarcinoma (75%), clear cells, squamous ans serous variety.
5. Hysteroscopy and biopsy
6. Iltrasound
7. Dopller ultrasound
8. A-125 (not specific)
9. CT
10. MRI
11. X-ray of lungs and bone and liver scanning
12. positron emission tomography scan

Staging

IA – the tumour invades less than half of the myometrium

IB – the tumour invades more than half of the myometrium

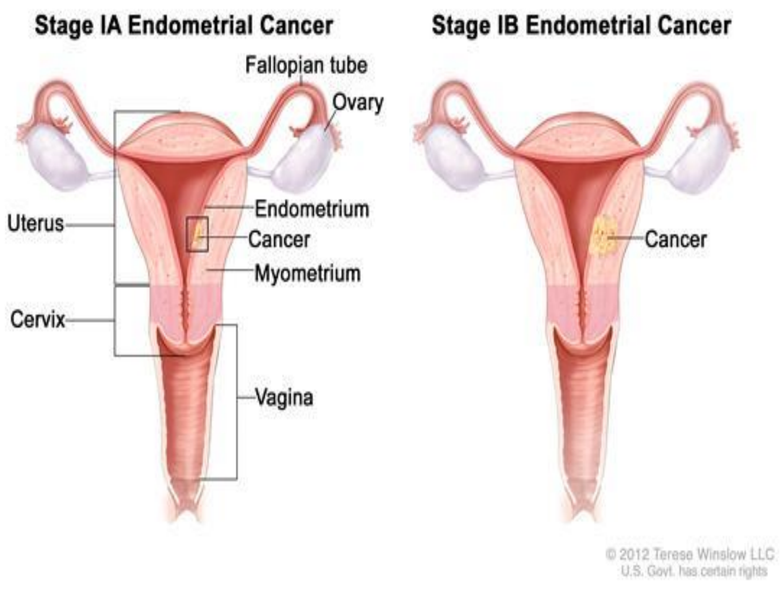


Fig. 2.9. Stagw IA and IB of endometrial cancer

Stage II

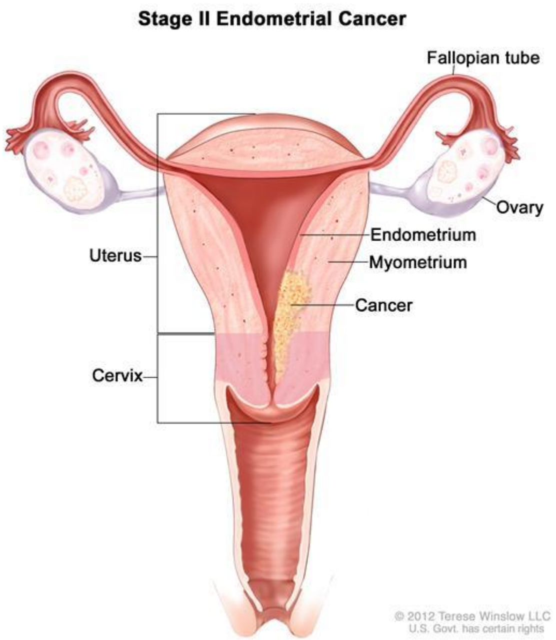


Fig. 2.10. Stage II of endometrial cancer

II – the tumour has spread to the cervix, but has not spread beyond the uterus

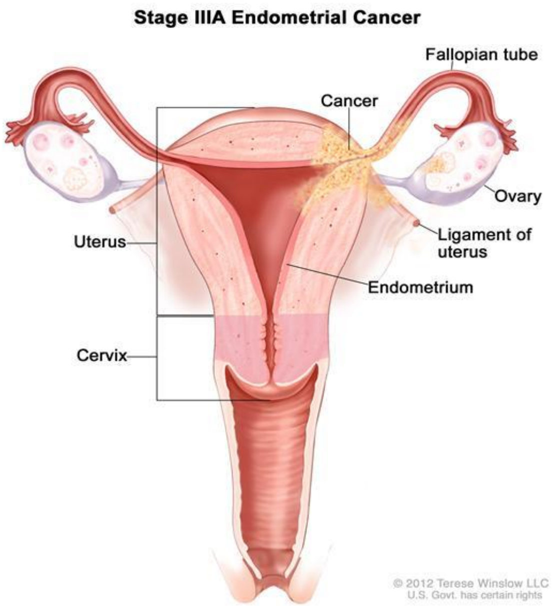


Fig.2.11. Stage IIIA of endometrial cancer

Stage III

IIIA – the tumour has invaded the perimetrium and\or fallopian tubes, ovaries and ligaments of the uterus

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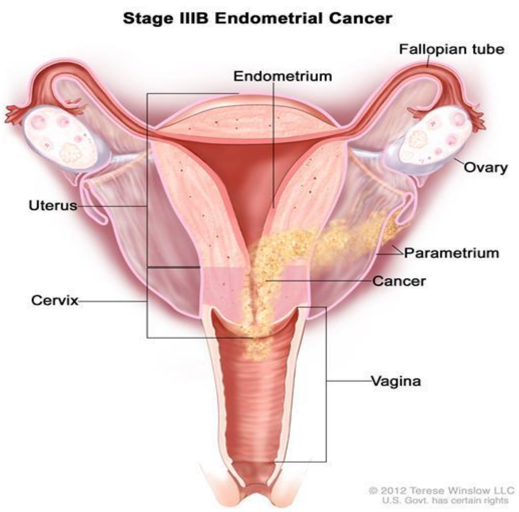
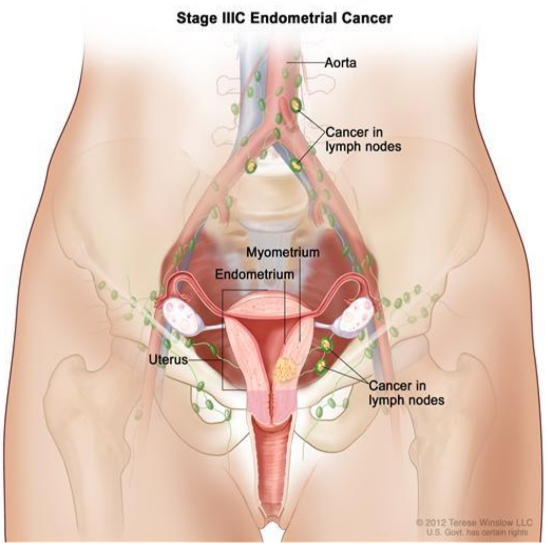


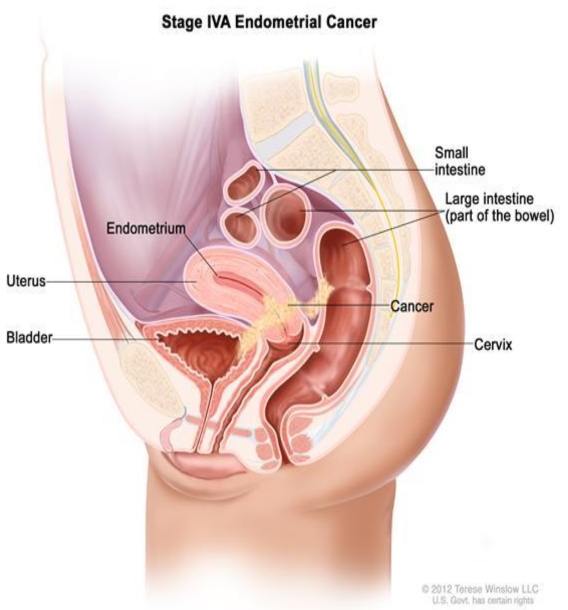
IIIB – the tumour has invaded parametrium

Fig.2.12. Stage IIIB of endometrial cancer



IIIC – the tumour has spread to the pelvic or paraaortic lymph nodes

Fig. 2.13. Stage IIIC of endometrial cancer



Stage IV A – the tumour has invaded into the adjacent organs

Fig.2.14. Stage IVA of endometrial cancer

- <u>Stage IVB</u>: Diastant metastasis are present

Treatment.

Surgical treatment – abdominal hysterectomy, bilateral salpingo-oophorectomy, omentectomy and pelvic as well as para-aortic lymph node sampling.

Surgical staging – peritoneal washings are obtained from subdiaphragmatic area, paracolic gutters and the pelvis and sent for cytology

Stages IB and IC – plus postoperative radiotherapy

Stage II – Brachytherapy followed by surgery

Stage III – inoperative. Chemotherapy

Stage IV – palliative radiotherapy, chemotherapy and progesterone may prolong life.

Uterine sarcoma

Uterine sarcomas are rare tumours comprising 1-3% of all genital tract cancers. It is a malignant non-epithelial neoplasm of the uterus. Uterine sarcomas have distinctive characteristics: rapid growth and hematogenous metastasis to liver, lungs, bones, as well as the vaginal walls. Sarcoma has an invasive growth and rapid penetration into adjacent organs and tissues. Although infrequent, uterine sarcomas are among the most lethal of all uterine malignancies. The 5-year survival rate reportedly ranges from 30% to 68%.

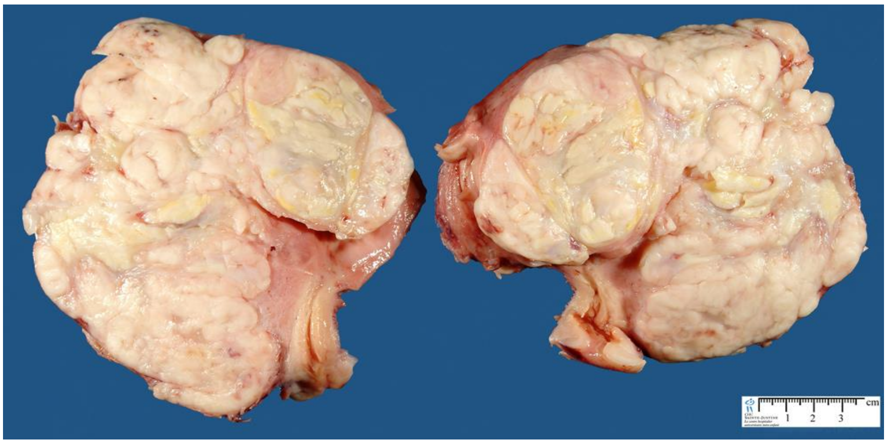


Fig.2.15. Uterine sarcoma

Etiology:

It's cause remains unknown. Probably, the development of this type on tumour has polyetiological factors along with dysembrioplasia and recurrent trauma, that is accompanied by proliferation of the tissues. Other scientist investigated DNA changes of certain genes occur when normal uterine cells develop in sarcomas. Risk factors include middle-aged and elderly women, African American women, smoking, drinking, or diet, women who have had pelvic radiation for treatment of other cancers.

Classification:

By the arising tissue:

- intramural, the tumours arise in the myometrium
- mucosal, the tumour develops from the endometrium
- tumour arising in the pre-existing myoma
- Grape-like sarcoma of the cervix

By the spread:

- By blood stream – metastases in the lungs and kidneys, liver, brain bones
- By lymphatics- to the lpelvic lymph nodes and para-aortic nodes
- Directly into the adjacent structures – multiple metastases over the peritoneum with accompanying ascites and large deposites in the omentum, at vulva

Symptoms:

1. Profuse and irregular vaginal bleeding
2. Vaginal discharge – offensive, watery associated at times with expulsion of fleshy necrotic mass
3. Abdominal pain – due to involvement of surrounding structures
4. Weakness, anorexia
5. Rapid enlargement of the fybroid

A rapid enlargement of a myoma in women in postmenopausal age is almost pathogmonic of sarcomatous change

Failure to respond and shrink in size following GnRH agonists administration strongly suggests the possibility of malignancy.

Diagnosis

1. Hystologicaly after removal of the uterus
2. endometrial biopsy or D&C may reveal the mucosal form
3. Doppler ultrasound

4. Hysteroscopy
5. Cystoscopy and rectoscopy
6. MRI or CT
7. Chest X-ray if a uterine sarcoma has metastasized (spread) to the lungs and as part of the testing before surgery.

Treatment

Types of treatment with uterine sarcoma:

- Surgery
- Radiation therapy
- Chemotherapy
- Hormone therapy

The type or combination of types of treatment depends on the type and stage of cancer, age, somatic status, Surgical treatment is used in most cases to remove the tumour (Total hysterectomy with bilateral salpingo-oophorectomy, omentectomy). Radiation, chemotherapy, and hormonal therapy are sometimes given to lower the risk of the recurrent cancer.

Gestational trophoblastic disease is a spectrum of abnormal growth and proliferation of the trophoblasts that continue even beyond the end of pregnancy

Three broad groups:

1. Benign hydatiform mole (complete or partial)
2. Persistant trophoblastic disease (includes invasive mole)
3. Choriocarcinoma.

Hydatiform mole.

Etiology:

1. Geographical and environmental influences

2. Vitamin A, β-carotene and folic acid deficiency
3. infection on a background of insufficient ovarian production of estrogen due to genetic disorders.
4. fertilization of an empty (non-nuclear) egg with two sperm

Morbid anatomy.

- Brunch of grape-like vesicles, pearly white in colour and translucent, containing watery fluid
- The vesicles vary in size from a few milimetres to 2-3 cm

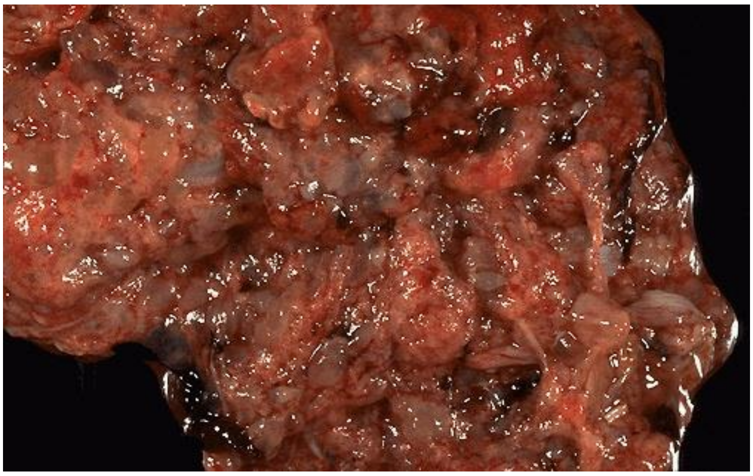


Fig.2.16. Macroscopic view of the hydatidive mole

Partial mole

- A fetus is identifiable, it often shows gross malformation, intrauterine growth retardation and in utero death
- Undue enlargamant seen in complete mole is rarely observed in a partial mole and the uterus may be of a normal size
- Hydrotropic changes a focal
- β-hC G levels are comparatively low
- malignant potential rare

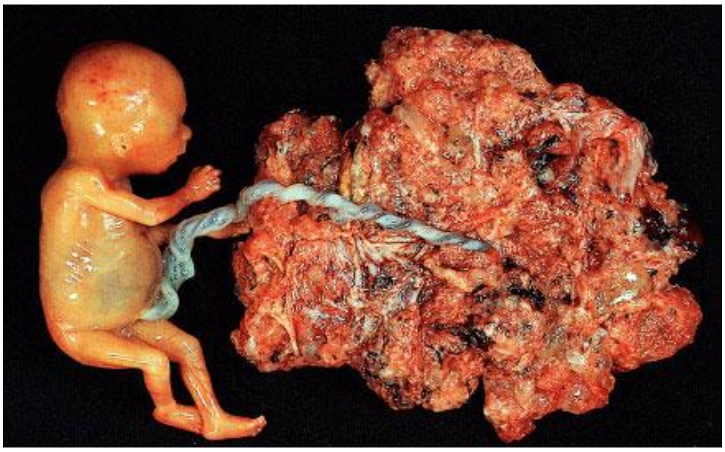


Fig.2.17. Partial hytatidive mole

Complete mole

- fetus is absent
- Fetal vessels are absent
- Hydrotropic changes are diffuse and placenta not present
- β-hC G levels are very high
- malignant potential 15-20%

Invasive mole

- they erode the wall of the uterus, burrow into the myometrium
- does not kill by distal metastasis and therefore cannot be considered cancer
- there is the evidence of chorionic villi
- trophoblastic tumor diagnosed up to 6 months following an abortion or a mole is often an invasive mole
- clinically diagnosed by persistant vaginal bleeding and pain following evacuation of hydatiform mole, persistently high levels of β-hC G, ultrasound.

Fig.2.18. Invasive mole

Clinical picture:

- Bleeding, which usually occur in the second trimester of pregnancy.
- Violation of the relation between pregnancy and uterine size by date of last menstrual period.
- Preeclampsia pregnancy and nausea, vomiting, preeclampsia in the second trimester of pregnancy.
- Sometimes developing hyperthyroidism (providing that at excessively high levels of the hormone human chorionic gonadotropin receptor binds TSH, causing the thyroid hyperfunction).
- Abdominal pain worries ~ 15% of patients.
- Often (27-46%) along with the uterus palpable ovarian tumors (lutein cysts) of different sizes. Sometimes the cyst size greater than the size of the uterus. In 95-96% of patients abortion is observed, during which the uterus at the same time is spotting vesicle like masses.

Diagnosis:

- Based on the results of a clinical, ultrasound, X-ray, histological methods of investigation and the determination of human chorionic gonadotropin.

- Clinical research - going to the history of life and disease, when viewed in the mirror pay attention to the color of the vaginal mucosa and the cervix, the presence of structures on them, which can be metastases.
- During bimanual examination pay attention to the texture, shape and size of the uterus.
- Ultrasound - reveals the presence of vesicles (syndrome "snow storm"), in the presence of luteal cysts evaluated their size and condition of the walls.
- X-ray of the chest can detect metastases in choriocarcinoma.
- Histological study provides a definitive answer about the nature of tissue samples, the degree of damage and aggressiveness. A reliable marker of hydatidiform mole is the definition of HCG, whose value increased significantly, exceeding 100,000 mIU / ml. This allows you to detect at an early stage of the disease.

Treatment

Involves primarily mole mass removal of the uterus, which is a radical method of treatment. In most cases 2-3 weeks comes complete involution of the uterus, the cervix becomes normal shape, the cervical canal is closed, bleeding stops. Removing the hytratidiform mole can be done by entering the contractile agents (prostaglandins, oxytocin), instrumental removal curette, in severe cases - through laparotomy and hysterectomy, supravaginal amputation or hysterectomy without appendages (with destructive form), chemotherapy.

Observation:

Determination of hCG spend every 2 weeks until a negative result, then within a year every 2 months. Spontaneous remission occurs in 80% of patients.

Clinical supervision for 2 years.

The next pregnancy is recommended to schedule 2 years after complete remission.

Choriocarcinoma

- Is a rare but one of the most malignant growth arising in the body of uterus

Symptoms.

- The bleeding is usually profuse
- Continued amenorrhea (due to a very high level of hCG secreted by the metastatic growth outside the uterus)
- Dyspnoea and haemoptysis with lung metastasis
- Symptoms of brain metastasis
- Vaginal metastasis – a bluish vascular tumor which bleeds easily on touch
- Enlarged uterus
- Gralunosa lutein cysts

Staging

Stage I – disease confined to the uterus

Stage II – GTD extands outrside the uterus but is limited to the genital structure

Stage III – lung metastasis with our without genital tract involvement

Stage IV – other metastasis

Diagnosis.

- Clinical features
- histological evidence
- serum β- hCG level
- X-ray of lungs
- Ct of lungs and brain
- Ultrasound scans of liver and pelvis

Treatment.

I. Chemotherapy.

1.1. Preventive chemotherapy for women that are at risk:

-age more than 35

- initial levels of serum β- hCG level ≥100,000IU/mL
- β- hCG levels fails to become normal by 7-9 weeks time or there is a re-elevation
- Infiltrative mole
- evidence of metastasis irrespective of the level of β- hCG
- previous history of a molar pregnancy
- women who are unreliable for follow-up

1.2. Curative chemotherapy.

II. Hysterectomy. (85% chemotherapy alone is successful)

Indications:

- Lesions confined to the uterus in women aged > 35 years, not desirous of fertility
- Placental site trophoblastic tumor
- Intractable vaginal bleeding
- Localised uterine lesion resistant to chemotherapy
- Accidental uterine perforation during uterine curretage

III. Radiation.

Fallopian tubes cancer

Primary carcinoma is uncommon and account for only 0,3(0,5%) of all cancers of the female genital tract. The tumour is highly malignant and spreads rapidly to the surrounding areas, and through lymphatic system to the pelvic organs. Very often, the tumour is in advanced stage when diagnosed and mostly it is diagnosed only on hystological study after the surgery.

Etiology:

Is not yet known. The theory of viral infection is now discussed, especially the role of Herpes virus type II and HPV infection.

Risk factors include:

- Inflammatory diseases of the appendages
- Age more than 45-50 years
- Nulipara or infertility due to amenorrhea or anovulatory menstrual cycles

Classification:

By origin

- Primary – if cancer originated in fallopian tube (very rare)
- Secondary – if cancer originated in another part and then spread to the fallopian tube

By histological type:

- Adenocarcinoma
- Sarcoma
- Mixed Mullerian tumors

By localization:

- Unilateral
- Bilateral

Stage 0 (Tis) – preinvasive cancer of the fallopian tube (in situ)

Stage I (T1) – the tumour is located in the fallopian tube (tubes)

- **IA (T1a)** – the tumour is located in one tube, does not grow beyond serous membrane, ascites is absent;
- **IB (T1в)** – the tumour is located in both fallopian tubes, does not grow beond serous membrane, ascites is absent;
- **IC (T1c)** – the tumour is located in one or both fallopian tubes, infiltrates serous membrane, atypical cells are found in ascetic fluid

Stage II (T2) – the tumour spreads to one or both fallopian tubes and pelvic organs

- **IIA (T2a)** – the spread of the tumour to uterus or ovaries

- **IIB (T2b)** – the spread of the tumour to other pelvic structures
- **IIC (T2c)** –the involvement of the pelvic organs with the presence of atypical cells in the ascetic fluid

Stage III (T3) – the tumour involves fallopian tube (tubes, is disseminating through the peritoneum beyond the pelvis, is metastasing to the regional lymph nodes.

- **IIIA (T3a)** – microscopic metastatic tumor foci are found on the peritoneum beyond pelvisy
- **IIIB (T3b)** – metastatic tumor foci on the peritoneum are less than 2 cm
- **IIIC (T3c/N1)** – metastatic tumor foci on the peritoneum are more than 2 cm, metastasis to the regional (inguinal, paraaortic) lymph nodes

Stage IVB (M1) – distant metastasis are present, besides the metastasis to the peritoneum.

Clinical features.

1. Mostly asymptomatic
2. Early symptom – watery discharge per vaginum
3. Postmenopausal bleedings sooner or later
4. Pain is a late symptom
5. A lump may be too small to palpate

Diagnoses.

Is difficult and often missed

1. Clinical investigation (complaints, history of the disease, bimanual examination)
2. Pap smear (rarely seen, but may be persistently positive)
3. Negative curretages in postmenopausal bleedings should arouse the suspicion of fallopian tubes malignancy
4. Laparoscopy
5. Ultrasound

6. Doppler flow
7. CA-125 sometimes arised

Treatment.

In operable cases consists of hysterectomy, bilateral salpingo-oophorectomy, pelvic lymph node sampling and omentectomy**.** Posoperative radiotheraphy, chemotherapy and progesterone hormonal therapy are often required. Choriocarcinoma if diagnosed is treated either by surgery or by chemotherapy.

Ovarian cancer

Among different cancers of female genitalia ovarian cancer is on the first place by the incidence. Ovarian cancer is observed in all age groups, even in children, but the most common in women of premenopause and menopausal period. Ovarian cancer ris the type of cancer with the worst prognostic in adult women. More than half of the patients who have clinical signs such as abdominal bloating and a feeling of fullness already show advanced stages.

Etiology is still an issue of investigation, but special genes such as *TP53*, *BRCA1* and *BRCA2* have been well investigated in cancerogenesis of ovarian cancer. These genes are widely accepted as the predisposing factors that trigger malignant transformation of the epithelial cells of the ovary. Among other predisposition factors the following are considered to higher the risk of ovarian cancer:

1. Patients of low parity
2. Decreased fertility
3. Delayed childbearing
4. Familiar predisposition
5. Genetic tumours
6. Age between 45-60 years

The protective factors the lower the risk include :

1. Multiparity
2. Breastfeeding
3. Anovulation
4. Use of COC

Classification.

1. Primary (endometrial) cancer of the ovary, usually is observed bilateral damage. Tumors uneven, dense, rarely reach large sizes. The morphological structure is glandular cancer with squamous epithelium foci. Average age of 30 years. Depending on the tissue of origin they are divided into:

1.1.Epithelial:

- serous (60%)

- mucinous (20%)

- endometrioid (2%)

- Brenner

- Undifferentiated

1.2. Non-epithelial:

- Germ cell (10-20%)

- sex cord stromal (3-5%)

- Unclassified

2. Secondary ovarian cancer often develops on the basis of so-called ovarian cystomas. These benign cystic tumor with different sizes up to huge and contain a clear or watery fluid (serous cystoma) or mucus (pseudomucinous cystoma). In most cases cancer develops in secous cystomas in the papillary growth that look like cauliflower and partially fill the cavity of the cystomas. Serous cancer is more common in the age of 40-60 years, mucinous - after 60 years.

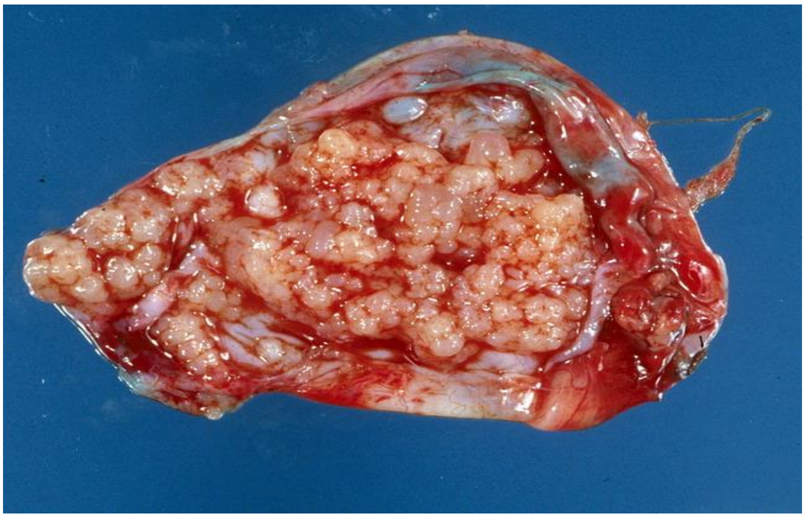


Fig.2.19. Papillary serous ovarian cancer

3. Metastatic may be from different other organ cancer, but depending on the frequency may be:

2.1 Typical:

- from the gastrointestinal tract

- gall bladder and pancreas

- late carcinomas from the breast cancer

- carcinomas of the corpus (10%) and cervix (1%)

2.2 Atypical – Krukenberg tumour

Clinical features. In the early stages the patients may not represent any complaints. In majority the clinical manifestation is very similar to the clinical features of benign ovarian tumors. Menstrual cycle in most cases is normal. Only in advanced stages the following complaints may be present:

1. Loss of apetite
2. Rapid enlargement of the tumour
3. Abdominal discomfort and pain
4. Abnormal or postmenopausal bleeding
5. An abdominal lump

6. Respiratory distress
7. Weight loss, cahcexia, anaemia

One of the frequent complications in case of movable ovarian tumors is pedicle torsion, that causes the clinical picture of acute abdomen, including nausea, vomiting, tachycardia, not rarely collapse. In case of rupture of the tumor it leads to dissemination of the process. Some of the tumors are hormone active and depending on the type of the hormones they are producing they may cause either masculinization or feminization.

Diagnosis. There are no specific findings for ovarian cancer in early stages of the disease. There are a couple of probable signs

1. General:
   - Abdominal swelling especially the one that is quickly enlarging
   - Cachexia and pallor of varying degree
   - Jaundice
   - Left supraclavicular lymph gland may be enlarged (Virchow's mesastasis)
   - Oedema leg or vulva
   - Enlarged firm and nodular liver may be present
   - A mass is felt in the hypogastrium
   - Ascites
   - Hydrothorax
   - Abdominal obstraction
2. Bimanual:
   - Firm consistency of the tumor, uneven surface, in most of the cases bilateral, with quick growth
   - The presence of metastatic foci in cul-de-sac, that are palpated during vaginal and rectal examination and felt like thorn
3. Laboratory tests. For screening CA 125 and HE 4 are used, but there is no completely specific marker.
4. Ultrasound of genitalia transvaginal and transabdominal

5. Special methods are used to exclude metastatic nature of the tumor or to determine the presence or absence of metastasis
    - CT and MRI
    - X ray of chest
    - Ultrasound of the inner organs
    - Barium enema
    - Positron emission tomography
    - Mammography
    - Gastroscopy/colonoscopy

Staging

Stage IA (T1a) - the tumor is present only in one of the ovaries, the capsule is intact

Stage IB(T1b) – the tumor is present in both ovaries, the capsule of the tumors is intact, no tumor cells in peritoneal washings

Stage IC (T1c) – one or both of the ovaries are incolved with either capsule rupture, or tumor cells of the capsule, no malignant cells in peritoneal cells.

Stage IIA (T2a) – extension of the tumor to the uterus and\or tubes, no malignant cells in peritoneal washings

Stage IIB (T2b) – extension to other pelvic tissues

IIC (T2c) – pelvic exrension with malignant cells in peritoneal washings

IIIA (T3a) – microscopic peritoneal metastasis beyond pelvis

IIIB (T3b) – macroscopic 2cm or less peritoneal metastasis beyond pelvis

IIIC (T3c) – macroscopic metastasis more than 2 cm beyond pelvis and\or regional lymph node metastasis

IV – distant metastasis

Treatment

In case of ovarian cancer one of the main methods of treatment in non advanced stage is surgical treatment, conducting hysterectomy with appendages and omentumectomy. Intraoperational histological investigation is to made during operation to decide the type of surgery needed to be made. In case of advanced stages palliative operations are made to reduce the size of tumor.

Nowadays chemotherapy is widely used for treatment of ovarian cancer. Besides chemotherapy especially is case of papillary cystadenoma radiotherapy s used

MCQs

1. The most common type of ovarian cancer is:

A. Germ cell

B. Unidentified

C. Sex cord-stromal

D. Epithelial

2. The risk factors for cervical cancer in most cases present is:

A. IUD use

B. Chlamydia infection

C. Overweight

D. Violations in diet

E. HPV infection

3. A rapid enlargement of fibroid in women in postmenopausal age and failure to respond to GnRH agoinist suggest the possibility of:

A. Uterus sarcoma

B. Ademocarcinoma

C. Necrosis of fibroid node

D. Rapid growth of fibroid node

4. Which of the following for partial hydatidive mole is true:

A. Diffuse hydrotropic changes

B. A fetus is identifiable

C. β-hCG levels are comparatively high

D. A fetus is indentifiable
E. malignant potential is high

5. Which of the following symptoms is mostly probable in women with coriocarcinoma:
    A. Persistant or irregular heamorrhage following an abortion, a molar pregnancy or a normal delivery, usually profuse
    B. Dyspareunia
    C. Dysuria
    D. Abdominal swelling

Key answers:

1. D
2. E
3. A
4. D
5. A

Pelvic inflammatory diseases

More than half of appeals to a gynecologist (50-60%) have pelvic inflammatory diseases.

In all countries the incidence of PID is increasing. It can lead to irreversible damage to the genitalia and is the primary preventable cause of infertility in women.

In case of acute inflammation – a pronounced body reaction - fever, chills, loss of appetite, headache, changes in blood – elevated leucocytes, leukocyte formula is moved to the left, increased erythrocyte sedimentation rate, and significant local manifestations - pain, redness and swelling at the site of the inflamed organ, local hot flashes, if chronic course - clinical symptoms are less pronounced, but there are a variety of morphological changes in damaged organs and tissues (thickening, moving, adhesions)

Etiology. Depending on the etiological factor PID are divided into non-specific and specific. Etiological factors include different types of Staphyloccocus, Streptococcus, E.Coli, Proteus, Enterococcus, anaerobic infection, Gardnerella, Candida, an association of microbes. There are exogenous factors that provoke the disease (different infectous agents) and endogenous - internal, that promote the inflammation – tissue necrosis, thromboses, large hemorrhages. Infection may be spread by lymphatic system, haematogenous or canalicular way (trough vagina, cervical canal, uterus cavity and fallopian tubes). There are physiological and artificial barriers that prevent from pelvic inflammatory diseases . Physiological include pudendal cleft closure, acidic pH of vaginal secretion, os closure with cervical plug, endometrial lining downward movement, symbiotic bacterial flora (Lactobacillus acidophilus) and artificial barrier - barrier methods of contraception. Risk factors include menstruation, multiple sex partners, IUD use, vaginal douching.

Pelvic inflammatory diseases of non-specific etiology

Vulvitis is the inflammation of vulva. Vulvitis is classified as primary – in childhood and in elderly women because of the poor hygiene, especially during menses, obesity, chemical, thermal, mechanical irritation, abrasions, diabetes, cystitis and secondary – because of the irritation by purulent discharges from vagina and cervix in case of colpitis, endocervicitis.

Fig.3.1. Vulvitis

Vulvitis may be also classified as acute and chronic.

Symptoms of acute vulvitis include pain and itching in the pudendal cleft, that increase during walk and if touched, purulent discharges, edema and hyperemia of vestibule of the vagina, of labia minora and majora, internal surfaces of legs. The skin is easily macerated. In case of chronic vulvitis the symptoms are not that prominent and may include Itching, heartburn, skin hyperemia, sometimes labia minora hypertrophy. Chronic inflammation may be the cause of condilomas.

Diagnosis include the evaluation of the complaints, history, visual inspection of vulva, gynecological examination, bacteriological and bacterioscopic investigation.

Treatment. To eliminate the cause of vulvitis if such was found, washing the vulva with solution of potassium permanganate (1:10000), a solution of chamomile, hygiene, if the cause is bacterial, fungal or parasitic - Terzhinan one vaginal tablet before going to bed intravaginally, duration of treatment - 10 days or Neotrizole one vaginal tablet before bed time intravaginally for 8 days.

Bartolinitis – a result of infectous inflammation of the vaginal big vestibule gland. Disease is caused by Staphylococci, Escherichia, Gonococci sometimes

Trichomonas. Most often occurs in the case of inflammation vestibule, vulvitis. Regardless of the type of agent, the process begins in the excretory gland - canakulitis, then it can spread to the parenchyma of the gland itself, it causes serous, sero-purulent or purulent inflammation, an abscess Bartholin's gland may be formed.

Fig.3.2. Abscess of the Bartholin's gland

Symptoms in case of canaculitis patients complain of pain in the are of external genitalia, discharges, inspection reveals hyperemia around the excretory duct, if squeezed, a drop of pus may be seen, that should be investigated. In case of abscess of the Bartholin's gland the patients represent with complaints of pain in the area of the Bartholin's gland, the pain is prominent, increases during walk, the temperature may be increased. During inspection the area of the Bartholin's gland is increased in size, the hyperemia of the skin, the gland is painful on palpation, if the abscess is already formed fluctuation is present.

Treatment. In case of canaculitis - eliminate the cause according to the bacteriological analysis.

Treatment of abscess of the Bartholin's gland include incision and drainage of the gland when the fluctuation is already present. Bacteriological analysis, elimination of the etiological factor. If left untreated, the abscess usually is drainaging in a couple of days itself, but the remaining pus in the gland may lead to chronization of the process. In case of recurrent pseudo - abscesses and cysts- extirpation of the gland.

Colpitis is the inflammation of the mucosa layer of the vagina. Predisposing factors include hypofunction of the ovaries, mechanical of chemical injury of the epithelium, acute infectious diseases, the presence of the general causes that lower the counteraction the organism (metaboloic disorders, diabetes mellitus), etc.

Etiology. The pathogens are Staphyloccocus, Streptococcus, E.Coli, Diphtheric bacillus, Klebsiela, Enterobacter, Candida, Chlamidya, Gardnerella.

Symptoms include discharges from vagina, itching and burning in the area of vagina and external genitalia, discomfort during urination.

Diagnosis consists of history taking, visual inspection, speculum examination – in acute stage of the disease vaginal mucosa edematous, hyperemic, bleeding when touched, covered with purulent or serous stratification, and obligatory bacterioscopic and bacteriological analysis.

Treatment depends of the etiological factor. Depending on the etiological factor antimicrobial, antifungal or combination of drugs is used, local therapy is done depending on the cause.

Endocervicitis (cervicitis).

Etiology. The etiological factors are Staphylococcus, Streptococcus, E.Coli, Enterococcus, Mycoplasma, etc. Predisposing factors include cervical ruptures during labour, cervical trauma during artificial abortion, inflammatory diseases of other genitalia, cervical erosion, etc.

Symptoms. Even in acute stage the temperature remains normal. Patients complain of discharges from vagina, sometimes dull pain in the lower abdomen.

Diagnosis includes history taking, speculum examination - the external os is surrounded by dark red edematous mucous layer, thick purulent discharges are “hanging” from the cervical canal; bacterioscopic and bacteriological analysis.

Fig.3.3. Masroscopic difference between normal cervix and cervicitis

Treatment is aimed to eliminate the cause and non-specific inflammation (antibiotics including local therapy).

Acute endometritis is the inflammation of the internal linning of the uterus.

Etiology. Acute endometritis may be observed because of the penetration of pathogens through the cervical canal mostly after intrauterine manipulations, such as D&C, artificial abortion, IUD, hysteroscopy, or through lymphatic or hematogenous way.

Symptoms. Complaints include pain, radiating to the sacrum elevated body temperature, disruptions of the general state, sometimes metrorrhagia, discharges from vagina.

Diagnosis. Complaints, history are evaluated, abdominal palpation – the abdomen is tender in the lower part, gynecological examination - the uterus is slightly enlarged, painfull, discharges are mucous or muco-purulent, bacteriologic and bacterioscopic investigations, blood count – leucocytosis, elevated ESR.

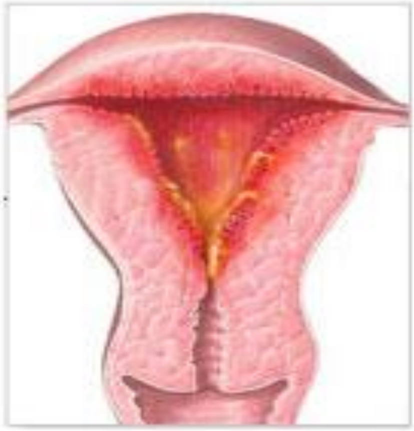


Fig.3.4. Endometritis

Treatment. Mostly acute stage lasts for 8-9 days. Treatment includes hospitalization, bed rest, diet, antibiotics of broad spectrum, antifungal therapy, analgetics, infusion if needed, if it occurred on the background of incomplete abortion – instrumental removal of the fertilized egg parts left in the uterine cavity after 24-48 hours of antimictobal therapy, if it occurred because of the IUD use, IUD should be removed immediatelly.

Adnexitis (salpingo-oophoritis)

Most of the patients represent **history** of obstructed labor, abortions, use of an intrauterine device, surgical interventions on the pelvic organs, casual sex, failure to comply the rules of personal hygiene, the rejection of condoms, etc.

Complaints: abdominal pain, fever up to 38-40 ° C, chills, nausea and sometimes vomiting, purulent discharge from the genital tract, dysuria. Severity of symptoms depends on the pathogen and the reactivity of the organism (immunity).

Diagnosis evaluation of history, predisposing factors, complaints, gynecological examination (swollen, enlarged, painful appendages are determined. If inflammation of the uterus is present at the same time purulent discharges from the genital tract may be present), clinical exam: blood count, urine analyses, bacteriologic and bacterioscopic analyses, ultrasound, laparoscopy.

Treatment depends on the etiological factor. Includes bed rest, antibiotics, analgetics, antispasmodics.

Purulent tuboovarial abscess is a complication of salpingo-oophoritis

Diagnosis:

1. Patient's condition is serious, skin pale, with cyanotic shade, the temperature rises to 39 ° C, pulse frequent, as a result of intoxication hypovolemia occures, clinically manifested reduced BP, abdomen is soft, participates in the act of breathing may be a slight bloating, mainly in the lower divisions,painful in the same areas. Sometimes it is possible to palpate the upper pole of the formation coming out of the pelvis. The appearance of symptoms of peritoneal irritation indicates a threat of a breakthrough.
2. During bimanual examination if there are abscess a slightly enlarged painfull uterus is palpated, pain increases with movements. Frequently uterus is soldered into one conglomerate with enlarged appendages. At acute disease course adventitious formation has unclear contours anduneven texture, it is usually fixed, sharply painful.
3. Lab – leukocytosis , with a shift to the left, ESR more than 30 mm / h, a positive reaction with C-reactive protein, reduction albumin-globulin coefficient to 0.8

Treatment: If no signs of probable rupture- intravenous infusions and wide-range antibiotics like Cefoxitime 2 g / in every 6 hours and doxycycline 100 mg orally 2 times a day. If the patient does not respond to this antibiotic therapy- ampicillin (or amoxiclav), gentamicin (or cefuroxime) and clindamycin (or metronidazole). Re (control) gynecological study performed 48 h after normalization of body temperature monitoring objective regression of clinical symptoms: pain in the uterus and excursions in the area appendages. With obvious clinical remission of patients transferred to oral antibiotics (doxycycline) for 10-14 days prior to hospital discharge. If more severe TOA resistant to antibiotic therapy or with clinical signs of rupture of the abscess (symptoms of peritoneal irritation, the presence of pus in Douglas), surgery (lapcaroscopic or laparotomy) is necessary. In the course of unilateral TOA salpingo-oophorektomy is performed on the affected side, if bilateral- hysterectomy may be necessary with bilateral salpingo-oophorectomy.

Indications for surgical treatment of inflammatory diseases:

1. Bartholin's gland abscess and pseudo abscesses, cysts
2. A big amount of condiloma accuminata
3. Pyometra
4. Ineffective conservative treatment of pyosalpinx and pyoovar or tuboovarial abscess or with clinical signs of rupture of the abscess
5. Suppuration of the parametritis infiltrate, nonefective treatment of parametritis
6. Peritonitis

Parametritis – the inflammation parauterine tissue

Depending on the localization of the inflammatory process it may be classified as Forms –anterior, posterior, right side or left side

Patients **complain** of malaise, headache, lower abdomen pain, thirst, tongue dryness, elevated body temperature, dysuria, dyspepsia.

Diagnosis. The doctor takes into account the complaints, history, the anterior abdominal wall is tender on palpation, a painful infiltrate is palpated on the side of affection with uneven contoures, the uterus is deviated to the opposite side, when suppurated – fluctuation is present. Ultrasound of the pelvis. Reveals the occurrence of focal changes, bacteriologic and bacterioscopic investigations. During the resorption of inflammatory infiltrate patient's condition improves. Complication - suppuration and breakthrough of the infiltration .

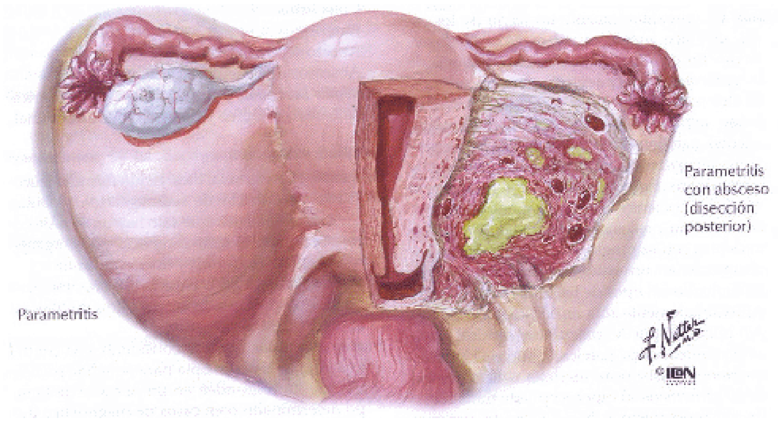


Fig.3.5. Parametritis

Treatment - Includes bed rest, antibiotics, analgetics, antispasmodics. In case of suppuration – incision and drainage.

Pelvioperitonitis – inflammation of the pelvic peritoneum.

Etiology:

- Staphylococcus, Chlamidia, anaerobic, Gonoccocus, E.Coli
- Inflammation of uterus and fallopian tubes
- Abscess rupture
- Uterus perforation
- Fallopian tubes hydrotubation
- Abortions

Clinical manifestation. Two stages may be distinguished – open before formation of adhesions and closed after their formation.

Open stage . General state disruption. Increasing pain in the abdomen. Hyperthermia to 38-39˚S, PS to 120 beats / min. Tongue dry, nausea, vomiting, abdominal muscle tension, positive symptoms of peritoneal irritation in the lower abdomen, peristalsis weakened, impaired function of adjacent organs, increased sedimentation rate, leukocytosis, shift to the left. Per vaginal examination (PV) difficult because of the sharp pain and tension anterior abdominal wall. Sharp pain when shifting the cervix. Smooth, overhanging rear vault.

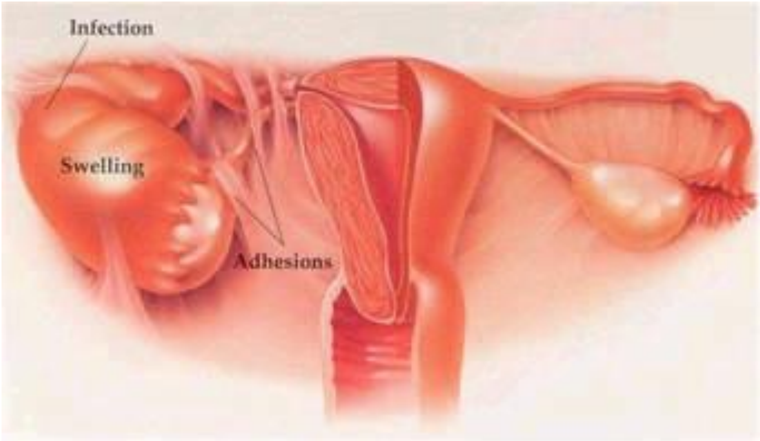


Fig.3.6. Tuboovarial abscess, formation of adhesions

Closed stage Under the influence of the treatment is demarcation of inflammation in the small pelvis due to the formation of adhesions and block it with the intestines and omentum . The patient's condition improves significantly. The inflammatory exudate is absorbed. When unfavourable COURSE the exudate may fester with the formation of an abscess in the small pelvis, which can break into rectum, abdomen and dangerous for the development of diffuse peritonitis of gynecological origin (timely evacuation of pus!)

Treatment of pelvioperitonitis

1. Antibiotics
   - Cefalosporines of III generation (Cefotafime 1,0 g intra venous 3 times per day; Ceftriaxone 1,0 – 2,0 g I/V 2 times per day) plus Metronidazole 0,5 I/V 3 times per day

   - Clindamicine (900 mg I/V 3 times per day) and Amicacine (1,0 per day I/v or I/M) not less than 4 – 5 days, then Clindamicine 450 mg 4 times per day orally till 14 days of treatment;

2. Intravenous infusion: Coloids and cristaloids (1:2) 2 – 2,5 liters (more if needed)

3. Non-steroidal unti-inflammatory therapy
4. Analgetics
5. Cold on the lower abdomen

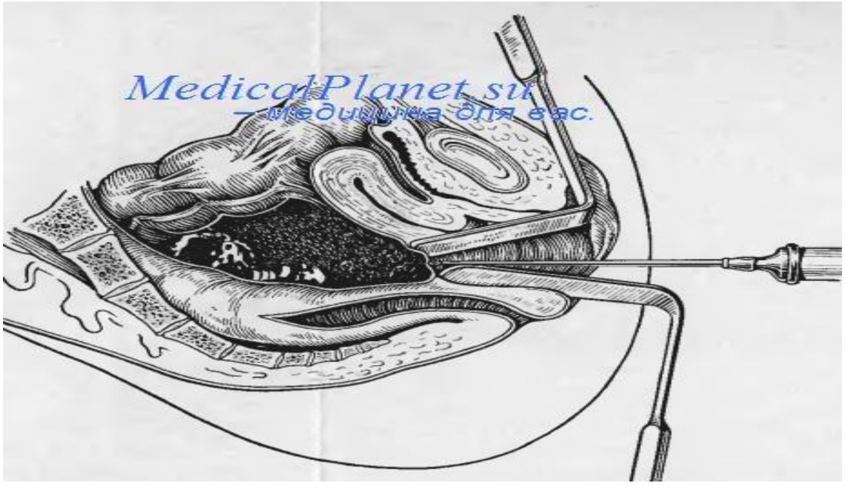


Fig.3.7. Cukdocentesis

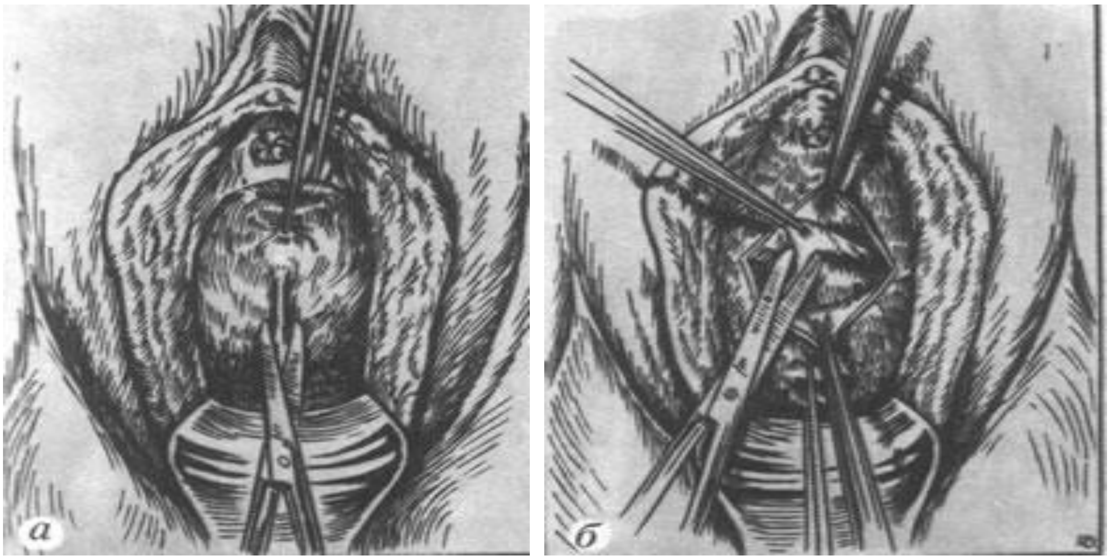


Fig.3.8. Surgical treatment of pelviopetitonitis (Colpotomy)

Pelvic inflammatory diseases of specific etiology

Trichomoniasis. Delitescence – 4-28 days. 20% - remain asymptomatic, 70% - typical discharge, which is profuse, thin, creamy or slightly green in colour, irritating and frothy.

Classification: primary (acute, subacute, torpid), chronic (more than 2 months.), Trichomonas carrier

Diagnosis. Gynecological examination - the vaginal walls are tender, angry looking and the discharge causes pruritus and inflammation of the vulva, there are often multiple small punctate strawberry spots on the vaginal vault and portio vaginalis of the cervix (strawberry vagina), urinary symptoms – dysuria, frequent urination, Bacteriological, PCR and antigen testing

Fig.3.9. Macroscopic view of discharges and cervix in case of trichomoniasis

Treatment. Both partners are treated, obsnaining from intercourse or use a condom during therapy

Metronidazole 200 mg 3 times per day for 7 days (2g 1 day only before going to sleep) or Tinidazole 300mg twice daily for 7 days or Secnidazole 1000mg daily for 2 days, Ornidazole 500 mg vaginally.

Gonorrhea

May be a cause of urethritis, Bartolinitis, endocervicitis, proctitis, endometritis, salpingitis, pelvioperitonitis

Classification: primary (acute, subacute, torpid), chronic, latent

Diagnosis. 50% remain asymptomatic. Complaints : excessive irritant vaginal discharge, dysuria, acute unilateral pain and swelling over the labia due to the involvement of Bartholin's gland, rectal discomfort due to associated proctitis.

Gynecological exam -labia may be swollen, purulent discharges, purulent exutade escapes from the urethral meatus or Bartholin's duct when squeezed, congested ectocervix, increased mucopurulent discharges, Nucleic acid amplification testing of urine or endocervical discharge, bacteriological and bacterioscopic investigation

Treatment Antibiotics (ceftriaxone, Ciprofloxacin, Ofloxacin, Cefixime, Levofloxaci), immunotherapy, local therapy

Follow up: cultures 7 days after the therapy, repeat cultures at monthly intervals following menses for three months.

Chlamidial infection . Can be a cause of urethritis, cervicitis, salpingitis, pharyngitis, conjunctivitis, arthritis (Reiter's syndrome). Remains asymptomatic in 75%

Typical complaints include dysuria, dyspareunia, poscoital bleeding, itermenstrual bleeding.

Diagnosis: gynecological exam -mucopurulent cervical discharges, cervical oedema, cervical ectopy and cervical friability, Chlamidial nucleic acid amplification testing, bacterioscopic investigation, PCR reaction, ELISA detection of the Chlamidia antigen.

Fig.3.10. Macroscopic view of discharges and cervix in case of Chlamidial infection

Treatment : antibiotics (azitmomycin, doxycycline, ofloxacyn, erythromycin), antifungal medications, local treatment. Lab exam is repeated in 1,5-2 months

Candidal(monilial) vaginitis

Risk factors – promiscuity, immunosupression, HIV, woman pregnancy, steroid therapy, following long-term broad spectrum antibiotic therapy, diabetes mellitus, poor hygiene and obesity.

Clinical features – pruritus vulva, vaginal irritation, dysuria and passage of thick curdy or flaky discharge.

Diagnosis: complaints, gynecological exam – congestion of the vaginal wall with curdy discharge often visible at the vulvar mucocutaneous junction and in the posterior fornix, Lab exam – microscopic smear of the vaginal discharge, bacteriological.

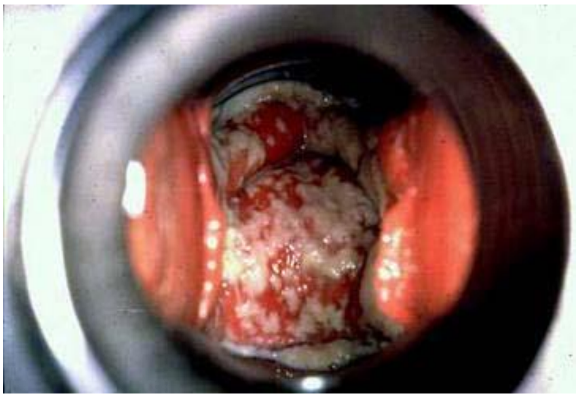


Fig.3.11. Macroscopic view of discharges and cervix in case of Candidial vaginitis

Treatment. Acute – a single doze of fluconazole 150 mg for both partners, local intravaginal application of antifungal agents like imidazole, miconazole, clotrimazole . Reccurent infection – fluconazole orally 150 mg every 72 hours for 3 dozes and then weekly for a few weeks plus local therapy.

Ureaplasmosis, Mycoplasmosis. Mycoplasma often associated with Trichomonas, chlamydia, gonococcus, anaerobes. Forms: acute and chronic, without specific course. Diagnosis: bacteriological method serological paired sera, immunological, ELISA. May lead to infertility. Treatment: macrolides, tetracyclines, immunomodulators.

Viral lesion – Genital herpes. Incubation period – 3-7 days

Clinical manifestation. Primary infection – malaise, fever and vulval paraesthesia followed by appearance of vesicles on the vulva resulting ulcers which are shallow and painfull, the lesion heal without scarring (lasts for app. 2 weeks). Reccurent outbreaks – shorter duration and milder in severity, prodromal symptoms – burning and itching, systematic symptoms are generally absent. Complications – encephalitis, urinary tract involvement causing retention of urine, severe pain.

Diagnosis: complaints, history, visual inspection, Lab exam – immunologic or cytologic tests, viral cultures from the swabs taken from the base of the vesicles, biopsy .

Fig.3.12. Macroscopic view of labia majora et minora in case of genital herpes

Treatment: Oral acyclovir 200 mg 5 times per day for 5 days, local application of acyclovir cream, obstain of intercourse until total re-epithelization , Caesarean section is recommended during pregnancy in the presence of active infection to avoid neonatal infection.

HPV (condiloma accuminata) are caused by HPV Cause – HPV 6 and 11 types. Vaginal discharges and pregnancy favours their growth. Cervix is affected in 70%, vulva 25%, vagina 10%, anus 20%. Symptoms depend on the localization, spread of the process and may include discomfort, itching, dysuria and discomfort while moving the bowel, or be asymptomatic.

Fig.3.13. Condiloma accuminata of vulva

Treatment – cryotherapy, elecrto cautery, laser therapy, surgical excision, topical use of 5-fluorouracil.

Prevention – HPV vaccine.

<u>Bacterial vaginosis .</u>

Etiology – Gardnerella vaginalis

Symptoms - homogenous, grayish-white and adherent to vaginal wall discharges with fishy smell without extensive evidence of inflammation

Diagnosis includes evaluation of complaints, gynecological exam, Gram stained vaginal smear – presence of more gardnerella or mobiluncus morphotypes with few or absent lactobacilli and Lab criteria

- ✖ Amsel's four criteria of diagnostic – homogenoous vaginal discharge, vaginal pH >4,5, Positive whiff tests (fishy (anime) odour when a drop of discharge is mixed with 10 per cent potassium hydroxide solution, presence of clue cells(vaginal epithelial cells are seen covered with these coccobacilli and the cells appear as stipped or granular)

Bacteria Vaginosis Discharge

Fig.3.14. Macroscopic view of discharges and cervix in case of Bacterial vaginosis

<u>Treatment –</u> metronidazole 200mg orally thrice daily for 7 days, clindamycin cream and metronidazole gel are recommended for vaginal application daily for 5 days to prevent obstetric complications, the patient's sexual partner should be treated simuntaneously

<u>Prevention –</u> to avoid risk factors, that are:

- ✓ frequent change of sexual partners;
- ✓ use of intrauterine contraceptives;
- ✓ inflammatory diseases of the urogenital area;
- ✓ antibacterial drugs and immunosuppressants.

<u>Tuberculosis</u> Is almost always secondary to primary infection. The fallopian tubes are invariably the primary sites. The spread may be haematogenous, lymphatic or direct and ascending from a male with urogenital tuberculosis.

May cause:

- ✓ salpingitis (100%) -the initial site of infection – submucousal layer, elongated distended distal tube with patent abdominal ostium like "tobacco pouch"
- ✓ endometritis (60%) the tubercule is situated in the basal layer, may leed to Asherman's syndrome
- ✓ cervicitis(5-15%) rare, may be ulcerative or bright nodular

- ✓ vulvitis and vaginitis (1%) the lesion may be ulcerative or hypertrophic variety
- ✓ oophoritis (30%) surface tubercules, adhesions, thickening or even caseating abscess
- ✓ peritonitis “wet” and “dry” variety

Diagnosis:

1. Past history of tuberculosis
2. Symptoms – asymptomatic, infertility, menstrual abnormality (menorrhagia and amenorrhea or oligomenorrhea), chronic pelvic pain, constitutional symptoms, sometimes weakness, low grade fever, anorexia, anemia or night sweats, the lesion is accidentally diagnosed during investigation for infertility or dysfunctional uterine bleedings.
3. Health status
4. Per abdomen palpation may be negative
5. Per vaginum palpation may be 50 % negative
6. Blood – leucocyte count and ESR
7. Mantoux test – positive in most of the cases
8. Chest X-ray
9. Diagnostic uterine curettage during the week preceding menstruation
10. Nucleic acid amplification
11. Diagnostic of first day menstrual discharge, lymph node biopsy, HSG, laparoscopy

Treatment: Chemotherapy – isoniazid, rifampicin, ethambutol ininitial phase for 2 months in constituton phase further 4 months. A patient may be considered cured if at least 2 reports including histological and bacteriological examinations become negative. Indications for surgical treatment – unresponsiveness of active disease in spite of adequate anti-tubercular chemotherapy, tubercular pyosalpinx, ovarian abscess or pyometra, persistant menorrhagia and/or chronic pelvic pain causing deteriorating health status.

<u>Medical rehabilitation:</u>

1. Largely the restoration of the women specific functions is promoted by physiotherapy methods. Acupuncture, impact on acupressure points pulse currents of different frequencies, laser beams can be used.
2. Afterwards spa treatment may be recommended. Natural factors can reduce the time required for recovery, or succeed where previous treatment did not lead to final cure the patient.
3. Rehabilitation actions should be based on the age of patients, concomitant diseases, the state of neuroendocrine system, immunity.
4. With timely appointment of adequate treatment, rehabilitation proper conduct of the majority of women who have had inflammation, reproductive health can be restored.

MCQs

1. The treatment of Bartholin's gland abscess is:
   A. Inscision and drainage, antibiotics
   B. Observation, hormonal ointments
   C. Dry warmth, analgetics
   D. Non-steroidal anti-inflammatory drugs, antibiotics
2. Adnexitis is:
   A. An inflammation of ovaries and fallopian tubes
   B. The inflammation of external genitalia
   C. The inflammation of all the layers of uterus
   D. The inflammation of ovaries only
3. The etiological factor of bacterial vaginosis is:
   A. Mycoplasma hominis
   B. Ureaplasma urealyticum
   C. Candida albicans
   D. Gardnerella vaginalis
   E. Streptococcus
4. In most of the cases tuberculosis of female genitalia causes:
   A. Oophoritis

B. Salpingitis
C. Endometritis
D. Cervicitis
E. Peritonitis

5. The indications for surgical treatment in case of PID:
   A. Ineffective conservative treatment of pyosalpinx and pyoovar or tuboovarial abscess or with clinical signs of rupture of the abscess
   B. Endometritis
   C. Cervicitis
   D. Adnexitis

Key answers

1. A
2. A
3. D
4. B
5. A

Acute abdomen

Acute abdomen is a collective term that unites a group of acute diseases, mainly of the abdomen, of different etiology and clinical course. It is a disaster in abdominal cavity, a threat to a woman's life and requires immediate medical help.

Etiology

- ✓ Diseases of the Chest: myocardial infarction, aneurysm rupture, inflammation of the lower fractions of lung spasm of the coronary vessels of the myocardium
- ✓ Diseases of the abdominal cavity
  - Surgical causes: acute apendicitis, perforative ulcer of the stomach, acute cholecystitis, pancteatitis, intestinal obstruction, incarcerated hernia ....
  - Gynecological diseases:
    - Haemorrhages from the inner genitalia
    - The sudden circulatory disorders of the inner genitalia
    - Acute inflammation
    - Peritonitis of gynecological origin

Main clinical symptoms of acute abdomen.

1. Subjective symptoms: in most of the cases the beginning is sudden, more rarely - a gradual. One of the most prominent symptoms is pain. There is often a sudden (torsion cysts), more rarely gradual (inflammation). Is due to spasm, hyperextension of the capsule, organ rupture, irritation of the peritoneal nerve endings. Localization of pain gynecological origin - the abdomen, buttocks. Irradiation in the rectum, vulva, legs, shoulder It may be missing in old age, in shock, in exhausted patients, Vomiting is a common feature. Is due to peritoneal irritation, hiccups (caused by irritation of the phrenic nerve),

constipation, lack of bowel movement (an important early sign of acute abdomen, is due to intestinal paralysis) or diarrhea (may be a sign in some of the patients).

2. Objective signs:
    a. Facies Hippocratica - pale with icteric shade; features sharpened, eyes sunken, staring. Absence of “face Hippocrates "does not prove the absence of acute abdomen
    b. Dry tounge, coated
    c. Weakened abdominal breathing - a characteristic feature. The patient spontaneously reduces excursion of the abdominal wall. In diffuse peritonitis abdomen is not involved in breathing
    d. Rigidity of the abdominal wall - the main and most common symptom. Palpation should be done gently, with the whole hand. May be absent the old and exhausted patients
    e. Pain. Pay attention to where the most. Gynecological diseases - below lin. interspinalis.
    f. Flatulence - characteristic of the later stages of peritonitis. Peristalsis is not listening
    g. Temperature – depends on the etiology
    h. Pulse rate – most common tachycardia. “Scissors" - tachycardia at normal body temperature: early peritonitis, intra-abdominal bleeding
    i. Blood changes – is present in all pathological states
        i. Inflammaroty processes - leukocytosis, accelerated erythrocyte sedimentation rate, increasing the number of neutrophils, the "shift" to the left
        ii. intra-abdominal bleeding - fall of hemoglobin, decreased number of red blood cells

<u>Acute abdomen in case of intra-adominal bleeding</u>

Etiology:

1. The most common - ectopic pregnancy, bleeding from the ovary
2. More rarely – intraabdominal haemorrhages in case of uterus perforation, injure of the vessels while performing the culdocentesis.

Ectopic pregnancy is a state when the fertilized egg does not move into the uterus and is attached somewhene else e.g. to the fallopian tube, ovaty, omentum, etc.

Classification:

1. Based on the location:
   a. Tubal pregnancy
   b. Ovarian pregnancy
   c. Cervical
   d. In the uterus horn
   e. In the mesentery of the uterus
   f. Abdominal
2. Depending on the course:
   a. progressive;
   b. interrupted (tubal abortion, rupture of the fallopian tube);
   c. missed abortion.

Risk factors of the ectopic pregnancy:

1. The history of the inflammation processes.

2. Adhesion proceses of the pelvic organs due to the previous surgery on the inner genitalia, pelviopeitonitis, abortions.

3. Disruptions of the hormonal function of the ovaries.

4. Genital infantilism.

5. Endometriosis.

6. A prolonged usage of IUD.

7. Assisted reproductive technology

Diagnosis.

1. The appearance of pregnancy signs such as delay of menstruation, mammary glands edema, the change of smell, taste and other senses that is characteristic of pregnancy, early gestosis signs (nausea, vommiting and oth.), positive immunological reactions of pregnancy (hCG in serum and urine).
2. Menstrual cycle disorders – spotting bloody discharges from the vagina may be after a delay of menstruation (in most of the cases), start with the the beginning of a new menstruation or before the planned menstruation.
3. Pain - one side cramping or constant in the lower abdomen may be sudden intense in the lower abdomen, positive peritoneal symptoms in the lower abdomen of various intensity, pain irradiates to rectum, perineum and sacrum.
4. The signs of intraabdominal bleeding: positive Kulenkampff symptom (signs of peritoneal irritation along with the absence of local muscle tension in the lower abdomen), horizontal position - positive bilateral "frenikus" symptom, vertical - dizziness, loss of consciousness, in case of significant haemoperitoneum - Schetkin-Blumberg symptom, progressive decline of hemoglobin, erythrocytes, hematocrit
5. Changes of general condition: weakness, dizziness, fainting, cold sweat, collapse, hemodynamic violation, nausea, vomiting reflex, flatulence, single diarrhea
6. Gynecological exam : cyanosis of the mucous membrane of the vagina and cervix, uterine size smaller than gestational term of pregnancy, unilateral pain and increase of uterine appendages, overhanging of the vagina vault (if haemoperitoneum), acute pain while palpating the posterior vaginal fornix ("Douglas shout"), pain while moving the uterus sidewards
7. Lab exam: quanlitative or quantitative test for hCG. Qualitative determination of hCG in urine is possible at any institution of public health, while the quantitative analysis of hCG in serum (rate less the expected gestational term during physiological pregnancy) is carried out in health facilities of III level.
8. Instrumental methods:

a. Ultrasound -no fetal eggs in the uterus, visualization of the embryo outside the uterine cavity, a formation of heterogeneous structure in the projection of the fallopian tubes is detected, significant amount of free fluid in Douglas pouch .
b. Laparoscopy – visual investigation of ectopic pregnancy that looks as thickening of the uterine tube with purple - bluish color, fallopian tube rupture, Haemorrhage from the ampullary opening or from the place of rupture, presence of blood in liquid form or blood clots in the abdomen and in Douglas pouch, presence of the elements of fetal egg in the abdominal cavity.
c. Diagnostic curettage of the uterus- Diagnostic curretage of the uterus cavity is done if the ultrasound is absent and in case of informative agreement of the patient for this manipulation, the absence of the elements of fetal egg in the material, presence of decidual tissue in the material
d. Culdocentesis - Is done for diagnoses of the tubal abortion. Presence of liquid blood in the material – one of the signs of ectopic pregnancy. In case of clinical features of intra-abdominal bleeding culdocentesis is not done – a delay in the time of laparotomy.

Symptoms of ectopic pregnancy, that is interrupted by the fallopian tube rupture: In a woman, that feels pregnant a sudden cramps like pain in the lower abdomen starts, that irradiates into perineum and lower extremity. A short episode of unconciousness may be present. Vomiting, nausea, hiccups. Positive frenicus symptom. Pale skin, cold sweat, tachicardia, weakness, hypotonia, painfull abdomen, symptoms of perineum irritation.

PV. Cyanosis, spotting bloody discharges, the internal investigation is painfull, especiallly the movements of the uterus, the “Douglas shout”, the presence of very painful tumor like formation in the area of appendages.

Symptoms of ectopic pregnancy that is interrupted by the tubal abortion: Not that pronounced symptoms. Periodic deterioration, and cramping pain is characteristic. In attacks painful abdomen, not pronounced with symptoms of peritoneal irritation. Dark bloody discharge after the attack. A painful formation with not clear contours at the side of the uterus.

Differential diagnosis Diagnosis of ectopic pregnancy is quite simple in patients with amenorrhea, pregnancy signs, pain in the lower abdomen and bleeding. But it is necessary to exclude the following conditions:

1. Torsion of ovarian cysts or acute appendicitis.
2. Interruption of uterine pregnancy.
3. Hemorrhage in the corpus luteum.

Treatment of ectopic pregnancy The principles of management of patients with ectopic pregnancy are:

1. Suspected ectopic pregnancy is an indication for immediate hospitalization.
2. Early diagnosis helps to reduce the number of complications and allows you to use alternative therapy.
3. In the case of established diagnosis of ectopic pregnancy it is necessary to conduct urgent surgery (laparoscopy, laparotomy). Surgical treatment of ectopic pregnancy is optimal. In modern practice, conservative treatment of ectopic pregnancy is possible to use.
4. In severe clinical picture of the affected ectopic pregnancy, presence of hemodynamic violations, hypovolemia, the patient hospitalized immediately for urgent surgery as soon as possible by laparotomic access. If the clinical picture is not that pronounced, no signs of hypovolemia and internal bleeding - pelvic ultrasound and / or laparoscopy are made.

5. On prehospital stage in case of interrupted ectopic pregnancy first aid volume is determined by the patient's general condition and the magnitude of blood loss.

6. Severe patient's condition - absolute indication for surgery laparotomic access with removal of the pregnant uterine tube and conducting antishock therapy.

7. Apply a comprehensive approach to the treatment of women with an ectopic pregnancy, which includes:

- ✓ a) surgery;
- ✓ b) Suppression of bleeding, hemorrhagic shock, blood loss;
- ✓ c) postoperative period;
- ✓ d) Rehabilitation of reproductive function.

9. Performing organ preservable operations in an ectopic pregnancy is accompanied by the risk of postoperative persistent trophoblast, which is the result of its incomplete removal of the fallopian tubes and abdominal cavity. The most effective method of prevention of this complication is thorough toilet abdominal cavity 2 to 3 liters of sodium chloride and single dose of methotrexate at a dose 75-100mg IM 1 - 2 days after surgery.

Types of operations:

1. Salpingostomy (tubotomy). Performed longitudinal salpinhostomy. After removal of fetal eggs salpinhostoma is not sewed If the chorion villi do not grow into the muscle membrane of the fallopian tube curettage is performed
2. Segmental resection of the uterine tube. The segment of the fallopian tube where the egg is fertilized is removed and then anastomosis of the two ends of the tube is performed . If it is impossible to perform salpingo-salpingo

anastomosis at the moment both ends can be tied up and anastomosis can be put later.

3. Salpingoectomy. This operation is performed in the case of interrupted tubal pregnancy, accompanied by massive bleeding.

Conservative treatment of EP. Treatment of progressive ectopic pregnancy with methotrexate can be done only in healthcare of third level, where there is a possibility of determining the β-subunit of hCG in serum and transvaginal Ultrasound. To avoid the introduction of methotrexate in normal uterine pregnancy or missed abortion it is prescribed only in the following cases:

1. Increased levels of β-subunit of hCG in serum after organ surgery on the fallopian tube, which was performed on the progressive ectopic pregnancy.

2. Definition by transvaginal ultrasound a fetal eggs of 3,5 cm diameter in the area of uterus appendages, if the level of β-subunit of hCG is more than 1500 IU / L and the absence of fetal eggs in the uterus.

Scheme for prescription of methotrexate:

- 1st day: determination the β-subunit of hCG in serum, blood count, determination of group and Rh factor of the blood of women, the activity of liver enzymes.
- 2nd day: 75-100 ml methotrexate intramuscularly
- 7th day: determination the β-subunit of hCG in serum. If the β-subunit of hCG in serum decreased by less than 15% on the eighth day, methotrexate is administered repeatedly in the same dose.

Ovarian pregnancy. Developed in case of fertilization in the cavity of the follicle. The incidence of ovarian pregnancy is 0.5-1% of all ectopic pregnancies and ranks second in frequency after tubal pregnancy. The only risk factor of this type of ectopic pregnancy is the use of intrauterine contraceptive devices.

Diagnosis. Clinical signs are the same as in tubal pregnancy. When disturbed ovarian pregnancy hemorrhagic shock is possible. In 75% of cases of ovarian pregnancy ovarian apoplexy is incorrectly diagnosed. Transvaginal ultrasound helps in diagnosis – a fertilized egg is visualized in the ovary and the positive qualitative reaction for HCG.

Ultrasound signs of ovarian pregnancy:

- Uterine tube on the affected side is not changed;

- Fertilized egg is in the projection of the ovary;

- The fertilized egg to the uterus is connected to the uterus by lig.ovarii propria;

- Among fetal membranes ovarian tissue is visualized.

Treatment of ovarian pregnancy. Surgery involves the removal fetal eggs and wedge resection of the ovary. In the case of massive ovarian lesions and significant intraperitoneal bleeding ovariectomy is performed.

Cervical pregnancy. One of the rare and difficult variants of ectopic pregnancy, when the fertilized egg implantation occurres in the cervical canal.

Diagnosis of cervical pregnancy. History, including gynecological history. Attention is payed to the number of abortions and course postabortion period, inflammatory diseases of the internal genitalia, including the cervix. Speculum examination- visualization of cyanotic “barrel” cervix. Careful bimanual pelvic examination - the uterus along with the cervix as "sandglass". An ultrasound of the pelvic organs.

Ultrasound signs:

- The absence of fetal eggs in the uterus;

- Hyperechogenity of the endometrium (decidua tissue);

- Uterus as sandglass;

- Extension of the cervical canal;

- The fertilized egg in the cervical canal;

- Placental tissue in the cervical canal;

- Closed internal uterine orifice.

Differential diagnosis of cervical pregnancy. Cervical pregnancy is differentiated from spontaneous abortion, myoma, cervical cancer, prolapse of submucous pedunculated fibroid, trophoblastic tumor, placenta previa. Ultrasound can clearly hold a differential diagnosis, to identify differences between cervical pregnancy and other obstetric and gynecological pathology

Treatment of cervical pregnancy. Categorical rejection of the uterus curettage, which can lead to profuse bleeding. The method of treatment of cervical pregnancy - surgery (hysterectomy). After confirming the diagnosis of cervical pregnancy and determining the blood group Rh- factor, establishing intravenous catheter an informed written consent of the patient to perform hysterectomy is obtained. The department orders fresh frozen plasma of the same group and red cell mass.

Abdominal pregnancy. Composes 0.003% of all cases of ectopic pregnancy. There are primary and secondary abdominal pregnancy. Primary - implantation a fertilized egg in the abdomen. Secondary - formed when the fertilized egg is located in the abdominal cavity after tubal abortion. Maternal mortality in abdominal pregnancy is 7-8 times higher than in the tubal pregnancy, and 90 times higher than in the uterine pregnancy.

Symptoms of the abdominal pregnancy. Clinical manifestations depend on the pregnancy term: in the first and early second trimester, they do not differ from the symptoms of tubal pregnancy. At a later term pregnant women complain of pain during fetal movements, feeling movements in the epigastric region or sudden cessation of fetal movements. Physical investigation reveals easily palpable fetal parts and a uterus of small size separately. (Abdominal pregnancy is diagnosed in case of the absence of uterine contractions after oxytocin). Ultrasound is used. If ultrasound uninformative, the diagnosis is confirmed by X-ray, CT and MRI. On radiographs of the abdominal cavity, removed in the lateral projection, fetal skeleton shadow is visualized, which is superimposed on the shadow of the mother's spine.

Treatment of abdominal pregnancy. Considering high risk of maternal mortality, as soon as the diagnosis is carried out surgical treatment is conducted. During the surgical treatment vessels that supply blood to the placenta are isolated and tied up, and possibly removed. If this is not possible due to heavy bleeding, placenta is tamponated. Tampons are removed in 24-48 hours. If it is impossible to select these vessels, clipping and ligation of the umbilical cord is done, the placenta is left. In the case of the placenta after surgery is left in the abdominal cavity its condition is assessed by ultrasound and determination of β-subunit of hCG. In these cases there is a very high risk of intestinal obstruction, fistulas, sepsis. The use of methotrexate is contraindicated, since it is accompanied by severe complications, especially sepsis. The cause of sepsis is massive necrosis of the placenta.

Ovarian apoplexy is a sudden hemorrhage that is accompanied by violation of the integrity of ovarian tissue and bleeding into the abdominal cavity. Among the reasons intra-abdominal bleeding makes 0.5 - 2.5%. It is known that a small hemorrhage in the ovary during rupture of the follicle and corpus luteum formation is a common occurrence. Such hemorrhages are not accompanied by any clinical symptoms.

Etiopathogenesis of ovarian apoplexy. Changes in ovarian tissue often arise because of the suffering of genital inflammation, appendicitis. Hematoma formation within the ovary (acute pain due to increase intraovarial pressure). Rupture of ovarian tissue because of congestive hyperemia, varicose vessels - intra-abdominal bleeding.

Provoking factors of ovarian apoplexy: trauma, physical stress, sex, it can happen in a state of complete rest and even during sleep, it may occur in different phases of the menstrual cycle, but more often during ovulation.

Symptoms of ovarian apoplexy:

1. Sudden severe abdominal pain from the affected ovary, nausea, vomiting. The clinical picture depends on the massiveness and velocity bleeding. Signs of intraperitoneal bleeding include tachycardia, hypotension, pale skin, the tension of the anterior abdominal wall, the positive symptoms of peritoneal irritation, frenikus-symptom

2. Vaginal investigation: uterus is normal size, the affected ovary somewhat enlarged, of soft consistency, sharply painful; rear vault smoothed, painful

3. Ultrasound - no significant pathology of organs; the presence of free fluid in the abdomen

Some authors distinguish between two forms of ovarian apoplexy:

- Anemic
- Pain

Treatment of ovarian apoplexy: if diagnosed in time and the absence of significant intraperitoneal bleeding, bed rest, cold on the lower abdomen, dynamic monitoring is recommended. Surgical treatment should be most conservative: rupture suturing or resection of the ovary, in some of the cases when there is no possibility to preserve the ovary –oophorectomy.

Sudden circulatory disorders of the inner genitalia include:

- Torsion of the appendages tumour
- Necrosis of the fibromatous node

- Torsion of the healthy appendages

<u>Torsion of the appendages tumour.</u> Anatomical and surgical peduncule are distinguished. Anatomical peduncule includes lig. Infundibulopelvicum, lig. ovarium propr, mesosalpinx. Surgical peduncule includes the same + fallopian tube.

Etiology of the appendages tumour torsion is not always known. Risk factors include multiparous women and sudden rotation movement stop (exercise, dance, sometimes during sleep).

Pathogenesis of the appendages tumour torsion. Pathological changes are caused by malnutrition of the tumor. The changes depend either it happened quickly or rapidly, the torsion is less 360˚ or more than 360˚. If it happened quickly than the stop blood flow causes necrosis and the development of peritonitis. If it happened slowly, violations of the flow in veins cause plethora, the tumor can break (cherry – brown colour), this may lead to necrosis and development of peritonitis.

Symptoms of the appendages tumour torsion depend on the speed and degree of torsion A history of a cyst, lower abdomen pain, often cramping with irradiation in the leg and back, tachycardia, subfebrile temperature, nausea, vomiting, lack of bowel movement (or diarrhea), bloating, muscular rigidity of the abdomen, positive symptoms of peritoneal irritation. Vaginal investigation in the area of appendages – round formation of elastic consistency, sharply painful, often examination difficult because of the tensions and pain the anterior abdominal wall. Ultrasound reveals a tumour in the area of appengages, free fluid in the abdominal cavity, lab exam in dynamics (leukocytosis), undulating caurse of the disease.

Differential diagnosis of the appendages tumour torsion:

- Ectopic pregnancy, ovarian apoplexy
- Acute apendicitis
- Intestinal obstruction

- Acute inflammation of the appendages
- Renal colic

Treatment: urgent hostitalization, if confirmed diagnosis - urgent laparotomy and removal of the torted tumor. **N.B.:Detortion of the peduncle is not recommended!!!**

Fibroid node necrosis. The frequency rank is 7%. Deficiency of blood supply due to torsion, bending, fibromatous node compression

Pathogenesis. There are three necrosis variants:

- Dry necrosis – slow development of process with the formation of shrinckled necrotic tissue
- Wet necrosis – necrosis is acccompanied by the formation of the cystic cavities
- Red necrosis – because of the blood supply violation; the tissue on the periphery becomes red

At the beginning the process is aseptic, then the infection is joined.

Symptoms. Patients have complaints of sharp pain in the lower abdomen, that may irradiate to the back, elevated body temperature, dry mouth, thirst, diarrhea (in most of the cases once).

Diagnosis. There doctor takes into account the complaints, history of uterus fibroid, general examination: the abdomen is tense, painful of palpation in the lower abdomen, the symptoms of peritoneal irritation are positive in the lower abdomen, gynecological exam – uterus fibroid and a painfull node, ultrasound –the necrotic changes in the fibroid node, free fluid in the lower abdomen.

Treatment. In all cases – surgical treatment. After 40 years – hysterectomy with tubes and abdominal cavity drainage. Intensive postoperative therapy. In young women, especially when they are interested in pregnancy, if the node is pedunculated, conservative myomectomy and abdominal cavity drainage along with intensive therapy is done.

Torsion of the healthy appendages. In the literature data is observed in women of about 30 years. A case of torsion in a girl of 8 weeks is described. Symptoms are the same as ovarian cyst torsion. Usually the diagnoses is made on laparotomy (the most common diagnoses is acute apendicitis).

Acute abdomen in case of inflammation

Acute abdomen in case of inflammation may be due to inner genitalia inflammation: metroendometritis, salpingo-oophoritis, parametritis, pelvioperitonitis, diffuse peritonitis of gynecological origin.

Etiology: Gonococcus, Chlamidia, Streptococcus, Staphylococcus, E.Coli, Proteus, Enterococcus. **The most common cause is mixed aerobic and anaerobic infection!!!**

Pelvioperitonitis see pg.

Diffuse peritonitis of gynecological origin is a non limited inflammation of the serous cover of the abdominal cavity (peritoneum)**.**

Etiology:

1. Aseptic – because of the urine, bile, the cystoma content, etc.
2. Because of infection spread because of

   - Perforation: breakthrough of a pelvic abscess, rupture of pyosalpinx, malnutrition tumors, septic abortion, uterine perforation ...
   - Direct inflammation switch to the peritoneum from the inflammated organ (postpartum metroendometritis)

Classification of peritonitis:

1. By the character of exudat:
   - Serous, fibrinous, purulent, hemorrhagic (Cr, TBC)орагічні (Cr, TBC)
2. By spread:
   - Local, wide spread (2/5 anatomic departments of the abdominal cavity), total (6 or more departments AC)
3. By course
   - Acute, chronic
4. The nature of infection
   - Primary (haematogenously and lymphogenousy)
   - Secondary - infectious-inflammatory, perforated, traumatic, post-operative.
5. By microbiological features
   - bacterial
   - aseptic
   - Special forms - cantceromatous, parasitical, rheumatoid, granulomatous

Pathogenesis. Peritoneal area is equal to the surface area of the human body. The basis - pronounced generalized vascular disorder at the level of microcirculation. Inadequate blood supply to organs and tissues leads to general hypoxia - metabolic - destructive changes in the kidney, liver, small intestine. Violation of intestinal barrier function leads to a deepening of intoxication

Symptoms Depends on the etiology. If it occurred because of the rupture of the abscess - the clinical picture appears in the first hours, if because of other causes - for a longer time. Pain is a constant feature (with movement, coughing, at rest - friction of intestins during peristalsis), hiccups and vomiting - a constant feature. Originally with gastric contents, and then with an admixture of bile and then feces, the pulse is frequent, soft, weak filling, Hippocrates face – a pale yellowish tinge, sharp features, expression - indifferent, eyes fallen, distant, fixed, tongue dry, body temperature is not always high. In severe cases it may be subfebrile.

Diagnosis includes taking into account the symptoms, history, examination of the abdomen: tense abdomen, does not participate in the act of breathing, inaudible motility (silence), positive symptoms of peritoneal irritation, blood tests: acceleration of erythrocyte sedimentation rate, leukocytosis with a shift to the left. Bad prognosis - leukopenia, increase in hematocrit, urinalysis - increase the proportion, protein cylinders.

Phases of diffuse peritonitis. Three phases are distinguished : reactive, toxic and terminal. The dynamics is very fast. From reactive to the terminal phase may take 48-72 hours.

Symptoms of reactive phase: Compensatory mechanisms are saved, there is no violation of cellular metabolism, patients are excited, euphoric, complaint of abdominal pain, weakness, dry mouth, nausea, vomiting, shortness of breath, body temperature is high or subfebrile, bloating, positive symptoms of peritoneum irritation, paresis of bowel peristalsis, lab tests- leukocytosis with a shift to the left, accelerated ESR, urinalysis is without change.

Symptoms in the toxic phase: patient is adynamic, apathy, delusions, Hippocratic face, tongue coated, tachycardia that is more than hyperthermia, vomiting, dry skin, the abdomen is bloated, progressive paresis intestine, oliguria, hypo- and dysproteinemia increases, leukocytosis and left shift, toxic granularity of neutrophils, increased hematocrit, in urine – protein, cylinders.

Symptoms of the terminal phase: all changes are even more profound nature, prevalent symptoms of central nervous system - the state of prostration, pulse is arrhythmical, sudden dyspnoe, hypotension, full bowel paralysis, pronounced bloating.

Diagnosis is often very difficult. This is especially true of postnatal and postoperative women. Only careful observation, the intensity of symptoms help establish the correct diagnosis.

Treatment. The only treatment for diffuse peritonitis is surgery !!! In order to optimize the conditions of required surgery intensive preoperative preparation is needed: correction of VCB, reduce of intoxication, intestinal paresis, protein deficiency, normalization of fluid and electrolyte balance, decompression of the stomach through a nasogastral tube. The duration of preparation - 1-3 hours.

Infusion therapy includes Refortan or Hekodez 500ml, Dextran (reosorbilact 400ml), Ringer's solution 1000 ml, Sodium bicarbonate 4% 150-300ml depending on parameters. The total volume of the infusion should be at least 2 - 3 l.

Principles of surgical treatment: lower middle cut, if separate unilateral lesions of the appendages - the diseased organ is removed, if bilateral lesions and tumor perforation, purulent necrosis myoma node, septic abortion - hysterectomy with tubes. Lavage of the abdominal cavity with antiseptic. In the mesentery of the small intestine 150 ml 0.25% novocaine is injected, transnasal intestinal intubation, drainage of the abdominal cavity (5 drainages).

Principles of postoperative care: infusion therapy (2 - 4 l per day), antibiotic therapy, Recovery of motor function bowel evacuation (cleansing enemas, cerukal in 2 ml / 3 times a day, prozerin 1 ml of 0.1% , umbretyd), fractional intraperitoneal perfusion of izoosmolar solutions, UVRB therapy in combination with extracorporeal hemosorption or plazmoforez, prevention of thrombosis (cibor, kleksan, fraksyparyn), improve circulation - Trental, Couranti, immunomodulators (Tymolin, T-activin), heart medications. If necessary - stimulation of diuresis.

MCQs

1. What is FALSE about the diagnosis of interrupted ectopic pregnancy:
   A. Menstrual cycle disorders are present – spotting bloody discharges after a delay of menstruation
   B. Pain usually is not present
   C. Positive pregnancy signs
   D. Increased levels of hCG
   E. No fetal egg in the uterine cavity

2 .What is true about the treatment of ectopic pregnancy:

A. Hospitalization is not needed
B. Optimal treatment – urgent surgery (laparotomy or laparoscopy)
C. Severe patient's condition – absolute indication for laparoscopy
D. Conservative treatment is not used

3.What is FALSE about cervical pregnancy:

A. fertilized egg is implanted in the cervical canal
B. During speculum examination visualization of cyanotic "barrel" shaped cervix
C. On ultrasound – the fetal egg is absent in the uterine cavity
D. The method of treatment – curettage

4.What is FALSE about ovarian apoplexy:

A. Provoking factors include trauma, physical exercise, stress, sex
B. Positive signs of intraperitoneal bleading
C. On bimanual palpation uterus is enlarged
D. On ultrasound the presence of free fluid in the abdomen

5.What is TRUE about the appendages tumour torsion:

A. The risk factors include menopause
B. Pain is not present

C. On ultrasound no pathological changes are found

D. Treatment – urgent laparotomy and removal of the torted tumour

Key answers

1. B
2. B
3. D
4. C
5. D

Infertility

Infertility. An infertile couple is a couple in which if desired to have a child with active sexual intercourse without the use of contraceptives, conception does not occur within 12 months. It is believed that pregnancy occurs under the condition regular (two to three times a week) sex within 1 year in 75% of couples without contraception.

The term ***primary*** infertility is used when history did not occur conception, ***secondary*** infertility if there was the presence of conceiving in the past.

Etiology. Nowadays it is believed that approximately half of the cases are because of male infertility and half because of female.

Causes of male infertility include:

- Congenital (undescended testes, Kartagener syndrome (loss of ciliary function and sperm motility), hypospadias (failure to deposit sperm in high vagina)
- Thermal factor (varicocele)
- Infection (mumps orchitis after puberty, Mycoplasma, Chlamydia)
- General factors (chronic diseases, malnutrition, heavy smoking)
- Endocrine (gonadotropin deficiency, hypoprolactinaemia, increased levels of FSH)
- Genetic (chromosomal abnormality – Klinefelter's syndrome 47 XXY)
- Iatrogenic (radiation, cytotoxic drugs, nitrofurantoin, cimetidine, β-blockers)
- Immunological factor (antibodies against spermatozoal surface)
- Obstruction of the efferent ducts (infection like tubercular, gonococcal or surgical trauma)

- ✖ Failure to deposit sperm high in the vagina (erectile dysfunction, ejaculatory defect, hypospadias)
- ✖ Sperm abnormality (loss of sperm motility, abnormal sperm morphology)
- ✖ Errors in seminal fliud (unusually high or low volume of ejaculate, low fructose content, high prostaglandin content, undue viscosity)

Causes of female infertility. The main causes of female infertility are:

- Endocrine factors - 35-40%
- Tube and peritoneal factors - 20-30%
- Immunologic factors - 20%
- Cervical factor - 5% .

Approximately 10-15% of cases the cause of infertility is unexplained

Ovarian factors include anovulation or oligoovulation, Luteal phase defect (corpus luteum life span is less than 10 days), luteinised unruptured follicular syndrome (trapped ovum), that is caused by endometriosis or hyperprolactinaemia.

Tubal and peritoneal factor is the presence of peritubal adhesions and even minimal endometriosis that may causeinfertility.

Uterine factor include uterine hypopasia, inadequate secretory endometrium, fibroids, endometritis, uterine synechiae or congenital malformations of uterus.

Cervical factor may be due to anatomic changes – congenital elongation, second degree uterine prolapse and acute retroverted uterus; physiologic changes: scanty mucus due to amputation, conisation or deep cauterisation of the cervix; excessive, viscous or purulent discharge as in chronic cervicitis.

Vaginal factors: atresia of vagina, transverse vaginal septum, septate vagina or narrow introitus causing dyspareunia, vaginitis and purulent discharges

Combined factors - a combination of different factors mentioned above.

<u>Algorithm of diagnosis of infertility:</u>

1. The collection of physical, gynecological and reproductive history, general and gynecological examination;
2. RW, HIV;
3. A schedule of basal temperature for 2 months;
4. Colposcopy;
5. Analysis of discharge, screening for urogenital infections, cytologic examination;
6. Pelvic ultrasound (1-14 day of MC)
7. Hysterosalpingography on the 7 - 11 day of MC
8. Hormonal examination: FSH, LH, prolactin, estradiol, testosterone on the 3-7 day of MC, Progesterone on the 20-22 day of MC
9. Hysteroscopy, laparoscopy on the 7-14 day of MC
10. Additional studies on the basis of:
    - ✖ Hormonal examination (cortisol, DHEA sulfate, insulin, T3, T4, TSH, growth hormone, antibodies to tireoglobuline), and samples (7-28 day of MC)
    - ✖ Examination of mammologist, mammography (7-14 day of MC)
    - ✖ R - graphy sella turcica, MRI.

Examination men is held together and simultaneously with the examination women and includes:

1. RW, HIV;
2. Testing for urogenital infections;
3. Examination of ejaculate by the WHO classification;
4. In the presence of pathology in semen further held:
    - ✖ Bacteriological analysis of sperm for sterility

- ✖ Hormonal examination (FSH, LH, prolactin, testosterone)
- ✖ Trial capatcitation
- ✖ Ultrasound of the prostate and scrotum

Indications for treatment:

1. Extreme oligospermia
2. Azoospermia
3. Low volume ejaculate
4. Impotency

Management is often difficult and unsatisfactory

Principles of female infertility treatment:

1. Induction of ovulation: general (psychotherapy, reduction of weight in obesity as in PCOS), drugs - Clomiphene citrate 50 mg daily (max 250 mg daily) between 2 and 5 day of MC – for 6 cycles Adjuvant therapy includes in case of hyperinsulinaemia and insuline resistency – metformin, if elevated androgens – dexamethasone 0,5 mg daily for 10 days, starting from the 1st day of cycle, in case of subclinical hypothyroidism – Eltiroxin 0,1 mg, if elevated prolactine – brocriptine or carbegoline. In case anovulation is due to failure of LH surge – hCG 5000 IU 7 days after the last dose of chlomiphene therapy. Gonadotropin use. Indications – hypogonadotropic, hypogonadism, clomiphene failure or resistant cases, unexplained infertility, sub fertile women who are elderly
2. Treatment of luteal phase defect: Natural progesterone as vaginal suppositories 100 mg 3 times daily starting from the day of ovulation. If the pregnancy test is positive in 14 days, it should be continued up to 10 weeks of pregnancy. Clomiphene citrate, in refractory cases - IVF
3. Treatment of luteinised unruptured follicle: hCG 5000-10 000 IU intramuscular, ovulation inducing drugs followed by ovulatory hCG, bromocriptine therapy if associated with hyperprolactinaemia

4. Types of surgical treatment: Laparoscopic ovarian drilling (LOD) or laser vaporization, wedge resection, surgery for pituitary prolactinomas, surgical removal of virilising or other functioning ovarian or adrenal tumor, utero-vaginal surgery
5. Tubal and peritoneal factor treatment: if peritubal adhesions – salpingo-ovariolysis, proximal tubal block – salpingography under fluroscopy if due to mucous plugging, proximal tubal cannulation with a guide wire under hysteroscopic guidance, distal tubal block – fimbrioplasty, fimbriolysis, neosalpingostomy, mid tubal block – reversal of tubal ligation – reanastomosis. Adjuvant therapy of tubal and peritoneal factors infertility is used to improve the result of tubal surgery. The therapy includes: prophylactic antibiotics, use of adhesion prevention devices, postoperative hydrotubation
6. Treatment of cervical factor infertility - cervical mucous quality can be improved by conjugated oestrogen 1,25 mg orally daily starting on day 8 for 5 days. If infection is present - antibiotics
7. Treatment of immunological factor infertility - In presence of antisperm antibodies – dexamethasone 0,5 mg at bed time in follicular phase. If no effect – IUI or IVF or CSI
8. Uterovaginal surgeries include Myomectomy – especially in submucous fibroid, metroplasty-removal of septum or unification operation, adhesiolysis (hysteroscopic), enlargement of the vaginal introitus, hysteroscopic polypectomy

Artificial insemination. There are two main methods of artificial insemination: intrauterine insemination (IUI) (that is divided into artificial insemination husband (AIH) and artificial insemination donor (AID)) and fallopian tube sperm perfusion.

AID. The purpose – to by pass the endocervical canal which is abnormal and to place increased concentration of mobile sperm as close to the fallopian tubes

Indications:

- Cervical mucous pathology
- Cervical stenosis
- Oligospermia of asthenospermic
- Immune factor
- Male factor – impotency or anatomical defect but normal ejaculate can be obtained
- Unexplained infertility

Fallopian tube sperm perfusion. The indications are the same.

In vitro fertilization and embryo transfer.

Indications:

- Tubal disease
- Unexplained infertility
- Endometriosis
- Male factor infertility
- Multiple factors
- Failed ovulation induction
- Ovarian failure
- Women with normal ovaries but no functional uterus
- Women with genetic risk

In vitro fertilization may be done

a. In natural cycle (collecting the oocyte 36 hours after the onset of the LH surge)
b. Controlled ovarian hyperstimulation

c. Monitoring of follicular growth (endometrial thickness more than 8-9 mm, 2 or more follicles of 17-18 mm, 36 hoers after the hCG is given)
d. Oocyte retrieval – through vaginal route under ultrasound guidance

Embryo transfer. The fertilised ova at 6-8 blastomers stage are placed in the uterine cavity close to the fundus about 3 days after fertilization through a fine flexible soft catheter transcervically. Not more than 3 embryos are transferred per cycle to minimize multiple pregnancy. Luteal phase support includes progesterone starting on the day after oocyte retrieval 200 mg 3 times per day oral or vaginal.

Gamete intrafallopian transfer (GIFT). Both the sperm and the unfertilized oocytes are transferred into the fallopian tubes, fertilization is achieved in vivo. The prerequisite is to have normal uterine tubes**.**

Zygote intrafallopian transfer (ZIFT) - the placement of the zygote (following one day of in vitro fertilization) into the fallopian tube can be done either through the abdominal ostium by laparoscope or through the uterine ostium under ultrasound guidance.

Indications for intracytoplasmic sperm injection (ICSI) include: severe oligospermia, asthenospermia, teratospermia , presence of sperm antibodies etc.

MCQs

1. Infertility is :
   A. An infertile couple is a couple in which if desired to have a child with active sexual intercourse without the use of contraceptives, conception does not occur within 12 months.
   B. An infertile couple is a couple in which if desired to have a child with active sexual intercourse without the use of contraceptives, conception does not occur within 6 months.

C. An infertile couple is a couple in which if desired to have a child with irregular sexual intercourse without the use of contraceptives, conception does not occur within 12 months.
D. An infertile couple is a couple in which if desired to have a child with active sexual intercourse with the use of contraceptives, conception

2. Nowadays it is believed that:
   A. approximately 30% of the cases are because of male infertility and 70% because of female.
   B. aproximately half of the cases are because of male infertility and half because of female.
   C. approximately 70% of the cases are because of male infertility and 30% because of female.
   D. Nowadays it is believed that approximately 10% of the cases are because of male infertility and 90% because of female.
3. The most widespread cause of female infertility is:
   A. Tube and peritoneal factor
   B. Immunologic factor
   C. Endocrine factor
   D. Cervical factor
4. What drug is used for induction of ovulation in most cases:
   A. Clomiphene citrate 50 mg daily from 2 to 5rh day of MC
   B. Eltiroxin 0,1 mg daily
   C. Carbegoline
   D. Didrogesterone 0,02 g per day
5. What is tue about the treatment of tubal and peritoneal factor of infertility:

A. The first line treatment is the use of antibiotics
B. Hydrotubation is never used in the postoperative period
C. Mostly surgical treatment is used
D. Combined oral contraceptives are widely used.

Key answers

1. A
2. B
3. C
4. A
5. C

Family planning

Family planning is the planning of when to have children, and the use of birth controland other techniques to implement such plans. Other techniques commonly used include sexuality education, prevention and management of sexually transmitted infections, pre-conception counseling and management, and infertility management.

Family planning is sometimes used as a synonym for the use of birth control, however, it often includes a wide variety of methods, and practices that are not birth control. It is most usually applied to a female-male couple who wish to limit the number of children they have and/or to control the timing of pregnancy (also known as spacing children). Family planning may encompass sterilization, as well as abortion.

Birth control methods have been used since ancient times, but effective and safe methods only became available in the 20th century. Some cultures limit or discourage access to birth control because they consider it to be morally or politically undesirable.

Principles of contraceptive choice:

1. Providing comprehensive information on the methods and means of contraception.
2. Informed wish of woman / partners to use a contraceptive method.
3. The choice of contraceptive according to health woman / partners.
4. The choice of contraceptive according to the age of woman / partners.
5. It should be reliable.

To assess the effectiveness of the contraception method is used Pearl index that shows how many women become pregnant out of 100, using one or another method of contraception for one year. Different types of birth control methods have large differences in effectiveness, actions required of users, and side effects:

Combined hormonal contraceptives – 0,1-0,9

The progestogen-only pills – 0,08-0,09

Hormonal patch – 0,4-0,9

IUD,Implant – 0,9-3

Birth Control Shot (injection) – 0,3-0,4

Condom, Spermicide – 2-14

Morning-After Pill (Emergency Contraception) – 1-2

Breastfeeding as Birth Control – 2-3

Birth Control Vaginal Ring – 0,4-0,65

Fertility Awareness-Based Methods (FAMs) – 3-18

The most effective methods are those that are long acting and do not require ongoing health care visits. Surgical sterilization, implantable hormones, and intrauterine devices all have first-year failure rates of less than 1%.Hormonal contraceptive pills, patches or vaginal rings, and the lactational amenorrhea method (LAM), if used strictly, can also have first-year (or for LAM, first-6-month) failure rates of less than 1%.[25] With typical use first-year failure rates are considerably high, at 9%, due to incorrect usage.[19] Other methods such as condoms, diaphragms, and spermicides have higher first-year failure rates even with perfect usage.[25] The American Academy of Pediatrics recommends long acting reversible birth control as first line for young people.

Not all contraceptive methods are appropriate for all situations, and the most appropriate method of birth control depends on a woman's overall health, age, frequency of sexual activity, number of sexual partners, desire to have children in the future, and family history of certain diseases. Individuals should consult their health care providers to determine which method of birth control is best for them.

Methods of contraception:

1) Natural methods-
   a) Lactational Amenorrhea Method
   b) Periodical abstinence :

• calendar (or regular)method;

• basal body temperature method;

• cervical mucus method;

•symptothermal method - basal body temperature method + cervical mucus method

2) Coitus interruptus - Withdrawal (Pull Out Method)
3) Barrier methods:

a) Condoms:- male; - female;

b)Diaphragms, caps, sponges.

c) Spermicides.

4) IUD (intrauterine device): - a copper IUD; - hormonal IUD (progestin).

5) Hormonal Methods:

- Combined oral contraceptives ("the pill");
- Progestin-only pills (POPs).
- Contraceptive patch.
- Injectable birth control.
- Vaginal rings.
- Implantable rods.
- Emergency Contraceptive Pills (ECPs).

6) Sterilization:

- Tubal ligation;

-Vasectomy.

<u>Lactational Amenorrhea Method</u>

Breastfeeding can be used as birth control when, after giving birth, a woman breastfeeds her baby exclusively. That means the baby does not drink anything besides breast milk. The act of breastfeeding naturally changes a woman's hormones so that she does not become pregnant.Effectiveness is an important and common concern when choosing a birth control method. Like all birth control methods, breastfeeding is much more effective when you do it correctly. Less than 1 out of 100 women who practice continuous breastfeeding perfectly will become pregnant. About 2 out of 100 women who use continuous breastfeeding will become pregnant in the first six months if they don't always practice it correctly.

Using breastfeeding as birth control can be effective for six months after delivery only if a woman:

-does not substitute other foods for a breast milk meal;

- feeds her baby at least every four hours during the day and every six hours at night;

- has not had a period since she delivered her baby.

Fertility Awareness-Based Methods (Periodical abstinence)

FAMs work by keeping sperm out of the vagina in the days near ovulation, when a woman is most fertile — most likely to become pregnant. To prevent pregnancy, women can abstain from vaginal intercourse on their fertile days. Or they can use withdrawal, a condom, a sponge, a diaphragm, or a cap on those days.

Calendar or Rhythm method (Knaus–Ogino method)

To find the estimated length of the pre-ovulatory infertile phase, nineteen (19) is subtracted from the length of the woman's shortest cycle. To find the estimated start of the post-ovulatory infertile phase, ten (10) is subtracted from the length of the woman's longest cycle.A woman whose menstrual cycles ranged in length from 30 to 36 days would be estimated to be infertile for the first 11 days of her cycle (30-19=11), to be fertile on days 12-25, and to resume infertility on day 26 (36-10=26). When used to avoid pregnancy, the rhythm method has a perfect-use failure rate of up to 9% per year.

A woman's fertile days depend on the life span of the egg and the sperm. Her egg lives for about a day after ovulation. Sperm can live inside her body for about six days. A woman has a chance of her egg joining a sperm about seven days of every menstrual cycle. This includes the five days before ovulation. It includes the day of ovulation. It also includes the day or two after ovulation — even though it's less likely to happen then.The calendar method can only predict what are most likely to be safe days. It is especially risky if your cycles are not always the same length. That's why it should always be used with other methods.

Basal body temperature monitoring is a contraceptive method which relies on the woman monitoring her basal body temperature on a daily basis. A woman’s body temperature changes throughout the menstrual cycle and changes in her body temperature coincide with hormonal changes which indicate fertile and non-fertile stages of the cycle. By monitoring her temperature every day, a woman can determine the periods of her menstrual cycle when she is and is not fertile.

Some basal thermometers are to be used in the mouth and some are to be used in the rectum. Rectal thermometers are generally more reliable. Take your temperature every morning as soon as you wake up. Keep the thermometer in place for five full minutes. Your BBT may change when you are upset or don't get enough sleep. Illness, stress, jet lag, and smoking may also affect your body temperature.

Women who choose to use this method must also take care to learn how to monitor and chart their basal body temperature correctly. Correct monitoring and use of the method involves:

-Measuring the basal body temperature every day, that is before getting out of bed, eating or performing any physical activity;

-Recording the basal body temperature measurement on a graph each day, so that trends in body temperature are easy to spot;

-Watching for a slight increase in temperature of 0.2-0.5°C, which indicates ovulation has passed;

-Abstaining from sex or using an alternative form of contraception from the first day of the menstrual cycle (commencement of menstrual bleeding) until three days after the 0.2-0.5°C temperature rise.

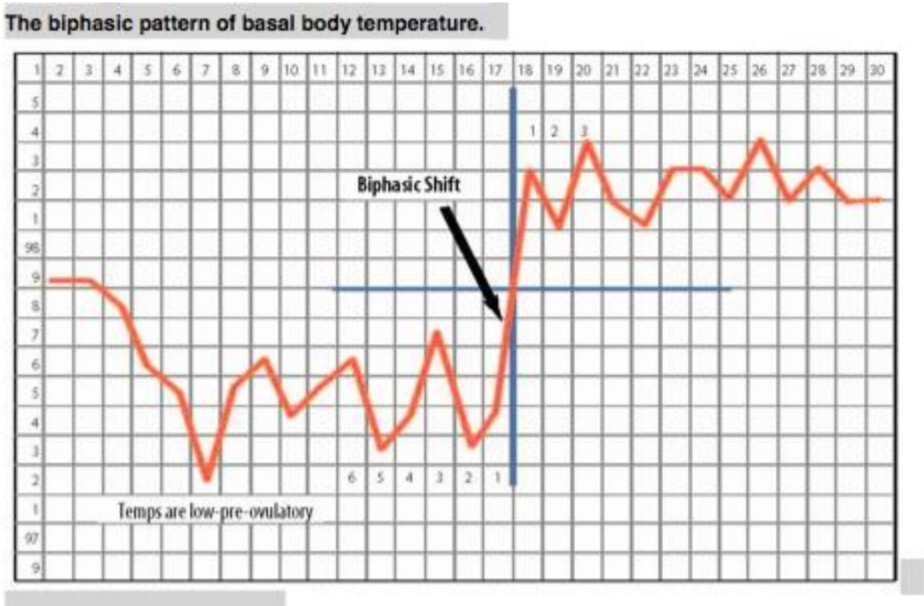


Fig. 6.1. Biphasic pattern of basal body temperature

The cervical mucus method is based on careful observation of mucus patterns during the course of menstrual cycle. Before ovulation, cervical secretions change — creating an environment that helps sperm travel through the cervix, uterus and fallopian tubes to the egg. By recognizing the changing characteristics of cervical mucus, you can predict when you'll ovulate. In turn, this may help you determine when you're most likely to conceive.

During a typical monthly cycle, a woman first has a few days of menstrual bleeding, followed by a few "dry days" when the vagina seems quite dry and no mucus is present. Closer to the time of ovulation she starts to have more wetness or mucus. As ovulation approaches, the mucus becomes clear and slippery and stretches without breaking, like a raw egg white. The last day of peak wetness is right before ovulation, thencome days of less mucus. Any time the slippery stretchy mucus is noticed, intercourse should be avoided until two days after it is all gone — about eight days out of each cycle. Mucus should not be checked right before or after sex, as semen and natural sexual lubricating moisture can be confused with cervical mucus.

Symptothermal method–it's combination of basal body temperature method and cervical mucus method.

Withdrawal (Pull Out Method) - a man who uses withdrawal will pull his penis out of the vagina before ejaculation — the moment when semen spurts out of his penis. Withdrawal is also known as coitus interruptus and the pull out method. Of every 100 women whose partners use withdrawal, 4 will become pregnant each year if they always do it correctly. Of every 100 women whose partners use withdrawal, 27 will become pregnant each year if they don't always do it correctly.

Even if a man pulls out in time, pregnancy can still happen. Some experts believe that pre-ejaculate, or pre-cum, can pick up enough sperm left in the urethra from a previous ejaculation to cause pregnancy. If a man urinates between ejaculations before having sex again, it will help clear the urethra of sperm and may increase the effectiveness of withdrawal.

Barrier methods - designed to prevent sperm from entering the uterus, barrier methods are removable and may be an option for women who cannot use hormonal methods of contraception.

Male condoms. This condom is a thin sheath that covers the penis to collect sperm and prevent it from entering the woman's body. Male condoms are generally made of latex or polyurethane, but a natural alternative is lambskin (made from the intestinal membrane of lambs). Latex or polyurethane condoms reduce the risk of spreading sexually transmitted diseases (STDs). Lambskin condoms do not prevent STDs. Male condoms are disposable after a single use.

Female condoms. These are thin, flexible plastic pouches. A portion of the condom is inserted into a woman's vagina before intercourse to prevent sperm from entering the uterus. The female condom also reduces the risk of STDs. Female condoms are disposed of after a single use.

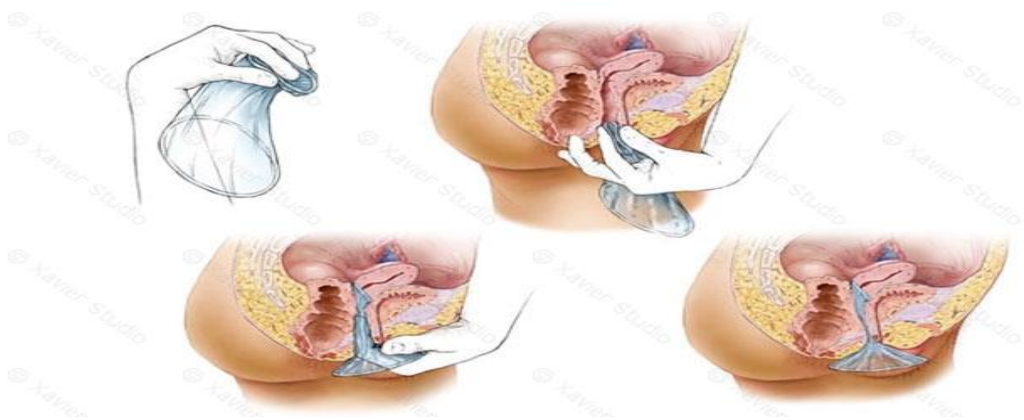


Fig.6.2. Female condome, insersion.

Diaphragms. Each diaphragm is a shallow, flexible cup made of latex or soft rubber that is inserted into the vagina before intercourse, blocking sperm from entering the uterus. Spermicidal cream or jelly should be used with a diaphragm. The diaphragm should remain in place for 6 to 8 hours after intercourse to prevent pregnancy, but it should be removed within 24 hours. Traditional latex diaphragms must be the correct size to work properly, and a health care provider can determine the proper fit.

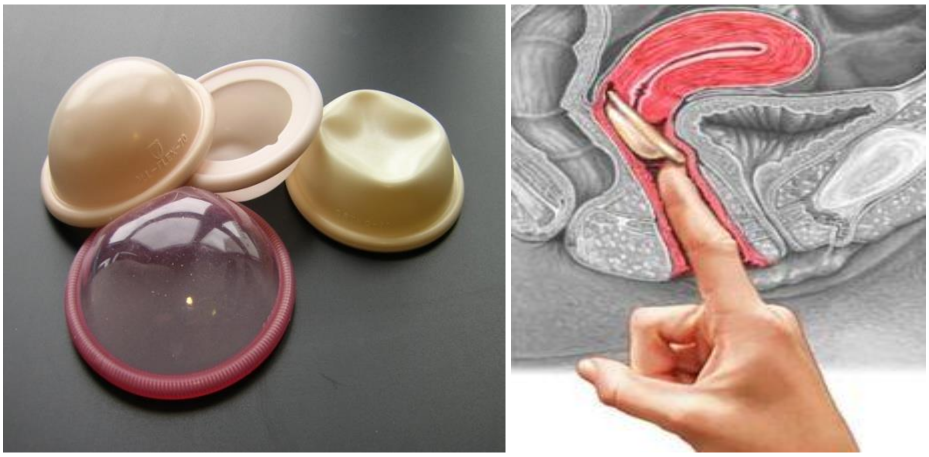


Fig.6.3. Types of diaphragms, insertion.

Contraceptive sponges. These are soft, disposable, spermicide-filled foam sponges. One is inserted into the vagina before intercourse.The sponge blocks sperm from entering the uterus, and the spermicide also kills the sperm cells. The sponge should be left in place for at least 6 hours after intercourse and then removed within 30 hours after intercourse.

Fig.6.4. Contraceptive sponges, the correct position in vagina.

Spermicides. A spermicide destroys sperm. A spermicide can be used alone or in combination with a diaphragm or cervical cap. The most common spermicidal agent is a chemical called nonoxynol-9 (N-9). It is available in several concentrations and forms, including foam, jelly, cream, suppository, and film. A spermicide should be inserted into the vagina close to the uterus no more than 30 minutes prior to intercourse and left in place 6 to 8 hours after intercourse to prevent pregnancy. Spermicides do not prevent the transmission of STDs and may cause allergic reactions or vaginitis.

IUD (intrauterine device)

IUDs are small, "T-shaped" devices made of flexible plastic. A health care provider inserts an IUD into a woman's uterus to prevent pregnancy. There are two types of IUD— copper (ParaGard, Nova T. Multiload-250 (MLCu-250,) and hormonal (Mirena). The hormonal IUD releases a small amount of progestin. Mirena is effective for five years. After the recommended length of time, or when the woman no longer needs or desires contraception, a health care provider removes or replaces the device.

A copper IUD releases a small amount of copper into the uterus, causing an inflammatory reaction that generally prevents sperm from reaching and fertilizing the egg.If fertilization of the egg does occur, the physical presence of the device prevents the fertilized egg from implanting into the lining of the uterus. Copper IUDs may remain in the body for 12 years. A copper IUD is not recommended for women who may be pregnant, have pelvic infections, or had uterine perforations during previous IUD insertions. It also is not recommended for women who have cervical cancer or cancer of the uterus, unexplained vaginal bleeding, or pelvic tuberculosis.

A hormonal IUD releases a progestin hormone into the uterus. The released hormone causes thickening of the cervical mucus, inhibits sperm from reaching or fertilizing the egg, thins the uterine lining, and also may prevent the ovaries from releasing eggs. Hormonal IUDs can be used for up to 5 years. Currently, Mirena, a levonorgestrel-releasing IUD, is the only FDA approved hormonal IUD that is available.

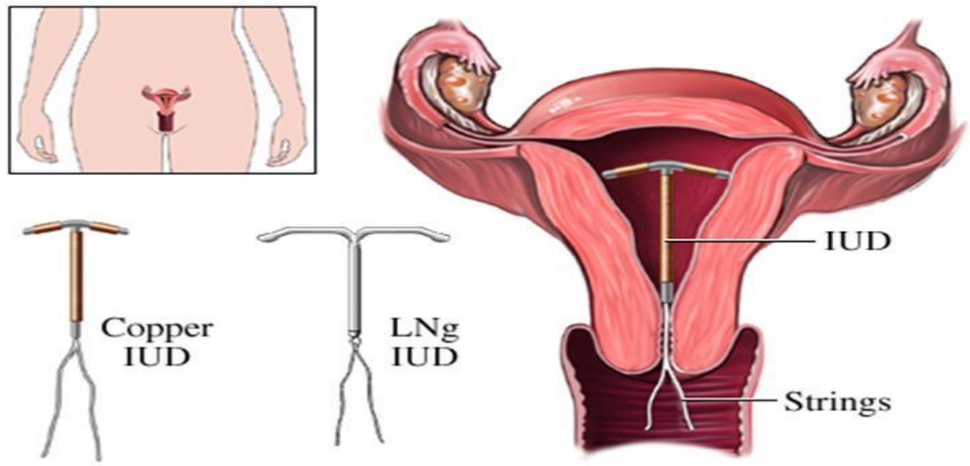


Fig.6.5. Diffetent types of IUD. Correct position of the IUD in the uterine cavity.

Side effects of the IUD are limited primarily to the uterus. These include: cramps, spotting, heavy menstrual flow, infection, pelvic inflammatory disease (PID), and infertility.It is also possible for the IUD to pass through (perforate) the uterine wall and enter the abdominal cavity, where it must be retrieved surgically. Perforation of or trauma to the uterus by the IUD occurs in 1/1,000 insertions. Warning signs of possible complications from an IUD include abdominal pain, heavy bleeding, abnormal spotting or bleeding, and a smelly vaginal discharge. If a woman experiences any of these signs, she should contact her health care professional.

An IUD may not be appropriate for women who have heavy menstrual bleeding, had previous pelvic infections, have more than one sexual partner, or plan on getting pregnant. This is because IUDs do not protect against sexually transmitted infections (STDs) and should not be in place if a woman intends to become pregnant. If women become pregnant with their IUDs in place, 50% of the pregnancies end in miscarriage. Women who use non-progesterone types of IUDs are less likely to have an ectopic pregnancy compared to women using no contraception. When a woman using an IUD does become pregnant, the pregnancy is more likely to be ectopic, but still ectopic pregnancy in a user of an IUD is a rare occurrence.

Serious complications due to infection associated with an IUD may prevent a woman from being able to become pregnant in the future. Also, with the progesterone-releasing IUD (levonorgestrel IUD), a reduction in menstrual flow and a decrease in painful menstrual cramping are often observed with continued use. This is because the progesterone hormone can cause thinning of the lining of the uterus. These menstrual changes are not dangerous in any way and do not mean that the contraceptive action of the IUD is diminished. The IUD provides no protection against sexually transmitted diseases (STDs).

How is an IUD removed? An IUD must be removed by a health care professional. It is very important that a woman not attempt to remove an IUD on her own, as serious problems may result. IUD removal is carried out by determining the position of the uterus, then locating and grasping the stings of the IUD with a special forceps or clamp. The health care professional will then remove the IUD by gentle traction on the strings. Complications of IUD removal are rare, and removal can take place at any time. Some studies have shown that removal is easier during the menstrual period, when a woman's cervix is typically softer, than during other times in the menstrual cycle.

Hormonal Methods

Combined oral contraceptives

The combined oral contraceptive pill (COCP), often referred to as the birth control pill or colloquially as "the pill", is a birth control method that includes a combination of an estrogen (estradiol) and a progestogen (progestin). When taken by mouth every day, these pills inhibit female fertility. They were first approved for contraceptive use in the United States in 1960, and are a very popular form of birth control. They are currently used by more than 100 million women worldwide and by almost 12 million women in the United States.Use varies widely by country, age, education, and marital status.

Combined oral contraceptive pills should be taken at the same time each day. If one or more tablets are forgotten for more than 12 hours, contraceptive protection will be reduced.[13] Most brands of combined pills are packaged in one of two different packet sizes, with days marked off for a 28 day cycle. For the 21-pill packet, a pill is consumed daily for three weeks, followed by a week of no pills. For the 28-pill packet, 21 pills are taken, followed by a week of placebo or sugar pills. A woman on the pill will have a withdrawal bleed sometime during the placebo week, and is still protected from pregnancy during this week. The placebo pills allow the user to take a pill every day; remaining in the daily habit even during the week without hormones. Placebo pills may contain an iron supplement,[15][16] as iron requirements increase during menstruation.

The estimated probability of pregnancy during the first year of perfect use of the pill is 0.3%, and the estimated probability of pregnancy during the first year of typical use of the pill is 9%. Contraceptive efficacy may be impaired by: 1) missing more than one active pill in a packet, 2) delay in starting the next packet of active pills (i.e., extending the pill-free, inactive or placebo pill period beyond 7 days), 3) intestinal malabsorption of active pills due to vomiting or diarrhea, 4) drug interactions with active pills that decrease contraceptive estrogen or progestogen levels.The effectiveness of the combined oral contraceptive pill appears to be similar whether the active pills are taken continuously for prolonged periods of time or if they are taken for 21 active days and 7 days as placebo.

The hormones in "the Pill" have also been used to treat other medical conditions, such as polycystic ovary syndrome (PCOS), endometriosis, amenorrhea, menstrual cramps, adenomyosis, menorrhagia (excessive menstral bleeding), menstruation-related anemia and dysmenorrhea (painful menstruation). Women who are experiencing menstrual dysfunction due to female athlete triad are sometimes prescribed oral contraceptives as pills can create menstrual bleeding cycles.[27] However, the condition's underlying cause is energy deficiency and should be treated by correcting the imbalance between calories eaten and calories burned by exercise. Oral contraceptives should not be used as an initial treatment for female athlete triad.

Common side effects

Different sources note different incidences of side effects. The most common side effect is breakthrough bleeding. A 1992 French review article said that as many as 50% of new first-time users discontinue the birth control pill before the end of the first year because of the annoyance of side effects such as breakthrough bleeding and amenorrhea.[32] One study found that women using birth control pills blinked 32% more often than those not using the contraception. Nausea, vomiting, headache, bloating, breast tenderness, swelling of the ankles/feet (fluid retention), or weight change may occur. Vaginal bleeding between periods (spotting) or missed/irregular periods may occur, especially during the first few months of use.

Major side effects:

1) Venous thromboembolism - Combined oral contraceptives increase the risk of venous thromboembolism (including deep vein thrombosis [DVT] and pulmonary embolism [PE]).[42] These blood clots can cause permanent disability or death. COC pills also confer a risk of first ischemic stroke,[5] and current use significantly increases the risk of cardio-vascular disease among those at high risk.[6] These risks are greatest in women with additional risk factors, such as smoking (which increases risk substantially) and long-continued use of the pill, especially in women over 35 years of age.
2) Cancer – a systematic review in 2010 did not support an increased overall cancer risk in users of combined oral contraceptive pills, but did find a slight increase in breast cancer risk among current users, which disappears 5–10 years after use has stopped.
3) Weight – a 2011 Cochrane systematic review found that studies of combination hormonal contraceptives showed no large difference in weight

when compared with placebo or no intervention groups. The evidence was not strong enough to be certain that contraceptive methods do not cause some weight change, but no major effect was found. This review also found "that women did not stop using the pill or patch because of weight change.

4) Depression - Low levels of serotonin, a neurotransmitter in the brain, have been linked to depression. High levels of estrogen, as in first-generation COCPs, and progestin, as in some progestin-only contraceptives, have been shown to promote the lowering of brain serotonin levels by increasing the concentration of a brain enzyme that reduces serotonin. This observation, along with some small research studies[61] have inspired speculation that the pill causes depression.

   Progestin-only contraceptives are known to worsen the condition of women who are already depressed. However, current medical reference textbooks on contraception[21] and major organizations such as the American ACOG,[63] the WHO,[64] and the United Kingdom's RCOG[65] agree that current evidence indicates low-dose combined oral contraceptives are unlikely to increase the risk of depression, and unlikely to worsen the condition in women that are currently depressed.
5) Hypertension - Bradykinin lowers blood pressure by causing blood vessel dilation. Certain enzymes are capable of breaking down bradykinin (Angiotensin Converting Enzyme, Aminopeptidase P). Progesterone can increase the levels of Aminopeptidase P (AP-P), thereby increasing the breakdown of bradykinin, which increases the risk of developing hypertension.
6) Other effects - other side effects associated with low-dose COCPs are leukorrhea (increased vaginal secretions), reductions in menstrual flow, mastalgia (breast tenderness), and decrease in acne. Side effects associated with older high-dose COCPs include nausea, vomiting, increases in blood pressure, and melasma (facial skin discoloration); these effects are not strongly associated with low-dose formulations.

Contraindications - Combined oral contraceptives are generally accepted to be contraindicated in women with pre-existing cardiovascular disease, in women who have a familial tendency to form blood clots (such as familial factor V Leiden), women with severe obesity and/or hypercholesterolemia (high cholesterol level), and in smokers over age 40. COC are also contraindicated for women with liver tumors, hepatic adenoma or severe cirrhosis of the liver, those who have migraine with aura and for those with known or suspected breast cancer. (WHO category 4).

Progestin-only pills (POPs).

A woman takes one pill daily, preferably at the same time each day. Progestin-only pills may interfere with ovulation or with sperm function. POPs thicken cervical mucus, making it difficult for sperm to swim into the uterus or to enter the fallopian tube. POPs alter the normal cyclical changes in the uterine lining and may result in unscheduled or breakthrough bleeding. These hormones do not appear to be associated with an increased risk of blood clots.

The mechanism of action of progestogen-only contraceptives depends on the progestogen activity and dose:

-Very-low-dose progestogen-only contraceptives, such as traditional progestogen-only pills (and subdermal implants Norplant and Jadelle and intrauterine systems Progestasert and Mirena), inconsistently inhibit ovulation in ~50% of cycles and rely mainly on their progestogenic effect of thickening the cervical mucus, thereby reducing sperm viability and penetration.

-Intermediate-dose progestogen-only contraceptives, such as the progestogen-only pill Cerazette (or the subdermal implant Nexplanon), allow some follicular development (part of the steps of ovulation) but much more consistently inhibit ovulation in 97–99% of cycles. The same cervical mucus changes occur as with very-low-dose progestogens.

-High-dose progestogen-only contraceptives, such as the injectables Depo-Provera and Noristerat, completely inhibit follicular development and ovulation. The same cervical mucus changes occur as with very-low-dose and intermediate-dose progestogens.

In anovulatory cycles using progestogen-only contraceptives, the endometrium is thin and atrophic. If the endometrium were also thin and atrophic during an ovulatory cycle, this could, in theory, interfere with implantation of a blastocyst (embryo).

<u>Benefits -</u> Lacking the estrogen of combined pills, they are not associated with increased risks of DVT or heart disease. With the decreased clotting risk, they are not contraindicated in the setting of sickle-cell disease. The progestin-only pill is recommended over regular birth control pills for women who are breastfeeding because the mini-pill does not affect milk production (estrogen reduces the amount of breast milk). Like combined pills, the minipill decreases the likelihood of pelvic inflammatory disease.

<u>Side-effects -</u> With no break in the dosage, menstrual flow does not initially occur at a predictable time. Most women tend to establish, over a few months, light spotting at approximately regular intervals.May cause mastalgia (breast tenderness) and mood swings.Some women may experience abdominal cramps and heavy bleeding.

Progestin-only mini-pills, implants, and shots are good choices for women who:

-Are breast-feeding. The mini-pill is a good choice for breast-feeding mothers. It is very low-dose and does not affect the milk supply. Breast-feeding further reduces the chance of pregnancy.

-Need short- or long-term birth control that can be stopped at any time. (But it may take from 12 weeks to 18 months to become pregnant after stopping the birth control shot.)

-Prefer a form of birth control that does not interfere with sexual spontaneity.

-Cannot take estrogen, including those who smoke and are older than 35; have long-standing, poorly controlled diabetes; have heart disease; have problems with blood clots; or have high blood pressure.

-Have migraine headaches with auras, or women whose migraines get worse when taking the estrogen in combination birth control pills.

-Have heavy, painful menstrual periods. Progestin reduces heavy bleeding and cramping.

-Have anemia from heavy menstrual bleeding.

-Have sickle cell disease. Women with sickle cell disease may have fewer problems from their disease when using the birth control shot.

Contraceptive patch

This is a thin, plastic patch that sticks to the skin and releases hormones through the skin into the bloodstream. The patch is placed on the lower abdomen, buttocks, outer arm, or upper body. A new patch is applied once a week for 3 weeks, and no patch is used on the fourth week to enable menstruation. The hormones in the patch are the same hormones as in the birth control pill — estrogen and progestin. Because the birth control patch works like the pill, it probably carries the same possible disadvantages. The patch may not be suitable for women who smoke and who are 35 or over, or who weigh 90kg or more.

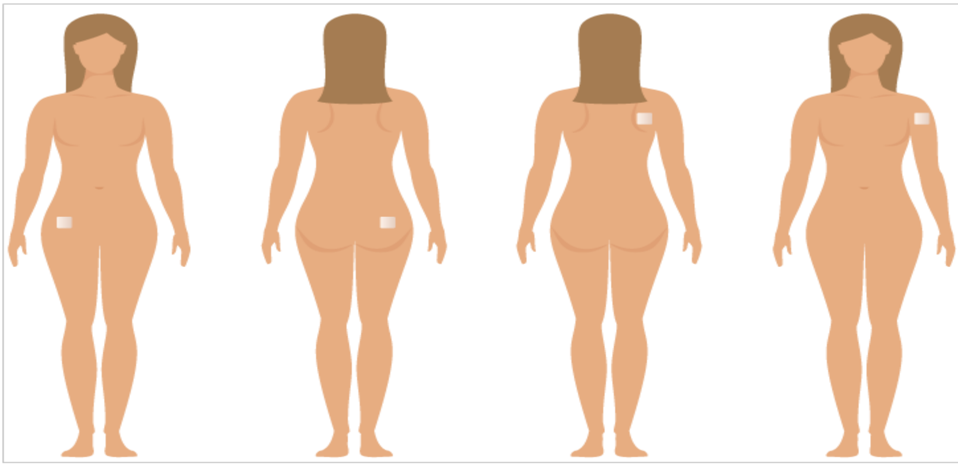


Fig.6.6. The parts of the body where the patch is usually stuck on.

You should not stick the patch on: sore or irritated skin, anywhere it may get rubbed off by tight clothing,or on breasts.

Injectable birth control

This method involves injection of a progestin, Depo-Provera® (DMPA—depomedroxyprogesterone acetate), given in the arm or buttocks once every 3 months. This method of birth control can cause a temporary loss of bone density, particularly in adolescents. However, this bone loss is generally regained after discontinuing use of DMPA. Most patients using injectable birth control should eat a diet rich in calcium and vitamin D or take vitamin supplements while using this medication.

The birth control shot is one of the most effective methods of birth control available. Less than 1 out of 100 women will get pregnant each year if they always use the birth control shot as directed. About 6 out of 100 women will get pregnant each year if they don't always use the birth control shot as directed.

Most women can use the birth control shot safely. But all medications have some risks, so safety is a concern when choosing a birth control method. Certain conditions increase the risk of serious side effects. You should not use the shot if you are taking the medication aminoglutethamide to treat Cushing's syndrome are pregnant have breast cancer have had fragility bone fractures.

Side effects - Irregular bleeding is the most common side effect, especially in the first 6 to 12 months of use. For most women, periods become fewer and lighter. After one year, half of the women who use the birth control shot will stop having periods completely. Some women have longer, heavier periods. Some women have increased spotting and light bleeding between periods.

Because the birth control shot is long lasting, it can take a long time to get pregnant after getting your last shot — anywhere from 6–10 months. So, Depo-Provera is not a good birth control method for you if you’re thinking of getting pregnant soon. Although Depo-Provera is highly effective in preventing pregnancy, in the very rare cases where pregnancy does occur, it is more likely to be an ectopic pregnancy, which can be life threatening.

Vaginal rings

The ring is thin, flexible, and approximately 2 inches in diameter. It delivers a combination of a synthetic estrogen (ethinyl estradiol) and a progestin. The ring is inserted into the vagina, where it continually releases hormones for 3 weeks. The woman removes it for the fourth week and reinserts a new ring 7 days later. Risks for this method of contraception are similar to those for the combined oral contraceptive pills, and a vaginal ring is not recommended for any woman with a history of blot clots, stroke, or heart attack, or with certain types of cancer. Currently, the NuvaRing is the only approved vaginal ring.

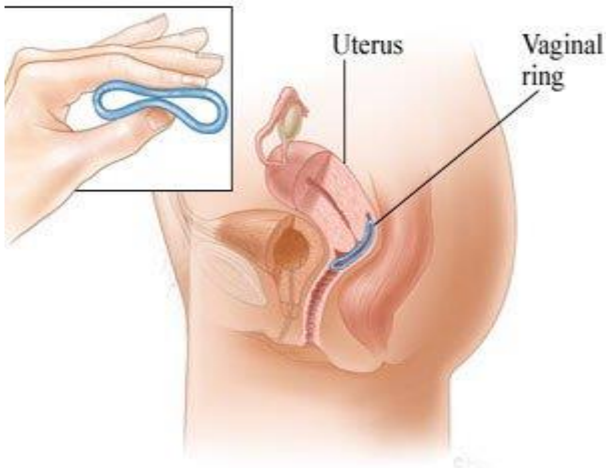


Fig.6.7. Vaginal ring, correct position in vagina

Vaginal rings are easily inserted and removed. Vaginal walls hold them in place. Although their exact location within the vagina is not critical for clinical efficacy, rings commonly reside next to the cervix. Rings are typically left in place during intercourse, and most couples report no interference or discomfort.

Implantable rods

The birth control implant is a thin, flexible plastic implant about the size of a cardboard matchstick. It is inserted under the skin of the upper arm. It protects against pregnancy for up to three years. The implant is available under the brand names Implanon and Nexplanon. Like several other methods of birth control, such as the birth control shot, the birth control implant releases a hormone — progestin. The birth control implant is very effective. Less than 1 out of 100 women a year will become pregnant using the implant.

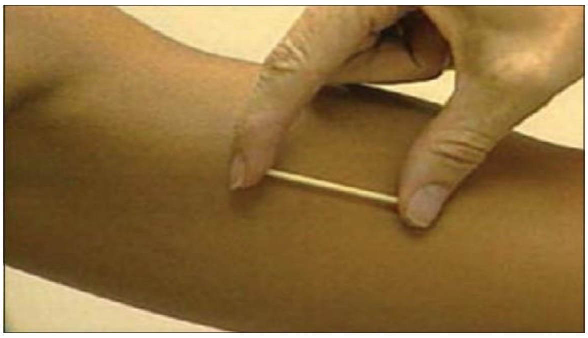


Fig.6.8. Implantable rod.

Benefits- Using the birth control implant is safe, simple, and convenient. Women like the implant because the ability to become pregnant returns quickly when you stop using the implant. It can be used while breastfeeding. It can be used by women who cannot take estrogen. It gives continuous long-lasting birth control without sterilization. There is no medicine to take every day. Nothing needs to be put in place before vaginal intercourse.

Disadvantages - Irregular bleeding is the most common side effect, especially in the first 6–12 months of use. For most women, periods become fewer and lighter. After one year, 1 out of 3 women who use the birth control implant will stop having periods completely. Some women have longer, heavier periods. Some women have increased spotting and light bleeding between periods. The implant cannot be used by women who have breast cancer.

Emergency Contraceptive Pills (ECPs)

ECPs are hormonal pills, taken either as a single dose or two doses 12 hours apart, that are intended for use in the event of unprotected intercourse. If taken prior to ovulation, the pills can delay or inhibit ovulation for at least 5 days to allow the sperm to become inactive. They also cause thickening of cervical mucus and may interfere with sperm function. ECPs should be taken as soon as possible after semen exposure and should not be used as a regular contraceptive method. Pregnancy can occur if the pills are taken after ovulation or if there is subsequent semen exposure in the same cycle.

Emergency contraception can be used up to five days (120 hours) after unprotected intercourse. You may want to use it if:

- you weren't using any birth control when you had sex;

- you forgot to take your birth control pills, patch, ring, or other birth control method;

- your partner's condom broke or slipped off your partner didn't pull out in time or you were forced to have unprotected vaginal sex.

You might have also heard that the morning-after pill causes an abortion. But that's not true. The morning-after pill is not the abortion pill. Emergency contraception is birth control, not abortion. Levonogestrel pills are up to 89 percent effective when taken within 72 hours (three days) after unprotected sex. They continue to reduce the risk of pregnancy up to 120 hours (five days) after unprotected sex, but they are less effective as time passes. Levonogestrel pills may not work as well for women who have a body mass index (BMI) of more than 25.

Disadvantages - Side effects are uncommon, and usually stop within a day or two. Possible side effects include an earlier or later, heavier or lighter period than usual breast tenderness, dizziness, or headaches, and nausea or vomiting. If you vomit within two hours of taking the pill(s), it won't be effective and you need to take it again.

Frequent use may cause periods to become irregular and unpredictable. Emergency contraception should not be used as a form of ongoing birth control because there are other forms of birth control that are a lot more effective and less expensive.

Sterilization

Sterilization is a permanent form of birth control that either prevents a woman from getting pregnant or prevents a man from releasing sperm. A health care provider must perform the sterilization procedure, which usually involves surgery. These procedures usually are not reversible.

Tubal ligation- During a sterilization procedure, a health care provider closes or blocks a woman's fallopian tubes. Closing the tubes can be done in several ways. One way is by tying and cutting the tubes — this is called tubal ligation. The fallopian tubes also can be sealed using an instrument with an electrical current. They also can be closed with clips, clamps, or rings. Sometimes, a small piece of the tube is removed. Sometimes, tiny inserts are put in the tubes. Tissue grows around them and blocks the tubes. The brand name for this type of sterilization is Essure.

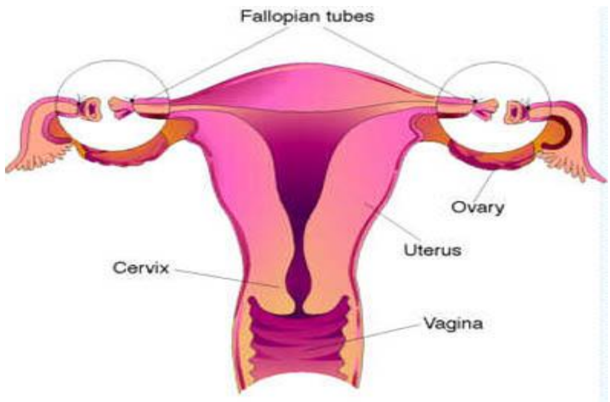


Fig.6.9. Tubal ligation

Most women can be sterilized safely. But like any medical procedure, there are risks. One possible risk is that the tubes may reconnect by themselves — but this is rare. When women get pregnant after being sterilized, about 1 out of 3 has a pregnancy that develops in a fallopian tube- ectopic pregnancy. Ectopic pregnancy is serious and may be life threatening.

Sterilization may be right for you if:

- You don't want to have a child biologically in the future.
- You have concerns about the side effects of other methods.
- Other methods are unacceptable.
- Your health would be threatened by a future pregnancy.
- You don't want to pass on a hereditary illness or disability.
- You and your partner agree that your family is complete, and no more children are wanted.
- You and your partner have decided that sterilization is better for you than vasectomy is for him.

You should consider any possible life changes, such as divorce, remarriage, or death of children. You don't need your partner's permission to be sterilized, but it may be helpful to discuss it with your partner or anyone else who could be part of the decision-making process.

<u>Vasectomy -</u> is a surgical procedure that cuts, closes, or blocks the vas deferens. This procedure blocks the path between the testes and the urethra.The sperm cannot leave the testes and cannot reach the egg. It can take as long as 3 months for the procedure to be fully effective. A backup method of contraception is used until tests confirm that there is no sperm in the semen. The sperm are absorbed by the body instead of being ejaculated.

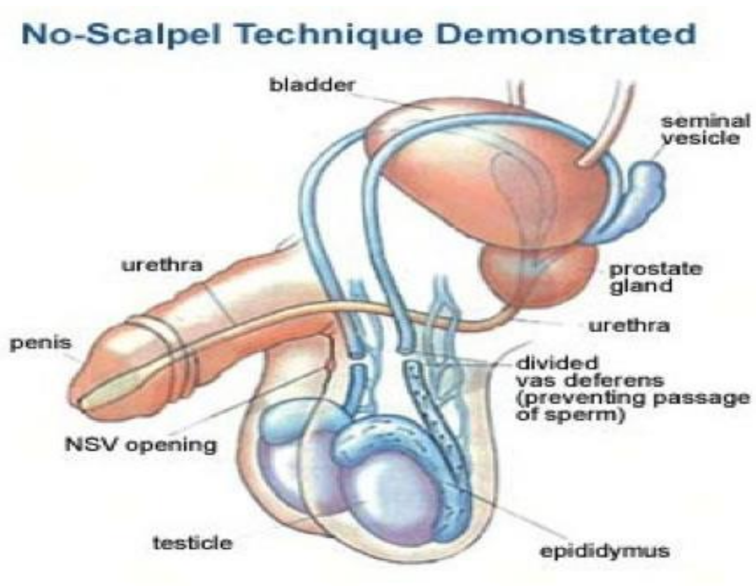


Fig.6.10. No-scalpel technique of vasectomy

Vasectomy is the most effective birth control for men. It is nearly 100 percent effective.Complication rates for vasectomy are generally lower for the no-incision method than for methods that include cutting the skin. Other potential problems include:

-bruising, which usually clears up on its own;

- hematomas — swellings that contain blood. They usually clear up by themselves, or with bed rest or ice packs. In rare cases, they need to be drained by a health care provider;

-hydroceles — swellings that contain fluid and tenderness near the testicles. They usually clear up in about a week. Applying heat and wearing an athletic supporter can help. In rare cases, they need to be drained with by a health care provider;

- granuloma — sperm that leaks from the tubes and causes a small lump under the skin near the site of the surgery. This usually clears up by itself. Surgical treatment is sometimes required;

- pain or discomfort in the testicles. This is usually temporary, but in about 2 out of 100 cases the pain may be chronic and severe. Most of the time, pain is relieved by taking anti-inflammatory drugs or other medications. Very rarely, an injection called a spermatic cord block can be used to deaden the pain temporarily. Vasectomy reversal is very rarely needed to relieve pain permanently;

- Very rarely, the cut ends of a tube grow back together. This most often happens within four months of the operation and may allow pregnancy to happen.

-Decreased sexual desire or an inability to have an erection occurs in 4 out of 1,000 cases. The most likely cause is emotional — there is no physical cause for sexual dysfunction associated with vasectomy.

MCQs

1.What kind of contraception has the lowest Pearl index?:

A. Condom, spermicide

B. Combined oral contraceptives

C. Hormonal patch

D. Progesterone only pills

2. What is FALSE about lactational amenorrhea method:

A. is used in momen for six months after delivery only if a woman with regular breastfeeding

B. women shoud not substitute other foods for a breast milk meal;

C. the women shoud feed her baby at least every eight hours;

D. is possible only if the women has not had a period since she delivered her baby.

3. To find out the fertile days according to calendar or rhythm method the woman should:

A. To find the estimated length of the pre-ovulatory infertile phase, nineteen (19) is subtracted from the length of the woman's shortest cycle. To find the estimated start of the post-ovulatory infertile phase, ten (10) is subtracted from the length of the woman's longest cycle

B. To find the estimated length of the pre-ovulatory infertile phase, nineteen (19) is subtracted from the length of the woman's logest cycle. To find the estimated start of the post-ovulatory infertile phase, ten (10) is subtracted from the length of the woman's shortest cycle

C. To find the estimated length of the pre-ovulatory infertile phase, nineteen (10) is subtracted from the length of the woman's shortest cycle. To find the estimated start of the post-ovulatory infertile phase, ten (19) is subtracted from the length of the woman's longest cycle

D. To find the estimated length of the pre-ovulatory infertile phase, nineteen (15) is subtracted from the length of the woman's shortest cycle. To find the estimated start of the post-ovulatory infertile phase, ten (20) is subtracted from the length of the woman's longest cycle

4. As ovulation approaches the cervical mucus:

A. is absent, so-called “dry days”

B. a big amount of non clear (yellowish) mucus is present

C. the mucus becomes clear and slippery, stretches without breaking

D. the mucus becomes clear and slippery, easily breaks

5. Which of the following statement about vasectomy is FALSE:

A. it takes 6 months for the procedure to be fully effective

B. is the most effective birth control for men

C. is a surgical procedure that cuts, closes or blocks the vas deverens

D. blocks the path between the testes and the urethra

Key answers

1. D
2. C
3. A
4. C
5. A

The list of recommended literature:

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