Vaginal Diseases and Vulvar Disorders: Bacterial Vaginosis, Vulvitis and more

See online here

Colpitis and bacterial vaginosis are diseases of the vagina. Apart from the symptoms themselves, there is always the risk of ascending infection. Moreover, inflammations of the outer genitalia are an important clinical issue. For example, vulvitis is very frequent and ubiquitous. Further, the outer genitalia are notably sensitive so that diseases can cause great discomfort for the patient, even if those diseases are harmless. This article discusses the pathogens, diagnostic tests, and treatment of vaginal diseases and vulvar disorders.

Colpitis

Colpitis (or vaginitis) refers to the **inflammation of the vagina**. A pathological **vaginal discharge** and epithelial reddening are typical symptoms of colpitis.

The pH of the vaginal milieu is normally **acidic** (**3.8–4.5)**. This way, the excessive proliferation of pathogenic germs is inhibited. Lactic acid bacteria are responsible for this milieu. They are called **Döderlein's bacteria** and produce lactic acid based on estrogen.

Accordingly, the vaginal flora is disturbed if, for instance, the lactic acid bacteria are inhibited. Cervical mucus and menstrual blood can lead to alkalinization. Other irritations can be caused by a lack of estrogen, diabetes mellitus, foreign bodies (e.g. tampons),

vaginal douches, sexual contact, or antibiotics.

Pathogens of colpitis

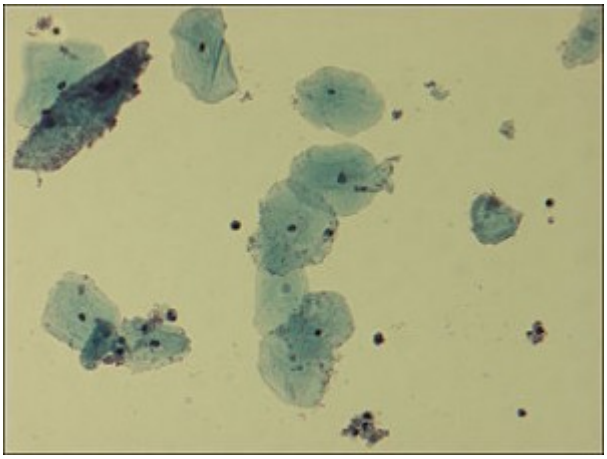
Inflammation of the vagina can be due to several reasons. The most frequent causes are:

- Bacterial infections (bacterial vaginosis)
- Fungal infections with candida (vaginal thrush)
- Trichomoniasis

Bacterial Vaginosis

One major form of colpitis is bacterial vaginosis, which, as the name suggests, is **vaginosis caused by bacteria.**

Pathogens of bacterial vaginosis



Microscopic view of *Gardnerella vaginalis*

Gardnerella vaginalis can be found in the vaginal secretion of symptom-free, sexually active women. It is assumed that the transmission of this microorganism occurs via vaginal intercourse. Additionally, bacteria from the perianal region and bacteria of sexual partners can change the vaginal flora. This can promote the proliferation of anaerobes, such as *G. vaginalis*, which replace the lactic acid bacteria.

Note: Bacterial vaginosis is the most frequent form of colpitis, being present in 5–8% of women. *G. vaginalis* is the most common cause of bacterial vaginosis.

Clinical presentation of bacterial vaginosis

Reddening and itching are not present in bacterial vaginosis. Specific findings are a **white-gray, very thin, sometimes foamy vaginal discharge** and its **fishy** smell, with an alkaline pH. An ascending infection can develop as a complication.

Diagnostics for bacterial vaginosis

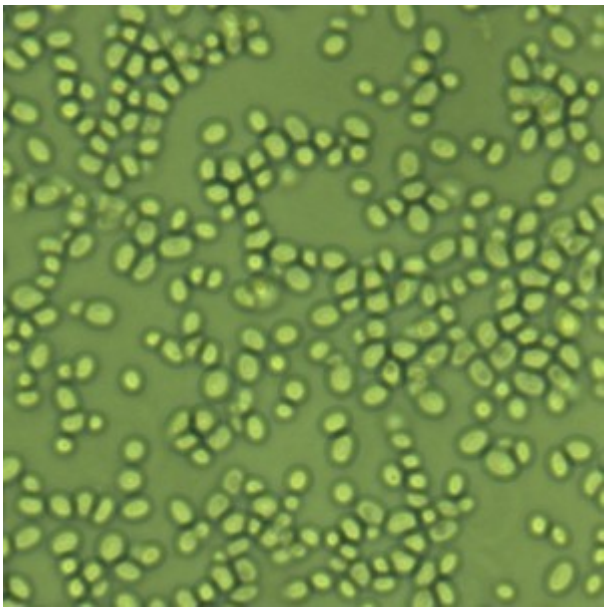
Clinical examination	White-gray, foamy, thin vaginal discharge, fishy smell, pH of 4.8–5.5

Direct microscopic examination	Vaginal secretion with leukocytes, numerous bacteria, clue cells (i.e., epithelial cells fully covered with *G. vaginalis* and other bacteria)
Culture	Not recommended as in most cases, mixed infections are present

Treatment of bacterial vaginosis

Once tests are completed, treatment should be commenced. The administration of **5-nitroimidazole** (metronidazole 2 × 400 mg for 5 days) is the established treatment. The healing rate is approx. 95%. **The simultaneous treatment of sexual partners is not recommended**.

Vaginal Thrush



Candida glabrata (License: Public Domain)

Vaginal thrush refers to a **fungal infection that leads to colpitis**. In over 80% of cases, these fungal infections are caused by ***Candida albicans***. In rare cases, they are caused by ***Candida glabrata*.** Frequently, candida is already present in the vulva and vagina.

Thus, vaginal thrush is normally an **endogenous infection**. If the vaginal flora is disturbed, the proliferation of germs is promoted. Hormonal fluctuation (e.g., pregnancy or oral contraceptive use), antibiotic therapy, or immunodeficiency can also promote infection.

Clinical presentation of vaginal thrush

Itching, burning, pain, and discharge are typical symptoms of vaginal thrush. Vaginal thrush normally occurs together with vulvitis.

Diagnostics for vaginal thrush

Clinical examination	White crumbly discharge

Microscopic direct specimen	Confirmation through pseudomycelia. The detection of sprout cells only shows the colonization of yeasts.
Microbiological detection	Only if clinical examination and direct specimen yield no significant results.

Treatment of vaginal thrush

A first step is **local treatment with nystatin and imidazole medication** in the vagina and on the vulva; 5–7 days are usually sufficient.

If the vaginal thrush is recurrent, systemic therapy with fluconazole becomes necessary. Treating the partner is not necessary since vaginal thrush is an endogenous infection. However, the rate of recurrence is relatively high.

In the case of chronic recurrent vaginal thrush, high-dose **fluconazole** for several weeks is recommended. Further, regular prophylactic antimycotic treatment is indicated in some cases.

Trichomoniasis

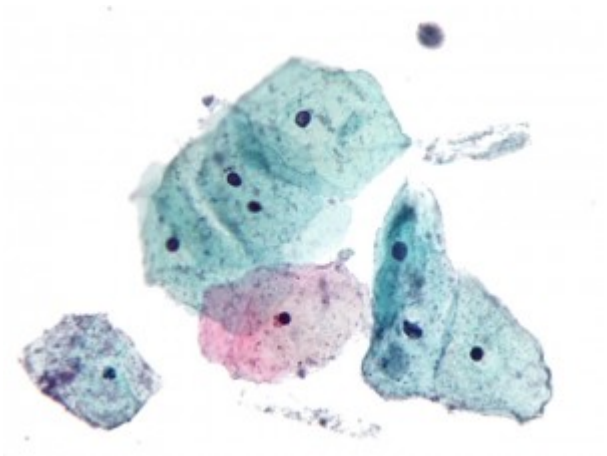


Image: “Micrograph showing Trichomoniasis”, By: Nephron.
License: CC BY-SA 3.0

Trichomoniasis is caused by ***Trichomonas vaginalis***, which is a **facultative pathogenic protozoon. Trichomoniasis** affects the vagina, glandular ducts, urethra, and less frequently, the bladder, rectum, and cervix.

Transmission occurs via sexual contact. The risk of infections is 70%. Recently, the number of infections has notably regressed and is now below 1%.

Clinical presentation of trichomoniasis

A characteristic sign of trichomoniasis is a **severe, liquid, foamy discharge**, which is sometimes **greenish-yellow**. Further, symptoms like burning, itching, and occasional dysuria and reddening can be observed.

Note: In 90% of men and women, trichomoniasis can be asymptomatic.

A potential complication of trichomoniasis is accompanying bacterial vaginosis.

Diagnostics for trichomoniasis

Clinical examination	Foamy vaginal discharge, pungent smell, reddening
Microscopic direct specimen	Moving trichomonads with surrounding leukocytes
Cytological cervical smear	

Treatment of trichomoniasis

Systemic administration of **5-nitroimidazoles** (1×2 g metronidazole) has a success rate of 90%. Treating the partner is necessary. **Condoms can prevent transmission**.

Nonspecific Colpitis

Nonspecific colpitis cannot be traced to one particular pathogen.

Vulvitis

Vulvitis is defined as **dermatitis of the labia** of women. In almost all cases, it is accompanied by a form of vaginitis.

Etiology of vulvitis

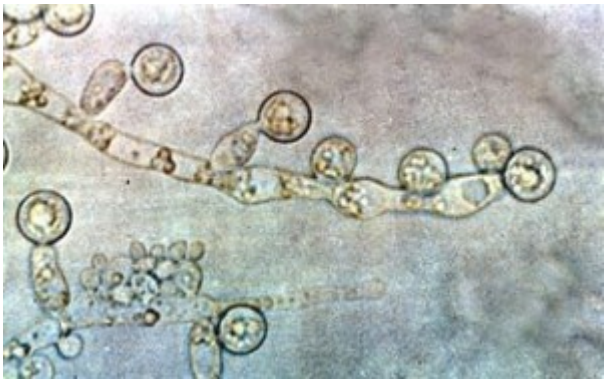


Image: *Candida albicans.* By: GrahamColm. License: CC BY 3.0

Primary causes of the disease can be **fungi, bacteria, or viruses.** Secondarily, an inflammation of the outer genitals can also be due to mechanical causes or hormonal changes.

Pathogens of vulvitis

In 95% of the cases, the fungus ***C. albicans*** is the most frequent pathogen of vulvitis. Bacteria like **A-streptococci, *Staphylococcus aureus*, and *Treponema pallidum*** are the second most frequent cause. Viruses like **herpes simplex** and **varicella-zoster** are rare triggers.

Secondary causes can be mechanical; for example, **maceration**, which is a consequence of obesity. Inflammation of the outer genitalia can also be caused by chemical irritation of the skin due to vaginal douches or detergents. Vulvitis can also be a secondary consequence of **pregnancy** and estrogen deficiency after **menopause**. In patients with **diabetes mellitus,** infections with *C. albicans* are frequent.

Note: Herpes genitalis causes the most painful vulvitis.

Clinical presentation of vulvitis

There are **3 main symptoms** of vulvitis, and they are the most prominent features of inflammations of the outer genitalia:

- **Burning pain** during walking, urination, and sexual intercourse
- **Vaginal discharge**
- **Pruritus:** the scratching caused by the strong itching often worsens the infections. If children present with this kind of itching, worms should be considered as a differential diagnosis

Examination shows the typical signs of inflammation; reddened and swollen skin is visible. **Candidiasis** is often accompanied by a clumpy white discharge. The **native specimen** and **Sabouraud agar** show evidence of fungal infection. In herpes genitalis infections, fine vesicles can be seen. If an inflammation of the hair follicle is present (i.e., **folliculitis)**, a small reddish area that is painful and sensitive to pressure is often observed.

Treatment of vulvitis

Clotrimazole, which is an antimycotic, is applied locally for fungal infections. Bacterial vulvitis can be treated locally with the antiseptic **povidone-iodine** and orally with **cephalosporin**. If an *S. aureus* infection is left untreated, folliculitis can develop into an abscess. Folliculitis must be surgically managed. For the relief of pain and itching, patients can apply **cortisone balm** and **chamomile hip baths**.

Bartholinitis

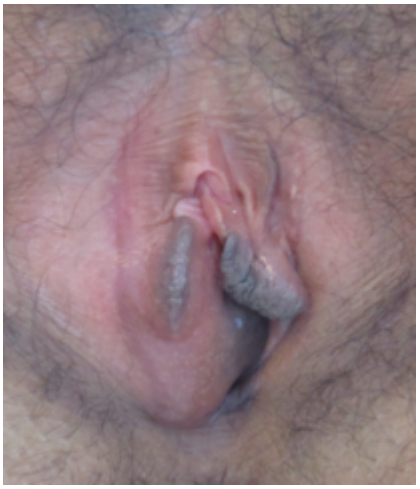


Image: “Bartholin’s cyst of the right side”.
By: Medimage. License: CC BY 3.0

Bartholin glands are located on the inside of the **inner labia**. Their excretory duct lies in the introitus area. Bartholinitis is an **inflammation of the Bartholin gland** which leads to painful swelling. In most cases, the inflammation is unilateral. If the excretory ducts are obstructed due to stasis of the glandular secretion (Bartholin cyst), an infection with intestinal germs can occur.

Etiology of bartholinitis

- *Neisseria gonorrhoeae*
- *S. aureus*
- *Escherichia coli*
- Anaerobe bacteria (*Bacteroides*, *Peptococcus*, and *Peptostreptococcus*)

Note: Primary infection with a pathogen is much less common than infection due to an obstructed duct.

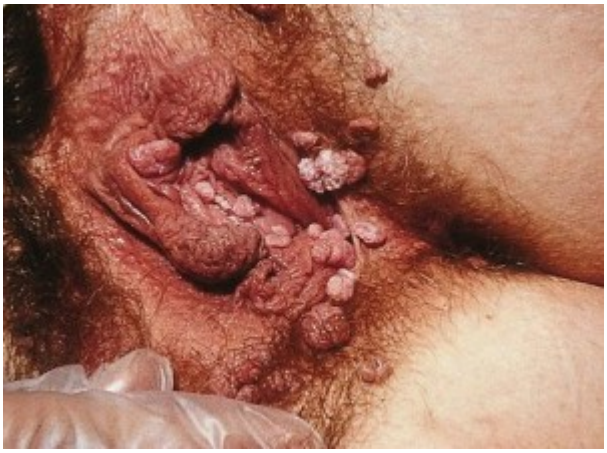
Clinical presentation of bartholinitis

If the secretory ducts are obstructed, **swelling** occurs, which can reach the size of a ping-pong ball. This cyst is painful when infected and can even lead to **problems walking**.

Treatment of bartholinitis

In case of a large cyst or an abscess, treatment involves **marsupialization**, which is performed under general anesthesia. If the bartholinitis is recurrent, **extirpation** of the Bartholin gland can be performed.

Condylomata Acuminata



Condylomata accuminata are **papillary, pointy epitheliomas** that mainly affect the vulva, vagina, porta uteri, and the anal region.

Etiology of condylomata acuminata

Infection with **HPV** (human papillomavirus) can trigger the formation of condylomata acuminata. Serotypes **6** and **11** are responsible for changes like pointy condylomas. Infection with **HPV 16 and 18 can lead to cervical or anal carcinoma**

Note: Almost 20% of sexually active women are HPV-positive with serotypes 6 and 11.

Clinical presentation of condylomata acuminata

Examination shows **pointy, papillary changes of epithelial cells**. They are arranged in a cockscomb-like manner.

Histology shows **koilocytes**. These are squamous epithelial cells with a perinuclear halo. Koilocytes are a sign of HPV infection.

Treatment of condylomata acuminata

Treatment options depend on the severity of the disease. The first step is topical treatment. In cases of mild infection, **denaturation** using **podophyllin** cream or 60% trichloroacetic acid is possible. For extreme infections, surgical treatment using **electric sling abrasion** or **CO_2 laser** has to be performed.

Note: All therapeutic measures have a recurrence risk of 25%.

Lichen Sclerosus: Vulvar Itching

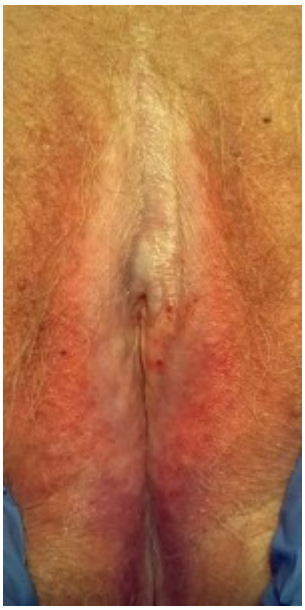


Image: “Lichen sclerosus in an 82-year-old woman, showing an ivory white coloring in the vulva, also stretching downward to the perineum.” By: Mikael Häggström. License: CC BY 1.0

Lichen sclerosus is a chronic disease and is the degenerative **change of the dermis**. It comprises a **shrinking** of the vulva and **sclerotization** of subcutaneous fat tissue.

Etiology of lichen sclerosus

Lichen sclerosus is caused by **skin shrinking due to a lack of estrogen.** Older women often experience estrogen deficiency in the postmenopausal period.

Clinical presentation of lichen sclerosus

Because of the marked pruritus, scratch defects can be noted. Examination shows

depigmentation, scratch defects, and **superinfection**. The shrinking is accompanied by **shiny vulvar skin**.

Diagnostics for lichen sclerosus

Histological examination involving **punch biopsy** or **excision** should be performed in order to exclude vulvar carcinoma and vulvar intraepithelial dysplasia.

Treatment of lichen sclerosus

Lichen sclerosus is treated with **cortisone creams** for at least **4 weeks** after the patient is free of complaints. **Fatty ointments** should be applied before any event of skin stress (urination, defecation, coitus, etc). Treatment with **corticoids** is supposed to prevent skin shrinking and synechia (adhesion of the labia).

As long as there is no contraindication, systemic estrogen should be considered. In any case, **local estrogen treatment** should occur. If symptoms persist, laser therapy or surgical interventions such as denervation may be necessary.

References

Kaufman, R. H., Faro, S., & Brown, D. (2005). *Benign diseases of the vulva and vagina*. Philadelphia, PA: Mosby.

Markos, A. R. (2009). *Sexually transmitted diseases*. New York: Nova Biomedical Books.

Marrazzo, J. M. (2012). Bacterial Vaginosis. *Sexually Transmitted Diseases*, 54-63. doi:10.1002/9781118314937.ch7

Marrazzo, J. M. (2013). Vaginal Biofilms and Bacterial Vaginosis: Of Mice and Women. *The Journal of Infectious Diseases*, *207*(10), 1481-1483. doi:10.1093/infdis/jit050

Notes