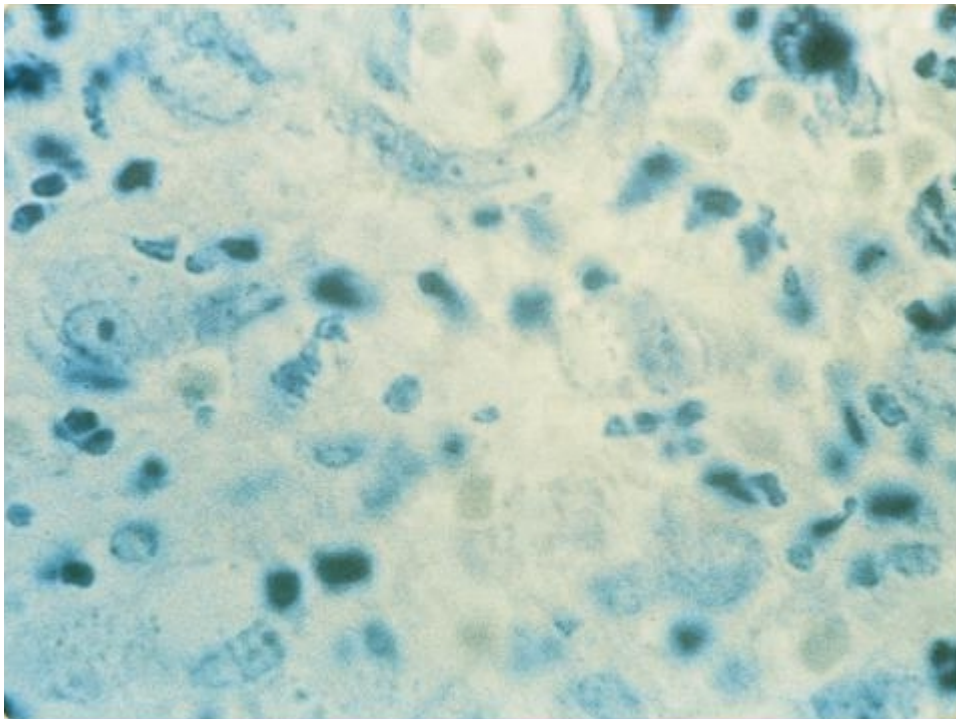


Donovanosis (Granuloma Inguinale) — Symptoms and Treatment

[See online here](#)

Donovanosis is a sexually transmitted disease that is caused by *Klebsiella granulomatis*. These are intracellular organisms that form inclusion bodies inside macrophages known as Donovan bodies. The disease is characterized by four different stages. First, nodular lesions develop, which then ulcerate. Plaques form in the third stage and hypertrophic lesions that look like genital warts are seen in the fourth stage. Treatment of donovanosis is azithromycin given for at least three weeks.



Definition and Epidemiology of Donovanosis

Donovanosis is defined as a **chronic bacterial infection** associated with the formation of **Donovan bodies** inside macrophages and lesions involving the mucus membranes and genital skin. The condition is also known as **granuloma inguinale**, and the typical presentation is that of **destructive penile or genital ulcers**.

Epidemiology of Donovanosis

Donovanosis is an **uncommon condition** with about **100 new cases** reported per year in the United States. Most of the cases of donovanosis are acquired while **traveling abroad**, especially when engaging in **sexual tourism**.

The condition is more common in **hot weather countries** including the tropics and subtropics. India, Southeast Asia, and Brazil have the highest incidence of donovanosis in the world. Additionally, donovanosis is more common in **African Americans** than in whites. The most likely cause for different incidence among different races is due to different socioeconomic statuses.

The condition can occur in **both men and women**. Donovanosis is a **sexually transmitted disease** that is more common in **young sexually active individuals** similar to other sexually transmitted diseases.

The condition might be associated with **significant morbidity** if left untreated. Patients can develop **lymphedema**. The chronic nature of the **ulceration** can increase the risk of **squamous cell carcinoma**. Relapse is common, even after treatment.

Etiology of Donovanosis

Donovanosis or granuloma inguinale is caused by an intracellular organism known as **Calymmatobacterium granulomatis**. More recently, it was shown that the organisms are actually from the Klebsiella species, therefore, the name has been changed to **Klebsiella granulomatis**.

In contrast to typical sexually transmitted diseases, Klebsiella granulomatis has a very low infectious capability and **repeated exposure** is needed for the patient to develop donovanosis.

Pathophysiology of Donovanosis

Once the patient acquires the causative organism Klebsiella granulomatis, repeated exposure is important in order for them to develop clinical symptoms. Repeated exposure to the organism, **poor genital hygiene**, and **unprotected sexual intercourse** are key to develop donovanosis.

Patients with donovanosis usually have **other sexually transmitted diseases** that affect the skin and allow entry of the organism. These organisms are obligate intracellular bacteria and they produce inclusion bodies inside the macrophages once engulfed.

At first, the enlarged macrophages cause **nodular lesions**, which eventually ulcerate. **Chronic ulcers** form, which can be destructive. The organisms can also affect the lymphatic system, cause **lymphedema** or **elephantiasis**.

Clinical Presentation of Donovanosis

The **incubation period** of Klebsiella granulomatis is usually **more than one month**. This long incubation period is, in fact, because of the necessity for repeated exposure and most likely because patients usually ignore the nodular lesions and only come late to the clinic once they develop genital ulcers.



Image: "Donovanosis Ulcer in a Female." License: [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)

Additionally, patients with donovanosis are usually coming from poor socioeconomic status and might have limited access to medical care, which again can explain the delayed presentation to the health care system.

Physical examination is very important in the evaluation of the patient presenting with donovanosis. There are **four main stages of the disease** that can be identified by a **physical examination of the genitalia**.

The initial stage is characterized by a nodular lesion which presents as a **small papule**. This nodular lesion might be **painful** and can be **red in color**. Unfortunately, this nodule can be **mistaken for a lymph node** which can delay the diagnosis and the appropriate treatment.

The second stage is known as **ulcerative donovanosis**. This is the most common presenting stage of the disease. At this stage, patients develop **painless expanding ulcers** that have **purulent discharge**. The margins of the ulcers are usually raised and rolled. These lesions are commonly found within the skin folds. **Multiple lesions** are common at this stage.

If left untreated, patients usually proceed to develop **cicatricial plaques**. These plaques are usually associated with **lymphedema**. The final stage is known as **hypertrophic donovanosis** and the lesions resemble genital warts. These lesions are characterized by **epithelial proliferation and dysplasia**; hence, they carry a significant risk of **malignant transformation**.

In the third stage of donovanosis, patients can develop an **elephantiasis-like picture** that is more confined to the genitalia, rather than the lower limbs.



- **Incubation period:** 1 – 360 days after exposure (average 50 days)
- Papule or firm **nodule**, which rapidly becomes an **ulcer**
 - Distal penis, prepuce, coronal sulcus, penile shaft
 - Labia minora and fourchette
 - Cervix
 - Anus

- **Ulcer** beefy red & non-tender with rolled edges (base bleeds easily)
- **Multiple ulcers** may coalesce to form large ulcers.
- Without treatment:
 - Severe genital disfigurement
 - Pseudoelephantiasis
 - Dissemination to liver & bone

Diagnostic Workup for Donovanosis

Isolation and culture of the organism are not easy or straightforward; therefore, the best way to diagnose donovanosis is by **direct examination of smears** obtained from the base of one of the ulcers.

Microscopic examination can reveal **cytoplasmic inclusions inside macrophages and histiocytes**. Donovan bodies are bipolar-staining cytoplasmic inclusion bodies identified within macrophages. These cytoplasmic inclusions are very characteristic of donovanosis and are usually sufficient to make the diagnosis. **Giemsa or pinacyanol stains** are usually used to visualize Donovan bodies.

Polymerase chain reaction testing to identify the organism's DNA are available but unfortunately are only used for research indications. Patients presenting with donovanosis should be **screened for other sexually transmitted diseases** including [gonorrhea](#) and [chlamydia](#).

Klebsiella granulomatis organisms are known to become invasive and **infect the bone** in the late stages of the disease. Therefore, patients presenting with extensive and severe donovanosis might need specific radiography techniques, including **radio-isotope scanning of the bone or x-rays** of possibly affected bony structures to exclude bony involvement.

Histopathological examination of the ulcers can reveal **acanthosis** and **epithelial hyperplasia**. The dermis is usually infiltrated by plasma cells and macrophages. **Small subdermal abscesses** are also commonly identified on histopathological examination.



- Direct **microscopy** from smears of ulcer base or **histopathology** of a biopsy specimen
- **Donovan bodies**
 - Giemsa, Wright, or silver stains
- **Culture:** very difficult
- **Molecular methods:** promising, but none FDA-approved
- **Serology:** has no role in diagnosis.

Treatment of Donovanosis

Donovanosis is a rare condition. Because of this, treatment options for donovanosis are usually based on experience and experts' opinions, rather than on well-controlled clinical trials.

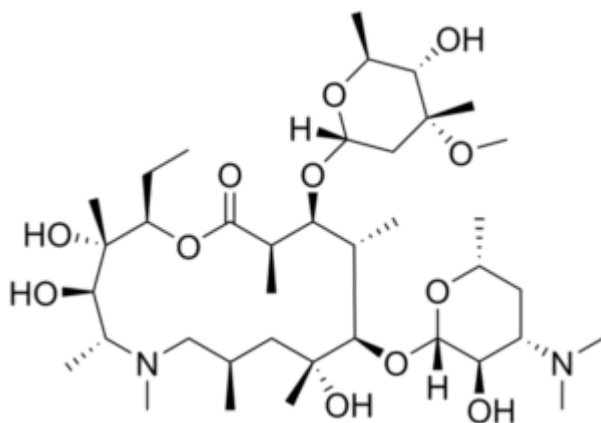


Image: "Chemical Structure of Azithromycin." by Edgar181 - Own Work. License: Public Domain

Similar to chlamydia and other sexually transmitted diseases, the treatment of choice for donovanosis is **azithromycin**. In contrast to the treatment of chlamydial urethritis, donovanosis usually needs a longer duration of treatment. Azithromycin should be given **at least for three weeks**. Treatment is sometimes longer than three weeks and the decision to stop treatment should be based upon the **complete disappearance of the disease's symptoms**.

Patients might not respond to azithromycin for the first few days. In that case, **gentamicin** should be used intravenously.

Unfortunately, despite treatment, **recurrent donovanosis** is common. The condition might recur up to one year after effective treatment. Healing of donovanosis ulcers can leave **scars** or **hypertrophic lesions**. This might be disfiguring and require **surgical correction**.

Prevention of donovanosis has been shown to be possible by **adequate sexual education, early diagnosis, and prompt treatment**. Prevention programs are becoming more readily available in endemic areas and they are showing a clear decline in the incidence of the condition since their introduction.

Prognosis

If untreated the lesions may continue to increase in size and despite treatment, recurrent donovanosis is common. Relapse may occur up to 18 months after treatment. Healing of donovanosis ulcers can leave scars or hypertrophic lesions. This might be disfiguring and require surgical correction. Squamous cell carcinoma and basal cell carcinoma may occur in long-standing lesions.

References

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