Haemophilus Ducreyi — Chancroid, Diagnosis and Treatment

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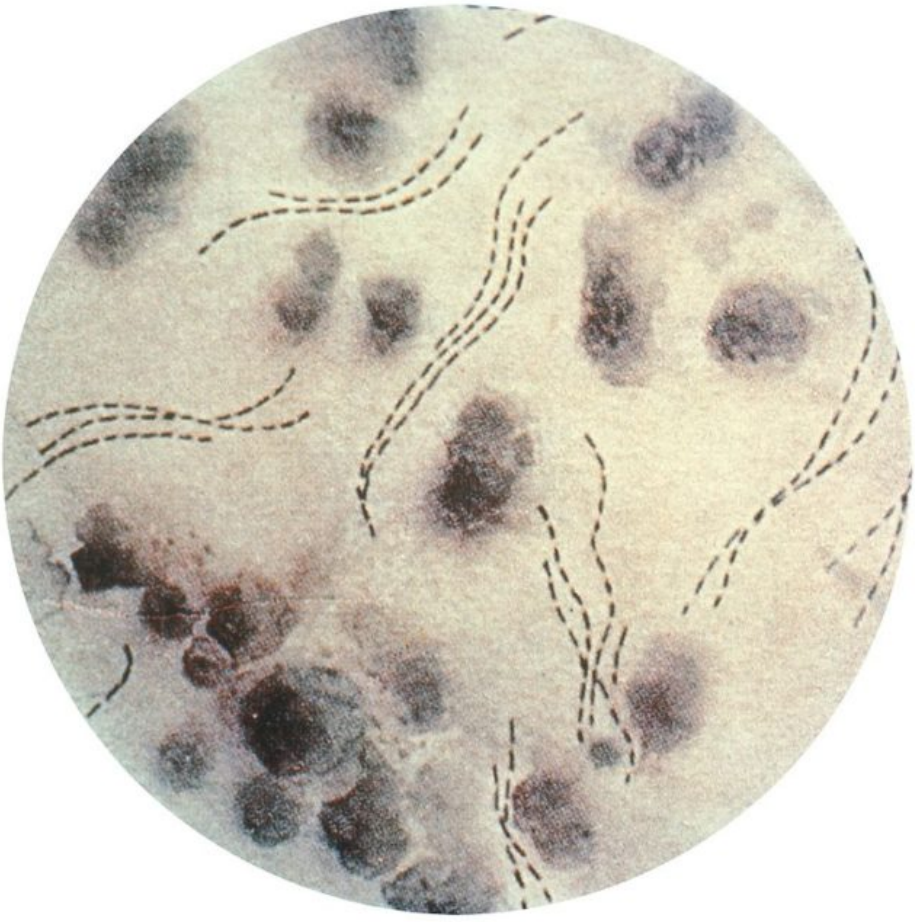
In 1889, Auguste Ducrey at the University of Naples published his research about the causative agent of chancroid, which is associated with the presence of genital ulcers. The pathogen, *Haemophilus ducreyi*, which is a gram-negative bacillus, was named after the scientist. Chancroid is a highly contagious sexually transmitted disease (STD) presenting with extremely painful genital ulcers accompanied by enlarged inguinal lymph nodes (buboes).



Background

Chancroid is a highly contagious sexually transmitted disease (STD). It presents with extremely **painful,** necrotizing genital ulcers, often accompanied by enlarged inguinal

lymph nodes (buboes), which may suppurate. It is also known as soft chancre disease.

Etiology

Chancroid is caused by a bacterium, *Haemophilus ducreyi*. ***Haemophilus ducreyi*** is a small, gram-negative, non-spore-forming, non-motile, facultative anaerobic coccobacillus that grows best in a humid atmosphere containing 5% CO_2, at temperatures of 33–35°C (microaerophilic conditions).

Pathophysiology

Haemophilus ducreyi is a highly infectious bacterium that is **transmitted sexually** when it gains tissue access via skin microabrasions and mucosal breaks that occur during sexual intercourse. It mainly affects the genital area and does not penetrate intact skin, although autoinoculation to nonsexual sites, such as the eye, has been reported. The mean incubation period is 5 to 7 days, with the range being 1 day to 2 weeks. *H. ducreyi* only affects humans and has no intermediate or secondary hosts.

After tissue invasion, the bacterium forms **tender papules**. These papules turn into **pustules** that rupture after 2 to 3 days and form uneven **ulcers**. A cytotoxin, cytolethal distending toxin (CDT), plays an important part in the formation of the ulcers.

Chancroid is not a life-threatening disease. Even if the ulcers are not treated in a timely manner, they typically resolve spontaneously within 3 months. In some cases, the ulcers may lead to complications, such as painful, suppurative lymphadenopathy.

The chronic use of antibiotics for the treatment of genital ulcers has led to the emergence of **widespread resistant strains** of *H. ducreyi* in developing countries.

Epidemiology

Chancroid is an uncommon infection in most of the developed countries, including the United States. The Centers for Disease Control and Prevention has reported only six cases of chancroid in 2014 in the US, but the actual number of cases may be higher as many cases are not tested and not reported.

The highest incidence of chancroid is observed in young adult males 20–25 years of age with a male-to-female ratio of 1:3. The incidence is also higher in individuals with low socioeconomic status, poor hygiene, high-risk sexual behavior (e.g., prostitutes), and drug abuse.

International

Chancroid is endemic in many developing nations. It is a major cause of genital ulcer disease in sub-Saharan Africa, Southeast Asia, and Latin America although the exact figures are not available. There is a racial predominance; uncircumcised, non-white men are usually affected the most.

Clinical Presentation

The first sign usually noted is an **inflammatory papule surrounded by a region of erythema**. Soon, a pustule is formed that ruptures to form a sharply circumscribed ulcer

with indurated edges.

The common clinical presentation is extremely painful ulcer(s), almost always limited to the genital area and the inguinal lymph nodes, and often multiple in number. A typical chancroid ulcer is about 1 to 2 centimeters in diameter and has an erythematous base with gray or yellow purulent discharge. The ulcer margins are clearly demarcated, and the ulcers bleed when scraped.

In men, the most common sites for chancroid are the glans penis, prepuce, corona, and perianal areas; the labia, introitus, and perianal areas are the most commonly affected areas in women.

One-half of patients with chancroid develop painful inguinal lymphadenopathy, usually unilateral. The involved lymph nodes may enlarge and present as fluctuating buboes with subsequent ulceration within 1 to 2 weeks.

Image: “A penis with patches of skin disease along the shaft; and another with a diseased glans and a lump in the groin. Chromolithograph, c. 1888. Iconographic Collections” by http://wellcomeimages.org/indexplus/obf_images/d5/b4/ae9e84207d86782e72728582c163.jpg Gallery: http://wellcomeimages.org/indexplus/image/V0010270.html. License: CC BY 4.0

The patients with *H. ducreyi* ulcers may give a history of unprotected sex with multiple partners and prostitutes. **Other signs may be:**

- Dyspareunia
- Vaginal discharge
- Fever

Differential Diagnosis

- Herpes simplex
- Syphilis (chancre)
- Lymphogranuloma venereum
- Donovanosis (granuloma inguinale)
- Behçet syndrome
- Fixed drug eruptions

Investigations

Laboratory studies

- **Microscopy of Gram stain smear**: Gram stain microscopic examination of *H. ducreyi* looks like “fingerprints” or “schools of fish”.
- **Culture:** The isolation of *H ducreyi* on special media will confirm the diagnosis, but such tests are not widely available.
- **Polymerase chain reaction (PCR):** Almost 100% specific and sensitive but expensive.
- **Immunochromatography**: 100% specific and cost-effective. It takes 15 minutes to perform the test, and it is useful to express diagnostics of painful genital ulcers.

Every patient with chancroid should be tested for HIV/AIDS and other common sexually transmitted diseases, such as syphilis, herpes simplex virus, gonorrhea, and chlamydia.

Treatment

Antimicrobial therapy is the mainstay of treatment for chancroid and should be started as soon as the diagnosis is suspected. The following antibiotic regimens have been recommended by the Centers for Disease Control and Prevention (CDC):

- Azithromycin – 1 g orally (PO) as a single dose **or**
- Ceftriaxone – 250 mg IM as a single dose **or**
- Ciprofloxacin – 500 mg PO twice daily for 3 days **or**
- Erythromycin base – 500 mg PO three times daily for 7 days

Azithromycin and ceftriaxone have the advantage of increased compliance as they are administered as a single-dose regimen and they are also comparatively safe in pregnant women.

Needle aspiration and/or **incision** and **drainage** may be needed for the management of buboes.

Patients should avoid unprotected sexual intercourse during the course of treatment until the ulcers have resolved. Their sexual partners should also be treated irrespective of the symptoms.

References

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Epidemiology of Haemophilus ducreyi Infections via nih.gov

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UK National Guideline for the Management of Chancroid 2014 via bashh.org

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Notes