Haemophilus Ducreyi — Chancroid, Diagnosis and Treatment

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In 1889, Auguste Ducrey at the University of Naples published his research about the causing agent of chancroid associated with the presence of genital ulcers, 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 that may be accompanied by enlarged
inguinal lymph nodes (buboes). It 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% CO₂, at the temperature of 33-35°C (microaerophilic conditions).

### Pathophysiology

*Haemophilus ducreyi* is a highly infectious bacterium that is transmitted sexually by gaining tissue access via skin micro-abrasions and mucosal breaks that occur during sexual intercourse. It mainly affects the genital area and does not penetrate the intact skin, although auto-inoculation has been reported to the non-sexual sites, such as the eye. The mean incubation period is 5 – 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, which later turn into pustules that rupture after 2 – 3 days forming uneven ulcers. A cytotoxin, cytolethal distending toxin (CDT) plays an important part in the formation of ulcers.

Chancroid is not a life-threatening disease. Even if the ulcers are not treated timely, they resolve spontaneously within three months and some 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 the widespread resistant strains of *H. ducreyi* in the 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 high incidence of chancroid is observed in young adult males of 20-25 years of age with a male-to-female ratio of 1:3. The incidence is also higher in persons with low socioeconomic status, poor hygiene, 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 common clinical presentation is with extremely painful ulcer(s) that are almost always limited to the genital area and the inguinal lymph nodes, and are often multiple in number. A typical chancroid ulcer is around 1 to 2 centimeter in diameter, having an erythematous base with a 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 while the labia, introitus, and perianal areas are most commonly affected areas in women.

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

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 but cost-effective. It takes 15 minutes to perform the test, useful in express diagnostics of painful genital...
ulcers.

Every patient with chancroid should be tested for the 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 and their sexual partners should also be treated irrespective of the symptoms.

**References**

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