

END THE OF HORROR WORM: *Dracunculus medinensis*.

Farhan A. Yusuf, School of Pharmacy, B.Pharm IV

INTRODUCTION

Dracunculus medinensis is a nematode that causes **dracunculiasis**. It is also known as the guinea worm disease and is caused by the large female nematode which is the longest nematode infecting humans. The adult female is longer than the male and can grow up to about 1m in length inside the body of the human host. The worm inhabits the cutaneous and subcutaneous tissues of infected individuals.

Scientific Classification of *D. medinensis*

Kingdom: Animalia	Superfamily: Dracunculoidea
Phylum: Nematoda	Family: Dracunculidae
Class: Secernentea	Genus: <i>Dracunculus</i>
Order: Camallanida	Species: <i>D. medinensis</i>

Binomial name: *Dracunculus medinensis*



Figure 1: Male and female guinea worm, female longer than male.



Figure 2: copepod

Life Cycle.

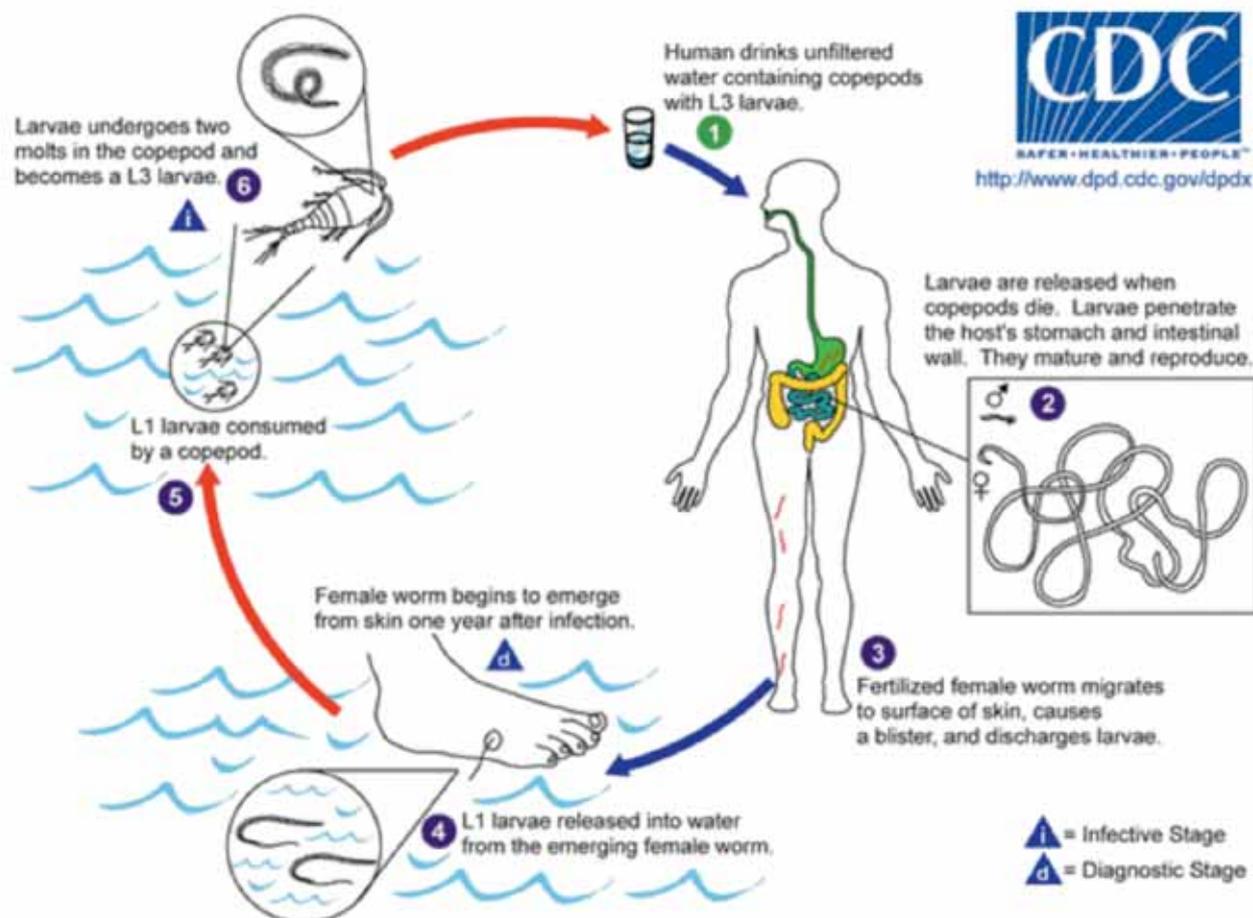


Figure 3: The lifecycle of the guinea worm

Humans become infected by drinking unfiltered water containing copepods (small crustaceans) that have been infected with *D. medinensis* larvae. After ingestion, the copepods die and release the larvae, which then penetrate the host's stomach, intestinal wall, and enter into the abdominal cavity and retroperitoneal space.

After maturing, an adult male worm dies after mating while the female migrates into the subcutaneous tissues towards the surface of the skin. After about a year of infection, the female worm forms a blister on the skin, generally on the distal lower extremity (foot), which breaks

open. It can also emerge from other parts of the body like the head, torso, upper extremities, buttocks, and genitalia. The patient then seeks to relieve the local discomfort by placing their foot in water, but when the lesion comes into contact with water, the female worm emerges and releases her larvae. The larvae are then ingested by a copepod, and after two weeks (and two molts) the larvae become infectious. Ingestion of the copepods in drinking water is the last stage that completes the cycle.

Pathology.

Female worms elicit allergic reactions during

blister formation as they migrate to the skin, causing an intense burning pain. Such allergic reactions produce rashes, nausea, diarrhea, dizziness, and localized edema. Upon rupture of the blister, allergic reactions subside but skin ulcers form, through which the worm can protrude, the ulcers can be infected by bacteria leading to abscesses. Healing is complete only when the worm is removed.

Death of the adult worms in joints can lead to arthritis and paralysis in the spinal cord.



Figure 4: The worm finds its way out upon rupture of the blister

Interesting features of the parasite that make it very difficult to manage.

As the female grows inside the body, the host remains unaware of its presence. The worms prevent pain by secreting opiates and dodge the immune system by coating themselves with human proteins. The pain and burning sensation it causes when the blister ruptures causes the victim to go to search for cool water to relieve the burning where the female can release larvae.

The annual cycle maximizes the chances of the larvae finding stagnant water where the copepods can be infected.

There is no vaccine to prevent the disease, no drug to treat it and no protective immunity after infection to prevent re-infection.

Therefore the only way to deal with this infection is to prevent the disease from spreading.

The main **effects** of the disease are on the productivity of the infected people. Children infected cannot go to school and adults infected are so weakened and in pain that they cannot take part in farming and other productive activities leading to an increased financial burden.

Treatment.

The traditional technique which involves winding the worm out on a stick has been a treatment used successfully for centuries but proves to be a very painful method. An alternative method is done by surgically removing the worm. The surgical procedure is only successful if the entire worm is near the surface of the skin.



Figure 5: A worm being rolled out from a patient

Preventive measures taken.

Only humans are infected by the guinea worm, and the larvae die within months if no one

swallows the copepods carrying them. So stop human infections and the worm disappears.

There are two simple ways of preventing infection:

- Stop infected people from contaminating the water supplies with the larvae.
- Drink boiled and filtered water.

Clean drinking water alone helped eradicate guinea worm from many countries over the past century. Then, in 1986, the World Health Organization declared guinea worm eradication an official goal.

Making of wells and bore holes would be the ideal method to make sure that clean water is supplied but these methods have proved to be expensive therefore cheaper and effective measures have been employed to deal with the situation.

The successful measures that have been taken so far include:

- Filters for household water stores.
- Use of pesticides to kill the copepods and.
- Containment areas for infected people to go to when the worm appears. This prevents infected individuals from contaminating water supplies. Now there are many containment centers in Africa staffed by local volunteers trained to remove worms using the tiring method of winding them gently around a stick.

Challenges being faced.

- Financial constraints.

- Changing people's beliefs – caused by witchcraft.
- Changing people's behavior and removing doubts.
- As cases become rarer they, are more difficult to find and contain.

Conclusion.

With all these measures taken, most of the disease has already been eradicated with the major burden now lying in Sudan where the prevalence of war conditions presents itself as a bottleneck. But the efforts are there and the people responsible seem optimistic that by 2012 we may bid our farewell to this real life monster.

The challenge also lies in finding ways to eradicate other bacterial, viral and protozoan diseases. These are more difficult to tackle because their numbers are greater and so is the distribution. But the hope and the will is there, all that is needed is a way.

References.

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