Cutaneous Larva Migrans

Cutaneous larva migrans is a roundworm (usually hookworm) infection.[1] The hosts are cats, dogs and other animals. Humans normally become infected with the hookworm larvae by walking barefoot on a beach, or by contact with soil that is contaminated with animal faeces.[2] Infection occurs most commonly in tropical or subtropical areas. Increase in foreign travel means that it is becoming increasingly common to see cutaneous larva migrans in the UK.

Aetiology[1, 2]

A number of different roundworms can cause cutaneous larva migrans:

- *Ancylostoma braziliense*: the most common; hosts are wild and domestic dogs and cats; primarily found in central and southern USA, Central and South America and the Caribbean
- *Ancylostoma caninum*: hosts are dogs; primarily found in Australia.
- *Uncinaria stenocephala*: hosts are dogs; primarily found in Europe.
- *Bunostomum phlebotomum*: hosts are cattle.

Rarely:

- *Ancylostoma ceylanicum*.
- *Ancylostoma tubaeforme*: hosts are cats.
- *Strongyloides papillosus*: hosts are sheep, goats, and cattle.
- *Strongyloides westeri*: hosts are horses.

Nematodes that use humans as a primary host:

- *Necator americanus*.
- *Ancylostoma duodenale*.

NB: cutaneous larva migrans should not be confused with visceral larva migrans and ocular larva migrans which are different conditions caused by the parasites *Toxocara canis* or *Toxocara cati* (common roundworms of dogs and cats).

Life cycle

- Deposited faeces from the animal host can contain hookworm eggs. These hatch in warm, moist, sandy soil.
- Larvae that come into contact with human skin can penetrate through hair follicles, tiny skin cracks or even intact skin. The larvae then migrate underneath the skin. Unlike in the animal host, the larvae cannot penetrate the dermis in humans, limiting cutaneous larva migrans to the outer layers of skin.
- In animal hosts, penetration of the dermis and passage of the larvae into the venous and lymphatic system allows transportation to the lungs. Migration to the trachea leads to swallowing of the larvae by the animal host. There is maturation of the larvae in the intestine, subsequent egg production, and then excretion in the faeces. This completes the life cycle and allows transmission.
- *N. americanus*, *A. duodenale* and *S. stercoralis* are nematodes that use humans as a primary host and are rare causes of cutaneous larva migrans. With these species, infection can lead to the completion of the life cycle in humans with adult worms living in the intestines. This can lead to diarrhoea, malabsorption and malnutrition.[1]
Epidemiology

- It can affect all ages but tends to be seen more commonly in children.
- Infection occurs most commonly in tropical or subtropical areas. Cutaneous larva migrans is indigenous to the Caribbean, Central and South America, Africa, and Southeast Asia.

Risk factors

- Sunbathing and walking on the beach barefoot.
- Children may have been playing in sandpits.
- Soil under housing and at construction sites may also be contaminated.

Presentation

- In the history taking, ask about recent travel and other risk factors.
- The feet, toe web spaces, hands, knees, abdomen, anogenital region and buttocks are the most common sites of hookworm penetration.
- Penetration can cause tingling or pricking of the skin at that site within 30 minutes.
- There may be a nonspecific, erythematous skin eruption at the site of hookworm entry.
- Larvae can remain dormant for some months but migration can sometimes begin immediately.
- Once the larvae begin migration, raised, pink or flesh-coloured, tortuous, snake-like tracks that are 2-3 mm wide form about 3-4 cm from the site of penetration. This is due to an allergic immune response to the larvae or its byproducts.
- Tracts can advance between 2 mm-2 cm per day, depending on the species.
- Skin lesions can cause intense pruritus.

Differential diagnosis

- Contact dermatitis.
- Dermatophytoses.
- Erythema chronicum migrans associated with Lyme disease.
- Photoallergic dermatitis.
- Scabies.

Investigations

- Diagnosis is usually clinical. (The Dermatology Information System (DermIS) link below has images of typical skin changes).[5]
- Skin biopsy ahead of the leading tract may show a larva in a burrow and inflammatory infiltrate.[6]
- Optical coherence tomography can identify the larvae in the epidermis and allow direct removal.[7]

Management

Cutaneous larva migrans is a self-limiting infection but can be treated with albendazole or ivermectin.[8] Most cases will resolve within 4-8 weeks because the larvae cannot penetrate the dermis, cannot reproduce, and eventually die.[2]

- Treatment with anthelmintics can shorten the disease course, ease pruritus and lead to resolution of skin tracts within one week.[2]
- Liquid nitrogen cryotherapy for the progressive end of the larval burrow is another alternative treatment. However, it is painful and multiple treatments are usually needed.[9]
- Antihistamines and topical corticosteroids can be added to the treatment to help pruritus.

Complications

- Secondary skin infection which may need treatment with antibiotics.
- Löffler's disease: this is the combination of pulmonary infiltrates and eosinophilia that can occur with heavy infestation of larvae. A generalised sensitisation with soluble antigens in the lung causes the pulmonary infiltrates.[10]

Prognosis

- Cutaneous larva migrans is a self-limiting condition and, without any treatment, most cases will resolve within 4-8 weeks.[2]

Prevention

- Avoiding direct skin contact with contaminated soil - eg, wearing shoes on the beach, and not sunbathing or sitting directly on sand.
- Prohibiting cats and dogs on beaches.
- Deworming of pets.
- Covering sandpits when not in use.
Further reading & references

2. Cutaneous larva migrans; DermNet NZ, Accessed October 2008
5. Larva Migrans Cutanea; DermIS (Dermatology Information System)
8. Hookworm; DPDx, Centers for Disease Control and Prevention

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