Cutaneous larva migrans

- Updated 2014 Dec 12 07:39:00 AM: case report of creeping eruption due to spirurina type X larva (Lancet 2014 Dec 6) view update | Show more updates

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### General Information

#### Description:
- parasitic skin disease caused by animal hookworm larvae characterized by erythematous, pruritic track at infection site

#### Also called:
- CLM
- creeping eruption
- creeping verminous dermatitis
- sandworm eruption
- hookworm folliculitis
- plumber's itch

### Epidemiology

#### Who is most affected:
- infection most common in inhabitants of and travelers to tropical and subtropical countries
  - Southeast Asia
  - Africa
  - South America
  - Caribbean
- also common in southeastern United States
- cutaneous larva migrans infection more common in tourists than business travelers or immigrants
  - based on prospective cohort study
  - 165 patients with skin disease after returning from tropical areas were evaluated
  - 8 patients (4.8%) had cutaneous larva migrans
  - tourists associated with higher risk of cutaneous larva migrans compared to immigrants, expatriates, or business travelers in univariate analysis (p = 0.001)
Incidence/Prevalence:
- cutaneous larvamigrans accounts for 2%-3% of illnesses in travelers, with highest prevalence in travelers returning from Caribbean, Southeast Asia, and Central America\(^1\)
- peak prevalence in rainy season\(^1\)
  - eggs and larvae survive longer in moist soil
  - **cutaneous larvamigrans more common during rainy season and in children in endemic area in Brazil**
    - based on 2 cross-sectional surveys, 1 conducted in dry season and 1 in rainy season in Brazil
    - overall prevalence 4.4% in rainy season vs. 1.7% in dry season
    - peak prevalence (14.9%) in children ≤ 4 years old
- 22 cases of cutaneous larvamigrans in outbreak at children's aquatic day camp in Florida in July 2006 (MMWR Morb Mortal Wkly Rep 2007 Dec 14;56(49):1285 full-text)

Likely risk factors:
- possible exposure risks include living in or traveling to endemic area, especially with beach exposure\(^1, 2\)
- less frequent use of protective footwear while walking to beach in endemic area may increase risk of infection (Trop Med Int Health 2000 May;5(5):330 full-text)
- **walking barefoot and living in home without solid floor associated with higher risk of cutaneous larvamigrans**
  - based on 2 cross-sectional surveys
  - 62 patients with cutaneous larvamigrans identified in 2 villages in rural Brazil
  - factors associated with increased risk of cutaneous larvamigrans
    - living in home without solid floor (odds ratio [OR] 1.99, 95% CI 1.22-3.23)
    - walking barefoot (OR 1.77, 95% CI 1.12-2.8)

Causes:
- infection with animal hookworms\(^1, 2, 3\))
  - most common causative species
    - Ancylostoma braziliense
    - Ancylostoma caninum
  - other causative species include
    - Uncinaria stenocephala
    - Bunostomum phlebotomum

Pathogenesis:
- adult hookworms living in intestines of animals (typically cats or dogs) shed eggs in feces\(^1, 2, 3\)
- eggs hatch in soil and develop into infective larvae\(^1, 2, 3\)
- human infection usually due to contact with larvae in soil or sand, or even by contact with contaminated clothes or towels\(^1, 2\)
- larvae penetrate corneal layer of epidermis causing reddish papule at entry site\(^4\)
- typically, larvae cannot move into lymphatic or venous systems of humans (humans are accidental hosts), remaining confined to skin and do not complete life-cycle\(^1, 2\)
- larvae eventually die and are resorbed\(^2\)
- very rarely, Ancylostoma caninum larvae may invade intestines causing eosinophilic enteritis\(^1, 3\)

**History and Physical**

**History:**

**Chief concern (CC):**
- extreme pruritus at infection site\(^1, 2\)
- linear or serpiginous, slightly elevated, erythematous track in skin\(^1, 2\)
- pain may also be present\(^1\)
- Ancylostoma caninum may rarely enter intestine and cause eosinophilic enteritis characterized by\(^1\)
  - abdominal pain
  - nausea
  - diarrhea

**History of present illness (HPI):**
- track usually appears 1-5 days after larval penetration\(^1, 2\)
- incubation period may last ≥ 1 month, as long as 4-7 months have been reported\(^1, 2\)
- track extends a few mm to cm per day\(^2\)
- may last from 2-8 weeks to several months (in rare cases may last for years)\(^1, 2\)

**Social history (SH):**
- ask if patient has lived in or visited area with endemic hookworm\(^1\)

**Physical:**

**Skin:**
- linear or serpiginous, slightly elevated, erythematous tracks in skin\(^1, 2, 3\)
  - about 3 mm wide, up to 15-20 mm long
  - may extend a few mm to cm per day
  - majority of patients have single track
  - track location
    - usually on feet, buttocks, or thighs
    - may also be on arms, elbows, legs, knees, breasts, or back
    - rarely found on face, scalp, genitals, or oral mucosa
  - image can be found in *N Engl J Med 2010 Jan 28;362(4):e10* full-text
- other skin findings may include\(^1, 2\)
Lungs:

- check for signs of pulmonary eosinophilia (Loeffler syndrome)(1, 2)

**Making the diagnosis:**

- diagnosed clinically by characteristic tracks in skin(1, 2)
  - creeping eruption
  - linear or serpiginous
  - slightly elevated
  - erythematous
  - pruritic
- diagnosis supported by exposure risks including living in or traveling to endemic area, especially with beach exposure(1, 2)

- images of skin presentations can be found in *Am Fam Physician* 2010 Jan 15;81(2):203 full-text and *Am Fam Physician* 2005 Dec 1;72(11):2313 full-text

**Differential diagnosis:**

- other parasitic causes of creeping eruption(1, 2)
  - gnathostomiasis (*Lancet* 2001 Mar 31;357(9261):1011), commentary can be found in *Lancet* 2001 Jul 28;358(9278):332
  - Pelodera strongyloides and zoonotic Strongyloides spp.
  - Spirurina spp.
  - larva currens (Strongyloides stercoralis)
  - *loiasis* (Loa loa)
  - dracunculiasis (*Dracunculus medinensis*)
  - fascioliasis (*Fasciola gigantica*)
  - migratory myiasis (*Gasterophilus* spp.)
  - cercarial dermatitis (swimmer's itch)
- *scabies*
- *tinea corporis*(1)
- contact dermatitis(1)
- *herpes zoster*(1)
- serpiginous ganglion cyst(1)
Ancylostoma caninum associated eosinophilic enteritis may be mistaken for acute appendicitis or intestinal obstruction\(^1\)

**Testing overview:**
- testing not usually needed for diagnosis\(^1,2\)
  - blood tests not routinely recommended, though may show eosinophilia
  - skin biopsy rarely identifies parasite, though may reveal larvae in follicular canal in patients with hookworm folliculitis

**Treatment overview:**
- untreated eruptions usually resolve in 2-8 weeks\(^2\)
- medication options for antihelminthic treatment of cutaneous larvamigrans
  - ivermectin 200 mcg/kg orally single dose, second dose if treatment failure
  - albendazole 400-800 mg orally daily for 3-7 days
  - thiabendazole tiabendazole 10%-15% topically 3 times daily for 5-7 days
  - single-dose ivermectin may be more effective for treating cutaneous larvamigrans than single-dose albendazole (level 2 [mid-level] evidence)
  - topical thiabendazole reported to be as effective as oral albendazole for treatment of cutaneous larvamigrans (level 2 [mid-level] evidence)
- treat secondary impetigo with topical antibiotics\(^1,2\)

**Medications:**
- ivermectin\(^1,2\)
  - dosing 200 mcg/kg orally single dose, second dose if treatment failure
  - hookworm folliculitis may require multiple doses
  - contraindicated in pregnant or breastfeeding women and children weighing < 15 kg (33 lbs) or < 5 years old, though significant adverse events not reported in these populations when used off-label or inadvertently
  - ivermectin reported to be effective for treatment of cutaneous larvamigrans (level 3 [lacking direct] evidence)
    - based on case series
    - 64 patients with cutaneous larvamigrans treated with ivermectin 200 mcg/kg, 14 patients had 1-2 subsequent doses
    - single-dose cure rate 77%, overall cure rate 97%
    - pruritus resolved in median 3 days, lesions disappeared in median 7 days
    - Reference - Clin Infect Dis 2000 Aug;31(2):493 full-text, correction can be found in Clin Infect Dis 2001 Feb 1;32(3):523
  - single-dose ivermectin may be more effective for treating cutaneous larvamigrans than single-dose albendazole (level 2 [mid-level] evidence)
    - based on small randomized trial without blinding
    - 21 patients with cutaneous larvamigrans randomized to ivermectin 12 mg orally
single dose vs. albendazole 400 mg orally single dose

- cure rate without relapse 100% in ivermectin group vs. 47% in albendazole group ($p = 0.017$)
- no significant adverse effects reported with either treatment

- albendazole$^{(1,2)}$
  - dosing 400-800 mg orally daily for 3-7 days
  - **oral albendazole 400 mg/day for 1 week reported to be effective for treatment of cutaneous larvamigrans (level 3 [lacking direct] evidence)**
    - based on case series
    - 24 patients with cutaneous larvamigrans with extensive and/or multiple lesions were treated with albendazole 400 mg orally daily for 7 days
    - 100% cure rate with no recurrences reported
    - no adverse effects reported
  - **albendazole ointment reported safe and effective for treatment of cutaneous larvamigrans in children (level 3 [lacking direct] evidence)**
    - based on case series
    - 2 children (each aged 2 years) with cutaneous larvamigrans treated with albendazole 10% ointment 3 times daily for 10 days
    - lesions resolved within 1 week of treatment
    - 1 patient had relapse after 3 months in different area of body, which resolved within 1 week after additional round of treatment

- thiabendazole/tiabendazole$^{(1,2)}$
  - topical treatment with 10%-15% concentration 3 times daily for 5-7 days$^{(1)}$
    - effective for cutaneous larvamigrans, but of limited use for multiple or widespread lesions
    - not effective against hookworm folliculitis
  - **topical thiabendazole reported to be as effective as oral albendazole for treatment of cutaneous larvamigrans (level 2 [mid-level] evidence)**
    - based on retrospective cohort study
    - 44 patients with cutaneous larvamigrans received 1 of 4 treatments
      - albendazole 400 mg orally daily for 3-5 days (31 patients)
      - thiabendazole 10% cream topically for 10 days (5 patients)
      - thiabendazole 1.5 g orally for 3 days (4 patients)
      - no treatment due to resolution of lesions (4 patients)
    - 77% cure rate in patients receiving oral albendazole and 80% in patients receiving topical thiabendazole
    - all patients receiving oral thiabendazole required additional treatment
○ oral dosing 50 mg/kg/day for 2-4 days
  - not routinely recommended as frequent adverse effects and lower efficacy than ivermectin or albendazole
  - not available worldwide
○ treat secondary impetigo with topical antibiotics\(^1, 2\)

**Other management:**
○ freezing edge of track not recommended as painful and largely ineffective\(^1, 2, 3\)

**Complications and Prognosis**

**Complications:**
○ secondary bacterial infection from scratching infected area\(^1, 2\)
  - common pathogens are Staphylococcus aureus or streptococci
  - may occur in 8%-24% of patients in resource-poor communities, and 0%-8% of returning travelers with cutaneous larva migrans
○ eosinophilic pneumonia may occur\(^2\)
○ visceral larva migrans caused by Ancylostoma caninum in case report (*Minerva Pediatr 1981 Sep 30;33(18):917 [Italian]*)

**Prognosis:**
○ untreated eruptions usually resolve in 2-8 weeks, although infections as long as 2 years reported\(^1, 2\)
○ symptoms usually resolve within 1 week with medication\(^2\)

**Prevention and Screening**

**Prevention:**
○ treat dogs and cats regularly with antihelminthic drugs\(^1\)
○ consider limiting access of dogs and cats to urban beaches and playgrounds\(^1\)
○ encourage removal of dog or cat feces by pet owner, especially in urban areas\(^1\)
○ cover sandboxes to prevent animals from defecating in and contaminating soil\(^1, 3\)
○ when visiting beaches in endemic areas\(^1, 2, 3\)
  - wear sandals or other protective footwear
  - use sun chair or mattress when sitting or laying down as towels do not provide sufficient protection
  - avoid beaches where dogs and cats are present
  - lay in areas of sand washed by tide rather than dry sand

**Guidelines and Resources**

**Guidelines:**
- World Health Organization (WHO) guideline on evaluation of soil-transmitted helminthiasis and schistosomiasis at community level can be found at [WHO 1998 PDF](#).
- World Health Organization (WHO) guideline on assessing efficacy of antihelminthic drugs against schistosomiasis and soil-transmitted helminthiases can be found at [WHO 2013 PDF](#).

**Review articles:**
- Case report can be found in [JAMA 2014 Oct 8;312(14):1458](#).
- Case presentation can be found in [CMAJ 2008 Jul 1;179(1):51 full-text](#).
- Case presentation can be found in [Cleve Clin J Med 2006 May;73(5):458 PDF](#).
- Case presentation can be found in [J Fam Pract 2006 Sep;55(9):773](#).
- Case presentation can be found in [Am Fam Physician 1999 Aug;60(2):471 full-text](#).
- Case report can be found in [Am Fam Physician 2010 Jan 15;81(2):203 full-text](#).
- Case report of creeping eruption due to spirurina type X larva can be found in [Lancet 2014 Dec 6;384(9959):2082](#).
- Case report of Cutaneous myiasis in patient with seborrheic eczema can be found in [Lancet 2014 Mar 15;383(9921):1012](#).
- Case report of hookworm folliculitis can be found in [Am Fam Physician 2005 Dec 1;72(11):2313 full-text](#).

**MEDLINE search:**
- To search MEDLINE for (*Cutaneous larvamigrans*) with targeted search (Clinical Queries), click [therapy, diagnosis, or prognosis](#).

**Patient Information**
- Handout from [University College London Hospitals PDF](#).
- Technical information from [Patient Plus](#).

**ICD-9/ICD-10 Codes**

**ICD-9 codes:**
- 126.2 ancylostomiasis due to *Ancylostoma braziliense*
- 126.3 ancylostomiasis due to *Ancylostoma ceylanicum*
- 126.8 other specified ancylostoma
- 126.9 ancylostomiasis and necatoriasis, unspecified

**ICD-10 codes:**
- B76.0 ancylostomiasis

**References**

**General references used:**

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