79

A 34-Year-Old Male Immigrant from Peru With Chronic Diarrhoea and Severe Weight Loss

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Clinical Presentation

History

A 34-year-old man presents to a hospital in Chile with a 6-month history of severe chronic diarrhoea associated with colicky abdominal pain and weight loss of approximately 20 kg. For more than 12 years he has suffered from recurrent episodes of diarrhoea and abdominal cramps; the frequency of these episodes appears to have increased in the past 2 years.

The patient originates from northern Peru but has been living in Chile for the past 9 years. He reports that his Peruvian wife and children are healthy, but that his mother and one brother suffered from chronic abdominal symptoms of unknown origin, leading to wasting and subsequent death at the age of 45 and 28 years, respectively.

Clinical Findings

The patient is cachectic with a severe loss of muscle mass and a body weight of 44 kg (BMI 17). Apart from slight pain on abdominal palpation, the physical examination is normal: He is afebrile, liver and spleen are not enlarged, there is no palpable lymphadenopathy and no peripheral oedema.

Laboratory results

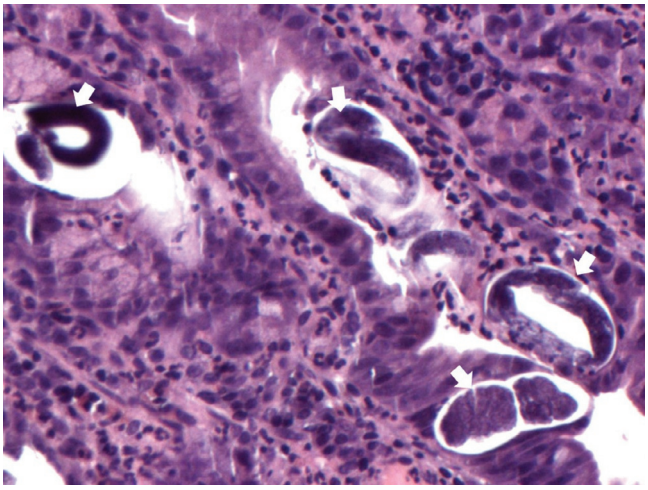
His laboratory results on admission are shown in Table 79.1.

Other Investigations

Abdominal CT scan and abdominal MRI are without any pathological findings. Oesophagogastroduodenoscopy appeared macroscopically normal. Histology of a duodenal biopsy is shown in Fig. 79.1.

TABLE 79.1 Laboratory Results

Parameter	Patient	Reference
WBC ($\times 10^9$/L)	11.7	4.5–11.0
Platelets ($\times 10^9$/L)	644	150–450
Haemoglobin (g/dL)	12.4	13.5–17.5
Protein (g/dL)	4.9	6.0–8.0
Albumin (g/dL)	2.2	3.5–5.0
ESR (mm/h)	26	1–14
HIV test	negative	-



• **Fig. 79.1** Duodenal biopsy with signs of chronic duodenitis and multiple elongated structures (arrows) compatible with a helminth infection (H&E stain, magnification ×400).

Questions

1. Which helminth infections can cause such clinical manifestations and which parasitological examination(s) should urgently be performed to clarify the histopathology report?
2. Would you order any additional investigations?

Discussion

A migrant of Peruvian origin living in Chile presents with chronic diarrhoea and abdominal pain, leading to severe weight loss and cachexia. Laboratory values show signs of malabsorption and inflammation. The physical examination, abdominal imaging and upper GI endoscopy are unremarkable, but the pathologist reports structures compatible with helminth infection in duodenal biopsies.

Answer to Question 1

Which Helminth Infections Can Cause Such Clinical Manifestations and Which Parasitological Examination(s) Should Urgently Be Performed to Clarify the Histopathology Report?

Chronic diarrhoea, malabsorption and wasting are usually not associated with intestinal helminth infections. Therefore diagnosis and treatment are often delayed. The two main helminth species capable of causing chronic diarrhoea and wasting are *Strongyloides stercoralis* and *Capillaria philippinensis* (see Case 58). In immunocompromised patients, intestinal protozoa such as *Cryptosporidium* species or *Cystoisospora belli* might cause similar manifestations. Our patient originated from northern Peru, a tropical region highly endemic for *S. stercoralis.* Routine ova and parasite stool tests might be ordered; but most importantly, specific tests to detect larvae of *S. stercoralis* such as an agar plate method or the Baermann technique should be performed. The latter has the advantage of being technically simple and providing results within a few hours. If stool samples are positive, respiratory samples and urine should also be examined for *S. strongyloides* larvae.

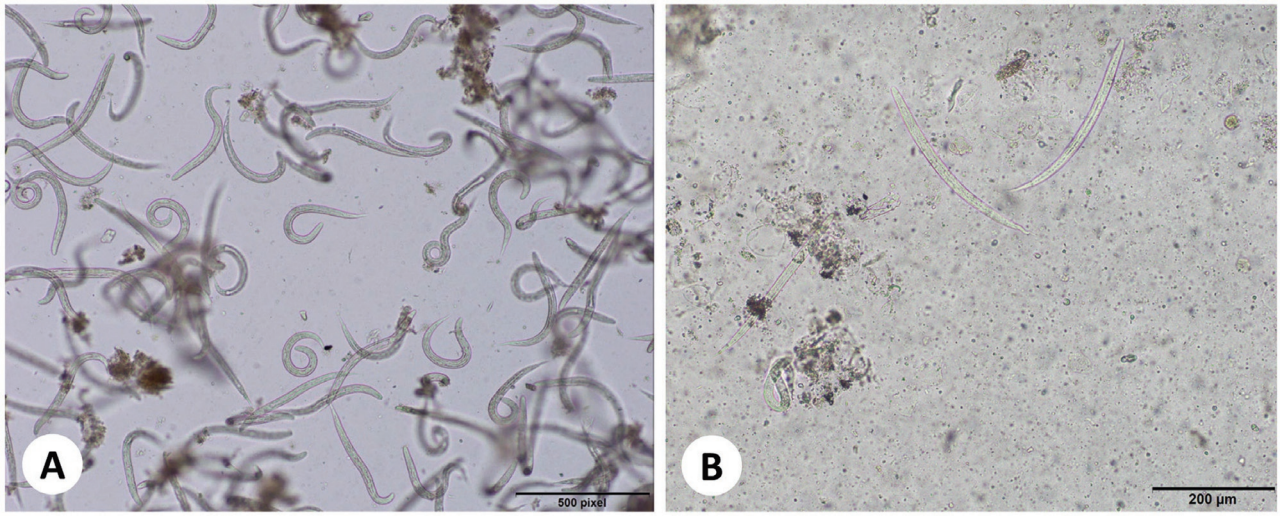
Answer to Question 2

Would You Order Any Additional Investigations?

Because *S. stercoralis* is the most probable cause of this severe disease, serology for HTLV-1 should be ordered. HTLV-1 is an important risk factor for *S. stercoralis* hyperinfection syndrome, and Peru is endemic for this retrovirus. The family history of the patient also hints at this virus that is commonly transmitted by breastfeeding.

The Case Continued…

The patient was hospitalized and stabilized under symptomatic treatment and parenteral nutrition. After the histopathology report was received, a fresh stool sample was sent to the parasitology laboratory for Baermann testing, which demonstrated a high load of rhabditiform larvae of *S. stercoralis* (Fig. 79.2A). Numerous larvae were also present in respiratory secretions (Fig. 79.2B), but not in urine. Oral treatment with ivermectin (200 μg/kg per day × 7 days) was initiated and repeated after 2 weeks. HTLV-1 coinfection was confirmed by serology. The patient recovered from diarrhoea and other abdominal symptoms within weeks. Parasitological follow-up examination after 3 months was negative. At that point, the patient had gained 13 kg and was without postprandial abdominal cramps for the first time in more than 10 years. Baermann testing of the family and other household members revealed asymptomatic *S. stercoralis* infection of his wife and one of the two children. His wife tested HTLV-1 positive, but both children were negative.



• **Fig. 79.2** (A) Baermann technique showing high load of motile rhabditiform larvae of *S. stercoralis* in a stool sample. (B) Rhabditiform larvae are also present in a wet mount preparation of respiratory secretion.

SUMMARY BOX

HTLV-1-Associated *Strongyloides stercoralis* Hyperinfection Syndrome

S. stercoralis is a soil-transmitted nematode, capable of maintaining chronic intestinal infection through a cycle of auto-infection. It is a poverty-associated neglected disease, endemic in most tropical and subtropical regions worldwide. Strongyloidiasis is not unusual in returning travellers, who typically present with non-specific gastrointestinal complaints and/or eosinophilia (see Case 20). In immunocompromised patients, the parasite may multiply massively, resulting in severe and potentially fatal complications, commonly called "hyperinfection syndrome". Corticosteroids play a major role as a risk factor for strongyloides hyperinfection syndrome. In addition, HTLV-1 infection is an important predisposing condition.

HTLV-1 is a neglected retrovirus, which is primarily transmitted by breastfeeding, but also by sexual contact and blood products. It causes a Th1-predominant T-cell proliferation and a marked shift towards type 1 cytokines. This immunological imbalance affects the Th2-mediated control of *S. stercoralis,* with the risk of accelerated auto-infection leading to increased loads of *Strongyloides* adults and larvae.

In HIV/AIDS, T-cell response is shifted towards Th2 cytokines; therefore HIV infection is not usually associated with strongyloides hyperinfection syndrome, even though some cases have been described, e.g. in the context of immune reconstitution inflammatory syndrome (IRIS).

HTLV-1-associated *S. stercoralis* hyperinfection syndrome mostly presents as severe chronic diarrhoea, malabsorption, and wasting. Disseminated forms, which are characterized by invasion of extraintestinal tissues (apart from the lung passage of larvae), a more rapid progress and a high lethality, are more typically found in patients under corticosteroid therapy. Because patients with hyperinfection lack common hallmarks of strongyloidiasis, such as eosinophilia and elevated IgE levels, diagnosis is often delayed or missed.

The drug of choice for patients with strongyloides hyperinfection syndrome is ivermectin given over prolonged periods of time (e.g. 7 days for two or more cycles). Patients with signs of dissemination (e.g. larvae in urine) should be treated with ivermectin and albendazole in combination with broad-spectrum antibiotics to prevent Gram-negative infections (e.g. sepsis or meningitis) commonly associated with larval dissemination.

Management can be challenging in severely ill patients incapable of resorbing ivermectin from the gastrointestinal tract, e.g. in paralytic ileus, because no parenteral anthelminthic drugs are licensed for use in humans. However, parenteral ivermectin is commonly administered in veterinary medicine and some case reports describe successful subcutaneous treatment with a veterinary formulation of the drug. Because treatment failures might occur, patients require close follow-up. Family members should be screened for both *S. stercoralis* and HTLV-1 infection. Patients originating from endemic countries should be screened for *Strongyloides* infection before initiation of any immunosuppressive therapy.

Further Reading

1. Brooker SJ, Bundy DAP. Soil-transmitted Helminths (Geohelminths). In: Farrar J, editor. Manson's Tropical Diseases. 23rd ed. London: Elsevier; 2013 [chapter 55].
2. Solomon T. Virus Infections of the Nervous System. In: Farrar J, editor. Manson's Tropical Diseases. 23rd ed. London: Elsevier; 2013 [chapter 21].
3. Keiser PB, Nutman TB. Strongyloides stercoralis in the immunocompromised population. Clin Microbiol Rev 2004;17:208–17.
4. Carvalho EM, Da Fonseca Porto A. Epidemiological and clinical interaction between HTLV-1 and Strongyloides stercoralis. Parasite Immunol 2004;26:487–97.
5. Toledo R, Muñoz-Antoli C, Esteban JG. Strongyloidiasis with emphasis on human infections and its different clinical forms. Adv Parasitol 2015;88:165–241.