Case 1

A 22-year-old male college student, who had recently returned from a surfing trip to Acapulco, Mexico, presented to the emergency department suffering from crampy abdominal pain, malaise, nausea, fever, and bloody, mucoid diarrhea. Stool specimens were collected and sent to the laboratory for routine culture for enteric bacilli and examination for ova and parasites.

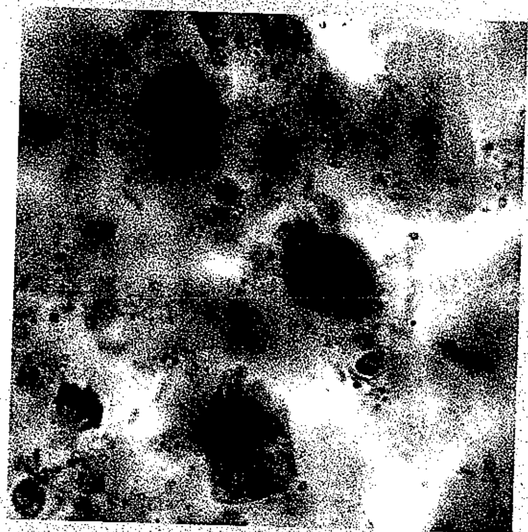

Figure 1.1

Stool cultures were negative for bacterial pathogens. A moderate number of ameboid trophozoites, measuring 20 to 30 μm, with finely granular cytoplasm, evenly distributed peripheral nuclear chromatin, and ingested red blood cells were seen in the permanent trichrome stain. A characteristic trophozoite is shown in Fig. 1.1. No cyst forms were seen.

QUESTIONS

1. Based on the morphological description given, which intestinal parasite would you suspect is causing this patient's infection? Could this parasite be confused with nonpathogenic parasites? If so, which nonpathogenic parasites could it be confused with?

2. Although no information regarding the stool consistency (formed, semisolid, or liquid) was given, what would you suspect the consistency of this patient's stool to be? Why?

3. Which nonpathogenic parasite is morphologically indistinguishable from this parasite? What characteristic can be used to differentiate pathogenic from nonpathogenic species of this parasite?

4. Is this parasite capable of causing extraintestinal infection? Explain.

5. How is this parasite transmitted?

6. What laboratory techniques are recommended to diagnose infection with this parasite?

7. Should this patient be treated? How?

8. Discuss the pathogenesis of amebiasis.

9. Describe the life cycle of this parasite.

10. Discuss the epidemiology of this infection.

11. Discuss the prevention and control of amebiasis.

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Case 2

A 25-year-old woman had recently returned from a trip to the Rocky Mountains. She had been traveling with a group of campers, who had obtained their drinking water from a lake. A few days after returning home, she presented to her internist suffering from profuse watery diarrhea, crampy epigastric pain, and foul-smelling flatulence. She discovered that most of the other campers had reported symptoms similar to her own.

Three stool specimens were submitted for laboratory analysis. All specimens were negative for enteric bacterial pathogens, and two were also negative for parasites. Since the specimens for ova and parasites were received in vials containing the preservatives polyvinyl alcohol and 10% formalin, no wet mounts were made to detect motility. A permanent trichrome stain revealed rare, oval protozoan trophozoites, measuring 9 to 20 μm in length and 5 to 15 μm in width. The broad anterior end of each trophozoite contained a concave area which covered half the ventral surface. The structure of this parasite gave the overall appearance of a "smiling face" (Fig. 2.1). Rare cysts, having four nuclei, and characteristic median bodies and longitudinal fibers were also seen. Typical cysts are demonstrated in Fig. 2.2.

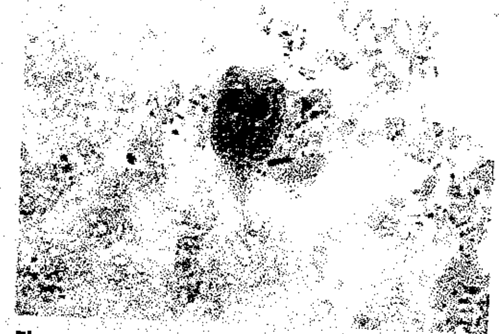
Figure 2.1

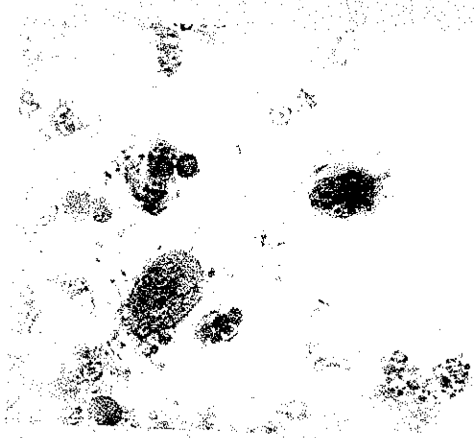
Figure 2.2

QUESTIONS

1. Which protozoan parasite is causing the camper's infection? Which form of this parasite is infectious?

2. How is this parasite transmitted?

3. How can this infection be controlled and prevented?

4. How does this parasite attach itself to the intestinal wall? Which condition might result as a consequence of this attachment?

5. How is this infection treated?

6. Describe the life cycle of this parasite.

7. Describe the pathogenesis of this infection.

8. How is the laboratory diagnosis of this infection made?

9. Discuss the epidemiology of this infection.

10. How does the structure of these trophozoites account for the "smiling-face" appearance?

Case 13 A previously healthy 10-year-old boy was seen in July in the emergency department suffering from fever and a severe

Case 4

A 25-year-old American homosexual man was seen in the emergency room for bloody diarrhea and crampy abdominal pain of several weeks' duration and was treated based on the results of laboratory studies. His symptoms resolved, and he appeared to make a full recovery.

Six months later, he presented to his family physician suffering from weight loss, malaise, fever, fatigue, and abdominal pain in the right upper quadrant. Laboratory studies revealed leukocytosis, mild anemia, and elevated levels of liver enzymes, including alkaline phosphatase and transaminases. Stool specimens for culture and examination for ova and parasites were negative for bacterial pathogens and parasites.

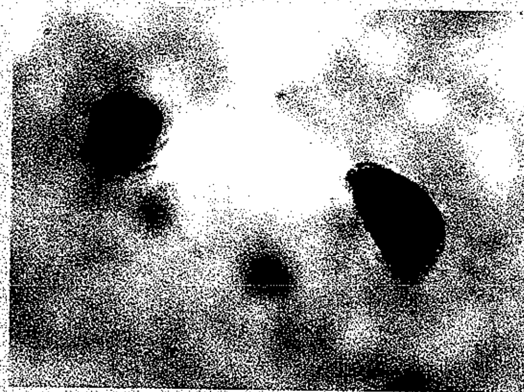

Figure 4.1

A computed tomography (CT) scan of the liver was performed and revealed several hepatic lesions. Because of the CT scan abnormalities, an ELISA for serum antibodies was ordered, which confirmed the diagnosis of his illness. A cyst of the parasite causing his illness is shown in Fig. 4.1.

QUESTIONS

1. What is this patient's diagnosis? Which protozoan parasite is shown in Fig. 4.1?
2. How does the patient's illness correlate with his previous episode of bloody diarrhea? Why is the patient's stool specimen negative for parasites?
3. Describe the life cycle of this parasite as it relates to this patient's infection.
4. Can abscesses caused by this parasite occur in organs other than the liver?
5. Which laboratory tests were probably used to make a diagnosis at the time the patient was first seen in the emergency room? Which specimen might prove useful in making a diagnosis during the patient's latest visit?
6. What risk to the patient exists in performance of a surgical procedure to obtain a liver aspirate?
7. How might the patient's homosexuality be related to his infection?
8. How should this patient be treated?
9. Which serological tests were probably ordered to confirm the diagnosis?
10. Discuss methods of control and prevention of infection with this parasite.

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Case 5

A 29-year-old human immunodeficiency virus (HIV)-infected man presented to his primary-care doctor complaining of chronic, severe, profuse, nonbloody, watery diarrhea. He had nausea and a poor appetite and had experienced a 15-lb weight loss over the past several months. His laboratory test results included a very low CD4 lymphocyte count (of only 100). Stool specimens cultured for enteric bacilli were negative. Fecal specimens examined for ova and parasites, which included a microscopic study of the concentrated sediment and a permanent trichrome-stained smear, were negative for intestinal parasites.

A special stain was then ordered in the microbiology laboratory, which led to a diagnosis of intestinal parasites. Microscopic examination revealed very tiny parasites, not much larger than staphylococcal cells. A typical parasite is shown in Fig. 5.1.

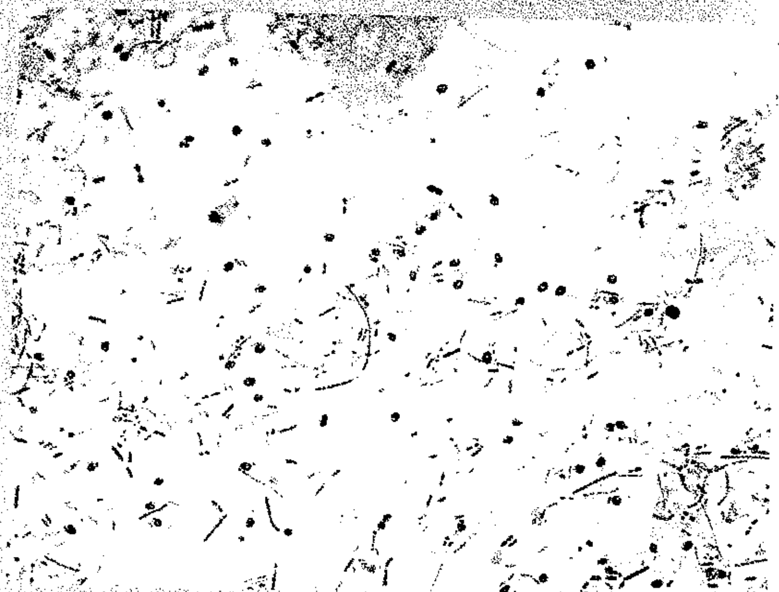

Figure 5.1

QUESTIONS

1. Which stain was used to stain the parasite shown in Fig. 5.1?
2. Which group of obligate intracellular protozoan parasites would you suspect of causing this infection in an AIDS patient? Which member of this group would you expect might be causing this patient's infection? Why?
3. How do these parasites differ from other intracellular intestinal protozoans?
4. How do these parasites multiply?
5. How is infection with this parasite transmitted?
6. How is the laboratory diagnosis of infection with this parasite made?

headache of several days' duration.

Case 8

A 43-year-old man had recently returned from a month-long trip to New Guinea, where he visited his uncle, who was a pig farmer. He had been suffering from abdominal pain and severe, watery, nonbloody diarrhea since returning to the United States from the trip. He visited his family physician in search of a diagnosis.

Since his symptoms were consistent with a diagnosis of dysentery, stool specimens were sent to the laboratory for culture for bacterial pathogens, including *Shigella dysenteriae,* which causes bacillary dysentery, and a routine examination for intestinal parasites, including *Entamoeba histolytica,* which causes amebic dysentery. The culture was negative for enteric bacterial pathogens. The permanent trichrome-stained smear was negative for parasites. However, a moderate number of large bean-shaped ciliated trophozoites were seen microscopically on the wet preparation made from the concentrated stool specimen. A typical parasite is shown in Fig. 8.1.

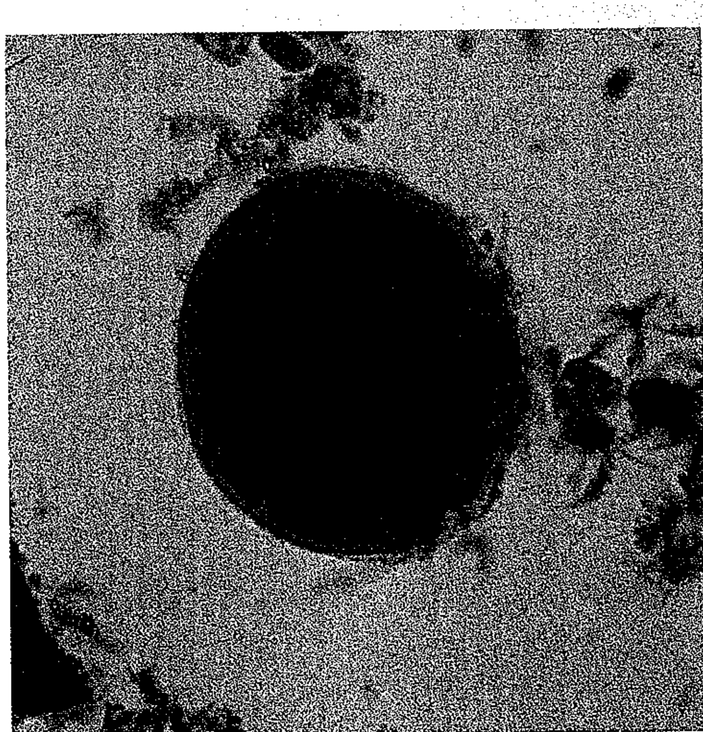

Figure 8.1

QUESTIONS

1. Which protozoan parasite would fit the morphological description of the parasite observed in the microscopic wet mount? What is this condition called?
2. Describe the appearance of characteristic trophozoites of this parasite.
3. Describe the appearance of characteristic cysts of this parasite.
4. Why do you think the permanent trichrome stained smear was negative for this parasite?

1. Explain why it is likely that this patient's disease process is infectious.
2. What two parasitic agents are likely to cause the type of infection seen in this patient? Briefly describe the epidemiology of each. Which is more likely in this particular patient? Why? What risks would aspiration of the liver lesion caused by these agents pose to the patient?
3. This patient denied having any nausea, vomiting, or diarrhea. Is this typical for the type of infection this patient has? What is the likelihood of finding the organism causing his liver process in this patient's feces?
4. Briefly describe the virulence factors produced by this organism that are responsible for the tissue damage it causes.
5. One of the observations made about intestinal tract infections with this agent is that up to 90% are asymptomatic. What new information concerning this genus may explain that finding?
6. Why is serologic testing the typical way in which this infection is diagnosed? What other techniques have been shown to be of value in diagnosing this infection?

CASE 28

This 19-year-old Mexican man presented to the ~~walk-in clinic~~ complaining of a 5-day history of severe right-sided flank and right upper quadrant pain. He stated that the pain came on suddenly and got much worse over the few days prior to presentation. The pain was most severe on inspiration. He had some chills but denied fevers. He was anorexic, not having eaten anything over the preceding 24 hours. He denied vomiting, diarrhea, nausea, blood in stool, or shortness of breath.

On physical examination, he was flushed and mildly diaphoretic. His temperature was 37.5°C, his blood pressure was 153/75 mm Hg, and his heart rate was 102/min. Physical examination was significant for hepatomegaly of 20 cm with diffuse tenderness and guarding, greatest in the right upper quadrant and flank. His white blood cell count was 16,900/µl with 13,100 polymorphonuclear leukocytes (PMNs) per µl. Otherwise, his laboratory findings were within normal limits. Computed tomography (CT) of his abdomen showed a ring-enhancing lesion in the liver that on admission was 2.9 by 2.5 cm. Two days later the lesion had grown to 4 by 3.4 cm. A drain was placed. Three days later the lesion measured 4.3 by 4.1 cm, and the drain was found to be posterior to the lesion. An aspirate from the lesion had 1+ PMNs on Gram stain, but no organisms were seen. Bacterial and fungal cultures of his aspirate were negative.

He was treated with antibiotics, had progressively less fluid drained, had decreasing right upper quadrant pain, and was discharged on the eighth hospital day. He was never febrile throughout his hospital course. A serologic test revealed the etiology of his infection. Figure 1 shows what the organism causing this patient's infection looks like in stool specimens.

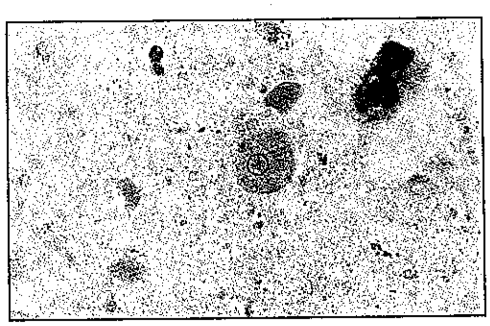

Figure 1