Case 3-2020: A 44-Year-Old Man with Weight Loss, Diarrhea, and Abdominal Pain

Neeti Warhekar, Eleanor Marcet, Peter Kolyvas, Christopher McKittrick
Chief Complaint

- 44-year-old man was evaluated at Massachusetts General Hospital due to weight loss, diarrhea, and abdominal pain
Patient History
Patient Background

- Patient grew up on an island in the Caribbean and had immigrated to the United States 10 years earlier; he had last returned to the Caribbean 4 months before admission.
- He had traveled extensively in the northeastern and Mountain West regions of the United States.
- He was married with one child but had no known sick contacts. He drank one beer per day and had never smoked cigarettes; he occasionally smoked marijuana.
- No family history of GI infections, cancers (his mother had ovarian cancer), peptic-ulcer disease, pancreatitis, irritable bowel syndrome, inflammatory bowel disease, autoimmune conditions, or malabsorption syndromes.
Patient Medical History

- Notable for depression, lumbar pain, and vitamin D deficiency.
- Intermittent diffuse headache persisted in the 3 weeks after discharge from other hospital. Patient also reported low-grade fever.
- Review of systems was negative for night sweats, chills, neck pain, photophobia, vision changes, chest pain, dyspnea, cough, coryza, sore throat, oral ulcers, back pain, dysuria, hematuria, rashes, joint or muscle pain, edema, and pruritus.
- Medications: venlafaxine, cholecalciferol, and omeprazole
- Patient took an herbal supplement of unknown type in the week after discharge from other hospital.
- Never used nonsteroidal antiinflammatory drugs.
- No known medication allergies.
History of Current Illness: Approximately 6 months before admission

Patient had:

- **Early satiety**
  - Feeling very full after eating very little
  - Nausea, vomiting after eating what is considered to be a normal-sized meal
- **Intermittent anorexia**
  - Lack of eating
- Consumed primarily liquids for breakfast and lunch; skipped dinner
- Lost 9 kg (20 lbs)
History of Current Illness: 1 month before admission

Patient was admitted to another hospital and presented with:

- Fever
- Malaise (general feeling of unwellness)
- Photophobia
- Retro-orbital pain
- Headache
iClicker Question

Based on the information given in the chief complaints, patient background, and patient medical history, what do you hypothesize for diagnosis?

A. Food Poisoning
B. Cancer
C. Parasite
D. Pregnancy
E. Celiac Disease
iClicker Question

Based on the information given in the chief complaints, patient background, and patient medical history, what do you hypothesize for diagnosis?

A. Food Poisoning  
B. Cancer  
C. Parasite  
D. Pregnancy  
E. Celiac Disease

Open ended
Photophobia

- “Photo” = light; “phobia” = fear, avoidance
- Abnormal and extreme sensitivity to light; a common symptom of migraines and headaches
  - Especially exacerbated by fluorescent lights, changes in light levels, and even natural light
- Causes include ocular conditions such as dry eyes and allergies, CNS disorders, and blepharospasm
  - Blepharospasm: abnormal blinking and spasming of the eyelids
Retro-Orbital Pain

- Complaint is “pain behind the eyes”
- Common cause is temporomandibular joint dysfunction (TMD)
- The retro-orbital bony complex includes the greater and lesser wings of the sphenoid bone (unpaired bone of neurocranium—in front of occipital bone)
- Lateral and medial pterygoid muscles insert into medial and pterygoid plates; always contracting these muscles leads to torque of sphenoid
- Leads to pressure behind eyes, blurred vision, and “ice pick pains”
- Associated with headaches and photophobia
History of Current Illness: Third Day at other Hospital

- Patient developed dysuria, nausea, and episodes of hemoptysis and diarrhea
  - Dysuria: painful or difficult urination
  - Hemoptysis: coughing up blood
  - Diarrhea: frequent liquid stools
- Was then discharged and prescribed omeprazole
Hemoptysis

- Coughing blood up from lungs or bronchial tubes
  - A common symptom of many minor respiratory illnesses, such as URI and viral bronchitis
- In smokers >40 years old, may be caused by primary lung cancer
- Cavitary Aspergillus (mold) infection
- In children, common causes are
  - Lower respiratory tract infection
  - Foreign body aspiration
After Discharging

- Upon emission, the patient developed constant epigastric pain
- ~1 hour after meals, patient experienced nausea, vomiting, diffuse abdominal bloating, and cramping
- Watery diarrhea began occurring twice/day
- One week after discharging, the patient’s primary care physician prescribed omeprazole
  - A proton pump inhibitor, used to decrease the amount of acid produced in the stomach
Presentation Upon Admission

- Near constant epigastric pain
  - pain /discomfort below the ribs in the area of the upper abdomen
- Nausea and vomiting 1 hour after meals
- Diffuse abdominal bloating and cramping
- Watery diarrhea twice daily
  - Absence of hematochezia or melena
Patient Vital Signs
Vitals @ Local Hospital

- Temp= **38.5 C** (101.3 F)  Normal= 36.2-37.2 C
- Heart Rate= **118 bpm**  Normal= 60-100 bpm
- Blood Pressure= **94/72 mm/Hg**  Normal= less than 120/80 mm/Hg
Vitals @ Massachusetts General Hospital

- Temp = **37.2 C** \((98.96 F)\)  
  Normal= 36.2-37.2 C
- Heart Rate = **107 bpm**  
  Normal= 60-100 bpm
- Blood Pressure = **101/57 mm/Hg**  
  Normal= less than 120/80 mm/Hg
- Oxygen Saturation = **99%**  
  Normal= 95%-100%
- BMI = **18.6**  
  Normal= 18.5-24.9
What could this Mean?

- **High Temp**
  - Infection (Viral, bacterial, etc)
  - Inflammatory conditions (rheumatoid arthritis)
  - Malignant Tumor
  - Certain medications

- **High Heart Rate**
  - Abnormal Heart conditions
  - Fever
  - Anemia
  - And much more...
Labs/Imaging
### Table 1. Laboratory Data.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Reference Range, Other Hospital</th>
<th>1 Mo before Current Admission, on Admission, Other Hospital</th>
<th>3 Wk before Current Admission, Day before Discharge, Other Hospital</th>
<th>Reference Range, This Hospital†</th>
<th>On Admission, This Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemoglobin (g/dl)</td>
<td>14.0–18.0</td>
<td>12.3</td>
<td>12.4</td>
<td>13.5–17.5</td>
<td>13.2</td>
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<tr>
<td>Hematocrit (%)</td>
<td>42.0–52.0</td>
<td>37.4</td>
<td>37.8</td>
<td>41.0–53.0</td>
<td>40.6</td>
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<tr>
<td>White-cell count (per µl)</td>
<td>4500–10,800</td>
<td><strong>28,600</strong></td>
<td>10,300</td>
<td>4500–11,000</td>
<td>11,170</td>
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<td>Differential count (%)</td>
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<tr>
<td>Neutrophils</td>
<td>40.0–80.0</td>
<td>63.9</td>
<td>35.9</td>
<td>40–70</td>
<td>53.4</td>
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<td>Bands</td>
<td>0.0–10.0</td>
<td>16.8</td>
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<tr>
<td>Immature granulocytes</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lymphocytes</td>
<td>7.0–36.0</td>
<td>5.0</td>
<td>43.3</td>
<td>22–44</td>
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<td>Atypical lymphocytes</td>
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<td>0.8</td>
<td>0</td>
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<td>Monocytes</td>
<td>4.0–8.0</td>
<td>9.2</td>
<td>9.7</td>
<td>4–11</td>
<td>12.4</td>
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<td>Eosinophils</td>
<td>1.0–6.0</td>
<td>0.8</td>
<td>9.8</td>
<td>0–8</td>
<td>5.0</td>
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<td>Basophils</td>
<td>0–1</td>
<td>0.5</td>
<td>0.6</td>
<td>0–1</td>
<td>0.4</td>
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<td>Metamyelocytes</td>
<td>0.0–2.0</td>
<td>3.4</td>
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<td>Platelet count (per µl)</td>
<td>150,000–450,000</td>
<td>258,000</td>
<td>415,000</td>
<td>150,000–400,000</td>
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<td>Sodium (mmol/liter)</td>
<td>135–145</td>
<td>133</td>
<td>126</td>
<td>135–145</td>
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<td>Potassium (mmol/liter)</td>
<td>3.3–4.5</td>
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<td>4.6</td>
<td>3.4–5.0</td>
<td>4.3</td>
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<td>Chloride (mmol/liter)</td>
<td>98–109</td>
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<td>92</td>
<td>100–108</td>
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<td>Carbon dioxide (mmol/liter)</td>
<td>24–32</td>
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<td>23</td>
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<td>Urea nitrogen (mg/dl)</td>
<td>6–19</td>
<td>14</td>
<td>11</td>
<td>8–25</td>
<td>11</td>
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<td>Creatinine (mg/dl)</td>
<td>0.4–1.2</td>
<td>1.0</td>
<td>0.8</td>
<td>0.60–1.50</td>
<td>0.62</td>
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<td>Glucose (mg/dl)</td>
<td>70–100</td>
<td><strong>126</strong></td>
<td>101</td>
<td>70–110</td>
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### Labs (cont.)

<table>
<thead>
<tr>
<th>Test</th>
<th>Lower Limit</th>
<th>Normal</th>
<th>Upper Limit</th>
<th>Lower Limit</th>
<th>Normal</th>
<th>Upper Limit</th>
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<td>Calcium (mg/dl)</td>
<td>8.5–10.5</td>
<td>8.1</td>
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<td>8.5–10.5</td>
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<tr>
<td>Total protein (g/dl)</td>
<td>6.0–8.5</td>
<td>5.3</td>
<td>5.4</td>
<td>6.0–8.3</td>
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<tr>
<td>Albumin (g/dl)</td>
<td>3.3–5.2</td>
<td>2.4</td>
<td>2.4</td>
<td>3.3–5.0</td>
<td>2.2</td>
<td></td>
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<tr>
<td>Alanine aminotransferase (U/liter)</td>
<td>0–40</td>
<td>32</td>
<td>17</td>
<td>10–55</td>
<td>38</td>
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<tr>
<td>Aspartate aminotransferase (U/liter)</td>
<td>0–37</td>
<td>19</td>
<td>12</td>
<td>10–40</td>
<td>30</td>
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<tr>
<td>Alkaline phosphatase (U/liter)</td>
<td>40–129</td>
<td>62</td>
<td>53</td>
<td>45–115</td>
<td>68</td>
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<td>Total bilirubin (mg/dl)</td>
<td>0.2–1.2</td>
<td>0.3</td>
<td>0.2</td>
<td>0.0–1.0</td>
<td>0.2</td>
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<td>Serum osmolality (mOsm/kg)</td>
<td>285–295</td>
<td>272</td>
<td>263</td>
<td>280–290</td>
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<td>Lactate (mmol/liter)</td>
<td>0.5–1.9</td>
<td>1.9</td>
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<td>0.5–2.2</td>
<td>1.2</td>
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<tr>
<td>Iron (µg/dl)</td>
<td>45–160</td>
<td>37</td>
<td>30–160</td>
<td>36</td>
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<tr>
<td>Total iron-binding capacity (µg/dl)</td>
<td>228–428</td>
<td>205</td>
<td>230–404</td>
<td>105</td>
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<td>Ferritin (ng/ml)</td>
<td>20–250</td>
<td>82</td>
<td>10–200</td>
<td>130</td>
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<td></td>
</tr>
<tr>
<td>Erythrocyte sedimentation rate (mm/hr)</td>
<td>0–13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>C-reactive protein (mg/liter)</td>
<td>&lt;8</td>
<td></td>
<td></td>
<td>59.2</td>
<td></td>
<td></td>
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<tr>
<td>Fecal calprotectin (µg/g)</td>
<td>&lt;50</td>
<td></td>
<td></td>
<td>1038.8</td>
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</table>
What is the normal **FASTING** blood sugar (glucose) level?

A.  <100 mg/dL (<5.6 mmol/L)  
B.  100-125 mg/dL (5.6 to 6.9 mmol/L)  
C.  126-145 mg/dL (7 mmol/L to 8 mmol/L)  
D.  146-170 mg/dL (8 mmol/L to 9.4 mmol/L)  
E.  >170 mg/dL (>9.4 mmol/L)
iClicker Question

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E. >170 mg/dL (>9.4 mmol/L)
Imaging
Imaging (cont.)
Imaging (cont.)
Imaging (cont.)
Imaging (cont.)
iClicker Question

What structure is the red arrow pointing to?

A. Stomach
B. Diaphragm
C. Kidney
D. Heart
E. None of the above
iClicker Question

What structure is the red arrow pointing to?

A. Stomach  
B. Diaphragm  
C. Kidney  
D. Heart  
E. None of the above

Liver!
Differential Diagnosis

1. CANCER
2. AUTOIMMUNE DISEASE
3. INFECTION
Cancer
Differential Diagnosis - Cancer

- Low likelihood due to diffuse nature of intestinal abnormality
- Lymphoma
  - Most likely small-bowel lymphoma: immunoproliferative small bowel disease (IPSID)
    - Abdominal pain
    - Malabsorption
    - Weight loss
    - Diarrhea
    - Hepatosplenomegaly seen in advanced IPSID
- Unlikely:
  - enteropathy-associated T-cell lymphoma (associated with celiac disease), Burkitt’s lymphoma, and B-cell lymphomas
    - Associated with obstruction, perforation, or hemorrhage
Immunoproliferative Small Intestinal Disease

- secretion of truncated immunoglobulin alpha heavy chains without an associated light chain by plasma cells infiltrating the bowel wall
- Treatments:
  - chemotherapy
  - immunotherapy medications
  - radiation therapy
  - bone marrow transplant
iClicker Question

Which of the labeled regions is the heavy chain in the structure of the immunoglobulin?

a. A  
b. B  
c. C  
d. D  
e. E
Which of the labeled regions is the heavy chain in the structure of the immunoglobulin?

Lymphoma

Why it fits diagnosis

- GI tract is most common extranodal site
- Unexplained weight loss
- Evidence of *H. Pylori* infection
  - Sign of lymphoma involving mucosa-associated lymphoid tissue of the stomach

Why it doesn’t fit diagnosis

- Diffuse nature of intestinal abnormality on CT imaging
- Less than 10% of lymphomas in the U.S. involve the small bowel
  - Common in Middle East and Mediterranean
- Patient is neither a young adult nor older than 55
Autoimmune Diseases
Celiac Disease

Inside view of the small intestine

Healthy villi

Villi

Celiac disease

Nutrients
Celiac Disease

● Symptoms
  ○ Abdominal Pain
  ○ Diarrhea, Bloating, Heartburn, Indigestion, vomiting, nausea
  ○ Malnutrition
  ○ Fatigue
  ○ Weight Loss
  ○ Osteoporosis
  ○ Hypoalbuminemia (low blood albumin levels)

● How it’s diagnosed
  ○ Tissue Transglutaminase IgA Test
  ○ Immune system makes antibodies that attack this transglutaminase enzyme
  ○ Measure these antibodies to diagnose Celiac

● Treatment = Dietary avoidance of gluten
iClicker Question

Why is it important to measure total IgA levels in addition to performing the Tissue Transglutaminase IgA Test

A. It is an additional test to verify that the person has Celiac disease
B. To ensure that the body has normal antibody production and IgA levels
C. It is used as a way to measure the patient’s overall immunological strength
D. All of the above
E. None of above
iClicker Question

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E. None of above
Celiac Disease

Why it fits diagnosis

- Diarrhea
- Weight loss
- Hypoalbuminemia
- Abdominal Pain
- Elevated Inflammatory Markers
- Elevated fecal calprotectin

Why it doesn’t fit diagnosis

- Negative Tissue Transglutaminase IgA Test
- Meningeal symptoms not associated with Celiac’s
Autoimmune Enteropathy

- Rare autoimmune disorder where body produces antibodies against enterocytes, goblet cells, and intestines
- Some forms caused by mutation in FOXP3 gene
- Usually affects infants and children (rarely in adults)
- Presents similar to Celiac Disease but not due to Gluten
Autoimmune Enteropathy

- **Symptoms**
  - Abdominal Pain
  - Diarrhea, Bloating, Gas, Heartburn, Indigestion, vomiting, nausea
  - Malnutrition
  - Fatigue
  - Weight Loss
  - Intestinal bleeding
  - Inflammation
Autoimmune Enteropathy

- **How it’s diagnosed**
  - Detection of antibodies against enterocytes, goblet cells, or other intestinal structures
  - Biopsy of intestine showing villi damage and lymphocytosis in intestines

- **Treatment**
  - Corticosteroids~ reduce inflammation and calm immune system
  - Immunosuppressants~ Tacrolimus or Sirolimus
  - Intravenous Nutrition
  - Stem cell transplant (severe cases)
iClicker Question

What is the function of the goblet cells?

A. They secrete mucus in order to protect the mucous membranes
B. They produce endocrine hormones that travel through the bloodstream
C. They support the local cell growth of the enterocytes
D. They absorb the nutrients from the food that is consumed
E. None of the above
iClicker Question

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Autoimmune Enteropathy

Why it fits diagnosis
- Diarrhea
- Weight loss
- Abdominal Pain
- Inflammatory Markers Elevated

Why it doesn’t fit diagnosis
- Meningeal/neurological symptoms not associated with Autoimmune Enteropathy
- Adults rarely diagnosed
Eosinophilic Gastroenteritis

- Extremely Rare autoimmune digestive disease with unknown etiology
- Most likely cause is Hypersensitivity to certain foods (However a single food allergy cannot be determined)
- Eosinophils infiltrate GI tract
Eosinophilic Gastroenteritis

- **Symptoms**
  - Abdominal Pain
  - Diarrhea, Bloating, Gas, Indigestion, vomiting
  - Nausea
  - Inflammation of GI tract
  - Possible malnutrition
  - Weight loss
Eosinophilic Gastroenteritis

- How it’s diagnosed
  - Eosinophilic infiltration of GI tract must be seen in biopsy
  - Lack of evidence for other intestinal diseases
  - Exclusion of all other possible diagnosis

- Treatment
  - Corticosteroids—reduce inflammation and calm immune system (prednisone)
  - No cure—simply treat symptoms
Eosinophilic Gastroenteritis

Why it fits diagnosis
- Diarrhea
- Abdominal Pain
- Nausea
- Vomiting
- Weight loss
- Intestinal malaise

Why it doesn’t fit diagnosis
- VERY rare disorder
- No Eosinophilia (high Eosinophil levels) in GI tract biopsy or current hospital admission

<table>
<thead>
<tr>
<th>Eosinophils</th>
<th>1 Mo before Current Admission, Other Hospital</th>
<th>1 Mo before Current Admission, Other Hospital</th>
<th>3 Wk before Current Admission, Day before Discharge, Other Hospital</th>
<th>Reference Range, This Hospital</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1.0–6.0</td>
<td>0.8</td>
<td>9.8</td>
<td>0–8</td>
<td>5.0</td>
</tr>
</tbody>
</table>
Where do eosinophils develop before differentiating?

A. Blood
B. Thymus
C. Spleen
D. Bone Marrow
E. Gonads
iClicker Question

Where do eosinophils develop before differentiating?

A. Blood
B. Thymus
C. Spleen
D. Bone Marrow
E. Gonads
Infection
Giardiasis

- caused by a microscopic parasite
  - Giardia duodenalis also named *Giardia lamblia*
- most frequently diagnosed intestinal parasitic disease in the United States and among travelers with chronic diarrhea
- mode of transmission: water (drinking and recreational)
- Cysts and trophozoites detected in stool
- Symptoms:
  - Diarrhea
  - Gas
  - Greasy stools
  - Stomach or abdominal cramps
  - Upset stomach or nausea/vomiting
  - Dehydration (loss of fluids)
  - can cause weight loss and failure to absorb fat, lactose, vitamin A and vitamin B12
Giardiasis

- Cysts are the resistant forms infection occurs by the ingestion of cysts in contaminated water, food, or by the fecal-oral route (hands or fomites)
- Stool examination was negative
Human Immunodeficiency Virus (HIV)

- A virus spread through contact with blood, semen, pre-semenal fluid, vaginal secretions, or breast milk; usually spread through having unprotected sex or needle sharing
- The virus attacks and destroys CD4+ WBCs of immune system (T-cells, which trigger additional immune response)
  - The loss of CD4+ cells makes it quite difficult for the body to fight off infection and certain cancers
  - Without treatment, AIDS (Acquired Immunodeficiency Virus, the most advanced stage of HIV infection) can develop
- Many HIV-associated infections cause prolonged diarrheal syndrome with weight loss
  - “wasting syndrome”
- However, the patient’s HIV screen was negative
iClicker Question

What kind of virus is Human Immunodeficiency Virus?

A. Retrovirus
B. Positive sense
C. Negative sense
D. Adenovirus
E. Coronavirus
iClicker Question

What kind of virus is Human Immunodeficiency Virus?

A. Retrovirus  
B. Positive sense  
C. Negative sense  
D. Adenovirus  
E. Coronavirus
Mesenteric Lymphadenitis

- Lymph node inflammation of the mesentery
  - Mesentery → fold of peritoneum which attaches the stomach, small intestine, pancreas, and spleen to the posterior wall of the abdomen
- Usually caused by a viral or bacterial intestinal infection: doctors investigated *Mycobacterium Avium*
- Symptoms may mimic appendicitis or intussusception; leads to mesenteric lymph node enlargement, diarrhea, nausea, and vomiting
- **Unlikely in this patient because he was HIV-negative; mesenteric lymphadenitis is usually associated with HIV as an opportunistic disease**
Whipple’s Disease

- Characterized by infection with *Tropheryma whippeli* bacterium
- Leads to infiltration of foamy macrophages in small bowel
  - Leads to abdominal pain, diarrhea, malabsorption, joint pain
  - Fever, lymphadenopathy, CNS abnormalities
- Diagnosis made by periodic acid-Schiff staining of small-bowel biopsy specimen (this would show foamy macrophages in lamina of gut)
- Organism can be determined by PCR testing of biopsy specimens
- Unlikely diagnosis for this patient because of the absence of joint symptoms, as well as the occurrence of an acute episode of neutrocytic meningitis
Foam cells are fat-laden macrophages that contain low-density lipoproteins, which give the cell a foamy appearance. What is the least dense class of plasma lipoprotein?

A. Very low-density lipoprotein (VLDL)
B. High-density lipoprotein (HDL)
C. Low-density lipoprotein (LDL)
D. Chylomicrons (ULDL)
E. Phosphatidylinositol
Foam cells are fat-laden macrophages that contain low-density lipoproteins, which give the cell a foamy appearance. What is the least dense class of plasma lipoprotein?

A. Very low-density lipoprotein (VLDL)
B. High-density lipoprotein (HDL)
C. Low-density lipoprotein (LDL)
D. Chylomicrons (ULDL)
E. Phosphatidylinositol
Tropical Sprue

- An important consideration, given that the patient is from the Caribbean and has a wasting diarrheal illness
- Due to uncharacterized intestinal infection, leading to persistent small-bowel mucosal damage and flattening of villi
- Leads to severe hypoalbuminemia, and diffuse bowel-wall edema
- Megaloblastic anemia (folate and vitamin $B_{12}$ deficiency)
- Unlikely in this patient since he has mesenteric lymphadenopathy, which is not characteristic of tropical sprue
iClicker Question

We recently learned about various types of necrosis in MCB 458. Which type is most characteristic of focal fungal or bacterial infection?

A. Caseous  
B. Coagulative  
C. Liquefactive  
D. Fibrinoid  
E. Gangrenous
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Parasitic Infection: Strongyloidiasis

- Infectious disease caused by a nematode in the genus *Strongyloides*
  - *Strongyloides stercoralis* is the primary species that accounts for human disease
- Primary mode of infection is through contact with soil contaminated with larvae
  - Larvae penetrate skin, migrate through the body, and settle in the small intestine where they lay their eggs
  - Auto-infection likely: possible for people to be infected for their entire lives
- Symptoms include epigastric pain, nausea, vomiting, fat and Vitamin B₁₂ malabsorption; hypoalbuminemia and peripheral edema
Parasitic Infection: Strongyloidiasis: Hyperinfection

- Associated with greatly increased worm burden
- Often occurs when patients are immunosuppressed or infected with Human T-lymphotropic virus type 1 (HTLV-1)
- Nematode becomes more invasive—penetrates bowel mucosa, causes watery and bloody stools with severe abdominal pain
- May even progress to meningitis or bacteremia due to tendency of worms to carry bowel flora through intestinal wall
- Treated with antiparasitic medications (Stromectol)
Human T-lymphotropic Virus Type 1 Infection (HTLV-1)

- Retrovirus of the human T-lymphotropic virus (HTLV) family
- Implicated in a variety of opportunistic diseases: adult T-cell lymphoma, HTLV-1-associated myelopathy, uveitis, and Strongyloides stercoralis
- Once integrated, HTLV-1 exists only as a provirus; spreads through viral synapses
- Very few virions are produced; usually no detectable virus in blood plasma (only in genital secretions)
- Predominantly infects CD4+ T-cells
- Usually spread sexually in the Caribbean
- Treated with antiretroviral agents
Final Diagnosis: Strongyloidiasis with human T-lymphotropic virus type 1 infection.

- Patient is from a region where strongyloidiasis is an endemic
- Was deduced using upper and lower endoscopies
Treatment

- CDC recommends ivermectin 200 μg per kilogram of body weight for strongyloidiasis
- treated with ivermectin (200 μg per kilogram per day) for 14 days, followed by tapering doses every 2 weeks for 1 month
- received monthly treatment with ivermectin thereafter, given that he was infected with HTLV-1 and had a high risk of persistent and recurrent infection
Ivermectin

- Discovered in the late 1970s
- Originates from a single microorganism isolated from Japanese soil
- Started out as a veterinary drug to kill internal and external parasites in livestock
- Treats a variety of internal nematode infections, including Onchocerciasis, Strongyloidiasis, Ascariasis, cutaneous larva migrans, filariasis, Gnathostomiasis and Trichuriasis, as well as for oral treatment of ectoparasitic infections, such as Pediculosis (lice infestation) and scabies (mite infestation).
- First used on humans to treat river blindness (Onchocerciasis)
- Mainstay of a campaign to rid the world of Onchocerciasis and Lymphatic filariasis
Resolution

- Patient’s gastrointestinal symptoms resolved completely gained back more than 23 kg over the course of several months after he began treatment
Clinical Relevance

- Strongyloidiasis is a vastly underestimated disease in developing tropical countries
- It infects more than 100 million people worldwide
- Especially prevalent among the immunosuppressed, such as those infected with HTLV-1 or HIV
- HTLV-1 is considered a sexually transmitted infection (STI), especially in the Caribbean and Latin America, where sex is the primary form of transmission
- Continually increasing infection is attributed to poor hygiene, insufficient drinking water, and secondarily, a lack of sex education
Highest Prevalence rate of Strongyloides stercoralis

- No data or unknown
- 0-10%
- 10-20%
- 20-30%
- 30-40%
- 40-50%
- > 50%
Questions?
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