Imaging of gastro-intestinal disease in patients with AIDS

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Patient DR

• DR is a 43 yo man with HIV and HCV who presents with abdominal pain, one episode of minimal hematemesis, chronic weight loss, and diarrhea.
• Most recent viral load 15,500, CD4 91, on HAART
• PMH

HIV/AIDS
Chronic Hepatitis C
Kaposi’s sarcoma
Candida esophagitis
Refractory ascites
Esophageal varices sp/ banding
HIV-associated dementia
DR’s Physical Exam
(positive findings only)

General: Severely cachectic man

HEENT: Tongue beefy red, dried blood in mouth, dry mucous membranes

Abdomen: Distended, with shifting dullness. Guaiac +

DR’s Abdominal CT

- Ascites
- Cirrhotic liver
- Spleno-megaly
MRI: cirrhosis and its consequences

Surface nodularity of the liver

Ascites

Varices

Splenomegaly

Courtesy of Dr. Rofsky
AIDS overview

- 38 million people are living with HIV/AIDS
- 20 million people have died since the beginning of the epidemic
- HAART markedly reduced mortality, AIDS, AIDS-defining diagnoses and hospitalizations

- ¼ of HIV+ patients are co-infected with Hepatitis C virus
- Tuberculosis co-infection up to 40% - 60% in US inner cities.

DDx GI bleed and abdominal discomfort in DR

- Bleeding esophageal varices +/- coagulopathy
- Bleeding ulcers (esophageal, gastric, duodenal)
- Kaposi’s sarcoma
- GI lymphoma
- Cytomegalovirus colitis
- Typhilitis
- Cryptosporidiosis
- Salmonellosis
- Histoplasmosis
- Spontaneous bacterial peritonitis
AIDS-defining illnesses (CDC)

Common
- Pneumocystis carinii pneumonia (42.6%)
- Candidiasis of the esophagus or airway (15.0%)
- Wasting (10.7%)
- Kaposi’s sarcoma (10.7%)
- Disseminated Mycobacterium avium complex (4.8%)
- Tuberculosis (4.5%)
- Cytomegalovirus disease (3.7%)
- HIV-associated dementia (3.6%)
- Recurrent bacterial pneumonia (3.0%)
- Toxoplasmosis (2.6%)
- Lymphoma (1.9%)
- Cryptosporidiosis, persistent (1.5%)
- Herpes simplex, chronic infection (0.5%)

Less common
# CD4 Count and Pathogens

<table>
<thead>
<tr>
<th>CD4 &gt;200</th>
<th>CD4 200-100</th>
<th>CD4 &lt;100 cells/μL</th>
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<tbody>
<tr>
<td><em>Tuberculosis</em></td>
<td><em>Cryptosporidiosis</em></td>
<td><em>Mycobacterium avium complex</em></td>
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<tr>
<td><em>Candidiasis</em></td>
<td><em>Coccidioidomycosis</em></td>
<td><em>Histoplasmosis</em></td>
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<td><em>Cryptococcus</em></td>
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<td><em>Herpes zoster</em></td>
<td><em>Cryptococcosis</em></td>
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<td><em>Hairy leukoplakia</em></td>
<td><em>Toxoplasmosis</em></td>
<td><em>Cytomegalovirus</em></td>
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<tr>
<td><em>Kaposi’s sarcoma</em></td>
<td><em>Pneumocystosis</em></td>
<td><em>Lymphoma</em></td>
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Abdominal disease in AIDS

Two major categories:
1) Infection

2) Neoplasms
   a. Kaposi’s sarcoma
   b. Non-Hodgkin’s lymphomas
Abdominal symptoms in AIDS

Very common (up to 90%)
- Intolerance to medications
- Thrush
- Diarrhea – chronic, associated with weight loss and malnutrition

Common
- Odynophagia and dysphagia
- Abdominal pain (RUQ especially)
- Fevers
- Anorectal disease
Odynophagia – secondary to acute HIV infection

Acute HIV infection:
- Fever, pharyngitis, adenopathy, myalgias, and rash.

HIV ulcers
- Multiple discrete shallow ulcers
- Early HSV infection looks identical

Images courtesy of Dr. Gramm
Candida esophagitis

Second most common AIDS-defining illness

Present with odynophagia, dysphagia, or chest pain.

CD4 count <200 cells/μL

Diffuse, confluent plaques present, with a “cobblestone” appearance.

Advanced

Mild

Images Courtesy of Dr. Gramm
Candida esophagitis

Creamy plaques present along the long axis of the esophagus in this less severe case.

Advanced case:
Confluent plaque creating a pseudo-membrane is present.

CMV esophagitis

There are multiple large (>2cm), discrete ulcers in the distal esophagus. Note the intervening mucosa is normal.

Vasculitis $\rightarrow$ ischemia $\rightarrow$ ulcer formation

## Diarrhea in an patient with AIDS

### Symptoms

<table>
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<th>Symptoms</th>
<th>Likely Pathogens</th>
</tr>
</thead>
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<tr>
<td>Epigastric cramps, bloating, nausea</td>
<td>MAC, Cryptosporidium, Isospora</td>
</tr>
<tr>
<td>Severe watery diarrhea, weight loss</td>
<td>Cryptosporidiosis</td>
</tr>
<tr>
<td>Hematochezia and lower abdominal cramping</td>
<td>CMV, C. diff, Shigella, Campylobacter</td>
</tr>
<tr>
<td>Anorectal tenesmus, dyschezia</td>
<td>Herpes simplex virus, N. gonorrhea, Chlamydia</td>
</tr>
</tbody>
</table>

**An aggressive approach to diagnosis is recommended.**
Cryptosporidiosis

- Occurs with CD4 count <200 cells/μL
- Intracellular parasites that infect GI tract epithelial cells
- Causes a hypersecretory diarrhea
  - Similar to Isospora belli and Microsporidia infection

Non-specific radiographic findings:
- Small bowel fold enlargement
- Gastropathy (rigidity)
- Gallbladder wall thickening
Cryptosporidiosis

Gastropathy with retained food

Jejunal fold enlargement

Courtesy of Dr. Gramm
Mycobacterium avium complex

- Occurs with CD4 count < 100 cells/μL
- Typically present with clinical enteritis: abdominal pain, fevers, malabsorption, night sweats, weight loss, severe anemia,
- Bulky mesenteric adenopathy and small bowel involvement
- Disseminated MAC infection → hepatosplenomegaly with microabscesses
Mycobacterium avium complex

Duodenal and jejunal irregular fold thickening

Lamina propria macrophages containing MAC

Wilcox, CM. Overview of gastrointestinal manifestations of AIDS. *UpToDate*. 2004.
MAC enteritis

Mycobacterium avium complex

Bulky mesenteric lymphadenopathy present.

CD4 < 50 cells/μL

It is important to distinguish from tuberculosis lymphadenitis.

Courtesy of Dr. Gramm
Nodal enlargement DDx

- Mycobacterium tuberculosis
- Mycobacterium avium complex
- Cytomegalovirus
- Varicella zoster virus
- Pneumocystis carinii
- Histoplasmosis
- Cryptococcosis
- Lymphoma
- Kaposi’s sarcoma
Mycobacterium tuberculosis

“The Great Imitator”

Most common – low attenuation mesenteric lymphadenopathy, nodules in the omentum and peritoneum, and high attenuation ascites.
CMV is most common life threatening opportunistic infection in the AIDS patient. CD4 count < 100 cells/uL. Pneumatosis and bowel perforation can result.

Markedly thickened folds of the transverse and descending colon, consistent with pseudo-membrane formation.
Cytomegalovirus colitis

Vasculitis in submucosa
→ thrombosis and ischemia


http://www.hopkins-aids.edu/educational/caserounds/images/jhas_case_abpelvic2.jpeg
Liver and Biliary Tree

• Hepatomegaly very common
  (50% clinically, vast majority at autopsy)
• Chronic HBV or HCV infection widespread
• Liver tests are non-specific in HIV-infected patients and liver biopsies abnormal in 95%.
• AIDS cholangiopathy
AIDS cholangiopathy

- Cryptosporidium or Cytomegalovirus
- Present with right upper quadrant pain, nausea, vomiting, fever, and elevated white count and serum alkaline phosphatase
- Acalculous cholecystitis
- AIDS cholangitis – features:
  - Papillary stenosis
  - Biliary duct strictures and thickening
Acalculous Cholecystitis

Gallbladder wall thickening in both CT and ultrasound. Minimal pericholecystic fluid is present on ultrasound.

Images courtesy of Dr. Gramm
AIDS cholangiopathy

Mathieson JR, Smith FR. Hepatobiliary and pancreatic ultrasound in AIDS. Saunders: London. 1998, Figure 17.19.

Courtesy of Dr. Gramm
Anorectal Disease

- Most common in patients who engage in anal intercourse

Symptoms:
  Dyschezia, BRBPR, tenesmus

Findings:
  Perirectal abscesses
  Anal fistulas
  Ulcerations
  Proctitis
  Anorectal carcinoma
HSV Proctitis

Peri-rectal wall thickening secondary to inflammation, with possible fistula formation.
Neoplasms of the GI tract
Kaposi’s sarcoma

- More likely to occur in homo- or bi-sexual patients with CD4 count <200 cells/μL
- Associated with human herpes virus 8
- Preceded by cutaneous manifestations

Courtesy of Dr. Gramm

Bulky polypoid lesions
Kaposi’s sarcoma of the colon

Complications:
- Diarrhea, bleeding, obstruction, perforation, and protein-losing enteropathy
- Hepatosplenomegaly is also common

**DDx:** lymphoma, infection, hematogenous metastases, polyps, Crohn’s, and bacillary angiomatosis

Large, annular, submucosal red-purple masses – circumferential infiltration and obstruction in the colon

Non-Hodgkins lymphoma

- 60-fold greater risk of developing lymphoma than in the general population
- Almost all have extranodal disease
- Bulky adenopathy common
- (DDx includes KS and mycobacterium)
Non-Hodgkins lymphoma

Hepatomegaly with two low attenuation lesions present in the liver.

Ultrasound of liver with multiple hypoechoic lesions.

Koh DM. Langroudi B, Padley SPG. Abdominal CT in patients with AIDS. Imaging 2002: 24-34. Figure 12a.

Disseminated disease

- Hematogenous dissemination is rare
- Why? Neutrophil function is relatively intact
- Granulocytopenia secondary to
  - Medications
  - Infected indwelling catheters
Disseminated candidiasis → Necrotizing entercolitis

Pneumatosis intestinalis and mesenteric air are present.

DR

DR is a patient with advanced AIDS
- Bleeding esophageal varices secondary to portal hypertension from cirrhosis and coagulopathy

A therapeutic paracentesis was performed. During his hospital course he received treatment for candidal esophagitis.

Social work became involved because it was unclear he had been taking his medications, a VNA was re-organized.

He was placed on a NJ feeding tube for his AIDS enteropathy (chronic diarrhea, weight loss, and malnourishment).


References continued


Acknowledgements

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