General Internal Medicine Cases
Show and Tell:
Clinicopathologic Board Vignettes
Dr. Richard N. Mitchell and
Dr. Maria A. Yialamas
IRIM 2012
(we have nothing to disclose... at least regarding conflicts of interest)

49 y.o. mother of three
Fatigue, peripheral edema, flu-like illness beginning 1 month ago

HCT 35
BUN 28/creatinine 1.4
Albumin 2.8/globulin 3.6
Cholesterol 440
Urinalysis: 4+ protein/benign sediment.
CCr 90% predicted
Urine protein 3.5 gm/24 hrs

Nephrotic Syndrome
CHILDREN
Minimal change 65%
Focal and segmental glomerulosclerosis (FSGS) 10%
Membranoproliferative GN 10%
Membranous GN 5%
ADULTS
FSGS 35%
Membranous GN (most are idiopathic) 30%
Minimal change 10%
Membranoproliferative GN 10%

Secondary Nephrotic Syndrome
Systemic Illness
Diabetes mellitus
Collagen – vascular diseases
Amyloidosis
Sarcoidosis

Secondary Nephrotic Syndrome, cont’d
Infections
Bacterial
Strep
Syphilis
Endocarditis
Viral
Hepatitis B
HIV
Protozoal
Malaria
Helminths
Secondary Nephrotic Syndrome, cont’d

Neoplasms
- CA
- Lymphoma, Leukemia
- Multiple Myeloma

Toxins – Drugs
- Heroin
- NSAIDS
- Gold, Mercury

Membranous GN

Majority (85%) are idiopathic

Collagen-vascular (e.g., SLE)

Neoplasm
- CA – stomach, lung, colon
  (25% of those with MGN > age 50)
- Hepatitis B (and other chronic infections)
- Drugs – gold, captopril, penicillamine

Minimal Change
- steroid responsiveness

Lymphoma
Leukemia

Focal and Segmental Glomerulosclerosis
- Heroin
- AIDS

What to look for: proteinuria

- glomerulus
- cellularity of glomerulus
- basement membrane
- cellular architecture (on EM)
- immunofluorescence
Membranoproliferative glomerulonephritis

- Type I (subendothelial deposits)
  - Circulating immune complexes (SLE, hepatitis B and C, endocarditis)
  - Idiopathic
- Type II (dense deposit disease)
  - C3 nephritic factor (autoantibody to C3 convertase)
Focal and segmental glomerulosclerosis

- Primary epithelial injury
- HIV-associated nephropathy
- Heroin-associated nephropathy
- Idiopathic
- Compensatory changes after parenchymal loss
- Focal glomerulitis (vasculitides, IgA nephropathy)

Kimmelstiel-Wilson disease (nodular glomerulosclerosis)

Diabetic glomerulopathy

Nephritic syndrome (hypertension, hematuria, proteinuria)

Crescentic (rapidly progressive) glomerulonephritis

- Nephritic syndrome
- Autoimmune/systemic disease
  - Goodpasture’s
  - Wegener’s granulomatosis
  - Henoch-Schönlein purpura
  - SLE
  - Polyarteritis nodosa
- Post-infectious
- Idiopathic
34 y.o. teacher

Fatigue and anorexia for 3 – 4 months.

Transfusions 9 mos. ago.
Occasional beer. Occasional acetaminophen

SGOT 255
SGPT 200
Alkaline Phosphatase 155
BILI 0.6/0.8
Pro-time 12/11
Albumin 3.0

Transaminitis of Hepatic Origin
Poor correlation with extent of hepatic damage
SGOT/SGPT ratio
Other indicated tests
  - Hepatitis serologies
  - Albumin/PT
  - ANA, ASMA, ALKM-1
  - Toxic levels
  - Fe/TIBC, Ferritin
  - Ceruloplasmin
  - α-1-anti-trypsin
  - Abdominal US

What to look for: elevated transaminases
- liver architecture
- portal inflammation
- hepatocyte necrosis
- inclusions

Acute hepatitis
- Toxic
- Ischemic
- Infectious
- Auto-immune
alcoholic hepatitis
Mallory’s hyaline
ground-glass cytoplasm
hepatitis B
sanded nuclei
Non-alcoholic steatohepatitis (NASH)
hepatocyte death
inflammation
steatosis
Non-alcoholic steatohepatitis (NASH)

infectious hepatitis
portal triad
chronic persistent
normal architecture
cords and sinuses
chronic active

cirrhosis
dense bridging fibrosis
regenerating nodules
cirrhosis (trichrome stain: fibrosis = blue)
Cirrhosis

- Hepatitis C 25%
- Alcoholic liver disease 20%
- Hepatitis C plus ALD 15%
- Cryptogenic (NAFLD?) 15%
- Hepatitis B +/- Hepatitis D 15%
- Miscellaneous 5%
  (Wilson's, hemochromatosis, α-1-anti-trypsin deficiency, autoimmune, PBC, PSC, VOD, etc.)

Alcoholic hepatitis

α-1-anti-trypsin deficiency
(PAS stain; pink = glycoprotein)

Intracellular α-1-anti-trypsin

Asymptomatic 47 y.o. housewife
Alk Phos 320
SGOT, BILI WNL
Elevated 5' NT

Hemochromatosis

Prussian blue stain
(blue = iron)

Alkaline Phosphatase

Liver, bone, placenta, intestine tumors

Children, pregnancy, old age

Bone vs. Liver: 5' NT, leucine aminopeptidase, GGT

No help in DDX intra vs. extra hepatic

Alkaline Phosphatase

DDX:
- Cholestasis
- Primary biliary cirrhosis (90% anti-mitochondrial antibody positive)
- Sclerosing cholangitis (ERCP)
- Granuloma (sarcoidosis vs TB)
- Metastatic tumors
  - ALK PHOS 95%
  - SGOT 50%
  - BILI 30%
What to look for: abnl alk phos

- duct obstruction
- intra- vs extra-hepatic
- inflammation
- nodules

51 y.o. policeman with increased stool frequency, 20 lb. weight loss

UGI, BaE WNL
HGB 11.2, MCV 72
Fe/TIBC 40/380
Protein 6.6, ALB 2.7

Stool OB negative
Malabsorption
Abnormal intralumenal digestion
Abnormal uptake & transport of nutrients across intestinal epithelium
Abnormal transport into blood stream

Malabsorption, cont’d
Screen with albumin, cholesterol, carotene, tissue transglutaminase, anti-endomyseal antibody
Malabsorption usually documented by increased fecal fat
Mucosal defect suggested by abnormal D-xylene, low Fe, low folate, low albumin

Small Bowel Biopsy
Diagnostic
Whipple’s
Amyloidosis
Abetalipoproteinemia

Often Diagnostic
Celiac disease (sprue)
Intestinal lymphoma
Crohn’s disease
Giardia, Isospora, Cryptosporidia, MAI

What to look for: malabsorption
- small bowel architecture (crypt: villus ratio)
- epithelial integrity
- deposition in lamina propria
- bugs

Crohn’s disease: transmural inflammation and fibrosis
Giardia, Isospora, Cryptosporidia, MAI

Celiac disease
no villi, all crypts
inflammation in lamina propria
flattened epithelium
celiac disease

normal small bowel
normal architecture (ratio of 3-4:1)

fistula tracts
granulomas

villi
villi
no villi, all crypts
inflammation in lamina propria
flattened epithelium
Amyloidosis abetalipoproteinemia

Lamina propria filled with amyloid
dilated lymphatics
epithelial cells with retained lipid

Whipple’s Disease

Macrophages in lamina propria stuffed with bacilli

Giardiasis

Giardia trophozoites

Spore-forming protozoans

Cryptosporidium (AFB stain on aspirate)

Isospora (AFB stain on aspirate)

Microsporidium (trichrome stain on aspirate)

Cyclospora (modified AFB on fecal smear)

45 y.o. man with 1 month of fragile blisters

<table>
<thead>
<tr>
<th>BLISTERS, cont’d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythema Multiforme (Stevens – Johnson)</td>
</tr>
<tr>
<td>Lupus</td>
</tr>
<tr>
<td>Porphyria Cutanea Tarda</td>
</tr>
</tbody>
</table>

What to look for: blisters
- location of cleft
- inflammation
- immuno-fluorescence pattern
A healthy 29 y.o. medical resident volunteers to give blood.

The blood bank finds a hemoglobin of 9.

He brings you the peripheral smear to review.

What to look for:

- peripheral smear
  - RBC size, shape, central pallor
  - WBC number, granularity, nuclear segmentation
  - platelet number, size
Hypochromic anemia

- Iron deficiency
- Blood loss
- Malabsorption
- Increased requirement

- Impaired heme synthesis (sideroblastic)
- Hereditary, idiopathic, toxins (lead, alcohol)

Hypochromic anemia, cont’d

- Defective iron reutilization
- Anemia of chronic disease
- Impaired globin synthesis
  - alpha and beta thalassemia

β-thalassemia

- pre-splenectomy
- post-splenectomy

sideroblastic anemia

- ringed sideroblasts (marrow)
- basophilic stippling (ribosome clumping)

β-thalassemia

- nucleated RBC
- mega-platelets

megaloblastic anemia

- hypersegmented PMN
- macrocytes/ovalocytes
hemolytic anemia

hemolysis

schistocytes

mechanical

TTP or DIC

spherocytosis

elliptocytosis

sickle cell disease

spur cells

(betalipoproteinemia or cirrhosis)

burr cells

(uremia)

babesiosis

malaria

Acute myelogenous leukemia

Auer rods (M2-M4)
A 32 y.o. teacher has a routine urinalysis. The sediment was abnormal.

What to look for: urine
- cells
- casts
- crystals

Hyaline casts (proteinuria)
Broad casts (ESRD)
RBC cast (glomerulonephritis)
WBC cast (pyelonephritis)
Tubular cell cast (ATN)
Granular cast (ATN)
Struvite crystals
Oxalate crystals
Uric acid crystals
Urinary Calculi

- Calcium (oxalate or phosphate) (75% of all calculi)
  - hypercalcemia (5%)
  - hypercalciuria (55%)
  - hyperuricosuria (20%)
  - hyperoxaluria (5%)
  - Idiopathic
- Magnesium ammonium phosphate (struvite) (10-15%)
- Uric acid (6%)-radiolucent
- Cystine (1%)-radiolucent

Board Style Practice Question

79 y.o. woman with 6 month h/o headache, carpel tunnel symptoms, fatigue and unexplained weight loss.

A biopsy is performed.

A. amyloidosis
B. Hashimoto’s thyroiditis
C. temporal arteritis
D. Churg-Strauss syndrome
E. rheumatoid arthritis
Board Style Practice Question

36 y.o. man with 5 year h/o HIV infection; frequently non-compliant with medications. Now with progressive dyspnea and lung opacifications.

A biopsy is performed.

A. Pneumocystis jiroveci pneumonia
B. respiratory syncytial virus
C. hypersensitivity pneumonitis
D. sarcoidosis
E. cytomegalovirus

Board Style Practice Question

44 y.o. woman with 6 month h/o bloating, dyspepsia, and microcytic anemia.

A biopsy is performed.
A. pernicious anemia/autoimmune gastritis
B. gastric carcinoma, *linnitus plastica* type
C. Zollinger-Ellison syndrome
D. gastrointestinal stromal tumor
E. *Helicobacter pylori* gastritis

---

**Board Style Practice Question**

25 y.o. woman medical student with a single supraclavicular lymph node.

A biopsy is performed.

---

A. non-Hodgkins lymphoma
B. Hodgkins lymphoma
C. metastatic ovarian carcinoma
D. tuberculosis
E. reactive lymphadenopathy

---

**Hodgkins lymphoma (Reed-Sternberg cell)**