Interactive Case Presentation #2: Autoimmune Liver and Biliary Diseases

Moderator:
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Texas Liver Institute
Austin, Texas
HPI: 52 yo Caucasian female w/ history of elevated liver enzymes, first noted April 2016.

- 5/12/16: AST/ALT 100s-200s, ALP 180, Tbili 0.9, Albumin 4.4, Plts 280
- 6/4/16: AST/ALT in the 1000s, ALP 380, Tbili 1.1, Albumin 3.4, Plts 299
- VS: 145/92, 75, 16, 97.6, Weight: 154, BMI 28

Meds:
- ASA 81 mg, Multi vit, Lipitor 20 mg, levothyroxine 100 mcg
- Took nitrofurantoin x 12 weeks for recurrent UTIs last fall
# The Patient: T.H.

## PMH/PSH:
- Hyperlipidemia
- UTIs
- Anxiety
- HTN
- Hypothyroidism
- Prediabetes

## FMH:
- M-hypothyroidism, Sjogren syndrome
- D-Alzheimer’s, HTN
- Denies family history of liver disease

## Social:
- Married
- Non smoker
- ETOH: 2-4 per week with dinner
- Illicit Drugs: Denies
- Blood transfusion before 1992: Denies
- Tattoos: 1 from tattoo parlor 10 years ago
The Patient: T.H.

**ROS:**
- +anxiety
- +vague RUQ discomfort
- +fatigue
- +mild pruritus
- +arthralgia

**PE:**
- +central adiposity, otherwise unremarkable
- Unable to elicit abd tenderness
- No hepatosplenomegaly
- No signs of decompensated liver disease
Differential Diagnosis?
Differential Diagnosis

• NAFLD
  + Metabolic syndrome features: overweight, central adiposity, prediabetes, hyperlipidemia, HTN
  - Liver enzymes too elevated for NAFLD

• Hepatitis C
  + Tail end of Baby Boomer generation, greatest risk of having HCV, tattoo
  - No other risk factors

• Autoimmune Hepatitis (AIH)
  + Personal hx hypothyroidism, family hx autoimmune disease, took meds believed to be possible triggers for AIH, often see very high AST/ALT
  - Usually ALP is not elevated

• Primary Biliary Cholangitis (PBC) or Primary Sclerosing Cholangitis (PSC)
  + Middle aged female, fatigue, ALP is elevated, pruritus

• Drug Induced Liver Injury (DILI)
  + Nitrofurantoin known to cause DILI
Work up Recommendation

Labs

- CBC, CMP, pt/INR, GGT
- Immunoglobulins A, G, M
- Viral serologies, acute and chronic: Hep C Ab, Hep B and Hep A, EBV, HSV
- Genetic liver diseases: ceruloplasmin, iron %, alpha 1 antitrypsin
- Autoimmune: AMA M2, ASMA, ANA

Imaging and Staging Liver Disease

- Abdominal US
- Elastography or Fibroscan

Hold off on liver biopsy at this time until lab results are in.
An Overview of Primary Biliary Cholangitis & Primary Sclerosing Cholangitis

Emma Pham, MPAS, PA-C
Texas Liver Institute
Transplant Hepatology
University of Texas Health Science Center
San Antonio, Texas
Normal Hepatobiliary Anatomy

http://hb.surgery.ucsf.edu/media/2907208/UCSF045_EatrahepaticBileDuctAnatomy
Primary Biliary Cholangitis (PBC)

• Formerly Primary Biliary Cirrhosis
• Autoimmune progressive, cholestatic disease which may extend over many decades
• Combination of genetic predisposition and environmental triggers
• Destruction of intrahepatic bile ducts

2. Primary biliary cirrhosis (PBC). PathPedia website. 
Important Tidbits to Remember

- 95% affected are women
- After HCV, second most common reason for transplant in women
- Elevated alkaline phosphatase is main lab feature
- Symptoms may be absent early in disease
- Untreated, most will progress to advanced disease over 15 years
Clinical Presentation

• Most common symptoms
  – Fatigue
  – Pruritus
• SICCA syndrome (dry eyes and/or dry mouth)
• CREST syndrome

Symptoms have no correlation with the natural history of disease

Calcinosis
Raynaud’s
Sclerodactyly
Esophageal dysmotility
Telangiectasias
Many Patients with PBC Also Suffer from Cholestasis and/or Cirrhosis

<table>
<thead>
<tr>
<th>Complications of chronic cholestasis(^1)</th>
<th>% of Patients Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteoporosis</td>
<td>20%-44%</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>75%-95%</td>
</tr>
<tr>
<td>Vitamin deficiency</td>
<td>8%-33%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Complications related to cirrhosis</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Varices associated with portal hypertension</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>(with early-stage disease)(^1)</td>
</tr>
<tr>
<td></td>
<td>~31%</td>
</tr>
<tr>
<td></td>
<td>(with late-stage disease)(^2)</td>
</tr>
<tr>
<td>Hepatocellular carcinoma</td>
<td>1%-6% of patients per year(^1)</td>
</tr>
</tbody>
</table>

Forms of PBC\(^1\)

- Up to 30% may have a severe, progressive form of PBC resulting in early development of liver fibrosis and liver failure\(^1\)
- Some patients progress through histological stages in less than a decade\(^2\)

AASLD Suggested Diagnostic Algorithm for Patients With Suspected PBC

1. Elevated serum alkaline phosphatase (ALP) activity
2. Exclude other causes of liver disease including alcohol and drugs
3. Cross sectional imaging of liver to exclude biliary obstruction
4. AMA (antimitochondrial antibody), ANA (antinuclear antibody), ASMA (anti-smooth muscle antibody)
5. Consider liver biopsy, especially if AST>5x ULN or AMA negative

Additional Useful Tests
- IgM elevation
- M2 antibody
Ursodeoxycholic Acid (UDCA)

- Orally administered nontoxic bile acid
- Balances the bile acid ratio normally produced by the liver, some of which are more toxic to the liver
- UDCA in a dose of 13-15 mg/kg/day
- UDCA is initiated gradually and given BID
Ursodeoxycholic Acid (UDCA)

- Improvement in liver tests will be seen within a few weeks and 90% of the improvement usually occurs within 6-9 months
- Safe, may improve clinical symptoms, delay progression of disease and survival, and improve QOL
- However, up to 40% of PBC patients treated with UDCA have a suboptimal response

Pares A, Gastroenterology, 2006; Marschall HU, Gastroenterology, 2005.
ALP <1.67 x ULN and Normal Bilirubin after 1 Year of UDCA is Highly Predictive of Outcome

Global PBC Study Group (N=4845)

Lammers, EASL, AASLD. 2013.
Obeticholic Acid (OCA)

- A modified bile acid and FXR agonist
- OCA given to individuals with PBC with an inadequate response to or unable to tolerate UDCA
- Produced a significant clinically meaningful improvement in liver biochemistry
- Approved by FDA on May 27, 2016 (Ocaliva)
Long-term Management of Patients with PBC (AASLD Guidance)

- Liver tests every 3-6 months
- Thyroid status (TSH) annually
- Bone mineral densitometry every 2-4 years
- Vitamins A, D, K annually if bilirubin >2.0
- Upper endoscopy every 1-3 years if cirrhotic or Mayo risk score >4.1
- Ultrasound ± AFP every 6 months in patients with known or suspected cirrhosis
PBC Prognosis Using Mayo Risk Score

The Updated Natural History Model for Primary Biliary Cirrhosis

In the following model, short-term survival probability of a patient with primary biliary cirrhosis is estimated based on repeated observation. Please enter data in the corresponding boxes.

How old is the patient? [ ] (years)
What is the bilirubin? [ ] (mg/dl)
What is the albumin? [ ] (g/dl)
What is the prothrombin time? [ ] (seconds)
Does the patient have peripheral edema? [No] [Yes]
Is the patient on diuretic therapy? [No] [Yes]

Risk score: [ ]

Estimated Probability of Survival (%)

<table>
<thead>
<tr>
<th>Time</th>
<th>0</th>
<th>3 Mos.</th>
<th>6 Mos.</th>
<th>9 Mos.</th>
<th>12 Mos.</th>
<th>15 Mos.</th>
<th>18 Mos.</th>
<th>24 Mos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>
PBC Prognosis Using Mayo Risk Score

- How old is the patient? 50 (years)
- What is the bilirubin? 3 (mg/dl)
- What is the albumin? 3 (g/dl)
- What is the prothrombin time? 15 (seconds)
- Does the patient have peripheral edema? Yes
- Is the patient on diuretic therapy? No

Risk score: 8.38137

Estimated Probability of Survival (%)

<table>
<thead>
<tr>
<th>Time</th>
<th>3 Mos.</th>
<th>6 Mos.</th>
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</thead>
<tbody>
<tr>
<td>100</td>
<td>96</td>
<td>93</td>
<td>92</td>
<td>90</td>
<td>87</td>
<td>82</td>
<td>81</td>
</tr>
</tbody>
</table>
Liver transplantation (LT)

- Indicated for
  - Patients progressing to decompensated cirrhosis
    - Patients with late diagnosis
    - No response to UDCA (30-40%)
    - MELD $> 15$
    - HCC meeting transplant criteria
  - Patients with intractable pruritus
PBC Summary

• PBC is chronic cholestatic disease resulting in destruction of intrahepatic bile ducts
• Most common symptoms of PBC is fatigue and profound pruritus
• Elevated ALP with positive AMA is highly disease-specific
• Majority of patients respond to UDCA
• OCA can be used as adjunct therapy for patients that are non-responder or partial responders to UDCA
• Liver transplantation is an option for patients who are decompensated or have refractory pruritus
What is PSC?: Primary Sclerosing Cholangitis

- Chronic progressive inflammatory disease than affects extra and/or intrahepatic bile ducts
  - biliary stricturing and fibrosis
  - “chain of lakes” on cholangiogram

Bile duct stricturing = “chain of lakes”

ERCP: endoscopic retrograde cholangio-pancreatography
Epidemiology, Natural History & Prognosis

- Prevalence 6-8/100,000
- Usually diagnosed in 20s and 30s
- Male predominance~3:1
- 80% have IBD- usually ulcerative colitis (UC) 90%
  - 4% with UC get PSC
- ~44% asymptomatic at diagnosis
- Median survival ~12 years
- 4th leading diagnosis leading to LT in North America
- Associated with cancer
  - Cholangiocarcinoma
  - HCC (with cirrhosis)
  - Colon Cancer (if IBD present)
Clinical Presentation

- Ranges from asymptomatic to pruritus, fatigue or even jaundice
- May have recurrent bouts of cholangitis with fevers/chills and bacteremia
Diagnosis of PSC

- Cholestatic Liver Tests (elevated ALP and GGT)
- Cholangiography (MRCP or ERCP)
- Exclusion of secondary sclerosing cholangitis
- 95% at least one autoantibody
  - 85% + pANCA
  - 50% + ANA
  - 25% + SMA

pANCA is perinuclear antineutrophil cytoplasmic antibody

Treatment

• Medical management
  – Ursodeoxycholic acid (20-25 mg/kg)
    • Uncertain benefit but should not use high dose
  – Pruritus: cholestyramine, rifampicin, opioid antagonist

• Endoscopic therapy
  – Balloon dilation and stenting
    • Dilation recommended due to decreased risk of infection
    • Follow bili and alk phos for treatment improvement

• Cholangiocarcinoma (CCA) and HCC surveillance
Liver Transplantation

• Indicated for
  – Patients progressing to decompensated cirrhosis
    • MELD > 15
    • HCC meeting transplant criteria
  – Patients with intractable pruritus, recurrent bacterial cholangitis, or cholangiocarcinoma

• Eventually most patients will require LT as there is no effective treatment
PSC Summary

• Chronic progressive inflammatory disease affect extra- and/or intrahepatic bile ducts
• No established therapy, however ursodiol can be used
• Risk of biliary cancers and colon cancer
• Liver transplantation is often the only treatment option
<table>
<thead>
<tr>
<th>Similarities and Differences</th>
<th>Primary Biliary Cholangitis</th>
<th>Primary Sclerosing Cholangitis</th>
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</thead>
<tbody>
<tr>
<td>Etiology Unclear</td>
<td>Etiology Unclear</td>
<td></td>
</tr>
<tr>
<td>Effects Intrahepatic bile ducts</td>
<td>Can effect extra-intrahepatic bile ducts</td>
<td></td>
</tr>
<tr>
<td>Vanishing bile ducts</td>
<td>Stricturing of bile ducts</td>
<td></td>
</tr>
<tr>
<td>Presence lymphocytes, plasma cells, macrophages, and PMNs on biopsy</td>
<td>Absences of inflammatory cells on biopsy</td>
<td></td>
</tr>
<tr>
<td>Associated with SICCA or CREST syndrome</td>
<td>Associated with UC</td>
<td></td>
</tr>
<tr>
<td>UDCA helps in majority of patients; OCA recently approved</td>
<td>New drug therapies are in clinical development; in general PSC leads to liver transplantation</td>
<td></td>
</tr>
</tbody>
</table>
Back to Rebekah
Lab/Imaging Results (June 10, 2016)

• Labs:
  – Alb 4.4, Tbili 0.5, Alk Phos 200, AST 91, ALT 110, IgM and IgG elevated, ferritin 444, GGT 72, WBC 5.9, Hgb 13.1, HCT 40.7, Plt 280
  – EBV PCR neg, HSV PCR neg, HAV IgM neg, HBV surface AG neg, HBV core IgM AB neg, HCV AB neg
  – ANA 1:160 (pos), AMA M2 +, SMA +

• Abdominal US
  • Liver: mild fatty liver with no focal lesions, spleen: normal

• Elastography
  • 8.2 kPa
  • Moderate fibrosis?

• Biopsy performed and confirmed PBC and AIH
Rebekah asks Christy to present on AIH
Autoimmune Hepatitis (AIH)

Christy Rosas, MPAS, PA-C
Texas Liver Institute
San Antonio, Texas
AIH: Clinical Presentation

• 30% present with cirrhosis
• Up to 50% may present with jaundice
• Asymptomatic (35-45%) with abnormal enzymes
  – Often discovered during evaluation for other autoimmune conditions
AIH: Demographics and Epidemiology

- Afflicts ~200,000 in U.S.A.
- Incidence 1.9 per 105 per year
  - Prevalence 16.9 per 105
- Afflicts both children and adults
  - Female to male ratio=4:1
- Bimodal age distribution: 10-20 vs. 45-75 yrs
- 6% liver transplants in US
AIH Pathogenesis

• Genetic factors
  – Antigen presentation/immunocyte activation
  – DRB1 encodes for MHC II antigen binding grooves (antigen presentation to T cells)

• Triggering factors
  – Infections (HCV, HDV)
  – Medications
    - Minocycline, Nitrofurantoin, Methyldopa, Atorvastatin, Diclofenac, Augmentin, Isoniazid, Infliximab

Czaja et al. Hepatology 2002;36:479
Manns et al. Hepatology 2006;14:S132
Diagnosis

• Serology
  – Positive ANA, SMA or LKM
  – Elevated serum IgG to twice normal levels
  – 5% have seronegative disease

• Histology
  – Biopsy required for diagnosis ALWAYS
  – Sometimes atypical features
  – Overlap syndromes (PBC/PSC)
Goals for treatment of AIH

• Normalization of ALT and IgG
• Normalization of histology
• Regression of fibrosis
• Prevention of cirrhosis
• Minimization of side effects
AIH: Criteria for Treatment

• Symptomatic disease and either
  – AST >10-fold normal
  – AST 5-10 fold normal and >2-fold elevation of IgG

• Presence of fibrosis
Combination Therapy

Acute presentation and severe histological activity

- Corticosteroids 30-60 mg/day for 1-2 weeks + AZA 50-100 mg/day
- Prednisone 10 mg/day + AZA 50-100 mg/day
  - Gradual taper off prednisone

Asymptomatic AIH and mild-moderate histological activity

- Corticosteroids 20 mg/day for 1-2 weeks + AZA 50 mg/day
  - Gradual reduction 2.5 mg/week + same AZA dose
- Prednisone 5-10 mg/day + AZA 50 mg/day
  - Gradual taper off prednisone

Adjust the AZA dose depending on the biochemical response and tolerance

AIH Treatment Side Effects

• Long term prednisone
  – Osteoporosis and fractures
  – Diabetes
  – Obesity
  – CV disease
• Cytopenias
• AZA-induced pancreatitis
• Long term lymphoma and skin cancer risks
AIH: Take Home Points

• Chronic hepatocellular disease in genetically predisposed patients of unclear trigger
• Diagnosis based upon liver enzymes, serology, gamma globulins, and **histology**
• Immunosuppressive therapy is the mainstay of treatment and is long term for nearly all patients
• Tailor therapy based upon treatment endpoints
Back to Rebekah
Patient T.H.: Treatment Plan

• PBC
  – Ursodiol
  – Obeticholic acid if no response

• AIH
  – Treat with azathioprine and prednisone, weaning the latter off in few months
Roundtable/Q&A