Cirrhosis & Portal Hypertension: Radiologic Findings

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Our Patient

- **HPI** – 50 year-old male presents with confusion
- **PMH** – alcoholism, s/p cholecystectomy
- **PE** – jaundice, positive abdominal fluid wave
- **Labs** – Abnormal LFTs: nl aminotransferases, ↑ TBili, ↑ PT, ↓ Alb, ↑ Ammonia, ↑ Alk Phos
- **Impression** – Alcoholic cirrhosis, Hepatic encephalopathy
Menu of Tests

• Ultrasound (US)

• Computed tomography (CT)

• Magnetic resonance imaging (MRI)

• Nuclear medicine
Our Patient: US Imaging

Ultrasound of Liver

Ascites

Liver

Doppler studies: patent portal & hepatic veins

courtesy of BIDMC PACS
# Differential Diagnosis: Hepatic Ascites*

<table>
<thead>
<tr>
<th>Sinusoidal</th>
<th>Post-Sinusoidal</th>
<th>Pre-Sinusoidal</th>
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<tbody>
<tr>
<td>- Cirrhosis (81%)</td>
<td>- Constrictive pericarditis</td>
<td>- Portal or Splenic vein thrombosis</td>
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<tr>
<td>- SBP</td>
<td>- Right-sided CHF</td>
<td>- Schistosomiasis</td>
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<tr>
<td>- Hepatitis</td>
<td>- Tricuspid insufficiency</td>
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<tr>
<td>- Liver Metastases</td>
<td>- Budd-Chiari syndrome</td>
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<td>- HCC</td>
<td>- Veno-occlusive disease</td>
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*Portal Hypertension-Related Etiologies*
Hepatic Anatomy

CT Abdomen: Normal

Patient 1

Liver
Aorta
Stomach
Spleen

CT Abdomen with IV contrast
courtesy of BIDMC PACS
Our Patient: CT Imaging

CT Abdomen with IV contrast

- Falciform ligament
- Nodular Liver
- Ascites
- Stomach
- Spleen

courtesy of BIDMC PACS
Our Patient: Diagnosis

Liver Cirrhosis

Portal Hypertension

Ascites, Varices, Splenomegaly, Encephalopathy

Netter, F.H. The CIBA Collection of Medical Illustrations, Volume 3: Digestive System, Part III, 1957
Portal Hypertension Signs & Symptoms

Netter, F.H. The CIBA Collection of Medical Illustrations, Volume 3: Digestive System, Part III, 1957
Portal System: Portacaval Anastomoses

Netter, F.H. The CIBA Collection of Medical Illustrations, Volume 3: Digestive System, Part III, 1957
Esophageal Varices

Our Patient

CT Abdomen with IV contrast
courtesy of BIDMC PACS
Esophageal Varices: Another Look

Normal Anatomy

Abnormal Anatomy

Netter, F.H. The CIBA Collection of Medical Illustrations, Volume 3: Digestive System, Part I, 1957
Esophageal Varices: Barium Study

Normal

Abnormal
Esophageal Varices: Endoscopy

Normal

Abnormal

http://medlib.med.utah.edu/WebPath/GIHTML/GI121.html

http://home.t-online.de/home/afreytag/o06e.htm
CT Abdomen: Normal

Patient 1

Liver
Aorta
Stomach
Spleen
Gastric Varices

Our Patient
More Varices – Spleen & Bowel

Our Patient

CT Abdomen with IV contrast
courtesy of BIDMC PACS
Splenomegaly

Patient 2

Anasarca

CT Abdomen w/ IV contrast

Patient 3

Ascites

MR Abdomen T2 Coronal

courtesy of BIDMC PACS
One More Finding…

Our Male Patient

Gynecomastia

CT Abdomen without IV contrast
courtesy of BIDMC PACS
Our Patient: Course

- High risk for UGIB and HCC
- Intractable Ascites – TIPS procedure
- Liver Transplant
TIPS Procedure

Our Patient

Angiogram

TIPS stent with contrast demonstrates flow from portal vein to IVC, thus bypassing the liver.

courtesy of BIDMC PACS
TIPS Procedure: US Imaging

Our Patient

Liver Ultrasound

- Ascites
- Liver
- Stent

courtesy of BIDMC PACS
TIPS Procedure: Color Doppler US

Our Patient

Liver Ultrasound

- Patent TIPS
- Red = flow towards transducer
- Blue = flow away from transducer
The TIPS procedure relieved the ascites somewhat. Our patient went on to receive a liver transplant.
References

- Gamuts, Radiology Texts, UptoDateonline
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