Liver Cirrhosis and TIPS

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Agenda

• Patient Presentation

• Liver Cirrhosis and Portal Hypertension

• Role of Imaging

• Transjugular Intrahepatic Portosystemic Shunt (TIPS) for the Treatment and Prevention of Variceal Bleeding
Patient History

- 47 y/o male w h/o cirrhosis/HCV/ETOH, transferred from OSH w esophageal variceal bleeding
- Child C disease, treated w Octreotide, continues to bleed despite endoscopic treatment
- In the ICU, received resuscitation including 6 units of blood and FFP
- Hct 33.8, AST/ALT 98/42, TBili 5.2, Albumin 2.0
Recent Ultrasound

Courtesy of BIDMC

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DDX of Imaging Findings: Heterogeneous Echo Pattern

- Cirrhosis
- Metastatic disease
- Hepatocellular carcinoma
- Fatty infiltration (uncommon)
- Hepatoblastoma (uncommon)
Liver Cirrhosis: Definition and Problem

- Late stage of progressive hepatic fibrosis, characterized by distortion of normal architecture and formation of regenerative nodules

- Responsible for 373,000 hospitalizations and 25,000 deaths in the US
Liver Cirrhosis: Etiologies

1. Alcoholism
2. Viral hepatitis
3. Immunologic disorders
4. Biliary disorders
5. Metabolic disorders
6. Cardiovascular disease
7. Drugs and toxins
8. Misc.
Liver Cirrhosis: Complications

- Portal hypertension
- Ascites
- Variceal hemorrhage
- Spontaneous bacterial peritonitis
- Hepatorenal syndrome
- Encephalopathy
- Hepatocellular Carcinoma
- Hepatopulmonary syndrome
Portal Hypertension

- Hepatic Venous Pressure Gradient (HVPG)
  - HVPG = WHVP - FHVP

- Portal hypertension is defined as a HVPG > 5 mmHg

- The complications of portal hypertension do not appear until the HVPG > 12 mmHg
Collateral Circulation

- Gastroesophageal
- Paraumbilical
- Hemorrhoidal
- Splenic venous bed
- Pancreato-duodenal
- Retroperitoneal
Imaging Options

The major utility of imaging is in the evaluation of the complications of cirrhosis.

- Ultrasound
- CT
- MRI
- MR Angiography
- Nuclear Medicine
Liver Cirrhosis Imaging: Ultrasound

Liver Cirrhosis Imaging: CT
Liver Cirrhosis Imaging: MRI
Treatment Goals

• Slowing the progression of liver disease
• Prevention of superimposed disease
• Preventing and treating complications
Variceal Bleeding: High Mortality

Survival curve illustrating the poor prognosis after a 1\textsuperscript{st} variceal bleed. 30\% risk of death each episode, 30-40\% are alive after 2 years.

Graham DV, Gastroenterology 1981, 80:800
Primary Prevention of Variceal Bleeding

• Patients with cirrhosis should be screened endoscopically to evaluate the presence of varices

• Patients with varices or at risk for bleeding should be managed medically
  – β blockers

Sharara and Rockey, NEJM 2001
Active or Secondary Prevention of Variceal Bleeding

- Medical management
  - Octreotide
- Endoscopic therapy
  - Band ligation
  - Sclerotherapy
- TIPS
- Shunt Surgery
Transjugular Intrahepatic Portosystemic Shunt (TIPS)

- Interventional procedure
- Shunt between PV and IVC
- Established indications
  - Portal Hypertension with variceal bleeding that has failed endoscopic treatment
  - Refractory ascites
Transjugular Intrahepatic Portosystemic Shunt (TIPS)

- Rt IJ access
- Obtain WHVP and venogram

- 16 G needle through RHV to PV
- Obtain portal pressures and venogram
Transjugular Intrahepatic Portosystemic Shunt (TIPS)

- Dilate tract with PTA balloon
- Deploy metallic stent
- Dilate stent until pressure < 10 mmHg
- Embolization of varices (optional)
TIPS Images

Courtesy of BIDMC
TIPS: Upside

• TIPS has been proven to control acute variceal bleeding where conventional therapy has failed

• TIPS is associated with less procedural mortality and morbidity than shunt surgery in advanced liver disease
TIPS: Downside

• TIPS does not improve survival

• Complications
  – New onset encephalopathy (10-25%)
  – Shunt occlusion (30% at one year)
  – Right heart failure

• Contraindications
  – Prehepatic portal hypertension
  – Pulmonary hypertension

Sharara and Rockey, NEJM 2001
TIPS: Use

- TIPS is best used as a bridge to transplantation in patients with advanced liver disease

Sharara and Rockey, NEJM 2001
Patient Outcome

- 47 y/o male w advanced cirrhosis (Child C) who has failed endoscopic management of variceal bleeding
- Undergoes successful TIPS procedure
  - HVPG <10 mmHg
  - Follow up US: patent shunt
- Transferred from ICU to medical floor
- Bleeding from NGT has subsided
- Now being considered for transplant
- Awaiting discharge
Summary

• Cirrhosis
  – Portal hypertension
  – Variceal hemorrhage

• Role of imaging in Cirrhosis

• Successful case of TIPS used as a bridge to transplantation for patients with advanced liver disease
References

6. UptoDate®
Thank You

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