Endoscopic Diagnostic and Therapeutic Interventions in Liver Disease

Todd H. Baron MD, FASGE
Overview

• Diagnostic
  • ERCP for PSC
  • EUS-guided liver biopsy

• Therapeutic
  • Gallbladder drainage
  • EUS-guided gastric variceal embolization
  • ERCP for PSC, post-transplant
PSC: Role of Endoscopy

• Diagnosis of PSC
• Detection of cholangiocarcinoma
• Treatment of PSC related complications
  • stones
  • dominant strictures
• palliation of biliary obstruction
• pre-transplant therapy
Diagnosis of PSC

• Cholangiography remains the gold standard
• Characteristic cholangiographic findings
• ERCP is invasive, but recommended when MRCP non-diagnostic or equivocal when clinical suspicion is high
Endoscopic finding: Retraction of The Papilla

• Small series – seen in 70% of patients
• Not seen with isolated intrahepatic PSC

Endoscopic Treatment of PSC Strictures

• Generally undertaken with worsening liver function tests
  AND
• Symptoms of cholangitis, pruritus
• Dominant strictures
Dominant stricture

- Stenosis of the CHD with a diameter of ≤1 mm
- Stenosis of the CBD with a diameter of ≤1.5 mm
Goals of Treatment

• Improve symptoms
• Improve liver function tests
• Delay transplantation
Detection of Cholangiocarcinoma

• Cholangiographic findings not predictive
• Brush cytology –
  • Performed in dominant strictures
  • Sensitivity 43%; specificity 97%
  • Fluorescent in-situ hybridization (FISH) increases accuracy
• Intraductal biopsies complementary
Fluorescent in situ Hybridization

1. Mixed population
2. Fixation
3. Hybridization
4. Probe
5. Fluorescent dye
6. Target (16S rRNA)
7. Ribosome
8. 30S subunit containing 16S rRNA
9. Cytoplasm
10. Nucleoid
11. Plasmid
12. Cell wall
13. Cytoplasmic membrane
14. Fluorescent oligonucleotide probes
15. Washing
16. Hybridized cells
17. FISH analysis
18. Fluorescence microscopy
19. Flow cytometry

UNC SCHOOL OF ME
Fluorescent in-situ hybridization (FISH)

• Used to detect and localize the presence or absence of specific DNA sequences on chromosomes

• Abnormal FISH results
  • Polysomy
  • Chromosomal deletions
Single operator cholangioscopy

• Allows targeted biopsies of dominant strictures – may increase sensitivity
• Can facilitate passage of guidewires across strictures

Endoscopic Ultrasound-Guided Liver Biopsy for Parenchymal Liver Disease
Endoscopic Ultrasound (EUS) Guided Liver Biopsy

• Originally used for focal pancreatic and hepatic lesions
• Real-time Doppler available
• Bi-lobar approaches
  • Left lobe: Transgastric
  • Right lobe: Transduodenal
• Similar diagnostic and tissue yield as compared to traditional techniques
Endoscopic Ultrasound–guided Parenchymal Liver Biopsy: Single Center Experience of a New Dedicated Core Needle

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Methods

• All samples sent to surgical pathology for diagnosis

• Independent, experienced liver pathologist reviewed all biopsies
  • Total Specimen Length (TSL)
  • Complete Portal Triads (CPT)

• Adequacy defined by AASLD guidelines
  • CPT ≥ 11
  • TSL ≥ 30 mm
Results

- Total of 24 patients included
- Adequacy of samples
  - Based on CPT: 23/24 = 95.8%
  - Based on TSL: 21/24: 87.5%
- 1 Adverse Event: subcapsular hemorrhage

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<th># of Passes</th>
<th>TSL (mm)</th>
<th>CPT</th>
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<td>Average</td>
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<td>65.3</td>
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<td>Median</td>
<td>2.0</td>
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Results – Histologic Diagnosis

- NASH: 42%
- PSC: 21%
- AIH: 4%
- Cirrhosis: 13%
- Heart Failure: 8%
- Hemochromatosis: 4%
- Cholestasis: 4%
- Non-Diagnostic: 4%

NASH: Non-Alcoholic Steatohepatitis
PSC: Primary Sclerosing Cholangitis
AIH: Autoimmune Hepatitis
### Results - Comparison With Previous Studies

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<th>Approach</th>
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<td><strong>Current Study</strong></td>
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<td>65.6</td>
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Gallbladder Drainage

• Used in patients with advanced liver disease as a bridge to transplant and as destination therapy in non-transplant patients
• Can be performed transpapillary at ERCP AND without biliary sphincterotomy
• Can be performed transmurally using EUS
Transpapillary Drainage

• Performed using ERCP techniques
• Nasobiliary tube = stent placement

• Advantages
  • Can be performed without sphincterotomy
  • Can be used when transmural approach not ideal
  • Does not preclude surgery

• Disadvantages
  • Traversing cystic duct
  • Limited diameter stents
How is Transmural Drainage Performed?
HOW TO KILL A ZOMBIE

1. CHOOSE YOUR WEAPON
2. AIM FOR THE HEAD
3. DON'T MISS
   (or it will eat your brains)
EUS Gallbladder Drainage
Transmural Drainage

• Advantages
  • Large diameter stents
  • Can allow direct gallstone interventions

• Disadvantages
  • Can preclude laparoscopic surgery
  • Difficult when gallbladder contracted
  • Technically challenging
  • Risks if failure after puncture
Treatment of Gastric Varices
Post-liver transplant Biliary Complications

• Usually performed at the time of ERCP

• Management of
  • Anastomotic and non-anastomotic strictures
  • Anastomotic and non-anastomotic leaks
  • Biliary stones and casts
EUS-Guided Transhepatic Drainage
Prior Interventions

- Percutaneous biliary drainage, 4 years ago
  Drain in place for 1 month, poorly tolerated

- Percutaneous biliary drainage, 3 years ago
  Drain in place for 2 months, poorly tolerated

- Single-balloon enteroscope ERCP, 2 years ago
  Failed to reach the hepaticojejunostomy
Conclusions

• Endoscopic therapy can play a key role in the diagnosis and management of liver disease

• Endoscopic management outside of esophageal variceal banding consists of ERCP and EUS modalities

• Endoscopic management of complex liver disease is done in the context of a multidisciplinary approach with hepatologists and hepatobiliary surgeons