The Role of Endoscopy in Pancreatitis

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Disclosures

- Boston Scientific – Consultant
- Medtronic – Consultant
- Apollo Endosurgery – Consultant
- Off-label uses that are discussed will be identified accordingly
Objectives

- Discuss the role of Endoscopy in diagnosis
- Discuss the role of Endoscopy in therapy
  - To scope or not to scope
- Endoscopic management of complications
Case 1

- A 43yo Hispanic female with obesity, DM2 presents with acute epigastric abdominal pain
- WBC 16k, Alt 225, Lipase >4000
- No EtOH, lipids WNL, Ca WNL, no significant family Hx
- Trans-abdominal U/S: 7 mm CBD without stone
- MRCP normal

What is your diagnosis? What Next?
Case 1

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Biliary Pancreatitis: Gallstone Migration
Diagnosis of Biliary Pancreatitis

- **Biochemical**
  - ↑bilirubin, alkaline phosphatase, ALT, AST, amylase
  - x3 fold elevation of ALT has 95% PPV

- **Imaging**
  - US - gallbladder not seen in up to 20%
    - ~20% sensitive for CBD stones
  - CT - useful for prognosis
  - ERCP - ‘gold standard’
  - What about **Endoscopic Ultrasound**?
# Diagnosis of choledocholithiasis

<table>
<thead>
<tr>
<th></th>
<th>Ultrasound</th>
<th>EUS</th>
<th>ERCP</th>
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<tbody>
<tr>
<td>Sensitivity</td>
<td>50%</td>
<td>91%</td>
<td>92%</td>
</tr>
<tr>
<td>Specificity</td>
<td>100%</td>
<td>100%</td>
<td>87%</td>
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<tr>
<td>Accuracy</td>
<td>83%</td>
<td>97%</td>
<td>89%</td>
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<tr>
<td>PPV</td>
<td>100%</td>
<td>100%</td>
<td>79%</td>
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<tr>
<td>NPV</td>
<td>74%</td>
<td>95%</td>
<td>94%</td>
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Chak et al, Gastrointest Endosc, 1999
EUS Detection of Occult Cholelithiasis

Acute pancreatitis (n=89)
  Biliary cause = 64

US (18), CT (6), repeat US (6), ERCP (13)

'Idiopathic pancreatitis' (n=18)

EUS

gallstone (14), CBD stone (3)

Idiopathic pancreatitis (n=4)

Liu et al, Gastrointest Endosc, 2000
Sludge!
Diagnosis of Biliary Pancreatitis

- EUS or MRCP?
- Systematic Review: 301 pts
- No significant difference:
  - Aggregated sensitivity 93 vs 85%
  - Aggregated specificity 96 vs 93%
- EUS may have higher sensitivity for small stones (<6mm)
- EUS can detect biliary sludge, MRCP generally cannot

EUS is highly accurate for evaluation of suspected biliary pancreatitis
Case 1

- EUS performed:
Case 2

- 54yow o/w healthy presents with dx of acute pancreatitis 02/14
- c/o intermittent RUQ abd pain for past year
- Single episode of elevation in lipase to 288 09/13
- Lipids, Ca2+ normal, no sig EtOH, no meds/suppl
- Transabdominal U/S wnl
- What Next?
Case 2

What Next?
Case 2

15 x 15 mm hypoechoic area in neck with upstream duct dilation and atrophy
Case 2

PANCREAS (FINE NEEDLE ASPIRATION):
- Scant atypical ductal cells (see comment)

COMMENT: The cytomorphological features are suspicious for adenocarcinoma. Material however is somewhat scant and the patient's history of pancreatitis has been noted. Recommend clinical and imaging correlation with further work-up as indicated.
Case 2

• Treated with 5-FU, abraxane, oxaliplatin, avastin x 6 months
• Underwent distal pancreatectomy at Hopkins, R0 resection, 3/23 LN+
• Recommended further chemo
• Disease progression, death 01/15

Anyone age > 40 with unexplained pancreatitis → EUS
Case 3

- 54 y/o Asian male is admitted with vague abdominal pain and pancreatitis
- Reports history of 30 pound weight loss
- Managed conservatively and discharged
- Pain is improved but now returns jaundiced
- No ETOH, HL, or stones (prior U/S)
- MRI ordered
MR Pancreas is performed

23 mm mass of head of pancreas with biliary stricture and upstream dilation
What is your next step?

1. Pancreaticoduodenectomy (Whipple)
2. ERCP w stent placement
3. Check IgG4 and also perform EUS/ERCP
4. EUS
Case 3

- Serum IgG4: 307
- EUS
Case 3

- **FNA**

Benign pancreatic tissue with partial **acinar atrophy**, areas of **fibrosis**, and mild to moderate **mixed inflammatory cell infiltrates** consisting of lymphocytes, plasma cells, neutrophils and occasional eosinophils.
Autoimmune Pancreatitis

- **AIP**: systemic inflammatory disease that affects the pancreas
  - Type I: lymphoplasmacytic infiltrate (IgG4 +)
  - Type II: Idiopathic duct centric (IgG4 (-)
- Type I more likely to present as mass lesion, systemic disease
- Elevated IgG4 only present in ~20% in Type II
- May result in pancreatic duct strictures, biliary strictures (autoimmune cholangiopathy)
Autoimmune Pancreatitis

- **HISORt criteria:**
  - Histology,
  - Imaging – Sausage pancreas, peripancreatic halo,
  - Serology – IgG4,
  - Other organs,
  - Response to therapy

- **Ampullary bx:** near 100% specificity

- **Treatment:** Prednisone 6-8 weeks. Recurrent 20-25% may require immunomodulators

Sugumar A., Curr Opin Gastroenterol 2010
Case 4

- 75yo male presents at 6PM with abdominal pain, fever to 38.9, hypotension, tachycardia, altered mental status
- Bilirubin 8.1, lipase 2500
- 1st year GI fellow is called for ERCP who states “We should let the patient cool off”
- Now what?
- Call attending/fire fellow?
Biliary Stone Extraction in Acute Pancreatitis

- Severe vs Mild pancreatitis
- Cholangitis/jaundice
- Persistent obstruction
Meta-analysis of 5 RCTs 702 pts: early ERCP decreased complications but NOT mortality in predicted severe pancreatitis, mild - no difference
Indications for ERCP in Biliary Pancreatitis

- Jaundice (bilirubin > 5mg/dl)
- Cholangitis
- Severe pancreatitis (within 24 hrs)
- Smoldering or worsening clinical course
Case 4
Case 4 Returns…

- Patient returns 2 months later with recurring post-prandial abdominal pain, early satiety, occasional vomiting
- CT scan ordered
- Pseudocyst
- What Next?
Pseudocysts

- History of Pancreatitis!
- No true epithelium
- Caution: *peripancreatic fluid collection in acute pancreatitis*
- A late complication > 4 weeks
- Treat for symptoms only
- Endoscopic EUS-guided Cystogastrostomy
Evolution of Necrosis into a Pseudocyst

Day 1  Day 7  Day 28
**Management of Pseudocysts**

- **Pseudocyst**
  - Asymptomatic
    - Follow
  - Symptomatic
    - Rapidly enlarging Complication
    - Drain
    - Persists 6 - 12 months
    - Drain
  - *Observe

*Large cysts can be safely followed, but are more likely to require drainage*
Case 4
Lumen-Apposing Metal Stent

- Decreased procedure time
- 90+% technical and clinical success

Lumen-Apposing Metal Stent (LAMS)
Walled-off Necrosis

- Indications for intervention on pancreatic necrosis:
  - pain requiring narcotics
  - suspicion of infected necrosis
  - inability to eat
  - failure to thrive
  - gastric/duodenal/biliary obstruction

- Up to 40% of patients with unsuspected infected necrosis

Management of Walled-off Necrosis
Necrosectomy
Minimally invasive step-up approach versus maximal necrosectomy in patients with acute necrotizing pancreatitis (PANTER)
Walled-off Necrosis

- Multicenter prospective randomized trial
- 88 patients (45 open necrosectomy, 43 step-up)
- Randomized to:
  - open necrosectomy
  - step up - percutaneous or endoscopic drainage
    - + 72 hours – second procedure
    - + 72 hours – VARD - Video-assisted retroperitoneal debridement
- Intervention deferred for 4 weeks when possible
Walled-off Necrosis

- Primary endpoint:
  - 69% of open necrosectomy
  - 40% of step up - risk ratio 0.57, p=0.006
- Step-up with **less multi-organ failure** 12% v 40%, p=0.002
- Step-up with **less new-onset DM** 16% v 38%, p=0.02
- Rate of death similar: 16% v 19%, p= 0.70

“Step-up” approach is standard of care, endoscopic therapy first line
Walled-off Necrosis – Which Stent(s)?

- 2 U.S. Centers – 313 pts
  - 106 DPS – double pigtail stents
  - 101 FCSEMS – fully covered self-expanding metal stents
  - 86 LAMS – lumen-apposing metal stents
- No difference in technical success 99%
- Overall clinical success 89.6%
- Early AE lower in the FCSEMS group c/w DP and LAMS group (1.6%, 7.5%, and 9.3%, p<0.01)
Walled-off Necrosis – Which Stent(s)?

- At 6mo f/u, resolution lowest with DPS
  - (81% vs 95% FCSEMS vs 90% LAMS; p=0.001)
- Less procedures with LAMS
  - (2.2 vs 3 FCSEMS vs 3.6 DPS, p=0.04)
- On multivariate analysis, DPS sole predictor of treatment failure
- Likelihood of success: FCSEMS = LAMS, but LAMS with more early AEs (bleeding)
Case 5

- 17yo female with a history of chronic pancreatitis
- Complained of recurrent pain episodes resulting in missed school days
- Requiring narcotic pain medications
- Referred for possible endoscopic therapy
Case 5
Case 5
Pancreaticocholeangiography

Cholangioscopy
Case 5

- A month later, patient with improvement in pain
- However patient continues on narcotics
- Mother asks, “Is there anything we can do to control the pain without the drugs?”
Celiac Plexus Block

- Useful in the management of chronic pain
  - Pancreatic cancer – neurolysis (98% EtOH)
  - Chronic pancreatitis – block (TAC)

- Celiac plexus
  - Dense network of ganglia and nerve fibers
  - Transmits pain sensation for the pancreas
Celiac Plexus Block

Percutaneous

Endoscopic Ultrasound
Celiac Plexus Block

- **Efficacy**
  - Decreased pain based on mean visual analog score
  - Decreased opioid use
  - Reduction in constipation

- **Safety**
  - No increased adverse events

Yan BM, Myers RP. Am J Gastroenterol. 2007.
Celiac Ganglia Neurolysis

- Ganglia CAN be visualized on EUS
- Ovoid, irregular, “raisins”
- 200 consecutive pts: Ganglia seen in 81%
- Access/Injection of ganglia may lead to pain, hemodynamic response
- RCT 68 pts – VAS decrease of 3 pts
  - Response 74 vs 46%
  - Complete response 50 vs 18%

Conclusions

- EUS is critical in the diagnostic evaluation of acute pancreatitis
- ERCP is indicated for decompression in the setting of severe pancreatitis/cholangitis
- Endoscopic management of pseudocysts and WON is first line
- Endoscopic therapy is a useful adjunct in the management of chronic pancreatitis

Sugumar A., Curr Opin Gastroenterol 2010
Thank you!
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