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Endoscopic Treatment of Chronic Pancreatitis Complications

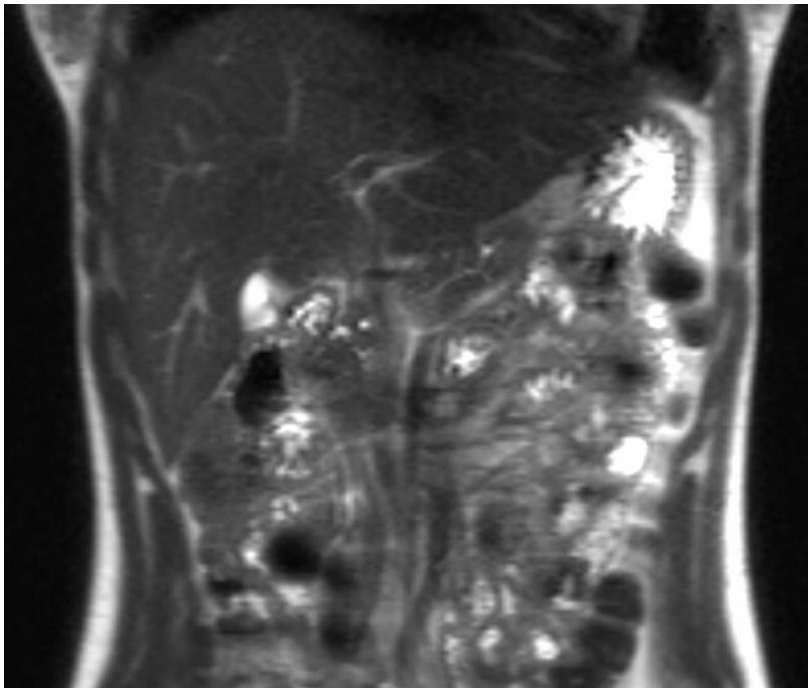
Matthew Giefer MD

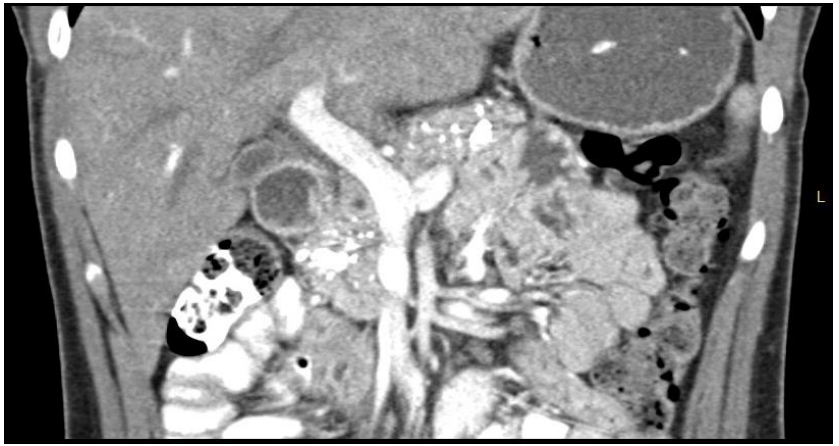
Pancreas Fest 2019

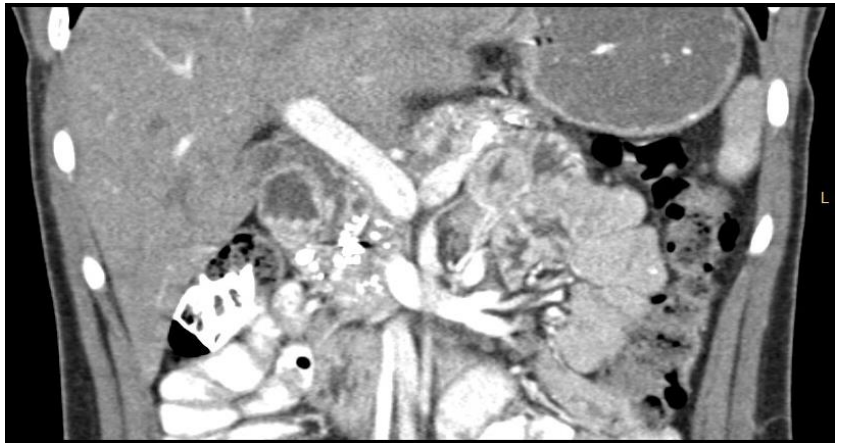
16 y/o female with chronic pancreatitis

- Episodic pain flares beginning at age 8
- Exocrine failure
- PRSS1 gene mutation
- Frequency of pain flares transitioned from 1-2/year to every 2 months
- Imaging obtained to examine for duct obstruction, stricture, etc.

MRCP vs. CT







ERCP

Non-surgical treatment of chronic pancreatitis complications

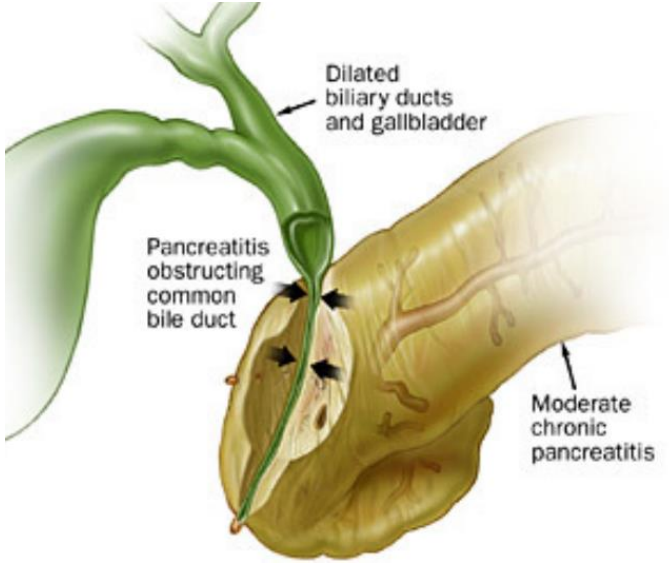
- **Pancreatic duct obstruction**
  - ERCP
  - Extracorporeal shock wave lithotripsy (ESWL) with or without ERCP
- **Benign biliary strictures**
  - ERCP
- **Pancreatic fluid collections**
  - Endoscopic drainage procedures
- **Chronic pain**
  - EUS for celiac plexus block/neurolysis

Pancreatic duct obstruction

- **Main pancreatic duct stones**
  - Small stones (<5mm) are typically amenable to standard techniques including balloon or basket extraction
  - Large stones (>5mm) usually require other techniques
    - Extracorporeal shock wave lithotripsy (ESWL)
    - Electrohydraulic lithotripsy (EHL) appears to be effective but safety/efficacy data on use in PD is less robust
    - Mechanical lithotripsy in PD is associated with higher risks than CBD
- **Main pancreatic duct strictures**
  - Standard endoscopic therapies (stricture dilation and stenting) are highly successful
- **Side branch pancreatic duct stones/strictures**
  - Typically NOT amenable to endoscopic therapy or ESWL

Benign biliary strictures

- Estimated prevalence in adult CP ranges widely (3-46%) and less is known about pediatric prevalence.
  - Typically presents with jaundice, pruritus and pain
  - ~10% may develop cholangitis or biliary cirrhosis
- ERCP with stricture dilation and stenting is very effective but long term stenting is often required

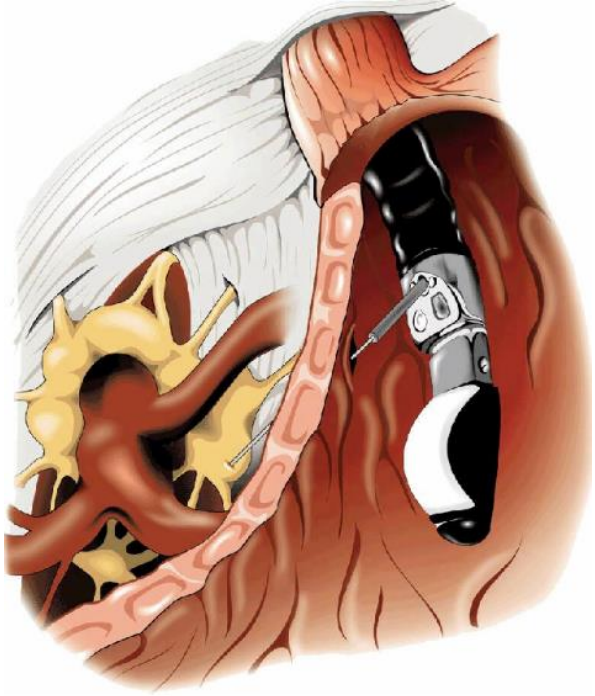


Pancreatic fluid collections

- Pseudocysts develop in ~30% of adult CP patients
  - Rate of pseudocyst formation is higher than in the AP population (2-13%)
  - Acute necrotic collections and walled of necrosis are less common in in the CP population compared to the AP population
- Infection or gastrointestinal obstruction are rare
  - <10% of CP fluid collections require drainage
- When drainage is necessary, endoscopic drainage is preferred
  - Equally effective as surgical drainage with fewer complications, shorter hospitalization and decreased cost

Chronic pain

- Multi-modal medical therapy continues to be standard of care
- EUS guided celiac plexus block
  - Injection of local anesthetic and steroid mixture at celiac plexus nerve bundle
  - Neurolysis with ethanol injection is typically done only in malignant disease



Adult outcomes

- Pancreatic duct obstruction
  - ERCP decompression improves pain in 65% of patients
  - ERCP stricture treatment is associated with immediate (65-95%) and long term (32-68%) pain improvement
- Benign biliary strictures
  - Reported response rates vary from 37-100% with SEMS or multiple plastic stents
- Pancreatic fluid collections
  - ~90% respond to transmural or transpapillary drainage
- Celiac plexus block
  - Short term benefit in 50-60% but repeat injections often do not yield additional benefits

Pediatric outcomes

- Very little data on ERCP outcomes in chronic pancreatitis. No systematic studies on CP fluid collection or celiac plexus block in children.

Benefit of Endoscopic Interventions in Pediatric ARP and CP

Intervention	ARP, n = 155 n (%)	CP, n = 146 n (%)	P
Therapeutic ERCP performed	21 (14)	96 (66)	<0.0001 *
Helpful for at least one indication	9/16 (56)	44/83 (53)	0.812
Biliary sphincterotomy performed	11/151 (7)	36/136 (26)	<0.0001 *
Helpful	6/10 (60)	12/30 (40)	0.300
Biliary stenting performed	2/151 (1)	11/138 (8)	0.006 *
Helpful	2/2 (100)	3/10 (30)	–
Pancreatic sphincterotomy performed	4/151 (3)	68/138 (49)	<0.0001 *
Helpful	2/4 (50)	33/66 (50)	–
Pancreatic duct stenting performed	6/151 (4)	60/137 (44)	<0.0001 *
Helpful	2/5 (40)	28/57 (49)	–
Pancreatic stone removal performed	1/151 (1)	30/137 (22)	<0.0001 *
Helpful	1/1 (100)	18/18 (100)	–

* Statistically significant.

Table 1. Clinical symptoms and use of analgesia prior to the first ERCP and since the last ERCP. AP: acute pancreatitis. (*): statistical significance; $p < 0.001$.

Severity of pain before the first ERCP			Wilcoxon test
Median 8.5; IQR 6.0–10.0			
Severity of pain since last ERCP			
Median 1.0; IQR 1.0–3.0 (*)			
Frequency of pain before the first ERCP			Wilcoxon test
Median 4.0; IQR 3.0–5.0			
Frequency of pain since last ERCP			
Median 0; IQR 0–1.0 (*)			
Non-opiates before the first ERCP			McNemar test
38/38 (100%)			
Non-opiates since last ERCP			
13/38 (34%) (*)			
Opiates before the first ERCP			McNemar test
26/38 (68%)			
Opiates since last ERCP			
1/38 (3%) (*)			
Absolute number of attacks of AP before the first ERCP		since last ERCP	
35/38 (92%)		8/38 (21%) (*)	Fisher *t*-test
Number of AP	Number of patients	Number of patients	
Multiple (≥4)	18/38	3/18 (one episode in all three children)	
3	3/38	1/3 (one episode)	
2	6/38	1/6 (one episode)	
1	8/38	1/8 (one episode)	
0	3/38	2/3 (one episode and two episodes)	

- Troendle et al. Pancreas. 2017.
- Kohoutova et al. UEG Journal. 2019.

Case follow up

- Patient experienced ~6 months of decreased pain and improved quality of life after ESWL and ERCP.
- Worsening pain prompted repeat ERCP where no obstructing stones/strictures were found.
- Referred for TPIAT. Low islet yield.
- 18 months after surgery she is pain free and headed off to college this fall.

My opinion

- The potential short term benefits of ERCP/ESWL should be discussed with all patients who have duct obstruction and worsening CP symptoms.
- Avoid treating CP related pancreatic fluid collections whenever possible.
- Celiac plexus block should be approached cautiously in children.
- Endotherapy needs to be studied better in the pediatric CP population to assure it does not lead to worsened outcomes in patients destined for TPIAT.