Surgical Management of Chronic Pancreatitis
42F with h/o chronic pancreatitis due to alcohol use with chronic upper abdominal pain, s/p ERCP and unsuccessful stent placement of the MPD

PMH: ESRD on HD, HTN, CVA

PSH: denies

Meds: nexium, folate, calcium acetate, amlodipine, clonidine, isosorbite mononitrate, hydralazine, keppra, labetalol, citalopram, dilaudid

All: morphine, percocet

SH: + alcohol (quit 7 years ago)
Case Report

- **PE:**
  - NAD
  - VS- 97.9 143/104 93
  - Abdomen- soft, nondistended, epigastric tenderness without rebound/guarding
  - Chest- CTAB
  - Ext- warm, FROMx4

- **Labs:**
  - CBC- 7/9/30/328
  - BMP- 140/4.1/100/28/16/2.76/79
  - LFTs- 6.9/4/36/20/125/0.3
  - Lipase- 40
Case Report

- **MRCP 2/11/2013:**
  - Tortuous and dilated pancreatic duct 8mm
  - Suggestion of filling defect at the pancreatic head
  - Normal CBD
Chronic Pancreatitis

- Persistent inflammation and irreversible fibrosis associated with atrophy of the pancreatic parenchyma
  - chronic pain
  - endocrine insufficiency
  - exocrine insufficiency
- Head of the pancreatic gland is most of the time the epicenter of the disease, therapy for pain relief must be designed around this area
- Incidence: 3 - 10/100,000
Etiology of chronic Pancreatitis

- Alcohol (70%)
- Idiopathic, including tropical (20%)
- Other (10%)
  - Hereditary
  - Hyperparathyroidism
  - Hypertriglyceridemia
  - Autoimmune pancreatitis
  - Obstruction
  - Trauma
  - Pancreas divisum
Symptoms

- Abdominal pain
  - Perineural inflammation
  - Ductal hypertension
- Chronic fistula
- Diabetes mellitus
- Weight loss
- Steatorrhea
Diagnosis

- Imaging
  - CT
  - MRI/MRCP
  - ERCP
  - EUS

- Functional test
  - fecal elastase-1
  - fecal fat and weight estimation test
Cambridge Classification of Pancreatic Morphology in Chronic Pancreatitis

| Cambridge Class | Main Pancreatic Duct | Abnormal Side Branches |
|-----------------|----------------------|------------------------|
| Normal          | Normal               | 0                      |
| Equivocal       | Normal               | <3                     |
| Mild            | Normal               | >3                     |
| Moderate        | Abnormal             | <3                     |
| Marked          | Abnormal             | >3                     |

Characteristics:

- Abnormal MPD
  - terminates prematurely (abrupt, tapering, irregular)
  - multiple MPD strictures
  - MPD dilated >6 mm
  - ductal filling defects (stones)
- intrapancreatic or extrapancreatic “cavities”
- contiguous organ involvement (stenoses of common bile duct or duodenum, arterial venous fistula)
Treatment: Palliation of Symptoms

- **Medical**
  - Pain control
  - Pancreatic enzyme replacement
  - Antisecretory therapy

- **Interventional**
  - ERCP with dilatation and stent placement
  - ESWL
  - Endoscopic stone extraction

- **Surgical**
  - Dilated pancreatic duct (>6 mm): drainage procedure
  - Normal pancreatic duct: resectional procedure
Indications for surgical Treatment

- Treatment goals for surgical therapy
  - Pain relief
  - Delay or reversal of exocrine insufficiency

- Selection criteria for pain relief
  - Chronic pancreatitis is really present
  - Imaging studies show a severe anatomic defect
  - The “driver” (etiology) has been removed
  - Symptoms fit the anatomic pattern
  - Plans are made based on current anatomy from up-to-date imaging
Types of surgical Procedures

- **Drainage**
  - Longitudinal pancreaticojejunostomy (modified Puestow)

- **Hybrid (Combination of Drainage and Resection)**
  - Local resection of pancreatic head and pancreaticojejunostomy (Frey)
  - Duodenum-sparing resection of the pancreatic head (Beger)

- **Resection**
  - Pancreaticoduodenectomy
  - Distal pancreatectomy
  - Total pancreatectomy
| Pattern                                      | No Surgery | Endoscopy | Puestow | Frey | PD | Distal Resection |
|----------------------------------------------|------------|-----------|---------|------|----|------------------|
| MPD obstruction head, dilated duct          |            |           |         | X    | X  |                  |
| MDP obstruction head, no dilated duct       |            |           |         |      | X  |                  |
| No MDP obstruction head, dilated duct       | X          | X         |         |      |    |                  |
| No MDP obstruction head, no dilated duct    |            |           |         |      |    |                  |
| MPD obstruction in body/tail                |            |           |         |      |    | X                |
Side-to-side Roux-en-Y Pancreaticojejunostomy (modified Puestow)
Local resection of the pancreatic head with longitudinal Pancreaticojejunostomy (Frey)
Duodenum-sparing resection of the pancreatic head
(Beger)
Outcomes

- **Endoscopic therapy:**
  - Pain relief 60-80% after 3-4 treatment sessions

- **Surgical therapy:**
  - Resectional and hybrid procedures: pain relief 85-90% long term
  - Drainage procedures: pain relief 75-85%
Outcomes: Endoscopic vs surgical drainage

- Retrospective review of 39 patients from 2000-2004, randomly assigned to endoscopic drainage or operative pancreaticojejunostomy
- 5 year follow-up

Cahen et al: Long-term Outcomes of endoscopic vs surgical drainage of the pancreatic duct in patients with chronic pancreatitis. Gastroenterology 2011;141:1690-1695
### Outcomes: Endoscopic vs surgical drainage

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| Variable                              | Endoscopy (n = 16) | Surgery (n = 15) |
|---------------------------------------|--------------------|------------------|
| Follow-up (mo), mean (SD)             | 85 ± 14            | 92 ± 11          |
| Ongoing alcohol abuse, n (%)          | 0                  | 3 (20)           |
| Izbicki pain score, mean (SD)         | 39 ± 28            | 22 ± 31          |
| Pain relief, n (%)                    |                    |                  |
| Complete/partial pain relief          | 4/2 (25/13)        | 8/4 (53/27)      |
| No relief                             | 10 (62)            | 3 (20)           |
| SF-36 quality-of-life scores<sup>a</sup> |                    |                  |
| Physical health component             | 43 ± 11            | 48 ± 9           |
| Mental health component               | 46 ± 9             | 48 ± 10          |
| EQ-5D based health utility scores<sup>c</sup> |                    |                  |
| UK values                             | 0.79 ± 0.21        | 0.82 ± 0.26      |
| Dutch values                          | 0.82 ± 0.18        | 0.83 ± 0.25      |
| Exocrine function, n (%)              |                    |                  |
| Insufficiency persisted               | 10 (63)            | 11 (73)          |
| Insufficiency developed               | 6 (38)             | 2 (13)           |
| Insufficiency resolved                | 0                  | 2 (13)           |
| Fecal elastase (μg/g)                 | 46 ± 60            | 67 ± 96          |
| Endocrine function, n (%)             |                    |                  |
| Insufficiency persisted               | 4 (25)             | 4 (27)           |
| Insufficiency developed               | 7 (44)             | 3 (20)           |
| Sufficiency persisted                 | 5 (31)             | 8 (53)           |
Outcomes: Beger vs Frey

- RCT including 74 patients at single center with 9 years follow-up
- No differences between pain scores and quality of life between the 2 procedures

| Criterion                        | Beger (n = 26)          | Frey (n = 25)        |
|----------------------------------|-------------------------|----------------------|
| Pain VAS                         | 20 (0–100)              | 20 (0–100)           |
| Frequency of pain attacks        | 25 (0–100)              | 0 (0–100)            |
| Pain medication                  | 0 (0–100)               | 0 (0–100)            |
| Inability to work                | 0 (0–100)               | 0 (0–100)            |
| Total                            | 45 (0–350)              | 20 (0–100)           |
| Pain score                       | 11.25 (0–75)            | 11.25 (0–99.75)      |

| Functioning Scale and/or Items*  | Beger (n = 26)          | Frey (n = 25)        |
|----------------------------------|-------------------------|----------------------|
| Physical status                  | 100 (0–100)             | 100 (0–100)          |
| Working ability                  | 100 (0–100)             | 100 (0–100)          |
| Cognitive functioning            | 83.3 (0–100)            | 83.3 (0–100)         |
| Emotional functioning            | 74.95 (0–100)           | 66.6 (0–100)         |
| Social functioning               | 74.07 (0–100)           | 83.3 (0–100)         |
| Global quality of life           | 66.7 (0–100)            | 58.35 (0–83.4)       |

Strate et al: Long-term follow-up of a Randomized trial comparing the Beger and Frey Procedure for Patients Suffering from Chronic Pancreatitis. Ann Surg 2005;241:591-598
Outcome: Beger vs Whipple

- Retrospective review at single center of 95 patients undergoing Whipple or duodenum preserving procedure (Frey/Beger/ modification) from 1999-2006
- No difference in 30d morbidity and mortality, postop pain and quality of life

Table 2 Operative characteristics and postoperative course

|                              | PD group (n = 59) | DPHR group (n = 22) |
|------------------------------|-------------------|---------------------|
| Duration of procedure, min, mean ± SD | 360 ± 119*        | 246 ± 72*          |
| Estimated blood loss, ml, mean ± SD     | 535 ± 544         | 214 ± 327          |
| Duration of stay, days, median (range)  | 12.0 (9.8-14.2)   | 9.5 (3.3-15.7)     |
| 30-day mortality, n (% of patients)     | 2 (3%)            | 0 (0%)             |
| 30-day morbidity, n (% of patients)     | 26 (44%)          | 12 (55%)           |
| Delayed gastric emptying               | 9 (15%)           | 1 (5%)             |
| Wound infection/dehiscence             | 6 (10%)           | 5 (23%)            |
| Pancreatic leak/fistula                | 4 (7%)            | 3 (14%)            |
| 30-day re-operation, n (% of patients)  | 1 (2%)            | 2 (9%)             |

Table 4 Postoperative quality of life assessment

|                                | PD group (n = 27) | DPHR group (n = 12) |
|--------------------------------|-------------------|---------------------|
| Functional Scales, mean ± SD   |                   |                     |
| Physical status                | 67.5 ± 32.3       | 67.2 ± 34.4         |
| Working ability                | 50.6 ± 41.2       | 56.9 ± 41.1         |
| Cognitive functioning          | 56.8 ± 32.1       | 68.1 ± 38.6         |
| Emotional functioning          | 48.4 ± 32.6       | 62.5 ± 26.7         |
| Social functioning             | 50.6 ± 36.5       | 54.2 ± 40.3         |
| Global quality of life         | 48.8 ± 29.3       | 52.8 ± 30.8         |

Mcclaine et al: A comparison of pancreaticoduodenectomy and duodenum-preserving head resection for the treatment of chronic pancreatitis. HPB 2009 Dec;11(8):677-83
Chronic pancreatitis is a chronic inflammatory process leading to fibrosis and atrophy of the pancreatic parenchyma.

Main reason for surgical consultation is chronic pain.

Selection criteria for operative intervention include correlation between symptoms and anatomic changes on imaging.

Procedure types include drainage, resection and hybrid procedures.

With correct patient selection, long-term pain relief is achievable in >85%.
References

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