North Carolina Society of Gastroenterology
2026 Annual Meeting

ERCP in Altered Anatomy: Scenic Route or Express Lane?

Kelly Hathorn, MD
Clinical Assistant Professor of Medicine
UNC Chapel Hill

Joint Providership

No Financial Disclosures

Objectives:

As a result of this presentation, physicians/APPs will be able to…

1. *Improve their understanding of the approach to biliary decompression in patients with altered anatomy*
2. *Recognize the limitations of more 'traditional' ERCP in this population and refer to centers with EUS-guided techniques as applicable*

ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY (ERCP)

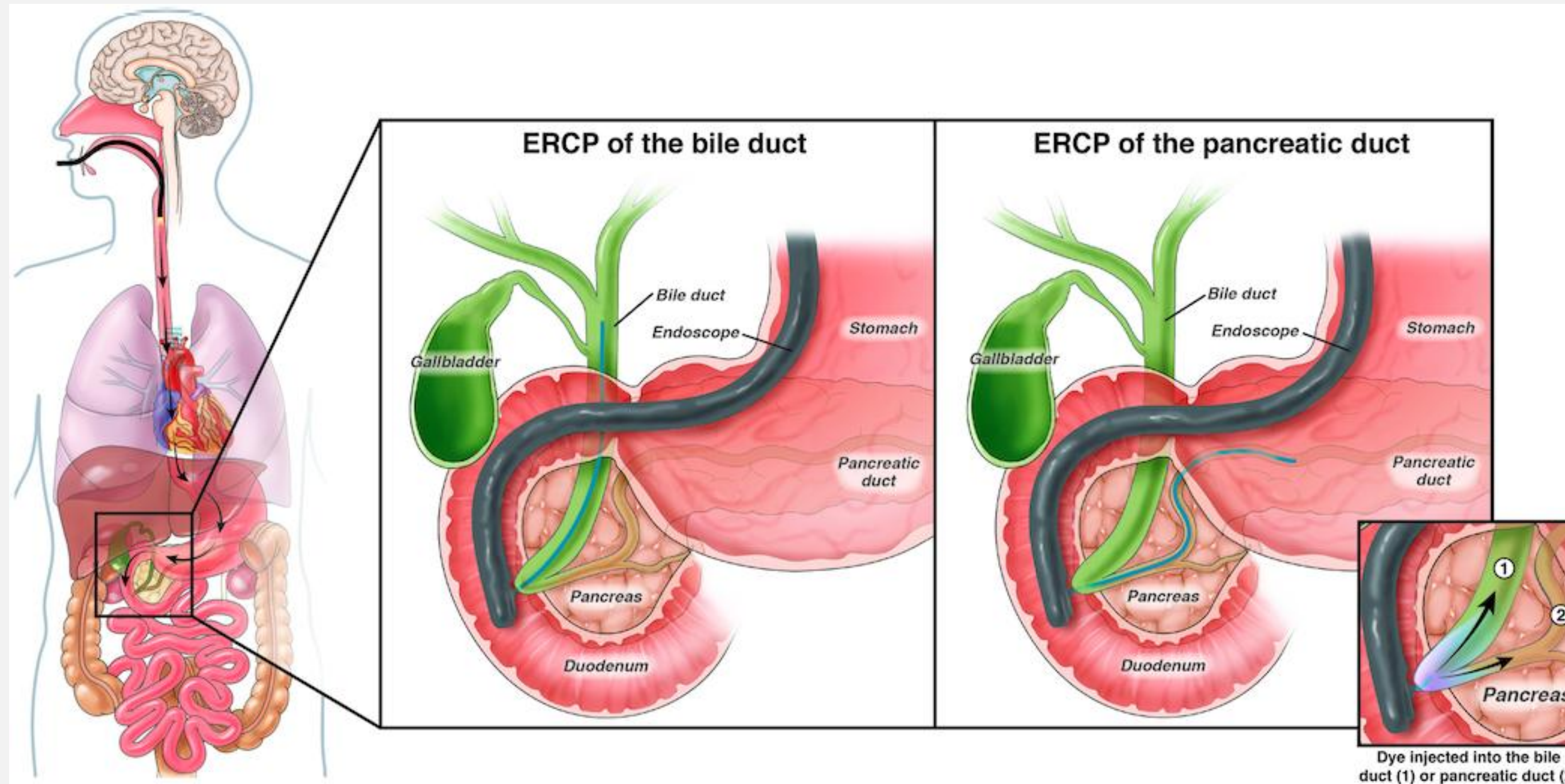


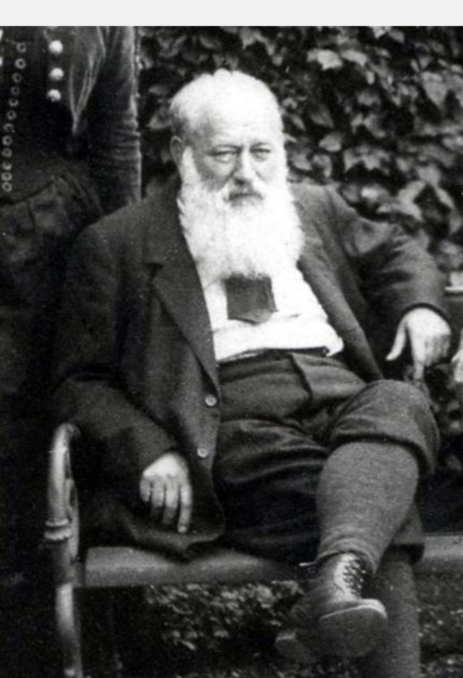
Image from AGA GI patient center, available online at https://patient.gastro.org/endoscopic-retrograde-cholangiopancreatography-ercp/

ERCP INDICATIONS:

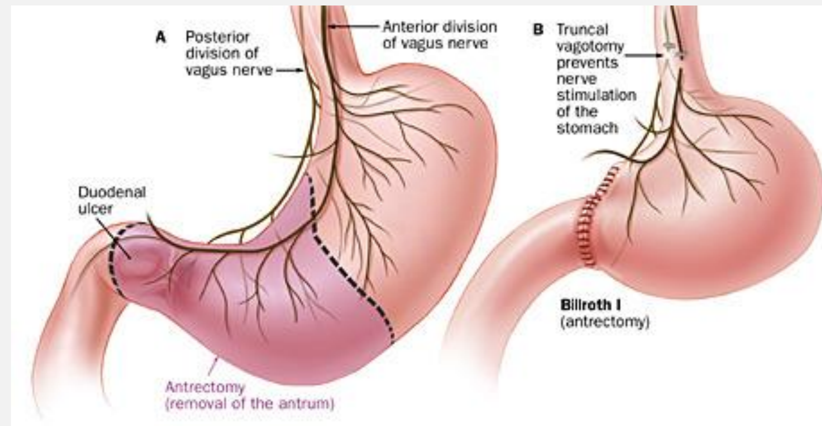
- Obstructive Jaundice
  - Choledocholithiasis
  - Biliary strictures
    - Benign – inflammatory, post-operative anastomotic strictures, chronic pancreatitis
    - Malignant- cholangiocarcinoma, pancreatic cancer, ampullary carcinoma, metastatic disease with lymphadenopathy
- Pancreatitis
  - Acute gallstone, acute recurrent
  - Chronic pancreatitis with stones or strictures
- Symptomatic papillary stenosis (Sphincter of Oddi Type 1)
- Post-operative bile leaks
- Rarely used for diagnosis of PSC, choledochal cysts (non-invasive imaging used more frequently)

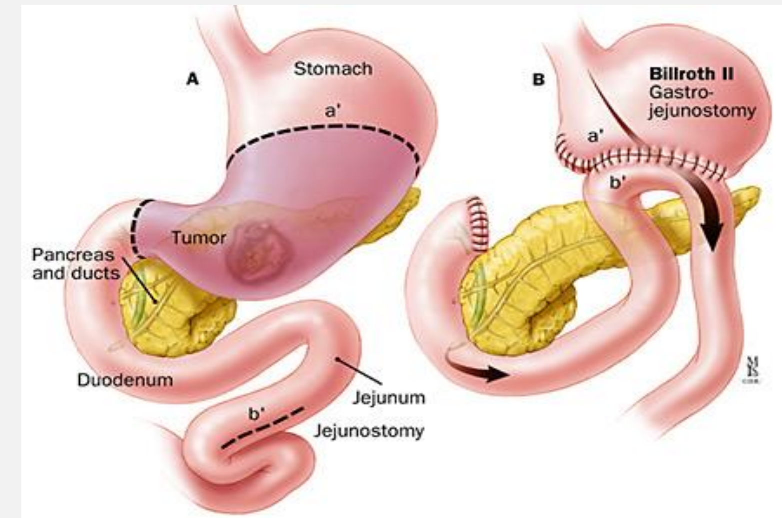
ANATOMICAL CONSIDERATIONS

- Billroth II
- Whipple (Pancreaticoduodenectomy)
- Post-transplant or resection- often a Roux-en-Y hepaticojejunostomy
- Bariatric Surgery:
  - Roux-en-Y Gastric Bypass (RYGB)
  - Biliopancreaticodiversion and Duodenal Switch (BPDDS)
- Often will now use EUS-guided techniques for biliary access in many of these scenarios



BILLROTH





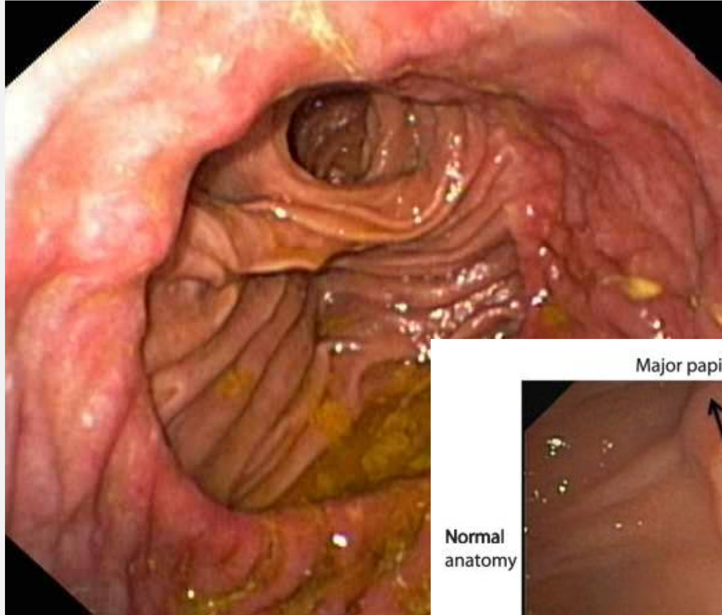
- Billroth I- resection of antrum/distal body/pylorus + anastomosis to duodenum (i.e. gastroduodenostomy)

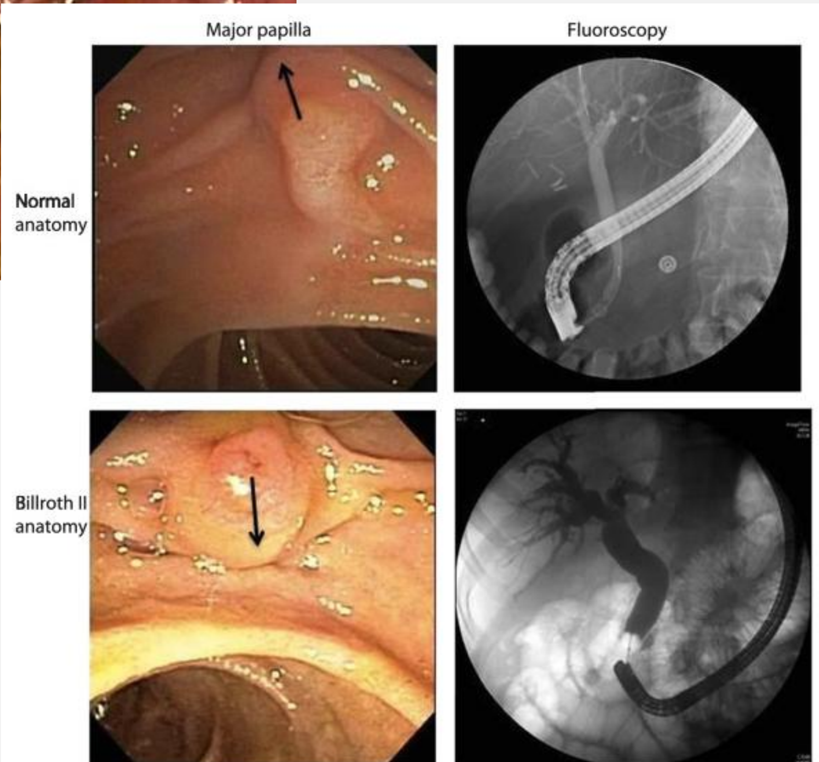
- Billroth II- resection of distal stomach and duodenal bulb + duodenal oversew + GJ anastomosis

https://ykhoa.org/d/image.htm?imageKey=SURG/60689

https://quizlet.com/204190132/gastrointestinal-disease-flash-cards/

BILLROTH II ERCP CONSIDERATIONS



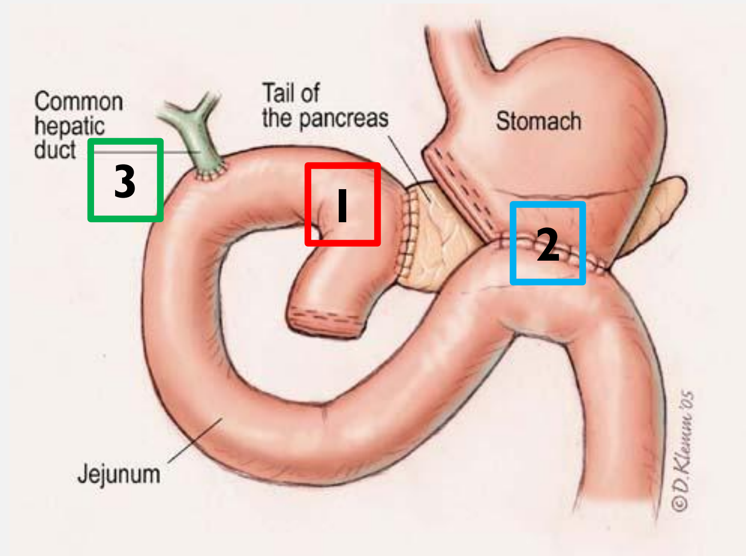


- Endoscopically:
  - Afferent and efferent jejunal limbs
  - ERCP can be technically difficult due to the inverted orientation of the papilla
    - Can often perform using the duodenoscope
      - Pros: able to use standard ERCP scope + equipment with elevator, Cons: can be difficult to maneuver
      - Major papilla almost always at 12 o'clock position, with sphincterotomy towards the 6 o'clock position
    - Can sometimes require use of a forward viewing scope (try using a cap!)

Figure from Enestvedt et al; VideoGIE 2016.
Baron, TH. ERCP. 2019.

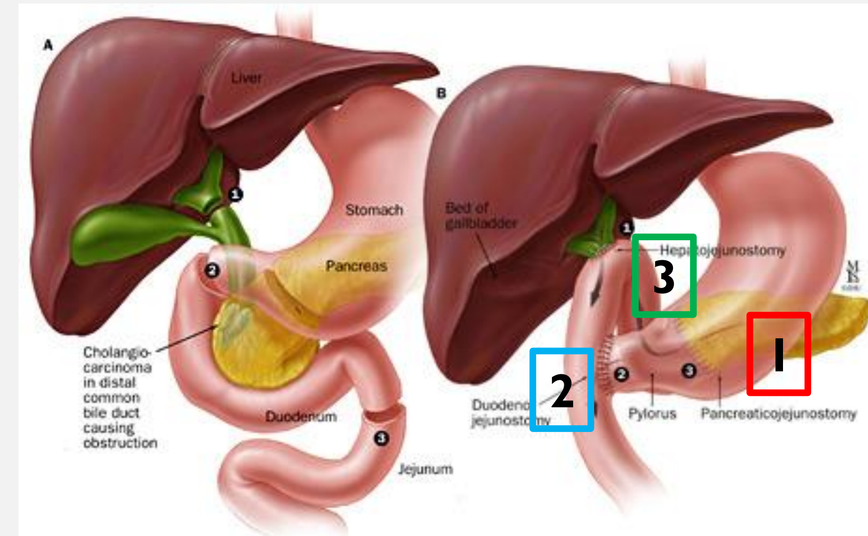
WHIPPLE (PANCREATICODUODENECTOMY)

- Classic Whipple



Antrectomy + pancreaticoduodenectomy + pancreaticojejunostomy + GJ anastomosis + choledochojejunostomy/hepaticojejunostomy

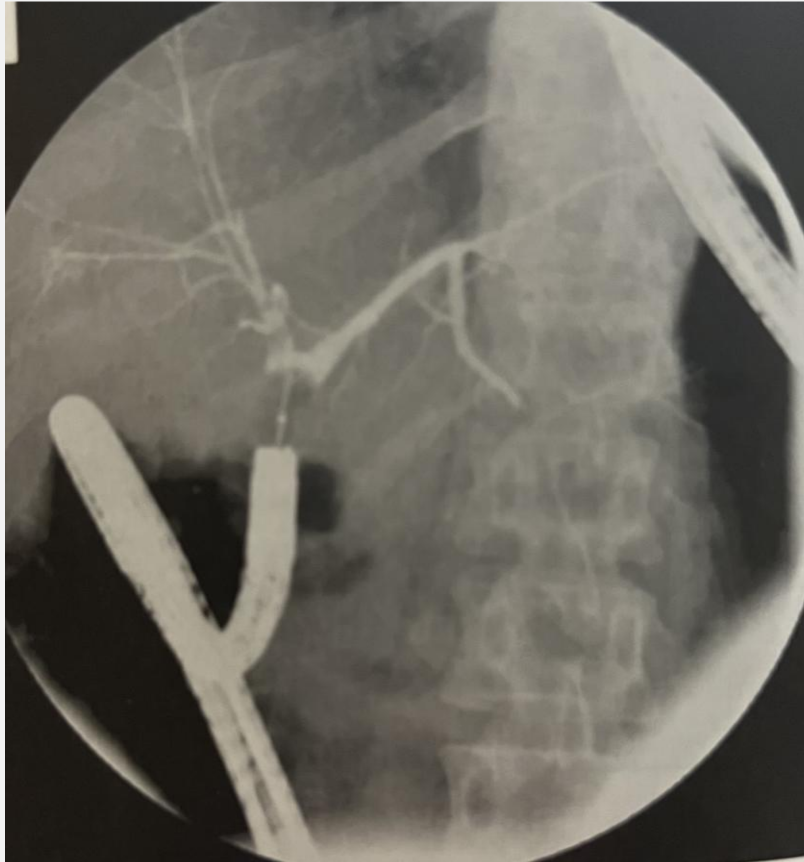
- Pylorus-Sparing Whipple



Preserve the pylorus and proximal bulb + pancreaticojejunostomy + duodenojejunostomy+ choledochojejunostomy/hepaticojejunostomy

https://ykhoa.org/d/image.htm?imageKey=SURG/60689
https://ykhoa.org/d/image.htm?imageKey=SURG/60689

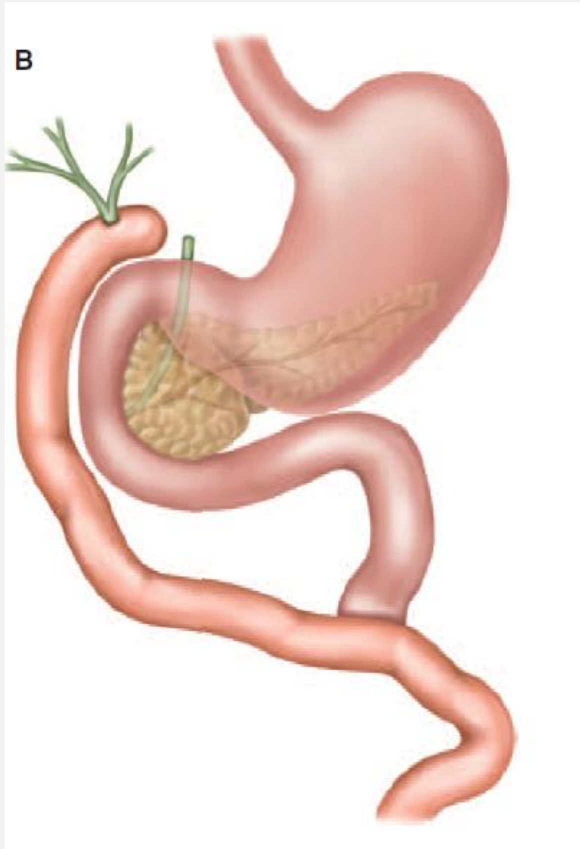
WHIPPLE- ERCP CONSIDERATIONS



- Can readily perform with either a forward-viewing or duodenoscope because the typical challenges of cannulating an intact papilla are absent
  - Afferent limb typically in the 10 o'clock position
  - Endoscopically, bile duct anastomosis appears as a round orifice with bile exiting, frequently located eccentrically or retracted behind an intestinal fold on the left side

Baron TH, ERCP, 2019.

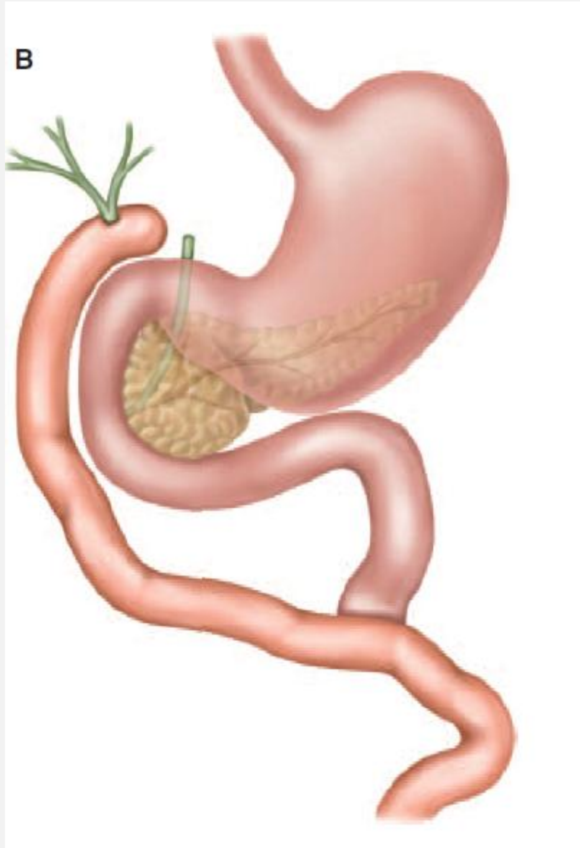
ROUX-EN-Y HEPATICOJEJUNOSTOMY



- Normal stomach + jejunojejunostomy + Roux-limb with a hepaticojejunostomy biliary reconstruction
- ERCP options:
  - Deep enteroscopy (device assisted vs peds colonoscope)
    - Requires traveling through duodenum, ligament of Treitz, proximal jejunum, JJ anastomosis, and afferent limb
  - EUS-guided approaches possible

Baron TH, ERCP, 2019.

CASE PRESENTATION



- 76 y.o woman with cholecystectomy complicated by bile duct injury which required a Roux-en-Y HJ reconstruction
- Presented > 10 years later with a one-year history of intermittent nausea, abdominal pain, abnormal LFTs, and subjective fever

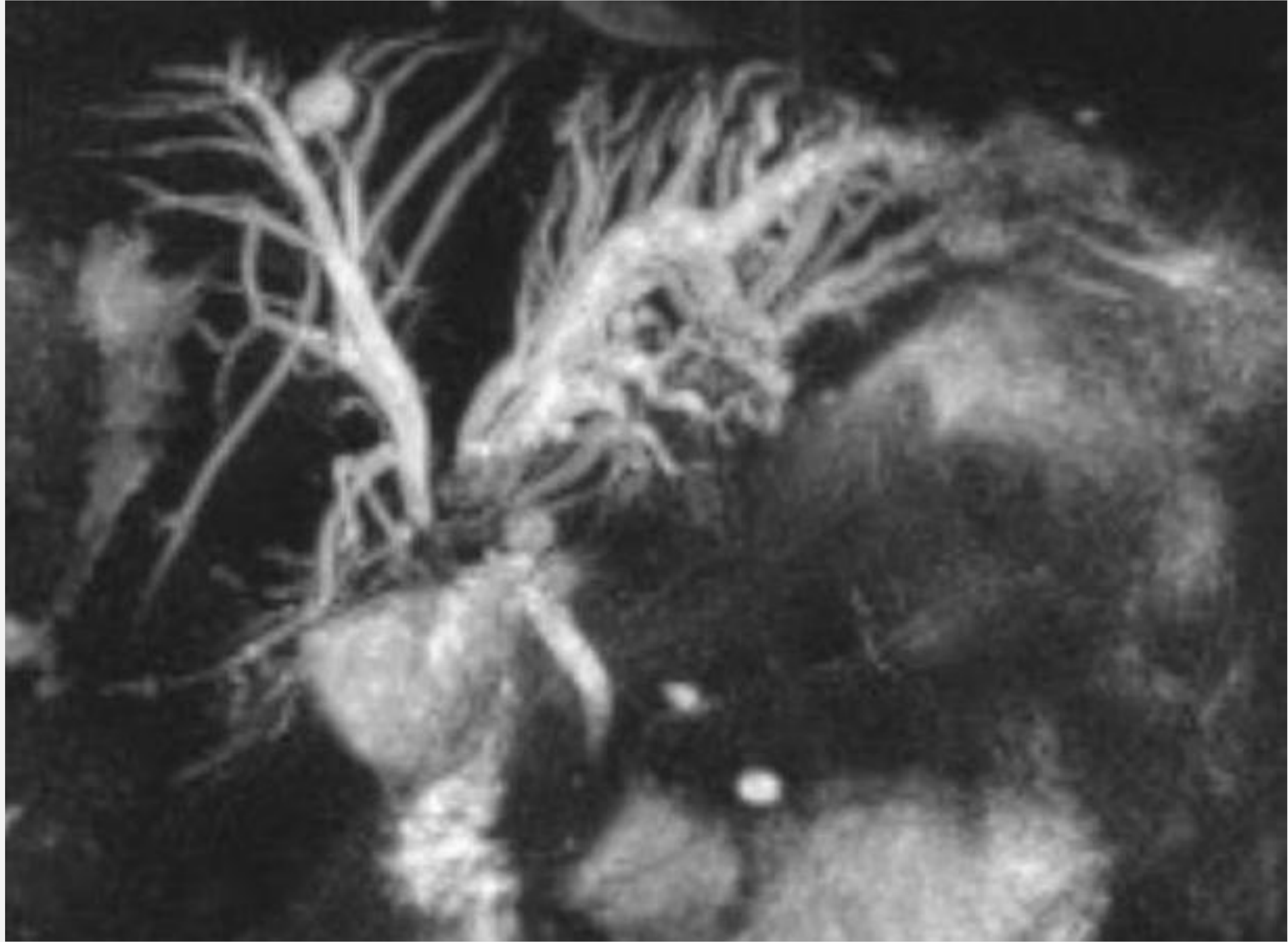


Photo courtesy of Dr. Todd Baron

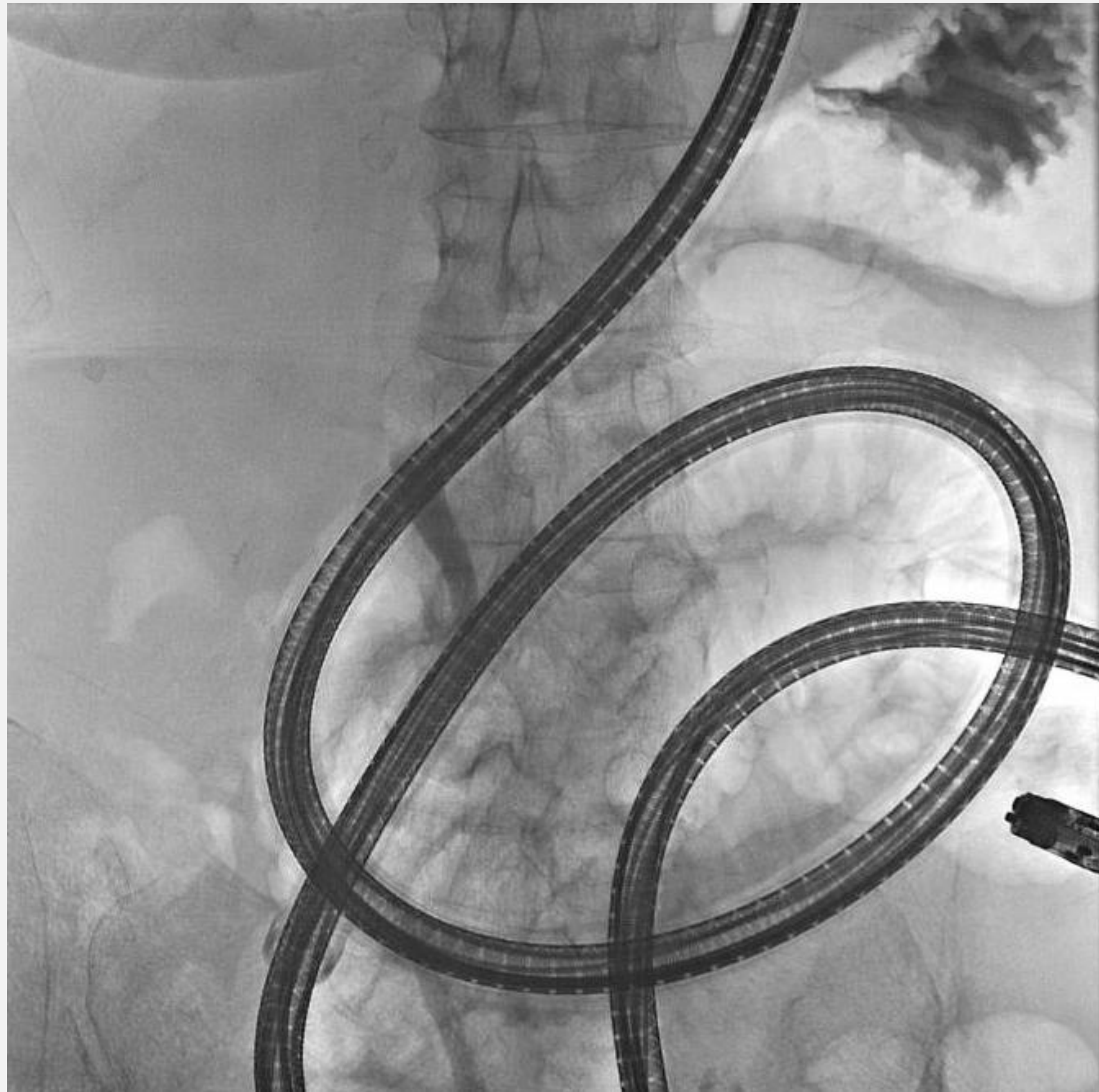


Photo courtesy of Dr. Todd Baron

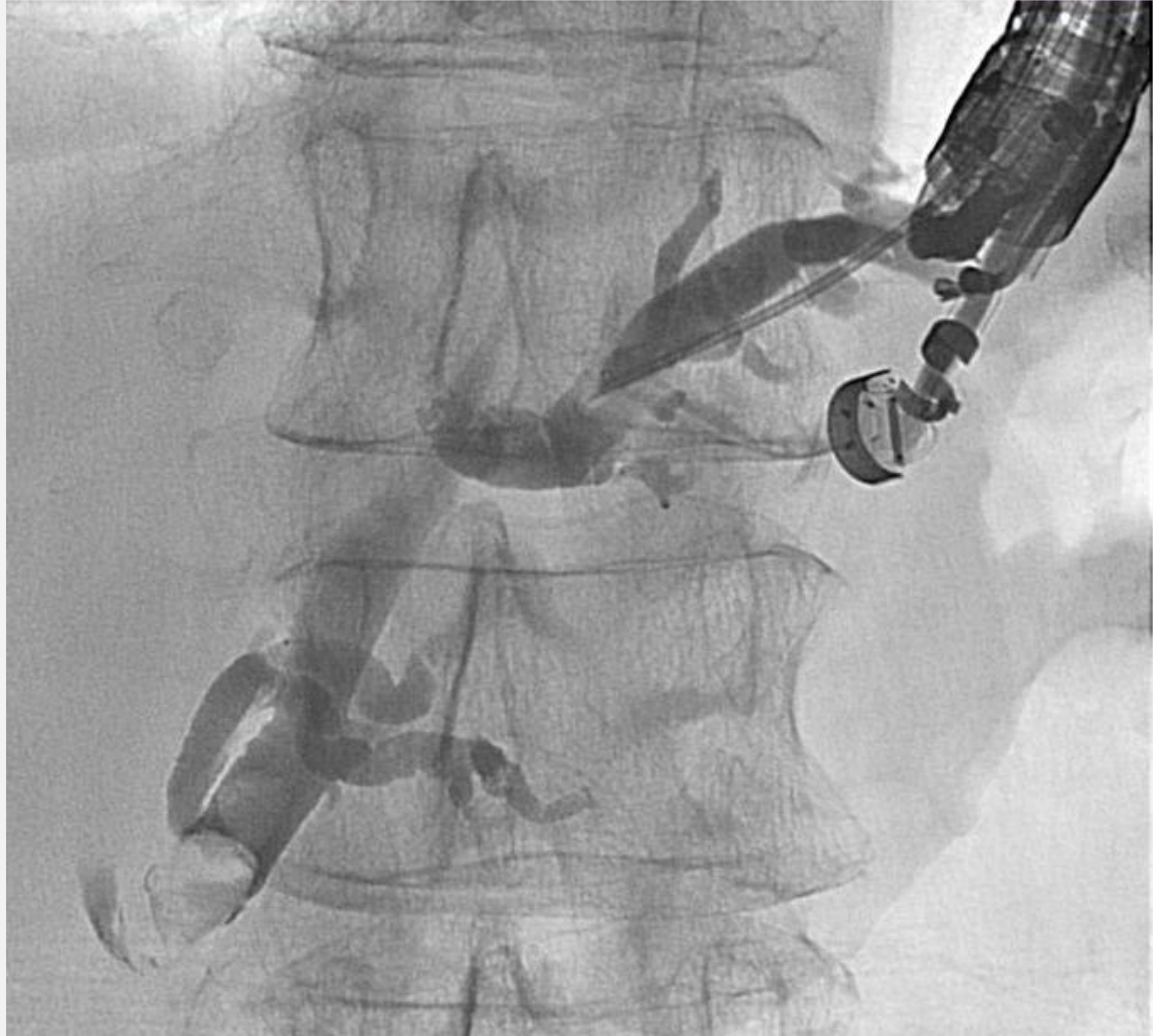
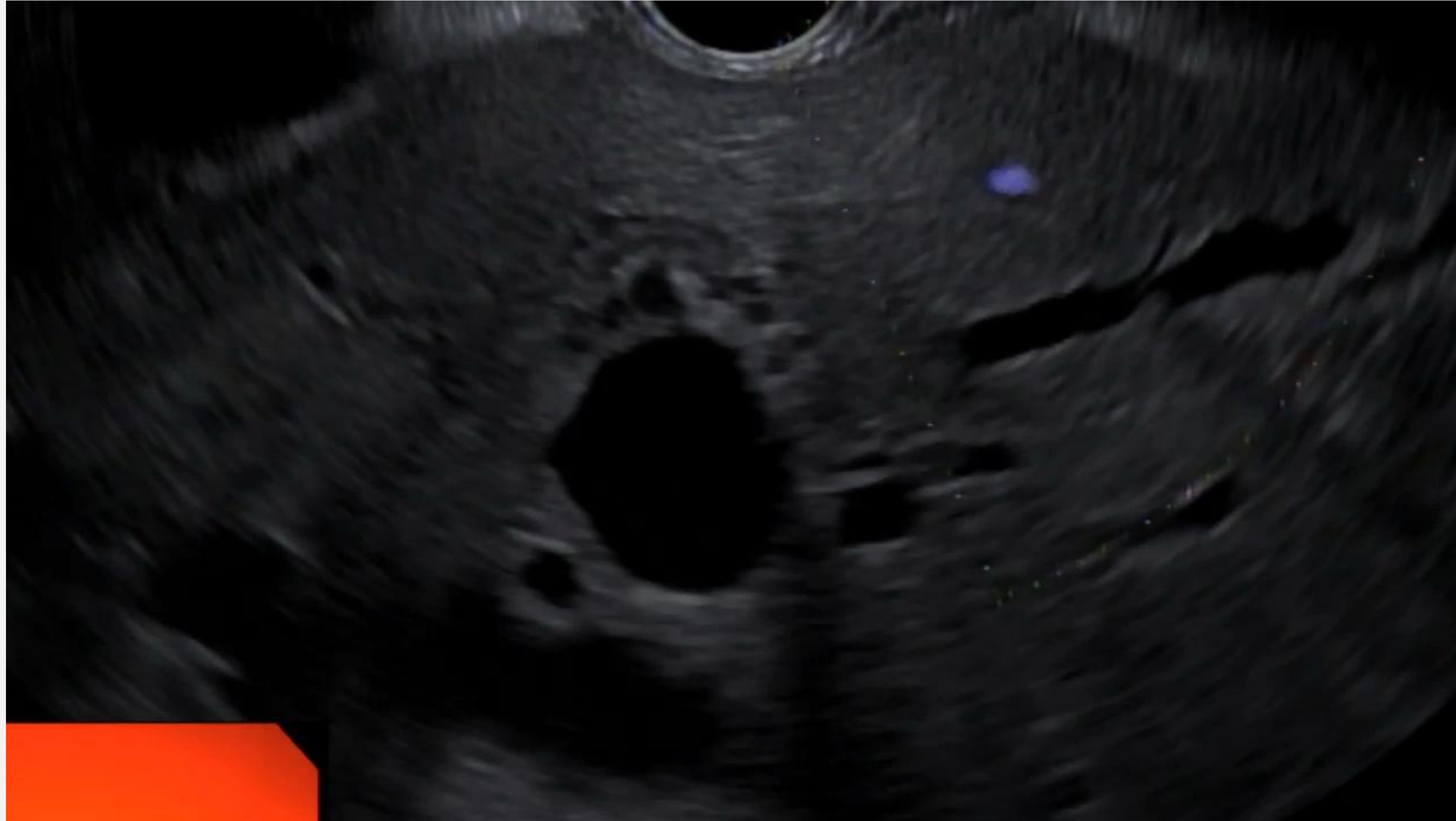


Photo courtesy of Dr. Todd Baron

EUS-GUIDED HEPATICOGASTROSTOMY



Video courtesy of Dr. Todd Baron and Dr. Judy Trieu

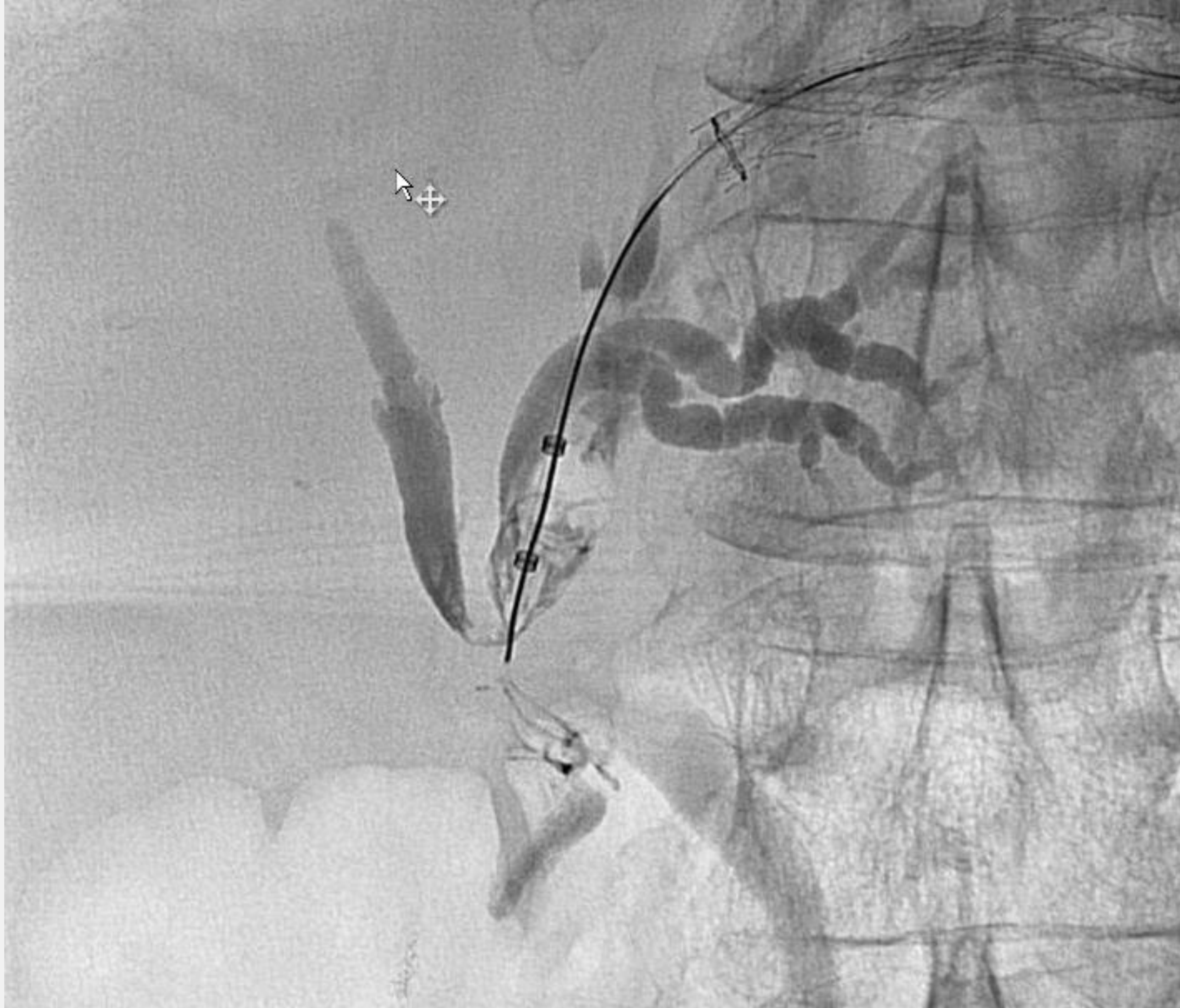


Photo courtesy of Dr. Todd Baron

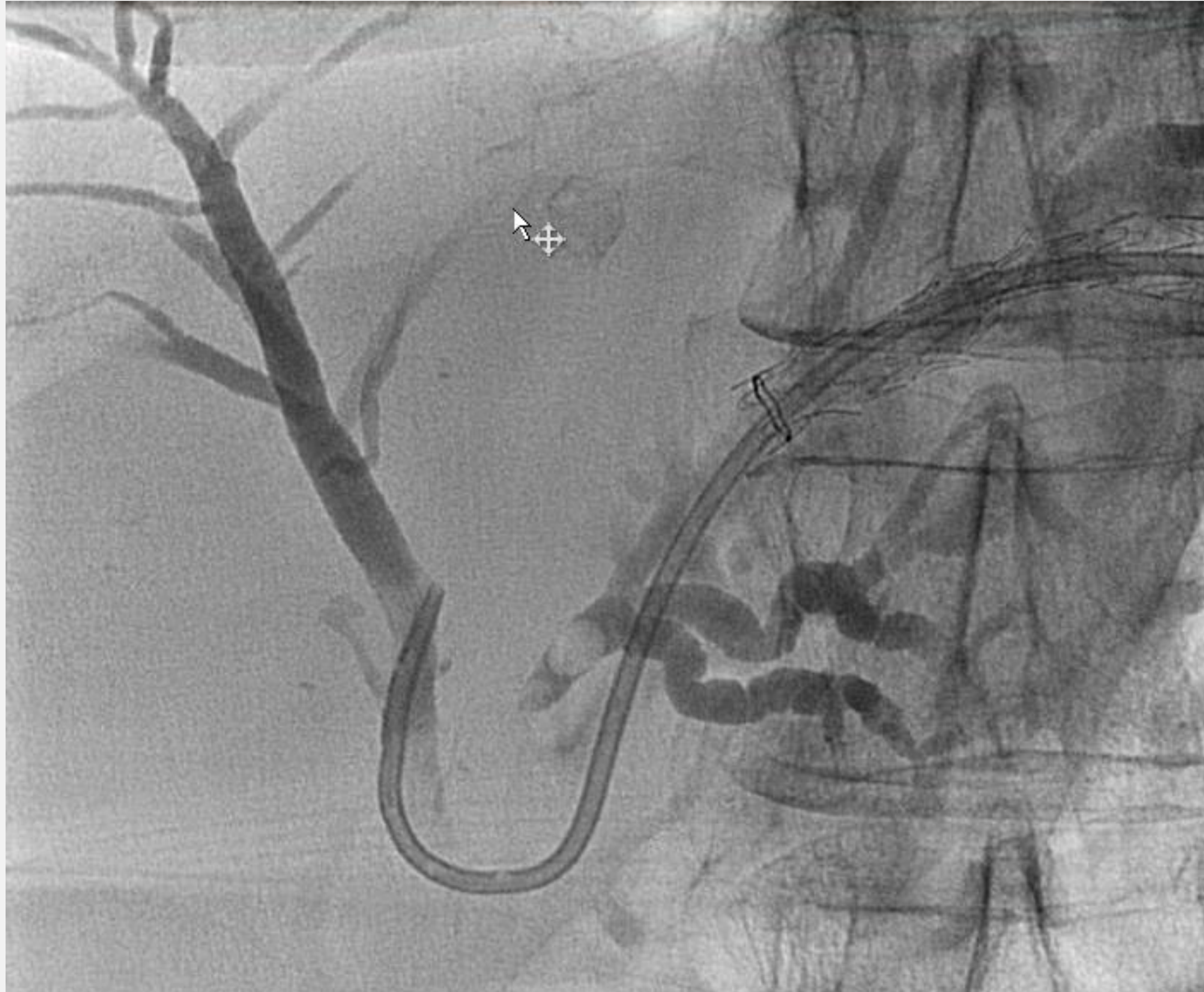


Photo courtesy of Dr. Todd Baron

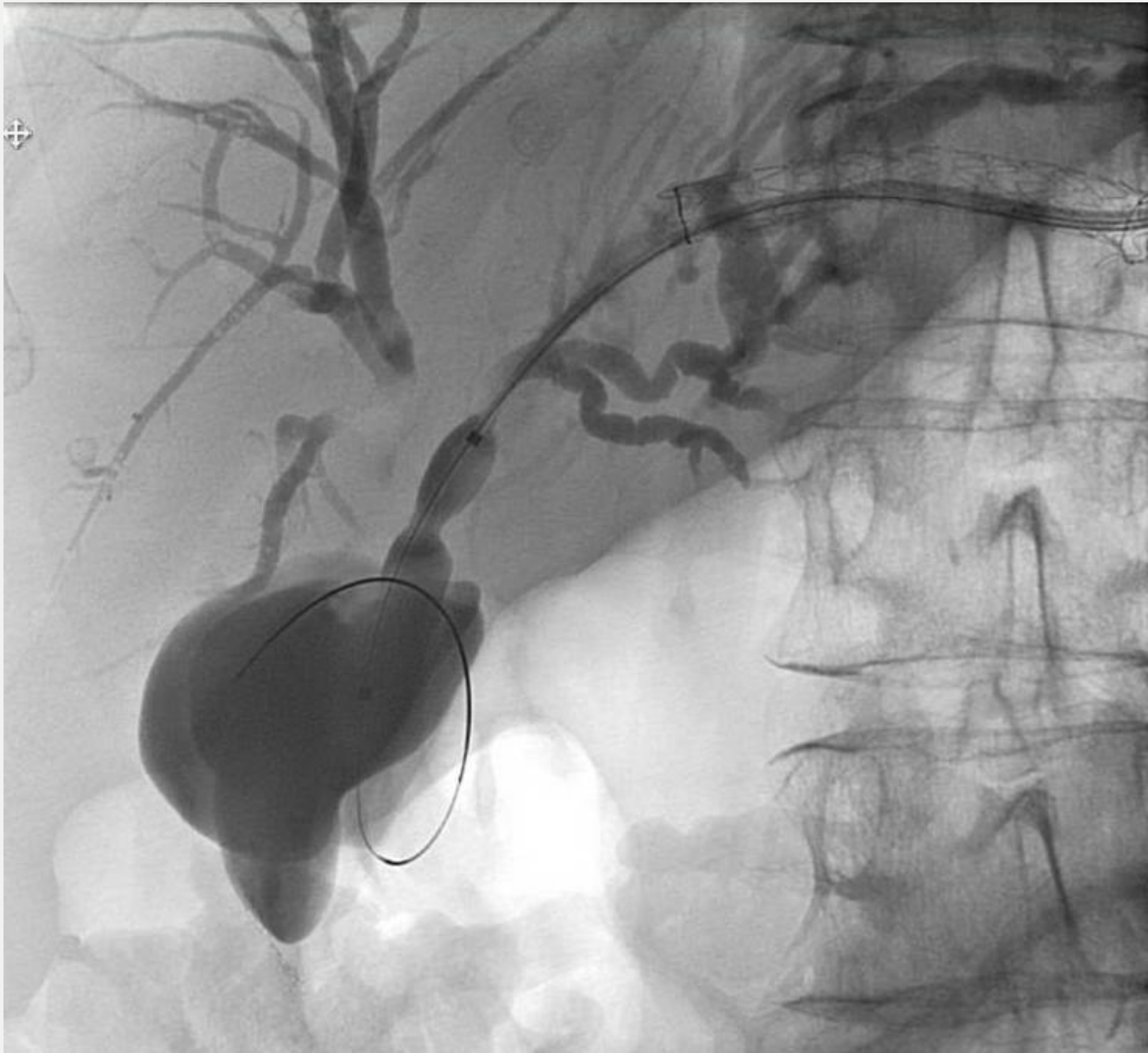


Photo courtesy of Dr. Todd Baron

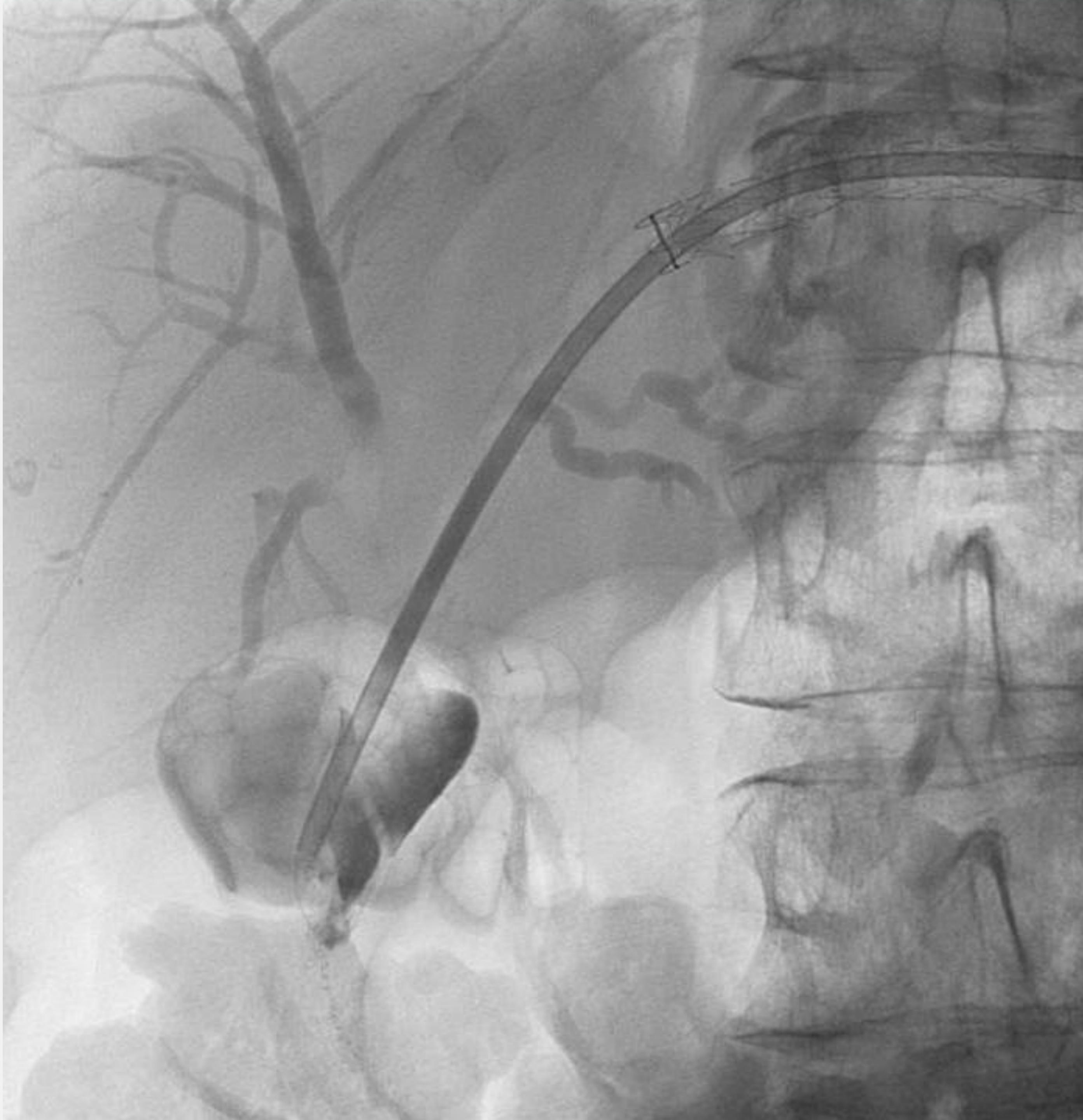


Photo courtesy of Dr. Todd Baron

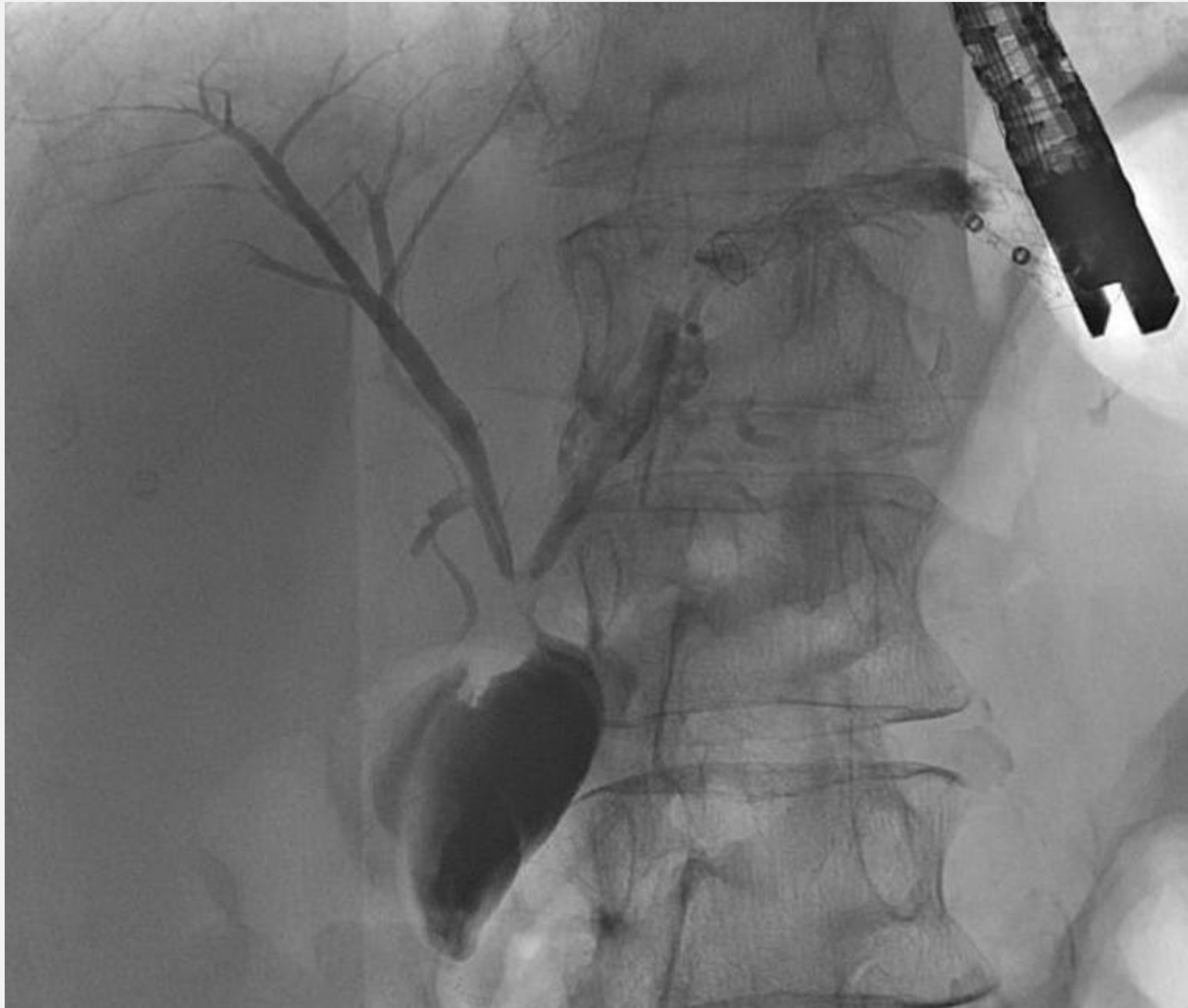
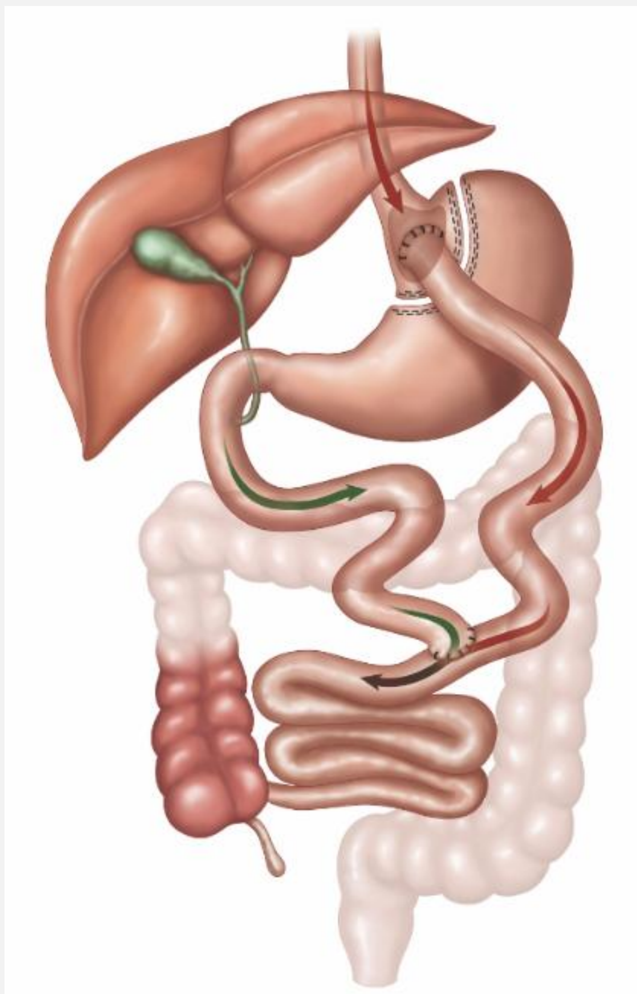


Photo courtesy of Dr. Todd Baron

ROUX-EN-Y GASTRIC BYPASS



- Creation of Gastric pouch + gastrojejunostomy with Roux limb (>100 cm) + biliopancreatic limb + jejujuno-jejunal anastomosis + common limb
  - Multiple options for ERCP
    - Device-assisted enteroscopy (SBE, DBE)
    - Via PEG
    - Lap-assisted ERCP
    - Endoscopic ultrasound-direct transgastric ERCP (EDGE)

Baron TH, ERCP, 2019.;
https://www.jnjmedicaldevices.com/en-US/treatment/weight-loss-surgery/gastric-bypasss

ENDOSCOPIC ULTRASOUND-DIRECT TRANSGASTRIC ERCP (EDGE) PROCEDURE

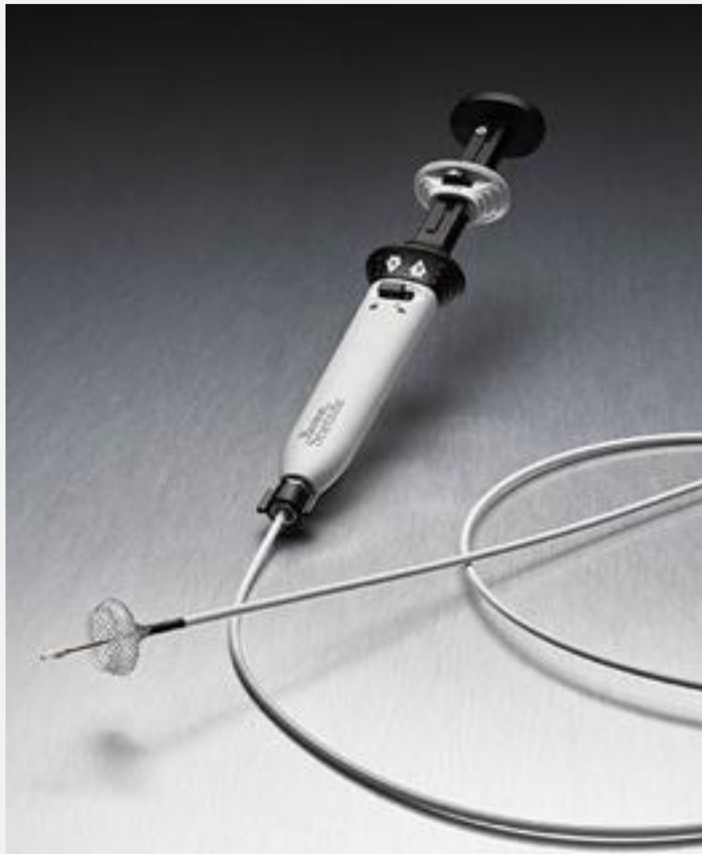
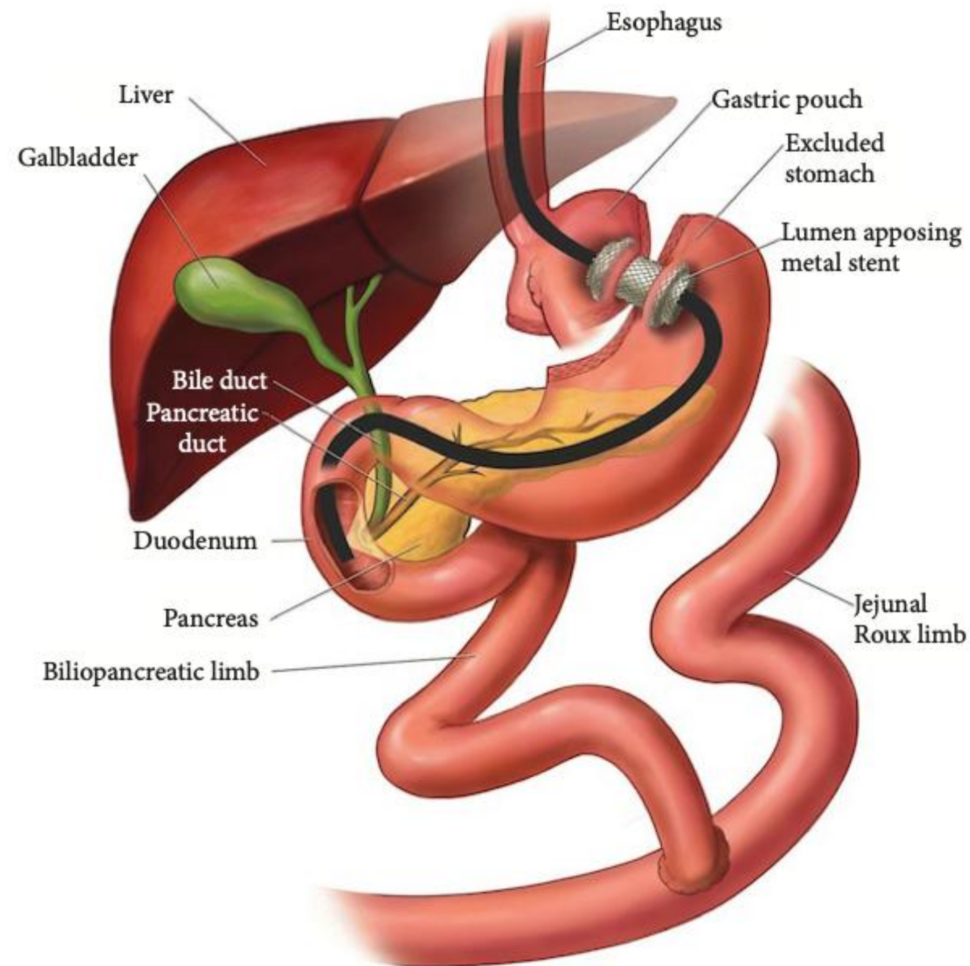


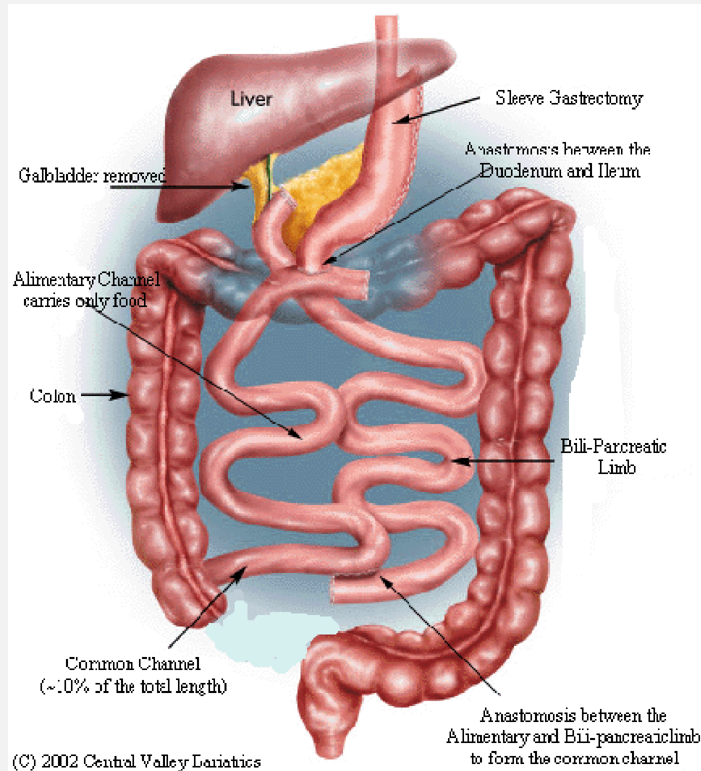
Image from Boston Scientific, available online at https://www.bostonscientific.com/en-US/products/stents--gastrointestinal/axios-stent-and-electrocautery-enhanced-delivery-system.html

ENDOSCOPIC ULTRASOUND-DIRECT TRANSGASTRIC ERCP (EDGE) PROCEDURE



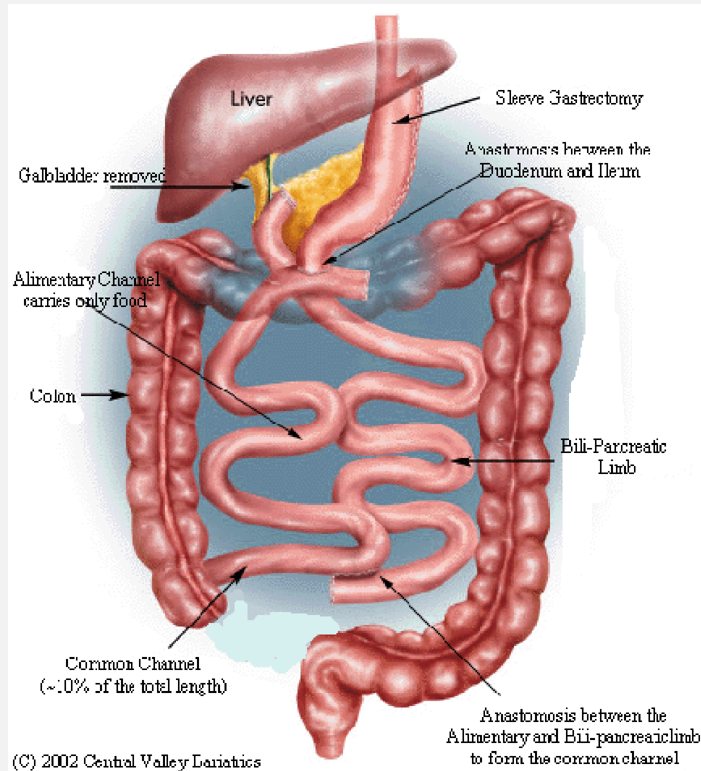
Video courtesy of Dr. Todd Baron and Dr. Christina Gainey; Honda H, Clinical Endoscopy 2022.

BILIOPANCREATIC DIVERSION + DUODENAL SWITCH (BPDDS)

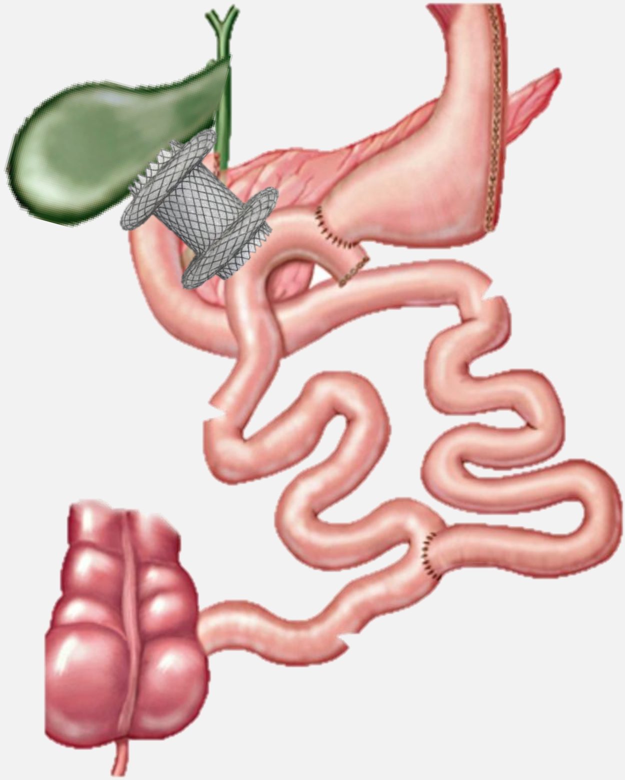


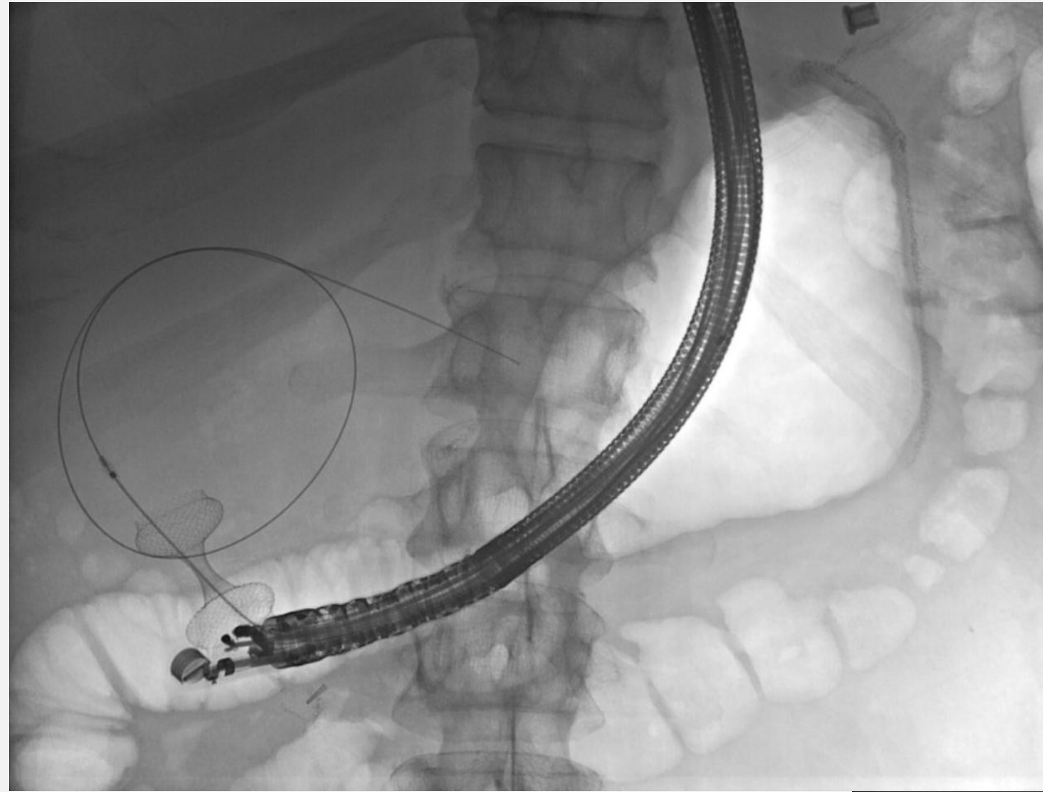
- Gastric sleeve + post-pyloric transsection + duodeno-ileal anastomosis creating alimentary limb (150 cm) + long biliopancreatic limb + common channel (100-150 cm)
- Traditional ERCP is not possible in these patients
- EUS-guided approaches may be feasible

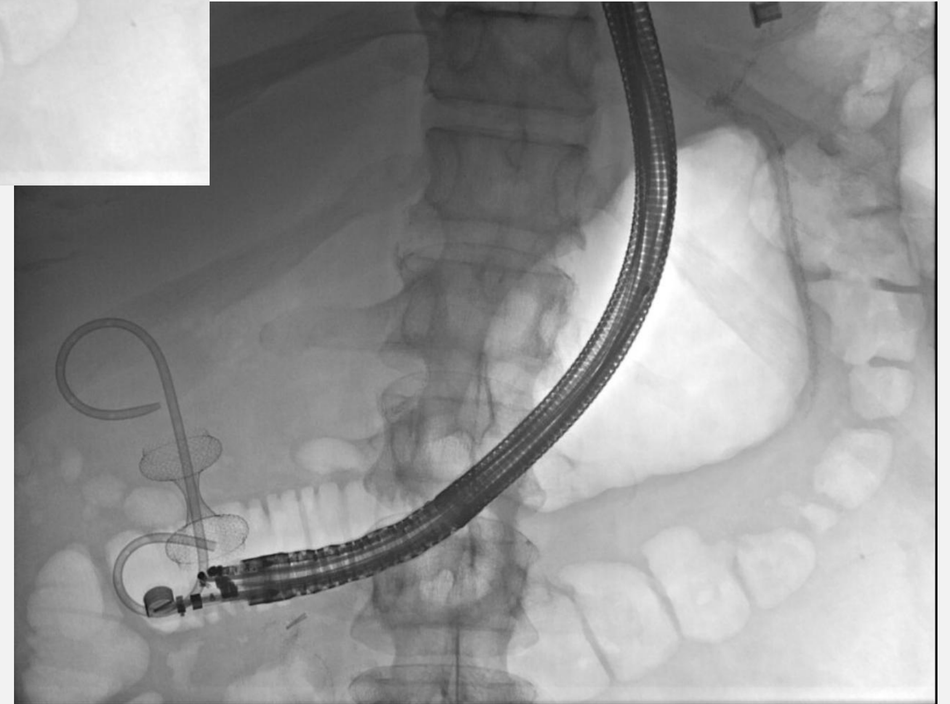
CASE PRESENTATION

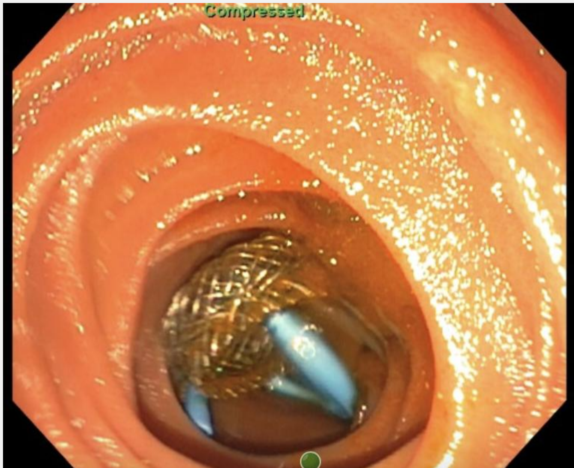


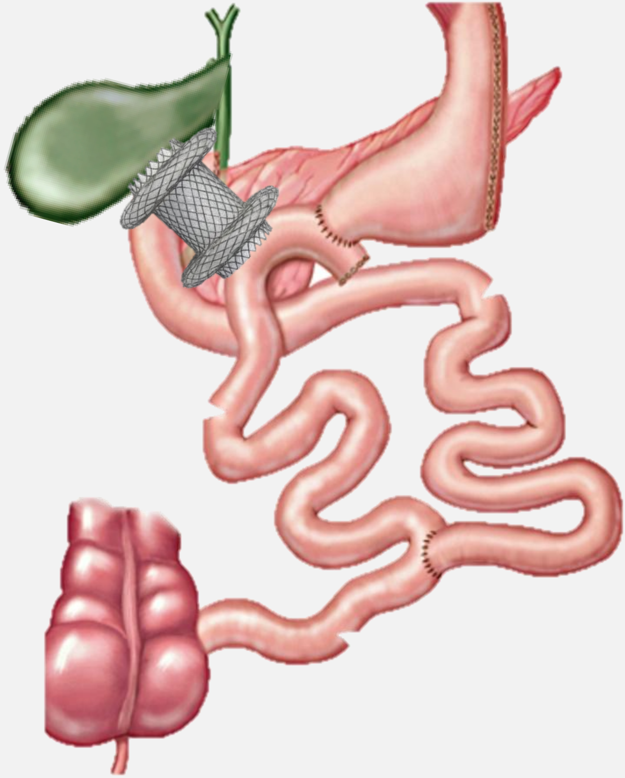
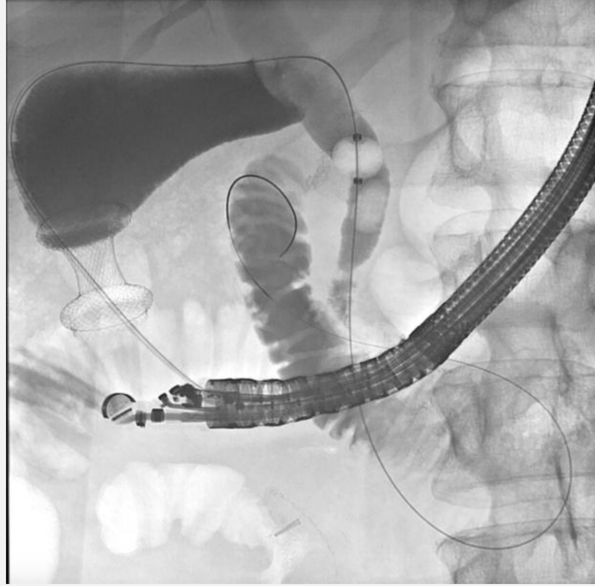
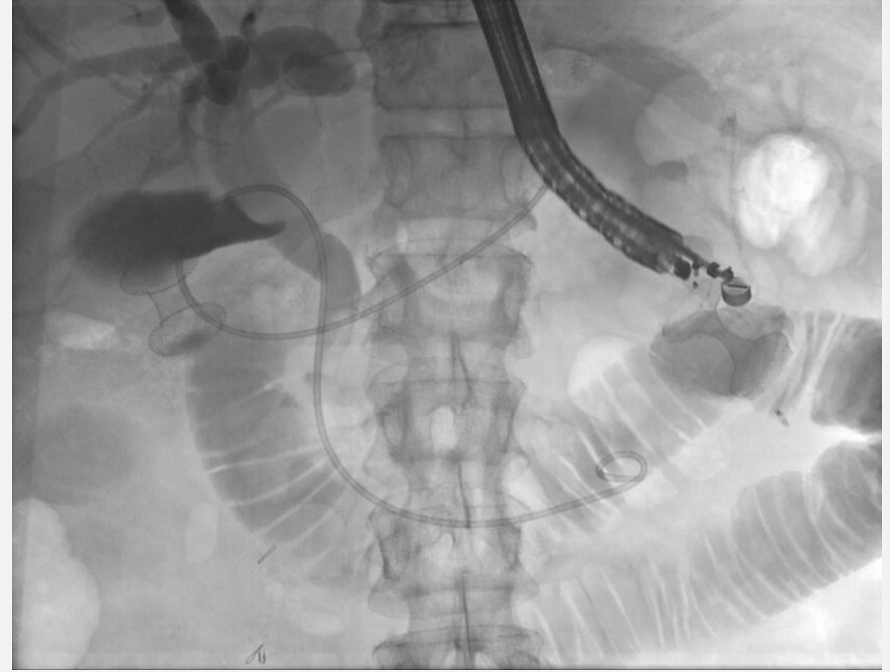
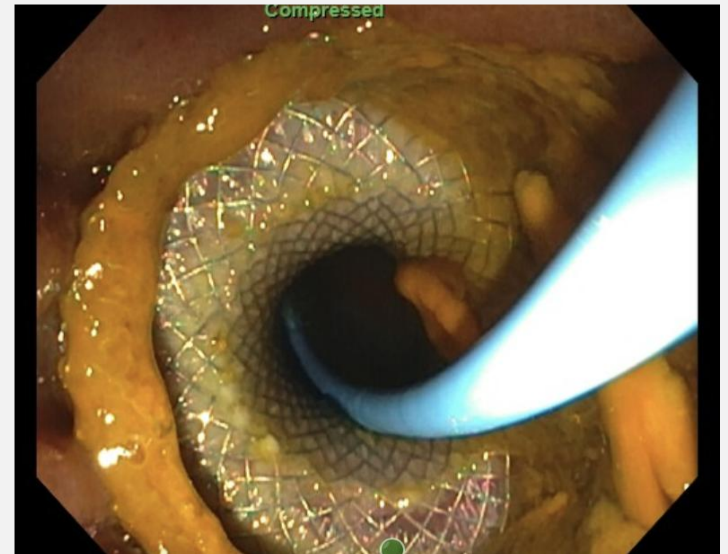
- 50 y.o. M with a history of BPDDS. No history of cholecystectomy.
- Presenting with Jaundice, intermittent fevers, fatigue/itching
- CT
  - Marked intra and extrahepatic biliary ductal dilation
  - Distal CBD obstruction secondary to intraluminal tumor vs choledocholithiasis

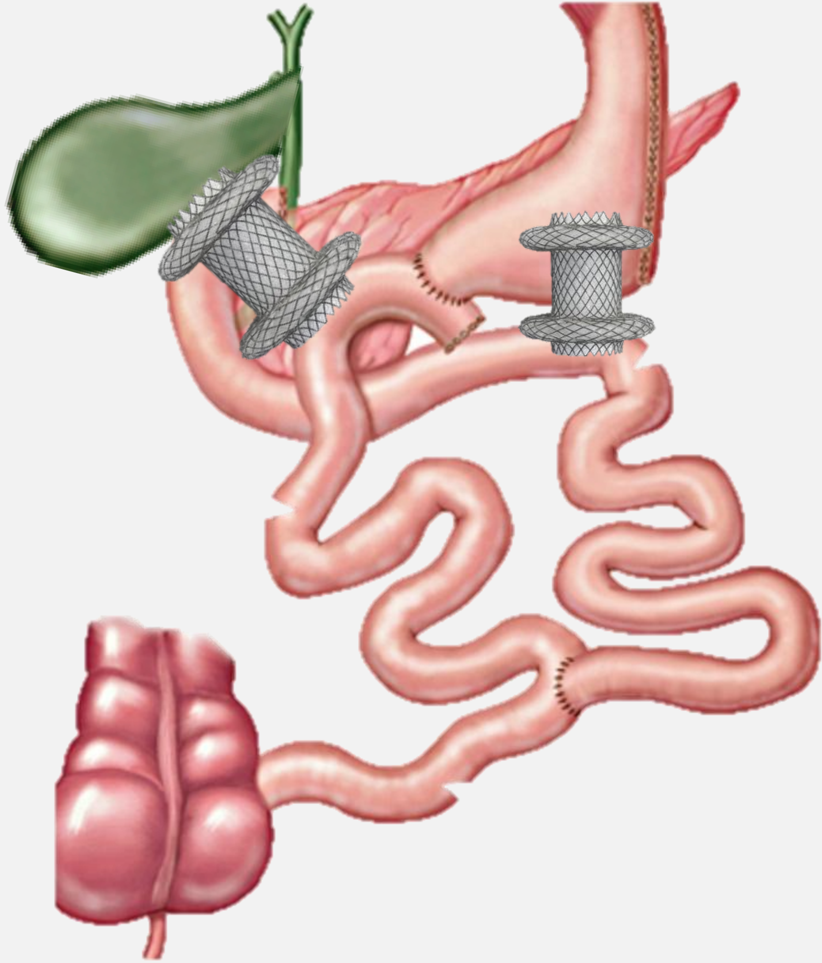







Compressed





Compressed



CME/MOC Question:

A 49-year-old patient with prior RYGB and prior cholecystectomy who presents with symptoms of cholangitis and imaging findings consistent with choledocholithiasis. All of the following are reasonable management options EXCEPT:

A. Percutaneous hepatic drainage
B. Single balloon enteroscopy for transpapillary ERCP
C. Traditional duodenoscope for transpapillary ERCP
D. EUS-guided biliary drainage

Joint Providership

American Society for Gastrointestinal Endoscopy

NORTH CAROLINA SOCIETY OF GASTROENTEROLOGY

CME/MOC Answer

C. Unable to perform traditional transpapillary ERCP with duodenoscope in RYGB anatomy

Joint Providership

American Society for
Gastrointestinal Endoscopy