

# Double balloon ERCP

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# Double balloon enteroscope



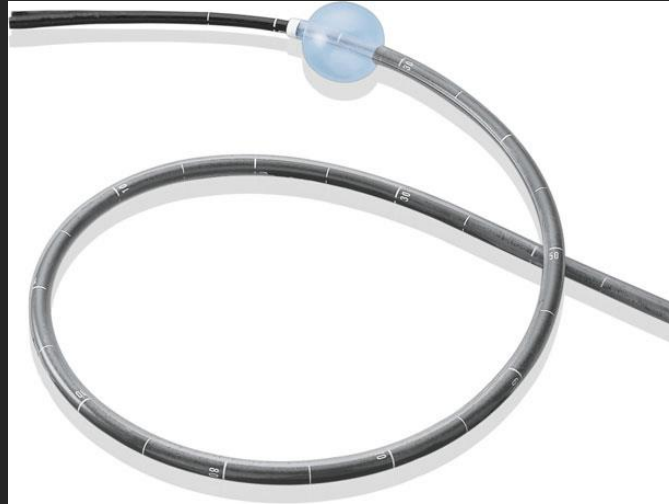
Used for small intestine examination



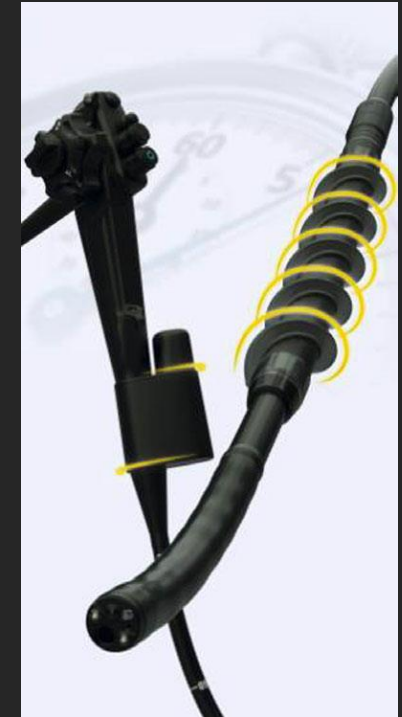
# Double balloon scope

- Length 200 cm
- Must add 10-15 cm when the length of the working channel is discussed
- Working channel diameter 3,2 mm (previous model 2,8 mm)
- Larger working channel – better sucking ability
- CO2 is necessity!!

# Other kind of scopes



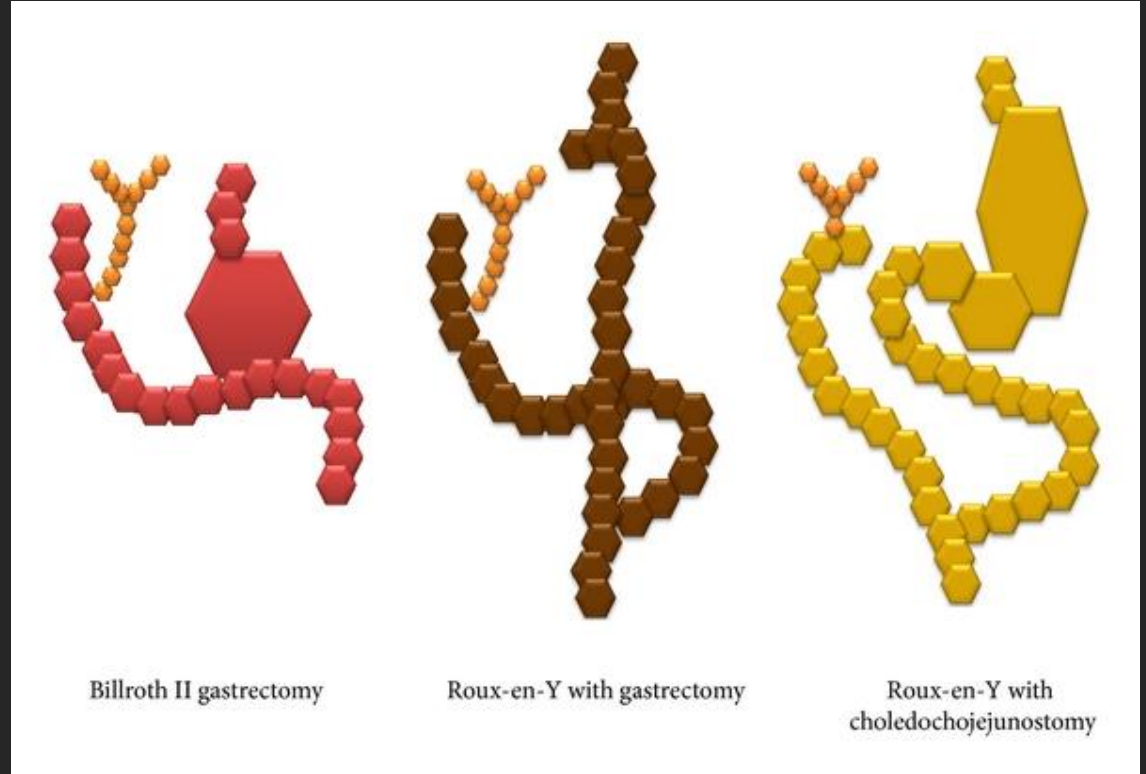
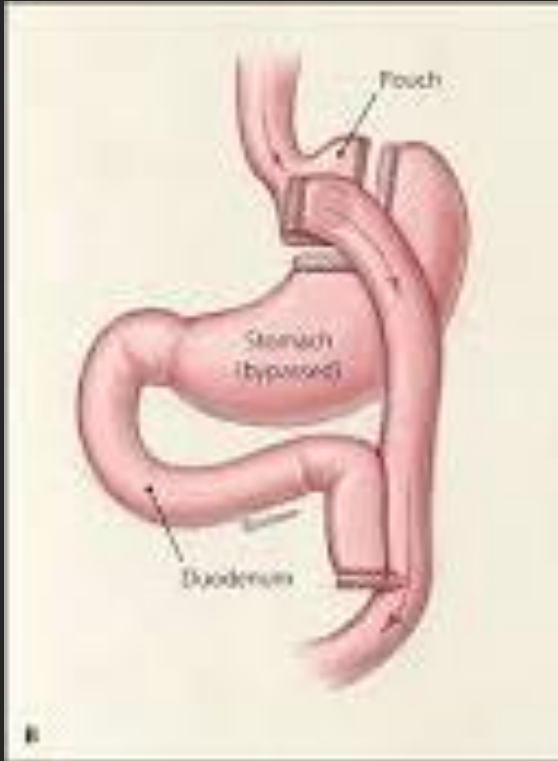
- Length 150-200
- Working channel 2.8-3.2mm
- Passive bending
- Increased rigidity
- Water jet channel
- A lot of prototypes from Fujifilm and Olympus
- With short scope you can use regular ERCP devices



Spiral overtube  
enteroscope



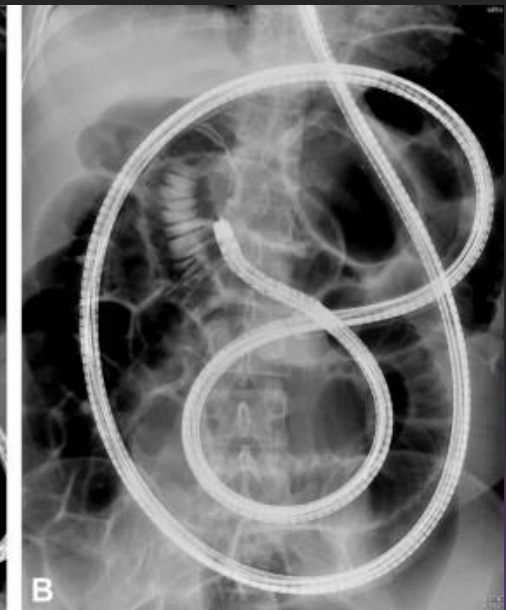
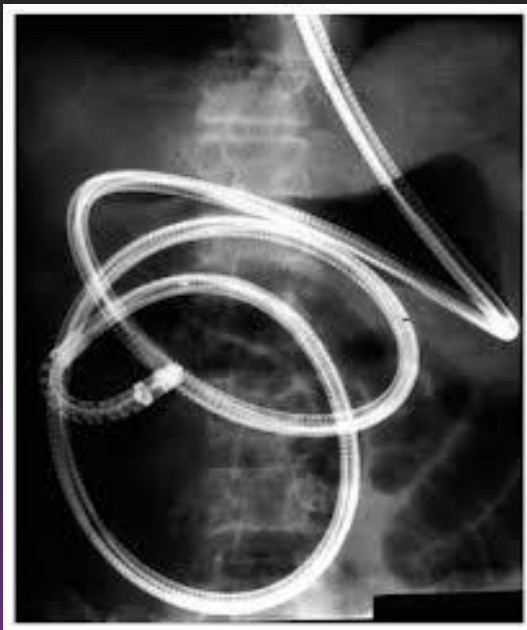
# Double balloon-ERCP



- Gastric bypass obesity surgery
- Stomach resection
- Gastrectomy
- Hepaticojejunostomy, liver transplantation

# Double balloon-ERCP

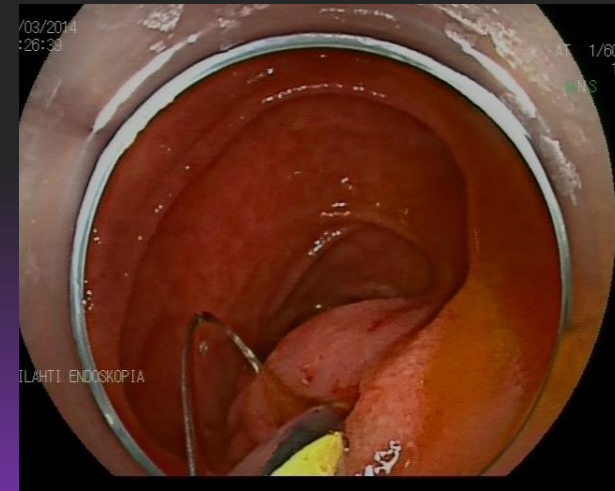
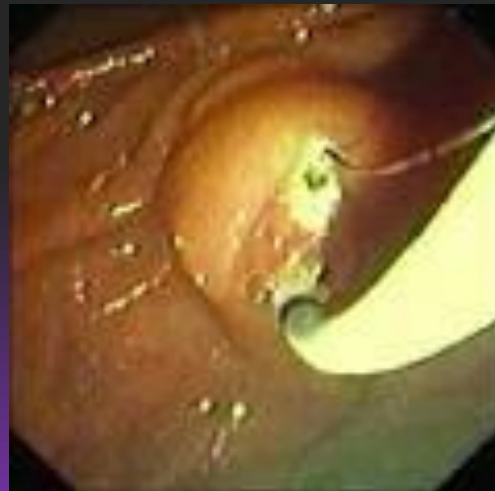
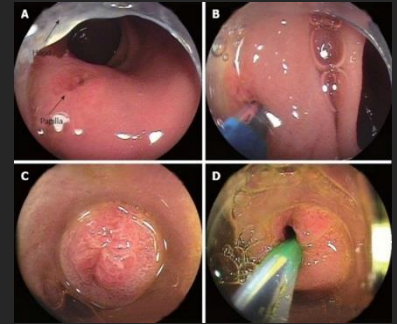
- Indications similar with regular ERCP, but no stenting in malignant disease





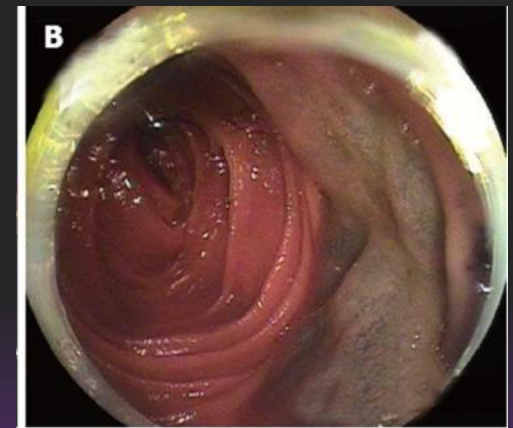
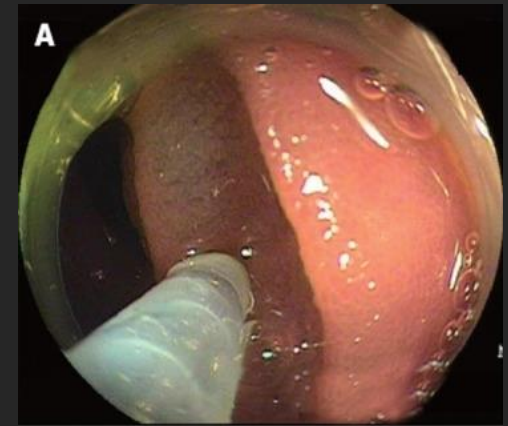
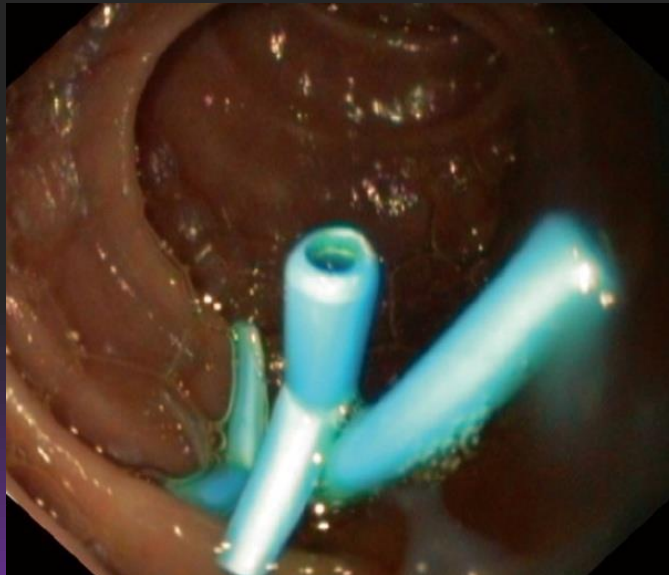
# DB-ERCP devices

- Length 240-250 cm
- Catheter
- Guide wire 650 cm
- Transparent cap on the tip of the scope
- Guide wire length 450cm can be used but catheter must be cut with a knife to be able to change the device
- Sphincterotome
- Needle knife
- Brush



# DB-ERCP devices

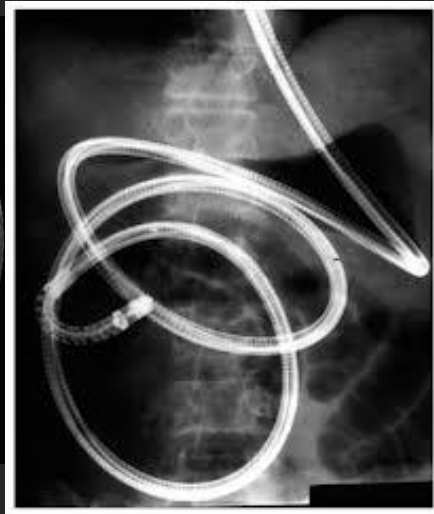
- CRE-dilation balloon (controlled radial expansion)
- Stone extraction balloon
- Basket (crushing)
- 7fr and 8,5fr pusher and stent
- Ink
- Clips



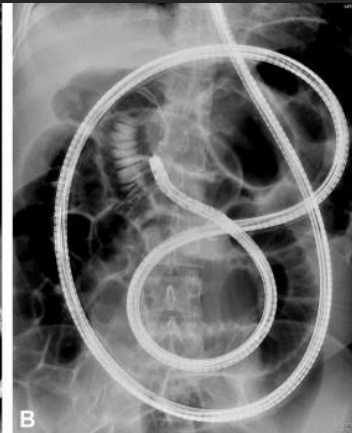
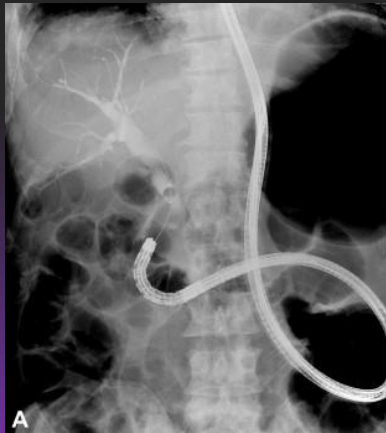
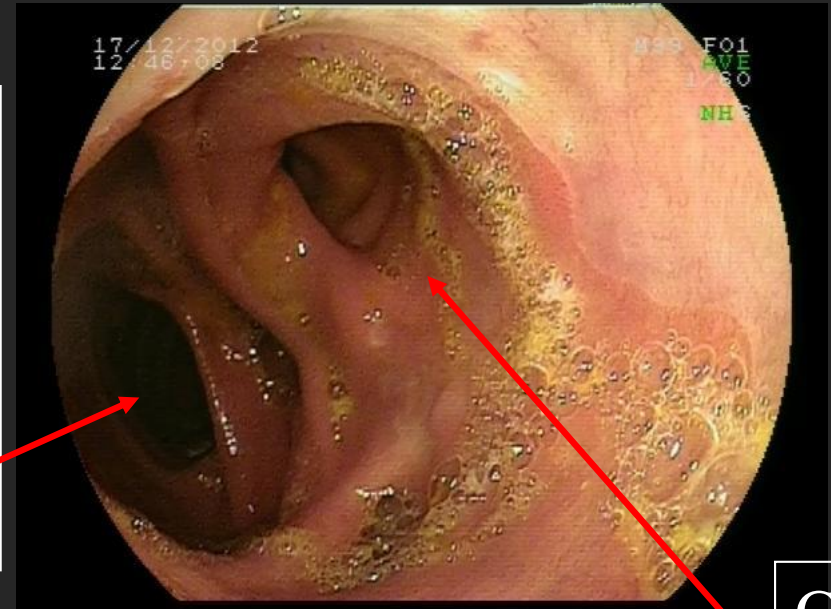
# DB-ERCP in Meilahti

- 2012: 6 procedures / success rate 50%
- V 2013: 26 / 73%
- V 2014: 23 / 96%
- V 2015: 32 / 84%
- V 2016: 37 / 89%
  - 2 papilla could not be reached
  - 1 chronic pancreatitis (could not cannulate pancreatic duct, did not have abdominal pain..)
  - 1 pancreas transplant (could not find the papilla of the transplant)
- V 2017: 61
- V 2018: 73

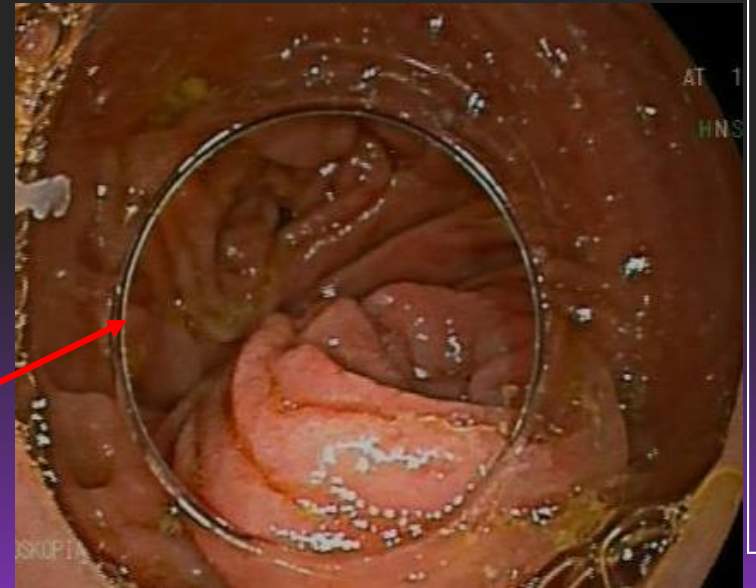
# DB-ERCP / how to choose lumen



W  
R  
O  
N  
G  
??



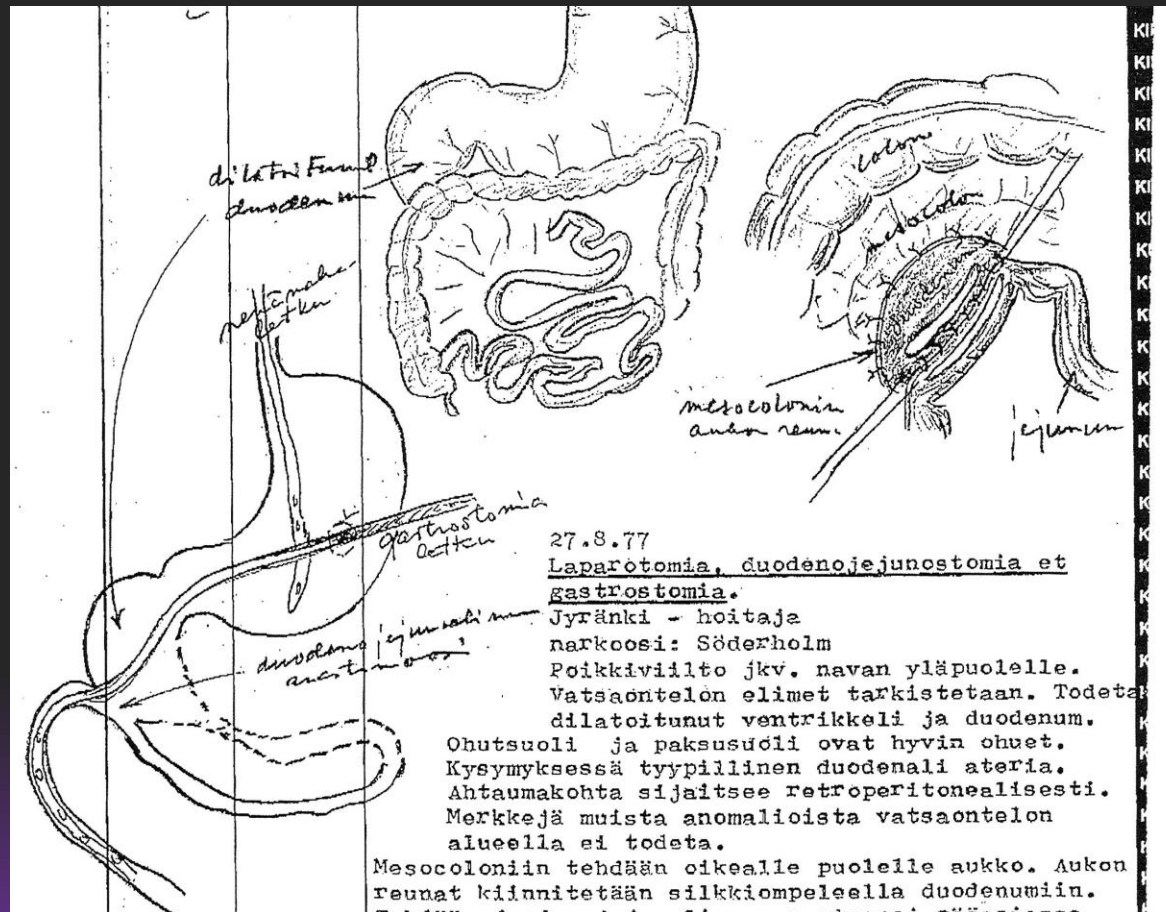
CAP



C  
O  
R  
R  
E  
C  
T  
??



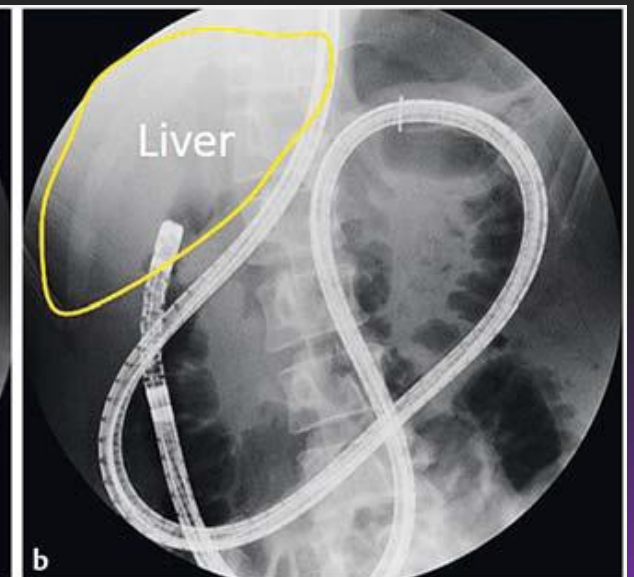
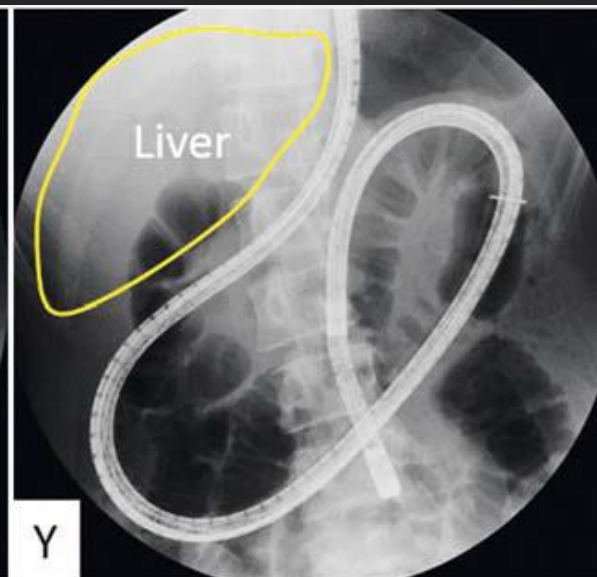
# Good operation report is helpful!!



# DB-ERCP correct lumen

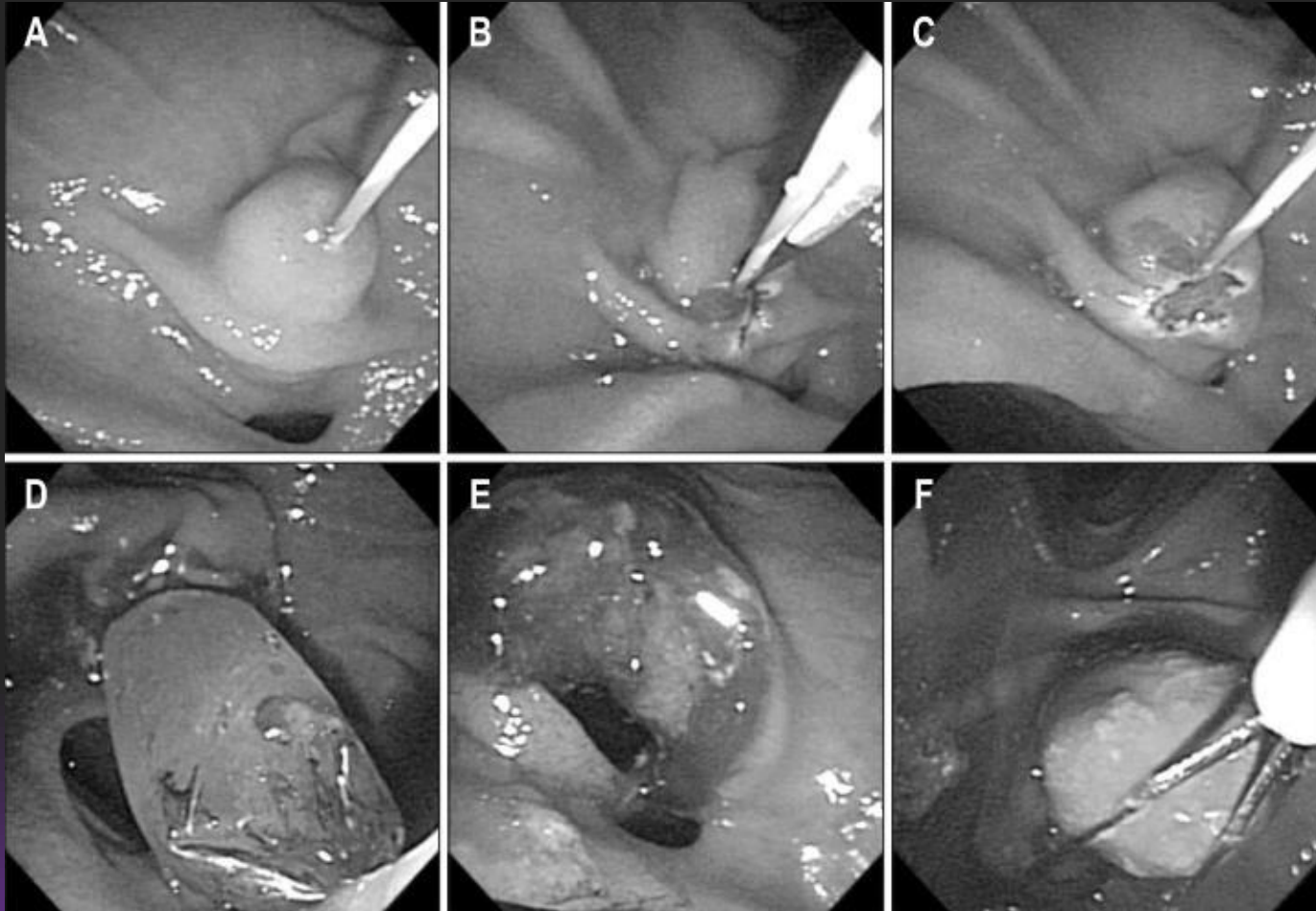
*Tsutsumi et al Endoscopy 2017*

- Selected the lumen in which the distal end of the scope progressed toward the patients' liver or head
- Accuracy of the method was  $23/26 = 88\%$



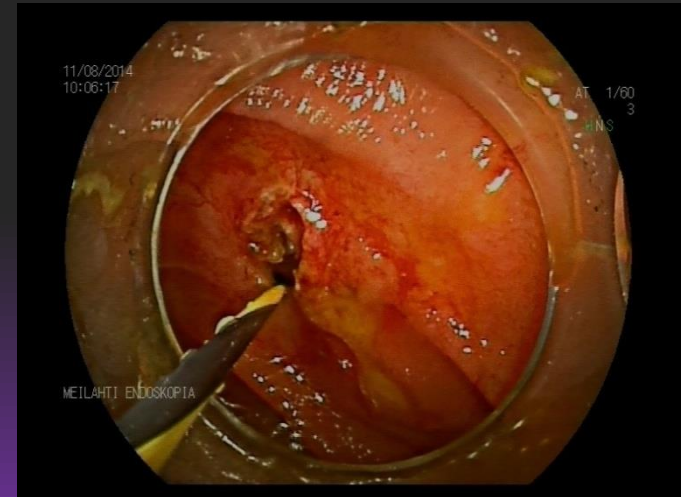


# Large balloon dilatation DB-ERCP



# Hepaticojejunostomy stricture

- 72y female
- 08/2013 pancreaticoduodenectomy (Whipple) uncinatus tumor, Gradus II NET, pT2N1
- Suffered from several cholangitis episodes
- Suspicion of stricture in hepaticojejunostomy anastomosis

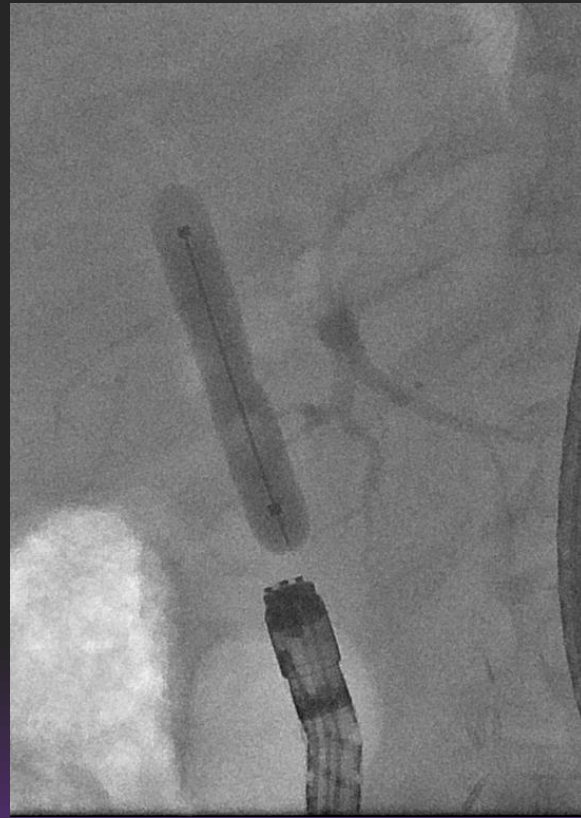


- Needle knife, dilatation ad 10mm
- Custom-made covered SEMS, Hanaro stent for DB-enteroscope, TTS
- Diameter 10mm, length 20 mm , antimigration flaps
- Former therapeutic channel 2,8mm, now 3,2mm !!!!

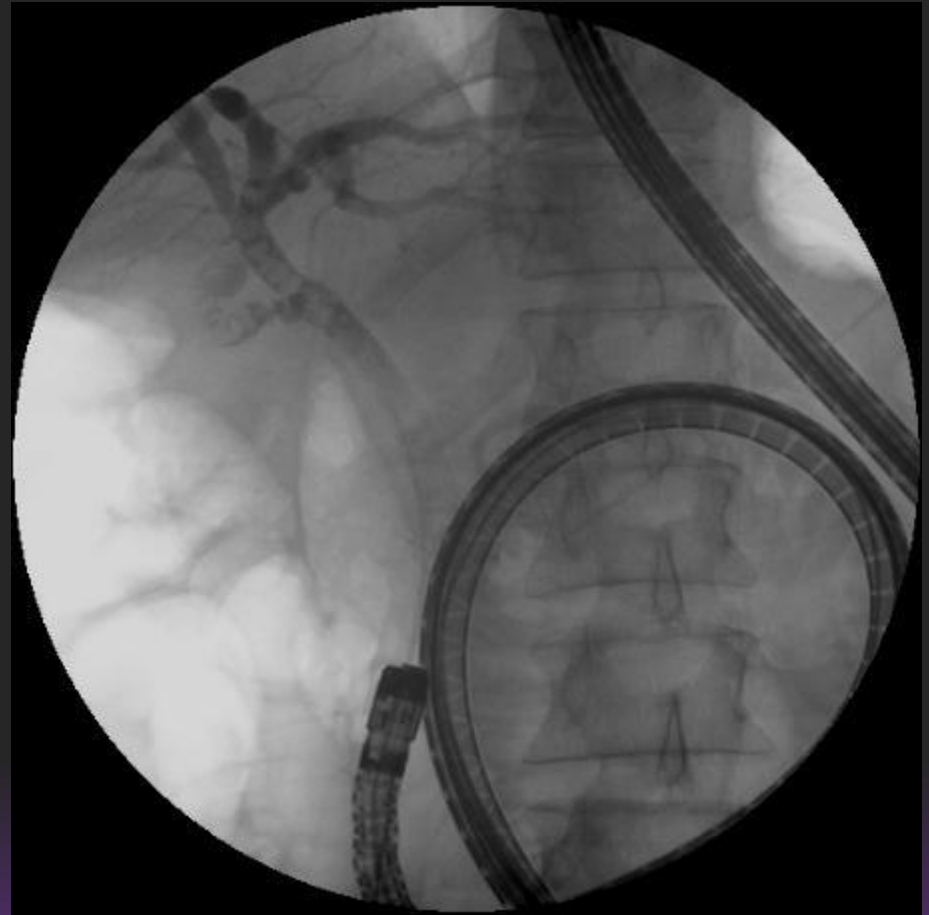




# DB-ERCPC 8/2014

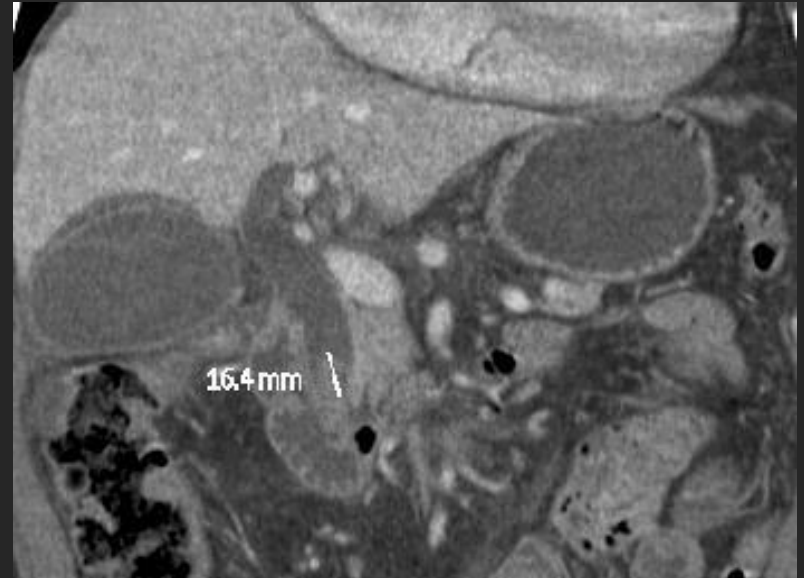


# Choledochal stones, patient 1



# Choledochal stones, patient 2

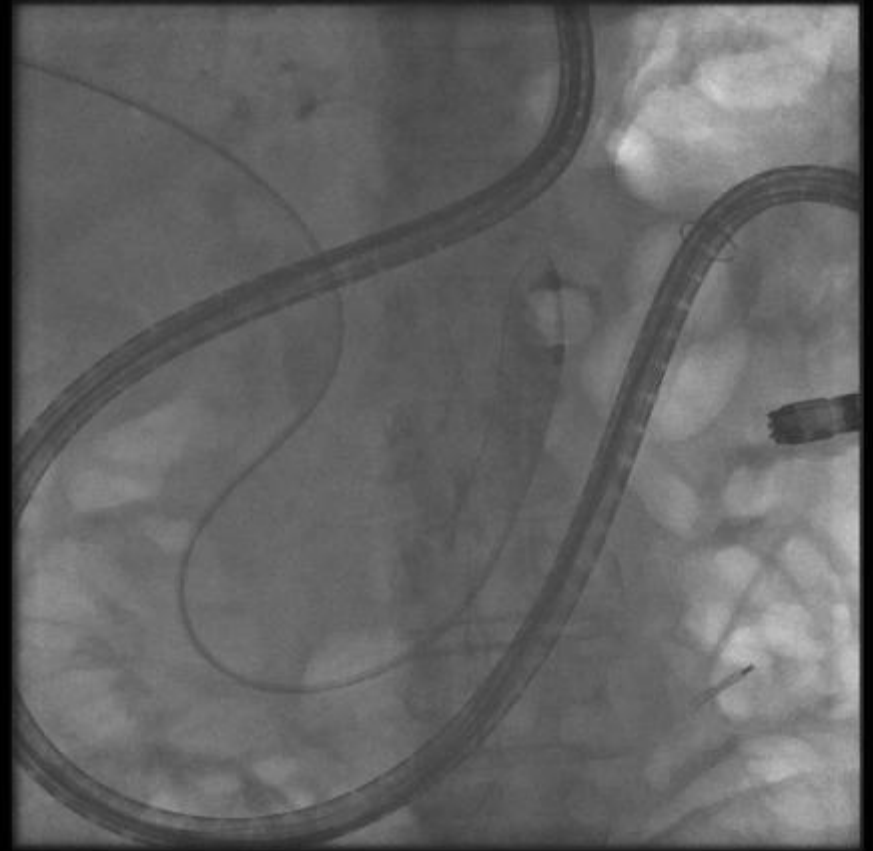
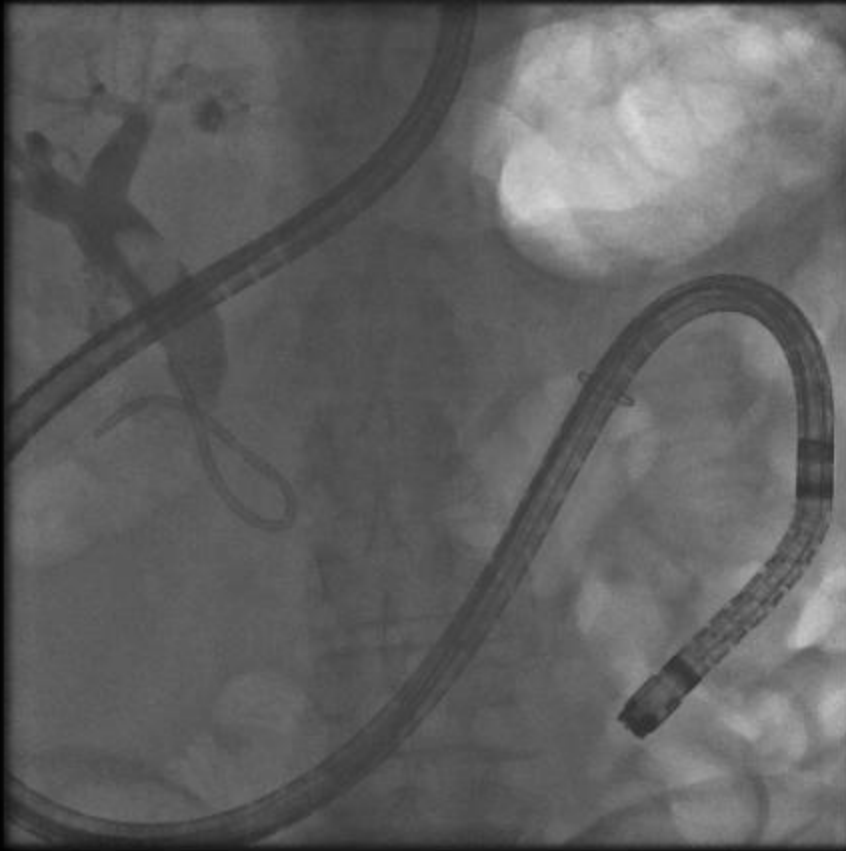
- 89y male from Tampere
- 1999 stomach resection  
roux-y for cancer
- Now abdominal pain
- Choledochal stone found
- PTC, internal-external,
  - hematoma in liver



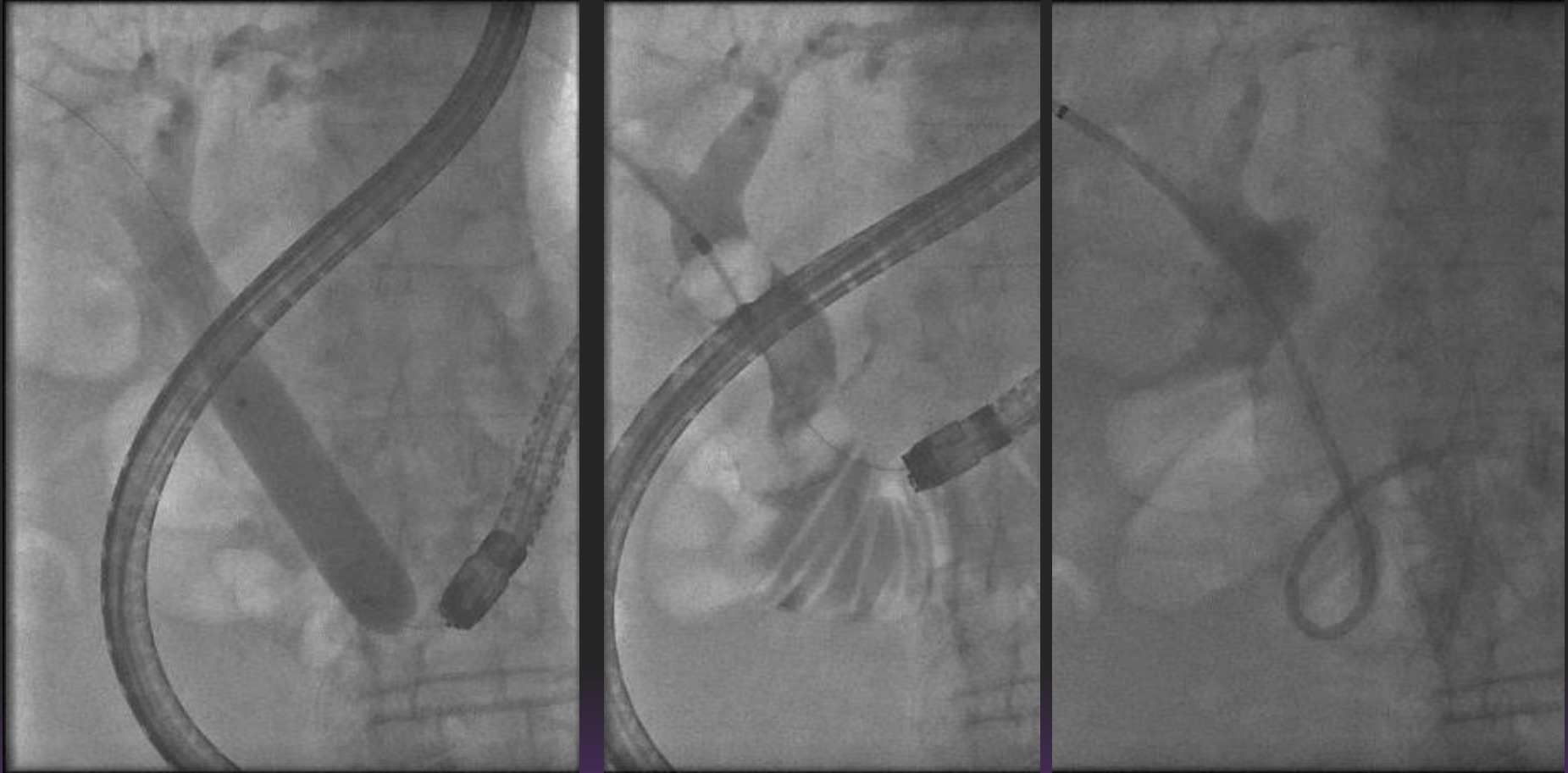


# Choledochal stones, patient 2

- First to wrong loop....



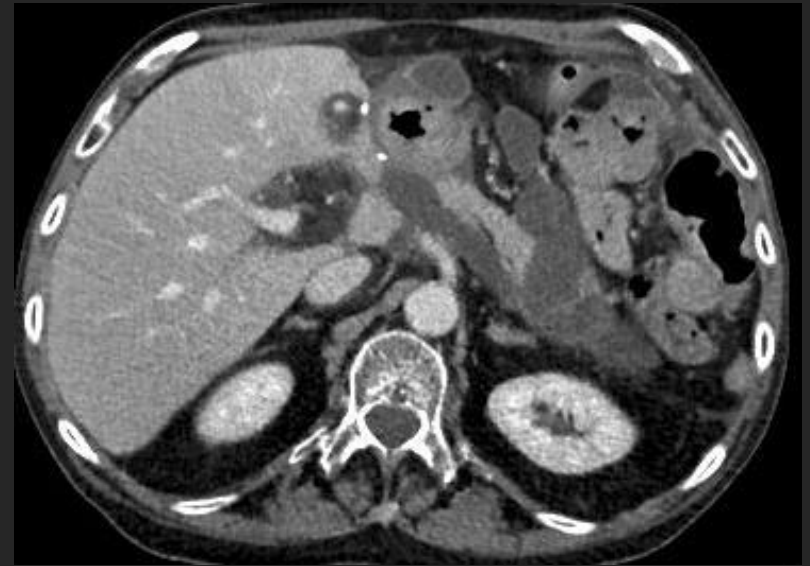
# Choledochal stones, patient 2



PTC for 3 days, antibiotics for 1 week

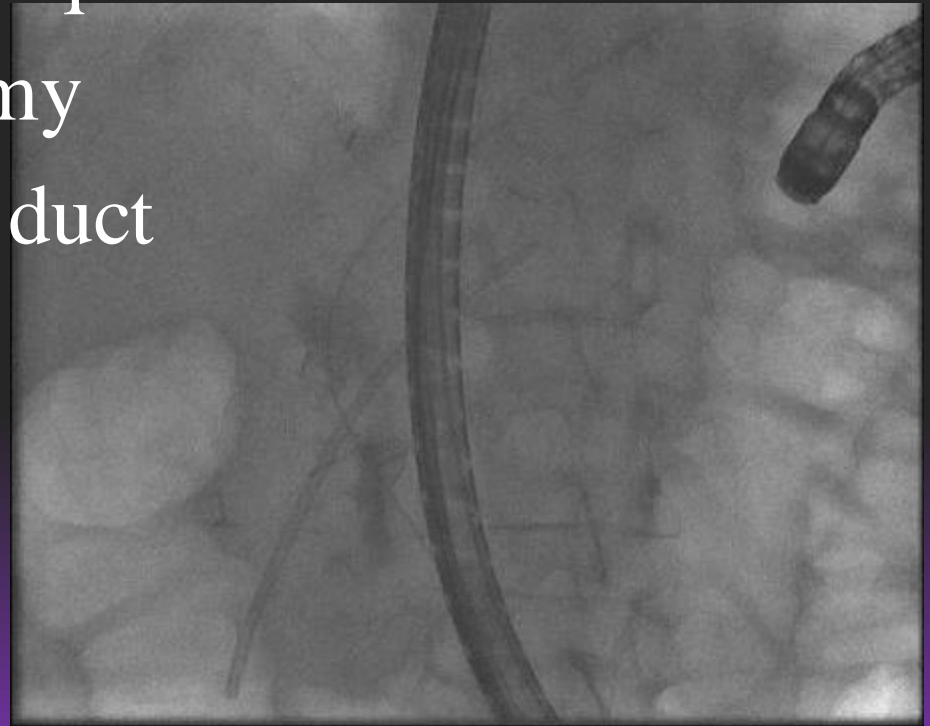
# Pancreatic fistula

- 62y male from HYKS
- 12/2013 gastrectomy  
roux-y for cancer
- US + drain in abscess
- XX-amyl 18 555 U/l
- Pancreatic fistula

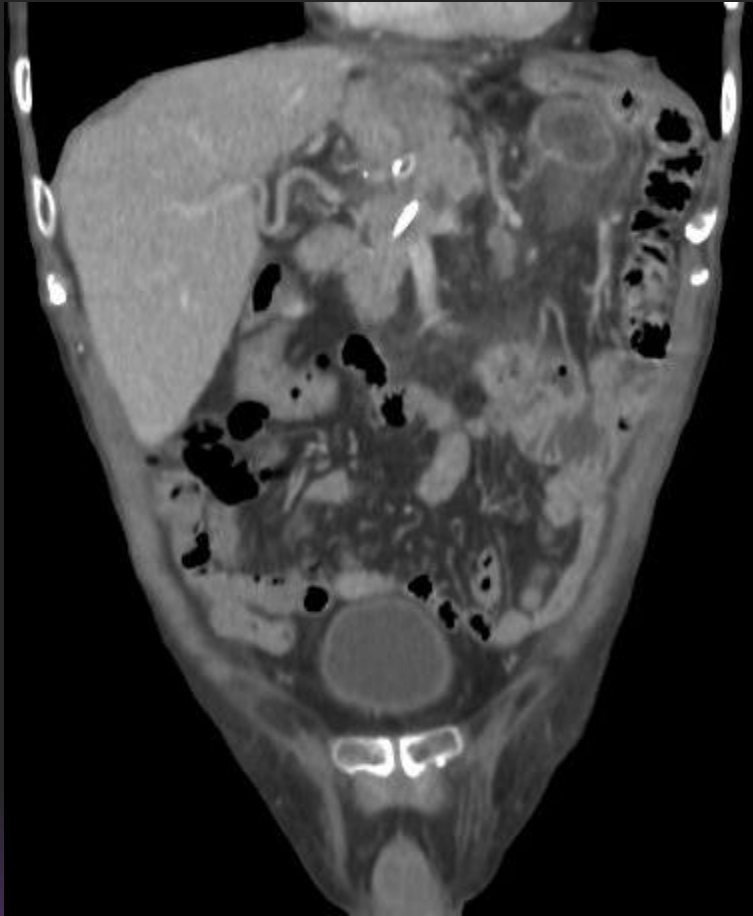


# Pancreatic fistula

- Nuutinen 15 minutes to papilla
- Extremely difficult cannulation
- 1. guide wire to biliary duct
- Double guide wire technique
- Pancreatic sphincterotomy
- Dilatation of pancreatic duct
- Stent 7Fr, 7cm



# Pancreatic fistula



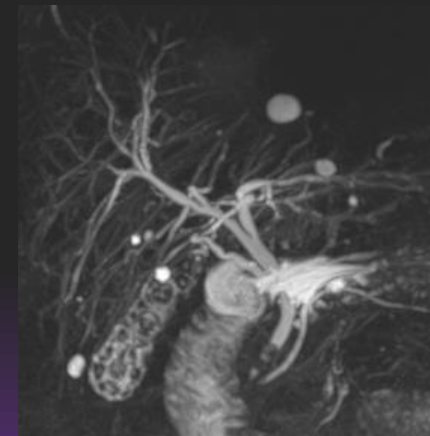
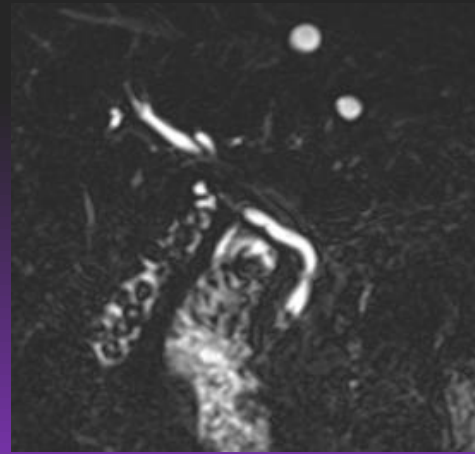
# Gastric bypass choledochal stones

- Treatment options, if stones in gallbladder as well
  - LCC and laparoscopic removal of choledochal stone
  - Open surgery
  - LCC and laparoscopy assisted ERCP through abdominal wall
  - DB-ERC and removal of choledochal stone following LCC later

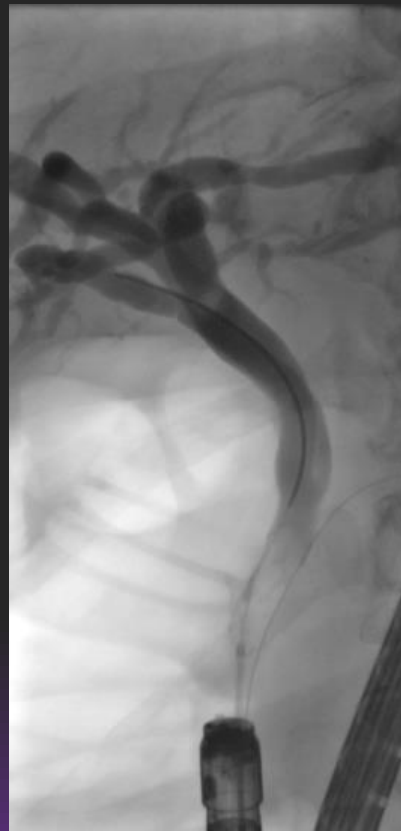
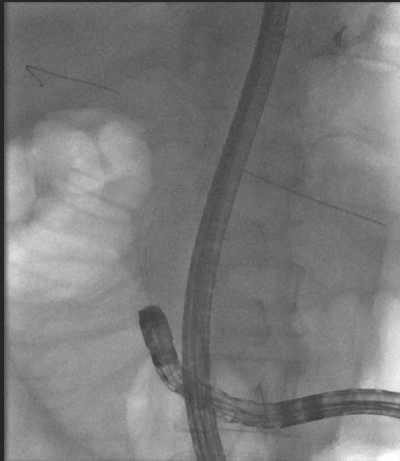


# Gastric bypass / Case 1

- Gastric bypass 11/2015
- Stricture in enteroanastomosis, reoperation, Bile in abdominal cavity, peritonitis, long ICU treatment
- Pace maker, paroxysmal atrial fibrillation, varfarin, sleeping apnea..
- Abd pain, liver enzymes high



# Gastric bypass / Case 1



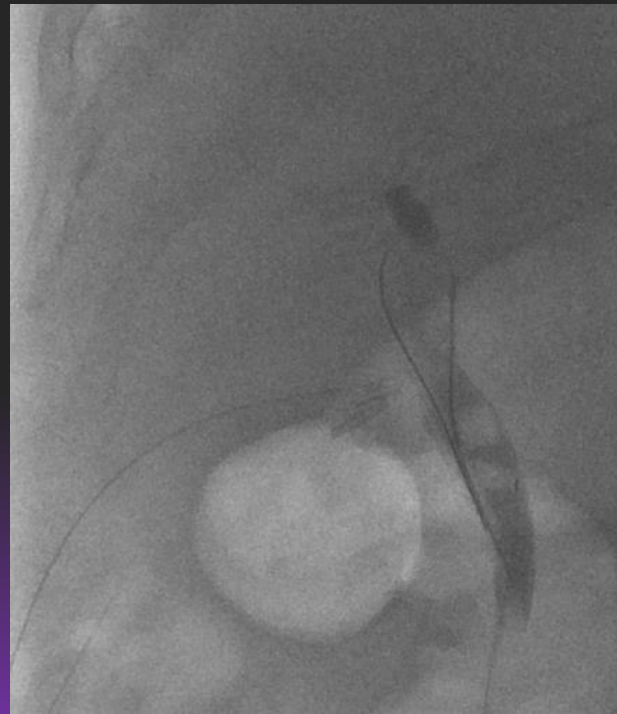
# Gastric bypass / Case 2

- Gastric bypass 2012
- 10/2018 cholecystitis
- Open cholecystectomy, cholangiography, choledochotomy, cholangioscopy, choledocholithotomy, T-tube
- In postoperative cholangiography:  
*stones..*



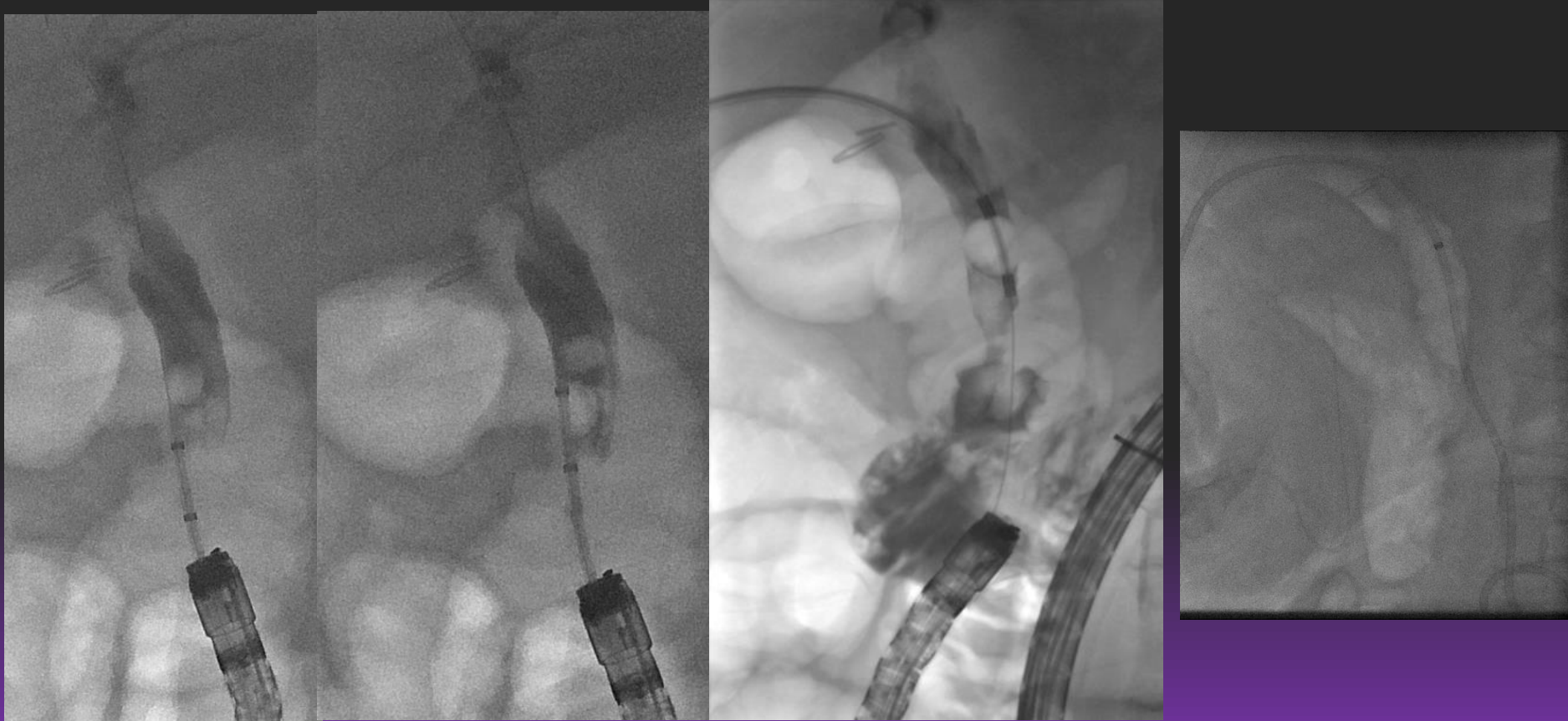
# Gastric bypass / Case 2 / DB-ERCP

- Wire through T-tube to ease cannulation
- Small EPT and balloon dilatation until 10mm
- Still one stone remains..



# Gastric bypass / Case 2 / DB-ERCCP

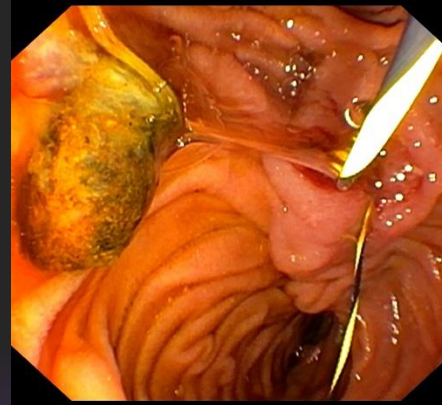
- Extraction balloon via DB and via T-tube channel
- In the end new PTC





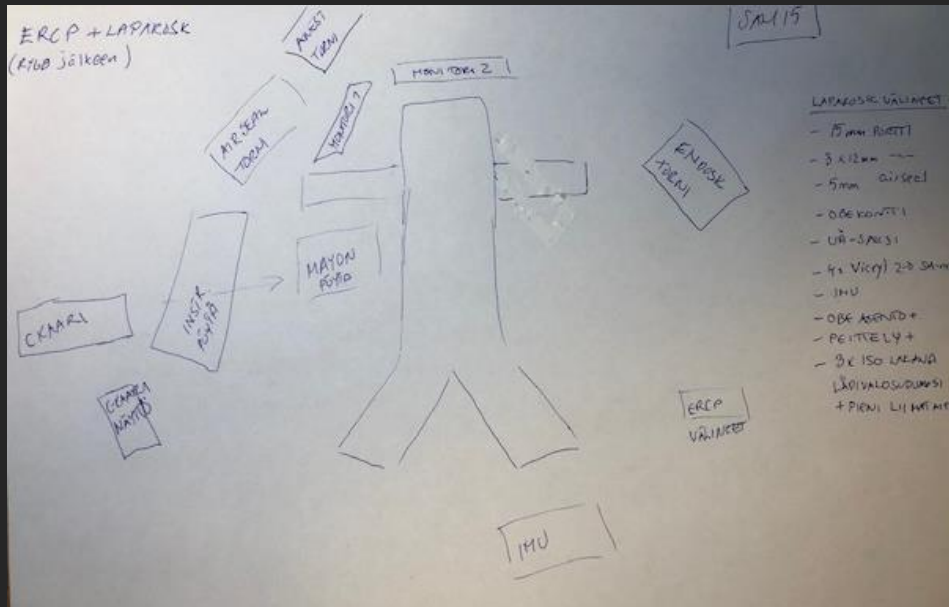
# Gastric bypass / Case 2 / Laparoscopy-assisted ERCP

- 15mm troachar
- Guide wire to duodenum / PTC removal
- Easy to remove stone by ERCP and balloon



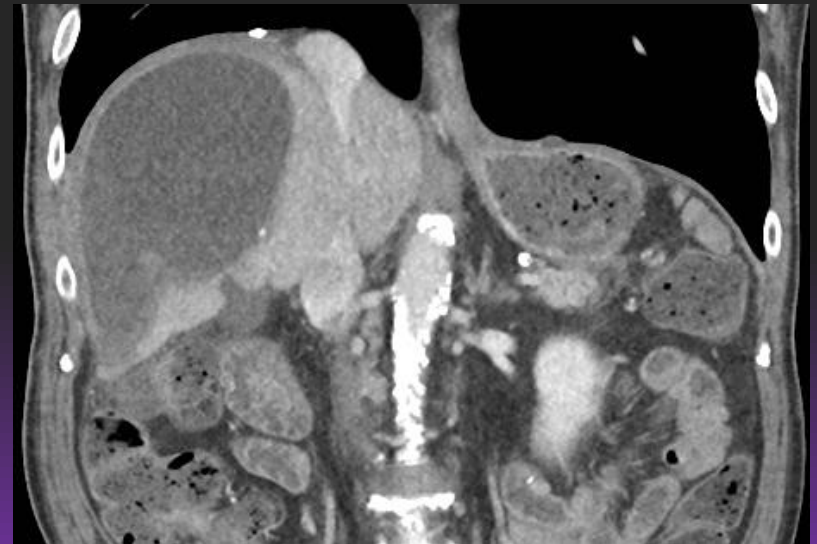


# Gastric bypass / Case 2 / Laparoscopy-assisted ERCP

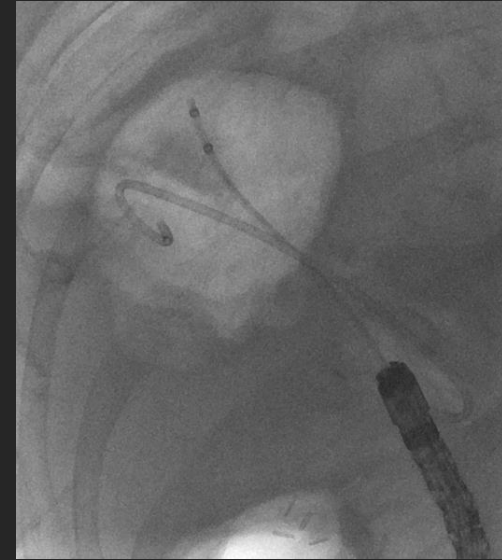
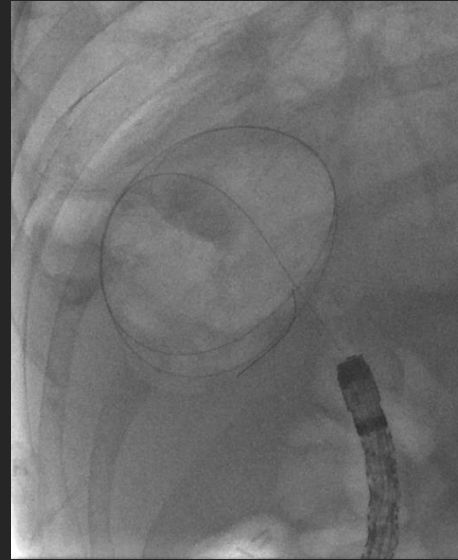


# Whipple, liver abscess

- 6/2016 whipple for neuroendocr cancer pT3N1
- Several percutaneous drainages
- 29.11.2016 liver resection, segments 7-8 (stone in dilated intrahepatic duct)
- Klebsiella sepsis



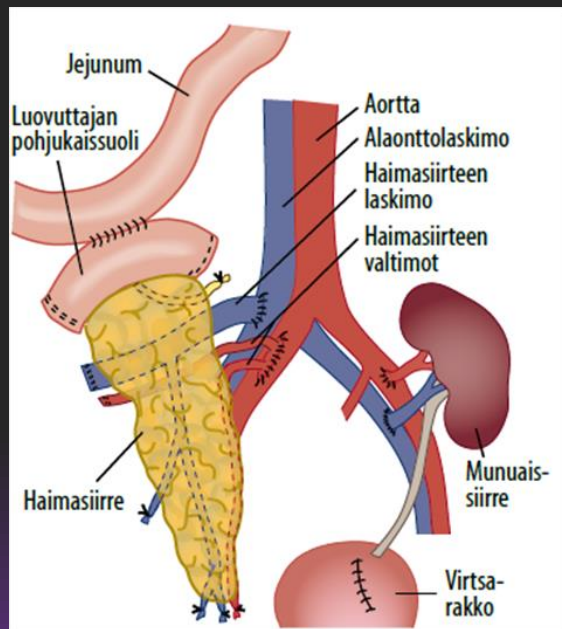
# Whipple, liver abscess



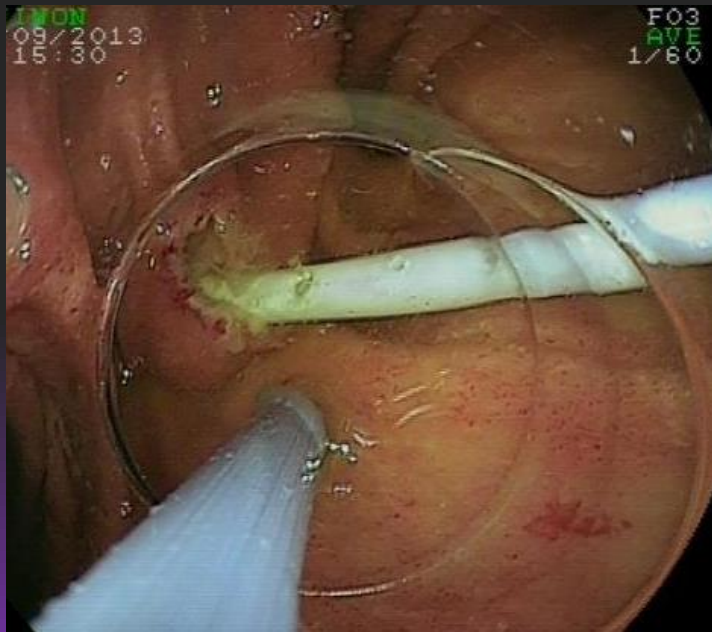


# Pancreas transplant DB-ERCP

- 7/2013 Pancreas transplant
- Abscess beside the pancreas transplant



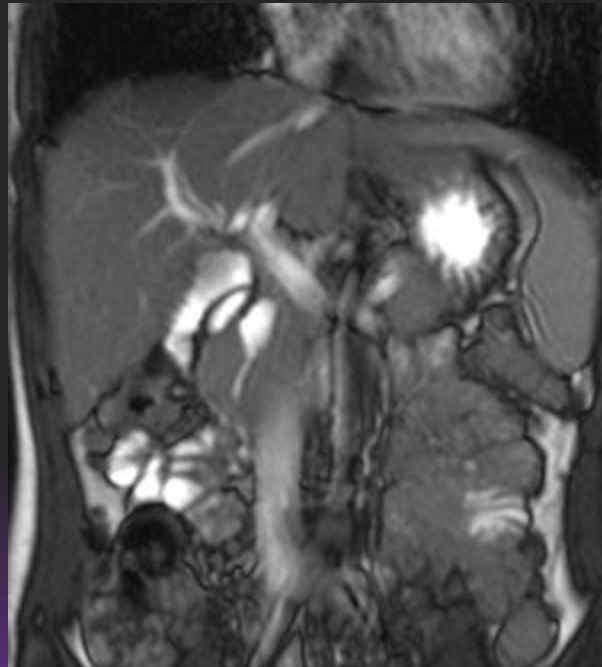
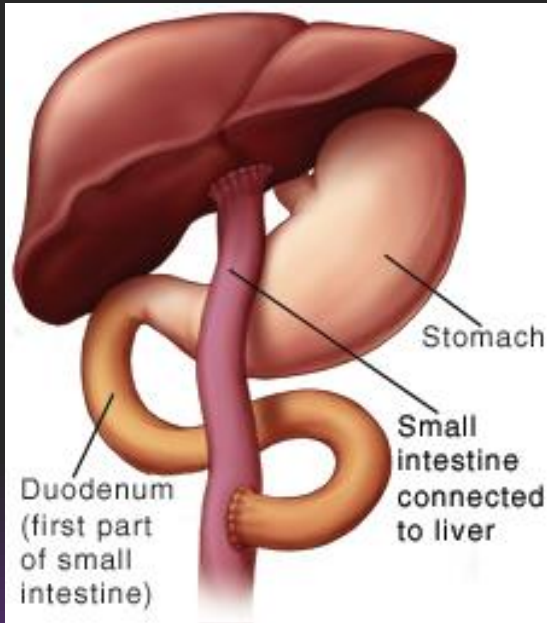
# Pancreas transplant DB-ERCP





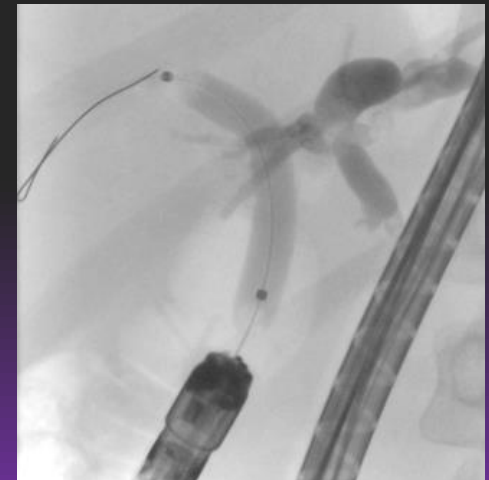
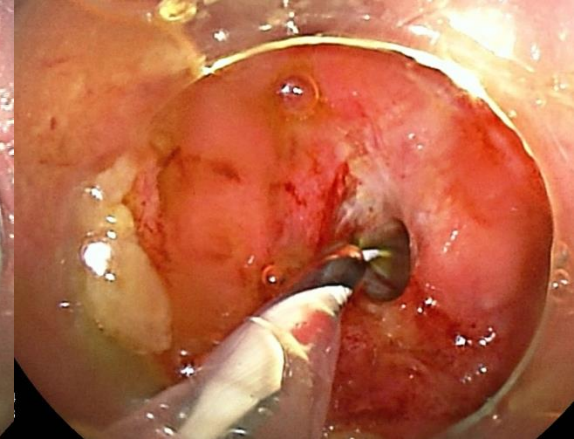
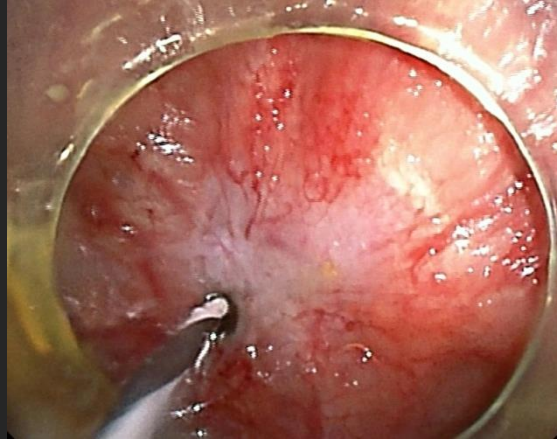
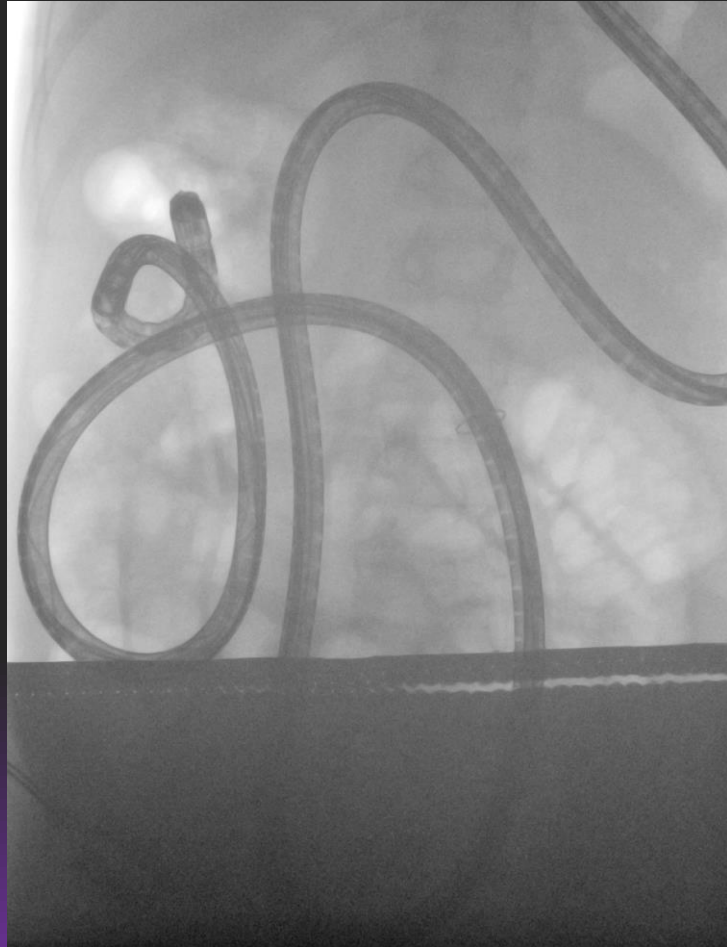
# 10 y boy

Choledochal cyst operated when 4 years old  
Kasai- type operation, now 10 years old  
3/2017 DB-ERCP unsuccessful



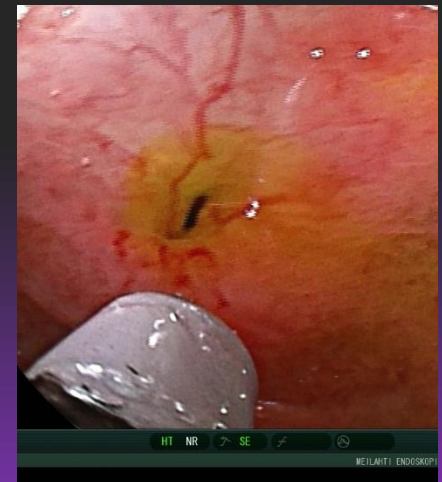
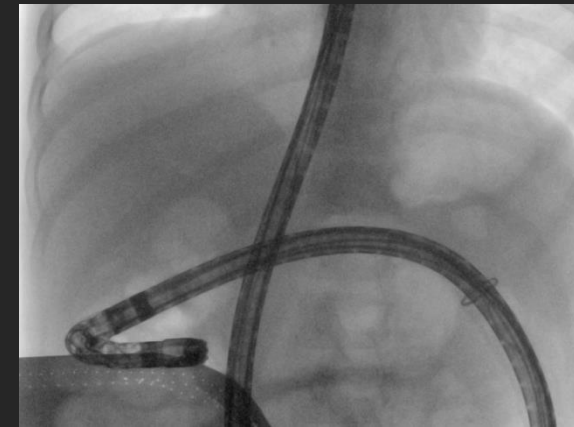
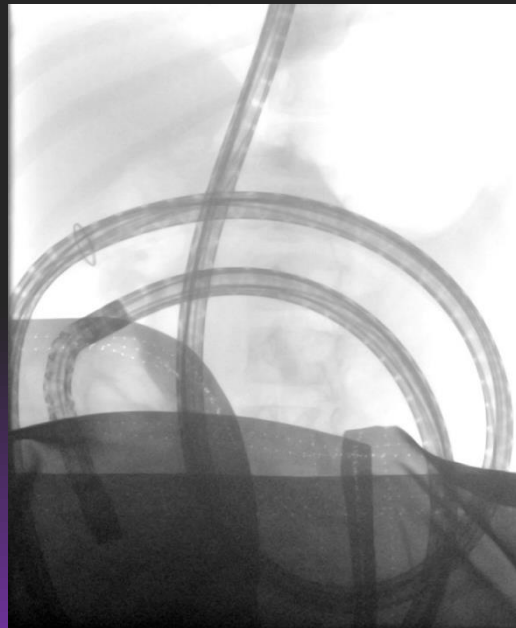
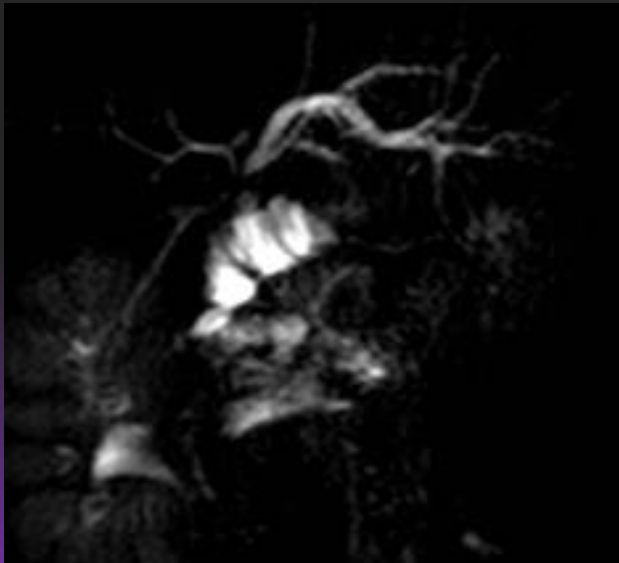
# Children / 10 y boy

1/2018 DB-ERCP and dilatation succeeded

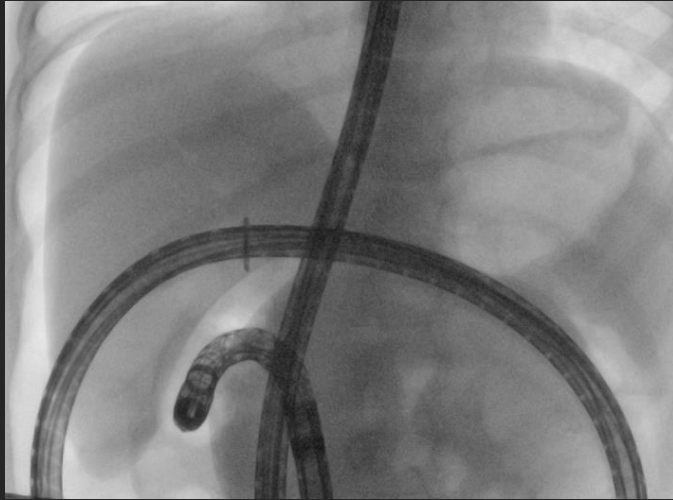


# 7y girl

- Choledochal cyst operated when 1 y, Hepaticojejunostomy
- Episodes of cholangitis
- Suspicion of anastomotic stricture



# 7y girl



- HJ anastomosis dilated until 7mm
- Perforation of enteroanastomosis operated

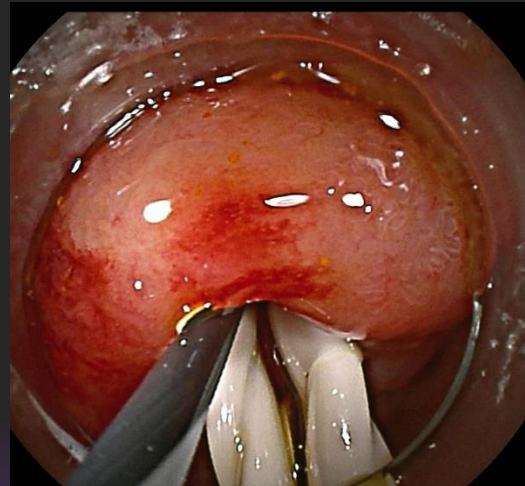
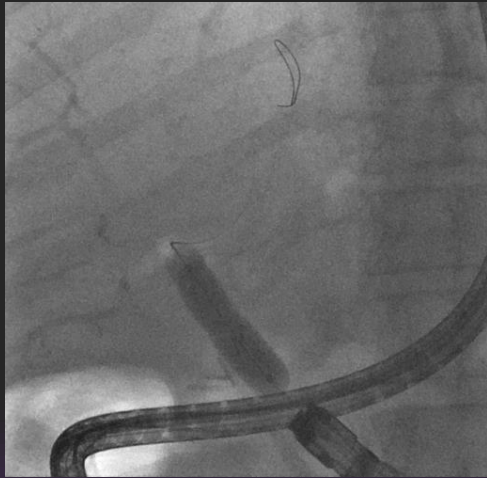
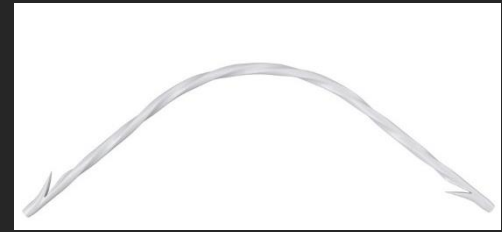
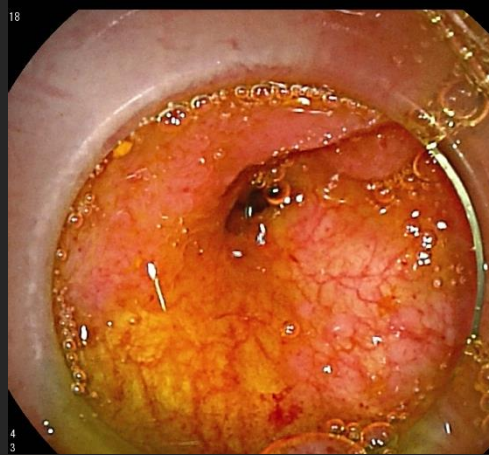
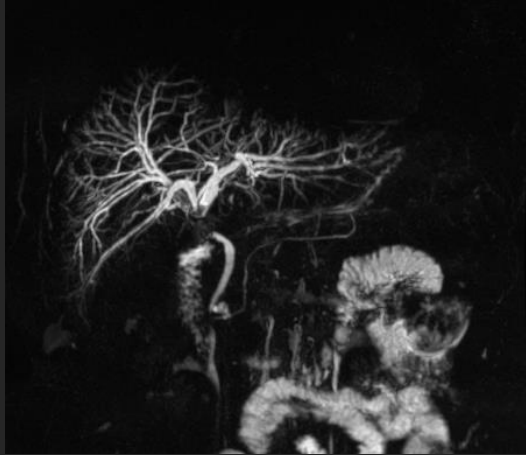


There may be complication





# Biodegradable stent



# Conclusion

- DB-ERCP is difficult many times. If you are planning to start this in your center, I recommend that you learn the procedure in some experienced center
- We still lack good devices and they are being developed quite slowly (covered metallic stent)
- When successful, it is very useful for the patient
- The 1st procedure with short enteroscope, 3,2mm
- The role of PTC in the future?
- Shift to treatment also malignancies

# Future ??

