ENDOSCOPIC TREATMENT OF HILAR STRICTURES

Leena Kylänpää
Gastrointestinal surgeon
Helsinki University hospital
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Hilar stricture: etiology

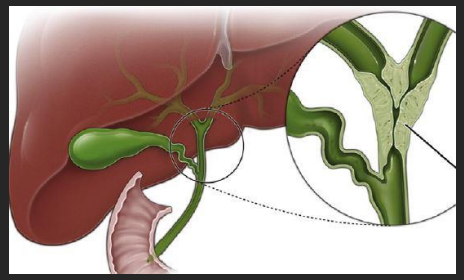
MALIGNANT

- Cholangiocarcinoma
- Local extension
  - Gallbladder CA
  - Pancreatic CA
  - HCC
- Lymphnode metastases
  - Breast
  - Colon
  - Stomach
  - Ovarian
  - Lymphoma
  - Melanoma

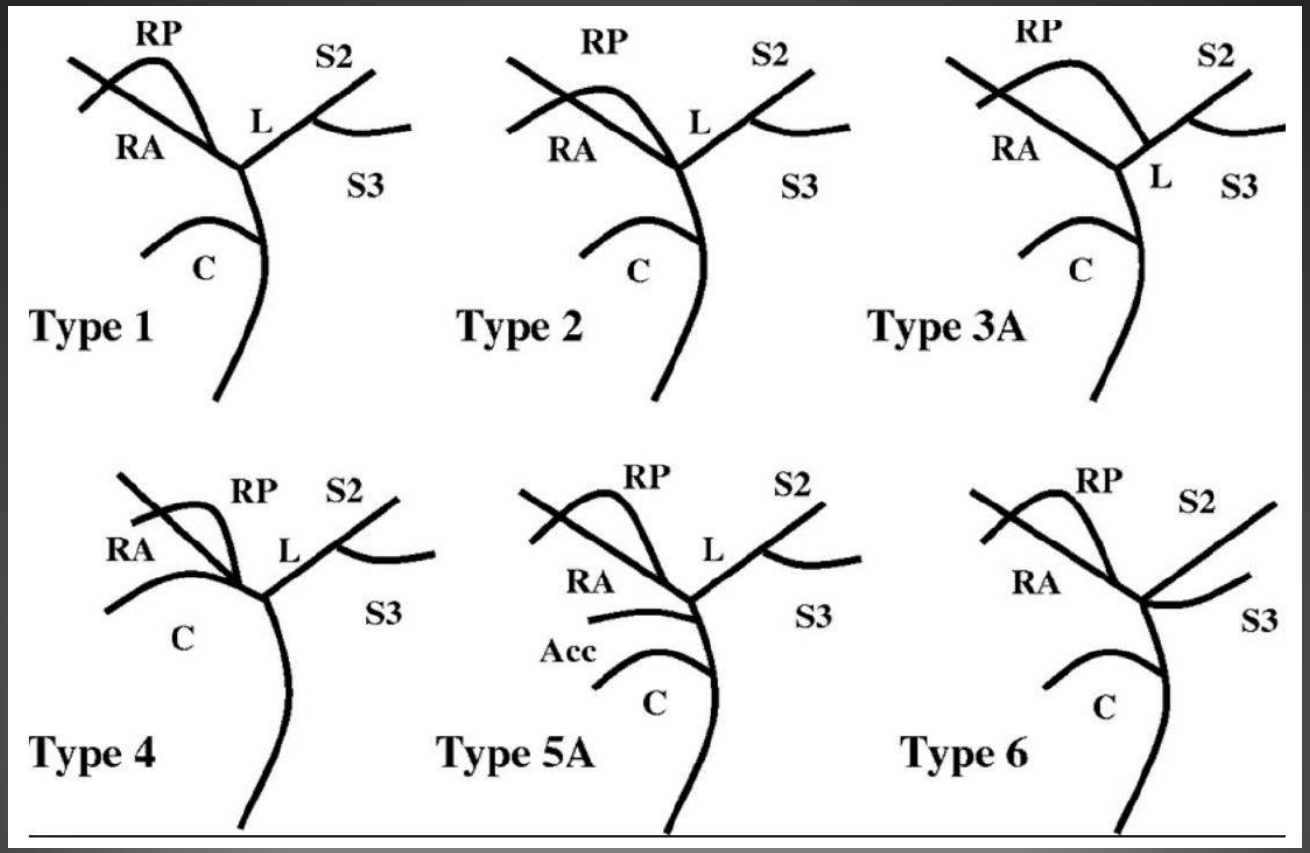
BENIGN

- Postoperative
- PSC
- Stone disease
- Autoimmune cholangiopathy
- Biliary portapathy
- Mirizzi's syndrome
- Other

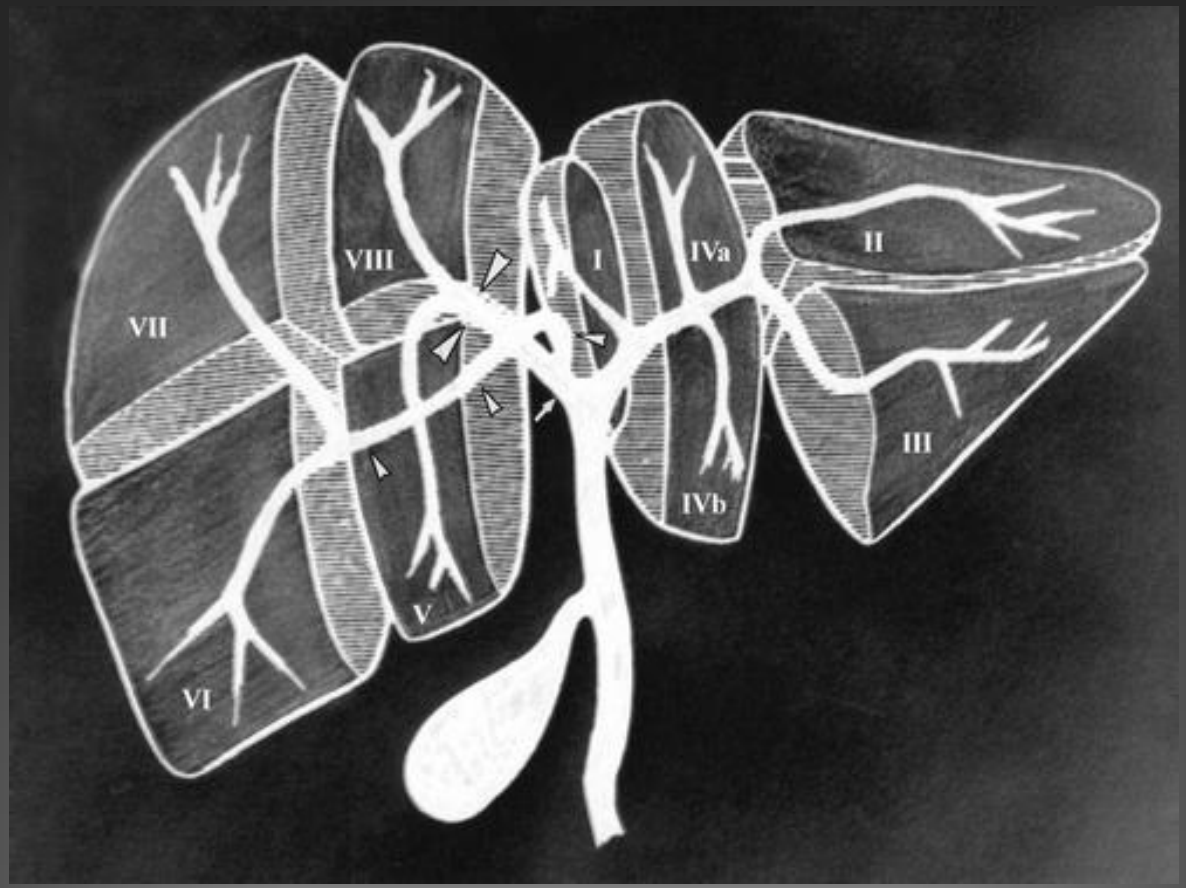
Hilar stricture



- Within 2cm of the hepatic bifurcation



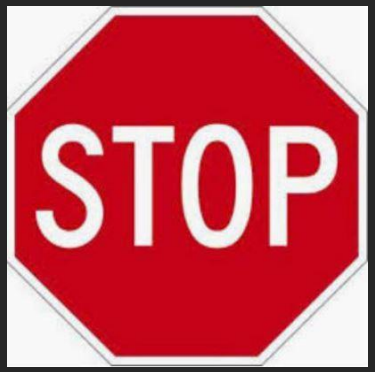
Understanding hilar antomy



Diagnostics I

- Symptoms and findings
  - Iching, jaundice, fever, pain
- Lab: CRP, liver enzymes, CEA, CA19-9, s-IgG4
- US, CT, MRCP, EUS
- Previous operations ?
  - Cholecystectomy, Altered anatomy, Liver resection, Liver transplantation

Diagnostics II



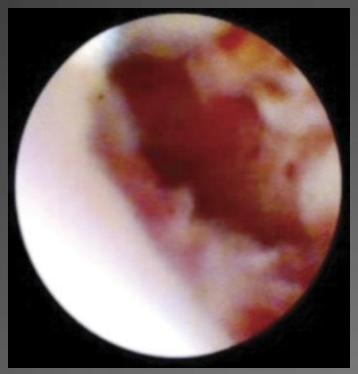
- Multidisciplinary team
- Is it malignant ?
- Is it resectable
  - Comorbidities
  - Vessels
  - Metastases
- Is drainage necessary at all before surgery ?
- If cytology / biopsy is needed, is ERCP the safest way? Or PTC? Or EUS

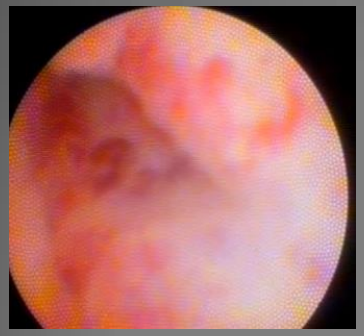
Diagnostics III

- ERCP
  - Cytology, flow cytometry
  - Cholangioscopy needed?
    - Biopsies, irrigation fluid – IgG4 staining
  - Papilla biopsy – IgG4 staining
  - Endobiliary biopsies

Cholangioscopy

- Visual impression
  - Tortuous vessels
  - Infiltrative stricture
  - Villous mass

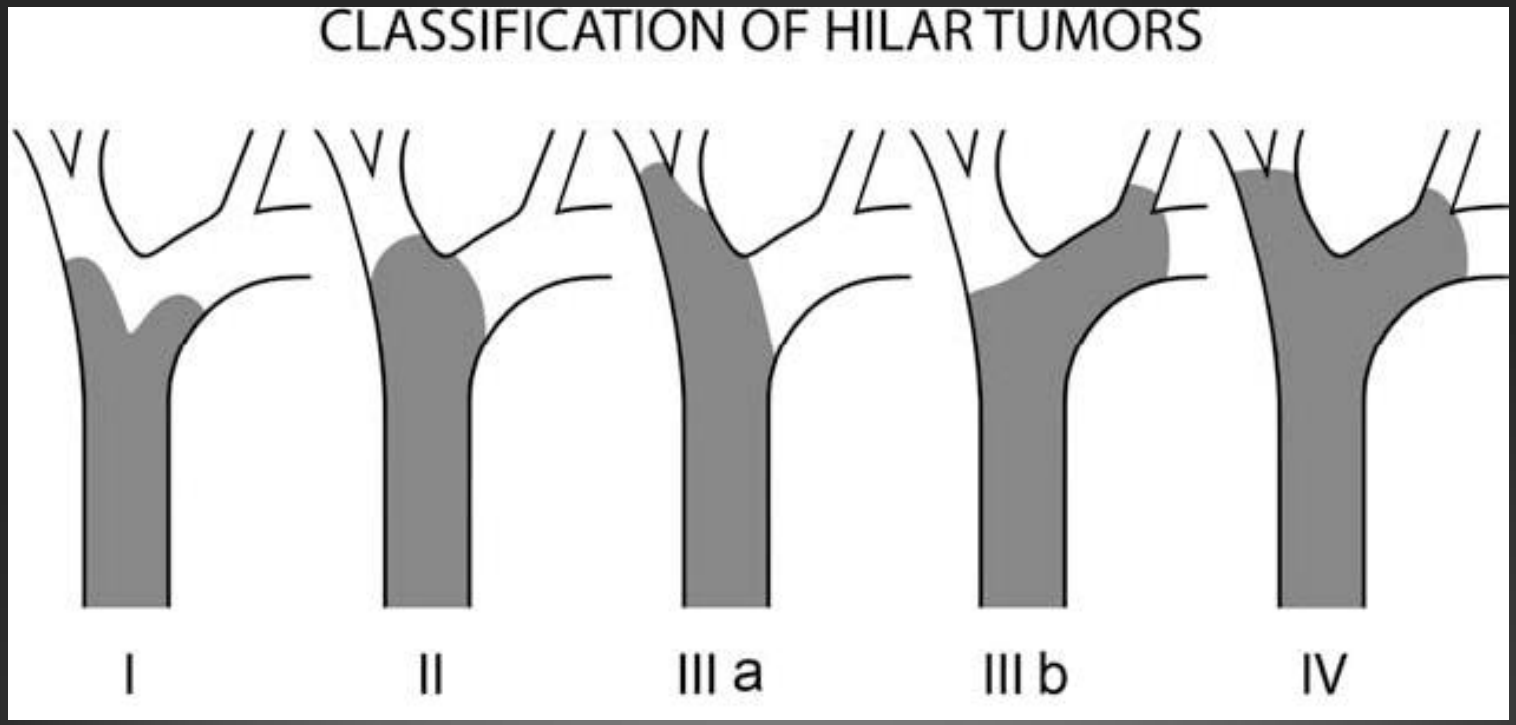




Endobiliary biopsies

- Biopsy forceps along wire
- Regular biopsy forceps
- Paediatric colonoscopy forceps
- Need a good sphincterotomy
- KEEP GUIDEWIRE IN to help freehand cannulation
- Pass a 10fr stent pusher into distal CBD to aid repeat cannulation with forceps

Bismuth classification



I	II	III a	III b	IV
Unilateral SEMS	Unilateral / Bilateral SEMS	Unilateral SEMS or PTC		PTC / nothing

Management questions

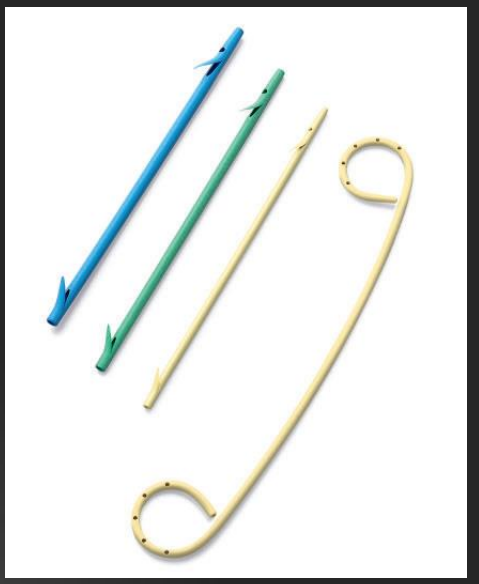
- Drainage vs no drainage
- Endoscopic vs PTC
- Unilateral vs (Bi)lateral
- Plastic vs metal
- Stent configurations
- Transpapillary vs intraductal
- Role of palliative therapies
- Future areas of study

Multidisciplinary approach

Plastic stents

Tannenbaum

J-type

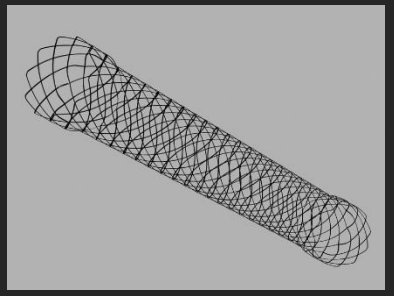


Straight Pigtail

- Pros:
  - Cheap
  - Easy to remove
  - Forgiving
- Cons:
  - Obstruction, must be changed ~ 3 months
  - In theory, 7 plastic stents are equal to 1 10mm wide metal stent
  - Slower initial resolution of jaundice

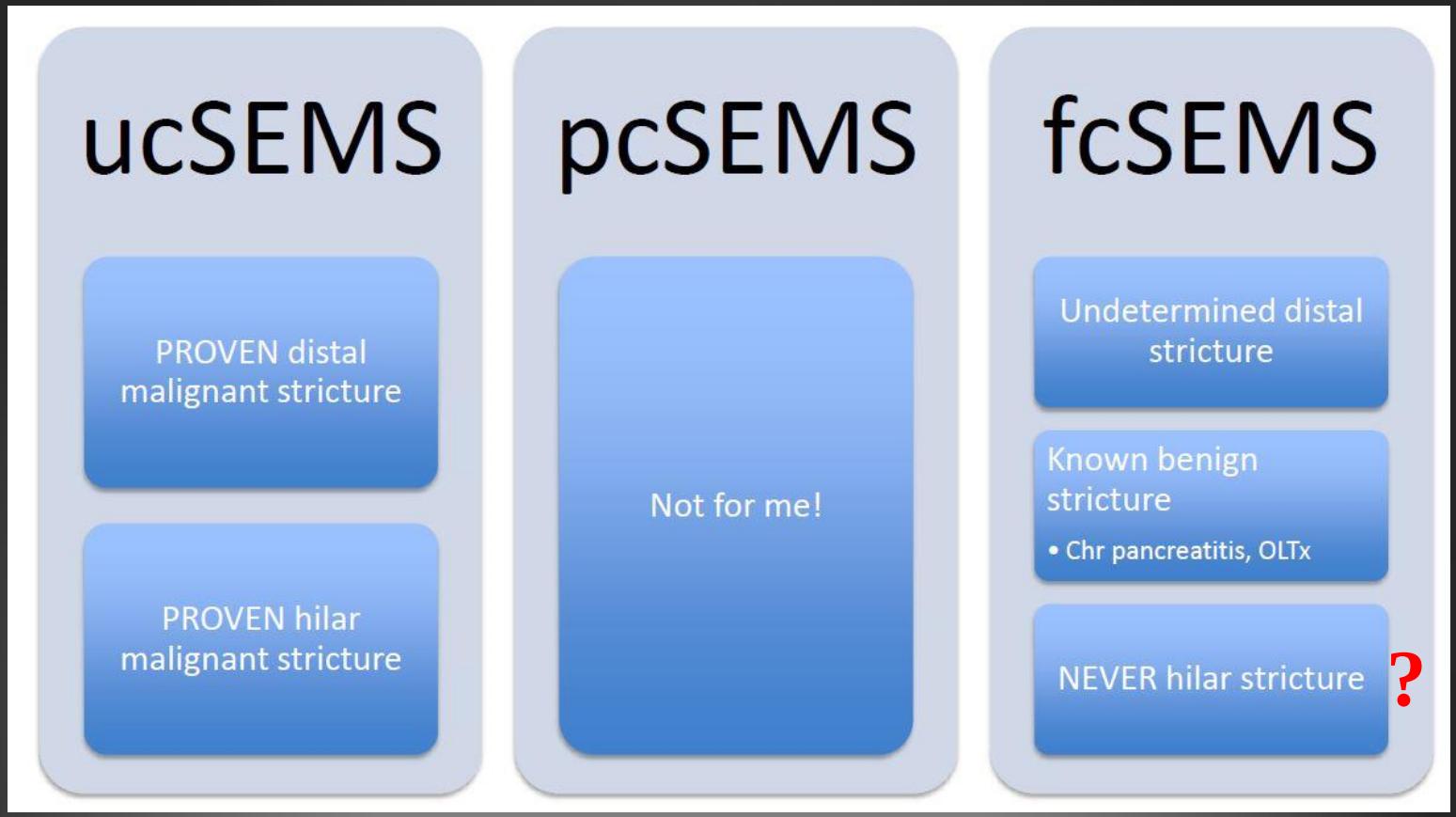
Metal stents

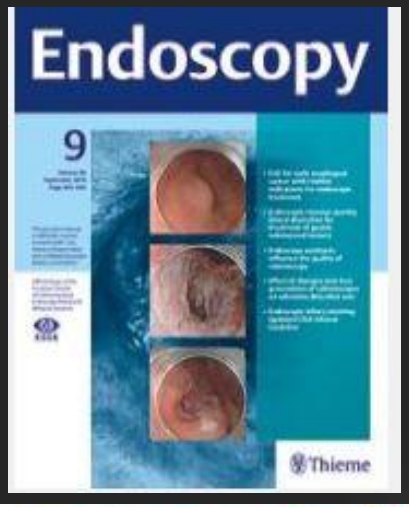
covered, uncovered, partially covered



- Pros
  - Rapid resolution of jaundice / sepsis
  - Covered stents usually removable < 6 months
  - Long duration of efficacy
- Cons
  - Cost
  - Covered: Migration, the longer, the better
  - **UNFORGIVING if uncovered**
    - Hilar disease, nonmalignant diagnosis
  - Complications
    - Pancreatitis / cholecystitis/ impaction / ingrowth / overgrowth

Metal stent


ucSEMS
PROVEN distal malignant stricture
PROVEN hilar malignant stricture
pcSEMS
Not for me!
fcSEMS
Undetermined distal stricture
Known benign stricture
• Chr pancreatitis, OLTx
NEVER hilar stricture
?



Endoscopic biliary stenting ESGE guideline

Endoscopy 2018; 50: 910–930

Endoscopic biliary stenting: indications, choice of stents, and results: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline – Updated October 2017

Jean-Marc Dumonceau[1], Andrea Tringali[2], Ioannis S. Papanikolaou[3], Daniel Blero[4], Benedetto Mangiavillano[5], Arthur Schmidt[6], Geoffroy Vanbiervliet[7], Guido Costamagna[8], Jacques Devière[9], Jesús García-Cano[10], Tibor Gyökeres[11], Cesare Hassan[12], Frédéric Prat[13], Peter D. Siersema[14], Jeanin E. van Hooft[15]

RECOMMENDATION

ESGE suggests assessing the resectability of malignant hilar strictures in the absence of biliary stents. Weak recommendation, low quality evidence.

Proximal biliary obstruction if you do ERCP..

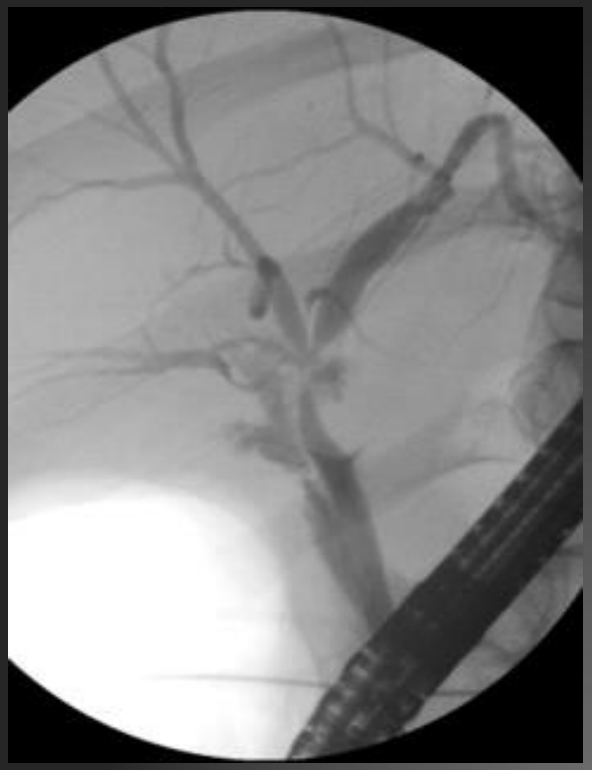
- Be sure about target
  - One side may be atrophied / subsegmental obstructed
  - Drain remnant liver if surgery planned
  - Aim for >50% liver drainage

- ucSEMS ONLY IF PALLIATIVE and PROVEN CA
  - Never use fully covered across hilum ???

- Contrast only in segments you will drain
- Always use antibiotics
- Should be high volume units / endoscopists

Postoperative stricture / fcSEMS

Poley, Gastrointest Endosc 2011



Duration 5 months, LCC injury

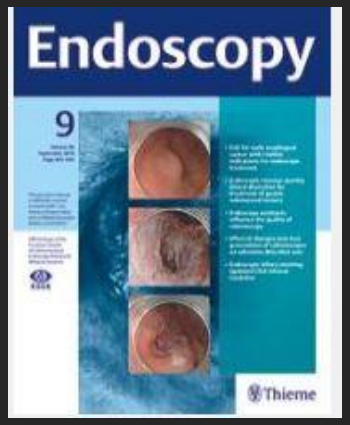
”Postcholecystectomy stricture

- Cholecystectomy 9/2018
- Injury to the right hepatic branch

Resectable Hilar strictures Drainage vs No Drainage

- Meta-analysis
  - No benefit to pre-op drainage
  - Increase in post-op AE's, infectious complications
- Drainage indicated if:
  - Acute cholangitis
  - Neo-adjuvant therapy planned
  - Hyperbilirubinemia contributing to co-morbidities
  - Delayed surgery

Liu, Dig Disc Sci 2011
Mansour, HPB 2015



Endoscopic biliary stenting ESGE guideline

Endoscopy 2018; 50: 910–930

RECOMMENDATION

ESGE suggests against routine preoperative biliary drainage in patients with malignant hilar obstruction. The indication and route for preoperative biliary drainage should be decided by a multidisciplinary team based on patient characteristics and institutional experience.

Weak recommendation, low quality evidence.

RECOMMENDATION

ESGE recommends performing drainage of malignant hilar strictures in high volume centers with a multidisciplinary hepatobiliary team.

Strong recommendation, moderate quality evidence.

Resectable Perihilar CCA
ERCP vs PTC

- Meta-analysis of 275pts (ERCP) vs 158 (PTC)
  - Lower rate of complications, 30d morbidity, conversion to other procedure in PTC group *Al Mahjoub, J Vasc Interv Radiol 2017*

- RCT of ERCP (n=27) vs PTC (n=27)
  - Higher overall mortality in PTC group (11/27, RR 3.67) causing study to terminate early *Coelen, RJS Lanc Gastroenterol Hepat 2018*

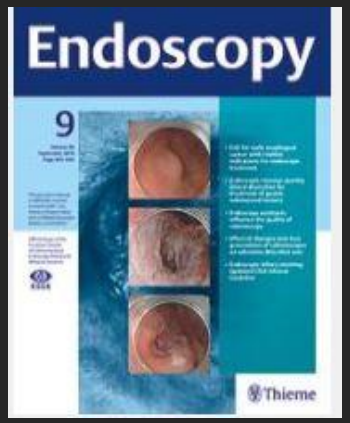
- PTC demonstrated increased risk for tumor dissemination at 2 and 5 years (29% vs 12%; 36% vs 15%)
  - No difference in cholangitis, mortality

Higuchi, J Gastrointest Surg 2017

ERCP favored vs PTC

- High technical and clinical success rates
- High safety
- Tissue sampling easier
- Cholangioscopy possible
- Avoidance of external tubes
- Gastroenterologists and GastroSurgeons manage the patients

Take home:
Determine expertise at center



Endoscopic biliary stenting ESGE guideline Palliative drainage

Endoscopy 2018; 50: 910–930

RECOMMENDATION

ESGE suggests, for palliative endoscopic drainage of Bismuth types II – IV strictures, drainage of ≥ 50 % of the liver volume and avoidance of the opacification of biliary ducts that will not be drained.

Weak recommendation, low quality evidence.

RECOMMENDATION

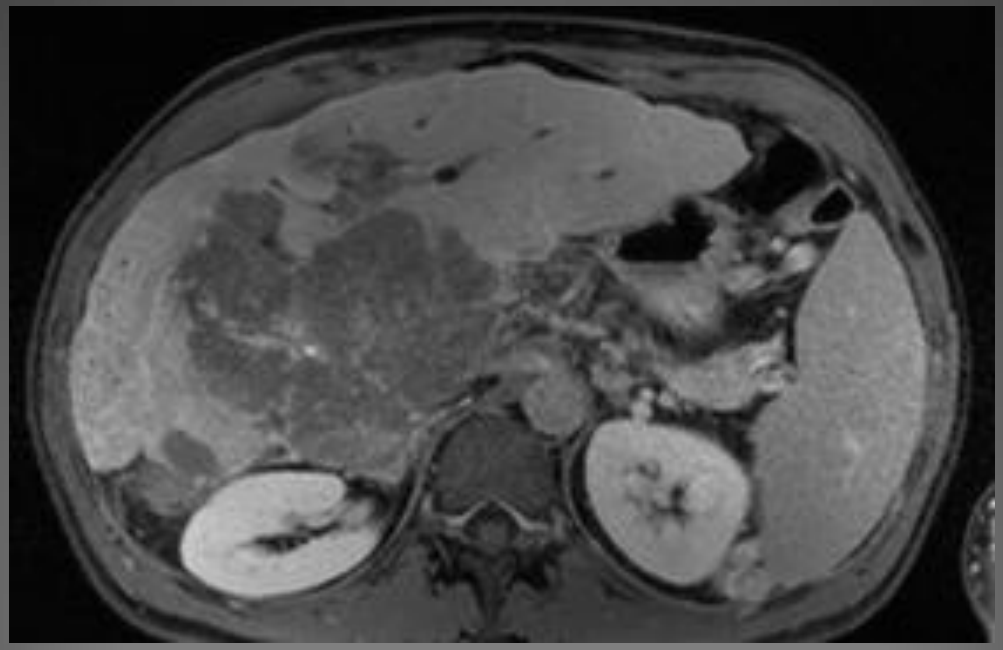
ESGE recommends uncovered SEMSs for palliative drainage of malignant hilar obstruction.

Strong recommendation, moderate quality evidence.

Plastic versus metal

- Malignancy **must be sure** for metal stent

- Own patient: Male with sclerosing cholangitis
- Multidisciplinary consensus (Liver surgeon, radiologist, ERCP doctor): Inoperable cancer: Metal stent



- Lymphoma, in remission after cytostats
- 9 x ERCP performed
- 1 open operation
- 2 x PTC

- Liver transplantation finally..

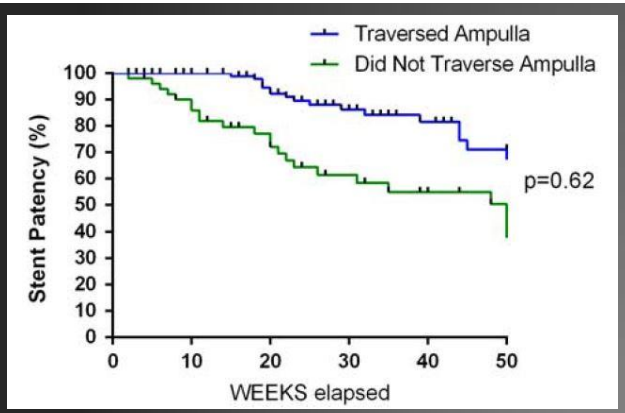
Tips Tricks: Stent length

- Measure with wire or dilator
- Don’t worry about cystic duct
- Stay close to papilla as stent exists scope
  - Avoid pushing down and displacing wire
- Choose stent that is stiff enough
- Choose stent that is easy to deploy
  - Even some metallic stents are hard to deploy
- Get the proximal end right, distal end less critical
- Keep the wire in until you are happy

SEMS above or below the papilla ?

- Retrospective study SEMS placed for hilar malignancy
- 52 pts *above* papilla vs 120 pts *below* papilla

	Group A (n = 52)	Group B (n = 120)	P
Immediate complications [no. patients (%)]	1 (1.92)	14 (11.7)	0.041
Perforation	1 (1.92)	2 (1.67)	
Migration	0	0	
Bleeding	0	2 (1.67)	
Pancreatitis	0	9 (7.50)	0.059
Cholangitis	0	1 (0.83)	
Stent occlusion (patient percentage)	50	45	0.61
Mean stent patency (wk ± SEM)	32.89 ± 3.63	29.6 ± 1.75	0.3
Median stent patency (wk)	25.5	22.5	0.47
Median survival (wk)	26	29	0.49



No significant difference in patency

- When stent is released transpapillary, it facilitates future reinterventions

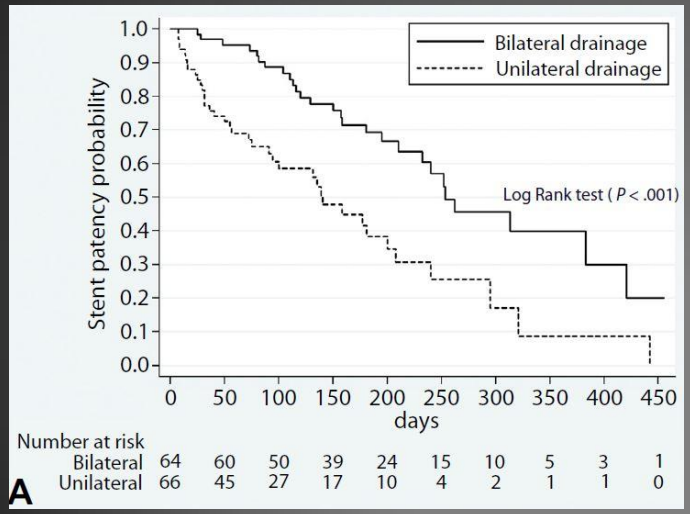
Cosgrove, J Clin Gastroenterol 2017

Bilateral vs Unilateral SEMS

Lee et al GIE 2017

- Bilateral n=67, Unilateral n = 66, prospective randomized

	Bilateral	Unilateral	P value
Tech success	95.5%	100%	0.244
Clinical success	95.3%	84.9%	0.047
Re-intervention	42.6%	60.3%	0.049



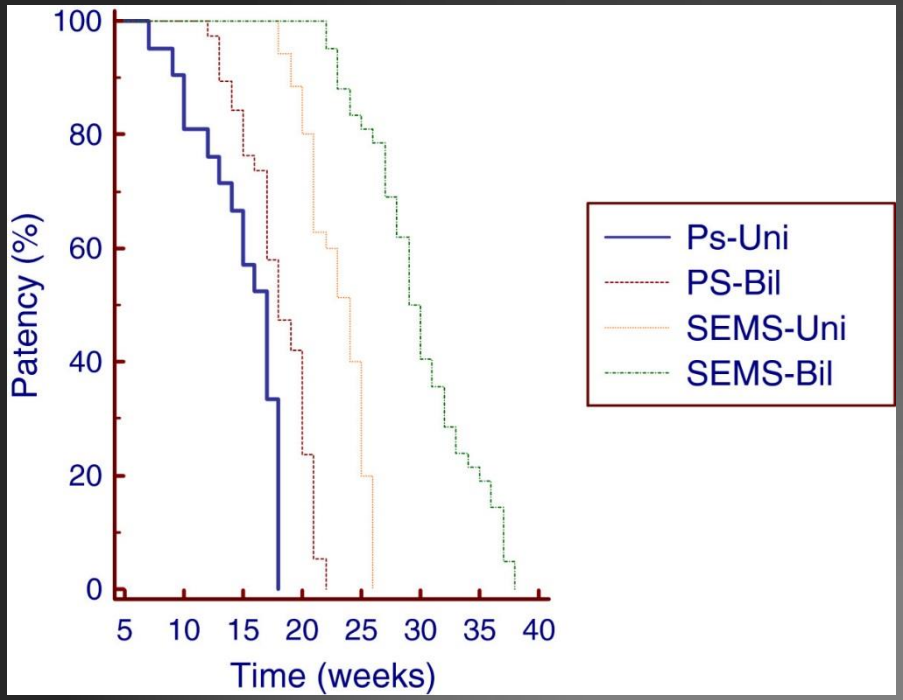
Bilateral stents more durable stent patency
HR 0.30, p < 0.001

No difference in survival probability, late AEs

Cholangiocarsinoma

Liberato et al BMC Gastroenterol 2012

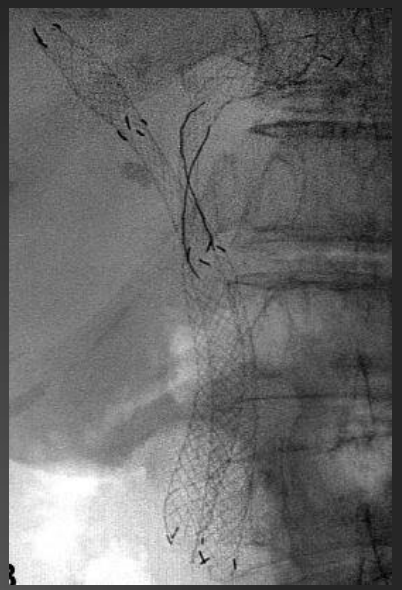
- In Lissabon 450 patients 1995-2010



- Ps = plastic
- SEMS = metal

Stent-in-stent vs Stent-by-Stent

- Prospective trial of patients with malignant hilar stricture
  - SIS (n=34) vs SBS (n=35)
- No differrence in success
  - Technical (100% vs 91%)
  - Clinical (94% vs 91%)
- No difference in adverse events
- Stent patency rate at 3 months higher in SIS group but not significant ($p<0.059$)



Lee, GIE 2019

Tip Tricks: Sequential Bilateral stenting

- Use long wire (or long and short)
  - Mechanical advantage
- Get both guidewires in place
  - Sometimes hydrofilic angled wire needed – then change
  - Experienced assistant if possible
- Consider dilatation (4 or 6mm)
- Deploy more difficult stent first
  - Usually left due to angle
- If metal – leave across papilla

Contents lists available at ScienceDirect

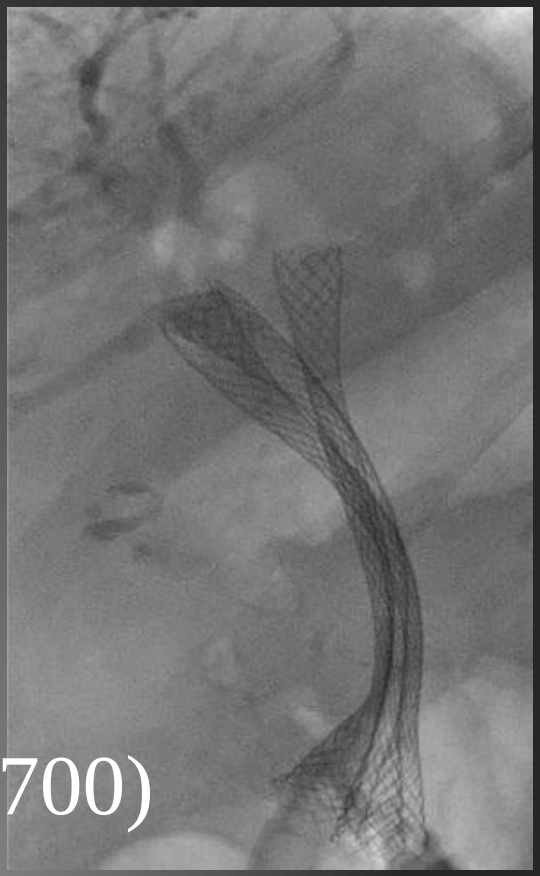
Digestive and Liver Disease

journal homepage: www.elsevier.com/locate/dld

A 17 years retrospective study on multiple metal stents for complex malignant hilar biliary strictures: Survival, stents patency and outcomes of re-interventions for occluded metal stents

Ivo Boškoski[a,b,*], Andrea Tringali[a,b], Pietro Familiari[a,b], Vincenzo Bove[a,b], Rosario Landi[a,b], Fabia Attili[a,b], Vincenzo Perri[a,b], Graziano Onder[a], Massimiliano Mutignani[c], Guido Costamagna[a,b]

- 17 years experience
- 134 / 740 (18%), got ≥ 2 SEMS
- Bismuth I excluded
- AE rate 7.5%
- Reinterventions 41%
- Mean survival 323 days (range 27-1700)

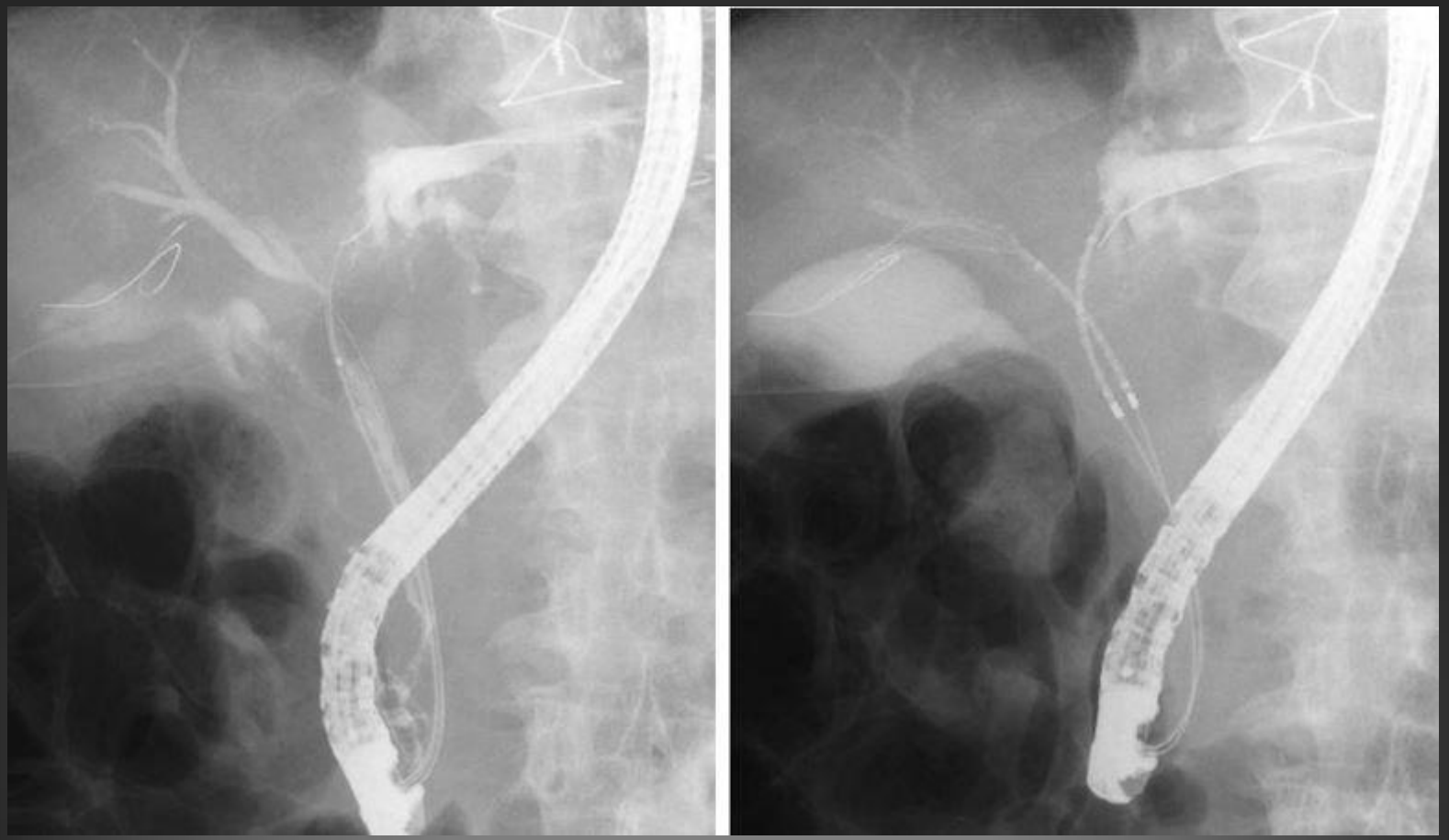


Sequential Hilar metal stenting

- If the 2nd SEMS cannot be placed, the procedure cannot be reattempted, because the first-placed SEMS can never be removed

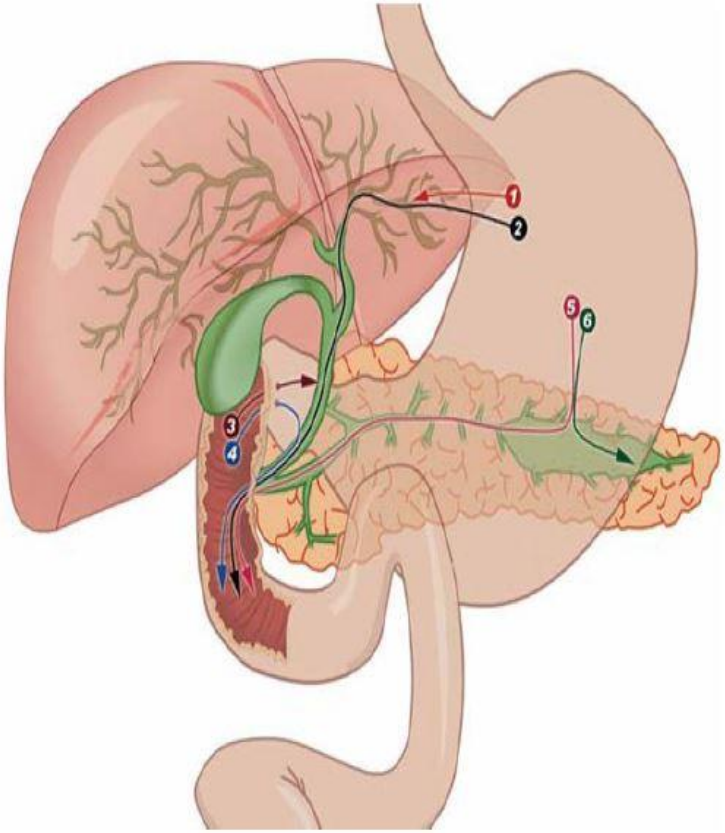
  → PTC may be required

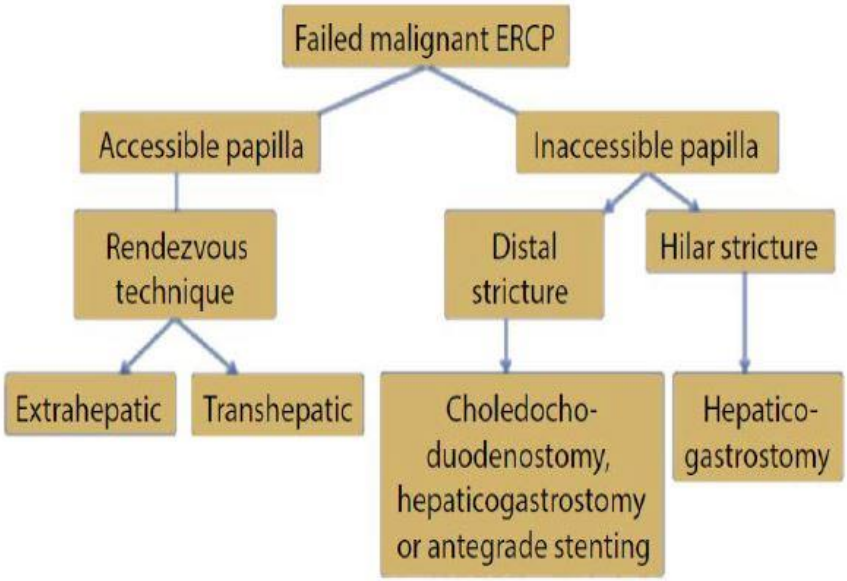
Parallel/ Simultaneous Hilar metal stenting



Inoue, Dig Dis Sci 2017

Drainage alternatives to ERCP





Strategy, malignant hilar stricture

Resectable ?

Multidisciplinary approach
Pre-op drainage?

Palliation: treating cholestatic symptoms and minimizing AE's

Goals: >50% Drainage
? Ablation therapy

Selective drainage

PTC

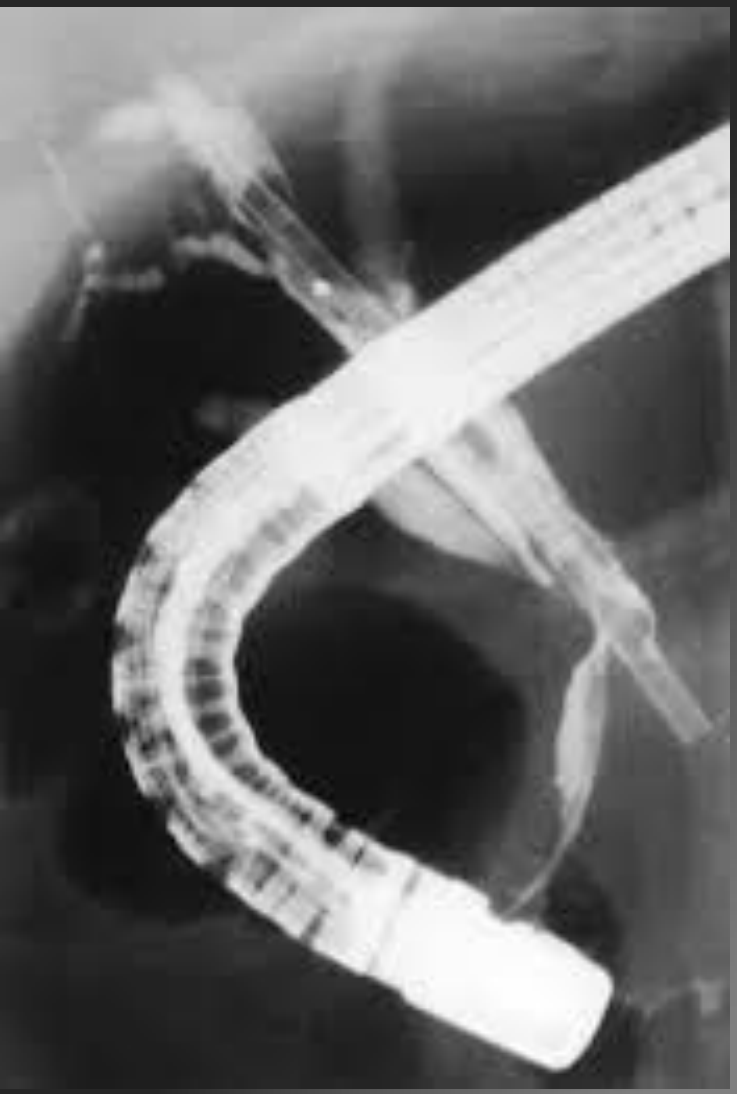
ERCP

Metal stents
- Pre-procedural mapping

Plastic stents
Repeat sessions

Unilateral vs Multilateral

Proximally Migrated Stents



- Open sphincter
  - Sphincteroplasty?
- Wire past stent
  - Traction large balloon alongside or above
- Wire through stent
  - 4mm dilatation balloon within stent (10fr)
  - Soehendra for plastic
- Cannulate with grabbers/snare/basket
- Cholangioscopy (2mm working channel)