

Cholangioscopy

ERCP

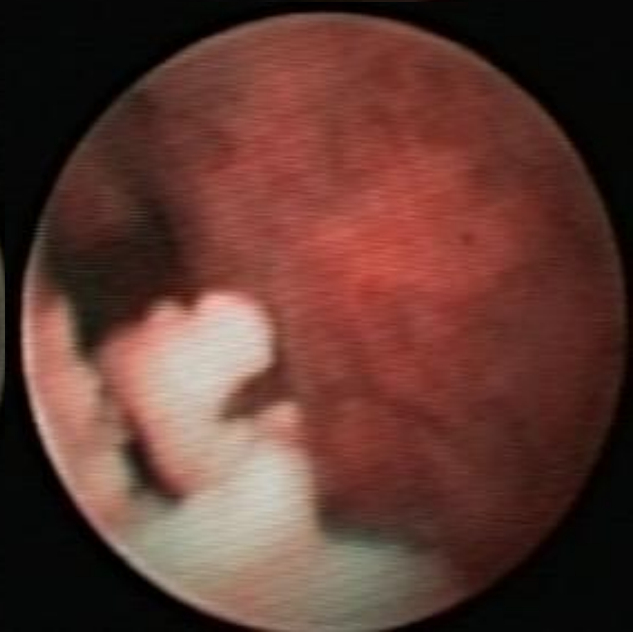
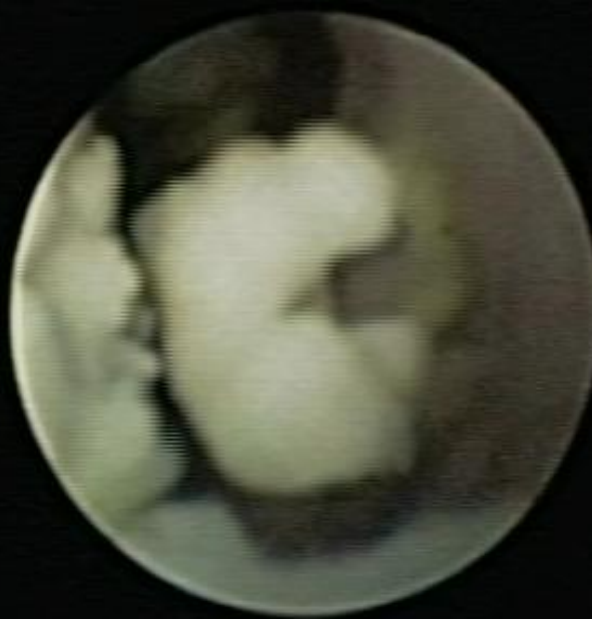
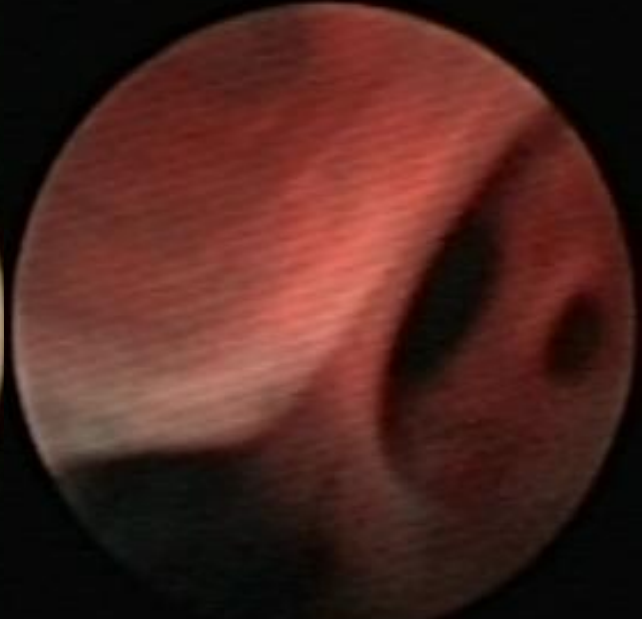
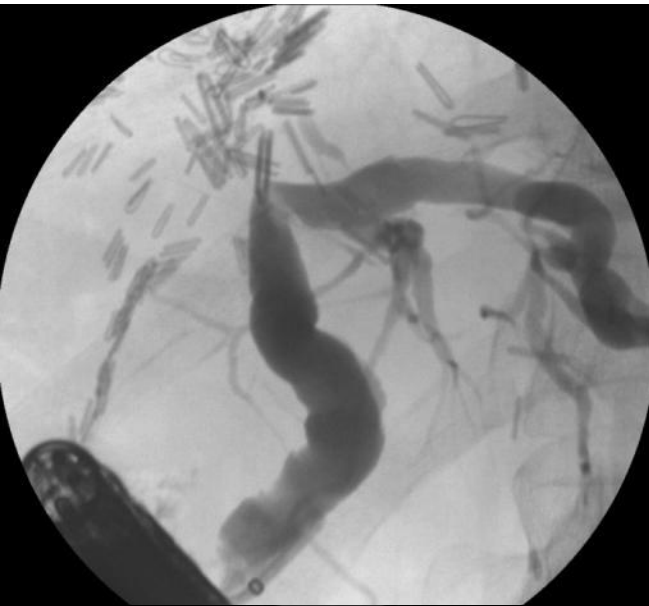
Cliniques universitaires Saint-Luc, Brussels, Belgium | Tom MOREELS
Place, Date

Olympus does not assume any liability for the completeness, accuracy and up-to-dateness of the information provided by the speaker. Liability claims against Olympus related to damages of a material or non-material nature which have been caused due to the use or non-use of the information provided by the speaker or due to the use of incorrect an/or incomplete information are strictly excluded.

This presentation created by Tom Moreels including its content are protected by copyright. You are not authorized to duplicate, distribute, reproduce or process, to make it publicly accessible or to perform this presentation or its contents without prior written consent of the owner of contents.

Agenda

1. Cholangioscopy.
2. History of cholangioscopy.
3. Technical aspects.
4. Indications.
5. Safety.
6. How do I do it ?
7. Conclusions.

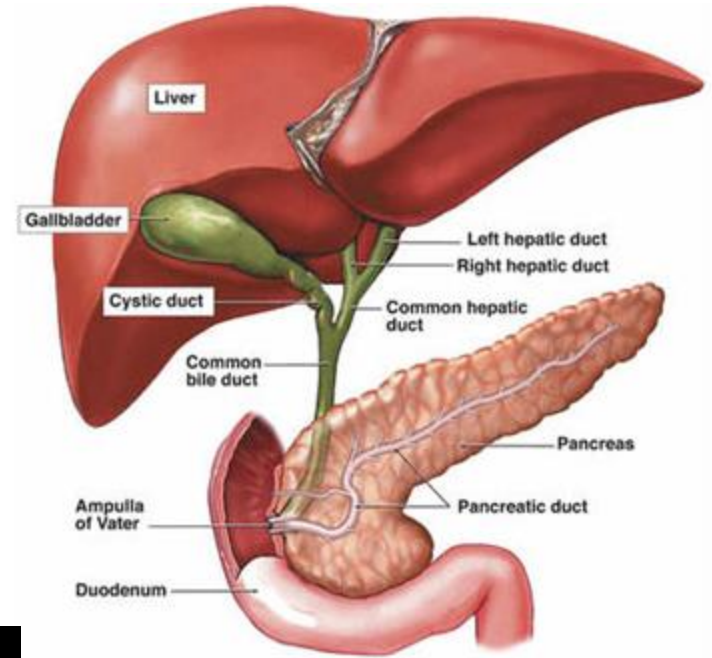
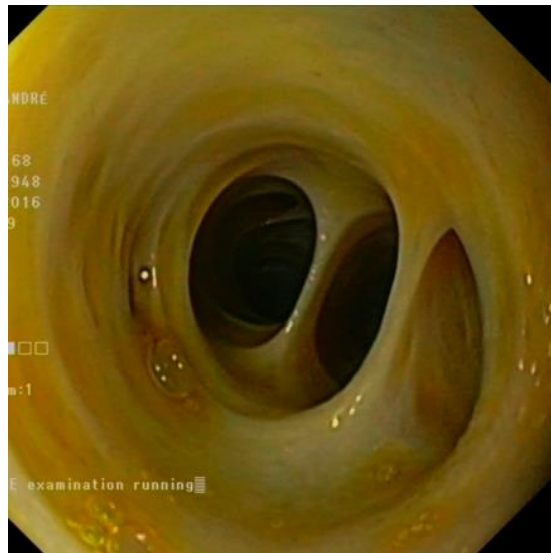
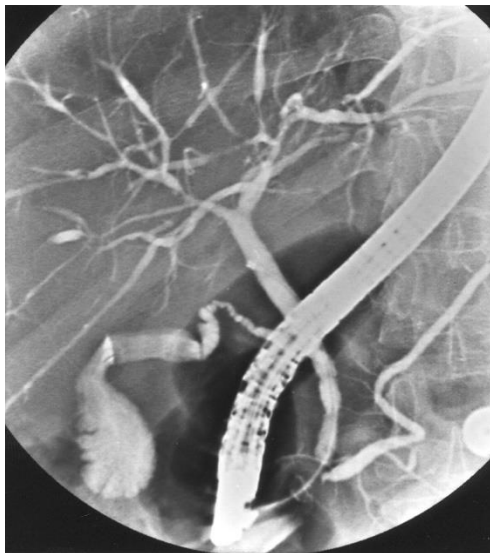


Cholangioscopy

Direct endoscopic visualization of the bile ducts

Cholangiography: radiological visualization

Cholangioscopy: endoscopic visualization



History of cholangioscopy

REPORTS ON NEW INSTRUMENTS AND NEW METHODS

Endoscopy 8 (1976) 172-175
© Georg Thieme Verlag, Stuttgart

Peroral Cholangioscopy

W. Rösch, H. Koch, L. Demling

Department of Internal Medicine, University of Erlangen-Nuremberg

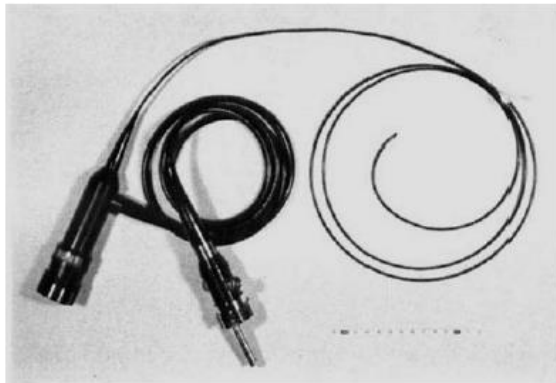


Fig. 1 a



Fig. 1 b

Fig. 1 a + b a) Side-Viewing endoscope (Motherscope) and End-Viewing cholangioscope (Babyscope). b) Babyscope advanced through the instrumentation channel of the motherscope.

History of cholangioscopy

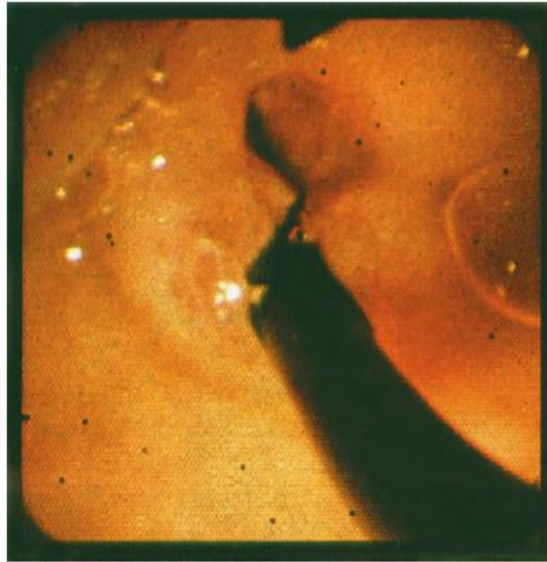


Fig. 2 Babyscope introduced into the common bile duct following endoscopic papillotomy.

Figs 2, 4, 5 and 7 were made with Olympus-Instruments.



Fig. 3 Babyscope advanced into the hepatic ductal system.

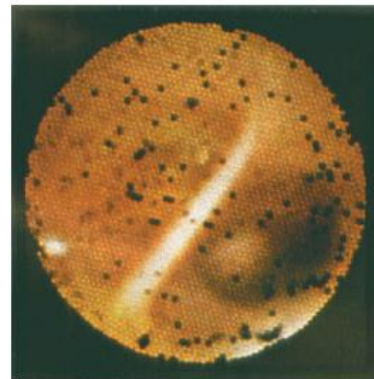


Fig. 4 View of a normal choledochus.

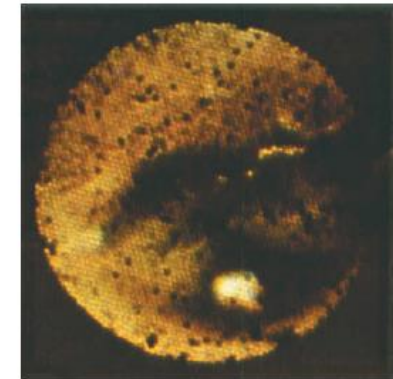


Fig. 5 Large concrement in the common bile duct.

History of cholangioscopy

Peroral Direct Cholangioscopy (PDCS) Using Routine Straight-view Endoscope

First Report

Y. Urakami, E. Seifert, H. Butke

Dept. of Gastroenterology Reinhard-Nieter-Krankenhaus Wilhelmshaven, W.-Germany

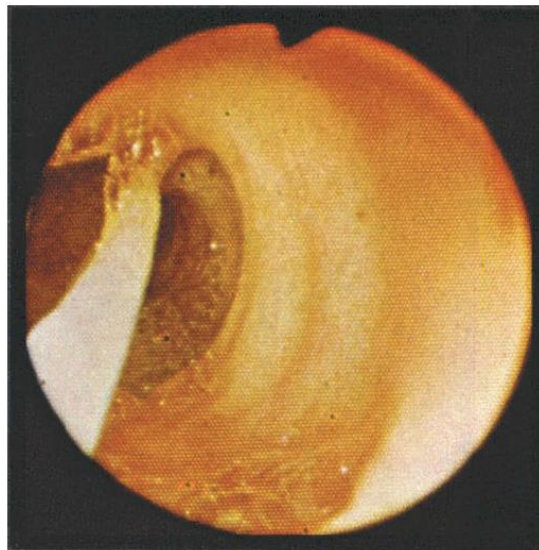
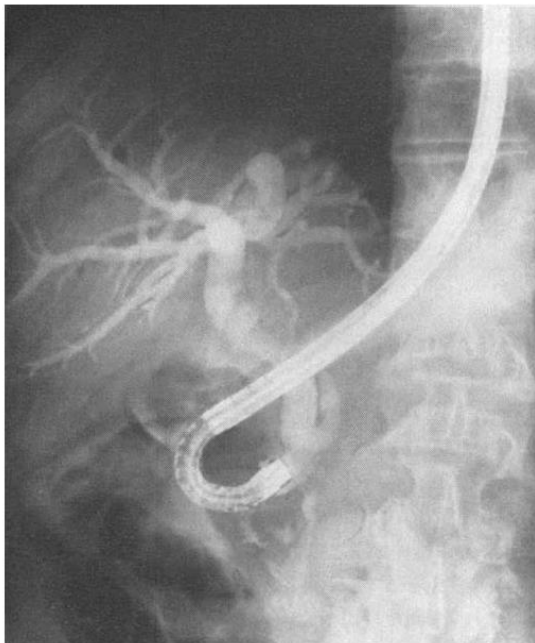


Fig. 8 PDCS gives a good survey of the entire common bile duct.

Technical aspects

■ Access Routes

- Percutaneous transhepatic cholangioscopy (PTCS)
- Peroral transpapillary cholangioscopy (POCS)

Direct vs indirect peroral cholangioscopy

■ Cholangioscopy Types

➤ POCS

Indirect: Mother-baby endoscopes (dual operator)

Single-use cholangioscopy (single operator SOCS)

Direct: Ultrathin upper GI endoscope

Single-Balloon Enteroscope (altered anatomy)

■ Imaging

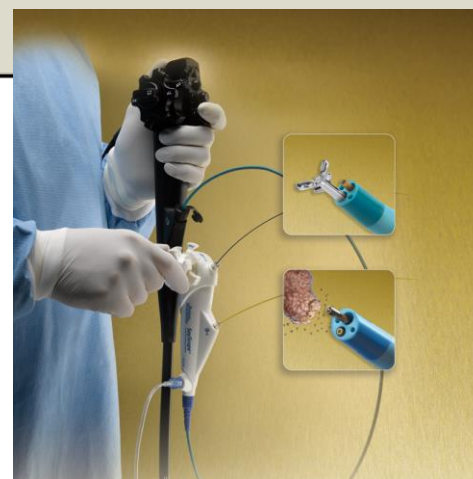
- Fiberoptic or Digital Video (Chip-based)



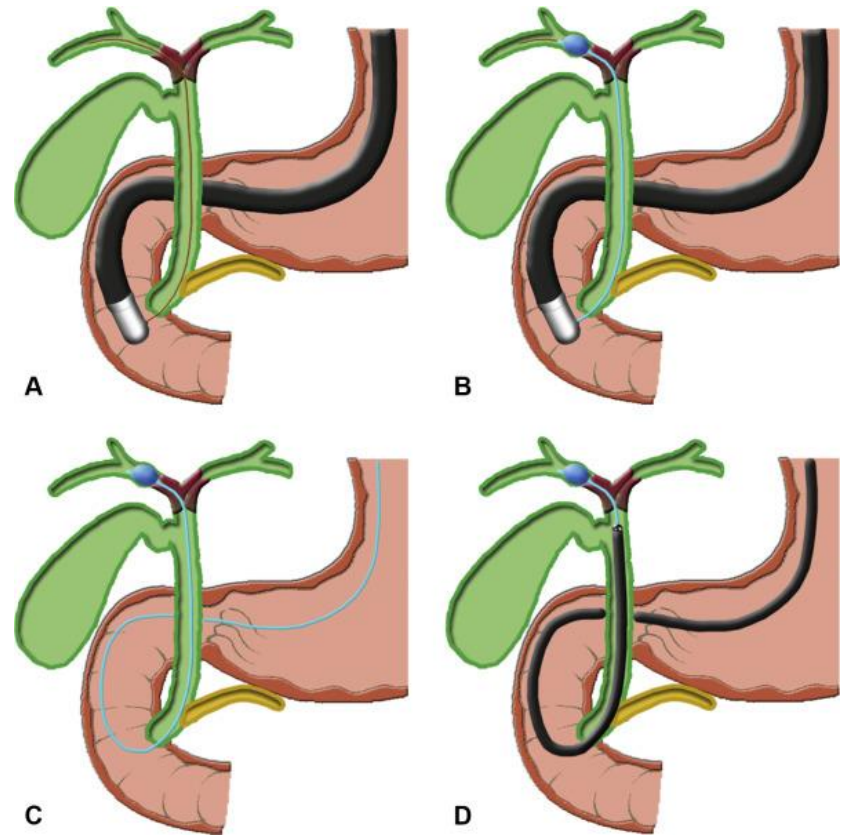
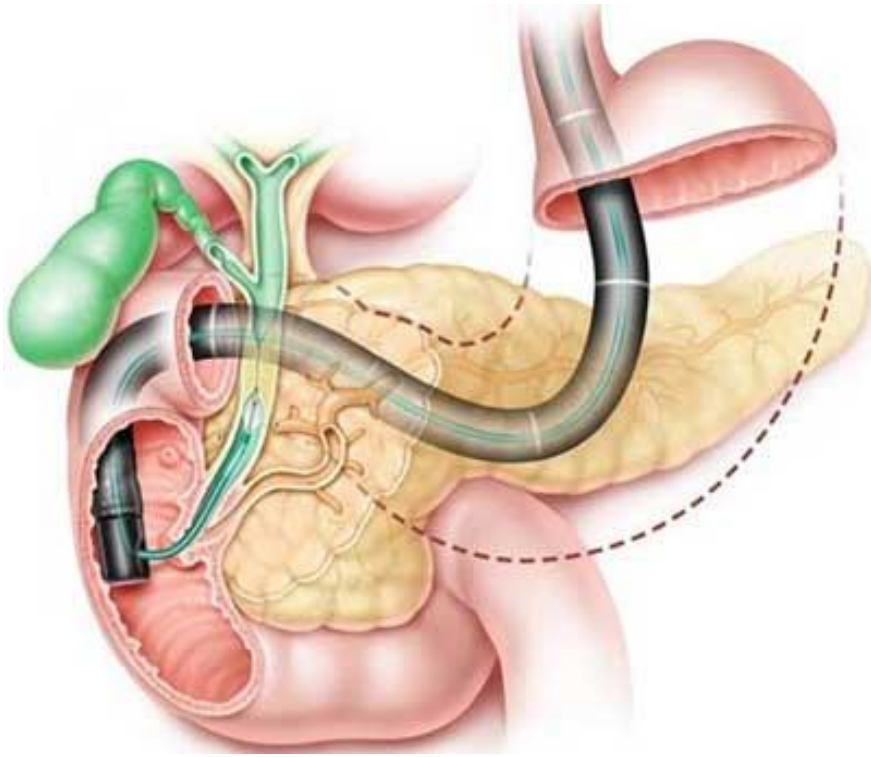
Technical aspects

TABLE 1. Cholangioscopy systems

Company	Model	Distal diameter, mm	Accessory channel, mm	Depth of field, mm	Per-oral	Working length, mm
Pentax	FCP-9P	3.1	1.2	1-50	Yes	1900
	FCN-15X	4.8	2.2	3-50	No	350
Olympus	CHF-BP30	3.1	1.2	1-50	Yes	1870
	CHF-CB30L/S	2.7	1.2	2.5-50	No	700 or 450
Boston Scientific	SpyGlass analog probe (reuse)	0.77	.9 optic channel	2-7		3000
	SpyGlass catheter (analog, single use)	3.4	1.2/0.6/0.6		Yes	2200
	SpyScope DS	3.5	1.2		Yes	2140



Technical aspects



Indications

Diagnostic applications		Therapeutic applications	
Common	Uncommon	Common	Uncommon
Indeterminate biliary strictures	Biliary cyst evaluation	Lithotripsy for choledocholithiasis	Biliary guidewire placement
Verification of bile duct stone clearance	Bile duct ischemia evaluation (post-liver-transplant)		Transpapillary gallbladder drainage
Staging of cholangiocarcinoma	Ductal involvement in ampullary adenoma		Foreign body removal (e.g., stent)
Intraductal US	Hemobilia	Intraductal photodynamic therapy	

Indications

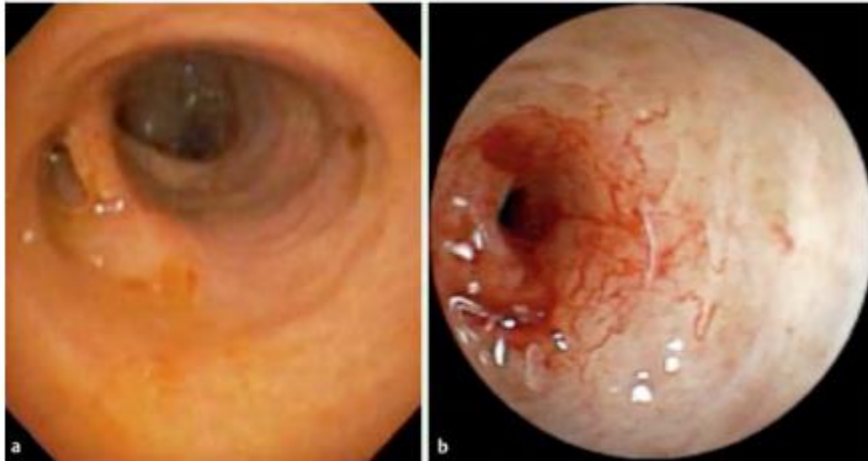


Fig. 3 Direct cholangioscopy. **a** Normal common bile duct with the cystic duct orifice. **b** Biliary stricture due to a desmoplastic cholangiocellular carcinoma with neovascularization.

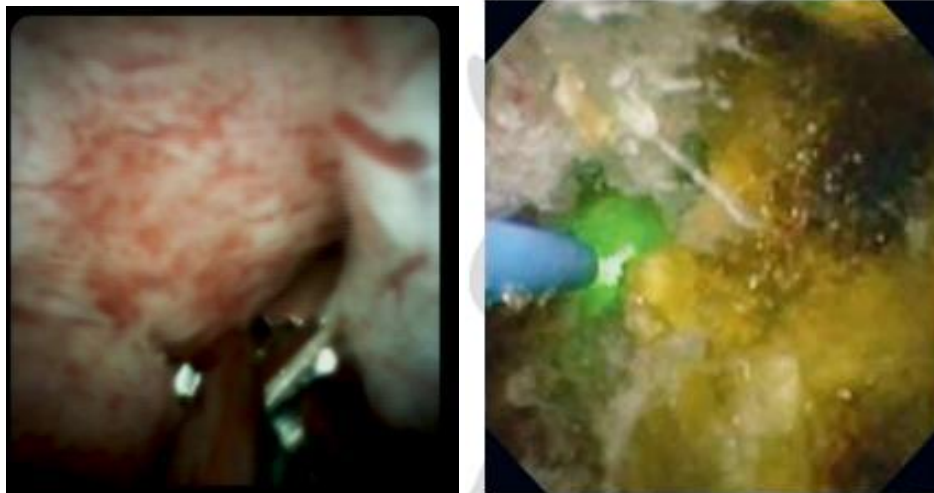


Fig. 1 "Mother-baby" dual-operator video cholangioscopy. Laser fragmentation of a common bile duct stone.

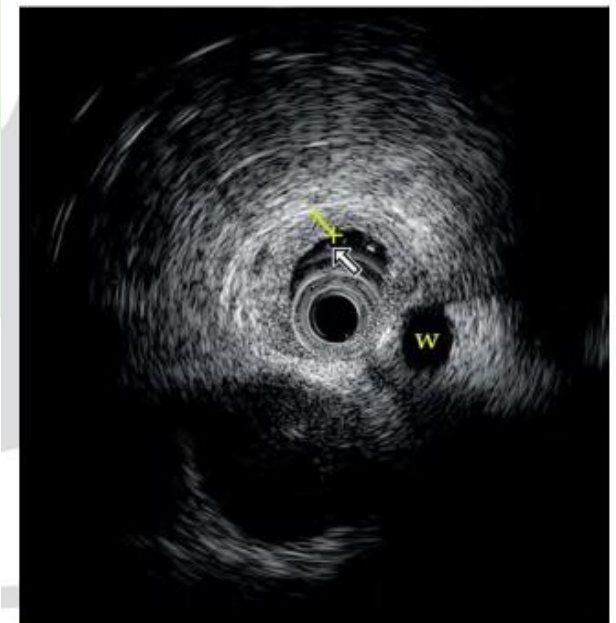


Fig. 5 Intraductal ultrasound. The 20-MHz miniprobe shows a diffuse thickening of the common bile duct (arrow) secondary to cholangiocarcinoma (infiltrating type). W, duct of Wirsung.

Indications

Intraductal biliopancreatic imaging: European Society of Gastrointestinal Endoscopy (ESGE) technology review



Authors

Andrea Tringali¹, Arnaud Lemmers², Volker Meves³, Grisca Terheggen⁴, Jürgen Pohl³, Guido Manfredi⁵, Michael Häfner⁶, Guido Costamagna¹, Jacques Devière², Horst Neuhaus⁴, Fabrice Caillol⁷, Marc Giovannini⁷, Cesare Hassan⁸, Jean-Marc Dumonceau⁹



STATUS EVALUATION REPORT



Cholangiopancreatography



Prepared by: ASGE TECHNOLOGY COMMITTEE

Sri Komanduri, MD, Nirav Thosani, MD, Barham K. Abu Dayyeh, MD, MPH, Harry R. Aslanian, MD, FASGE, Brintha K. Enestvedt, MD, MBA, Michael Manfredi, MD, John T. Maple, DO, FASGE, Udayakumar Navaneethan, MD, Rahul Pannala, MD, MPH, Mansour A. Parsi, MD, FASGE, Zachary L. Smith, DO, Shelby A. Sullivan, MD, Subhas Banerjee, MD, FASGE, Chair

Indications

General problems in creating scientific evidence for cholangioscopy

- No defined standards regarding procedure
 - (➔Reproducibility between centres limited)
- Cholangioscopy is an expert procedure
 - (➔Trial results do not necessarily translate into daily practice)
- Imaging findings have to be translated by the endoscopist
 - (➔Based on impressions, not on measurements)
- Scientific gold standard (RCTs) for many questions not feasible
- Key figures can hardly be regarded separate from cholangiography (+ other modalities)
 - (➔Sensitivity and specificity calculation may be biased)

Indications: indeterminate strictures



malignant



postoperative



inflammatory

Boston
Scientific



Indications: indeterminate strictures

- Benign

- Post-operative: cholecystectomy; partial liver resection; liver transplantation
- Post-traumatic
- Ischemic: secondary sclerosing cholangitis
- Inflammatory:
 - primary sclerosing cholangitis
 - autoimmune cholangiopathy
 - vasculitis
- Infectious
 - recurrent cholangitis
 - abscesses
 - HIV-cholangiopathy

Indications: indeterminate strictures

- Malignant
 - Cholangiocarcinoma
 - Hepatocellular carcinoma
 - Malignant compression by lymphnodes

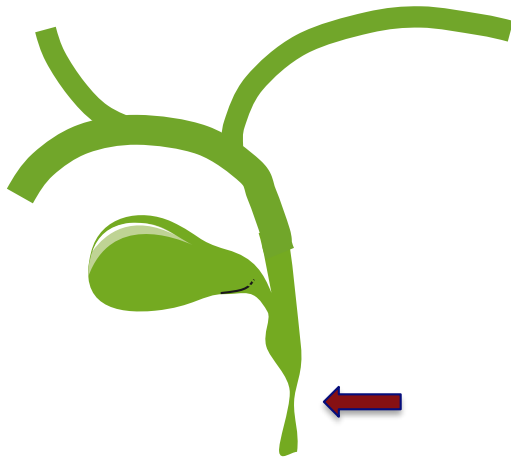
Cholangioscopy: guidewire cannulation + biopsy

Indications: indeterminate strictures

Idiopathic	Secondary
Primary biliary cholangitis	Ischemic (post liver transplantation)
Primary sclerosing cholangitis	Infectious cholangiopathy
Overlap syndroms	AIDS cholangiopathy
IgG4 cholangitis	Drug-induced
Idiopathic adulthood ductopenia	Iatrogenic injury (surgery)
Biliary atresia	Graft-vs-host disease involving the liver
Congenital	Eosinophilic cholangitis
Ductal plate malformations (Caroli disease, congenital cysts, polycystic liver disease)	Choledocolithiasis
Cystic fibrosis	Portal cavernoma cholangiopathy
Malignant	Ischemic (sickle cell disease)
Cholangiocarcinoma	

Indications: indeterminate strictures

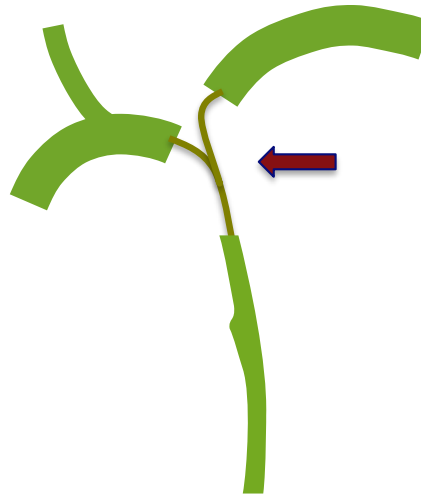
Stricture morphology (MRCP/ERCP)



Adenoma

Cholangiocellular carcinoma

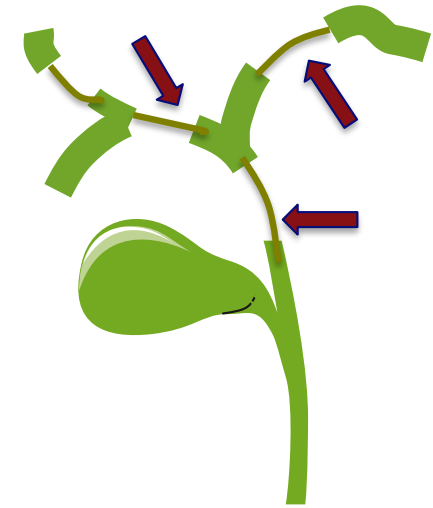
Chronic pancreatitis



Cholangiocellular carcinoma

Autoimmune cholangitis

Postoperative stricture



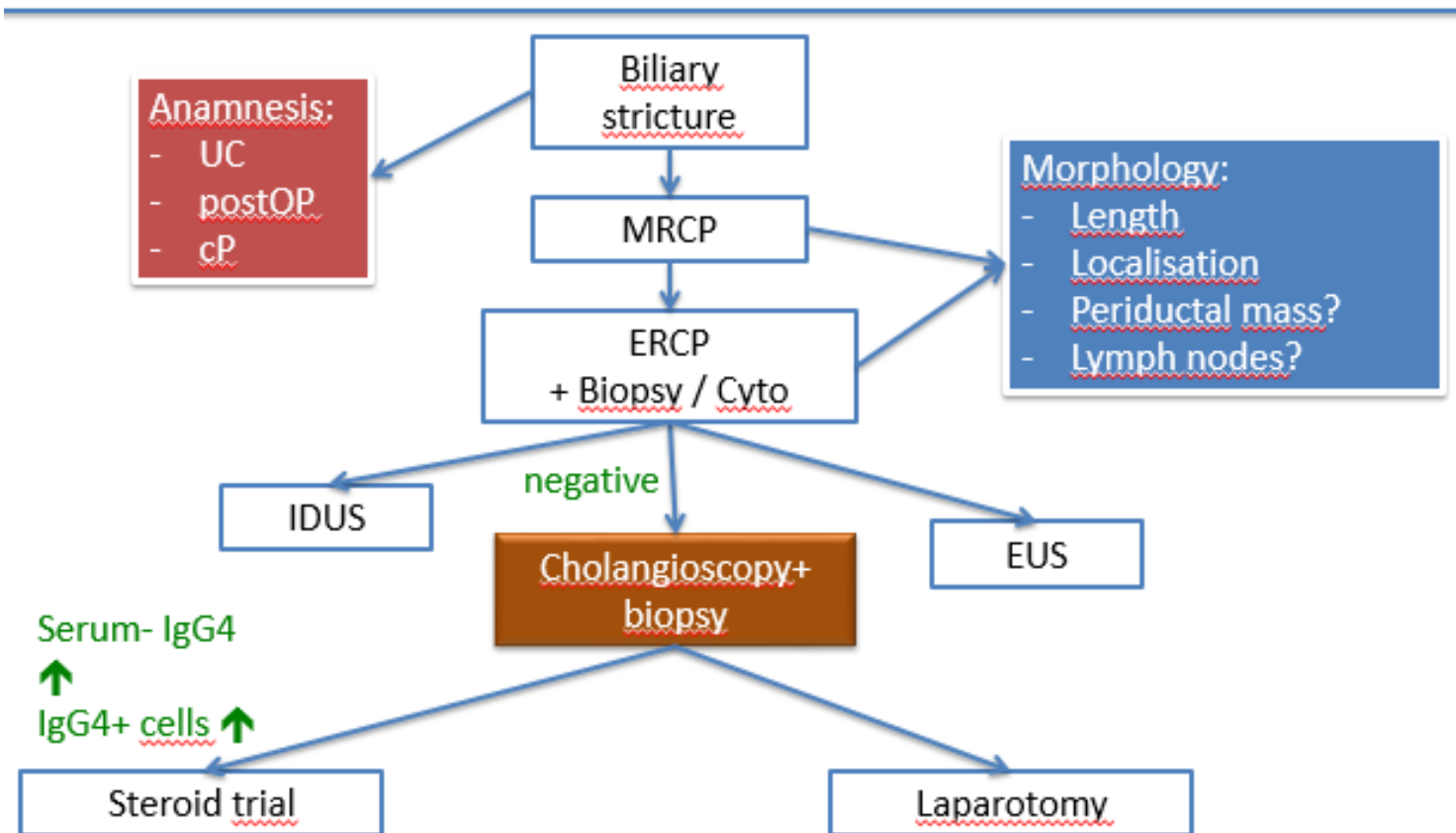
PSC / SSC

Autoimmune cholangitis

Post-transplant strictures

Indications: indeterminate strictures

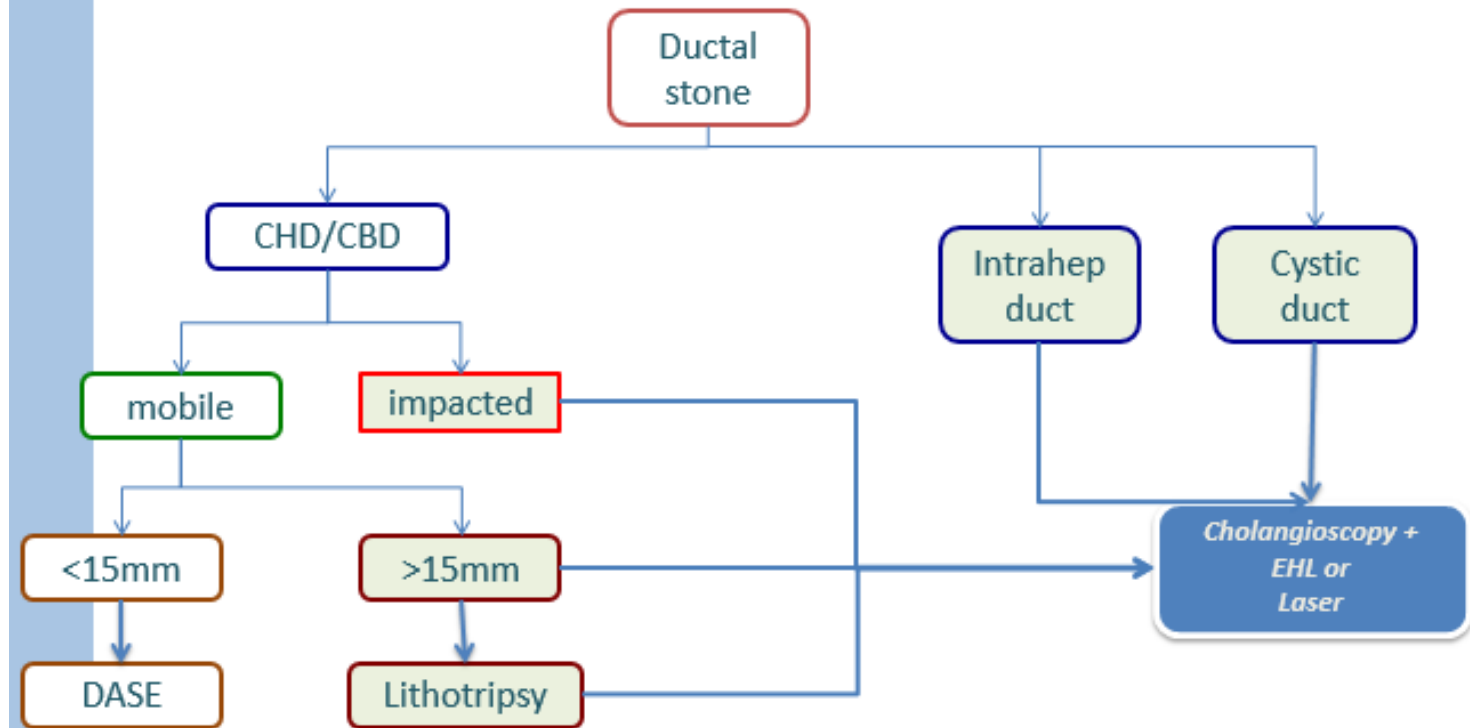
Differential Diagnosis of Biliary Strictures

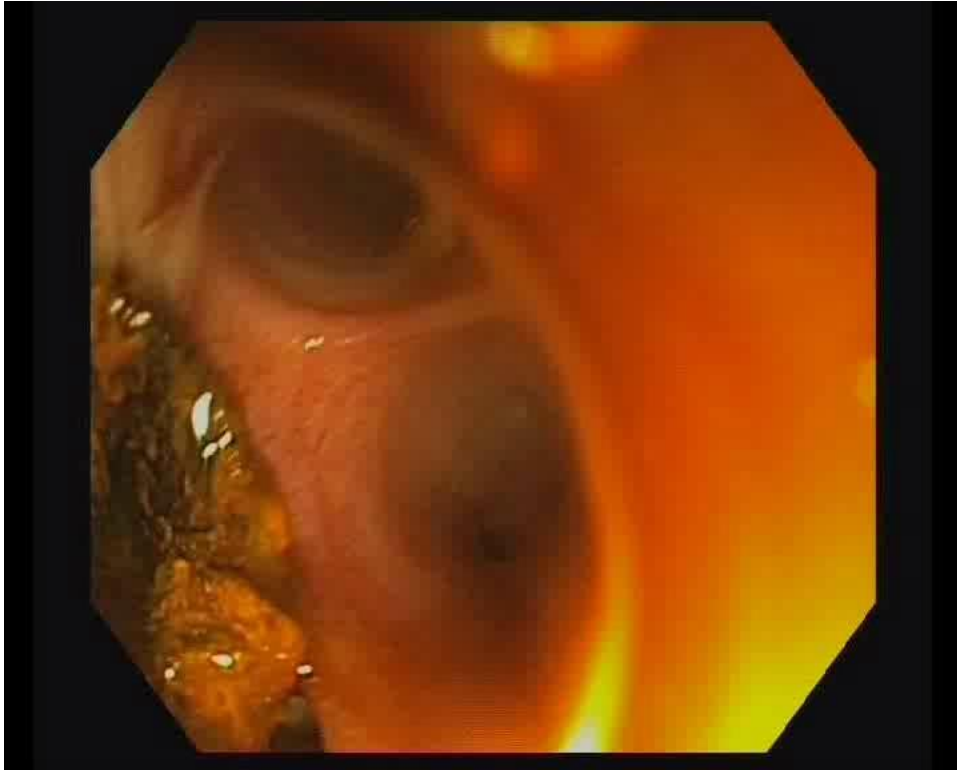


Indications: complex biliary stones

Management of complex stones

90% of biliary stones can be removed with standard lithotripsy methods





Safety

Overall rates of adverse events are higher with POCS than ERCP alone (7% vs 2.9%)

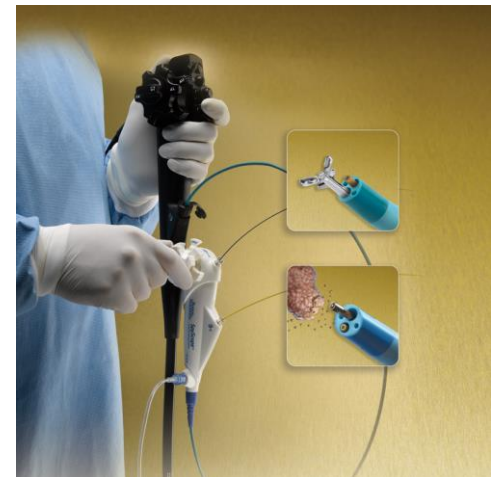
Most serious adverse events of POCs are air embolism and bile duct perforation

- In efforts to prevent air embolism, CO₂, or water and/or saline solution insufflation is recommended when direct cholangioscopy is performed
- POCS with and without intraductal lithotripsy has been associated with:
 - cholangitis rates of 0% to 14%
 - hemobilia rates of 0% to 3%
 - bile leak rate of 1% (attributable to intraductal lithotripsy)

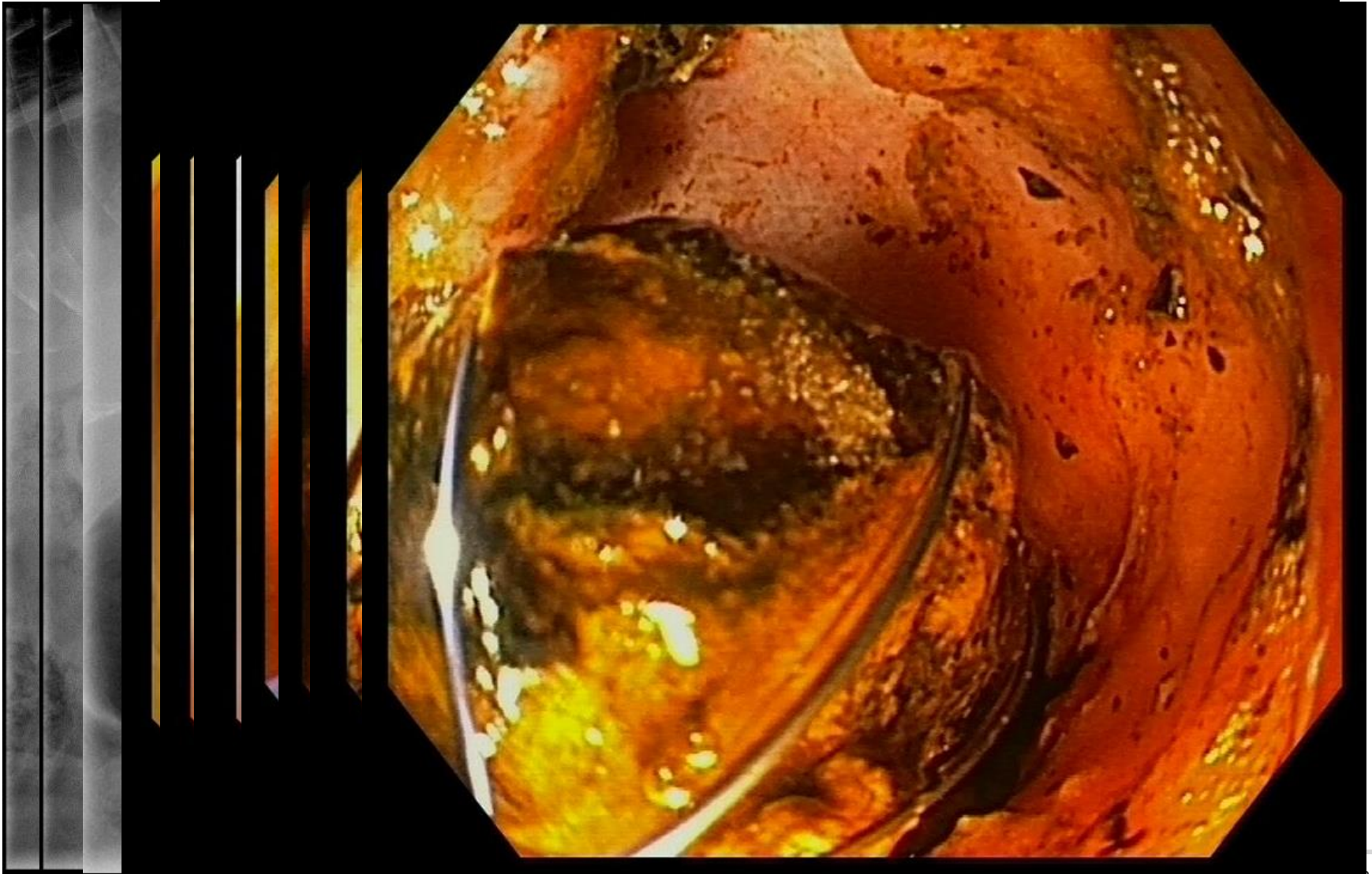


How do I do it ?

1. CO₂ insufflation
2. Conventional ERCP with large size sphincterotomy
3. Insertion of cholangioscope over the guidewire
4. Single-operator vs dual-operator
5. Waterjet + aspiration
6. Also feasible in the pancreatic duct (pancreatoscopy)
7. Also feasible in patients with altered anatomy (direct POCs using SBE)



How do I do it ?



Conclusions

1. Cholangioscopy is opening up the biliary tree to endoscopic access / therapy
2. Undetermined biliary strictures and difficult biliary stones
3. Many other useful indications (also pancreas)
4. Single-operator vs dual-operator
5. Cholangioscopy is still under evolution (improvement is needed)
6. Add-on to MRCP – EUS – ERCP

