Evaluation and Management of Strictures in PSC Using ERCP

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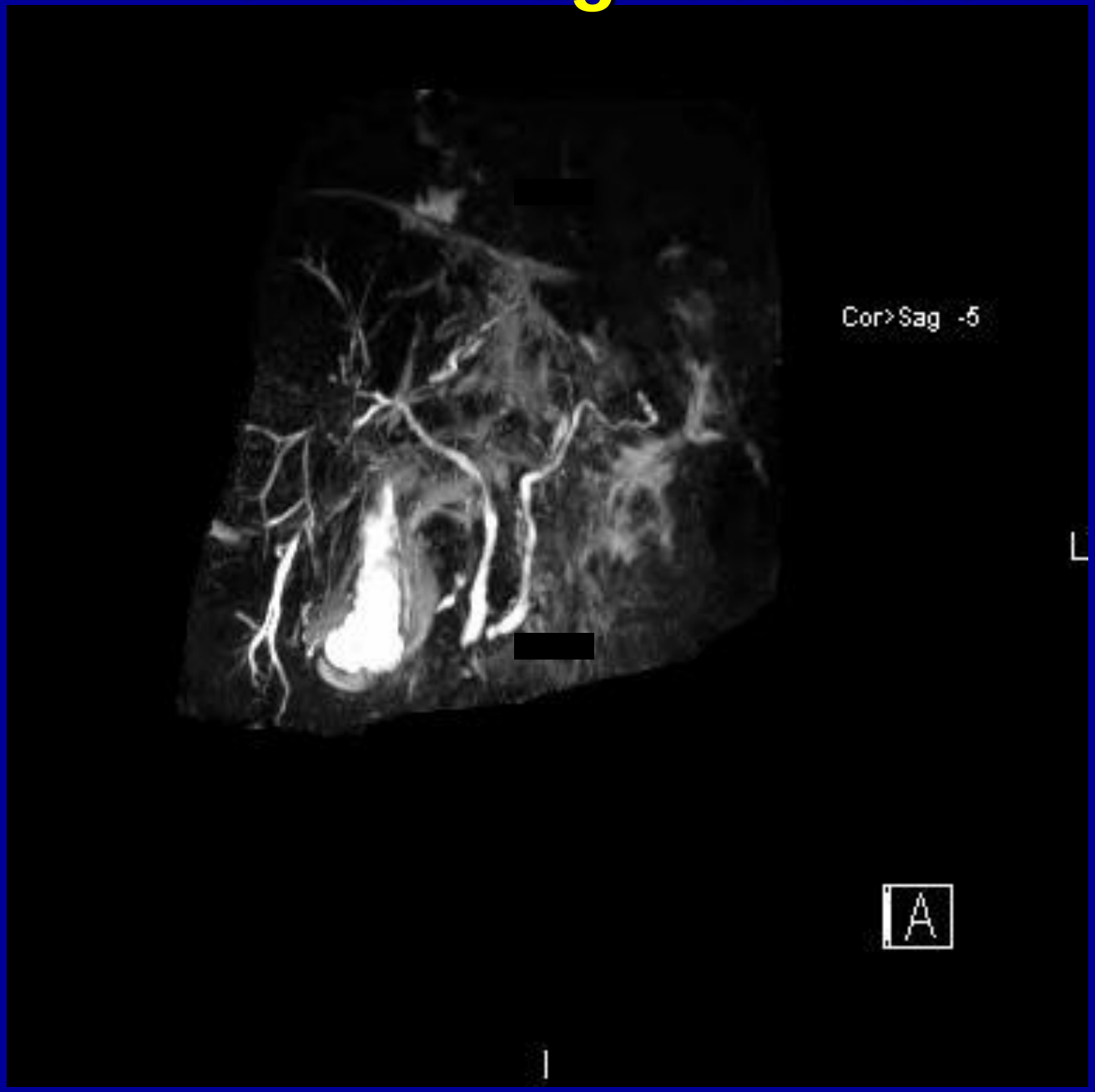
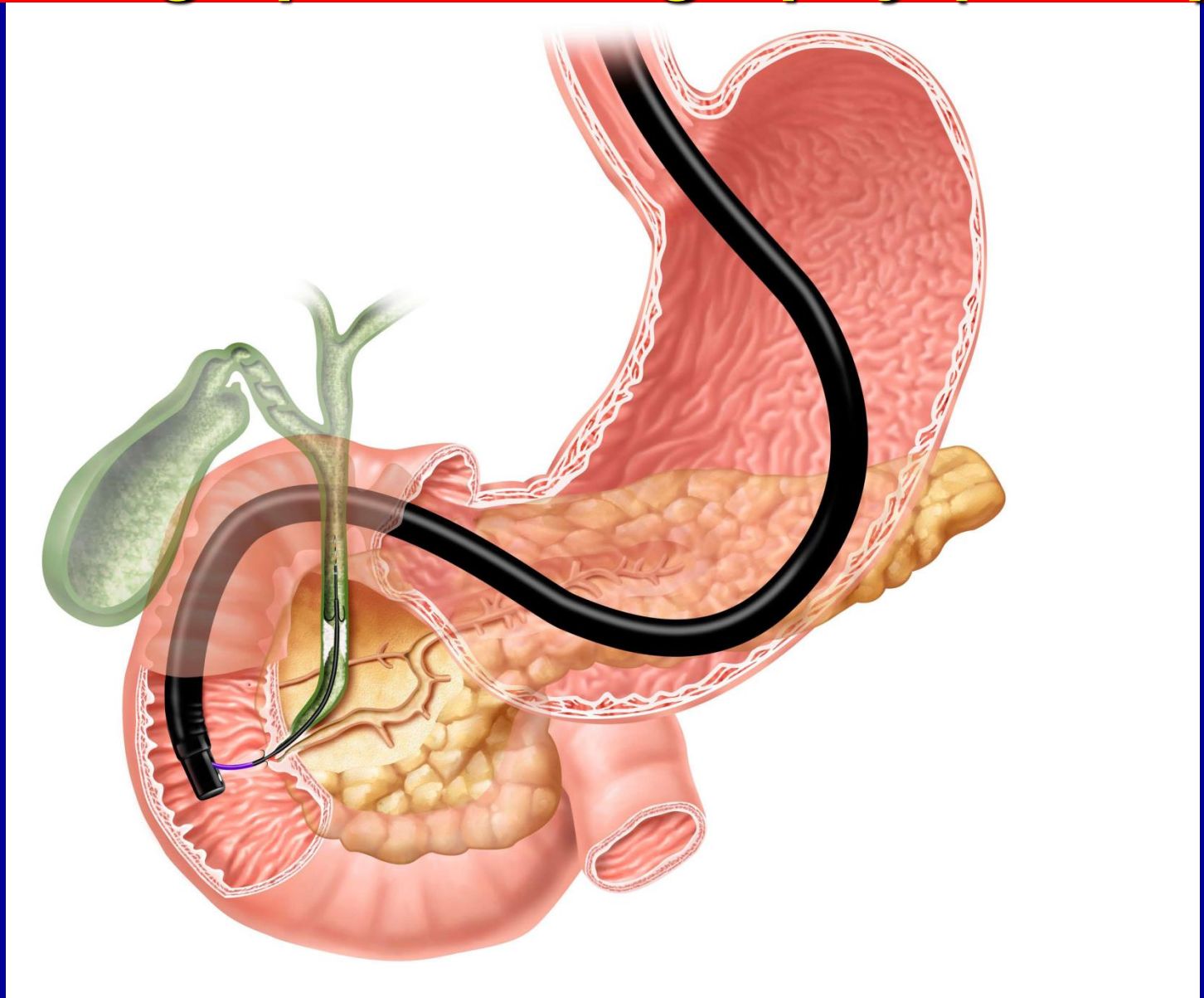
MRCP to Diagnose PSC



Endoscopic Retrograde Cholangiopancreatography (ERCP)



When to Perform ERCP

- Confirm PSC
- Treat symptoms of cholestasis
- Exclude malignancy
  - Decompensation of known PSC
    - Worsening cholestasis
    - H/O variceal bleeding
    - Increasing cholangitis episodes
    - Elevated tumor serology or signs/symptoms of occult malignancy

Dominant Stenoses

- Noted in 10% - 20% of PSC patients
- Main duct and/or right and left hepatic duct
  - Tissue sampling (brush and biopsy) to exclude malignancy
- Palliative treatment with balloon dilation and stenting
  - No RCT on optimal duration of dilation and/or stenting

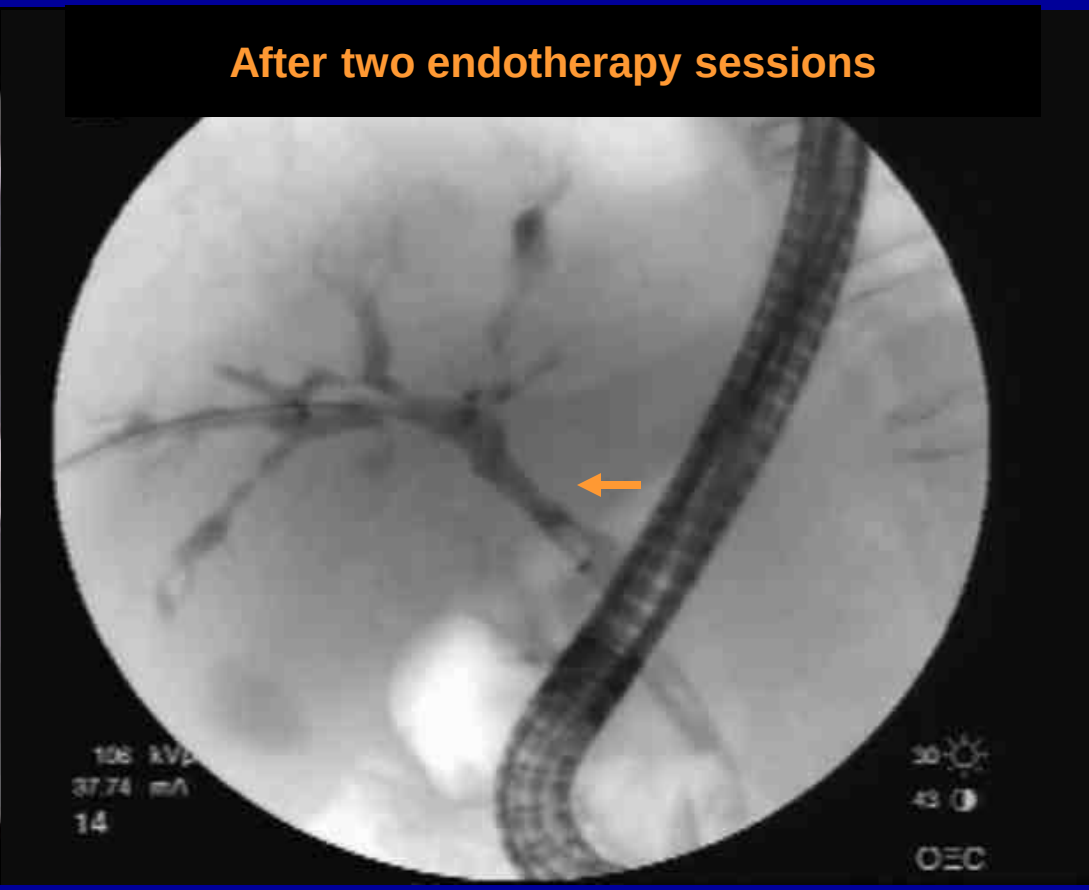
ERCP is Used to Treat Symptoms and Exclude Cancer

Treatment Options

- ERCP with passage or balloon dilation alone
- ERCP with dilation followed by stenting
  - U of Colorado preference – similar strategy as multiple stents for benign post-choly strictures
- PTC with drainage tubes – for ERCP failures
- Antibiotic prophylaxis

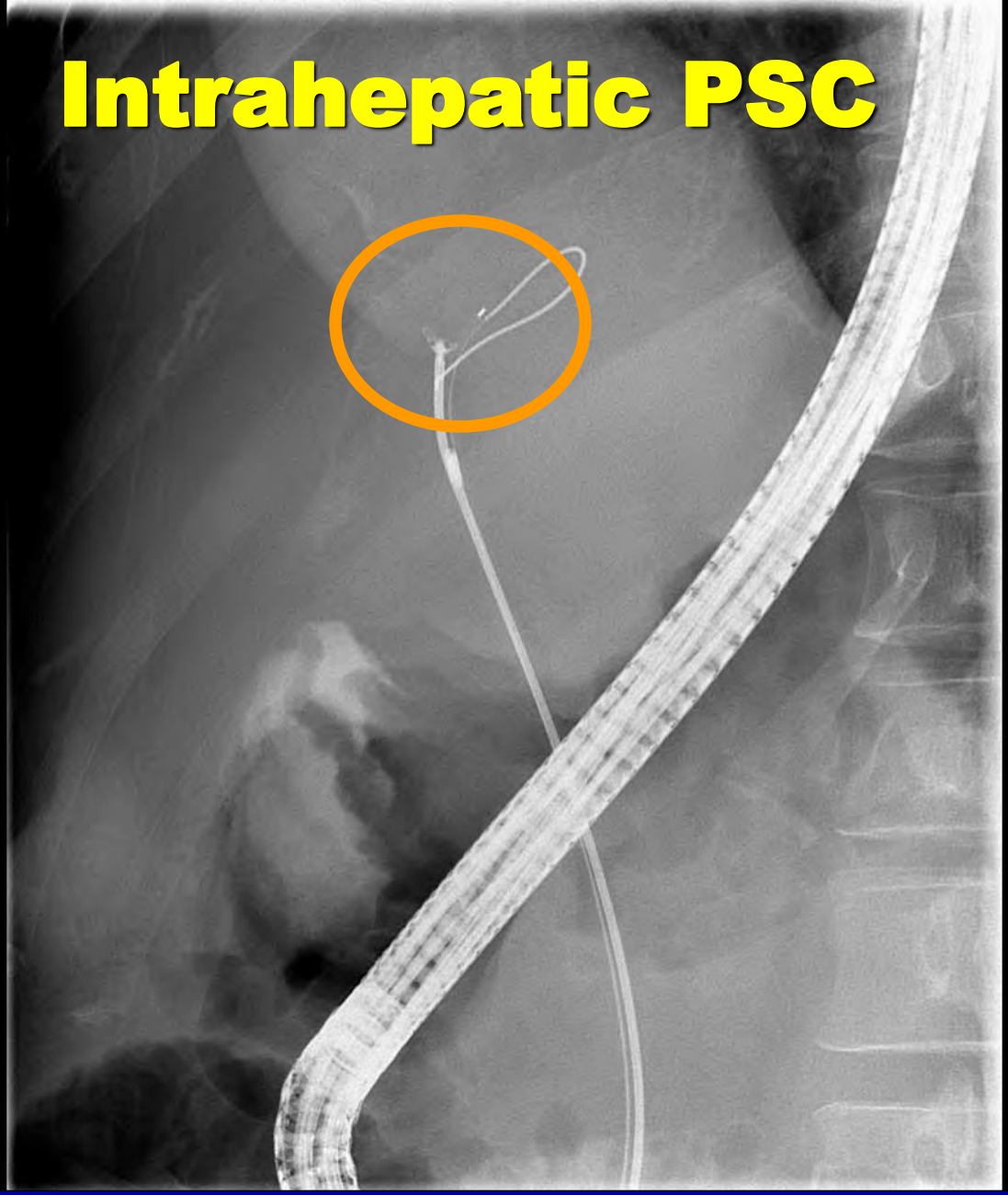
Extrahepatic PSC

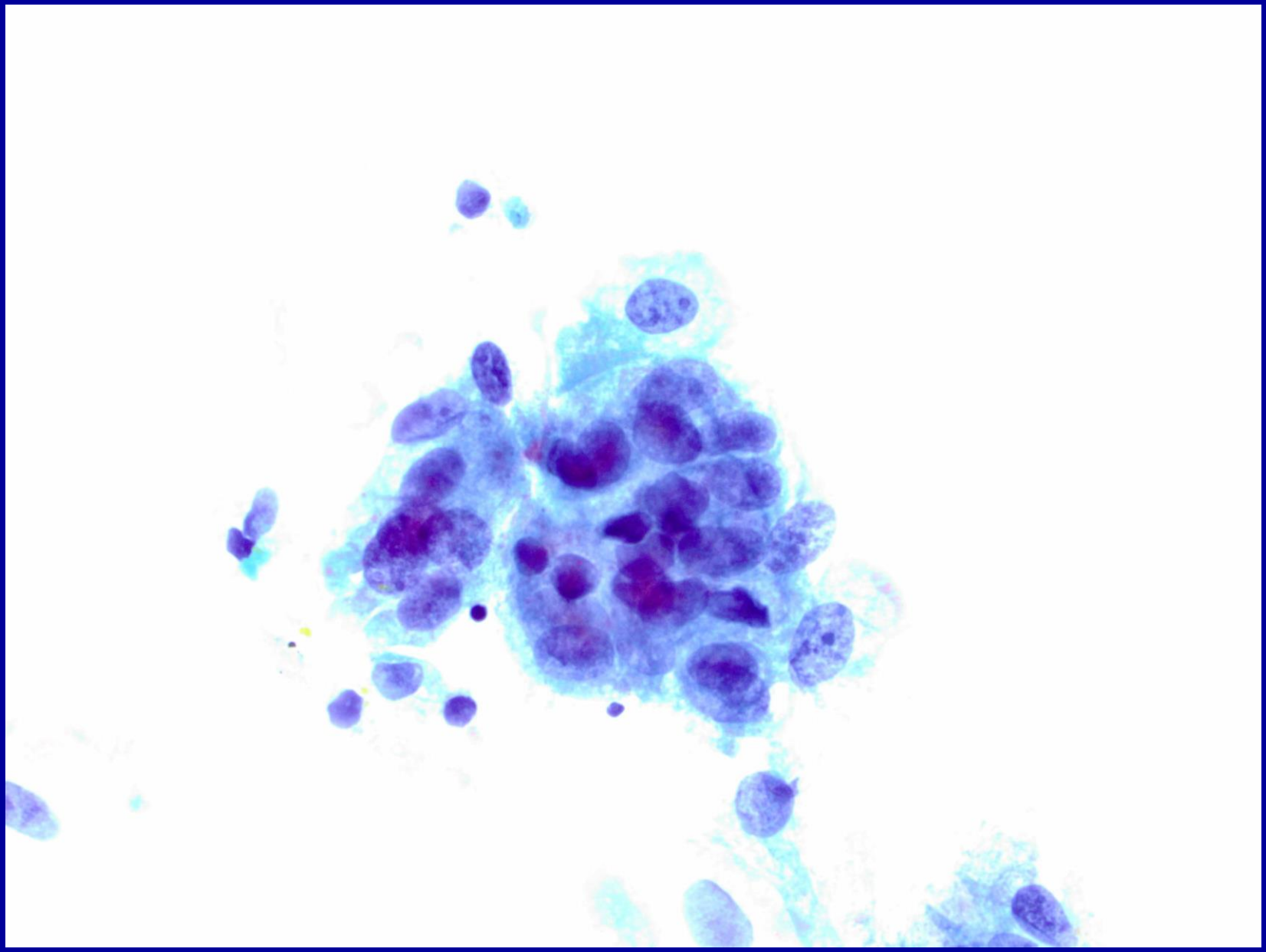
Extrahepatic PSC



Intrahepatic PSC

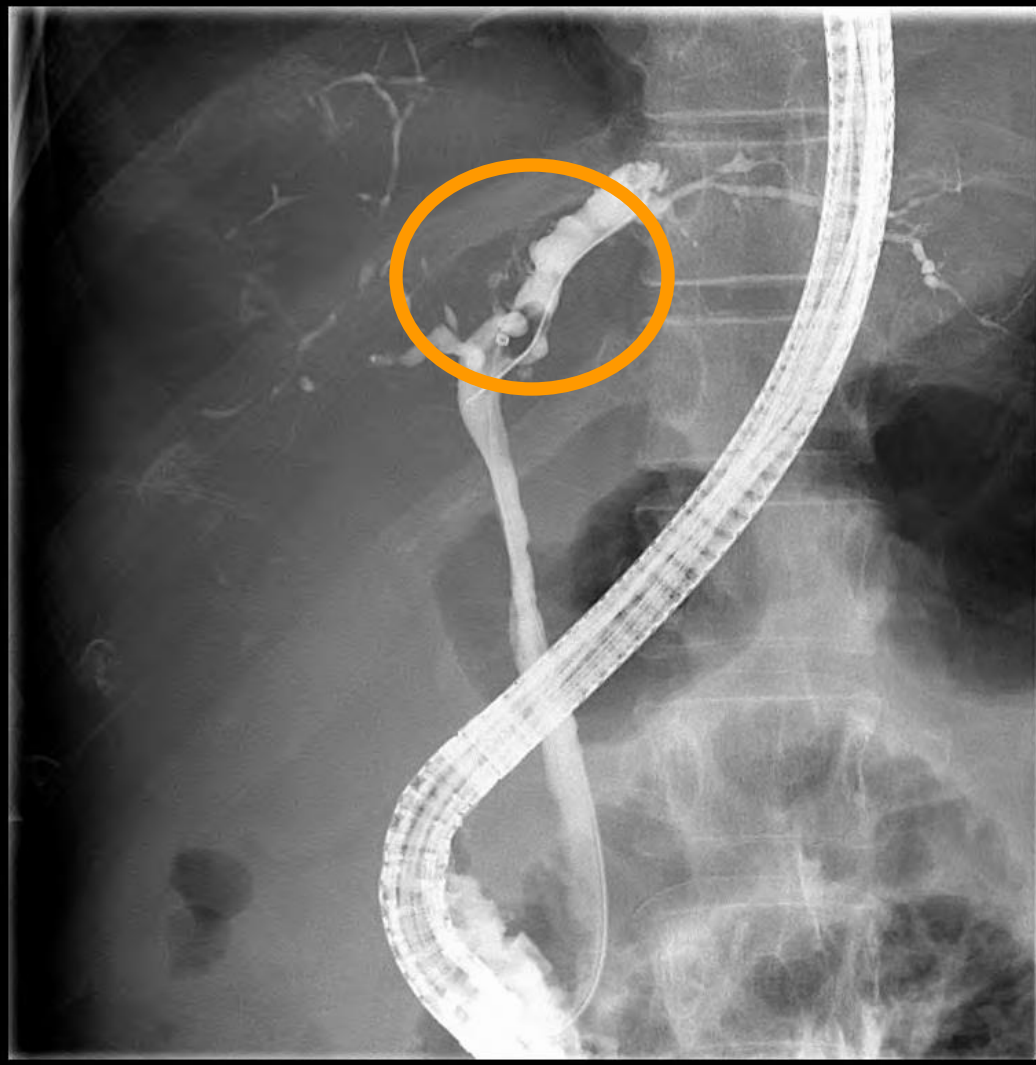
Intrahepatic PSC





Pre-Stenting

Post-Stenting



ERCP Tissue Sampling in PSC

- **Brush cytology:**
  - **Sensitivity: 29-73%**
  - **Specificity: 95%-100%**
- **Biopsy forceps:**
  - **Sensitivity: 29%**
  - **Specificity: 100%**

Aljiffry, et al. Analytical review for DS in PSC. 2011 HPB;13
Levy, et al. 2008 AJG 103

Fluorescence in situ hybridization (FISH)

- Four fluorescently labeled probes that hybridize to pericentric regions
  - Cs 3, 7, 17, 9p21
  - Fluorescence microscope

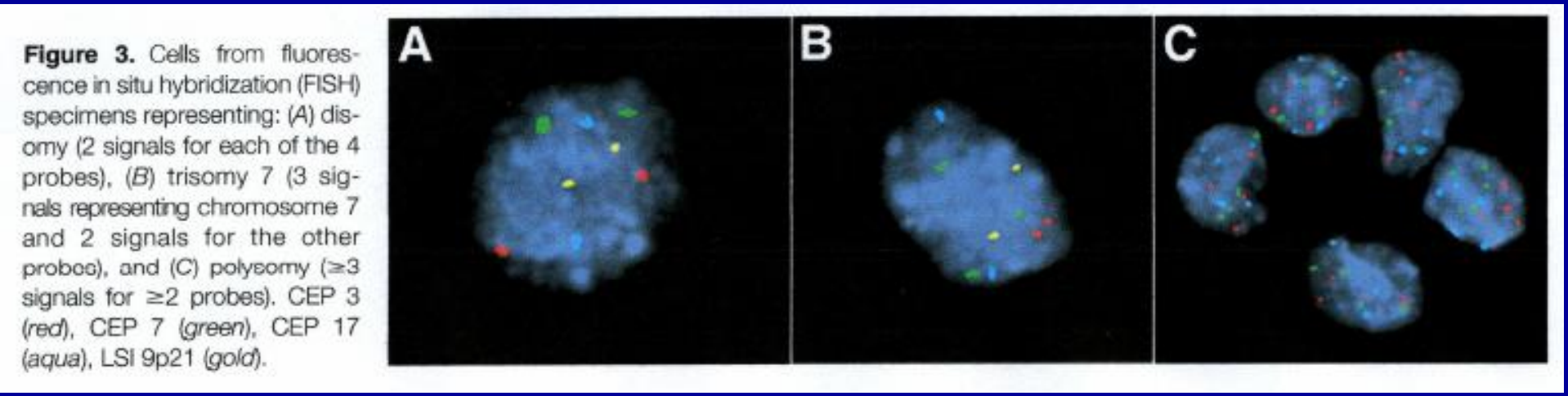
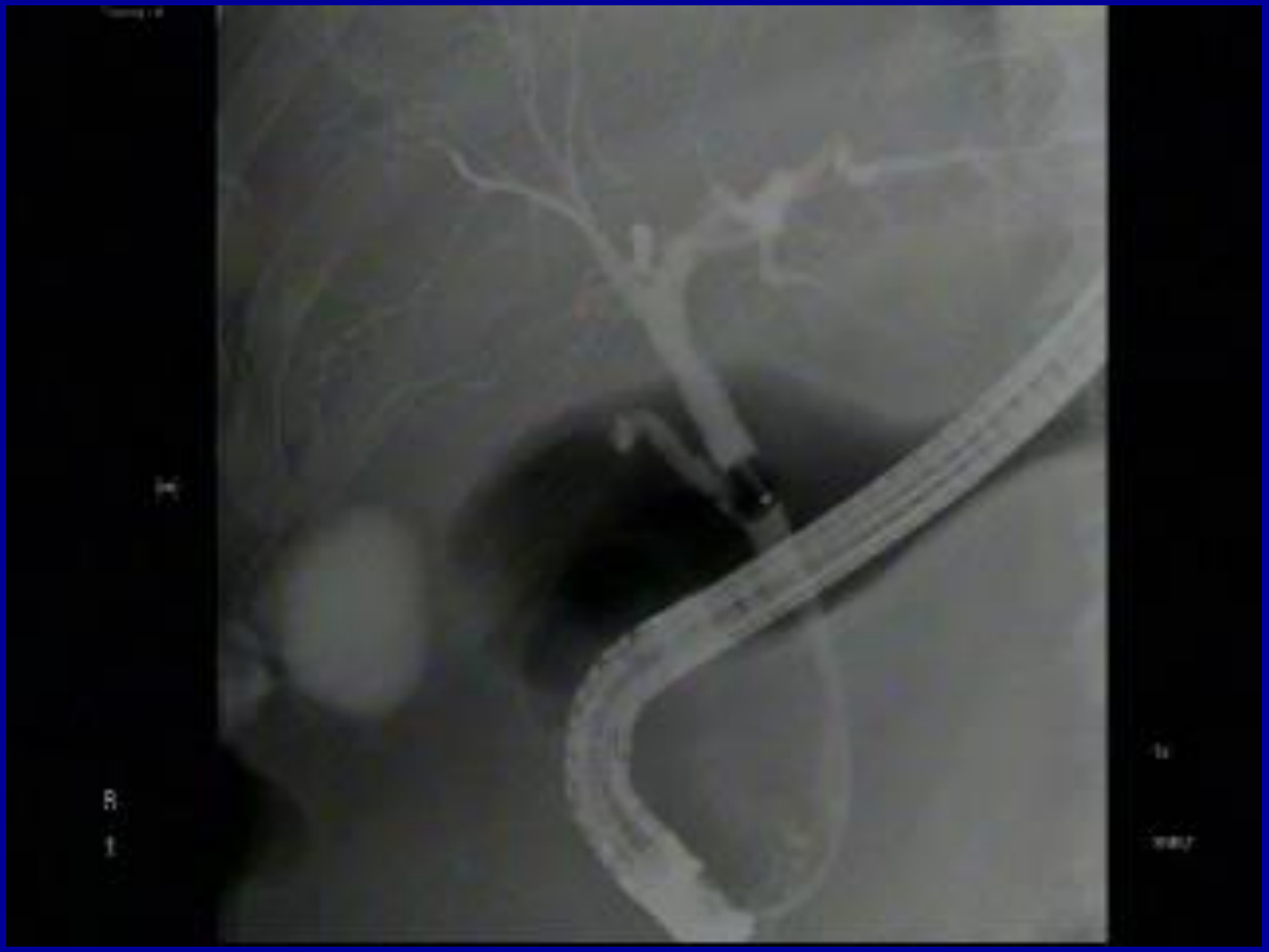
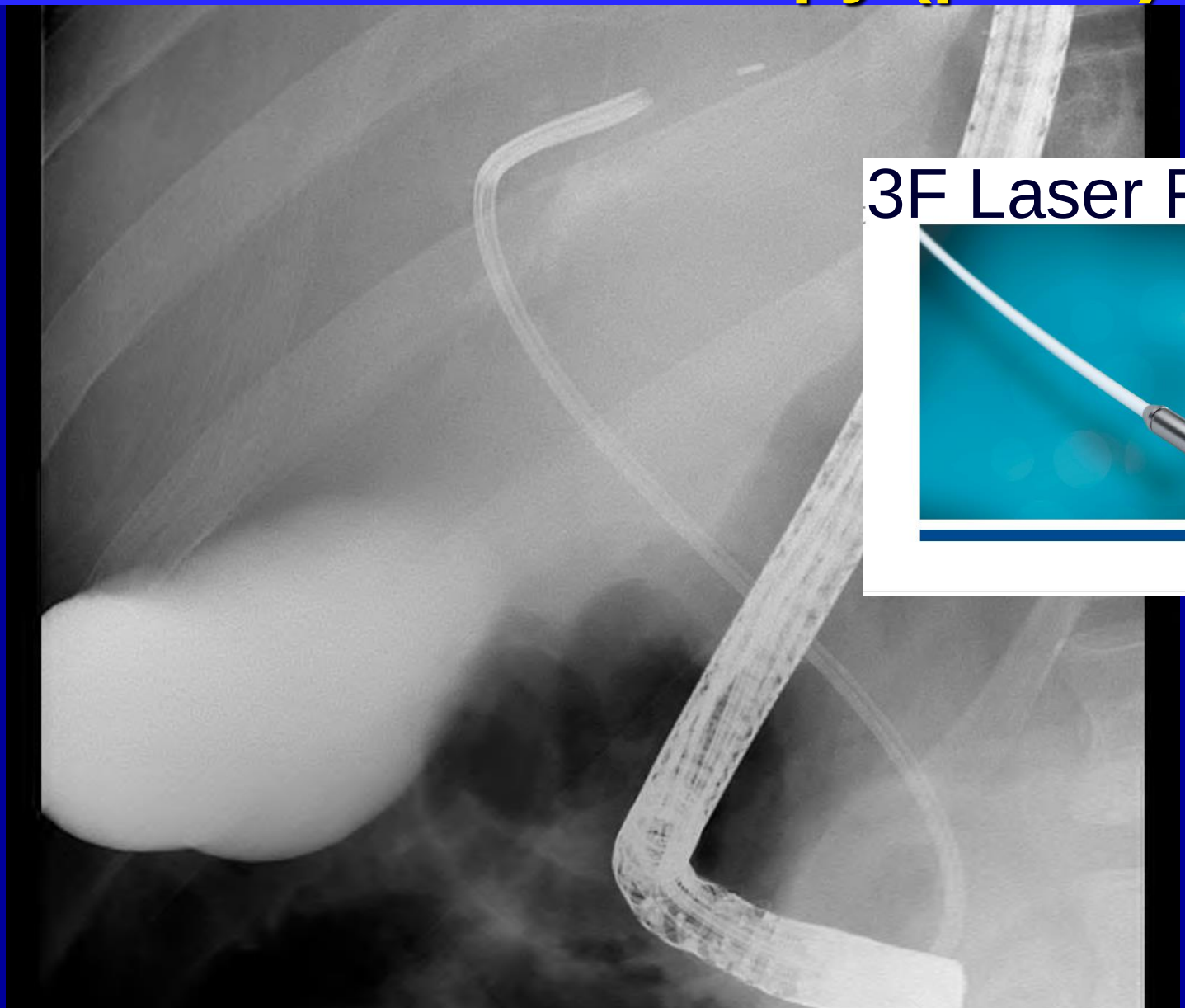


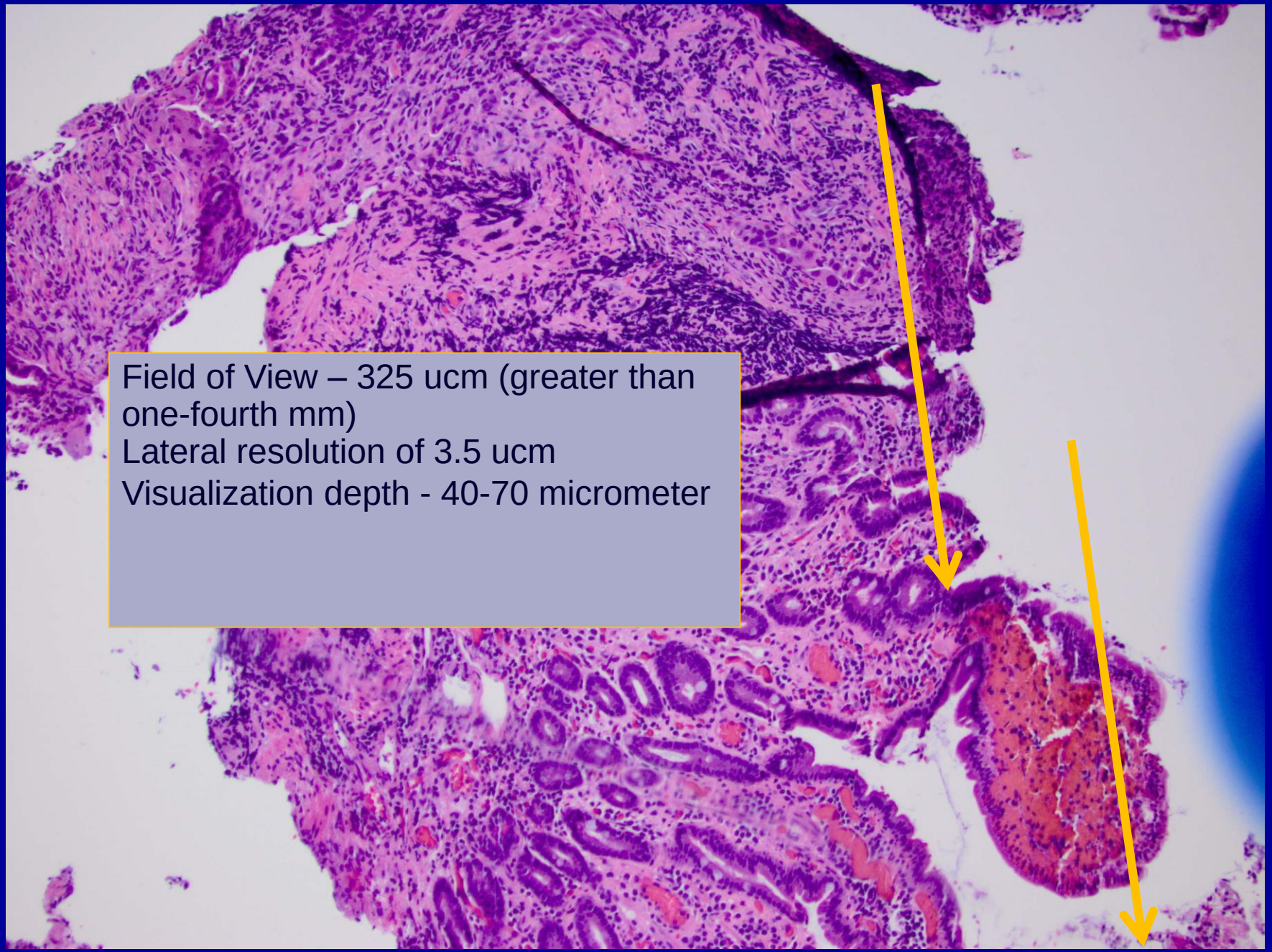
Figure 3. Cells from fluorescence in situ hybridization (FISH) specimens representing: (*A*) disomy (2 signals for each of the 4 probes), (*B*) trisomy 7 (3 signals representing chromosome 7 and 2 signals for the other probes), and (*C*) polysomy (≥3 signals for ≥2 probes). CEP 3 (*red*), CEP 7 (*green*), CEP 17 (*aqua*), LSI 9p21 (*gold*).

Barr Fritcher, et al. evaluation of indeterminate PB strictures. 2009 *Gastro*:136:2180



Biliary Probe-based Confocal Laser Endomicroscopy (pCLE)




Field of View – 325 ucm (greater than one-fourth mm)
Lateral resolution of 3.5 ucm
Visualization depth - 40-70 micrometer

Measures of Validity for pCLE in PSC Patients with Dominant Stenoses

Operating Characteristics	pCLE % (CI%)	Tissue Sampling % (CI%)
Sensitivity	100 (19-100)	0 (0 - 81)
Specificity	61 (36-83)	94 (73-99)
NPV	100 (71-100)	90 (67 - 98)
PPV	22 (4-60)	0 (0-84)

** Two explants – corresponding dysplasia (LGD and HGD) suspected by pCLE not confirmed by ERCP sampling

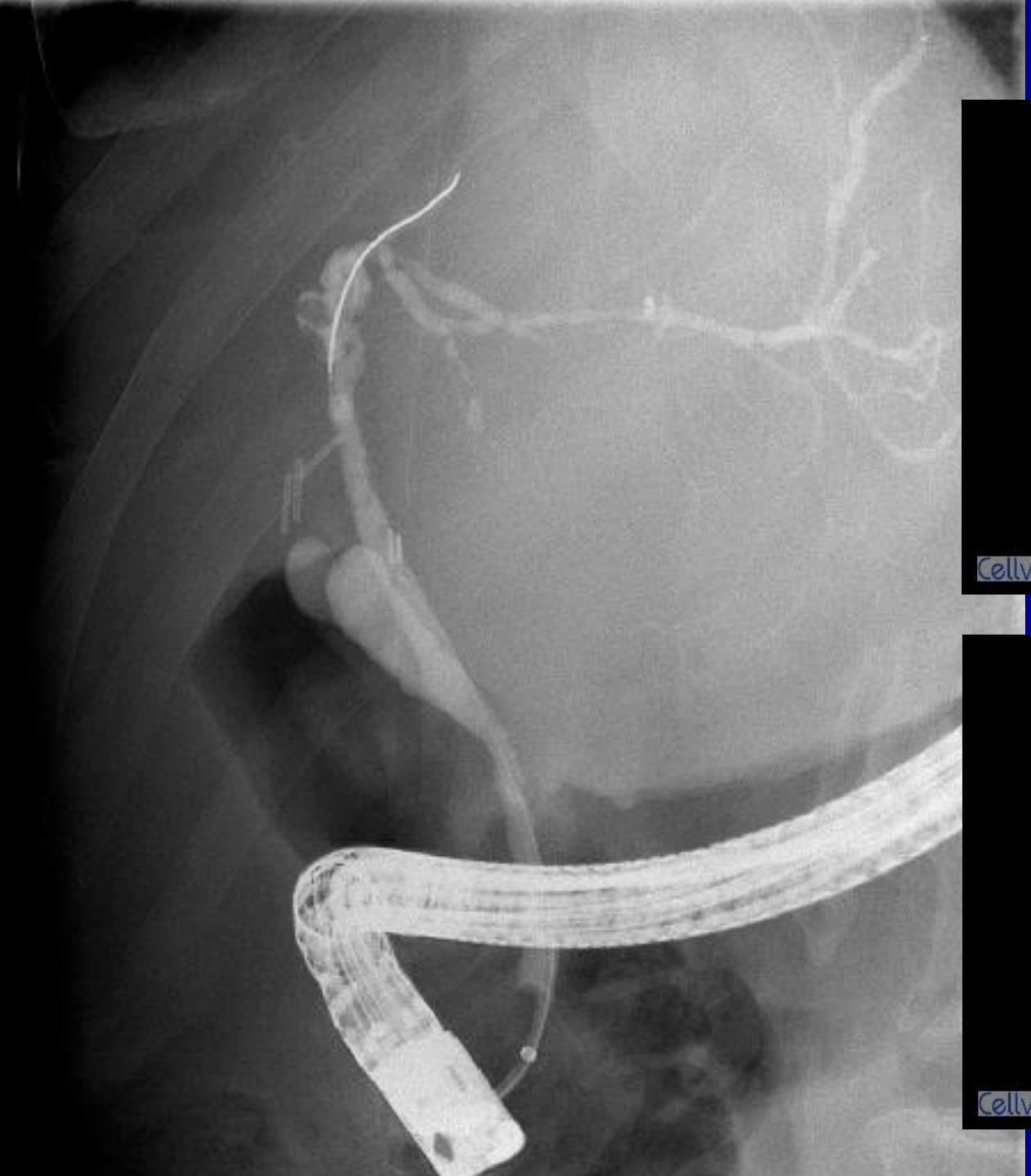
Heif, Yen, Shah. DDS 2013

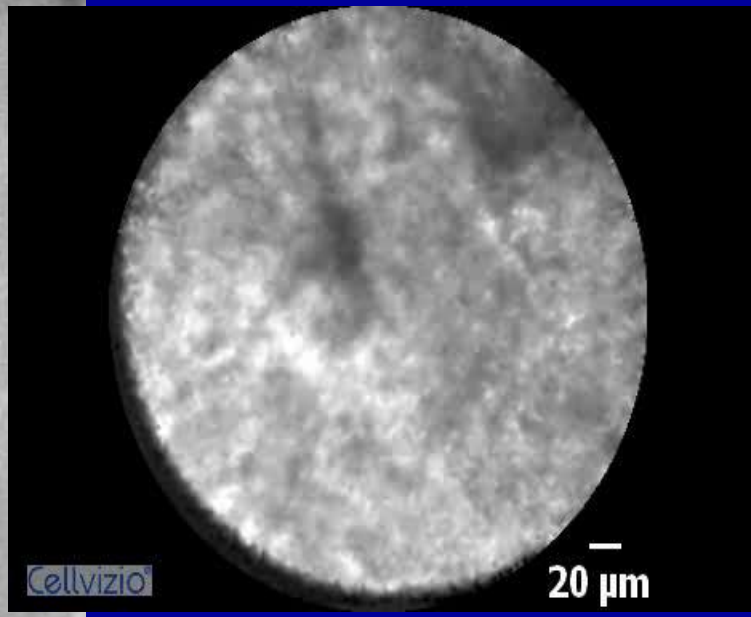
Multicenter Registry Study of pCLE in PSC Patients with Dominant Stenoses

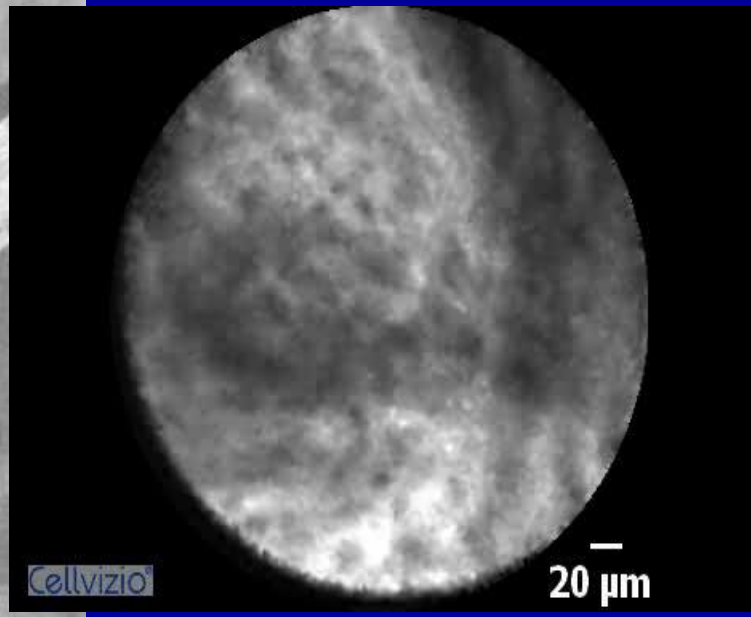
Participating Centers:
U of Colorado
U of Pittsburgh
Cornell, NYC
Columbia, NYC

PSC Patient 3 (liver transplant)

- 58 year-old male
- PSC for 15+ years, UC for 20+ years
- Indication- Suspected hilar mass on CT and rising CA19-9 (169)

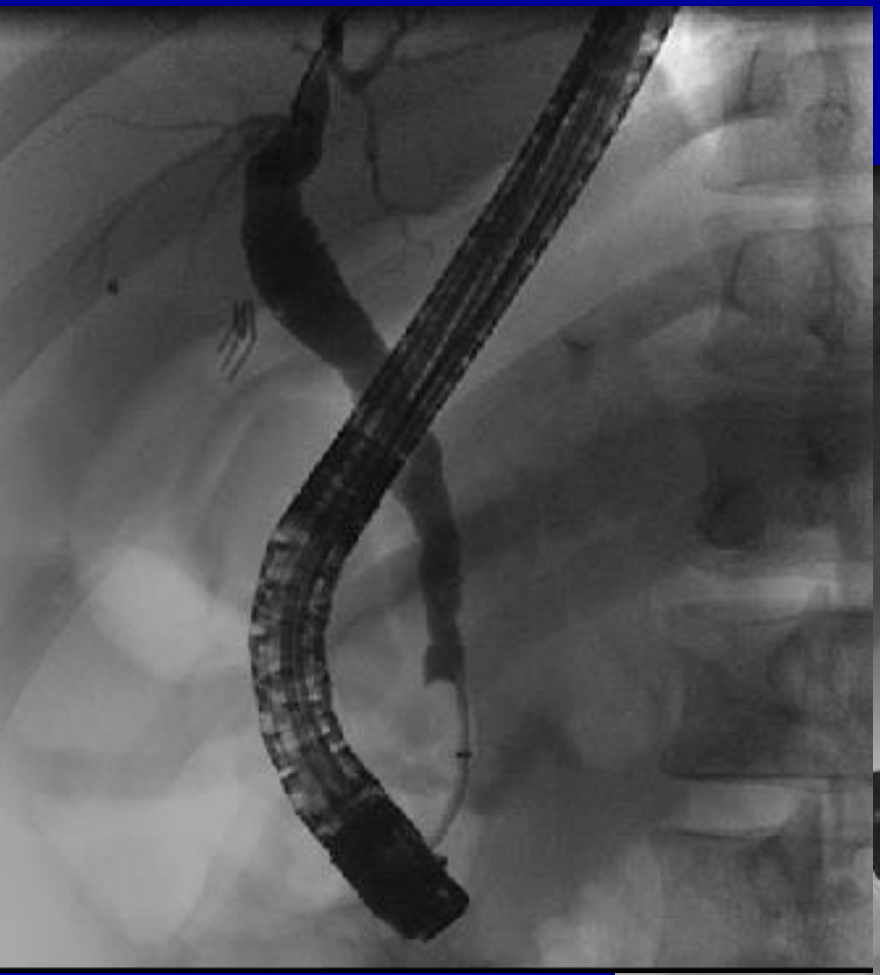


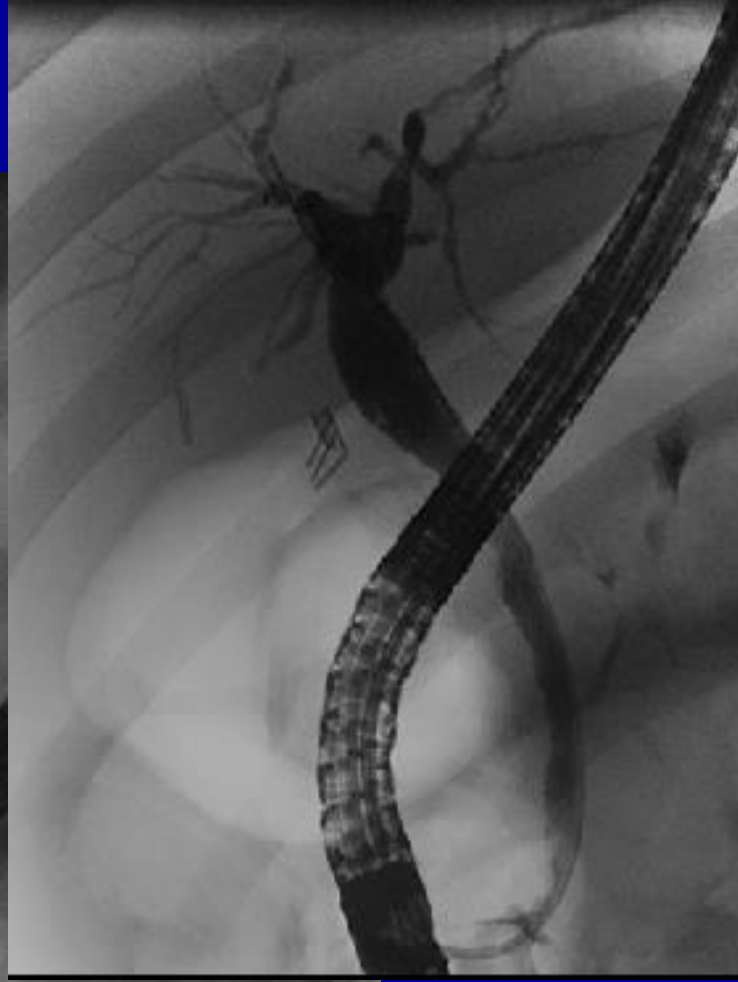

Cellvizio
20 µm


Cellvizio
20 µm

PSC Patient 3 (liver transplant)

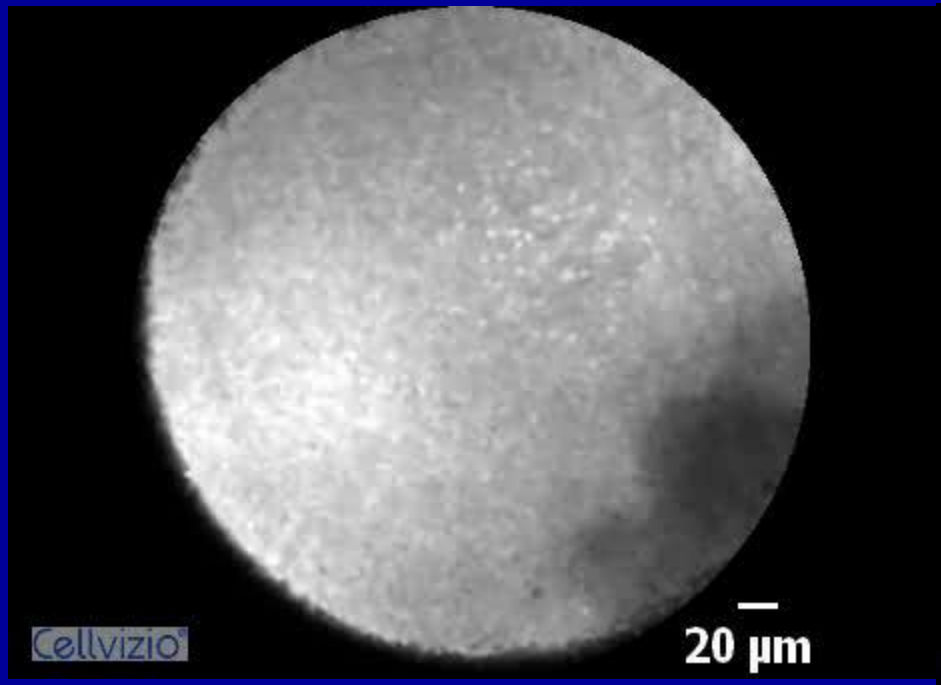
- Liver explant showed benign changes!

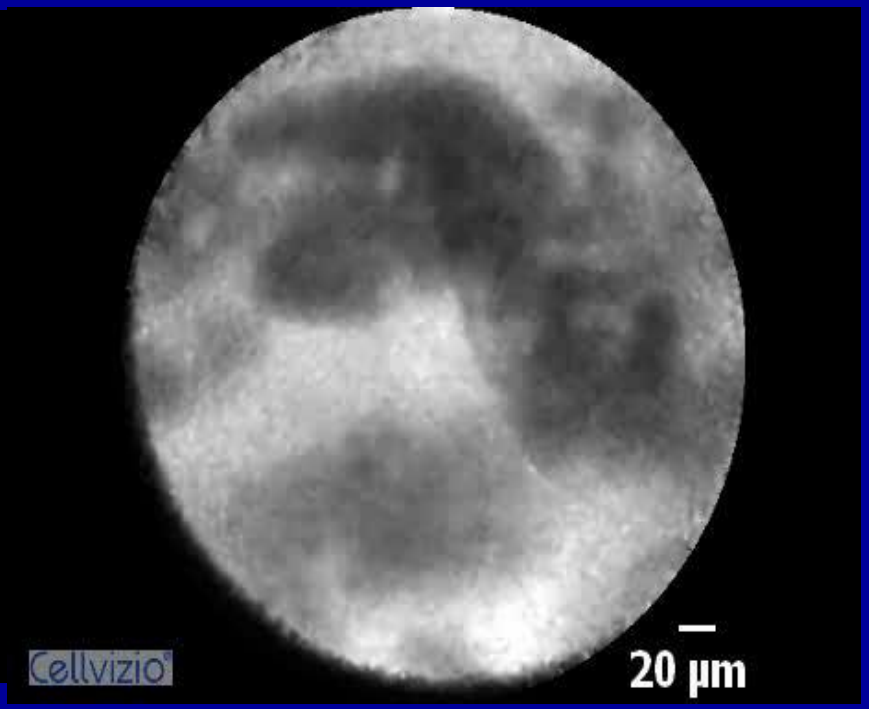





PSC Patient 8

- 19 year-old male
- ≤ 1 year of PSC and UC
- Indication for pCLE – brushings from DS with highly atypical ductal cells suspicious for carcinoma. CA19-9 (9.3)





Stricture at common bile duct
Pathology- biopsy HGD and FISH showed polysomy
Follow-up ERCP showed HGD in distal CBD and right main duct.
Awaiting Transplant

Conclusions

- Lab studies, imaging such as CT or MRI, and symptoms will determine need for ERCP
- ERCP is used to evaluate and treat dominant stenoses
- Dominant stenoses are narrowings in the main trunk of the tree (common bile duct) or its main branches
- Biopsies and brushings are done to help to exclude cancer.
- Laser confocal microscopy is promising to further evaluate strictures in PSC

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