간담췌 질환에서 내시경의 역할

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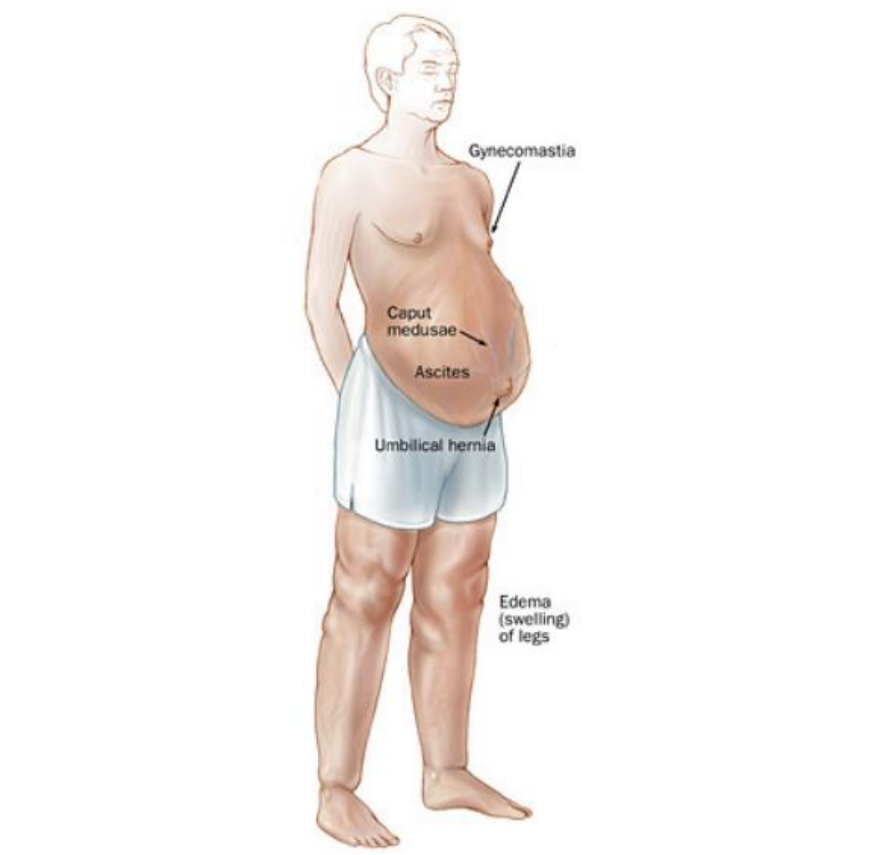
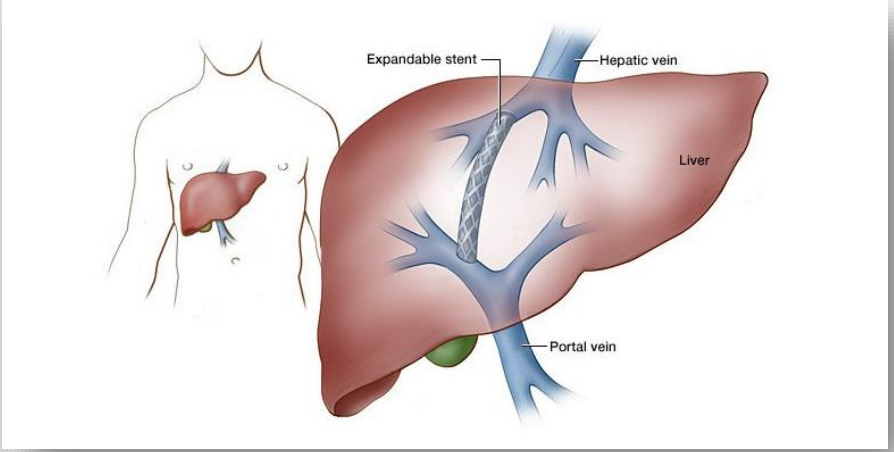
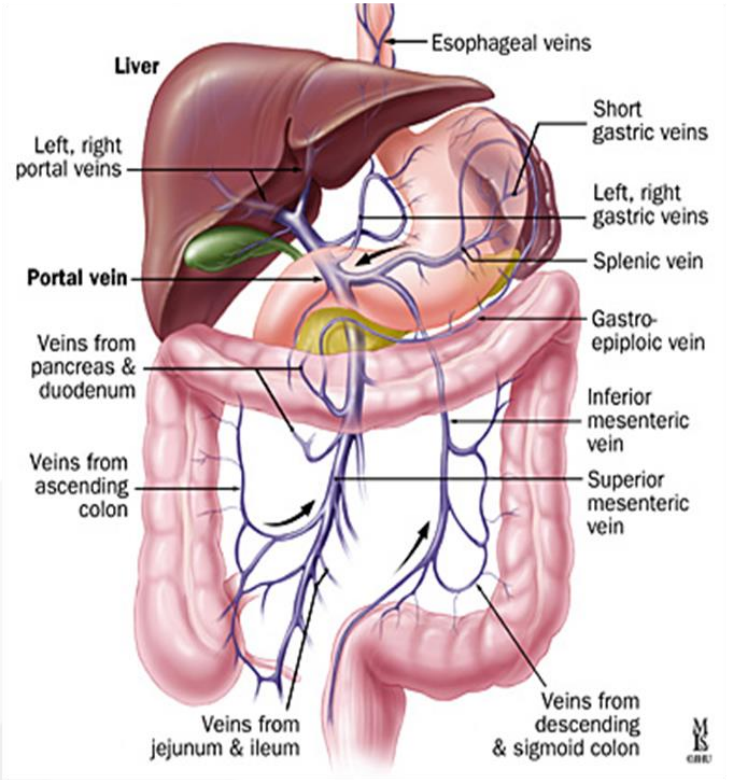
Liver

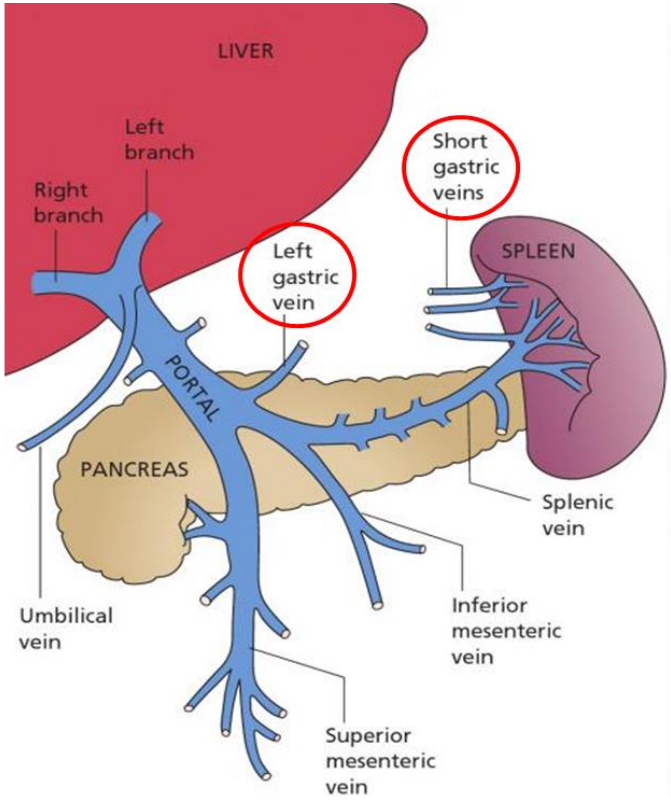
Clinical manifestations of portal hypertension



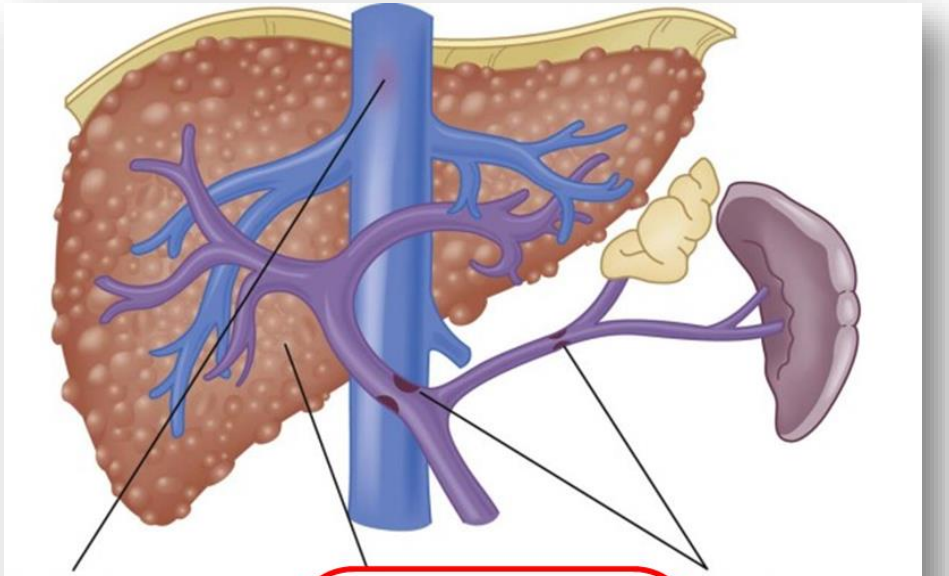


Anatomy : The Portal Venous System





Cause of Portal Hypertension



Posthepatic
Budd-Chiari syndrome
Constrictive pericarditis
Inferior vena caval obstruction
Right-sided heart failure
Severe tricuspid regurgitation

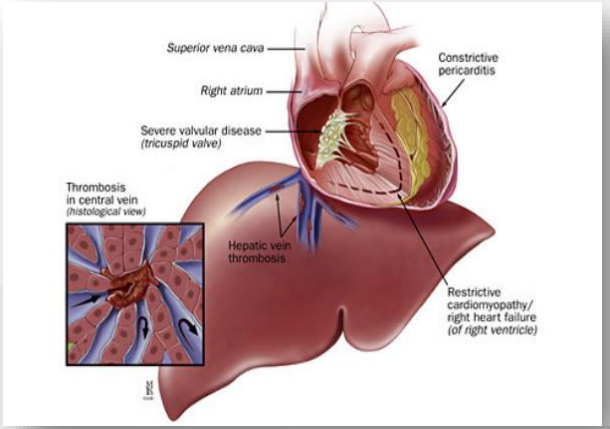
Intrahepatic
Presinusoidal
- Idiopathic portal hypertension
- Primary biliary cirrhosis
- Sarcoidosis
- Schistosomiasis

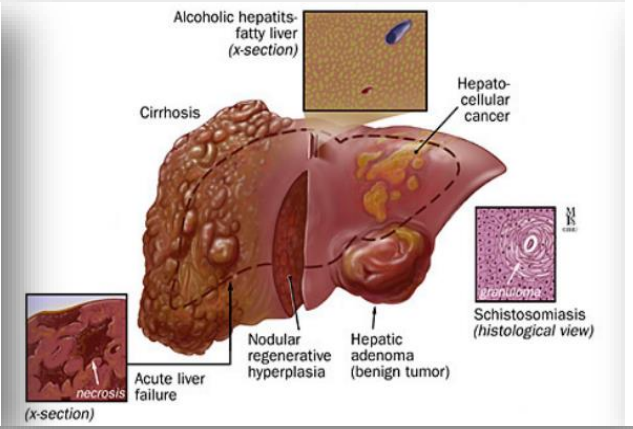
Sinusoidal
- Alcoholic cirrhosis
- Alcoholic hepatitis
- Cryptogenic cirrhosis
- Postnecrotic cirrhosis

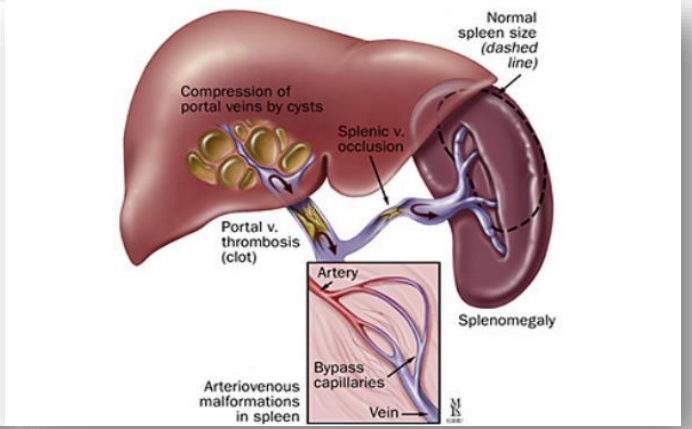
Postsinusoidal
- Sinusoidal obstruction syndrome

Prehepatic
Portal vein thrombosis
Splenic vein thrombosis

Suprahepatic, hepatic, and infrahepatic



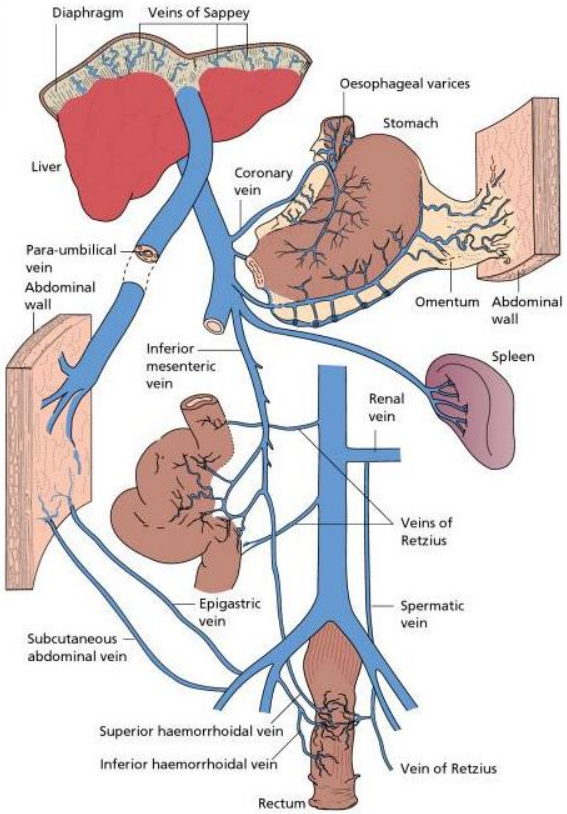




Development of Collaterals

- Normal
  - Systemic vein pressure > portal vein
  - Systemic bed → portal bed
- In portal HTN
  - Portal vein >systemic vein
  - Reversal of flow
  - To decompress the portal pressure

    : angiogenesis, development of new collaterals, increase in the size of the collaterals, usually insufficient



Pathophysiology: Gastroesophageal Varices

Development of varix

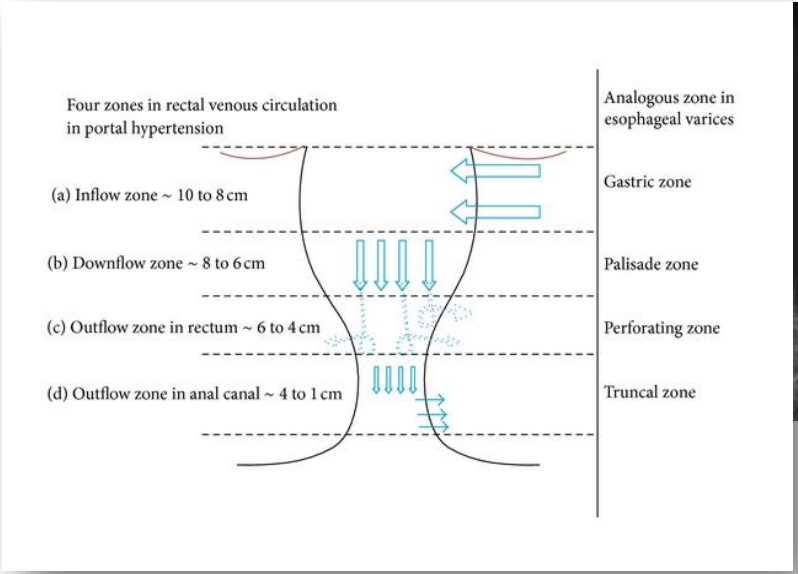
: HVPG at least 10 mmHg

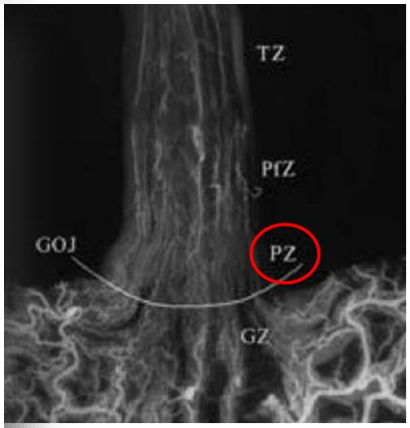
Venous drainage of GEJ

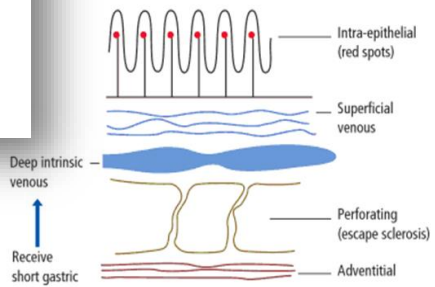
- Gastric zone
- Palisade zone
- Perforating zone
- Truncal zone

Distal esophagus : coronary v.

Fundus: short gastric v. → splenic v.







Natural History and Epidemiology

- Variceal hemorrhage : 12% / year
  - 5% for small varices and 15% for large varices
  - Red wale marks and advanced liver disease
- Recurrent variceal hemorrhage in 1 year : 60%
- 6 week mortality with bleeding episode: 15-20%
  - 0% in Child A patients, 30% in Child C patients

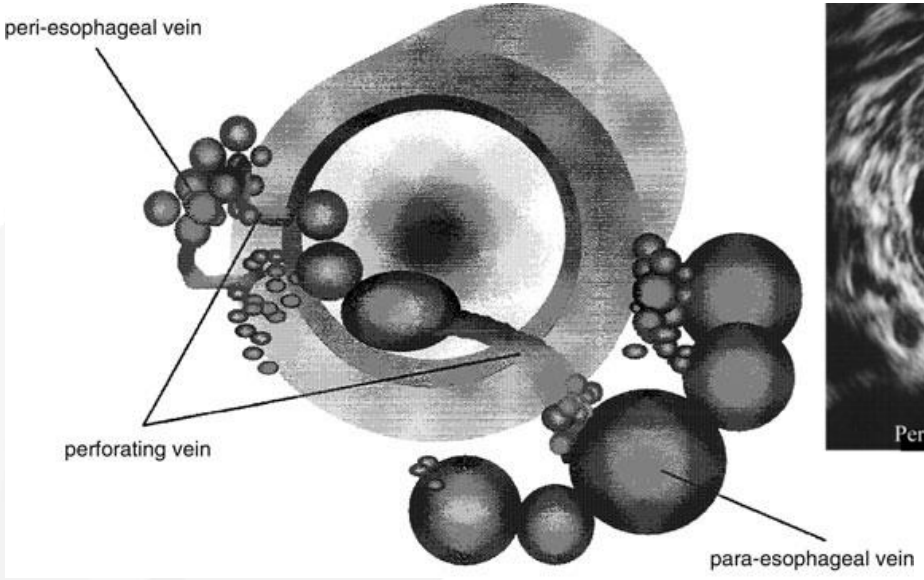
Diagnosis of Gastroesophageal Varices

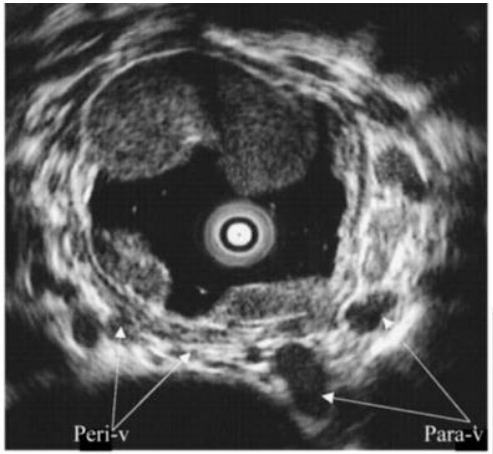
- Esophagogastroduodenoscopy (EGD)
  - Gold standard
  - **During withdrawal of the endoscope**
  - Esophagus, maximally inflated, the stomach, completely aspirated
  - The size of the varices in the lower third of the esophagus is the most important

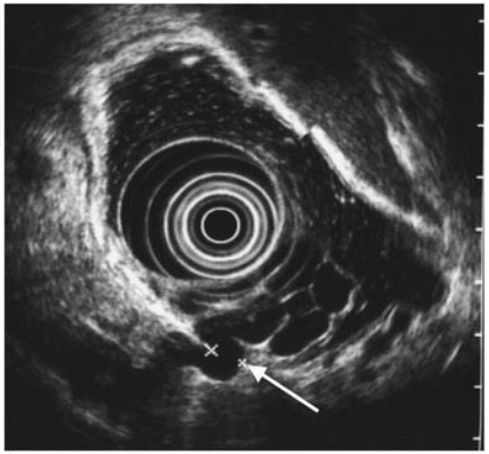
Diagnosis of Gastroesophageal Varices

- EUS
  - As good as EGD for detection of esophageal varices, but better than EGD to detect gastric varices
  - To determine predictors for recurrence of varices after therapy
    : presence and size of paraesophageal varices
  - Echo-free or hypoechoic lumen in the esophageal submucosa

Diagnosis of Gastroesophageal Varices: EUS

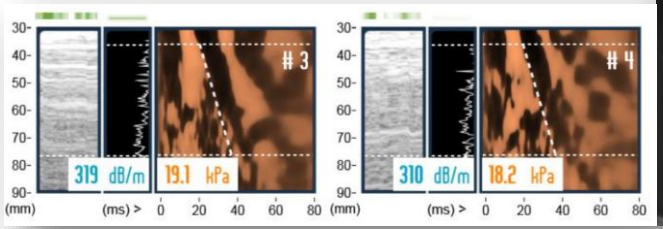


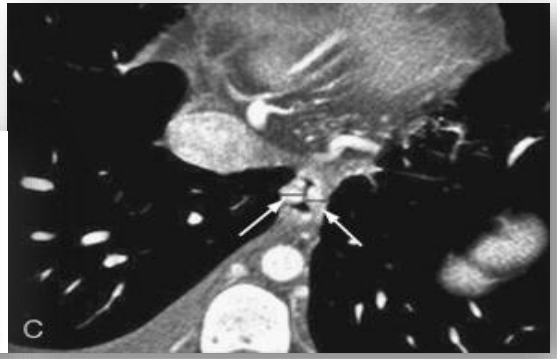




Diagnosis of Gastroesophageal Varices

- Ultrasonography
  - Portal hypertensive change: splenomegaly, reversal of flow in the portal vein, portosystemic collateral blood flow
  - Portal vein diameter >13mm: presence of esophageal varices
  - Transient elastography; liver stiffness correlate to the presence/ degree of esophageal varices
- CT
  - Detection rate: 92% for large varices, 53%-60% for small varices
- MRI
  - Sensitivity of Gd-enhanced MRI: 81%





Classification of Esophageal Varices

- Several endoscopic classification systems for esophageal varices
  - Simple classification recommended by AASLD/EASL
  - Japanese Research Society for Portal Hypertension (JRSPH) system
  - Dagradi classification
  - Westaby classification

AASLD / EASL / APASL recommendation

- The size classification: as simple as possible
  - 2 grades : small (≤ 5mm) or large (›5mm)
  - 3 sizes
    - Small: minimally elevated veins above the mucosa
    - Medium: tortuous veins occupying less than 1/3 of the esophageal lumen
    - Large: occupying more than 1/3 of the lumen
- Presence or absence of red color signs

JRSPH system

- Six categories
  - Location (L)
  - Form (F)
  - Color (C)
  - Red color sign (RC)
  - Bleeding signs
  - Mucosal findings

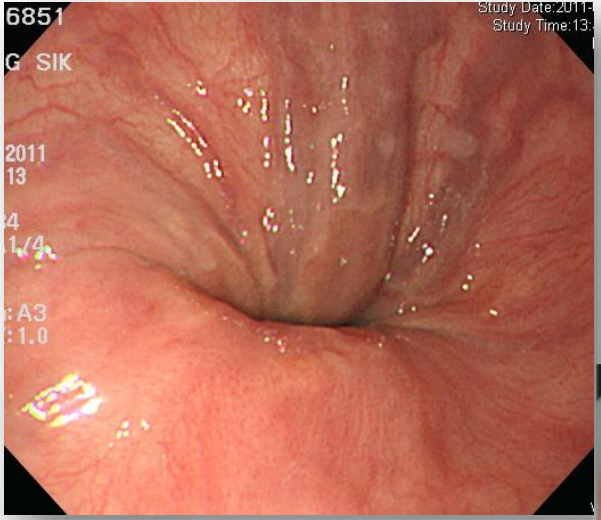
Location

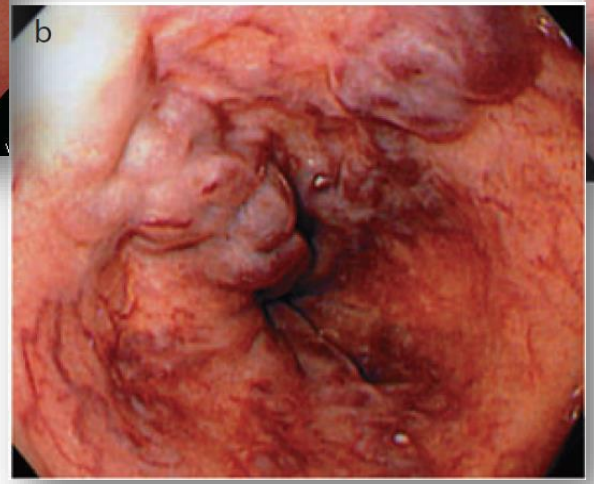
- Ls
  - Locus superior
  - Upper part of the esophagus
- Lm
  - Locus medialis
  - Middle part of the esophagus
- Li
  - Locus inferior
  - Lower part of the esophagus

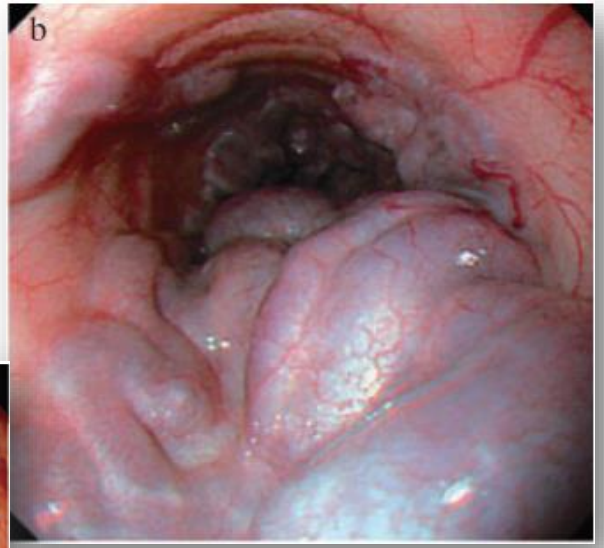
Form

- F_0: no varicose appearance
- F_1: straight, small-caliber
- F_2: moderately enlarged, beaded
- F_3: markedly enlarged, nodular or tumor-shaped

Form



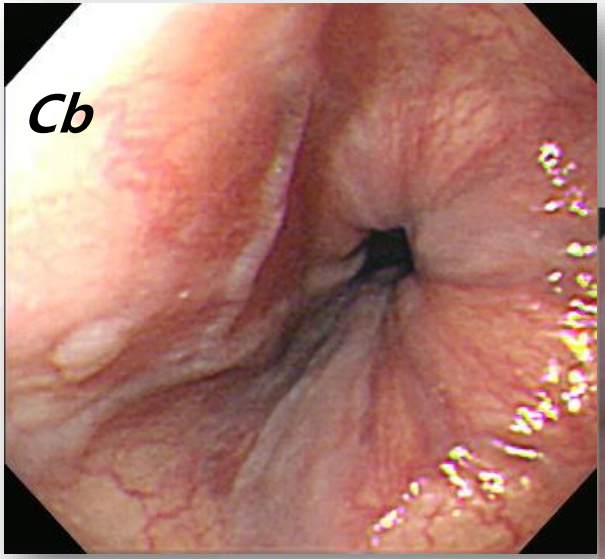


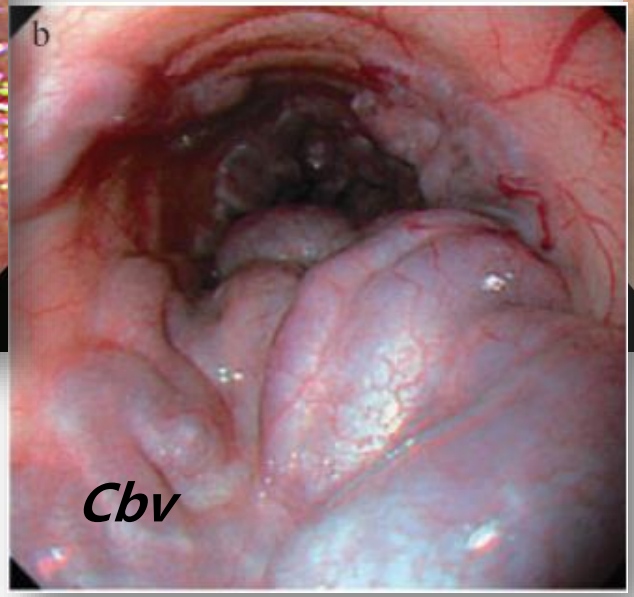


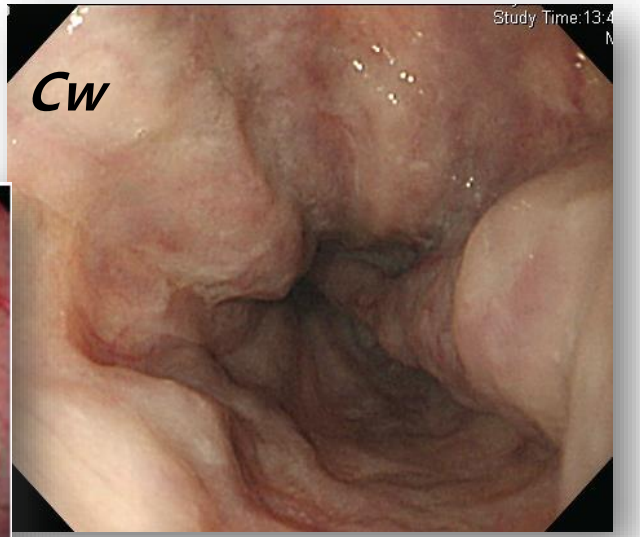
Color

- Cw
  - White varix
  - Look like large folds of the esophageal mucosa
- Cb
  - Blue varix
  - Bluish-white or cyanotic, distended by blood
  - Cbv (violet), Cb-Th (thrombosed)

Color







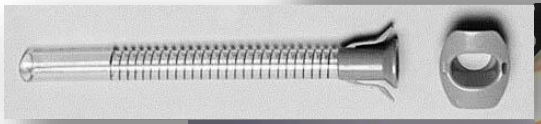
Red Color Signs

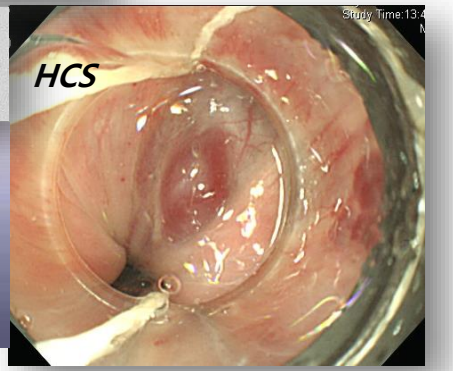
- Reddish changes immediately beneath the submucosa
- Reliable predictors of the risk of variceal bleeding
- Categories
  - Red wale markings (RWM)

    : longitudinal dilated veins resembling whip marks
  - Cherry-red spots (CRS)

    : small red spots on the mucosal surface (2-3mm)
  - Hematocystic spots (HCS)

    : large (4mm or more), round, red projections look like blood blisters. blood coming from the deeper extrinsic veins straight out towards the lumen through a communicating vein into the superficial veins

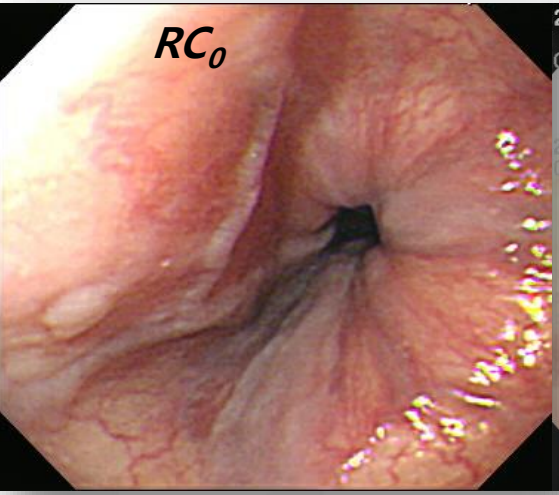


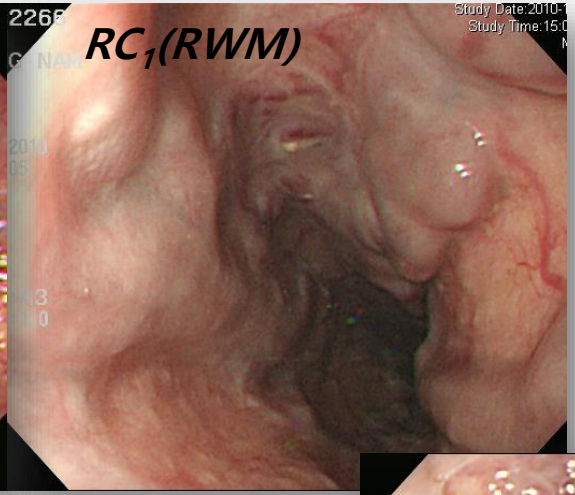


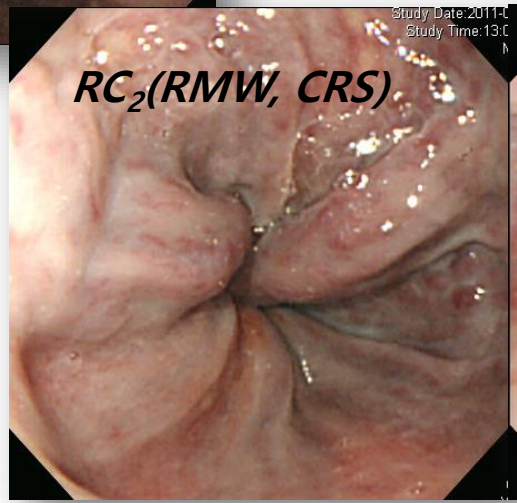
Red Color Signs

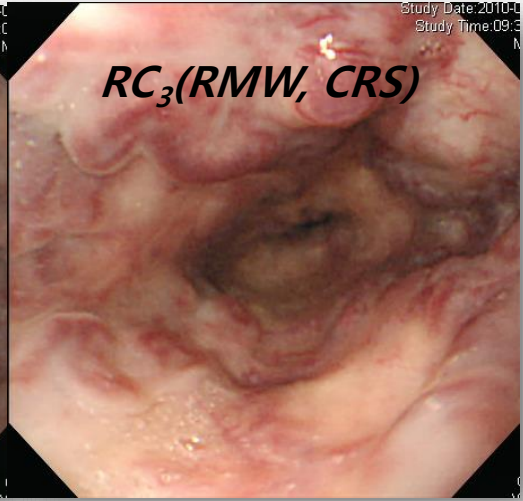
- Grade
  - RC_0: absent
  - RC_1: small in number and localized
  - RC_2: intermediate between RC1 and RC3
  - RC_3: large in number and circumferential

Red Color Signs





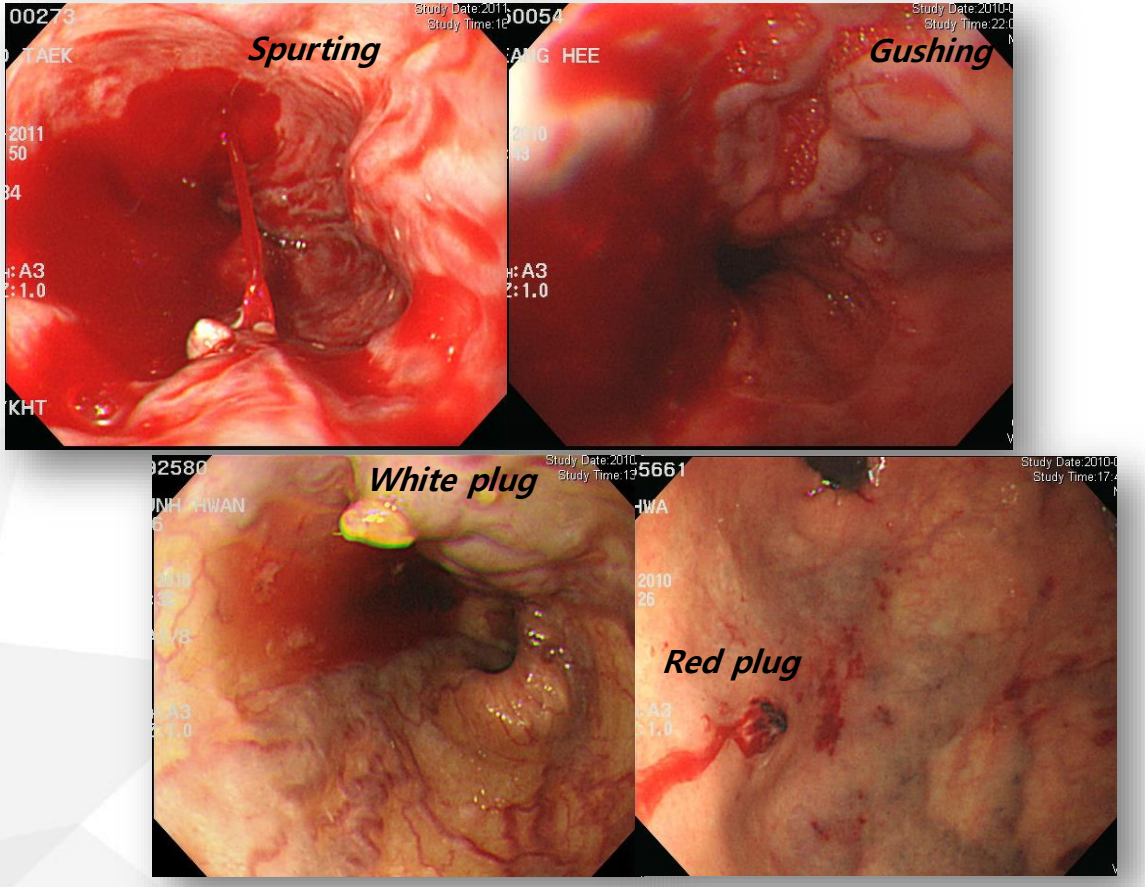




Bleeding Signs

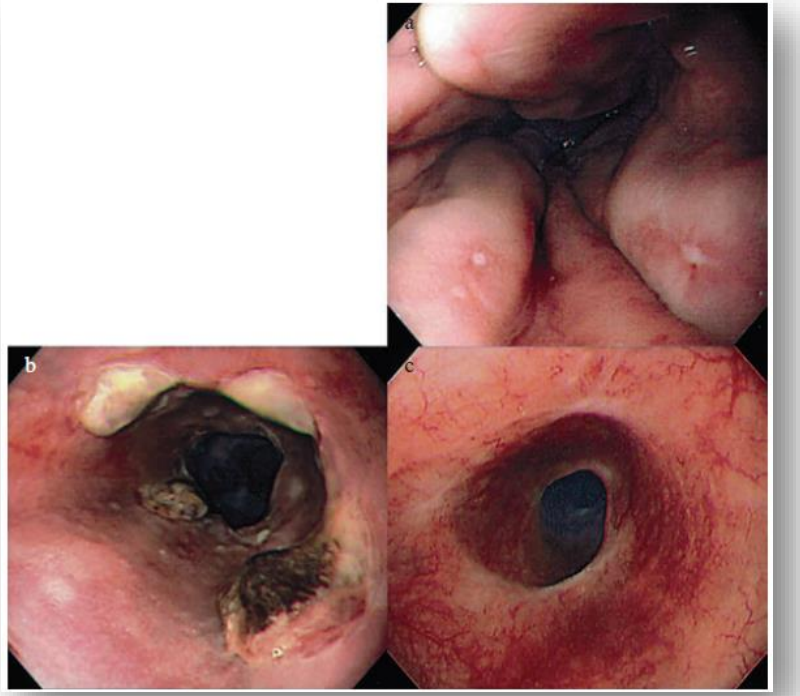
- During bleeding / After hemostasis
- During bleeding
  - Gushing
  - Spurting
- After hemostasis
  - Red plug
  - White plug

Bleeding Signs



Mucosal Findings

- E : erosion
- Ulcer : Ul
- Scar : S



Classification of Gastric Varices - JRSPH

- Relation to the cardiac orifice
  - Lg-c: adjacent to the cardiac orifice
  - Lg-cf: extension from the cardiac orifice to the fornix
  - Lg-f: localized to the fornix
  - Lg-b: located in the body
  - Lg-a: located in the antrum
- Size : similar to esophageal varices
  - F_1,F_2,F_3

Description

- In the order of the six main categories

  (L, F, C, RC, bleeding signs, and mucosal findings)

  - **Esophageal varices with RWM and CRS**

    : Ls, F_3, Cb,RC_3 (RWM, CRS)

  - Spurting bleeding from EV

    : Lm, F_2, Cb, RC_1 (CRS), spurting bleeding

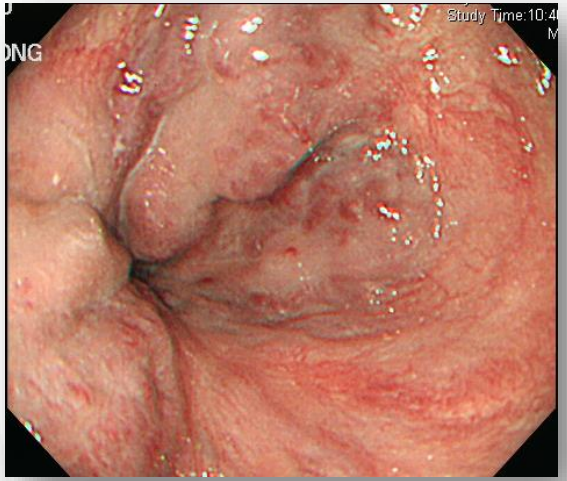
  - Esophageal varices and fundic varices

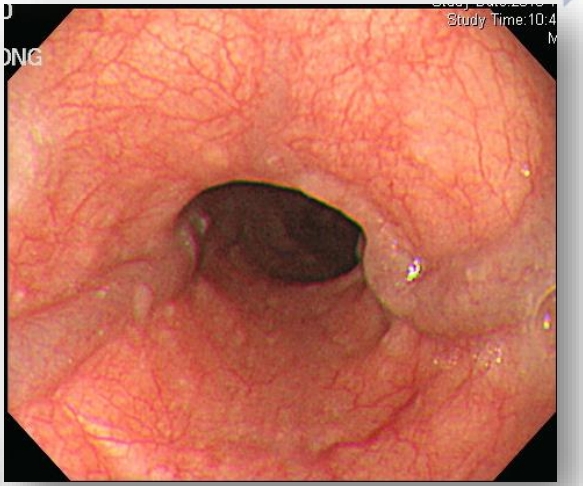
    : Ls, F_3, Cb,RC_2(RWM,CRS),Lg-f, F_2, RC_0

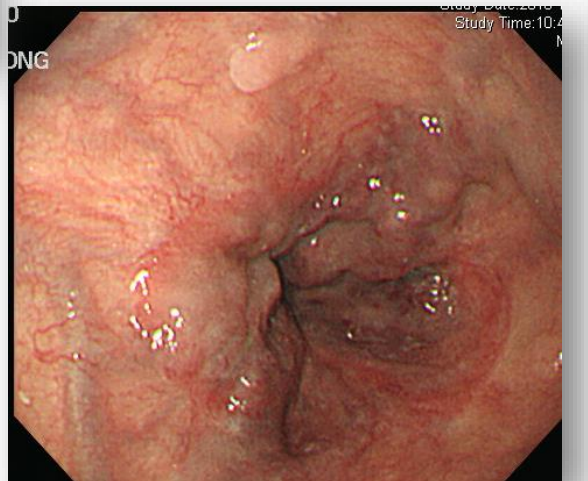
  - **Spurting bleeding from GV extending from the cardiac orifice to the fornix: Lg-cf, F_3, spurting bleeding**

Example

Lm, F2, Cb,RC2 (RWM, CRS)

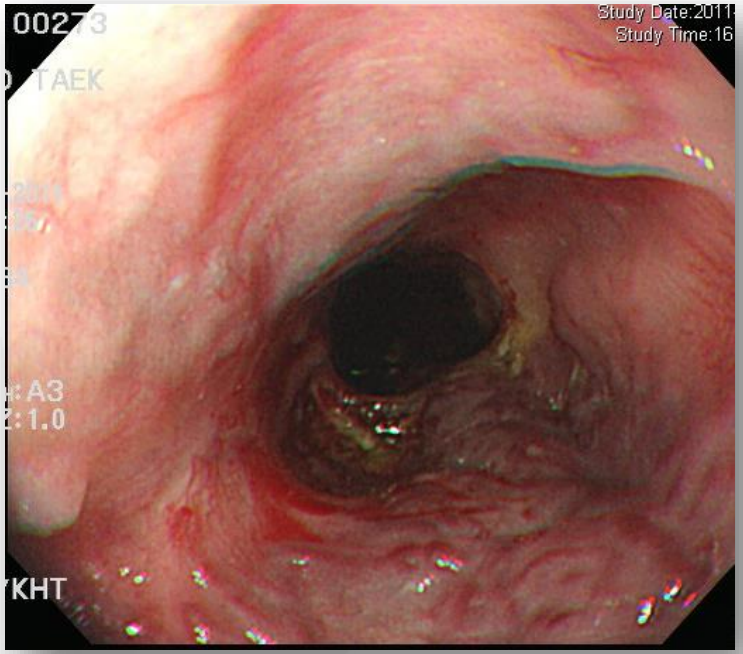


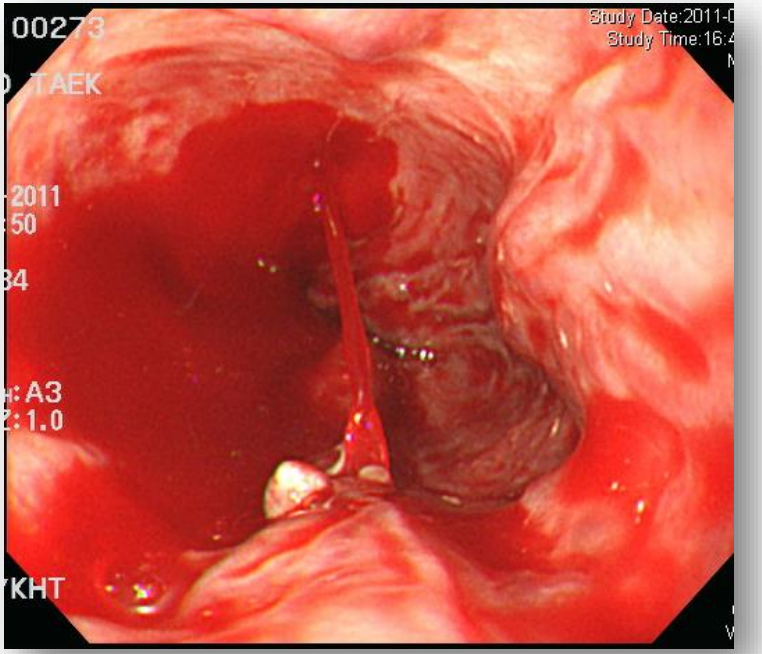




Example

Lm, F3, Cb, RC2 (RMW), spurting bleeding,S





Westaby classification

- Grade I

  : Varices flush with the wall of the esophagus

- Garde II

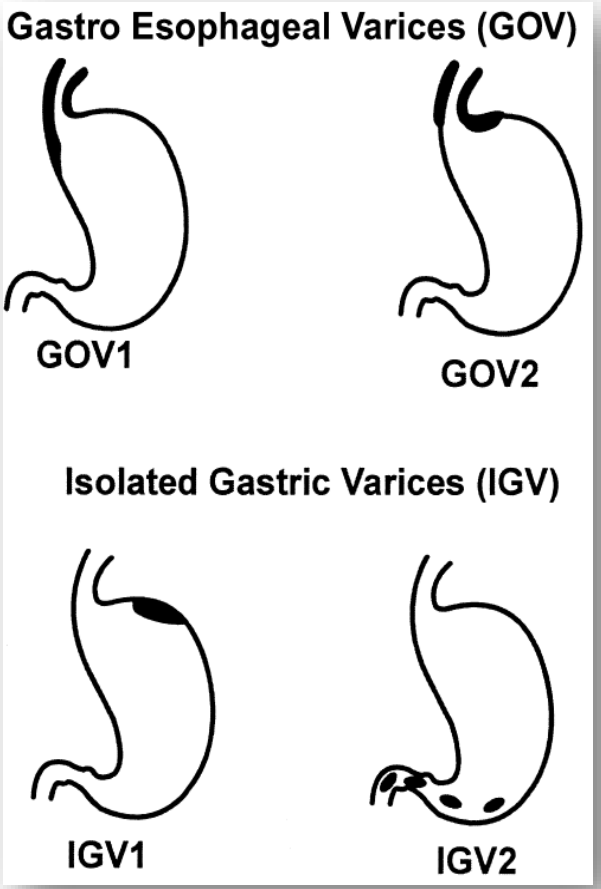
  : Varices protrude no more than half way to the center of the esophageal lumen

- Grade III

  : Varices protrude more than half way to the center of the esophageal lumen

Classification of Gastric Varices – Sarin's

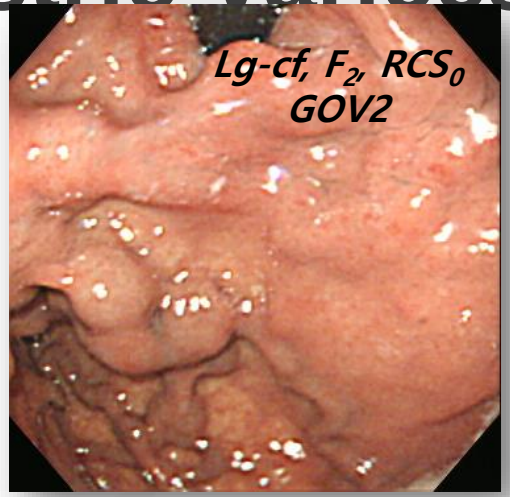
- Sarin's classification
  - GOV1: continuation of esophageal varices and extend for 2 to 5 cm below the GE junction along the LC side of the stomach
  - GOV2: continuation of esophageal varices and extend into the fundus
  - IGV1: isolated gastric varices located in the fundus
  - IGV2: isolated ectopic varices anywhere in the stomach

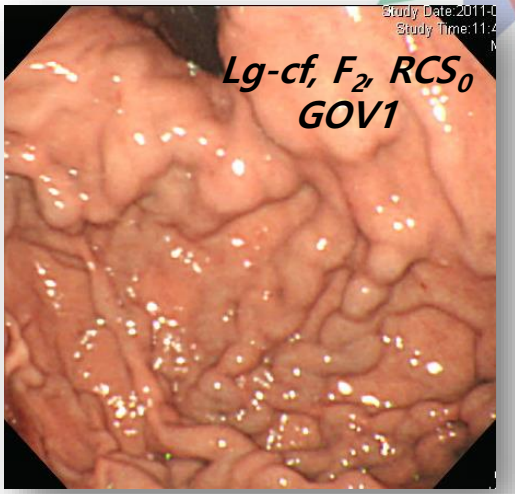


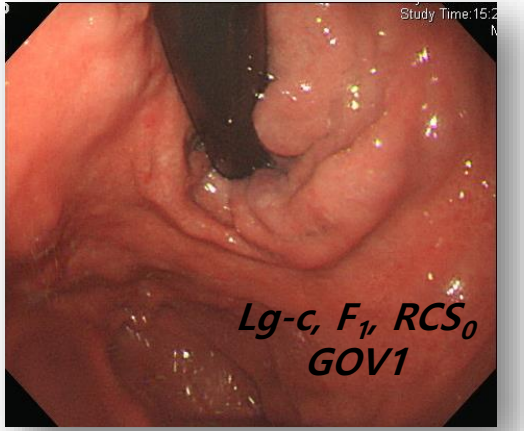
Classification of Gastric Varices

- Small: less than 10mm in diameter
- Medium: 10 to 20 mm in diameter
- Large: large greater than 20mm in diameter

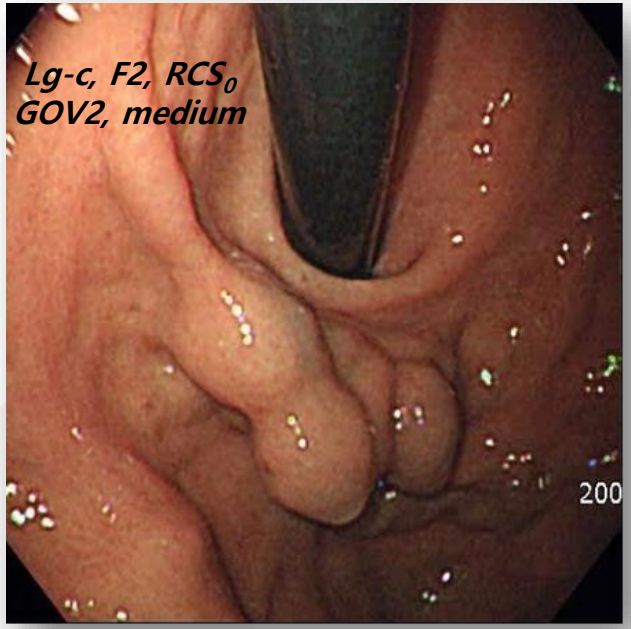
Gastric Varices

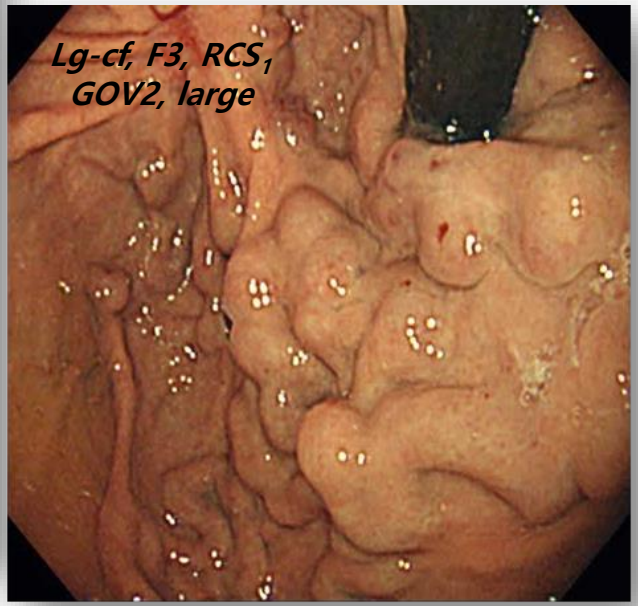


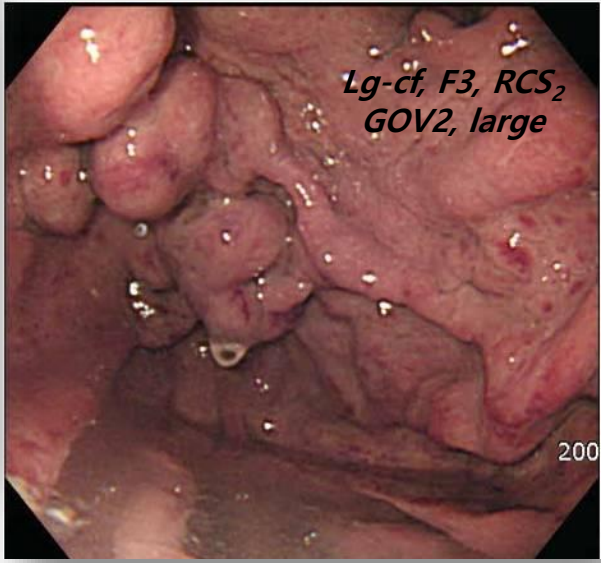




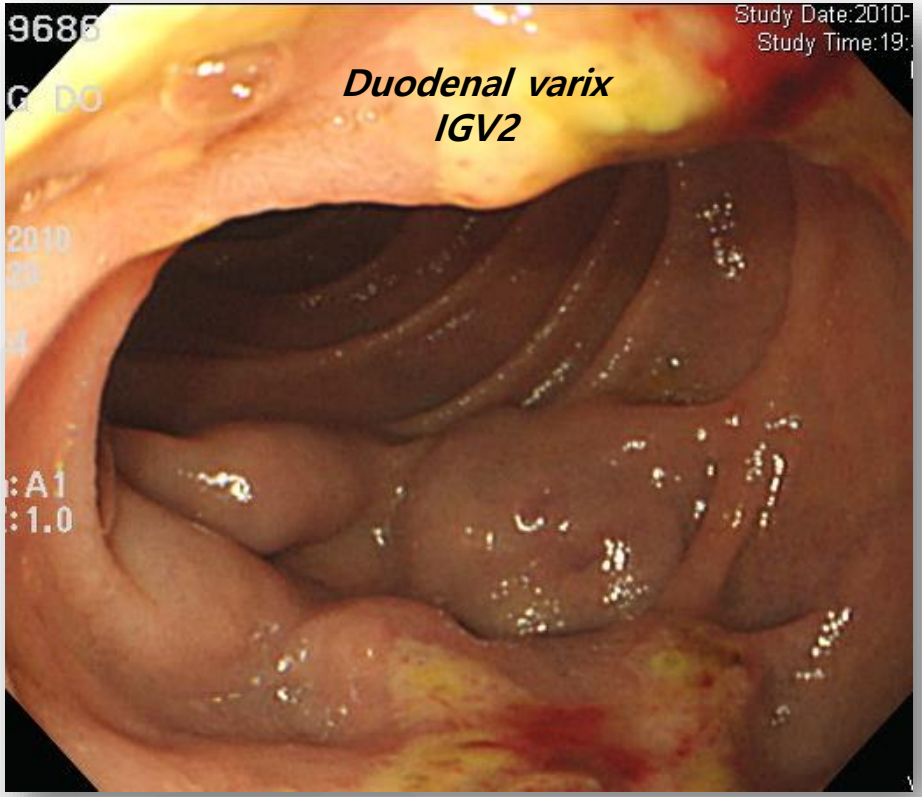
Gastric Varices

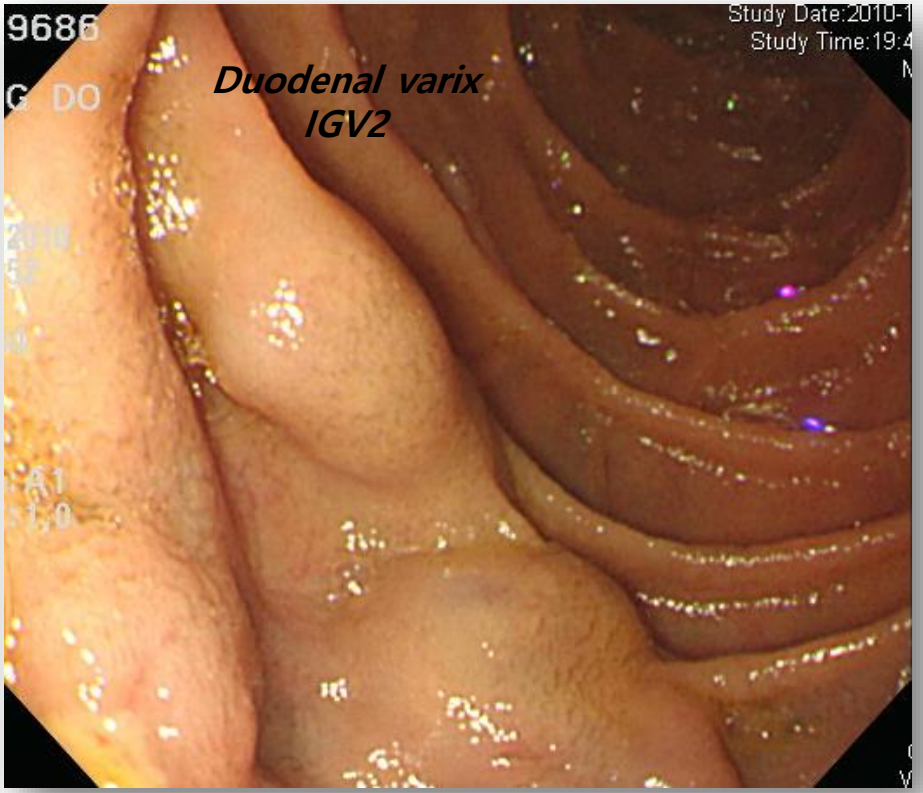






Ectpoic varix

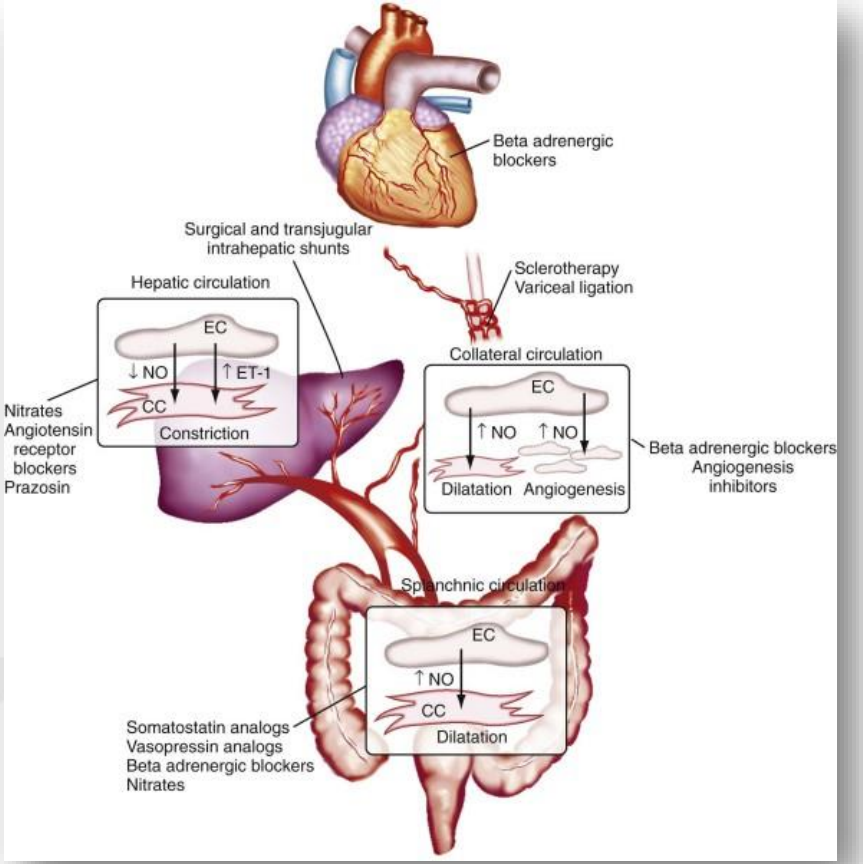




Screening Policy

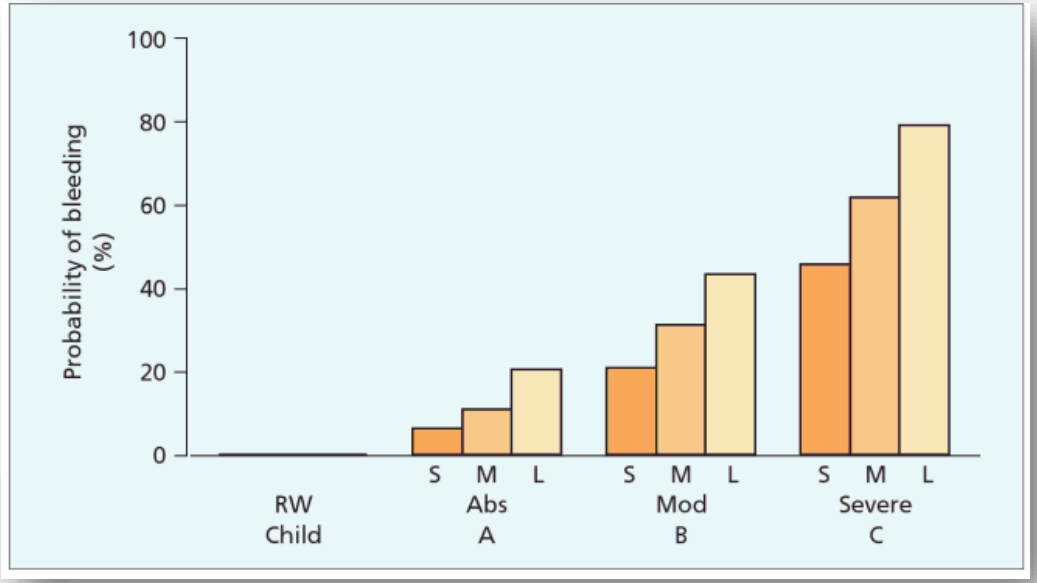
- All patients with a diagnosis of cirrhosis should be screened for varices with an EGD
  - No varices, repeat EGD in 2-3 years
  - Small varices, repeat EGD in 1-2 years
  - EGD once a year in patients with decompensation
  - No EGD follow up in patients on β-blockers

Therapeutic Options



Risk Stratification of Esophageal Varices

NIEC (North Italian Endoscopy Club) Index



NEJM 1988;31:983-9

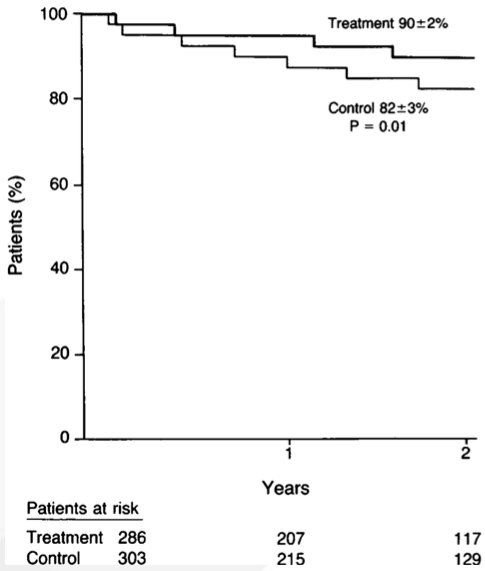
Therapies to Prevent the First Bleeding

- Pharmacological therapies
  - Nonselective β-blockers (NSB)
  - β_2 effect: splanchnic vasoconstriction, portal inflow↓
  - β_1 effect: cardiac output ↓, portal inflow↓
  - Propranolol or nadolol
- Endoscopic therapies
  - Endoscopic variceal ligation (EVL)

β-blockers : The evidences

589 Patients from 4 RCTs, NSB (286) *vs* Placebo (303)

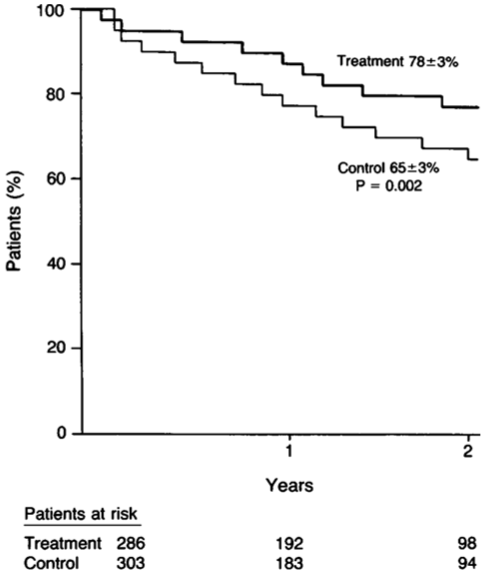
Overall Bleeding



Patients at risk

Treatment	286	207	117
Control	303	215	129

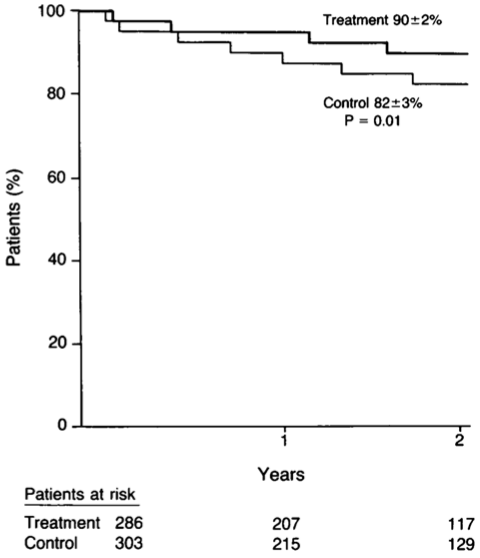
Fatal Bleeding



Patients at risk

Treatment	286	192	98
Control	303	183	94

Overall Survival



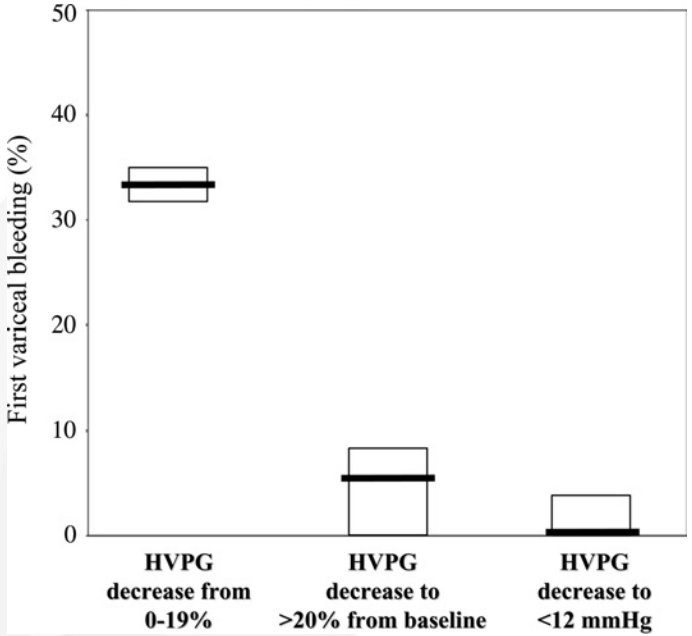
Patients at risk

Treatment	286	207	117
Control	303	215	129

NEJM 1991;19:475-505

Response Guided Therapy

- HVPG and bleeding



- Propranolol
  - Starting dose of **20mg Bid**
  - Increase to maximal tolerated dose until heart rate is **55/min**
  - Indefinite duration
- Nadolol
  - Starting dose of 40mg daily

β-blockers : Side Effects

- Withdrawal of the drug: in 15% - 20%
- Common adverse effects
  - Dizziness
  - Breathlessness
  - Fatigue
- Contraindication
  - Reactive airway disease
  - Peripheral vascular disease
  - DM

Endoscopic Variceal Ligation

- First introduced in 1989
- The blood flow is completely interrupted, producing ischemic necrosis of the mucosa and submucosa
- Granulation takes place, leaving shallow ulcerations that heal in 14 to 21 days
- EVL sessions are repeated monthly interval until eradication
- For large varices

EVL: The Evidences

Meta-Analysis of EVL *vs* No Treatment (5 trials, 601 subjects)

Outcomes*	RR (CI)	RR Reduction	NNT (CI)
First esophageal variceal bleed	0.36 (0.26-0.50)	64%	4 (3-6)
Bleed-related mortality	0.20 (0.11-0.39)	80%	7 (5-11)
All-cause mortality	0.55 (0.43-0.71)	45%	5 (4-9)

Hepatology 2001;33:802-807

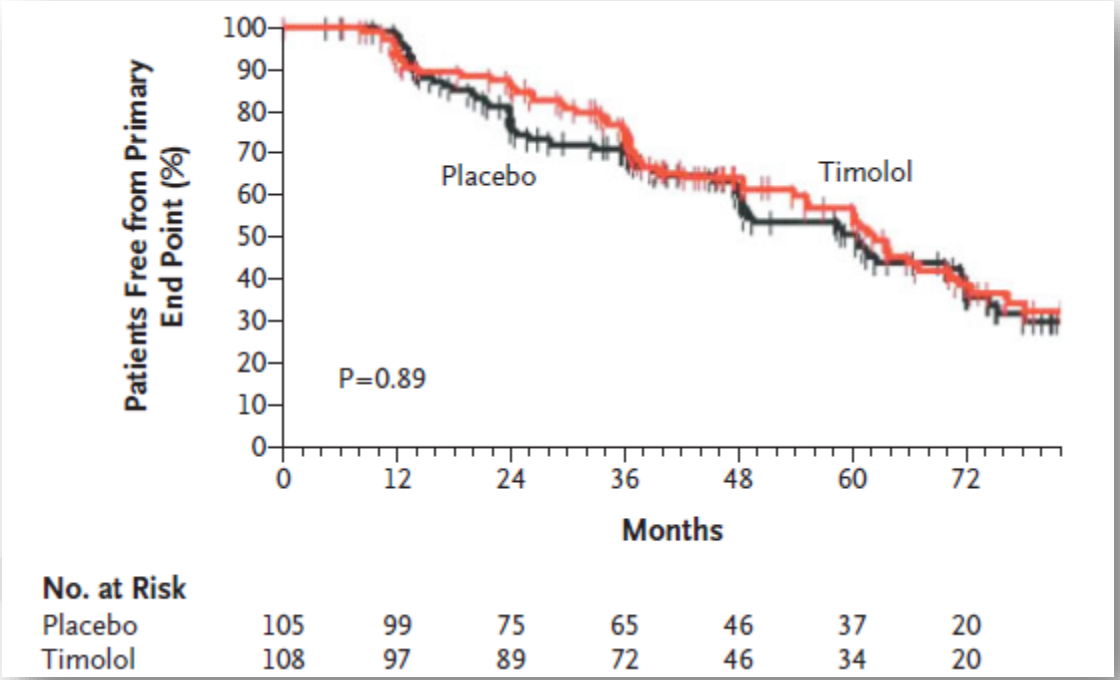
The Clinical Scenario of Primary Prophylaxis

- Patients with cirrhosis and without varices
- Patients with cirrhosis and small varices
  - With high risk of bleeding (Child B/C or RCS)
  - Without high risk of bleeding
- Patients with cirrhosis and medium/large varices
  - With high risk of bleeding
  - Without high risk of bleeding

Patients without Varices

- Repeat EGD in 2-3 years

Development of varix or variceal hemorrhage



NEJM 2005;353:2254-2261

Patients with small varices

- With high risk of bleeding (Child B/C or RCS)

  : Nonselective β blockers should be used

- Without high risk of bleeding

  : β blocker can be used (long-term benefit, not proven)

  or repeat EGD in 1-2 years

- Nonselective β-blockers in the prevention of first varceal hemorrhage in patients with small size varices

  : 7% *vs* 2% over 2 years, not significant

Semin Liver Dis 1999;19:475-505

Patients with medium/large varices

- Medium/large varices with high risk of bleeding

  : EVL or nonselective β blockers

- Medium/large varices w/o high risk of bleeding

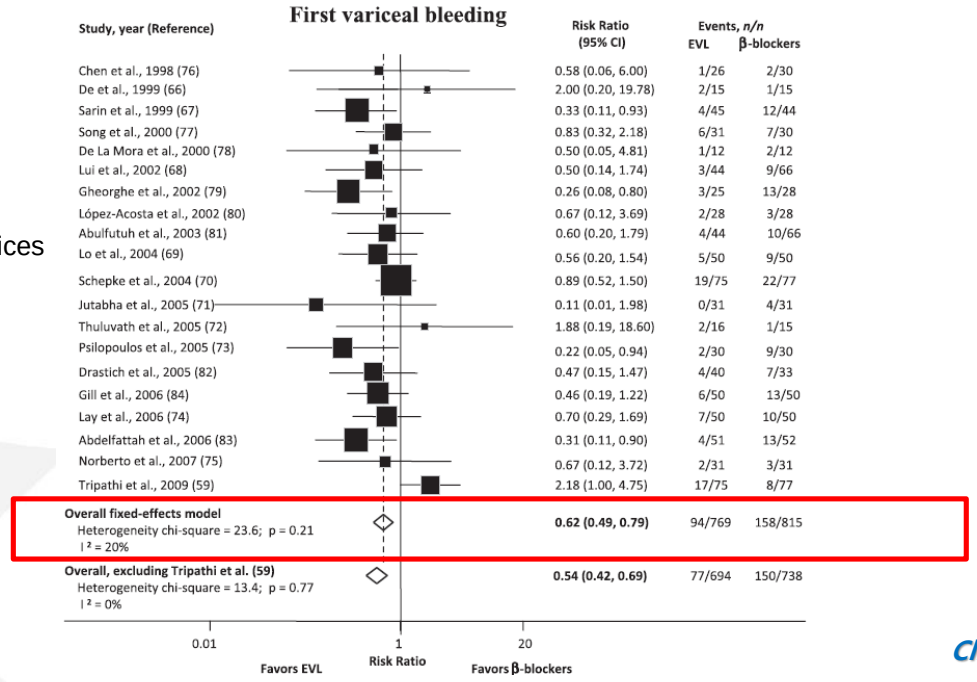
  : EVL or nonselective β blockers

  : β blockers are preferred and EVL in patients with contraindication or intolerance or non-compliance to β blockers (AASLD)

Patients with medium/large varices

Meta-Analysis of EVL *vs* β blockers (16 trials, 1318 subjects)

Patients with medium/large varices



Clin Liver Dis 2010;14:231-250

Prophylaxis of First Variceal Bleeding:Summary

Clinical Situation	Treatment	Goal	Duration	Follow up EGD
No varices	No			every 2-3 years
Small varices	β blockers may be recommended	Increase to maximal tolerated dose or until HR 55/min	Indefinite	Every 1 year Not in β blocker users
Small varices + RCS or child B/C	β blockers		Indefinite	No
Medium/Large varices	β blockers		Indefinite	
	EVL	Variceal eradication	Until eradication	3Mo, 6Mo, 1yr

Upper GI Bleeding in Cirrhosis

- Cirrhosis with upper GI bleeding (465 patients)
  - Esophageal varices (68%)
  - Gastric varices (11%)
  - Portal hypertensive gastropathy (6%)
  - Duodenal ulcer (3%)
  - Gastric ulcer (2%)

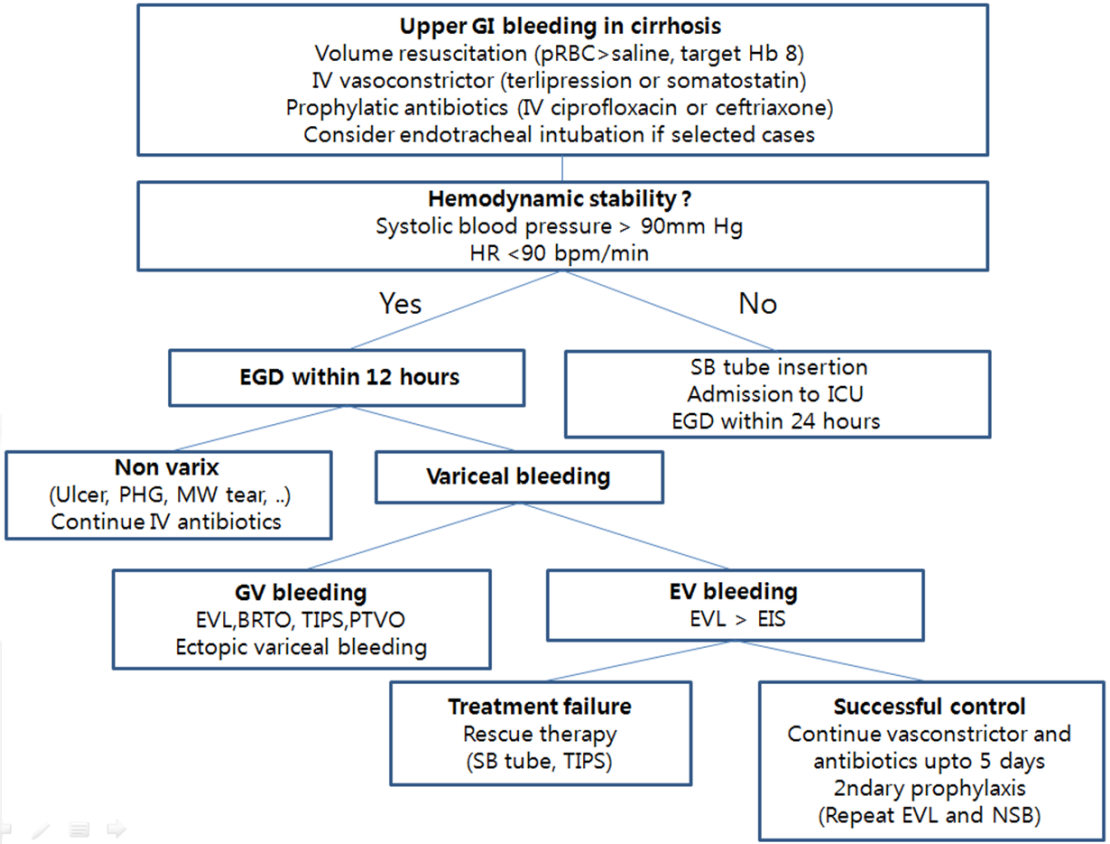
- **Upper GI bleeding in a cirrhotic patient must be presumed to be variceal origin until proven otherwise!!**

Hepatology 2003;38:599-612

Acute Variceal Hemorrhage (AVH)

- Gold standard of diagnosis : endoscopy
- Definition of AVH
  - In a patient with known or suspected portal hypertension
  - Presence of hematemesis within 24 h of presentation, and/or ongoing melena, with melena within last 24 h
- Recent bleed
  - Clinically significant bleed occurred within 6 weeks of presentation

Treatment Algorithm of AVH



Endoscopic Management of AVH

- Endoscopy as soon as the patient is hemodynamically stabilized in a monitored unit (at least 12 hrs)
- In endoscopy unit

  : Hemodynamically stable patient, no hepatic encephalopathy, no cardiopulmonary dysfunction
- Otherwise, in ER or ICU by portable device

Check List Before Endoscopy

- Patient

  : Vital sign, two IV lines, fluid (blood), O_2 supplement, consent

- Endoscopy unit

  : Check endoscope (suction), emergency cart, patient monitor, accessories, SB tube, at least 3 medical persons

- Preparation prior to endoscopy

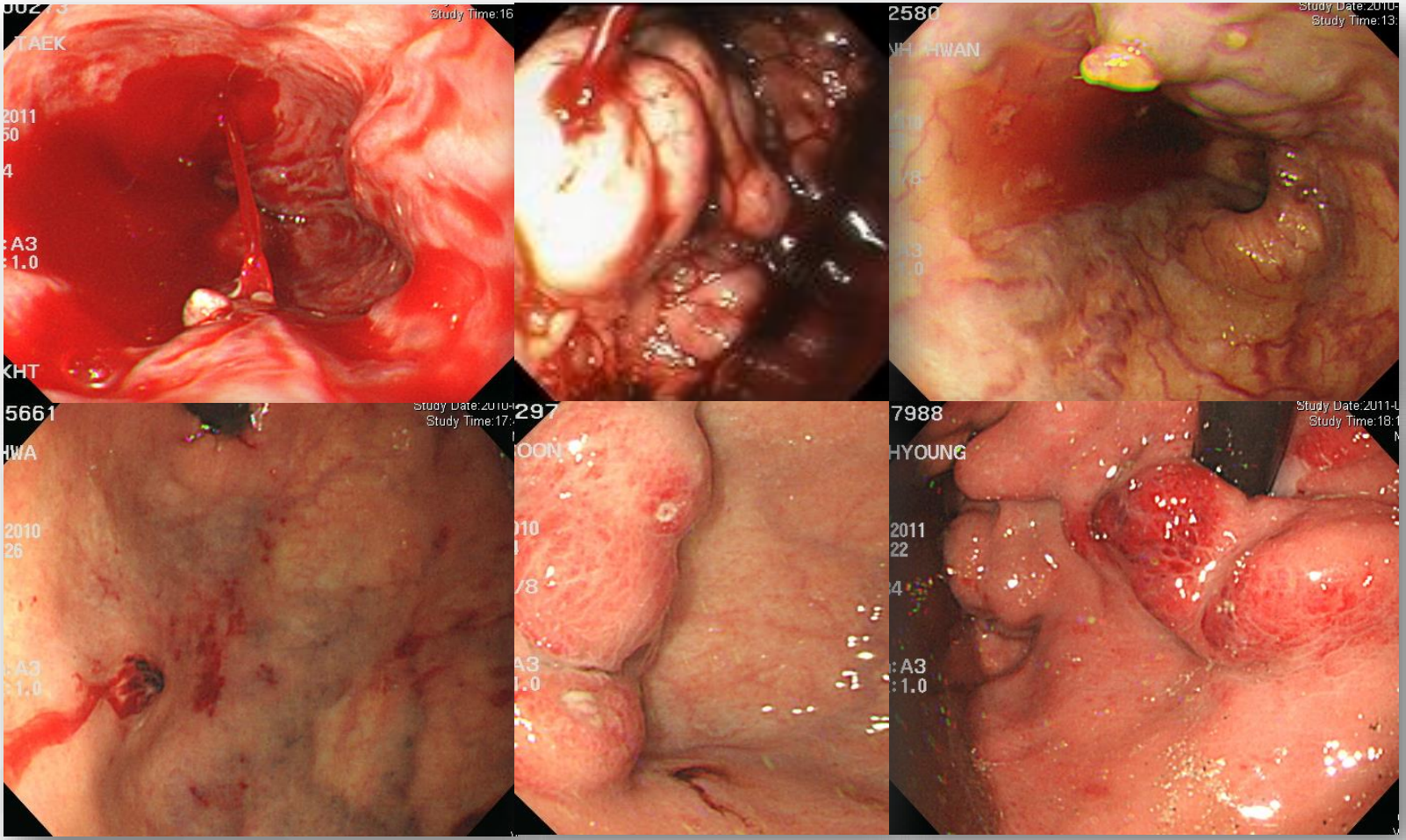
  : SBP>80 mmHg, intubation if necessary, IV drugs (vasoconstrictors, antibiotics, PPI)

- Routine sedation is not recommended

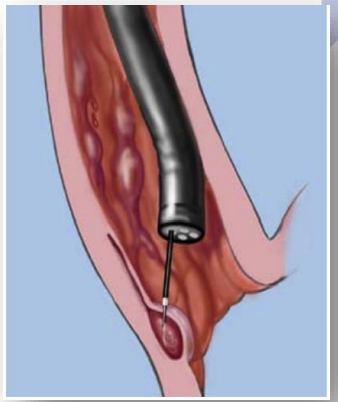
Diagnosis of Variceal Bleeding

- Bleeding from esophageal varices
  - Direct visualization of bleed issuing from an esophageal varix, usually spurting
  - Presence of a sign of recent bleed on a varix

    : white nipple sign or overlying clot
  - Presence of esophageal varices with red color signs and blood in the stomach in the absence of another source of bleeding
  - Presence of esophageal varices with red color signs and clinical signs of upper GI bleeding (hematemesis or melena), without blood in the stomach

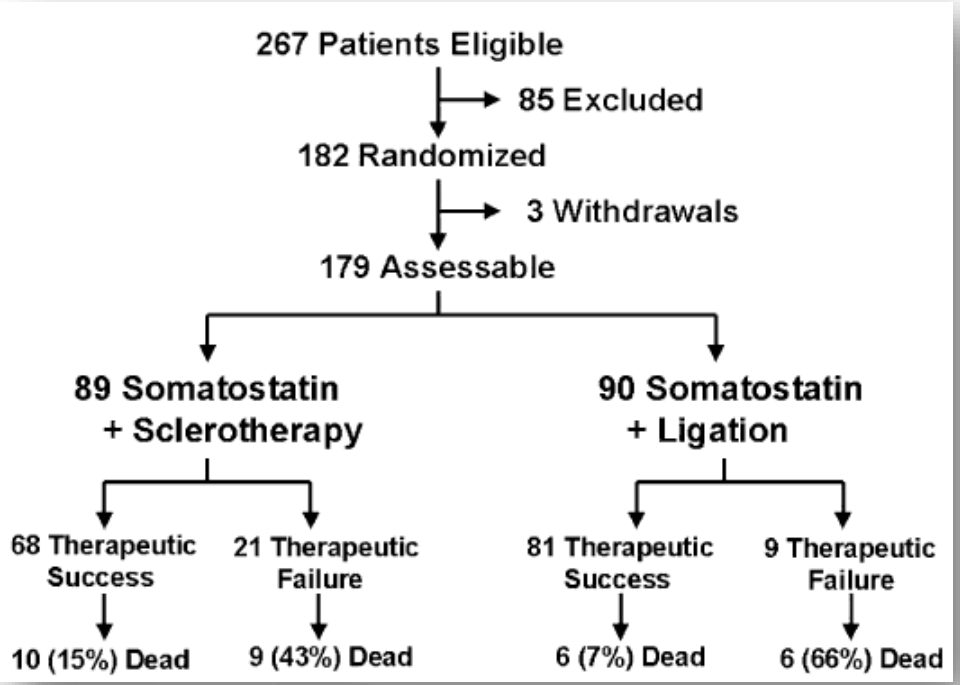


Role of Endoscopic Therapy in AVH



- Endoscopic band ligation
- Endoscopic sclerotherapy (ES)
  - Injection of a sclerosing agent (ethanolamine up to 10-15cc) into the variceal lumen (intravariceal) or adjacent to it (paravariceal)
  - Cause a thrombosis of the varix and inflammation of the surrounding mucosa
  - Disadvantage: esophageal ulcer, bacteremia
- EVL is more effective than ES with greater control of hemorrhage, lower rebleeding, and lower adverse events but without differences in mortality

EVL is better than ES



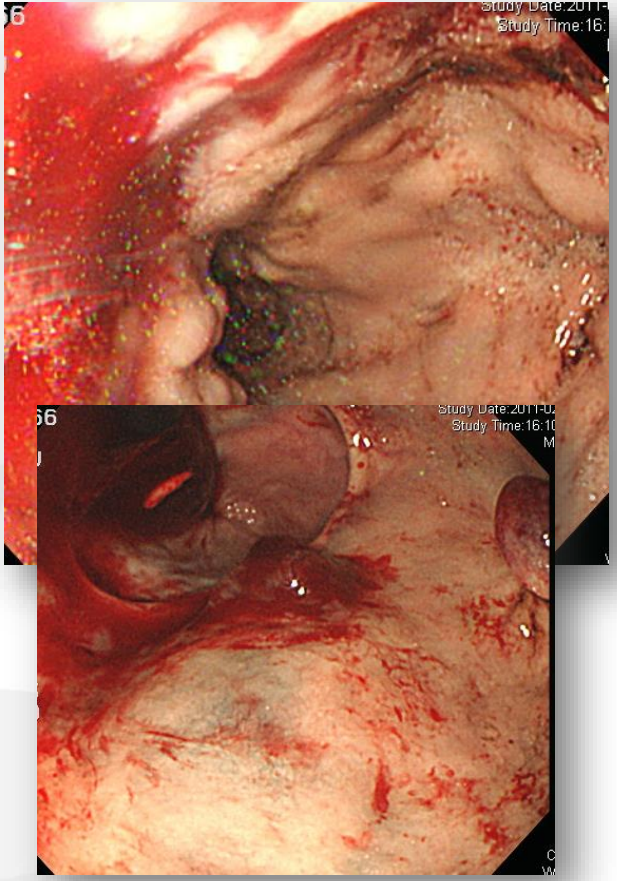
Side Effects

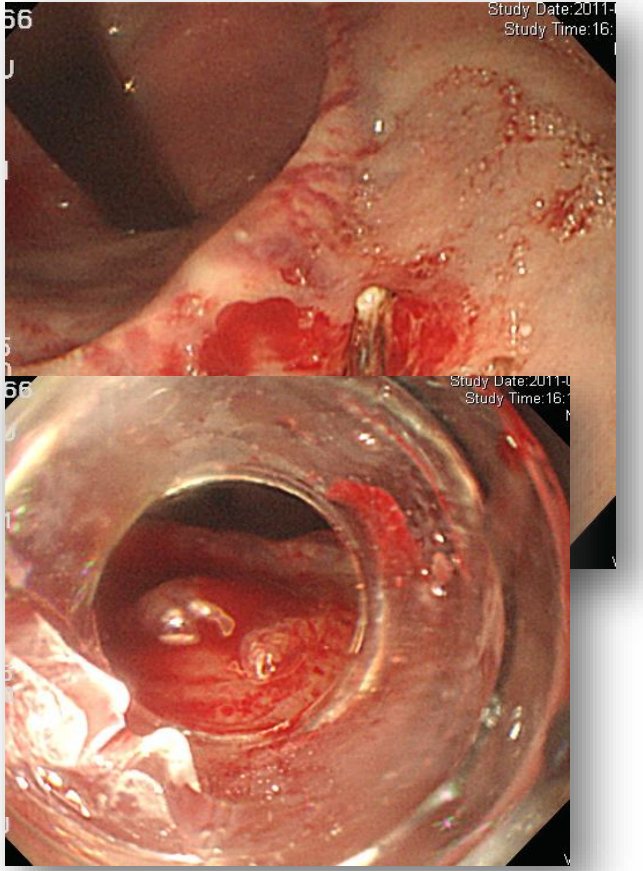
	ES	EVL	RR (95% CI)	*P*
Overall	25 (28%)	13 (14%)	1.9 (1.1-2.5)	0.03
Total	28	14		
Major	12 (13%)	4 (4%)	3.1 (1.1-9.1)	0.04
Minor	16 (18%)	10 (11%)	1.6 (0.8-3.4)	0.21

- Therapeutic failure 24% vs 10%, RR=2.4, 95% CI 1.1-4.9
- Failure to control bleeding 15% vs 4%, p = 0.02

J Hepatol 2006;45:560-567

Endoscopic Sclerotherapy





Failure to Control AVH

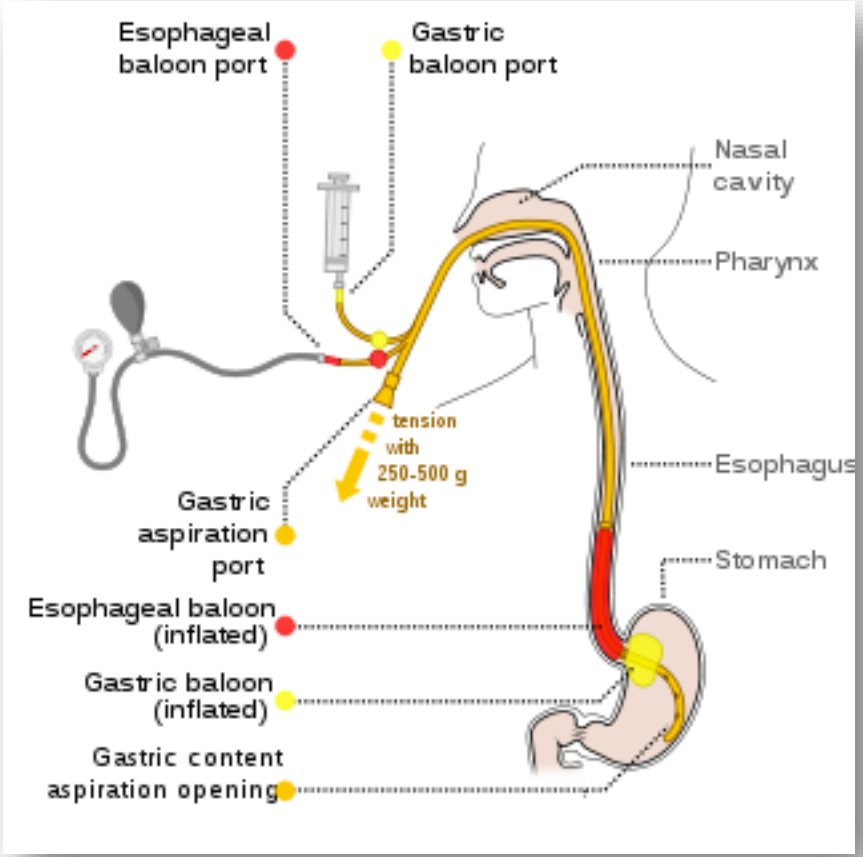
- 15-20% of patients with AVH

  : early rebleed or failure to control bleeding

- Failure to control AVH(within 48hr)
  - Direct visualization during endoscopy
  - Fresh hematemesis after 2hr of combination therapy
  - 2(or 3) drop in hemoglobin within 24h period without transfusion
  - Development of hypovolemic shock

Rescue Therapy – Balloon Tamponade

Sengstaken-Blakemore (SB) tube



Rescue Therapy – Balloon Tamponade

- Hemostasis by direct compression of bleeding varices
- Uncontrolled bleeding or massive and profuse bleeding
- Temporary ‘bridge’ therapy: maximum 24 hrs
- Pneumatic compression of the fundus and the lower esophagus, stop bleeding in 85% of cases
- Recurrence in half of the patients following deflation
- Complication (20-30%)

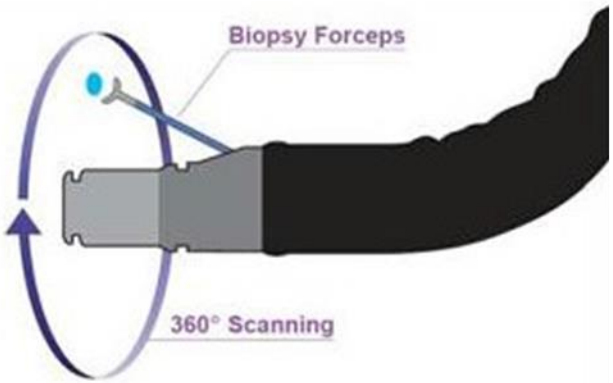
  : aspiration pneumonia, esophageal perforation
- If hemostasis is not achieved within 2 hrs, other therapeutic options should be tried

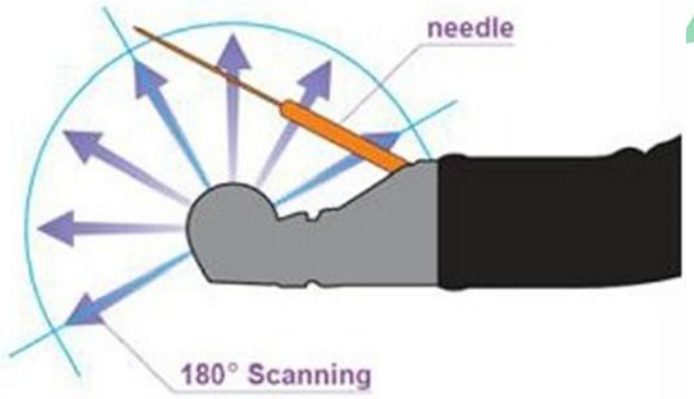
Rescue Therapy

- Second endoscopy
  - Carefully planned (if bleeding is mild and the patient is hemodynamicall y stable)
  - Need caution and more expertise

- TIPS
  - Shunt (surgical or TIPS) has clinical efficacy as salvage therapy
  - In patients whom hemorrhage from esophageal varices cannot be contr olled
  - Rebleeding despite combined pharmacological and endoscopic therapy

Pancreas





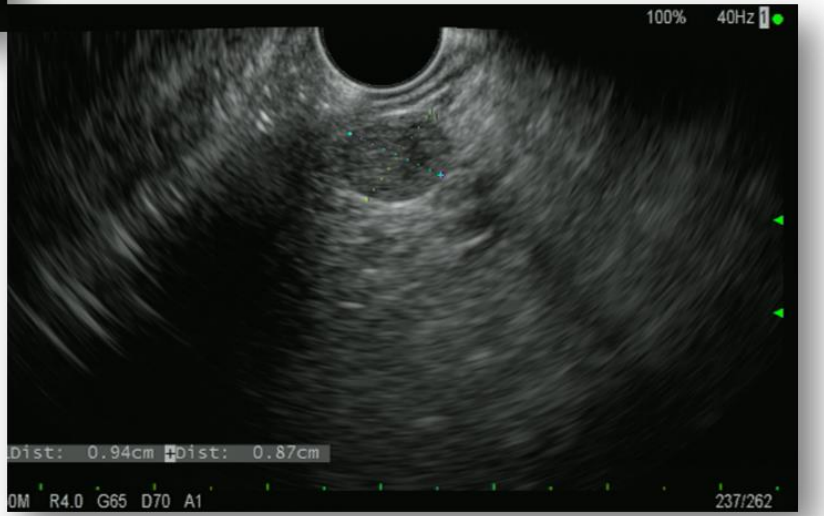
ORIGINAL ARTICLE: Clinical Endoscopy

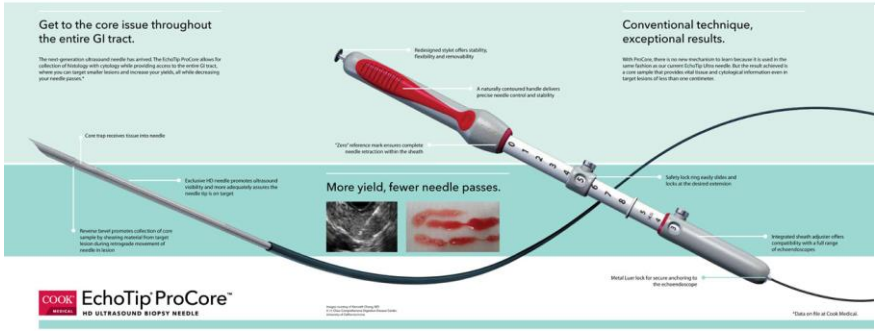
Linear-array EUS improves detection of pancreatic lesions in high-risk individuals: a randomized tandem study CME

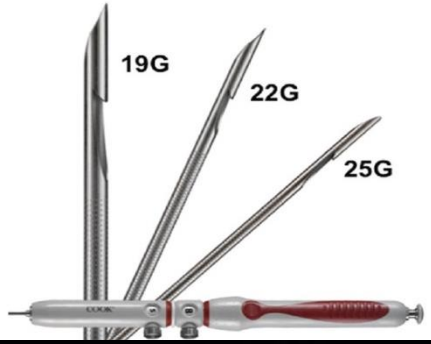
Eun Ji Shin, MD, PhD,[1] Mark Topazian, MD,[2] Michael G. Goggins, MD,[1] Sapna Syngal, MD, MPH,[3,4] John R. Saltzman, MD,[4] Jeffrey H. Lee, MD, MPH,[5] James J. Farrell, MD,[6] Marcia I. Canto, MD, MHS[1]

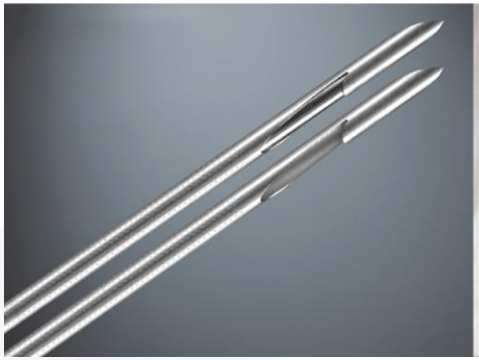
Baltimore, Maryland; Rochester, Minnesota; Boston, Massachusetts; Houston, Texas; New Haven, Connecticut, USA


100% 20Hz 2
1Dist: 1.00cm 2Dist: 0.58cm
7.50M R3.5 G66 D70 A1
75/76


100% 40Hz 1
Dist: 0.94cm Dist: 0.87cm
0M R4.0 G65 D70 A1
237/262


Get to the core issue throughout the entire GI tract.
The next-generation ultrasound needle has arrived. The EchoTip ProCore allows for collection of histology with cytology while providing access to the entire GI tract, where you can target smaller lesions and increase your yields, all while decreasing your needle passes.*
Redesigned stylet offers stability, flexibility and removability
A naturally contoured handle delivers precise needle control and stability
"Zero" reference mark ensures complete needle retraction within the sheath
Core trap receives tissue into needle
Exclusive HD needle promotes ultrasound visibility and more adequately assures the needle tip is on target
Reverse bevel promotes collection of core sample by shearing material from target lesion during retrograde movement of needle in lesion
More yield, fewer needle passes.
Safety lock ring easily slides and locks at the desired extension
Integrated sheath adjuster offers compatibility with a full range of echoendoscopes
Metal Luer lock for secure anchoring to the echoendoscope
Conventional technique, exceptional results.
With ProCore, there is no new mechanism to learn because it is used in the same fashion as our current EchoTip Ultra needle. But the result achieved is a core sample that provides vital tissue and cytological information even in target lesions of less than one centimeter.
*Data on file at Cook Medical.
COOK MEDICAL
EchoTip ProCore™
HD ULTRASOUND BIOPSY NEEDLE

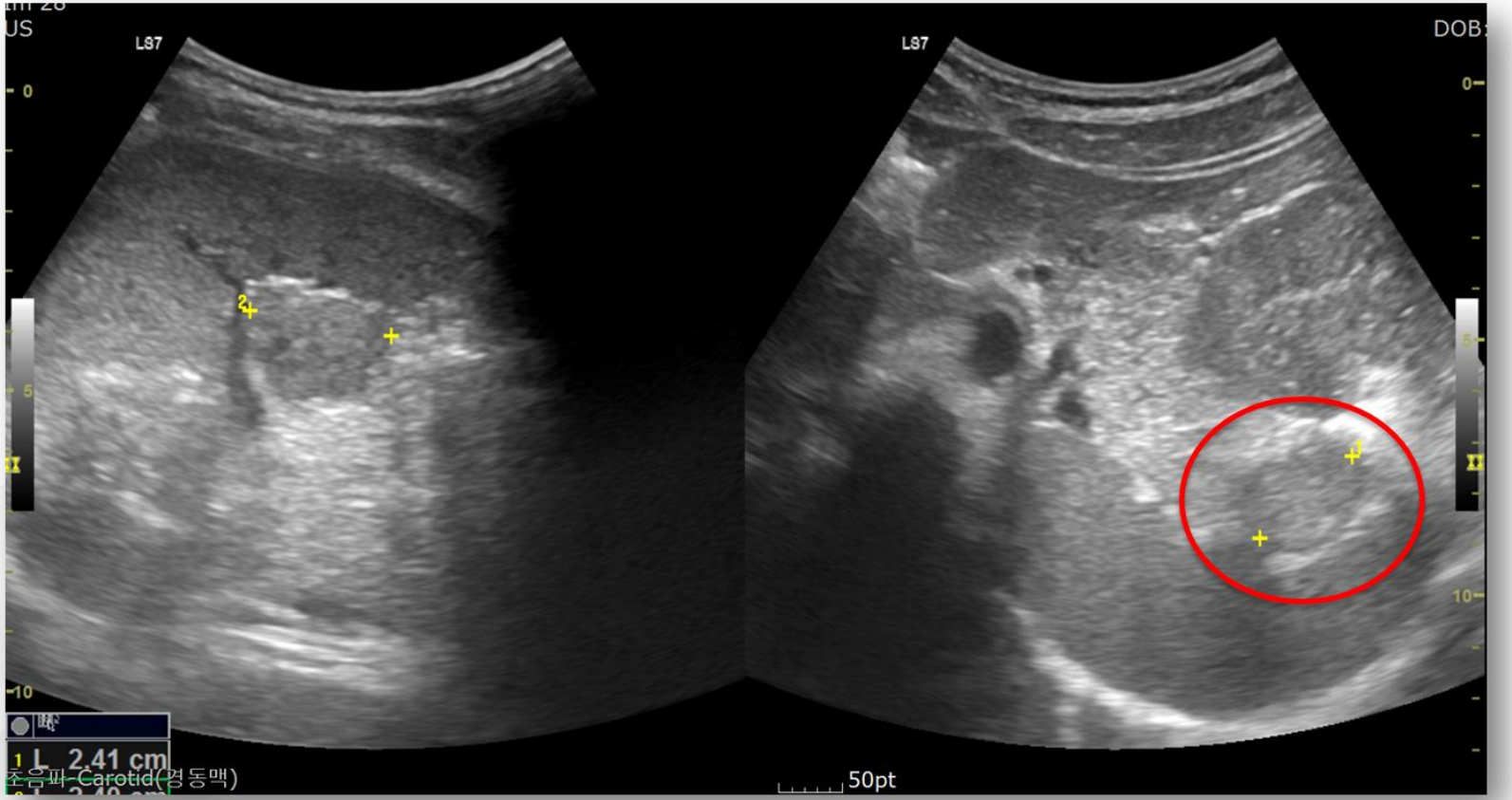

19G
22G
25G



Brief Hx.

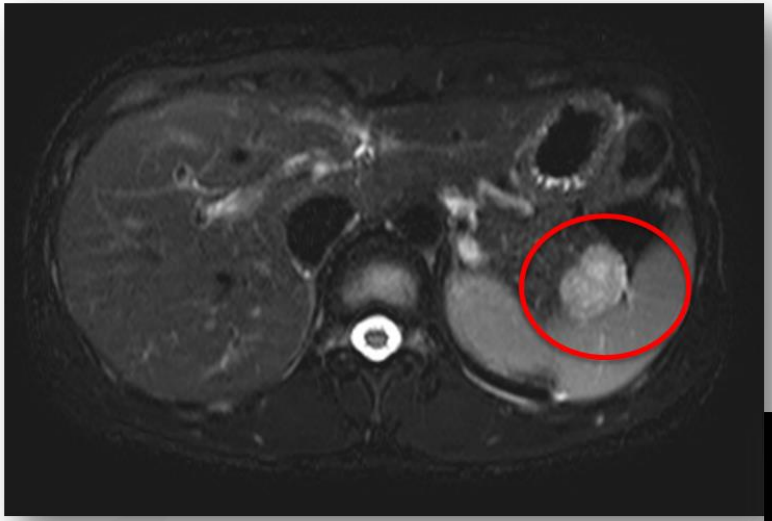
- 25세 여자
- 특이 과거력 없음
- 내원전 시행한 타병원 screening U/S상 splenic hilum에서 pancreatic tail로 abutting하는 약 2.3 cm크기의 mass로 내원함

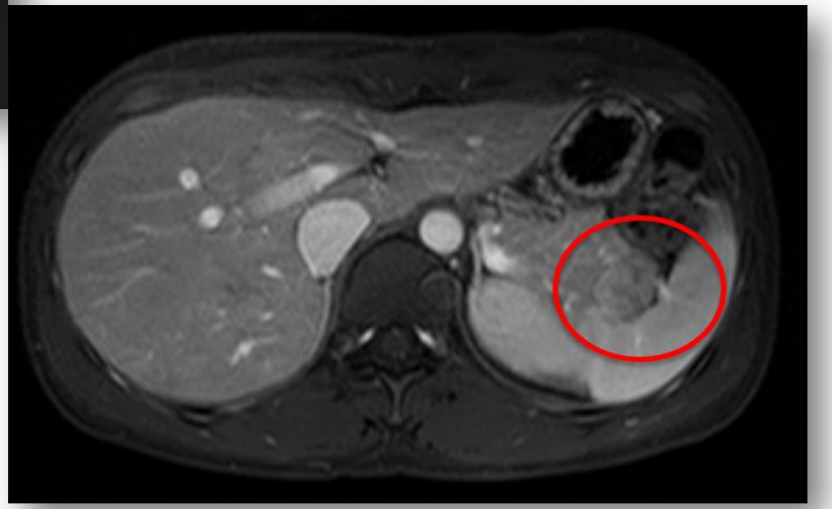
Outside LGP U/S image



CT scan

MR pancreas





What's your impression?

- **Impression**

1. Outside LGP US

→ Nodular lesion around splenic hilum abutting to pancreas tail

Imp) Large accessory spleen

2. CT scan at our hospital

→ A 2.5cm sized low attenuating mass in pancreas tail; delayed enhancement가 의심되며 p-duct dilatation은 없음.

--DDx> **microcystic serous cystadenoma, MCN, SPT**

Imp)?

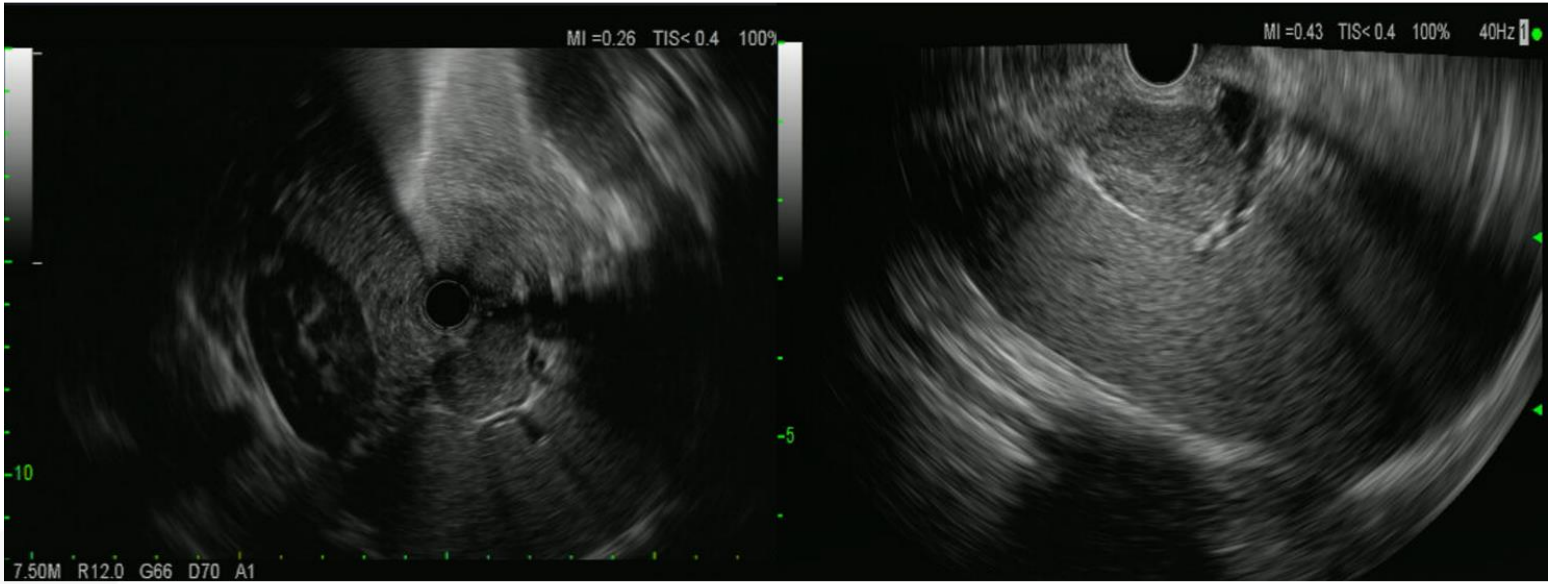
3. MR pancreas at our hospital

DDx> **R/O Solid pseudopapillary tumor**

R/O Solid endocrine tumor

R/O Accessory spleen

Radial and linear EUS



EUS

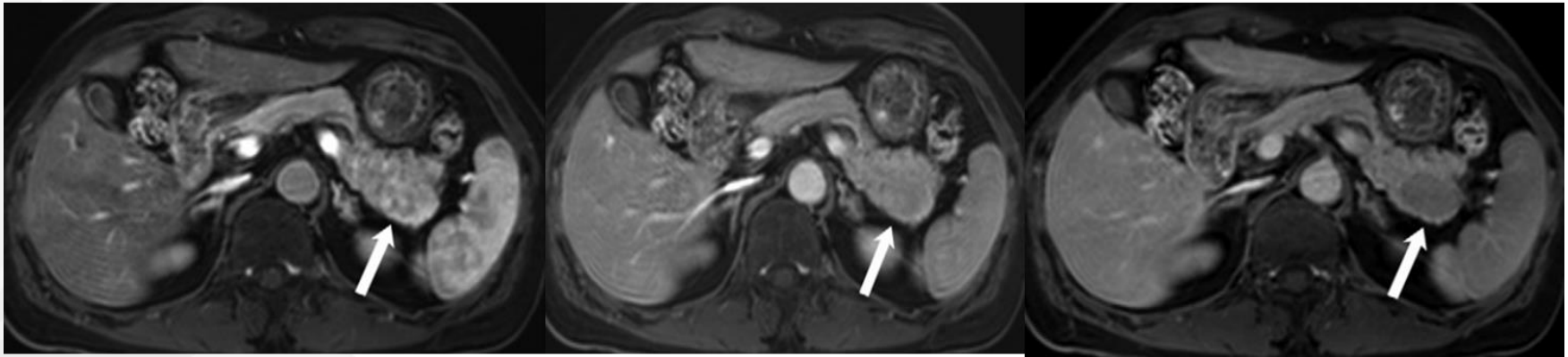
→ oval-shape , 2.5cm x 1.9 cm 크기의 heterogenous hypoechoic mass-like lesion이 관찰됨.Echotexture가 spleen과 비슷한 양상 으로 관찰됨

Imp) Intrapancreatic accessory spleen

Differentiation of Intrapancreatic Accessory Spleen from Small Solid Pancreatic Tumor

Accessory spleen, also referred as splenunculi.

- Common congenital defect
- **10-30% of population**
- Easily misdiagnosed as PNET because of their hypervascular appearance.

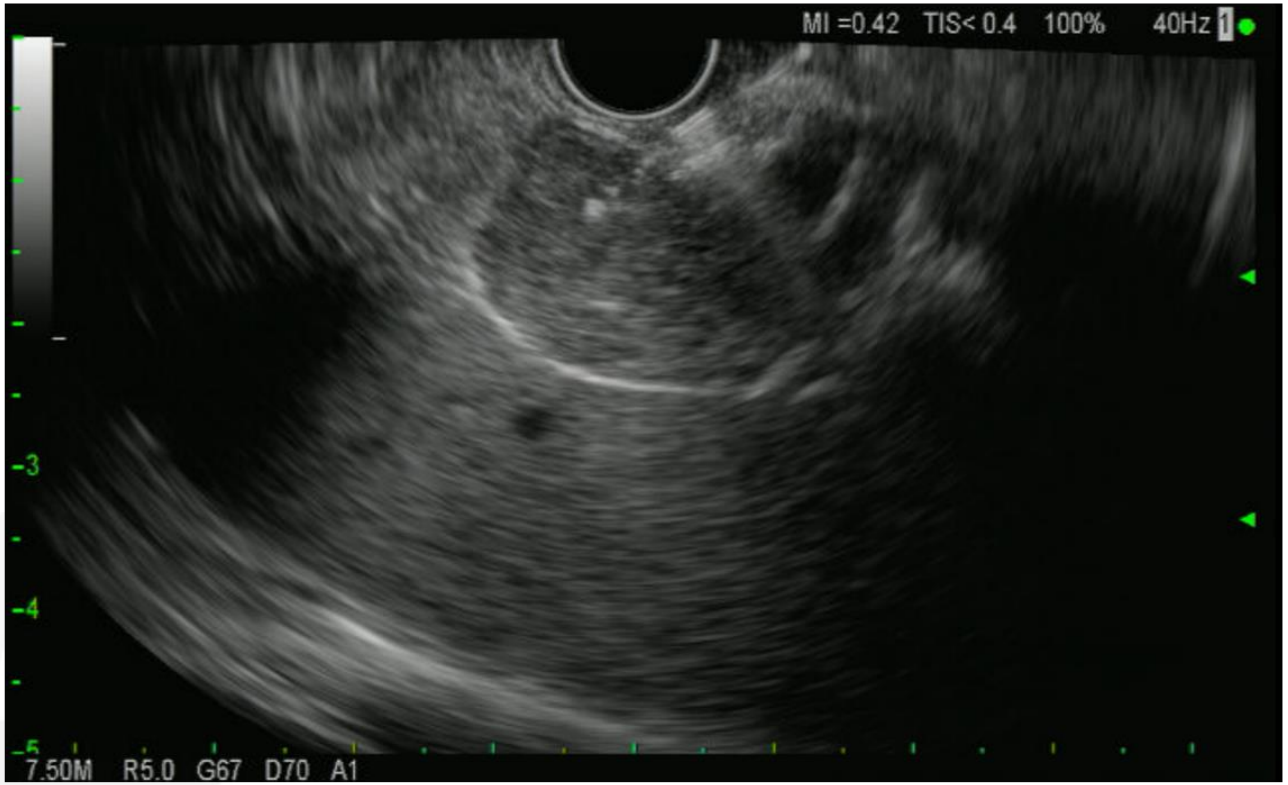


Signal Intensities of IPAS and Small Solid Tumors of the Pancreas Compared with Spleen Parenchyma

Imaging and Intensity	IPAS (n = 20)	Small Solid Tumor (n = 22)	P Value
TI weighted			.050
Hyperintensity	0 (0)	1 (4)	
Isointensity	17 (85)	11 (50)	
Hypointensity	3 (15)	10 (46)	
T2 weighted			.001
Hyperintensity	1 (5)	8 (36)	
Isointensity	19 (95)	9 (41)	
Hypointensity	0 (0)	5 (23)	
Gadoxetic acid enhanced			
Arterial phase			< .0001
Hyperintensity	0 (0)	6 (27)	
Isointensity	20 (100)	4 (18)	
Hypointensity	0 (0)	12 (55)	
Portal phase			< .0001
Hyperintensity	0 (0)	9 (41)	
Isointensity	20 (100)	5 (23)	
Hypointensity	0 (0)	8 (36)	
Late phase			< .0001
Hyperintensity	0 (0)	9 (41)	
Isointensity	20 (100)	9 (41)	
Hypointensity	0 (0)	4 (18)	

Radiology 2013; 266:159–167

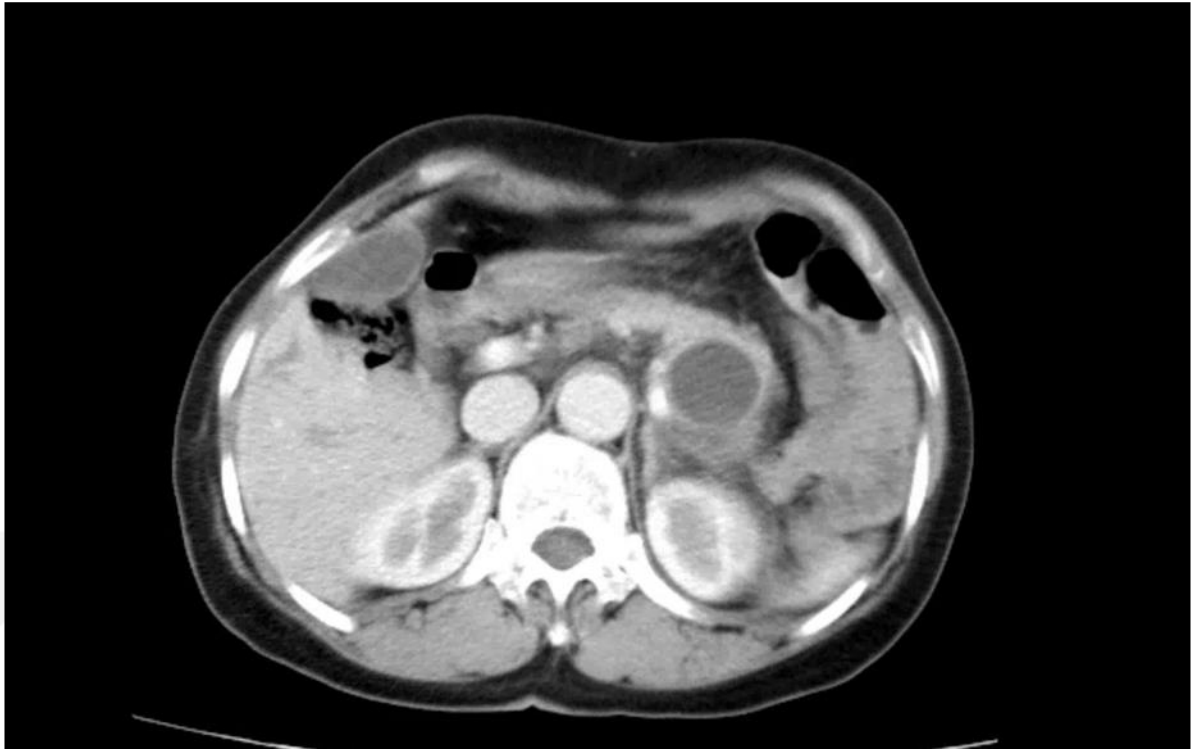
EUS-guided FNAB



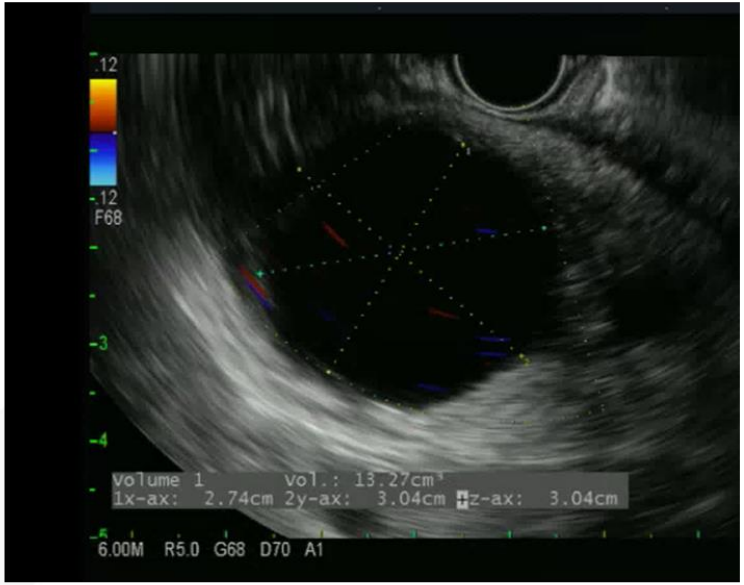
Pancreas, tail, EUS-guided needle biopsy::

Solid pseudopapillary neoplasm

M/61 Pancreatic mass로 내원



Cystic fluid analysis using EUS

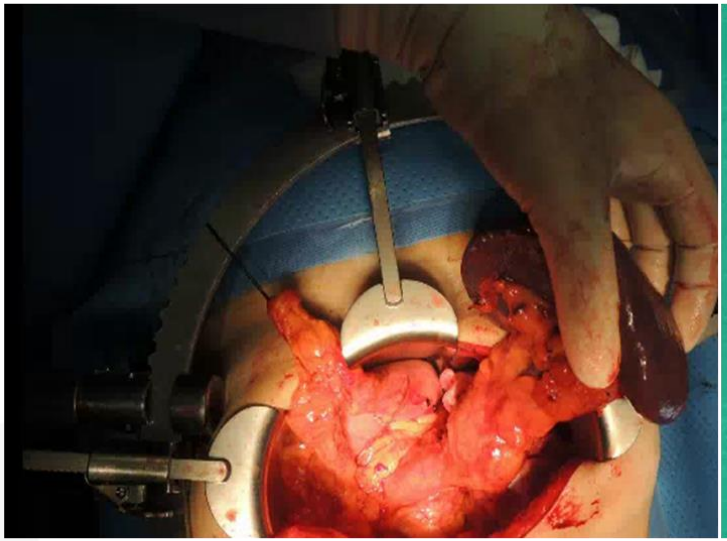


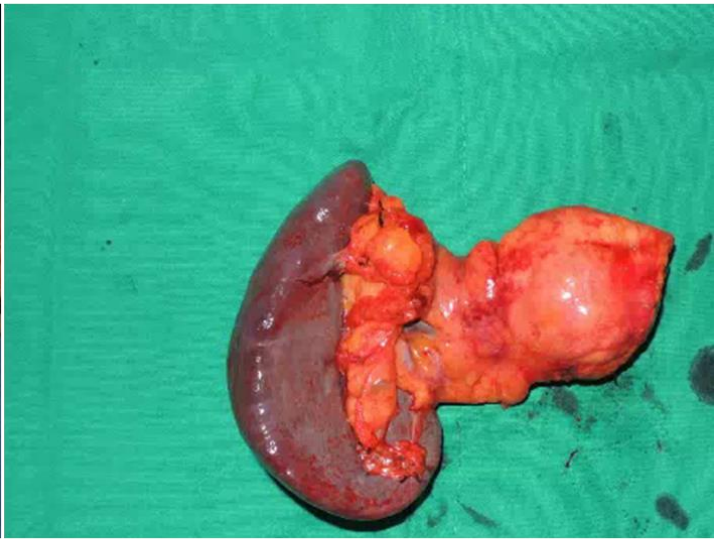
검 사 결 과

시계열 조회

검사일시	검 사 명	결 과	+/-	Max	Min	Rmk	수정
2014-07-01 08:35	CEA <ASCITIC FLUID> EUS guided pancreatic cyst drainage	2048 ng/mL					
2014-07-01 08:35	CA 19-9 <ASCITIC FLUID> EUS guided pancreatic cyst drainage	>10000 U/ml					

OP





K: mesocolic mass DIAGNOSIS :

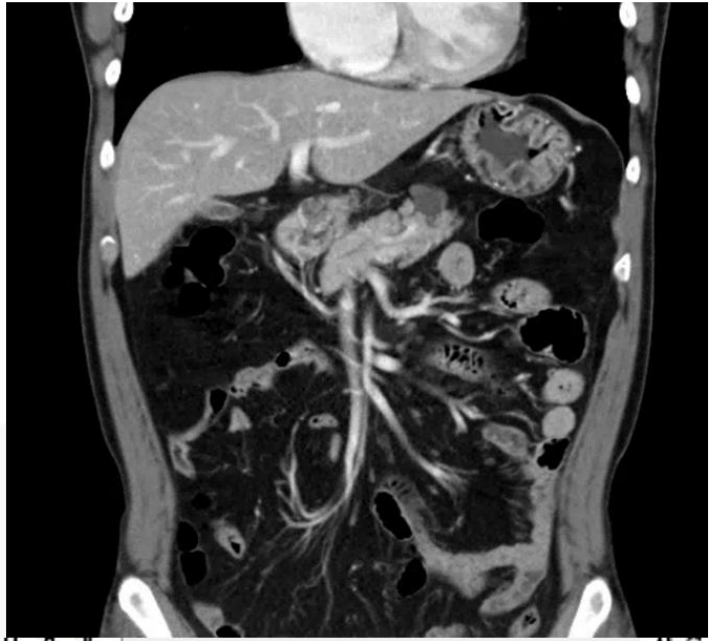
Pancreas, distal pancreatectomy:

1. Mucinous cystic neoplasm with low grade dysplasia
   - Size: 2.5 cm
   - confined to the pancreas
   - lymphovascular invasion: (-)
   - perineural invasion: (-)
   - clear surgical resection margin
2. Chronic pancreatitis with fibrosis and atrophy

Spleen, splenectomy:

No diagnostic abnormality recognized

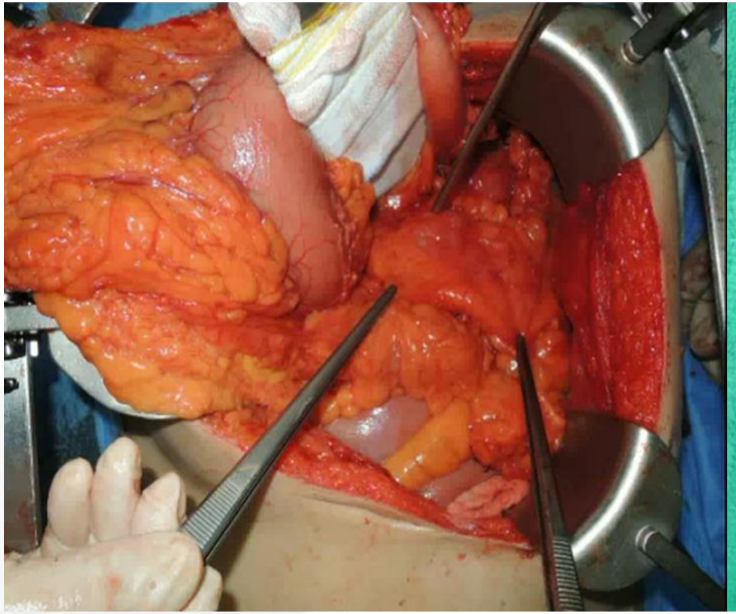
58/M 우연히 발견된 췌장낭종

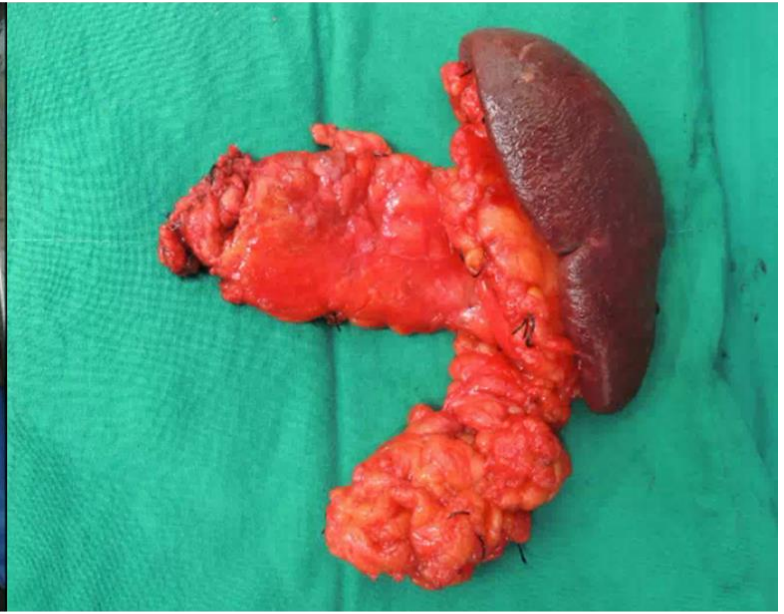


검사일시	검 사 명	결 과
-10-07 08:40	CEA <ASCITIC FLUID> EUS guided pancreatic cyst drainage	44.14 ng/m
-10-07 08:40	CA 19-9 <ASCITIC FLUID> EUS guided pancreatic cyst drainage	63.70 U/m

검사일시	검 사 명	결 과	+/-	Max	Min	Rmk	수정
-10-06 16:32	Amylase(Ascitic Fluid) [응] <ASCITIC FLU	>2400 IU/L					
	ID> EUS guided pancreatic cyst drainage						

OP



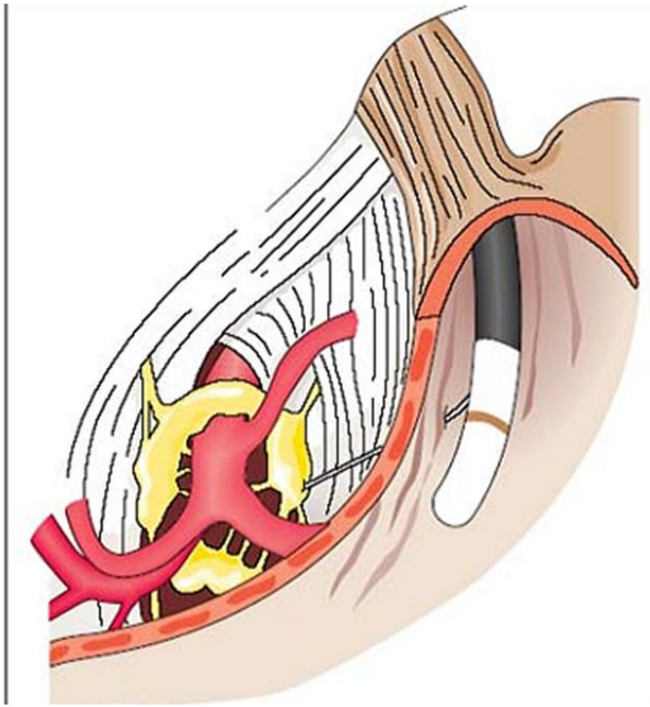


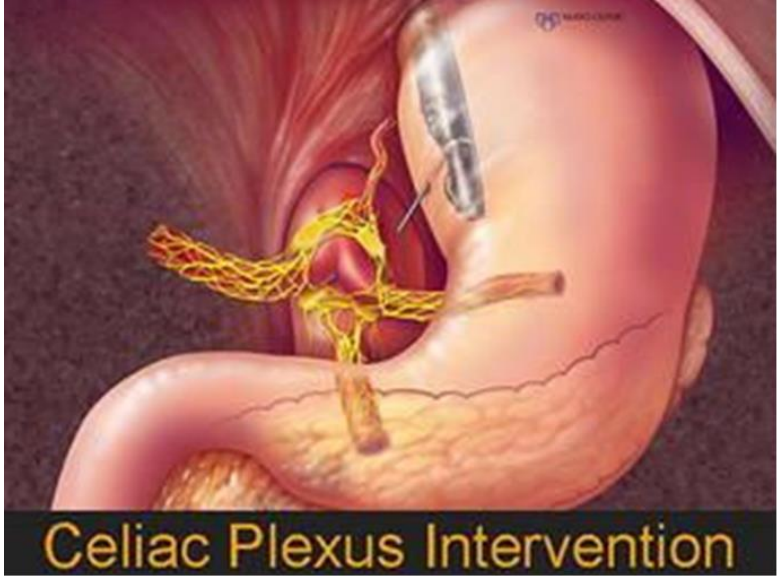
2014-10-22 Distal pancreatectomy

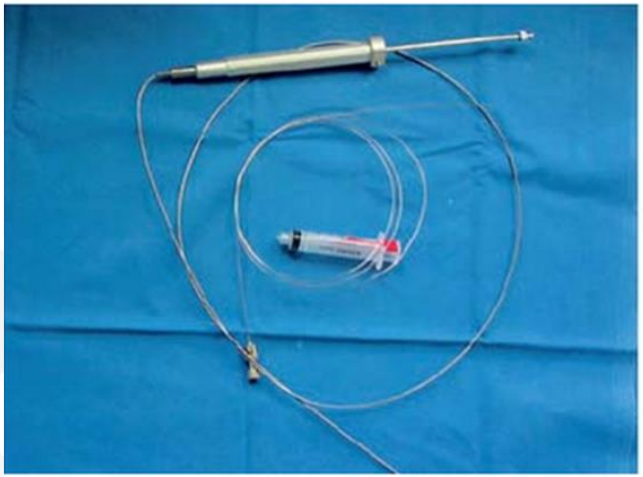
DIAGNOSIS :
Pancreas, body, distal pancreatectomy:
Intraductal papillary mucinous neoplasm with intermediate-grade dysplasia,
with clear resection margin

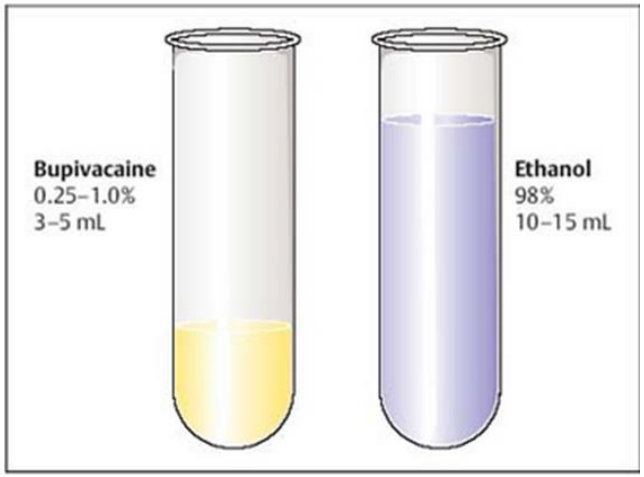
F/U lab : WNL
F/U tumor marker : WNL (CA 19-9 7.31)

Endoscopic ultrasound-guided celiac plexus blockade



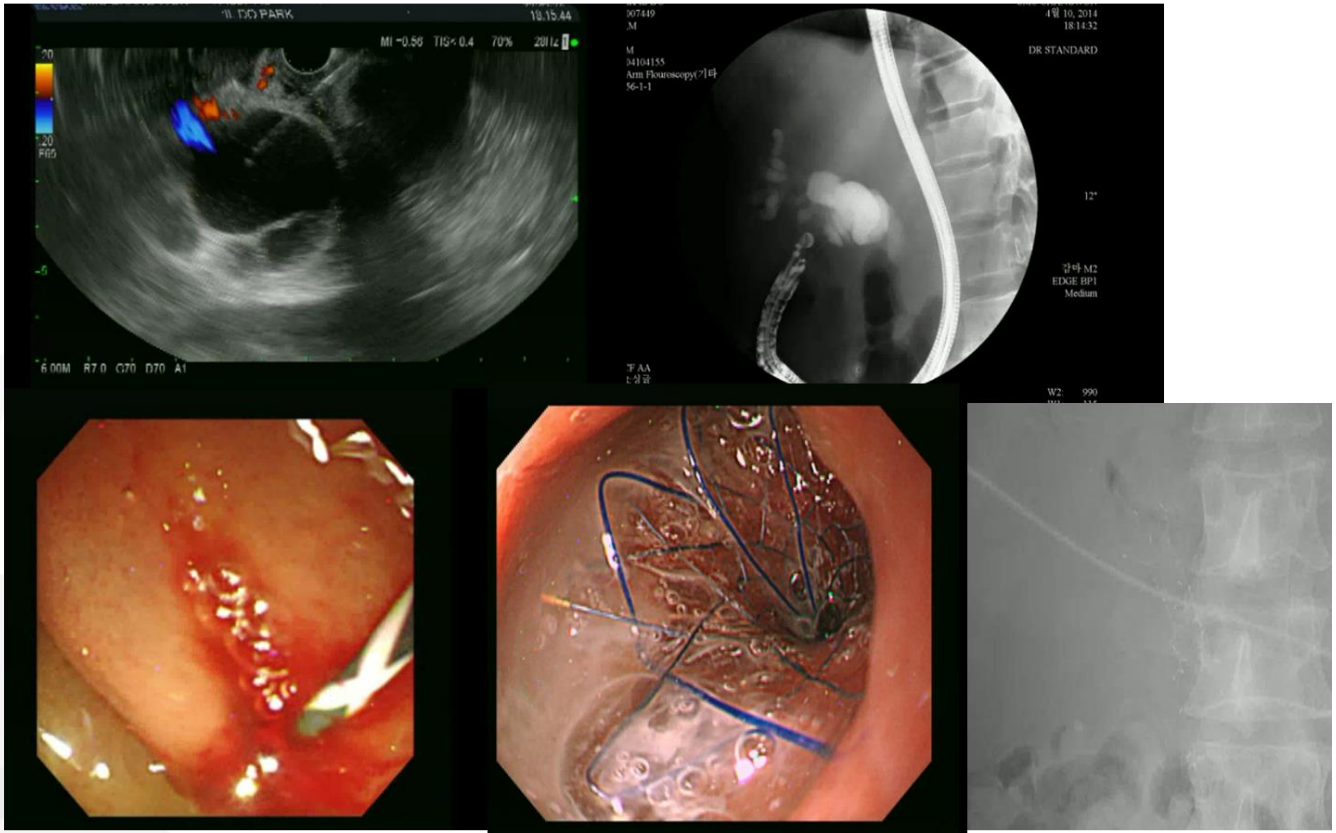

Celiac Plexus Intervention




Bupivacaine
0.25–1.0%
3–5 mL
Ethanol
98%
10–15 mL

M/58 pancreatic cancer

EUS-guided choledochoduodenostomy



Biliary tract

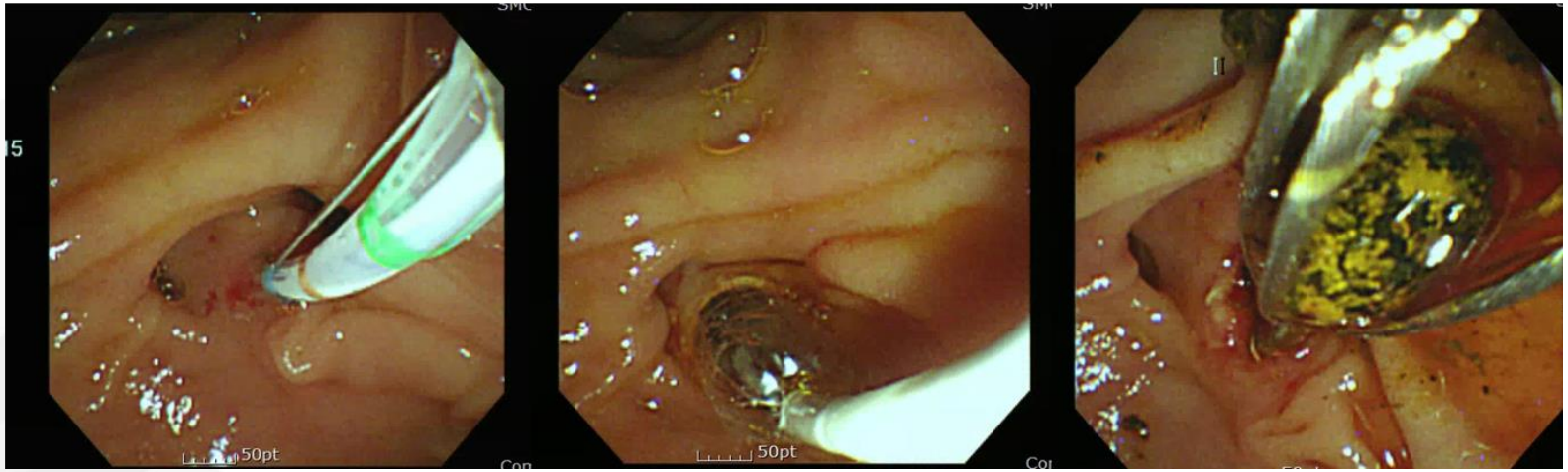
Case presentation (F/85)

- C.C : RUQ pain

- Present illness:
  - 7년전 liver abscess에 대한 치료력있는 분으로 내원전 수일전 부터 시작된 우상복부 동통을 주소로 타 병원 들린뒤 APCT check후 CBD stone with cholangitis imp.하에 외래로 의뢰됨

Case presentation (F/85)

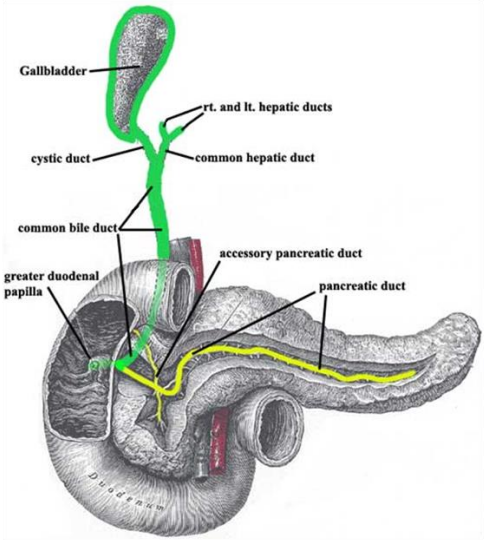
당일 오후

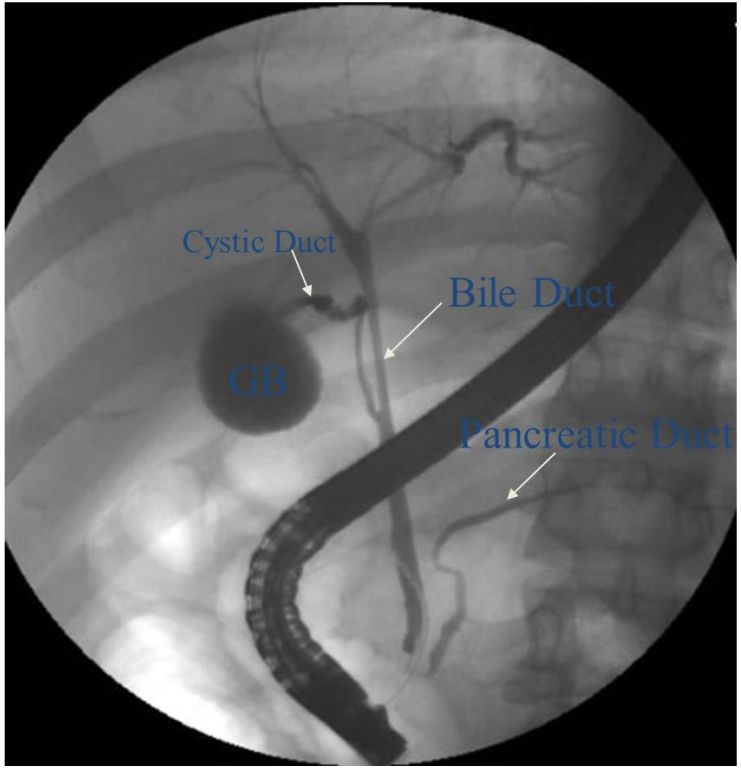


Acute suppurative Cholangitis

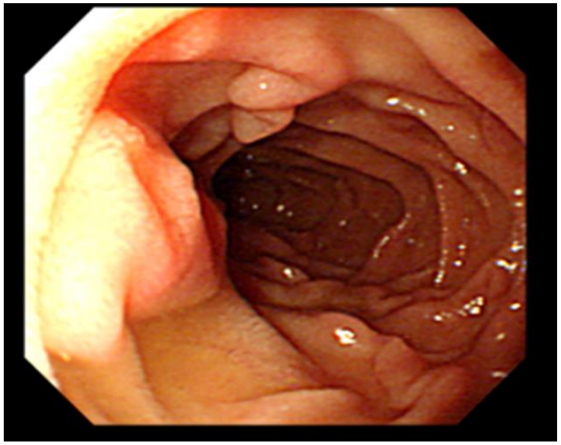
- Prognosis: poor (when it is untreated)
- **Conservative treatment with antibiotics** (24 – 48 hr) in mild courses: can be tried but, who can guarantee ?
- **Biliary decompression** by ERCP or PTC is essential for life saving: decreased mortality from 100% to 40%

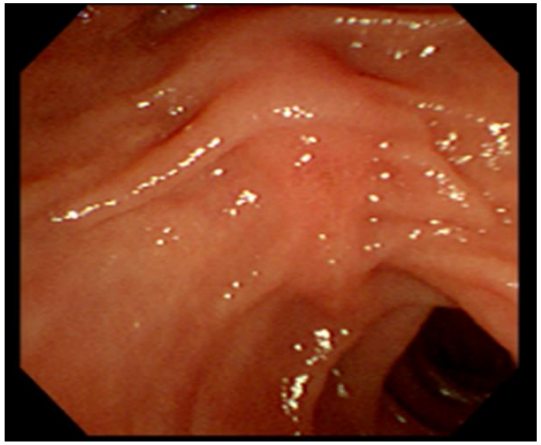
Anatomy

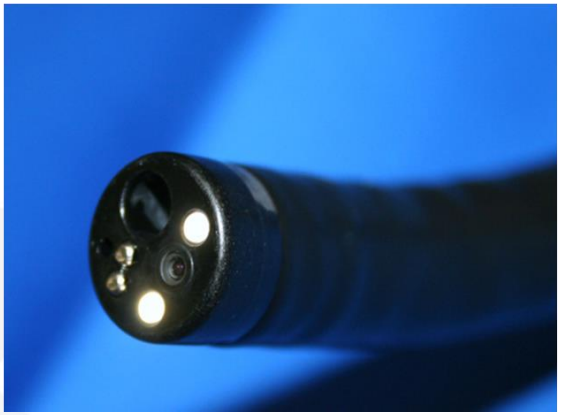

Gallbladder
rt. and lt. hepatic ducts
cystic duct
common hepatic duct
common bile duct
accessory pancreatic duct
greater duodenal papilla
pancreatic duct
Duodenum

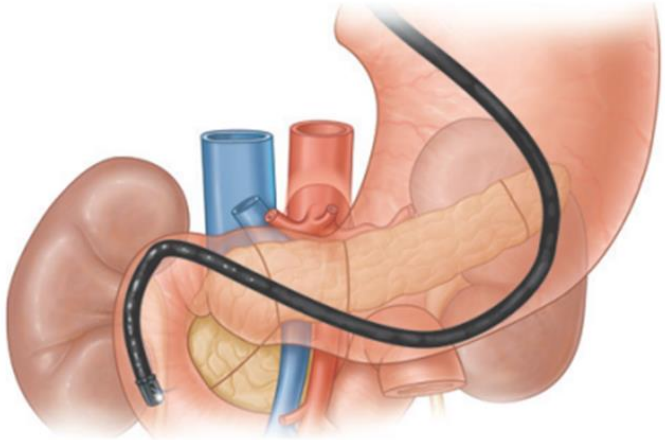

Cystic Duct
Bile Duct
GB
Pancreatic Duct

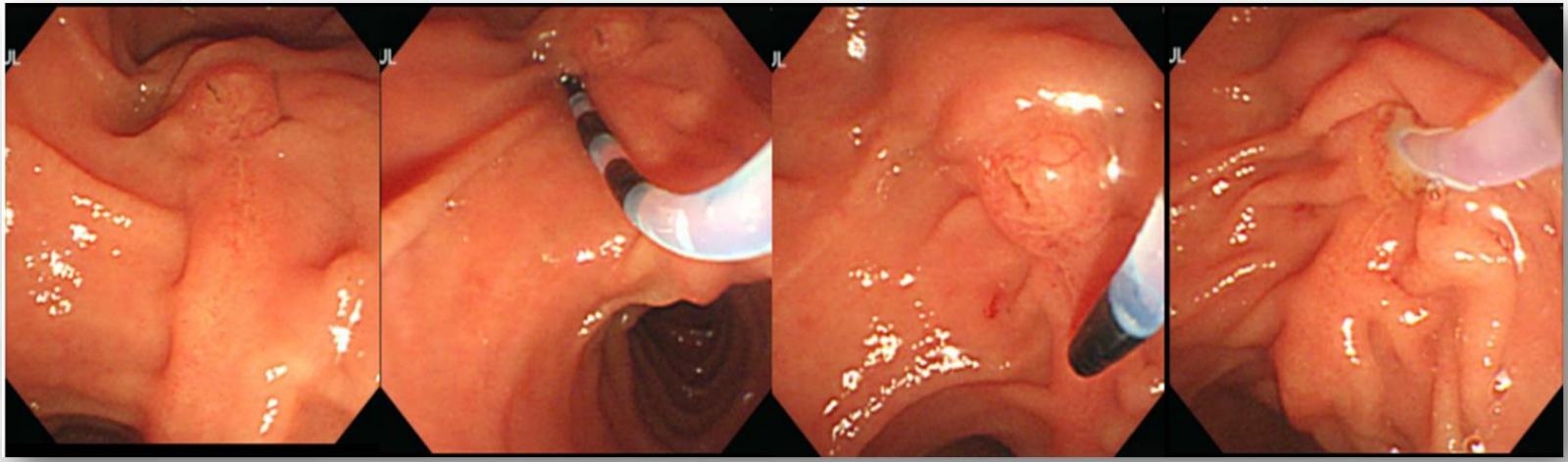
The View of the Ampulla of Vater

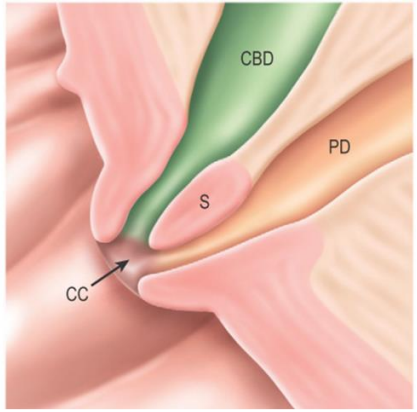


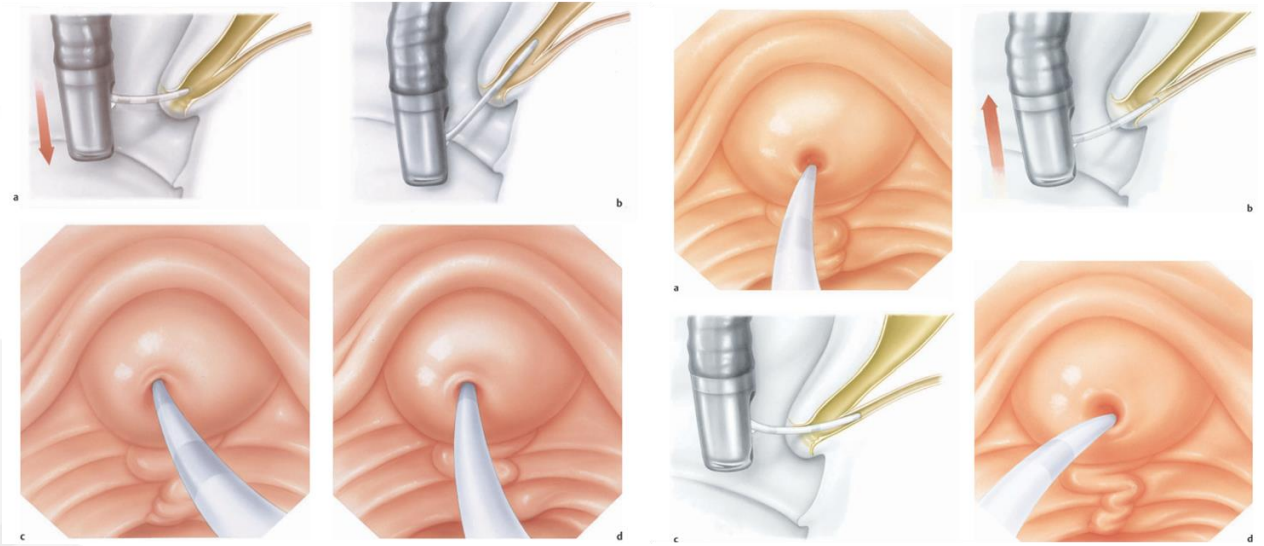


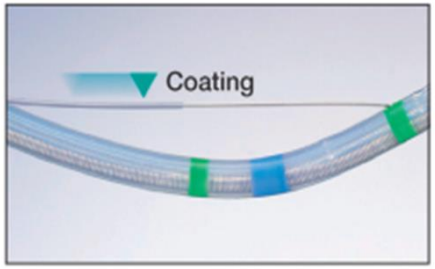


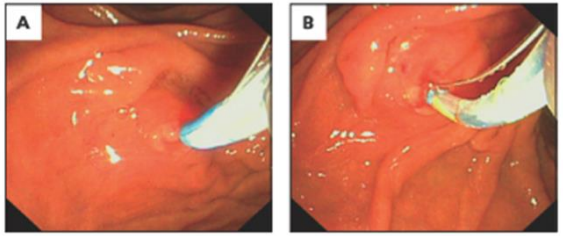


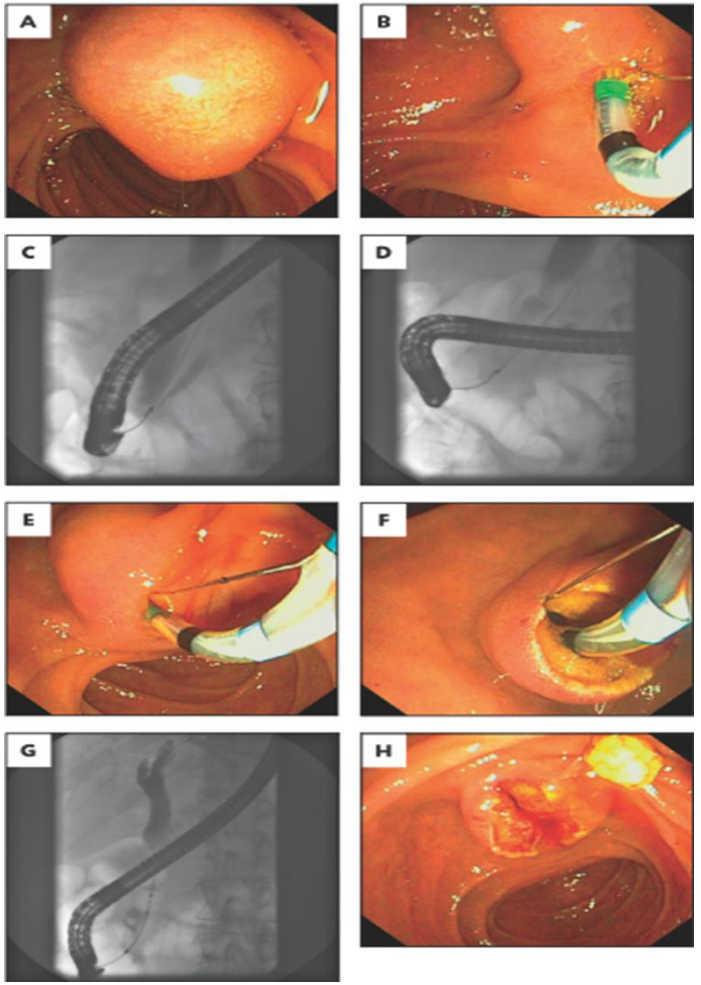


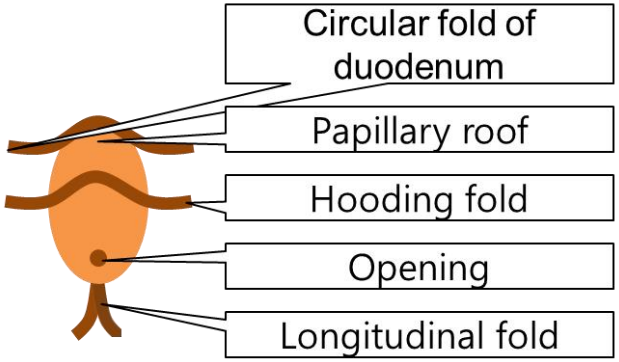

CBD
PD
S
CC


a
b
a
b
c
d
c
d

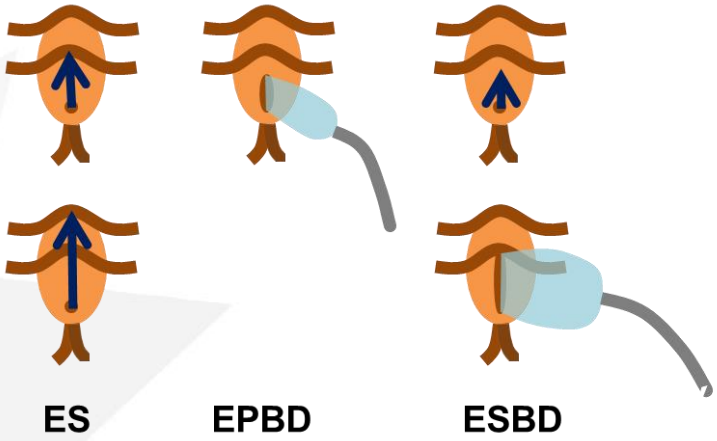

Coating

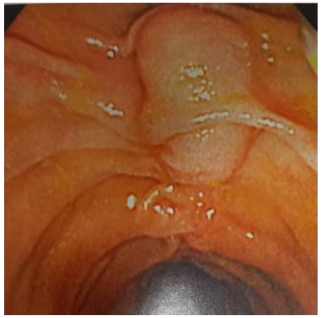

A
B

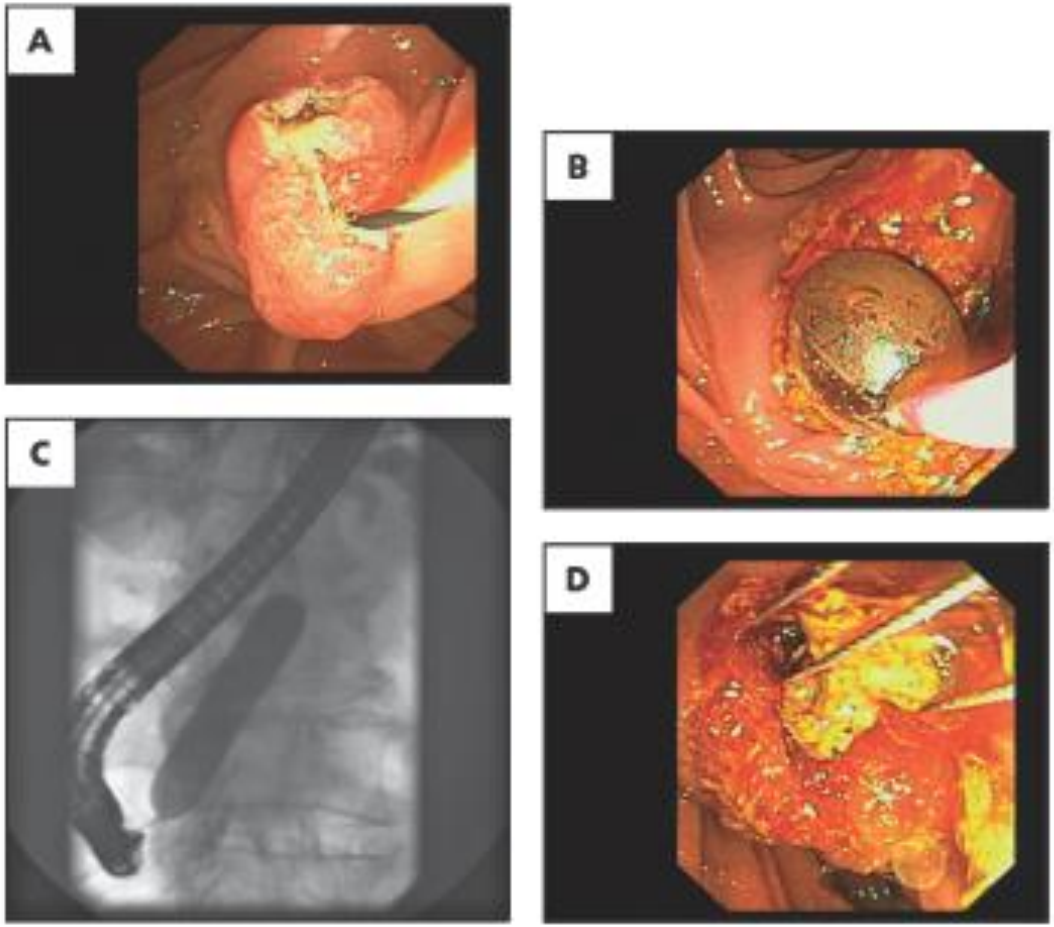

A
B
C
D
E
F
G
H



The structures of ampulla of Vater

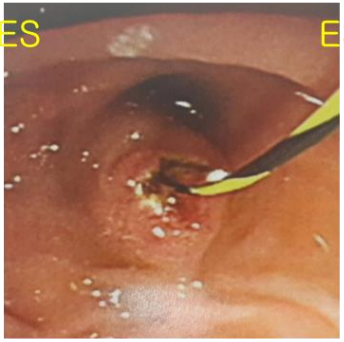


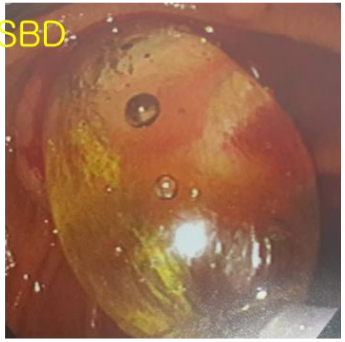


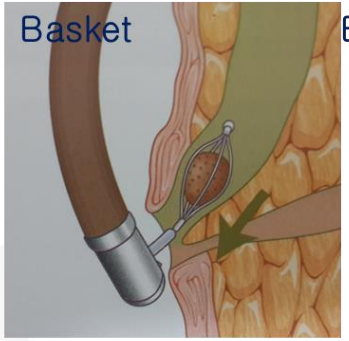

A
B
C
D

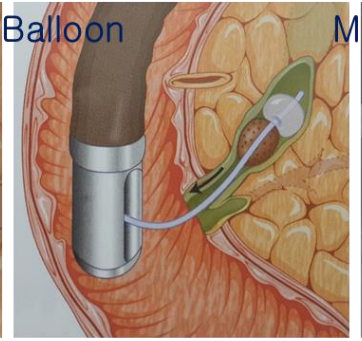

CBD access

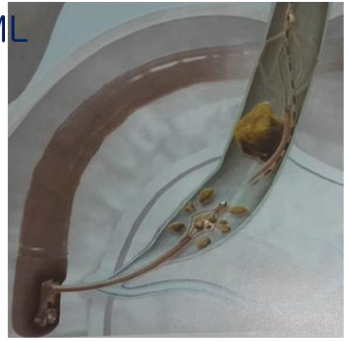

Cholangiogram


ES

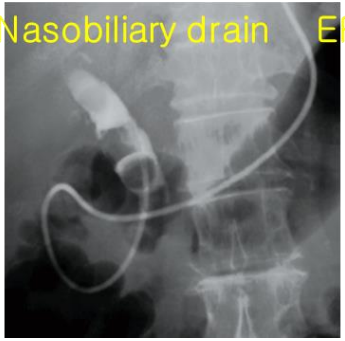

ESBD

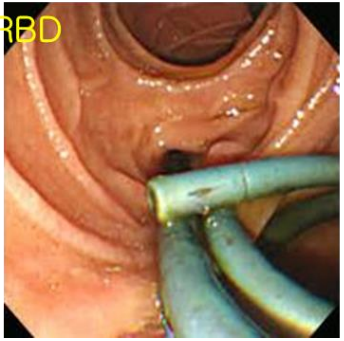

Basket


Balloon


ML


Cholangiogram


Nasobiliary drain


ERBD

Case presentation (M/79)

- C.C : Epigastric pain

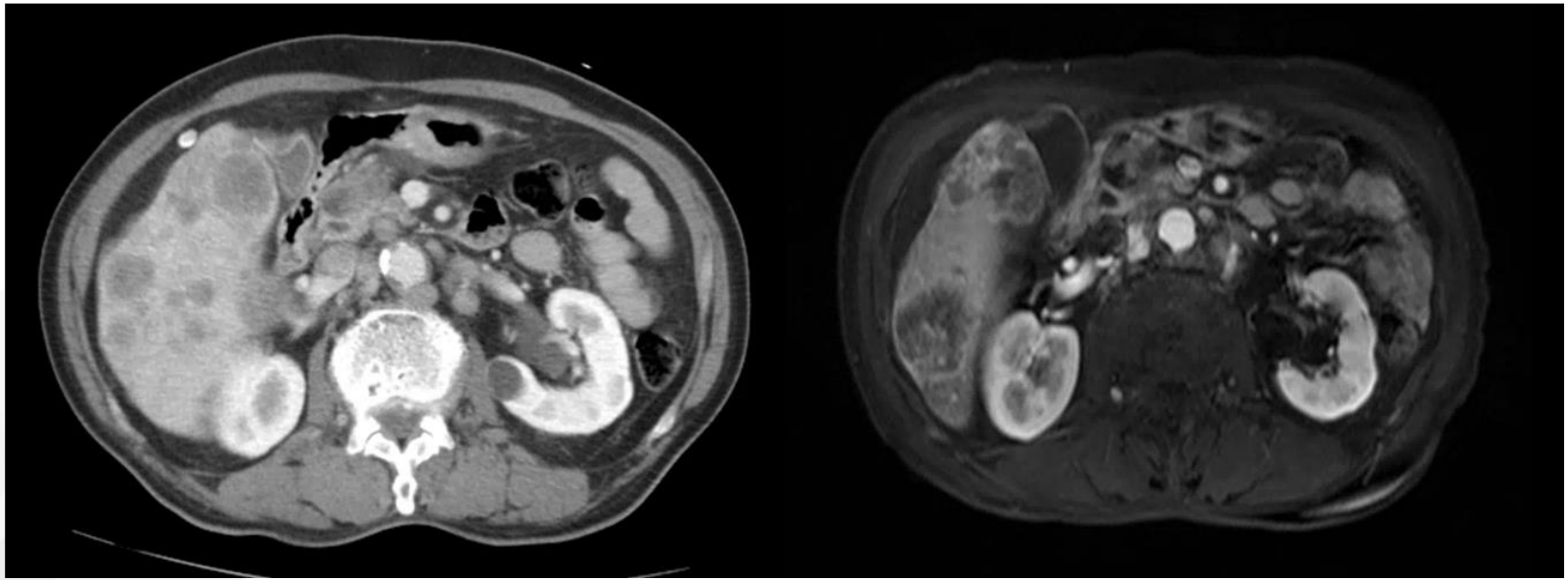
- Present illness:
  - 본원에서 AMI 로 진료력 있으시고 10년전에서 CVA 있었으나 현재 medication받고 있지 않으심

    복부의 전반적인 동통으로 타병원 들린뒤

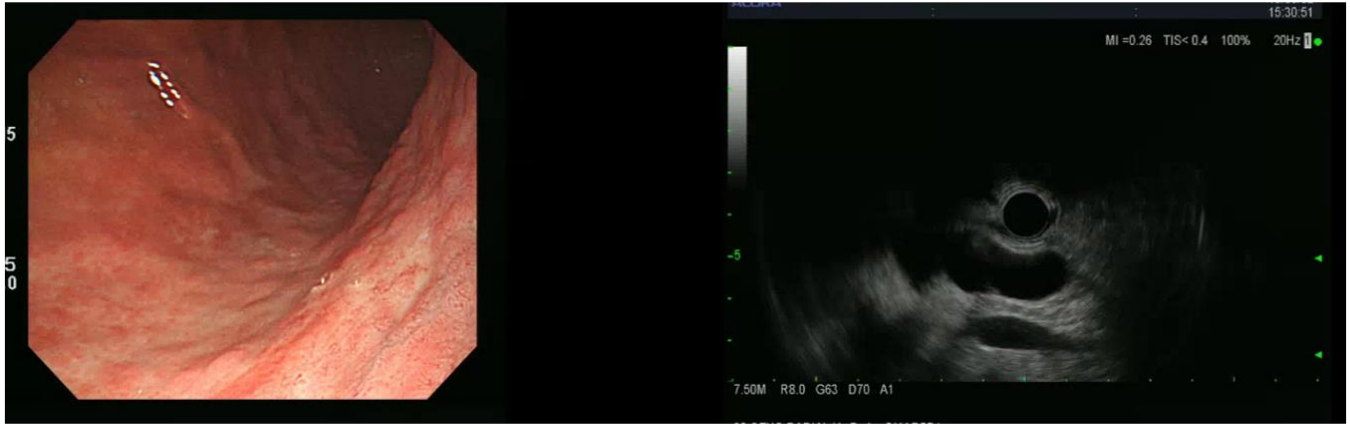
    APCT check하고 pancreatic mass

    의심되어 제 외래로 내원하심

Case presentation (M/79)



EUS-guided FNA



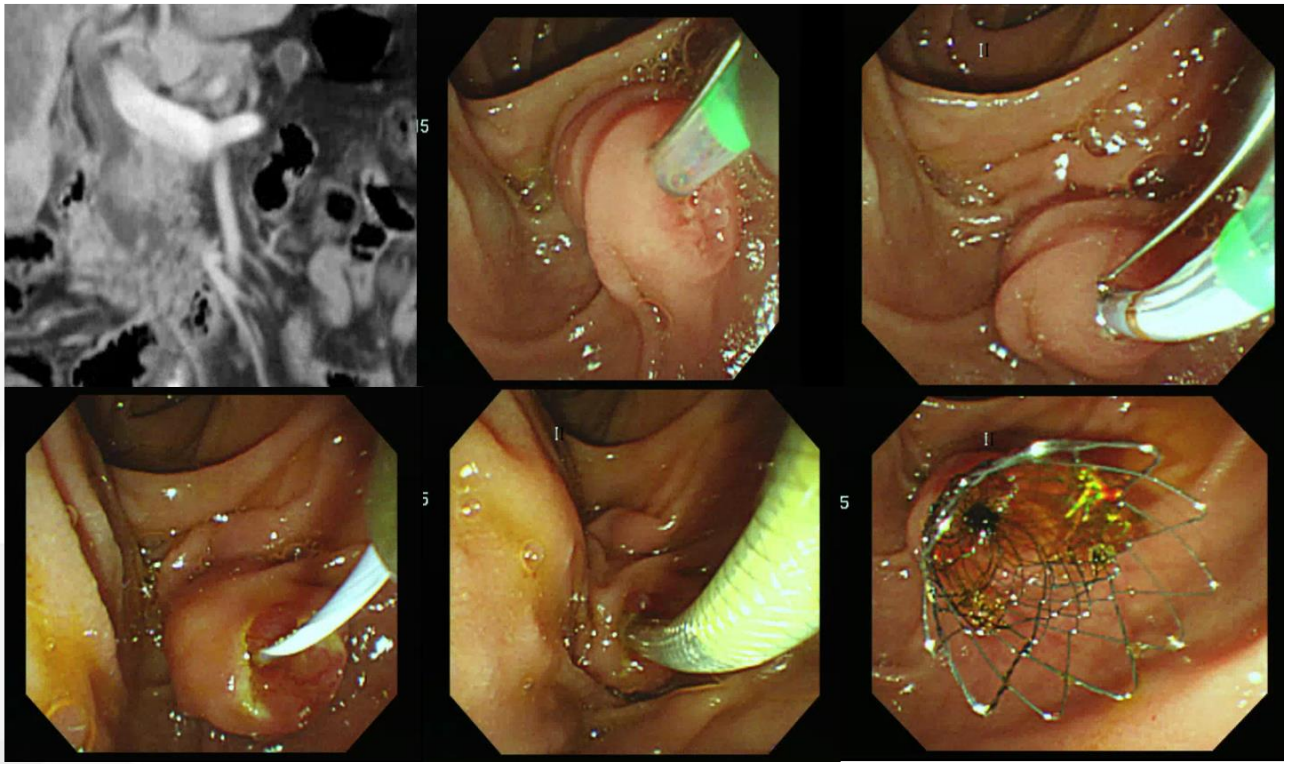
Cytology results

CYTOPREPARATION:
☑26 Wet-fixed smears stained with Papanicolaou's

MACROSCOPIC OBSERVATION: about 0.2 mℓ, bloody clot material

CYTOLOGIC DIAGNOSIS :
Pancreas, EUS-guided fine needle aspiration:
Malignant
Carcinoma, poorly differentiated.

CBD obstruction due to Pancreatic head cancer



ERCP가 필요한 경우

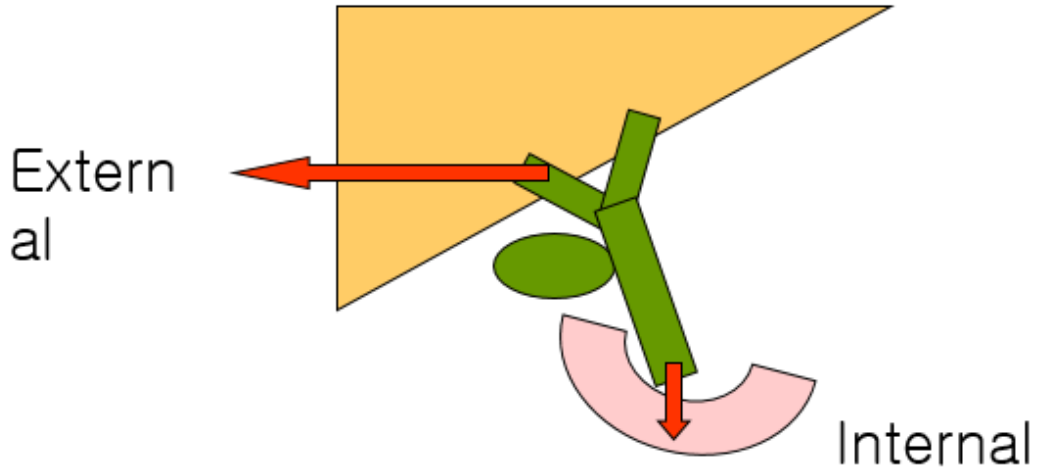
- Imaging study (US, CT)에서 CBD stone이 보일 때
- Imaging study에서 CBD dilatation이 있으면서 LFT abnormality (특히 ALP상승)이 있을 때

Biliary obstruction

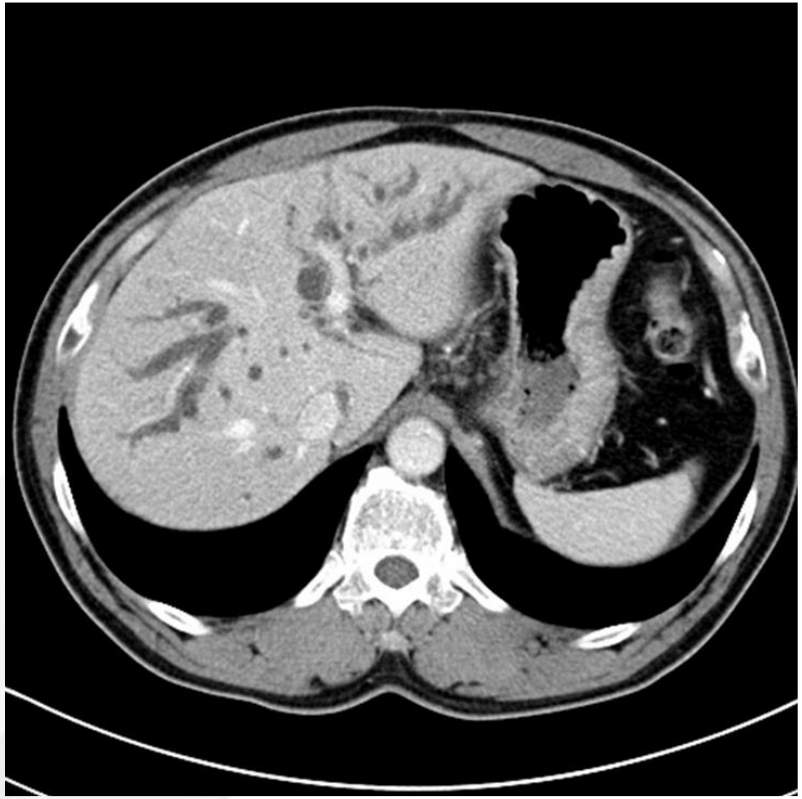
rise in intraductal pressure

interruption of bile flow to the gut

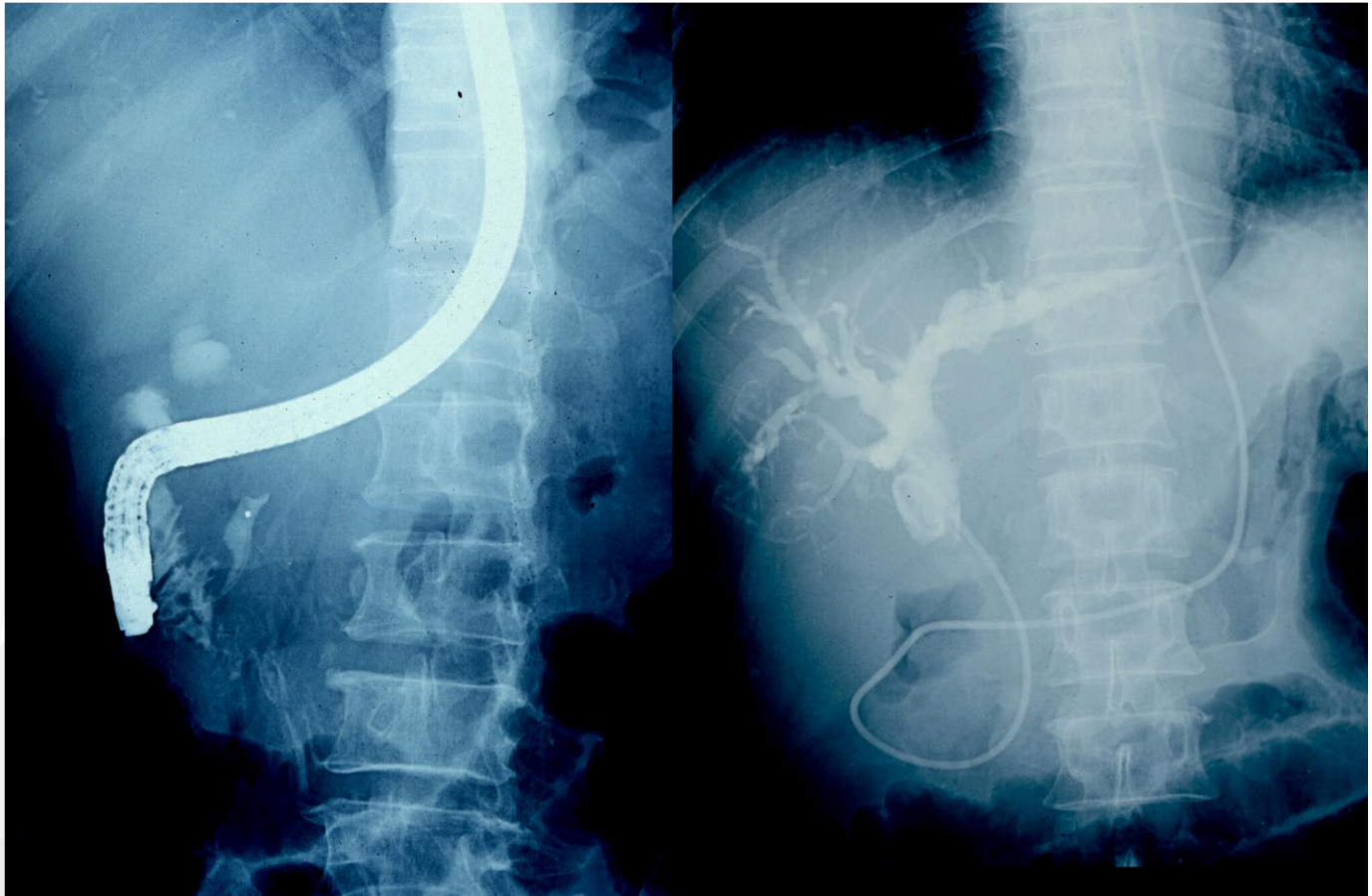
Biliary drainage



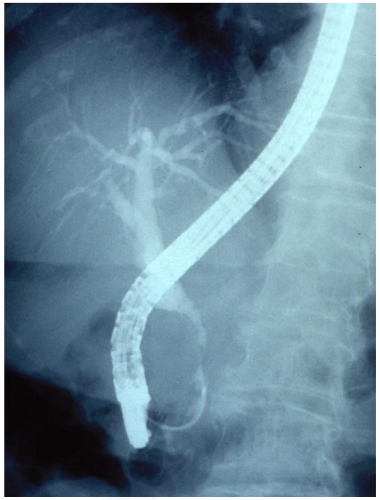
PTBD

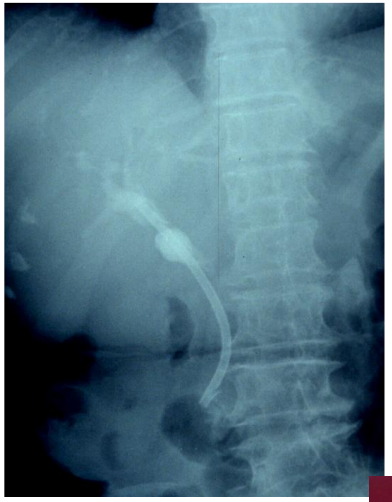


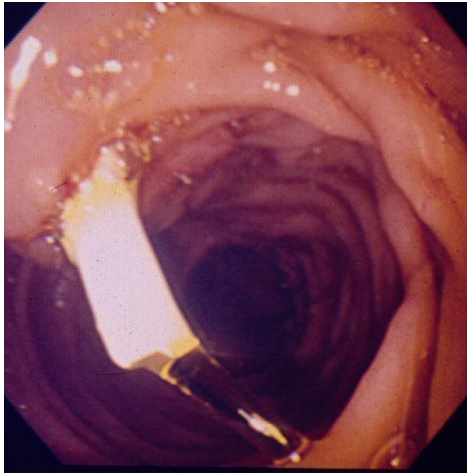
ENBD

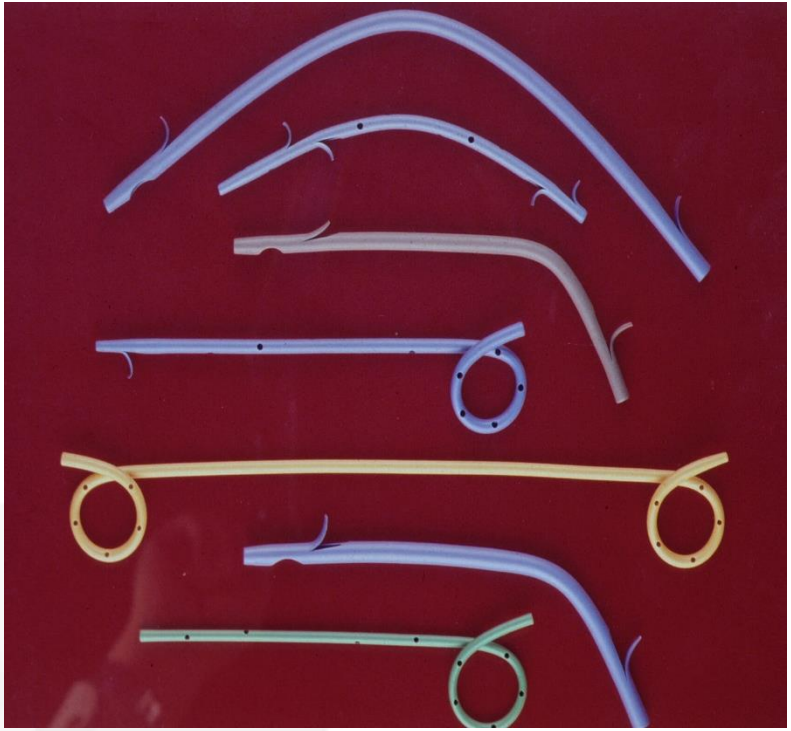


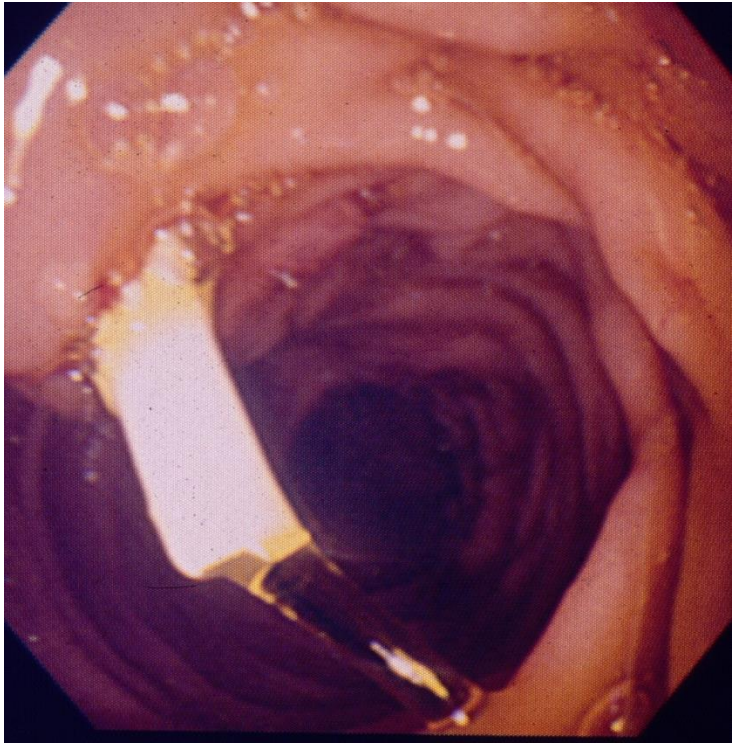
ERBD (Plastic stent)



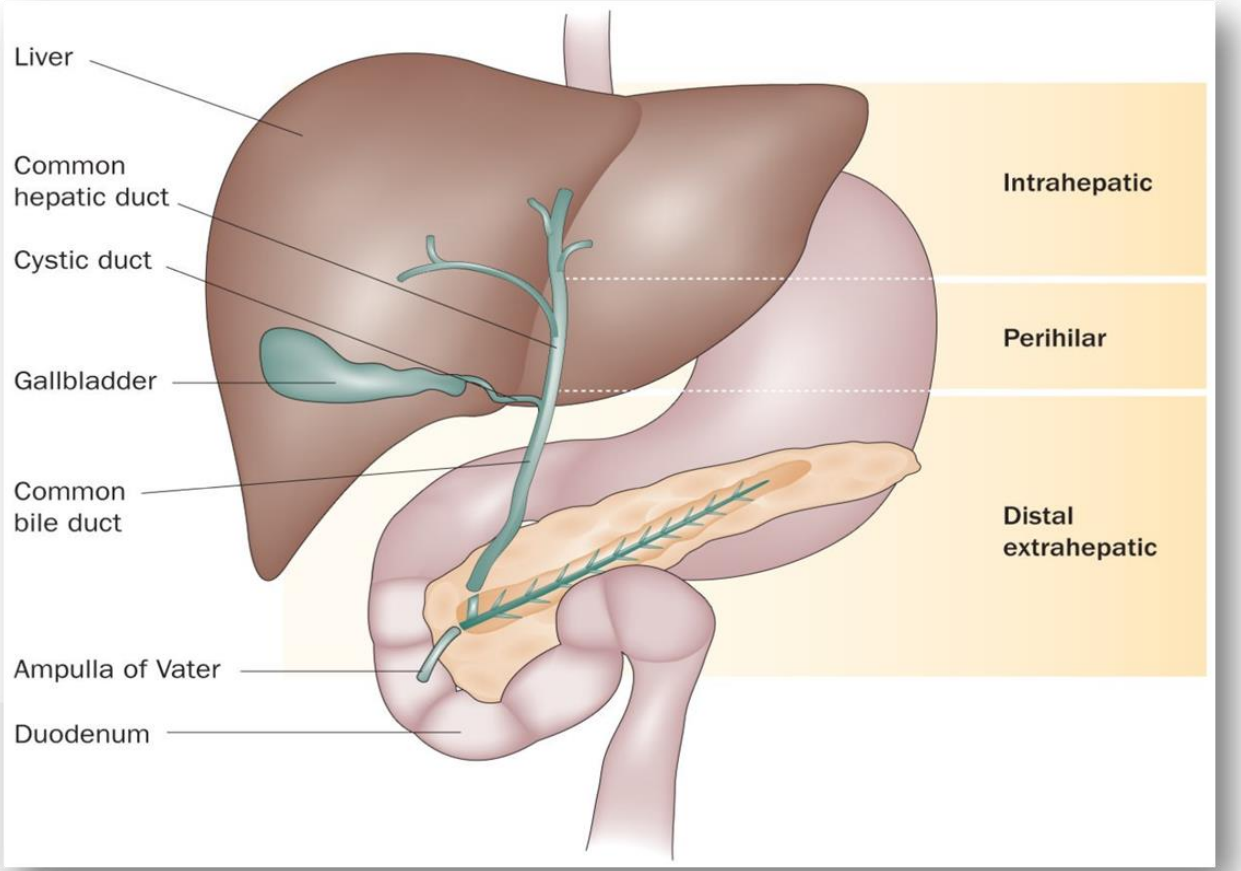






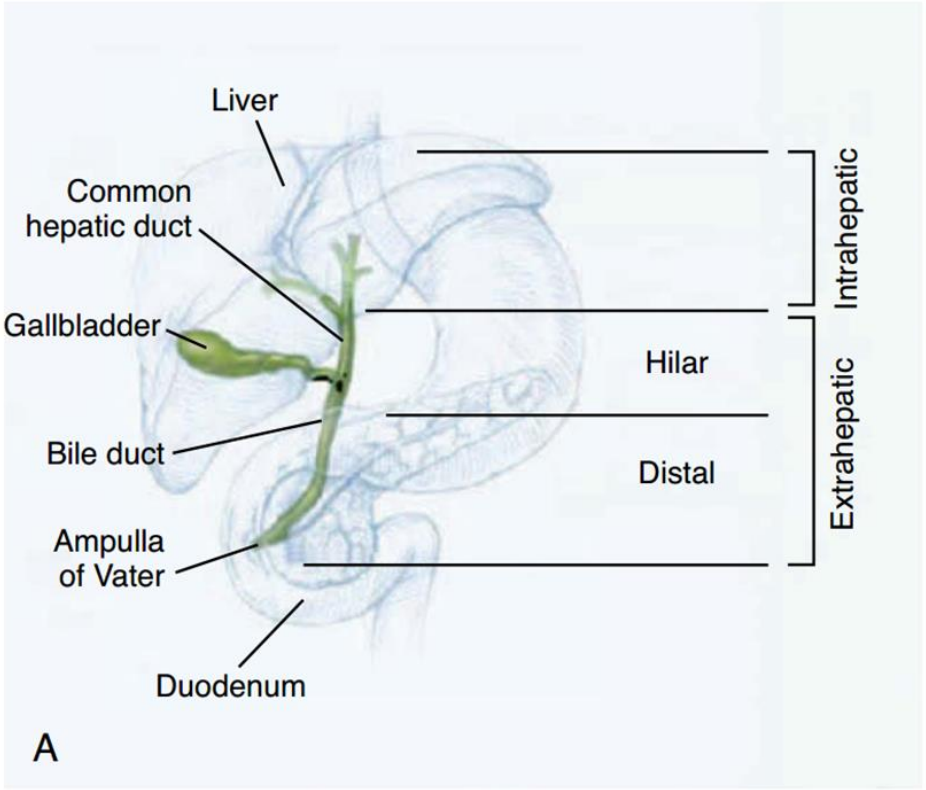


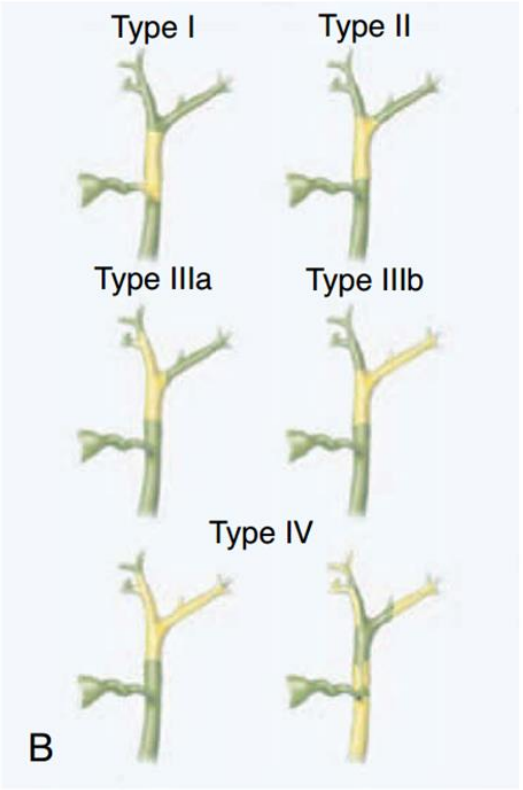
Classification of Cholangiocarcinoma



Blechacz et al. Nat Rev Gastroenterol Hepatol.; 8(9): 512–522

Anatomic classification





Sleisenger and Fordtran's Gastrointestinal and Liver Disease , 9th edition

Clinical consideration

What is the size of a normal bile duct?

- Varies at different levels
- US 6-8 mm
- CT 8-10 mm
- Essentially unknown

What makes up a biliary stricture?

- Proximal dilatation
- Intrahepatic BD> 40% of parallel intrahepatic portal vein

Main questions for the doctor and the patient?

" Is this truly cancer ?"

Indeterminate bile duct strictures (IBDS)

Challenge in differentiating benign from malignant causes

- Biliary strictures are frequently a diagnostic dilemma
- Pre-operative diagnostic testing can establish a diagnosis in most patients, but indeterminate lesions still account for up to 20% of cases
- Should reduce unnecessary surgeries on benign strictures

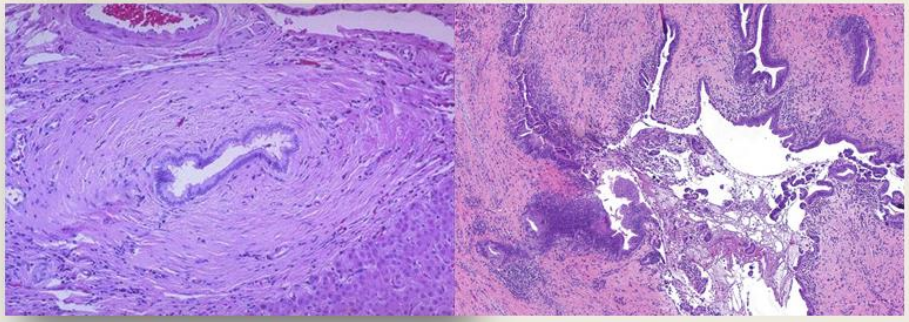
Pathophysiology

Benign strictures

- Damage to the bile ducts during surgery or trauma to the abdomen
- Recurring condition, such as pancreatitis or bile duct stones
- Chronic disease, such as primary sclerosing cholangitis (PSC)

Fibrosis and Narrowing of the Bile Duct Lumen

PSC



Autoimmune cholangiopathy

Pathophysiology

Malignant strictures

- The result of either a primary bile duct cancer
  Narrowing of the bile duct lumen and obstructing the flow of bile

- Extrinsic compression of the bile ducts by a neoplasm in an adjacent organ
  Gallbladder, pancreas, or liver

External compression by gallbladder cancer

Etiology of bile duct stricture

Benign	**Iatrogenic (liver transplant, cholecystectomy)** **Primary sclerosing cholangitis** **Chronic pancreatitis** **Autoimmune pancreatitis** **IgG4 related cholangiopathy** **Autoimmune cholangitis** **Mirizzi Syndrome** **Infections (tuberculosis, viral, parasitic, HIV cholangiopathy)** **Ischemia** **Vasculitis** **Trauma** **Radiation therapy**
Malignant	Pancreatic cancer **Cholangiocarcinoma** Metastatic disease with external compression (lymph nodes)

Clinical practice of IBDS

No mass on cross-sectional imaging

- Typically contrast-enhanced CT or MRI

Conventional histopathology is non-diagnostic

- ERCP with brush cytology


Ideal endoscopic sampling technique:
High sensitivity → few false negatives
Perfect specificity → no false positives
Harewood GC. Curr Opin Gastroenterol 2008
MONTY PYTHON
and the Holy Grail
1975

Assessment and management of patients with IBDS

Key steps

Characterization of the stricture pathogenesis

- History
- Laboratory studies
- Cross-sectional imaging
- Invasive imaging and tissue sampling

Relief of biliary obstruction

Defnitive treatment or palliation of the pathologic process

- Medical, endoscopic, percutaneous, or surgical means

Historical feature of IBDS

A. Historical features suggestive of benign etiologies

History of right upper quadrant surgery

Trauma

Ulcerative colitis or Crohn disease

Chronic pancreatitis

Difficult biliary stone disease

Stable weight

Fluctuating labs

B. Historical features suggestive of malignant etiologies

Never-operated abdomen

Absent history of abdominal illness

Weight loss

Short course without antecedent illness

Decompensation of known primary sclerosing cholangitis

Clinical Clue

A. Reassuring

Younger patient

h/o pancreatitis

h/o biliary stone

Normal CA 19-9 (?)

Elevated IgG4

Stable weight

Prior hepatobiliary surgery

(ex. Cholecystectomy)

B. Concerning

Weight loss

Elevated CA 19-9 (?)

Long-term PSC

Longer stricture (>1cm)

Asymmetric stricture

AUPBD

Choledochal cyst

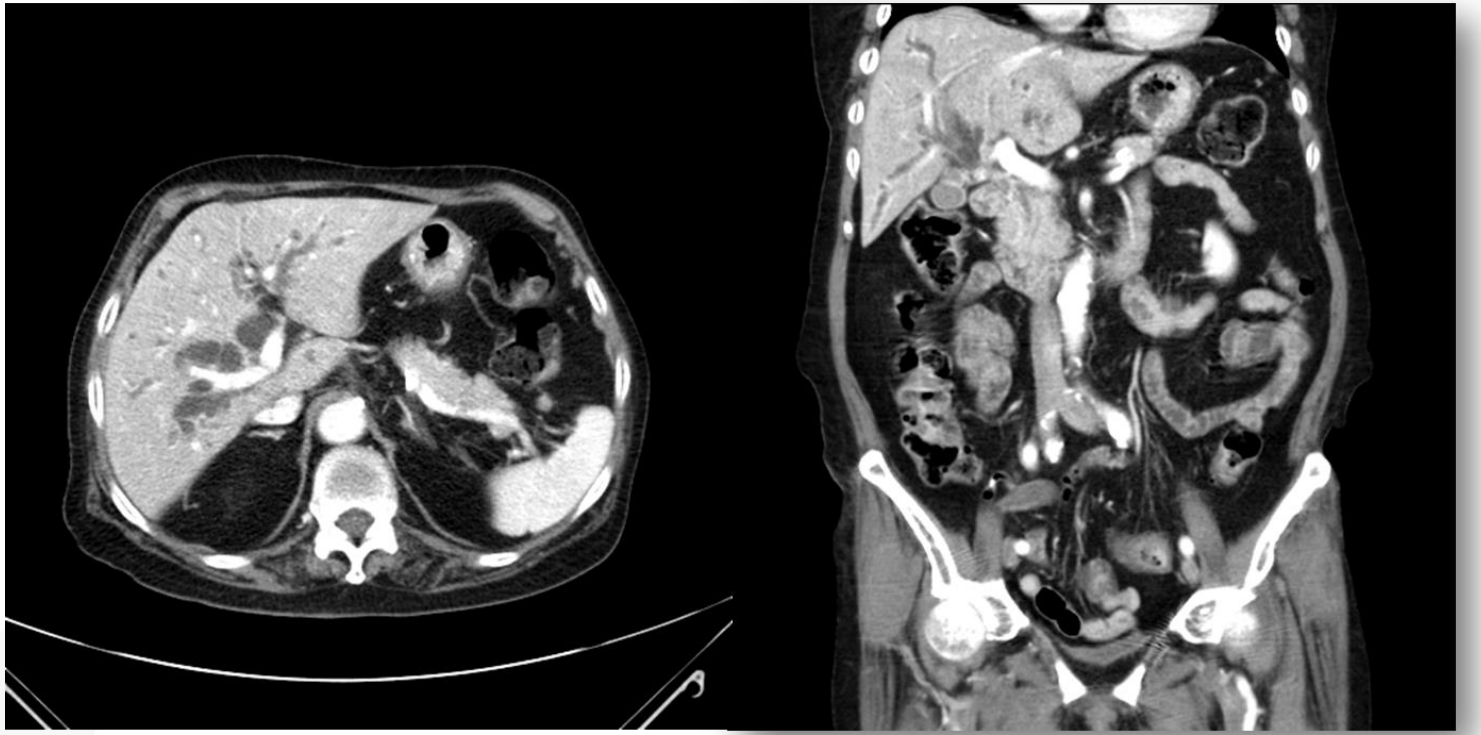
Testing modalities

"Despite a large number of tests available to establish the benign or malignant nature of biliary strictures, no single test has sufficient sensitivity to be considered adequate."

"Up to 20% of indeterminate biliary strictures are determined to be benign following surgical intervention"

"Typically, noninvasive laboratory and imaging tests are part of an initial evaluation often leading to endoscopic approaches with tissue sampling."

Christopher L. Bowlus et al. Nat Rev Gastroenterol Hepatol. 2016 Jan;13(1):28-37

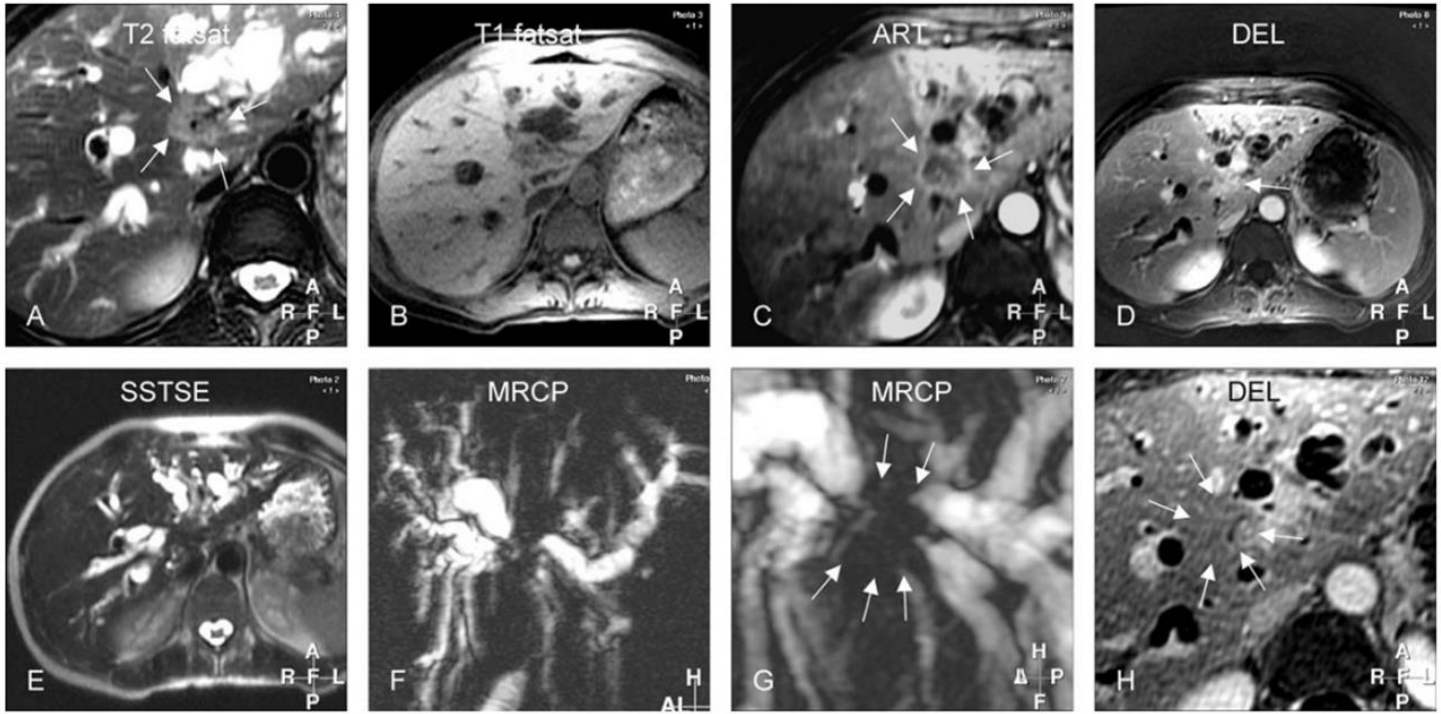


81 y.o. F
AST 90 IU/L
TB 9.0
GB in situ
Itching
symptom

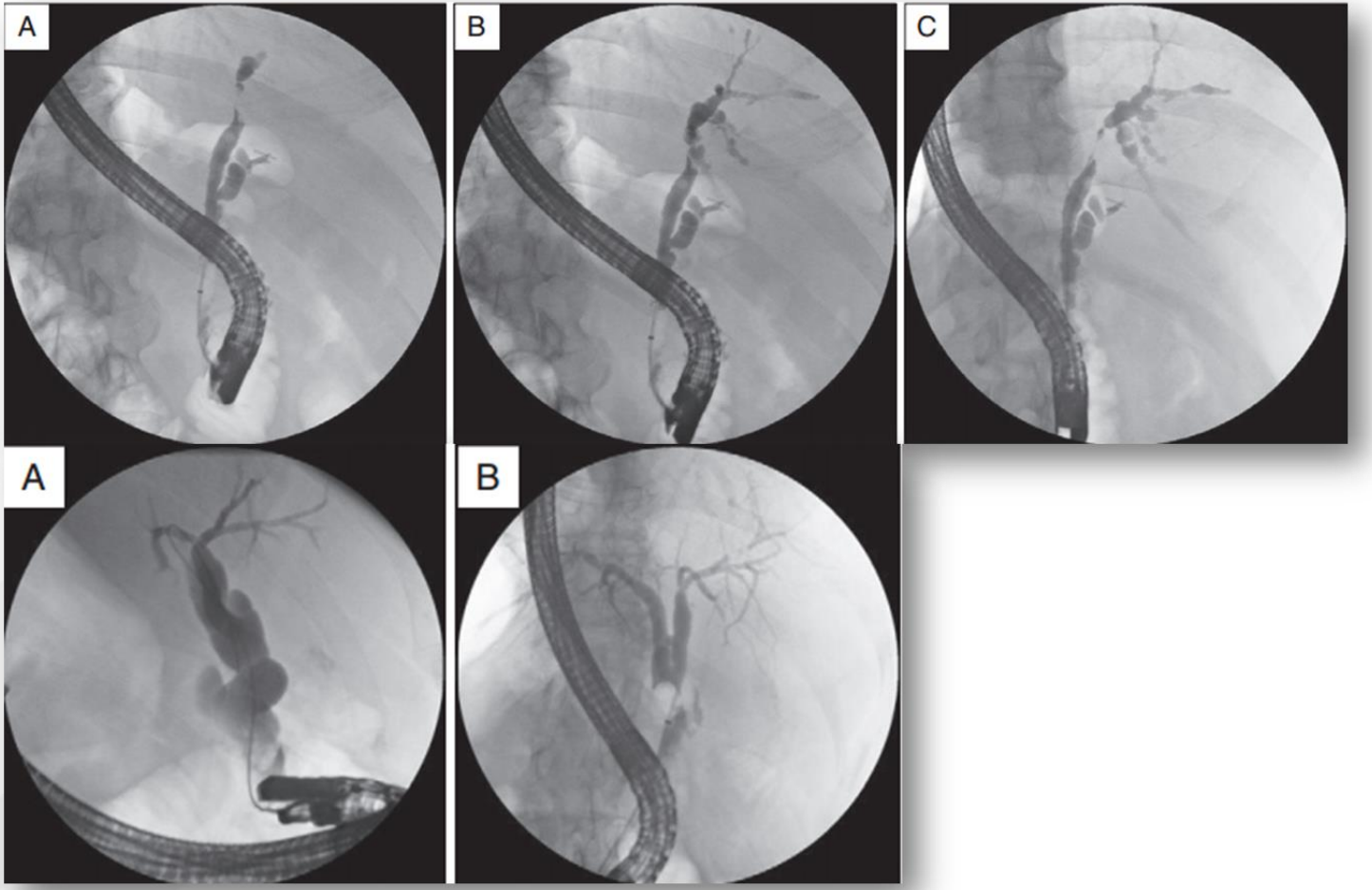
Perihilar cholangiocarcinoma-typical

After injection of gadolinium

Ring-shaped or heterogeneous enhancement with persistent



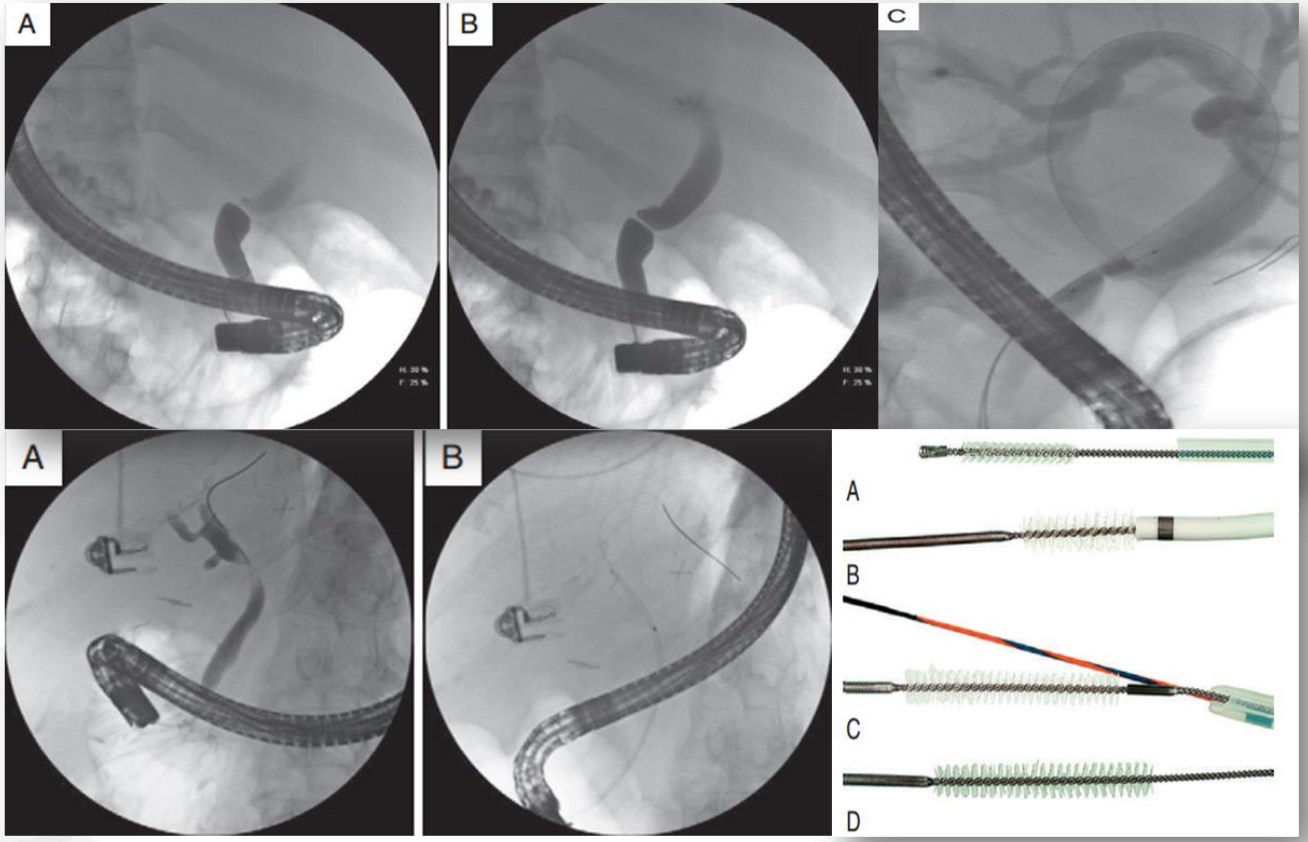
John L. Gollan. et al. Liver MRI



Todd H. Baron et al. ERCP, 2nd edition

Tissue Acquisition and Pathologic Investigations

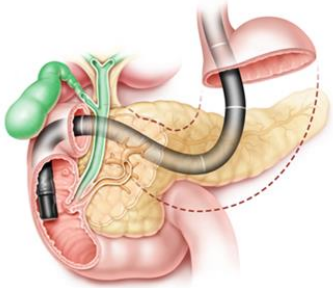
Brush Cytology



Todd H. Baron et al. ERCP, 2nd edition

Cholangiopancreatoscopy

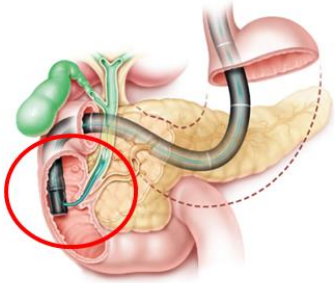
- Endoscopic Retrograde Cholangiopancreatography
- Radiographic images (similar to black and white x-rays) are taken to document findings



Fluoroscopy image of
Left Hepatic Duct (LHD) villous lesion

Cholangiopancreatoscopy

- Cholangioscopy is the examination of the bile ducts using an endoscope to enable direct visualization of the biliary tree during ERCP, can help obtain biopsy specimens, lead to the diagnosis of abnormalities, and guide stone therapy.

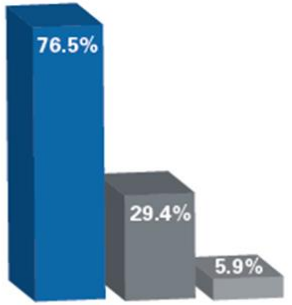


SpyGlass™ DS System image showing
LHD villous lesion in same patient

Indeterminate Stricture Diagnosis

26 Patients, Peter Draganov, MD, et al, *GIE*, Vol. 75(2), 2012

Key Results: Demonstrated **76.5%** sensitivity using SpyBite™ Forceps performing cholangioscopy with the SpyGlass System vs **29.4%** sensitivity using blind biopsy and **5.9%** sensitivity using brushings.

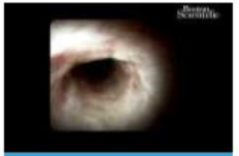


Benign Strictures

The following images demonstrate benign post-operative strictures treated with plastic st
vascular abnormalities, nodules or exophytic tissue.
Click on an image for a larger view

Benign Stricture

Benign Stricture Post-Liver Transplant



Common Bile Duct Stricture

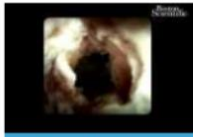
Malignant Strictures

The following images depict various characteristics of malignant strictures.
Click on an image for a larger view

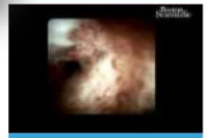
Characteristics of a Malignant Stricture

Cholangiocarcinoma Extension

Cholangiocarcinoma STX

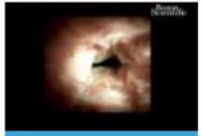


Exophytic Vascular Tissue



Increased Vascularity

Tumor Vessel

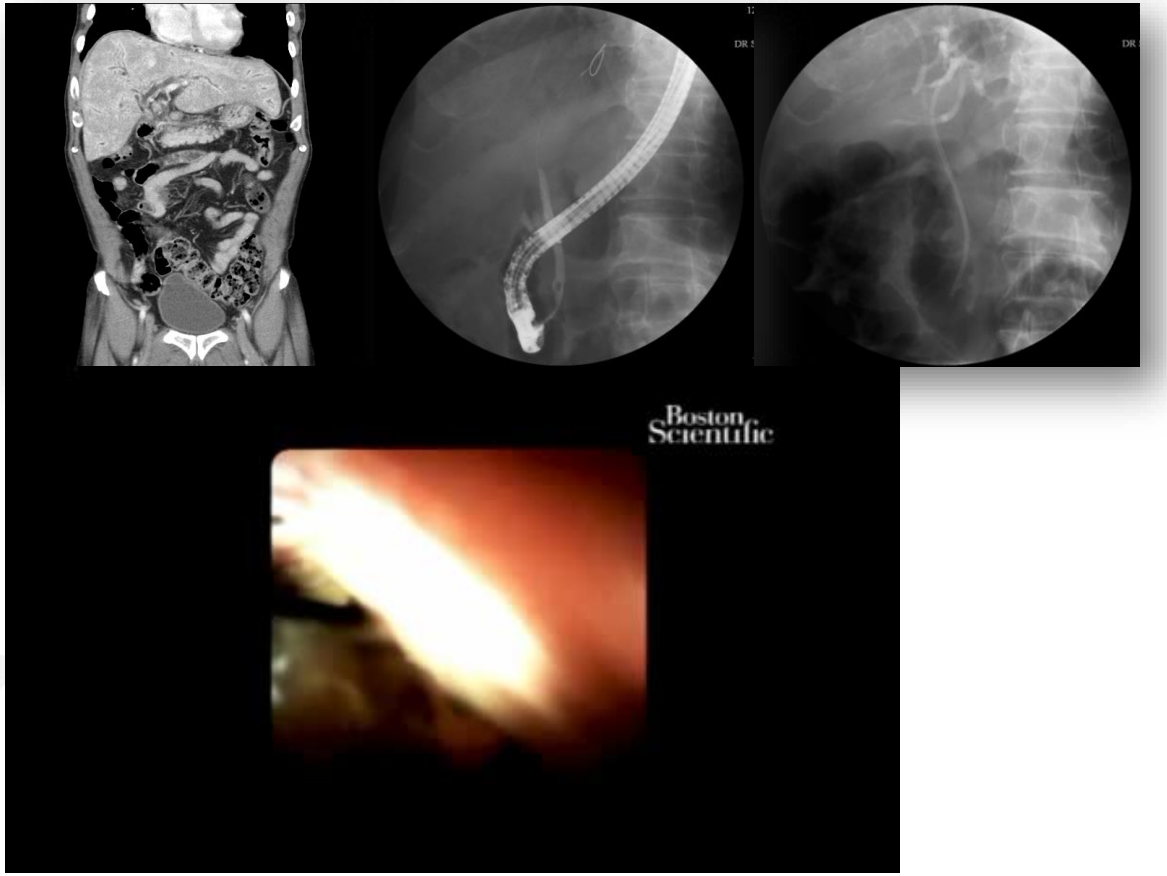


Vascular Lakes

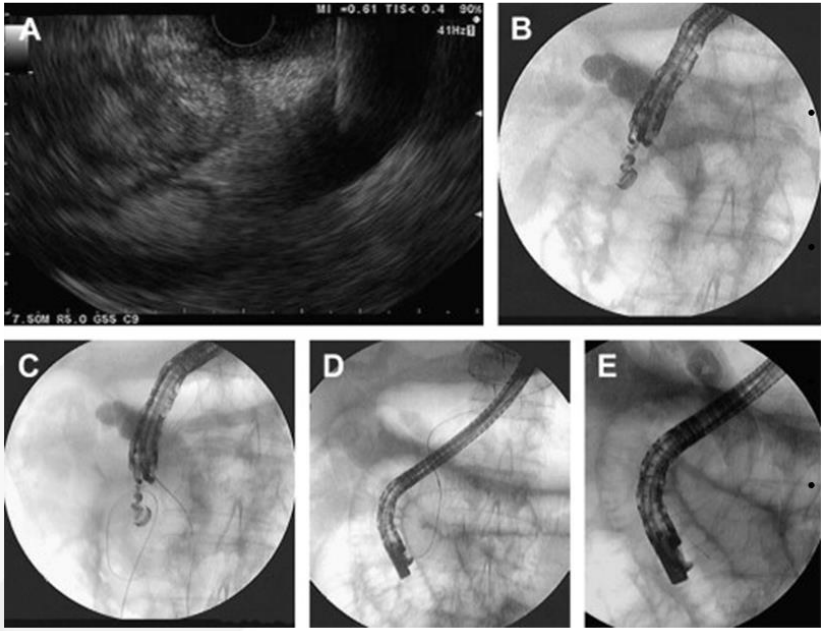
Indeterminate perihilar biliary stricture

- Single operator fiberoptic choledochoscopy

68 y.o. M
AST 105 IU/L
TB 11.4 mg/dL
s/p cholecystectomy
Presenting with worsening RUQ pain and fever



EUS 유도 담도배액술(유두부 접근시) (rendezvous technic)



- (*A*) The extrahepatic bile duct was punctured from the **second portion of the duodenum** under EUS guidance.
- (*B*) A cholangiogram was taken through the needle to determine the configuration of the biliary ducts.
- (*C*) A guide wire was placed though the needle, biliary duct, obstruction, and ampulla, deeply into the duodenum.
- (*D*) Deep biliary cannulation was achieved **over the guide wire**.
- (*E*) A metallic stent was deployed at the stricture.

Gastrointest Endosc Clin N Am. 2012 Apr;22(2):249-58

Thank You
for Your Attention !