# 2013 Gastroenterology Winter School

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<td>개회사</td>
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<td>08:30-09:00</td>
<td>조주연  간기능 해석과 협진 보기</td>
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<td>09:00-09:30</td>
<td>최문석  만성 B형 간염 환자 보기</td>
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<td>09:30-10:00</td>
<td>백용한  간경변 환자의 진료</td>
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<td>10:00-10:30</td>
<td>곽길연  간암 환자의 진료</td>
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<td>10:30-11:00</td>
<td>Coffee Break</td>
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<td>11:00-11:30</td>
<td>김은란  빈틈없고 안 아픈 대장내시경 비법</td>
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<tr>
<td>11:30-12:00</td>
<td>민양원  염증성 장질환</td>
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<tr>
<td>12:00-12:30</td>
<td>장동경  대장 종양성 병변의 진단과 치료</td>
</tr>
<tr>
<td>12:30-13:30</td>
<td>Lunch Time</td>
</tr>
<tr>
<td>13:30-14:00</td>
<td>이규택  응급실에서 단도 환자 보기</td>
</tr>
<tr>
<td>14:00-14:30</td>
<td>이종균  응급췌장 질환</td>
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<tr>
<td>14:30-15:00</td>
<td>이광혁  췌담도 질환에서 내시경 검사</td>
</tr>
<tr>
<td>15:00-15:30</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>15:30-16:00</td>
<td>김정환  내시경 관찰법 및 내시경 소견의 기술법</td>
</tr>
<tr>
<td>16:00-16:30</td>
<td>민병훈  진정관련 및 심혈관 합병증</td>
</tr>
<tr>
<td>16:30-17:00</td>
<td>박정호  식도 기능 검사의 이해</td>
</tr>
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날짜: 2013년 2월 16일 (토)
장소: 삼성서울병원 암센터 B1 강당
의사협회 평점: 6평점
2013 gastroenterology Winter School

Session 3. 췌담도

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응급실에서 담도 환자 보기

이규택
응급실에서 담도환자 보기

- Winter School 2013 -

Kyu Taek Lee M.D.

Department of Medicine, Samsung Medical Center
Sungkyunkwan University School of Medicine, Seoul, Korea

F/66

1. 1997년 mitral stenosis을 하여 valve replacement 후에 warfarin과 aspirin 복용 중, 본원에서 1997년 IHD stone과 CBD stone으로 치료 받음. 2009년 1월 27일 나뭇가지에서 발생한 우상복부 통증과 오한 및 발열로 밤 11시에 응급실 내원

   - 의식 (alert), V/S (38.0°C - 96/min - 145/70 mmHg)
   - WBC; 12,410 (seg:88.7%), ESR (64), PT (30%, 2.64), T.B.(2.0), AST/ALT (325/90)
   - CT: IHD stone with CBD stone with underlying recurrent pyogenic cholangitis
F/66

2. 2009년 1월 28일 오후 3시경 ERCP방 앞에 대기, 간호사가 대기 환자 상태가 나쁨을 보고 함.

- 의식 (drowsy, obey command는 가능),

Dyspnea있으면서 O₂ 3L 주면서 check한 SPO₂ 92%

- 보호자에게 패혈증으로 진행하고 있음을 설명, 담즙배액술 실시 못하면 사망하고 시술 중 환자 상태 때문에 CPR가능성 높음을 설명하고시술 동의 얻음.

- CPR장비 준비하고, ENBD필요한 준비해 놓고 전처치없이 ERCP 시행
Acute suppurative Cholangitis

- Charcot’s triad: RUQ pain, jaundice, fever
- 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%

**ENBD (7 Fr) insertion, Procedure time: 3 min.**
F/80

1. 2001년 Distal CBD stone으로 본원에서 EST and removal of CBD stone 시술, 그 후 F/U 없이 지내다 2010년 1월 22일부터 심한 복통과 소화불량증세가 있어서 1월 23일 토요일 오후 3시 24분에 응급실 내원

- 의식 (drowsy), V/S (38.9°C - 105/min – 123/68 mmHg), SPO2 (92%)
- WBC; 6,460 (seg:85%), PLT (83,000), CRP (12.5) T.B.(5.9), AST/ALT (321/201), ALP (194)
- CT: multiple CBD stones with cholangiohepatitis

F/80

2. 경과

- 4시경 ER GI Fellow V/S stable하다고 notify
- 6시 20분 intubation (SPO2: 90% at O2 4l/min)
- 6시 30분 환자 의식상태가 Drowsy하다고 notify
  오후 8시 PTBD시행
  : ICU입원하여 ventilator care & antibiotics
- 1월 24일 오후 10시 48분 사망 (septic shock due to cholangitis)
Two biliary conditions meet in ER

- Stone: pain, fever, jaundice
  - biliary colic, cholecystitis, cholangitis

- Jaundice: benign vs malignant
Management of GB stone (I)

- Principle of asymptomatic GB stones: wait & see

- Indication of treatment
  - symptomatic GB stones: biliary colic
  - associated complications: acute cholecystitis, gallstone pancreatitis, gallstone fistula
  - increased risk of gallstone complications: calcified or porcelain GB, previous attack of acute cholecystitis regardless of current symptomatic status, large sized GB stones (>3 cm), congenitally anomalous GB
Management of GB stone (II)

- Method of treatment
  - Laparoscopic cholecystectomy: Tx of choice
  - Oral dissolution therapy: Ursodeoxycholic acid (UDCA)
    decrease cholesterol saturation of bile
    dose; 8 – 10 mg/kg
    effective in functioning GB, patent cystic duct,
    cholesterol stone,
    Ix; symptomatic (< 10%), number ≤ 3, size ≤ 10 mm

ERCP가 필요한 경우

- Imaging study (US, CT)에서 CBD stone이 보일 때
- Imaging study에서 CBD dilatation이 있으면서 LFT abnormality (특히 ALP상승)이 있을 때
  * 단순히 amylase, lipase만 상승되어 있고, CBD dilatation이 없거나 LFT가 정상화 되었을 때는 불필요
Clinical signs of Acute cholecystitis

Triad

(1) Biliary colic, RUQ tenderness
   - plateau and remains constant for more than 6-12 hours.
   - sometimes radiating to the back or the right shoulder.

(2) Fever

(3) Leukocytosis

Acute cholecystitis

• Nausea, vomiting
• **Murphy’s sign**: 우상복부 촉진시 심호흡하면서 동통과 흡식 중단 (inspiratory arrest)
• Jaundice, elevated liver enzymes - occurs in about 20% of cases, even in the absence of common duct stones.
• Higher fever, jaundice – suggest common duct stones.
Diagnosis of Acute Cholecystitis

US (best method)
- detects stone and thickened gallbladder wall
- 90-95%에서 gallstone이 발견.

Radionucleotide biliary scan (Confirm)
- nonvisualization of GB (fails to visualize the gallbladder at one hour)
- normal scan filling the gallbladder virtually eliminates acute cholecystitis

CT: 합병증(기종성 담낭염, 천공)의심, 다른 질환
(췌장염, 기복증, 복강농양)배제
Treatment of Acute Cholecystitis

- NPO and Hydration
- L-tube insertion: ileus (+)
- Pain control (meperidine, NSAIDs)
- IV antibiotics: 경한 경우에 그람 음성균을 겨냥한 단일 제제, 중한 경우에 그람 음성, 양성, 혐기성균을 모두 겨냥한 복합 제제
- Laparoscopic cholecystectomy – treatment of choice, Call GS doctor in ER
- PTGBD: 중한 경우나 합병증 (GB empyema, GB abscess) 동반되었으나 환자 상태가 수술 불가능한 경우
Acalculous cholecystitis

- 담석을 동반하지 않은 급성담낭염
- 전체 급성 담낭염의 5-10%
- 원인: stress (trauma, burn, major op.), vasculitis, infectious agents (Salmonella, cytomegalovirus, Cryptosporidium), obstructive (tumor, parasites, hypomotility)
- common situation: prolonged fasting, immobility, hemodynamic instability
- 치료: 수술 (prompt cholecystectomy)
- 예후: 나쁘다. 합병증 (perforation, gangrene, empyema)이 잘 생김.

Emphysematous cholecystitis

- 원인 – ischemia or gangrene in GB wall, gas producing organism (Clostridium welchii, C. Perfrigens, E.coli...), old age, DM
- 진단 – gas within GB lumen
- 치료 – 수술, 항생제
Emphysematous cholecystitis

담도 결석 (choledocholithiasis)
Management of Bile Duct Stones

- Principle in management of common bile duct stones
  - treat all cases irrespective of symptoms
  - methods of treatment:
    - **Endoscopic sphincterotomy (EST)**; Tx of choice
    - Open CBD exploration

- Principle in management of intrahepatic bile duct stones
  - Hepatectomy: limited to one lobe, associated with atrophy and stricture
  - Percutaneous transhepatic cholangioscopy-lithotripsy (PTCS-L)

담도 결석 (choledocholithiasis)

- 대부분 (85%)은 cholesterol stone으로 GB stone이 내려온 것 (GB stone의 10-15%가 담도로 내려감).
- CBD 자체에서 형성되는 닫석은 대부분 pigment stone (hemolysis, parasite infestation, congenital anomaly..)으로 수술 후에 재발을 잘 함.
- 합병증 – cholangitis, obstructive jaundice (ALP – direct bilirubin – aminotransferase 순으로), pancreatitis, secondary biliary cirrhosis, malabsorption…
Jaundice Patient in ER

- **Obstructive Jaundice** vs Cholestatic Jaundice
  - History: abdominal pain, fever, prior biliary surgery, older age
  - P/Ex: fever, abdominal tenderness, palpable abdominal mass, abdominal scar
  - Lab: Predominant elevation of serum **ALP** relative to aminotransferase, PT normal or normalizes with vitamin K administration, elevated serum amylase or lipase

CBD stone extraction after EST
Decision tree for Obstructive Jaundice

- History, P/Ex, routine Lab → ALP or AST/ALT elevated → Biliary tract obstruction a consideration? → US or CT → dilated bile duct → ERCP or PTC

- Drainage procedure in malignant obstruction
  - PTBD in intrahepatic bile duct obstruction
  - Endoscopic drainage (ENBD, ERBD) in extrahepatic bile duct obstruction

PTBD
ENBD

ERBD (Plastic stent)
응급실에서 유의사항

• 금요일 밤에 급성담관염이 의심되는 환자가 응급실에 내원했는데 어떻게 draiage를 할까요?

• Drainage가 필요한 환자가 Antiplatelet or anticoagulant drugs (aspirin, warfarin, ticlopidine, clopidgrel…)을 복용하고 있는데, 빨리 시술이 필요하면?
응급 체장 질환

이종균
응급 체장 질환
-급성 체장염

이종균
성균관대학교 의과대학 내과학교실

응급실에 급성췌장염 의심 환자가 왔을 때 꼭 파악해야 할 사항들

1. 급성 체장염이 맞는가?
2. 원인이 무엇인가?
3. 정도가 심한가?
4. 동반된 합병증이 있는가?
5. 적절한 치료는 무엇인가?
Diagnosis of acute pancreatitis

- Severe constant abdominal pain
- Serum amylase and/or lipase > 3N
- Image finding
- Exclusion of other causes

Acute abdomen with hyperamylasemia

- Perforated viscus (esp. peptic ulcer)
- Acute cholecystitis and biliary colic
- Acute intestinal obstruction
- Mesenteric vascular occlusion
- Peritonitis
- Dissecting aortic aneurysm
- Connective tissue disorders with vasculitis
- Diabetic ketoacidosis
- Ectopic pregnancy
Symptoms

- Abdominal pain
- Low-grade fever
- Tachycardia
- Hypotension
- Shock
  - hypovolemia secondary to exudation of blood and plasma proteins into the retroperitoneal space
  - increased formation of kinin peptides, which cause vasodilation and increased vascular permeability
  - systemic effects of proteolytic and lipolytic enzymes released into the circulation
- Respiratory distress
- Skin discoloration

Laboratory findings

- Amylase
  - onset; 2-12 hours, duration; 3-5 days
  - unrelated to severity
  - salivary gl., liver, intestine, kidney, fallopian tube
  - tumor - lung, esophagus, breast, ovary
  - normal in acute pancreatitis
    - after 5 days
    - acute exacerbation in chronic pancreatitis
    - hypertriglyceridemia
- Lipase
  - Longer duration, more specific to pancreas
Radiologic findings

- Chest X-ray
  - pleural effusions, atelectasis, ARDS
- Simple abdomen
  - ileus
  - *sentinel loop*; isolated dilated loop of small bowel overlying the pancreas
  - *colon cutoff sign* - dilation of the transverse colon

Ultrasonography

- Limited visualization of pancreas by intestinal gas or adipose tissue
- Single best noninvasive test for detecting cholelithiasis
Causes of acute pancreatitis

- Support diagnosis
- Prevent progression and recurrence

CT

- Diagnosis
- Exclusion of other surgical abdomen
- Severity of pancreatitis
- Local complications
Gallstone pancreatitis

- 의심 소견: 담석, 담관 확장, cholestatic LFT
- 대부분 작은 담석: 90%는 자연 배출
- 중증 체장염 또는 48시간 내에 호전되지 않는 경우에
  - 내시경적괄약근절개술
- 담석성 체장염은 대부분 만성화되지 않는다

Alcoholic pancreatitis

- 수년간에 걸친 알코올 섭취에 의해 발생
  - 하루 평균 60 gm, 3년 이상, 1주 내 음주
- 증상은 처음이라도 조직학적으로는 만성 변화

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Hypertriglyceridemia

- Serum TG > 500~1000mg/dL
- Release of free fatty acids → may damage acinar cells or capillary endothelium
- Hyperlipoproteinemia, alcohol abuse, DKA
Autoimmune Pancreatitis (AIP)

- Autoimmune mechanism
- Serum IgG4 > 135 mg/dL
- Lymphoplasmacytic sclerosing pancreatitis (LPSP)
- Other organ involvement
- Good response to steroid

Mild pancreatitis vs. Severe pancreatitis

- interstitial edema
- mortality < 2%
- parenchymal necrosis
- systemic organ failure or local complications such as necrosis, pseudocyst, abscess
- mortality 10~15%
**APACHE II scoring system**

<table>
<thead>
<tr>
<th>Physiologic variable</th>
<th>High abnormal range</th>
<th>Low abnormal range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+4</td>
<td>+1</td>
</tr>
<tr>
<td></td>
<td>+3</td>
<td>+2</td>
</tr>
<tr>
<td>Temperature rectal (°C)</td>
<td>&lt; 39.0</td>
<td>38.5–38.9</td>
</tr>
<tr>
<td>Mean arterial pressure (2 x diastolic systolic)/3</td>
<td>&lt; 100</td>
<td>100–109</td>
</tr>
<tr>
<td>Heart rate (ventricular response)</td>
<td>&gt; 180</td>
<td>140–179</td>
</tr>
<tr>
<td>Renal function (serum creatinine in mg/dL)</td>
<td>&gt; 30</td>
<td>25–34</td>
</tr>
<tr>
<td>Oxygenation</td>
<td>&gt; 50</td>
<td>35–49</td>
</tr>
<tr>
<td>Sedative medications (e.g., barbiturates)</td>
<td>&gt; 10</td>
<td>6–9</td>
</tr>
<tr>
<td>Glucose (mg/dL)</td>
<td>&gt; 200</td>
<td>180–199</td>
</tr>
<tr>
<td>LDH (IU/L)</td>
<td>&gt; 350</td>
<td>250–299</td>
</tr>
<tr>
<td>AST (IU/L)</td>
<td>&gt; 250</td>
<td>200–249</td>
</tr>
<tr>
<td>BUN (mg/dL)</td>
<td>&gt; 50</td>
<td>45–49</td>
</tr>
<tr>
<td>Creatinine (mg/dL)</td>
<td>&gt; 3.5</td>
<td>3.0–3.4</td>
</tr>
<tr>
<td>Days in hospital</td>
<td>&gt; 5</td>
<td>1–4</td>
</tr>
<tr>
<td>Acute respiratory distress syndrome</td>
<td>&gt; 2</td>
<td>0–1</td>
</tr>
<tr>
<td>Sepsis</td>
<td>&gt; 2</td>
<td>0–1</td>
</tr>
<tr>
<td>Septic shock</td>
<td>&gt; 2</td>
<td>0–1</td>
</tr>
<tr>
<td>Organ failure</td>
<td>&gt; 2</td>
<td>0–1</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>&gt; 2</td>
<td>0–1</td>
</tr>
<tr>
<td>Chronic health status</td>
<td>&gt; 2</td>
<td>0–1</td>
</tr>
<tr>
<td>Total score</td>
<td>&gt; 30</td>
<td>0–29</td>
</tr>
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**Apache II**

**At admission**

<table>
<thead>
<tr>
<th>Ranson Criteria (Alcoholic)</th>
<th>Modified Criteria (Biliary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &gt; 55 years</td>
<td>&gt; 70 years</td>
</tr>
<tr>
<td>WBC &gt; 16,000/mm³</td>
<td>&gt; 18,000/mm³</td>
</tr>
<tr>
<td>Glucose &gt; 200 mg/dL</td>
<td>&gt; 220 mg/dL</td>
</tr>
<tr>
<td>LDH &gt; 350 IU/L</td>
<td>&gt; 400 IU/L</td>
</tr>
<tr>
<td>AST &gt; 250 IU/L</td>
<td>&gt; 440 IU/L</td>
</tr>
</tbody>
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**During initial 48 h**

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<thead>
<tr>
<th></th>
<th>Ranson Criteria (Alcoholic)</th>
<th>Modified Criteria (Biliary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hct decrease &gt; 10 %</td>
<td>&gt; 10 %</td>
<td>&gt; 10 %</td>
</tr>
<tr>
<td>BUN increase &gt; 5 mg/dL</td>
<td>&gt; 2 mg/dL</td>
<td>&gt; 8 mg/dL</td>
</tr>
<tr>
<td>Calcium &lt; 8 mg/dL</td>
<td>&gt; 4 mg/dL</td>
<td>&gt; 5 mg/dL</td>
</tr>
<tr>
<td>PO₂ &lt; 60 mm Hg</td>
<td>&gt; 60 mm Hg</td>
<td>&gt; 60 mm Hg</td>
</tr>
<tr>
<td>Base deficit &gt; 4 mEq/l</td>
<td>&gt; 5 mEq/l</td>
<td>&gt; 5 mEq/l</td>
</tr>
<tr>
<td>Estimated fluid sequestration &gt; 6 l</td>
<td>&gt; 6 l</td>
<td>&gt; 6 l</td>
</tr>
</tbody>
</table>
Risk factors that adversely affect survival

- **Organ Failure**
  - cardiovascular: SBP < 90 mmHg, HR > 130/min
  - pulmonary: PaO₂ ≤ 60 mm Hg
  - renal: oliguria or increasing BUN/Cr
  - GI bleeding: > 500 mL/24 hr
- **Pancreatic necrosis**
- **Obesity (BMI>29); age >70**
- **Hemoconcentration (Hct > 44%)**
- **CRP > 150mg/L**
- **≥ 3 Ranson criteria, ≥ 8 APACHE-II score**
Compli options

- Local
  - necrosis +/- infection
  - pseudocyst
  - abscess
  - pancreatic ascites
  - bleeding

- Systemic
  - ARDS
  - hypotension
  - renal
  - GI bleeding
  - DIC
  - metabolic
  - CNS

[Image of diagram showing relative incidence and interventional window]
Guideline for prophylactic antibiotics

- Severe pancreatitis and greater than 30% necrosis
- Selection of antibiotics
  - spectrum, penetration of pancreatic tissue
  - (Imipenem), 2nd or 3rd generation Cephalosporin, Quinolone
- Duration: 2 weeks
- Increased risk of fungal or multi-resistant organisms

Cause of death in severe AP

<table>
<thead>
<tr>
<th>Days</th>
<th>No. of patients</th>
<th>Cause of death</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10</td>
<td>13</td>
<td>cardiac failure (11)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MOF (2)</td>
</tr>
<tr>
<td>11-20</td>
<td>3</td>
<td>cardiac failure (1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>gangrene of small intestine (1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MOF caused by infected necrosis (1)</td>
</tr>
<tr>
<td>21-30</td>
<td>2</td>
<td>MOF (1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cardiac failure caused by infected necrosis (1)</td>
</tr>
<tr>
<td>45-153</td>
<td>3</td>
<td>MOF caused by infected necrosis (3)</td>
</tr>
</tbody>
</table>

MOF; multiple organ failure

Management of mild pancreatitis

- Rest
- NPO for 2-3 days
- Pain control

Management of severe pancreatitis

- ICU care
  - hemodynamic monitoring (V/S, U/O, CVP)
  - mechanical ventilation with PEEP
- Aggressive fluid resuscitation
  - prevent pancreatic ischemia
  - 5~10 L/day, colloids : crystalloids 1:3
- NPO and TPN or enteral tube feeding
- Prophylatic antibiotics
- Early ERCP in severe gallstone pancreatitis
- Prevention and management of complications
ERCP in acute biliary pancreatitis

- Early ERCP
  - coexistent cholangitis
  - severe pancreatitis
  - change of severity sign from mild to severe
- EUS or MRCP
  - mild to moderate severity
  - Improving, intermediate probability of CBD stone
- Cholecystectomy without ERCP
  - mild
  - low probability of CBD stone

Guideline

The role of endoscopy in the evaluation of suspected cholelithiasis

<table>
<thead>
<tr>
<th>Predictors of cholelithiasis</th>
<th>Likelihood of CBD Stone Based on Clinical Predictors (Table 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very strong</td>
<td>Symptomatic Patient with Cholecystolithiasis</td>
</tr>
<tr>
<td>CBD stone on transabdominal US</td>
<td>Low</td>
</tr>
<tr>
<td>Clinical ascending cholangitis</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Bilirubin &gt; 4 mg/dL</td>
<td>High</td>
</tr>
<tr>
<td>Strong</td>
<td>Laparoscopic Cholecystectomy</td>
</tr>
<tr>
<td>Dilated CBD on US (&gt; 6 mm with gallbladder in situ)</td>
<td>No Cholecystectomy</td>
</tr>
<tr>
<td>Bilirubin level 1.8-4 mg/dL</td>
<td>Laminaroscopic IOC or Laminaroscopic Ultrasound</td>
</tr>
<tr>
<td>Moderate</td>
<td>Pre-operative ERCP</td>
</tr>
<tr>
<td>Abnormal liver biochemical test other than bilirubin</td>
<td>Depending on costs and local expertise</td>
</tr>
<tr>
<td>Age older than 55 y</td>
<td></td>
</tr>
<tr>
<td>Clinical gallstone pancreatitis</td>
<td></td>
</tr>
<tr>
<td>Assigning a likelihood of cholelithiasis based on clinical predictors</td>
<td></td>
</tr>
<tr>
<td>Presence of any very strong predictor</td>
<td></td>
</tr>
<tr>
<td>Presence of both strong predictors</td>
<td></td>
</tr>
<tr>
<td>No predictors present</td>
<td></td>
</tr>
<tr>
<td>All other patients</td>
<td></td>
</tr>
</tbody>
</table>

CBD, Common bile duct.
급성췌장염 의심 시 파악해야 할 사항

1. 급성췌장염이 맞는가?
   □ 다른 질환 배제 필요
2. 원인이 무엇인가?
   □ 뚜렷한 원인이 없으면 다른 진단 가능성 염두
   □ 원인 교정 및 재발 방지
3. 정도가 심한가?
   □ 치료가 다르다
4. 동반된 합병증이 있는가?
   □ 사망 원인 - 다발성 장기부전, 감염
5. 적절한 치료는 무엇인가?
   □ 수액, 항생제, ICU, 조기 시술 적응증

Infected necrosis

□ 30~50% mortality rate
□ Suspicion
   □ newly developed signs of organ failure
   □ fever after initial response to conservative tx.
   □ gas (+) on CT scan
□ Surgical necrosectomy & lavage
□ Endoscopic necrosectomy in localized necrosis

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췌담도 질환에서 내시경 검사

이광혁
ERCP
(Endoscopic Retrograde CholangioPancreatography)
• ERCP
• EST
• CBD stone removal
• ERBD
• ENBD
• Photodynamic therapy
• Endoscopic papillectomy

EUS
(Endoscopic UltraSound)
• EUS
• EUS-FNA
• EUS-TCB
• EUS-guided therapy
  – Drainage
  – Anastomosis
  – Ablation
  – Injection
Perforation

• Endoscopic perforation → surgery
• Instrumental perforation → supportive

Pancreatitis

• Same as acute pancreatitis from other causes
• Severity assessment

Close observation of Complications

• Change of abdominal pain, Vital sign, P/E
• Perforation: Simple abdomen, chest PA
• Pancreatitis: Amylase/Lipase
• Bleeding: CBC
• Infection: Cholangitis, Cyst infection
Need an Expert? Yes!

- Our nation
  - At least 1 year of training in gastrointestinal endoscopy
  - At least 1 year of training in investment
- Advanced endoscopic course in USA
  - ERCP Fellowship: 1 year
  - EUS Fellowship: 1 year

For diagnosis
EUS, MRCP >? ERCP
Endoscopic Sphincterotomy (EST)

- Therapeutic intent
- Complication
  - Perforation
  - Bleeding
- Techniques
  - Depth - 1/2 - 2/3 outside AOV
  - Direction - 12 o’clock position
  - Limit - Oral protrusion
  - Speed - Control

Accessories in ERCP

- Catheter
- Papillotome
- Guide-wire
- Stent
  - Metal
  - Plastic
- Balloon
  - Dilatation
  - Retrieval
- Basket
  - Lithotripsy
Plastic stent

- Removable
- Benign stricture
- Exchange – 3 months
- Shapes

Palliative management of malignant biliary obstructions

- Percutaneous drainage
- Endoscopic drainage
Treatment of distal obstruction

- Placement of self-expanding metal stent is the treatment of choice from some randomized trials.

Covered metal stent

- Prevention of tumor ingrowths
- Cholecystitis or Obstruction of branched duct

Bilateral stent

- Parallel
- Y stent

Photodynamic therapy

Endoscopic papillectomy

- AOV adenoma
- Pancreatic duct stent
Endoscopic ultrasound

- High resolution and Tissue acquisition
- Esophagus – Stomach – Duodenum 2nd
- Intervention

Radial type Vs Linear type

EUS guided tissue diagnosis using linear EUS

Needle Vs TruCut® biopsy

- 22G
- 25G
- 19G – therapeutic
- 19G
EUS guided tissue diagnosis

**EUS-FNA (aspiration)**
1. 22G or 25G needle
2. No site limitation
3. Cytological analysis

**EUS-TCB (TruCut biopsy)**
1. 19G needle – stiff
2. Some site limitation
3. Histological analysis

**EUS-FNA (ProCore)**
1. 22G or 25G needle
2. No site limitation
3. More tissue

---

EUS-FNA for pancreatic cancer

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metastatic</td>
<td>Yes</td>
</tr>
<tr>
<td>Advanced unresectable</td>
<td>Yes</td>
</tr>
<tr>
<td>Borderline resectable</td>
<td>Yes</td>
</tr>
<tr>
<td>Resectable</td>
<td>Maybe, yes</td>
</tr>
<tr>
<td>Undetectable</td>
<td>Yes</td>
</tr>
</tbody>
</table>
**Pancreatic Cystic Neoplasm**

- Solid component
- Fluid analysis
  - CEA
  - Amylase
- Poor cytological yield

**Therapeutic applications**

- Drainage and Anatomosis
  - Pseudocyst, pancreatic abscesses
  - Biliary tract, Pancreatic duct, Jejunum
- Ablation
  - CPN block, cyst ablation, solid mass ablation
  - Ethanol, chemotherapeutics, fiducial, biological agent