Cholangitis
Difficult stone management

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Case 1

- 79 y old woman
- Medical history:
  - Diabetes – insuline treatment
  - Hypertension
  - Obesity
  - CABG + Pacemaker
  - Ilocolic resection for T2 colonadenoca 2009

Clinical presentation

- Dyspepsia and vomiting for 3 days
- Abdominal pain
- Fever > 38,5 ° for 2 days
- Icteric for 1 day
- Syncope – medical transport to Emergency Room
- No recent antibiotics

At Emergency room

- BP 85/45 mmHg, HR: 115/'
- Temp 38,9°C
- Jaundice

Lab results

- WBC 18900
- CRP 356 mg/l
- Creat 1,6 mg/dl
- AST 125, ALT 188 u/l
- gGT 480, AF 280 u/l
- Bili 4,6 mg/dl

Abdominal US

- Cholecystolithiasis
- Normal galbladder wall
- Normal intrahepatic bile ducts
- Extrahepatic bile duct 12 mm

Charcot's triad

- **Abdominal pain**
- **Fever**
- **Jaundice**

- + Inflammatory respons
- + Abnormal liver tests
- + biliary dilation

Question 16

A. Blood cultures, Empiric AB, hypotensive shock treatment
B. 1+ urgent EUS/MRCP
C. 1+ urgent ERCP with prior EUS/MRCP
D. 1+ urgent ERCP without prior EUS/MRCP

Question 16

25% 1. Answer A
25% 2. Answer B
25% 3. Answer C
25% 4. Answer D

10

Question 16

A. Blood cultures, Empiric AB, hypotensive shock treatment
B. 1+ urgent EUS/MRCP
C. 1+ urgent ERCP with prior EUS/MRCP
D. 1+ urgent ERCP without prior EUS/MRCP

- 70-80 % of cholangitis will respond to conservative management with AB + elective ERCP in 24 to 48 h
- Urgent ERCP only in:
  - Persistent abdominal pain
  - Hypotension despite adequate resuscitation
  - Fever > 39 °
  - Mental confusion (predictor of poor outcome)

Kimura J Hepatobiliary pancreat surg 2007
Hui, Aliment pharmacol Ther 2001
Salek, J Clin Gastroenerol 2009

Empiric antibiotics in this case
Question 17

A. Piperacillin-tazobactam
B. Amoxicillin-clavulanate
C. Ciprofloxacin
D. Ciprofloxacin + 5-nitro-imidazole

Question 17

25% 1. Answer A
25% 2. Answer B
25% 3. Answer C
25% 4. Answer D

10

Empiric antibiotics in this case Question 17

A. Piperacillin-tazobactam
B. Amoxicillin-clavulanate
C. Ciprofloxacin
D. Ciprofloxacin + 5-nitro-imidazole

Sanford antimicrobial guide

- Community acquired, absence of device and no recent AB exposure
  - Amoxicillin-clavulanate (or cefuroxime+5-nitro-imidazole)
  - In case of peni-allergy: aztreonam or ciprofloxacin or levofloxacin + 5-nitro-imidazole or moxifloxacin
  - Duration:
    - 1 à 3 days after drainage
    - 7 days after drainage in case of bacteremia or sepsis
    - 21 days after drainage in case of hepatic abscess

The Sanford Guide to Antimicrobial therapy Belgian/luxembourg edition

Sanford antimicrobial guide

- Community acquired with device or recent AB exposure
  - Piperacillin-tazobactam (or Meropenem or ceftazidim + 5-nitro-imidazole)
  - In case of peni-allergy: Meronem or ciprofloxacin or levofloxacin + 5-nitro-imidazole + vancomycin
  - Duration:
    - 1 à 3 days after drainage
    - 7 days after drainage in case of bacteremia or sepsis
    - 21 days after drainage in case of hepatic abscess

Question 18

- After hemodynamic stabilisation and empiric antibiotics in this case: Direct to ERCP or imaging before?
  A. Wait & See
  B. Lap-Cholecystectomy
  C. ERCP without prior EUS/MRCP
  D. ERCP only after EUS/MRCP

Question 18

25% 1. Answer A
25% 2. Answer B
25% 3. Answer C
25% 4. Answer D

10

Question 18

A. Wait & See
B. Lap-Cholecystectomy
C. ERCP without prior EUS/MRCP
D. ERCP only after EUS/MRCP

Direct ERCP or Diagnostic Imaging

- In case of charcot's triad and abnormal liver tests, we proceed directly to ERCP
- In case of symptoms suggestive for cholangitis but without Charcot's triad, we need imaging: Abdominal US and if necessary: MRCP or EUS

Case 2

- 75 y old woman
- Medical history
  - Obesity
  - Diabetes
  - hypertension

Clinical presentation

- Jaundice
- No fever, no inflammation
- Unremarkable abdominal examination
- Known cholecystolithiasis
- Abdominal US:
  - Cholecystolithiasis, no cholecystitis
  - CBD 18 mm, intraductal stones

Question 19

A. Single stage lap CCE and lap CBDE
B. Two stage ERCP + ES and lap CCE
C. Ursodesoxycholic Acis
D. 1 or 2

Question 19

25% 1. Answer A
25% 2. Answer B
25% 3. Answer C
25% 4. Answer D

10

Question 19

A. Single stage lap CCE and lap CBDE
B. Two stage ERCP + ES and lap CCE
C. Ursodesoxycholic acid
D. 1 or 2

(SS) Single stage LCCE + LCBDE versus (TS) two stage LCCE and ERCP + ES

• Stone clearance:	SS 87 % -	TS 79 %	(P= 0,17)
• Postop morbidity:	SS 19 % -	TS 15 %	(P= 0,99)
• Mortality:			(P= 0,42)
• Conversion to other proc	SS 12 % -	TS 13,9 %	(P= 0,39)
• Length hospital stay			(P= 0,45)
• Total operative time			(P= 0,92)
• Hospital charges			=
• Number of procedures	SS <	TS	

Jiong, World J Gastroenterol 2012

SS) Single stage LCCE + LCBDE versus (TS) two stage LCCE and ERCP + ES

Conclusion:

Single stage management is equivalent to two-stage management but requires fewer procedures. However, patient's condition, operator's expertise and local resourses should be taken into account in making treatment decisions.

Jiong, World J Gastroenterol 2012

- 85 – 95 % of stones can be managed by conventional methods:
  - ES (endoscopic sphincterotomy)
  - Basket or balloon extraction

Strömberg, Br J Surg 2009

Factors associated with difficulties

- Difficulties accessing the bile duct/papilla
- Large number of stones (>10)
- Large size of stones (> 15 mm)
- Unusually shaped stones
- Location of the stones (intrahepatic, prestenotic, cystic duct..)

1. Mechanical lithotripsy
2. Endoscopic large balloon dilation
3. Electrohydraulic/laser lithotripsy
4. Biliary stenting
5. (Extracorporeal shockwave lithotripsy)

1. Mechanical Lithotripsy

- Trough the scope
  - Three layer system: basket, inner plastic sheat and outer metal sheat

- Salvage device
  - Removing handle of basket and duodenoscope + endotriptor under fluoroscopic guidance

- Succes mechanical lithotripsy
  Depending on stone diameter:
  > 90% if < 10 mm stone
  68 % if > 28 mm stone

Cipolletta: Br J surg 1997

Difficulties ML

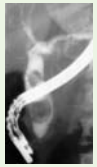
- Stone impaction:
  - Failure to pass te stone
  - Failure to open the basket around the stone
- Stone density:
  - Hard: difficult to crush
  - Soft: often molded to the bile duct shape

Garg, Gastrointest Endosc, 2004 / Leung, Gastrointest. Endosc, 2004

2. Endoscopic papillary large balloon dilation

Question 5

Question 20



A. BD 20 mm balloon with prior limited EST
B. BD 10 mm balloon
C. BD 20 mm balloon without prior EST
D. BD 20mm balloon with prior full EST

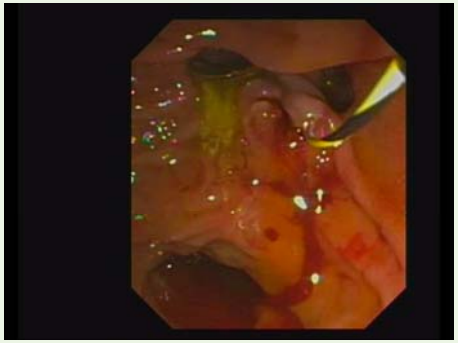
Question 20

25%	1.	Answer A
25%	2.	Answer B
25%	3.	Answer C
25%	4.	Answer D

10

Question 20

1. BD 20 mm balloon with prior limited ES
2. BD 10 mm balloon
3. BD 20 mm balloon without prior EST
4. BD 20mm balloon with prior full EST



2. Endoscopic papillary large balloon dilation

- EPLBD with prior EST (large or limited)
- EPLBD without prior EST

Jin, World J Gastroenterol 2014
Kim, world J Gastroenterol 2013

Comparison between endoscopic papillary large balloon dilation with and without endoscopic sphincterotomy *n* (%)

	EPLBD with EST	No. of studies	EPLBD without EST	No. of studies	*P* value
No. of procedures	2511	30	413	3	
Mean of mean age, yr	69.6 ± 8.6[1]	29	70.3 ± 2.3[1]	3	0.808
Periampullary diverticulum	773 (36.7)	23	122 (33.2)	2	0.186
Initial success	1745 (84.0)	24	285 (76.2)	3	< 0.001
Success without EML	2077 (83.2)	30	306 (76.7)	3	0.001
Use of EML	353 (14.1)	30	86 (21.6)	3	< 0.001
Overall success	2407 (96.5)	30	388 (97.2)	3	0.432
Overall adverse events	209 (8.3)	30	29 (7.0)	3	0.370
Pancreatitis, total; M/Mod/S/F	61; 51/9/0/1 (2.4)	30	16; 14/2/0/0 (3.9)	3	0.089
Bleeding, total; M/Mod/S/F	91; 75/11/2/2 (3.6)[2]	30	8; 7/1/0/0 (1.9)	3	0.079
Perforation, total; M/Mod/S/F	15; 3/6/3/3 (0.6)	30	2; 0/2/0/0 (0.5)	3	1.000
Other adverse events	42 (1.7)	30	3; 3/0/0/0 (0.7)	3	0.148
AE-related surgery	6 (0.2)	30	0 (0)	3	1.000
AE-related death	6 (0.2)	30	0 (0)	3	1.000

mean ± SD;
One case of bleeding was not graded for severity. M: Mild; Mod: Moderate; S: Severe; F: Fatal; EPLBD: Endoscopic papillary large balloon dilation; EST: Endoscopic sphincterotomy; EML: Endoscopic mechanical lithotripsy; AE: Adverse event.

World J Gastroenterol 2013 December 14; 19(46): 8580-8594.
Published online 2013 December 14. doi: 10.3748/wjg.v19.i46.8580.

Comparison of adverse events among endoscopic papillary large balloon dilation with large, limited and without endoscopic sphincterotomy *n* (%)

	EPLBD with large EST	EPLBD with limited EST	EPLBD without EST	*P* value
No. of procedures	756	946	413	
Overall adverse event	65 (8.6)	71 (7.5)	29 (7.0)	0.568
Pancreatitis	18 (2.4)	29 (3.1)	16 (3.9)	0.349
Bleeding	31 (4.1)	12 (1.3)	8 (1.9)	0.001[1]
Perforation	3 (0.4)	5 (0.5)	2 (0.5)	1.000
Other adverse events	13 (1.7)	25 (2.6)	3 (0.7)	0.054
AE-related surgery	2 (0.3)	2 (0.2)	0 (0.0)	0.832
AE-related death	2 (0.3)	0 (0.0)	0 (0.0)	0.166

EPLBD with large EST vs EPLBD with limited EST, *P* = 0.001; EPLBD with large EST vs EPLBD without EST, *P* = 0.544; EPLBD with limited EST vs EPLBD without EST, *P* = 0.35. EPLBD: Endoscopic papillary large balloon dilation; EST: Endoscopic sphincterotomy; AE: Adverse event.

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Recommendations EPLBD

1. EPLBD with large, especially full-incision should be avoided to prevent bleeding
2. EPLBD with limited EST is recommended, when stone is seen te be to large on cholangiogram, to reduce risk of bleeding and perforation
3. EPLBD is recommended in pt with coagulopathy, periampullary diverticulum and surgically altered anatomy

Jin, World J Gastroenterol 2013

Recommendations EPLBD

4. EPLBD should be avoided in pt with distal bile duct strictures
5. Balloon diameter should be determined on stone diameter, not exceeding distal bile duct diameter
6. Gradually inflate balloon in three steps
7. Ballon dilation must be ceased if central waist does not disappear or patient indicates severe pain

Jin, World J Gastroenterol 2013

3. Electrohydraulic/laser lithotripsy

- Ductal clearance in : 64 – 97 % (LL)
  : +/- 80 % (EHL)
- Complications (7-9 %)
  - Hemobilia, cholangitis, ductal perforation
- Direct visualisation needed

Mc Henri, Curr Treat Options Gastroenterol 2006
Hochberger, Gut 1998
Lee, endoscopy 2010
Arya, am J Gastroenterol 2004
Hui, Aliment Pharmacol Ther 2003

- Direct visualisation
  - Cholangioscope through duodenoscope
  - Direct Peroral cholangioscopy
  - PTC with cholangioscopy

4. Biliary stenting

- Mandatory if ductal clearance is not achieved
- CBD stones reduce in size in 60 % by mechanical irritation
- In combination with ursodeoxycholic acid and/or Terpene Therapy for 6 months

Lee, Dig Endosc 2010
Han, Am J Gastroenterol 2009