

8[^] edizione
Top Ten
IN GASTROENTEROLOGIA

17-18 MARZO 2017

ISEO (BS)

Iseo Lago Hotel - Via Colombera, 2

Gianpiero Manes



**Linee guida sulla terapia
endoscopica della colelitiasi**



- Gallstones are common with prevalence as high as 10% to 15% in developed countries
- The overall cumulative incidence of gallstone formation was 0.60% per year
- Most patients with gallstones will remain asymptomatic throughout their lifetime and the likelihood of developing symptoms diminishes with time
- The cumulative probability of developing biliary pain or complications is 10-25%
- The annual risk of patients with asymptomatic gallstones developing symptoms is 2% to 3% with only 1% to 2% experiencing major complications
- Stones that are larger (>10 mm), multiple, or more than 5 years old are associated with increased risk of complication

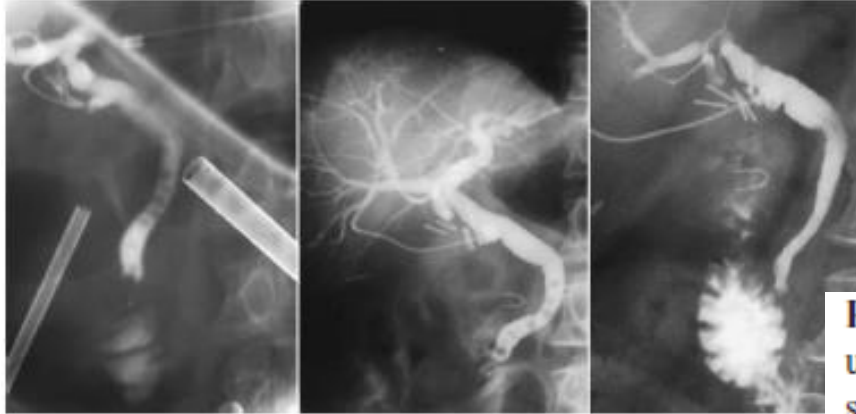
A Prospective Study of Common Bile Duct Calculi in Patients Undergoing Laparoscopic Cholecystectomy

Natural History of Choledocholithiasis Revisited

Chris Collins, AFRCSI,* Donal Maguire, MD, FRCSI,* Adrian Ireland, MCh, FRCSI,*
Edward Fitzgerald, MB, FRCR,† and Gerald C. O'Sullivan, MCh, FRCSI*

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(*Ann Surg* 2004;239: 28–33)



Results: Operative cholangiography was attempted in 997 consecutive patients and was accomplished in 962 patients (96%). Forty-six patients (4.6%) had at least one filling defect. Twelve of these had a normal cholangiogram at 48 hours (26% possible false-positive operative cholangiogram) and a further 12 at 6 weeks (26% spontaneous passage of calculi). Spontaneous passage was not determined by either the number or size of calculi or by the diameter of the bile duct. Only 22 patients (2.2% of total population) had persistent common bile duct calculi at 6 weeks after laparoscopic cholecystectomy and retrieved by endoscopic retrograde cholangiopancreatography.

Conclusions: Choledocholithiasis occurs in 3.4% of patients undergoing laparoscopic cholecystectomy but more than one third of these pass the calculi spontaneously within 6 weeks of operation and may be spared endoscopic retrograde cholangiopancreatography. Treatment decisions based on assessment by operative cholangiography alone would result in unnecessary interventions in 50% of patients who had either false positive studies or subsequently passed the

Natural Course vs Interventions to Clear

Common Bile Duct Stones

Data From the Swedish Registry for Gallstone Surgery and Endoscopic Retrograde Cholangiopancreatography (GallRiks)

Table 4. Unfavorable Outcomes for Each CBDS Strategy Chosen in 3828 Patients^a

Strategy	Unfavorable Outcome, No./ Total No. (%) of Patients ^b	OR (95% CI) ^c
1. No intraoperative measures	150/594 (25.3)	1 [Reference]
Strategies 2-7	411/3234 (12.7)	0.44 (0.35-0.55)
2. Postoperative ERCP	103/572 (18.0)	0.66 (0.49-0.87)
3. Laparoscopic choledochotomy	8/141 (5.7)	0.18 (0.08-0.37)
4. Open choledochotomy	141/781 (18.1)	0.65 (0.49-0.85)
5. Transcystic extraction	35/512 (6.8)	0.23 (0.15-0.33)
6. Intraoperative ERCP	98/889 (11.0)	0.37 (0.28-0.49)
7. Flushing/manipulation	26/339 (7.6)	0.26 (0.17-0.41)
Total	561/3828 (14.7)	NA

Abbreviations: CBDS, common bile duct stone; ERCP, endoscopic retrograde cholangiopancreatography; NA, not applicable; OR, odds ratio.

RESULTS In 38 864 cholecystectomies, CBDSs were found in 3969 patients, of whom 3828 underwent analysis. Earlier or ongoing symptoms were more common with increasing stone size ($P < .001$). In total, postoperative unfavorable outcomes were found in 14.9% but less frequently for patients with smaller stones ($P < .01$). Among patients in whom no intraoperative measures were taken (representing natural course), the risk for unfavorable outcomes was 25.3%. This risk was significantly lower in patients in whom any measure was taken to clear the ducts (12.7%; odds ratio, 0.44 [95% CI, 0.35-0.55]). The same was found when small (<4 mm) and medium (4-8 mm) stones were analyzed separately (odds ratio, 0.52 [95% CI, 0.34-0.79] and 0.24 [95% CI, 0.17-0.32], respectively).

JAMA Surgery October 2014 Volume 149, Number 10

CBDS Size, mm	No. (%) of Patients		
	All	Symptomatic ^b	With Unfavorable Outcome ^c
<4	904 (26.2)	362 (40.0) ^d	101 (11.2) ^e
4-8	1923 (55.7)	980 (51.0) ^f	295 (15.3)
>8	625 (18.1)	425 (68.0)	117 (18.7)
All	3452 (100.0)	1767 (51.2)	513 (14.9)

- ***ESGE recommends stone extraction to symptomatic patients with common bile duct stones. (Strong recommendation, low quality evidence)***
- ***ESGE suggests that stone extraction is offered to asymptomatic patients with CBDS, so long as they are fit enough to tolerate intervention (Weak recommendation, low quality evidence).***

Table 1 Clinical and trans-abdominal ultrasound scanning (USS) features with a specificity for common bile duct stones (CBDS) $>0.95^{246}$

Indicator for CBDS	Specificity	Sensitivity	+ve likelihood ratio	-ve likelihood ratio
CBDS on USS	1.00	0.3	13.6	0.70
Cholangitis	0.99	0.11	18.3	0.93
Pre-operative jaundice	0.97	0.36	10.1	0.69
Dilated CBD on USS	0.96	0.42	6.9	0.77

Predictor	Sensitivity	Specificity	Predictive values	
			Positive	Negative
Age (>55)	57%	49%	51%	56%
Female gender	57%	32%	43%	46%
History of jaundice	43%	66%	54%	55%
History of pancreatitis†	7%	75%	20%	47%
Bilirubin > 30 $\mu\text{mol/L}^*$	74%	48%	57%	66%
Alkaline phosphatase > 300 units/L	79%	35%	53%	65%
AST > 120 units/L	81%	25%	49%	60%
Amylase > 500 units/L†	28%	51%	33%	45%
Dilated CBD*	53%	73%	64%	64%
CBD stone U/S*	36%	90%	78%	58%
Multiple, small gallbladder stones	83%	29%	52%	64%

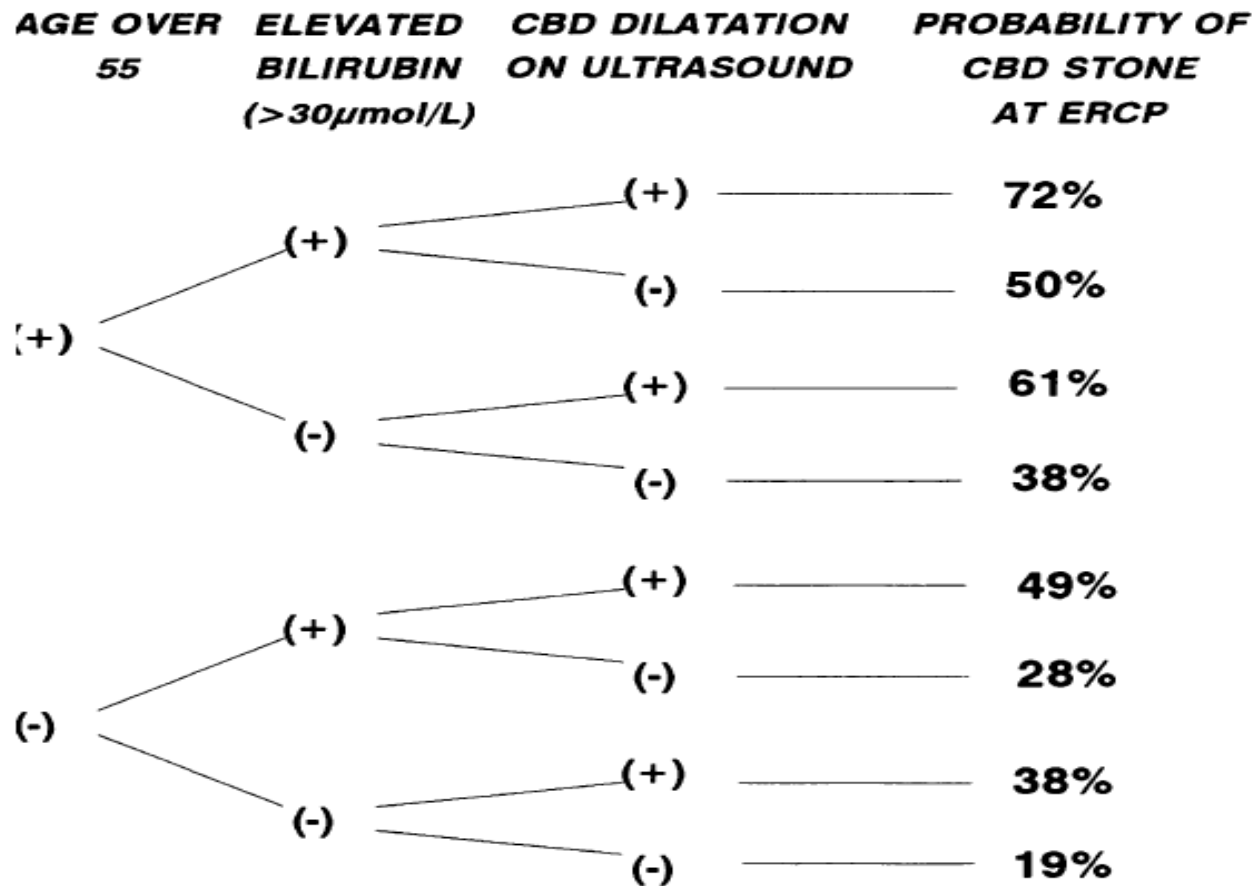
GGT = gamma glutamyl transferase; AST = Aspartate aminotransferase; ALT = Alanine aminotransferase; CBD = common bile duct; U/S = abdominal ultrasonography.

The optimal biochemical values used as cut-offs were determined by ROC curve analysis (see Figures 1 and 2).

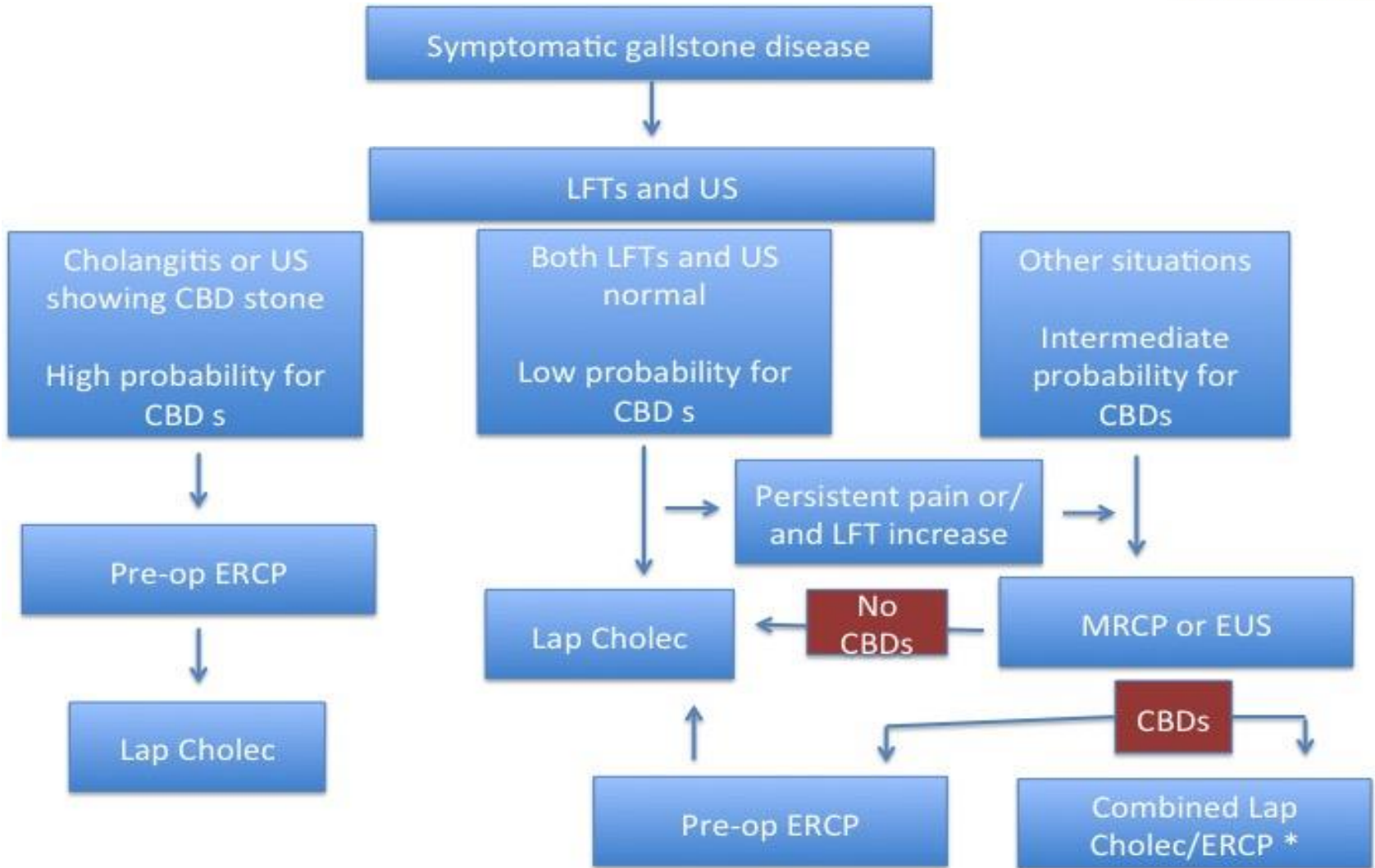
Although not an indication for pre-operative ERCP, the presence of multiple small gallbladder stones was examined as a possible predictor of bile duct stone at ERCP. Dilated CBD on ultrasound was reported as such or over 6 mm in diameter.

* Significant predictors of a CBD stone ($p < 0.01$).

† Significant predictors of the absence of a CBD stone on univariate analysis ($p < 0.01$).



- *ESGE recommends combining clinical, biochemical (liver function tests) and US findings to stratify the probability of CBD stones (Strong recommendation, Moderate level of evidence)*



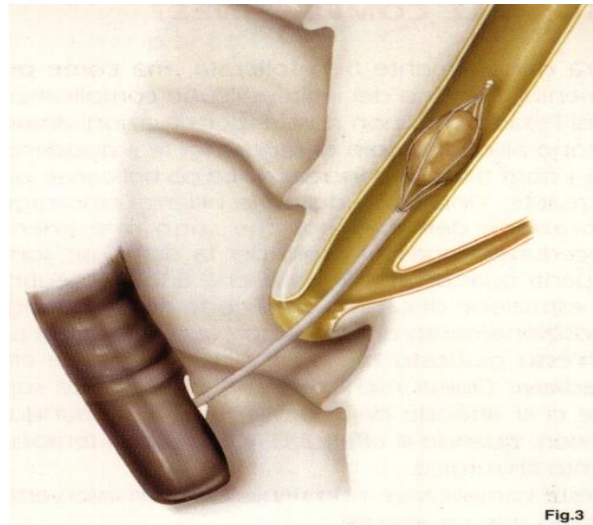
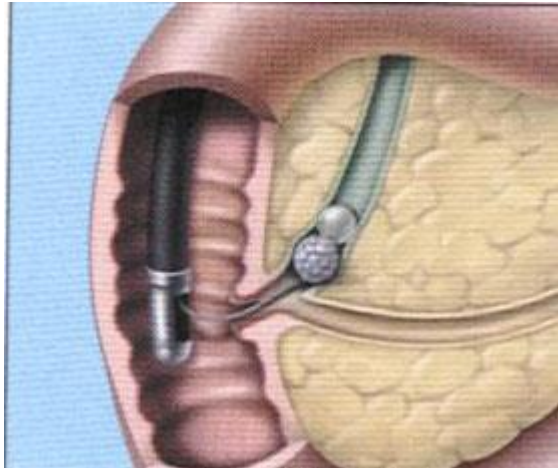
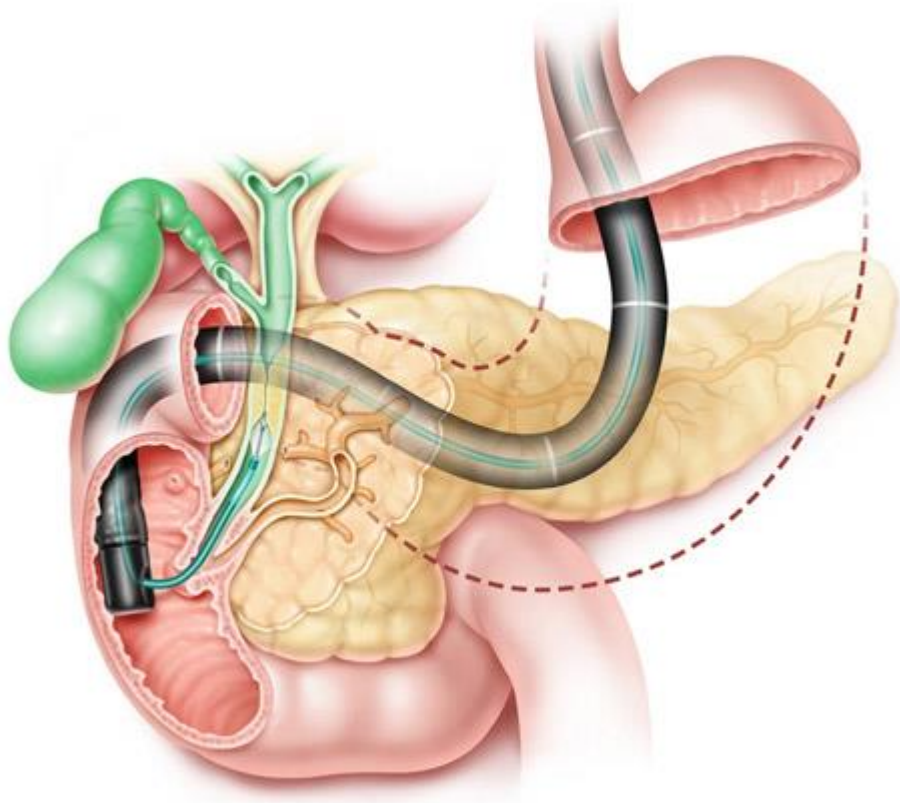
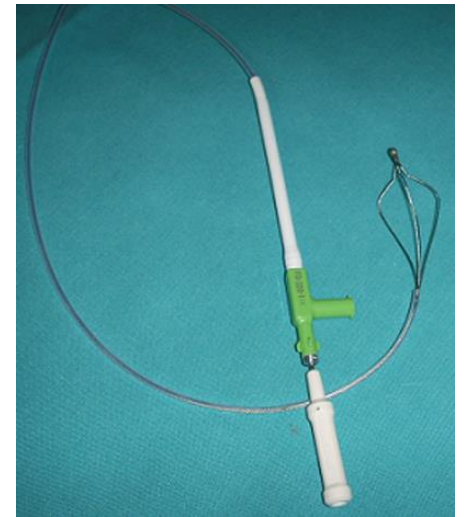
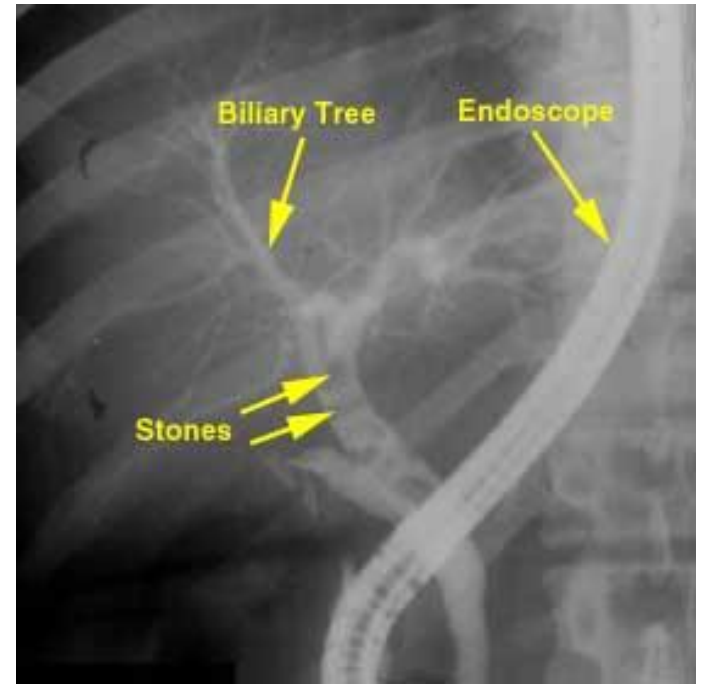


Fig.3





- *ESGE suggests to define difficult biliary stones those not amenable to be removed with conventional techniques (endoscopic sphincterotomy + balloon/basket) (Weak recommendation, very low quality of evidence)*

La litiasi biliare complessa

La litiasi biliare viene definita complessa per fattori legati:

Al calcolo

- Dimensione del calcolo > 2 cm (> 1.5 cm);
- Presenza di uno o più calcoli incuneati;

Alla sede del calcolo

- Al di sopra di un segmento duttale ristretto;
- Nel dotto cistico;
- Sindrome di Mirizzi;
- Diametro del CBD > 15 mm;
- Conformazione del CBD distale;

Alle caratteristiche del paziente

- Età superiore a 65 anni;
- Comorbidity di rilievo.
- Pregressa gastrectomia e/o chirurgia biliare;
- Presenza di diverticolo periampollare;

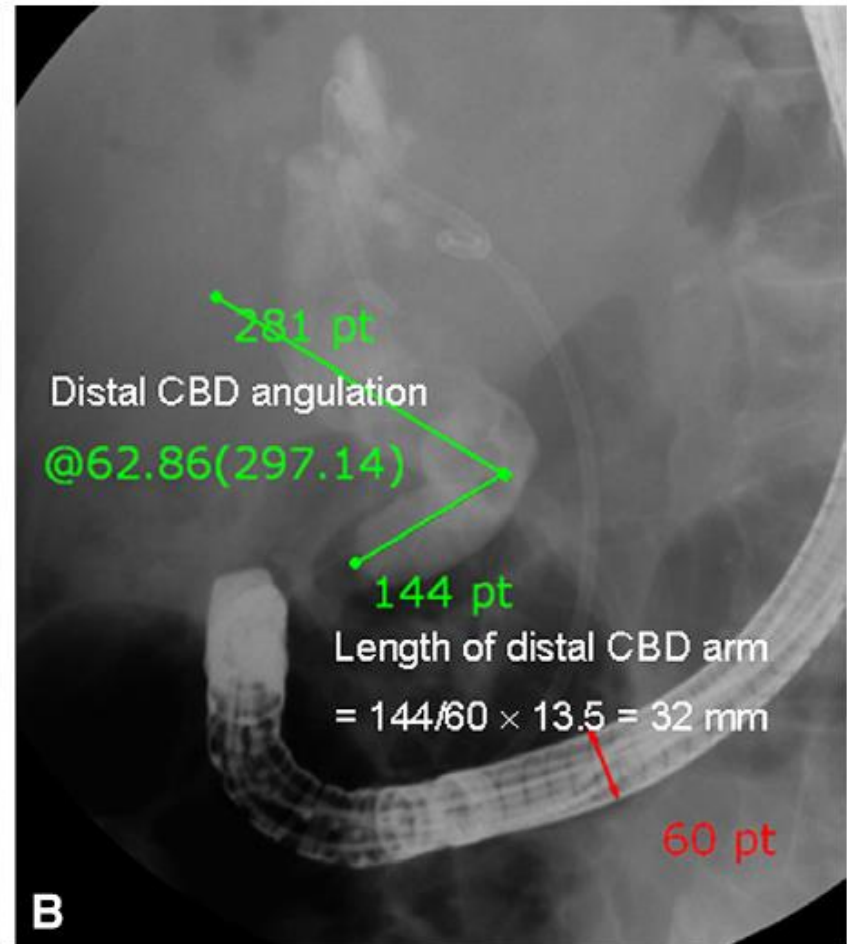
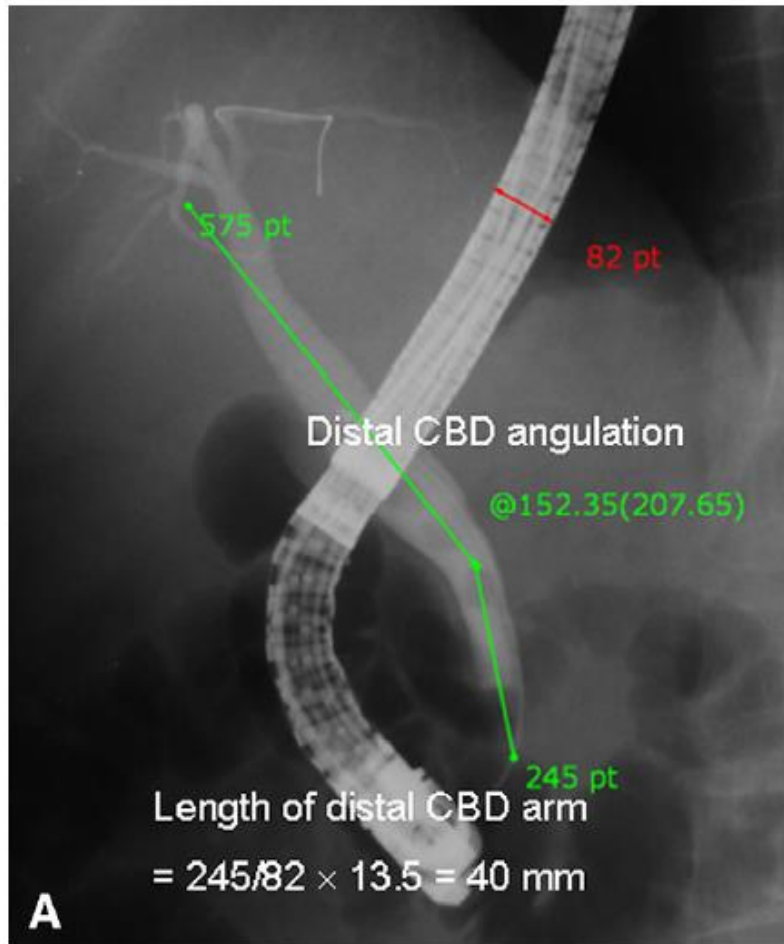
Problematic stones

Problematic anatomy

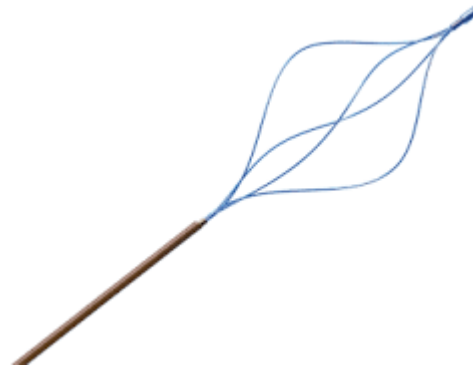
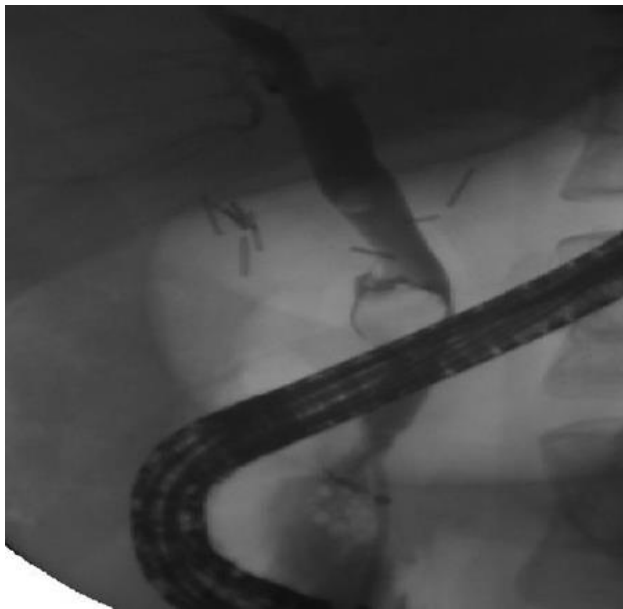
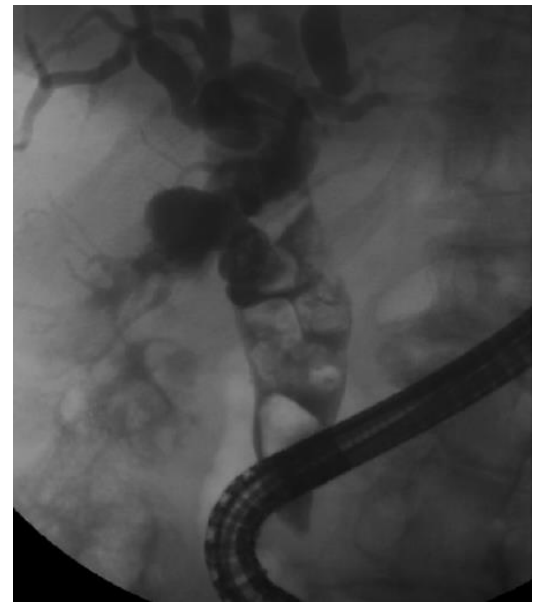
Problematic patient

Problematiche tecniche legate alle diverse condizioni

- **Raggiungere il calcolo**
 - Anatomia dell'albero biliare
 - Sede del calcolo
- **Afferrare il calcolo**
 - Dimensioni del calcolo
 - Dimensioni della via biliare
 - Numero dei calcoli
- **Rimuovere il calcolo**
 - Dimensioni del calcolo rispetto al calibro della via biliare e della sfinterotomia



Kim HJ, et al. Factors influencing the technical difficulty of endoscopic clearance of bile duct stones. *Gastrointest Endosc* 2007; **66**: 1154-1160



EDITORIAL

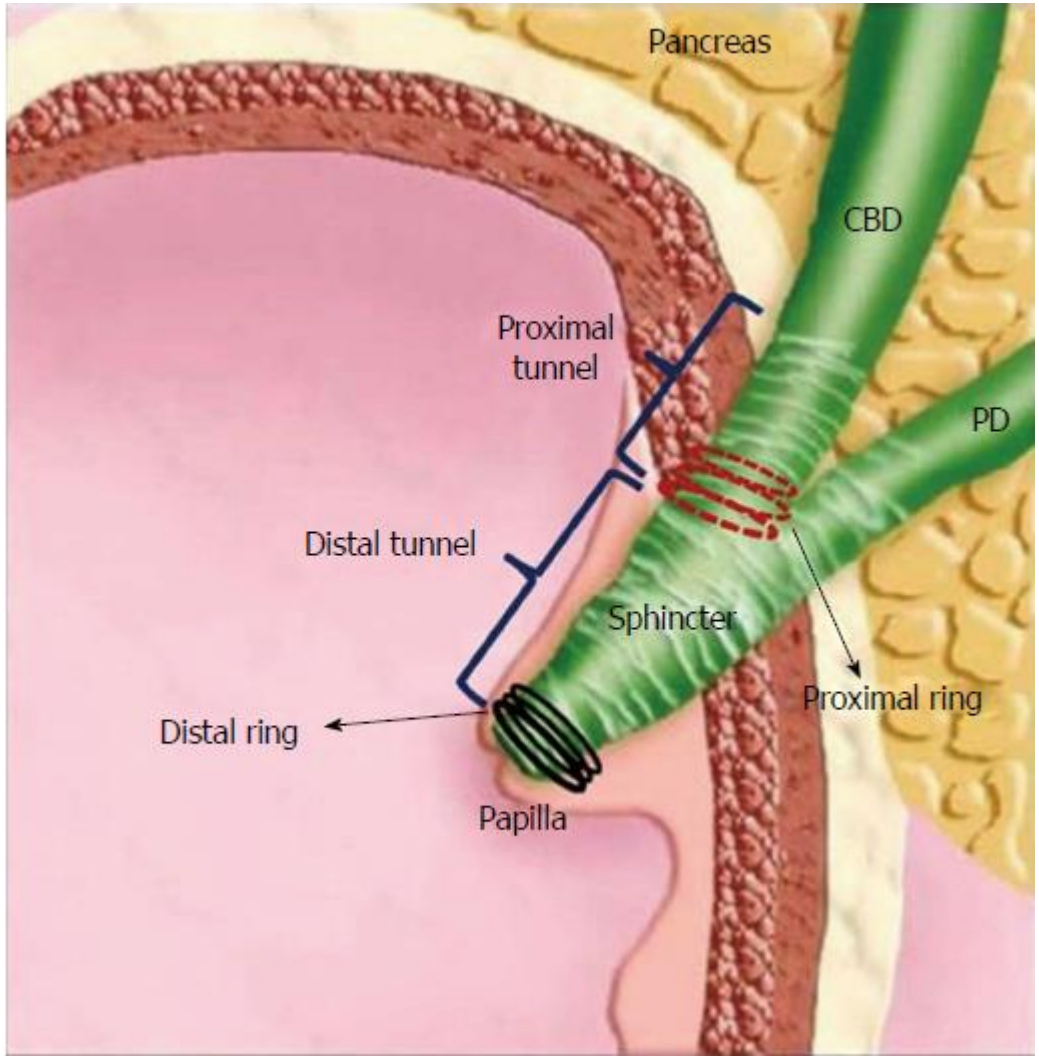
Difficult bile-duct stones: cut, dilate, or both?

David L. Carr-Locke, MD, FRCP, FASGE

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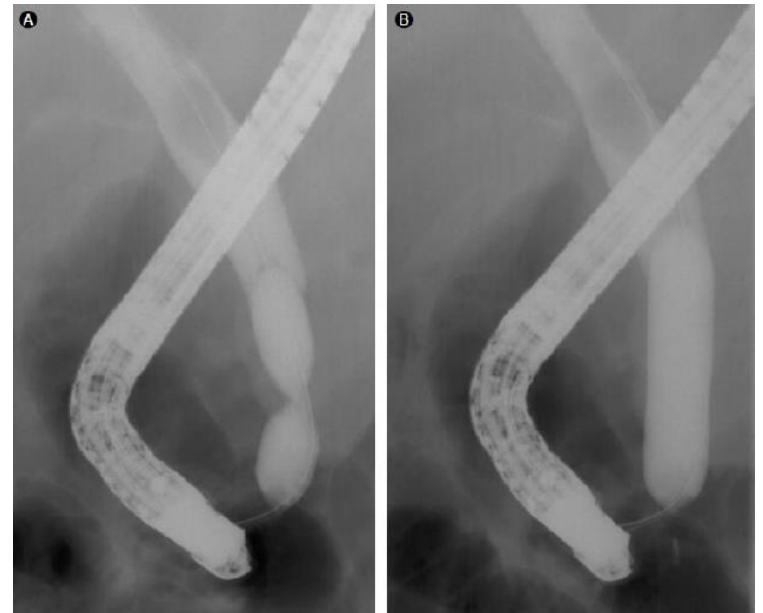
Carr-Locke's 6 maxims for difficult stones

My "6 maxims" for endoscopic management of choledocholithiasis are the following: (1) assess the bile-duct anatomy, (2) adjust the procedure to the clinical situation, (3) make an adequate exit for the stones to be removed, (4) think about using lithotripsy, (5) always extract in the bile-duct axis, and (6) remember that there is no mandate to complete the procedure in one session if it is not safe to do so.

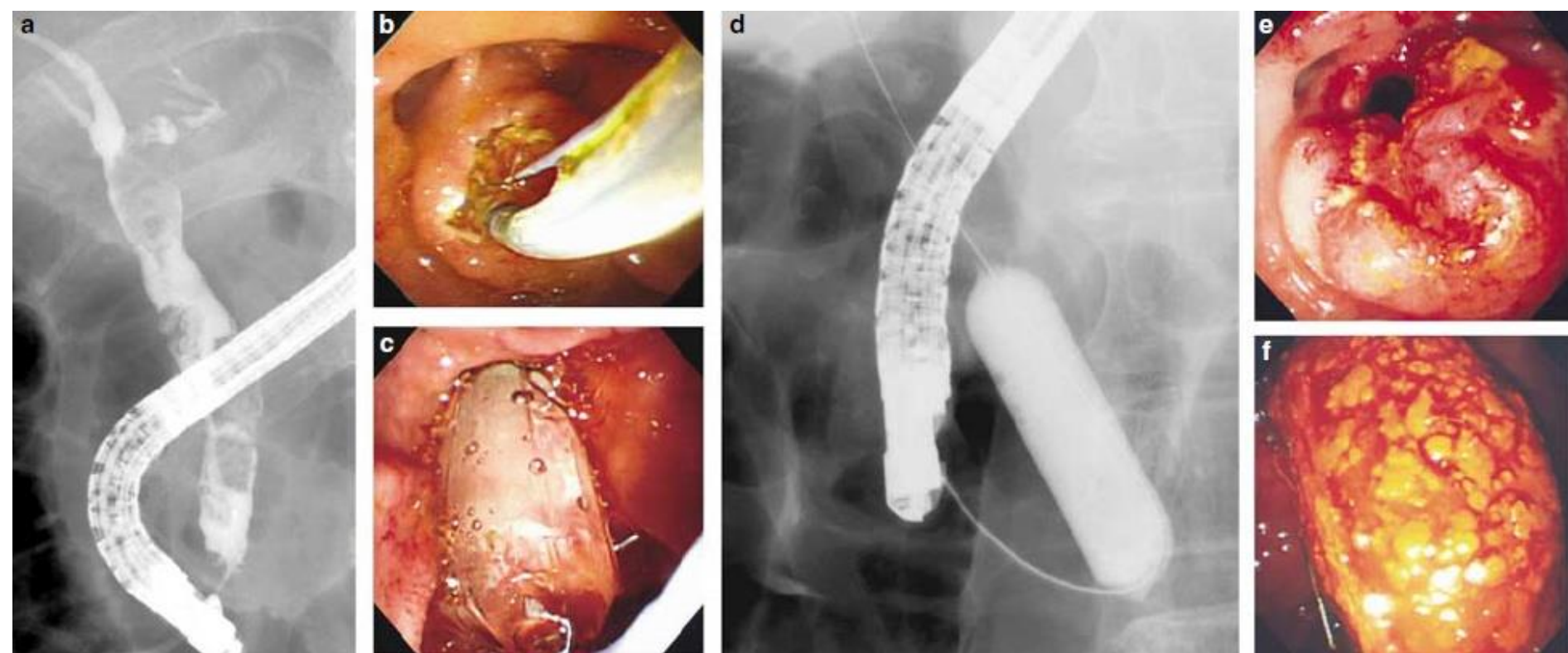


Endoscopy papillary balloon dilatation (EPBD)

- Minor rischio di sanguinamento
- Maggior rischio di pancreatite
- Uguale rischio di perforazione
- Peggior clearance del calcolo
- Più frequente ricorso a ML



Endoscopy papillary Large balloon dilatation (EPLBD)



Ersoz G, et al. Biliary sphincterotomy plus dilation with a large balloon for bile duct stones that are difficult to extract. *Gastrointest Endosc* 2003; **57**: 156-159

Endoscopy papillary Large balloon dilatation (EPLBD)

- Preceduta da sfinterotomia (estensione?)
 - (riduce il rischio di pancreatite)
- Palloncini di 12-20 mm di diametro
 - (dimensioni sulla base delle dimensioni delle VB e dei calcoli da rimuovere)
- Durata della dilatazione
 - (1-2 minuti; tempo necessario a far sparire la «incisura»)
- Controindicata in caso di stenosi della via biliare (OR=17.08; 95% CI 3.93-74.132)
- Da non usare in caso di calcoli < 1cm

Park SJ et al. Factors predictive of adverse events following endoscopic papillary large balloon dilation: results from a multicenter series. Dig Dis Sci 2013

Table 2 Rates of adverse events after endoscopic sphincterotomy combined with large balloon dilation *n* (%)

Ref.	No. patients	ESLBD	PEP	Bleeding	Perforation	Cholangitis	Miscellaneous	Overall AEs
Ersoz <i>et al</i> ^[9]	58		2 (3.4)	5 (8.6)	0	2 (3.4)	0	9 (15.5)
Bang <i>et al</i> ^[12]	22		1 (4.5)	0	0	0	0	1 (4.5)
Espinel <i>et al</i> ^[33]	22		0	0	0	0	0	0
Lee <i>et al</i> ^[13]	55		0	0	0	0	0	0
Minami <i>et al</i> ^[28]	88		1 (1.1)	1 (1.1)	0	1 (1.1)	12 (13.6)	15 (17.0)
Maydeo <i>et al</i> ^[34]	60		0	5 (8.3)	0	0	0	5 (8.3)
Heo <i>et al</i> ^[23]	100		4 (4.0)	0	0	0	1 (1.0)	5 (5.0)
Kim <i>et al</i> ^[31]	9		0	0	0	0	0	0
Attasaranya <i>et al</i> ^[29]	103		0	2 (1.9)	1 (1.0)	0	3 (2.9)	6 (5.8)
Misra <i>et al</i> ^[35]	50		4 (8.0)	3 (6.0)	0	0	0	7 (14.0)
Itoi <i>et al</i> ^[15]	53		1 (1.9)	0	0	1 (1.9)	0	2 (3.8)
Park <i>et al</i> ^[44]	6		0	1 (16.7)	0	0	0	1 (16.7)
Kim <i>et al</i> ^[19]	27		0	0	0	0	0	0
Itoi <i>et al</i> ^[27]	18		0	0	0	0	0	0
Kim <i>et al</i> ^[42]	70		1 (1.4)	0	0	0	0	1 (1.4)
Itoi <i>et al</i> ^[32]	11		0	0	0	0	0	0
Kurita <i>et al</i> ^[43]	24		0	0	0	0	0	0
Youn <i>et al</i> ^[32]	101		5 (5.0)	2 (2.0)	1 (1.0)	0	2 (2.0)	10 (9.9)
Kim <i>et al</i> ^[33]	16		0	1 (6.3)	0	0	0	1 (6.3)
Itoi <i>et al</i> ^[34]	15		0	0	0	0	0	0
Stefanidis <i>et al</i> ^[17]	45		1 (2.2)	1 (2.2)	0	0	0	4.4
Kim <i>et al</i> ^[16]	72		5 (6.9)	0	0	1 (1.3)	0	6 (8.3)
Rosa <i>et al</i> ^[14]	30		1 (3.3)	0	0	0	0	1 (3.3)
Paspatis <i>et al</i> ^[46]	124		4 (3.2)	6 (4.8)	2 (1.6)	5 (4.0)	0	17 (13.7)
Sakai <i>et al</i> ^[47]	59		0	1 (1.7)	1 (1.7)	1 (1.7)	1 (1.7)	4 (6.8)
Yang <i>et al</i> ^[25]	169		2 (1.2)	4 (2.4)	1 (0.6)	1 (0.6)	0	8 (4.7)
Poincloux <i>et al</i> ^[45]	62		2 (3.2)	5 (8.0)	0	2 (3.2)	0	9 (14.5)
Harada <i>et al</i> ^[25]	30		0	0	0	0	0	1 (3.3)
Yoon <i>et al</i> ^[41]	52		0	0	0	0	0	0
Teoh <i>et al</i> ^[18]	73		2 (2.7)	1 (1.4)	0	1 (1.4)	1 (1.4)	5 (6.8)
Hwang <i>et al</i> ^[36]	69		3 (4.3)	0	1 (1.4)	0	1 (1.4)	5 (7.2)
Rosa <i>et al</i> ^[14]	68		9 (13.2)	0	0	1 (1.5)	0	10 (14.7)

Endoscopic Sphincterotomy Combined With Large Balloon Dilation Can Reduce the Procedure Time and Fluoroscopy Time for Removal of Large Bile Duct Stones

Takao Itoi, MD, PhD¹, Fumihide Itokawa, MD¹, Atsushi Sofuni, MD¹, Toshio Kurihara, MD¹, Takayoshi Tsuchiya, MD¹, Kentaro Ishii, MD¹, Shujiro Tsuji, MD¹, Nobuhito Ikeuchi, MD¹ and Fuminori Moriyasu, MD¹

Table 2. Outcome of ESLBD and EST

	ESLBD	EST	P value
Complete removal of stone	53/53 (100%)	47/48 (98%)	0.291
<i>Session of procedure</i>			
First	51	41	0.057
Second	2	6	—
No. of mechanical lithotripsy procedures	3	12	<0.01
<i>Procedure time (mean±s.d., min)</i>			
Cannulation time (range)	7.4±5.1 (3–34)	6.6±5.9 (2–28)	0.343
Stone removal time (range)	24.9±8.8 (10–60)	33.6±13.8 (8–83)	<0.05
Total (range)	31.6±11.3 (13–72)	40.2±16.3 (12–89)	<0.05
<i>Radiation exposure time</i>			
Cannulation time (range)	4.0±3.9 (1–23)	3.4±3.8 (1–20)	0.228
Stone removal time (range)	8.9±3.7 (3–32)	16.4±12.8 (3–50)	<0.05
Total (range)	13.1±6.6 (4–35)	21.9±14.7 (3–63)	<0.05

ESLBD, endoscopic sphincterotomy plus large balloon dilation; EST, endoscopic sphincterotomy.

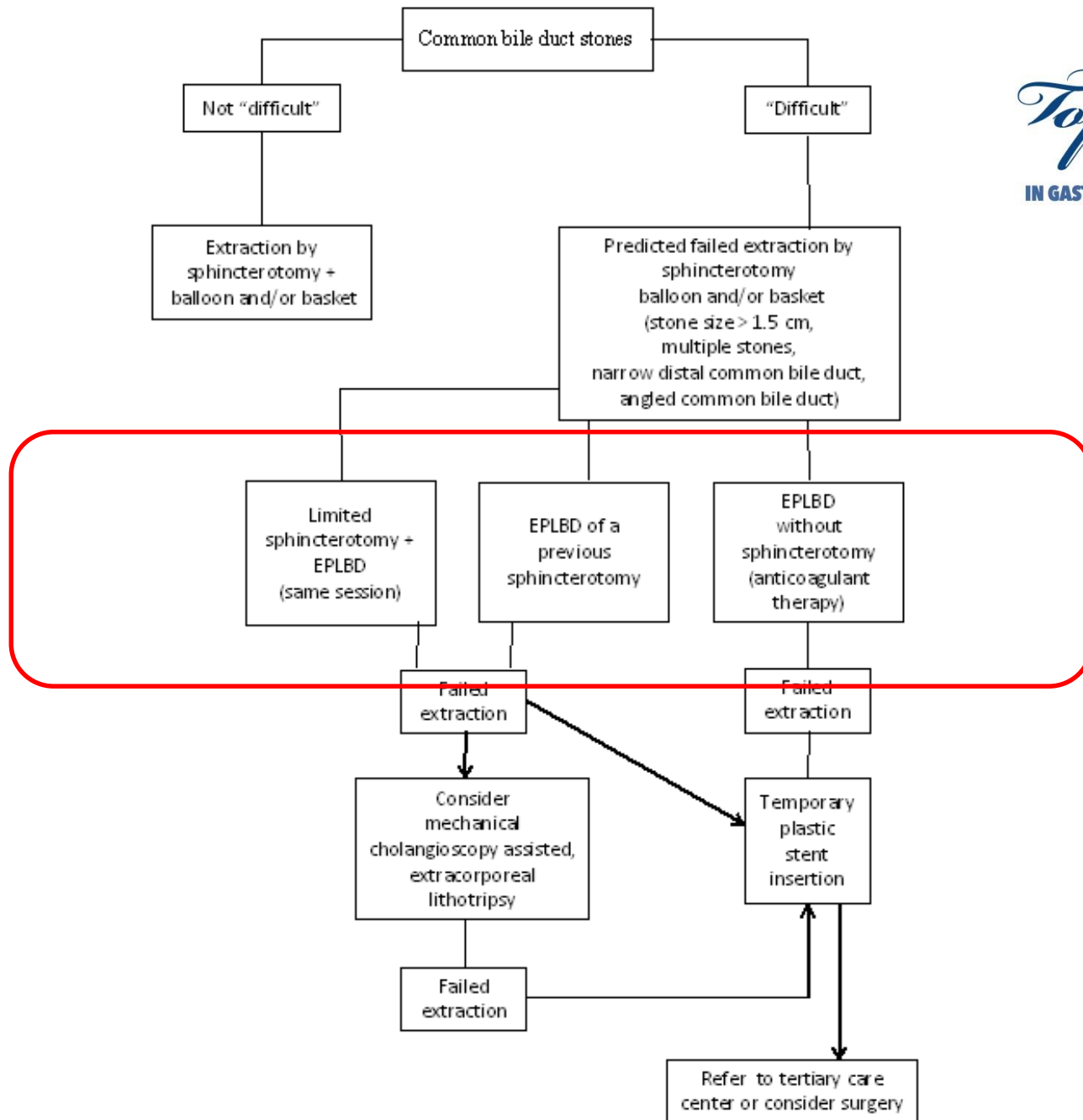
Table 3. Complications^a in ESLBD and EST

	ESLBD (n=53)	EST (n=48)	P value
<i>Pancreatitis^a</i>	1 (1.9%)	2 (4.1%)	0.500
Mild	1	1	
Moderate	0	1	
<i>Cholangitis^a</i>	1 (1.9%)	1 (2.1%)	0.944
<i>Hemorrhage^{a,b}</i>	0	0	—
<i>Perforation^a</i>	0	0	—
<i>Total^a</i>	2 (3.8%)	3 (6.3%)	0.567
<i>Acute endoscopic bleeding</i>	1 (1.9%)	4 (8.3%)	0.136

ESLBD, endoscopic sphincterotomy plus large balloon dilation; EST, endoscopic sphincterotomy.

^aAccording to Cotton's criteria. ^bHemorrhage requiring blood transfusion.





- ***ESGE recommend EST+EPLBD as first line approach to remove difficult and large (≥ 15 mm) CBD stones, since it reduces the need for mechanical lithotripsy and has a lower incidence of adverse events, compared to EST alone. (Strong recommendation; high quality evidence).***
- ***ESGE suggest, during EPLBD, to use a balloon not larger than the diameter of the the distal CBD. (Weak recommendation; low quality evidence).***

Difficult bile-duct stones: cut, dilate, or both?

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Carr-Locke's 6 maxims for difficult stones

My "6 maxims" for endoscopic management of choledocholithiasis are the following: (1) assess the bile-duct anatomy, (2) adjust the procedure to the clinical situation, (3) make an adequate exit for the stones to be removed, (4) think about using lithotripsy, (5) always extract in the bile-duct axis, and (6) remember that there is no mandate to complete the procedure in one session if it is not safe to do so.

Biliary stenting come bridge therapy nei calcoli difficili

Scopi dello stenting:

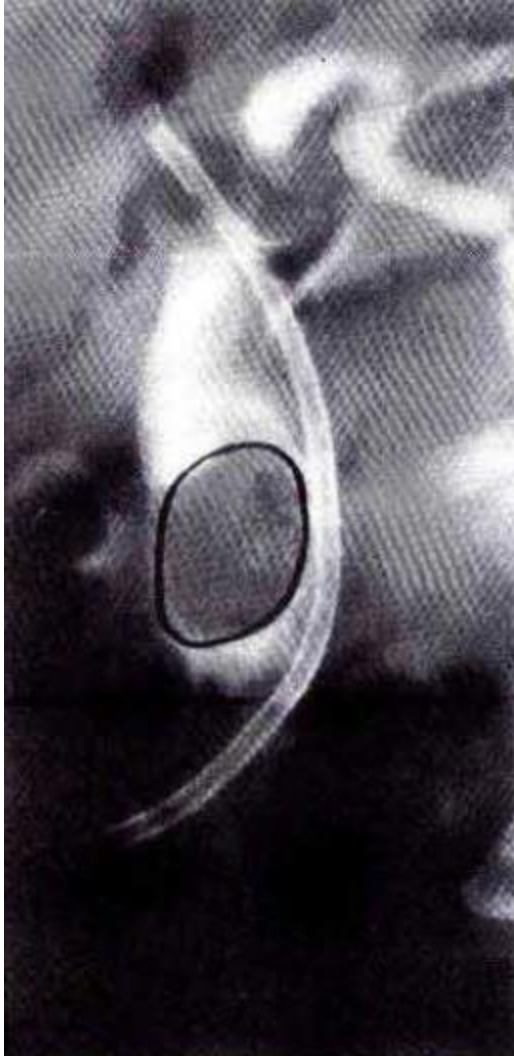
- Decompressione biliare  Terapia dell'ittero e della colangite
- Ridurre le dimensioni dei calcoli  Stones clearance



- ***ESGE recommends biliary stenting as a bridge to a further interventional procedure in patients with unsuccessful common bile duct stone removal (strong recommendation, moderate quality of evidence).***

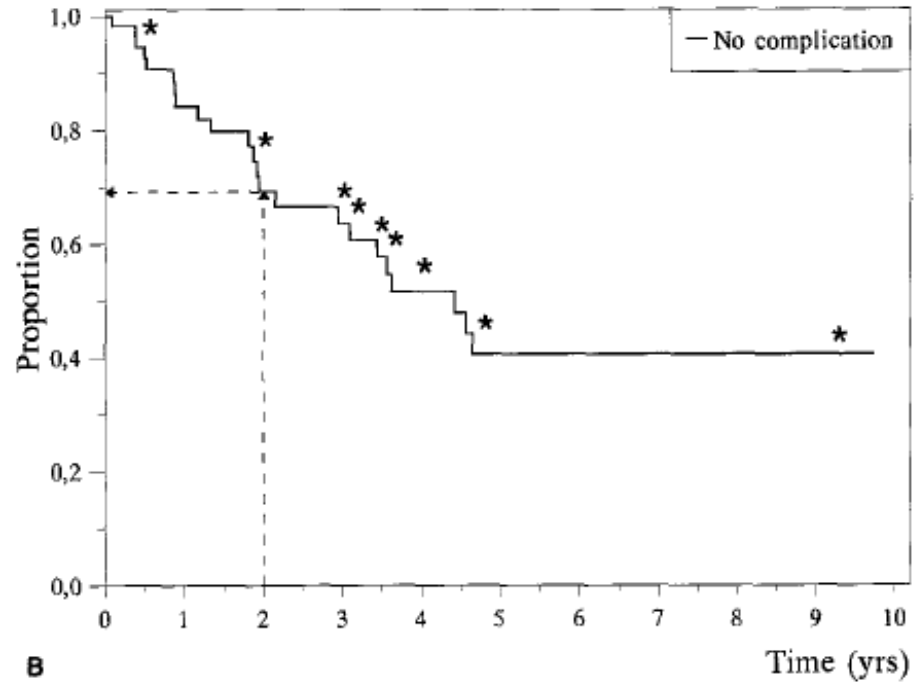
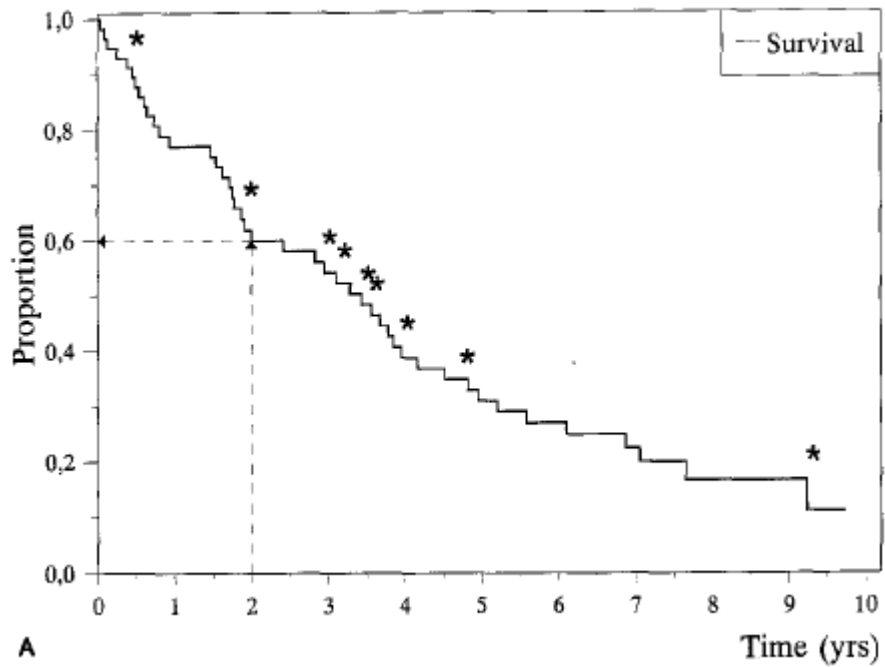
Short term effect of stent on difficult stones

	Pazients (n)	Mean age	Follow up	Size reduction (mm)	Clearance (%)
Chan 1998	28	71	17-1002 days	24.9 to 20.1	26
Jain 2000	20	75	6 months		55
Katsilenos 2008	41	73	6 months	1.61 to 1.24	75
Fan 2011	45	67.3	3-6 months	23.1 to 15.4	95.5
Han 2009	28	74,5	6 months	21.6 to 12.2	92,8
Lee 2011	22	76,9	6 months	19.12 to 12.04	86,4
Horiuchi 2010	40	77,8	2 months	1.2 to 1	93
Hong 2011	52	69,1	4 months	15.3 to 11.5	94,2



Long term effect of stent on difficult stones

	Patients (n)	Mean age	Follow-up (months)	Early Complications (%)	Late Complications (%)	Biliary related death (%)
Bergman (1995)	58	80,0	36	0	40 (16)	16
Ang (2006)	83	75,4	19	0	33,7 (20)	0
Pisello (2008)	30	82,0	4-66	30	34 (7)	6,6
Maxton (1996)	26	82	12	0	(15)	0



Bergman GIE 1995

Endoscopic plastic stenting for bile duct stones: stent changing on demand or every 3 months. A prospective comparison study

Pietro Di Giorgio¹, Gianpiero Manes², Enzo Grimaldi³, Michele Schettino⁴, Alessandra D'Alessandro³, Andrea Di Giorgio¹, Francesco Giannattasio¹

Endoscopy 2013; 45: 1014–1017

	Group A	Group B	P value	Total
Patients, n	39	39		78
Sex, M/F, n	22/17	21/18	1.000	43/35
Age, mean, years	75.3	77.4	0.964	76.3
Reason for previous failure, n				
Stones size	17	19	0.941	36
No. stones	22	20	0.954	42
Sphincterotomy, n	33	34	1.000	67
Follow-up, mean (range), months	14.2 (4–23)	12.8 (2–21)	1.000	13.5 (2–23)

	Group A	Group B	P value
Patients, n	39	39	
Cholangitis, n (%)	3 (7.7)	14 (35.9)	0.030 ¹
Deaths, n (%)	1 (2.6) ²	3 (7.6) ²	0.616

¹ P<0.05

² Mean age 83.2 years

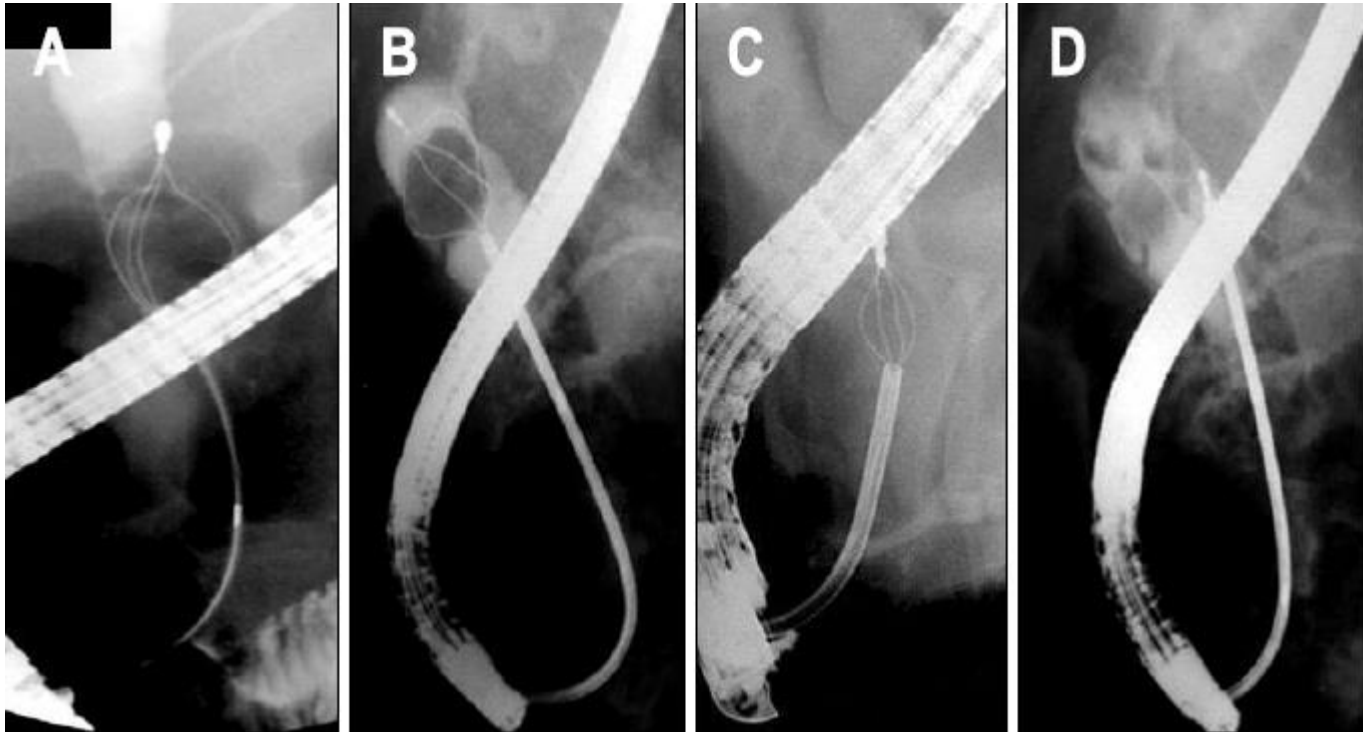
- ***ESGE suggests against definite or permanent biliary stenting in patients with short life expectancy because of high complication and mortality rates in a medium-term follow-up (strong recommendation, moderate quality of evidence)***
- ***ESGE recommends stent exchange at 3-6 months in patients with unsuccessful common bile duct stone removal to ensure adequate biliary drainage (strong recommendation, moderate quality of evidence)***

Procedure di litotrissia

- Intracanalare
 - Litotrissia meccanica
 - Litotrissia elettroidraulica
 - Litotrissia laser
- Extracanalare
 - ESWL

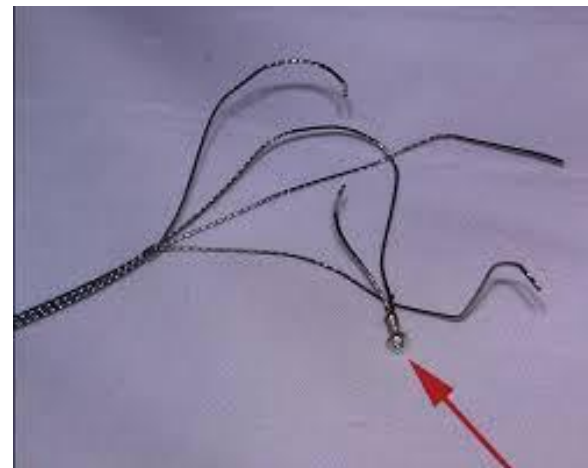
Litotrissia meccanica

- È di solito utilizzata quando si deve rimuovere un calcolo che chiaramente non passerà la papilla aperta



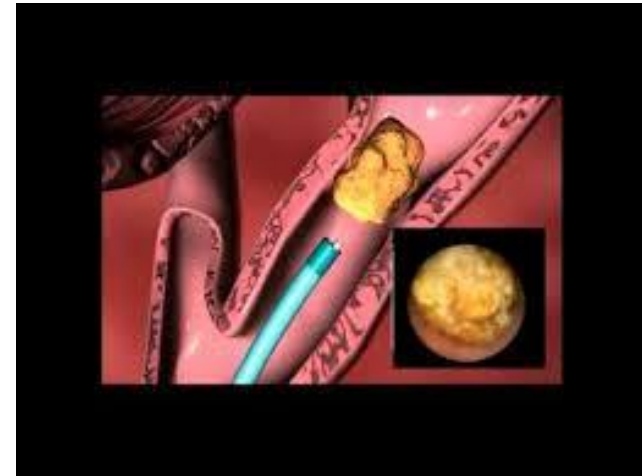
Come è fatto un litotritore meccanico «elettivo» TTS

Punto di rottura
sulla punta

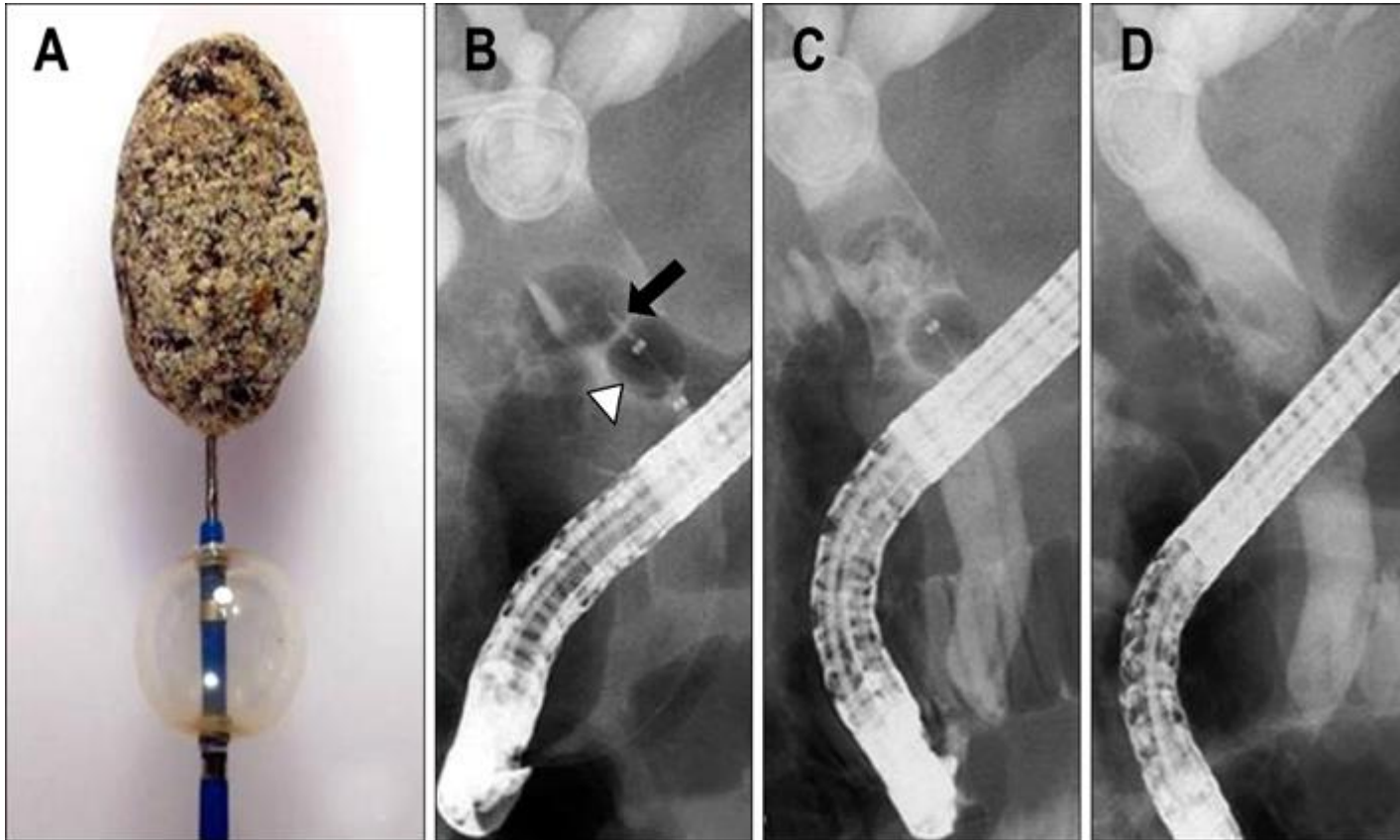


- *ESGE suggests ML in case of difficult to remove stones, when EST plus EPLBD have failed to achieve stone clearance or EPLBD is contraindicated (Weak recommendation, moderate quality evidence)*
- *ESGE suggests against attempts of endoscopists not confident with emergency (out-of-the-scope) lithotripsy techniques to remove difficult stones with baskets. (Weak recommendation, no evidence)*

Nuove tecniche di litotrissia

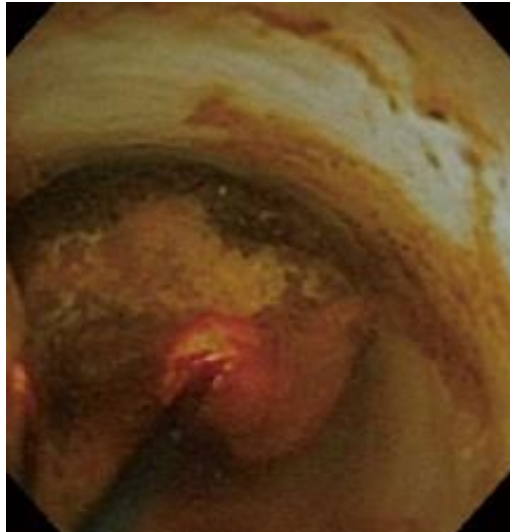


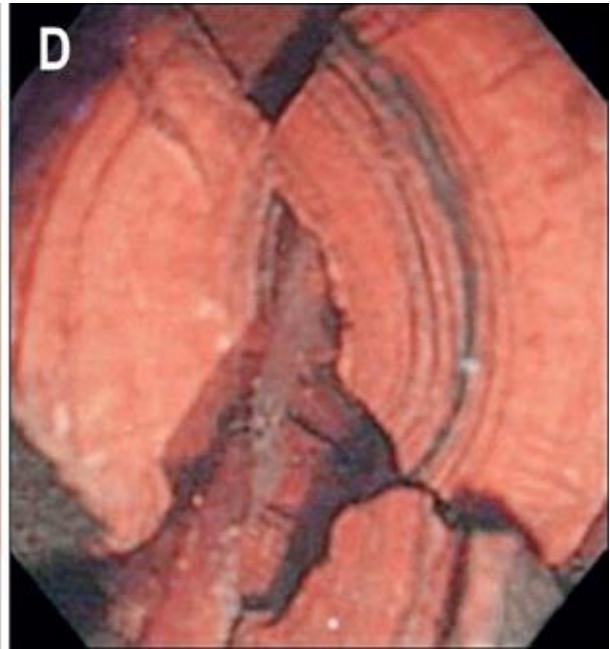
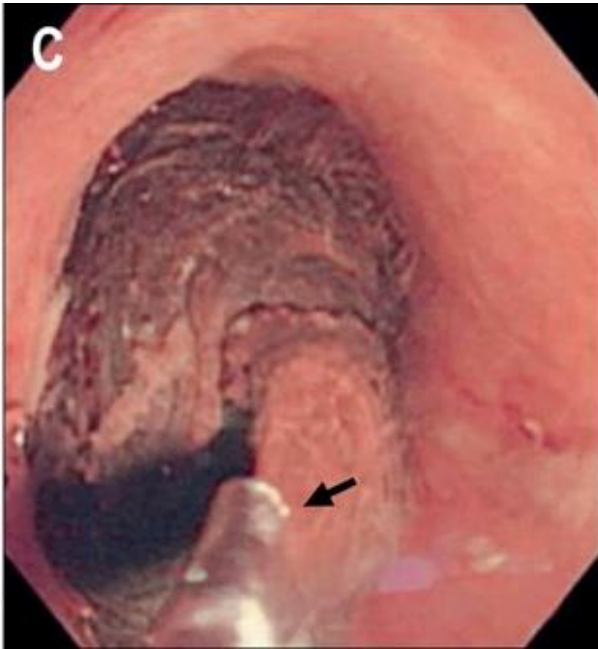
Litotrissia elettroidraulica



Litotrissia Laser

- Neodymium: yttrium-aluminum-garnet (Nd: YAG),
- Flash lamp-pulsed dye (coumarin),
- Flash lamp-pulsed dye (rhodamine) with an automatic stone recognition system
- Frequency Doubled Double Pulse Nd:YAG (FREDDY) system





- ***ESGE suggests that the use of cholangioscopy-directed lithotripsy of bile duct stones after failure of conventional techniques (EPLBD and or ML) as it is an effective and safe treatment of difficult bile duct stones (weak recommendation, moderate quality evidence)***
- ***ESGE suggest that type of cholangioscopy and lithotripsy should depend on local availability and experience (weak recommendation, low quality evidence)***
- ***ESGE suggests that cholangioscopy-directed lithotripsy should be restricted to the setting of tertiary care centers (weak recommendation, no evidence)***

Acute Cholangitis

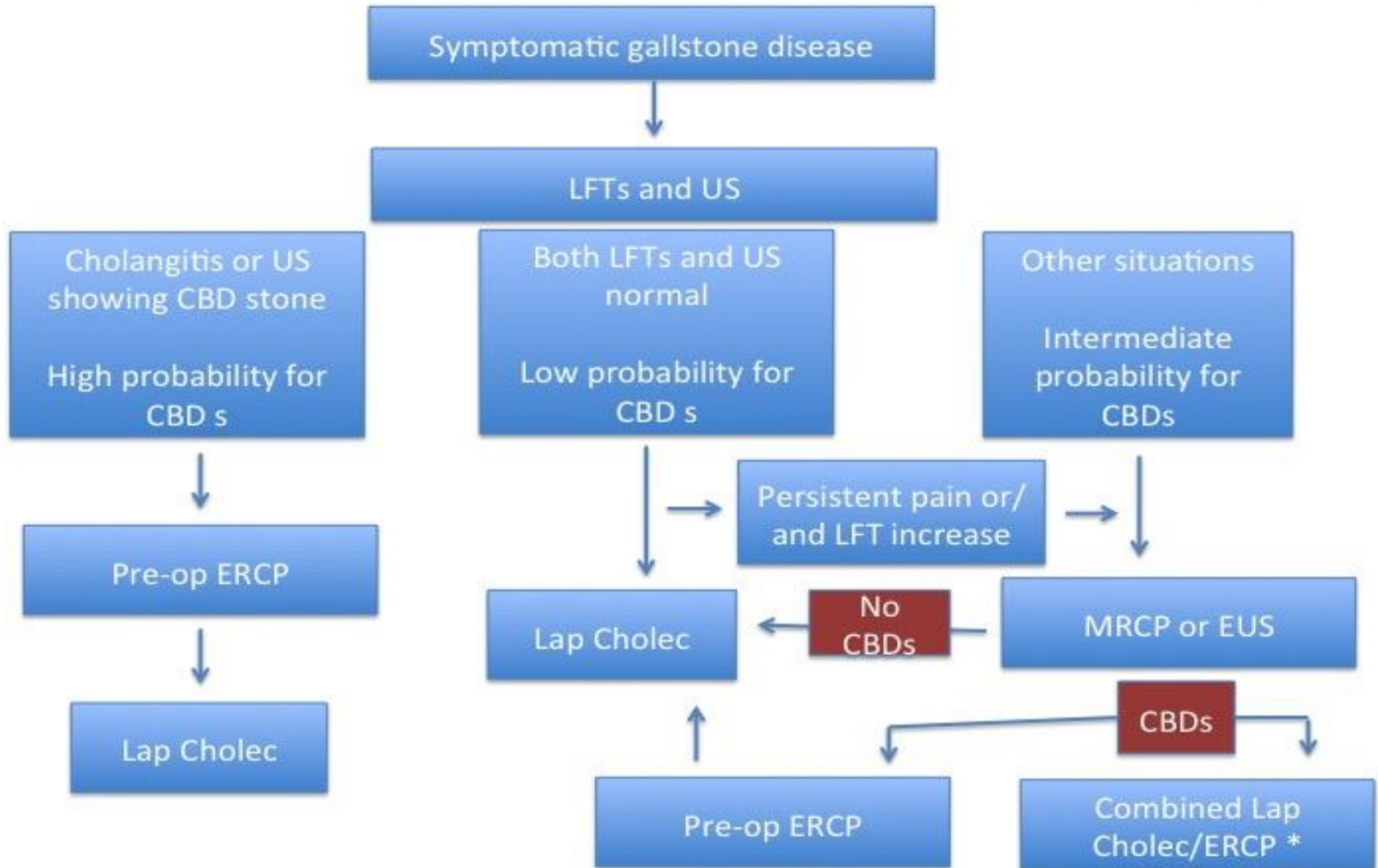
- The 2013 revision of the Tokyo Guidelines (TG13) classified acute cholangitis as
- **Severe:** dysfunction of at least one of the following systems, cardiovascular, neurological, respiratory, renal, hepatic or hematological system (specific criteria are stated for each item);
- **Moderate:** any of the following : whole blood cells count >12,000 or <4,000/mm³, fever ≥39 °C, age ≥75 years, total bilirubin ≥5 mg/dL, hypoalbuminemia;
- **Mild:** no criteria of moderate/severe cholangitis ¹.
- (<https://play.google.com/store/apps/details?id=co.jp.c2inc.tg> , <https://itunes.apple.com/us/app/tokyo-guidelines-tg13/id597389974?mt=8>).

- ***ESGE and EASL recommend the following timing for endoscopic biliary drainage in patients with acute cholangitis classified according to TG13 as:***
 - ***Severe: as soon as possible and within 12 hours for patients with septic shock (hypotension requiring vasopressors);***
 - ***Moderate: within 48-72 hours;***
 - ***Mild: elective (strong recommendation, low quality evidence).***

- ***ESGE recommends urgent biliary drainage in patients with acute biliary pancreatitis and concomitant cholangitis and/or persistent cholestasis (strong recommendation, high quality evidence).***
- ***ESGE recommends against routine early ERCP in patients with a predicted mild acute biliary pancreatitis (strong recommendation, high quality evidence).***
- ***ESGE suggests to not perform routine early ERCP in predicted severe acute biliary pancreatitis with no concomitant cholangitis and/or persistent cholestasis (weak recommendation, moderate quality evidence).***

Grazie per l'attenzione

- ***ESGE recommends stone extraction to symptomatic patients with common bile duct stones. (Strong recommendation, low quality evidence)***
- ***ESGE suggests that stone extraction is offered to asymptomatic patients with CBDS, so long as they are fit enough to tolerate intervention (Weak recommendation, low quality evidence).***



EDITORIAL

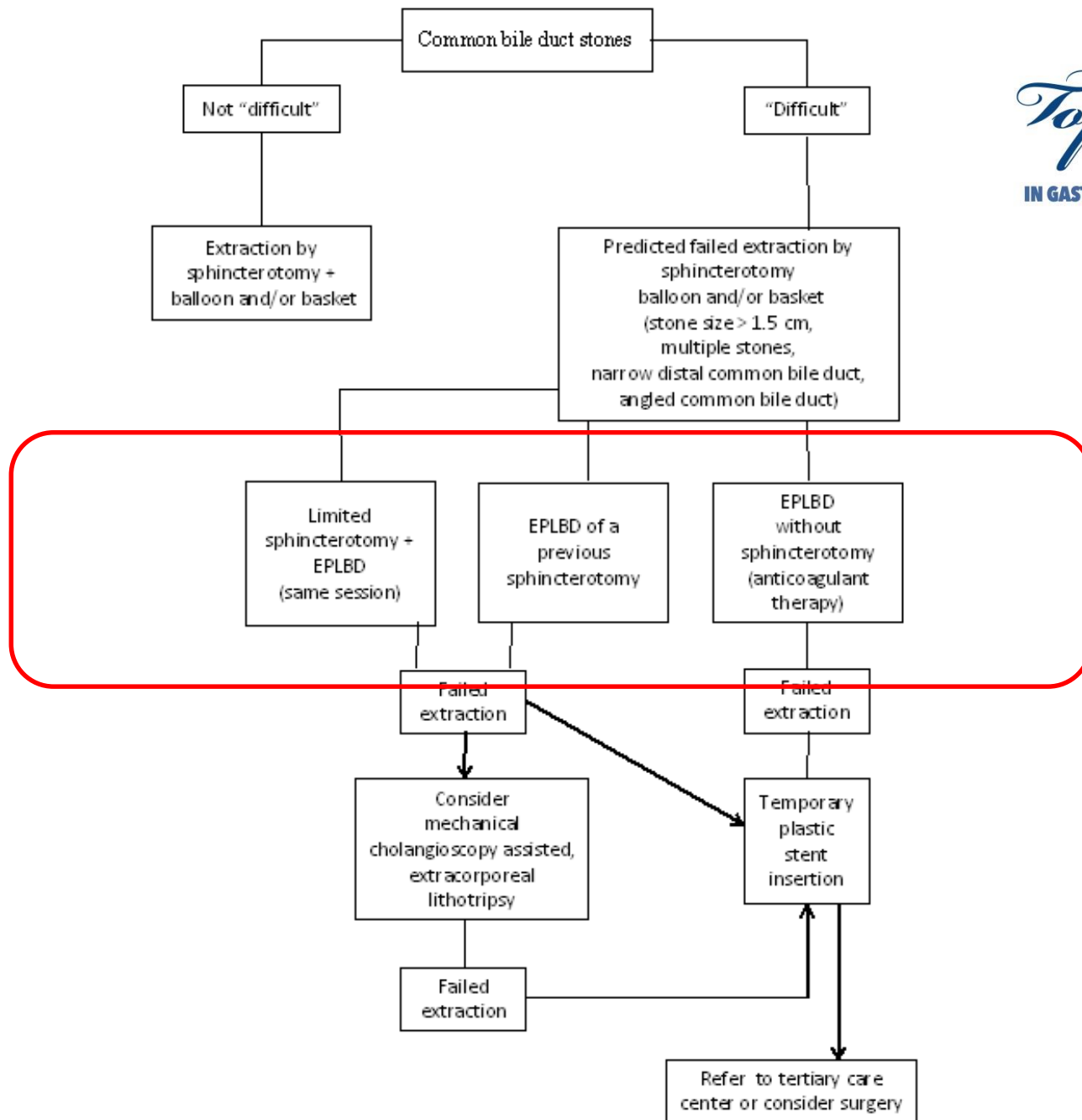
Difficult bile-duct stones: cut, dilate, or both?

David L. Carr-Locke, MD, FRCP, FASGE

*The Endoscopy Institute
Brigham and Women's Hospital*

Carr-Locke's 6 maxims for difficult stones

My "6 maxims" for endoscopic management of choledocholithiasis are the following: (1) assess the bile-duct anatomy, (2) adjust the procedure to the clinical situation, (3) make an adequate exit for the stones to be removed, (4) think about using lithotripsy, (5) always extract in the bile-duct axis, and (6) remember that there is no mandate to complete the procedure in one session if it is not safe to do so.



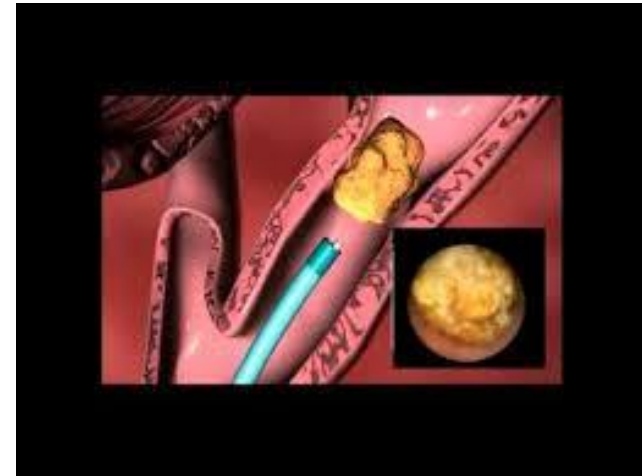
- ***ESGE recommends biliary stenting as a bridge to a further interventional procedure in patients with unsuccessful common bile duct stone removal (strong recommendation, moderate quality of evidence).***

- ***ESGE suggests against definite or permanent biliary stenting in patients with short life expectancy because of high complication and mortality rates in a medium-term follow-up (strong recommendation, moderate quality of evidence)***
- ***ESGE recommends stent exchange at 3-6 months in patients with unsuccessful common bile duct stone removal to ensure adequate biliary drainage (strong recommendation, moderate quality of evidence)***

Procedure di litotrissia

- Intracanalare
 - Litotrissia meccanica
 - Litotrissia elettroidraulica
 - Litotrissia laser
- Extracanalare
 - ESWL

Nuove tecniche di litotrissia



- ***ESGE and EASL recommend the following timing for endoscopic biliary drainage in patients with acute cholangitis classified according to TG13 as:***
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