

Wat is nieuw en relevant in de gastro-intestinale endoscopie?

Prof. Dr. Pieter Hindryckx
Dienst endoscopie
Maag-darm- en leverziekten

Algemene trends over de laatste 5-10 jaar

- Enorme toename van beeldresolutie (quasi tot op celniveau)
- Opkomst van artificiële intelligentie
- Diagnostische => therapeutische endoscopie
- Complexere procedures
- Management van complicaties vaak in eigen handen

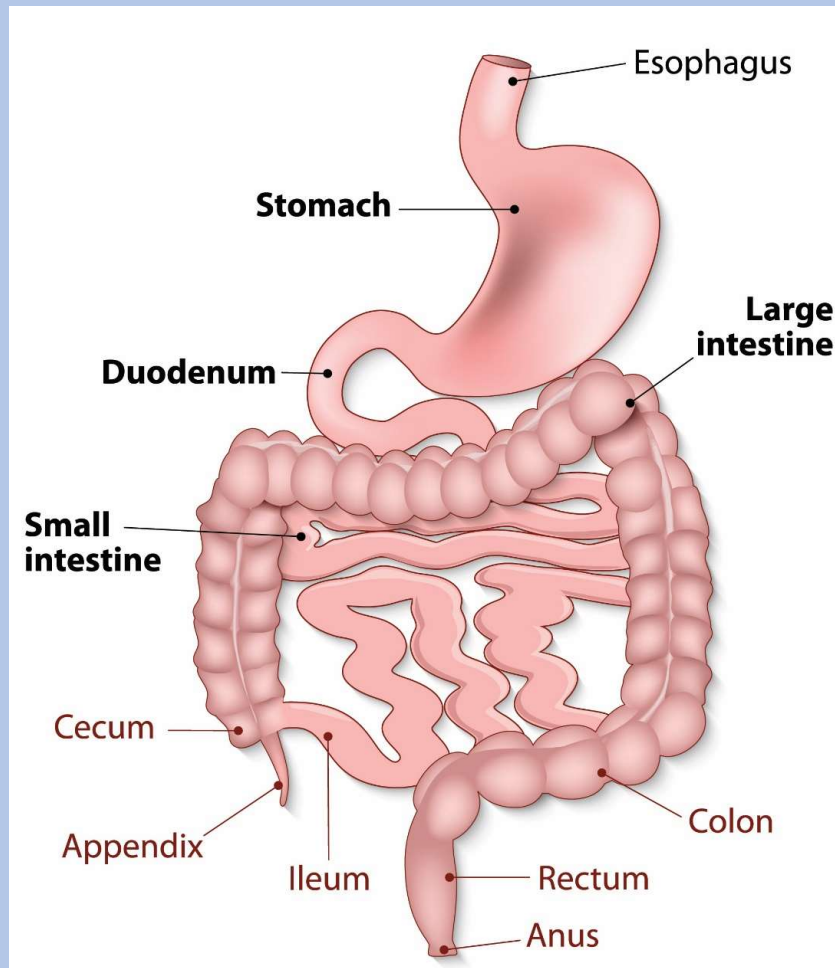
Therapeutische endoscopist => Endoscopisch chirurg

Entering the field of the surgeon

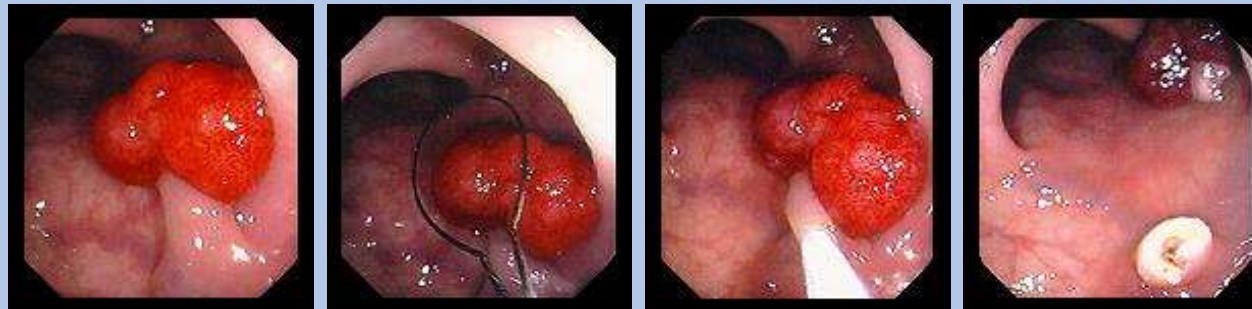


ENDOLUMINELE ENDOSCOPIE

A: Endoscopische resecties



Endoscopische resecties

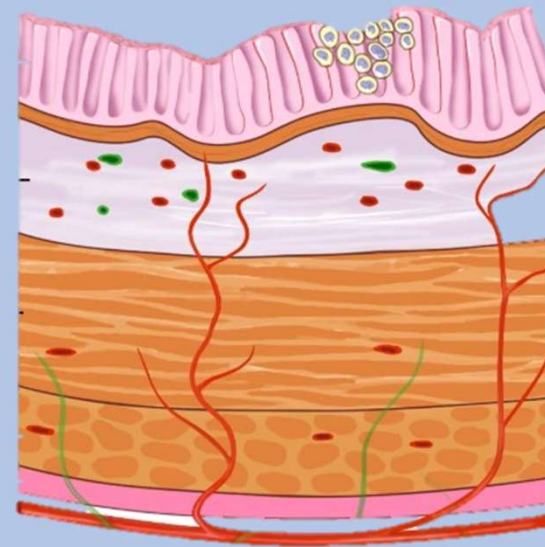


Klassieke poliepectomie (lusresectie)

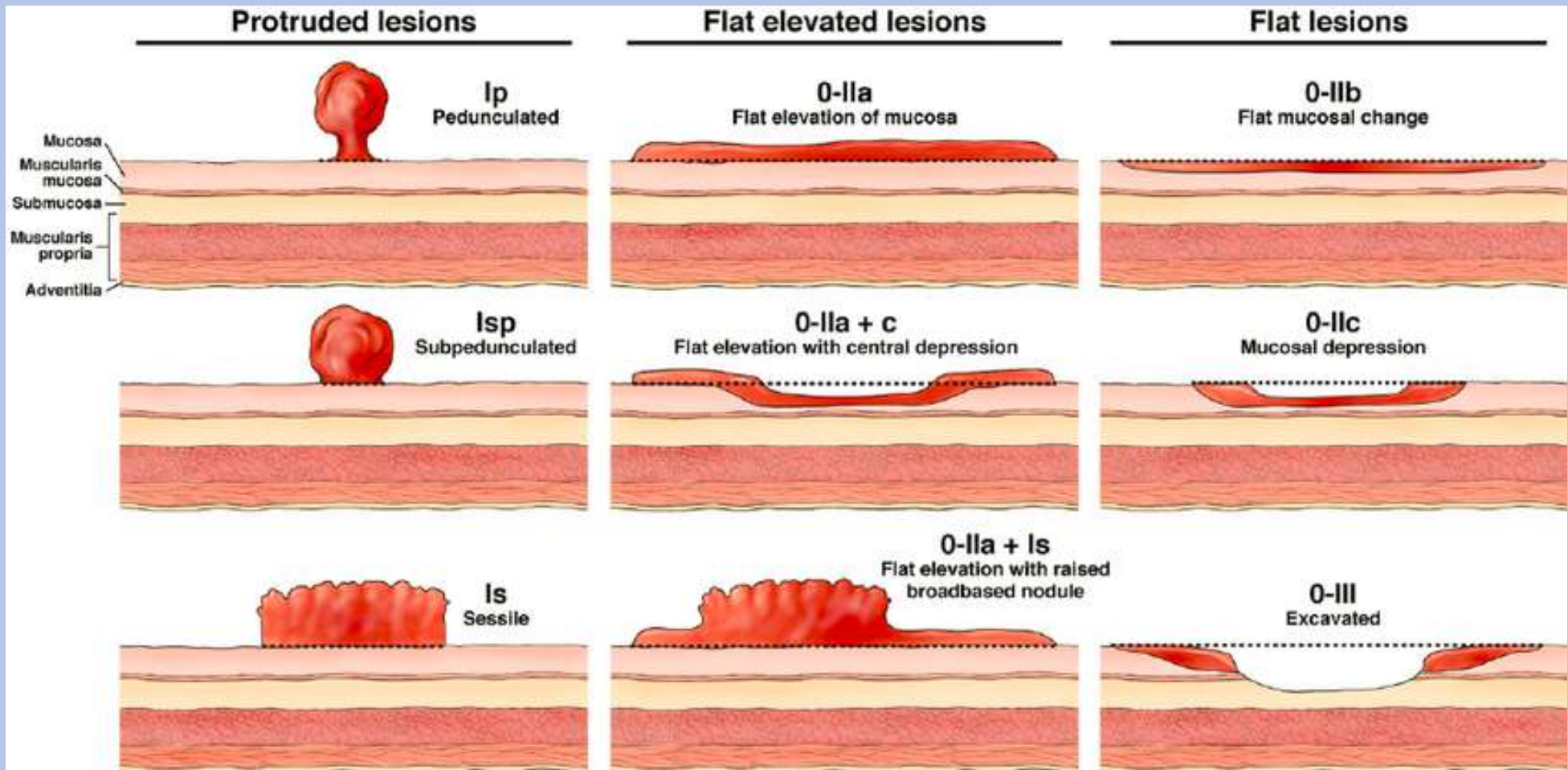
- EMR: endoscopische mucosale resectie
- ESD: endoscopische submucosale dissectie
- FTR: full-thickness resectie

Keuze van techniek?

- Geen lymfevaten in de mucosa
- Ziekte beperkt tot mucosa => geen kans op lymfeklieraantasting en verdere uitzaaiingen

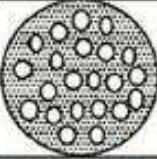
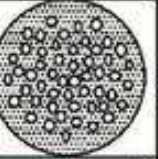
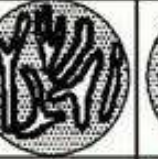


HOE INSCHATTEN VAN RISICO OP SUBMUCOSALE INVASIE?



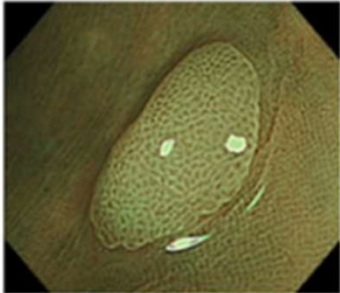
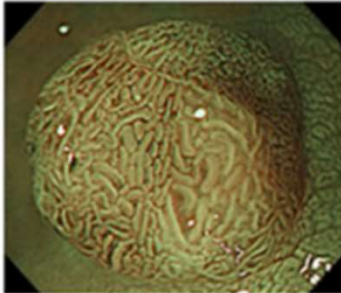
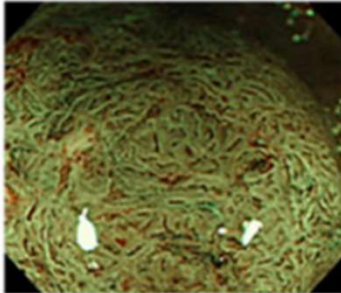
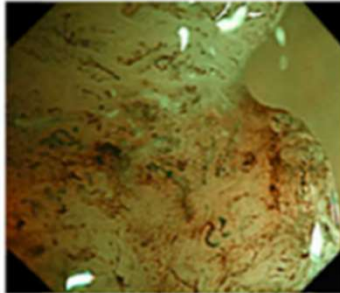
HOE INSCHATTEN VAN RISICO OP SUBMUCOSALE INVASIE?

But how about the Kudo classification of crypts ?

I	II	III s	III L	IV	V	V
						
						
Normal crypts	Hyperplastic polyp	Tubular adenoma (HGD)	Tubular adenoma (LGD)	Tubulo-villous adenoma	Endoscopically resectable cancer	Endoscopically irresectable cancer

Tanaka S. High-resolution colonoscopy. GIE 2006;64:604-13

HOE INSCHATTEN VAN RISICO OP SUBMUCOSALE INVASIE?

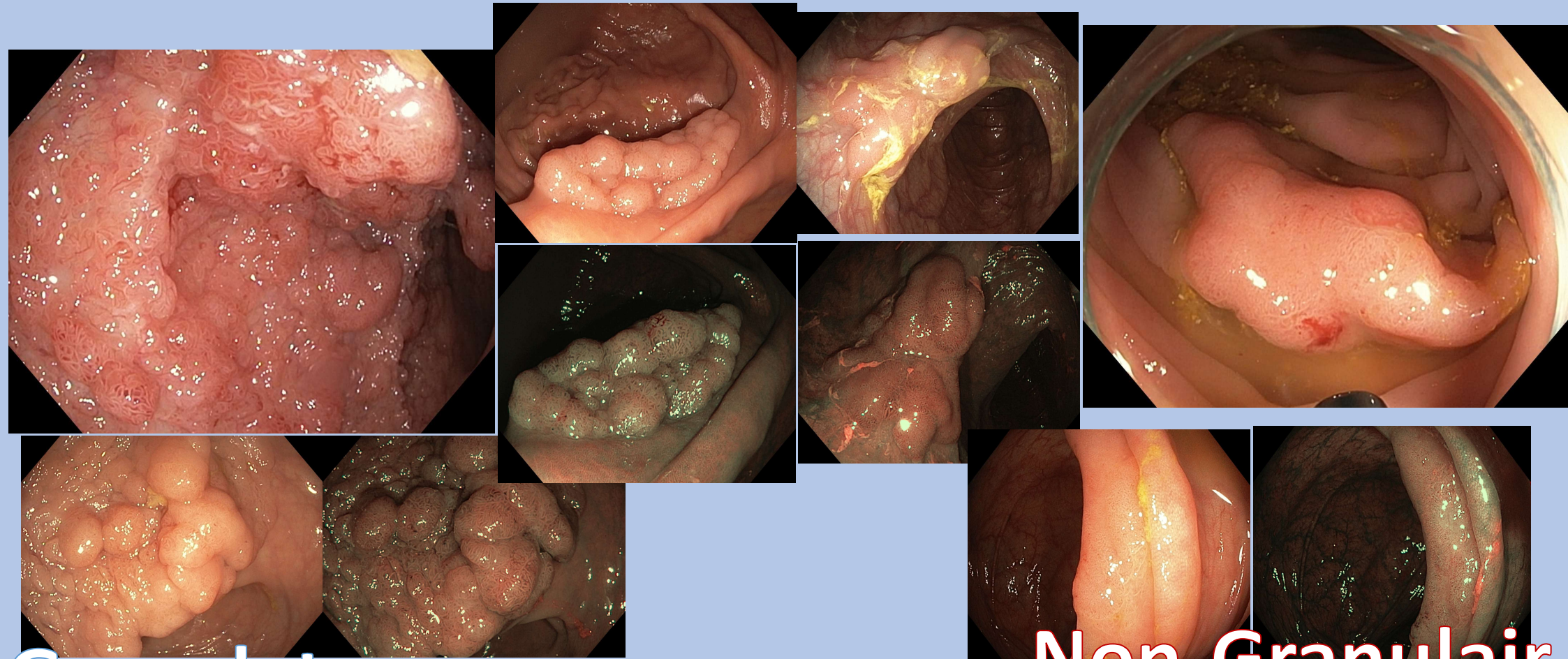
	Type 1	Type 2A	Type 2B	Type 3
Vessel pattern	• Invisible * ¹	• Regular caliber • Regular distribution (meshed/spiral pattern) * ²	• Variable caliber • Irregular distribution	• Loose vessel areas • Interruption of thick vessels
Surface pattern	• Regular dark or white spots • Similar to surrounding normal mucosa	• Regular (tubular/branched/papillary)	• Irregular or obscure	• Amorphous areas
Most likely histology	Hyperplastic polyp/ Sessile serrated polyp	Low grade intramucosal neoplasia	High grade intramucosal neoplasia/ Shallow submucosal invasive cancer * ³	Deep submucosal invasive cancer
Endoscopic image				

*1. If visible, the caliber in the lesion is similar to surrounding normal mucosa.

*2. Micro-vessels are often distributed in a punctate pattern and well-ordered reticular or spiral vessels may not be observed in depressed lesions.

*3. Deep submucosal invasive cancer may be included.

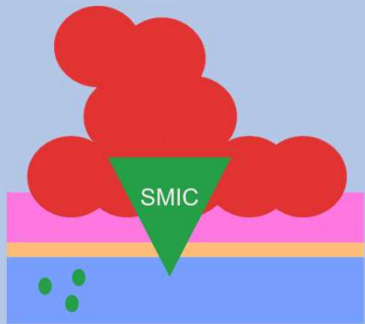
Granulair vs Non-granulair



Granulatr

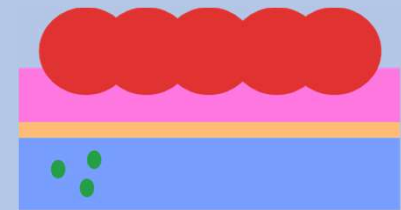
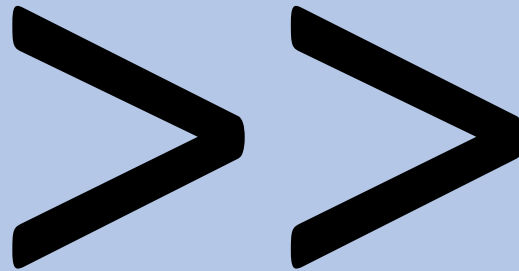
Non-Granulair

HOE INSCHATTEN VAN RISICO OP SUBMUCOSALE INVASIE?



nongranulair
linkercolon
19.1%

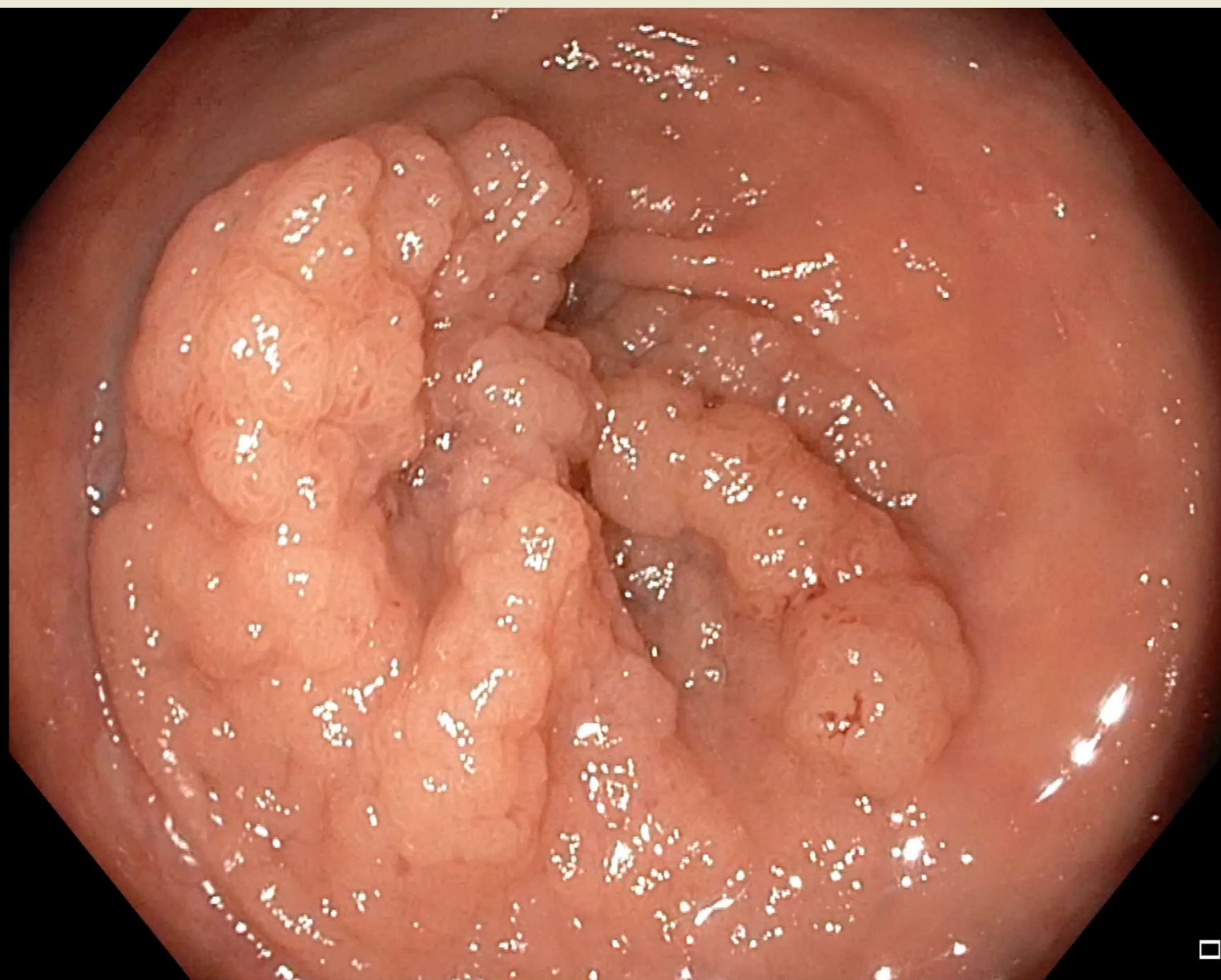
risico SMIC



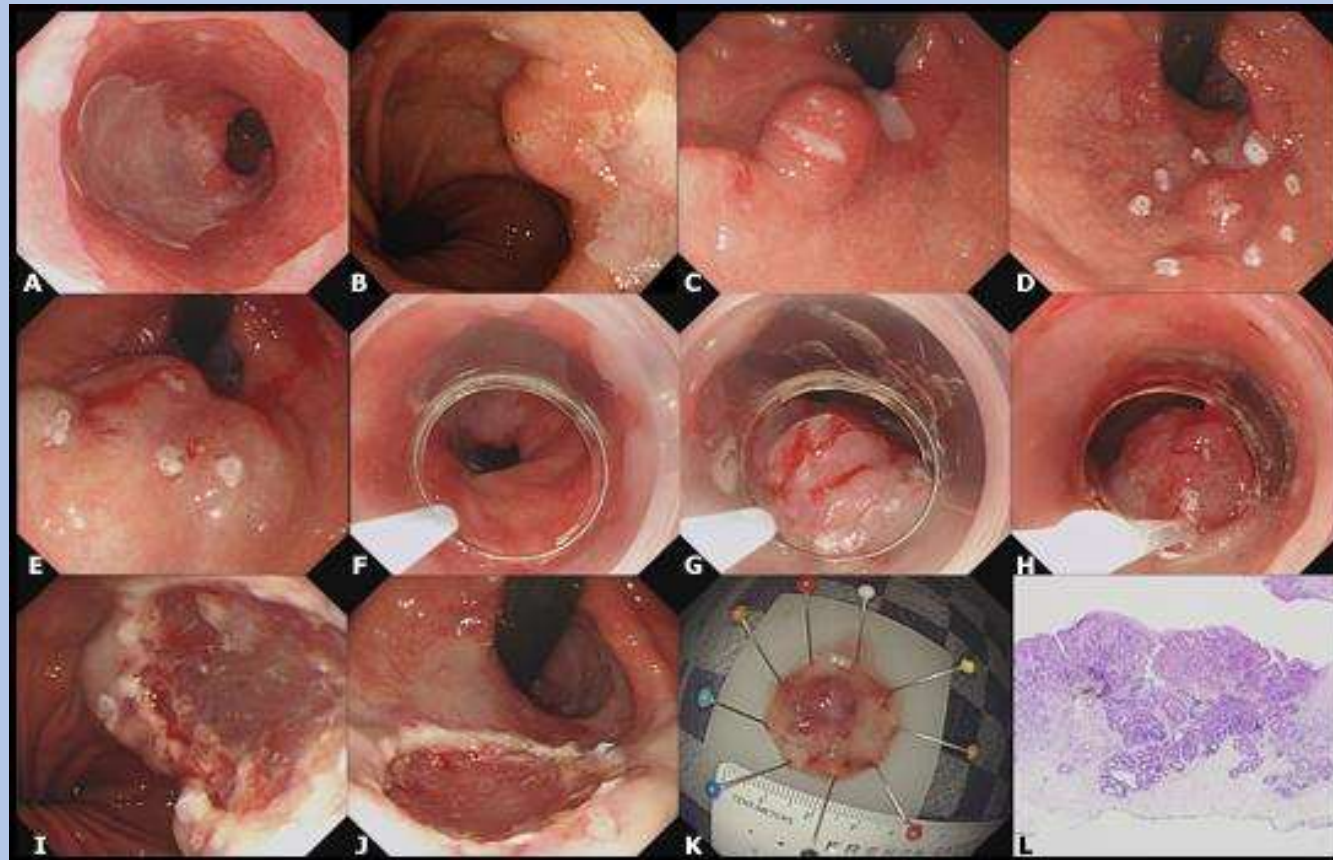
granulair
rechtercolon
2.0%

Keuze van techniek

- Zone van irregulair pit patroon
 - Nongranular letsel linkercolon/rectum
 - Non-lifting sign
 - Kudo 5 patroon
 - Geëxcaveerd ulceratief letsel
 - Alle andere gevallen
- ESD, full-thickness
- Heelkunde
- Meestal EMR

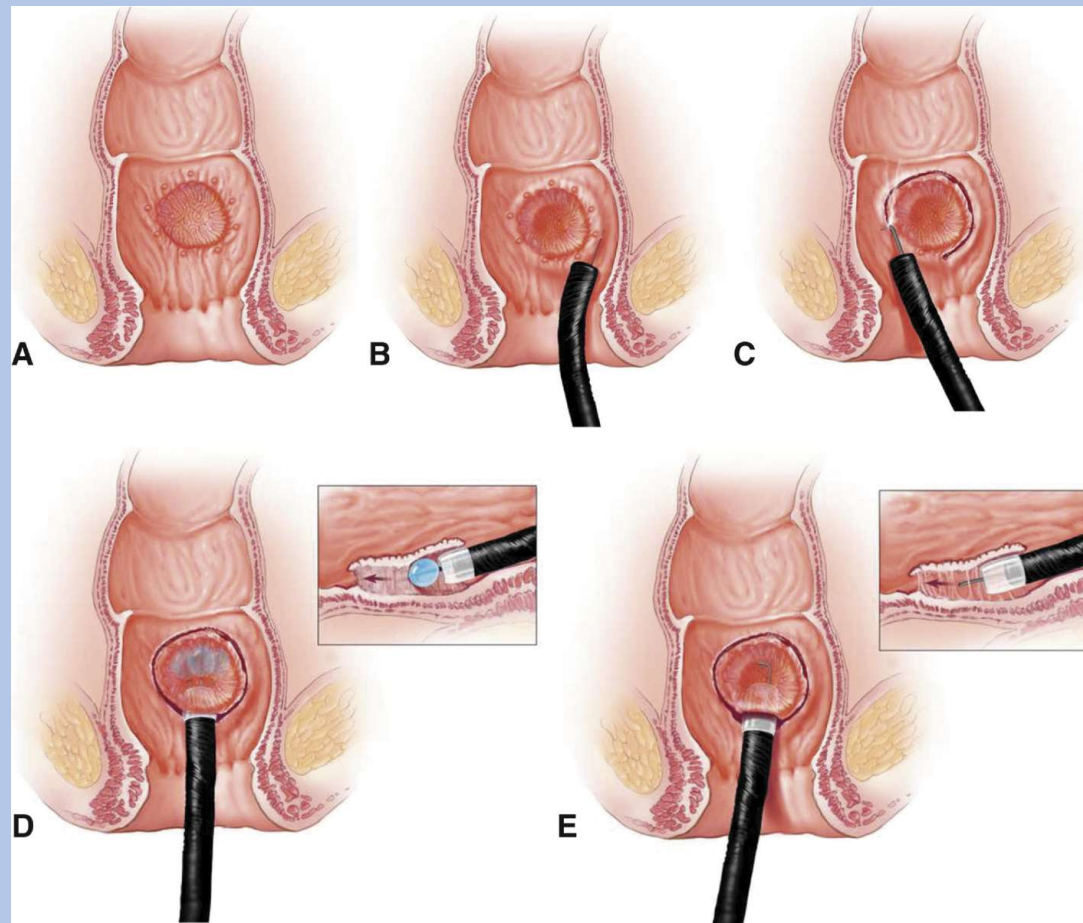


EMR



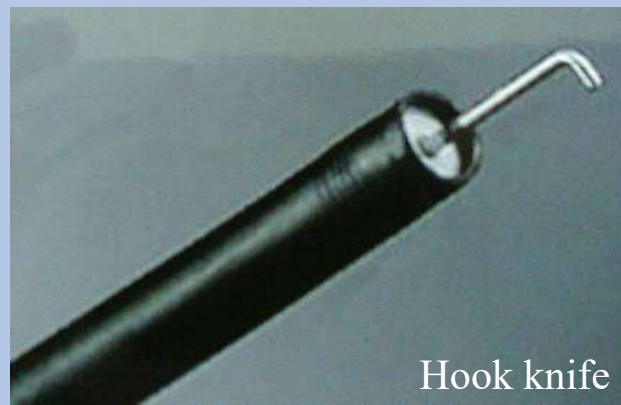
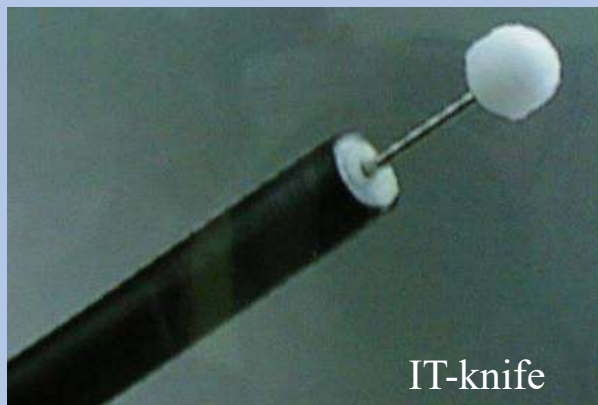
Barrett met adenoCa T1

ESD



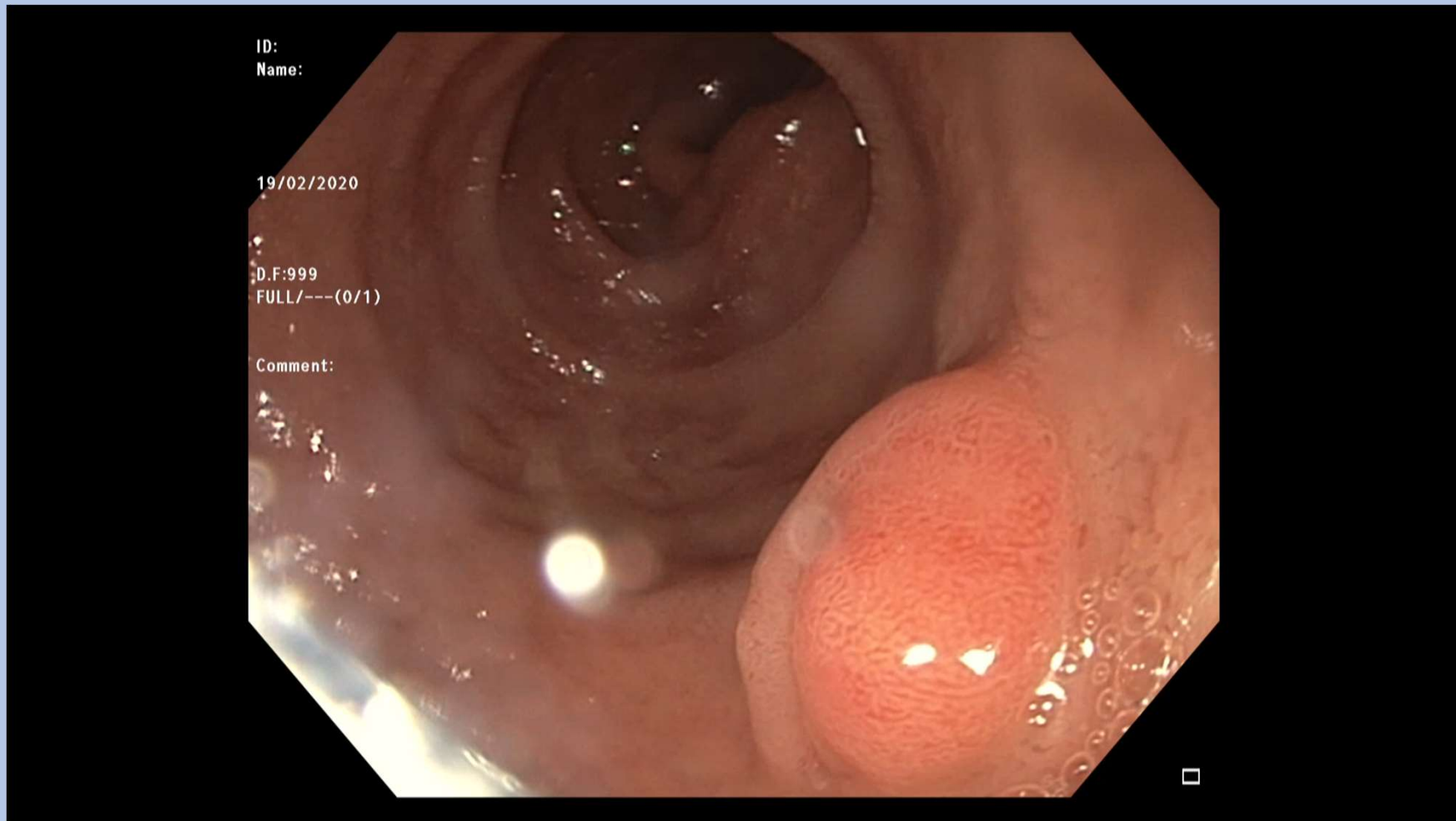
ESD

“En bloc” resectie van letsels met hoge probabilliteit op (oppervlakkige) submucosale invasie





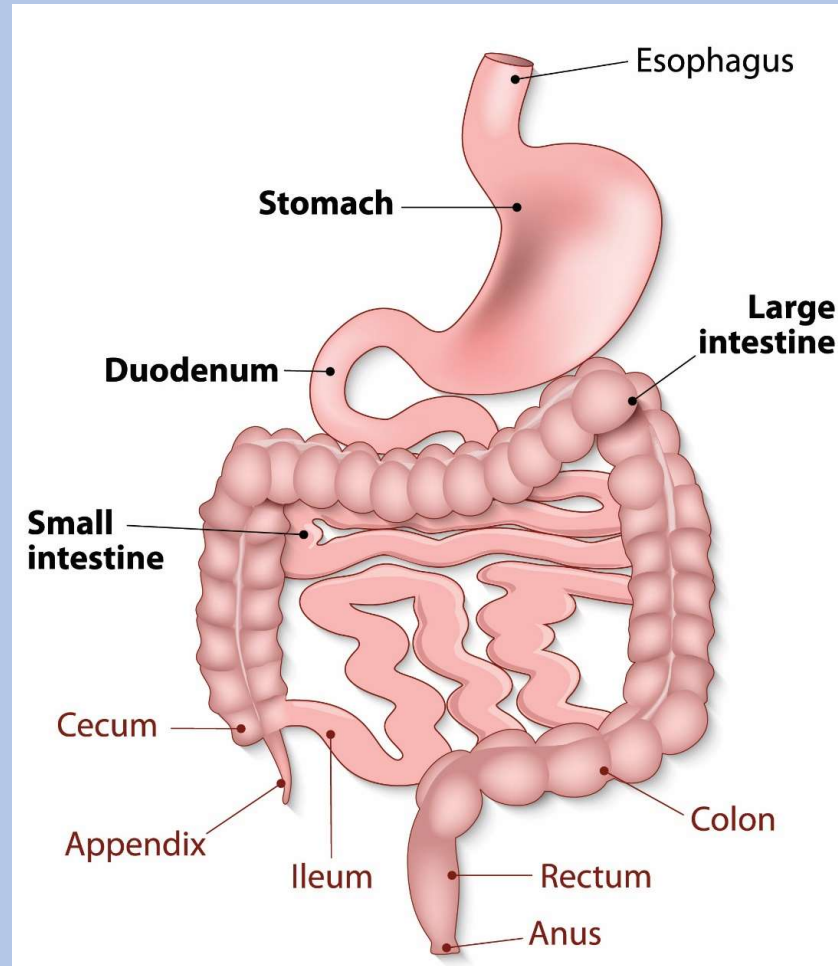
Full thickness resectie



OTS Clip



B: Andere recente endoluminele procedures



POEM (perorale endoscopische myotomie

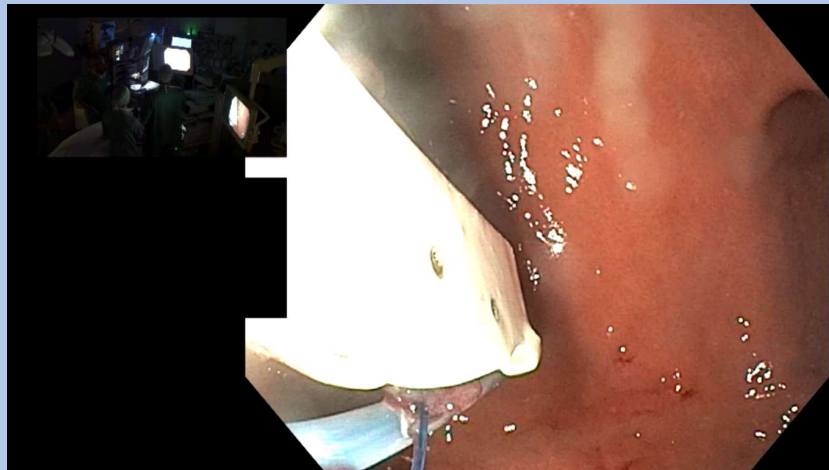
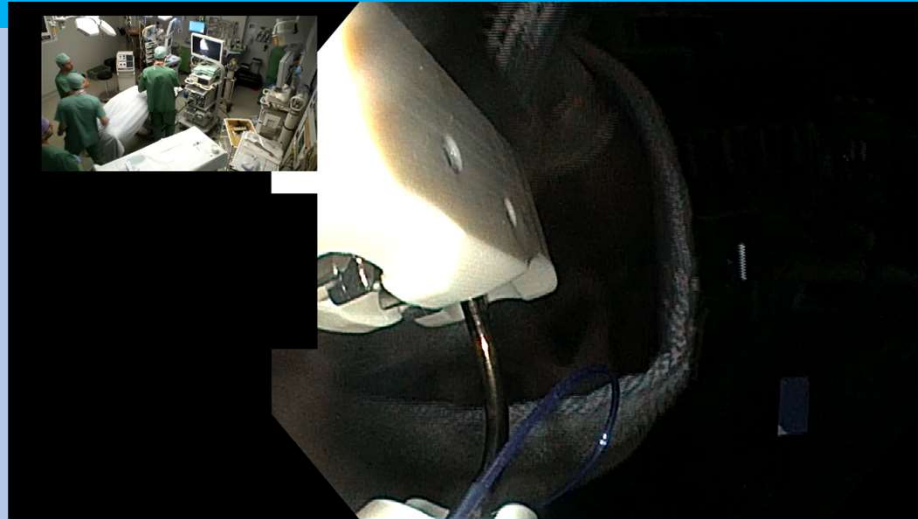
**Submucosal injection
of saline/indigo carmine**



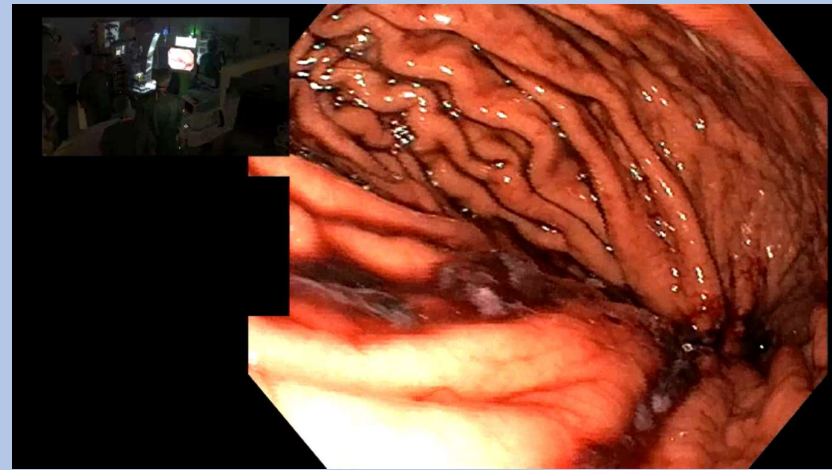
EXTRACTIE BURIED BUMPER



Endoscopische maagverkleining



VOOR HECHTING

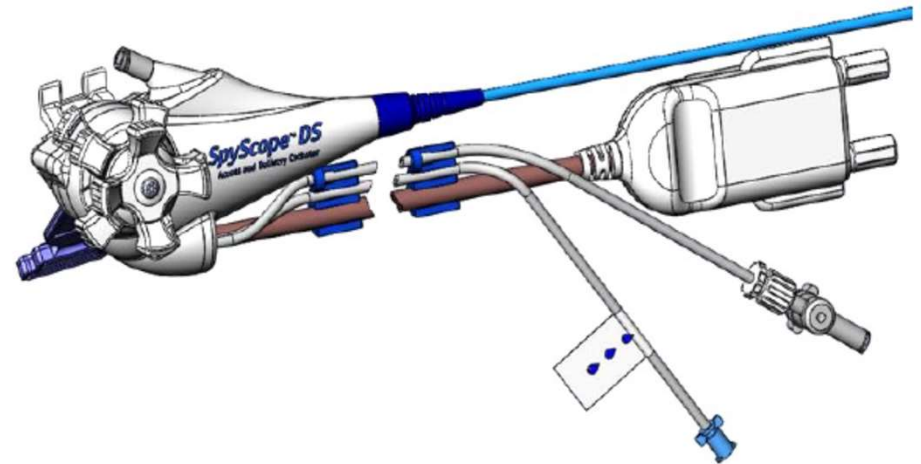


NA HECHTING

ERCP EN EUS



- Eliminated Probe
- Redesigned Handle Connection
- Convenient Irrigation Port
- Redesigned Handle
- New Working Channel Design
- Dual Irrigation
- Dual LED
- 60% Greater Field of View
- 4 Way Steerability
- Digital Sensor 4x Resolution
- Updated Packaging



- Single Use
- Smaller Footprint
- Integrated Optics
- Combined Processor and Light Source
- No White Balance or Need to Focus



Indicaties voor cholangioscopie

- Stone lithotripsy (bile duct, cystic duct, pancreatic duct)
- Selective guide wire placement
- Dominant strictures in PSC
- Undetermined strictures
- Cholangiocarcinoma diagnosis/extension
- Intraductal check after RFA for residual ampulloma
- Disconnected duct (access to pancreatic duct through collection)
- Extraction of migrated stents
- (Assessment of main duct IPMN : spy discover)
- (Hemobilia)



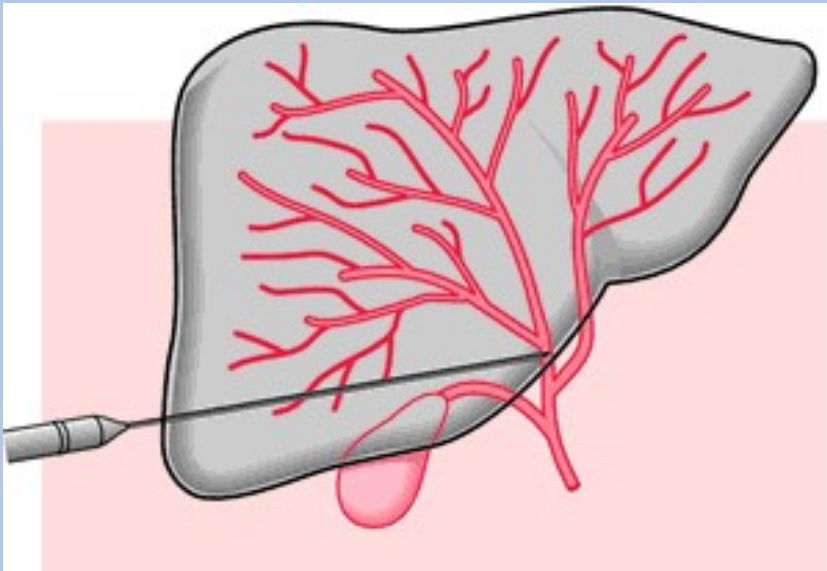
Boston
Scientific



Interventionele EUS: huidige mogelijkheden

- Drainage van peripancreatische collecties
- Galweg/pancreaskanaaldrainage
- Galblaas drainage
- Gastro-gastrostomie bij gastric bypass
- Gastro-jejunostomie – jejuno-jejunostomie -
- Plexus coeliacus block
- Plaatsing van fiducials
- Radiofrequente ablatie van pancreastumoren
- Vasculaire interventions (coiling, injectie lijm, portale drukmeting,...)

Klassieke alternatieve toegang bij falen ERCP: PTC



PTC

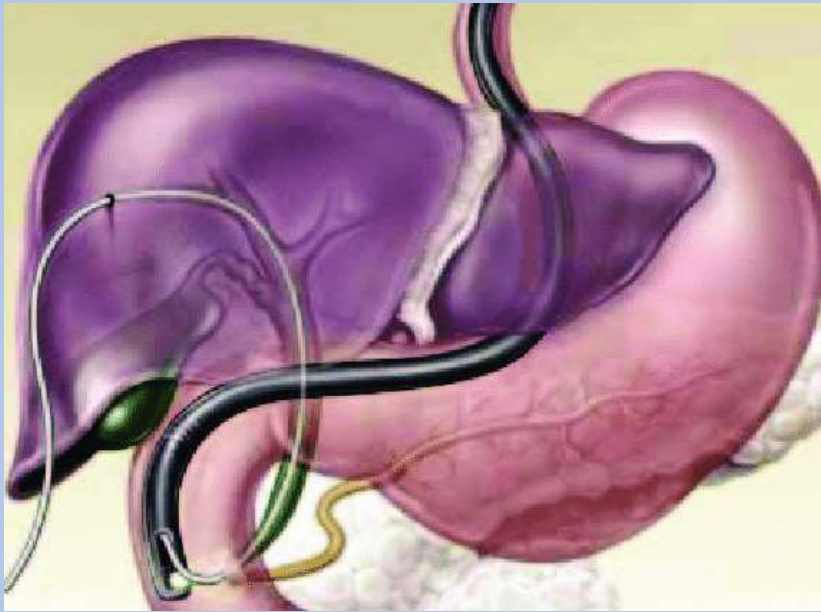
PROBLEMEN MET PTC

- 1: Lastig voor de patient
- 2: Potentiële complicaties
- 3: Externe drainage = slechte QoL

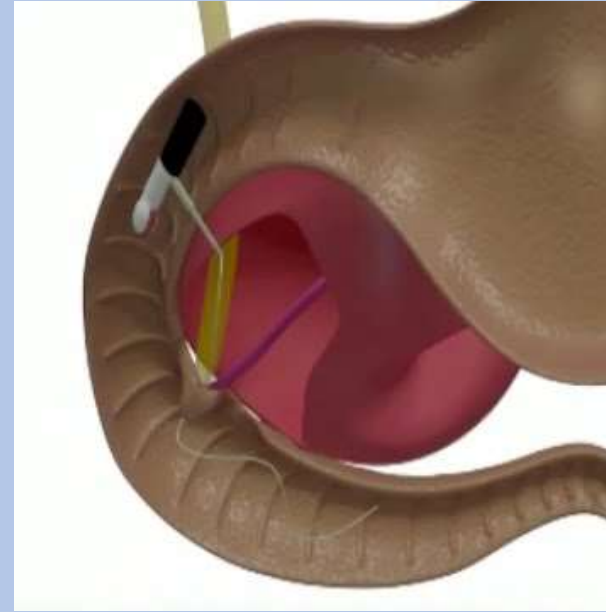


NOOD AAN ALTERNATIEF

Rendez-vous procedure



PTC-guided rendez-vous



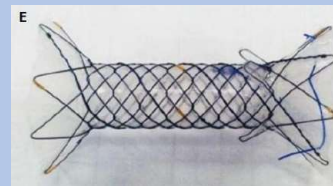
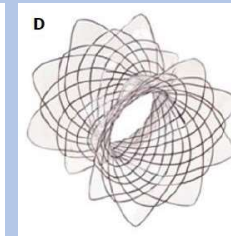
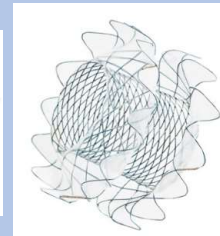
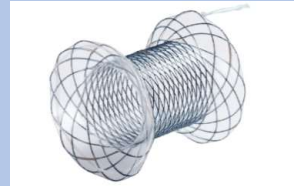
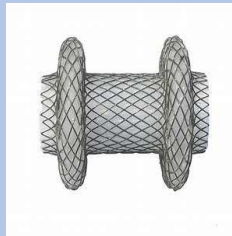
EUS-guided rendez-vous

EUS-guided rendez-vous procedure



Lumen-apposing metal stents: karakteristieken

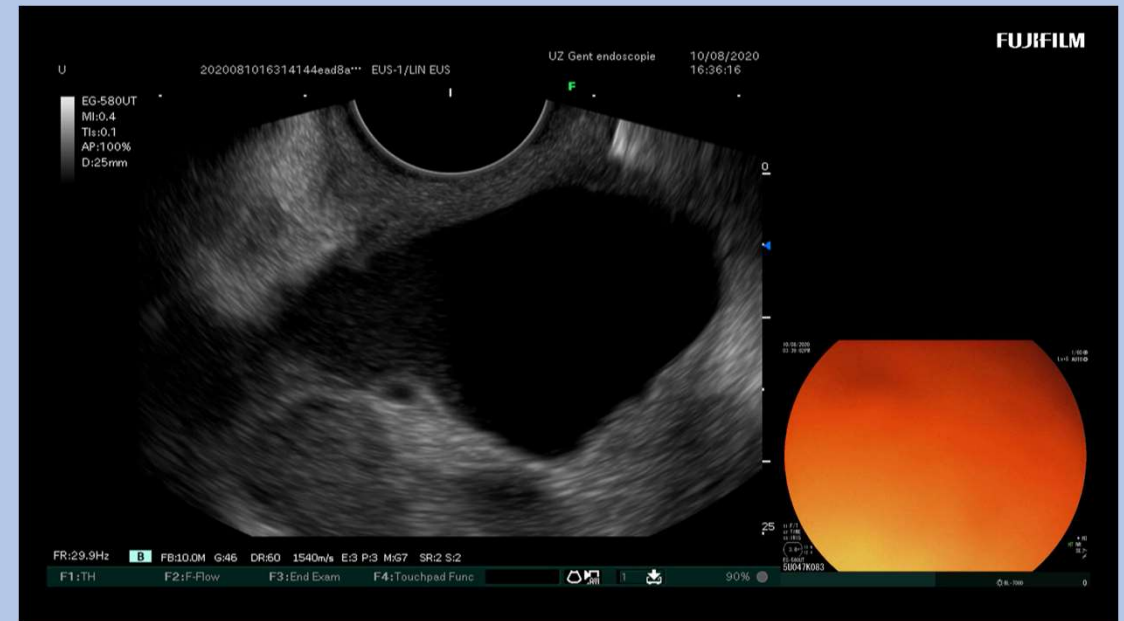
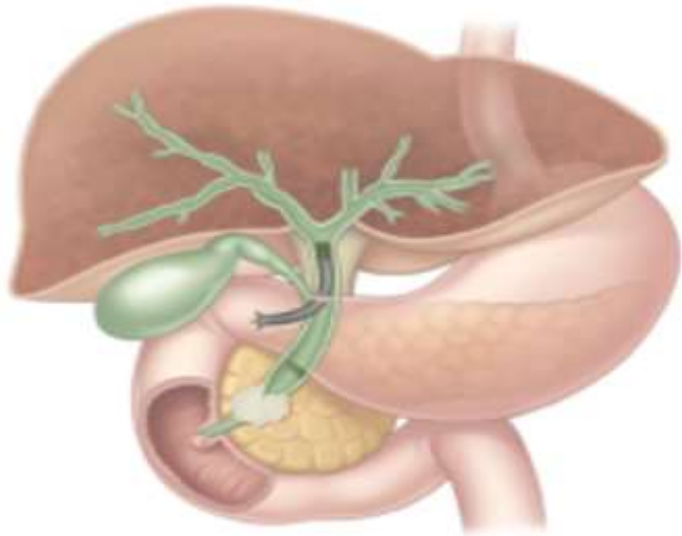
- **1: Diabolo configuratie**
- **2: Korte lengte**
- **3: Brede diameter**



- Technisch doel: anastomose creëren dus GI lumen en aanpalende structuren

EUS-geleide galwegdrainage met LAMS

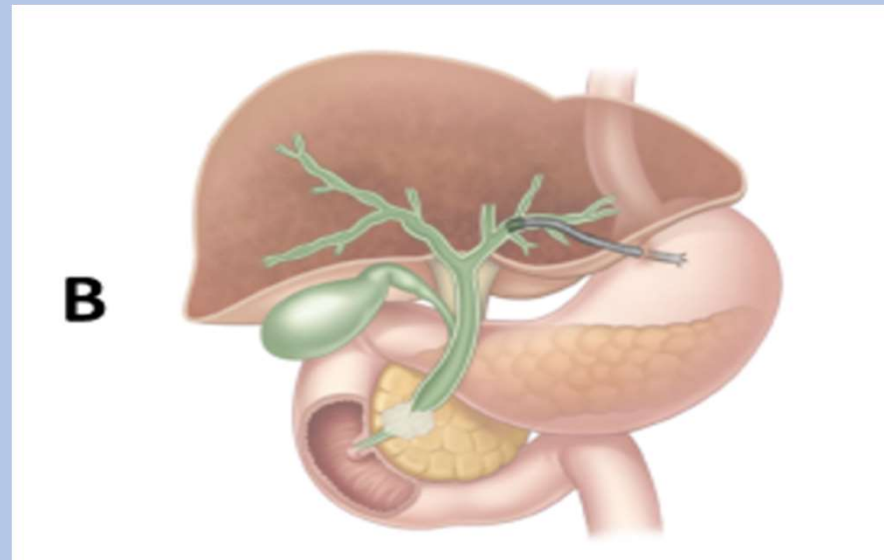
Indicatie: gefaald ERCP/maligne distale strictuur

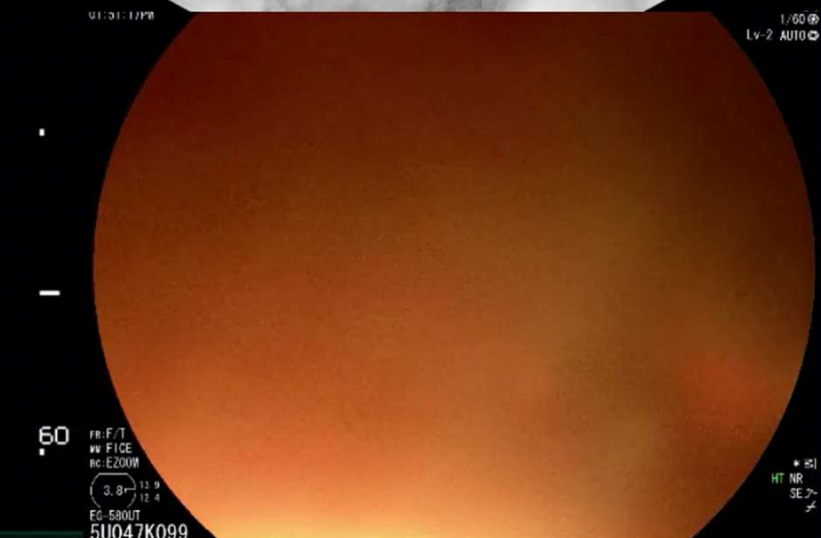
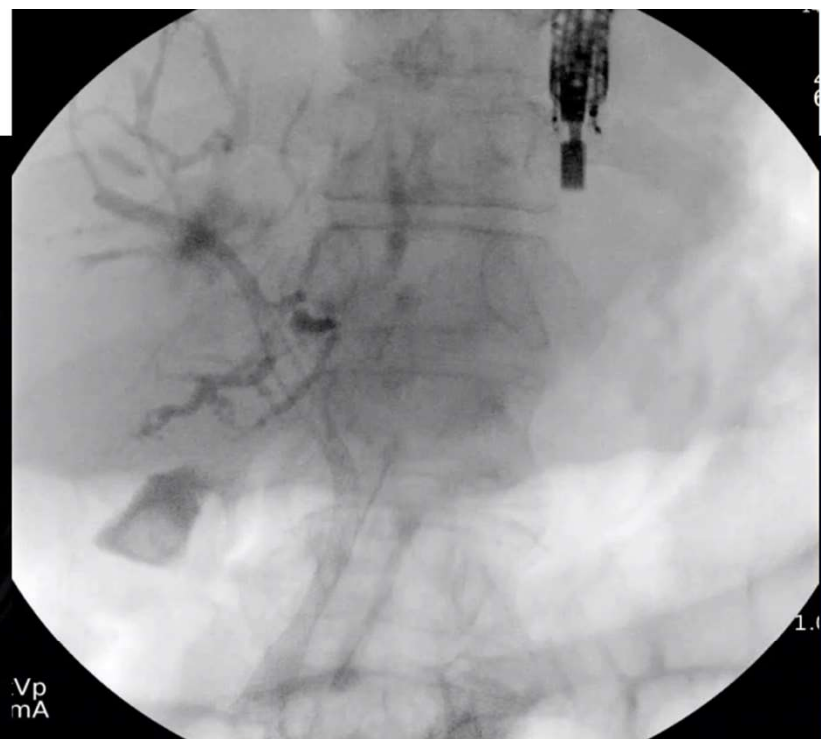
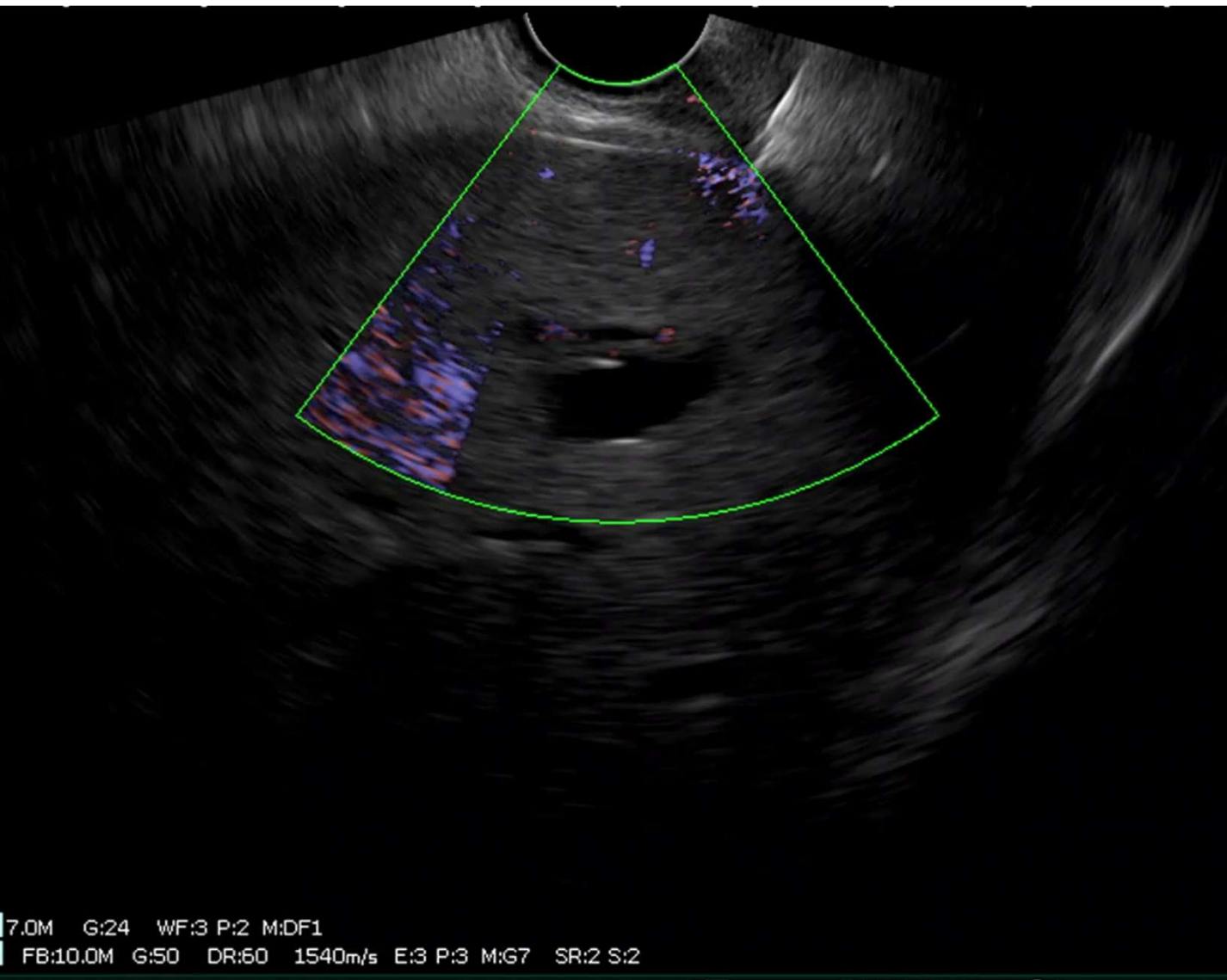


CHOLEDOCHODUODENOSTOMIE

EUS-geleide galwegdrainage met hepaticogastrostomie

Hepaticogastrostomie: Palliatieve biliare drainage bij gefaald of onmogelijk ERCP+ creëren van access voor biliare interventie bij patiënten met gewijzigde anatomie





7.0M G:24 WF:3 P:2 M:DF1
FB:10.0M G:50 DR:60 1540m/s E:3 P:3 M:G7 SR:2 S:2

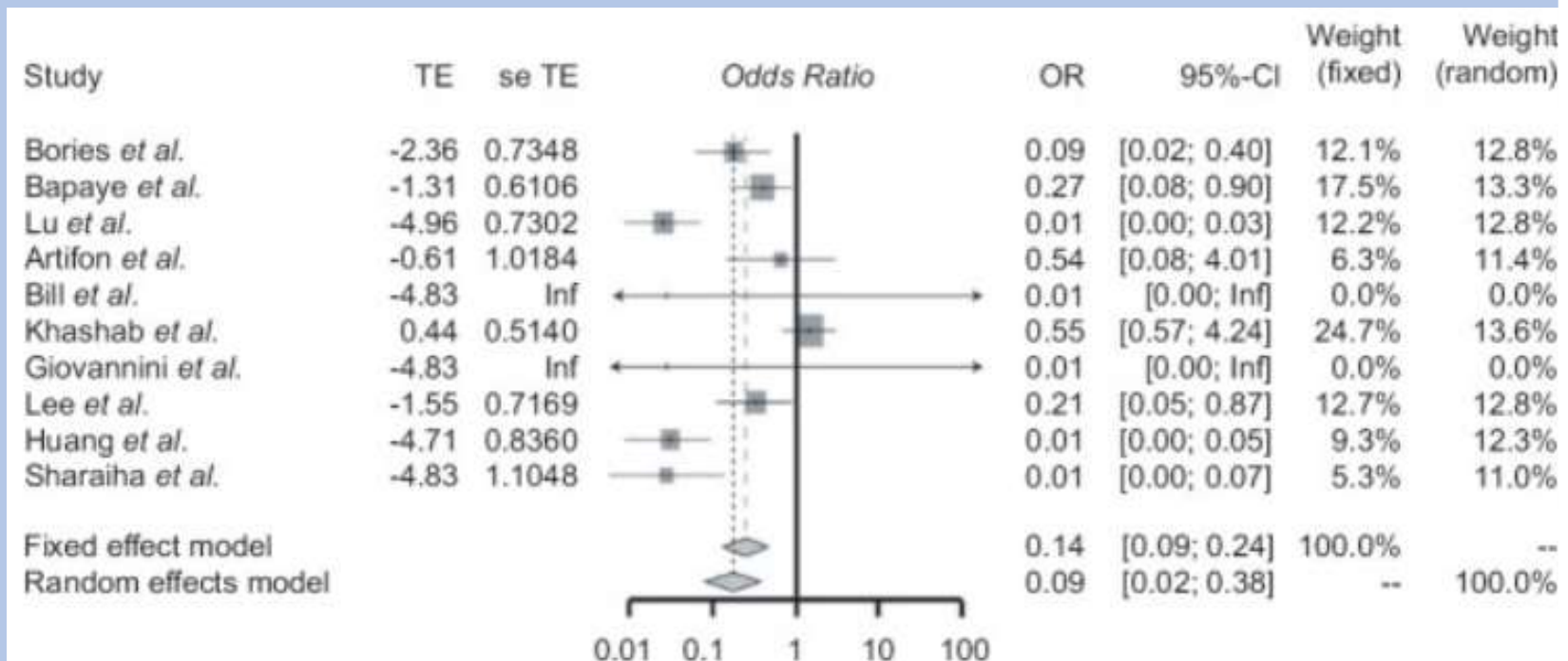
60

PR:F/T
W FICE
RE:E200M
3.8-12.4
EG:580UT
5U047K099

* 21
HT NR
SE 21

Failed/difficult ERCP: PTD vs. EUS guided

Complications:



Heterogeneity: $I^2 = 88\%$, $\tau^2 = 3.8036$, $P = 0.01$

ERCP or EUS-guided biliary drainage for malignant distal bile duct obstruction

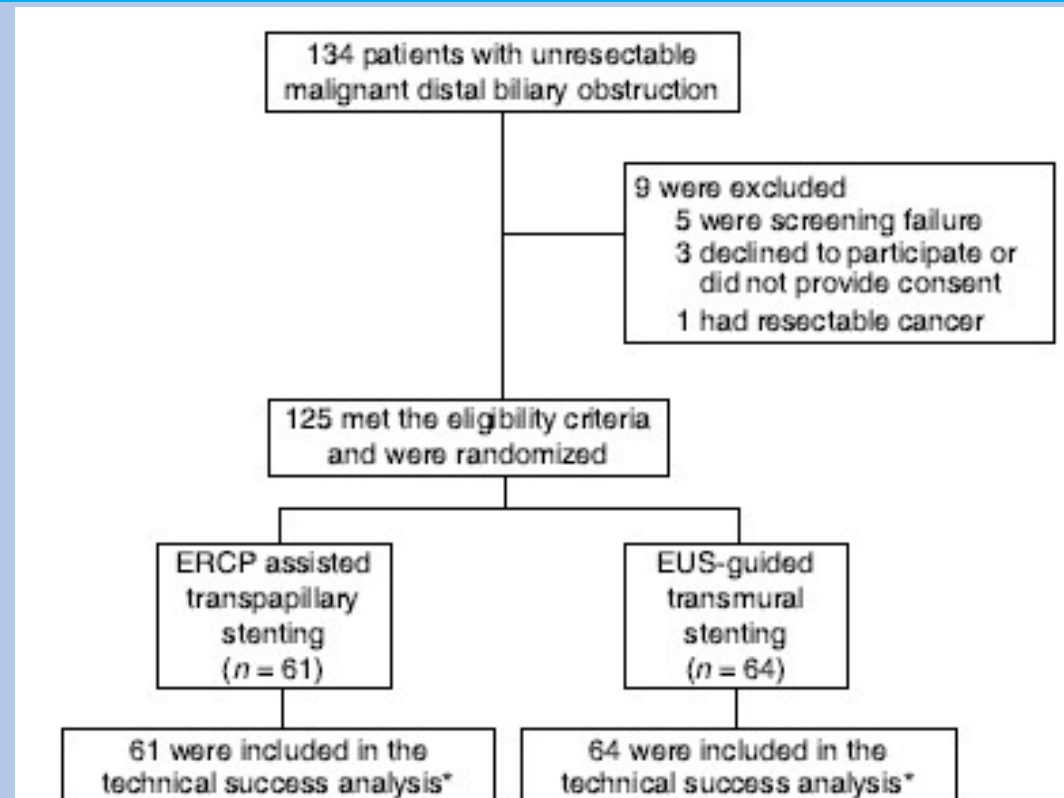


Fig. 1 Flow diagram of enrolled patients.

*Technical success rates were calculated by intention-to-treat analysis

Table 4 Comparison of transpapillary and transmural stent placement in patients without duodenal invasion or surgically altered anatomy

Outcome measures	ERCP (<i>n</i> =45)	EUS-BD (<i>n</i> =43)	<i>P</i> value
Technical success, <i>n</i> (%)	45 (100)	40 (93.02)	0.11
Clinical success, <i>n</i> (%)	39 (86.7)	39 (90.7)	0.73
Procedure time, min (range)	14 (10, 20)	4.8 (3.2, 11.8)	<0.001
Adverse events, <i>n</i> (%)			
Early (≤2 weeks, procedure-related)	9 (20)	3 (6.9)	0.07
Late (>2 weeks)	8 (17.4)	2 (4.7)	0.09
Mortality, <i>n</i>	37	30	0.17
Procedure-related	0	0	
Disease progression	37	29	
Cardiopulmonary complication	0	1	
Reintervention rate, <i>n</i> (%)	18 (40)	5 (11.6)	0.003
Reintervention method, <i>n</i>			1.00
ERCP	15	5	
EUS-BD	2	0	
PTBD	1	0	
Hospital stay, median (IQR), days	5 (4, 6)	4 (3, 5)	0.01

EUS-geleide galblaasdrainage versus percutane galblaasdrainage

ORIGINAL RESEARCH

Endosonography-guided gallbladder drainage versus percutaneous cholecystostomy in very high-risk surgical patients with acute cholecystitis: an international randomised multicentre controlled superiority trial (DRAC 1)

Anthony Y B Teoh ¹, Masayuki Kitano ², Takao Itoi,³ Manuel Pérez-Miranda,⁴ Takeshi Ogura,⁵ Shannon Melissa Chan,¹ Carlos Serna-Higuera,⁴ Shunsuke Omoto,⁶ Raul Torres-Yuste,⁴ Takayoshi Tsuchiya,³ Ka Tak Wong,⁷ Chi-Ho Leung ¹, Philip Wai Yan Chiu ¹, Enders Kwok Wai Ng,¹ James Yun Wong Lau¹

Teoh aYB, et al. Gut 2020

EUS-geleide galblaasdrainage versus percutane galblaasdrainage

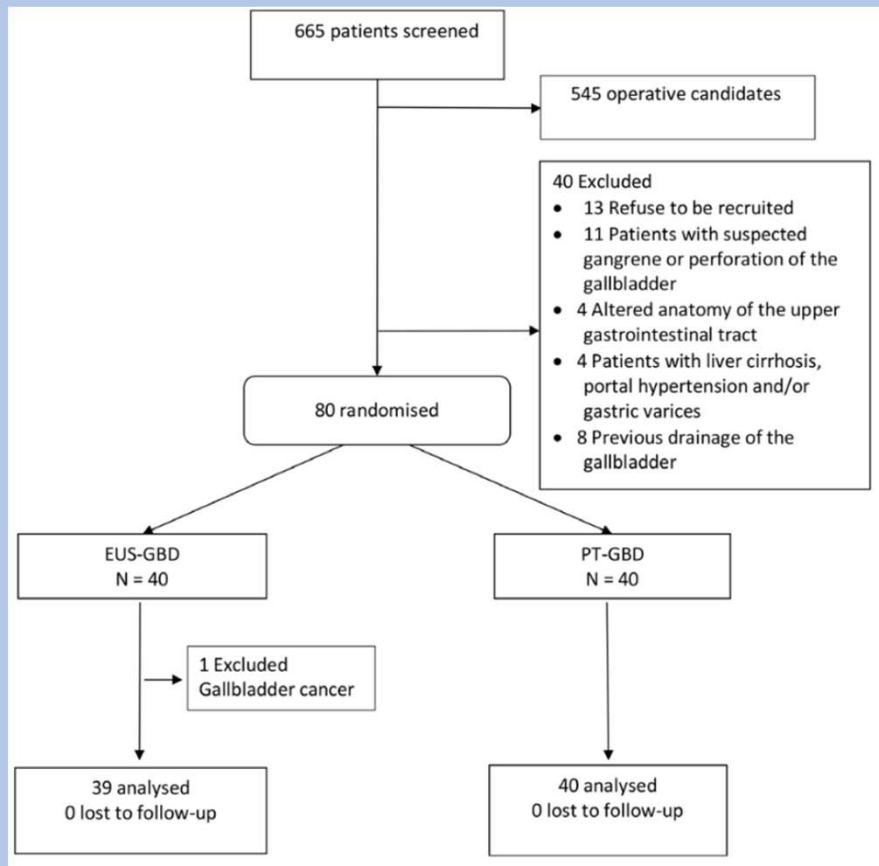


Table 2 Comparison of the clinical outcomes between the two groups

	EUS-GBD n=39	PT-GBD n=40	P value
1-year adverse events (%)	10 (25.6)	31 (77.5)	<0.001
Grading 1/2/3/4/5	1/1/6/0/2	13/6/8/0/4	
Recurrent acute cholecystitis (%)	1 (2.6)	8 (20)	0.029
Reinterventions after 30 days (%)	1 (2.6)	12 (30)	0.001
Reinsertion of PT-GBD	0	12	
Clearing blocked stent	1	0	
Unplanned admissions (%)	6 (15.4)	20 (50)	0.002
30-day adverse events (%)	5 (12.8)	19 (47.5)	0.001
Grading 1/2/3/4/5	0/1/2/0/2	6/4/5/0/4	
30-day mortality (%)	3 (7.7)	4 (10)	1
Technical success (%)	38 (97.4)	40 (100)	0.494
Clinical success (%)	36 (92.3)	37 (92.5)	1
Procedure time (minutes)	22.7 (13.0)	27.4 (12.0)	0.108
Analgesic requirements (total paracetamol in mg)	3345 (5663)	5165 (5068)	0.034
Hospital stay (days)*	8 (4–13)	9 (7–14)	0.181

05/05/2022
07:50:57AM



1/60 Ⓢ
Lv-2 AUTO Ⓢ

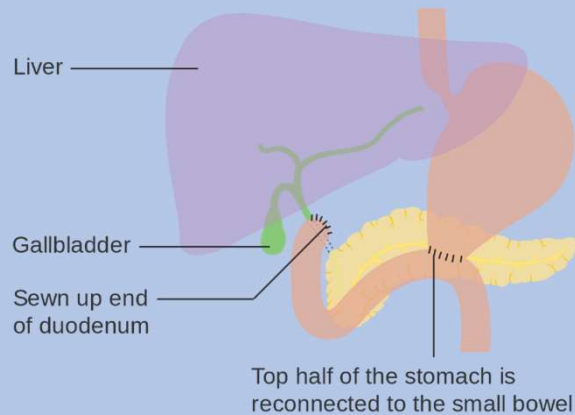
01: F/T
02: REC
03: IRIS
4.2 13.1
11.3
ED-580XT
3D127K205

* Ⓢ
HT NR
SE 7
ナ



1.

Patients with surgically altered anatomy



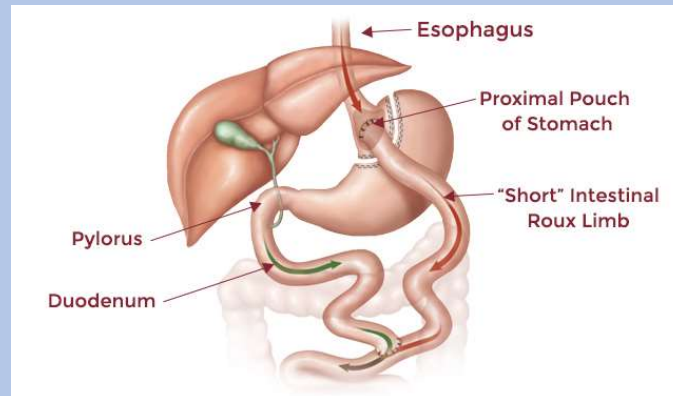
Billroth II

Endoscope

Often duodenoscope

Inverted sphincterotome?

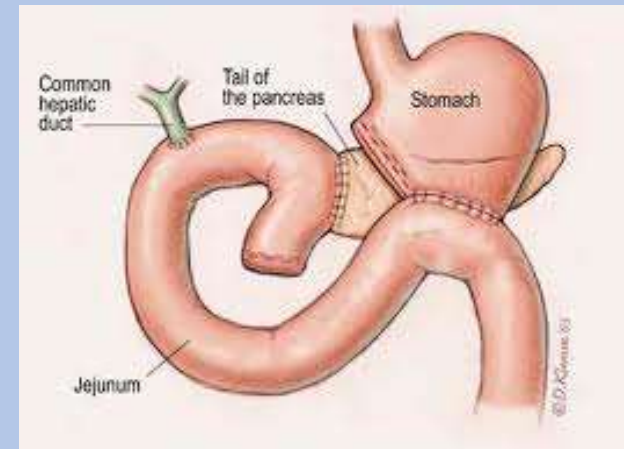
YES



Roux-en-Y gastric bypass

Enteroscope (duodenoscope if through excluded stomach)

YES (not in case of EDGE)

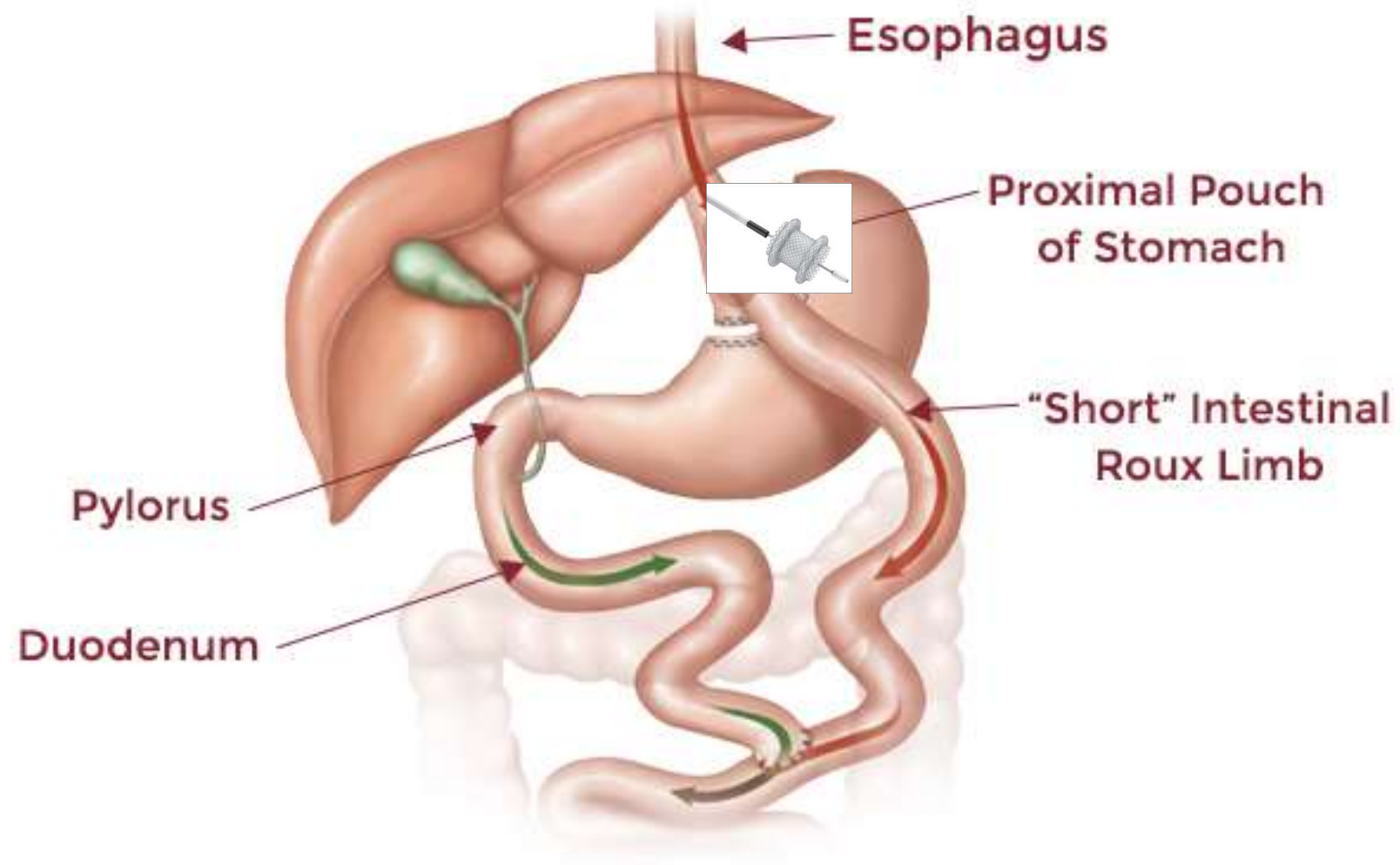


Whipple

Enteroscope

NO

ERCP in patients with previous gastric bypass

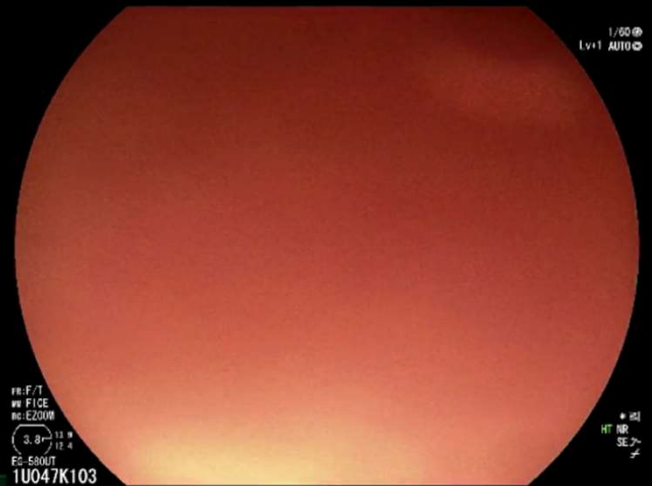


EUS-1/LIN EUS

UZ Gent endoscopie

27/07/2020
13:48:36

EG-580UT
MI:0.3
TI:0.2
AP:100%
D:60mm



FR:29.9Hz B FB:10.0M G:46 DR:60 1540m/s E:3 P:3 M:G7 SR:2 S:2

F1:TH F2:F-Flow F3:End Exam F4:Touchpad Func



0



90%

FR:F/T
WE FICE
no:E200R
0.8 13.8
7 12.4
EG-580UT
1U047K103

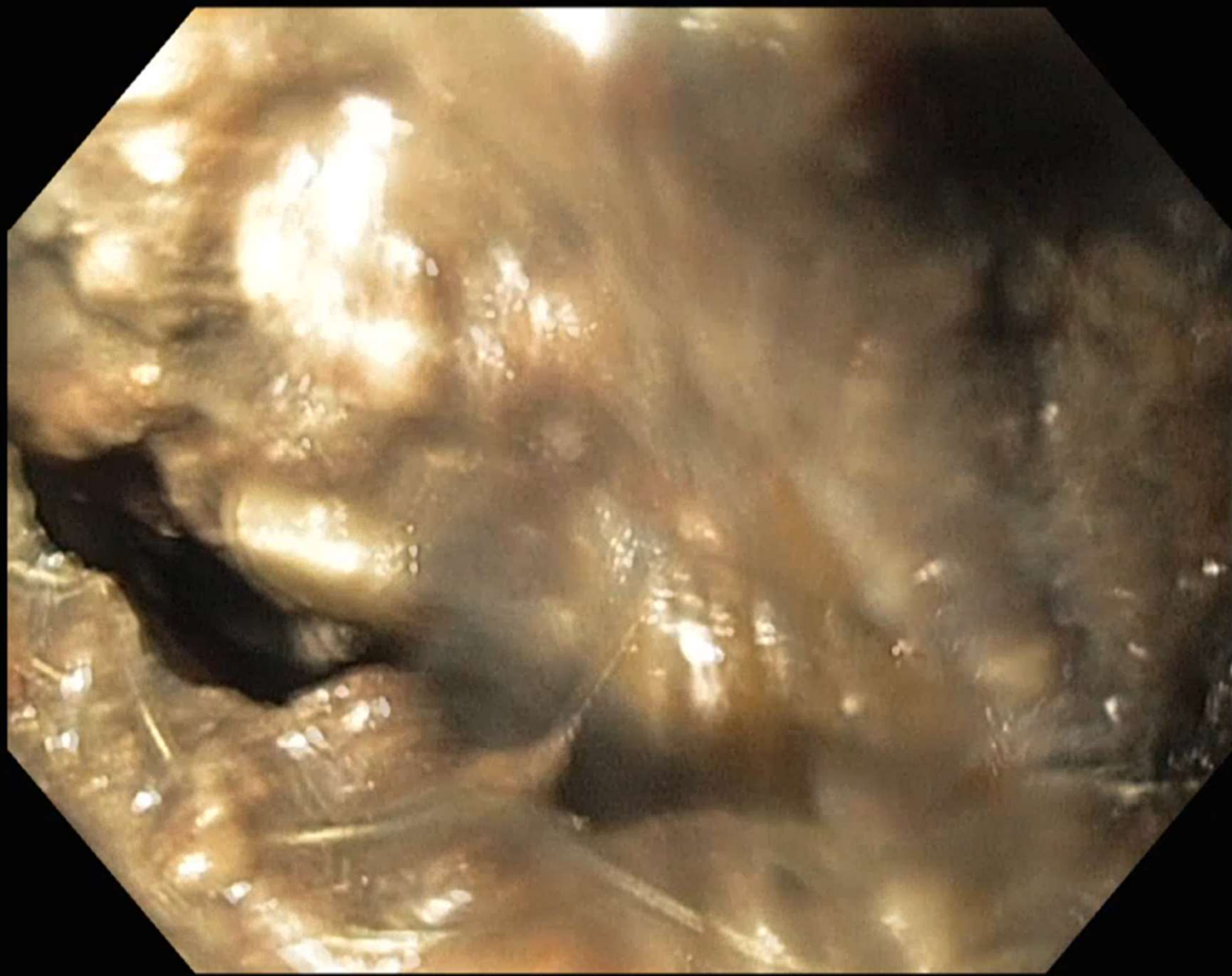
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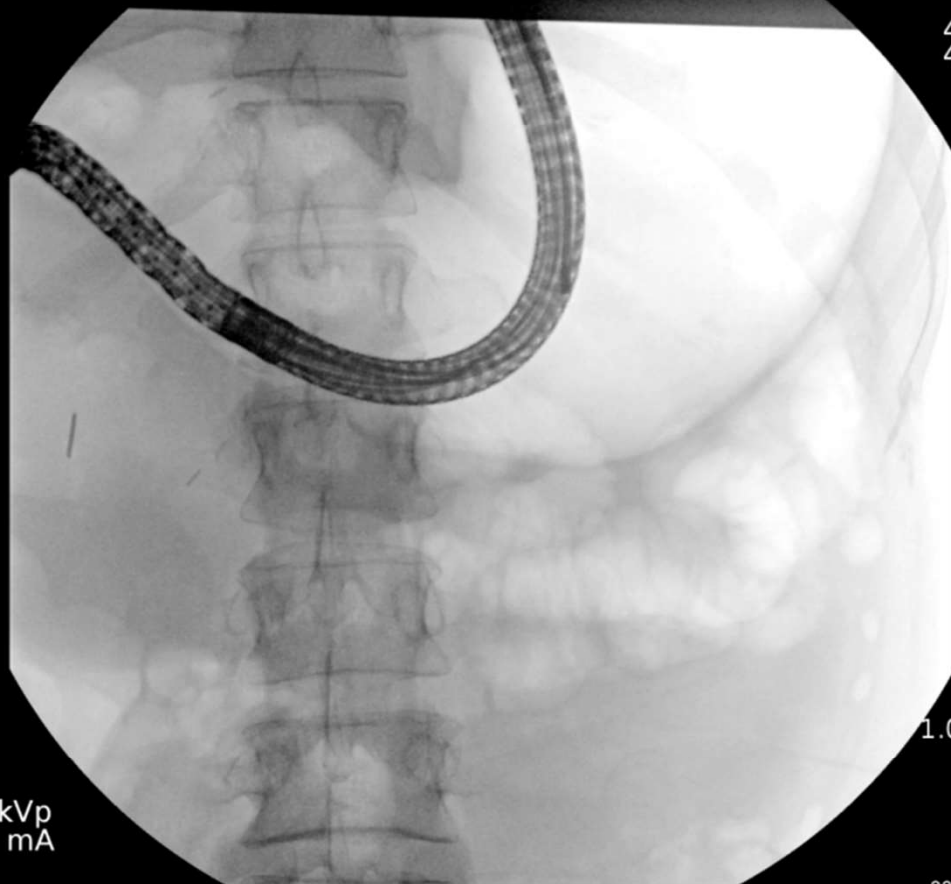
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EXAMPLE 2



ANDERE ALTERNATIEVE ROUTES VIA LUMEN-APPOSING METAL STENTS





41°
41°

76 kVp
2,0 mA

LIH
R

1.0X
0°

00,3 min

OFC



S1: F/T
S2: LM
S3: IRIS
3.8 12.0
EC-760R-V/I
4C728K081

BL-7000





LAMS gastro-jejunostomie vs duodenale stent

► Table 2 Matched cohort: outcome comparisons.

	EUS-GE (n = 88)	Duodenal stenting (n = 88)	OR (95 %CI)
Efficacy			
Primary outcomes			
• Technical success, n (%) [95 %CI]	83 (94) [89–99]	86 (98) [95–100]	0.39 (0.07–2.04)
• Clinical success, n (%) [95 %CI]	80 (91) [85–97]	66 (75) [66–84]	3.33 (1.39–8.00)
• Per-protocol clinical success, n (%) [95 %CI]	80 (96) [92–100]	66 (77) [68–86]	8.06 (2.30–28.57)
• Time to clinical success, median (IQR), days	1 (1–2)	2 (2–3)	
• Time to oral intake, median (IQR), days	1 (0–1)	1 (0–1)	
• Recurrence of obstructive symptoms, n (%) [95 %CI] *	1 (1) [0–4]	17 (26) [15–37]	0.04 (0.01–0.28)
• Time to recurrent obstructive symptoms, median (IQR), days	243 (N/A)	57 (27–169.5)	
Secondary outcomes			
• Length of hospital stay, median (IQR), days	4 (2–10.8)	4 (1–9.5)	
• Survival, median (IQR), days	85 (43–157)	57 (18.5–130.5)	
Safety			
Overall adverse events, n (%) [95 %CI]	9 (10.2) [3.8–16.7]	18 (20.5) [11.9–29.0]	0.44 (0.19–1.05)
ASGE AE severity grading system, n (%) [95 %CI]			
• Mild	2 (2.3) [0–5.5]	6 (6.8) [1.5–12.2]	0.32 (0.06–1.62)
• Moderate	3 (3.4) [0–7.3]	9 (10.2) [3.8–16.7]	0.31 (0.08–1.19)
• Severe	4 (4.5) [0.1–9.0]	2 (2.3) [0–5.5]	2.05 (0.37–11.49)
• Fatal	0 (0)	1 (1.1) [0–3.4]	0.99 (0.97–1.01)

EUS-GE, endoscopic ultrasound-guided gastroenterostomy; OR, odds ratio; IQR, interquartile range; N/A, not applicable; ASGE, American Society for Gastrointestinal Endoscopy; AE, adverse event.

* Per-protocol cohorts.

LAMS gastroenterostomie vs chirurgische gastroenterostomie

	EUS-guided gastroenterostomy (n = 77)		Laparoscopic gastroenterostomy (n = 48)		Odds ratio (95% confidence interval), P value
Efficacy					
Technical success	73	(94.8)	48	(100)	.17 (.01-3.20), .297
Clinical success	71	(92.2)	42	(87.5)	1.69 (.51-5.58), .534
Per-protocol clinical success	71	(97.3)	42	(87.5)	5.07 (.98-26.28), .057
Time to oral intake, days	1	(0-1)	3	(1-5)	<.001
Full diet tolerability	32	(41.6)	19	(39.6)	1.16 (.56-2.44), .854
Time to full diet, days	2	(1-4)	8	(4-21)	<.001
Gastroenterostomy dysfunction	1	(1.3)	0	(.0)	1.90 (.08-47.64), 1.000
Time to dysfunction, days	243	N/A	N/A	N/A	N/A
Distal obstruction	8	(10.4)	1	(1.3)	5.45 (.66-45.02), .151
Time to distal obstruction, days	34	(18-138)	13	N/A	N/A
Safety					
Overall adverse events	5	(6.5)	15	(31.3)	.15 (.05-.46), <.001
Mild	2	(2.6)	1	(2.1)	1.25 (.11-14.21), 1.000
Postprocedural fever	2	(2.6)	0	(.0)	3.21 (.15-68.35), .523
Moderate	1	(1.3)	5	(10.4)	.11 (.01-1.00), .106
Sepsis	1	(1.3)	0	(.0)	1.90 (.08-47.64), 1.000
Need for re-endoscopy	0	(.0)	4	(8.3)	.06 (.00-1.21), .020
Severe	2	(2.6)	9	(18.8)	.12 (.03-.59), .007
Intraperitoneal lumen-apposing metal stent deployment	2	(2.6)	N/A	N/A	N/A
Anastomotic leak	N/A	N/A	3	(6.3%)	N/A
Anastomotic bleeding	N/A	N/A	2	(4.2)	N/A
Surgical reintervention	N/A	N/A	3	(6.3)	N/A
Fatal	0	(.0)	0	(.0)	1.000
Other					
Procedure duration, min	51	(36-79.8)	95	(75-118)	<.001
Hospital stay, days	4	(2-10.5)	8	(5-20)	<.001
Weight change after 2 months, kg	-1	(-4.0 to 1.1)	-4	(-4.2 to .8)	.390
Postprocedural survival, days	103	(44-252)	147	(68-335)	.246

TAKE HOME MESSAGES

VERBETERDE IMAGING EN NIEUWE ENDOSCOPISCHE RESECTIETECHNIEKEN
MAKEN MINIMAAL INVASIEVE BEHANDELING VAN OPPERVLAKKIGE TUMOREN
IN HET GI STELSEL MOGELIJK

ERCP IS NIET MEER LOS TE KOPPELEN VAN EUS

INTERVENTIONELE EUS: SNEL EVOLUERENDE ENDOSCOPISCHE SUBDISCIPLINE
MET TAL VAN APPLICATIES