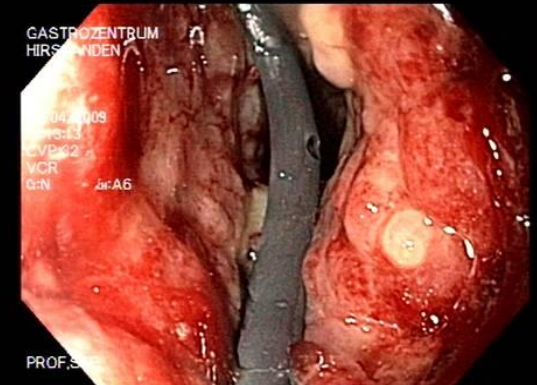


Severe Acute Pancreatitis & Walled Off Necrosis Management



Stefan Seewald

Pacific Northwest Gastroenterology Society

STATE-OF-THE-ART IN

GASTROINTESTINAL ENDOSCOPY COURSE

February 27th 2016

Necrotizing pancreatitis

- ***Treatment paradigms have been changing***
 - Open surgical necrosectomy to „minimally invasive“ procedures
 - Main indication for intervention: infected necrosis
 - Timing of intervention - „as late as possible“
 - Endoscopic necrosectomy is feasible, however should only performed in selected cases

*Sarr M. & Seewald S. Clin Gastroenterol Hepatol 2010;8:1000
Van Santvoort HC: et al. Gastroenterology 2011;141:1254-63*

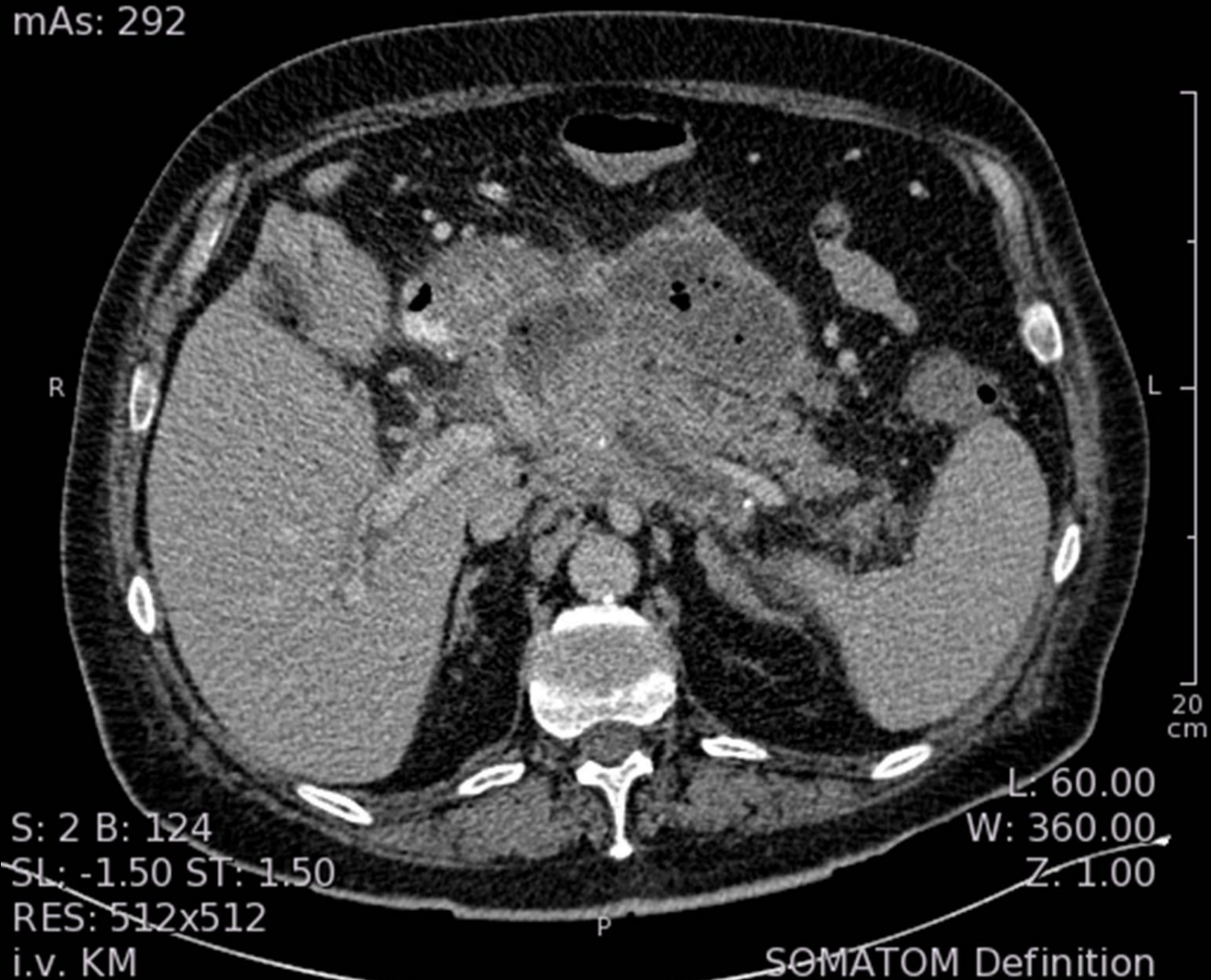
A Conservative and Minimally Invasive Approach to Necrotizing Pancreatitis Improves Outcome

HJALMAR C. VAN SANTVOORT,* OLAF J. BAKKER,* THOMAS L. BOLLEN,† MARC G. BESSELINK,*
USAMA AHMED ALI,* A. MARJOLEIN SCHRIJVER,* MARJA A. BOERMEESTER,§ HARRY VAN GOOR,||
CORNELIS H. DEJONG,¶ CASPER H. VAN EIJCK,** BERT VAN RAMSHORST,# ALEXANDER F. SCHAAPHERDER,††
ERWIN VAN DER HARST,§§ SIJBRAND HOFKER,||| VINCENT B. NIEUWENHUIJS,||| MENNO A. BRINK,¶¶
PHILIP M. KRUYT,### ERIC R. MANUSAMA,*** GEORGE P. VAN DER SCHELLING,††† TOM KARSTEN,§§§
ERIC J. HESSELINK,|||| CORNELIS J. VAN LAARHOVEN,¶¶¶ CAMIEL ROSMAN,### KOOP BOSSCHA,****
RALPH J. DE WIT,†††† ALEXANDER P. HOUDIJK,§§§§ MIGUEL A. CUESTA,||||| PETER J. WAHAB,¶¶¶¶ and
HEIN G. GOOSZEN* for the Dutch Pancreatitis Study Group

with patients with only peripancreatic necrosis ($n = 315$), had a higher risk of organ failure (50% vs 24%, $P < .001$) and mortality (20% vs 9%, $P < .001$). **CONCLUSIONS:** Approximately 62% of patients with necrotizing pancreatitis can be treated without an intervention and with low mortality. In patients with infected necrosis, delayed intervention and catheter drainage as first treatment improves outcome.

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2297969
Seewald^Stefan

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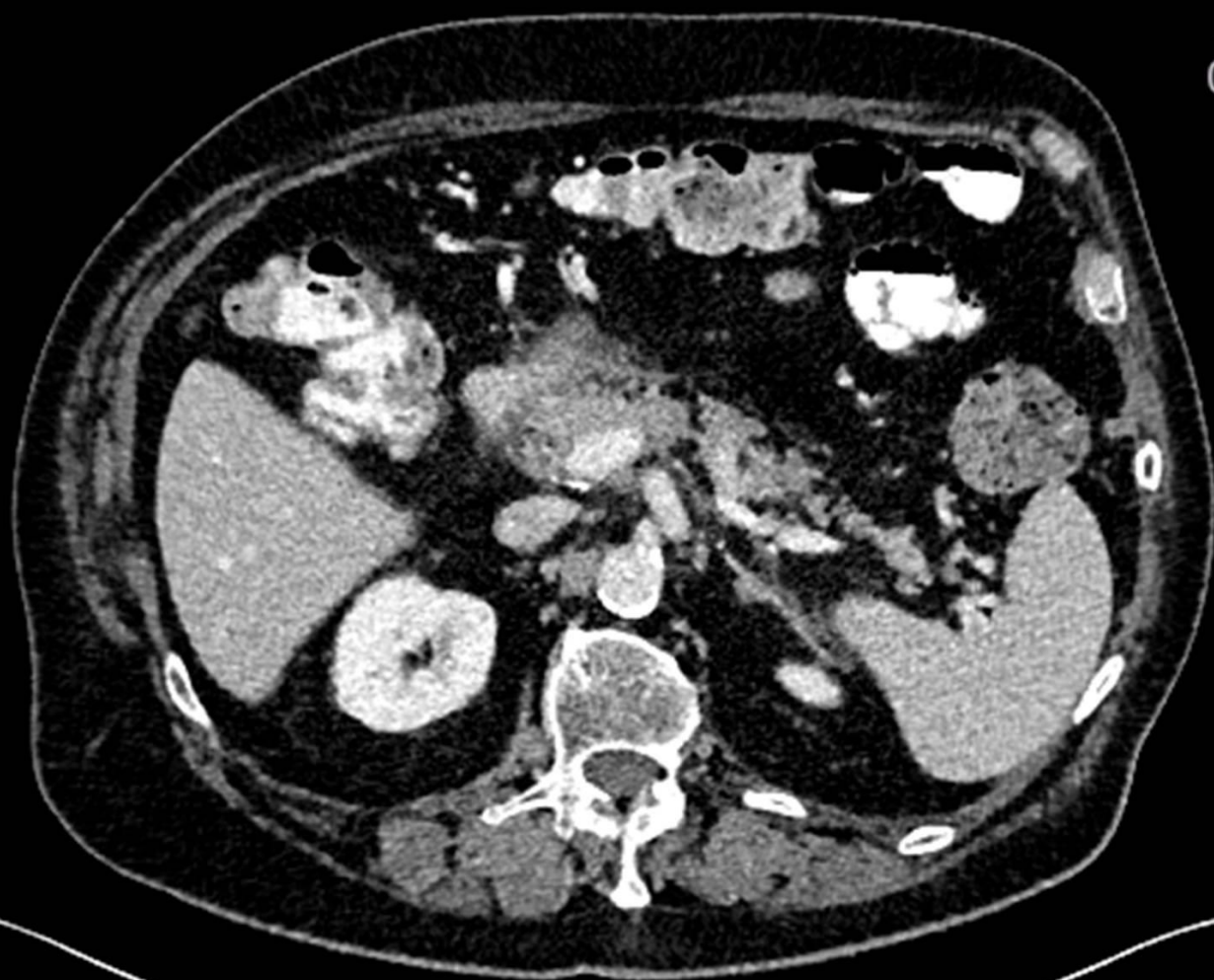
20
cm

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NS: 1

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FOV: 444.00 mm x 555.00 mm

L: 45.00
W: 315.00
Z: 1.00
R: 0° S:
P: -37/0



Severe acute interstitial pancreatitis
Chronic pancreatitis
Traumatic
Post pancreatic surgery

Severe acute necrotizing pancreatitis

Acute pancreatic fluid collections

Acute necrotic collection

Pseudocyst

≥ 30d

Walled off pancreatic necrosis

Asymptomatic

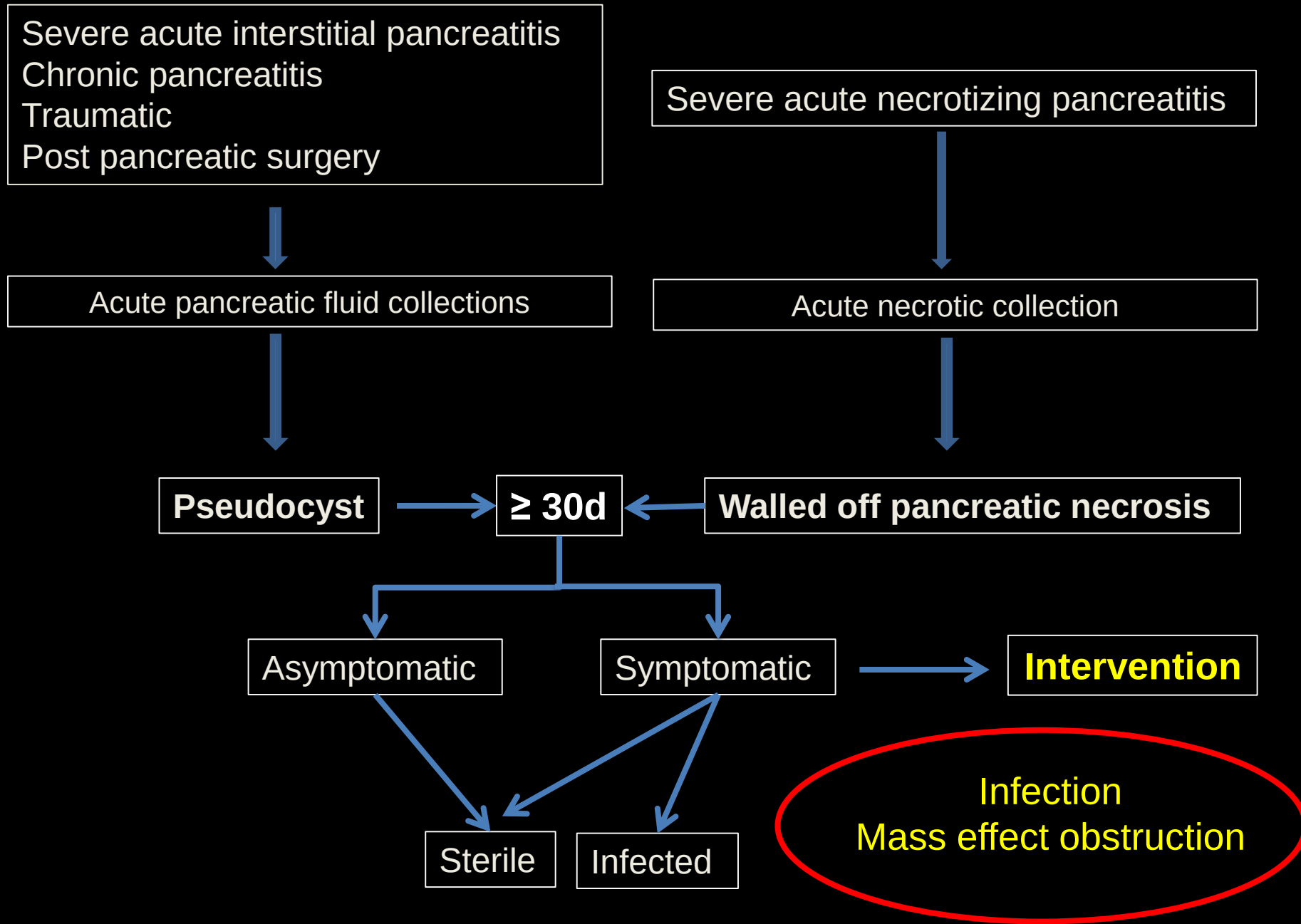
Symptomatic

Intervention

Sterile

Infected

Infection
Mass effect obstruction



Intervention

Endoscopic/percutaneous approach

- *Indications*
 - Symptomatic pseudocysts
 - Infected fluid collections (abscess, WOPN)
- *Contraindications*
 - Early fluid collections (pseudocysts < 4 weeks)
 - Distance of more than 1 cm from the GI wall
 - Ascites, Coagulopathy

Objectives

- Indications
- Endoscopic approach
- Endoscopic necrosectomy
- Pancreatic duct intervention

Endoscopic Approach

- Initial transmural puncture and placement of transmural stent(s)+/- nasocystic drainages
- EUS- or non EUS-guided

Endoscopic approach

Simultaneous Double Wire Technique	
Seewald et al 2006	• 22 gauge FNA needle, • 5-Fr Teflon inner catheter • 8.5-Fr Teflon outer catheter • Two 0.035 inch guide wires
Sequential Multiple Wire Technique	
Jansen et al 2007	• 19 Gauge EUS FNA needle • 6/8.5/10 Fr Cystotome • 0.035 inch guide wires
Ang et al 2008	• 19 gauge EUS-FNA needle • Wire guided needle knife • 10Fr Soehendra biliary dilator • 0.035 inch guide wires

Name :

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Geburtsdatum :

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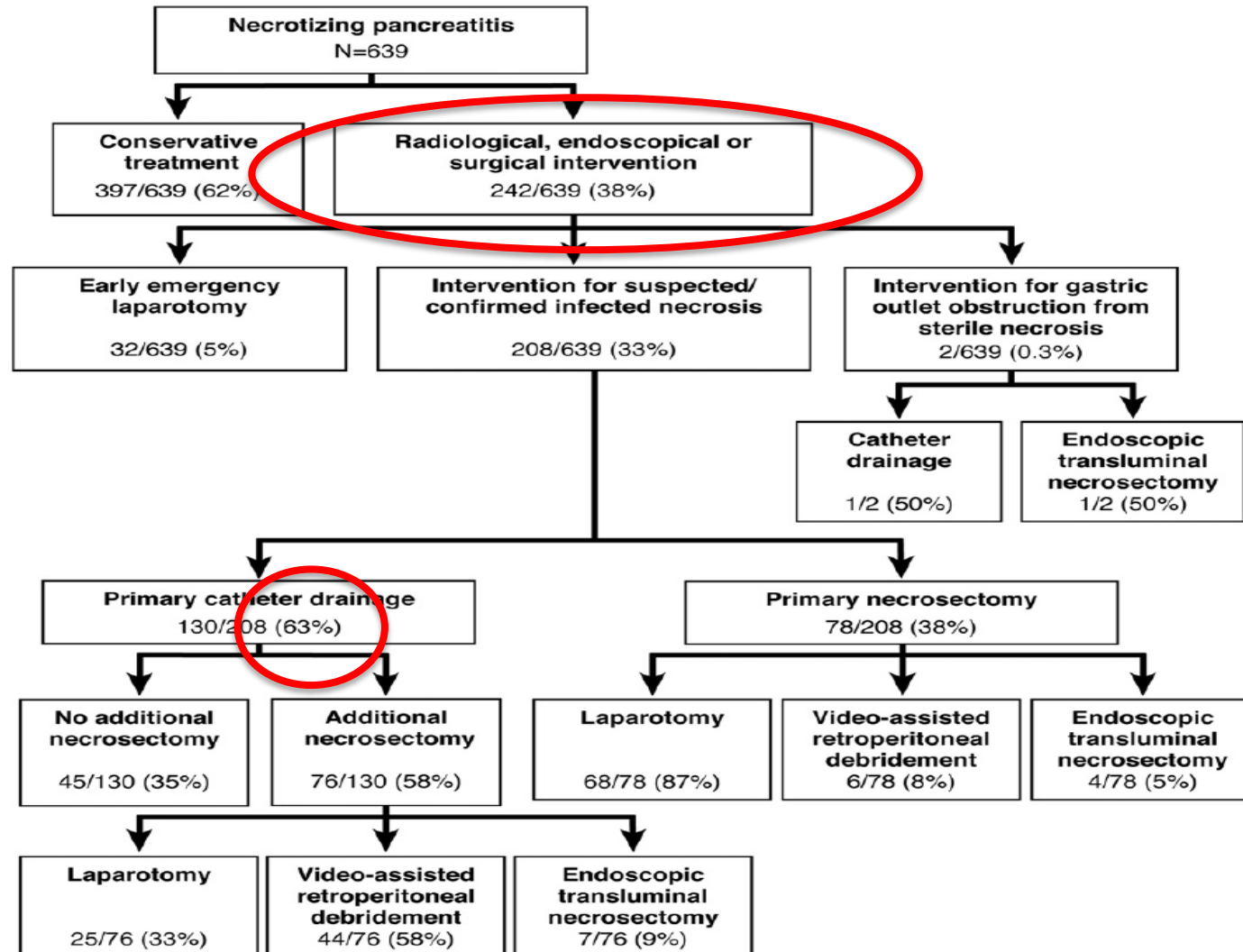
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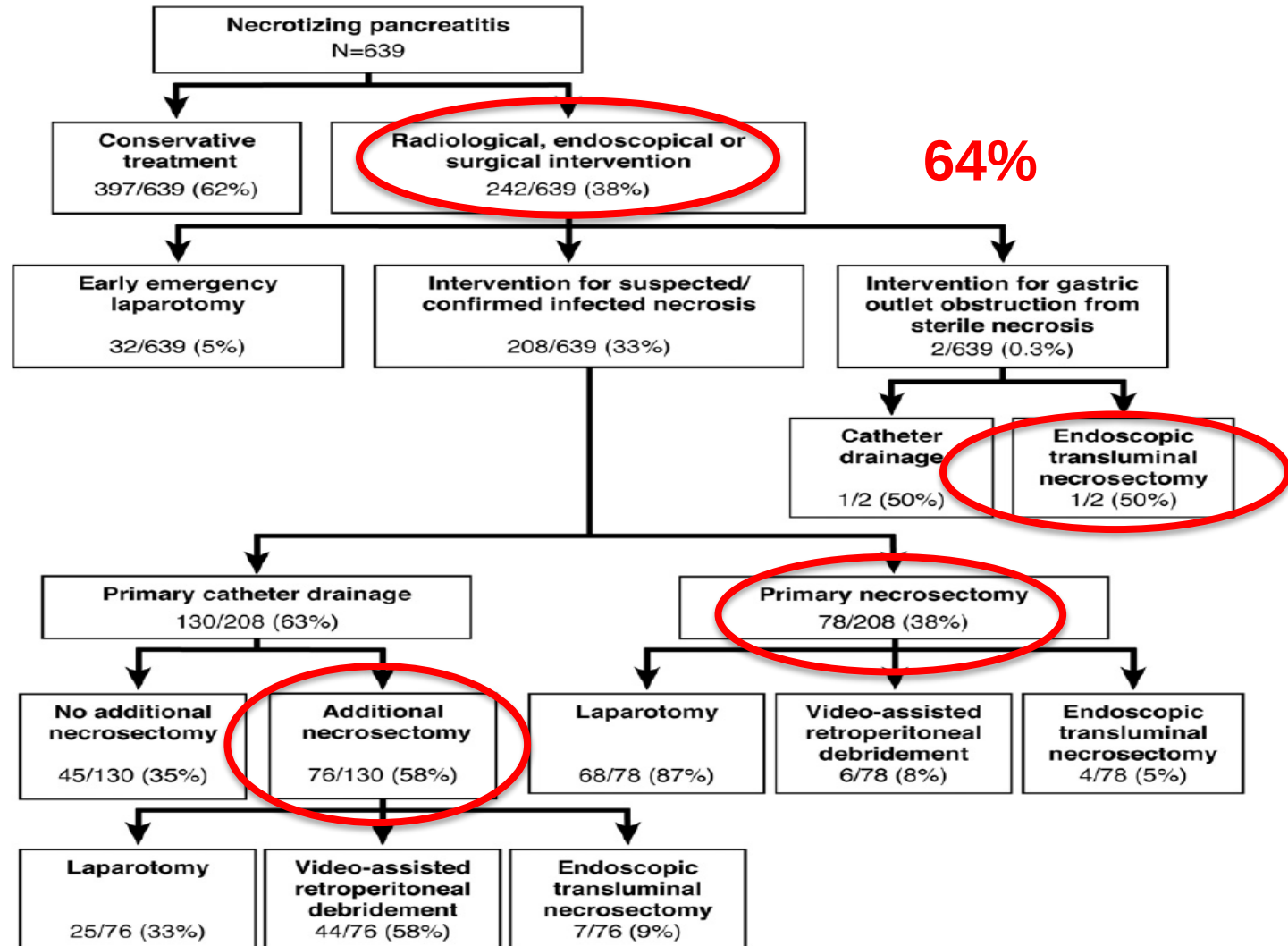
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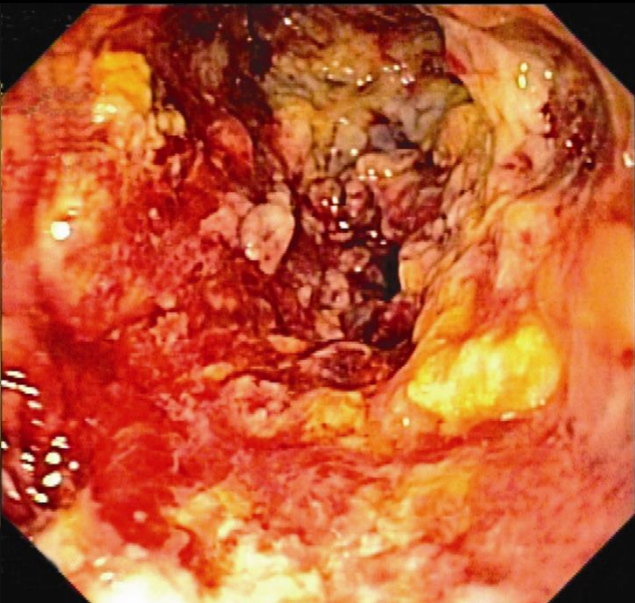
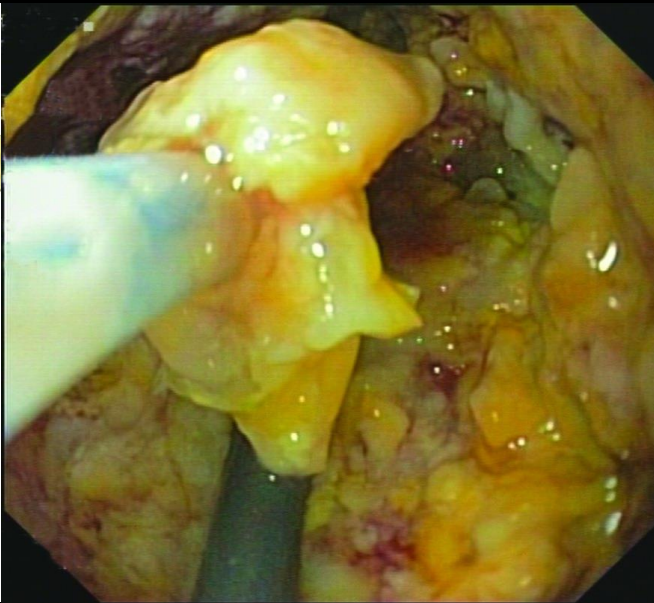
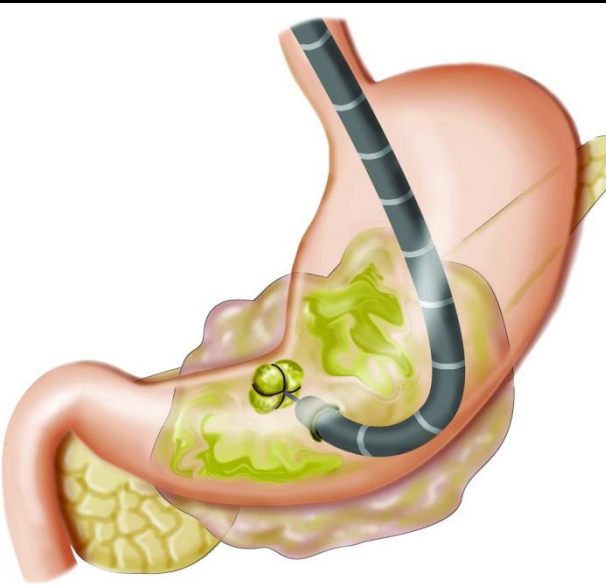
Objectives

- Indications
- Endoscopic approach
- Endoscopic necrosectomy
- Pancreatic duct intervention





Endoscopic Necrosectomy



Seifert et al . *Lancet* 2000;356:653
Seewald et al. *GIE* 2005;62:92

Endoscopic Necrosectomy

Caution: Perforation, Bleeding, Embolism

- Stepwise balloon-dilation up to 18 mm
- Insertion of Dormia-basket under fluoroscopy
 - *FG-22Q, Olympus, Japan*
- Pediatric, diagnostic or therapeutic endoscopes can be inserted directly into the cavity
 - *Dormia Basket, Snares*
- Temporary placement of covered metal stents?
- CO₂ Insufflator
 - *UCR Olympus, Japan;*
 - *E-Z-EM, Inc, Lake Success , NY, USA*

GASTROZENTRUM
HIRSLANDEN

25/04/2009

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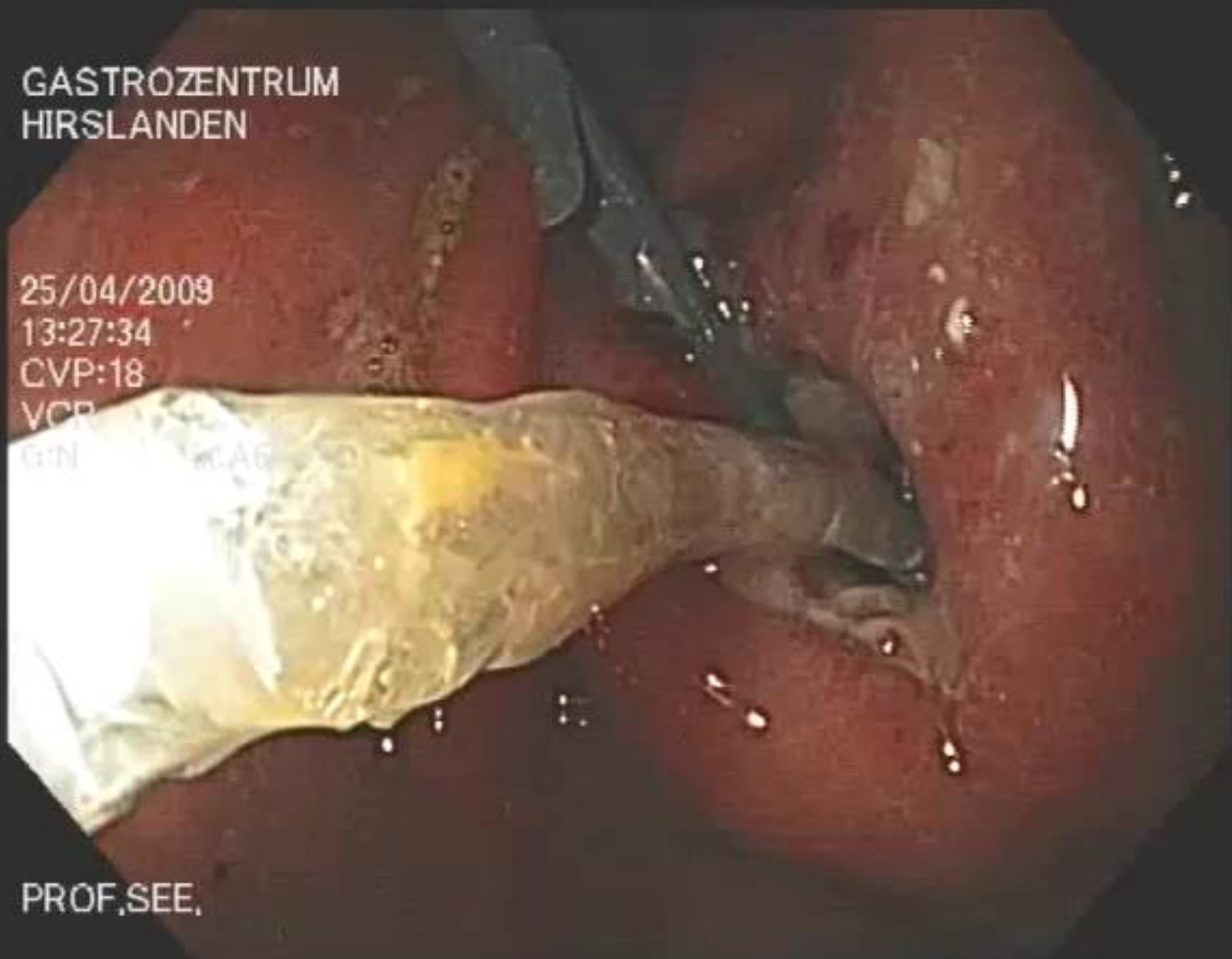
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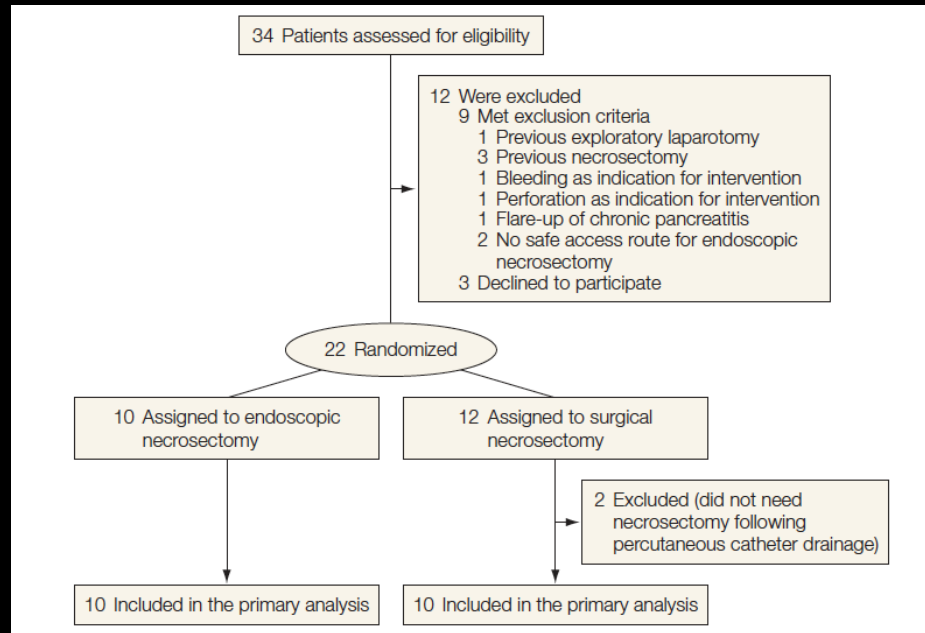
W.A.6

PROF,SEE,



Endoscopic Transgastric vs Surgical Necrosectomy for Infected Necrotizing Pancreatitis

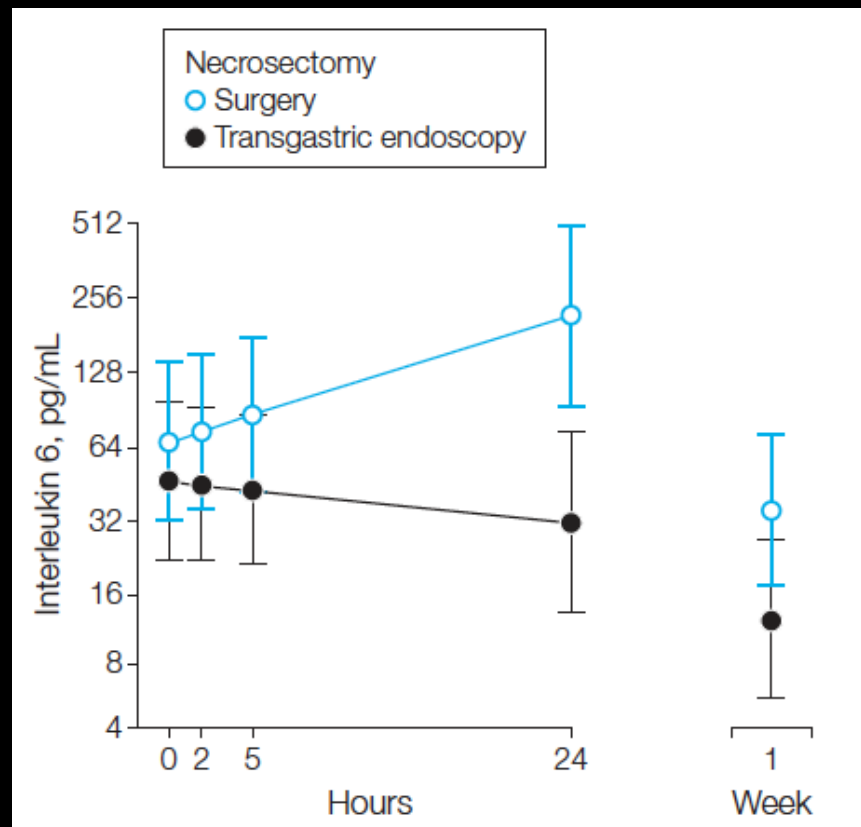
A Randomized Trial



- **Main outcome measures**
 - postprocedural proinflammatory response (IL-6)
 - predefined composite end point of major complications
 - *new onset organ failure, intraabdominal bleeding, enterocutaneous fistula, perforation and pancreatic fistula*

Endoscopic Transgastric vs Surgical Necrosectomy for Infected Necrotizing Pancreatitis

A Randomized Trial



Endoscopic Transgastric vs Surgical Necrosectomy for Infected Necrotizing Pancreatitis

A Randomized Trial

	Surgical Necrosectomy (n=10)	Endoscopic Necrosectomy (n=10)	p value
Major complications or death	8 (80%)	2 (20%)	0.03
Death	4 (40%)	1 (10%)	0.30
Major complications:			
New onset multi organ failure	5 (50%)	0 (0%)	0.03
Intraabdominal bleeding	0 (0%)	0 (0%)	
Enterocutaneous fistula or perforation	2 (20%)	0 (0%)	0.47
Pancreatic fistula	7 (70%)	1 (10%)	0.02
Long term complications:	n=6	n=9	
New onset diabetes	3 (50%)	2 (22%)	0.33
Use of pancreatic enzymes	3 (50%)	0 (0%)	0.04
Persisting fluid collections	3 (50%)	2 (22%)	0.33
Health care utilization	n= 10	n= 10	
Number of necrosectomies (endo or surg)	1 (1 – 2)	3 (2 – 6)	0.007
ICU admission after randomization	5 (50%)	1 (10%)	0.14
Days in hospital after randomization	36 days (17 – 74)	45 days (12 – 69)	0.91

Endoscopic necrosectomy

First author (year) [Ref]	Study design	n	Successful treatment, %	Morbidity, %	Mortality, %
Seifert (2000) [6]	Retrospective	3	100	0	0
Seewald (2005) [3]	Retrospective	13	69	31	0
Charnley (2006) [8]	Retrospective	13	92 ¹ (69)	0	15 ²
Papachristou (2007) [10]	Retrospective	53 ³	53	21	0
Voermans (2007) [7]	Retrospective	25	93	7	0
Kang (2008) [11]	Retrospective	1 ⁴	100	0	0
Mathew (2008) [20]	Retrospective	6	100	0	0
Escourrou (2008) [9]	Retrospective	13	100 ⁵ (85)	46	0
Schrover (2008) [12]	Retrospective	8	75	25	13
Gardner (2009) [18]	Retrospective	25	88	32	0
Seifert (2009) [13]	Retrospective	93	80	26	7.5
Gardner (2011) [14]	Retrospective	104	91	14	5.8
Seewald (2012) [21]	Retrospective	80 ⁶	83.8	26	0
Bakker (2012) [19]	Prospective ⁷	10	80	20	10
Present study	Retrospective	57	75	33	11

„Crow feet“: Air within the portal vein system



Endoscopic necrosectomy

Indication is the key

van Santvoort et al. ***Gut*** 2010; 59: 1587

Dual-modality drainage of infected and symptomatic walled-off pancreatic necrosis: long-term clinical outcomes

Andrew S. Ross, MD, Shayan Irani, MD, S. Ian Gan, MD, Flavio Rocha, MD, Justin Siegal, MD, Mehran Fotoohi, MD, Ellen Hauptmann, MD, David Robinson, MD, Robert Crane, MD, Richard Kozarek, MD, Michael Gluck, MD

Take-home Message

- Dual-modality drainage for symptomatic and infected walled-off pancreatic necrosis results in favorable clinical outcomes, complete avoidance of pancreaticocutaneous fistulae, surgical necrosectomy, and major procedure-related adverse events while maintaining single-digit disease-related mortality.

Dual-modality drainage of infected and symptomatic walled-off pancreatic necrosis: long-term clinical outcomes

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n	117
Completed treatment	103
Procedure & disease related mortality	0% 3.4%
Follow-up	749.5 days
Need for surgery for necrosectomy or procedure related complications	0
Drainage removal	103 / 103 (100%)
Development of pancreaticocutaneous fistula	0

„Treat the leak and
the consequences of the leak!“

Richard Kozarek *Chicago 17th of April 2015*

Pancreatic-fluid collections: a randomized controlled trial regarding stent removal after endoscopic transmural drainage



Marianna Arvanitakis, MD, Myriam Delhayce, MD, PhD, Maria Antonietta Bali, MD, Celso Matos, MD, Viviane De Maertelaer, PhD, Olivier Le Moine, MD, PhD, Jacques Devière, MD, PhD

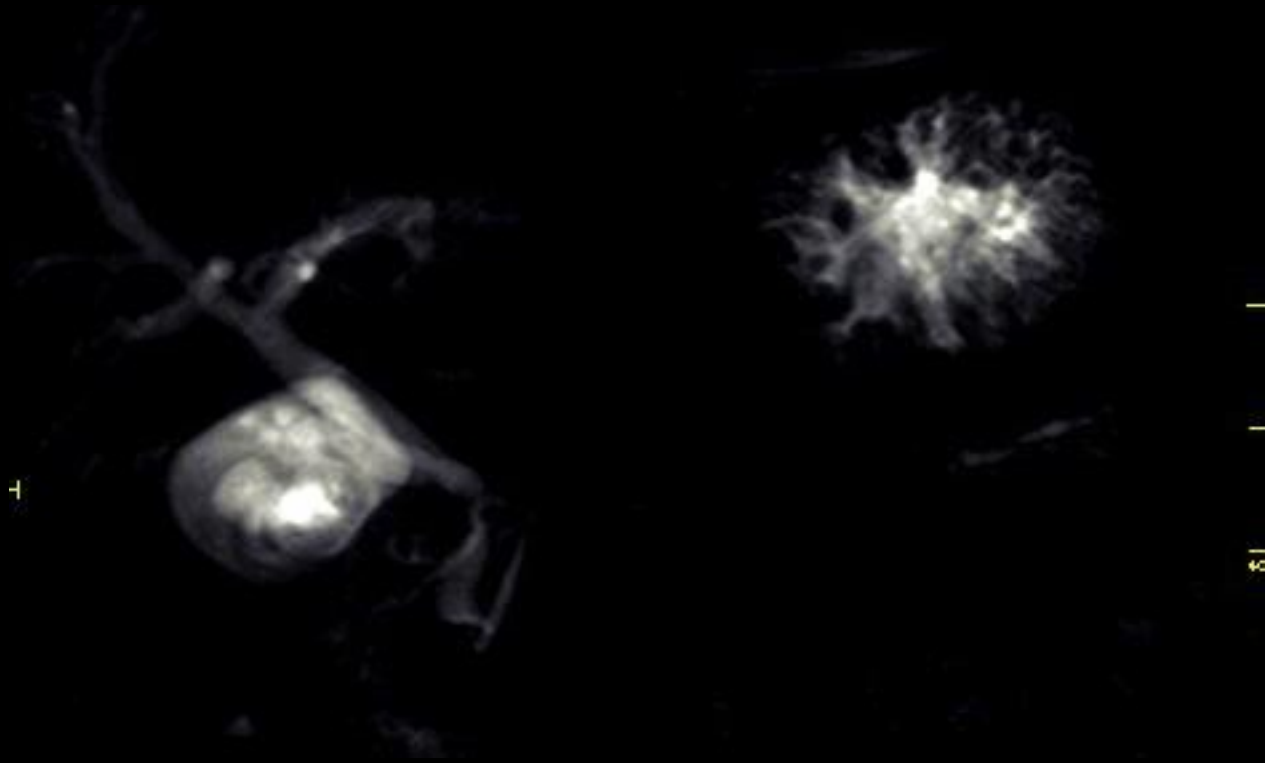
Brussels, Belgium

Stents serve as a guide to keep the fistula patent between the pancreatic duct and the digestive tract

	Group A Stent maintained	Group B Stent removed	p < 0.05	Non-randomized Stent maintained
n=46	15	13		18
Recurrence	0%	5 (38%)	0.013	0%
Median duration of stent	12 months (3-20)	2 months (2-3.5)	0.004	4 months (2-12)

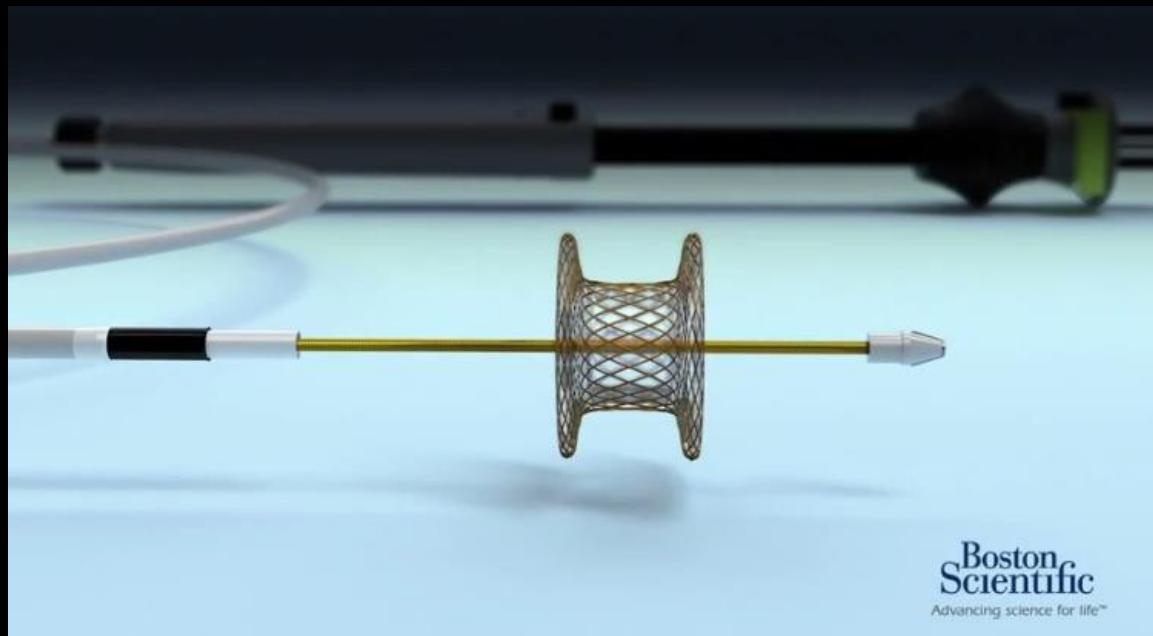
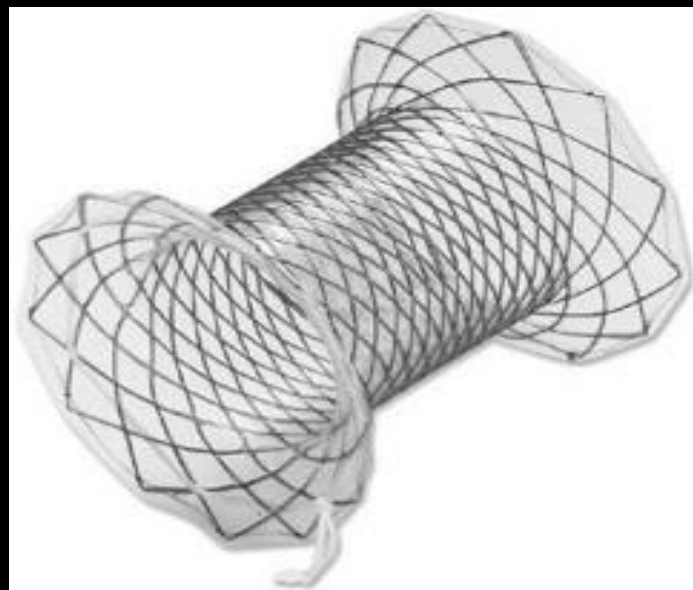
Arvanitakis et al. ***Gastrointest Endosc*** 2007; 65(4): 609

„Disconnected duct syndrome“



- 70 year old patient (necrotizing biliary pancreatitis 2009)
- 4 sessions of endoscopic necrosectomy
- transgastric stent in place since 6 years (CRP 4 g/dl, Lipase 40 U/L)
- Sekretin MRCP: „Disconneted Duct“ (contrast medium into the stomach)

FCSEMS?



Author	N	Type of PFC	Type of SEMS	Technical success	Clinical success	Complications
<i>Itoi et al GIE 2012</i>	15	PC	AXIOS	100%	100%	Migration: 1
Yamamoto et al GIE 2013	9	PC: 5 WOPN: 5	NAGI	100%	77%	2 / 9 (22%) Bleeding: 1 migration: 1
Moon et al GIE 2014	4	PC: 3 WOPN: 1	SPAXUS	100%	100%	0
Chandran et al GIE 2014	47	PC: 39 WOPN: 9	NAGI	98.1%	76.6%	Early:10 (21%) Late:14 (29.7%)
Walter et al Endoscopy 2015	61	PC: 15 WOPN: 46	AXIOS	98%	93%	Migration: 3 Dislodgement: 3 Infection: 4 Perforation: 1
Shah et al CGH 2015	33	PC: 22 WOPN: 11	AXIOS	91%	93%	Pain: 3 Migration: 1 Dislodgement: 1
<i>Dhir et al GIE 2015</i>	47	PC	NAGI	91.4%	87.2%	Fever: 2 (4.6%)
Rinninella et al GIE 2015	93	PC: 37 WOPN: 52 AFC: 4	Hot AXIOS	98.9%	93.5%	5/ 93 (5.4%) Perforation: 1 Massive bleeding : 1 Pneumoperitoneum: 1 Stent dislodgement : 1 Post drainage infection: 1

Author	N	Type of PFC	Type of SEMS	Technical success	Clinical success	Complications
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Endoscopic ultrasound-guided placement of plastic vs. biflanged metal stents for therapy of walled-off necrosis: a retrospective single-center series

	Plastic (n=27)	BFMS (n=43)	p value
Technical success rate	27 / 27 (100%)	43 / 43 (100%)	NS
Clinical success rate	25 / 27 (92.6%)	42 / 43 (97.7%)	NS
Mean procedural time			
EUS drainage	42.6 min	28.8 min	<0.0001
Re-intervention	41.8 min	34.9 min	<0.0001
Complications	5 / 27 (18.5%) Stent migration :1 Mediastinal emphysema : 1 Bleeding :3	3 / 43 (7%) Stent migration : 2 Perforation :1	NS
Mortality	2 / 27 (7.4%)	0 / 43 (0%)	NS
Cost	\$5,352	\$6,274	NS

Fully covered self-expandable metal stents: The “be all and end all” for pancreatic fluid collections?

are needed because the subgroup of patients who will benefit most from this approach has not yet been defined clearly. The placement of FCSEMSs can now be done quickly and easily. However, this should not lull us into complacency. We must not forget that all management issues from the start to the end of treatment must be clearly thought through and addressed.

Conclusions

- Endoscopic necrosectomy is accepted as a minimally invasive treatment option but careful patient selection is crucial and it may not be needed in all cases.
- A step up approach is warranted, taking into account risk-benefit analysis.
- As part of holistic management, in order to prevent recurrence of pancreatic fluid collection, the integrity of pancreatic duct must be assessed and if disrupted, treated.

GastroZentrum
Hirslanden



HIRSLANDEN
KLINIK HIRSLANDEN



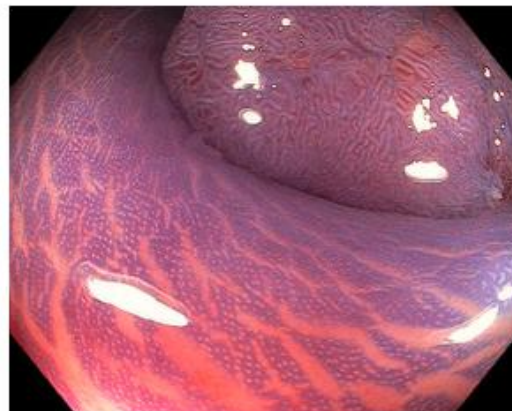
HIRSLANDEN PROFESSIONAL

ENDOSWISS 2015-LIVE
INTERNATIONAL WORKSHOP ON DIAGNOSTIC
AND THERAPEUTIC ENDOSCOPY, ZURICH, 6 JUNE 2015

Pre-meeting: «Endoscopic Master Class», 5 June 2015

Location: Klinik Hirslanden, Zurich
with Live Transmission from Klinik Hirslanden Zurich & Departement of
Gastroenterology, Hepatic-Pancreatology and Digestive Oncology,
Université Libre de Bruxelles, Belgium
International Faculty:
Jacques Bergman (The Netherlands), Jacques Devière (Belgium),
Stefan Groth (Germany), Greg Haber (USA), Aryn Hall (United Kingdom),
Rehan Haidry (United Kingdom), Hirohito Inoue (Japan), Sergey Kashin (Russia),
Satish Rao (USA), Adolfo Renzi (Italy), Yutaka Saito (Japan)

EndoSwiss 2017 Live
June 24th 2017



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Predicting Success of Catheter Drainage in Infected Necrotizing Pancreatitis

Robbert A. Hollemans, MD,† Thomas L. Bollen, MD,‡ Sandra van Brunschot, MD,§ Olaf J. Bakker, MD,*
Usama Ahmed Ali, MD,* Harry van Goor, MD, PhD,¶|| Marja A. Boermeester, MD, PhD,||
Hein G. Gooszen, MD, PhD,# Marc G. Besselink, MD, PhD,|| and Hjalmar C. van Santvoort, MD, PhD*||;
on behalf of the Dutch Pancreatitis Study Group*

- Post hoc analysis of a prospective cohort of 639 patients with necrotizing pancreatitis
- 130 patient undergoing primary catheter drainage for (suspected) infected necrosis
- Prediction of success of catheter drainage
 - Survival without necrosectomy: 45 / 130 (35%)

