2022 SCSG GI SYMPOSIUM

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Management of Peripancreatic Fluid Collections

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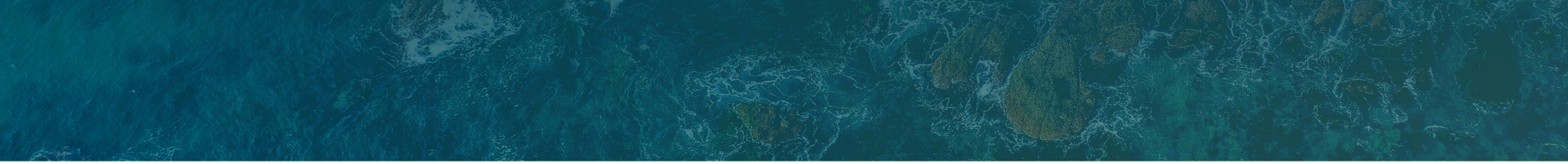
Disclosures

- None



How Do We Resuscitate?

Waterfall Trial

- DDW 2022 Presentation
- de Madaria et al
- Interim analysis
- Multicenter RCT (18 centers)
- Aggressive vs Moderate goal directed fluid resuscitation for acute pancreatitis

Waterfall Trial

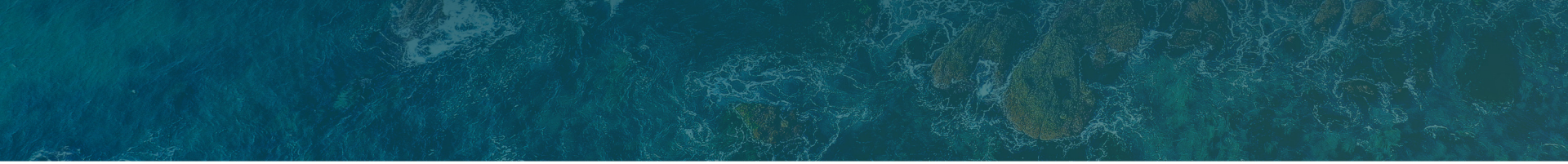
- Randomized within 8h of AP diagnosis
  - LR 20ml/kg bolus over 2h->3ml/kg
  - LR 10ml/kg bolus over 2h in hypovolemia or no bolus in normovolemia ->1.5ml/kh
- Primary endpoint moderate and severe pancreatitis

Waterfall

- N=249 included
- Aggressive arm: median 7.7L LR
- Moderate 5.4L LR
- Study halted due to differences in safety outcomes without difference in efficacy

Waterfall

- Aggressive arm
  - had greater fluid overload 20.5% vs 7.1% $p<0.01$
  - Not associated with improved outcomes
  - Trend toward more persistent organ failure & necrosis
  - LOS greater in aggressive group 6 vs 5 days $p=0.02$



When Do We Drain?

POINTER Trial

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Immediate versus Postponed Intervention for Infected Necrotizing Pancreatitis

L. Boxhoorn, S.M. van Dijk, J. van Grinsven, R.C. Verdonk, M.A. Boermeester, T.L. Bollen, S.A.W. Bouwense, M.J. Bruno, V.C. Cappendijk, C.H.C. Dejong, P. van Duijvendijk, C.H.J. van Eijck, P. Fockens, M.F.G. Francken, H. van Goor, M. Hadithi, N.D.L. Hallensleben, J.W. Haveman, M.A.J.M. Jacobs, J.M. Jansen, M.P.M. Kop, K.P. van Lienden, E.R. Manusama, J.S.D. Mieog, I.Q. Molenaar, V.B. Nieuwenhuijs, A.C. Poen, J.-W. Poley, M. van de Poll, R. Quispel, T.E.H. Römkens, M.P. Schwartz, T.C. Seerden, M.W.J. Stommel, J.W.A. Straathof, H.C. Timmerhuis, N.G. Venneman, R.P. Voermans, W. van de Vrie, B.J. Witteman, M.G.W. Dijkgraaf, H.C. van Santvoort, and M.G. Besselink, for the Dutch Pancreatitis Study Group*

POINTER Trial

- Comparison of immediate vs delayed drainage of WON
- Multicenter RCT, Aug 2015-Oct 2019
- N=104
- Dutch Pancreatitis Group

POINTER

- Immediate drainage: within 24h of randomization once infected necrosis diagnosed
  - occurred at median 24 days
- Postponed drainage: Drainage once encapsulation/WON occurs
  - median 29 days

POINTER

Table 2. Primary and Secondary End Points for the Intention-to-Treat Analysis.

End Point	Immediate Catheter Drainage (N=55)	Postponed Catheter Drainage (N=49)	Relative Risk or Mean Difference (95% CI)
Primary end point			
Comprehensive Complication Index score — mean (95% CI)*	57 (50 to 65)	58 (50 to 67)	−1 (−12 to 10)†
Secondary end points — no. (%)‡			
Death within 6 months	7 (13)	5 (10)	1.25 (0.42 to 3.68)
New-onset organ failure§	14 (25)	11 (22)	1.13 (0.57 to 2.26)
Pulmonary	5 (9)	8 (16)	0.56 (0.20 to 1.59)
Cardiovascular	11 (20)	9 (18)	1.09 (0.49 to 2.40)
Renal	3 (5)	4 (8)	0.67 (0.16 to 2.84)
New-onset multiple organ failure	4 (7)	8 (16)	0.45 (0.14 to 1.39)
Bleeding	8 (15)	10 (20)	0.71 (0.31 to 1.66)
Perforation of a visceral organ or enterocutaneous fistula	5 (9)	4 (8)	1.11 (0.32 to 3.91)
Pancreaticocutaneous fistula	6 (11)	4 (8)	1.34 (0.40 to 4.46)
Incisional hernia	0	0	—
Wound infection	0	1 (2)	—
Exocrine insufficiency			
Use of enzymes	20 (36)	19 (39)	0.94 (0.57 to 1.54)
Fecal elastase <200 mg/g¶	25 (48)	14 (32)	1.51 (0.90 to 2.53)
Endocrine insufficiency	11 (20)	10 (20)	0.98 (0.46 to 2.11)
Clavien–Dindo ≥III complication‖	42 (76)	40 (82)	0.94 (0.77 to 1.14)

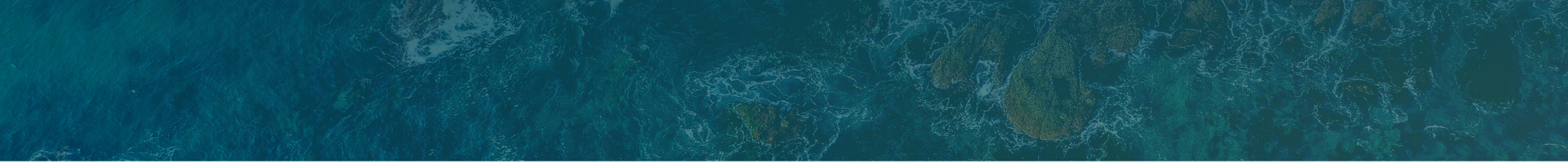
POINTER

Table 3. Secondary End Points Related to Health Care Utilization.*

End Point	Immediate Catheter Drainage (N=55)	Postponed Catheter Drainage (N=49)	Relative Risk (95% CI)	Mean Difference (95% CI)
Catheter drainage — no. (%)	55 (100)	30 (61)	1.63 (1.31 to 2.04)	
Necrosectomy — no. (%)	28 (51)	11 (22)	2.27 (1.27 to 4.06)	
Mean total surgical, endoscopic, and radiologic interventions for infected necrosis (95% CI) — no.	4.4 (3.6 to 5.3)	2.6 (1.8 to 3.6)		1.8 (0.6 to 3.0)
Mean total catheter drainage procedures (95% CI) — no.	3.1 (2.6 to 3.8)	1.9 (1.3 to 2.8)		1.2 (0.3 to 2.2)
No. of catheter drainage procedures — no. of patients (%)				
0	0	19 (39)		
1	20 (36)	15 (31)		
2	8 (15)	2 (4)		
≥3	27 (49)	13 (27)		
Mean total necrosectomies (95% CI) — no.	1.3 (0.8 to 1.9)	0.7 (0.3 to 1.3)		0.6 (−0.1 to 1.2)
No. of necrosectomies — no. of patients (%)				
0	27 (49)	38 (78)		
1	13 (24)	4 (8)		
2	3 (5)	1 (2)		
≥3	12 (22)	6 (12)		
Mean length of stay in ICU (95% CI) — days	12 (6 to 23)	12 (6 to 23)		0 (−11 to 11)
Mean length of stay in hospital (95% CI) — days	59 (50 to 70)	51 (40 to 65)		8 (−9 to 23)
Mean total inpatient hospital costs (95% CI)†				
€	52,914 (43,783 to 67,860)	46,747 (35,194 to 64,642)		6,166 (−12,968 to 23,361)
$	67,321 (55,704 to 86,336)	59,475 (44,776 to 82,242)		7,845 (−16,499 to 29,721)

POINTER

- 19 patients (39%) were treated conservatively with antibiotics and did not require drainage
- Immediate drainage did not clearly result in worse outcomes
- Selective early drainage can be done in deteriorating/critically ill patients not responding to medical management



How Do We Drain?

Prometheus Study

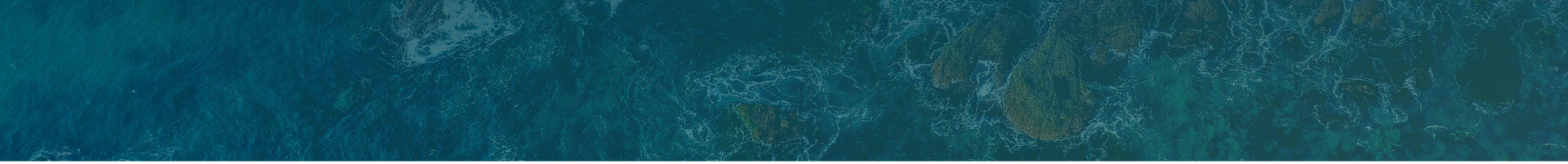
- Velasquez Rodriguez et al, DDW 2022
- Plastic pigtail vs LAMS EUS drainage of **WON**
- Multicenter RCT, Spain
- June 2017 - October 2019
- Primary endpoint: short-term (4-weeks) clinical success determined by the reduction of the pancreatic collection (<50% or <5cm)
- 12mo follow up

Prometheus Study

- 61 patients with WON
  - 30 patients in LAMS group and 31 in DPS group.
- Short-term clinical success was superior in LAMS cohort, without significant difference (63% LAMS vs 45% DPS, p=0.154).
- Procedure duration (38 vs 53min, p<0.005) was significantly shorter in LAMS cohort.

Prometheus

- more additional and rescue procedures were needed in DPS cohort, it was non-significant.
- Length of hospital stay and stent-related adverse events (39%LAMS vs 45%DPS, $p<0.641$) were similar



Is LAMS Safe?

Lumen-apposing metal stents for drainage of pancreatic fluid collections: does timing of removal matter?

Manu Nayar [1], John S Leeds [1], UK & Ireland LAMS Colloborative, Kofi Oppong [2]

LAMS Adverse Effects

- Retrospective, 18 centers in UK & Ireland
- N=1018 LAMS drainage of pancreatic fluid collections
- 1.1% immediate bleeding, 1.9% delayed bleeding (>24h)
- Adverse events not associated with stent dwell time
- Buried stent in 4.7%

What About that Disconnected Pancreatic Duct?

OPEN ACCESS

Impact of disconnected pancreatic duct on recurrence of fluid collections and new-onset diabetes: do we finally have an answer?

Jahangeer Basha, Sundeep Lakhtakia, Zaheer Nabi, Partha Pal, Radhika Chavan, Rupjyoti Talukdar, Mohan Ramchandani, Rajesh Gupta, Rakesh Kalapala, G Venkat Rao, D Nageshwar Reddy

Disconnected pancreatic duct

- ¾ of patients in a large retrospective study
- The presence of DPD was a significant risk factor for the recurrence of fluid collections as well as new-onset DM.
- Incidence of recurrent fluid collections and the requirement of reintervention was low (<10%).

Discconected Pancreatic Duct

- N=274 WON, Retrospective, single center
- Drained with Nagi Stent (Jan 2013-June 2017)
- MRCP and ERCP performed in nearly all patients
- DPD 73.8%

Disconnected Pancreatic Duct

- Recurrent PFC developed in 34 out of 256 subjects (13.2%) at a median follow-up of 5months (range: 1–19).
- Majority (97%) of the cases who developed recurrent PFC had DPD
- Reinterventions were required in 17 (6.6%) cases with symptomatic recurrences

Disconnected Pancreatic Duct

- The occurrence of DM was significantly higher in those with DPD (31.4% vs 16.6%, p=0.036,OR 2.29,
- Conclusion plastic stents probably not routinely necessary after removal of LAMS

RCT on Disconnected Duct

- Reddy et al, Hyderabad
- *Endoscopy* 2022
- N=104 DPD after metal stent drainage of WON
- Sep 2017 – March 2020
- DPD confirmed on MRCP and ERCP
- Nagi stent for initial drainage
- Randomized to 1-2 7Fr stents vs no stent

RCT on Disconnected Duct

- At 3mo, 6 patients had recurrent PFCs
  - 3 in each group
  - No difference at 6, 12mo either
  - No difference in need for intervention

And the Gallbladder?

Timing of Cholecystectomy in Necrosis

- Dutch Pancreatitis Group; Hallensleben et al, *Gut*
- Optimal timing of cholecystectomy after necrotizing biliary pancreatitis
- Post hoc analysis of multicenter, prospective cohorts from PANTER/PYTHON/TENSION trials

Timing of Cholecystectomy in Necrosis

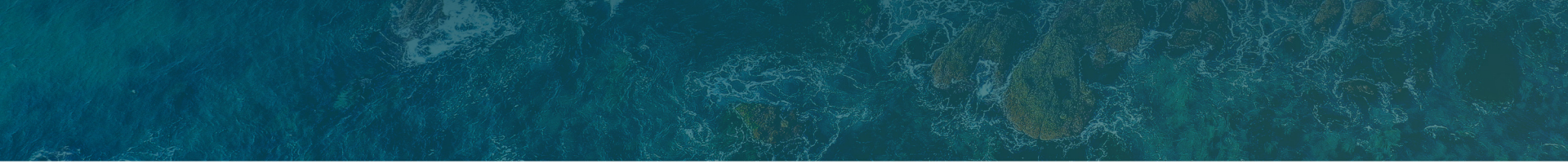
- 2005-2014
- N=248 necrotizing biliary pancreatitis
  - 191 (77%) underwent cholecystectomy
  - Median 103 days after discharge

Timing of Cholecystectomy in Necrosis

- Risk of recurrent pancreatitis was lower when cholecystectomy performed within 8 weeks of discharge
  - Risk ratio 0.14 (0.02-0.99, p=0.02)
- Risk of recurrent overall biliary event was lower when cholecystectomy was performed within 10 weeks
  - -Risk ratio 0.49 (0.27-0.90, p=0.02)

Timing of Cholecystectomy in Necrosis

- Risk of complications of cholecystectomy including infected necrosis did not decrease significantly over time
  - Biloma, abscess, infected necrosis, bleeding, biliary injury, adhesions, gallbladder spill, conversion to open, subtotal, drain placement
- Endoscopic sphincterotomy did not decrease the rates of biliary events
  - ES performed in 117 (47%) of 248 patients



Can I Get Some Help?

Advances in Technology

- Axios long saddle – 15mm long, can drain collections >10mm away
- Hot Spaxus – comparable outcomes to Hot Axios
- 6mm and 8mm Hot Axios – for pseudocysts
- EndoRotor – appears efficacious with acceptable side effect profile based on small studies

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