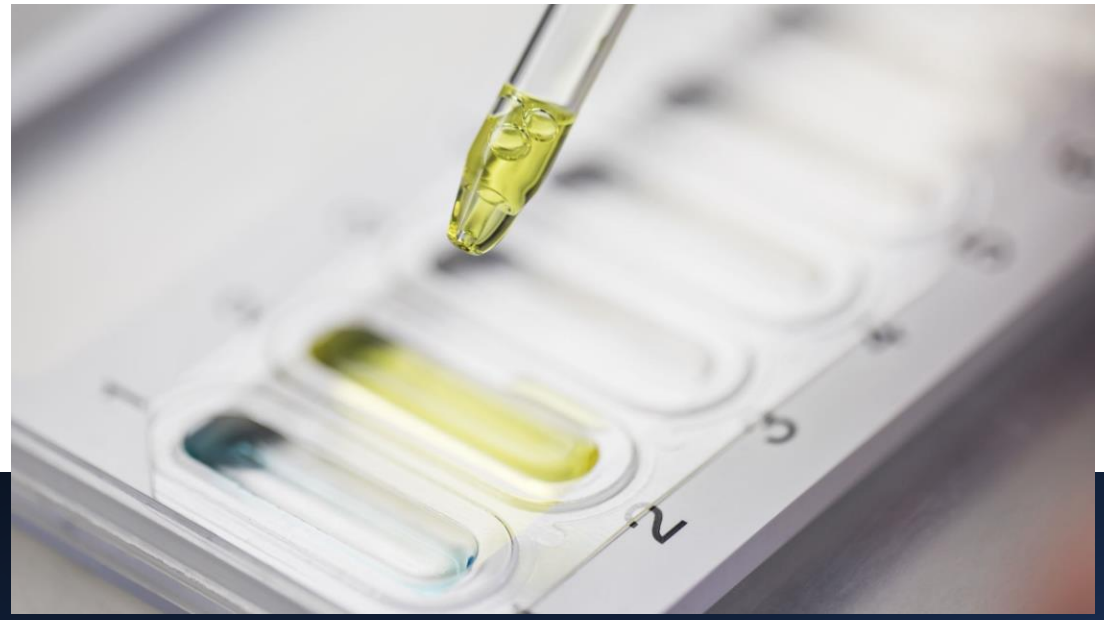
Managing Acute Pancreatitis



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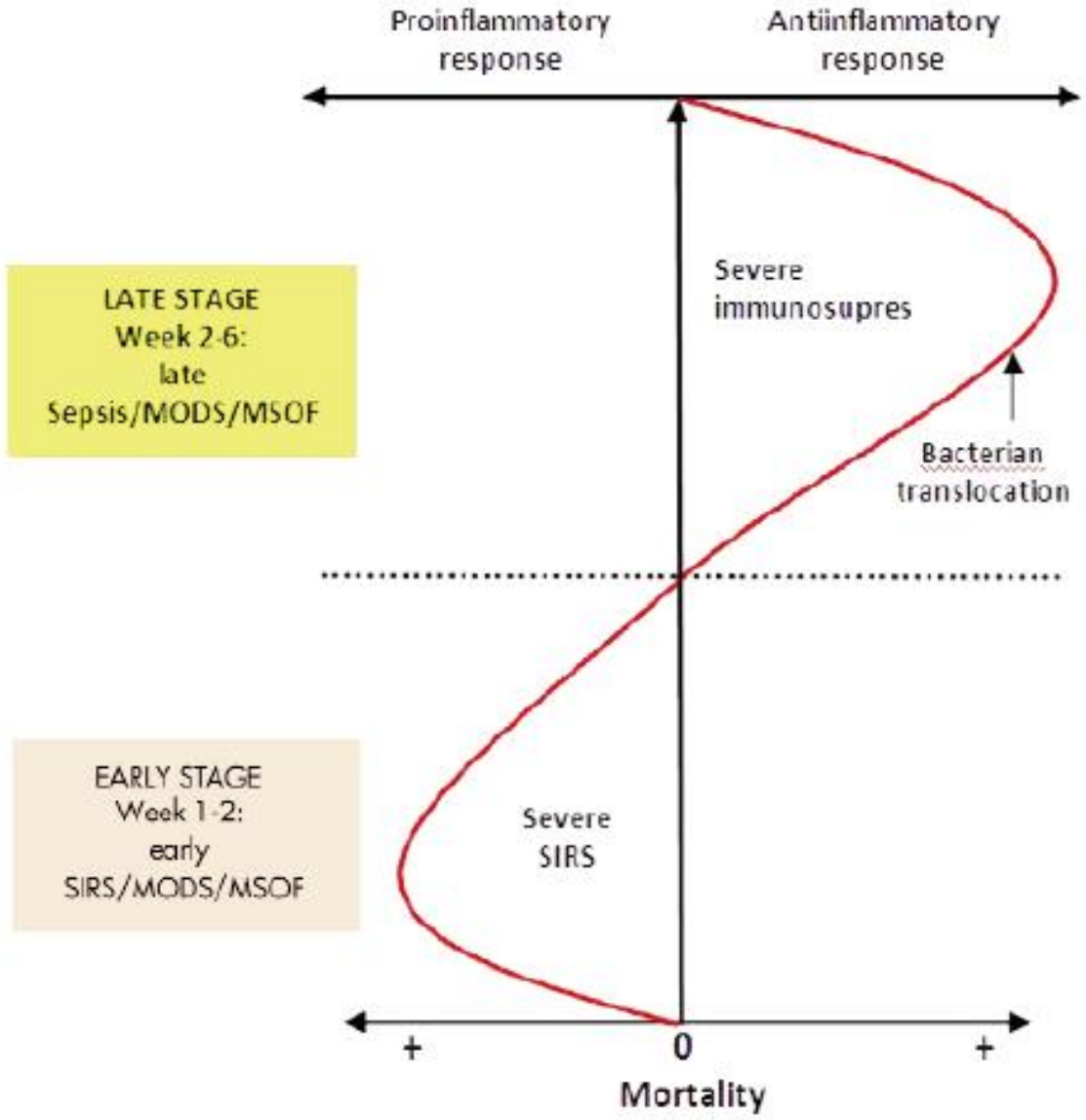
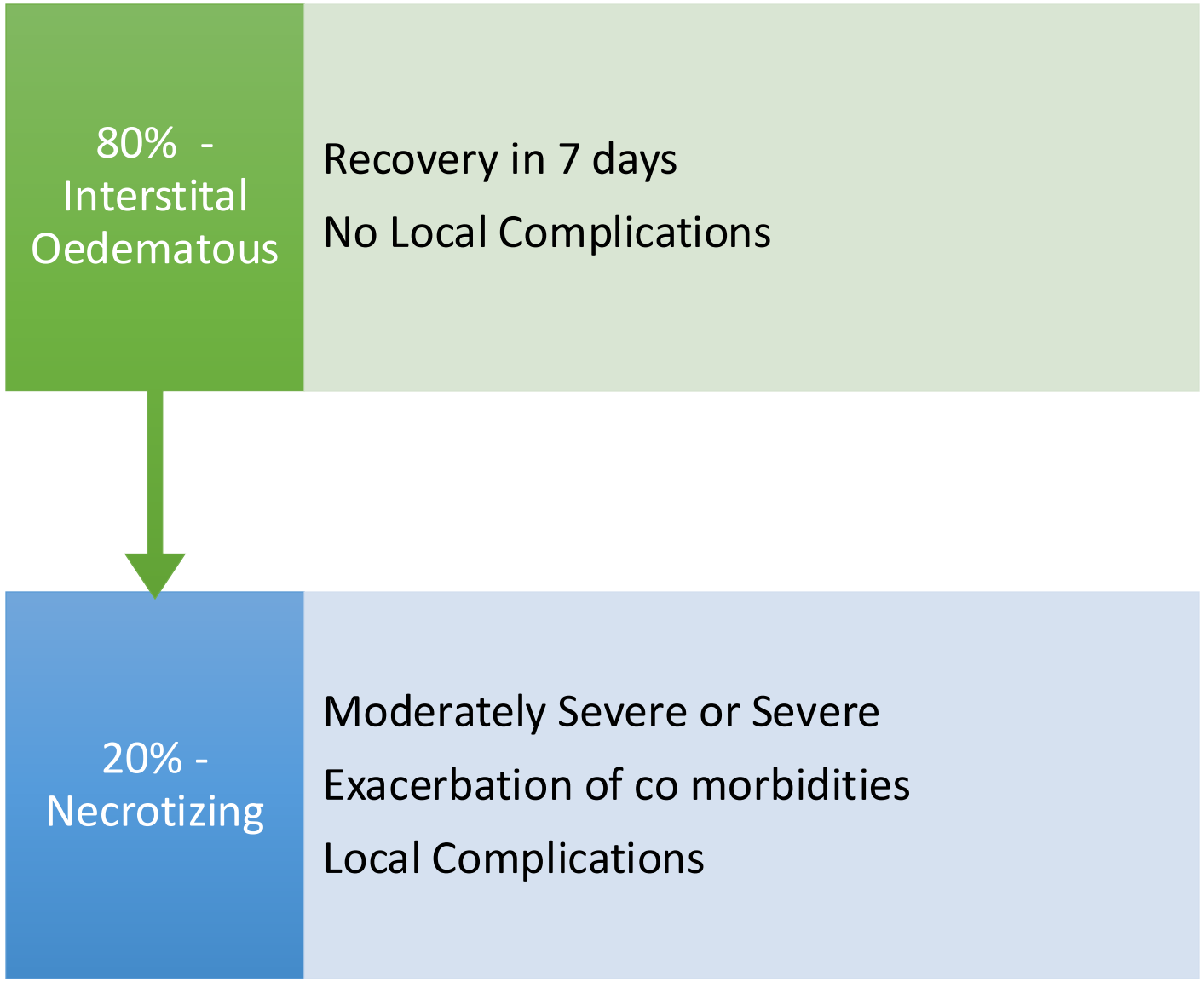
Introduction

- Phases & Grades of AP
- WATERFALL Trial
- Dealing with local complications
- Strategies for dealing with Walled of Necrosis
- Other important Landmark trials

Phases of acute pancreatitis



Acute Pancreatitis

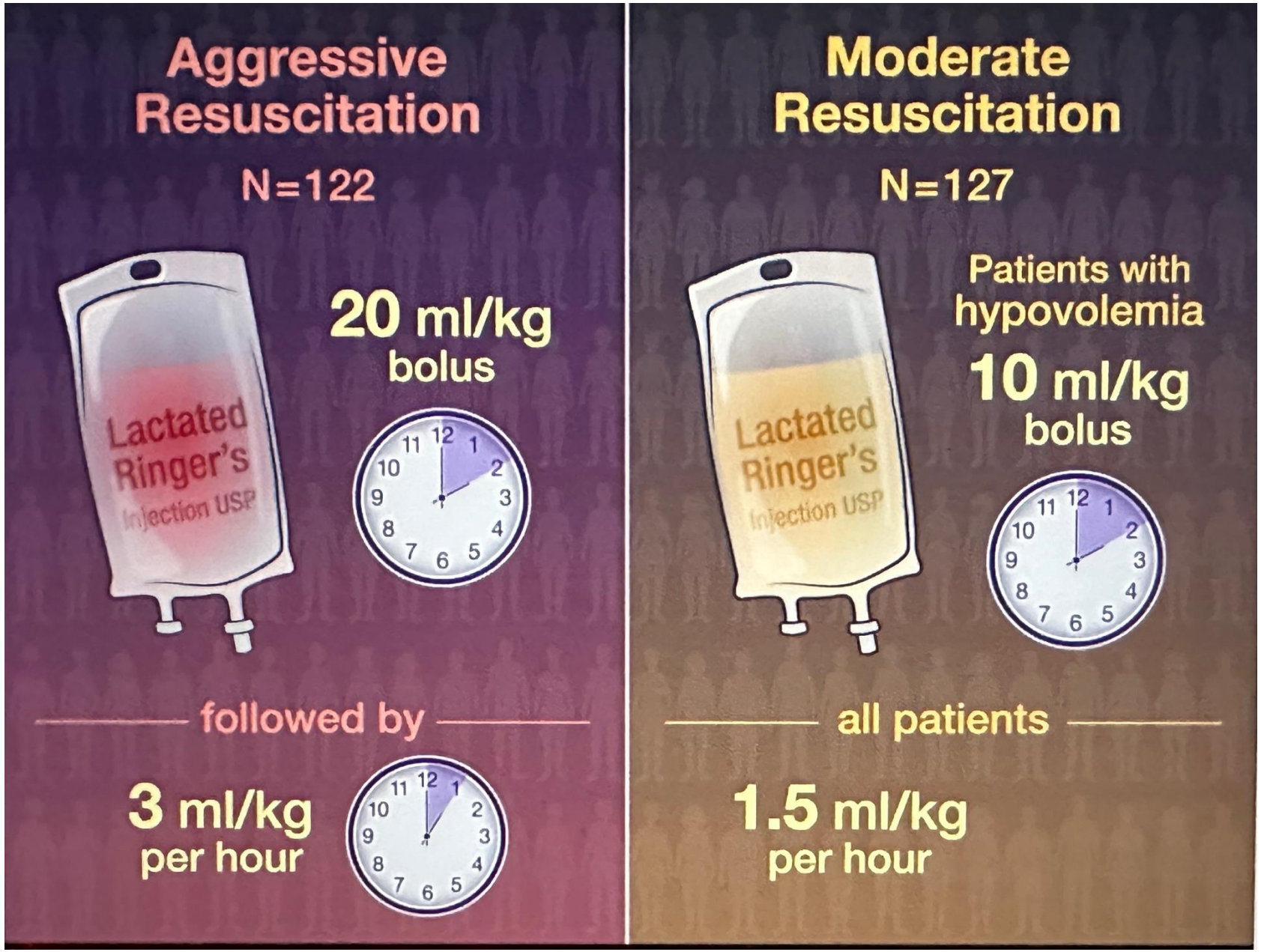


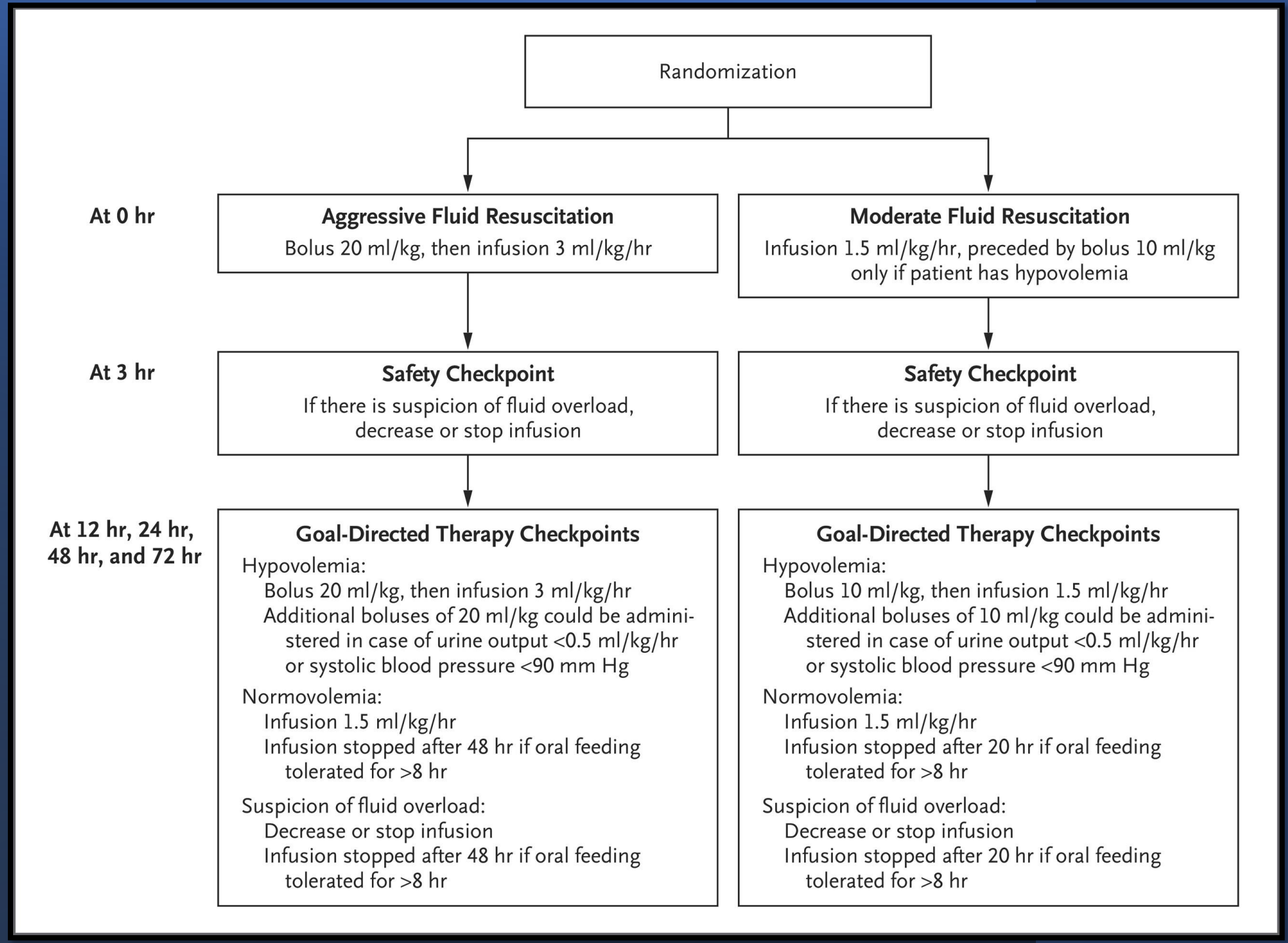
Severity of AP

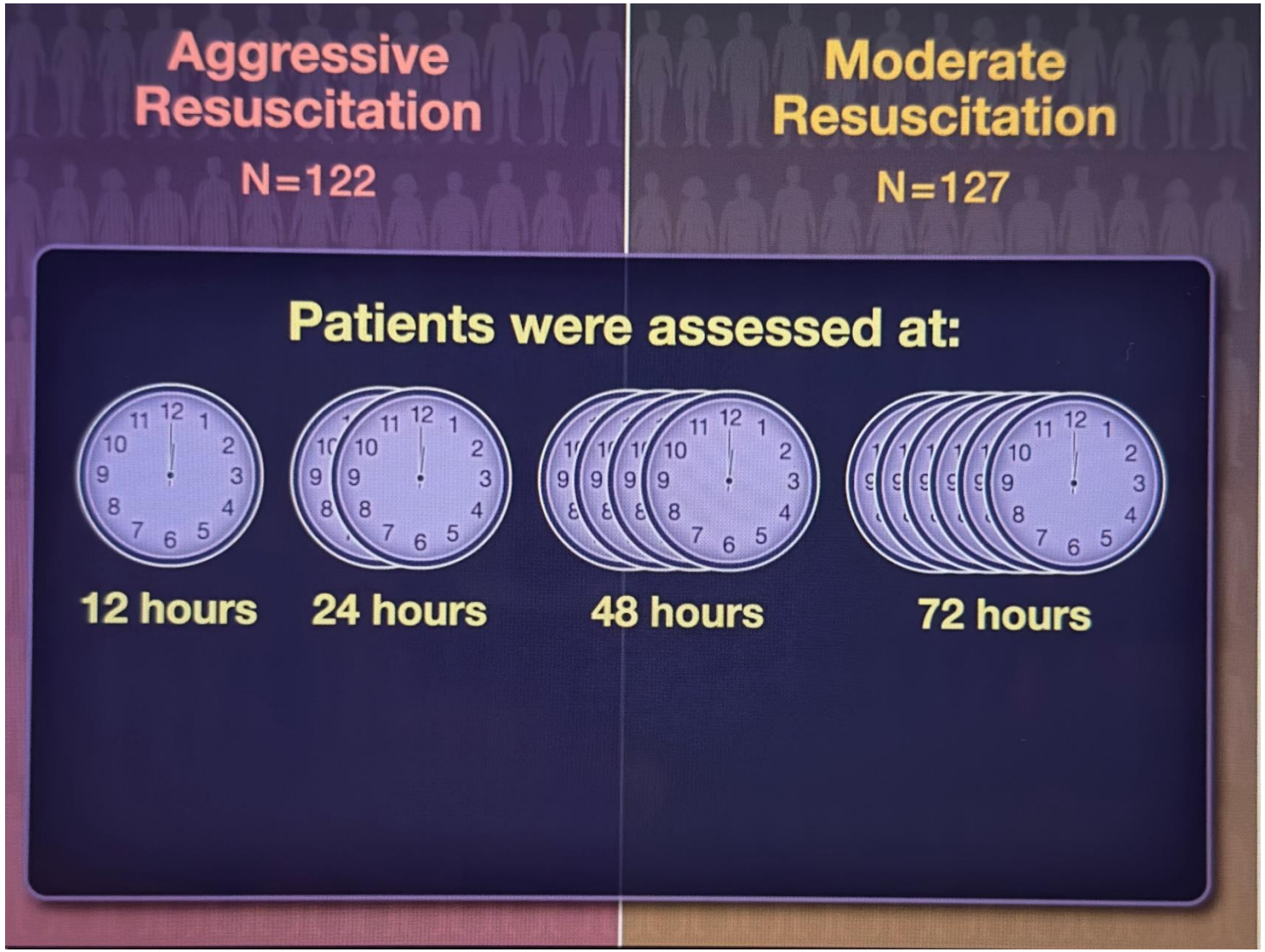
- **Mild AP** – no organ failure

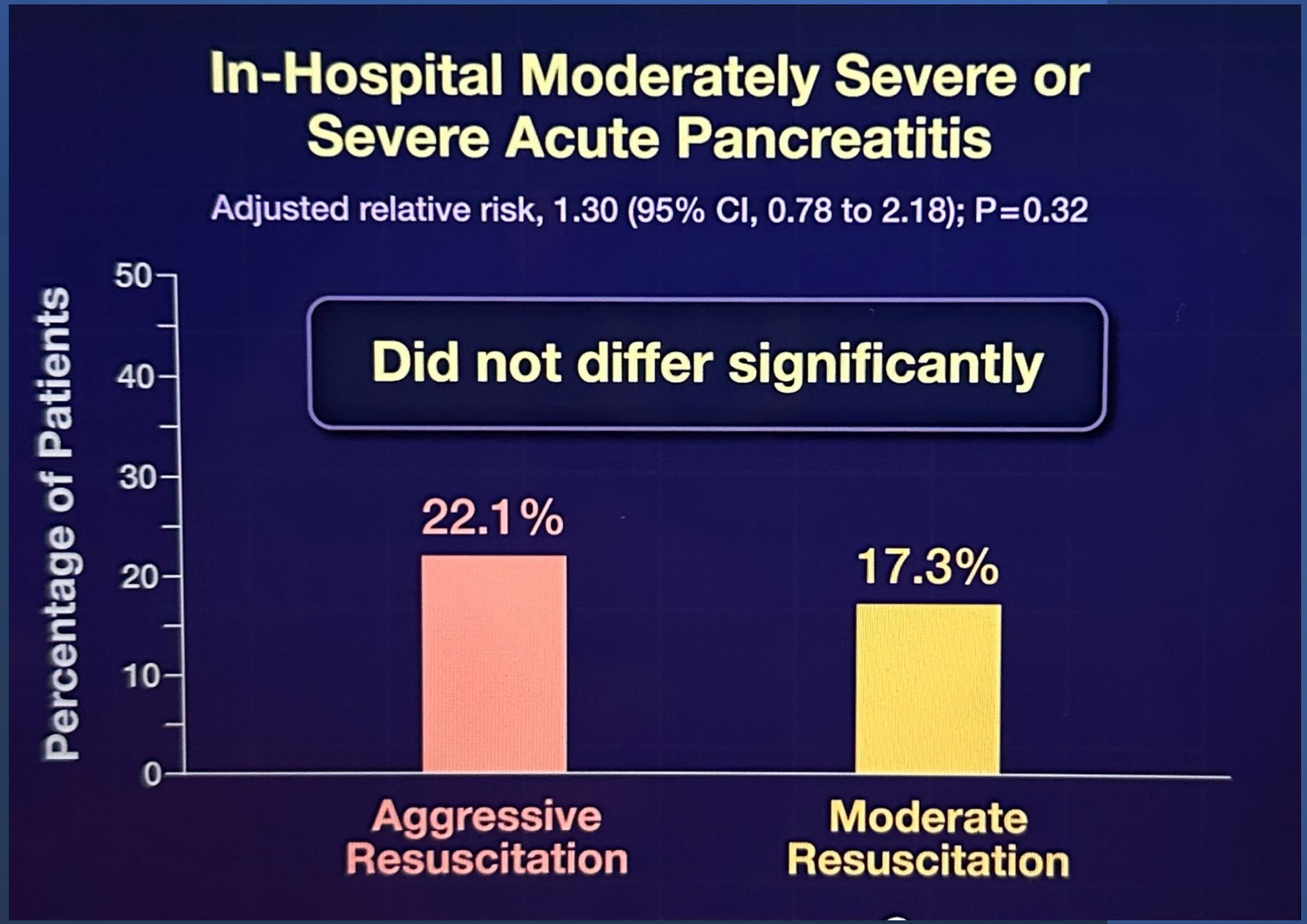
- **Moderately severe AP**
  - transient organ failure
  - local complications or
  - exacerbation of co-morbid disease.
- **Severe acute pancreatitis**
  - organ failure >48hrs
  - Often have one or more local complications.
  - Increased risk of death if within the first few days (50%).
  - Mortality is extremely high if infected necrosis develops.

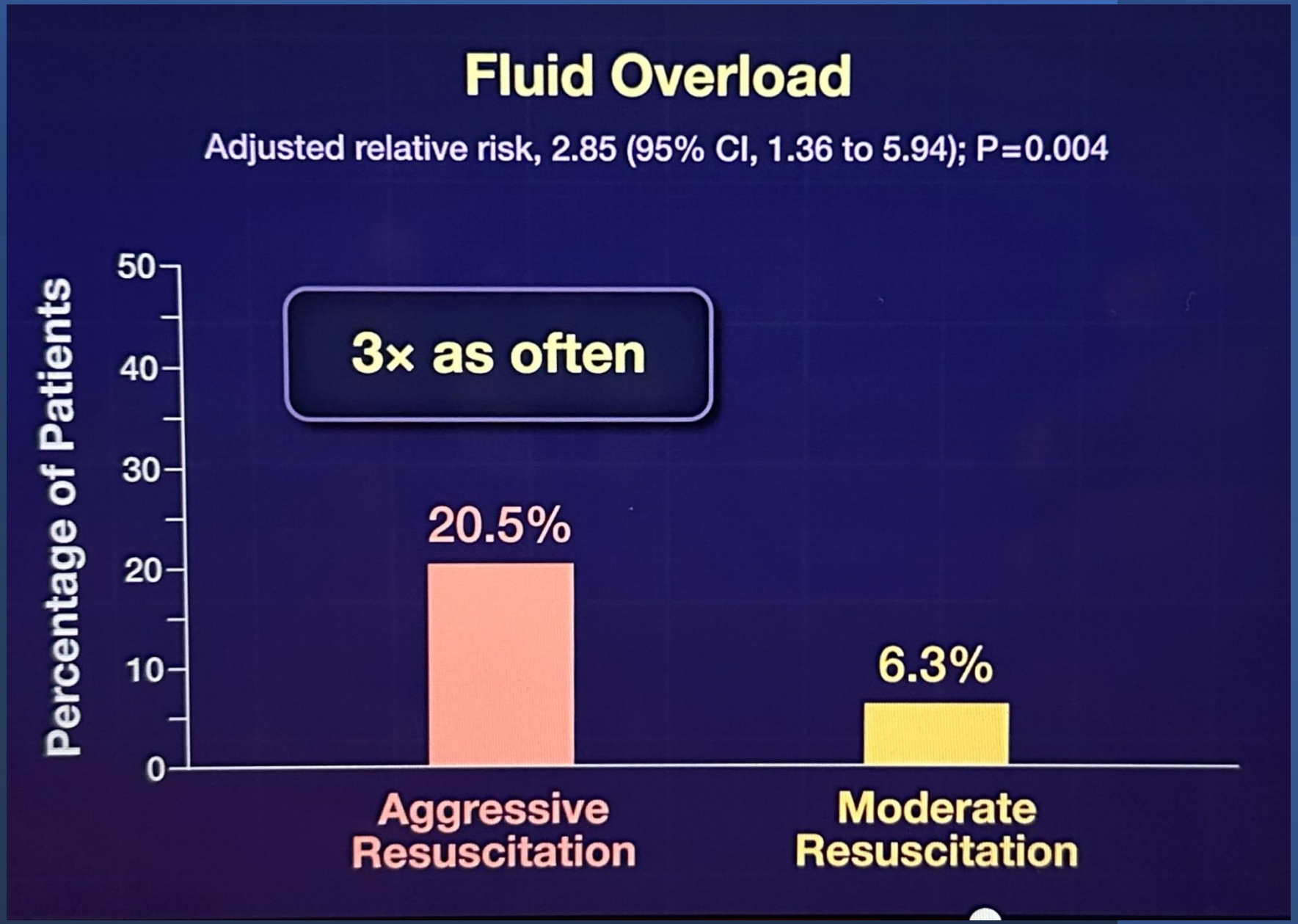
Waterfall Trial

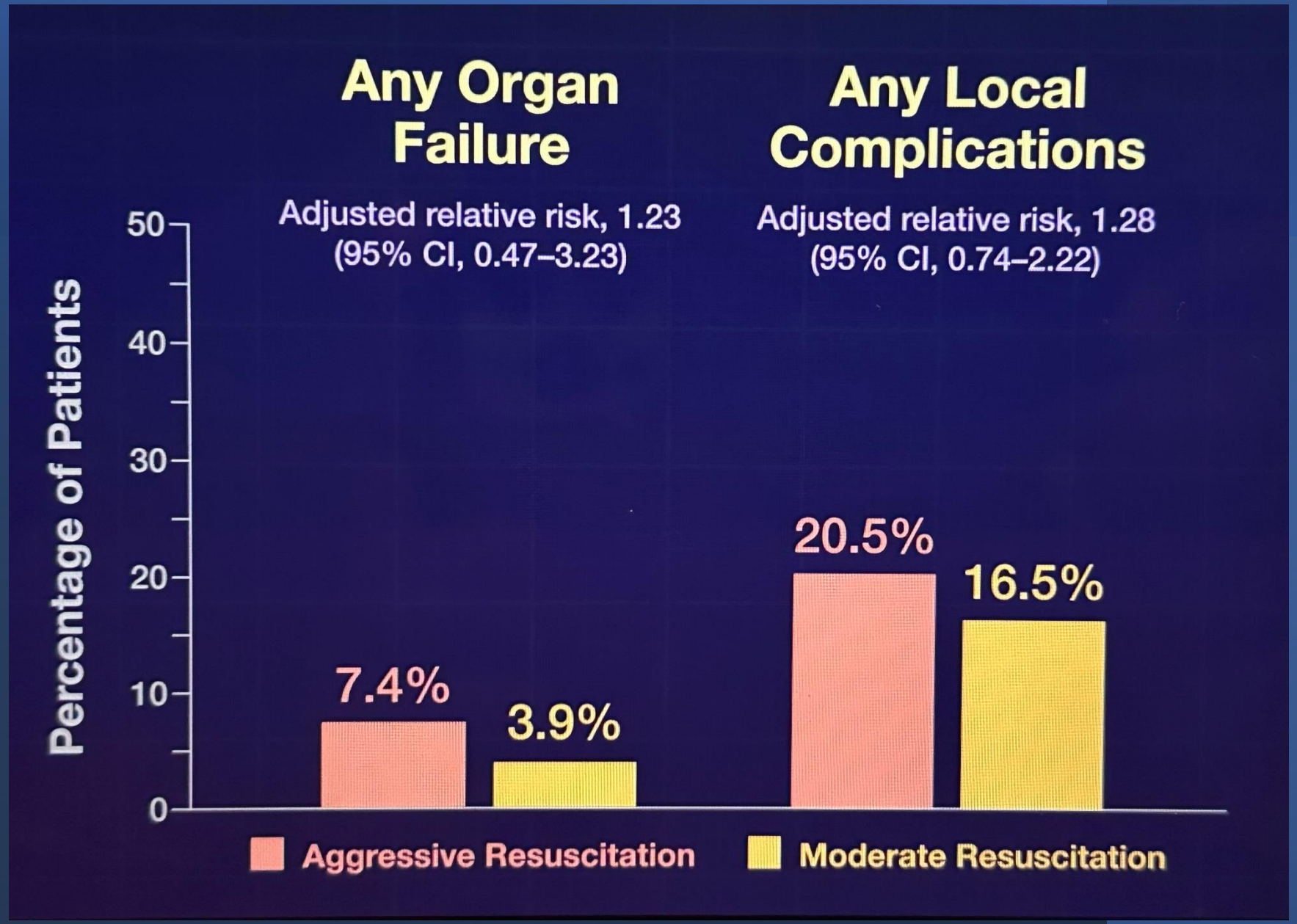


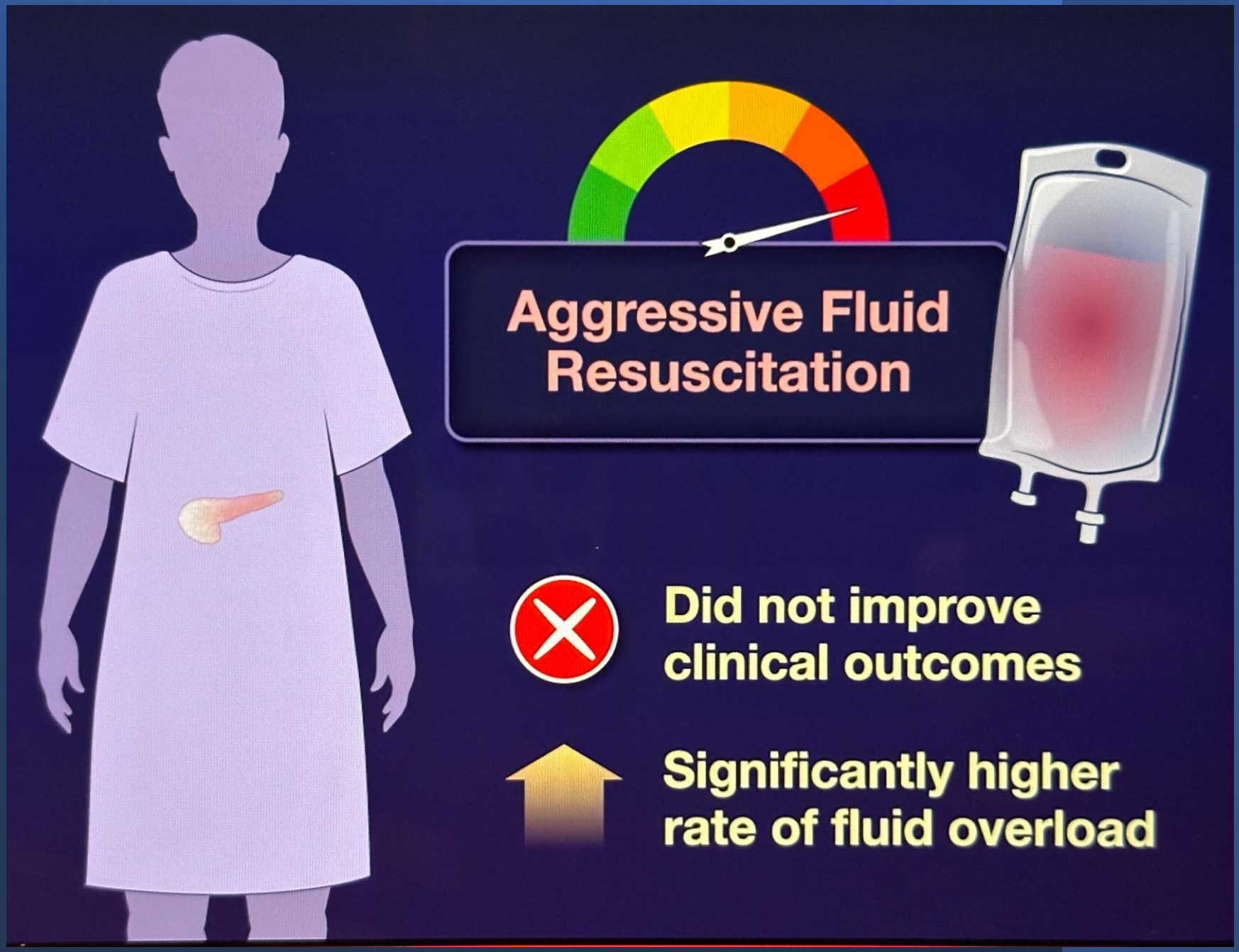

Randomization
At 0 hr
Aggressive Fluid Resuscitation
Bolus 20 ml/kg, then infusion 3 ml/kg/hr
Moderate Fluid Resuscitation
Infusion 1.5 ml/kg/hr, preceded by bolus 10 ml/kg only if patient has hypovolemia
At 3 hr
Safety Checkpoint
If there is suspicion of fluid overload, decrease or stop infusion
Safety Checkpoint
If there is suspicion of fluid overload, decrease or stop infusion
At 12 hr, 24 hr, 48 hr, and 72 hr
Goal-Directed Therapy Checkpoints
Hypovolemia:
Bolus 20 ml/kg, then infusion 3 ml/kg/hr
Additional boluses of 20 ml/kg could be administered in case of urine output <0.5 ml/kg/hr or systolic blood pressure <90 mm Hg
Normovolemia:
Infusion 1.5 ml/kg/hr
Infusion stopped after 48 hr if oral feeding tolerated for >8 hr
Suspicion of fluid overload:
Decrease or stop infusion
Infusion stopped after 48 hr if oral feeding tolerated for >8 hr
Goal-Directed Therapy Checkpoints
Hypovolemia:
Bolus 10 ml/kg, then infusion 1.5 ml/kg/hr
Additional boluses of 10 ml/kg could be administered in case of urine output <0.5 ml/kg/hr or systolic blood pressure <90 mm Hg
Normovolemia:
Infusion 1.5 ml/kg/hr
Infusion stopped after 20 hr if oral feeding tolerated for >8 hr
Suspicion of fluid overload:
Decrease or stop infusion
Infusion stopped after 20 hr if oral feeding tolerated for >8 hr


Aggressive Resuscitation
N=122
Moderate Resuscitation
N=127
Patients were assessed at:
12 hours
24 hours
48 hours
72 hours

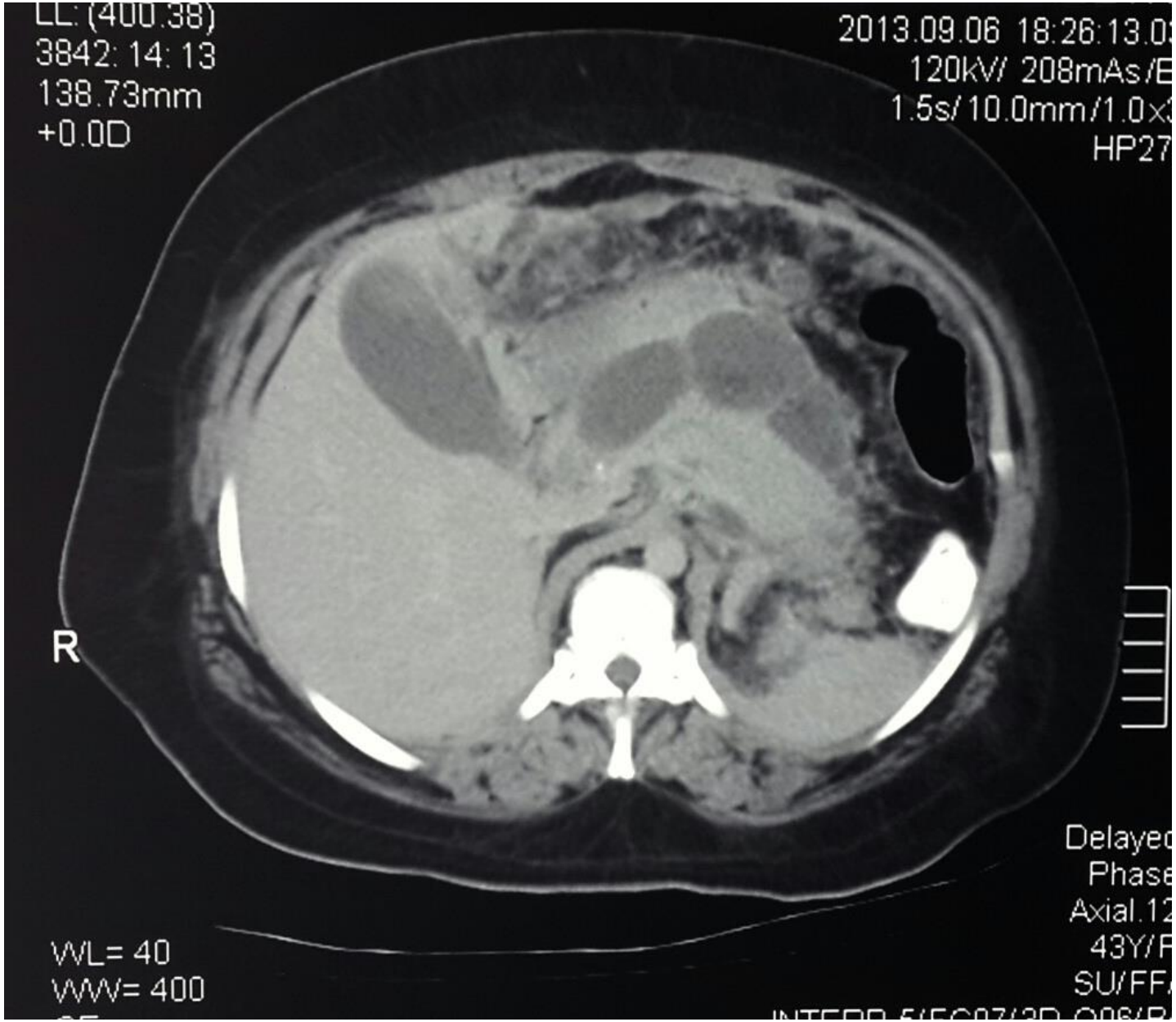

In-Hospital Moderately Severe or Severe Acute Pancreatitis
Adjusted relative risk, 1.30 (95% CI, 0.78 to 2.18); P=0.32
Percentage of Patients
50
40
30
20
10
0
Did not differ significantly
22.1%
17.3%
Aggressive Resuscitation
Moderate Resuscitation


Fluid Overload
Adjusted relative risk, 2.85 (95% CI, 1.36 to 5.94); P=0.004
Percentage of Patients
50
40
30
20
10
0
3× as often
20.5%
6.3%
Aggressive Resuscitation
Moderate Resuscitation

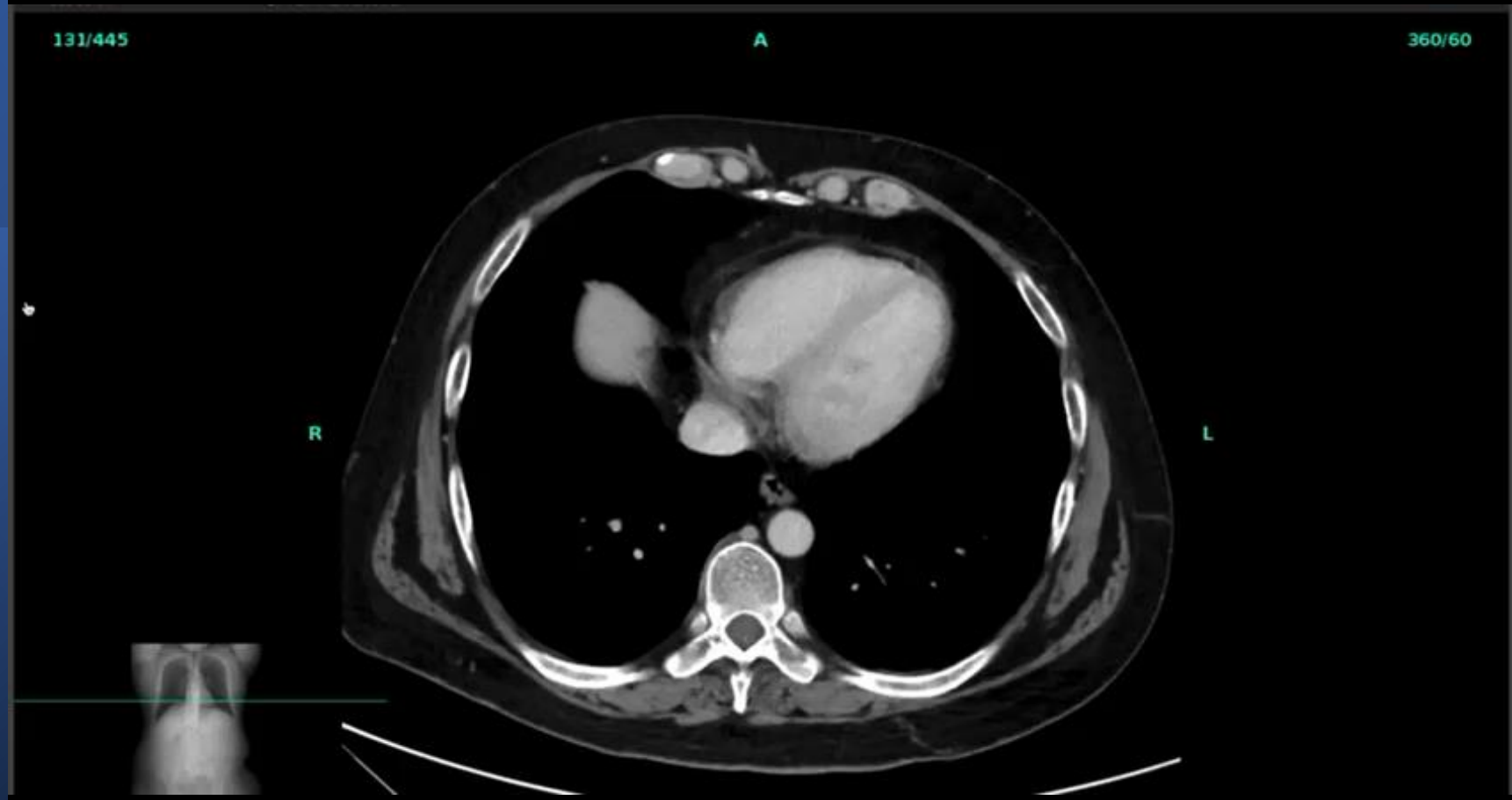

Any Organ Failure
Adjusted relative risk, 1.23
(95% CI, 0.47–3.23)
Any Local Complications
Adjusted relative risk, 1.28
(95% CI, 0.74–2.22)
Percentage of Patients
50
40
30
20
10
0
7.4%
3.9%
20.5%
16.5%
Aggressive Resuscitation
Moderate Resuscitation


Aggressive Fluid Resuscitation
Did not improve clinical outcomes
Significantly higher rate of fluid overload

Peripancreatic fluid collection < 4weeks



Pseudocyst > 4 weeks

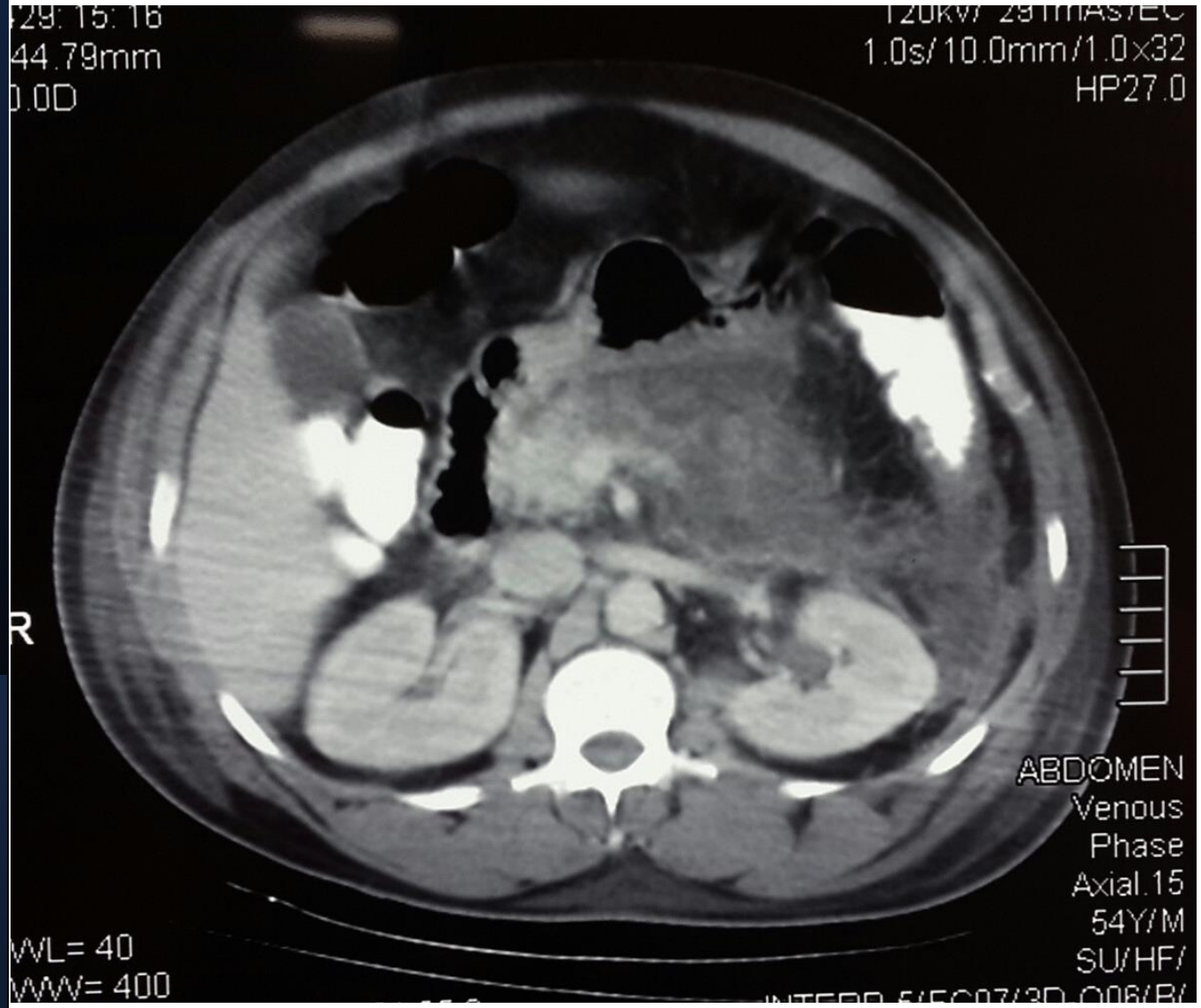


Management of Pseudocysts

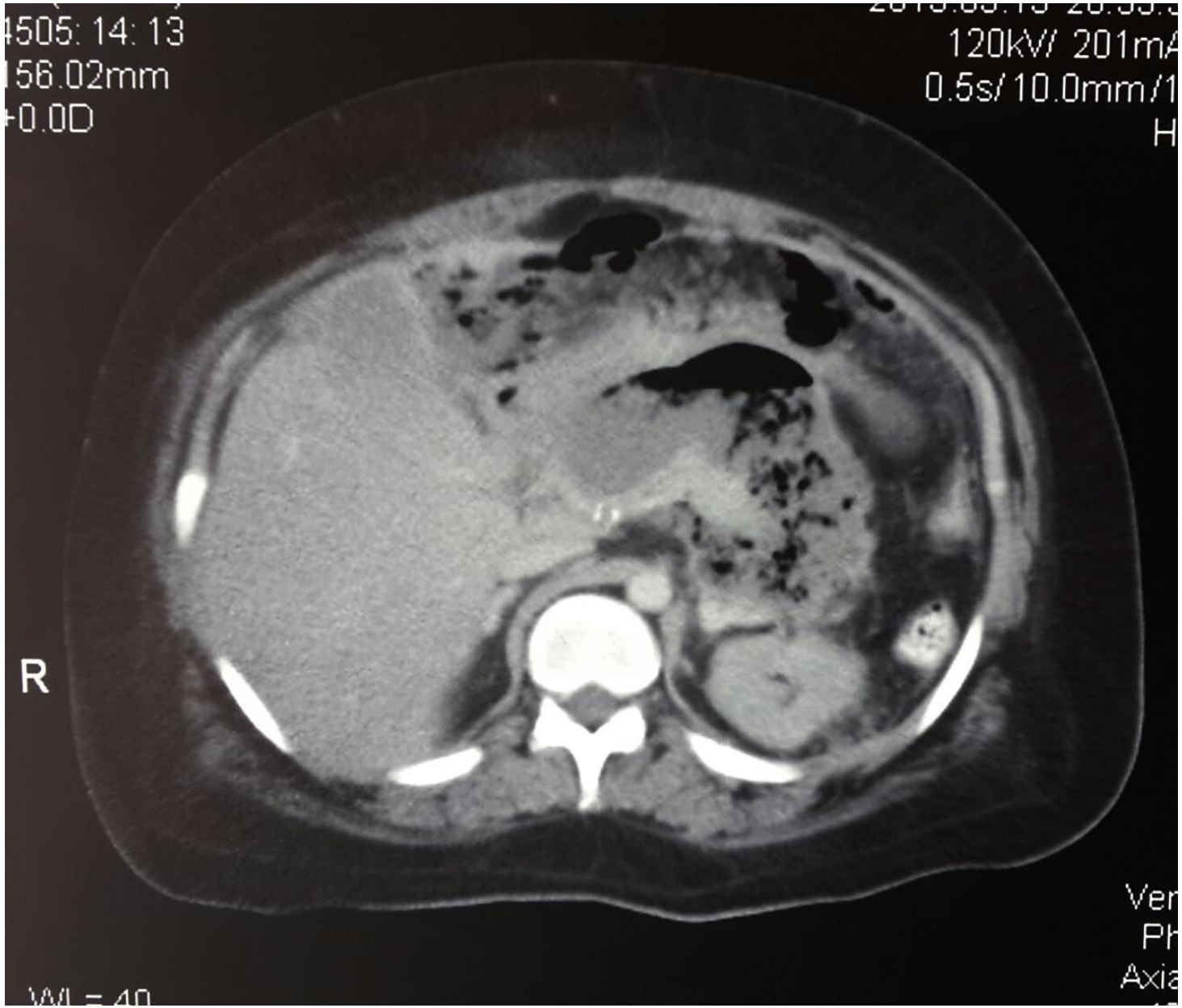
- Watch and wait approach unless
- Pain
- Gastric outlet obstruction
- Jaundice
- Infection
- Size doesn't matter

- Our protocol in the setting of acute pancreatitis is to aspirate to dryness – endoscopic or percutaneous
- Debris/Pus – Stent or pigtail
- Recurrence –Stent or pigtail

Acute Necrotic collection < 4weeks



Walled Off Necrosis > 4 weeks



Endoscopic Options

- Transmural looking for a bulge
- Transpapilliary
- EUS guided is now the standard of care

Cyst features for Endoscopic Drainage

- Anatomical location adjacent to the luminal gastrointestinal tract
- Size of collection >5 cm
- Gut compression
- Apposition to the gastrointestinal wall (<1 cm)
- Single cyst
- Mature cyst
- Absence of disconnected segment of pancreatic duct

Which Type of Stent?

- Double Pigtail
  - Option for pure fluid collection
  - In combination with LAMS/FCSEMS
- FCEMS
  - better clinical outcomes
  - lower adverse event rates
  - lower risk of stent occlusion
  - less stent migration
  - Lower rate of infection
- LAMS
  - One stop approach to drainage
  - Eliminate steps that may prolong the procedure
  - Technical success rate >98% for Fluid collection
  - Technical success rate > 88% for WON

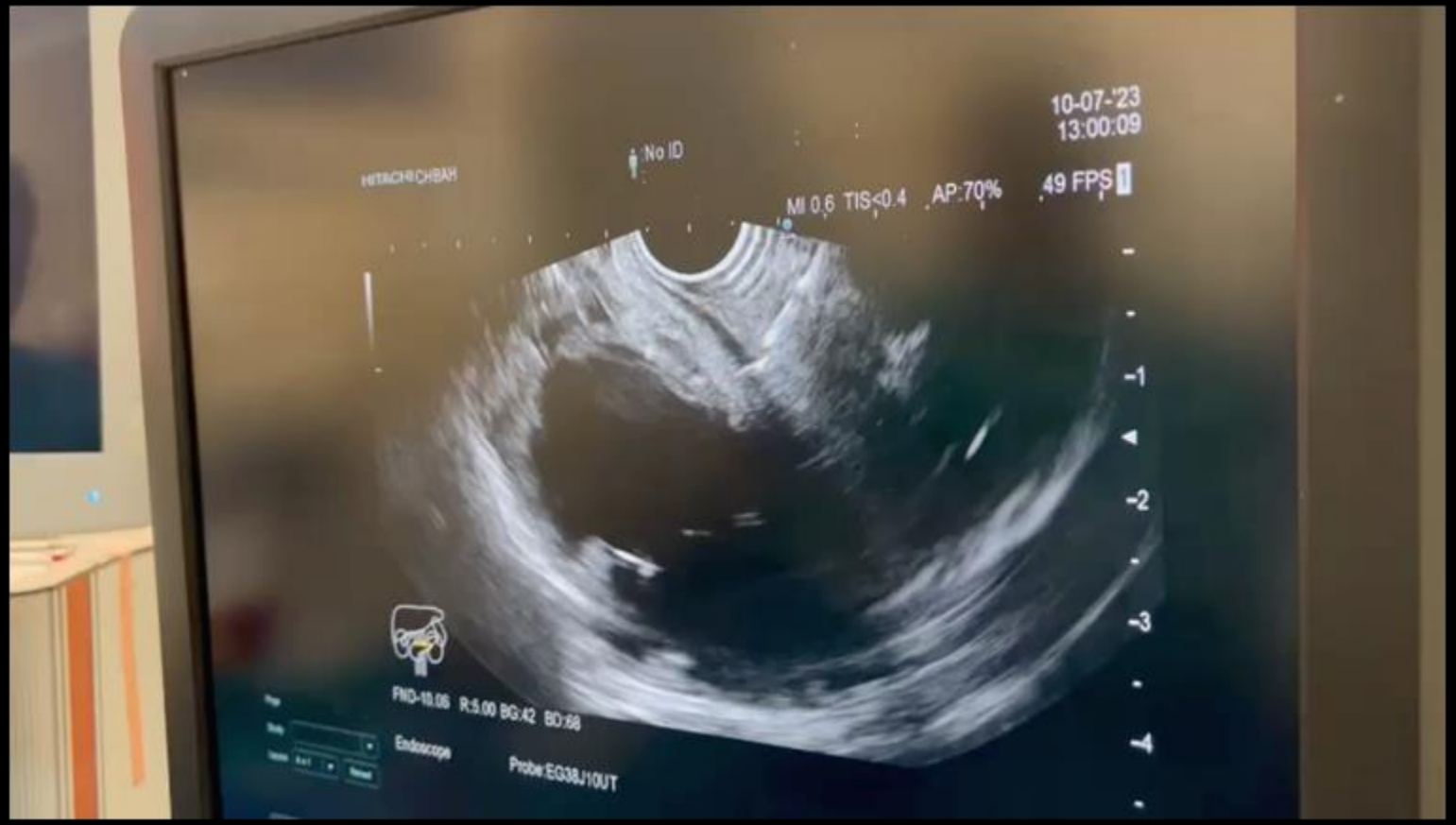
Sharaiha RZ, DeFilippis EM, Kedia P, et al. Metal versus plastic for pancreatic pseudocyst drainage: clinical outcomes and success.Gastrointest Endosc 2015

Adjuncts to stents

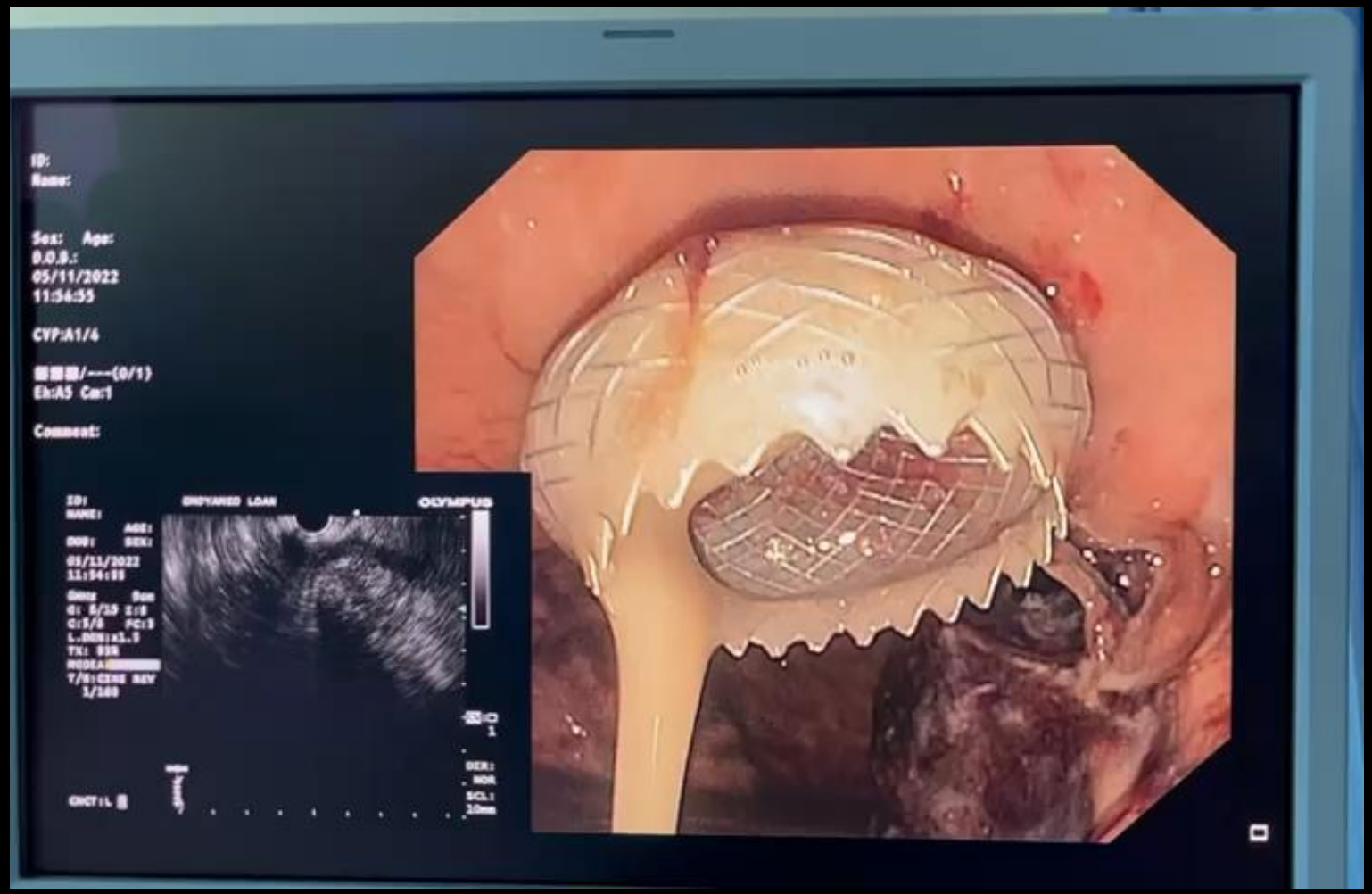
- IVI antibiotics
- Stop PPI's
- Nasocystic irrigation tubes improves clinical success
- Direct Endoscopic Necrosectomy (DEN)
- Dual Modality Drainage(DMD)
- Multiple Transluminal Gateway Technique(MTGT)

Powers PC, Siddiqui A, Sharaiha RZ, et al. Discontinuation of proton pump inhibitor use reduces the number of endoscopic procedures required for resolution of walled-off pancreatic necrosis. Endosc Ultrasound 2019

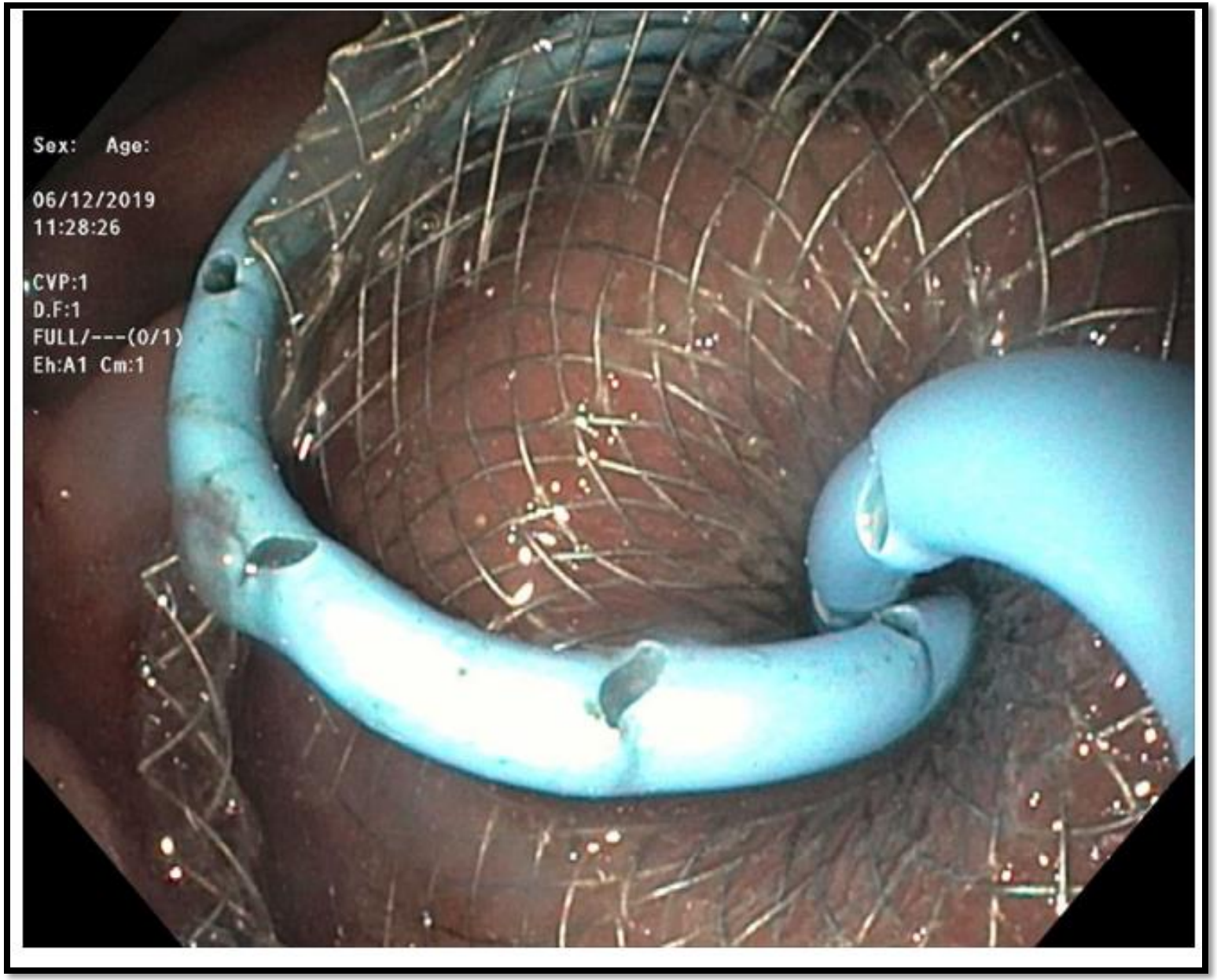
Infected Pseudocyst



Post Drainage procedure with a LAMS



Double Pigtails in combination with LAMS



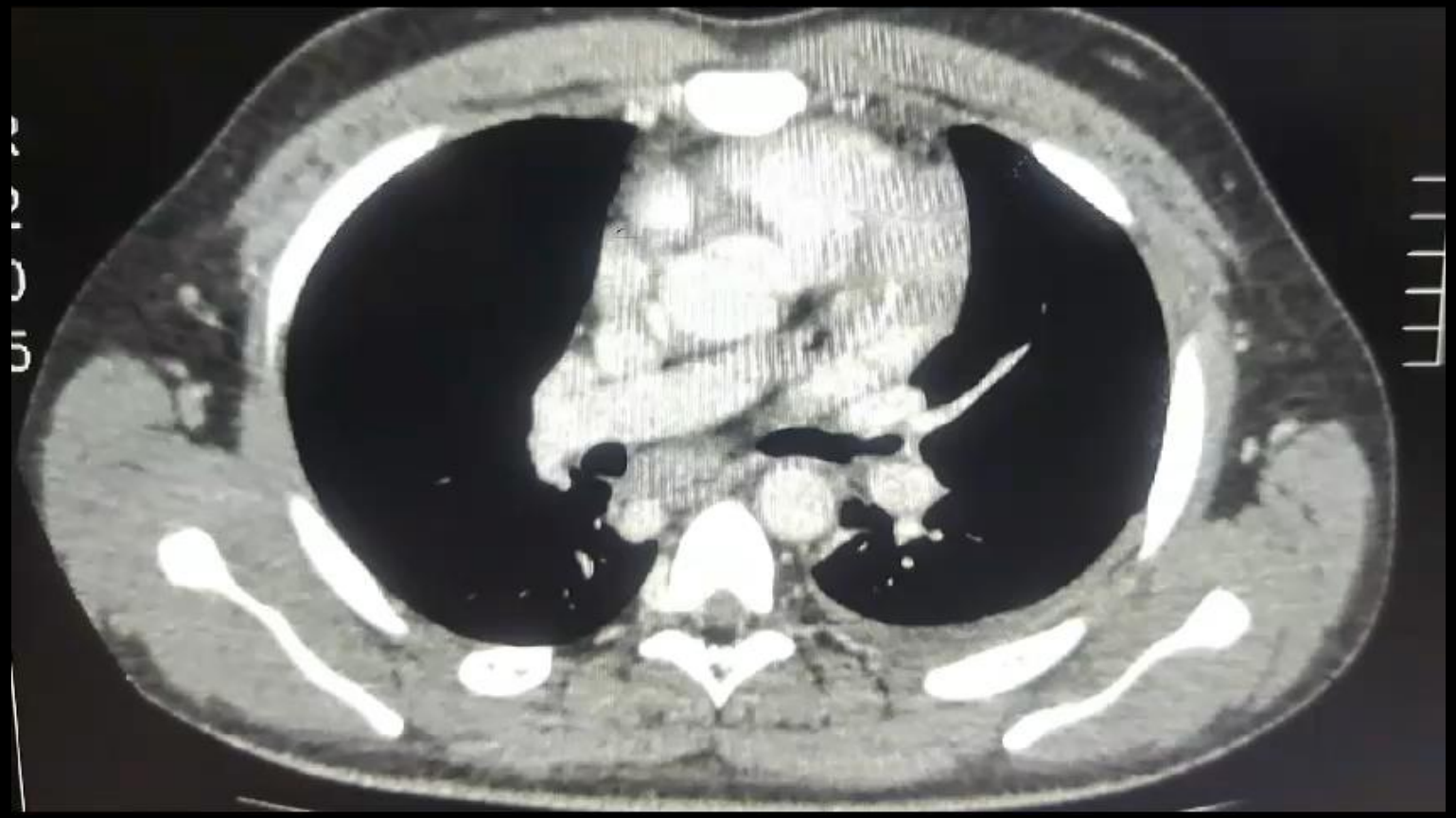
Landmark Trials - Walled of Necrosis

- PANTER trial
  - 2010 NEJM
  - Step up approach decreased mortality
  - Percutaneous drainage alone was enough in 30% of patients
- PENGUIN Trial – 2012 JAMA
  - EN reduced the proinflammatory response
- Miser Trial – 2019 Gastroenterology
- Tension Trial 2013 – Extension trial 2023
  - endoscopic step-up approach was not superior to the surgical step-up approach
  - NO reduction in death or major complications in patients
  - Endoscopy overall fewer pancreatico-cutaneous fistula
  - Endoscopy needed fewer reinterventions

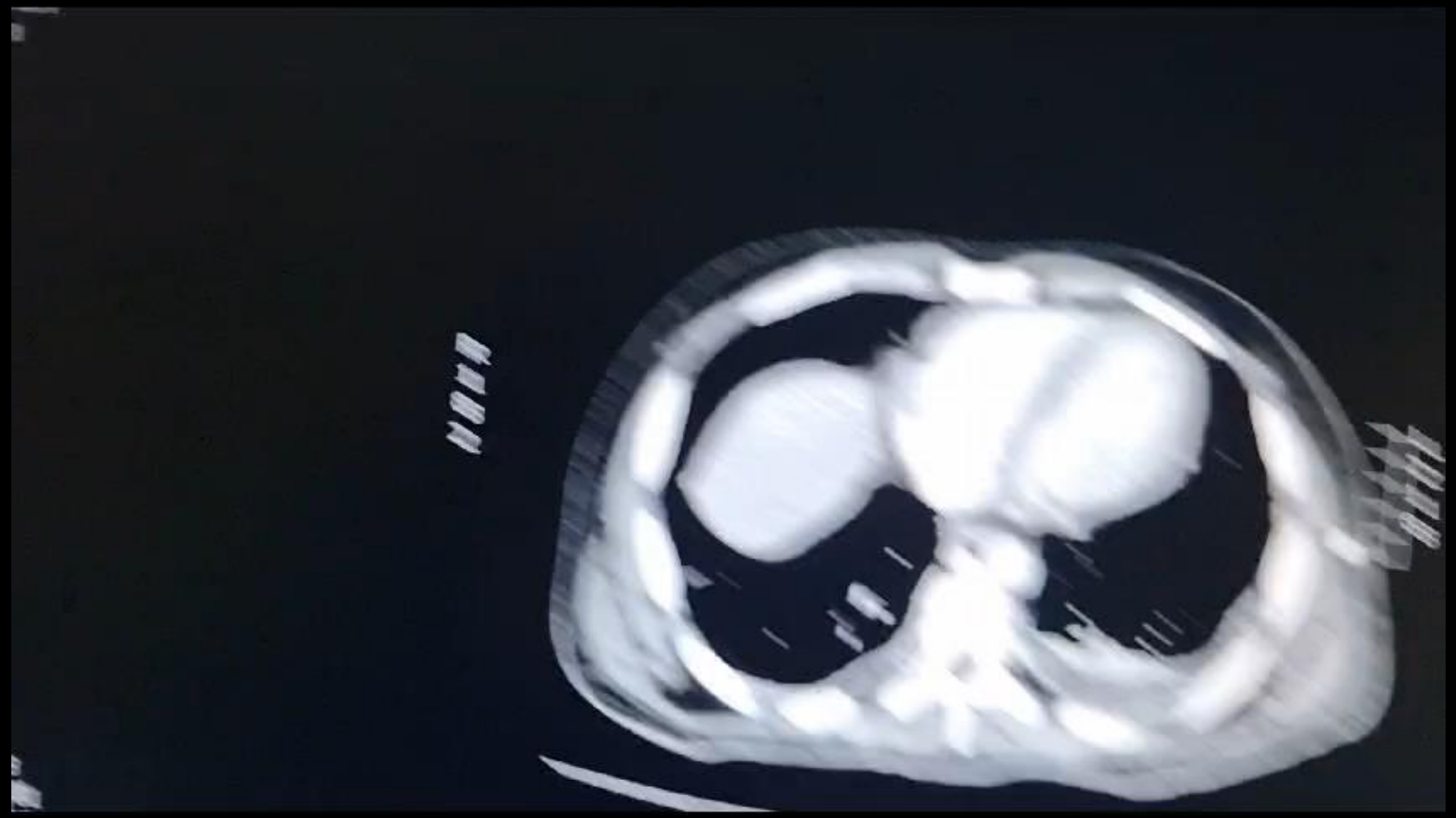
Landmark Trials - Walled of Necrosis

- Pointer Trial 2021 NEJM
  - Timing of intervention
  - Immediate versus Postponed Intervention for Infected Necrotizing Pancreatitis
  - No benefit to immediate drainage
  - Postponed drainage patients received fewer interventions

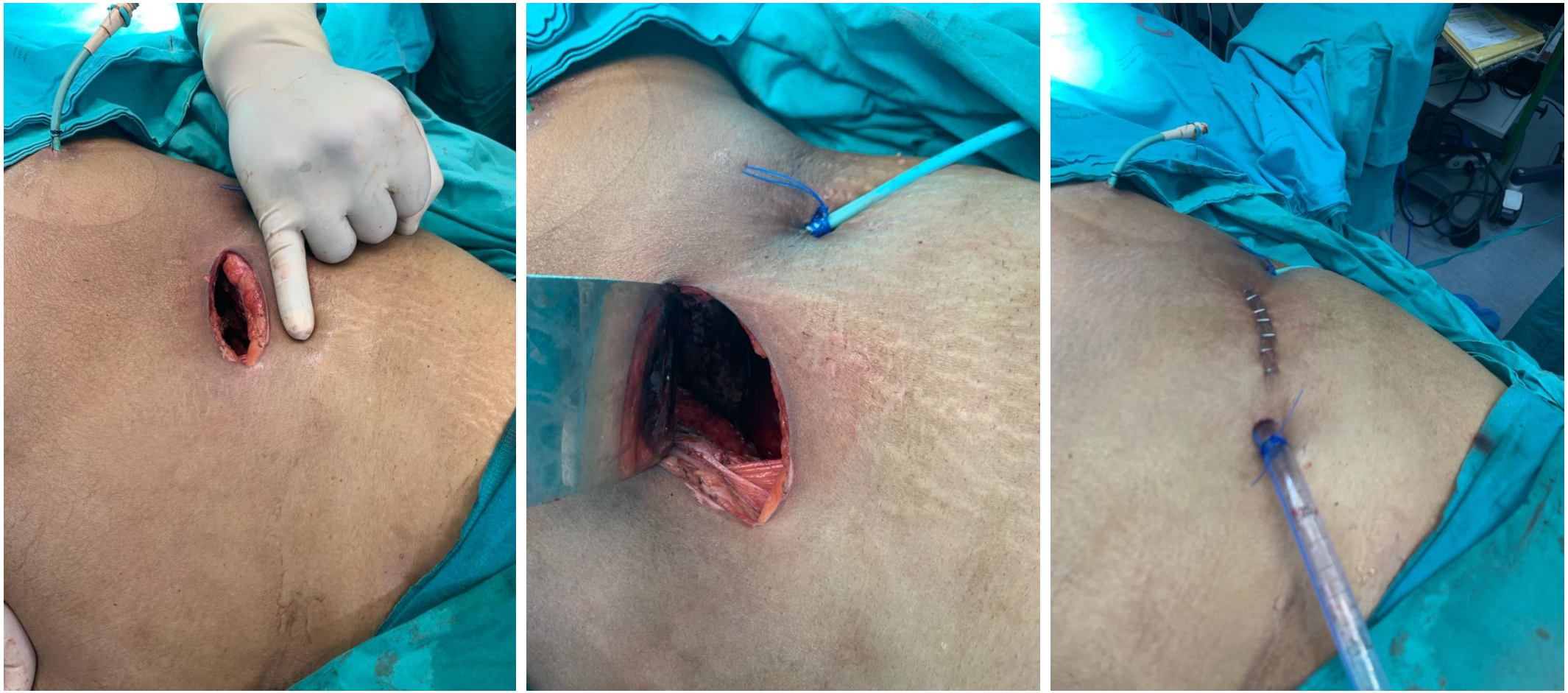
WON in a 29yr old male 9/11/2023



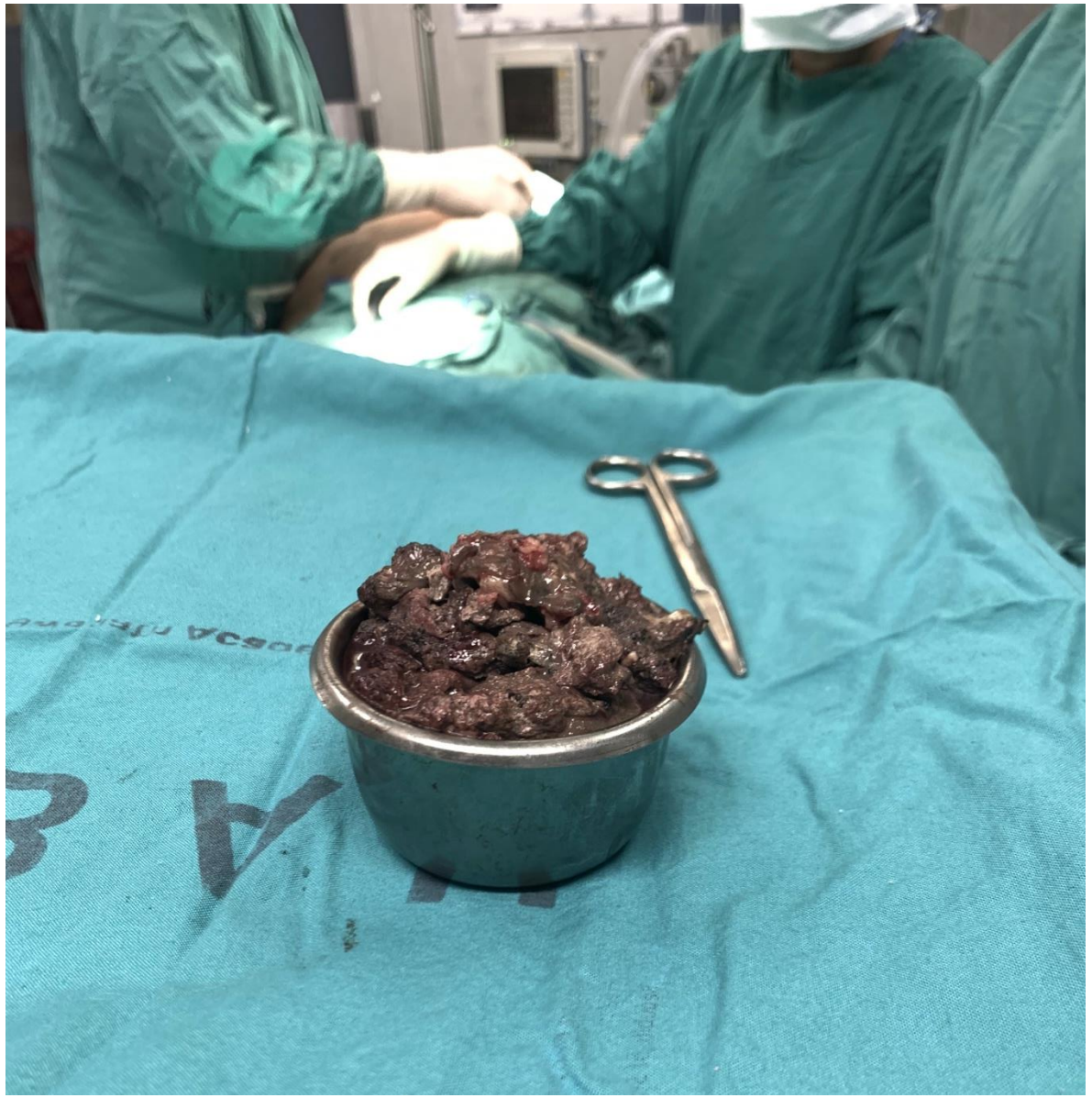
Multiple Techniques required – 02/12/2023



Occasionally we have to Combine Techniques



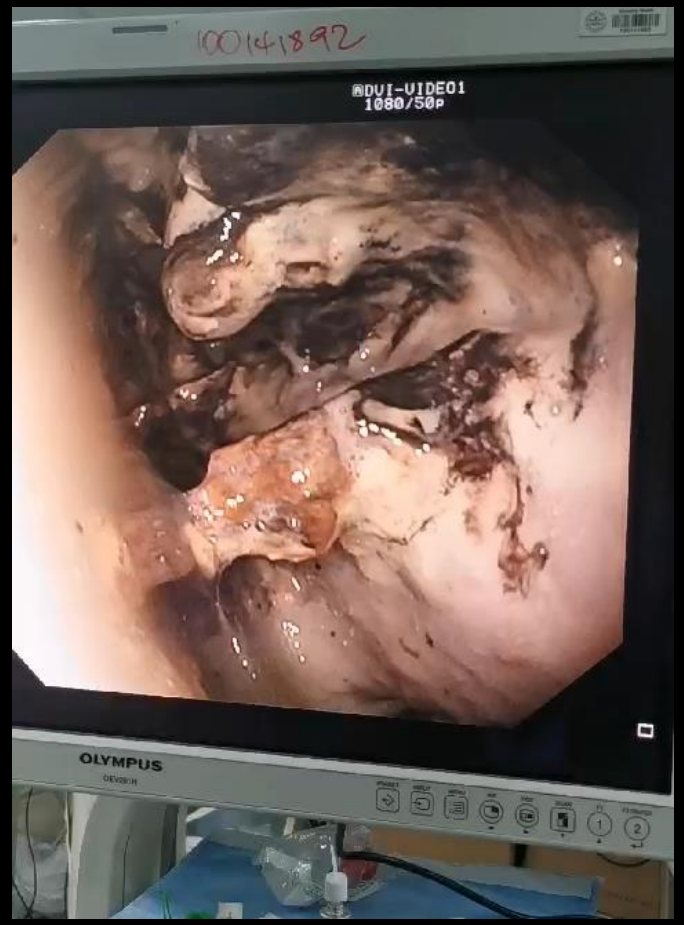
Infected Necrosis

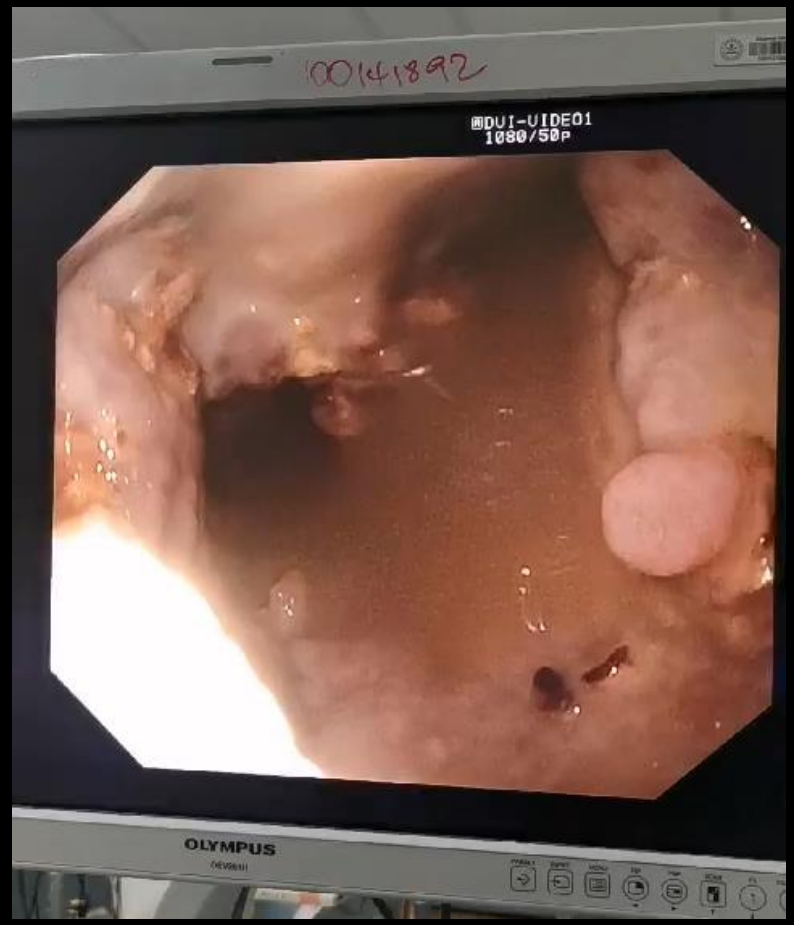


Dealing with Necrosis

- Percutaneous Drainage
- Minimally Invasive Retroperitoneal Debridement and Irrigation
  - Amplats Dilators
  - Nephroscope
  - Fuller- Elliot Drains
- Video Assisted Retroperitoneal Debridement(VARD)
  - Laparoscopic Stack
  - Forceps
- Intraperitoneal Laparoscopic Approach
- Open Necrosectomy
- Endoscopic

Direct Endoscopic Necrosectomy





Limitations to Endoscopic Necrosectomy and future directions

- Removal of necrosis is challenging
- Still require the “ideal accessory” for removal of debris
- We need something to liquify the necrosis

Conclusions

- Moderate Fluid Resuscitation is the way to go
- Local complications should be graded using the Revised Atlanta classification
- Pure Fluid collections:
  - Only Symptomatic Pseudocysts should be addressed
- Try to Delay drainage according to the POINTER trial
- WON:
  - Adressed using a step up approach – “take the stoke out of the fire”
  - Depending on location of infected necrosis decide on a percutaneous approach or endoscopic approach
  - Have the skills to safely perform VARD/MIRP
  - Have the skills to perform DEN
- Refer patients to a High-volume Centre