



# Endoscopic Management of Complications !



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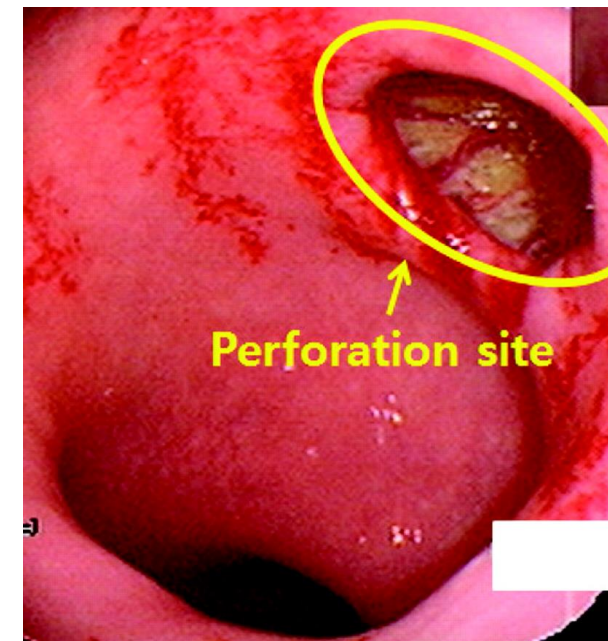


@BilalMohammadMD



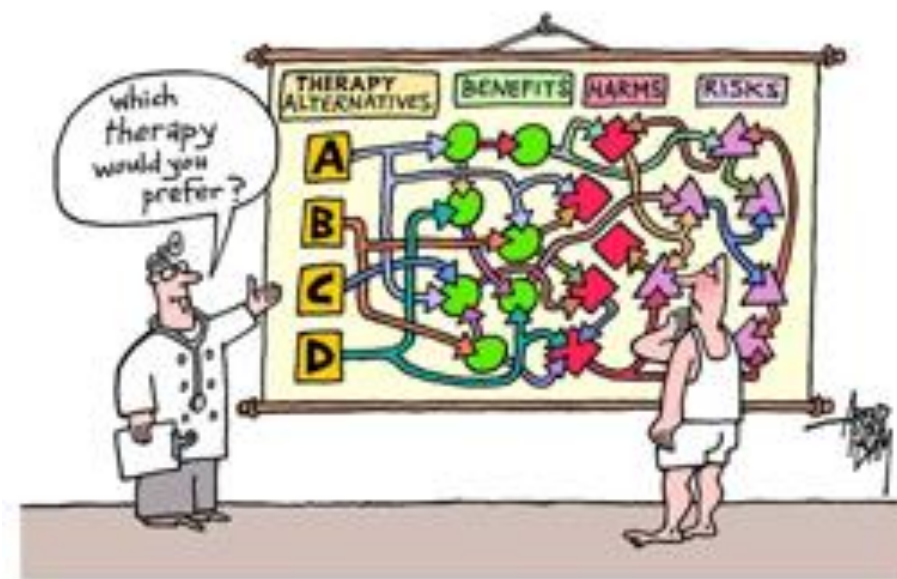
# Complications Can Occur

- Gastroenterologists will encounter  $\geq 1$  significant adverse event in their career
- GI fellow has 1 in 3 odds of facing a procedural complication
- Complications can happen to the best of endoscopists



# Consent

- Management of a complication starts before the procedure even starts
- Consent needs to be “informed”
- Beyond legal and institutional requirements
- Discuss alternatives
- Discussion with family members
- Open access endoscopy
- Patient-endoscopist rapport



*informed consent*



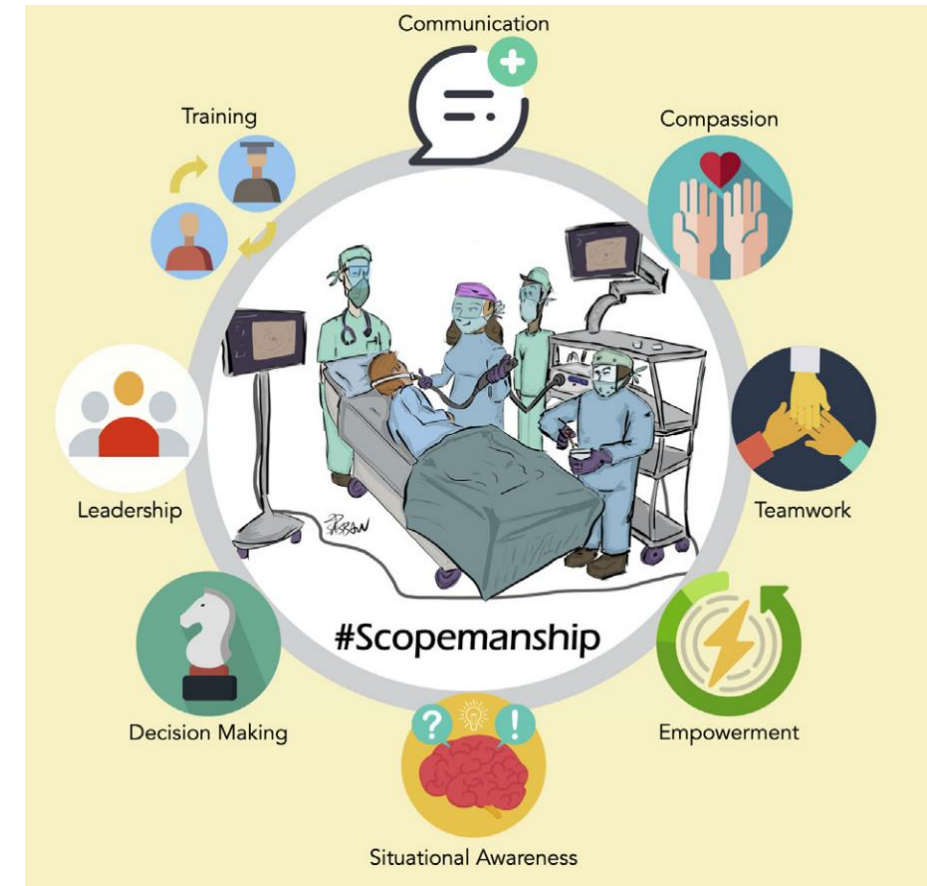
# I Had a Complication – Now What ?

- Technical skills
  - Taught and discussed
  - Bleeding
  - Perforation
  - Infection
  - Post ERCP (Pancreatitis)
  - Rare: Splenic injury
  - Sedation related
- Non-technical skills



# I Had a Complication – Now What ?

- Early recognition and management is key
- Culture change from “See Peritoneum and Run” to “Evaluate and Fix”
- Most endoscopic complications can be managed endoscopically by you or someone else
- Tool Box
  - TTS clips, OTSC, Suturing, Stents, EVT, Hemostatic Spray



*Bollipo, Bilal, Siau, Charabaty et al, Gastro 2020*

# Complication Time Out !

- Take a Deep Breath
- **Think of this as running a code blue**
- Communicate (anesthesia, team members in room)
- Assign clear roles (call for Abx, IR/ Surgery back up)
- Stabilize (needle decompression)
- Can you fix the problem (?perforation – clips?)
- Can someone else fix the problem (colleague next door)
- Call for help





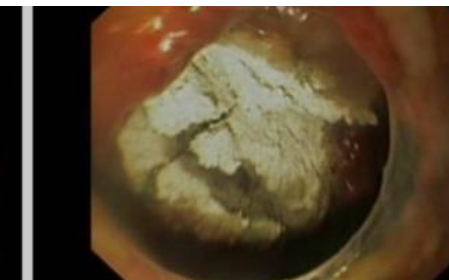
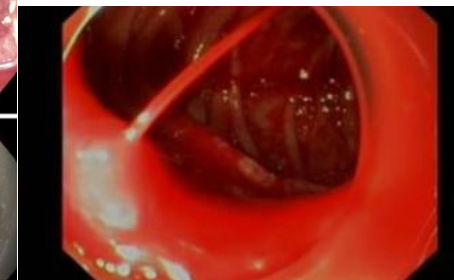
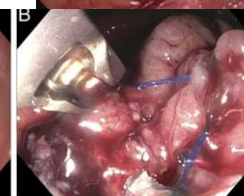
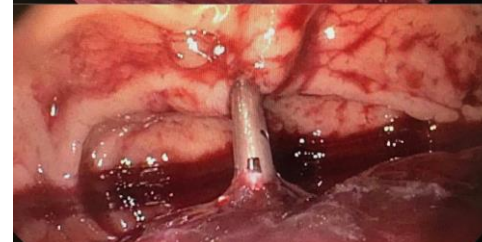
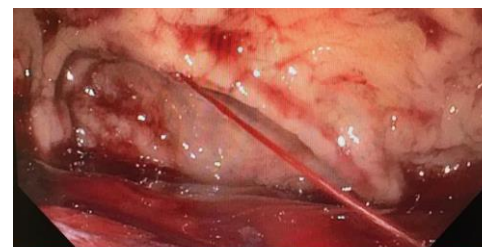
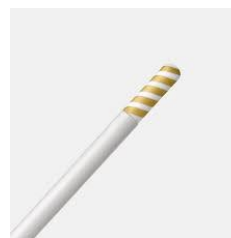
# Bleeding

- Rarely seen with diagnostic EGD
- More likely in patients with coagulopathy, blood thinner use and thrombocytopenia
- Typically following interventions (dilation, polypectomy, EMR)



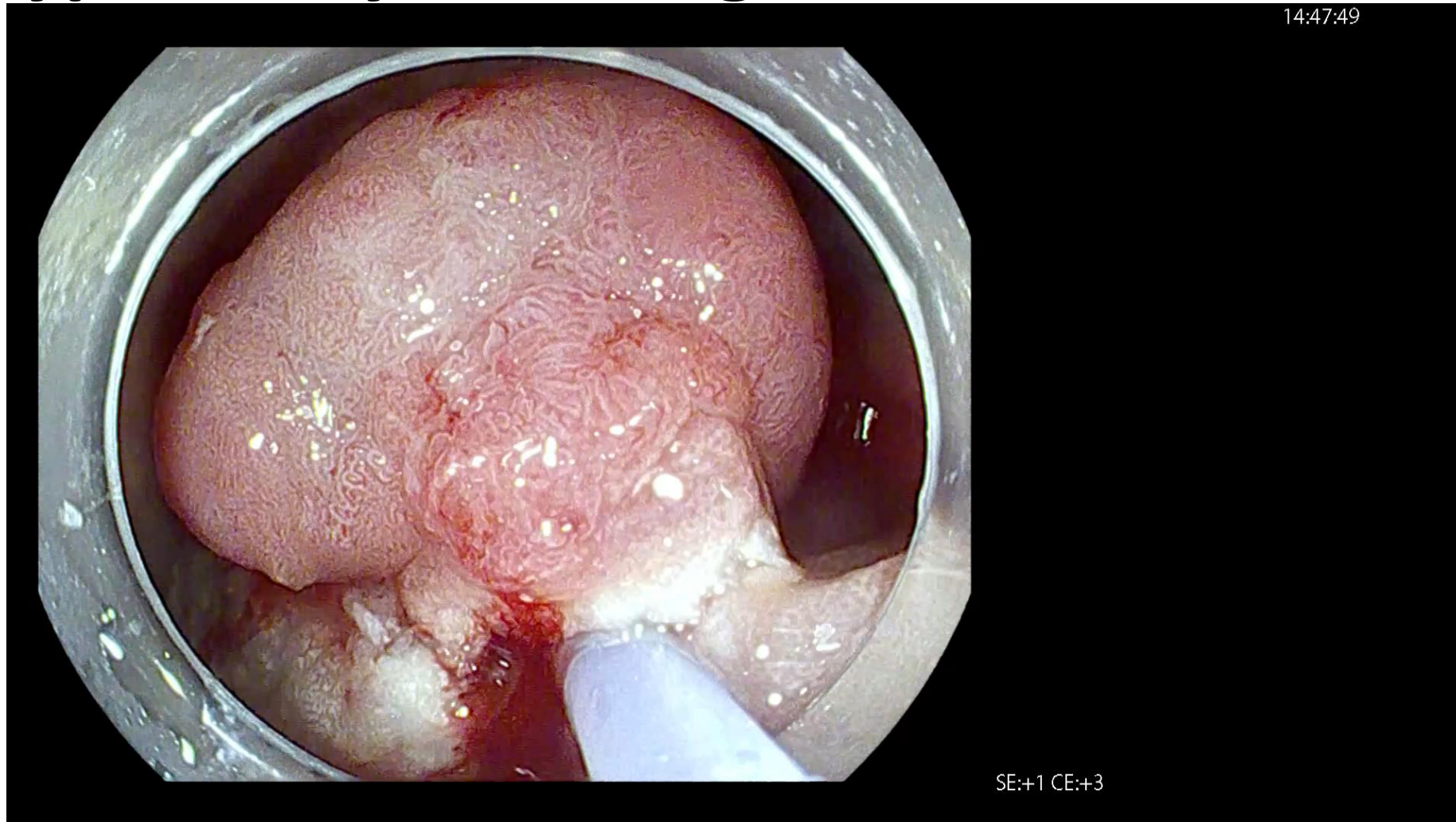
# Bleeding tool kit

- Epinephrine
- Thermal therapy
  - Bipolar therapy, coagulation grasper forceps, APC, STSC
- Mechanical therapy
  - TTS clips, OTSC
- Endoscopic suturing
- Hemostatic sprays





# Post Polypectomy Bleeding

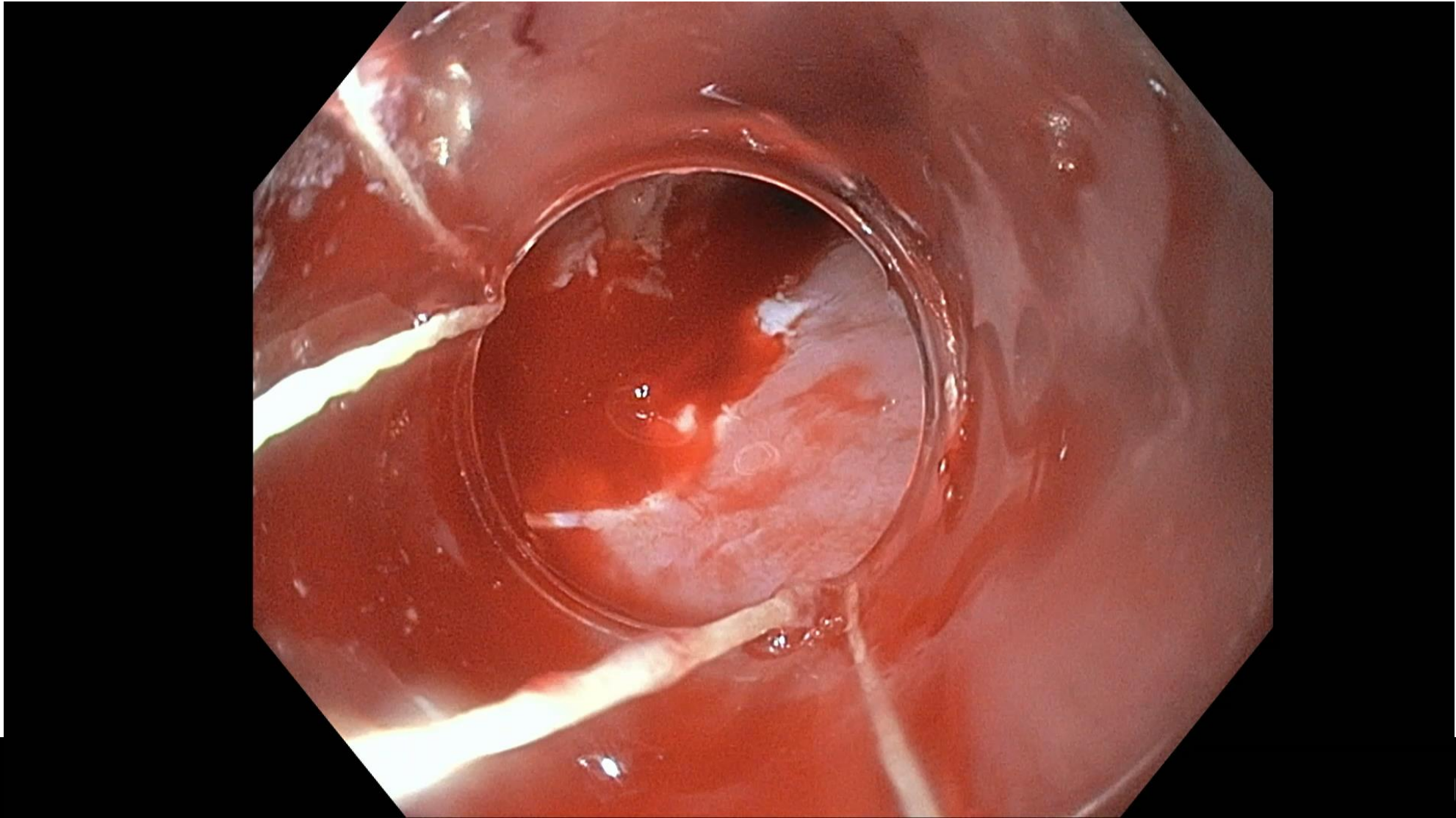


Video courtesy:  
Dr Robert Bechara





# Bleeding





# Perforation

- Low rate of esophageal perforation in diagnostic EGD
- Dilation increases the rate of perforation
- Diagnostic colonoscopy: 0.3% - 0.01%
- 7 fold increase for therapeutic colonoscopy





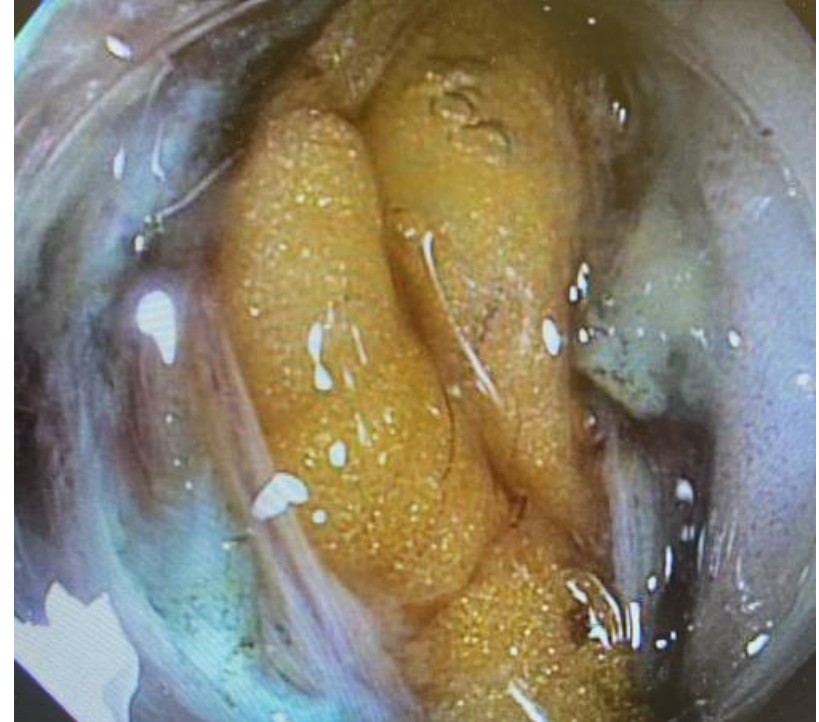
# Increased risk of perforation

- Patient factors
  - Age, frailty
  - Prior surgeries and altered anatomy
  - Diverticulosis
  - Zenkers diverticulum
- Procedure factors
  - Dilation
  - Large polyp resection
  - Looping
  - Ampullectomy



# Perforation ...

- Deep muscle injury / target sign
- Hemodynamic instability
  - Difficult to ventilate
  - Increased peak airway pressures
- Inability to insufflate
- Visible peritoneum



*“Early Intervention and Management of Perforation can Reduce Need for Surgery”*



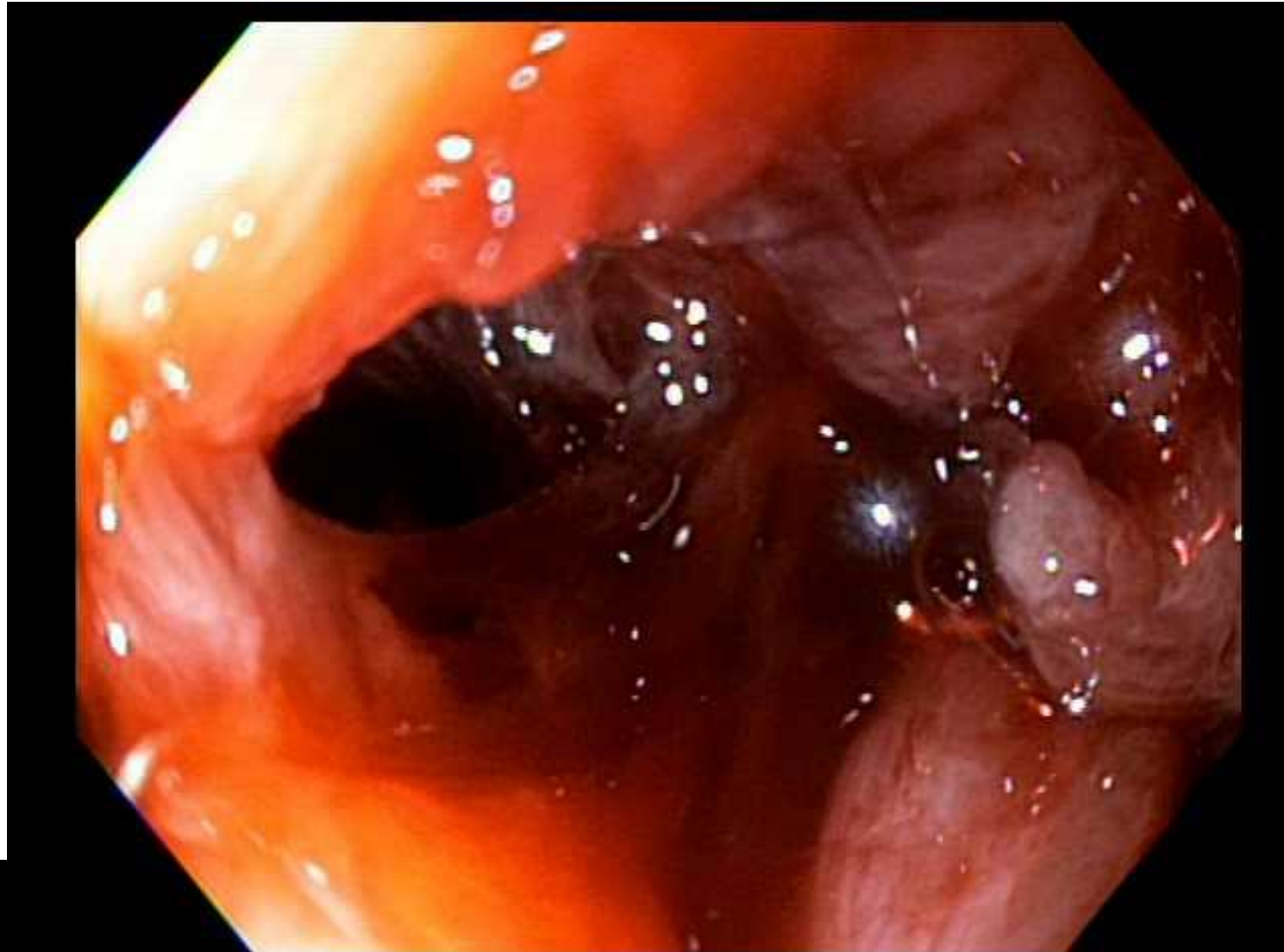
# Case Example

- 59 Y M presents for EGD for refractory esophageal stricture
- Prior dilations attempted in the community but not aggressively dilated
- Undergoes Savary dilation up to 54 Fr with minimal resistance
- Re-look endoscopy performed



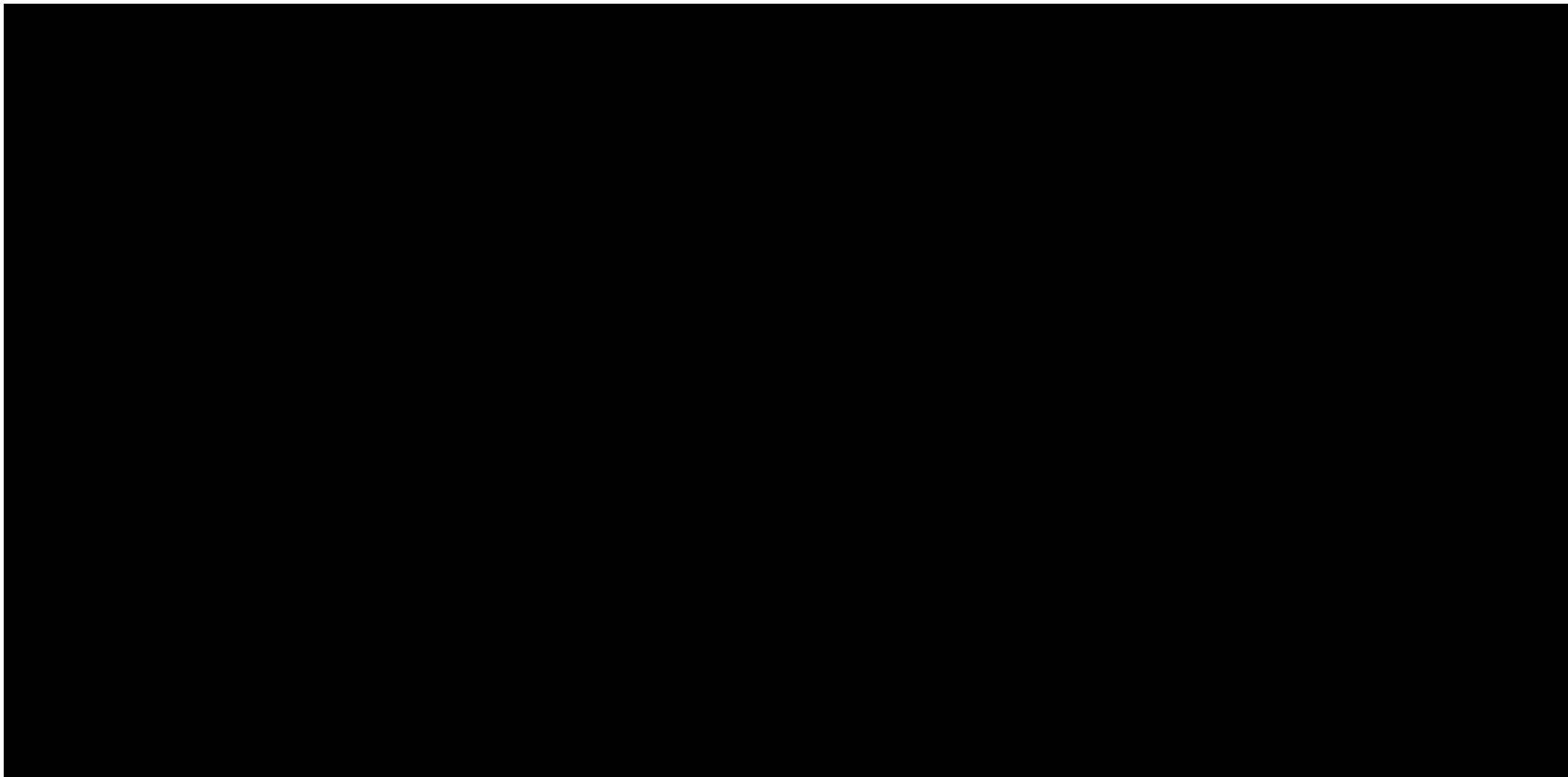


# Re-Look Endoscopy



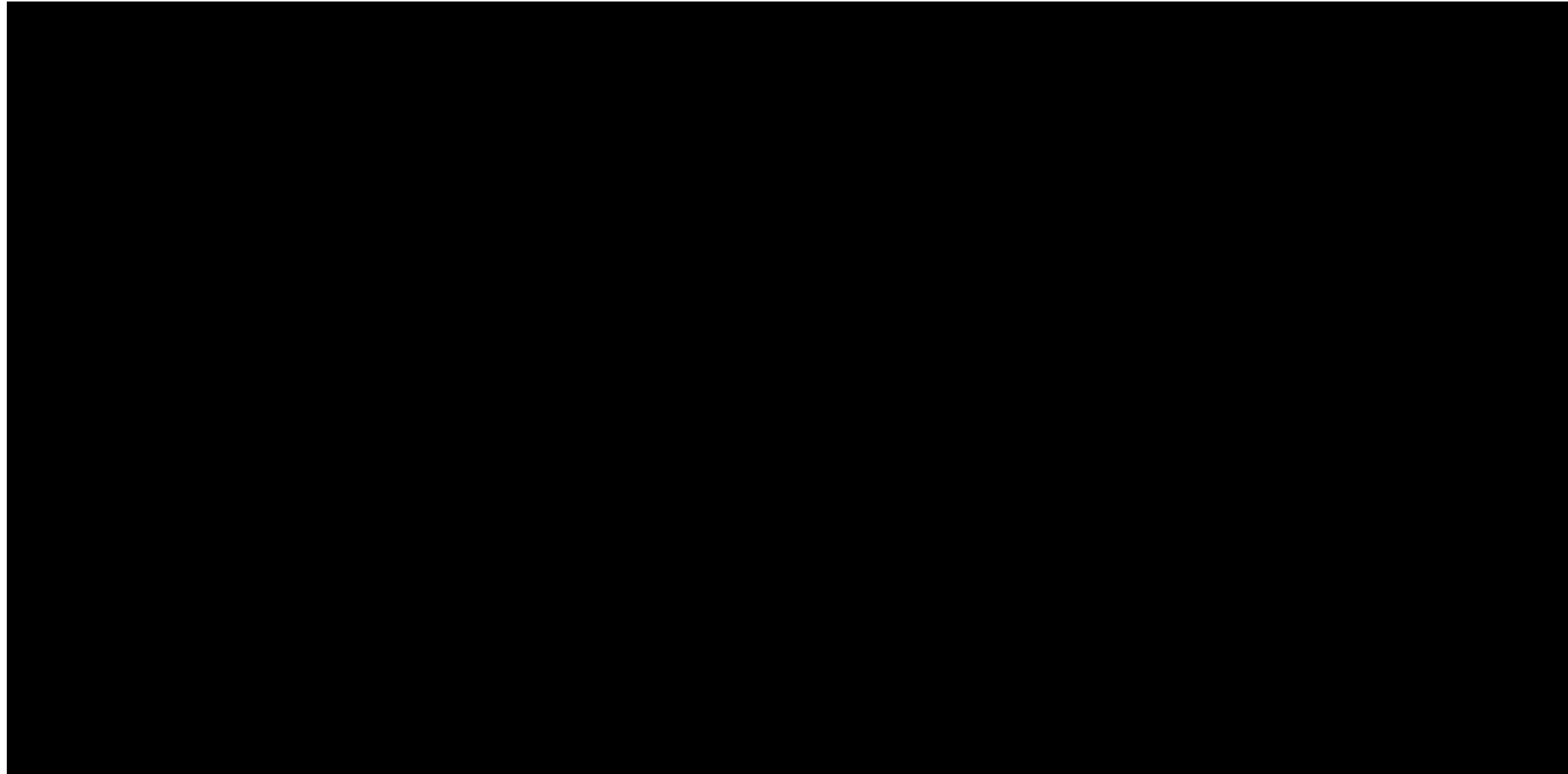


# Management





# Needle Decompression





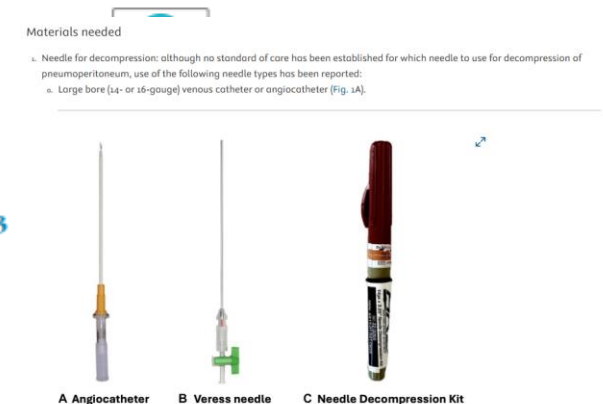
# Needle Decompression



## REVIEW ARTICLE

### Percutaneous needle decompression for tension pneumoperitoneum during GI endoscopy: a step-by-step guide CME

Natalie J. Wilson, MD,<sup>1</sup> Rahul Karna, MD,<sup>2</sup> Giovanni A. Roldan, MD,<sup>2</sup> Roberto Osorio Cintron, RN,<sup>3</sup> Alexander Leaf, RN,<sup>3</sup> Daniela Guerrero Vinsard, MD,<sup>3</sup> Mohammad Bilal, MD<sup>3</sup>



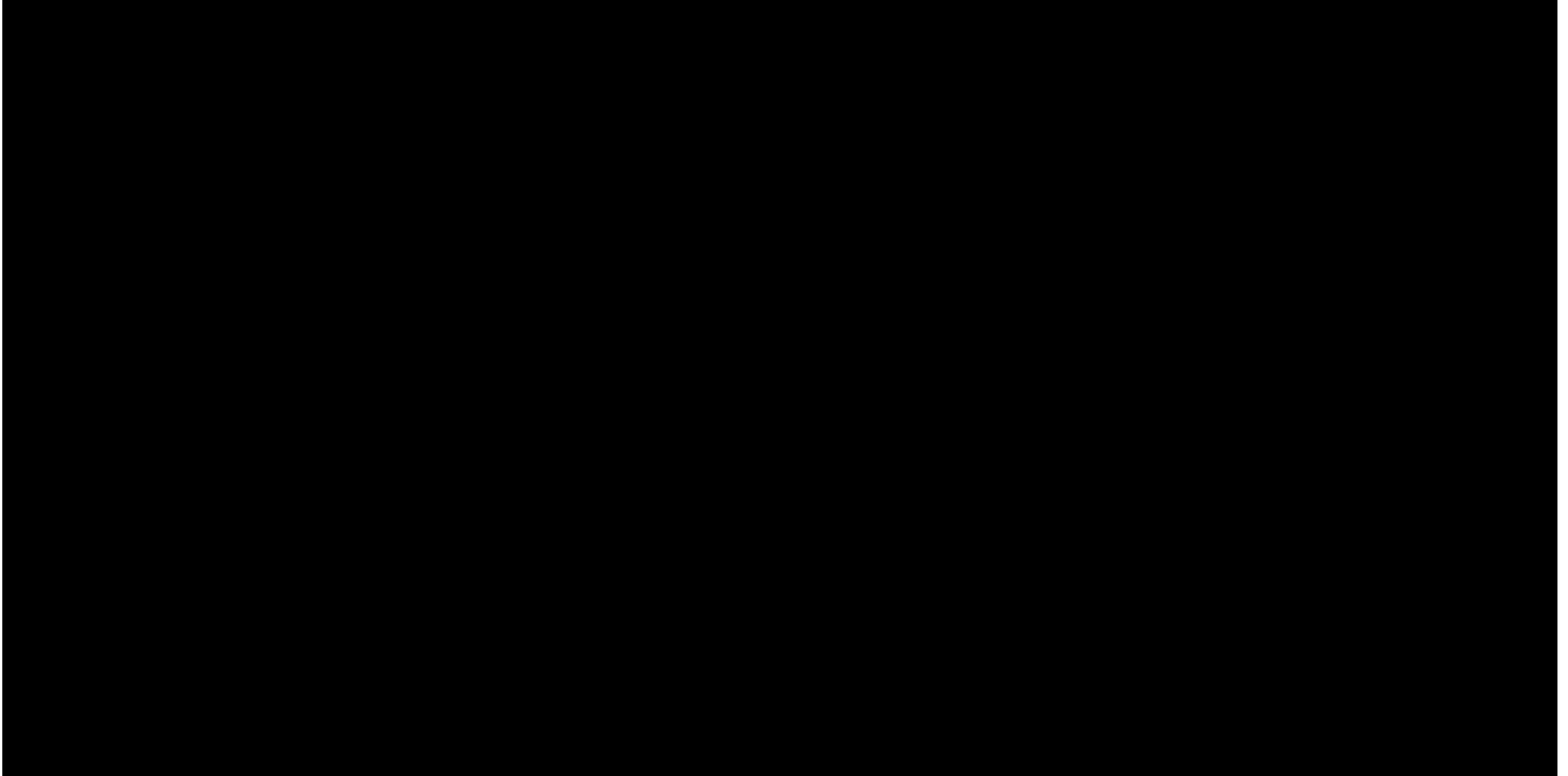


# ERCP Related Duodenal Perforation





# Perforation





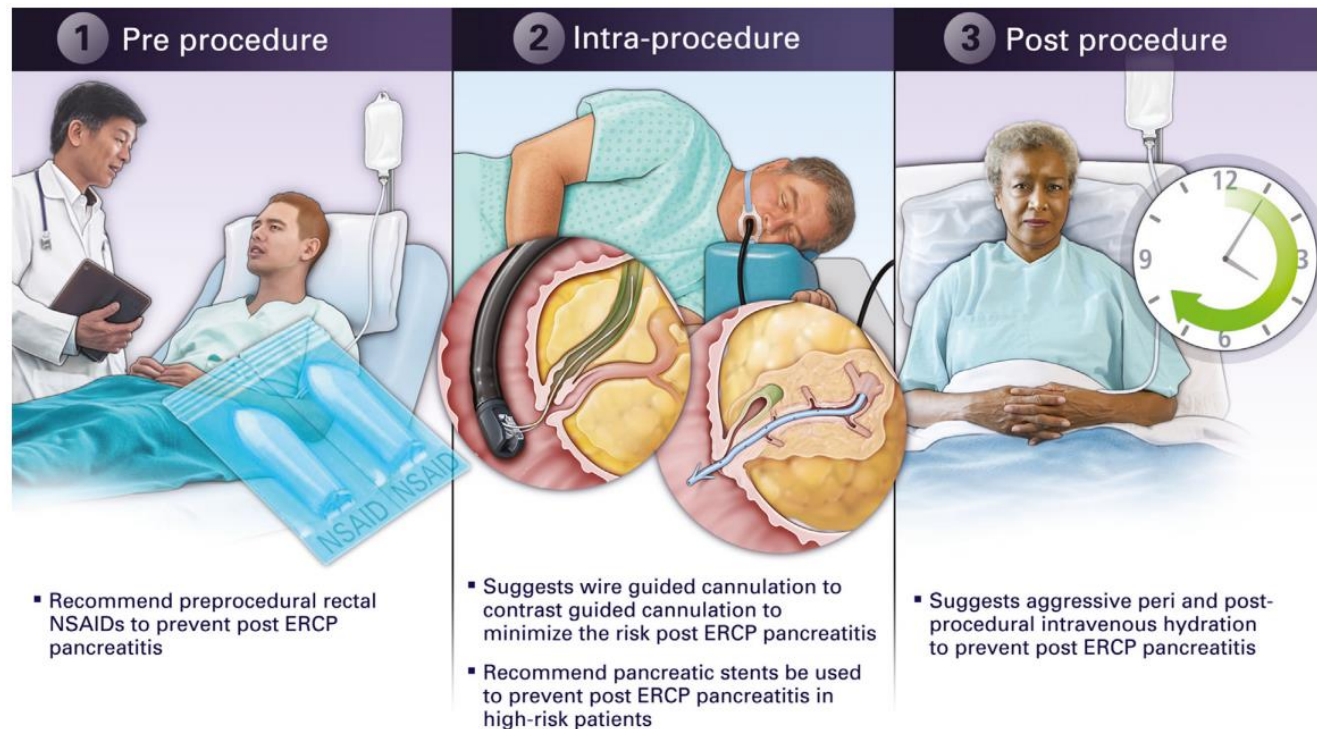
# Case Example

- 32 Y F presents for ERCP for choledocholithiasis
- ERCP with biliary sphincterotomy performed and multiple stones removed
- Rectal Indomethacin administered
- Does well immediately post-operative and discharged home 90 mins after procedure
- Presents to hospital same night with abdominal pain
- Lipase is elevated and CT scan shows acute pancreatitis



# Post-ERCP Pancreatitis

- Could this be avoided ?
- What could have been done better in this case ?
- Management



# Post-ERCP Pancreatitis

**Recommendation 5:** In unselected patients undergoing ERCP, the ASGE suggests aggressive periprocedural and postprocedural intravenous hydration to prevent PEP (*Conditional recommendation/Moderate quality of evidence*).

- 20 ml / kg bolus = 1400 ml
- Followed by initial rate of 3 ml /kg for 8 hours = 1680 ml
- LR used in most trials

70 kg person



# Post-ERCP Pancreatitis

- 1950 patients were randomized
- Post-ERCP Pancreatitis
  - 14.9% in Indomethacin vs 11.3% in Indomethacin plus stent group
- Post-hoc ITT analysis of risk difference
  - Indomethacin alone was inferior to the combination of indomethacin plus prophylactic stent ( $p=0.011$ ).
  - The relative benefit was consistent across study subgroups but appeared more prominent among patients at highest risk for pancreatitis.
- Safety outcomes similar in both groups

Articles 

## Indomethacin with or without prophylactic pancreatic stent placement to prevent pancreatitis after ERCP: a randomised non-inferiority trial



B Joseph Elmunzer, Lydia D Foster, Jose Serrano, Gregory A Coté, Steven A Edmundowicz, Sachin Wani, Raj Shah, Ji Young Bang, Shyam Varadarajulu, Vikesh K Singh, Mouen Khashab, Richard S Kwon, James M Scheiman, Field F Willingham, Steven A Keilin, Georgios I Papachristou, Amitabh Chak, Adam Slivka, Daniel Mullady, Vladimir Kushnir, James Buxbaum, Rajesh Keswani, Timothy B Gardner, Nauzer Forbes, Amit Rastogi, Andrew Ross, Joanna Law, Patrick Yachinski, Yen-I Chen, Alan Barkun, Zachary L Smith, Bret Petersen, Andrew Y Wang, John R Saltzman, Rebecca L Spitzer, Collins Ordiah, Cathie Spino, Valerie Durkalski-Mauldin, on behalf of the SVI Study Group\*

### Summary

**Background** The combination of rectally administered indomethacin and placement of a prophylactic pancreatic stent is recommended to prevent pancreatitis after endoscopic retrograde cholangiopancreatography (ERCP) in high-risk patients. Preliminary evidence suggests that the use of indomethacin might eliminate or substantially reduce the need for stent placement, a technically complex, costly, and potentially harmful intervention.

**Methods** In this randomised, non-inferiority trial conducted at 20 referral centres in the USA and Canada, patients (aged  $\geq 18$  years) at high risk for post-ERCP pancreatitis were randomly assigned (1:1) to receive rectal indomethacin alone or the combination of indomethacin plus a prophylactic pancreatic stent. Patients, treating clinicians, and outcomes assessors were masked to study group assignment. The primary outcome was post-ERCP pancreatitis. To declare non-inferiority, the upper bound of the two-sided 95% CI for the difference in post-ERCP pancreatitis (indomethacin alone minus indomethacin plus stent) would have to be less than 5% (non-inferiority margin) in both

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See Online/Comment  
[https://doi.org/10.1016/S0140-6736\(23\)02719-8](https://doi.org/10.1016/S0140-6736(23)02719-8)

\*Additional members of the study group are listed in the appendix (pp 14–15)  
Division of Gastroenterology & Hepatology, Medical University of South Carolina, Charleston,





# Post-ERCP Pancreatitis – Lessons Learned

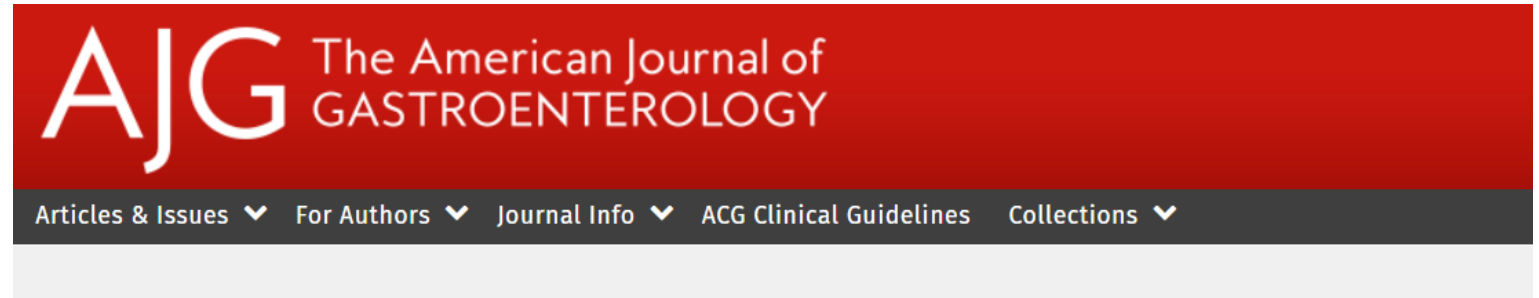
- Prevention is BEST
- Strong indication for ERCP
- PD stent placement (deep PD cannulation, repeated access, high-risk patients)
- Patient in our case could have gotten more IV fluids
- 8 hours of IV fluids likely not possible in outpatients in the US in most centers
- In high-risk patients - more fluid over 2-3 hrs maybe a more cost-effective approach (more data is needed)





# Professionalism Aspect in Management of Complications

- Communication
- Disclosure
- Legal Issues
- Post complication management



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## Professionalism in the Management Endoscopic Adverse Events – Consensus Document from the American College of Gastroenterology Professionalism Committee

Bilal, Mohammad MD<sup>1</sup>; Feld, Lauren D MD<sup>2</sup>; Hernandez, Lyndon V MD<sup>3,4</sup>; Feld, Andrew D MD JD<sup>5,6</sup>; Anderson, Joseph C MD<sup>7,8</sup>; Bloomfeld, Richard S MD<sup>9,a</sup>

Author Information

*The American Journal of Gastroenterology* ();10.14309/ajg.0000000000002474, August 17, 2023. | DOI: 10.14309/ajg.0000000000002474

BUY

PAP

Metric



# Post Complication Follow-Up

- Example: Esophageal perforation during Dilation
- Follow up and communication ensure relationship continues
- Patient returns for serial dilations
- Phone call / clinic visit





# Coping with Complications

- Complications don't only cause harm to patient
- Lead to distress and emotional impact on endoscopist and the endoscopy team as well
- Physician peer-support is essential
- Culture where we do NOT blame and shame for complications
- Peer-review / QA / QI meetings to learn and improve
- Time to re-group BUT get back at it
- Debrief with team
- Remember positive impact "WE" made





# Second Victim

Gastroenterology  aga

RESEARCH LETTER · [Articles in Press](#), July 25, 2025

## Psychosocial Impact of Endoscopic Procedural Complications on Gastroenterologists: The Second Victims

[Erik A. Holzwanger](#)   · [Andy Silva-Santisteban](#) · [Erika Tsuchiyose](#) · [Mohammad Bilal](#) · [Ankit Chhoda](#) · [The Innocent Study Consortium](#) · [Mandeep S. Sawhney](#) [Show less](#)

|                      | Not at all true | Slightly or somewhat true | Very or extremely true |
|----------------------|-----------------|---------------------------|------------------------|
| Psychological impact | (%)             | (%)                       | (%)                    |
| Nervousness          | 17.56           | 58.02                     | 4.43                   |
| Sadness/grief        | 0.76            | 24.43                     | 74.81                  |
| Anger/frustration    | 12.98           | 48.09                     | 38.93                  |
| Physical reactions   | 32.06           | 41.22                     | 26.72                  |
| Reliving moment      | 31.30           | 38.17                     | 30.53                  |
| Nightmares           | 64.89           | 23.66                     | 11.45                  |

**Table 1**  
Psychological Impacts of Serious Adverse Events (N = 131)



# Summary

- Complications are part of interventional specialties and happen to everyone
- Informed consent
- Take “Ownership” of complication
- Stay calm
- In 2026, most endoscopic complications can be fixed by YOU or a colleague
- Complication Time Out !
- Honest and empathetic disclosure
- Coordinate care
- Find your peer-support group
- Debrief and learn
- Be mindful of legal implications
- Lets get back at it !!!





# Thank You !

