Complications and Endoscopic Suturing

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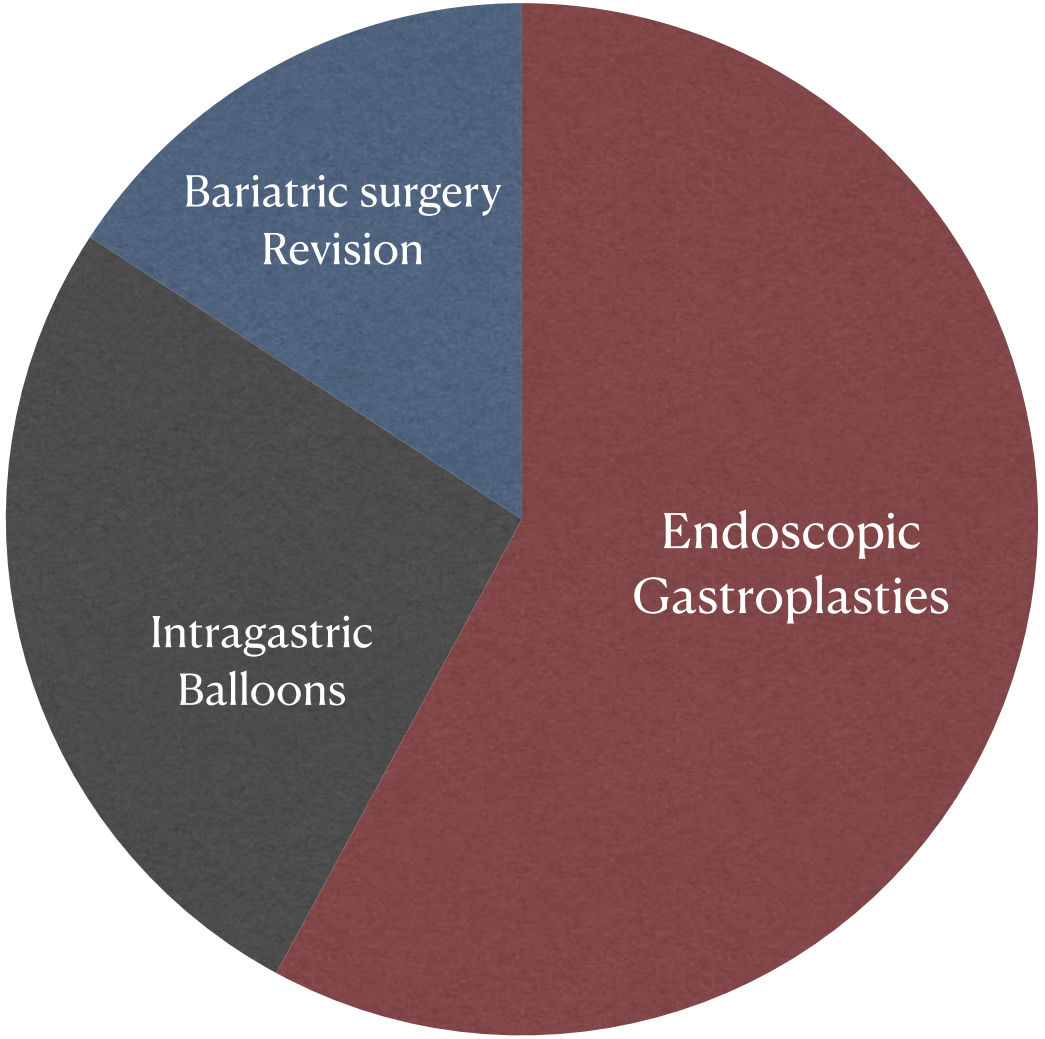
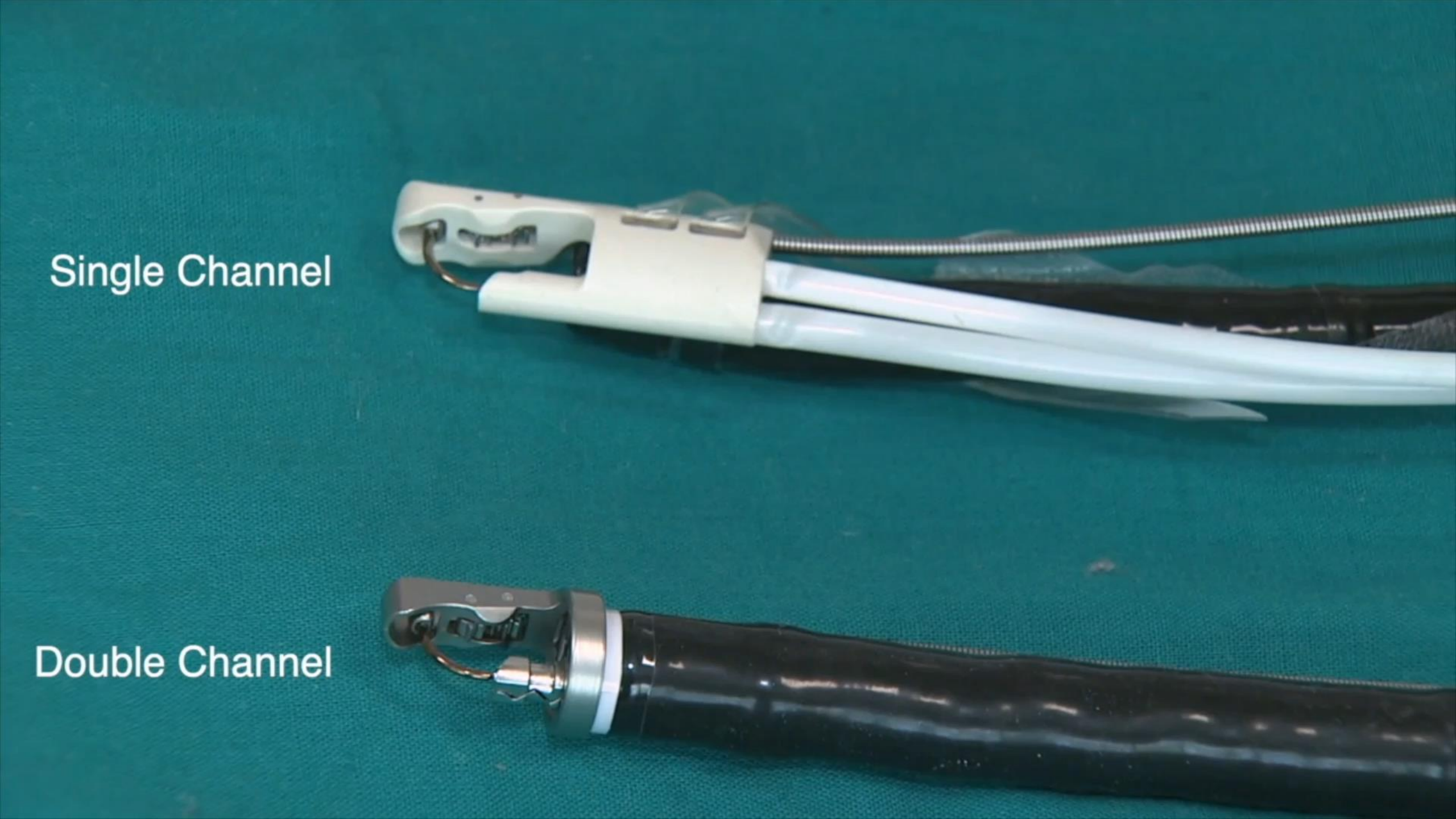
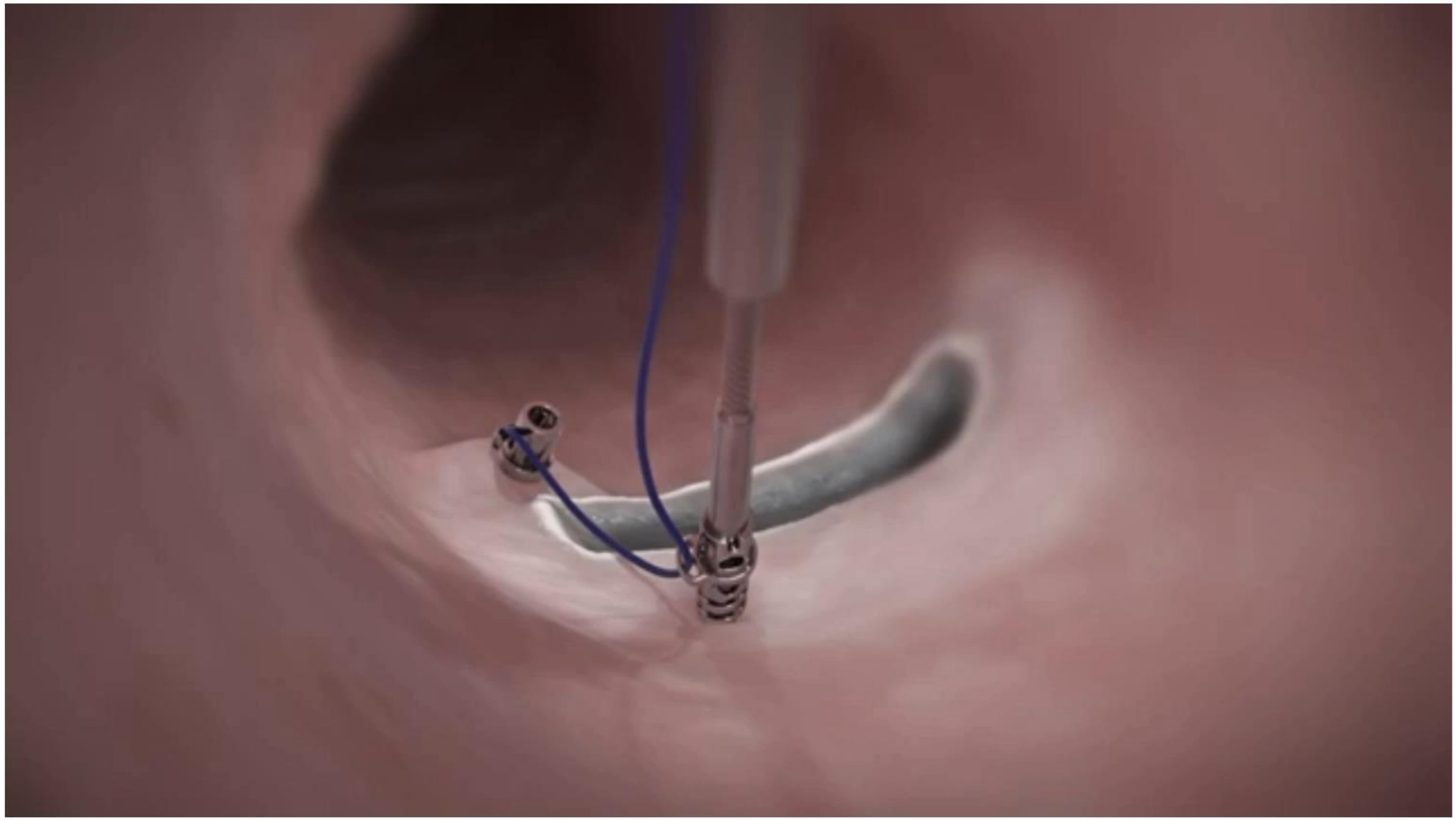
Disclosures



Apollo Endosurgery, USA	Consultant
Madrid International Bariatric Endoscopy Training Academy	Co-Director
Academy of Endoscopy, USA	Trainer and Treasurer


Single Channel
Double Channel

X-Tack Endoscopic Closure

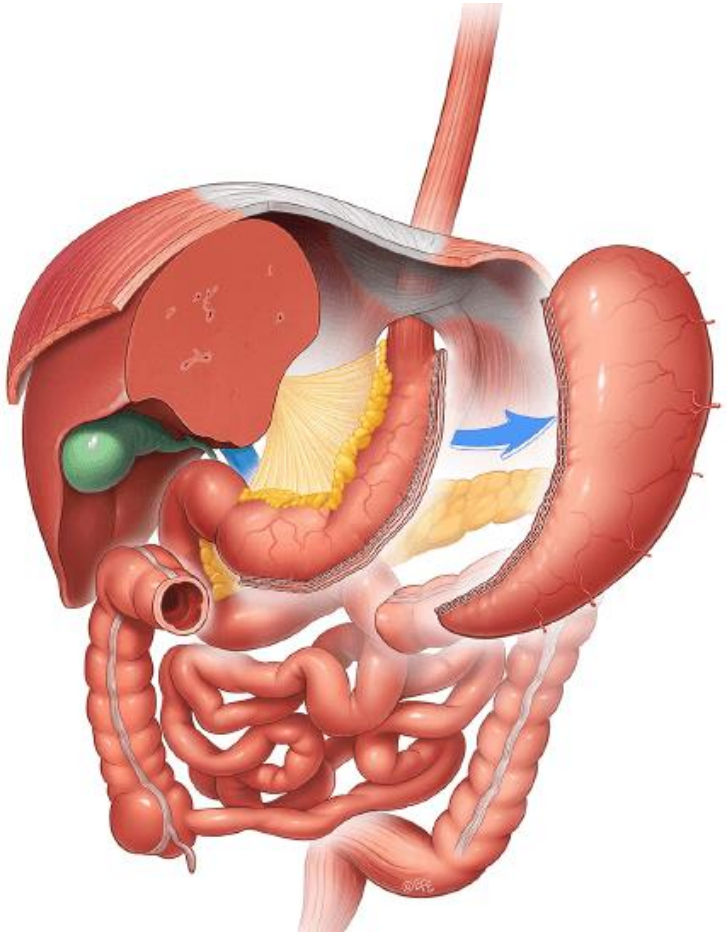


Complications and Endoscopic Suturing

- Bariatric surgical complications - role of endoscopic suturing
- Complications arising out of endoscopic suturing

Bariatric Surgery

Sleeve Gastrectomy

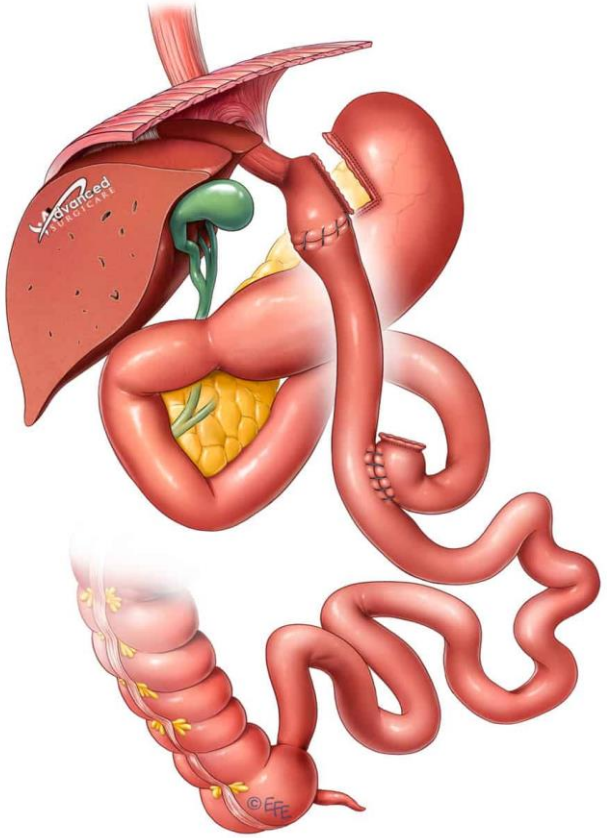


TBWL % (5 years)	22.5%
Early Complications (<30 days) Minor Major	 7.4% 5.8%
Late Complications (>30 days- 5 years) Minor Major	 10.7% 8.3%

Sleeve Pass RCT, JAMA 2018
Sleeve ByPass RCT, Lancet 2024

Bariatric Surgery

Roux-En-Y Gastric Bypass

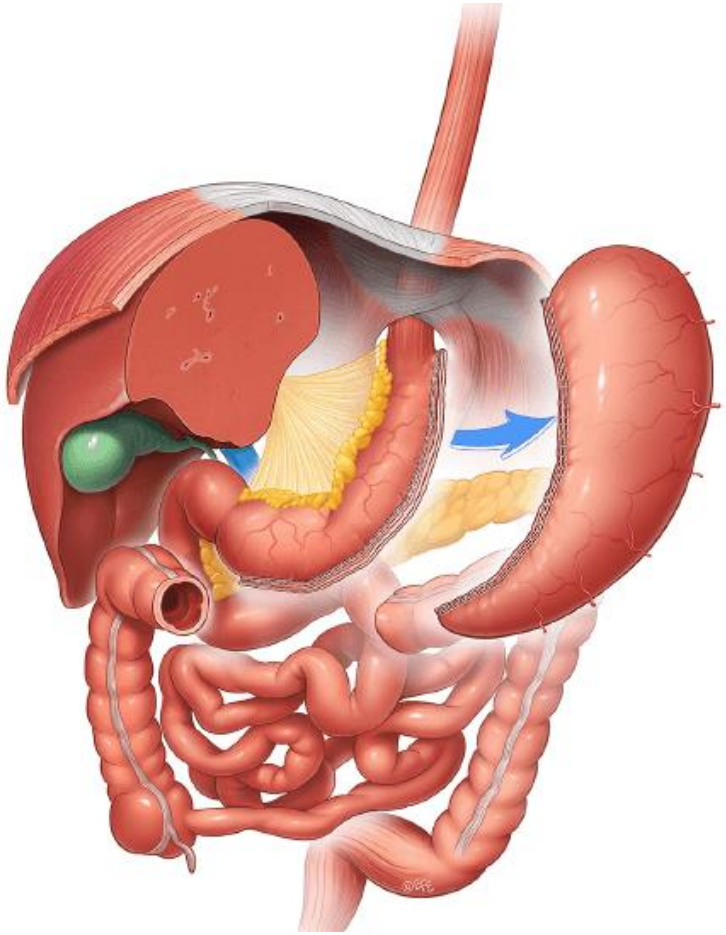


TBWL % (5 years)	26.5%
Early Complications (<30days) Minor Major	 17.1% 9.4%
Late Complications (>30days- 5 years) Minor Major	 10.9% 15.1%

Sleeve Pass RCT, JAMA 2018
Sleeve ByPass RCT, Lancet 2024

Bariatric Surgery

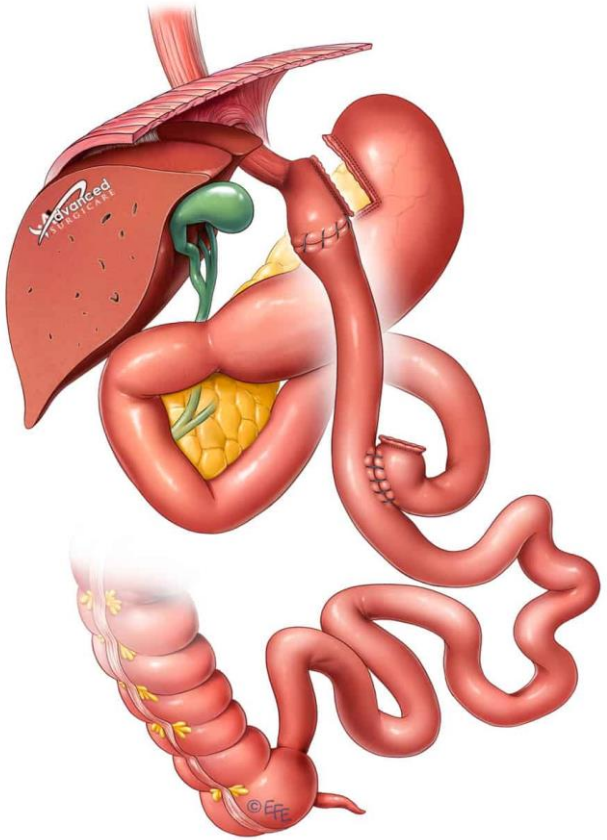
Sleeve Gastrectomy



- Gastric stenosis (0.7-4%)
- Staple line leak and Fistula (0.7-1%)
- Peptic stricture

Sleeve Pass RCT, JAMA 2018
Sleeve BvPass RCT, Lancet 2024

Complications with Bariatric Surgery



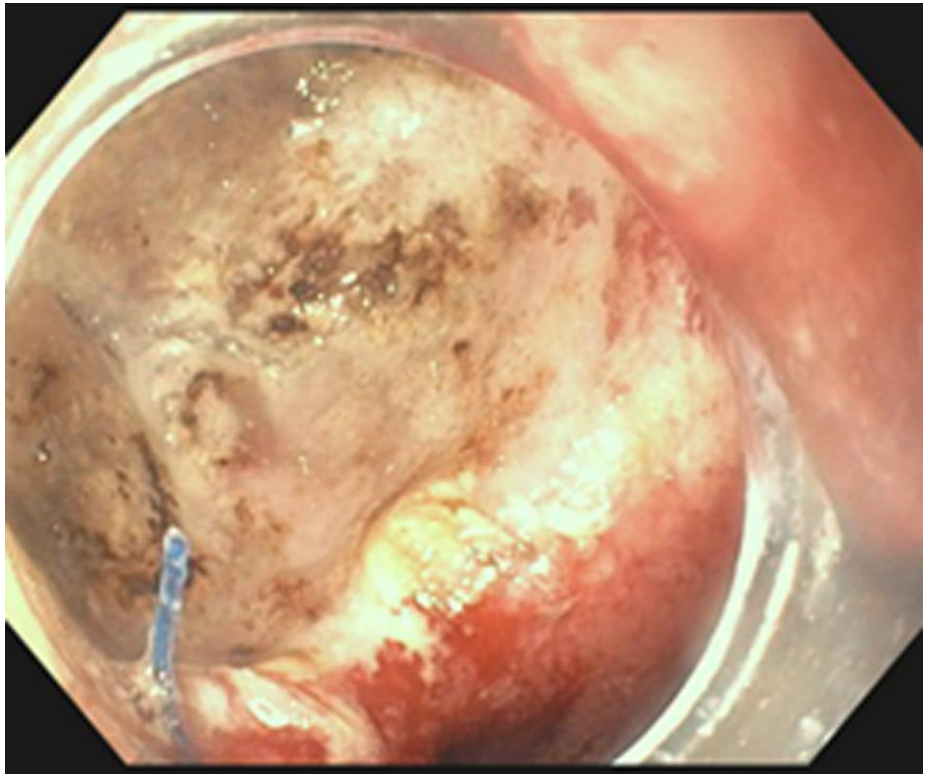
- Marginal Ulceration (3-7%)
- Anastomotic strictures (0.3-0.5%)
- Anastomosis leak (0.5-5%)
- Dumping syndrome (0.5%)
- Weight regain (15-30%)

Basaran et al. Int Jnl Obesity 2024
Abu Dayyeh et al. Gastro Clin North Am 2023

Marginal Ulcers

Risk factors

- NSAIDs
- DM
- H.Pylori
- Pouch size and foreign body reaction
- Smoking
- Alcohol
- G-G Fistula

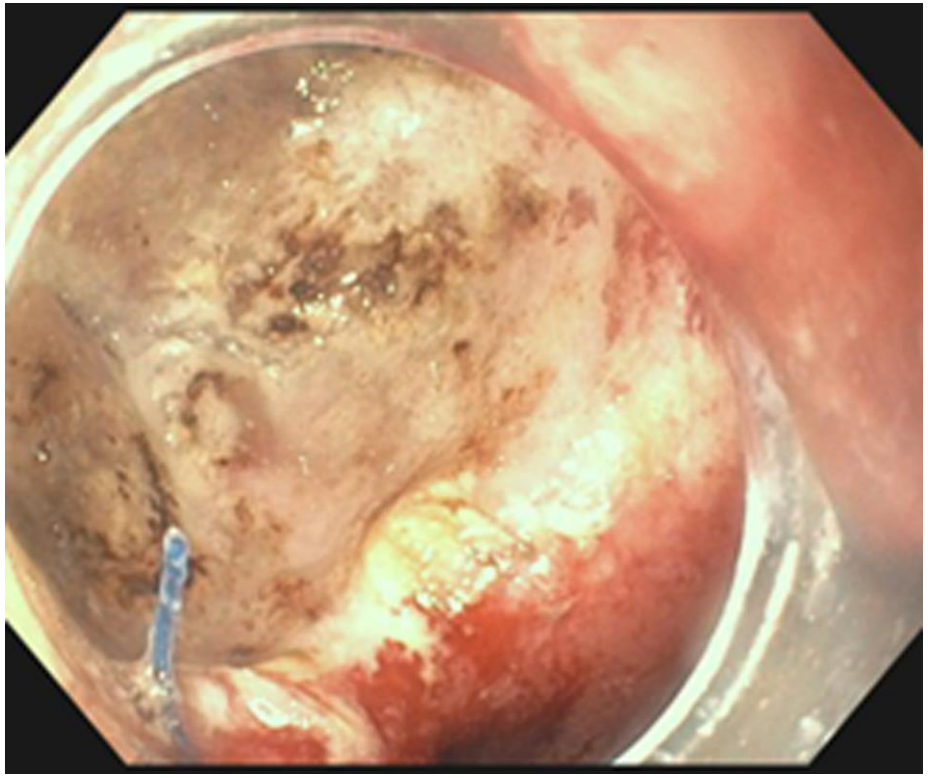


Kerbage VGIE 2023

Marginal Ulcers

Treatment

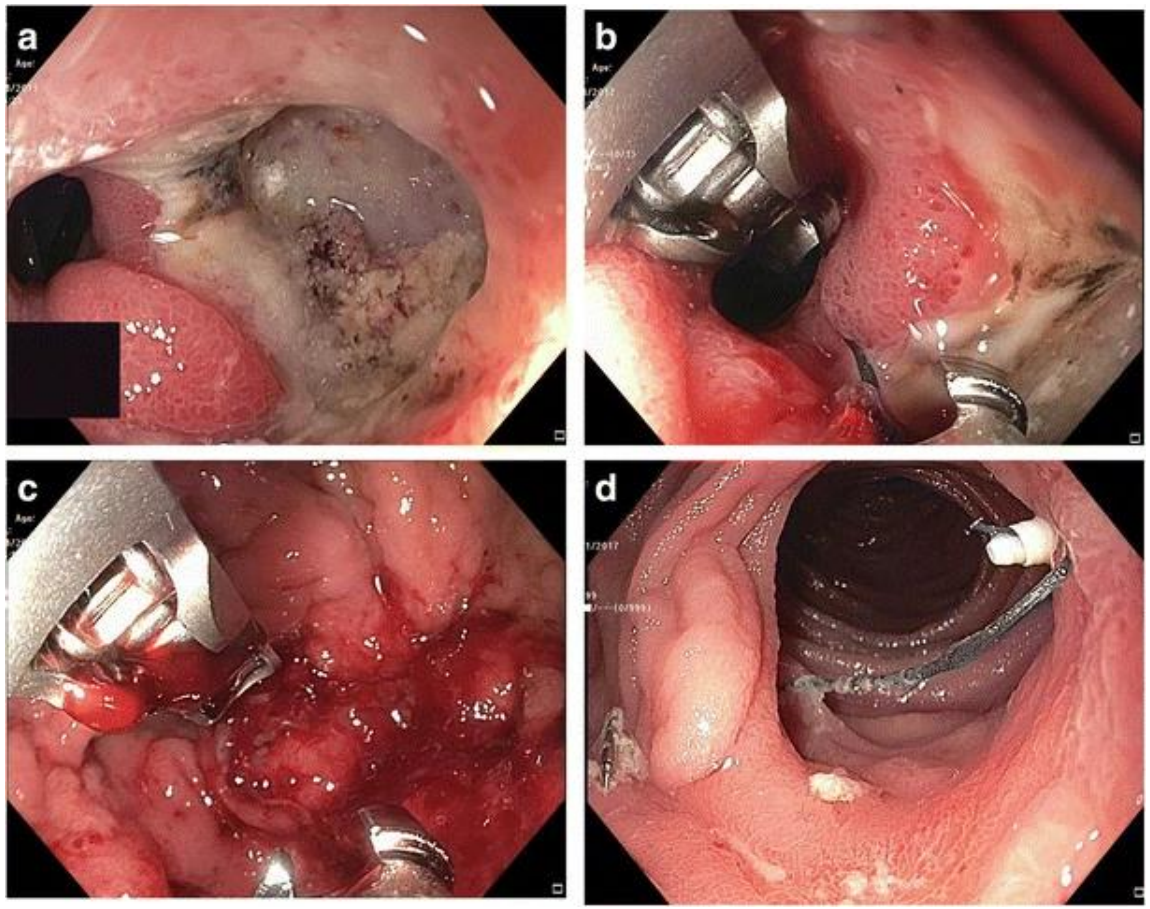
- PPI ad Sucralfate
- Removal of foreign body
- Manage risk factors



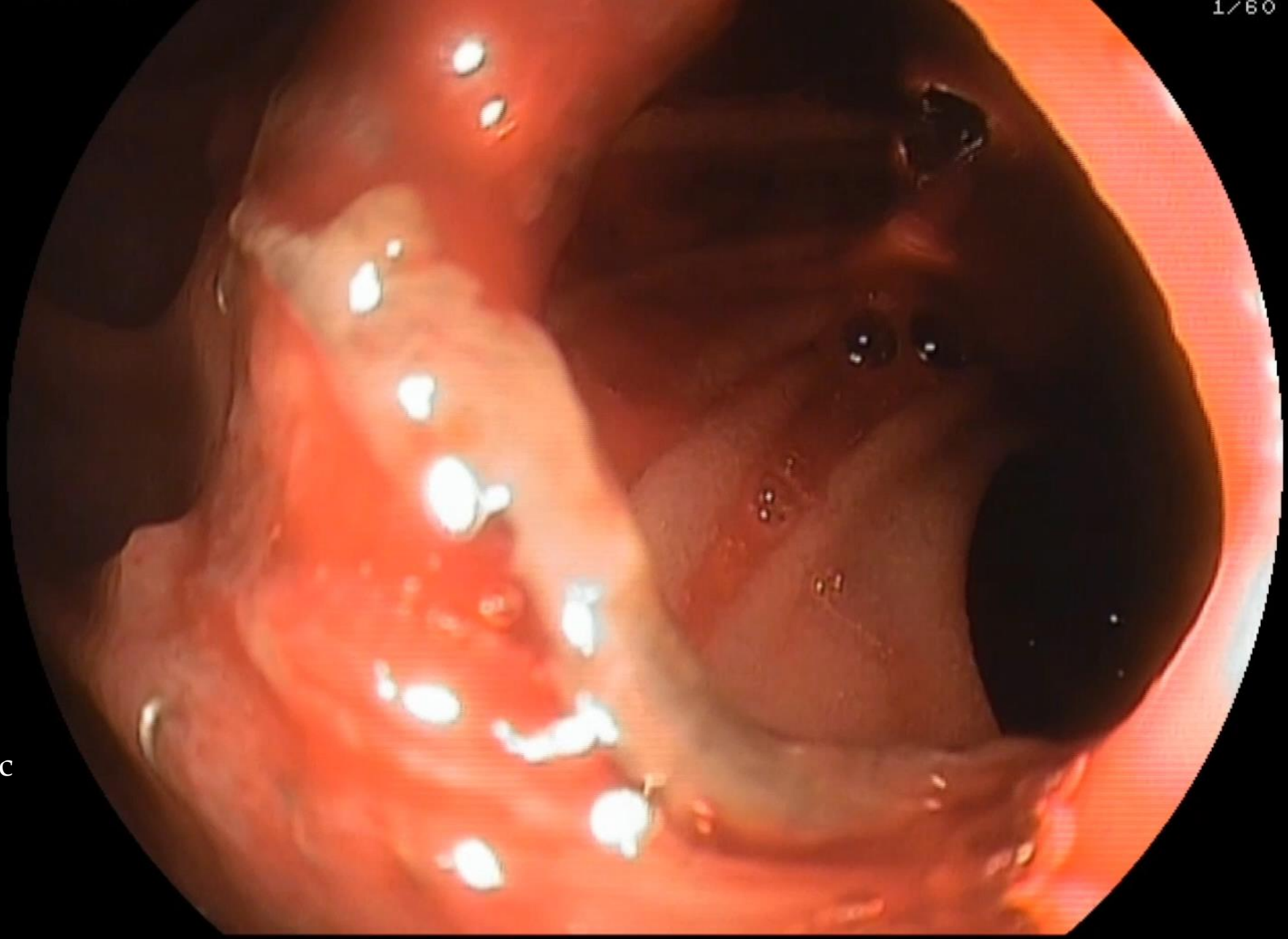
Kerbage VGIE 2023

Refractory Marginal Ulcers

- Endoscopic suturing
- Endoscopic stenting
- Surgery



Barola et al. Ob Surg 2018

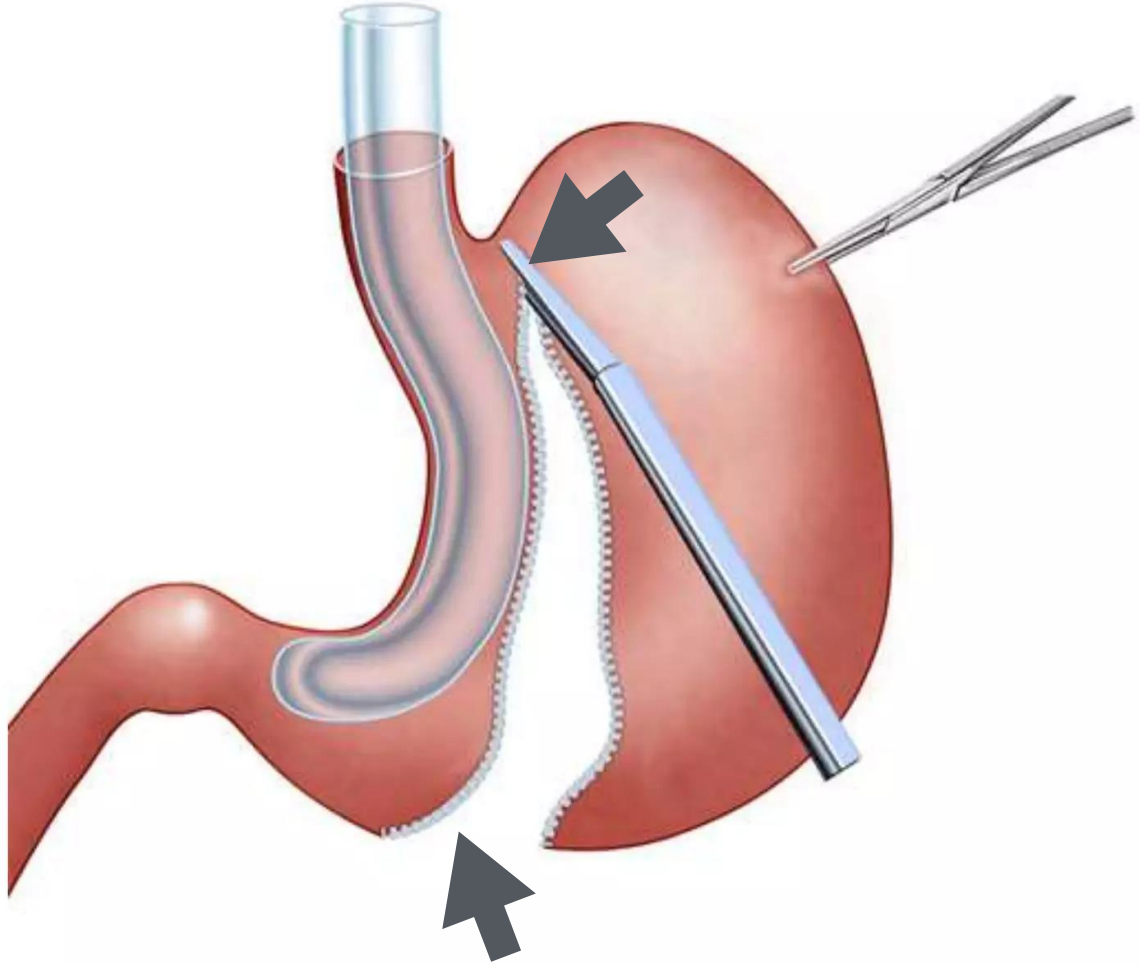


Anastomotic bleeding

Sleeve Stenosis

- Edema and ischemia (early post-op)
- Torsion or Kinking along staple lines

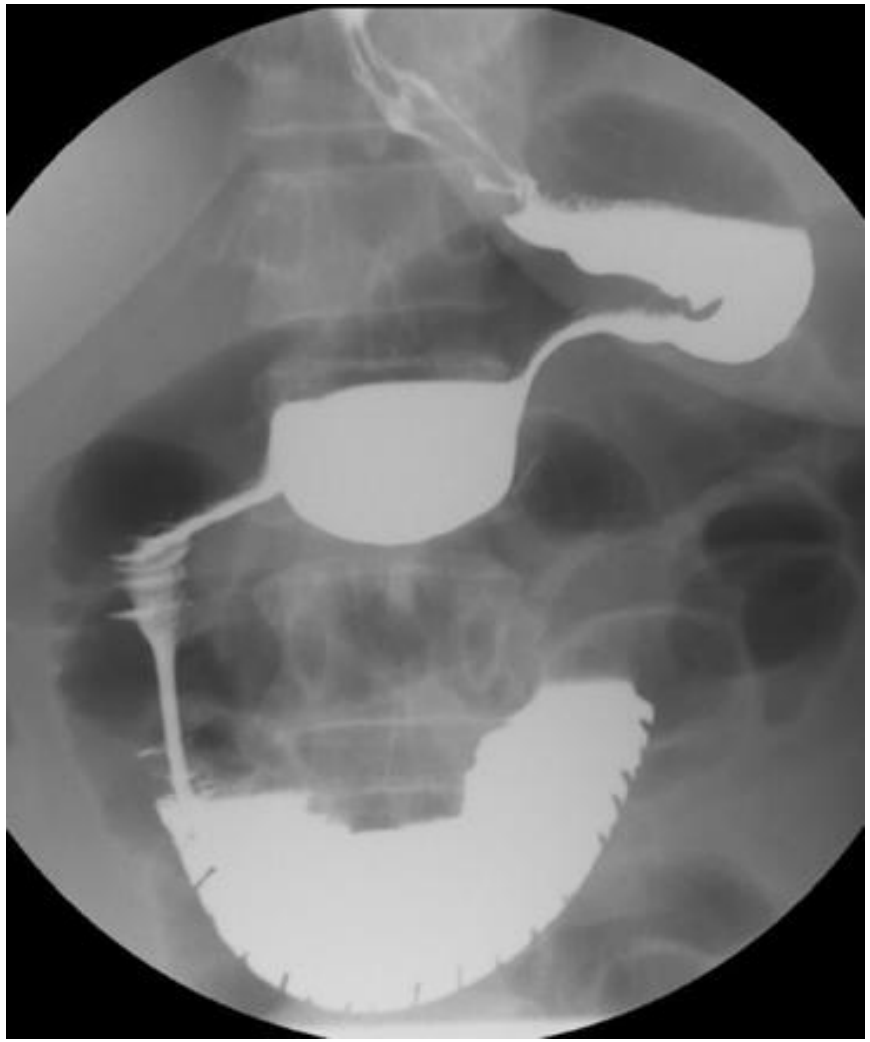
- A combination of Barium studies and endoscopy is useful to characterise



Sleeve Stenosis

- Correlate with patient symptoms
- Sometimes endoscopy can pass- does not exclude stenosis
- Delineate the location (proximal, mid, distal)

Avoiding excessive lateral traction on the greater curvature during stapling during surgery can prevent stenosis

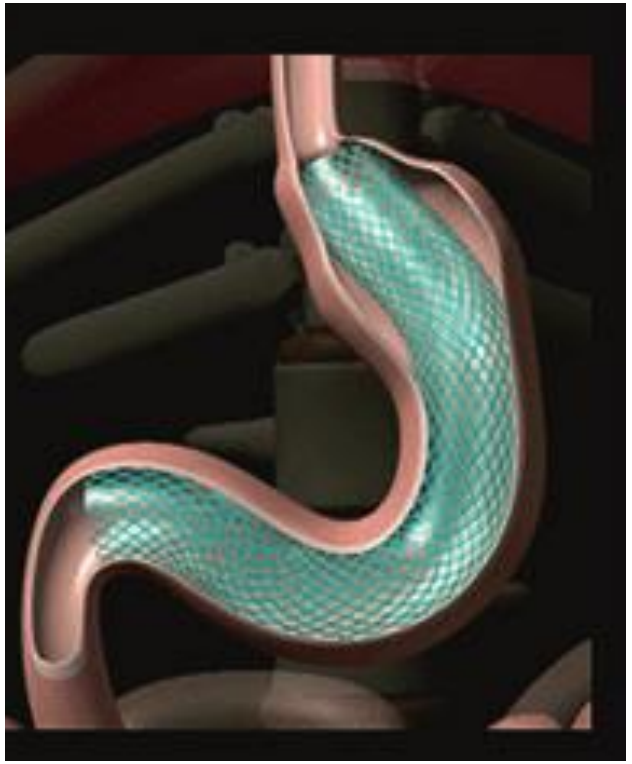


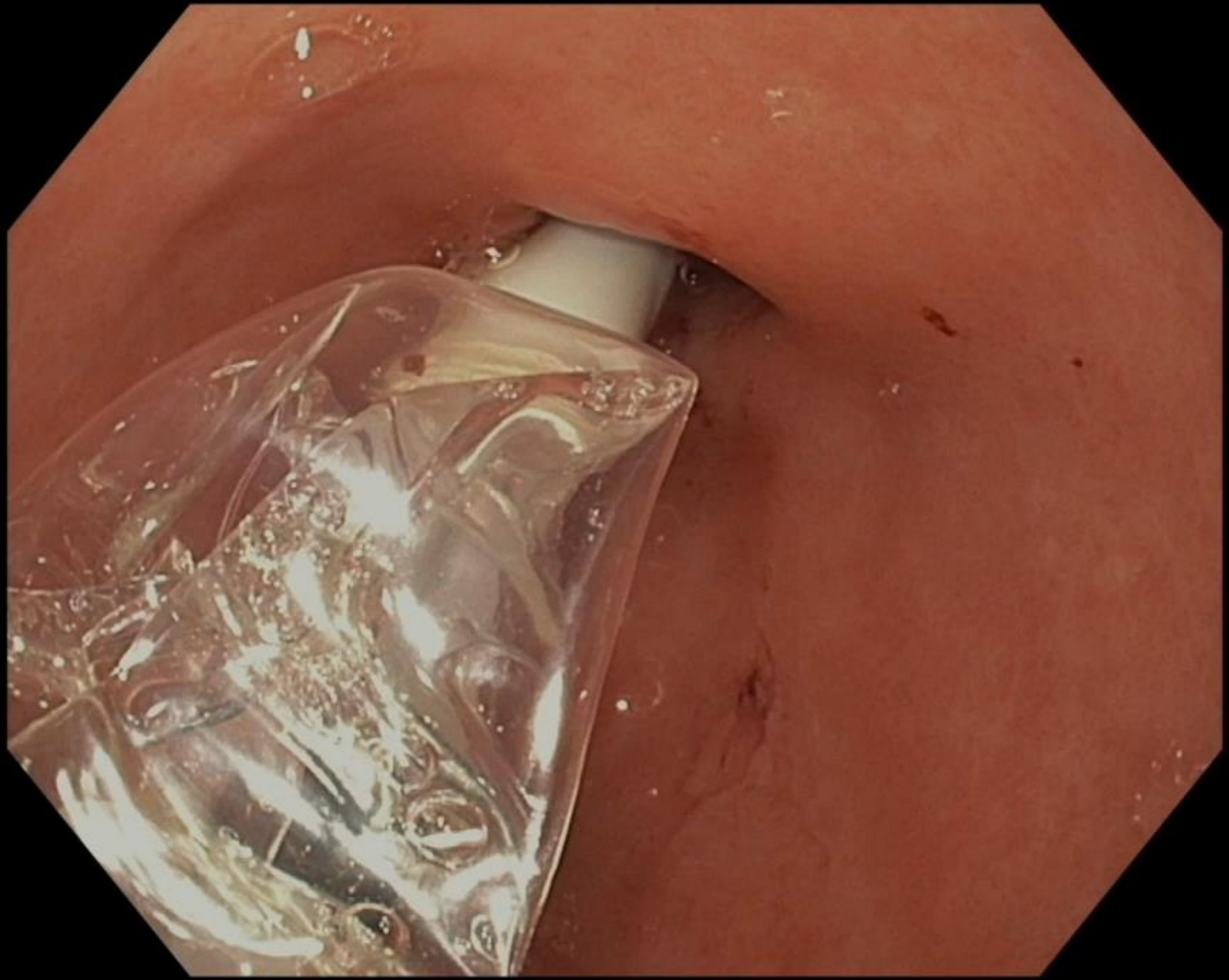
Endoscopic Management

CRE Balloon

Rigiflex Achalasia Balloon

Stenting





Endoscopic Management

CRE Balloon

Rigiflex Achalasia Balloon

Overall Success	**76%**
Proximal stenosis	90%
Distal stenosis	70%
Late stenosis (>3 months)	61%

Chang et al. GIE 2019

ID:
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Sex: Age:
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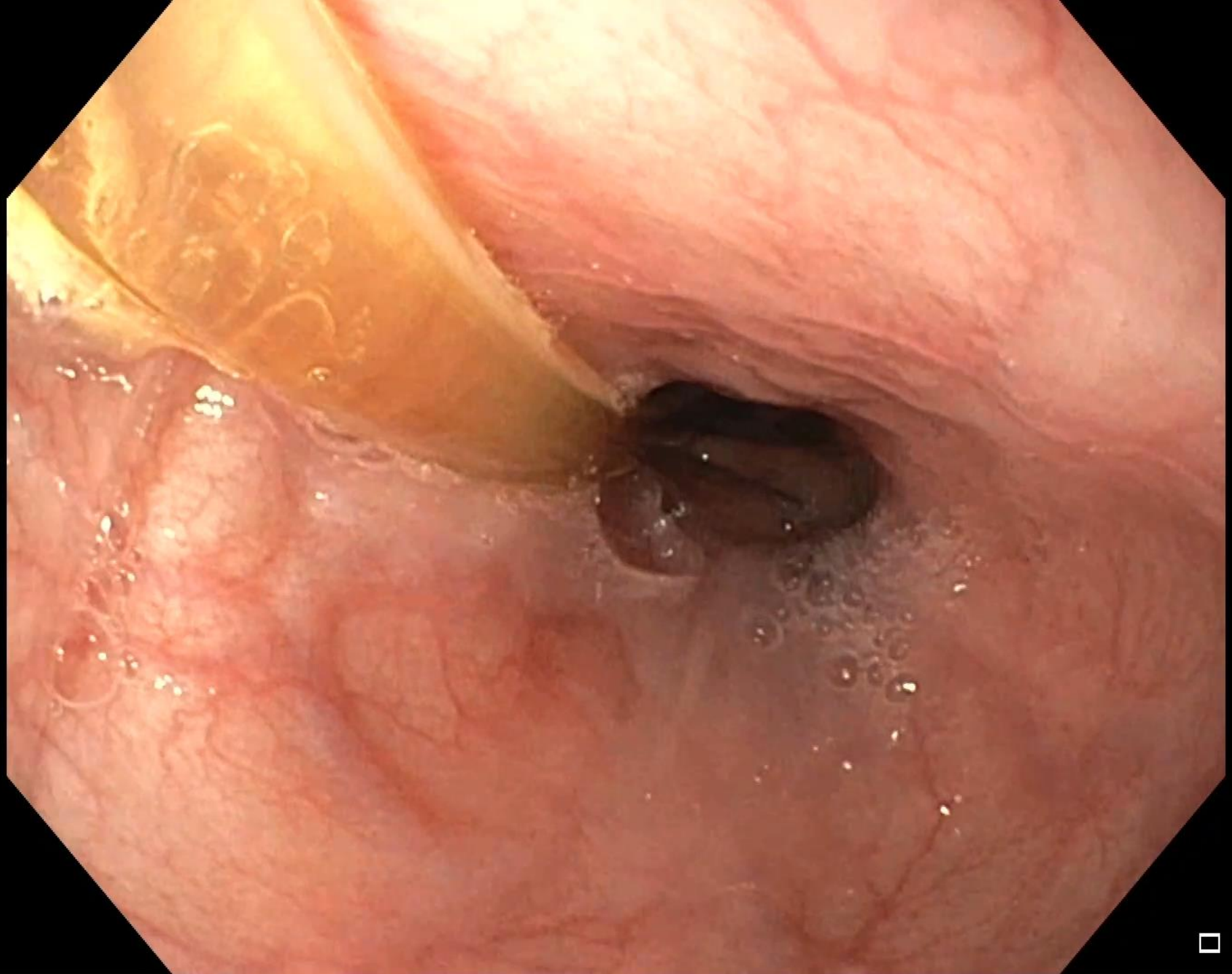
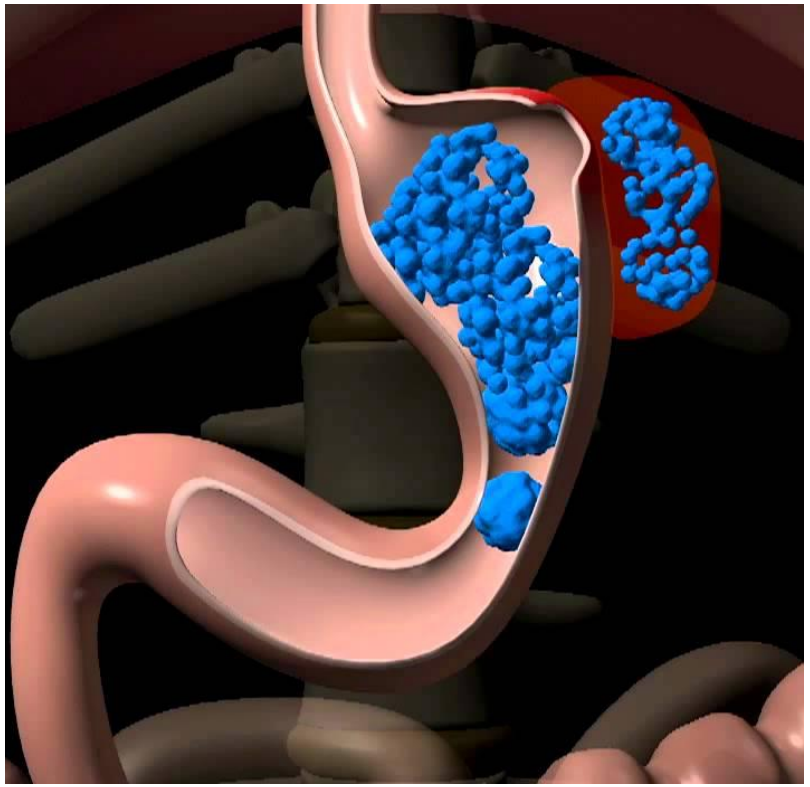


Staple Line Leak

- Proximal stomach- immediately below angle of his
- Ischemia due to take down of short gastric vessels
- Thinner wall of fundus
- Downstream stenosis
- High intra-luminal pressure
- Non compliant stomach



Courtesy: Marchesini

OTSC closure of Leak/Fistula

	Endoscopic success	Endoscopic failure
Age (years)	40 (21–62)	34 (19–62)
Female gender	8 (57%)	6 (54%)
BMI	44 ± 5	45 ± 5
Time from LSG to leak diagnosis (days)	32	30
Time from leak to OTSC (days)	18	25
Defect size (mm)	8	9

Success with OTSC alone -31%

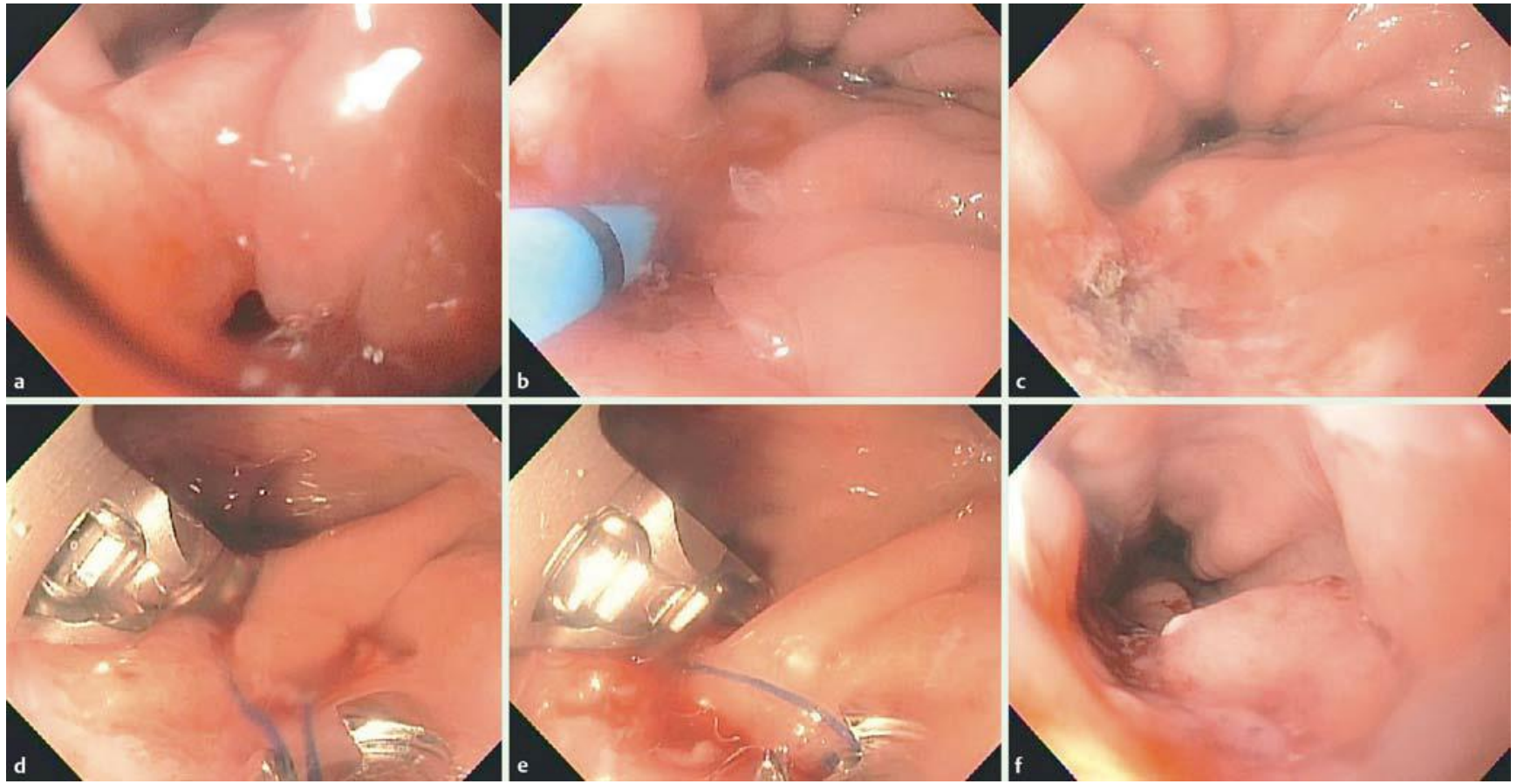
Mizrahi et al. Obes Surg 2020

OTSC closure of Leak/ Fistula

- Technical factors- unable to get perpendicular views
- Unhealthy tissue with untrained collection
- Poor nutrition
- Failure to address the high intraluminal pressure

Mizrahi et al. Obes Surg 2020

Safety and efficacy of fistula closure by endoscopic suturing: a multi-center study



- Technical success-100%
- Immediate clinical success- 100%
- 12 months closure- 22.4%

Mukewar et al . Endoscopy 2015

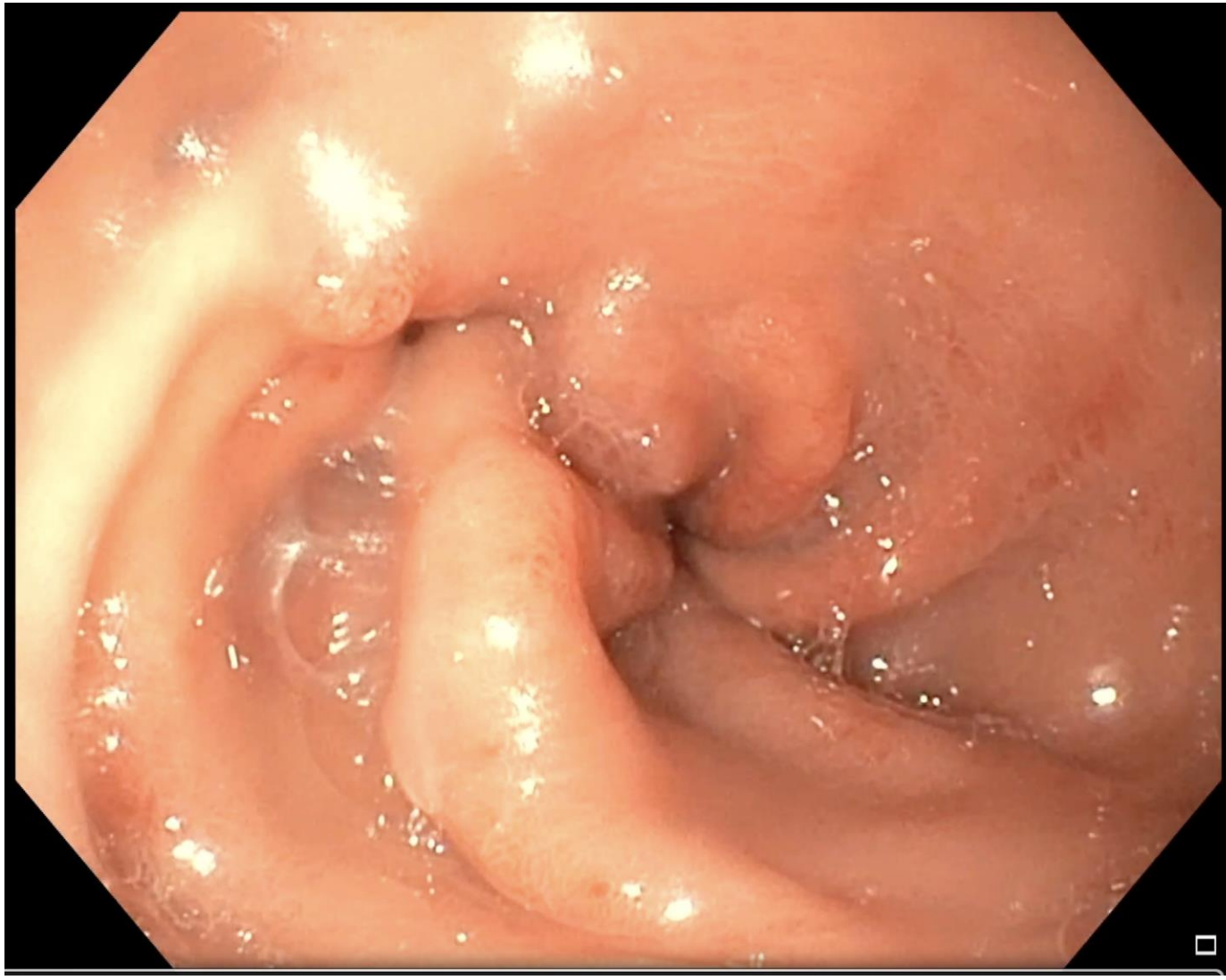
Management of Leak

Diversion therapy

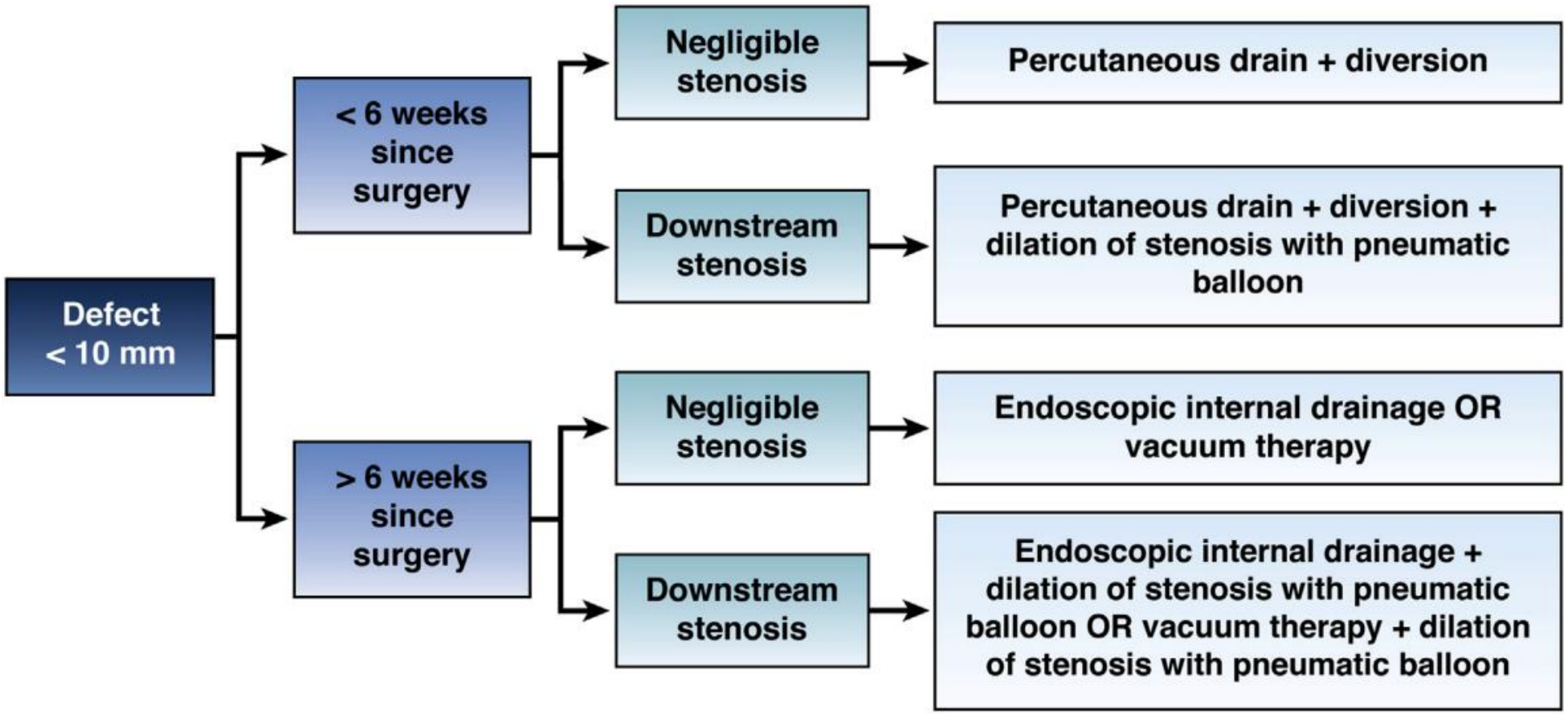
- FCSEMS + Perc Drain
- PCSEMS + Perc Drain

Internal Drainage

- Pig-tail stent
- Septotomy
- Endo Vac

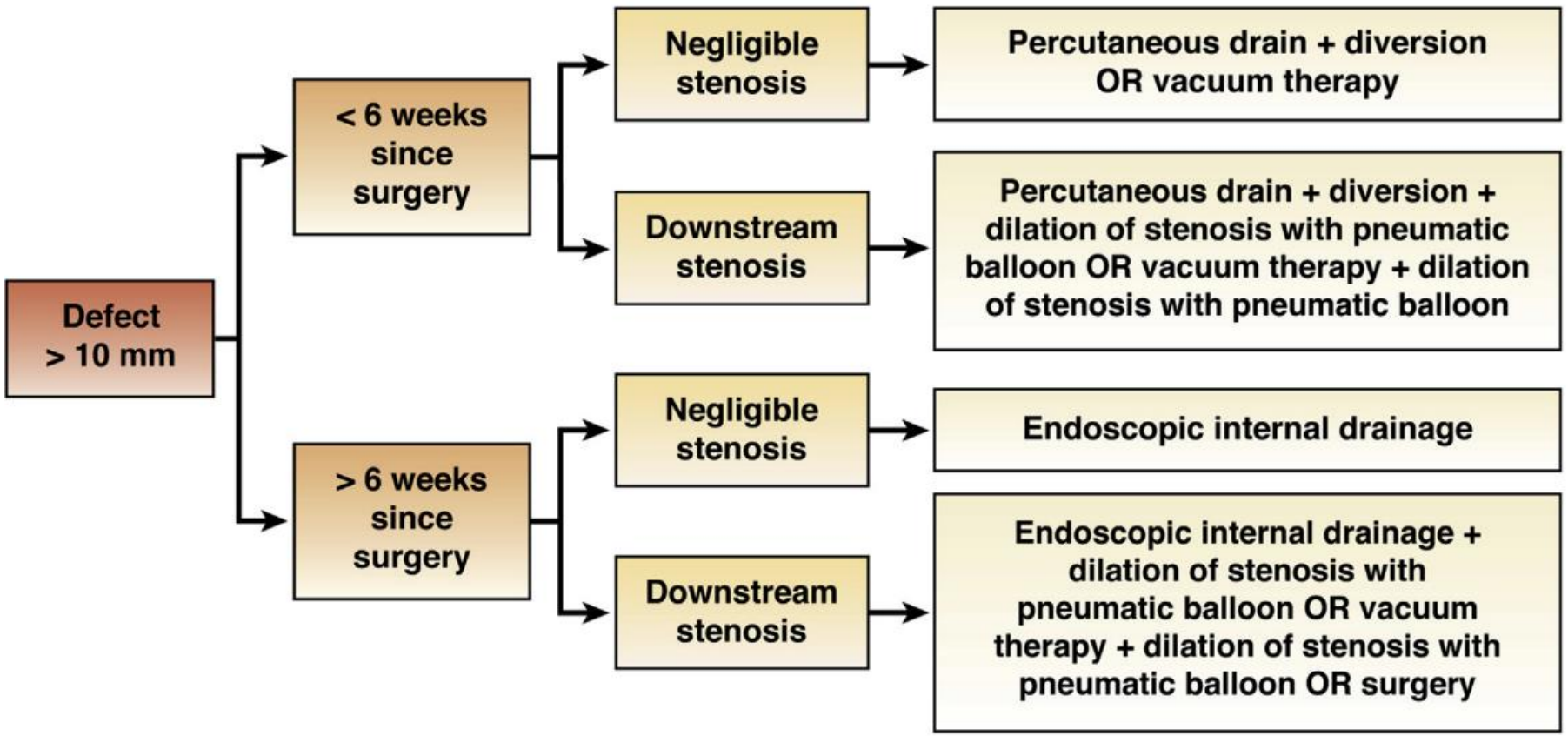


Management of Leak



AGA Update 2021

Management of Leak



AGA Update 2021

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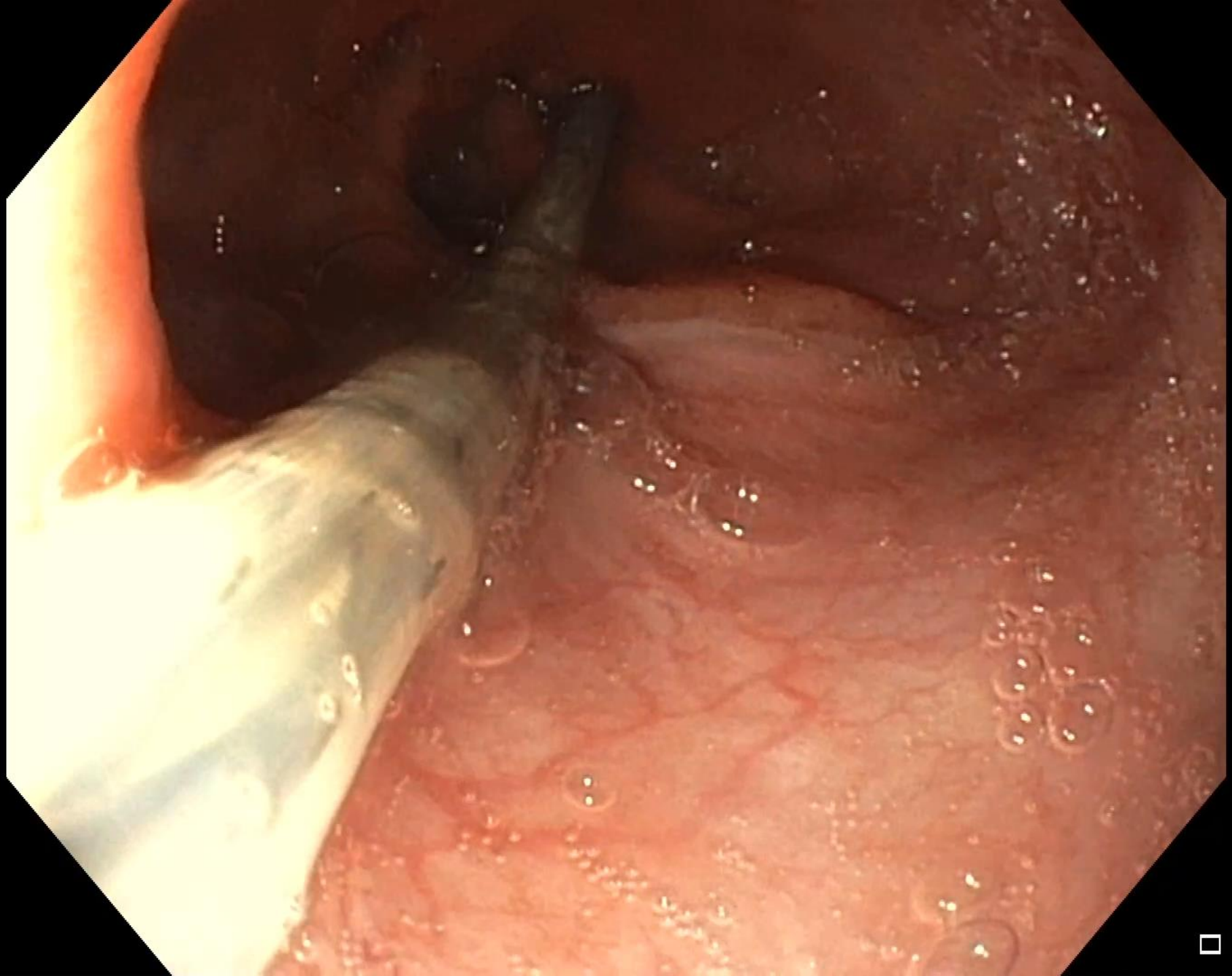
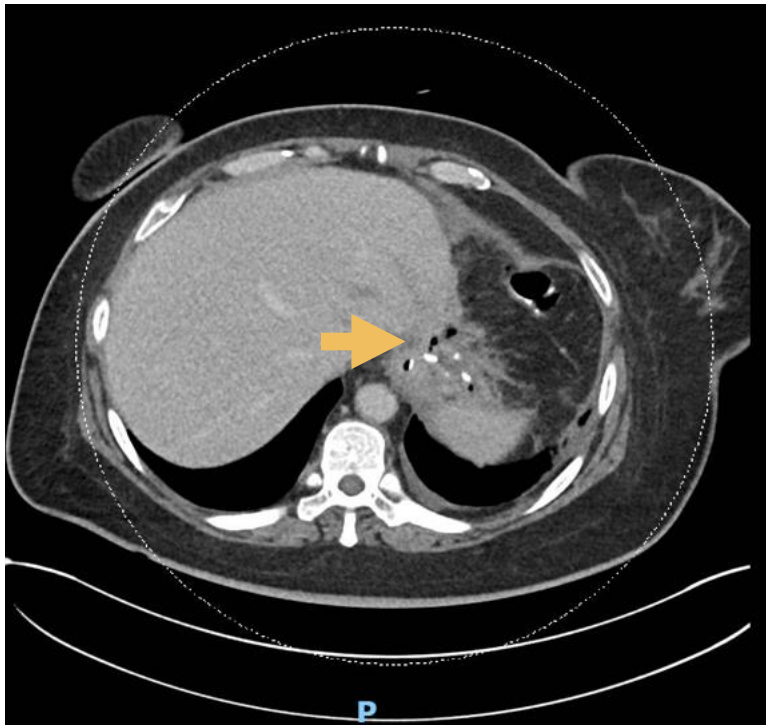
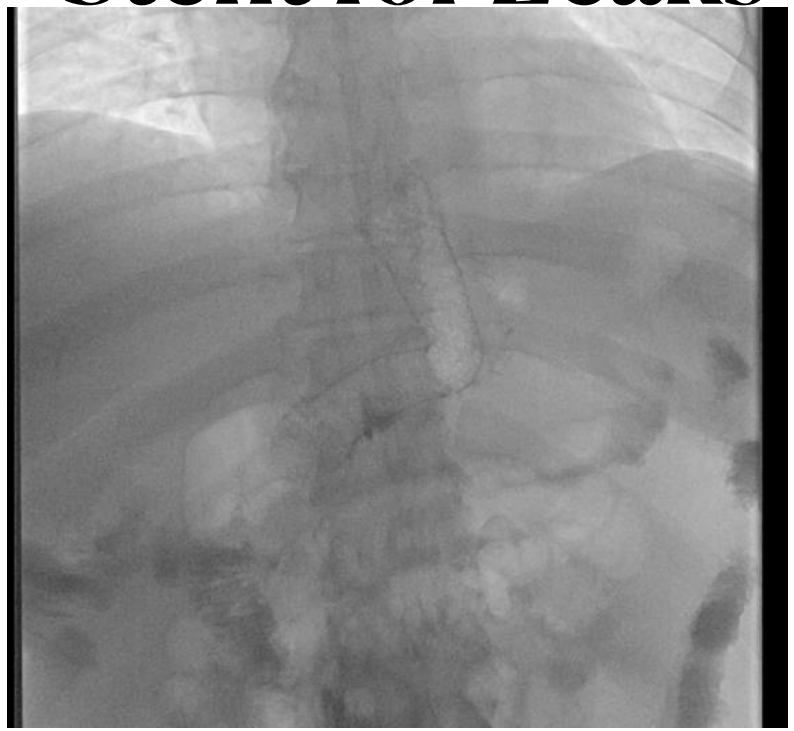
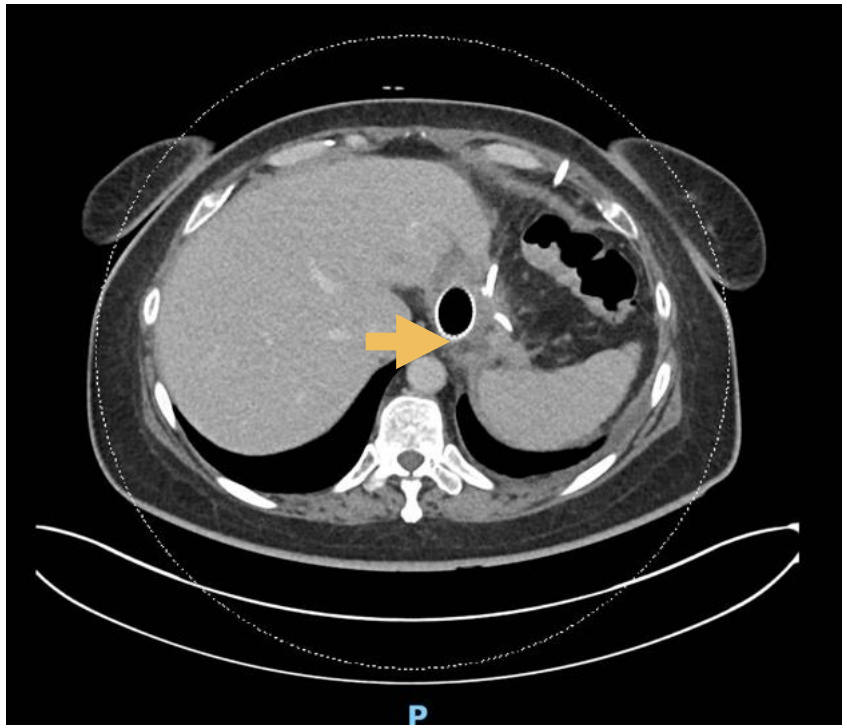


Stent for Leaks



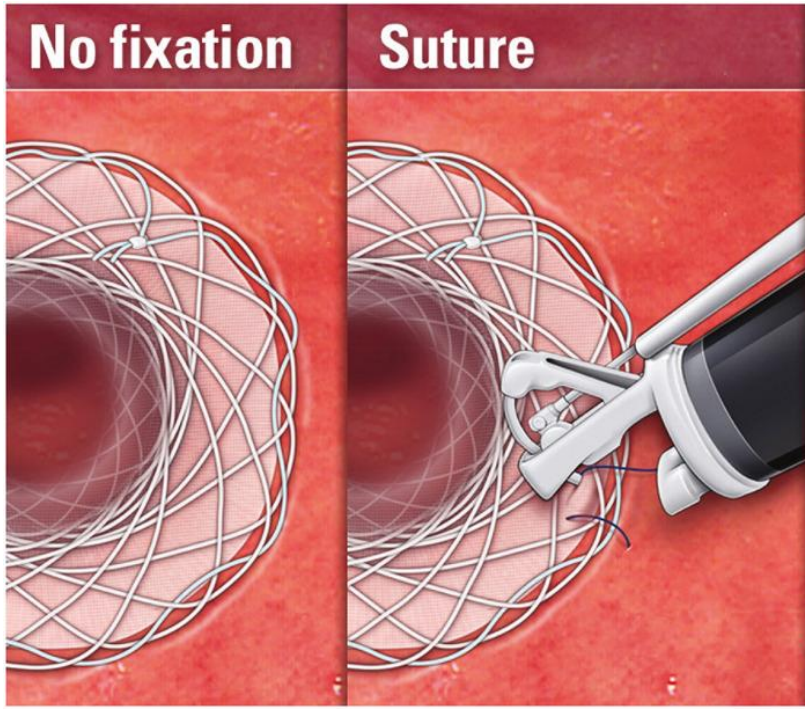


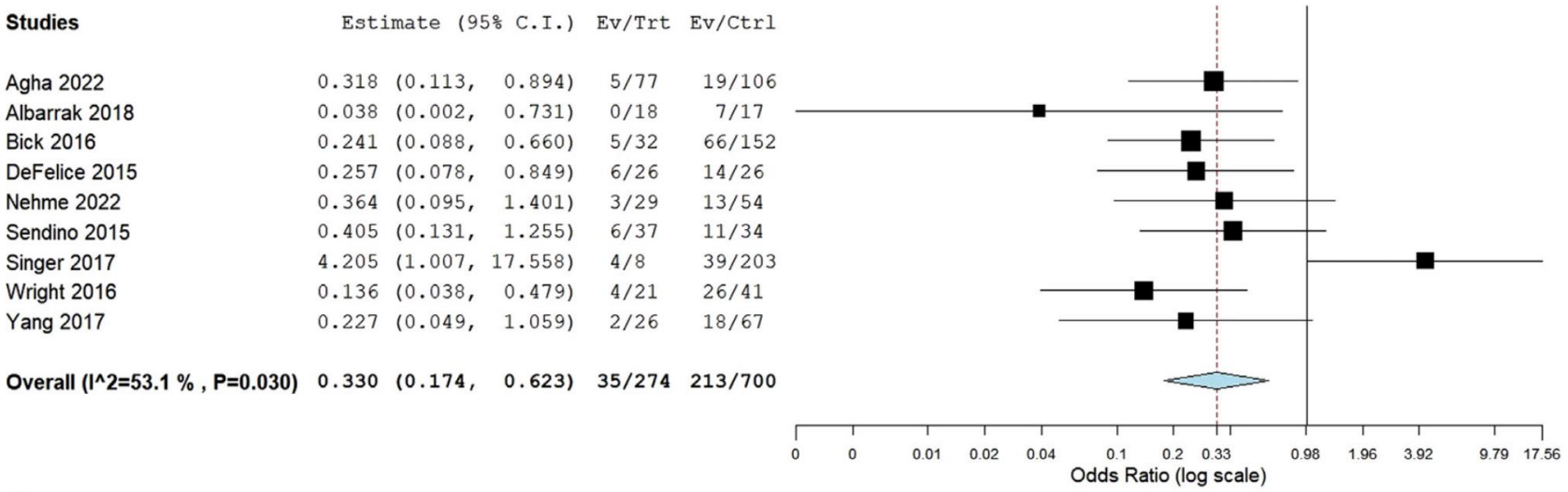


Leak closure rate	85.89% (95% CI, 82.52–89.25%)
Sent Dwell time	44 days
Migration rate	18.65% (95% CI, 14.32–22.98%)
Re-operation rate	13.54% (95% CI, 9.94–17.14%)

Hernandez et al. Obes Surg 2022

Stent Fixation with Endoscopic suturing

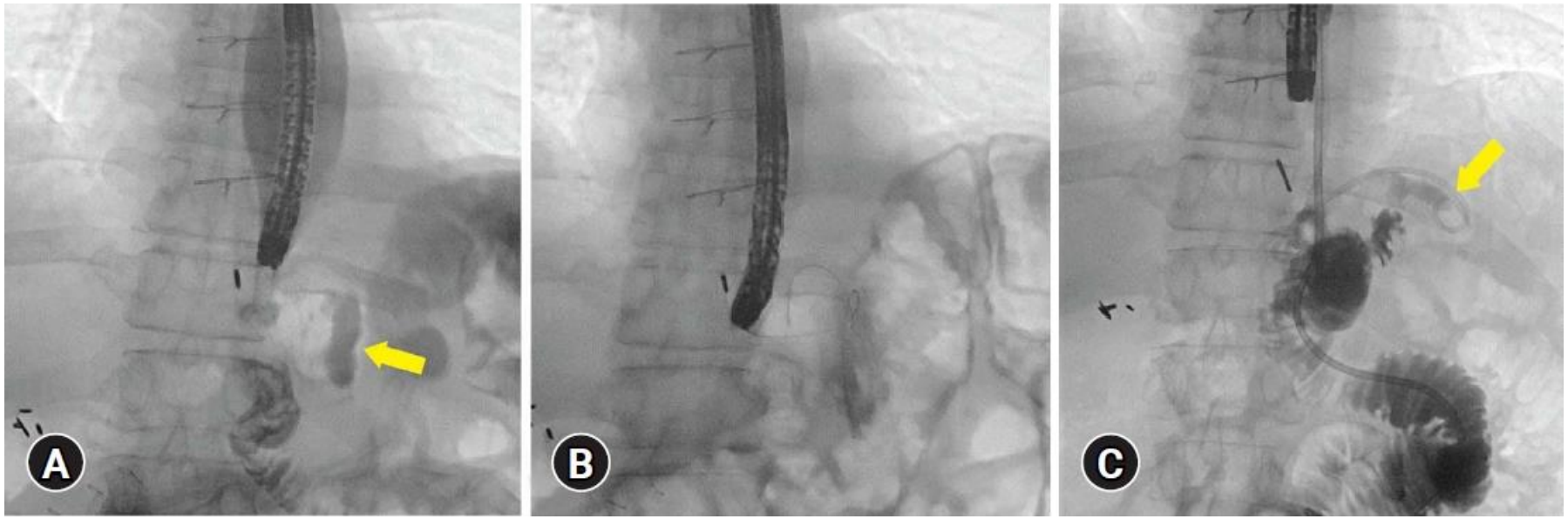




Gangway et al. TAGE 2024

Park et al. GIE 2022

Internal Drainage for Leaks

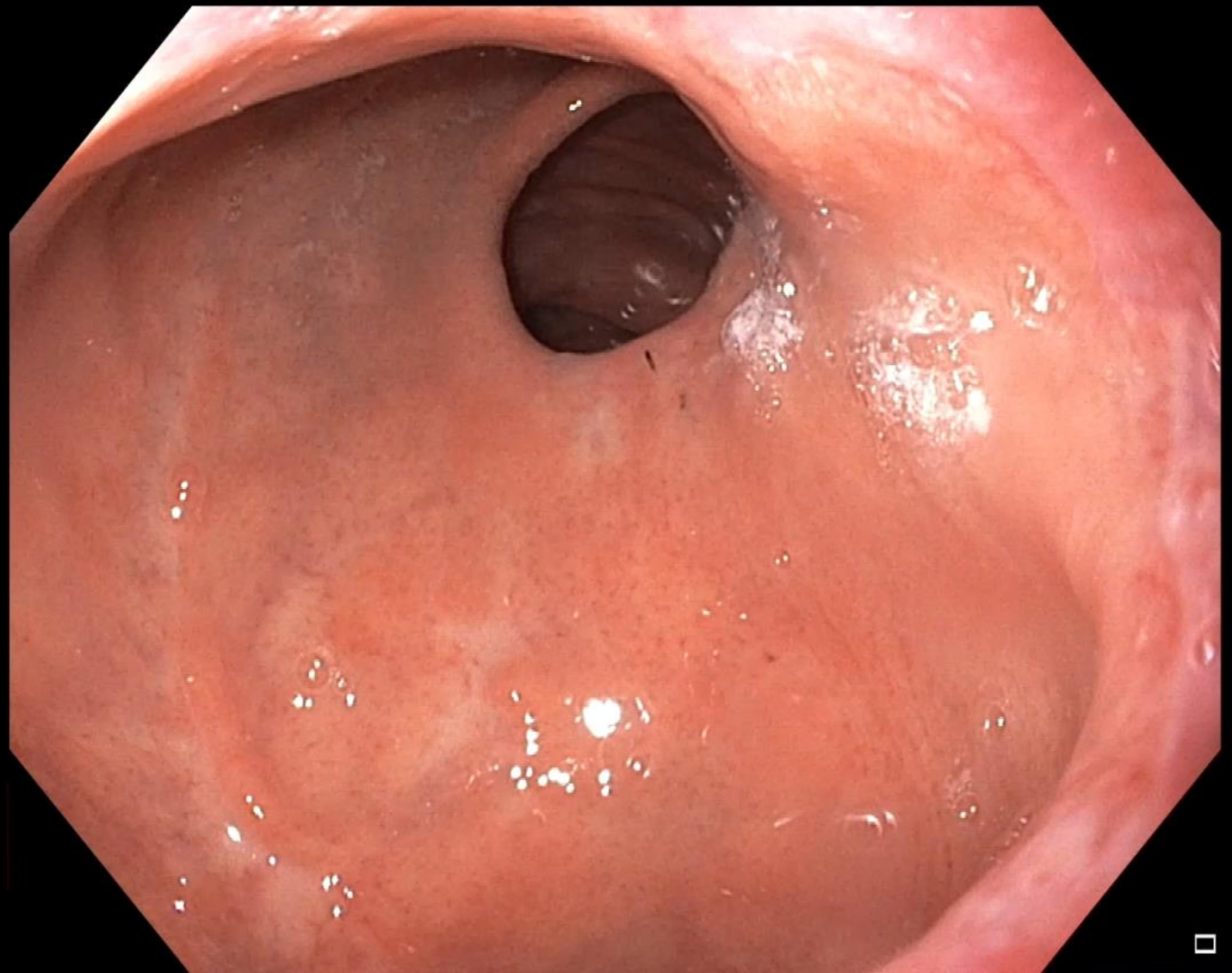


EID vs. Closure success rate	86% vs.63%
Failed closure -> EID	75%

Lorenzo GIE 2018

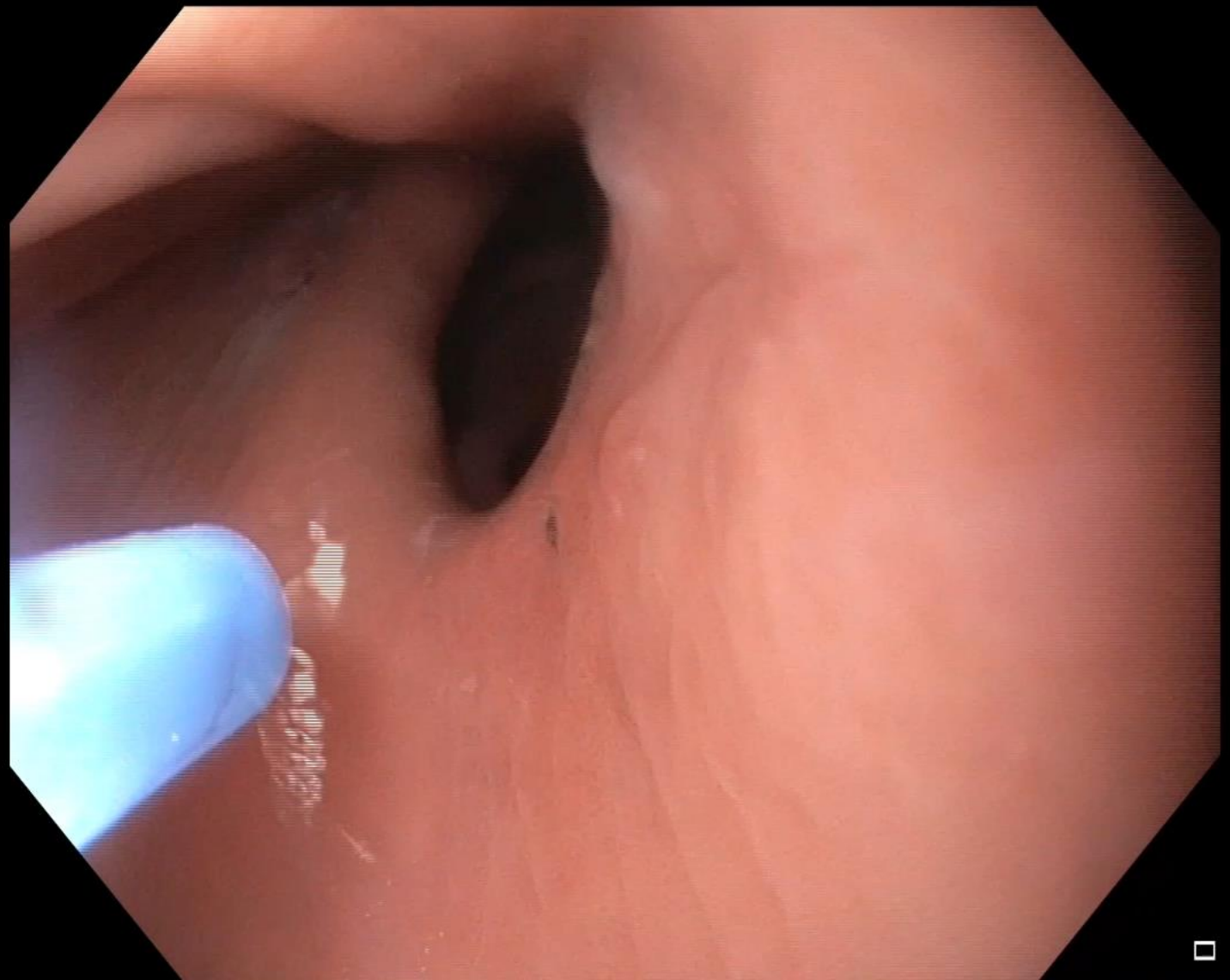
Dilated Gastrojejunal Anastomosis

- Dumping syndrome
- Weight regain



Dilated Gastrojejunal Anastomosis

- Forced APC 0.8 -1L, 70-80 watts
- %TBWL at 12 months -10%
- GJ stenosis-7%
- GI bleeding 2.8%



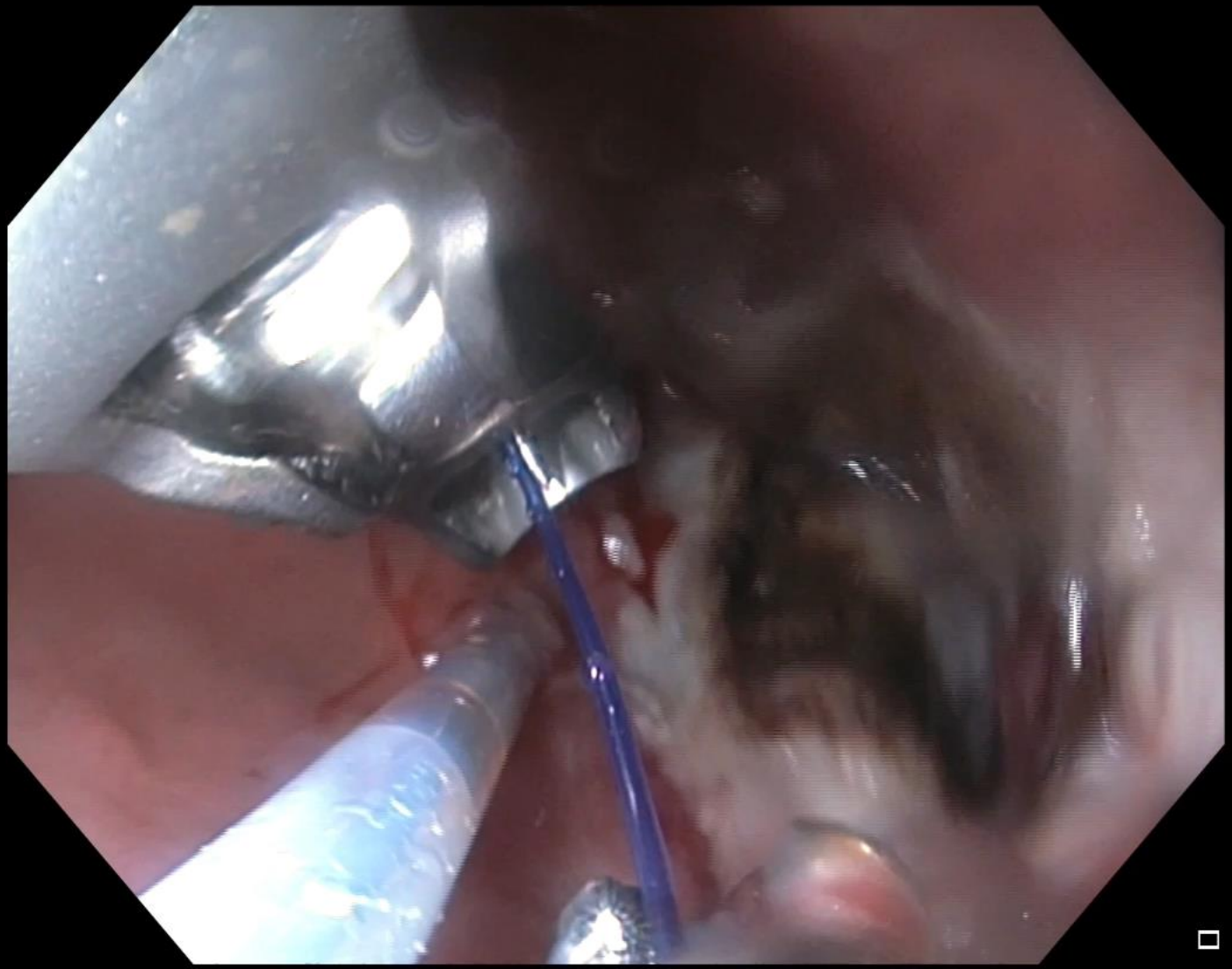
Jirapinyo et al. GIE 2020

Dilated Gastrojejunal Anastomosis

- TORE
- 30 mm —-> 9.5 mm
- 3 sutures

Weight stabilisation and dumping resolution

- 12 months- 98.2%
- 24 months- 91.4%
- 48 months- 75%



Lovis et al. Surg Endo 2024

Dilated Gastrojejunal Anastomosis

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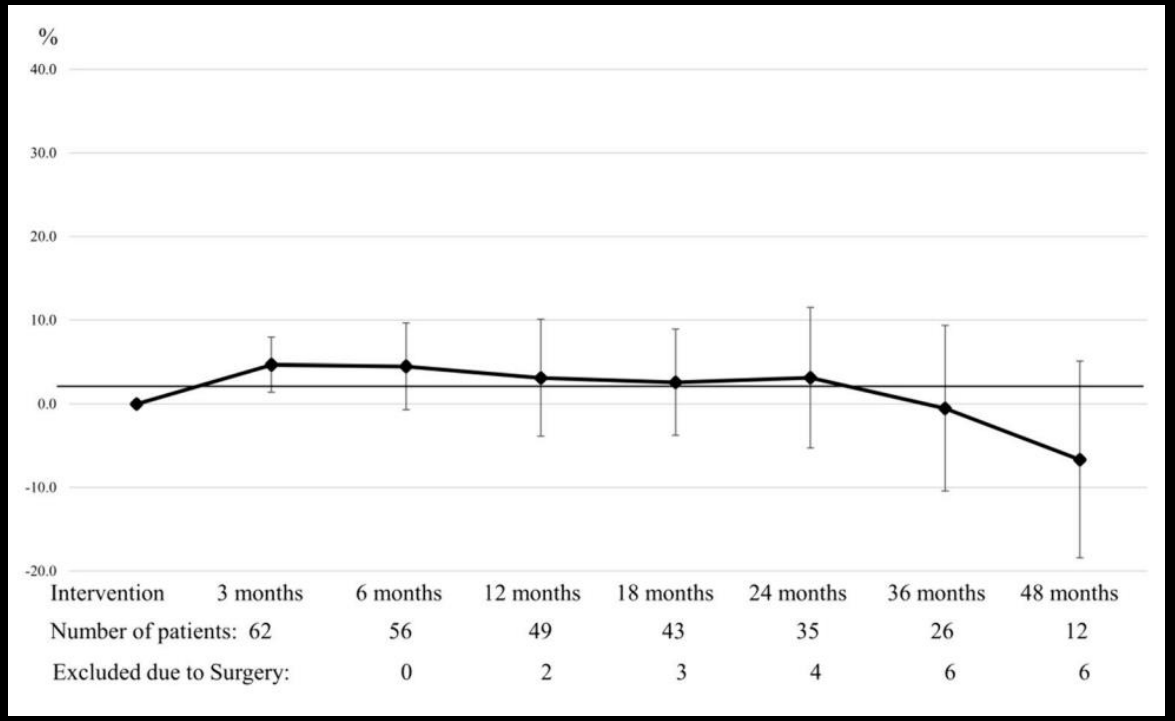
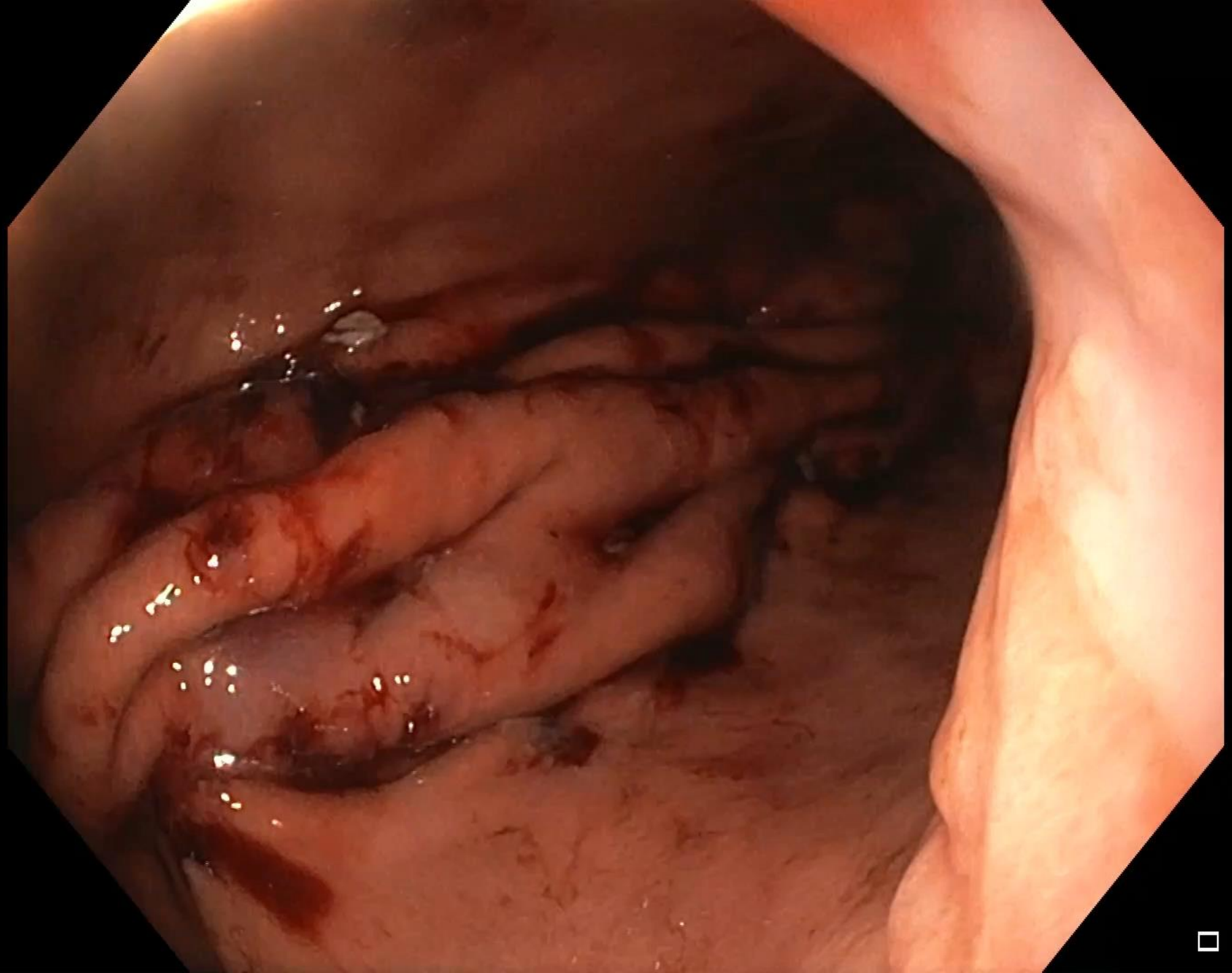


Jirapinyo et al. GIE 2020

Lovis et al. Surg Endo 2024

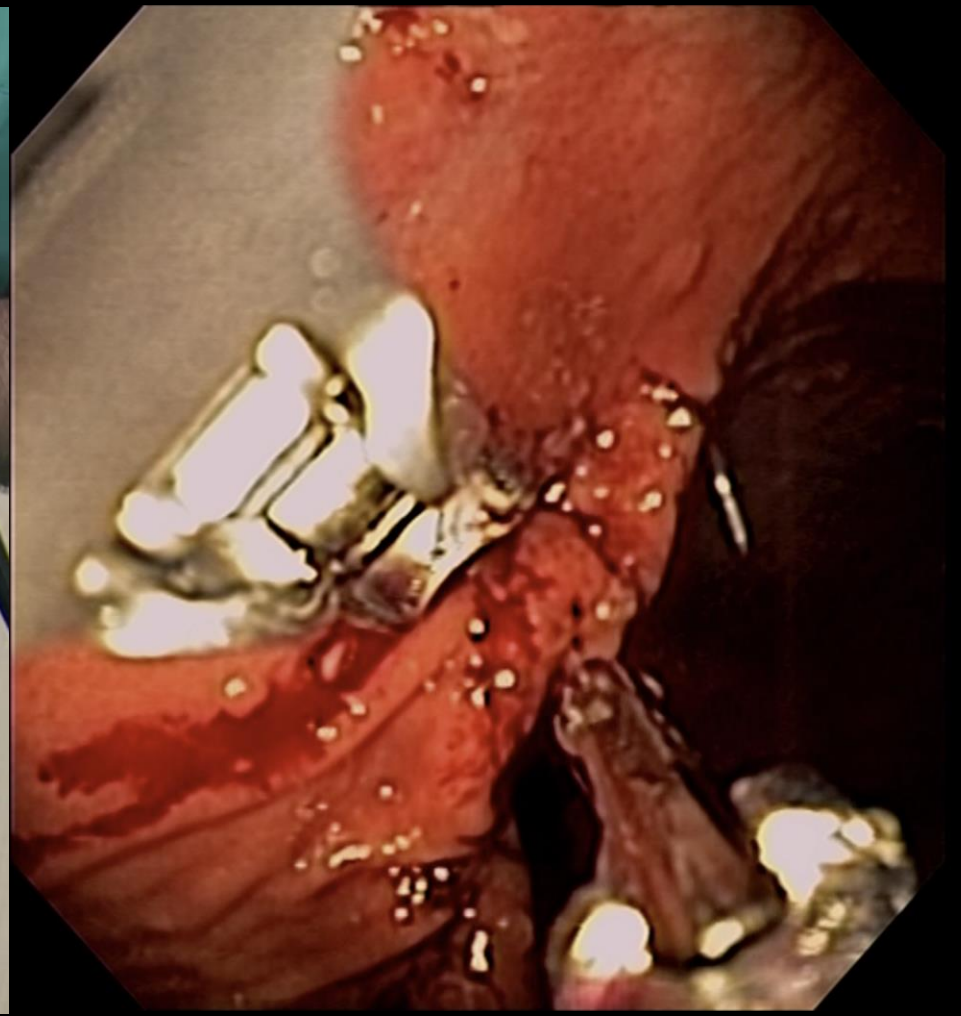
Complications From Endoscopic Suturing

Post ESG

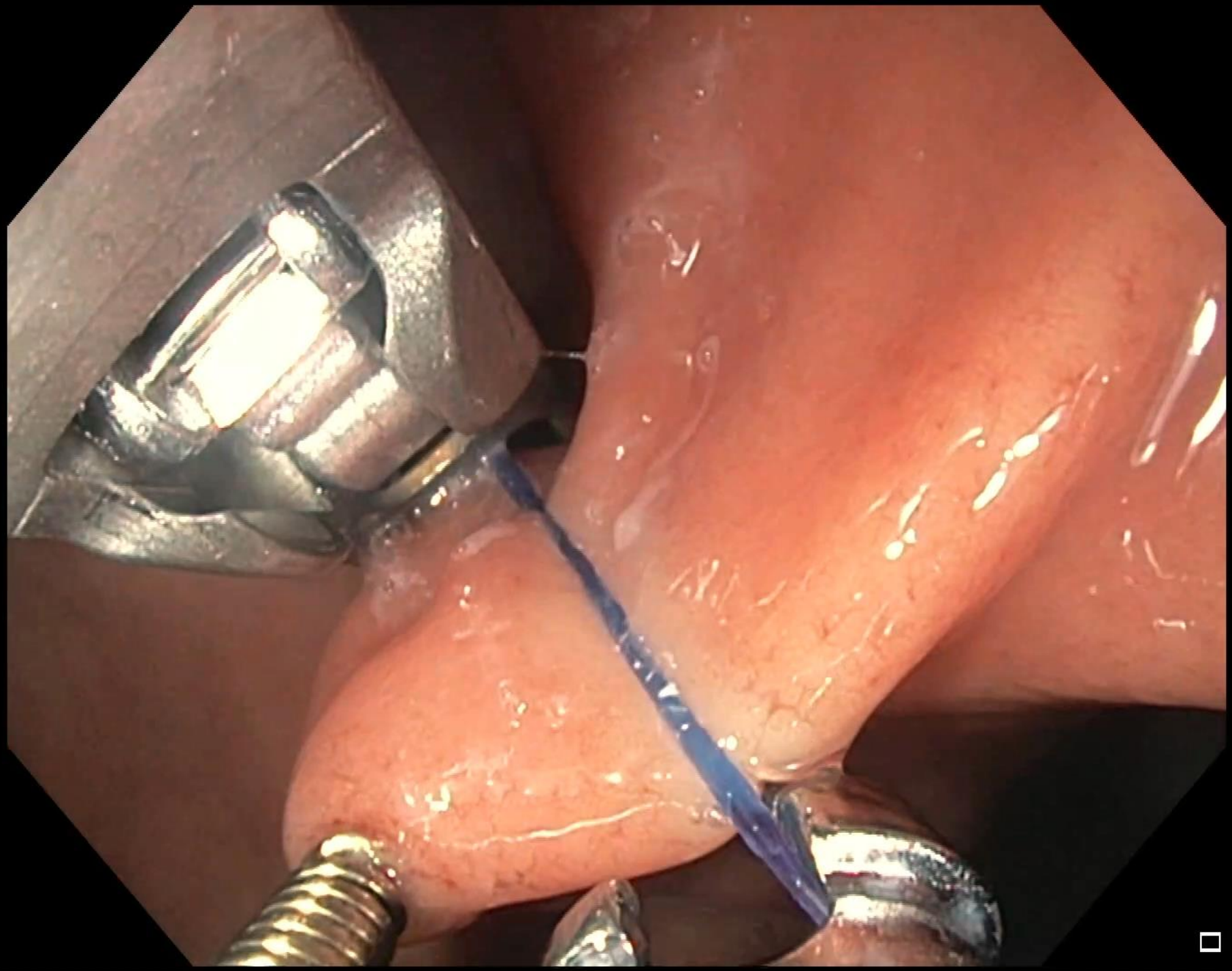


- In-advertent closure

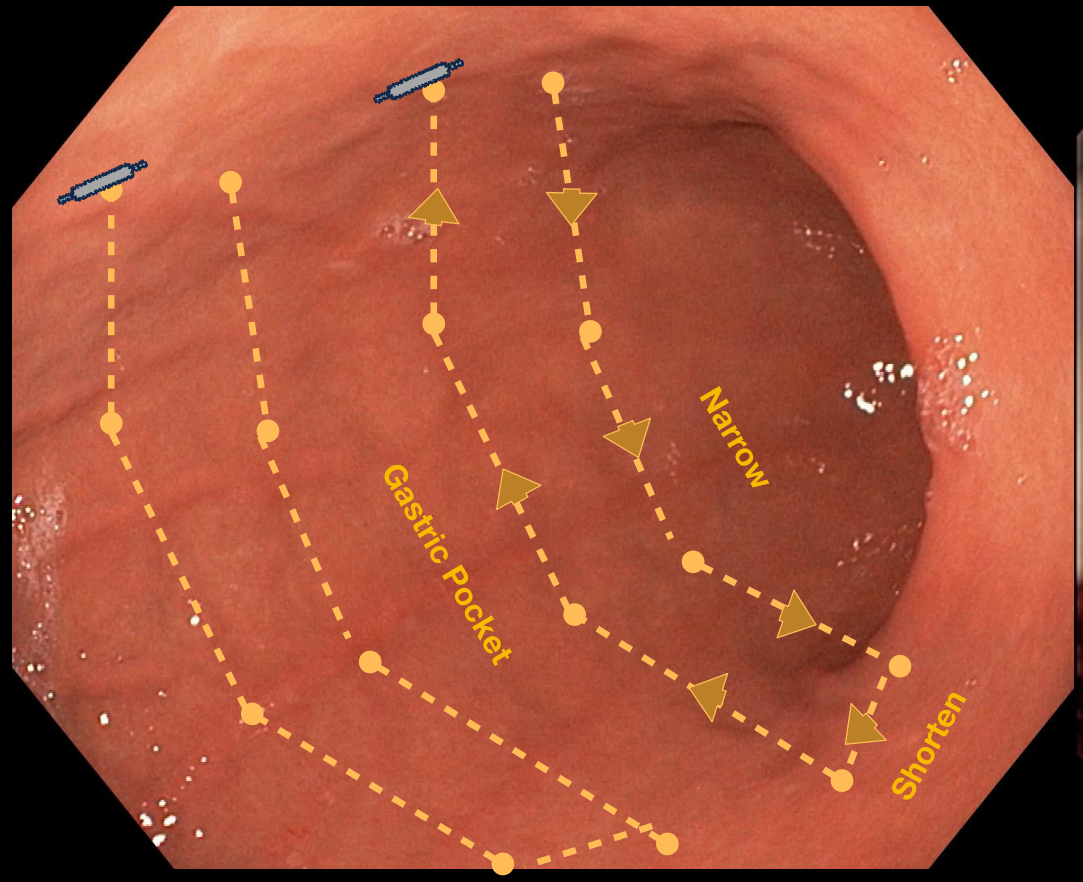

HOSPITALES
apollo
endosurgery

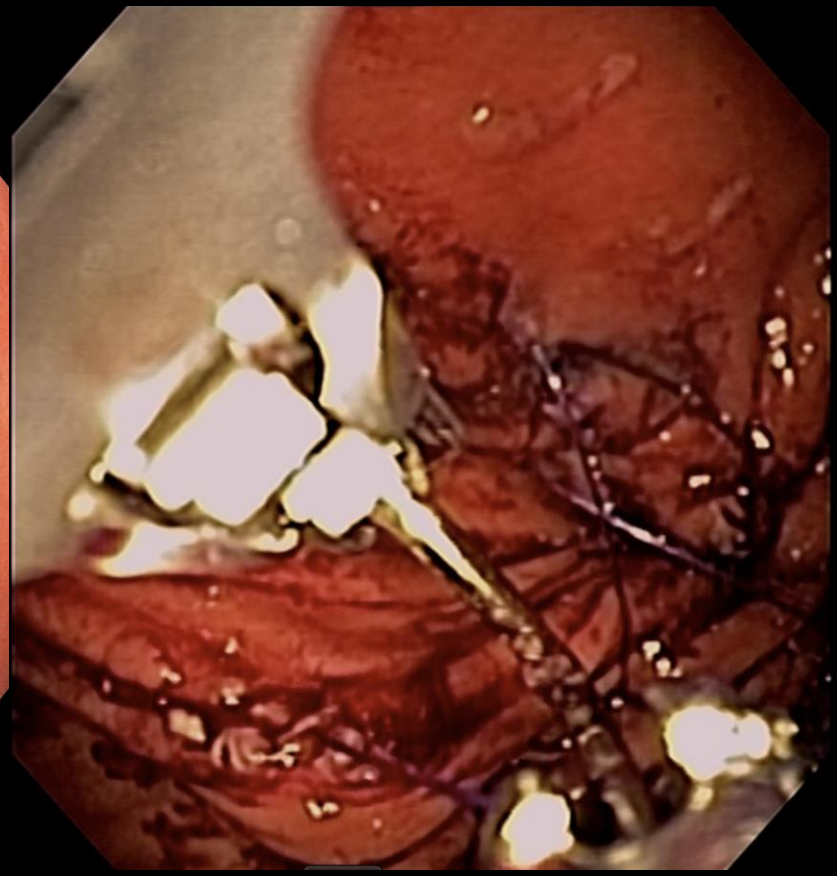


Accidental Suture Release

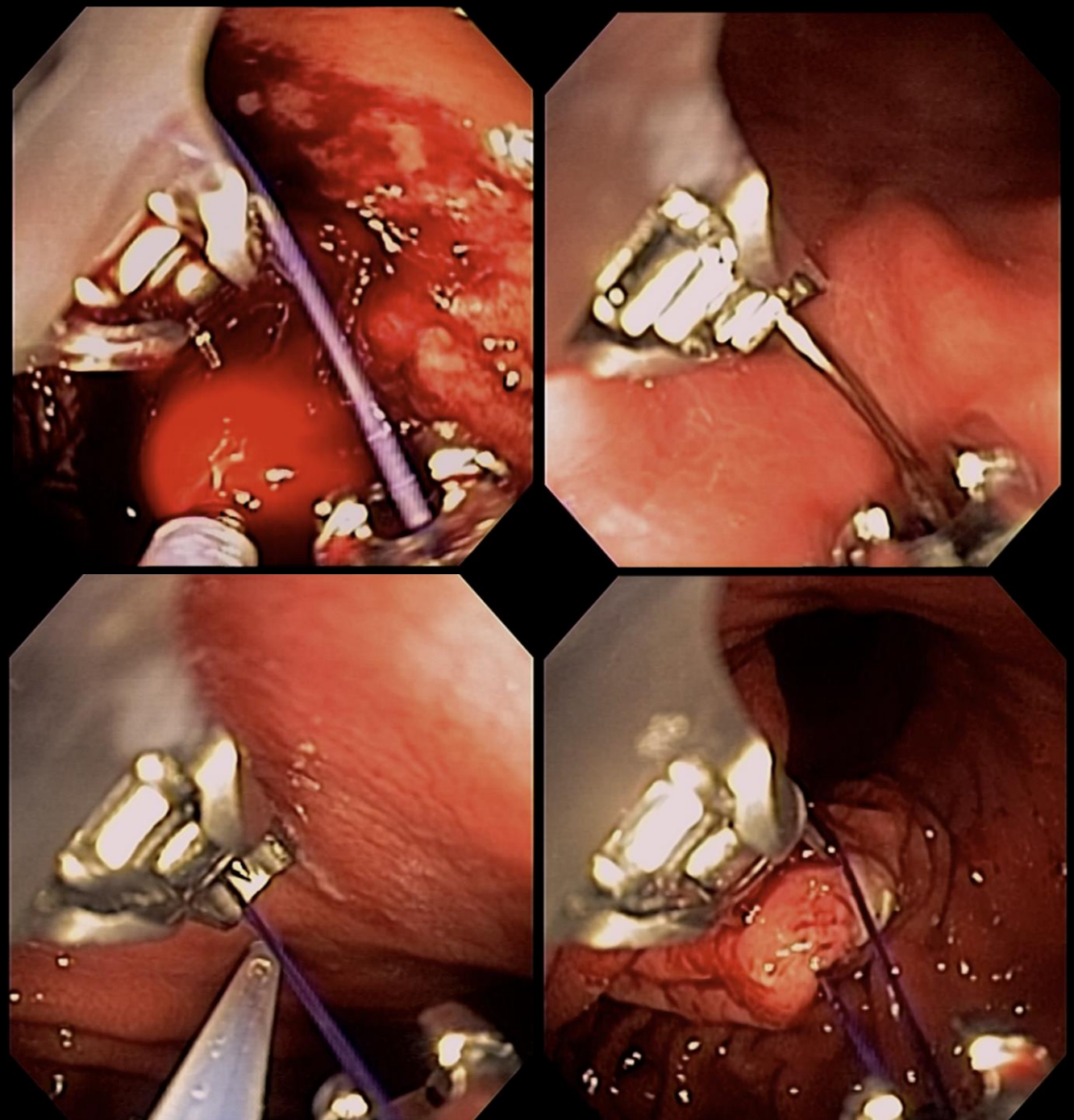


Suture Crossing

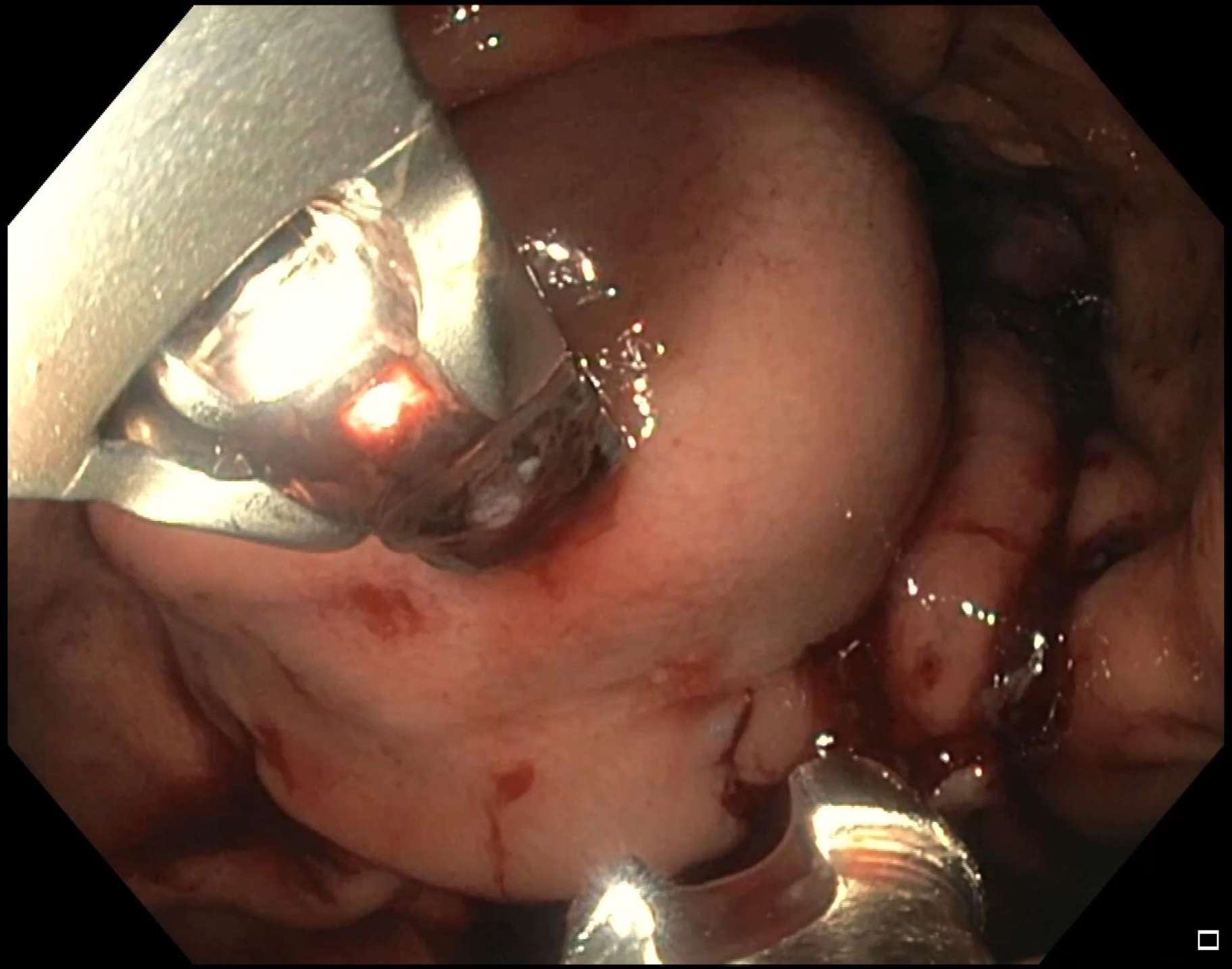




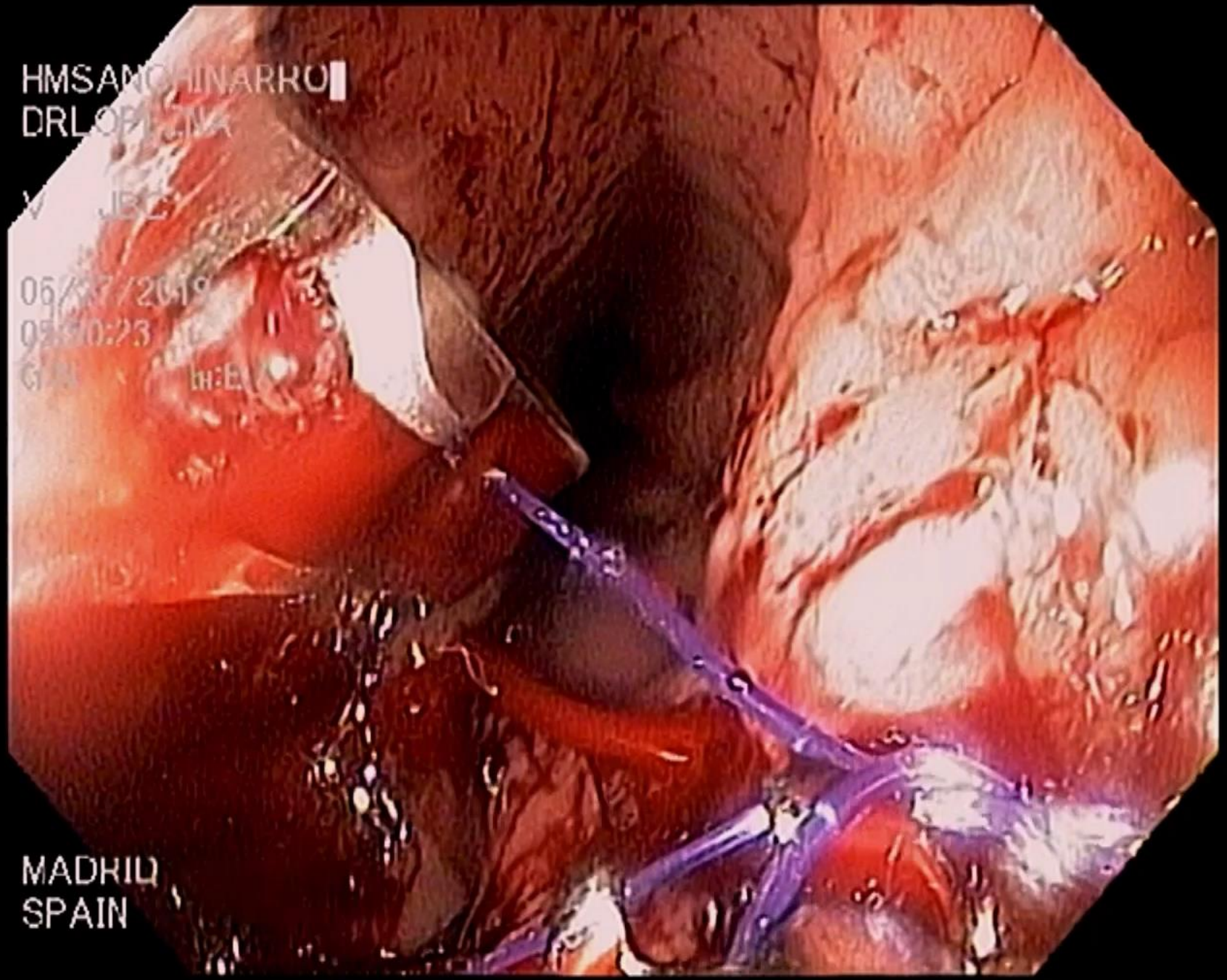
Bleeding during ESG



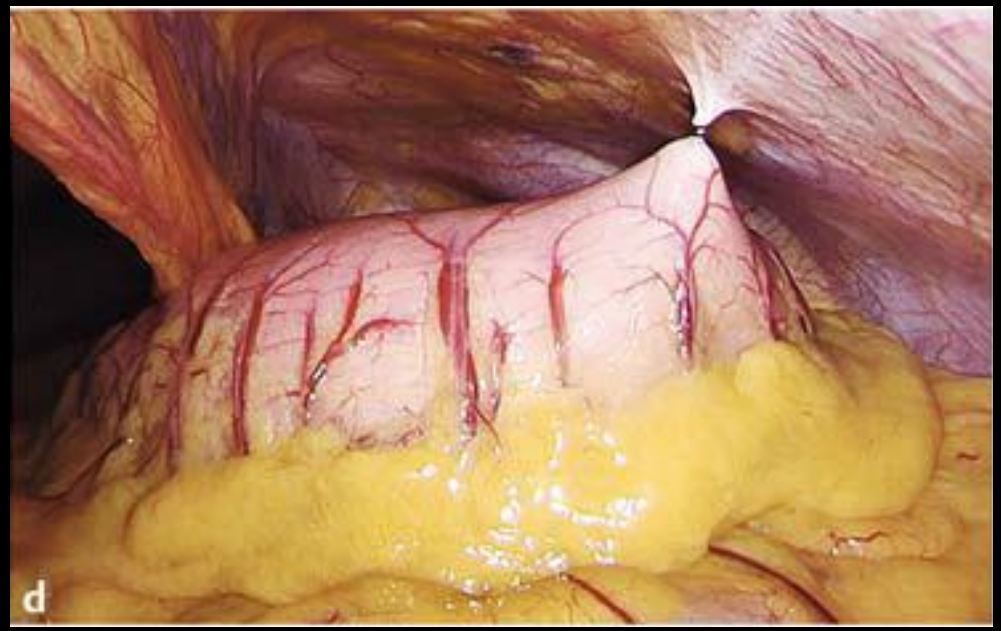
Hematoma from Puncture

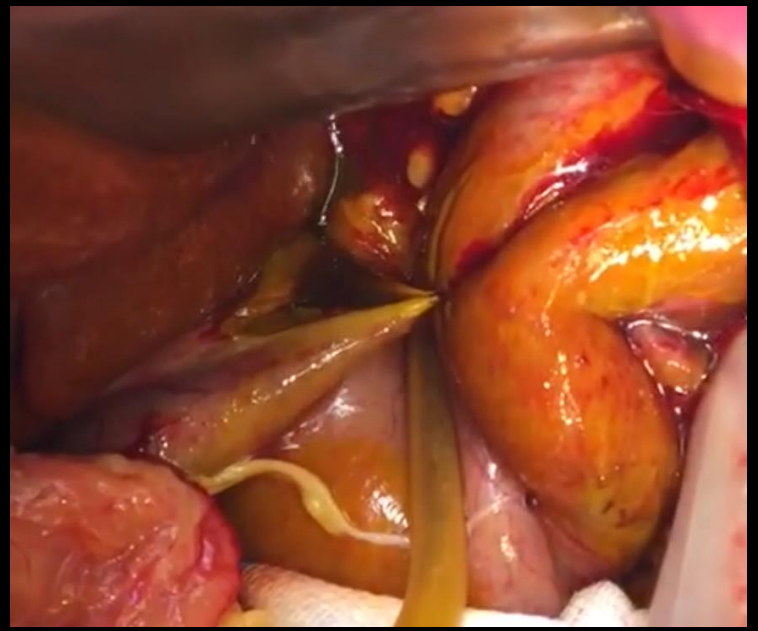


Spurting during ESG



Deep Helix rotation





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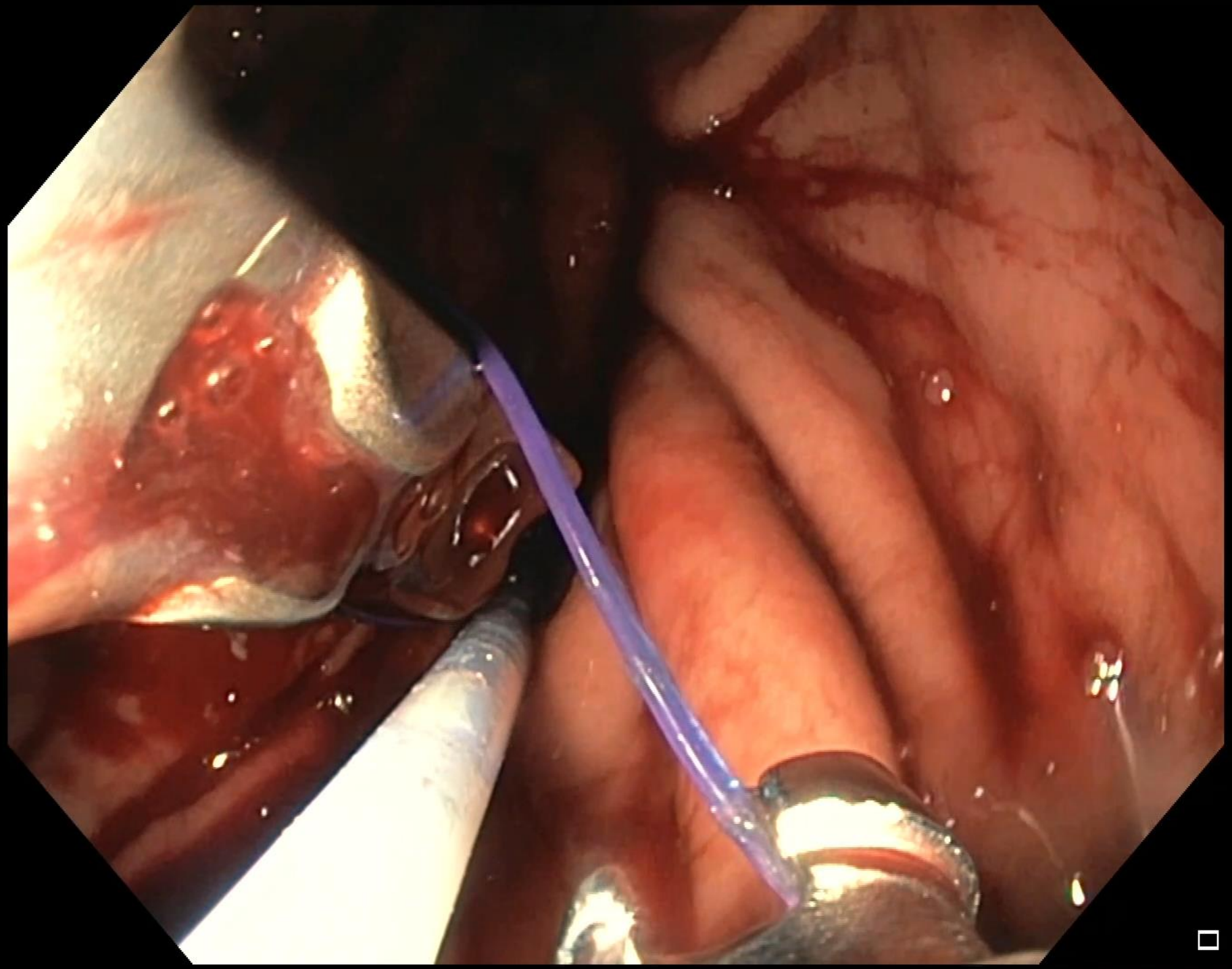
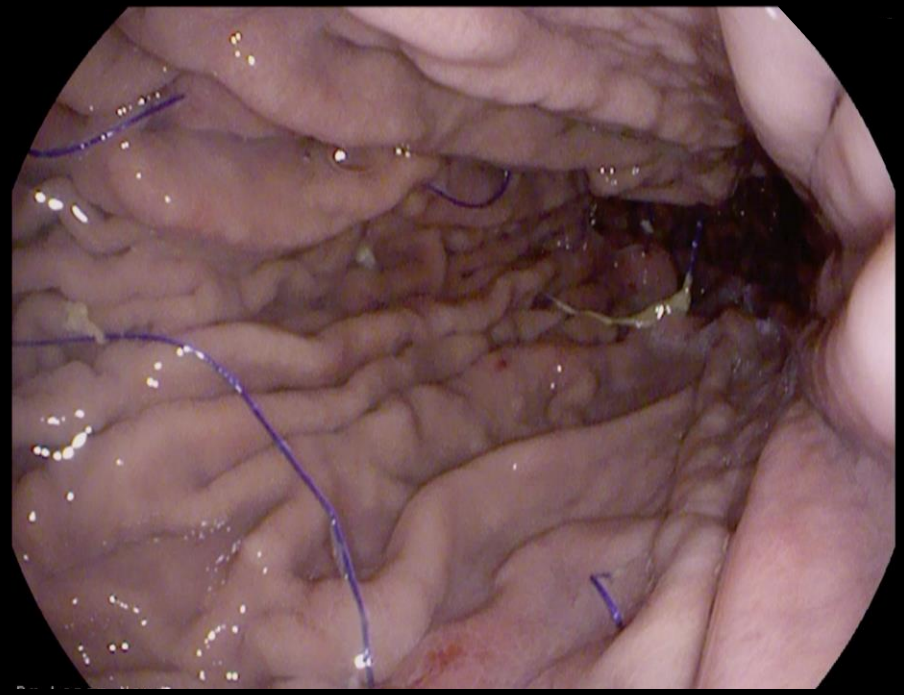
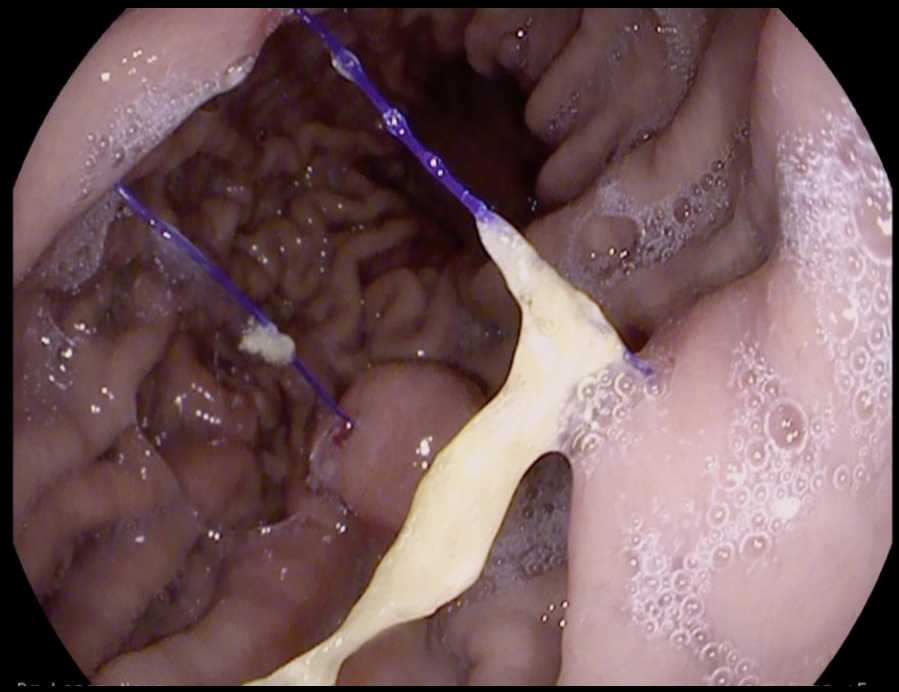
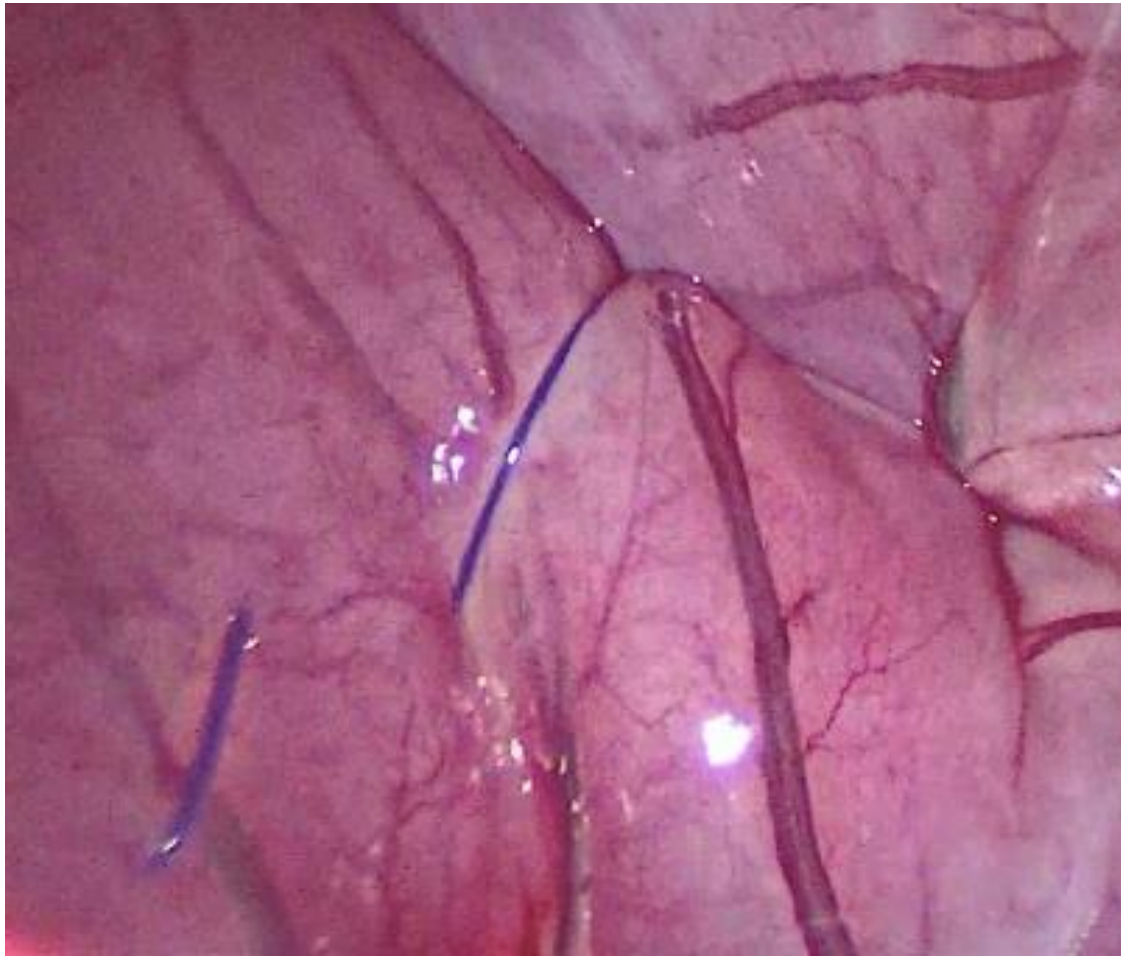


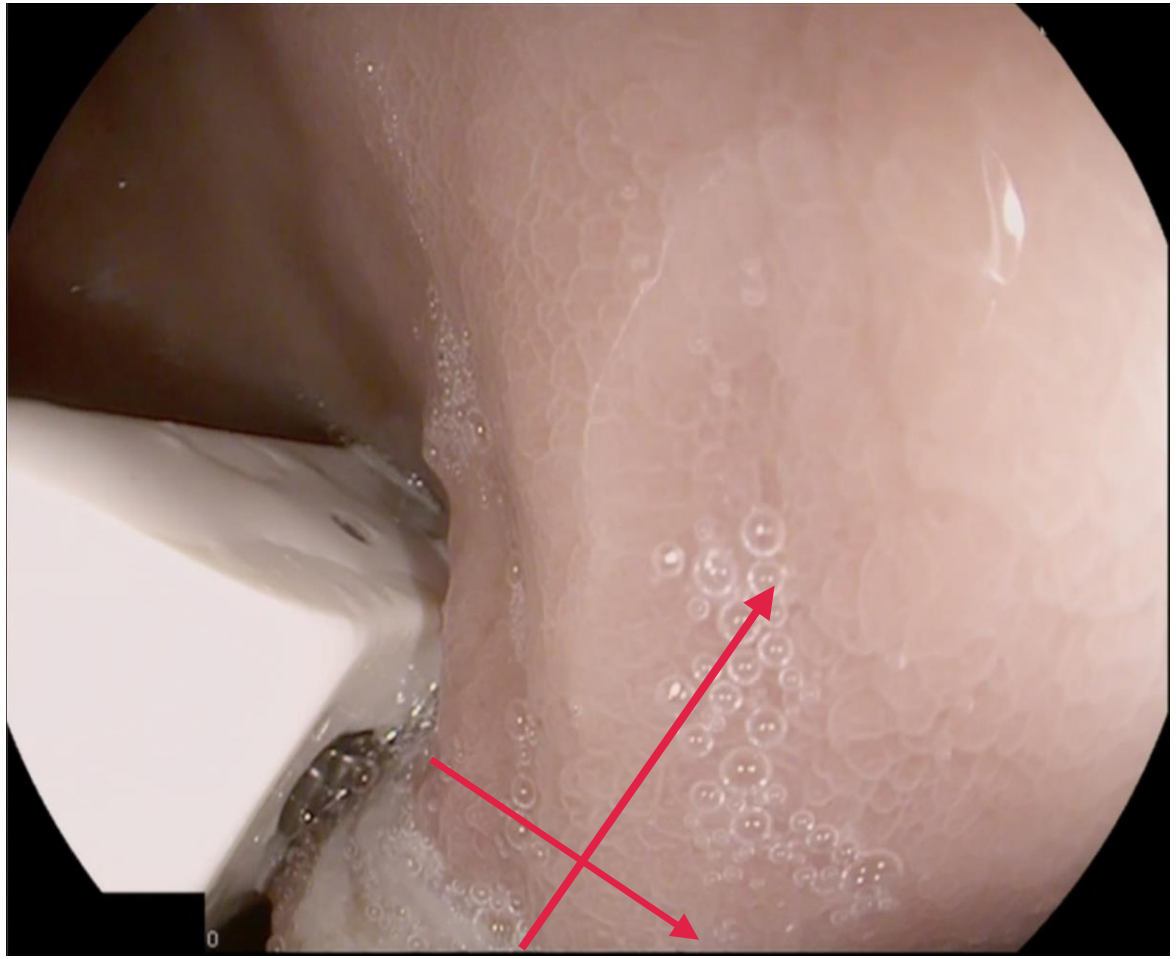
Suture Dehiscence



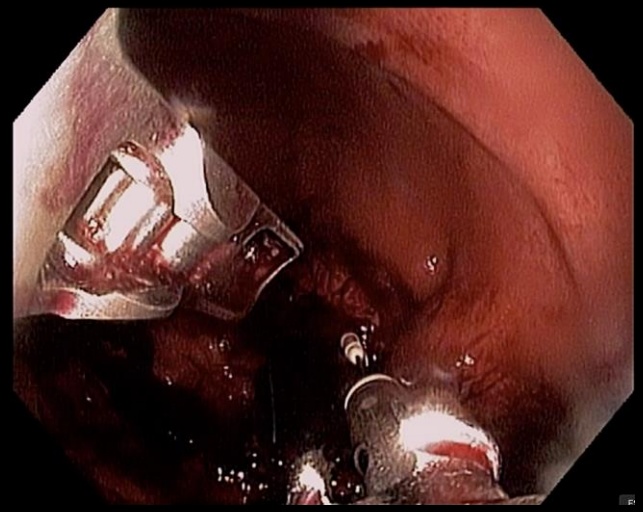
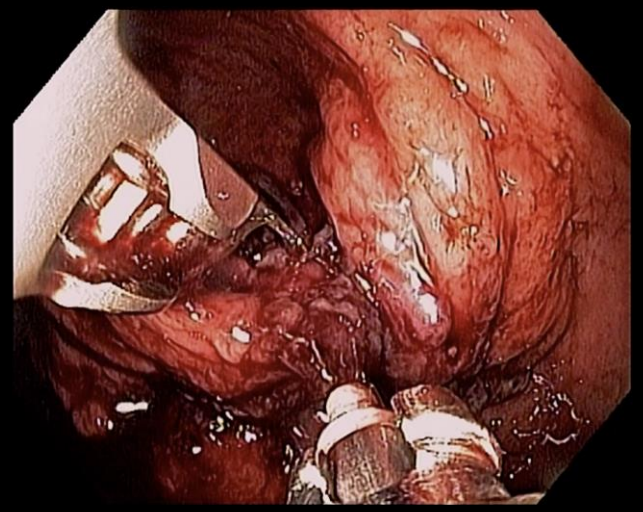
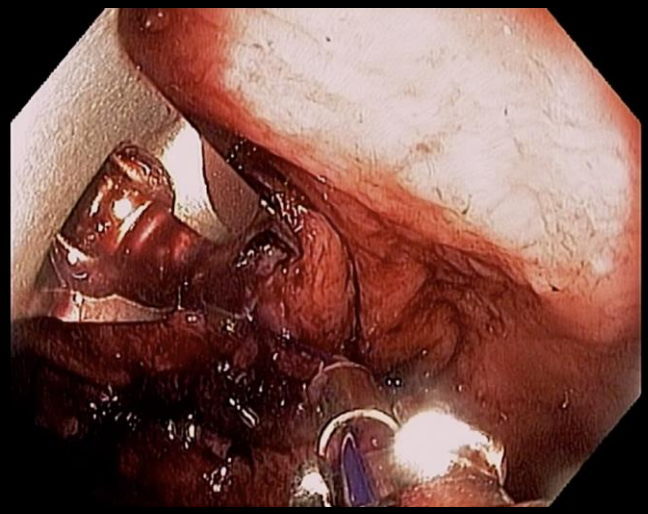
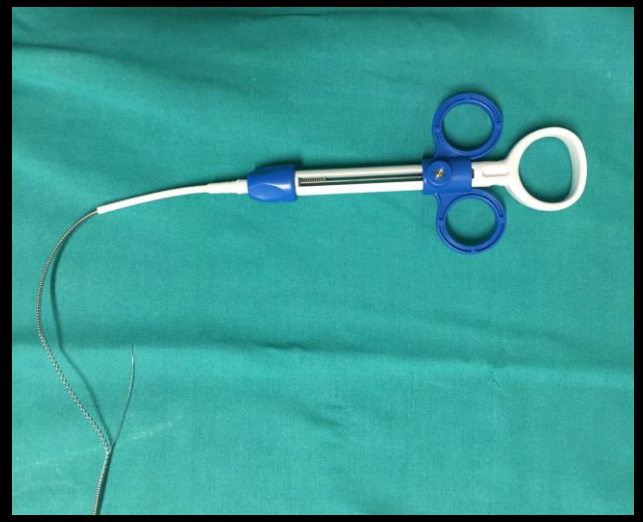
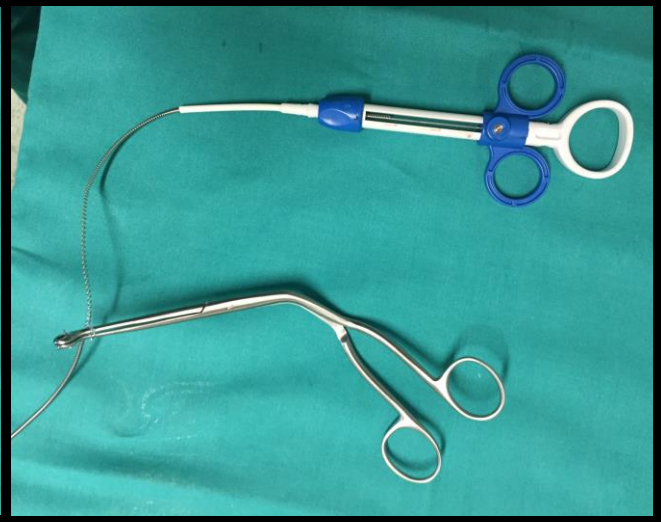
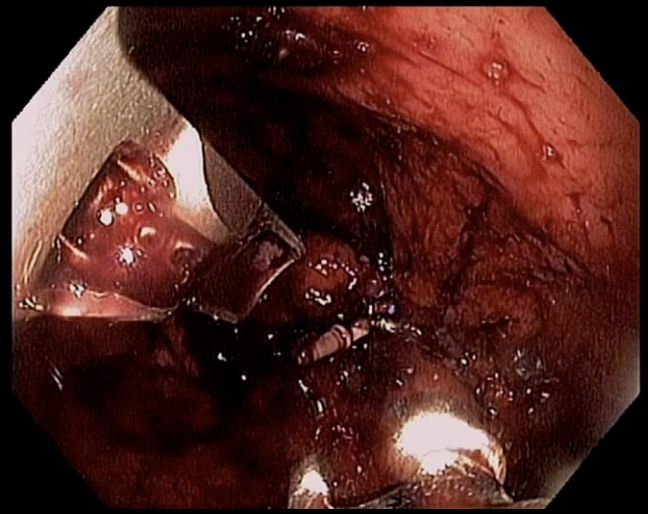


Transmural Suturing- The Critical factor

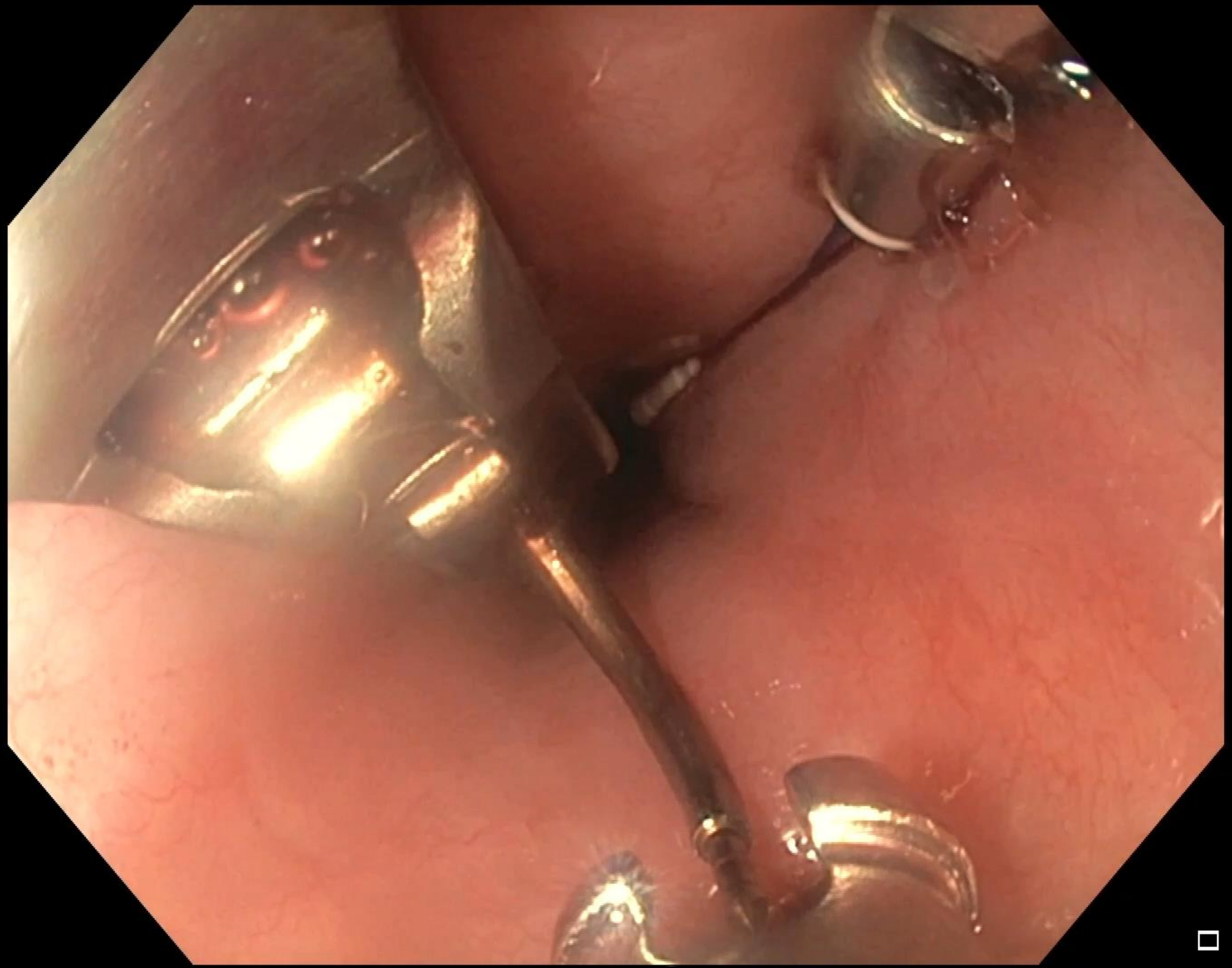




Cinch failure

Cinch failure



Conclusion

- Different bariatric surgical procedures have their own unique complications
- Complications can have morbidity and poor patient outcomes
- Management of complications requires a multidisciplinary approach
- Endoscopy techniques can be utilized as first-line to manage most bariatric surgical complications
- Early recognition and early intervention are key for good outcomes
- Endoscopic skills at suturing can prevent unwanted complications