



# Baxter: Staple line buttress and hemostasis

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DFW – Dallas / Fort Worth Metroplex



**LONESTAR**  
**BARIATRICS**

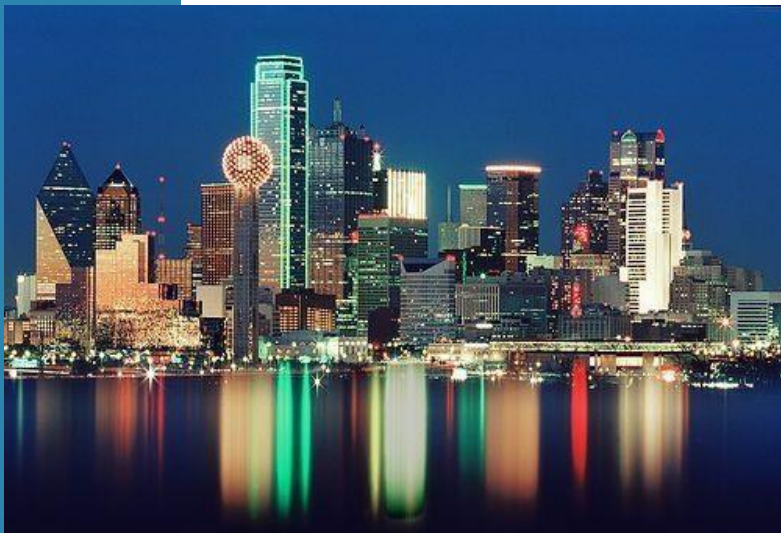
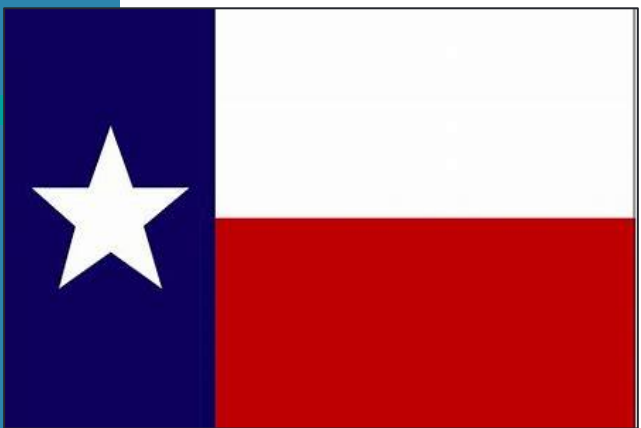


# Disclosures

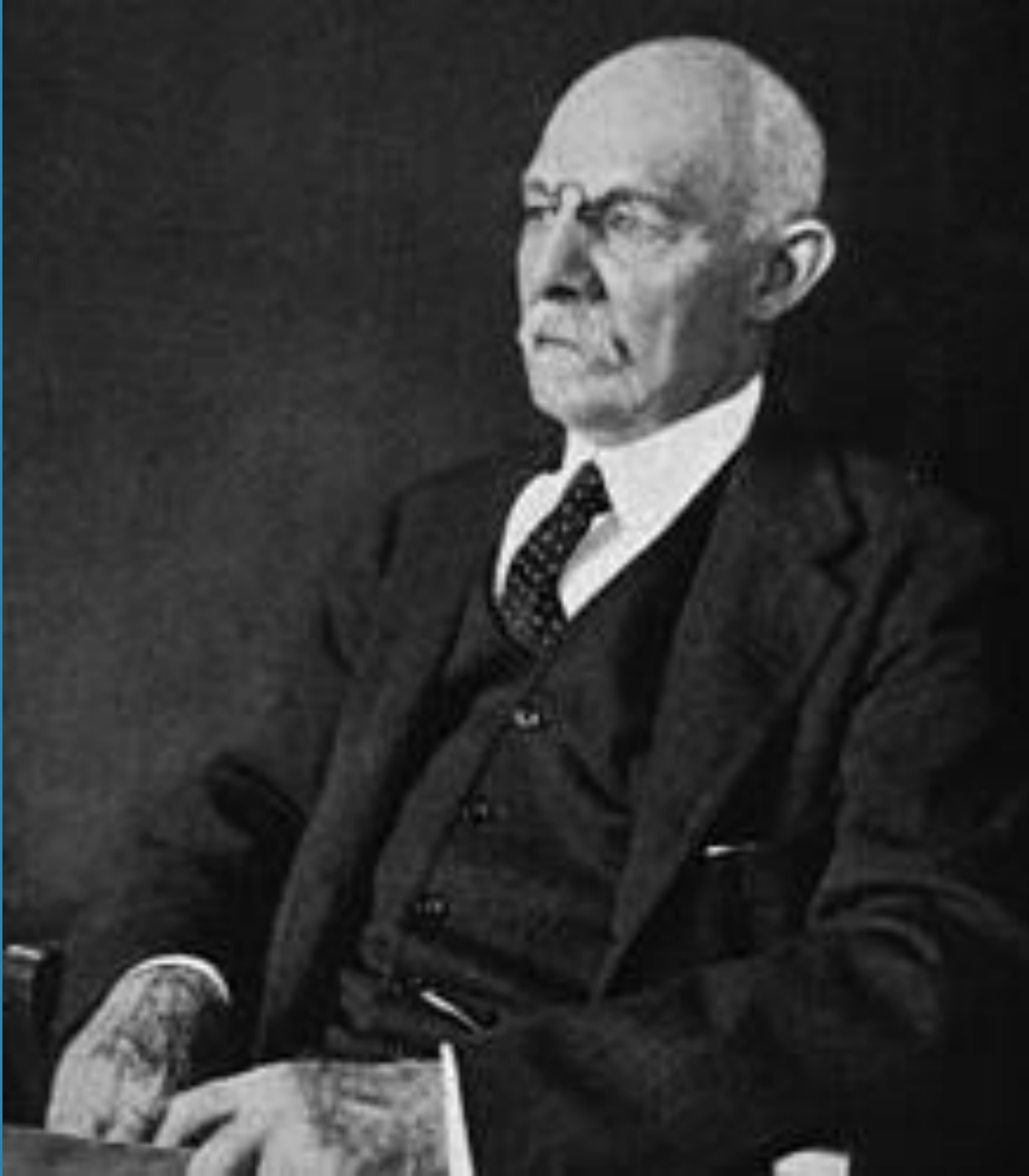
- Baxter
- Levita
  - MARS
- Pacira –  
Exparel

# Objectives

- Salutations
- Specifically acknowledge
  - IFSO
  - Baxter
- Hemostasis
- Compression
- Benefits/Options
- Complications





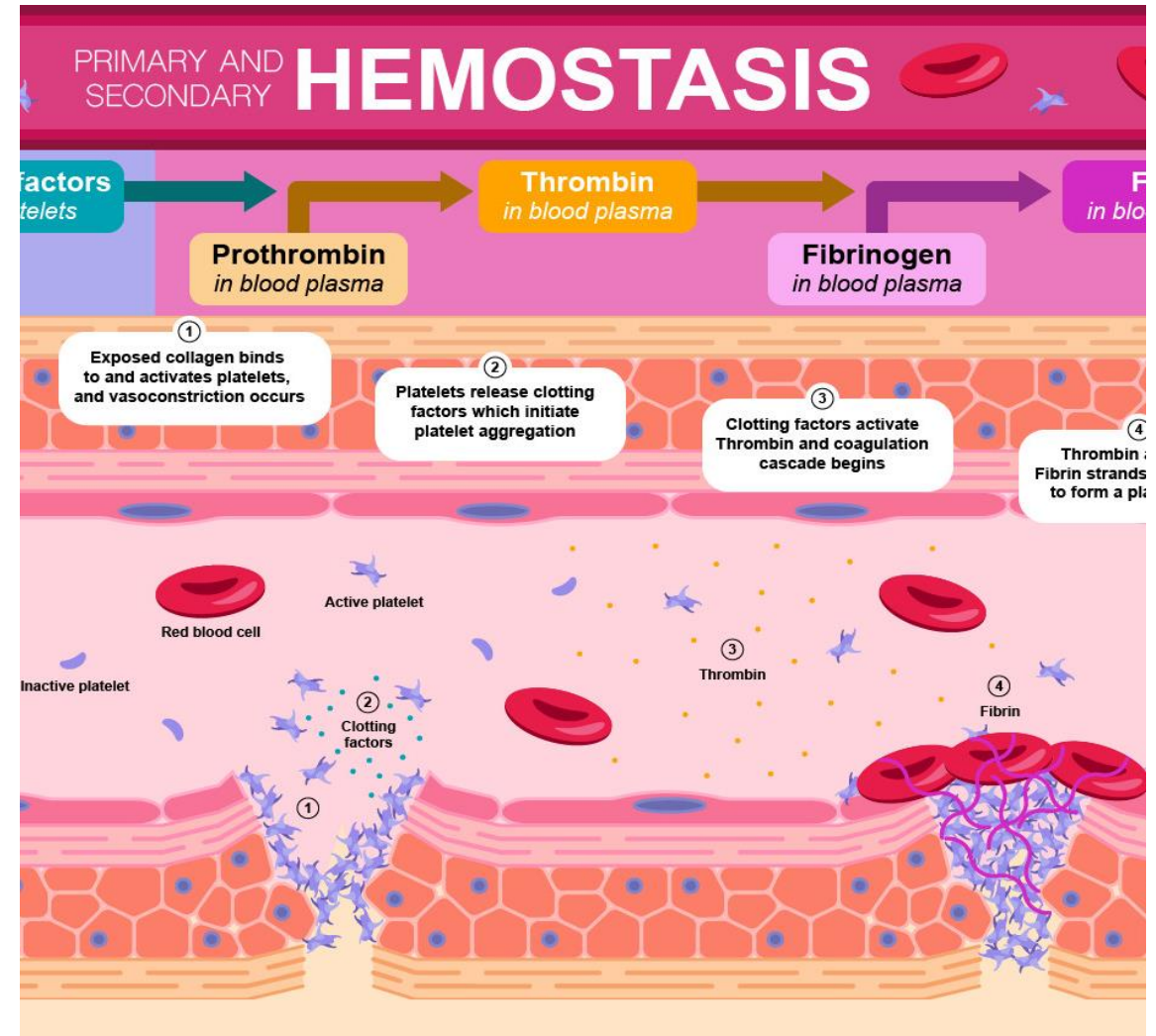


**Dr. Halsted**

**One of the Big  
Four: Osler,  
Welch & Kelly**

# Hemostasis

- Process to stop bleeding
- Vasoconstriction
- Platelet plug
- Coagulation
  - Complex cascade
- Fibrin clots
  - Tisseel \*(spray application)





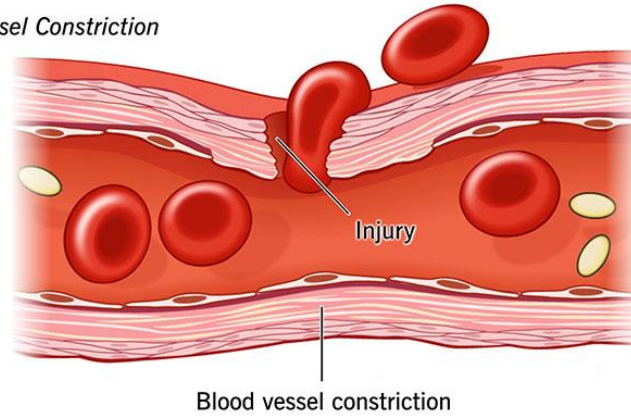


# Hemostasis

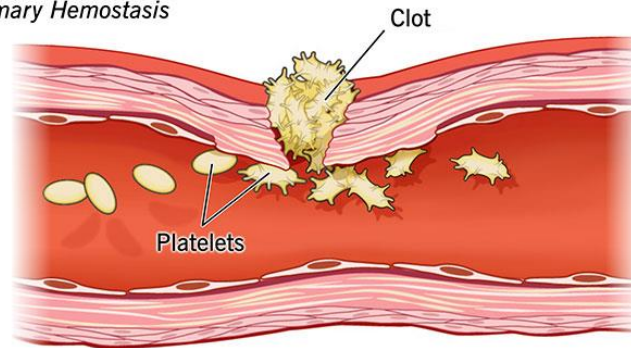
- How to prevent
- How to manage
- What is available
- What are my options

## Hemostasis

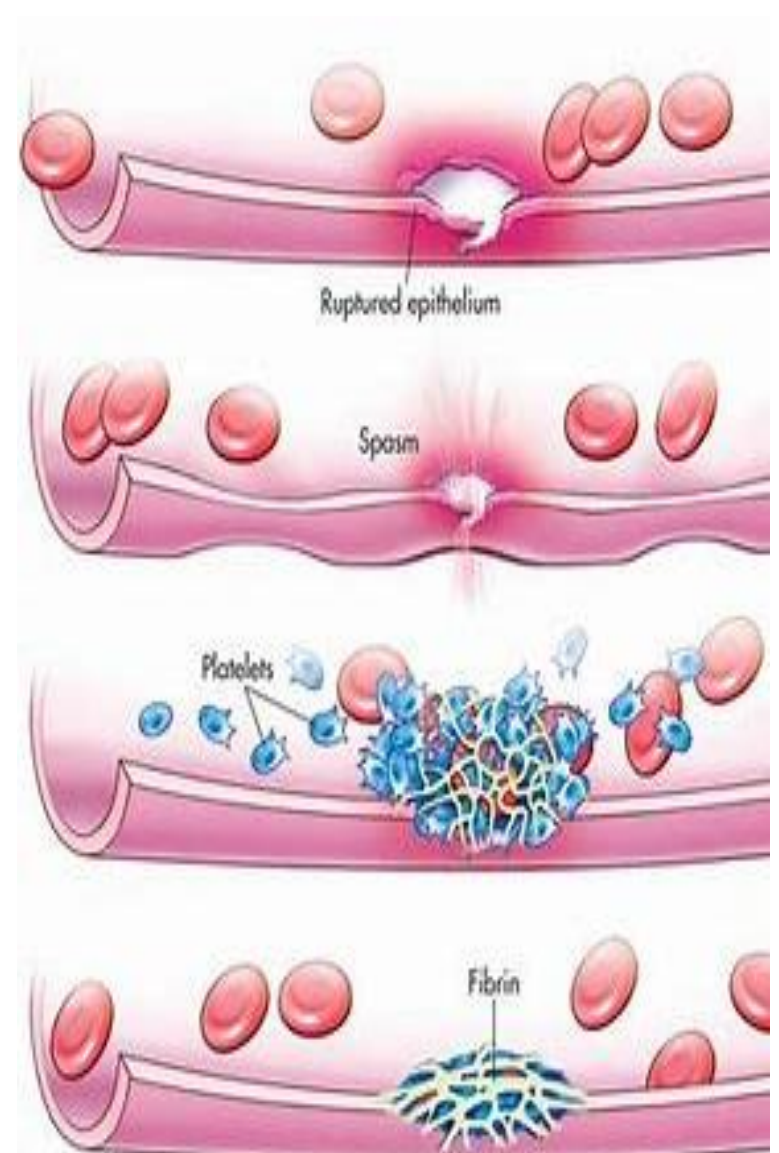
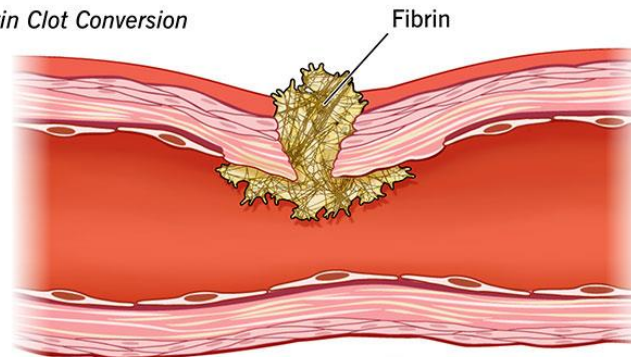
### A) Vessel Constriction



### B) Primary Hemostasis



### C) Fibrin Clot Conversion





Ethicon

Medtronic

EZ stapler



# Compression

- Medtronic
  - Covidien
- Echelon
  - Ethicon JNJ
- EZ stapler

$$\text{Compression set} = \frac{H_0 - H_2}{H_0 - H_1} \times 100 \%$$

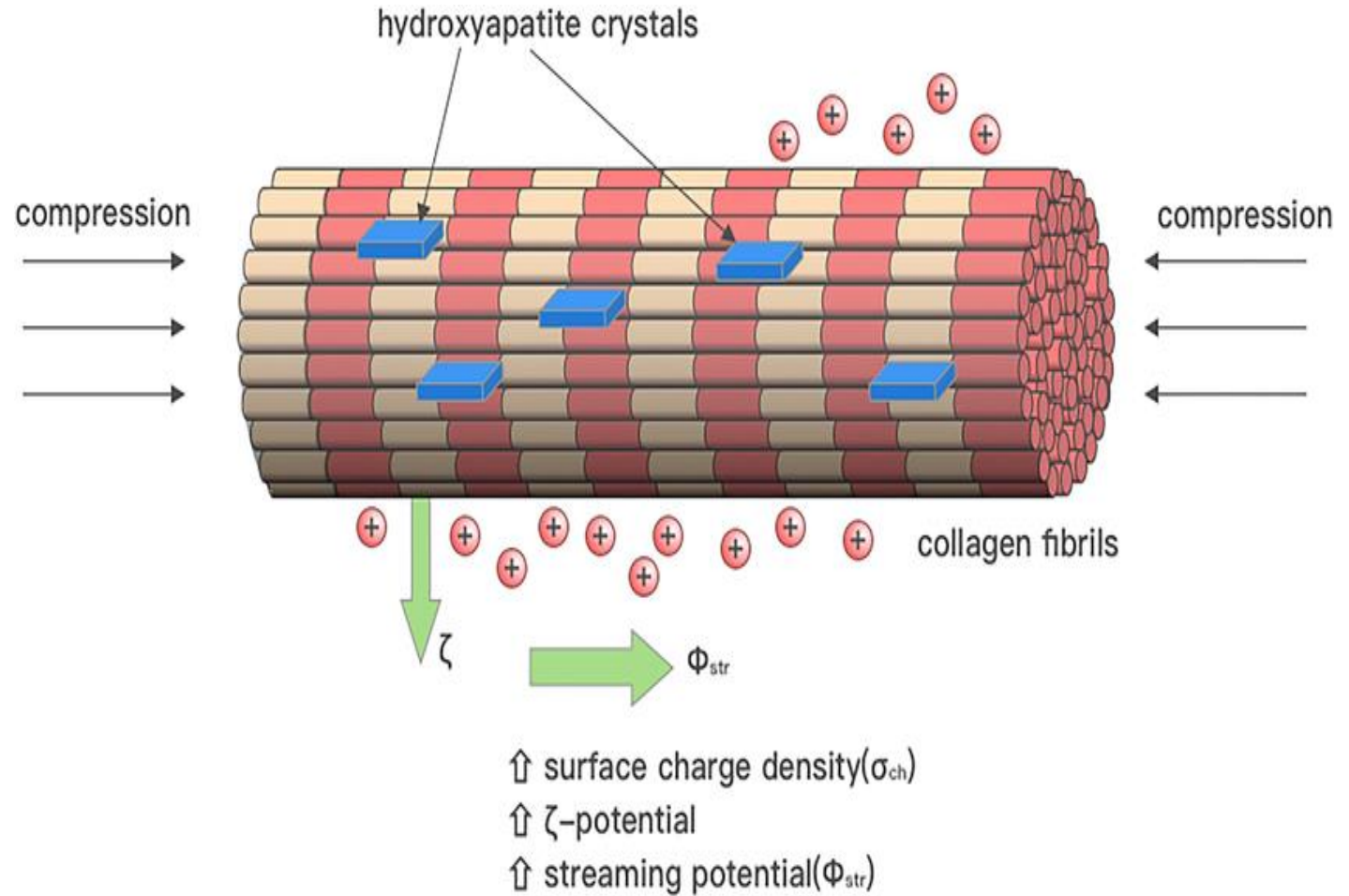
$H_0$  : Height of the specimen before compression

$H_1$  : Height of the specimen during compression

$H_2$  : Height of the specimen after compression

# Compression

- Tissue
- Properties
- Thickness
- Muscle mass





# Stomach Anatomy

Cardia

Fundus

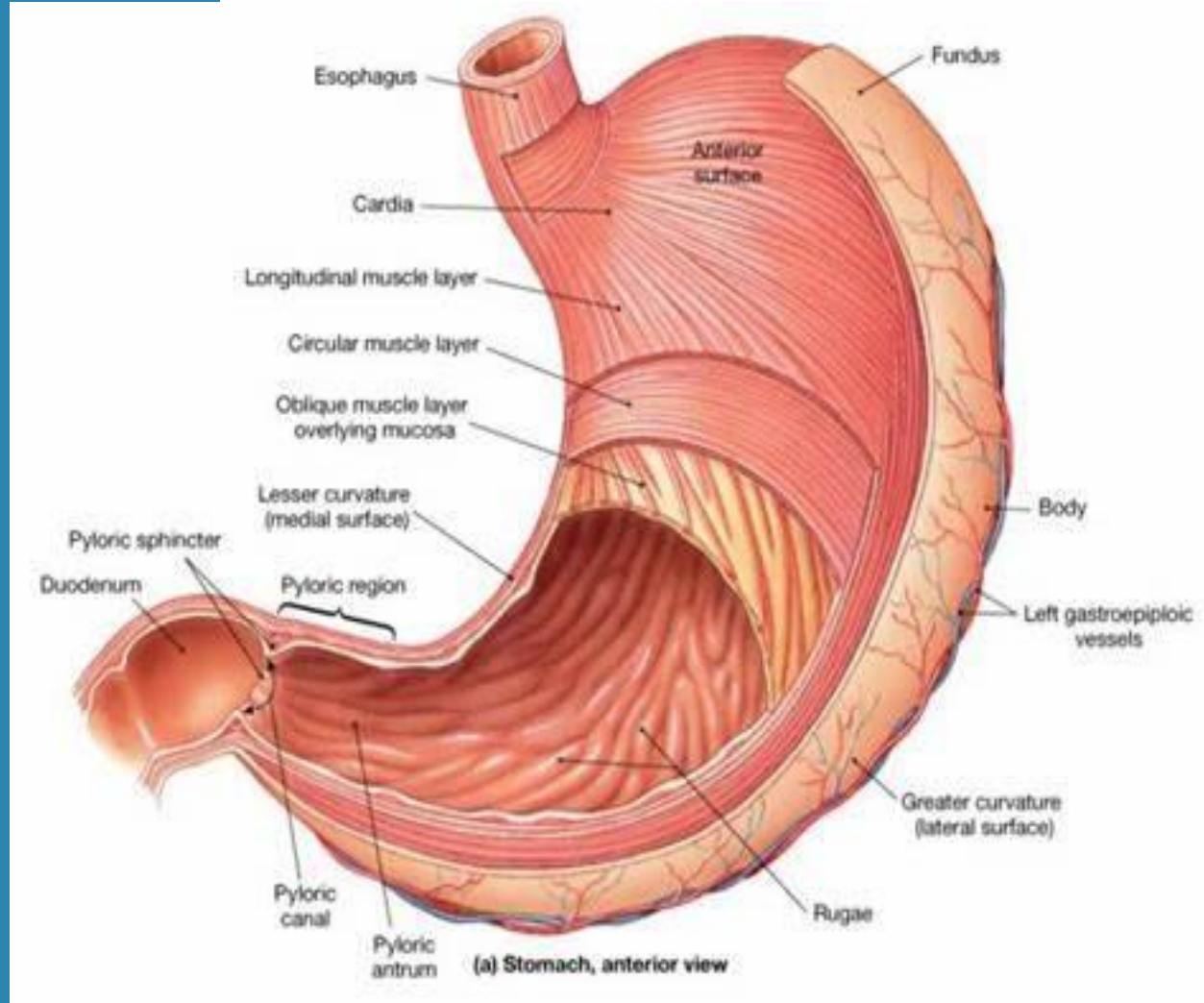
Muscular Layers

Longitudinal

Circular

Oblique

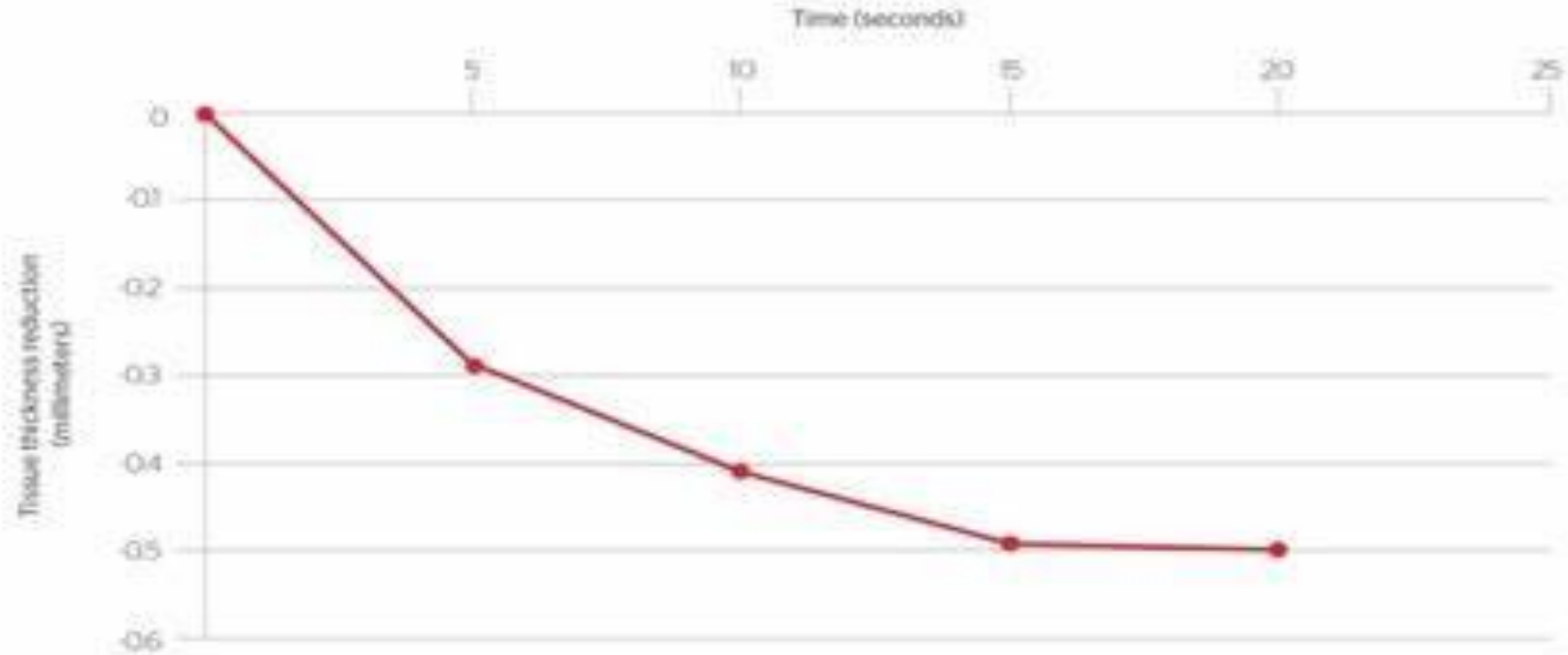
\* antrum / distal to incisura



# Compression

## Tissue compression over time

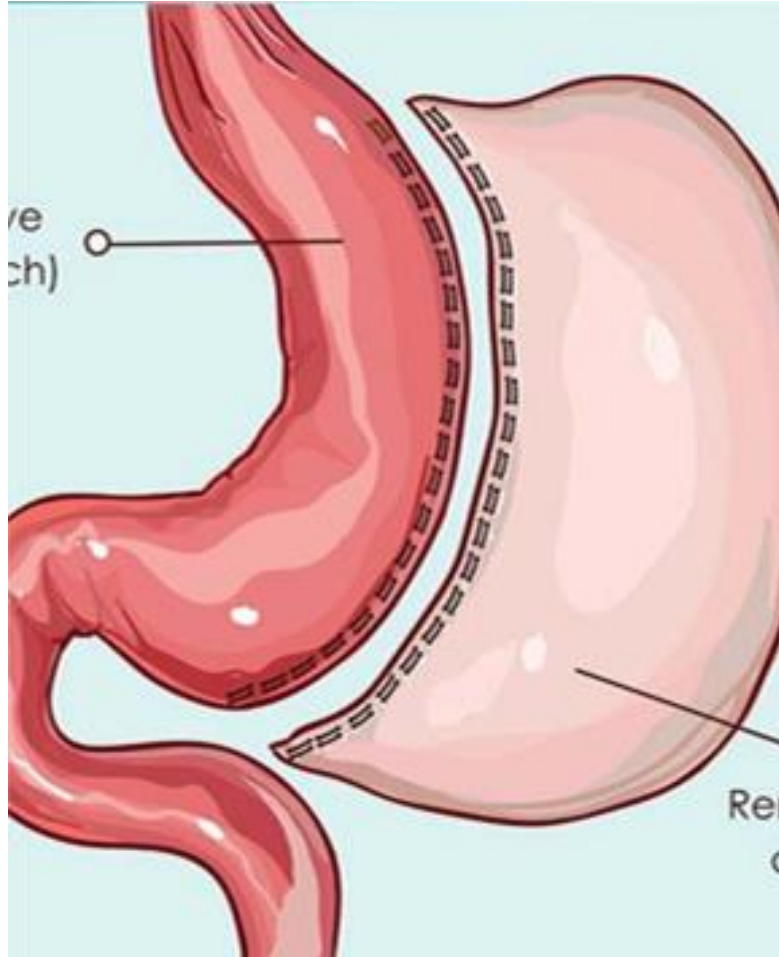
Sample: ECHELON 60mm (after jaw closure)



# Benefits – Peristrips

## Exposure to Baxter

- Products
- Benefits
  - Surgeon
  - Hospital
- Complications
- Cost
  - Hospital
  - Patient
  - Surgeon
- Outcomes
- Quality data / MBSAQIP



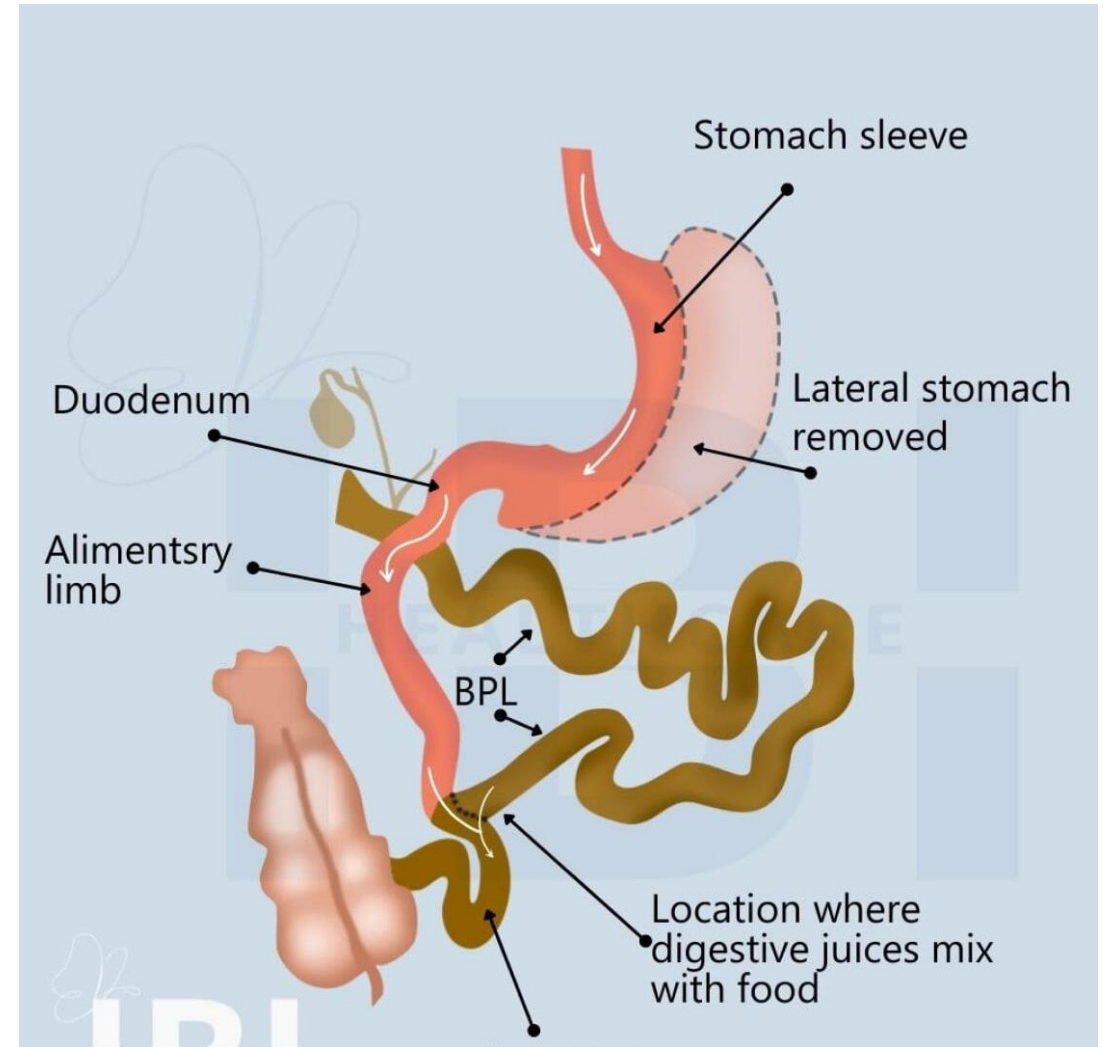
## Surgeon

- Benefits
  - Outcomes
  - Security
- Cost saving
- Quality score
- Leverage

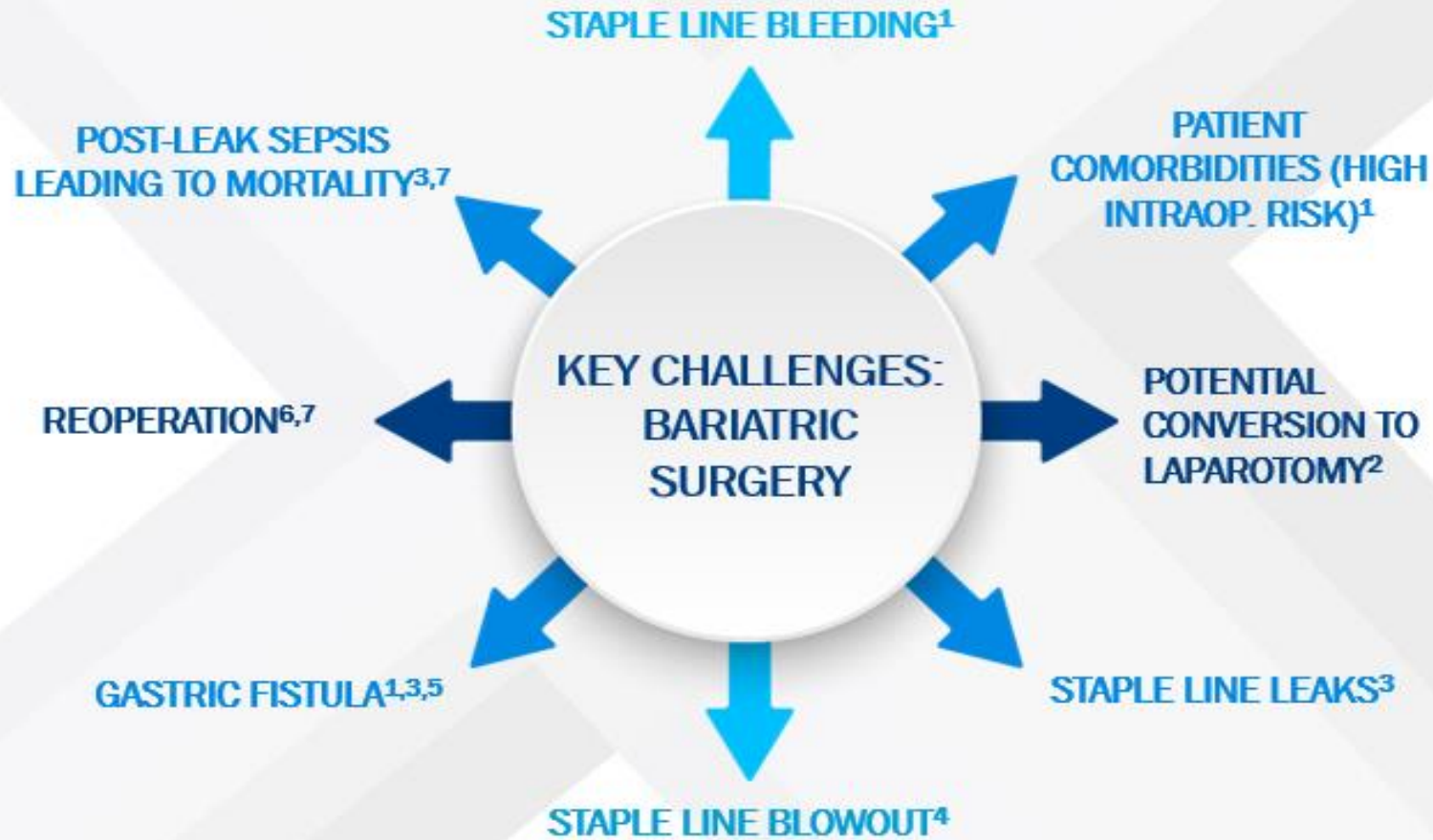


# Practice Breakdown

- RYGB
  - 35%
- LSG
  - 35%
- DS / SADI
  - 10%
- Revisions
  - 20%

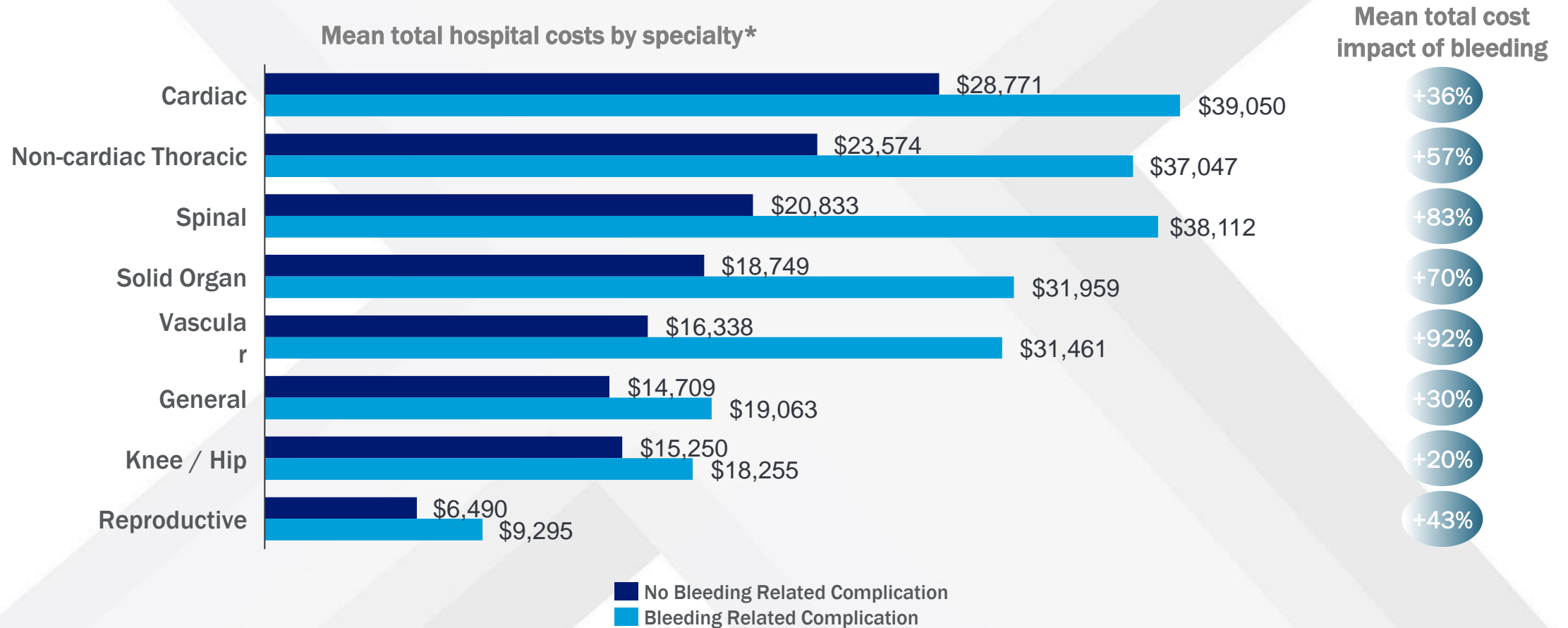


# KEY CHALLENGES IN BARIATRIC SURGERY



1. Silecchia G, et al. *Ann Gastroenterol.* 2018;31:56-64. 2. Lujan JA, et al. *Ann Surg.* 2004; 239: 433-437. 3. Lee MM, et al. *Obesity Surg.* 2004;14:1321-26. 4. Errebo MJ, et al. *Dan Med J.* 2014;61:A4844. 5. Carrodeguas L, et al. *Surg Obes Relat Dis.* 2005;1:467-474. 6. Augustin T, et al. *Obes Surg.* 2016;26:345-349. 7. See C, et al. *Am J Surg.* 2002; 183: 533-538.

# Bleeding complications dramatically increase costs<sup>1</sup>

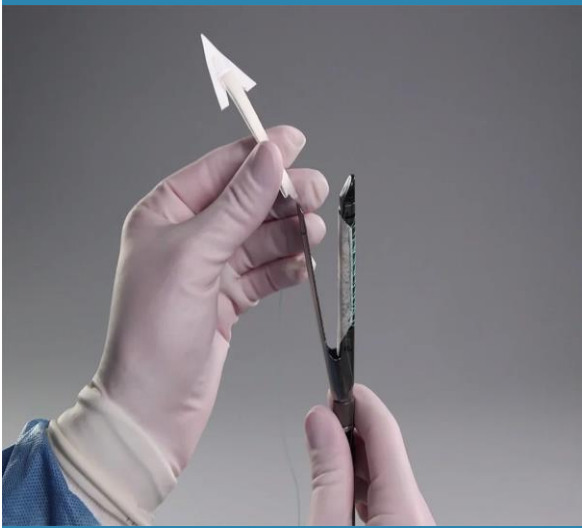


1. Stokes ME, et al. *BMC Health Serv Res.* 2011; 11:135

\*Mean total adjusted hospital costs (95% CI) in 2007 \$US by surgical cohort.

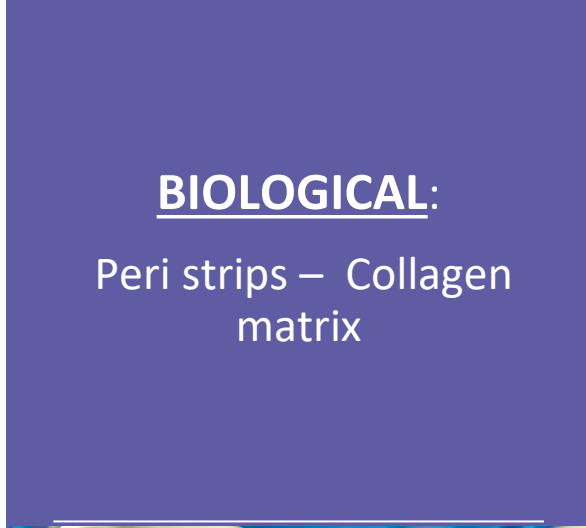


# OPTIONS



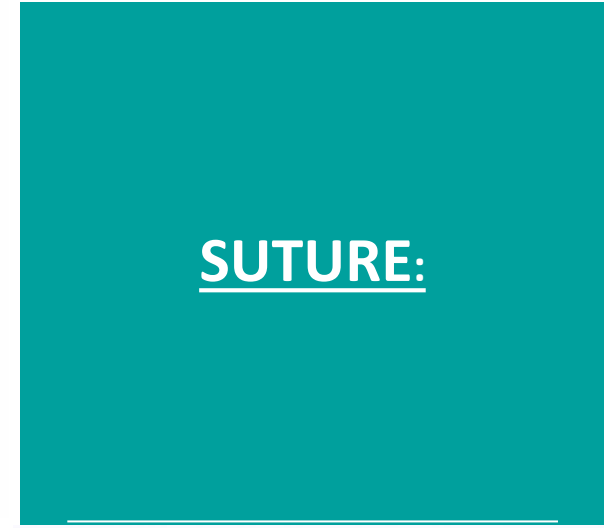
## SEAMGUARD:

Synthetic –  
bioabsorbable



## BIOLOGICAL:

Peri strips – Collagen  
matrix



## SUTURE:



## NAKED:

Medtronic  
J&J  
Da Vinci  
EZ stapler



# Staple Line Buttresses: Potential Advantages and Disadvantages

- Staple Line Buttresses
  - Potential Advantages<sup>1</sup>
    - Spreads tension across entire staple line
    - Reduces risk of staple line bleeding
    - Increases staple line burst pressure
    - O.R. time reduction
    - Decrease in length of hospital stay
  - Potential Disadvantages
    - Adds thickness to the tissue<sup>1</sup>
    - Time of application<sup>2</sup>
    - Added cost for application<sup>1</sup>

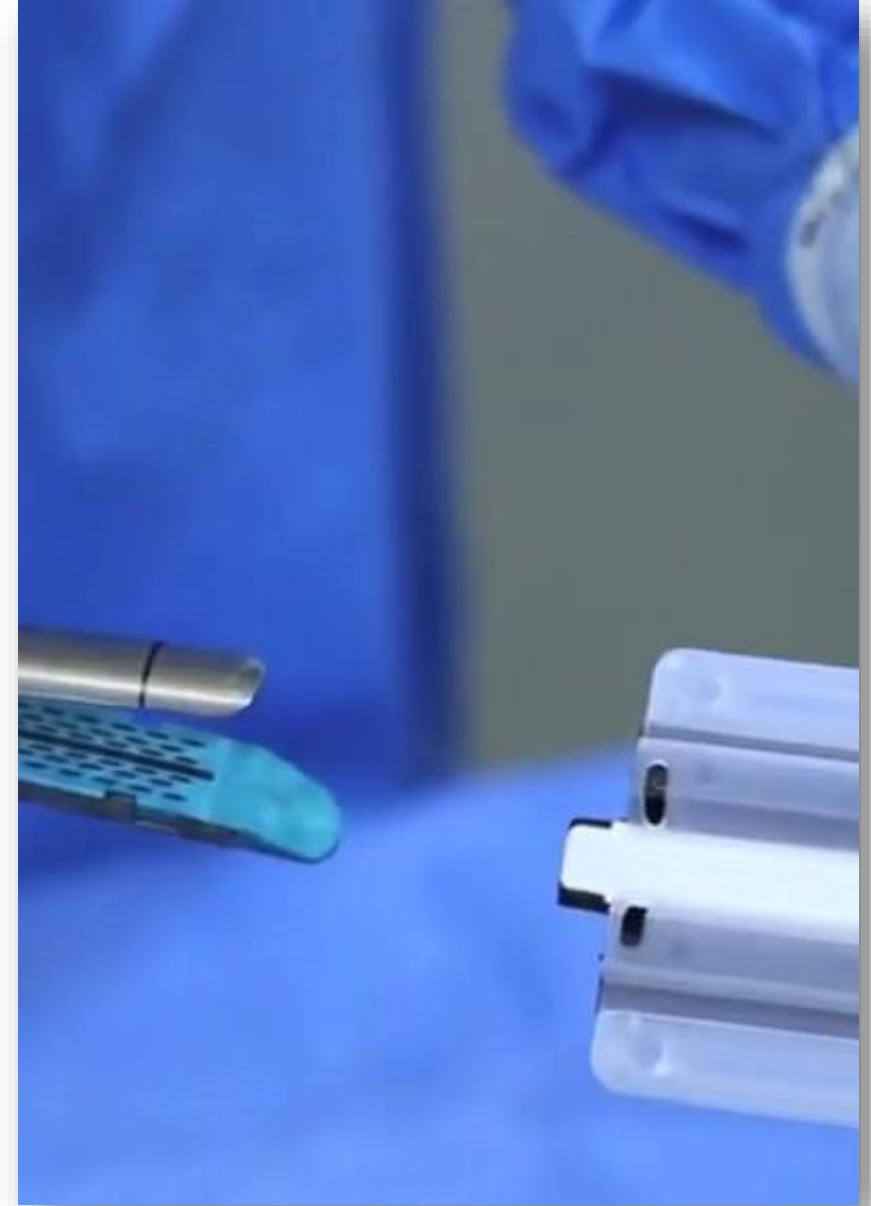


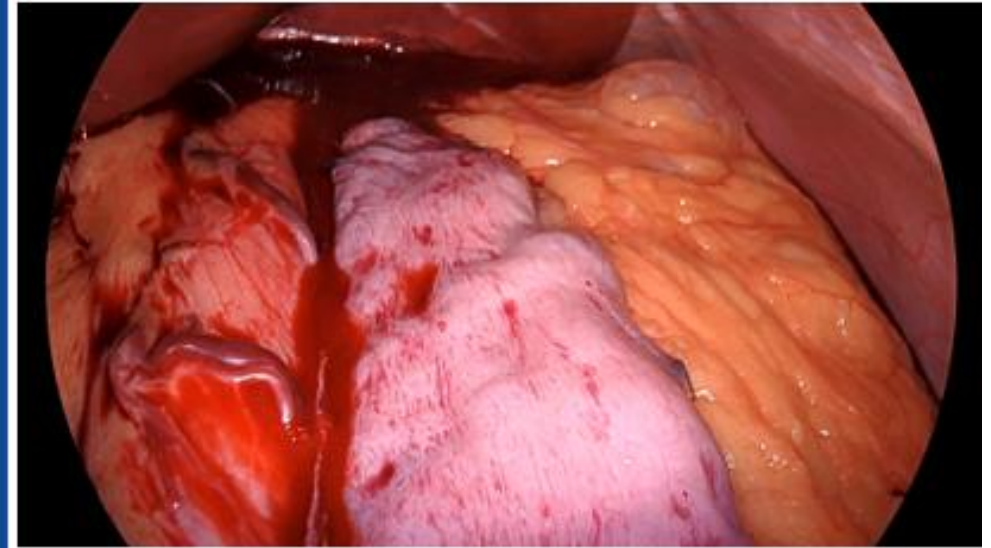
Image from Baxter

# WHY USE STAPLE LINE REINFORCEMENT?

## Staple Line Bleeding

- Postoperative bleeding occurs in 0.8-9%<sup>1</sup>
- Most often, staple line bleeding will respond to conservative measures<sup>2</sup>
- May require transfusion<sup>3</sup>
- May require reoperation<sup>3</sup>
- May extend hospital stay<sup>3</sup>

➤ *Staple line bleeding is another complication of current stapling devices, but generally of less consequence than leaks<sup>3</sup>*



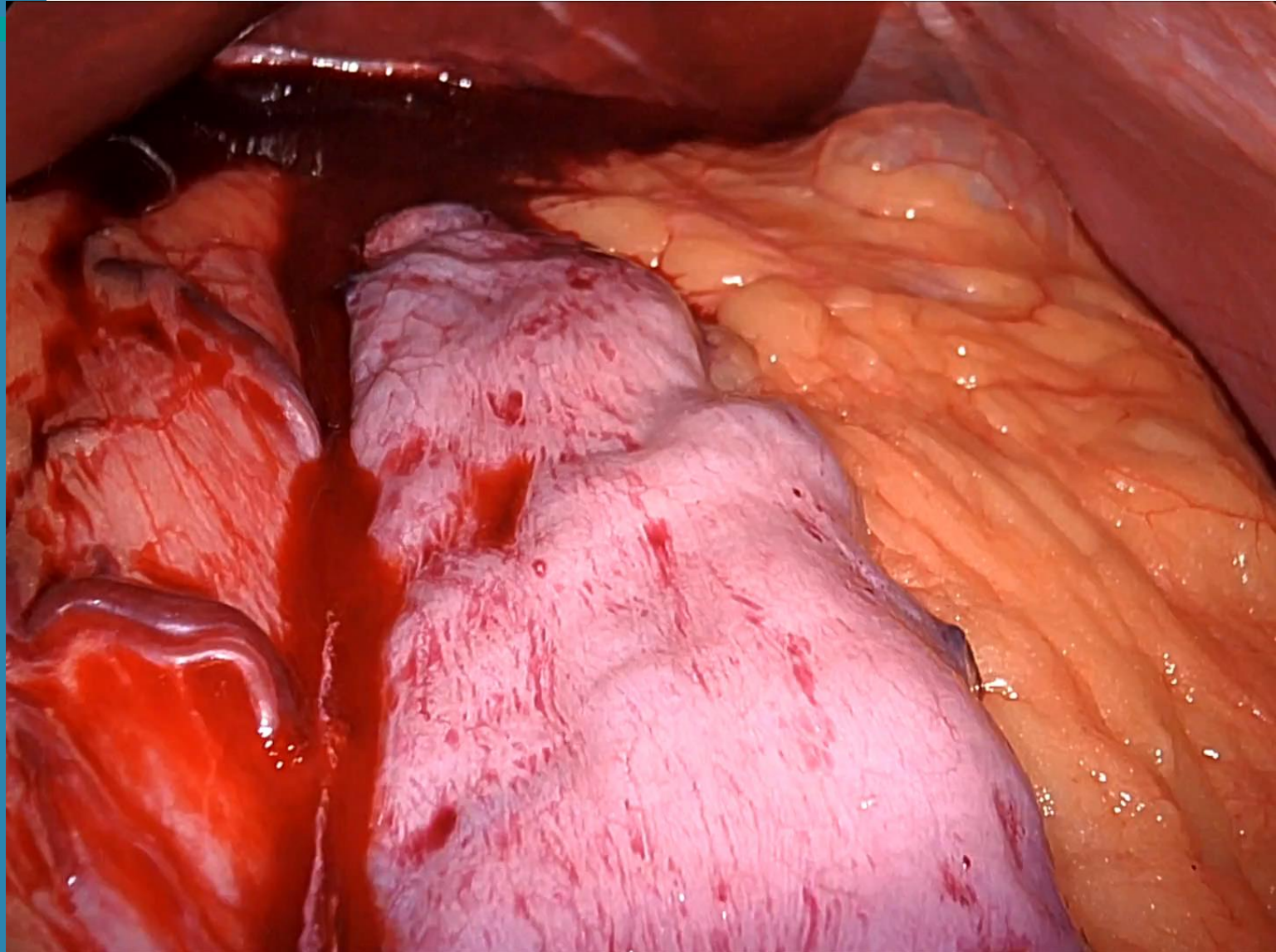
Video courtesy of Dr. Saber

1. Nguyen NT, et al. *Arch Surg.* 2005;140: 773-778. 2. Farraye FA, et al. *Bariatric Surgery: A Primer for Your Practice*; 131. Slack Incorporated, New Jersey, 2006. 3. Shikora S. *Obesity Surg.* 2004;14:1313-20. 4. Lewis KM, et al. *Surgery.* 2017;161:771-781.



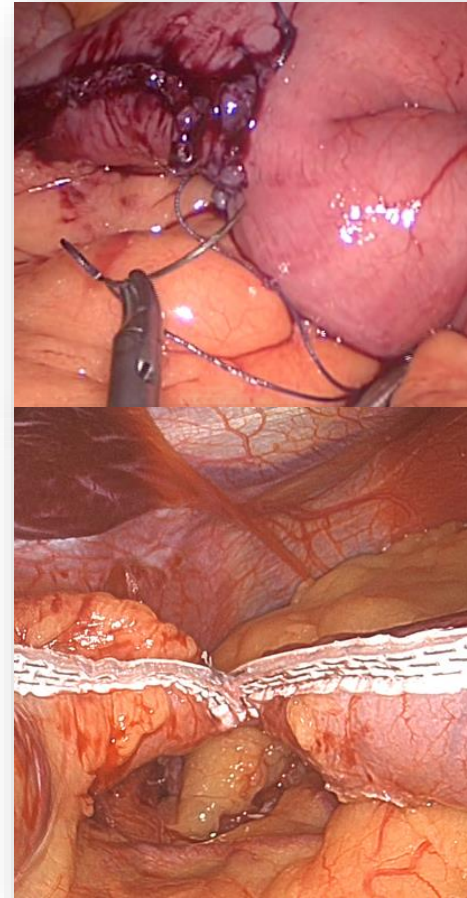
# Complications: Staple line bleeding

- Courtesy footage
- Non reinforced tissue
- Last staple fire
- Question



# Staple Line Reinforcement Options

- Suture Oversewing<sup>1</sup>
- Buttress Options<sup>1</sup>
  - Synthetic – Bioabsorbable
    - SEAMGUARD Bioabsorbable Staple Line Reinforcement<sup>2</sup>
  - Biologic Tissue
    - PERI-STRIPS DRY with VERITAS Collagen Matrix (PSDV)<sup>3</sup>



Images courtesy of Dr. Saber

**Please refer to Indications and Important Risk Information at the end of this slide presentation.**

# Why Use Staple Line Reinforcement?

- Staple Line Leak<sup>1</sup>
- Staple line failure occurs in 0.5-6% of laparoscopic gastric bypass procedures
- Failure can lead to acute gastrointestinal leak which often results in rapid development of:
  - Severe peritonitis
  - Septic shock
  - Multiple organ dysfunction and, in some instances, death
  - Survivors generally have protracted and expensive recoveries

- • *Acute staple line leak has a significant morbidity and a high mortality<sup>1</sup>*

1. Shikora S. *Obesity Surg.* 2004;14:1313-20.

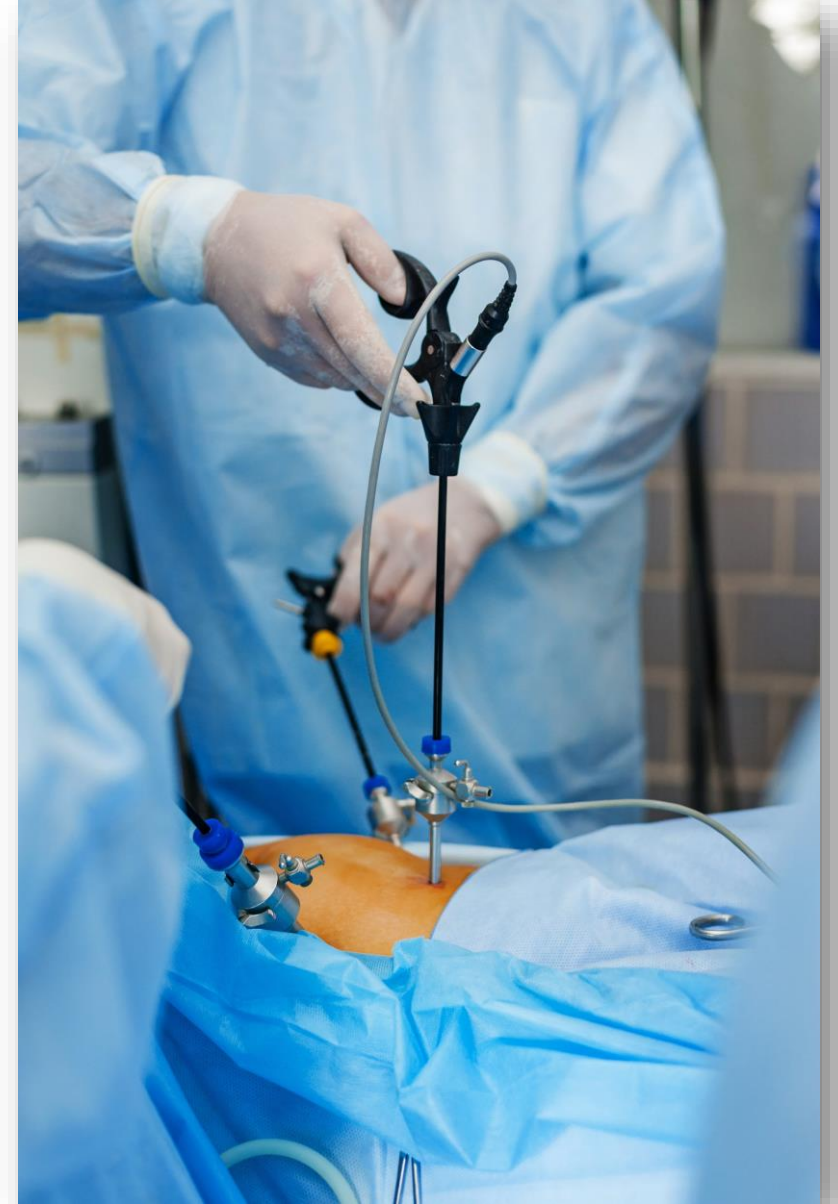


Image from Shutterstock



# Buttress Pros

Benefits:

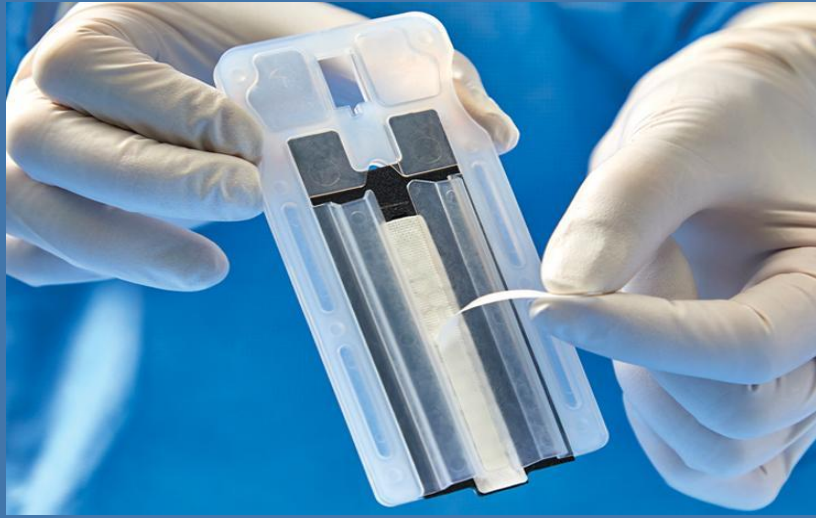
Reduce leaks

Bleeding risk reduction

Cost savings







# Baxter Products

# Peri-Strips reinforcements

- Bovine pericardium
- Strength / compression
- Easy to apply / use
- 20 years of data



Collagen fibers are multidirectional<sup>1</sup>

1. Sacks MS, et al. *ASAIO J.* 1994;40:M632-M637. 2. Shieh M. *Bariat Times.* 2011;8:14-16.  
3. Shikora SA, et al. *Obes Relat Dis.* 2008; 4:729-734. 4. Limpert JN, et al. *Am J Surg.* 2009;198:e60-e65.

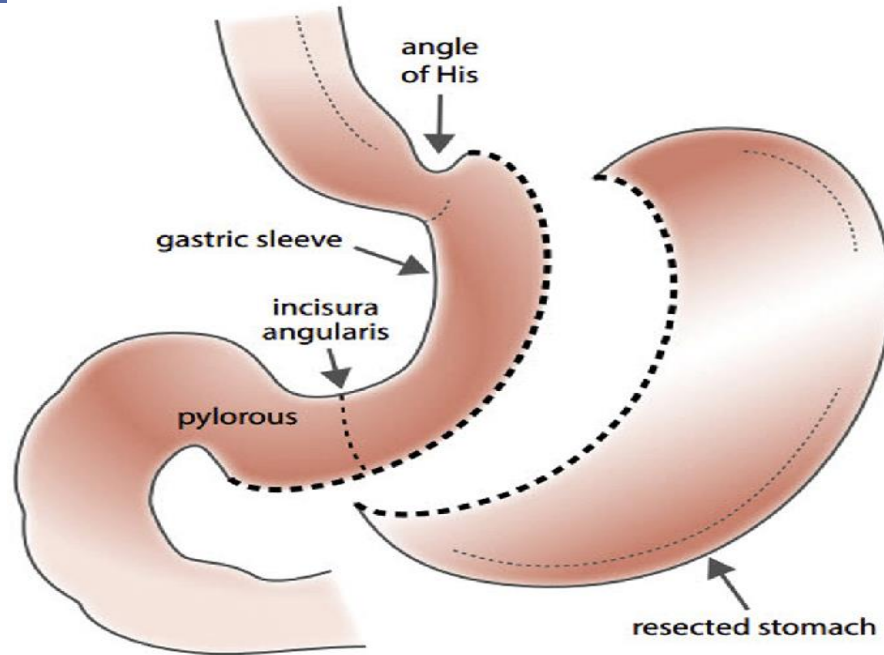


# Peri-Strips reinforcement

**Baxter**



# Observe fundamentals:



observe tenet of surgery  
vasculature  
compression  
angles

Instrumentation  
staple height





# Tisseel \* Fibrin sealant

- Fibrin sealant
- Wide range application
- Adjunct to suture / stapling
- Indication
- Hemostasis and sealant
  - Anastomosis



# Tisseel \* Fibrin sealant

- Frozen
- First thaw product
- Drip or spray application
- Duplospray
- \*\* do not microwave
- \*\* do not expose to temp >37





## Case presentations

These case studies are presented only as examples and should not be considered as medical advice for any specific patient.

Videos and case details are courtesy of Dr. Carlton.

**Baxter**





**Peri-Strips**  
easy load  
team effort

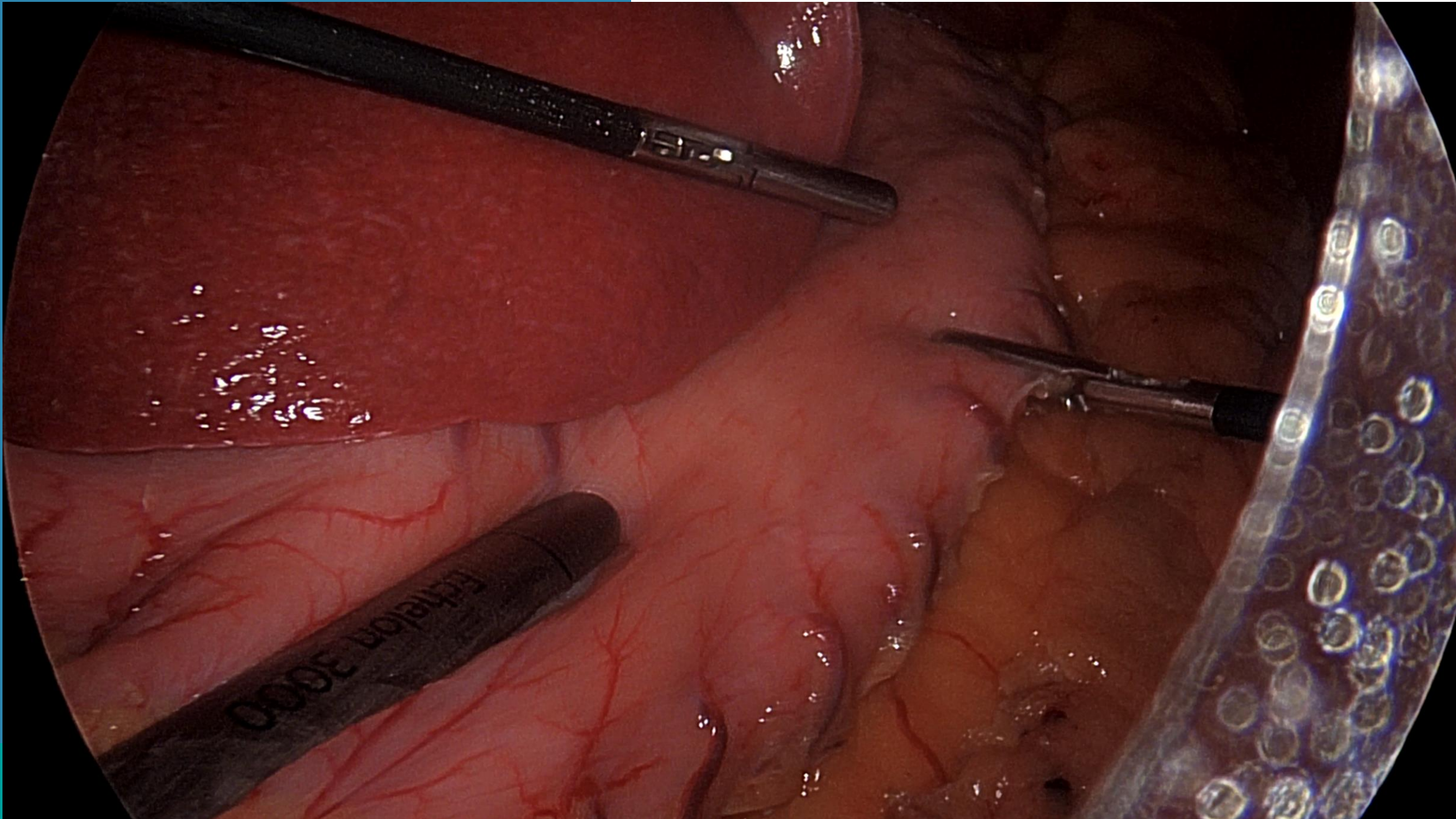
**Baxter**



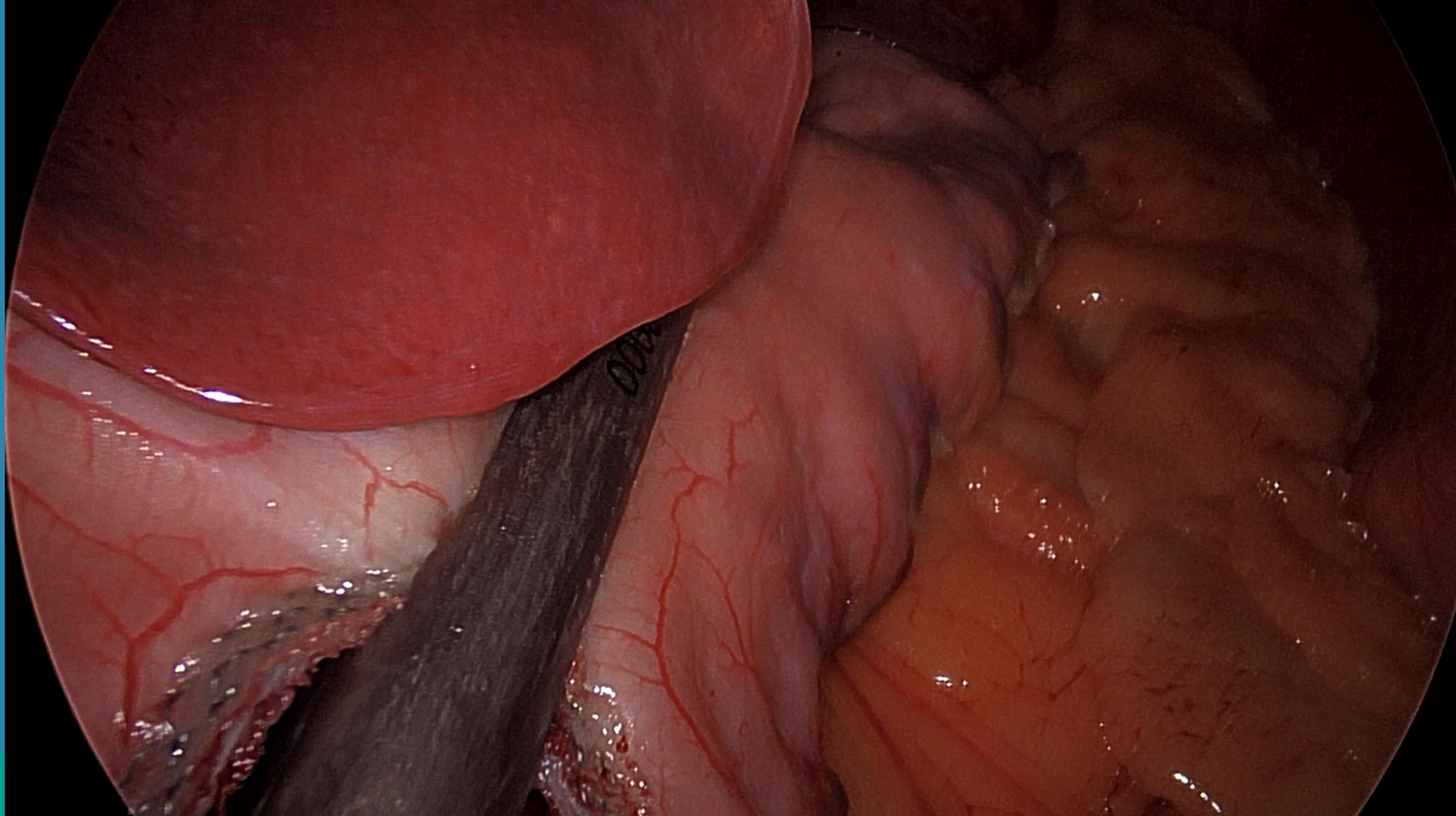
# Gastric Sleeve

**Baxter Peri-Strips**

***Baxter***





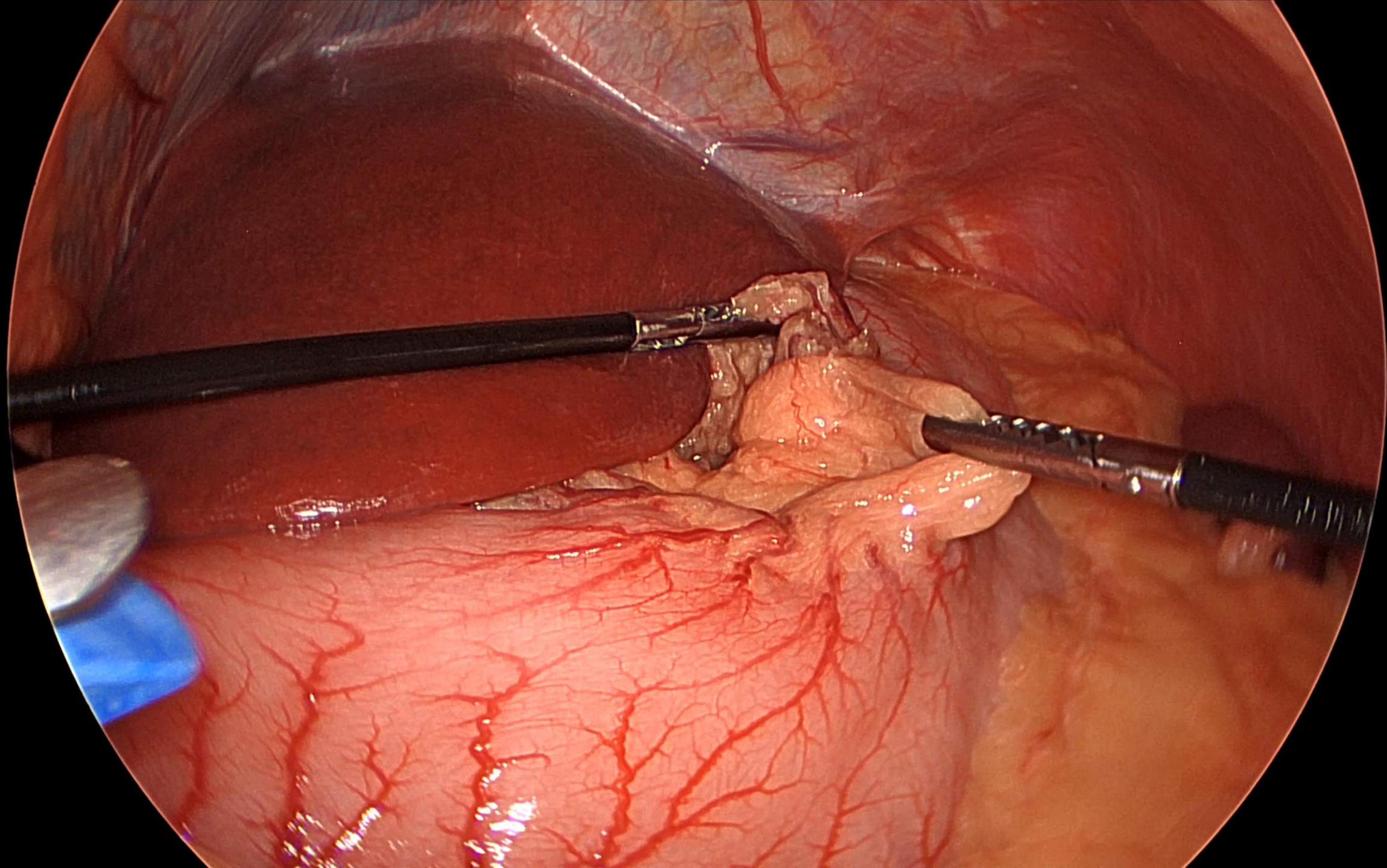


# Gastric Bypass

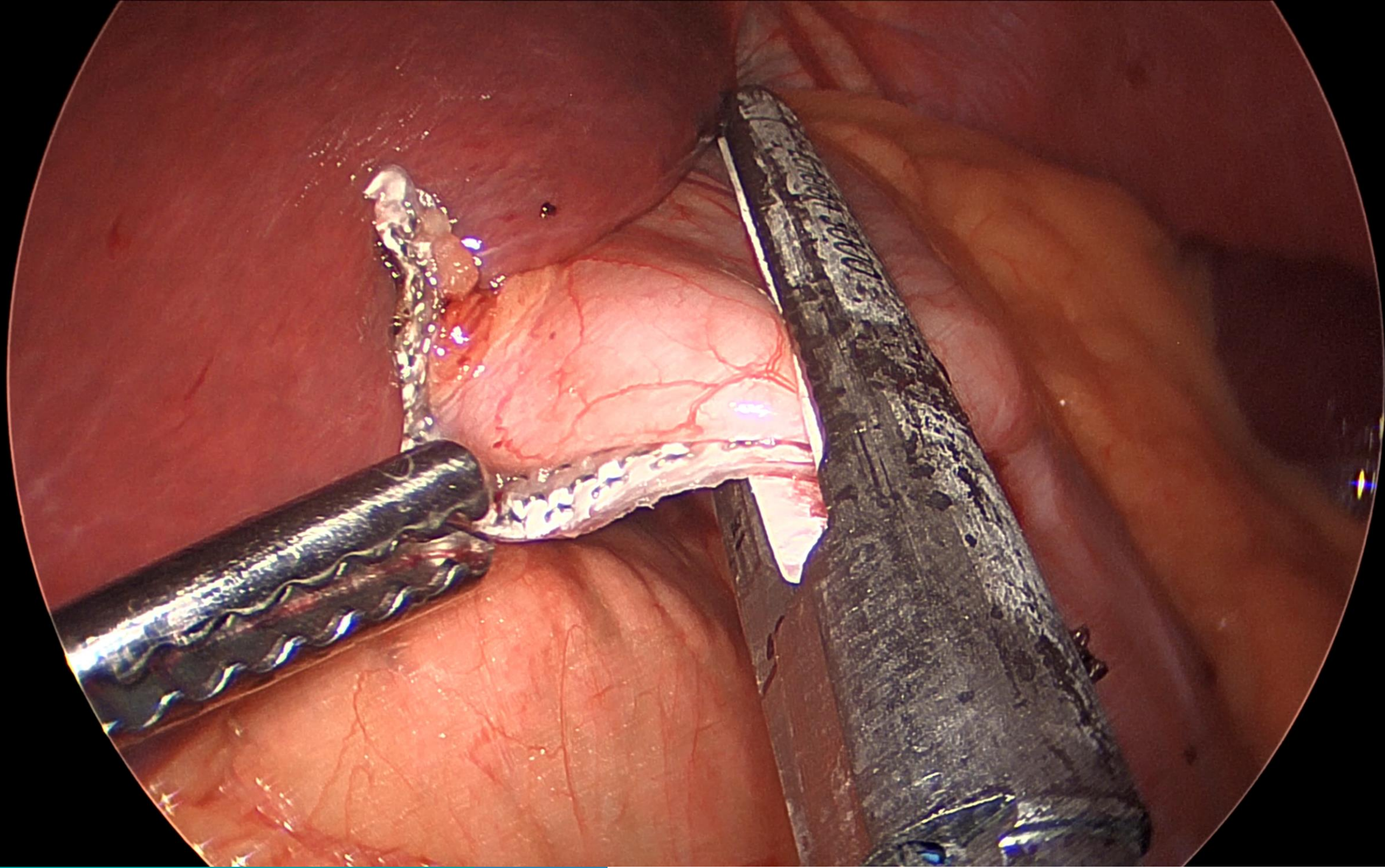
**Baxter Peri-Strips**

***Baxter***

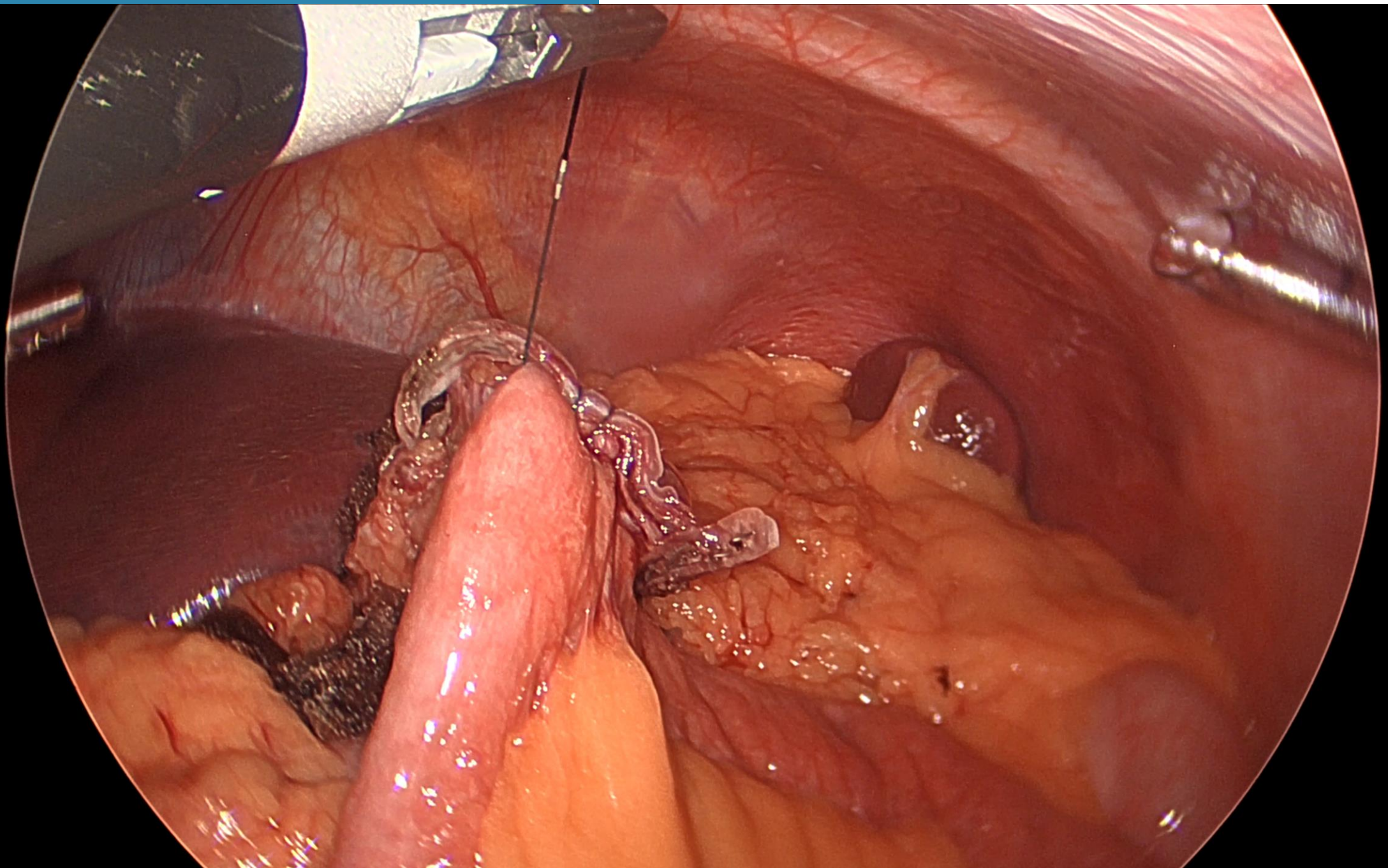




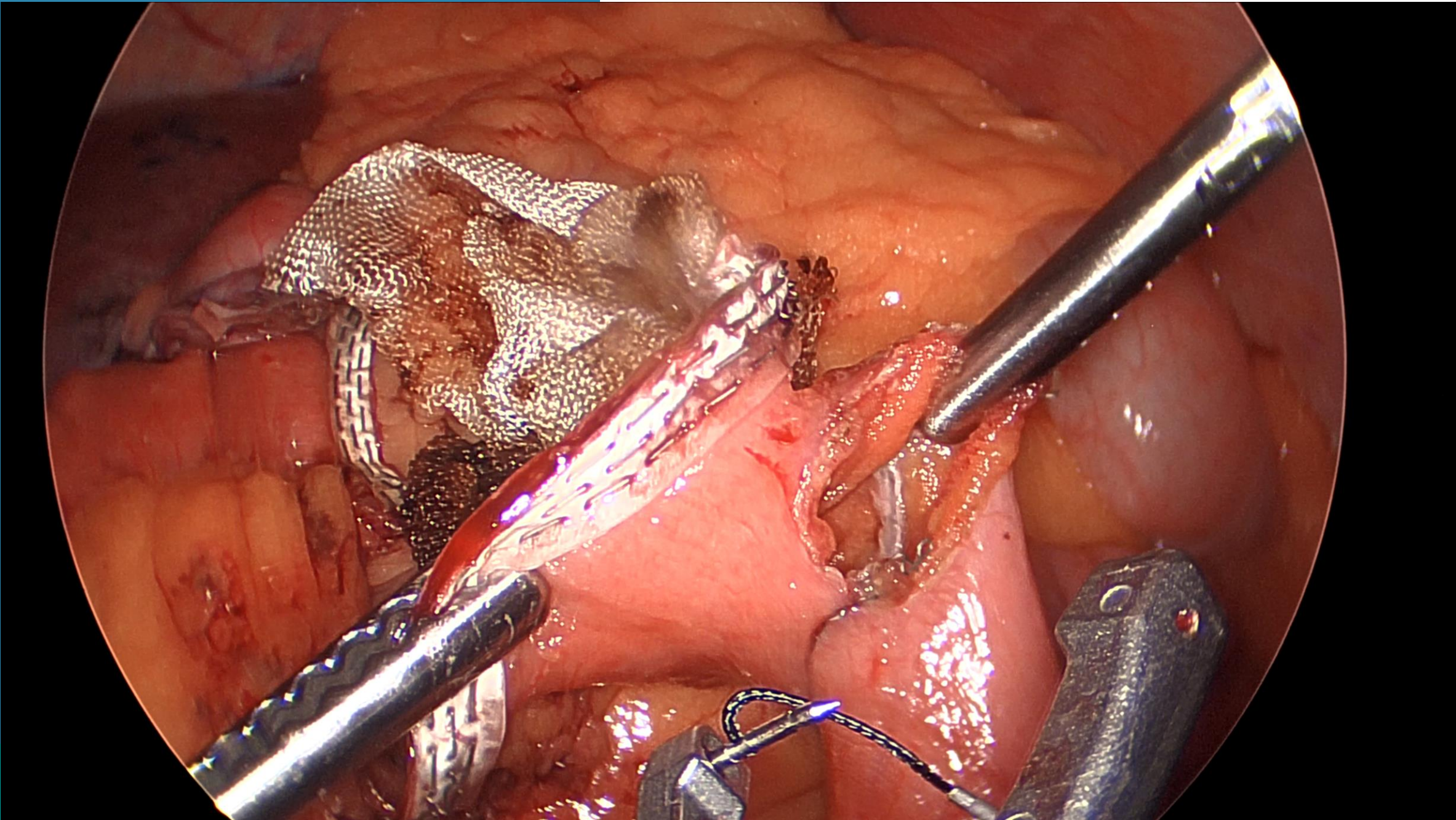








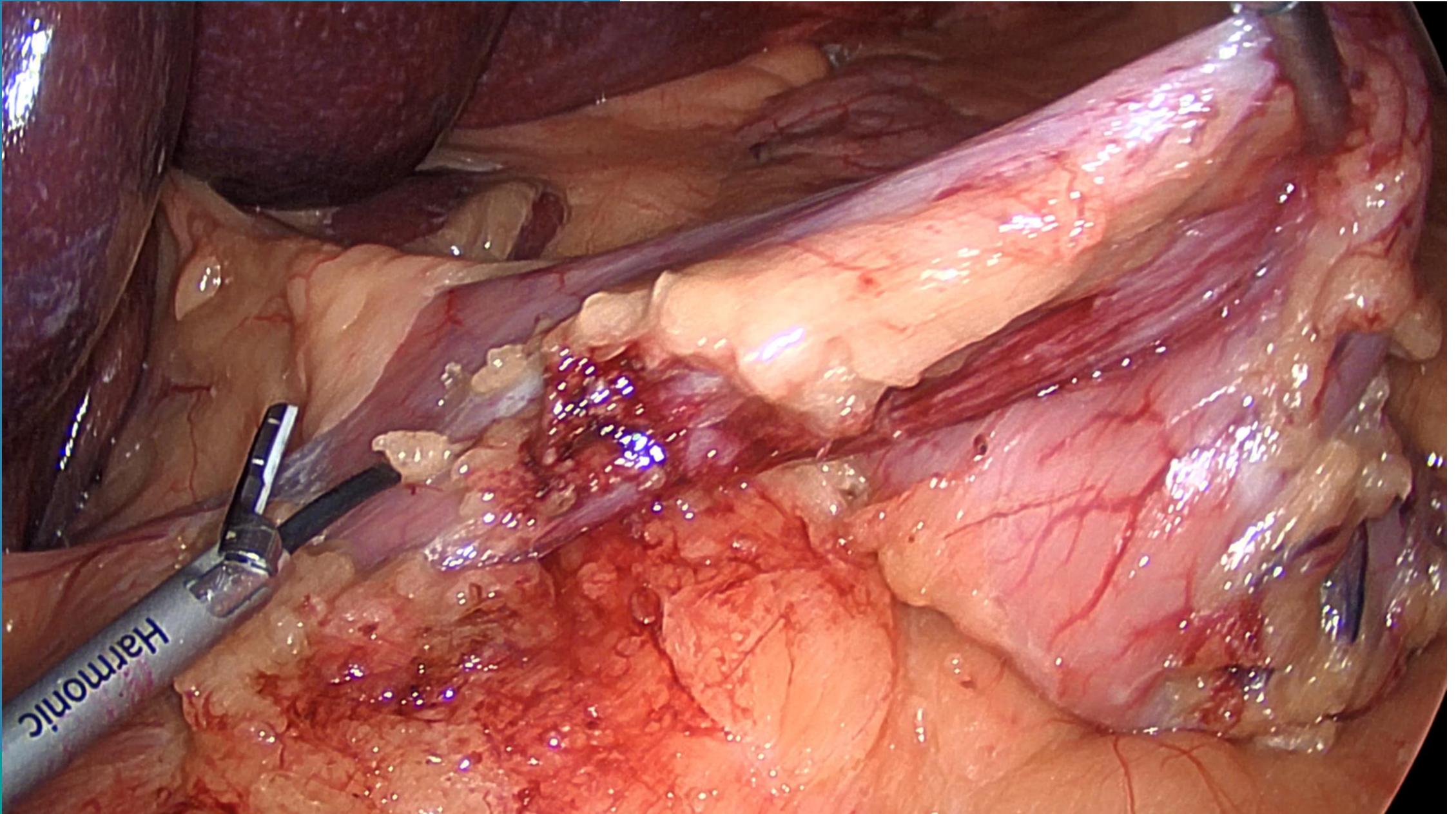




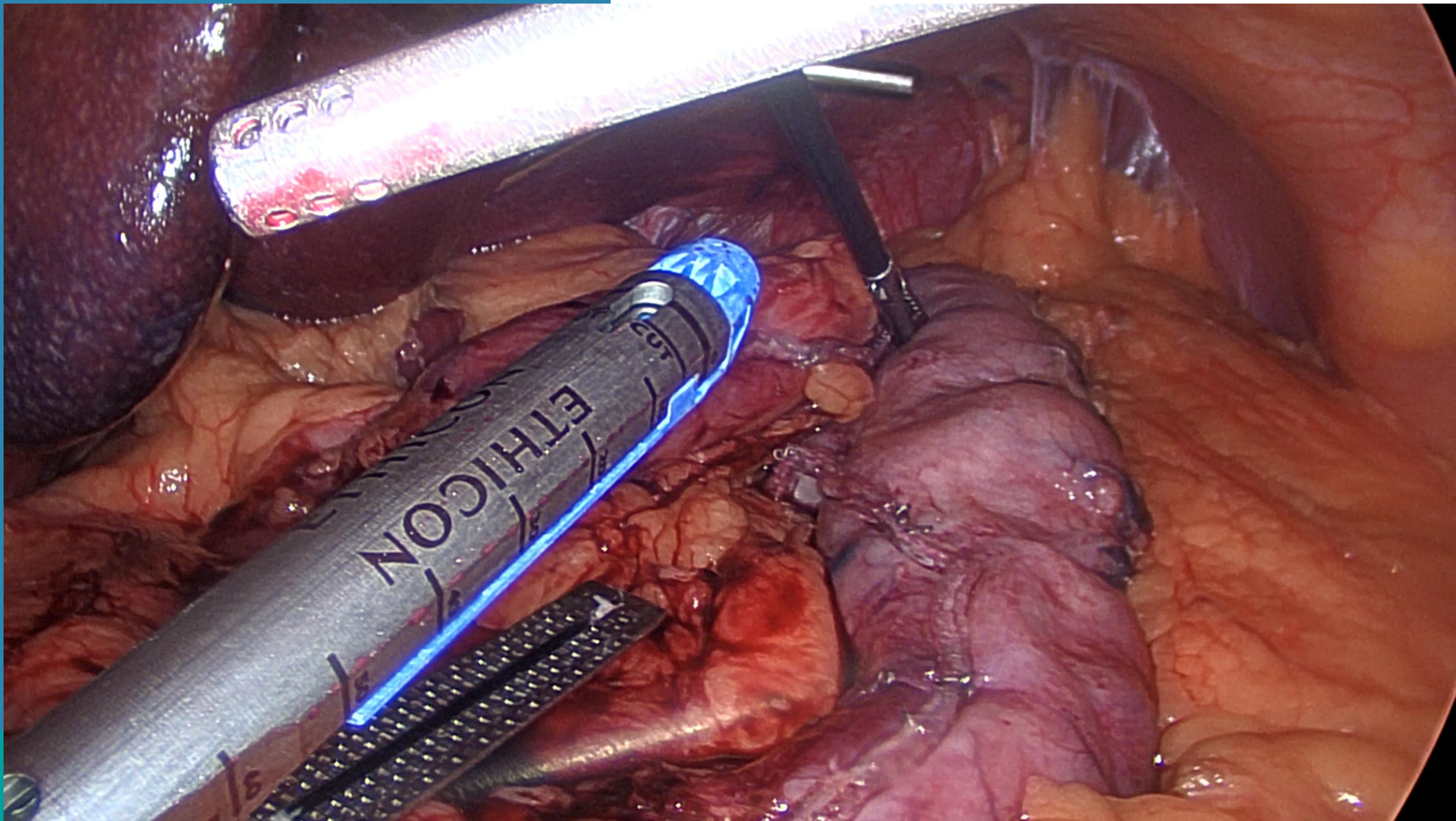


# Duodenal Switch

**Retro duodenal dissection**









# Summary

- While the current stapling devices are extremely safe and reliable, staple line failures can and do occur<sup>1</sup>
- Staple line buttressing:<sup>2</sup>
  - Spreads tension across entire staple line
  - Improves compression
  - Reduce the risk of staple line bleeding and leaks
  - Increases staple line burst pressure



1. Shikora S. *Obesity Surg.* 2004;14:1313-20. 2. Shikora SA, Mahoney CB. *Obes Surg.* 2015;25:1133-1141. Image from Shutterstock  
3. Shikora SA, et al. *Surg Obes Relat Dis.* 2008;4:729-734. 4. Limpert JN, et al. *Am J Surg.* 2009;198:e60-e65.

**Baxter**



THANK YOU

*Baxter*



# QUESTIONS?

[DrC@lonestarbariatrics.com](mailto:DrC@lonestarbariatrics.com)

[www.lonestarbariatrics.com](http://www.lonestarbariatrics.com)

The screenshot shows the top portion of the Lonestar Bariatrics website. The header is white with a navigation menu containing links for Home, Our Practice, Weight Loss Options, Abdominal Surgery, Patient Stories, and Resources. On the right side of the header, the phone number (972) 200-2374 and a CONTACT link are displayed. The main hero section features a background image of a surgeon in blue scrubs and a surgical mask. Overlaid on the left is the Lonestar Bariatrics logo, which includes a stylized map of Texas with a star and the text 'LONESTAR BARIATRICS'. Below the logo is a 'WATCH OVERVIEW VIDEO' button with a play icon. In the bottom right corner of the hero section, there is a red 'CONTACT US' button. A small accessibility icon is visible in the bottom left corner of the hero section.

**LONESTAR BARIATRICS**

Home Our Practice Weight Loss Options Abdominal Surgery Patient Stories Resources

(972) 200-2374  
CONTACT

**LONESTAR BARIATRICS**

Dr. Chad Carlton

WATCH OVERVIEW VIDEO

BOARD CERTIFIED BARIATRIC & GENERAL SURGEON

CONTACT US