Management of Para-Esophageal Hernias (PEH)

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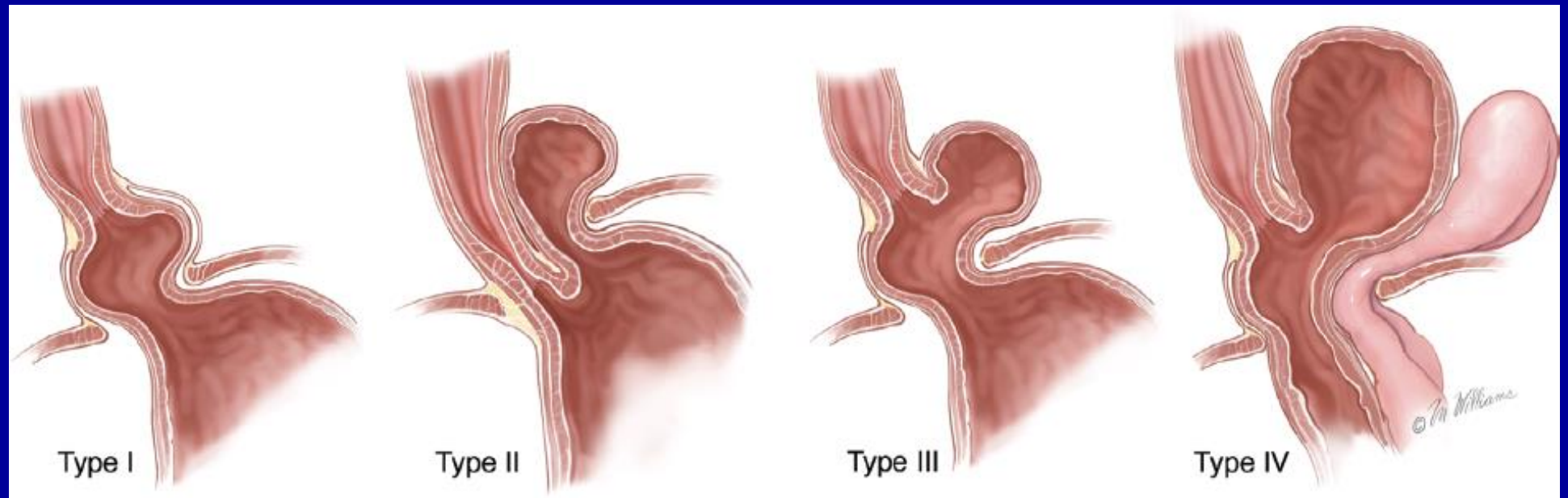
Henderson Lecture. Toronto, June 2024

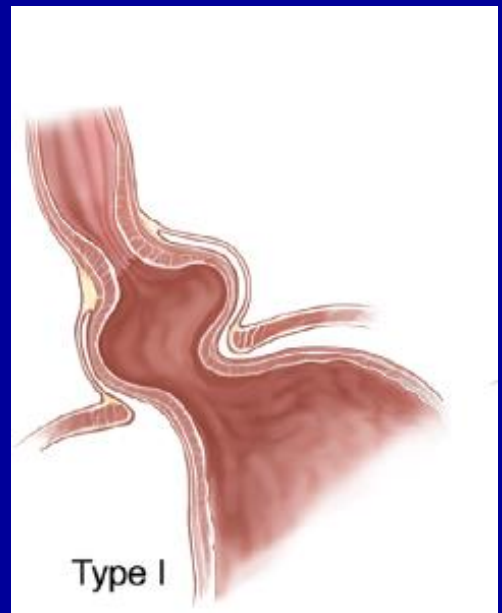
No Disclosures



Source: D. J. Sugarbaker, R. Bueno, Y. L. Colson, M. T. Jaklitsch, M. J. Krasna, S. J. Mentzer, M. Williams, A. Adams: *Adult Chest Surgery*, 2nd Edition: www.accesssurgery.com

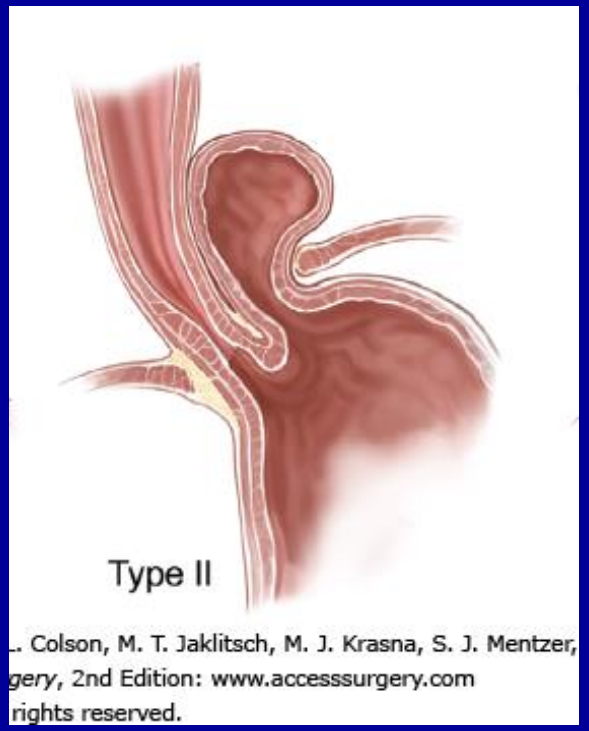
Type 1: Sliding hernia

- The gastroesophageal junction herniates through the esophageal hiatus into the mediastinum
- Most common type
- GERD, Dysphagia (Schatzki rings)



Type 2: Paraesophageal hernia

- Least common
- The gastric cardia and LES remain below the diaphragm.
- The gastric fundus herniates through the defect into the mediastinum
- Can lead to dysphagia, ulceration and anemia



. Colson, M. T. Jaklitsch, M. J. Krasna, S. J. Mentzer,
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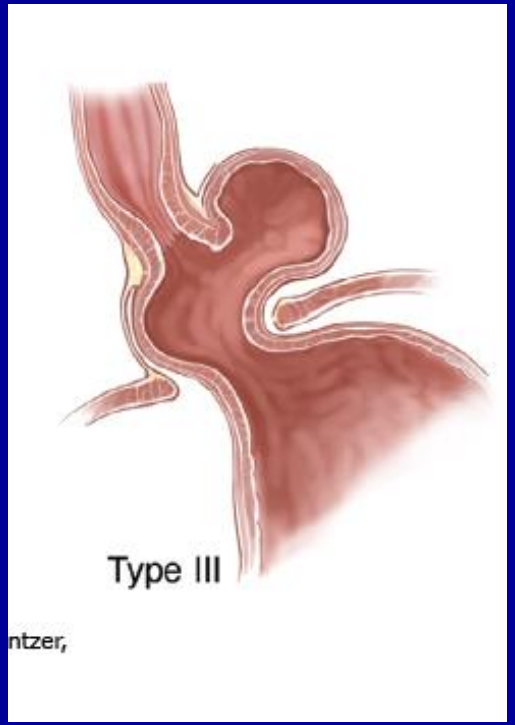
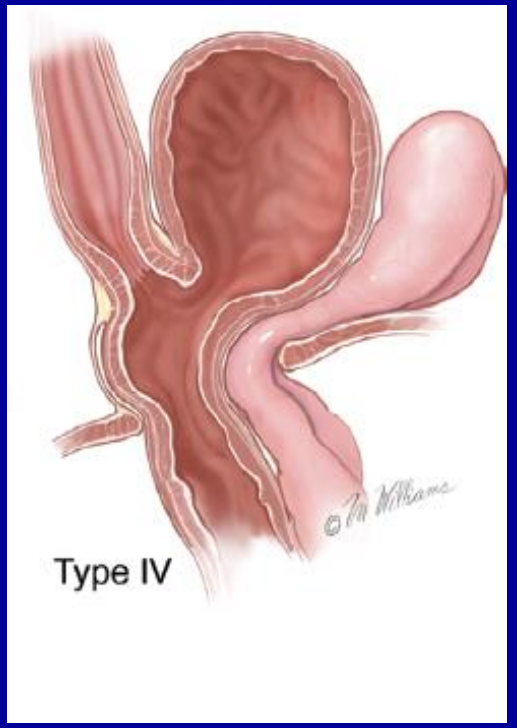
Type 3: Mixed hiatal hernia

- Combined types 1 and 2 hernias.
- Usually patient has initially one type of hernia that progress to a mixed type.



Type 4: Complex Hiatal Hernia

- Progressive enlargement of the diaphragmatic opening eventually can lead to herniation of organs other than the stomach.
- The transverse colon and omentum are most commonly involved, but the spleen and small bowel also may herniate into the chest.



Indications for surgery

- GERD refractory to medical management
- Large hernia (risk of strangulation)
- Symptoms of obstruction
  - Chest pain with meals
  - Dysphagia
  - Early satiety

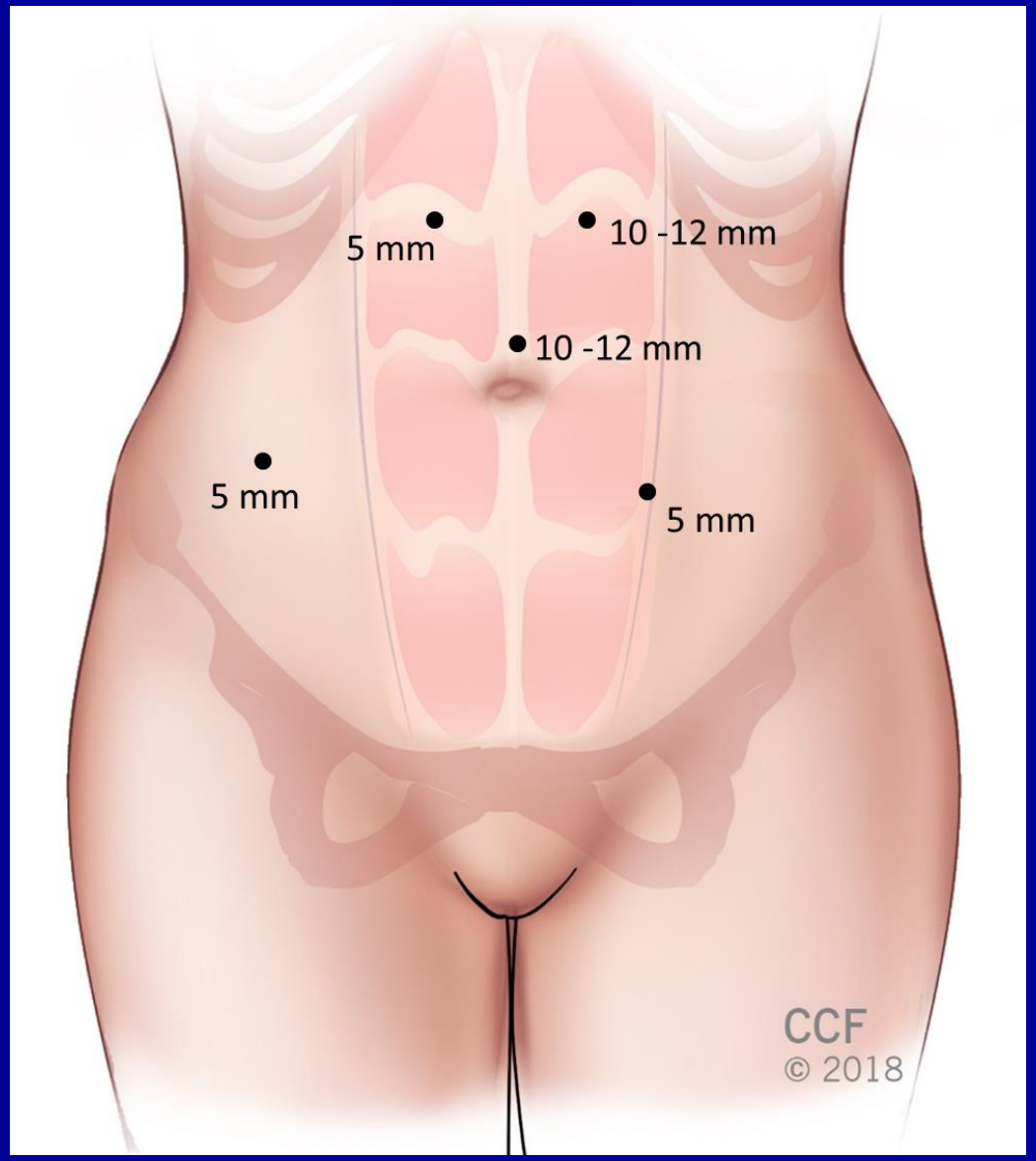
Work up for PEH

- Manometry
  - To determine the value of Nissen (360 deg)vs Toupet (270 degree) vs Dor (180 deg) fundoplication
- 4-hour NM Gastric Emptying study
  - May be inaccurate in large hernias due to obstruction
- Barium Swallow
- EGD
  - Rule out ulcers
- CT scan for Redo Anti-reflux surgery

Principles of hernia surgery

- Reduction of the hernia
  - Restore intra-abdominal esophageal length
- Resection of the sac
- Closure of the crural defect.
- Fixation
  - Fundoplication vs Gastropexy

Port Placement



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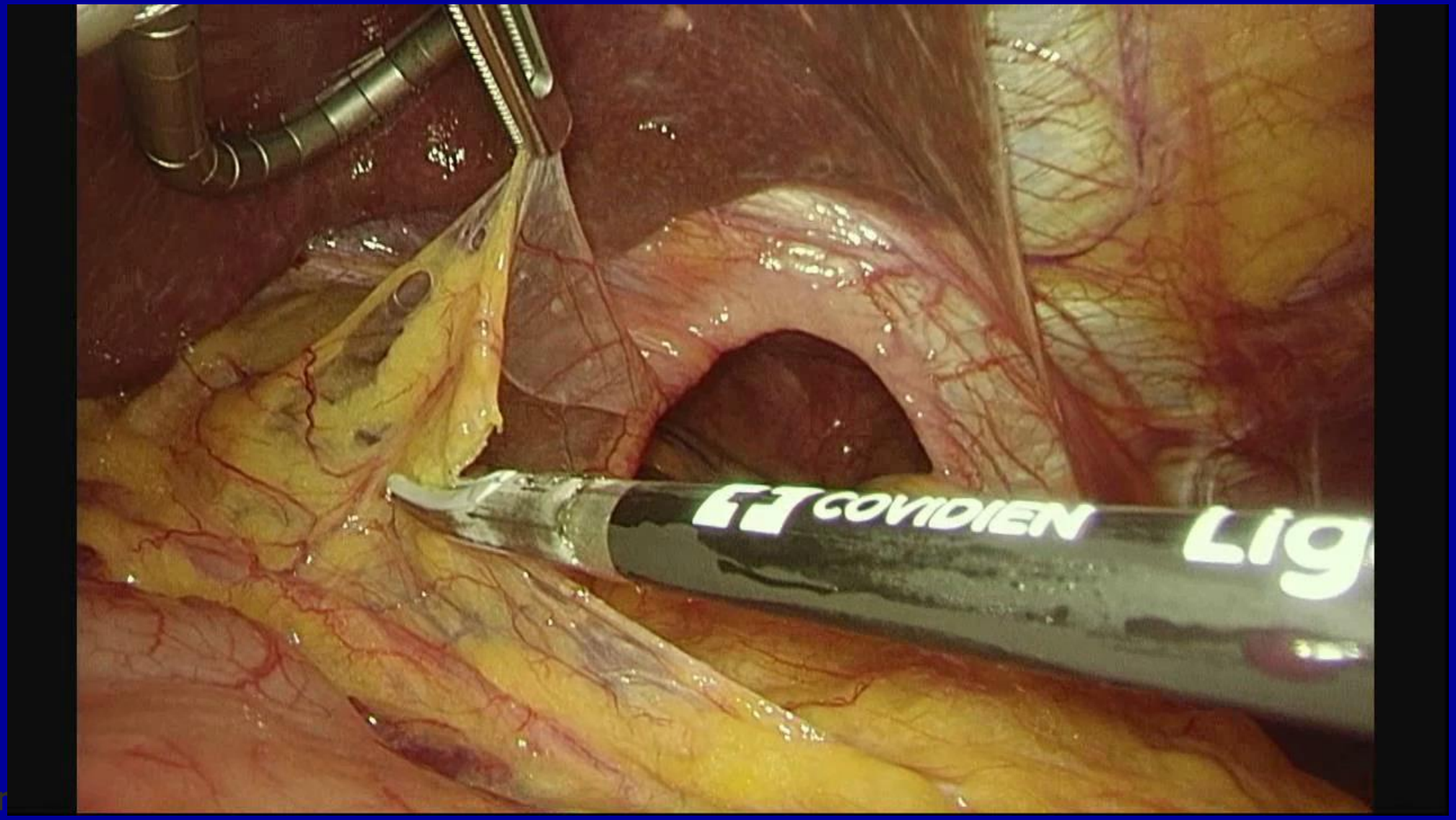
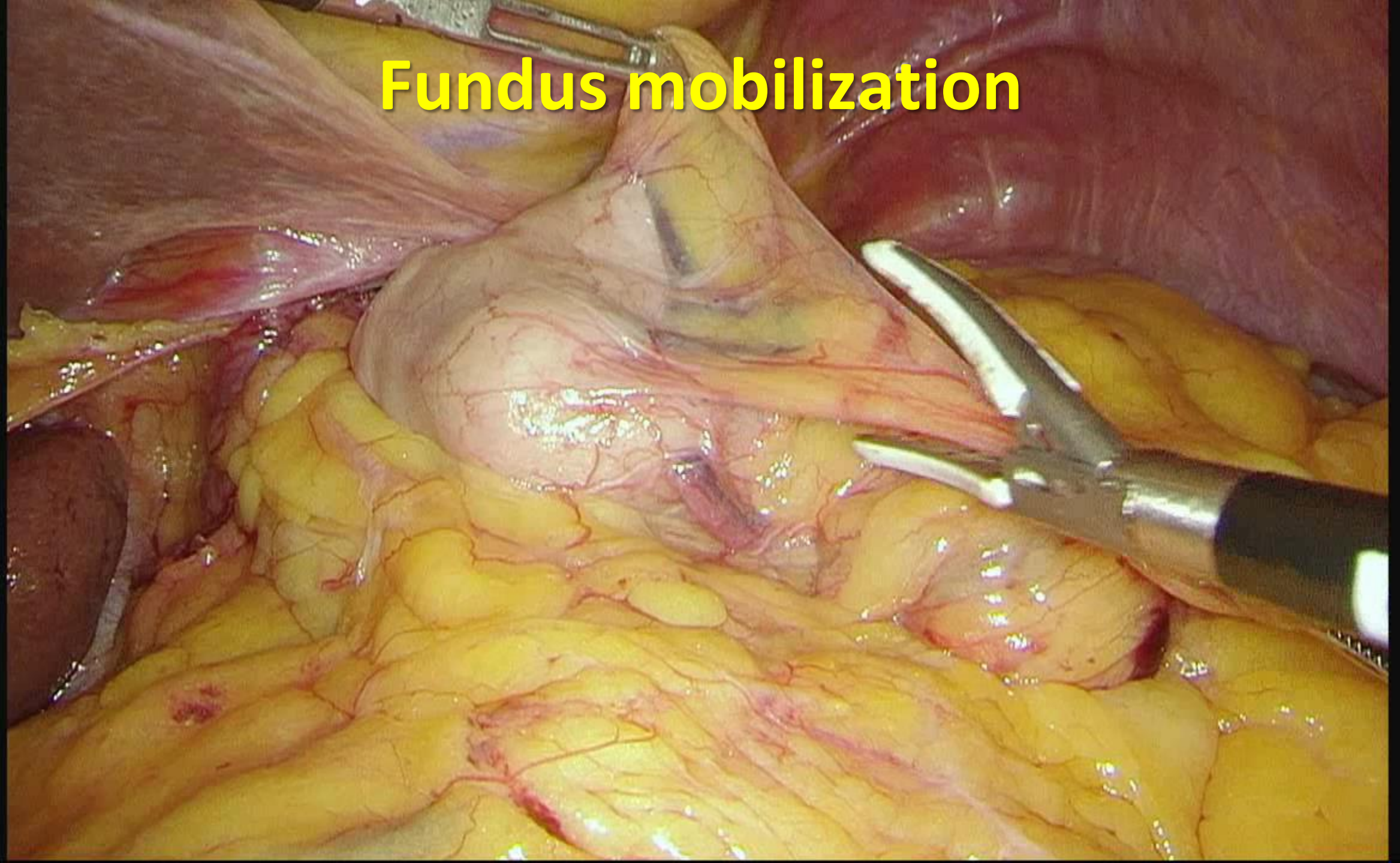
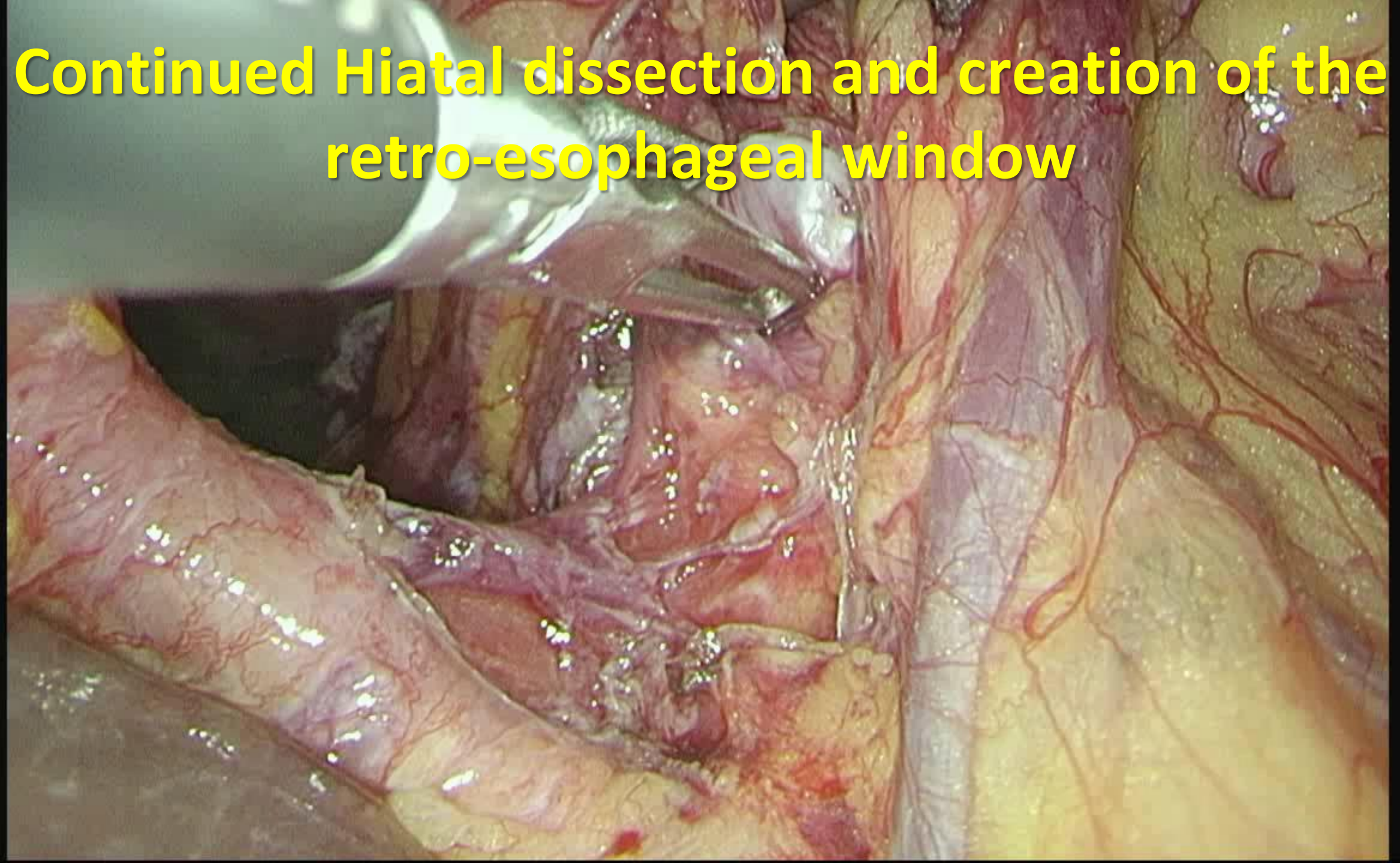
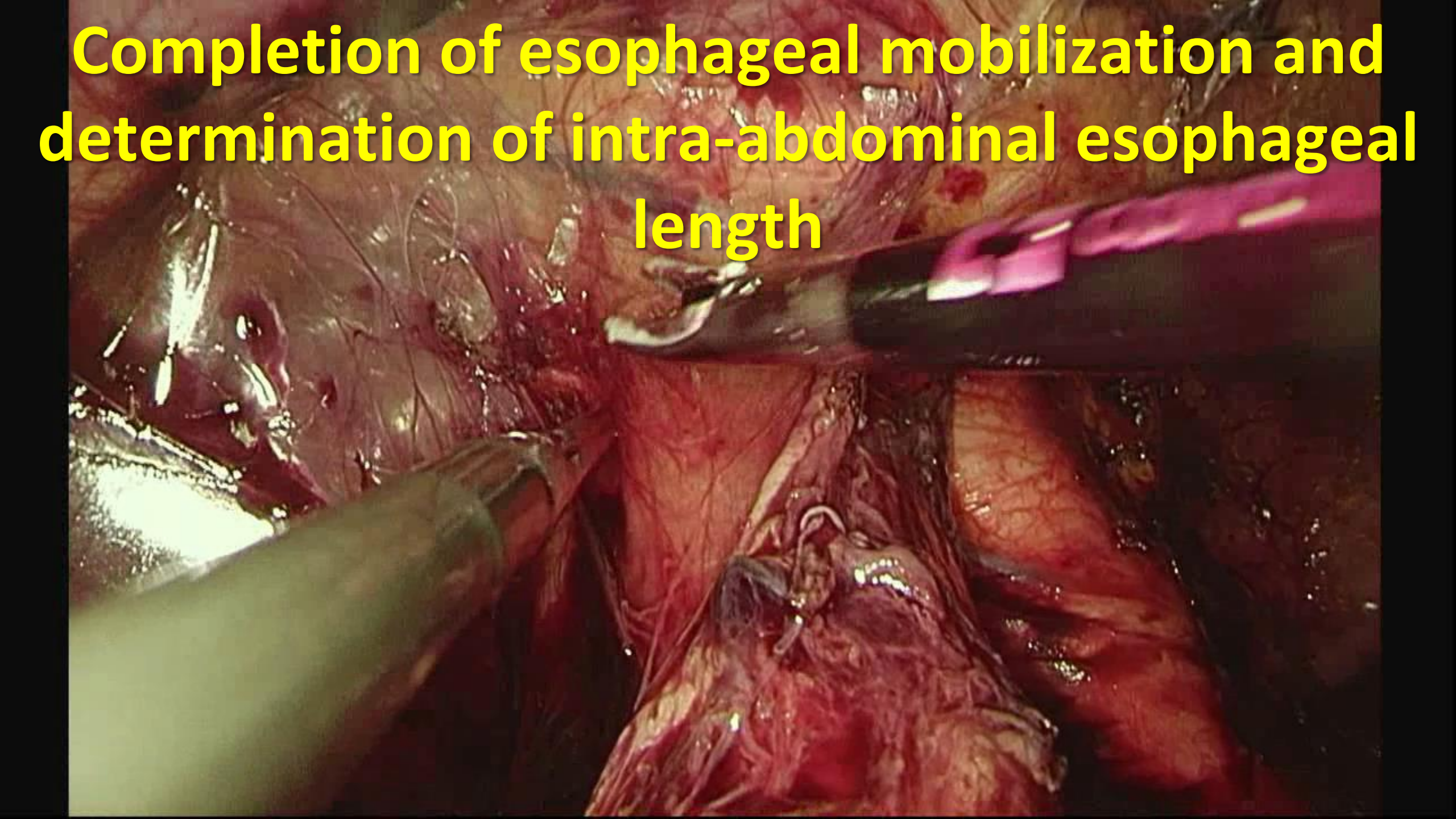
Entering the right dissection plane

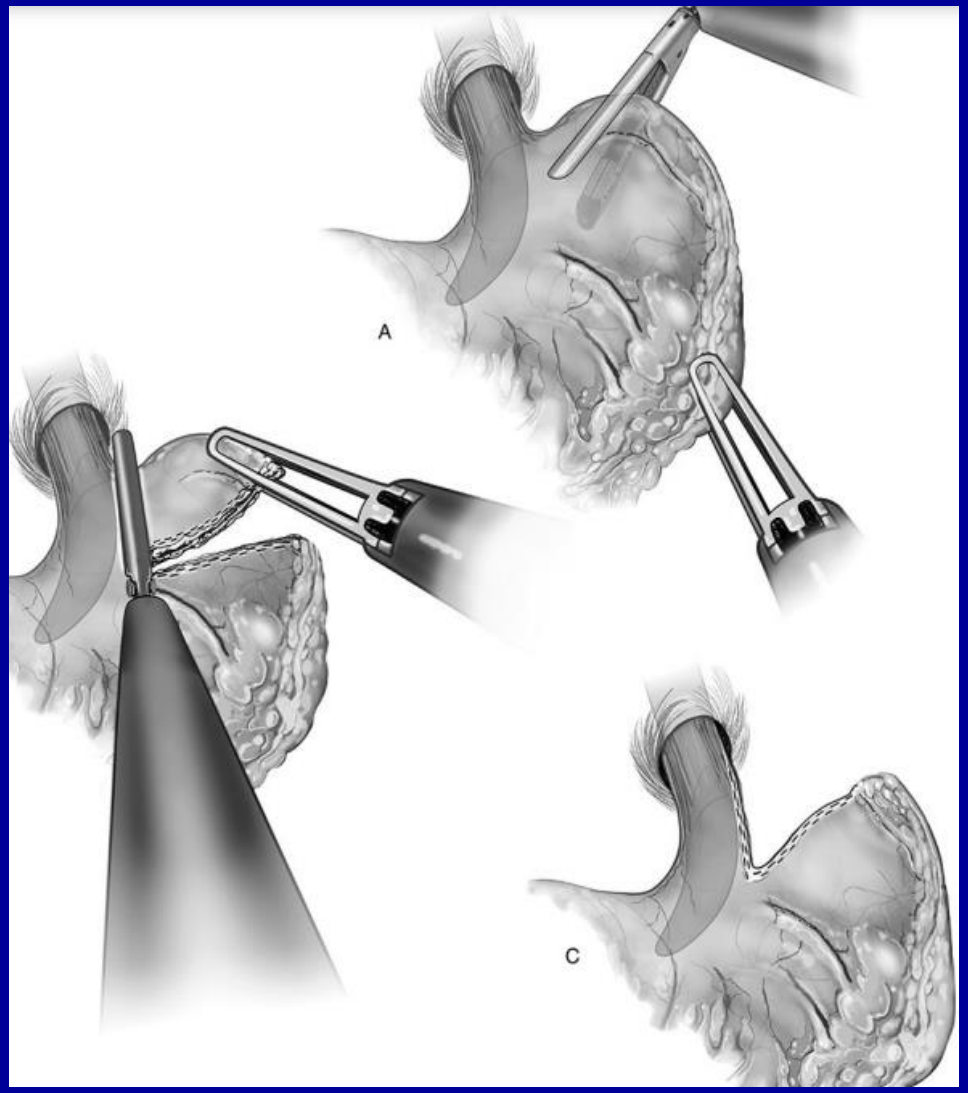



Fundus mobilization

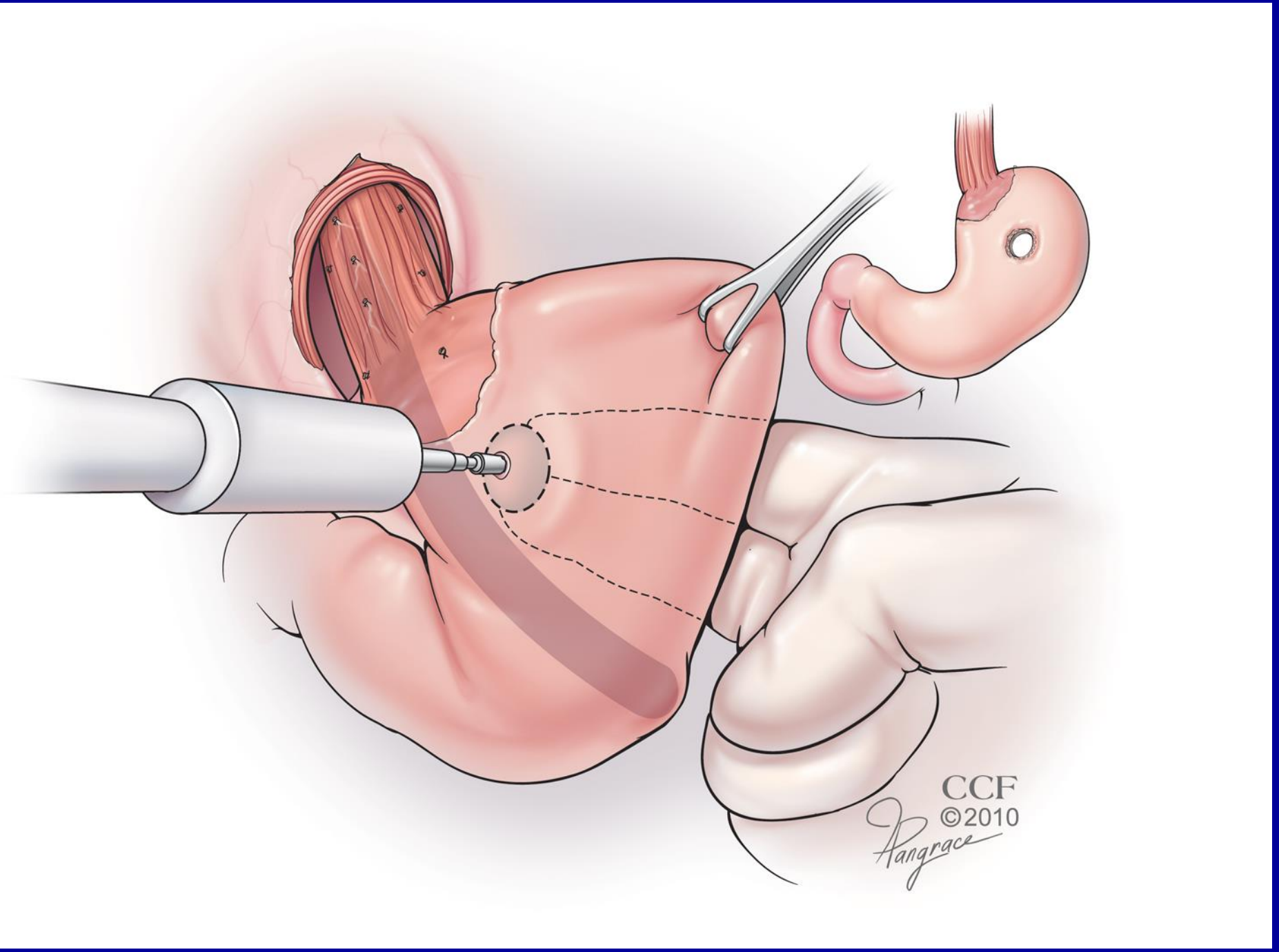

Continued Hiatal dissection and creation of the retro-esophageal window


Completion of esophageal mobilization and determination of intra-abdominal esophageal length

Wedge Gastroplasty



Addressing the short esophagus – wedge gastroplasty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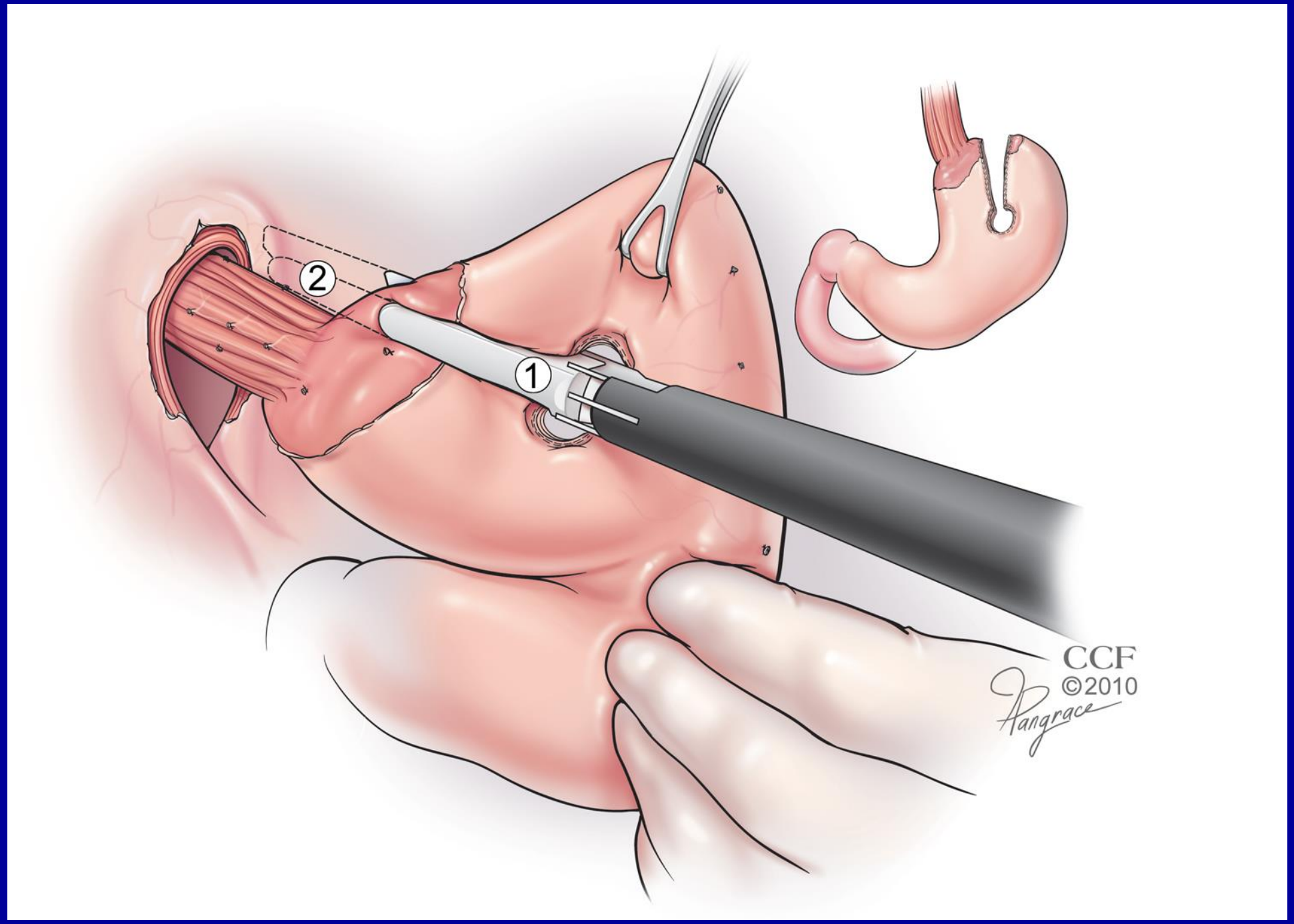
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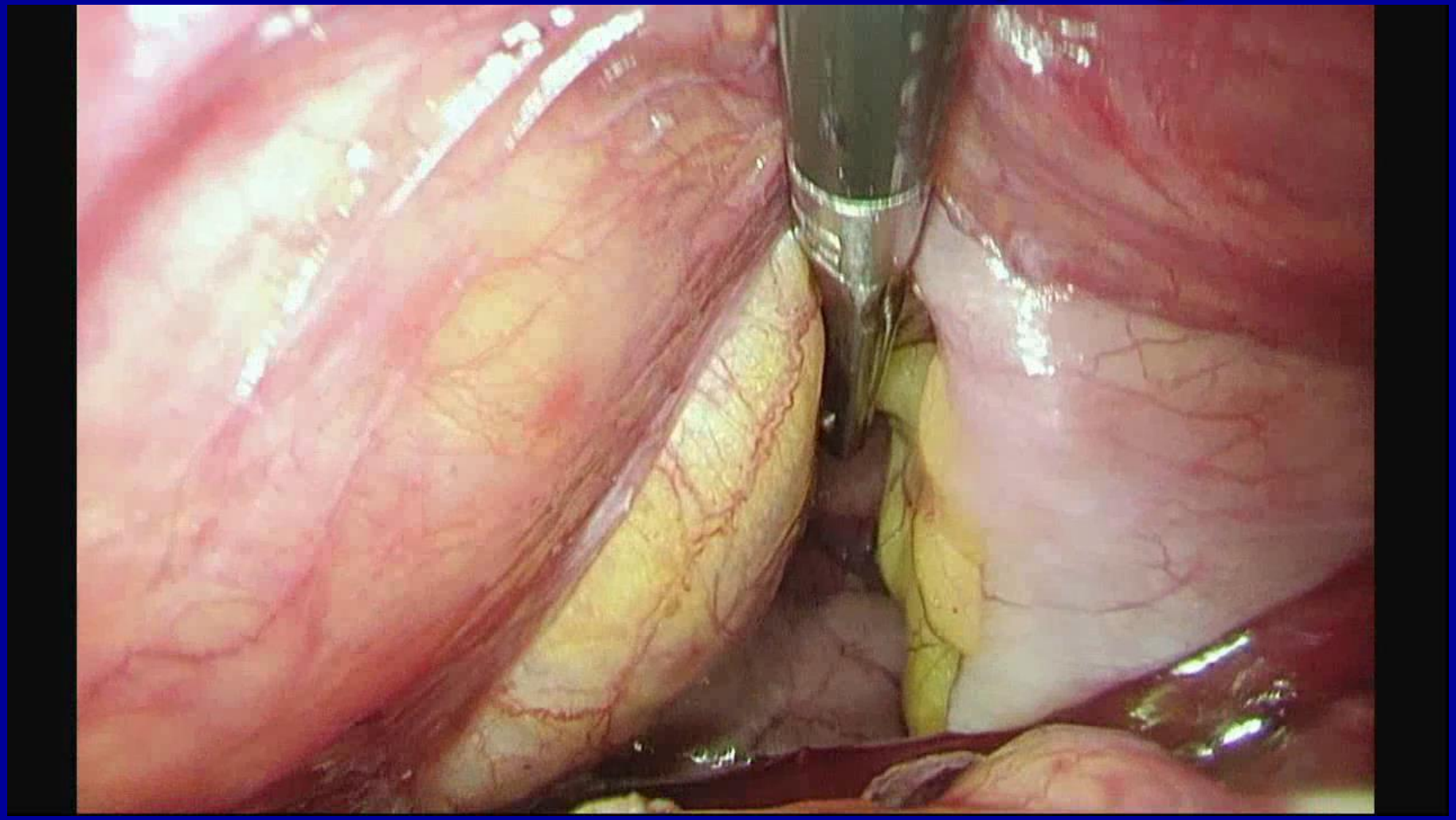
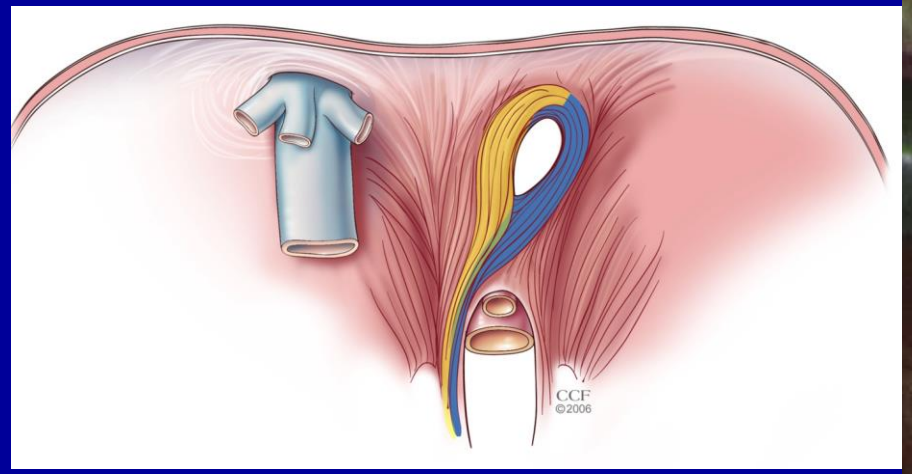
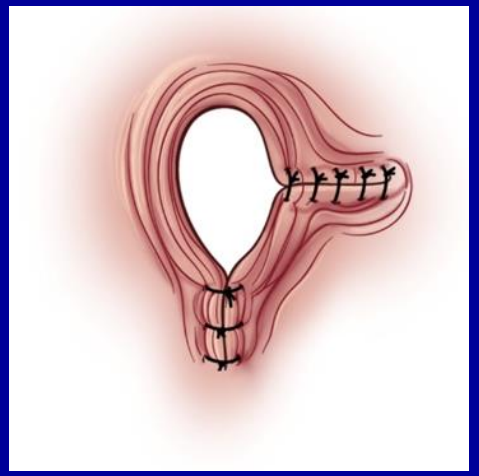
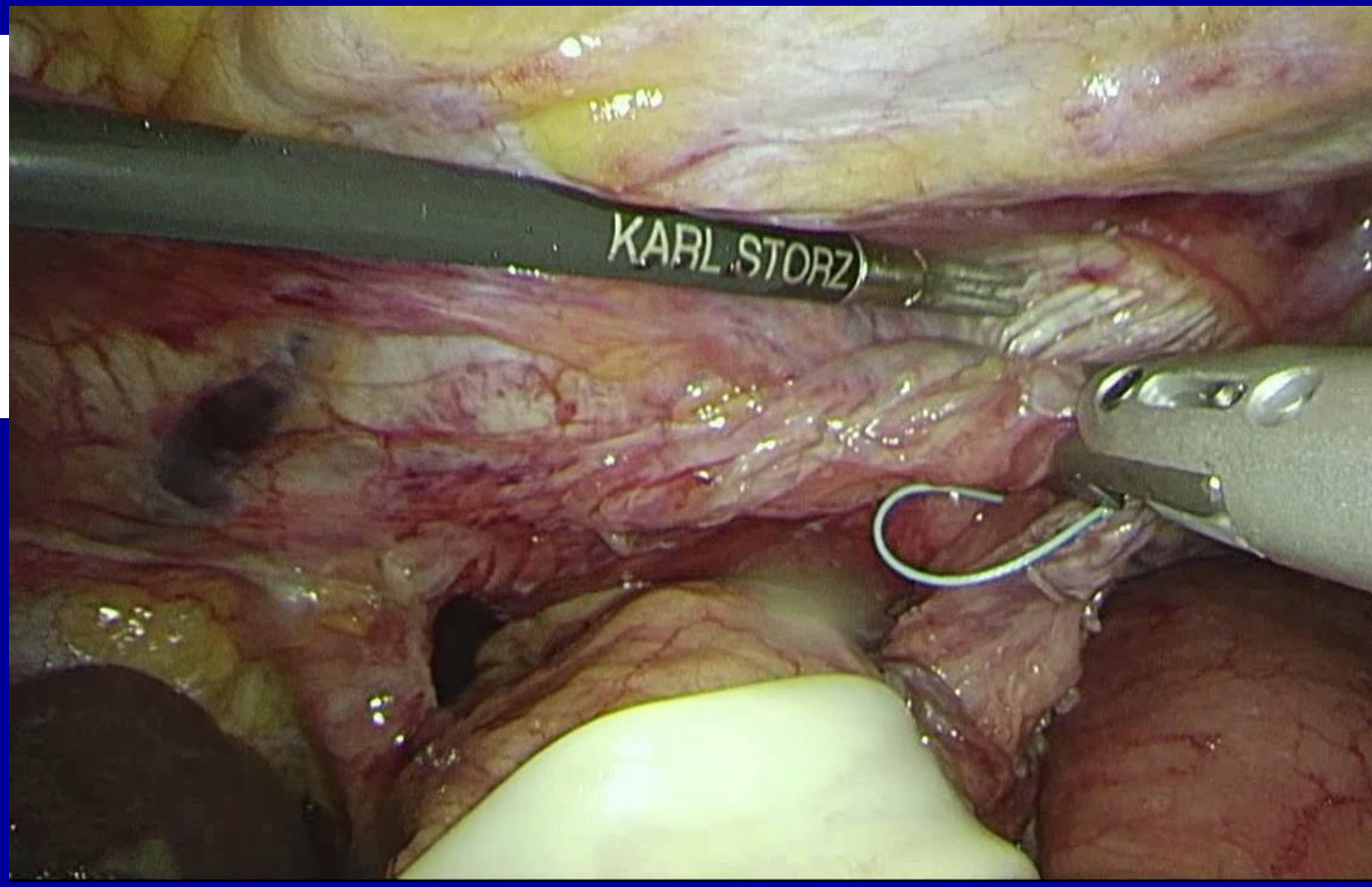
Addressing the short esophagus
Transthoracic stapling



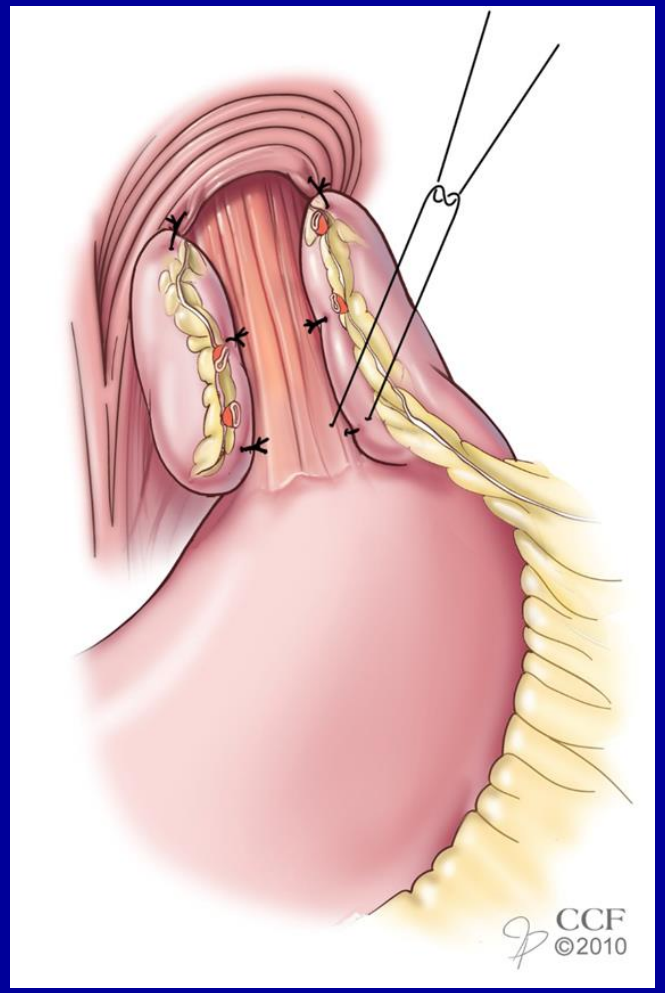
Cruroplasty







Partial Fundoplication



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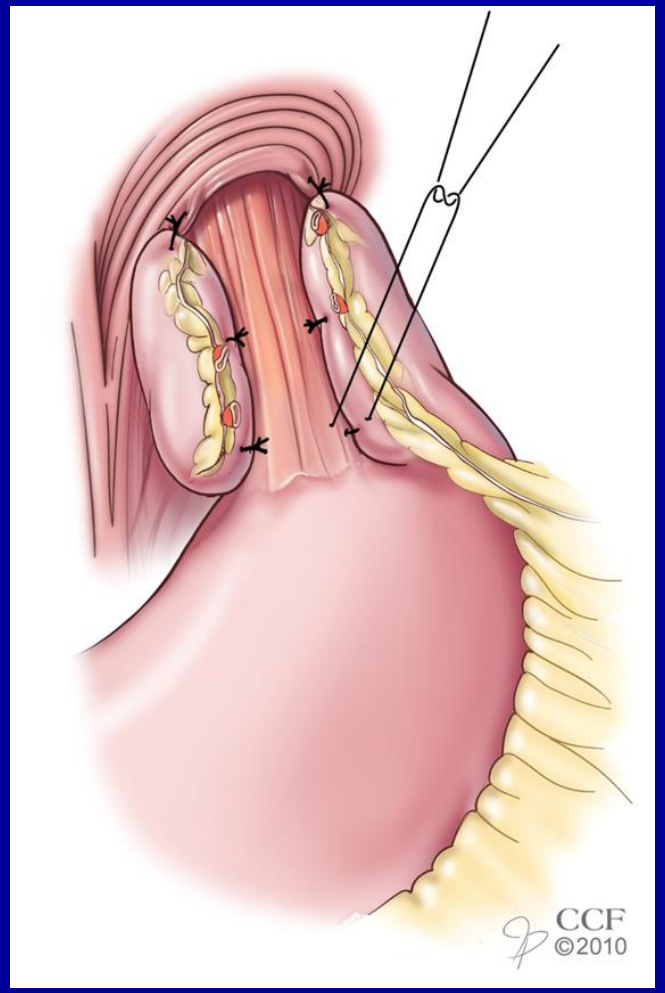
UNDOCK BEFORE MOVING TABLE
LASER OFF
1x 30°
1 DUAL BLADE RETRACTOR
2 SMALL GRASPING RETRACTOR
3
4 CADIERE FORCEPS

Partial Fundoplication



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UNDOCK BEFORE MOVING TABLE
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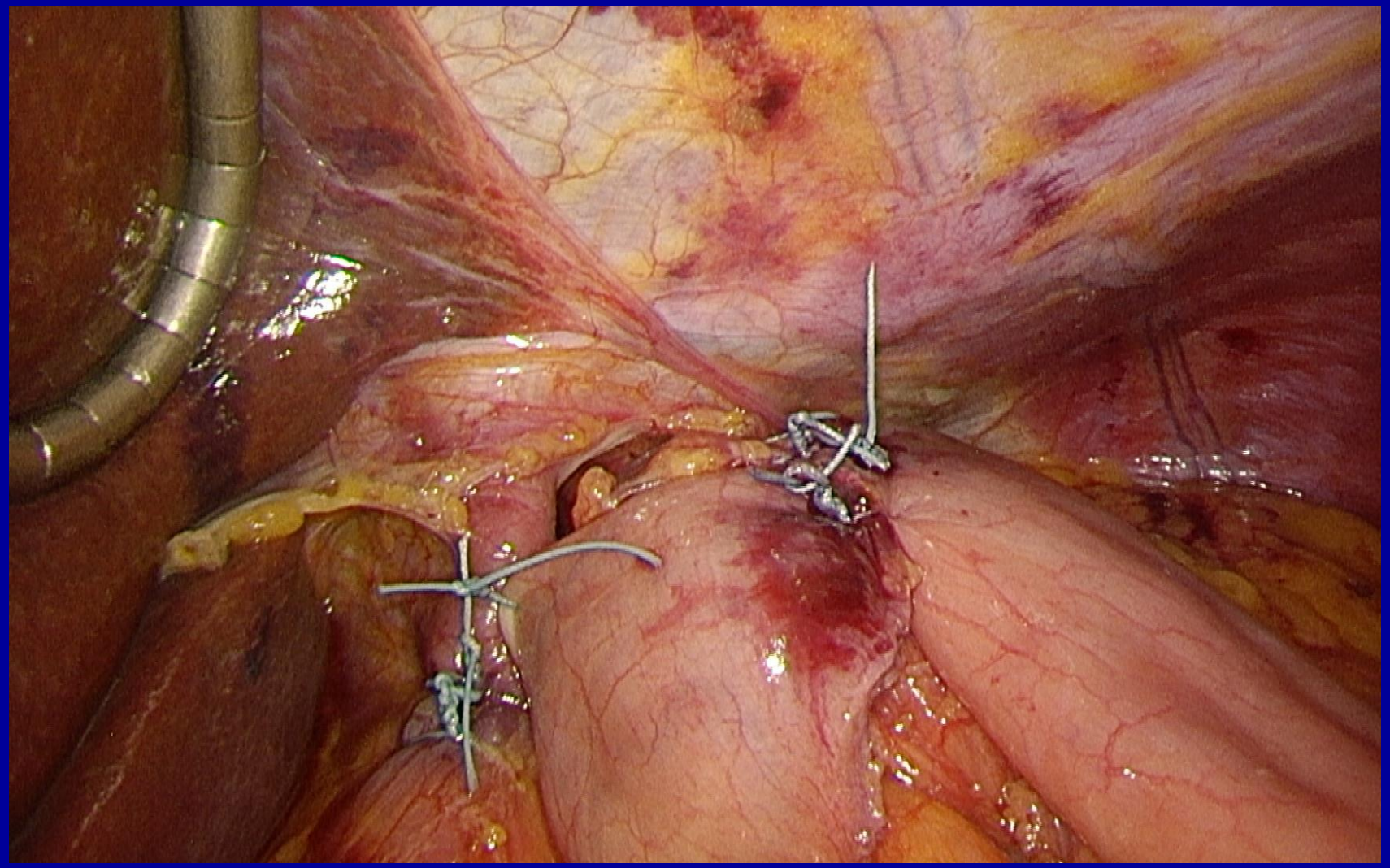
4 CADIERE FORCEPS

Nissen Fundoplication



Summary: Pitfalls

- Don’t strip the peritoneum on the crura – difficult to close it after
- Watch traction on the penrose – EGJ disassociation
- Remove the GEJ fat pad – prevent affixing the wrap into fat pad
- Don’t just approximate the only posterior crura – may cause an angulation of the esophagus
- Consdier Endoflip

Laparoscopic Nissen Fundoplication: Clinical Outcomes at 10 Years

Kelly, Jamie J. BM, FRCS[*,†]; Watson, David I. MD, FRACS[†,*]; Chin, Kin Fah BM, FRCS[*]; Devitt, Peter G. MS, FRCS, FRACS[*]; Game, Philip A. MBBS, FRCS, FRACS[*]; Jamieson, Glyn G. MS, FRACS[*]

Journal of the American College of Surgeons 205(4):p 570-575, October 2007.

Lap Nissen

- 247 patients
- 83% were highly satisfied
- 84% had good or excellent GERD control
- 17% revision
- 21% antiacid medication use

Journal of the American College of Surgeons 205(4):p 570-575, October 2007

Wraps
If so, which one? If not, why not?

Original Investigation

FREE

April 20, 2022

Clinical Outcomes of a Laparoscopic Total vs a 270° Posterior Partial Fundoplication in Chronic Gastroesophageal Reflux Disease

A Randomized Clinical Trial

Apostolos Analatos, MD[1,2,3]; Bengt S. Håkanson, MD, PhD[4,5]; Christoph Ansorge, MD, PhD[1,2]; et al

» Author Affiliations | Article Information

JAMA Surg. 2022;157(6):473-480. doi:10.1001/jamasurg.2022.0805

Nissen Vs Toupet

Outcome	Mean (SD)		*P* value between groups[a]	*P* value vs baseline PF[b]	*P* value vs baseline TF[b]
	PF	TF			
Baseline					
No.	150	142	NA	NA	NA
Reflux	4.3 (1.5)	4.4 (1.4)	.93	NA	NA
Abdominal pain	3.6 (1.3)	3.6 (1.2)	.56	NA	NA
Indigestion	3.7 (1.3)	3.6 (1.3)	.79	NA	NA
Obstipation	2.1 (1.2)	2.3 (1.3)	.43	NA	NA
Diarrhea	2.3 (1.4)	2.3 (1.5)	.78	NA	NA

JAMA Surg. 2022;157(6):473-480.

Nissen Vs Toupet

15 y Postoperation					
No.	159	151	NA	NA	NA
Reflux	1.9 (1.2)	1.7 (1.1)	.18	<.001	<.001
Abdominal pain	2.1 (1.1)	1.9 (1.0)	.43	<.001	<.001
Indigestion	2.7 (1.2)	2.6 (1.1)	.66	<.001	<.001
Obstipation	2.1 (1.1)	2.1 (1.1)	.45	.86	.11
Diarrhea	2.4 (1.3)	2.2 (1.3)	.06	.45	.27

JAMA Surg. 2022;157(6):473-480.

Nissen vs Toupet

- The long-term findings of this randomized clinical trial indicate that PF and TF are equally effective for controlling GERD and quality of life in the long term.

- Although PF was superior in the first years after surgery in terms of less dysphagia recorded, this difference did not prevail when assessed a decade later.

JAMA Surg. 2022;157(6):473-480.

Durability of giant hiatus hernia repair in 455 patients over 20 years

PA Le Page[1], R Furtado[1], M Hayward[2], S Law[2], A Tan[2], SJ Vivian[3], H Van der Wall[4], GL Falk[1,2,3]

[1]Concord Repatriation General Hospital, NSW, Australia
[2]University of Sydney, NSW, Australia
[3]Sydney Heartburn Clinic, Lindfield, NSW, Australia
[4]Concord Nuclear Imaging, NSW, Australia

Ann R Coll Surg Engl 2015; 97: 188–193

Table 1 Objective testing and recurrence rates stratified by time

	0–1 years	1–5 years	5–10 years	>10 years
Number having objective test*	321/455 (70.5%)	211/416 (50.7%)	80/299 (26.8%)	12/190 (12.6%)
Overall rate of new diagnosis of recurrence	13.7%	30.8%	40.1%	50.0%
Rate of new diagnosis of >2cm recurrence	3.4%	9.5%	13.8%	25.0%
Rate of new diagnosis of <2cm recurrence	10.3%	21.3%	26.3%	25.0%

*Denominator is the number of patients eligible for testing given that they had reached the respective follow-up period.

Ann R Coll Surg Engl 2015; 97: 188–193

To mesh or not to mesh
That is the question!

ORIGINAL ARTICLES

Biologic Prosthesis Reduces Recurrence After Laparoscopic Paraesophageal Hernia Repair

A Multicenter, Prospective, Randomized Trial

Brant K. Oelschlager, MD, Carlos A. Pellegrini, MD,* John Hunter, MD,† Nathaniel Soper, MD,‡ Michael Brunt, MD,§ Brett Sheppard, MD,† Blair Jobe, MD,† Nayak Polissar, PhD,‖ Lee Mitsumori, MD,* James Nelson, MD,* and L. Swanstrom, MD¶*

Ann Surg 2006;244: 481–490

Biologic Prosthesis Reduces Recurrence

108 patients randomized

- 51 SIS repair
- 57 standard repair

Oelschlager BK, AS 2006;244:481-90.

Biologic Prosthesis Reduces Recurrence

Recurrence at 6 months

9%	**(4)**	**SIS repair**
24%	**(12)**	**standard repair (*P*=.04)**

Oelschlager BK, AS 2006;244:481-90.

ORIGINAL SCIENTIFIC ARTICLES

Biologic Prosthesis to Prevent Recurrence after Laparoscopic Paraesophageal Hernia Repair: Long-term Follow-up from a Multicenter, Prospective, Randomized Trial

Brant K Oelschlager, MD, FACS, Carlos A Pellegrini, MD, FACS, John G Hunter, MD, FACS, Michael L Brunt, MD, FACS, Nathaniel J Soper, MD, FACS, Brett C Sheppard, MD, FACS, Nayak L Polissar, PhD, Moni B Neradilek, MS, Lee M Mitsumori, MD, Charles A Rohrmann, MD, Lee L Swanstrom, MD, FACS

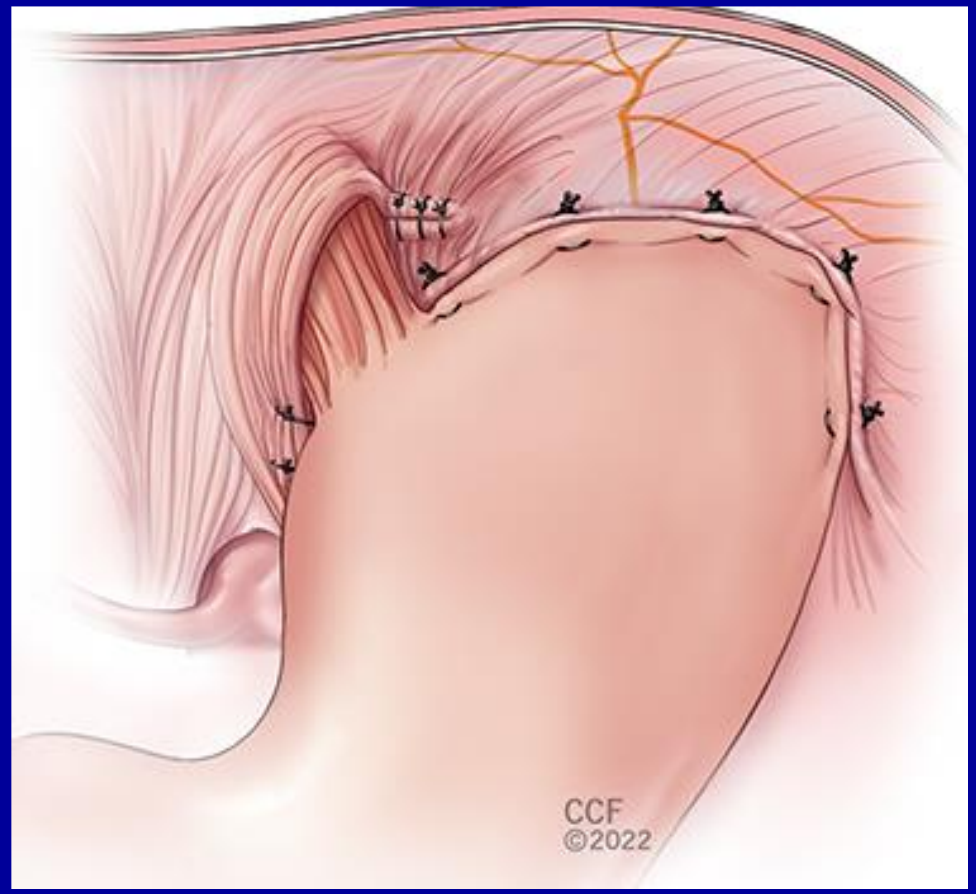
-50% in each group had a recurrent hernia at an average of 5 years after the repair

J Am Coll Surg 2011;213:461–468

Gastropexy

- Patients with Central Obesity
- Elderly patient
- Medically frail patient
- Reflux symptoms need to be minimal and well controlled on PPI

Gastropexy



Robotic-Assisted Diaphragmatic Gastropexy

Nethra Jain, MD, Monisha Sudarshan, MD, MPH,
Sadia Tasnim, MD, Sudish Murthy, MD, PhD, Siva Raja, MD, PhD

Cleveland Clinic, Cleveland, OH

Robotic-Assisted Diaphragmatic Gastropexy

Nethra Jain, MD, Monisha Sudarshan, MD, MPH,
Sadia Tasnim, MD, Sudish Murthy, MD, PhD, Siva Raja, MD, PhD

Cleveland Clinic, Cleveland, OH

Redo Anti-reflux surgery


THE
"WHY"
MATTERS

Why leads to How
and
How lead to success

Why should you revise

- Recurrent Hernia with symptoms
- Recurrent GERD without recurrent Hernia
- Dysphagia without recurrent Hernia

- Recurrence without symptoms are not an indication for revision

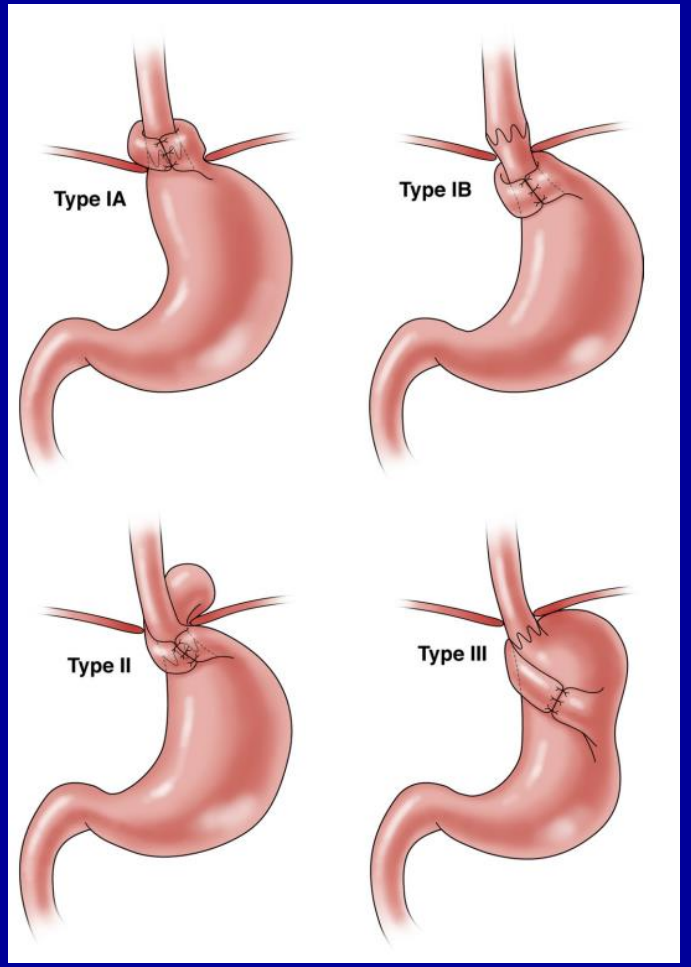
Table 4 Causes of Failure of Previous Antireflux Procedure

	n=3,175
Anatomical abnormalities	
Intrathoracic wrap migration	885 (27.9%)
Wrap disruption	722 (22.7%)
Telescoping	448 (14.1%)
Para-esophageal hiatal herniation	195 (6.1%)
Hiatal disruption	167 (5.3%)
Tight wrap	168 (5.3%)
Stricture	60 (1.9%)
Wrong primary diagnosis	
Achalasia	37 (1.2%)
Esophageal spasms	7 (0.2%)
Sclerodermia	4 (0.1%)
Esophageal carcinoma	1 (0.03%)
Disturbed esophageal motility	13 (0.4%)
No cause for failure identified	194 (6.1%)
Miscellaneous	347 (10.9%)
Not reported	120 (3.8%)

Percentages exceed 100% since more than one cause of failure was found during several reoperations

J Gastrointest Surg (2009) 13:1539–1549

Types of slipped wraps



CLINICAL GASTROENTEROLOGY AND HEPATOLOGY Vol. 11, No. 5

META-ANALYSIS

Outcomes of Laparoscopic Redo Fundoplication in Patients With Failed Antireflux Surgery

A Systematic Review and Meta-analysis

Francisco Schlottmann, MD, MPH,✉ Francisco Laxague, MD,* Cristian A. Angeramo, MD,* Emmanuel E. Sadava, MD,* Fernando A. M. Herbella, MD,‡ and Marco G. Patti, MD†*

Ann Surg 2021;274:78–85

Findings

- 30 studies with 2095 patients
- Conversion rate was 6.02% (95% CI, 4.16%–8.91%)
- Prevalence of major morbidity was 4.98% (95% CI, 3.31%–6.95%)
- prevalence estimate of recurrence across the studies was 10.71% (95% CI, 7.74%–14.10%)
- Mean follow up was 25 months

Ann Surg 2021;274:78–85

Findings

- Symptom improvement was 78.50% (95% CI, 74.71%–82.03%)
- QoL improvement was 80.65% (95% CI, 75.80%–85.08%)
- The proportion of LRF with mesh was reported in 25/30 studies, ranging from 0 (12 studies) to 100% (2 studies)

- **selection bias
- **length of follow up is to short to draw long term conclusions

Ann Surg 2021;274:78–85

Making a case for a lengthening procedure in a Redo setting

The definition of insanity if doing the same thing and expecting a different result

MASSIVE HIATUS HERNIA: EVALUATION AND SURGICAL MANAGEMENT

Donna E. Maziak, MDCM
Thomas R. J. Todd, MD
F. Griffith Pearson, MD

Objective: **Paraesophageal hernias represent advanced degrees of sliding hiatus hernia with intrathoracic displacement of the intraesophageal junction. Gastroesophageal reflux disease occurs in most cases, resulting in acquired short esophagus, which should influence the type of repair selected.** ***Methods:*** **Between 1960 and 1996, 94 patients with massive, incarcerated paraesophageal hiatus hernia were operated on at the Toronto General Hospital. The mean age was 64 years (39 to 85 years), with a female**

JTCVS. VOLUME 115, ISSUE 1, P53-62, JANUARY 1998

Collis gastroplasty

- 94 patients underwent giant PEH repair
- 80% needed a collis gastroplasty
- 90 patients with 94 month follow up
- 93% success
- 2.2% re-operation

JTCVS. VOLUME 115, ISSUE 1, P53-62, JANUARY 1998

Making a case for a lengthening procedure in a Redo setting

- Advantages
  - Takes tension off the repair
  - Avoids the need to do extensive mediastinal dissection and risk bilateral vagal injury
  - Reduces recurrence rates
- Disadvantages
  - Low risk of a leak
  - Risk of post-op GERD due to presence of gastric mucosa above the wrap.

The Short Esophagus

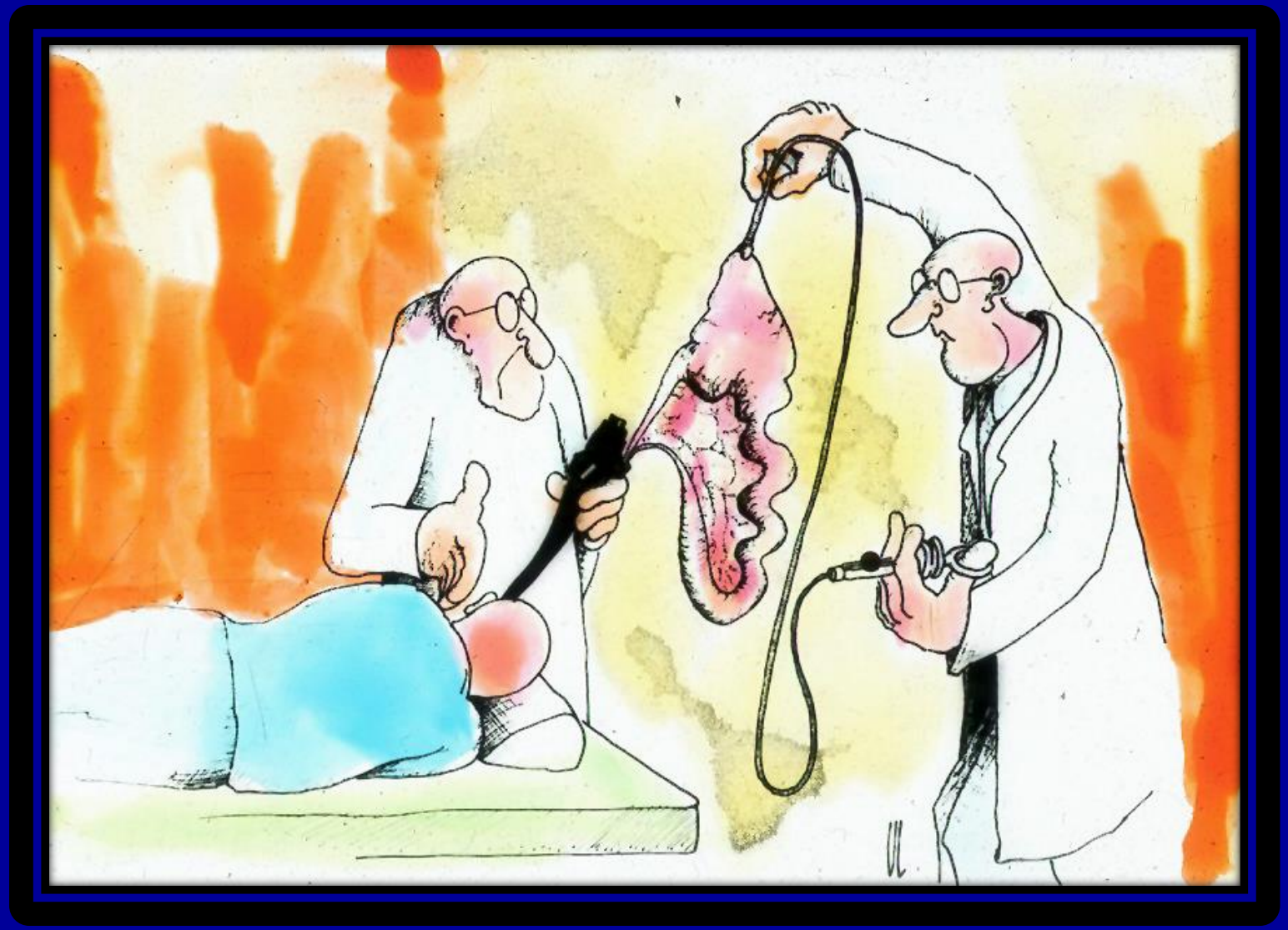
Peptic stricture

History of dilation

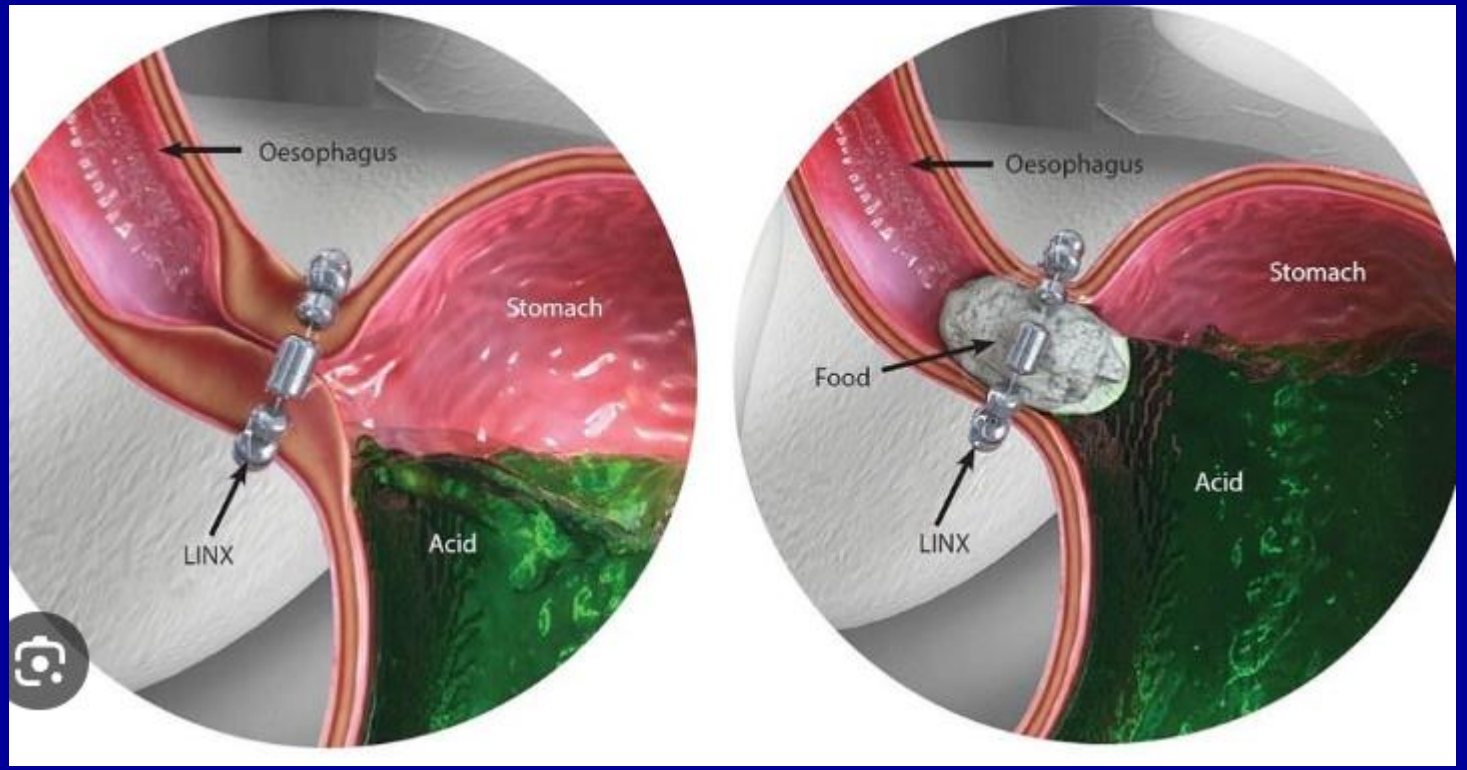
Type III HH (>4cm)

Significant Non-reducible component of Hiatal Hernia on retroflexion in EGD

Paradigm Shifts in GI Diseases



Magnetic Sphincter Augmentation



Images obtained from the internet

Surg Endosc (2018) 32:1762–1768
https://doi.org/10.1007/s00464-017-5859-4

Favorable results from a prospective evaluation of 200 patients with large hiatal hernias undergoing LINX magnetic sphincter augmentation

F. P. Buckley III[1] · Reginald C. W. Bell[2] · Kate Freeman[2] · Stephanie Doggett[1] · Rachel Heidrick[2]

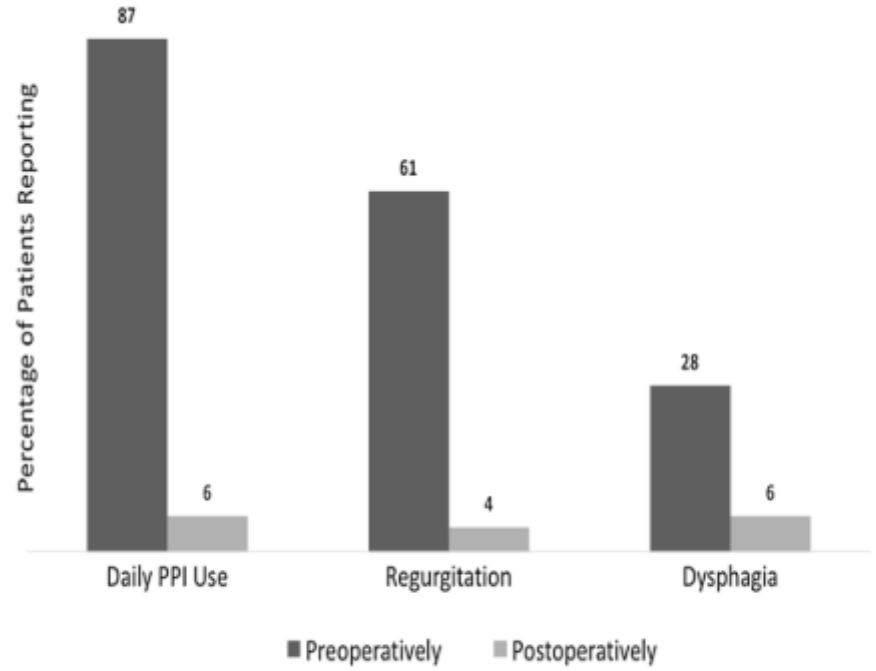


Fig. 2 Percentage of patients reporting daily PPI use, regurgitation, and dysphagia before and after surgery

Surg Endosc (2018) 32:1762–1768

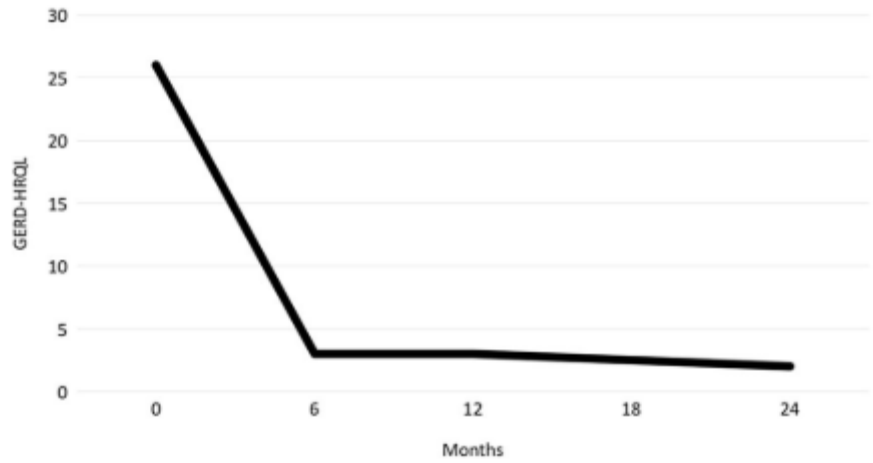


Fig. 1 Median GERD-HRQL Scores. Numbers of patients completing the survey are 192 preoperatively, 102 at 6 months, 63 at 12 months, and 15 at 24 months

Surg Endosc (2018) 32:1762–1768

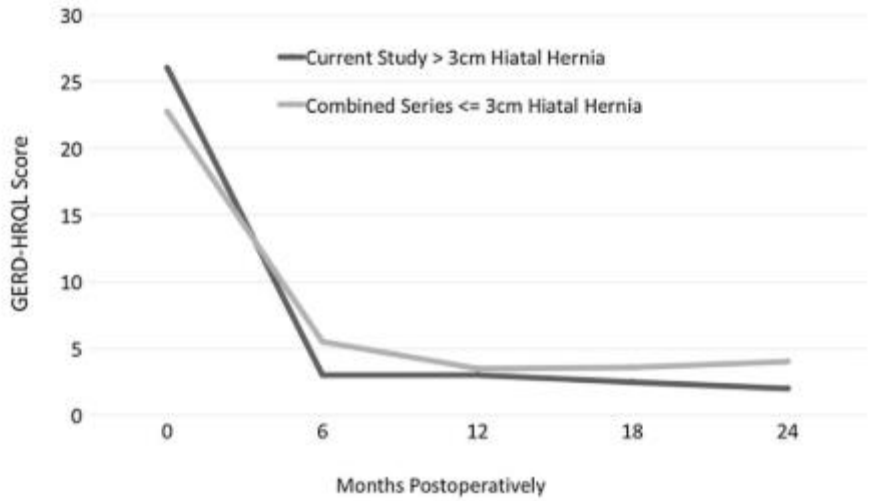
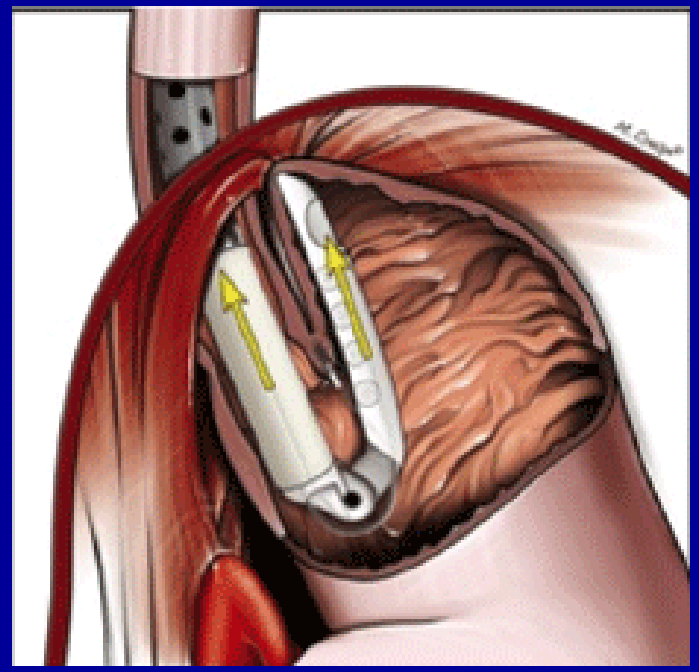


Fig. 3 GERD-HRQL scores of current study in comparison to combined series [3, 12, 31–33]

Surg Endosc (2018) 32:1762–1768

Devices for TIF



EsophyX

Medigus

Pictures sourced from device

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Transoral incisionless fundoplication for recurrent symptoms after laparoscopic fundoplication

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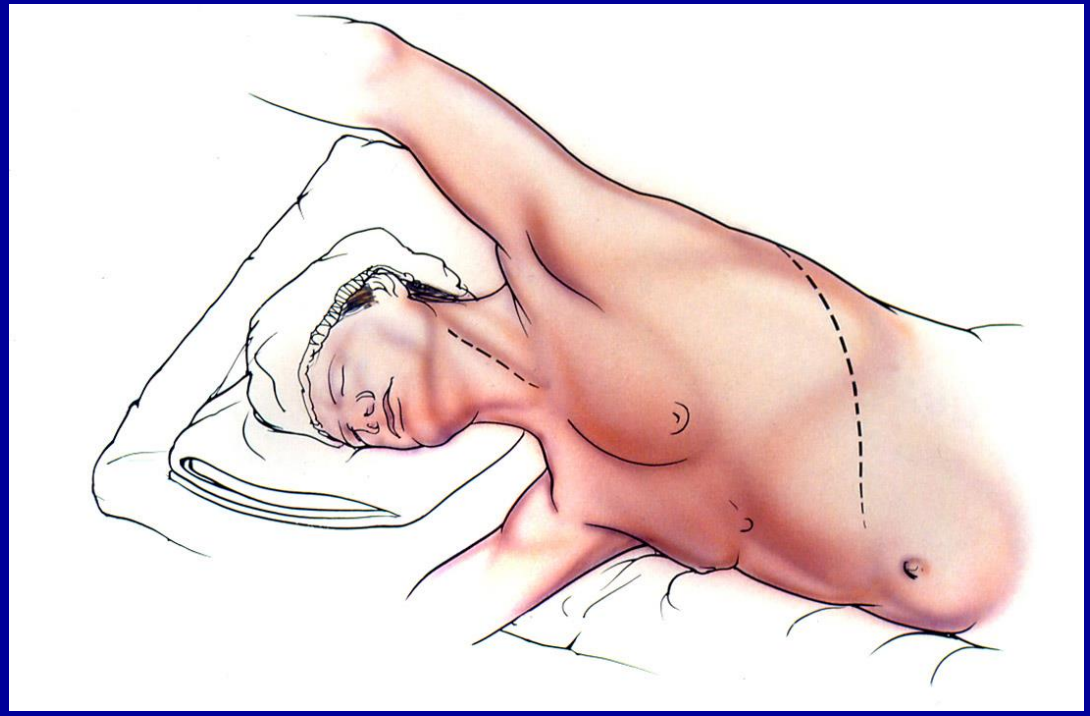
TIFF after Nissen

- 22 patients
- Median time from prior Nissen- 4.1 years
- Mean GERD-HRQL score improved from 24.3 ± 22.9 to 14.75 ± 21.6 ($p = 0.014$)
- Mean Reflux Severity Index (RSI) score improved from 14.1 ± 14.6 to 9.1 ± 8.0 ($p = 0.046$)
- 78% healed their esophagitis
- No difference between TIFF and revisional surgery

REY-Gastric Bypass

- If there is intractable GERD or gas bloat after multiple redo-surgery, a REYGB is a reasonable option
  - Especially in the obese population
- Avoid a distal gastrectomy. Save the stomach!!!
- Leave your self with more (not less) options for the future.
- Recurrent hernia after a REY-GB is an even more difficult problem

Left Thoracoabdominal Approach



Final Thoughts

- Paraesophageal Hernia repairs are safe and effective
- Recurrences are common and one should be ready to deal with them
- Mesh may be necessary in some cases but often it is a surgeon preference
- “Devices” are likely in our future but not ready for prime time

Final Thoughts

- Revisional anti-reflux surgery are most often not an emergency. There is time to think
- Redo surgery require a different skill set. Best to get senior help early in your career.
- Exhaust medical therapy before entertaining surgery
- Set realistic expectations

The battlefields of surgery are littered with the remains of new operations, which foundered and perished in the follow up clinic.

Mr. Ronald Belsey MD


Thank You
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