Endoscopic Suturing & Bariatric Endoscopy: The Next Frontiers in Endoluminal Surgery

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Disclosure

No relevant conflicts of interest to disclose

Outline

- A Brief History of Endoscopy
- Endoscopy Suturing & Overstitch
- Obesity in the U.S.
- Endoscopic Sleeve Gastroplasty
- Revisions and Fistulae
- Horizon Line

Where We've Come From

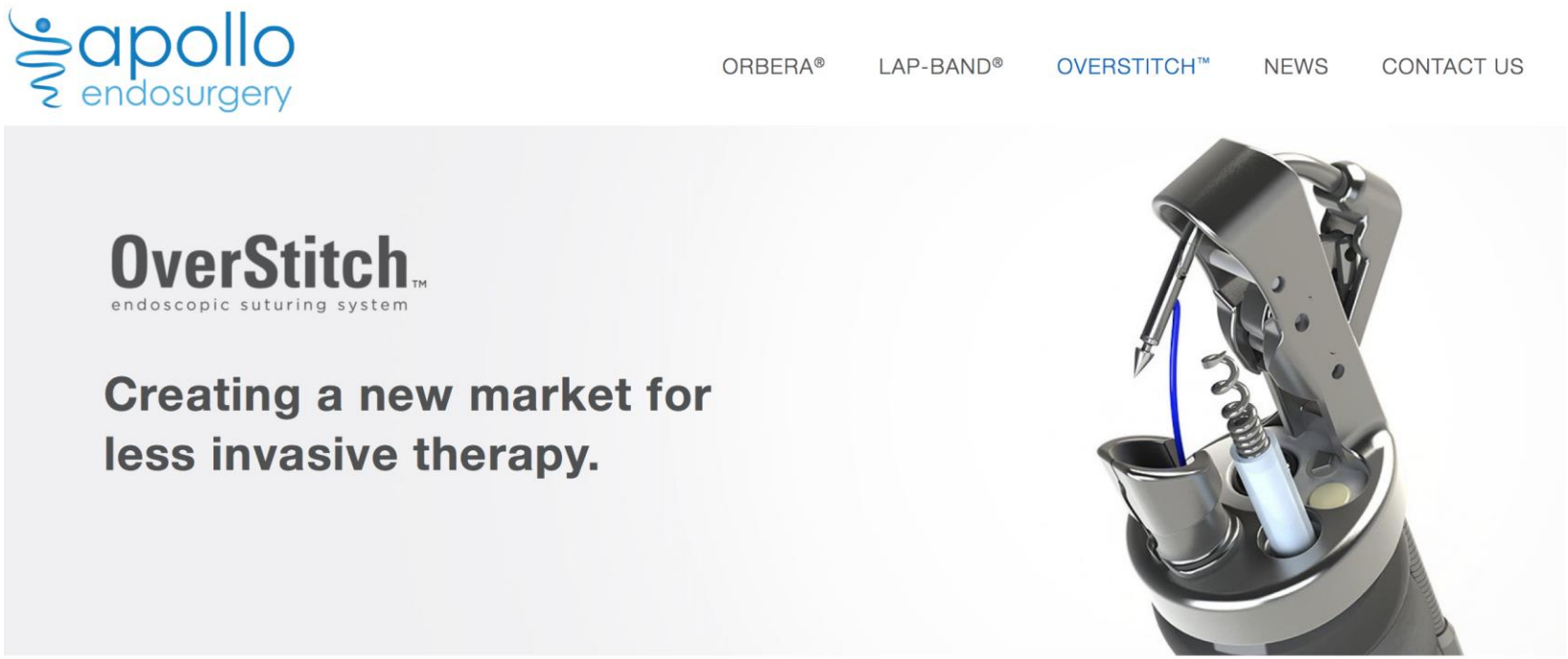
FIRST ENDOSCOPE by *Philip Bozzini* 1806

Germany

Endoscopy in 2019

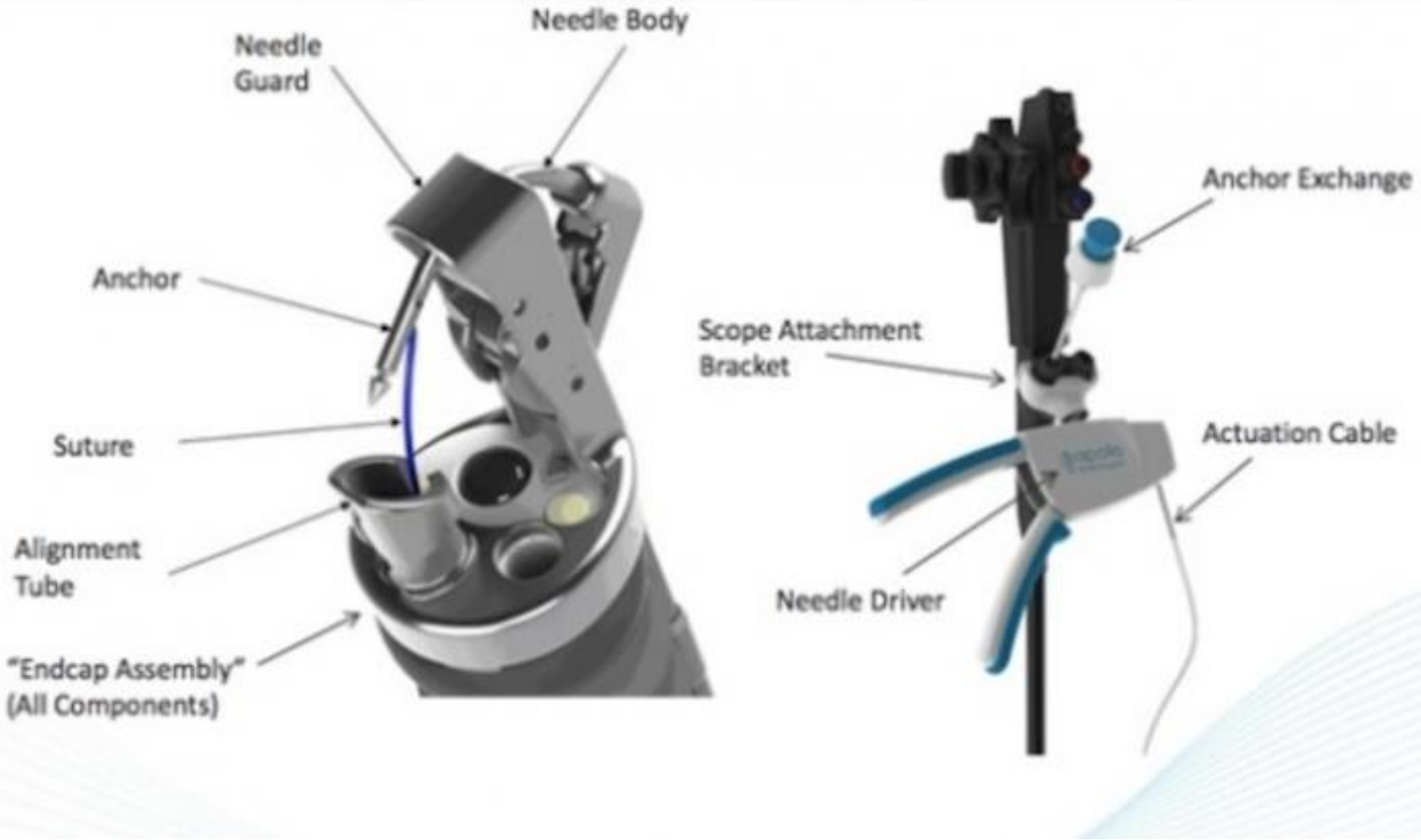
GIF-2TH180

Endoscopic Suturing

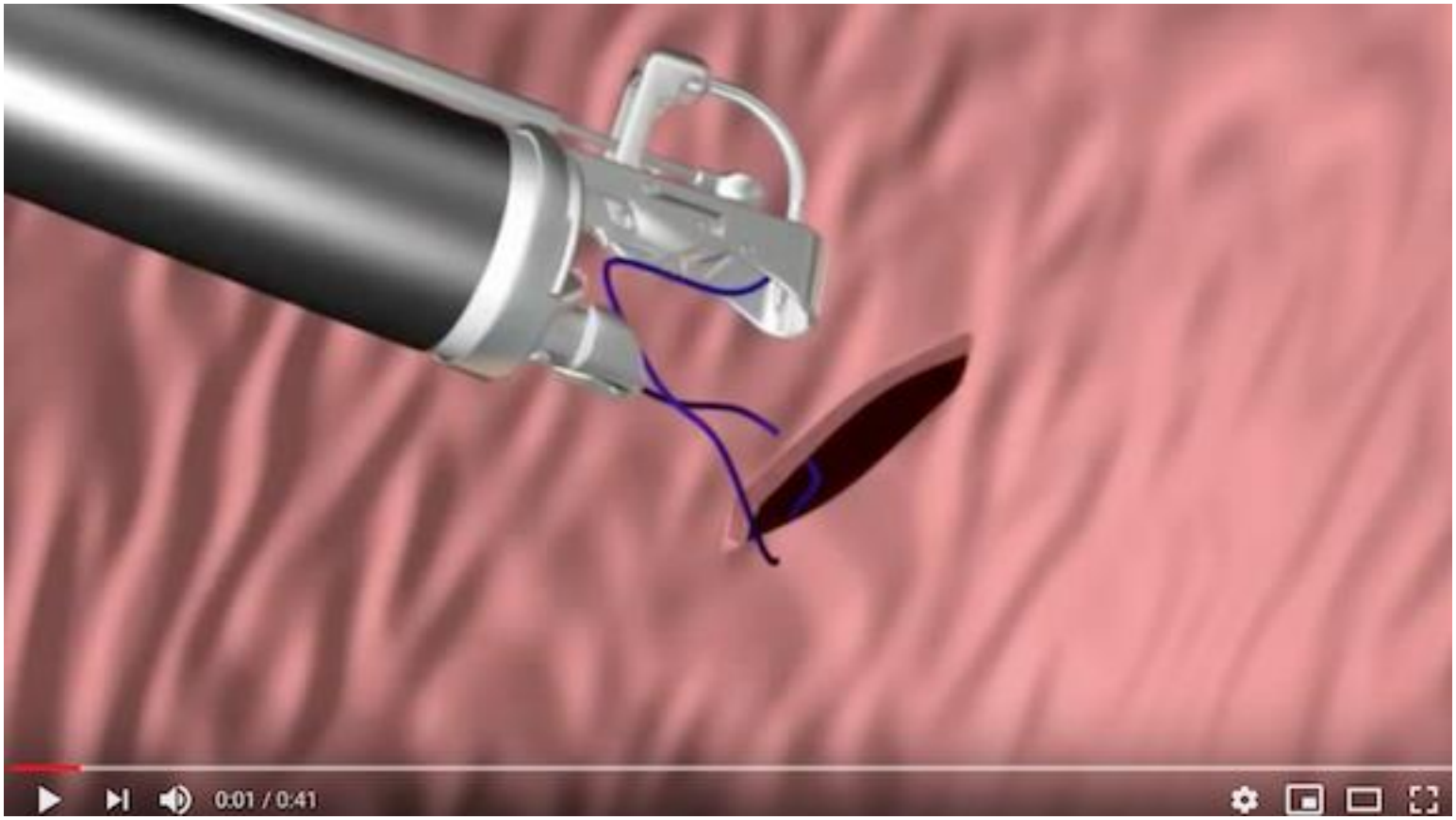


- Full-thickness
- FDA-approved for apposition of GI tract tissue
- Over 10,000 procedures performed: leaks, fistulae, RYGB stoma revision, EMR/ESD defects, POEM, ESG
- Disposable
- Therapeutic double-channel endoscope required

Endoscopic Suturing



Endoscopic Suturing



https://www.youtube.com/watch?v=Q6FRT-cTdFU

JAMA The Journal of the American Medical Association

June 7, 2016, Vol 315, No. 21 >

Original Investigation | June 7, 2016

Trends in Obesity Among Adults in the United States, 2005 to 2014 FREE

Katherine M. Flegal, PhD[1]; Deanna Kruszon-Moran, MS[1]; Margaret D. Carroll, MSPH[1]; Cheryl D. Fryar, MSPH[1]; Cynthia L. Ogden, PhD[1]

Obesity: A Big U.S. Problem

- **Obesity** (*BMI ≥ 30*)**:**
  - **35%** of **men**
  - **40%** of **women**
- **Morbid obesity** (*BMI >40 or ≥35 with comorbidities*)
  - **5.5%** for **men**
  - **10%** for **women**
- **Economics: $190 billion** in 2005[2]
- **21% of health care expenditures**[2]

1. Flegal, *JAMA*. 2016
2. Cawley J et al, *J Health Econ*. 2012

Obesity: Complications

- **Death** from all causes & from CVD
- **Disease**: DM2, HTN, HLD, gout, stroke, VTE, cholelithiasis, GERD, NAFLD, depression, OA, infertility, OSA, CAD, CHF, atrial fibrillation
- **Cancers**: breast, endometrial, cervical, liver, pancreatic, colon, gallbladder, kidney, leukemia
- **QOL**: negative social & economic consequences

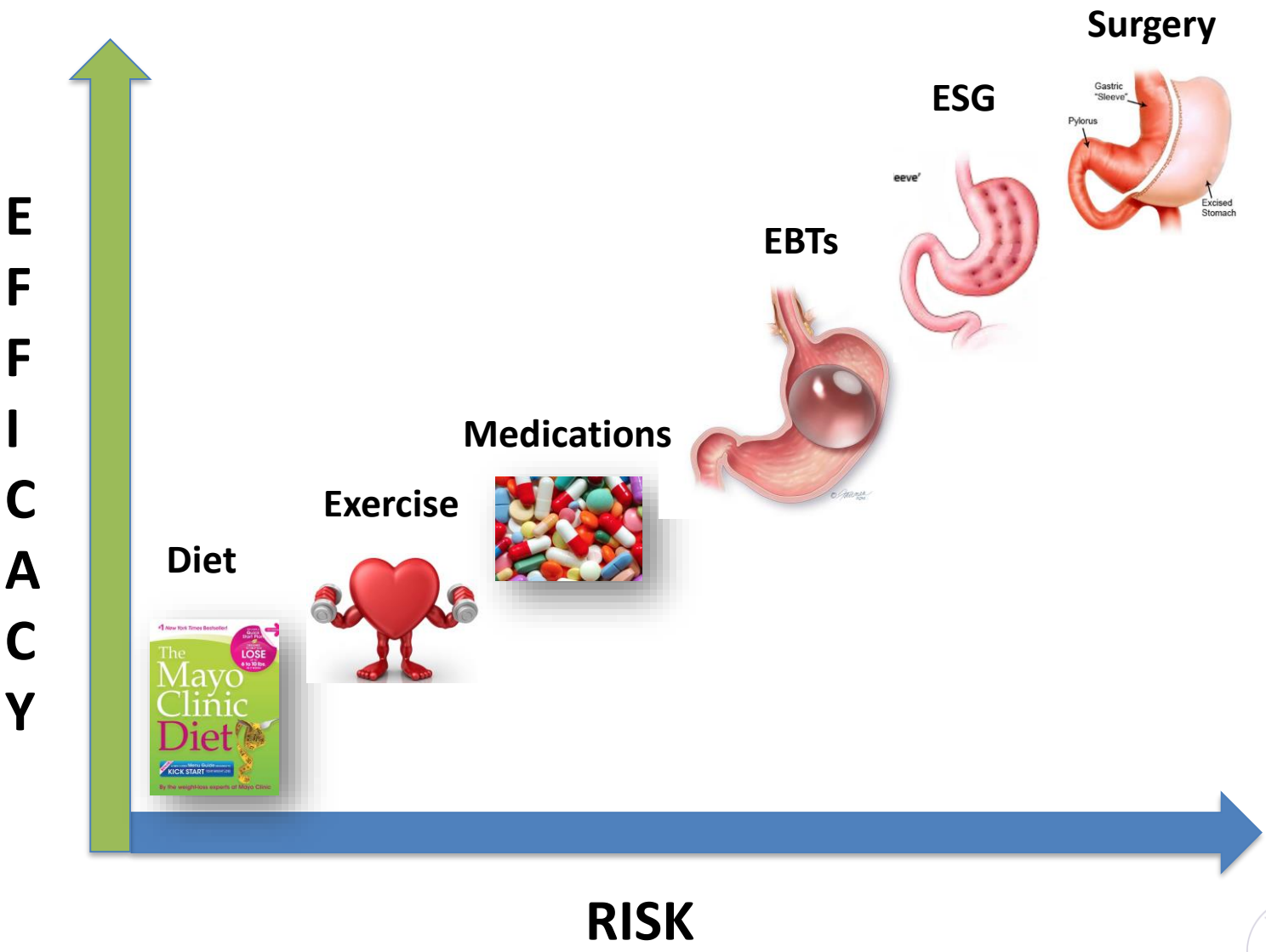
Cohen J, et al "Endoluminal Bariatric Procedures", NOTES, *Springer*, 2016

Obesity: Unmet Needs Remain

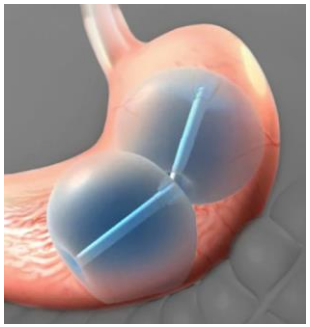
- Despite advances in **neuronal**, **hormonal**, **metabolic** & **inflammatory** mechanisms of obesity, **bariatric surgery** remains **only current effective, long-term therapy**[1]
- Only **1%** of qualified patients undergo surgery due to **limited access**, **patient preference**, **risks** & **costs**[2]

1. Sjostrom L. J Intern Med 2013
2. Mechanick JI, et al. Surgery for Obesity and Related Diseases 2013

Expanding Therapeutic Options

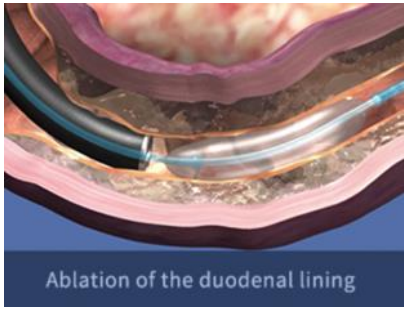


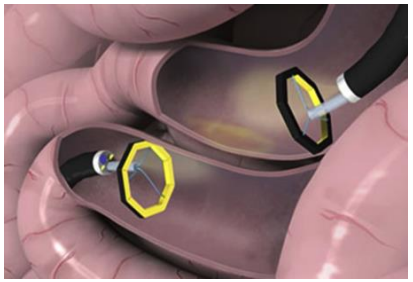
Endobariatric Armamentarium: 2018







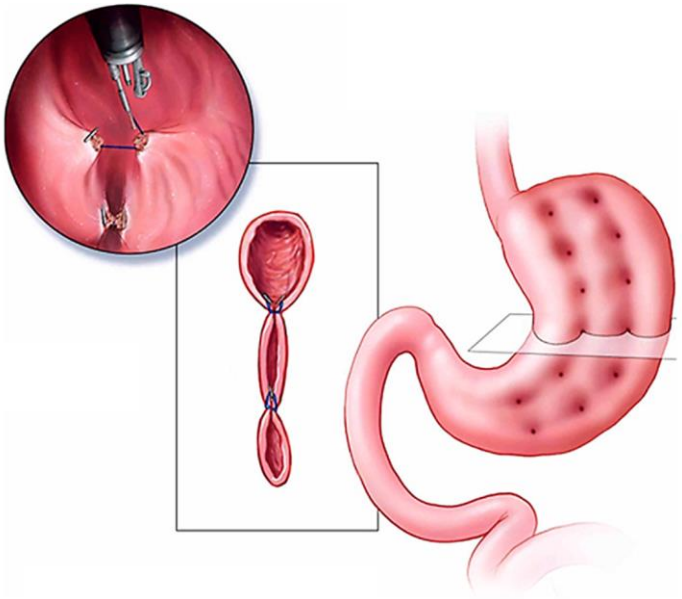
Cohen J, et al “Endoluminal Bariatric Procedures”, NOTES, *Springer*, 2016

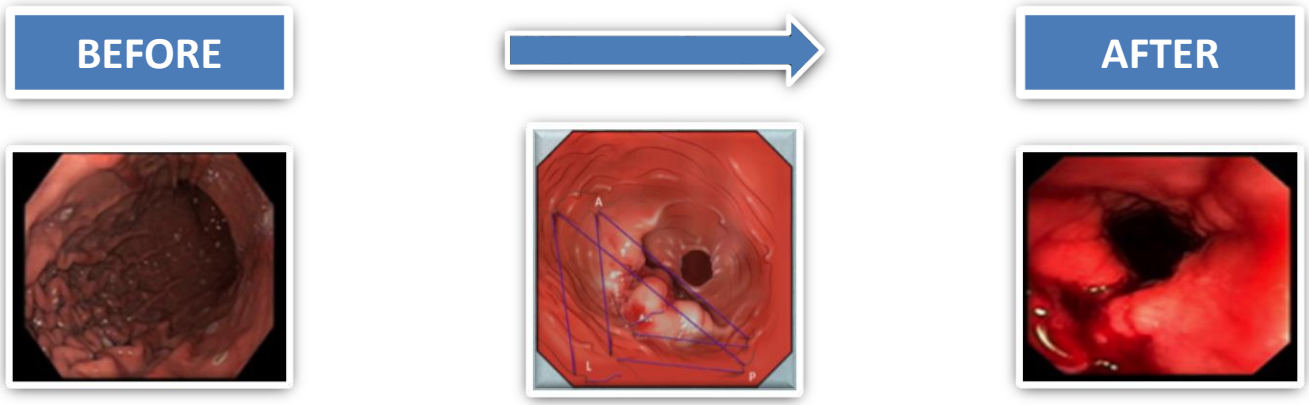
Categories of Bariatric Endoscopy

Endoluminal Bariatric Procedures	Examples
1. Early-Intervention Procedures	Treating patients that are overweight or obese but who do not meet criteria for conventional bariatric surgery
2. Primary Obesity or Metabolic Procedures	Target is durable weight loss and/or focus on co-morbid metabolic conditions such as diabetes
3. Bridge Procedures	Offer short-term weight reduction to decrease operative risks associated with morbid obesity prior to bariatric surgery (i.e. IGBs)
4. Revisional Procedures	Addressing weight regain in traditional bariatric operations (i.e. TORe)
5. Post-Surgical Complication Procedures	Managing anastomotic leaks, stenosis, bleeding, strictures and fistulae
6. Endoscopy in Post-Surgical Patients	Includes procedures to access the pancreatobiliary limb in patients who have previously underwent bariatric surgery (i.e. single-balloon ERCP, EDGE)

Cohen J, et al "Endoluminal Bariatric Procedures", NOTES, *Springer*, 2016

Endoscopic Sleeve Gastroplasty





Abu Dayyeh BK, et al, *Gastrointest Endosc*. 2013

ESG Evidence: Durability

Obes Surg. 2017 Apr 27. doi: 10.1007/s11695-017-2693-7. [Epub ahead of print]

Endoscopic Sleeve Gastroplasty for Obesity: a Multicenter Study of 248 Patients with 24 Months Follow-Up.

Lopez-Nava G[1], Sharaiha RZ[2], Vargas EJ[3], Bazerbachi F[3], Manoel GN[4], Bautista-Castaño I[1], Acosta A[3], Topazian MD[3], Mundi MS[5], Kumta N[2], Kahaleh M[2], Herr AM[2], Shukla A[2], Aronne L[6], Gostout CJ[3], Abu Dayyeh BK[7].

- 3 centers, retrospective
- 248 patients
- Age: 45 (mean), 73% female
- Baseline BMI: 38
- 6 months: %TBWL = 15.2%
- 24 months: %TBWL = 18.6%
- Five (2%) serious adverse events

ESG Evidence: Durability - 2019

Five-year ESG outcomes

Five-year ESG outcomes reveal significant total body weight loss

- The research showed less than 1 percent complications, an improvement over surgical procedures

- 15-20% TWL at 5 years

ESG Evidence: Metabolic

Clin Gastroenterol Hepatol. 2017 Apr;15(4):504-510. doi: 10.1016/j.cgh.2016.12.012. Epub 2016 Dec 23.

Endoscopic Sleeve Gastroplasty Significantly Reduces Body Mass Index and Metabolic Complications in Obese Patients.

Sharaiha RZ[1], Kumta NA[2], Saumoy M[2], Desai AP[2], Sarkisian AM[2], Benevenuto A[2], Tyberg A[2], Kumar R[3], Igel L[3], Verna EC[4], Schwartz R[2], Frissora C[2], Shukla A[3], Aronne LJ[3], Kahaleh M[2].

- Single center, prospective
- 91 patients
- Age: 44 (mean), 68% female
- Baseline BMI: 41
- 6 months: %TBWL = 14.4
- 12 months: %TBWL = 17.6
- 24 months: %TBWL = 20.9
- One (1%) serious adverse event (perigastric leak)

ESG Evidence: Metabolic

Clin Gastroenterol Hepatol. 2017 Apr;15(4):504-510. doi: 10.1016/j.cgh.2016.12.012. Epub 2016 Dec 23.

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Table 2. Post-ESG Improvement in Weight and Medical Comorbidities at 12 Months (N = 53)

	Before ESG, mean (SD)	12 months after ESG, mean (SD)	*P* value
HgbA1c, % (all patients)	6.1 (1.1)	5.5 (0.48)	.05
HgbA1c, % (only diabetes and prediabetes)	6.6 (1.2)	5.6 (0.51)	.02
Waist circumference, *cm*	119.66 (14.05)	92.75 (5.85)	<.001
SBP, *mm Hg*	129.02 (13.44)	122.23 (11.69)	.023
LDL, *mg/dL*	121.62 (38.61)	124.27 (27.82)	.786
TG, *mg/dL*	131.84 (83.19)	92.36 (39.43)	.017
ALT, *mg/dL*	32.28 (16.43)	20.68 (11.44)	<.001

Revisional Bariatric Endoscopy

- Trans-oral Outlet Reduction (TORe)
- Addressing weight regain after RYGB
- Etiologies of weight regain:
  - Nutritional habits
  - Psychosocial environment
  - Genetics
  - Fistula
  - Increased gastric pouch volume
  - Dilated gastrojejunal anastomosis (GJ)

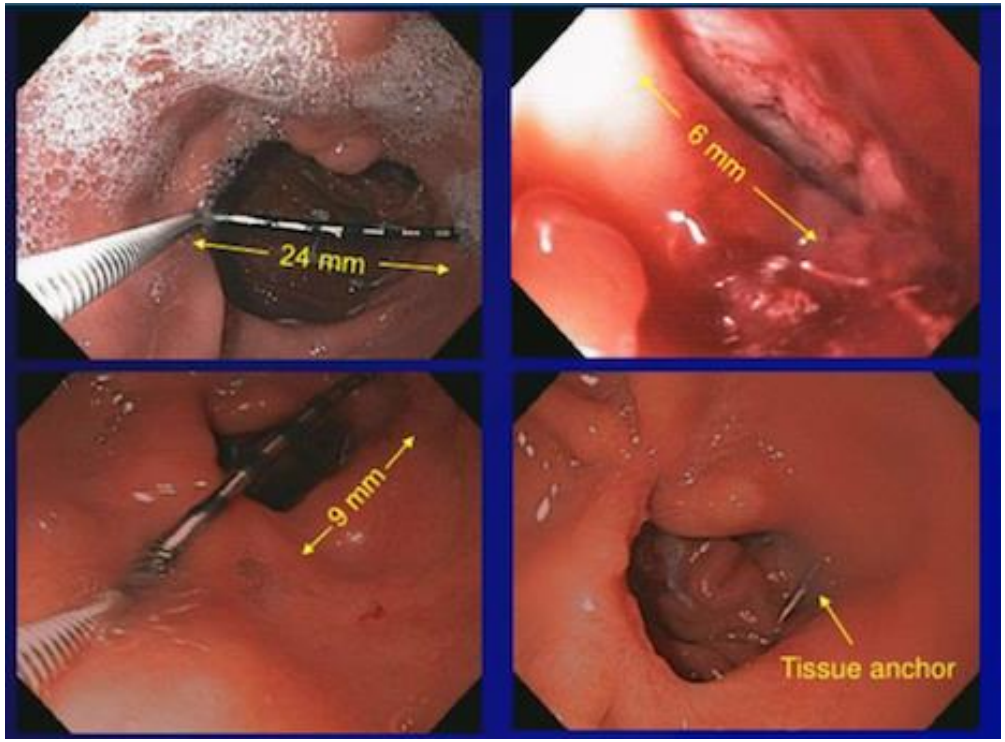
Abu Dayyeh BK, Lautz DB, Thompson CC, Clin Gastro Hep, 2011

Revisional Bariatric Endoscopy: TORe

- Outlet reduction:
  - Tissue ablation with APC
  - Interrupted or purse-string sutures at anastomotic margin
  - Goal reduction <1cm

Initial

3 Months (-31 lbs)



Abu Dayyeh BK, Lautz DB, Thompson CC, Clin Gastro Hep, 2011

TORe: 3 Year Data

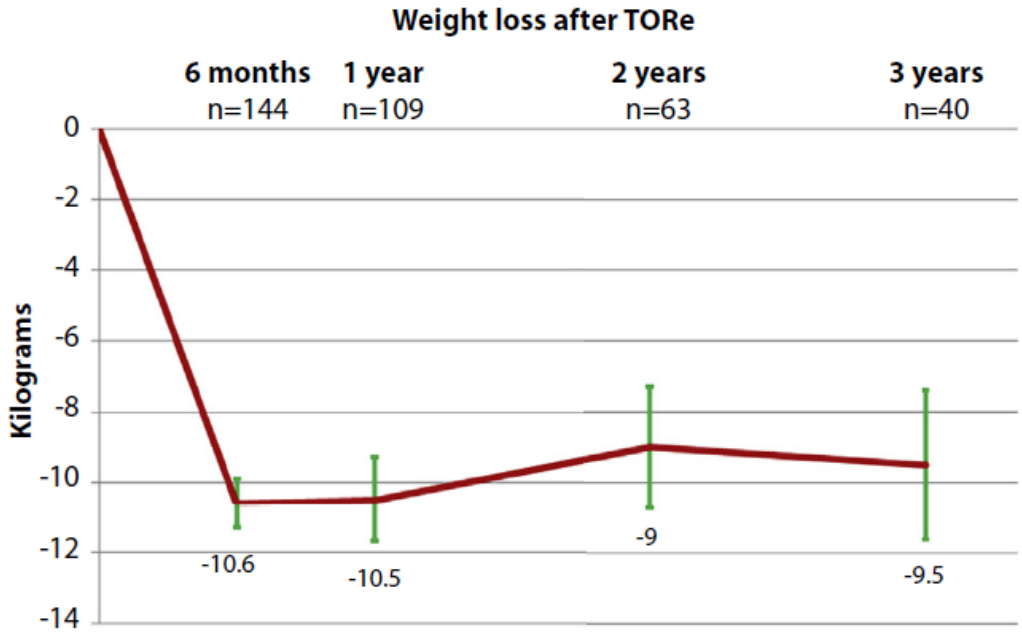


Figure 2. Weight loss trend. *TORe*, transoral outlet reduction.

TABLE 2. Total weight loss with and without pouch reduction

	No pouch reduction	Pouch reduction	*P* value
12 mo	6.7 ± 1.5	9.9 ± 1.2	.10
24 mo	9.6 ± 2.4	6.5 ± 1.7	.28
36 mo	7.5 ± 2.3	7.2 ± 2.1	.94

Kumar, N et al. *GIE*. 2016.

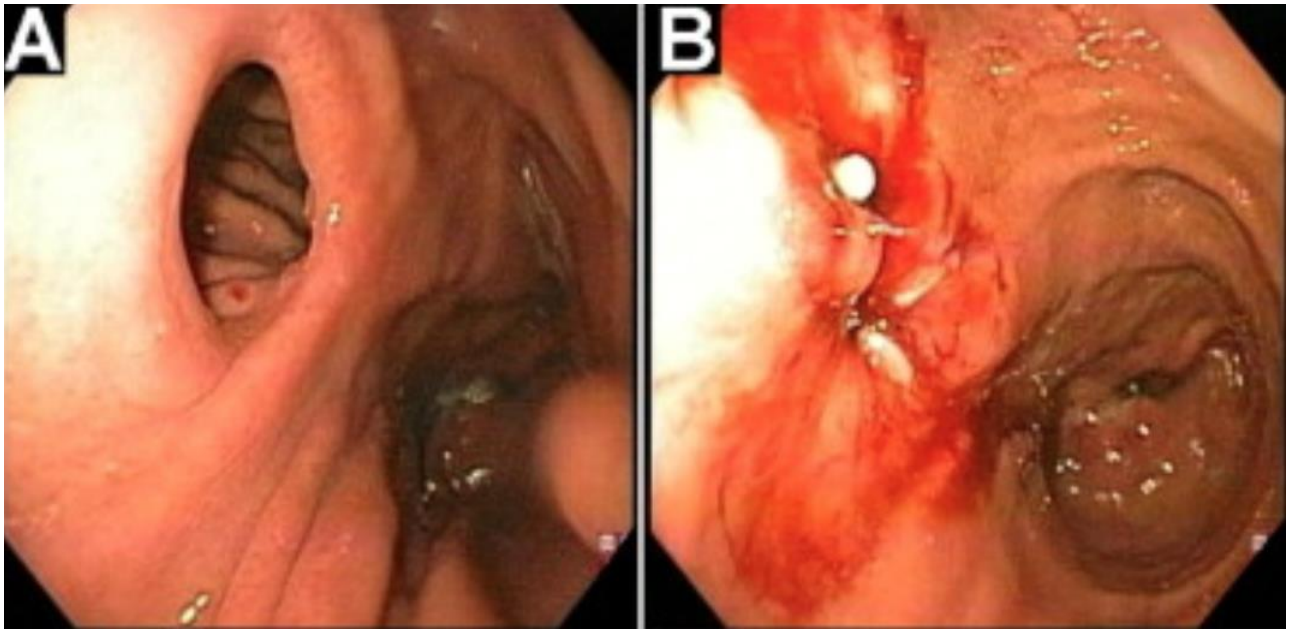
Endoscopy for Post-Surgical Complications

- Anastomotic ulceration – GI bleeding
- Anastomotic stenosis
- **Gastro-gastric fistula**
- Surgical leaks
- Abdominal pain
- Sleeve stenosis
- Sleeve leaks
- Malnutrition in RYGB

Schulman, AR et al. *Am Journal of Gastro*. 2017

Endoscopy for Post-Surgical Complications

- **GASTROGASTRIC FISTULA**
  - Often presents with weight regain or marginal ulceration
  - Endoscopic suturing closure carries decreased morbidity
  - 20% successful closure at 12 months
  - OTS Clips are an option but may interfere if surgery required



Kumar, N et al. *Clin Gastro Hep*. 2013

Other Applications of Endoscopic Suturing

- Suturing stents in place
- Managing iatrogenic perforations
- Closing POEM or G-POEM sites
- Closing large defects from EMR/ESD
- Gastro-cutaneous (i.e. PEG-related) fistula closure
- ? NOTES

Conclusion

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Thank you

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