Sleeve Gastrectomy
The good, bad, and ugly
Leaks, stricture, stenosis…

What do we do with the scope to mend it

Manoel Galvao Neto MD MsC IFSO IFASMBS FASGE

IFSO
NAPOLI
2023

Disclosures

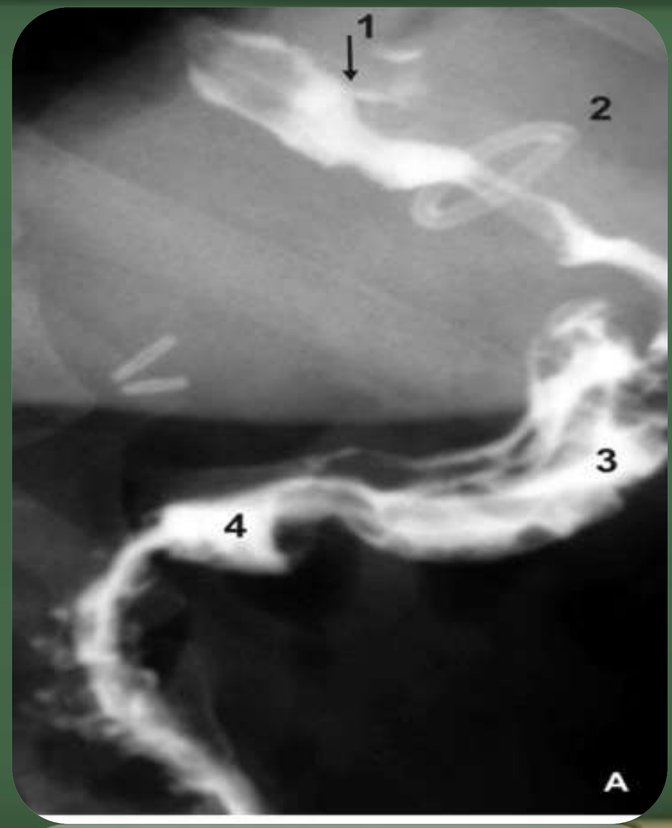
Manoel Galvao Neto

- ✓ *Gi Dynamics*
- ✓ *Apollo EndoSurgery*
- ✓ *USGI*
- ✓ *ERBE*
- ✓ *Keyron*

✓International consultant

✓Scientific Advisory Board

Bariatric Endoscopy



SLEEVE GASTRECTOMY LEAKS

SLEEVE GASTRECTOMY LEAKS PATHOPHYSIOLOGY

PRESSURE!

The Sleeve gastrectomy creates a hiper pressure low complaint system…

PRESSURE!

It took a while to understand …

PRESSURE!

It took a while to understand …

bioengineering

MDPI

Article

Biomechanical Investigation of the Stomach Following Different Bariatric Surgery Approaches

Ilaria Toniolo [1], Chiara Giulia Fontanella [1,2,*], Mirto Foletto [2,3] and Emanuele Luigi Carniel [1,2]

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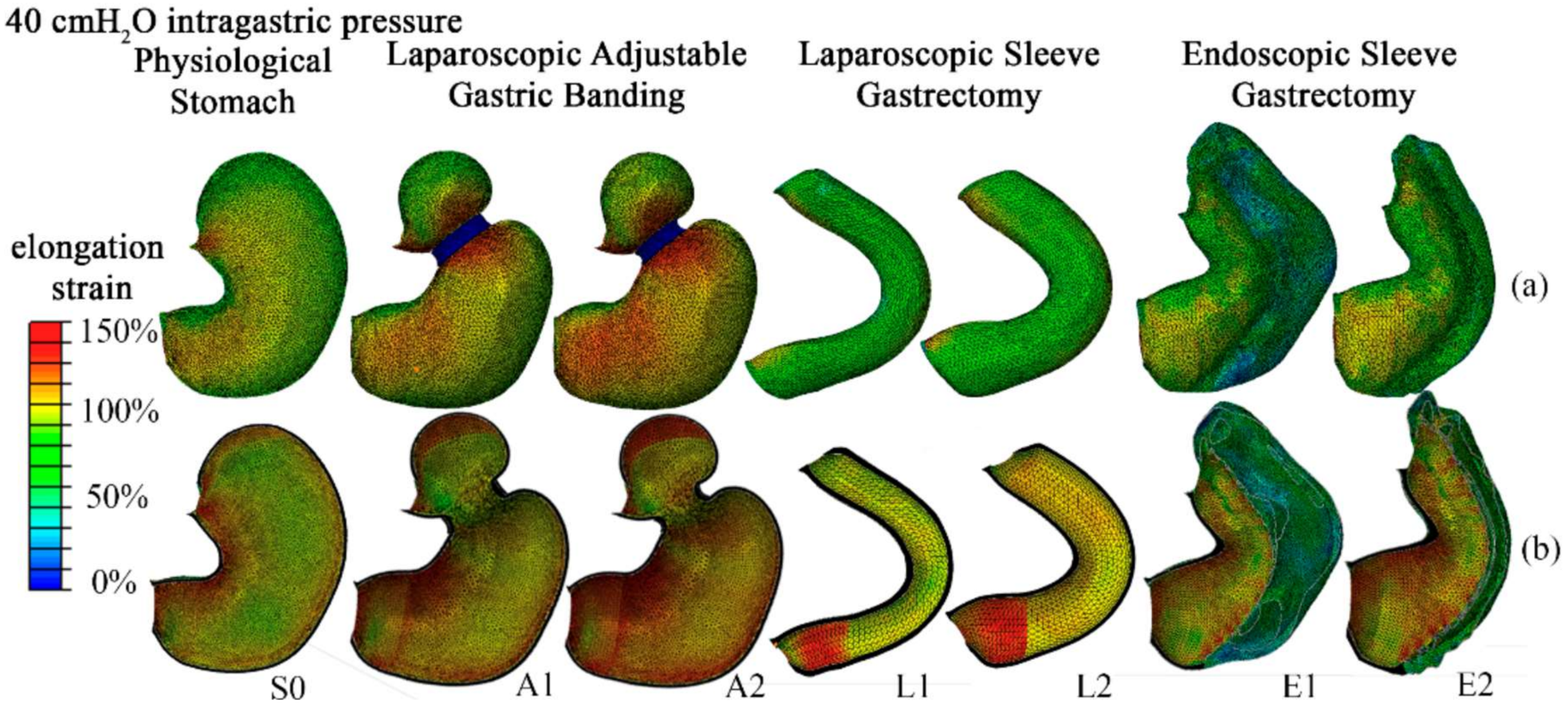

Figure 6. Contours of stomach distension as tissue elongation strain at 40 cm H_2O intragastric pressure: comparison of results for physiological stomach (S0), laparoscopic adjustable gastric banding (A1, A2), laparoscopic sleeve gastrectomy (L1, L2), and endoscopic sleeve gastroplasty (E1, E2) for the outer (**a**) and inner layers (**b**).

ELSEVIER

Surgery for Obesity and Related Diseases ▮ (2015) 00–00

SURGERY FOR OBESITY AND RELATED DISEASES

Original article

Laparoscopic total gastrectomy as an alternative treatment to postsleeve chronic fistula

Almino Cardoso Ramos, M.D.[a,*], Manoela Galvão Ramos, M.D.[a], Josemberg Marins Campos, M.D., Ph.D.[b], Manoel dos Passos Galvão Neto, M.D.[a], Eduardo Lemos de Souza Bastos, M.D., Ph.D.[a]

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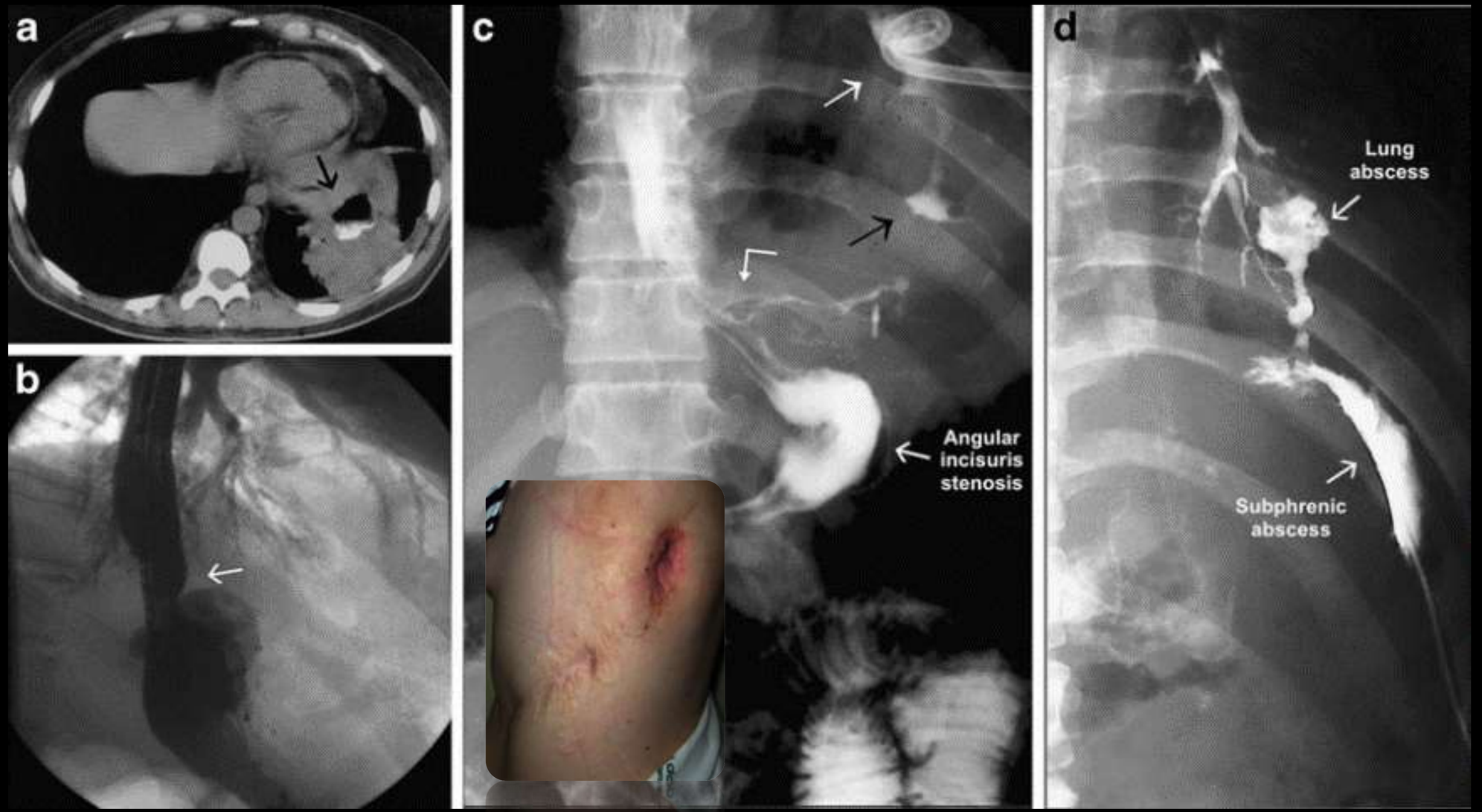
Received June 27, 2014; accepted October 26, 2014

OBES SURG
DOI 10.1007/s11695-011-0444-8

CLINICAL REPORT

Gastrobronchial fistula after sleeve gastrectomy and gastric bypass: endoscopic management and prevention

Josemberg Marins Campos · Eduardo Franca Pereira · Luis Fernando Evangelista · Luciana Siqueira · Manoel Galvão Neto · Victor Dib · Marcelo Falcão · Vitor Arantes · Diego Awruch · Walton Albuquerque · João Ettinger · Almino Ramos · Álvaro Ferraz


a
b
c
Angular incisuris stenosis
d
Lung abscess
Subphrenic abscess

SURGICAL OPTIONS

Damage control X conversion x resection

- Acute
  - Drain percutaneous X laparoscopic
  - Suturing ?
- Chronic
  - Convert to RYGB
  - EsophagoJejunostomy (loop and roux-and-Y)
  - Total gastrectomy

ELSEVIER

Surgery for Obesity and Related Diseases 15 (2019) 1844–1849

SURGERY FOR OBESITY AND RELATED DISEASES

Review article

Surgical management for chronic leak following sleeve gastrectomy: Review of literature

Marius Nedelcu, M.D.[a,*], Marc Danan, M.D., Ph.D.[a], Patrick Noel, M.D., Ph.D.[a,b], Michel Gagner, M.D., F.R.C.S.C., F.A.C.S., F.A.S.M.B.S.[c], Anamaria Nedelcu, M.D.[a], Sergio Carandina, M.D., Ph.D.[a]

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Received 13 December 2018; accepted 10 March 2019

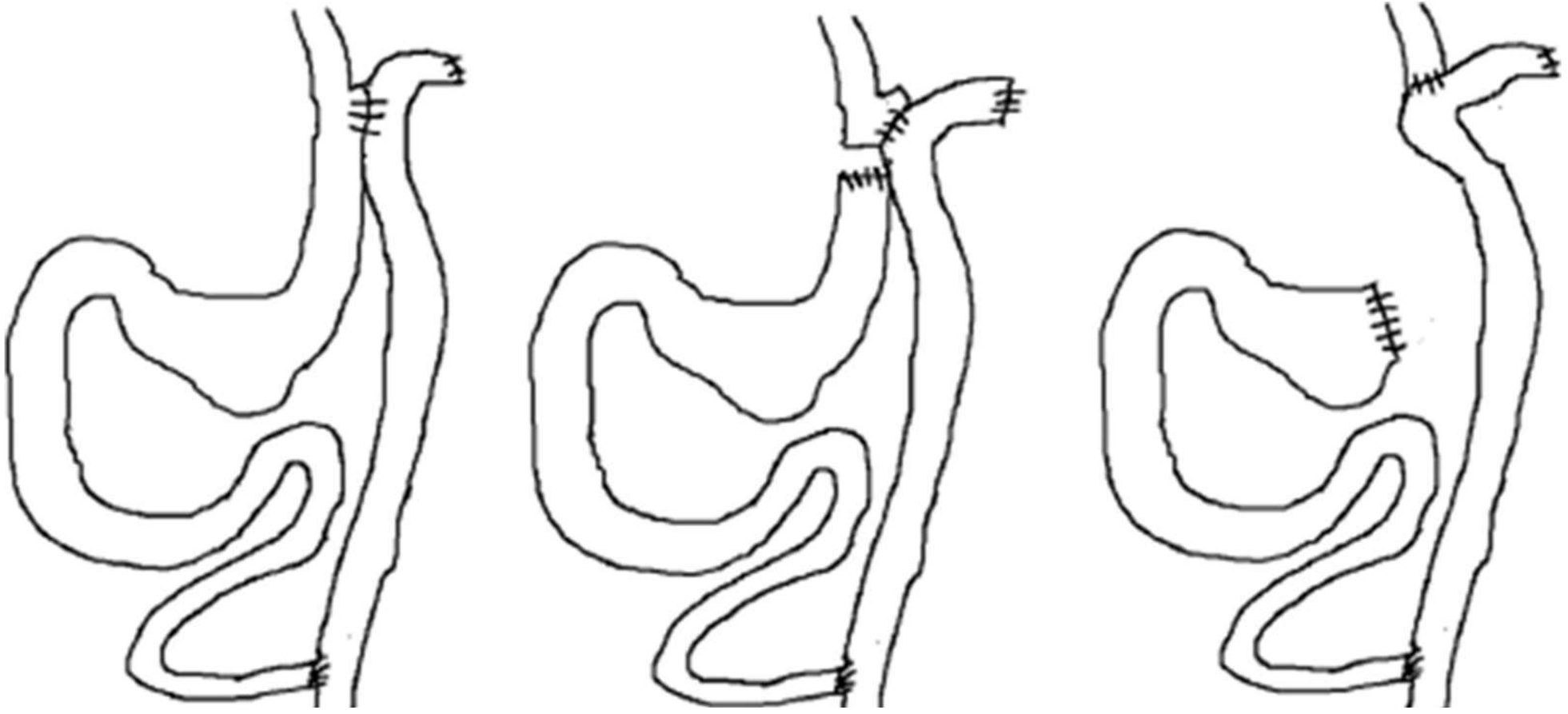


Table 1
Results of reconstructive surgery for chronic leak following LSG

Procedure	Number	Laparoscopic approach	Conversion rate	Leak	Mortality
Total gastrectomy	65 cases	50.8%	3.1%	7.7% (5 cases)	0 cases
Fistulojejunostomy	41 cases	95.1%	7.3%	21.9% (9 cases)	1 case
RYGB	8 cases	75%	0%	37.5% (3 cases)	1 case

RYGB = Roux en Y gastric bypass.

ENDOSCOPIC OPTIONS

SLEEVE LEAKS
ENDOLUMENAL STRATEGY

ELSEVIER

Surgery for Obesity and Related Diseases 8 (2012) 8–19

SURGERY FOR OBESITY AND RELATED DISEASES

Original article

International Sleeve Gastrectomy Expert Panel Consensus Statement: best practice guidelines based on experience of >12,000 cases

Raul J. Rosenthal, M.D., F.A.C.S., F.A.S.M.B.S.*, for the International Sleeve Gastrectomy Expert Panel

Received October 26, 2011; accepted October 27, 2011

Surg Obes Relat Dis. 2012 Jan-Feb;8(1):8-19. Epub 2011 Nov 10.

International Sleeve Gastrectomy Expert Panel Consensus Statement: best practice guidelines based on experience of >12,000 cases.

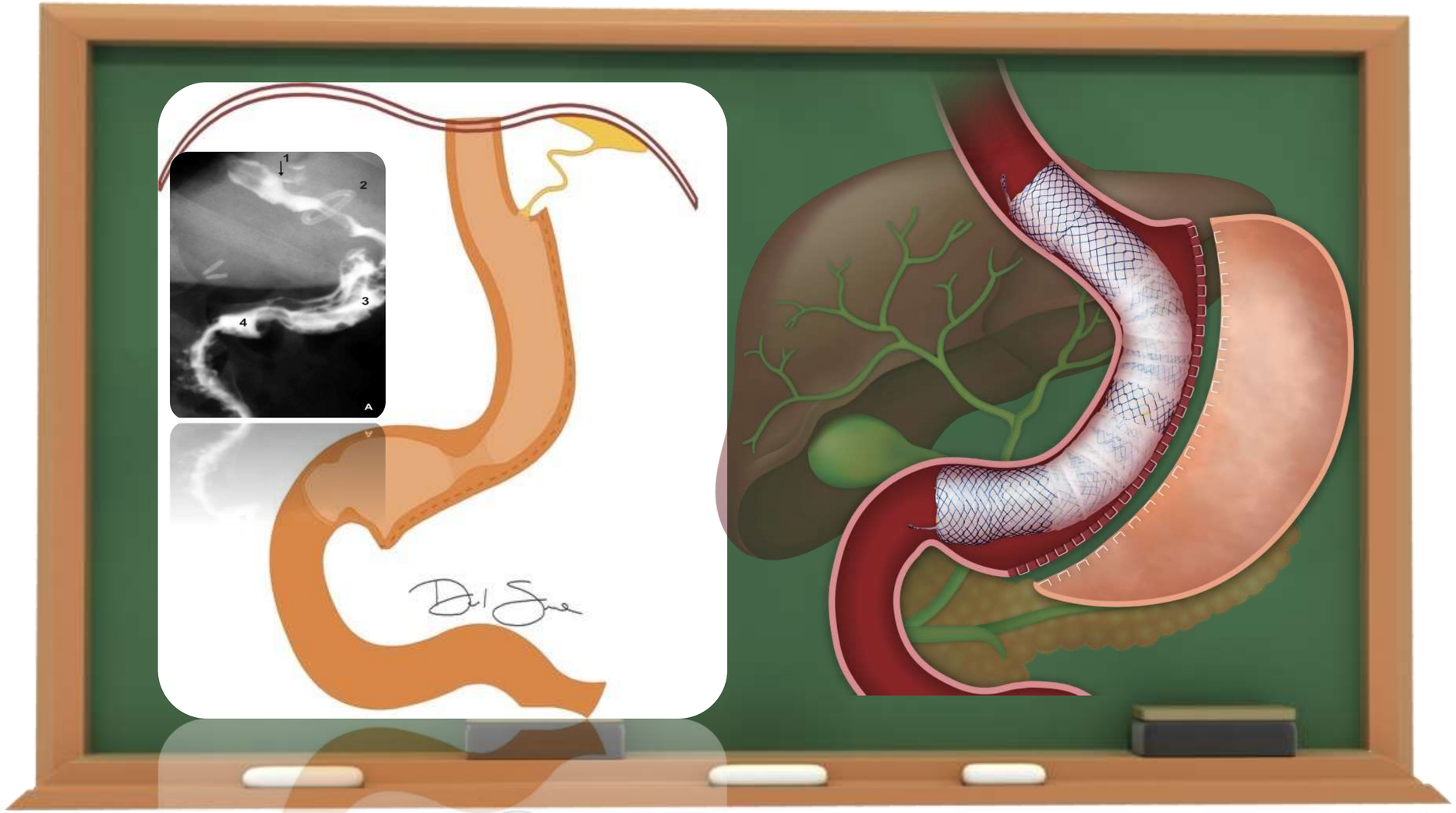
Rosenthal RJ; International Sleeve Gastrectomy Expert Panel, Diaz AA, Arvidsson D, Baker RS, Basso N, Bellanger D, Boza C, El Mourad H, France M, Gagner M, Galvao-Neto M, Higa KD, Himpens J, Hutchinson CM, Jacobs M, Jorgensen JO, Jossart G, Lakdawala M, Nguyen NT, Nocca D, Prager G, Pomp A, Ramos AC, Rosenthal RJ, Shah S, Vix M, Wittgrove A, Zundel N.

Department of Surgery, Section of Minimally Invasive Surgery, Cleveland Clinic Florida, 2950 Cleveland Clinic Boulevard, Weston, FL 33331, USA. rosentr@ccf.org

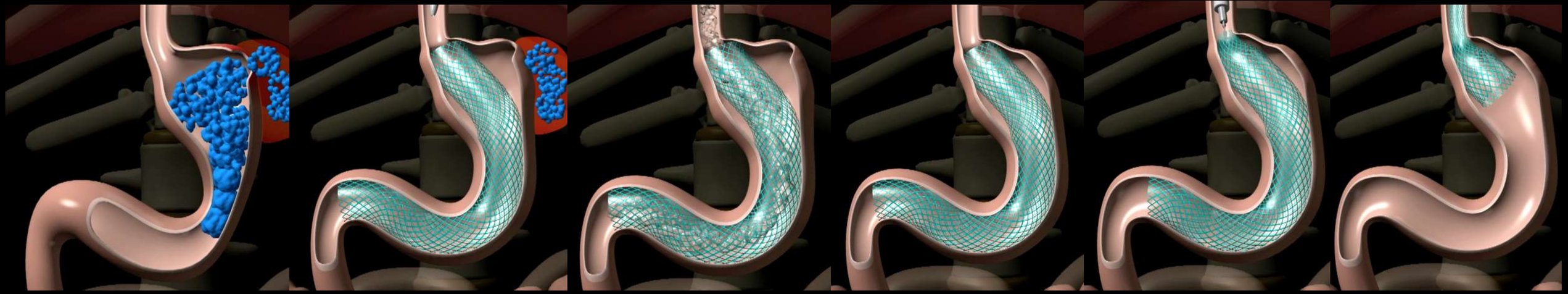
Based on time of presentation (from primary procedure)

Acute	***Early***	***Late***	***Chronic***
Within 7 days	1-6 wk	6 -12 wk	>12 wk

Surg Obes Relat Dis 8(1):8-19, 2012 Jan.



SLEEVE LEAKS
STENTS - SEMS



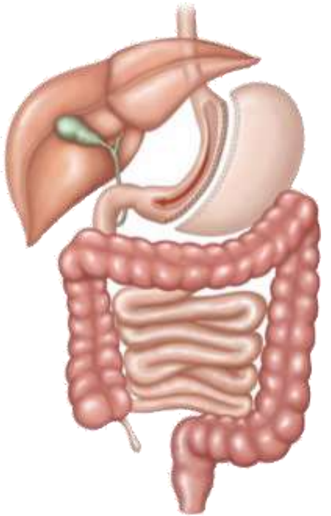
Sleeve gastrectomy Leaks

Obesity Surgery
https://doi.org/10.1007/s11695-018-3236-6

REVIEW ARTICLE

Efficacy and Safety of Stents in the Treatment of Fistula After Bariatric Surgery: a Systematic Review and Meta-analysis

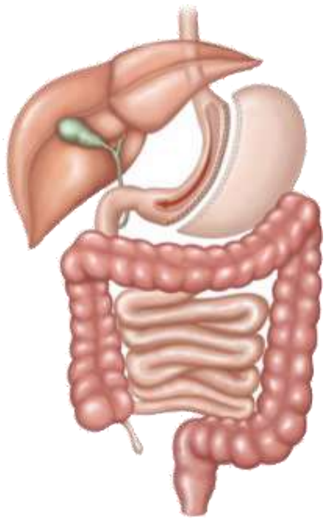
Ossamu Okazaki[1] · Wanderley M. Bernardo[1] · Vitor O. Brunaldi[1] · Cesar C. de Clemente Junior[1] · Maurício K. Minata[1] · Diogo T. H. de Moura[1] · Thiago F. de Souza[1] · Josemberg Marins Campos[2] · Marco Aurélio Santo[3] · Eduardo G. H. de Moura[1]



Sleeve gastrectomy Leaks

Efficacy and Safety of Stents in the Treatment of Fistula After Bariatric Surgery: a Systematic Review and Meta-analysis

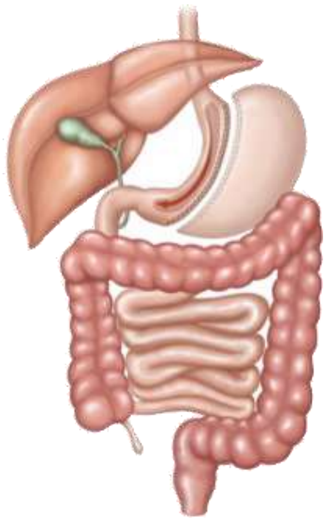
- 24 studies
- 187 patients
- Mean age was 42.94 ±0.46 years
- Mean BMI was 40.04 ± 0.38 kg/m
- Overall success rate was 72.8%



Sleeve gastrectomy Leaks

Efficacy and Safety of Stents in the Treatment of Fistula After Bariatric Surgery: a Systematic Review and Meta-analysis

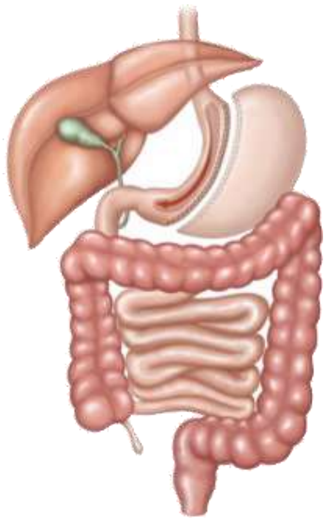
- ☑ Leak site - 13 studies - N = 90p
- ☑ Proximal - 94.4%
- ☑ Middle - 04.4%
- ☑ Distal - 01.1%



Sleeve gastrectomy Leaks

Efficacy and Safety of Stents in the Treatment of Fistula After Bariatric Surgery: a Systematic Review and Meta-analysis

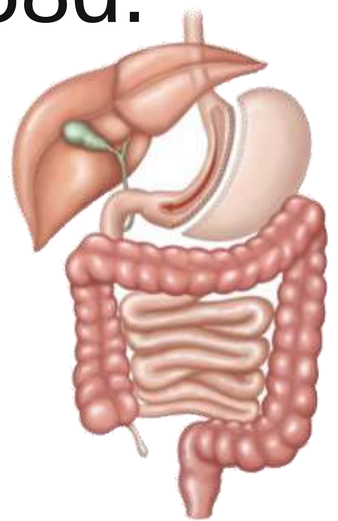
- Leak timing -15 studies = 92 patients,
- Acute fistula - 48.91% (1–7 days)
- Early fistula - 34.78% (1–6 weeks)
- Late fistula - 6.52% (6–12 weeks)
- Chronic fistula - 8.7% (> 12weeks)



Sleeve gastrectomy Leaks

Efficacy and Safety of Stents in the Treatment of Fistula After Bariatric Surgery: a Systematic Review and Meta-analysis

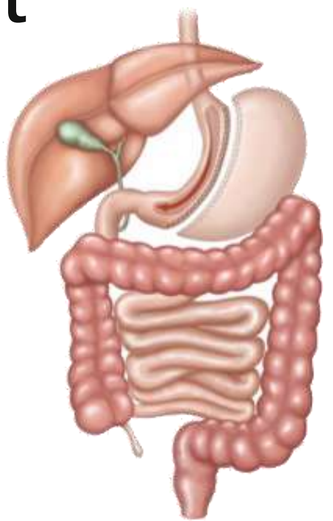
- # of stents per patient was 1.4 ± 0.03
- Mean days for diagnosis 3.35 ± 0.28d
- Mean days with stent was 48.77 ± 0.58d.
- Stent migration rate was 28.2%



Sleeve gastrectomy Leaks

Efficacy and Safety of Stents in the Treatment of Fistula After Bariatric Surgery: a Systematic Review and Meta-analysis

- ☑ No data on fistula size
- ☑ No reported perforation cases
- ☑ Bleeding requiring additional proc -2pt
- ☑ No deaths reported



SURGERY FOR OBESITY AND RELATED DISEASES

ABSTRACT ONLY | VOLUME 12, ISSUE 7, SUPPLEMENT , S74-S75, AUGUST 01, 2016

Sleeve Gastrectomy leak: endoscopic management through customized bariatric stent

Manoel Galvao Neto • Lyz Silva • Luiz Gustavo de Quadros • Maíra Danielle Gomes de Souza • Almino Ramos • Alvaro Bandeira Ferraz • Josemberg Campos • Show less

DOI: https://doi.org/10.1016/j.soard.2016.08.486

Sleeve gastrectomy leak: endoscopic management through a customized long bariatric stent

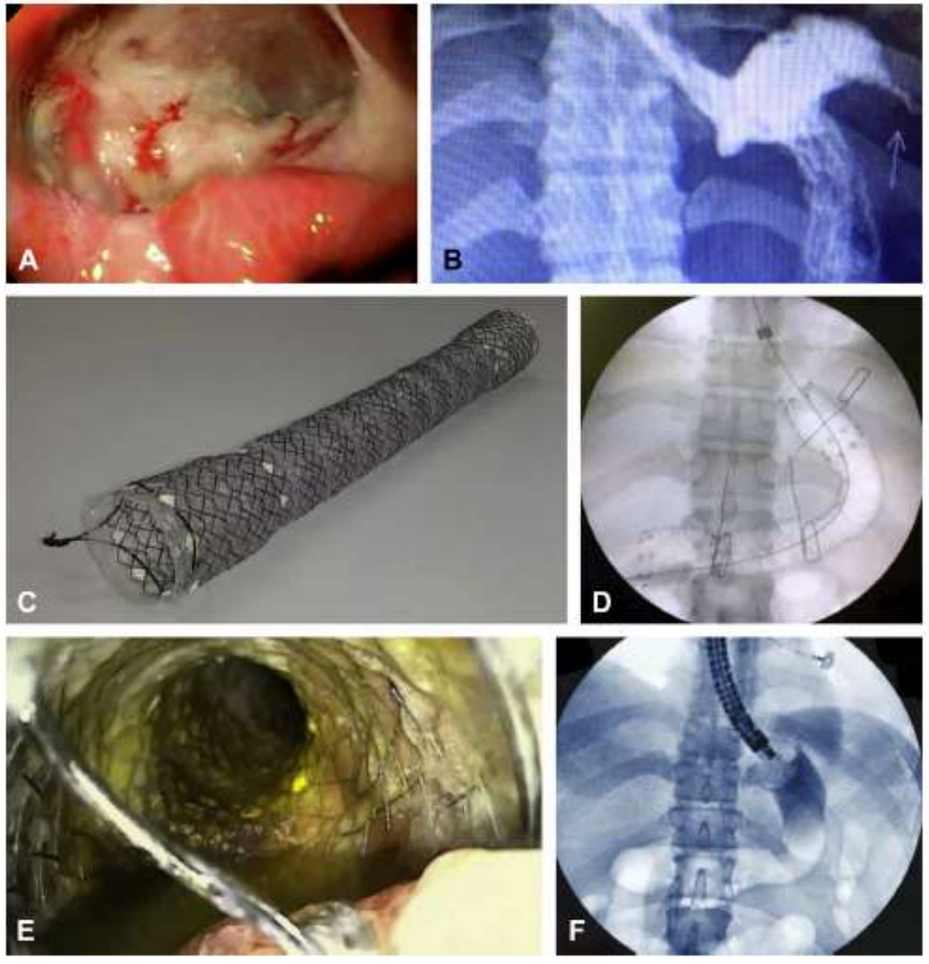


Figure 1. A, Endoscopic view of perigastric cavity and septum below the GEJ. **B,** Radiographic view of stomach with flow of contrast medium through leak orifice. **C,** Totally covered nitinol stent, 200 mm × 28 mm × 30 mm. **D,** Radioscopic control: stent positioned 3 cm above GEJ, in a transpyloric manner. **E,** Stent removal: proximal suture grasped by raptor forceps, with removal under radiologic control. **F,** Radiographic control after stent removal, showing resolution of axis deviation and closure of leak orifice. *GEJ*, gastroesophageal junction.

A 28-year-old woman, body mass index 35 kg/m^2, underwent laparoscopic sleeve gastrectomy, without drain placement. Twelve days later, she experienced abdominal pain with radiation to her left shoulder, fever, and leukocytosis. The patient was admitted with a clinical diagnosis of gastric leak. Endoscopy showed a leak orifice below the gastroesophageal junction (GEJ), allowing passage to a perigastric cavity, with a small amount of purulent fluid and debris (Figs. 1A and B). This cavity was endoscopically washed with saline solution until the return of fluid was clear. The stomach had an axis deviation to the right, creating a stricture at the level of the incisura angularis, with difficult endoscope passage. A customized metallic bariatric stent (totally covered nitinol stent, 200 mm × 28 mm × 30 mm, Expand Stent, Plastimed S.R.L., Buenos Aires, Argentina) was placed, with the patient under general anesthesia (Fig. 1C; Video 1, available online at www.videogie.org). The stent was placed 3 cm above the GEJ, with the distal end on the duodenum, by use of a guidewire, under radioscopic guidance (Fig. 1D). No sutures, clips, or other fixation methods were used. Antibiotic agents already prescribed for sepsis control by the surgical team were maintained. For 3 days the patient experienced thoracic pain, moderate nausea, and biliary vomiting as a result of the stent diameter and position in the duodenum. A control radiograph showed the stent in a proper position.

The patient was discharged on the fourth day after stent placement, with a liquid diet, a proton pump inhibitor agent, antiemetic agents, and instructions to sleep in a semisitting position. On the seventh day, a radiograph with contrast medium showed good flow through the stent, which was in a good position. During the following weeks, her diet was progressed to soft foods, and the patient had no pain, with occasional biliary vomiting. After 3 weeks, the patient was readmitted for stent removal. Endoscopy showed the stent in the proper position, with small tissue ingrowth at the proximal end. There was exuberant tissue formation at the distal end, but with lumen patency. Associated with this, an asymptomatic shallow ulcer was seen on the duodenum. The stent was removed with the aid of a raptor forceps (US Endoscopy, Mentor, Ohio) without difficulty (Fig. 1E). Endoscopic revision showed resolution of the axis deviation and closure of the leak, confirmed by radiograph with contrast medium (Fig. 1F). At a 3-month follow-up visit, the patient was asymptomatic.

Featured Videos are select videos republished from the March 2017 issue of *VideoGIE*. Written transcript of the video audio is available online at www.VideoGIE.org.

Featured Videos

This video can be viewed directly from the GIE website or by using the QR code and your mobile device. Download a free QR code scanner by searching "QR Scanner" in your mobile device's app store.

DISCLOSURE

Dr Neto is a consultant for Ethicon Endosurgery, Apollo Endosurgery, Fractyl Laboratories, GI Dynamics, and GI Windows. All other authors disclosed no financial relationships relevant to this publication.

Lyz Bezerra Silva, MD, MS, Manoel Galvão Neto, MD, MS, João Caetano Marchesini, MD, MS, Eduardo S. N. Godoy, MD, Josemberg Campos, MD, DS, *Department of Surgery, Federal University of Pernambuco, Recife, PE, Brazil*

http://dx.doi.org/10.1016/j.gie.2017.02.028

Results

	Mean	Min	Max
Leak Diagnosis (days)	12.8	4	18
Stent placement time (days)	21.7	12	40
Stent removal time (weeks)	3.9	3	6
Healing time (weeks)	4.6	3	14
Follow up time (months)	6.2	2	24

No additional surgical procedures

2 cases needed septotomy / dilation (8 and 14 wks to heal)

All patients referred severe full stent related symptoms:

Nausea,

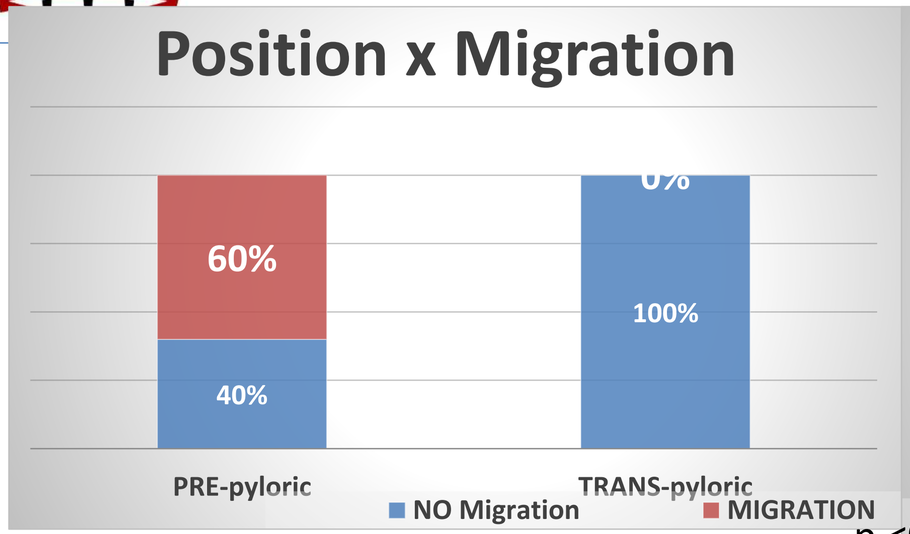
Vomiting,

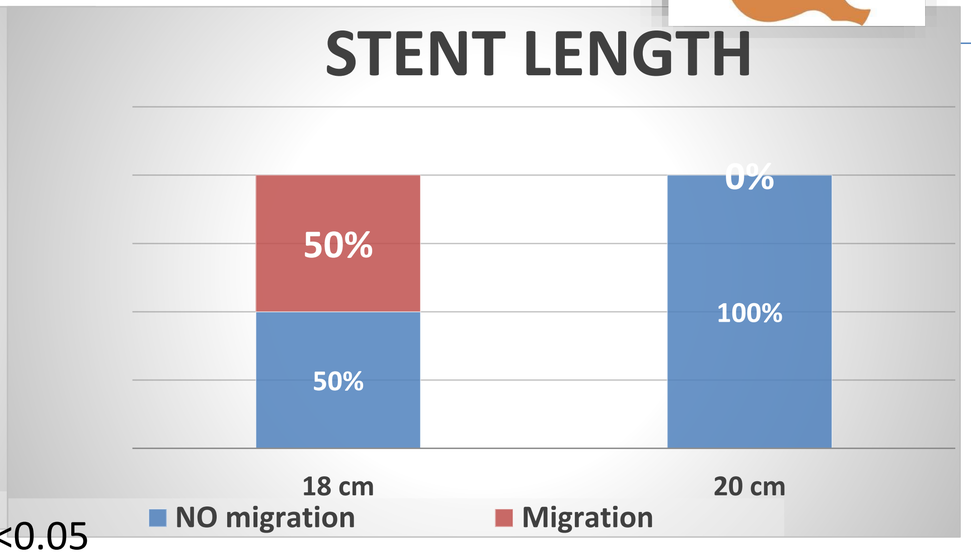
Retrosternal pain;

Symptoms were controlled (to moderate) with oral drugs after 4 to 5 days in 61.1% of cases.

Success was achieved in 100%

Results





p <0.05

None	14 (77,8%)
Migration	3 (16,7%)
Self-limited hemorrhage	1 (5,6%)

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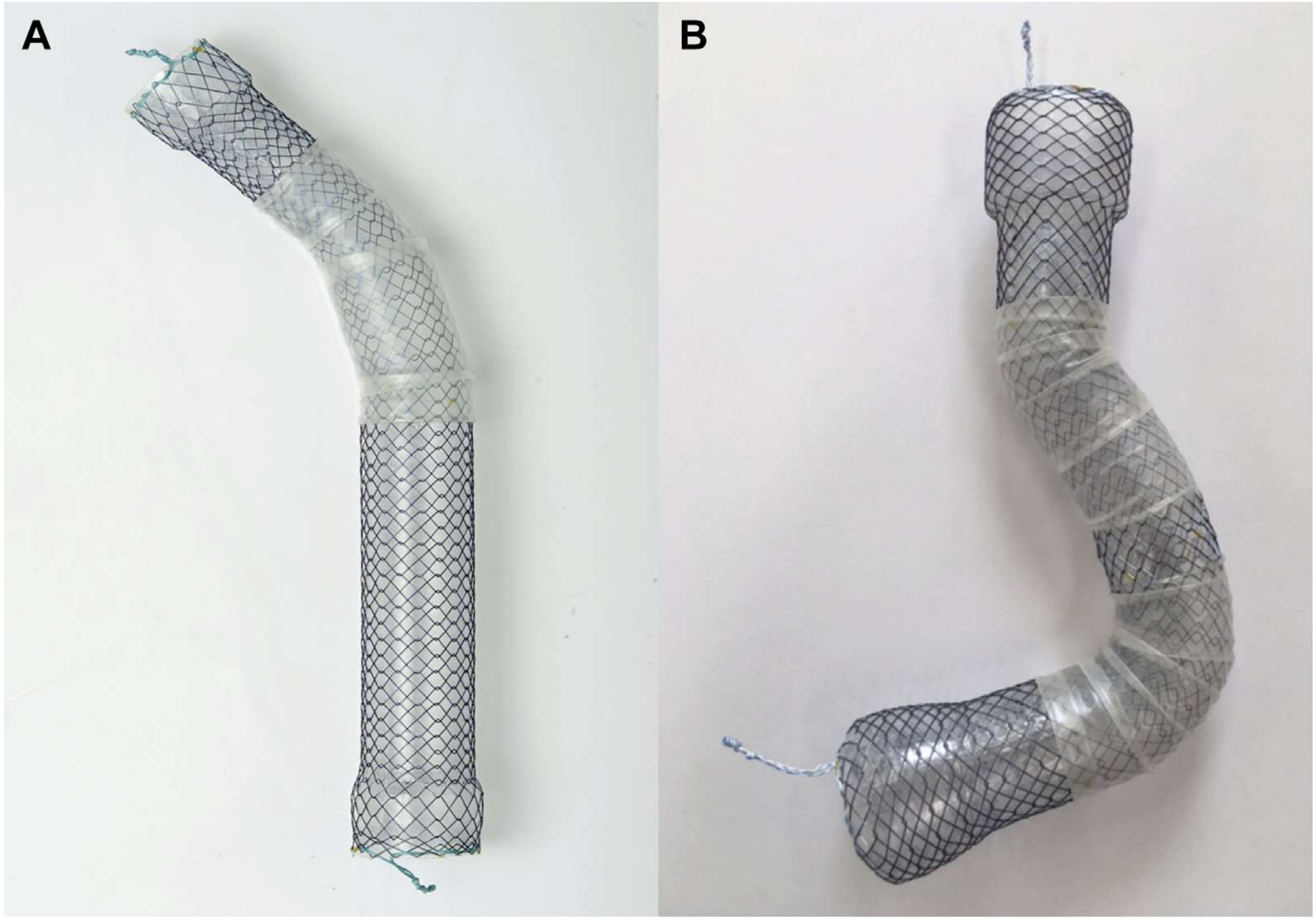
Surgery for Obesity and Related Diseases ■ (2019) 1–11

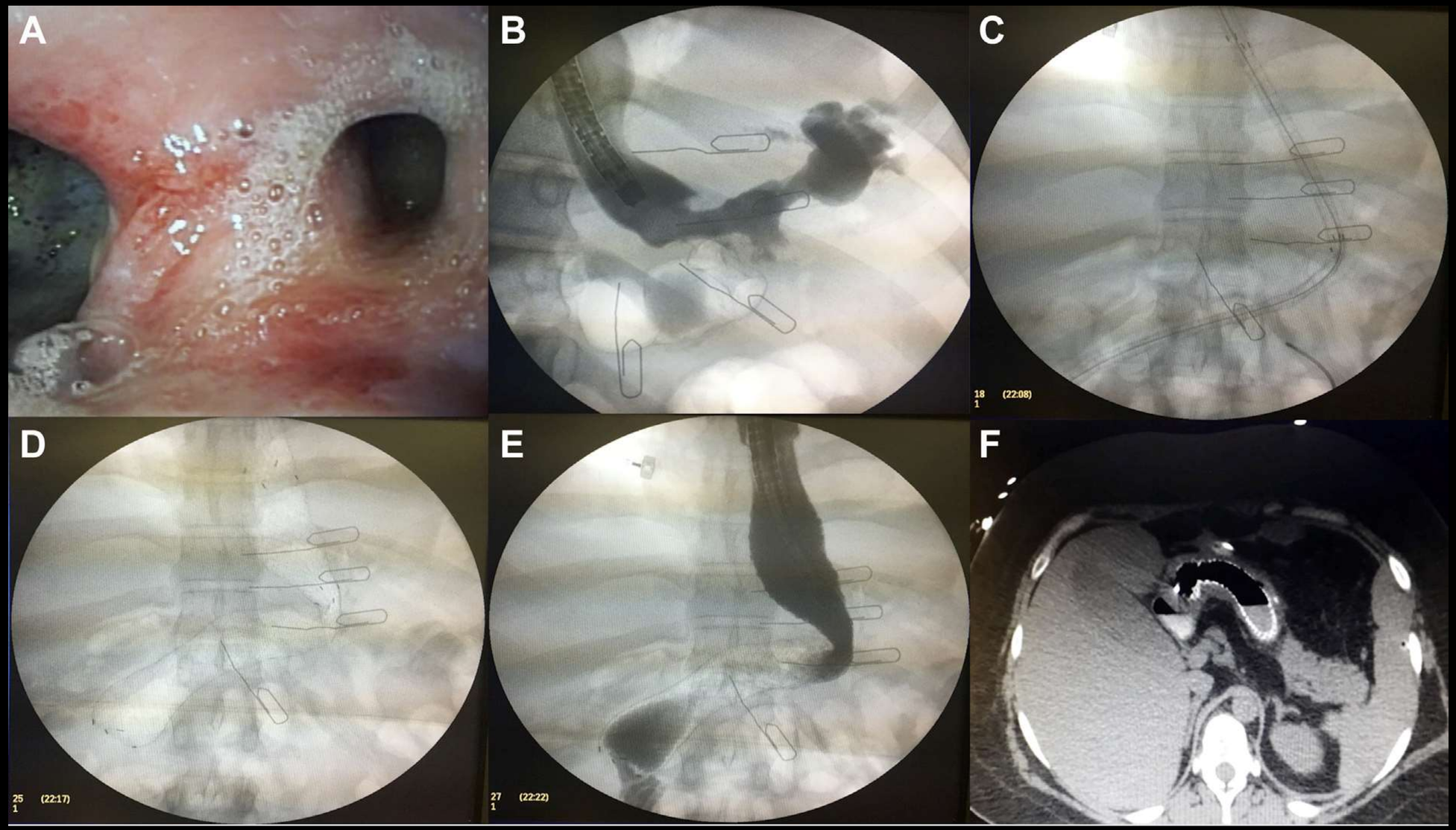
SURGERY FOR OBESITY AND RELATED DISEASES

Original article

Outcomes of a novel bariatric stent in the management of sleeve gastrectomy leaks: a multicenter study

Diogo Turiani Hourneaux de Moura, M.Sc., M.D., Ph.D.[a,b], Eduardo Guimarães Hourneaux de Moura, M.Sc., M.D., Ph.D.[b], Manoel Galvão Neto, M.D.[c,d], Pichamol Jirapinyo, M.P.H., M.D.[a], Newton Teixeira, M.D.[e], Ivan Orso, M.D., Ph.D.[f], Luiz Gustavo Quadros, M.D.[g], Artagnan Amorim, M.D.[h], Filipe Medeiros, M.D.[i], Durval Rosa Neto, M.D.[j], João de Siqueira Neto, M.D.[k], Alvaro Albano, M.D.[l], Luiz Henrique de Sousa, M.D.[m], Delano Almeida, M.D.[n], Igor Antunes Marchetti, M.D.[o], Flávio Ivano, M.D., Ph.D.[p], João Henrique Felicio de Lima, M.D.[q], Marcelo Falcão, M.D., Ph.D.[r,s], Christopher C. Thompson, M.Sc., M.D., F.A.S.G.E., F.A.C.G., A.G.A.F.[a,*]


A
B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18 (22:08)
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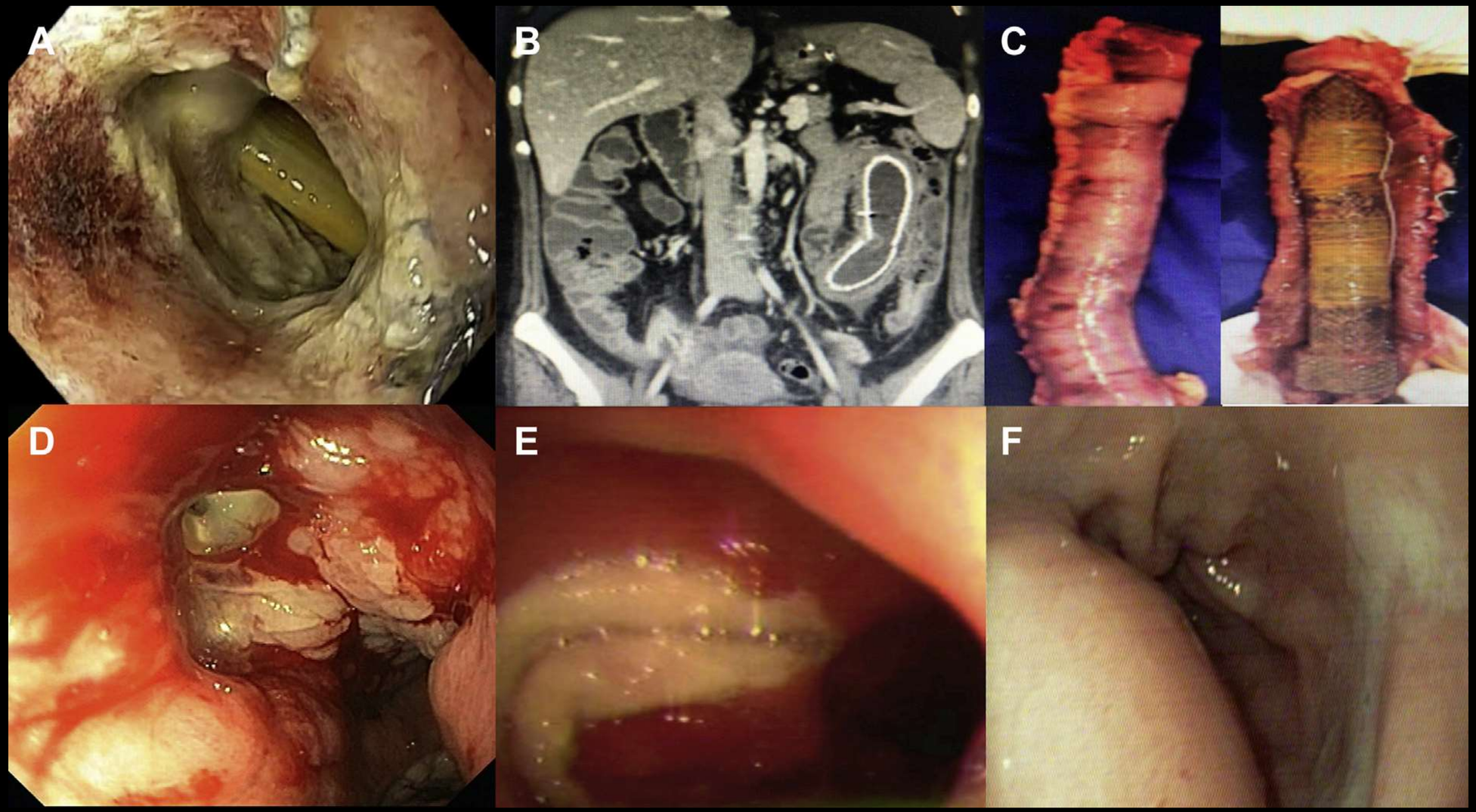
Bariatric Stent Adverse Events



World Journal of Gastrointestinal Surgery

World J Gastrointest Surg. Dec 27, 2013; 5(12): 337–340.
Published online Dec 27, 2013. doi: 10.4240/wjgs.v5.i12.337
PMCID: PMC3879419

Fatal aortoesophageal fistula bleeding after stenting for a leak post sleeve gastrectomy

Majid A Almadi, Fahad Bamihriz, and Abdulrahman M Aljebreen

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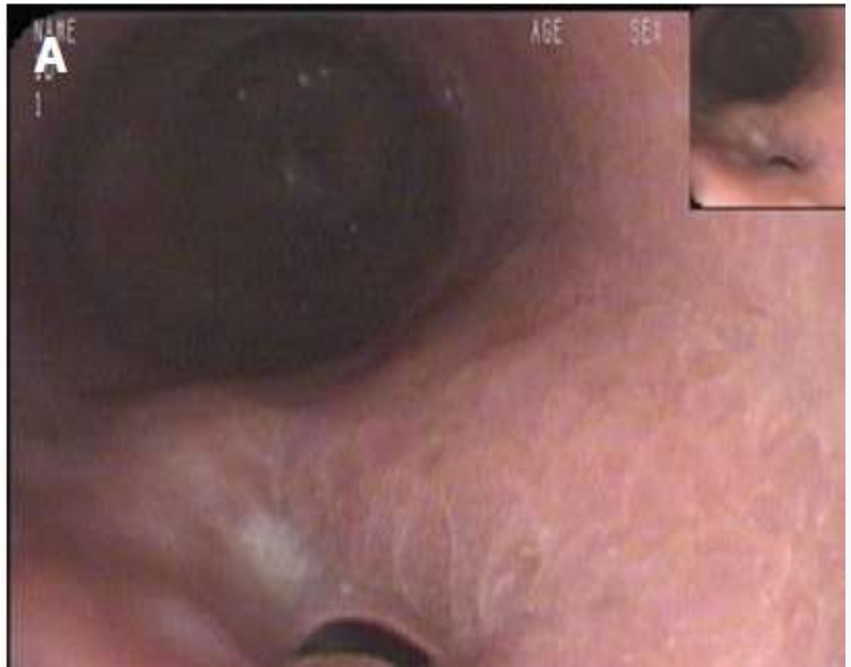

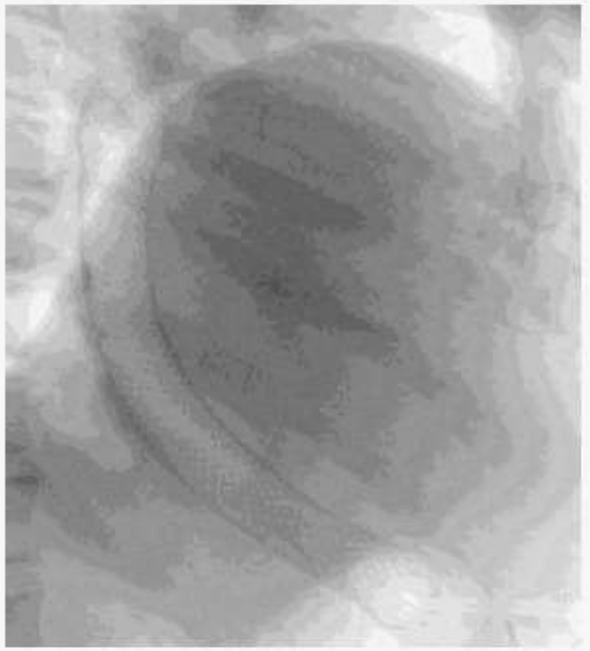

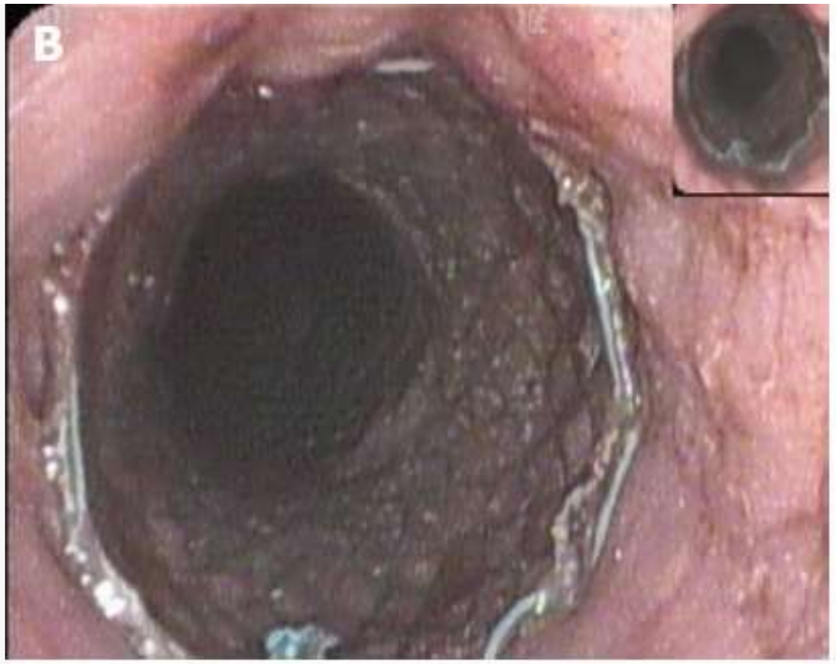

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Fatal aortoesophageal fistula bleeding after stenting for a leak post sleeve gastrectomy

Majid A Almadi, Fahad Bamihriz, and Abdulrahman M Aljebreen

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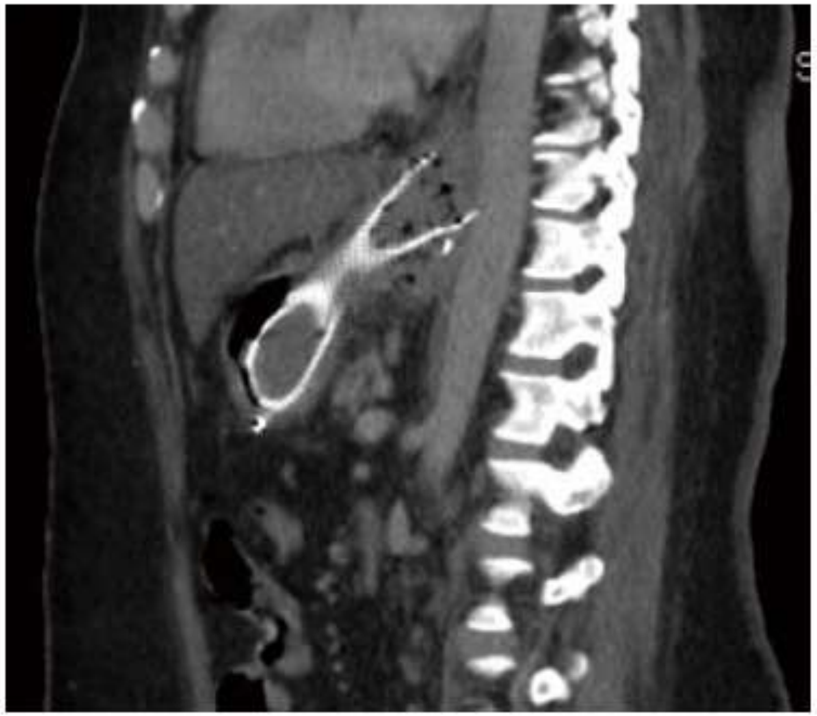


SURGERY FOR OBESITY AND RELATED DISEASES

Log in

ORIGINAL ARTICLE | VOLUME 17, ISSUE 2, P340-344, FEBRUARY 01, 2021

Aortic injuries following stents in bariatric surgery: our experience

Gianfranco Donatelli, M.D., Ph.D. • Thierry Manos, M.D. •

Patrick Noel, M.D., F.A.C.S., F.A.S.M.B.S. •

Jean-Loup Dumont, M.D. • Anamaria Nedelcu, M.D. •

Marius Nedelcu, M.D., F.A.S.M.B.S.

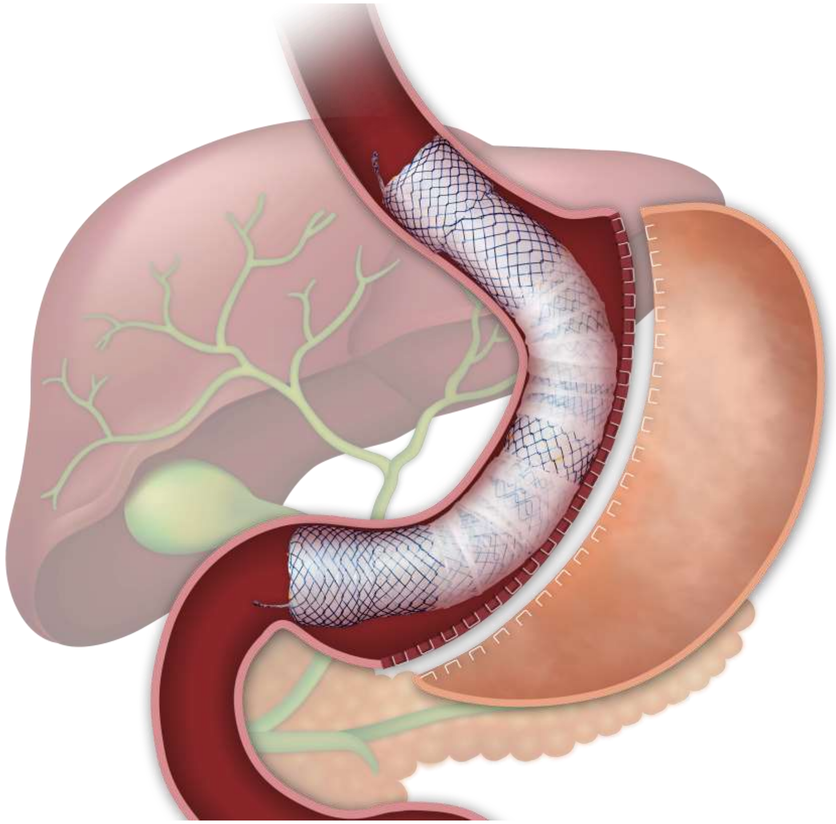
Published: September 22, 2020 •

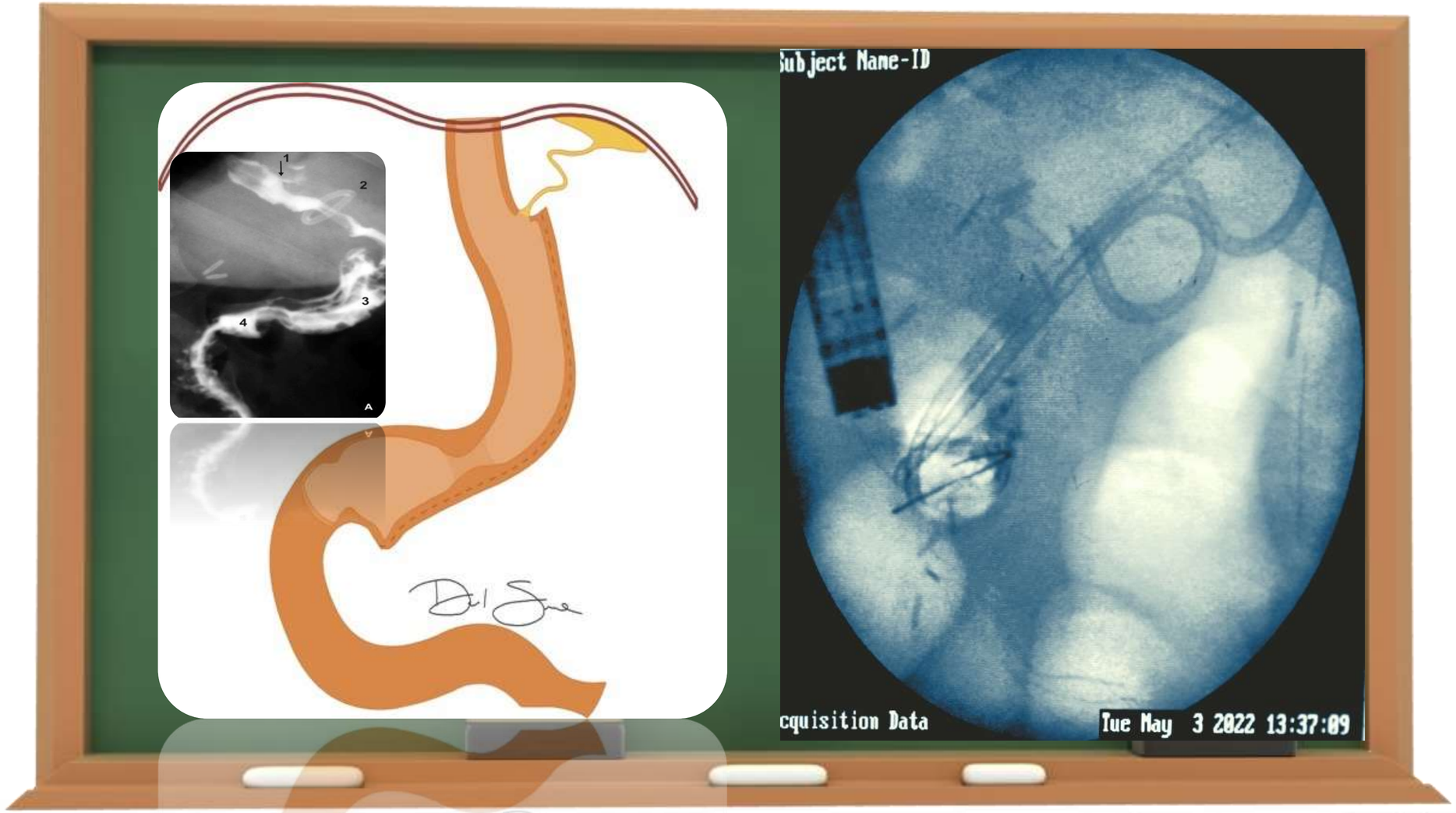
DOI: https://doi.org/10.1016/j.soard.2020.09.028 •

Table 1
Baseline demographic characteristics and outcomes of surgical procedure

Age	Sex	POD complication	Clinical characteristics
27	F	POD 4	Fever and abdominal pain
50	F	POD 8	Tachycardia
43	M	POD 5	Sepsis (transferred from outside)
29	F	POD 11	Peritonitis
34	F	POD 5	Fever and left shoulder pain

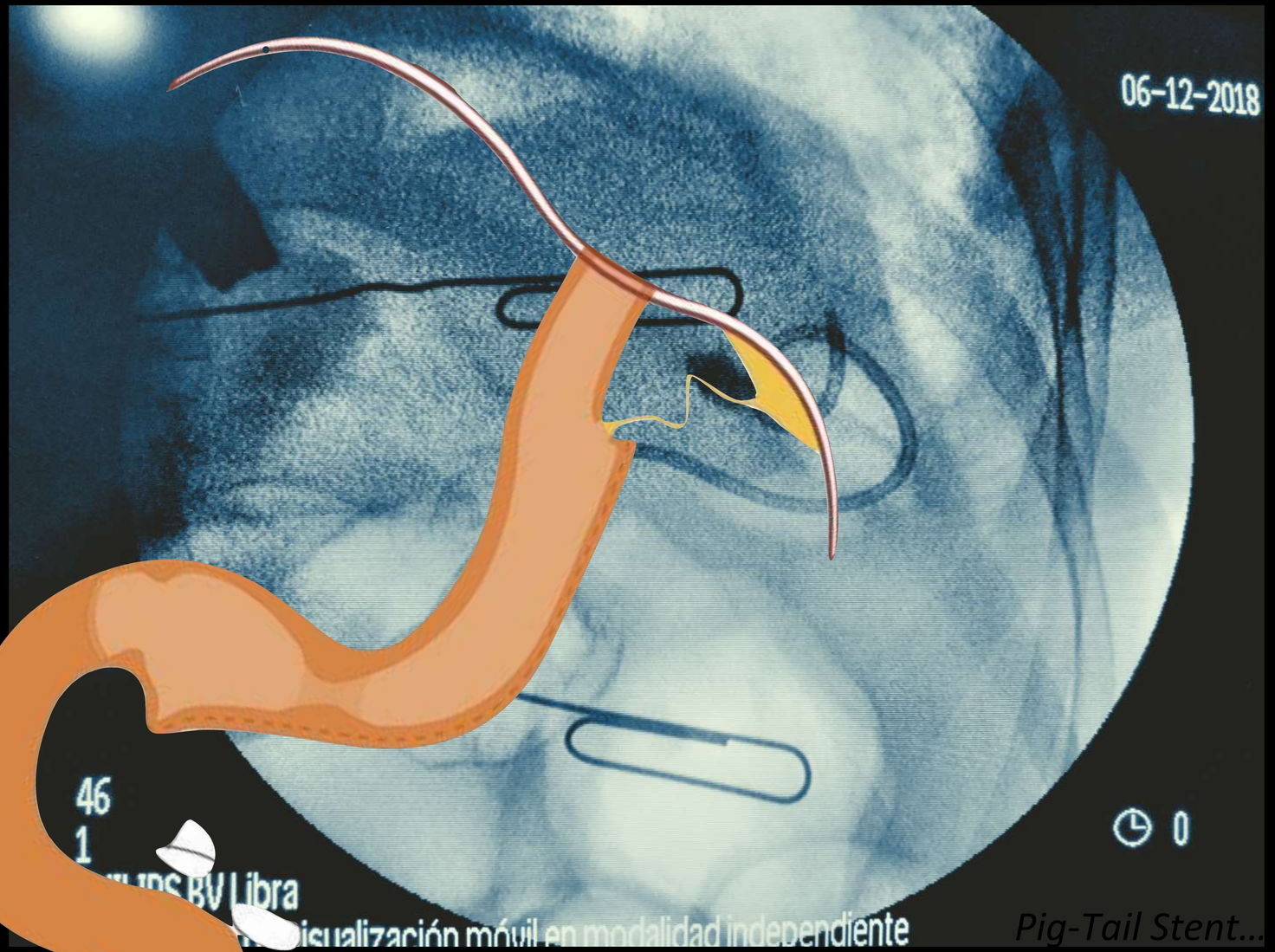
POD = postoperative day; F = female; M = male.





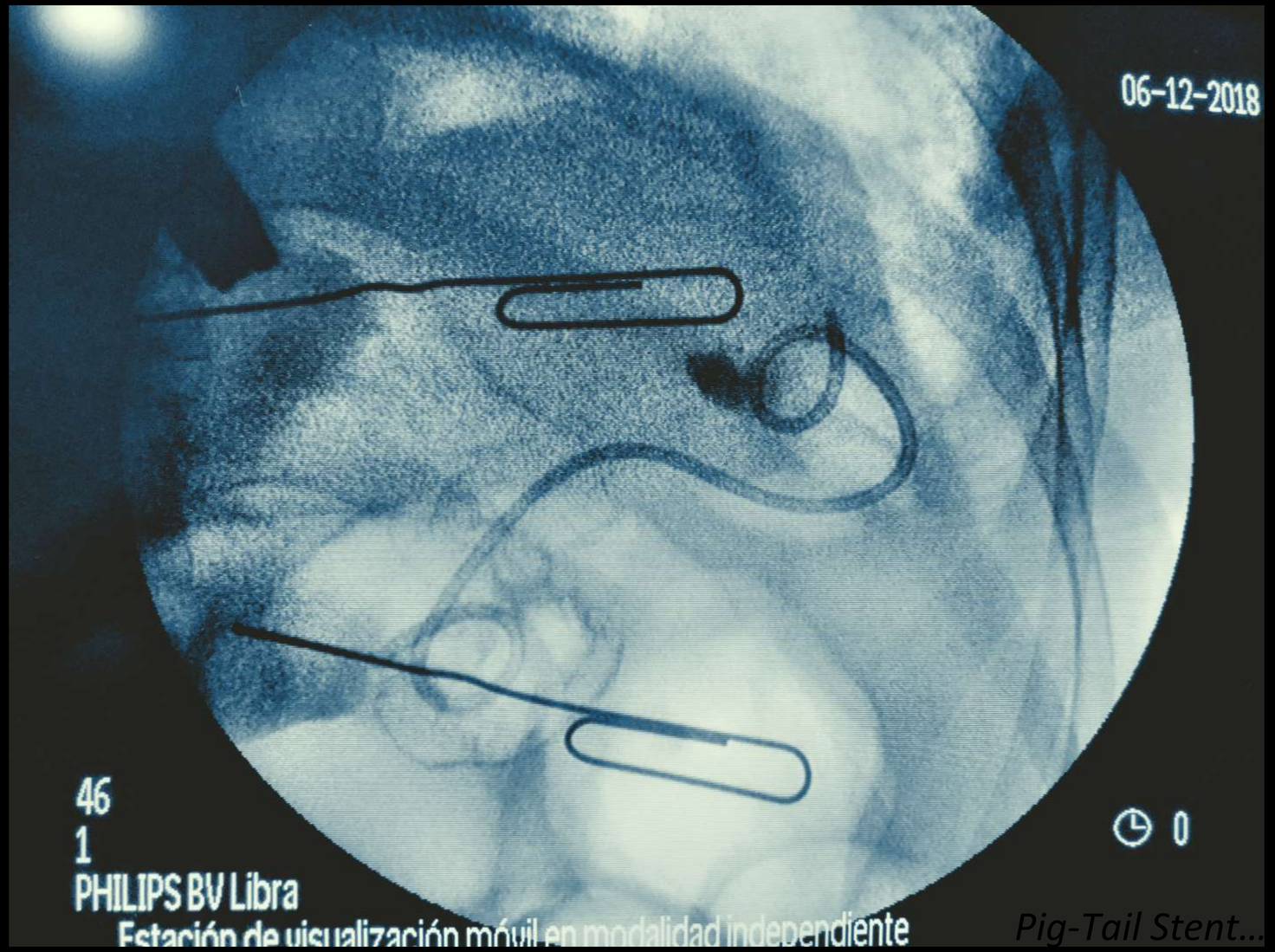
SLEEVE LEAKS
PIG TAIL STENT

Galvao Neto M, Romero G, Quadros LG, Aceves M
2018 - 2019 - 2020

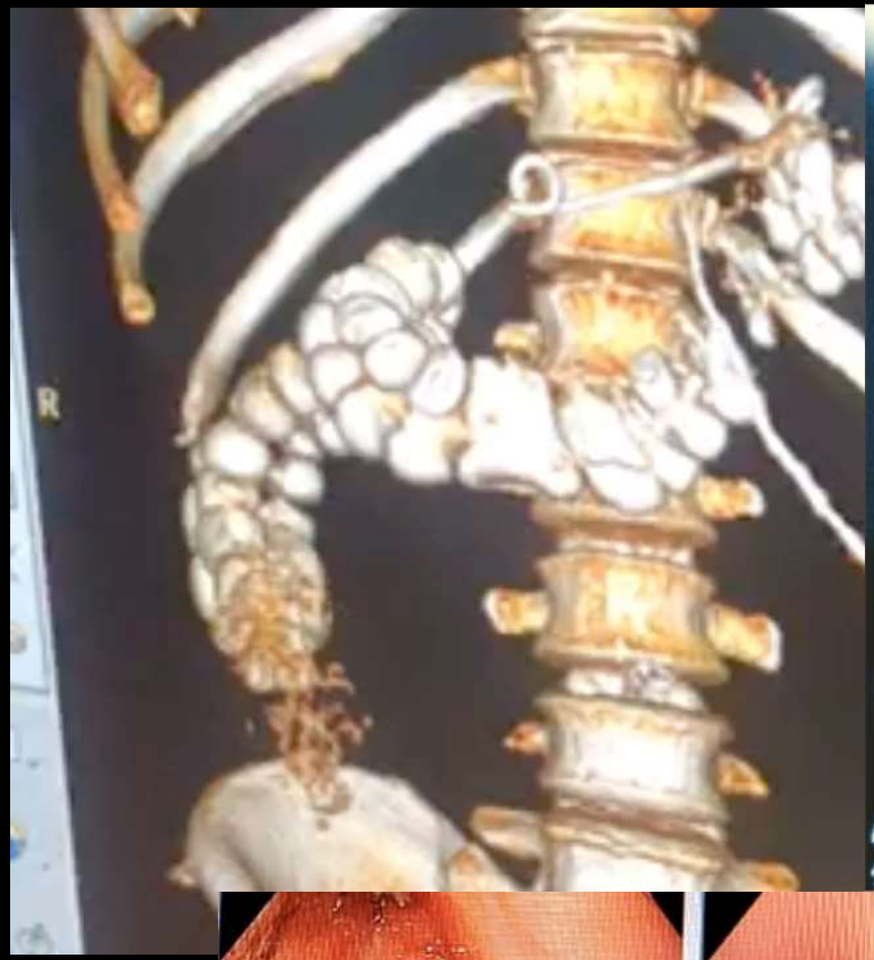


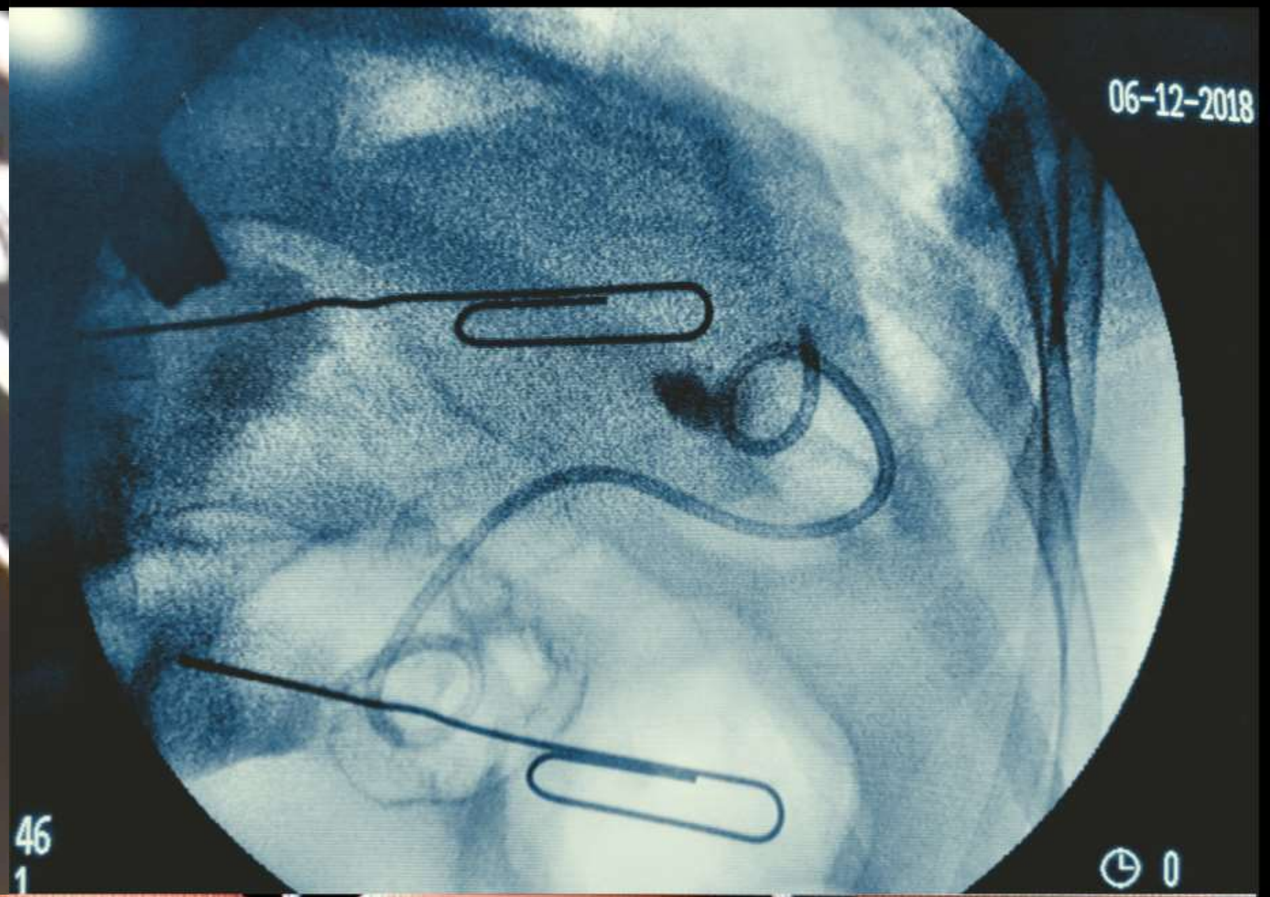
Pig-Tail Stent...

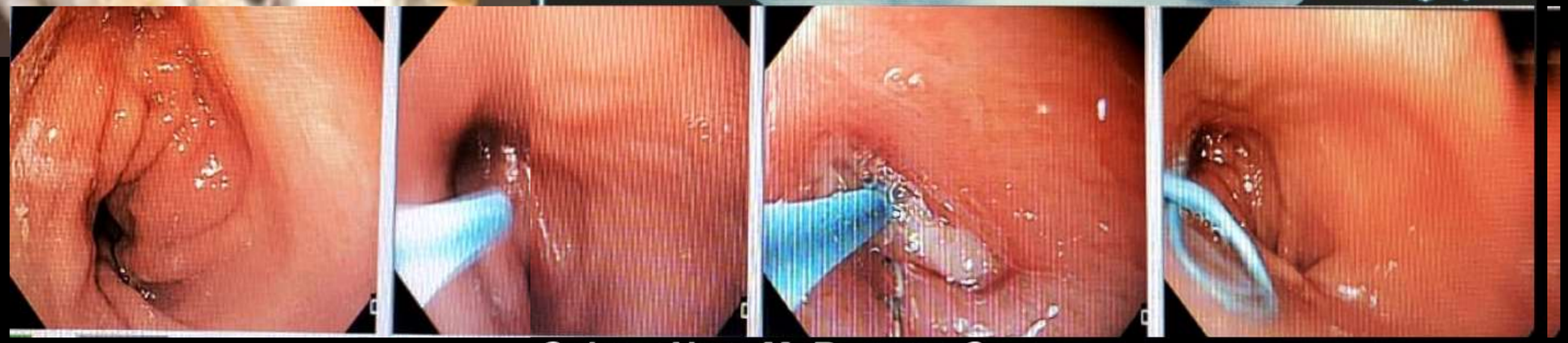
Galvao Neto M, Romero G, Quadros LG, Aceves M
2018 - 2019 - 2020



Galvao Neto M, Romero G, Quadros LG, Aceves M
2018 - 2019 - 2020







Galvao Neto M, Romero G
2018

SURGERY FOR OBESITY AND RELATED DISEASES ASMBS

GASTRIC LEAK AFTER LAPAROSCOPIC SLEEVE GASTRECTOMY: MANAGEMENT WITH ENDOSCOPIC DOUBLE PIGTAIL DRAINAGE. A SYSTEMATIC REVIEW

Running head: Pigtail drainage in gastric leak

Antonio GIULIANI[1], MD, PhD, Lucia ROMANO[1*], MD, Michele MARCHESE[2], MD, PhD, Stefano NECOZIONE[3], MD, Giovanni CIANCA[1], MD, Mario SCHIETROMA[1], MD, Francesco CARLEI[1], MD.

[1] Department of General Surgery, San Salvatore Hospital. Department of Biotechnological and Applied Clinical Sciences, University of L'Aquila, L'Aquila, Italy
[2] Surgical Endoscopy Unit, San Salvatore Hospital, L'Aquila, Italy
[3]Epidemiology Unit, Department of Life, Health and Environmental Sciences, University of L'Aquila, L'Aquila, Italy

Table 2: Characteristics of the selected studies

681pt

AUTHOR	YEAR	COUNTRY	NUMBER OF PATIENTS	NUMBER OF PATIENTS TREATED WITH DPS
Gonzales, Lorenzo [9]	2018	France	44	44
Rebibo, Bartoli [10]	2016	France	86	47
Bouchard, Eisendrath [11]	2016	Belgium	33	33
Donatelli, Ferretti [12]	2014	France	21	21
Donatelli, Dumont [13]	2015	France	67	67
Cosse, Rebibo [14]	2018	France	112	89
Pequignot, Fuks [15]	2012	France	25	7
Lorenzo, Guilbaud [16]	2017	France	100	44
Talbot, Yee [17]	2015	Australia	64	7
Nedelcu, Manos [18]	2015	France	19	6
Christophorou, Valats [19]	2014	France	110	20

Table 3 - Details of complications 13.73%

AUTHOR	NUMBER OF PATIENTS TREATED WITH DPS	COMPLICATIONS
Gonzales, Lorenzo [9]	44	11
Rebibo, Bartoli [10]	47	4
Bouchard, Eisendrath [11]	33	4
Donatelli, Dumont [13]	67	6
Pequignot, Fuks [15]	7	2
Nedelcu, Manos [18]	6	1
Total	**204**	**28**

HIGHLIGHTS

Gastric leak remains the main complication after sleeve gastrectomy, but there are no standardized guidelines for its treatment.

To date, many studies have investigated the safety and efficacy of DPS, but their results remain inconsistent and only a limited number of them report a significant sample size.

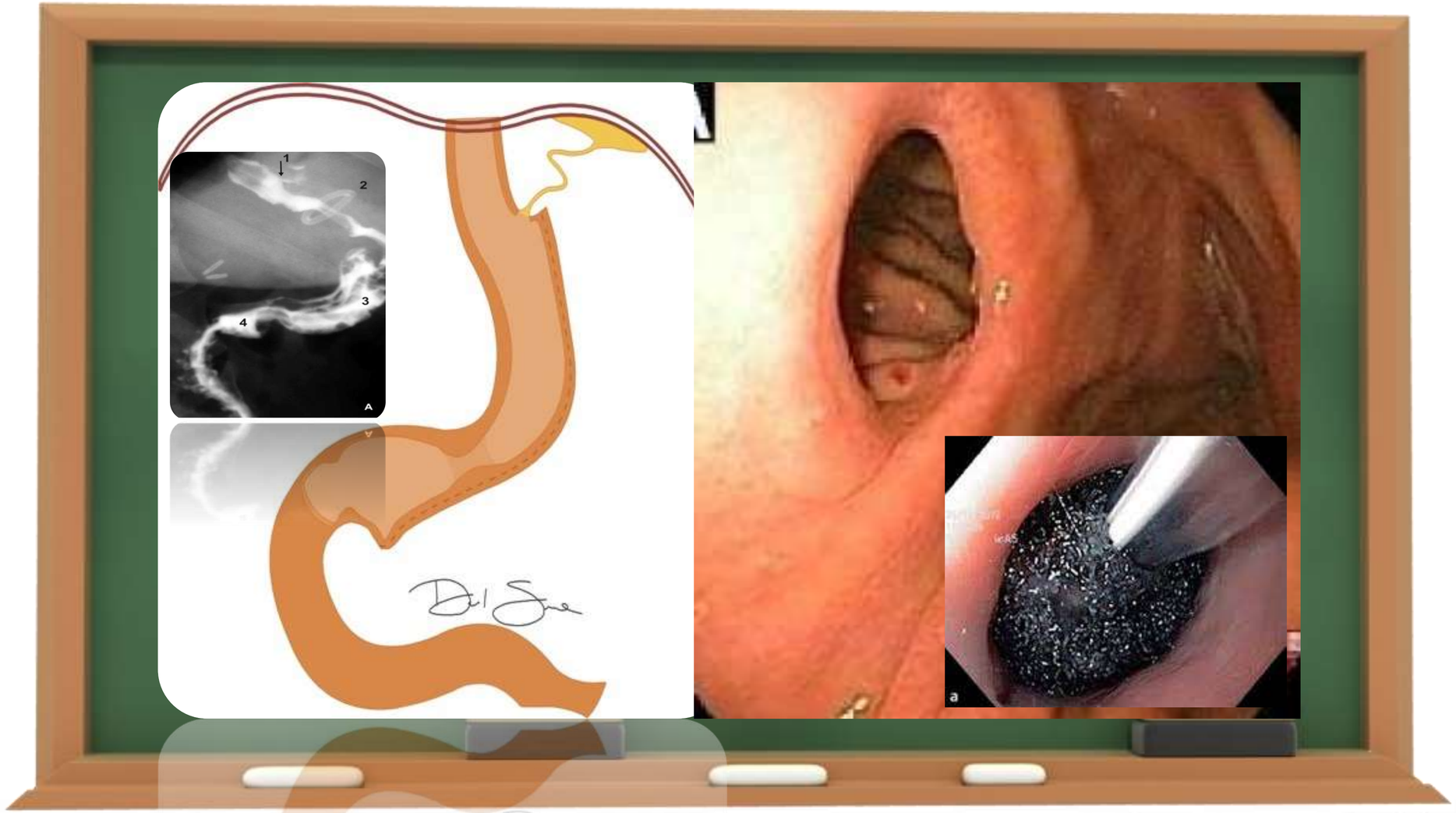
To our best knowledge, there's no previous review evaluating the effects of this endoscopic management.

The aim of our work is to carry out a comprehensive literature review on the efficacy of the DPS endoscopically positioned to treat leak post-sleeve gastric resection.

The results showed that DPS had high rate of successful leak closures (84.42% in total and 85.92% as first line treatment).

84.42% success

Pig-Tail Stent…



SLEEVE LEAKS
E-VAC

Original article

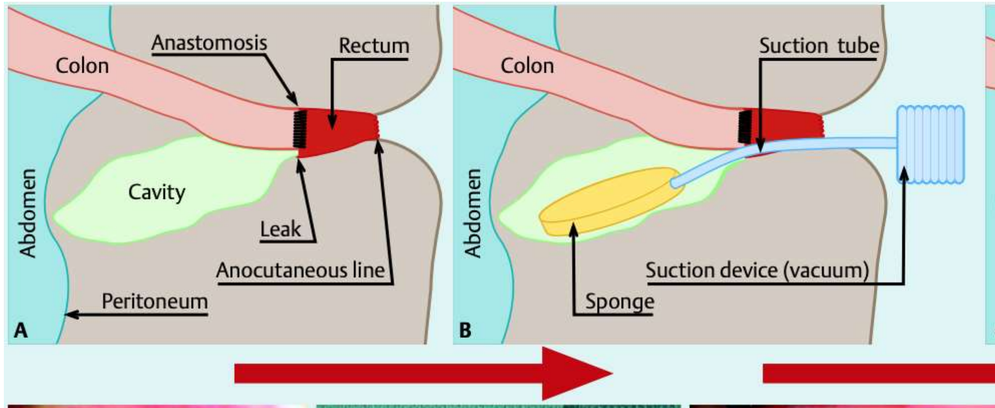
doi:10.1111/j.1463-1318.2008.01485.x

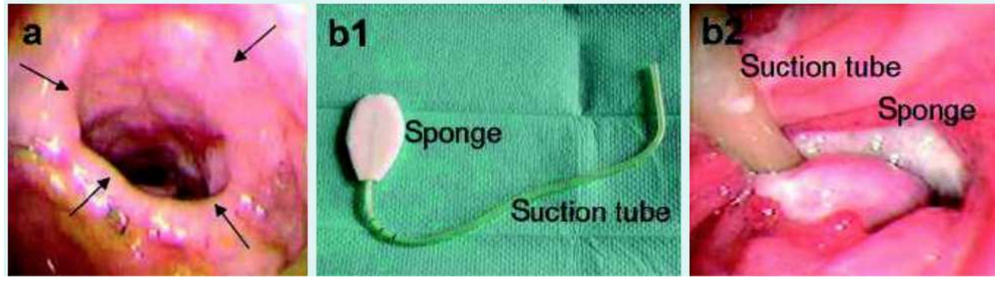
Endo-sponge treatment of anastomotic leakage after ileo-anal pouch anastomosis: report of two cases

P. J. Van Koperen, M. I. Van Berge Henegouwen, J. F. M. Slors and W. A. Bemelman

Department of Surgery, Academic Medical Center, Amsterdam, The Netherlands

Received 9 October 2007; accepted 13 October 2007



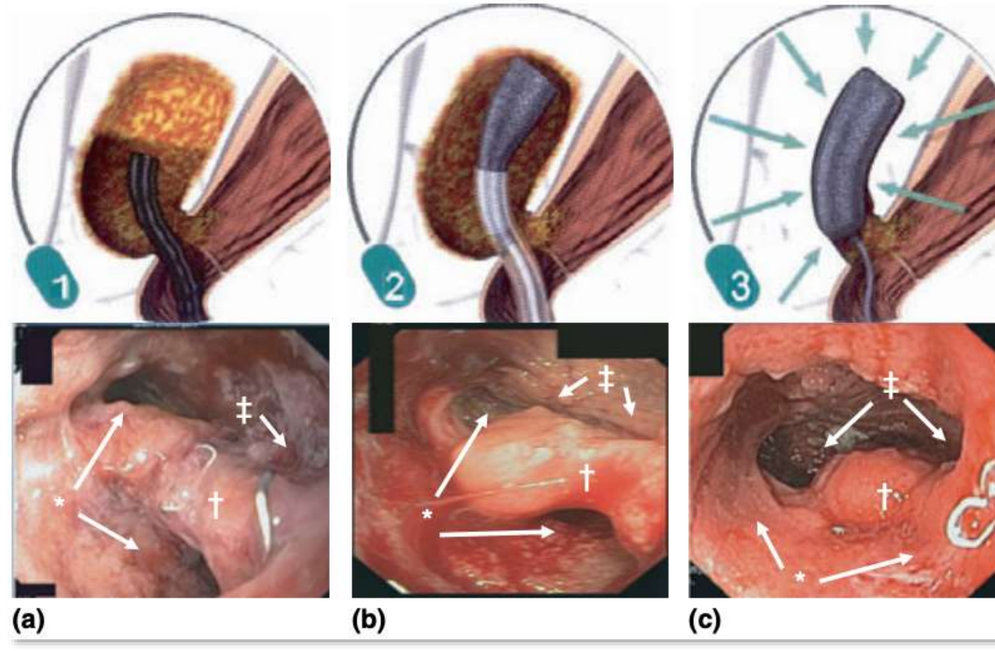


192 Original article

Endoscopic transanal vacuum-assisted rectal drainage (ETVARD): an optimized therapy for major leaks from extraperitoneal rectal anastomoses

Authors A. Glitsch*, W. von Bernstorff*, U. Seltrecht, I. Partecke, H. Paul, C. D. Heidecke

Institution Department of General Surgery, Visceral, Thoracic and Vascular Surgery, University Hospital, Ernst-Moritz-Arndt-Universität, Greifswald, Germany



- Sponge = uniform distribution of the vacuum

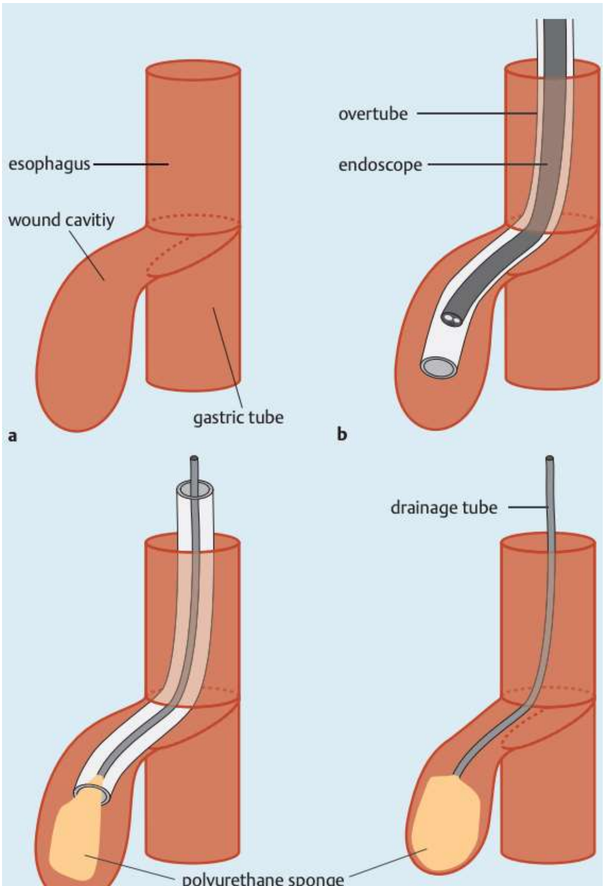
Drainage of esophageal leakage using endoscopic vacuum therapy: a prospective pilot study

Authors M. Ahrens[1]*, T. Schulte[1]*, J. Egberts[1], C. Schafmayer[1], J. Hampe[2], A. Fritscher-Ravens[2,3], D. C. Broering[1], B. Schniewind[1]

Institutions
[1] Department of General Surgery and Thoracic Surgery, University Hospital Schleswig-Holstein, Kiel, Germany
[2] Department of Internal Medicine, University Hospital Schleswig-Holstein, Kiel, Germany
[3] Homerton University Hospital, London, United Kingdom

Endoscopy 2010; 42: 693 – 698

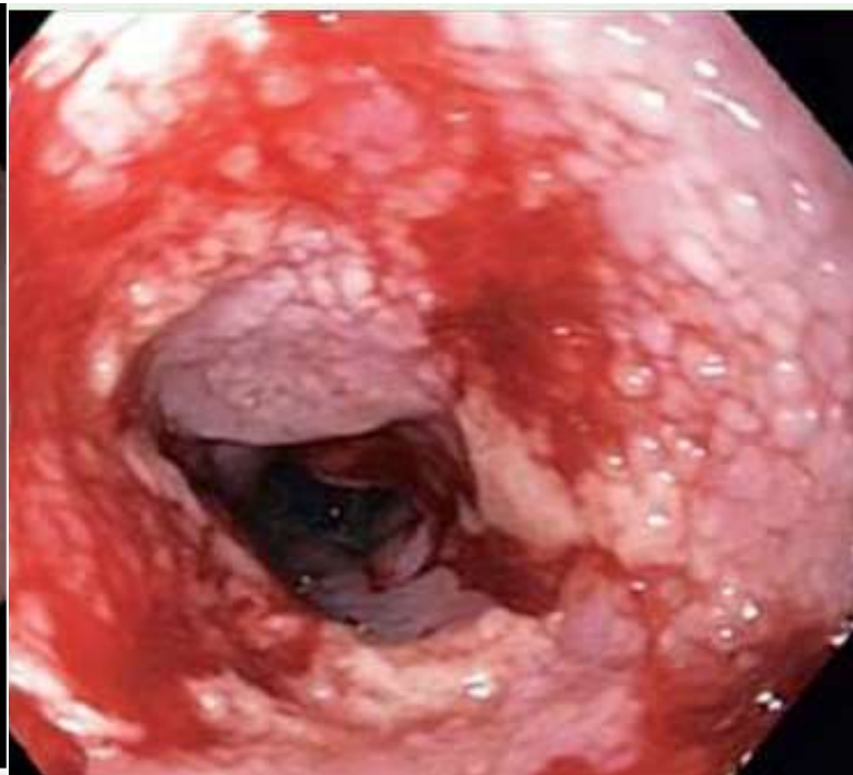
- 5 pts (4 esophagectomies + 1 Zenker`s diverticulotomy)
- Nasogastric tube + sponge
- Continuous negative pressure (70-80mmHg)
- Replacement 2-3x / week

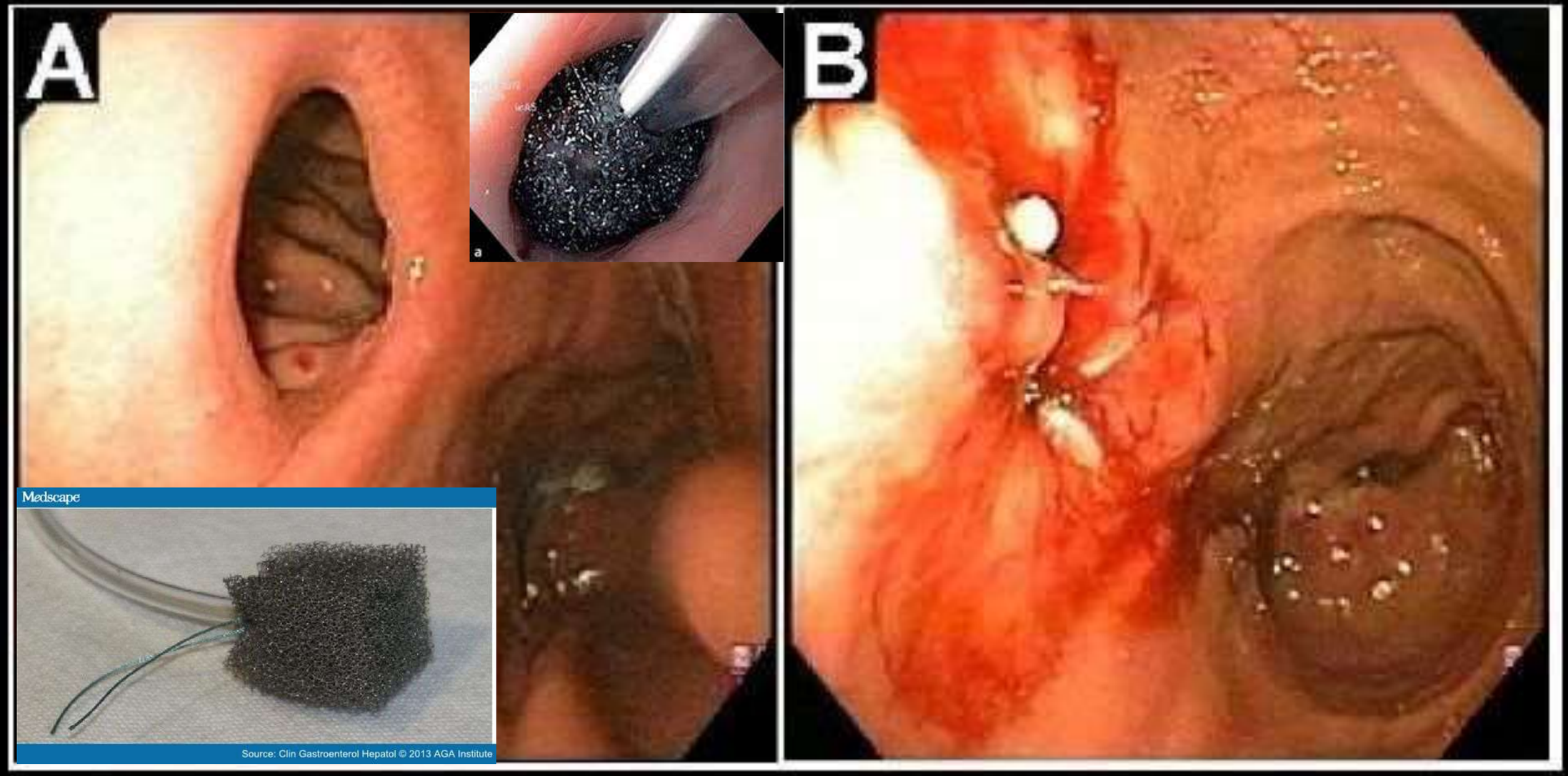


Successful treatment of a gastric leak after bariatric surgery using endoluminal vacuum therapy

Endoscopy 2013; 45: E267–E268

- 2013 - First bariatric patient (RYGB) treated with EVT





SURGERY FOR OBESITY AND RELATED DISEASES
OFFICIAL JOURNAL OF THE AMERICAN SOCIETY FOR METABOLIC AND BARIATRIC SURGERY
ASMBS American Society for Metabolic & Bariatric Surgery

Sleeve Gastrectomy - Complications

Article in Press

Management of gastric leaks after sleeve gastrectomy with endoluminal vacuum (E-Vac) therapy

Steven G. Leeds, M.D., James S. Burdick, M.D.

DOI: http://dx.doi.org/10.1016/j.soard.2016.01.017

Article Info

Sleeve gastrectomy high Leaks

- Management of gastric leaks after sleeve gastrectomy with endoluminal vacuum (E-Vac) therapy
  - 9pt.
    - 8 of 9pt patients were referred with a mean of 61 days (5–233) after LSG.
    - 6 of 9pt had laparoscopic procedures before their admission.
    - 5 of 9pt had self-expanding metal stents with failure.
    - 10.3 procedures/pt was done to place and exchange the Endo-SPONGE.
    - Average of 50 treatment days.
    - All 9 patients had resolution of leaks
    - Discharge disposition
      - 2pt sent to rehabilitation facilities / 1 death not attributable to E-Vac / 6pt went home.

Obesity Surgery
https://doi.org/10.1007/s11695-019-04269-6

ORIGINAL CONTRIBUTIONS

Endoscopic Vacuum Therapy for Staple Line Leaks after Sleeve Gastrectomy

Rami Archid[1] · Dörte Wichmann[1] · Wilfried Klingert[1] · Giorgi Nadiradze[1] · Felix Hönes[1] · Nicole Archid[1] · Ahmed E. Othman[2] · Suhaib J. S. Ahmad[3] · Alfred Königsrainer[1] · Jessica Lange[1]

Obesity Surgery
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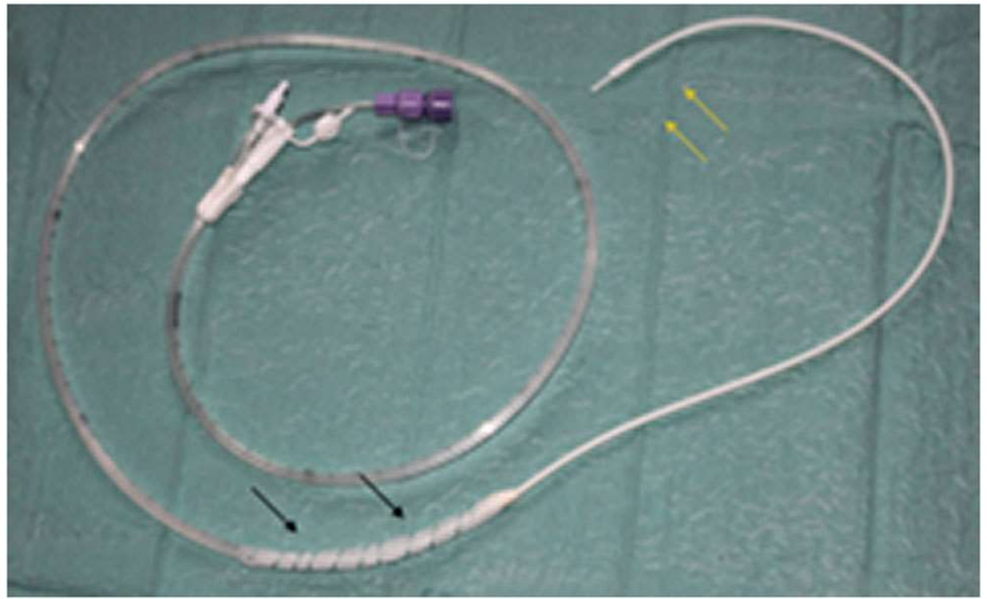

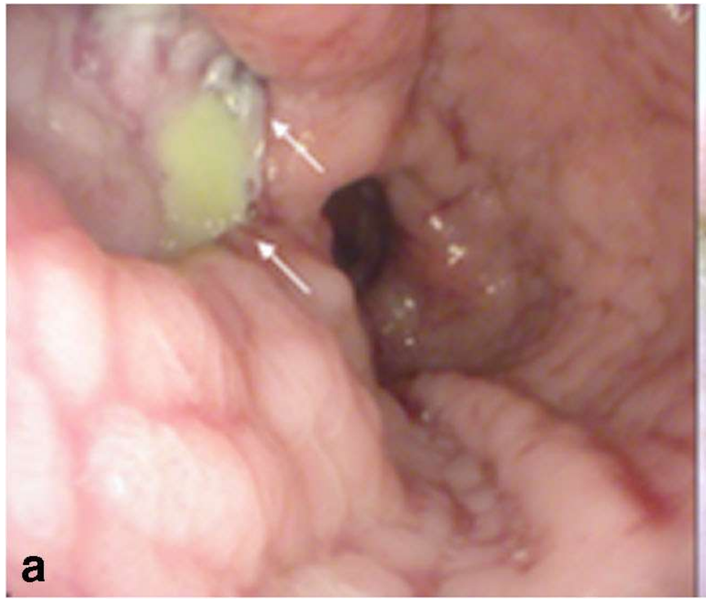

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- 8 pt

Clinical success of 87.5%

- 9.8 ± 8.6 days of EVT,
- 3.3 ± 2.2 endoscopies,
- 19 ± 15.1 days of hospitalization,

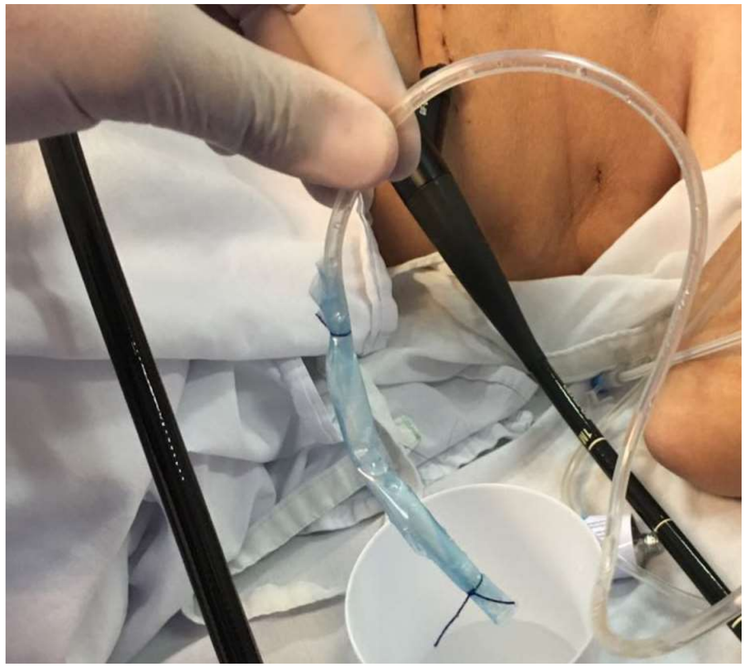
Tu1052

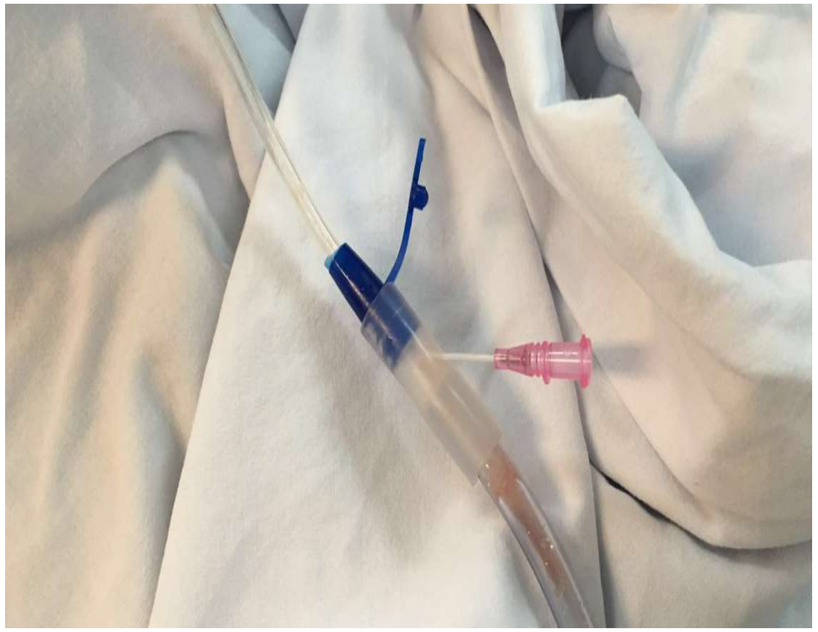
NEVER LOSE SUCTION: MODIFIED ENDOSCOPIC VACUUM THERAPY AS PRIMARY TREATMENT FOR ACUTE ESOPHAGOGASTRIC ANASTOMOSIS FISTULAS.

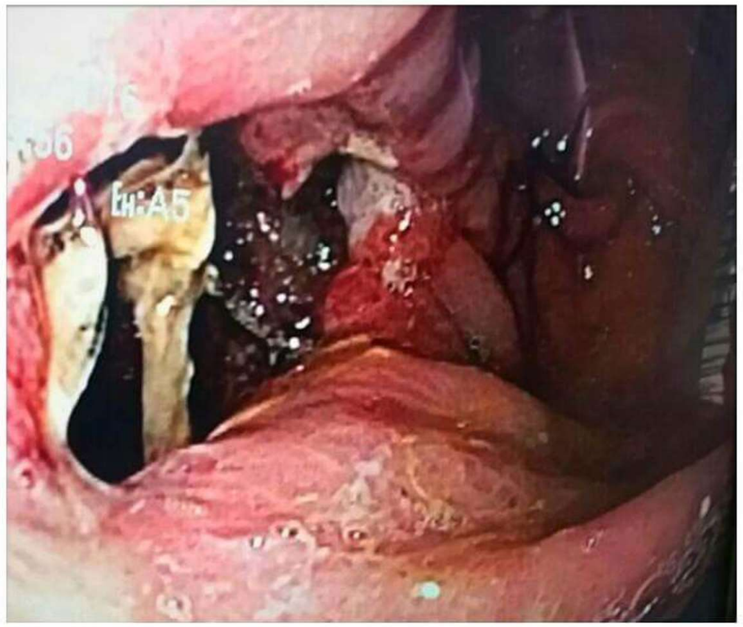
Flaubert M. Sena*2, Dilhana S. Badurdeen1, Rodrigo Conrado de Lorena Medeiros3, Gabriel Tavares Xavier Simplicio3, Mouen A. Khashab1, Anthony N. Kalloo1, Luiz G. Quadros4, Manoel Galvao Neto5, Vivek Kumbhari1, Josemberg M. Campos3

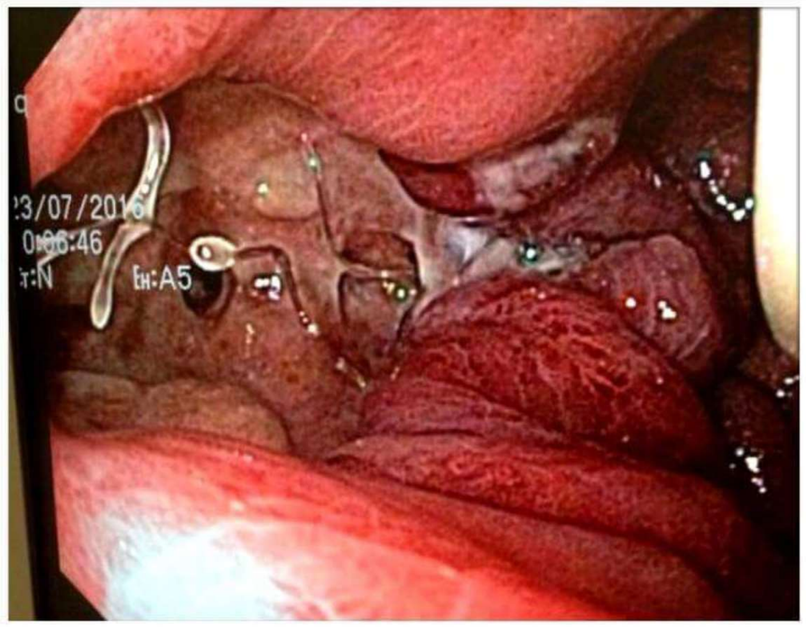
DDW Digestive Disease Week®	Duration since Surgery (Days)	Treatment Duration (Days)	Number of device changes	Complications During mod EVAC therapy
Patient 1	8	7	0	None
Patient 2	5	14	1	None
Patient 3	8	14	1	None
Patient 4	7	60	8	None
Patient 5	7	14	1	None
Patient 6	8	28	2	None
Patient 7	8	14	1	None
Patient 8	7	14	1	None

HUOL
Hospital Universitário
Onofre Lopes
UFRN









COURTESY OF
DR FLAUBERT SENA DE MEDEIROS / UFRN-HUOL-SCODE

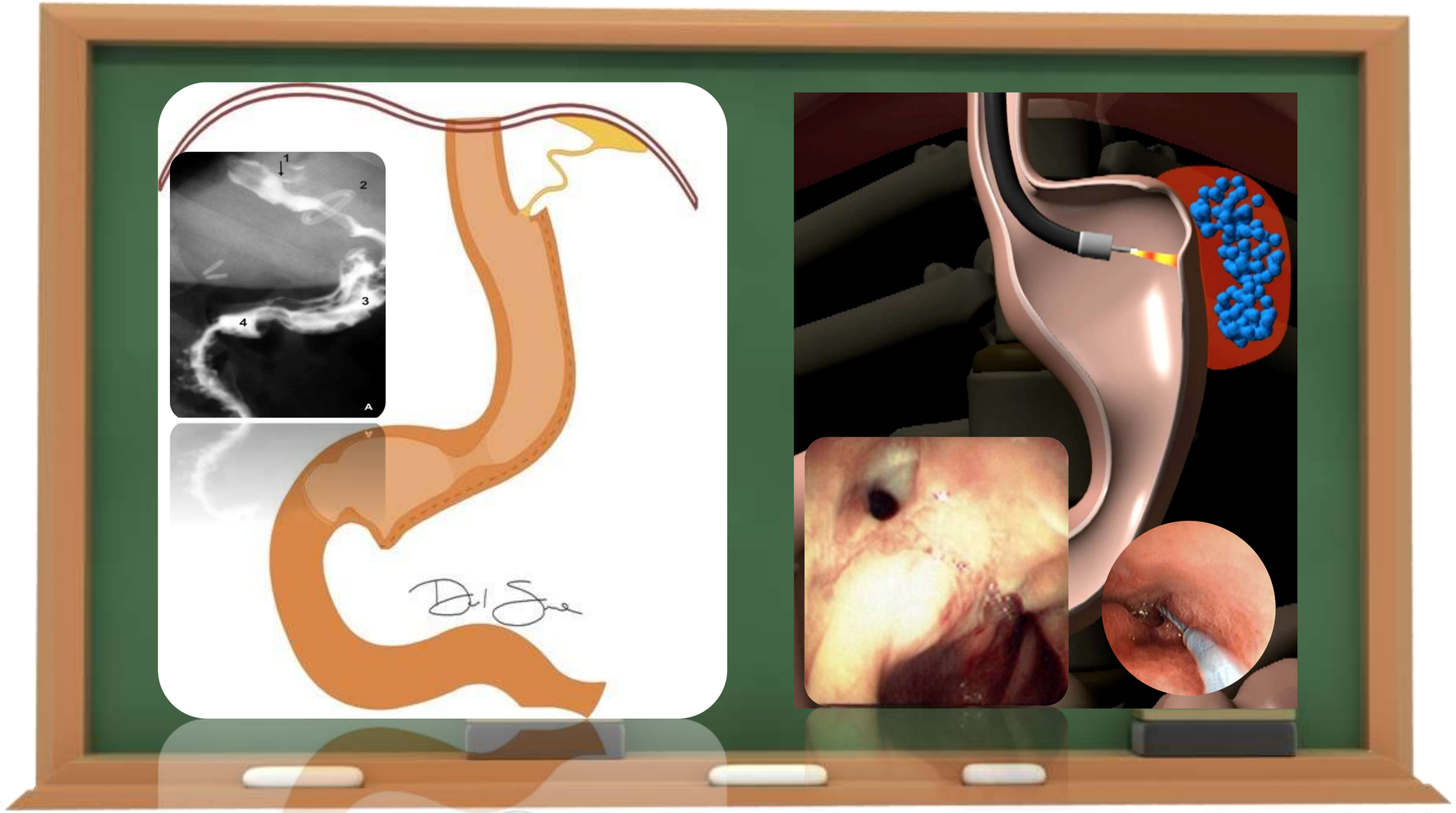
Adverse events:

BLEEDING FROM ARTERIAL FISTULAS

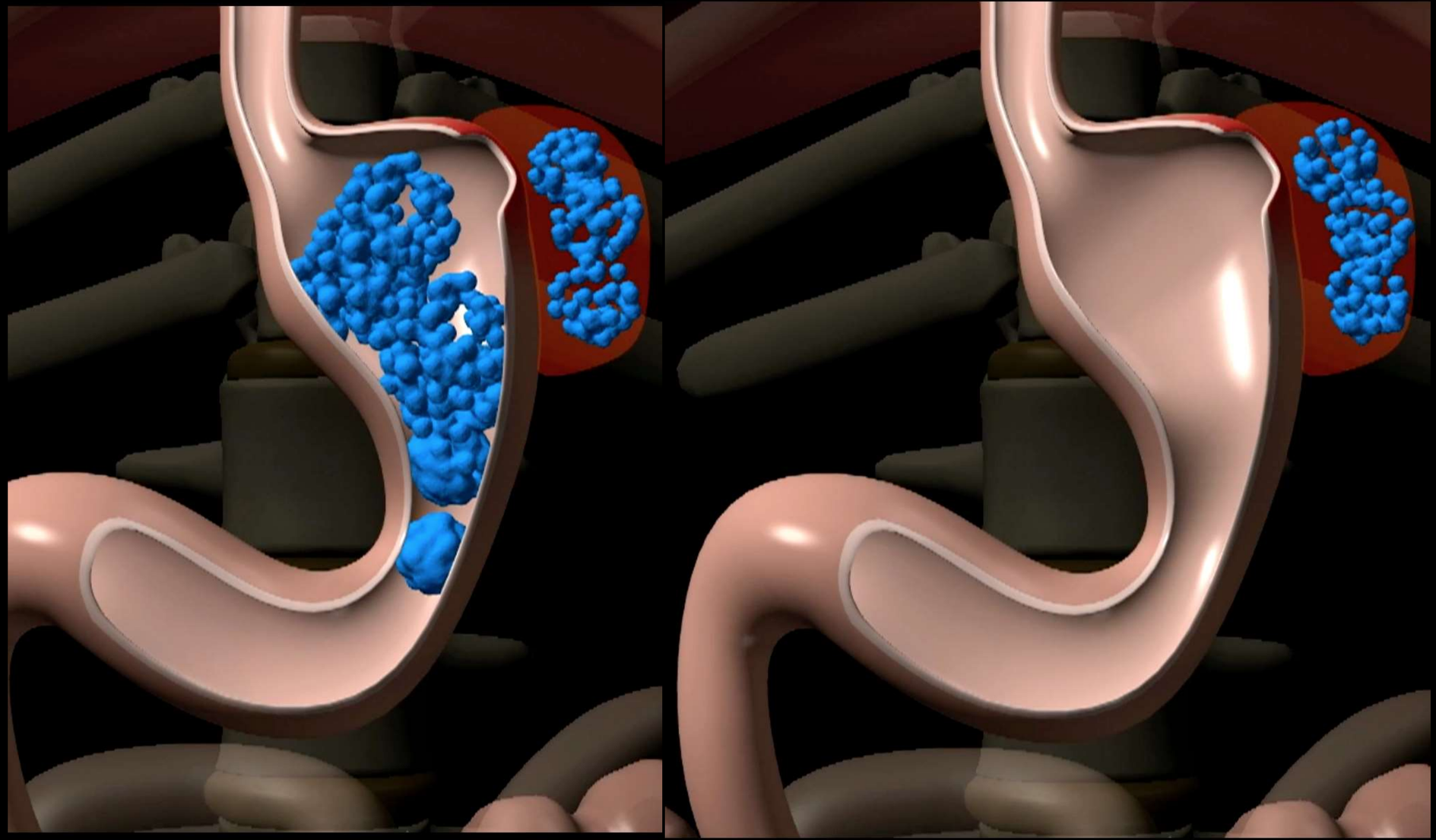
Ahrens *et al* – 1 aortoesophageal fistula during bougination

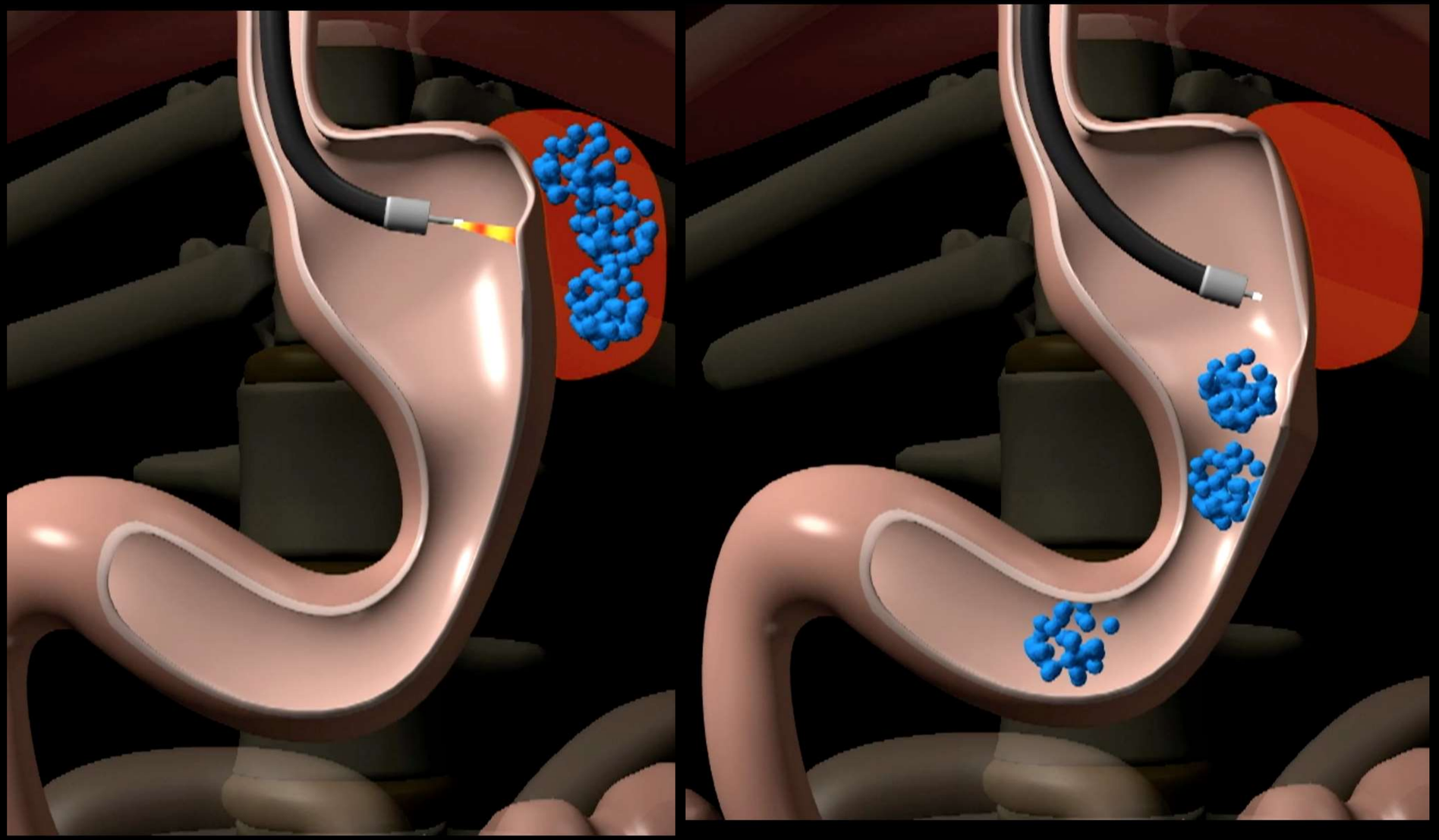
Laukoetter *et al* – 1 aortoesophageal fistula, 1 atrium fistulization

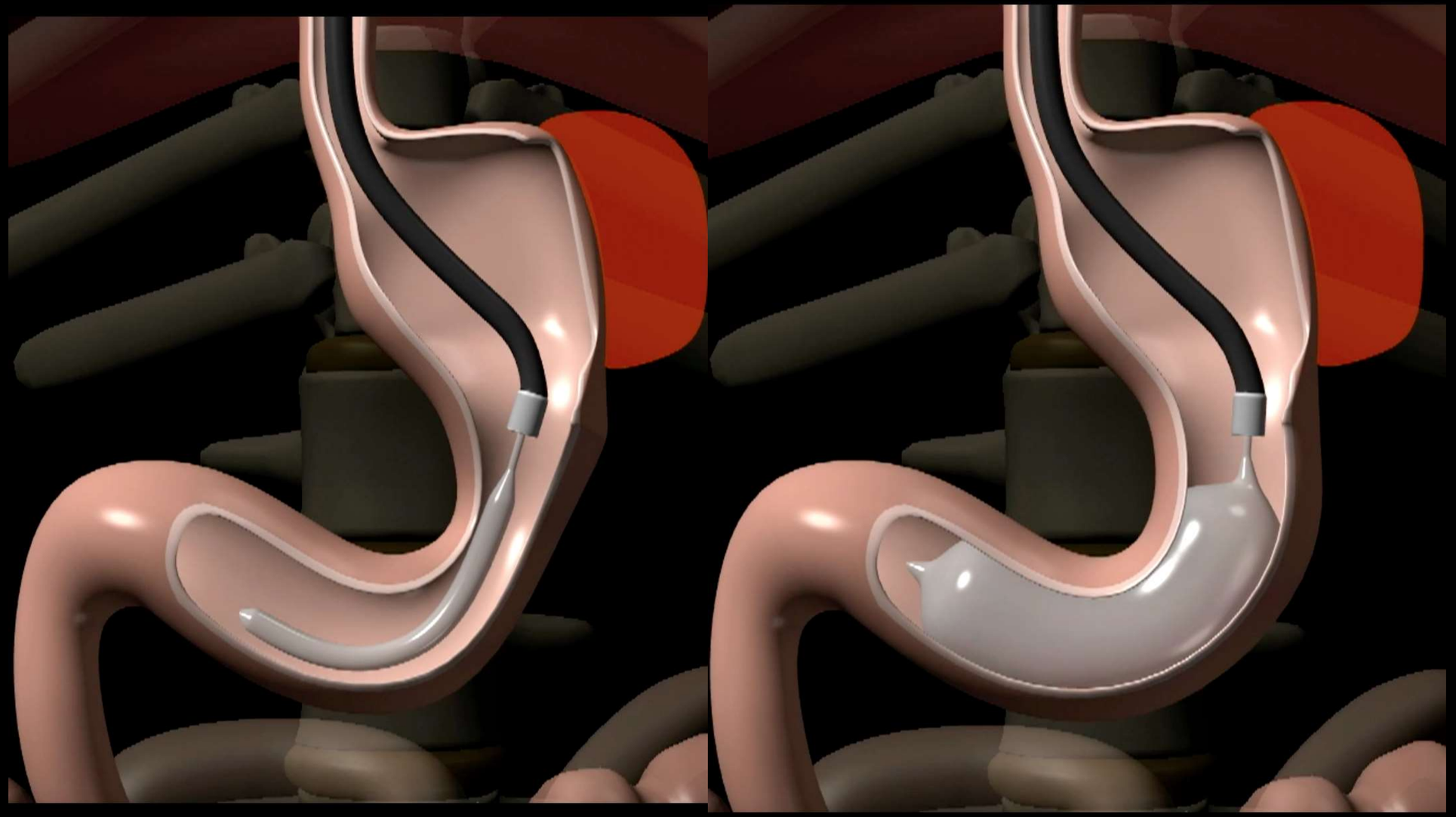
Laukoetter MG, Surg Endosc 2017
Ahrens M, Endoscopy 2010

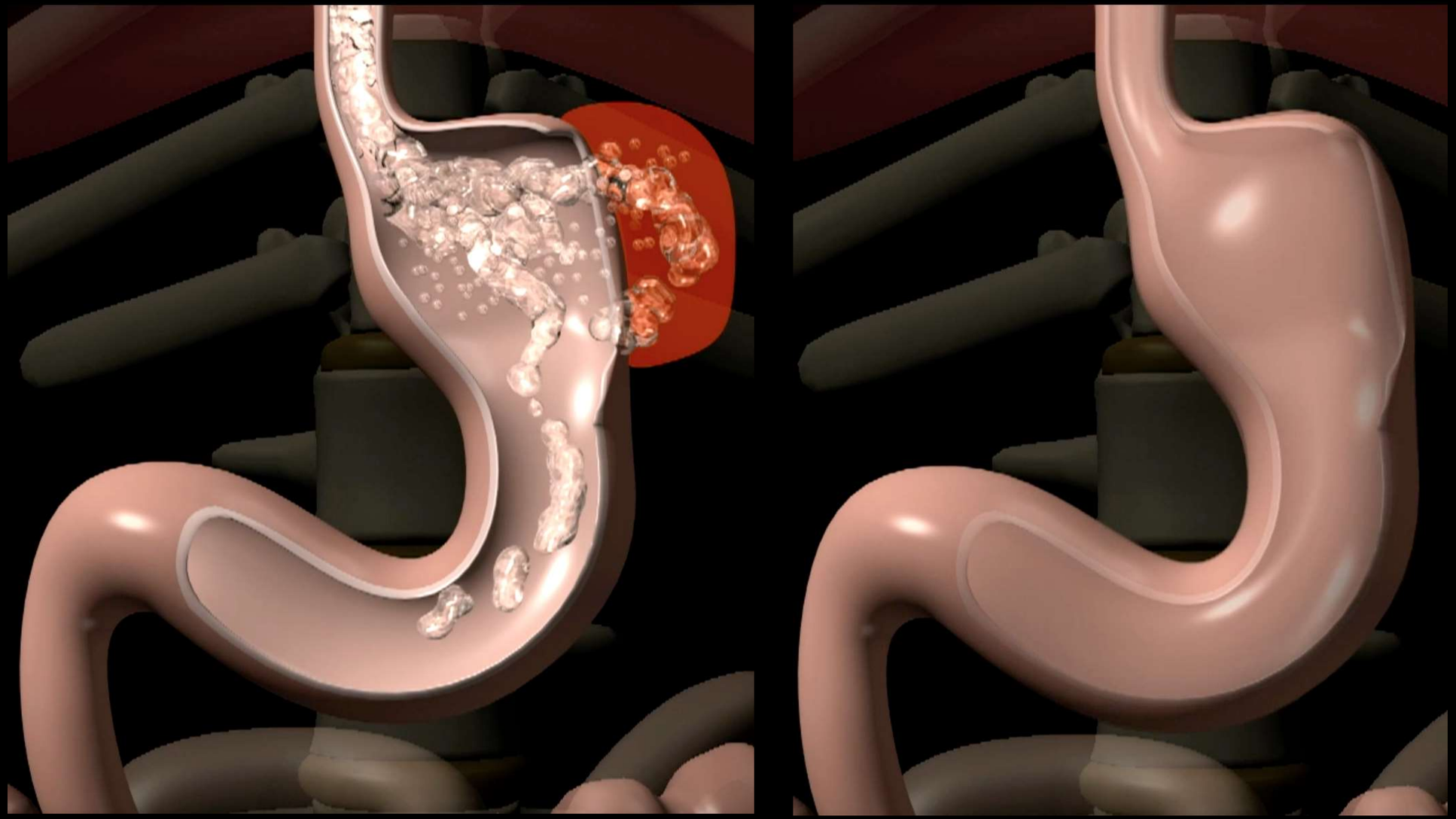


SLEEVE LEAKS
SEPTOMY









Surg Endosc
DOI 10.1007/s00464-014-3869-z

Bariatric postoperative fistula: a life-saving endoscopic procedure

Giorgio Baretta · Josemberg Campos · Sércio Correia · Helga Alhinho · João Batista Marchesini · João Henrique Lima · Manoel Galvão Neto

A Septum and fistulous orifice (left); B fistula orifice; C enlargement of the pouch diameter after septotomy

Septomy + Pneumatic Dilation…

OBES SURG
DOI 10.1007/s11695-016-2256-3

VIDEO SUBMISSION

Septotomy and Balloon Dilation to Treat Chronic Leak After Sleeve Gastrectomy: Technical Principles

Josemberg Marins Campos[1] · Flávio Coelho Ferreira[1] · André F. Teixeira[2] · Jones Silva Lima[1] · Rena C. Moon[2] · Marco Aurélio D'Assunção[3] · Manoel Galvão Neto[3]

Septomy + Pneumatic Dilation…

Published online: 08.01.2020

Original article

Thieme

Endoscopic septotomy as a treatment for leaks after sleeve gastrectomy

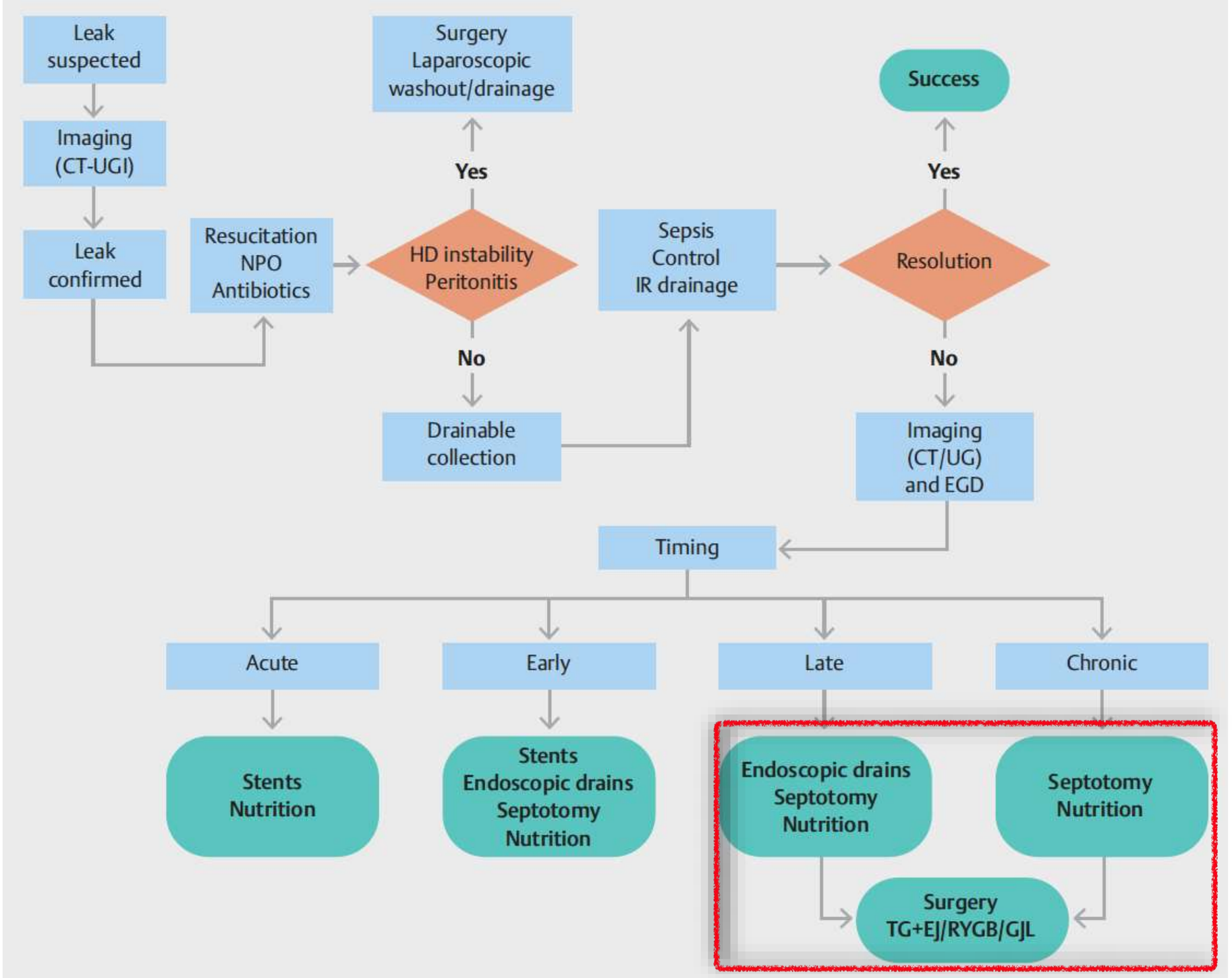
Meeting presentations: Digestive Disease Week 2019

OPEN ACCESS

Authors

Ramon Diaz, Leonard K. Welsh, Juan Esteban Perez, Andres Narvaez, Gerardo Davalos, Dana Portenier, A. Daniel Guerron

Septomy + Pneumatic Dilation…


Leak suspected
Imaging (CT-UGI)
Leak confirmed
Resucitation NPO Antibiotics
HD instability Peritonitis
Yes
No
Surgery Laparoscopic washout/drainage
Drainable collection
Sepsis Control IR drainage
Resolution
Yes
No
Success
Imaging (CT/UG) and EGD
Timing
Acute
Early
Late
Chronic
Stents Nutrition
Stents Endoscopic drains Septotomy Nutrition
Endoscopic drains Septotomy Nutrition
Septotomy Nutrition
Surgery TG+EJ/RYGB/GJL

▶ **Table 1** Cohort of patients who underwent septotomy at our institution.

Gender	Age (year)	Time to leak (days)	Leak location	Stricture	Septotomy	Operative time (min)	Morbidity	Mortality	Additional procedure
Female	43	25	Upper third	No	Yes	71	No	No	0
Female	42	11	Upper third	Yes	Yes	79	No	No	0
Female	40	19	Upper third	Yes	Yes	65	No	No	0
Female[1]	69	7	Upper third	No	Yes	55	No	No	Re-septotomy
Male	62	14	Upper third	No	Yes	125	No	No	0

[1] Patient who due to septotomy and treatment failure underwent to total gastrectomy.

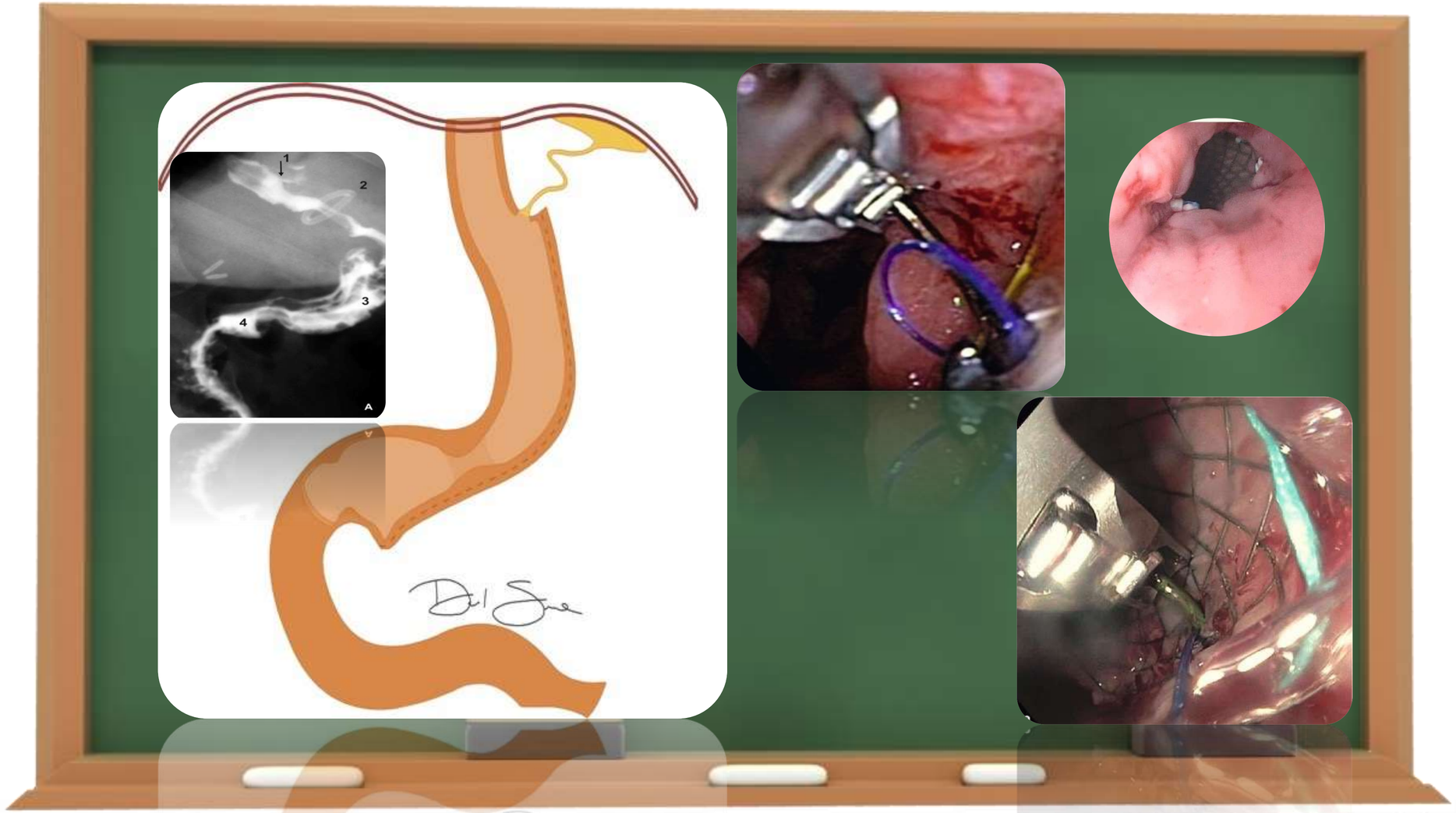
Septomy + Pneumatic Dilation…

▶ **Table 2** Largest publications related to septotomy as a treatment for leaks after LSG.

Author (year)	Number of patients	Cutting device	Dilata-tion	Number of ses-sions (mean)	Time to septotomy from leak (days)	Time to heal (days)
Baretta (2015)[1] [25]	9	Needle-Knife or APC	7	1.81	NR	24.67
Mahadev (2017) [28]	9	Needle-Knife (3) and APC (6)	5	2.3	60.2	NR
Shnell (2017) [29]	10 (6 late and 4 chronic)	APC (8) and BFD (2)	8	5	NR	NR

APC, argon plasma coagulation; NR, not reported; BFD, balloon fistula dilatation.
[1] Authors reported their experience with septotomy in gastric bypass and biliopancreatic diversion as well.

Septomy + Pneumatic Dilation…



SLEEVE LEAKS
ENDOSUTURING

Endoscopic suture fixation of esophageal fully covered self-expanding metal stents

Rieder et al. Endoscopy 2012

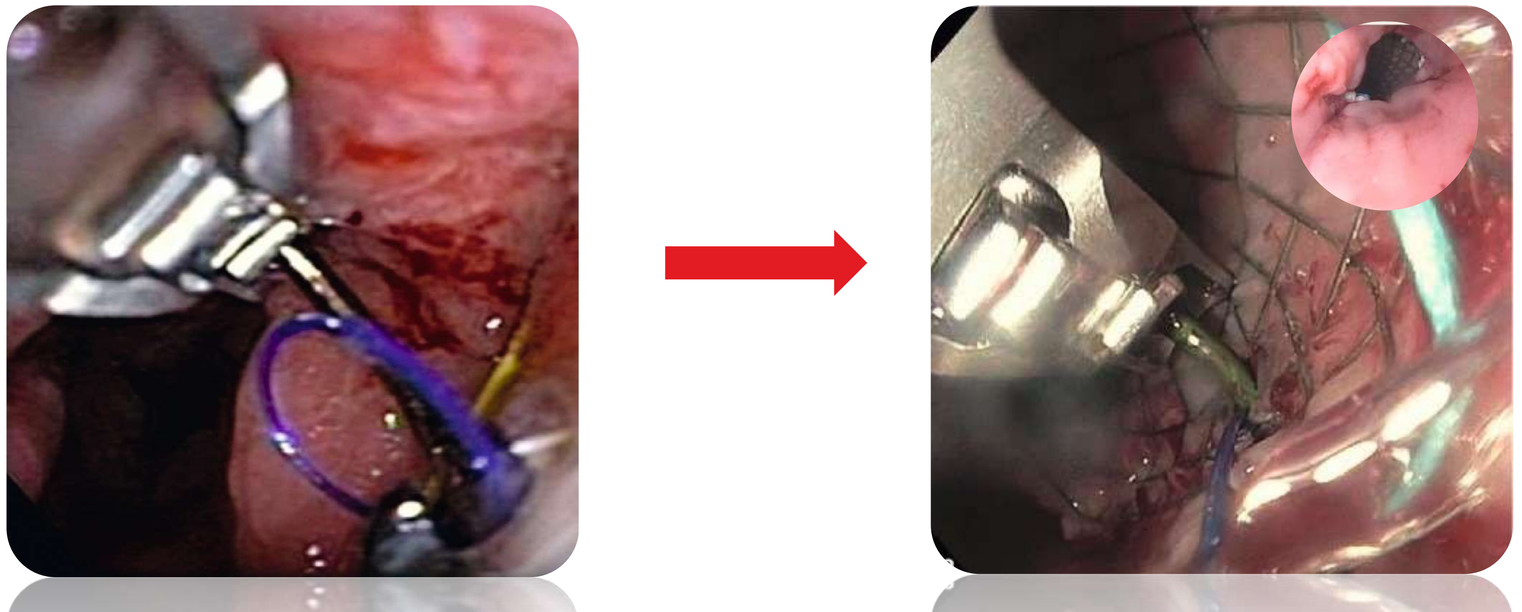
Endoscopy 2014; 46(S 01): E623-E624
DOI: 10.1055/s-0034-1390782

Cases and Techniques Library (CTL)

Full-thickness endoscopic suturing of staple-line leaks following laparoscopic sleeve gastrectomy

Jennifer X. Cai, Mouen A. Khashab, Patrick I. Okolo III, Anthony N. Kalloo, Vivek Kumbhari

Department of Medicine and Division of Gastroenterology and Hepatology, The Johns Hopkins Medical Institutions, Baltimore, MD, USA



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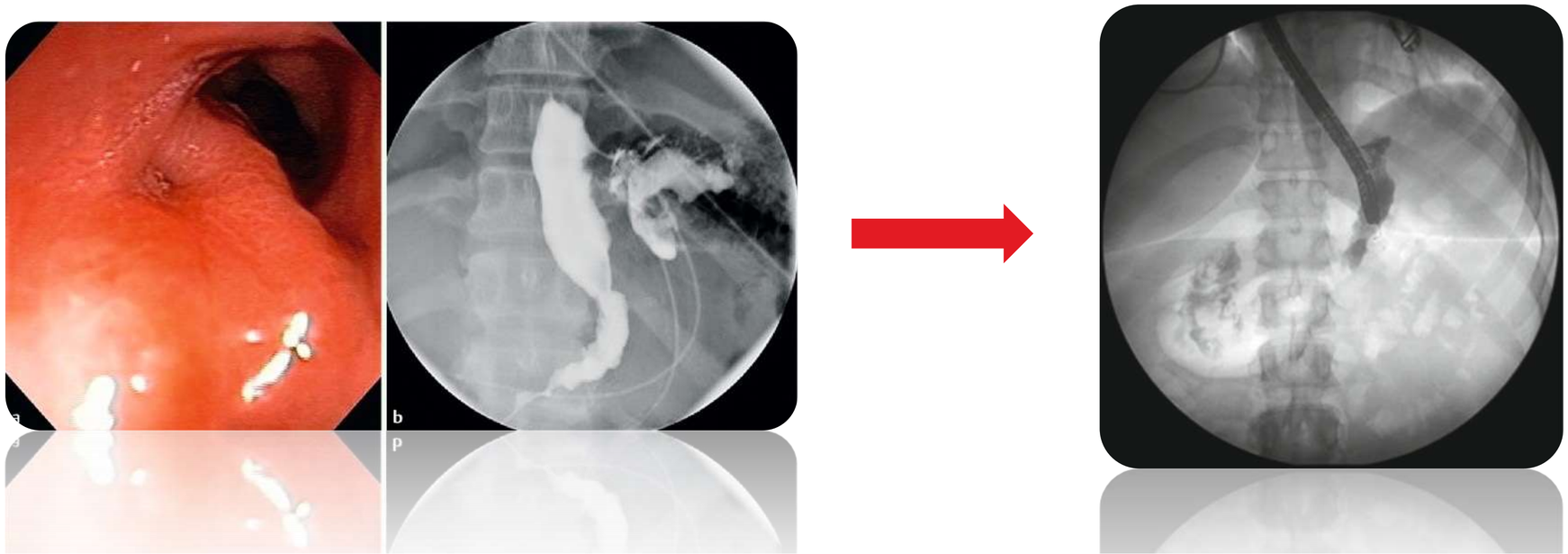
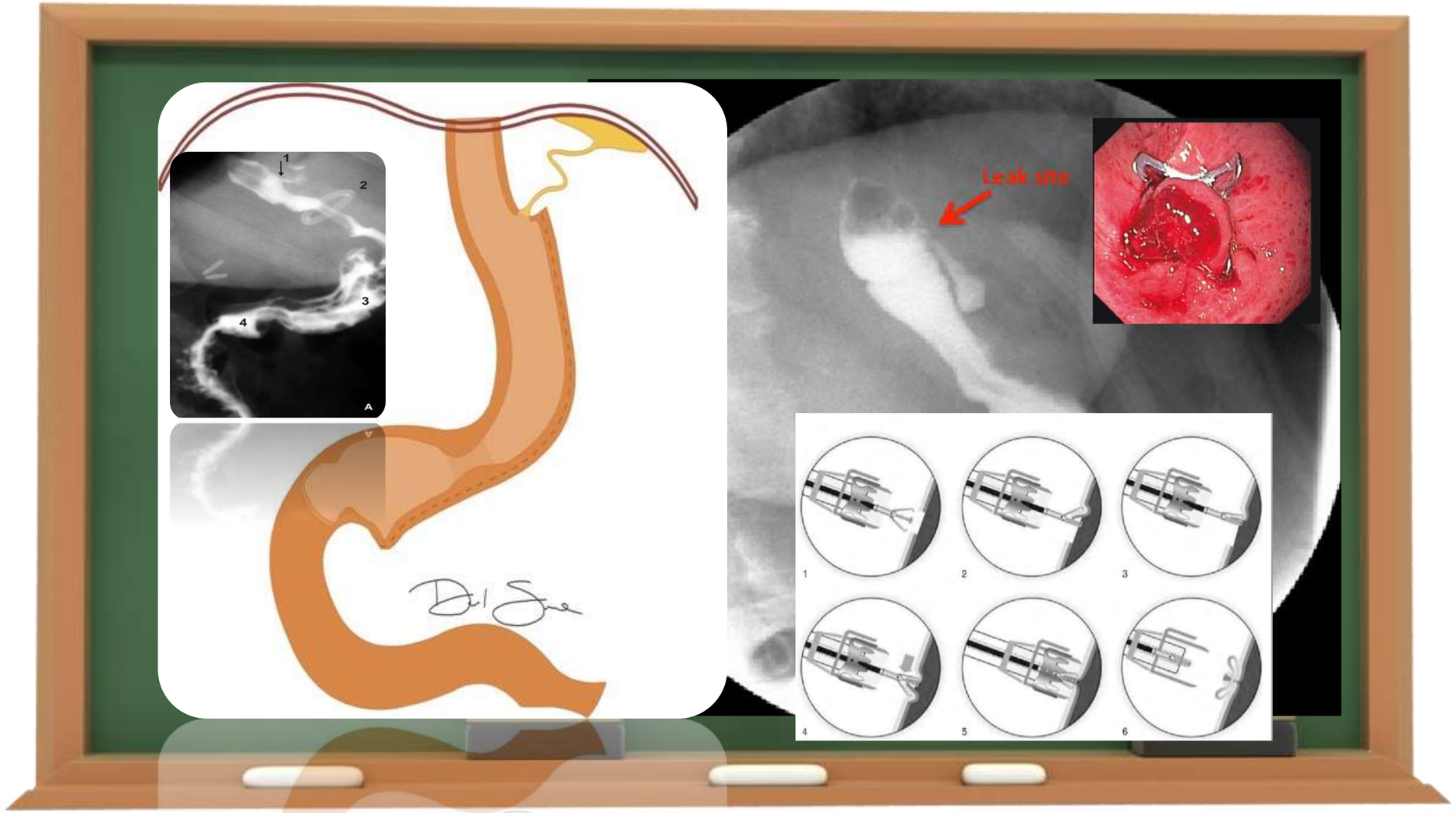




SLEEVE LEAKS
OVER THE SCOPE CLIP

Obesity Surgery (2021) 31:813–819
https://doi.org/10.1007/s11695-020-05036-8

ORIGINAL CONTRIBUTIONS

Staple Line Leaks Following Laparoscopic Sleeve Gastrectomy: Low Efficacy of the Over-the-Scope Clip

Ido Mizrahi[1,2] · Ronit Grinbaum[1] · Ram Elazary[1] · Tzlil Mordechay-Heyn[1] · Noam Kahahna[1] · Julia Epshtein[3] · Harold Jacob[3] · Nahum Beglaibter[1]

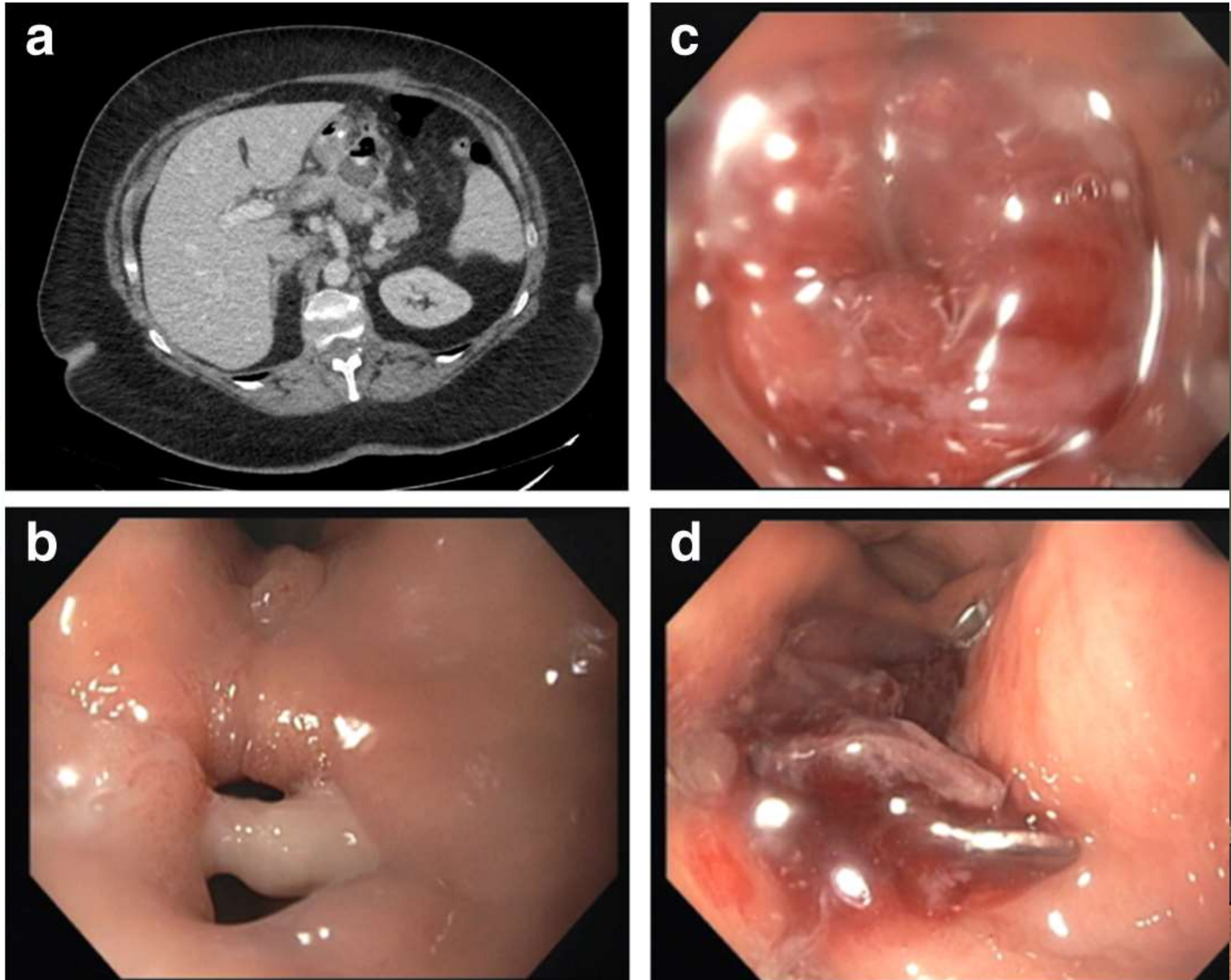
Received: 23 May 2020 / Revised: 1 October 2020 / Accepted: 6 October 2020 / Published online: 13 October 2020

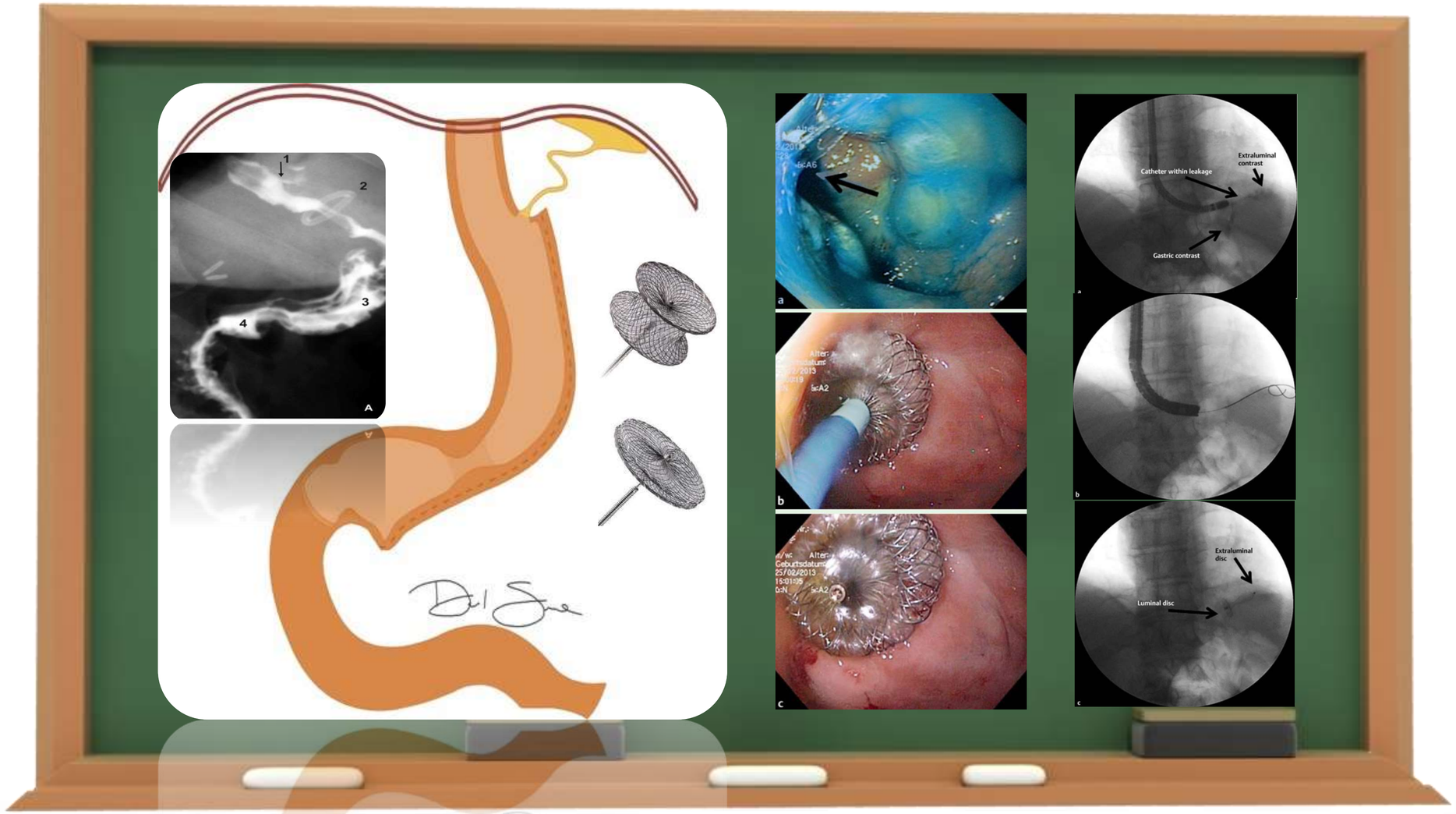
Staple Line Leaks Following Laparoscopic Sleeve Gastrectomy: Low Efficacy of the Over-the-Scope Clip

Leaks post LSG (N=26)

- OTSC (N=8)
- OTSC → Stent (N=3)
- Stent → OTSC (N=2)
- OTSC→ endoscopic suturing (N=1)
- Mortality (N=1)

Total gastrectomy with esophago-jejunostomy (N=11)





Wiest Reiner et al. Cardiac occluder for closure of gastric leak… Endoscopy 2014; 46: E487–E488

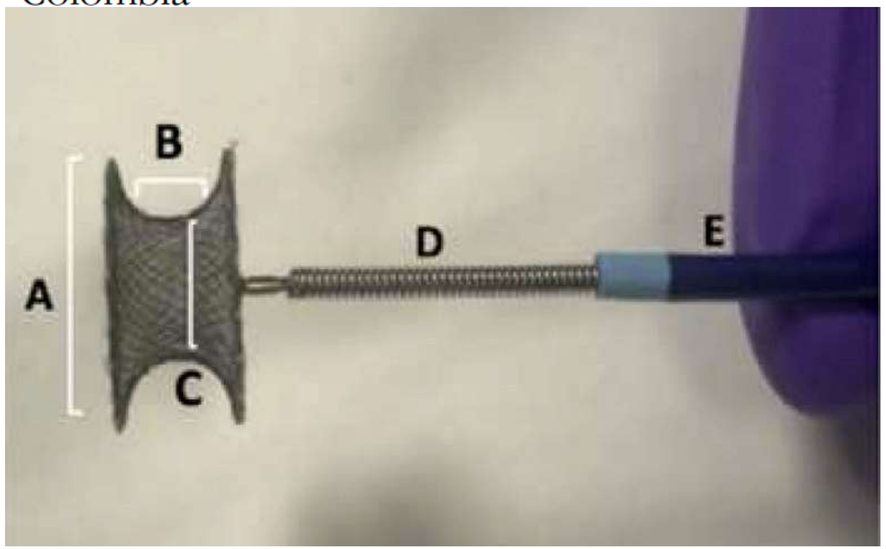
SLEEVE LEAKS
CARDIAC OCCLUDER

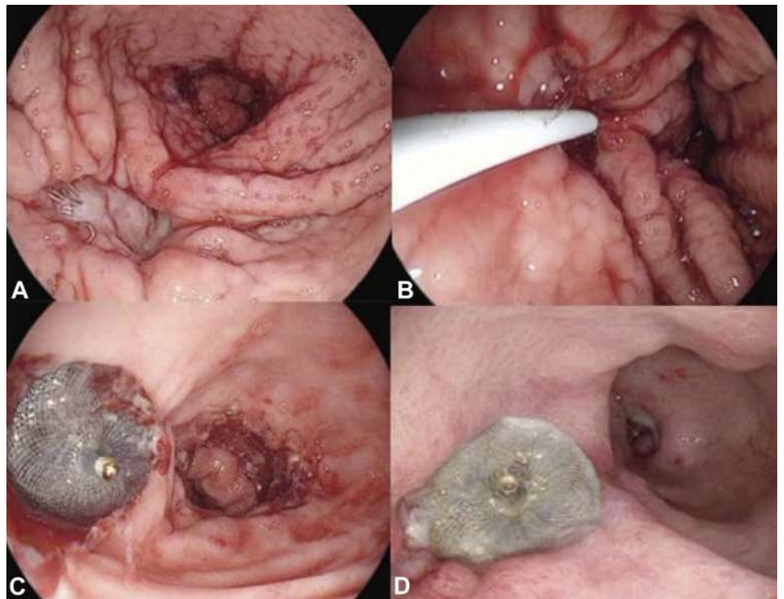
ORIGINAL ARTICLE: Clinical Endoscopy

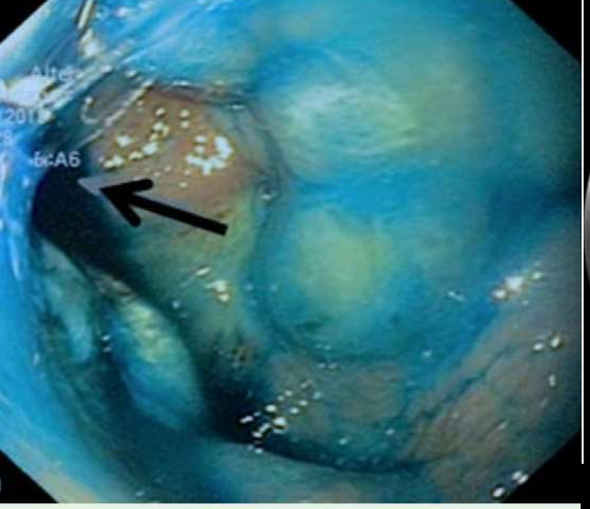
Efficacy of the cardiac septal occluder in the treatment of post-bariatric surgery leaks and fistulas

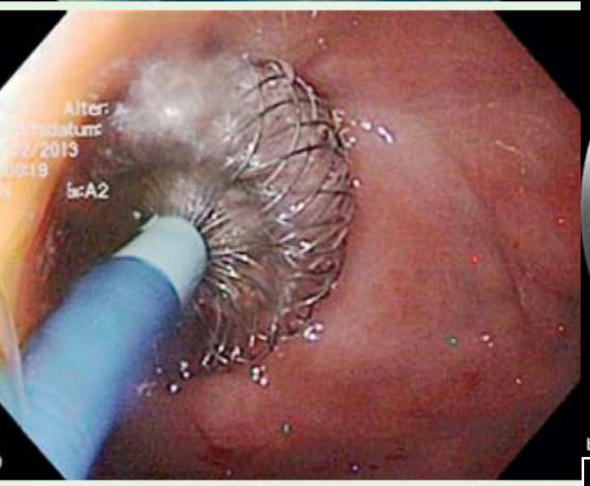
Alberto Baptista, MD, PhD,[1] Diogo Turiani Hourneaux De Moura, MD, MSc, PhD,[2,3] Pichamol Jirapinyo, MD, MPH,[2] Eduardo Guimarães Hourneaux De Moura, MD, MSc, PhD,[3] Andres Gelrud, MD,[4] Michel Kahaleh, MD,[5] Alberto Salinas, MD,[1] Luis Carlos Sabagh, MD,[6] Andrés Ospina, MD,[6] Víctor Zambrano Rincones, MD,[7] Raul Doval, MD,[8] Jack William Bandel, MD,[9] Christopher C. Thompson, MD, MHES[2]

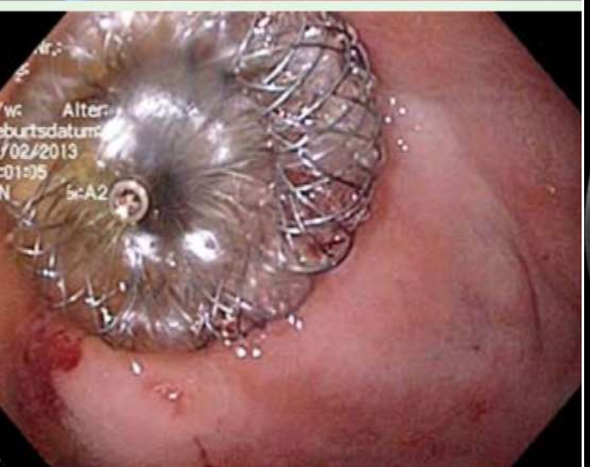
Caracas, Venezuela; Boston, Massachusetts, USA; São Paulo, Brazil; Miami, Florida; Piscataway, New Jersey, USA; Bogota, Colombia

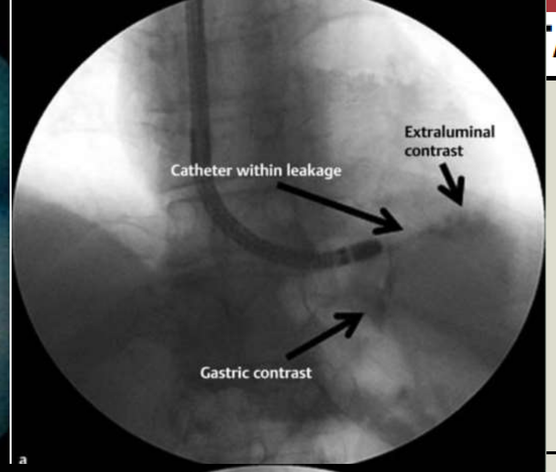












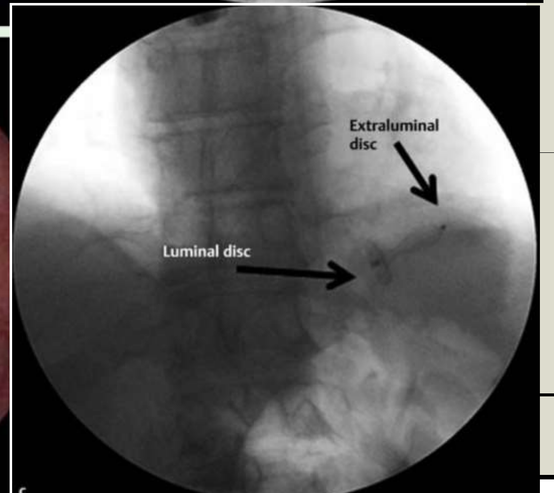
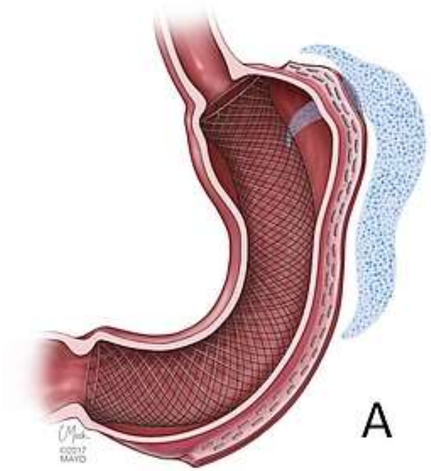
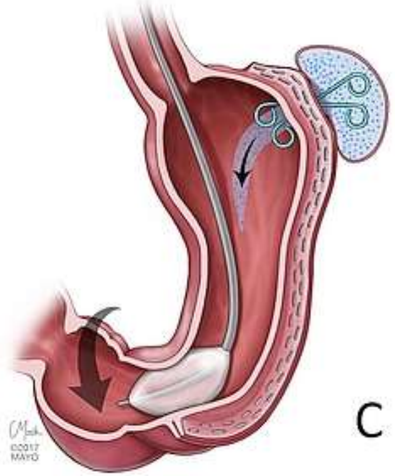


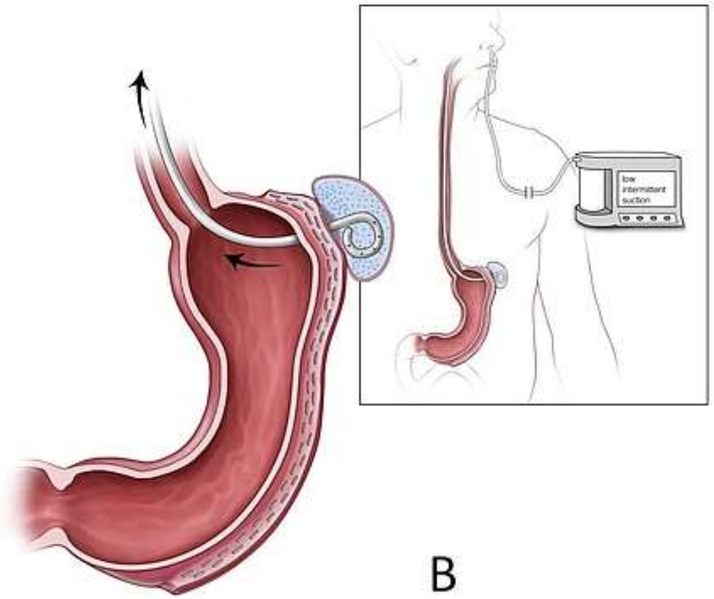
TABLE 2. Clinical and demographic features

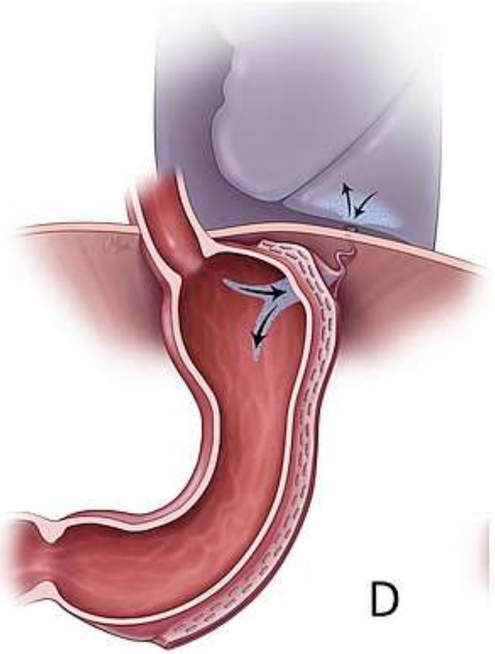
Age (years), mean (±SD)	**39 (±12)**
Sex, n (%)	
Male	15 (34.9)
Female	28 (65.1)
Type of bariatric surgery, n (%)	
Sleeve gastrectomy	31 (72.1)
Gastric bypass	12 (27.9)
Time from surgery to CSDO placement, n (%)	
Acute	3 (6.9)
Early	5 (11.6)
Late	23 (53.5)
Chronic	12 (27.9)
Success closure, n (%)	
Yes	39 (90.7)
No	4 (9.3)
Follow-up (weeks), mean (±SD)	34.30 (± 23.18)

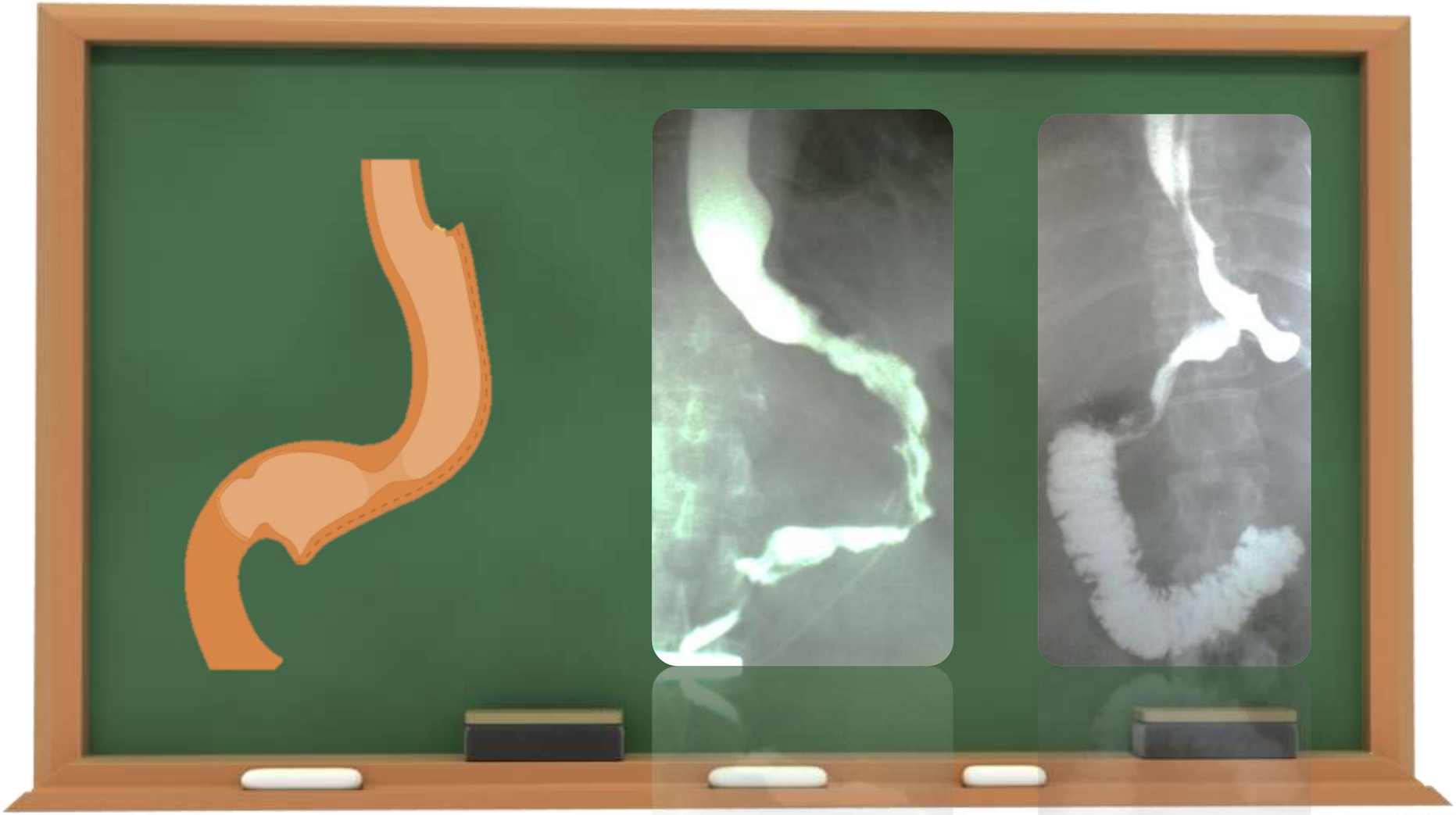
Sleeve gastrectomy high Leaks
Subjective comparison











Strictures, Stenosis

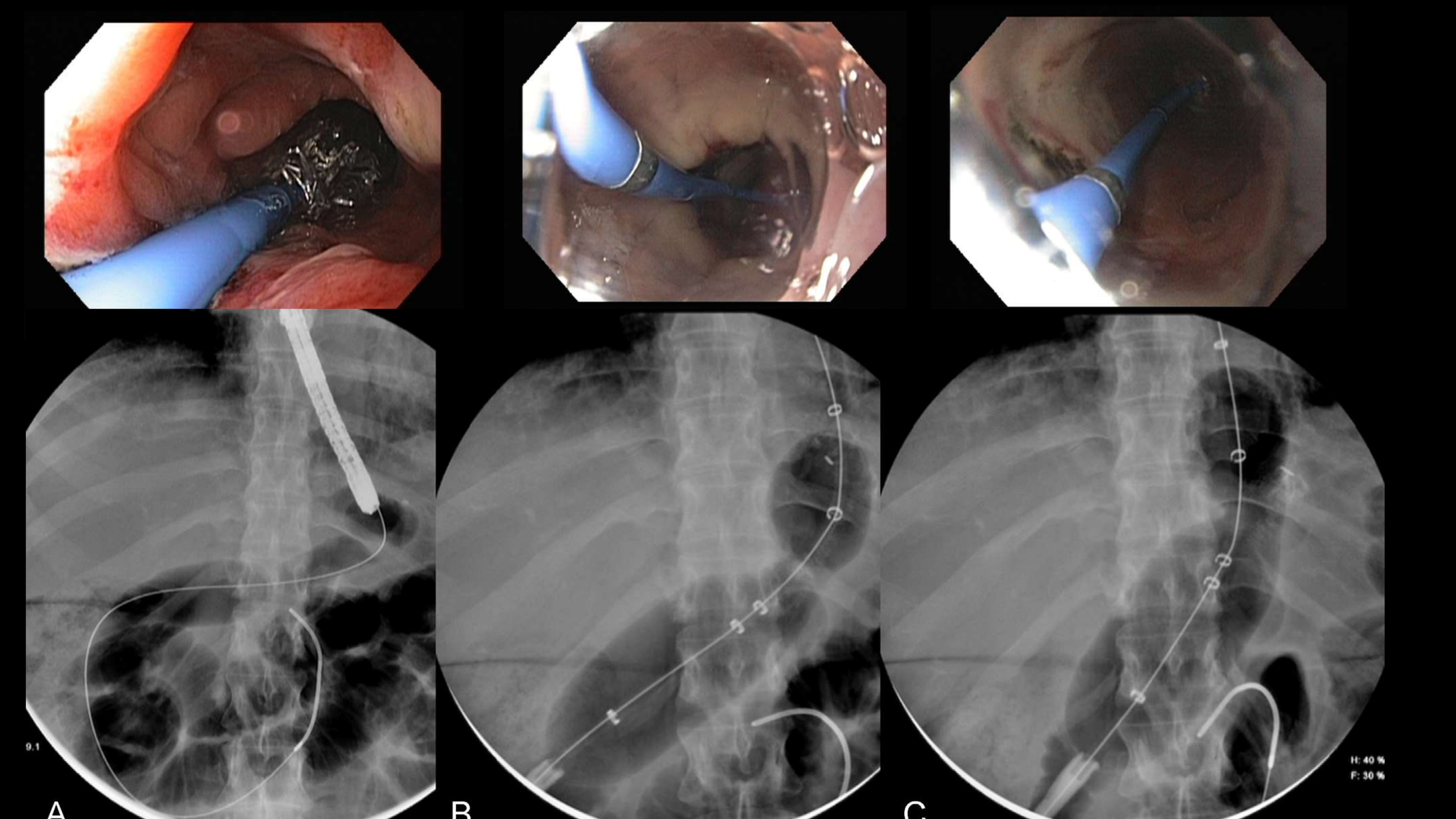
SPECIAL SECTION ON SLEEVE GASTRECTOMY

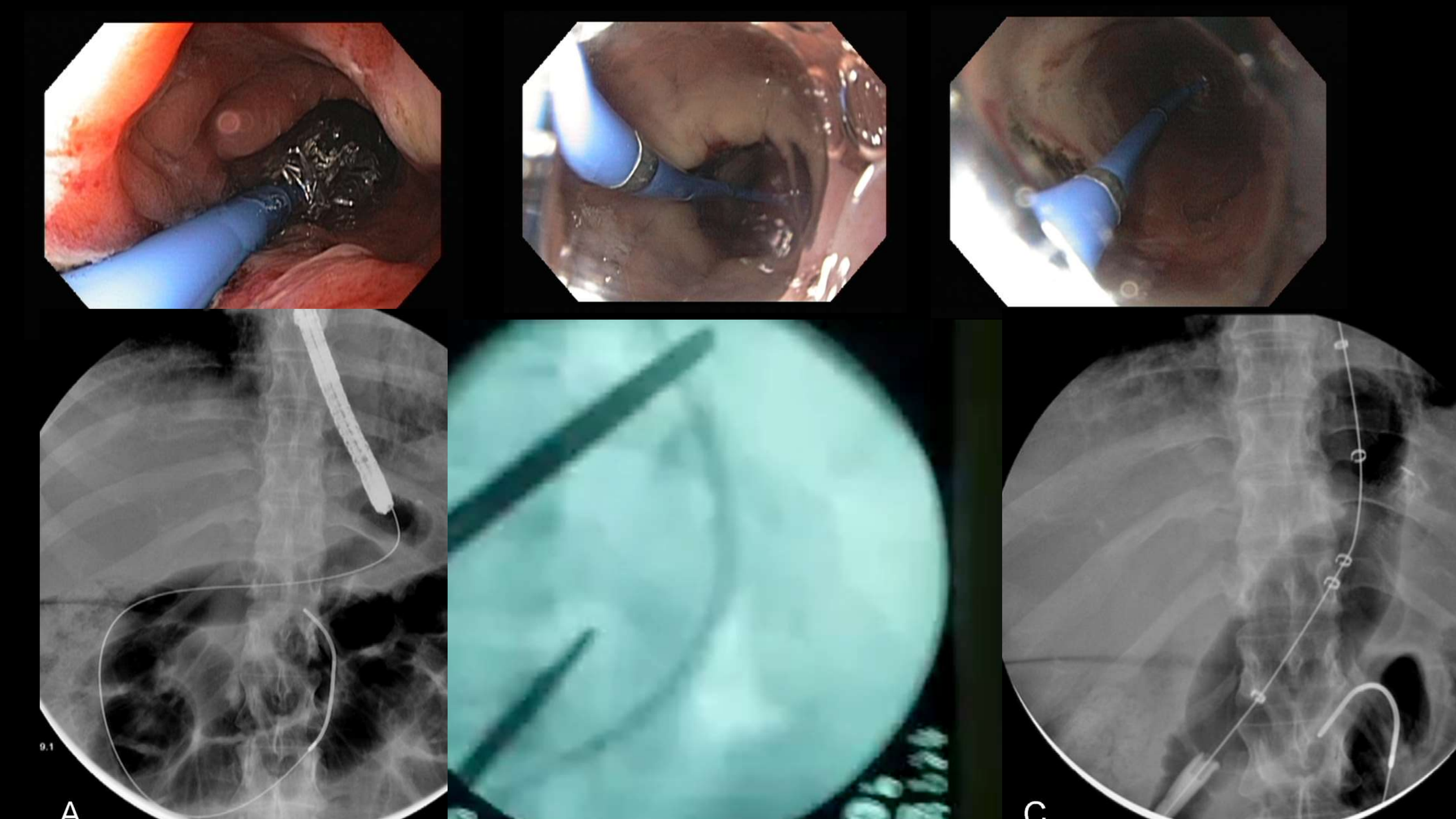
Surg Laparosc Endosc Percutan Tech • Volume 20, Number 3, June 2010

Strictures After Laparoscopic Sleeve Gastrectomy

Natan Zundel, MD, FACS, Juan D. Hernandez, MD,† Manoel Galvao Neto, MD,‡ and Josemberg Campos, MD§*

PNEUMATIC DILATION 2ND STEP
ACHALASIA BALLOON


A
B
C
H: 40 %
F: 30 %


A
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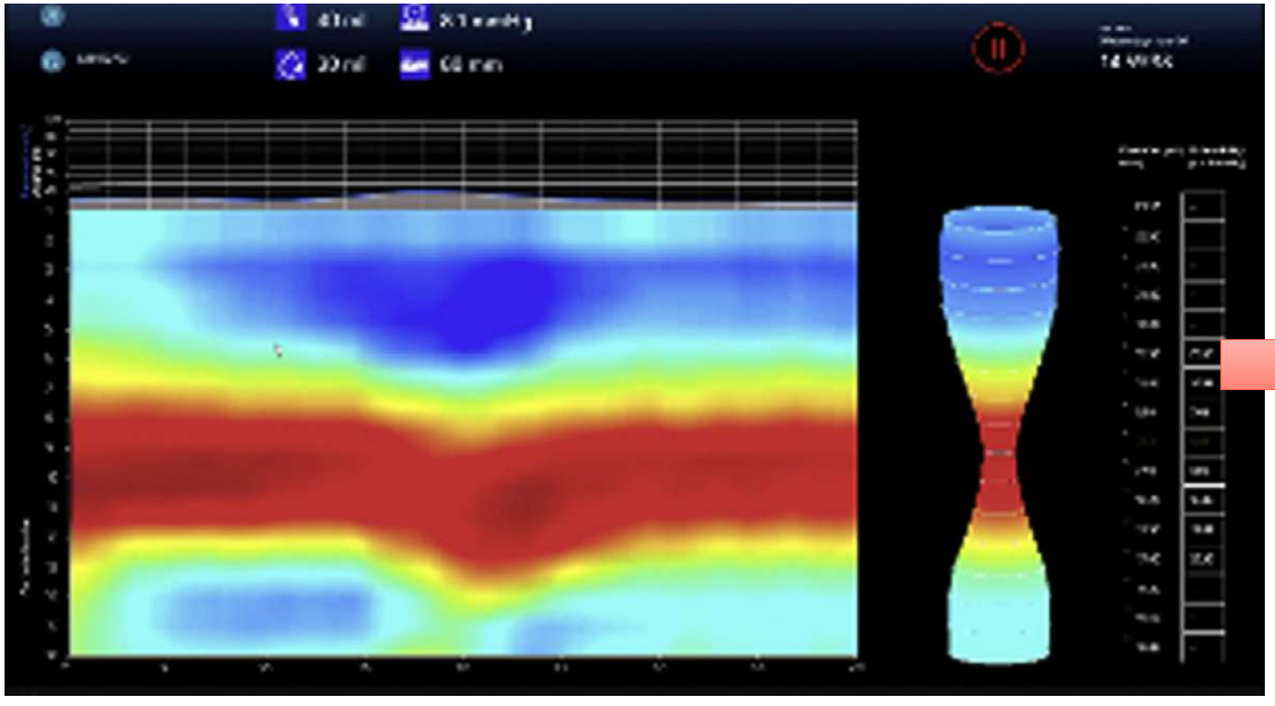
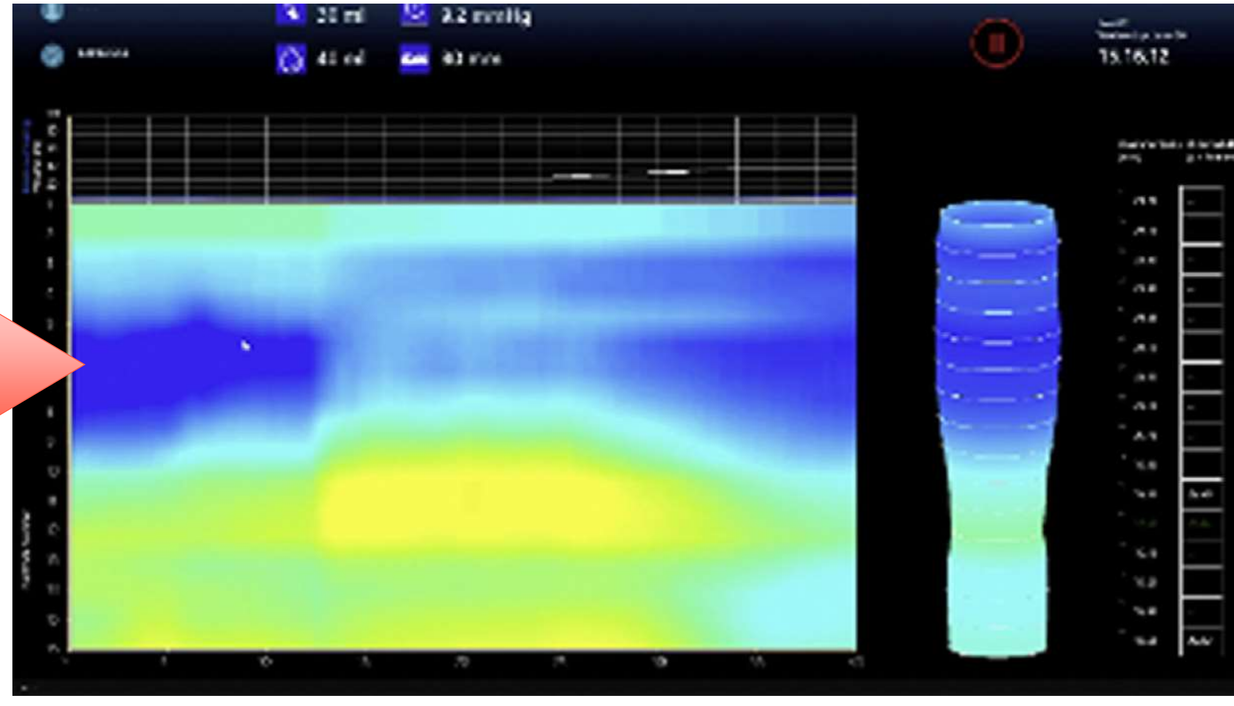
VIDEO CASE REPORT

Objective assessment of luminal diameter and distensibility by an impedance planimetry system before and after pneumatic dilation in gastric sleeve stenosis

Lindsay Janes, MSE,[1] Kevin Platt, MD,[2] Lydia Watts, BS,[2] Allison R. Schulman, MD, MPH[2,3]





OBES SURG
DOI 10.1007/s11695-017-2689-3

ORIGINAL CONTRIBUTIONS

An Algorithmic Approach to the Management of Gastric Stenosis Following Laparoscopic Sleeve Gastrectomy

Abhishek Agnihotri[1] · Sindhu Barola[2] · Christine Hill[3] · Manoel Galvao Neto[4] · Josemberg Campos[5] · Vikesh K Singh[2] · Michael Schweitzer[6] · Mouen A Khashab[2] · Vivek Kumbhari[2,7]

- ☑ N = 17p
  - ☑ 88,2% success (70,6% ballon, 17,6% balloon + sequential SEMS)
  - ☑ All dilated for 30mm 9p get a second dilation. 4p get a third for 40 mm.
  - ☑ AE
    - ☑ 1 esophageal tear treated conservatively

LSG patients presenting with nausea, vomiting, GERD, abdominal pain

Barium swallow and EGD

Alternative diagnoses

Gastric stenosis

Achalasia 30mm dilation

Resolution

Persistent

Achalasia 35 mm dilation and repeat up to a total of 3-4 dilations

Resolution

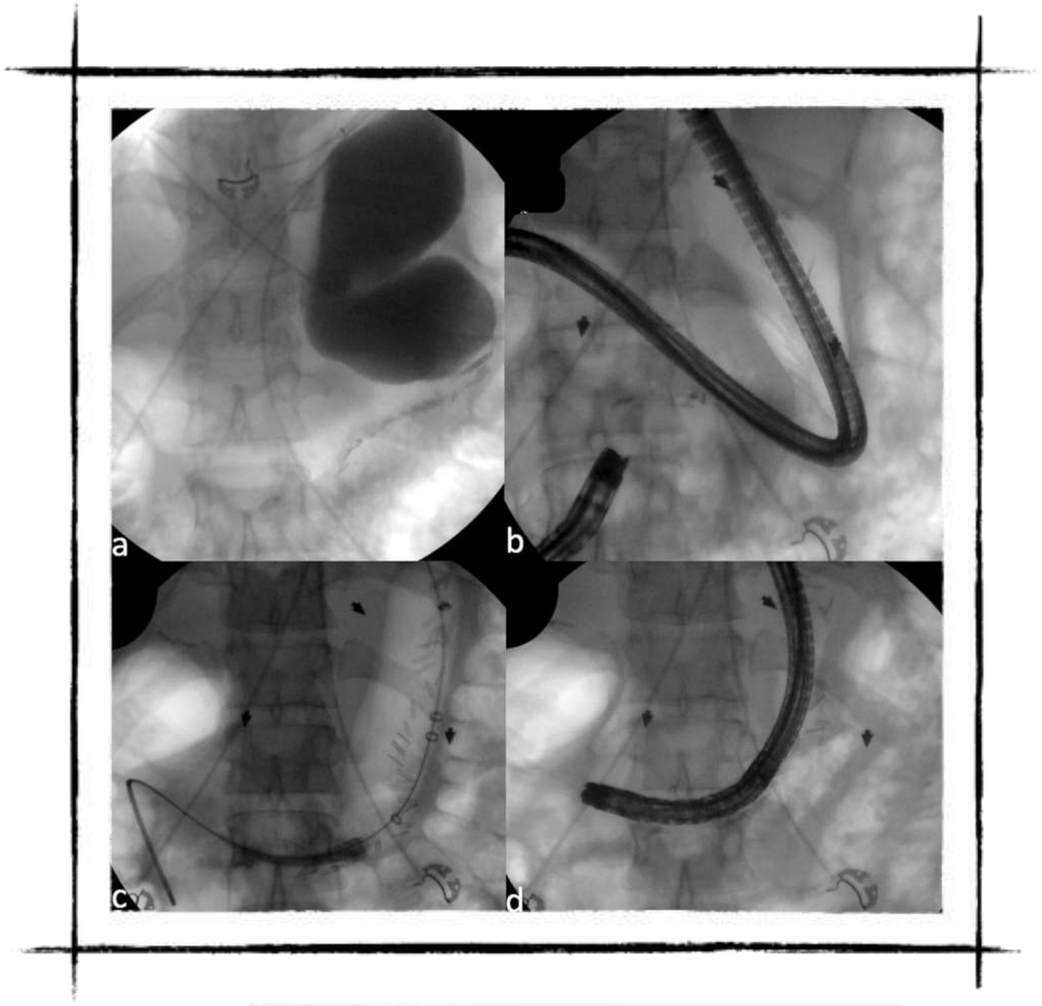
Persistent

FCSEMS and secured with sutures with plans to change every 6 months

Resolution

Persistent

Surgery- seromyotomy, RYGB



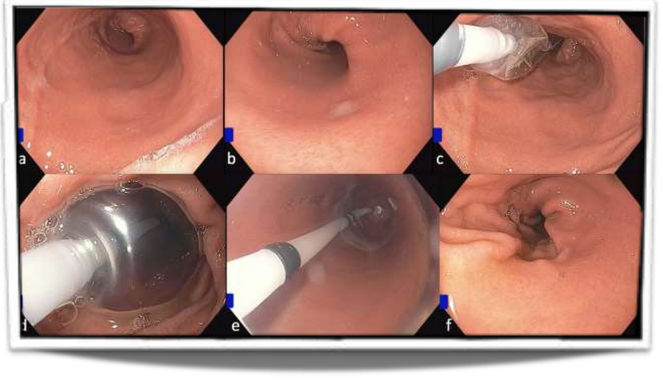


Table 2 Various endoscopic interventions on each patient

Patient ID	Achalasia balloon dilations performed	Total number of balloon dilations	Wallflex™ FCSEMS placement	Duration of Wallflex™ FCSEMS placement	Niti-S FCSEMS Taewoong FCSEMS placement	Surgical intervention
1	35 mm	1	23 × 120 mm	8 days		
2	30 mm > 30 mm > 35 mm	3				
3	30 mm > 35 mm > 35 mm	3				RYGB
4	30 mm	1				
5	30 mm > 30 mm	2				
6	30 mm > 35 mm	2	23 × 120 mm	43 days	18 × 60mm	
7	30 mm > 30 mm > 35 mm	3	23 × 120 mm	28 days	18 × 60mm	
8	30 mm > 35 mm > 35 mm > 35 mm	4				
9	30 mm	1				RYGB
10	30 mm	1				
11	30 mm	1				
12	30 mm	1				
13	30 mm	1				
14	30 mm	1				
15	30 mm > 35 mm	2				
16	30 mm > 35 mm	2				
17	30 mm > 35 mm	2				

88,2% success rate
70,6% w ballon alone
17,6% Ballon = SEMS

ELSEVIER

Surgery for Obesity and Related Diseases ▮ (2016) 00–00

SURGERY FOR OBESITY AND RELATED DISEASES

Original article

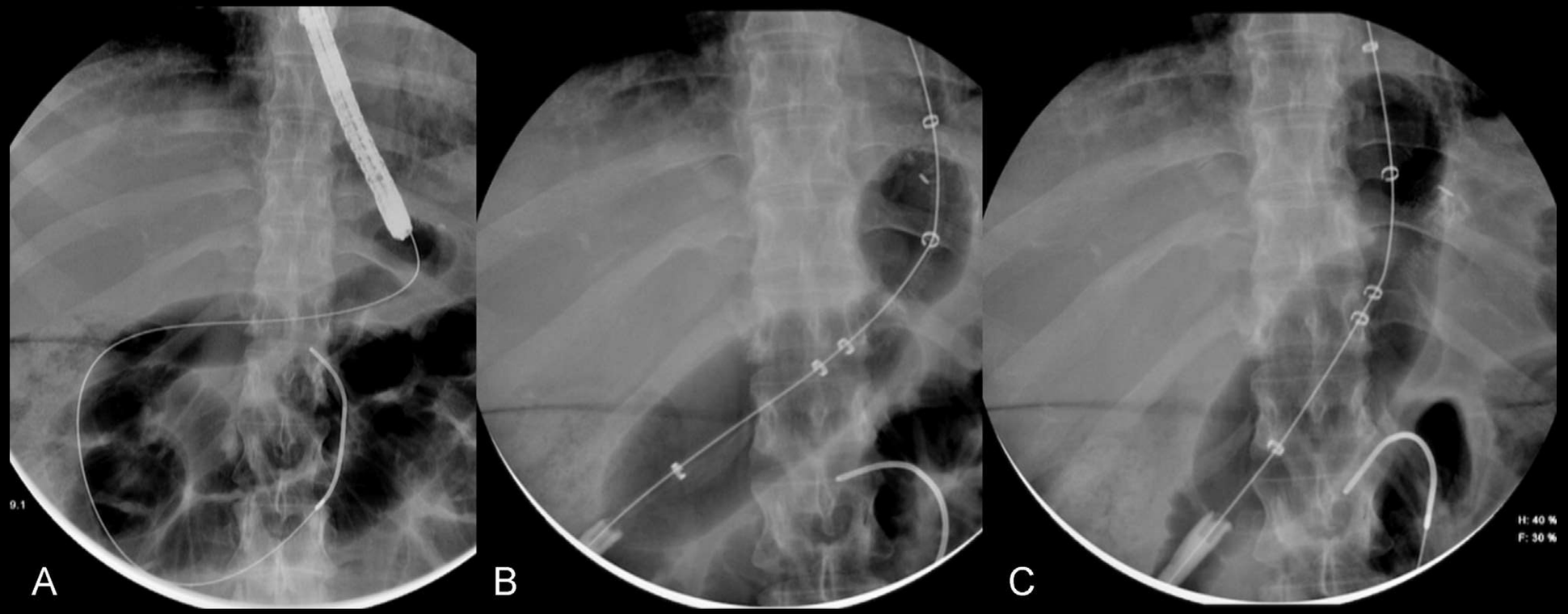
Pneumatic dilation for functional helix stenosis after sleeve gastrectomy: long-term follow-up (with videos)

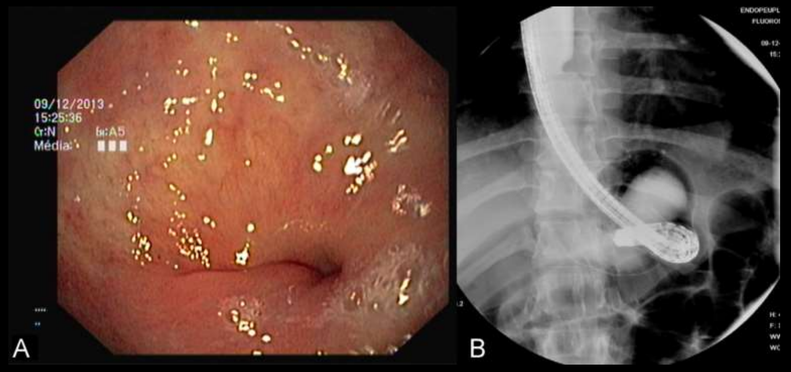
Gianfranco Donatelli, M.D.[a,*], Jean-Loup Dumont, M.D.[a], Guillame Pourcher, M.D.[b], Hadrien Tranchart, M.D.[b], Thierry Tuszynski, M.D.[a], Ibrahim Dagher, M.D.[b], Jean-Marc Catheline, M.D.[c], Renaud Chiche, M.D.[d], Jean-Pierre Marmuse, M.D.[e], Stavros Dritsas, M.D.[f], Bertrand-Marie Vergeau, M.D.[a], Bruno Meduri, M.D.[a]

[a]*Unité d'Endoscopie Interventionnelle, Hôpital Privé des Peupliers, Paris, France*
[b]*Department of Digestive Surgery, Institut Mutualiste Montsouris, Paris Descartes University, Paris, France*
[c]*Service de Chirurgie Viscérale, Centre Hôspitalier de Saint-Denis, Saint-Denis, France*
[d]*Service de Chirurgie Viscérale, Clinique Geoffry Sant Hilaire, Ramsay Générale de Santé, Paris, France*
[e]*Service de Chirurgie Digestive et Viscérale, Hôpital Universitaire Bichat - Claude Bernard - AP-HP, Paris, France*
[f]*Service de Gastroenterologie, Hôpital René Dubos, Pontoise, France*

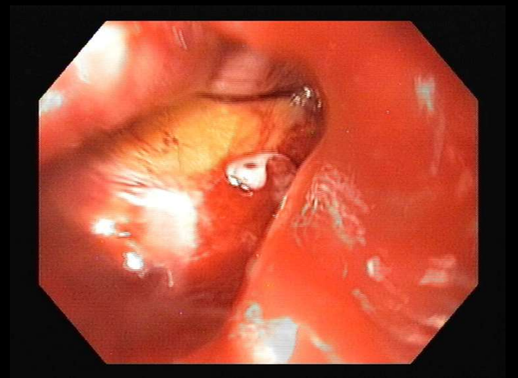
Received July 1, 2016; revised September 18, 2016; accepted September 20, 2016

- ☑ N = 35p
  - ☑ 6o% sucess in 15,5m F-U
  - ☑ 35p single dilated for 30mm 13p get a second dilation to 35mm.8p get a third for 40 mm.
  - ☑ Treatment failure
    - ☑ Complete helix stricture, and persistently dilated gastric pouch above kinking


A
B
C


09/12/2013
15:25:36
A

B



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Surgery for Obesity and Related Diseases ▮ (2017) 00–00

SURGERY FOR OBESITY AND RELATED DISEASES

Editorial comment

Comment on: Pneumatic dilation for functional helix stenosis following sleeve gastrectomy: long-term follow-up

In postsleeve gastric strictures, endoscopy can demonstrate a reduction in the gastric lumen, usually near the *incisura*, associated with a difficult, or even impossible, scope progression. Typical symptoms include dysphagia, vomiting, and excessive weight loss. Treatment can be done with pneumatic 30-mm balloon dilation, associated with stenotomy when necessary [1,2]. Dilation with hydrostatic TTS balloon seems to be ineffective. When endoscopy fails, surgical management is an option via Roux-en-Y gastric bypass (RYGB) conversion or, in isolated cases, total gastrectomy if surgical manipulation is too difficult [3].

The article by Donatelli et al. confirms previous findings that the sleeve gastrectomy procedure, despite its popularity, efficacy, and relatively good safety profile, has different types of complications. The sleeve gastrectomy leak, neo–gastroesophageal reflux disease, and sleeve gastrectomy "functional" stenosis take some time to recognize, because even though we give them the same name, they are very different from similar situations in other bariatric procedures like RYGB.

Bariatric endoscopy begins to address this issue in a minimally invasive way with a very good safety profile, sparing stomachs from surgical revision. With RYGB, the stenosis is relatively simple to treat with hydrostatic CRE dilation balloons, but when related to sleeve gastrectomy, that approach tends to fail, and a novel approach was described as pneumatic balloon dilation with an off-label use of achalasia balloons. The series by Donatelli et al. with more patients showed good results in 60% of the series and draws attention to the variables that point to possible failures, in turn pointing to a future algorithm that mixes endoscopic and surgical techniques in a stepwise manner.

Natan Zundel, Manoel Galvao Neto
Herbert Wertheim College of Medicine, Florida International University, Miami, Florida

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[1] Zundel N, Hernandez JD, Galvao Neto M, et al. Strictures after laparoscopic sleeve gastrectomy. Surg Laparosc Endosc Percutan Tech 2010;20(3):154–8.

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SURGERY FOR OBESITY AND RELATED DISEASES

ASMBS

REVIEW ARTICLE | VOLUME 16, ISSUE 7, P955-966, JULY 01, 2020

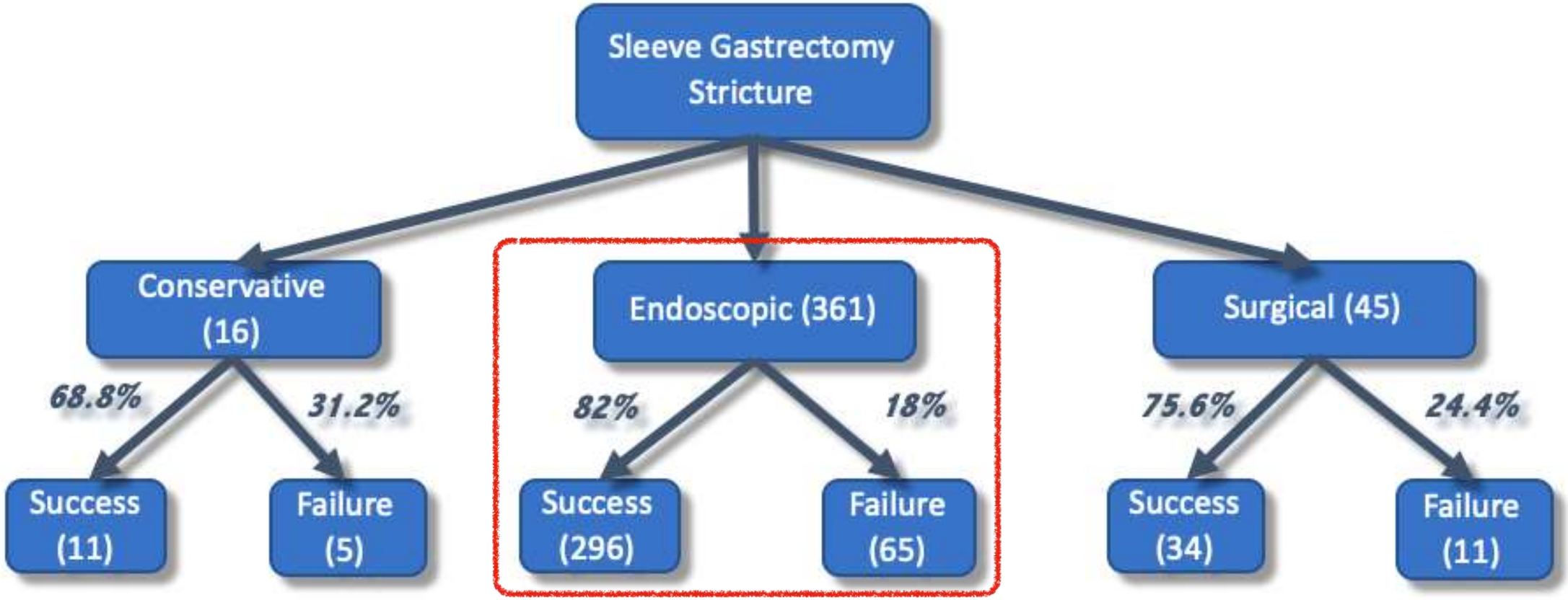
Isolated sleeve gastrectomy stricture: a systematic review on reporting, workup, and treatment

Vitor Ottoboni Brunaldi, M.Sc., M.D. • Manoel Galvao Neto, M.Sc., M.D. • Natan Zundel, M.D. • Barham K. Abu Dayyeh, M.P.H., M.D., F.A.S.G.E.

Published: March 17, 2020 • DOI: https://doi.org/10.1016/j.soard.2020.03.006 •

AUTHOR, YEAR	N	F/M	AGE	BMI	PRESENTATION	STRICTURE	STENOSIS	TWIST	PROXIMAL	MID-BODY	INCISURAS	ANTRUM
THOMOPOULOS 2019	2	-	-	-	-	-	-	-	-	-	-	2
FAYAD 2019	6	-	-	-	-	-	6	-	-	6	-	-
LEVY 2018	21	-	-	-	-	-	26	-	11	2	12	-
DHOREPATIL 2018	33	27/6	46.4±9.6	43.7±6.4	5.6±6.8 months		21		5	18	10	
EL-MATBOULY 2017	3		-									
DESLAURIERS 2017	27	23/4	40.6 (17-60)	46.5 (32-57)	10.3 months (1-61)				7		20	
AGNIHOTRI 2017	17	16/1	42.7±12.8	32.9±7.7	11 months (3-14)	-	-	-	-	-	-	-
ABD ELLATIF 2017	45	40/5	41.8±13 (25-58)	48.7 (43-59)	59.8±13	-	-	45	-	-	-	-
AL SABAH 2016	26	22/4	34.6±10.8	43±1.6	95 days	-	26	-				
NOCCA 2016	2											
CHANG 2016	9	5/4	37.8 (27-46)	34.6 (32.1-39.8)	14 ± 30 days	1	9	8			8	
NATH 2016	33						8	25				
SAKRAN 2016	3				<30 days							
ELLATIF 2016	54	-	-	-	-	54	-	-	-	-	-	-
REBIBO 2015	17 (1 with GF)	16/1	45 (28-63)	42.2 (35.6-60.1)	47.2 days (1-114)		11	6	-	15	2	-
IANNELI 2014	2	2	42 (39 and 45)	40 (38 and 42)				2				
QUEZADA 2016	6	-	-	-	-	-	6	-	-	-	-	-
GUETTA 2015	3					3						
COSTA 2016	2	1/1	24 and 25	41.8 and 32.3	10 and 20 days			2				
KALAISELVAN 2015	2	2/0	28 and 50	74.4 and 43.1	17 and 20 months		2				2	
OGRA 2014	26	15/11	45.3±9	46.5±8.1	150±224 days		26		3		23	
SHNELL 2014	16	13/3	44±13.3	42.4±7.7	183±279 days (median 91)		16			16		
VILALLONGA 2013	16	8/8	40.6 (28-62)	30.5 ± 9.3	547±491 days		16		2	1	13	
BURGOS 2013	5	2/3	36.8±15.1	36.5±2.1	49.6 ± 89.9		5		1	4		
ZACARIAH 2013	3										3	
MOSZKOWICZ 2013	4	3/1	31.2±7.6	39.5±2.3			4					
PARIKH 2011	8	8/0	42±7.9 (28-54)	42.6±6.3	48.2±42 days		8		1	7		
SCHEFFEL 2011	3	3/0	40.3±6.8	52 and 55			2	1	1	1	1	
LACY 2010	3						3		1	2		
SUDAN 2010	2	1/1	39.5±0.7	46±5.6	11.5±3.5	2					2	
ZUNDEL 2010	12	8/4	center 1 (n=3) = 40.3±19.5		C1: 5.3±7.5 days C2: 1mo - 2y	12				3	6	
DAPRI 2009	9		45.2±13.4 (SG) and 51.4±4 (SG/DS)	36±6.2 (SG) and 26.6±7.3 (SG/DS)	9.2±2.6 mo (SG) and 18.6±13.2 mo (SG/DS)				2		7	

Primary treatment



Endoscopic treatment