Stenting im oberen GI-Trakt

Ärzte/Pflegefortbildung 02.07.2021

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Table of content

Malignant disease

Malignant esophageal stricture

- Stenting has almost a 100% technical success rate with an improvement in dysphagia score of at least 2 points (from 3 [liquids only] to 1 [almost all solids]) within 1–2 days.

※ ESGE recommends placement of **partially or fully covered self-expanding metal stents (SEMSs) for palliation of malignant dysphagia over laser therapy, photodynamic therapy, and esophageal bypass** (strong recommendation, high quality evidence).

※ For **patients with longer life expectancy**, ESGE recommends **brachytherapy as a valid alternative** or in addition to stenting in esophageal cancer patients with malignant dysphagia. Brachytherapy may provide a survival advantage and possibly a better quality of life compared to SEMS placement alone. (Strong recommendation, high quality evidence.)

Esophageal stenting for benign and malignant disease: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline

- by Spaander Manon CW et al. [Endoscopy. 2016 Oct;48(10):939-48.]

Malignant disease

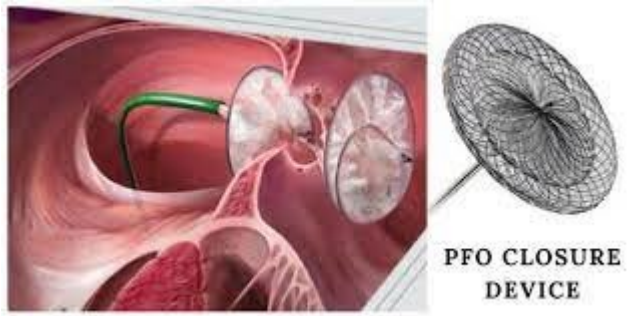
Malignant tracheoesophageal or bronchoesophageal fistula

- Malignant tracheoesophageal or bronchoesophageal fistula develops in 5% to 15% of patients with esophageal cancer and in less than 1% of patients with lung carcinoma. Usually fistulas are late developments of advanced cancer or adverse event of cancer therapies, in particular chemo radiotherapy. Often the patient has a short life expectancy.

※ Esophageal SEMS placement is recommended as the preferred treatment for sealing malignant tracheoesophageal or bronchoesophageal fistula (strong recommendation, low quality evidence).

※ Application of double stenting (esophagus and airways) can be considered when fistula occlusion is not achieved by esophageal or airway prosthesis alone (strong recommendation, low quality evidence). Maybe a problem with perfusion

※ Placing an amplatzer septal occluder as of label therapy



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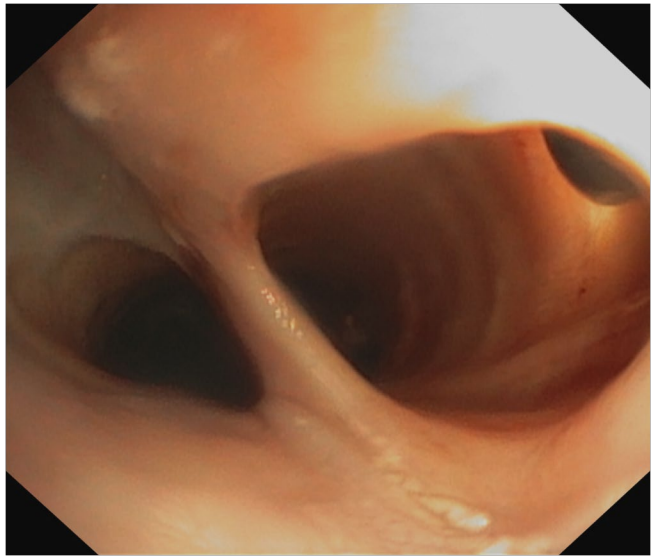

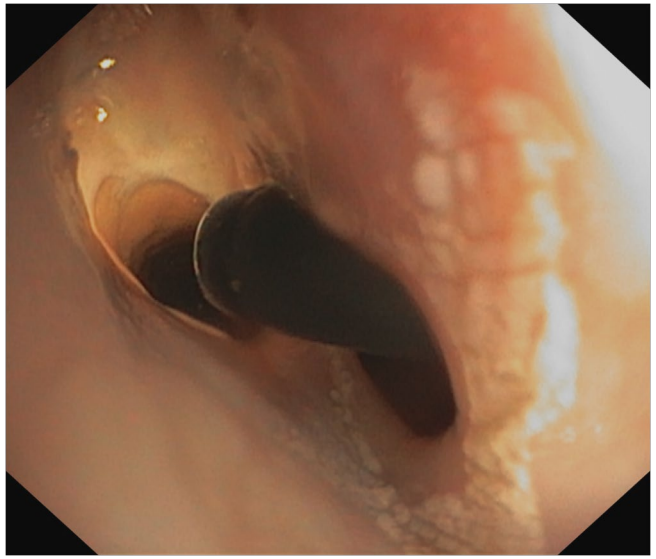

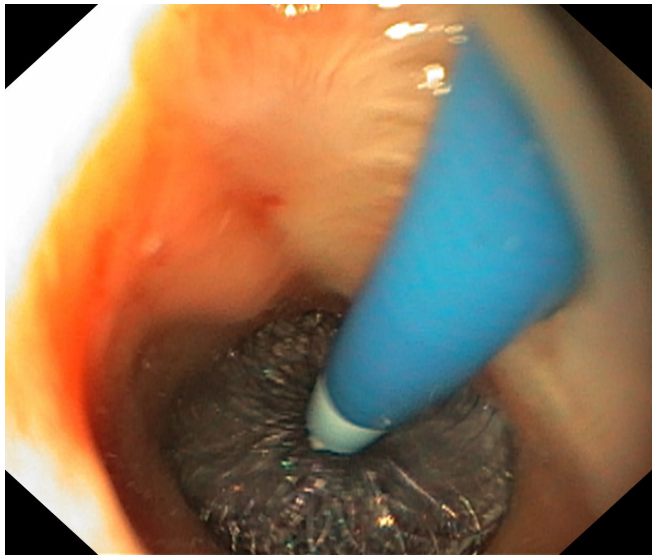

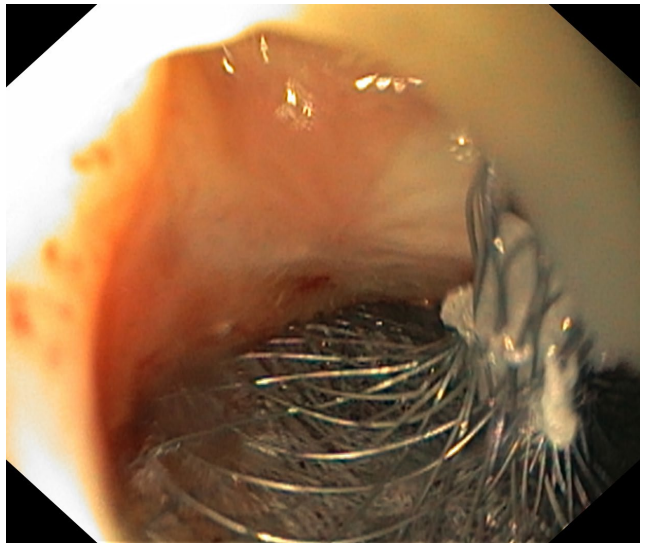

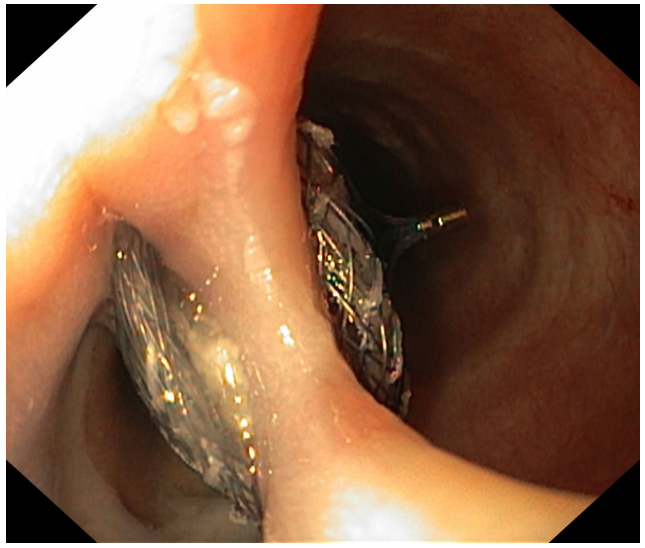

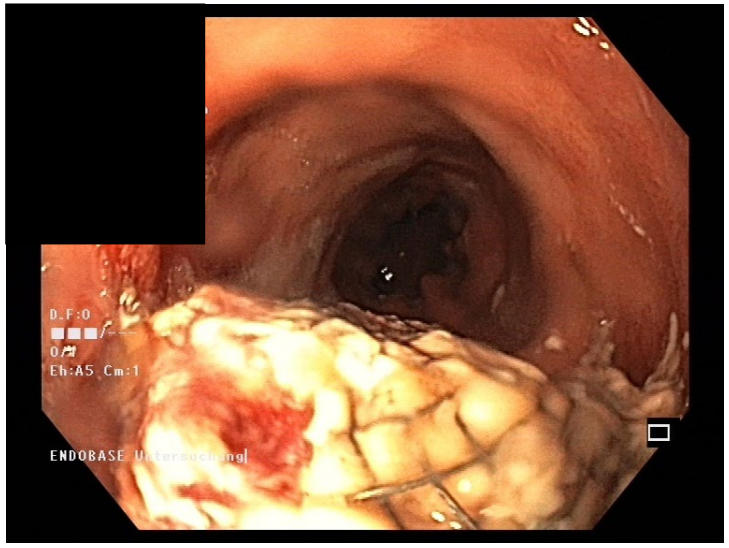
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ENDOBASE Untersuchung

Malignant disease

When is SEMS not recommended

- Stent placement for malignant dysphagia as a bridge to surgery: Stent migration, Chest discomfort, Comparable surgery result

※ ESGE does not recommend SEMS placement as a bridge to surgery or prior to preoperative chemo radiotherapy. It is associated with a high incidence of adverse events, and other satisfactory options such as placement of a feeding tube are preferable. (Strong recommendation, low quality evidence.)

- Esophageal stents and concomitant palliative treatment with radiotherapy: Potential scattering from the metal material in SEMSs may complicate radiation dosimetry

※ ESGE does not recommend the concurrent use of radiotherapy if an esophageal stent is present (strong recommendation, low quality evidence)

※ ESGE suggests that SEMS placement with concurrent single-dose brachytherapy is safe and effective for relief of dysphagia (weak recommendation, low quality evidence

Esophageal stenting for benign and malignant disease: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline

- by Spaander Manon CW et al. [Endoscopy. 2016 Oct;48(10):939-48.]

Benign disease

Indications

Peptic stricture / Scharzki's ring or Web

Anastomotic stricture

Caustic and Radiation induced stricture

Achalasia (?)

Perforations

Acute variceal bleeding

Benign disease

Refractory benign esophageal stricture: Peptic stricture / Scharzki's ring or Web / Anastomotic stricture

※ ESGE suggests consideration of temporary placement of self-expandable stents for refractory benign esophageal strictures (weak recommendation moderate quality evidence).

※ ESGE does not recommend permanent stent placement for refractory benign esophageal stricture; stents should usually be removed at a maximum of **3 months** (strong recommendation, weak quality evidence).

※ ESGE suggests that FCSEMSs be preferred over PCSEMSs for the treatment of refractory benign esophageal stricture, because of their lack of embedment and ease of removability (weak recommendation, low quality evidence)

Esophageal stenting for benign and malignant disease: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline
- by Spaander Manon CW et al. [Endoscopy. 2016 Oct;48(10):939-48.]

Benign disease

Refractory benign esophageal stricture: Peptic stricture / Scharzki's ring or Web / Anastomotic stricture

- Peptic strictures are caused by gastroesophageal reflux disease, but are nowadays less common due to the increased use of proton pump inhibitors
- Schatzki rings appear to be related to reflux as well, and in some patients, they can also cause symptoms of dysphagia
- In patients with short strictures (eg, anastomotic strictures), lumen apposing metal stents have been used successfully
- How should the appropriate treatment be selected?

Perform at least 5 sessions of dilation with a Savary or balloon dilator → If that is not effective, dilation can be combined with corticosteroid injections (for peptic strictures only; maximum of 3 sessions) or incisional therapy (for anastomotic strictures and Schatzki rings; maximum of 3 sessions) → **If those sessions are unsuccessful, there is a role for temporary stent placement with fully covered self-expandable stents or biodegradable stents**, followed by self-dilation and surgery.

Management of Refractory Benign Esophageal Strictures

- by Peter D. Siersema [Gastroenterol Hepatol (N Y). 2018 Mar;14(3):189-191.]

Benign disease

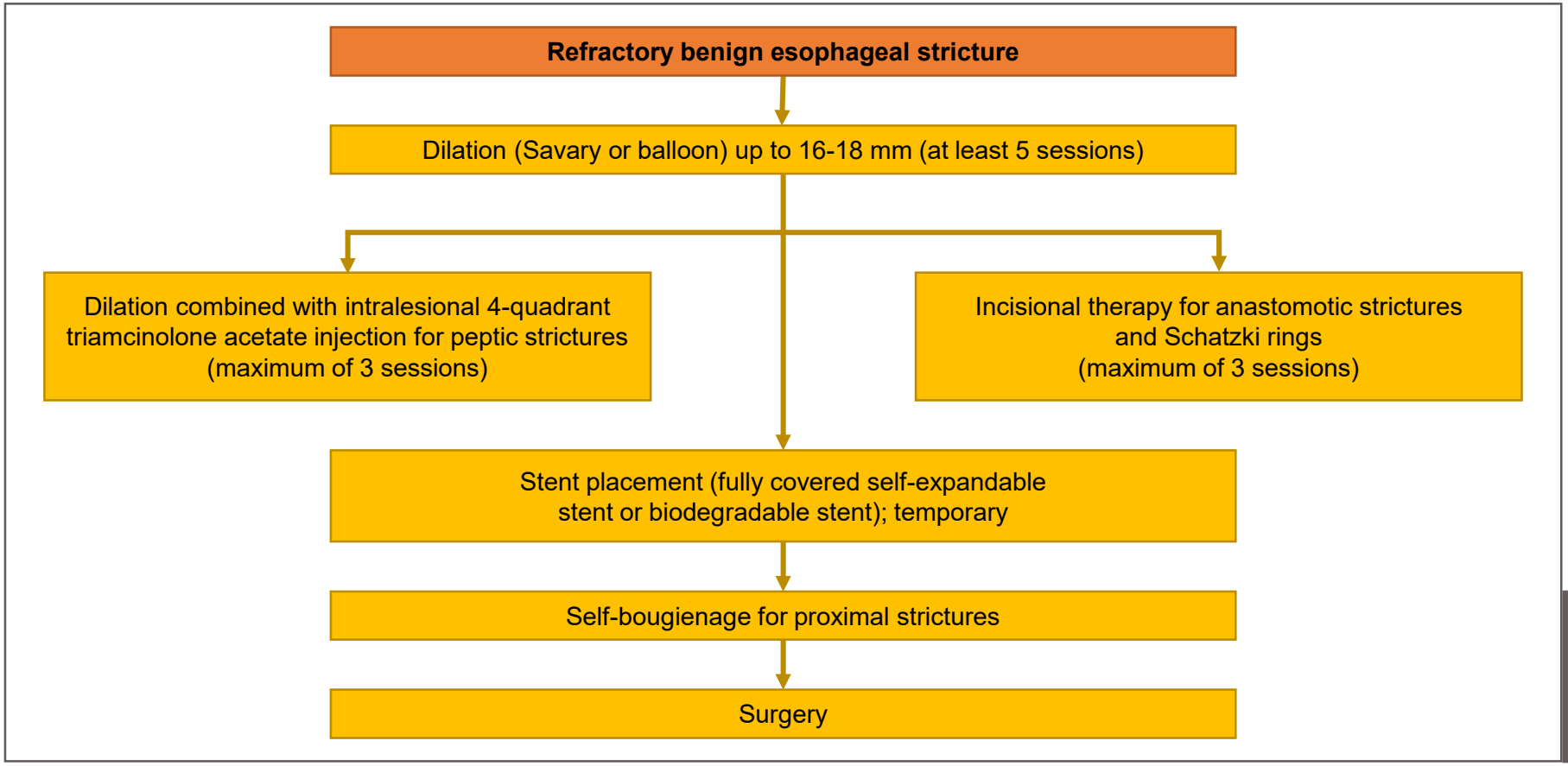

Figure. A treatment algorithm proposes the appropriate management of refractory benign esophageal strictures.

Management of Refractory Benign Esophageal Strictures

- by Peter D. Siersema [Gastroenterol Hepatol (N Y). 2018 Mar;14(3):189-191.]

Benign disease

Refractory benign esophageal stricture: Caustic and Radiation/PDT induced stricture

- Caustic strictures are usually difficult to treat because the granulation tissue is very strong and plentiful; therefore, the longer the stent is left in place, the more difficult is to remove it
- **Later than 4 weeks from stent placement, granulation tissue grows within the distal non covered areas of the stent and within the stent covered trunk, as a consequence of the silicon cover usury. Sometimes APC is needed to remove the stent.**
- Generally, **when managing benign disease, the stent should be removed within 2 months** so that late stent-related problems are avoided.
- **Transient placement of a SEMS could significantly improve prognosis of patients with benign stenosis refractory to dilation procedure**. **By the use of APC, SEMS can be removed after a long period despite the development of tissue overgrowth at the edges of the stent.**
- **There are some studies with SEMS in Achalasia**

Self-Expandable Metal Stenting of Refractory Upper Gut Corrosive Strictures: A New Role for Endoscopy?

- by Raffaele Manta et al. [Case Rep Gastrointest Med. 2011;2011:346413.]

Benign disease

Benign esophageal leaks, fistulas, and perforations

- **Aim:** **T**he standard approach to benign esophageal perforations consists of conservative treatment or surgery. In this study, we investigated the efficacy of short-term stent placement for nonmalignant esophageal perforations.
- **Methods:** This is a prospective single-center study of patients with benign esophageal perforations in whom a removable self-expandable stent was placed.
- **Results:** A total of **33 patients** underwent stent insertion owing to an **iatrogenic perforation (n=19), Boerhaave's syndrome (n=10), or other causes (n=4)**; this resulted in an immediate and complete sealing of the lesion in 32 patients (97%). Stents migrated in 11 patients (33%). Four patients required an esophageal resection for failed stent therapy (n=3) and failed stent removal (n=1). The 90-day mortality rate was 15%. **A total of 33 endoscopic stent extractions were attempted. Overall, 23 stents were extracted within 6 weeks (group I) and 10 stents between 6 and 84 weeks (group II). Extractions were uncomplicated in all patients in group I (100%) vs. in 5 patients in group II (50%) (P=0.001)**. Six extraction-related complications occurred in group II, including two self-limiting bleedings, three stent fractures, and one impacted stent.
- **Conclusion :** In patients with a benign esophageal perforation, temporary stent therapy is effective and provides a good alternative to surgery. Complications due to stent removal can be prevented by **removal of the prosthesis within 6 weeks after insertion**, without compromising the efficacy of treatment.

Short-Term Esophageal Stenting in the Management of Benign Perforations

- by M C W Spaander et al. [Am J Gastroenterol. 2010 Jul;105(7):1515-20.]

Benign disease

Acute variceal bleeding

- Published systematic review and meta-analysis showing that treatment with SEMSs is successful in controlling severe or refractory acute variceal bleeding, without the occurrence of severe adverse events and with a 1-month survival of more than 60%

- These findings confirmed that this therapy can be used as a bridge to transjugular intrahepatic portosystemic shunt (TIPS) or liver transplantation in a significant proportion of patients

- In published studies SEMSs have remained in place for up to **2 weeks**.

※ ESGE recommends considering placement of a SEMS for the treatment of esophageal variceal bleeding refractory to medical, endoscopic, and/or radiological therapy, or as initial therapy for patients with massive bleeding (strong recommendation, moderate quality evidence).

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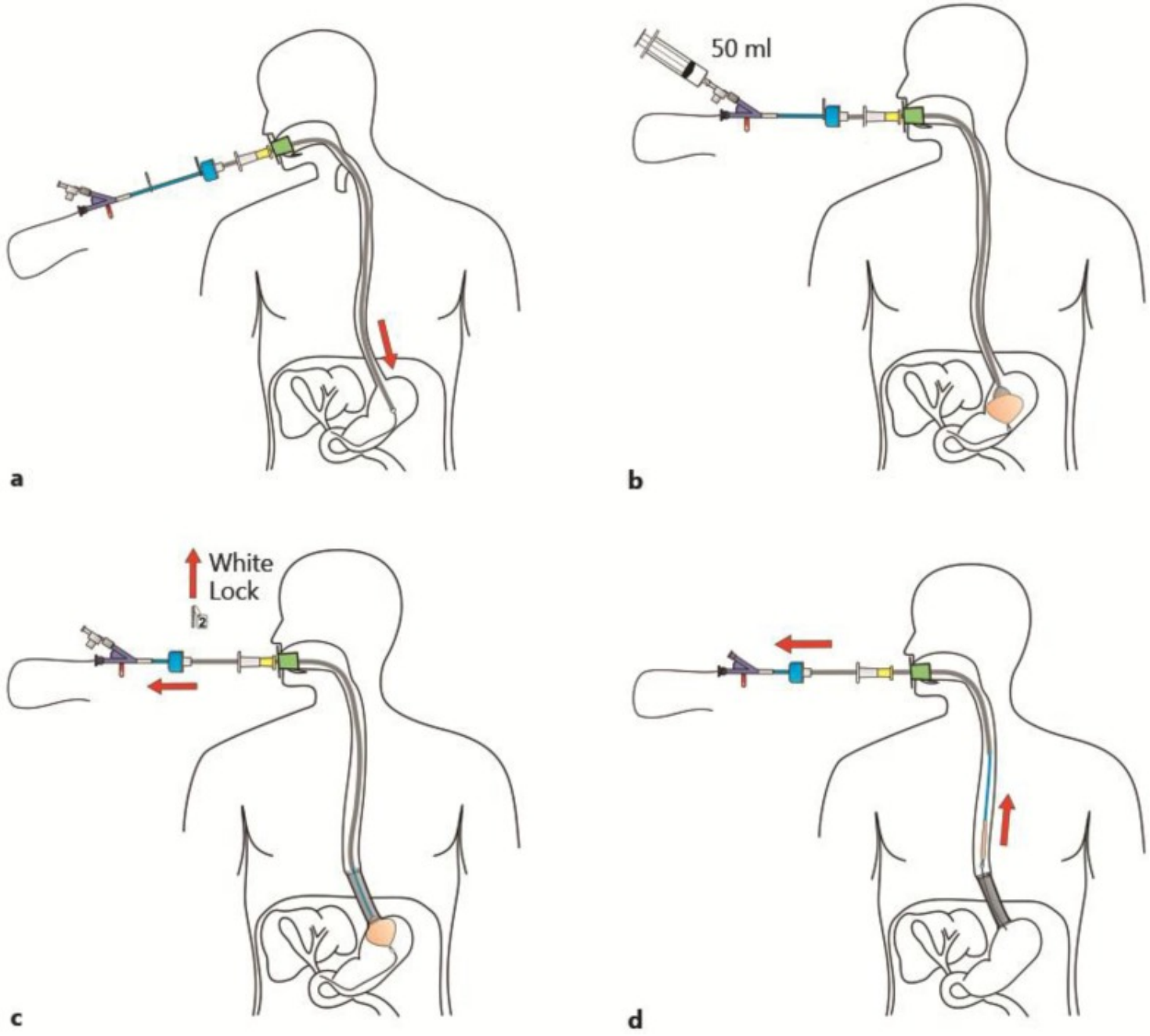
- by Manon C W Spaander et al. [Endoscopy. 2016 Oct;48(10):939-48.]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Article recommended removal period

Benign disease

- **Refractory benign esophageal stricture**

- Peptic stricture / Scharzki's ring or Web / Anastomotic stricture: **Max 3 months**
- Caustic stricture : **4 weeks** , otherwise, would be needed APC for removal
- Radiation/PDT induced stricture : **Within 2 months**
- (Achalasia: **3 ~ 7 days)**

- **Benign esophageal leaks, fistulas, and perforations: Within 6 weeks**

- **Acute variceal bleeding : Within 2 weeks**

Common adverse event / How to avoid

- Severe pain: **appropriate size of stent**. **If the distance between the upper esophageal sphincter and the stricture is less than 2cm, placement of large-diameter SEMSs is associated with more pain and discomfort including foreign-body sensation.**
- Migration**: Choice of an appropriate stent diameter, fixing with Stentfix**
- Bleeding: **Choice of an appropriate stent diameter** (less ulcer formation). **Prophylaxis with proton pump inhibitor when stent placement across the gastroesophageal junction.**
- Fistula: **Fistula may be caused by the progression of cancer, previous radiotherapy, and by erosion at the edge(s) of the stent, which are the widest parts of the device, into the esophageal wall.** In a large retrospective study no statistically significant relationship was detected between stent diameter or presence of a flange and the development of esophagorespiratory fistula. **Prior radiotherapy is the most important risk factor for the development of esophagorespiratory fistula after SEMS placement**
- Perforation: **Dilation before stent placement is associated with a significantly increased risk of major adverse events, in particular perforation. Excessive manipulation of the guidewire, stricture dilation, and passage of the endoscope across the stricture should all be avoided to minimize the risk of perforation .**

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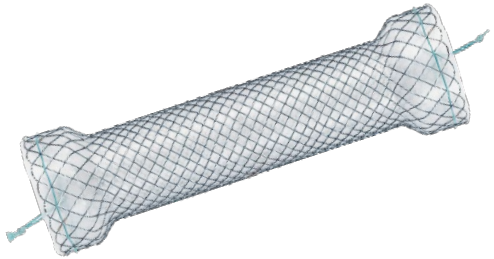
- by Manon C W Spaander et al. [Endoscopy. 2016 Oct;48(10):939-48.]

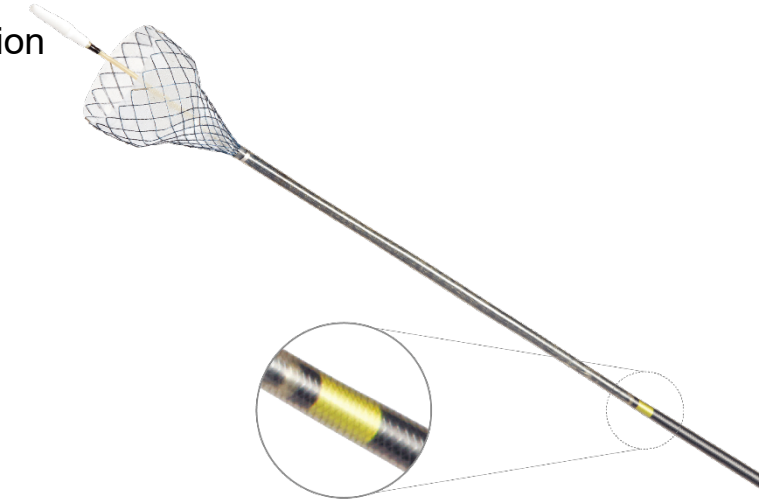
Distal Release

Delivery System

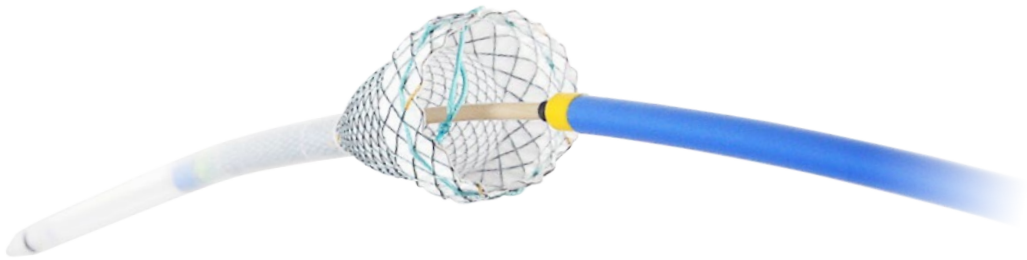
Easy and Simple stenting through the scope channel

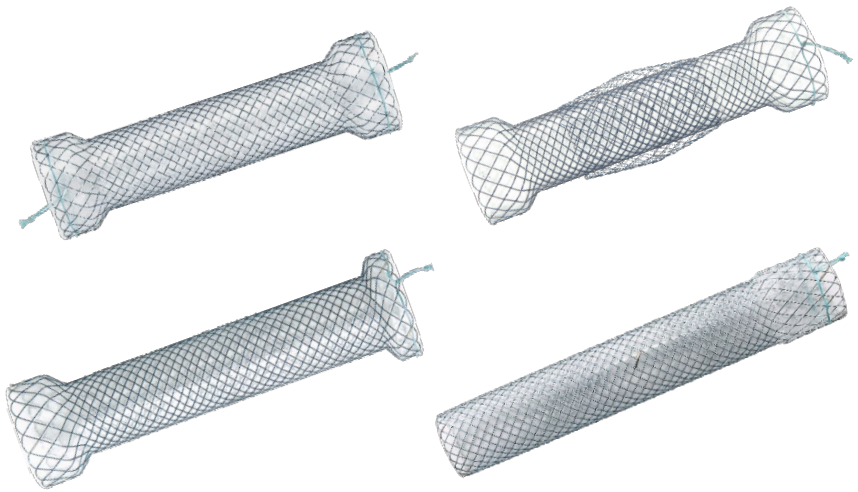
- Preloaded in a **10.5Fr delivery system** for esophageal fully covered / partially covered stent
- **The practical solution for tight, narrow or tortuous anatomies**
- **Yellow marker** on the black inner sheath for accurate placement under endoscopic visualization





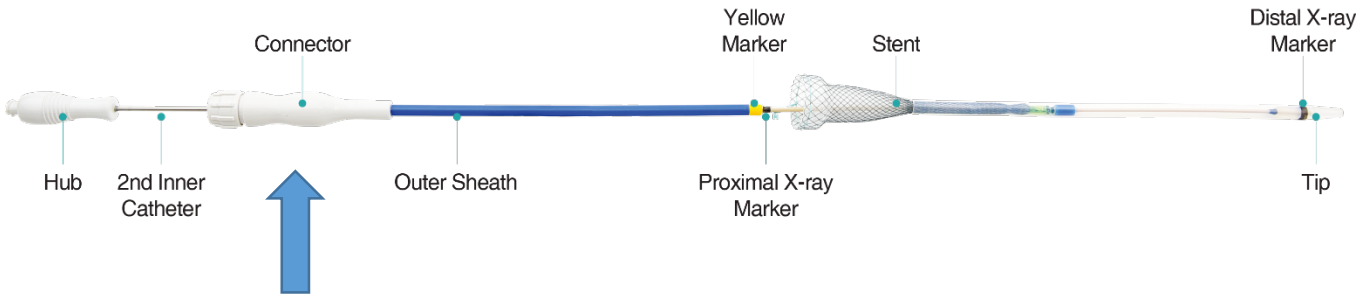
Proximal Release Delivery System





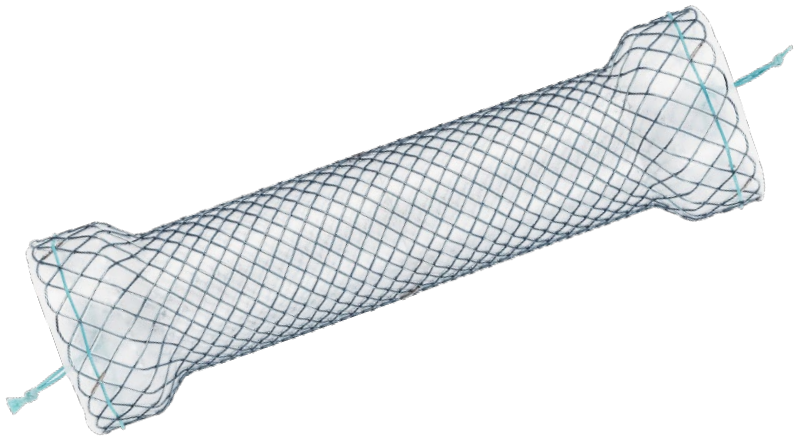
Visualization of the proximal tumor margin

- **Accurate stent positioning**
  - The proximal part is released earlier than its distal part to enable placement with consideration of the proximal tumor margin without a fluoroscope
  - Recommended for upper esophageal strictures



Fixed end

Esophageal Stent



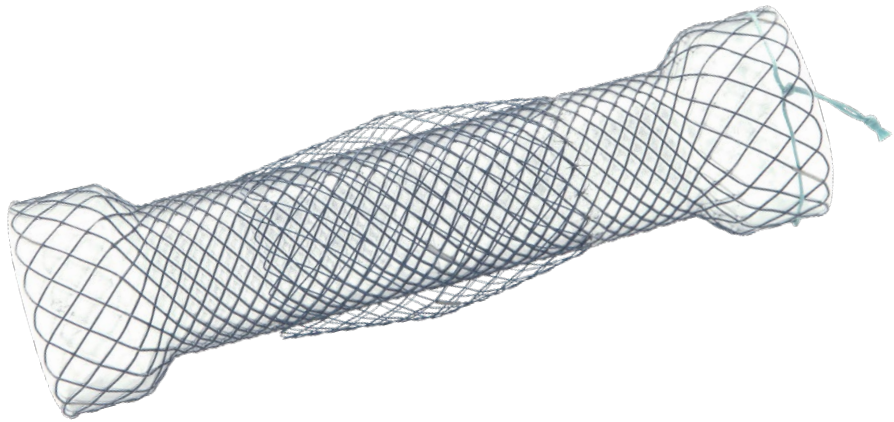
for benign and malignant esophageal strictures

- **Fixed cell with a braided construction**
  - High flexibility and optimal radial force
  - Both head ends (8mm larger than trunk) help to minimize migration
- **Silicone covering and soft round ends**
  - Reduce tissue ingrowth and hyperplasia reaction
- **Visible green suture for easy removal**
- **Radiopaque marker:** 4 (four) at both ends & 2 (two) in the middle

*Best use: benign and malignant esophageal strictures						
Release	**Type**	**Code**	**Stent**		**Delivery System**	
			Diameter (mm)	**Length (cm)**	**Diameter (Fr)**	**Length (cm)**
Distal	Fully covered	ES**--F	16,18	6,8,10,12, 14,15	16	70
			20,22		20	
	Partially covered	ES**--B	24,26		22	

- Strings on both ends model available
- Proximal Release Delivery System available
- Various TTS Delivery Length available (160cm, 180cm, 220cm)

DOUBLE™ Esophageal Stent



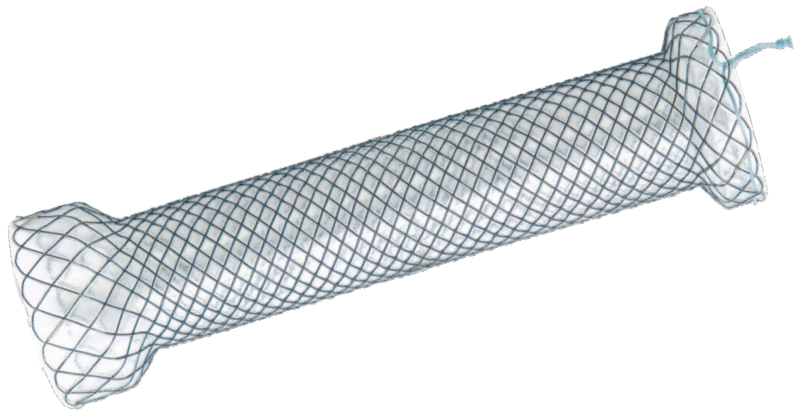
for malignant esophageal strictures

- **Double layered design**
  - Full silicone covering prevents the risk of tumor ingrowth
  - The additional uncovered outer mesh helps to resist migration
- **Retrieval string** at proximal end helps repositioning
- **Radiopaque marker:** 4 (four) at both ends & 2 (two) in the middle

*Best use: malignant esophageal strictures				
Code	Stent		Delivery System	
	Diameter (mm)	Length (cm)	Diameter (Fr)	Length (cm)
ES**--FD	16,18	6,8,10,12,14,15	18	70
	20,22		20	
	24,28		22	

- Strings on both ends model available
- Proximal Release Delivery System available

CERVICAL™ Esophageal Stent



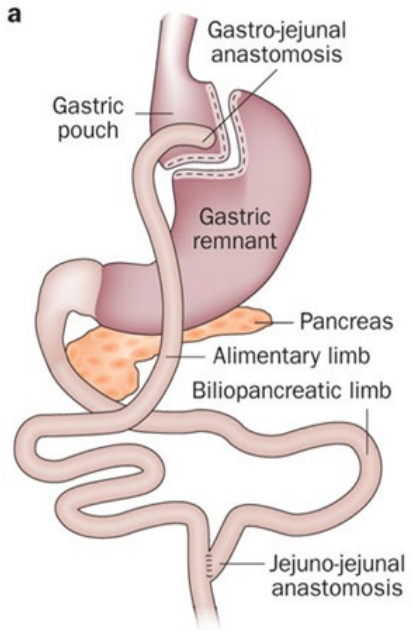
*Best use: upper esophageal strictures				
Code	Stent		Delivery System	
	Diameter (mm)	Length (cm)	Diameter (Fr)	Length (cm)
ES**--FV	16,18	6,8,10,12,14,15	16	70
	20,22		20	
	24		22	

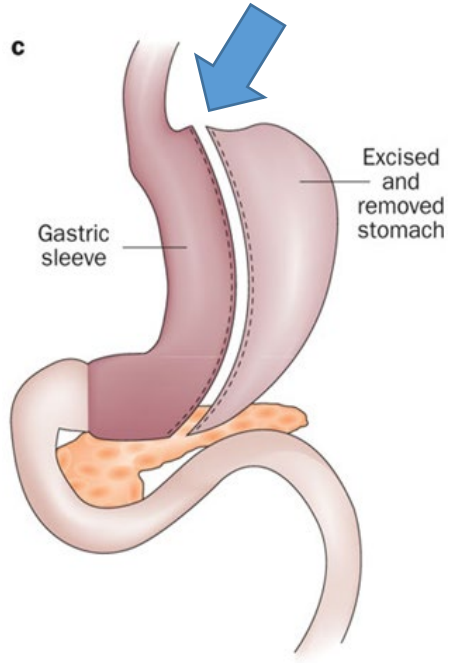
- Strings on both ends model available
- Proximal Release Delivery System available

for upper esophageal strictures

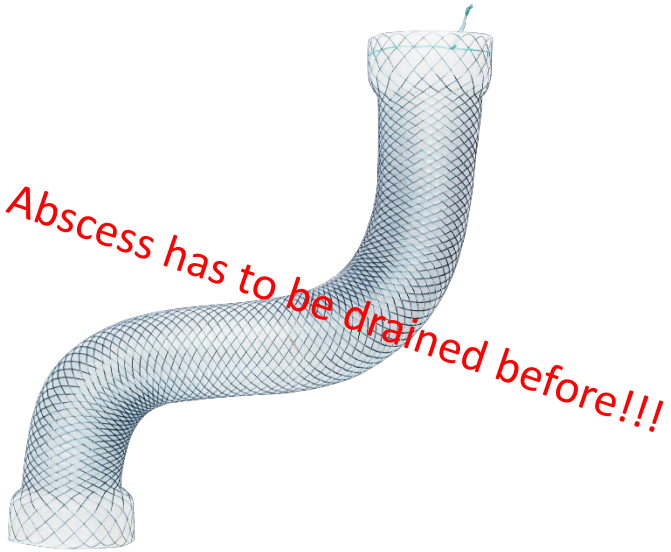
- **The short proximal head design** prevents damage to the vocal cords in cases of stent placement close to the upper esophageal sphincter
- **Silicone covering:** Reduce the risk of tumor ingrowth
- **Visible green suture for easy removal**
- **Radiopaque marker:** 4 (four) at both ends & 2 (two) in the middle

Bariatric surgery / Complication management





MEGA™ Esophageal Stent

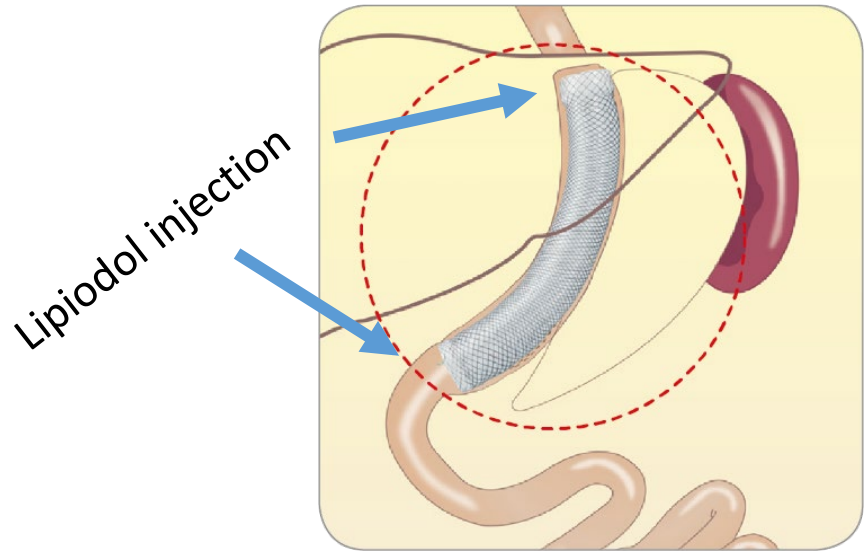


*Best use: leak or fistula after sleeve gastrectomy				
Code	Stent		Delivery System	
	Diameter (mm)	Length (cm)	Diameter (Fr)	Length (cm)
ES**--F	22,24,28	18,23	20	70

- Strings on both ends model available

for leak or fistula after sleeve gastrectomy

- **Specially designed soft and flexible body:** Adapts to the acute anatomy after sleeve gastrectomy
- **Large diameter and long length of the stent:** \
- **Full silicone covering** allows easy removal
- **Radiopaque marker:** 4 (four) at both ends & 2 (two) in the middle



BETA™ Esophageal Stent

for leak or fistula after bariatric surgery

- **Both distal and proximal** retrieval strings help for easy removal or repositioning
- **Outer double layers:** Silicone covered double layers prevent the risk of migration and any substance to contact the leak or fistula
- **Flexible and conformable structure:** Unfixed cell construction provides excellent flexibility and conformability to fit in tortuous anatomy
- **Radiopaque marker:** 4 (four) at both ends & 3 (three) in the middle of each ring

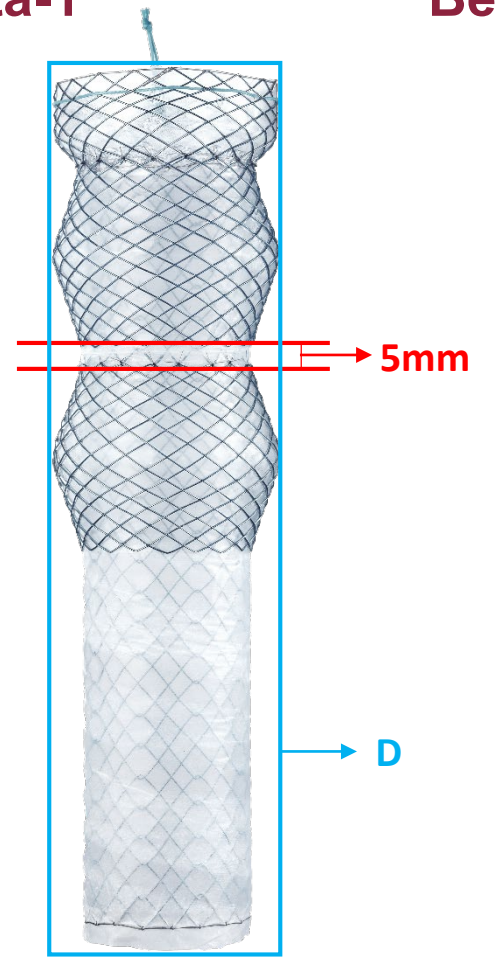
***Best use: leak or fistula after bariatric surgery**

Type	Code	Stent		Delivery System	
		Diameter (mm)	Length (cm)	Diameter (Fr)	Length (cm)
BETA 1 (5mm gap)	EK**--FND2	22	14,15,16,18 ,20,22,23	20	70
		24		22	
		26,28	14,15,16,18 ,20		
BETA 2 (25mm gap)	EK**--FNT2	18,20,22	10,12,14,15 ,16,18,20	20	
		24,26,28		22	

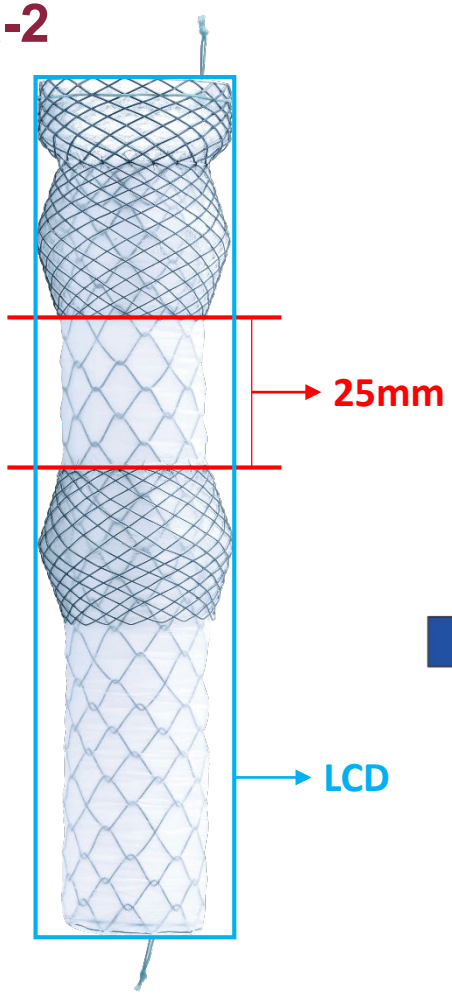
BETA™

Esophageal Stent

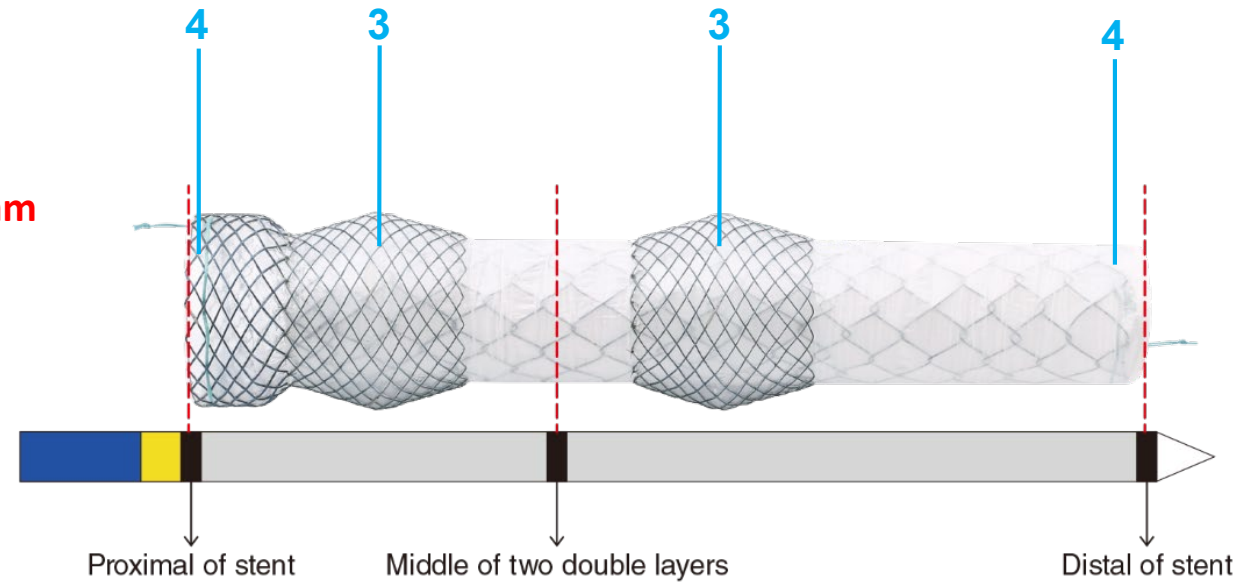
Beta-1



Beta-2



Radiopaque markers of stent



Radiopaque markers of delivery system

BETA™ Esophageal Stent

Integrated Approaches for the Management of Staple Line Leaks following Sleeve Gastrectomy

- by Mauro Montuori et al. [J Obes. 2017;2017:4703236.]

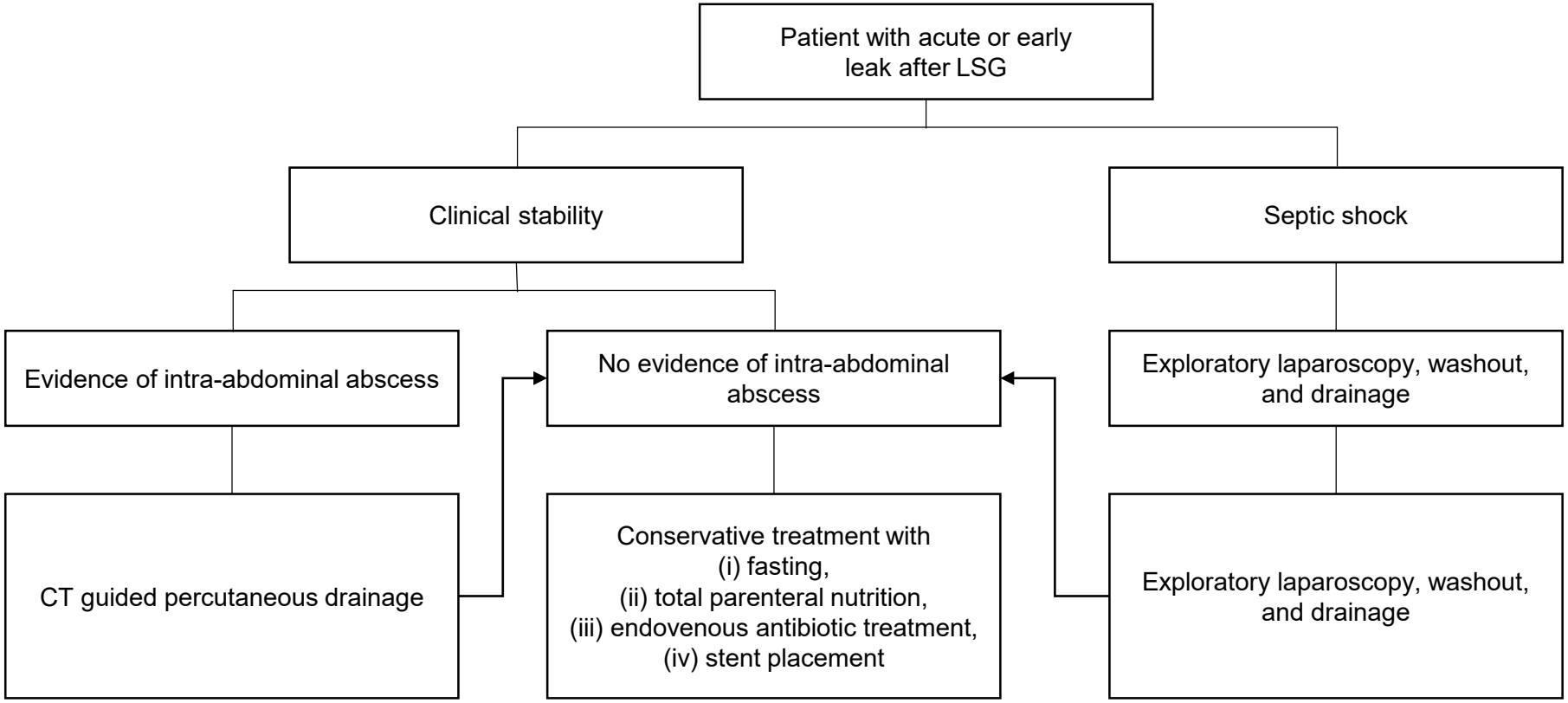
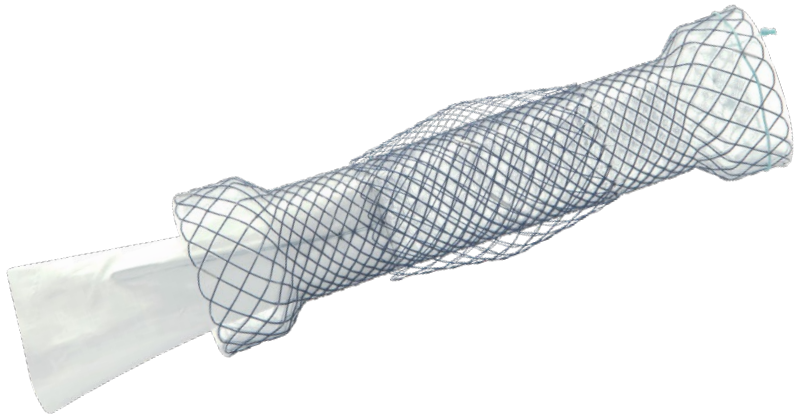


Figure 3. Flow chart for the management of gastric leaks.

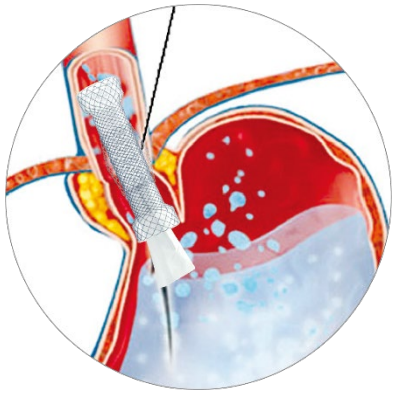
DOUBLE™ Esophageal Stent (Anti-reflux)



*Best use: malignant esophageal strictures				
Code	Stent		Delivery System	
	Diameter (mm)	Length (cm)	Diameter (Fr)	Length (cm)
EA**--FD	16,18	6,8,10,12,14,15	18	70
	20,22		20	
	24,28		22	

for preventing gastroesophageal reflux

- **Double layered design with an Anti-reflux skirt**
  - The PTFE skirt blocks gastric refluxs with the stent placement at the EG junction
  - The additional uncovered outer mesh helps to resist migration
- **Retrieval string** at proximal end helps repositioning
- **Radiopaque marker:** 4 (four) at both ends & 2 (two) in the middle



Ende