

How to choose and place the ideal stent in the esophagus

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Stent choice and placement in the esophagus- Indications



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Utrecht

- Malignant esophageal obstruction
- Benign esophageal stricture
- Benign esophageal rupture or perforation

Stent choice and placement in the esophagus- Indications



University Medical Center
Utrecht

- Malignant esophageal obstruction

Malignant obstruction – Patient selection



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Common indications

- Mid-/distal esophageal cancer
- Extrinsic compression
- Fistulas

“Newer” indications

- Proximal esophageal cancer
- Recurrent cancer after esophagectomy/
gastrectomy

Malignant obstruction – Stent placement



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What is needed?

- Endoscope
 - Normal diameter (8-10 mm)
 - Small diameter (4.9-5.9 mm)
- Guidewire (stiff)
 - 0.038-inch Savary
 - 0.035-inch Amplatz
- Fluoroscopy (?)
- Stent

Verschuur EML, et al. Stenting gastro-oesophageal tumours. In: Audisio RA (ed.), Atlas of procedures in surgical oncology. World Scientific Publishing 2009: 117-24.

Malignant obstruction – Stent placement



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Alternatives for endoscopy *plus* fluoroscopy

- Endoscopy alone
 - Endoscope alongside stent during placement (proximal release)
- Fluoroscopy alone
 - Use contrast medium to visualize tumor length
- Distance marker on stent introduction catheter
 - Only available with some stent types (e.g. Ultraflex)
 - Is of ease with stent placement in the OR

Verschuur EML, et al. Stenting gastro-oesophageal tumours. In: Audisio RA (ed.), Atlas of procedures in surgical oncology. World Scientific Publishing 2009: 117-24.

Malignant obstruction – Stent placement



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 - 0.035-inch Amplatz
- (Fluoroscopy)
- Stent

Verschuur EML, et al. Stenting gastro-oesophageal tumours. In: Audisio RA (ed.), Atlas of procedures in surgical oncology. World Scientific Publishing 2009: 117-24.

Malignant obstruction – First generation stents



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Ultraflex

**Flamingo
Wallstent
(Boston Scientific)**

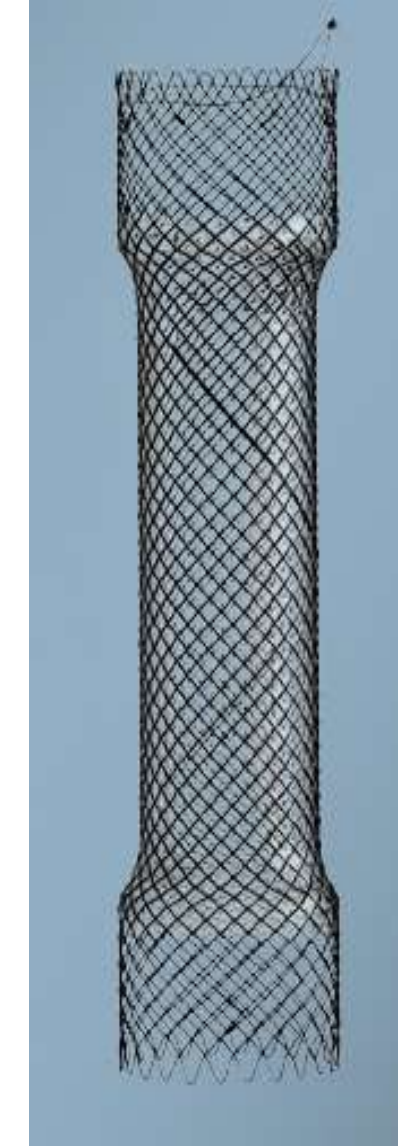
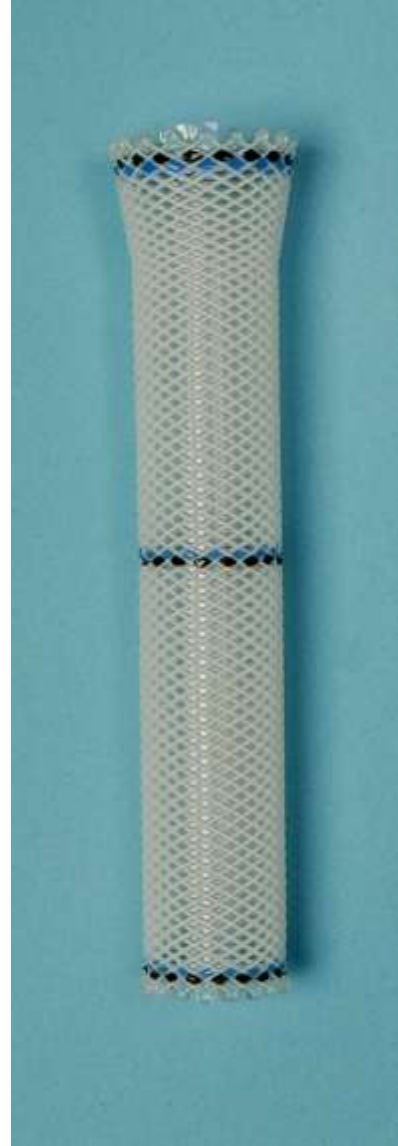
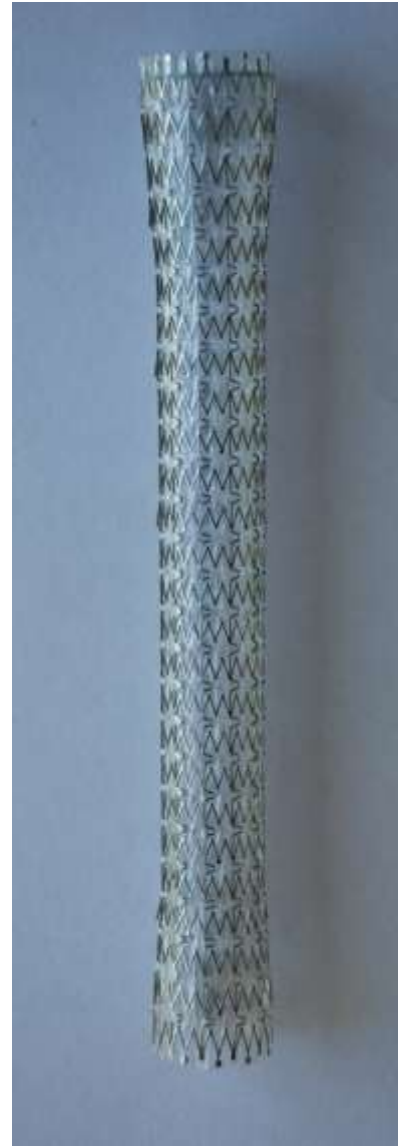
Wallstent

**Z-stent
(Cook)**

Malignant obstruction – Latest generation stents



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Niti-S
(Taewoong)

SX-Ella
(Ella CS)

Alimaxx-E
(Merit)

Polyflex
(Boston Scientific)

Wallflex PC

Evolution
(Cook)

Ultraflex
(BS)

Stents - Complications and recurrent dysphagia



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Procedure-related complications (5%)

- Perforation, (aspiration) pneumonia, (severe) pain

Stents - Complications and recurrent dysphagia



University Medical Center
Utrecht

Procedure-related complications (5%)

- Perforation, (aspiration) pneumonia, (severe) pain

Perforation

- Avoid dilation
- Stent placement is best treatment!

(Aspiration) Pneumonia

- Patient in left lateral position, especially if the stent is placed across the GE junction

Pain

- More common after previous radiation and/or chemotherapy
- Narcotic analgesics
- Stent removal may be necessary

Stents - Complications and recurrent dysphagia



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Procedure-related complications (5%)

- Perforation, (aspiration) pneumonia, (severe) pain

Late complications (10-15%)

- Hemorrhage, fistula formation

Stents - Complications and recurrent dysphagia



University Medical Center
Utrecht

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Late complications (10-15%)

- Hemorrhage, fistula formation

Hemorrhage

- Hemorrhage mostly not caused by stenting but by tumor progression
- Difficult to treat, sometimes is 4x5Gy radiation therapy effective

Fistula formation

- Can be due to the stent, usually at upper end (pressure), or due to tumor progression
- Treated by stent repositioning or repeat stenting

Stents - Complications and recurrent dysphagia



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Utrecht

Procedure-related complications (5%)

- Perforation, (aspiration) pneumonia, (severe) pain

Late complications (10-15%)

- Hemorrhage, fistula formation

Minor complications (10-20%)

- (Minor) pain, gastroesophageal reflux

Stents - Complications and recurrent dysphagia



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Utrecht

Procedure-related complications (5%)

- Perforation, (aspiration) pneumonia, (severe) pain

Late complications (10-15%)

- Hemorrhage, fistula formation

Minor complications (10-20%)

(Minor) pain

- Usually self-limiting within a few days, sometimes short-term analgesics

Gastroesophageal reflux

- PPIs, no late night meals, sleep in half-sitting position
- Stents with anti-reflux valve (?)

Stents - Complications and recurrent dysphagia



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Procedure-related complications (5%)

- Perforation, (aspiration) pneumonia, (severe) pain

Late complications (10-15%)

- Hemorrhage, fistula formation

Minor complications (10-20%)

- (Minor) pain, gastro-esophageal reflux

Recurrent dysphagia (20-35%)

- Stent migration, tissue in- and overgrowth, food obstruction

Recurrent dysphagia



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Tissue in- and overgrowth



Food obstruction



Stent migration

Prevention of recurrent dysphagia



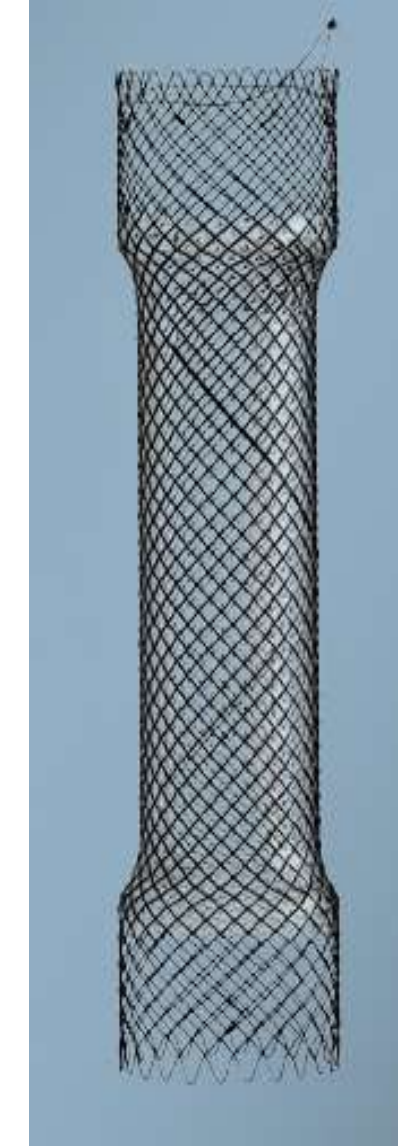
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- **Tissue in- and overgrowth**
 - Full cover
 - Non-metal/non-nitinol material
- **Food obstruction**
 - Large diameter
 - Cover inside
- **Migration**
 - Increase outer resistance
 - Large diameter
 - Shouldering
 - Partial cover

Malignant obstruction – Stent choice



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Niti-S
(Taewoong)

SX-Ella
(Ella CS)

Alimaxx-E
(Merit)

Polyflex
(Boston Scientific)

Wallflex PC

Evolution
(Cook)

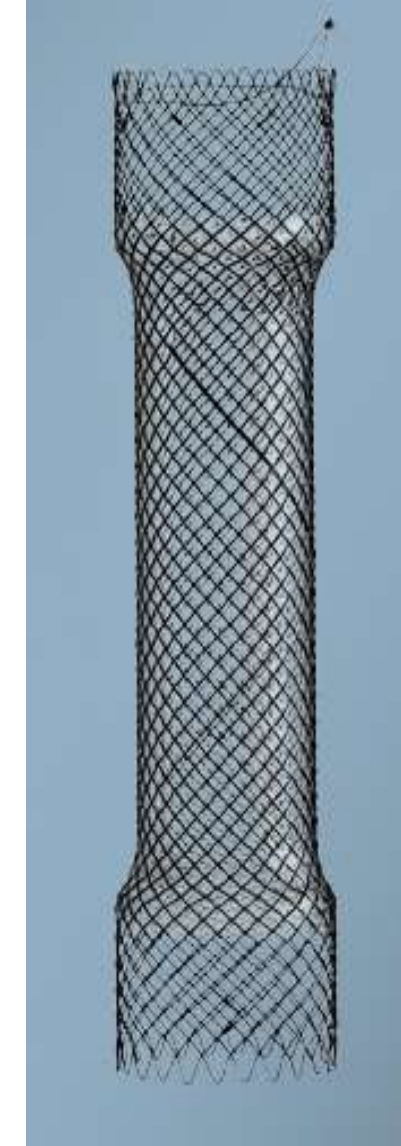
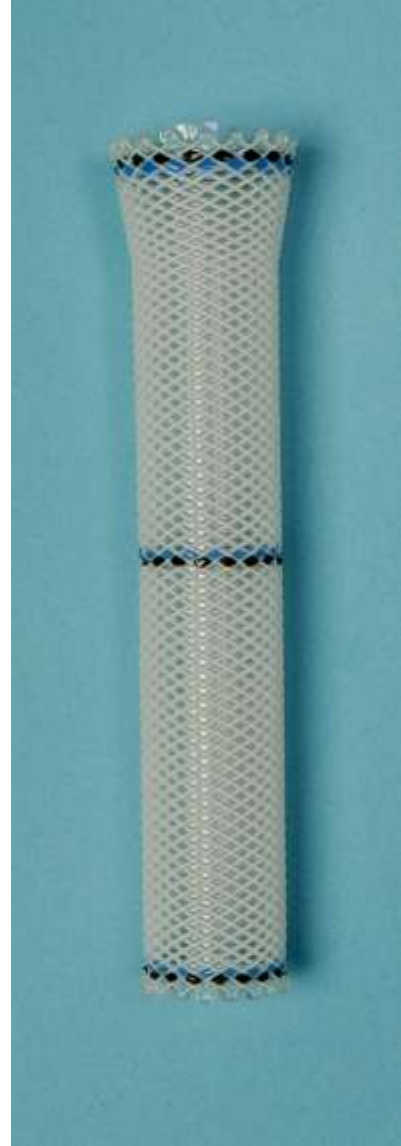
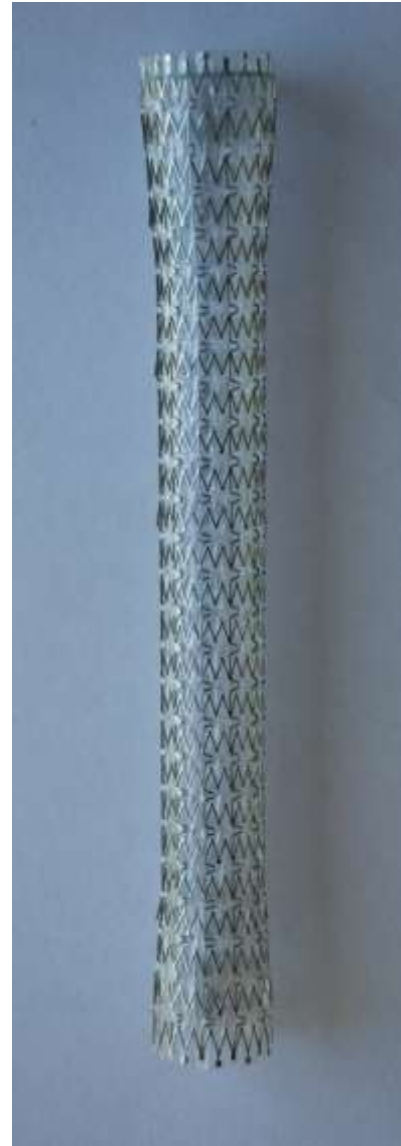
Ultraflex
(BS)

Malignant obstruction – Stent choice mid esophagus



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Mid esophagus Mid esophagus Mid esophagus Mid esophagus Mid esophagus Mid esophagus Mid esophagus



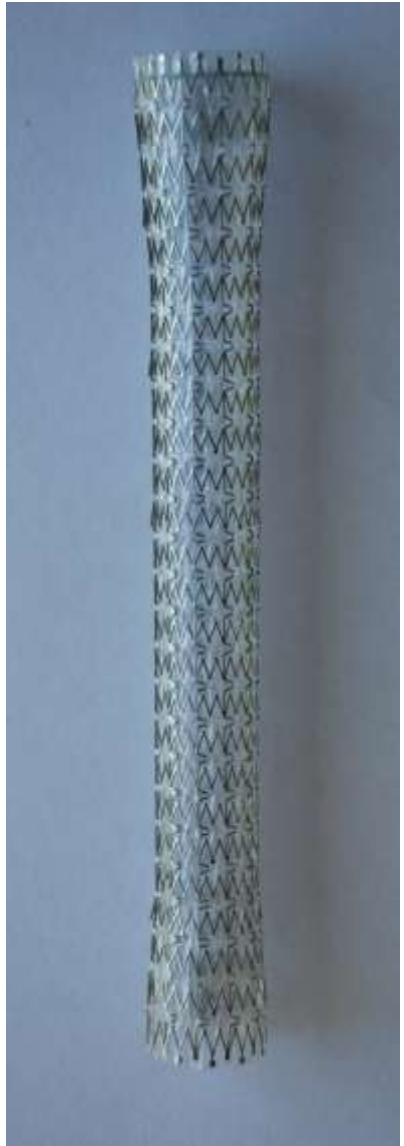






Niti-S (Taewoong) **SX-Ella (Ella CS)** **Alimaxx-E (Merit)** **Polyflex (Boston Scientific)** **Wallflex PC**
Evolution (Cook) **Ultraflex (BS)**

Malignant obstruction – Stent choice mid esophagus










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Mid esophagus	Mid esophagus	Mid esophagus	Mid esophagus	Mid esophagus	Mid esophagus	Mid esophagus
						
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Malignant obstruction – Stent choice mid esophagus



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Mid esophagus	Mid esophagus	Mid esophagus	Mid esophagus	Mid esophagus	Mid esophagus	Mid esophagus
						
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Malignant obstruction – Stent choice mid esophagus



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Mid
esophagus



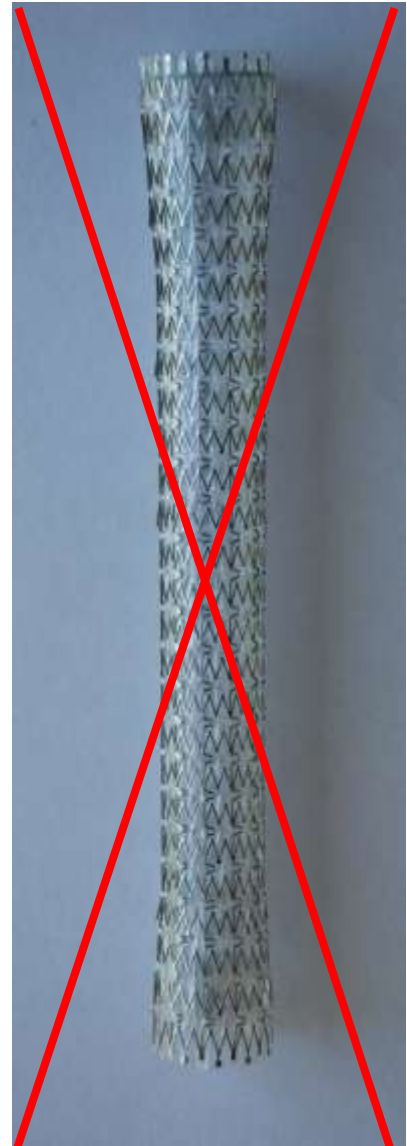
Niti-S
(Taewoong)

Mid
esophagus



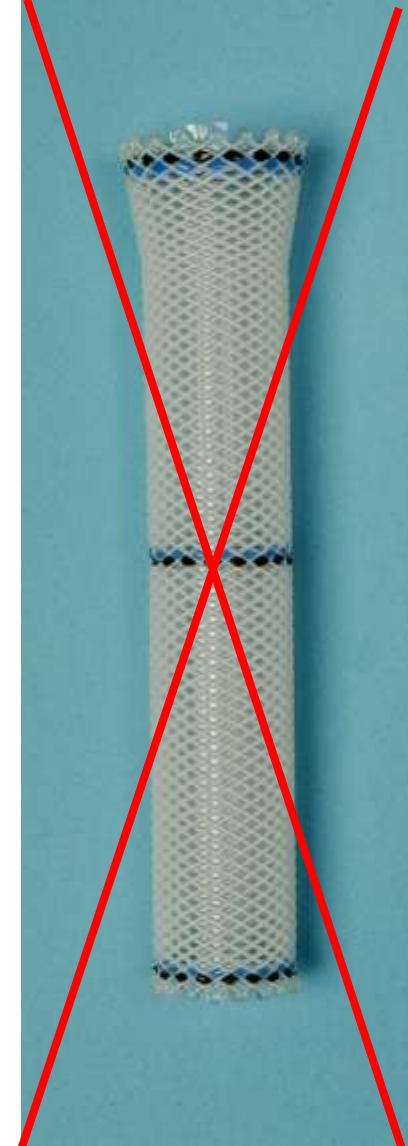
SX-Ella
(Ella CS)

Mid
esophagus



Alimaxx-E
(Merit)

Mid
esophagus



Polyflex
(Boston Scientific)

Mid
esophagus



Wallflex PC

Mid
esophagus



Evolution
(Cook)

Mid
esophagus



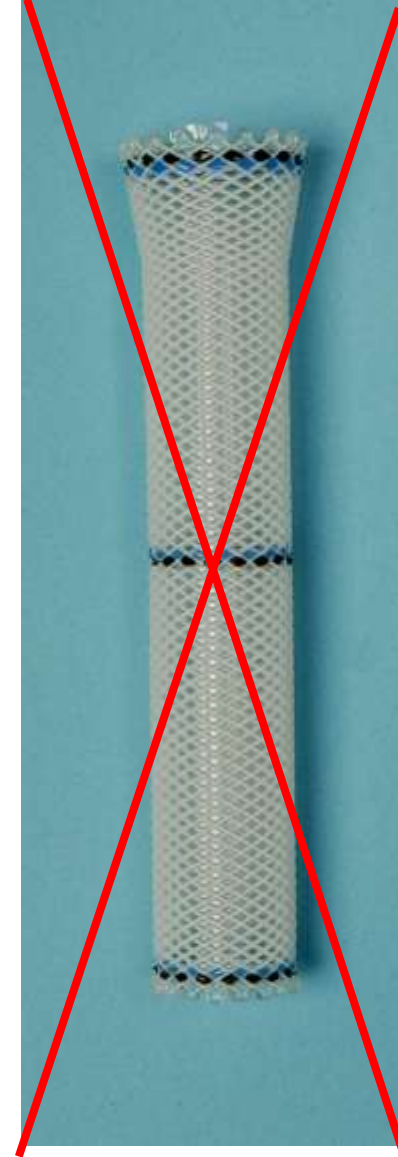
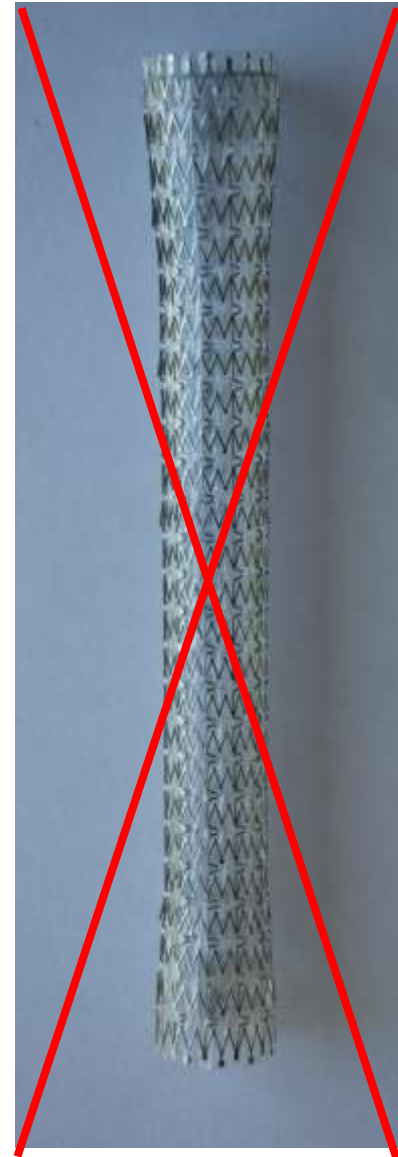
Ultraflex
(BS)

Malignant obstruction – Stent choice mid esophagus



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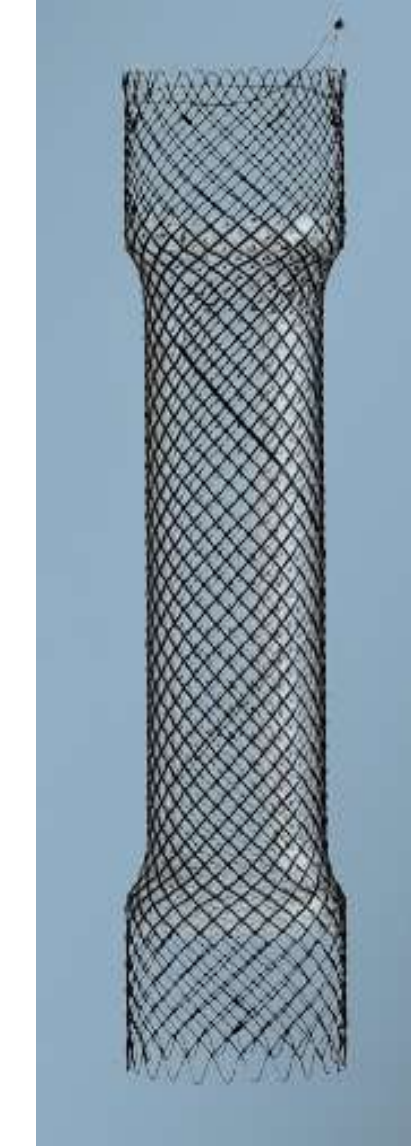
Mid
esophagus



Mid
esophagus



Mid
esophagus



Mid
esophagus



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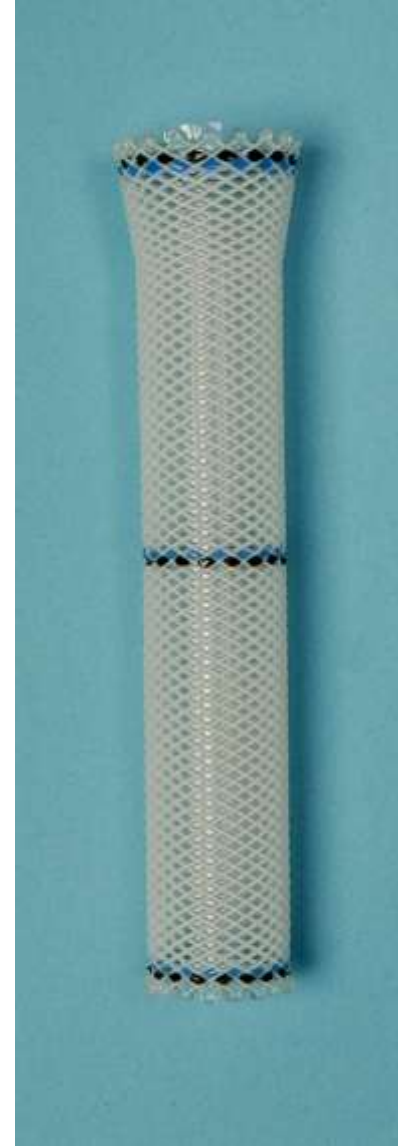
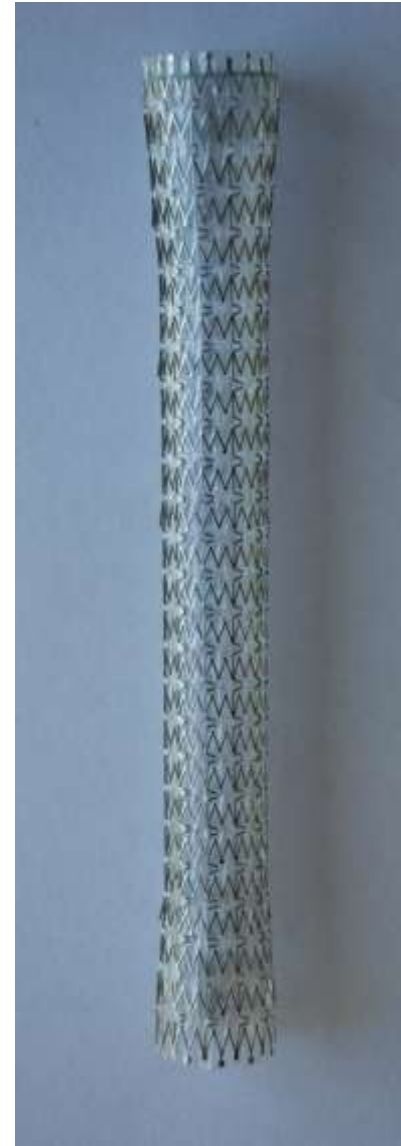
Ultraflex
(BS)

Malignant obstruction – Stent choice across GEJ



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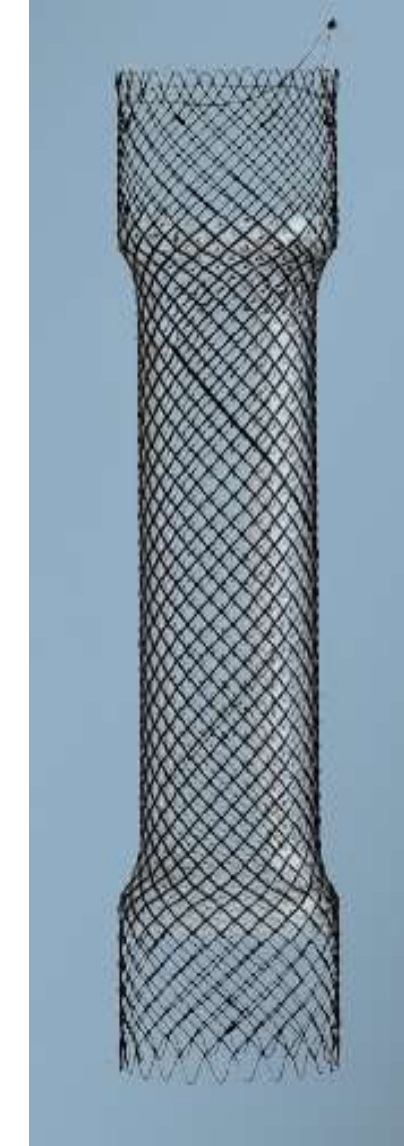
Across GEJ



Across GEJ



Across GEJ



Across GEJ



Niti-S
(Taewoong)

SX-Ella
(Ella CS)

Alimaxx-E
(Merit)

Polyflex
(Boston Scientific)

Wallflex PC

Evolution
(Cook)

Ultraflex
(BS)

Malignant obstruction – Stent choice prox. esophagus

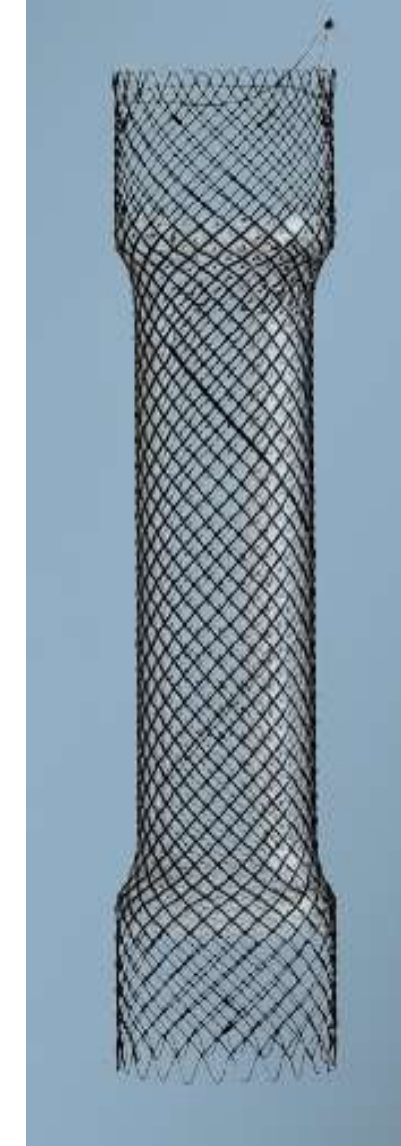
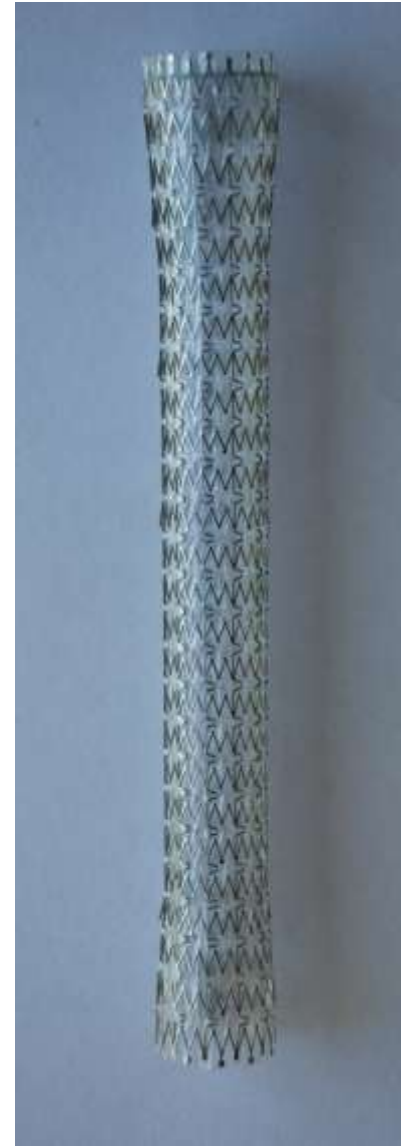


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Proximal
esophagus



Proximal
esophagus



Proximal
esophagus



Niti-S
(Taewoong)

SX-Ella
(Ella CS)

Alimaxx-E
(Merit)

Polyflex
(Boston Scientific)

Wallflex PC

Evolution
(Cook)

Ultraflex
(BS)

Stents for malignant obstruction

Conclusions



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- All stents are safe and effective for the palliation of **malignant dysphagia**
- **Recurrent dysphagia** remains a problem and needs to be reduced
- Stent choice should be based on **indication** (e.g. GEJ, proximal)

Stent choice and placement in the esophagus- Indications



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- Malignant esophageal obstruction
- Benign esophageal stricture

Benign obstruction - Treatment algorithm



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Benign Esophageal Stricture

Peptic stricture

Web/Schatzki's ring

Radiation stricture

Caustic stricture

PDT-induced stricture

Anastomotic stricture

1st STEP

Dilation (Savary-Gilliard or balloon) up to 16-18 mm (≥ 3 sessions)

2nd STEP

3rd STEP

4th STEP

Benign obstruction - Treatment algorithm



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Benign Esophageal Stricture

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1st STEP

Dilation (Savary-Gilliard or balloon) up to 16-18 mm (≥ 3 sessions)

2nd STEP

Dilation combined with 4-quadrant triamcinolone acetate (max. 3 sessions)
and/or
Incisional therapy (max. 3 sessions) for Schatzki's ring/anastomotic stricture

3rd STEP

4th STEP

Benign obstruction - Treatment algorithm



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Benign Esophageal Stricture

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3rd STEP

Stent placement

4th STEP

Benign obstruction – Stent choice



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Fully covered stents

- Niti-S
- Polyflex
- SX-Ella
- Alimaxx-E
- (Evolution)
- (Wallflex)

Benign obstruction – Stent choice



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Fully covered stents

- Niti-S
- Polyflex
- SX-Ella
- Alimaxx-E

Advantage:

- Removable

Disadvantages:

- Stent migration
- Tissue overgrowth
- Stent removal is still indicated

Benign obstruction – Stent choice



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Fully covered stents

- Niti-S
- Polyflex
- SX-Ella
- Alimaxx-E

Biodegradable stents

- Ella BD stent

Benign obstruction – Stent choice



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Fully covered stents

- Niti-S
- Polyflex
- SX-Ella
- Alimaxx-E

Biodegradable stents

- Ella BD stent

Advantages:

- Stent removal not necessary
- No stent migration

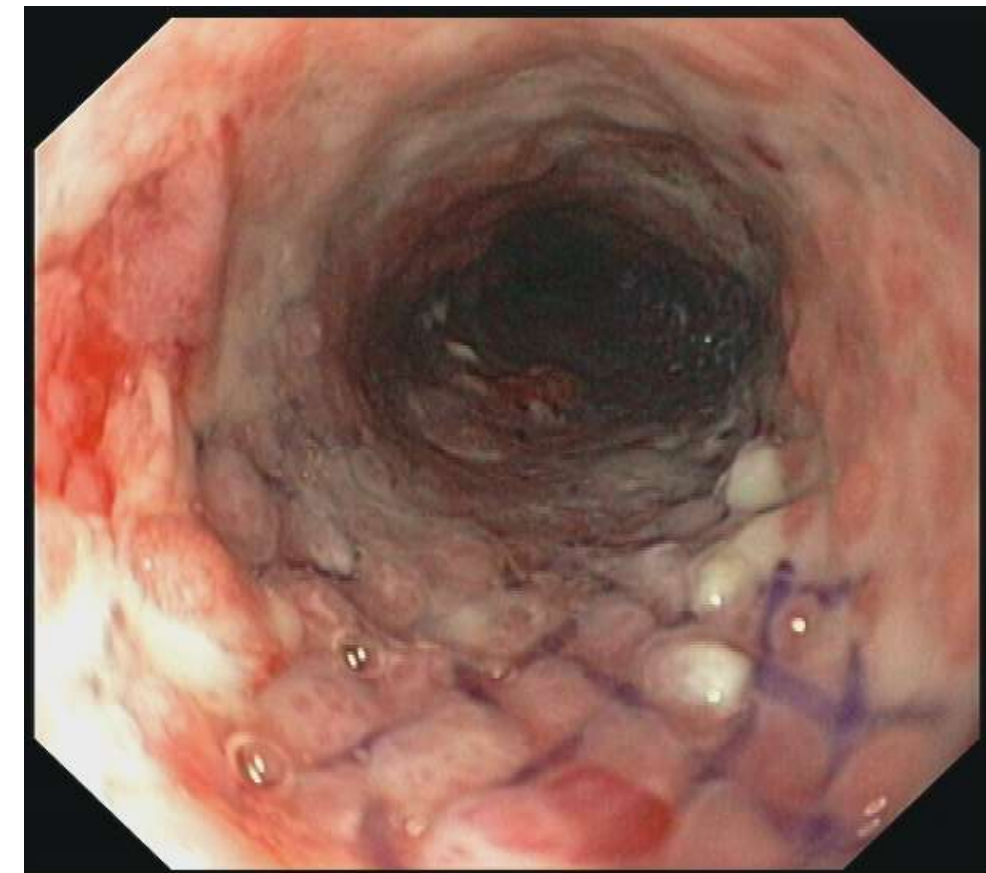
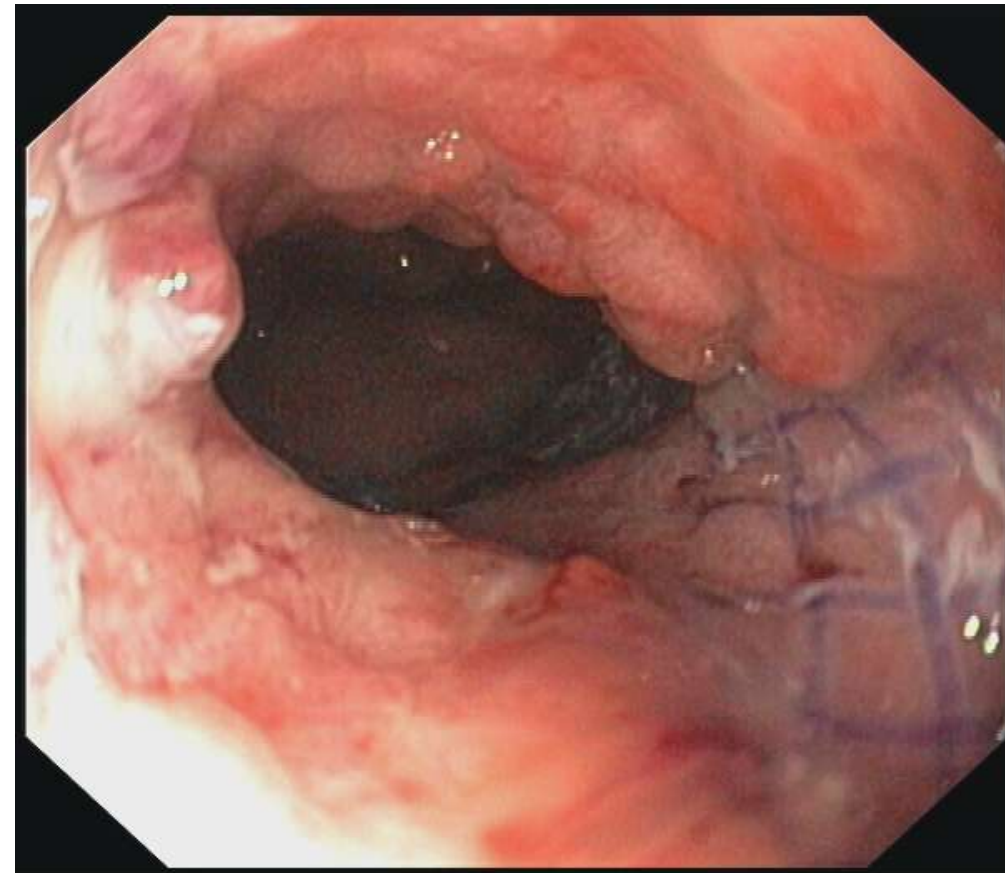
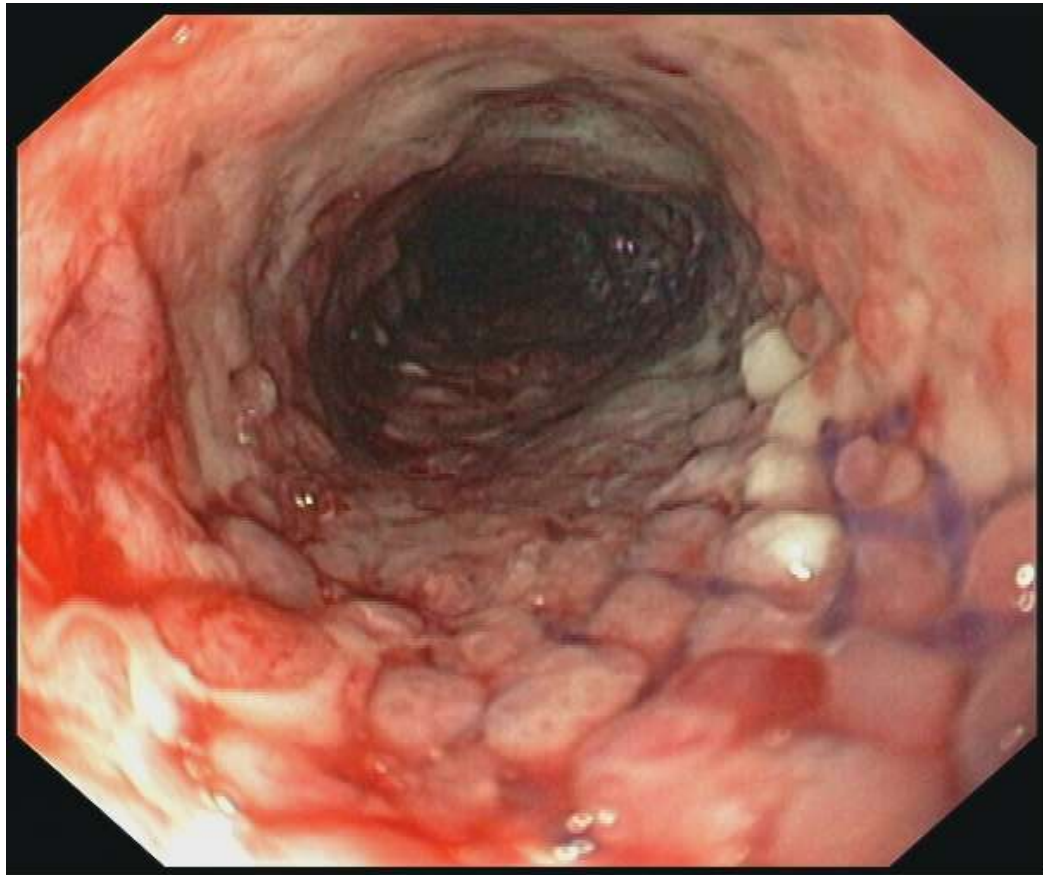
Disadvantages:

- Tissue ingrowth
- Repeat stent placement

Mr. S, 68 yrs



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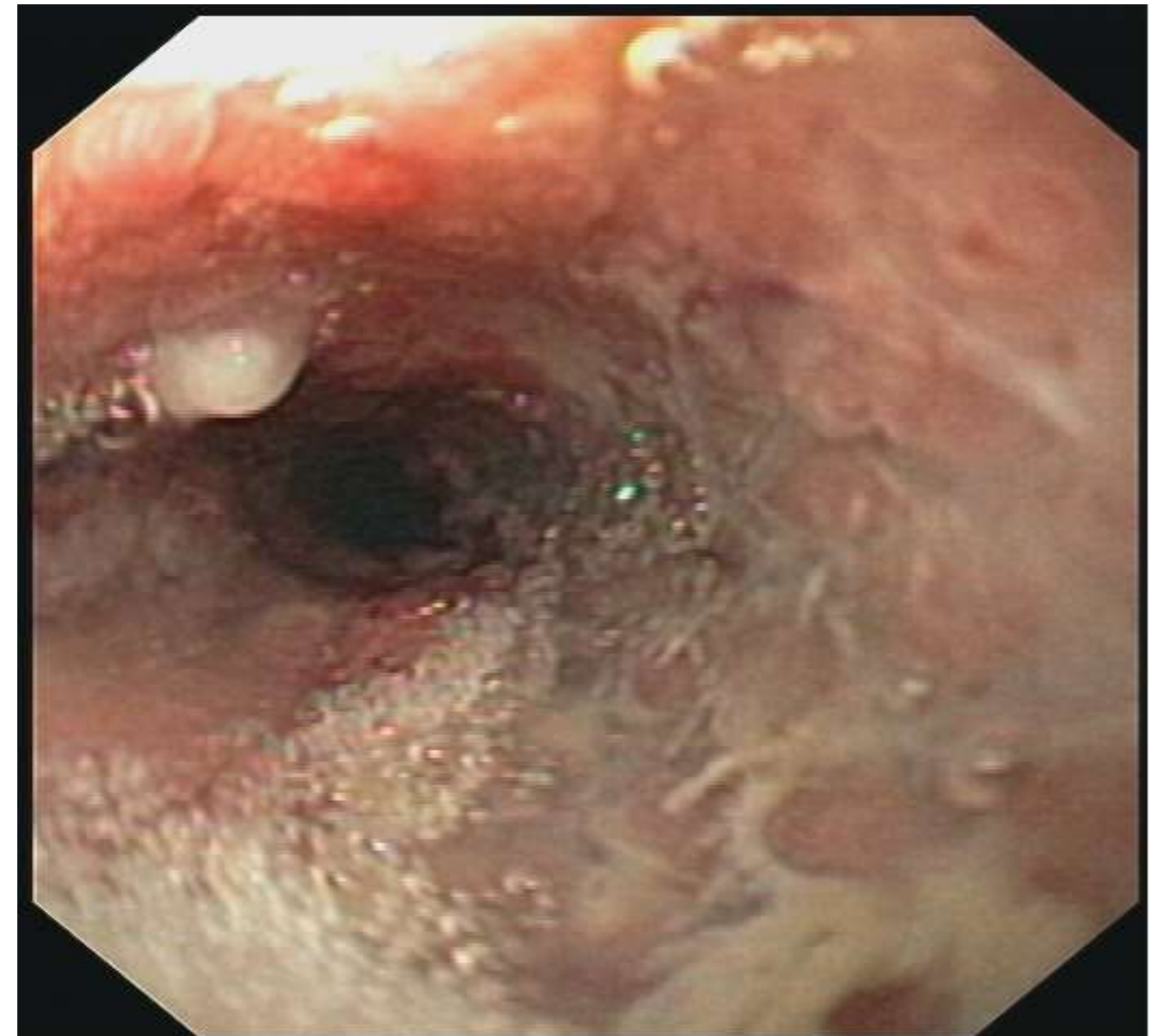
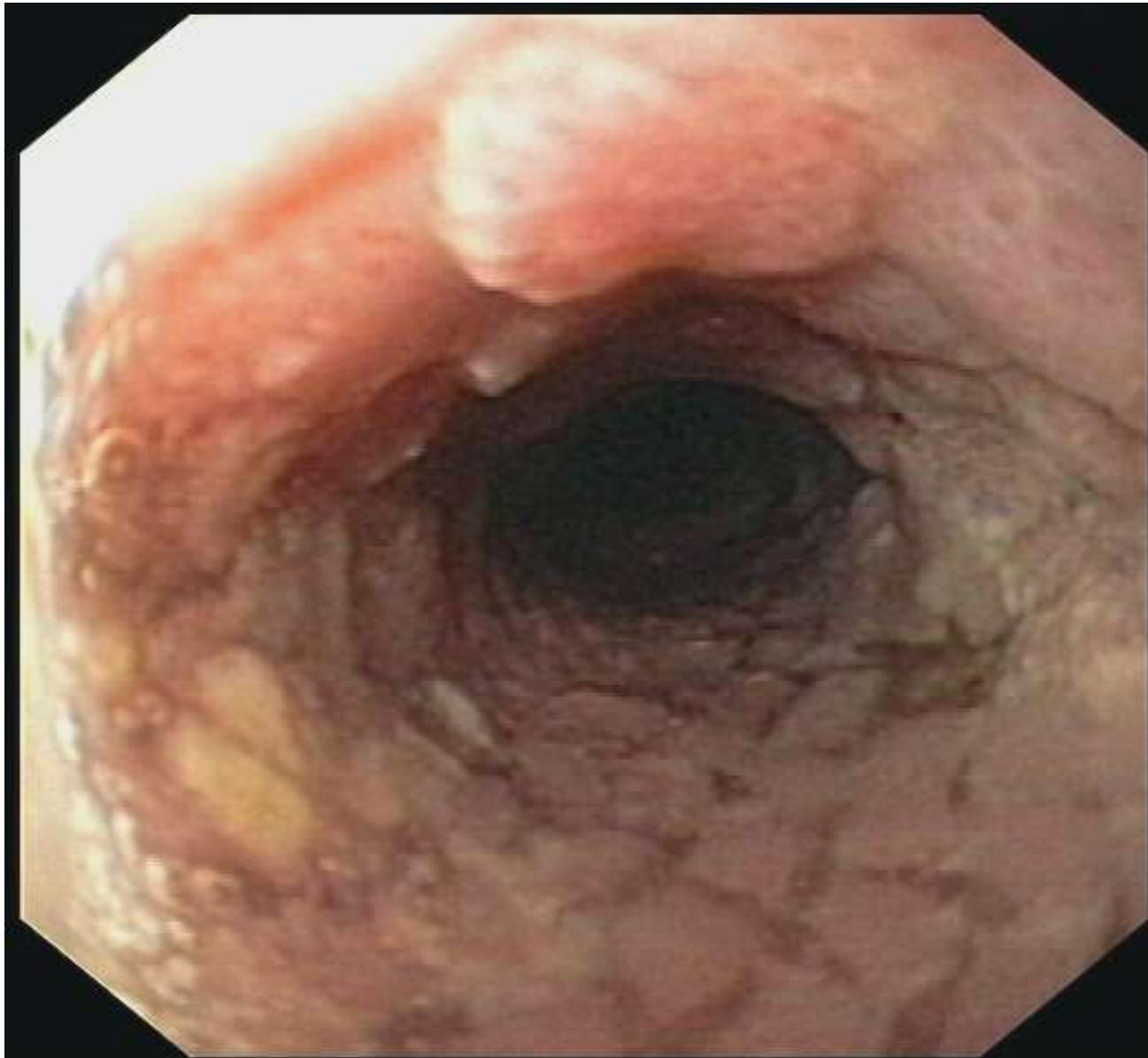


4 weeks after ELLA BD stent placement; dysphagia score: 0

Mr. S, 68 yrs



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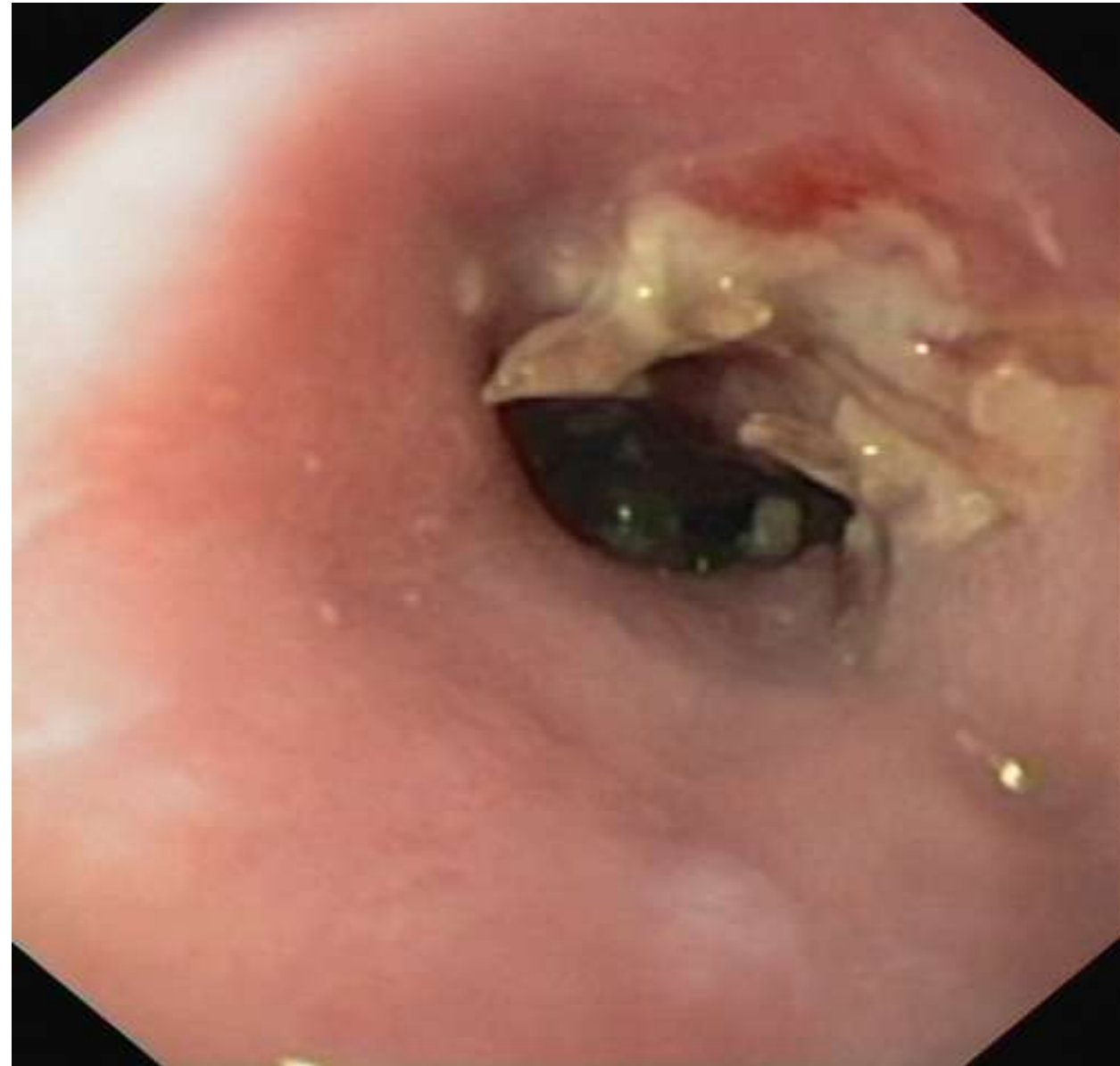


8 weeks after ELLA BD stent placement; dysphagia score: 0

Mr. S, 68 yrs



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16 weeks after ELLA BD stent placement; dysphagia score: 0
Recurrent dysphagia at 20 weeks → 2nd ELLA BD stent

Benign obstruction - Treatment algorithm



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Benign Esophageal Stricture

Peptic stricture Web/Schatzki's ring Radiation stricture Caustic stricture PDT-induced stricture Anastomotic stricture

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Dilation (Savary-Gilliard or balloon) up to 16-18 mm (≥ 3 sessions)

2nd STEP

Dilation combined with 4-quadrant triamcinolone acetate (max. 3 sessions)
and/or
Incisional therapy (max. 3 sessions) for Schatzki's ring/anastomotic stricture

3rd STEP

Stent placement

4th STEP

Self-bougienage (mainly for strictures in the prox. esophagus)
and/or
Surgery

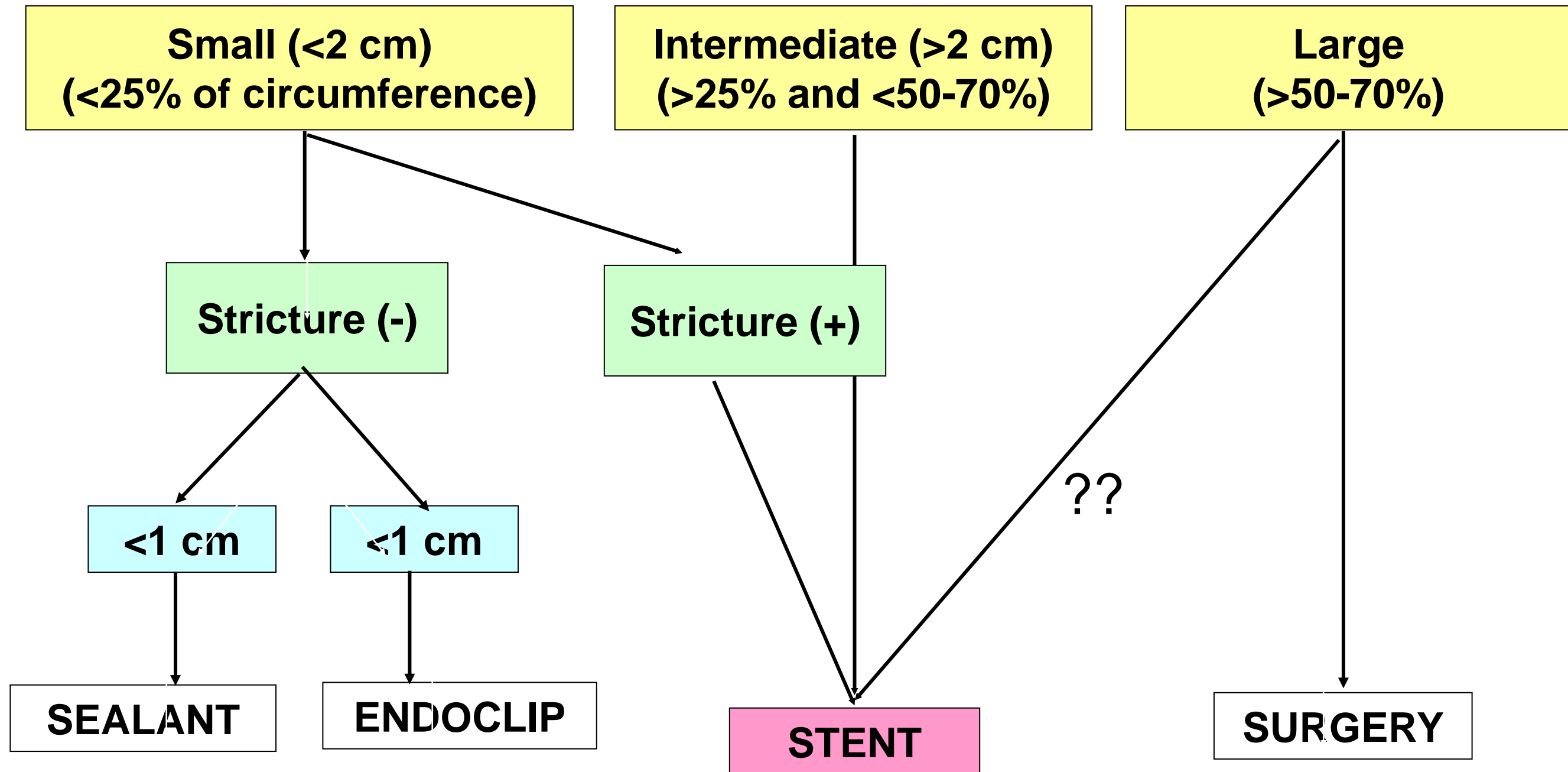
Stent choice and placement in the esophagus- Indications



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- Malignant esophageal obstruction
- Benign esophageal stricture
- Benign esophageal rupture or perforation

Benign rupture - Treatment algorithm



Benign rupture - Stent choice



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Fully covered stents

- Niti-S
- Polyflex
- SX-Ella
- Alimaxx-E
- (Evolution)
- (Wallflex)

Benign rupture - Stent choice



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Fully covered stents

- Niti-S
- Polyflex
- SX-Ella
- Alimaxx-E

Disadvantage:
- Incomplete sealing

Benign rupture - Stent choice



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Fully covered stents

- Niti-S
- Polyflex
- SX-Ella
- Alimaxx-E

Partially covered stents

- Ultraflex
- Evolution
- Wallflex

Benign rupture – Stent choice



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Fully covered stents

- Niti-S
- Polyflex
- SX-Ella
- Alimaxx-E

Partially covered stents

- Ultraflex
- Evolution
- Wallflex

Advantage:

- Complete sealing

Disadvantage:

- Repeat stenting
- Difficult to remove
(stent-in-stent technique)

Benign indications - Protocol for stent placement



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1. Strictures that:

- are caused by ischemic injury,
- present < 6 to 12 months after the injury,
- are > 5 cm

are stented for \geq 8-16 weeks

Benign indications - Protocol for stent placement



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1. Strictures that:

- are caused by ischemic injury,
- present < 6 to 12 months after the injury,
- are > 5 cm

are stented for \geq 8-16 weeks

2. In all other cases, stents are inserted for a shorter period, usually 4-8 weeks

Benign indications - Protocol for stent placement



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1. Strictures that:
 - are caused by ischemic injury,
 - present < 6 to 12 months after the injury,
 - are > 5 cmare stented for $\geq 8-16$ weeks
2. In all other cases, stents are inserted for a shorter period, usually 4-8 weeks
3. When symptoms recur after stent removal, then a second stent is placed

Benign indications - Protocol for stent placement



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4. When partially covered SEMS are used, endoscopy should be performed at **4-week intervals** to visualize embedding of the stent in the esophageal mucosa

Benign indications - Protocol for stent placement



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4. When partially covered SEMS are used, endoscopy should be performed at **4-week intervals** to visualize embedding of the stent in the esophageal mucosa
5. If embedding has occurred, stent removal is performed, and another, preferably **fully covered stent**, is placed

Benign indications - Protocol for stent placement



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4. When partially covered SEMS are used, endoscopy should be performed at **4-week intervals** to visualize embedding of the stent in the esophageal mucosa
5. If embedding has occurred, stent removal is performed, and another, preferably **fully covered stent**, is placed
6. Because fully covered SEMS also carry a risk of hyperplastic tissue overgrowth, periodic endoscopy **at 6-week intervals** is recommended

Stent placement - Future



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Malignant esophageal strictures:

- (New design) biodegradable stents (covered)
- Stents *plus*
 - radiation therapy (brachytherapy)
 - chemotherapy
- Bridge-to-Surgery (?)

Stent placement - Future



Malignant esophageal strictures:

- (New design) biodegradable stents (covered)
- Stents *plus*
 - radiation therapy (brachytherapy)
 - chemotherapy
- Bridge-to-Surgery (?)

Benign esophageal strictures or ruptures:

- (New design) biodegradable stents (covered)
- Non-traumatic, flexible nitinol stents



Gevraagd: 2 MDL-artsen

De afd. MDL van het UMC Utrecht zoekt op korte termijn 2 MDL-artsen

Speerpunten van de afdeling zijn: oncologie, geavanceerde endoscopie, hepatologie (m.n. HCC en levertumoren) en IBD

Functiebeschrijving:

Als staflid houdt men zich o.a. bezig met aan speerpunten gerelateerde patiëntenzorg, (translationeel) wetenschappelijk onderzoek en opleiding van 10 a.s. MDL-artsen en studenten

Collega's die binnenkort hun opleiding voltooien worden eveneens uitgenodigd om te solliciteren.