

Esophageal Stents: Placement, Complications, Tips, and Tricks



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Abstract

Esophageal stents are widely used to treat a variety of problems, most commonly malignant dysphagia. Malignant dysphagia can be present in patients with unresectable, resectable, and potentially resectable cancer. Esophageal stents are also utilized to treat esophageal strictures, fistulas, perforations, and leaks. Stent placement usually requires both endoscopic and fluoroscopic guidances, but can be done with either modality safely. Most stents are placed distally and across the gastroesophageal junction, but proximal stent placement (which requires more precise placement) can also be performed. Complications include bleeding and perforation (which are rare) as well as migration, tumor overgrowth, and tumor ingrowth (which are more common). The techniques of placement of an esophageal stent with some tips and tricks regarding placement and management of complications are reviewed in the given video. This article is part of an expert video encyclopedia.

Keywords

Complications; Dysphagia; Esophageal cancer; Esophageal stent; Migration; Standard endoscopy; Video.

Video Related to this Article

Video available to view or download at [doi:10.1016/S2212-0971\(13\)70030-X](https://doi.org/10.1016/S2212-0971(13)70030-X)

Materials

- Upper endoscope.
- Guide wires.
- Straight biliary catheters.
- Fluoroscopy.
- Esophageal stents.

Background and Endoscopic Procedures

In general, adequate stent deployment involves placing the stent across the site of the obstruction (generally a tumor in patients with malignant dysphagia) with at least 1 cm of the stent positioned above below the stricture; some very proximal stents require a more precise placement of the proximal end of the stent, as shown in the video.

Some physicians like to mark the proximal and distal ends of the tumor with contrast injections or endoscopic clips, or use external fluoroscopic markers, such as coins, paper clips, or other metallic objects. These can all be helpful during stent placement as they clearly delineate the proximal and distal ends of the tumor. The use of these proximal and distal markers should be considered optional, and many physicians prefer to use contrast injection alone to delineate the stricture more clearly, or fluoroscopic markers, such as the position of

the endoscope when it is located at the proximal and distal ends of the tumor when deciding on stent length and to guide stent placement.

- Most stents are placed for malignant dysphagia, but benign indications exist.

Key Learning Points/Tips and Tricks

In general, dilation of a stricture before placing the stent is not required. Dilation of the stricture, especially a malignant stricture, is more likely to increase the risk of perforation than it is to assist with stent deployment in any meaningful way. A variety of guide wires can be used for esophageal stent placement. There is no standard guide wire. Some physicians like a soft and floppy guide wire that can easily traverse strictures. Other physicians like a very stiff wire (such as a Savary wire). Guide wire choice is best individualized to the patient's overall situation.

Once the stricture in question has been adequately delineated and guide wire access through the entire length of the stricture has been obtained, the stent is advanced across the stricture and deployed. Stents can be deployed under fluoroscopic guidance, endoscopic guidance, or a combination of the two. Stent deployment can be performed with the physician directly operating the deployment catheter to control the stepwise release of the prosthesis, or the actual deployment can be controlled by an assistant/technician while the physician holds the delivery catheter itself and makes fine adjustments to the stent position during deployment. Both of these techniques tend to result in excellent stent placement. Some currently available stents can be reconstrained once stent deployment has begun; this allows sub-optimal positions or deployments to be abandoned via reconstraining the stent.

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It is important to remember that complete stent deployment may not occur immediately. It often takes 48–72 h for complete stent deployment to take place. Some currently available stents may leave the lumen very narrow following deployment, yet will provide excellent relief from dysphagia after the stent fully expands. Once the stent is in place, it is generally not necessary to do a thorough endoscopic evaluation of the entire stent. If this is performed, it may increase the risk of stent migration. Nonetheless, in some patients, a full evaluation of the stent following appointment is required and, if performed gently, is usually safe.

- Stent placement should be precise.
- Stent position can be adjusted during deployment.
- Use of guide wires and fluoroscopy is extremely helpful during deployment.
- Stent expansion may take time to fully develop after deployment.

Complications and Risk Factors

Immediate complications of stent placement include pain, bleeding, and perforation. Pain can be absent to severe, and tends to abate over a period of one week. If pain is protracted and/or severe, the stent can be endoscopically removed in most cases. Bleeding is often mild and subclinical. Perforation is also uncommon. Gastroesophageal reflux disease (GERD) may develop if the stent is placed across the gastroesophageal junction. Delayed complications are much more common. Delayed complications include stent migration (which is much more common in the era of fully covered stents) as well as tumor ingrowth, tumor overgrowth, delayed bleeding, and delayed perforation. In general, migration, tumor ingrowth, and tumor overgrowth are the most commonly seen delayed complications. There is ongoing debate about whether chemotherapy and/or radiation therapy increases the risk of complications in patients receiving esophageal stents. Older literature supports the notion that chemotherapy and/or radiation therapy increases the risk of complications; newer literature tends not to see this association.

In the current era of fully covered esophageal stents, many patients receive stents before neoadjuvant therapy. Stents placed in this context have a very high rate of migration, approaching 50%. Migration in this context may not necessarily be viewed as a complication as it may reflect tumor response to neoadjuvant therapy. Patients who migrate an esophageal stent into their stomach following neoadjuvant therapy can have the stent removed endoscopically. Alternatively, patients who undergo esophagectomy can have the stent removed, either from the esophagus or the stomach, by the surgeon at the time of surgery.

- Complications include bleeding, pain, migration, GERD, tumor overgrowth, tumor ingrowth, and perforation.

Alternatives

Alternatives to esophageal stents include nasal enteric tubes, gastrostomy tubes, and jejunostomy tubes. Total parenteral nutrition can also be used in patients who are not candidates for stent placement.

Scripted Voiceover

<i>Time (min:sec)</i>	<i>Voiceover text</i>
00:01-:16	Esophageal stents are commonly utilized for a variety of purposes and in modern clinical practice.
00:20-:28	The most common indications for the treatment of malignant dysphasia, stents can be placed in preoperative and non-operative candidates.
00:31-:36	Other indications include the treatment of benign esophageal strictures, fistulas, and leaks.
00:41-:45	The representative stent deployment will now be shown focusing on the endoscopic view.
00:46-:58	The patient in this case has a very proximal esophageal cancer. There is complete obstruction of the esophagus and the endoscope cannot pass into the distal esophagus or the stomach.
00:59-1:09	The guidewire in this case, a straight biliary guidewire through a straight biliary catheter is advanced through the tumor and access is obtained to the distal esophagus and stomach.
1:10-1:23	The stent is then advanced over the wire and deployed. Because the tumor is very proximal in this patient, an effort is made to overlap the proximal end of the stent to the very proximal end of the tumor as much as possible.
1:28-1:34	After stent deployment the delivery catheter and associated guidewire can be removed from the patient.
1:38-1:44	The stent can then be inspected for position, patency, and signs of any immediate complications.
1:48-1:56	You can see the stent is in excellent position; tumor is visible through the stent entrance. The stent is widely patent.
2:02-2:45	Representative stent deployment will now be shown emphasizing the fluoroscopic view. In this patient the endoscope could be advanced through the tumor to the distal portion of the mass into the gastric cardia. This position is marked endoscopically with an image. The endoscope is then withdrawn to the proximal aspect of the tumor and an image is also obtained. Thus, the distal and the proximal end of the stricture are then clearly marked. A wire, in this case a savory wire, is advanced through the tumor and into the stomach and the endoscope is removed over the wire. The stent, in this case a fully covered stent, is advanced across the stricture, the distal most portion of the stent, below the bottom of the tumor.
2:48-2:58	Final adjustments are made, deployment is allowed to commence. In this patient, the stent is deployed in a distal proximal manner as is most commonly performed.

3:03–3:15	The stent is fully deployed, clearly bridging the entire tumor. The delivery catheter and its guidewire are then removed from the patient and the stent is left in place bridging the entire tumor.	sign of response to neoadjuvant therapy. Stent migration is unfortunately a common development following deployment, especially with fully covered stents. Most migrations can be managed endoscopically.
3:20–3:25	Endoscopic inspection following deployment usually reveals a fully deployed and well placed stent.	6:09–7:08
3:29–3:44	Here you see a fully covered stent in good position across a tumor; tumor is visible through the stent. Through and through endoscopic evaluation of the stent is not required post deployment, but can be performed if desired. Here you see a retroflex view of a distal stent.	This video illustrates complete migration of an esophageal stent into the gastric cardia. The stent is grasped by rat tooth forceps around the proximal retrieval string if possible. The stent is then withdrawn through the tumor and the esophagus with the rat tooth forceps. Note here that when the endoscope is removed from the patient, the stent has come off the rat tooth forceps. The rat tooth forceps have been withdrawn back into the endoscope and the patient is reintubated. The stent is located just below the level of upper esophageal sphincter. The endoscope passes into the proximal esophagus. The stent is grasped, again with the rat tooth forceps, by the retrieval string and removed from the patient. Other complications including tumor ingrowth and overgrowth can be treated by stent within stent placement. Perforations are rare, but can often be managed by other stent placements.
3:46–4:05	Endoscope is then straightened and removed through the stent. Distal portion of the stent is in good position in the gastric cardia. The stent is patent without signs of complication or other difficulties, and the proximal end of the stent is above the proximal end of the tumor.	
4:13–4:31	If clinically indicated, a stent can be placed in the very proximal esophagus. This requires very precise placement by the endoscopist. Here you see a fully covered stent placed immediately below the upper esophageal sphincter, and a patient with a very proximal cancer. This patient tolerated the stent well.	
4:35–4:44	Complications can occur. In this case, you see an infolded stent immediately after deployment.	
4:48–5:23	Infolding can occur due to poor placement, incorrect stent size, or may be a sign of a noncompliant tumor. The stent can be left in place, removed or manually adjusted to allow complete expansion. Stent placement can be adjusted following deployment as needed. A rat tooth forceps allows for rapid and efficient stent adjustment in most cases. This video shows the use of a rat tooth forceps to proximally adjust the position to fully cover an esophageal stent. The stent is moved approximately for a distance of 2 cm.	
5:25–5:38	When the stent is felt to be in adequate position, the rat tooth forceps release the stent and the position can be directly assessed endoscopically. If satisfactory, no other adjustment is required.	
5:48–6:05	Some stent migrations are associated with recurrent dysphagia and warrant stent replacement. At other times stent migration is a	

Further Reading

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