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Stent insertion for malignant esophageal strictures: endoscopy with fluoroscopy or endoscopy alone

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Dysphagia is a debilitating consequence for patients with esophageal cancer. Recanalization of the obstruction with esophageal stents is one of the palliative measures that can most improve the quality of life in these patients.

Among patients with dysphagia due to obstructing esophageal cancer, stent insertion has a high technical success (>98%) with clinical success observed in 80% to 90% of cases with rapid relief of dysphagia (1).

Esophageal cancers may induce also tracheoesophageal fistula or free perforation.

For some time now, most stents used for obstructing esophageal cancer are self-expanding metal stents (SEMS). They are inserted with a much smaller diameter

than they will have once fully deployed. This allows them to traverse very severe strictures without usually requiring prior dilation. And if dilation is necessary, it is to a small diameter with little risk of tumor perforation.

The esophagus is a relatively straight tubular organ, measuring approximately 25 cm in length. Being close to the mouth, it is very accessible. In fact, during upper GI endoscopy, the upper esophageal sphincter, is usually located about 15 cm from the incisors. Once the esophagus is reached, there are fewer angulations that can make stent insertion difficult, such as in the sigmoid colon or duodenum.

Interventional radiologists typically insert esophageal stents under fluoroscopic guidance only (2), whereas endoscopists insert them exclusively under endoscopic monitoring (3) or by endoscopy and fluoroscopy (4).

This issue of the Spanish Journal of Gastroenterology publishes the study by Relvas et al. (5) that compares the results of endoscopic and fluoroscopic stent insertion in obstructive esophageal tumors. Since the study originates from a gastroenterology department, it may be understood that the fluoroscopy-only insertion group is actually a mixed group, i.e., endoscopic insertion with fluoroscopic guidance.

One reason the authors mention for not using fluoroscopy, is that it requires specific infrastructure that may not be available in all settings. The difficulty the endoscopists encounter in using proper radiological facilities is probably the main reason for not employing fluoroscopy in esophageal stenting. This is the reason given, for instance, by Austin et al. (3) and White et al. (6) in their respective studies dealing with this topic.

Endoscopists sometimes encounter extreme difficulties in using radiological facilities, even with endoscopic retrograde cholangiopancreatography (ERCP), where fluoroscopy is mandatory in most cases.

Some time ago, someone jokingly said that the true meaning of ERCP was “Endoscopy and Radiology Conflict Permanent”.

Proper placement of a guidewire beyond the esophageal stricture is often the first and most critical step in esophageal stenting, as it is in all stenting procedures in the gastrointestinal tract and biliary tree (7). The undeployed stent is then slid over the

guidewire.

Fluoroscopy offers a high degree of certainty that the guidewire has successfully passed through the stenosis, but it is generally assumed that it is not necessary for esophageal stent placement if the stenosis can be passed through with an endoscope. (1). Therefore, when radiology is unavailable, several endoscopic methods can be employed. There are several models of ultrathin endoscopes that have a maximum external diameter of 6 mm or less and can traverse many malignant strictures. Once the tumor has been traversed, a guidewire can be left in the stomach through the endoscope's working channel.

It is very useful to cross the esophageal stricture with an ERCP guidewire pre-inserted in the working channel of the ultrathin endoscope.. First, the stricture is cannulated with the guidewire and then the endoscope is passed over it. When the ultrathin endoscope has reached the stomach, the ERCP guidewire can be exchanged for a stiffer one.

Upon withdrawing the endoscope, the stricture should be characterized: diameter, length, angulation, proximal and distal aspects (1). Its proximity to the cardia or to the upper esophageal sphincter should also be evaluated. This will allow to select the length and model of stent. For example, if the neoplasm is at the cardia, the distal end of the stent will be placed in the gastric cavity. The stent should be very flexible and without excessive stiffness, otherwise it will not adapt well to the angle between the esophagus and the stomach and will migrate easily.

If a through-the-scope stent (TTS) is chosen, the guidewire can be backloaded into a therapeutic endoscope to allow insertion of the stent through its working channel. On the contrary, when over-the-wire stents are chosen, stent deployment can be monitored using the ultrathin gastroscope placed side-to-side. If the undeployed stent has a soft shaft (like the Ultraflex®), with a tendency to bend once the tumoral stricture is encountered, the endoscope may provide more stiffness to prevent crooking and allow the endoprosthesis to traverse the stricture without the need of previous dilation (figure 1).

It is not uncommon for the stricture to be so severe that it cannot be traversed even with an ultrathin endoscope. If fluoroscopy is unavailable, the tumor usually has

an orifice can be probed with a very thin guidewire, such as those used in ERCP. 0.025-inch or 0.035-inch guidewires with a hydrophilic tip can be used. These guidewires are very unlikely to cause any perforation.

It can be assumed that the guidewire passed "blindly", that is, without knowing its real situation by fluoroscopy, has successfully traversed the malignant stricture by the endoscopist's tactile sensation, as in ERCP cannulation, and because the guidewire does not rotate backward in the endoscopic view.

Once the guidewire has passed freely beyond the tumor, an ERCP catheter can be inserted over it, allowing the thin guidewire to be replaced with a more rigid one, over which the undeployed stent can slide.

A biliary dilator can also be passed over the ERCP guidewire and dilate the stricture up to 8 mm. This small dilatation is generally safe. 8 mm (2 mm more than the outer diameter of the ultrathin endoscope) is usually done in safety, for instance, in the common bile duct. Balloon dilation of the malignant stricture to 11 mm has been reported without apparent complications (8). However, it is of paramount importance to ensure that the guidewire passed blindly through the tumor has successfully traversed the stricture. In the study by Relvas et al. (5), dilation was required prior to SEMS placement in 12 patients (11.7%), due to inability to pass the stricture with the endoscope.

The dilation balloon does not fit into the working channel of the ultrathin endoscope. A conventional gastroscope should be used and then replaced with the ultrathin endoscope and try to traverse the dilated stricture

Another important aspect for stent inserion in the esophagus is to measure the distance from the tumor to the sphincters.

The cervical esophagus extends from the cricopharyngeus, about 15 cm from the incisors, to the sternal notch about 20 cm. The upper and middle thoracic esophagus extends from 20 to 30 cm, and the lower thoracic esophagus extends from 30 cm to the gastroesophageal junction (cardia) about 40 cm from the incisors.

Relvas et al. (5) found tumors in the lower esophagus/cardia in 47.6% of occasions, followed by the mid-esophagus (37.8%) and the upper esophagus (14.6%).

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The mid-esophagus is perhaps the easiest site for esophageal stenting. The upper and lower ends of the stent typically do not contact the sphincters and the segment is usually relatively straight.

Relvas et al. (5) had 5.8% of malposition/migration in stents placed near the gastroesophageal junction. Aspiration pneumonia occurred only in one patient and perhaps was related to stent in the cervical esophagus. Stent insertion in this area requires very fine adjustments and endoscopic vision is important. Stent deployment can be also monitored with an ultrathin endoscope inserted nasally.

The most frequent complication found by Relvas et al. (5) were chest pain (40.7%) and vomiting (22.3%). This was perhaps related with stent diameter and radial expansion force. In most cases, a diameter of 18 mm is usually sufficient to alleviate dysphagia. In the cervical esophagus, smaller diameters and special designs may be necessary to avoid foreign body sensation and other discomfort (figure 2).

Endoscopists know how to insert esophageal and even colonic stents (9) without fluoroscopy,. The study by Relvas et al. (5) confirms that insertion with only endoscopic control has similar results to when fluoroscopy is also used. But despite our sophistication and imagination in overcoming the lack of radiological facilities, fluoroscopy provides reassurance that things are going well during the procedure that is almost impossible to equal using other methods (7). Relvas et al. (5) also recognized that in specific clinical scenarios such as complex strictures or altered anatomy, fluoroscopy was intentionally selected. As a result, some degree of confounding by indication may have occurred in their study.

Our advice is that it is always best to use endoscopy and fluoroscopy for stent insertion in malignant esophageal strictures. When appropriate radiological equipment is unavailable, there is already extensive scientific literature, such as the study we discussed, that supports exclusively endoscopic insertion of esophageal stents. However, it must be kept in mind that the endoscopist assumes greater risks. This fact should be made known to patients and healthcare providers.

Furthermore, we expect that endoscopists will have their own high-quality radiology facilities, like those available to interventional cardiologists.

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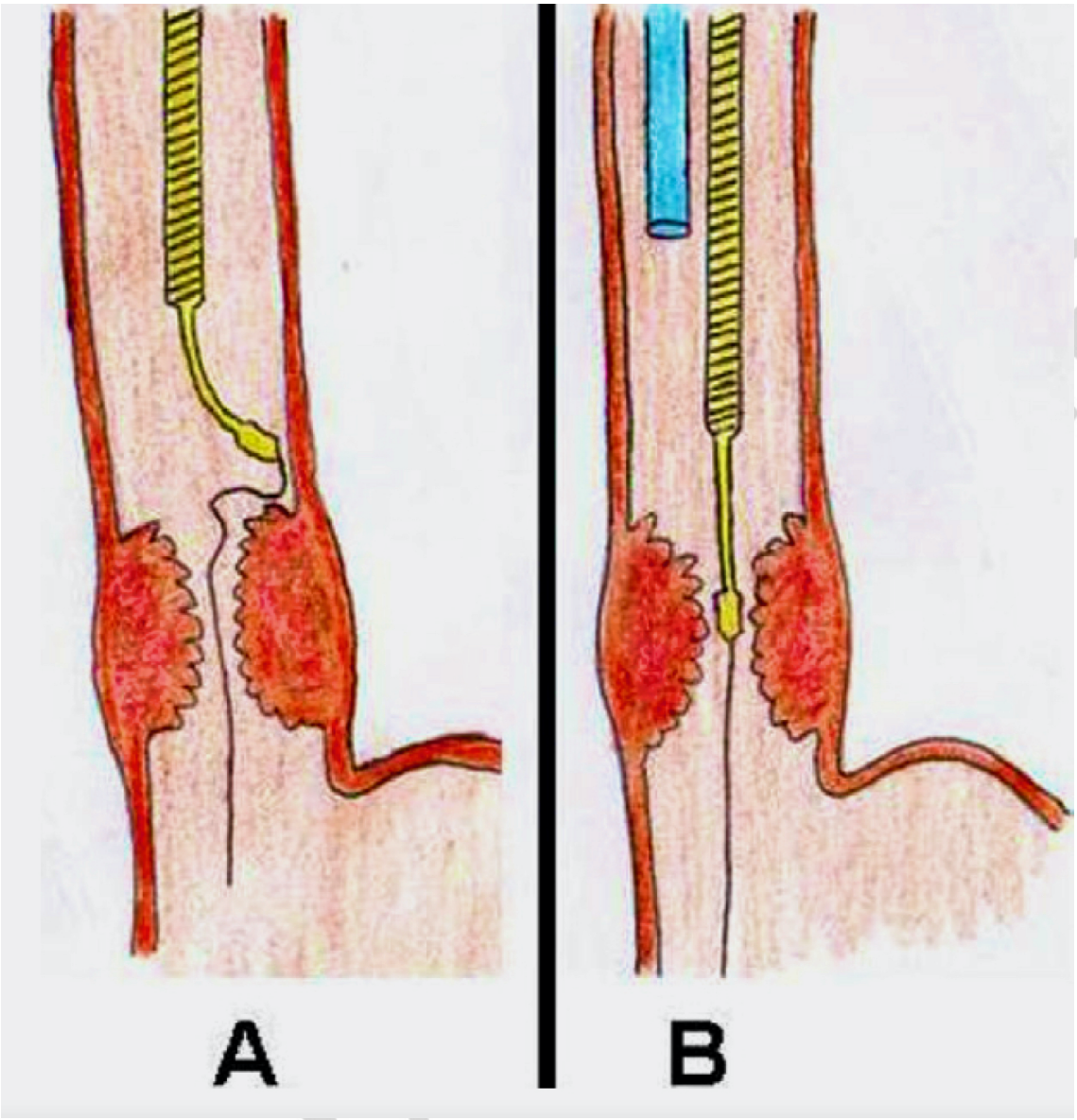

Figure 1. A) The soft shaft of the undeployed stent is unable to traverse the stricture although it is glided over a guidewire. B) The ultrathin endoscope is placed side-to-side providing stiffness to the system and allowing the stent to cross the tumor.

(From García-Cano J, Bermejo-Saiz E. Endoscopic insertion of esophageal self-expanding metal stents to palliate malignant dysphagia without fluoroscopy. Gastrointest Endosc 2013;77 (5S): AB349).

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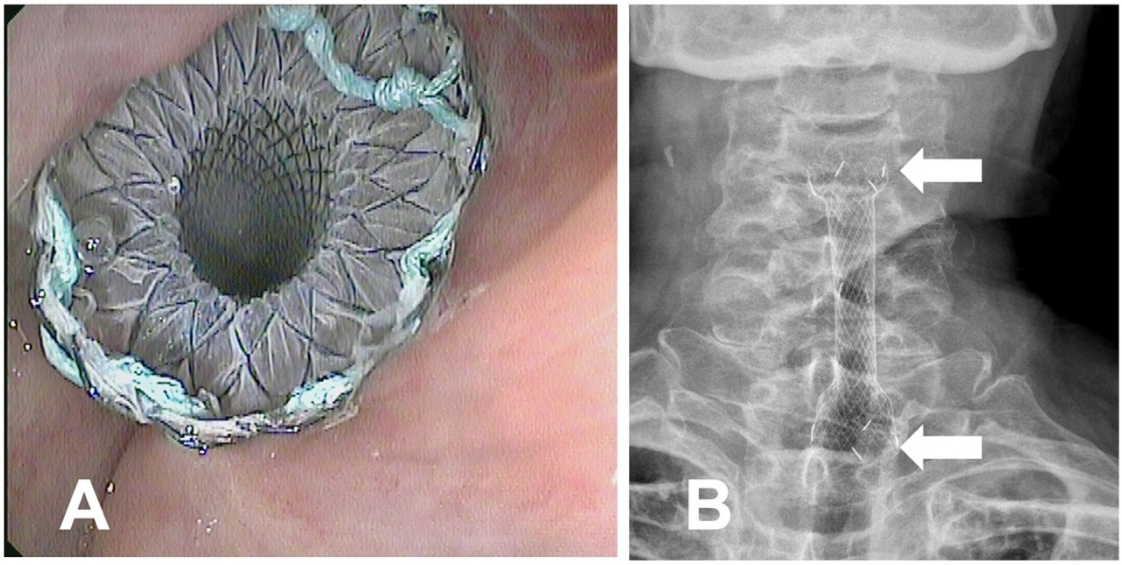

Figure 2. A) Insertion of a 16 mm wide, 6 cm long, fully covered, self-expanding metal stent (Niti-S cervical stent) into a malignant stricture in the cervical esophagus. B) X-ray of the cervical spine showing the stent after insertion