

Step-by-step approach to endoscopic gastroplasty by a novel single-channel endoscopic suturing system



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Endoscopic gastroplasty (EG) reduces gastric volume by use of a series of full-thickness internal plications and mimics the surgical sleeve gastrectomy.¹ EG with use of the Overstitch device (Apollo Endosurgery, Austin, Tex, USA) is shown to be safe and effective in achieving weight loss.^{2,3} However, the device has certain limitations: (1) it requires a dual-channel endoscope, which is not widely available; (2) the endoscope is stiff and less maneuverable; (3) the field of vision gets impaired when the device is mounted; and (4) the suction ability decreases with the accessories in the working channel. Recently, a novel single-channel endoscopic suturing device was designed to overcome these limitations and ease the performance of full-thickness suturing. We describe the technique of EG with the novel single-channel suturing system, and we provide tips for successful gastroplasty (Video 1, available online at www.VideoGIE.org).

The single-channel endoscopic suturing system (Overstitch Sx; Apollo Endosurgery) can be mounted on most flexible endoscopes with a diameter ranging from 8.8 to

9.8 mm (Fig. 1). It has an external catheter sheath, which has 2 separate working channels independent of the scope channel and can be used to operate the overstitch accessories (anchor exchange, tissue helix, suture cinch). The needle-driver assembly is fixed at the side of the distal scope end and does not interfere with the field of view. Unlike the conventional device, the tissue helix, when introduced through the working channel, appears at the central axis of the needle-driver assembly, which enables easy alignment of the tissue for suturing without the need for complex endoscope maneuvering. The longer distal length of the suturing system allows capturing a large amount of tissue with the full-thickness bites.

For successful EG, here are some tips and tricks. We perform the procedure with the patient in the left lateral position and under general anesthesia. We inspect the stomach for the presence of adverse pathologic conditions before performing gastroplasty.⁴ We administer antibiotics before the procedure and use CO₂ insufflation and water-jet function.

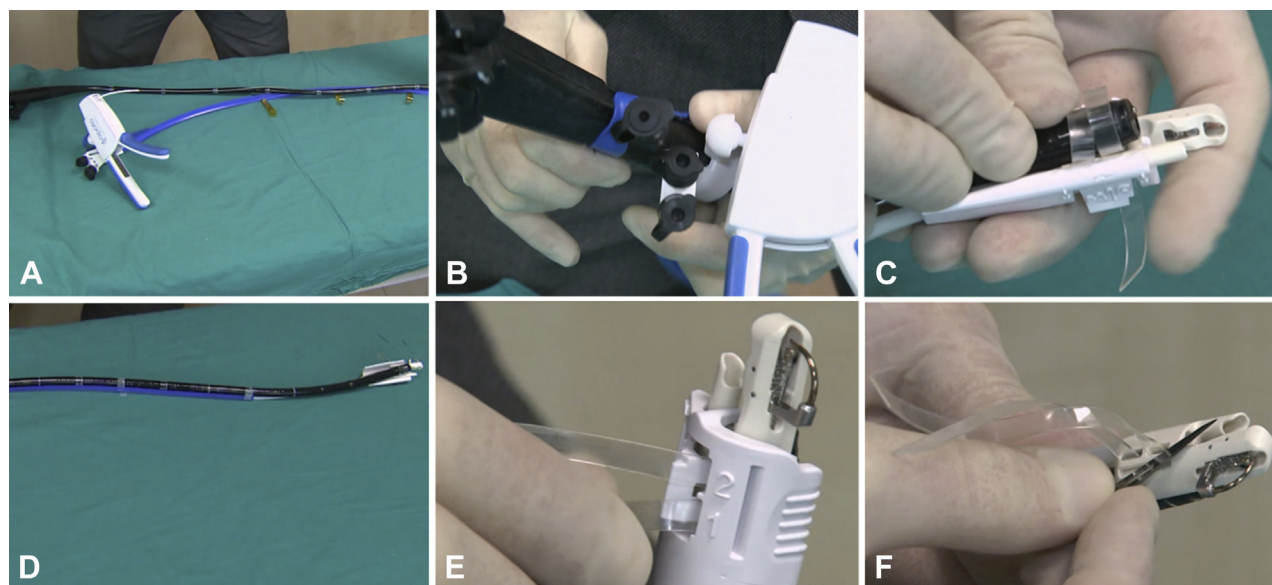


Figure 1. Setting up a single-channel suturing system. **A**, The suturing system can be mounted on most available single-channel endoscopes. Introduce the scope between the metallic wire and the plastic sheath, and align across the length of the external catheter. **B**, Fix the external working channel close to the endoscope channel, and fasten it with the rubber strap. **C**, Introduce the distal end of the scope into the plastic cap with the needle-driver assembly. **D**, Fix the external catheter to the scope shaft using the silicone straps. **E**, At the distal end, secure the needle-driver assembly to the scope by tightening the straps. Once done, remove the plastic case. **F**, Trim the excess strap using a blade, and smooth the cut edges.

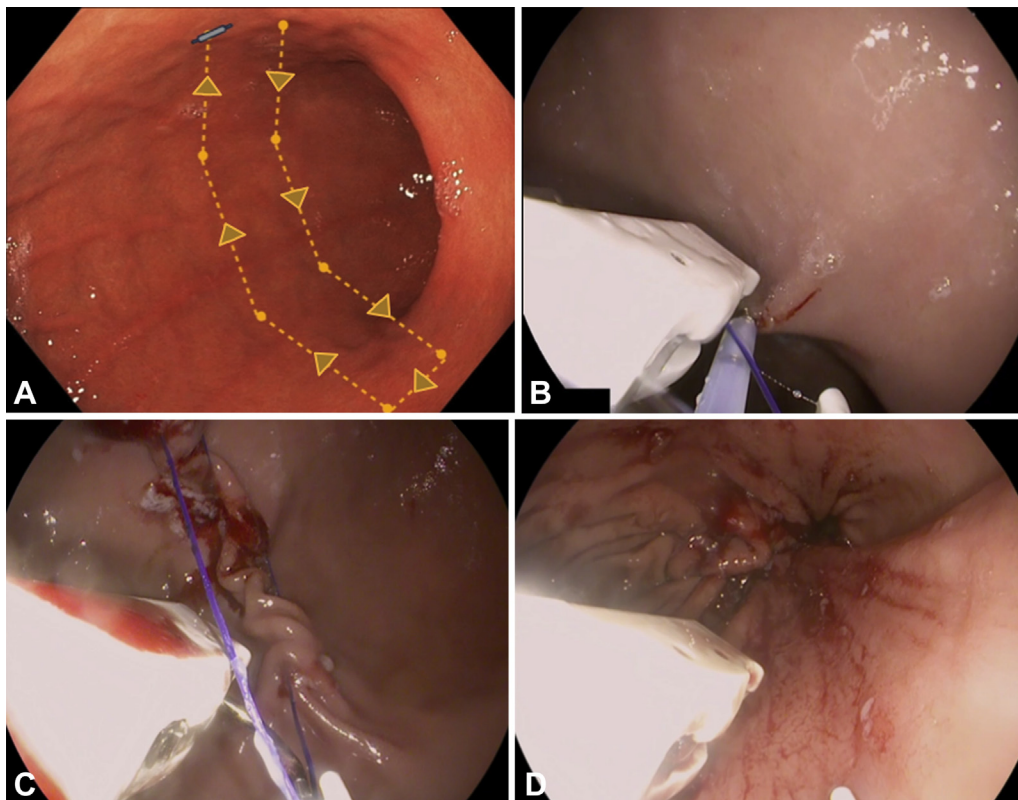


Figure 2. Endoscopic sleeve gastropasty. **A**, We perform a U-shaped suture pattern. **B**, We approach the target site from a distance. We start at the anterior wall and anchor the tissue using a tissue helix. We do not exert excess pressure on the helix and rotate it only 3 times to prevent deeper penetration and damage to abdominal organs. **C**, We continue to traverse through the greater curve and the posterior wall, and then repeat the pattern in reverse before cinching. We ensure the suture runs in 1 direction without forming alpha loops. **D**, Successful creation of a full-thickness plication at the distal body. We repeat this and progress proximally to complete the sleeve gastropasty. We spare the fundus of the stomach.

We insert an overtube and advance the endoscope holding the external sheath. We start at the distal body and perform a U-shaped suture pattern composed of 8 to 10 full-thickness bites. We use the external working channel for accessories and spare the scope channel. We do not premark with argon plasma coagulation because the unefaced view of the single-channel system allows us to locate the site for suturing precisely. We approach the target site from a distance, and under direct visualization we position the helix device over the tissue. We apply gentle pressure and rotate the helix clockwise 3 times to anchor the tissue. Excessive pressure and rotation may penetrate the abdominal cavity, causing a leak, pneumoperitoneum, or the trapping of adjacent structures. We pull the tissue inside the distal assembly of the suturing device, which additionally displaces the adjacent structures from the path of the needle track. Whenever resistance is encountered during traction, we rotate the helix anticlockwise once or twice to reduce the tissue bulk or remove it and choose a different site for suturing.

To achieve full-thickness bites consistently, we place the tissue captured by the helix perpendicular to the needle driver. We always start at the anterior wall, 1 cm proximal to the incisura, continue to traverse through the greater

curvature as far as the posterior wall, and repeat the pattern in reverse before we cinch the suture to form a plication. The flexibility of the endoscope and the smooth edges of the distal cap allow us to maneuver the device with ease without causing mucosal injury and bleeding. We ensure that the suture travels in 1 direction without creating loops because this prevents incomplete tissue approximation and suture breakage. We advocate securing the cinching catheter with the left hand and applying intermittent and incremental tension to tighten the suture, because this will bring the walls of the stomach together to form a sleeve. Any overzealous and forceful traction of the suture will result in thinning and premature suture disruption before cinching. We follow the above steps and perform 4 to 5 suture plications in the proximal part of the gastric body, sparing the fundus (Fig. 2). We postulate that this technique decreases the anteroposterior and craniocaudal diameters of the stomach. We do not routinely advance the scope to the pylorus or duodenum after EG because overdistention and inadvertent manipulation may loosen the sutures. We close the needle driver, ensure it is free of tissue and suture, and withdraw it inside the overtube and safely remove them together.

In conclusion, EG may be safely performed using the novel single-channel suturing system. The design of the device facilitates easier performance of gastroplasty, and its compatibility with most single-channel endoscopes from different platforms increases accessibility to full-thickness suturing in clinical practice.

DISCLOSURE

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Abbreviation: EG, endoscopic gastroplasty.

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