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Inside the Operating Room

Tips for creating the ideal gastric conduit

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Despite improvements in surgical care, esophagectomy continues to be a complex surgical procedure with a steep learning curve and is associated with significantly high morbidity (46%) and perioperative mortality (11%) [1,2]. Essential steps in performing esophagectomy for cancer include construction of the gastric conduit (GC), lymph node (LN) dissection, and creation of an esophagogastric anastomosis. Literature reviews and comparative studies related to the technical aspects of esophagectomy focus mainly on the (i) approach, transhiatal, transthoracic, or 3-hole, left thoracoabdominal; (ii) type of anastomosis, circular stapled, linear stapled, or hand-sewn; and (iii) whether the procedure is open, minimally invasive, robotic, or hybrid. However, little is discussed or investigated regarding the construction of the GC. The construction of the perfect/ideal GC is an essential part of the esophagectomy procedure. Technical faults in the construction of the GC, such as making it too wide, making it too narrow, spiraling, having steps-ups, and having a nonuniform diameter, could lead to significant postoperative complications, delayed postoperative recovery, and impairment of the quality of life.

The abdominal part of the esophagectomy includes the following:

1. Mobilizing the greater curvature of the stomach: Our preference is opening the gastrocolic omentum below the level of the pylorus to easily identify and preserve the gastroepiploic vessels and follow their trajectory along the greater curvature of the stomach. The Kocher maneuver is routinely performed to bring the pylorus to the diaphragmatic hiatus.
2. Creating a vascularized omental flap.
3. Chemical pyloroplasty by administering the pylorus with 100 units of Botox in the 4 quadrants using the endoscopic needle.
4. Creating the GC.
5. Evaluating the vascularity of the conduit using indocyanine green (ICG): We routinely transect the nonperfused segment of the tip of the conduit using the linear stapler [3]. A recent systematic review showed that ICG fluorescent imaging is a crucial adjunctive tool for reducing anastomotic leakage after esophagectomy, suggesting that it should be performed during esophageal reconstruction [4].
6. Abdominal regional LN dissection: In our experience, LN dissection is much easier once the conduit is disconnected from the gastric remanent and dropped below the pancreas, allowing for an unobstructed view of the porta hepatis, celiac axis, and all the way to the spleen in preparation for extended LN dissection.
7. Feeding jejunostomy tube placement.

The ideal GC should be as follows: (i) the diameter is 4 to 5 cm, (ii) the diameter is uniform throughout, (iii) the length is adequate, (iv) there are no step-ups, and (v) there is no spiraling effect.

There are 3 important points to emphasize in our technique. First, the circumference of the GC should be along the greater curvature side of the stomach. Second, there are 2 important points of retraction while stapling for construction of the GC, both of which are performed through either R4 along the left anterior axillary line

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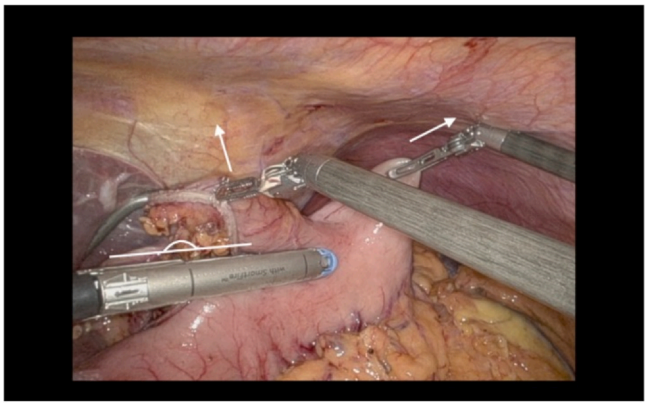

Figure 1. Lateral retraction toward the gastric body/antrum junction.

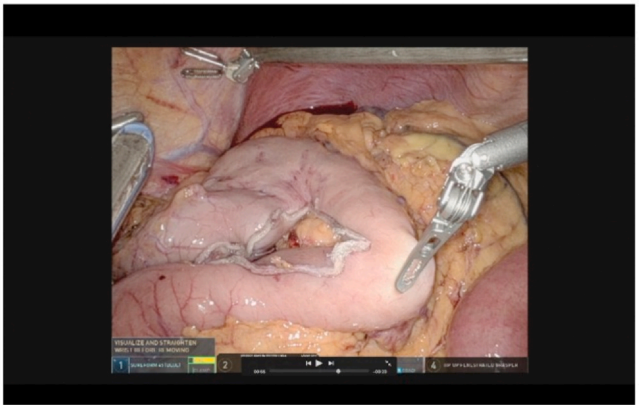

Figure 2. Downward retraction maintaining the alignment of the staple line.

for robotic esophagectomy or by the lower left midclavicular trocar for minimally invasive esophagectomy: lateral retraction until we reach 4.5 cm of the gastric body antrum junction (Fig. 1), followed by downward traction (Fig. 2) until we reach 5 cm below the gastroesophageal junction. The retraction technique helps to maintain a uniform width of the conduit, prevent spiraling effect, and provide extra length of the conduit. In addition, making sure the next staple load is precisely placed along the same line as the previous one is essential to avoid conduit spiraling and step-up configuration. Third, we prefer to use 45-mm linear staplers as they allow better maneuverability and easy angulation and minimize the length of technical errors. We routinely use 4- to 5-cm-wide GC as it functions well, does not occupy large space in the mediastinum, and is not too small that it would preclude the passage of the 25-mm or 28-mm circular stapler. Several studies have been conducted to evaluate the optimal width of the GC. A randomized controlled study (RCT) conducted in Japan demonstrated equivalent outcomes (tissue blood flow, anastomotic leak, and postoperative nutritional status) between the subtotal stomach and the narrow gastric tube [5]. Another RCT showed that a narrow gastric tube was associated with less reflux and better long-term quality of life [6]. Shen et al.'s [7] retrospective comparative study of 5- to 3-cm-wide GC among patients with esophageal cancer who underwent minimally invasive esophagectomy showed that the incidence of anastomotic leak was significantly less in the 3-cm GC group than in the 5-cm GC group (8.7% vs 17.3%, respectively; P =.041).

In the Video (available online at http://doi.org/10.1016/j.gassur.2024.101927), we demonstrate our technique of creating the GC as part of the esophagectomy procedure and provide technical tips to surgeons undertaking this complex operation.

Author contributions

Ziad Awad: manuscript writing/editing; Carolina Garcia: video creation/editing.

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Declaration of Competing Interest

The authors declare no competing interests.

Supplementary material

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.gassur.2024.101927.

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