Commentary: “Sometimes the hardest thing in life is to know which bridge to cross and which to burn”—A word for the reluctant minimally invasive esophageal surgeon

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Disclosures: Author is a proctor for Intuitive Surgery and a speaker for AstraZeneca.

Received for publication June 18, 2019; accepted for publication July 1, 2019; available ahead of print Aug 5, 2019.

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J Thorac Cardiovasc Surg 2019;158:1479-80

0022-5223/\$36.00

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<https://doi.org/10.1016/j.jtcvs.2019.07.010>

In 2015, the number of minimally invasive esophagectomies (MIEs) surpassed the number of open esophagectomies performed in the United States, according to data from the National Cancer Database.¹ Like most other complex, minimally invasive, thoracic procedures, the perceived benefit of video-assisted or robotically assisted surgery will likely continue to drive an increase in the number of MIEs performed annually. A common criticism of MIE is the steep learning curve. Even for surgeons trained in advanced minimally invasive esophageal procedures, the inflection in the learning curve occurs after 33 to 54 cases performed independently.² Perhaps because of this steep learning curve, some surgeons have resorted to hybrid approaches, which usually include laparoscopy and thoracotomy.³ In this issue of the *Journal*, Dr Wayne Hofstetter⁴ offers an excellent commentary on the merits of 3 esophagectomy variants: open, hybrid, and minimally invasive. Dr Hofstetter is a superb esophageal surgeon who is reluctantly embracing minimally invasive techniques for esophagectomy, in response to recognition of some advantages and, admittedly, to patient and market forces.

There are 2 available randomized trials that have either compared open esophagectomy with MIE (the Traditional Invasive vs. Minimally Invasive Esophagectomy [TIME] trial)⁵ or compared hybrid MIE with laparoscopy and thoracotomy (the MIRO trial).⁶ It is important to note the significant differences between the 2 trials, which include not only the number of patients enrolled but also the completely minimally invasive approach in the TIME trial compared with a hybrid approach in the MIRO trial. It is also important to note that 14% of patients in the MIE group of the TIME trial had conversion of the procedure to open surgery, which is significantly higher than previously reported conversion rates of less than 5%.⁷ Despite the high conversion rate, there were unquestionable advantages to the MIE

Intrathoracic anastomosis with “sticks.”

Central Message

Minimally invasive esophagectomy (MIE) offers clear benefits to patients. Hybrid approaches may be a useful starting point for surgeons reluctant to adopt MIE, but they should not be their final goal.

See Article page 1475.

approach in the TIME trial, the most important of which were improvements in patient-reported outcomes, such as pain, and in overall global health. The MIRO trial also showed benefits of minimally invasive surgery despite the fact that all patients underwent a thoracotomy. Patients in the hybrid MIE group had fewer major complications and fewer major pulmonary complications.

As a surgeon practicing MIE, I see the hybrid approach as a bridge to a completely minimally invasive surgical approach. Thoracic surgeons have switched their practice away from thoracotomy for lung cancer resection, because we believe, on the basis of clinical studies, that patients will have less pain and fewer complications, despite longer operative times. There is no reason why this should not hold true for the thoracic portion of an esophagectomy. Moreover, because switching from laparotomy to laparoscopy has been advantageous, it is logical to assume that abolishing the thoracotomy in favor of thoracoscopy will additionally benefit patients who undergo esophagectomy.

I also believe that many of the complications related to the learning curve have their origin in the abdominal portion of the procedure, which is performed with laparoscopy in the hybrid procedure. For example, Ramage and colleagues⁸ reviewed 158 MIEs and found 4 cases of gastric tube necrosis, all of which occurred in the first 73 patients. On careful review of the etiology of the problem, 2 patients

were found to have an injury to the gastroepiploic arcade, 1 patient was found to have necrosis related to a tight hiatus, and 1 patient was found to have gastric tube necrosis of unknown origin. It is clear that these are problems related to the abdominal portion of the procedure. Another common argument of the reluctant minimally invasive surgeon is that lack of tactile feedback may affect the ability to obtain an R0 resection. There is very little evidence, however, that this is true. Randomized studies^{5,6} and large retrospective series⁹ failed to demonstrate superiority of tactile feedback to that provided by “sticks” in accomplishing an R0 resection. Finally, overall survival is the most important outcome measure for most patients who undergo cancer surgery, and it is similar after MIE or open esophagectomy.^{1,5,6,9}

To maximize the value of esophagectomy to our patients, we need to choose a technique that will maximize their quality of life and survival. If long-term quality of life is similar between 2 techniques, we need to maximize long-term survival. If both long-term quality of life and survival are equivalent, the surgeon needs to use the technique that will reduce complications and pain. I believe that MIE checks all these boxes and is the procedure that provides the best “bang for the buck” for patients undergoing esophagectomy. The British philosopher Bertrand Russell is credited with the aphorism that “Sometimes the hardest thing in life is to know which bridge to cross and which to burn.” My word of advice to the reluctant minimally

invasive esophageal surgeon is this: You do not need to burn the open surgery bridge, but to maximize value to your patients, you must cross the minimally invasive bridge. Hybrid esophagectomy is the first step in crossing that bridge, but it should not be the last.

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