Everything, in Retrospect, is Obvious

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The title of this editorial is a quote from Michael Lewis referring to his interpretation of recent financial market upheavals, but also seems relevant to a cornerstone of surgical research and practice—the retrospective review. Minimally invasive surgery (MIS) is a fundamental component of modern surgical practice and continues to offer the potential for quicker recovery and shorter length of hospital stay. It is well established that the technical steps of gastrectomy can be accomplished with smaller incisions and typically with associated improvements in short-term outcomes. However, the supporting data and existing trials are not without at least some controversy that I can attempt to stir up for the purposes of an entertaining, and hopefully informative, editorial.

In the article that accompanies this editorial, Nakauchi et al. report that MIS gastrectomy resulted in fewer complications with no difference in survival outcomes compared with open gastrectomy.¹ In a single-institution review of 845 patients limited to negative resection margins over a 10-year period, 63% of patients underwent open gastrectomy compared with 37% MIS. MIS patients had several more favorable characteristics, such as lower American Society of Anesthesiologists (ASA) status, less chronic kidney disease, less deep venous thrombosis, more distal tumors, more recent year of surgery, less total gastrectomies, smaller tumors, less need for neoadjuvant therapy, lower pT stage, lower pN stage, and less lymphovascular invasion. Patients undergoing MIS surgery had fewer complications on unadjusted comparison, as expected based on the difference in variables above, and the

difference persisted on multivariable analysis—but only by the thinnest of statistical margins (95% CI 0.49–1.00, $p = 0.049$; Supplementary Table 1).

There are many accomplishments to this study worthy of mention. The outcomes are excellent, and the low rates of 30-day complications and death are to be commended. Reassurance is also provided for one of the main objectives of the study in that MIS surgery was not independently associated with diminished survival. This work is clearly the result of highly skilled surgeons at a recognized center of excellence dedicated to advancing the latest MIS techniques. The length of postoperative stay is also fantastic for a relatively older series of patients that extends back to 2007. The authors were likely integrating many components of enhanced recovery after surgery (ERAS) before ERAS was even a defined acronym.

Yet we need to be careful viewing outcomes through the retrospectroscope and only accepting the results that fit our inherent biases. It makes perfect sense that MIS surgery is associated with fewer complications. Unfortunately, neoadjuvant chemotherapy had its own statistically significant association that should raise additional questions. Preoperative chemotherapy was independently associated with diminished survival, which is tough to accept given the multiple phase III randomized controlled trials (RCTs) in Western populations of patients with gastric cancer demonstrating improved survival with a perioperative chemotherapy approach.²

Would these results stand up to the highest level of evidence in a randomized controlled trial? Thankfully we have the answer, hot off the digital press. Before I reference this landmark study, we should briefly revisit the East versus West debate in gastric cancer. There are RCTs from Korea demonstrating the oncologic equivalency of laparoscopic and open distal gastrectomy, although most focus on early gastric cancer and exclude patients undergoing total gastrectomy.³ Due to the well-established differences in tumor biology and adverse prognostic factors

between gastric adenocarcinoma from Eastern and Western countries, I will limit the discussion to the one Western RCT available.⁴

In the Laparoscopic Versus Open Gastrectomy for Gastric Cancer (LOGICA) trial, investigators from ten experienced upper gastrointestinal centers in the Netherlands reported short-term outcomes of 227 patients.⁴ In summary, laparoscopic and open gastrectomy were the same with no differences in hospital length of stay, post-operative complications, and lymph node evaluation. Interestingly, there was also no difference in quality of life between MIS and open surgery. Our colleagues from the Netherlands are to be congratulated for recognizing the lack of randomized trials in Western populations and performing the first trial in a population where incidence and case volumes are lower, preoperative chemotherapy is more commonly utilized, and total gastrectomy is more commonly required. The authors note additional concerns relevant to Western populations beyond tumor biology, as our patients have higher body mass index, higher age, and more advanced pathologic stage (due to the lack of national standardized screening programs). The quality of this RCT was further strengthened in that all patients were treated with a standardized ERAS protocol and evaluated in a multidisciplinary conference.

Complementary data from the study by Nakauchi et al. confirm previous reports on the ability to complete MIS gastrectomy. The authors are to be commended for their rigorous outcome assessment and vigorous statistical

analysis. The results of this study can be used to highlight the need for further studies into cost effectiveness for MIS and robotic surgery, particularly if traditional surgical outcomes may be the same. Quality-of-life outcomes are also needed as there may not be a difference. Of course, fellow and resident training and the learning curve should be at the forefront of our programs as not all centers may be able to meet the minimum level of 20 gastrectomies per year as required in the LOGICA trial.

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