



We Asked the Experts: Lessons from the Past Should Guide the Future—Considerations on the Treatment of Esophageal Achalasia

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“Those who do not remember the past are condemned to repeat it”

George Santayana, *The life of reason*, 1905

Jorge Agustín Nicolás Ruiz de Santayana y Borrás, known in the USA as George Santayana (1863–1952), was a philosopher, essayist, poet, and novelist. He is famous for his quotes which have frequently withstood the test of time. For instance, everyone has heard the saying that history repeats itself, often in the context of being told to learn from your own mistakes or mistakes made by others. There are many examples of events in history that remind us of this quote. For instance, Napoleon attempted the invasion of Russia in 1812 but failed because of the brutal winter weather which caused many deaths among his soldiers. One hundred years later, Hitler made the same mistake, and the invasion of Russia by the Axis forces in 1941 (Operation Barbarossa) eventually failed for the same reasons, signaling the beginning of the end of the Third Reich.

Unfortunately, Surgery offers many examples of failure of learning from the past, repeating mistakes at the detriment of patients' well-being. We will use the treatment of achalasia as an example of history repeating itself.

In the early 1990s, minimally invasive surgical approaches were developed for the treatment of many abdominal diseases. An area of distinct progress was that of foregut disorders such as gastroesophageal reflux disease and achalasia.

In January 1991, a UCSF team lead by Dr. Carlos Pellegrini performed the first minimally invasive myotomy in the USA [1]. This was accomplished using a left thoracoscopic approach which replaced the standard left posterolateral thoracotomy. The operation was done using five small trocars, without insufflation of the chest cavity and reproduced the same steps of the open procedure, with a myotomy that extended distally for about 5 mm onto the gastric wall. An antireflux procedure was not added. The preliminary results showed that the operation was feasible, was associated with a short hospital stay and minimal postoperative pain, and replicated the same results of open surgery with relief of symptoms in about 90% of patients. However, the initial enthusiasm was soon tempered by a surprising finding. Although 2/3 of patients were asymptomatic, 60% of them had a pathologic amount of reflux when tested by pH monitoring [1]. This finding raised serious concerns because in achalasia there is no peristalsis, one of the main factors promoting clearance of the gastric refluxate. Therefore, once the barrier of the lower esophageal sphincter is ablated by the myotomy, free reflux of gastric contents can occur, with prolonged contact with the esophageal mucosa due to slow clearance, and the consequent risk of peptic strictures, Barrett's esophagus, and adenocarcinoma. This was considered particularly dangerous in young patients as they would be exposed to years of uncontrolled reflux. Based on these findings and the experience of many centers in Europe and South America, the thoracoscopic approach was soon abandoned in favor of a laparoscopic approach with the addition of a partial fundoplication. The rationale of this switch in technique was soon proved to be correct. For instance, Patti et al. compared the outcome in 60 achalasia patients treated by thoracoscopic (30 patients) or laparoscopic approach plus an anterior fundoplication (30 patients) [2]. While the relief of symptoms was similar and excellent in both groups,

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postoperative pH monitoring showed pathologic reflux in 60% of patients after thoracoscopic myotomy but in only 10% after laparoscopic myotomy with fundoplication. These results were later confirmed by many retrospective and prospective studies that showed that when a laparoscopic myotomy was coupled with a partial fundoplication, relief of symptoms occurred in 85% to 90% of patients, while pathologic reflux by pH monitoring was present around 10% of the time [3]. Over the following decade, a laparoscopic Heller myotomy with a partial fundoplication (Toupet or Dor) became the primary treatment modality for achalasia in most centers around the world, as it determined a very good balance between an excellent relief of dysphagia and a very low incidence of pathologic reflux.

In 2010, Dr. Inoue from Japan published the results of a new endoscopic technique for the treatment of esophageal achalasia—per oral endoscopic myotomy (POEM) [4]. This technique is based on an endoscopic approach with the initial creation of a submucosal tunnel in the esophageal wall. Subsequently, the circular fibers of the esophageal wall and the proximal stomach are transected, therefore relieving the distal obstruction at the level of the gastroesophageal junction. The results of this initial report were soon replicated in many other centers showing that, at a short-term follow-up, the relief of dysphagia was excellent [3]. In addition, patients spent only one day in the hospital and had minimal discomfort. POEM was even more effective than a LHM in patients with type III achalasia as it allowed a longer myotomy on the esophagus and it represented an excellent way to treat recurrent symptoms after a LHM [5]. Soon, however, many studies showed that the initial belief that POEM could avoid postoperative reflux because it left the peritoneum and the phreno-esophageal membrane intact was wrong. For instance, Familiari et al. showed that relief of symptoms could be achieved in 94% of patients, but when post-POEM pH monitoring was performed, pathologic reflux was present in 53.4% of patients [6]. Overall, these findings were confirmed in a very extensive meta-analysis comparing laparoscopic myotomy with fundoplication to POEM [3]. Relief of dysphagia was, in fact, 88% after LHM but 93% after POEM, but pathologic reflux by pH monitoring was present in 11% of patients after LHM but in 48% after POEM. Cases of Barrett's esophagus, peptic strictures, and adenocarcinoma have been documented after POEM [7].

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The last 20 years have witnessed the implementation of many critical innovations in surgery. Some like minimally invasive surgery or the endovascular treatment of

abdominal aortic aneurysms have benefitted patients tremendously, while others have been less successful. But how should innovations be implemented? As stressed by Ferreres et al., the introduction of a new technique should ideally provide an answer to the following questions [8]:

- Is it feasible?
- Is it safe?
- Does it offer clinical advantages to patients and the health care system?

There is no question that an expert endoscopist can perform POEM, and the data of the last 10 years have shown that the operation is safe and effective. But does it really offer a clinical advantage to patients and the health care system? We do not think so, as the major risk of this procedure is to exchange one disease process—achalasia—for another—gastroesophageal reflux disease.

It is therefore quite surprising that the lesson of the past has been easily forgotten by some of the same people who promoted the switch from a thoracoscopic myotomy to a LHM with a fundoplication to limit the incidence of pathologic reflux, and now they are in favor of POEM. Recently, the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) has released guidelines for the treatment of achalasia stating that “*adult and pediatric patients with type I and II achalasia may be treated with either POEM or laparoscopic Heller myotomy based on surgeon and patient's shared decision-making*” (5). This statement raises major ethical issues. It is, in fact, quite odd that it is stated that the decision can be shared by patients and surgeons, as patients rarely know the history and the literature, while surgeons are very selective in their interpretation of the literature. Clearly, the lessons of the past have been forgotten.

Conflict of interest The authors have no conflict of interest to declare.

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