

35. Maret-Ouda J, Wahlin K, El-Serag HB, Lagergren J. Association between laparoscopic antireflux surgery and recurrence of gastroesophageal reflux. *JAMA*. 2017;318(10):939-946. doi:10.1001/jama.2017.10981

36. Lødrup A, Pottegård A, Hallas J, Bytzer P. Use of proton pump inhibitors after antireflux surgery: a nationwide register-based follow-up study. *Gut*. 2014;63(10):1544-1549. doi:10.1136/gutjnl-2013-306532

37. Lord RVN, Kaminski A, Oberg S, et al. Absence of gastroesophageal reflux disease in a majority of patients taking acid suppression medications after Nissen fundoplication. *J Gastrointest Surg*. 2002;6(1):3-9. doi:10.1016/S1091-255X(01)00031-2

38. Bonatti H, Bammer T, Achem SR, et al. Use of acid suppressive medications after laparoscopic antireflux surgery: prevalence and clinical indications. *Dig Dis Sci*. 2007;52(1):267-272. doi:10.1007/s10620-006-9379-7

39. Thompson SK, Jamieson GG, Myers JC, Chin KF, Watson DI, Devitt PG. Recurrent heartburn after laparoscopic fundoplication is not always recurrent reflux. *J Gastrointest Surg*. 2007;11(5):642-647. doi:10.1007/s11605-007-0163-6

Invited Commentary

Long-term Efficacy of Total and Partial Posterior Fundoplication to Treat Gastroesophageal Reflux Disease

Bernard Dallemagne, MD; Silvana Perretta, MD

In this issue of *JAMA Surgery*, Analatos et al¹ report the results of a randomized clinical trial that compared total and 270° partial posterior fundoplication in patients with chronic gastroesophageal reflux disease (GERD) with more than 15 years of follow-up.¹ Clinical control of GERD and dysphagia rates were comparable, whereas dysphagia was higher after total fundoplication at the 3-year follow-up reported by the same group.² These results corroborate the evidence from a comparable study³ in open surgery and a meta-analysis⁴ of long-term results of laparoscopic fundoplication. One might therefore think that the debate between total vs partial fundoplication is finally over, at least as far as the 270° partial fundoplication is concerned, with the results for other partial valves being certainly less favorable in terms of reflux control.⁵

Analatos et al¹ do not mention or stress the importance of the surgical technique used in this study, which is clearly accountable for the consistent and homogenous results. It seems important to emphasize that the authors applied the principles of a tension-free repair, namely that of a floppy valve, total or partial, based on the correct identification and freeing of the upper part of the gastric fundus and extensive esophageal

mobilization.^{2,6} The combination of various (mis)interpretations of the adequate technique to build a partial or total fundoplication, together with a short follow-up, can largely explain the variety and inconsistency of the results reported in the literature.⁷

Although the subjective evaluation of clinical results is fundamental when assessing the effect of surgery on a functional disease, the lack of objective measures in this report is a limiting factor. Although difficult to collect, objective data could have helped refine the analysis of the results for each technique, in particular with regard to the reasons leading to use of proton pump inhibitors (25% of patients in both groups) and the small but consistent increase in dysphagia rate over time in the partial fundoplication group. At a time when the long-term use of proton pump inhibitors is under scrutiny and sometimes has a role in the argumentation of the surgical option, it seems important to understand the reasons for their use after antireflux surgery, because they may be related to anatomical failures and/or extraesophageal factors, as mentioned by the authors.

In conclusion, this study provides additional evidence of the long-term equivalence in terms of efficacy of total and 270° partial fundoplication in the treatment of GERD when the surgical technique and key steps are respected.

ARTICLE INFORMATION

Author Affiliations: Department of Digestive and Endocrine Surgery, University of Strasbourg, Strasbourg, France (Dallemagne, Perretta); Institute for Research Against Digestive Cancer (IRCAD), Strasbourg, France (Dallemagne, Perretta).

Corresponding Author: Bernard Dallemagne, MD, Institute for Research Against Digestive Cancer, 1 Place de L'Hôpital, 67000 Strasbourg, France (bernard.dallemagne@ircad.fr).

Published Online: April 20, 2022. doi:10.1001/jamasurg.2022.0806

Conflict of Interest Disclosures: None reported.

REFERENCES

1. Analatos A, Håkanson BS, Ansoerge C, Lindblad M, Lundell L, Thorell A. Clinical outcomes of a laparoscopic total vs a 270° posterior partial

fundoplication in chronic gastroesophageal reflux disease: a randomized clinical trial. *JAMA Surg*. Published online April 20, 2022. doi:10.1001/jamasurg.2022.0805

2. Håkanson BS, Lundell L, Bylund A, Thorell A. Comparison of laparoscopic 270° posterior partial fundoplication vs total fundoplication for the treatment of gastroesophageal reflux disease: a randomized clinical trial. *JAMA Surg*. 2019;154(6):479-486. doi:10.1001/jamasurg.2019.0047

3. Mardani J, Lundell L, Engström C. Total or posterior partial fundoplication in the treatment of GERD: results of a randomized trial after 2 decades of follow-up. *Ann Surg*. 2011;253(5):875-878. doi:10.1097/SLA.0b013e3182171c48

4. Du X, Hu Z, Yan C, Zhang C, Wang Z, Wu J. A meta-analysis of long follow-up outcomes of laparoscopic Nissen (total) versus Toupet (270°

fundoplication for gastro-esophageal reflux disease based on randomized controlled trials in adults. *BMC Gastroenterol*. 2016;16(1):88. doi:10.1186/s12876-016-0502-8

5. Broeders JA, Broeders EA, Watson DI, Devitt PG, Holloway RH, Jamieson GG. Objective outcomes 14 years after laparoscopic anterior 180-degree partial versus nissen fundoplication: results from a randomized trial. *Ann Surg*. 2013;258(2):233-239. doi:10.1097/SLA.0b013e318278960e

6. Hunter JG, Swanstrom L, Waring JP. Dysphagia after laparoscopic antireflux surgery. The impact of operative technique. *Ann Surg*. 1996;224(1):51-57. doi:10.1097/00006658-199607000-00008

7. Dallemagne B, Perretta S. Twenty years of laparoscopic fundoplication for GERD. *World J Surg*. 2011;35(7):1428-1435. doi:10.1007/s00268-011-1050-6