

gastroesophageal reflux. *JAMA*. 2017;318(10):939-946. doi:10.1001/jama.2017.10981

40. 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.Ob013e3182171c48

Invited Commentary

Similar Effectiveness of Total and 270° Posterior Fundoplication for the Treatment of Gastroesophageal Reflux Disease

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In this issue of *JAMA Surgery*, Håkanson and colleagues¹ report the results of a randomized, double-blind study comparing the laparoscopic total fundoplication (360°) with a 270° posterior partial fundoplication. The main outcome measure was acid exposure at 3 years after surgery. Their results show that the 2 procedures were similar with respect to controlling abnormal reflux, but the partial fundoplication was associated with a lower degree of dysphagia after 2 years. This study¹ confirms the results of a randomized clinical trial² of open total and posterior partial fundoplication with 2 decades of follow-up, which showed that the 2 procedures result in similar control of reflux. The results of the study by Håkanson et al¹ are also supported by randomized trials and meta-analysis.^{3,4}

The debate about partial vs total fundoplication has been around for many years. In the 1990s, some groups suggested the use of a tailored approach to decrease the problem of a high incidence of postoperative dysphagia after laparoscopic total fundoplication; in this approach, a total fundoplication was performed in patients with normal esophageal peristalsis, but a partial posterior fundoplication was used when abnormal peristalsis was present.⁵ The initial results confirmed that a partial fundoplication provided the same symptomatic relief and control of reflux as a total fundoplication but with a lower incidence of postoperative dysphagia.⁵ However, this approach was slowly aban-

doned as many single-center, retrospective studies in the United States showed that while the short-term results were similar, the partial fundoplication had a recurrence rate between 40% and 50% at a longer follow-up, particularly when esophageal dysmotility was present.^{6,7} In addition, a large study from the University of California, San Francisco showed that a partial (240°) fundoplication was less effective than a total fundoplication in controlling reflux, while the incidence of postoperative dysphagia was similar, even in patients with weak peristalsis.⁷

How can we reconcile the results of these studies? Regarding reflux control, it can be assumed that a 270° posterior partial fundoplication is more effective than the 180° or 240° fundoplication used in other studies.¹ Longer follow-up will determine if these findings will be maintained. As far as the lower degree of dysphagia seen after partial fundoplication, it is important to note that Håkanson et al¹ did not use a bougie, a step that has been shown to significantly decrease the incidence of postoperative dysphagia.⁸ In addition, the difference in the incidence of dysphagia after the 2 procedures was quite small and of short duration.

Overall, this is an important study¹ that confirms the efficacy of a 270° posterior partial fundoplication in the treatment of gastroesophageal reflux disease, suggesting that both the total and the partial fundoplication have a place in the armamentarium of the surgeons who treat patients with gastroesophageal reflux disease.

ARTICLE INFORMATION

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REFERENCES

1. 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 [published online March 6, 2019]. *JAMA Surg*. doi:10.1001/jamasurg.2019.0047.

2. 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.Ob013e3182171c48

3. Shaw JM, Bornman PC, Callanan MD, Beckingham JJ, Metz DC. Long-term outcome of laparoscopic Nissen and laparoscopic Toupet fundoplication for gastroesophageal reflux disease: a prospective, randomized trial. *Surg Endosc*. 2010;24(4):924-932. doi:10.1007/s00464-009-0700-3

4. Broeders JAJL, Mauritz FA, Ahmed Ali U, et al. Systematic review and meta-analysis of laparoscopic Nissen (posterior total) versus Toupet (posterior partial) fundoplication for gastro-oesophageal reflux disease. *Br J Surg*. 2010; 97(9):1318-1330. doi:10.1002/bjs.7174

5. Patti MG, Arcerito M, Tong J, Wang A, Mulvihill SJ, Way LW, De Pinto M, de Bellis M. Comparison of laparoscopic total and partial

fundoplication for gastroesophageal reflux. *J Gastrointest Surg*. 1997;1(4):309-314. doi:10.1016/S1091-255X(97)80050-9

6. Fernando HC, Luketich JD, Christie NA, Ikramuddin S, Schauer PR. Outcomes of laparoscopic Toupet fundoplication compared to laparoscopic Nissen fundoplication. *Surg Endosc*. 2002;16(6):905-908. doi:10.1007/s004640080007

7. Patti MG, Robinson T, Galvani C, Gorodner MV, Fisichella PM, Way LW. Total fundoplication is superior to partial fundoplication even when esophageal peristalsis is weak. *J Am Coll Surg*. 2004;198(6):863-869. doi:10.1016/j.jamcollsurg.2004.01.029

8. Patterson EJ, Herron DM, Hansen PD, Ramzi N, Standage BA, Swanström LL. Effect of an esophageal bougie on the incidence of dysphagia following Nissen fundoplication: a prospective, blinded, randomized clinical trial. *Arch Surg*. 2000; 135(9):1055-1061. doi:10.1001/archsurg.135.9.1055