Is Complete Or Partial Fundoplication Superior For Surgical Management Of Medically Resistant GERD?

Evidence Level II

Surgical antireflux interventions are indicated in medically refractory gastroesophageal reflux disease (GERD) causing distressing symptoms. Controversy exists as to whether a complete wrap or any of several partial wrap methods proves superior in pediatric patient clinical outcome.

Complete fundoplication, defined as a wrap of 360 degrees, was performed in all 15 studies that we identified using the Nissen method. Partial wrap, defined as anything less than 360 degrees, was performed using a variety of techniques: Thal (Ceriati 1998, Esposito 2006, Goessler 2007, Kazerooni 1994, Kubiak 2011, Levin 2011, Strecker-McGraw 1998, van der Zee 1994), Toupet (Allal 2001, Esposito 2006, Georgeson 1998, Goessler 2007, Levin 2011, Weber 1999), Boix-Ochoa (Cohen 1999, Subramaniam 2000), Watson (Wagener 2007) and Vertical Gastric Plication (Durante 2007). Our primary clinical outcome of interest was remission of reflux, while the secondary outcome was associated peri/post-operative complications (e.g. dysphagia, gas-bloat syndrome, hiatal hernia).

We identified two systematic reviews comparing complete and partial fundoplication methods in children (Glen 2014, Mauritz 2013). Mauritz (2013) included eight studies (1 interventional, 7 observational) and no statistically significant differences between complete and partial fundoplication with regard to either reflux resolution or post-operative complications were found. Glen (2014) performed a meta-analysis on data from randomized control trials (Durante 2007, Kubiak 2011) and observational studies (Allal 2001, Ceriati 1998, Cohen 1999, Georgeson 1998, Goessler 2007, Kazerooni 1994, Levin 2011, Strecker-McGraw 1998, Subramaniam 2000, van der Zee 1994, Wagener 2007, Weber 1999) separately, and found no differences in reflux resolution between wrap types in either analysis. In an update on the Glen (2014) paper, we conducted pre-specified sub-group analyses comparing Nissen to the individual partial wrap methods (Thal (Ceriati 1998, Goessler 2007, Kazerooni 1994, Kubiak 2011, van der Zee 1994), Toupet (Allal 2001, Georgeson 1998, Goessler 2007, Weber 1999) and Boix-Ochoax (Cohen 1999, Subramaniam 2000)); these similarly revealed no differences in reflux resolution or dysphagia.

Neurologically impaired patients have a reported higher incidence of GERD and subsequent post-operative relapse (Goessler 2007, Subramaniam 2000). As a result, Glen (2014) included a sub-group analysis of data on only neurologically impaired children from the two interventional studies. An odds ratio of 1.33 favouring complete fundoplication for reflux resolution was calculated, although the difference was not statistically significant.

One major obstacle in the meta-analysis of these data is the pre-operative heterogeneity between groups, which can introduce confounding factors. Only three papers made an attempt to determine the baseline equivalence between groups (Levin 2011, Wagener 2007, Weber 1999). Another major issue in the available data is a lack of objective outcome measurement both with regard to the evaluator and technique used. None of the studies indicated blinding of the post-operative management healthcare workers and only three observational studies (Allal 2001, Strecker-McGraw 1998, Weber 1999) used objective measures to assess recurrence of reflux, potentially introducing detection bias. All other outcome assessments were either based on need for surgical revision (Georgeson 1998, Kubiak 2011), clinical scores (Durante 2011) or not otherwise specified in detail.

Based on the available evidence it is impossible to recommend one fundoplication method over another. Rather, choice of method should be based on the preferences of the surgeon and patient on an individual case basis. The lack of pre-operative group standardization makes it especially difficult to draw any conclusions for patients with comorbidities. More prospective studies are needed with larger sample sizes, longer post-operative follow-up and universally clear outcome measures to address these deficits.

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Systematic Reviews

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Randomized Controlled Trials

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Non-Randomized Trials: Comparison Studies

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Non-Randomized Trials: Non-Comparison Studies

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Georgeson KE. Laparoscopic fundoplication and gastrostomy. Semin Laparosc Surg 1998;5:25-30.