

Antireflux Surgery in Special Presentations

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ABSTRACT

Gastro-esophageal reflux disease (GERD) was defined according to the Montreal consensus as “a condition which develops when the reflux of stomach contents causes troublesome symptoms and/or complications”. A recent randomized-controlled trial showed that laparoscopic Nissen fundoplication was superior to medication in reducing reflux-related heartburn⁵.

Antireflux surgery represented by Nissen fundoplication is a valuable solution in typical GERD cases. For patients presented with one of the different presentations; like failed previous fundoplication, Non-Erosive Reflux Disease (NERD), Barrett's dysplasia, and esophageal dysmotility, a complete or partial wrap should be cautiously decided.

Keywords: Gastro-esophageal reflux disease (GERD); Stomach; Medical therapy

BACKGROUND

Symptoms were considered “troublesome” if they adversely affected an individual's wellbeing. From a surgical perspective, GERD is the failure of the antireflux barrier, allowing abnormal reflux of gastric contents into the esophagus [2]. GERD has long been recognized as a significant public health concern. Heartburn afflicts more than two thirds of adults at some point in their lives, and accounts for millions of physician office visits every year [3]. In the last 30 to 40 years, research findings have given rise to a more robust understanding of its pathophysiology, clinical presentation, and management. Several randomized controlled trials with follow-up of these studies ranging from 1 to 10.6 years have compared surgical therapy with medical therapy for the treatment of GERD. These studies strongly support surgery as an effective alternative to medical therapy both for patients with good symptom control on medical therapy and for those who achieve only partial symptomatic relief from PPIs [4].

A recent randomized-controlled trial showed that laparoscopic Nissen fundoplication was superior to medication in reducing reflux-related heartburn [5]. Surgery proved the only treatment capable of physically controlling reflux and is very effective (improved quality of heartburn control, reduction of regurgitation, better sleep pattern, increased activities and exercise, etc.) Nissen fundoplication remains the standard procedure for correction of pathologic reflux disease [6]. When compared with partial fundoplication operations, this procedure; provides best relief for symptoms, returns the postsurgical patient to normal 24-h pH values and better increases the distal esophageal sphincter pressures.

Nonerosive reflux disease (NERD) remains the predominant form of GERD. Current thinking is that NERD and erosive reflux disease (ERD) are distinct phenotypes of GERD rather than the old concept which regarded them as components of a disease spectrum. Non erosive reflux disease is a very heterogeneous group with significant overlap with other functional gastrointestinal disorders, thus represent a challenge in antireflux surgery. The NERD patient group incorporates subgroups which differ significantly in terms of presentation, pathophysiology, and management. Patients with functional heartburn are more likely to have psychopathology, similar to functional dyspepsia patients [7]. Failed fundoplication is another presentation due to difficult pathology, technical problem, inexperience. Barrett's esophagus (BE) is the result of continuous injury of the esophageal mucosa by gastric refluxate. This condition can progress to low-grade (LGD) and high-grade dysplasia (HGD) and eventually to adenocarcinoma [8]. Barrett esophagus which harbor dysplastic changes can present as special surgical entity. The relation between the short esophagus and antireflux surgery has been a topic of keen interest in the esophageal literature of the past 40 years. There is, however, a striking paucity of reference to the short esophagus in the current laparoscopic literature. This is worrisome because it may imply that many patients undergoing laparoscopic surgery who have a short esophagus are unrecognized and perhaps treated inappropriately. This may also explain the higher failure rates and increased postoperative dysphagia reported some author [9]. Reflux esophagitis of peptic origin with a significant alkaline component of the refluxate may be responsible for significant esophageal damage. Abnormal esophageal motility (dysmotility) either hyperperistaltic or aperistaltic both present a challenging to antireflux surgery choice.

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Scleroderma causes atony and poor propulsion in majority of patients affected by this condition when referred for reflux symptoms.

METHOD

To describe special presentations of Gastroesophageal Reflux Disease (GERD) in which Antireflux surgery choice needs precaution and experience. We categorized the most important possible types of presentation.

- Non Erosive Reflux Disease (NERD) is the simplest and at the same time the most difficult type to decide about antireflux surgery
- Failed previous fundoplication
- Dysplastic Barrett esophagus
- Short esophagus
- Alkaline reflux esophagus
- Abnormal motility esophagus, and those patients with
- Connective tissue disorders (Scleroderma) are examples of those critical special presentations. Review PubMed literatures of some of these difficult presentations and adding our experience in managing some of those cases.

RESULT

Many studies stated that both GERD and NERD patients get benefit from antireflux surgery. In one of these recent studies, at 6 months after surgery, complete resolution or partial improvement of GERD symptoms was observed in 80.8% and 15.4%, respectively, of the NERD group, versus 88.6% and 2.3% of the ERD group. Symptom resolution rates were not different between the groups ($P = 0.363$) [10].

For fundoplication failure: despite excellent results, the total fundoplication operation may fail just as its partial fundoplication counterpart.

Reports on re-operative surgery for gastroesophageal reflux bear witness to these failures [11-14]. The dysplastic Barrett's esophagus (BE) and its possible progression to low or high grade dysplasia and to adenocarcinoma when subjected to Anti reflux surgery (ARS) might regress but not eliminated the progression to cancer. And study showed this regression of dysplasia of BE happens in short segment BE but not in long-segment BE. Modulation of gene expression is involved in the genesis and reversion of short-segment intestinal metaplasia after ARS. The major operative and anatomic causes of failed fundoplication are slipped fundoplication, failure to identify a short esophagus, insufficient hiatal dissection to achieve good intra abdominal esophagus and problems with the wrap construction. Other study stated that complete takedown and reestablishment of the normal anatomy, recognition of a short esophagus, and decision to do elongation with proper placement of the wrap are essential components of the procedure. Those patients suffering from reflux alkaline esophagitis whether from partial or total gastrectomy, should be treated by total bile diversion with Roux diversion with a 50- 60cm limb and a bilateral truncal vagotomy should ensure full protection for the esophageal mucosa. Those with incompetent pylorus with reflux esophagitis of peptic origin having significant alkaline component can benefit from Nissen fundoplication, if minimal or erosive damage exists, or an elongation gastroplasty with a total fundoplication if the damage is more severe.

Antireflux surgery in esophageal dysmotility needs thinking about modification of fundoplication or at least select a tailored procedure. Dysmotility range from hypermotility to aperistaltic esophagus. In weak or inefficient peristalsis, reviewing their experience at UCSF, Patti *et al.* reported that 19% of patients with esophageal dysmotility ($n=141$) who underwent a partial (240 degrees) fundoplication had objective evidence of symptomatic reflux, compared to 4% symptomatic failure rate in the group of patients ($n=94$) who underwent a laparoscopic Nissen fundoplication; the incidence of post-operative dysphagia was similar between the 2 groups and the average duration of follow-up was 67 months; the author [15]. Similarly, a multicenter retrospective review of 48 patients with severe esophageal dysmotility (contraction amplitude <30 mmHg and/or $>70\%$ non-peristaltic esophageal body contractions) appear to demonstrate the safety of laparoscopic Nissen fundoplication: In esophageal aperistalsis, some authors consider the absence of esophageal contractility as a contra-indication to fundoplication from the fear of creating pseudo-achalasia [16]. Armijo and colleagues recently reported a series of 51 patients with esophageal dysmotility on either conventional manometry or HRM: 9 patients had esophageal body motility and 42 severe hypomotility. These patients underwent a Toupet fundoplication with a hiatal hernia repair (31 patients had a HH >5 cm). At a mean follow-up of 25 months (1-7 years), the authors reported significant improvement in GI symptoms, including heartburn, regurgitation and use of PPI. Despite persistence of dysmotility on upper gastro-intestinal studies that were performed at 12 months, the long-term incidence of dysphagia was 26.7% compared to 58.8% pre-operatively [17]. Surgical fundoplication is not the only surgical procedure described for the management of GERD in the setting of severe esophageal dysmotility. In fact, Roux-en-Y gastric bypass (RYGBP) is known to reduce acid reflux in the morbidly obese population, partially by achieving the greatest excess weight loss among all bariatric surgeries [18,19].

DISCUSSION

NERD and ERD are the 2 main types of GERD. According to several previous reports, only one fourths of symptomatic GERD patients have erosive esophagitis [20-22]. Particularly in Asia, NERD comprises 78%-93% of all reflux disease, although there has been an increase in ERD [23] NERD is the commonest type of GERD. Many physicians and patients consider NERD to be a mild form of GERD that could progress to more severe erosive disease. Physicians usually do not recommend surgical treatment for NERD because they consider NERD to be a mild form of reflux disease. However, the severity of mucosal damage examined by endoscopy is not correlated with the symptomatic severity [23]. A lower response to PPI treatment for NERD would support a greater role for surgery in the treatment of patients with NERD. Patients with NERD are more likely to become candidates for antireflux surgery.

The effectiveness of fundoplication was comparable for NERD and ERD in this study. Broeders *et al.* compared subjective and objective outcomes of Nissen fundoplication between 96 patients with NERD and 117 with ERD for 5 years after surgery. Relief of reflux symptoms, reduction of PPI use, improvement of quality of life scores, reduction of total acid exposure time, and increase in LES pressure were all similar between NERD and ERD.

In my series of about 823 cases NERD represent the majority 76% (compatible with the Asian studies) and were not responding to medical treatment, most of them showed endoscopy finding

pointing to grade II-IV Hiatal laxity with no mucosal damage. Those with persistent symptoms and not responding to PPI, usually enrolled in more investigations like HRM (High resolution esophageal Manometry), to rule out dysmotility, then subjected to Nissen floppy fundoplication. And those with weak esophageal peristalsis are subjected to Toupet fundoplication. NERD patients were 156 (19%) out of 823 subjected to Antireflux surgery. The majority 133 (85.25 %) patients improved and stopped taking medications, 12 (7.6) cases need further medication and close follow up. The rest are 11 patients (7%), improve regarding reflux symptoms but have some dysphagia, 5 resolve within 3 months and 2 need esophageal dilatation, and improve in 1 year time. From this experience we learn that tailoring Fundoplication by Toupet 270 degree wrap is a good choice for dysmotility cases with NERD, and even ERD. When the proper indication exists and no technical errors are made, the failed fundoplication may be due to fundoplication disruption. Causes of fundoplication disruption are many, but not necessarily indicate change of type of fundoplication when re-operating.

A. Poor technique i.e.:

1. Incomplete dissection of retained mediastinal prolapse of stomach and having enough intraabdominal esophagus.
2. Incomplete short gastric division, thus the fundus is not sufficient to have floppy wrap
3. Poor application of stomach (suture number and type and fixation to esophagus and (diaphragm), weak hiatus repair (not using augmented mesh when indicated)
4. Twisted wrap
5. Wrap on stomach. (I have seen famous GIT and Bariatric surgeons doing this fault).

B. Difficult pathology i.e.:

1. Short esophagus with excessive fibrous reaction, not elongating esophagus
2. Week wide hiatus, or fibrosed frozen
3. This causes eversion of wrap, prolapse into mediastinum, if wrap done without esophageal lengthening.

The large paraesophageal hernia with chronic shortening may well be responsible for a short esophagus as well. In these patients, four choices of repair are available: 1) the Collis gastroplasty associated with a partial or total fundoplication; 2) a total fundoplication; 3) the intrathoracic fundoplication; and 4) the intrathoracic Thal-Nissen repair.

Maher [24] operated for transthoracic repair in all but three of his 55 patients. In 12 patients he preferred to perform a Thai repair.

Hill et al. reported on 114 patients with a failed Nissen fundoplication. Most of these patients presented with recurrent reflux symptoms and dysphagia. They transformed the first operation into a Hill posterior gastropexy. They report satisfactory results in 80% of the patients with 2% mortality.

Leonardi and Ellis [11], however, reported on 54 failed operations and only three patients with strictures had to be re-operated through the chest: two had a Collis-Nissengastroplasty with excellent results, one required a resection.

Ellis [14] observed excellent reflux control and a normal recreation of a high pressure zone amplitude when using a gastroplasty with a

total fundoplication for patients with a strictured esophagus.

The esophagus is rendered atonic by esophageal myotomy performed for primary idiopathic motor disorders.

Adding an antireflux operation below a myotomized segment may result in the esophagus being unable to properly empty its content.

Gastroplasties, with either partial or total fundoplication, will result in obstructive symptoms

The use of a Nissen fundoplication, even if made loose and short, creates enough functional obstruction over time to warrant reoperation in nearly 50% of patients treated with this operation.

The use of a partial fundoplication to protect the myotomized esophagus from potential reflux seems to reach its goal while allowing satisfactory emptying of the esophagus. Dor fundoplication is a 180 degree anterior wrap found the least obstructive but may not protect well from inevitable reflux.

Scleroderma causes atony and poor propulsion in a majority of patients affected by this condition when referred for reflux symptoms.

A standard Nissen repair in this situation may become obstructive.

In our experience of 14 patients treated for that condition, 12 had a total fundoplication although modified by being made short (2 cm) and over a large bougie.

Our observations showed that these patients had symptoms of slow emptying and only one showed episodes of dysphagia.

Thus, the ideal operation in the scleroderma patient may not be a total fundoplication, but for the time being, it provides significantly better comfort for these patients, even with the imperfect results.

Interestingly, the notion that the type of fundoplication should be tailored to esophageal motility [25,26] has been challenged by several studies. The available evidence suggests that the outcomes of patients with esophageal dysmotility are not affected by the type of fundoplication [27-29].

Atypical variants of achalasia are under recognized. Nine randomized controlled trials (including both open and laparoscopic techniques) with follow-up of 1 to 5 years have compared the Toupet fundoplication with the Nissen [30-33]

The majority of published studies have demonstrated lower dysphagia rates after Toupet fundoplication and no difference in heartburn control between the two procedures at follow up.

CONCLUSION

Nissen fundoplication is equally beneficial to patients with NERD and ERD. The absence of erosive esophagitis on endoscopy in patients with GERD symptoms should be no longer a reason to avoid antireflux surgery.

It seems that the extent of damage and the type of damage and dysfunction that dictate best the choice of an antireflux operation other than the Nissen fundoplication. A variety of Antireflux surgery is the salvage step in many difficult presentations like NERD, Dysplasia, short esophagus, and esophageal dysmotility.

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REFERENCES

- Vaki NI, Zanten S. V, Kahrilas P, Dent J, Jones R, "The Montreal definition and classification of gastroesophageal reflux disease: a global evidence-based consensus," *The American Journal of Gastroenterology*, vol. 101, pp. 1900–1920, 2006.
- Wetscher G J, Redmont E.J, Vititi, L.M.H. Pathophysiology of gastroesophageal reflux disease. In *Gastroesophageal Reflux Disease*, R.A. Hinder, ed. (Austin, TX: R. G. Landes Company), pp 7-2, 1993.
- Everhart J. E, Ed., "The burden of digestive diseases in the United States," US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, US Government Printing Office, Washington, DC, USA, NIH Publication No. 09-6443, 2008.
- Antonino A, Giorgio R, Giuseppe F,* Giovanni D. V, Silvia D. G, Giuseppe D. B, et al. Hiatal Hernia Repair with Gore Bio-A Tissue Reinforcement: Our Experience, *Case Rep Surg*. 2014; 2014: 851278.
- Spechler SJ, Hunter JG, Jones KM. Randomized trial of medical versus surgical treatment for refractory heartburn. *N Engl J Med* 2019; 381:1513-1523.
- DeMeester TR, Johnson LF, Ken! AH. Evaluation of current operations for the prevention of gastroesophageal reflux. *Ann Surg* 1974;180:511-525.
- Stanghellini V, Barbara G, Cogliandro R, "Overlap between GERD and IBS: irrefutable but subtle," *Journal of Clinical Gastroenterology*, vol. 41, 2, pp. S114–S117, 2007. C. H. Knowles and Q. Aziz, "Visceral hypersensitivity in nonerosive reflux disease," *Gut*, vol. 57, no. 5, pp. 674–683, 2008.
- Allaix M. E, Patti M. G. Antireflux surgery for dysplastic Barrett. 2015 Mar; 39(3):588-94. doi: 10.1007/s00268-014-2632-x.
- Watson DI, Jamieson GG, Game PA, Williams RS, Devitt PG. Laparoscopic reoperation following failed antireflux surgery. *Br J Surg* 1999; 86: 98–101.
- Park J. M, Chi K. C, Antireflux surgery is equally beneficial in nonerosive and erosive gastroesophageal reflux disease. *Ann Surg Treat Res*. 2018 Aug; 95(2): 94–99.
- Leonardi HK, Ellis FH. Re-operative surgery for gastroesophageal reflux. In: Jamieson GG (ed) *Surgery of the Esophagus*. London: Churchill Livingstone, 1988:291-298.
- Thor K, Mercer CD, James E, Hill LD. Post-Nissen syndrome. In: Siewert JR, Holscher DH (eds) *Diseases of the Esophagus*. Berlin: Springer-Verlag, 1988; 1203-1205.
- Orringer MB. Management of failed antireflux procedures. *Surgery* 1987; 181-195.
- Ellis FH Jr., Leonardi HK, Dabuzhsky L, Crozier RE Surgery for short esophagus with stricture: an experimental and clinical manometric study. *Ann Surg* 1978; 188:341-350.
- Patti MG, Robinson T, Galvani C. Total fundoplication is superior to partial fundoplication even when esophageal peristalsis is weak. *J Am Coll Surg* 2004; 198:863-9; discussion 869-70. 10.1016/j.jamcollsurg.2004.01.029
- Armijo PR, Hennings D, Leon M. Surgical Management of Gastroesophageal reflux disease in patients with severe esophageal dysmotility. *J Gastrointest Surg* 2019; 23:36-42. 10.1007/s11605-018-3968-6
- Buchwald H, Avidor Y, Braunwald E. Bariatric surgery: a systematic review and meta-analysis. *JAMA* 2004; 292:1724-37. 10.1001/jama.292.14.1724
- Madalosso CA., Gurski S, Callegari-Jacques RR. The impact of gastric bypass on gastroesophageal reflux disease in patients with morbid obesity. *Ann Surg* 2010; 251:244-8. 10.1097/SLA.0b013e3181bdf20
- Ronkainen J, Aro P, Storskrubb T, Johansson SE, Lind T, Bolling-Sternevald E, et al. High prevalence of gastroesophageal reflux symptoms and esophagitis with or without symptoms in the general adult Swedish population: a Kalixanda study report. *Scand J Gastroenterol*. 2005; 40:275–285.
- Goh KL. Gastroesophageal reflux disease in Asia: a historical perspective and present challenges. *J Gastroenterol Hepatol*. 2011;26(Suppl 1):2–10.
- Okamoto K, Iwakiri R, Mori M, Hara M, Oda K, Danjo A, et al. Clinical symptoms in endoscopic reflux esophagitis: evaluation in 8031 adult subjects. *Dig Dis Sci*. 2003;48:2237–
- Strate U, Emmermann A, Fibbe C, Layer P, Zornig C. Laparoscopic fundoplication: Nissen versus Toupet two-year outcome of a prospective randomized study of 200 patients regarding preoperative esophageal motility. *Surg Endosc* 2008;22:21-30
- Novitsky YW, Wong J, Kercher KW. Severely disordered esophageal peristalsis is not a contraindication to laparoscopic Nissen fundoplication. *Surg Endosc* 2007; 21:950-4.
- Maher JW, Hocking MP, Woodward ER. Reoperations for esophagitis following failed antireflux procedures. *Ann Surg* 1985; 201:723-727.
- Yadlapati R, Hungness ES, Pandolfino JE. Complications of antireflux surgery. *Am J Gastroenterol* 2018;113:1137-47. 10.1038/s41395-018-0115-7.
- Booth M I, Stratford J, Jones L, Dehn T C. Randomized clinical trial of laparoscopic total (Nissen) versus posterior partial (Toupet) fundoplication for gastro-oesophageal reflux disease based on preoperative oesophageal manometry. *Br J Surg* 2008;95:57-63.
- Jones C. M, Raymond F, Watson J, Peters H, FACS, Atypical Variants of Classic Achalasia Are Common and Currently Under-Recognized: A Study of Prevalence and Clinical Features, *Journal of the American College of Surgeons*, Volume 213, Issue 1, July 2011, Pages 161-162.
- Hershcovici T, Fass R. Nonerosive reflux disease (NERD) - an update. *J Neurogastroenterol Motil*. 2010;16:8–21.
- Galey K. M , Wilshire C. L, Niebisch C, Jones C, Raymond D. P, Watson T. J, et al. Atypical variants of classic achalasia are common and currently under-recognized: a study of prevalence and clinical features. 2011 Jul;213(1):155-61; discussion 162-3.
- Broeders JA, Draaisma WA, Bredenoord AJ, Smout AJ, Broeders IA, Gooszen HG. Long-term outcome of Nissen fundoplication in non-erosive and erosive gastroesophageal reflux disease. *Br J Surg*. 2010; 97:845–852.
- Fibbe C, Layer P, Keller J, Strate U, Emmermann A, Zornig C. Esophageal motility in reflux disease before and after fundoplication: a prospective, randomized, clinical, and manometric study. *Gastroenterology* 2001;121:5-14.
- Chrysos E, Tsiaoussis J, Zoras O J, Athanasakis E, Mantides A, Katsamouris A, et al. Laparoscopic surgery for gastroesophageal reflux disease patients with impaired esophageal peristalsis: total or partial fundoplication? *J Am Coll Surg* 2003;197:8-15.

33. Hagedorn C, Lonroth H, Rydberg L, Ruth M, Lundell L. Long-term efficacy of total (Nissen-Rossetti) and posterior partial (Toupet)

fundoplication: results of a randomized clinical trial. J Gastrointestinal Surg (2002)6:540-545.