

ADVANCES IN GERD

Current Developments in the Management of Acid-Related GI Disorders

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Surgical Treatment of Obese GERD Patients

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G&H What is the current understanding of the association between obesity and gastroesophageal reflux disease?

LS Gastroesophageal reflux disease (GERD) is one of the comorbidities associated with morbid obesity, which is well known to be at epidemic proportions in the United States. (According to the Centers for Disease Control and Prevention, morbid obesity is defined as a body mass index of 35 kg/m² or greater.) There is not a 100% correlation between obesity and GERD, though GERD is certainly high on the list of complaints that morbidly obese patients have, as it is seen in probably 60–70% of these patients. Thus, this relationship is quite common, and it is likely causal, in that the patients have GERD because they are obese. Supposed mechanisms for the relationship include increased intra-abdominal pressure due to abdominal fat and overdistension of the stomach from overeating. Not only can these factors overcome the lower esophageal sphincter (acutely or chronically), they can even force the stomach through the hiatus—and hiatal hernia certainly predisposes patients to GERD. On the other hand, it is not unusual that GERD leads to weight gain in and of itself. Speculative theories to explain this phenomenon mostly posit that reflux patients develop maladaptive eating behaviors as a result of GERD, including eating and drinking more often to clear their esophagus of acid and eating high carbohydrate foods to absorb the intragastric acid.

G&H When is surgery indicated for GERD treatment in obese patients rather than proton pump inhibitors or endoscopic treatment options?

LS The role of surgery in the treatment of GERD is the same for obese or nonobese patients. It should be considered for patients whose symptoms are not controlled by maximized medical treatment (proton pump inhibitors [PPIs] and lifestyle modification), for patients who have symptoms or problems primarily related to positional regurgitation (such as recurrent pneumonias or cough), or patients who have persistent complications related to anatomic distortions of a hiatal hernia such as anemia from Cameron's ulcers, epigastric pain, or food trapping above the diaphragm. Many patients experience failure of medical treatment due to factors unrelated to the efficacy of PPIs in their case. These can include the inability to afford PPIs, intolerance of medications, poor compliance, maladaptive eating habits, or obesity. A benefit of surgery is that it is somewhat imposed on the patients and does not require long-term compliance. It is also a mechanical solution meant to restore normal physiology and so does not depend upon a physiologic response to chemical modulation. To this extent, an antireflux surgery is a "cure" for GERD, whereas medication is palliative.

Of course, surgeons and medical doctors always encourage patients to avoid inciting factors for their GERD—overeating, chocolate, and coffee—as well as to lose weight. Unfortunately, the success of dietary efforts at losing weight is less than 2% over the long term.

G&H How effective are the surgical options for obese GERD patients?

LS If an obese patient meets the criteria stated above for an antireflux surgery, the surgeon is faced with multiple options. For the nonobese patient, the gold standard is the laparoscopic 360-degree fundoplication. It is commonly accepted that a patient with a primary esophageal motil-

ity disorder should probably have a partial fundoplication to minimize the incidence of postoperative dysphasia. A laparoscopic Nissen in a thin patient, performed by a high-volume surgeon, has a subjective success rate of 90–95%. The objective confirmation of reflux correction is seen in 85–90%. Population studies often show a higher use of PPIs postoperatively—and this is often noted as a criticism of antireflux surgery—but when closely scrutinized, most of these patients are taking PPIs for nonreflux reasons (dyspepsia, flatulence, and unusual reasons such as bone pain). For the morbidly obese patient, however, the options are more complex.

There is some controversy regarding the use of fundoplication in obese and morbidly obese patients with regard to its success rate in this situation. Early on, it was proposed that the failure rate would be higher for obese patients. Later, it was shown by Anvari and others that failure rates were not higher.

Another option for the morbidly obese GERD patient is a gastric bypass surgery. This procedure works by decreasing the amount of acid and gastric contents available to reflux into the esophagus. Of course, it also imposes weight loss, which helps GERD as well. It should be kept in mind, however, that it does nothing to restore the lower esophageal sphincter and, therefore, these patients still have regurgitation, albeit in smaller, less caustic amounts. The current guidelines for gastric bypass and other types of bariatric surgery, which were established by the Centers for Disease Control and Prevention, state that these procedures are typically indicated for patients with a body mass index of greater than 40 kg/m² or greater than 35 kg/m² with comorbidities such as diabetes and reflux.

The most common bariatric procedure currently performed in the United States is laparoscopic Roux-en-Y gastric bypass, followed by laparoscopic restrictive band procedure, and then open Roux-en-Y gastric bypass, which is still practiced at some obesity surgery centers. In general, surgery for obesity is highly effective, certainly more effective than medical or dietary means. Surgery is successful in 80% of people for dramatically decreasing weight as well as treating comorbidities, including diabetes and GERD. The Roux-en-Y gastric bypass is also currently considered to be the most effective bariatric procedure, both overall and for GERD. There are some older procedures that were more aggressive such as the distal jejuna-ileal bypass (abandoned since the 1970s due to nutrition complications) and the duodenal switch, which is still practiced in certain cases and which is perhaps even more effective than the current Roux-en-Y as far as weight loss is concerned, but it has more surgical risk. The Roux-en-Y's 80% success rate in all obese patients for losing more than 60% of excess body weight is the current hallmark of successful bariatric surgery. Gastric banding is

somewhat less successful (approximately 50%), though it is much easier and reversible. There is a scattering of other procedures such as the gastric sleeve, which is somewhat of an intermediate between the two other procedures.

As mentioned, in general, these surgeries are quite effective, particularly at eliminating the comorbidities that accompany morbid obesity. As far as GERD is concerned, the Roux-en-Y procedure has a reported 70–90% symptomatic success rate at controlling reflux symptoms and a 60–80% objective reflux control rate. Restrictive procedures such as the gastric band or vertical banded gastroplasty are typically considered to be “GERDagenic” and as such are considered to be contraindicated in obese patients with prominent reflux symptoms at presentation.

G&H Is there any danger in using PPIs in patients who have undergone gastric bypass or other surgeries?

LS Among morbidly obese patients with GERD who undergo bypass to address their morbid obesity, roughly 70–75% will experience GERD relief. This leaves 20–30% of bypass patients still suffering from GERD, and there are no contraindications to taking PPIs in these patients. In actuality, PPIs are routinely used in this patient population. One of the complications commonly associated with Roux-en-Y gastric bypass is marginal ulceration of the gastric jejunum. These patients are often put back on their PPIs as well. Absorption is still good with PPIs in patients who have undergone gastric surgery. PPIs have nearly the same safety and side effect profiles in these patients as in the general population, and the dosage is typically not adjusted.

G&H Are repeat procedures often necessary?

LS The 10-year success rate of an elective fundoplication for GERD in a nonobese patient is around 90%. Obesity may slightly increase the long-term failure rate, though this is not well documented. If a primary GERD surgery fails in a morbidly obese patient, a bariatric surgery (Roux-en-Y bypass) should be considered as a re-operative option.

However, repeat surgeries of bariatric procedures themselves are very difficult and may be associated with increased morbidity. The most commonly revised bariatric surgery is probably laparoscopic band, due to the band failing, the inability to achieve successful weight loss, or the exacerbation of GERD symptoms. Failed band patients are sometimes offered laparoscopic bypass, which is technically much more difficult and a little more risky, so it is not an option that surgeons prefer. Reoperations on other procedures are usually performed only if there

is a complication such as a fistula. If a Roux-en-Y bypass patient does not lose weight, they may be offered a revision to shrink their gastric pouch or to lengthen the Roux length. One of the newer developments is trying to salvage these surgeries endoscopically. There are several new endoscopic devices to shrink the pouch endoscopically if it becomes dilated and the patient starts regaining weight or to reduce a stoma that is between the stomach and intestine, once again by placing endoscopic sutures and trying to decrease the overall volume. This probably has minimal effect on persistent GERD symptoms, however. On rare occasions, procedures may need to be reversed if the patient loses too much weight or has nutritional problems. Psychological testing and counseling is always performed prior to surgery. We try to ensure that patients will do well with bypass because its reversal is very difficult and associated with a high morbidity rate and many patients regain the majority of their weight.

Likewise, there are occasions where a patient who has had a fundoplication in the past presents for a weight loss surgery. This is, once again, a difficult surgery with a higher morbidity, but it can be performed. Most authors report that they completely reverse the fundoplication before doing the bypass. Obviously, this predisposes the patient to recurrent reflux, and we have preferred instead to leave the fundoplication intact and transect the stomach below it, thus giving the patient the maximal assurance that weight loss will not come at the price of recurrent reflux.

G&H Are there any contraindications to these surgical options?

LS There are many relative, and a few absolute, contraindications for any surgical options. Some morbidly obese patients are very ill and may be too ill to undergo general anesthesia for any of these procedures. When that happens, we may perform an endoscopic procedure such as a gastric balloon so that the patient loses enough weight and is healthy enough to undergo a definitive bariatric surgery. Other contraindications are specific to the types of antireflux or bariatric surgery that are being performed. We tend to discourage patients who have severe reflux from undergoing a band procedure, as the band is a bit of a “refluxogenic” procedure. Likewise, a gastric sleeve will usually not take care of the reflux or will make it worse. These patients do best with a bypass. Other contraindications deal with the psychological makeup of the patient. It is very common in bariatric centers for a mental health worker to evaluate patients to ensure that they can handle fairly radical changes in their lifestyle and body image. There are also rare occasions where we would not perform a bypass due to diseases that affect the upper

gastrointestinal tract such as scleroderma or giant hiatal hernias. Patients need to be sorted out very carefully prior to surgery; they must meet the right profile and be very motivated for the program because surgery is just one step in their whole weight loss. Gastroenterologists are often valuable partners in sorting these patients out.

G&H Has there been any cost-effectiveness analysis on surgical options for GERD in obese patients?

LS Several studies have examined the total cost of morbid obesity versus the cost savings if a significant number of patients undergo obesity surgery. These procedures are clearly expensive, though laparoscopy does make them more cost-effective and less costly overall. Longitudinal studies have demonstrated a tremendous decrease (a reduction in overall lifetime medical costs by 50% or more) in the amount of medical care that is consumed in a morbidly obese patient who has bypass surgery. In comparison, medical treatment of obesity and dieting are very unsuccessful, with success rates of only 5%.

Laparoscopic antireflux surgery has likewise been shown to be a cost-effective strategy for GERD treatment when compared to chronic medical therapy. We have reported a 4.5 year break even point for laparoscopic fundoplication, after which, medical treatment was more expensive.

Finally, a recent paper by Varela and associates showed that the acute costs of an antireflux surgery and a bariatric surgery (hospital charges, supplies, length of stay, complication costs) were equal for the two procedures.

G&H Are there any special concerns when performing these surgical procedures in obese patients with GERD?

LS We are always concerned that a standard fundoplication in an obese patient may be subject to extra stressors and fail, particularly if the patient continues to gain weight. As mentioned above, certain procedures (such as the lap band) are not advisable in morbidly obese patients who have GERD. On occasion, we will perform a bypass on a patient who has had antireflux surgery or we will add an antireflux surgery to the bypass on somebody who has severe reflux as their primary complaint. If a patient has a hiatal hernia, it should be repaired at the time of their surgery—no matter if it is a bariatric or antireflux procedure. We also try to clear up esophagitis and *Helicobacter pylori* infection prior to operating on patients. It is always a concern that, following a Roux-en-Y bypass, the endoscopist will no longer have access to the patient’s distal stomach (as it is disconnected from the proximal

stomach by a long jejunal limb) and will be unable to examine it afterwards. From a technical standpoint, obese patients are always classified as high surgical risks, so extra care must be taken when performing either a bariatric or antireflux surgery, particularly with regard to deep venous thrombosis, pulmonary embolism, and respiratory complications.

G&H What are the next steps for future research?

LS No one knows the exact cut-off for successful fundoplication in the obese patient: a body mass index of 40, 50, 60, or so on? Certainly, more research needs to be performed in this area to provide guidelines for gastroenterologists, gastrointestinal surgeons, and bariatric surgeons.

One of the hot topics in obesity surgery involves morbidly obese children and whether they should undergo surgery and, if so, what type. Several ongoing prospective studies are examining the nutritional impact of surgery on adolescents and the success rate, but these patients need to be followed for a long period of time before conclusions can be drawn. We are still trying to determine the most effective procedure and which patients should have which procedures. New technologies and techniques (particularly endoscopic ones), whether reducing the stomach size or bypassing the stomach, are very interesting and draw much attention. Finally, as mentioned previously, gastric bypass appears to improve diabetes in a high number (70–80%) of patients with type II diabetes, who can discontinue their insulin or who are no longer diabetic following bypass. There has been an interest in using gastric bypass as a pure treatment for

diabetes in nonobese patients who would otherwise not be considered. Gastroenterologists should be involved in these and all developments because new treatments will likely be performed by surgical endoscopists and, at most institutions, gastroenterologists help treat the complications (such as marginal ulcers, strictures, or leaks) that can arise from surgery.

Suggested Reading

Hong D, Khajanchee YS, Pereira N, Lockhart B, Patterson EJ, Swanstrom LL. Manometric abnormalities and gastroesophageal reflux disease in the morbidly obese. *Obes Surg*. 2004;14:744-749.

Patterson EJ, Urbach DR, Swanström LL. A comparison of diet and exercise therapy versus laparoscopic Roux-en-Y gastric bypass surgery for morbid obesity: a decision analysis model. *J Am Coll Surg*. 2003;196:379-384.

Picot J, Jones J, Colquitt JL, Gospodarevskaya E, Loveman E, et al. The clinical effectiveness and cost-effectiveness of bariatric (weight loss) surgery for obesity: a systematic review and economic evaluation. *Health Technol Assess*. 2009;13:1-190, 215-357, iii-iv.

Patterson EJ, Davis DG, Khajanchee Y, Swanström LL. Comparison of objective outcomes following laparoscopic Nissen fundoplication versus laparoscopic gastric bypass in the morbidly obese with heartburn. *Surg Endosc*. 2003;17:1561-1565.

Khajanchee YS, O'Rourke R, Cassera MA, Gatta P, Hansen PD, Swanström LL. Laparoscopic reintervention for failed antireflux surgery: subjective and objective outcomes in 176 consecutive patients. *Arch Surg*. 2007;142:785-901; discussion 791-792.

Swanström LL. Motion--Laparoscopic Nissen fundoplication is more cost effective than oral PPI administration: arguments for the motion. *Can J Gastroenterol*. 2002;16:621-623.

Anvari M, Bamehriz F. Outcome of laparoscopic Nissen fundoplication in patients with body mass index ≥ 35 . *Surg Endosc*. 2006;20:230-234.

Varela JE, Hinojosa MW, Nguyen NT. Laparoscopic fundoplication compared with laparoscopic gastric bypass in morbidly obese patients with gastroesophageal reflux disease. *Surg Obes Relat Dis*. 2009;5:139-143.