Reversible Pseudoachalasia in a Patient with Laparoscopic Adjustable Gastric Banding

Seth Lipka, MD[1]
Seymour Katz, MD, FACP, MACG[2,3]

[1]Department of Medicine, Nassau University Medical Center, East Meadow, New York; [2]North Shore University Hospital–Long Island Jewish Health System, Manhasset, New York; [3]St. Francis Hospital, Roslyn, New York

The incidence of obesity in the United States has increased dramatically along with its associated comorbidities (eg, heart disease, hypertension, and type 2 diabetes) and mortality risk.[1] Bariatric surgery has surfaced as one effective method to counteract morbid obesity. Compared with complete gastric bypass surgery, laparoscopic adjustable gastric banding (LAGB) has become more popular because of its reversibility and association with a shortened hospital course and fewer complications.[2] Complications from LAGB are typically device-related; however, recent reports of pseudoachalasia have surfaced.

Case Report

A 55-year-old woman presented with nocturnal cough and acid reflux. Her medical history included gastroesophageal reflux disease, iron deficiency, and laparoscopic adjustable gastric band placement that had been performed for treatment of obesity 3 years before presentation. She denied smoking cigarettes or use of alcohol or drugs. Her family history was only significant for hypertension in her mother. She had undergone an esophagogastroduodenoscopy 4 years prior without significant findings.

Her reflux symptoms, which had persisted for the past year, were unrelieved despite use of a proton pump inhibitor and over-the-counter antacids. She coughed nightly, regurgitated food, and had occasional nonbloody vomiting. Her physical examination findings were unremarkable other than the palpable laparoscopic band. Her metabolic panel and complete blood count were unremarkable.

A barium esophogram revealed a dilated esophagus beginning at 5 cm in the upper thoracic esophagus and channeling through to the gastric region with absent peristalsis (Figures 1 and 2). A gastric emptying study revealed esophagogastric junction (EGJ) obstruction with retention of the radiotracer. An endoscopy demonstrated a corrugated distal esophageal mucosa with pooling of secretions and a properly placed gastric band of the gastric cardia. A biopsy of the esophageal area showed mild noneosinophilic chronic inflammation.

Esophageal manometry revealed high lower esophageal sphincter pressure (LES) and aperistalsis findings consistent with achalasia. Subsequent band reduction resulted in a complete resolution of the patient's symptoms.

Discussion

Pseudoachalasia, or secondary achalasia, is a motility disorder that may be indistinguishable from achalasia. The danger of missing the diagnosis is that the condition can advance to an inoperable malignancy or result in an unneeded procedure, such as a myomectomy or pneumatic dilation. Pseudoachalasia was first described in 1947 by Ogilvie in a case that included submucosal infiltration of the lower esophagus by a carcinoma mimicking achalasia.[3] Approximately 3–4% of the cases diagnosed as achalasia are in fact pseudoachalasia.[4] The majority of cases of pseudoachalasia are caused by mechanical obstruction; however, infiltration of the myenteric plexus by underlying disease also has been described. Reversal of the underlying process, as in our case, leads to remission of pseudoachalasia.[5] Gockel and colleagues reviewed 264 cases between 1968 and 2002 in which the majority of cases were explained by malignant disease (53.9% primary and 14.9% secondary malignancy), followed by benign lesions (12.6%) or a complication of surgical procedures at the distal esophagus or proximal stomach (11.9%).[4] The symptoms of pseudoachalasia commonly include dysphagia, dyspepsia, regurgitation, retrosternal pain, and weight loss.

Address correspondence to:
Dr. Seymour Katz, 1000 Northern Boulevard, Great Neck, NY 11021;
Tel: 516-466-3240; Fax: 516-829-6421; E-mail: Seymourkatz.md@gmail.com

Figure 1. A dilated esophagus channeling through to the gastric region, with absent peristalsis, is shown. The arrow indicates the gastric band.

Pseudoachalasia is often indistinguishable from achalasia on barium studies and esophageal manometry. In pseudoachalasia, a clinician may find a rigid cardia or fail to pass the endoscope into the stomach. Failure to respond to calcium channel blockers, pneumatic dilation, or surgery is common. As in this case, the ability to distinguish between achalasia and pseudoachalasia often occurs after removal of a laparoscopic band.[6,7]

With the prevalence rate of obesity in the United States at 35.5% in men and 35.8% in women,[8] LAGB has become a frequent procedure for the management of obesity. LAGB is an independent risk factor for pseudoachalasia.[6] In a study of 121 patients followed after LAGB, esophageal dilation greater than 3.5 cm developed in 14% of patients in association with the development of an achalasia-like syndrome of dysphagia and vomiting.[9] However, pseudoachalasia evoked from LAGB appears to be reversible in most cases, as shown by Khan and colleagues who followed 6 patients with LAGB who had symptoms of achalasia.[6] These patients showed absent peristalsis on manometry and esophageal dilation on barium swallow consistent with pseudoachalasia.[6] After either partial liquid removal or complete removal of the laparoscopic band, symptoms resolved in all patients. Esophageal dilation improved in all patients, but manometric findings were variable: 2 patients had persistent aperistalsis, 2 patients had partial peristalsis, and 1 patient had complete return of normal peristalsis.

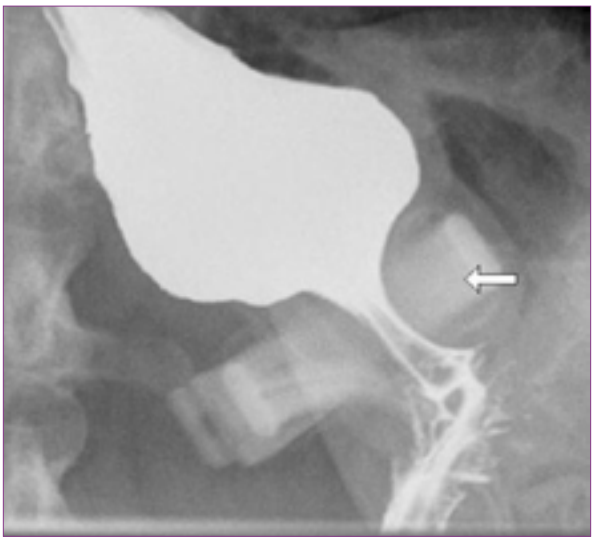

Figure 2. A view of the dilated esophagus and gastric band (arrow).

The mechanism of esophageal dilation and dysmotility postgastric banding is unknown. LES pressure and LES residual pressure are increased after LAGB.[10] A proposed mechanism is the high outflow resistance caused by the gastric band at the LES that creates a high-pressure area leading to a progressive weakening of the esophageal musculature. The inflammation around the laparoscopic band, with fibrosis or neuromuscular damage, may account for the variability of manometric studies.

One hypothesis for reversibility of manometry when the band is removed is that a chronic inflammatory process is prevented from becoming irreversible. Altered esophageal peristalsis after LAGB in patients with insufficient LES pressure may permit reflux secondary to the obstruction created by the gastric band.[11] Gastroesophageal reflux damage to the esophageal muscular layers induces low-amplitude peristalsis in the esophagus combined with high pressure created by the band.[12,13] Esophageal manometry cannot determine whether the high-pressure area is secondary to a hypertensive LES or from LAGB.[6]

High-resolution manometry (HRM) with esophageal pressure topography (EPT) may increase the sensitivity of detecting the exact metrics.[7] In a study of 22 patients who had undergone LAGB and had esophageal symptoms (dysphagia, vomiting, and regurgitation), esophageal dysmotility was prevalent. Three patients received a diagnosis of achalasia, 15 received a diagnosis of functional EGJ obstruction, and 2 received a diagnosis of hypotensive peristalsis.[14] Only 2 patients had normal results, and 2 patients continued to be symptomatic despite removal of the band (1 had functional EGJ obstruction, and 1 had achalasia). Even with HRM with EPT, the proximity of the band to the LES made it very difficult to separate the contributions that each makes to intraluminal pressure.[6]

Conclusion

Although the exact mechanism of pseudoachalasia in patients with LAGB is undefined, complete resolution of symptoms is seen in most cases with release of the band. Dysphagia in patients with LAGB should prompt a search for pseudoachalasia to prevent long-term sequelae.

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Review

Should the Lap Band Be Removed to Treat Pseudoachalasia?

George A. Fielding, MD

New York University School of Medicine
New York, New York

Obesity is currently the second largest cause of preventable death in the United States and is a devastating disease. Rates of incidence and associated complications of obesity rise exponentially every year. There are now more morbidly obese individuals in the United States than the total population of Australia. All of the currently available bariatric procedures are effective in helping morbidly obese patients lose weight and keep it off. All bariatric procedures have their drawbacks and challenges, though. They include leaks after bypass and sleeve procedures, band slippage and erosions, malnutrition after biliopancreatic diversion, weight regain, and failure. Most patients do well following bariatric procedures for management of obesity and go on to have a good quality of life.

Address correspondence to:
Dr. George A. Fielding, NYU Langone Medical Center, 530 First Avenue, Suite 10S, New York, NY 10016.

Since its introduction in 1994, laparoscopic adjustable gastric banding (LAGB) has been recommended for the treatment of morbid obesity, with successful outcomes by many bariatric surgeons worldwide. Since the approval of LAGB in 2001 in the United States by the US Food and Drug Administration, the use of the Lap-Band System (Allergan) has increased and given patients an alternative treatment to Roux-en-Y gastric bypass (RYGB) and, more recently, sleeve gastrectomy.

Successful modification of the band implantation technique, especially the use of the pars flaccida technique and hiatal hernia repair/cruroplasty in the initial operation, has substantially reduced the need for reoperation after band placement.[1,2] Changes in band technology (especially the use of wider, lower pressure bands) have resulted in further reductions in reoperation rates. The band is thought to primarily work by controlling hunger and increasing feelings of satiety without compromising energy reserves.[3] Adjustment strategies in the Division of Bariatric Surgery at the NYU Langone Medical Center have been modified accordingly and aim to keep patients in the "green zone," as described by Dixon and colleagues.[3] (They described 3 zones of band action: yellow, where there is no restriction; green, where patients feel satisfied with a small meal, which is the optimum level; and red, where the band is too tight, and patients have severe reflux and are unable to eat meals.) Thus, the major objective is to reduce hunger, rather than just be restrictive, and to keep the patients at a level where they are able

to eat most foods slowly, without developing reflux. Improved treatment protocols have resulted in long-term patient satisfaction and correlate with the reduction in the need for band revision and removal, and satisfaction rates compare favorably with those among patients who had band insertion procedures in the late 1990s and early 2000s.[4]

LAGB results in satisfactory weight loss, provided that the band is properly adjusted. O'Brien and colleagues recently reviewed 3,227 cases of patients treated with LAGB between September 1994 and December 2011.[5] A total of 714 patients had completed at least 10 years of follow-up; follow-up exceeded 10 years in 78% of patients. No perioperative mortality was associated with the primary placement or any revision procedures. A mean 47% excess weight loss (EWL; 95% confidence interval, 1.3) was achieved in all patients who were at or beyond 10 years' follow-up. The band was explanted in 6% of patients.

In a recent study by Weichman and colleagues that included 2,909 patients, the rate of EWL was 53% at 3 years and 47% at 6 years postsurgery.[6] In multivariate models, an increased number of office visits, younger age, female gender, and white race were significantly associated with a higher maximum EWL rate. One or more complications occurred in 12% of the total study cohort. The most common complications were band slippage (5%) and port-related problems (3%), suggesting that LAGB is a safe procedure with few early or late complications.

The literature on longer follow-up of LAGB suggests that a 50% EWL up to 10 years can be expected, with 50% of patients achieving a 50% EWL. The literature also suggests that the procedure poses very low risk to the patient.[5,7]

The major long-term concern regarding LAGB is the need for reoperation. The most common reason for reoperation is severe reflux following band slippage or pouch dilatation. Lap band pseudoachalasia, described in the case by Lipka and Katz,[8] is a potent cause of severe reflux and band intolerance but is rarer than pouch dilatation, band slippage, or expansion of an existing hiatal hernia.

Burton and colleagues evaluated a subset of 123 patients who had undergone LAGB but had adverse events or poor weight loss.[9] Patients underwent high-resolution video manometry that incorporated a semi-solid stress barium swallow protocol and were compared with 30 patients who had successful LAGB results (>50% EWL with no adverse events) and 56 preoperative patients. Outcomes were categorized based on anatomic appearance, transit through the band, and esophageal motility.

Five pathophysiologic patterns were identified: transhiatal enlargement (n=40), subdiaphragmatic enlargement (n=39), no abnormality (n=30), aperistaltic esophagus (n=7), and intermittent gastric prolapse (n=3). Esophageal motility disorders were more common in symptomatic and preoperative patients than in patients with successful LAGB outcomes (P=.01). Significant differences between patients with successful outcomes and symptomatic patients included the length of the high-pressure zone above the band (P<.005), peristaltic velocity (P<.005), frequency of previous surgery (P=.01), and lower esophageal sphincter tone (P=.05). Video manometry identified abnormalities in three quarters of symptomatic patients in whom conventional contrast swallow had not been diagnostic. Seven of these patients had pseudoachalasia. The research team then went on to assess the role of the lower esophageal contractile segment (LECS) in these patients.[10]

In the LECS assessment study, an intact LECS during normal swallows was more frequent in patients with a successful LAGB outcome than in symptomatic patients (95% vs 43%; P<.005). The rate of hypotensive swallows in symptomatic patients increased after removing all fluid from the gastric band (30% vs 17%; P=.002). An intact LECS in 70% of normal swallows defined normal motility in patients who had undergone LAGB. The researchers concluded that LECS is a valuable measure of esophageal function in patients who had undergone LAGB and that measuring LECS complements conventional manometry.

A team from the NYU Langone School of Medicine examined whether emptying, rather than removing, a gastric band will resolve hypotensive swallowing.[11] The key question was whether the band should be removed if pseudoachalasia developed. The research team retrospectively reviewed the clinical, manometric, and radiologic data of 6 female patients (age range, 37–55 years) in whom dysphagia or heartburn had developed and in whom manometric studies showed aperistalsis following LAGB. Fluid in the gastric bands was completely removed in 5 patients, and the band itself was removed in 1 patient. Reversibility of esophageal aperistalsis was then assessed.

Five patients (4 who had removal of the fluid from the band and 1 who had surgical removal of the band) underwent manometry. Of these, 2 patients had a partial return of peristalsis, 1 had normal peristalsis, and 2 others had continued aperistalsis but showed clinical improvement. Another patient had improvement of radiologic esophageal dilation but declined repeat manometry. The findings suggest that achalasia-like esophageal aperistalsis may be reversible.

A team from France took a slightly different view and advocated band removal.[12] Eleven (55%) of 20 patients with esophageal motility disorders fit the manometric criteria for an achalasia-like disorder, with a mean esophagogastric junction (EGJ) resting pressure of 32.1 cmH_2O and an EGJ relaxation pressure of 24.2 cmH_2O. Nine (82%) of the 11 patients underwent band removal that resulted in symptom resolution. The remaining 2 patients underwent band deflation. Manometric control after band removal showed both a decrease in resting and relaxation EGJ pressures (mean of 9.5 cmH_2O and 6.5 cmH_2O, respectively)

and a recovery of wave contractions in 88% of cases. Four patients underwent revision surgery due to weight regain and had successful outcomes.

In another study, consisting of 257 patients who underwent LAGB, 5 (2%) presented later with megaesophagus.[13] The mean time to development of megaesophagus was 32 months (range, 24–36 months). Preoperative esophageal manometry findings were normal in 4 (80%) of these 5 patients, and 1 patient had a nonspecific motility disorder. Megaesophagus partially improved in all of the patients after band deflation, but all patients required band removal because of persistent symptoms. Because band removal alone will always result in complete weight regain, the position among clinicians at the NYU Langone Medical Center—where more than 5,000 LAGB procedures have been performed—is to try to preserve the band as long as good weight loss is demonstrated. In the case of weight loss failure, however, the band is revised to address reflux and is removed if the patient requests band removal.

In a recent review of 3,876 patients who underwent LAGB at the NYU Langone Medical Center from January 1, 2001 to June 30, 2009, it was found that 411 (11%) had the band revised for pouch-related problems.[14] Of these 411 patients, only 9 (2%) subsequently had the band removed and 12 (3%) were referred for another type of bariatric procedure.

The 30-day patient complication rate for all reoperations was 0.5%. Weight loss was sustained both at 12 months and 24 months after reoperation and did not differ from weight loss in patients who did not undergo reoperation. Importantly, it has been found that, if a patient has lost weight with a band, he or she will maintain that weight loss after revision and that patient satisfaction with the band is not affected by reoperation. It has also been observed at the NYU Langone Medical Center that the incidence of band revision has fallen significantly over the past 5 years, which may be attributable to the introduction of newer bands and improved understanding of band physiology.

Revising a band is a safe procedure. It is certainly much safer than converting to a RYGB or sleeve gastrectomy. In a review of 66,303 patients who underwent RYGB, including 3,132 patients (5%) who had RYGB after removal of LAGB, it was shown that patients who had RYGB after a band removal were at greater risk for intraoperative complications (odds ratio [OR], 2.3; P=.002), postoperative complications (OR, 8.0; P<.001), and reoperations or reinterventions (OR, 6.0; P<.001) and had an increased length of hospital stay.[15]

In a study that compared primary sleeve gastrectomy (n=259) with sleeve gastrectomy plus band removal (n=46), the complication rate was 8% in the primary-sleeve group and 9% in the band-removal group.[16] The fistula rates were 3% and 4%, respectively (P=.56).

What should a surgeon offer a patient who reports adverse events or dissatisfaction after a band? If failed weight loss is an issue and the patient wants further help, the band should be removed and another procedure offered, with the understanding that there is a risk of substantial complications. However, if reflux secondary to band slippage, pouch dilatation, or a hiatal hernia is the issue, the band can be safely revised, and the patient can go on to have a successful outcome.

Even though pseudoachalasia is rare, thought must be given to its treatment. The simple approach is to remove the band, which will result in full regaining of weight. The more effective long-term approach might be to loosen the band for 6 weeks and then assess the esophageal diameter via an esophogram. If findings come back normal, which is usually the case, then the band can be gradually retightened. If findings are abnormal, then band removal with concurrent RYGB may be the best option.

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