

CASE REPORT

Recurrent aspiration pneumonia after laparoscopic adjustable gastric banding for obesity surgery

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Laparoscopic adjustable gastric banding (LAGB) is an increasingly common therapeutic option in the management of obesity and certain obesity-related comorbid conditions. As it gains popularity for its advantages of being minimally invasive and reversible, clinicians should be aware of growing evidence of esophageal and pulmonary complications, which may be irreversible and associated with long-term morbidity. We report a case of esophageal and pulmonary complications in a patient with successful weight loss after lap-band surgery necessitating its removal.

Keywords: *Morbid obesity; obesity surgery; laparoscopic adjustable gastric banding; aspiration pneumonia*

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The prevalence of obesity in the United States has increased dramatically during the last decades of the 20th century to the point that more than one third of adults are now obese (1). Laparoscopic adjustable gastric banding (LAGB) has become a widely used procedure for morbid obesity (2, 3). This technique is attractive, because it is minimally invasive, totally reversible, and can be adjusted to the patient's need (2, 4). Early postoperative pulmonary complications after LAGB have been reported and include pulmonary embolism, atelectasis, and acute respiratory distress (5–9). However, long-term pulmonary complications are rarely reported. This could be due to inadequate follow-up, loss of contact with many patients, and lack of specific symptoms. Physicians caring for patients with a history of bariatric surgery should be aware of potential long-term pulmonary complications so that timely management and loosening of the band can be undertaken to prevent future morbidity.

Case report

A 68-year-old man initially presented with a one-month history of cough, heartburn, and episodes of nocturnal regurgitation. Eight months prior to presentation, he had undergone LAGB for class III obesity with a body mass index (BMI) of 41 kg/m². Preoperatively, he had radiographic evidence of a small hiatal hernia but no history of gastro-esophageal reflux disease (GERD). His medical history was also notable for chronic obstructive pulmonary disease (COPD), obstructive sleep apnea, type II diabetes, hypertension, and hyperlipidemia.

His vital signs were normal, and there were no significant findings on physical examination. A clinical diagnosis of GERD was made and Omeprazole 20 mg twice daily was initiated. An upper gastrointestinal series was ordered which demonstrated a more dilated hiatal hernia, significant reflux, and probable stricture formation. He had an upper endoscopy which revealed the hiatal hernia but was otherwise normal. There was normal peristalsis on manometry, but the lower esophageal sphincter was not well assessed during the procedure. Barium swallows under fluoroscopy guidance showed evidence of esophageal dysmotility and hiatal hernia (Fig. 1). He had his band loosened, but his symptoms persisted.

Over a period of 15 months, he had three surgical repairs for recurrent hiatal hernias and suffered from progressively worsening symptoms with nasal and oral regurgitation. He remained reluctant to have his band completely deflated as the procedure had resulted in a significant reduction in his BMI from 41 to 27.

One month after being discharged from the pneumonia admission, he presented with a productive cough, worsening dyspnea, anorexia, and fatigue. On examination, he was hypoxemic with an oxygen saturation of 88% and tachypneic with a respiratory rate of 28 breaths per minute. Other vital signs were normal. His breath sounds were normal but there was dullness to percussion at the left lung base and bilateral, pitting lower extremity edema. Blood tests showed leukocytosis with a white blood cell count of 11,200 cells/ml. Chest radiograph indicated persistent left lower lobe infiltrate (Fig. 2) and a chest computed

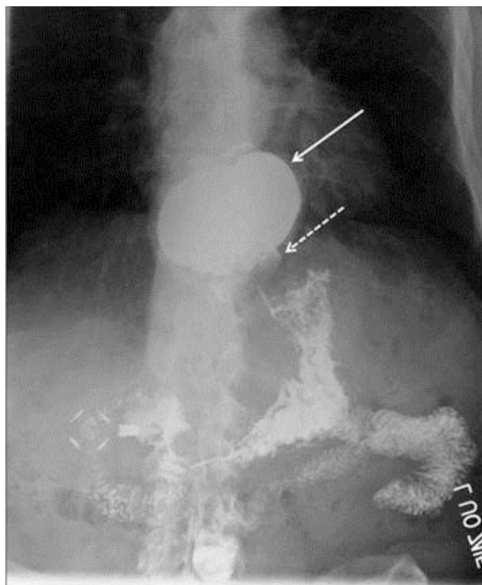


Fig. 1. Barium follow through fluoroscopy showing the lap-band (dashed arrow) as well as the hiatal hernia (solid arrow).

tomography (CT) scan revealed bilateral pulmonary nodules that were too numerous to count along with left lower lobe consolidation (Fig. 3a and b). In light of these findings, there was concern for metastatic disease.

After 7 days of levofloxacin and prednisone, he underwent bronchoscopy with evacuation of copious amounts of vegetable matter and mucus plugs. Lung biopsy was consistent with organizing aspiration pneumonia, and follow-up chest CTs at 1 and 3 months showed continued resolution of the nodules, strongly supporting an inflammatory etiology.

With persistent symptoms of reflux and aspiration, resulting in poor quality of life, and radiographic evidence of esophageal dysmotility, the decision was made to completely deflate the gastric band.

Over the next 4 months, his symptoms improved remarkably with no further pulmonary complications.

Discussion

LAGB is gaining popularity as an effective bariatric procedure with the advantages of being relatively safe, minimally invasive and reversible. Long-term esophageal complications of this procedure, some of which include esophageal dilatation, dysmotility and GERD, have been reported and in some instances are further complicated by pulmonary complications such as recurrent bronchial aspiration and pneumonia, bronchiectasis, and lung abscesses.

Recurrent aspiration pneumonia is an unusual and less commonly reported complication of LAGB. An observational study of 749 patients by Parikh et al. reported a 0.8% incidence of aspiration pneumonia (10). However, a recent retrospective cohort study by Avriel et al., looked



Fig. 2. Posterior–anterior view of the chest demonstrating left lower lobe pneumonia.

at major respiratory adverse events after LAGB (11). In their study of 2,100 patients who underwent LAGB, the most commonly reported major respiratory complications included aspiration pneumonia (19 patients) and pulmonary abscess (four patients). Other less common complications reported were empyema, asthma exacerbation and hemoptysis. Additionally, they also recognized the initiation of chronic diseases such as interstitial lung disease and bronchiectasis. A prior case series by Nehoda et al. reported two cases of immediate pulmonary complication in the form of aspiration pneumonia and had a decreased overall complication rate. However, they did not report any delayed pulmonary complications from surgery (12). Our patient developed pulmonary symptoms 8 months following the procedure.

The pathophysiology of respiratory problems after LAGB is complex. First, patients that undergo the LAGB procedure are morbidly obese and already possess one or more of risk factors for developing aspirations such as obstructive sleep apnea, presence of extra-thoracic restriction, exertional dyspnea, hypoventilation syndrome, and GERD. Second, adjustable gastric banding may provide a sufficient antireflux barrier in most of the obese patients with GERD. However, a subset of patients may be at higher risk of developing pulmonary complications (13, 14). For instance, patients with preoperatively defective esophageal body motility, LAGB may aggravate GERD symptoms and esophageal dilatation (15). In fact a comparative study by Suter et al. proposed that preoperative testing should be routinely performed (16). They also concluded that low amplitude of contraction in the lower esophagus and increased esophageal acid exposure should be regarded as contraindications to LAGB and patients with such findings should be offered an alternative procedure, such as Roux-en-Y gastric bypass. Interestingly, a prospective case series compared two surgical procedures, laparoscopic Roux-en-Y gastric bypass to LAGB in

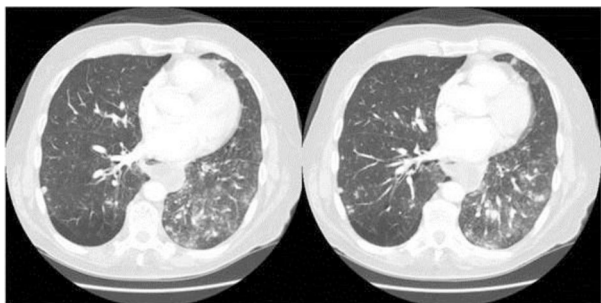


Fig. 3. (a) and (b) CT chest showing left lower lobe pneumonia and bilateral but predominant left lower lobe pulmonary nodules.

supermorbid obese patients. They reported that patients who underwent LAGB experienced a greater incidence of late complications requiring reoperations, had less weight loss, less reduction of medical comorbidity, and were dissatisfied (17). These findings were similar to those experienced by our patient. As described in our case presentation, our patient required multiple reoperations and eventual release of band causing significant morbidity.

While there is no established tool to help risk-stratify patients, a review of literature suggests that abnormal preoperative pH monitoring, pre-existing esophageal dysmotility and an esophageal caliber > 35 mm are risk factors, while a preceding history of GERD or hiatal hernias are inconsistent predictors (13, 14). Our patient did not have any such perioperative testing performed prior to surgical procedure. However, possible causes of failures in our patient consist of GERD, persistent hiatal hernia requiring repeated revisions, primary surgical technique error, complicated anatomy requiring revisions, and lack of consideration of converting to a laparoscopic sleeve gastrectomy or laparoscopic Roux-en-Y gastric bypass during those revisions.

Barium contrast swallow is the procedure of choice to assess band position and function. Essential criteria for the radiologic evaluation of LAGB are well described and consist of: position of port and tubing; stoma size; and volume of each upper gastric portion (18). Patients who develop respiratory symptoms such as chronic cough, nocturnal cough, nocturnal wheeze, or symptoms of aspiration should have additional testing performed. These include chest x-ray, and when necessary, high-resolution chest CT. In some cases, such as ours, bronchoscopy with bronchoalveolar lavage and, rarely, lung biopsy may be necessary to rule out interstitial lung disease and malignancy. Ideally, when patients develop respiratory symptoms, the band should be loosened. The diameter of the stoma can be adjusted by injecting or aspirating the band contents via the connected port to inflate or deflate the band. Removal or partial deflation of the band leads to symptom resolution in most patients; however, there can

be irreversible complications. If the symptoms do not resolve quickly, further investigation with barium swallow should be undertaken. In our patient, despite loosening the band and multiple surgical repairs of the hiatal hernia, symptoms did not resolve, necessitating removal of the band. However, it must be kept in mind that patients may be reluctant to remove the band, especially if they have had positive outcomes from the surgery. In such cases, patients must be carefully counseled and referred to an appropriate specialist.

Conclusions

With the rising prevalence of morbid obesity in the United States, bariatric surgery is becoming increasingly common. LAGB is one of the most commonly performed restrictive surgical procedures for the treatment of morbid obesity. Prior to LAGB, careful consideration should be given to the potential long-term complications of the procedure. Appropriate preoperative testing to risk stratify high-risk patients in order to discuss surgical options should be undertaken and is key to the prevention of long-term morbidity in patients undergoing bariatric surgery. In patients with a history of bariatric procedure that present with respiratory complaints, consideration of the long-term complications of bariatric surgery should be given.

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