

Radiographic Predictability of Hiatal Hernia Prior to Gastric Band Surgery

Joseph R. Broucek, MD, Lane A. Ritter, MD, Amanda B. Francescatti, MS, Claire H. Smith, MD, Minh B. Luu, MD, Khristi M. Autajay, RD, Jonathan A. Myers, MD

ABSTRACT

Background: Hiatal hernia (HH) is closely associated with morbid obesity. There is controversy over the need for preoperative imaging before laparoscopic adjustable gastric band placement. The aim of this study is to determine the predictive value of preoperatively diagnosing HH with upper gastrointestinal (UGI) series imaging.

Methods: A retrospective review of a single surgeon's experience with laparoscopic adjustable gastric band placements was performed. All patients received a preoperative UGI series. The decision to perform an HH repair at the time of gastric banding was based on intraoperative findings. Each patient's UGI study was compared with the operative report. Patients' outpatient records were also reviewed for subjective reflux symptoms or use of antireflux medications.

Results: Of 146 patients, 63 (43%) had intraoperative findings consistent with an HH and underwent repair. Of these, only 32 (50%) had a preoperative UGI study that showed an HH (positive predictive value, 50%). Of the 83 patients who did not have an intraoperative HH, only 51 (61%) had a congruent UGI (negative predictive value, 62%). No correlation was found between patient-reported symptoms and either radiologic or intraoperative findings.

Conclusions: UGI series have poor positive and negative predictive values in preoperatively diagnosing HH. In addition, subjective patient symptoms and the need for antireflux medication did not correlate with either radiologic or intraoperative findings of HH. Our results suggest that direct operative diagnosis is a more accurate method of detecting HH.

Key Words: Laparoscopic adjustable gastric band, Hiatal hernia, Preoperative UGI.

Rush University Medical Center, Chicago, IL, USA (all authors).

Address correspondence to: Jonathan A. Myers, MD, Rush University Medical Center, 1725 W Harrison St, Ste 810, Chicago, IL 60612, USA. Telephone: (312) 942-7462, Fax: (312) 942-2867, E-mail: jonathan_a_myers@rush.edu

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INTRODUCTION

Hiatal hernia (HH) has long been an entity associated with morbid obesity. It has been reported that up to 50% of upper gastrointestinal (UGI) series performed before bariatric procedures show the presence of an HH.¹ Fifteen years ago, HH was thought to be a contraindication to placement of a laparoscopic adjustable gastric band (LAGB).² This paradigm was subsequently refuted, and in current practice both procedures may be performed concurrently. Thus repairing the comorbid HH while simultaneously placing the gastric band is now a standard surgical approach.^{2,3} This approach has been shown to decrease overall rates of reoperation for LAGB recipients.^{4,5}

There remains controversy over the necessity of preoperative imaging before LAGB placement.^{6,7} We consistently noticed that preoperative UGI series were often not congruent with our intraoperative findings, specifically in reference to presence of an HH. This study set out to determine the predictive value of preoperative UGI series in diagnosing an HH in our LAGB patients.

METHODS

A retrospective review of 147 consecutive LAGB placements performed by a single surgeon (J.A.M.) in a university setting was performed. During each operative case, the surgeon determined whether a hiatal hernia repair (HHR), in the form of an anterior cruroplasty, was indicated. This determination was based on intraoperative findings during observation of the gastroesophageal junction. If an obvious HH or dimpling between the right and left crura was observed, further anterolateral dissection of the phrenoesophageal membrane 270° around the gastroesophageal junction was performed until the junction lay completely in the abdomen without any undue tension. The HH was reduced, and crural repair was performed with figure-of-8 nonabsorbable sutures to adequately reapproximate the anterior crura. Once the HHR was completed, placement of the adjustable gastric band was completed by the pars flaccida technique.

The database of 147 consecutive cases was retrospectively reviewed after institutional review board approval. Data

points pulled from the electronic medical record, outpatient clinic records, and operative reports included sex, age, body mass index, preoperative use of antireflux medications, patient-reported preoperative symptoms of reflux, and whether an HHR was performed. All patients who underwent placement of an LAGB had a thorough preoperative workup including, at a minimum, a history and physical examination, routine laboratory tests, electrocardiogram, chest radiograph, psychological evaluation, and registered dietitian counseling. All patients also underwent biphasic barium UGI examinations routinely preoperatively to survey for gross anatomic problems and fluoroscopic assessment for esophageal motility including reflux. Because many of the patients' large body sizes precluded routine positioning (eg, prone on a rolled-up towel to evoke HH appearance), the examinations were tailored for ease of performance. Close fluoroscopic observation of peristaltic activity with the patient in the recumbent position allowed accurate characterization of propulsive and nonpropulsive esophageal waves. Rotating the patient and having the patient sip water at the end of the examination were performed to elicit gastroesophageal reflux. The amount of reflux was documented to anatomic level, realizing that reflux is intermittent and difficult to duplicate. Every patient's preoperative UGI report was obtained and reviewed for the attending radiologist's conclusions about the presence of an HH. One patient was eliminated because of a UGI study that was considered inadequate and nondiagnostic, necessitating an endoscopic examination.

RESULTS

Of 146 total LAGB placements, 83 had LAGB alone. Sixty-three had concurrent LAGB placement and HHR as a result of intraoperative findings of an HH. The mean age of the patients who underwent LAGB alone was 42 years (range, 19–67 years) compared with 45 years (range, 27–63 years) for those patients who also required HHR. The mean body mass index was 48.1 kg/m² (range, 36.6–64.3 kg/m²) in patients with LAGB placement alone and 46.5 kg/m² (range, 36.0–63.0 kg/m²) in those also undergoing HHR. Of the 83 patients in this study who had LAGB placement alone, 18 (22%) were men, whereas 5 (8%) of the 63 patients who had LAGB and simultaneous HHR were men.

In comparing the UGI radiologic reports against the dictated operative reports, 32 of the 63 patients (51%) who had an HH observed intraoperatively also had an HH seen fluoroscopically, for a positive predictive value (PPV) of

50%. Conversely, of the 83 patients without intraoperative evidence of an HH, 32 (39%) did have a hernia reported fluoroscopically, for a negative predictive value of 62%. The sensitivity and specificity of a UGI series in preoperatively diagnosing an HH were 51% and 61%, respectively.

Outpatient clinic records were reviewed to determine whether there was a correlation between subjective patient-reported symptoms of reflux or use of antireflux medications in comparison with either fluoroscopic or intraoperative diagnosis of an HH. Of the 63 patients with an intraoperatively diagnosed HH, only 27 (43%) had positive responses in the patient history. Of the 64 patients diagnosed with HH radiographically with preoperative UGI series, only 25 (39%) had self-reported positive responses. Overall, the sensitivity of patient symptoms to a fluoroscopic diagnosis of HH was 39% and the sensitivity to an intraoperative HH diagnosis was 43%.

DISCUSSION

HH was originally believed to be a contraindication for LAGB placement because there was concern about an increased risk of band slippage and dysphagia.⁸ This concern was subsequently disproven by a number of groups who showed that HHR during LAGB increases lower esophageal sphincter pressure, thus improving reflux symptoms and restoration of the integrity of the cardioesophageal junction.⁸

In 1999 Angrisani et al² showed that HH was not a contraindication to placement of an LAGB and patients had symptomatic relief of reflux symptoms after band placement. Their study relied on preoperative UGI studies to diagnose the presence of an HH. Of the 40 patients in their study, 12 (30%) were affected by symptoms of gastroesophageal reflux disease. Of those 12, 4 (30%) had radiologic evidence of HH. All of the 12 symptomatic gastroesophageal reflux disease patients had resolution of their symptoms (except for 1 patient lost to follow-up) after LAGB placement. Dolan et al¹ showed, in 2003, that performing an HHR at the time of LAGB placement did not increase rates of either slippage or dysphagia and confirmed subjective patient improvement of reflux symptoms. They relied on intraoperative diagnosis because routine preoperative UGI studies were not required in their series. A larger series, presented by Gulkarov et al^{4,5} in 2008, confirmed that simultaneous LAGB placement and HHR actually reduced rates of reoperation.⁵ This group also relied heavily on intraoperative diagnosis and described the technique of carrying out further dissection when “dimpling” of the crus was observed, the technique

that we used in our series. As evidenced earlier, performing concurrent LAGB placement and HHR has become an accepted practice when an HH is present in band recipients. We chose to perform an anterior repair of encountered HHs to avoid disrupting tissues involved in the pars flaccida technique and potentially decreasing the risk of posterior slippage.

In our series of patients undergoing LAGB placement after receiving preoperative UGI series, we set out to evaluate the efficacy of reliance on fluoroscopic studies versus laparoscopic intraoperative diagnosis. We determined that preoperative UGI series showed a poor PPV in diagnosing HH as compared with intraoperative observations. We also confirmed that subjective patient symptoms do not correlate with the anatomic presence of HH and cannot be used reliably in preoperative planning.

There were limitations to this study. Because of referral patterns and insurance requirements, it was not possible to standardize the radiologic interpretation of the UGI studies in this retrospective review. In fact, the fluoroscopic studies were read by several radiologists at different institutions. The radiology literature's definition of HH in fluoroscopic studies is controversial in itself, and therefore the radiologists likely used some discretion in the diagnosis of small HHs.⁹

Of note, HHs are notoriously more difficult to diagnose in male patients because of the increased amount of fat in the phrenoesophageal region.¹⁰ Our series included 23 men (16%), but of these, only 5 (21%) had an HH diagnosed laparoscopically compared with 47% of female patients with an operatively diagnosed HH. This suggests that HH was likely underdiagnosed in our male patients. It may be beneficial to use a more liberal approach in carrying out further dissection of the fat pad in our obese male patients to prevent missing hiatal defects and the opportunity to repair them at the time of their LAGB placement. In addition, our evaluation of patient-reported symptoms was based on a simple history and not on a more formal measure of symptoms such as the modified DeMeester symptom scoring system.¹¹

Despite these limitations, we believe that the findings were striking enough that our conclusions remain sound.

CONCLUSION

UGI series have a poor PPV and negative predictive value in preoperatively diagnosing the presence of HH before LAGB placement. Reliance on such studies for operative planning may create a missed opportunity to repair the hiatal defect

concurrently with the placement of the LAGB and thus subject patients to potentially higher reoperation rates. Our study showed that subjective patient symptoms and the need for antireflux medication have no direct correlation with either radiologic or intraoperative findings of HH. Our results suggest that direct operative examination of the gastroesophageal junction is a more accurate method of determining the need for HHR during LAGB placement than UGI series.

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