Laparoscopic Adjustable Gastric Band Explantation and Implantation at Academic Centers

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BACKGROUND: The laparoscopic adjustable gastric band (LAGB) was approved for use in the US in 2001 and has been found to be a safe and effective surgical treatment for morbid obesity. However, there is a recent trend toward reduced use of LAGB nationwide. The objective of this study was to examine the prevalence and outcomes of primary LAGB implantation compared with revision and explantation at academic centers.

STUDY DESIGN: Data were obtained from the Vizient database from 2007 through 2015. The ICD-9-Clinical Modification and ICD-10-Clinical Modification were used to select patients with a primary diagnosis of obesity who had undergone LAGB implantation, revision, or explantation. Prevalence and outcomes of primary LAGB implantation compared with revision or explantation were analyzed. Outcomes measures included length of stay, ICU admission, morbidity, mortality, and cost.

RESULTS: From 2007 through 2015, a total of 28,202 patients underwent LAGB implantation for surgical weight loss. The annual number of LAGB implantation procedures decreased steadily after 2010. In the same time period, 12,157 patients underwent LAGB explantation. In 2013, the number of LAGB explantation procedures exceeded that of implantation. Laparoscopic adjustable gastric band revision rates remained stable throughout the study period. Mean length of stay, serious morbidity, and proportion of patients requiring ICU admission were higher for gastric band revision and explantation cases compared with primary LAGB implantation cases. There was no statistically significant difference in mortality or mean cost between the 2 groups.

CONCLUSIONS: Since 2013, the number of gastric band explantation procedures has exceeded that of implantation procedures at academic centers. Laparoscopic adjustable gastric band revision or explantation is associated with longer length of stay, higher rate of postoperative ICU admissions, and higher overall morbidity compared with LAGB implantation. (J Am Coll Surg 2017;225:532–537. © 2017 by the American College of Surgeons. Published by Elsevier Inc. All rights reserved.)

The laparoscopic adjustable gastric band (LAGB) was approved for use in the US in 2001 and has since been found to be a safe and effective surgical treatment for morbid obesity.[1] However, gastric banding can be associated with late complications, such as band slippage, requiring revision, or band erosion or poor weight loss, requiring band explantation. In a study of academic centers, Nguyen and colleagues[2] reported that there was a steady increase in the number of LAGB procedures performed annually from 2007 to 2009. The same article reported that gastric banding was associated with a low prevalence of band revision and explantation.[2] With the introduction of laparoscopic sleeve gastrectomy, there has been a drastic decline in LAGB implantations.[3] The aim of this study was to examine the updated prevalence of LAGB implantation, revision, and explantation at academic medical centers.

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Abbreviations and Acronyms
CM = Clinical Modification
LAGB = laparoscopic adjustable gastric band
PCS = Procedure Coding System

METHODS

Data were obtained from the Vizient clinical database. The Vizient database provides administrative, clinical, and financial information on inpatients from academic health centers and affiliated community hospitals in the US. Reported information includes, but is not limited to, patient demographics, length of stay, morbidity, in-hospital observed and expected mortality, and estimated cost of inpatient care. The Vizient database reports on in-hospital information only and does not provide any follow-up data after discharge. The Vizient database uses the Refined Diagnosis Related Group method to group patients based on severity and complexity of comorbidities and complications into the following classes of illness: minor severity, moderate severity, major severity, and extreme severity. In-hospital mortality was defined as the percentage of patients who died before discharge from the hospital. The 2015 Vizient risk-adjustment methodology accounts for risk adjustment for mortality as described by the risk-adjusted in-hospital mortality index. Risk adjustment is not available for any other outcomes through the Vizient database. Length of stay was defined as the time period from the index procedure to hospital discharge. Estimated cost of patient care was defined using the cost-to-charge ratio method. Approval for the use of the database was obtained from the Vizient.

We analyzed discharge data from January 1, 2013 to December 31, 2015 to examine the outcomes of primary LAGB implantation compared with laparoscopic band revision or explantation. We also obtained archived data for yearly case numbers of LAGB implantation, LAGB revision, LAGB explantation, laparoscopic Roux-en-Y gastric bypass, and laparoscopic sleeve gastrectomy performed between January 1, 2007 and December 31, 2012. Principal diagnoses and procedure codes of interest were defined using the ICD-9-Clinical Modification (CM) or ICD-10-CM/Procedure Coding System (PCS). Inclusion criteria included patients with a principle diagnosis of obesity or morbid obesity (ICD-9-CM: 278, 278.0, 278.01, 278.00; ICD-10-CM: E66, E66.0, E66.01, E66.09, E66.1, E66.8, or E66.9) who underwent LAGB implantation (ICD-9-CM: 44.95; ICD-10-PCS: 0DV64CZ), LAGB revision (ICD-9-CM: 44.96; ICD-10-PCS: 0DW643Z, 0DW64CZ), LAGB explantation (ICD-9-CM: 44.97; ICD-10-PCS: 0DP643Z, 0DP64CZ), laparoscopic sleeve gastrectomy (ICD-9-CM: 43.82, ICD-10-PCS: 0DB64Z3), or laparoscopic Roux-en-Y gastric bypass (ICD-9-CM: 44.38, ICD-10-PCS: 0D164ZA).

Data analyzed included patient characteristics (age, sex, race, severity class, and comorbidity), perioperative outcomes, in-hospital mortality, and cost for patients who underwent primary LAGB implantation, revision, or explantation. Data are expressed as mean ± SD. Statistical analysis was performed to analyze proportional and mean differences. Proportional differences were analyzed using chi-square tests. Mean differences were analyzed using 2-sample *t*-tests. A p value < 0.05 was considered statistically significant.

RESULTS

Figure 1 shows the yearly trends of LAGB implantation, LAGB revision, LAGB explantation, laparoscopic sleeve gastrectomy, and laparoscopic Roux-en-Y gastric bypass performed between 2007 and 2015. The annual number of LAGB implantation procedures peaked in 2010 and then declined dramatically in subsequent years. The proportion of patients undergoing LAGB revision remained stable throughout the entire study period; however, the proportion of patients who underwent LAGB explantation increased steadily starting in 2007. The number of LAGB explantations exceeded that of LAGB implantations in 2013. The annual number of laparoscopic Roux-en-Y cases peaked in 2010 and then declined steadily in subsequent years. Since laparoscopic sleeve gastrectomy was introduced, there has been a dramatic increase in the number of procedures performed, and it became the dominant bariatric surgery operation starting in 2013.

Table 1 shows the demographic characteristics of patients who underwent primary LAGB implantation compared with LABG revision or explantation from 2013 through 2015. In patients undergoing primary LAGB implantation, 89.4% were between the ages of 18 and 64 years. The percentage of patients in each severity of illness category were: minor 65.4%, moderate 33%, major 1.6%, and extreme 0%. In patients undergoing LAGB revision or explantation, 87.8% were between the ages of 18 and 64 years. The percentage of patients in each severity of illness category were: minor 22.7%, moderate 65.2%, major 11.2%, and extreme 0.9%.

Table 2 shows the outcomes of patients undergoing primary LAGB implantation compared with LAGB revision or explantation from 2013 through 2015. Mean length of