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Original article

Short-term morbidity associated with removal and revision of the laparoscopic adjustable gastric band

Timothy D. Jackson, M.D., M.P.H.[a,b,c,*], Fady Saleh, M.D., M.P.H.[a,c], Fayez A. Quereshy, M.D., M.B.A.[a,c], Sanjeev Sockalingam, M.D.[b], David Urbach, M.D., M.Sc.[a,b,c], Allan Okrainec, M.D. M.H.P.E.[a,b,c]

[a]*Division of General Surgery, University Health Network, Toronto, Ontario, Canada*
[b]*Bariatric Surgery Program, University Health Network, Toronto, Ontario, Canada*
[c]*Department of Surgery, University of Toronto, Ontario, Canada*

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Abstract

Background: Laparoscopic adjustable gastric band (LAGB) insertion is a commonly performed bariatric procedure with low associated short-term risk. Given that a significant number of patients will require additional revision/removal procedures, overall morbidity may be underestimated. The objective of this study was to define the 30-day morbidity associated with LAGB removal and revision procedures.

Methods: Patients undergoing revision or removal of LAGB were identified within The American College of Surgeons National Surgery Quality Improvement Program (ACS-NSQIP) participant use file using current procedural terminology and ICD-9 coding. Patients having concurrent procedures were excluded. Primary outcomes included 30-day morbidity. The rate of complications in the removal/revision patients versus primary LAGB insertion was compared. We also analyzed trends over time.

Results: A total of 3,236 patients underwent LAGB removal (n = 1,580), revision (n = 1,111) or port site revision (n = 545) from 2006–2011. The overall 30-day complication rate was 5.6% (95% confidence interval [CI]: 4.8%, 6.4%) and was higher in patients undergoing LAGB removal with a 6.8% (95% CI: 5.6%, 8.1%) adverse event rate (2.5% infectious, 2.3% wound, 2.4% reoperation). A total of 24,438 patients underwent primary LAGB insertion within the data set with a 30-day complication rate of 2.6% (95% CI: 2.4%, 2.8%). Patients undergoing LABG removal had a significantly higher complication rate than those having primary LAGB insertion with an odds ratio of 2.72 (95% CI: 2.18, 3.37). The proportion of LAGB revision/removal compared to primary placement increased annually over the study period (P for trend $<.001$).

Conclusion: The 30-day morbidity associated with LAGB revision is significant and higher than that associated with primary LAGB insertions. The potential need for future procedures and the associated additional morbidity should be considered when evaluating LAGB as a treatment option for morbid obesity. (Surg Obes Relat Dis 2014;▮:00–00.) © 2014 Published by Elsevier Inc. on behalf of American Society for Metabolic and Bariatric Surgery.

Keywords: Laparoscopic adjustable gastric band; Revisional bariatric surgery; ACS-NSQIP; Surgical outcomes

Laparoscopic adjustable gastric band (LAGB) placement remains a commonly performed bariatric procedure, principally due to its reported low-risk profile. While initially described in 1993, the LAGB was not approved for use in the United States until 2001 [1]. By 2010, the LAGB accounted for 46% of bariatric procedures performed in

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*Correspondence: Timothy D. Jackson, M.D., M.P.H., Division of General Surgery, University Health Network, 399 Bathurst St, 8-MP 322, Toronto, Ontario, Canada M5T 2S8.

E-mail: Timothy.Jackson@uhn.ca

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American College of Surgeons (ACS) accredited centers [2] and 31% of procedures performed within the Michigan Bariatric Surgery Collaborative [3]. It is estimated that LAGB comprised 17.8% of all bariatric surgery performed worldwide in 2011 [4].

Compared to other primary procedures such as the laparoscopic Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG), the LAGB has the lowest associated short-term morbidity although appears to be the least effective with respect to long-term sustained weight loss [5,6]. The overall morbidity of the LAGB is underestimated if long-term safety and efficacy are not considered. Emerging long-term outcome data suggests high rates of revisional surgery in patients with the LAGB. A recent report of 3,227 patients with up to 15 years of follow-up identified that 43% of patients required revision or removal of the LAGB [7]. Another study with up to 12 years of follow-up has reported a 48.6% LAGB explantation rate [8].

A clearer understanding of the risks associated with LAGB revision/removal procedures is needed because a significant number of patients with the LAGB will go on to require additional surgery. At present, there is limited data available describing this additional risk to inform patients and providers. The objective of this study was to define the 30-day morbidity associated with LAGB removal and revision procedures.

Methods

Study design

The ACS National Surgery Quality Improvement Program (ACS-NSQIP) is a prospective, multi-institutional cohort study collecting clinical data on patients undergoing surgical procedures in private sector hospitals for quality improvement purposes. Rich clinical data is collected on preoperative, intraoperative, and postoperative variables including 30-day outcomes. The ACS-NSQIP methodology has been described in detail elsewhere [9–14]. The study protocol was approved by our institutional Research Ethics Board.

Patient population

Patients undergoing revision or removal of LAGB were identified within the ACS-NSQIP participant use file from 2006–2011. Current procedural terminology (CPT) codes were used to group patients into those undergoing LAGB removal (CPT: 43772, 43774), LAGB revision (CPT: 43771, 43773), or procedures limited to the LAGB port site (CPT: 43886, 43887, 43888). Exclusion criteria were defined a priori to identify patients having only LAGB removal or LAGB revision as the sole operative procedure. Patients undergoing additional concurrent procedures (e.g., conversion to other bariatric procedures or gastric resection) or ICD-9 coding consistent with an alternative diagnosis were excluded (n = 641). Identification of the study population from the data set is outlined in Fig. 1. For further comparison, we also identified patients undergoing elective primary LAGB insertion (CPT: 43770) over the study period.

Outcomes of interest

The primary outcomes of interest included 30-day postoperative complications captured within the database and 30-day mortality. We also compared the rate of complications in patients undergoing LAGB removal/revision procedures to patients undergoing primary LAGB insertion

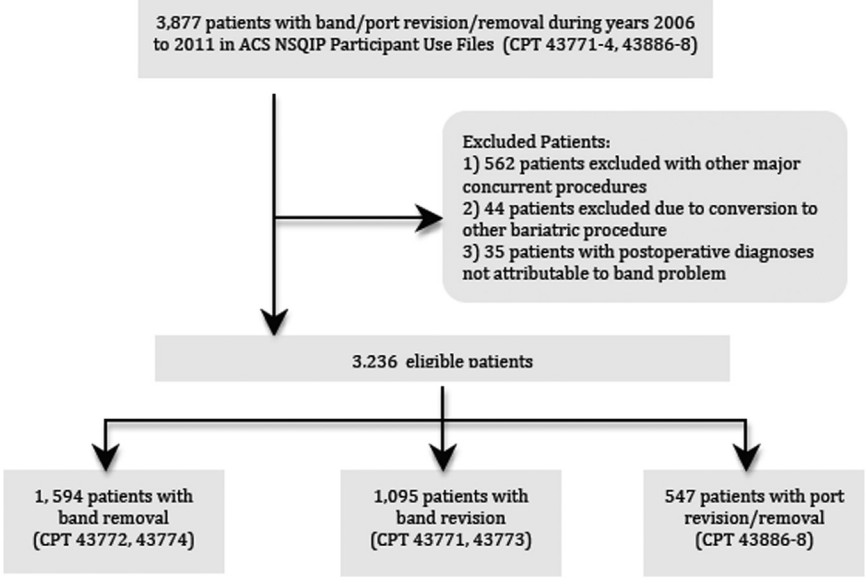

Fig. 1. Patient flow diagram. ACS-NSQIP = American College of Surgeons National Surgical Quality Improvement Program; CPT = current procedural terminology code.