Chapter 29
Laparoscopic Adjustable Gastric Banding: The Physician's Choice in Bariatric Surgery

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The laparoscopic adjustable gastric banding (LAGB) procedure is one of the most remarkable advances in weight management. The clear need to adjust the gastric "restriction" component of bariatric surgery to achieve great results was seen independently by two of the greatest innovators in bariatric surgery [1, 2]. The simultaneous light bulb moments, with clever modification, were soon adapted for the emerging laparoscopic era of surgery and were the very first laparoscopic bariatric procedures. Ongoing improvements in band technology, placement, and management have reduced morbidity and long-term complications and improved the effectiveness of LAGB. Today, LAGB offers patients fewer procedural complications and decreased hospital time compared with other weight-loss surgeries [3, 4] and excellent sustained weight loss if managed appropriately.

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D.W. Haslam et al. (eds.), *Controversies in Obesity*,
DOI 10.1007/978-1-4471-2834-2_29,

A better understanding of the mechanism of action of the band and other bariatric surgeries is emerging, but no bariatric surgical procedure is "restrictive," absolutely limiting intake, and none significantly delay the transit or absorption of food. If they did, then reducing meal size would simply be followed by more frequent meals. We have clearly shown through a double-blinded crossover trial that a well-adjusted band produced earlier satiation and excellent prolonged satiety following a small test meal [5]. The mechanism of action is via a rich plexus of gastric wall stretch receptors and vagal afferents situated immediately below the gastroesophageal junction and in a rodent model; the effect of the band can be switched on and off with adjustment and abolished by afferent nerve blockade [6]. In managing patients following LAGB surgery, it is critical that the whole practice team and each patient understand how the band works.

The LAGB procedure has the broadest range of indications of any bariatric surgery today. The most commonly used band, the Lap-Band, is now FDA approved for use in the BMI range of 30–35 with comorbidity. Not only does the band have the best early safety profile, it has ideal attributes for those wanting to achieve healthy sustained weight loss. The weight loss is gentle and progressive, allowing adequate adaptation and optimal nutrition to best preserve muscle mass during weight loss. This procedure allows a greater proportion of fat to be lost and fat-free tissues to be retained [7]. There is no GI diversion or resection involved such that micronutrient deficiencies, which predictably occur with more disruptive procedures, are not experienced. The controlled effect on weight loss is optimal for younger patients who are yet to maximize bone mass; for women planning a family, where balanced nutrition and appropriate weight change during pregnancy is important for mother and child; in the elderly, in whom weight loss should be controlled and must be accompanied by excellent nutrition, preservation of muscle, bone, and physical function; and in those with complex serious comorbidity where a safe gentle procedure followed by controlled sustained weight loss with excellent nutrition is required to optimize function and health outcomes.

LAGB surgery is the most standardized and reproducible bariatric surgery performed today. Weight loss is progressive over 2 or even 3 years and then appears sustainable. At 5 years postsurgery, mean percentage excess weight loss (% EWL) is 50–55 %, or 20–25 % of total weight. LAGB surgery also has the most rigorous evidence base, with years of audited studies prior to US FDA approval and series of randomized controlled trials showing it to be consistently superior to medical weight-loss therapies [8–11]. There is no better treatment for obesity-related comorbidity than sustained weight loss, and weight loss following LAGB surgery is accompanied by improvements in, or normalization of, insulin sensitivity and glycemia, obesity-related dyslipidemia, C-reactive protein (CRP), and other pro-inflammatory cytokine levels, nonalcoholic fatty liver disease, sleep disturbances including obstructive sleep apnea and daytime sleepiness, and ovulatory function and fertility in women with polycystic ovary syndrome [12, 13]. Perhaps the most important outcomes from a patient's perspective include enhanced quality of life, body image [14], and fewer symptoms of depression [15]. The other compelling health outcome following LAGB includes reduced mortality compared with obese community controls [16, 17]. LAGB however, appears consistently to be more cost-effective than RYGB [18] and even presents the rare scenario in health of a return on investment [19].

The reversible less-disruptive nature of LAGB lends itself to low procedural risks, shorter operations [20], and surgeries performed in day-stay ambulatory surgical centers [21, 22]. The incidence of late complications has varied, but there are clear indications that improved placement and management techniques have reduced incidence. Looking at cohorts of greater than 500 patients at baseline and followed at least 2 years has shown a 5 % reoperation rate for proximal pouch enlargement [23]. Erosion or migration of the band into the lumen of the stomach has an incidence of 1.5 % as reported in a recent meta-analysis of almost 16,000 patients, with lower rates being found with increased surgical experience [24]. Higher revision and explants rates were described in early

series before band placement and adjustment techniques had been refined [25, 26].

Bariatric surgery is not a stand-alone quick-fix solution; rather, it is a tool that is integrated with the chronic disease management of serious complex obesity. Bariatric surgery aftercare, therefore, does not sit well with a surgical care model. As for all chronic disease management, bariatric surgery requires indefinite follow-up, with access to a multidisciplinary integrated team to optimize health outcomes and minimize the risks and complications. Physicians are ideally placed to manage this ongoing care of patients, and the LAGB specifically is a physician's choice of bariatric procedure, due to its adjustability, which allows for the changing needs of a patient over time, similar to a cardiac pacemaker.

With the success of a patient-orientated, physician practice-led integrated model of chronic disease care [27, 28], rather than a surgical model of care, the LAGB has the ability to be among the most safe, effective, and accessible treatments for severe chronic obesity.

Disclosures Associate Professor Dixon is a consultant for Allergan Inc., Metagenics Inc. (Bariatric Advantage), and formerly Scientific Intake. He is also on the medical advisory board for Optifast, Nestle Australia. Our laboratory currently receives research funding from Medtronics Inc. (formally Ardian Inc.), Abbott (formerly Solvay) Pharmaceuticals, Allergan Inc., Servier and Scientific Intake. These organizations played no role in the design, analysis, or interpretation of data described here nor preparation, review, or approval of the manuscript.

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