Laparoscopic Removal of Adjustable Gastric Band as an Isolated Procedure: Indications and Early Surgical Outcomes

Haider Al-Shurafa 1, Ali Abelnoumous 1 and Zahraa Al-Shurafa 2

1 Department of surgery, Prince Sultan Military Medical City, Riyadh, Saudi Arabia
2 Alfaisal University, Riyadh, Saudi Arabia

*Correspondence author: Haider Al-Shurafa, FRCS, Prince Sultan Military Medical City, Riyadh, Saudi Arabia, Tel: 00966504912419, Fax: 00966 1 416 9283; E-mail: haidershurafa@yahoo.com

Received date: December 22, 2017; Accepted date: December 29, 2017; Published date: January 09, 2018

Abstract

Background: Adjustable gastric band (AGB) is one of the earlier bariatric procedures that frequently require revision due to either failure of complications.

Objectives: To evaluate the indications and outcomes of laparoscopic removal of AGB as an isolated surgical procedure.

Methods and Materials: A retrospective review of charts for all patients who underwent laparoscopic removal of AGB was carried out. Patients who had other types of surgeries done during the same operation were excluded. Data about the indications of band removal and the early surgical outcomes were collected.

Results: Between January 2003 and October 2016, 1676 bariatric operations were done. Of those, 76 patients (4.5%) had laparoscopic removal of AGB and it was an isolated surgical procedure in 26 (34.2%) patients. The indications for isolated LRAGB were: weight regain in 12 patients (46%), slippage of band in 9 patients (34.5%), band migration in 3 patients (11.5%) and infection of band in 2 patients (7.5%). There was no conversion to open surgery and no mortality associated with the procedure. The procedures were done electively in all except 2 patients who had acute gastric obstruction secondary to band slippage. Twenty-one patients had short (<48 hours) hospital stay while 5 patients, 2 with obstruction and 3 with infected bands, required longer hospital stay.

Conclusions: Isolated Laparoscopic removal of AGB is safe and requires short hospital stay in majority of patients. The commonest indication was weight regain however complications were also frequent. This makes AGB not a preferred option as weight reduction procedure.

Keywords: Laparoscopic removal of gastric band; Adjustable gastric band; Weight regain; Band erosion; Band slippage

Introduction

Weight reduction in obese patients is an effort to address the change in lifestyle. This method often fails in the morbidly obese patients and thus other options like pharmaceutical solutions or the use of bariatric Surgery should be considered. Bariatric surgeries are among the best treatment options for obesity due to high efficacy and sustained outcome [1,2]. Several trials and real-life reports have demonstrated the success of these operations in losing excess body weight (EBW) with an acceptable safety profile [3-5]. The response and rate of complications however varies between different bariatric procedures. Adjustable gastric band (AGB) was a very common bariatric procedure with a satisfactory short-term outcome [6,7]. Unfortunately, longer studies have shown a high rate of failure [8,9] and complications with a revision rate that exceeded 40% in some reported cohorts [10,11]. Removal of AGB is frequently done either through open technique or laparoscopically. Laparoscopic removal of AGB (LRAGB) is required for several reasons including lack of adequate loss of EBW (failure) [12], band erosion [13], band infection [14], food intolerance [15], band slippage [16], esophageal dysmotility [17], gastroesophageal reflux disease [18], pouch dilatation [19], and port infection [20]. Among the most common reasons for LRAGB by far is weight regain or failure to lose satisfactory amount of EBW [21]. Less commonly, complications may necessitate LRAGB in up to 25% [22]. The most common approach for removal of AGB is the laparoscopic approach while open technique might be needed in case of laparoscopic failure and/or previous upper abdominal surgeries [23]. Removal of AGB can be done in combination with other procedures like a second bariatric surgery or laparoscopic cholecystectomy but it can also be done as an isolated surgical procedure [24]. In case of complications, it is preferred to do LRAGB as an isolated procedure while in patients with failure it can either be done simultaneously with other bariatric procedure or as a first step of staged operation [24]. In this series, we are describing the frequency and the indications of LRAGB as an isolated procedure together with its early surgical outcomes.

Materials and Methods

The medical records for all patients who underwent LRAGB over the period from September 2003 to October 2016 were retrospectively reviewed. We included only patients who had isolated LRAGB.
who underwent simultaneous second bariatric surgeries or laparoscopic cholecystectomy were excluded. A single bariatric surgeon performed all operations. The data collected included demographics, indication for surgery, surgical technique used and early surgical outcomes. Ethical approval was obtained from the local Institutional review board. The descriptive analysis was performed using SPSS version 17.

**Results**

From September 2003 till October 2016, a total of 1676 bariatric procedures were performed in Prince Sultan Military Medical City, a tertiary care centre in Riyadh. Of those 76 (4.5%) were LRAGB. In 50 patients (75.8%) LRAGB was done simultaneously with a second bariatric procedure and they were not included in the analysis while in 26 patients (34.2%) LRAGB was done as an isolated surgical procedure (Table 1).

| Type of surgery                  | No. of cases | Percentage (%) |
|----------------------------------|--------------|----------------|
| All AGB Removal                  | 76           | 100            |
| Isolated AGB removal             | 26           | 34.2           |
| Removal of AGB and RYGB          | 26           | 34.2           |
| Removal of AGB and LSG           | 18           | 23.6           |
| Removal of AGB and MGB           | 6            | 8              |

**Table 1:** Type of procedures in patients who underwent AGB removal.

The median age for isolated LRAGB series was 39.5 years (19-67) and 73% of them were females. The median body mass index (BMI) was 33.4 (20.3-53.2) and the median duration from band insertion to removal was 6 years (1-14 years) (Table 2).

| Variables                     | N=26   |
|-------------------------------|--------|
| Gender (male/female)          | 7/19 (77/73%) |
| Age (years)*                  | 39.5 (19-67) |
| Weight (Kg)*                  | 92 (52-184) |
| Height (cm)*                  | 161 (155-187) |
| BMI (kg/m²)*                  | 33.4 (20.3-53.2) |
| Duration of AGB (years)*      | 6 (1-14) |

**Indications**

- Weight regain (AGB failure) 12 (46.1%)
- Band slippage without obstruction 7 (27%)
- Band slippage with obstruction 2 (7.7%)
- Band erosion 3 (11.5%)
- Band infection 2 (7.7%)

*Expressed as median and range.

**Table 2:** Characteristics of patients who had isolated LRAGB.

The most common indication for AGB removal was weight regain, reported in 12 patients (46.1%) with a BMI of 40-53 kg/m² at time of surgery. The procedure was done electively in this group of patients and it was considered a first stage procedure that was followed by laparoscopic sleeve gastrectomy in 2 patients, minigastric bypass in 3 patients and gastric bypass in 3 patients and those were done within 3-12 months after LRAGB. The remaining 4 patients had lost to follow up. The indications for removal in the rest of the patients were related to complications of the bands. The BMI was lower than the previous group and in some patients; it was less than 25 kg/m². Slippage of the band occurred in nine patients (11.8%) and 2 of them presented with acute stomal obstruction and required emergency admission and LRAGB after stabilization. Gastric erosion by the band was found in 3 patients (11.5%) who presented with increasing abdominal pain and they were diagnosed endoscopically. Removal of the band was done electively in these patients. Infection complicated AGB in two patients (7.7%) and that was an indication for urgent removal of the bands. The infection was mostly at the site reservoir and did not respond to appropriate courses of broad-spectrum antibiotics.

There was no mortality in this series and surgical drain was required in 4 patients (2 with erosion and 2 with infected bands). Gastrogaffin study was performed in all patients who had band erosion 2 days after operation and it did not show any leakage of contrast. One patient with band infection had persistent discharge from the wound at the reservoir site and was found to have a gastrocutaneous fistula for which he was re-admitted and underwent excision of the fistula under general anesthesia. Hospital stay was short (i.e. <48 hours) in 21 patients (80.8%) while in 5 patients (2 with band infection and 3 with band erosion) a longer hospital stay of 3-12 days, average of 5 days was required.

**Discussion**

Although short-term studies on AGB demonstrated favourable efficacy and safety outcomes [4,25], longer studies however reported unacceptable high rate of failure and complications. Spivac reported 50% failure of AGB in achieving 25% or more EBW loss after 10 years of follow up compared to 10.7% in gastric bypass patients [9]. Similarly, Kazsa showed that 66% of patients failed to achieve 50% loss of EBW after 24 months of insertion with reoperation rate of 16.7% [26]. More recently Caradina reported a band survival rate of 65.8% and 53% at 10 and 15 years with EBW loss of 38.7% and 35.1% respectively [27]. A larger study by O. Brien that included 3227 patients showed a durable EBW loss of 47% at 15 years but revision rate was 26% [28]. The technique of AGB insertion may have an impact of band survival as shown in a recently published randomized controlled trial where patients who underwent AGB with fixation technique named gastro-gastro suture had less re-intervention rate for band retrieval or repositioning than those who did not have it (19.4% vs11.3%; P = 0.013) [29].

Revisitional bariatric surgeries for AGB were shown consistently to be safe and their efficacy was very similar to primary sleeve gastrectomy and gastric bypass [30,31]. Jennings showed a mean EBW loss of 59.5% in primary gastric bypass compared to 59.4% in revisional bypass [30]. Similarly, Silicchia reported a mean EBW loss of 78.5% and 78% in primary and revisional sleeve gastrectomy respectively [31]. Revisitional surgeries can be performed as one-step or two-steps approach. A recent meta-analysis that included 11 studies and 1370 patients showed a comparable outcome from both approaches in term of complications, morbidity and mortality [24].
Isolated LRAGB can be done as a first step procedure prior to another bariatric surgery or primarily for removal of band due to complications or patient’s un-satisfaction. Although isolated LRAGB has been reported in several AGB literatures, we opted to describe in details the indications and outcomes of this procedure. Our case series consisted of one third of patients who underwent removal of AGB. These patients had LRAGB as an isolated surgical procedure while others had simultaneous conversion to other bariatric surgeries. Isolated LRAGB was safe and feasible with no mortality or major morbidity and required short hospital stay even in patients who had band-related complications. As reported in previous studies, band failure with weight regain was the leading indication followed by complications or patient’s un-satisfaction. Although isolated LRAGB has been reported in several AGB literatures, we opted to describe in details the indications and outcomes of this procedure. Our case series consisted of one third of patients who underwent removal of AGB. These patients had LRAGB as an isolated surgical procedure while others had simultaneous conversion to other bariatric surgeries. Isolated LRAGB was safe and feasible with no mortality or major morbidity and required short hospital stay even in patients who had band-related complications. As reported in previous studies, band failure with weight regain was the leading indication followed by complications or patient’s un-satisfaction.

Additionally it is a better option for patients with complication where risk of infection at site of operation is high. The decision of doing single-step or two steps revision of AGB should be individualized according to patient preference, indication and the expertise of the surgeon.

This study have several limitations including the retrospective design, small sample size and the lack of control arm, but it highlighted important aspects about the safety of the procedure as an option for patients who will undergo revision of their AGB.

Conclusion

In conclusion, isolated Laparoscopic removal of AGB is safe and requires short hospital stay in majority of patients. The commonest indication was weight regain however complications were also frequent. Although isolated LRAGB has been reported in several AGB literatures, we opted to describe in details the indications and outcomes of this procedure. Our case series consisted of one third of patients who underwent removal of AGB. These patients had LRAGB as an isolated surgical procedure while others had simultaneous conversion to other bariatric surgeries. Isolated LRAGB was safe and feasible with no mortality or major morbidity and required short hospital stay even in patients who had band-related complications. As reported in previous studies, band failure with weight regain was the leading indication followed by complications or patient’s un-satisfaction.

The authors declare that there is no conflict of interest regarding the publication of this paper.

References

1. Maeso S, Reza M, Mayol JA, Blasco JA, Guerra M, et al. (2010) Efficacy of the Da Vinci surgical system in abdominal surgery compared with that of laparoscopy: A systematic review and meta-analysis. Ann Surg 252: 254-262.
2. Puzziferri N, Roshek TB, Mayo HG, Gallagher R, Belle SH, et al. (2014) Long-term follow-up after bariatric surgery: A systematic review. JAMA 312: 934-942.
3. DeMaria EL, Pate V, Warthen M, Winegar DA (2010) Baseline data from American society for metabolic and bariatric surgery-designated bariatric surgery centers of excellence using the bariatric outcomes longitudinal database. Surg Obes Relat Dis 6: 347–55.
4. Sjostrom L (2013) Review of the key results from the Swedish obese subjects (sos) trial - a prospective controlled intervention study of bariatric surgery. J Intern Med 273: 219-234.
5. Al-Shurafa H, Elzaafarany AH, Albenmousa A, Balata MG (2016) Primary experience of bariatric surgery in a newly established private obesity center. Saudi Med J 37: 1089-1095.
6. Watkins BM, Montgomery KE, Ahroni JH (2005) Laparoscopic adjustable gastric banding: Early experience in 400 consecutive patients in the USA. Obes Surg 15: 82-87.
7. Gouillat C, Denis A, Badol-Van SP, Frereting V, Tussiot J, Campan P, et al. (2012) Prospective, multicenter, 3-year trial of laparoscopic adjustable gastric banding with the MIDBAN. Obes Surg 22: 572-581.
8. Himpens J, Cadiere GB, Bazi M, Vouche M, Cadiere B, et al. (2011) Long-term outcomes of laparoscopic adjustable gastric banding. Arch Surg 146: 804-807.
9. Spivak H, Abdelmalek ME, Beltran OR, Ng AW, Kitahama S (2012) Long-term outcomes of laparoscopic adjustable gastric banding and laparoscopic Roux-en-Y gastric bypass in the United States. Surg Endosc 26: 1909-1919.
10. Weiss HG, Kirchmayr W, Klaus A, Bonatti H, Muhlmann G, et al. (2004) Surgical revision after failure of laparoscopic adjustable gastric banding. Br J Surg 91: 235-241.
11. Sileccchia G, Racci V, Bacci S, Casella G, Rizzello M, et al. (2008) Reoperation after laparoscopic adjustable gastric banding: analysis of a cohort of 500 patients with long-term follow-up. Surg Obes Relat Dis 4: 430-436.
12. Alqahtani AR, Alhamedi M, Alamri H, Mohammed R, Darwish F, et al. (2013) Laparoscopic removal of poor outcome gastric banding with concomitant sleeve gastrectomy. Obes Surg 23: 782-787.
13. Cherian PT, Goussous G, Ashori F, Sigurdsson A (2010) Band erosion after laparoscopic gastric banding: A retrospective analysis of 865 patients over 5 years. Surg Endosc 24: 2031-2038.
14. Stedzmueller I, Hoeller E, Wiesmayer S, Kafka R, Aigner F, et al. (2005) Severe intra-abdominal infection due to Streptococcus Milleri following adjustable gastric banding. Obes Surg 15: 576-579.
15. Dargent J (2008) Isolated food intolerance after adjustable gastric banding: a major cause of long-term band removal. 18: 829-832.
16. Keidar A, Szold A, Carmon E, Blanc A, Abu-Abied S (2005) Band slippage after laparoscopic adjustable gastric banding: etiology and treatment. Surg Endosc 19: 262-267.
17. Gamagaris Z, Patterson C, Schaye V, Francois F, Traube M, et al. (2008) Lap-band impact on the function of the esophagus. Obes Surg 18: 1268-1272.
18. Woodward G, Cywes R, Billy H, Montgomery K, Cornell C, et al. (2012) Effect of adjustable gastric banding on changes in gastroesophageal reflux disease (GERD) and quality of life. Curr Med Res Opin 28: 581-589.
19. Brown WA, Burton PR, Andersson M, Korin A, Dixon JB, et al. (2008) Symmetrical pouch dilatation after laparoscopic adjustable gastric banding incidence and management. Obes Surg 18: 1104-1108.
20. Keidar A, Carmon E, Szold A, Abu-Abied S (2005) Port complications following laparoscopic adjustable gastric banding for morbid obesity. Obes Surg 15: 361-365.
21. Boza C, Gamboa C, Perez G, Cropavi F, Escalona A, et al. (2011) Laparoscopic adjustable gastric banding (LAGB): surgical results and 5-year follow-up. Surg Endosc 25: 292-297.
22. Tookey B, Golan ZARD M, Farid R (2016) Laparoscopic adjustable gastric banding: Efficacy and consequences over a 13-year period. Am J Surg 212: 62-68.
23. Daprio G, El Mourad H, Mathonnet P, Delaporte A, Himpens J, et al. (2013) Single-access laparoscopic adjustable gastric band removal: technique and initial experience. Obes Surg 23: 272-276.
24. Dang JT, Switzer NJ, Wu J, Gill RS, Shi X, et al. (2016) Gastric band removal in revisional bariatric surgery, one-step versus two-step: A systematic review and meta-analysis. Obes Surg 26: 866-873.
25. Doldi SB, Michelletto G, Lattuada E, Zappa MA, Bona D, et al. (2000) Adjustable gastric banding: 5-year experience. Obes Surg 10: 171-173.
26. Kasza J, Brody F, Vaziri K, Scheiffe C, McMullen S, et al. (2011) Analysis of poor outcomes after laparoscopic adjustable gastric banding. Surg Endosc 25: 41-47.
27. Carandina S, Tabbara M, Galay L, Polliand C, Azoulay D, et al. (2017) Long-term outcomes of the laparoscopic adjustable gastric banding: weight loss and removal rate. A single center experience on 301 patients with a minimum follow-up of 10 years. Obes Surg 27: 889-895.

28. O’Brien PE, MacDonald L, Anderson M, Brennan L, Brown WA (2013) Long-term outcomes after bariatric surgery: Fifteen-year follow-up of adjustable gastric banding and a systematic review of the bariatric surgical literature. Ann Surg 257: 87-94.

29. Le Coq B, Frering V, Ghunaim M, Campan P, Dabrowski A, et al. (2016) Impact of surgical technique on long-term complication rate after laparoscopic adjustable gastric banding (LAGB): Results of a single-blinded randomized controlled trial (ANOSEAN Study). Ann Surg 264: 738-744.

30. Jennings NA, Boyle M, Mahawar K, Balupuri S, Small PK (2013) Revisional laparoscopic Roux-en-Y gastric bypass following failed laparoscopic adjustable gastric banding. Obes Surg 23: 947-952.

31. Silecchia G, Rizzello M, De Angelis F, Raparelli L, Greco F, et al. (2014) Laparoscopic sleeve gastrectomy as a revisional procedure for failed laparoscopic gastric banding with a “2-step approach”: A multicenter study. Surg Obes Relat Dis 10: 626-631.