Short Communication

BIOMEDICAL Journal of Scientific & Technical Research

ISSN: 2574 -1241

DOI: 10.26717/BJSTR.2024.54.008547

The Approach to the Treatment of Morbid Obesity Through Endoscopic Gastroplasty (ESG)

De Sena Gabriele[1]*, Mauro Maria[2], Bentivoglio Davide[2], D'apice Flavia[2], Sglavo Nicola[2], Della Rocca Antonella[2], Di Chiara Maria Rosaria[2], Russo Antonella[2] and Porpora Danilo[2]

[1]*University of Ostrava, Czech Republic*

[2]*University of Campania Luigi Vanvitelli, Italy*

***Corresponding author:** De Sena Gabriele, University of Ostrava, Czech Republic

ARTICLE INFO

Received: December 16, 2023

Published: January 05, 2024

Citation: De Sena Gabriele, Mauro Maria, Bentivoglio Davide, D'apice Flavia Sglavo Nicola, Della Rocca Antonella, Di Chiara Maria Rosaria, Russo Antonella. The Approach to the Treatment of Morbid Obesity Through Endoscopic Gastroplasty (ESG). Biomed J Sci & Tech Res 54(3)-2024. BJSTR. MS.ID.008547.

ABSTRACT

Abbreviations: ESG: Endoscopic Sleeve Gastroplasty; T2DM: Type 2 Diabetes; OSAS: Obstructive Sleep Apnea Syndrome; GERD: Gastroesophageal Reflux Disease; AHT: Arterial Hypertension; EWL: Excess Weight Loss; EB: Endoscopic Bariatric

Introduction

The global epidemic of obesity has become a significant health concern, associated with substantial morbidity and mortality. Over the span of four decades, from 1975 to 2016, the prevalence of obesity worldwide has nearly tripled [1]. Despite efforts through lifestyle modifications and pharmacotherapy, achieving sustained weight loss remains a challenge for most individuals. Bariatric surgery stands out as a proven, long-term solution for weight loss, particularly in patients with class III and class II obesity-related comorbidities. However, this surgical intervention, while effective, is irreversible and carries inherent risks. Compounding the issue, less than 1-2% of eligible patients ultimately undergo bariatric surgery [2-4]. To address this treatment gap, endoscopic bariatric (EB) procedures have emerged as a minimally invasive alternative, bridging the divide between medical and surgical approaches to combat the obesity epidemic. Among these, Endoscopic Sleeve Gastroplasty (ESG) has gained prominence [5]. ESG, introduced in 2012 by Thompson and Hawes, employs a minimally invasive technique utilizing an endoscopic suturing device (such as the OverStitch by Apollo Endosurgery (Figures 1 & 2) or the Endomina System (Figure 3)) to apply full-thickness sutures in the stomach. This approach aims to reduce gastric capacity and modify gastric motility, offering an alternative to traditional bariatric surgery [6]. Since its inception, ESG has garnered increasing interest, with numerous studies highlighting its safety and efficacy [7-9].

Procedure Technique

The procedure represents a promising avenue for the management of severe obesity, providing a minimally invasive option with potential benefits that extend beyond those of conventional surgical interventions. Executing the Endoscopic Sleeve Gastroplasty (ESG) demands meticulous attention to specific procedures. The procedure necessitates general anesthesia administered by an anesthesiologist, with insufflation using CO2. Unlike traditional practices, there is no mandatory stomach marking for orientation before commencing the

procedure. Suturing patterns play a crucial role, with the square/rectangle or U pattern commonly chosen (Figure 4), involving the application of 4–6 sutures in each case. It is essential to refrain from suturing the antrum while focusing on reducing the greater gastric curvature (Figure 5). Addressing the fundus, endoscopists typically aim to reduce the most distal part (Figure 6). To enhance patient safety, antibiotics should be infused either before or immediately after the procedure. Remarkably, hospital discharge can be facilitated on the same day, emphasizing the minimally invasive nature of ESG. The ESG procedure technique displays variability across studies, with notable devices such as the double-channel Apollo OverStich System (Figure 1), the single-channel Apollo OverStich SX System (Figure 2), and the Endomina System (Figure 3) being employed [10-12].

Figure 1: Double channel Apollo OverStich System.

Figure 2: Apollo OverStich SX.

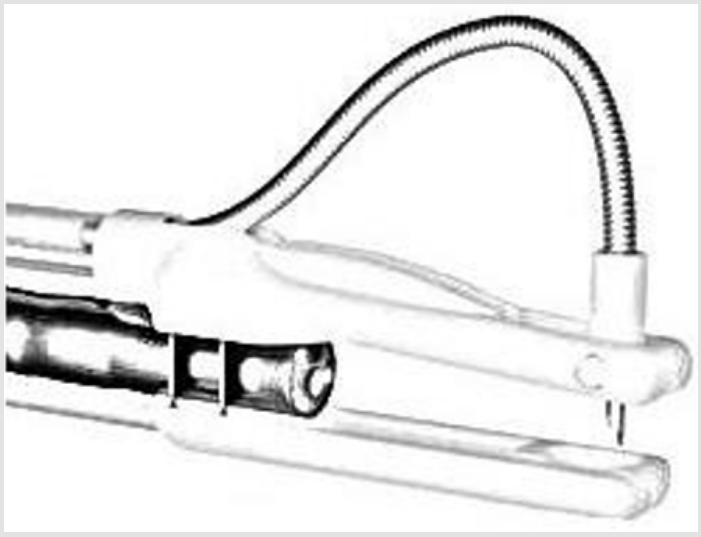

Figure 3: Endomina Sistem.

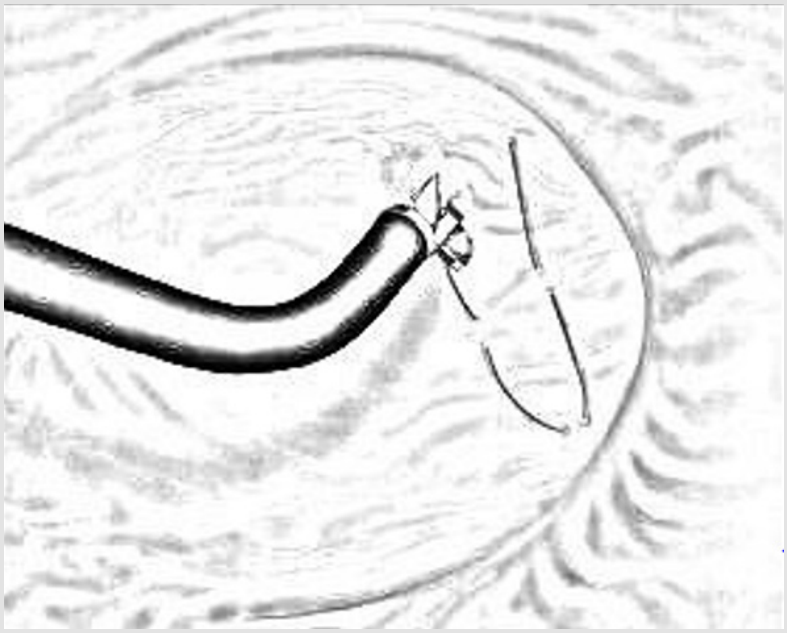

Figure 4: Endoscopic placement of 2/0 polypropylene sutures starting at the gastric antrum in a U- shaped pattern, taking the full thickness of the gastric wall using Apollo OverStich System. Most of the endoscopists did not use argon plasma coagulation markings to guide the procedure (95.1%). The gastric antrum should not be sutured because of its muscular strength and suture rupture.

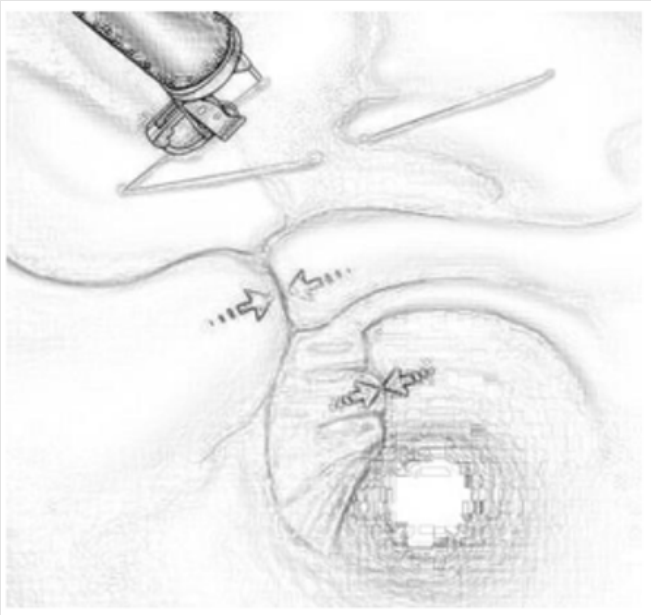

Figure 5: Endoscopic appearance after tightening the previously placed sutures. Most endoscopists use 4–6 sutures per case, with a varying number of bites per suture (more than 8–10 bites). Reinforcement is done on a case-by-case.

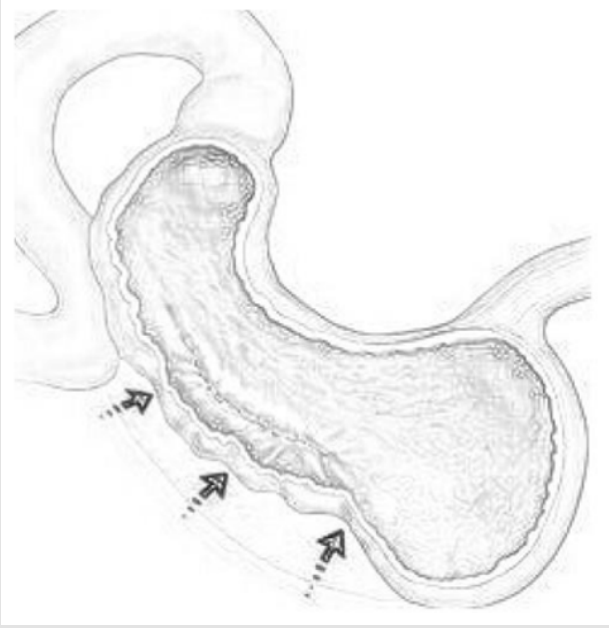

Figure 6: Upper gastrointestinal tract after performance of ESG reduction in diameter and length of the stomach, with preservation of the fundus. The aim of ESG should be to reduce (in a tube-like manner) the greater curvature rather than reducing the lumen as much as possible.

Indications

ESG is specifically indicated for the upper gastrointestinal tract post-reduction in diameter and length of the stomach, with a primary focus on preserving the fundus. The procedural goal is to achieve a tube-like reduction along the greater curvature, rather than maximal lumen reduction [8,13].

Absolute Contraindications

Absolute contraindications for ESG encompass active gastric ulcers in the body or fundus, congestive gastropathy, gastric polyposis, gastric or esophageal varices, and uncontrolled or untreated psychiatric disorders [8,14].

Preparation

In preparation for ESG, a preoperative endoscopy is imperative, performed by any endoscopist or the one executing the procedure. Additionally, a comprehensive laboratory work-up is mandatory. Pre-operative anticoagulation for deep vein thrombosis prophylaxis should align with clinical criteria. Ensuring a surgeon's participation in the team is crucial, especially when the ESG is conducted by a gastroenterologist. A multidisciplinary team, including a dietitian and psychologist, is essential for comprehensive patient follow-up [8,14].

Post-Procedure

Post-procedure, patients may receive recommended medications for the adaptation period, such as PPI, fosaprepitant; ondansetron, hyoscine/scopolamine, steroid (dexamethasone), and analgesics. PPIs should be continued for 1–3 months post-procedure [8,11,14].

Medications, Complications, and Post-Procedure Follow-Up

Routine use of metoclopramide is discouraged, and NSAIDs should be avoided. Typically, antibiotic therapy is unnecessary post-procedure. Deep vein thrombosis prophylaxis should be considered based on clinical evaluation. Follow-up should extend for at least 12 months. The most commonly reported complication is hematemesis, attributed to the internal nature of the sutures in ESG procedures, potentially causing gastric irritation and vomiting even with minor bleeding [8,11,14].

Discussion

Obesity, along with its associated complications such as type 2 diabetes, arterial hypertension, and dyslipidemia, constitutes a significant public health challenge. Laparoscopic sleeve gastrectomy (LSG) currently stands as the predominant bariatric surgical procedure. However, the Endoscopic Sleeve Gastroplasty (ESG) technique, while similarly focusing on the greater curvature of the stomach, presents several notable distinctions. Unlike LSG, ESG entails no abdominal incisions, eliminates the need for an operating room, and, in certain cases, is reversible. ESG induces remodeling while preserving the stomach's innervation and blood supply, providing potential repeatability and conversion to bariatric surgery if necessary [15]. ESG emerges as a particularly effective method for weight loss in patients unwilling or unable to undergo surgery, surpassing the outcomes achieved through drug treatments and physical exercise alone. Moreover, it might be considered a preparatory treatment for individuals with excessive obesity, for whom immediate bariatric surgery is contraindicated due to technical reasons. However, it's essential to note that data on the reduction of co-morbidities and associated biological parameters are still evolving and await widespread validation, similar to the established evidence for traditional bariatric surgery.

A significant contribution to the evolving knowledge on ESG comes from the MERIT trial, a major prospective randomized American multicenter study published in 2022. Among the 209 participants with class I or II obesity, those in the ESG group, coupled with lifestyle modification, demonstrated remarkable success. At 52 weeks, 77% achieved 25% or more excess weight loss (EWL) compared to only 12% in the control group. Impressively, this positive trend continued, with 68% maintaining an EWL of 25% or more at 104 weeks. Notably, ESG showcased broader health benefits, with 80% of participants experiencing improvement in one or more metabolic co-morbidities at 52 weeks. Furthermore, serious adverse events related to ESG were limited, occurring in only 2% of participants, with no mortality or need for intensive care or surgery reported.

The reduction in arterial hypertension (AHT), type 2 diabetes (T2DM), gastroesophageal reflux disease (GERD), obstructive sleep apnea syndrome (OSAS), and dyslipidemia correlated significantly with weight loss at six months, stabilizing at one year. A total weight loss exceeding 10% led to a substantial reduction in obesity-related co-morbidities [16]. Studies by Alqahtani et al. and Sharaiha et al. further support the efficacy of ESG. Alqahtani reported significant remission rates, including 76.5% for T2D, 100% for hypertension, and 56.3% for dyslipidemia at 12 months post-ESG. Sharaiha's findings indicated sustained weight loss after ESG over five years, reinforcing the long-term metabolic effects of the intervention. The correlation between weight loss and improvements in biological parameters underscores the metabolic efficacy of ESG, a trend consistent with studies in the surgical literature. In light of these findings, ESG emerges as a viable treatment for obesity-related co-morbidities, especially for patients who may not be candidates for surgery or prefer non-surgical interventions. Proposing ESG in such cases holds promise for reducing long-term morbidity and mortality associated with obesity and its myriad pathologies [17-19].

Conclusion

The endoscopic approach to bariatric surgery offers a compelling alternative by avoiding incisions and scarring, introducing reversibility, and demonstrating a low incidence of serious complications.

Specifically, Endoscopic Sleeve Gastroplasty (ESG), when combined with comprehensive multidisciplinary management, targeted dietary interventions, and physical activity, proves to be a potent strategy for achieving substantial weight loss and mitigating associated co-morbidities. At the one-year mark, ESG demonstrates a noteworthy total weight loss of 16.6%, showcasing its effectiveness as a minimally invasive intervention. Importantly, this weight loss is accompanied by a significant reduction in co-morbidities, including hypertension, type 2 diabetes (T2DM), obstructive sleep apnea syndrome (OSAS), dyslipidemia, and gastroesophageal reflux disease (GERD). ESG's impact extends beyond weight loss, as it also brings about a marked improvement in various biological parameters linked to weight, encompassing reductions in AST, ALT, triglycerides, total cholesterol, and fasting blood sugar levels. The findings underscore the multifaceted benefits of the endoscopic approach to bariatric surgery, positioning ESG as a comprehensive and effective solution for patients seeking weight loss with a minimized risk of complications. The reversibility of the procedure enhances its appeal, providing flexibility in the event of evolving patient needs or preferences. In conclusion, the promising outcomes of ESG, coupled with its advantageous features, suggest that it holds significant potential as a valuable tool in the comprehensive management of obesity and its associated health challenges [16-20].

Conflict of Interests

The authors declare that they have no conflicts of interest. No funding declared. All authors critically reviewed the manuscript and approved the final version submitted for publication.

References

1. HTTPS://WWW.WHO.INT/NEWS-ROOM/FACT-SHEETS/DETAIL/OBESITY-AND-OVERWEIGHT.
2. Henry Buchwald, Danette M Oien (2013) Metabolic/Bariatric Surgery Worldwide 2011. Obes surg 23(4): 427-436.
3. David Reed Flum, Steven H Belle, Wendy C King, Abdus S Wahed, Paul Berk, et al. (2009) Perioperative Safety in the longitudinal assessment of bariatric surgery Longitudinal Assessment of Bariatric Surgery (Labs) Consortium. N Engl J Med 361(5): 445-454.
4. Luigi Schiavo, Giuseppe Scalera, Vincenzo Pilone, Gabriele De Sena, Antonio Iannelli, et al. (2017) Fat Mass, fat-free mass, and resting metabolic rate in weight-stable sleeve gastrectomy patients compared with weight-stable nonoperated patients. Surg Obes Relat Dis 13(10): 1692-1699.
5. Abdellah Hedjoudje, Barham K Abu Dayyeh, Lawrence J Cheskin, Atif Adam, Manoel Galvão Neto, et al. (2020) Efficacy and Safety of Endoscopic Sleeve Gastroplasty: A systematic review and meta-analysis. Clin Gastroenterol Hepatol 18(5): 1043-1053.
6. Christopher Thompson, Endoluminal Greater Curvature Plication – A Case Series.
7. Monica Saumoy, Yecheskel Schneider, Xi Kathy Zhou, Alpana Shukla, Michel Kahaleh, et al. (2018) a single-operator learning curve analysis for the endoscopic sleeve gastroplasty; Gastrointest Endosc 87(2): 442-447.
8. Javier Graus Morales, Laura Crespo Pérez, Andrea Marques, Belén Marín Arribas, Rubén Bravo Arribas, et al. (2018) Modified endoscopic gastroplasty for the treatment of obesity. Surg Endosc 32(9): 3936-3942.
9. Aayed Alqahtani (2019) Endoscopic Sleeve Gastroplasty in 109 Consecutive Children and Adolescents with Obesity: Two-year Outcomes of a New Modality. Amj Gastroenterol 114(12): 1857-1862.
10. Gontrand Lopez-Nava, MP Galvão, I Bautista-Castaño, JP Fernandez-Corbelle, M Trell, et al. (2017) Endoscopic Sleeve Gastroplasty For Obesity Treatment: Two Years Of Experience. Arq Bras Cir Dig 30(1): 18-20.
11. Sérgio Barrichello, Diogo Turiani Hourneaux de Moura, Eduardo Guimaraes Hourneaux de Moura, Pichamol Jirapinyo, Anna Carolina Hoff, et al. (2019) Endoscopic sleeve gastroplasty in the management of overweight and obesity: An International Multicenter Study. Gastrointest Endosc 90(5): 770-780.
12. Christine Hill, Mohamad El Zein, Abhishek Agnihotri, Margo Dunlap, Angela Chang (2017) Endoscopic sleeve gastroplasty: The learning curve. Endosc Int Open 5(9): E900-E904.
13. Reem Z Sharaiha, Prashant Kedia, Nikhil Kumta, Louis J Aronne, Michel Kahaleh (2015) Endoscopic sleeve plication for revision of sleeve gastrectomy. Gastrointest Endosc 81(4): 1004.
14. lino polese, Luca Prevedello Amanda Belluzzi, Emilia Giugliano, Alice Albanese, et al. (2022) Endoscopic sleeve gastroplasty: results from a single surgical bariatric centre; Updates Surg 74(6): 1971-1975.
15. Lea Fayad, Atif Adam, Michael Schweitzer, Lawrence J Cheskin, Tokunbo Ajayi, et al. (2019) Endoscopic sleeve gastroplasty versus laparoscopic sleeve gastrectomy: A case-matched study. Gastrointest Endosc 89(4): 782-788.
16. Barham K Abu Dayye, Fateh Bazerbachi, Eric J Vargas, Reem Z Sharaiha, Christopher C Thompson, et al. (2022) Endoscopic Sleeve Gastroplasty For Treatment Of Class 1 And 2 Obesity (Merit): A Prospective, Multicentre, Randomised Trial. The Lancet 400(1035): 441-451.
17. Aayed Alqahtani, Abdullah Al-Darwish, Ahmed Elsayed Mahmoud, Yara A Alqahtani, Mohamed Elahmedi (2019) Short-term outcomes of endoscopic sleeve gastroplasty in 1000 consecutive patients. Gastrointestinal Endoscopy 89(6): 1132-1138.
18. Reem Z sharaiha, Kaveh Hajifathalian, Rekha Kumar, Katherine Saunders, Amit Mehta, et al. (2021) Five-Year Outcomes of Endoscopic Sleeve Gastroplasty for The Treatment Of Obesity. Clinical Gastroenterology and Hepatology19(5): 1051-1057.
19. Reem Z Sharaiha, Nikhil A Kumta, Monica Saumoy, Amit P Desai, Alex M Sarkisian, et al. (2017) Endoscopic Sleeve Gastroplasty Significantly Reduces Body Mass Index and Metabolic Complications in Obese Patients. Clin Gastroenterol Hepatol 15(4): 504-510.
20. Guillaume Lassailly, Robert Caiazzo, David Buob, Marie Pigeyre, Hélène Verkindt, et al. (2015) Bariatric Surgery Reduces Features of Nonalcoholic Steatohepatitis in Morbidly Obese Patients. Gastroenterology 149(2): 379-388.

ISSN: 2574-1241

DOI: 10.26717/BJSTR.2024.54.008547

De Sena Gabriele. Biomed J Sci & Tech Res

Submission Link: https://biomedres.us/submit-manuscript.php