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# ENDOSCOPIC SLEEVE GASTROPLASTY (ESG):

## Unveiling Clinical Evidence in Primary Endobariatric Procedures

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# ESG Safety and Efficacy

In the field of obesity management, Endoscopic Sleeve Gastroplasty (ESG) has emerged as a transformative primary endobariatric procedure, offering a minimally invasive alternative to surgery with proven clinical efficacy.

Clinical evidence demonstrates that ESG can lead to significant, lasting weight loss when combined with a prescribed diet and exercise programme. Over the past decade, the body of evidence supporting ESG's safety, efficacy, and durability has been meticulously developed, encompassing both level 1 evidence and large meta-analyses.

**40,000 ESG procedures performed worldwide.***

**15,000 patients included in clinical studies.***

**Over 200 clinical papers and abstracts published.***

**Follow-up data reported up to five years.****

* IFSO (International Federation for the Surgery of Obesity and Metabolic Disorders) Bariatric Endoscopy Committee Evidence-Based Review and Position Statement on Endoscopic Sleeve Gastroplasty for Obesity Management. 2024.
** Asokkumar R., et al. DEN Open. 2023.

## ESG: Efficacy in Terms of %EWL and %TBWL in Systematic Literature Review and Meta-Analysis

| Publication | Scope | Follow-up | %EWL | %TBWL |
|---|---|---|---|---|
| | | | %, (CI95%) | %, (CI95%) |
| **Fehervari 2023 [56]** | 35 studies | 12 mths | 51.7%, (43.5-59.9) | 16.2%, (13.1-19.4) |
| | 7,525 patients | 24 – 60 mths | 51.8%, (47.9-62.9) | 15.4%, (13.7-17.2) |
| **de Miranda 2020 [55]** | 11 studies | 1 mth | 31.08%, (20.79-41.36) | 8.56%, (7.94-9.18) |
| | 2,170 patients | 3 mths | 46.13%, (38.79-53.4) | 11.65%, (10.76-12.53) |
| | | 6 mths | 55.80%, (50.61-60.99) | 15.32%, (14.54-16.10) |
| | | 9 mths | 66.20%, (57.54-74.86) | 16.15%, (14.94-17.37) |
| | | 12 mths | 60.07%, (53.39-66.74) | 17.33%, (16.30-18.36) |
| | | 18 mths | 73.04%, (58.94-87.14) | 16.80%, (13.02-20.56) |
| **Hedjoudje 2020 [29]** | 8 studies | 1 mth | 32.42%, (23.50-41.34) | 8.77%, (8.06-9.47) |
| | 1,110 patients | 3 mths | 47.07%, (42.10-52.03) | 11.28%, (10.41-12.14) |
| | | 6 mths | 57.71%, (52.02-63.41) | 15.14%, (14.29-16.00) |
| | | 9 mths | 66.21%, (57.54-74.87) | 16.13%, (14.90-17.37) |
| | | 12 mths | 61.83%, (54.75-68.93) | 16.50%, (15.19-17.82) |
| | | 18 – 24 mths | 66.92%, (50.22-83.61) | 17.15%, (14.64-19.67) |
| **Li 2020 [285]** | 9 studies | 1 mth | 31.16% | 8.78% |
| | 1,542 patients | 3 mths | 43.61% | 11.85% |
| | | 6 mths | 53.14% | 14.47% |
| | | 12 mths | 59.08% | 16.09% |
| **Singh 2020 [57]** | 8 studies | 6 mths | 55.75%, (50.61-60.89) | 14.86%, (13.83-15.90) |
| | 1,859 patients | 12 mths | 61.84%, (54.75-68.93) | 16.43%, (15.23-17.63) |
| | | 18 mths | 66.87%, (50.14-83.60) | 16.81%, (13.02-20.59) |
| | | 24 mths | 60.40%, (48.88-71.92) | 20.01%, (16.92-23.11) |

## ESG: Efficacy in Terms of %EWL and %TBWL in Prospective Studies

| Publication | Country | Patients | Follow-up | %EWL<br>%, ±SD or<br>%, (CI95%) | %TBWL<br>%, ±SD or<br>%, (CI95%) |
|---|---|---|---|---|---|
| **Alqahtani 2023 [288]** | Saudi Arabia | 656 | 6 mths | 67.5%, ±31.9 | 11.0%, ±7.2 |
| | | | 12 mths | 88.0%, ±27.8 | 15.5%, ±6.3 |
| | | | 24 mths | 87.3%, ±24.5 | 15.1%, ±8.3 |
| | | | 36 mths | 75.2%, ±38.2 | 13.2%, ±10.9 |
| **Bhandari 2023 [286]** | India | 612 | 1 mth | 9.41%, ±1.66; (9.28-9.45) | 36.34%, ±2.12; (35.93-36.72) |
| | | | 3 mths | 13.28%, ±4.80; (12.90-13.66) | 40.24%, ±2.34; (39.82-40.68) |
| | | | 6 mths | 18.68%, ±4.52; (18.31-19.06) | 53.68%, ±4.53; (53.26-54.06) |
| | | | 12 mths | 21.20%, ±4.70; (20.81-21.59) | 56.92%, ±6.54; (56.51-57.30) |
| | | | 24 mths | 20.05%, ±5.23; (19.61-20.48) | 54.42%, ±4.45; (54.03-54.80) |
| | | | 36 mths | 18.74%, ±4.06 (18.31-19.12) | 51.10%, ±4.61; (50.71-51.48) |
| | | | 48 mnths | 18.19%, ±5.02 (17.72-18.57) | 49.30%, ±3.22; (48.91-49.68) |
| **Galvao-Neto 2020 [241]** | – | – | 1 mth | 26.7%, ±17.3 | 9.6%, ±6.3 |
| | | | 3 mths | All: 36.1%, ±31.1 | All: 13.1%, ±10.5 |
| | | | | Class I: 36.9%, ±43.2 | Class I: 12%, ±14.3 |
| | | | | Class II: 35.3%, ±11.2 | Class II: 14.2%, ±4.4 |
| | | | 6 mths | All: 47.3%, ±14.4 | All: 17.1%, ±4.9 |
| | | | | Class I: 51.1%, ±16.0 | Class I: 16.5%, ±5.1 |
| | | | | Class II: 43.7%, ±11.7 | Class II: 17.6%, ±4.6 |
| | | | 9 mths | 47.1%, ±18.0 | 16.90% |
| | | | 12 mths | All: 54.8%, ±17.4 | All: 19.7%, ±5.7 |
| | | | | Class I: 60.2%, ±19.8 | Class I: 20.1%, ±5.0 |
| | | | | Class II: 49.6%, ±12.8 | Class II: 19.3%, ±6.3 |
| **Sharaiha 2021 [287]** | US | 216 | 1 mth | - | 8.9%, (8.5-9.4) |
| | | | 3 mths | - | 12.3%, (11.5-12.9) |
| | | | 6 mths | - | 14.5%, (13.4-15.6) |
| | | | 12 mths | 47.9%, (42.4-53.3) | 15.6%, (14.1-17.1) |
| | | | 24 mths | - | 15.3%, (13.4-17.2) |
| | | | 36 mnths | 45.1%, (34.9-55.2) | 14.9%, (12.1-17.7) |
| | | | 48 mnths | - | 13.5%, (9.6-17.4) |
| | | | 60 mnths | 45.3%, (32.9-57.7) | 15.9%, (11.7-20.5) |

# Endoscopic sleeve gastroplasty for treatment of class 1 and 2 obesity (MERIT): a prospective, multicentre, randomised trial

*Barham K Abu Dayyeh et al. Lancet. 2022 Aug 6;400(10350):441-451.*

**Background:** Endoscopic sleeve gastroplasty (ESG) is an endolumenal, organ-sparing therapy for obesity, with wide global adoption. We aimed to explore the efficacy and safety of ESG with lifestyle modifications compared with lifestyle modifications alone.

**Methods:** We conducted a randomised clinical trial at nine US centres, enrolling individuals aged 21–65 years with class 1 or class 2 obesity and who agreed to comply with lifelong dietary restrictions. Participants were randomly assigned (1:1·5; with stratified permuted blocks) to ESG with lifestyle modifications (ESG group) or lifestyle modifications alone (control group), with potential retightening or crossover to ESG, respectively, at 52 weeks. Lifestyle modifications included a low-calorie diet and physical activity. Participants in the primary ESG group were followed up for 104 weeks. The primary endpoint at 52 weeks was the percentage of excess weight loss (EWL), with excess weight being that over the ideal weight for a BMI of 25 kg/m$^2$. Secondary endpoints included change in metabolic comorbidities between the groups. We used multiple imputed intention-to-treat analyses with mixedeffects models. Our analyses were done on a per-protocol basis and a modified intention-to-treat basis. The safety population was defined as all participants who underwent ESG (both primary and crossover ESG) up to 52 weeks.

**Findings:** events. A total of 39.3% had additional weight loss therapy (pharmacotherapy or procedure), with 3.6% getting repeat TORe. Amount of weight loss at 1 year (β=0.43, p=0.01) and an additional endoscopic weight loss procedure (β=8.52, p=0.01) were predictors of %TWL at 5 years.

**Interpretation:** ESG is a safe intervention that resulted in significant weight loss, maintained at 104 weeks, with important improvements in metabolic comorbidities. ESG should be considered as a synergistic weight loss intervention for patients with class 1 or class 2 obesity.
This trial is registered with ClinicalTrials.gov, NCT03406975.

**Funding:** Apollo Endosurgery, Mayo Clinic.

See Key Highlights

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# IFSO Bariatric Endoscopy Committee Evidence-Based Review and Position Statement on Endoscopic Sleeve Gastroplasty for Obesity Management

*Barham K. Abu Dayyeh et al. Obes Surg. 2024 Dec;34(12):4318-4348.*

**Background:** Obesity is a significant global health issue. Metabolic and bariatric surgery (MBS) is the gold standard in the treatment of obesity due to its proven effectiveness and safety in the short and long term. However, MBS is not suitable for all patients. Some individuals are at high surgical risk or refuse surgical treatment, while others do not meet the criteria for MBS despite having obesity-related comorbidities. This gap has driven the development of endoscopic solutions like endoscopic sleeve gastroplasty (ESG), which offers a less invasive alternative that preserves organ function and reduces risks. A recent IFSO International Delphi consensus study highlighted that multidisciplinary experts agree on the utility of ESG for managing obesity in patients with class I and II obesity and for those with class III obesity who do not wish to pursue or qualify for MBS. This IFSO Bariatric Endoscopy Committee position statement aims to augment these consensus statements by providing a comprehensive systematic review of the evidence and delivering an evidence-based position on the value of ESG within the spectrum of obesity management.

**Methods:** A comprehensive systematic review followed the Preferred Reporting Items for Systematic Reviews and Metaanalyses (PRISMA) and Cochrane guidelines.

**Results:** Systematic Review: The systematic review included 44 articles encompassing 15,714 patients receiving ESG. The studies varied from large case series to cohort studies and a randomized controlled trial (RCT). The mean baseline BMI was 37.56 kg/m2. The review focused on weight loss outcomes and safety data.

**Meta-analysis:**

| Time point | Mean % EWL | Mean % TBWL |
|---|---|---|
| 6 months | 48.04 | 15.66 |
| 12 months | 53.09 | 17.56 |
| 18 months | 57.98 | 16.25 |
| 24 months | 46.57 | 15.2 |
| 36 months | 53.18 | 14.07 |
| 60 months | 45.3 | 15.9 |

These results demonstrate significant weight loss following ESG.

**Safety:** The pooled serious adverse event (SAE) rate was 1.25%. This low rate of SAEs indicates that ESG is a relatively safe procedure.

**Quality of Evidence:** The quality of evidence from the included observational studies was assessed as very low, primarily due to the inherent limitations associated with observational study designs, such as potential biases and lack of randomization. In contrast, the quality of evidence from the single randomized controlled trial was rated as MODERATE, reflecting a more robust study design that provides a higher level of evidence despite some limitations.

See Key Highlights

# Four-year outcomes for endoscopic sleeve gastroplasty from a single centre in India

*Mahak Bhandari et al. J Minim Access Surg. 2023 Jan-Mar;19(1):101-106.*

**Background:** Bariatric endoscopy has emerged for non-surgical treatment of obesity, providing a treatment option for weight loss and associated comorbidities. Outcomes of endoscopic sleeve gastroplasty (ESG) of 12 months have been published by our team and there is a need for longer follow-up period understanding the effects of ESG techniques.

**Aim:** This report emphasises on weight loss pattern in follow-up time points and monitors the post-procedureimprovement in comorbidities with minimum 4-year follow-up of patients undergoing ESG at a single academic centre in India.

Subjects and Methods: This was a prospective cohort study. All procedures were performed by the same surgeon. Patients with a body mass index of >30 kg/m2 (or >27 with comorbidities) underwent ESG for treatment of obesity. Patients were systematically followed yearly after their procedure. Data collected on the primary outcome and secondary outcomes were analysed and presented.

**Results:** 612 patients (69.3% female) with a mean age of 40.70 ± 12.66 years and mean body mass index of 34.30 ± 5.05 kg/m2 underwent ESG. Out of 612 patients, follow-up rates for a 1-2-3 and 4 years were 93.1%, 90.2%, 81.7% and 81.9%, respectively. The mean percentage total body weight loss was 18.19% (95% confidence interval [CI]: 17.72–18.57) and %EWL was 49.30% (95% CI: 48.91–49.68) with 90% of participants-maintaining a percentage of total weight loss of ≥5% and 70% of patients maintaining an EWL of ≥25% at 4 years, respectively. Resolution/improvement of comorbidities was 51.2% cases of T2DM, 65.8% cases of hypertension, 73.6% cases of dyslipidaemia and 89.9% remission were in obstructive sleep apnoea. No patient required an emergency intervention, and there was no mortality or significant morbidity.

**Conclusions:** This study shows acceptable results with ESG at 4 years in our unit. Regular monitoring by a multidisciplinary nurtures weight loss, resolution or improvement of comorbidities and improvement of quality of life with low perioperative complications. There is a need for more reports with this approach to determine the amount and duration of weight loss outcome and medical intervention.

See Key Highlights

# Endoscopic gastroplasty versus laparoscopic sleeve gastrectomy: a noninferiority propensity score – matched comparative study

*Aayed R. Alqahtani et al. Gastrointest Endosc. 2022 Jul;96(1):44-50.*

**Background:** Endoscopic bariatric therapies are less-invasive alternatives to bariatric surgery, and endoscopic gastroplasty (ESG) represents the latest evolution. This study aims to compare weight loss, safety, and comorbidity resolution of ESG compared with laparoscopic sleeve gastrectomy (LSG).

**Aim:** This was a propensity score–matched study of patients who underwent ESG or LSG. Primary outcome was weight loss at 6, 12, 24, and 36 months. A noninferiority margin of 10% total weight loss (%TWL) was used. Secondary outcomes were safety and comorbidity resolution.

**Results:** A 1:1 propensity score match yielded 3018 patient pairs. Average age and body mass index (BMI) were 34 ± 10 years and 33 ± 3 kg/m$^2$, respectively, and 89% were women. Mean percentage of excess weight loss at 1, 2, and 3 years after ESG was 77.1% ± 24.6%, 75.2% ± 47.9%, and 59.7% ± 57.1%, respectively. Mean percentage of excess weight loss at 1, 2, and 3 years after LSG was 95.1% ± 20.5%, 93.6% ± 31.3%, and 74.3% ± 35.2%, respectively. The mean difference in %TWL was 9.7% (95% confidence interval [CI], 6.9-11.8; P < .001), 6.0% (95% CI, –2.0 to 9.4; P < .001), and 4.8% (95% CI, –1.5 to 8.7; P < .001) at 1, 2, and 3 years, respectively. Noninferiority was demonstrated at all follow-up visits. Fourteen ESG patients developed adverse events (.5%) versus 10 LSG patients (.3%). Comorbidity remission rates after ESG versus LSG were 64% versus 82% for diabetes, 66% versus 64% for dyslipidemia, and 51% versus 46% for hypertension, respectively. Eighty ESG patients (2.7%) underwent revision to LSG for insufficient weight loss or weight regain, and 28 had resuturing after primary ESG (.9%).

**Conclusions:** ESG induces noninferior weight loss to LSG with similar comorbidity resolution and safety profiles.

## Key Highlights

This study is a **propensity score–matched study** of patients who underwent ESG or LSG. A 1:1 propensity score match yielded 3,018 patient pairs.

## Key Findings

| | 6 months | 12 months | 24 months | 36 months |
|---|---|---|---|---|
| **Total weight loss, %** | | | | |
| Difference (95% confidence interval) | 2.9 (1.7-4.6) | 19.2 ± 7.7 | 16.2 ± 9.7 | 14.0 ± 12.1 |
| ESG | 15.1 ± 6.1 | 28.9 ± 8.2 | 22.2 ± 8.2 | 18.8 ± 7.5 |

- Adverse events occurred in 0.5% of ESG patients (n=10). These included bleeding events in 10 patients and 4 perigastric collections.
- At the latest follow-up, complete remission was observed in 64.3% of diabetes cases, 66% of dyslipidemia cases, and 50.5% of hypertension cases.
- Eighty ESG patients (2.7%) underwent revision to LSG for insufficient weight loss or weight regain after an average of 10 months, and 28 (0.9%) had a second ESG after a mean of 19 months.

**ESG fills a gap between medical management of obesity and bariatric surgery.** The procedure could serve an unmet need in the care of patients with obesity, and we position it accordingly.

## Study Remarks

- **Excellent safety** and **efficacy profile.**
- **Significant comorbidity resolution.**
- **Reintervention rate** due to weight regain was **very low:** 2.7% in total.

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# Laparoscopic Sleeve Gastrectomy After Endoscopic Sleeve Gastroplasty: Technical Aspects and Short-Term Outcomes

*Aayed R. Alqahtani et al. Obes Surg. 2019 Nov;29(11):3547-3552.*

**Background:** Background Endoscopic sleeve gastroplasty (ESG) utilizes full-thickness sutures to plicate the greater curvature of the stomach. As with other weight loss interventions, some patients end up requiring revision to another procedure for insufficient weight loss or weight regain, discomfort, and procedure-related adverse events.

**Objectives:** In this paper, we report our technique and short-term outcomes of revisional sleeve gastrectomy (LSG) after ESG. Setting Specialized medical center with standardized multidisciplinary protocols for medical, surgical, and endoscopic management of obesity.

**Methods:** A combined laparoscopic-endoscopic technique that identifies plication orientation and the location of anchors and sutures was employed. This prepares the stomach for safe stapling, excluding sutures and anchors from the staple line and the retained sleeve. Hereby, we report this technique with its short-term safety and efficacy outcomes.

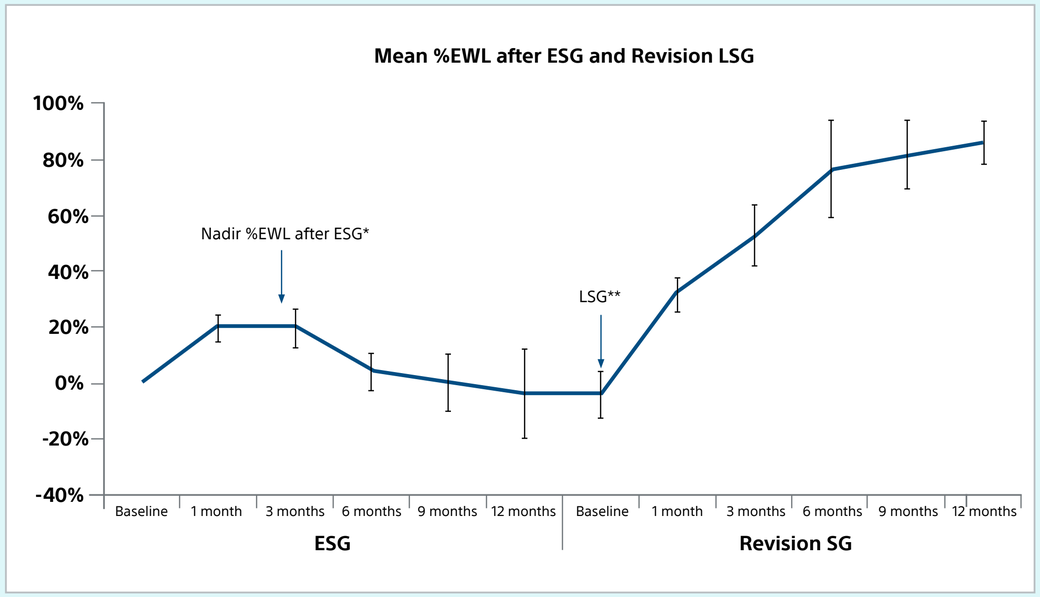
**Results:** Twenty patients (16 female; mean age 40 ± 6 years) underwent revisional LSG from a total of 1665 (1.2%) who underwent primary ESG. Mean body mass index at the time of primary and revision procedures were 35.0 ± 4.0 and 35.2 ± 3.8 kg/m$^2$, respectively. Nadir % total weight loss (%TWL) after primary ESG was 7.7 ± 3.5%. %TWL at 6 and 12 months after LSG was 21.0 ± 2.7 (n = 11) and 25.6 ± 4.1 (n = 8), respectively. There were no missed follow-up visits. Additionally, there was no mortality, prolonged hospital stay, adverse events, reoperations, or readmissions.

**Conclusions:** Based on this combined laparoscopic-endoscopic technique, laparoscopic sleeve gastrectomy is a safe and feasible revision option for patients who fail ESG.

## Key Highlights

**Retrospective study** of patients who did not lose sufficient weight (defined as < 5% of total weight) after at least three months from ESG, and those who experienced weight regain. **Twenty patients** underwent revisional LSG from a total of 1665 (1.2%) who underwent primary ESG.

## Key Findings




- %TWL at 6 and 12 months after LSG was 21.0 ± 2.7 and 25.6 ± 4.1, respectively.
- Additionally, there was no mortality, prolonged hospital stay, adverse events, reoperations, or readmissions.

## Study Remarks

- Low number of patients in need of ESG revision.
- The study demonstrates that **revision of ESG with LSG is safe, technically feasible, and effective.**

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# Re-suturing after primary endoscopic sleeve gastroplasty (ESG) for obesity

*Gontrand Lopez-Nava et al. Surg Endosc. 2021 Jun;35(6):2523-2530.*

**Introduction:** Although primary endoscopic sleeve gastroplasty (P-ESG) is effective, some patients may require revision procedures to augment weight loss. We hypothesized that a non-surgical approach using redo ESG (R-ESG) might be a viable option in such patients. We aimed to assess the safety and efficacy of R-ESG following P-ESG to treat obesity.

**Methods:** We reviewed the outcome of patients who underwent R-ESG at our unit. We classified them as weight loss failure (WF) —< 10% total body weight (TBWL) at 6-months; weight regain (WR) — lost ≥ 10% TBWL and regained 50% of the maximum weight loss at or after 1-year; weight plateau (WP) — lost ≥ 10% TBWL but could not lose further over 3-months. We analyzed the feasibility, safety, and evaluated the efficacy of R-ESG in each group.

**Results:** Of the 482 patients who underwent P-ESG, 35 (7%) required R-ESG (WF-12, WR-12, WP-11). The mean age, weight, BMI (38.2 kg/m2), and the number of sutures used during P-ESG were similar between the groups. The nadir %TBWL was lowest in WF group compared to WR and WP (6.5% vs. 20% vs. 22.4%, p = 0.001). The mean BMI at R-ESG was 33.6 kg/m2. The time to R-ESG was longer in the WR group compared to WF and WP (22.3 vs. 13.4 vs. 13.7 months, p = 0.03). We placed a median of 3 (range 2–6) sutures. R-ESG was technically successful, and no serious complications occurred. All except two patients were discharged on the same day. The overall %TBWL achieved by R-ESG was significantly higher in WP (26%) as compared to WF (11.2%) and WR (12%), respectively (p = 0.001).

**Conclusion:** The need for R-ESG after P-ESG is low. R-ESG is safe and induced weight loss in all patients. The maximum benefit was observed in WP.

## Key Highlights

**Retrospective study** of 37 patients undergoing R-ESG (repeated ESG).
Patient Classification for R-ESG:

- Weight loss failure (WF): losing < 10% TBWL at 6-months
- Weight regain (WR): lost ≥ 10% TBWL and regained 50% of the maximum weight loss at or after 1 year
- Weight plateau (WP): lost ≥ 10% TBWL but could not lose further over 3 months

## Key Findings

| Variables | Weight loss failure (WF-9) | Weight regain (WR-12) | Weight plateau (WP-9) | *p* value |
|---|---|---|---|---|
| Weight at R-ESG (kg) | 93.7 (10.5) | 98.7 (15.2) | 82.8 (13.7) | 0.008 |
| BMI at R-ESG (kg/m2) | 34.3 (3.4) | 35.8 (6.7) | 30.5 (4.3) | 0.04 |
| Redo suture (range) | 2 (2–3) | 3 (2–6) | 3 (2–5) | 0.14 |
| %TBWL post R-ESG | 5 (6.3) | 6 (5.1) | 4.5 (4.5) | 0.83 |
| Overall %TBWL | 11.2 (7.1) | 12 (9) | 26 (8.4) | 0.001 |
| BMI decline post R-ESG (kg/m2) | 1.8 (2.1) | 2.3 (2) | 1.5 (1.4) | 0.63 |
| Overall BMI decline (kg/m2) | 4.2 (2.9) | 5.1 (5.2) | 10.5 (4) | 0.002 |

Weight loss outcomes during 3-month follow-up after R-ESG.

## Study Remarks

- **R-ESG was technically successful,** with 95% of patients discharged on the same day.
- R-ESG was deemed necessary in only 7% of cases.
- **R-ESG is particularly useful for patients reaching a weight loss plateau,** providing an additional 5% (5.4%-6%) TBWL over 3 months to all patient categories in the study.

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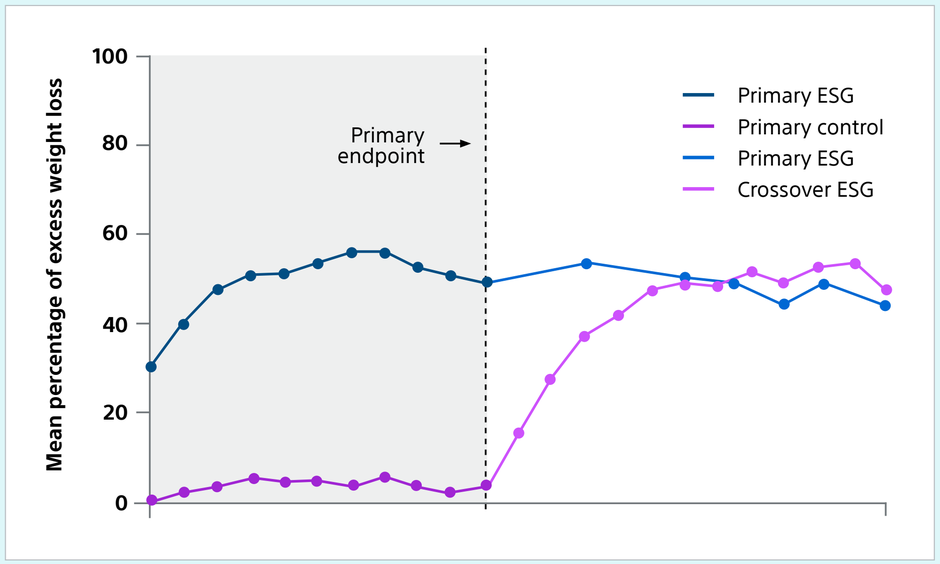
ENDO-2258004-AA

# Key Highlights

The Merit Trial is a **multicentre, prospective, randomised clinical trial** that evaluated the safety and effectiveness of the ESG procedure versus a medically monitored regimen of diet and healthy lifestyle.

# Key Findings




**13.6%**

Mean TBWL at 1Y

**2%**

SAE* rate among all ESG completers. All recovered.

* Severe Adverse Event

80% of participants in the ESG group with baseline comorbidities experienced improvement in one or more metabolic comorbidities.

| | ESG | | Lifestyle | | p |
|---|---|---|---|---|---|
| | Improve | Worsen | Improve | Worsen | |
| Diabetes Mellitus Type II (DMII) | 92% | 0% | 15% | 44% | <0.001 |
| Metabolic Syndrome + NAFLD + Inflammation | 83% | 0% | 35% | 38% | <0.001 |
| Hypertension (HTN) | 67% | 6% | 40% | 23% | =0.01 |

# Study Remarks

- ESG is **superior** to diet and lifestyle modification.
- This paper defines **best practices** for performing the ESG procedure and reports the results for this standardized technique.
- This paper demonstrates the **improvement in metabolic health parameters** after ESG.

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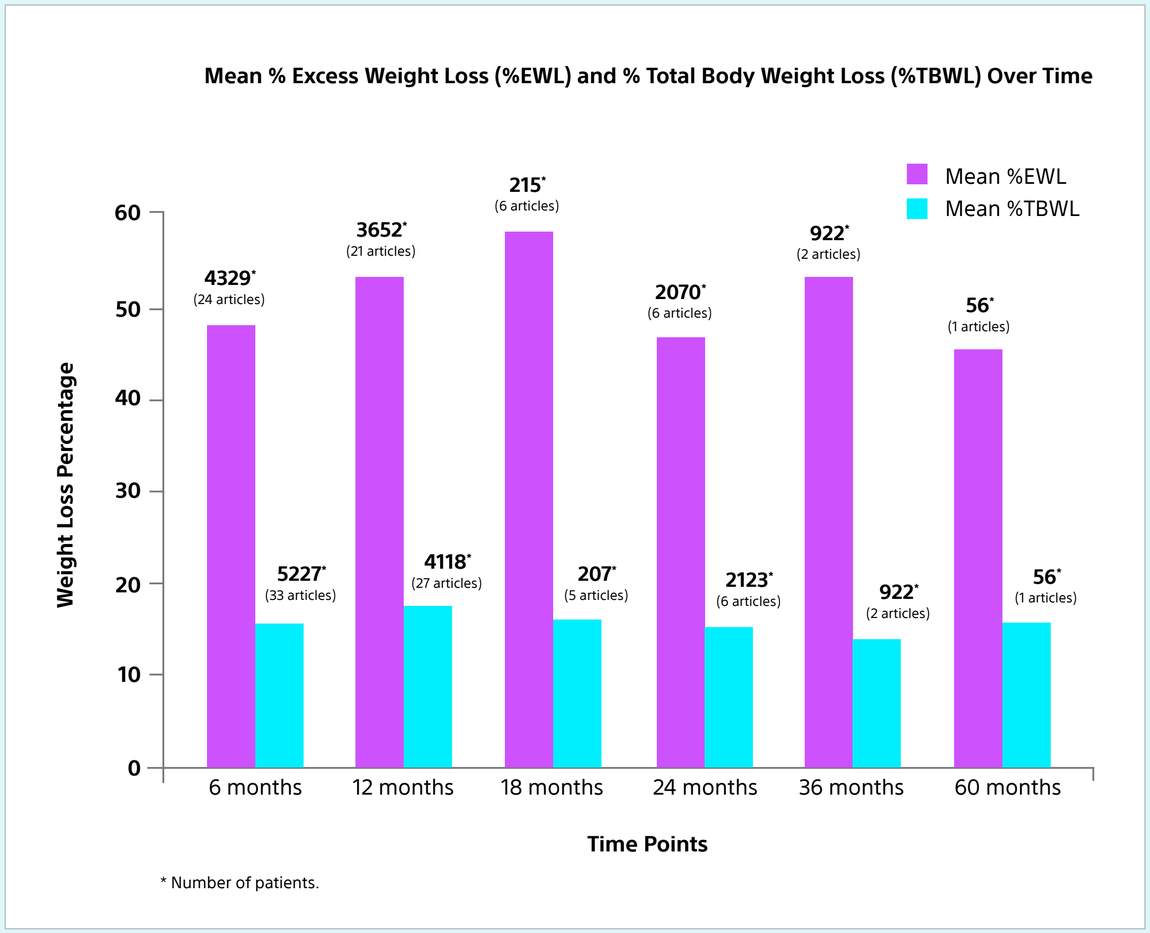
# Key Highlights

- The IFSO position statement supports and provides an **evidence base** for the role of ESG within the broader spectrum of obesity management.
- ESG is **particularly beneficial for** patients with class I and II obesity, as well as for those with class III obesity who are not suitable candidates for metabolic bariatric surgery.
- The ESG procedure is **clinically mature, homogeneous, and reproducible.**
- The **systematic review** included **44 articles** encompassing **15,714 patients** receiving ESG.
- More than **200 international medical articles** have been published on ESG.
- The procedure is currently employed clinically on all continents, and more than **40,000 clinical procedures** have been performed to date.




* Number of patients.

**Results:** Systematic Review: The systematic review included 44 articles encompassing 15,714 patients receiving ESG. The studies varied from large case series to cohort studies and a randomized controlled trial (RCT). The mean baseline BMI was 37.56 kg/m2. The review focused on weight loss outcomes and safety data.

See Key Highlights

## Key Highlights

- Single academic centre following up 612 ESG patients.
- **310 patients'** results reported at **4 years** follow-up.

## Key Findings

- Weight loss at 4 years:18.9% TWL.
- **No** reported **SAEs***

* Severe Adverse Event

| | 95% CI | %TWL | ≥5% TWL (%) | %EWL | ≥25% EWL (%) |
|---|---|---|---|---|---|
| 1 month | 9.28-9.45 | 9.41±1.66 | 92 | 36.34±2.12 | 87 |
| 3 months | 12.90-13.66 | 13.28±4.80 | 94 | 40.24±2.34 | 90 |
| 6 months | 18.31-19.06 | 18.68±4.52 | 97 | 53.68±4.53 | 90 |
| 1 year | 20.81-21.59 | 21.20±4.70 | 98 | 56.92±6.54 | 92 |
| 2 year | 19.61-20.48 | 20.05±5.23 | 93 | 54.42±4.45 | 80 |
| 3 year | 18.31-19.12 | 18.74±4.06 | 91 | 51.10±4.61 | 70 |
| 4 year | 17.72-18.57 | 18.19±5.02 | 90 | 49.30±3.22 | 70 |

**Comorbidity Resolution/Improvement:**

- 51.2% T2 diabetes
- 65.8% hypertension
- 73.6% dyslipidaemia
- 89.9% obstructive sleep apnoea

## Study Remarks

- Weight loss shows **stable results over time** across the 4 years follow-up.
- **Significant comorbidity resolution** across hypertension, T2 diabetes, cholesterol, and sleep apnoea.
- **Reintervention rate** due to weight regain was **very low:** 6.7% in total.