**“ENDOSCOPIC SLEEVE GASTROPLASTY: POTENTIAL THERAPY FOR OBESITY”**

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1. **Background**

Globally the prevalence of obesity and associated comorbidities are enhancing at an alarming rate. Over the past 30 years, revolutionary lifestyle adoption makes people consume inadequate diets and be physically inactive which results increasing in noncommunicable and, chronic diseases like obesity (defined as BMI ≥30 kg/m2). Obese individuals who have a body mass index between ≥ 35 to 40 kg/m2 and failure of diet, exercise, and drug therapy those individuals are considered for bariatric surgeries. Various bariatric surgeries like intragastric balloon insertion, endoscopic bypass surgeries, and laparoscopic surgeries have a history of invasiveness as well as these procedures have morbidity rates of up to 6%. Endoscopic sleeve gastroplasty has minimum invasiveness making it an efficient bariatric therapy for individuals of class II/III obesity. The incisionless ESG procedure is also available for lower BMI ≥30 kg/m2 andlower comorbidities.

A recent meta-analysis study shows a reduction in 15 % Total body weight loss (TBWL)and 58% Excess weight loss (EWL) at 6 months and the results were sustained for 12, 18, and 24months. This study also supports the minimum adverse events of 1-3% during and after the procedure**.** Although laparoscopic sleeve gastrectomy has high efficiency compared to other weight loss approaches, shows a 10-50 % failure rate, and 0.3% mortality rate.Another meta-analysis reported a significant improvement in obesity-related comorbidities by lowering HbA1c, triglycerides, alanine aminotransferase (ALT), and systolic blood pressure at 12 months

1. **Procedure guideline**
2. **Patient**

For the endoscopic sleeve, gastroplasty patients are selected based on BMI ranges between 30-34.9 kg/m² with the comorbidities like hypertension, diabetes mellitus, etc

1. **Method**

ESG is also called as “Apollo method”. This surgery can be employed by Overstitch (Apollo Endosurgery Inc., Austin, TX, United States). This is the cap-based flexible endoscopic suturing device mounted onto a double-channel endoscope.

1. **Suture pattern**

Many studies reported patterns of the sutures such as U-shaped, square patterns with reinforcement of stitches, and Z-shaped stitches. earlier argon plasma coagulation (APC) was utilized for marking the stitching points.



**Figure 1 U-shaped pattern with reinforcement stitches**

The anterior, as well as posterior walls of the stomach, are stitched together and the stomach appears to be tubular. This shape reduces the stomach accommodation capacity by 70% for meals which restricts the calorie intake. The stitching started at the incisura angularis and then moved to the greater curvature toward the fundus. This pattern creates the concentric curvature resulting tubular shape of the stomach lumen.

There are two types of suture patterns such as no longitudinal compression and longitudinal compression.

1. **No longitudinal compression**

The stitches were first taken to the anterior stomach wall, followed by greater curvature after that stitches were taken to the posterior wall, and the pattern repeats in the opposite direction. Plication sutures are triangular in shape and consist of 3 to 9 full-thickness bites, clinched together form circumferential compression of the greater curvature. 6 to 8 plications are used to produce gastric sleeves.

1. **Longitudinal compression**

The longitudinal compression technique started in two settings; the first suture started from the proximal antrum and ends at mid-body along the greater curvature and sec suture starts from mid-body ends into the fundus along the greater curvature.

1. **Physiology of weight reduction in ESG**

The tubular shape of the stomach is responsible for several physiological and structural changes resulting in weight loss.

Along with the tubular gastric reservoir reduces the portion of the meal and also Delays the gastric emptying time for solids; it also affects the glycaemic and hormone level.

* Alteration of Metabolic and physiological parameters: significant variations are found in leptin, glucagon-like peptide -1, and peptide YY levels in the research studies.
* The reduced size of the stomach promotes satiety at an early and obese patient limits their calorie intake.

1. **Efficacy of the procedure**

Several research studies show a significant loss of total body weight in the duration of 12, 18 & 24 months. In mild obese female patients, according to the mean baseline, BMI was 33.3+/-4.5 kg /m2. At 12 & 18 months, the mean % of total weight loss (TWL) was 15.0 % and 14.9% respectively.

During the ESG procedure, no evidence of micro & macro nutrient deficiency occurred. In point fact, the patient experienced weight loss, decreased blood glucose levels, and decreased body compositions like triglyceride levels.

1. **Adverse Events**

During the ESG procedure, the patient experienced common to moderate types of adverse events such as

* Pain and Nausea immediately after the procedure
* Upper gastrointestinal bleeding
* Perigastric fluid collection
* Trapped gas
* Dehydration

1. **Discussion/Conclusion**

Endoscopic sleeve gastroplasty is a less invasive and effective therapy for moderately obese patients. this therapy reduces the risk of long-term health issues associated with obesity such as heart disease, stroke, hypertension, diabetes mellitus, osteoarthritis, sleep apnea, and fatty liver disease. These surgeries modify the lifestyle by reducing 15 to 20% of weight loss achieved in 12 to 24 months. Although these surgeries have potential safety profile chances to develop severe gastric bleeding and peri gastric fluid accumulation. These adverse events can be reversed with medication therapy. In conclusion, endoscopic sleeve gastroplasty surgeries are less invasive and potentially safe compared with other bariatric surgeries.

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