

Endo-Bariatrics: A Lesser-Known Management Strategy for Obesity Therapy in South Asia

Ketan Laxman Pakhale

*Bariatric & Metabolic Physician, Specialist in EndoBariatrics, International Aviation Medical Examiner
DGCA-India & FAA-USA, METABOL - Lifestyle Clinic for Metabolic Syndrome - Mumbai, D. Y. Patil University-Navi Mumbai.*

Abstract

Overweight and obese individuals are at an increased risk for chronic complications like diabetes mellitus, cardiovascular disease, liver disease, malignancies, sleep apnea, osteoarthritis, urinary incontinence, and psychosocial issues. The prevalence of is increasing globally and in South Asia. While traditional methods such as lifestyle modifications, pharmacotherapy, and surgical interventions are widely known, endoscopic bariatric therapies (EBTs) have emerged as a lesser-known yet promising alternative. This article delves into the role of EBT in comprehensive weight loss programs, discussing its mechanisms, types, procedures, and future prospects in the context of South Asian obesity therapy.

Keywords: Endo-Bariatrics, intragastric balloon, endoscopic bariatric therapy, obesity

Introduction

Overweight and obese individuals are at an increased risk for chronic complications like diabetes mellitus, cardiovascular disease, liver disease, malignancies, sleep apnea, osteoarthritis, urinary incontinence, and psychosocial issues. The prevalence of is increasing globally and in South Asia. While traditional methods such as lifestyle modifications, pharmacotherapy, and surgical interventions are widely known, endoscopic bariatric therapies (EBTs) have emerged as a lesser-known yet

Address for correspondence

Dr Ketan Laxman Pakhale
Bariatric & Metabolic Physician, Specialist in Endo-Bariatrics,
International Aviation Medical Examiner: DGCA India & FAA-USA
METABOL - Lifestyle Clinic for Metabolic Syndrome
DY Patil University, Navi Mumbai
E-mail: drketan.pakhale@metabolindia.com

promising alternative. This article delves into the role of EBT in comprehensive weight loss programs, discussing its mechanisms, types, procedures, and future prospects in the context of South Asian obesity therapy.

Comprehensive Weight Loss Program: Meeting Unmet Needs

EBT fits well within comprehensive weight loss programs, addressing unmet needs in obesity management. South Asia faces unique challenges, including a high prevalence of obesity

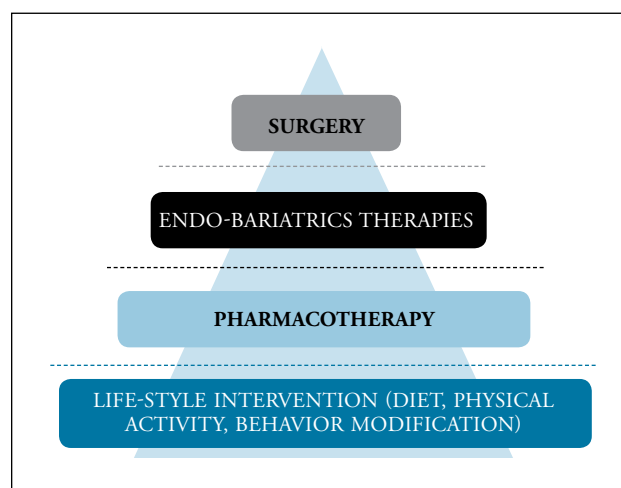


Diagram 1.

related comorbidities and limited access to health care resources. EBT offers a minimally invasive, cost-effective solution that can be tailored to individual patient needs, making it a logical progression in the fight against obesity.

Endoscopic Bariatric Therapy as a Logical Progression

EBT is a logical step forward in obesity management for several reasons:

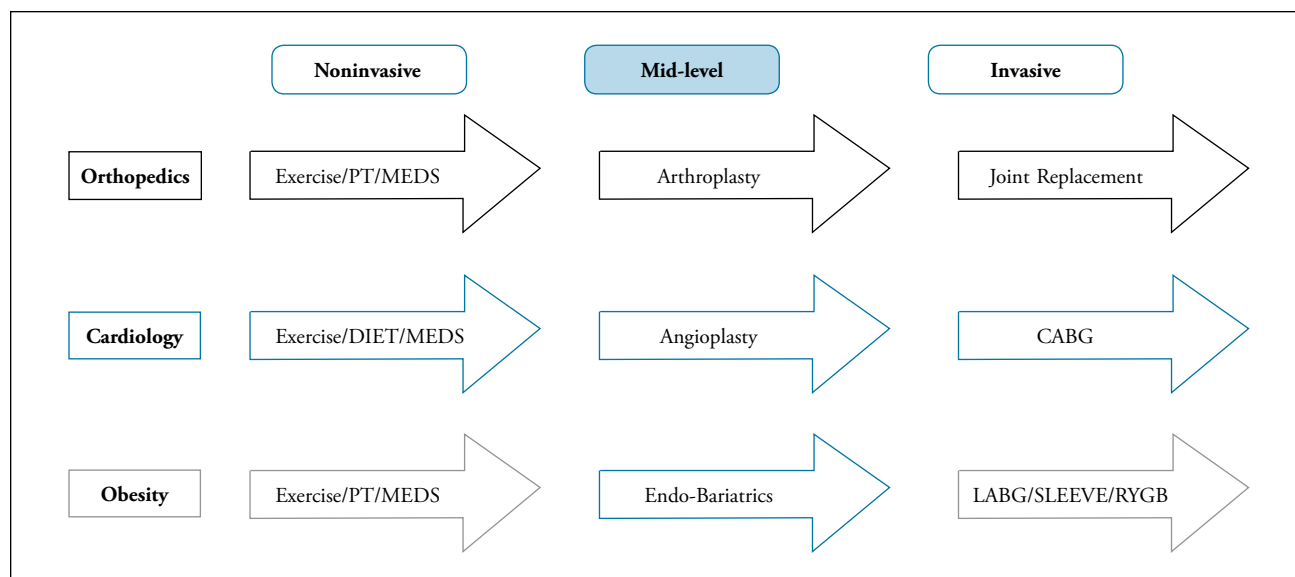


Diagram 2.

- Minimally Invasive: EBTs are performed using an endoscope inserted through the mouth, eliminating the need for incisions and reducing the risk of complications.
- Reduced Recovery Time: Patients benefit from shorter hospital stays and quicker recovery compared to traditional bariatric surgeries.
- Accessibility: EBT can be performed on patients who are not suitable candidates for surgery due to various health risks.
- Cost-effective: Generally, more affordable than surgical interventions, making EBT accessible to a broader population in South Asia.

Mechanism of Action of Endoscopic Bariatric Therapies

EBTs facilitate weight loss through mechanisms primarily involving restriction, malabsorption, and hormonal changes.

- Restriction: EBTs like intragastric balloons reduce the stomach’s capacity, promoting early satiety and decreasing food intake.
- Malabsorption: Certain procedures, such as EndoBarrier and endoluminal bypass, alter the digestive tract to reduce nutrient absorption.
- Hormonal Changes: Some EBTs induce hormonal changes that affect hunger and satiety signals, further aiding in weight loss.
- Restoration of Gut Microbiome: EBT induces weight loss through gastrointestinal (GI) and microbiome changes, restoring metabolic balance.

These mechanisms collectively contribute to significant weight loss and improvement in obesity-related conditions.

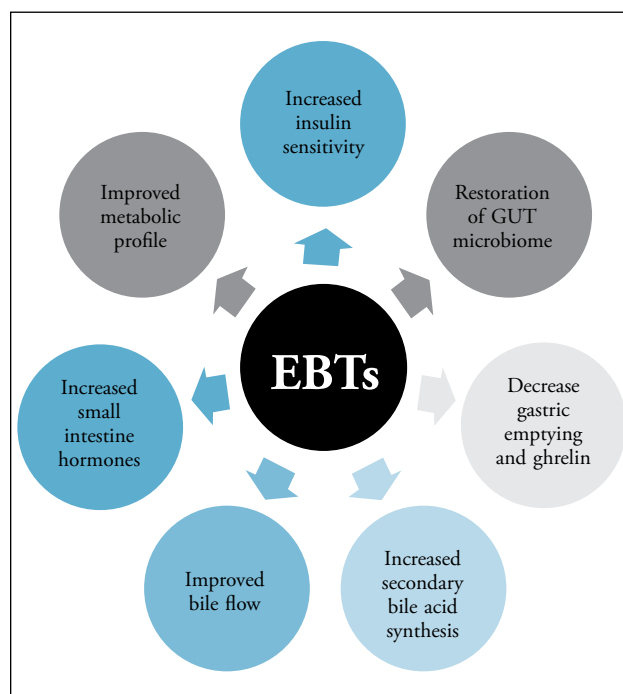


Diagram 3.

Types of Endoscopic Bariatric Therapies

Endo-bariatric therapy, short for endoscopic bariatric therapy, refers to minimally invasive medical procedures performed using an endoscope to address issues related to obesity and weight management.

Restrictive Procedures

Restrictive EBTs create physical barriers within the GI tract, obstructing food flow and delaying gastric emptying.

Table 1.

EBT Procedure	Definition	Example
Restrictive	Space-occupying balloons achieve restriction of the size of the gastric lumen. A balloon is filled with a methylene blue-saline solution to fill the stomach to induce early satiety.	Intragastric balloon (Spatz-3, Orbera®, ReShape™, Obalon®)
Malabsorption	A duodenal-jejunal bypass sleeve is opened at the duodenal bulb and extends into the small bowel. It creates a mechanical barrier that forces food to bypass the duodenum and proximal jejunum without mixing with pancreaticobiliary secretions, altering gut hormones.	Endoluminal malabsorptive device (EndoBarrier®)

- Intra-gastric Balloon (IGB): Intra-gastric balloon placement is a weight loss procedure that involves placing a saline-filled silicone balloon in your stomach.
- Transpyloric Shuttle (TPS): A device that obstructs the pylorus, delaying gastric emptying and promoting early satiety.

Malabsorption Procedures

Restrictive EBTs reduce the stomach's volume, leading to decreased food intake and early satiety. Major restrictive procedures include:

- Endoscopic Sleeve Gastroplasty (ESG): Sutures are used to create a sleeve-like shape in the stomach, significantly reducing its volume.
- Primary Obesity Surgery Endoluminal (POSE): Endoscopic sutures create folds in the stomach, reducing its capacity.
- EndoBarrier: A sleeve placed in the duodenum to prevent nutrient absorption in the upper small intestine.
- Endoluminal Bypass: Creates a bypass in the small intestine, reducing nutrient absorption.
- Duodenal Mucosal Resurfacing (DMR): Ablates the duodenal mucosa to alter nutrient sensing and absorption.

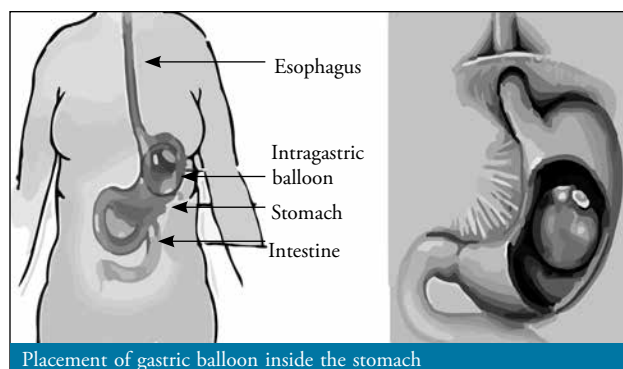


Diagram 4.

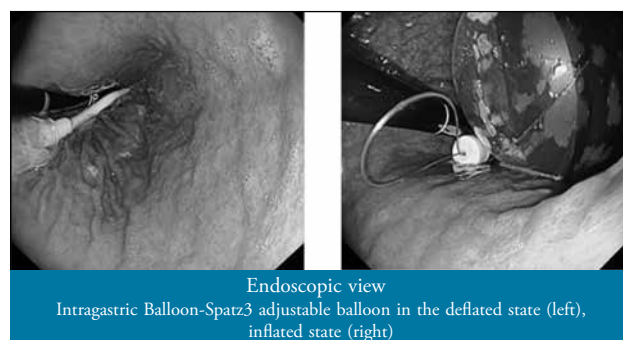


Diagram 5.

Procedures for Restrictive Procedures

Intra-gastric Balloon (IGB)

- Procedure: A deflated balloon is introduced into the stomach via an endoscope and then filled with normal saline. Temporary weight loss solution involving a gastric balloon that expands in the stomach, placed through a minimally invasive endoscopic procedure.
- Mechanism: Occupies space in the stomach, inducing early satiety, reducing food intake and making individual feel full faster.
- Duration: 12 months, after which the balloon is removed.
- Efficacy: Studies show an average weight loss of 10-15% of total body water (TBW), total body weight. An intra-gastric balloon requires commitment to a healthier lifestyle.

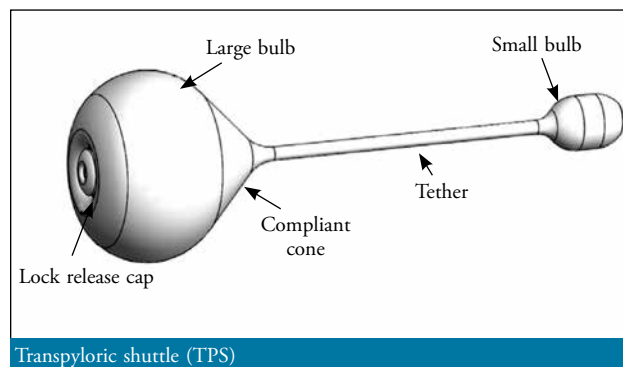


Diagram 6.

Transpyloric Shuttle (TPS)

- Procedure: An endoscopically placed device obstructs the pylorus, slowing gastric emptying.
- Mechanism: Prolongs the feeling of fullness and delays hunger.
- Duration: Can remain in place for up to a year.
- Efficacy: Demonstrates significant weight loss and improvement in metabolic parameters.

Procedures for Malabsorptive Endo-Bariatric Therapy

Endoscopic Sleeve Gastroplasty (ESG)

- Procedure: The stomach is sutured using an endoscope to create a sleeve, mimicking the surgical sleeve gastrectomy but without incisions.

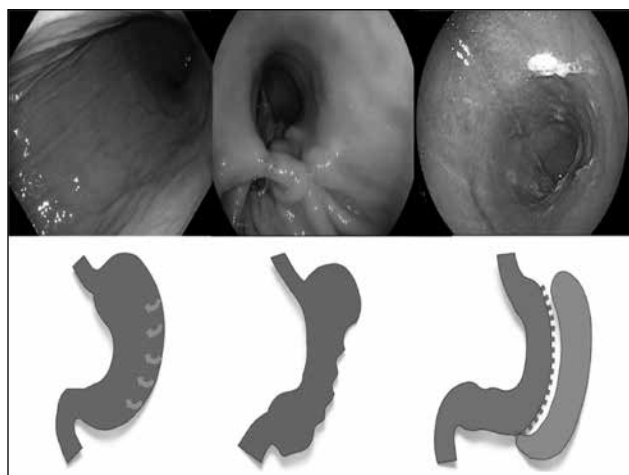


Diagram 7.

- Mechanism: Reduces stomach volume, leading to early satiety and decreased calorie intake.
- Duration: Permanent, with sutures designed to last.
- Efficacy: Patients typically lose 15-20% of their total body weight within a year.

Primary Obesity Surgery Endoluminal (POSE)

- Procedure: Endoscopic sutures create folds in the stomach, reducing its capacity.

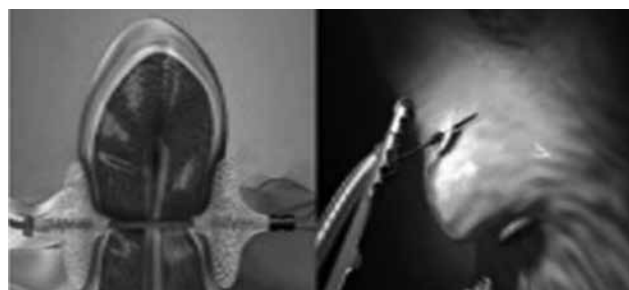


Diagram 8.

Table 2. Malabsorptive EBT Studies

Device	Weight Loss %	FDA Approval	Complications
EndoBarrier	TWL: N/A EWL: 12.6%	No	Bleeding, device migration, cholestasis, pancreatitis
Endoluminal bypass	TWL: N/A EWL: 54%	No	Bleeding, stomal/marginal ulcers, stomal stenosis, leaks, fistulas, pancreatobiliary disorder
Duodenal mucosal resurfacing	TWL: N/A EWL: N/A	No	Abdominal pain

- Mechanism: Limits the amount of food the stomach can hold, promoting early satiety.
- Duration: Permanent alterations to stomach structure.
- Efficacy: Results in an average weight loss of 10-15% of TBW total body weight.

EndoBarrier

- Procedure: A sleeve is placed in the duodenum to block nutrient absorption in the upper small intestine. The EndoBarrier, a 60 cm fluoropolymer sleeve, is endoscopically placed in the duodenum for up to 12 months, functioning as a duodenojejunal bypass liner. This

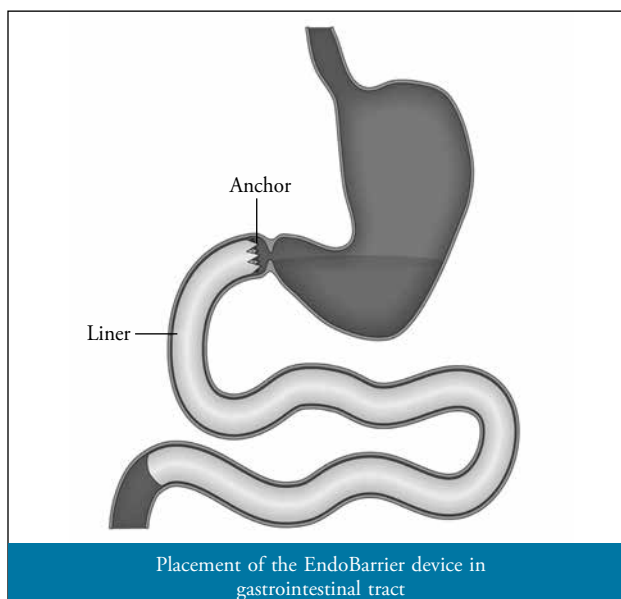


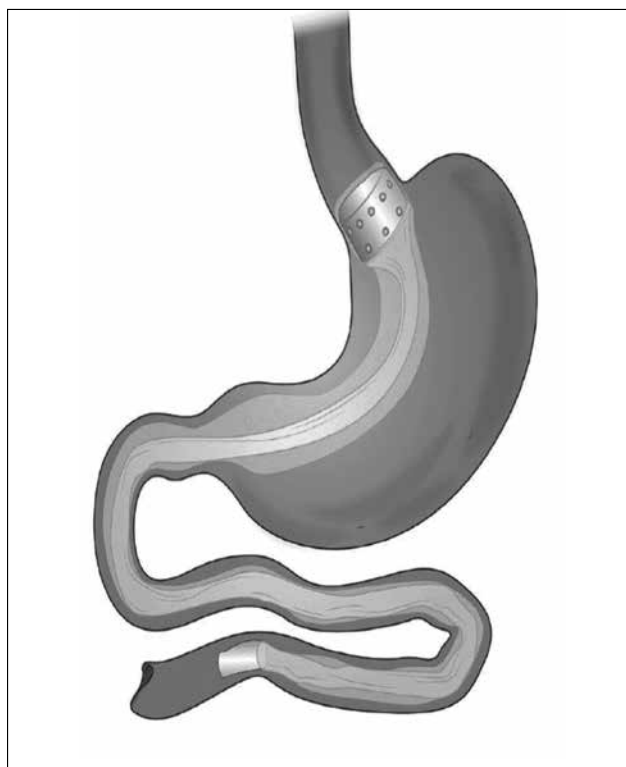
Diagram 9.

device aims to mimic the intestinal bypass component of RYGB.

- Mechanism: Prevents absorption of nutrients and calories.
- Duration: Up to 12 months.
- Efficacy: Significant weight loss and improvement in metabolic parameters. In a pilot study EndoBarrier implantation resulted in mean weight loss of 11.1% decrease from baseline. Positive outcomes observed in glycemic control, blood pressure, and cholesterol levels.

Endoluminal Bypass

- Procedure: Creates a bypass in the small intestine, reducing the surface area for nutrient absorption. This sleeve is anchored at the gastroesophageal junction, and upon deployment, it extends through the pylorus into the duodenum and proximal jejunum.
- Mechanism: Limits the calories and nutrients absorbed from food.
- Duration: Varies, often tailored to patient needs. In a pilot study, the device demonstrated weight loss efficacy with

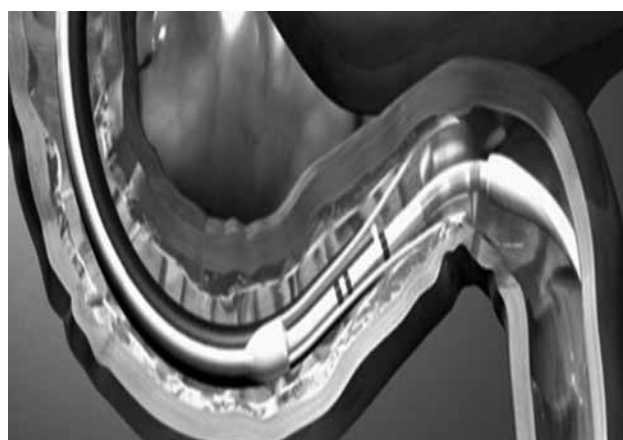


Gastro-duodeno-jejunal bypass sleeve

Diagram 10.

a mean total body weight loss of 14.6% over a 12-week treatment period.

- Efficacy: Effective in promoting weight loss and managing obesity related comorbidities.



Graphical representation of duodenal mucosal resurfacing

Diagram 11.

Duodenal Mucosal Resurfacing (DMR)

- Procedure: Duodenal mucosa lifted by saline to create thermal barrier protecting deeper tissues. Circumferential ablation through thermal exchange (hot water). Follow-up endoscopies and duodenal biopsies at 1 month and 3 month document mucosal healing.
- Mechanism: Changes the hormonal signals related to hunger and satiety.
- Duration: Effects can be long-lasting but may require repeat procedures.
- Efficacy: DMR hydrothermal ablation in the duodenum offers a beneficial metabolic response and improves hepatic indices, possibly via an insulin-sensitizing mechanism, in patients with T2DM.

Diagrammatic Presentation of FDA Endo-Bariatrics Therapies

Future Prospects: Endo-Bariatrics and Multidisciplinary Teams

The future of EBTs is bright, with ongoing research and technological advancements poised to enhance their efficacy and accessibility. Key futuristic approaches include:

- Combination Therapies: Integrating EBT with pharmacotherapy and lifestyle interventions to achieve synergistic effects.
- Personalized Medicine: Tailoring endoscopic treatments based on individual patient profiles for optimized results.
- Enhanced Multidisciplinary Approach: Collaborating with nutritionists, psychologists, and physical therapists to provide comprehensive care and support, addressing both the physical and psychological aspects of obesity.

Conclusion

EBTs play a crucial role in weight management for obese patients, serving as a link between pharmacotherapy and

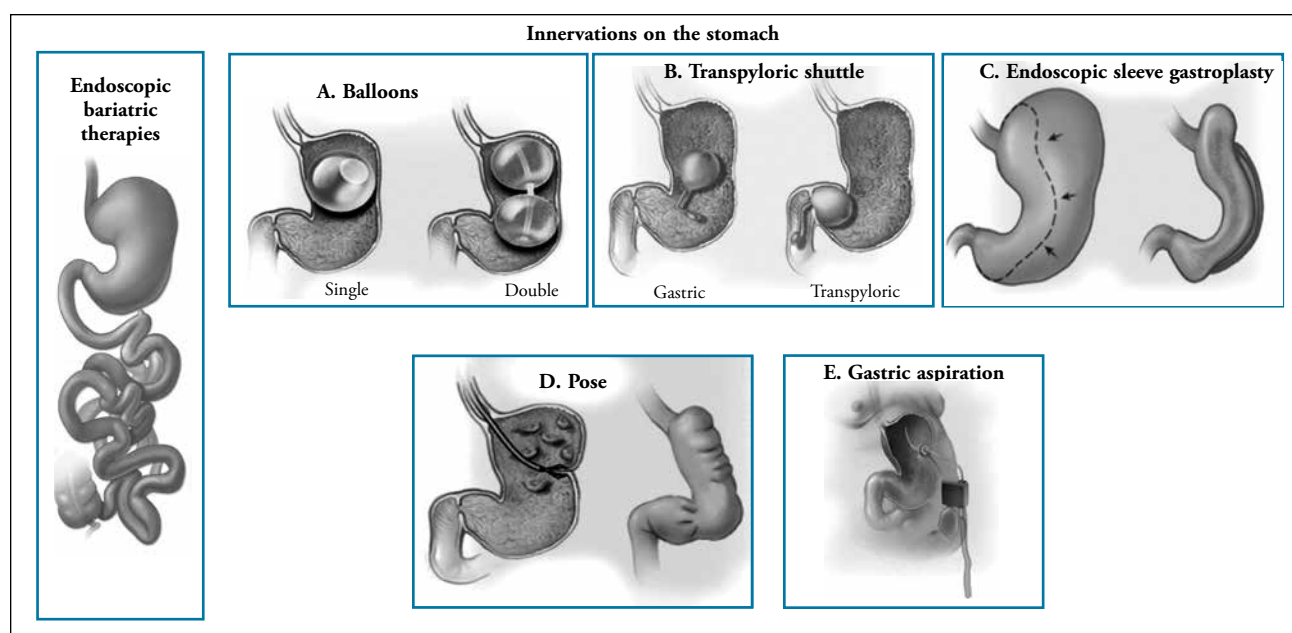


Diagram 12

traditional bariatric interventions, particularly in South Asia where the burden of obesity is growing. These minimally invasive procedures offer a viable alternative to traditional bariatric surgery, providing effective weight loss solutions with reduced risks and costs. The current approvals mark a substantial progress, and ongoing discussions for future US

FDA endorsements underscore the evolving role of these devices in treating obesity. Endo-Bariatrics play a crucial role in weight management for obese patients, serving as a link between pharmacotherapy and traditional bariatric interventions. Endo-Bariatrics present a versatile approach, offering a promising solution to the intricate challenges of obesity.

Suggested Reading

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