

Intragastric Balloon Placement as an Effort for Weight Reduction in Morbid Obesity Cases

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KEYWORDS

intragastric balloon, endoscopy, bariatric, obesity, weight loss.

ABSTRACT

In The background: The term "morbid obesity" refers to cases of obesity with a body mass index (BMI) ≥ 35 kg/m² accompanied by health conditions related to obesity. Intragastric balloon placement is a non-surgical endoscopic bariatric therapy for obesity. We present a case of morbid obesity that underwent intragastric balloon placement.

Case report: A 36-year-old woman experienced continuous weight gain over the past 10 years. Various attempts to lose weight had been made, but none were successful. She reported worsening heartburn over the last 3 months, which did not improve with medication. The BMI was calculated at 35.6 kg/m². Gastroscopy revealed mucosal hyperemia in the distal one-third of the esophagus, concluding that the patient had esophagitis. An intragastric balloon was placed via endoscopy, and the patient followed a special diet after the procedure. One month after placement, a weight loss of 9 kg was observed, and her heartburn complaints had significantly improved.

Conclusion: We report a case of morbid obesity that improved following intragastric balloon placement. This non-surgical endoscopic bariatric procedure is the first of its kind performed in Surabaya.

1. Introduction

The term morbid obesity is used in cases of obesity with a body mass index ≥ 35 kg/m² accompanied by health problems related to obesity. Obesity-related health conditions include metabolic disorders (diabetes mellitus, dyslipidemia), cardiovascular disorders (hypertension, coronary heart disease, heart failure, myocardial steatosis, atrial fibrillation), stroke, venous thromboembolism, musculoskeletal disorders (osteoarthritis, gout), gastrointestinal disorders (hepatobiliary disease, GERD), reproductive disorders (infertility, abnormal uterine bleeding, endometrial hyperplasia, polycystic ovarian syndrome, uterine fibroids, endometriosis, sexual dysfunction), genitourinary disorders (chronic kidney disease, kidney stones, urinary incontinence), psychosocial dysfunction (depression, dementia), respiratory disorders (obstructive sleep apnea, asthma, obesity hypoventilation syndrome), infections, and skin changes (striae, acanthosis nigricans, hirsutism) (1).

Intragastric balloon placement is a non-surgical endoscopic bariatric therapy in cases of obesity. Intragastric balloon therapy may be an option for obese individuals who have failed to achieve weight management through lifestyle modification (2). There are several types of balloons according to the material, volume, duration of therapy, and method of installation. These balloons are currently available and have been approved by Food and Drug Administration (FDA) including Orbera, obalon, ellipse, Reshape Duo, and Spatz (3).

We present a case of morbid obesity that underwent intragastric balloon placement as an attempt to reduce weight. This action is the first in Surabaya.

2. Case Illustrations

A 36-year-old woman whose weight has continued to increase for the last 10 years. Various efforts to lose weight, such as diet and physical exercise, have been carried out, but have not produced results. There is a complaint of heartburn which has been getting worse since the last 3 months and has not improved with the administration of mentosa medication. The patient had no history of hypertension, diabetes mellitus, or previous history of bariatric surgery.



Figure 1. Clinical photo of the patient before the intragastric balloon procedure

On physical examination, body weight was 86.8 kg, TB was 156 cm, and BMI was 35.6 kg/m². Blood pressure 110/70 mmHg. Abdominal circumference 113 cm. There is pressure pain in the epigastrum region.

Laboratory examination showed good results for the metabolic panel.

Table 1. Laboratory Results

Laboratory	
SGOT	29 U/L
SGPT	34 U/L
Creatinine	0,7 mg/dL
Triglycerides	72 mg/dL
Total cholesterol	136 mg/dL
HDL	38 mg/dL
LDL	85 mg/dL
GDP	105 mg/dL
GD2JPP	99 mg/dL

On gastroscopic examination, patchy hyperemia was found in the oropharynx and hyperemic mucosa in the distal 1/3 of the esophagus, which was concluded as esophagitis. There were no visible abnormalities in the stomach.

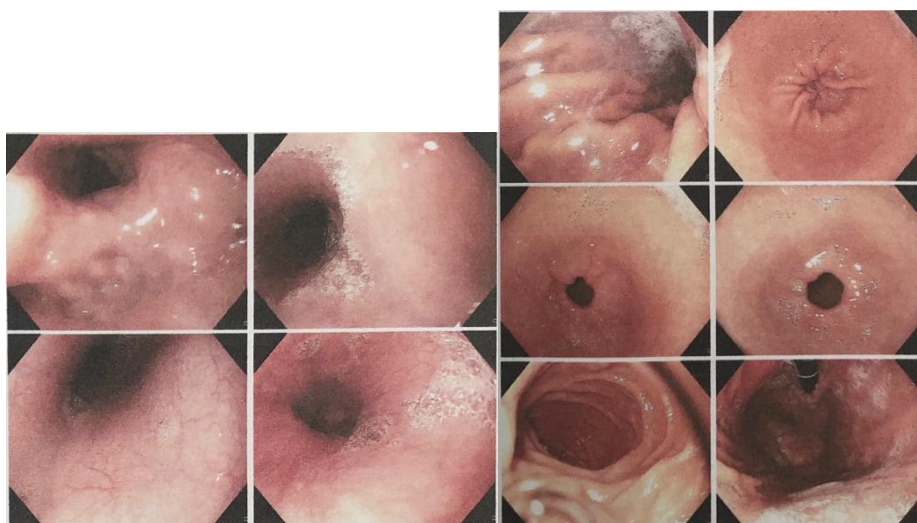


Figure 2. Results of Gastroscopy Examination

The patient underwent an intragastric balloon placement using the SPATZ balloon type via endoscopy.



Figure 3. SPATZ components

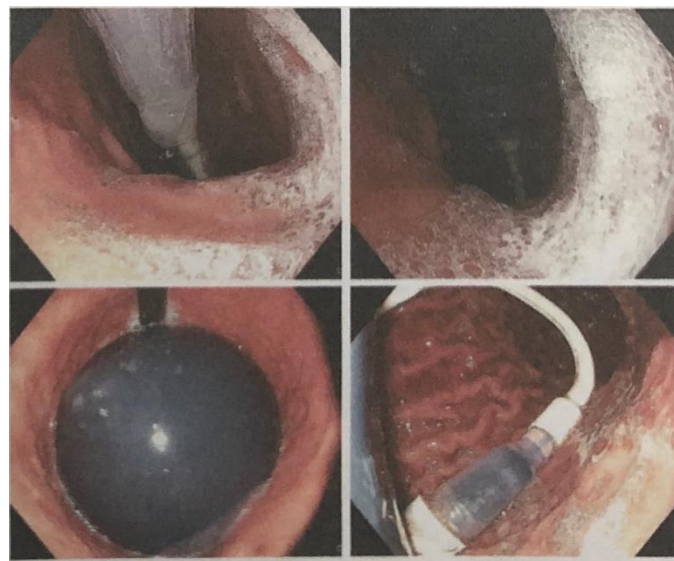


Figure 4. Intragastric Balloon Installation

Post Installation Evaluation

(The first week)

In the first week after the procedure, the patient complained of nausea, vomiting, heartburn and reflux. The patient is given Proton Pump Inhibitor (PPI), antispasmodic, and antiemetic. Patients undergo a special diet after intragastric balloon installation.

On the first day, only clear liquids are allowed (clear liquid) to avoid dehydration, such as mineral water, tea, juice without pulp, clear soup, and ice cream. Drink slowly, half a glass every 2 hours. Avoid drinking with a straw. Avoid fizzy drinks. On the second to third day, it is allowed to drink dairy products (liquid-dairy), such as milk, coffee, low-fat milk, 5% white cheese, yogurt without fruit pieces and sugar, etc. It is recommended to avoid drinking chocolate milk or eating chocolate. Eat small amounts at each meal, around 2-3 teaspoons. Continue drinking clear fluids throughout the day, slowly and gradually, 5-8 glasses per day, to avoid dehydration. During days three to seven, patients undergo phase 1 of the diet.

(Second Week)

In the second week of evaluation after the procedure, the patient had no complaints of nausea and vomiting and the heartburn had reduced. Reflux complaints are still felt. The patient continued taking PPIs and continued the transition phase diet. The patient begins to undergo physical exercise independently.

(The third week)

In the third week of evaluation after the procedure, reflux complaints decreased. The patient was still given PPI and continued the phase 2 diet as recommended by SPATZ. Eat slowly and chew more. Stop eating when you feel full. Intolerance to vegetables and beef can occur during this period. It is recommended to drink between meals (finish drinking 15 minutes before eating and drink again 30 minutes after eating). Stop eating and

drinking caffeinated drinks 3 hours before bed. If after consuming certain foods you experience complaints such as bloating, stomach pain, heartburn, nausea, belching, it is recommended not to eat them.

(Fourth Week)



Figure 5. Comparison of clinical photos of patients before and after the intragastric balloon procedure

At the evaluation 1 month after the procedure, the results of the patient's physical examination showed BB 77.8 kg, TB 156 cm, BMI 31.9 kg/m², and abdominal circumference 98 cm. When compared with the physical examination before installation of the intragastric balloon, it was found that the weight loss was 9 kg and the abdominal circumference was 15 cm. Previous complaints have improved significantly. The patient continued with phase 2 of the diet.

3. Discussion

orbidity and mortality are associated with body weight. Body mass index (BMI) ≥ 30 kg/m² categorized as obese (3). The higher the BMI, the greater the morbidity and mortality associated with obesity. Obesity in adults is associated with a significant reduction in life expectancy, especially in individuals who were obese when they were young (< 40 years) (4). Excess weight contributed to 4 million deaths globally in 2015.

By reducing weight, either surgically or non-surgically, it will improve comorbidities and complications of obesity and reduce overall mortality. Individuals with a BMI of 35-40 kg/m², especially those aged 20 to 39 years, are at high risk of obesity-related complications. Individuals in this risk category should use an aggressive therapeutic approach to lose weight (5).

There are several types of devices that are approved for use in obesity therapy if conventional therapy is ineffective, conventional therapy cannot be tolerated, the patient is unable/unwilling to undergo bariatric surgery, or as a bridge before bariatric surgery. However, safe and effective weight loss therapy is not accessible to everyone and not every patient is a good candidate. Endoscopic intragastric balloon therapy is a temporary (maximum 1 year for SPATZ balloon type) and minimally invasive method for weight loss. (6). This therapy is available in Surabaya.

The procedure for installing an intragastric balloon is by inserting a balloon filled with blue colored saline into the stomach through an endoscope (7). Placement of this balloon causes gastric restriction thereby increasing the feeling of fullness without changing the anatomy of the stomach (8). The indication for the use of an intragastric balloon is in individuals with a BMI of 30-40 kg/m² with 1 or more obesity-related comorbidities or unsuccessful lifestyle modifications (9). Contraindications for intragastric balloon placement include absolute contraindications (history of gastric surgery, coagulation disorders, active upper gastrointestinal bleeding, pregnancy, alcoholism, severe liver disease) and relative contraindications (history of abdominal surgery, hiatal hernia, inflammatory bowel disease, long-term use of NSAIDs, uncontrolled psychiatric illness) (10).

Evaluation after installation of an intragastric balloon is an important phase to pay attention to. In the first 48 hours, 90% of patients will complain of nausea and 72% will complain of vomiting. The next most common complaint is pain in the epigastric region and left hypochondriac in 50% of cases and reflux in 18% of cases. (11). PPI agents, antispasmodics and antiemetics can be given to reduce complaints. Avoid administering NSAIDs because they can increase the risk of gastrointestinal bleeding. If the urine color is found to be bluish, this indicates an intragastric balloon leak because the saline in the balloon is dyed blue. Evaluation via endoscopy must be carried out immediately if this occurs.

Intragastric balloons can produce a total weight loss of 6-15% (12). Although intragastric balloons are safe and effective in treating short-term obesity, they are temporary. To maintain weight loss after the balloon is removed, lifestyle modifications in the form of diet and regular physical exercise need to be carried out from the time the balloon is installed.

Diet needs to be paid attention to, especially in the first month after installation of an intragastric balloon. According to the guidelines for the SPATZ balloon type, there are 3 phases of the diet, namely phase 1, transition phase, and phase 2 (13). Phase 1 diet is the period immediately after installation, starting from the first day until the end of the first week. The transition phase diet starts from the second week to the third week. Phase 2 diet starts from the third week to the fourth week. Below is the type of food that can be consumed and what should be avoided at each phase.

Table 2. Phase 1 Diet Food List (Days 4-7) SPATZ Intragastric Balloon

FOOD GROUPS	FOOD YOU CAN EAT	FOOD YOU SHOULD AVOID EATING
Drinks/Soups 	- Water, Decaffeinated tea and coffee - between meals. Take small sips, drink at a slow pace - Tea and coffee that contain caffeine - without added sugar. Take small sips, between meals * Coffee / tea with caffeine should be avoided 3 hours before bedtime. - Non-carbonated diet drinks - *You can drink in moderation - Clear, low-fat chicken soup - Ground Vegetable soup -carrot zucchini, or well-ground pumpkin	- Sodas - Sugary-sweetened beverages - Alcohol- wine/beer etc. - Energy drinks - Vegetable soup - Soups based on legumes-peas, beans, etc. - Creamy soups
Meat/Fish/ Eggs/Cheese 	- Cooked patty/burger about 50 g - Salmon about 50 g - 1 chicken shank (without skin) - Scrambled egg - White cheese up to 5%	- Roasted chicken - Fried dishes such as: schnitzel, chicken nuggets etc. - Processed meat products such as: sausage, hamburger, kebab, pastrami - Beef - Legumes, tofu - Cottage cheese - Cheese with olives - Bulgarian or Hard cheeses
Milk/Yogurt 	- Milk - Soy milk without added sugar - Yogurt (without pieces) - Lowfat yogurt - Yogurt-based drink without added sugar	- Chocolate milk - Cream for coffee - Sugary milk sugars - Sour cream - Yogurt with fruit pieces - Chocolate-flavored dairy puddings - Probiotic Yogurt such as "Activia"

FOOD GROUPS	FOOD YOU CAN EAT	FOOD YOU SHOULD AVOID EATING
Vegetables 	- Peeled cucumber (Be sure to chew well) - Zucchini, carrots, pumpkin cooked - 1-2 tablespoons at a meal	- Vegetables - Salads - Cooked vegetables - Pickled vegetables
Fruits 	- ½ to 1 Baked or boiled apple or pear	- Fresh fruit - Dried fruit - Fruit-based drinks and smoothies
Grains/Nuts 	- Crackers -1-2 pcs - White bread or flatbread -1 slice - Mashed potatoes / sweet potatoes - 1-2 tbsp - White rice / pasta / quinoa - 1-2 tbsp	- Wholewheat bread - Wholewheat crackers - Cereal - Oats, granola - Brown rice, whole wheat pasta - Bulgur, buckwheat - Nuts
Fats 	- Tahini-1-2 tbsp - Oil – in small amounts - Avocado-1-2 tbsp	- Olives - Mayonnaise - Hummus - Salad Dressing - Margarine, butter - Fried food
Sweets/Desserts/ Snacks 	- Jam without added sugar - Low-fat, pieces free yogurt - Low fat frozen yogurt – in measured amounts	- Chocolate - Cakes, cookies - Energy bars - Pretzel, Popcorn, potato chips, etc. - Candy and chewing gum

Table 3. Transition Phase Diet Food List (Weeks 2-3) SPATZ Intragastric Balloon

FOOD GROUPS	FOOD YOU CAN EAT	FOOD YOU SHOULD AVOID EATING
Drinks/Soups 	- Water, Decaffeinated tea and coffee - between meals. Take small sips. Drinking at a slow pace. - Tea and coffee that contain caffeine - without added sugar. Take small sips, between meals. - * Coffee / tea with caffeine should be avoided 3 hours before bedtime. - Non-carbonated diet drinks- You can drink in moderation. - You can drink seltzer after a meal. - Low-fat chicken soup - vegetable soup	- Sodas/Sugar-sweetened beverages - Energy drinks - Alcohol- wine, beer etc. - Soups based on legumes-peas, beans, etc. - Creamy soups
Meat/Fish/Eggs/ Cheese 	- Cooked chicken / turkey - about 100 g - Cooked or baked fish - about 100 g - Canned tuna (low fat) -1 cup - Scrambled egg - Hard-boiled egg - Tofu - 100 g - All types of cheese up to 5%	- Beef - Fried meat dishes such as: schnitzel, patty, chicken nuggets etc. - Processed meat products such as: sausages/hotdog, pastrami, hamburger - Legumes - Smoked fish
Milk/Yogurt 	- Milk - Chocolate without added sugar - Yogurt (without pieces) - Low in fat dairy puddings - no sugar and no pieces, - - Low-fat yogurt	- Sugary milk - Cream for coffee - Sour cream - Sweet cream - Yogurt with fruit pieces

FOOD GROUPS	FOOD YOU CAN EAT	FOOD YOU SHOULD AVOID EATING
Vegetables 	- You can start incorporating most types of vegetables gradually (other than those listed in the 'foods to avoid' section, to the right) - 2-3 tablespoons of vegetables	- Celery, mushrooms, cabbage, cauliflower, broccoli, kale, radish, kohlrabi - Pickled vegetables
Fruits 	- You can start incorporating most types of fruit gradually (other than those listed in the column to the right)	- Persimmon, fresh and canned pineapple - Citrus fruits - orange, tangerine, grapefruit, pomelo, Red grapefruit, lemon - Cherries, mango - Dried Fruit - Fruit-based drinks and smoothies
Grains/Nuts 	- Bread from a white flour -1 slice - Crackers -2 pcs - Low-fiber cracker - 2-3 pieces - Low-fiber, sugar-free breakfast cereals - in measured quantities	- Wholewheat bread - Wholewheat crackers - Cereal - Oats, granola - Brown rice, whole-wheat pasta - Bulgur, buckwheat
Fats 	- Oil - in measured quantity - Tahini, avocado, chickpeas-1-2 tbsp - Mayonnaise light - Light salad dressings - Olives-in measured quantities	- Wholewheat breads - Wholewheat crackers - Oats, granola - Whole grains - Whole rice and couscous - Wholewheat pasta
Sweets/Desserts/ Snacks 	- Jam without added sugar - Low-fat, pieces free Yogurt - Low-fat frozen Yogurt – in measured amounts	- Energy bars that are rich in dietary fiber - Cakes, cookies and pastries - High-fat snacks such as: French fries, Doritos, potato chips etc. - Popcorn - Candy or chewing gum

Table 4. Phase 2 Diet Food List (Weeks 3-4) SPATZ Intragastric Balloon

FOOD GROUPS	FOOD YOU CAN EAT	FOOD YOU SHOULD AVOID EATING
Drinks/Soups 	- Water, Decaffeinated tea, and coffee - between meals. Take small sips. Drinking at a slow pace. - Tea and coffee that contain caffeine - without added sugar. Take small sips, between meals. - * Coffee / tea with caffeine should be avoided 3 hours before bedtime. - Non-carbonated diet drinks- You can drink in moderation. - You can drink seltzer after a meal. - Low-fat chicken soup - vegetable soup	- Sodas/Sugar-sweetened beverages - Energy drinks - Alcohol- wine, beer, etc. - Soups based on legumes-peas, beans, etc. - Creamy soups
Meat/Fish/Eggs/ Cheese 	- Cooked chicken / turkey - about 100 g - Cooked or baked fish - about 100 g - Canned tuna (low fat) -1 cup - Scrambled egg - Hard-boiled egg - Tofu - 100 g - All types of cheese up to 5%	- Beef - Fried meat dishes such as: schnitzel, patty, chicken nuggets, etc. - Processed meat products such as: sausages/hotdog, pastrami, hamburger - Legumes - Smoked fish
Milk/Yogurt 	- Milk - Chocolate without added sugar - Yogurt - low in fat - Dairy puddings- sugar-free, low-fat - Yogurt-based drink without added sugar	- Sugary milk - Cream for coffee - Sour cream - Sweet cream - Yogurt with fruit pieces - Probiotic Yogurt such as "Activia"

FOOD GROUPS	FOOD YOU CAN EAT	FOOD YOU SHOULD AVOID EATING
Vegetables 	- You can start incorporating most types of vegetables gradually (other than those listed in the foods to avoid' section, to the right) - 2-3 tablespoons of vegetables	- Celery, mushrooms, cabbage, cauliflower, broccoli, kale, radish, kohlrabi - Pickled vegetables
Fruits 	- You can start incorporating most types of fruit gradually (other than those listed in the column to the right)	- Persimmon, fresh and canned pineapple - Citrus fruits - orange, tangerines, grapefruit, pomelo, red grapefruit, lemon - Cherries, mango - Dried Fruit - Fruit-based drinks and smoothies
Grains/Nuts 	- Bread from white flour -1 slice - Crackers -2 pcs - Low-fiber cracker - 2-3 pieces - Low-fiber, sugar-free breakfast cereals - in measured quantities - Rice, pasta, mashed potatoes, sweet potato, quinoa, bulgur, buckwheat - up to 2 tbsp - Nuts-in measured quantities	- Wholewheat breads - Wholewheat crackers - Oats, granola - Whole grains - Whole rice and couscous - Wholewheat pasta
Fats 	- Oil - in measured quantities - Tahini, avocado, chickpeas-1-2 tbsp - Mayonnaise light - Light salads dressings	- Fried food - Salad dressings - Mayonnaise - Butter, margarine
Sweets/Desserts/ Snacks 	- Jam without added sugar - Low-fat, sugar-free Yogurt - Chocolate (over 60% solid cocoa) - in measured quantities - Pretzels in measured quantities	- Energy bars that are rich in dietary fiber - Cakes, cookies, and pastries - High-fat snacks such as French fries, Doritos, potato chips, etc. - Popcorn - Candy or chewing gum

4. Conclusion

We report a case of morbid obesity who underwent endoscopic intragastric balloon placement and underwent a special diet post-insertion. There was a weight loss of 9 kg, a reduction in abdominal circumference of 15 cm, and complaints of heartburn had improved significantly at 1 month post-treatment monitoring. This non-surgical bariatric endoscopic procedure is the first to be carried out in Surabaya.

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